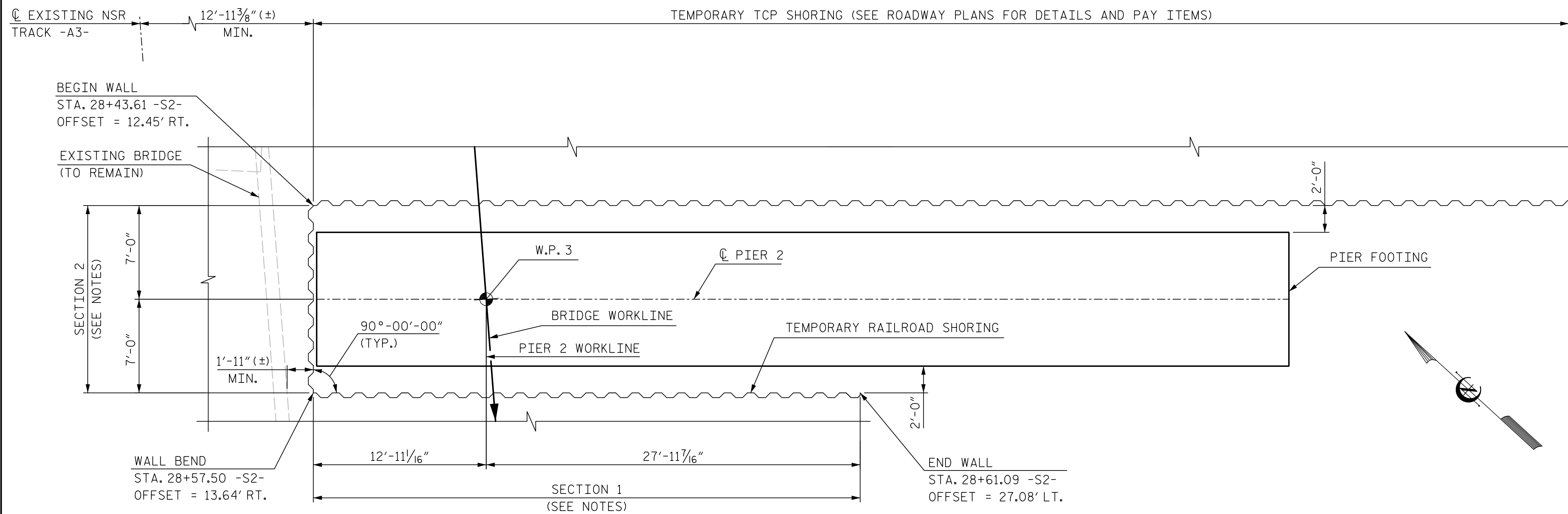


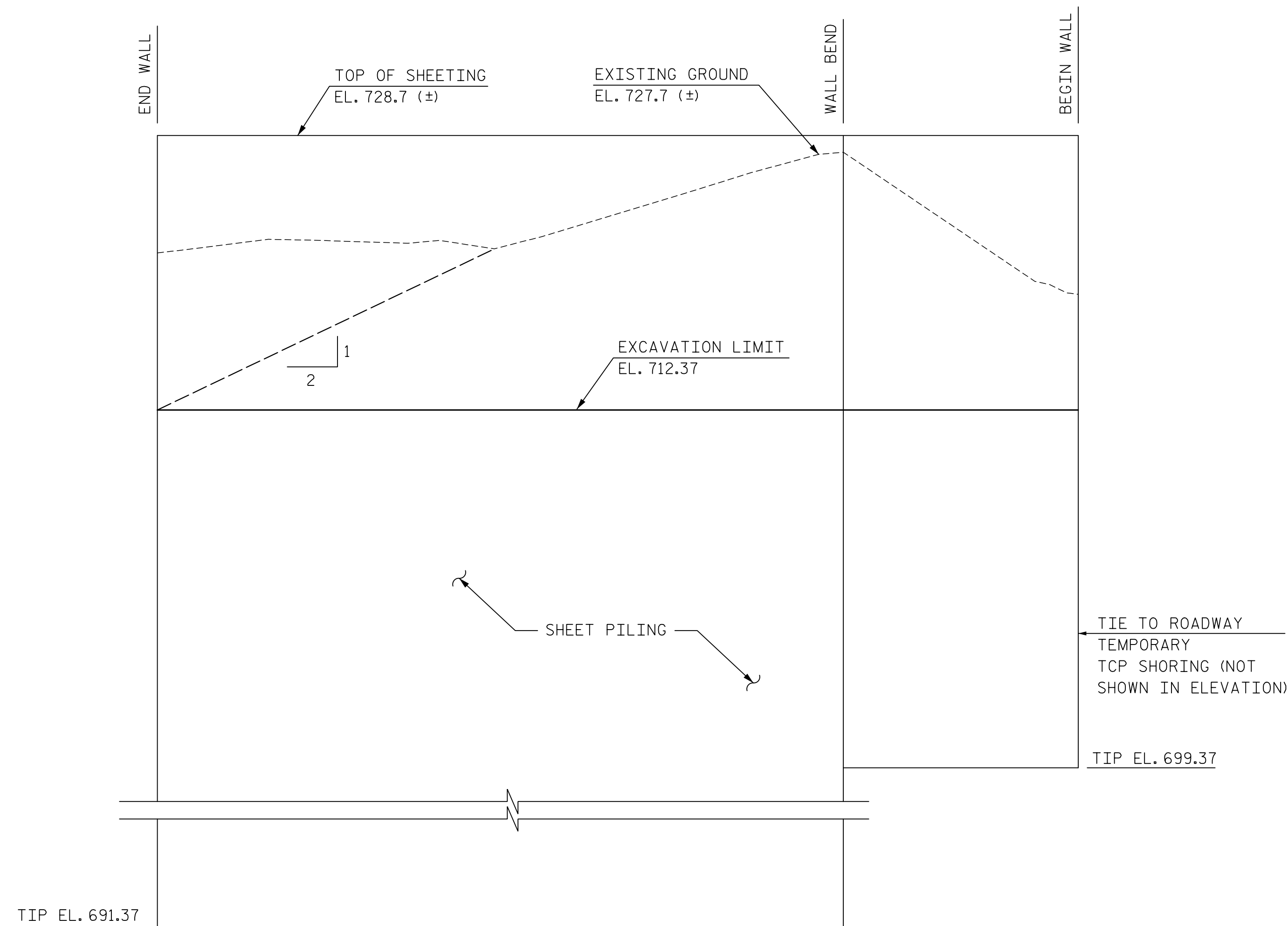
**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

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

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



TEMPORARY SHORING PLAN



TEMPORARY SHORING ELEVATION
(LOOKING AWAY FROM FOOTING)

NOTES:

SHORING HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

MAXIMUM WALL DEFLECTION LIMITED TO 1/2".

ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.

SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL (HOT ROLLED) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

SECTION 1:
MOMENT OF INERTIA/FT. 656.2 in⁴
SECTION MODULUS/FT. 66.8 in³

SECTION 2:
MOMENT OF INERTIA/FT. 156.9 in⁴
SECTION MODULUS/FT. 23.2 in³

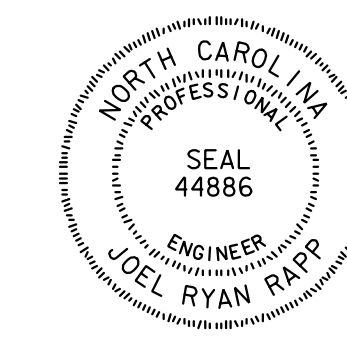
ASSUMED SOIL PARAMETERS
COARSE GRAINED SOILS:
SOIL MOIST UNIT WEIGHT - 120 PCF
SOIL FRICTION ANGLE - 30 DEGREES
UNDRAINED SHEAR STRENGTH - 0 PSF

* CONSTRUCTION SEQUENCE:

1. INSTALL SHORING TO REQUIRED TIP ELEVATION.
2. EXCAVATE TO EXCAVATION LIMIT SHOWN.
3. CONSTRUCT PROPOSED PIER.
4. BACKFILL PROPOSED PIER.
5. REMOVE SHORING.

* COMPLETE SHORING REMOVAL PRIOR TO ABUTMENT 2 EMBANKMENT CONSTRUCTION AND PILE INSTALLATION.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

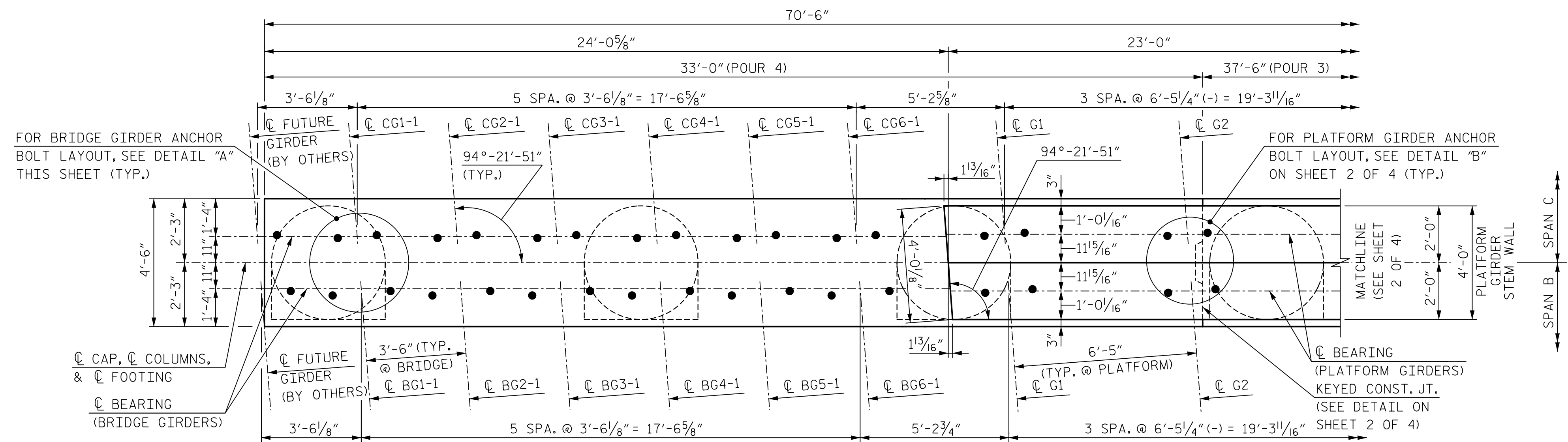


DocuSigned by:
2/21/2018

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
PIER 2
SHORING

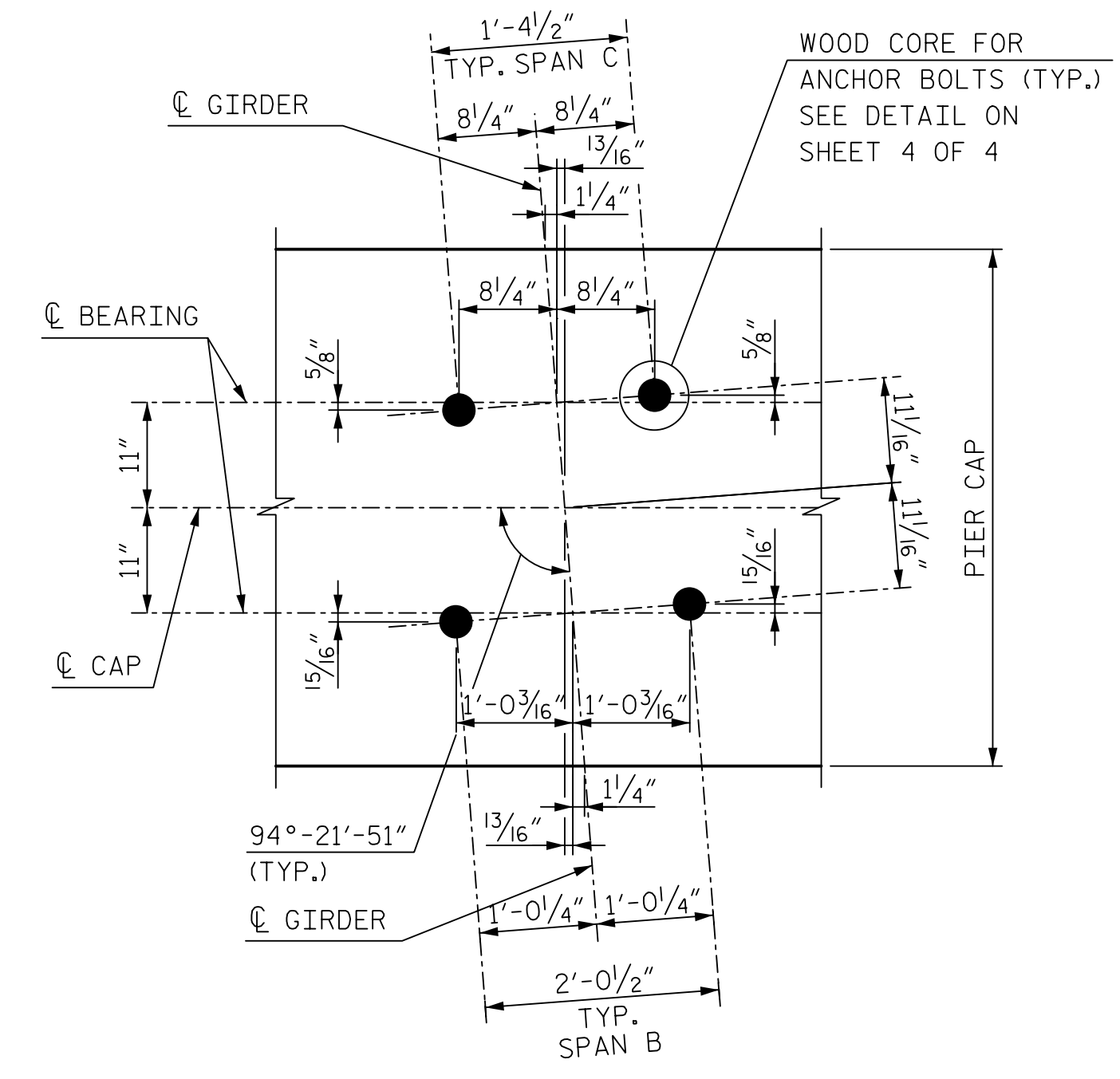
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 34		SHEET NO. S7-34	
DRAWN BY <u>B. VAUGHN</u>		DATE <u>10/17</u>		TOTAL SHEETS		51	
CHECKED BY <u>L. RAPP</u>		DATE <u>10/17</u>		REVISIONS			
				NO.		BY	
				DATE			
				NO.		BY	
				DATE			



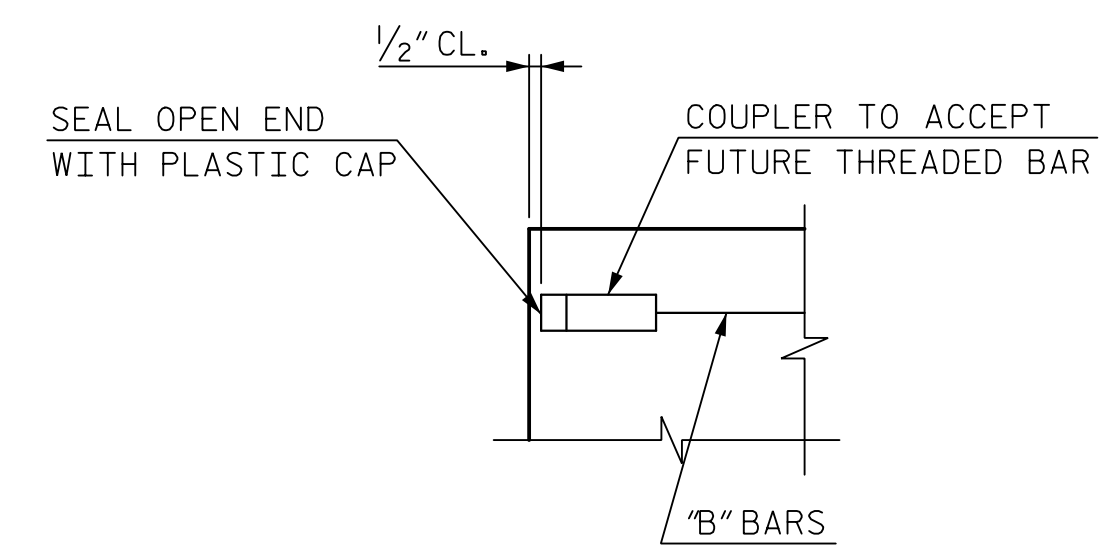
PLAN

NOTES:

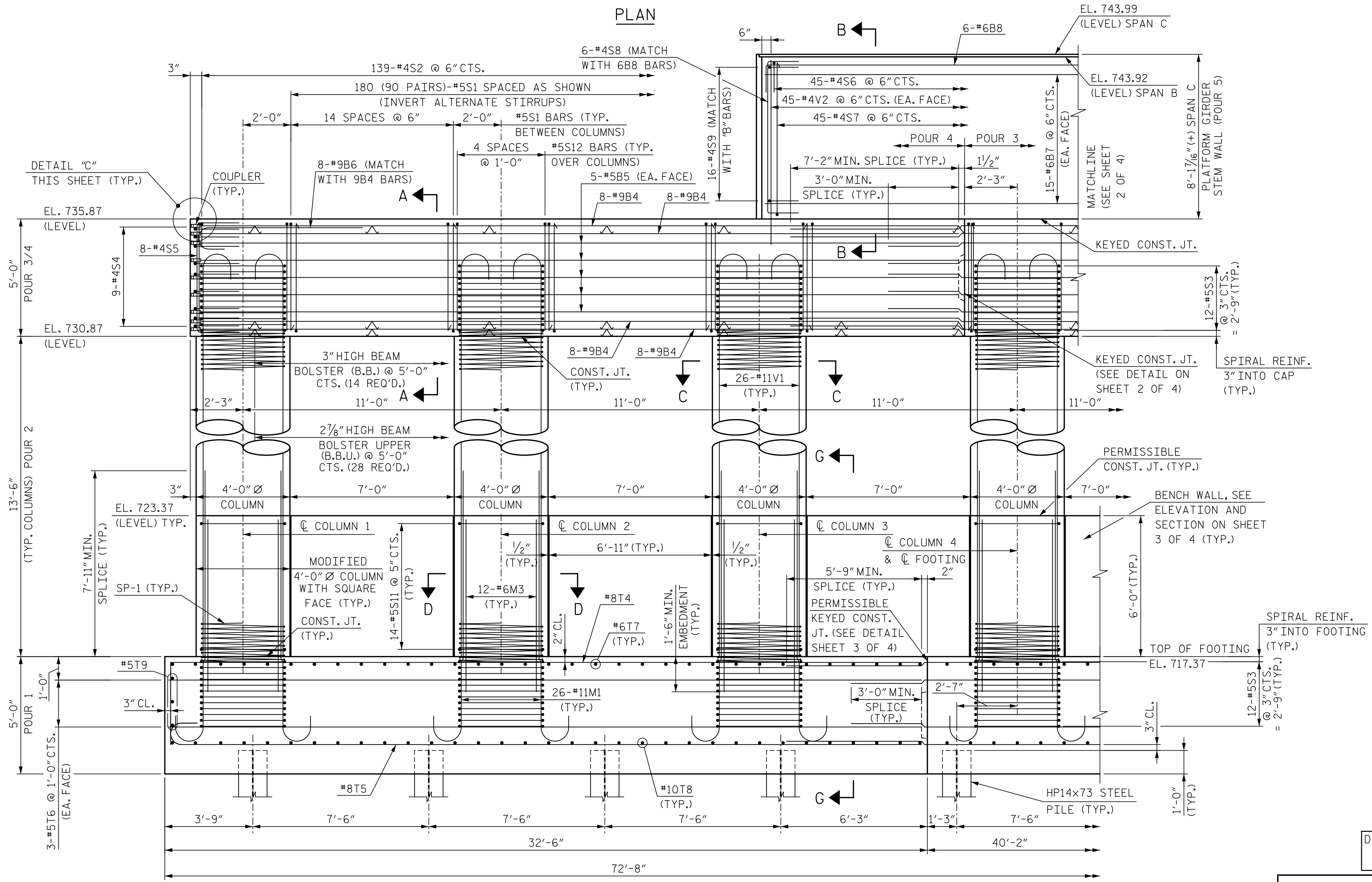
- ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C PIER UNLESS NOTED.
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" AND "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- TOP MAT OF FOOTING LONGITUDINAL AND TRANSVERSE REINFORCEMENT MAY BE SHIFTED AS NECESSARY TO CLEAR COLUMN REINFORCEMENT. DO NOT EXCEED 12" BETWEEN BARS.



DETAIL A - BRIDGE GIRDER ANCHOR BOLT LAYOUT



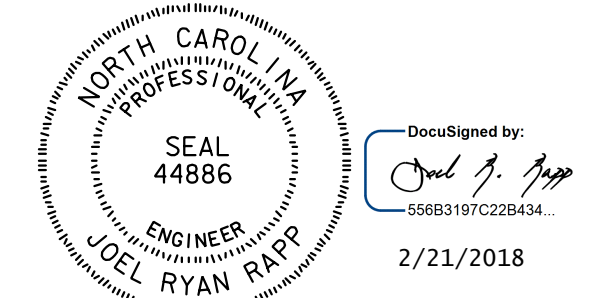
DETAIL C



ELEVATION

(BENCH WALL REINFORCEMENT NOT SHOWN FOR CLARITY)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



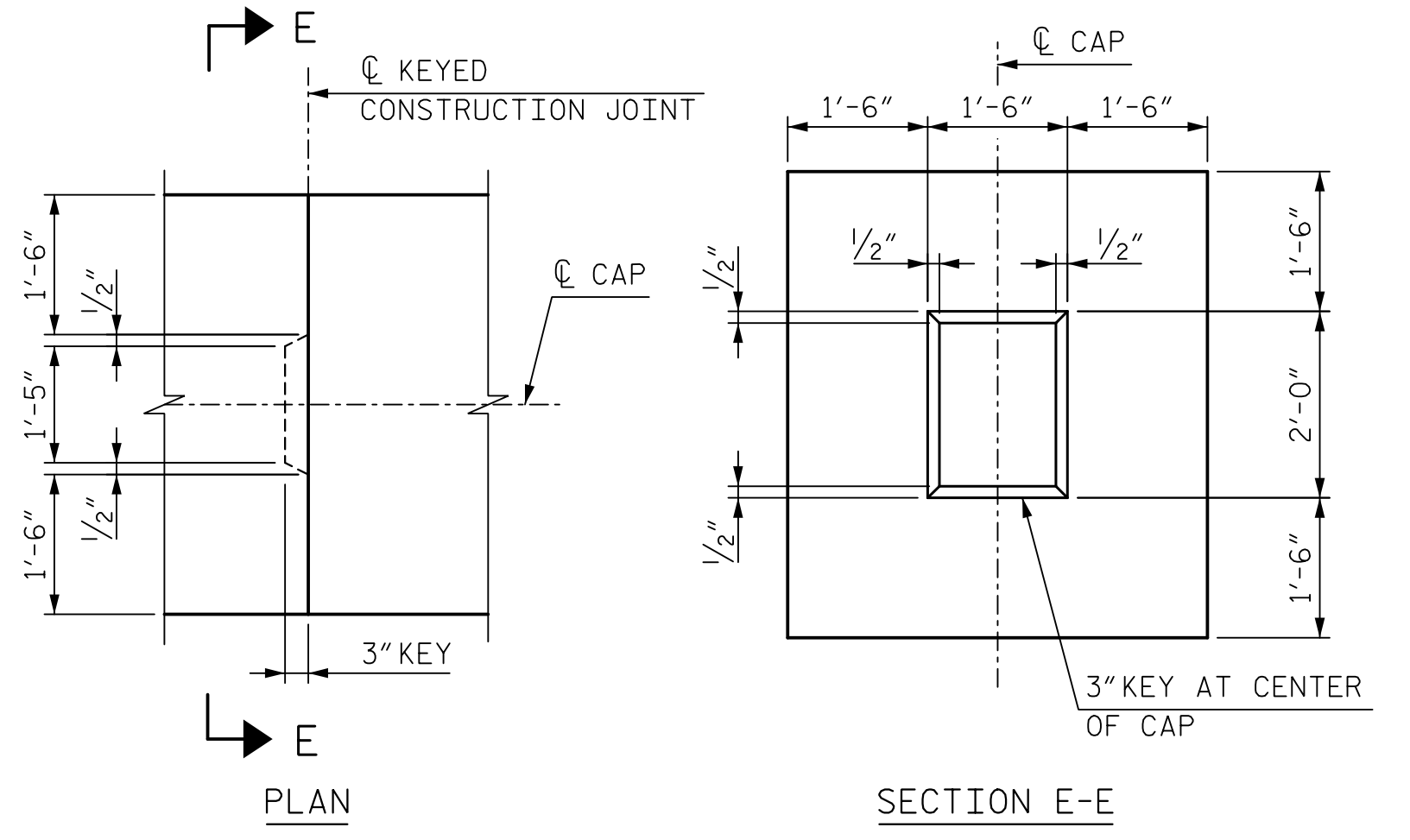
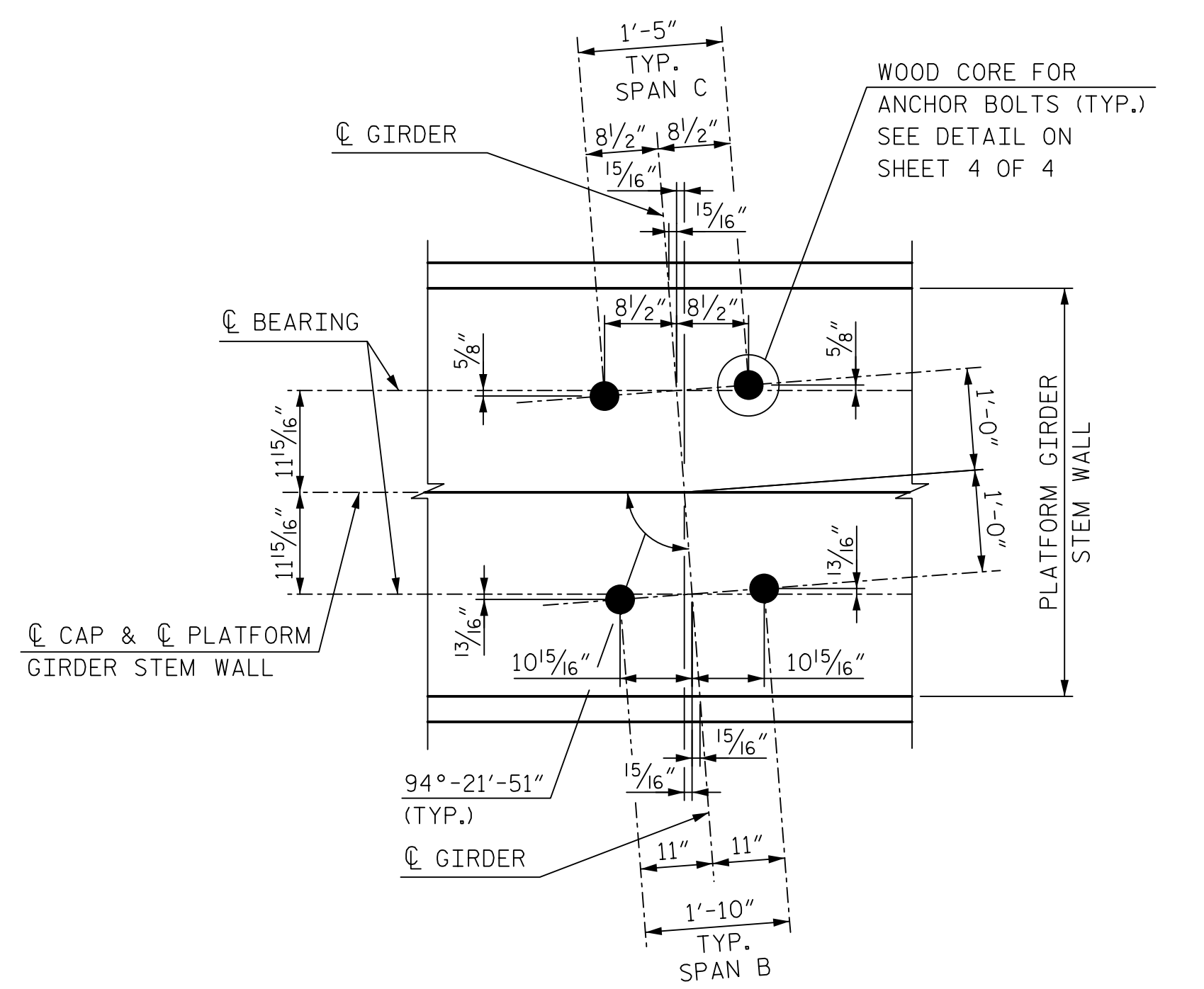
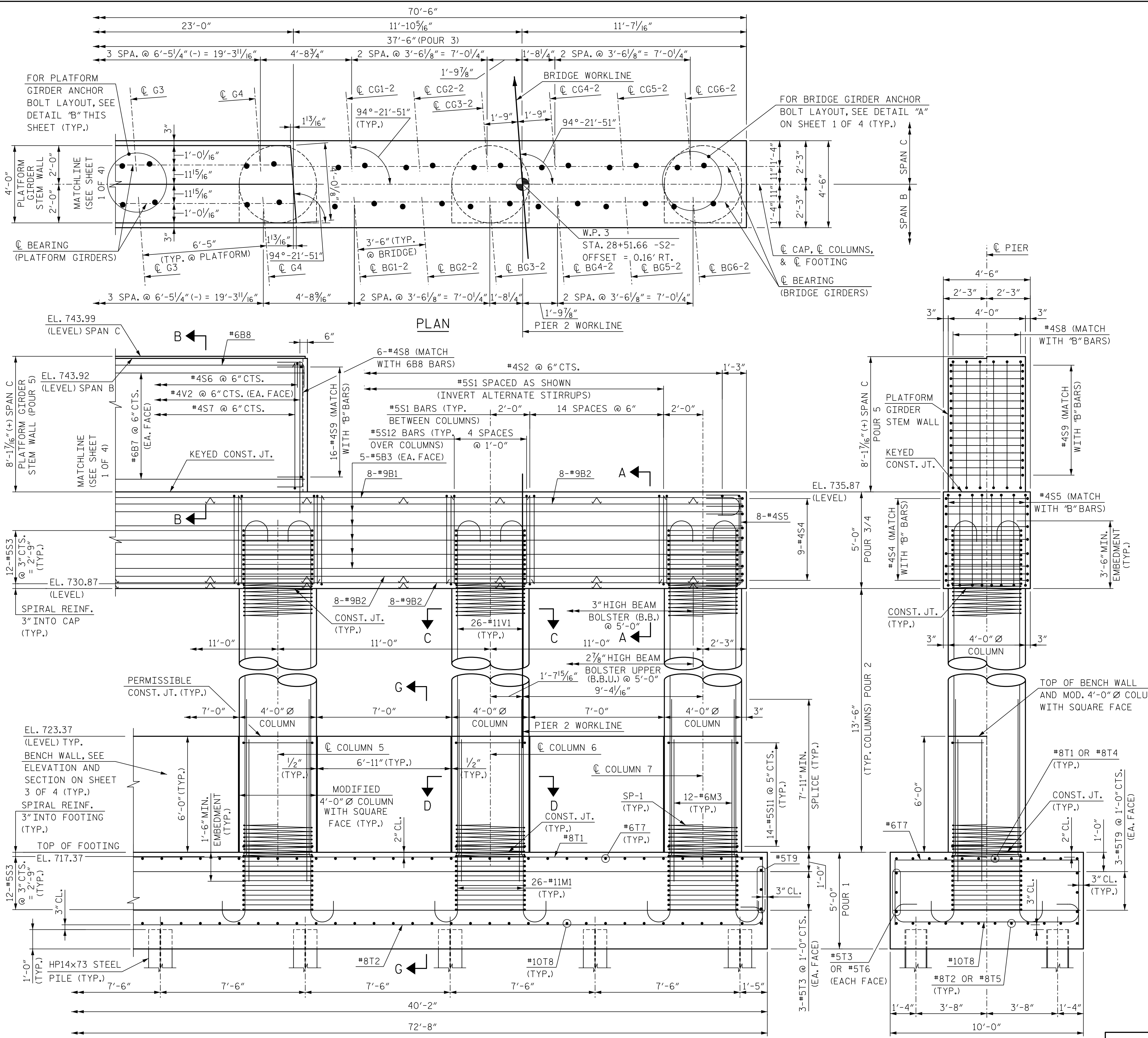
PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 PIER 2

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS				SHEET NO. S7-35 TOTAL SHEETS 51
DRAWN BY: B. VAUGHN CHECKED BY: L. RAPP	DATE: 9/17 DATE: 10/17	NO. 1 NO. 3 NO. 4	BY	DATE		

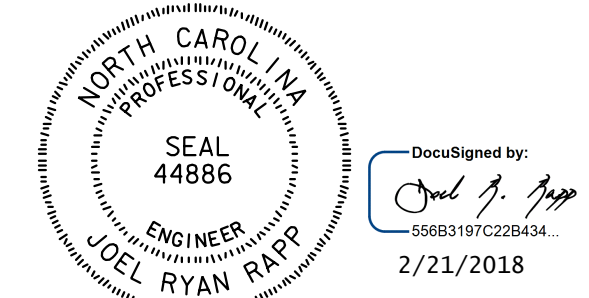


PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 PIER 2

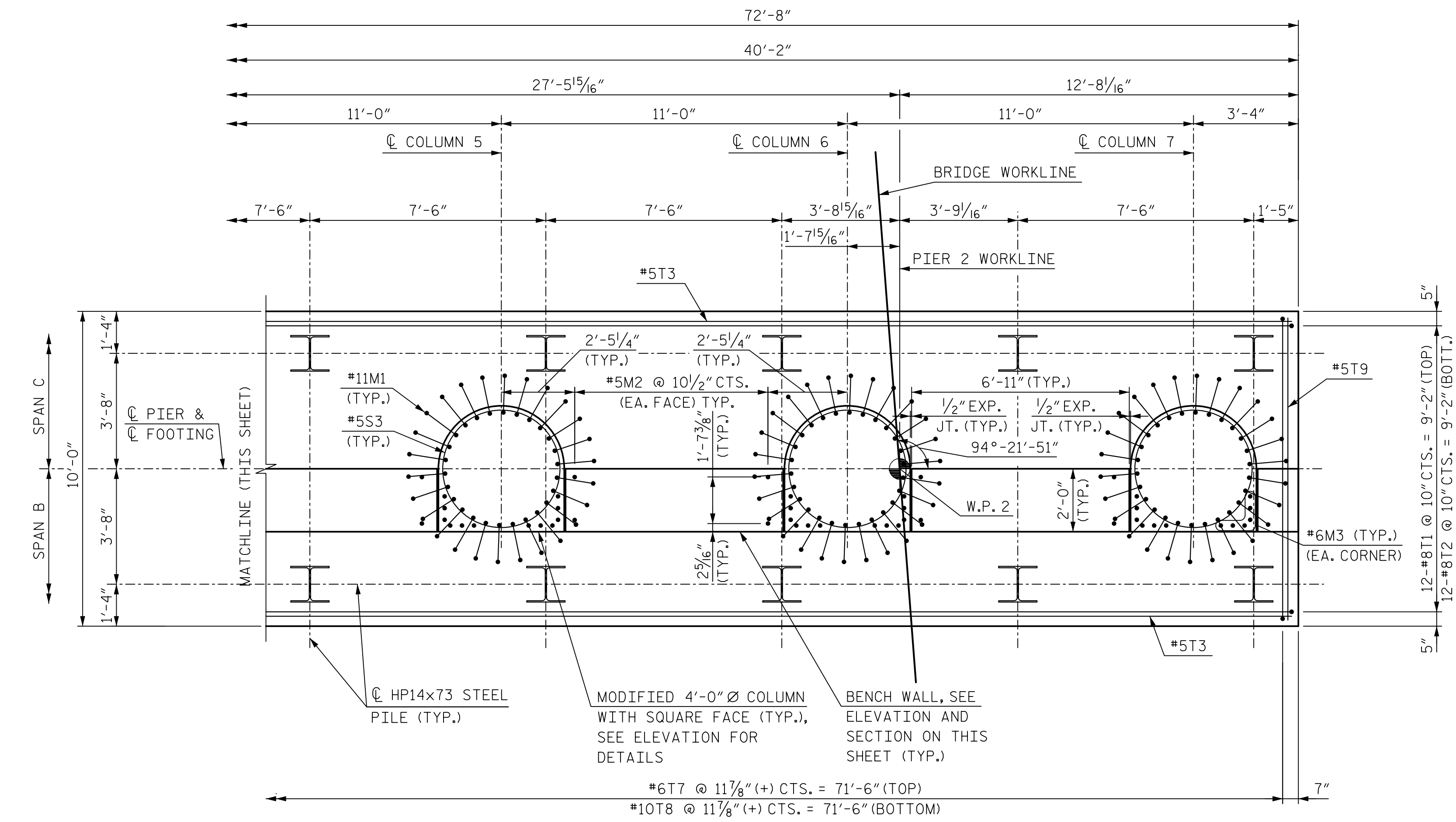
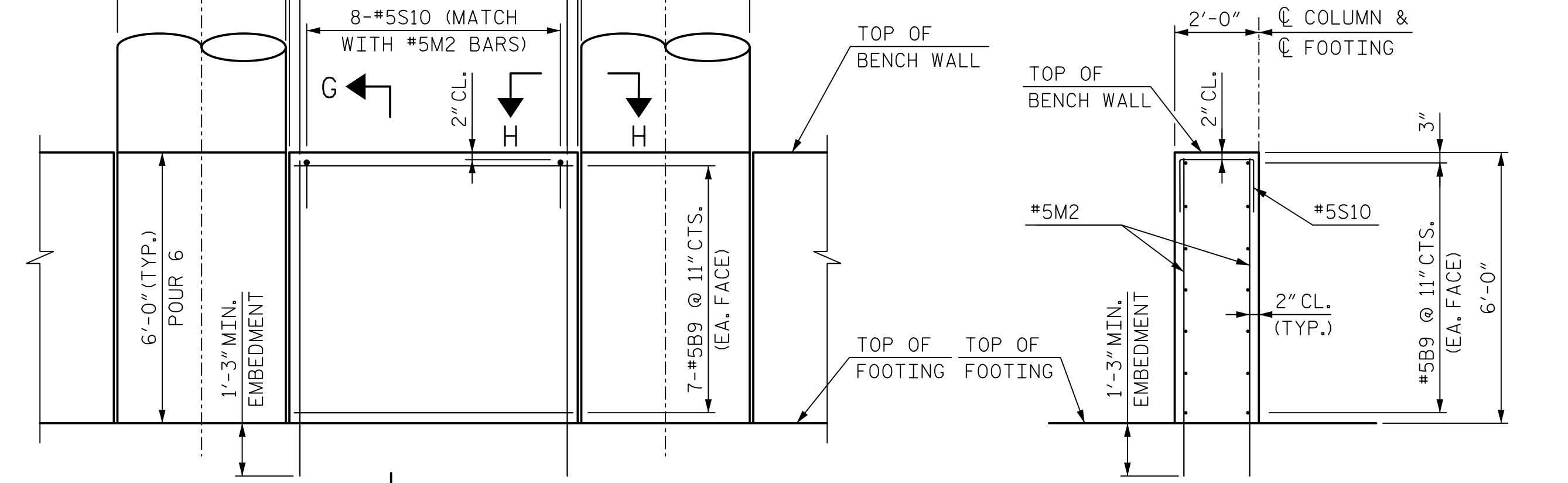
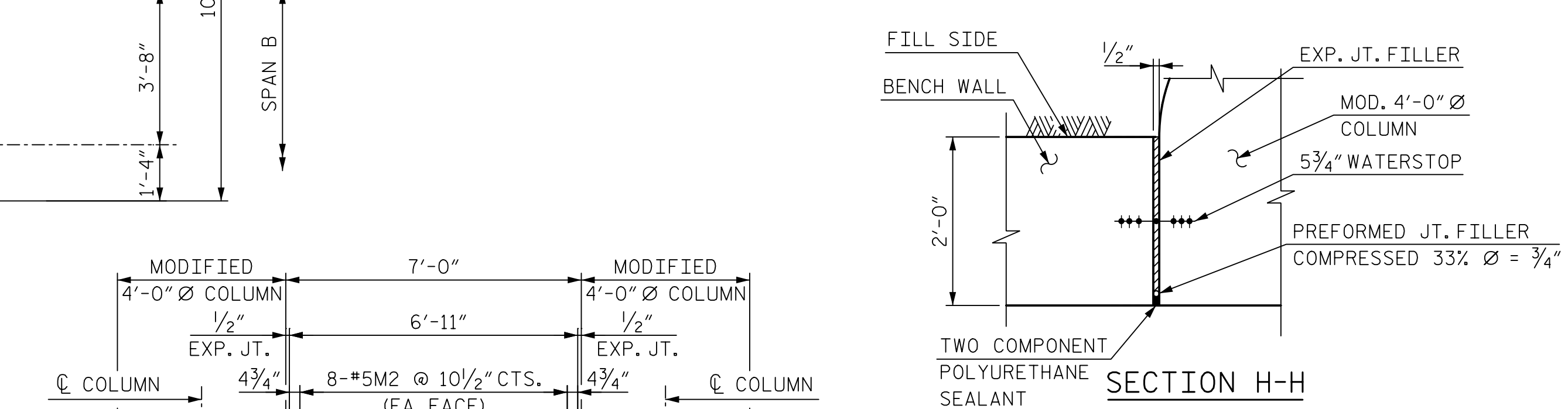
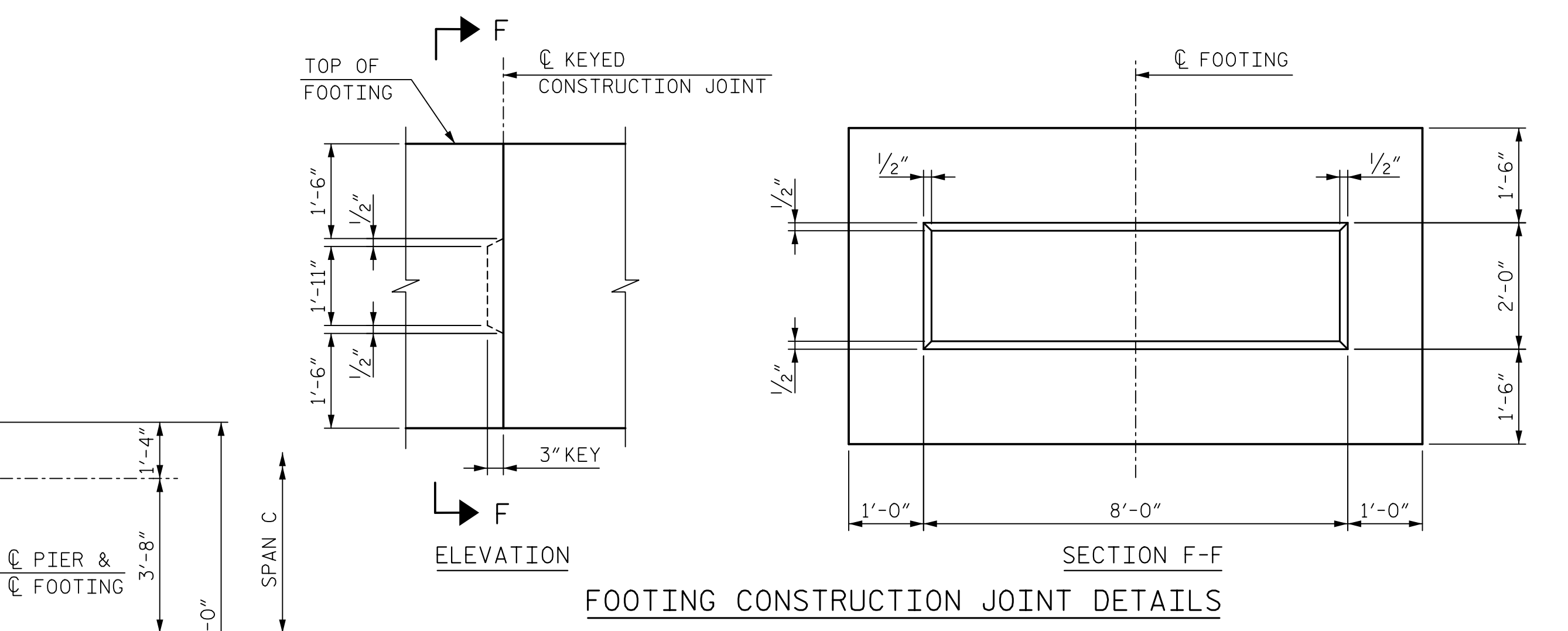
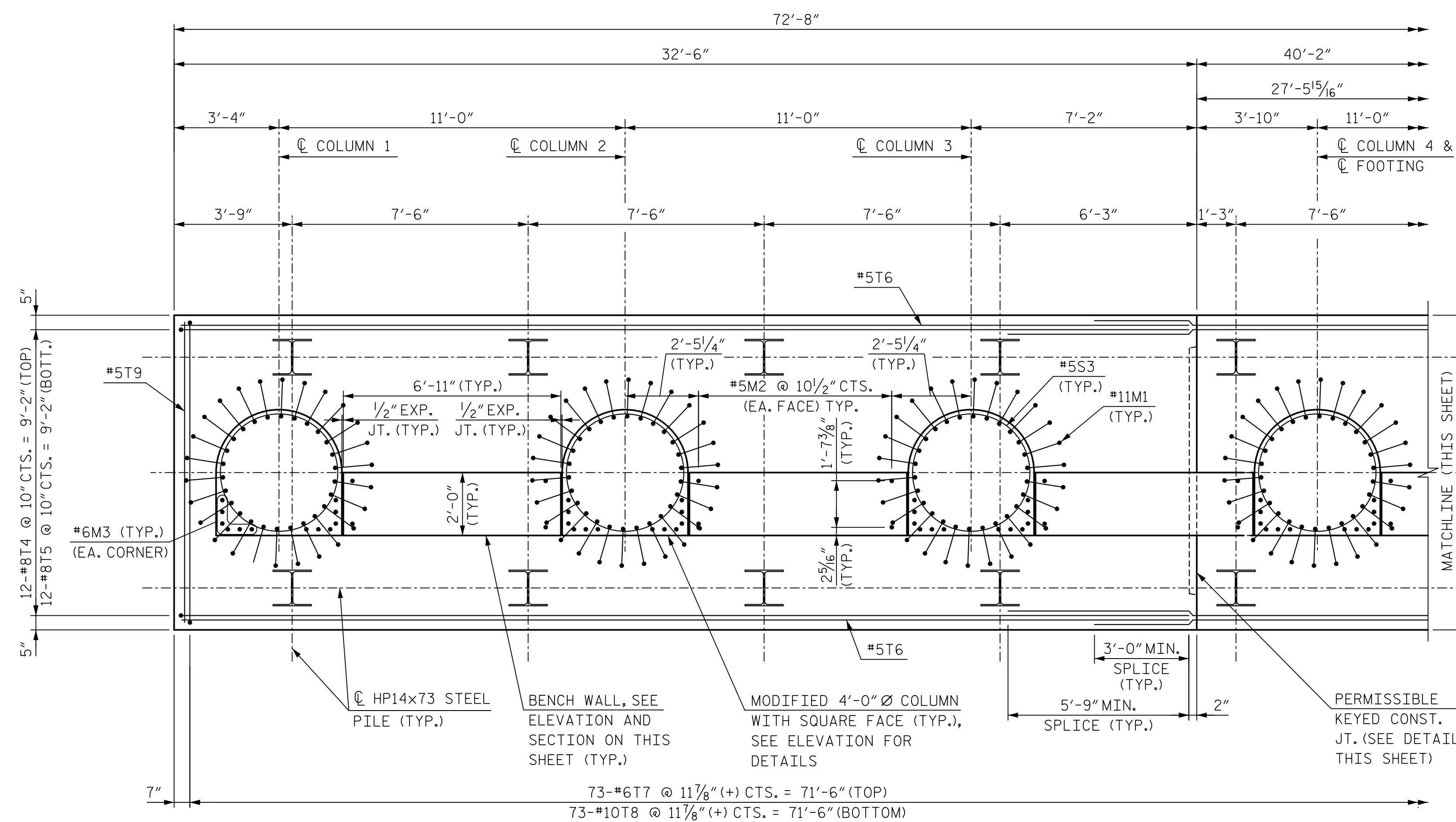


DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: <u>B. VAUGHN</u>	DATE: <u>9/17</u>	DWG. NO. <u>36</u>	
CHECKED BY: <u>L. RAPP</u>	DATE: <u>10/17</u>		

REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4

SHEET NO.	S7-36
TOTAL SHEETS	51



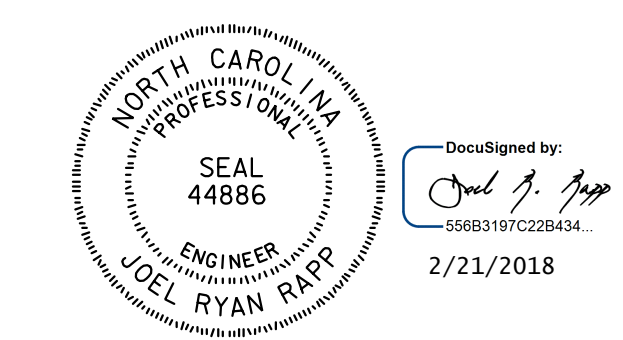
PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 3 OF 4

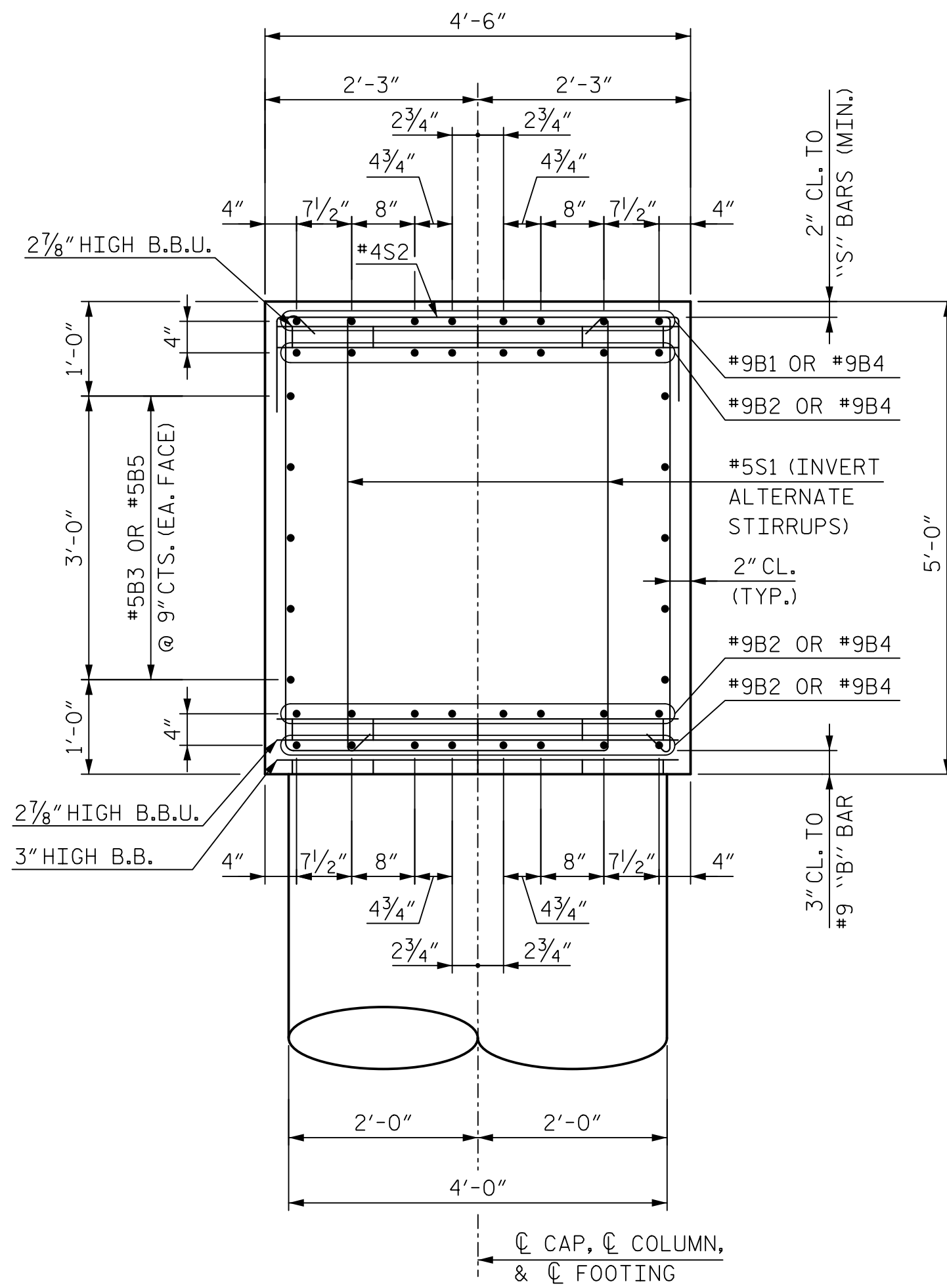
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 PIER 2

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

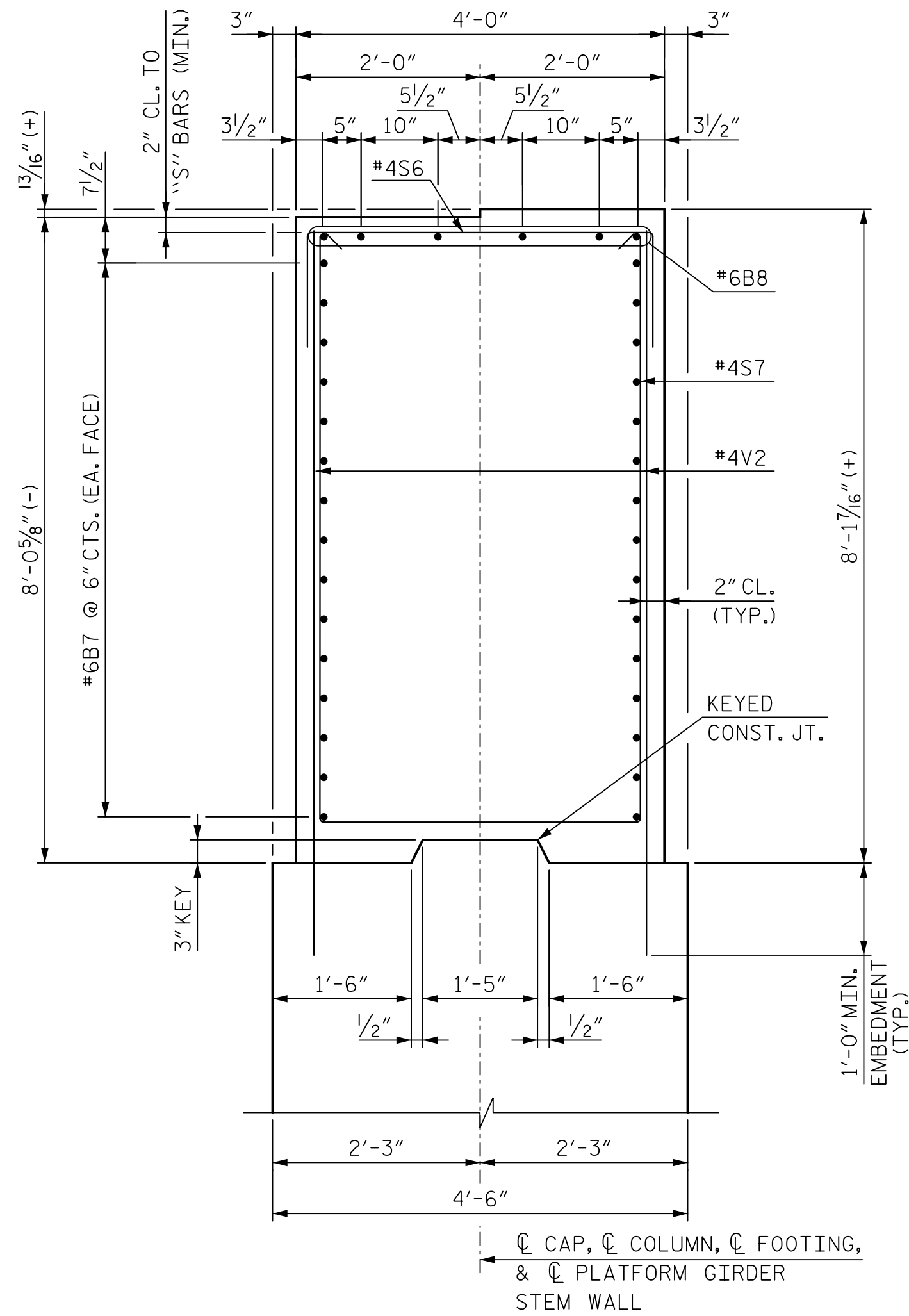


HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	DRAWN BY: <u>B. VAUGHN</u> CHECKED BY: <u>L. RAPP</u>	DATE: <u>9/17</u> DATE: <u>10/17</u>	DWG. NO. <u>37</u>			
	REVISIONS			SHEET NO. <u>S7-37</u>		
	NO. <u>1</u> <u>2</u>	BY	DATE	NO. <u>3</u> <u>4</u>	BY	DATE



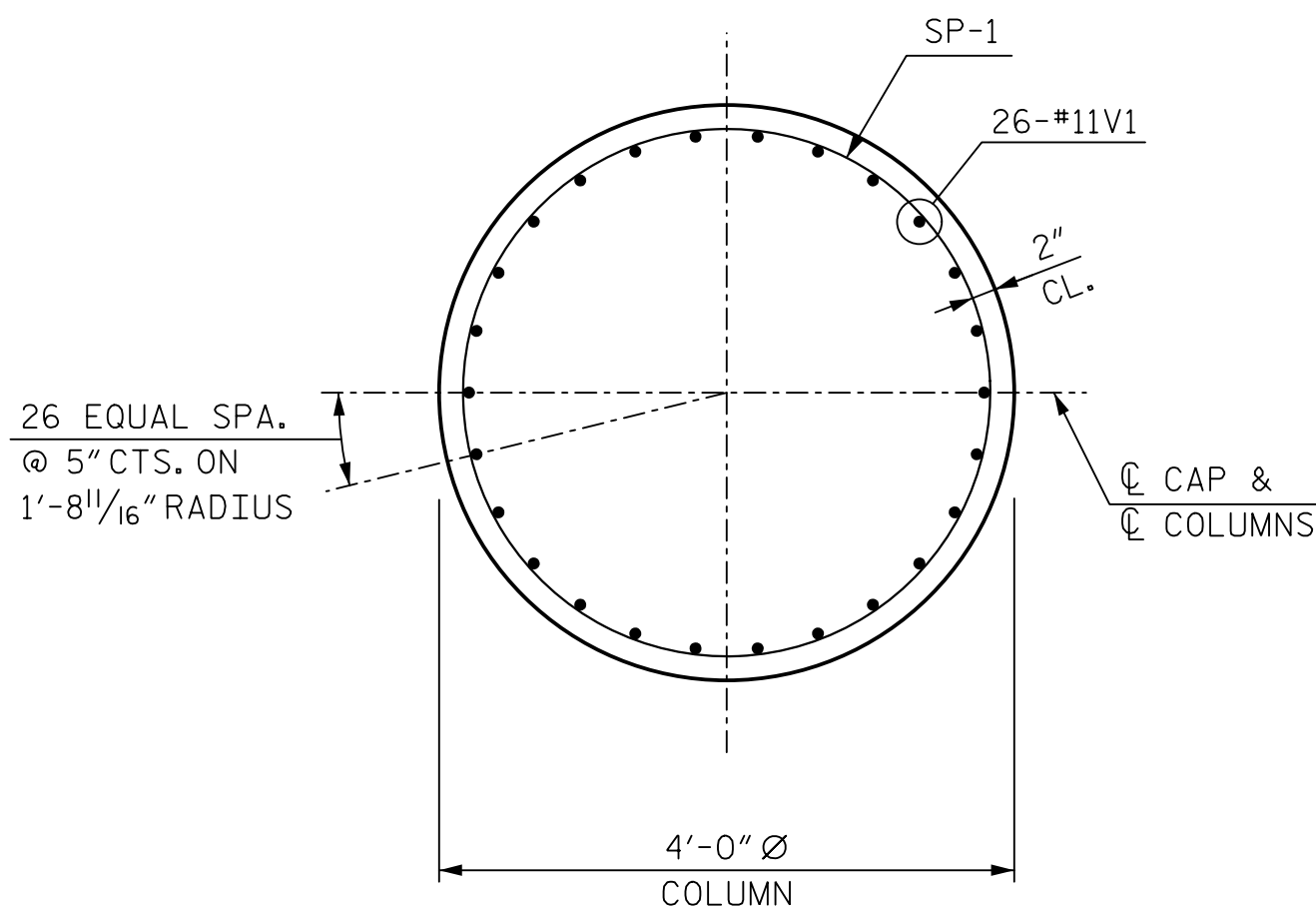
SECTION A-A

(COLUMN REINFORCING AND #5S12 BARS NOT SHOWN FOR CLARITY)

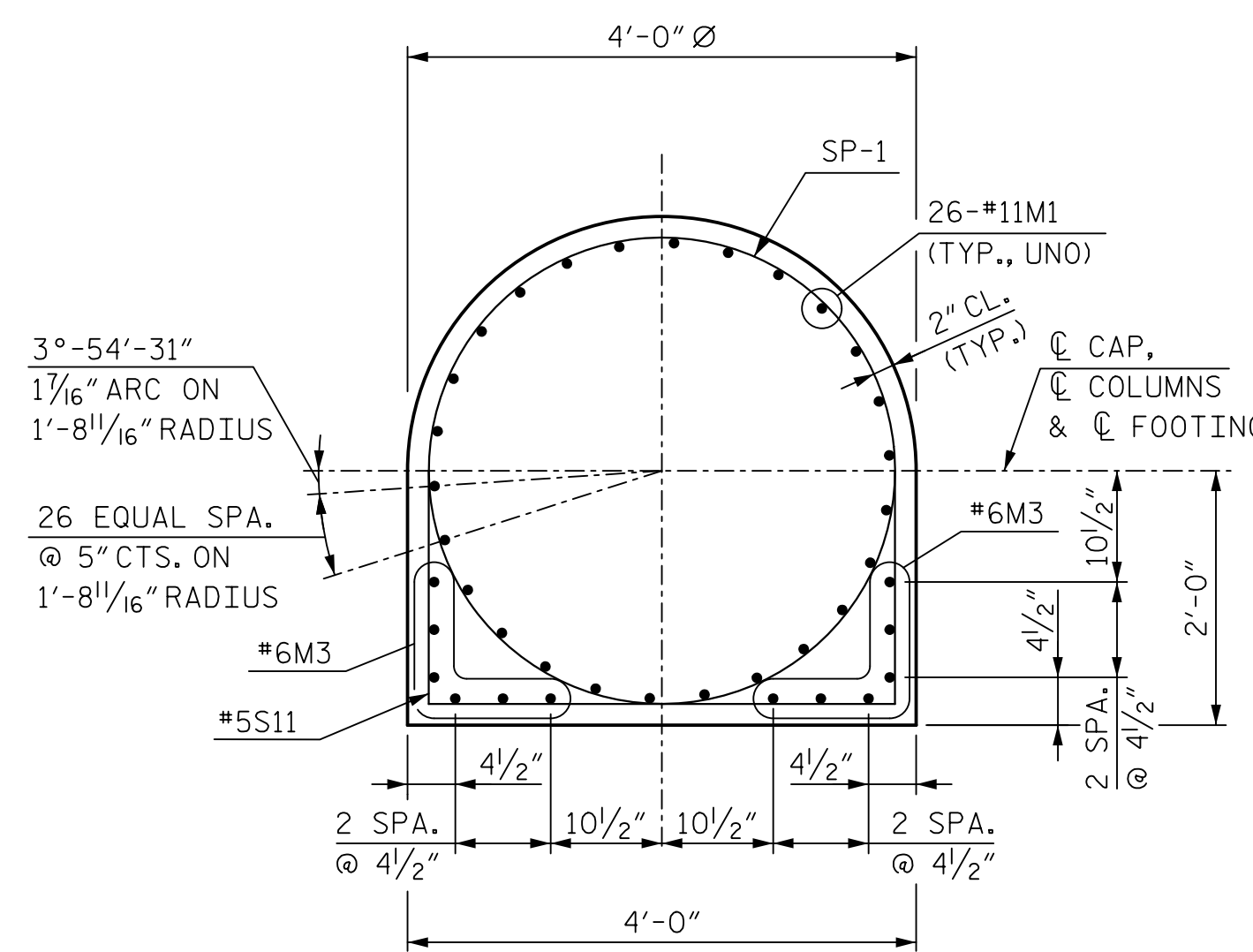


SECTION B-B

(CAP REINFORCING NOT SHOWN FOR CLARITY)

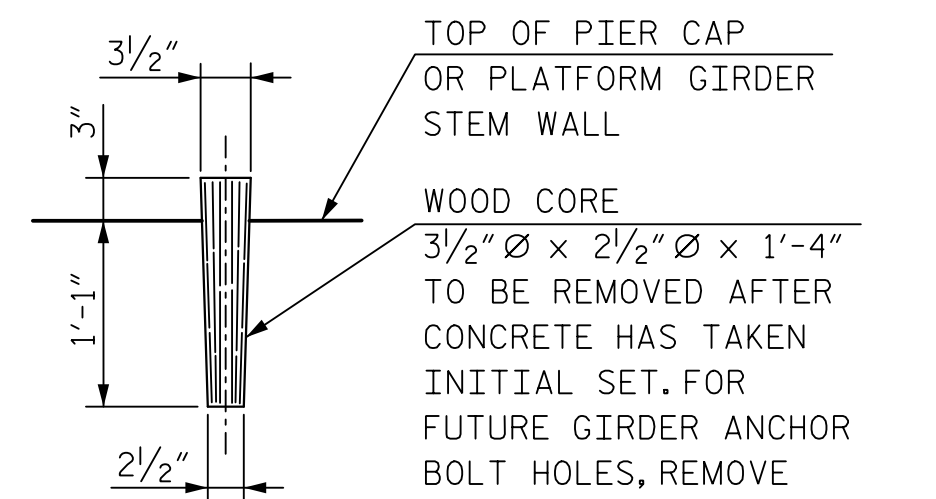


SECTION C-C



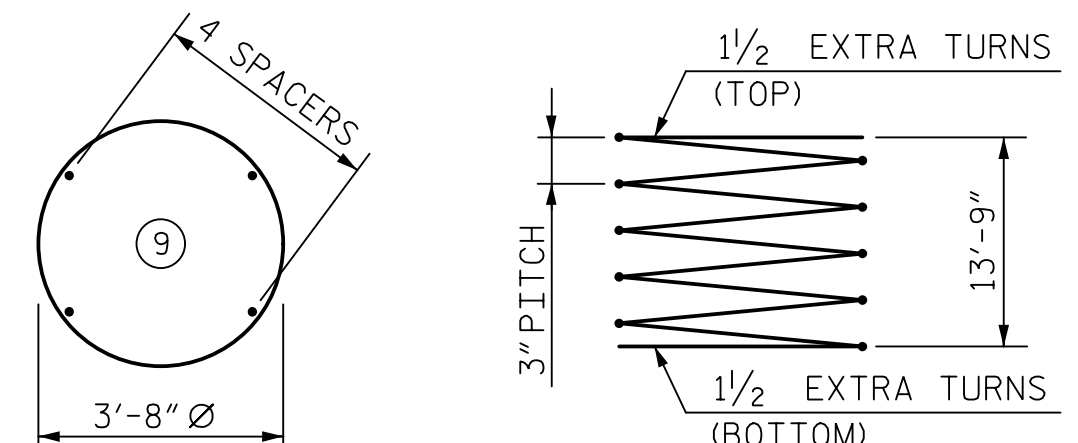
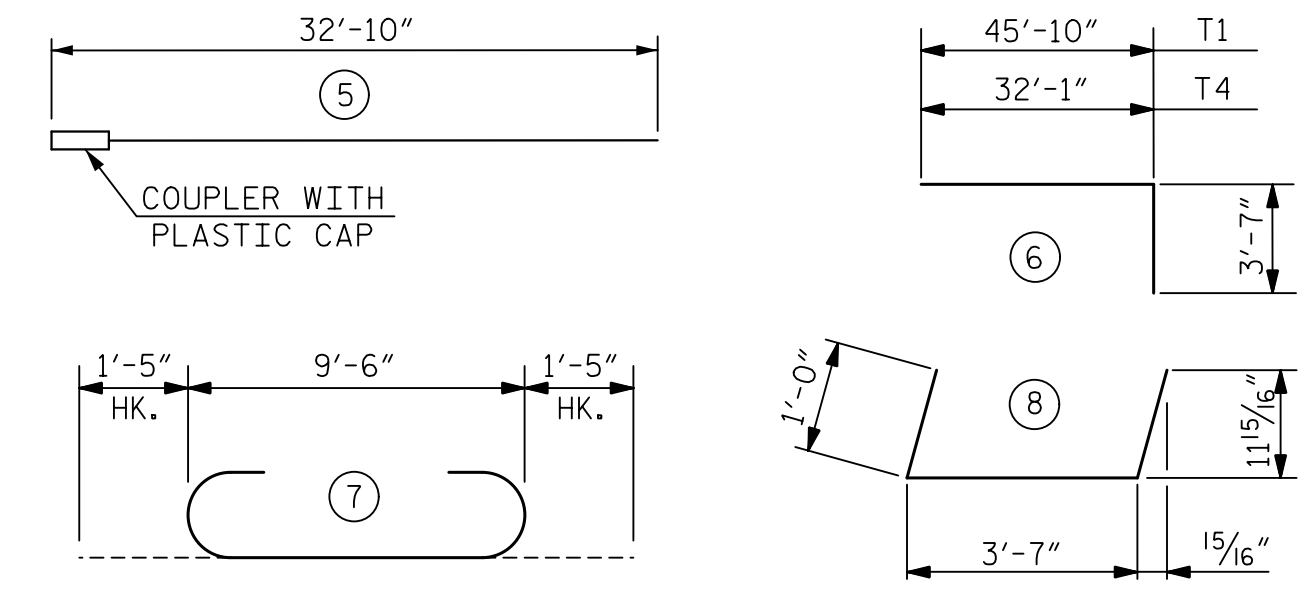
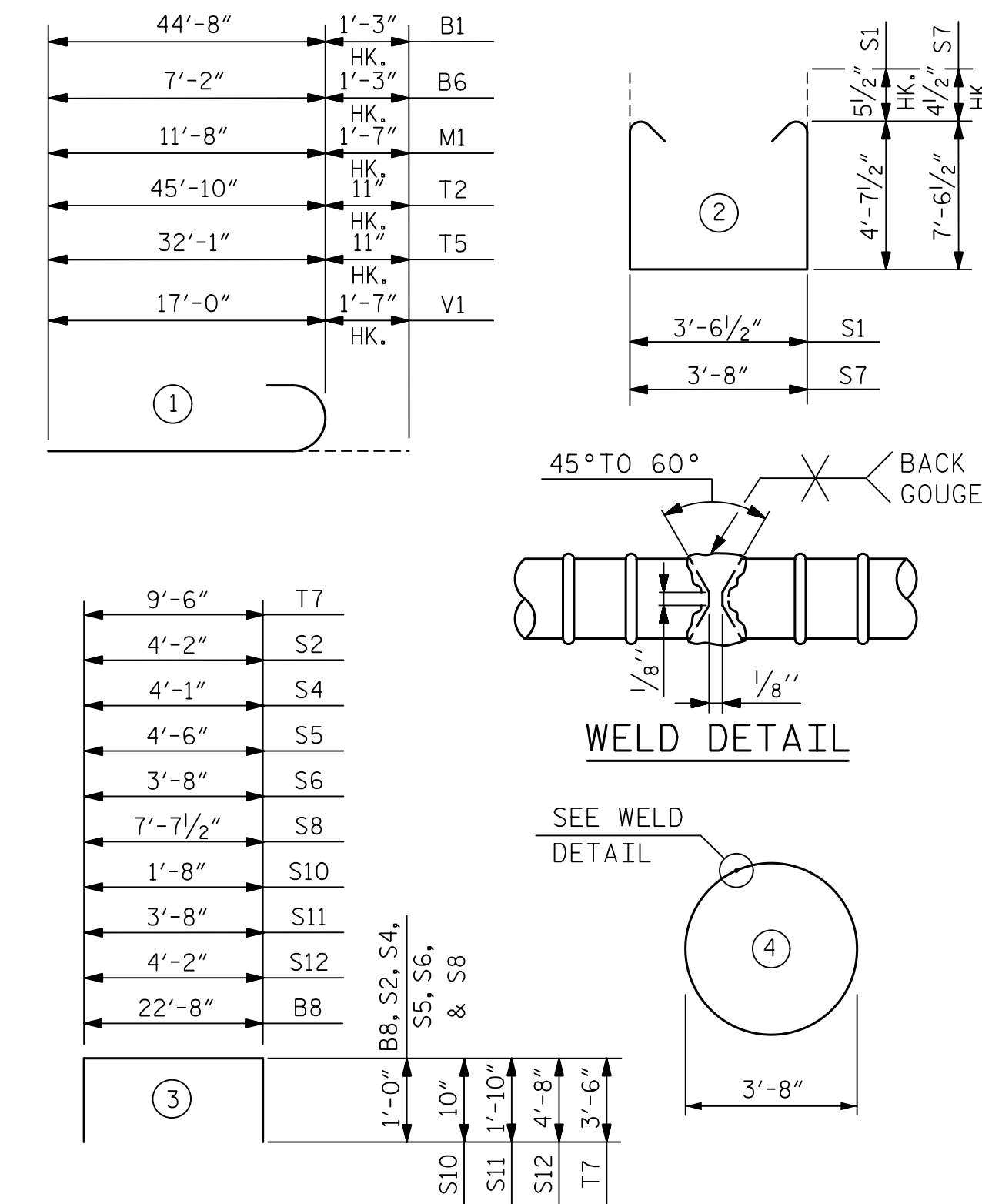
SECTION D-D

(V1 BARS NOT SHOWN FOR CLARITY)



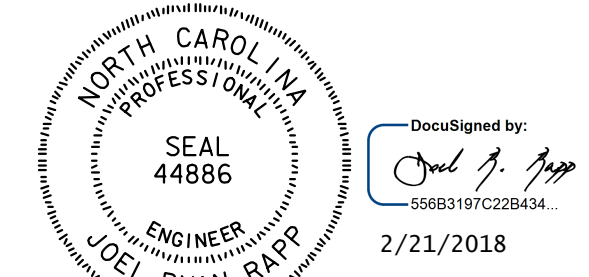
DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

* #5S3 CIRCULAR TIES SHALL BE ASTM DESIGNATION A706, GRADE 60, FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315.80.
 * THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BILL OF REINFORCING

PIER 2					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	45'-11"	1,249
B2	24	9	STR.	44'-8"	3,645
B3	10	5	STR.	40'-6"	422
B4	32	9	5	32'-10"	3,572
B5	10	5	5	32'-10"	342
B6	8	9	1	8'-5"	229
B7	30	6	STR.	22'-8"	1,021
B8	6	6	3	24'-8"	222
B9	84	5	STR.	6'-7"	577
S1	180	5	2	13'-9"	2,581
S2	139	4	3	6'-2"	573
* S3	168	5	4	11'-7"	2,030
S4	18	4	3	6'-1"	73
S5	16	4	3	6'-6"	69
S6	45	4	3	5'-8"	170
S7	45	4	2	19'-6"	586
S8	12	4	3	9'-8"	77
S9	32	4	8	5'-7"	119
S10	48	5	3	3'-4"	167
S11	98	5	3	7'-4"	750
S12	35	5	3	13'-6"	493
M1	182	11	1	13'-3"	12,812
M2	96	5	STR.	7'-1"	709
M3	84	6	STR.	7'-4"	925
T1	12	8	6	49'-5"	1,583
T2	12	8	1	46'-9"	1,498
T3	6	5	STR.	43'-1"	270
T4	12	8	6	35'-8"	1,143
T5	12	8	1	33'-0"	1,057
T6	6	5	STR.	32'-1"	201
T7	73	6	3	16'-6"	1,809
T8	73	10	7	12'-4"	3,874
T9	6	5	STR.	9'-6"	59
V1	182	11	1	18'-7"	17,969
V2	90	4	STR.	9'-1"	546
SP-1	7	**	9	668'-2"	4,878

QUANTITIES

ITEM	TOTAL
REINFORCING STEEL	LBS 63,422
SPIRAL COLUMN REINFORCING STEEL	LBS 4,878
CLASS AA CONCRETE:	
POUR 1	C.Y. 134.6
POUR 2	C.Y. 46.6
POUR 3	C.Y. 31.3
POUR 4	C.Y. 27.5
POUR 5	C.Y. 27.5
POUR 6	C.Y. 18.4
TOTAL	C.Y. 285.9
HP14x73 STEEL PILES	NO. 20 L.F. 733

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

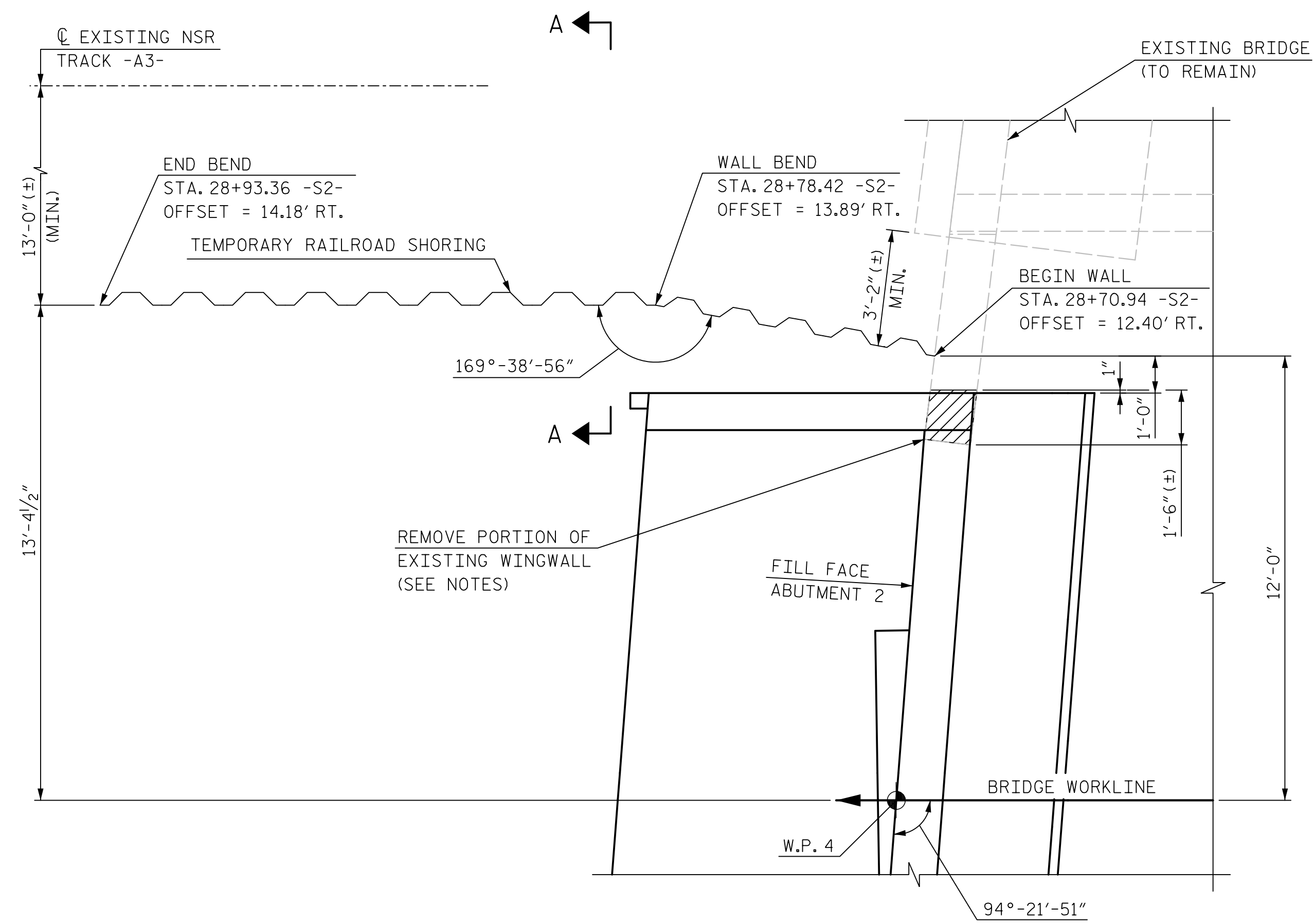
SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

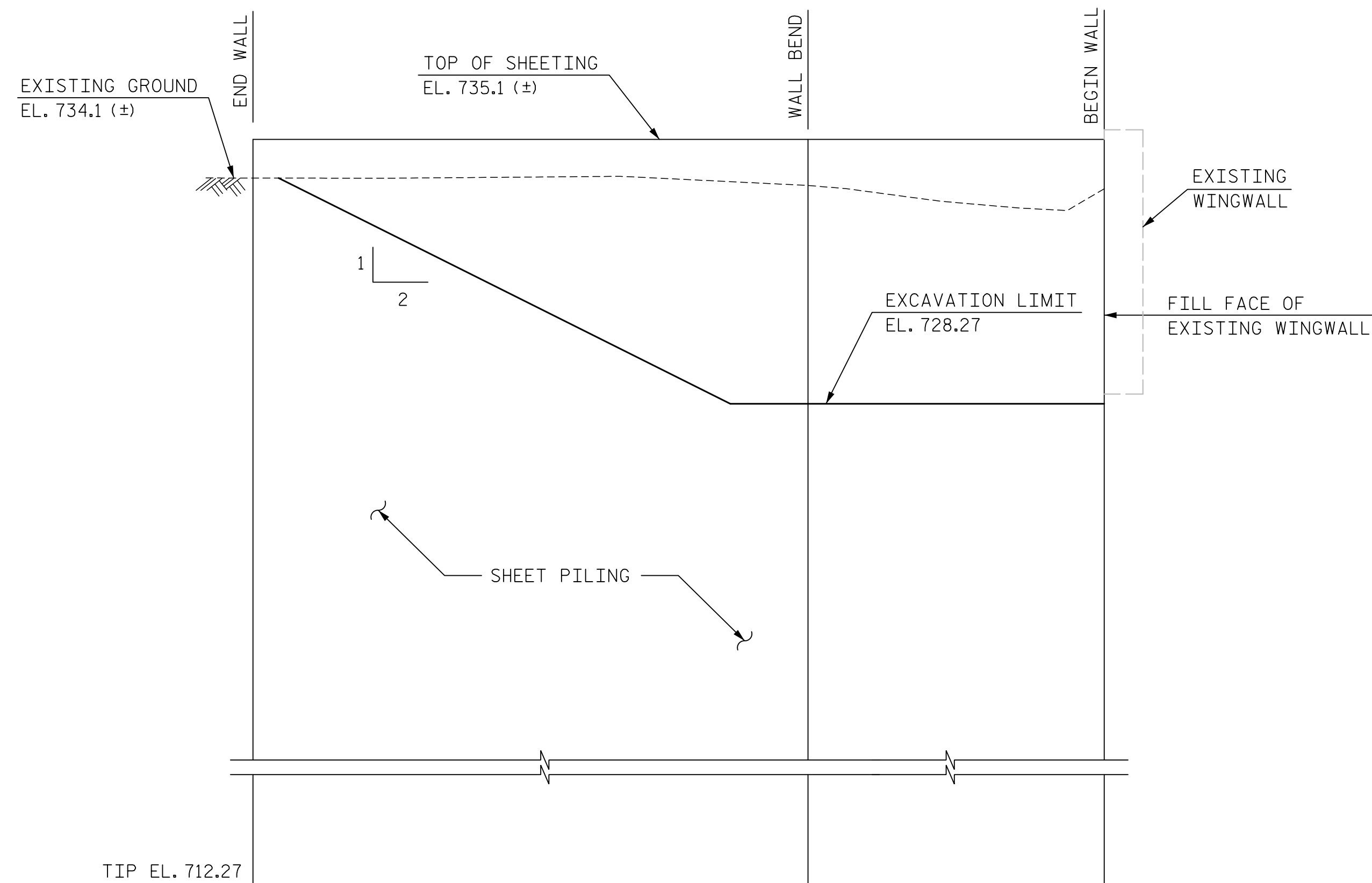
SUBSTRUCTURE

PIER 2

HNTB		HNTB NORTH CAROLINA, P.C.		REVISIONS		SHEET NO.	
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		NC License No. C-1554		NO.	BY	DATE	NO.
DRAWN BY: B. VAUGHN	DATE: 9/17	1		3			7
CHECKED BY: L. RAPP	DATE: 10/17	2		4			51



TEMPORARY SHORING PLAN



TEMPORARY SHORING ELEVATION
(LOOKING NORTH TOWARDS EXISTING TRACK)

NOTES:

SHORING HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA."

MAXIMUM WALL DEFLECTION LIMITED TO 3/8".

ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.

SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL (HOT ROLLED) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

MOMENT OF INERTIA/FT. 490.85 in⁴
SECTION MODULUS/FT. 60.7 in³

ASSUMED SOIL PARAMETERS

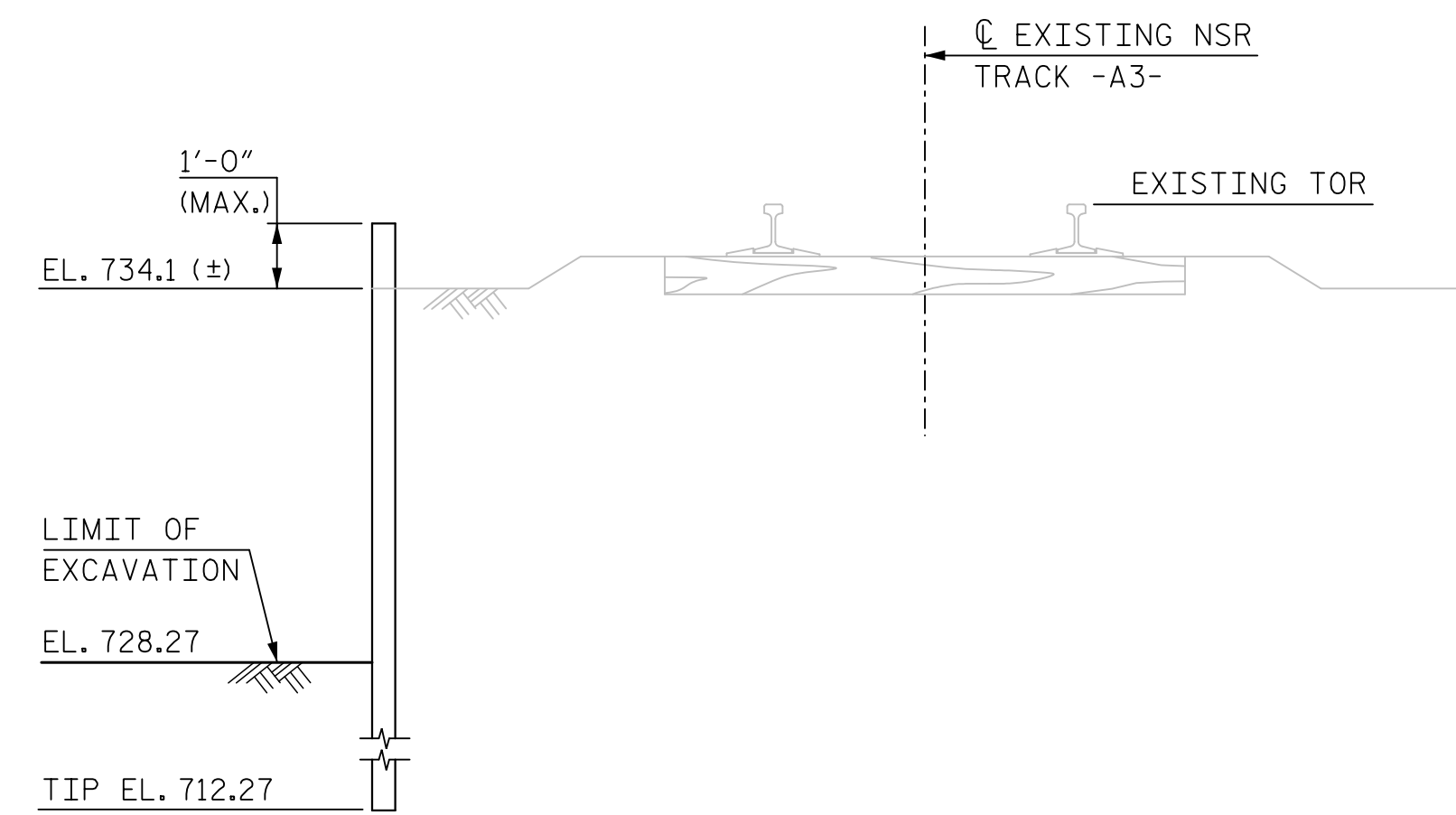
COARSE GRAINED SOILS:
SOIL MOIST UNIT WEIGHT - 120 PCF
SOIL FRICTION ANGLE - 30 DEGREES
UNDRAINED SHEAR STRENGTH - 0 PSF

EXISTING WINGWALL TO BE PARTIALLY REMOVED IN ACCORDANCE WITH SECTION 402 OF THE STANDARD SPECIFICATIONS.

REBAR IN THE PORTION OF THE EXISTING WINGWALL TO REMAIN SHALL BE CUT BACK TO A MINIMUM DEPTH OF 1" BELOW CONCRETE SURFACE AND PATCHED WITH AN EPOXY COMPOUND.

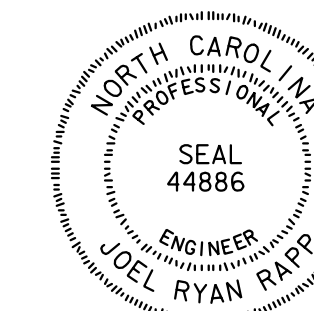
CONSTRUCTION SEQUENCE:

1. INSTALL SHORING TO REQUIRED TIP ELEVATION.
2. REMOVE EXISTING WINGWALL TO LIMITS SHOWN.
3. CONSTRUCT PROPOSED ABUTMENT.
4. BACKFILL PROPOSED ABUTMENT.
5. REMOVE SHORING.



SECTION A-A

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-



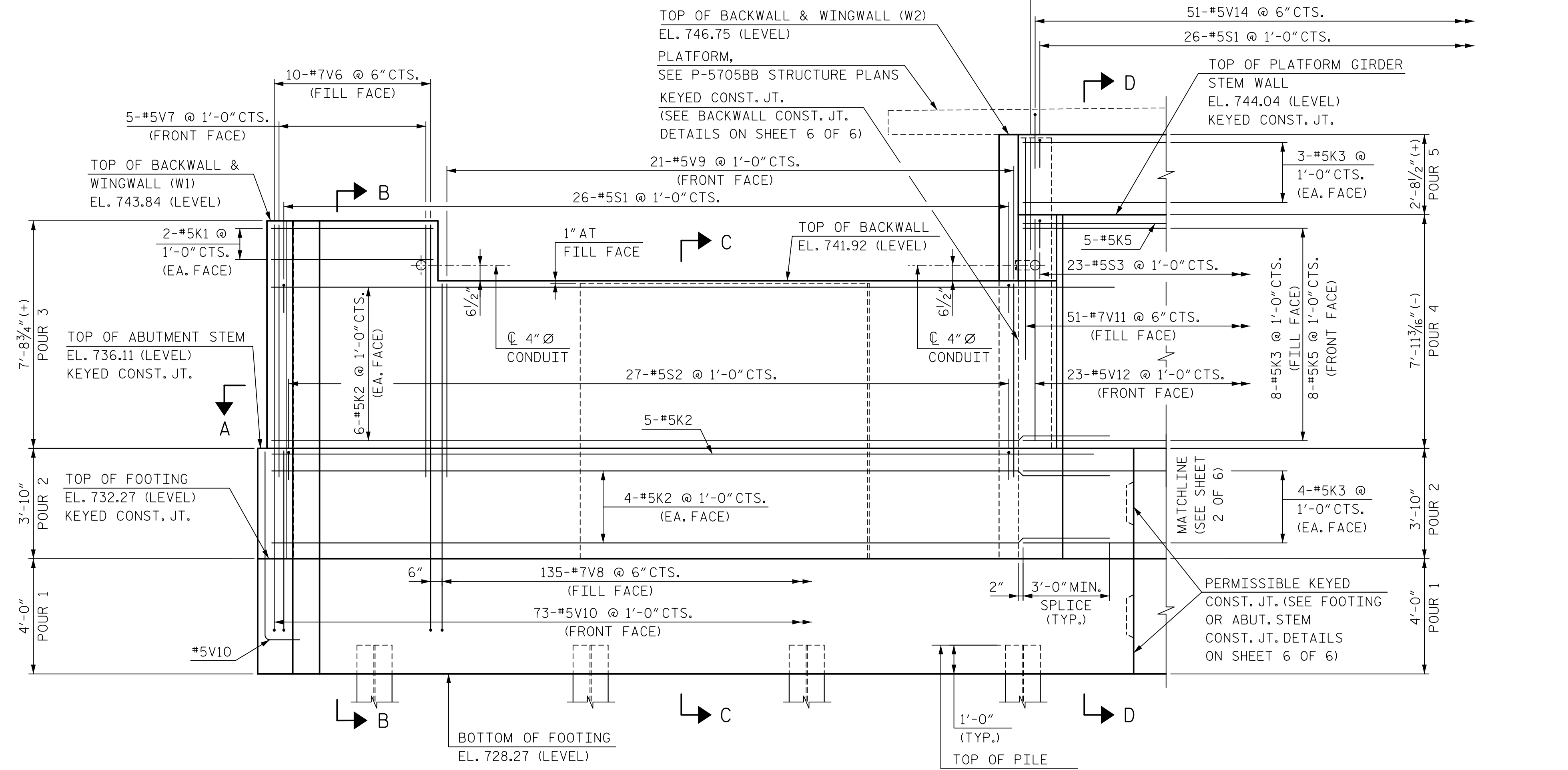
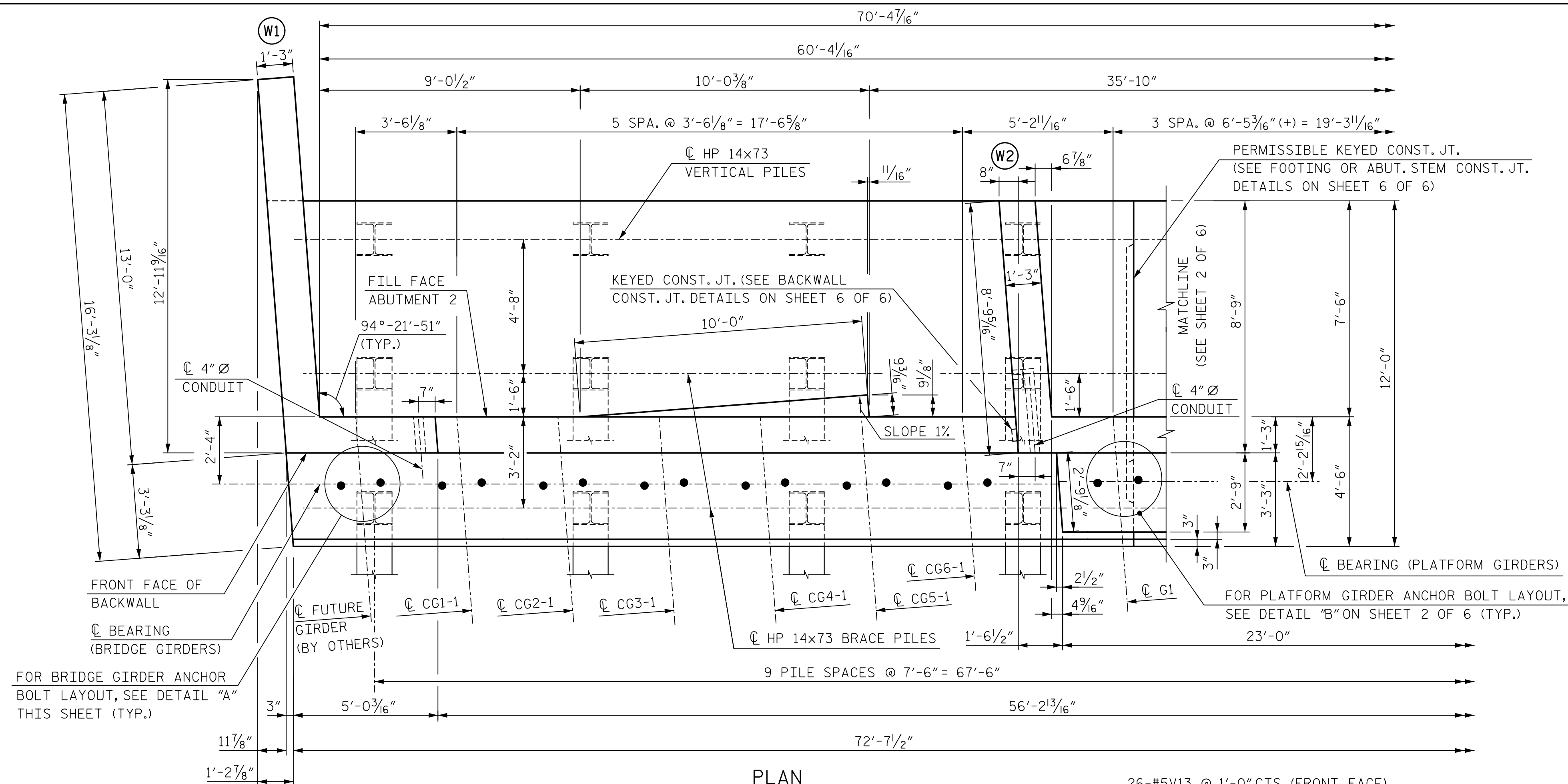
DocuSigned by:
Joel R. Rapp
05683197C22B434
2/21/2018

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
ABUTMENT 2
SHORING

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS					SHEET NO. S7-39 TOTAL SHEETS 51	
	NO.	BY	DATE	NO.	BY		DATE
	1			3			
DRAWN BY <u>B. VAUGHN</u> DATE <u>10/17</u> CHECKED BY <u>L. RAPP</u> DATE <u>10/17</u> DWG. NO. 39	2			4			



NOTES:

- FOR SECTION A-A, SEE SHEETS 3 OF 6 AND 4 OF 6.
- FOR SECTIONS B-B, C-C, AND D-D, SEE SHEET 5 OF 6.
- FOR WINGWALL ELEVATIONS AND SECTIONS, SEE SHEETS 3 OF 6 AND 4 OF 6.
- FOR LAYOUT AND DETAILS OF CONTINUOUS FRENCH DRAIN SYSTEM BEHIND ABUTMENT, SEE "STRUCTURE DRAINAGE DETAILS" SHEETS 3 OF 4 AND 4 OF 4.
- [Symbol] INDICATES 1:2 OR 3:12 PILE BATTER IN DIRECTION SHOWN. SEE ABUTMENT SECTIONS FOR MORE INFORMATION.

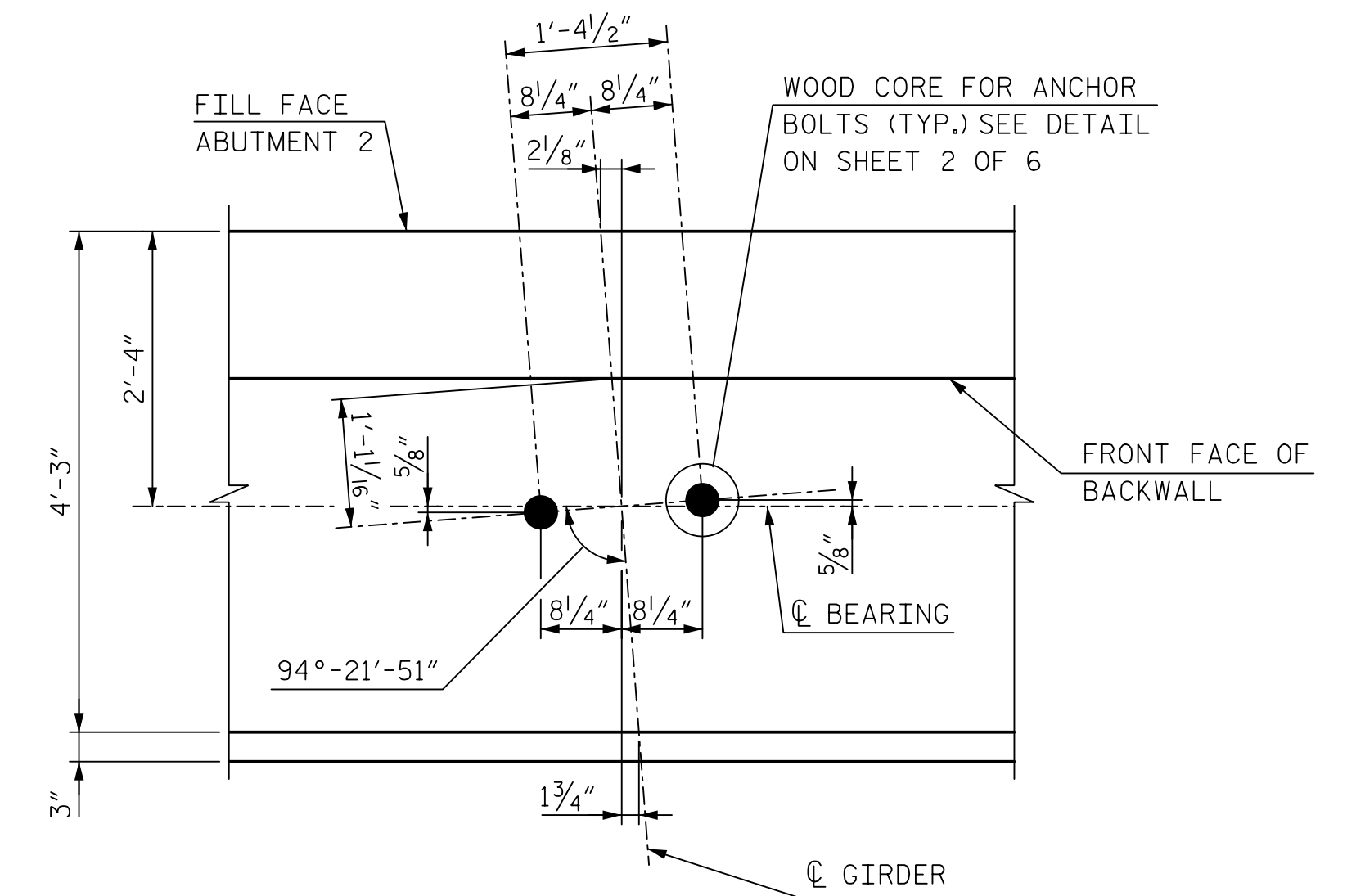
CONDUIT TO BE 4"Ø IN ACCORDANCE WITH UNDERWRITERS LABORATORY SPECIFICATIONS.

FOR LOCATIONS OF FENCE AND HANDRAIL ANCHORAGES IN TOP OF BACKWALL/WINGWALLS, SEE "SUPERSTRUCTURE: BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

FOR FOOTING REINFORCING, SEE ABUTMENT SECTIONS AND FOOTING REINFORCING PLAN ON SHEET 5 OF 6.

*5K2, *5K4, *5K5, *5S2, AND *5S3 MAY BE ADJUSTED AS NECESSARY TO CLEAR ANCHOR BOLTS. DO NOT EXCEED 12" BETWEEN BARS.

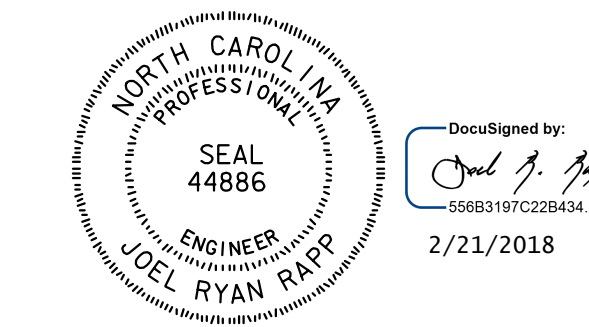
FOR LIMITS OF EXISTING BRIDGE WINGWALL REMOVAL, SEE "ABUTMENT 2 SHORING" SHEET.



DETAIL A - BRIDGE GIRDER ANCHOR BOLT LAYOUT

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 6

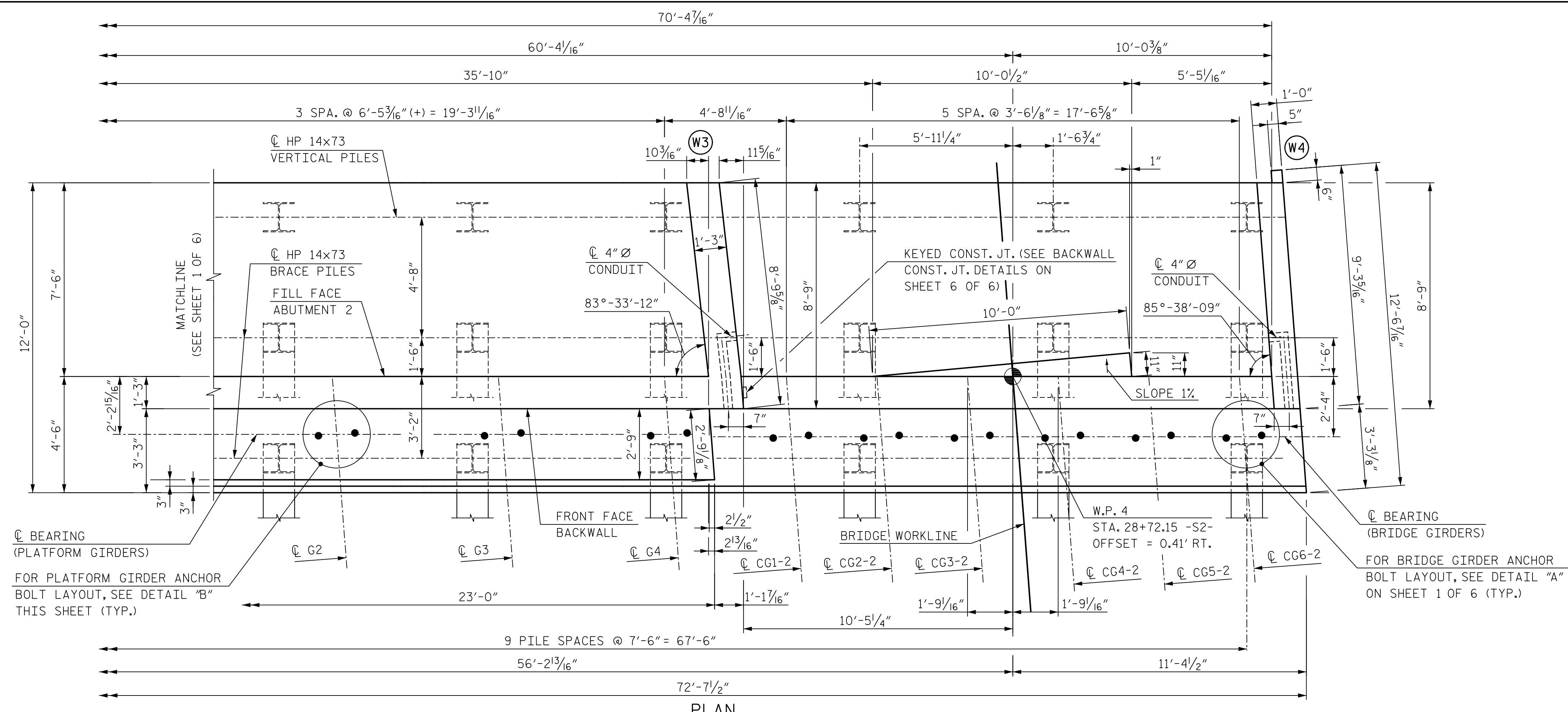


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

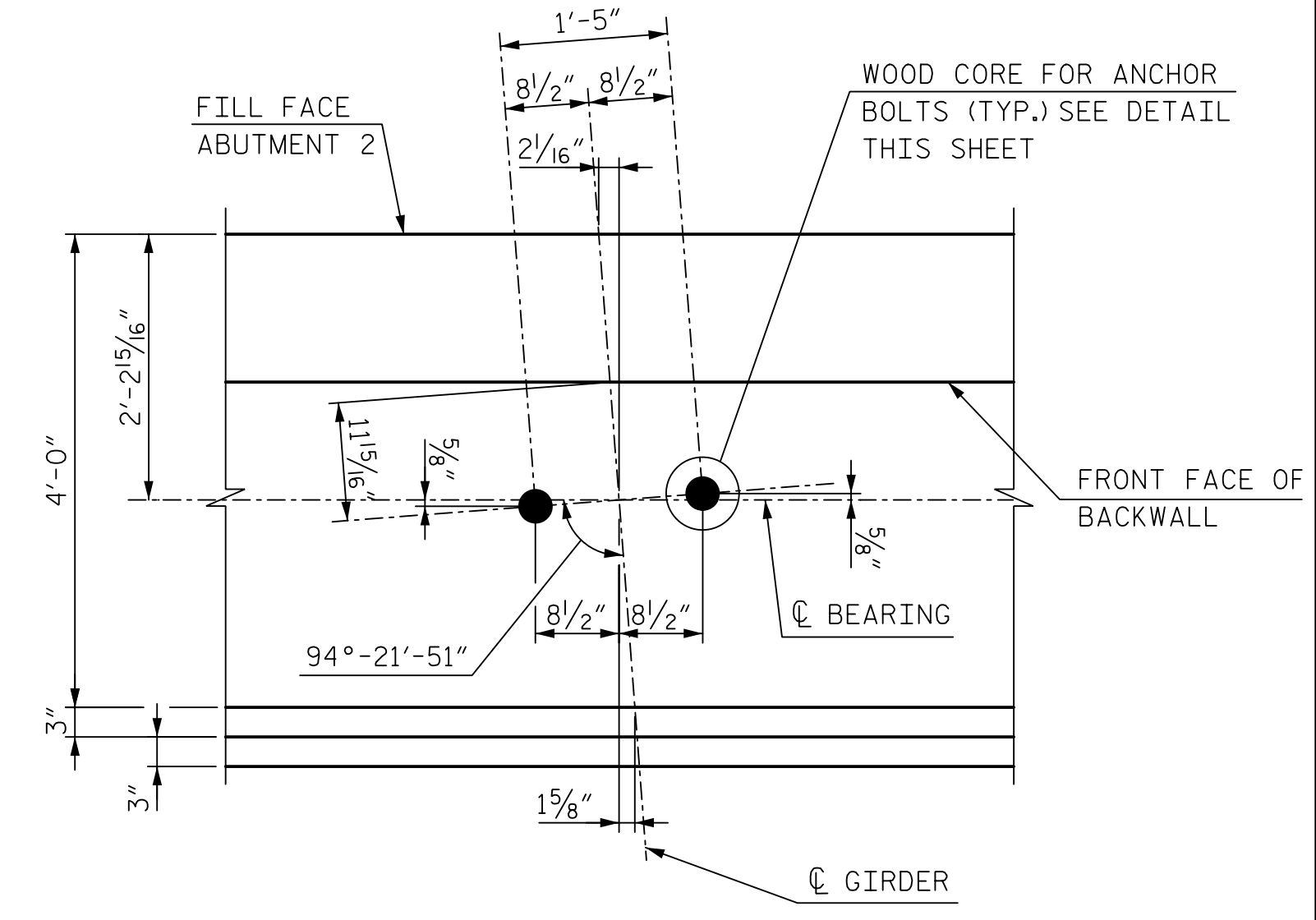
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 2

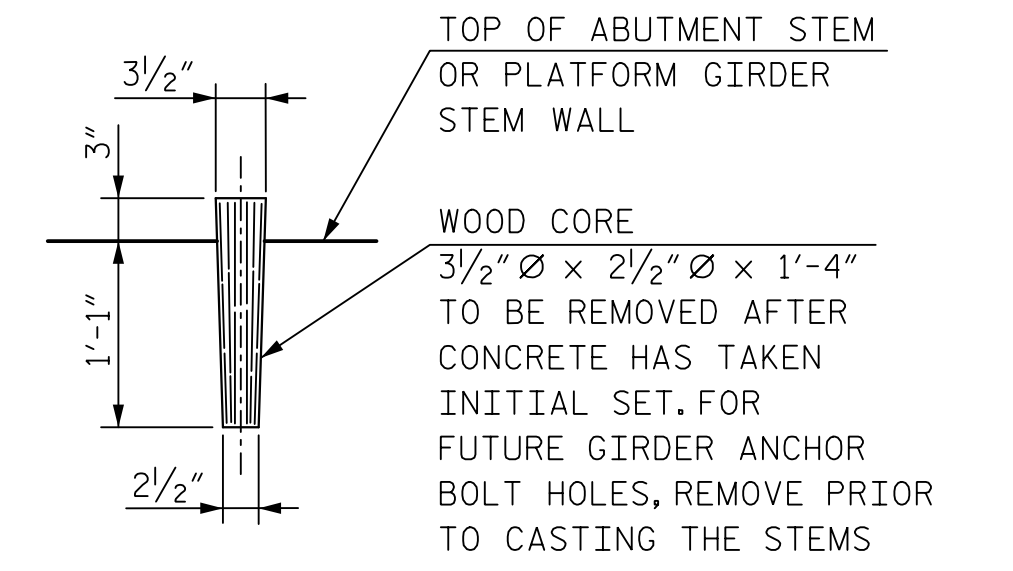
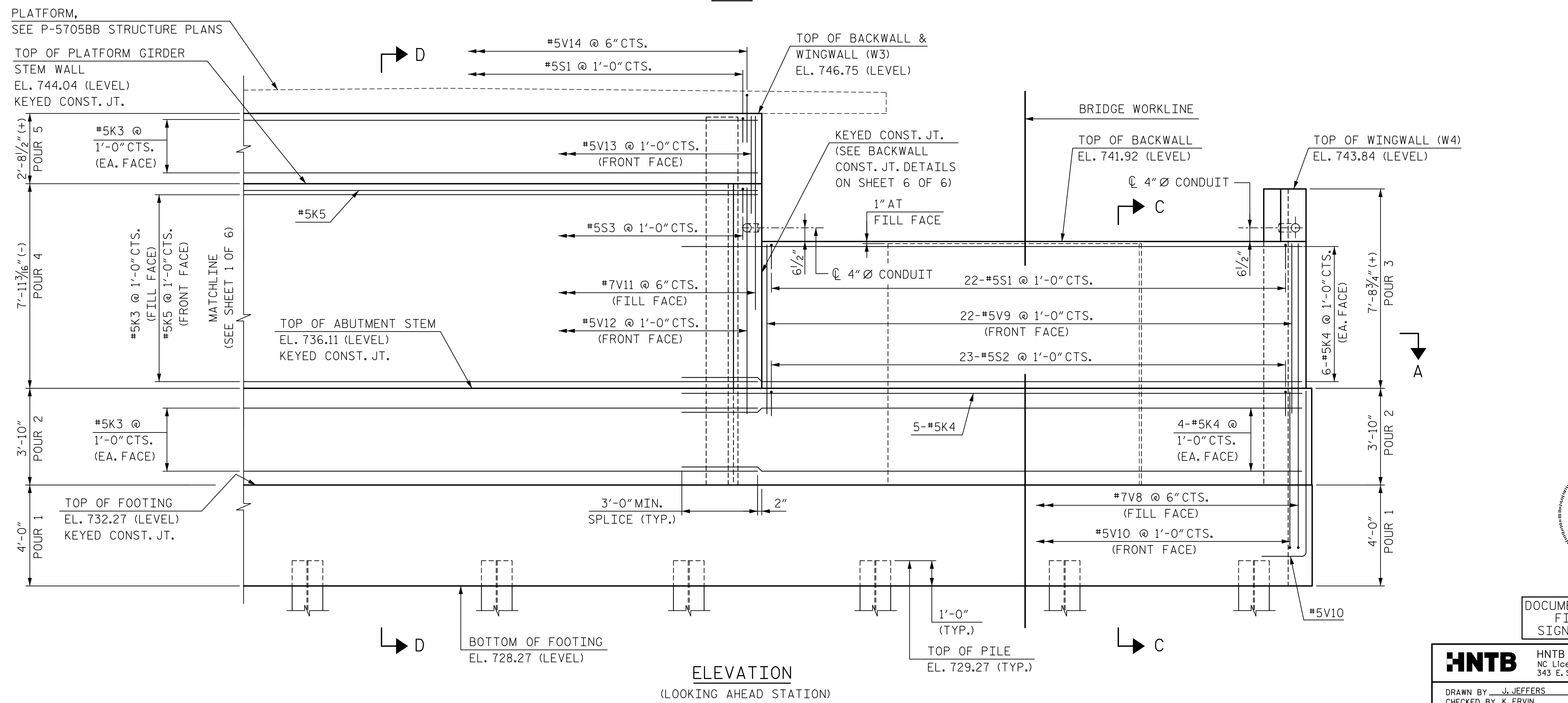
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S7-40 TOTAL SHEETS 51		
	NO.	BY	DATE	NO.		BY	DATE
	1		10/17	3			
2		10/17	4				



NOTE:
FOR NOTES, SEE SHEET 1 OF 6.



DETAIL B - PLATFORM GIRDER ANCHOR BOLT LAYOUT



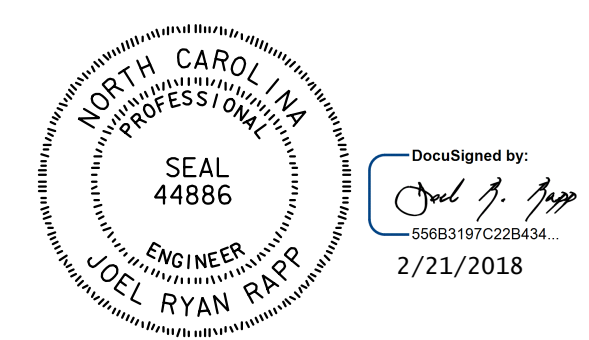
DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

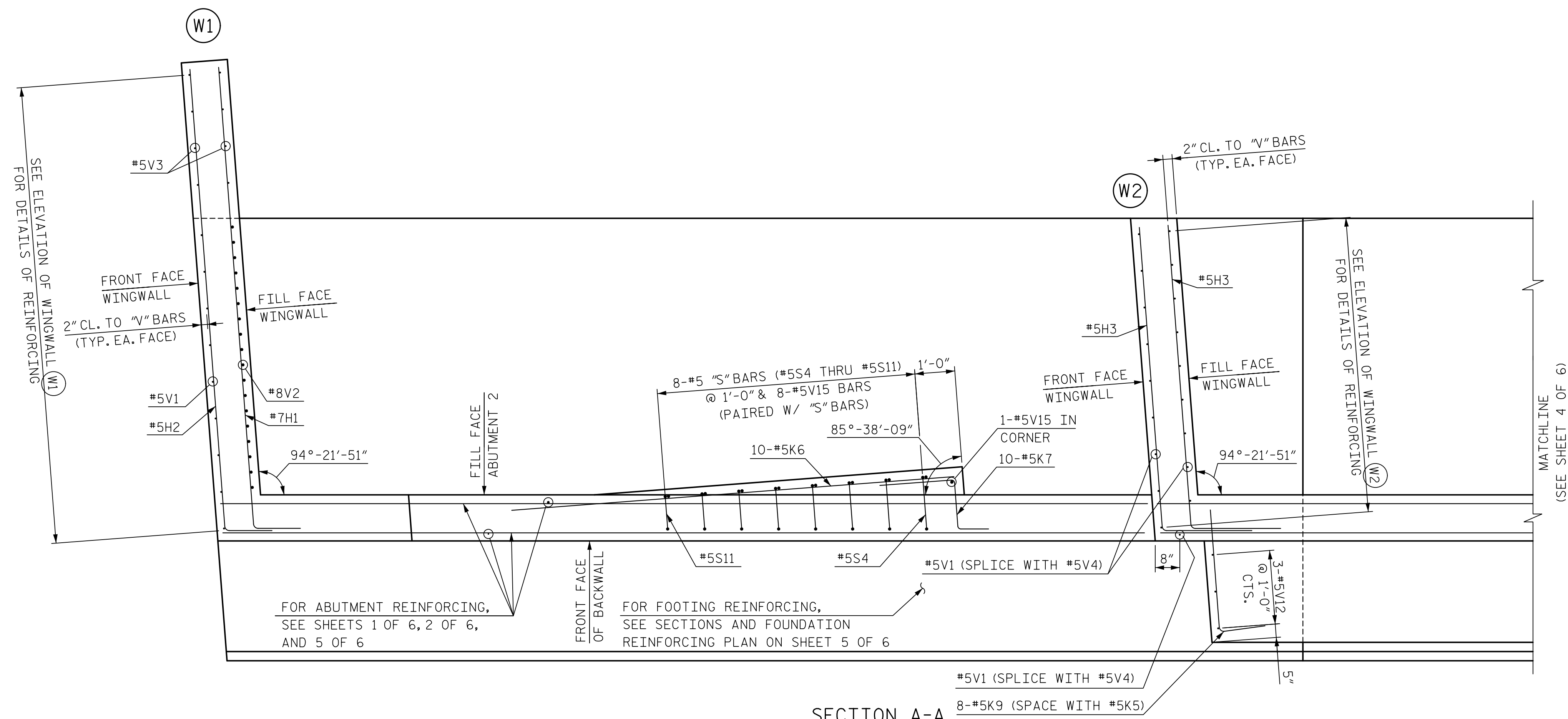
SUBSTRUCTURE
 ABUTMENT 2



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 41	
DRAWN BY: J. JEFFERS	DATE: 10/17	SHEET NO. S7-41	
CHECKED BY: K. ERVIN	DATE: 10/17	TOTAL SHEETS 51	

REVISIONS			
NO.	BY	DATE	DATE
1		3	
2		4	

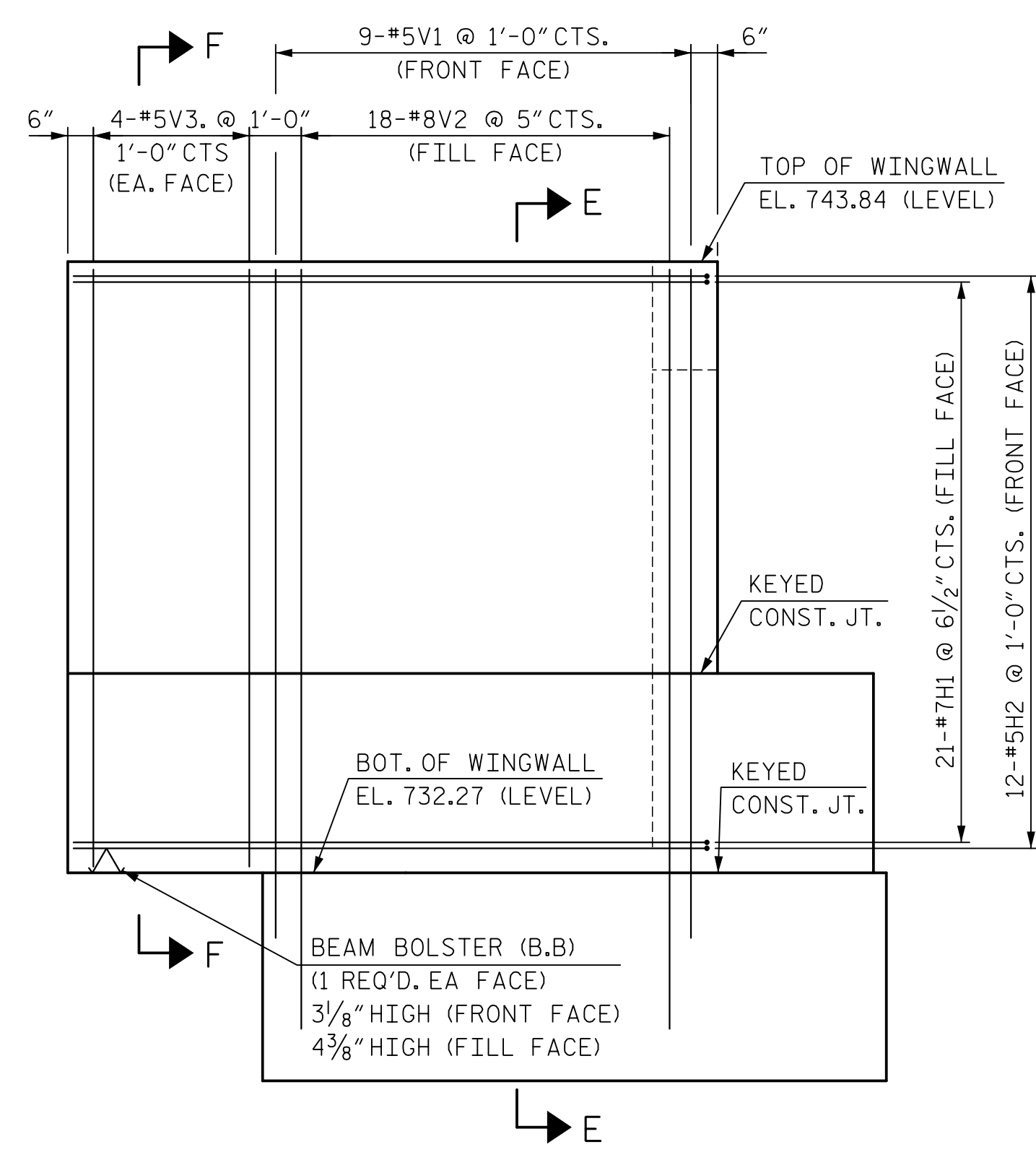


SECTION A-A

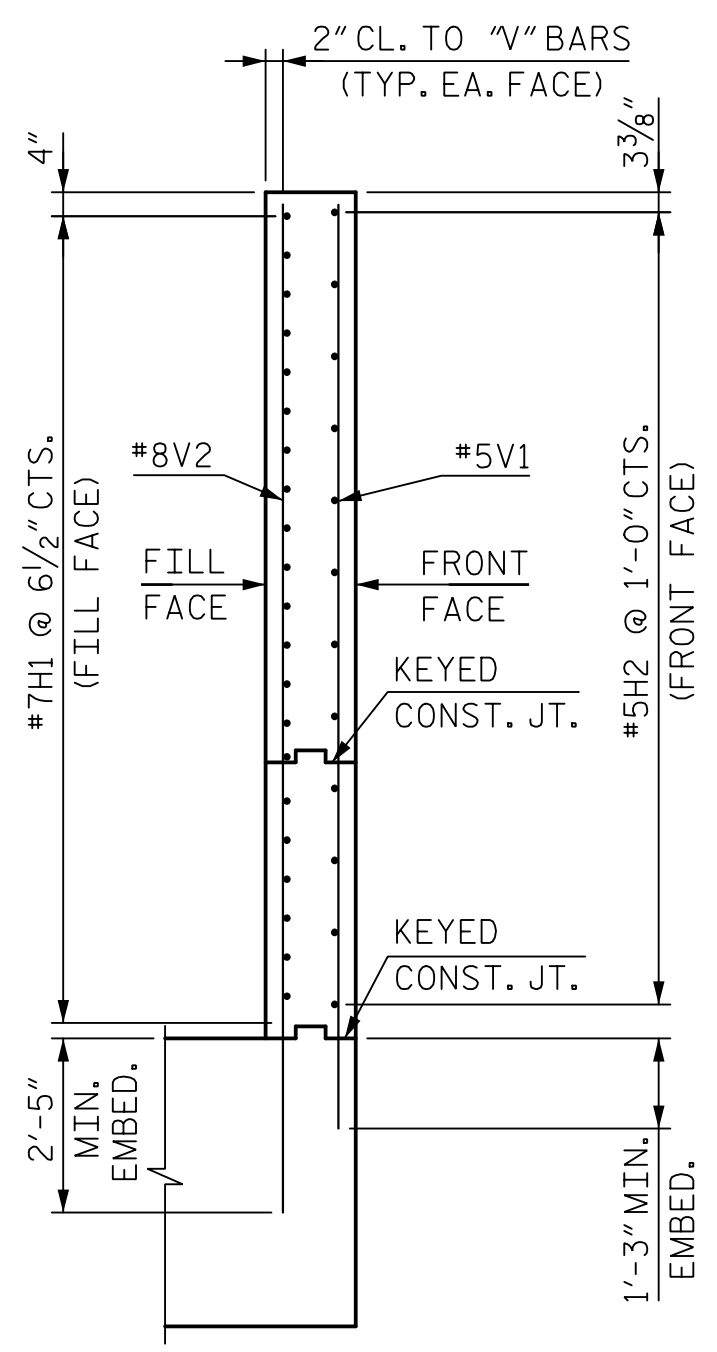
(#5V12 AND #7V8/#7V11 BARS ON FRONT FACE AND FILL FACE OF PLATFORM GIRDER STEM WALL NOT SHOWN FOR CLARITY)

FOR ABUTMENT REINFORCING, SEE SHEETS 1 OF 6, 2 OF 6, AND 5 OF 6

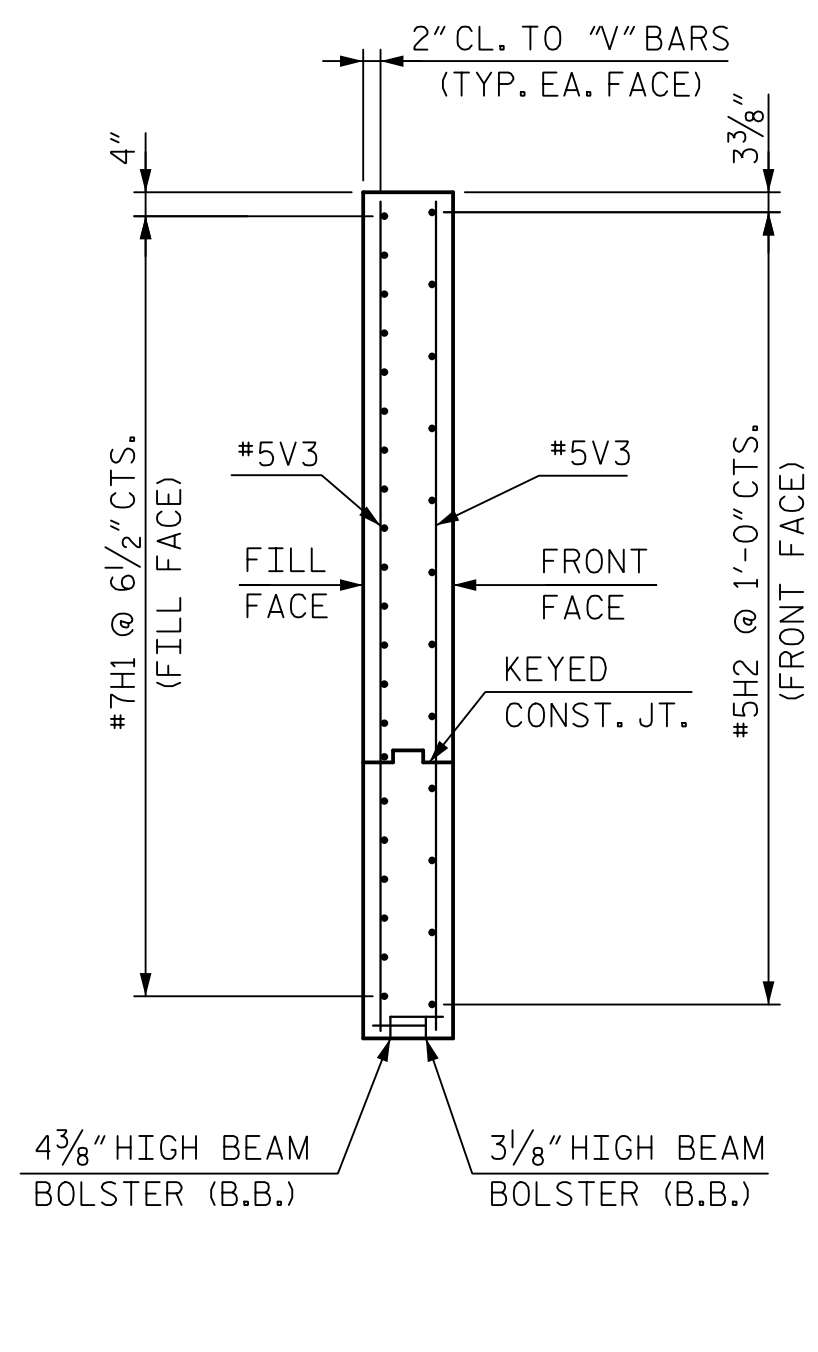
FOR FOOTING REINFORCING, SEE SECTIONS AND FOUNDATION REINFORCING PLAN ON SHEET 5 OF 6



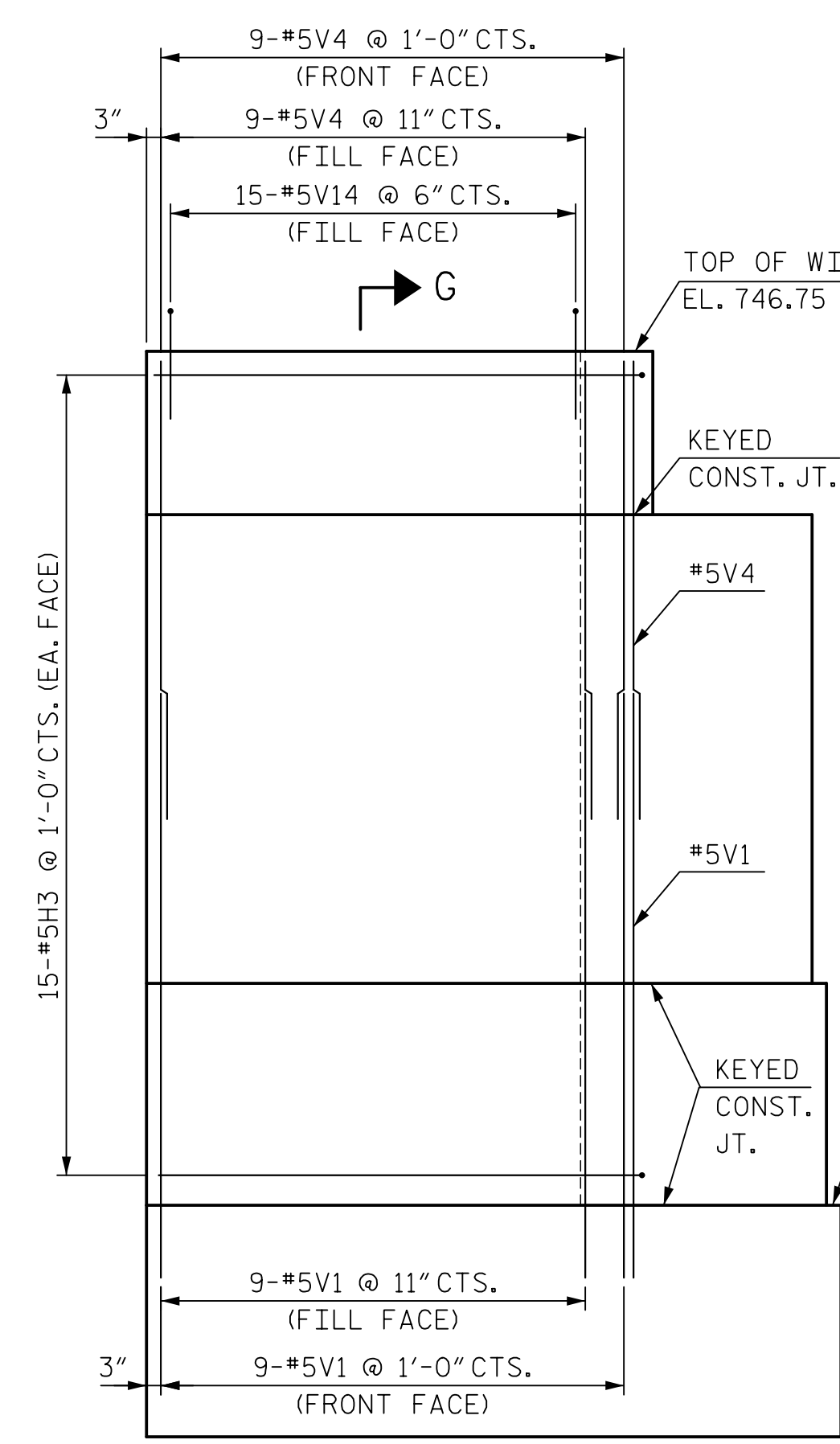
ELEVATION OF WINGWALL (W1)



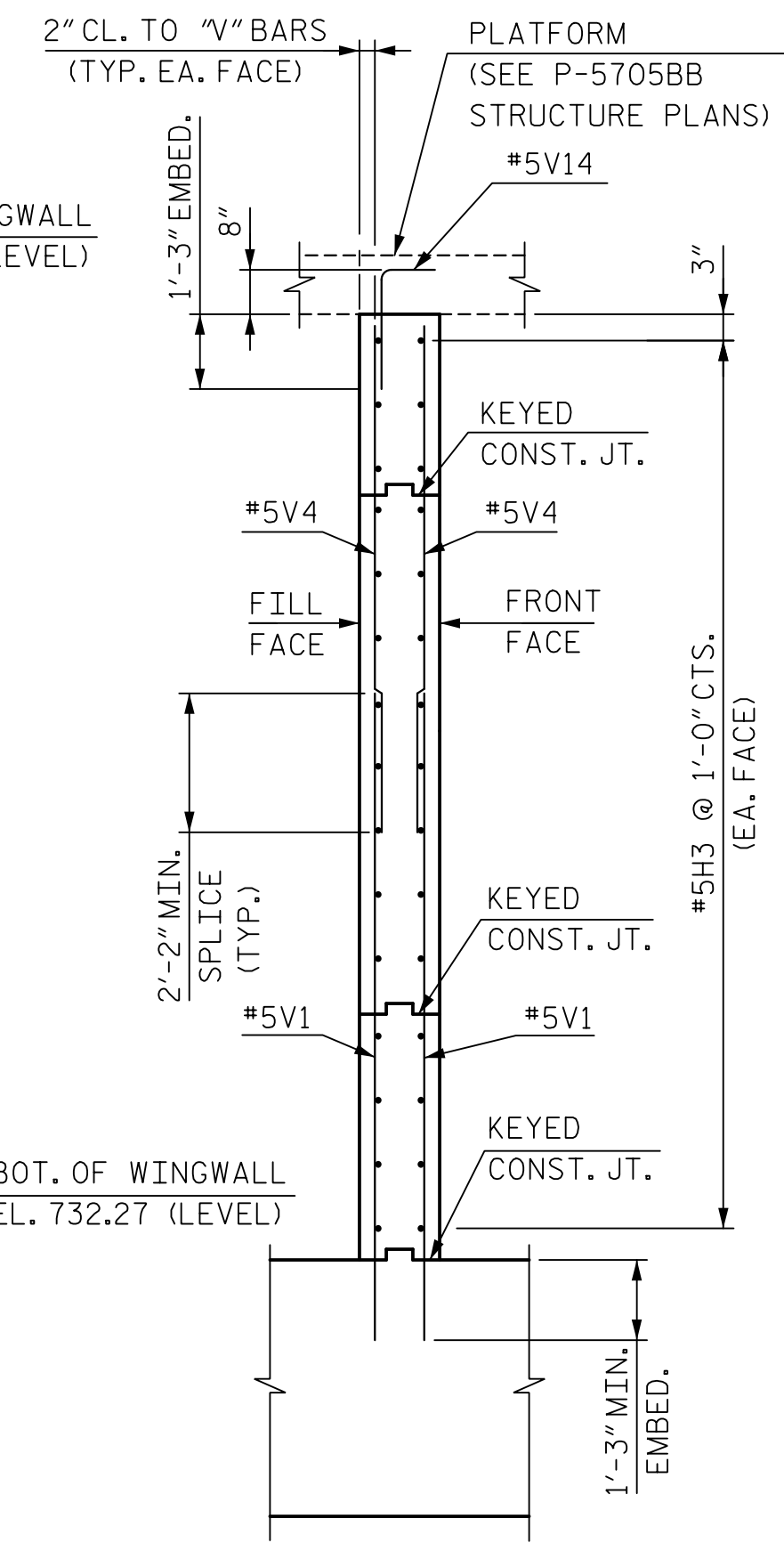
SECTION E-E



SECTION F-F



ELEVATION OF WINGWALL (W2)



SECTION G-G

NOTES:

FOR ABUTMENT AND WINGWALL DIMENSIONS, AND ABUTMENT ELEVATION, SEE SHEETS 1 OF 6 AND 2 OF 6.

FOR LOCATIONS OF FENCE AND HANDRAIL ANCHORAGES IN TOP OF BACKWALL/WINGWALLS, SEE "SUPERSTRUCTURE: BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

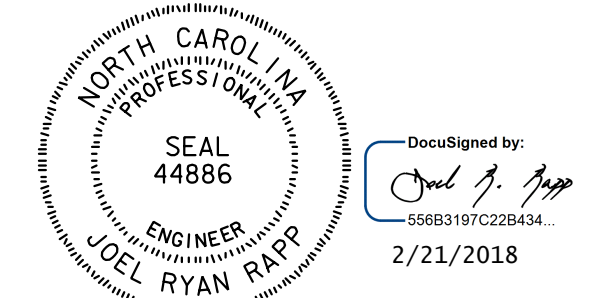
FOR KEYED CONSTRUCTION JOINT DETAILS, SEE SHEET 6 OF 6.

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 2



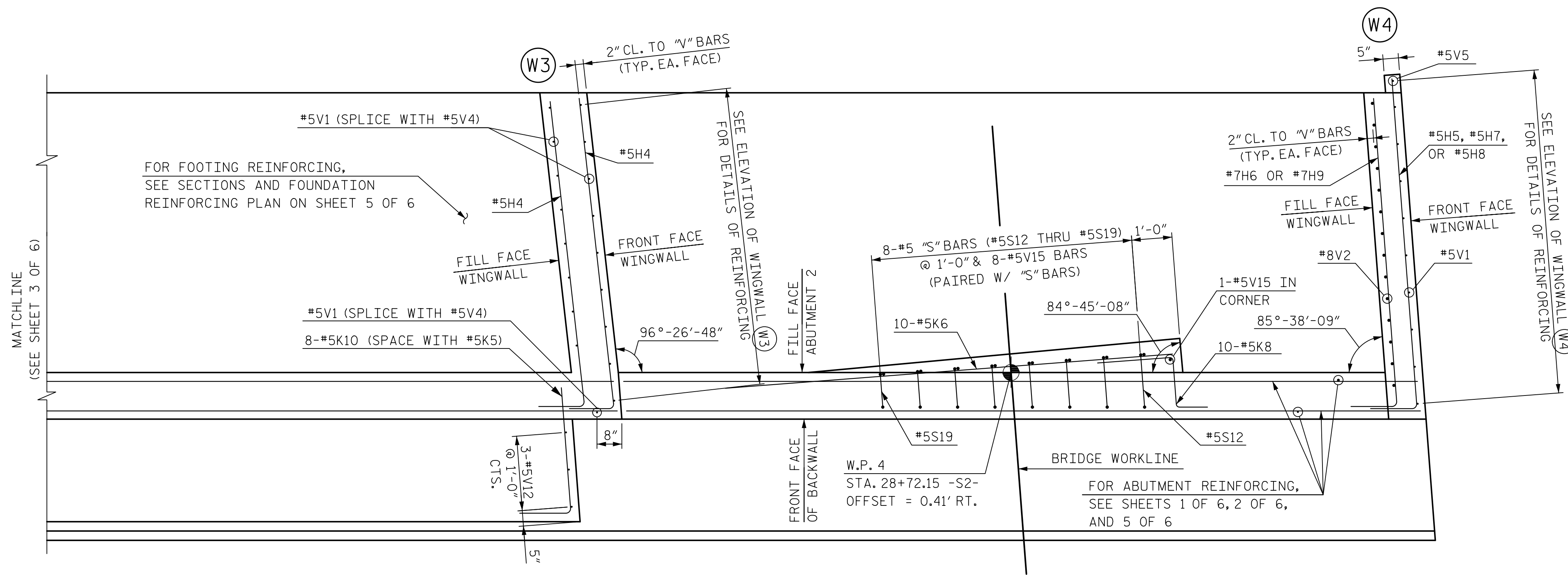
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

Drawn by J. JEFFERS DATE 10/17
 Checked by K. ERVIN DATE 10/17

DWG. NO. 42

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-42
1			3			TOTAL SHEETS
2			4			51

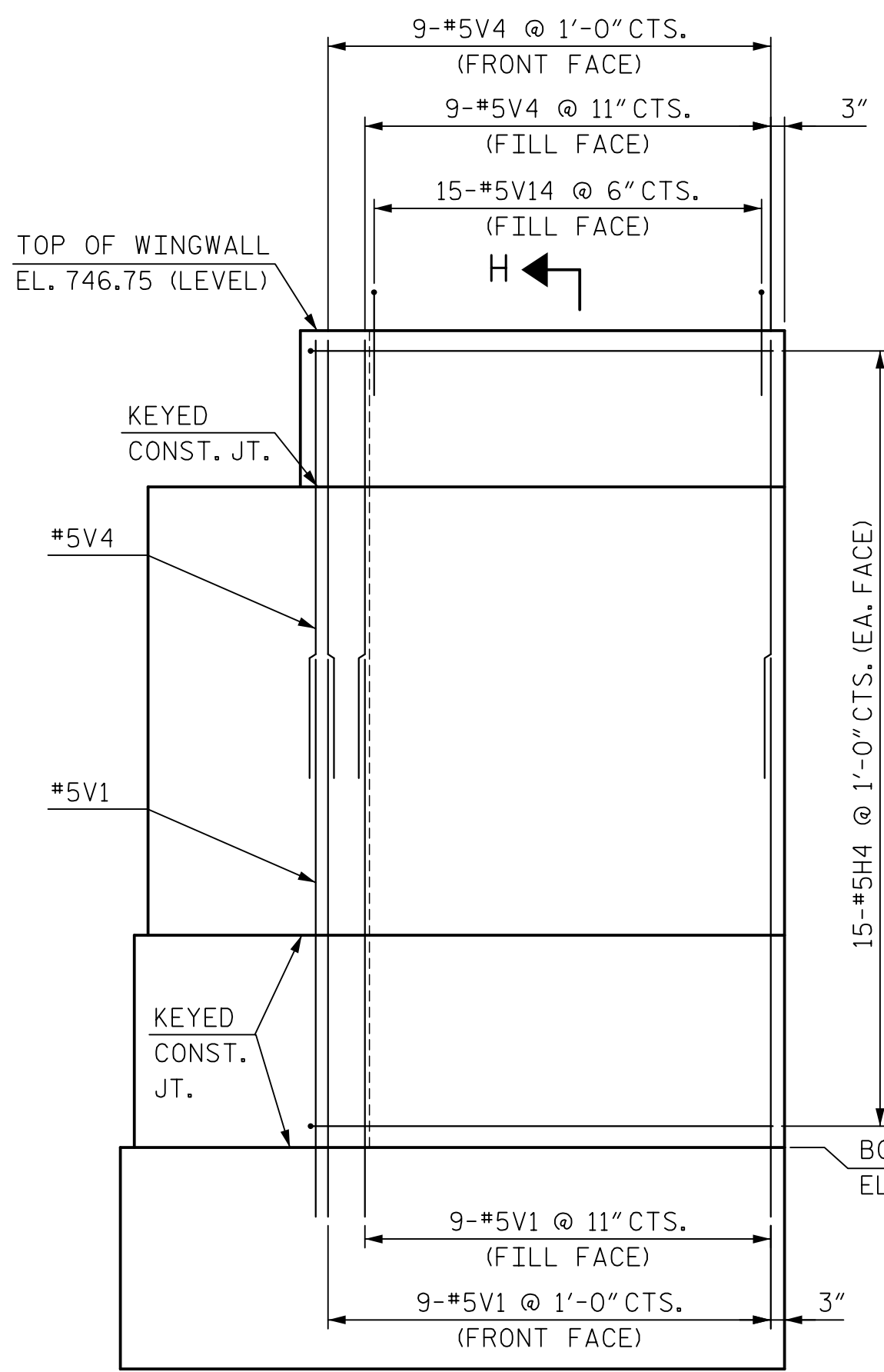


SECTION A-A

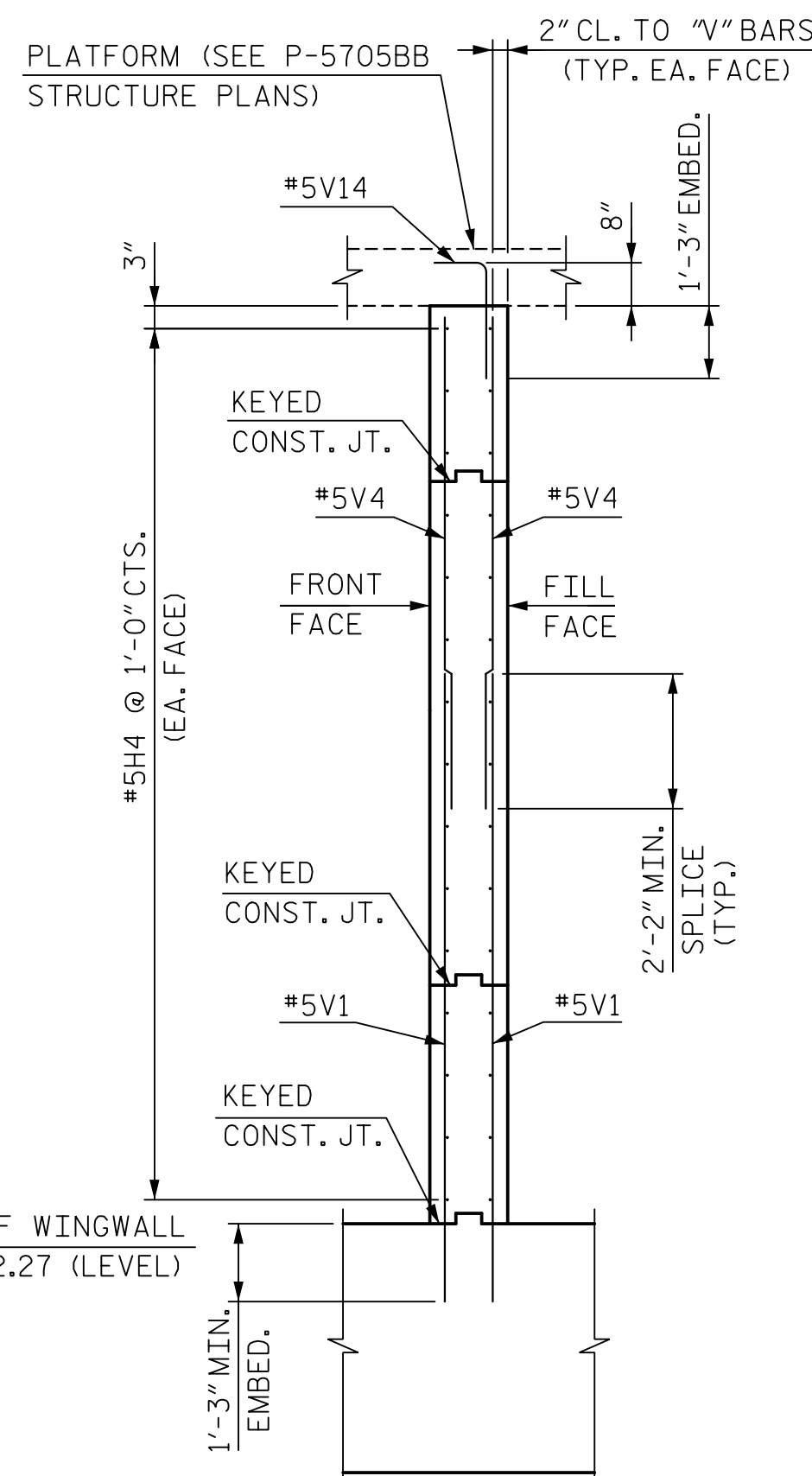
(*5V12 AND *7V8/*7V11 BARS ON FRONT FACE AND FILL FACE OF PLATFORM GIRDER STEM WALL NOT SHOWN FOR CLARITY)

NOTES:

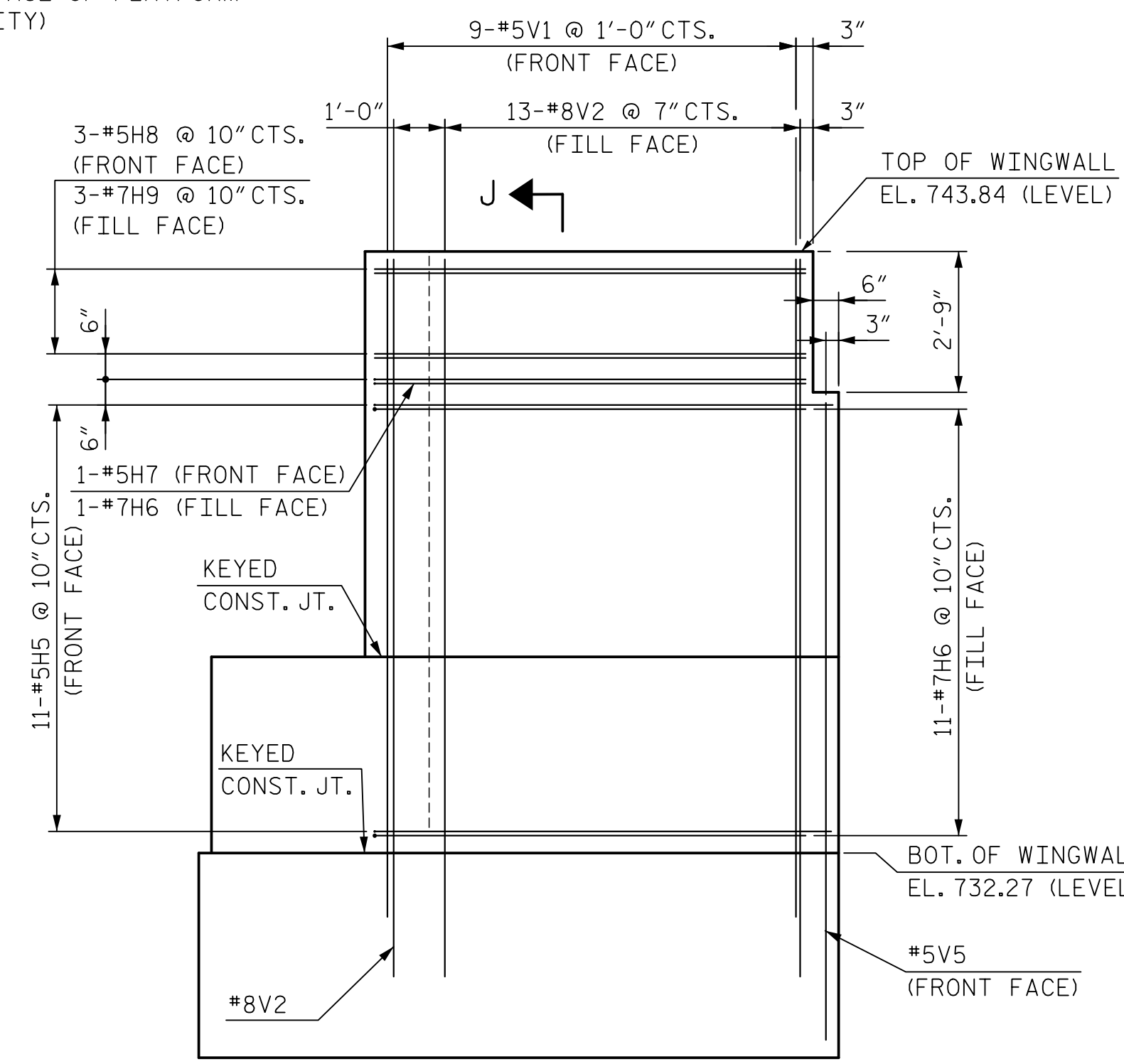
- FOR ABUTMENT AND WINGWALL DIMENSIONS, AND ABUTMENT ELEVATION, SEE SHEETS 1 OF 6 AND 2 OF 6.
- FOR LOCATIONS OF FENCE AND HANDRAIL ANCHORAGES IN TOP OF BACKWALL/WINGWALLS, SEE "SUPERSTRUCTURE: BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.
- FOR KEYED CONSTRUCTION JOINT DETAILS, SEE SHEET 6 OF 6.



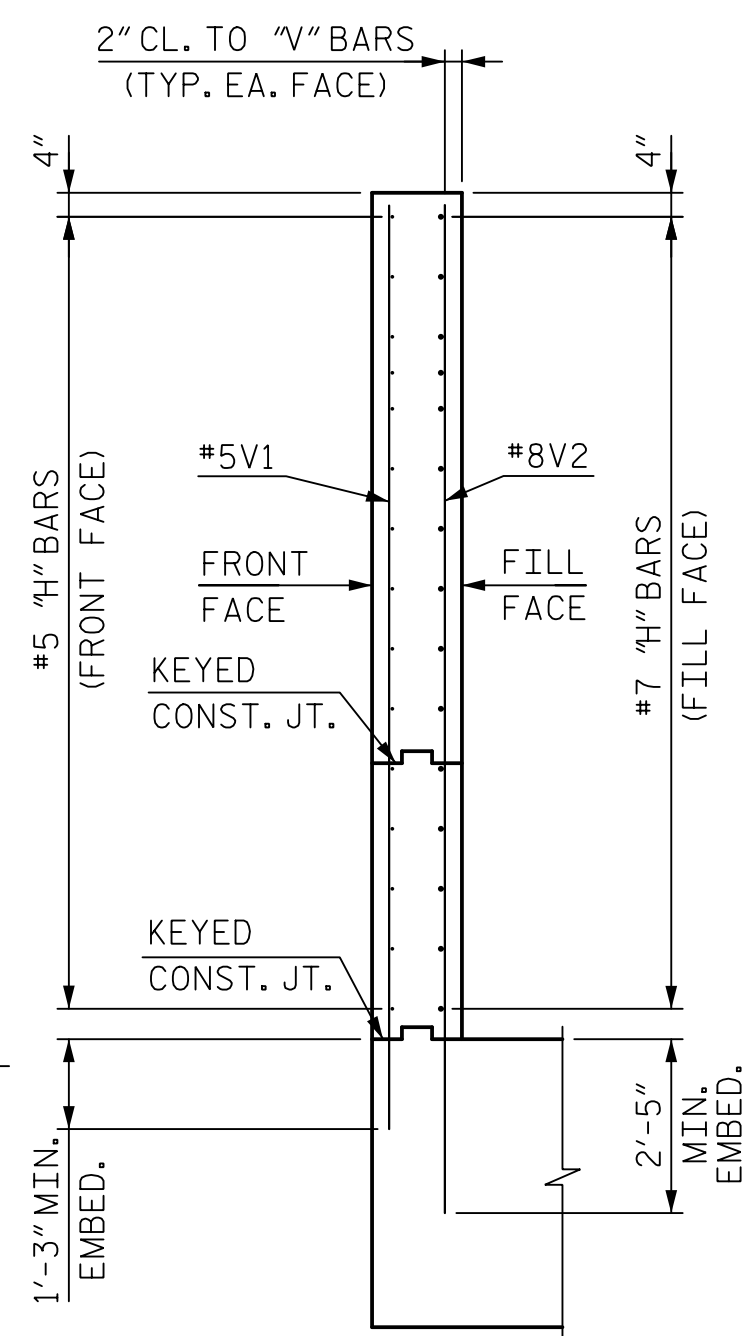
ELEVATION OF WINGWALL (W3)



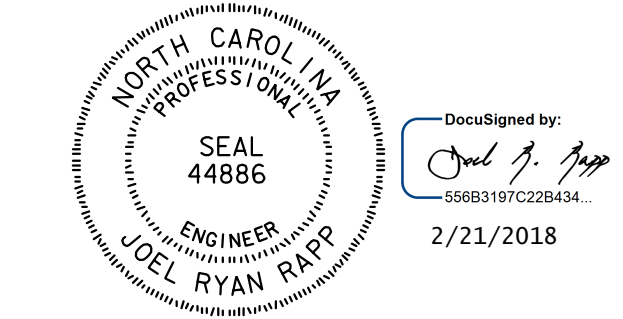
SECTION H-H



ELEVATION OF WINGWALL (W4)



SECTION J-J



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

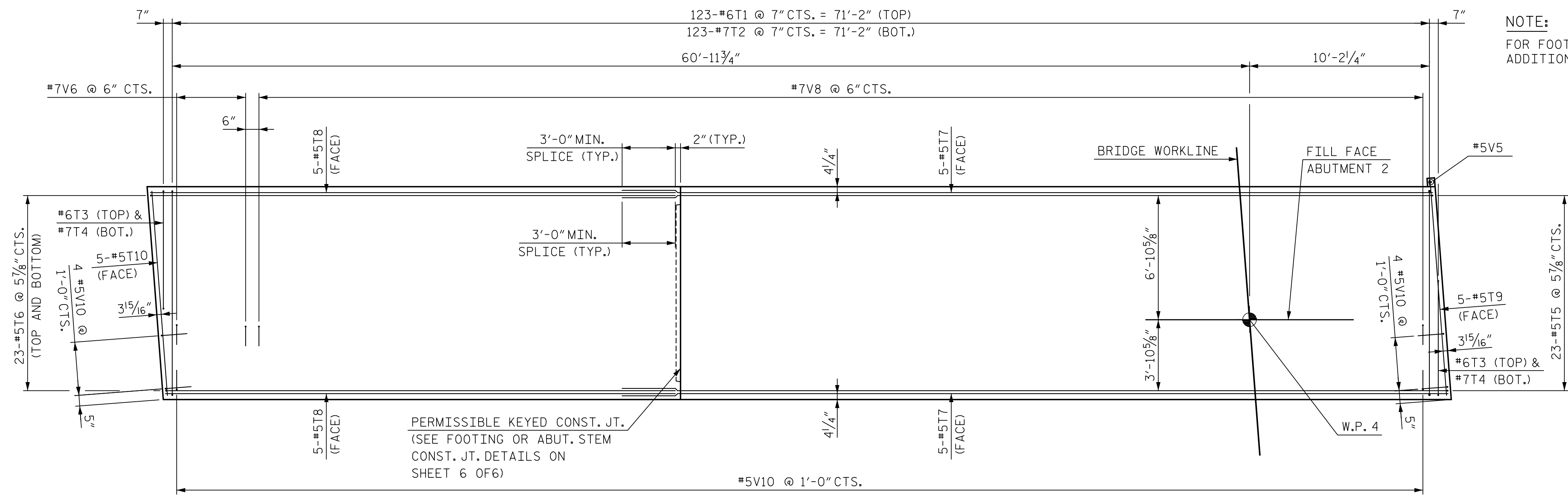
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

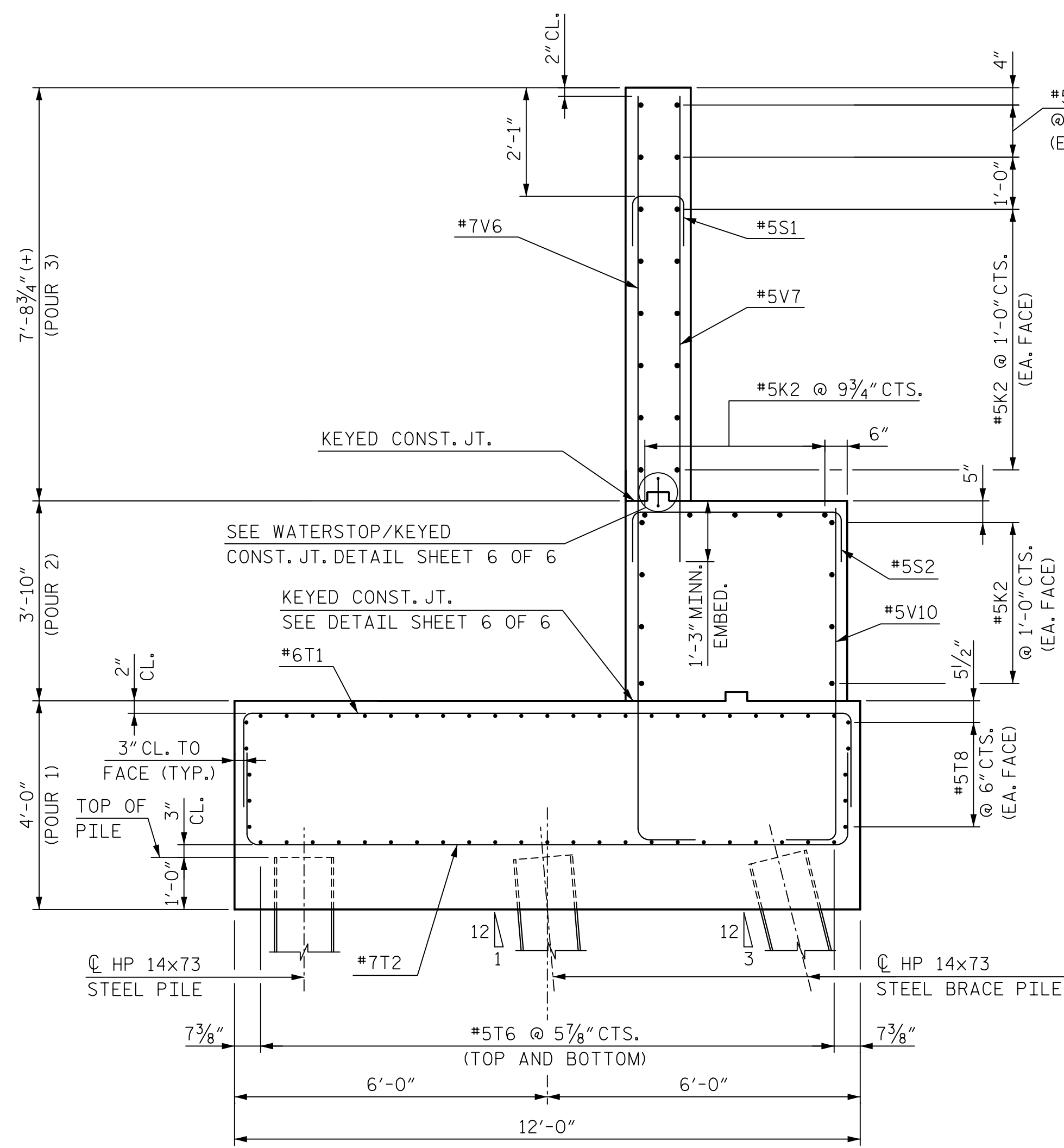
SUBSTRUCTURE
 ABUTMENT 2

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 43	
NO.	BY	DATE	REVISIONS
1		10/17	3
2		10/17	4
DRAWN BY <u>J. JEFFERS</u> DATE <u>10/17</u>			TOTAL SHEETS 51
CHECKED BY <u>K. ERVIN</u> DATE <u>10/17</u>			

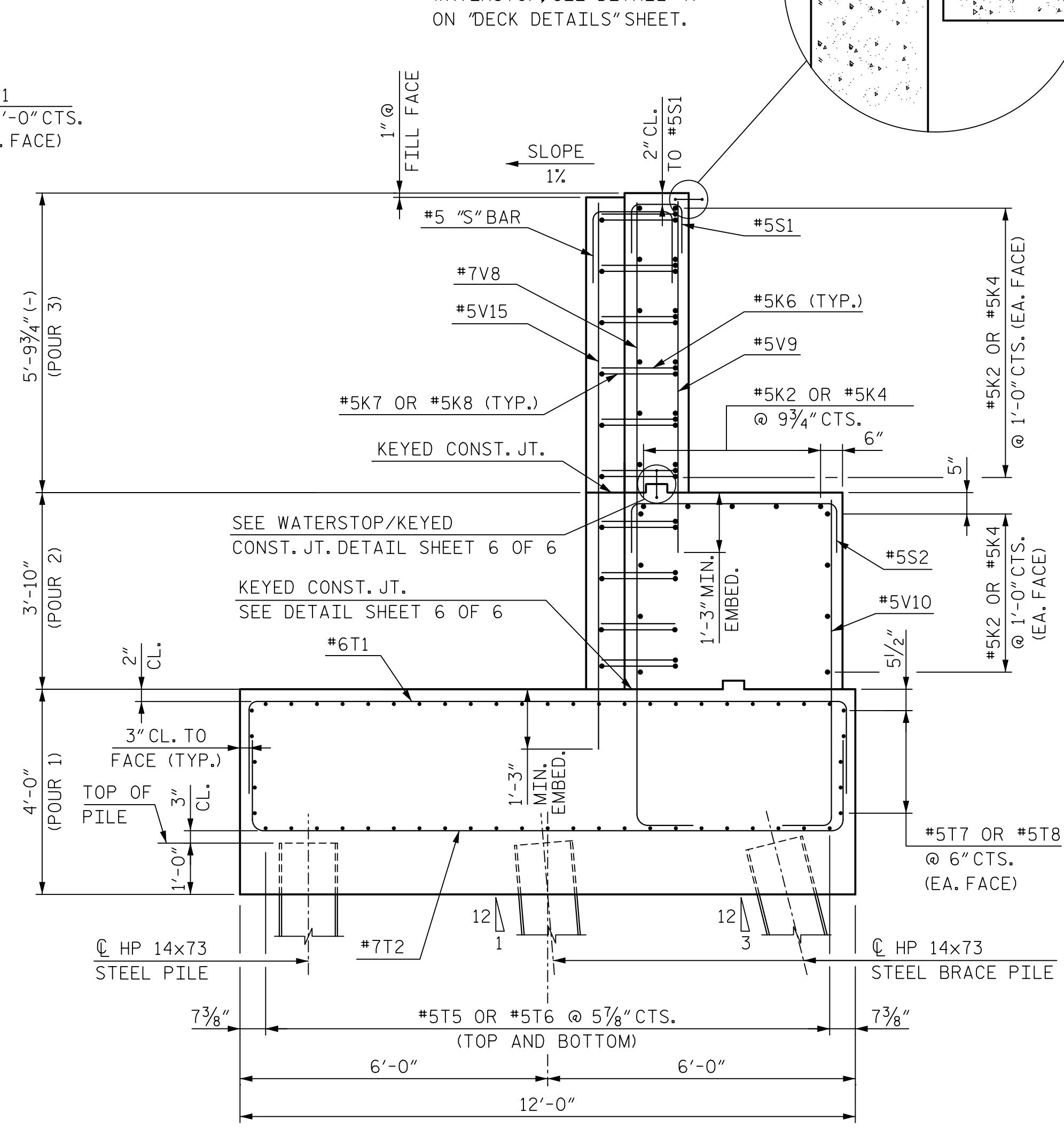


FOOTING REINFORCING PLAN
(WINGWALL BARS NOT SHOWN FOR CLARITY)

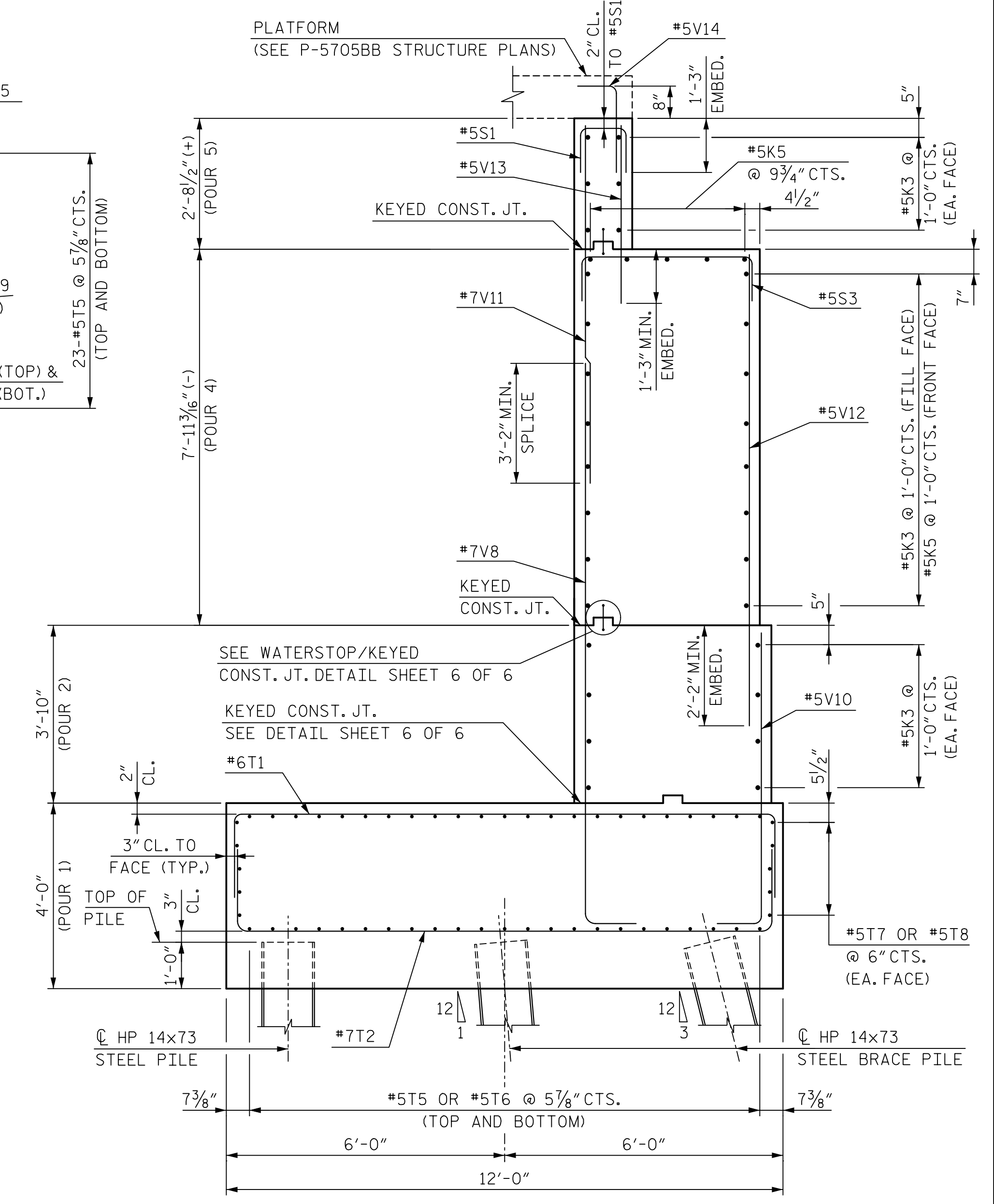
NOTE:
FOR FOOTING LAYOUT, LOCATIONS OF SECTIONS B-B, C-C, AND D-D, AND ADDITIONAL DIMENSIONS, SEE SHEETS 1 OF 6 AND 2 OF 6.



SECTION B-B

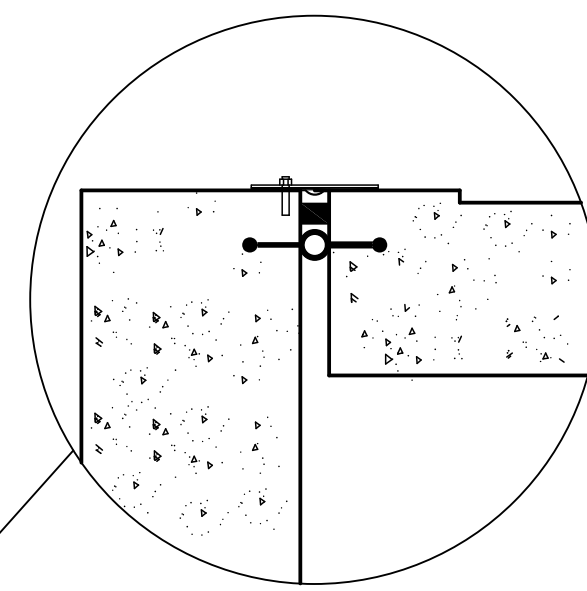


SECTION C-C



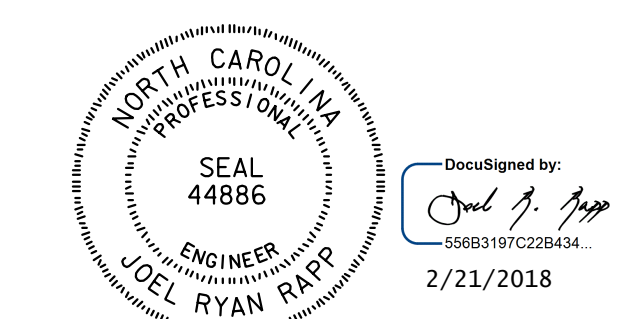
SECTION D-D

BULB-TYPE WATERSTOP REQUIRED FOR DETAILS OF BULB-TYPE WATERSTOP, SEE DETAIL "A" ON "DECK DETAILS" SHEET.



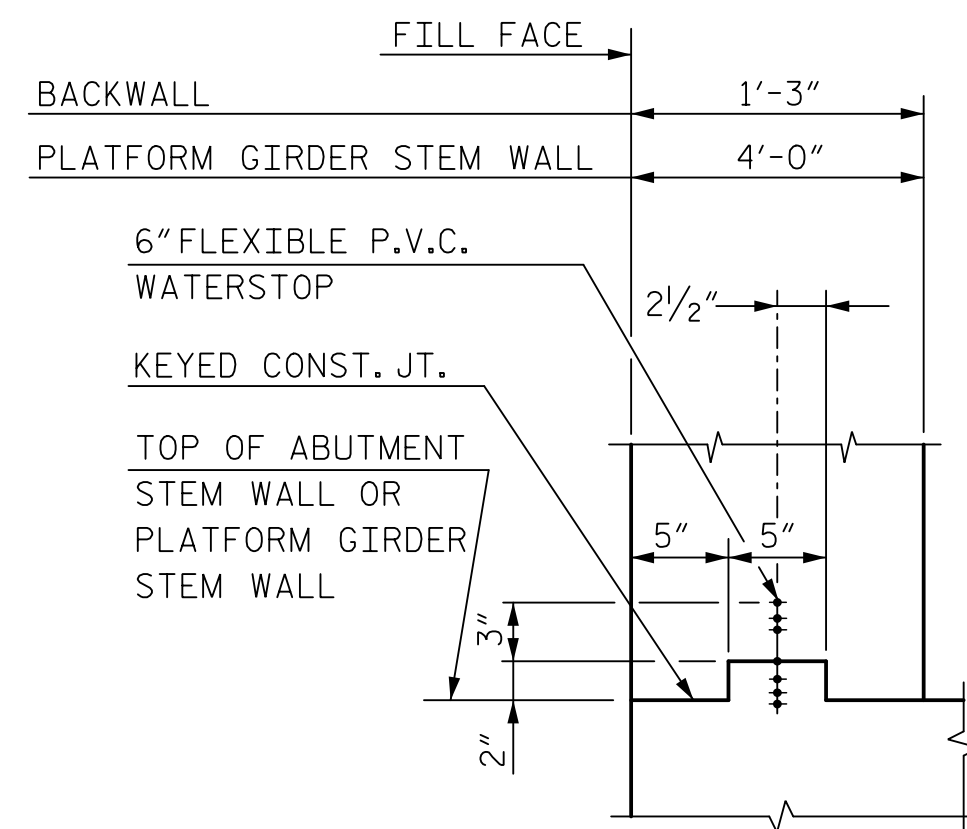
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 5 OF 6
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
ABUTMENT 2

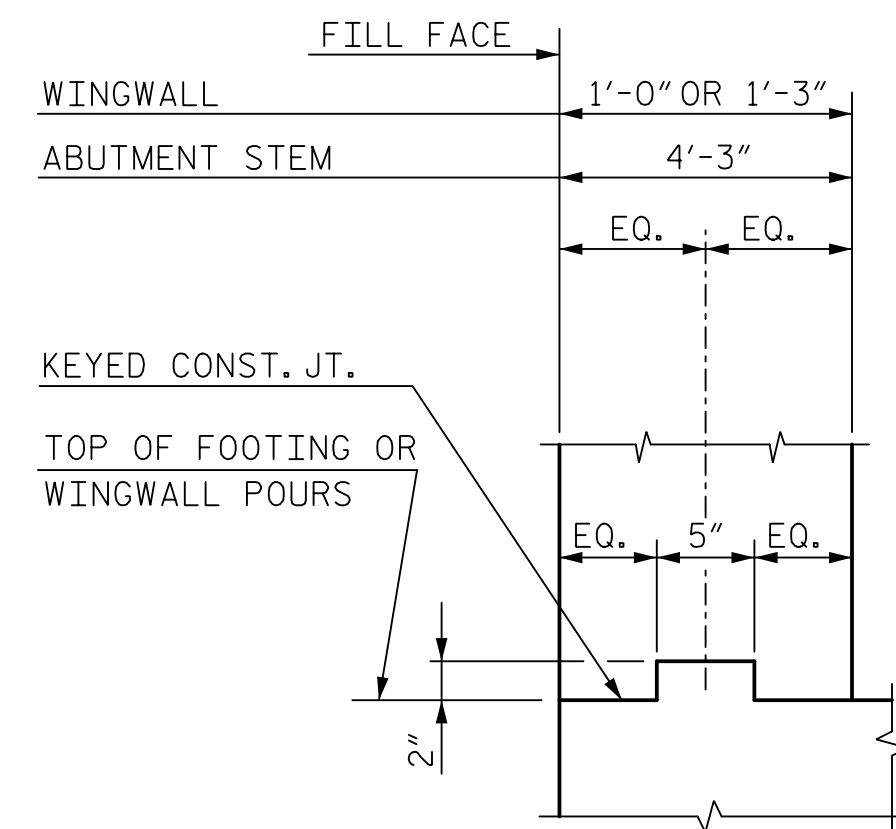


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

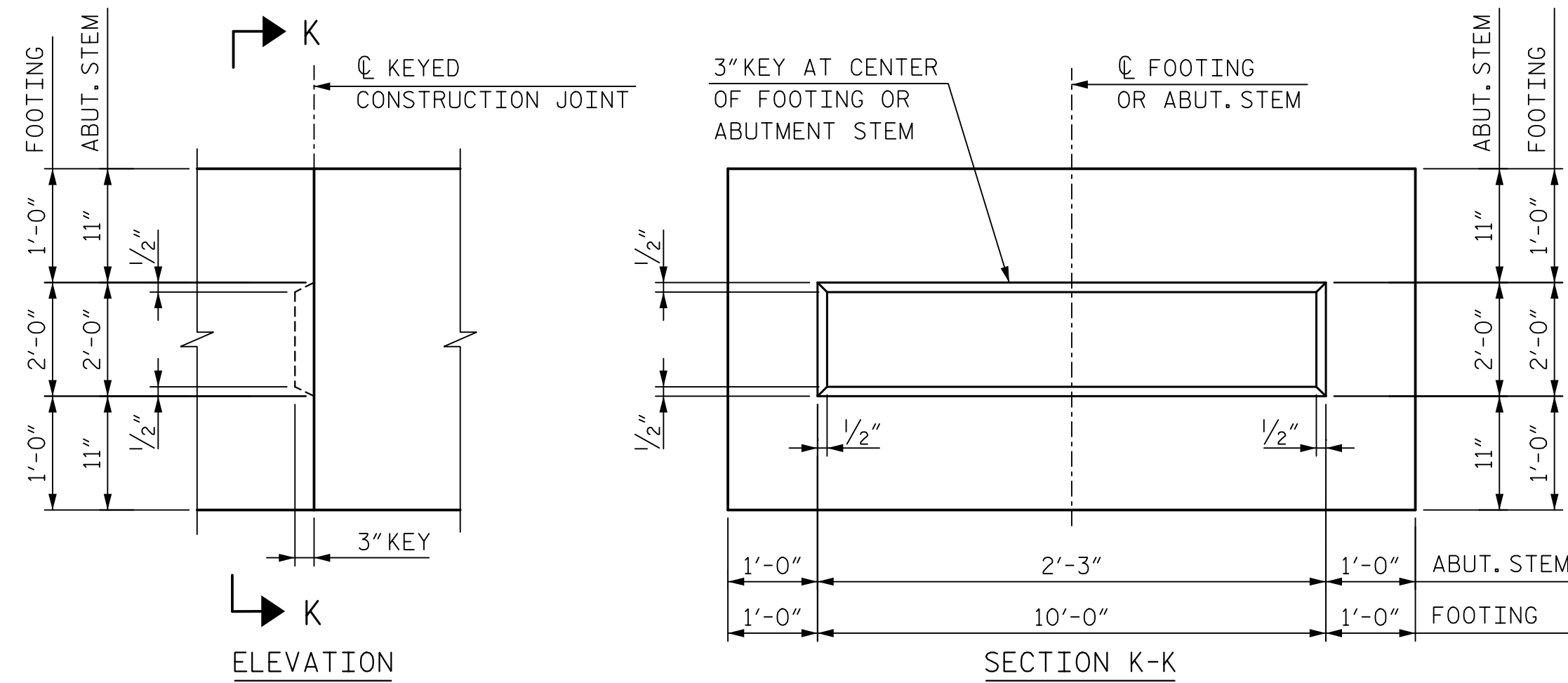
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 44	
DRAWN BY: J. JEFFERS	DATE: 10/17		
CHECKED BY: K. ERVIN	DATE: 10/17		
		REVISIONS	
NO.	BY	DATE	NO.
1			3
2			4
			SHEET NO. S7-44
			TOTAL SHEETS 51



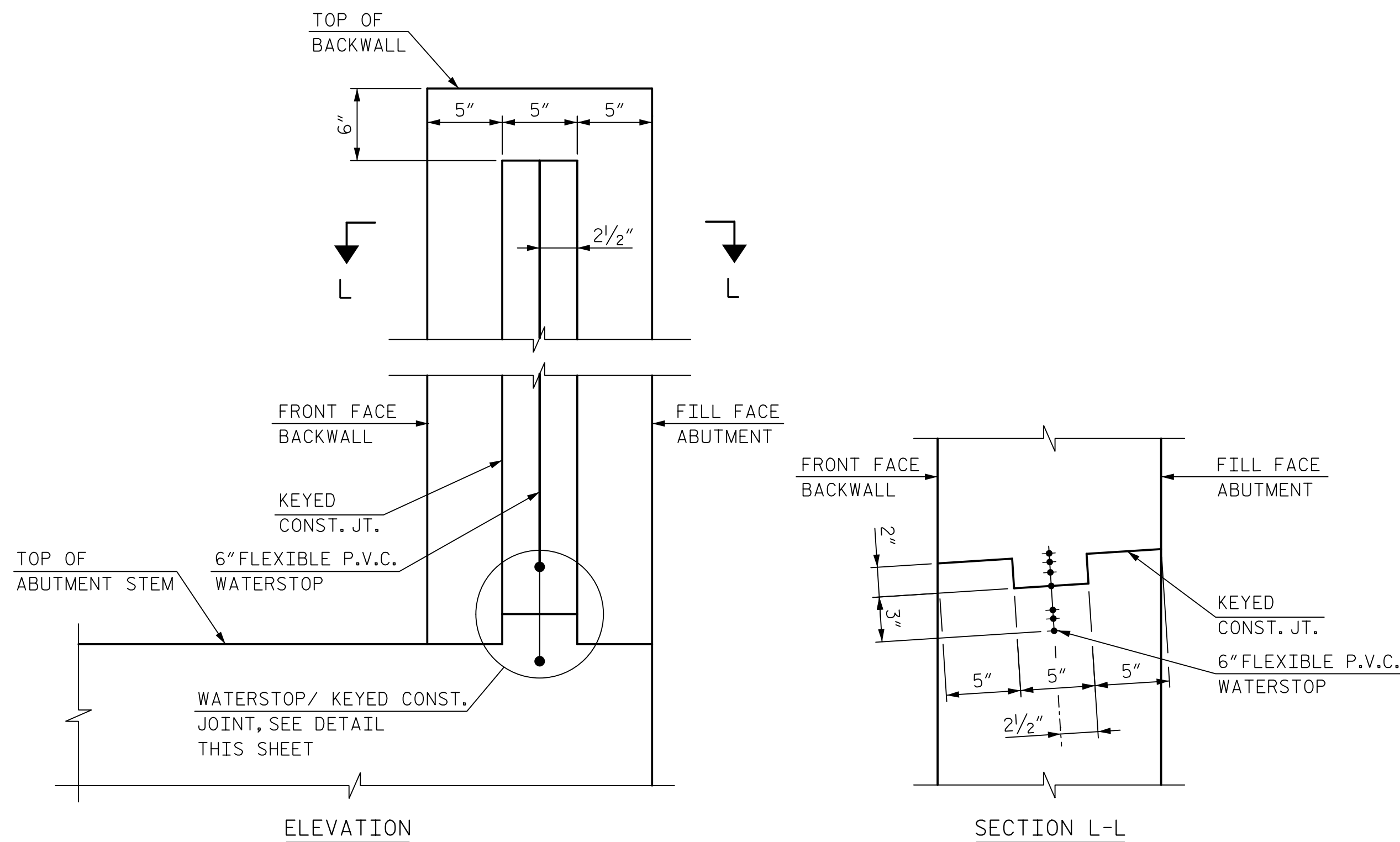
WATERSTOP/KEYED CONSTRUCTION JOINT DETAIL



KEYED CONSTRUCTION JOINT DETAIL



FOOTING OR ABUT. STEM CONSTRUCTION JOINT DETAILS



BACKWALL CONSTRUCTION JOINT DETAILS

BAR TYPES			
MARK	B	C	D
H1	12'-8"	1'-2"	1 1/16"
H2	12'-7"	10"	0 3/4"
H3	8'-4"	2'-5"	2 3/16"
H4	8'-4"	2'-5"	2 13/16"
H5	8'-10"	10"	1 3/8"
H6	8'-4"	1'-2"	1 5/16"
H7	8'-4"	10"	1 3/8"
K9	3'-7"	10"	0 3/4"
K10	3'-7"	10"	1 3/8"

NOTE: 'D' IS PARALLEL TO WINGWALL.

BILL OF REINFORCING											
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
ABUTMENT 2											
H1	21	7	2	13'-10"	594	T1	123	6	4	14'-8"	2710
H2	12	5	2	13'-5"	168	T2	123	7	4	14'-8"	3688
H3	30	5	2	10'-9"	337	T3	2	6	4	7'-2"	22
H4	30	5	1	10'-9"	337	T4	2	7	4	7'-2"	30
H5	11	5	1	9'-8"	111	T5	46	5	5	48'-0"	2303
H6	12	7	1	9'-6"	234	T6	46	5	5	30'-4"	1456
H7	1	5	1	9'-2"	10	T7	10	5	STR.	46'-5"	485
H8	3	5	STR.	8'-5"	27	T8	10	5	STR.	28'-9"	300
H9	3	7	STR.	8'-5"	52	T9	5	5	STR.	12'-1"	64
						T10	5	5	STR.	11'-6"	60
K1	4	5	STR.	4'-11"	21	V1	56	5	STR.	12'-8"	740
K2	25	5	STR.	28'-6"	744	V2	32	8	STR.	13'-10"	1182
K3	22	5	STR.	25'-3"	580	V3	8	5	STR.	11'-2"	94
K4	25	5	STR.	24'-8"	644	V4	38	5	STR.	5'-5"	215
K5	13	5	STR.	22'-8"	308	V5	1	5	STR.	12'-2"	13
K6	20	5	STR.	11'-6"	240	V6	10	7	5	15'-2"	310
K7	10	5	3	5'-6"	58	V7	5	5	STR.	8'-10"	47
K8	10	5	3	5'-8"	60	V8	135	7	5	13'-3"	3657
K9	8	5	2	4'-5"	37	V9	43	5	STR.	6'-11"	311
K10	8	5	1	4'-5"	37	V10	81	5	5	6'-3"	529
						V11	51	7	STR.	8'-3"	861
S1	74	5	4	3'-11"	194	V12	29	5	STR.	10'-2"	308
S2	50	5	4	6'-11"	361	V13	26	5	STR.	3'-11"	107
S3	23	5	4	6'-8"	160	V14	81	5	5	2'-9"	233
S4	1	5	4	4'-6"	5	V15	18	5	STR.	10'-8"	201
S5	1	5	4	4'-5"	5						
S6	1	5	4	4'-4"	5						
S7	1	5	4	4'-3"	5						
S8	1	5	4	4'-2"	5						
S9	1	5	4	4'-1"	5						
S10	1	5	4	4'-0"	4						
S11	1	5	4	3'-11"	4						
S12	1	5	4	4'-7"	5						
S13	1	5	4	4'-6"	5						
S14	1	5	4	4'-5"	5						
S15	1	5	4	4'-4"	5						
S16	1	5	4	4'-3"	5						
S17	1	5	4	4'-2"	5						
S18	1	5	4	4'-1"	5						
S19	1	5	4	4'-0"	5						
T1	1	5	4	4'-7"	5						
T2	1	5	4	4'-5"	5						
T3	1	5	4	4'-4"	5						
T4	1	5	4	4'-1"	5						

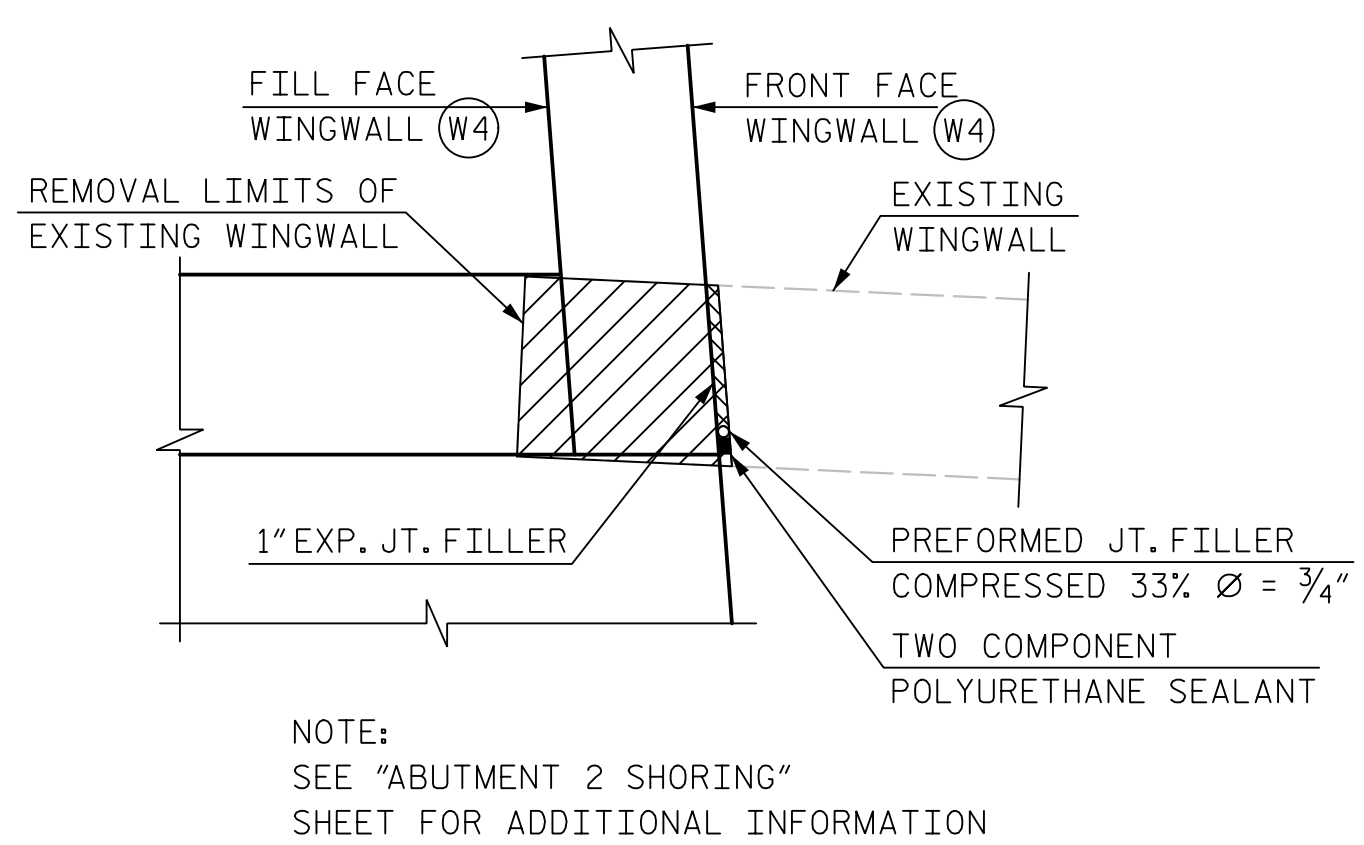
QUANTITIES		
ITEM		TOTAL
REINFORCING STEEL	LBS.	25,318
CLASS AA CONCRETE BREAKDOWN:		
POUR 1 FOOTING	CU. YDS	129.1
POUR 2 ABUTMENT STEM & BOTT. OF WINGS	CU. YDS	50.8
POUR 3 BRIDGE BACKWALL AND WINGS	CU. YDS	21.4
POUR 4 PLATFORM GIRDER STEM WALL & WINGS	CU. YDS	33.5
POUR 5 PLATFORM GIRDER BACKWALL AND WINGS	CU. YDS	5.1
TOTAL	CU. YDS	239.9
HP 14 X 73 STEEL PILES	NO.	30
	L.F.	1,200

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

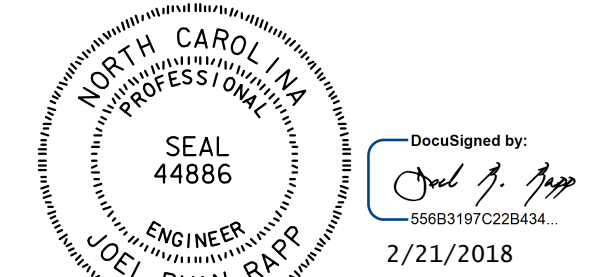
SHEET 6 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 2

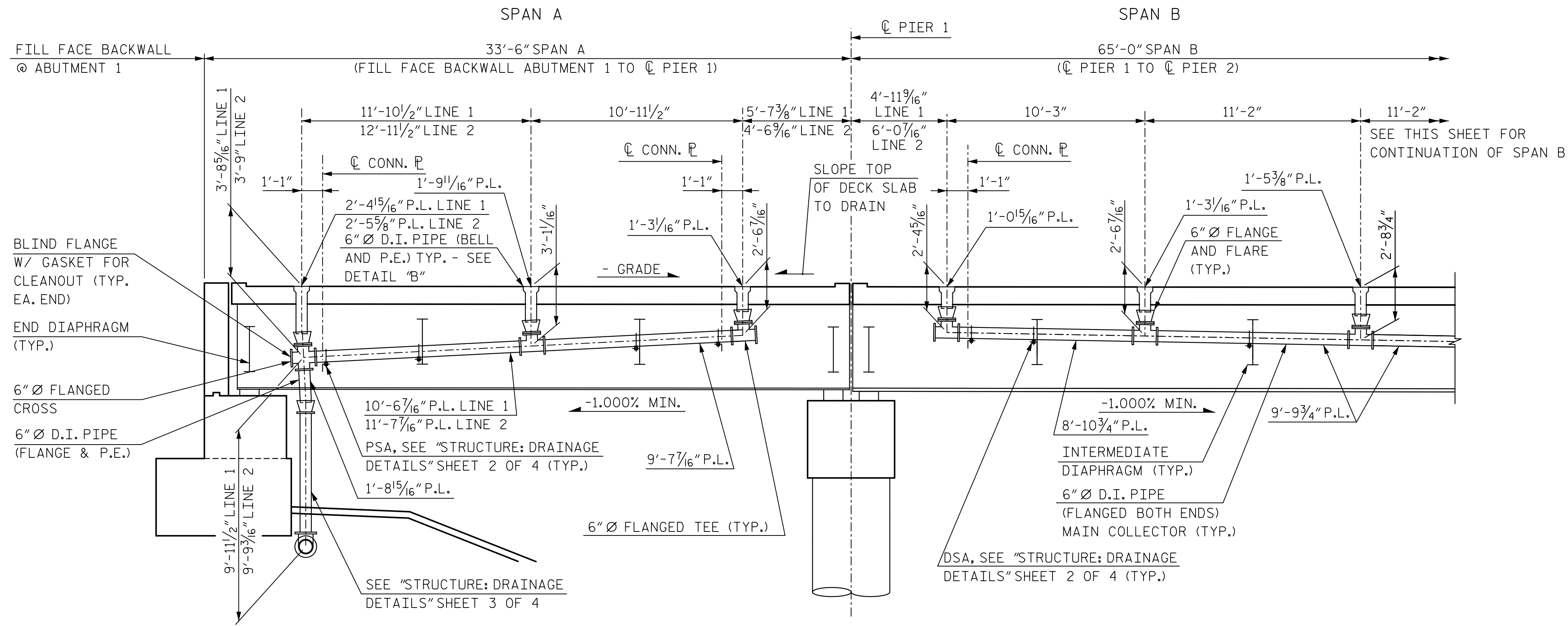


EXISTING ABUTMENT INTERFACE DETAIL



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	DRAWN BY <u>J. JEFFERS</u> DATE <u>10/17</u> CHECKED BY <u>K. ERVIN</u> DATE <u>10/17</u>	DWG. NO. 45
	REVISIONS	
	SHEET NO. S7-45 TOTAL SHEETS 51	



DRAINAGE DETAILS - SPAN A AND PORTION OF SPAN B

NOTES:

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

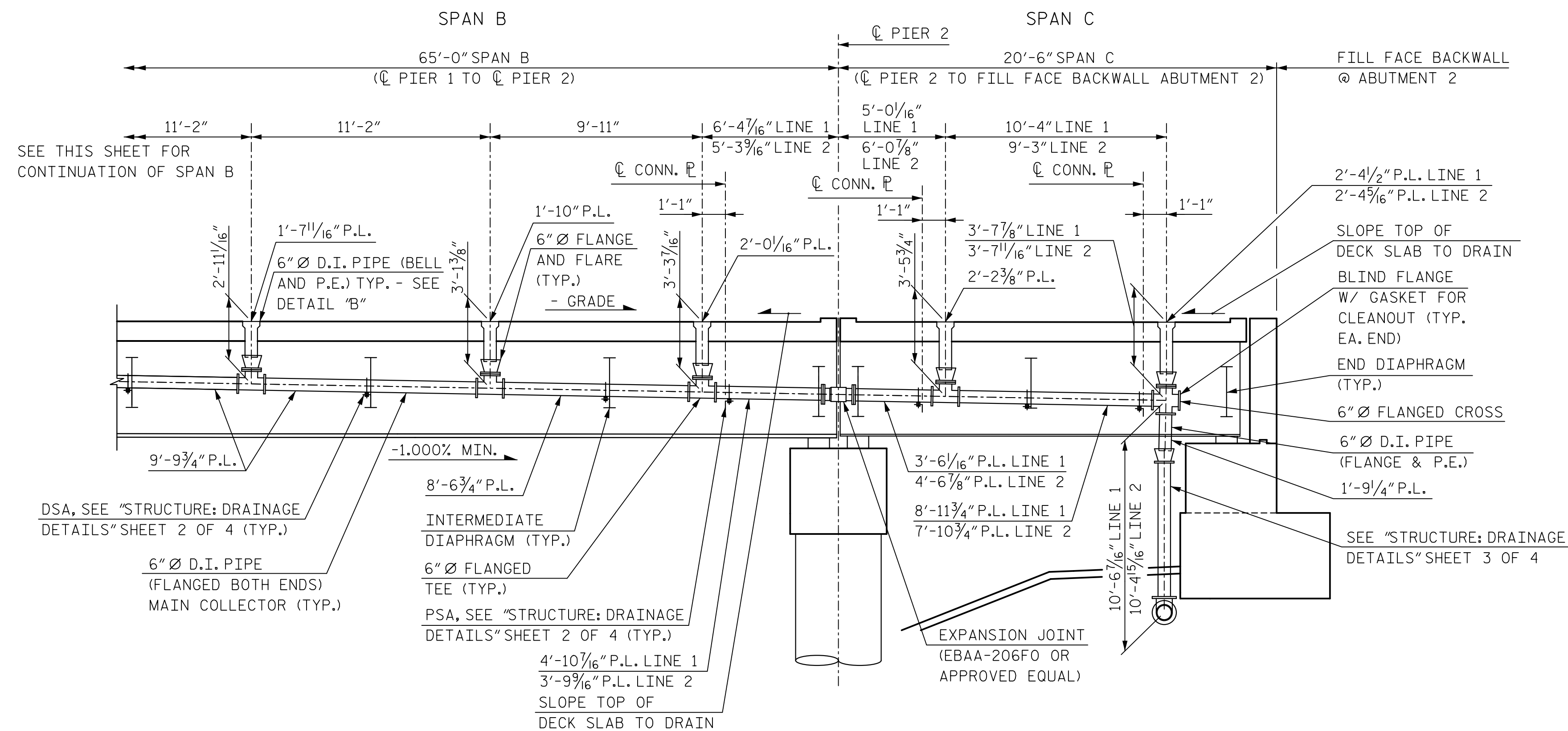
D.I. = DUCTILE IRON

P.L. = PIPE LENGTH

P.E. = PLAIN END

DRAINAGE LINE 1 IS LOCATED TO THE LEFT LOOKING AHEAD STATION AND DRAINAGE LINE 2 IS LOCATED TO THE RIGHT LOOKING AHEAD STATION.

FOR ADDITIONAL NOTES AND DETAILS, SEE "STRUCTURE: DRAINAGE DETAILS" SHEET 2 OF 4.



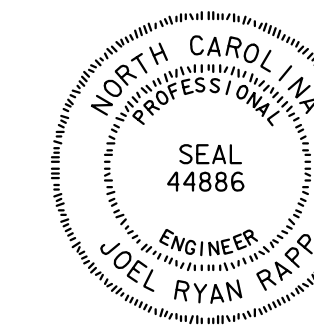
DRAINAGE DETAILS - PORTION OF SPAN B AND SPAN C

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STRUCTURE
 DRAINAGE
 DETAILS



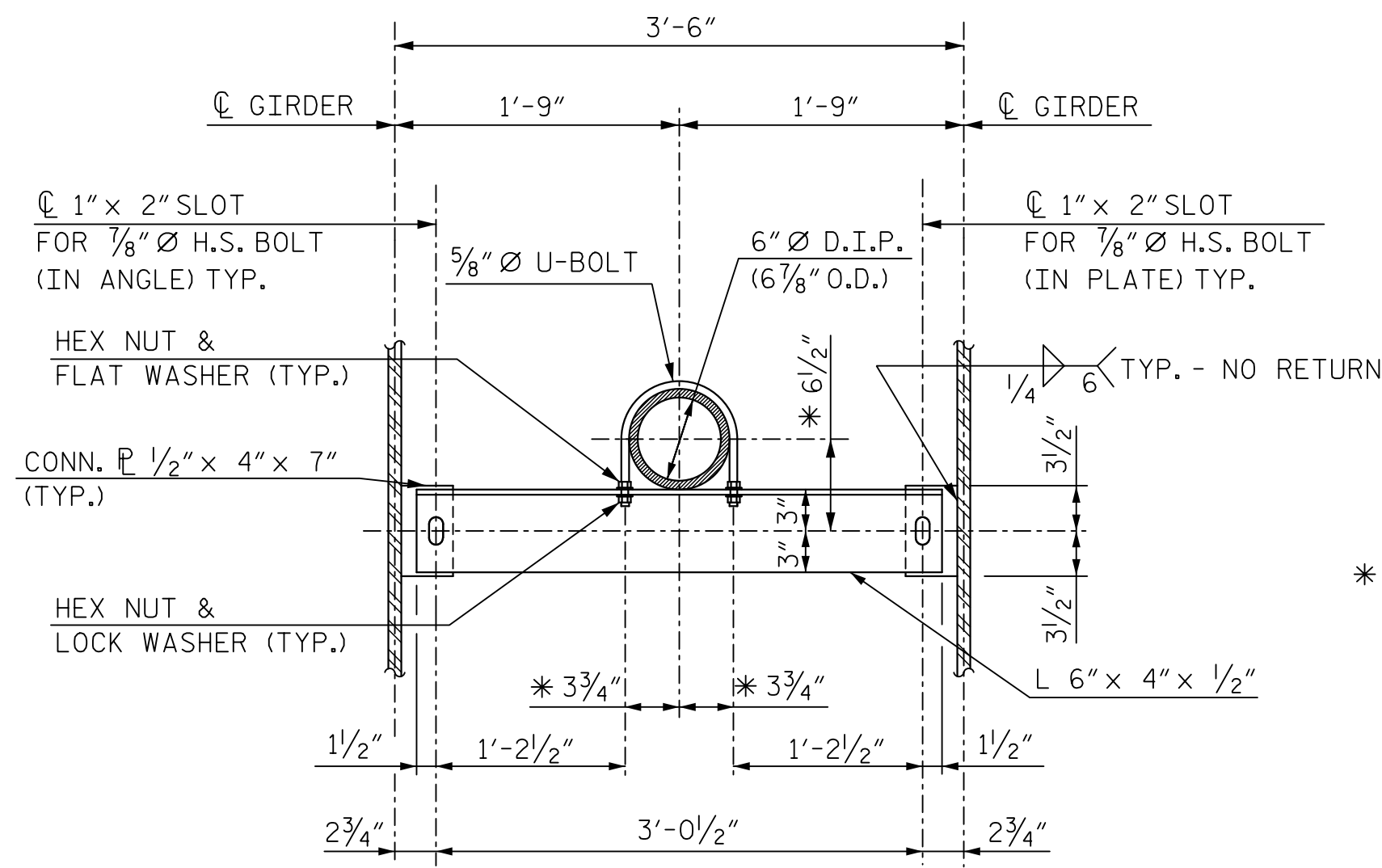
DocuSigned by:
 Joel R. Rapp
 55683197C228434
 2/21/2018

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

DRAWN BY B. VAUGHN DATE 8/17
 CHECKED BY R. RAPP DATE 9/17 DWG. NO. 46

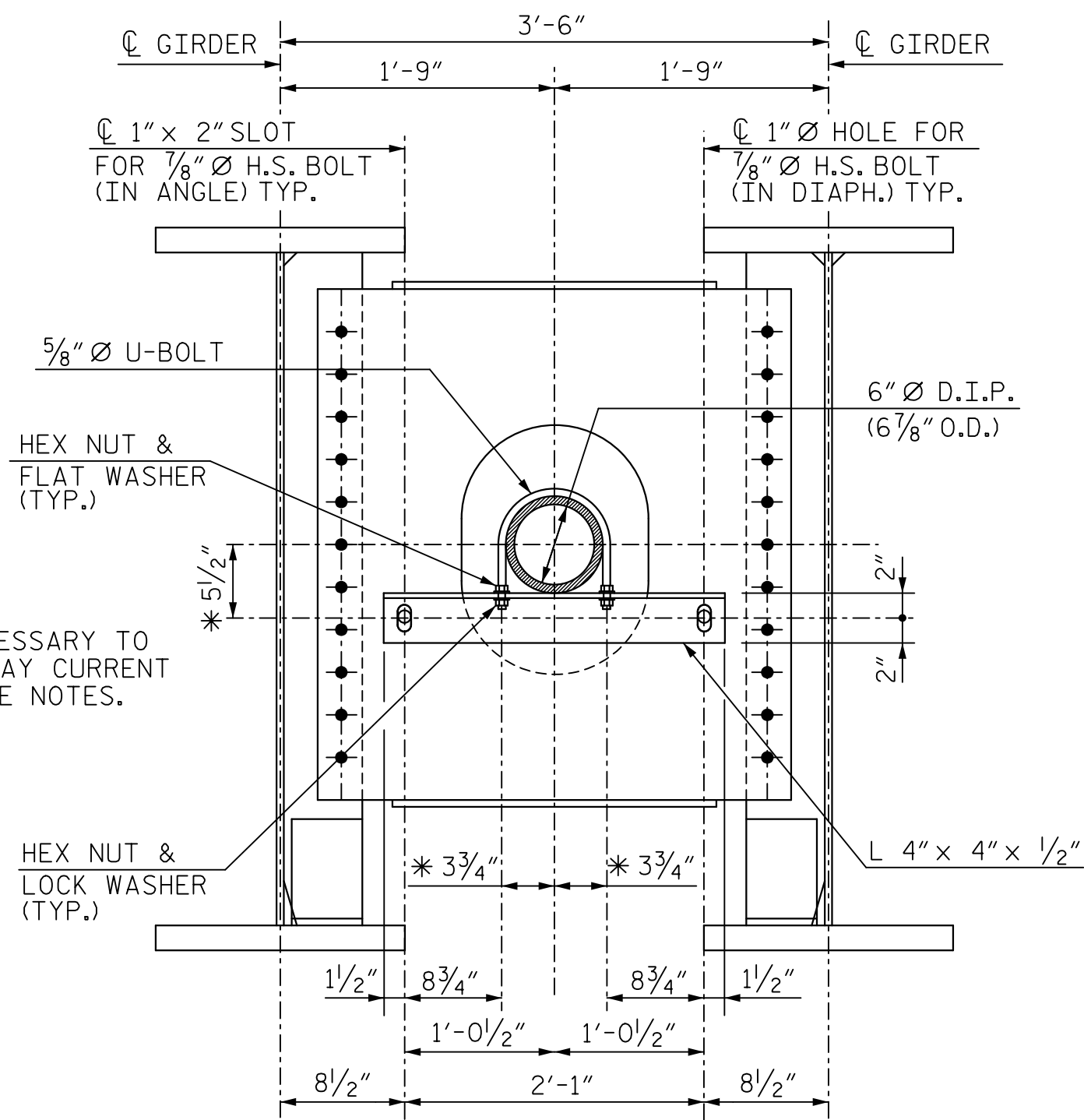
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-46
1			3			TOTAL SHEETS
2			4			51



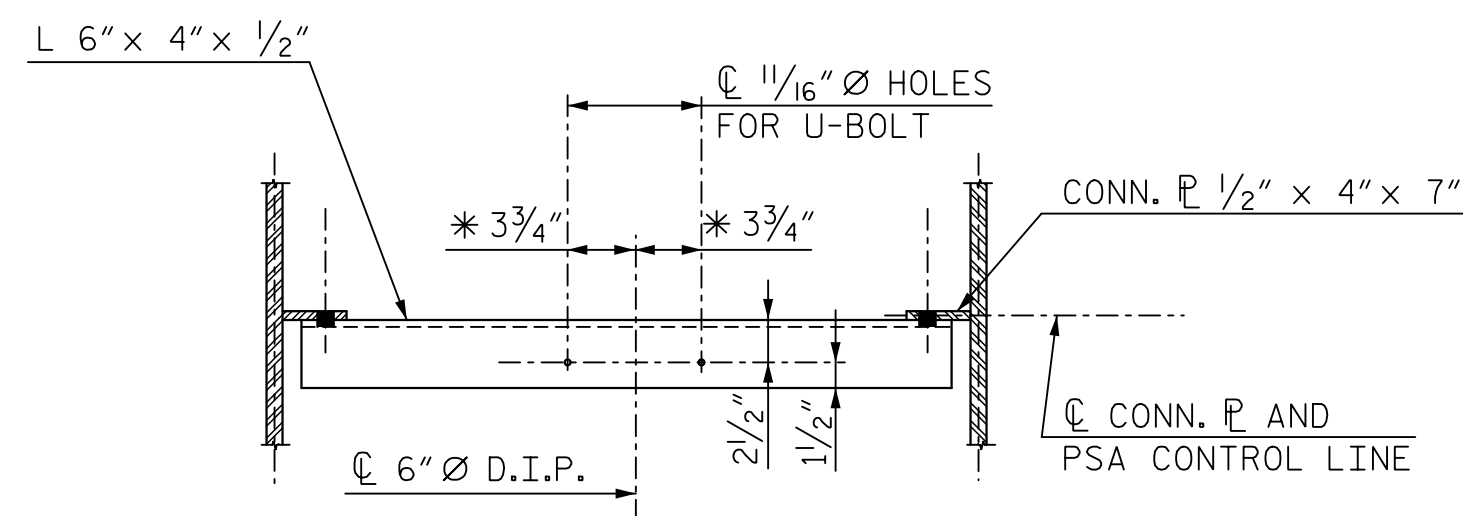
* ADJUST AS NECESSARY TO ALLOW FOR STRAY CURRENT PROTECTION. SEE NOTES.

ELEVATION

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

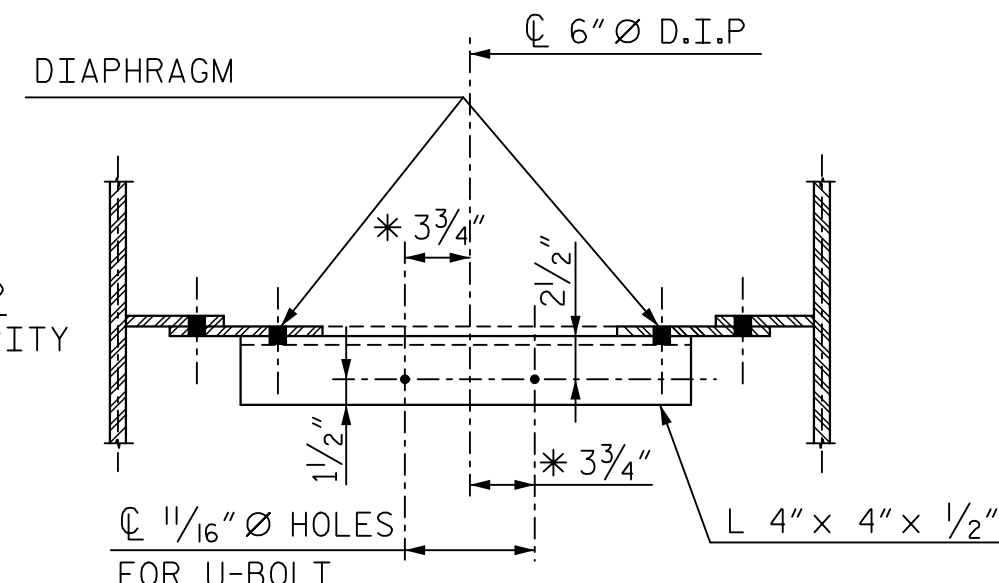


ELEVATION

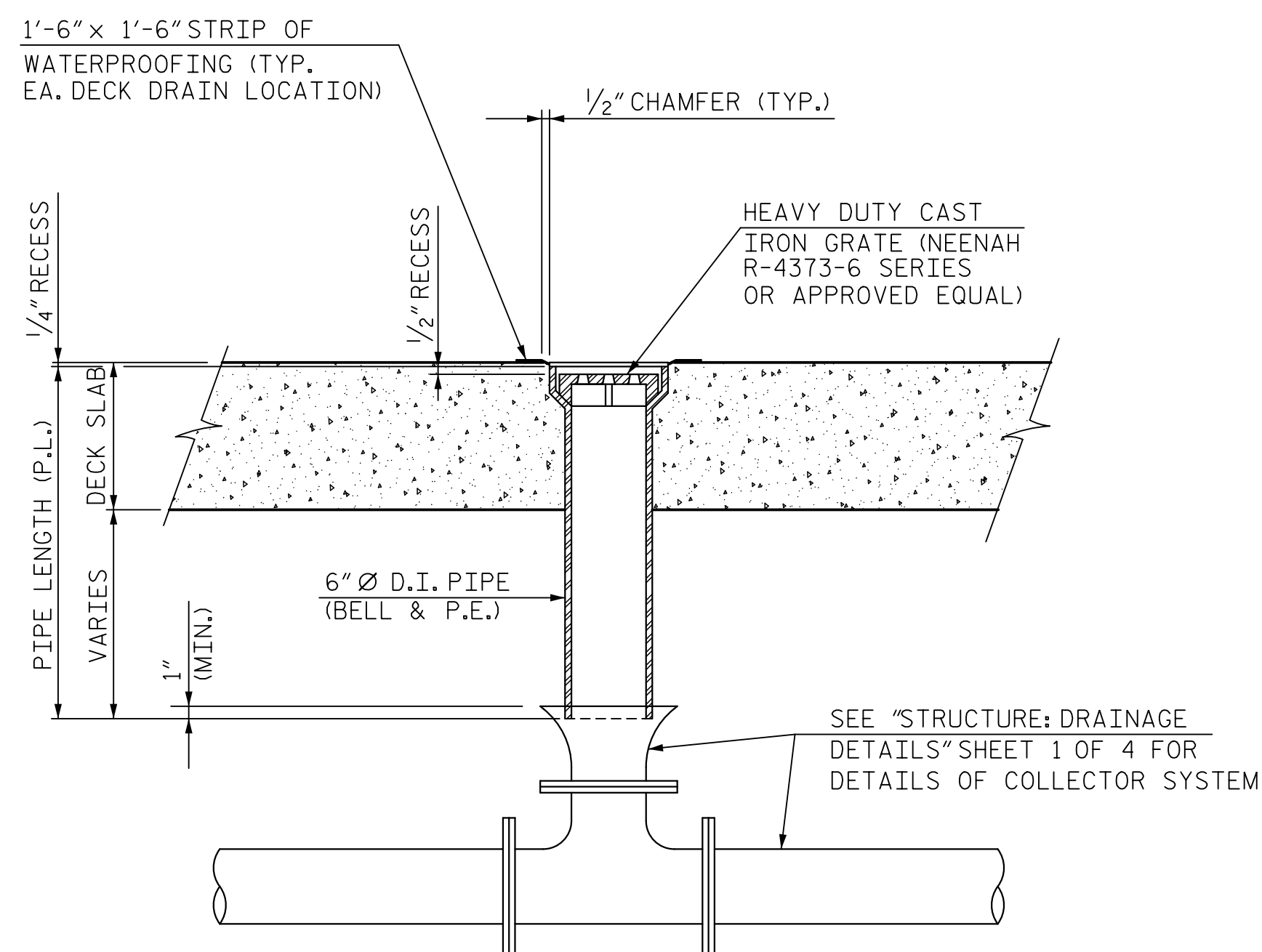


PIPE SUPPORT ANGLE (PSA)
(12 REQ'D.)

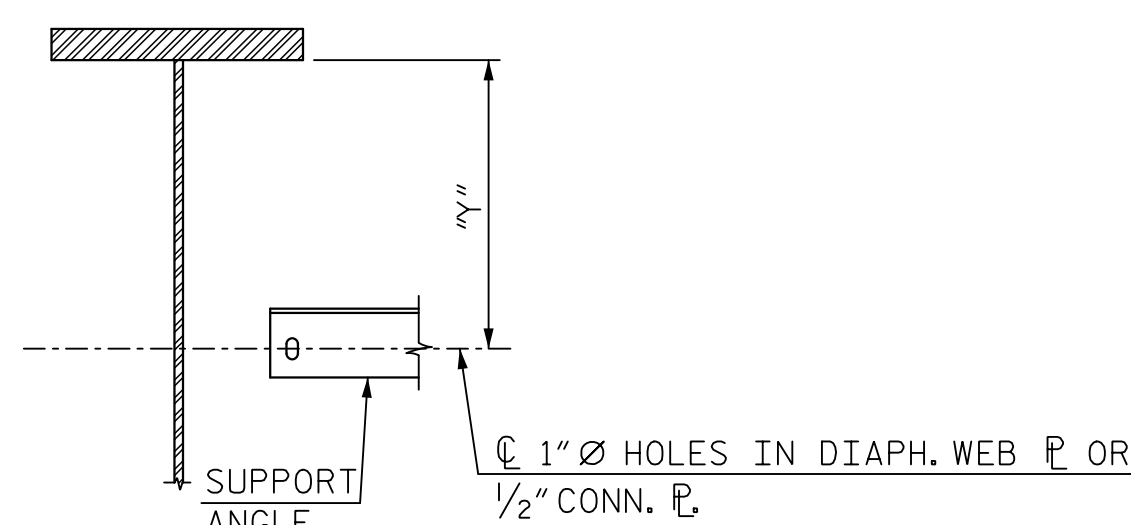
NOTE:
DIAPHRAGM FLANGE \bar{P} NOT SHOWN FOR CLARITY



DIAPHRAGM SUPPORT ANGLE (DSA)
(16 REQ'D.)



DETAIL "B"



DETAIL "A"

DSA	"Y"	DSA	"Y"	DSA	"Y"	PSA	"Y"
A1	2'-11"	B1	1'-11 3/16"	C1	3'-1 1/16"	A1	3'-3 3/16"
A2	2'-4 3/16"	B2	2'-2 1/8"			A2	2'-2 9/16"
		B3	2'-4 7/16"			A3	3'-3 3/16"
		B4	2'-6 3/4"			A4	2'-2 9/16"
		B5	2'-9"			B1	2'-0 1/16"
						B2	2'-11 1/8"
						C1	3'-1 1/16"
						C2	3'-3 3/16"
						C3	3'-1 1/16"
						C4	3'-2 15/16"

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 SHEETS.
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:

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

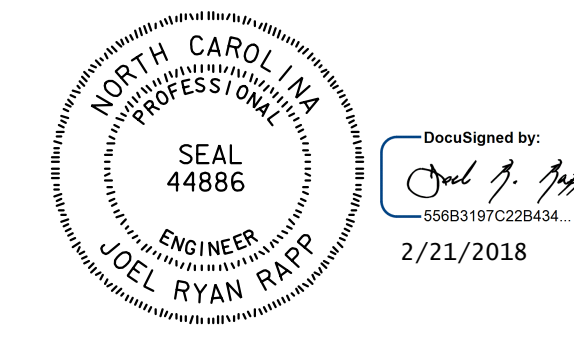
SUPERSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES		
ITEM	UNIT	TOTAL
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	168'-9 15/16"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	7'-0 3/8"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (BELL & P.E.)	FEET	38'-7 15/16"
6" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	3,070
6" I.D. DUCTILE IRON BLIND FLANGES	LBS	200
EXPANSION JOINT	EA.	2
HEAVY DUTY CAST IRON GRATES	EA.	22
PIPE SUPPORT ANGLES (PSA) *	EA.	12
DIAPHRAGM SUPPORT ANGLES (DSA) *	EA.	16

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

FOR SUBSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES, SEE "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 4.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 4

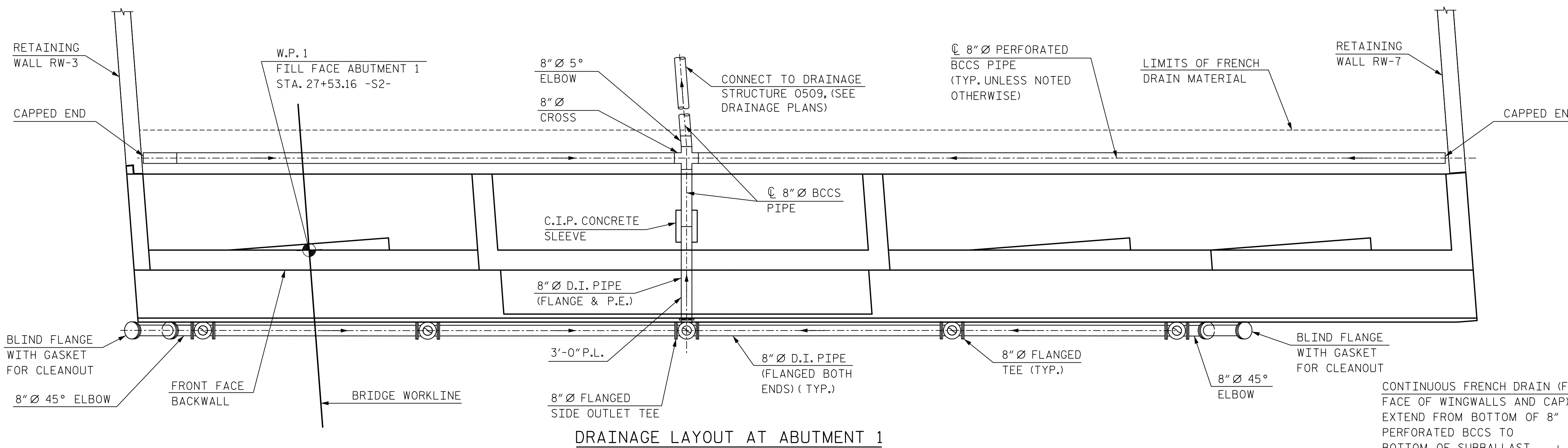


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

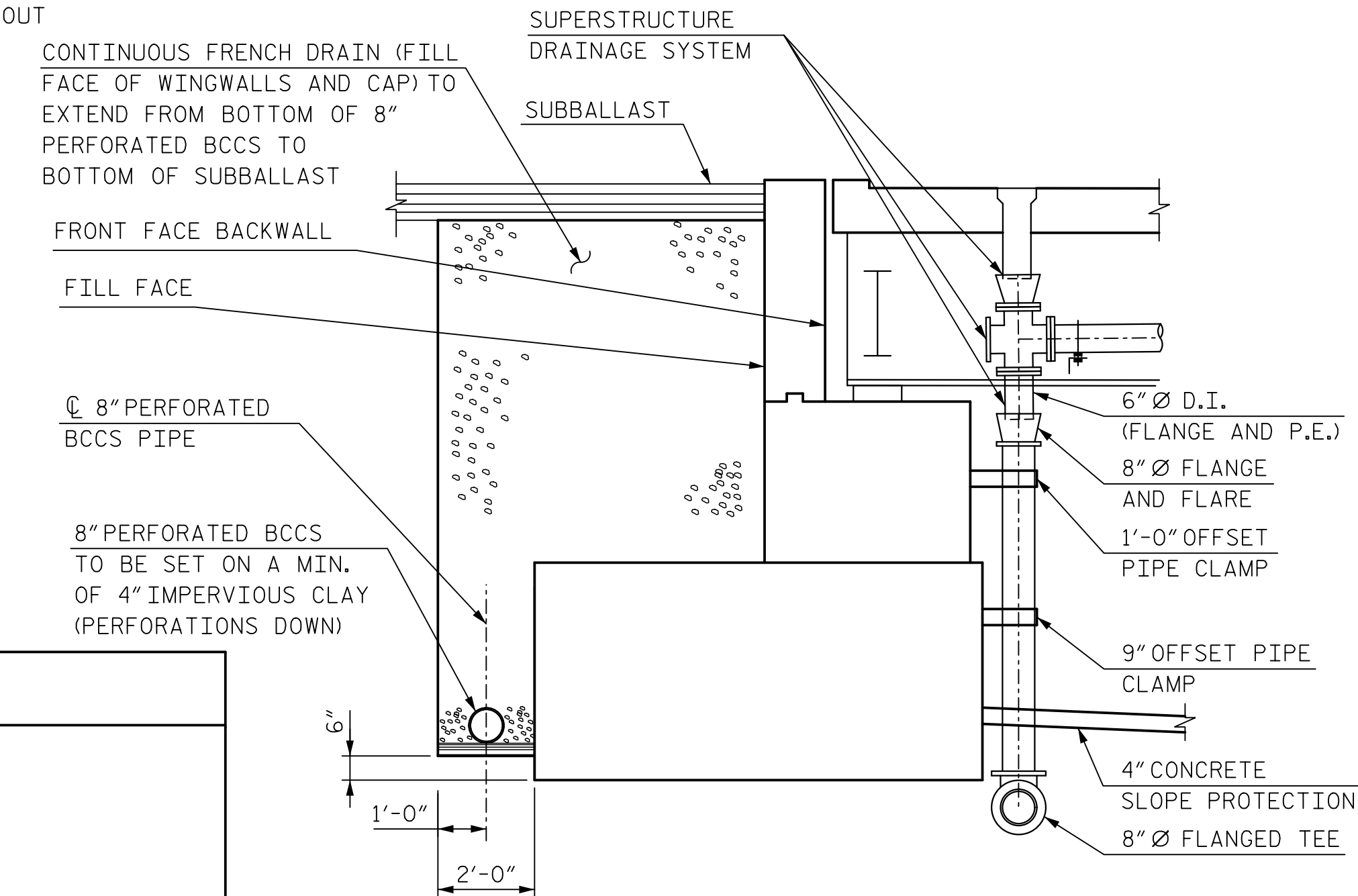
HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY <u>B. VAUGHN</u>	DATE <u>8/17</u>
CHECKED BY <u>R. RAPP</u>	DATE <u>9/17</u>
DWG. NO. 47	

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-47
1			3			TOTAL SHEETS
2			4			51

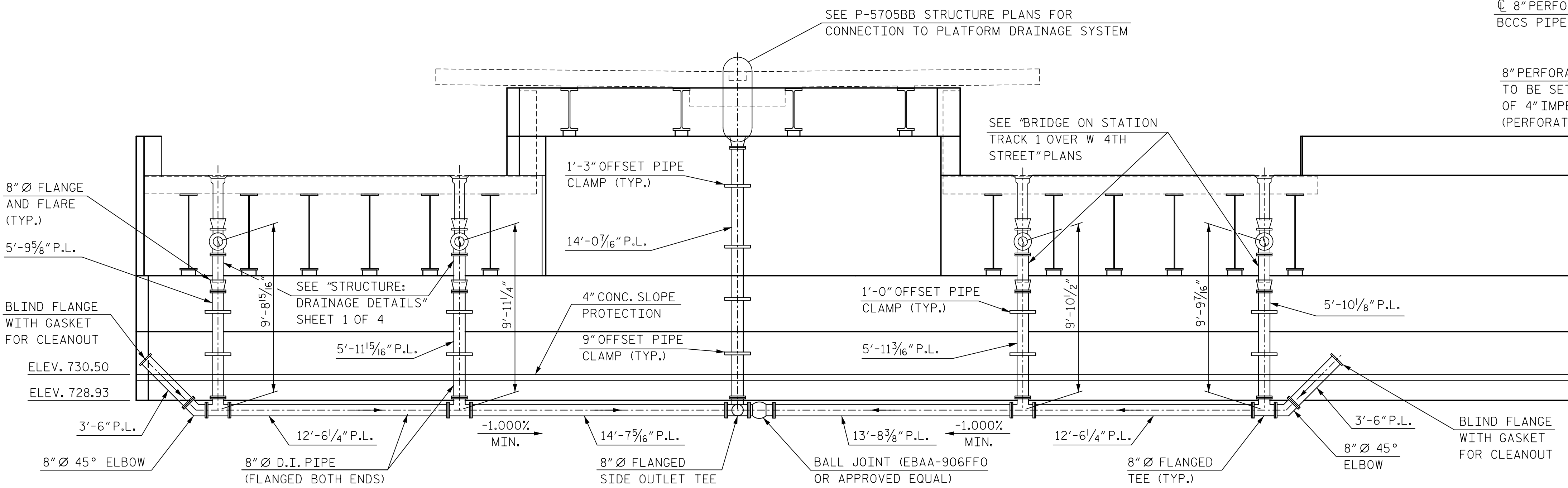
STRUCTURE
DRAINAGE
DETAILS



DRAINAGE LAYOUT AT ABUTMENT 1



ABUTMENT DRAINAGE DETAIL



ELEVATION AT ABUTMENT 1
(LOOKING AT FRONT FACE)

SUBSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES		
ITEM	UNIT	TOTAL
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	207'-9 5/16"
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	12'-6"
8" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	2,680
8" I.D. DUCTILE IRON BLIND FLANGES	LBS	126
BALL JOINT	EA.	1
8" I.D. OFFSET PIPE CLAMPS (9")	EA.	10
8" I.D. OFFSET PIPE CLAMPS (1'-0")	EA.	10
8" I.D. OFFSET PIPE CLAMPS (1'-3")	EA.	4

NOTES:
 FOR ADDITIONAL DETAILS, SEE "STRUCTURE: DRAINAGE DETAILS" SHEET 4 OF 4.
 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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

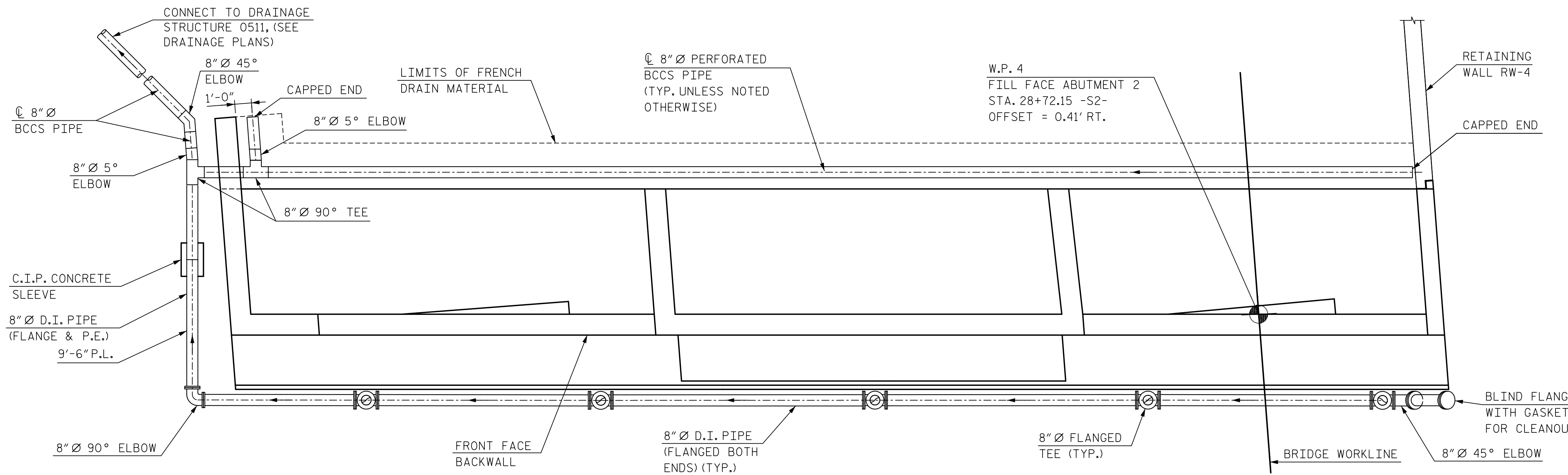
SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

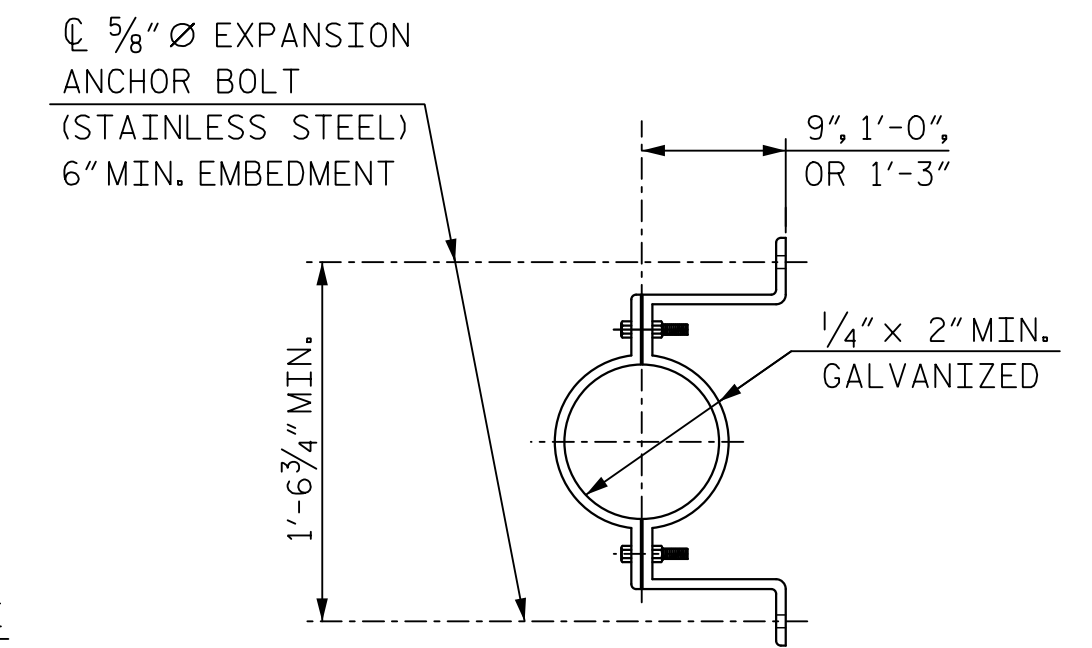
STRUCTURE
 DRAINAGE
 DETAILS

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS			SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-48	
1		10/17	3			TOTAL SHEETS	
2		10/17	4			51	

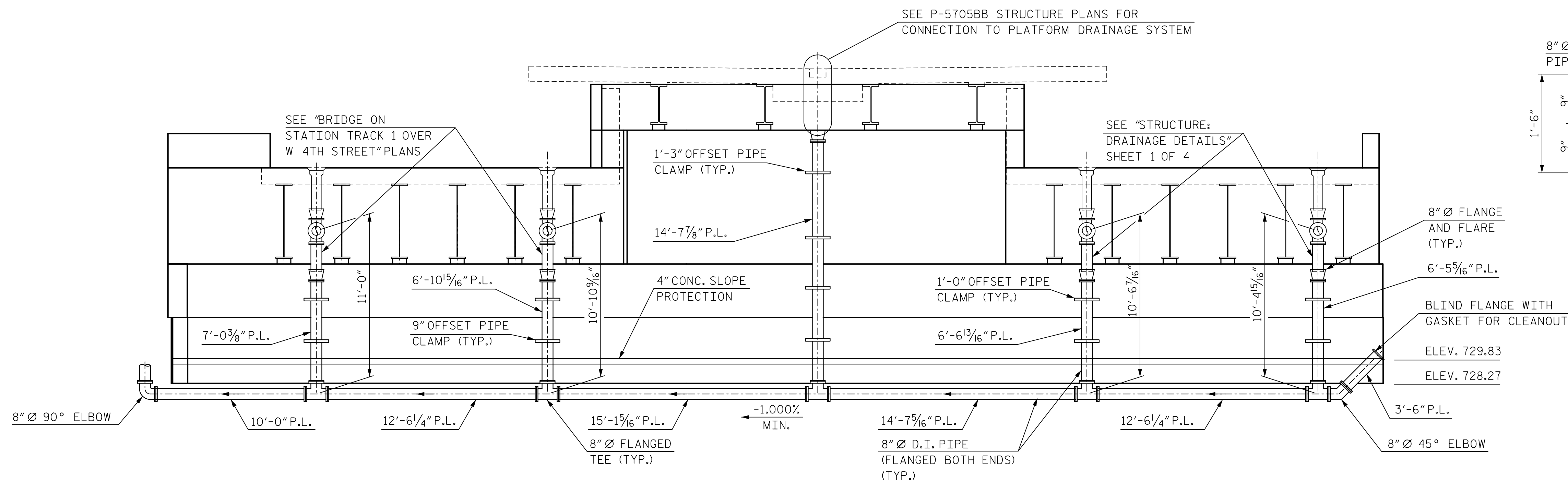
DRAWN BY B. VAUGHN DATE 10/17 DWG. NO. 48
 CHECKED BY R. RAPP DATE 10/17



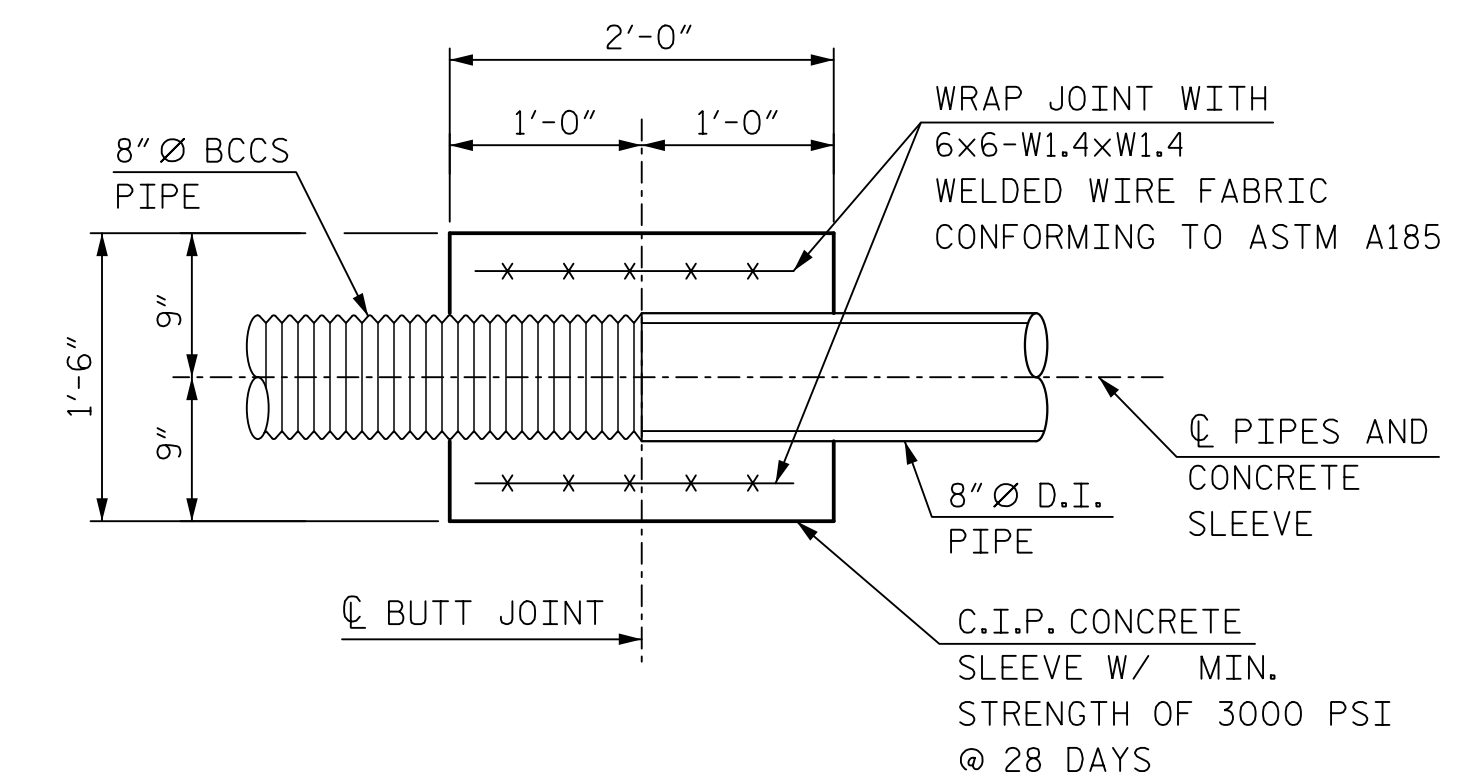
DRAINAGE LAYOUT AT ABUTMENT 2



OFFSET PIPE CLAMP DETAIL



ELEVATION AT ABUTMENT 2
(LOOKING AT FRONT FACE)



DIP-BCCS JOINT DETAIL

NOTES:

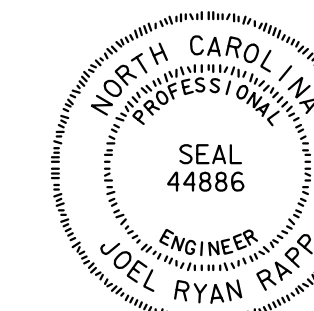
FOR SUBSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES AND ADDITIONAL DETAILS, SEE "STRUCTURE: DRAINAGE DETAILS" SHEET 3 OF 4.

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



DocuSigned by:
Joel R. Rapp
50683197C228434
2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

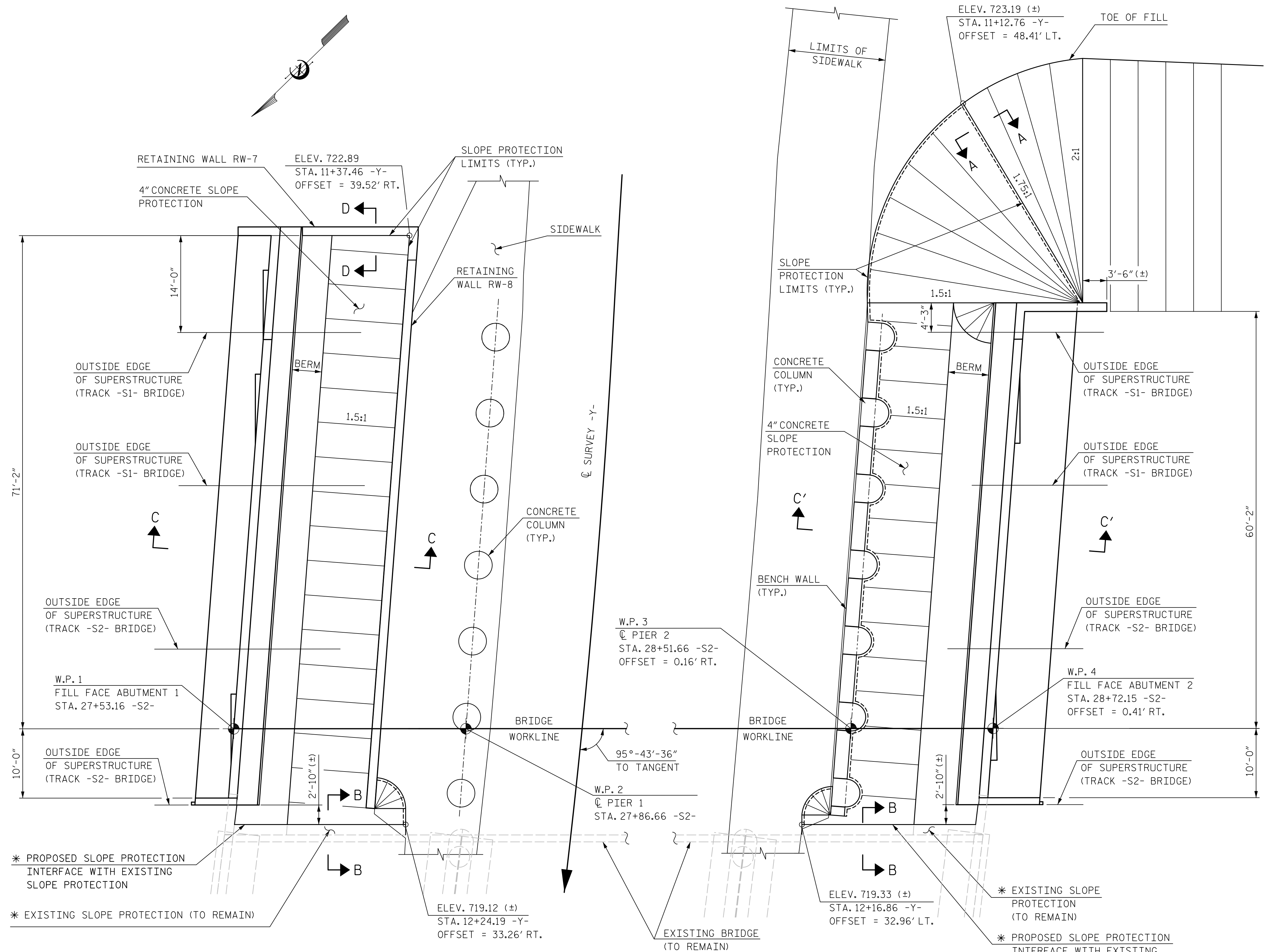
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURE
DRAINAGE
DETAILS

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY <u>B. VAUGHN</u>	DATE <u>10/17</u>	DWG. NO. <u>49</u>	
CHECKED BY <u>R. RAPP</u>	DATE <u>10/17</u>		

REVISIONS						SHEET NO. S7-49
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 51
2			4			



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

* THE PROPOSED LIMITS OF SLOPE PROTECTION ADJACENT TO THE EXISTING SLOPE PROTECTION ARE BASED ON AN APPROXIMATE LOCATION OF THE CURRENT EDGE OF THE EXISTING SLOPE PROTECTION. THE CONTRACTOR SHALL ADJUST THE PROPOSED SLOPE PROTECTION LIMITS BASED ON THE ACTUAL LOCATION OF THE EXISTING SLOPE PROTECTION. IF THE EXISTING SLOPE PROTECTION IS DAMAGED OR PARTIALLY REMOVED DURING THE ABUTMENT OR PIER CONSTRUCTION OPERATIONS FOR THE PROPOSED BRIDGE, THAT EXISTING SLOPE PROTECTION SHALL BE REMOVED BACK TO THE NEAREST VERTICAL CONSTRUCTION JOINT FROM THE TOP OF THE EXISTING BERM TO THE TOE OF THE EXISTING SLOPE. THE LIMITS OF THE PROPOSED SLOPE PROTECTION WILL THEN BE EXTENDED TO MATCH AGAINST THE ADJUSTED EDGE OF EXISTING SLOPE PROTECTION.

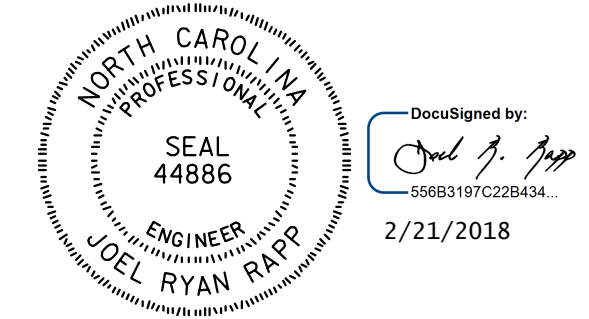
PLAN

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 2

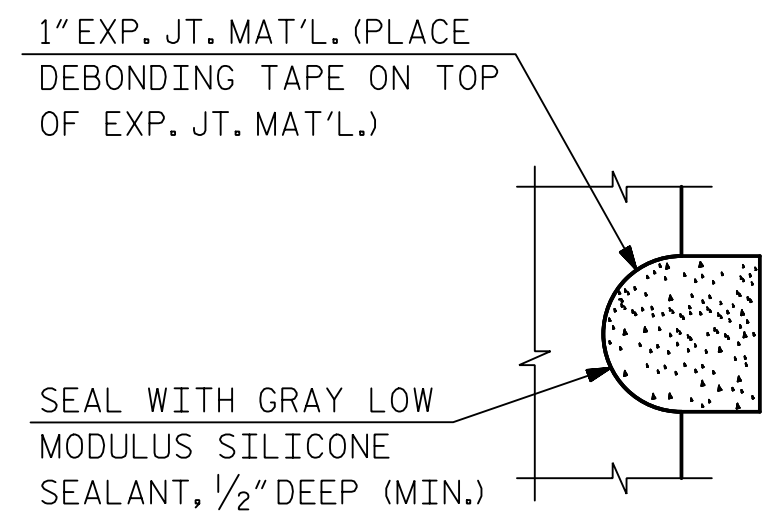
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION
 DETAILS



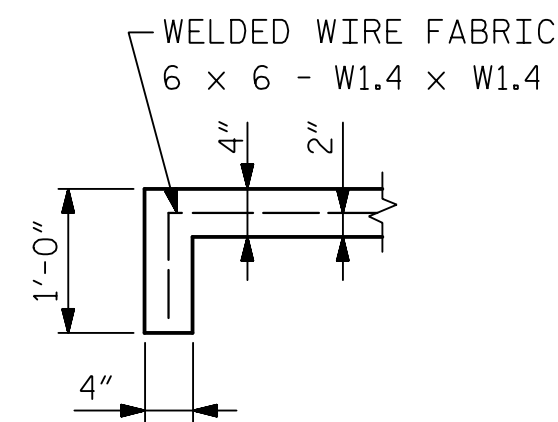
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S7-50		
	NO.	BY	DATE	NO.		BY	DATE
	1		10/17	3			
DRAWN BY <u>B. VAUGHN</u> DATE <u>10/17</u> CHECKED BY <u>R. RAPP</u> DATE <u>10/17</u> DWG. NO. 50					TOTAL SHEETS 51		

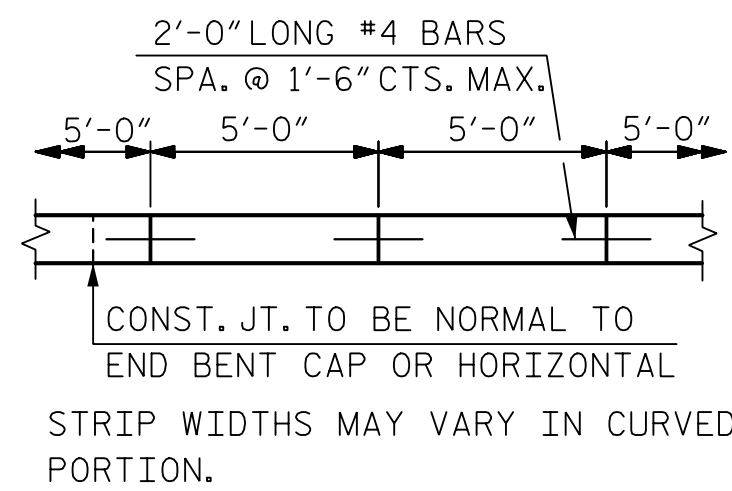


PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A PIER COLUMN

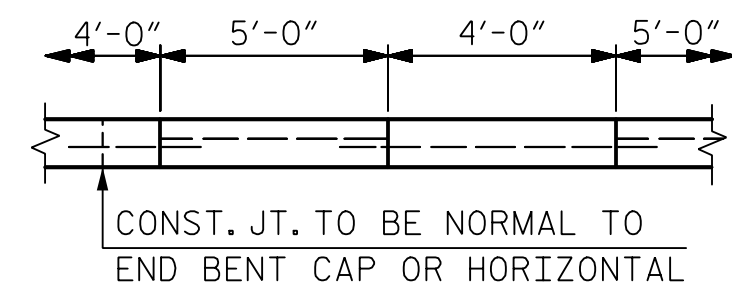
(BENCH WALL NOT SHOWN FOR CLARITY)



SECTION A-A



POURING DETAIL



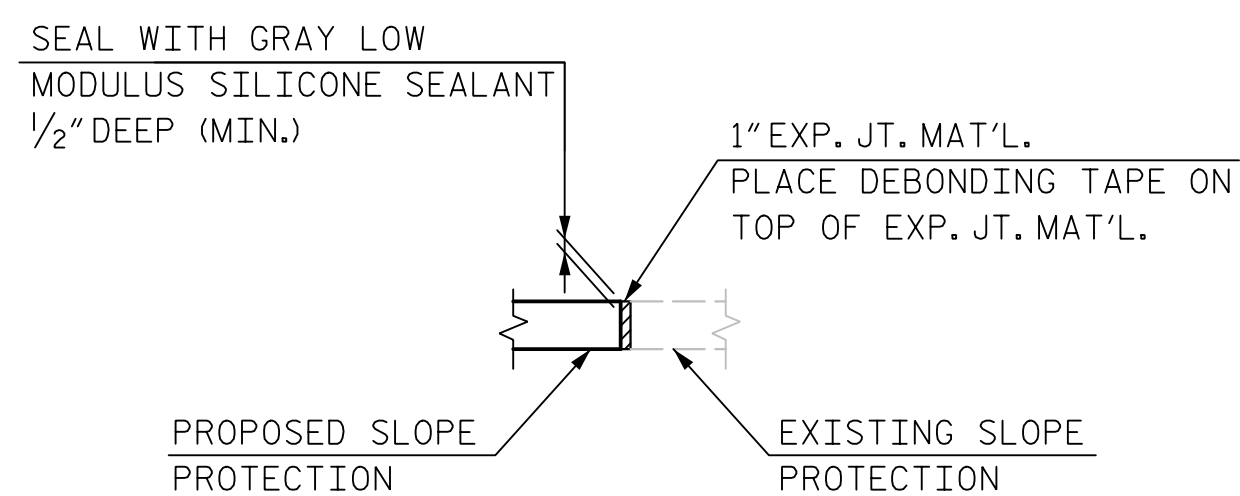
OPTIONAL POURING DETAIL

GENERAL NOTES:

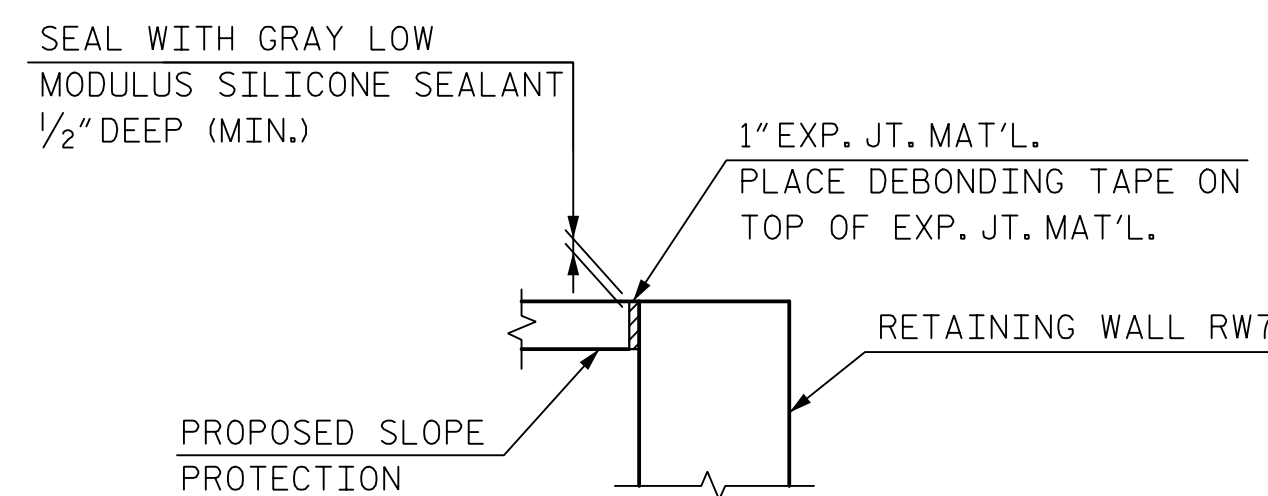
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

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.

ADDITIONAL SLOPE PROTECTION REQUIRED TO PROPERLY MATCH UP TO EXISTING SLOPE PROTECTION, AS DESCRIBED ON SHEET 1 OF 2, SHALL BE INCIDENTAL TO THE CONTRACT BID PRICE FOR THE PROVIDED QUANTITY.



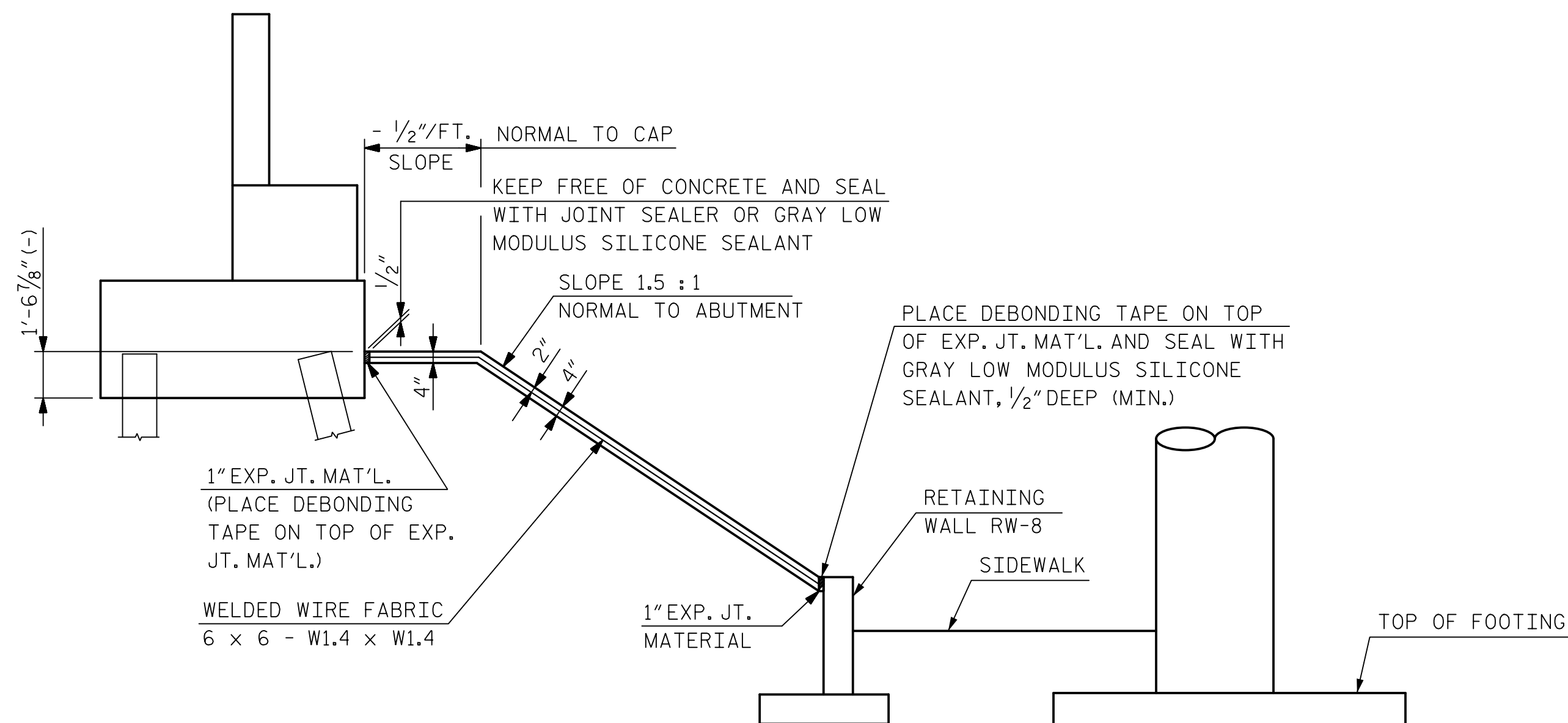
SECTION B-B



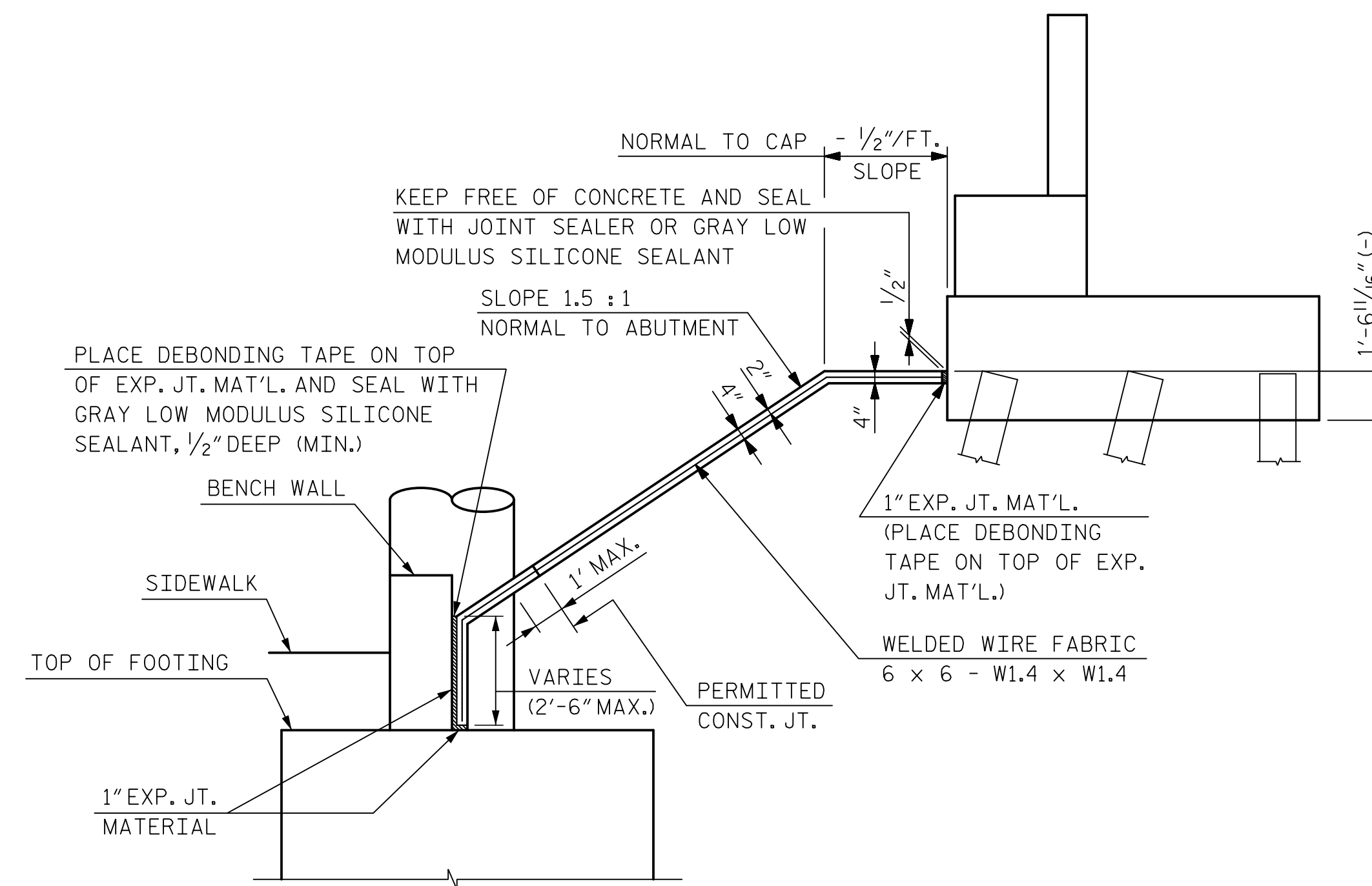
SECTION D-D

BRIDGE @ STA. 28+12.88 -S2-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
ABUTMENT 1	175	315
ABUTMENT 2	258	465

* QUANTITY SHOWN IS BASED ON 5'-0" POURS PER THE "POURING DETAIL".



SECTION C-C



SECTION C'-C'

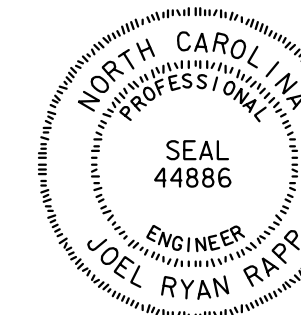
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION

DETAILS



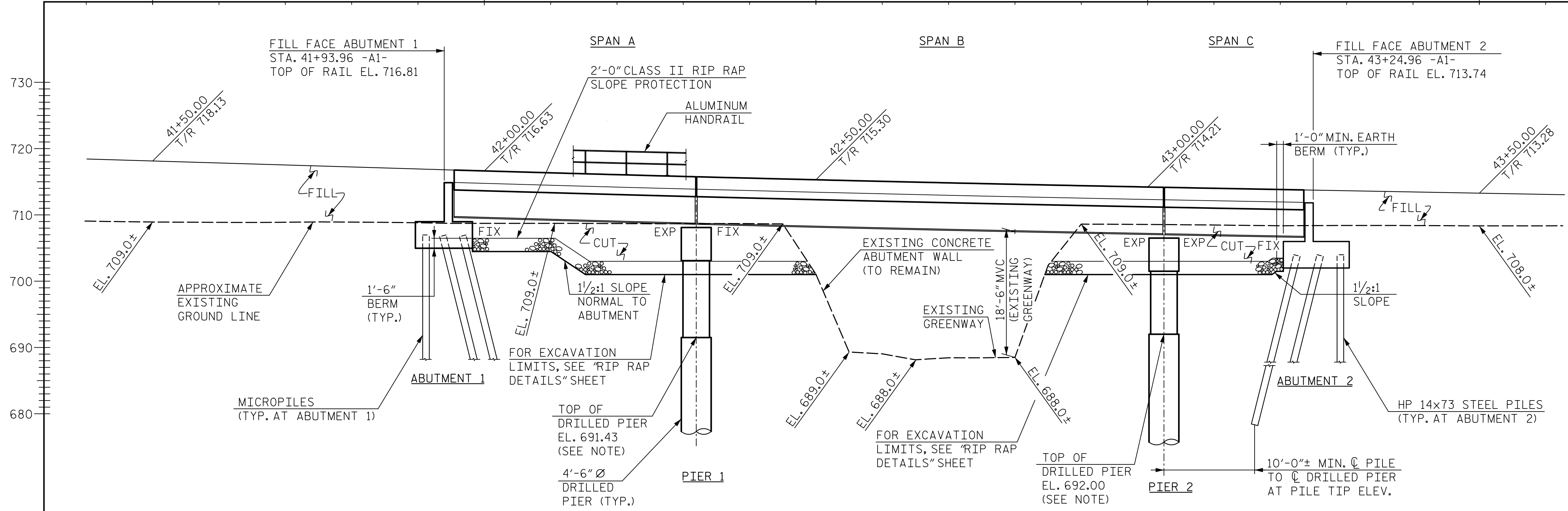
DocuSigned by:
 2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY <u>B. VAUGHN</u>	DATE <u>10/17</u>
CHECKED BY <u>R. RAPP</u>	DATE <u>10/17</u>
DWG. NO. 51	

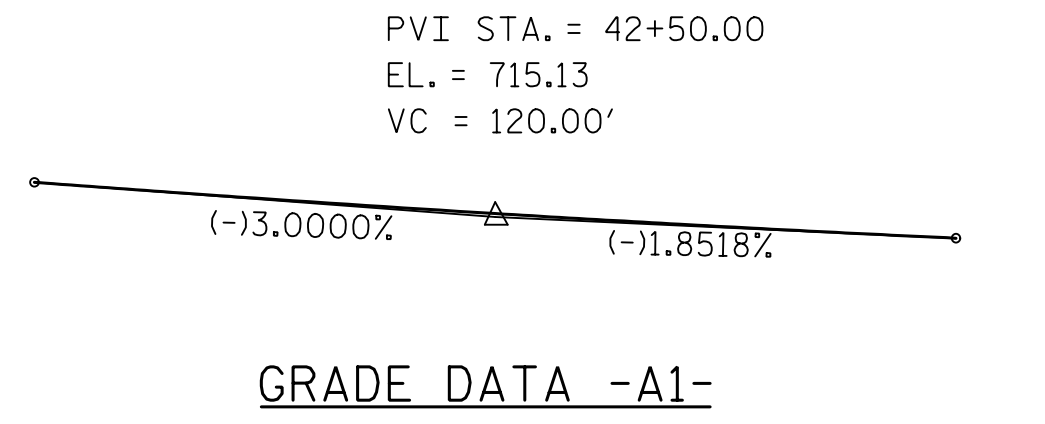
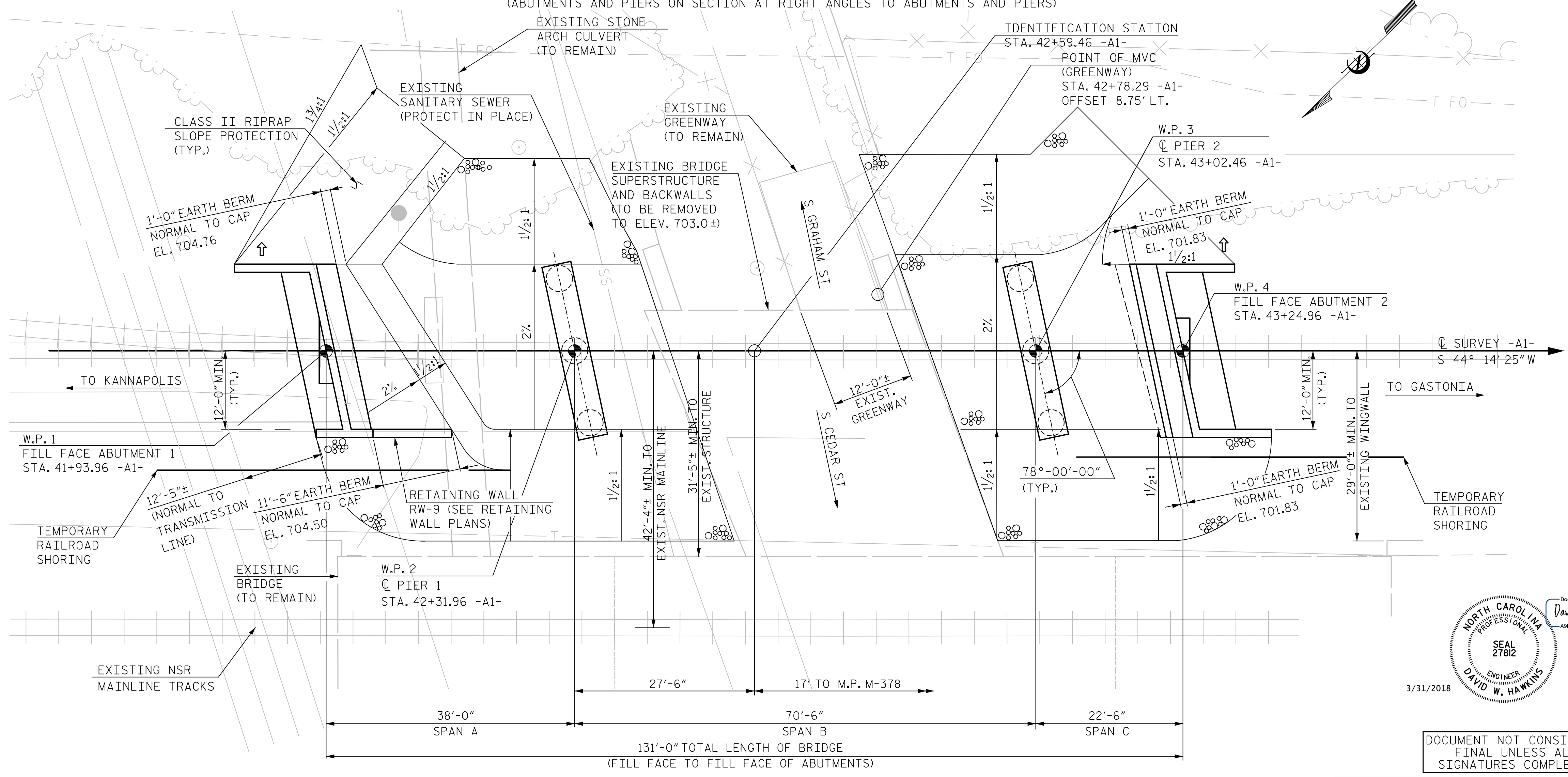
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-51
1			3			TOTAL SHEETS
2			4			51

0012DEL_P28

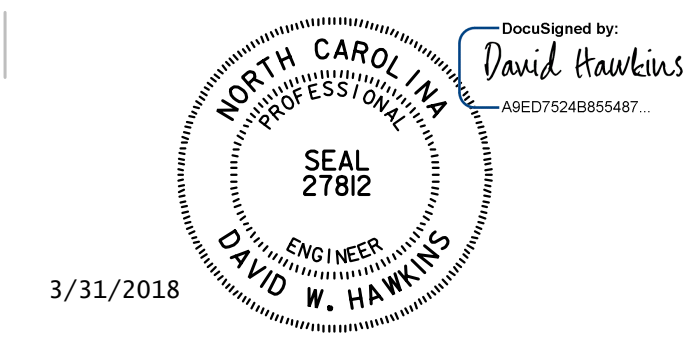


NOTES:
 SEE "GENERAL DRAWING: GENERAL NOTES (SHEET 4 OF 4)" FOR GENERAL NOTES.
 MVC = MINIMUM VERTICAL CLEARANCE
 ← STRUCTURE DRAINAGE OUTLET LOCATION AND DIRECTION.
 TOP OF DRILLED PIERS HAVE BEEN SET TO ACCOMMODATE A FUTURE FILL SLOPE AND ROADWAY SECTION. SEE "SUBSTRUCTURE - COLUMN AND DRILLED PIER CONSTRUCTION SEQUENCE - PIER".

SECTION ALONG C SURVEY -A2-
 (ABUTMENTS AND PIERS ON SECTION AT RIGHT ANGLES TO ABUTMENTS AND PIERS)



PLAN
 NOTES: PILES NOT SHOWN FOR CLARITY.



3/31/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

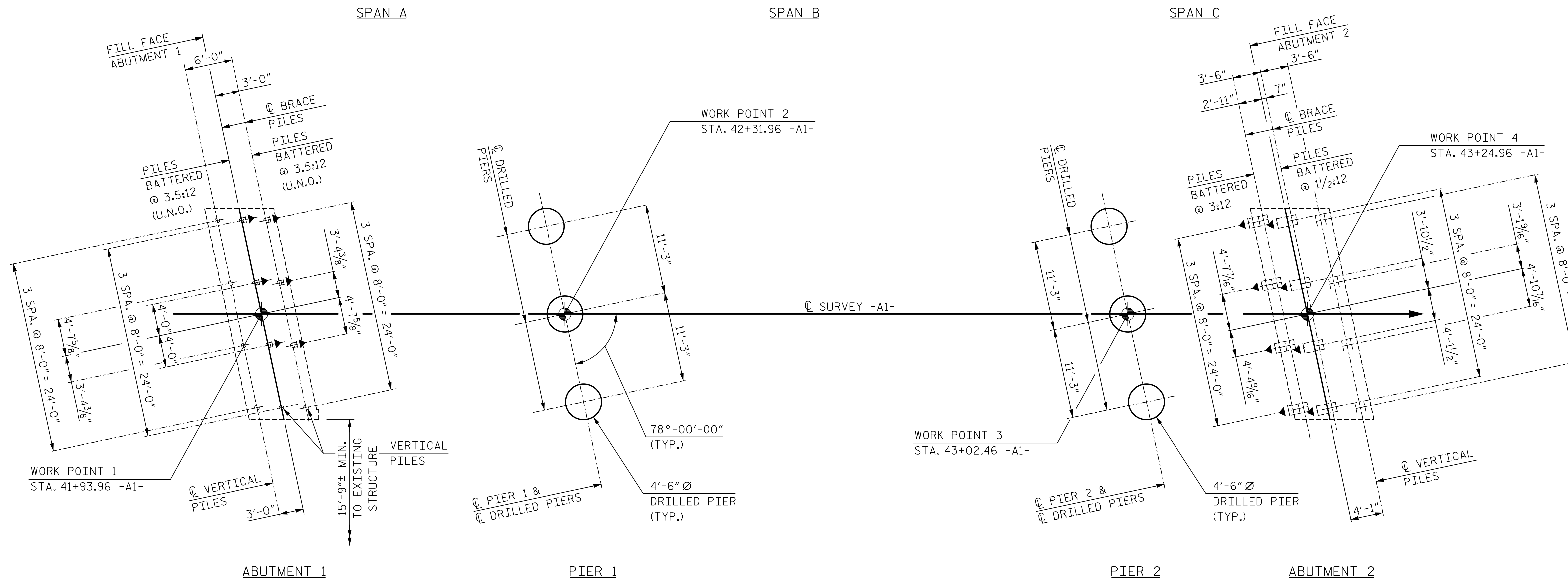
PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1- =

MILE POST: NS 378.00
 SHEET 1 OF 4 BRIDGE NO. _____

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 BRIDGE ON PROPOSED LEAD TRACK OVER P&N CORRIDOR BETWEEN W 4TH STREET AND W MOREHEAD STREET

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	CHECKED BY: D. HAWKINS	DATE: 11/17
DWG. NO. 1			

REVISIONS				SHEET NO.
NO.	BY	DATE	NO.	DATE
1			3	
2			4	
TOTAL SHEETS				39



FOUNDATION LAYOUT

FOUNDATION NOTES

FOR MICROPILES, SEE GEOTECHNICAL SPECIAL PROVISION.

MICROPILES AT ABUTMENT NO.1 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 70 TONS PER PILE.

INSTALL REINFORCING CASINGS FOR MICROPILES AT ABUTMENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 669 FT AND WITH A PENETRATION OF AT LEAST 10 FT INTO ROCK AS DEFINED BY ARTICLE 411 OF THE STANDARD SPECIFICATIONS.

USE REINFORCING CASINGS WITH YIELD STRENGTHS OF AT LEAST 45 KSI AND A MINIMUM WALL THICKNESS OF 0.5 IN FOR MICROPILES AT ABUTMENT NO.1.

ONE VERIFICATION TEST IS REQUIRED FOR MICROPILES INSTALLED AT ABUTMENT NO.1.

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

DRILLED PIERS AT PIER NO.1 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 405 TONS/PIER.CHECK FIELD CONDITIONS FOR THE REQUIRED TIP BEARING OF 30 TSF.

INSTALL DRILLED PIERS AT PIER NO.1 TO A TIP ELEVATION NO HIGHER THAN 671 FT (LT); 668 FT (CT); 668 FT (RT), SATISFY THE REQUIRED TIP BEARING AND HAVE A PENETRATION OF AT LEAST 9 FT INTO ROCK AS DEFINED BY ARTICLE 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT PIER NO.2 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 365 TONS/PIER.CHECK FIELD CONDITIONS FOR THE REQUIRED TIP BEARING OF 30 TSF.

INSTALL DRILLED PIERS AT PIER NO.2 TO A TIP ELEVATION NO HIGHER THAN 661 FT (LT); 656 FT (CT); 656 FT (RT), SATISFY THE REQUIRED TIP BEARING AND HAVE A PENETRATION OF AT LEAST 14 FT INTO WEATHERED ROCK AS DEFINED BY ARTICLE 411 OF THE STANDARD SPECIFICATIONS.

SPT ARE REQUIRED FOR DRILLED PIERS. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS. THE REQUIRED N60 SPT VALUE FOR DRILLED PIERS AT PIER NOS.1 AND 2 IS 100 BLOWS WITH 12 INCHES OR LESS PENETRATION.

AT THE CONTRACTORS OPTION, SLURRY CONSTRUCTION MAY BE USED FOR THE CONSTRUCTION OF DRILLED PIERS AT PIER NOS.1 AND 2. IF SLURRY CONSTRUCTION METHODS ARE USED, THEN POLYMER SLURRY IS REQUIRED.

IF SLURRY CONSTRUCTION METHODS ARE USED TO CONSTRUCT THE DRILLED PIERS AT PIER NOS.1 AND 2, INSTALL A TEMPORARY CASING A MINIMUM OF 20 FT. BELOW DRILLING GRADE PRIOR TO BEGINNING SLURRY EXCAVATION.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT PIER NOS.1 AND 2. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

THERMAL INTEGRITY PROFILING IS REQUIRED FOR DRILLED PIERS AT PIER NOS.1 AND 2. FOR THERMAL INTEGRITY PROFILING, SEE GEOTECHNICAL SPECIAL PROVISION.

CSL TUBES AND CSL TESTING ARE REQUIRED FOR DRILLED PIERS. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISION.

PILES AT ABUTMENT NO.2 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 55 TONS PER PILE.

DRIVE PILES AT ABUTMENT NO.2 TO A REQUIRED BEARING CAPACITY OF 110 TONS PER PILE.

TEST THE FIRST PRODUCTION PILE AT ABUTMENT NO.2 WITH THE PDA. FOR PDA TESTING, SEE GEOTECHNICAL SPECIAL PROVISION.

NOTES:

◀ INDICATES MICRO-PILE TO BE BATTERED IN DIRECTION OF ARROW AT THE RATE SHOWN.

◀ INDICATES STEEL PILE TO BE BATTERED IN DIRECTION OF ARROW AT THE RATE SHOWN.

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO FILL FACE ABUTMENTS, C PIER, OR WORKLINE.

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

ALL PILES AT ABUTMENT 1 ARE 7" Ø MICRO-PILES. ALL PILES AT ABUTMENT 2 ARE STEEL HP 14x73.

ALL DIMENSIONS TO BATTERED PILES ARE AT BOTTOM OF CAP ELEVATION.

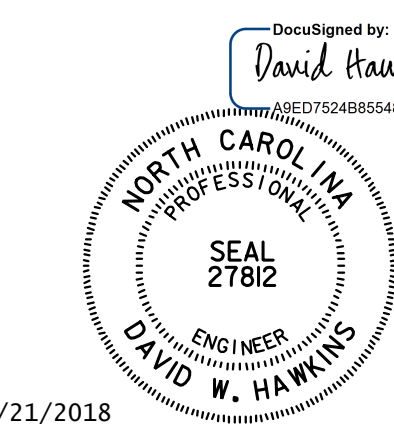
U.N.O. = UNLESS NOTED OTHERWISE

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

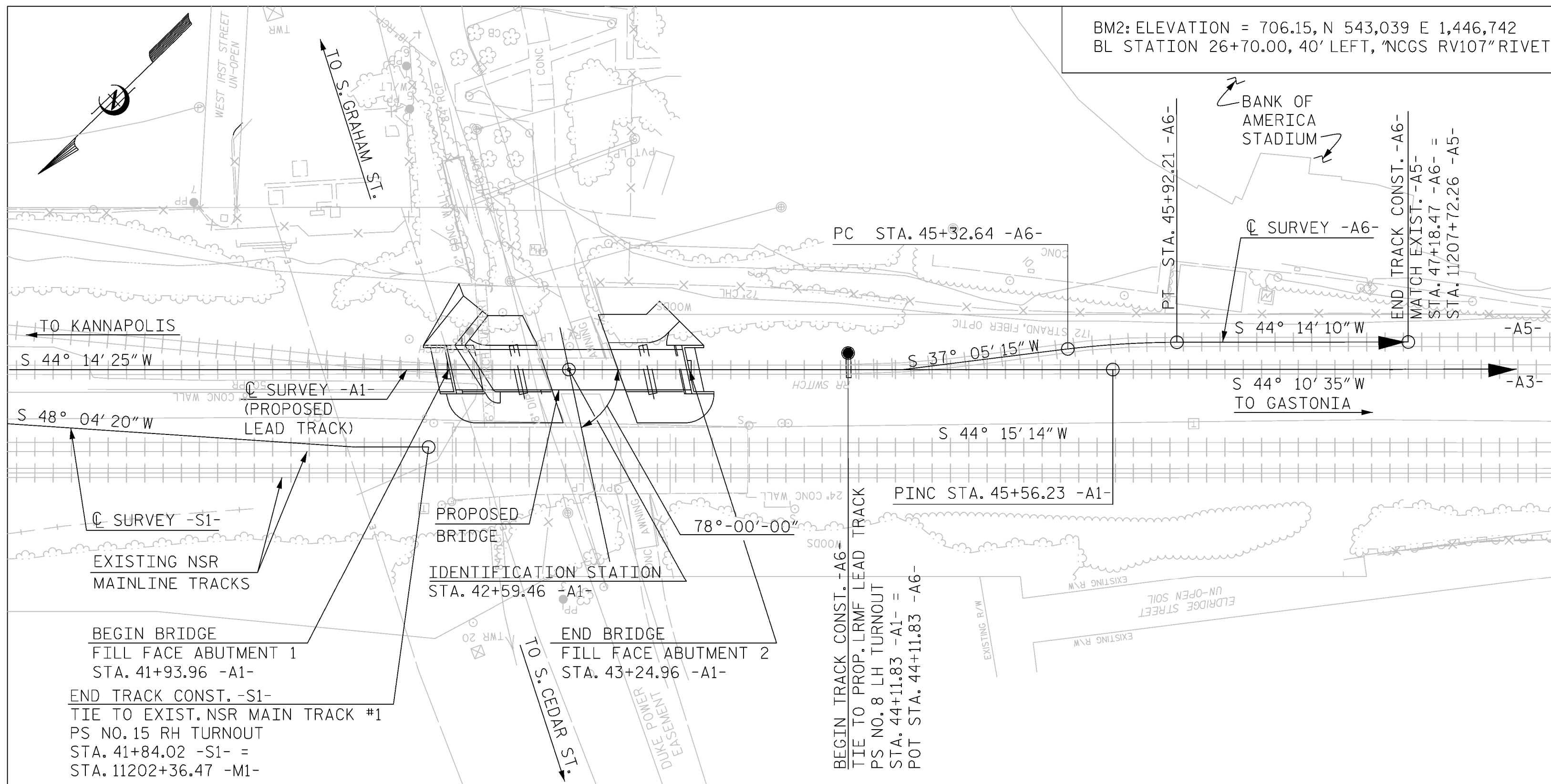
GENERAL DRAWING
 FOUNDATION LAYOUT
 AND
 FOUNDATION NOTES



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 2	
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
SHEET NO. S8-2					TOTAL SHEETS 39



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	TEMPORARY RAILROAD SHORING FOR ABUTMENT 1 STA. 42+59.56 -A1-	TEMPORARY RAILROAD SHORING FOR ABUTMENT 2 STA. 42+59.56 -A1-	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 42+59.46 -A1-	REMOVAL OF EXISTING STRUCTURE AT STA. 42+59.46 -A1-	4'-6" DIA. DRILLED PIERS IN SOIL	4'-6" DIA. DRILLED PIERS NOT IN SOIL	PDA TESTING	SID INSPECTIONS	SPT TESTING	THERMAL INTEGRITY PROFILER	CSL TESTING	REINFORCED CONCRETE DECK SLAB	CLASS AA CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 231,350 LBS. STRUCTURAL STEEL	PAINTING OF STRUCTURAL STEEL	HP 14 x 73 STEEL PILES	
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	L.F.	L.F.	EACH	EACH	EACH	EACH	EACH	SQ. FEET	CU. YARDS	LBS.	LBS.	LUMP SUM	LUMP SUM	NO.	L.F.
SUPERSTRUCTURE	---	---	---	---	---	---	---	---	---	---	---	2,822.1	---	---	---	LUMP SUM	LUMP SUM	---	---
ABUTMENT 1	---	---	---	---	---	---	---	---	---	---	---	---	50.9	5,244	---	---	---	---	---
PIER 1	---	---	---	---	14.5	53.0	---	3	3	3	3	---	38.9	19,254	6,054	---	---	---	---
PIER 2	---	---	---	---	70.0	33.0	---	3	3	3	3	---	35.8	23,230	7,985	---	---	---	---
ABUTMENT 2	---	---	---	---	---	---	---	---	---	---	---	---	55.8	5,695	---	---	---	12	420.0
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	84.5	86.0	1	6	6	6	6	2,822.1	181.4	53,423	14,039	LUMP SUM	LUMP SUM	12	420.0

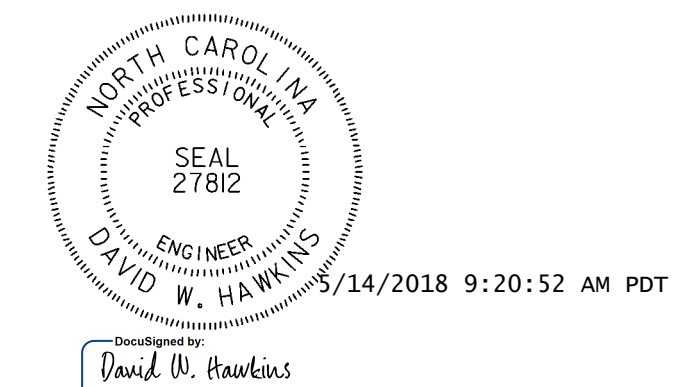
TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP14x73 STEEL PILES	7" DIA. MICROPILES	MIRCOPILE VERIFICATION TEST	WATER-PROOFING	METHOD B DAMPPROOFING	METAL RAIL (ALUMINUM)	CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES	STRUCTURE DRAINAGE SYSTEM AT STA. 42+59.46 -A1-	APPLICATION OF BRIDGE COATING	ABESTOS ASSESSMENT
	EACH	EACH	EACH	SQ. YARDS	SQ. YARDS	L.F.	L.F.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	---	---	---	294.2	---	304.3	256.4	---	---	LUMP SUM	LUMP SUM	LUMP SUM	---
ABUTMENT 1	---	12	1	4.8	48.5	---	---	350	390	---	---	LUMP SUM	---
PIER 1	---	---	---	---	---	---	---	---	---	---	---	LUMP SUM	---
PIER 2	---	---	---	---	---	---	---	---	---	---	---	LUMP SUM	---
ABUTMENT 2	12	---	---	5.9	54.6	---	---	260	290	---	---	LUMP SUM	---
TOTAL	12	12	1	304.9	103.1	304.3	256.4	610	680	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

EXISTING SINGLE SPAN GIRDERS AND DECK AND EXISTING BACKWALLS SHALL BE REMOVED AS SHOWN IN THE PLANS. REMOVAL OF THESE ITEMS SHALL BE PAID FOR ON A LUMP SUM BASIS AS "REMOVAL OF EXISTING STRUCTURE AT STATION 42+59.46 -A1-".

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

SHEET 3 OF 4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
LOCATION SKETCH AND
TOTAL BILL OF MATERIAL

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

DRAWN BY: J. BAYNE DATE: 9/17
CHECKED BY: D. HAWKINS DATE: 9/17

DWG. NO. 3

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1	DWH	5/10/18	3			39
2			4			

0012DEL_P28
1002ADD_P28

GENERAL NOTES:

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 16TH EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND NORFOLK SOUTHERN CORPORATION'S "GUIDELINES FOR DESIGN OF GRADE SEPARATED STRUCTURES UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AREMA MANUAL FOR RAILWAY ENGINEERING, VOL. 2, CH. 9, "SEISMIC DESIGN FOR RAILWAY".

REINFORCING STEEL SHALL BE 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. ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED.

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.

STRUCTURE DRAINAGE SYSTEM: 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 TO THE CHIEF ENGINEER BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA. FOR APPROVAL.

DAMP PROOFING: PIER COLUMNS UP TO GROUND LINE, BACK OF BACKWALLS AND ABUTMENT SEATS, AND BACK OF WINGS SHALL BE DAMP PROOFED WITH METHOD "B" DAMP PROOFING.

WATERPROOFING: BRIDGE DECK AND ALL CONSTRUCTION JOINTS 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:

- BRIDGE DECK AND INSIDE OF CONCRETE PARAPET AS SHOWN ON "SUPERSTRUCTURE TYPICAL SECTION" SHEET.
- ALONG FULL CIRCUMFERENCE OF EACH BOTTOM OF COLUMN TO TOP OF DRILLED PIER INTERFERENCE.
- ALONG FILL FACE OF HORIZONTAL CONSTRUCTION JOINT AT TOP OF FOOTING 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 SPLICED 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.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2018, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS (STRUCTURAL STEEL IN ACCORDANCE WITH CURRENT AREMA SPECIFICATIONS).

ALL CONCRETE SHALL BE 4,500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS 3/4 " EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND COMPLIANT WITH THE DESIGN STANDARDS OF NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY, AS A SUBMITTAL THROUGH THE ENGINEER, AT LEAST 2 WEEKS 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.

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

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

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

FOR CONDUIT IN PARAPETS, SEE SPECIAL PROVISIONS.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, 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 STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR WATERSTOPS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.

FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

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

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.

FOR CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

ALL BAR SUPPORTS AND ALL INCIDENTAL REINFORCING STEEL USED IN THE DECK AND PARAPET SHALL BE EPOXY COATED IN ACCORDANCE WITH THE NCDOT STANDARD SPECIFICATIONS.

THE CONCRETE DECK, STEEL GIRDERS AND CONCRETE BACKWALL OF THE EXISTING SINGLE SPAN BRIDGE SHALL BE REMOVED TO THE SEAT ELEVATION OF EXISTING ABUTMENT WALLS, APPROXIMATE EL. 703.0± AS SHOWN IN THE PLANS.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 42+64.46 -A1-".

FOR TEMPORARY RAILROAD SHORING, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

INDEX OF DRAWINGS

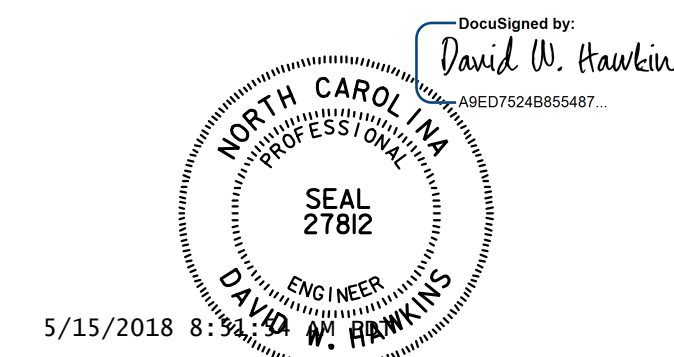
- GENERAL DRAWING: GENERAL PLAN & ELEVATION (SHEET 1 OF 4)
- GENERAL DRAWING: FOUNDATION LAYOUT AND FOUNDATION NOTES (SHEET 2 OF 4)
- GENERAL DRAWING: LOCATION SKETCH AND TOTAL BILL OF MATERIAL (SHEET 3 OF 4)
- GENERAL DRAWING: GENERAL NOTES (SHEET 4 OF 4)
- SEQUENCE OF CONSTRUCTION
- SUPERSTRUCTURE: TYPICAL SECTION
- SUPERSTRUCTURE: DECK DETAILS
- SUPERSTRUCTURE: PLAN OF DECK - SPAN A
- SUPERSTRUCTURE: PLAN OF DECK - SPAN B
- SUPERSTRUCTURE: PLAN OF DECK - SPAN C
- SUPERSTRUCTURE: FRAMING PLAN & GIRDER DETAILS - SPAN A AND SPAN C
- SUPERSTRUCTURE: FRAMING PLAN & GIRDER DETAILS - SPAN B
- SUPERSTRUCTURE: STRUCTURAL STEEL DETAILS
- SUPERSTRUCTURE: BEARING DETAILS (SHEET 1 OF 2)
- SUPERSTRUCTURE: BEARING DETAILS (SHEET 2 OF 2)
- SUPERSTRUCTURE: EXPANSION PLATE DETAILS
- SUPERSTRUCTURE: PARAPET DETAILS (SHEET 1 OF 2)
- SUPERSTRUCTURE: PARAPET DETAILS (SHEET 2 OF 2)
- SUPERSTRUCTURE: METAL HANDRAIL DETAILS (SHEET 1 OF 2)
- SUPERSTRUCTURE: METAL HANDRAIL DETAILS (SHEET 2 OF 2)
- SUPERSTRUCTURE: BILL OF MATERIAL
- SUBSTRUCTURE: ABUTMENT 1 SHORING (SHEET 1 OF 2)
- SUBSTRUCTURE: ABUTMENT 1 SHORING (SHEET 2 OF 2)
- 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: COLUMN AND DRILLED PIER CONSTRUCTION SEQUENCE - PIER
- SUBSTRUCTURE: PIER 2 (SHEET 1 OF 2)
- SUBSTRUCTURE: PIER 2 (SHEET 2 OF 2)
- SUBSTRUCTURE: ABUTMENT 2 SHORING
- SUBSTRUCTURE: ABUTMENT 2 (SHEET 1 OF 3)
- SUBSTRUCTURE: ABUTMENT 2 (SHEET 2 OF 3)
- SUBSTRUCTURE: ABUTMENT 2 (SHEET 3 OF 3)
- STRUCTURE DRAINAGE DETAILS (SHEET 1 OF 3)
- STRUCTURE DRAINAGE DETAILS (SHEET 2 OF 3)
- STRUCTURE DRAINAGE DETAILS (SHEET 3 OF 3)
- RIPRAP DETAILS

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

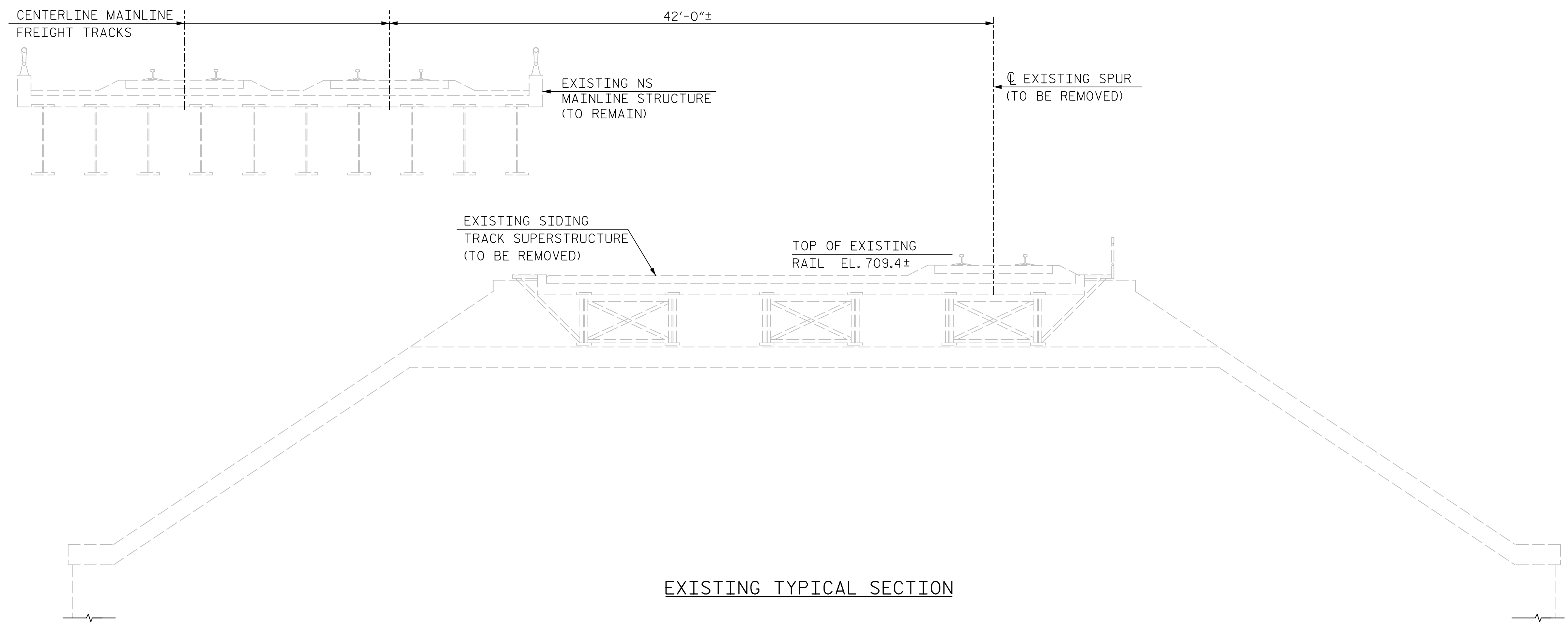
GENERAL DRAWING
GENERAL NOTES



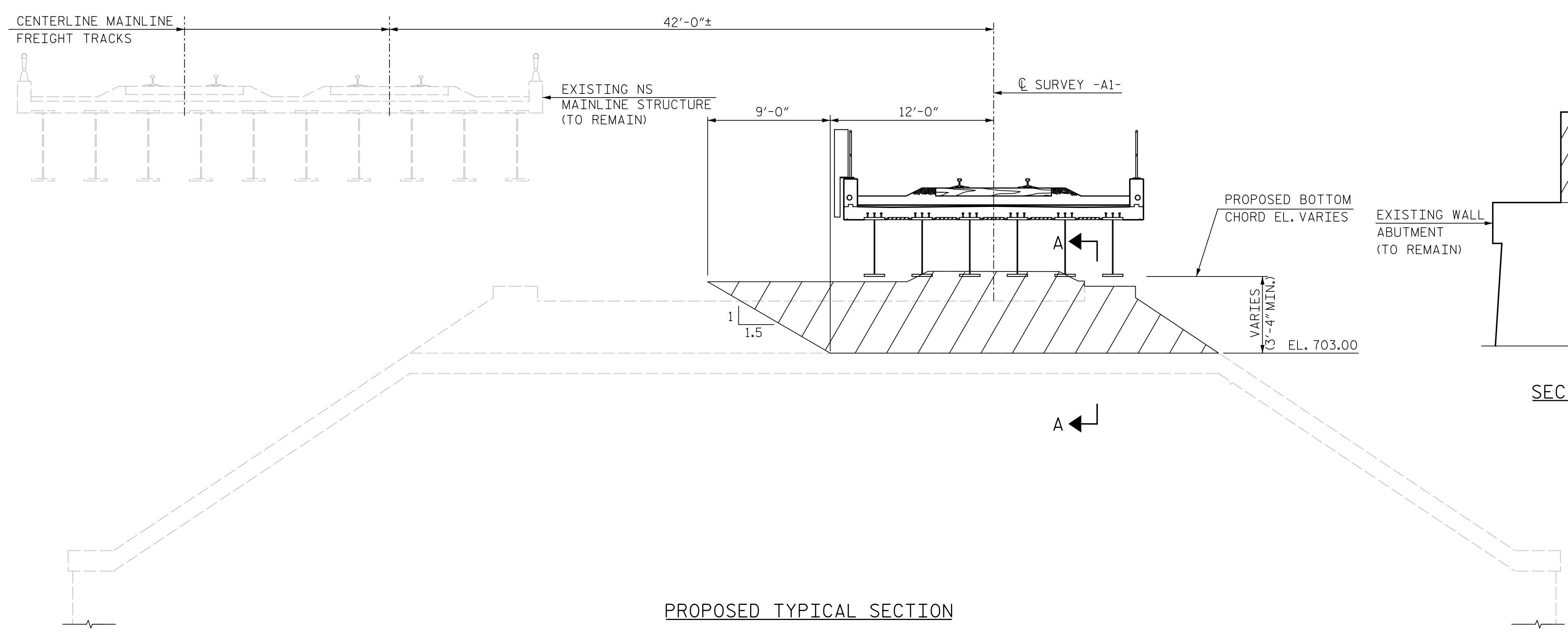
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS						SHEET NO. S8-4
	NO.	BY	DATE	NO.	BY	DATE	
DRAWN BY <u>J. BAYNE</u> CHECKED BY <u>D. HAWKINS</u>		DATE <u>8/17</u> DATE <u>11/17</u>					TOTAL SHEETS 39

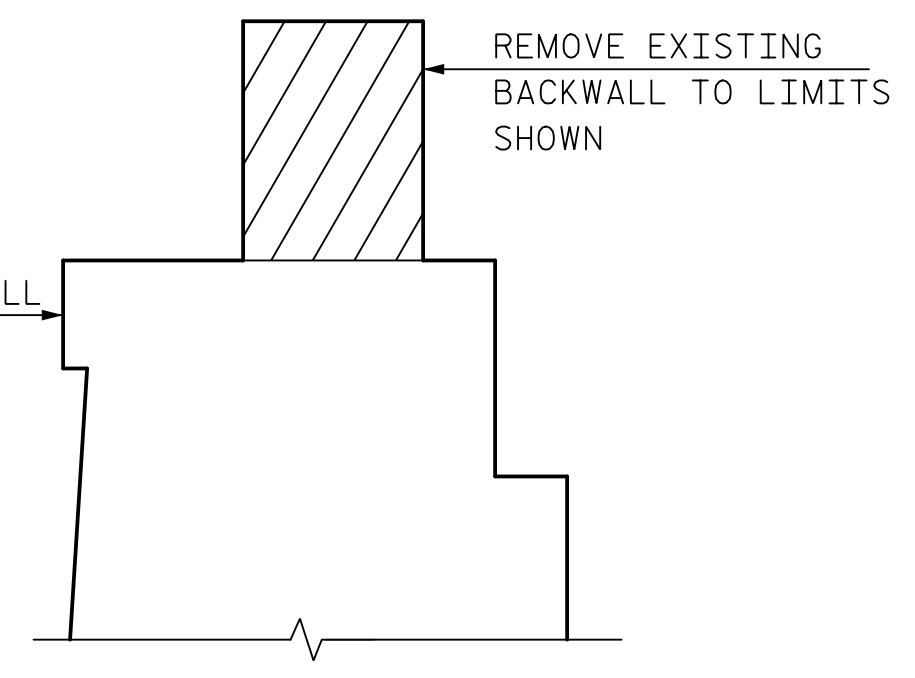
0012DEL_P28



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

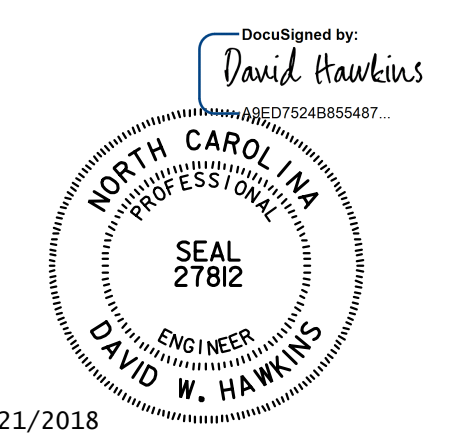


SECTION A-A

- CONSTRUCTION SEQUENCE**
1. CLOSE EXISTING SPUR TRACK TO RAIL TRAFFIC.
 2. REMOVE EXISTING SPUR TRACK SUPERSTRUCTURE AND BACKWALL TO LIMITS SHOWN.
 3. INSTALL TEMPORARY SHORING AT ABUTMENT 1 AND ABUTMENT 2.
 4. ROUGH GRADE TO LIMITS SHOWN ON "RIP RAP DETAILS" SHEET.
 5. INSTALL PROPOSED ABUTMENT AND PIER SUBSTRUCTURE.
 6. BACKFILL TO PROPOSED GRADE AND REMOVE TEMPORARY SHORING.
 7. FINISH GRADE, INSTALL SUPERSTRUCTURE AND RIP RAP SLOPE PROTECTION, TRACK CONTRACTOR TO CONSTRUCT TRACK AND OPEN TO RAIL TRAFFIC.

NOTES:
 EXISTING BACKWALL SHALL BE REMOVED TO THE LIMITS SHOWN. REMOVAL SHALL NOT EXCEED THE LIMITS SHOWN IN THE PLANS AND SHALL NOT BE UNDERTAKEN UNTIL APPROVAL HAS BEEN GIVEN BY THE ENGINEER. REINFORCING WITHIN THE LIMITS OF REMOVAL SHALL BE REMOVED TO A MINIMUM DEPTH OF 4" BELOW PROPOSED BACKWALL LIMITS. HOLE SHALL BE FILLED WITH CLASS AA CONCRETE.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SEQUENCE OF CONSTRUCTION

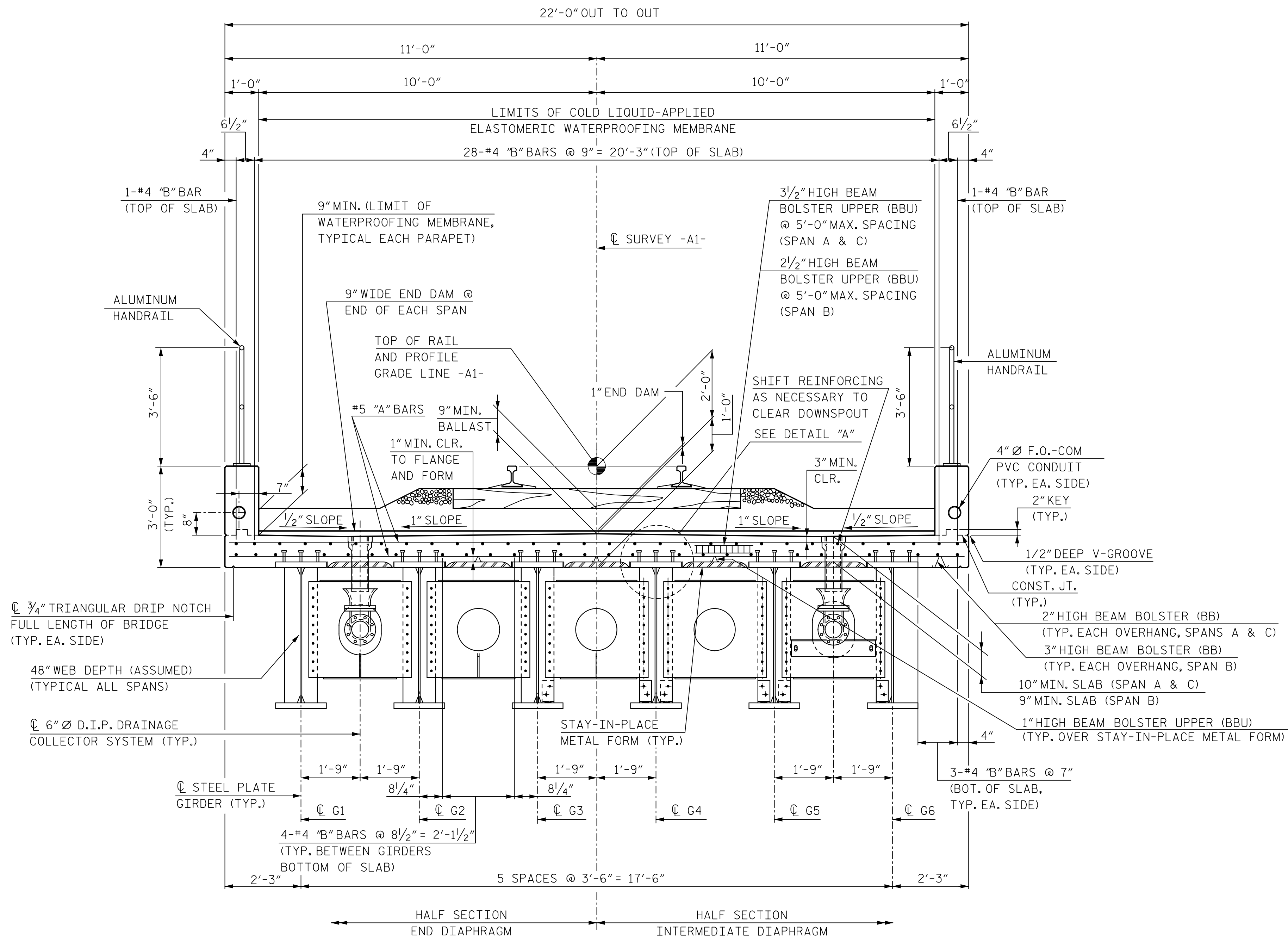
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 11/17
 CHECKED BY D. HAWKINS DATE 11/17 DWG. NO. 5

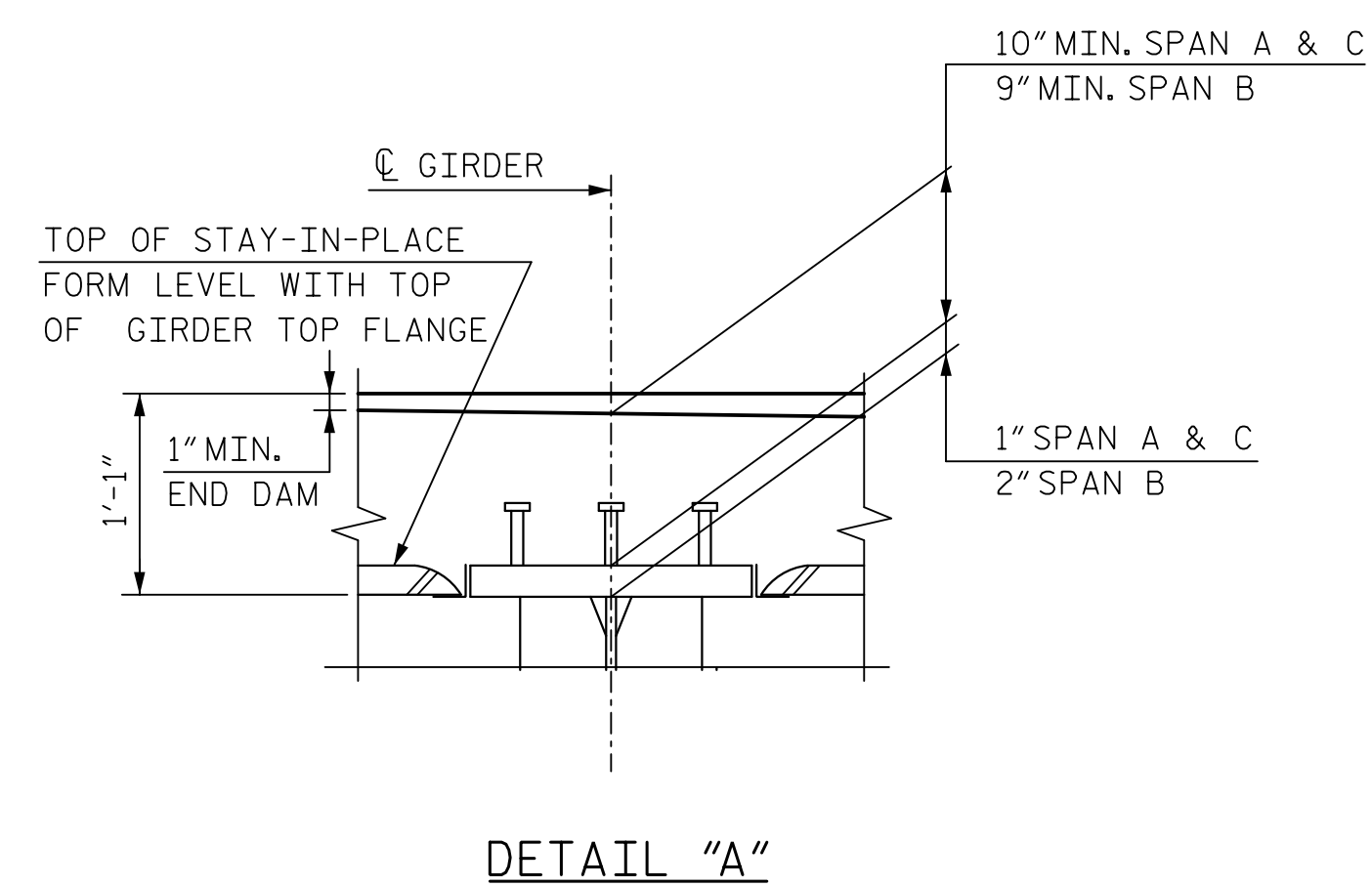
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-5
1			3			TOTAL SHEETS
2			4			39

NOTES FOR SIGNAL CONDUIT IN PARAPET
 SIGNAL CONDUIT TO BE 4" DIA. IN ACCORDANCE WITH UNDERWRITER'S LABORATORY SPECIFICATIONS.
 PROVISIONS SHALL BE MADE FOR EXPANSION BETWEEN DECK SLABS AT EXPANSION JOINTS AT PIERS 1 & 2 (GALVANIZED EXPANSION FITTINGS).
 COUPLING SHALL BE PROVIDED BEHIND BACKWALL OF ABUTMENT 1 AND 2 FOR CONNECTION TO 4" DIA. RIGID PIPE (RIGID PIPE BY RAILWAY COMPANY).
 FOR SIGNAL CONDUIT IN PARAPET SEE PROJECT SPECIAL PROVISIONS.

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 ALUMINUM HANDRAIL DETAILS, SEE "METAL HANDRAIL DETAILS" SHEETS.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.
 DESIGN INCLUDES WEIGHT OF 6" ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.

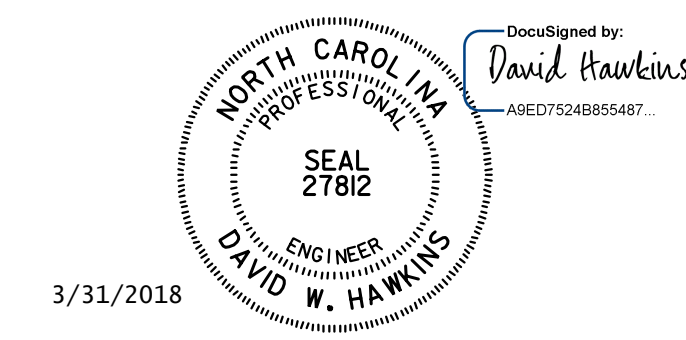


TYPICAL SECTION
 (ALL SPANS SIMILAR)



DETAIL "A"

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-



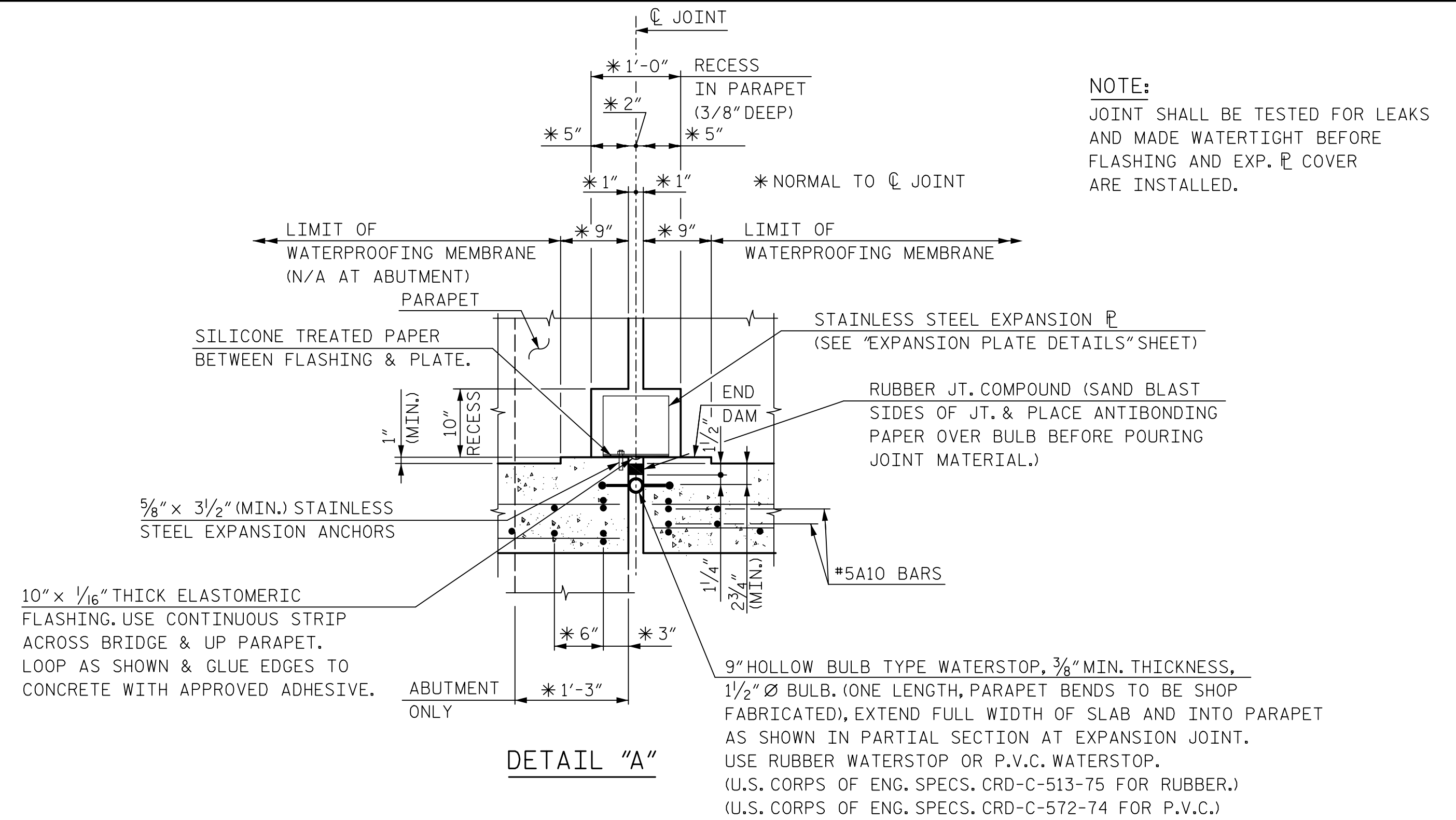
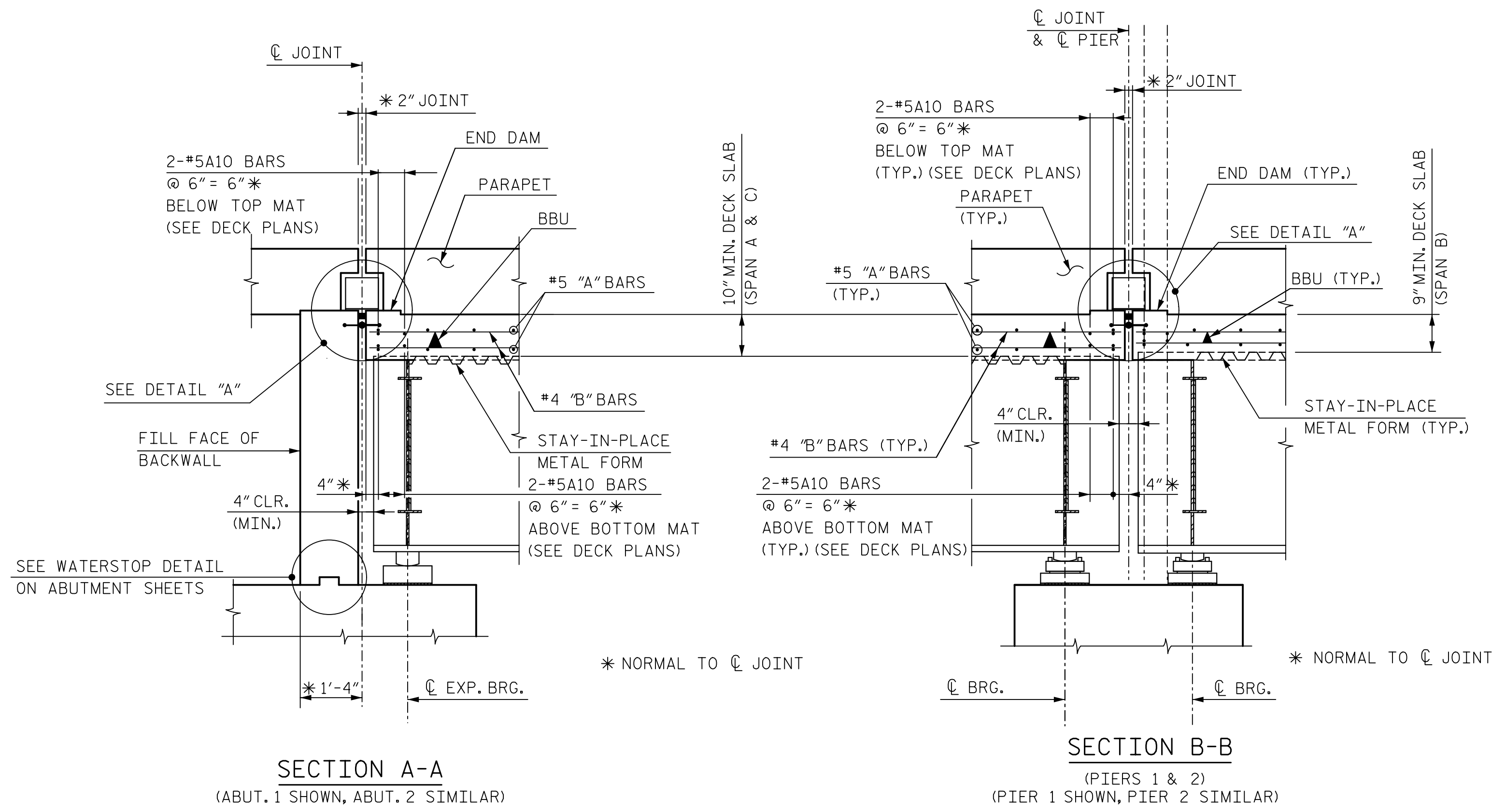
3/31/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

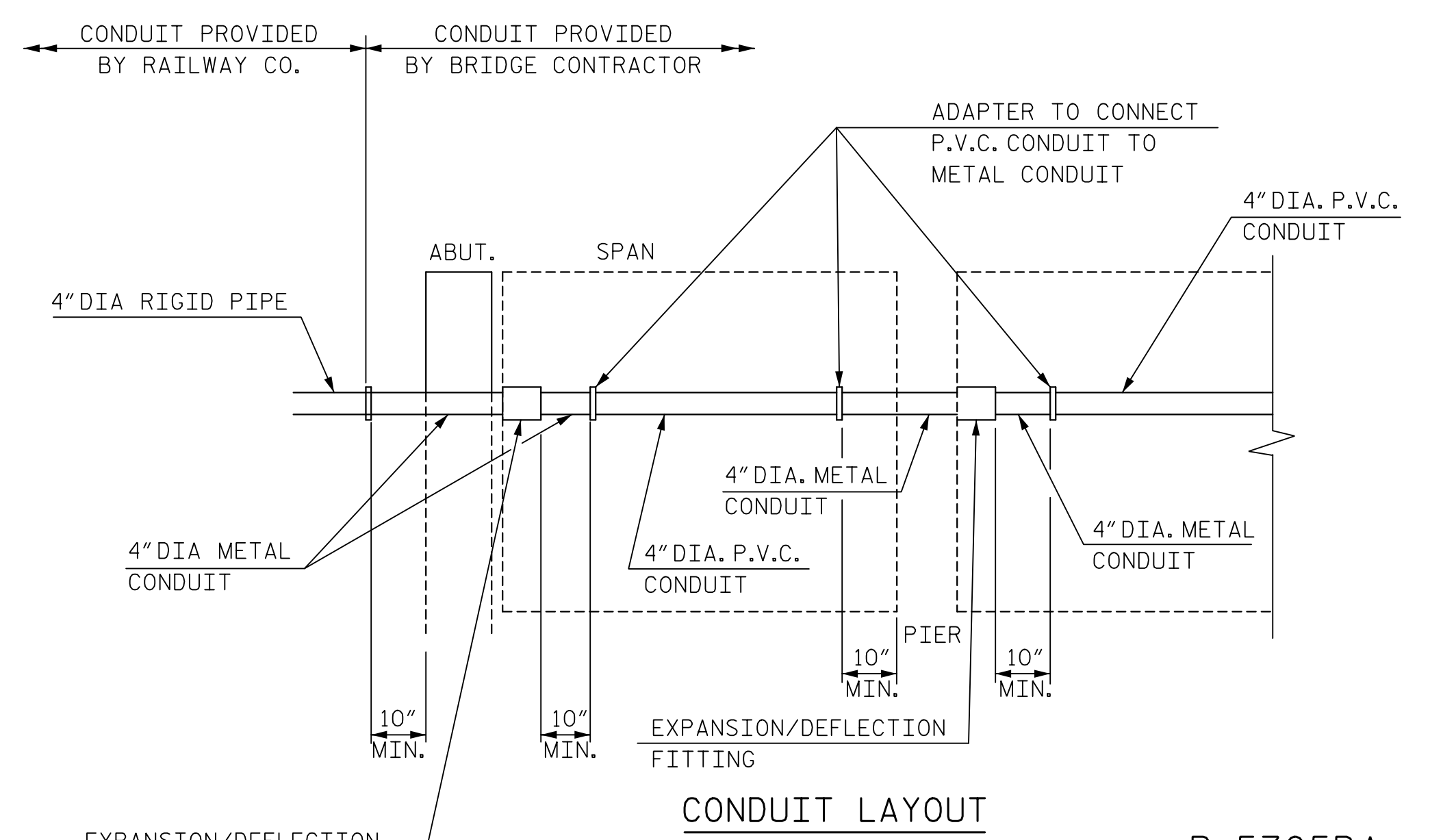
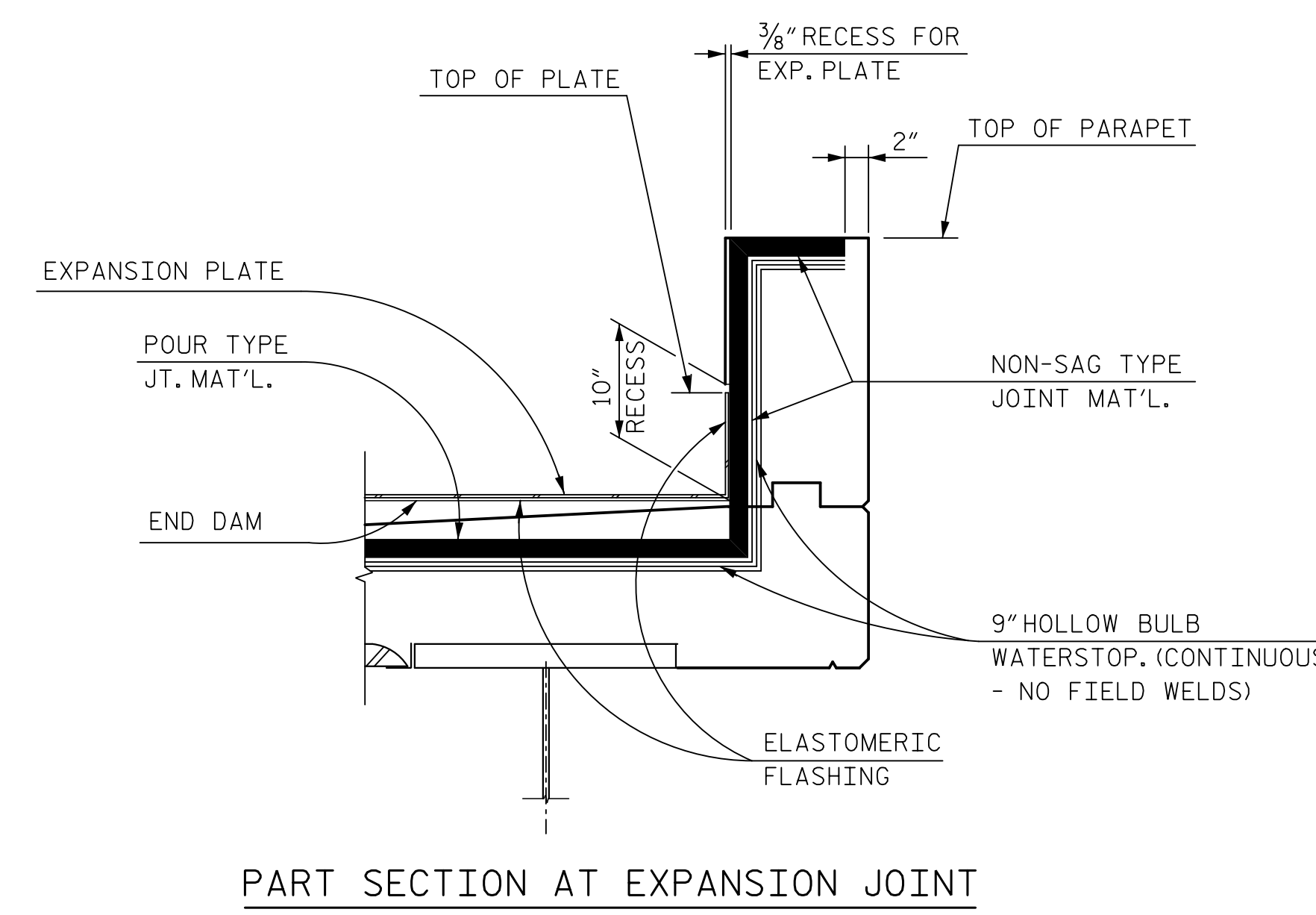
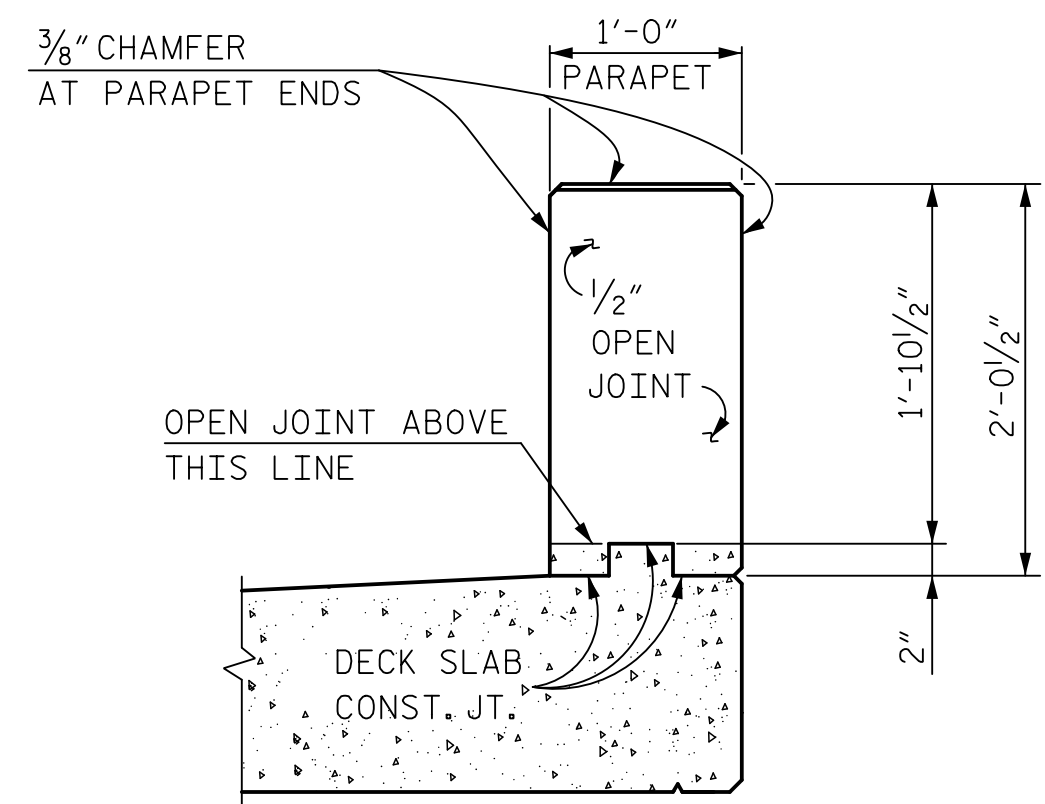
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-6 TOTAL SHEETS 39		
	NO.	BY	DATE	NO.		BY	DATE
	1		8/17	3			
2		9/17	4				

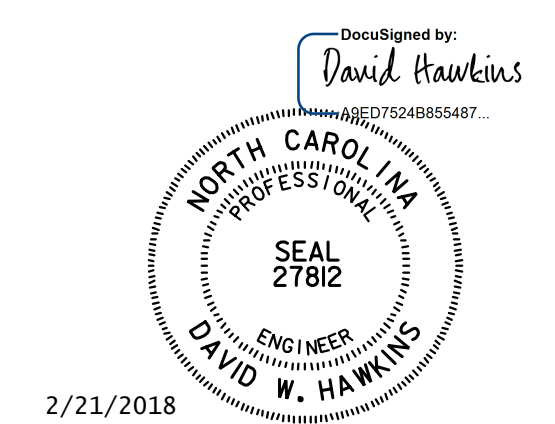
DWG. NO. 6
 DRAWN BY: J. BAYNE
 CHECKED BY: V. KOLLIPARA
 DATE: 8/17
 DATE: 9/17



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



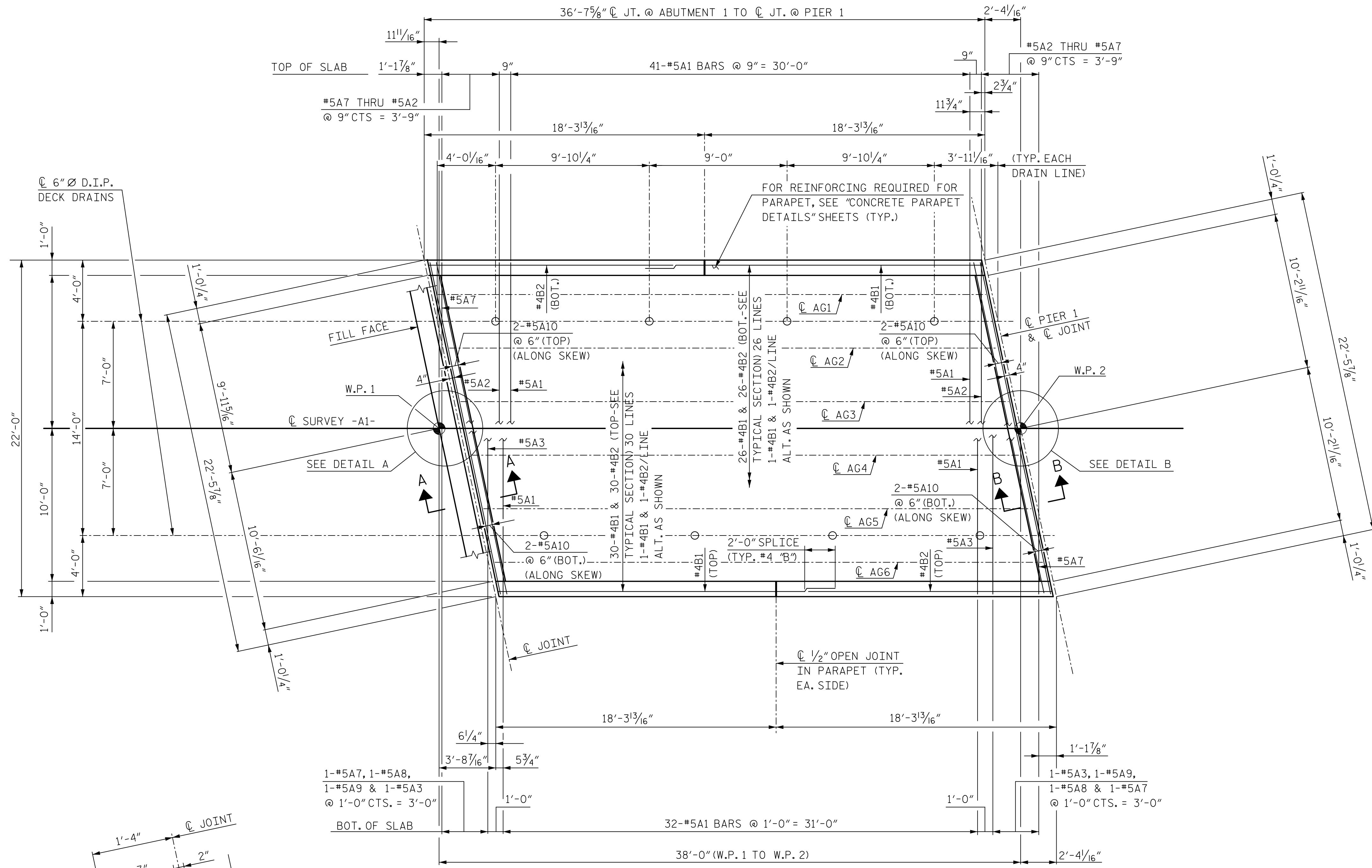
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-



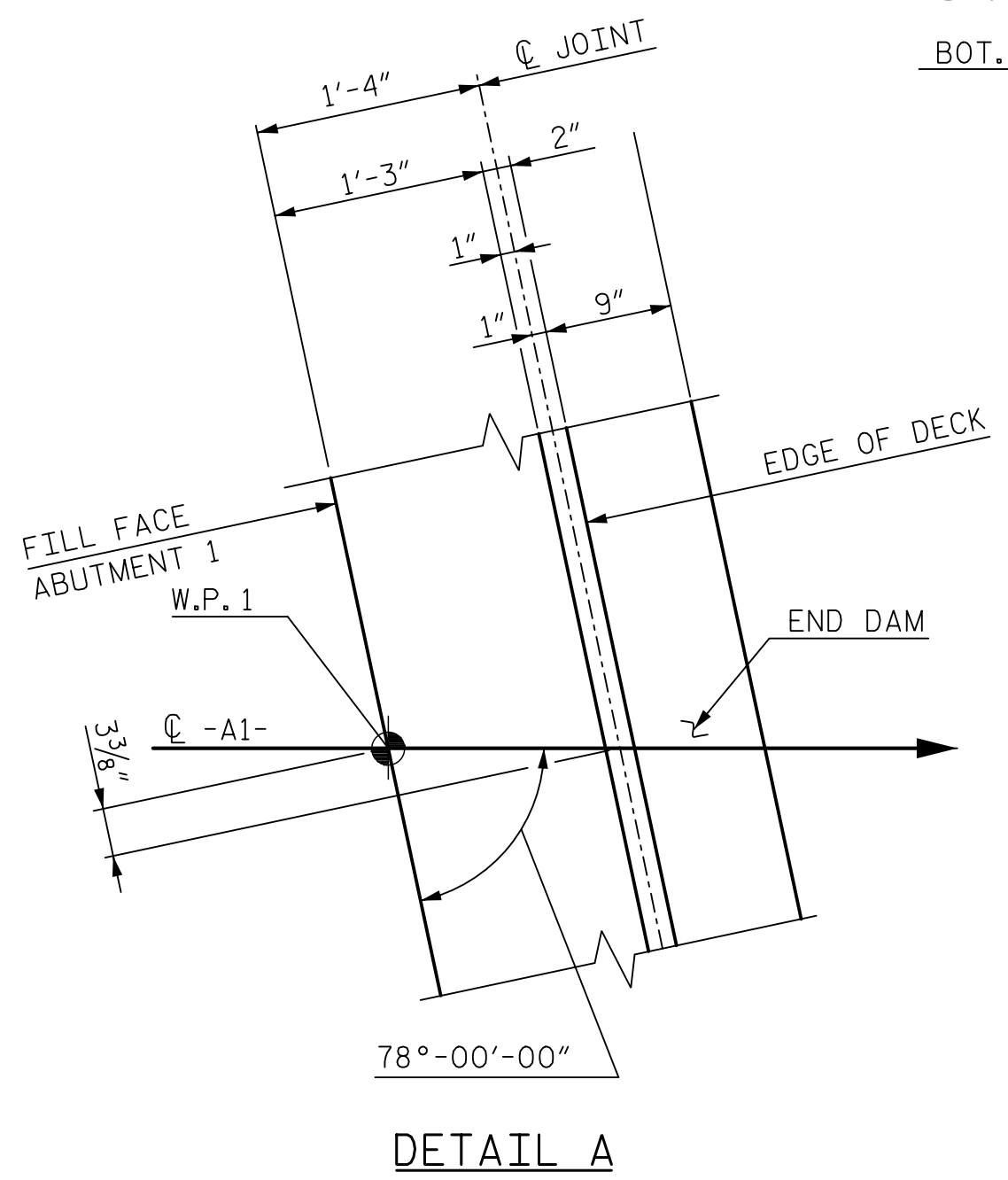
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 7	
DRAWN BY: J. BAYNE		DATE: 8/17		SHEET NO. S8-7	
CHECKED BY: V. KOLLIPARA		DATE: 9/17		TOTAL SHEETS 39	
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

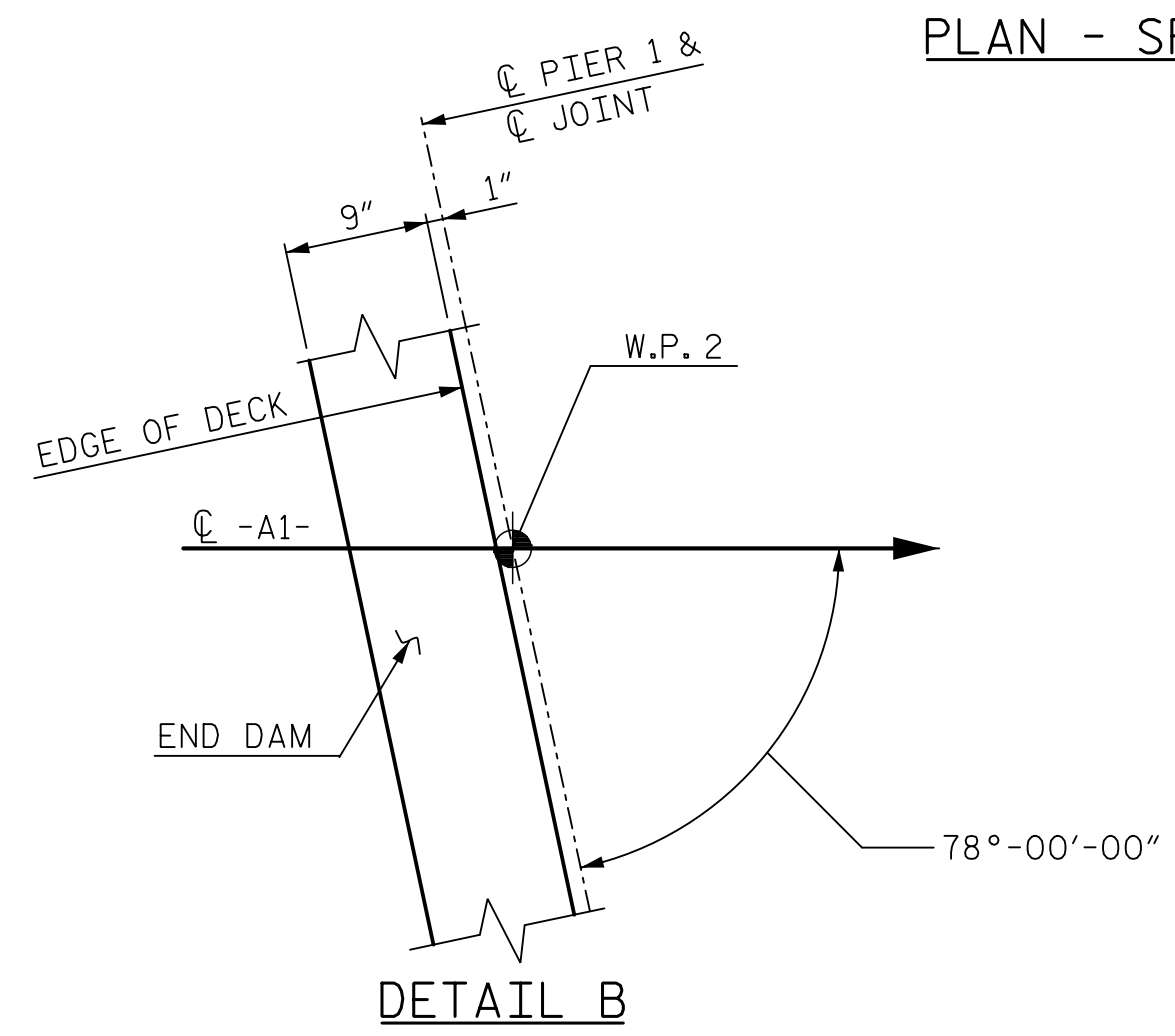
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DECK DETAILS



PLAN - SPAN A



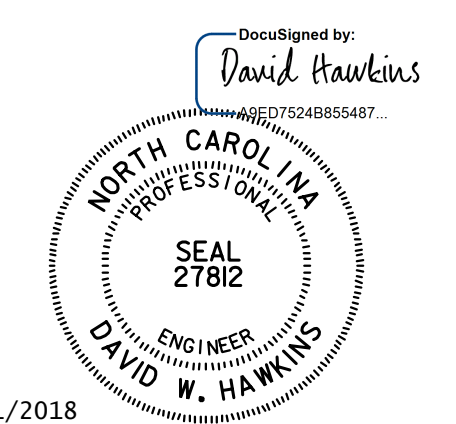
DETAIL A



DETAIL B

NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION A-A & B-B, SEE "SUPERSTRUCTURE DETAILS" SHEET.
 FOR DECK DRAIN DETAIL, SEE DETAIL "B" ON "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 3.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEETS.

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-



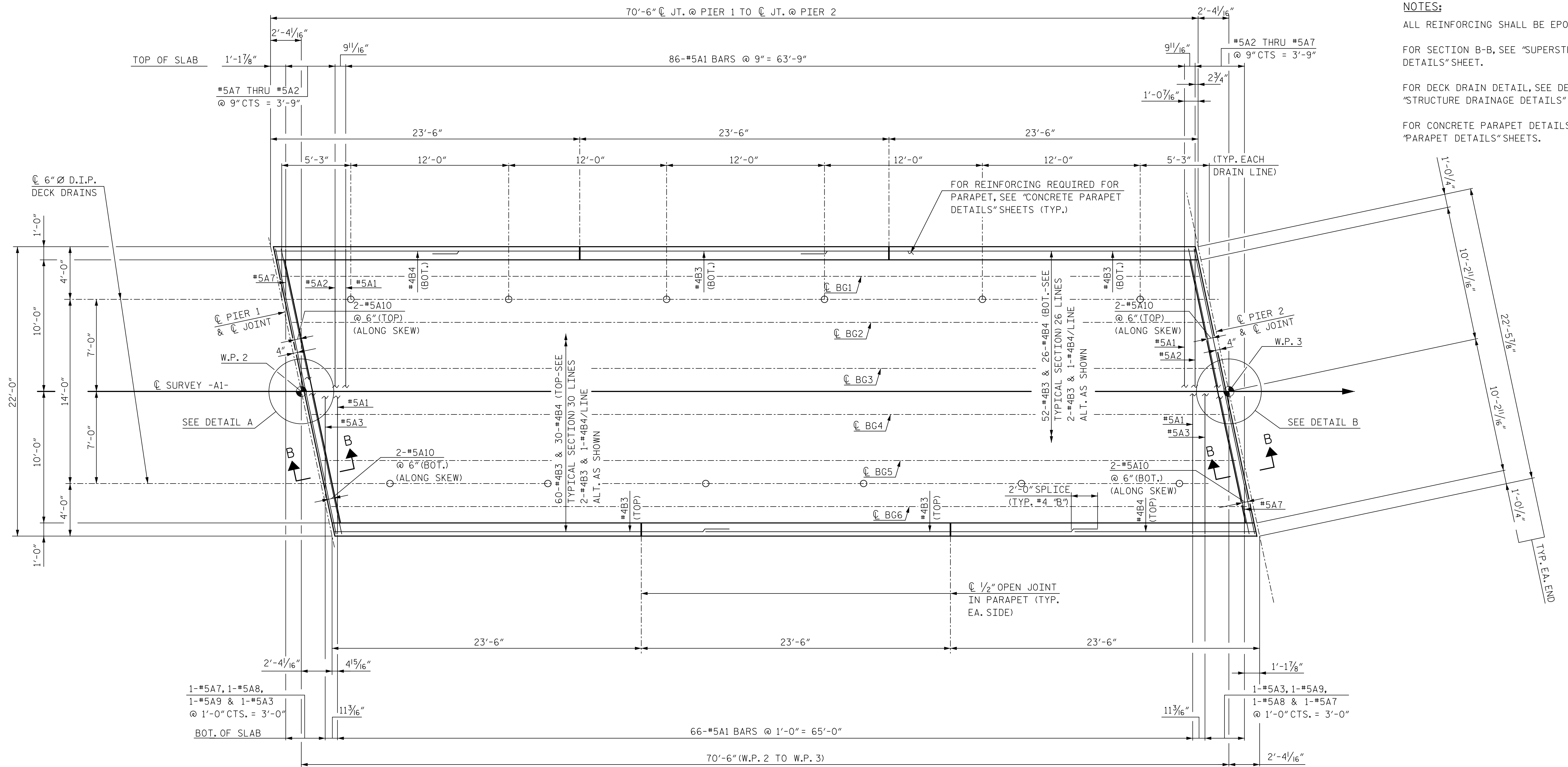
2/21/2018

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

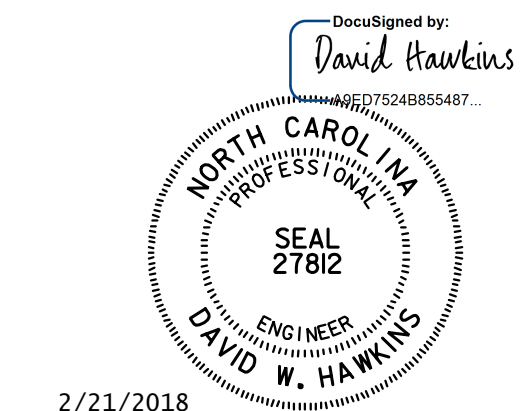
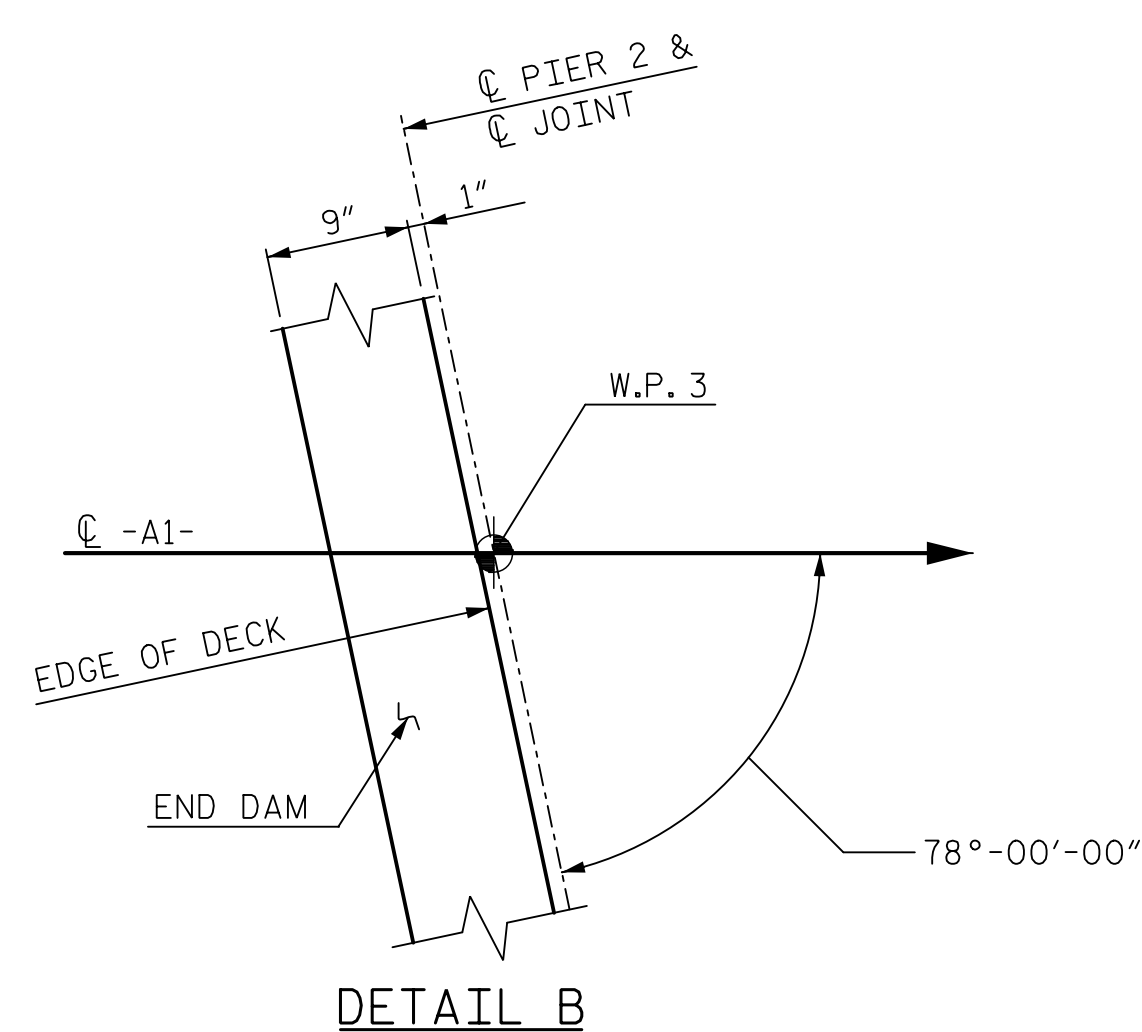
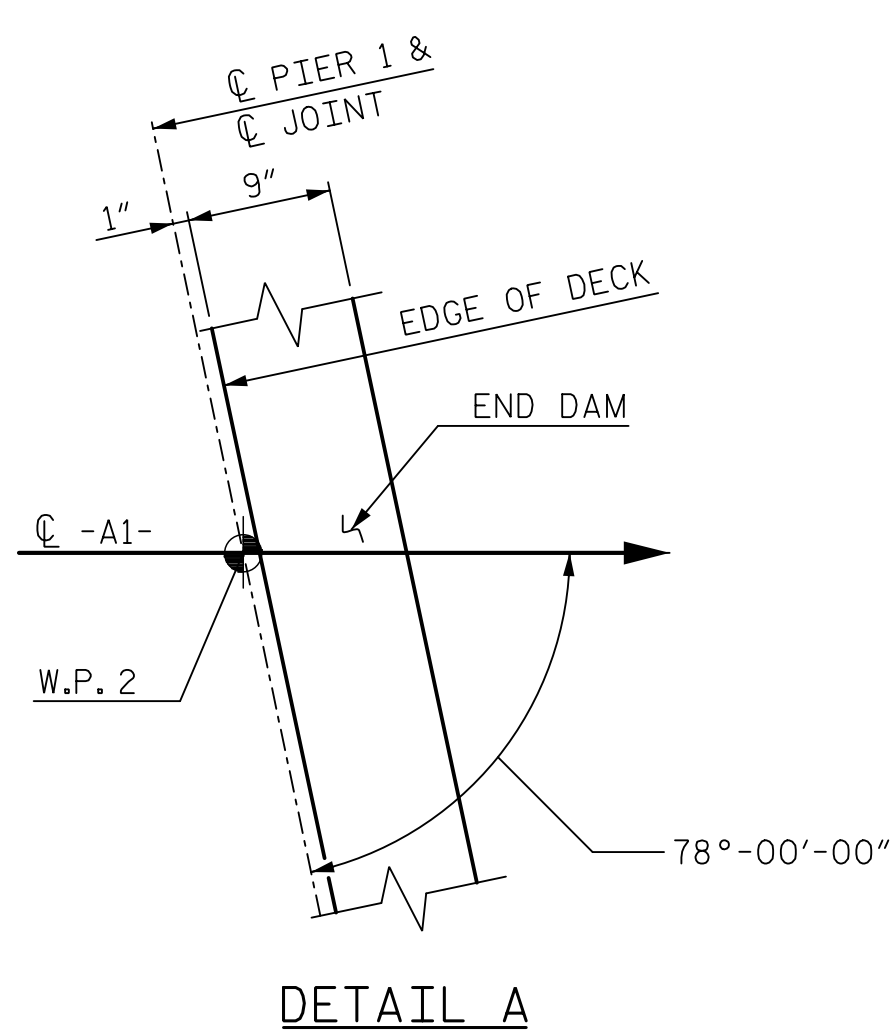
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	DWG. NO. 8	
CHECKED BY: V. KOLLIPARA	DATE: 9/17		

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-8
1			3			TOTAL SHEETS
2			4			39



PLAN - SPAN B

NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION B-B, SEE "SUPERSTRUCTURE DETAILS" SHEET.
 FOR DECK DRAIN DETAIL, SEE DETAIL "B" ON "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 3.
 FOR CONCRETE PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.



2/21/2018

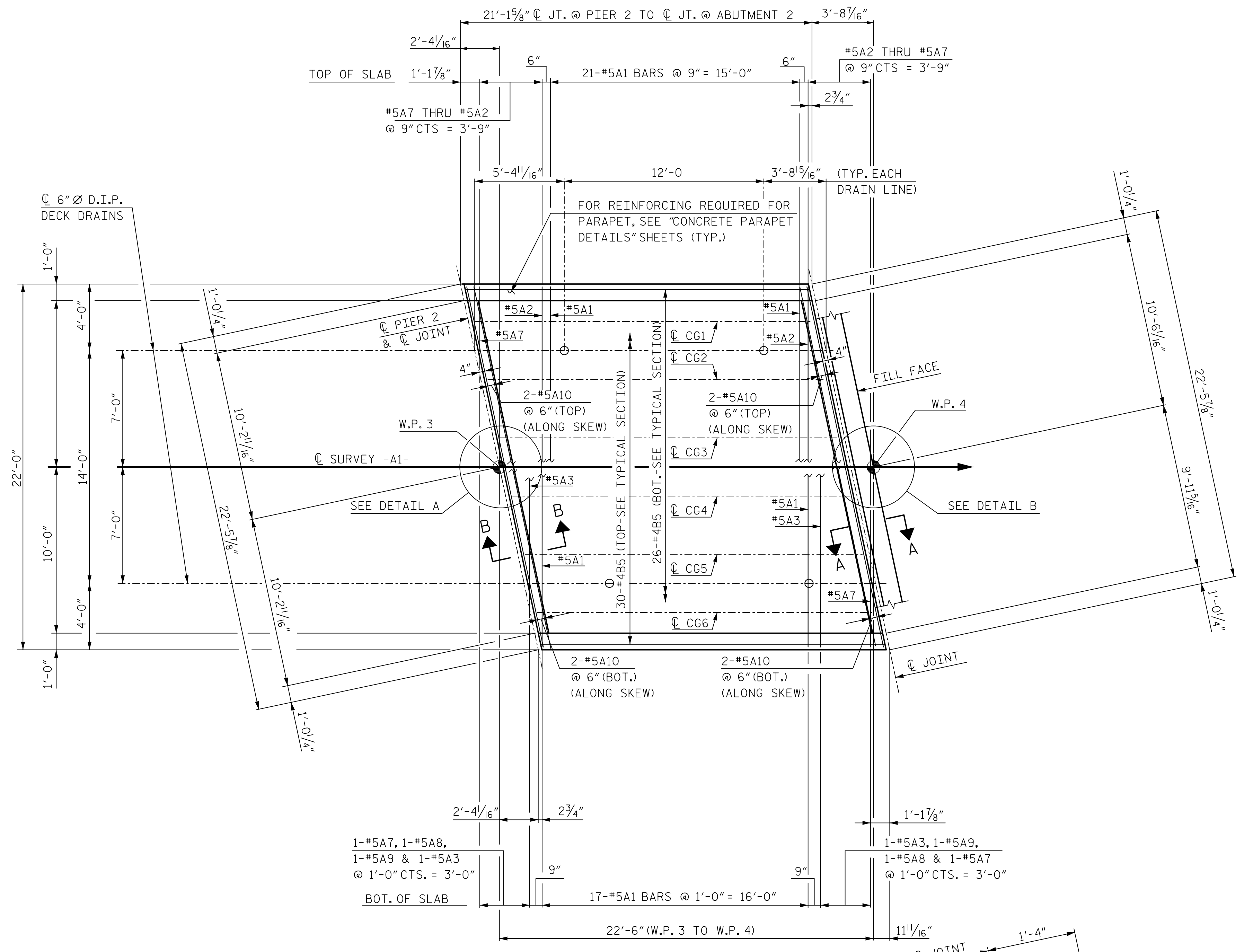
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

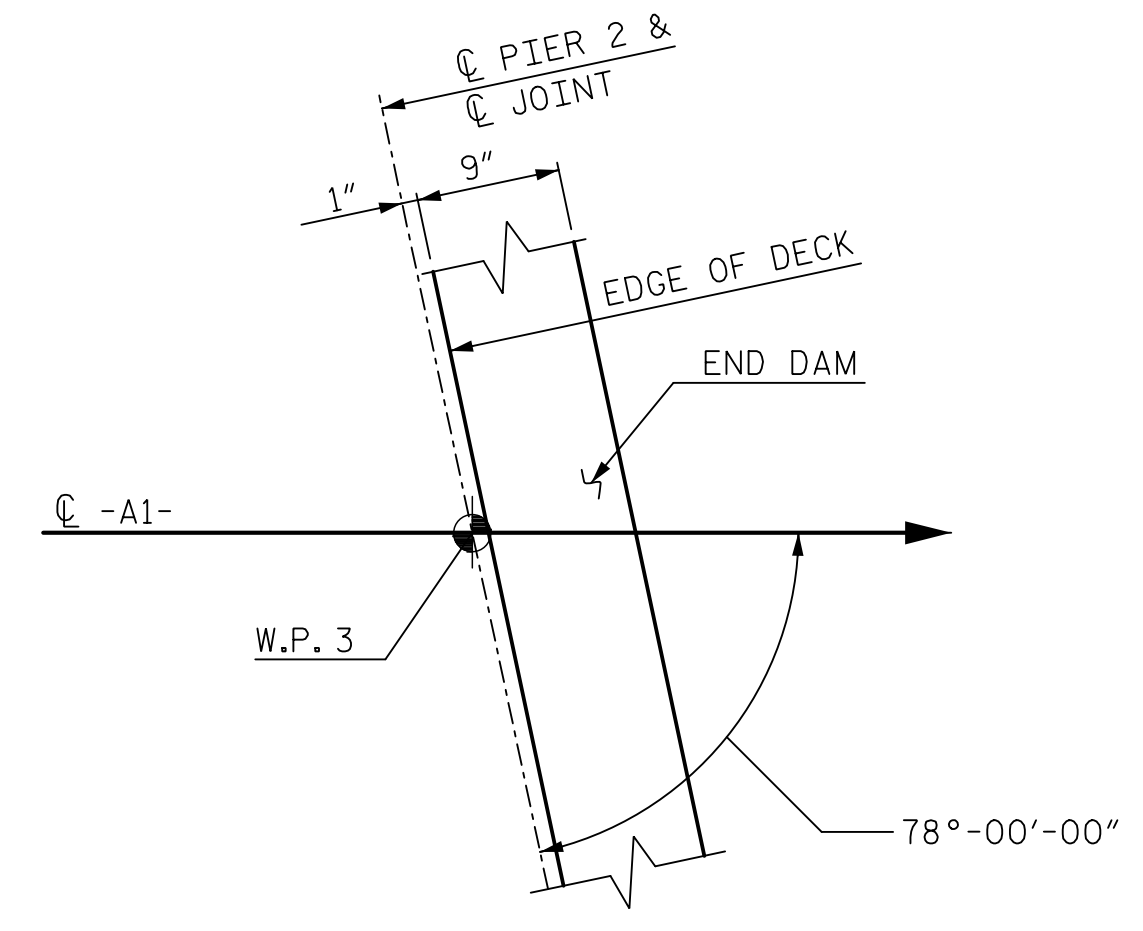
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF DECK - SPAN B

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO.		
	NO.	BY	DATE	NO.	BY	DATE	S8-9
	1			3			TOTAL SHEETS
DRAWN BY: J. BAYNE CHECKED BY: V. KOLLIPARA DATE: 8/17 DATE: 9/17 DWG. NO. 9	2			4			39

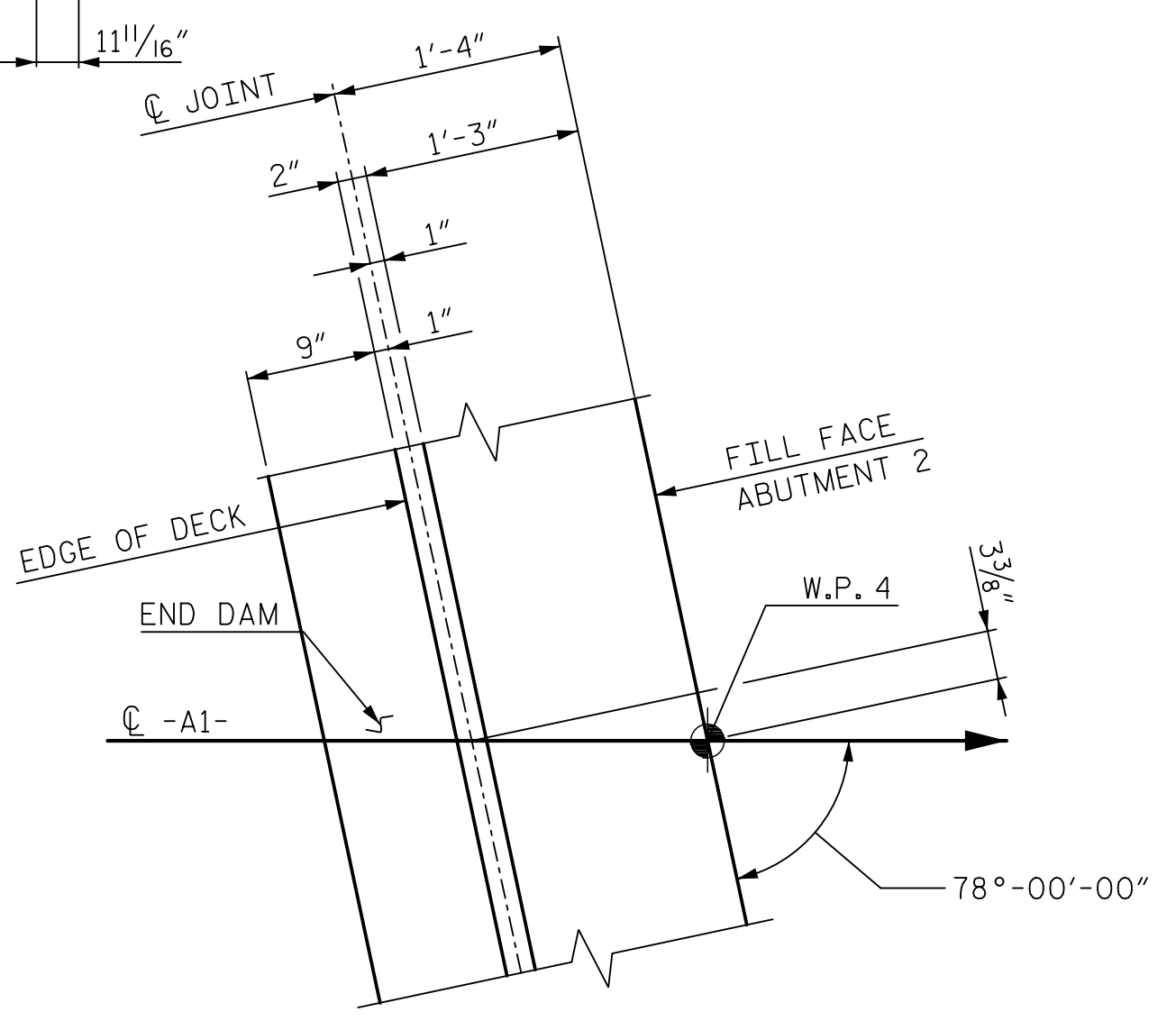
NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION A-A & B-B, SEE "SUPERSTRUCTURE DETAILS" SHEET.
 FOR DECK DRAIN DETAIL, SEE DETAIL "B" ON "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 3.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEETS.



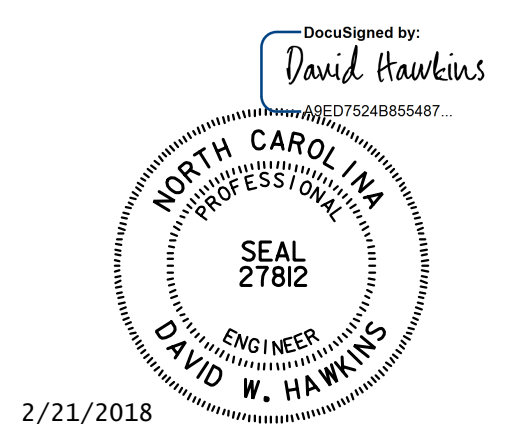
PLAN - SPAN C



DETAIL A



DETAIL B

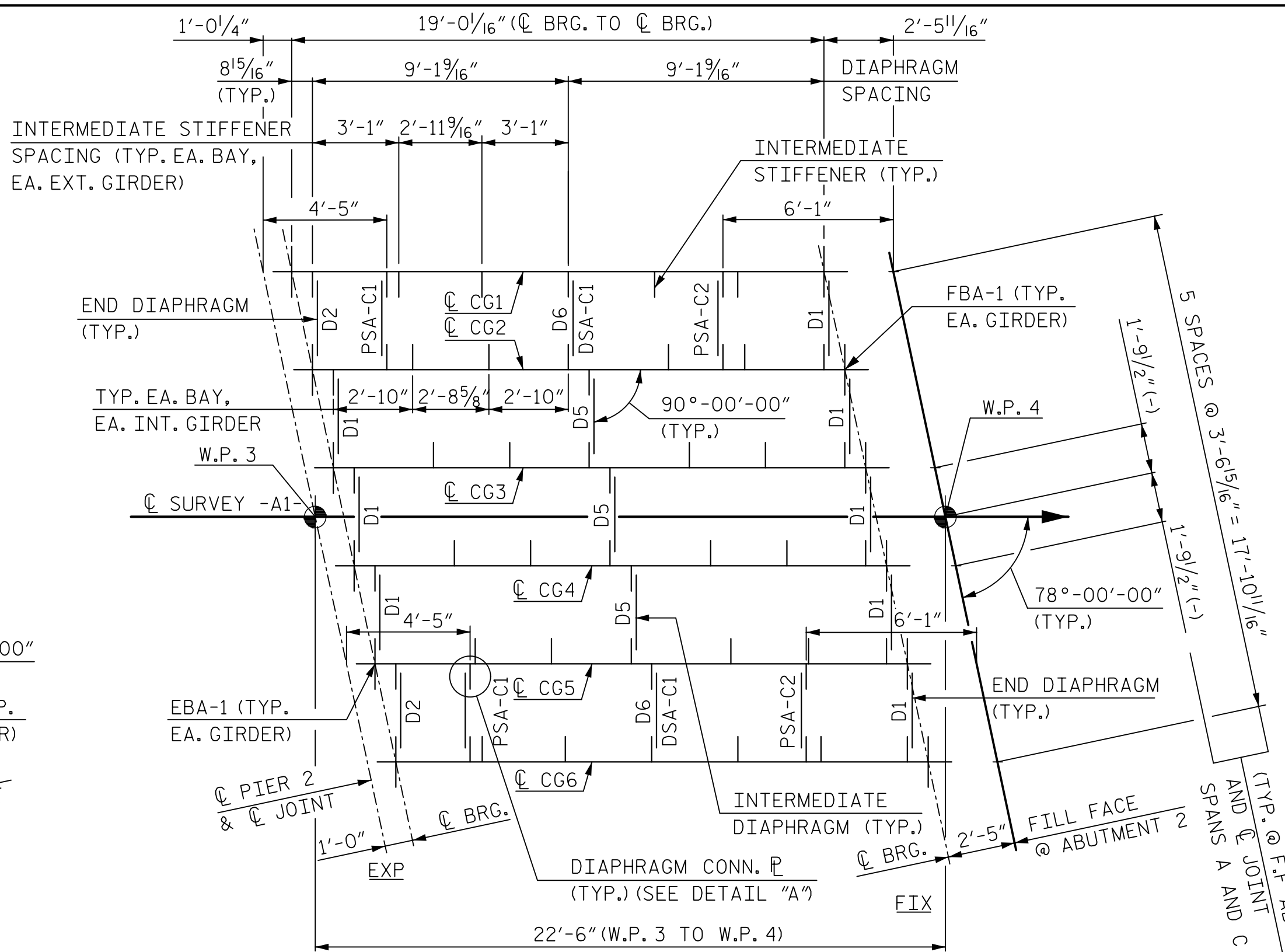
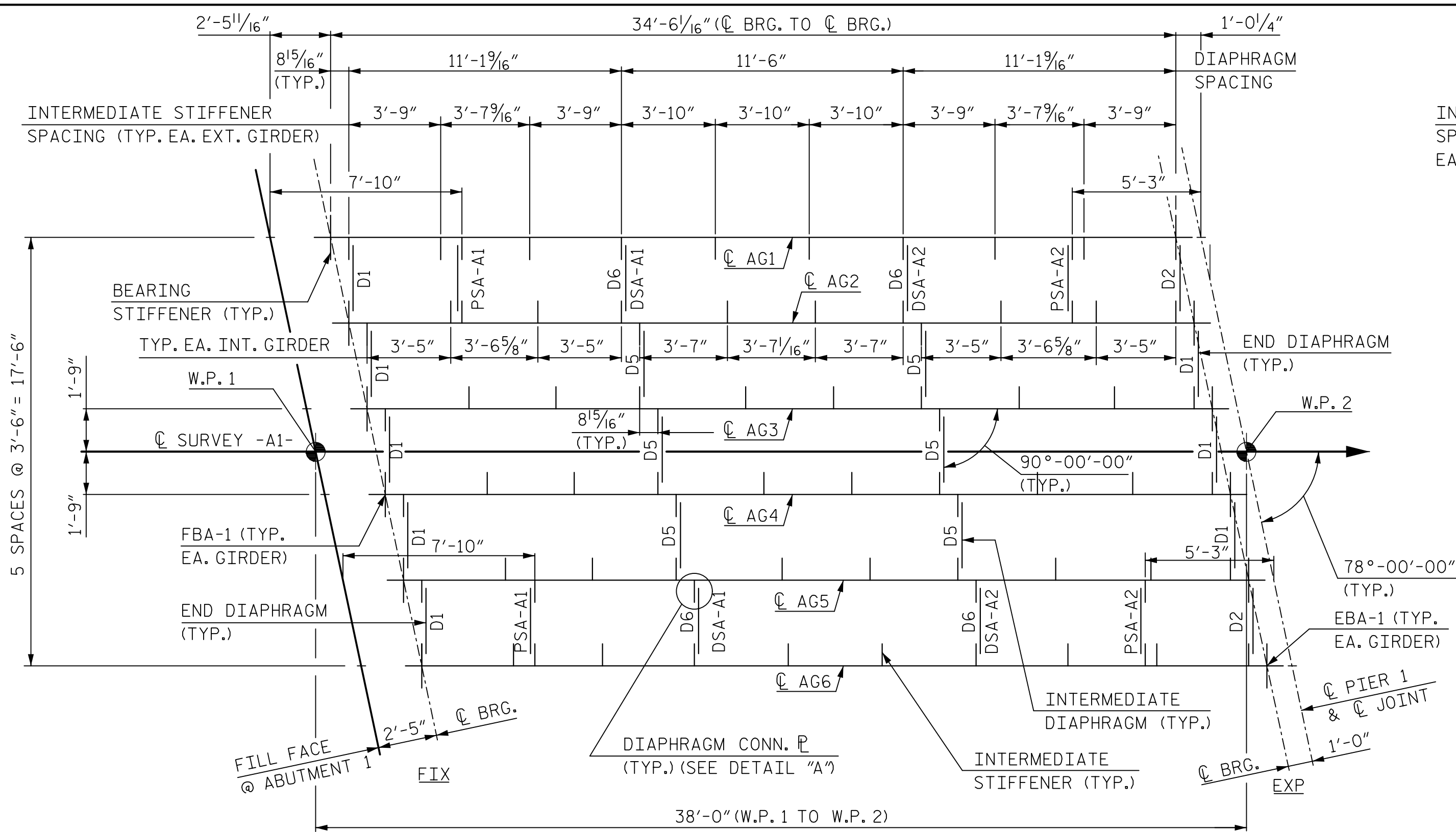


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

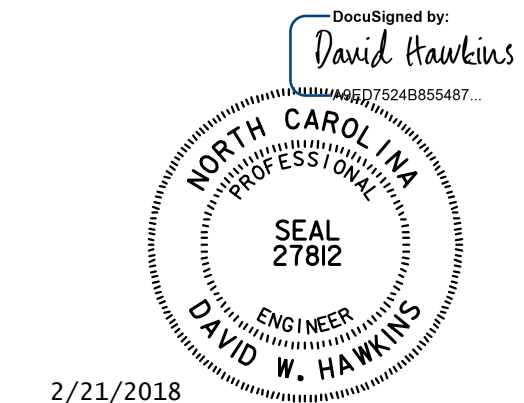
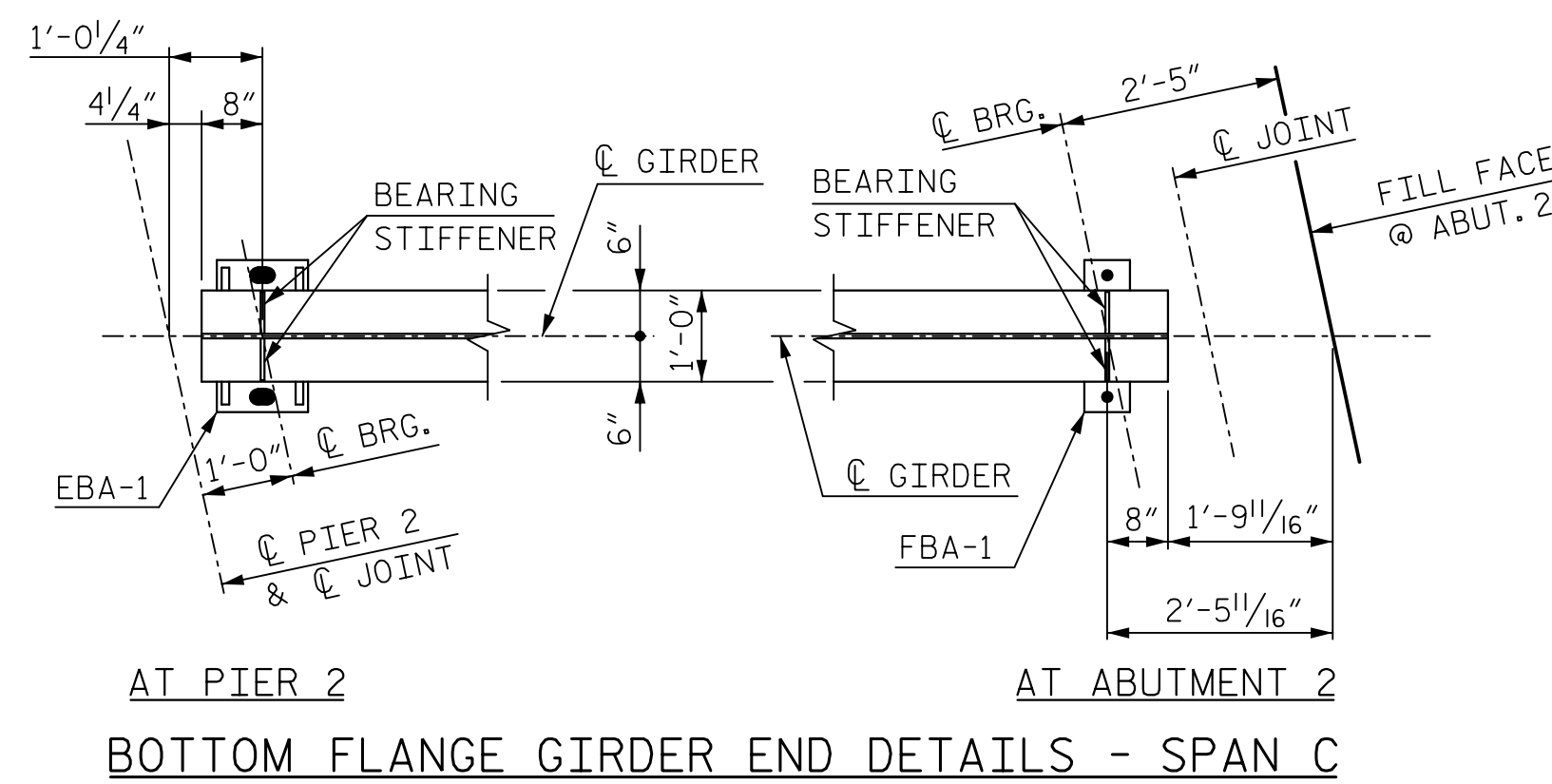
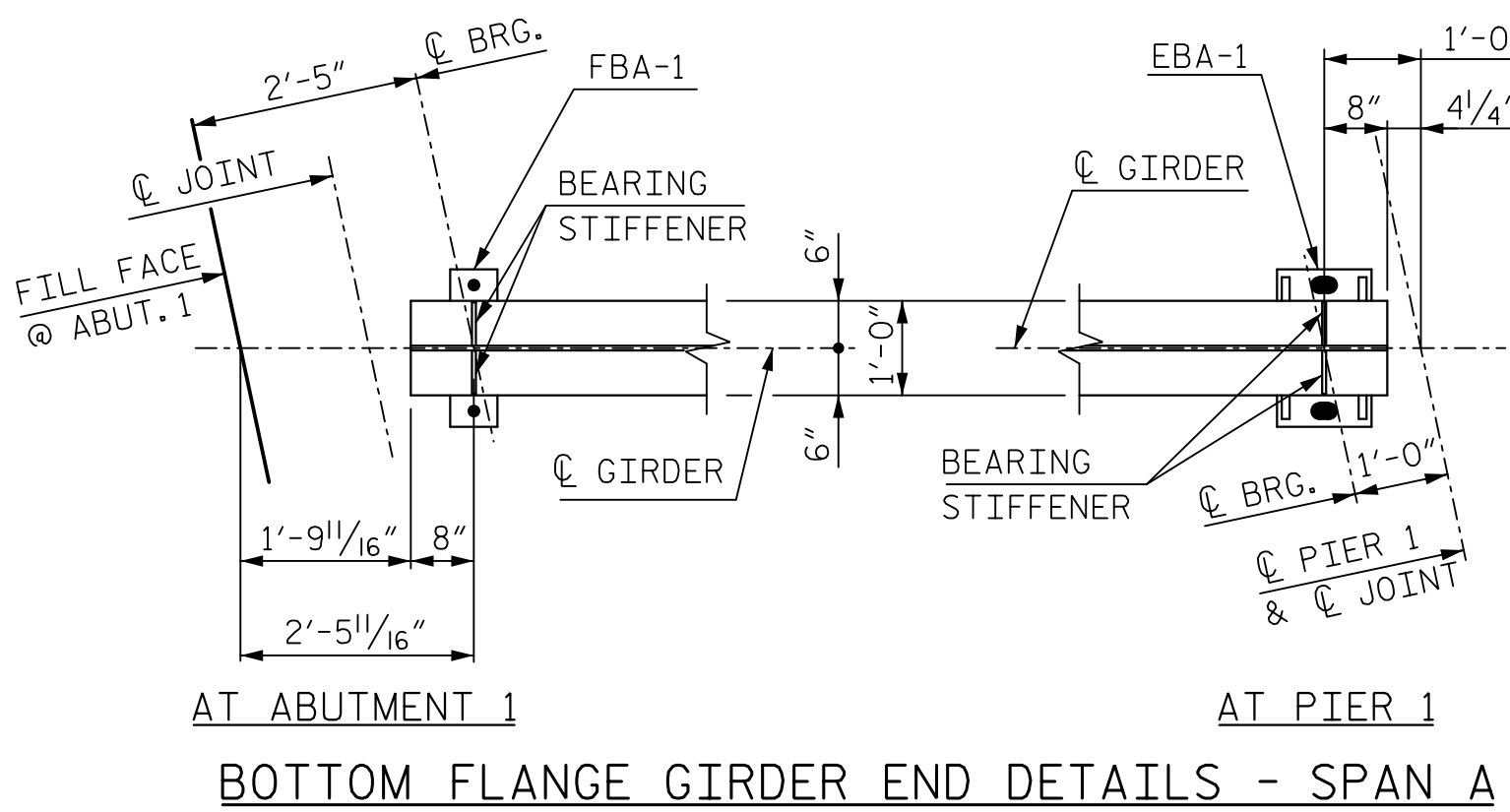
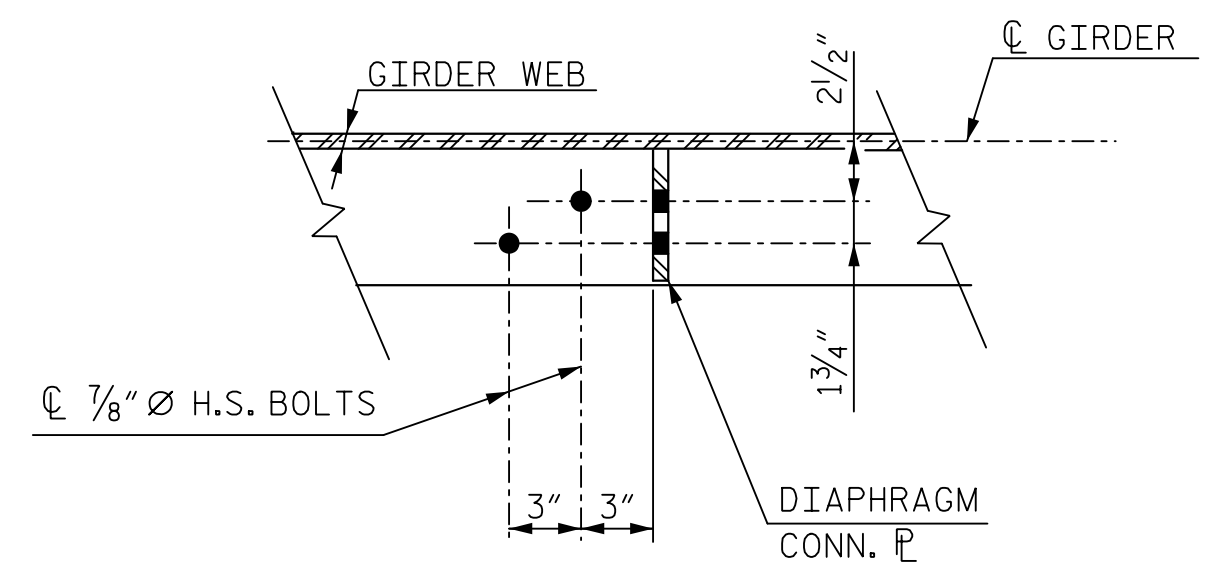
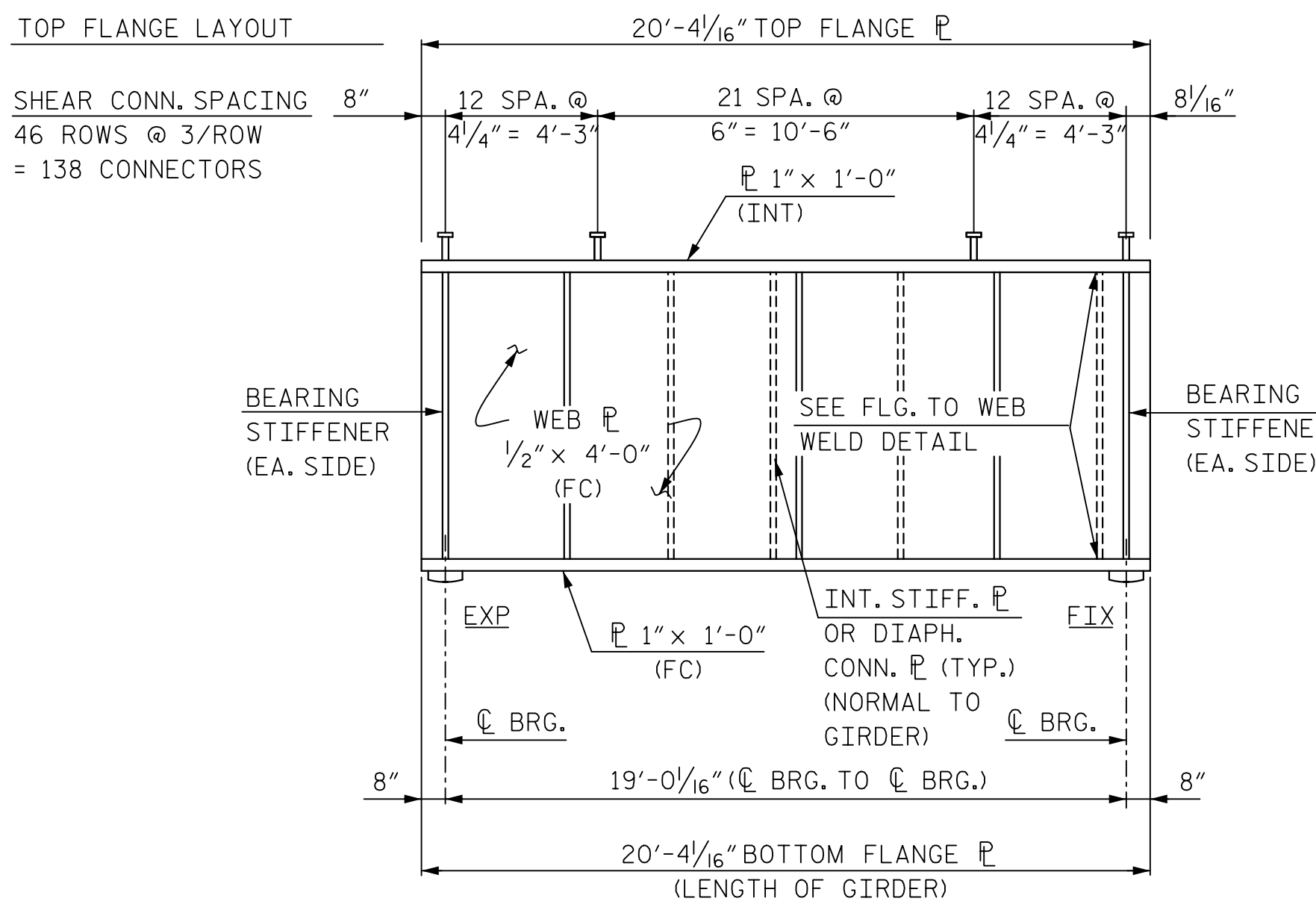
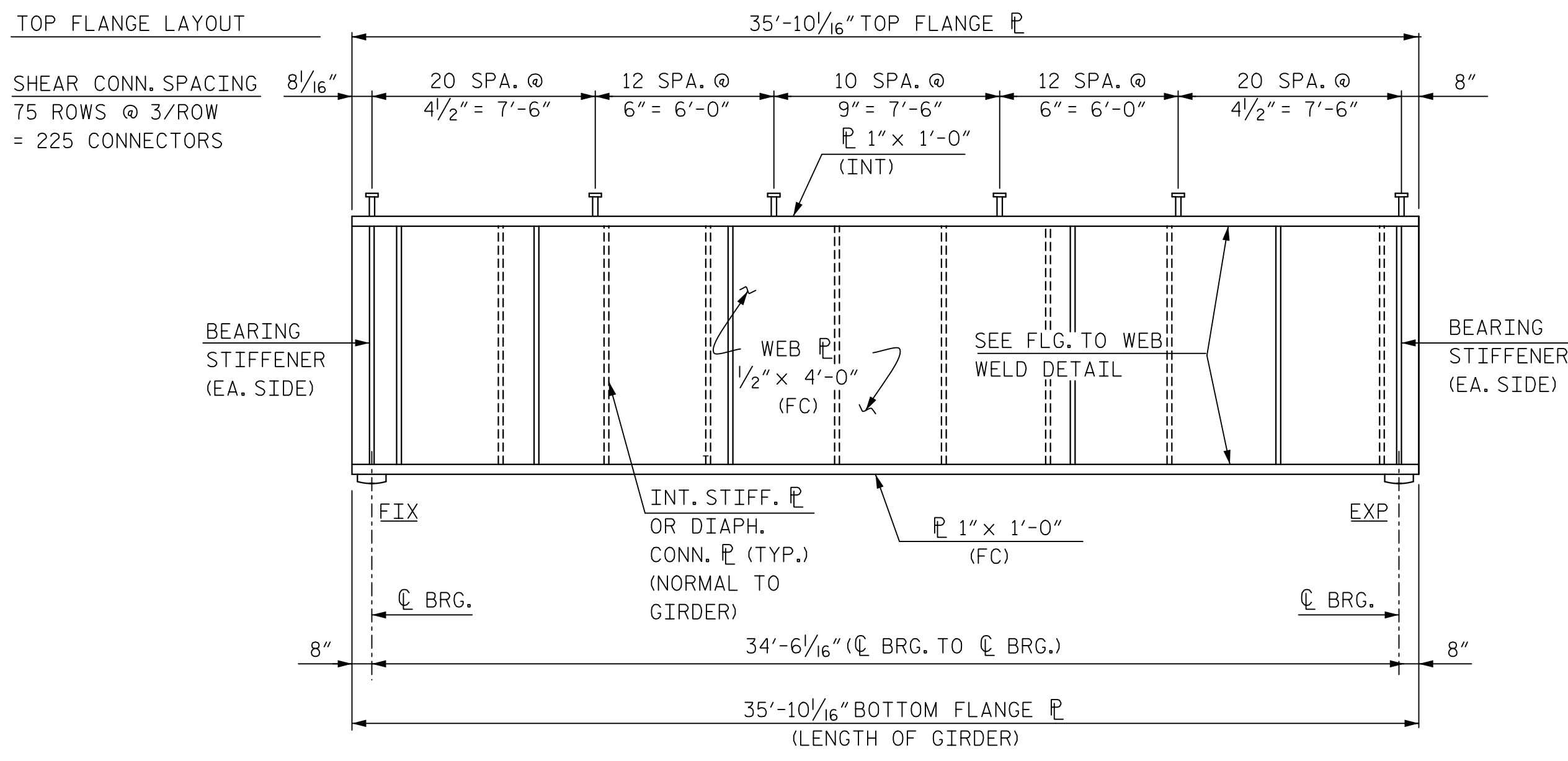
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

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

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS						SHEET NO. S8-10 TOTAL SHEETS 39
	NO.	BY	DATE	NO.	BY	DATE	
	1			3			
DRAWN BY: <u>J. BAYNE</u> DATE: <u>8/17</u> CHECKED BY: <u>V. KOLLIPARA</u> DATE: <u>9/17</u>	DWG. NO. 10		2		4		



NOTES:
ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
ABUTMENT FILL FACE, C PIER AND C BEARINGS ARE PARALLEL.
NO SHOP CAMBER REQUIRED.
REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
• STRUCTURAL STEEL NOTES
• DIAPHRAGM DETAILS
• STIFFENER AND CONNECTOR P DETAILS
• SHEAR CONNECTOR DETAILS
• FLANGE TO WEB WELD DETAIL
FOR BEARINGS, SEE "BEARING DETAILS" SHEET.
FOR DRAIN PIPE SUPPORT DETAILS, SEE "TYPICAL SECTION" SHEET.
FLANGE AND WEB SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.
FLANGE AND WEB SHOP SPLICE SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0"; SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAIL.
FC = FRACTURE CRITICAL
INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.



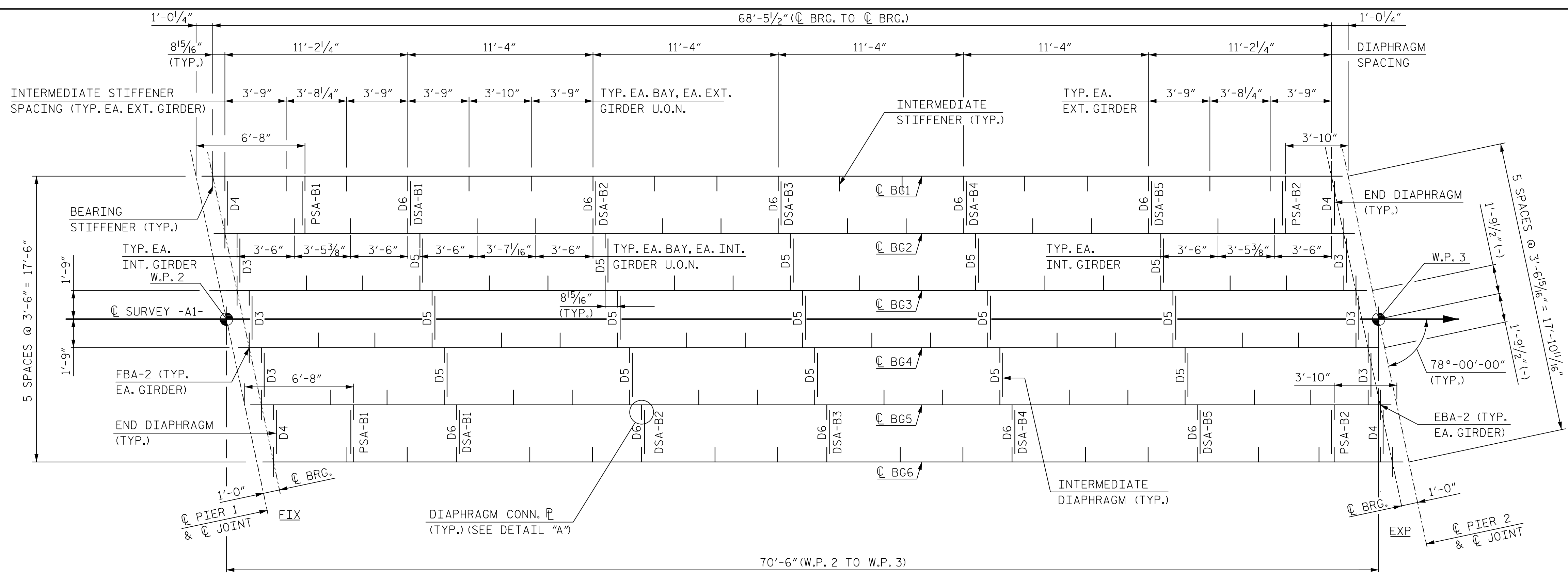
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

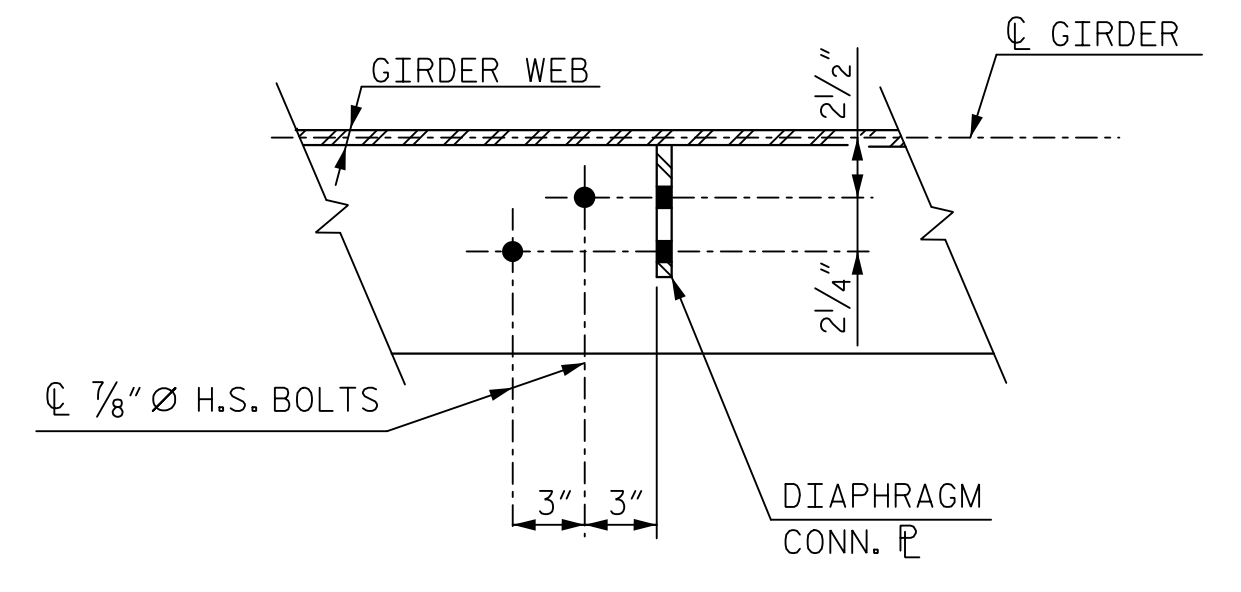
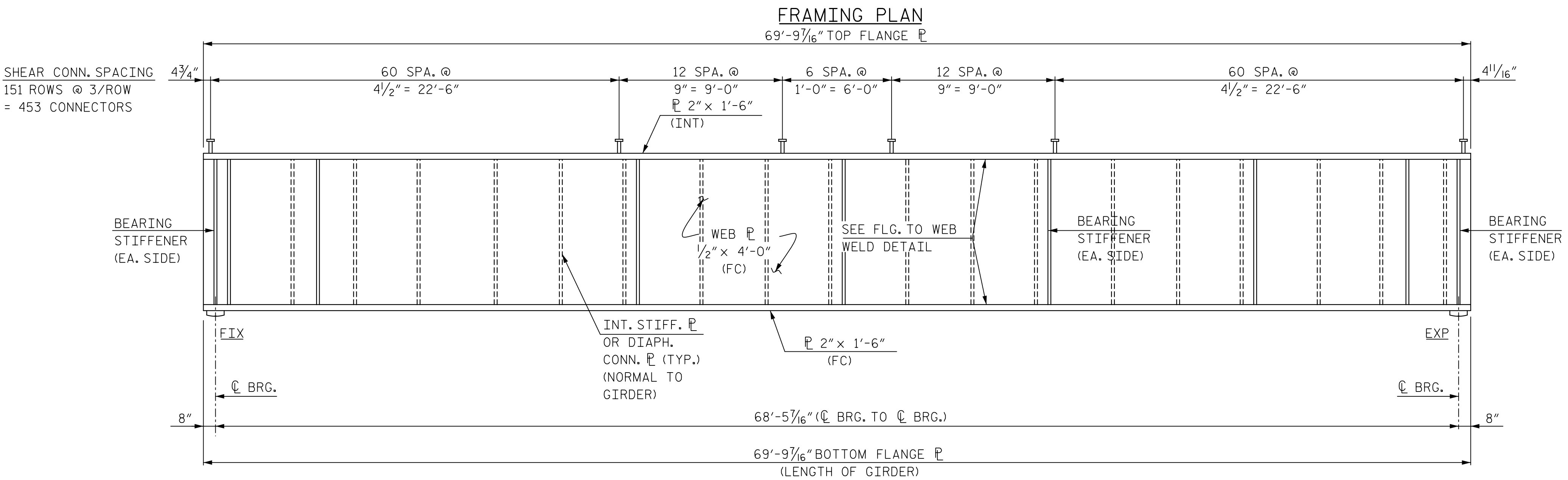
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN
AND GIRDER DETAILS
SPAN A AND SPAN C

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-11 TOTAL SHEETS 39		
	NO.	BY	DATE	NO.		BY	DATE
	1	J. BAYNE	8/17	3			
2	V. KOLLIPARA	9/17	4				

DWG. NO. 11

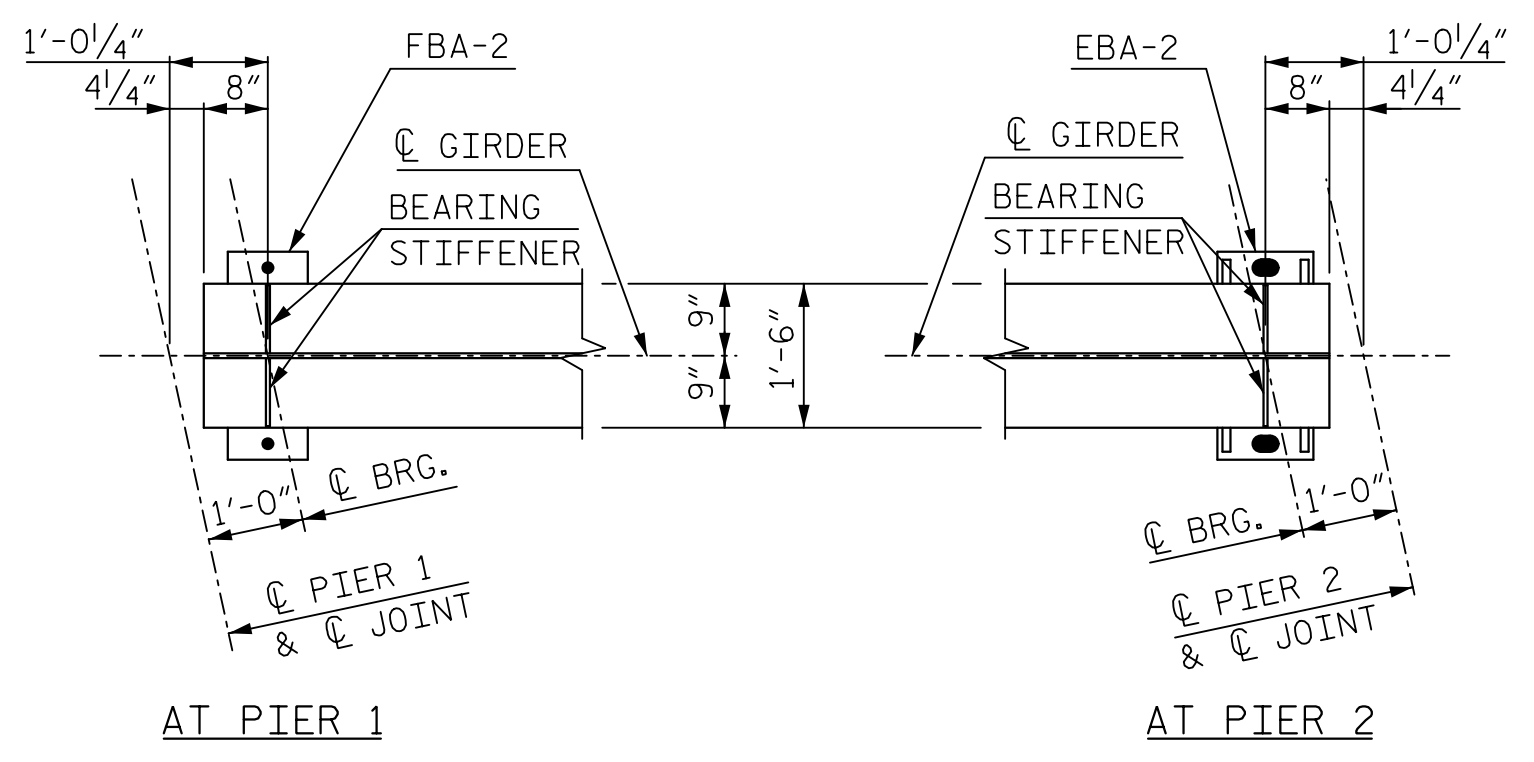


NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 ABUTMENT FILL FACE, C PIER AND C BEARINGS ARE PARALLEL.
 NO SHOP CAMBER REQUIRED.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR P DETAILS
 • SHEAR CONNECTOR DETAILS
 • FLANGE TO WEB WELD DETAIL
 FOR BEARINGS, SEE "BEARING DETAILS" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "TYPICAL SECTION" SHEET.
 FLANGE AND WEB SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.
 FLANGE AND WEB SHOP SPLICE SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAIL.
 FC = FRACTURE CRITICAL
 INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.
 U.O.N. = UNLESS OTHERWISE NOTED



DETAIL "A"
 (RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)

FRAMING PLAN
SPAN B
 69'-9 1/16" TOP FLANGE P
GIRDER ELEVATION
 (INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)



AT PIER 1
AT PIER 2
BOTTOM FLANGE GIRDER END DETAILS - SPAN B

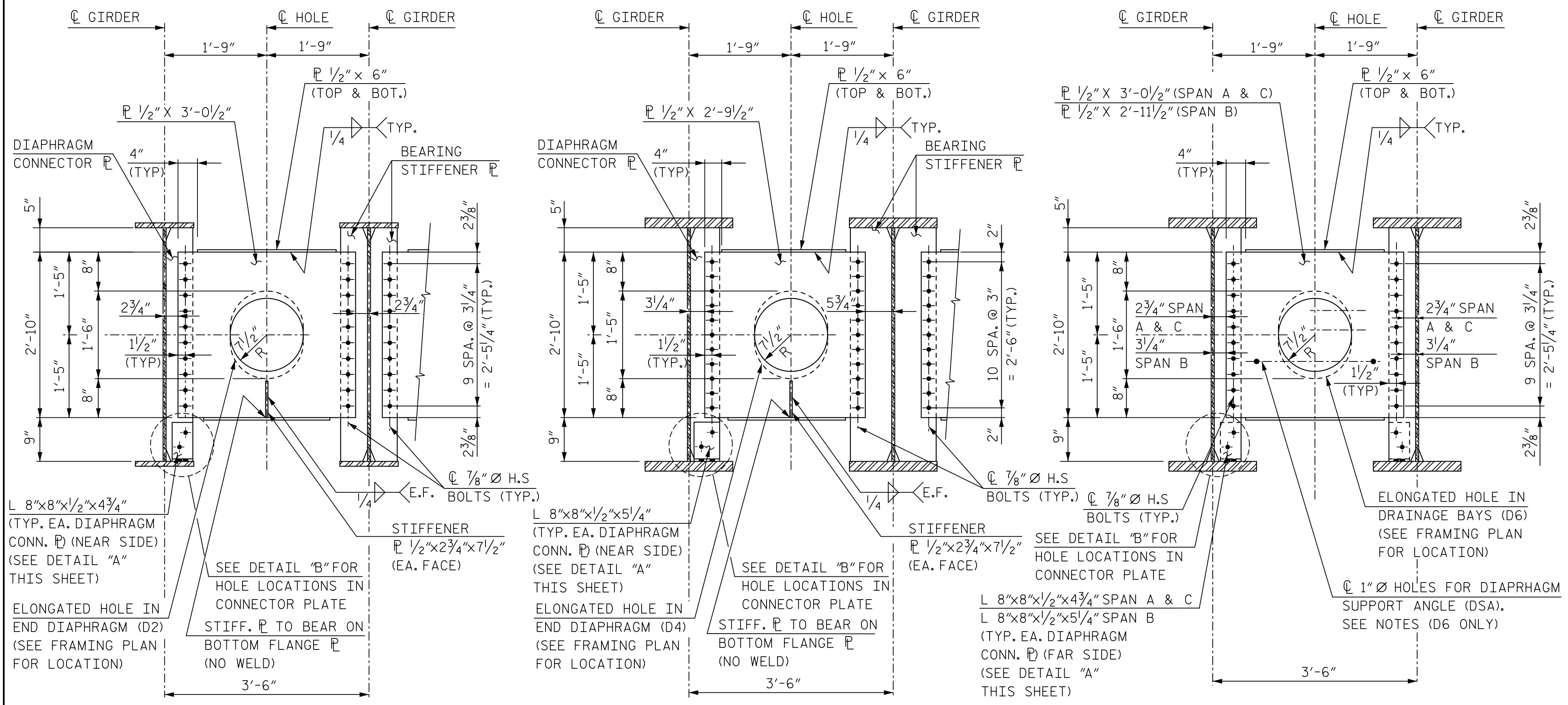
DocuSigned by:
David Hawkins
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS
 2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE FRAMING PLAN AND GIRDER DETAILS
SPAN B

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-12 TOTAL SHEETS 39		
	NO.	BY	DATE	NO.		BY	DATE
	1	J. BAYNE	8/17	3			
2	V. KOLLIPARA	9/17	4				



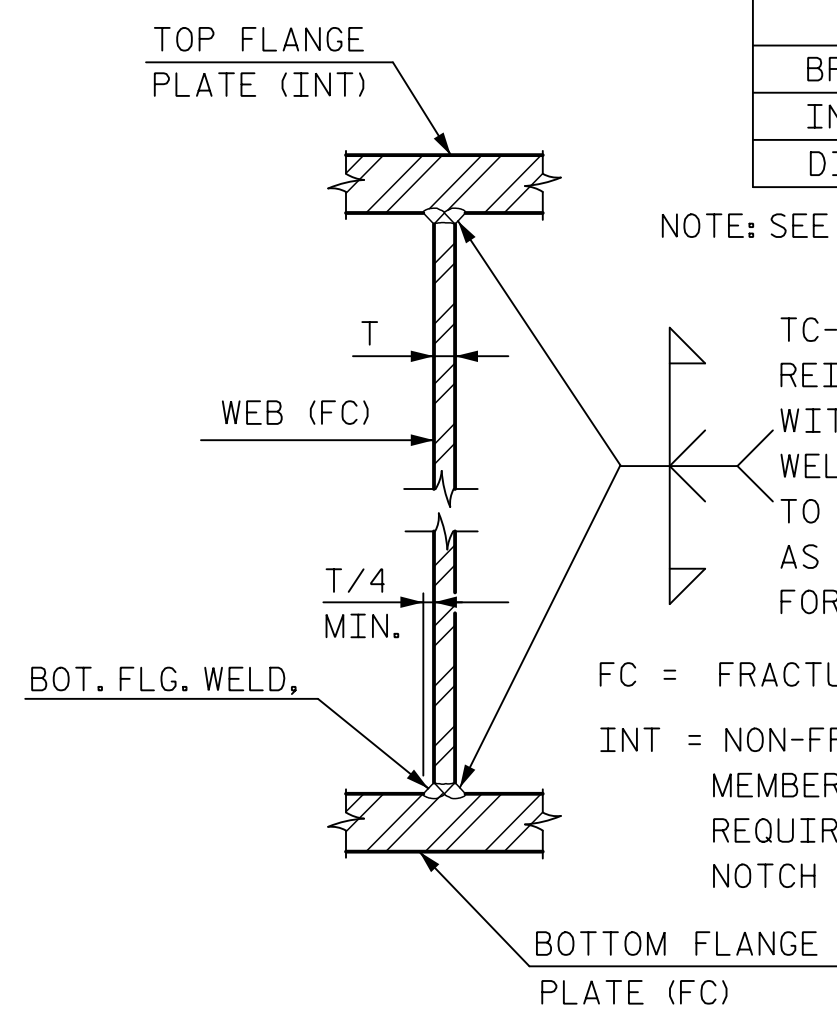
SECTION @ END DIAPHRAGM (D1) & (D2)

SECTION @ END DIAPHRAGM (D3) & (D4)

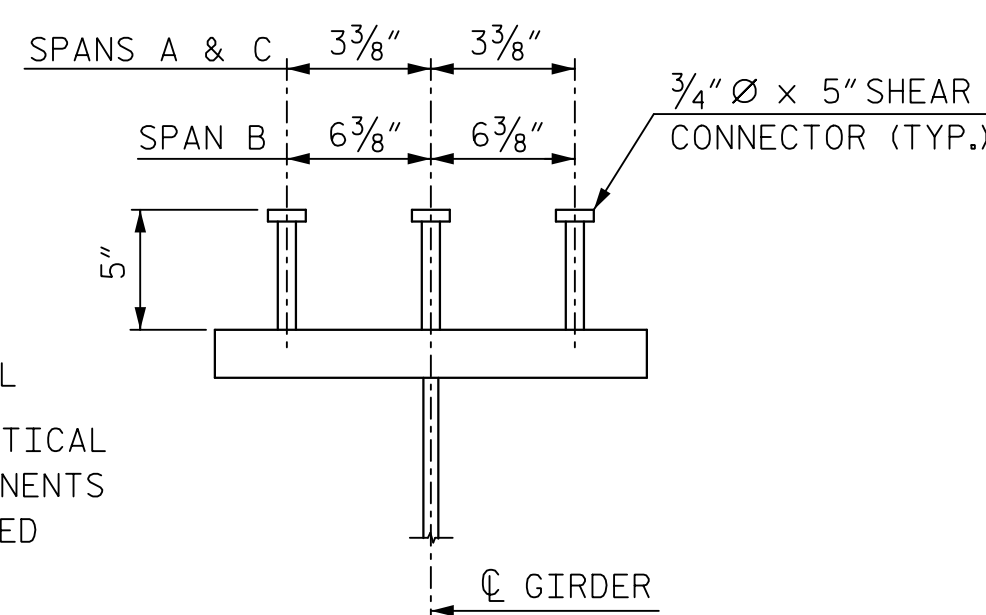
SECTION @ INTERMEDIATE DIAPHRAGM (D5) & (D6)

STIFFENER/CONN. PLATE SCHEDULE		
TYPE	SPANS A & C	SPAN B
BRG. STIFF.	5/8" x 5 1/2"	7/8" x 8 1/2"
INT. STIFF.	1/2" x 5 1/2"	1/2" x 6"
DIAPH. CONN. PL.	1/2" x 5 1/2"	1/2" x 6"

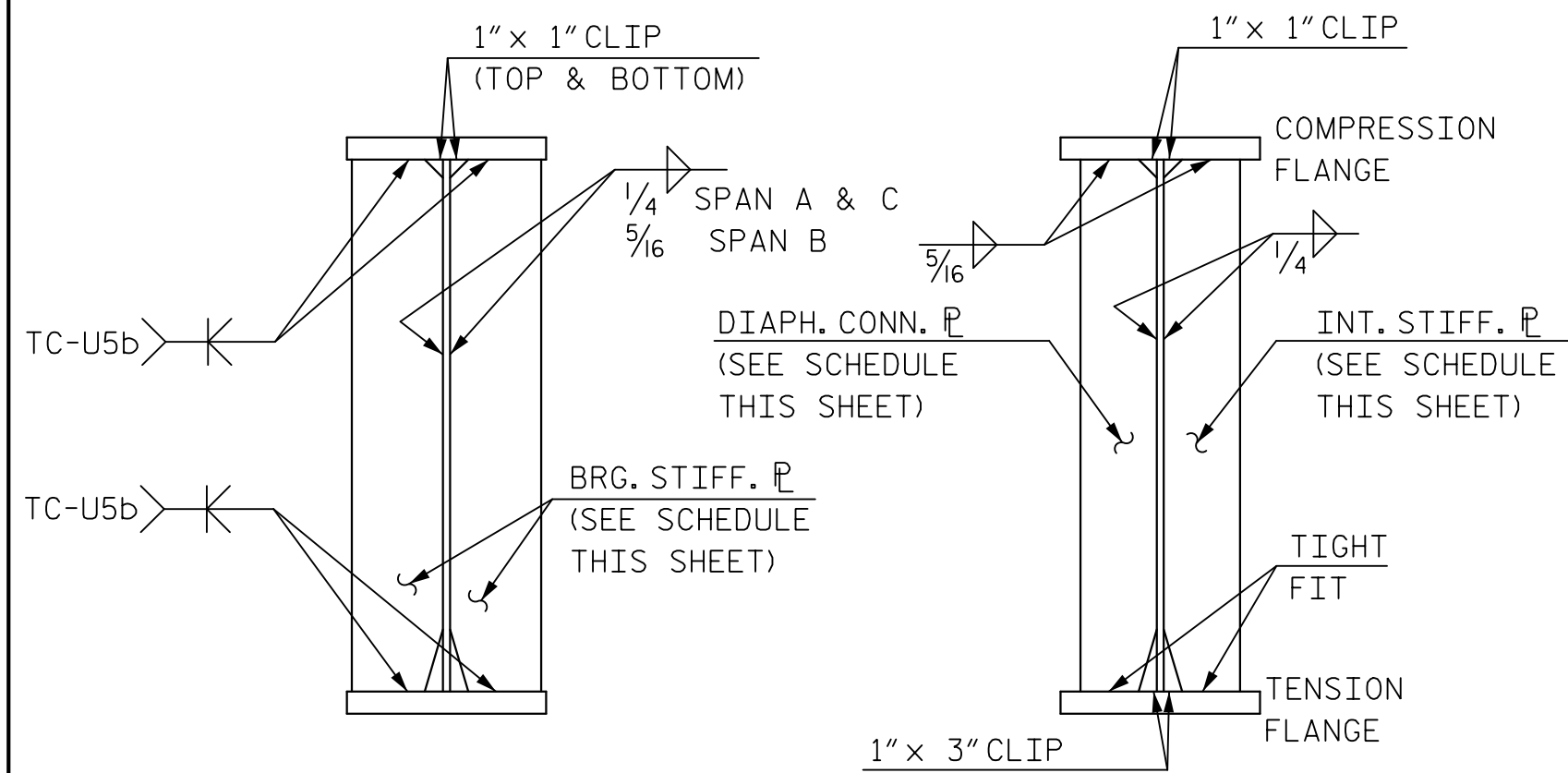
NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. PLATE LOCATIONS



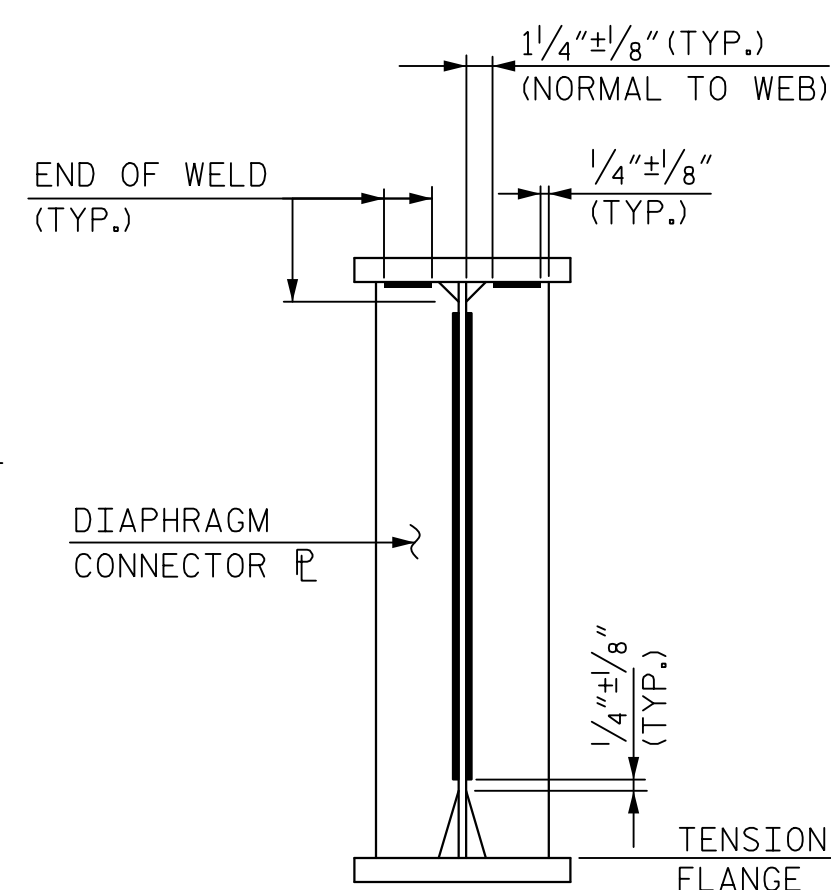
FLANGE TO WEB WELD DETAIL
NO SCALE



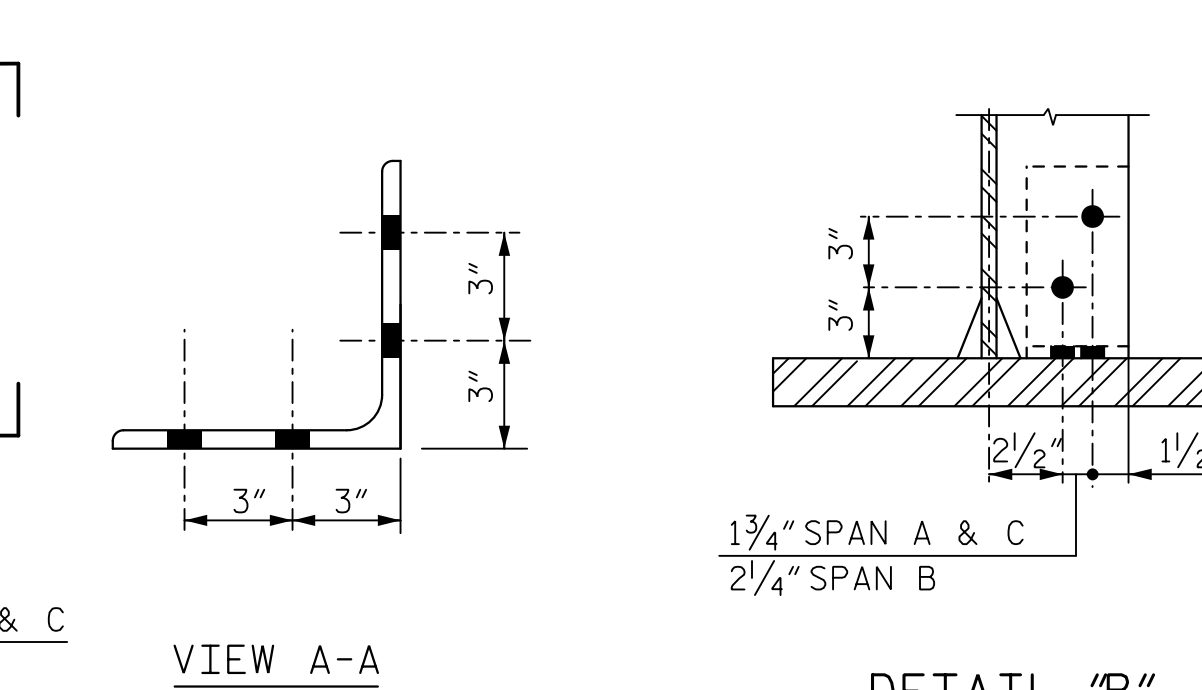
SHEAR CONNECTOR
DETAIL



STIFFENER/CONN. PLATE DETAILS

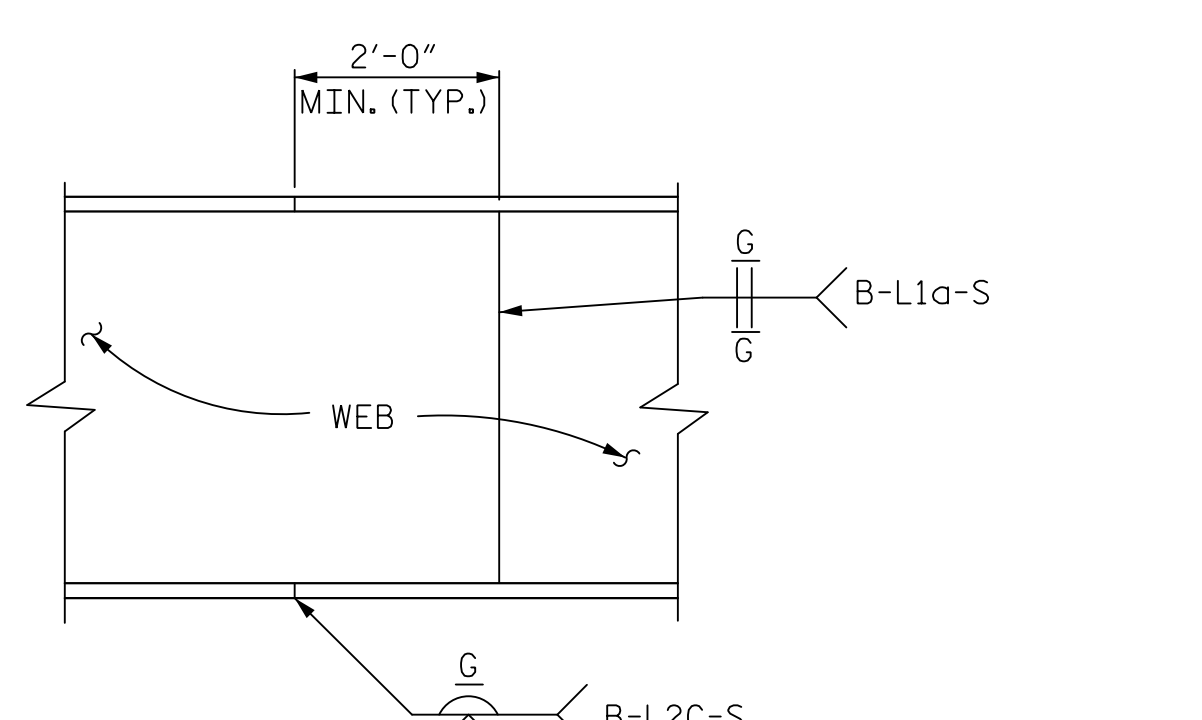


WELD TERMINATION DETAILS
(FILLET WELDS ONLY)



DETAIL "A"

DETAIL "B"



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 G GIRDER).

SHOP SPLICE DETAILS

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 F1554, GRADE 105. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM F2329.

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

GIRDER BOTTOM FLANGE PLATE INCLUDING WEB TO FLANGE WELD AND TENSION ZONE OF WEB PLATE ARE DESIGNED FRACTURE CRITICAL (FC) MEMBERS. THESE COMPONENTS SHALL MEET THE IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL FOR ZONE 2 REQUIREMENTS.

NORFOLK SOUTHERN CORPORATION 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 NORFOLK SOUTHERN CORPORATION OR ITS AUTHORIZED AGENT. SEE STRUCTURAL STEEL SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

FOR PAINTING STRUCTURAL STEEL, 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 AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, G.A. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN MP NS-378.00".

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.

SHEAR CONNECTORS ON GIRDERS MAY BE SHIFTED AS NECESSARY TO CLEAR FLANGE SPLICE WELDS.

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 PLATE OR INTERMEDIATE STIFFENER WELDS. 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.

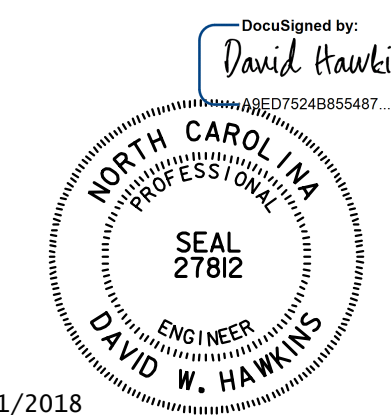
ALL WELDING CONNECTIONS SHALL BE MADE WITH SERIES E70 WELDING ELECTRODES.

FOR DETAILS OF DIAPHRAGM SUPPORT ANGLES (DSA), SEE "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 3.

FC = FRACTURE CRITICAL

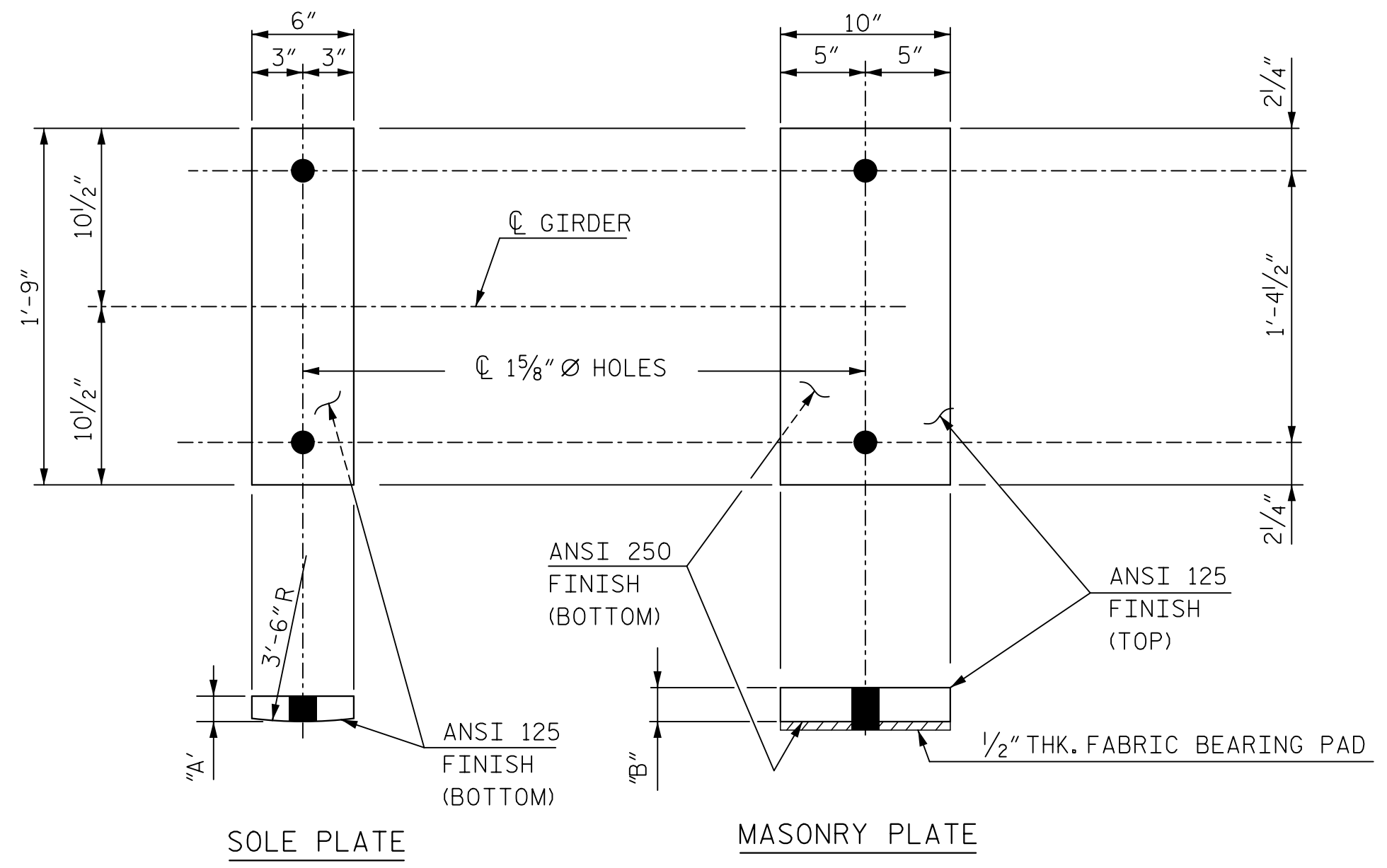
INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

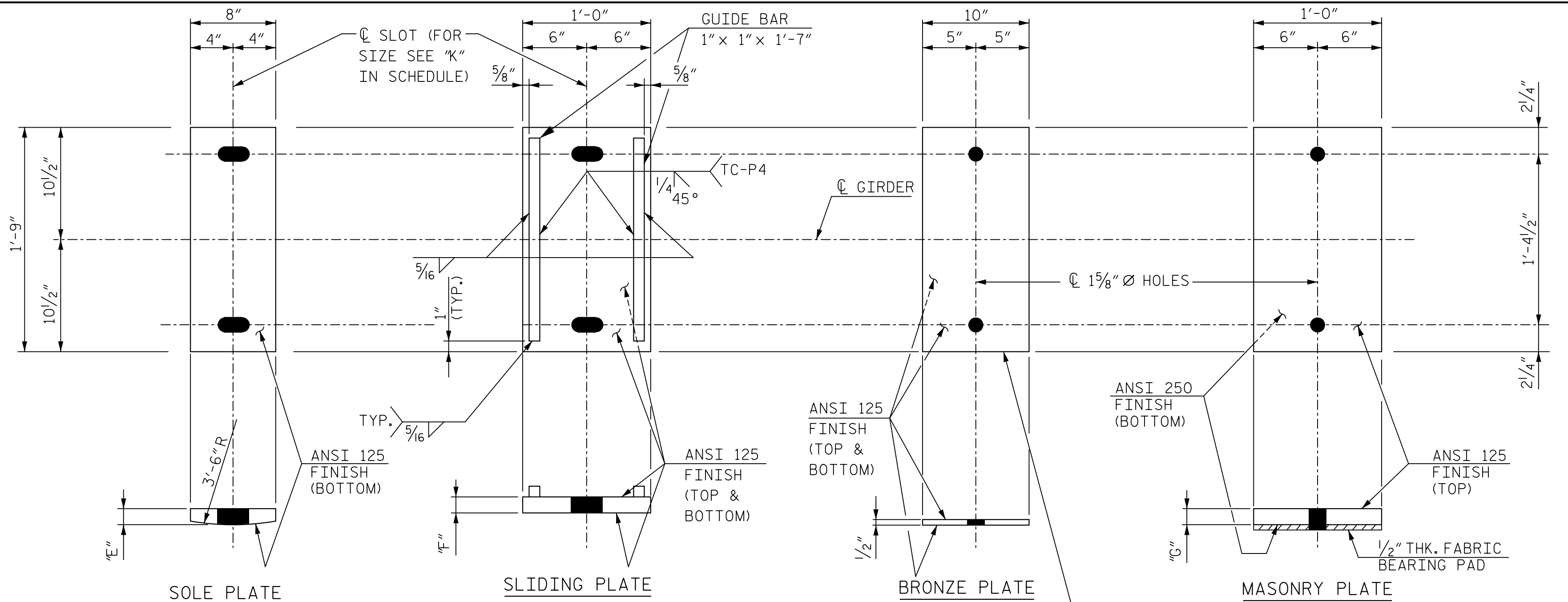


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

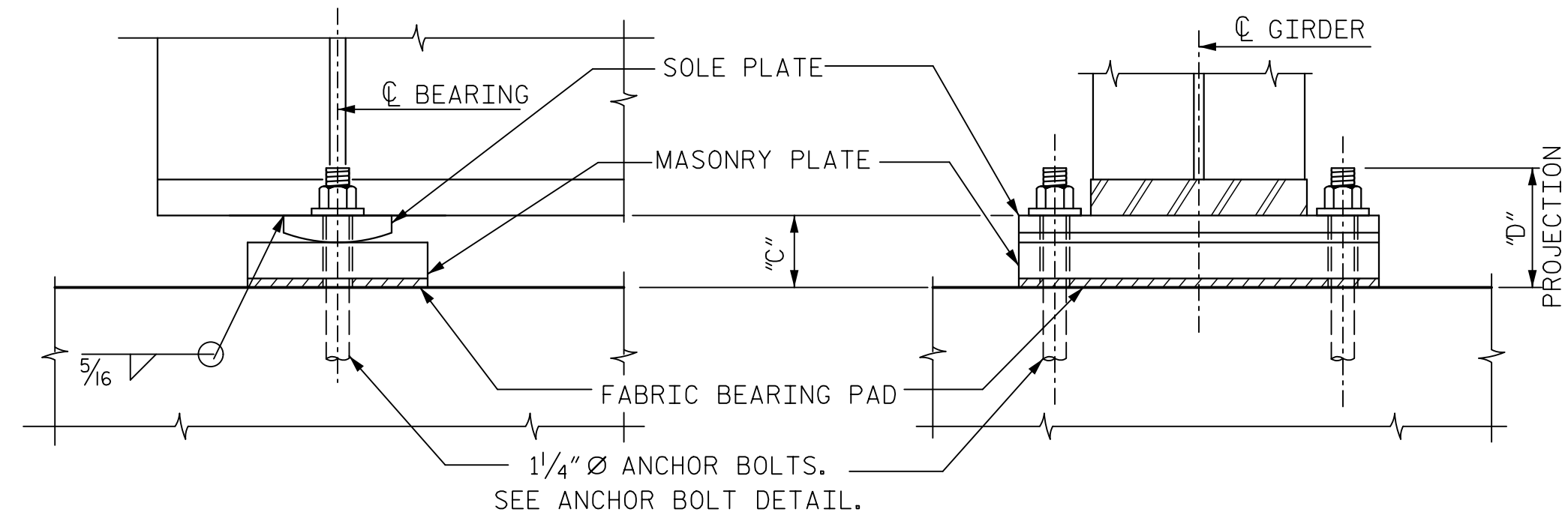
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-13		
	NO.	BY	DATE	NO.		BY	DATE
	1	J. BAYNE	8/17	3			
	V. KOLIPARA	9/17	4				
TOTAL SHEETS 39							



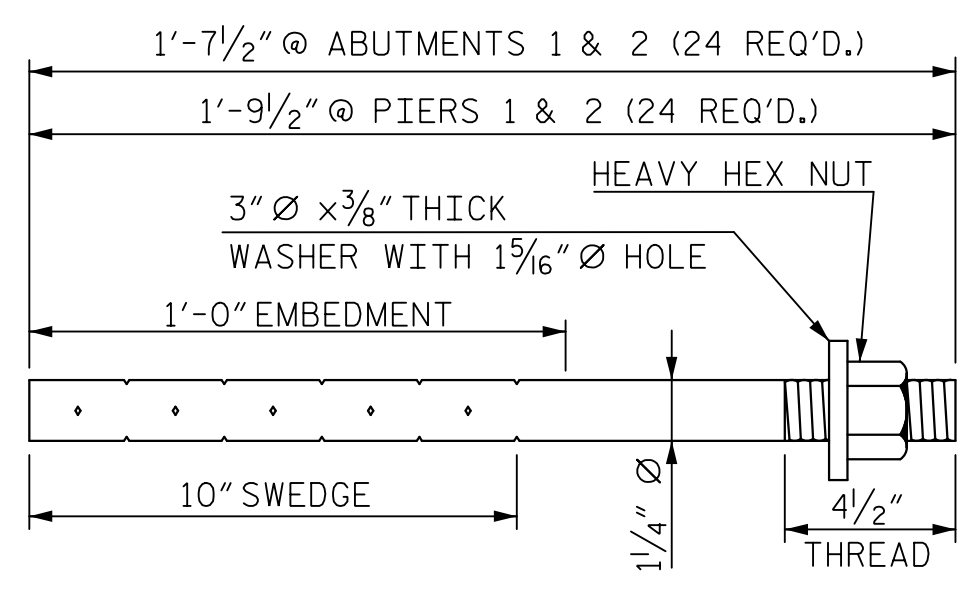
FIXED BEARINGS



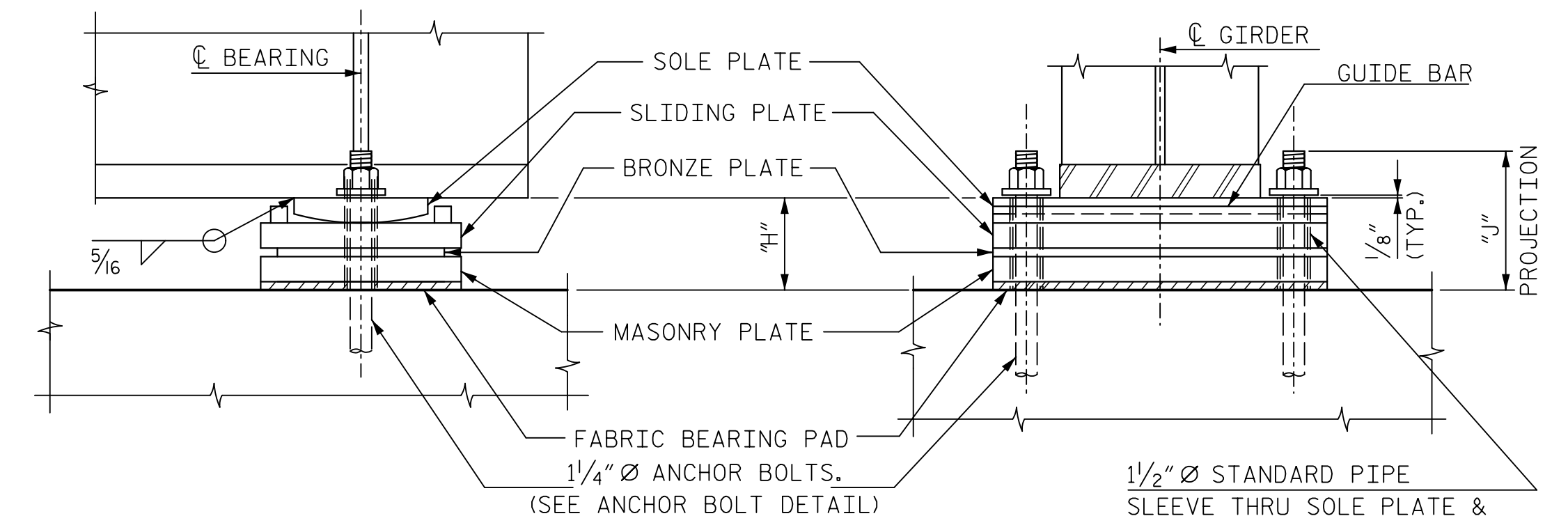
EXPANSION BEARINGS



FIXED BEARING ASSEMBLY (FBA-1)
(12 REQ'D)



ANCHOR BOLT DETAIL



EXPANSION BEARING ASSEMBLY (EBA-1)
(12 REQ'D)

BEARING PLATE SCHEDULE

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

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.

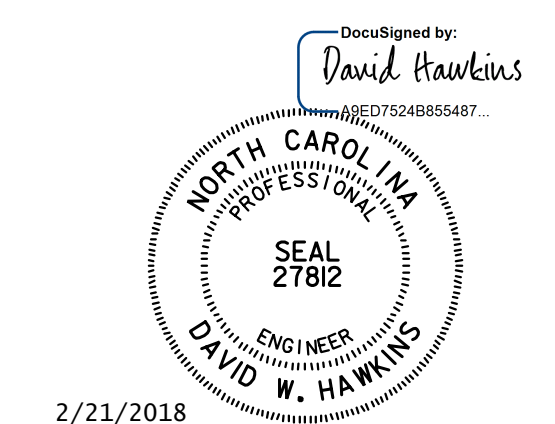
(B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.

(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.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

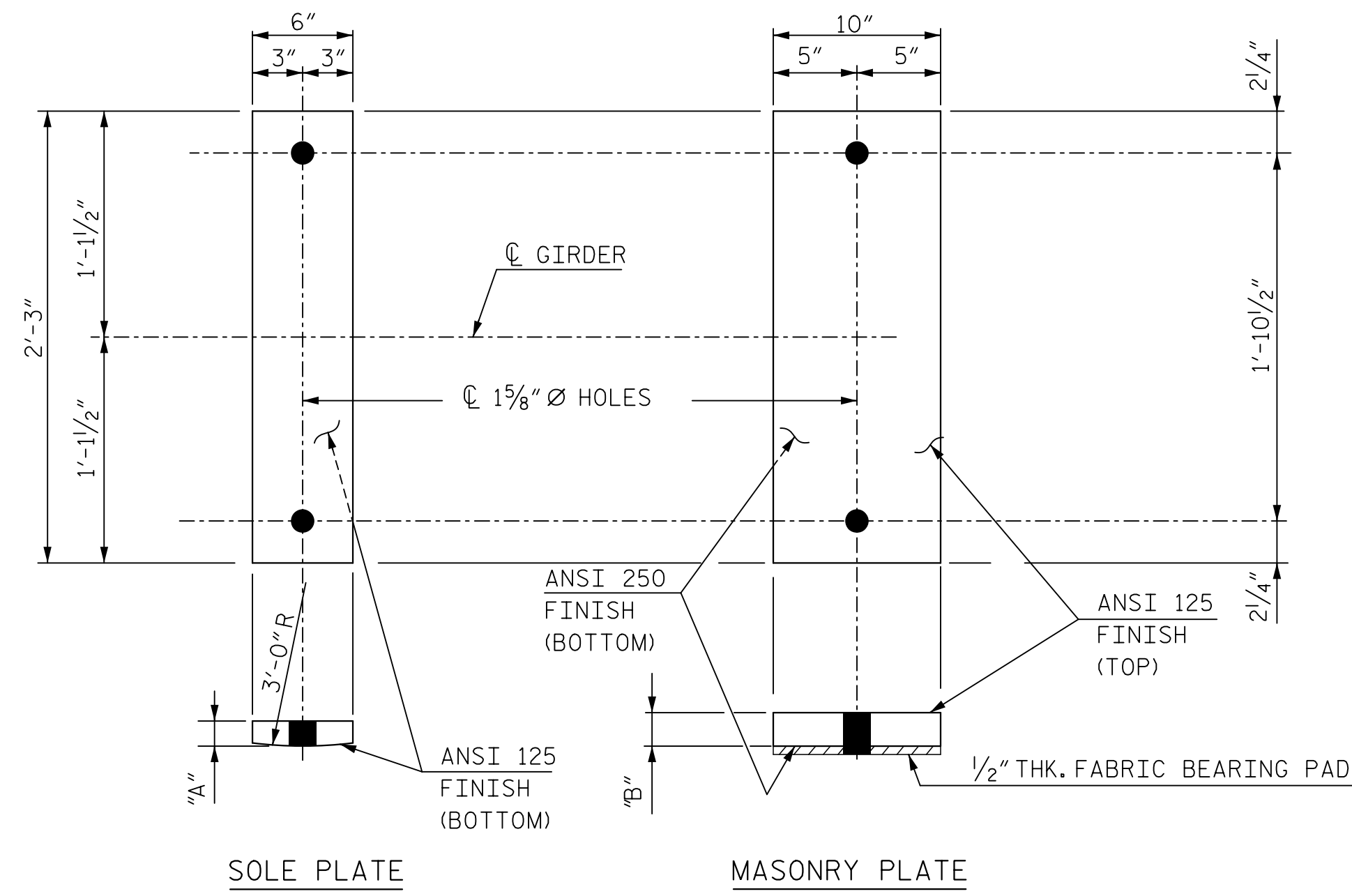
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 1 OF 2

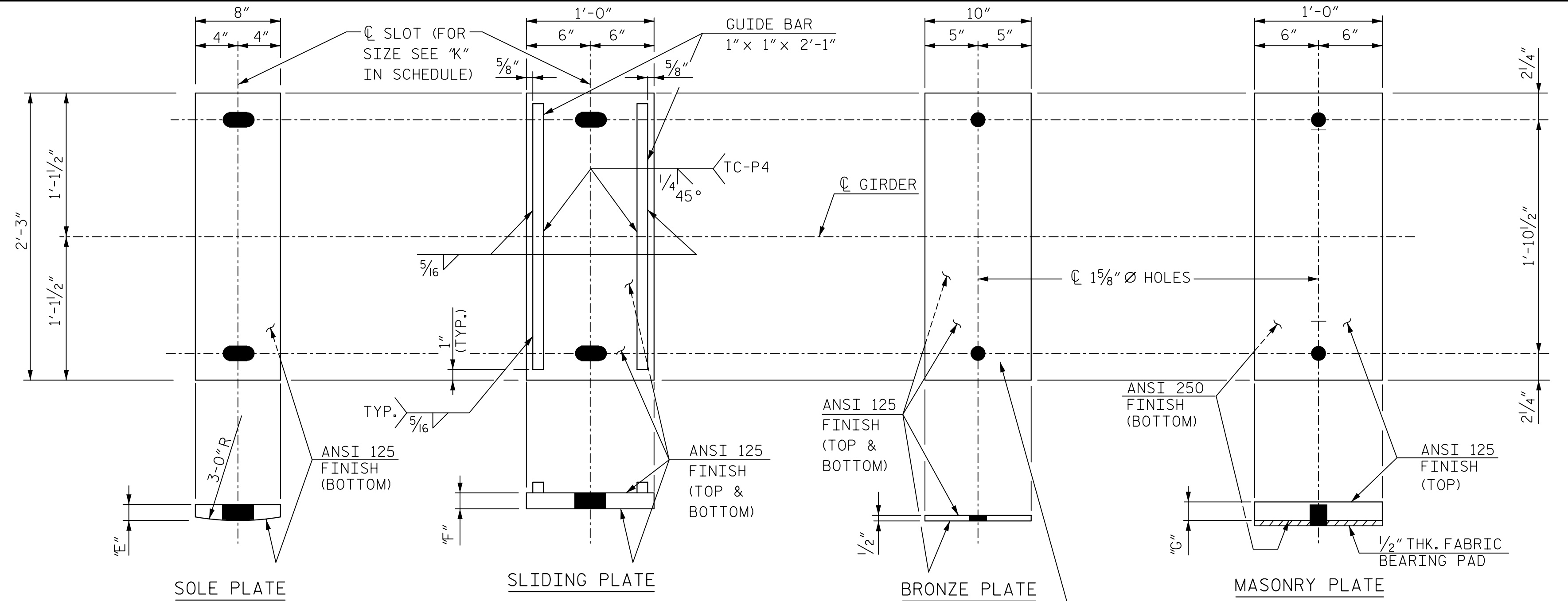
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 BEARING DETAILS
 SPANS A & C**

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-14		
	NO.	BY	DATE	NO.		BY	DATE
	1	J. BAYNE	8/17	3			
	V. KOLLIAPRA	9/17	4				
TOTAL SHEETS: 39							

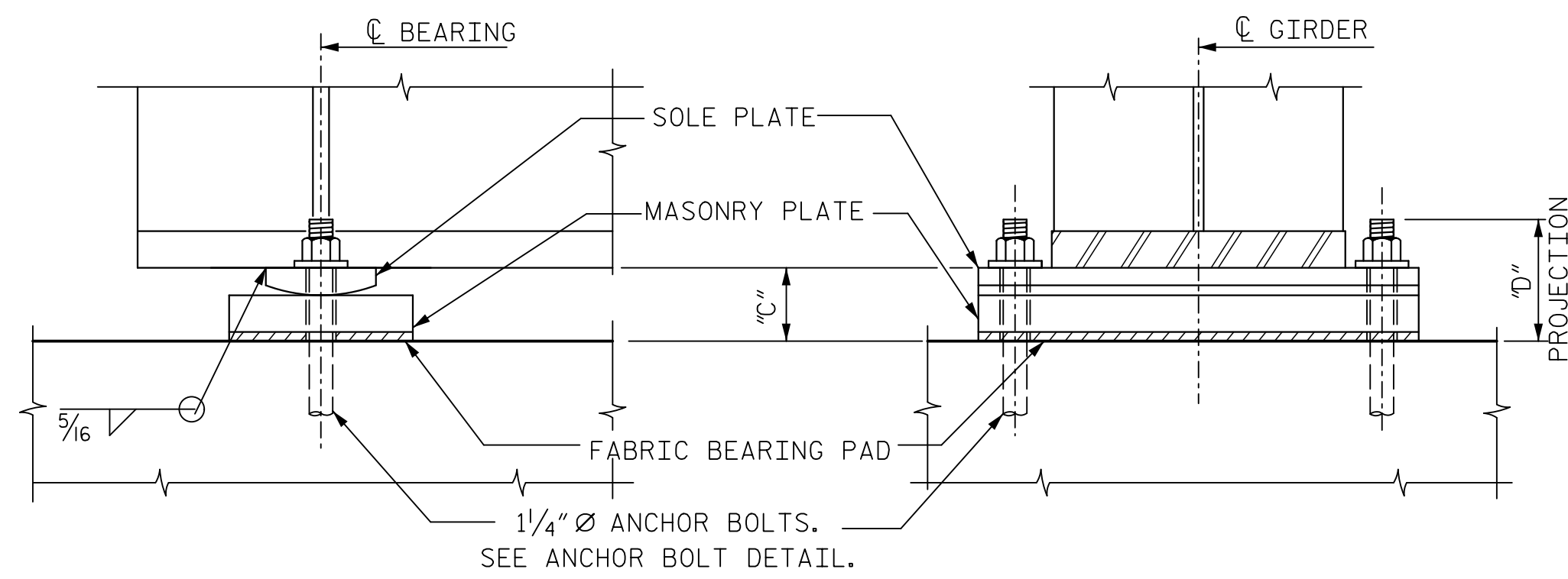


FIXED BEARINGS

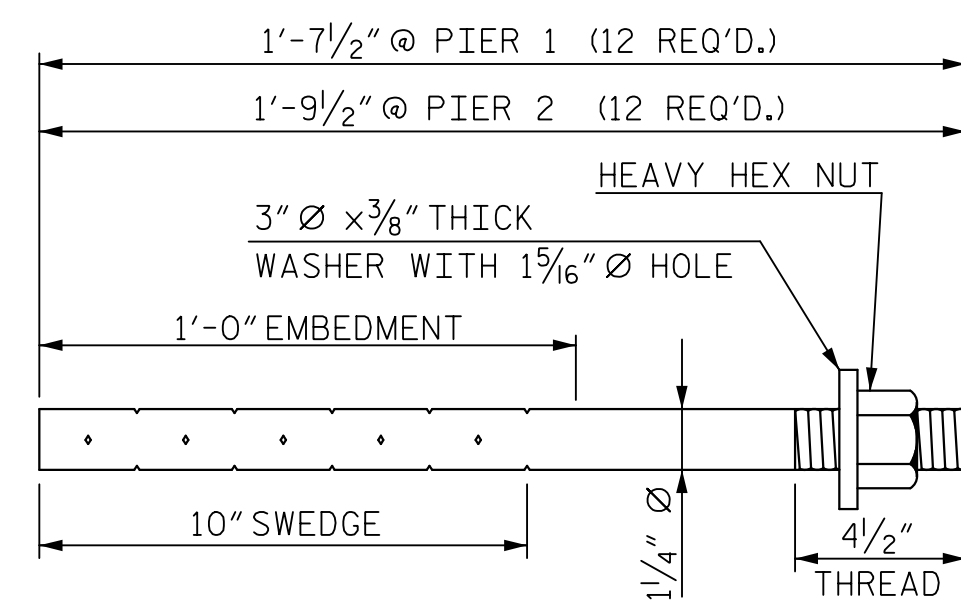


EXPANSION BEARINGS

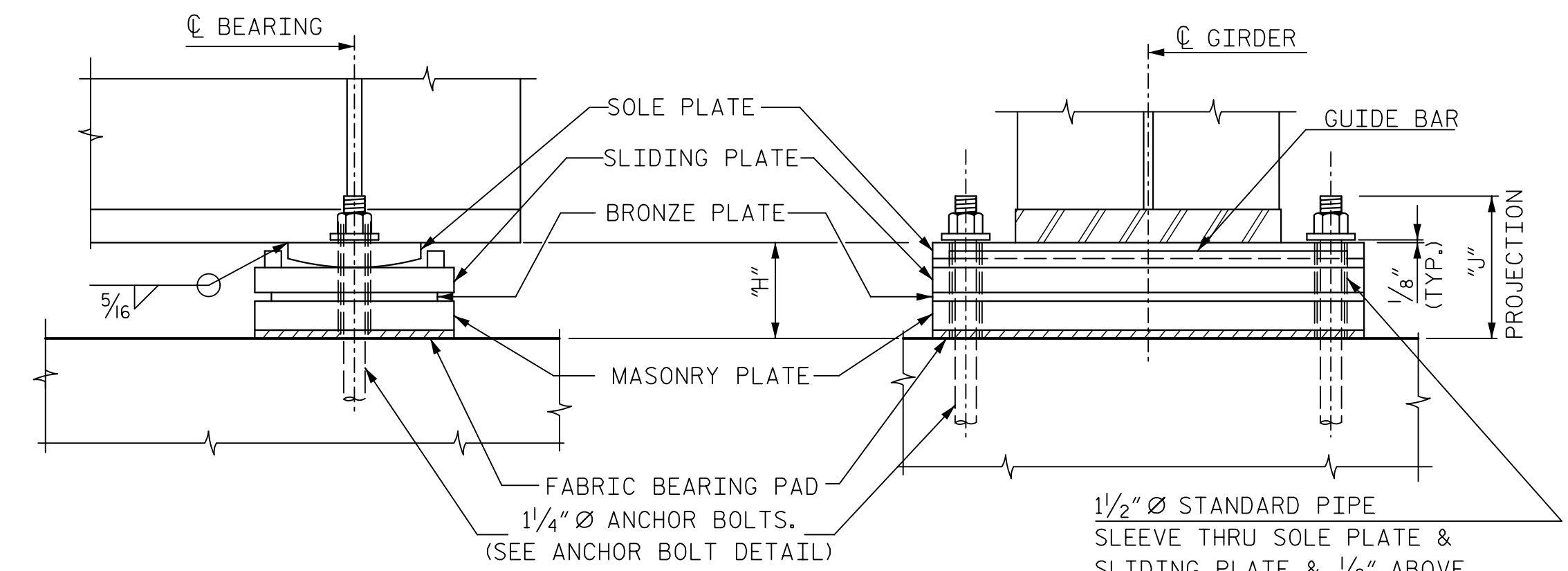
BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 911 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.



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



ANCHOR BOLT DETAIL



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

GIRDER	BEARING PLATE SCHEDULE									
	DIMENSIONS (in)									
	FIXED BEARING (FBA-2)				EXPANSION BEARING (EBA-2)					
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
BG1	1 1/2"	3 1/8"	5 1/8"	7 1/2"	1 1/2"	1 1/2"	2 5/8"	6 5/8"	9 1/2"	2" x 4"
BG2	1 1/2"	2 3/8"	4 1/8"	7 1/2"	1 1/2"	1 1/2"	2 3/8"	6 3/8"	9 1/2"	2" x 4"
BG3	1 1/2"	2 3/4"	4 3/4"	7 1/2"	1 1/2"	1 1/2"	2 1/4"	6 1/4"	9 1/2"	2" x 4"
BG4	1 1/2"	2 1/2"	4 1/2"	7 1/2"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9 1/2"	2" x 4"
BG5	1 1/2"	2 1/4"	4 1/4"	7 1/2"	1 1/2"	1 1/2"	1 7/8"	5 7/8"	9 1/2"	2" x 4"
BG6	1 1/2"	2"	4"	7 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	9 1/2"	2" x 4"

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.

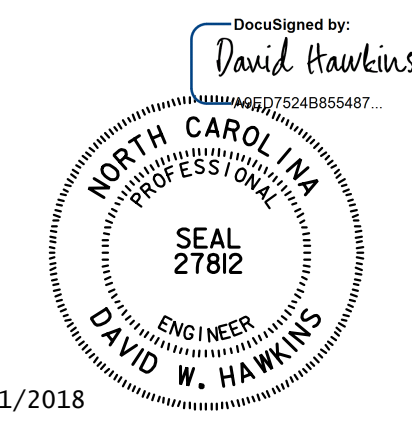
(B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.

(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.



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

SHEET 2 OF 2

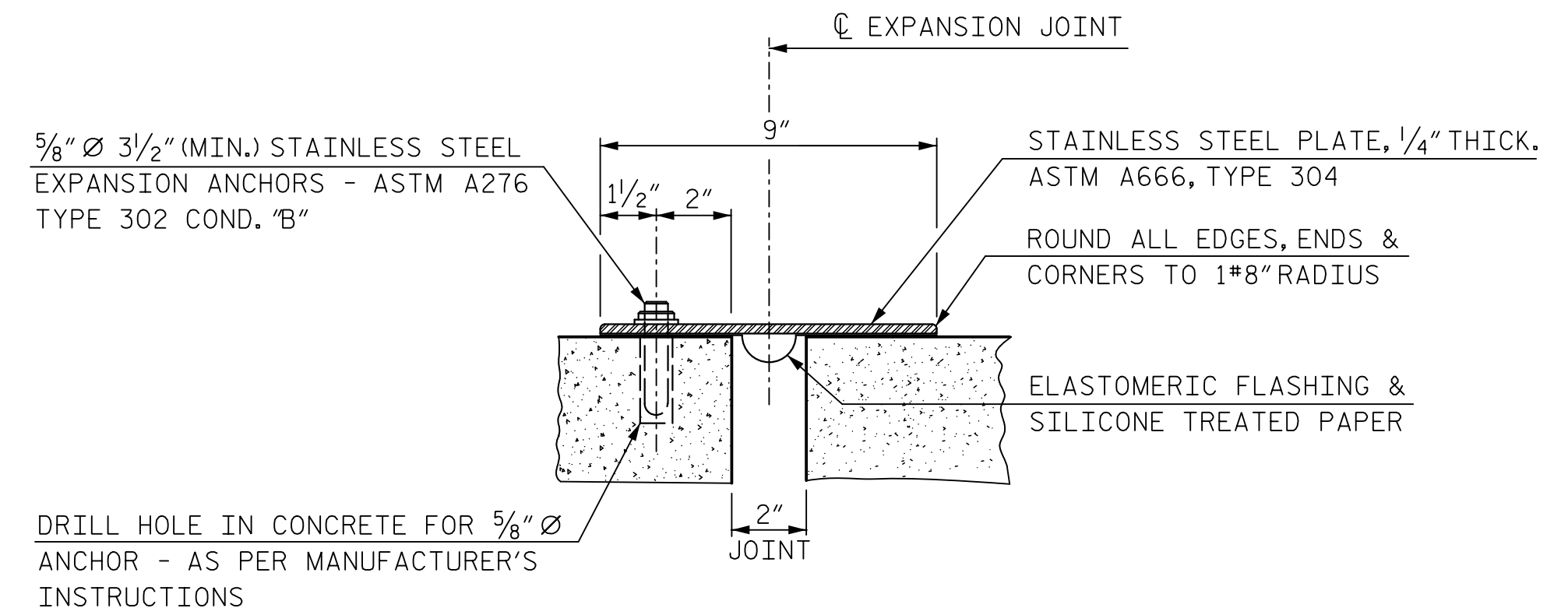
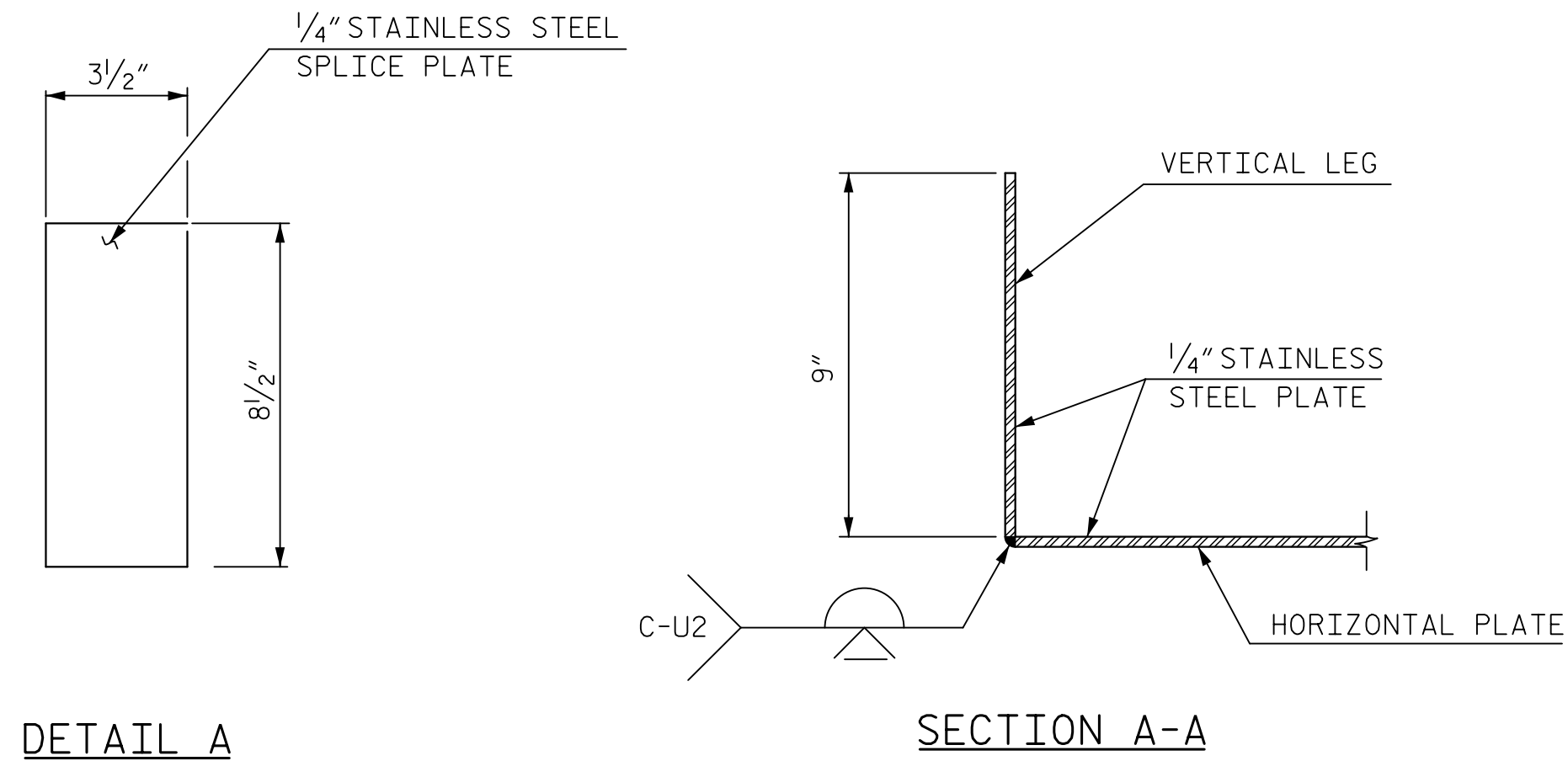
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BEARING DETAILS
SPAN B

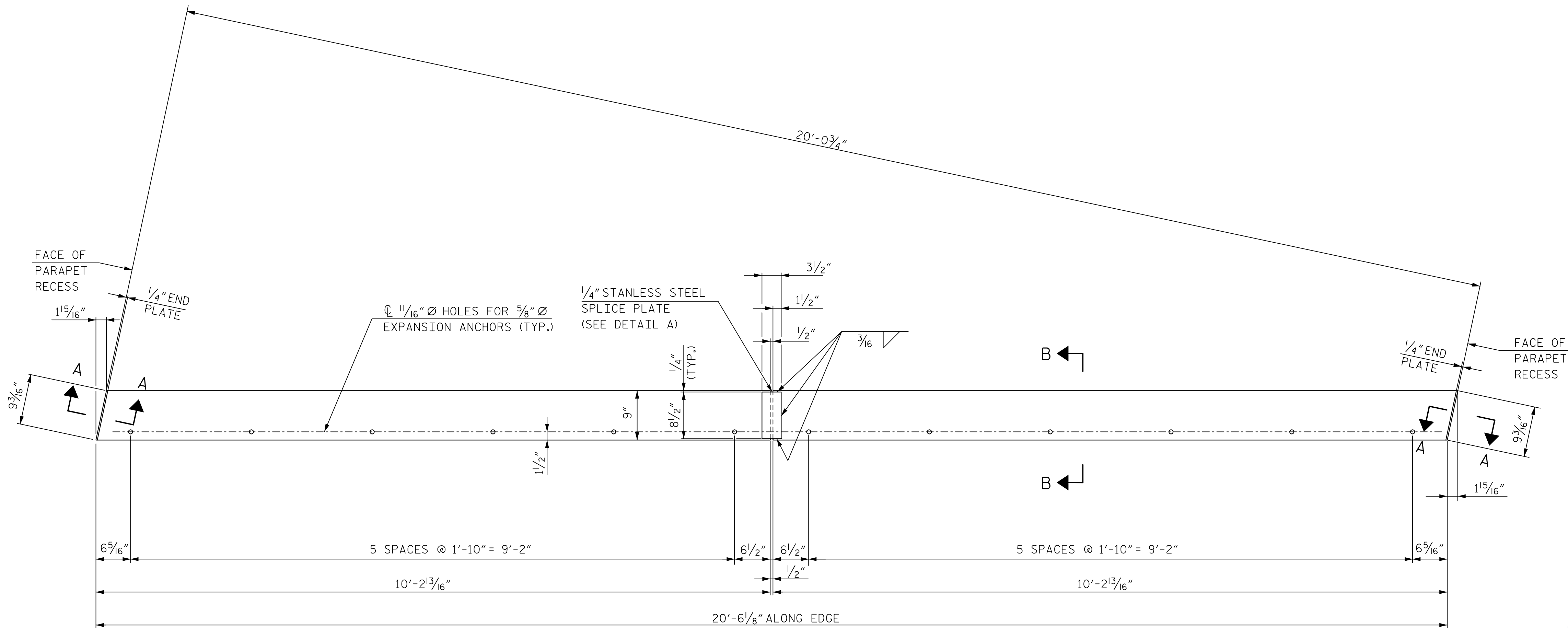
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	CHECKED BY: V. KOLLIPARA	DATE: 9/17
DWG. NO. 15			

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

TOTAL SHEETS: 39

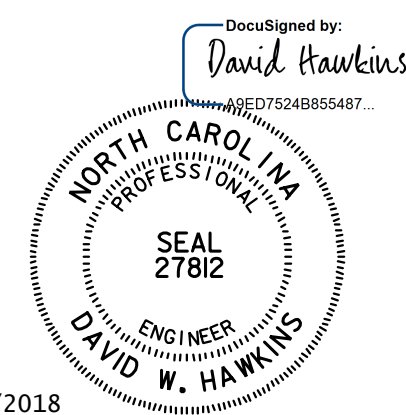


SECTION B-B
 DETAIL OF EXPANSION ANCHOR AND PLATE
 SEE DETAIL A ON "DECK DETAILS" SHEET FOR ADDITIONAL JOINT INFORMATION.



NOTE: PAYMENT FOR THE EXPANSION PLATE AND EXPANSION ANCHORS IS INCLUDED IN THE COST FOR STRUCTURE STEEL.

PLATE SHALL BE ANCHORED AT BACKWALL OF ABUTMENT 1 & 2, SPAN B SIDE OF PIER 1 AND SPAN B SIDE OF PIER 2.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

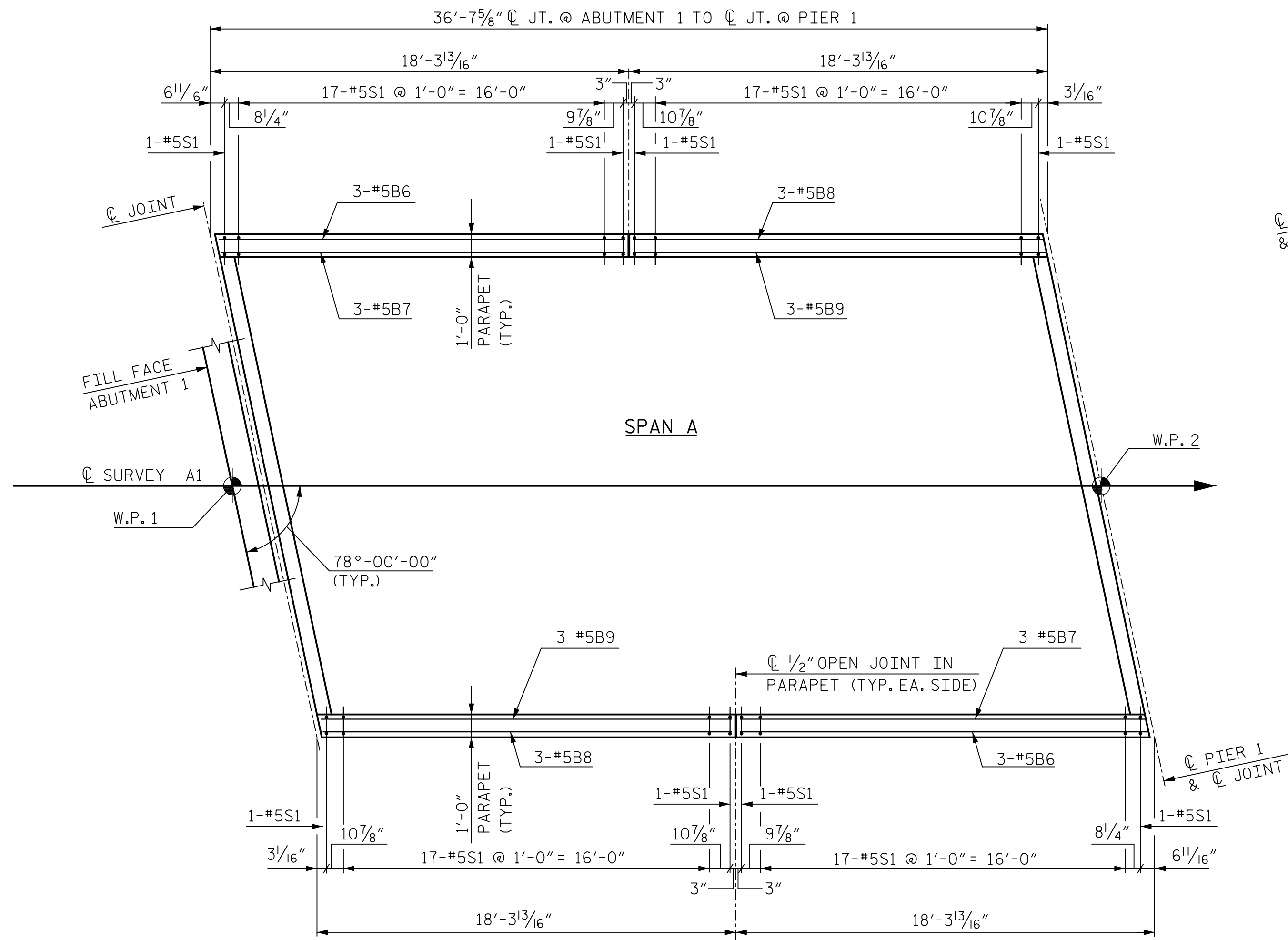
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 EXPANSION PLATE DETAILS

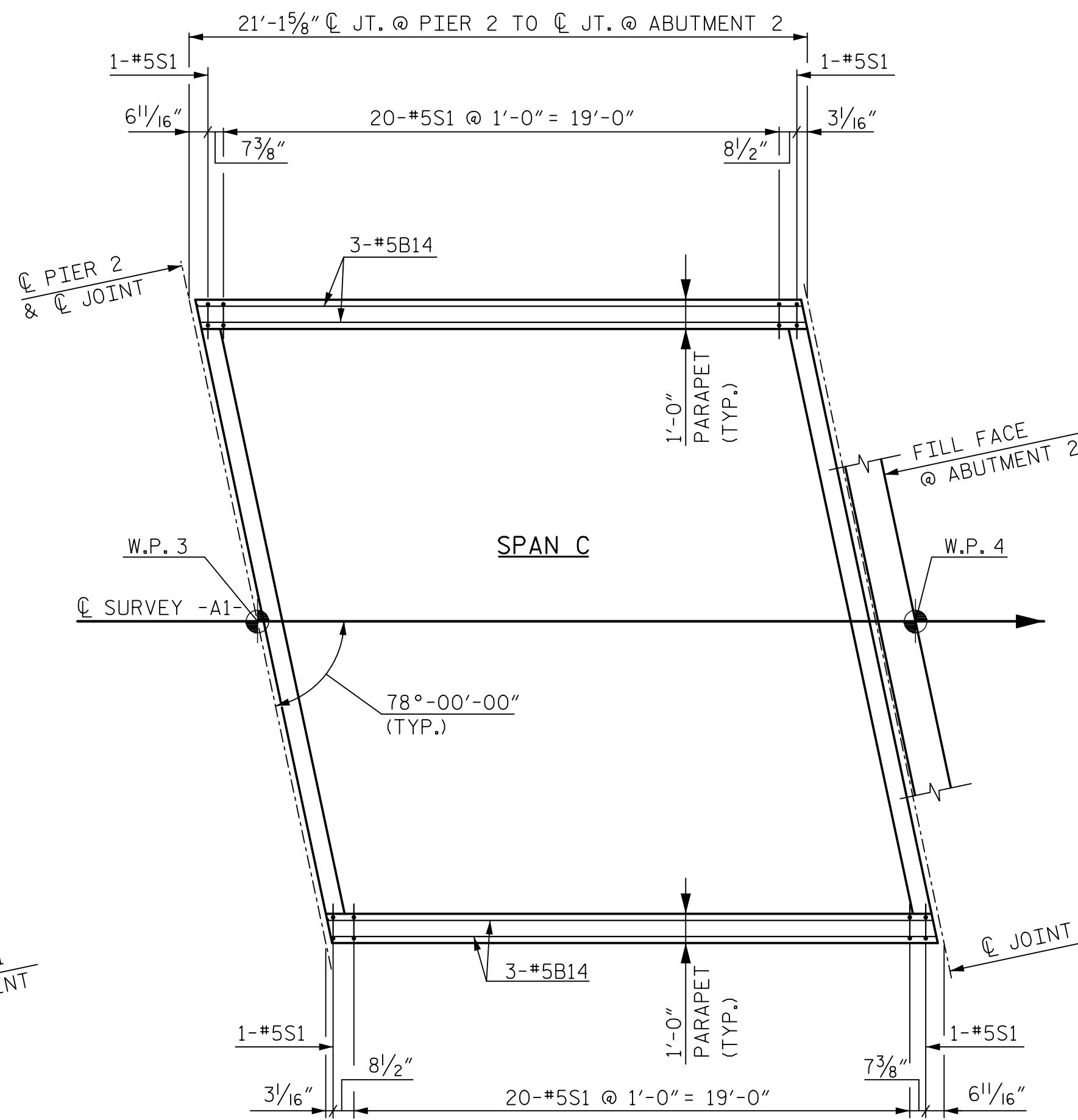
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	DWG. NO. i6	
CHECKED BY: V. KOLLIPARA	DATE: 9/17		

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

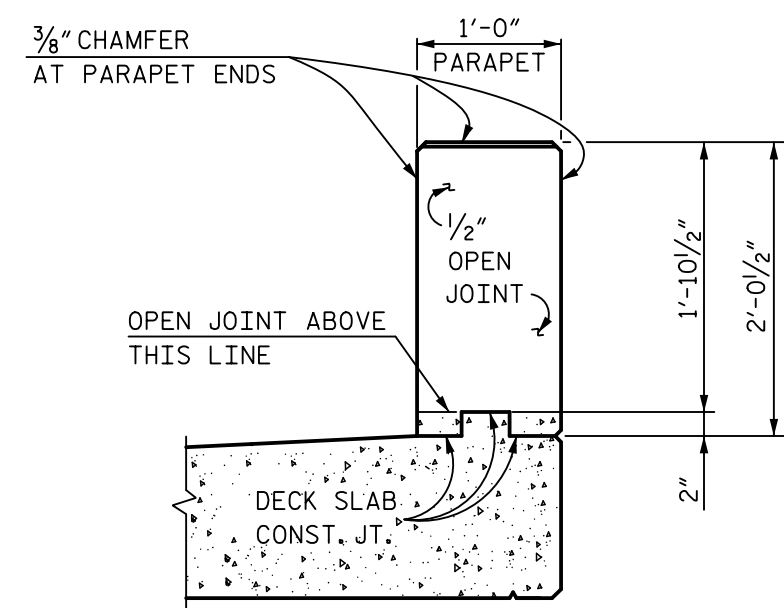
TOTAL SHEETS: 39



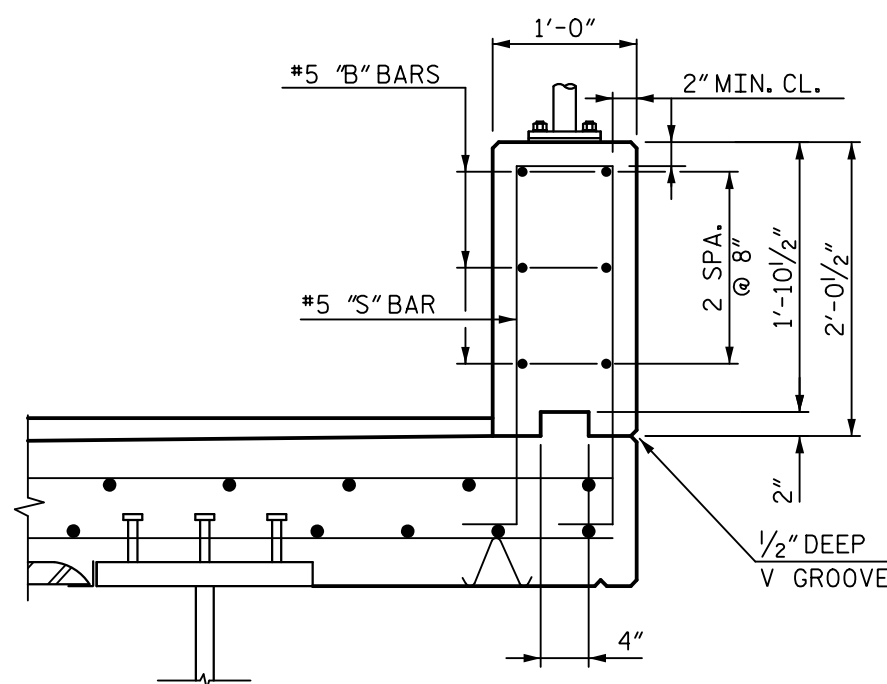
PLAN - SPAN A PARAPETS



PLAN - SPAN C PARAPETS



SECTION THRU OPEN JOINT IN PARAPET



SECTION THRU PARAPET

NOTES:

METAL HANDRAIL NOT SHOWN FOR CLARITY.

ALL HORIZONTAL DIMENSIONS SHOWN ARE MEASURED ALONG EXTERIOR FACE OF PARAPET.

ALL REINFORCING SHALL BE EPOXY COATED.

FOR LOCATION AND DETAILS OF SIGNAL CONDUIT IN CONCRETE PARAPET, SEE "TYPICAL SECTION" SHEET.

FOR ALUMINUM HANDRAIL DETAILS, SEE "METAL HANDRAIL DETAILS" SHEETS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF PARAPET AND IN ACCORDANCE WITH THE SPECIAL PROVISION FOR "CONCRETE PARAPET". THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS.

PAYMENT FOR CONCRETE PARAPET SHALL BE INCLUDED IN THE UNIT COST PAY ITEM FOR CONCRETE PARAPET.

PAY LENGTH = 256.4'

PROJECT NO. P-5705BA

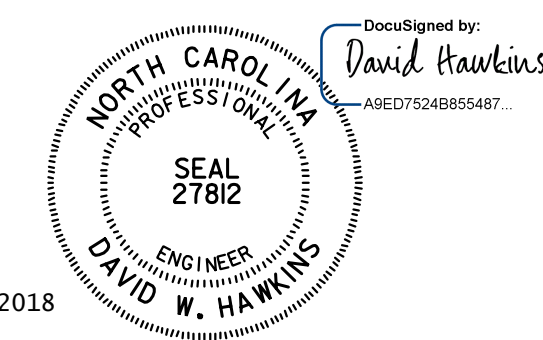
MECKLENBURG COUNTY

STATION: STA. 42+59.46 -A1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PARAPET DETAILS



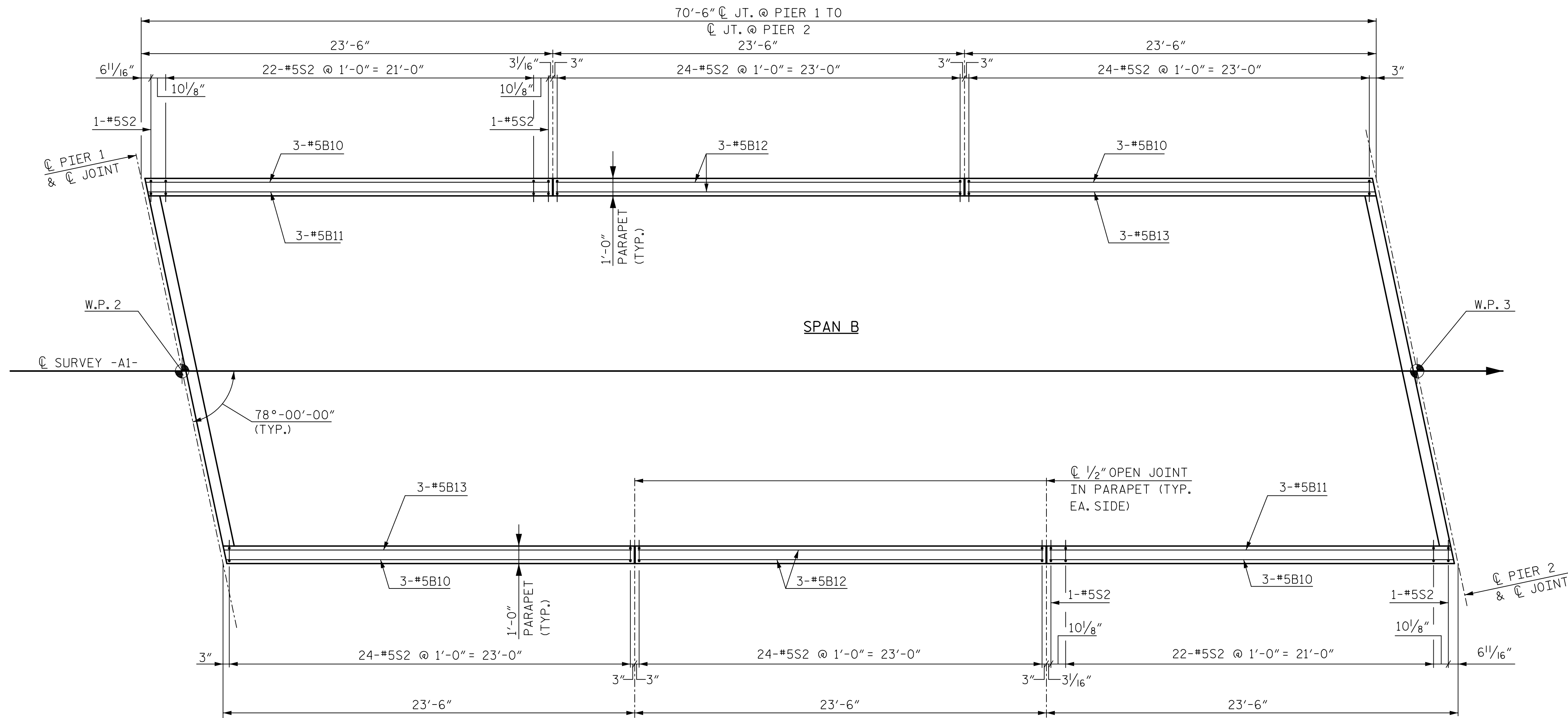
3/31/2018

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C.	
NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	DWG. NO. 17	
CHECKED BY: V. KOLLIPARA	DATE: 9/17		

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-17
1			3			TOTAL SHEETS
2			4			39

NOTES:
FOR NOTES, SEE SHEET "PARAPET DETAILS (1 OF 2)"

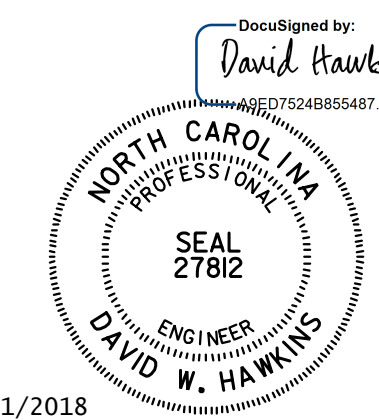


PLAN - SPAN B PARAPETS

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PARAPET DETAILS

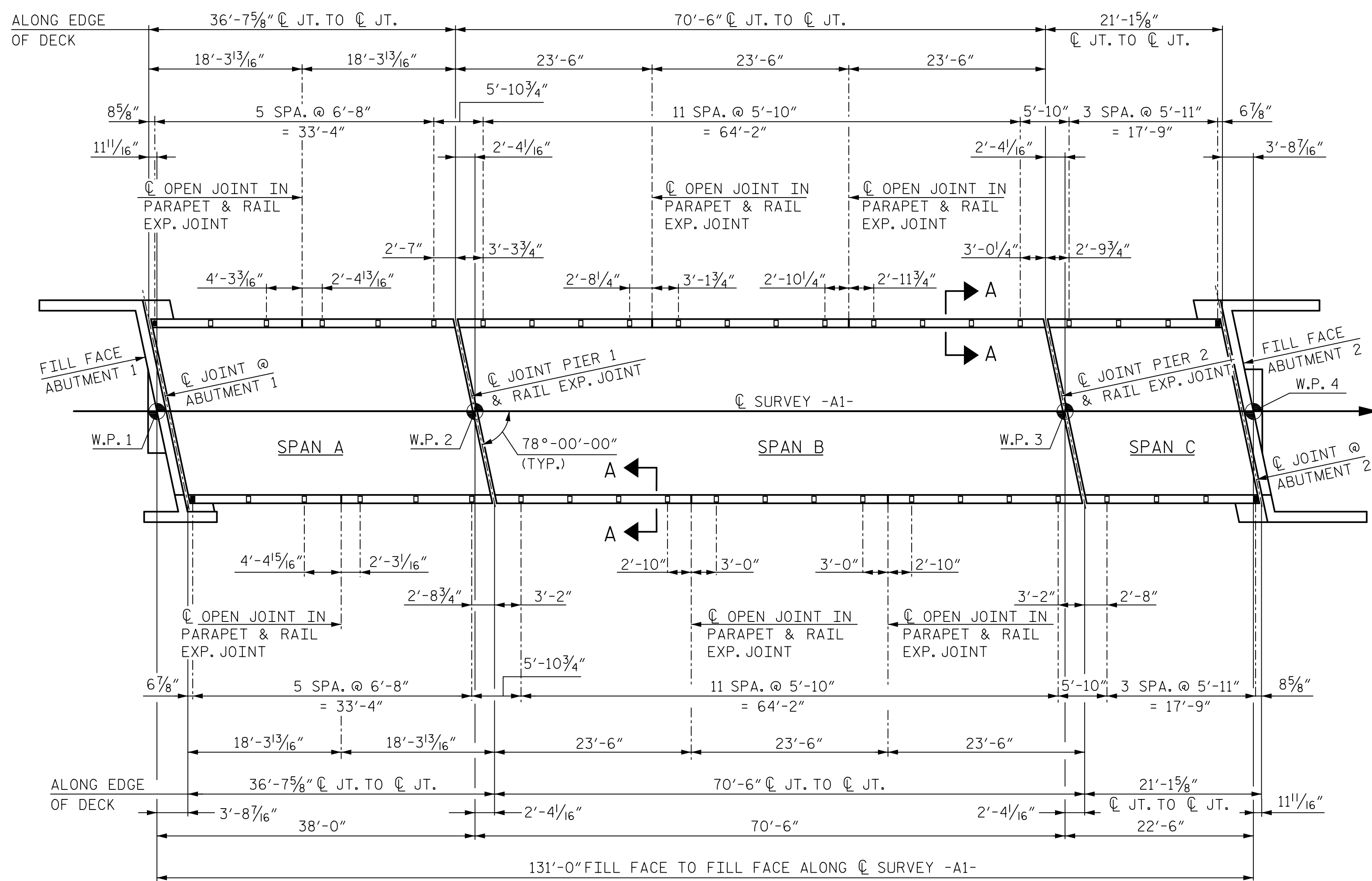


2/21/2018

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	DWG. NO. 18	
CHECKED BY: V. KOLLIPARA	DATE: 9/17		

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-18
1			3			TOTAL SHEETS
2			4			39



METAL HANDRAIL POST SPACING - BRIDGE

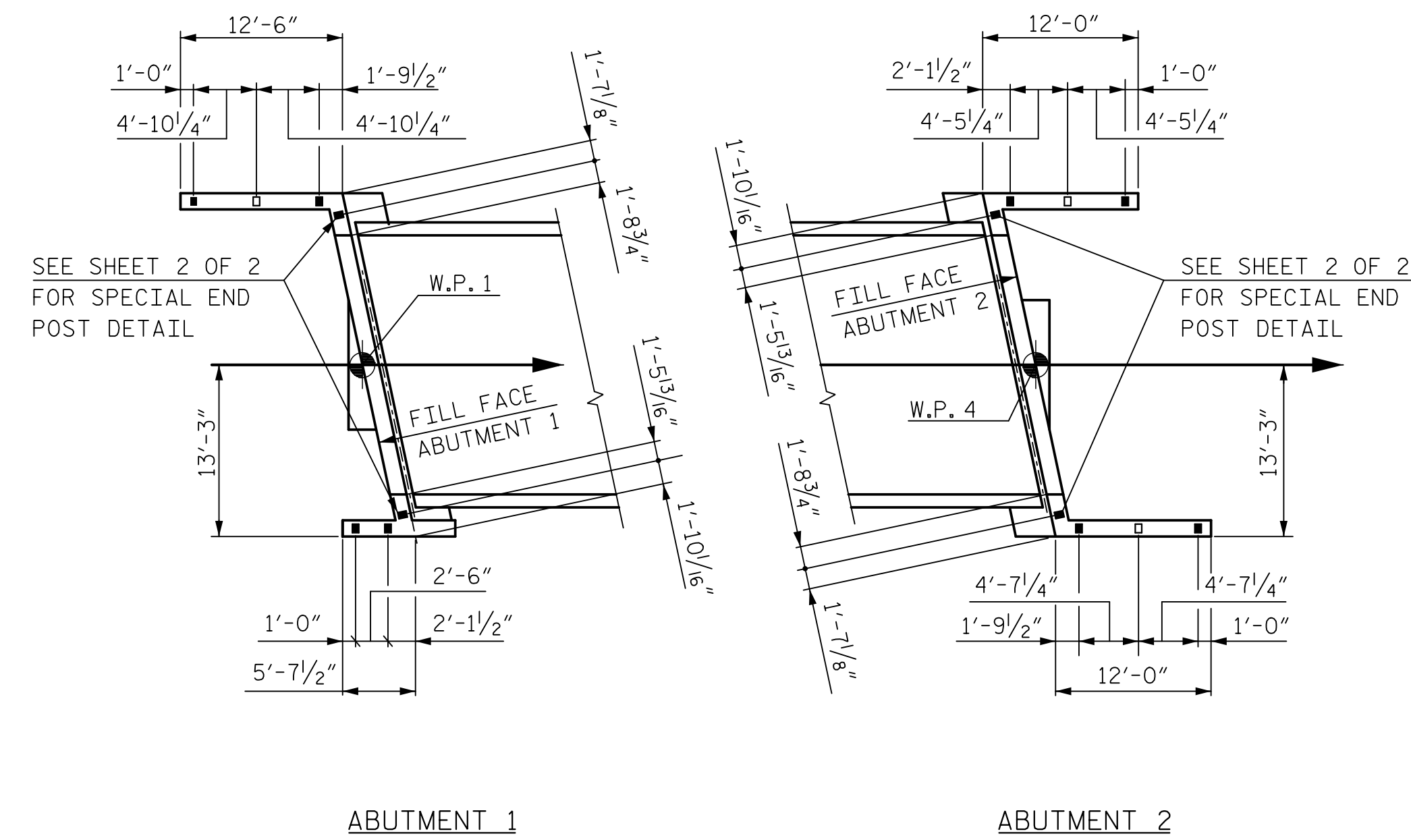
LEGEND

- - END POST
- - INTERIOR POST

NOTE: FOR SECTION A-A, SEE SHEET 2 OF 2.

ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF PARAPET/WINGWALL.

PAY LENGTH = 304.3'



ABUTMENT 1

ABUTMENT 2

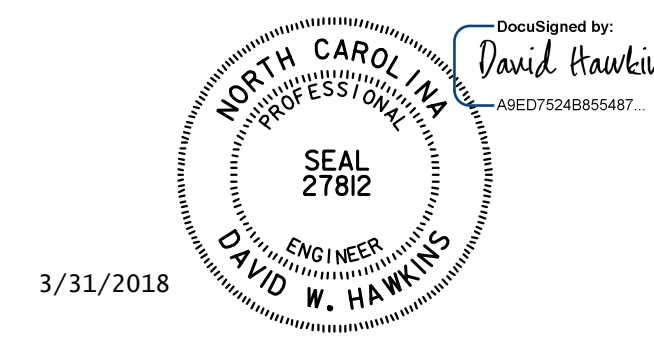
METAL HANDRAIL POST SPACING - WINGWALLS

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 METAL HANDRAIL
 DETAILS



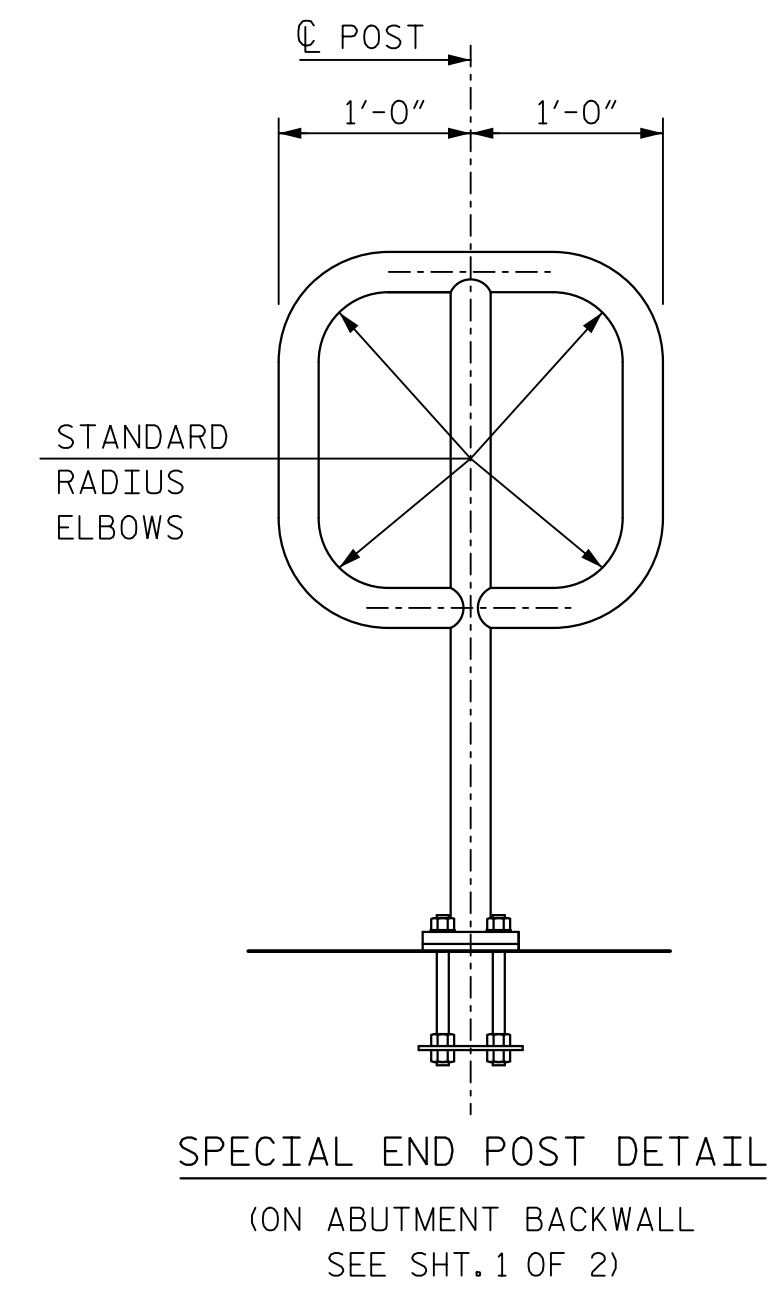
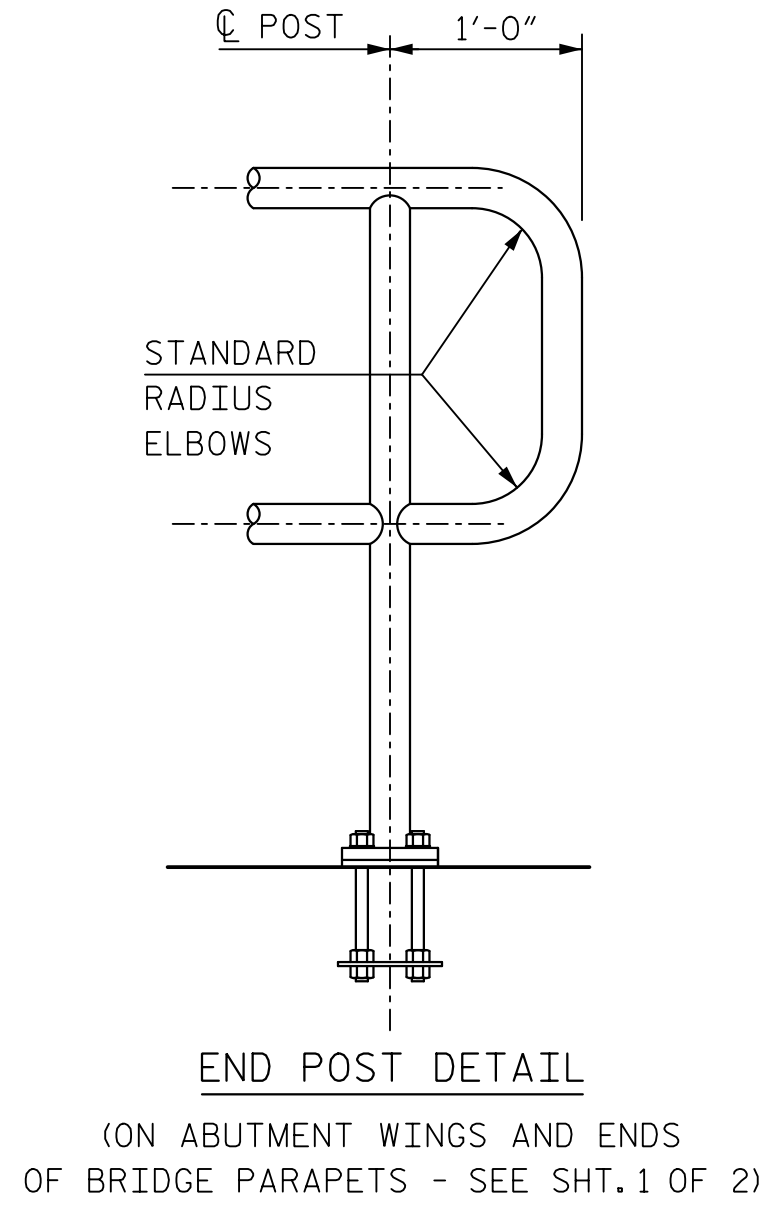
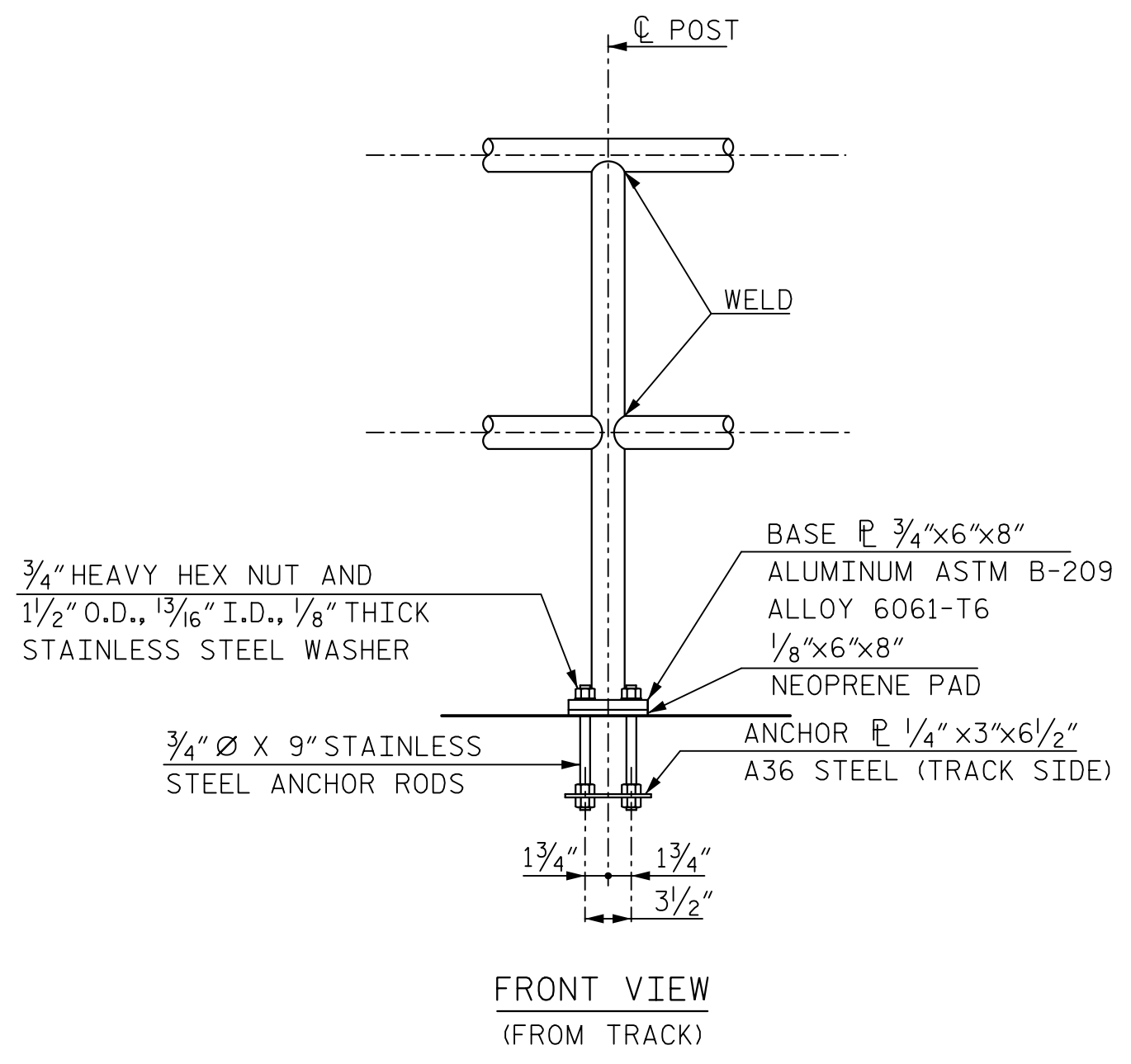
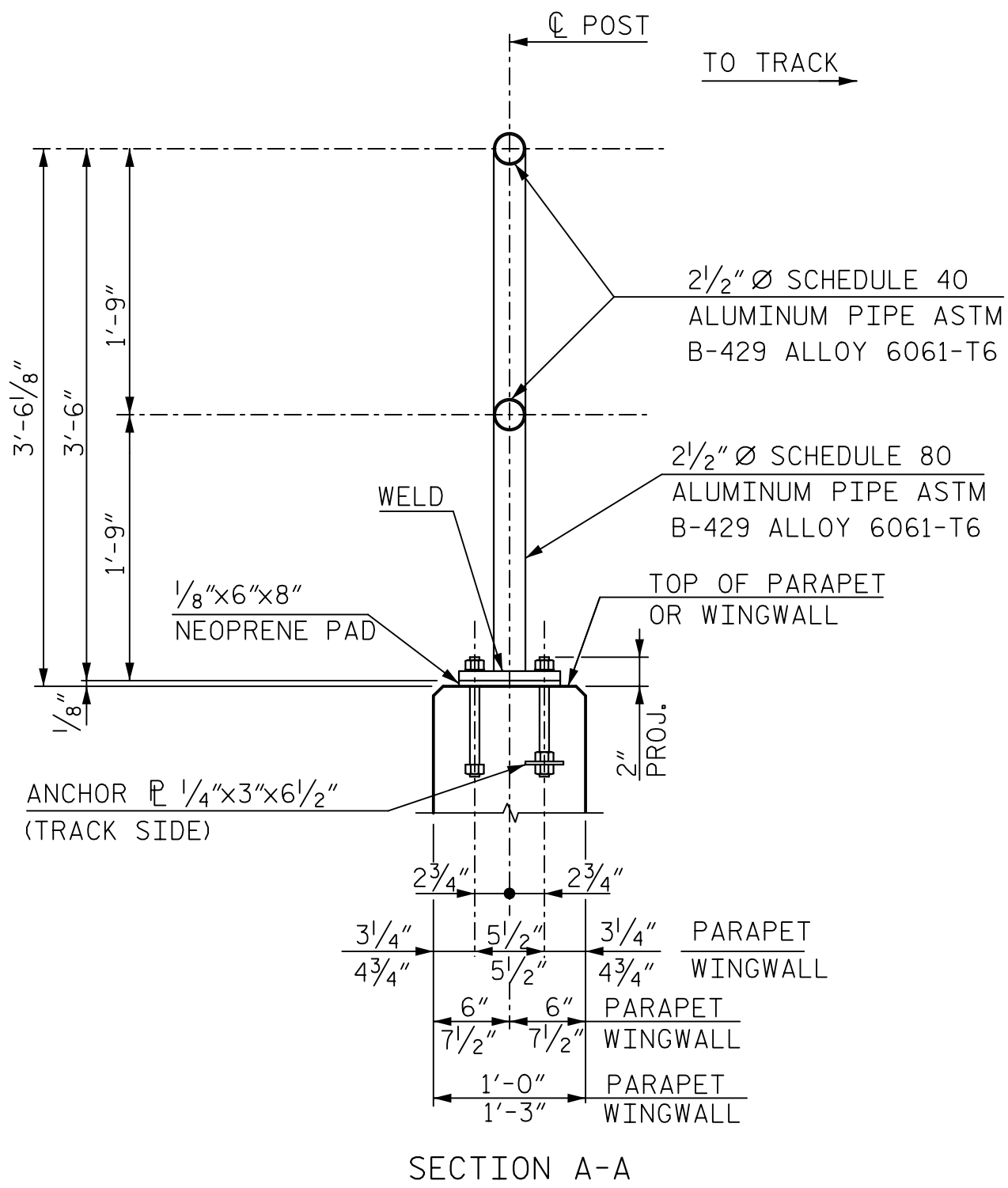
3/31/2018

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

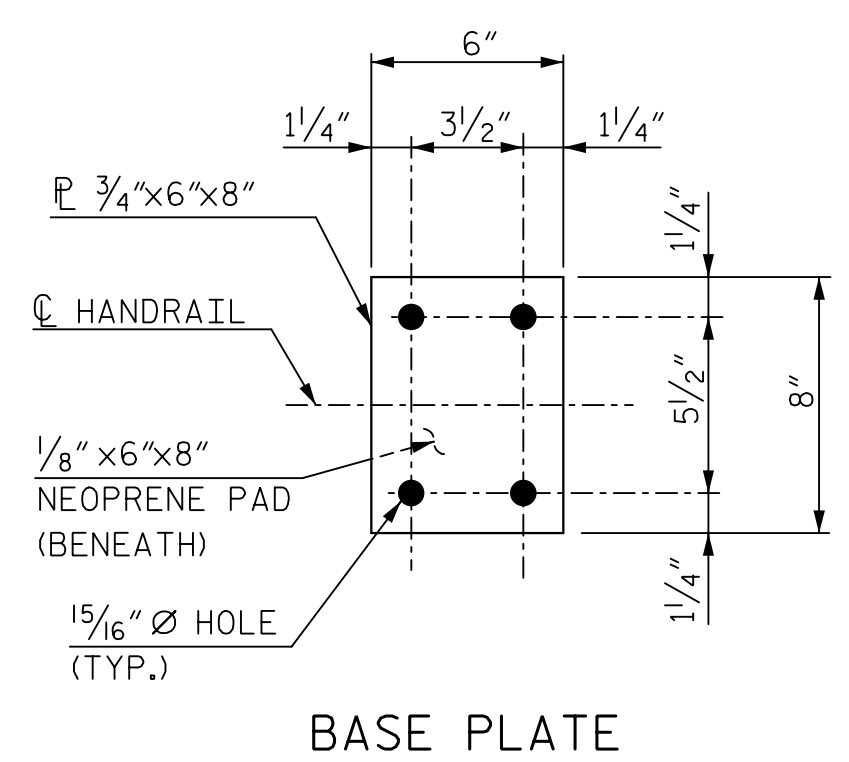
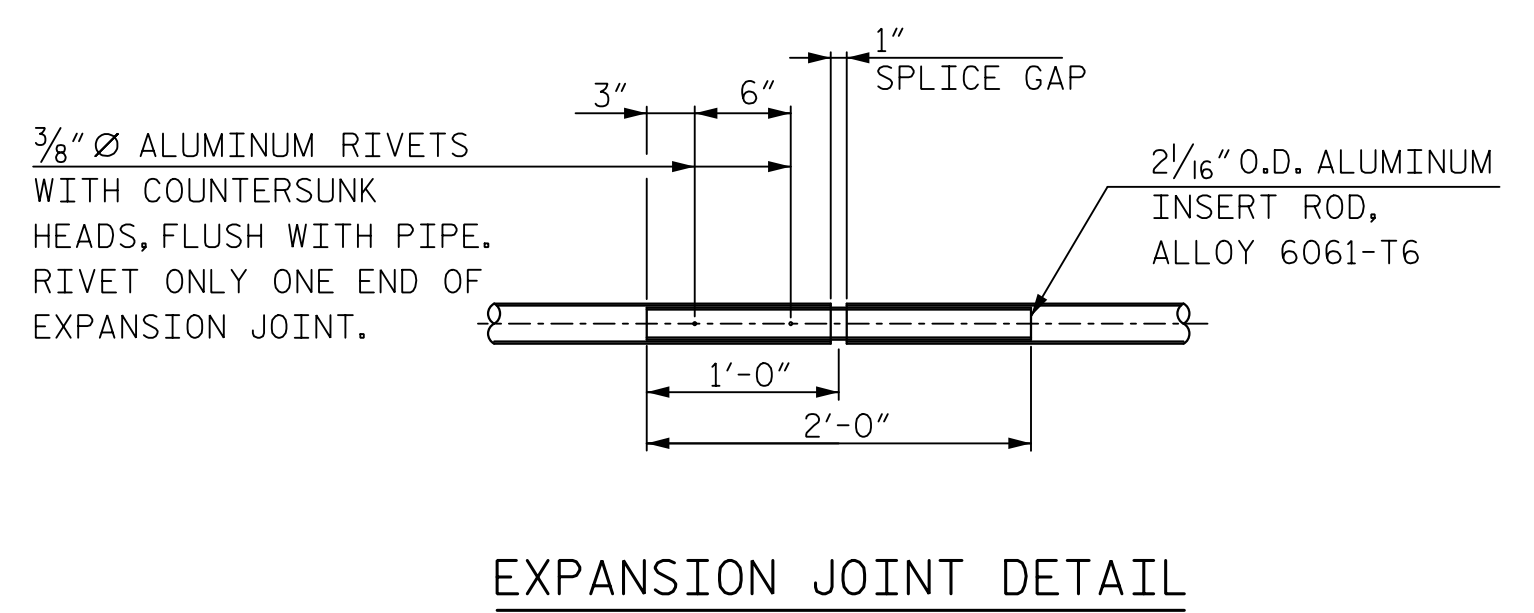
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 9/17	DWG. NO. 19	
CHECKED BY: N. ZAMUDIO	DATE: 9/17		

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

SHEET NO. S8-19
TOTAL SHEETS 39



ALUMINUM HANDRAIL AND POST



NOTES:

JOINTS IN RAILING (SPlice GAP) SHALL BE LOCATED AS SHOWN IN POST SPACING PLAN.

ALUMINUM PIPE TO BE ASTM B-429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B-209, ALLOY 6061-T6.

STAINLESS STEEL BOLTS, CAP SCREWS, AND NUTS TO BE ASTM A-276 TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A-276 TYPE 302.

POSTS TO BE SET PERPENDICULAR TO TOP OF PARAPET AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE BRIDGE.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POSTS. SHOP INSPECTIONS ARE NOT REQUIRED BY THE RAILROAD BUT MAY BE REQUIRED BY NCDOT.

AFTER ANCHOR ROD NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE NICKED TO LOCK NUTS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURES THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

ANCHOR PLATES SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.

ANCHOR RODS SHALL CONFORM TO ASTM SPECIFICATION A276 TYPE 302 OR 304, STAINLESS STEEL AND THREADS SHALL BE ROLLED, NOT CUT.

UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OR 304 STAINLESS STEEL.

LOWER ANCHOR ROD NUTS SHALL BE HEAVY STEEL HEX NUTS, PER ASTM A563.

THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0" AWAY FROM CENTERLINE OF POST. EXPANSION AND/OR SPLICE JOINTS FOR EACH RAIL OF TWO RAILINGS ARE TO BE PLACED IN THE SAME LOCATION AND IN THE SAME PANEL.

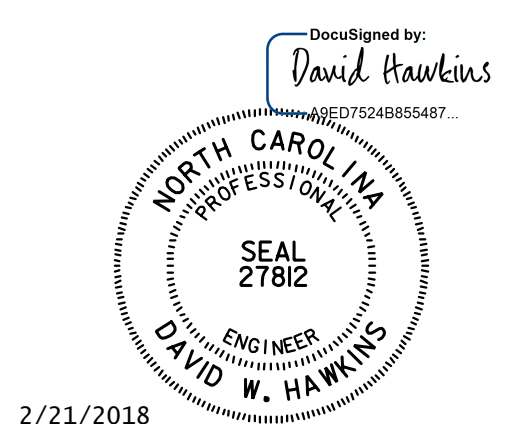
WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE - ALUMINUM.

THE LENGTH OF METAL RAIL TO BE PAID FOR SHALL BE THE CONTINUOUS LENGTH MEASURED FROM END TO END OF RAIL, ALONG THE TOP RAIL.

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

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

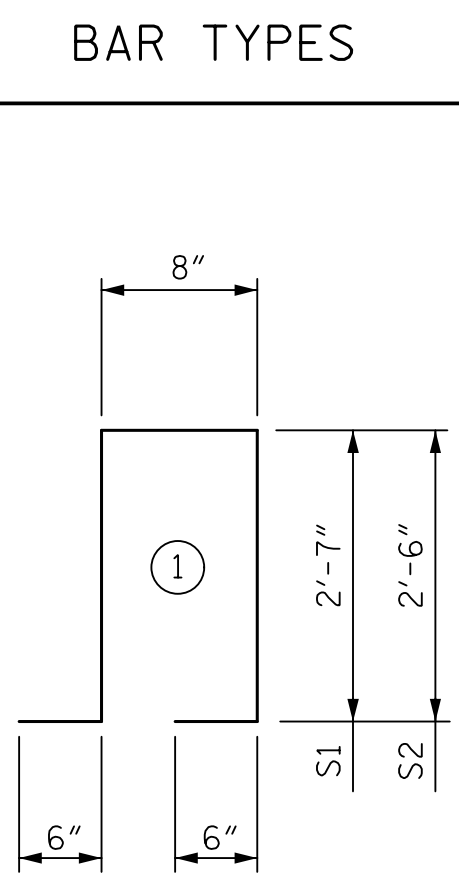
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

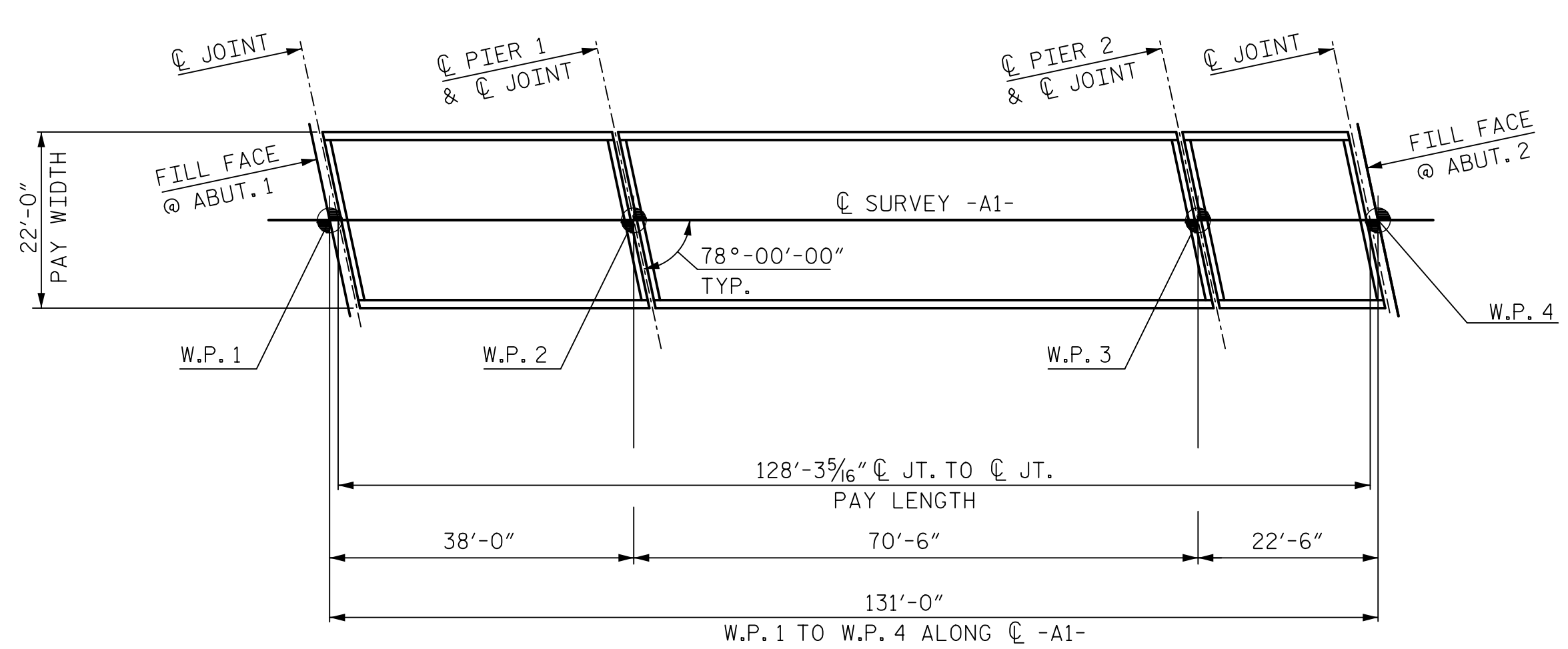
SUPERSTRUCTURE
 METAL HANDRAIL
 DETAILS

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-20		
	NO.	BY	DATE	NO.		BY	DATE
	1	J. BAYNE	9/17	3			
DRAWN BY		DATE		DWG. NO. 20		TOTAL SHEETS 39	
CHECKED BY		DATE					

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	73	5	STR.	21'-8"	1,650	A1	152	5	STR.	21'-8"	3,435	A1	38	5	STR.	21'-8"	859
A2	2	5	STR.	21'-7"	45	A2	2	5	STR.	21'-7"	45	A2	2	5	STR.	21'-7"	45
A3	4	5	STR.	18'-0"	75	A3	4	5	STR.	18'-0"	75	A3	4	5	STR.	18'-0"	75
A4	2	5	STR.	14'-6"	30	A4	2	5	STR.	14'-6"	30	A4	2	5	STR.	14'-6"	30
A5	2	5	STR.	11'-0"	23	A5	2	5	STR.	11'-0"	23	A5	2	5	STR.	11'-0"	23
A6	2	5	STR.	7'-5"	15	A6	2	5	STR.	7'-5"	15	A6	2	5	STR.	7'-5"	15
A7	4	5	STR.	3'-11"	16	A7	4	5	STR.	3'-11"	16	A7	4	5	STR.	3'-11"	16
A8	2	5	STR.	8'-7"	18	A8	2	5	STR.	8'-7"	18	A8	2	5	STR.	8'-7"	18
A9	2	5	STR.	13'-4"	28	A9	2	5	STR.	13'-4"	28	A9	2	5	STR.	13'-4"	28
A10	8	5	STR.	22'-2"	185	A10	8	5	STR.	22'-2"	185	A10	8	5	STR.	22'-2"	185
B1	56	4	STR.	22'-0"	823	B3	112	4	STR.	30'-0"	2,244	B5	56	4	STR.	20'-7"	770
B2	56	4	STR.	16'-2"	605	B4	56	4	STR.	14'-0"	524	B14	12	5	STR.	20'-7"	258
B6	6	5	STR.	17'-9"	111	B10	12	5	STR.	23'-0"	288						
B7	6	5	STR.	17'-7"	110	B11	6	5	STR.	22'-10"	143	S1	44	5	1	6'-10"	314
B8	6	5	STR.	17'-10"	112	B12	12	5	STR.	23'-1"	289						
B9	6	5	STR.	18'-0"	113	B13	6	5	STR.	23'-2"	145						
S1	76	5	1	6'-10"	542	S2	144	5	1	6'-8"	1,001						
				TOTAL	4,501					TOTAL	8,504					TOTAL	2,636



ALL BAR DIMENSIONS ARE OUT TO OUT

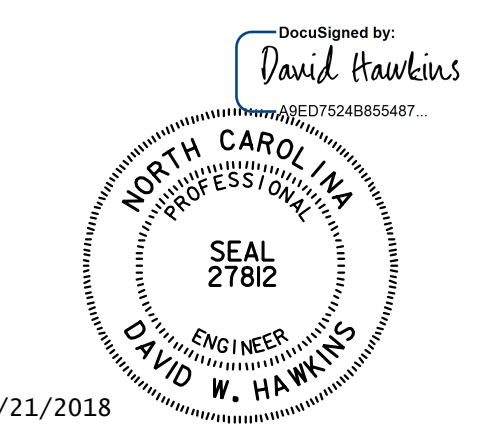


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FEET = 2,822.1)

QUANTITY BREAKDOWN BY SPAN			
	EPOXY COATED REINFORCING STEEL (LBS.)	CLASS AA CONCRETE (CU. YDS.)	
		DECK SLAB	PARAPETS
SPAN "A"	4,501	32.3	5.1
SPAN "B"	8,504	60.5	10.1
SPAN "C"	2,636	17.5	3.0
TOTALS	15,641	110.3	18.2

TOTAL SUPERSTRUCTURE QUANTITIES			
	REINFORCED CONCRETE DECK SLAB	EPOXY COATED REINFORCING STEEL	CLASS AA CONCRETE
	SQ. FT.	LBS.	CU. YDS.
DECK SLAB	2,822.1	12,215	110.3
PARAPET		3,426	18.2
TOTALS	2,822.1	15,641	128.5

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

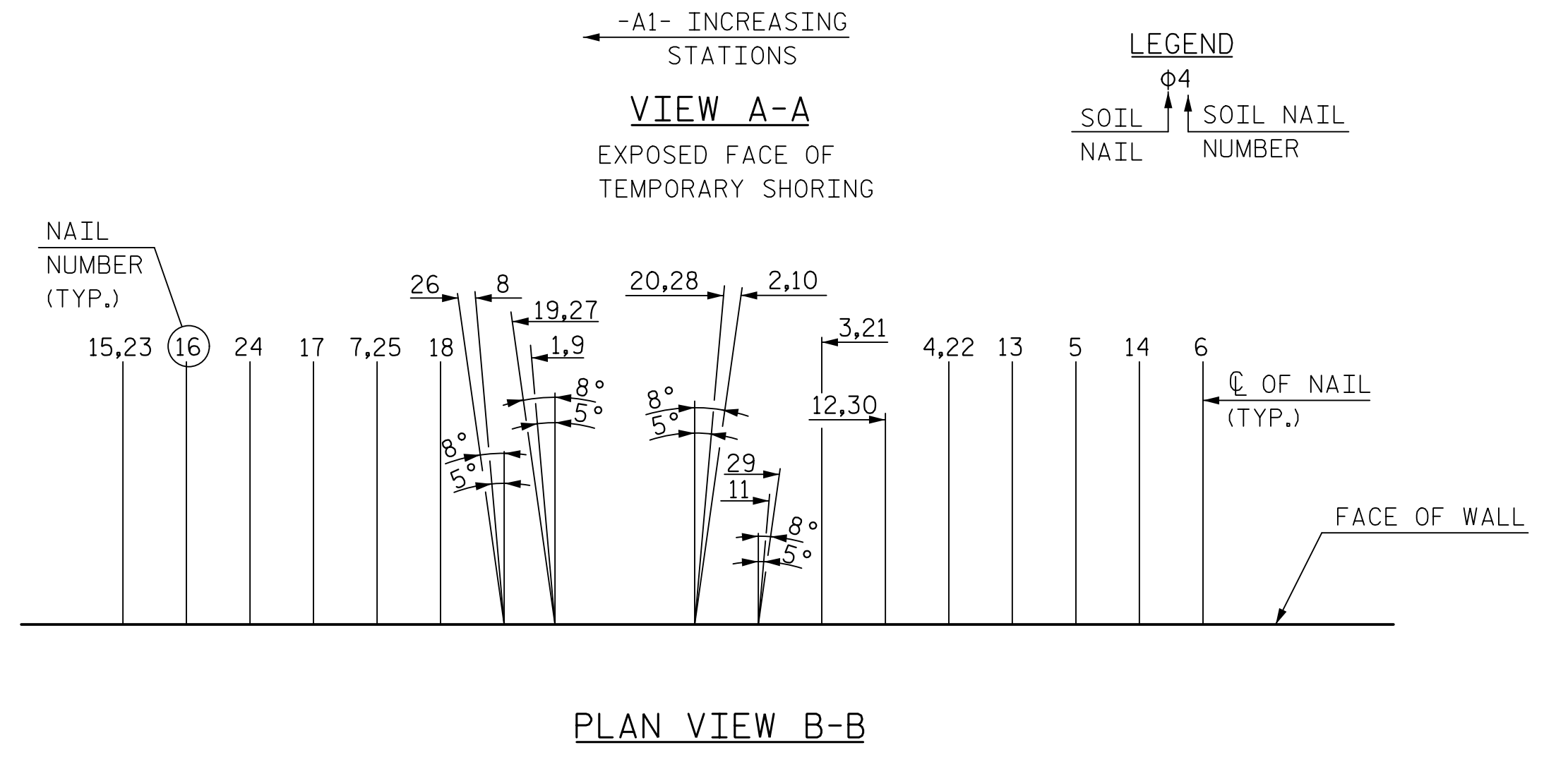
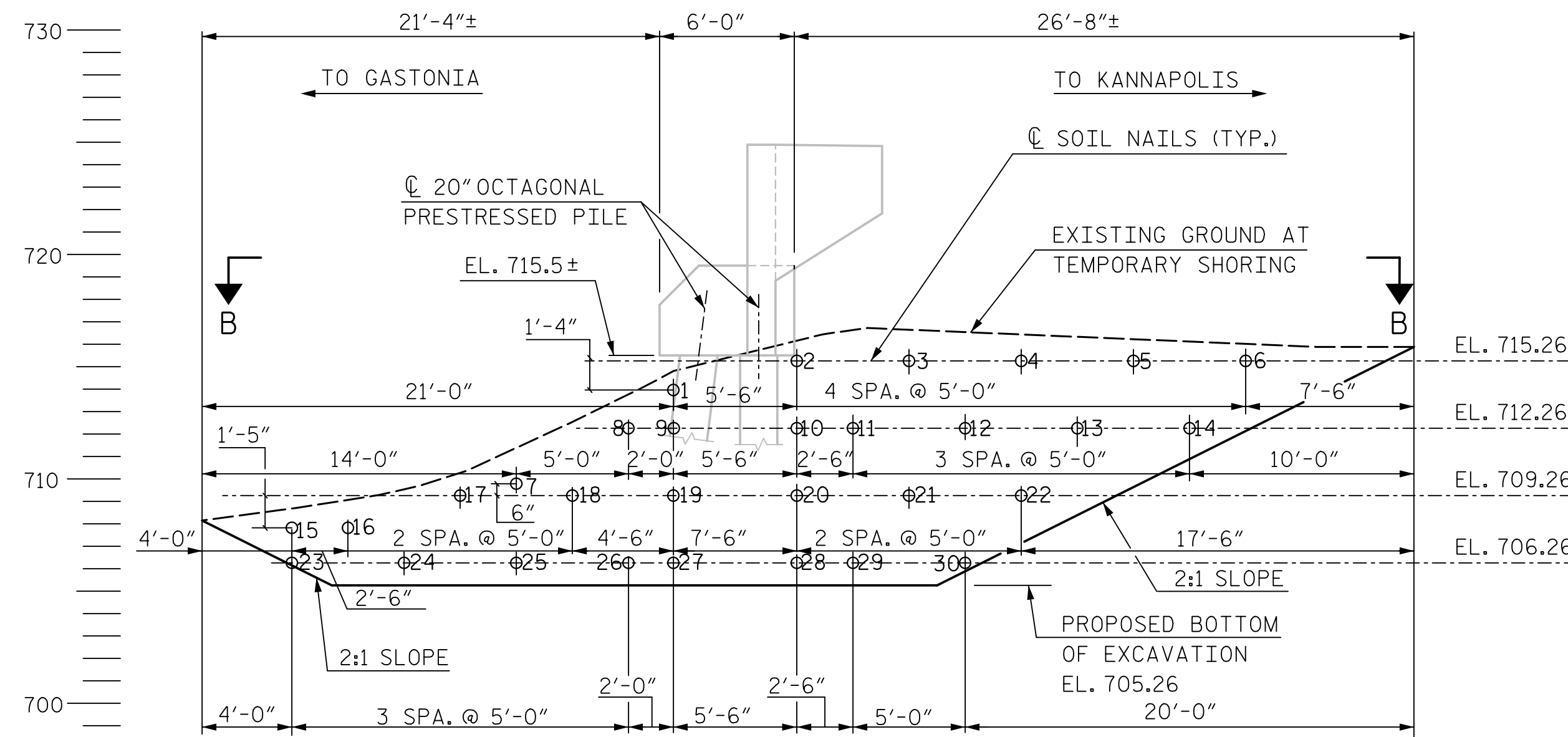
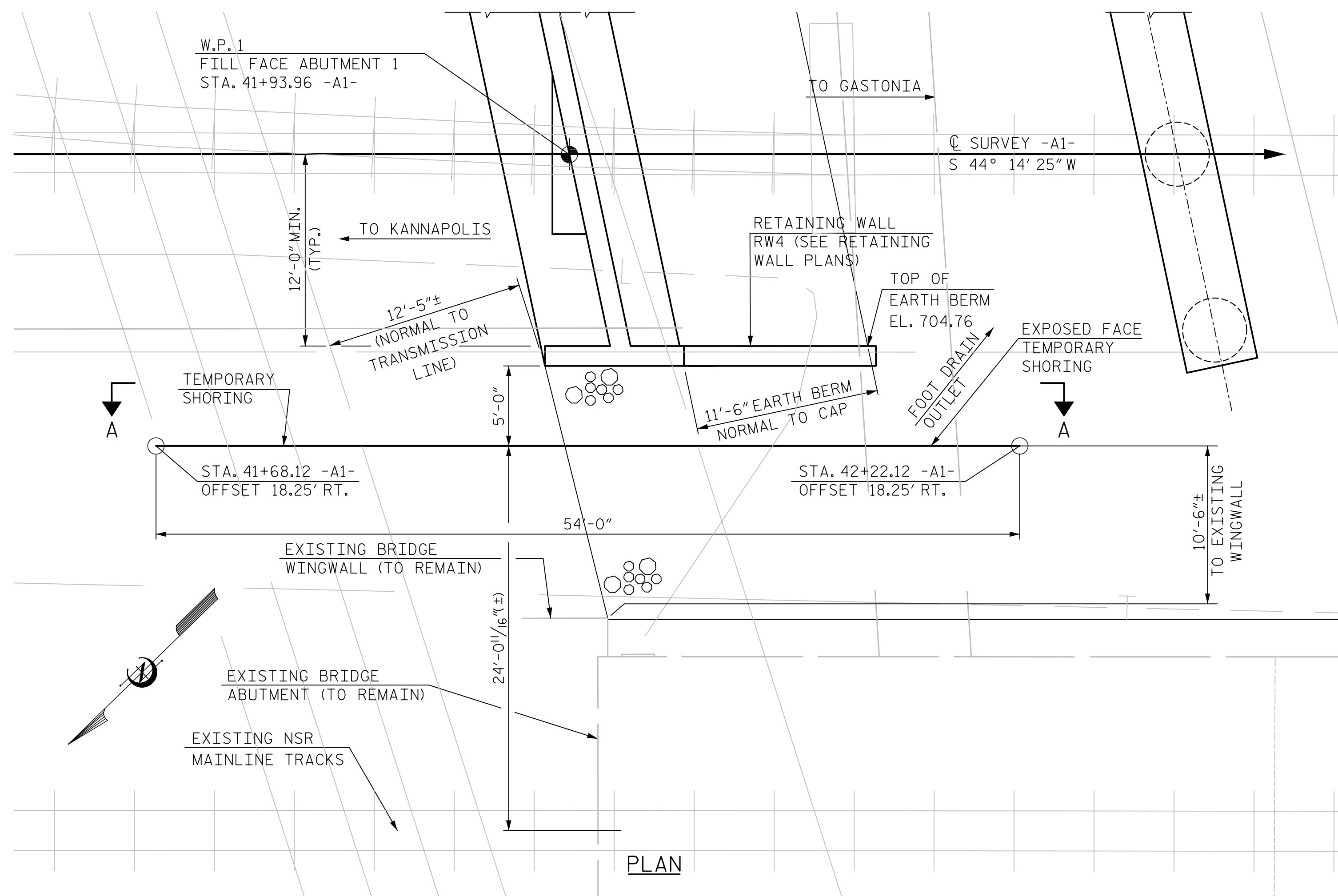


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	DWG. NO. 21	
CHECKED BY: V. KOLLIPARA	DATE: 9/17		

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-21
1			3			TOTAL SHEETS
2			4			39

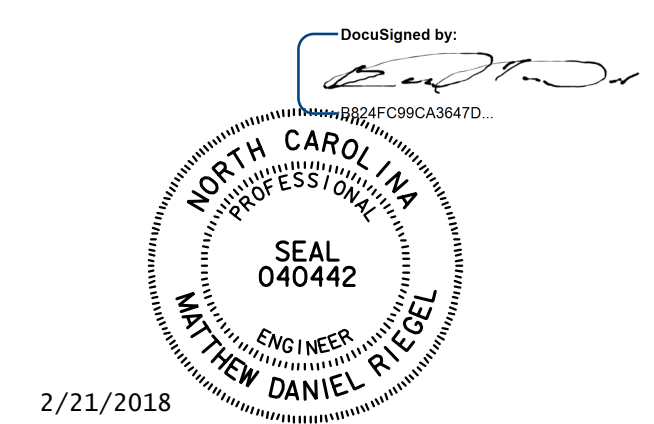


NAIL NUMBER	ANGLE ABOUT THE HORIZONTAL PLANE (DEGREES)	ANGLE ABOUT THE VERTICAL PLANE (DEGREES)
1	15	5
2	15	8
3	15	0
4	15	0
5	15	0
6	15	0
7	15	0
8	15	5
9	15	5
10	15	8
11	15	5
12	15	0
13	15	0
14	15	0
15	15	0

NAIL NUMBER	ANGLE ABOUT THE HORIZONTAL PLANE (DEGREES)	ANGLE ABOUT THE VERTICAL PLANE (DEGREES)
16	15	0
17	15	0
18	15	0
19	15	8
20	15	5
21	15	0
22	15	0
23	15	0
24	15	0
25	15	0
26	15	8
27	15	8
28	15	5
29	15	8
30	15	0

NOTE: FOR DIRECTION OF ANGLE ABOUT THE VERTICAL PLANE, SEE "PLAN VIEW B-B".
 FOR DIRECTION OF ANGLE ABOUT THE HORIZONTAL PLANE, SEE "TYPICAL SECTION" ON SHEET 2 OF 2.

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY: M. WRIGHT DATE: 11/17
 CHECKED BY: H. JOVANI DATE: 11/17 DWG. NO. 22

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

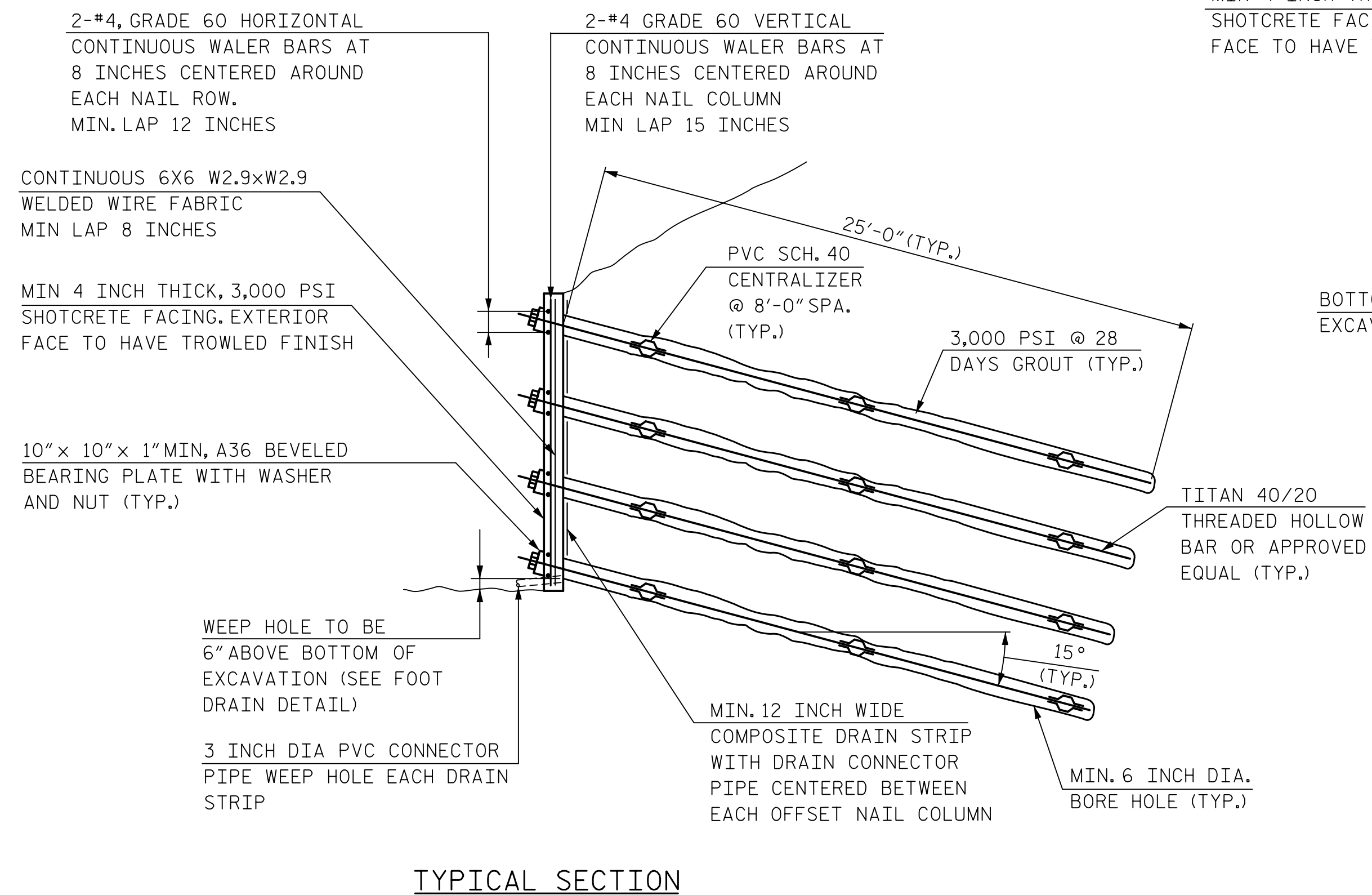
SUBSTRUCTURE
 ABUTMENT 1
 SHORING

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

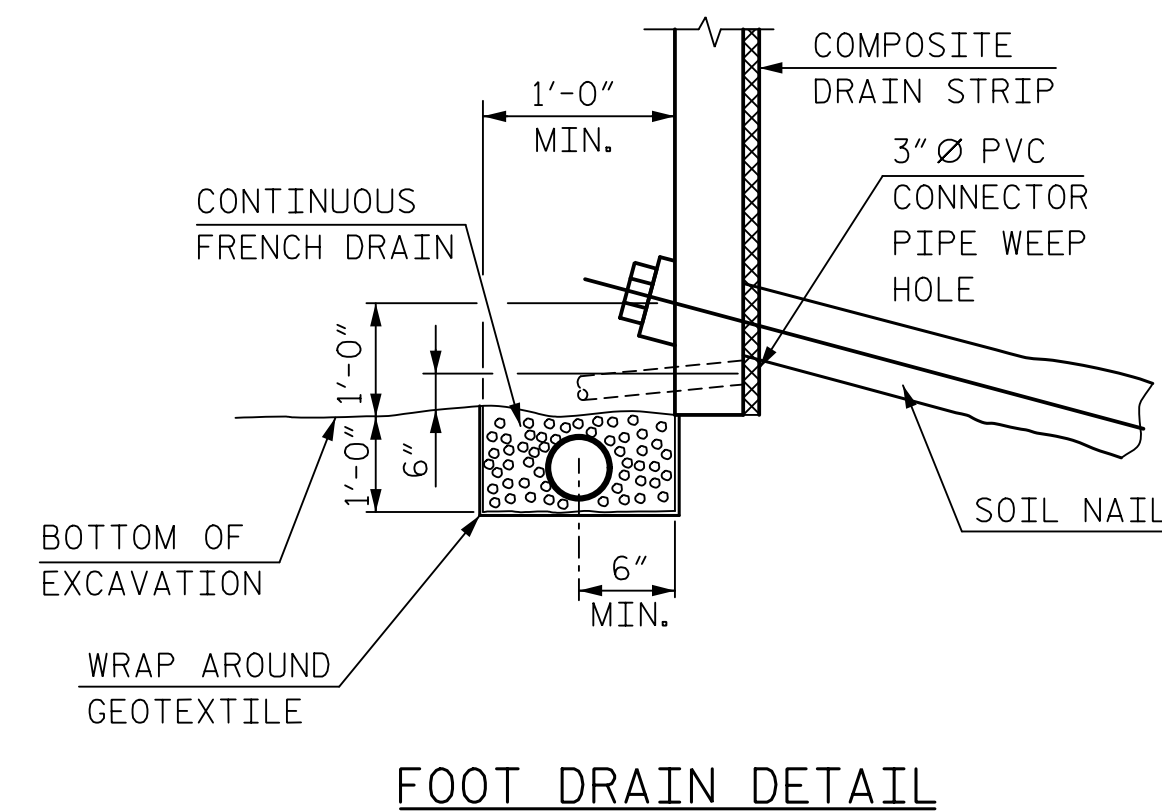
SHEET NO. S8-22
 TOTAL SHEETS 39

NOTES:

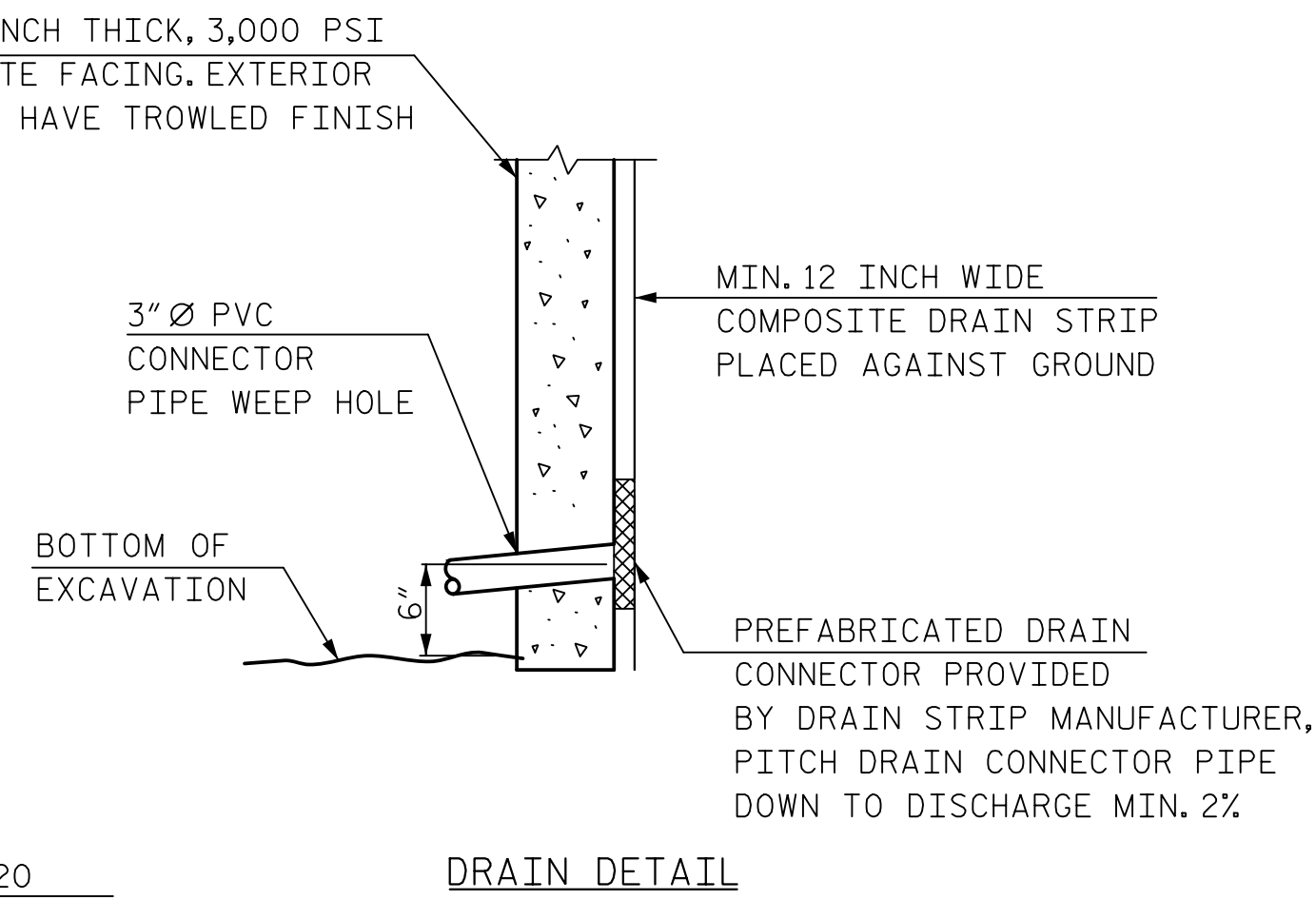
- FOR PLAN VIEW OF TEMPORARY SHORING, SEE SHEET 1 OF 2.
- MINIMUM SHOTCRETE COVER OF 2 INCHES (FRONT AND BACK) OVER STEEL REINFORCEMENT BAR AND MESH.
- DESIGN LOAD = 33 KIPS, ULTIMATE CAPACITY = 66 KIPS.
- ALL SOIL NAILS SHALL BE LEFT IN PLACE AFTER TEMPORARY WORK HAS FINISHED.



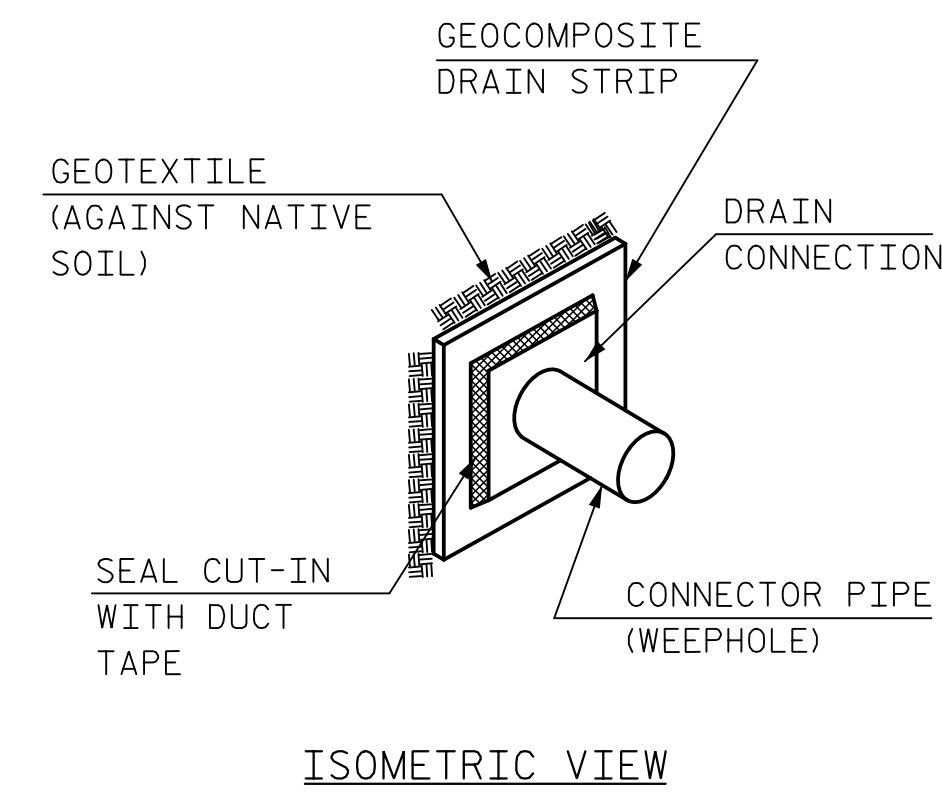
TYPICAL SECTION



FOOT DRAIN DETAIL

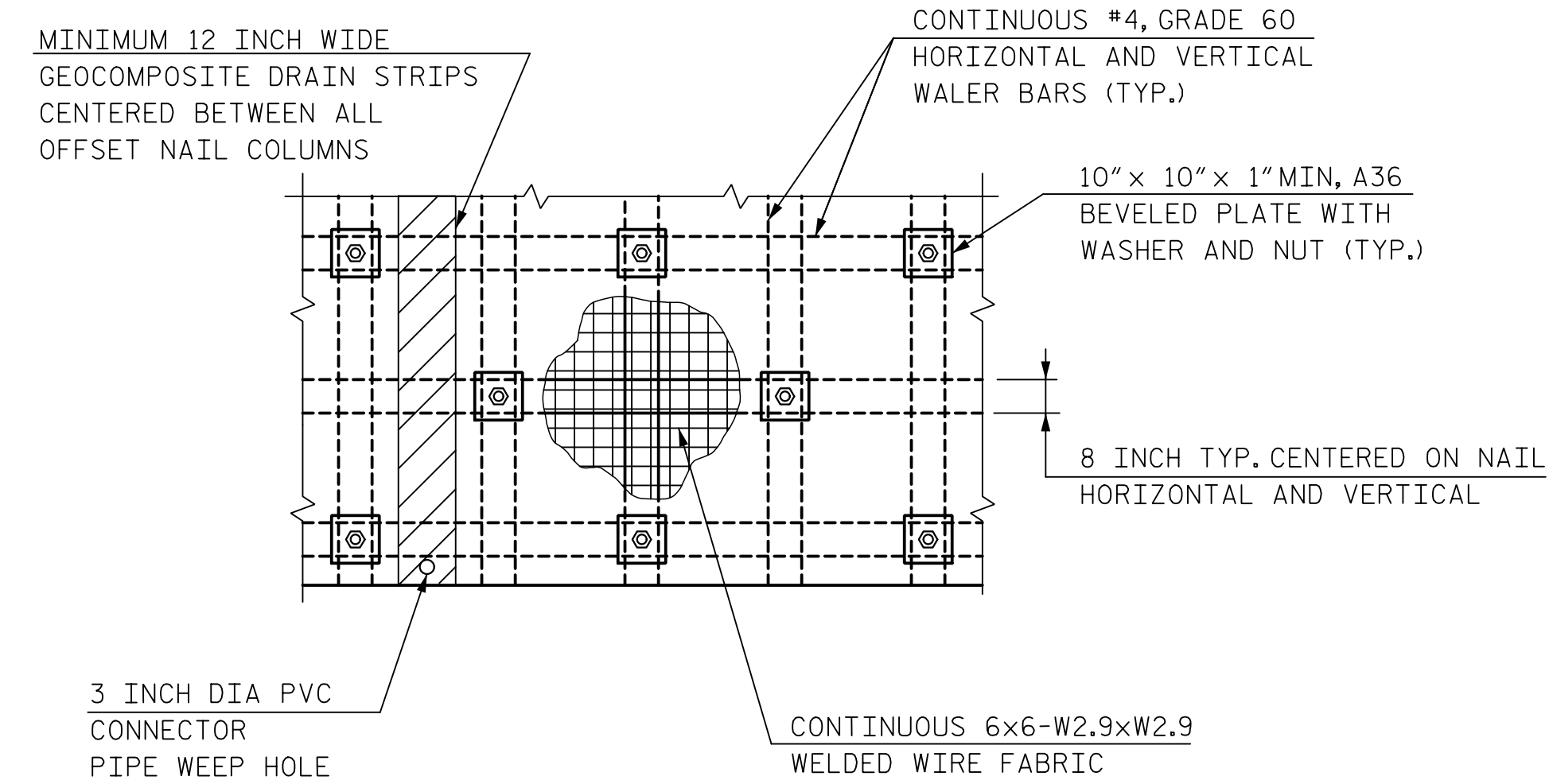


DRAIN DETAIL



ISOMETRIC VIEW

DRAIN CONNECTION DETAIL
(REINFORCEMENT STEEL NOT SHOWN FOR CLARITY)



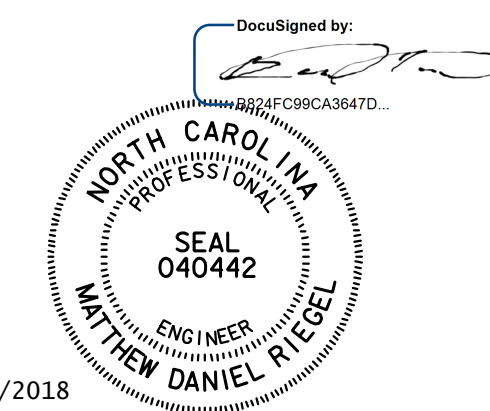
FACING REINFORCEMENT AND DRAINAGE

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

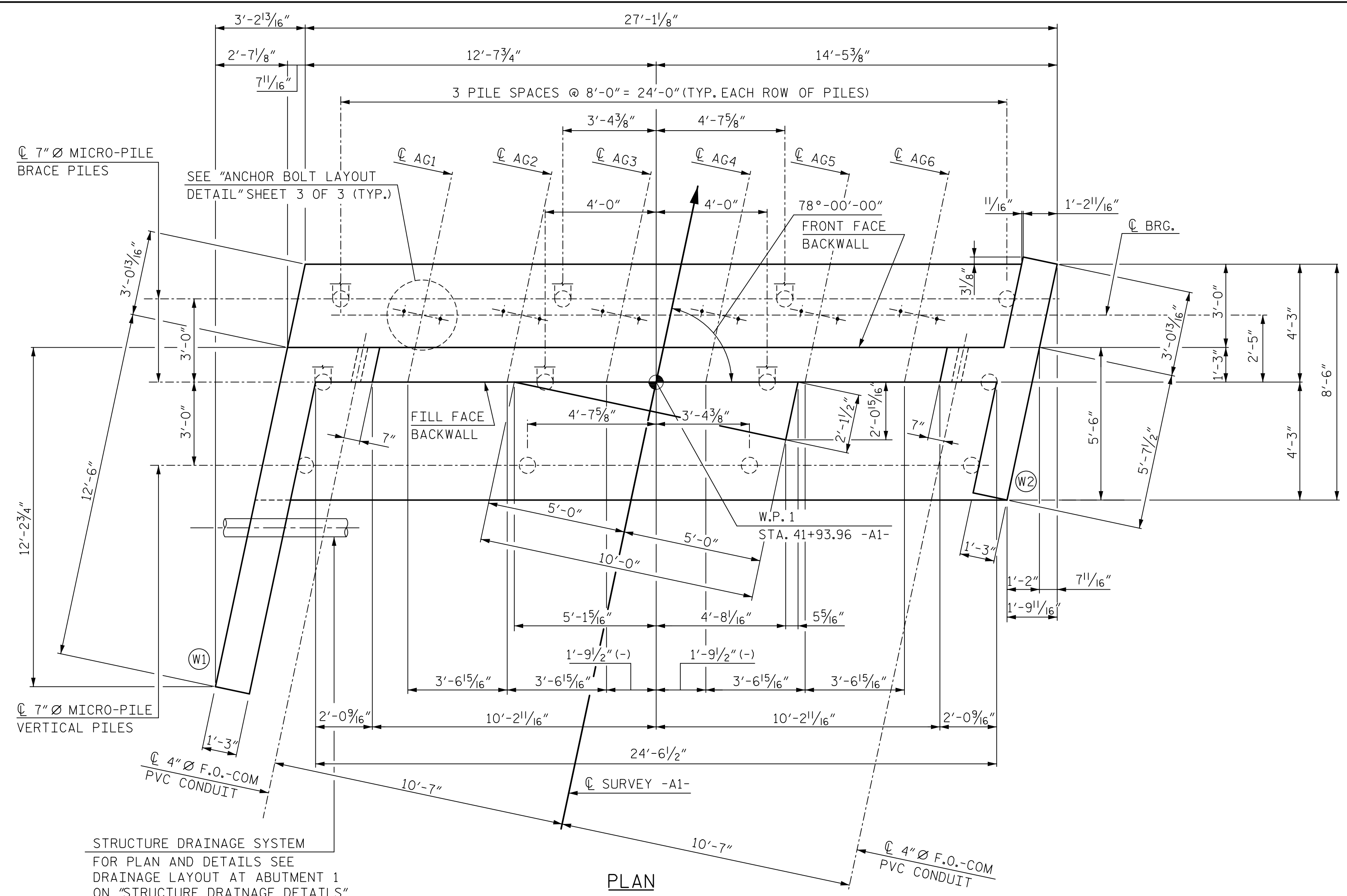
SUBSTRUCTURE
 ABUTMENT 1
 SHORING



2/21/2018

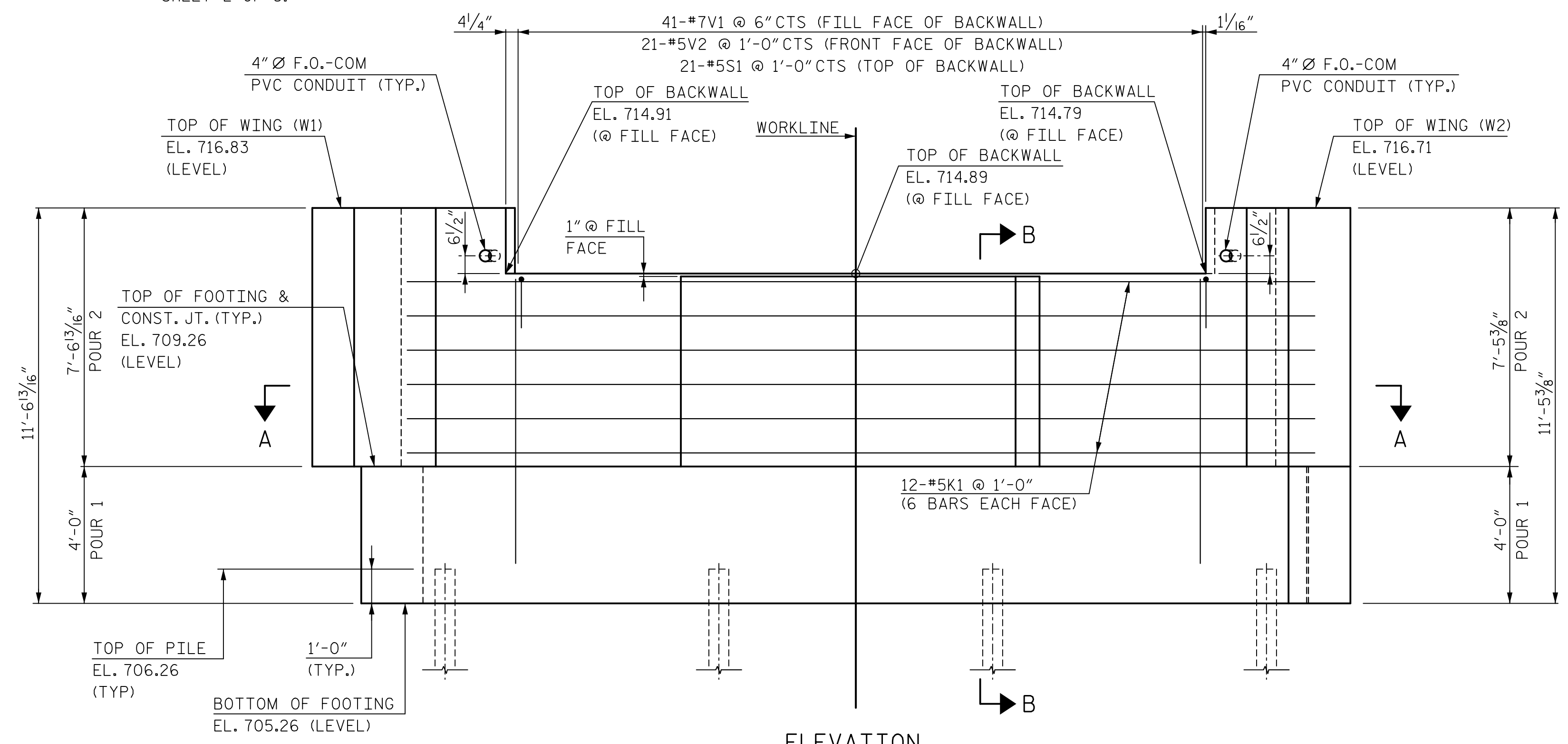
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	DRAWN BY: J. BAYNE DATE: 11/17 CHECKED BY: H. JOVANI DATE: 11/17				DWG. NO. 23	REVISIONS <table border="1"> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	NO.	BY	DATE	NO.	BY	DATE	1			3			2			4			SHEET NO. S8-23 TOTAL SHEETS 39
	NO.	BY	DATE	NO.	BY	DATE																			
	1			3																					
2			4																						



STRUCTURE DRAINAGE SYSTEM
 FOR PLAN AND DETAILS SEE
 DRAINAGE LAYOUT AT ABUTMENT 1
 ON "STRUCTURE DRAINAGE DETAILS"
 SHEET 2 OF 3.

PLAN



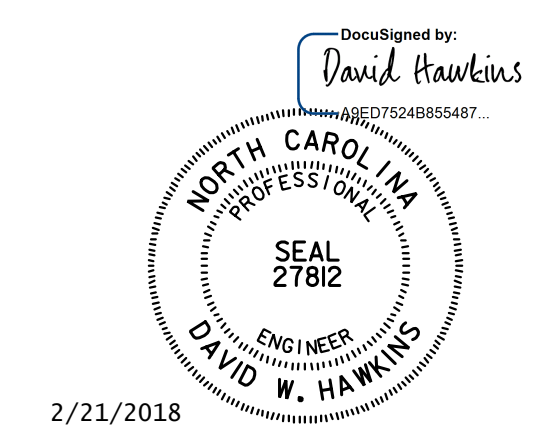
ELEVATION

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 3 OF 3.
- INDICATES PILE BATTERED AT 3.5:12 IN DIRECTION SHOWN.
- CONDUIT TO BE 4" Ø IN ACCORDANCE WITH UNDERWRITERS LABORATORY SPECIFICATIONS.
- FOR FOOTING REINFORCING, SEE SECTION B-B SHEET 2 OF 3 AND FOOTING REINFORCING PLAN SHEET 3 OF 3.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

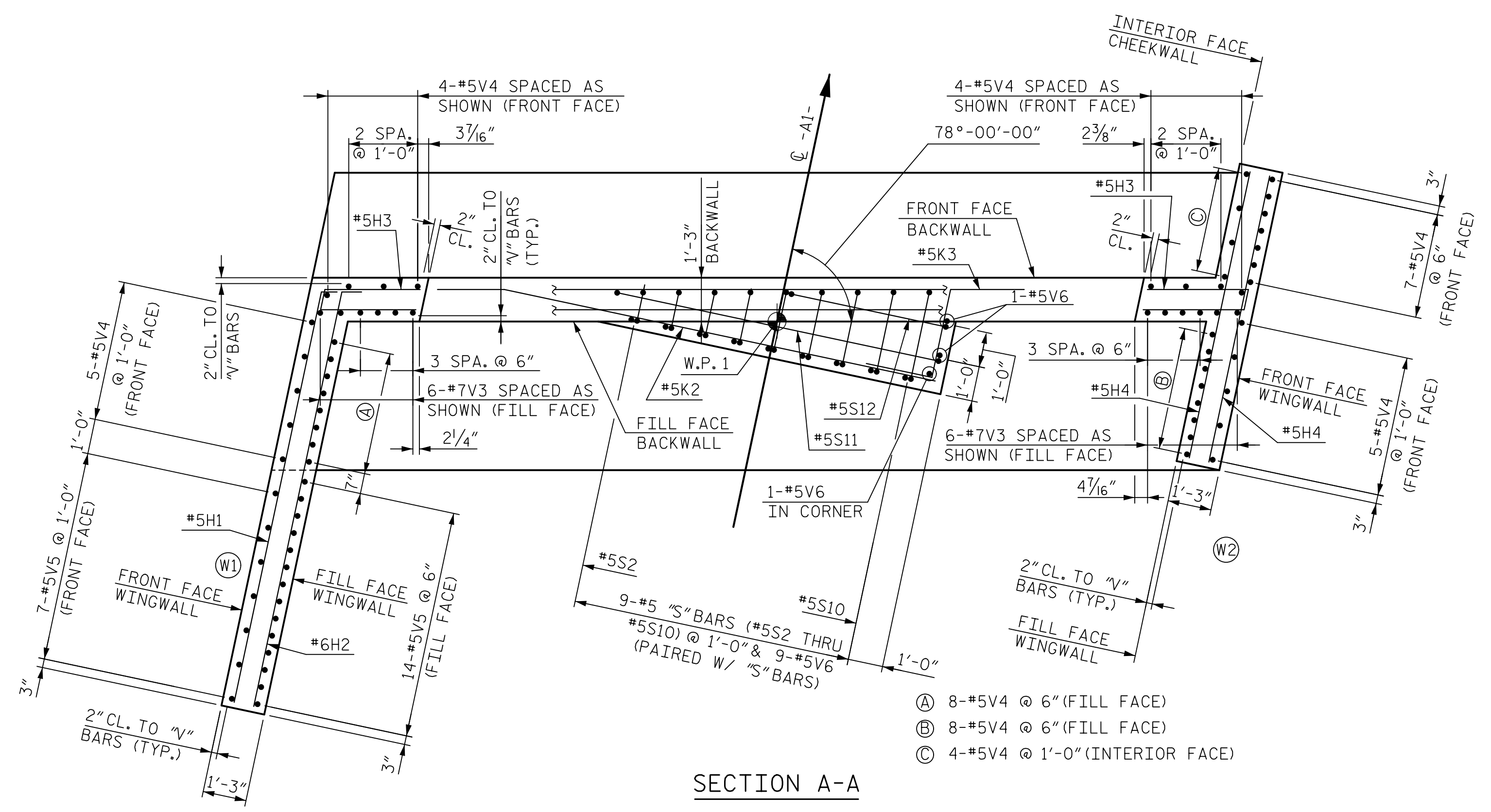
SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 ABUTMENT 1



2/21/2018

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

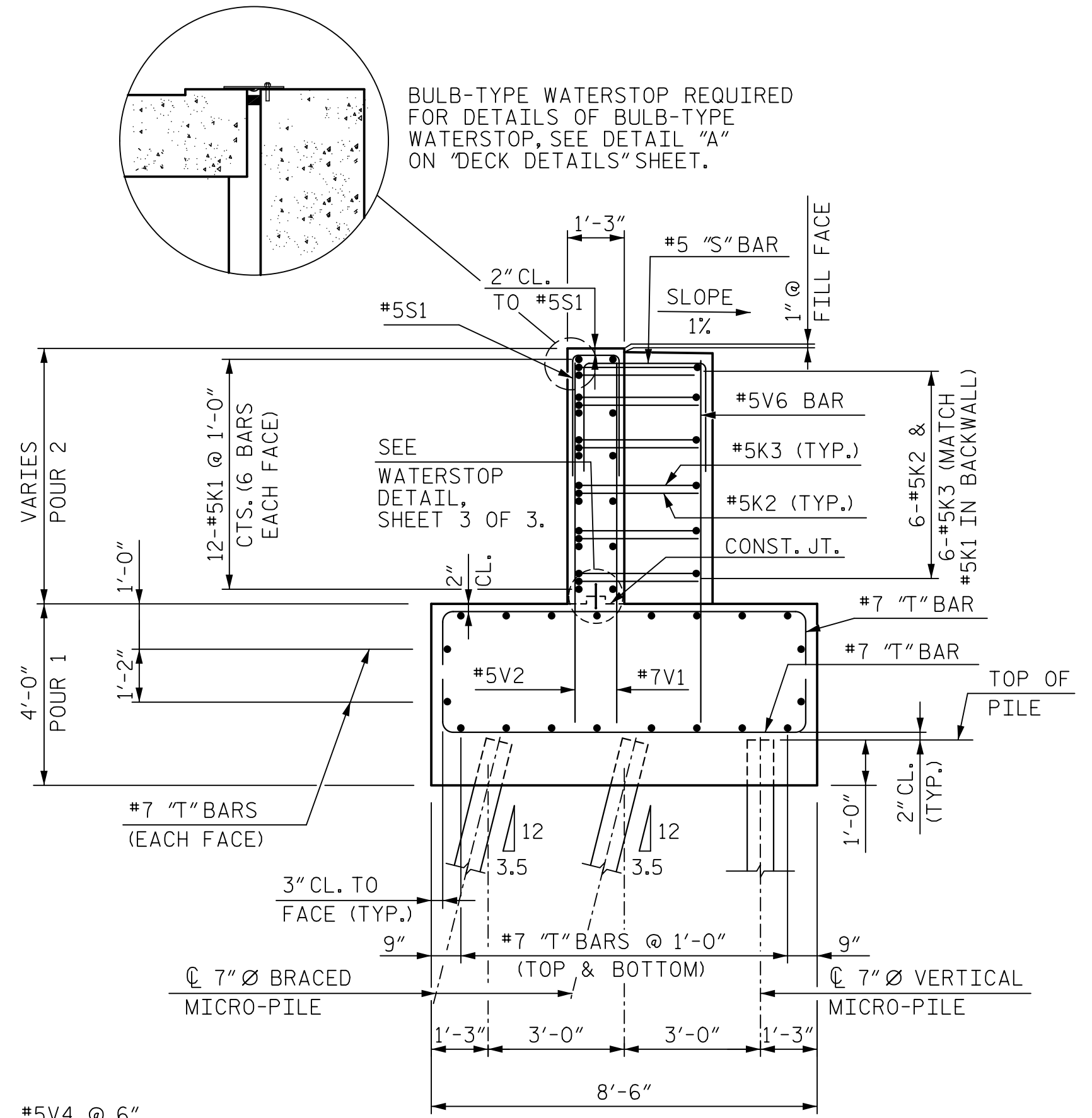
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS						SHEET NO. S8-24 TOTAL SHEETS 39
	NO.	BY	DATE	NO.	BY	DATE	
	1			3			
DRAWN BY <u>M. WRIGHT</u> DATE <u>10/17</u> CHECKED BY <u>J. WHEATLEY</u> DATE <u>10/17</u> DWG. NO. 24	2			4			



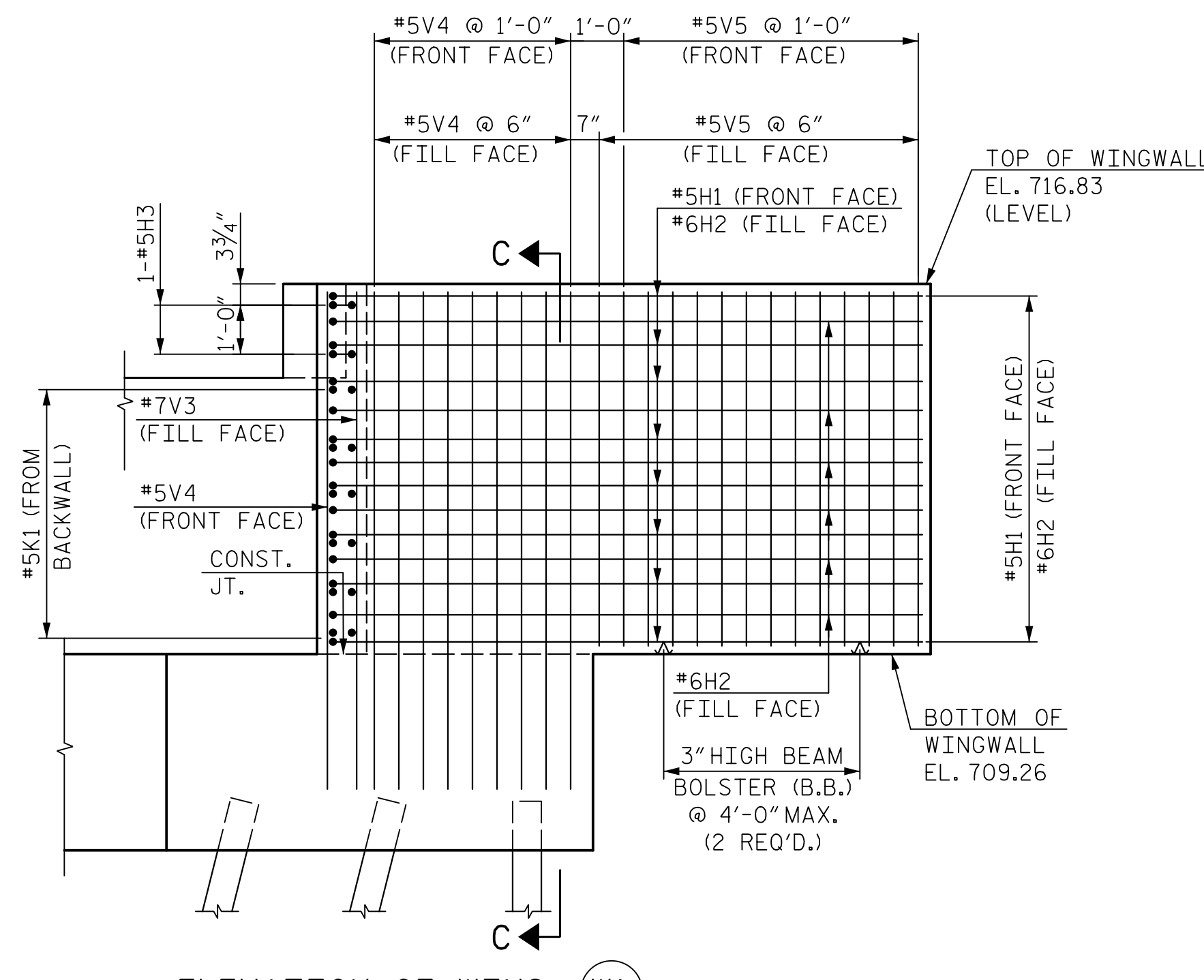
SECTION A-A

- Ⓐ 8-#5V4 @ 6" (FILL FACE)
- Ⓑ 8-#5V4 @ 6" (FILL FACE)
- Ⓒ 4-#5V4 @ 1'-0" (INTERIOR FACE)

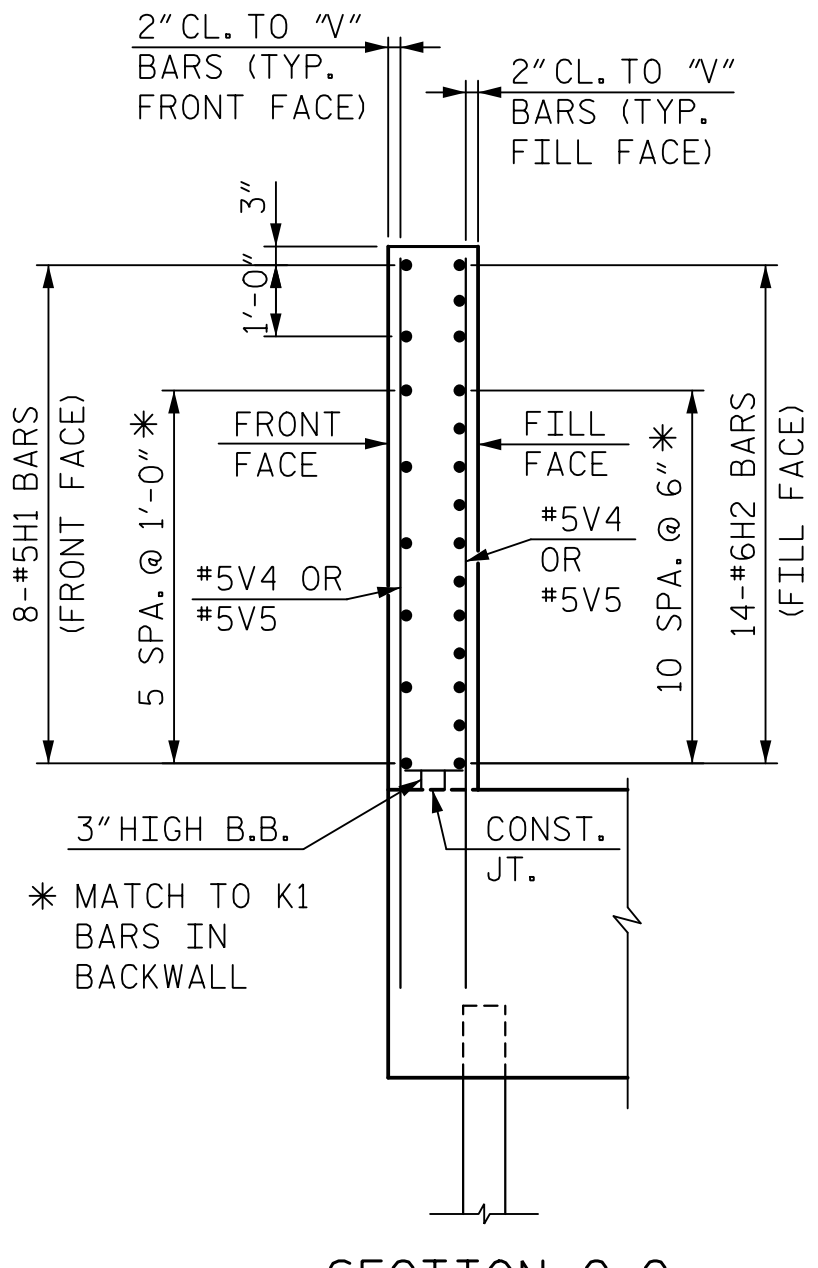
NOTES:
 FOR ABUTMENT AND WINGWALL DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.
 FOR LOCATIONS OF HANDRAIL ANCHORAGES IN TOP OF WINGWALLS, SEE "METAL HANDRAIL DETAILS" SHEETS.



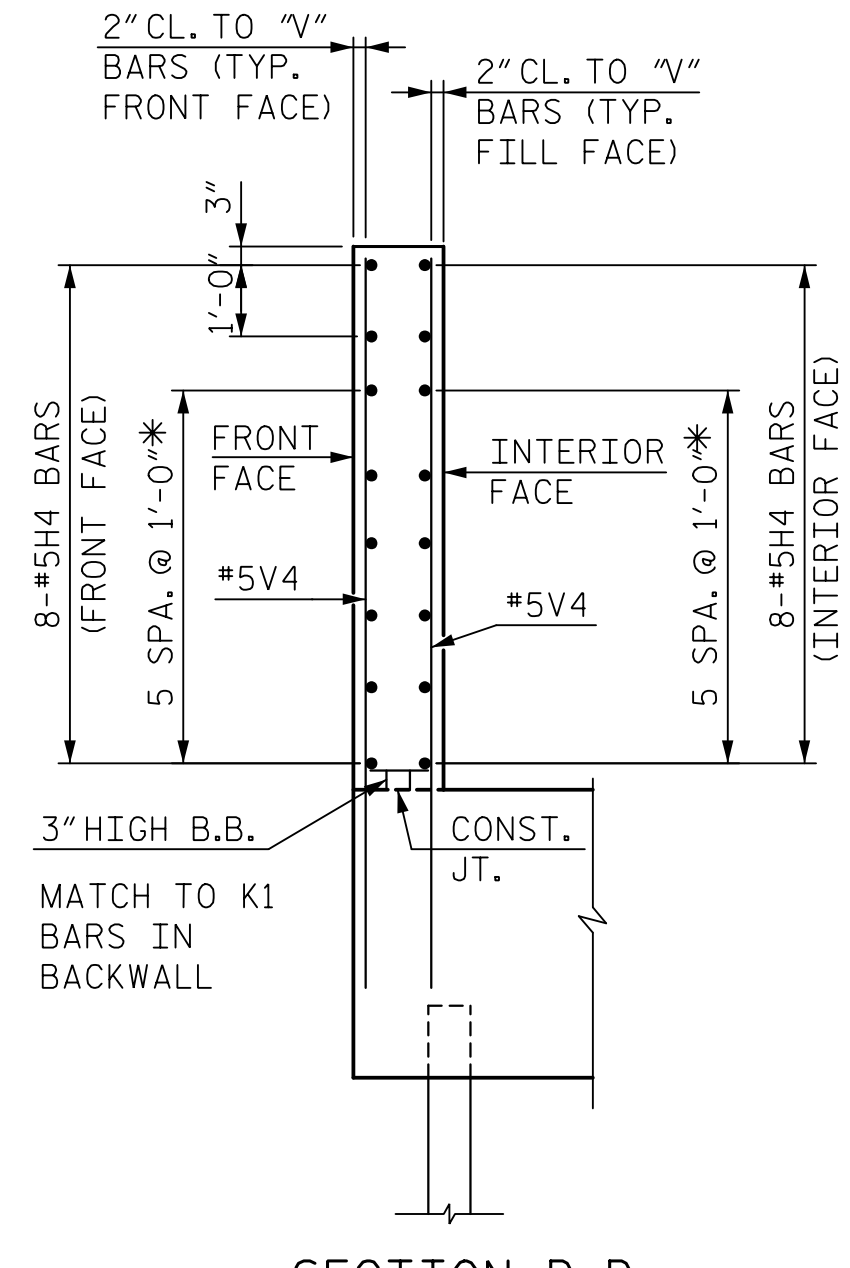
SECTION B-B



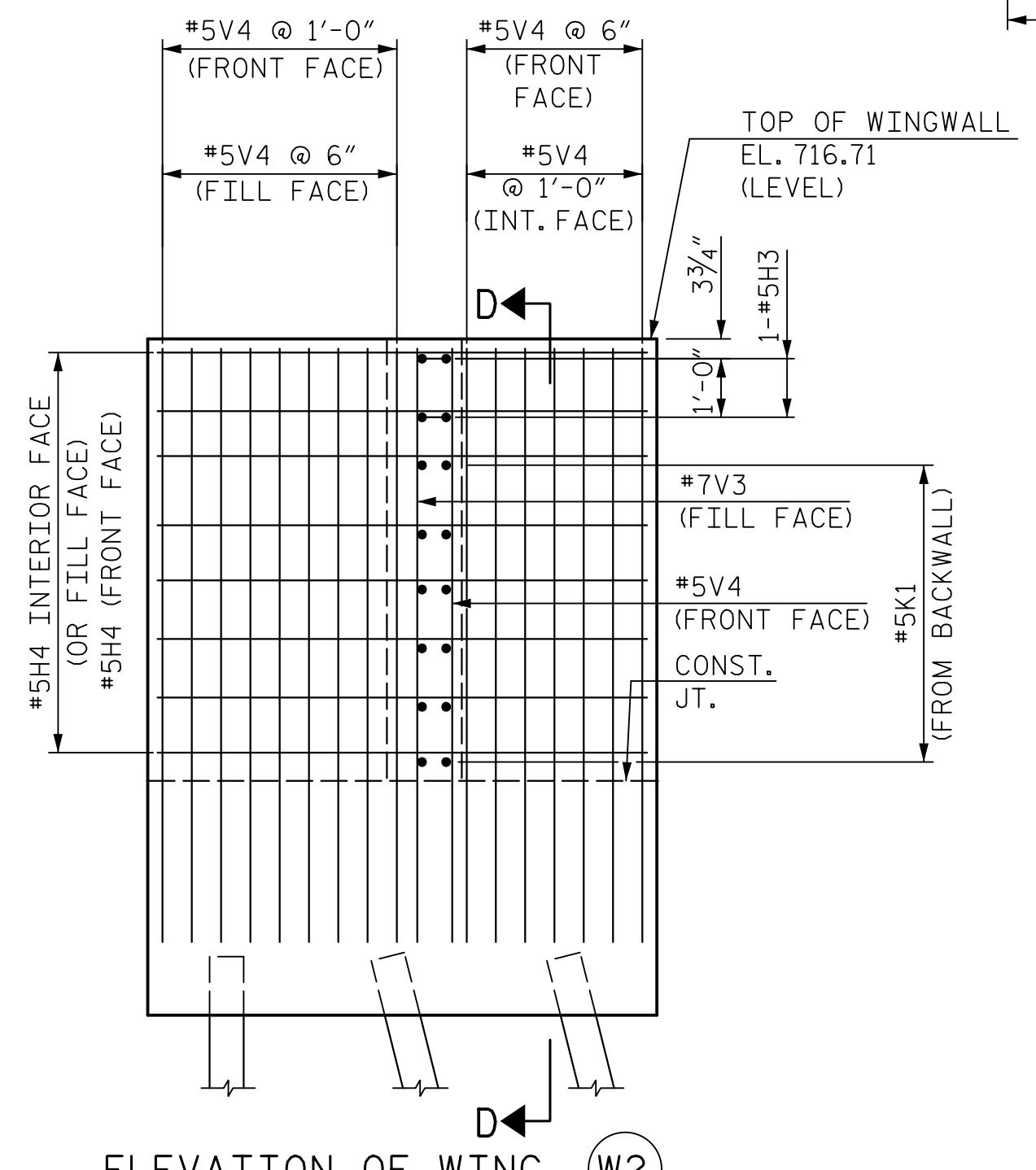
ELEVATION OF WING (W1)



SECTION C-C

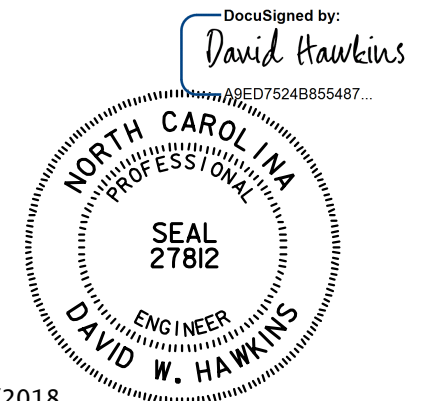


SECTION D-D



ELEVATION OF WING (W2)

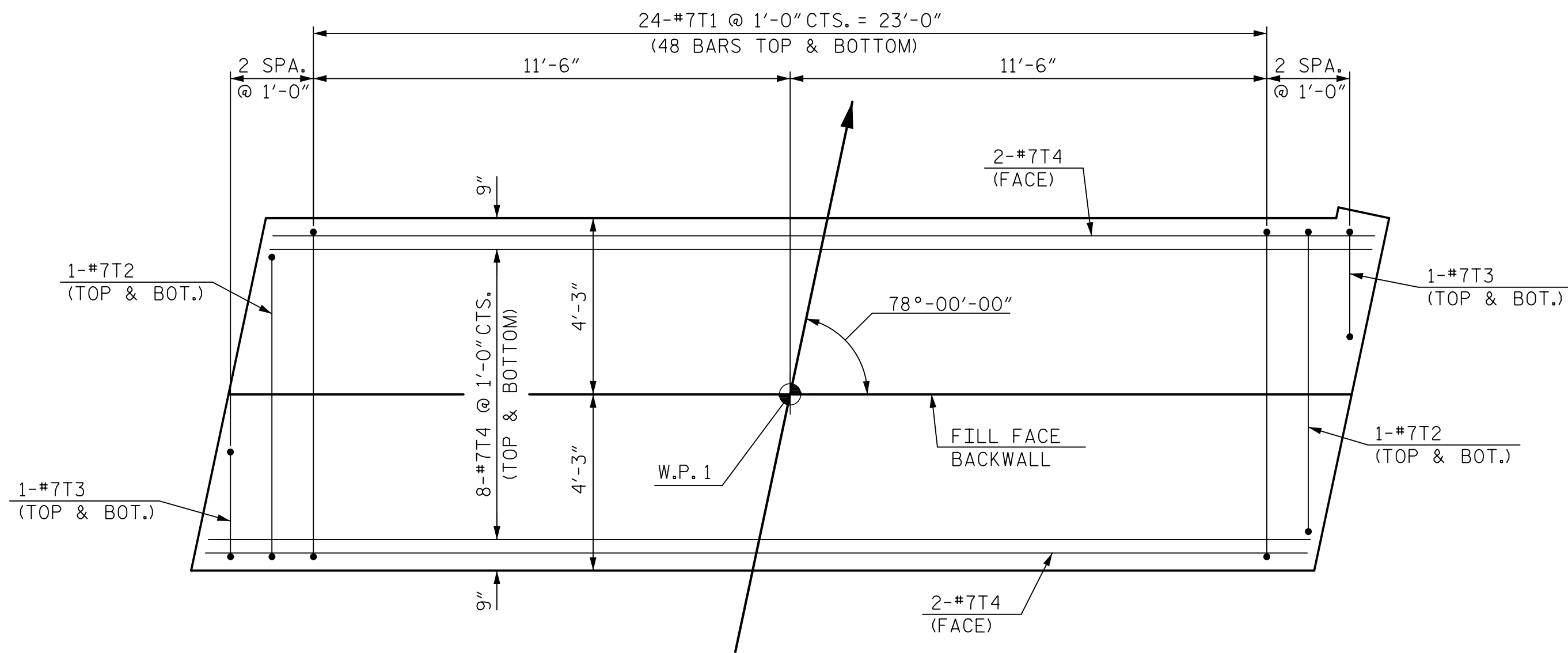
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



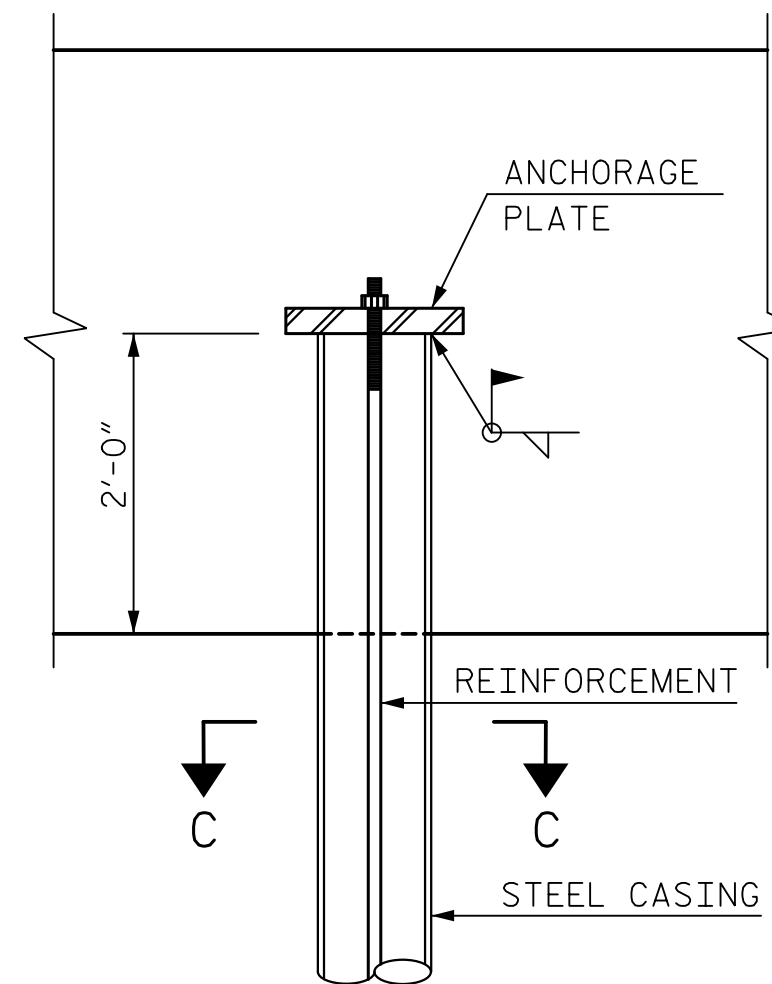
PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 ABUTMENT 1

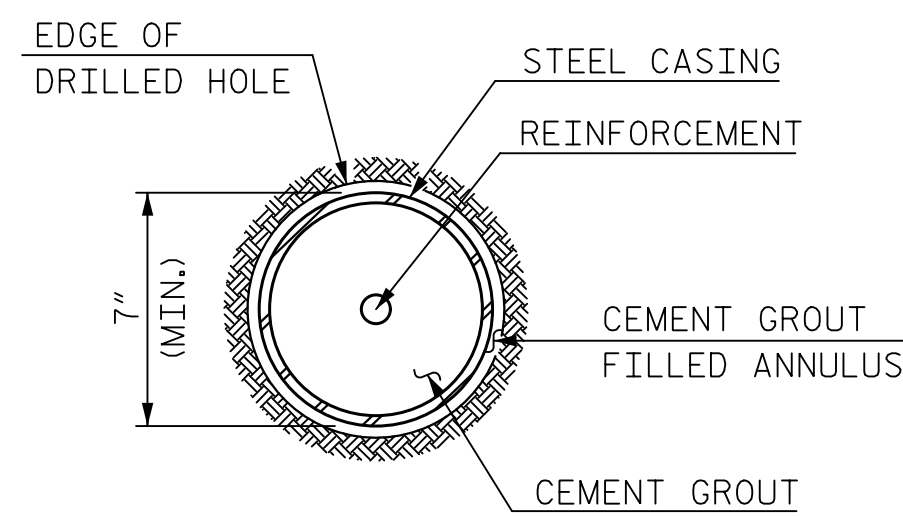
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 25	
DRAWN BY: M. WRIGHT	DATE: 10/17	CHECKED BY: J. WHEATLEY	DATE: 10/17	REVISIONS	
				NO.	BY
				1	3
				2	4
				SHEET NO. S8-25	
				TOTAL SHEETS 39	



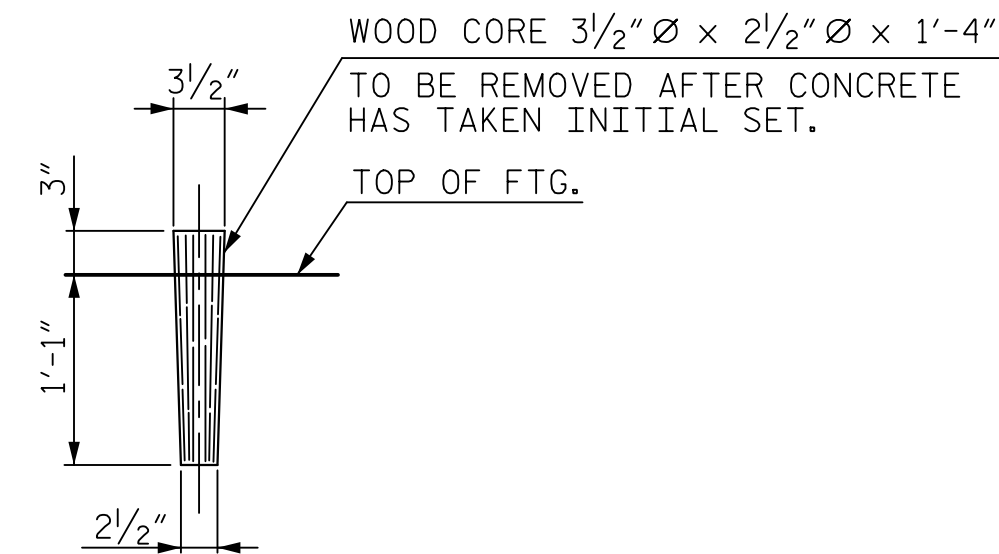
FOOTING REINFORCING PLAN



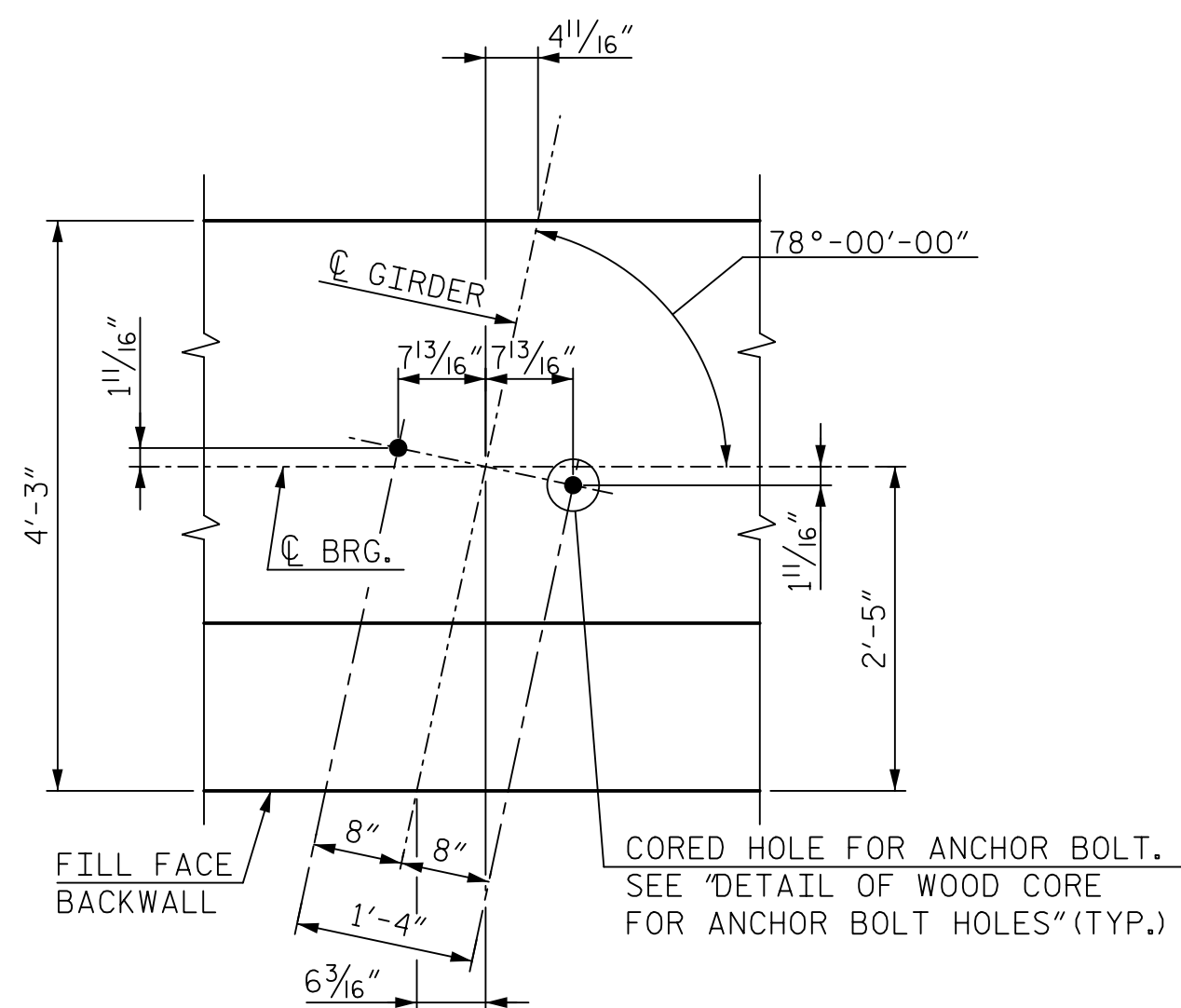
MICROPILE DETAIL



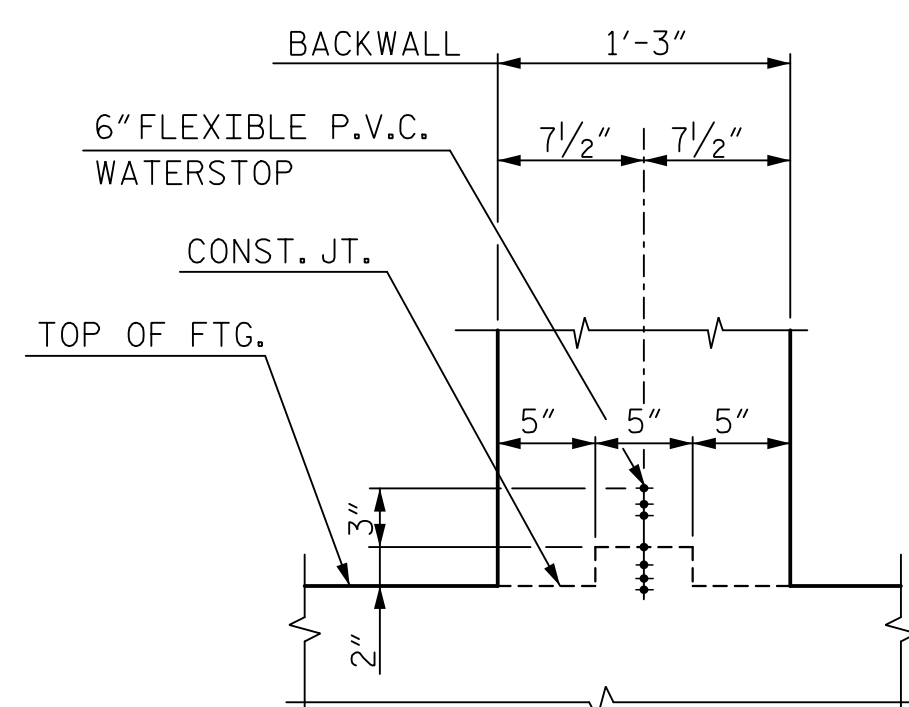
SECTION C-C



DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES



ANCHOR BOLT LAYOUT DETAIL



WATERSTOP DETAIL

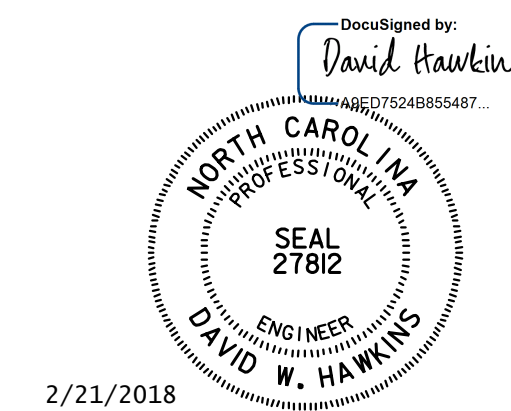
BAR TYPES				BILL OF REINFORCING			
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
ABUTMENT 1							
H1	8	5	1	12'-11"	108		
H2	14	6	1	13'-3"	279		
H3	4	5	2	6'-7"	27		
H4	16	5	STR	8'-4"	139		
K1	12	5	STR	26'-8"	334		
K2	6	5	3	14'-6"	91		
K3	6	5	4	6'-10"	43		
S1	21	5	5	3'-11"	86		
S2	1	5	5	4'-0"	4		
S3	1	5	5	4'-3"	4		
S4	1	5	5	4'-5"	5		
S5	1	5	5	4'-8"	5		
S6	1	5	5	4'-10"	5		
S7	1	5	5	5'-1"	5		
S8	1	5	5	5'-3"	5		
S9	1	5	5	5'-6"	6		
S10	1	5	5	5'-8"	6		
S11	1	5	5	12'-9"	13		
S12	1	5	5	8'-1"	8		
T1	48	7	6	10'-4"	1,014		
T2	4	7	6	9'-9"	80		
T3	4	7	6	5'-2"	42		
T4	20	7	STR	26'-6"	1,083		
V1	41	7	STR	8'-2"	684		
V2	21	5	STR	8'-2"	179		
V3	12	7	STR	10'-1"	247		
V4	46	5	STR	10'-1"	484		
V5	21	5	STR	7'-2"	157		
V6	12	5	STR	8'-1"	101		
					TOTAL	5,244	

ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

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

QUANTITIES		
ITEM		TOTAL
REINFORCING STEEL	LBS.	5,244
CLASS AA CONCRETE BREAKDOWN:		
POUR 1		
FOOTING	CU. YDS	34.1
POUR 2		
BACKWALL & WINGS	CU. YDS	16.8
TOTAL	CU. YDS	50.9
7" Ø MICROPILES	EACH	12



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

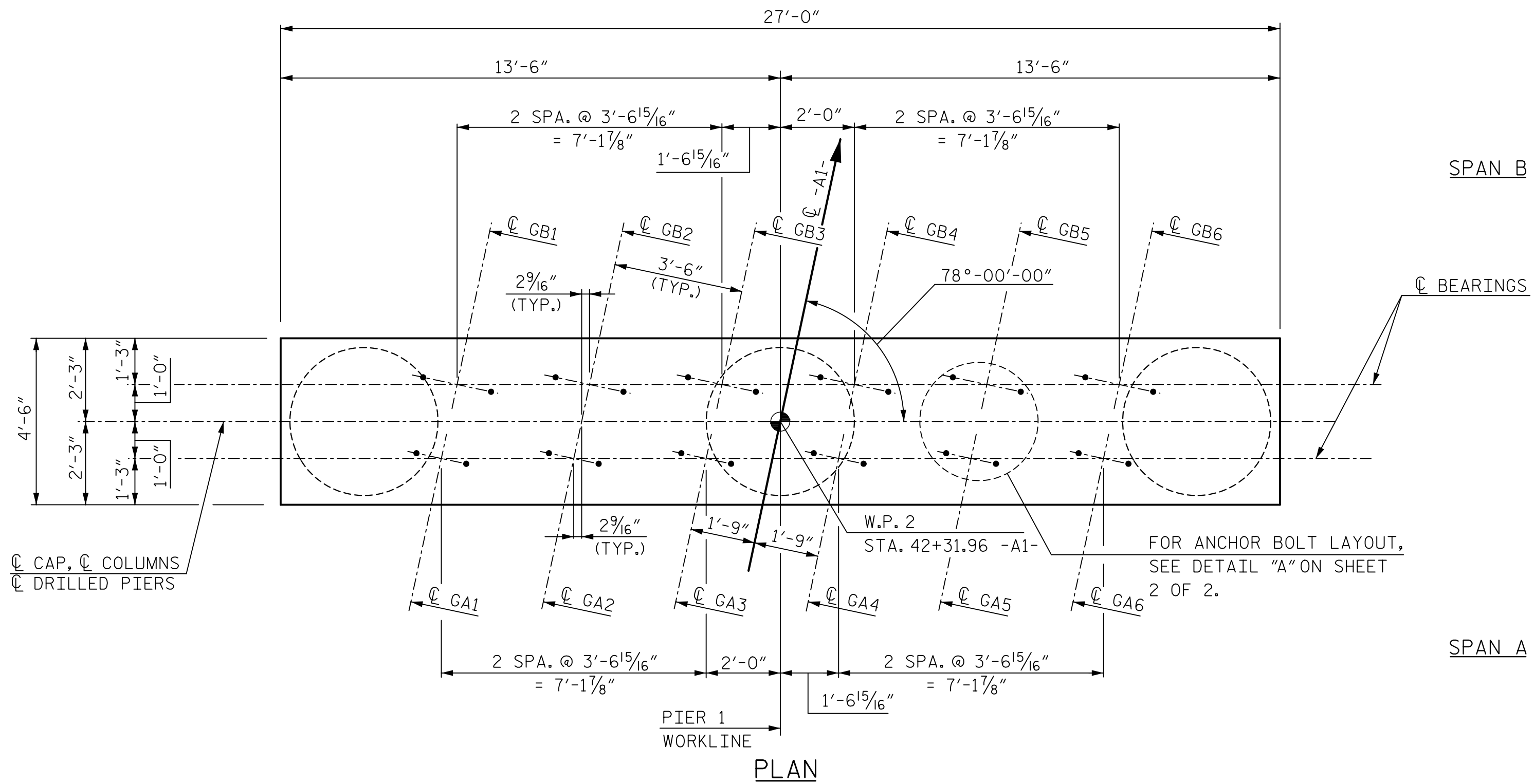
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 3 OF 3

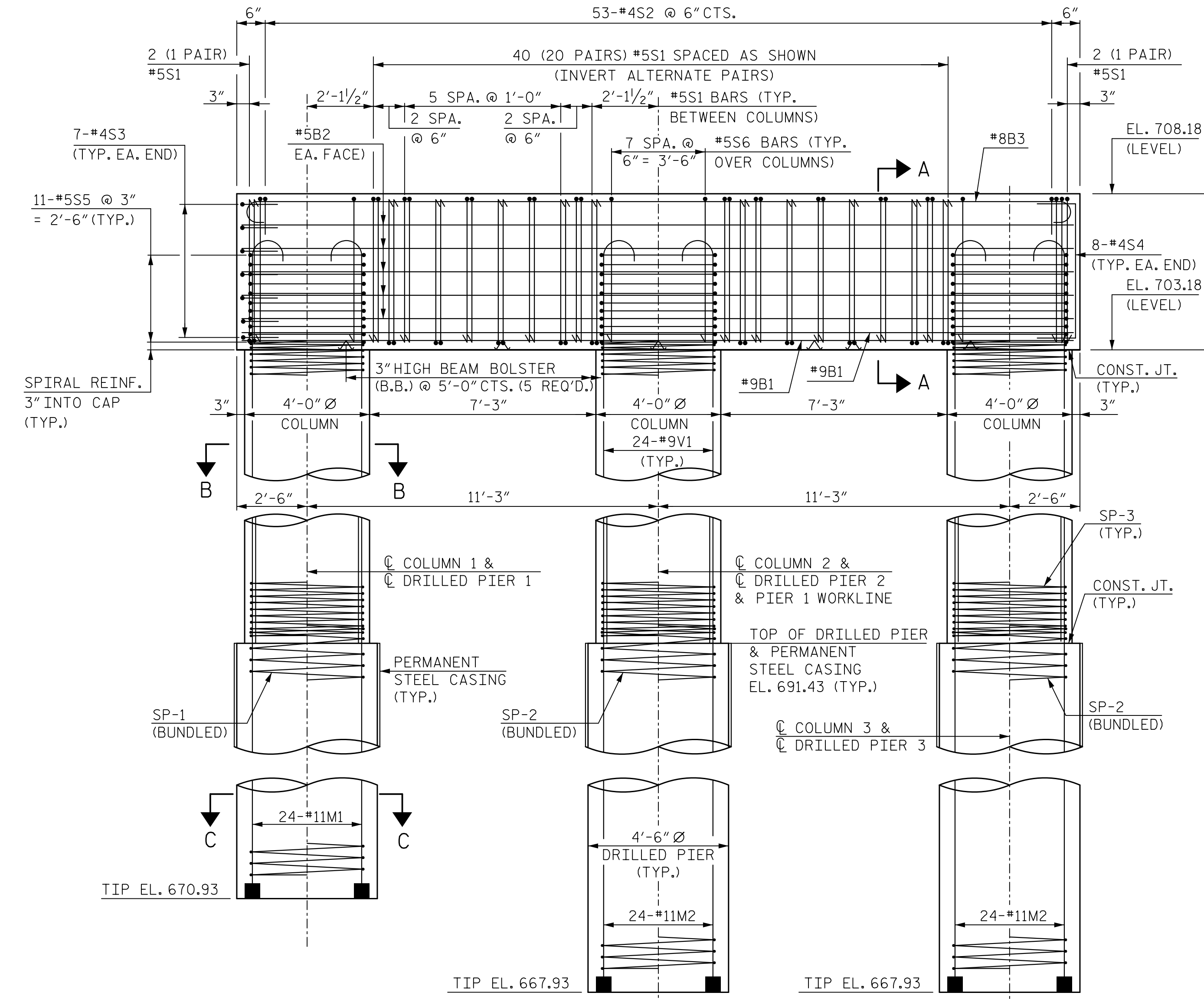
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 1

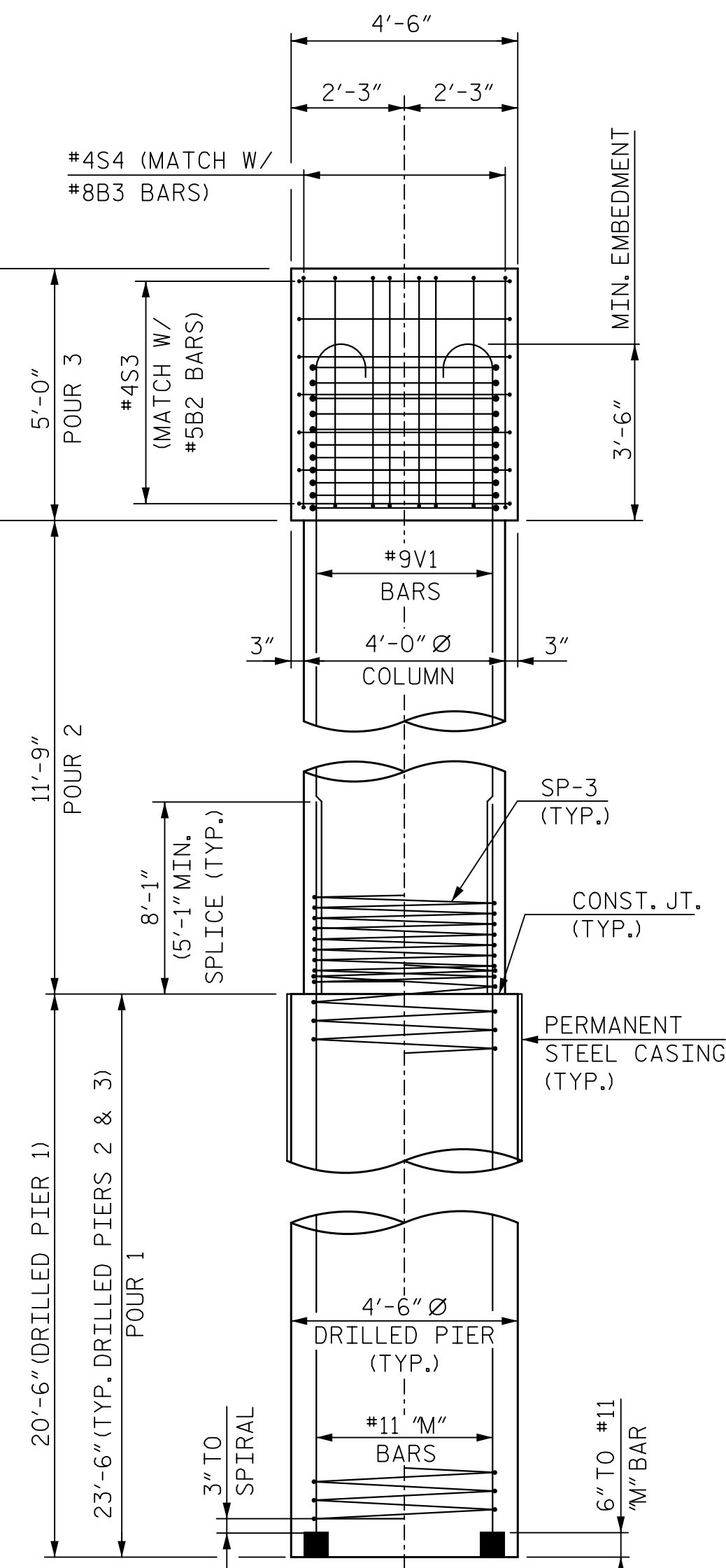
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO.		
	NO.	BY	DATE	NO.	BY	DATE	S8-26
	1			3			TOTAL SHEETS
DRAWN BY: <u>M. WRIGHT</u> DATE: <u>10/17</u> CHECKED BY: <u>J. WHEATLEY</u> DATE: <u>10/17</u> DWG. NO. 26				2			39



PLAN



ELEVATION



END ELEVATION

NOTES:

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C 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.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCING IS DETAILED WITH 3 FT. OF EXTRA LENGTH.

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

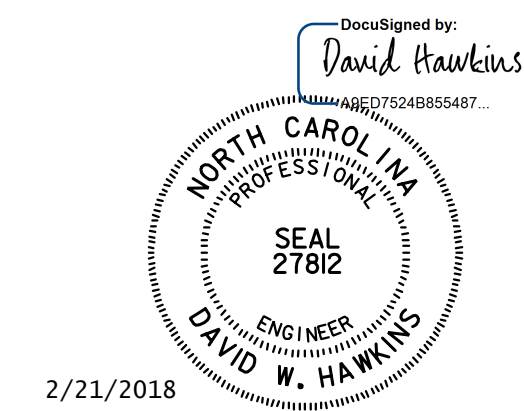
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

PIER 1

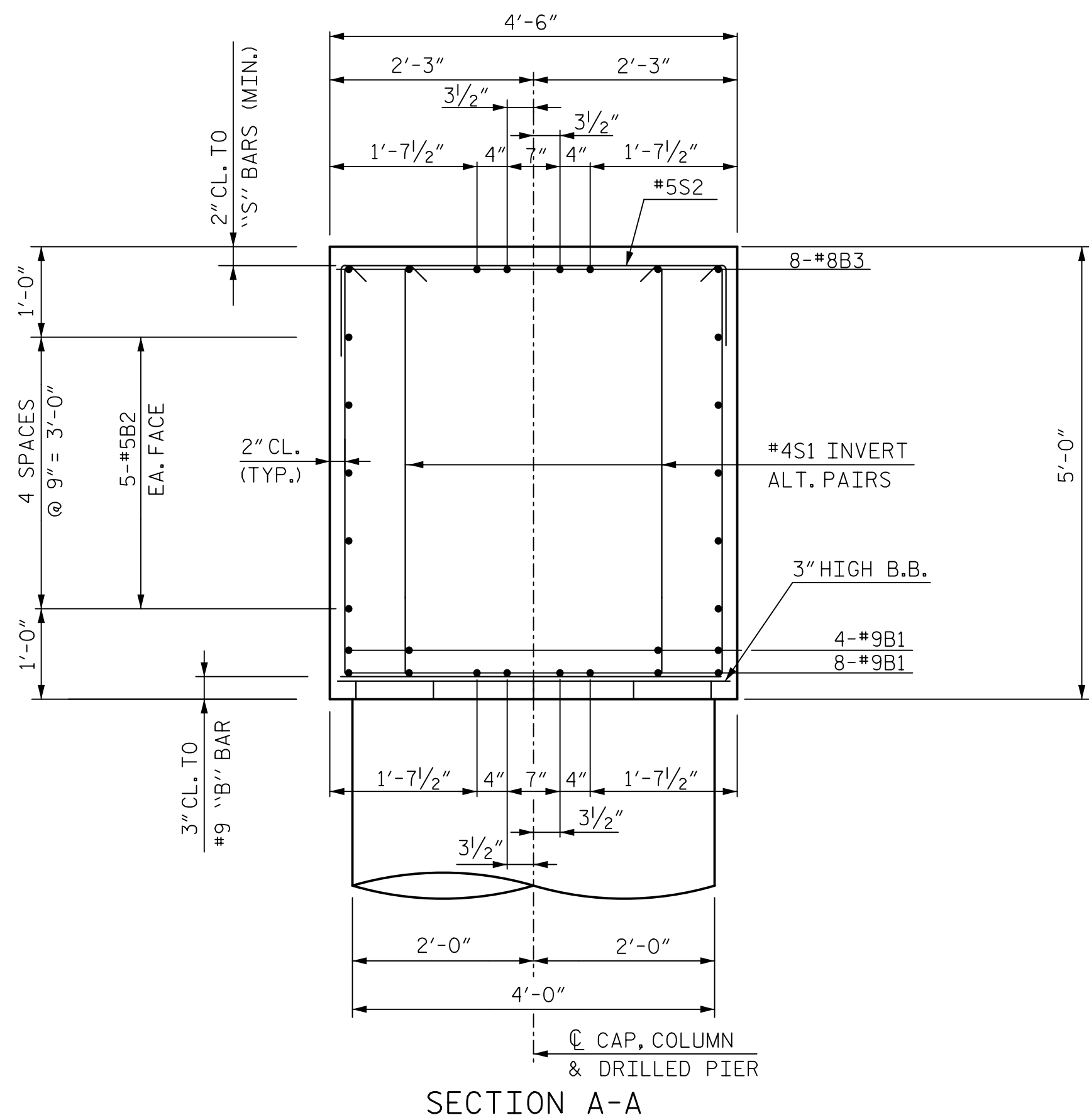


2/21/2018

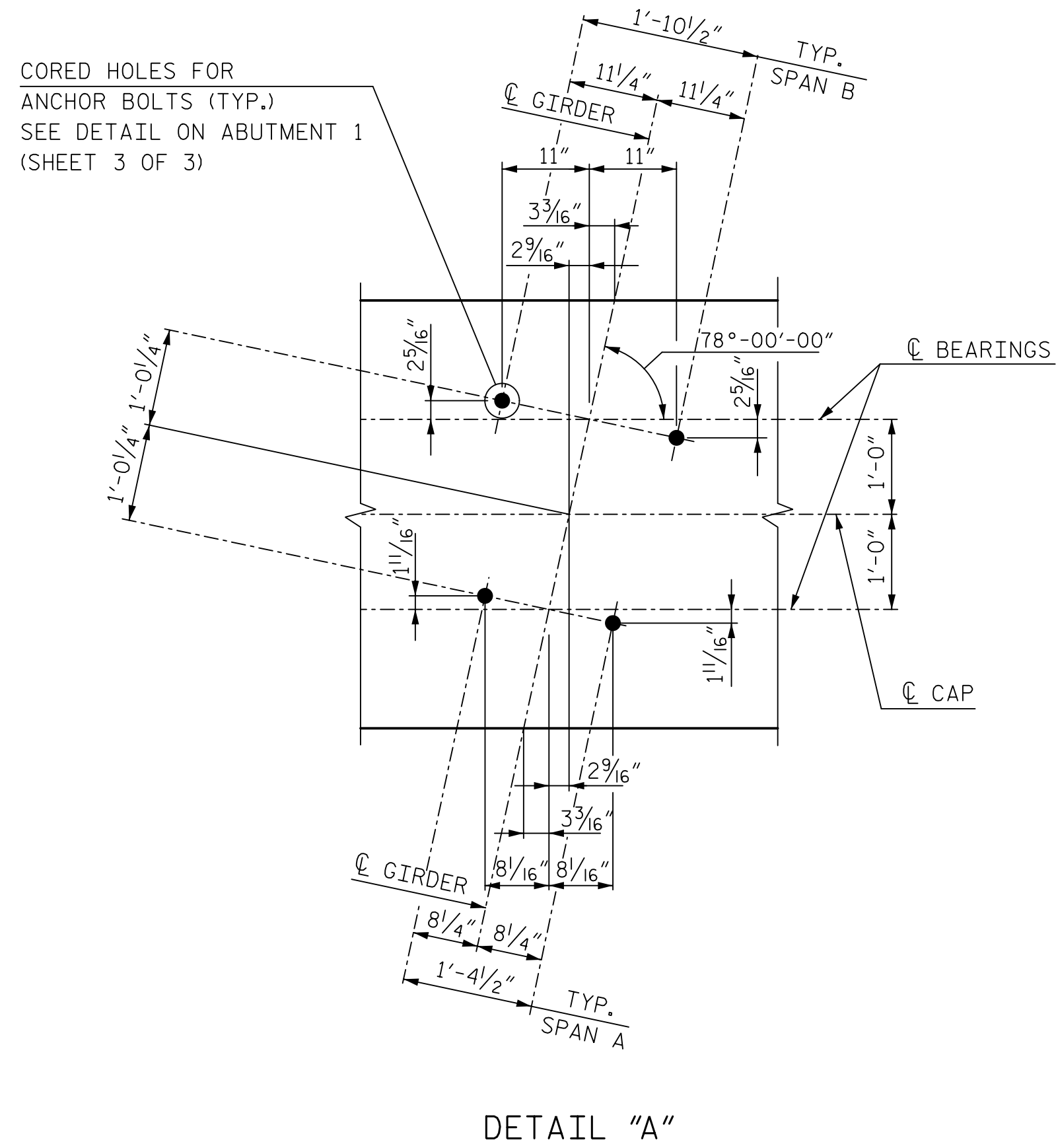
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	DRAWN BY: J. BAYNE	DATE: 11/17	DWG. NO. 27
	CHECKED BY: J. WHEATLEY	DATE: 11/17	

REVISIONS						SHEET NO. S8-27
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			

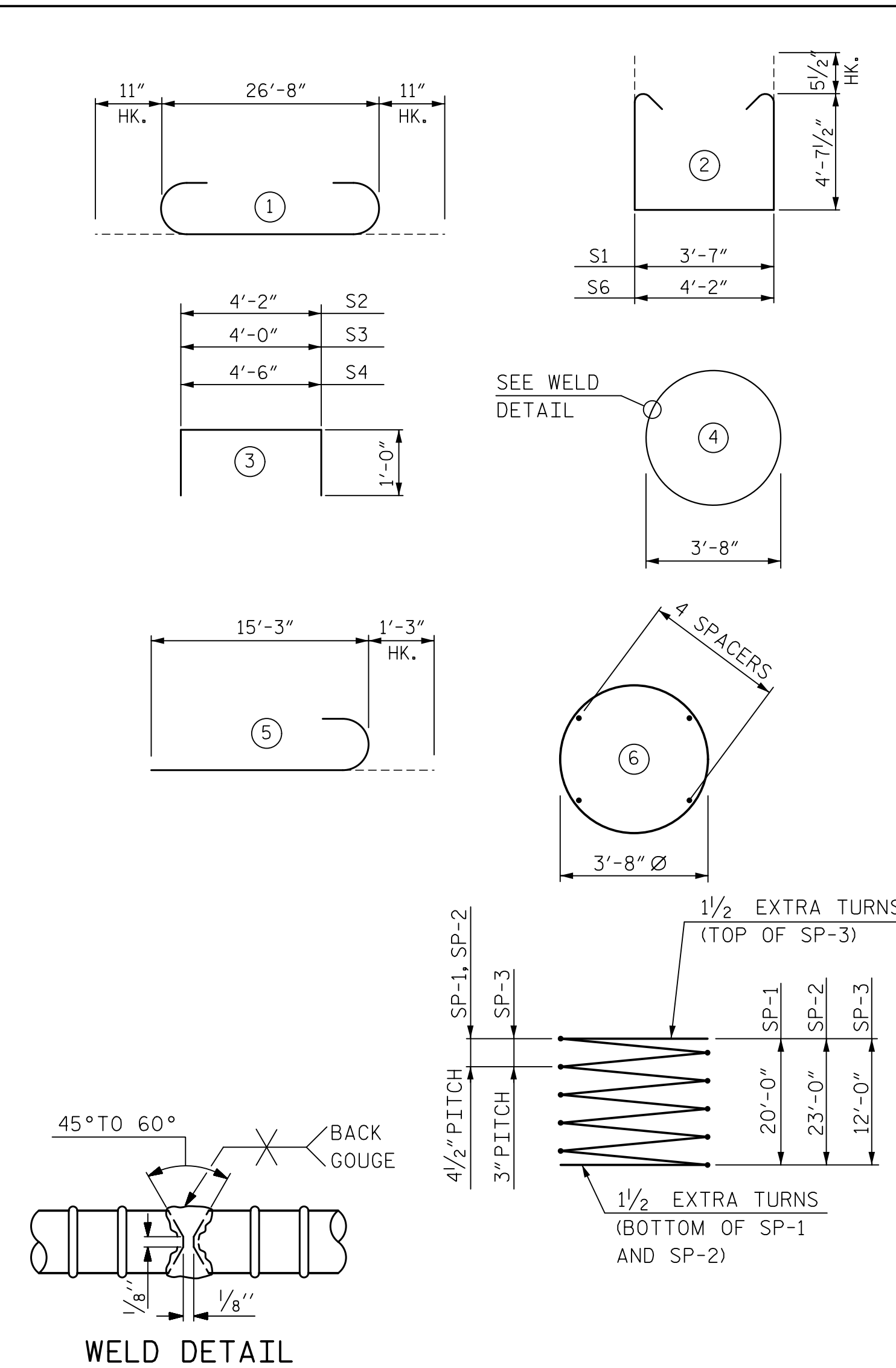


SECTION A-A



DETAIL "A"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

PIER 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	9	STR.	26'-8"	1,088
B2	10	5	STR.	26'-8"	278
B3	8	8	1	28'-6"	609
S1	44	5	2	13'-9"	631
S2	53	4	3	6'-2"	218
S3	14	4	3	6'-0"	56
S4	16	4	3	6'-6"	69
*S5	33	5	4	11'-7"	399
S6	24	5	2	14'-4"	359
M1	24	11	STR.	28'-1"	3,581
M2	48	11	STR.	31'-1"	7,927
V1	72	9	5	16'-6"	4,039
SP-1	2	**	6	624'-10"	1,303
SP-2	4	**	6	716'-0"	2,987
SP-3	3	**	6	563'-11"	1,764

QUANTITIES

ITEM	TOTAL
REINFORCING STEEL	LBS 19,254
SPIRAL COLUMN REINFORCING STEEL	LBS 6,054
CLASS AA CONCRETE:	
POUR 2	C.Y. 16.4
POUR 3	C.Y. 22.5
TOTAL	C.Y. 38.9
4'-6" DIA. DRILLED PIERS	NO. 3
DRILLED PIER IN SOIL	L.F. 14.5
DRILLED PIER NOT IN SOIL	L.F. 53
DRILLED PIER CONCRETE POUR 1	C.Y. 39.8
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIER	L.F. 60.0
SID INSPECTIONS	EACH 3
SPT TESTING	EACH 3
CSL TESTING	EACH 3
THERMAL INTEGRITY PROFILER	EACH 3

- * #5S5 CIRCULAR TIES SHALL BE ASTM DESIGNATION A706, GRADE 60. FABRICATION TO BE IN ACCORDANCE WITH THE 'MANUAL OF STANDARD PRACTICE', A.C.I. 315.80.
- ** THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE BUNDLED #5 PLAIN OR DEFORMED BAR.
- *** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

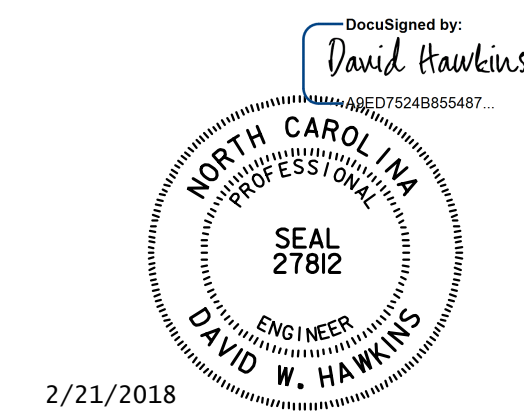
PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

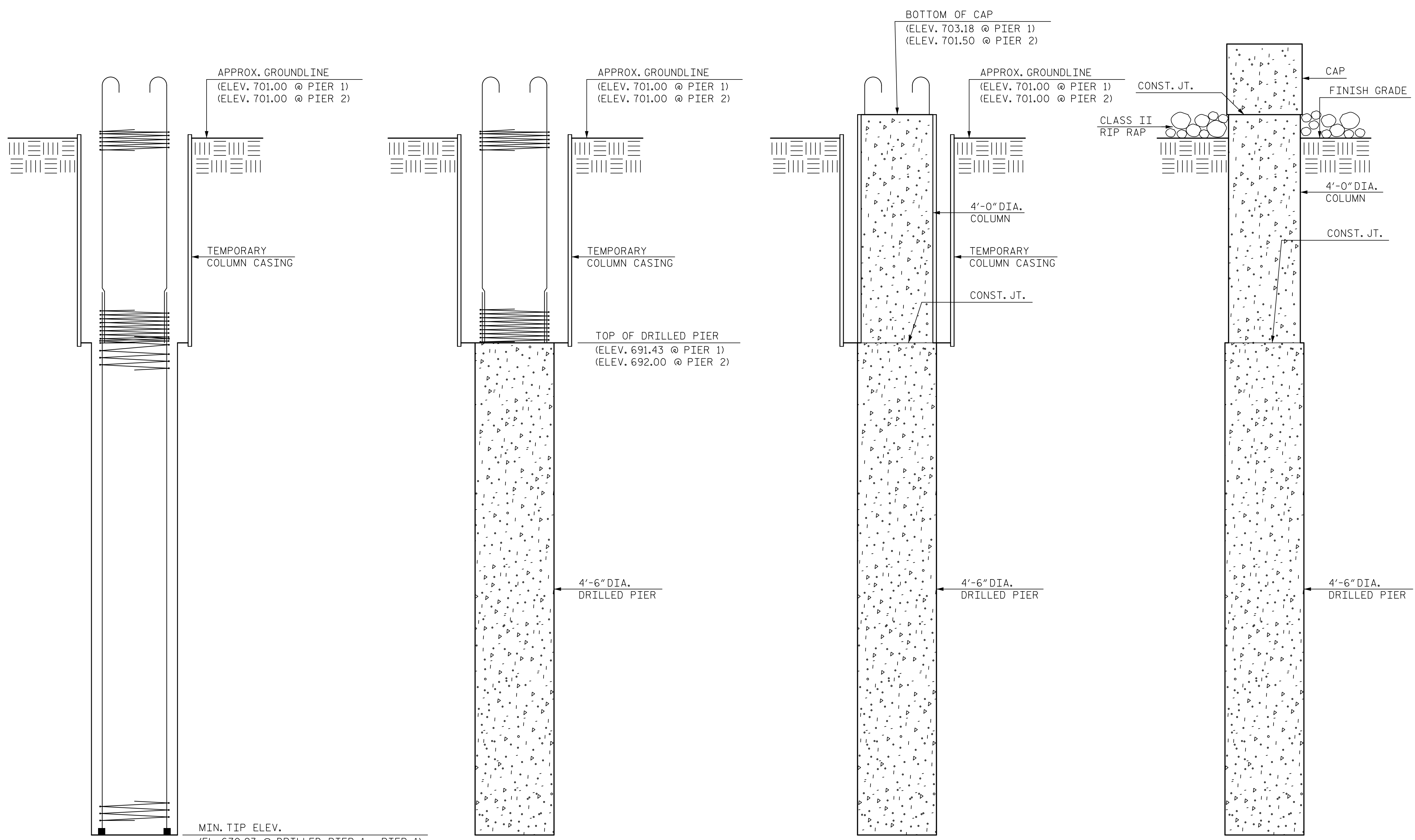
PIER 1



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: J. BAYNE	DATE: 11/17
CHECKED BY: J. WHEATLEY	DATE: 11/17
DWG. NO. 28	

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-28
1			3			TOTAL SHEETS
2			4			39



MIN. TIP ELEV.
 (EL. 670.93 @ DRILLED PIER 1 - PIER 1)
 (EL. 667.93 @ DRILLED PIERS 2 & 3 - PIER 1)
 (EL. 661.00 @ DRILLED PIER 1 - PIER 2)
 (EL. 656.00 @ DRILLED PIERS 2 & 3 - PIER 2)

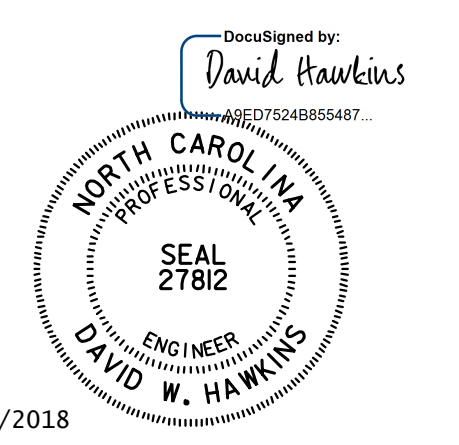
NOTES:

FOR COLUMN EXCAVATION SEE COLUMN EXCAVATION SPECIAL PROVISION.

THE CONTRACTOR SHALL DETERMINE THE DIAMETER OF TEMPORARY COLUMN CASING SUCH THAT THE WORK CAN BE COMPLETED. PROVIDE TEMPORARY COLUMN CASING A MINIMUM DIAMETER 6" GREATER THAN THE LARGEST CASING USED FOR DRILLED PIER CONSTRUCTION, AND A MINIMUM THICKNESS IN ACCORDANCE WITH TABLE 411-1 OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

THE CONTRACTOR HAS THE OPTION TO INSTALL THE COLUMN AND DRILLED PIER REINFORCING AT ONE TIME. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE ALIGNMENT AND POSITION OF THE REINFORCING CAGE.

CONTRACTOR SHALL ENSURE THAT THE TOP OF THE DRILLED PIER IS CLEAN AND FREE OF DEBRIS BEFORE PLACING COLUMN CONCRETE.



PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

- STEP 1
1. INSTALL TEMPORARY COLUMN CASING.
 2. EXCAVATE DRILLED PIER TO TIP ELEVATION IN ACCORDANCE WITH DRILLED PIERS SPECIAL PROVISION.
 3. INSTALL REBAR CAGE FOR DRILLED PIER. INSTALL REBAR CAGE FOR COLUMN IF DESIRED.

- STEP 2
1. POUR CONCRETE FOR DRILLED PIER TO TOP OF DRILLED PIER ELEVATION AS INDICATED.

- STEP 3
1. PLACE 4'-0" DIA. TEMPORARY COLUMN FORM.
 2. INSTALL REBAR CAGE FOR COLUMN, IF NOT ALREADY INSTALLED.
 3. POUR CONCRETE FOR COLUMN TO BOTTOM OF CAP ELEVATION AS INDICATED.
 4. REMOVE COLUMN FORMS.
 5. PROTECT THE COLUMN AND BACKFILL WITH CLEAN SAND.
 6. EXTRACT TEMPORARY COLUMN CASING.
 7. COMPLETE BRIDGE AND SHIFT RAILROAD TRAFFIC.

- STEP 4
1. EXCAVATE TO FINISH GRADE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

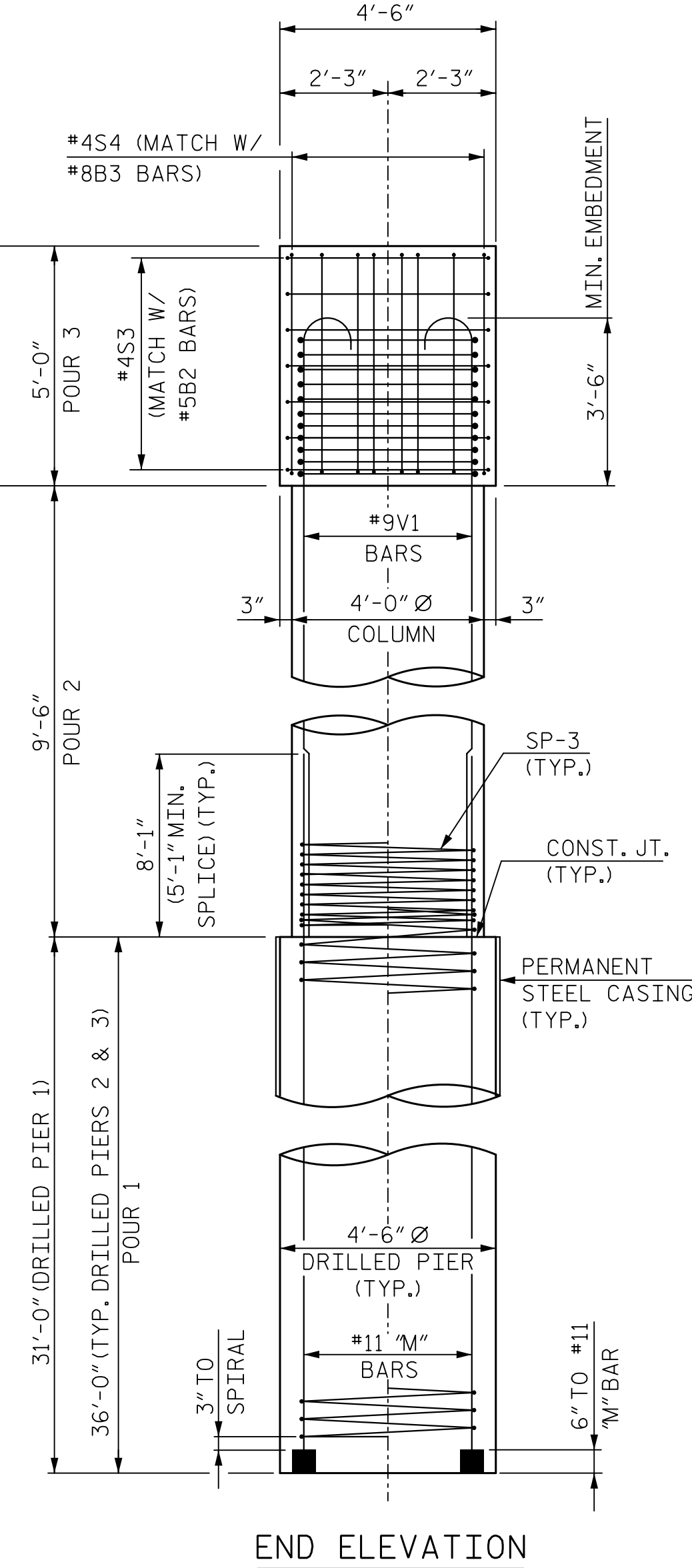
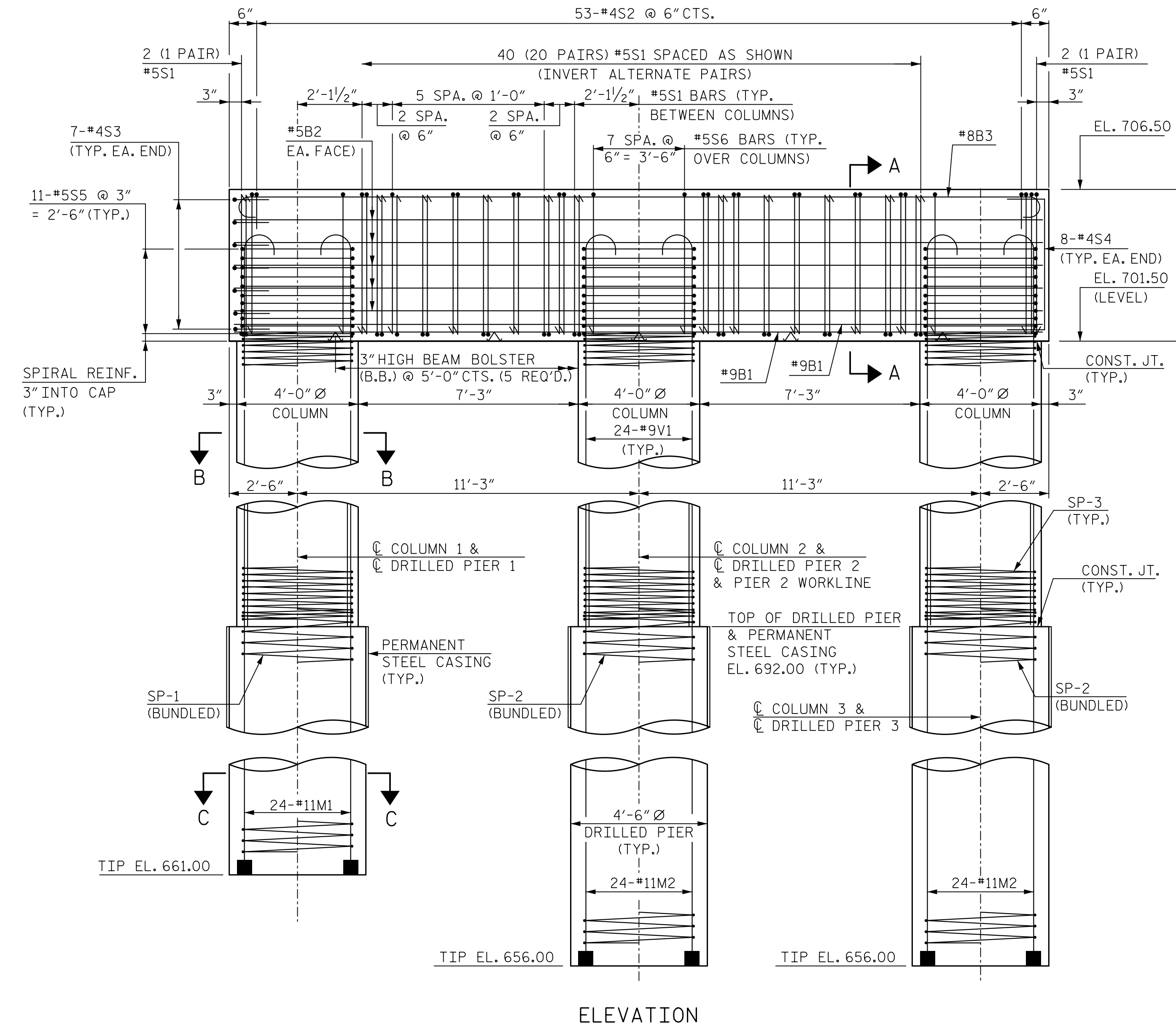
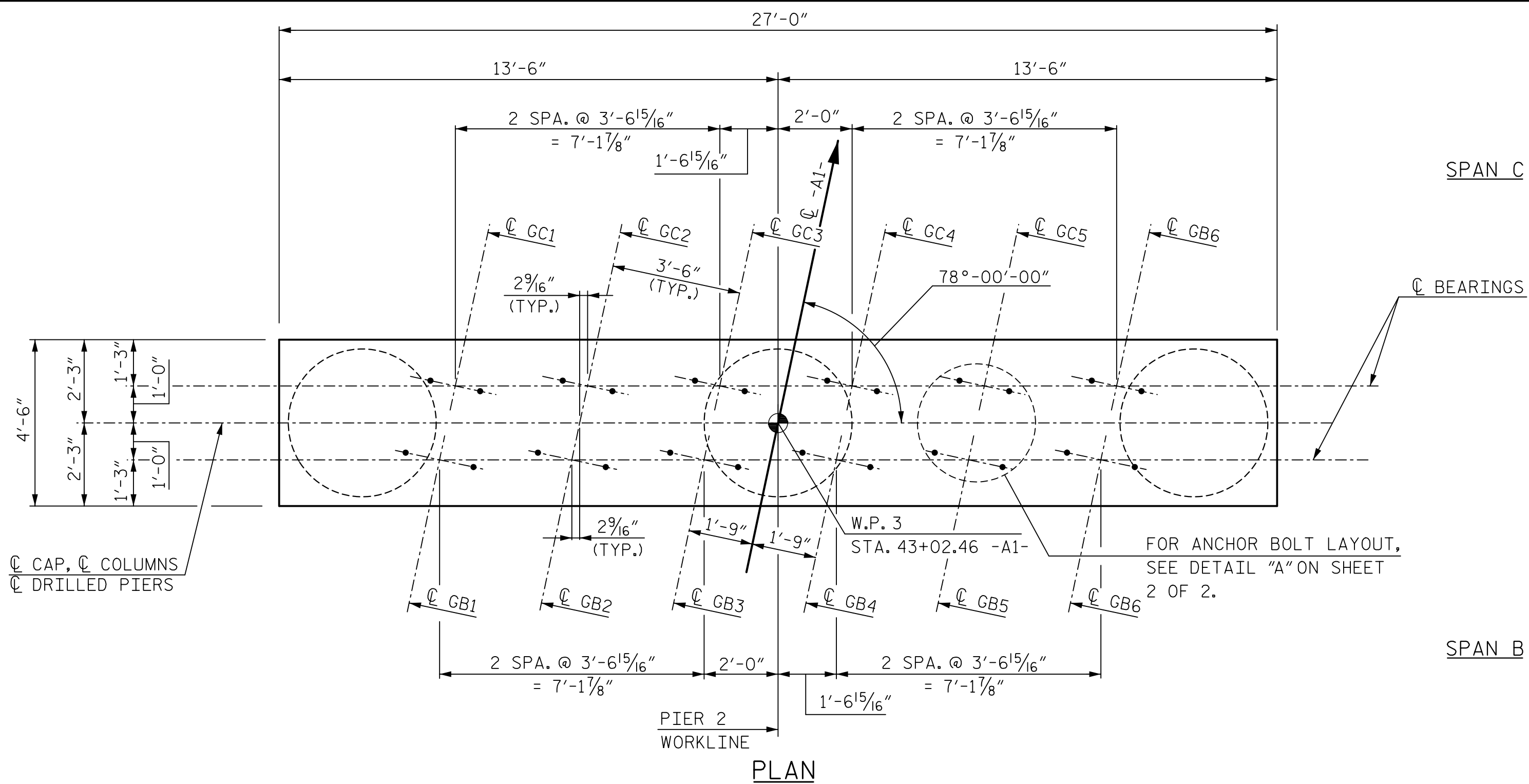
DRAWN BY: M. WRIGHT DATE: 11/17
 CHECKED BY: J. WHEATLEY DATE: 11/17

DWG. NO. 29

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 COLUMN AND DRILLED
 PIER CONSTRUCTION
 SEQUENCE - PIERS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			39
2			4			



NOTES:

- ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C 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.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCING IS DETAILED WITH 3 FT. OF EXTRA LENGTH.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL".

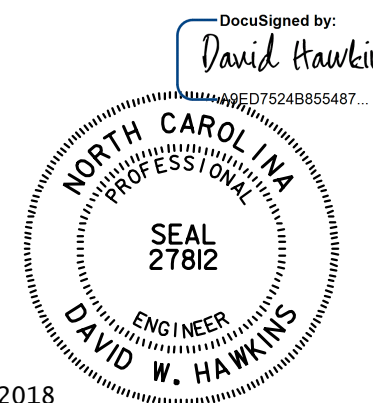
PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

PIER 2



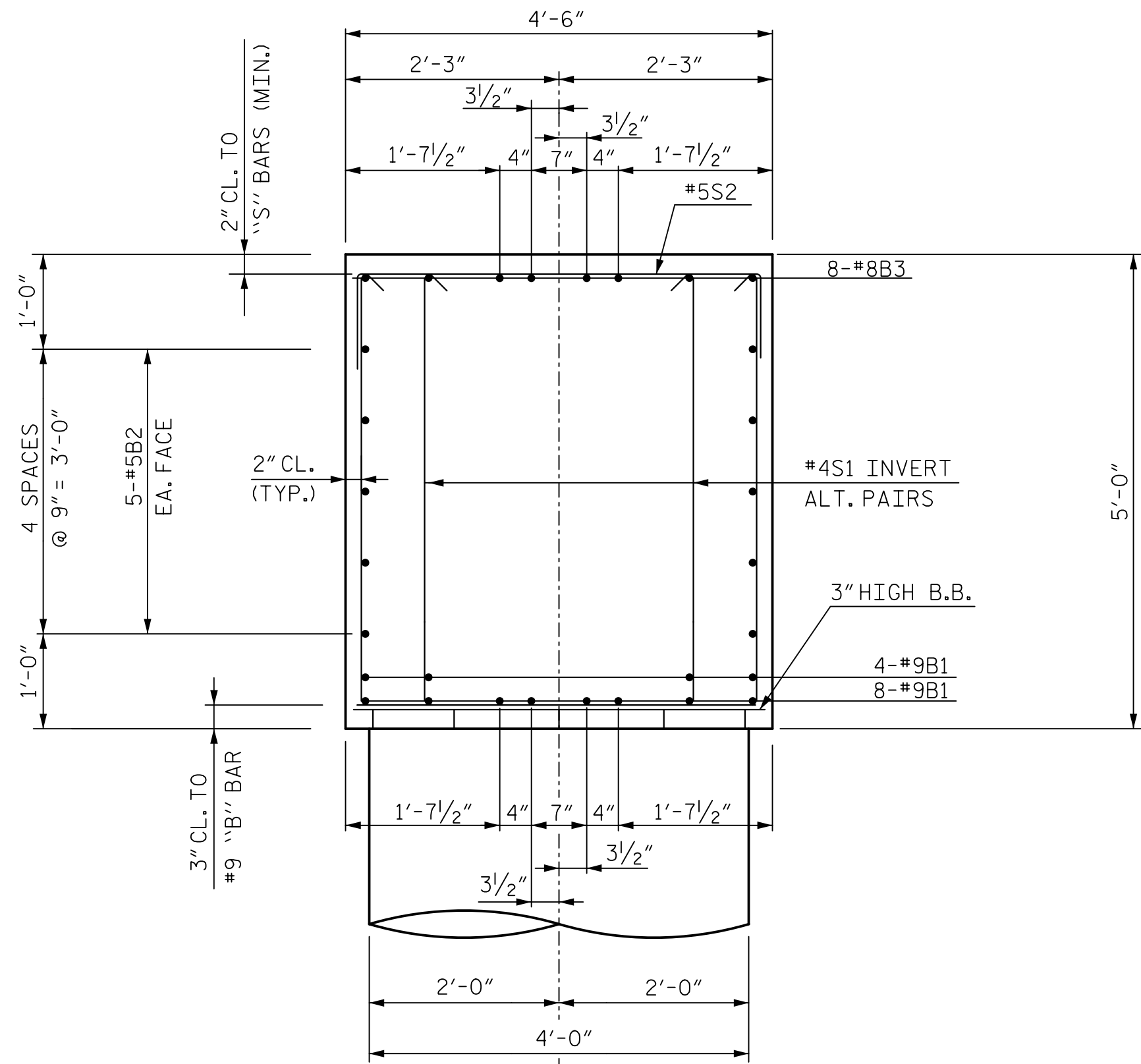
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

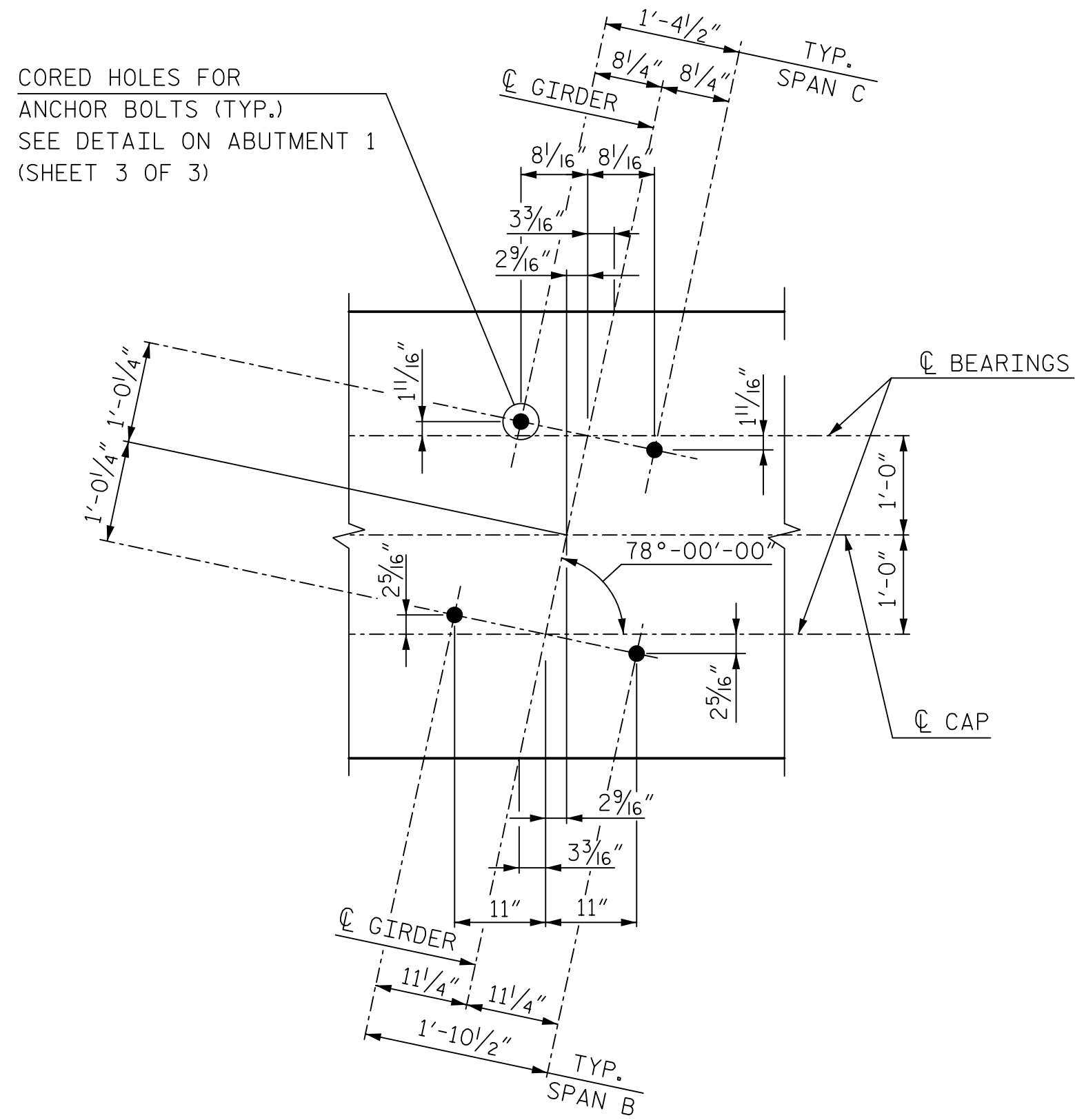
DRAWN BY J. BAYNE DATE 11/17
 CHECKED BY J. WHEATLEY DATE 11/17

DWG. NO. 30

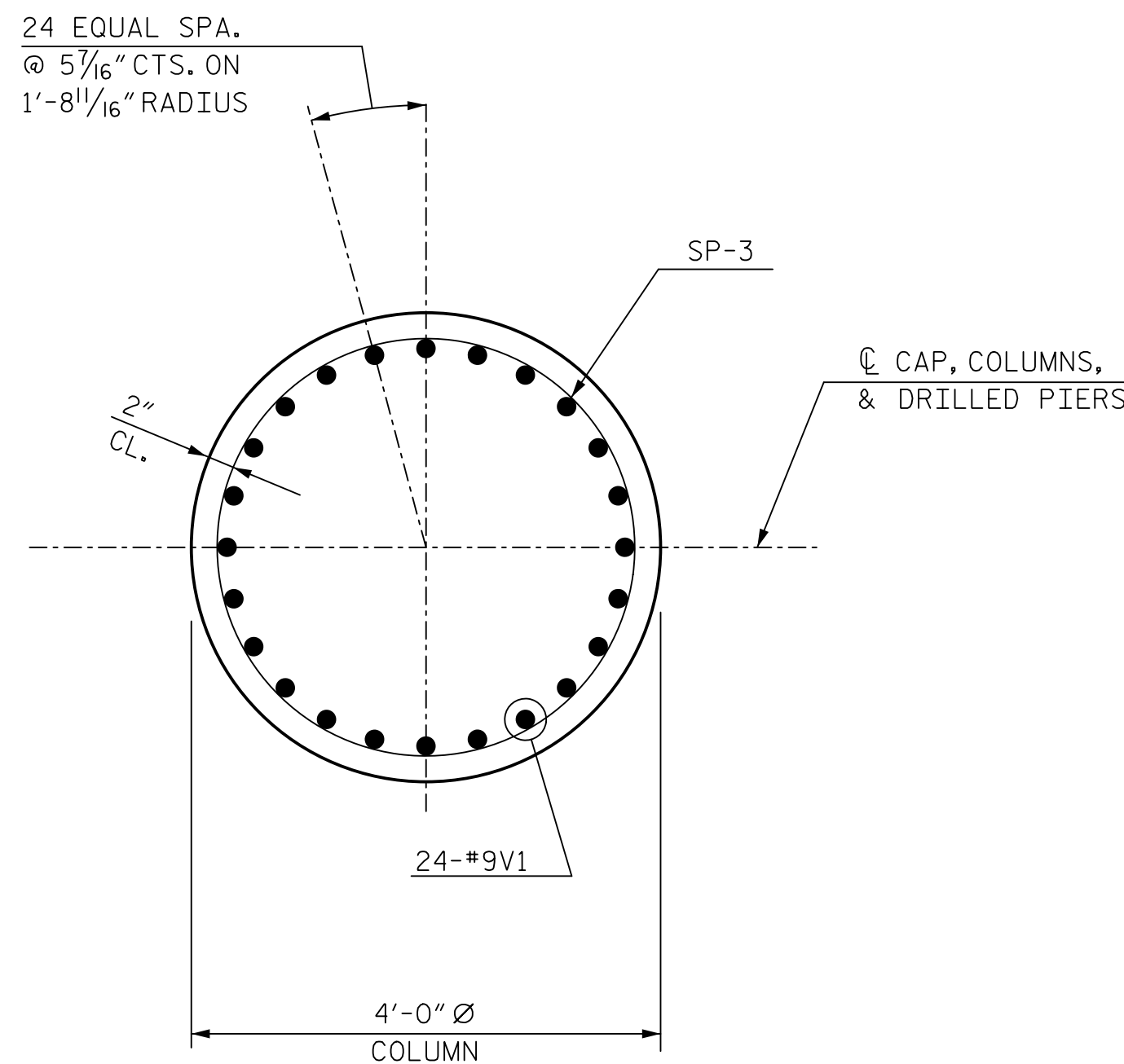
REVISIONS						SHEET NO. S8-30
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			



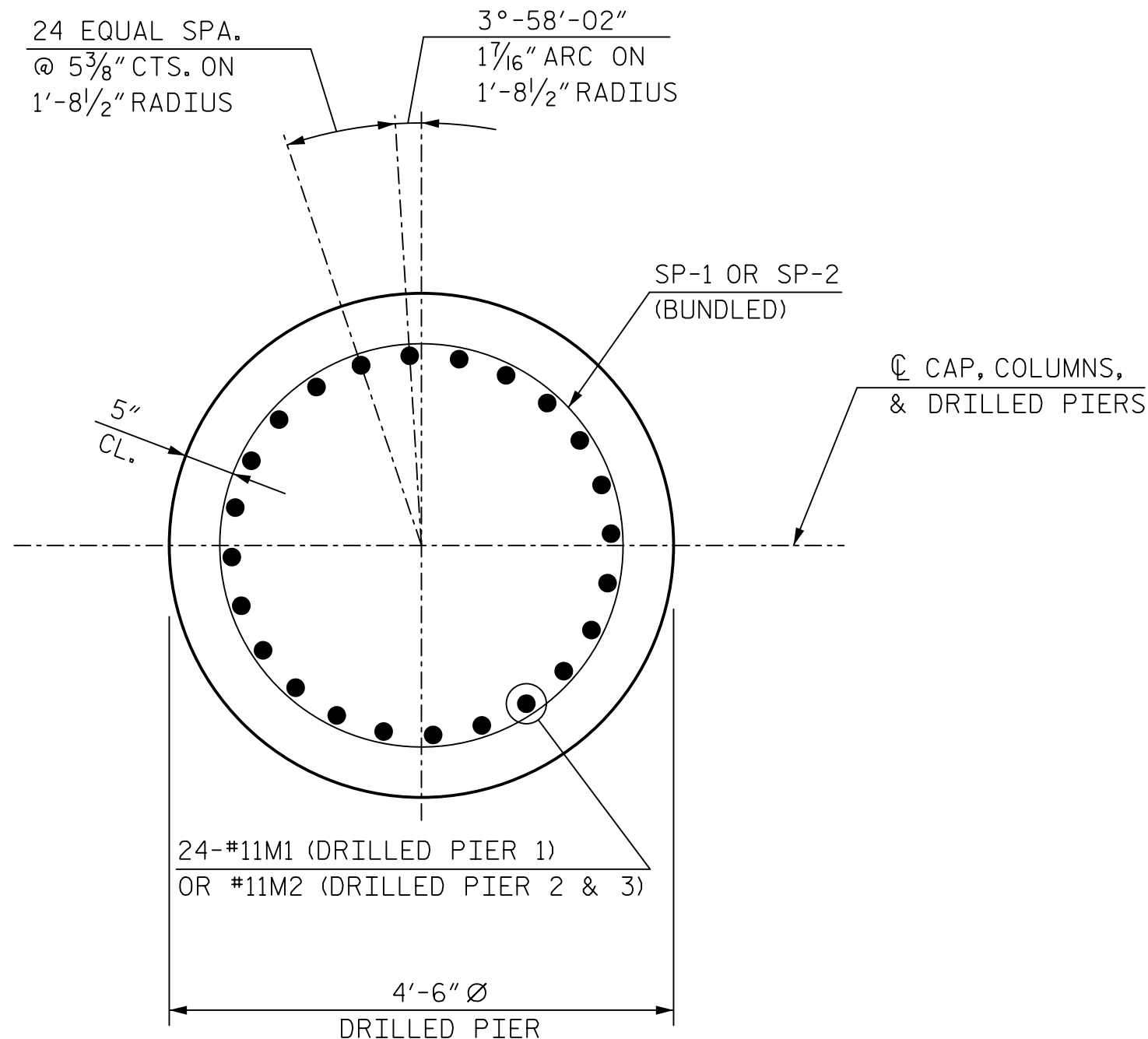
SECTION A-A



DETAIL "A"

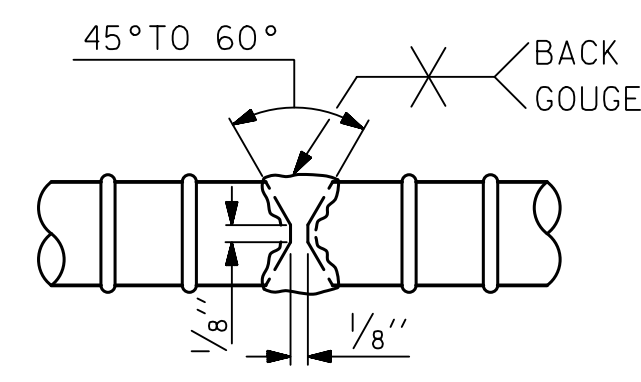
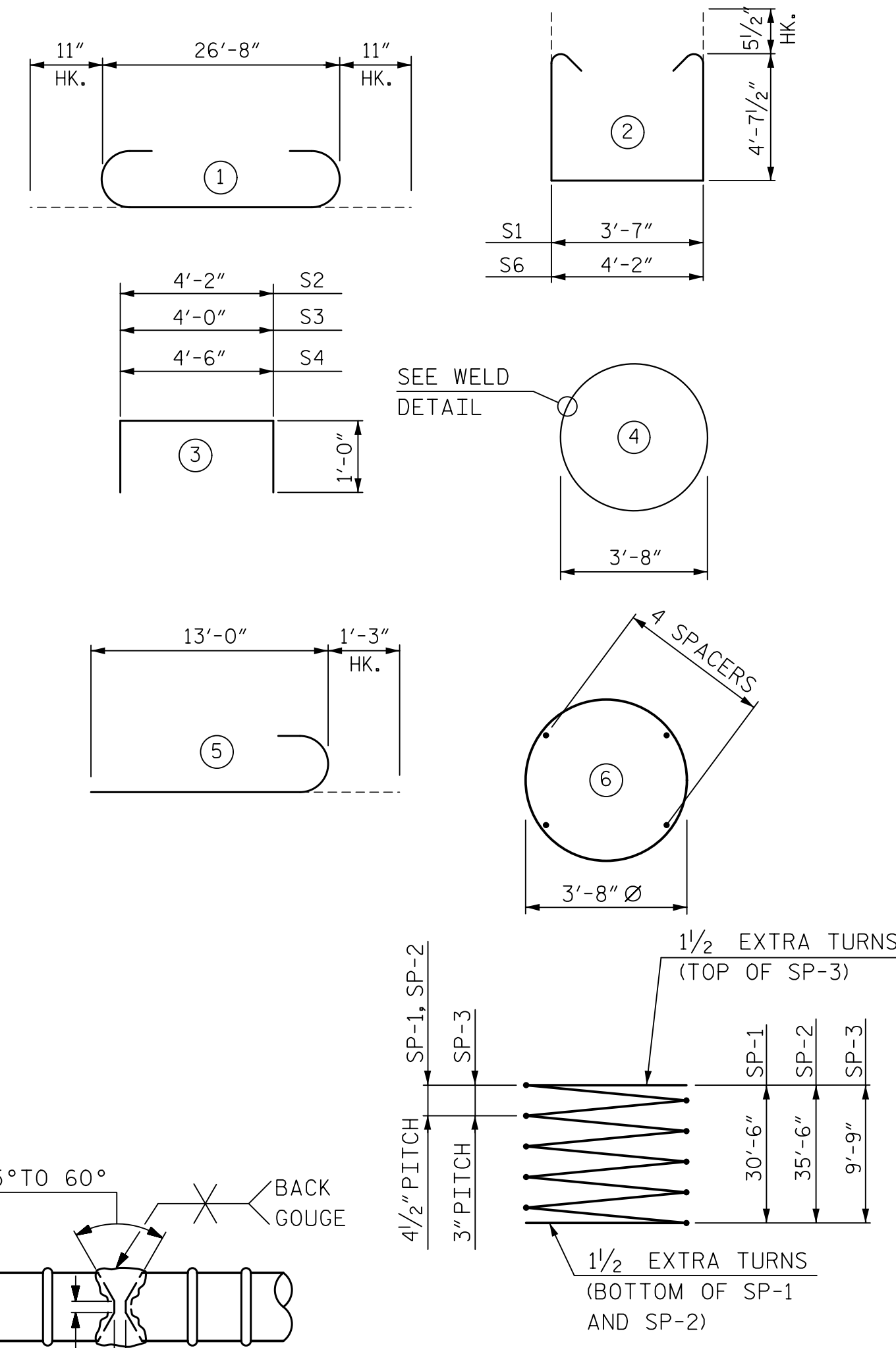


SECTION B-B



SECTION C-C

BAR TYPES



WELD DETAIL

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

PIER 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	9	STR.	26'-8"	1,088
B2	10	5	STR.	26'-8"	278
B3	8	8	1	28'-6"	609
S1	44	5	2	13'-9"	631
S2	53	4	3	6'-2"	218
S3	14	4	3	6'-0"	56
S4	16	4	3	6'-6"	69
S5	33	5	4	11'-7"	399
S6	24	5	2	14'-4"	359
M1	24	11	STR.	38'-7"	4,920
M2	48	11	STR.	43'-7"	11,115
V1	72	9	5	14'-3"	3,488
SP-1	2	**	6	943'-11"	1,969
SP-2	4	**	6	1095'-10"	4,572
SP-3	3	**	6	461'-5"	1,444

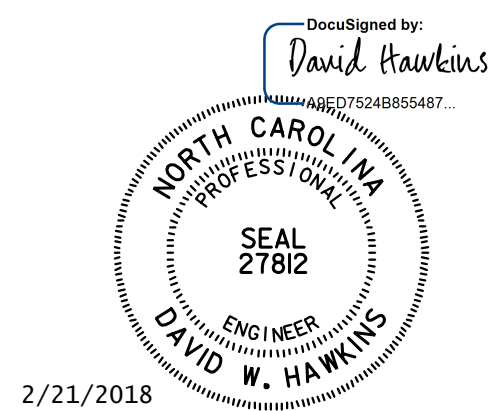
QUANTITIES

ITEM	TOTAL
REINFORCING STEEL	LBS 23,230
SPIRAL COLUMN REINFORCING STEEL	LBS 7,985
CLASS AA CONCRETE:	
POUR 2	C.Y. 13.3
POUR 3	C.Y. 22.5
TOTAL	C.Y. 35.8
4'-6" DIA. DRILLED PIERS	NO. 3
DRILLED PIER IN SOIL	L.F. 70.0
DRILLED PIER NOT IN SOIL	L.F. 33.0
DRILLED PIER CONCRETE POUR 1	C.Y. 60.7
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIER	L.F. 60.0
SID INSPECTIONS	EACH 3
SPT TESTING	EACH 3
CSL TESTING	EACH 3
THERMAL INTEGRITY PROFILER	EACH 3

- * #5S5 CIRCULAR TIES SHALL BE ASTM DESIGNATION A706, GRADE 60. FABRICATION TO BE IN ACCORDANCE WITH THE 'MANUAL OF STANDARD PRACTICE', A.C.I. 315.80.
- ** THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE BUNDLED #5 PLAIN OR DEFORMED BAR.
- *** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 2 OF 2



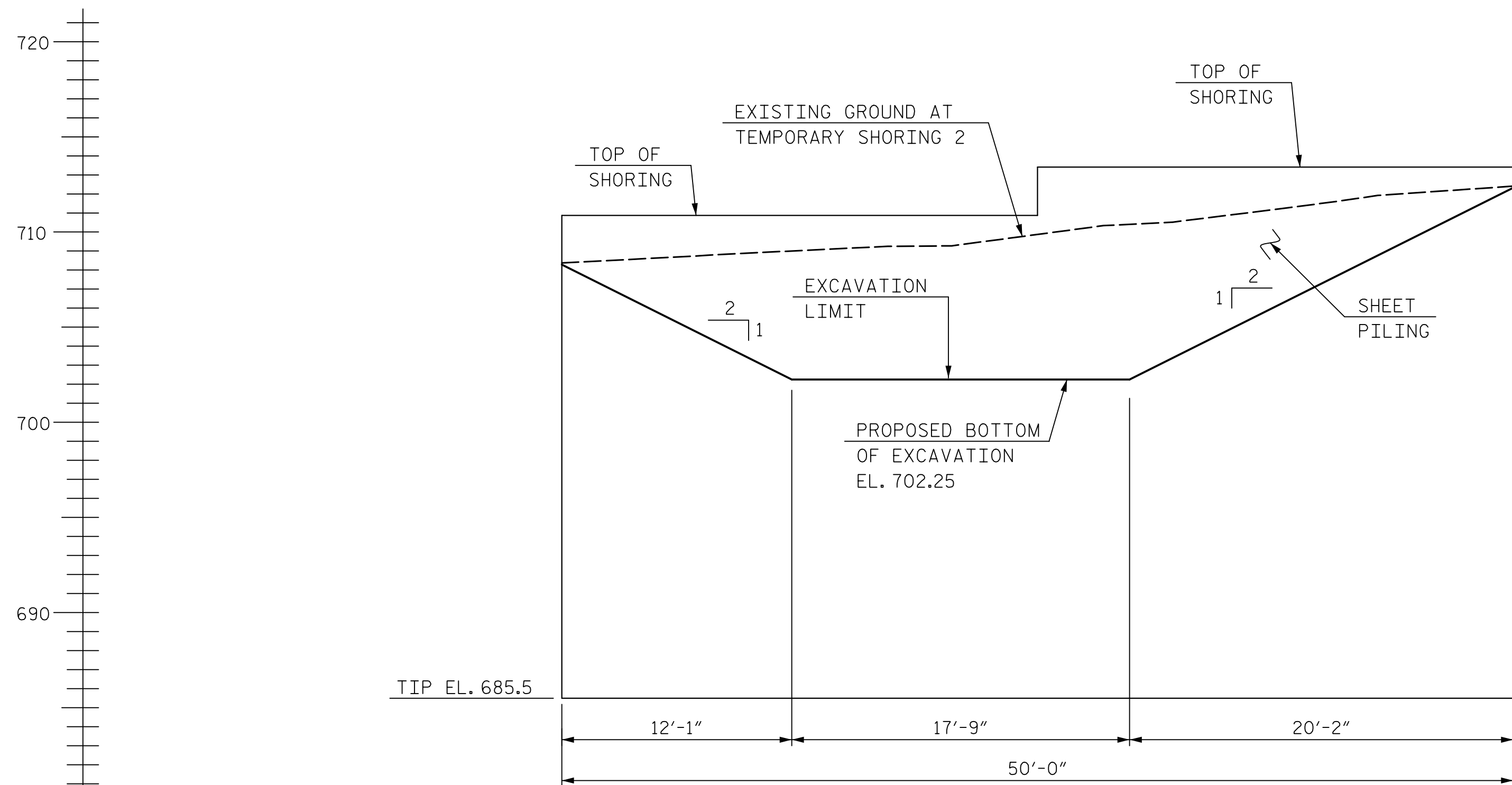
2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

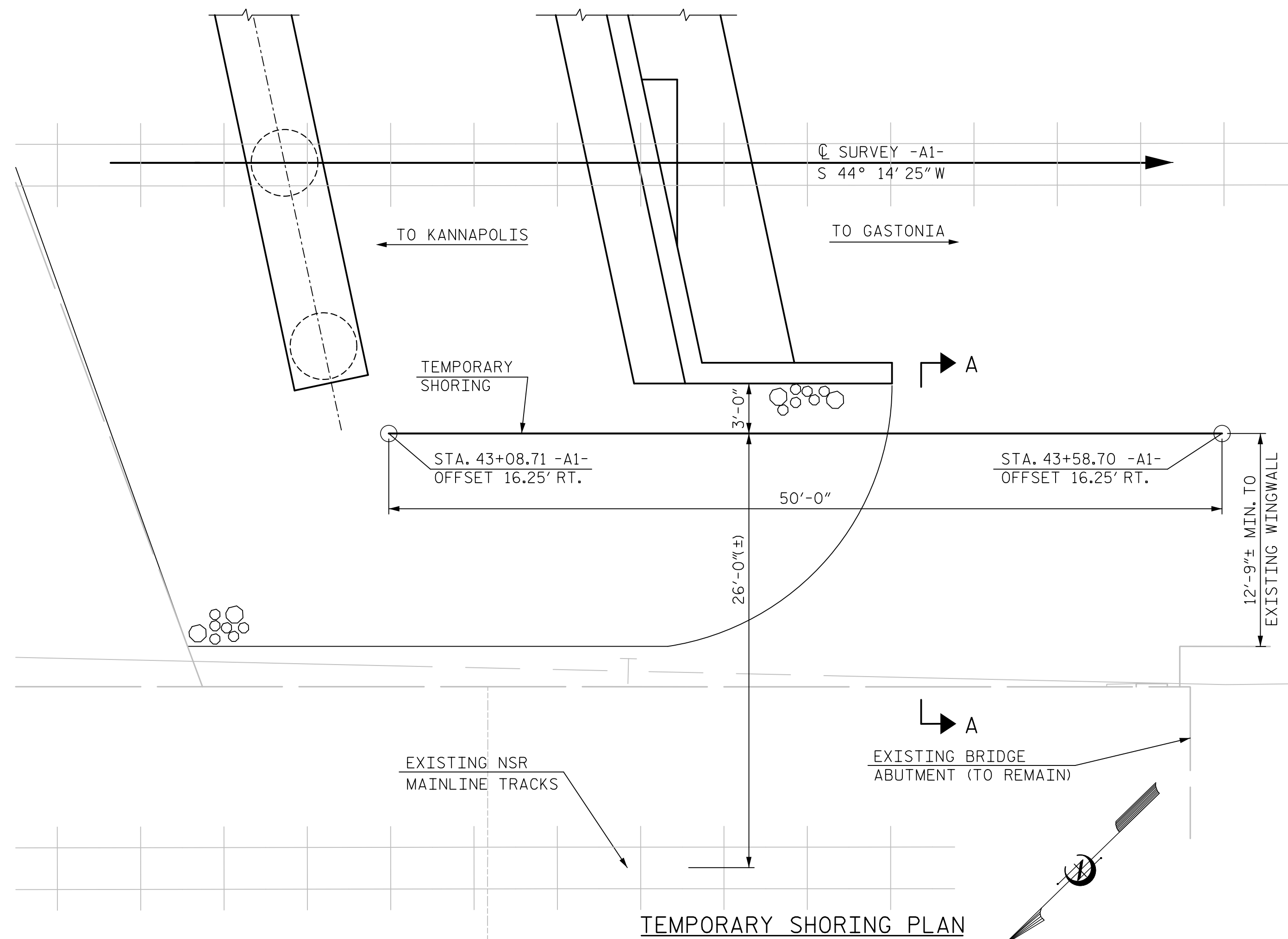
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 11/17
 CHECKED BY: J. WHEATLEY DATE: 11/17 DWG. NO. 31

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-31
1			3			TOTAL SHEETS
2			4			39



SECTION ALONG TEMPORARY SHORING AT ABUTMENT 2



TEMPORARY SHORING PLAN

NOTES:

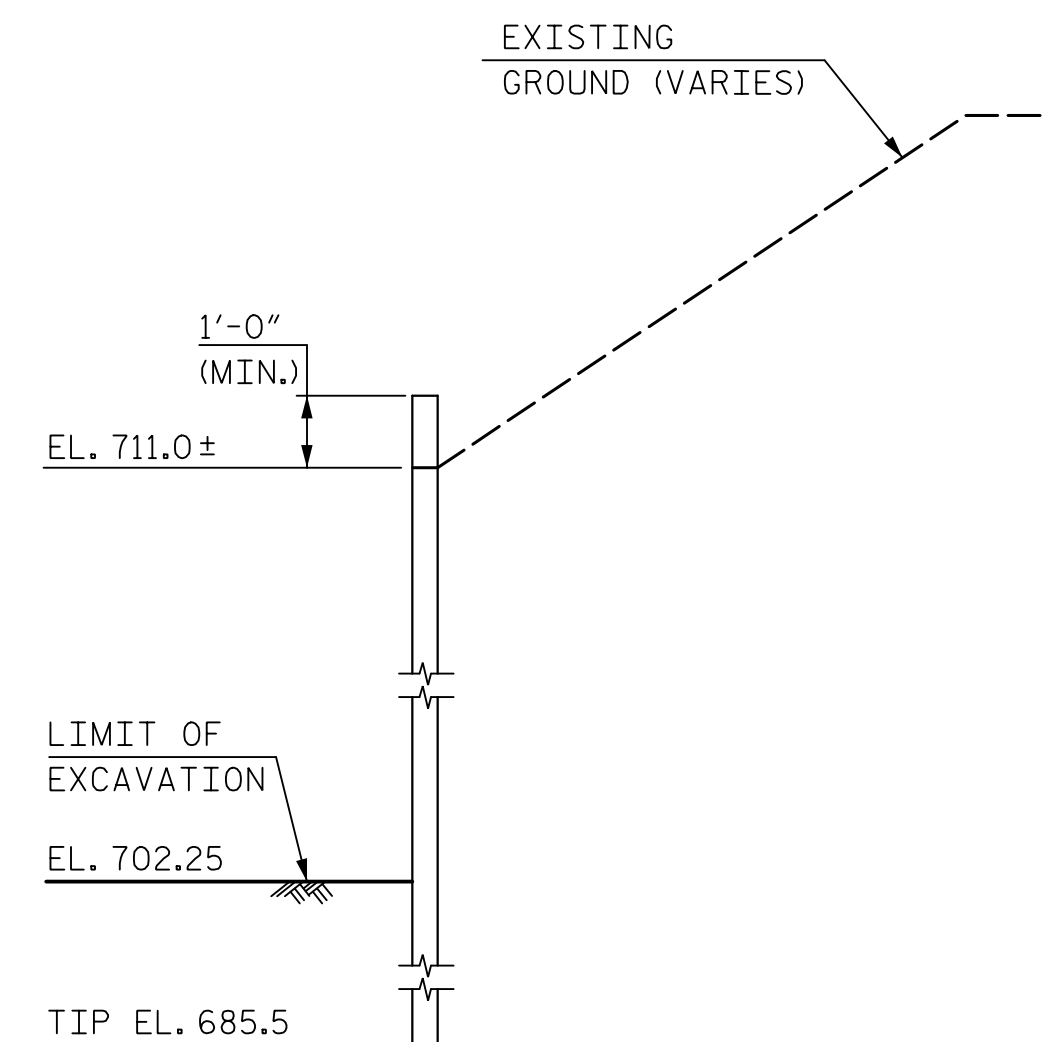
SHORING HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES.

MAXIMUM WALL DEFLECTION LIMITED TO 0.5".

ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.

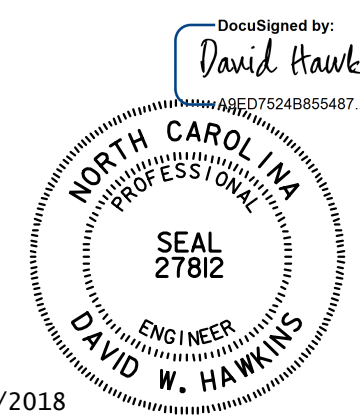
SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL (HOT ROLLED) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

MOMENT OF INERTIA/FT. 235.0 in⁴
SECTION MODULUS/FT. 10.0 in³



SECTION A-A

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

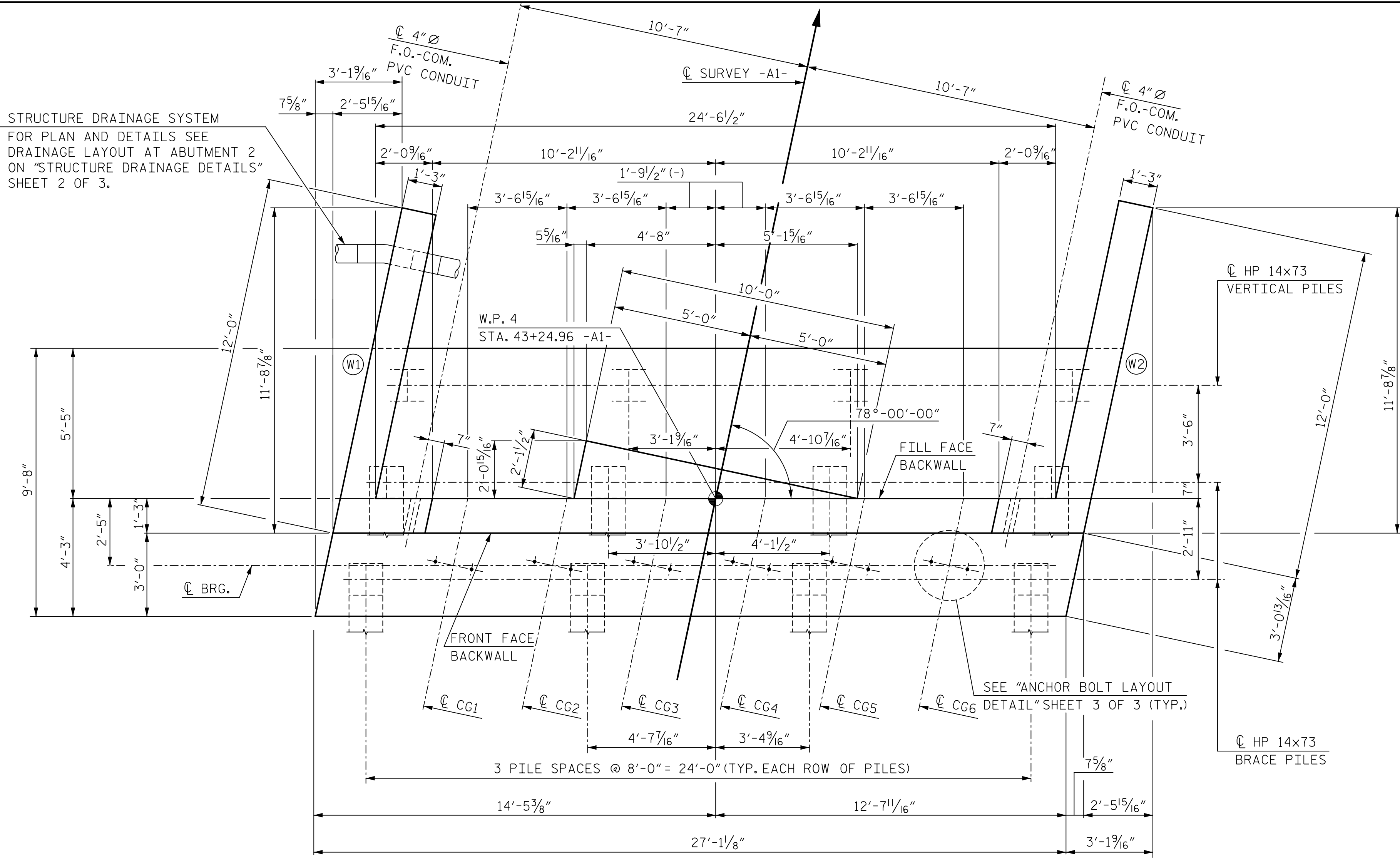
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
ABUTMENT 2
SHORING

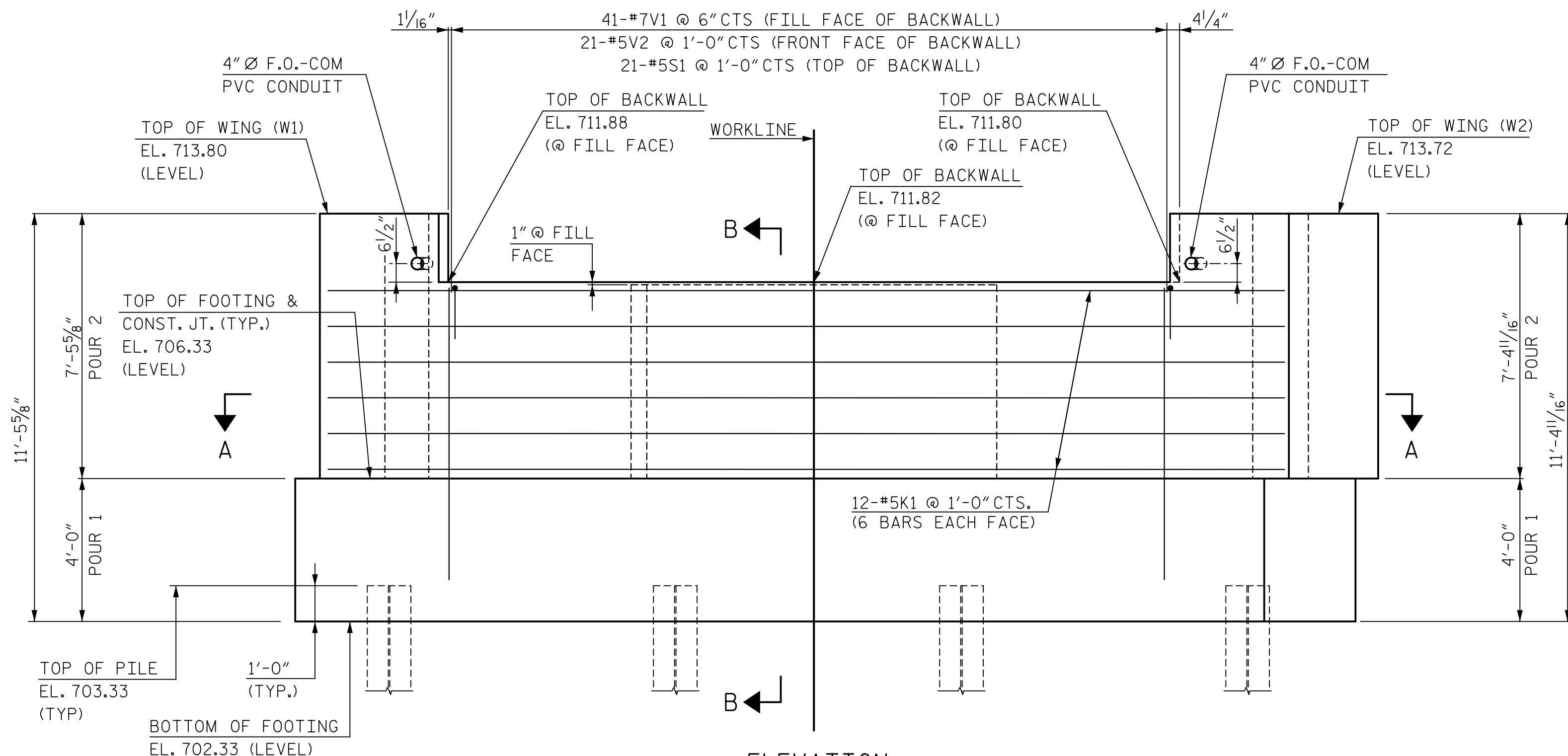
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 11/17	DWG. NO. 32	
CHECKED BY: J. WHEATLEY	DATE: 11/17		

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

SHEET NO. S8-32
TOTAL SHEETS 39



PLAN



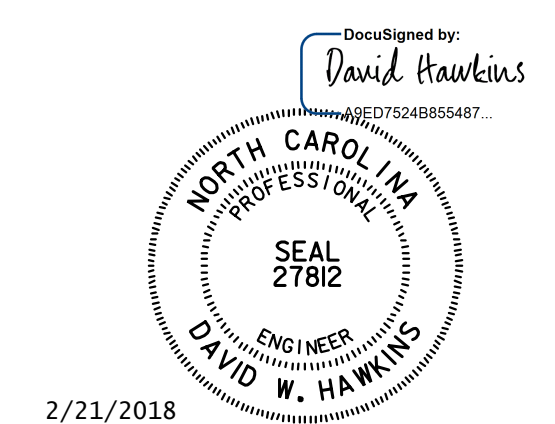
ELEVATION

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 2 OF 3.
- INDICATES PILE BATTERED IN DIRECTION SHOWN.
- CONDUIT TO BE 4" Ø IN ACCORDANCE WITH UNDERWRITERS LABORATORY SPECIFICATIONS.
- FOR FOOTING REINFORCING, SEE SECTION B-B SHEET 2 OF 3 AND FOOTING REINFORCING PLAN SHEET 3 OF 3.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 ABUTMENT 2



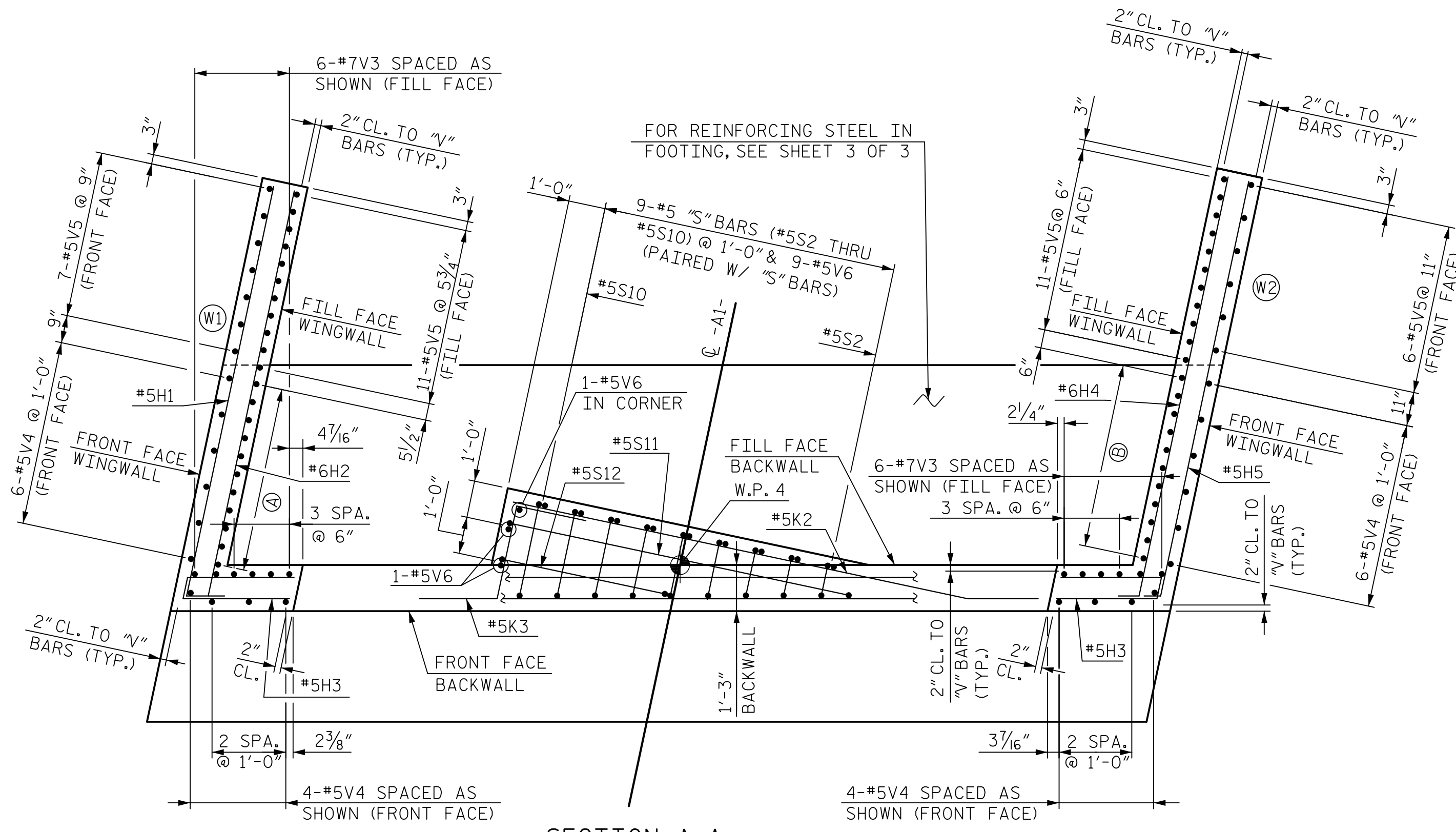
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 10/17	DWG. NO. 33	
CHECKED BY: J. WHEATLEY	DATE: 10/17		
REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4
			SHEET NO. S8-33
			TOTAL SHEETS 39

NOTES:

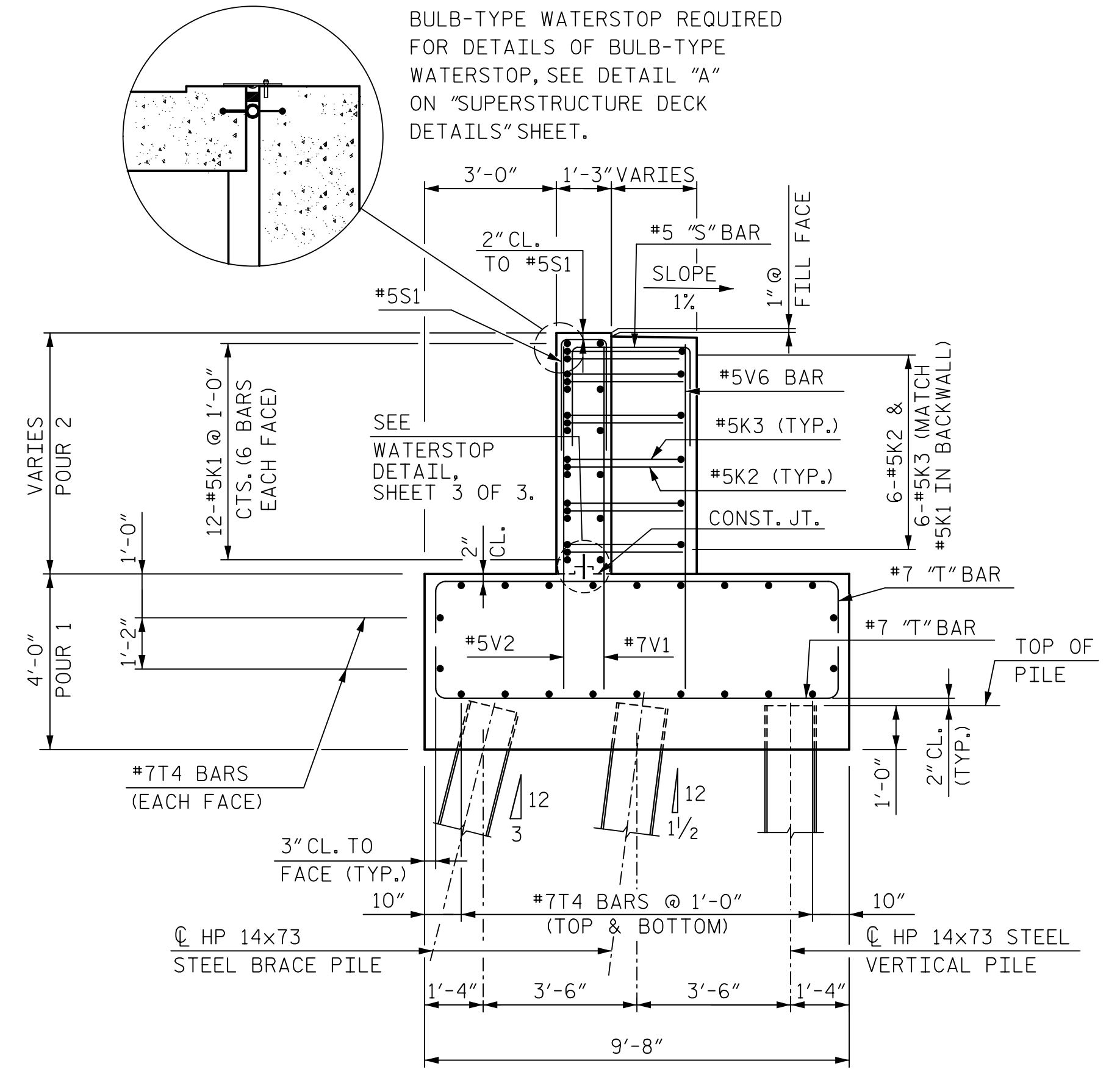
FOR ABUTMENT AND WINGWALL DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.

FOR LOCATIONS OF HANDRAIL ANCHORAGES IN TOP OF WINGWALLS, SEE "METAL HANDRAIL DETAILS" SHEETS.

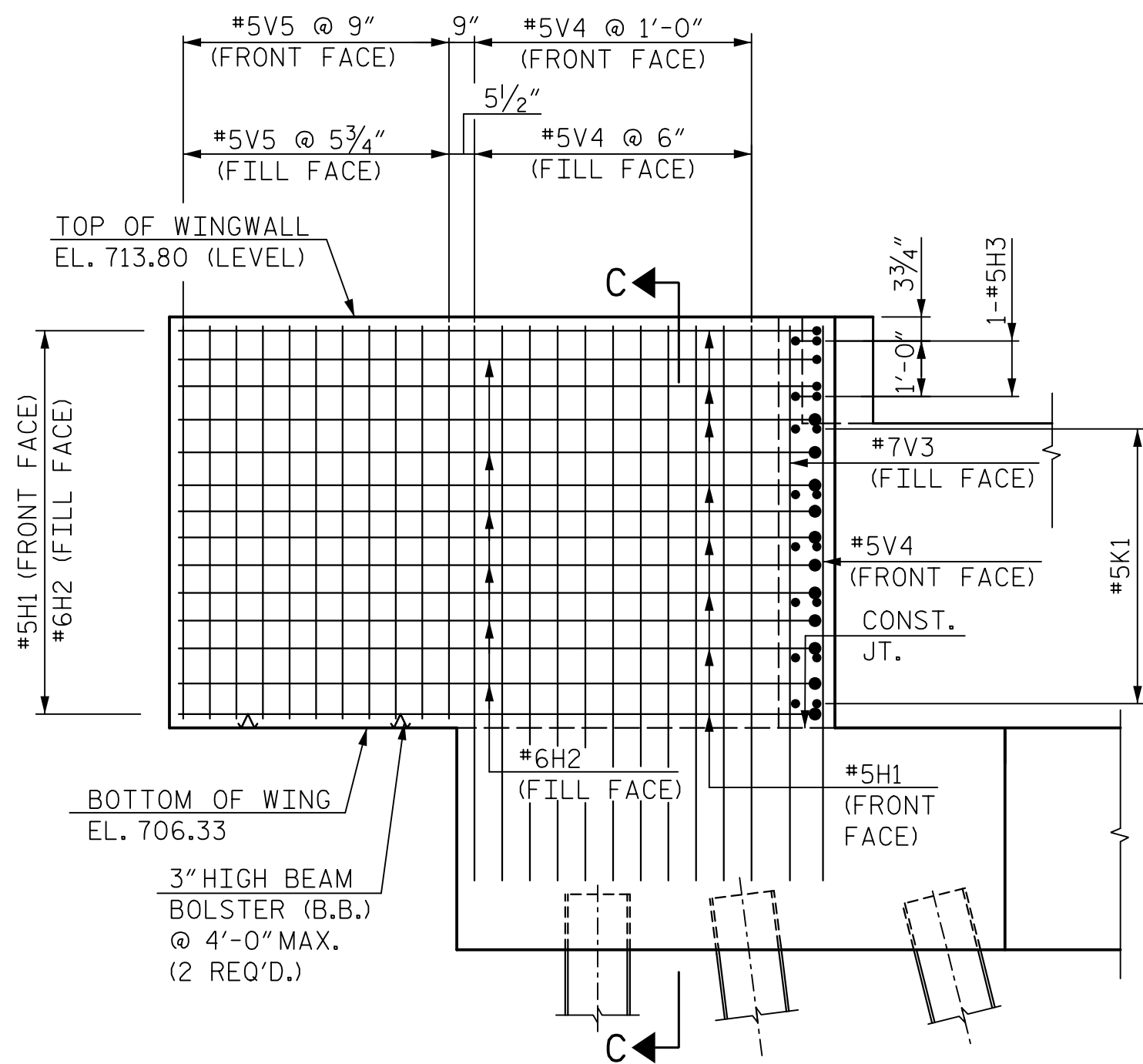


SECTION A-A

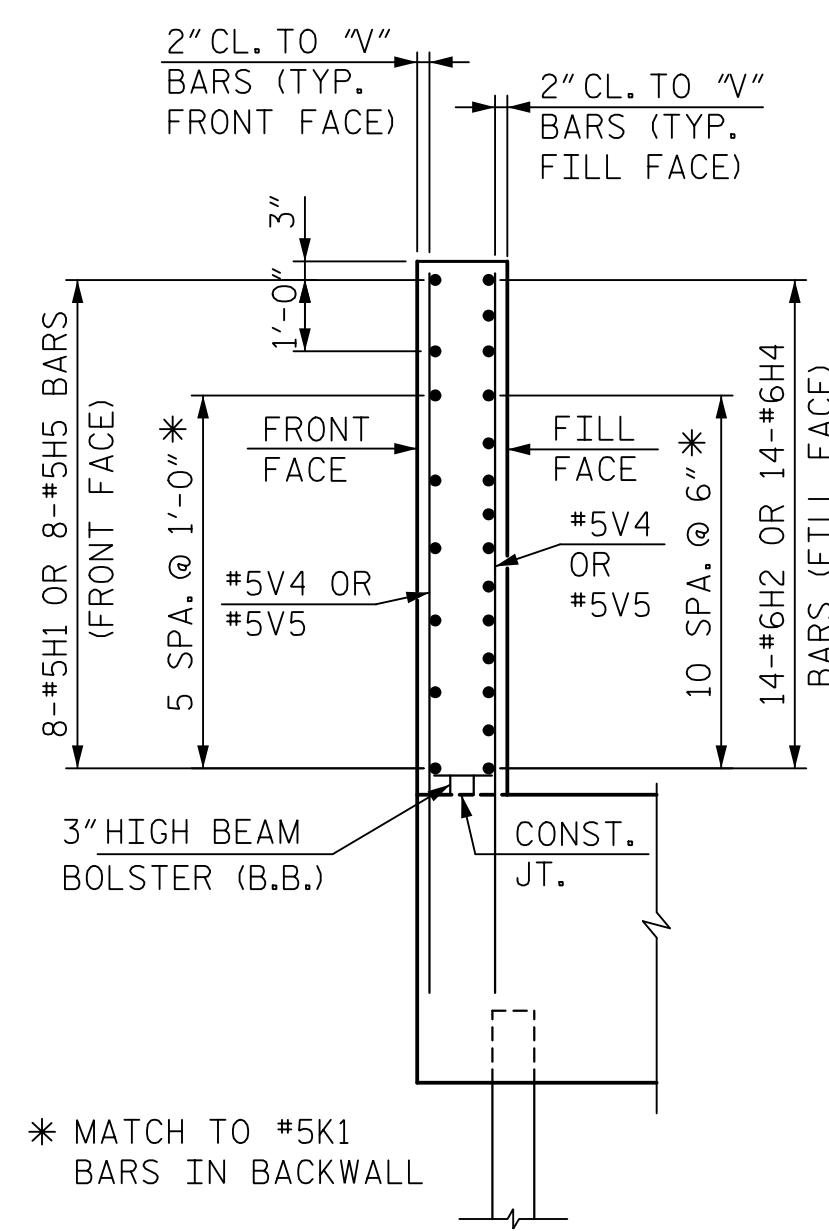
- (A) 11-#5V4 @ 6" (FILL FACE)
- (B) 11-#5V4 @ 6" (FILL FACE)



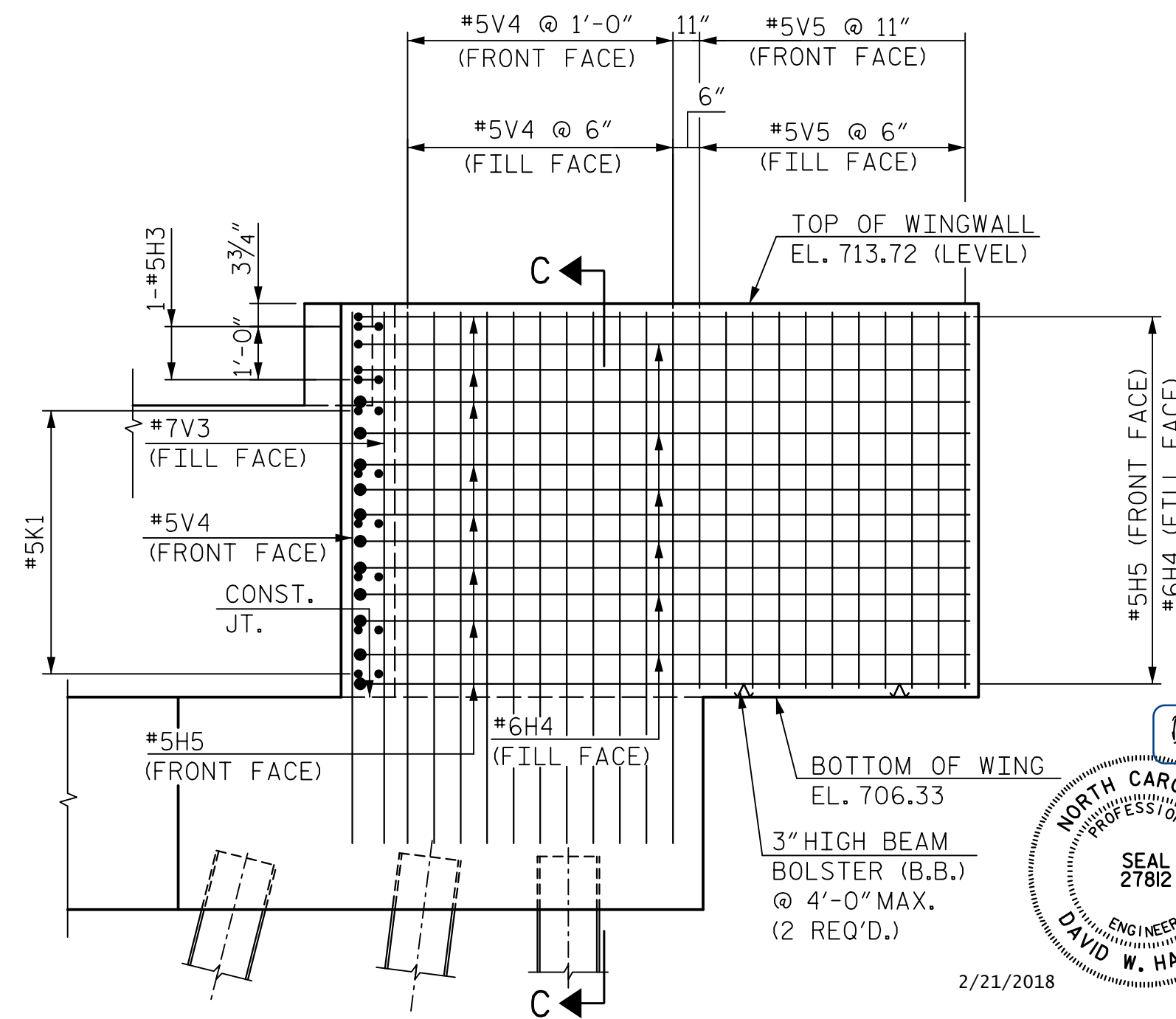
SECTION B-B



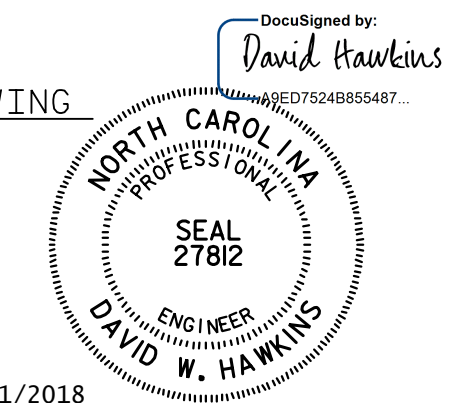
ELEVATION OF WING (W1)



SECTION C-C



ELEVATION OF WING (W2)



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

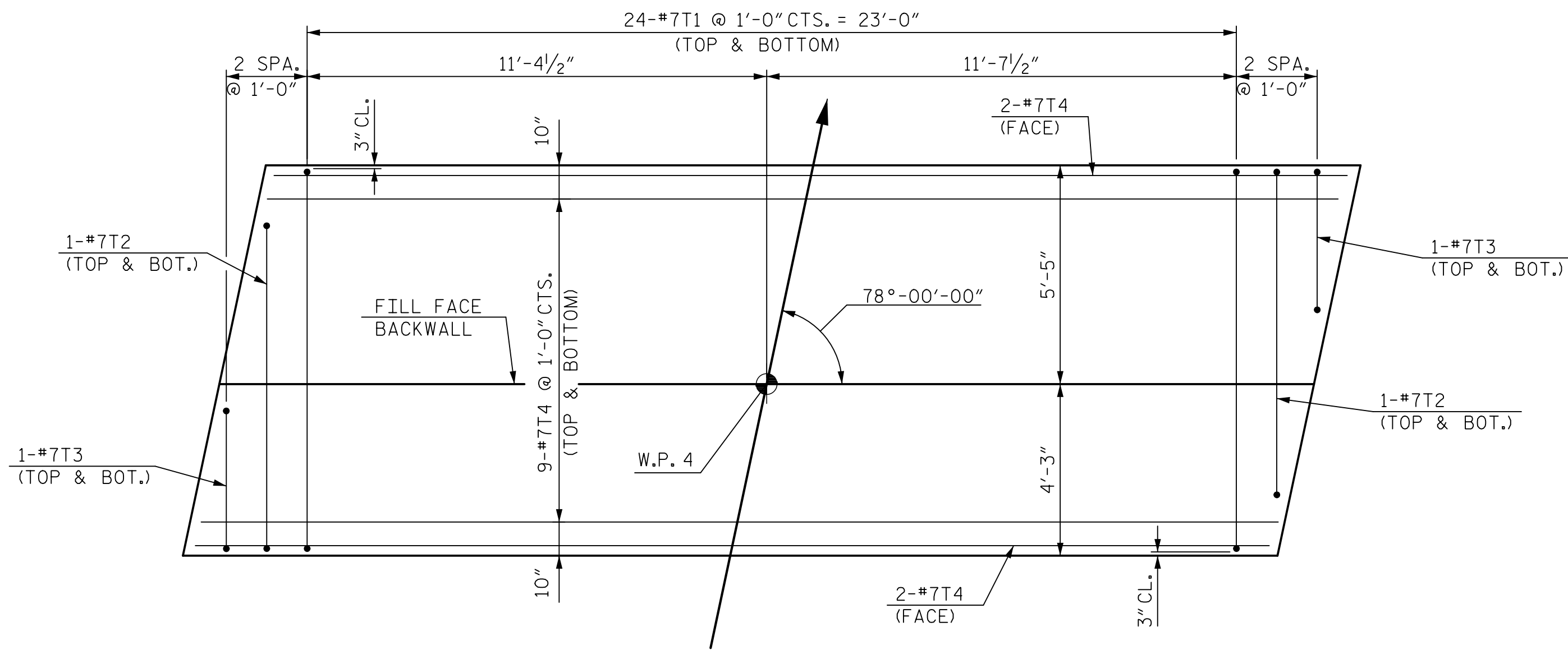
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 2

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 10/17	DWG. NO. 34	
CHECKED BY: J. WHEATLEY	DATE: 10/17		

REVISIONS					SHEET NO. S8-34
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 39
2			4		



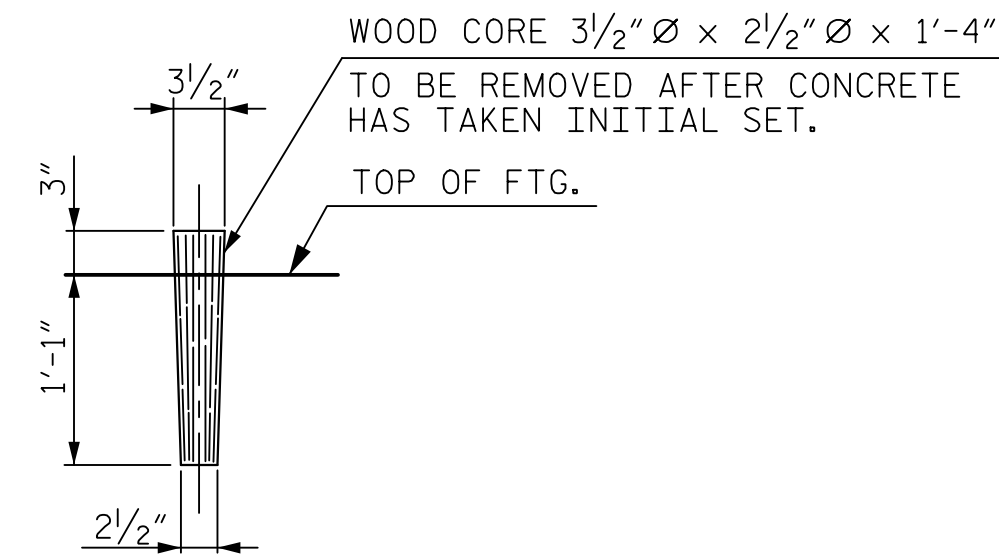
FOOTING REINFORCING PLAN

BAR TYPES					BILL OF REINFORCING						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
ABUTMENT 2											
H1	8	5	1	12'-4"	103						
H2	14	6	1	12'-4"	259						
H3	4	5	2	6'-7"	27						
H4	14	6	3	12'-6"	263						
H5	8	5	3	12'-2"	102						
K1	12	5	STR	26'-8"	334						
K2	6	5	4	14'-6"	91						
K3	6	5	5	6'-10"	43						
S1	21	5	6	3'-11"	86						
S2	1	5	6	4'-0"	4						
S3	1	5	6	4'-3"	4						
S4	1	5	6	4'-5"	5						
S5	1	5	6	4'-8"	5						
S6	1	5	6	4'-10"	5						
S7	1	5	6	5'-1"	5						
S8	1	5	6	5'-3"	5						
S9	1	5	6	5'-6"	6						
S10	1	5	6	5'-8"	6						
S11	1	5	6	12'-9"	13						
S12	1	5	6	8'-1"	8						
T1	48	7	7	11'-6"	1,128						
T2	4	7	7	10'-4"	84						
T3	4	7	7	5'-9"	47						
T4	22	7	STR	26'-6"	1,192						
V1	41	7	STR	7'-11"	663						
V2	21	5	STR	7'-11"	173						
V3	12	7	STR	9'-11"	243						
V4	42	5	STR	9'-11"	434						
V5	35	5	STR	7'-1"	259						
V6	12	5	STR	7'-10"	98						
					TOTAL					5,695	

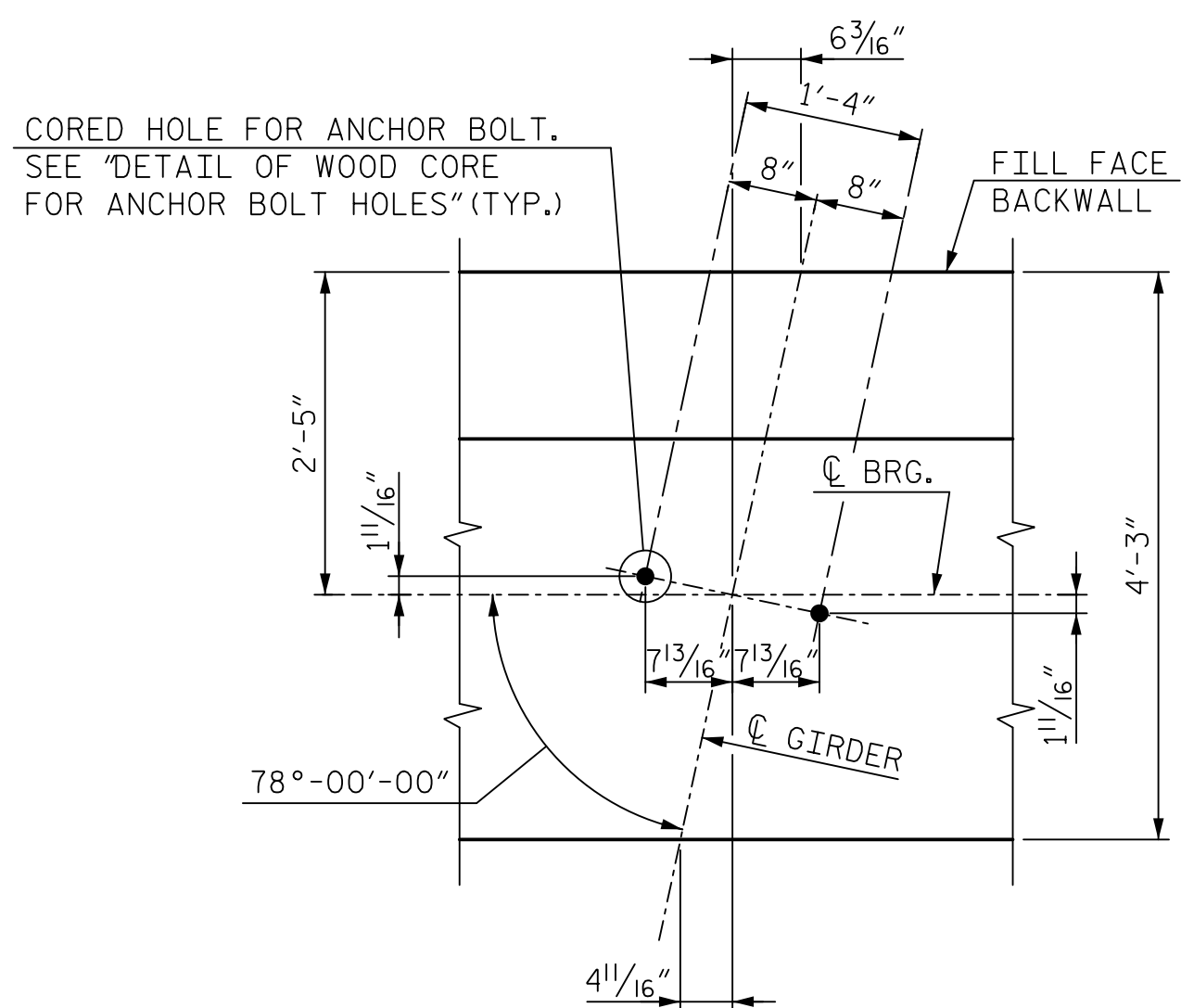
ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

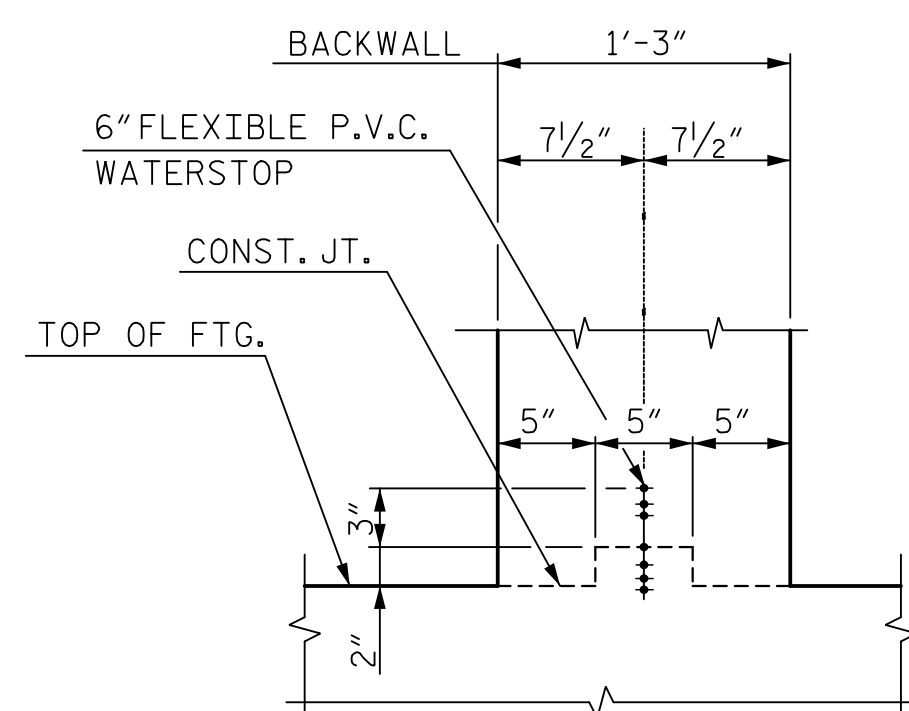
"T" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
FOR FOOTING LAYOUT AND DIMENSIONS, SEE SHEET 1 OF 3.



DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES

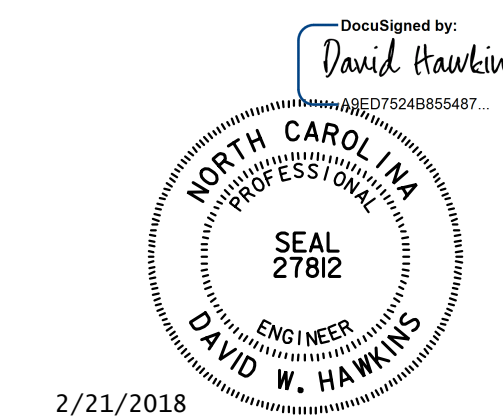


ANCHOR BOLT LAYOUT DETAIL



WATERSTOP DETAIL

QUANTITIES		
ITEM		TOTAL
REINFORCING STEEL	LBS.	5,695
CLASS AA CONCRETE BREAKDOWN:		
POUR 1 FOOTING	CU. YDS	38.9
POUR 2 BACKWALL & WINGS	CU. YDS	16.9
TOTAL	CU. YDS	55.8
HP 14 X 73 STEEL PILES	NO.	12
	L.F.	420.0



2/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: STA. 42+59.46 -A1-

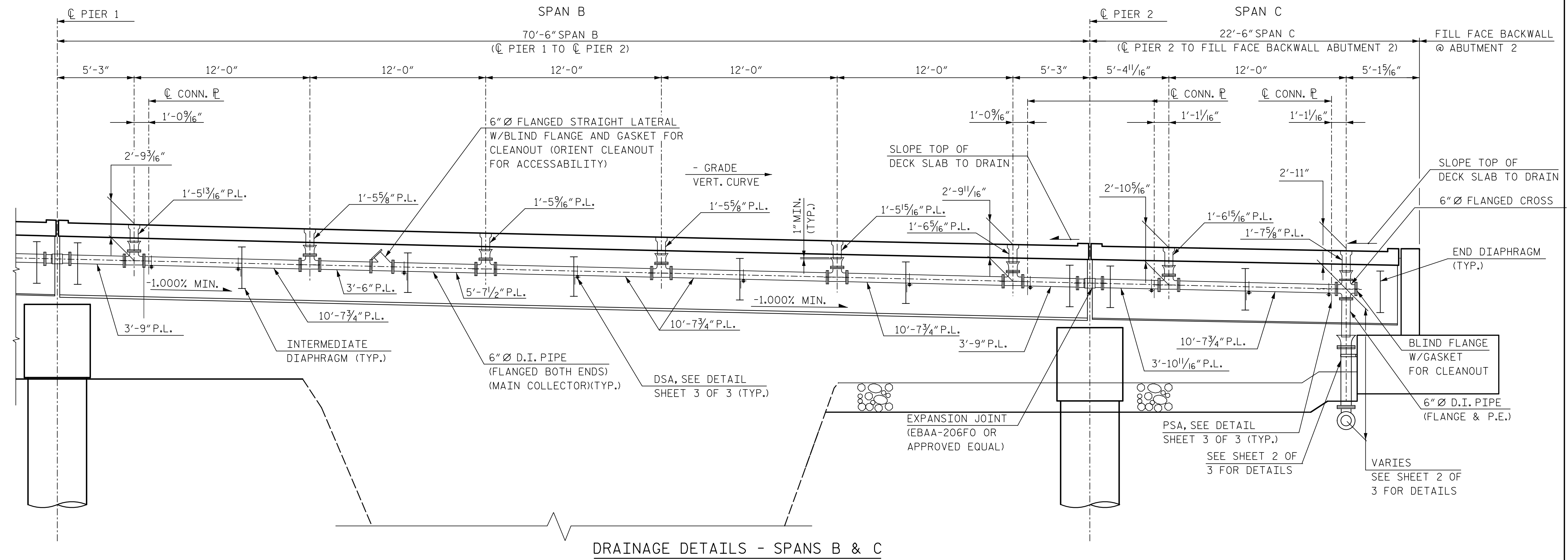
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

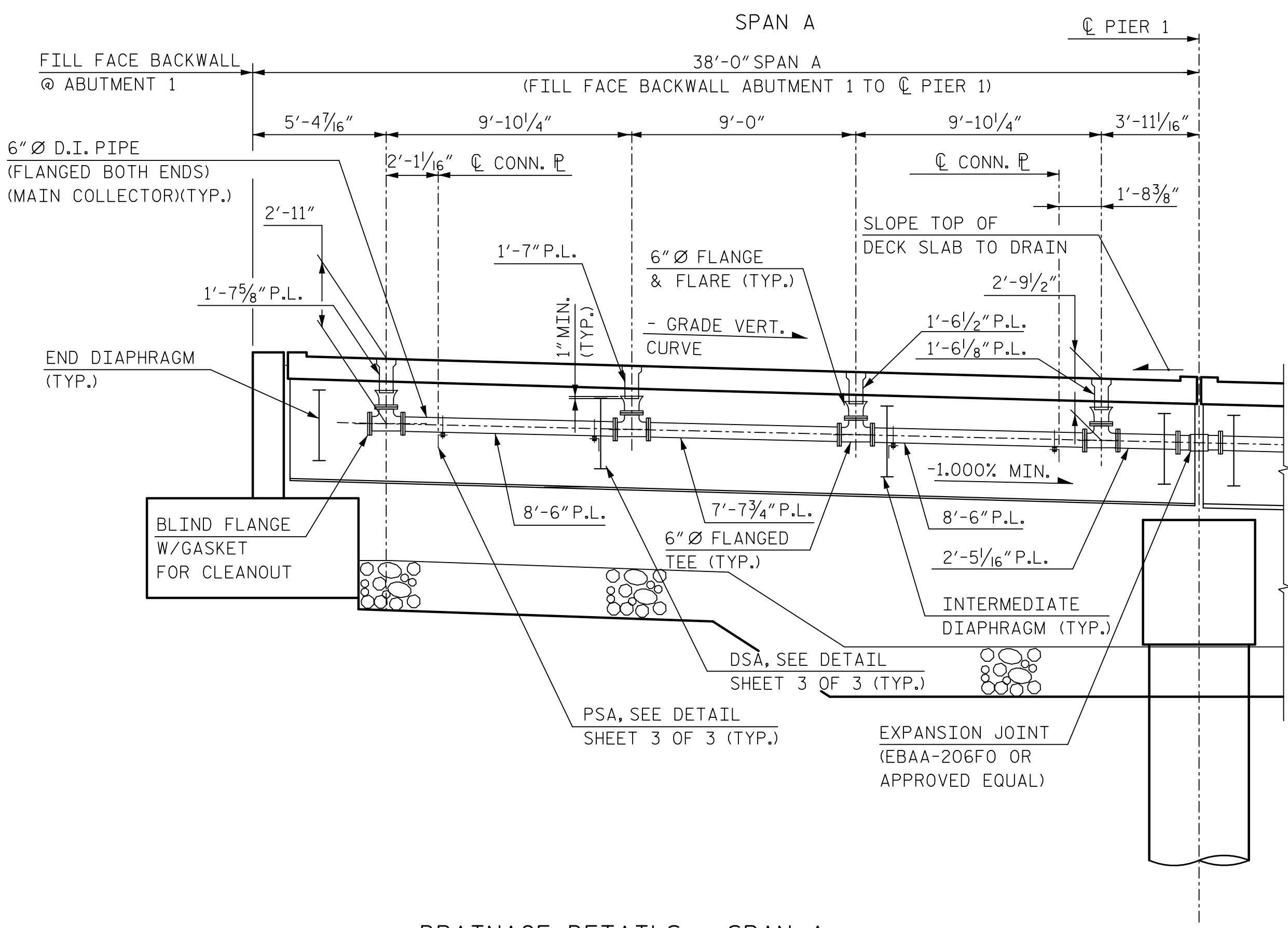
SUBSTRUCTURE
ABUTMENT 2

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY <u>M. WRIGHT</u>	DATE <u>10/17</u>
CHECKED BY <u>J. WHEATLEY</u>	DATE <u>10/17</u>
DWG. NO. 35	

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-35
1			3			TOTAL SHEETS
2			4			39



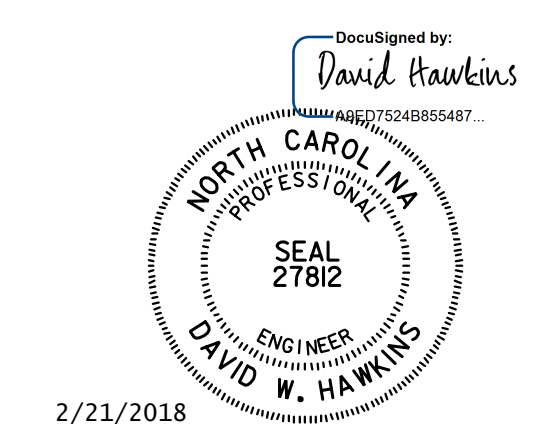
DRAINAGE DETAILS - SPANS B & C



DRAINAGE DETAILS - SPAN A

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

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET 1 OF 3

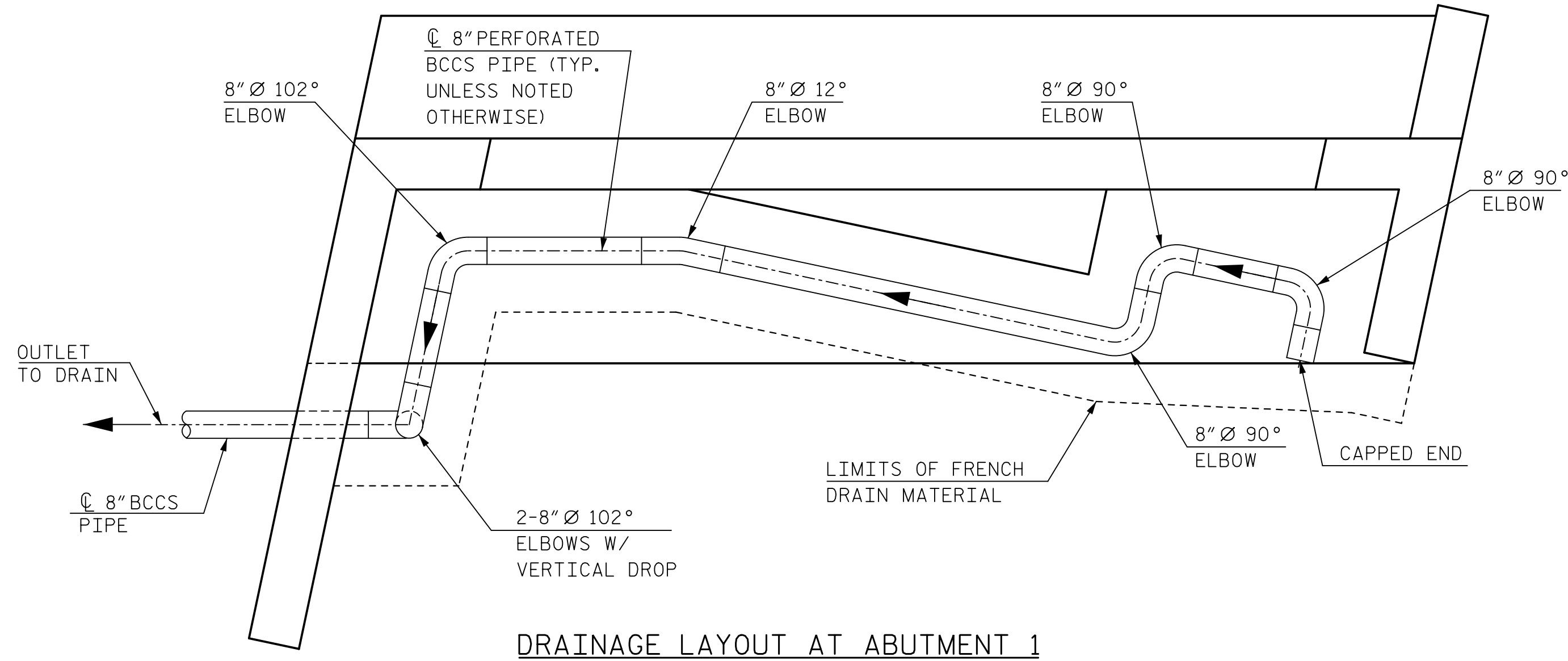
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STRUCTURE
 DRAINAGE
 DETAILS

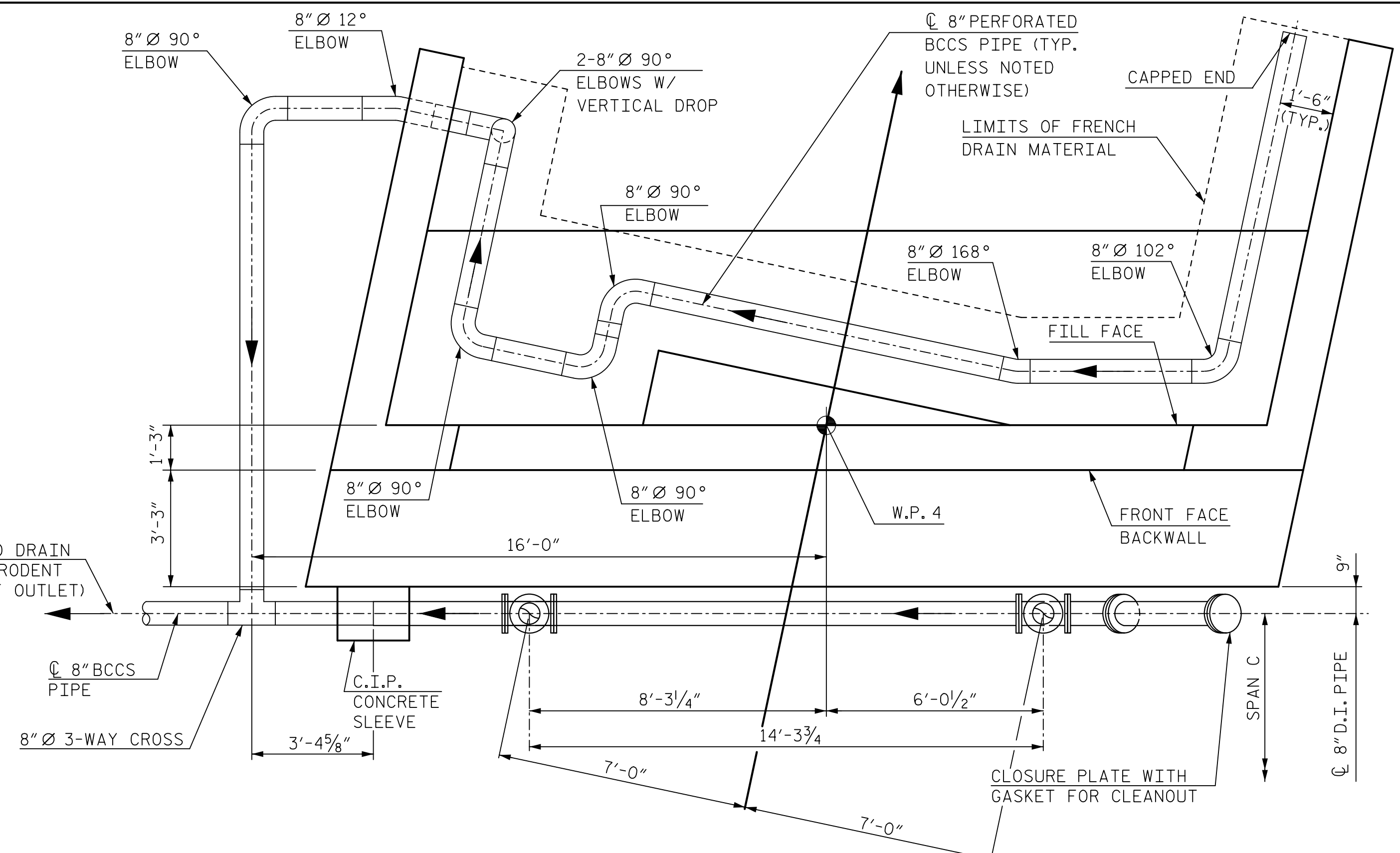
HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 8/17	DWG. NO. 36	
CHECKED BY: V. KOLLIPARA	DATE: 9/17		

REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4

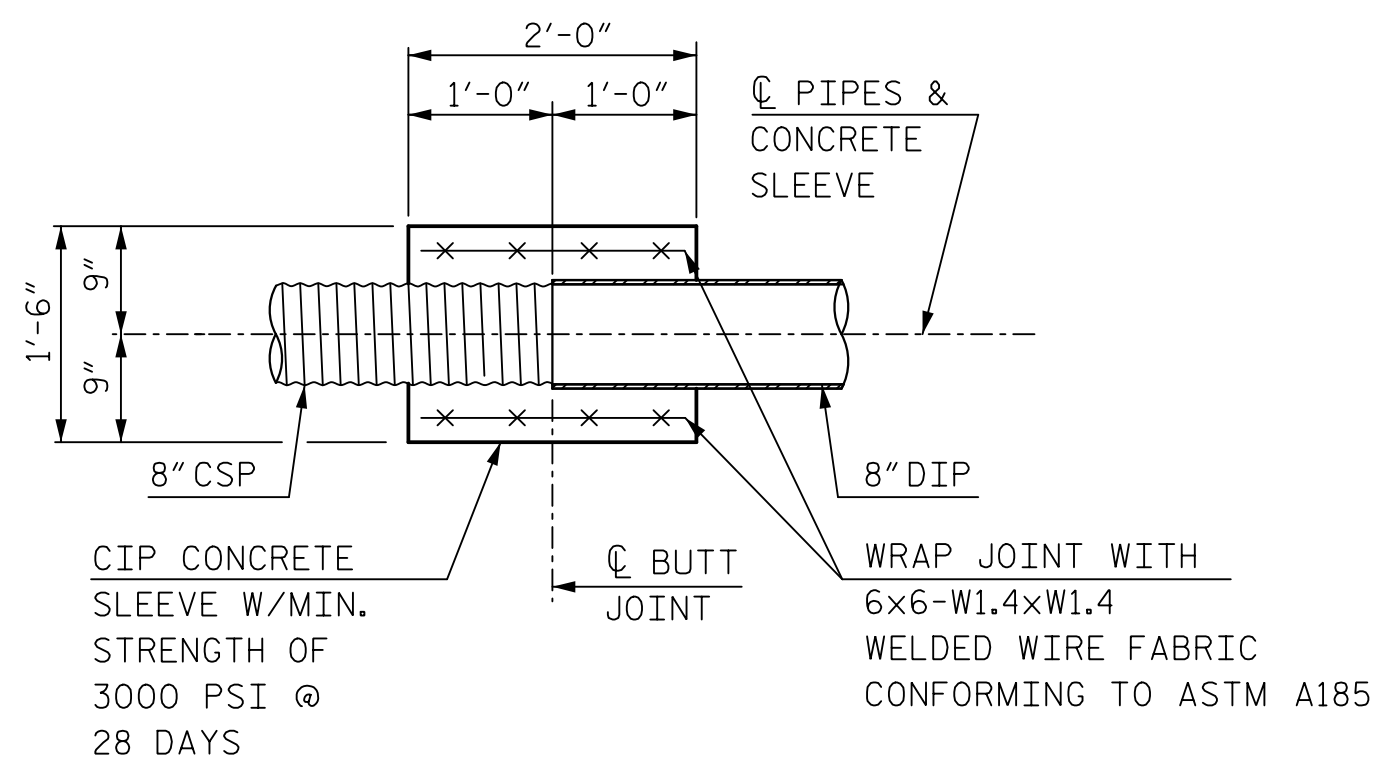
SHEET NO.	S8-36
TOTAL SHEETS	39



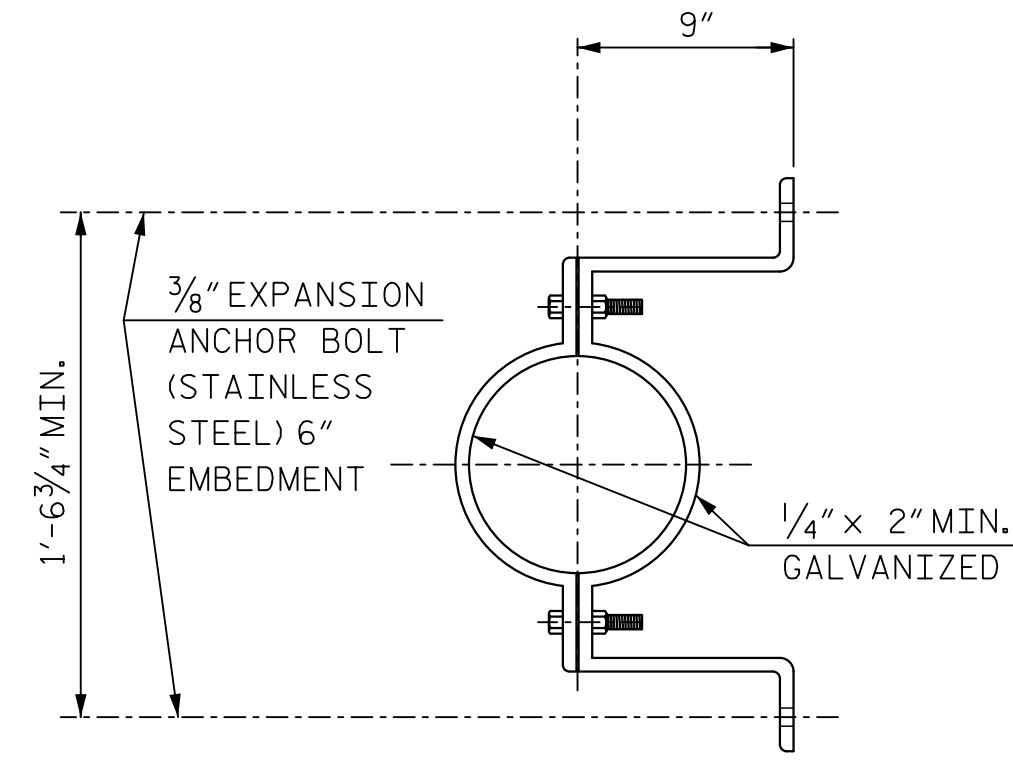
DRAINAGE LAYOUT AT ABUTMENT 1



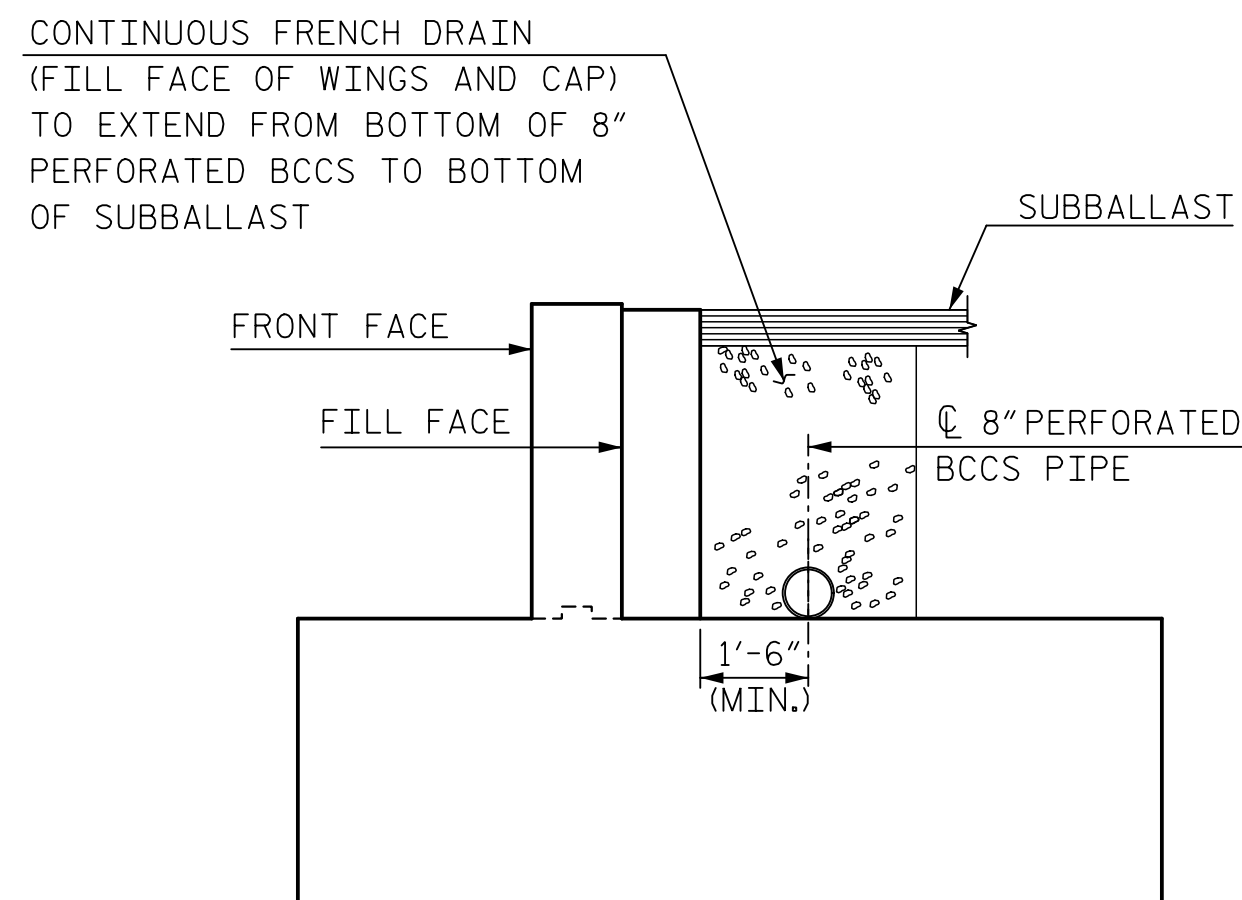
DRAINAGE LAYOUT AT ABUTMENT 2



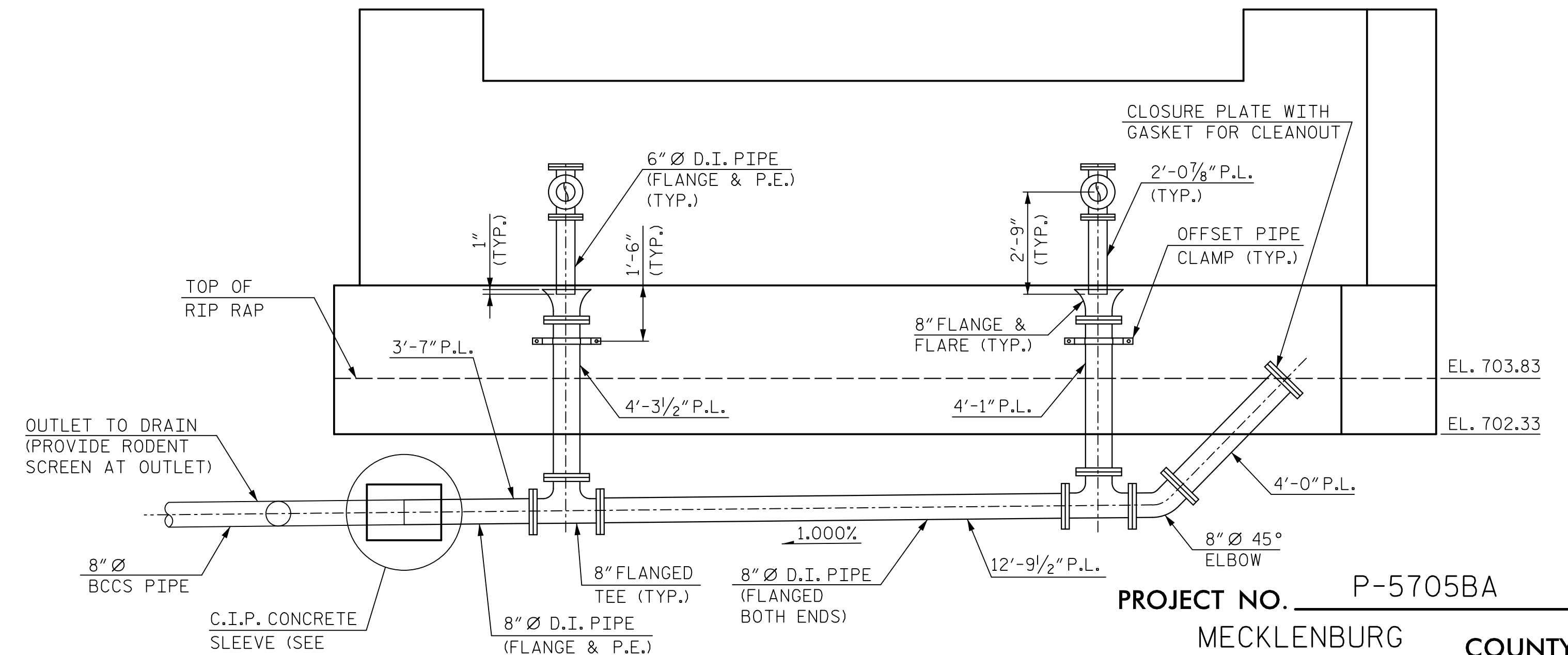
DIP-CSP JOINT DETAIL



OFFSET PIPE CLAMP DETAIL



CONTINUOUS FRENCH DRAIN DETAIL

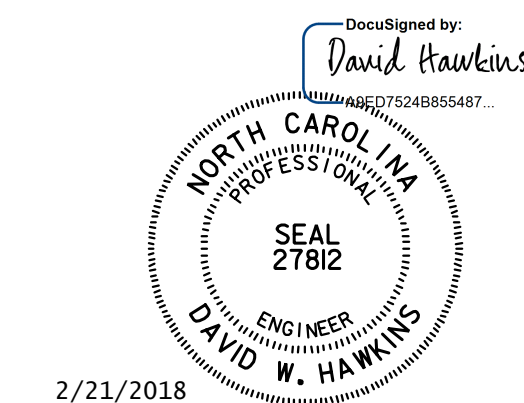


ELEVATION AT ABUTMENT 2
(LOOKING UP STATION)

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SUBSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES		
ITEM	UNIT	TOTAL
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	25.2
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	3.6
8" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	540
8" I.D. DUCTILE IRON BLIND FLANGES	LBS	42
8" I.D. OFFSET PIPE CLAMPS	EA.	2
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	4.2

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



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

DRAWN BY: J. BAYNE DATE: 10/17
 CHECKED BY: J. WHEATLEY DATE: 10/17 DWG. NO. 37

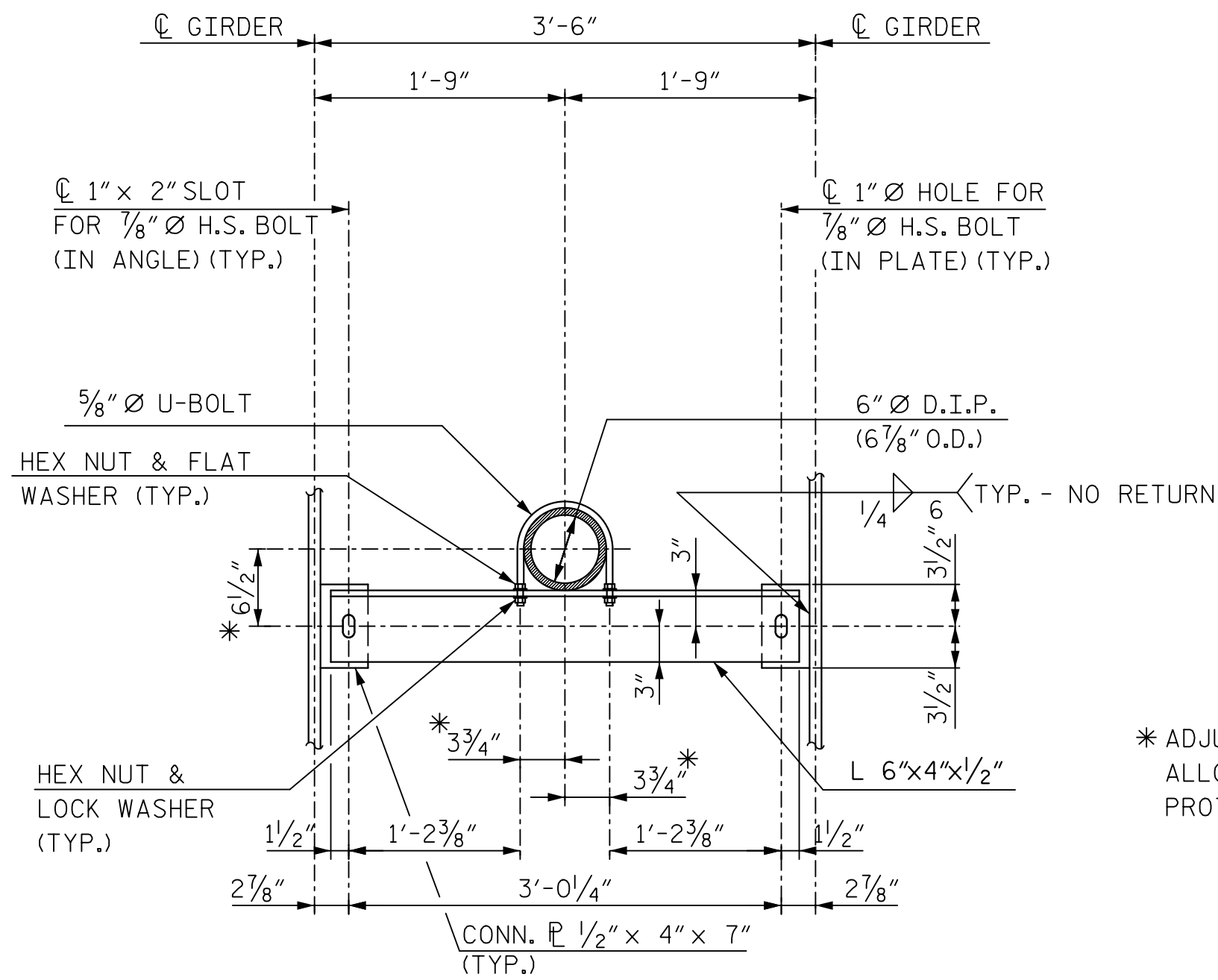
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

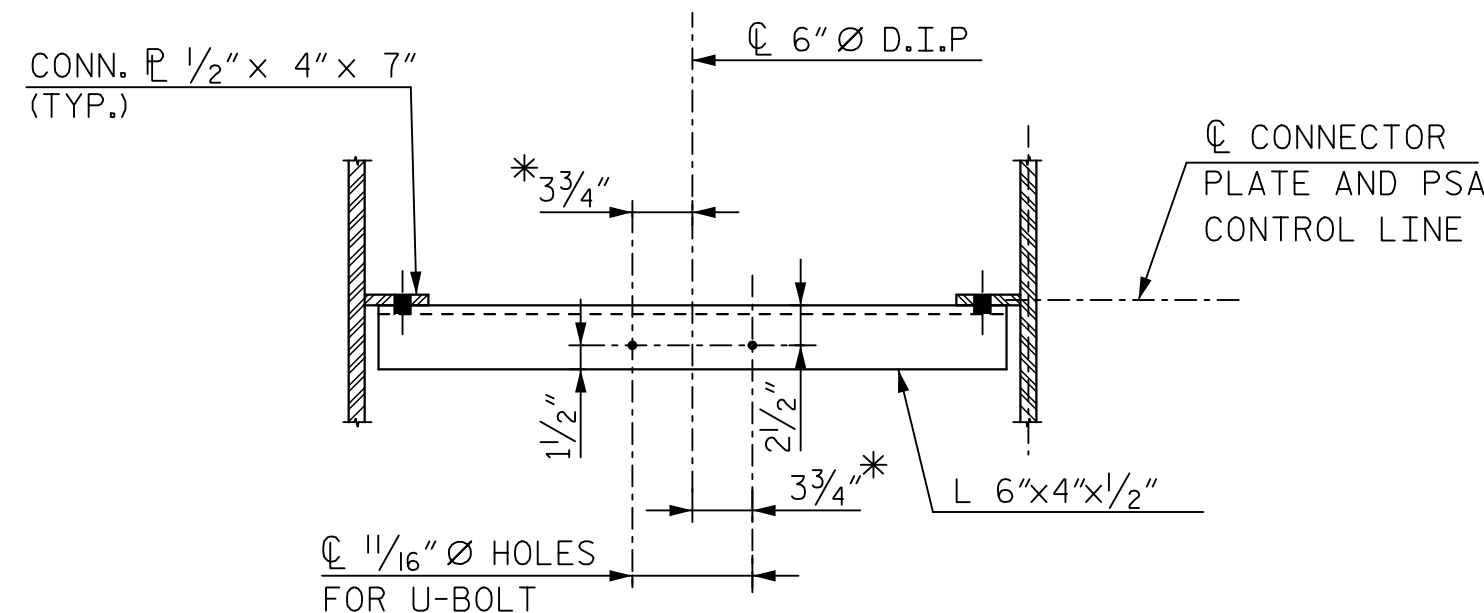
STRUCTURE
 DRAINAGE DETAILS

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

SHEET NO. S8-37
 TOTAL SHEETS 39

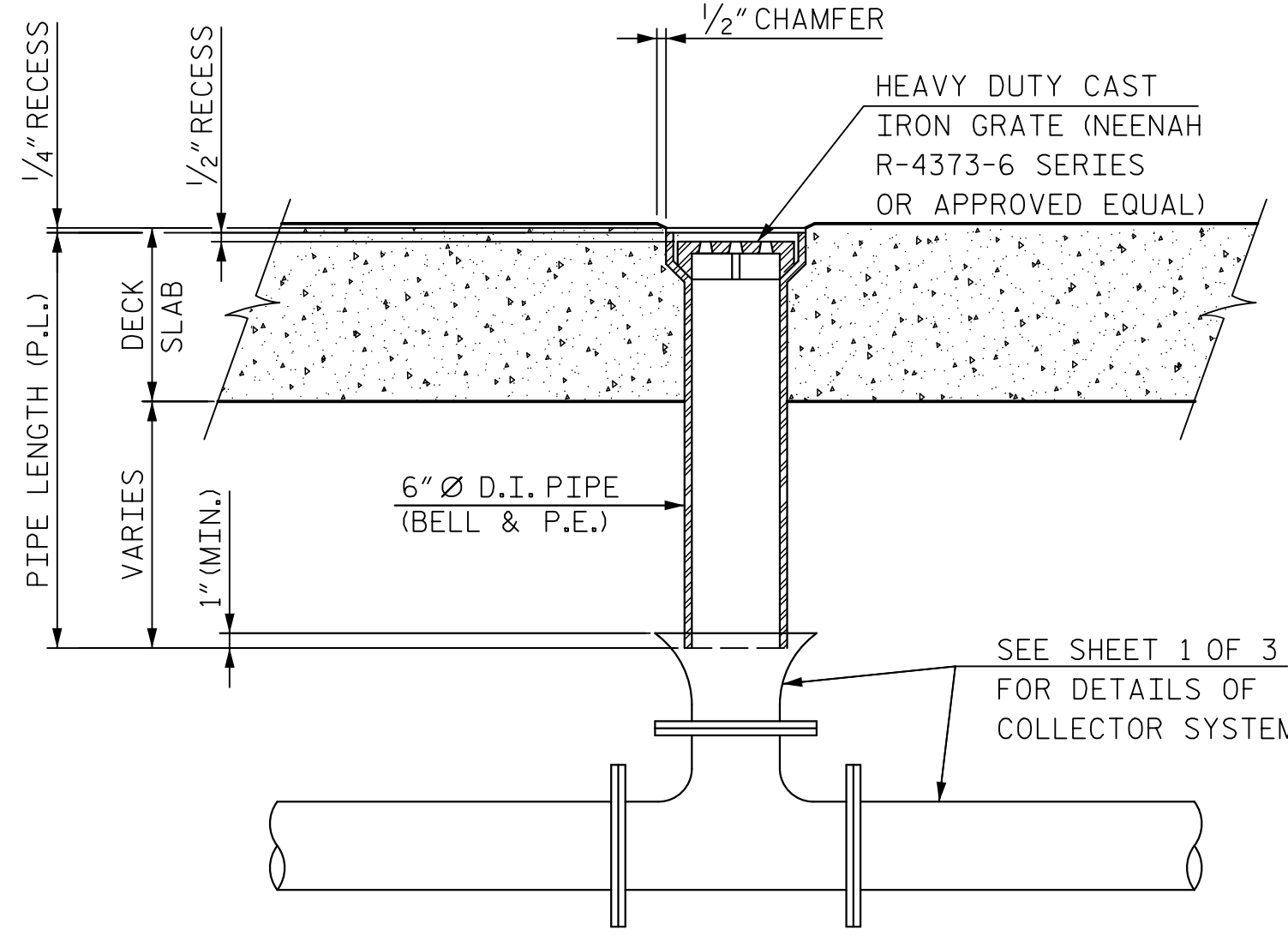


ELEVATION

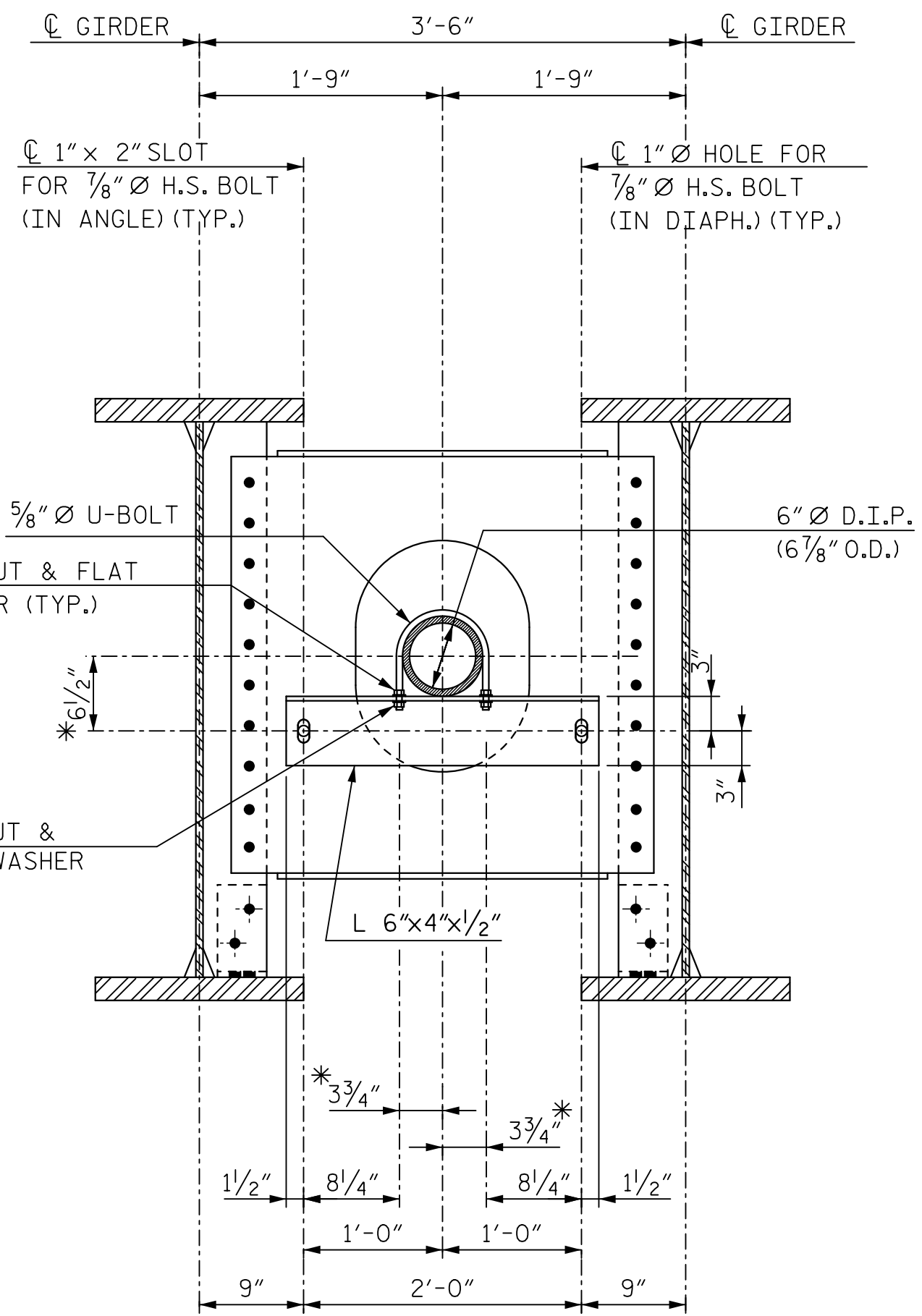


PLAN

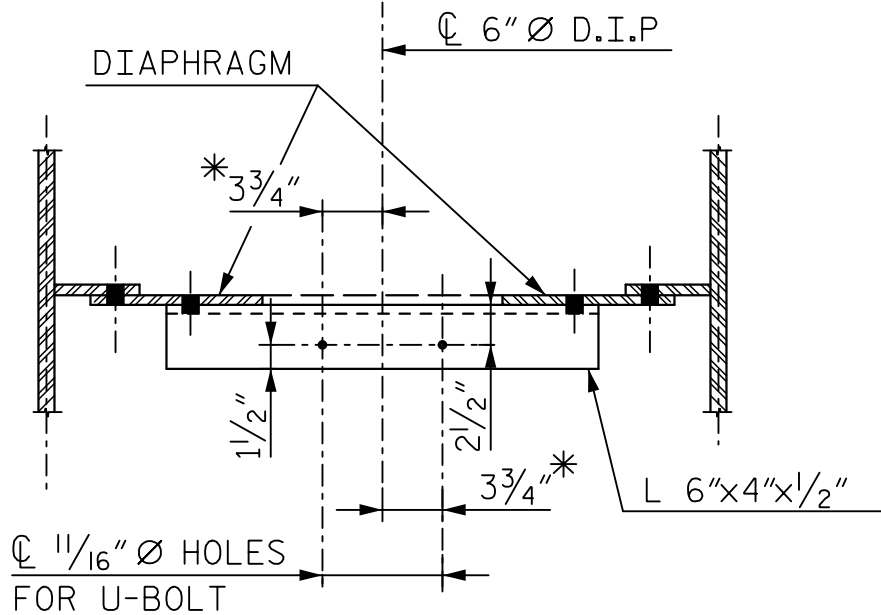
PIPE SUPPORT ANGLE (PSA)
(12 REQ'D.)



DETAIL "B"



ELEVATION

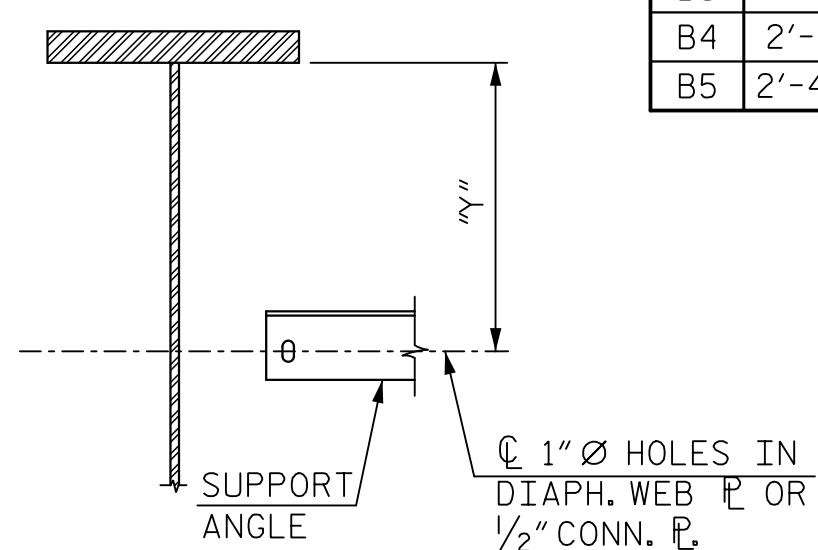


PLAN

DIAPHRAGM SUPPORT ANGLE (DSA)
(16 REQ'D.)

NOTE:
 DIAPHRAGM FLANGE P NOT SHOWN FOR CLARITY

DSA	"N"	DSA	"Y"	DSA	"Y"	PSA	"N"
A1	2'-5 15/16"	B1	2'-4 9/16"	C1	2'-6 1/16"	A1	2'-6 3/8"
A2	2'-5 5/16"	B2	2'-4 1/16"			A2	2'-5 1/16"
		B3	2'-4 1/16"			B1	2'-4 1/16"
		B4	2'-4 5/8"			B2	2'-5 1/4"
		B5	2'-4 15/16"			C1	2'-5 1/16"
						C2	2'-6 3/8"



DETAIL "A"

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:

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

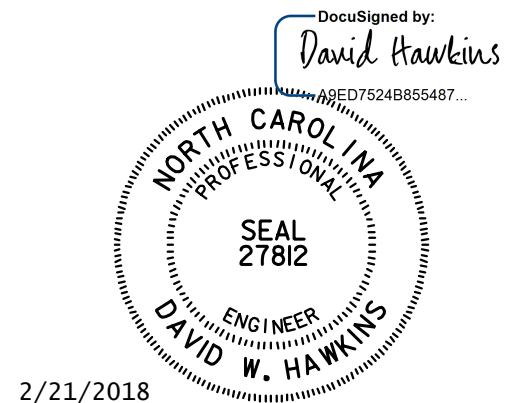
SUPERSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES		
ITEM	UNIT	TOTAL
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	201'-7 1/2"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (BELL & P.E.)	FEET	36'-9 3/8"
6" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	3,520
6" I.D. DUCTILE IRON BLIND FLANGES	LBS	150
EXPANSION JOINT	EA.	4
HEAVY DUTY CAST IRON GRATES	EA.	24
PIPE SUPPORT ANGLES (PSA) *	EA.	12
DIAPHRAGM SUPPORT ANGLES (DSA) *	EA.	16

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

PROJECT NO. P-5705BA
 MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STRUCTURE
 DRAINAGE DETAILS

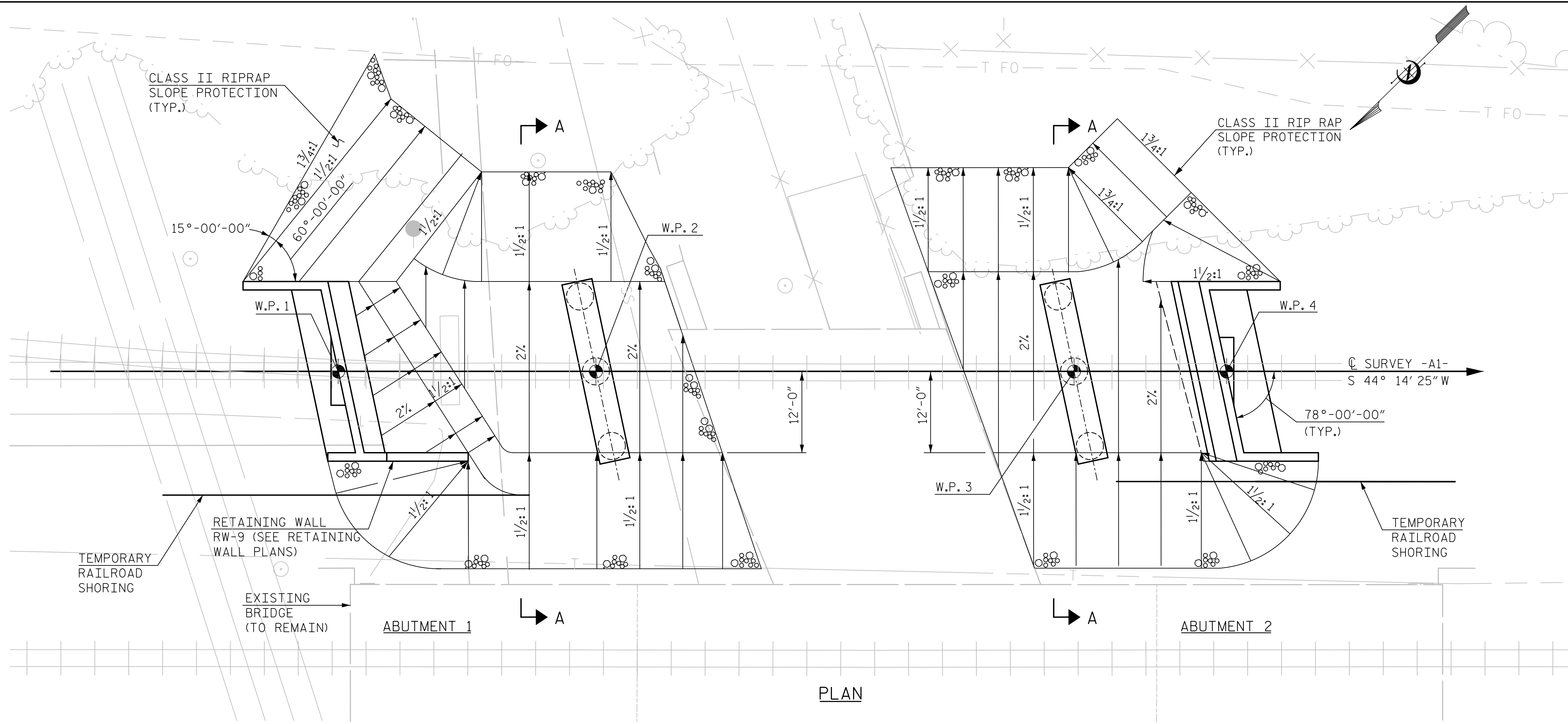


2/21/2018

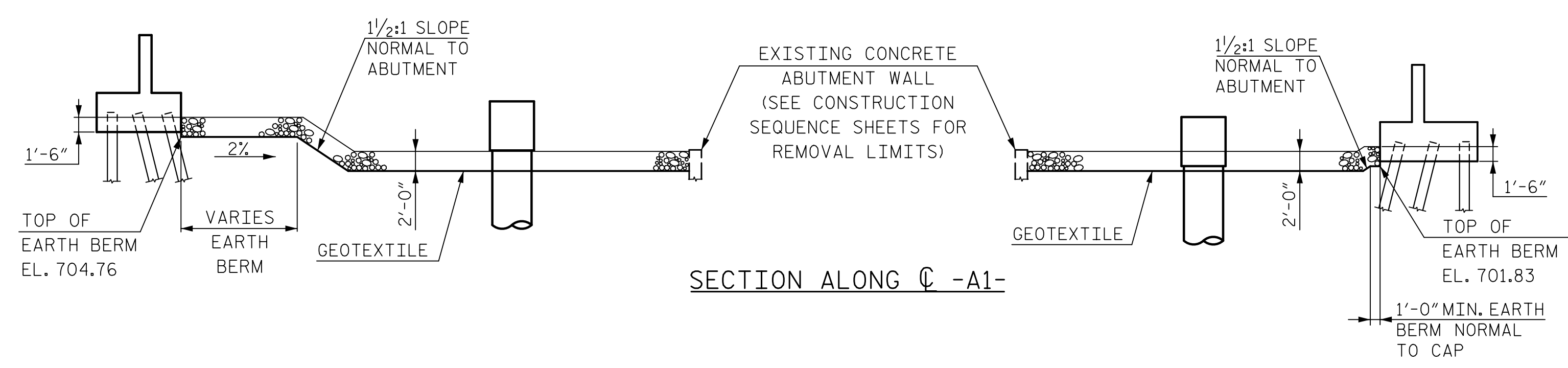
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: J. BAYNE	DATE: 8/17
CHECKED BY: V. KOLLIPARA	DATE: 9/17
DWG. NO. 38	

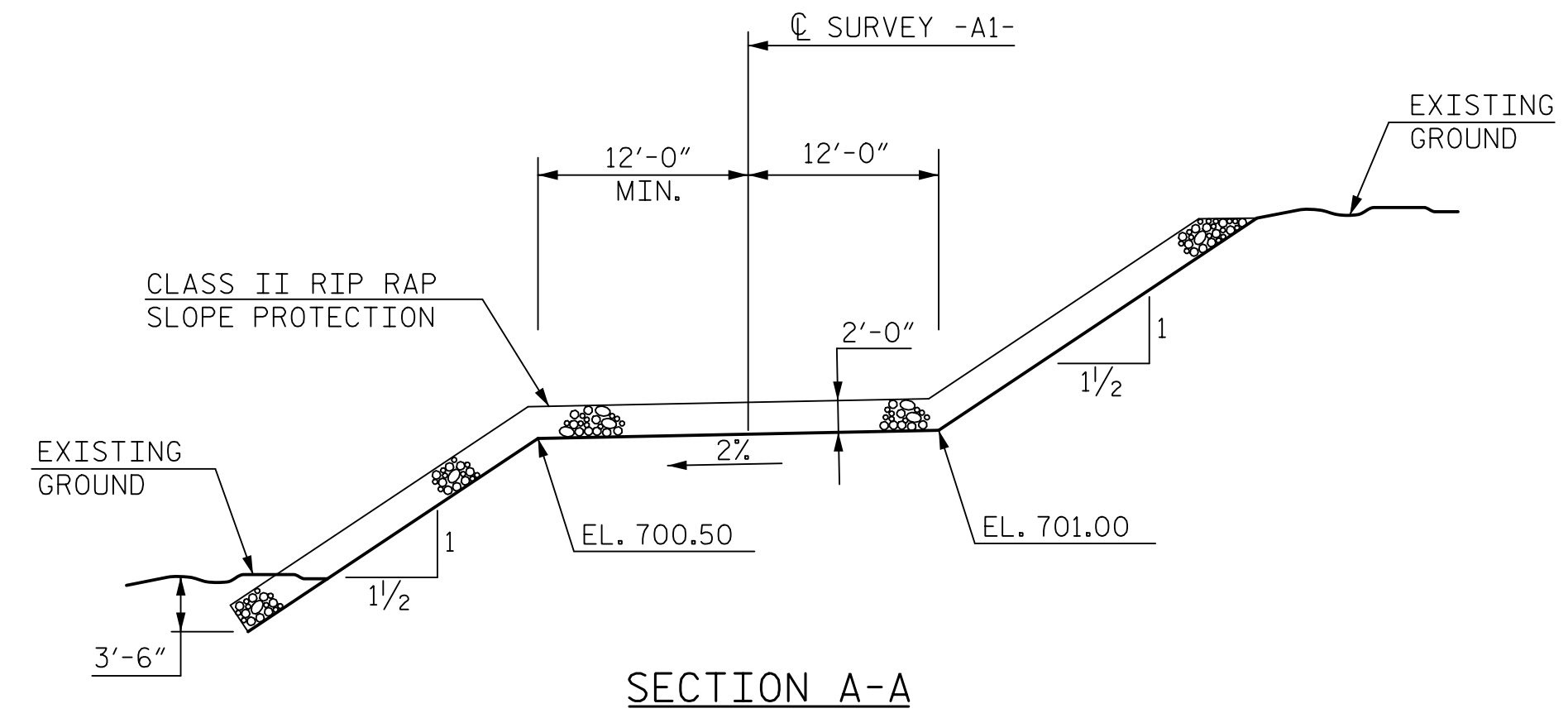
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S8-38
1			3			TOTAL SHEETS 39
2			4			



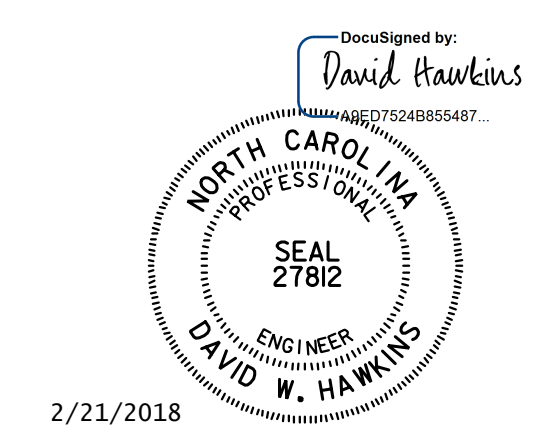
NOTES:
 FOR BERM WIDTH DIMENSIONS AND BERM ELEVATIONS, SEE GENERAL DRAWING.
 FOR TEMPORARY RAILROAD SHORING, SEE "ABUTMENT 1 SHORING" AND "ABUTMENT 2 SHORING" SHEETS.
 FOR RETAINING WALL RW-9, SEE RETAINING WALL PLANS.



BRIDGE @ STA. 42+59.46 -A1-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
ABUTMENT 1	350	390
ABUTMENT 2	260	290



PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: STA. 42+59.46 -A1-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RIP RAP DETAILS

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S8-39		
	NO.	BY	DATE	NO.		BY	DATE
	1			3			
2			4				
DRAWN BY: J. BAYNE DATE: 11/17 CHECKED BY: D. HAWKINS DATE: 11/17 DWG. NO. 39							

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990