

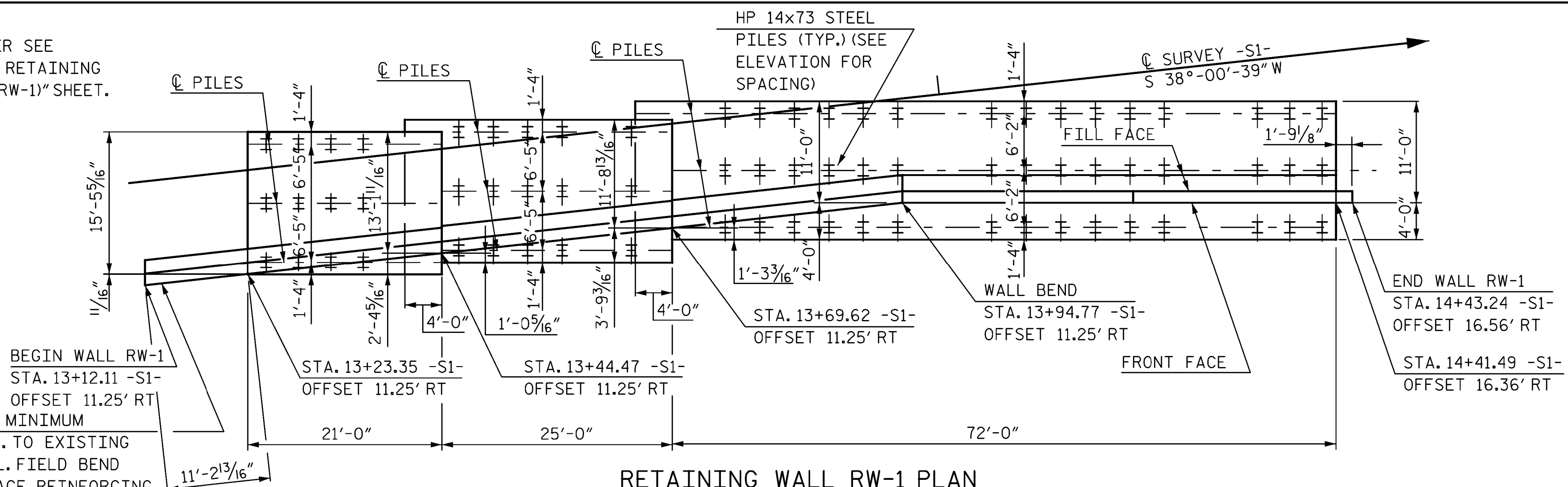
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0012DEL\_P28  
1002ADD\_P28

NOTE: FOR PILE BATTER SEE  
"CAST-IN-PLACE RETAINING  
WALL DETAILS (RW-1)" SHEET.



RETAINING WALL RW-1 PLAN

CAST IN PLACE WALL NOTES:

FOR REINFORCING IN FOOTING STEP, SEE STEP FOOTING DETAIL ON "CAST IN PLACE RETAINING WALL DETAILS (RW-1)" SHEET.

U.N.O. - UNLESS NOTED OTHERWISE

DESIGN LOAD: COOPER E80 PER AREMA. TRACK CENTERED 11'-3" MIN. FROM EXPOSED FACE OF WALL RW-1 AND RW-7.

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

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.

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.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, 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.

CONTRACTOR SHALL SUBMIT FORMWORK AND METHOD OF CONCRETE PLACEMENT FOR RW-1 AND RW-7 TO THE ENGINEER FOR APPROVAL. CONTRACTOR SHALL ENSURE THAT METHOD PROVIDES FOR CONSOLIDATION OF CONCRETE AT BASE OF WALL STEM.

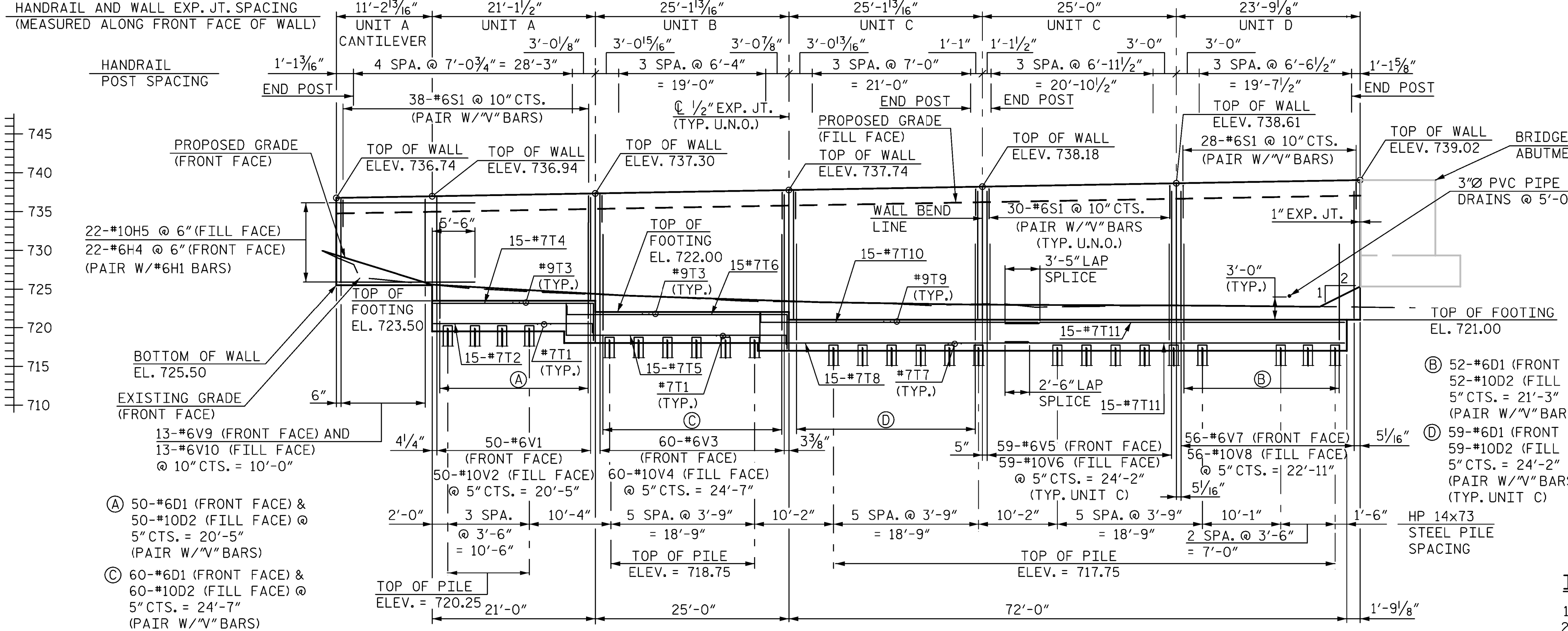
FOUNDATION NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS.

PILES AT RETAINING WALL NO. 1 AND RETAINING WALL NO. 7 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 100 TONS PER PILE

DRIVE PILES AT RETAINING WALL NO. 1 AND RETAINING WALL NO. 7 TO A REQUIRED BEARING CAPACITY OF 250 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW.

TEST THE FIRST PRODUCTION WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT RETAINING WALL NOS 1 AND 7. FOR PDA TESTING, SEE GEOTECHNICAL SPECIAL PROVISION.



RETAINING WALL RW-1 ELEVATION

INDEX OF DRAWINGS

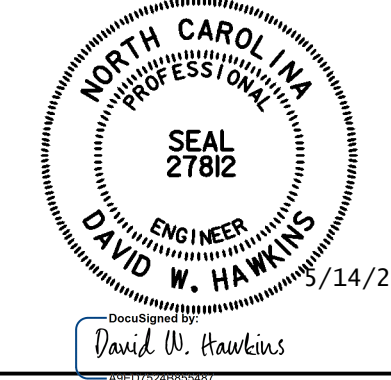
- 1 RETAINING WALL RW-1
- 2 RETAINING WALL RW-2
- 3 RETAINING WALL RW-3
- 4 RETAINING WALL RW-4 (SHEET 1 OF 2)
- 5 RETAINING WALL RW-4 (SHEET 2 OF 2)
- 6 RETAINING WALL RW-5
- 7 RETAINING WALL RW-7
- 8 RETAINING WALL RW-8
- 9 RETAINING WALL RW-9
- 10 PILE PANEL RETAINING WALL DETAILS (SHEET 1 OF 2)
- 11 PILE PANEL RETAINING WALL DETAILS (SHEET 2 OF 2)
- 12 CAST IN PLACE RETAINING WALL DETAILS (RW-1) SHEET 1 OF 3
- 13 CAST IN PLACE RETAINING WALL DETAILS (RW-7) SHEET 2 OF 3
- 14 CAST IN PLACE RETAINING WALL DETAILS (RW-7) SHEET 3 OF 3
- 15 WALL MOUNTED FENCE AND HANDRAIL DETAILS (SHEET 1 OF 2)
- 16 WALL MOUNTED FENCE AND HANDRAIL DETAILS (SHEET 2 OF 2)
- 17 METAL HANDRAIL DETAILS

NOTE: RETAINING WALL RW-6 REMOVED FROM PLANS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	PDA TESTING	CLASS AA CONCRETE	REINFORCING STEEL	HP 14x73 STEEL PILES		PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 STEEL PILES	7" DIA. MICROPILES	MIRCOPILE VERIFICATION TESTS	METHOD B DAMPPROOFING	METAL RAIL (STEEL) AND FENCE	METAL RAIL (ALUMINUM)	PILE PANEL RETAINING WALL
					NO.	L.F.							
RW-1	473.7	1	437.1	89,931	75	1,875	75			207.5		131.0	
RW-2											307.4		2,433.6
RW-3											317.9		2,373.5
RW-4											694.8		4,830.7
RW-5												191.7	667.0
RW-7	2,072.4	1	1,805.0	285,293	241	9,238.4	241			652.2		271.7	
RW-8	121.9		42.4	5,277						35.3			
RW-9	25.7		12.4	2,078				6	1	10.2			
TOTAL	2,693.7	2	2,296.9	382,579	316	11,113.4	316	6	1	905.2	1,320.1	594.4	10,304.8

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: 13+12.11 -S1-



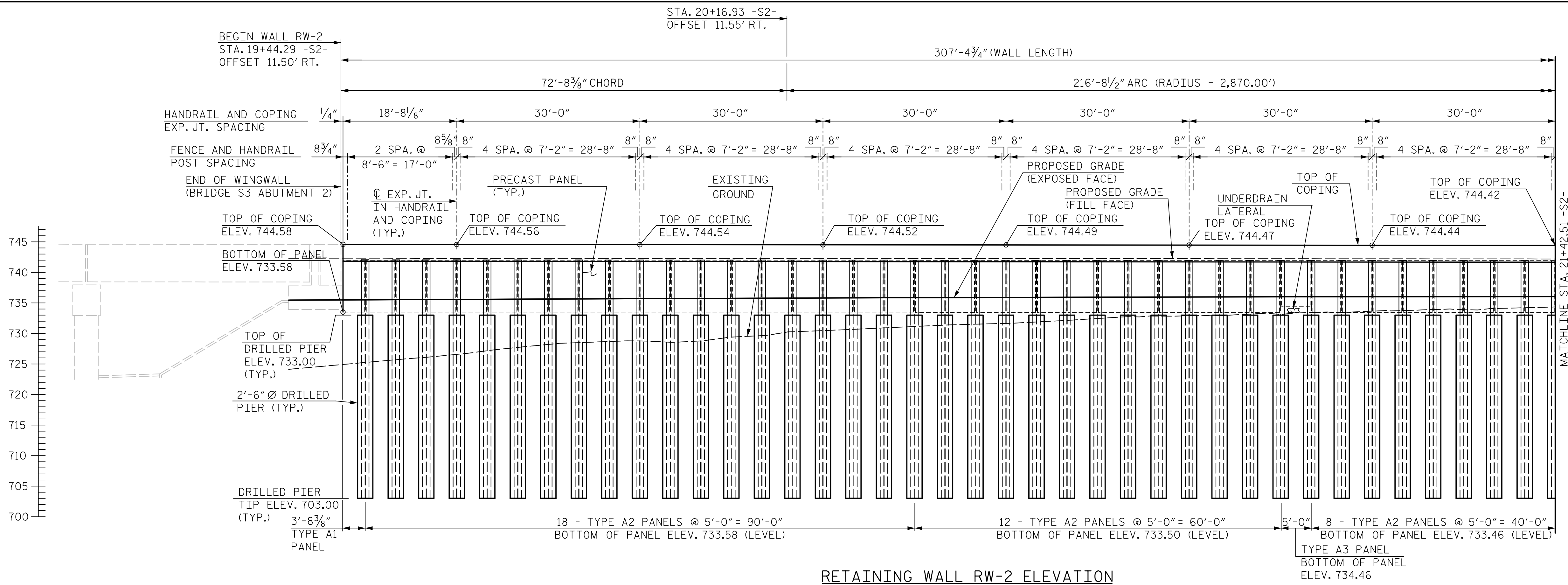
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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
  
RETAINING WALL RW-1

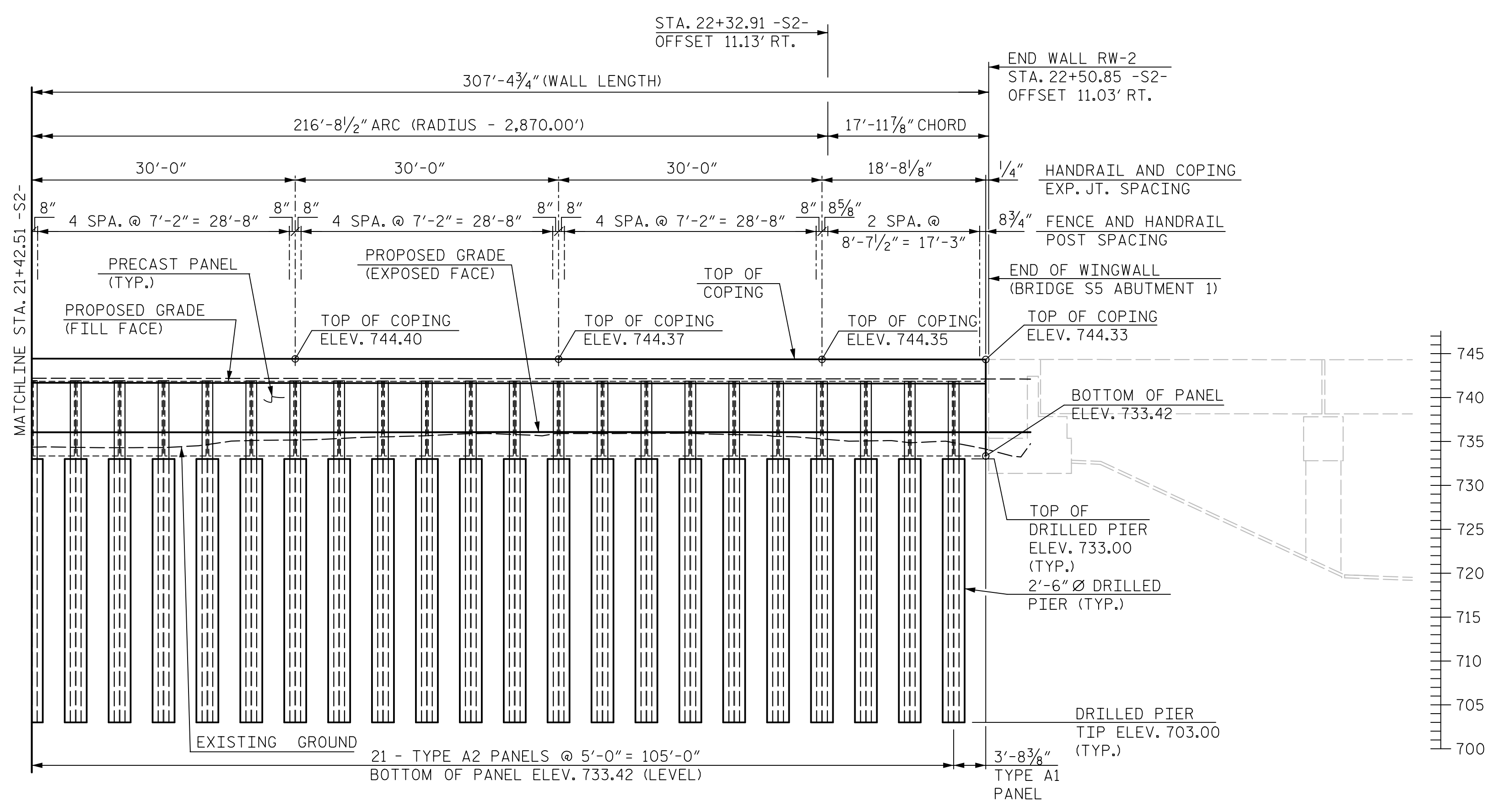
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1	DWH	5/10/18	3			TOTAL SHEETS
2			4			17

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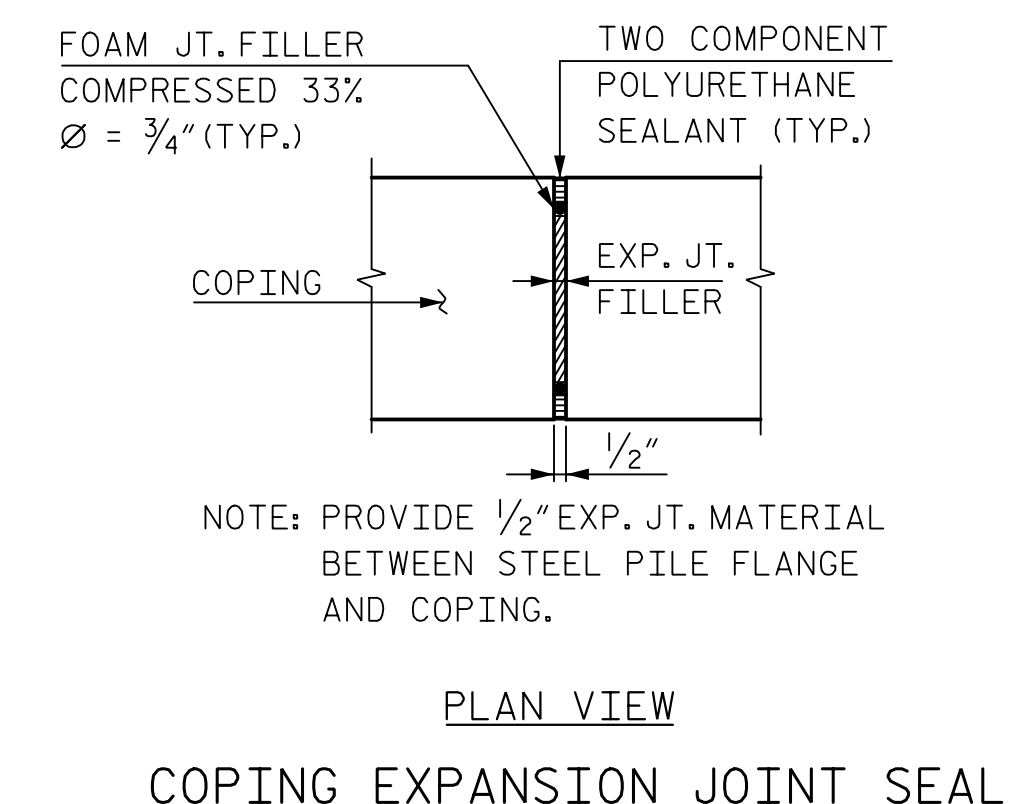
DRAWN BY M. WRIGHT DATE 11/17  
CHECKED BY D. HAWKINS DATE 11/17 DWG. NO. 1



RETAINING WALL RW-2 ELEVATION



RETAINING WALL RW-2 ELEVATION



**NOTES:**

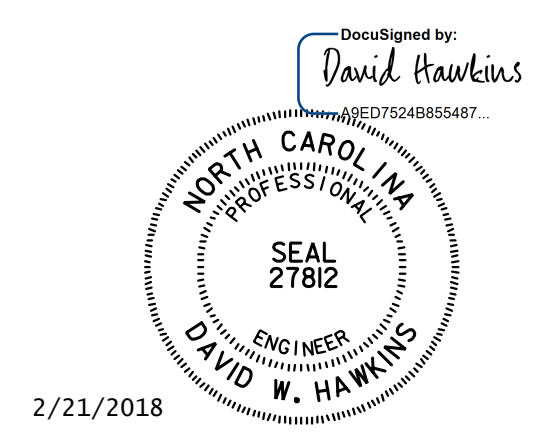
FOR PILE PANEL WALL NOTES AND PILE PANEL RETAINING WALL DETAILS, SEE "PILE PANEL RETAINING WALL DETAILS" SHEETS.

FOR FENCING AND HANDRAIL DETAILS, SEE "WALL MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

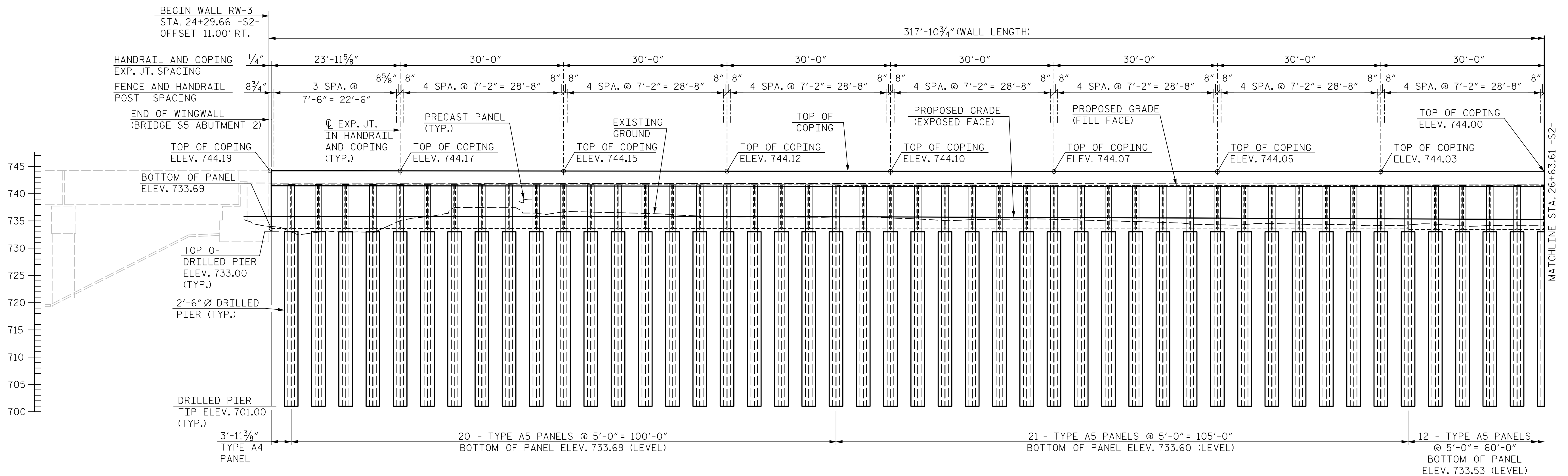
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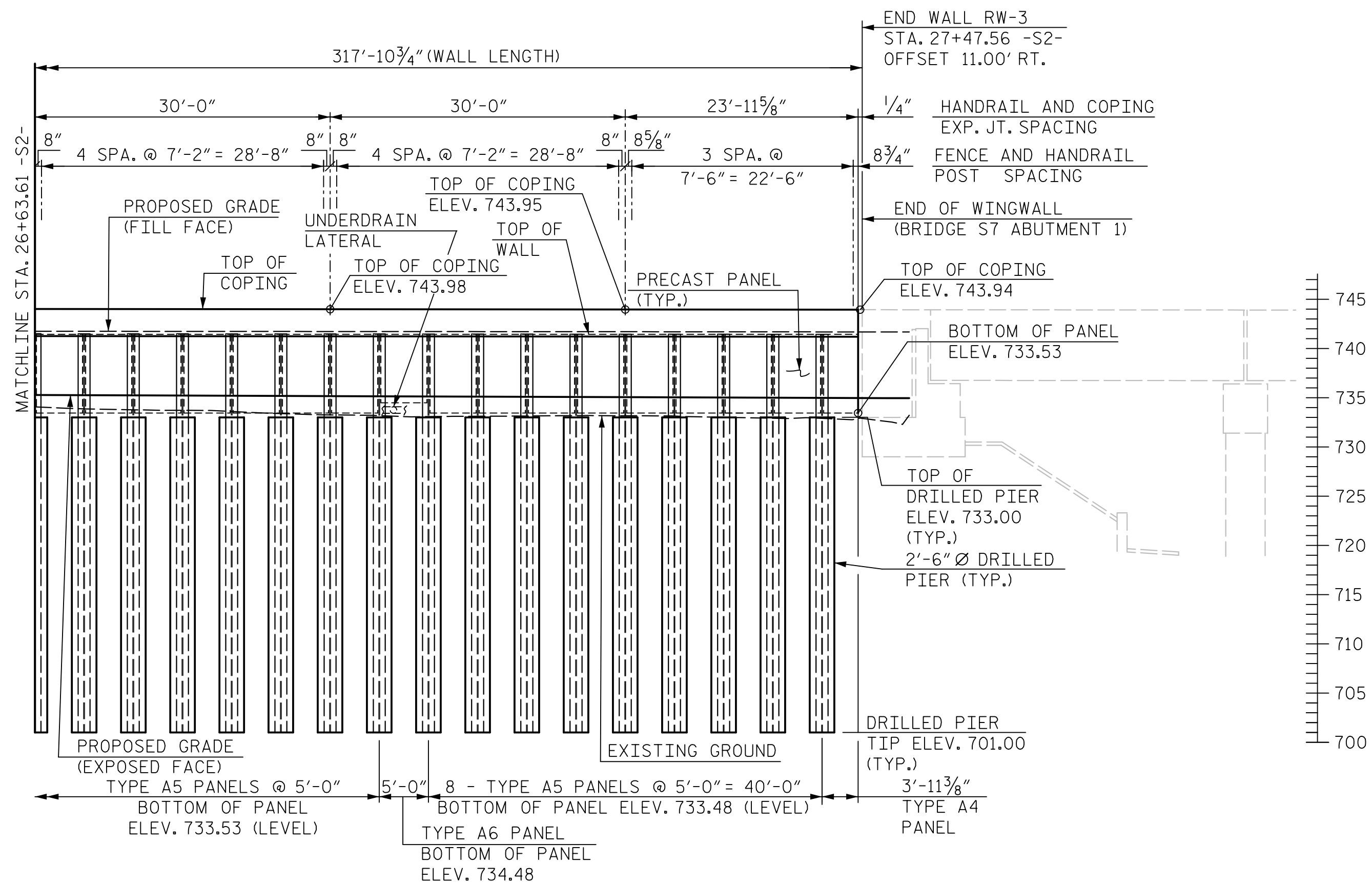
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CHECKED BY: <u>D. HAWKINS</u>	DATE: <u>10/17</u>		

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		RETAINING WALL RW-2		SHEET NO. W-2	
				TOTAL SHEETS 17	
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		



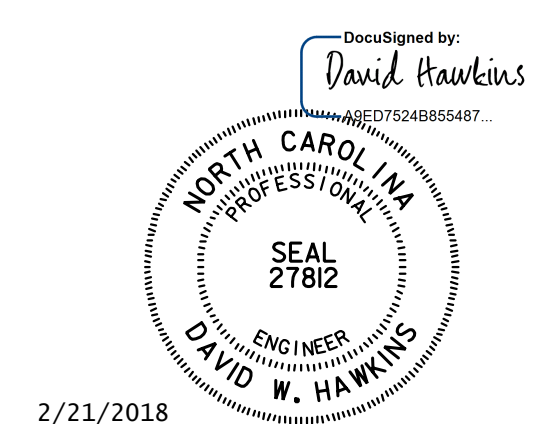
RETAINING WALL RW-3 ELEVATION



RETAINING WALL RW-3 ELEVATION

**NOTES:**  
 FOR PILE PANEL WALL NOTES AND PILE PANEL RETAINING WALL DETAILS, SEE "PILE PANEL RETAINING WALL DETAILS" SHEETS.  
 FOR FENCING AND HANDRAIL DETAILS, SEE "WALL MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.  
 FOR COPING EXPANSION JOINT DETAILS, SEE SHEET "RETAINING WALL RW-2".

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: 24+29.66 -S2-

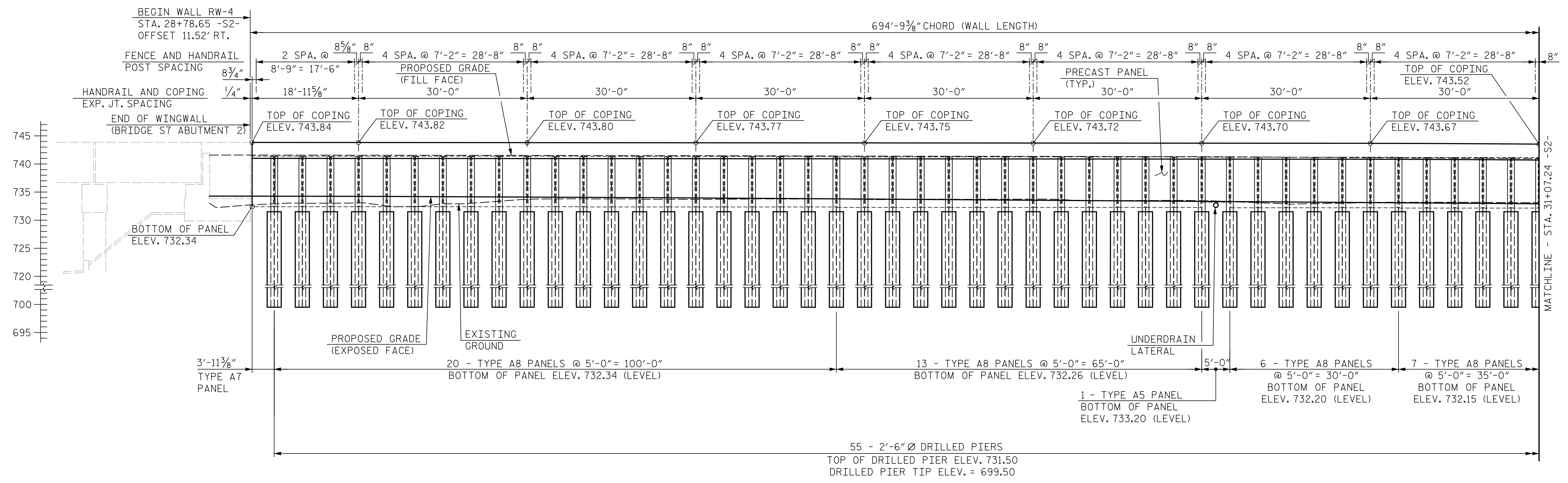


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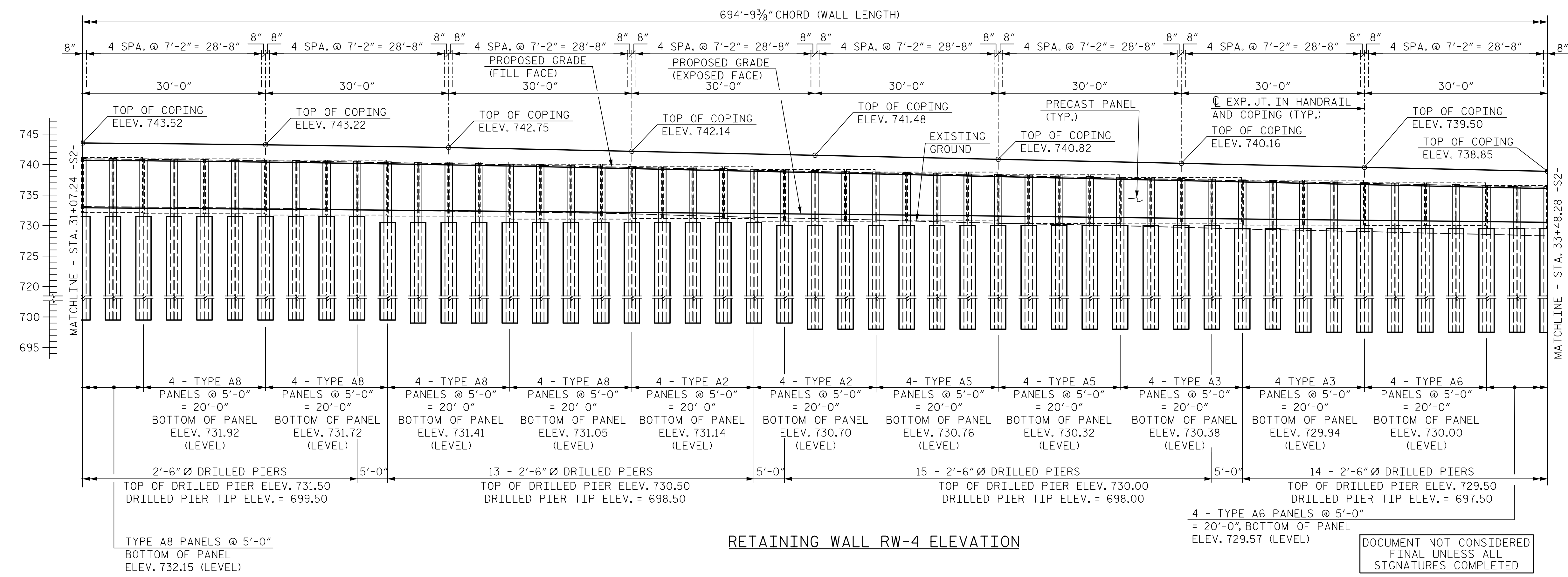
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 RETAINING WALL RW-3

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CHECKED BY: D. HAWKINS		DATE: 10/17		TOTAL SHEETS 17	

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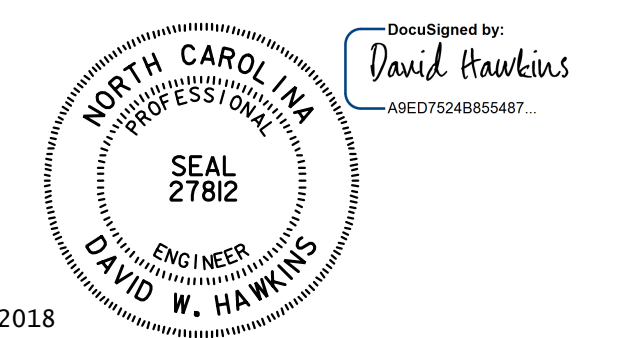
RETAINING WALL RW-4 ELEVATION



RETAINING WALL RW-4 ELEVATION

NOTES:

- FOR PILE PANEL WALL NOTES AND PILE PANEL RETAINING WALL DETAILS, SEE "PILE PANEL RETAINING WALL DETAILS" SHEETS.
- FOR FENCING AND HANDRAIL DETAILS, SEE "WALL MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.
- FOR COPING EXPANSION JOINT DETAILS, SEE SHEET "RETAINING WALL RW-2".



PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: STA. 28+78.65 -S2-

SHEET 1 OF 2

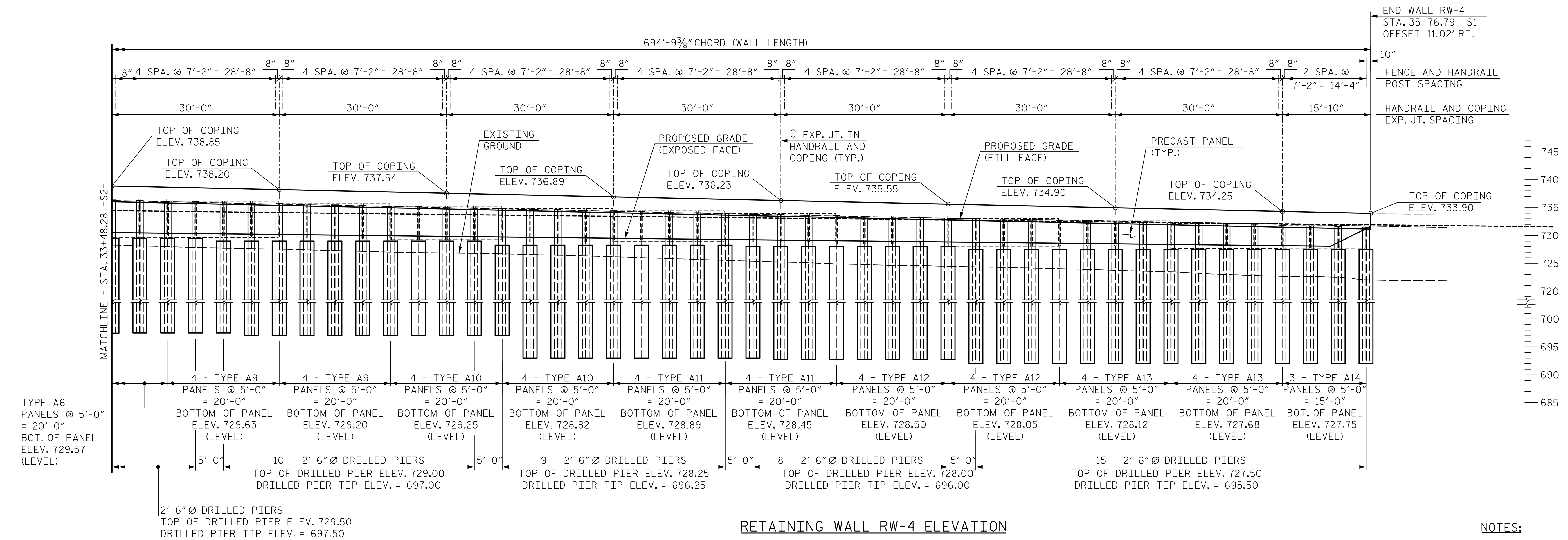
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RETAINING WALL RW-4

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



**NOTES:**

FOR PILE PANEL WALL NOTES AND PILE PANEL RETAINING WALL DETAILS, SEE "PILE PANEL RETAINING WALL DETAILS" SHEETS.

FOR FENCING AND HANDRAIL DETAILS, SEE "WALL MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

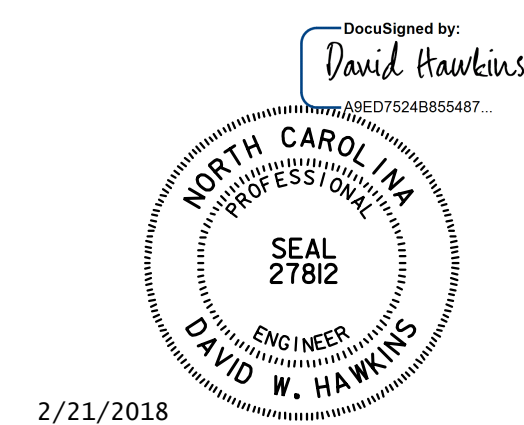
FOR COPING EXPANSION JOINT DETAILS, SEE SHEET "RETAINING WALL RW-2".

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: STA. 28+78.65 -S2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RETAINING  
 WALL RW-4



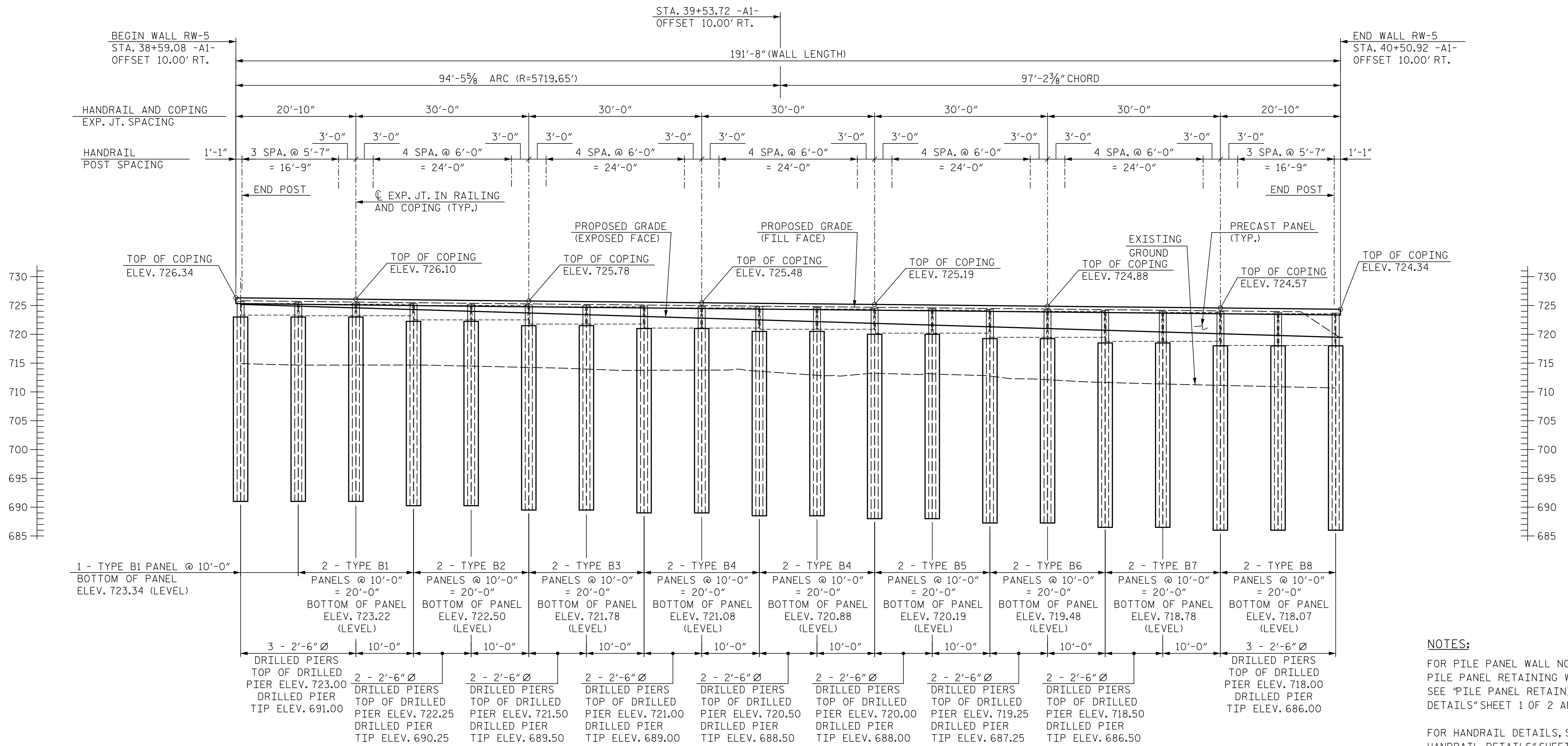
2/21/2018

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DRAWN BY: M. WRIGHT	DATE: 10/17	DWG. NO. 5	
CHECKED BY: D. HAWKINS	DATE: 10/17		

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

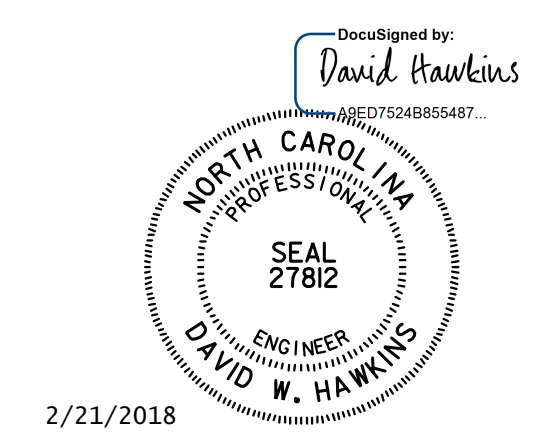
SHEET NO.	W-5
TOTAL SHEETS	17



RETAINING WALL RW-5 ELEVATION

**NOTES:**  
 FOR PILE PANEL WALL NOTES AND PILE PANEL RETAINING WALL DETAILS, SEE "PILE PANEL RETAINING WALL DETAILS" SHEET 1 OF 2 AND 2 OF 2.  
 FOR HANDRAIL DETAILS, SEE "METAL HANDRAIL DETAILS" SHEET.  
 FOR COPING EXPANSION JOINT DETAILS, SEE SHEET "RETAINING WALL RW-2".

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: STA. 38+59.08 -A1-

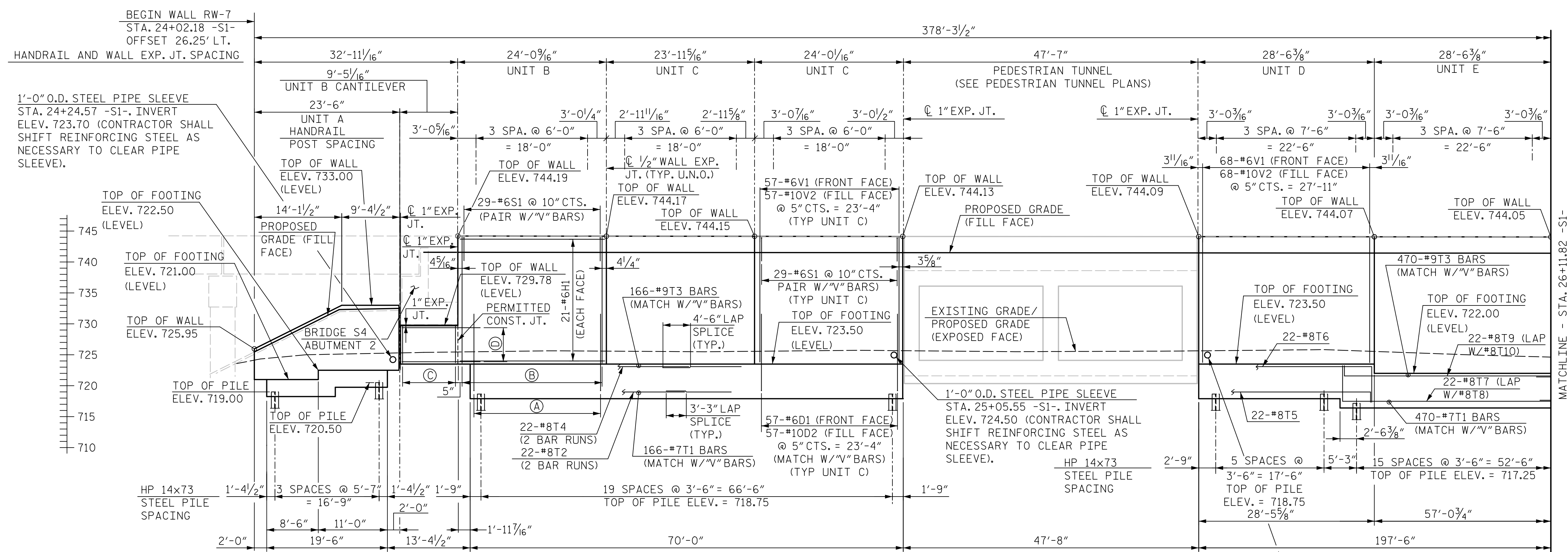


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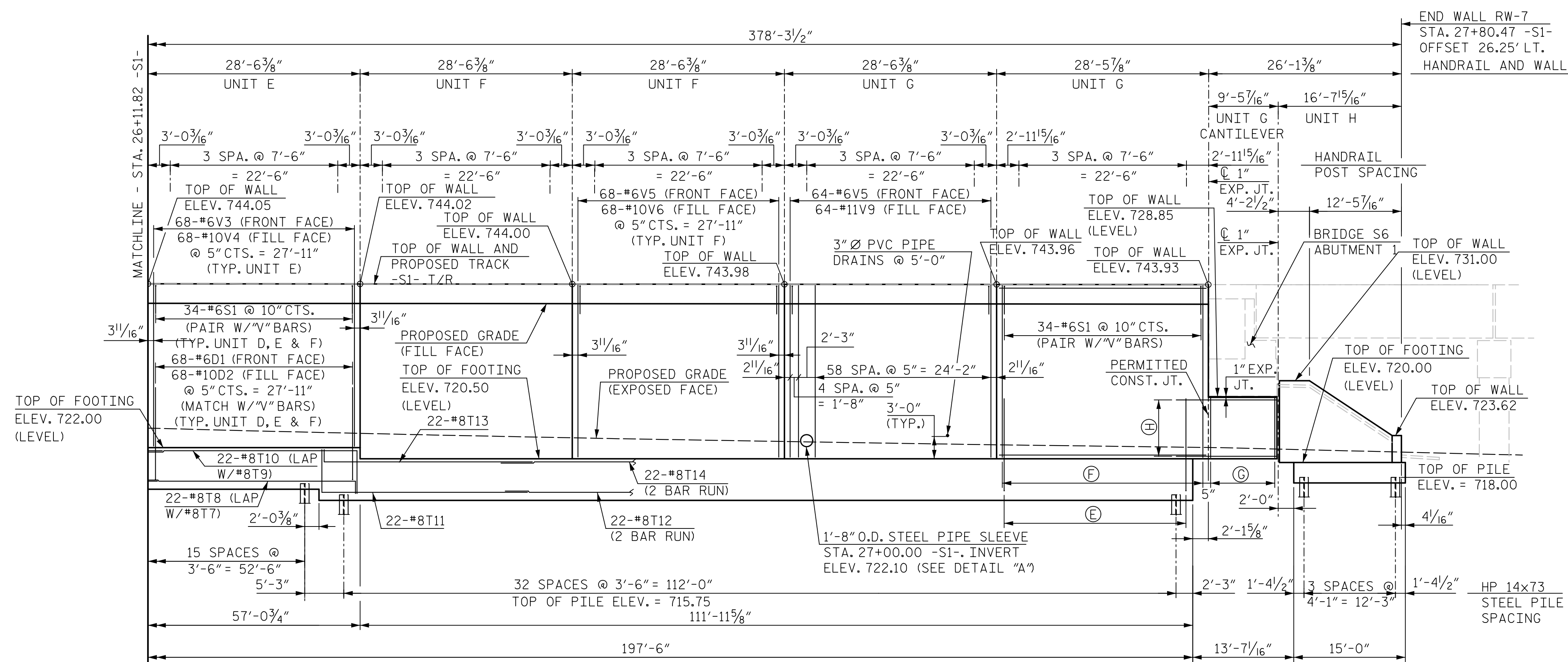
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RETAINING WALL RW-5

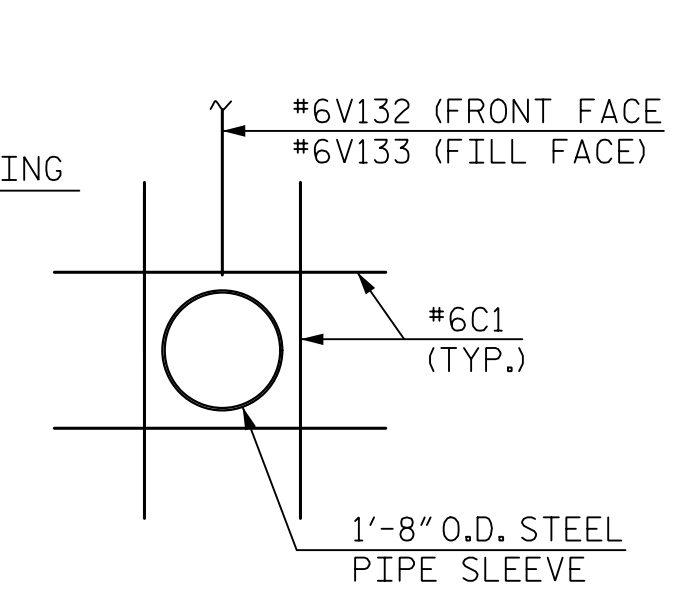
<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS						SHEET NO. W-6 TOTAL SHEETS 17
		NO.	BY	DATE	NO.	BY	DATE	
DRAWN BY: M. WRIGHT DATE: 10/17		1			3			
CHECKED BY: D. HAWKINS DATE: 10/17		2			4			
DWG. NO. 6								



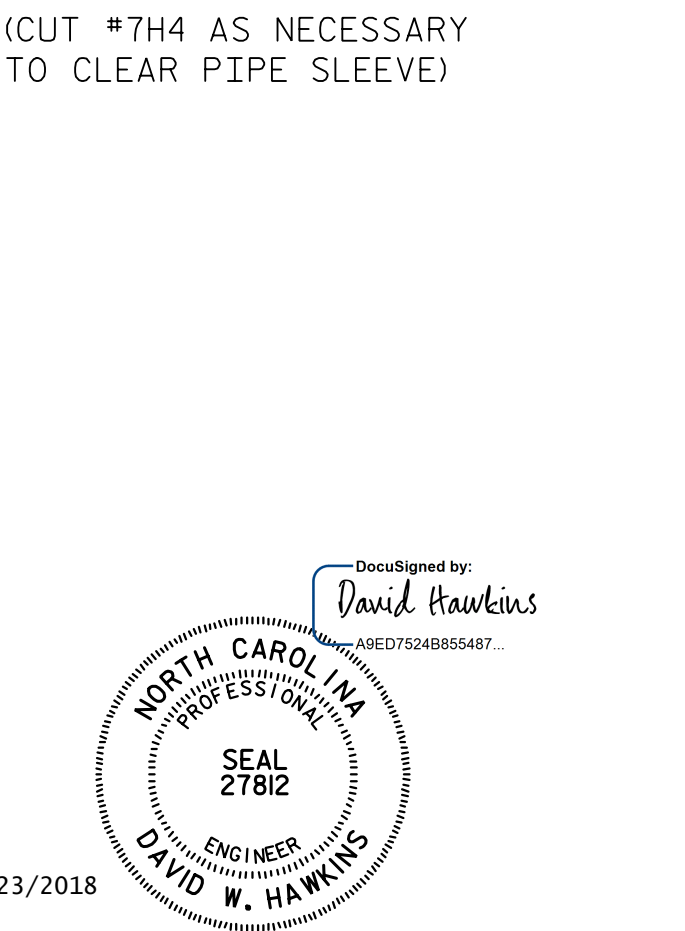
RETAINING WALL RW-7 ELEVATION



RETAINING WALL RW-7 ELEVATION



DETAIL "A"



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**NOTES:**

FOR WALL TYPICAL REINFORCING IN UNIT A, UNIT C THROUGH UNIT F, AND UNIT H, SEE "CAST-IN-PLACE WALL DETAILS" SHEETS.

FOR HANDRAIL DETAILS AND POST SPACING ON PEDESTRIAN TUNNEL, SEE PEDESTRIAN TUNNEL PLANS.

FOR HANDRAIL DETAILS AND POST SPACING ON BRIDGE ABUTMENTS, SEE BRIDGE PLANS.

FOR REINFORCING IN STEP FOOTING, SEE "STEP FOOTING DETAIL" ON "CAST IN PLACE RETAINING WALL DETAILS (RW-1)" SHEET.

CONTRACTOR SHALL MAINTAIN 2" MIN. CLEAR COVER TO REINFORCING STEEL IN WALL STEM.

CONTRACTOR SHALL MAINTAIN 3" MIN. CLEAR COVER TO REINFORCING STEEL TO SIDE FACES OF WALL FOOTING.

FOOTING CONSTRUCTION JOINTS ARE ALLOWED TO LIMIT CONCRETE POUR QUANTITY. CONSTRUCTION JOINTS SHALL BE LOCATED A MINIMUM OF 10' FROM FOOTING STEP AND A MIN. OF 1' FROM FACE OF PILE. CONSTRUCTION JOINT PLACEMENT SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.

FOR CAST IN PLACE WALL NOTES AND FOUNDATION NOTES, SEE "RETAINING WALL RW-1" SHEET.

- Ⓐ 52-#6D1 (FRONT FACE) AND 52-#10D2 (FILL FACE) @ 5" CTS. = 21'-3" (PAIR W/ "V" BARS IN STEM WALL)
- Ⓑ 57-#6V1 (FRONT FACE) AND 57-#10V2 (FILL FACE) @ 5" CTS. = 23'-4"
- Ⓒ 10-#6V7 (FRONT FACE) AND 10-#6V8 (FILL FACE) @ 1'-0" CTS. = 9'-0"
- Ⓓ 12-#10H3 (EA. FACE) @ 6" CTS. = 5'-6" (MATCH W/ #6H1 BARS)
- Ⓔ 62-#6D1 (FRONT FACE) AND 62-#11D8 (FILL FACE) @ 5" CTS. = 25'-5" (PAIR W/ "V" BARS IN STEM WALL)
- Ⓕ 67-#6V5 (FRONT FACE) AND 67-#11V9 (FILL FACE) @ 5" CTS. = 27'-6"
- Ⓖ 10-#7V10 (FRONT FACE) AND 10-#7V11 (FILL FACE) @ 1'-0" CTS. = 9'-0"
- Ⓖ 16-#10H5 (EA. FACE) @ 6" CTS. = 7'-6"

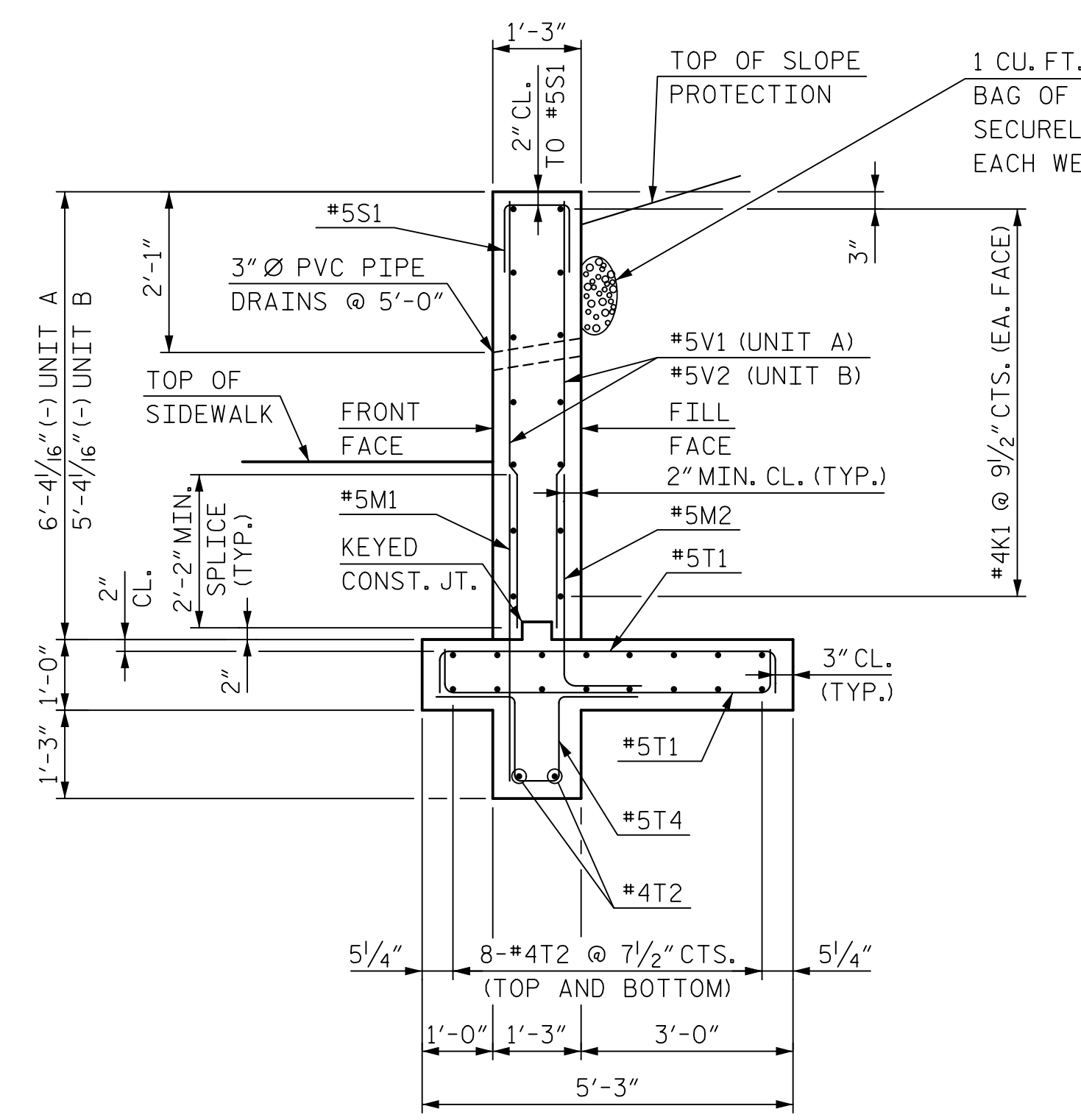
PROJECT NO. P-5705BA  
 MECKLENBURG COUNTY  
 STATION: 15+39.55 -S1-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

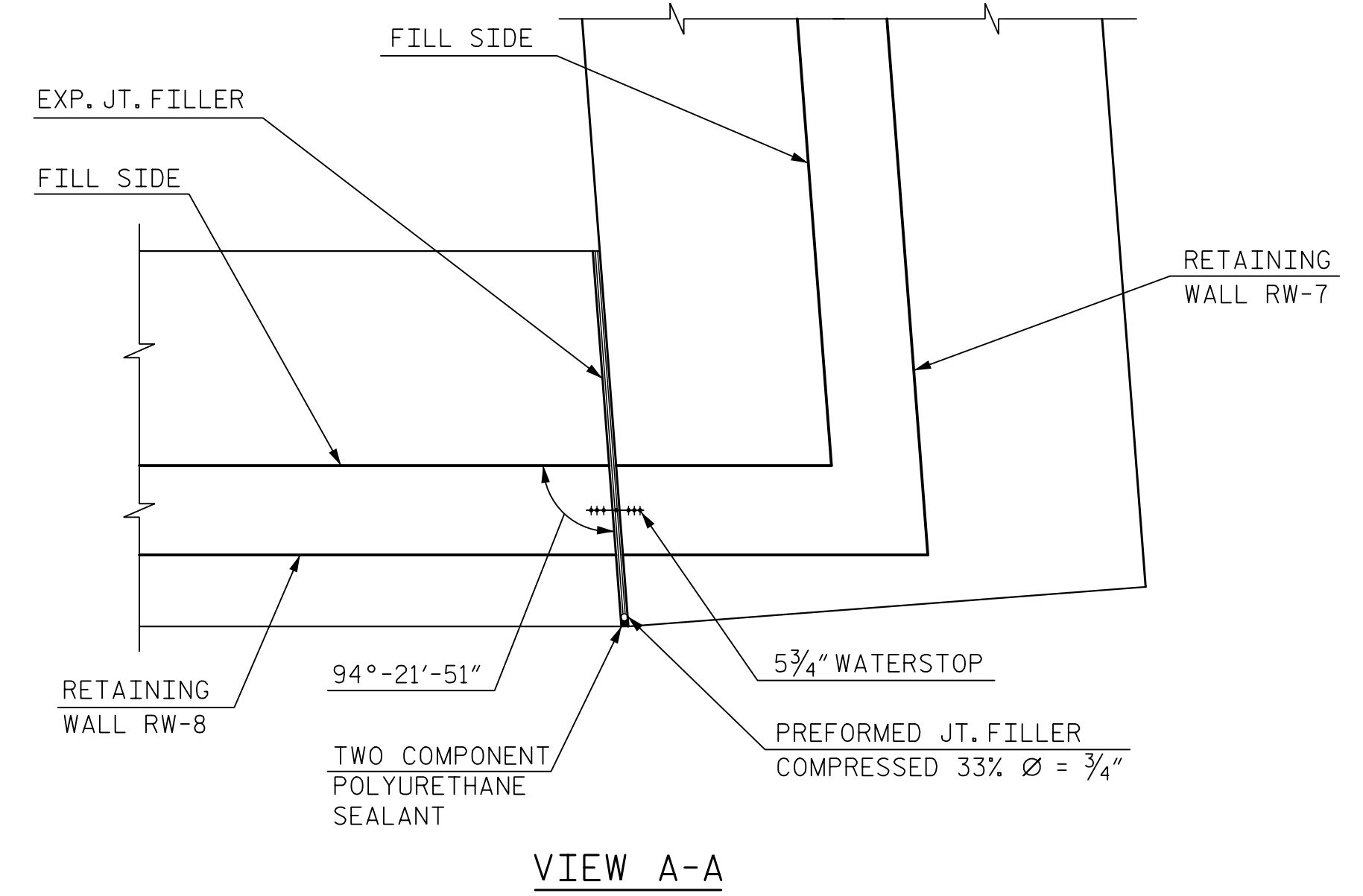
RETAINING WALL RW-7

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. W-7	
	NO.	BY	DATE	NO.		BY
DRAWN BY: M. WRIGHT CHECKED BY: D. HAWKINS DATE: 11/17 DATE: 11/17 DWG. NO. 7	1			3		
	2			4		
TOTAL SHEETS					17	

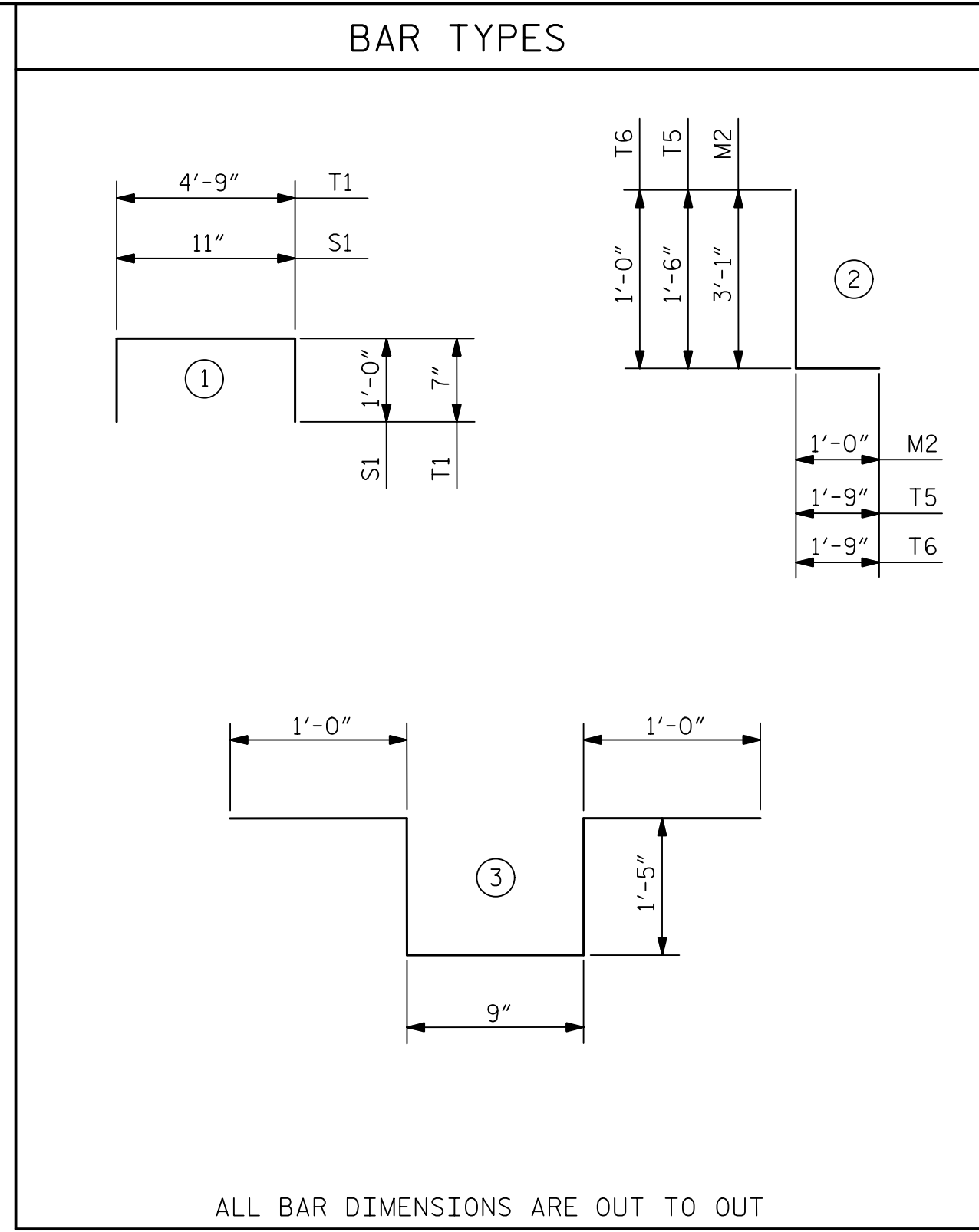




**TYPICAL SECTION**  
NOTE: #4T3 BARS TO BE USED IN PLACE OF #4T2 BARS IN UNIT B.

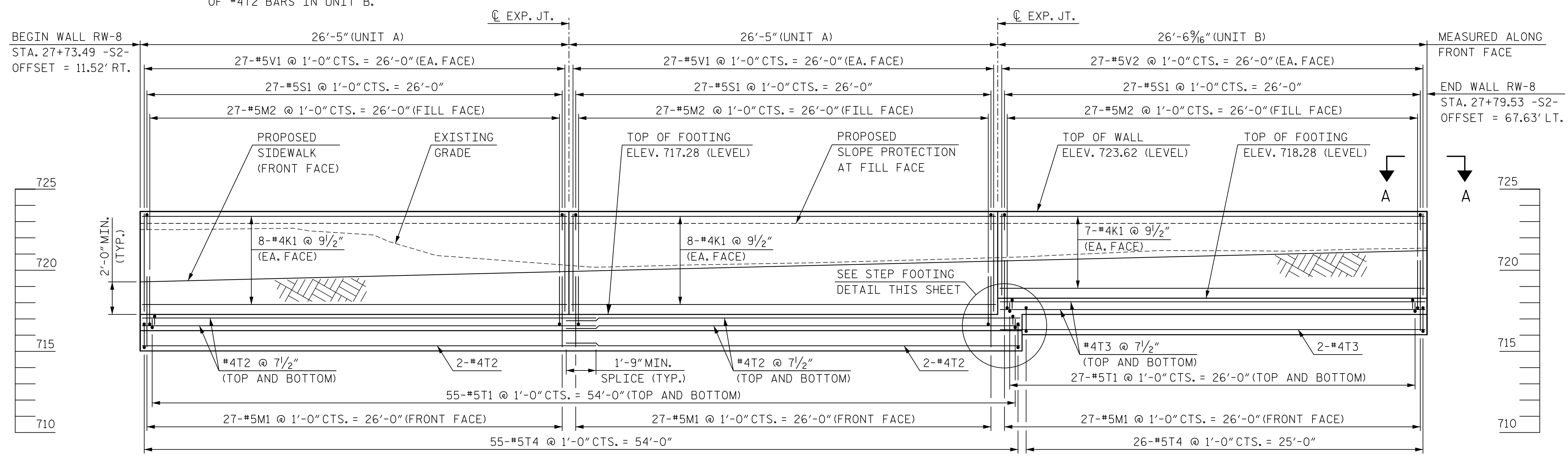


**VIEW A-A**



ALL BAR DIMENSIONS ARE OUT TO OUT

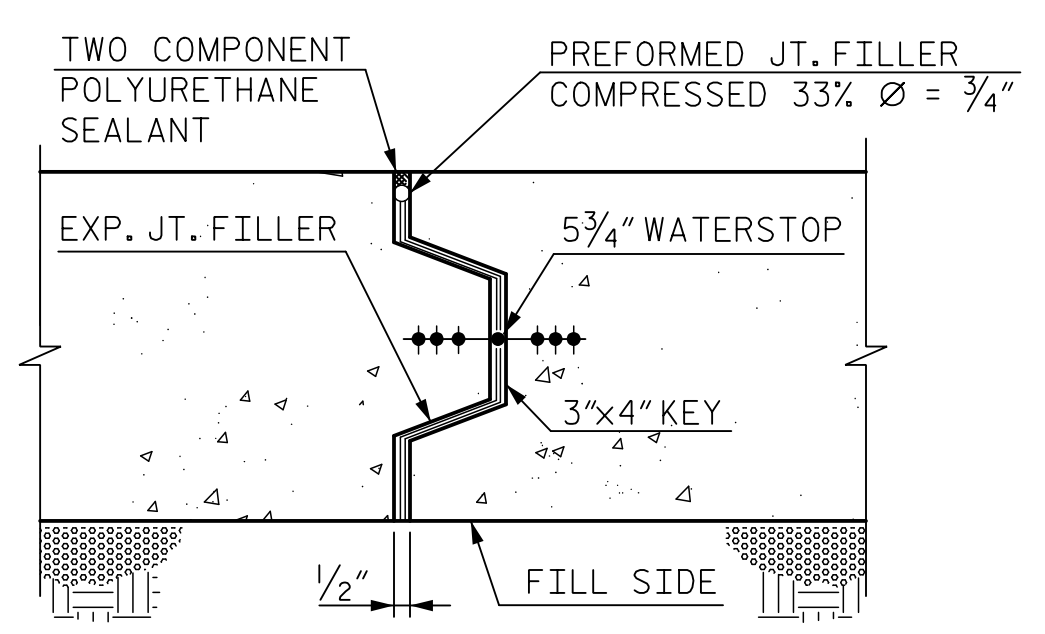
BILL OF REINFORCING					
RETAINING WALL RW-8					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
K1	46	4	STR.	26'-1"	801
S1	81	5	1	2'-11"	246
M1	81	5	STR.	4'-5"	373
M2	81	5	2	4'-1"	345
T1	164	5	1	5'-11"	1,012
T2	36	4	STR.	28'-8"	689
T3	18	4	STR.	25'-8"	309
T4	81	5	3	5'-7"	472
T5	18	4	2	3'-3"	39
T6	18	4	2	2'-9"	33
V1	108	5	STR.	6'-0"	676
V2	54	5	STR.	5'-0"	282
QUANTITIES					
ITEM					TOTAL
REINFORCING STEEL					
FOOTING				LBS	3,272
WALL				LBS	2,005
TOTAL				LBS	5,277
CLASS AA CONCRETE:					
FOOTING				C.Y.	20.3
WALL				C.Y.	22.1
TOTAL				C.Y.	42.4



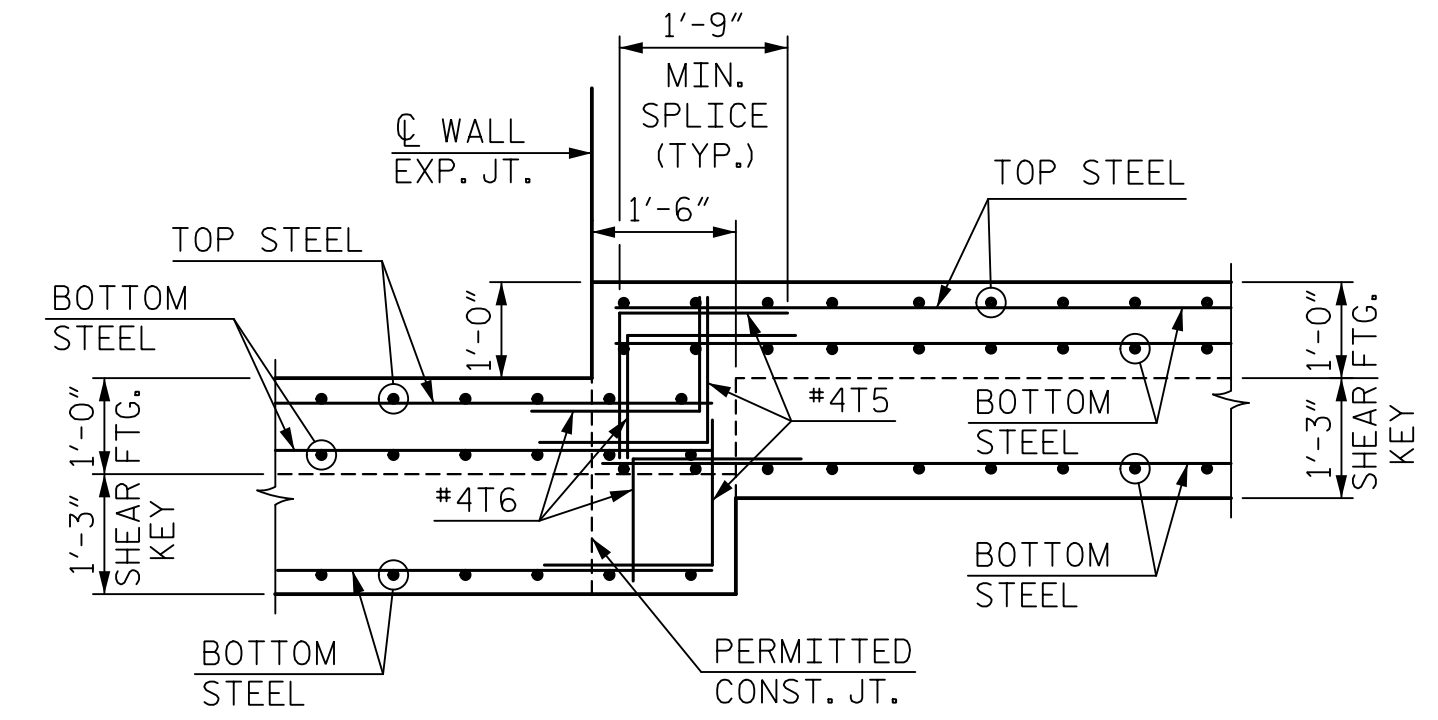
**RETAINING WALL RW-8 ELEVATION**

NOTES:  
WALL STATIONS AND OFFSETS ARE PROVIDED AT THE FRONT FACE OF WALL.  
FOR RETAINING WALL LOCATION, SEE TRACK PLANS.  
FOR ADDITIONAL NOTES, SEE 'RETAINING WALL RW-1' SHEET.

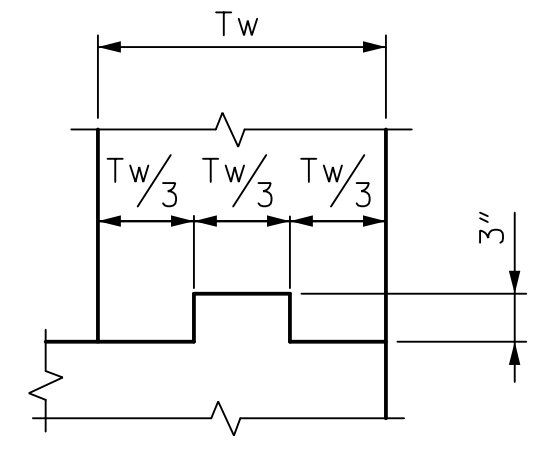
PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: POT STA. 27+73.49 -S2-



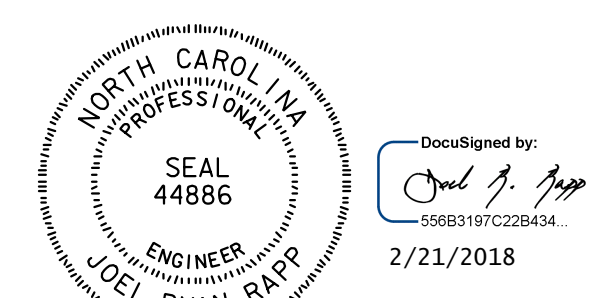
**TYPICAL WALL EXPANSION JOINT**



**STEP FOOTING DETAIL**



**WALL KEY DETAIL**

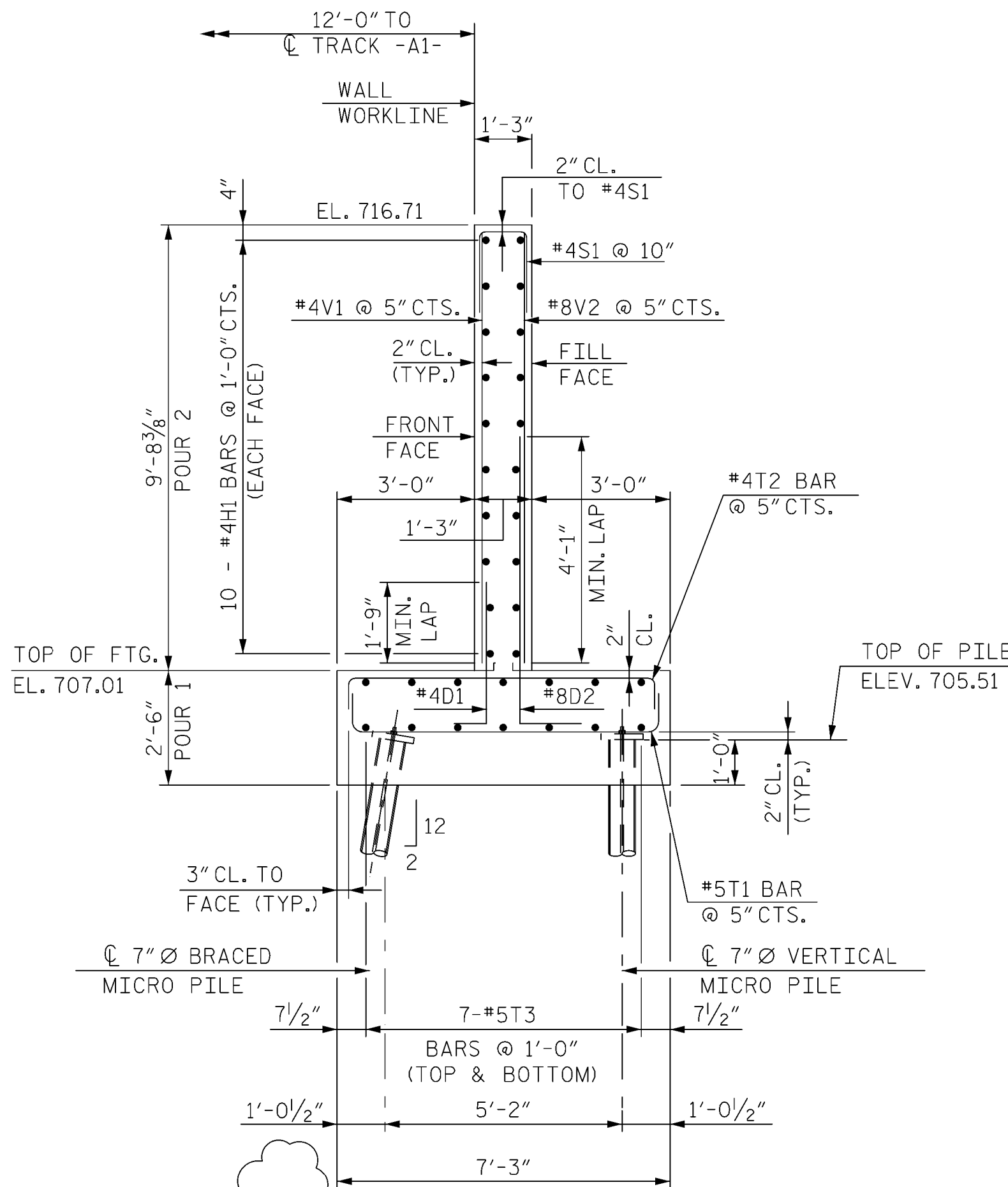


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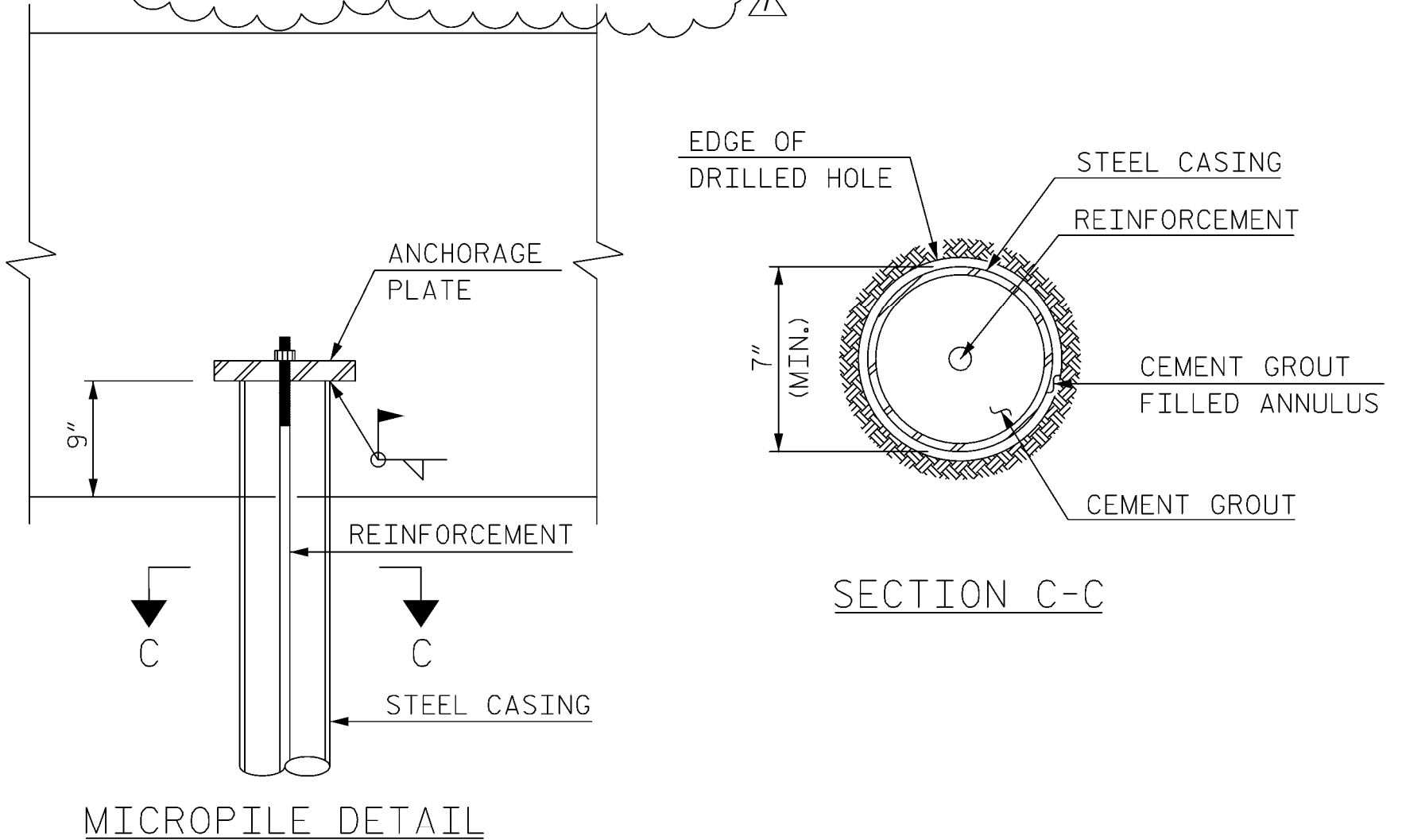
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DRAWN BY J. JEFFERS DATE 11/17  
CHECKED BY R. RAPP DATE 11/17 DWG. NO. 8

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RETAINING WALL RW-8					
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
					W-8
					TOTAL SHEETS 17

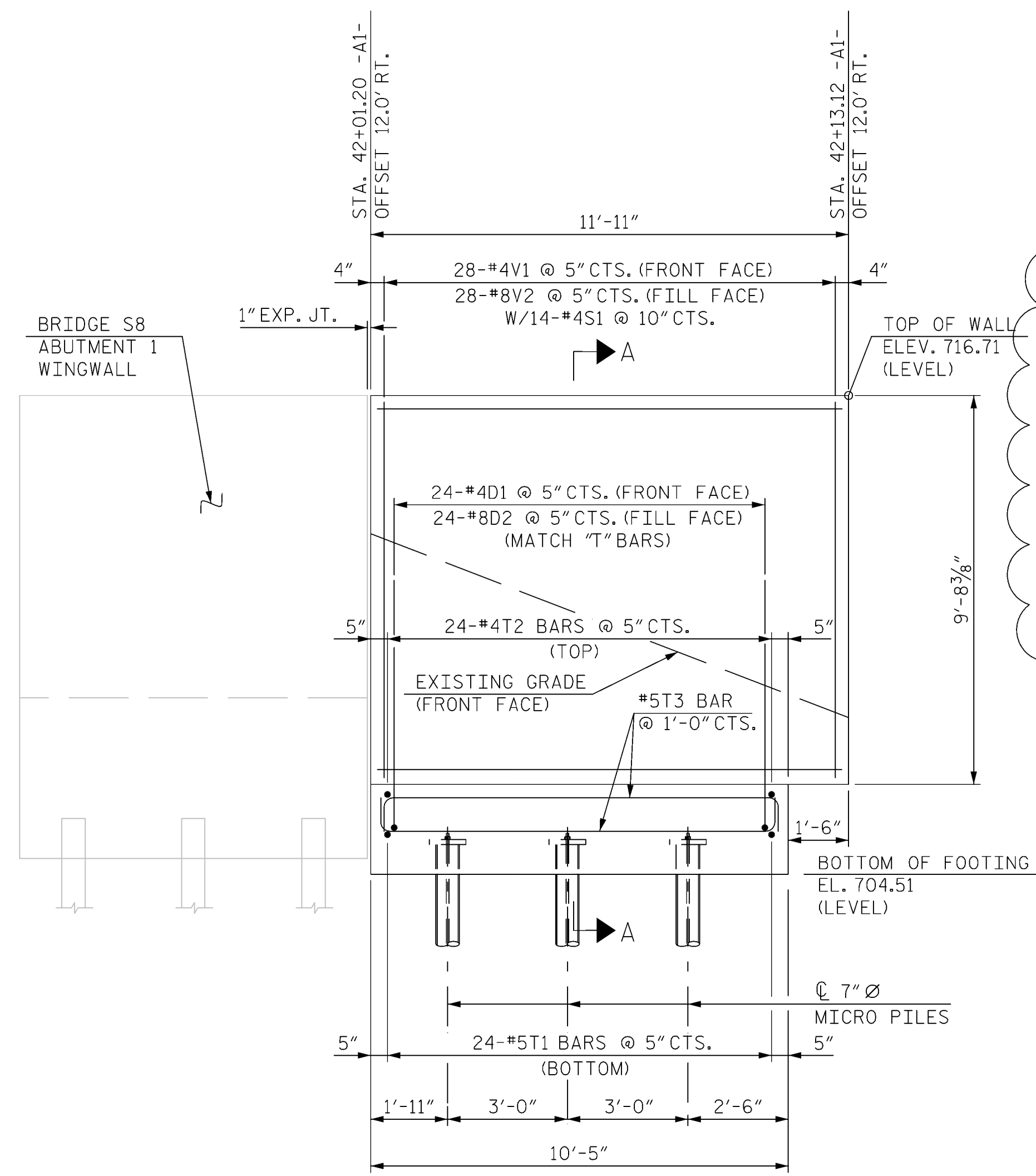


SECTION A-A



MICROPILE DETAIL

SECTION C-C

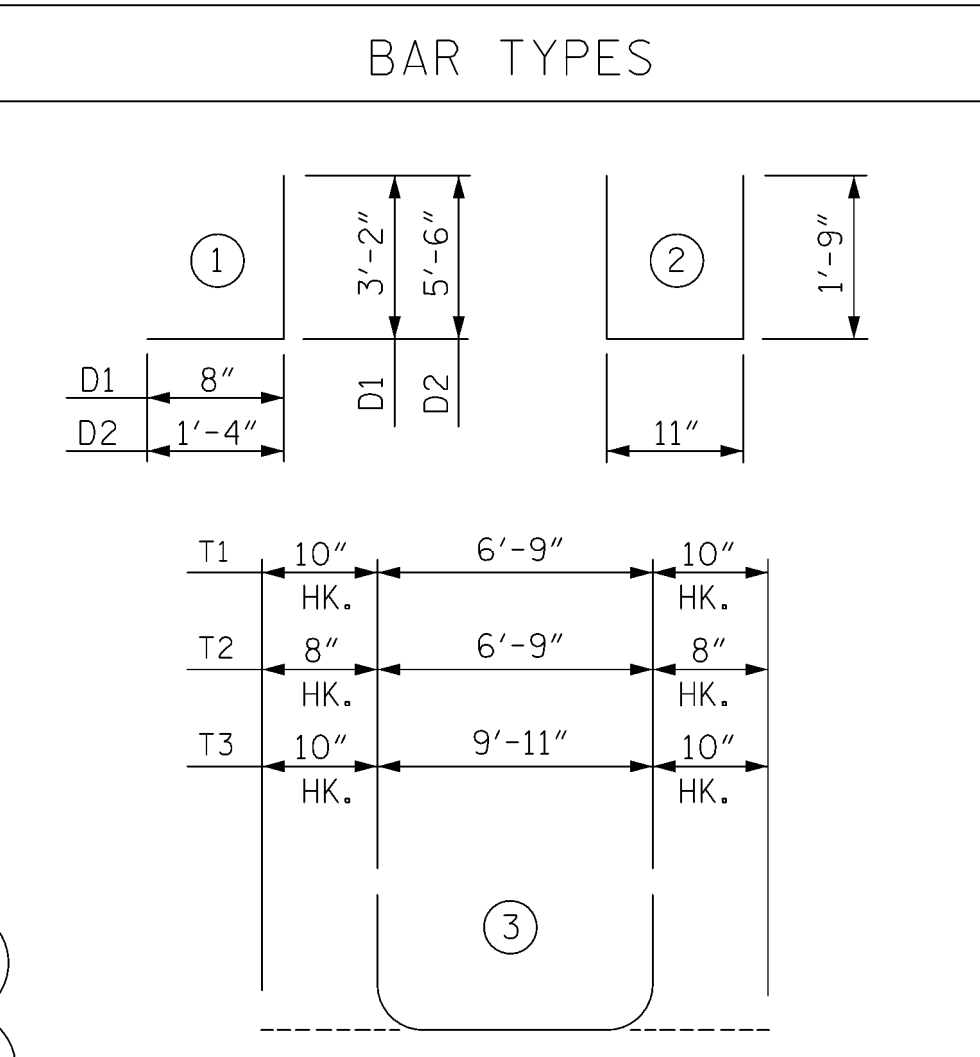


RETAINING WALL RW-9 ELEVATION

QUANTITIES	
ITEM	TOTAL
REINFORCING STEEL	LBS. 2,078
CLASS AA CONCRETE BREAKDOWN:	
POUR 1	
FOOTING	CU. YDS 7.0
POUR 2	
WALL RW-9	CU. YDS 5.4
TOTAL	CU. YDS 12.4
7" Ø MICROPILES	EACH 6

NOTES:  
FOR CAST IN PLACE WALL NOTES, SEE "RETAINING WALL RW-1" SHEET.  
PRIOR TO PLACEMENT OF MICROPILES, CONTRACTOR SHALL LOCATE EXISTING STONE ARCH CULVERT IN VICINITY OF MICROPILES. CONTRACTOR SHALL SUBMIT MICROPILE CLEARANCES TO CULVERT OPENING FOR APPROVAL BY THE ENGINEER.  
FOR WALL EXPANSION JOINT AND CONSTRUCTION JOINT, SEE "CAST IN PLACE RETAINING WALL DETAILS (RW-1)" SHEET.

FOUNDATION NOTES:  
FOR MICROPILES, SEE GEOTECHNICAL SPECIAL PROVISION.  
MICROPILES AT RW-9 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 70 TONS PER PILE.  
INSTALL REINFORCING CASINGS FOR MICROPILES AT RW-9 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 RW-9.  
ONE VERIFICATION TEST IS REQUIRED FOR MICROPILES INSTALLED AT RW-9.



BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
WALL RW-9					
D1	24	4	1	3'-10"	61
D2	24	8	1	6'-10"	438
H1	20	4	STR	11'-7"	155
S1	14	4	2	4'-5"	41
V1	28	4	STR	9'-4"	175
V2	28	8	STR	9'-4"	698
TOTAL					1,568
FOOTING RW-9					
T1	24	5	3	8'-5"	211
T2	24	4	3	8'-1"	130
T3	14	5	3	11'-7"	169
TOTAL					510

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: 42+01.20 -A1-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

RETAINING WALL RW-9

5/14/2018 9:20:52 AM PDT  
SEAL 27812  
DAVID W. HAWKINS  
ENGINEER  
DAVID W. HAWKINS  
A002754886687

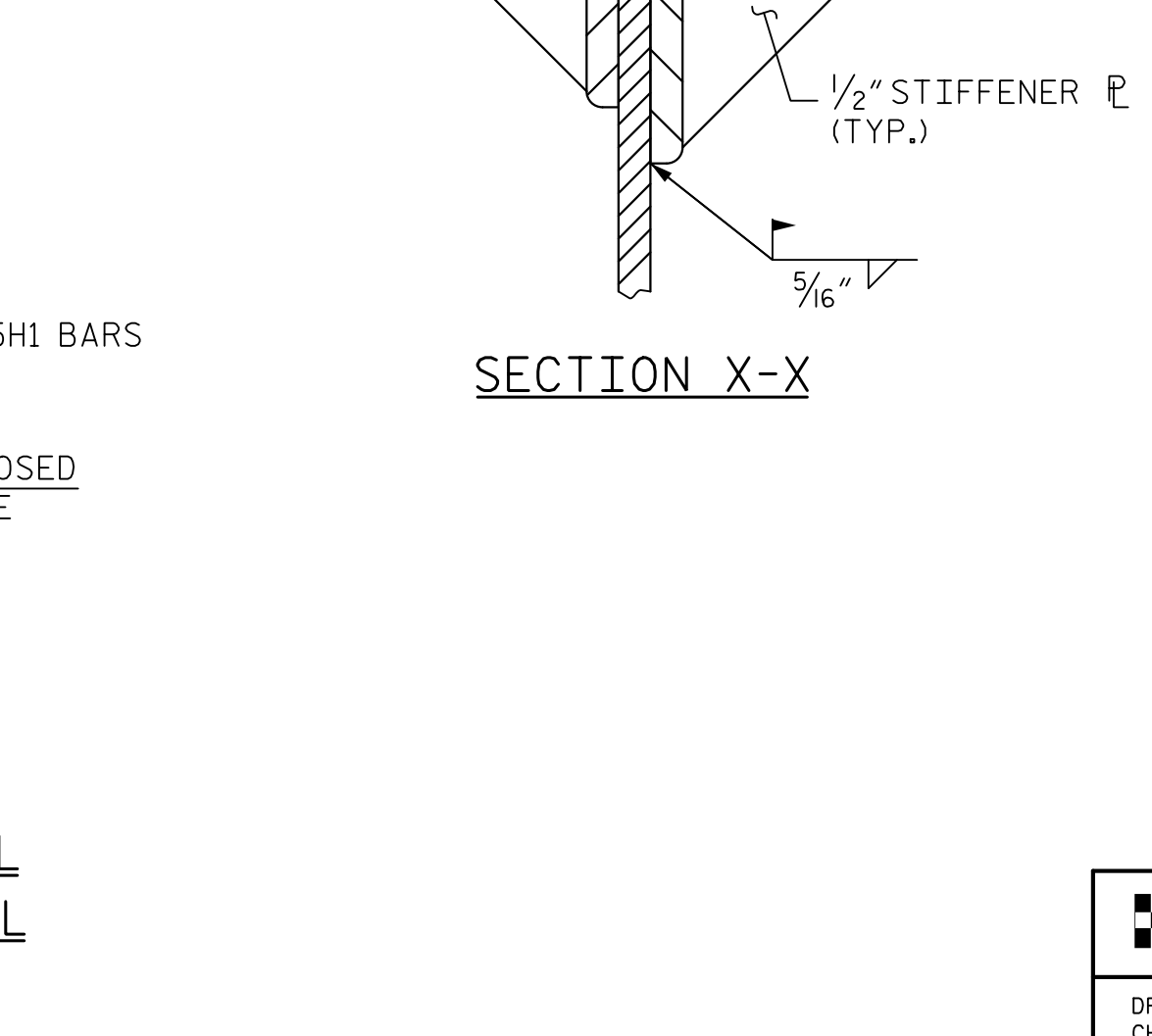
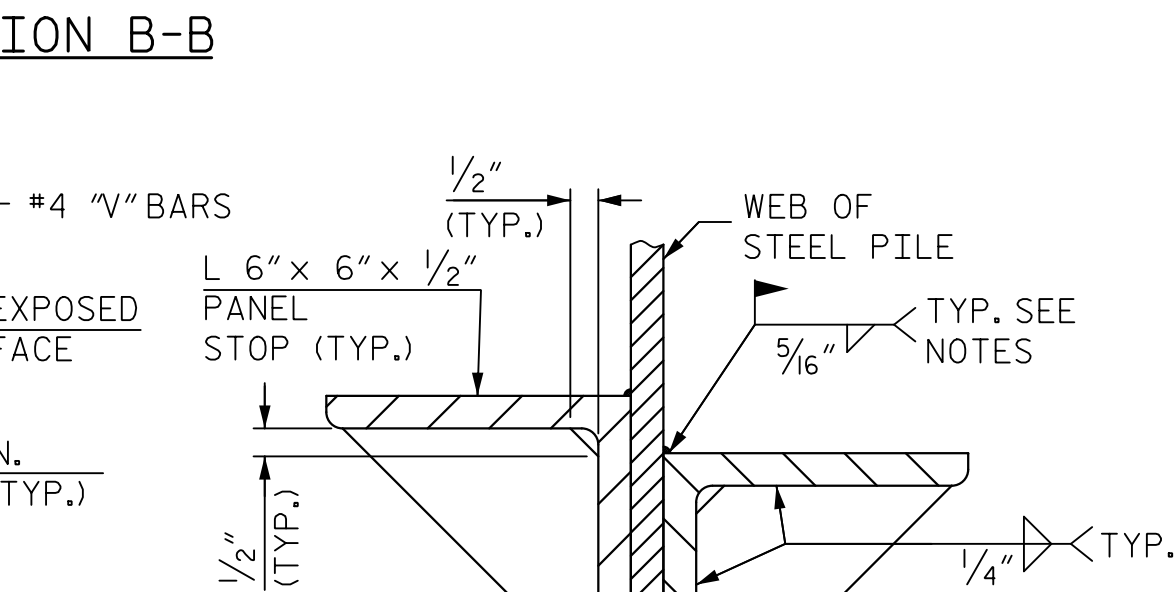
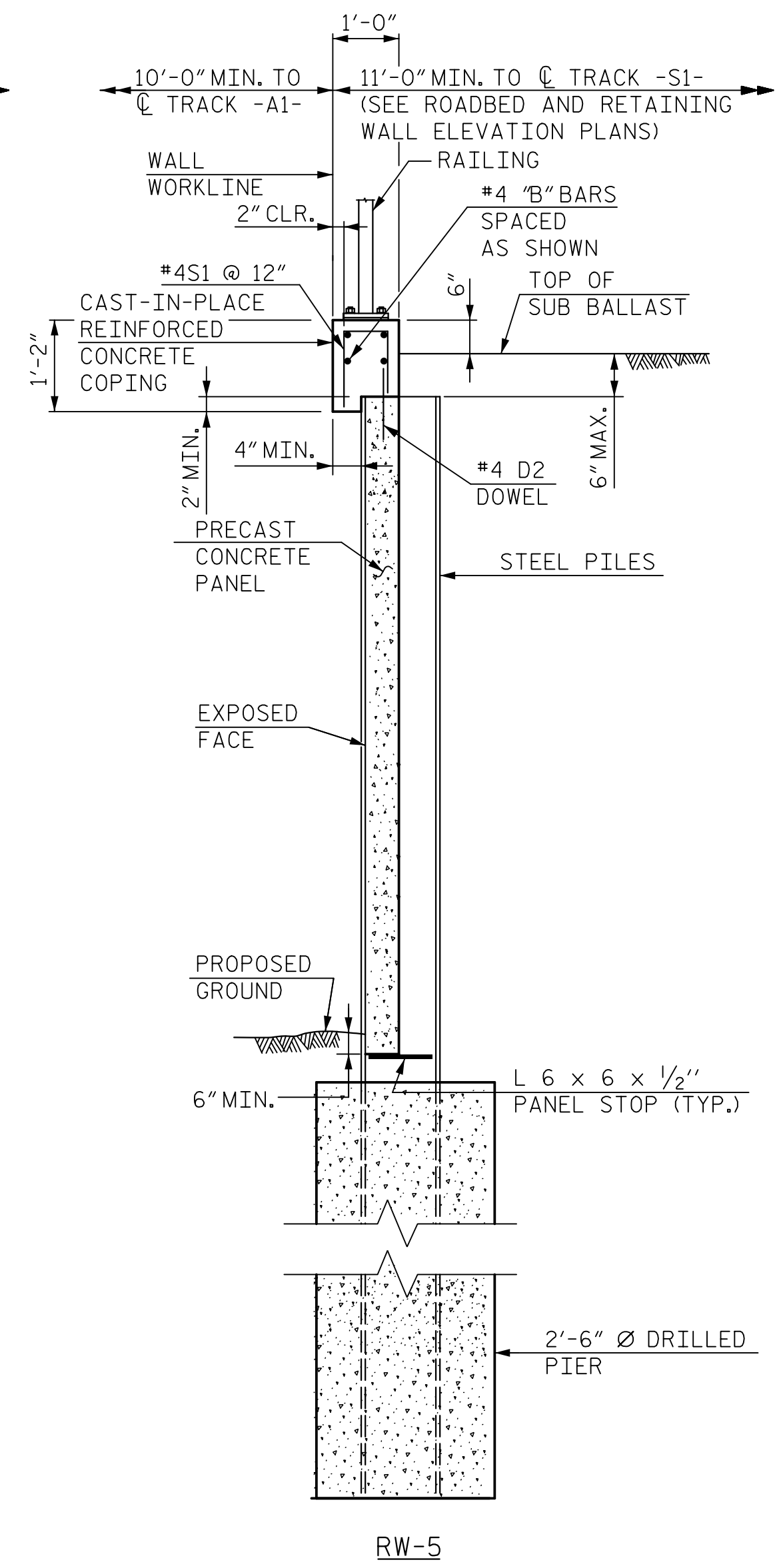
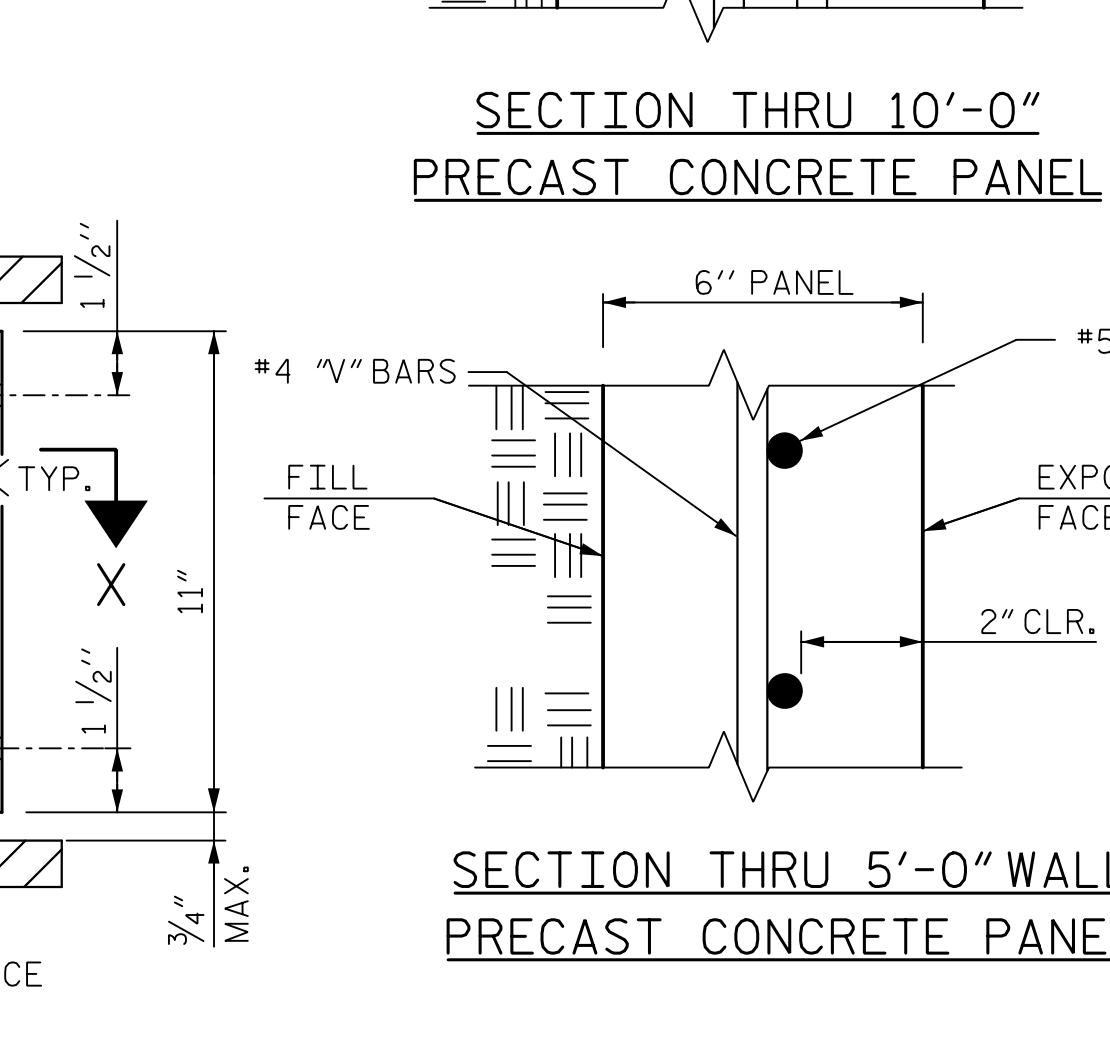
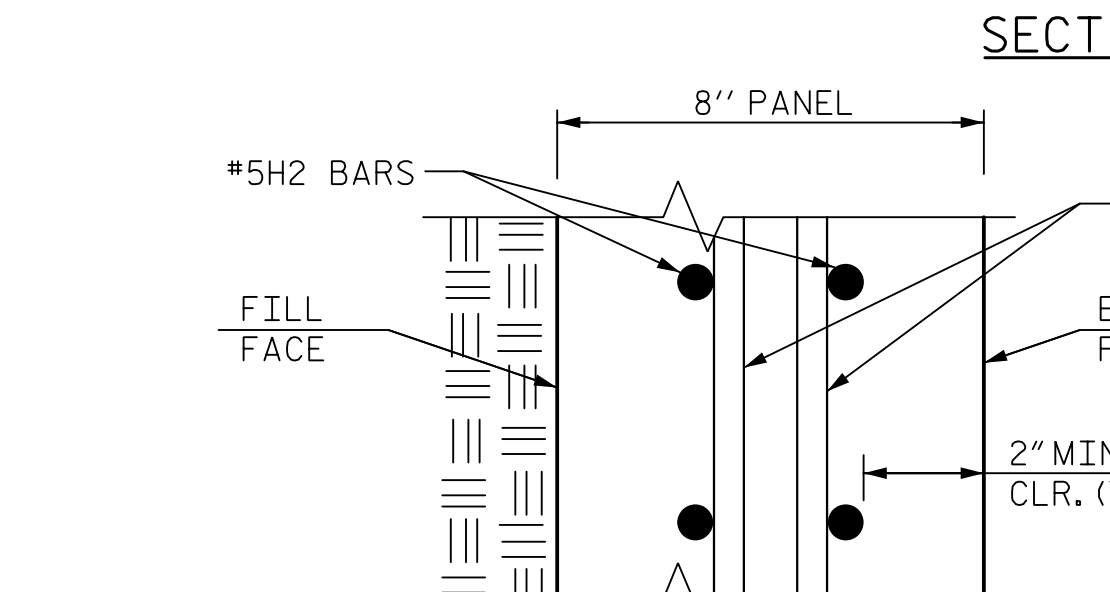
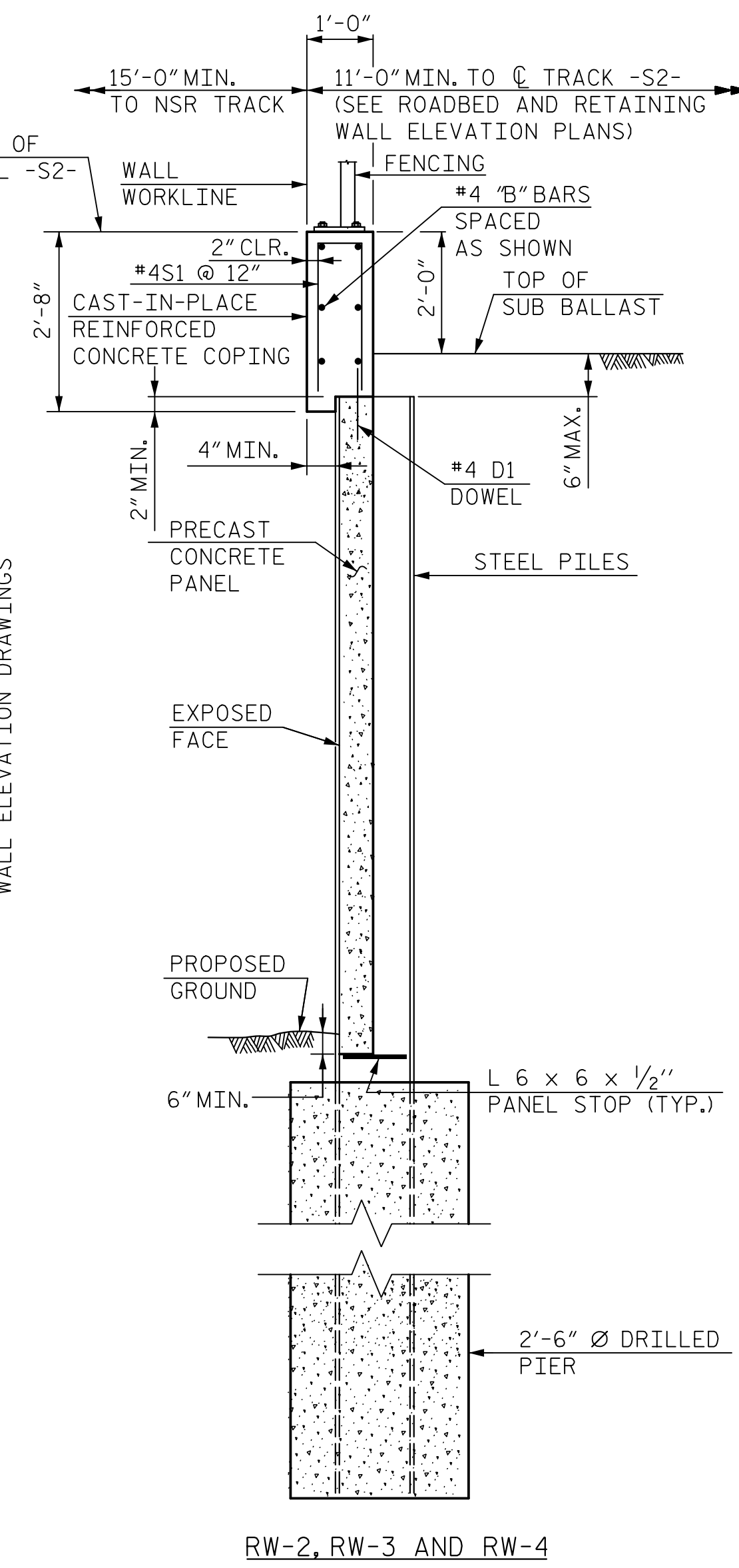
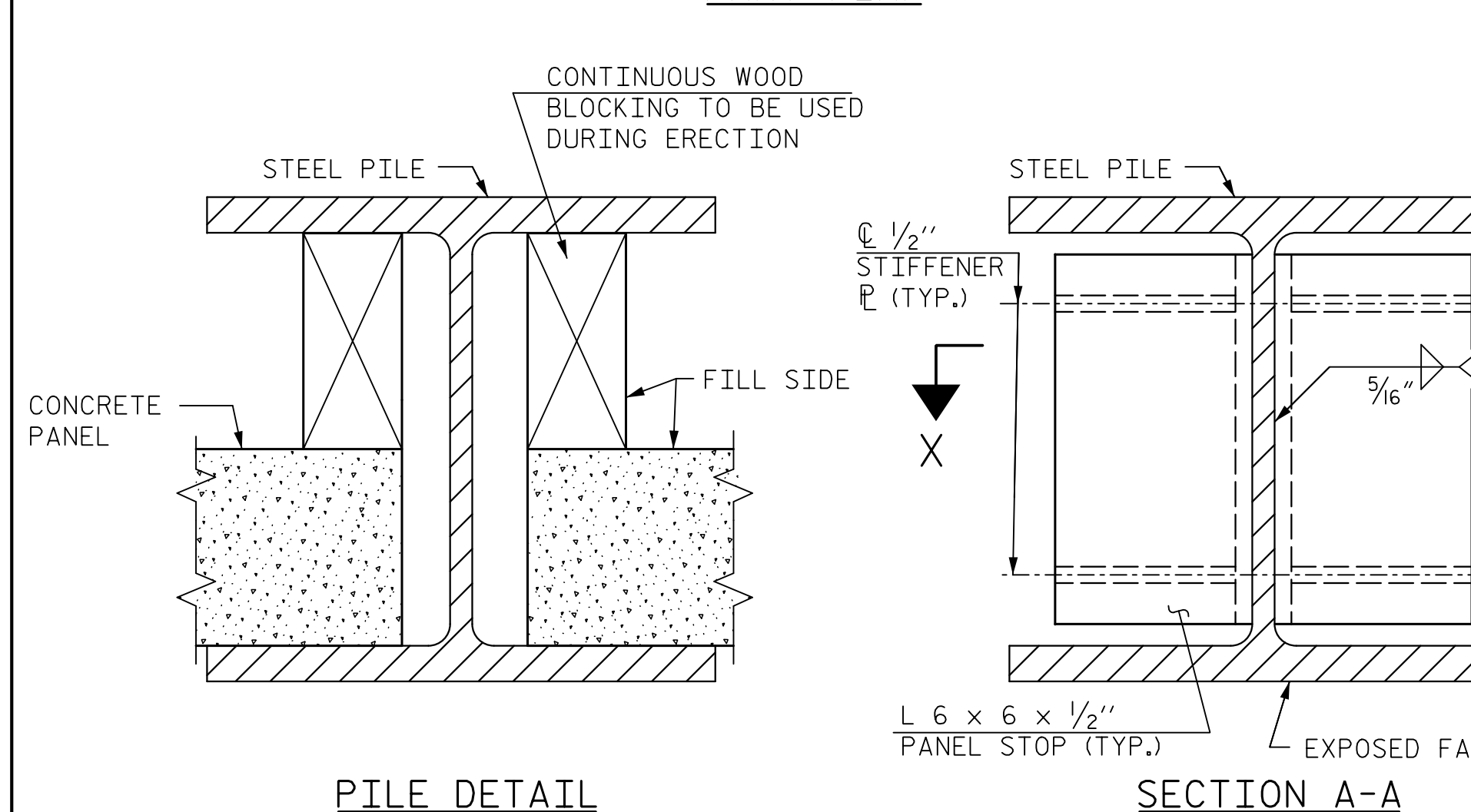
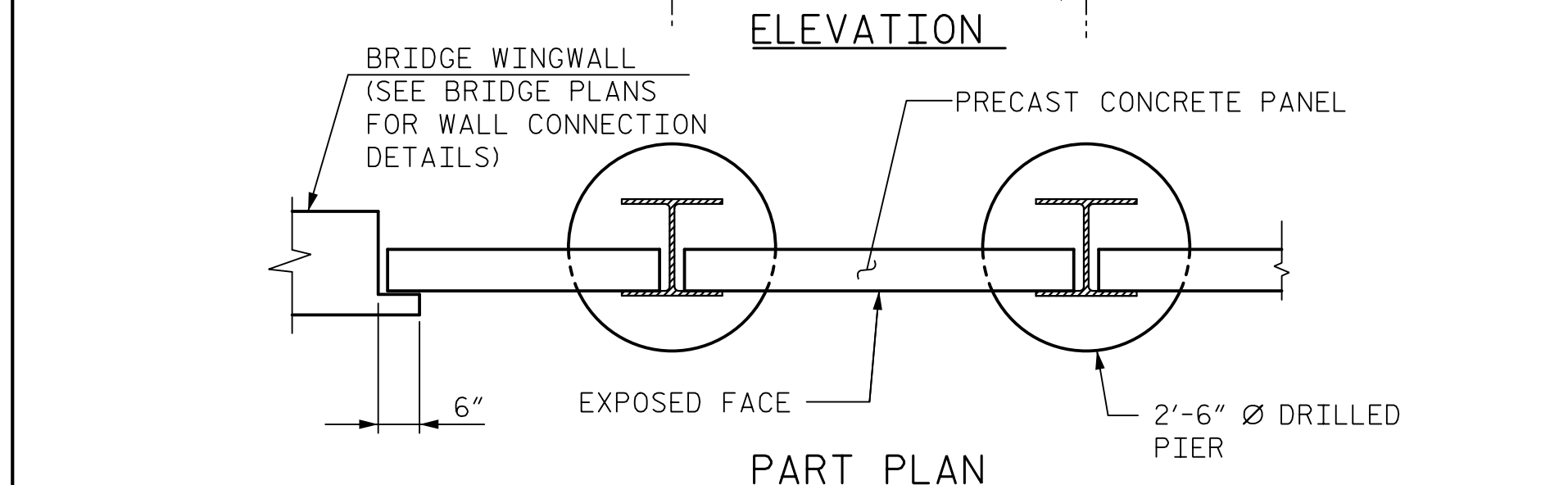
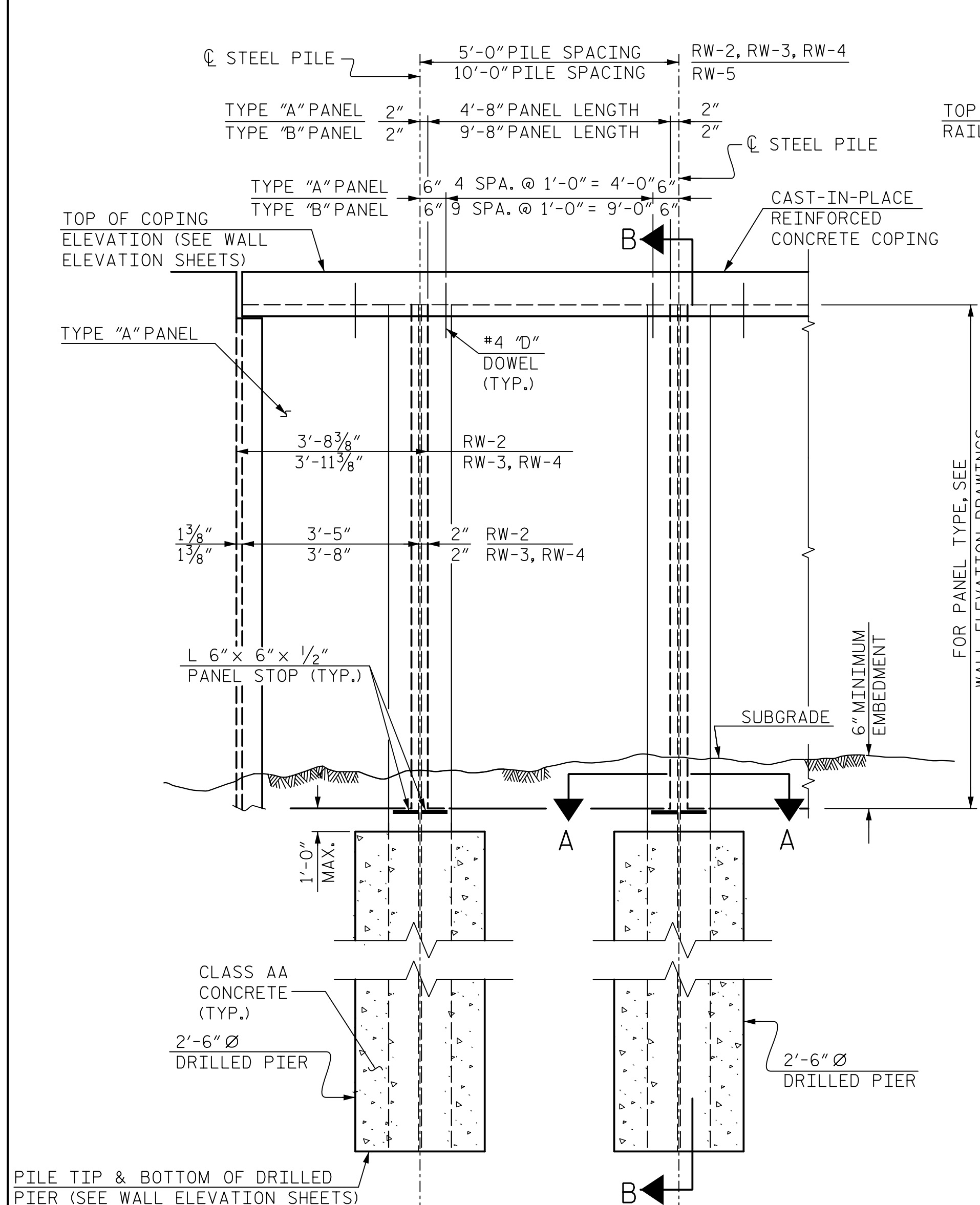
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DRAWN BY M. WRIGHT DATE 11/17  
CHECKED BY N. ZAMUDIO DATE 11/17 DWG. NO. 9

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

TOTAL SHEETS 17



**PILE PANEL WALL NOTES**  
 DESIGN LOAD: COOPER E80 PER AREMA, TRACK CENTERED 11'-0" MIN. FROM EXPOSED FACE OF WALL.  
 PILE PANEL WALLS SHALL BE CONSTRUCTED TO THE LINE AND GRADE AS SHOWN ON SHEETS RW2 TO RW5.  
 PILES, ANGLES, PLATES, AND LAGGING STOPS SHALL BE ASTM A709 GRADE 50 GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS. ANY DAMAGE DONE TO GALVANIZATION DUE TO DRILLING, WELDING, OR OTHER OPERATION SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIFICATIONS.  
 CONTRACTOR WILL VERIFY LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING SHAFTS TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.  
 IN LIEU OF PANEL STOPS, THE CONTRACTOR MAY USE A NON-SHRINK NON-METALLIC GROUT AS APPROVED BY THE ENGINEER BETWEEN THE FLANGES OF THE STEEL PILES FROM THE TOP OF THE DRILLED PIER CONCRETE TO THE ELEVATION REQUIRED TO SUPPORT THE BOTTOM PANEL.  
 CONCRETE FOR PANELS AND COPING SHALL BE CLASS AA AND HAVE MINIMUM f'c = 4500 psi. CONCRETE FOR DRILLED PIERS SHALL BE CLASS AA AND HAVE MINIMUM f'c = 4500 psi. AT 28 DAYS.  
 SPLICING OF PILES IS NOT PERMITTED.  
 EXCAVATION AND INSTALLATION OF PANEL SHALL OCCUR IN ONE CONTINUOUS PROCESS UNTIL COMPLETE. OPEN EXCAVATION SHALL NOT BE PRESENT DURING PASSING TRAINS.  
 DRILLED PIERS/STEEL PILES SHALL BE INSTALLED AT ALTERNATE LOCATIONS UNTIL OPEN HOLES ARE BACKFILLED. PIER CONCRETE SHALL BE SET A MINIMUM OF 3 DAYS PRIOR TO BACKFILL.  
 ALL PILES SHALL BE W14x145 IN SIZE.  
 STABILIZE EXCAVATIONS WITH STEEL CASING FOR DRILLED PIERS. FOR STEEL CASING REQUIREMENTS, SEE SPECIAL PROVISIONS FOR 'PILE PANEL RETAINING WALL'.  
 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 FLY ASH, 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.  
 FOR 'PILE PANEL RETAINING WALL', SEE SPECIAL PROVISIONS.  
 FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.  
 FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.  
 FOR RAILROAD TRACKWORK, 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 OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

PROJECT NO. P-5705BA  
 MECKLENBURG COUNTY  
 STATION: 19+44.29 -S2-, 24+29.66 -S2-, 28+78.65 -S2-, 32+59.08 -A1-

SHEET 1 OF 2

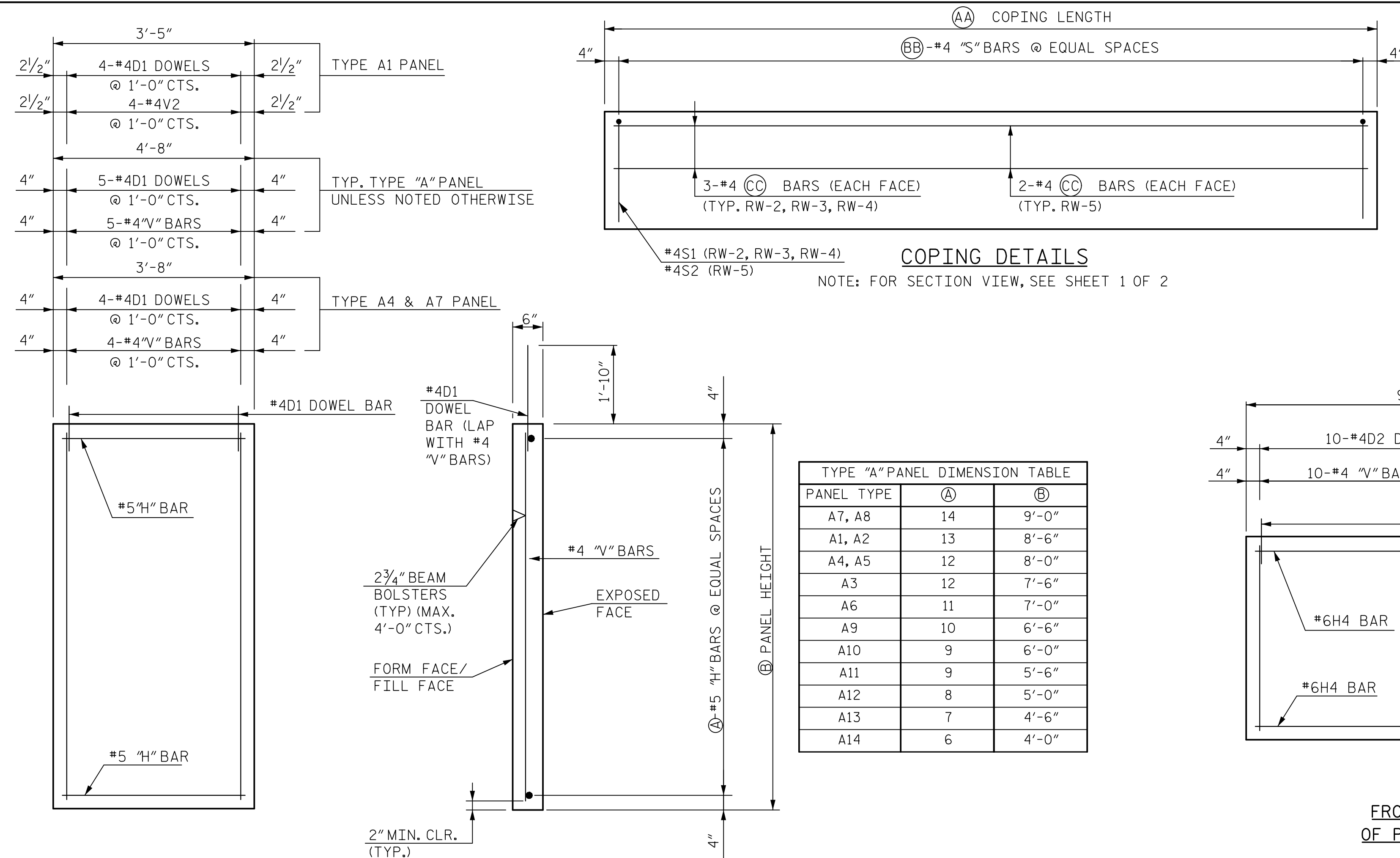
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PILE PANEL  
 RETAINING  
 WALL DETAILS

REVISIONS						SHEET NO. W-10
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 17
2			4			

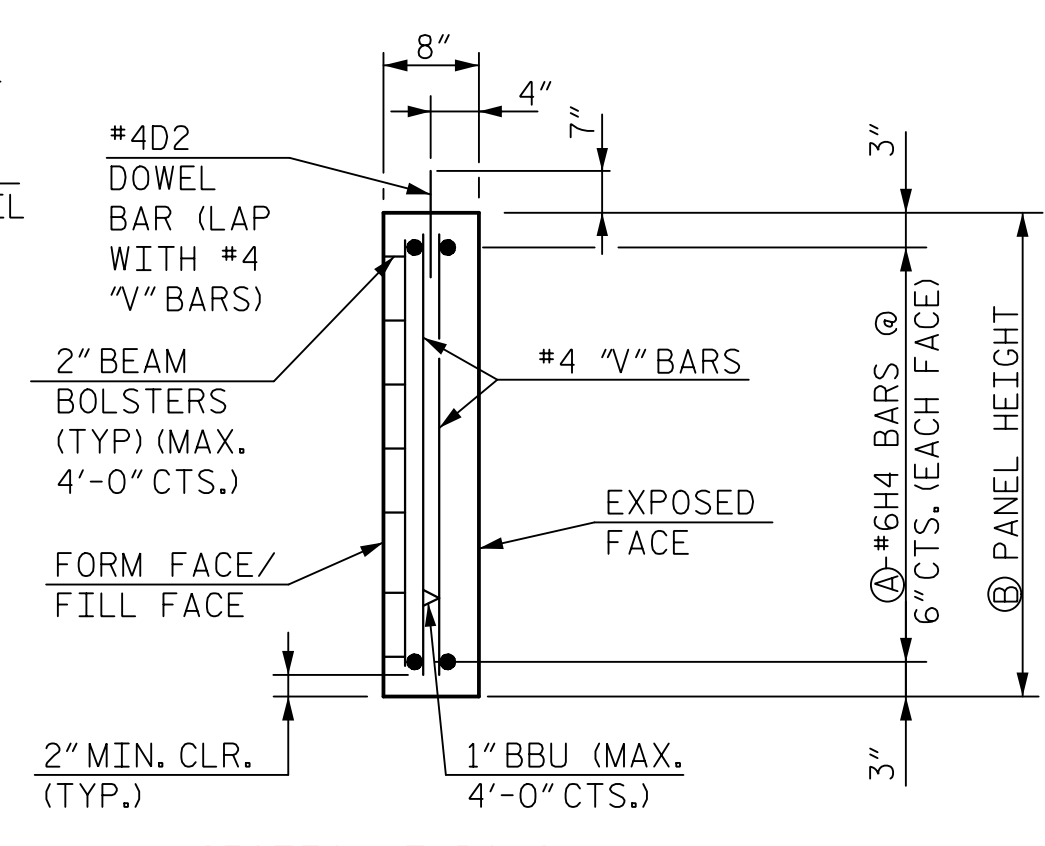
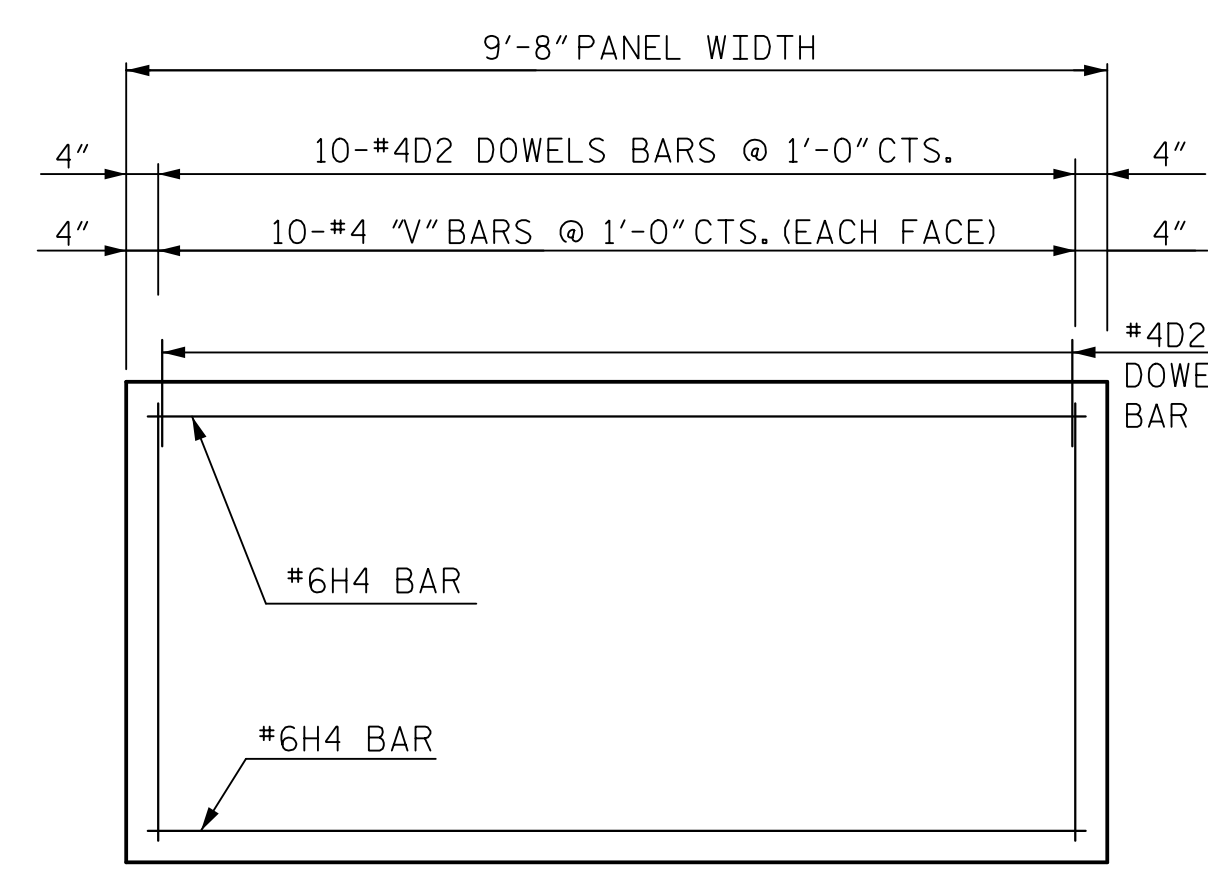
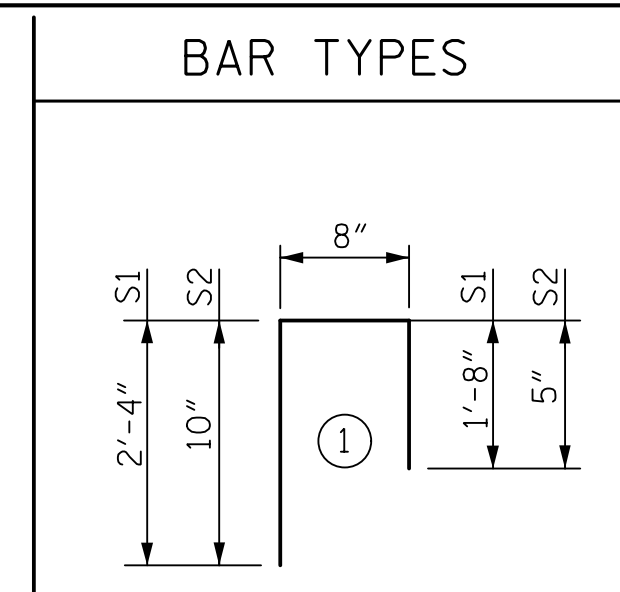
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 DWG. NO. 10

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



(AA)	(BB)	(CC)
15'-10"	17	B1
18'-8 <sup>1</sup> / <sub>8</sub> "	20	B2
18'-11 <sup>5</sup> / <sub>8</sub> "	20	B3
20'-10"	22	B4
23'-11 <sup>5</sup> / <sub>8</sub> "	25	B5
30'-0"	31	B6

COPING SECTION	BAR	NO.	SIZE	TYPE	LENGTH/WEIGHT	
					LENGTH	WEIGHT
FOR ONE COPING SECTION						
15'-10"	B1	6	4	STR.	15'-6"	62
	S1	17	4	1	4'-8"	53
18'-8 <sup>1</sup> / <sub>8</sub> "	B2	6	4	STR.	18'-4"	74
	S1	20	4	1	4'-8"	62
18'-11 <sup>5</sup> / <sub>8</sub> "	B3	6	4	STR.	18'-7"	75
	S1	20	4	1	4'-8"	62
20'-10"	B4	4	4	STR.	20'-6"	55
	S2	22	4	1	1'-11"	28
23'-11 <sup>5</sup> / <sub>8</sub> "	B5	6	4	STR.	23'-7"	95
	S1	25	4	1	4'-8"	78
	B6	6	4	STR.	29'-8"	119
RW-2, RW-3, RW-4	S1	31	4	1	4'-8"	97
	B6	6	4	STR.	29'-8"	79
RW-5	S2	31	4	1	1'-11"	40



PANEL TYPE	(A)	(B)
B8	11	5'-6"
B7	10	5'-0"
B6	9	4'-6"
B5	8	4'-0"
B4	7	3'-6"
B3	6	3'-0"
B2	5	2'-6"
B1	4	2'-0"

**NOTE:**  
FOR PILE PANEL RETAINING WALL NOTES AND ADDITIONAL DETAILS, SEE SHEET "PILE PANEL RETAINING WALL DETAILS" SHEET 1 OF 2.

**FRONT ELEVATION OF PRECAST PANELS**  
**SECTION THROUGH PRECAST PANELS**  
**TYPE "A" PRECAST PANEL DETAILS**

**FRONT ELEVATION OF PRECAST PANELS**

**SECTION THROUGH PRECAST PANELS**

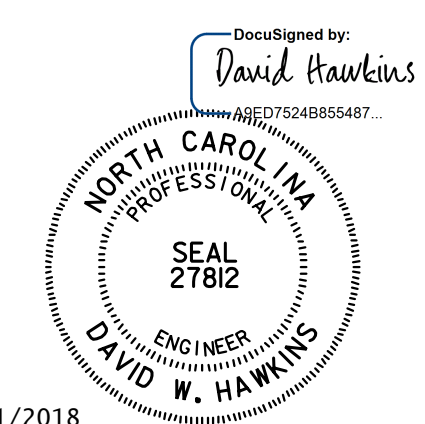
**TYPE "B" PRECAST PANEL DETAILS**

WALL NUMBER	PANEL TYPE	TOTAL NO. REQUIRED	PANEL WIDTH (W)	PANEL HEIGHT (H)	CLASS AA CONCRETE C.Y.	BAR TYPES																	
						HORIZONTAL						VERTICAL						VERTICAL					
						BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
RW-2	A1	2	3'-5"	8'-6"	0.5	H2	13	5	STR	3'-1"	42	D1	4	4	STR	3'-3"	9	V2	4	4	STR	8'-2"	22
	A2	59	4'-8"	8'-6"	0.7	H1	13	5	STR	4'-4"	59	D1	5	4	STR	3'-3"	11	V2	5	4	STR	8'-2"	27
	A3	1	4'-8"	7'-6"	0.7	H1	12	5	STR	4'-4"	54	D1	5	4	STR	3'-3"	11	V4	5	4	STR	7'-2"	24
RW-3	A4	2	3'-8"	8'-0"	0.5	H3	12	5	STR	3'-4"	42	D1	4	4	STR	3'-3"	9	V3	4	4	STR	7'-8"	21
	A5	61	4'-8"	8'-0"	0.7	H1	12	5	STR	4'-4"	54	D1	5	4	STR	3'-3"	11	V3	5	4	STR	7'-8"	26
	A6	1	4'-8"	7'-0"	0.6	H1	11	5	STR	4'-4"	50	D1	5	4	STR	3'-3"	11	V5	5	4	STR	6'-8"	22
RW-4	A7	1	3'-8"	9'-0"	0.6	H3	14	5	STR	3'-4"	49	D1	4	4	STR	3'-3"	9	V1	4	4	STR	8'-8"	23
	A8	60	4'-8"	9'-0"	0.8	H1	14	5	STR	4'-4"	63	D1	5	4	STR	3'-3"	11	V1	5	4	STR	8'-8"	29
	A2	8	4'-8"	8'-6"	0.7	H1	13	5	STR	4'-4"	59	D1	5	4	STR	3'-3"	11	V2	5	4	STR	8'-2"	27
	A5	9	4'-8"	8'-0"	0.7	H1	12	5	STR	4'-4"	54	D1	5	4	STR	3'-3"	11	V3	5	4	STR	7'-8"	26
	A3	8	4'-8"	7'-6"	0.7	H1	12	5	STR	4'-4"	54	D1	5	4	STR	3'-3"	11	V4	5	4	STR	7'-2"	24
	A6	8	4'-8"	7'-0"	0.6	H1	11	5	STR	4'-4"	50	D1	5	4	STR	3'-3"	11	V5	5	4	STR	6'-8"	22
	A9	8	4'-8"	6'-6"	0.6	H1	10	5	STR	4'-4"	45	D1	5	4	STR	3'-3"	11	V6	5	4	STR	6'-2"	21
	A10	8	4'-8"	6'-0"	0.5	H1	9	5	STR	4'-4"	41	D1	5	4	STR	3'-3"	11	V7	5	4	STR	5'-8"	19
	A11	8	4'-8"	5'-6"	0.5	H1	9	5	STR	4'-4"	41	D1	5	4	STR	3'-3"	11	V8	5	4	STR	5'-2"	17
	A12	8	4'-8"	5'-0"	0.4	H1	8	5	STR	4'-4"	36	D1	5	4	STR	3'-3"	11	V9	5	4	STR	4'-8"	16
	A13	8	4'-8"	4'-6"	0.4	H1	7	5	STR	4'-4"	32	D1	5	4	STR	3'-3"	11	V10	5	4	STR	4'-2"	14
A14	3	4'-8"	4'-0"	0.4	H1	6	5	STR	4'-4"	27	D1	5	4	STR	3'-3"	11	V11	5	4	STR	3'-8"	12	
RW-5	B8	2	9'-8"	5'-6"	1.3	H4	22	6	STR	9'-4"	308	D2	10	4	STR	2'-0"	13	V8	20	4	STR	5'-2"	69
	B7	2	9'-8"	5'-0"	1.2	H4	20	6	STR	9'-4"	280	D2	10	4	STR	2'-0"	13	V9	20	4	STR	4'-8"	62
	B6	2	9'-8"	4'-6"	1.1	H4	18	6	STR	9'-4"	252	D2	10	4	STR	2'-0"	13	V10	20	4	STR	4'-2"	56
	B5	2	9'-8"	4'-0"	1.0	H4	16	6	STR	9'-4"	224	D2	10	4	STR	2'-0"	13	V11	20	4	STR	3'-8"	49
	B4	4	9'-8"	3'-6"	0.8	H4	14	6	STR	9'-4"	196	D2	10	4	STR	2'-0"	13	V12	20	4	STR	3'-2"	42
	B3	2	9'-8"	3'-0"	0.7	H4	12	6	STR	9'-4"	168	D2	10	4	STR	2'-0"	13	V13	20	4	STR	2'-8"	36
	B2	2	9'-8"	2'-6"	0.6	H4	10	6	STR	9'-4"	140	D2	10	4	STR	2'-0"	13	V14	20	4	STR	2'-2"	29
B1	3	9'-8"	2'-0"	0.5	H4	8	6	STR	9'-4"	112	D2	10	4	STR	2'-0"	13	V15	20	4	STR	1'-8"	22	

LOCATION	PILE PANEL WALL
RW-2	2,433.6 S.F.
RW-3	2,373.5 S.F.
RW-4	4,830.7 S.F.
RW-5	667.0 S.F.

QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: 19+44.29 -S2-, 24+29.66 -S2-  
28+78.65 -S2-, 32+59.08 -A1-



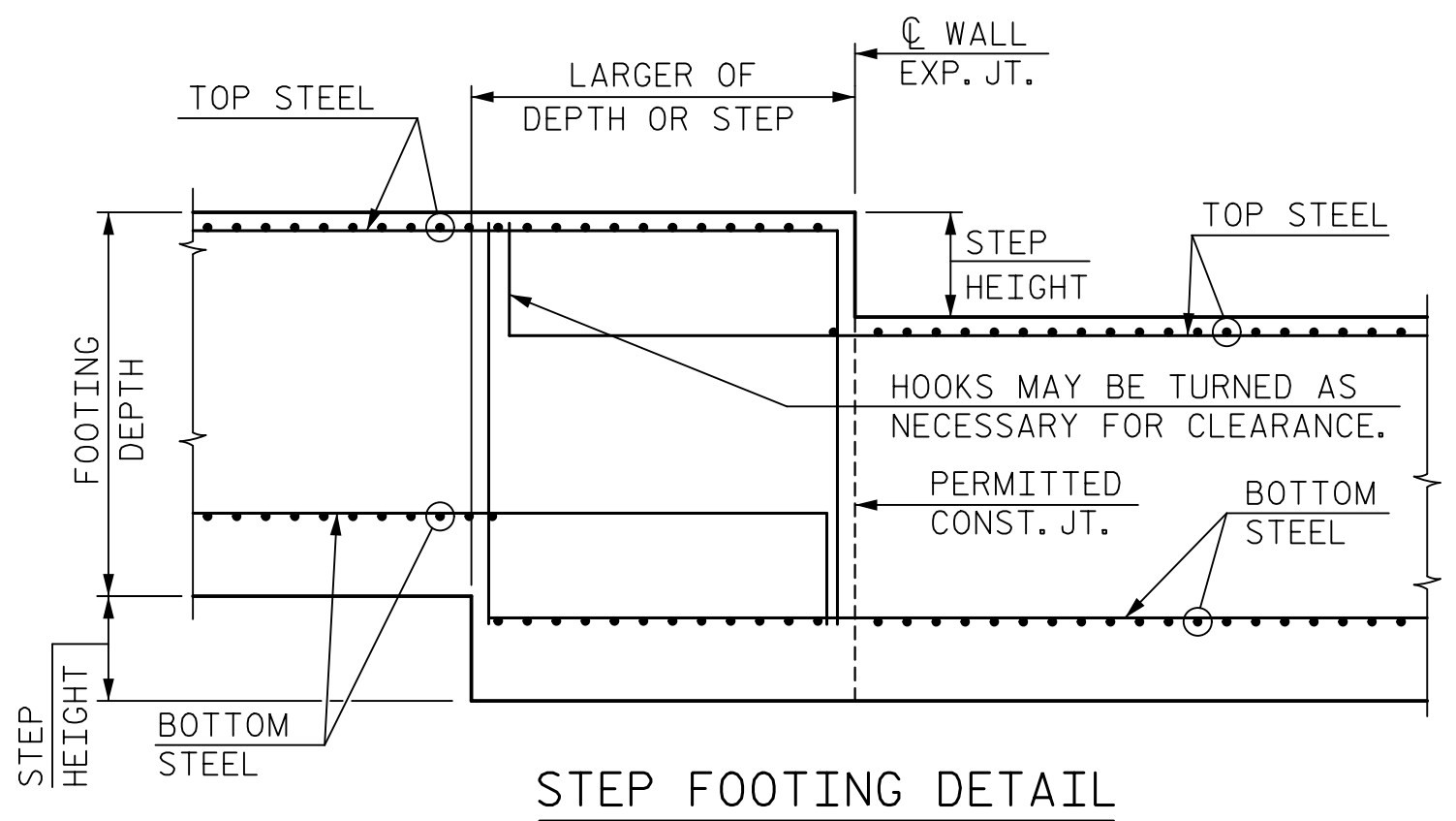
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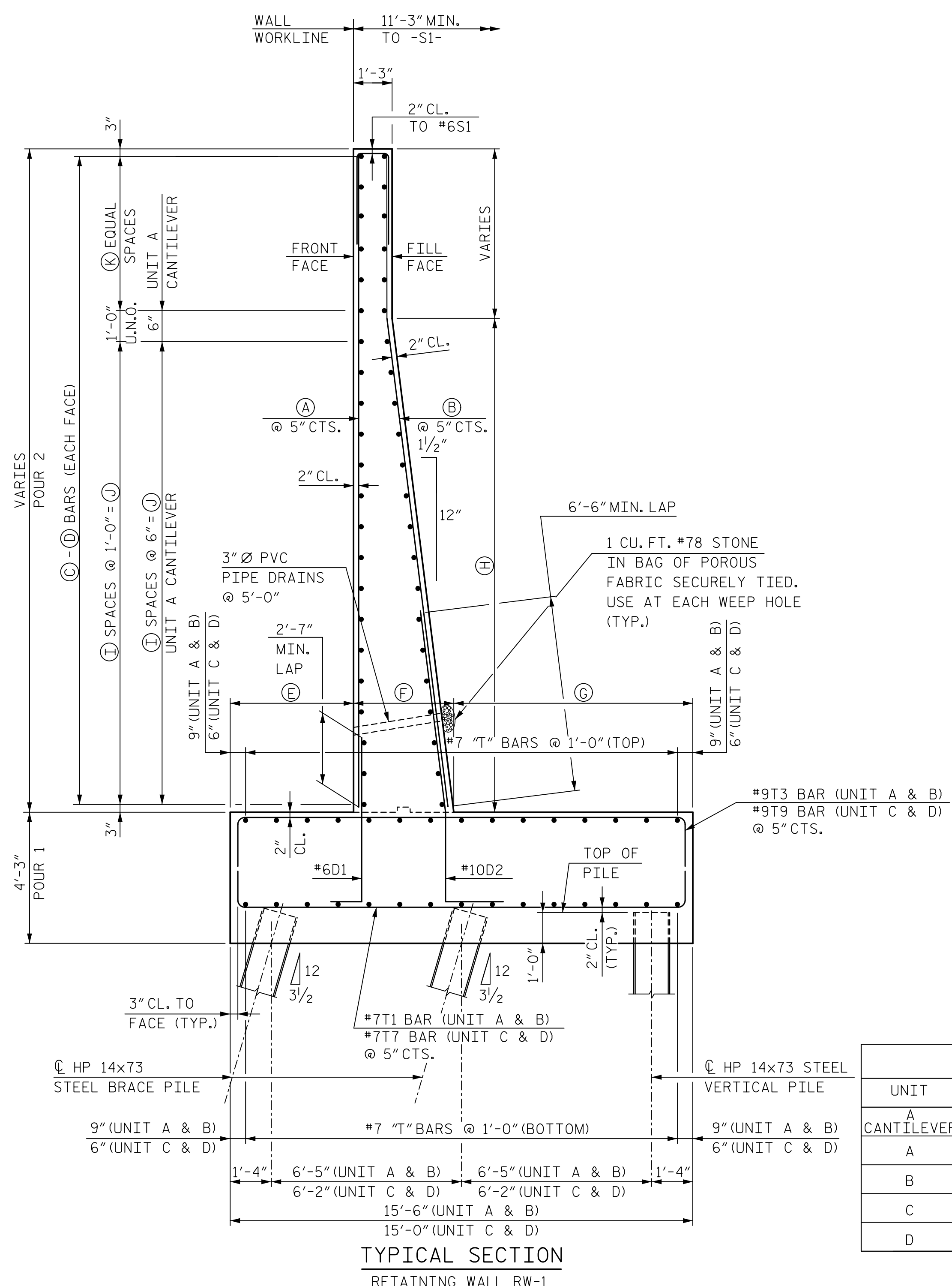
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PILE PANEL RETAINING WALL DETAILS

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS				SHEET NO.
DRAWN BY: M. WRIGHT	DATE: 10/17	NO.	BY	DATE	W-11	
CHECKED BY: D. HAWKINS	DATE: 10/17	1			TOTAL SHEETS	
		2			17	

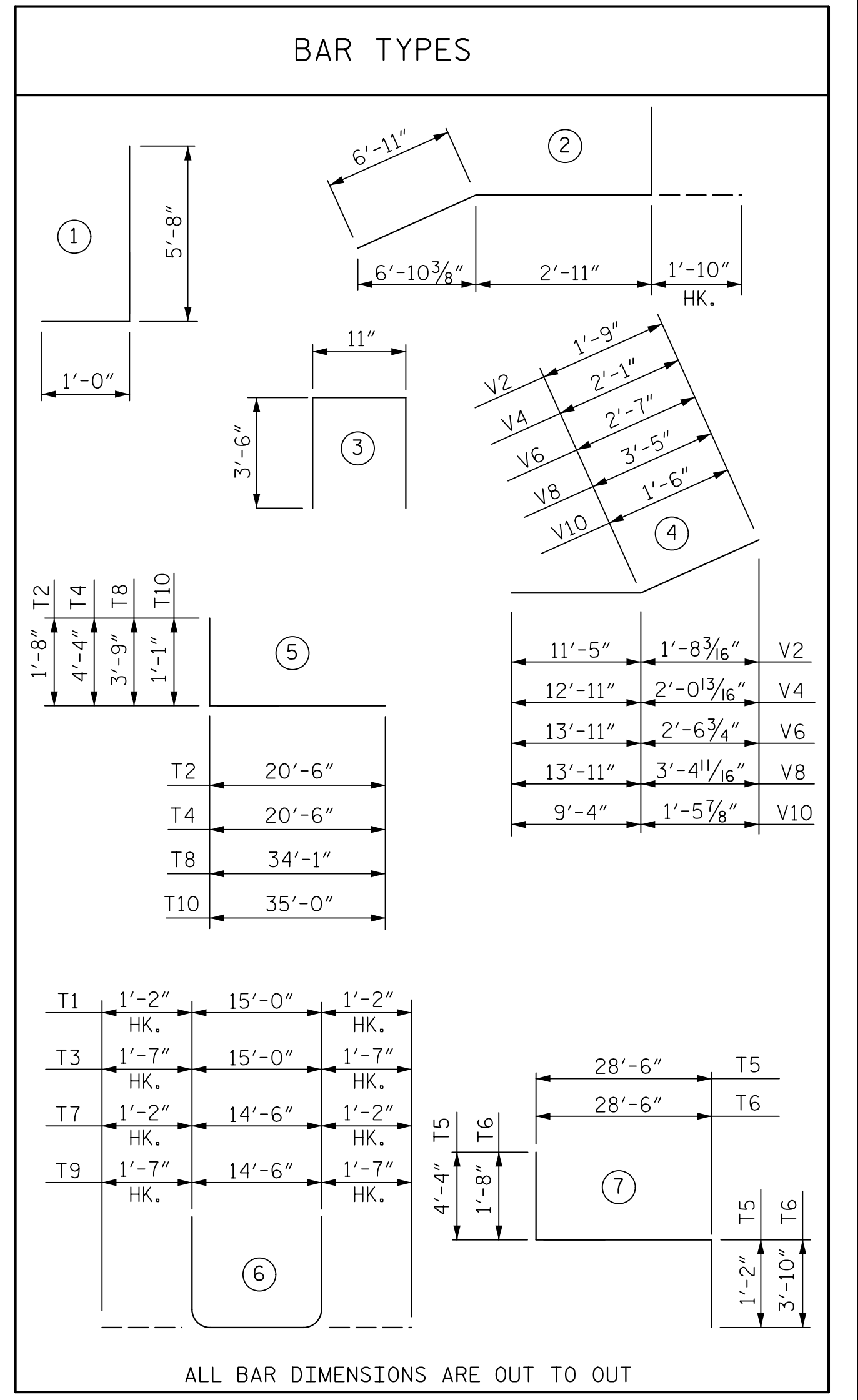


STEP FOOTING DETAIL

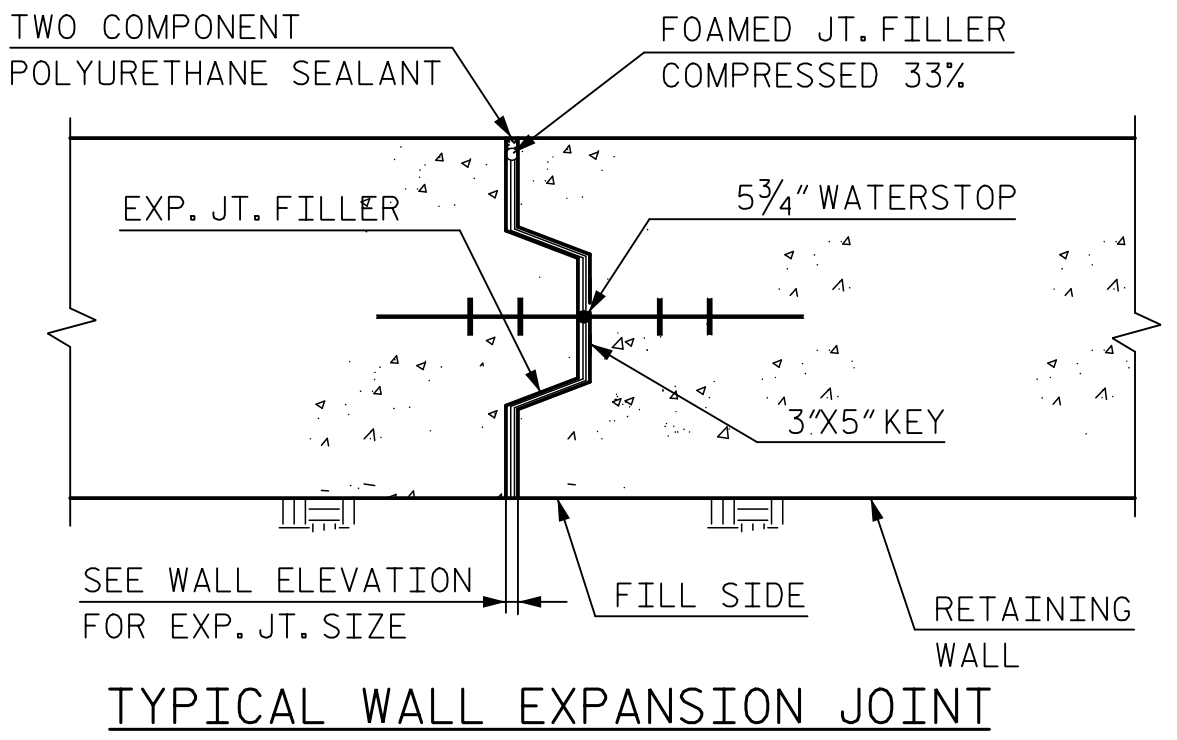


TYPICAL SECTION RETAINING WALL RW-1

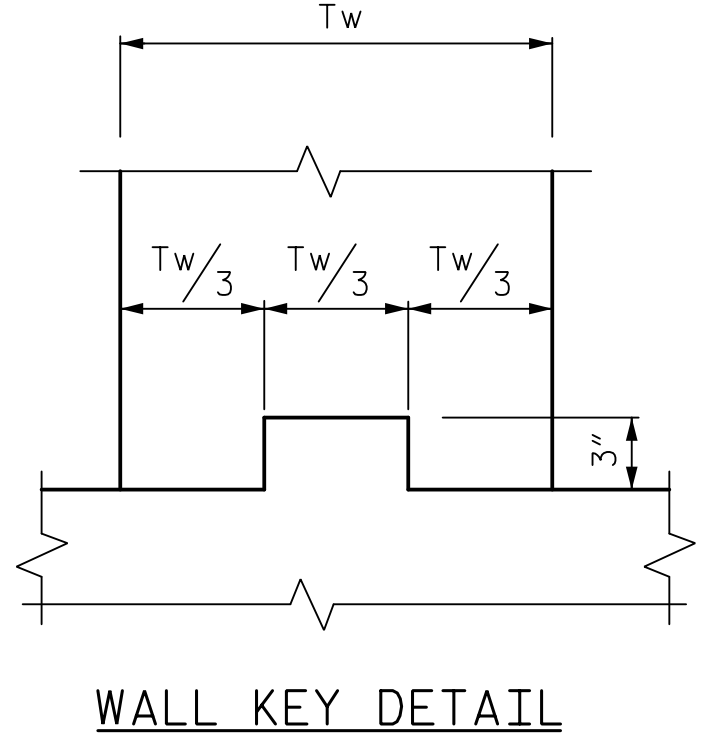
BILL OF REINFORCING						
UNIT A						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
H1	28	6	STR	20'-8"	869	
H4	11	6	STR	16'-6"	273	
H5	22	10	STR	16'-6"	1,562	
S1	38	6	3	7'-11"	452	
V1	50	6	STR	13'-1"	983	
V2	50	10	4	13'-2"	2,833	
V9	13	6	STR	10'-8"	208	
V10	13	6	4	10'-10"	212	
TOTAL					7,392	
UNIT B						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
H2	32	6	STR	24'-7"	1,182	
S1	30	6	3	7'-11"	357	
V3	60	6	STR	15'-0"	1,352	
V4	60	10	4	15'-0"	3,873	
TOTAL					6,764	
UNIT C						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
H2	72	6	STR	24'-7"	2,659	
S1	60	6	3	7'-11"	713	
V5	118	6	STR	16'-5"	2,910	
V6	118	10	4	16'-6"	8,378	
TOTAL					14,660	
UNIT D						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
H3	38	6	STR	23'-4"	1,332	
S1	28	6	3	7'-11"	333	
V7	56	6	STR	17'-3"	1,451	
V8	56	10	4	17'-4"	4,177	
TOTAL					7,293	
FOOTING						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
D1	280	6	1	6'-8"	2,804	
D2	280	10	2	11'-8"	14,057	
T1	119	7	6	17'-4"	4,216	
T2	15	7	5	22'-2"	680	
T3	119	9	6	18'-2"	7,350	
T4	15	7	5	24'-10"	761	
T5	15	7	7	34'-0"	1,042	
T6	15	7	7	34'-0"	1,042	
T7	179	7	6	16'-10"	6,159	
T8	15	7	5	37'-10"	1,160	
T9	179	9	6	17'-8"	10,752	
T10	15	7	5	36'-1"	1,106	
T11	30	7	STR	43'-11"	2,693	
TOTAL					53,822	
QUANTITIES						
REINFORCING STEEL					LBS.	89,931
CLASS AA CONCRETE:						
POUR 1 FOOTING					CU. YDS.	288.3
POUR 2 STEM WALL					CU. YDS.	148.8
TOTAL					437.1	
HP 14x73 STEEL PILES					NO.	75
					LIN. FT.	1,875



ALL BAR DIMENSIONS ARE OUT TO OUT



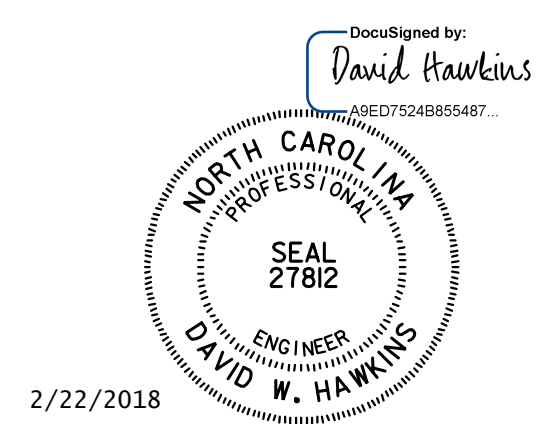
TYPICAL WALL EXPANSION JOINT



WALL KEY DETAIL

REINFORCING BAR TABLE											
UNIT	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
A CANTILEVER	#6V9	#6V10	22	SEE ELEVATION	N/A	2'-5 1/4"	N/A	9'-6"	18	9'-0"	2
A	#6V1	#10V2	14	#6H1	VARIES *	2'-8 1/4"	VARIES *	11'-6"	11	11'-0"	1
B	#6V3	#10V4	16	#6H2	VARIES *	2'-10 1/2"	VARIES *	13'-0"	12	12'-0"	2
C	#6V5	#10V6	18	#6H2	VARIES *	3'-0"	VARIES *	14'-0"	13	13'-0"	3
D	#6V7	#10V8	19	#6H3	4'-0"	3'-0"	8'-0"	14'-0"	13	13'-0"	4

\* SEE RETAINING WALL 1" SHEET FOR WALL LAYOUT INFORMATION.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 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: D. HAWKINS DATE: 11/17 DWG. NO. 12

PROJECT NO. P-5705BA  
 MECKLENBURG COUNTY  
 STATION: 13+12.11 -S1-

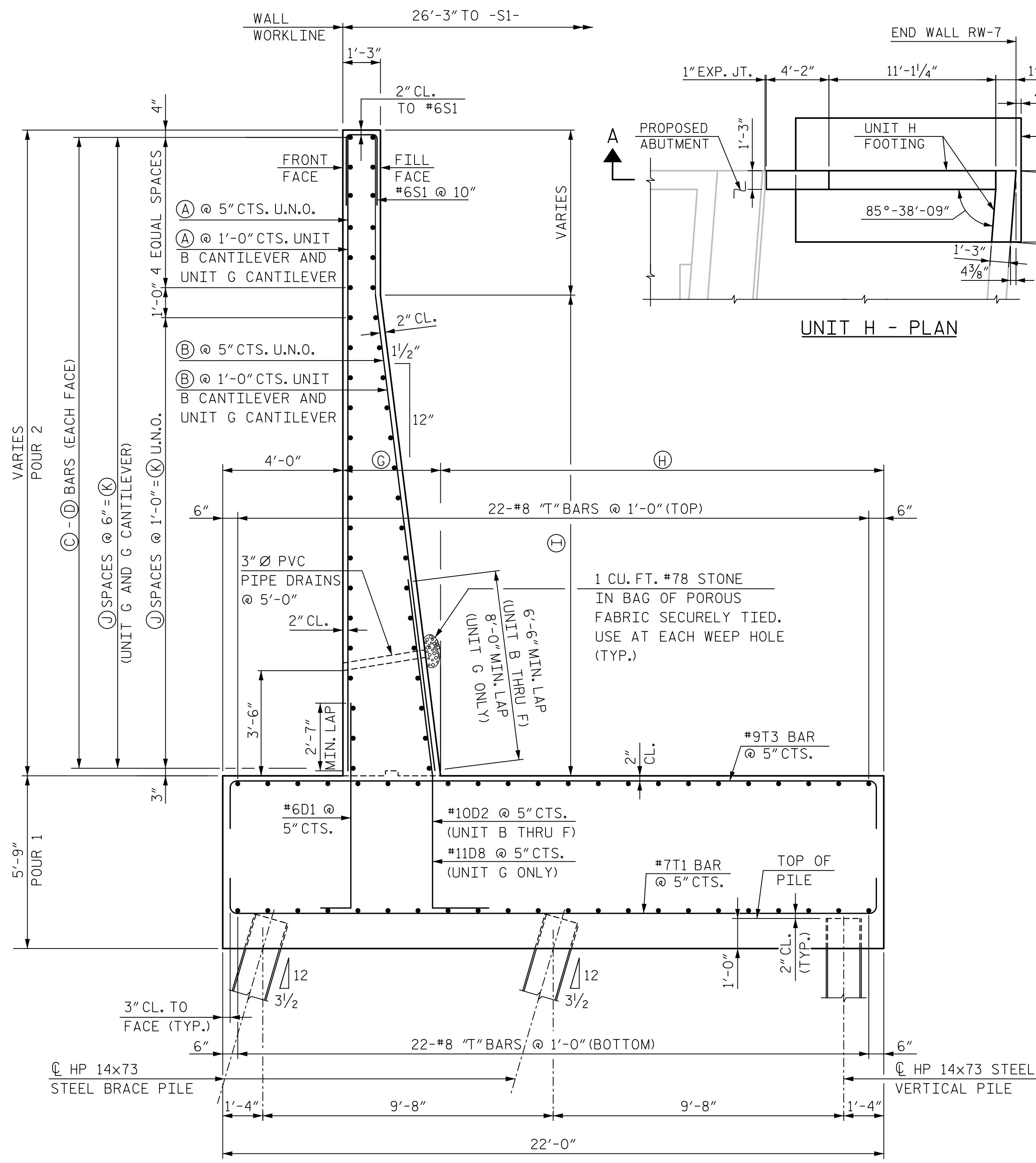
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

CAST-IN-PLACE  
 RETAINING WALL  
 DETAILS  
 (RW-1)

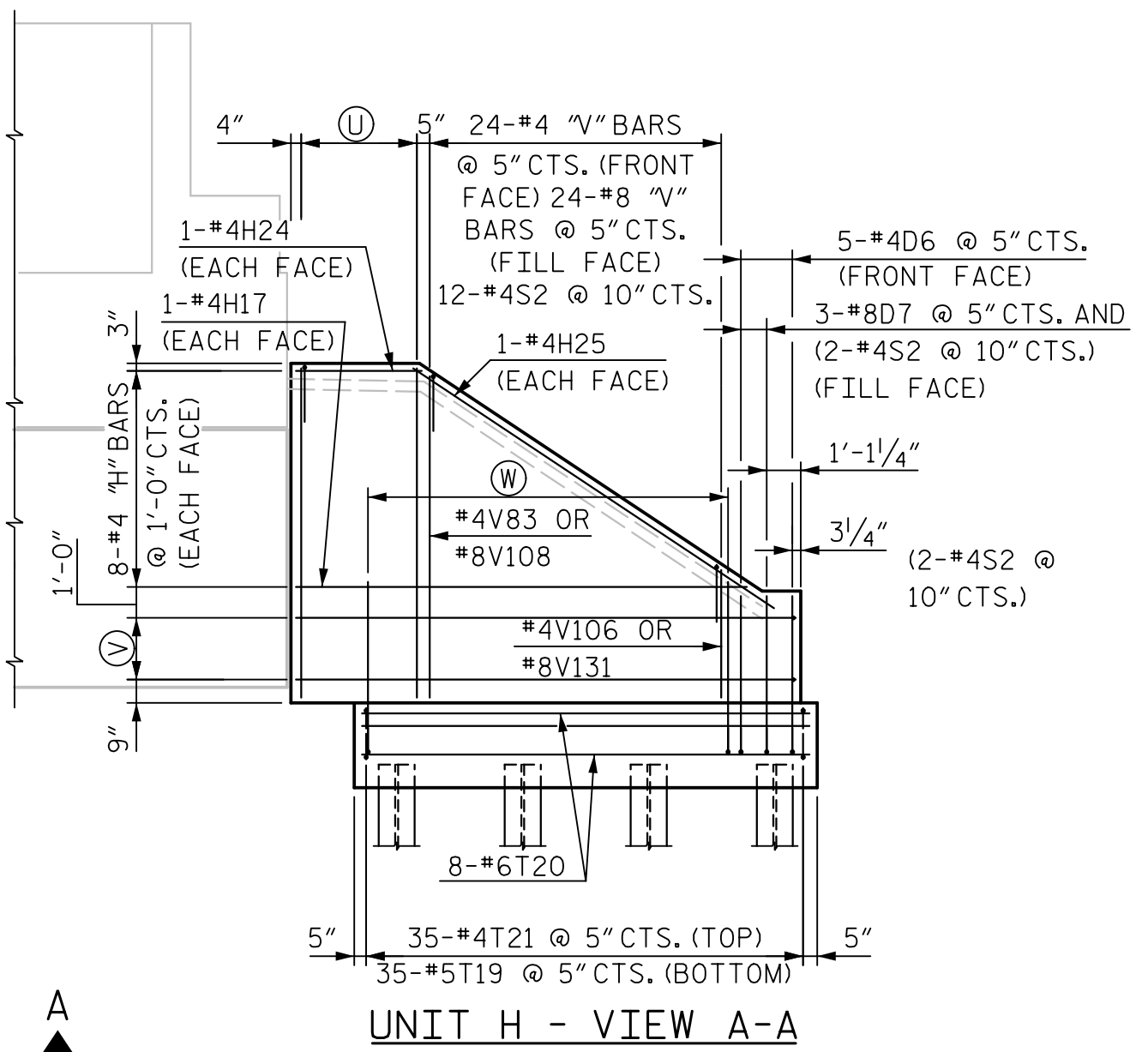
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-12
1			3			TOTAL SHEETS 17
2			4			

REINFORCING BAR TABLE									
UNIT	A	B	C	D	G	H	I	J	K
B CANTILEVER	#6V7	#6V8	12	#10H3	1'-3" UNIFORM	N/A	6'-3 3/8"	11	5'-6"
B,C	#6V1	#10V2	21	#6H1	3'-3"	14'-9"	16'-0"	15	15'-0"
D	#6V1	#10V2	21	#6H2	3'-3"	14'-9"	16'-0"	15	15'-0"
E	#6V3	#10V4	23	#6H2	3'-5 1/4"	14'-6 3/4"	17'-6"	17	17'-0"
F	#6V5	#10V6	24	#7H4	3'-7 1/2"	14'-4 1/2"	19'-0"	18	18'-0"
G	#6V5	#11V9	24	#7H4	3'-7 1/2"	14'-4 1/2"	19'-0"	18	18'-0"
G CANTILEVER	#7V10	#7V11	16	#10H5	1'-3" UNIFORM	N/A	8'-4 3/16"	15	7'-6"



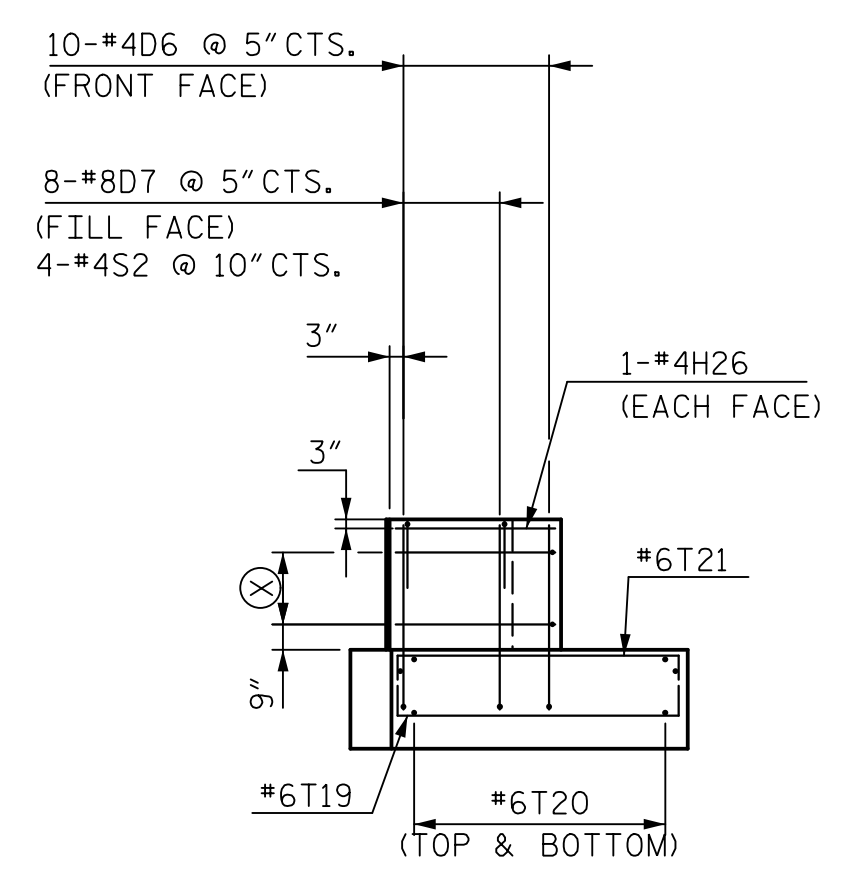
TYPICAL SECTION  
RW-7 UNIT B THRU UNIT G

- U 10-#4V82 @ 5" CTS. (FRONT FACE)  
10-#8V107 @ 5" CTS. (FILL FACE)  
5-#4S2 @ 10" CTS.
- V 3-#4H16 @ 1'-0" CTS. (EACH FACE)
- W 29-#4D3 @ 5" CTS. (FRONT FACE)  
29-#8D4 @ 5" CTS. (FILL FACE) (MATCH W/V BARS)

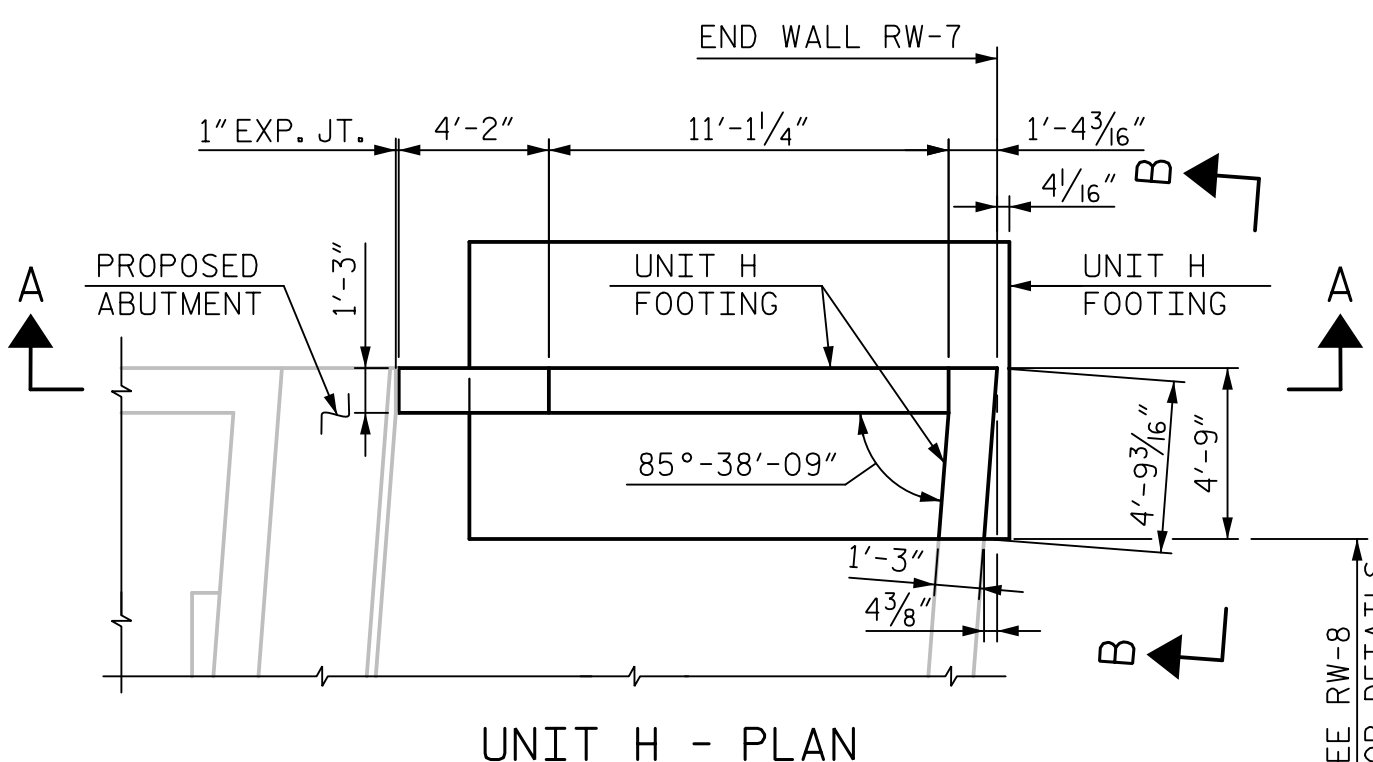


UNIT H - VIEW A-A

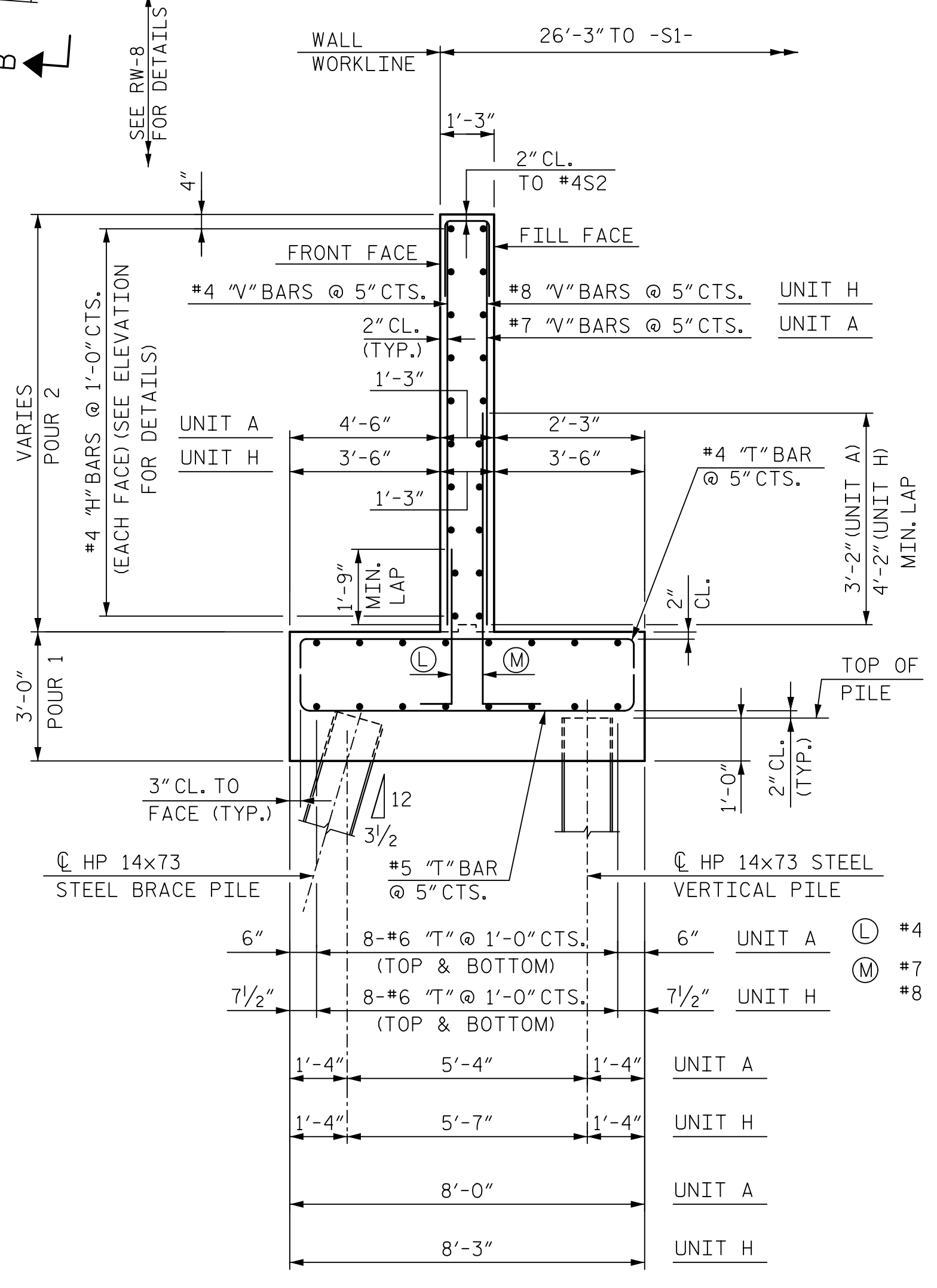
- X 3-#4H26 @ 1'-0" CTS. (EACH FACE)



UNIT H - VIEW B-B

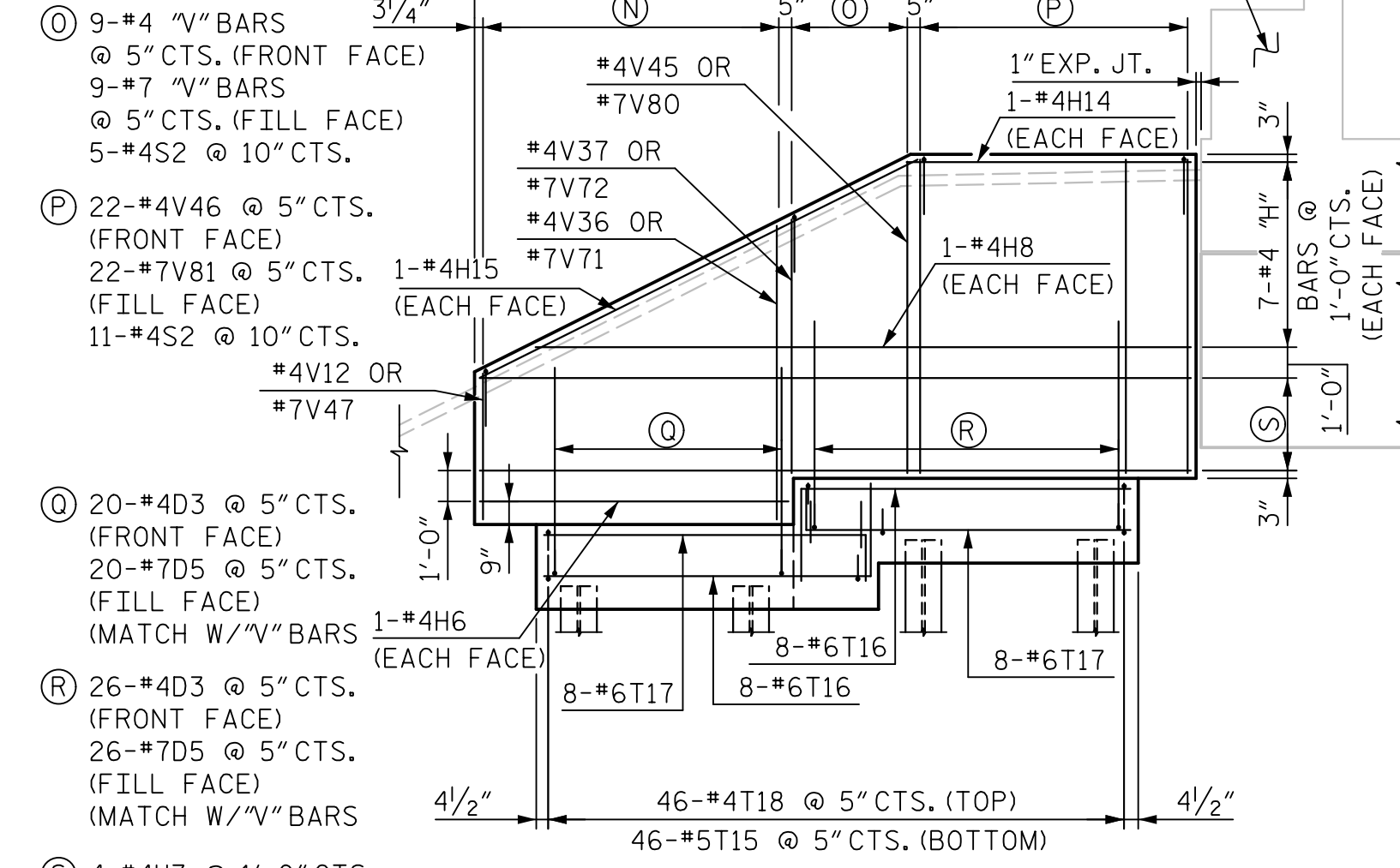


UNIT H - PLAN



TYPICAL SECTION  
RW-7 UNIT A AND UNIT H

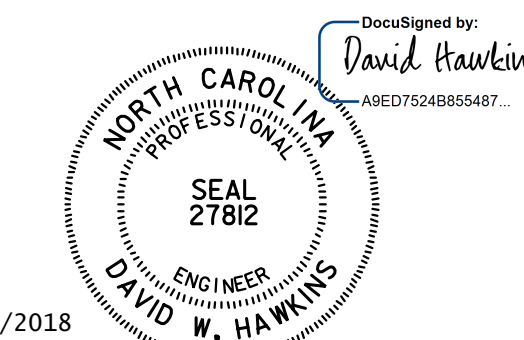
- N 25-#4 V BARS @ 5" CTS. (FRONT FACE)  
25-#7 V BARS @ 5" CTS. (FILL FACE)  
13-#4S2 @ 10" CTS.
- O 9-#4 V BARS @ 5" CTS. (FRONT FACE)  
9-#7 V BARS @ 5" CTS. (FILL FACE)  
5-#4S2 @ 10" CTS.
- P 22-#4V46 @ 5" CTS. (FRONT FACE)  
22-#7V81 @ 5" CTS. (FILL FACE)  
11-#4S2 @ 10" CTS.
- Q 20-#4D3 @ 5" CTS. (FRONT FACE)  
20-#7D5 @ 5" CTS. (FILL FACE)  
(MATCH W/V BARS)
- R 26-#4D3 @ 5" CTS. (FRONT FACE)  
26-#7D5 @ 5" CTS. (FILL FACE)  
(MATCH W/V BARS)
- S 4-#4H7 @ 1'-0" CTS. (EACH FACE)



UNIT A - ELEVATION

PROJECT NO. P-5705BA  
 MECKLENBURG COUNTY  
 STATION: 15+39.55 -S1-

SHEET 2 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 CAST-IN-PLACE  
 RETAINING WALL  
 DETAILS  
 (RW-7)



3/23/2018

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 13																									
DRAWN BY: M. WRIGHT		DATE: 11/17		SHEET NO. W-13																									
CHECKED BY: D. HAWKINS		DATE: 11/17		TOTAL SHEETS 17																									
<table border="1"> <thead> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <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> </tbody> </table>						REVISIONS						NO.	BY	DATE	NO.	BY	DATE	1			3			2			4		
REVISIONS																													
NO.	BY	DATE	NO.	BY	DATE																								
1			3																										
2			4																										

BILL OF REINFORCING

Table for UNIT A (top section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H6 through H15.

Table for UNIT A (middle section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V76 through V81.

Table for UNIT G with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars C1, H4, H5, S1, V5, V9, V10, V11, V12, V13.

Table for UNIT H with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V128, V129, V130, V131.

Table for UNIT A (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars S2, V12 through V26.

Table for UNIT B with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H1, H3, S1, V1, V2, V7, V8.

Table for UNIT H (middle section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H16 through H26.

Table for FOOTING with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars D1 through D8.

Table for UNIT A (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V27 through V41.

Table for UNIT C with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H1, S1, V1, V2.

Table for UNIT H (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars S2, V82 through V100.

Table for FOOTING (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars T1 through T21.

Table for UNIT A (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V42 through V56.

Table for UNIT D with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H2, S1, V1, V2.

Table for UNIT H (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V101 through V110.

Table for QUANTITIES with columns: REINFORCING STEEL, CLASS AA CONCRETE, HP 14x73 STEEL PILES.

Table for UNIT A (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V57 through V71.

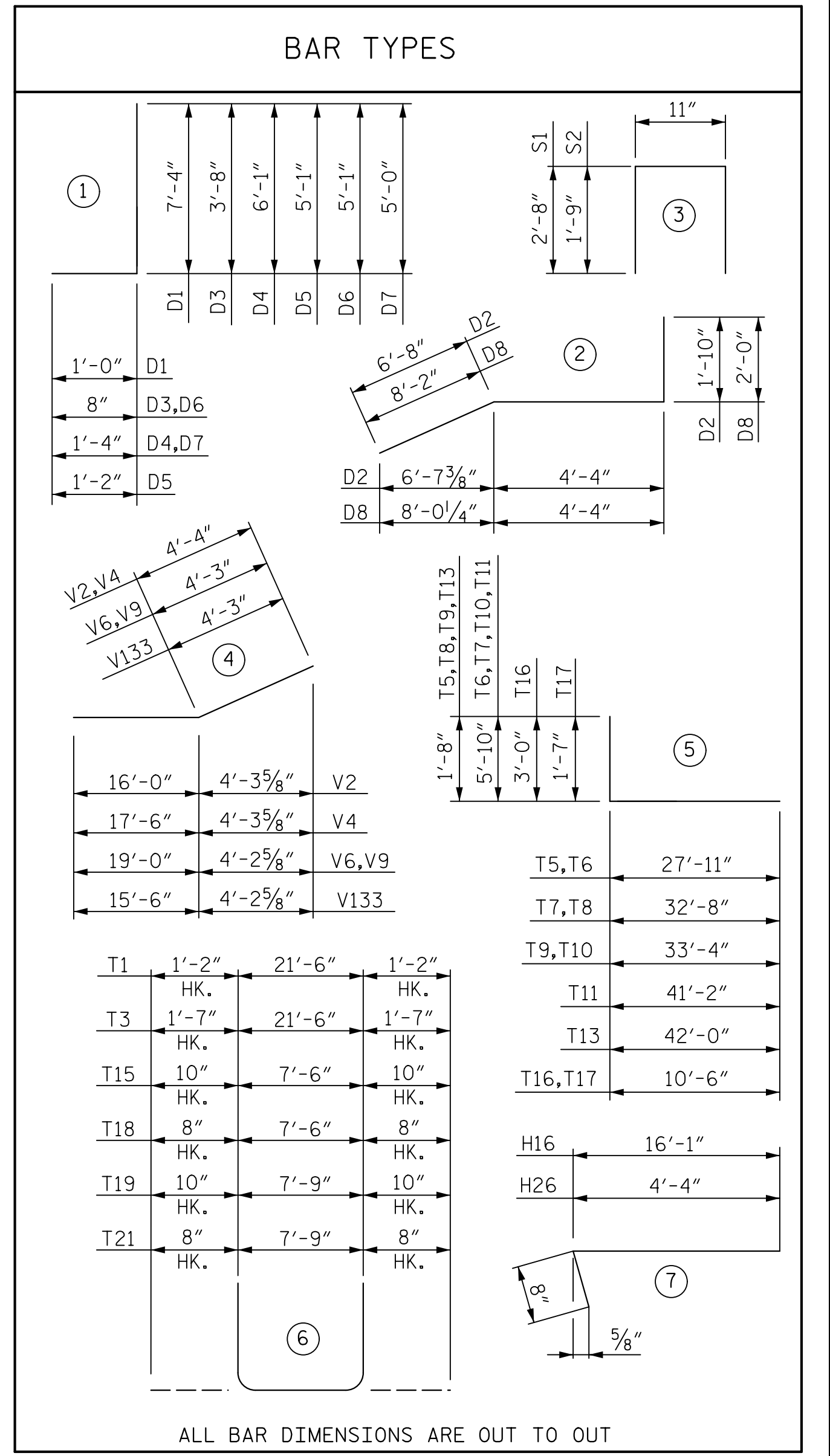
Table for UNIT E with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H2, S1, V3, V4.

Table for UNIT H (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V111 through V120.

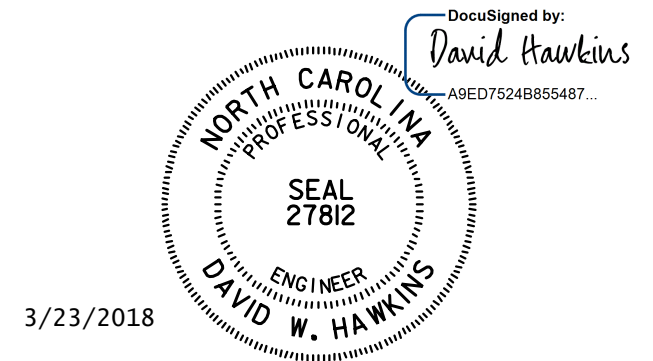
Table for UNIT A (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V72 through V75.

Table for UNIT F with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars H4, S1, V5, V6.

Table for UNIT H (bottom section) with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT. Includes bars V121 through V127.



ALL BAR DIMENSIONS ARE OUT TO OUT



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Table for HNTB NORTH CAROLINA, P.C. with columns: DRAWN BY, M. WRIGHT, CHECKED BY, D. HAWKINS, DATE, DWG. NO. 14.

PROJECT NO. P-5705BA MECKLENBURG COUNTY STATION: 15+39.55 -S1-

SHEET 3 OF 3 DEPARTMENT OF TRANSPORTATION CAST-IN-PLACE RETAINING WALL DETAILS (RW-7)

Table for REVISIONS with columns: NO., BY, DATE, NO., BY, DATE. Includes revision 1 and 2.

SHEET NO. W-14 TOTAL SHEETS 17

FOR POST SPACING, SEE WALL ELEVATIONS

FENCE AND HANDRAIL POST SPACING

**NOTES:**

FENCE FRAMEWORK INCLUDING BASE PLATES TO HAVE A FUSION BONDED BLACK VINYL COATING IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM F-1043.

FENCE POSTS AND RAIL SHALL BE SCHEDULE 40 STEEL PIPE IN ACCORDANCE WITH ASTM F-1043.

PROVISIONS SHALL BE MADE FOR THE DRAINAGE OF WATER FROM INSIDE THE FENCE POSTS.

CHAIN LINK FABRIC AND FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM F-668 AND HAVE A BONDED BLACK FUSION VINYL COATING.

MISCELLANEOUS METAL COMPONENTS SHALL MEET THE REQUIREMENTS OF ASTM A-36.

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

POST TO BE SET PERPENDICULAR TO TOP OF WALL AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE WALL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR POST, RAIL, AND FENCE FABRIC. SHOP INSPECTION IS NOT REQUIRED.

WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS BRIDGE WELDING CODE.

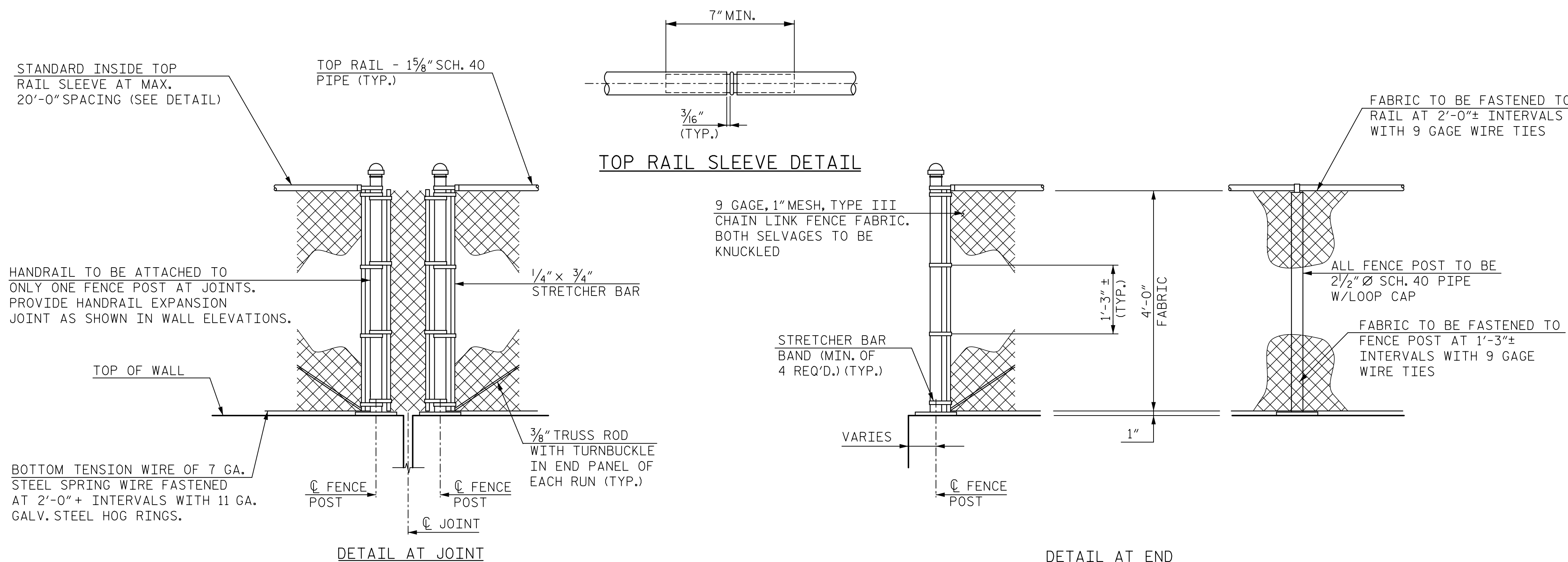
SEE SHEET 2 OF 2 FOR ADDITIONAL HANDRAIL DETAILS.

ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF WALL/COPING.

SHOP DRAWINGS FOR FENCE AND HANDRAIL ARE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

FOR FENCING AND HANDRAIL DETAILS AND POST SPACING ON BRIDGE, SEE BRIDGE PLANS.

FOR METAL RAIL (STEEL) AND FENCE, SEE SPECIAL PROVISIONS.

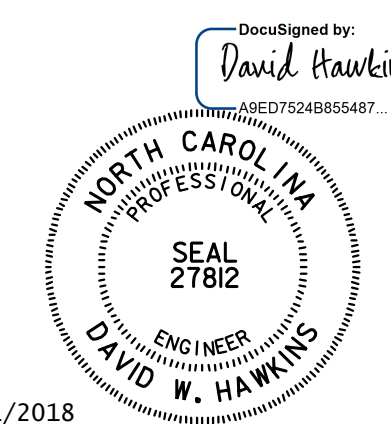


DETAILS FOR CHAIN LINK FENCE  
(HANDRAIL NOT SHOWN FOR CLARITY)

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY

STATION: STA. 19+44.29 -S2-  
STA. 24+29.66 -S2-  
STA. 28+78.65 -S2-

SHEET 1 OF 2



2/21/2018

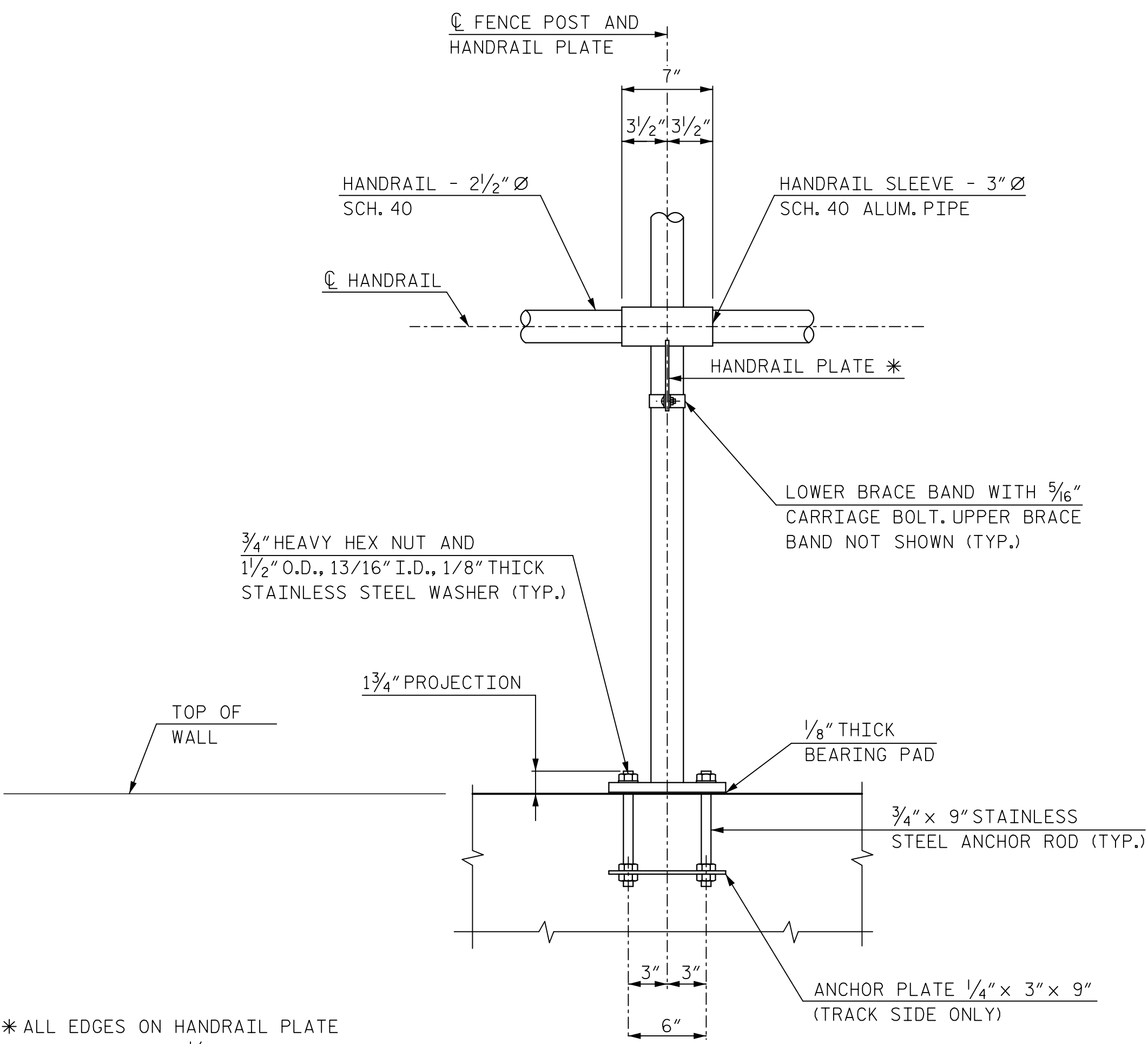
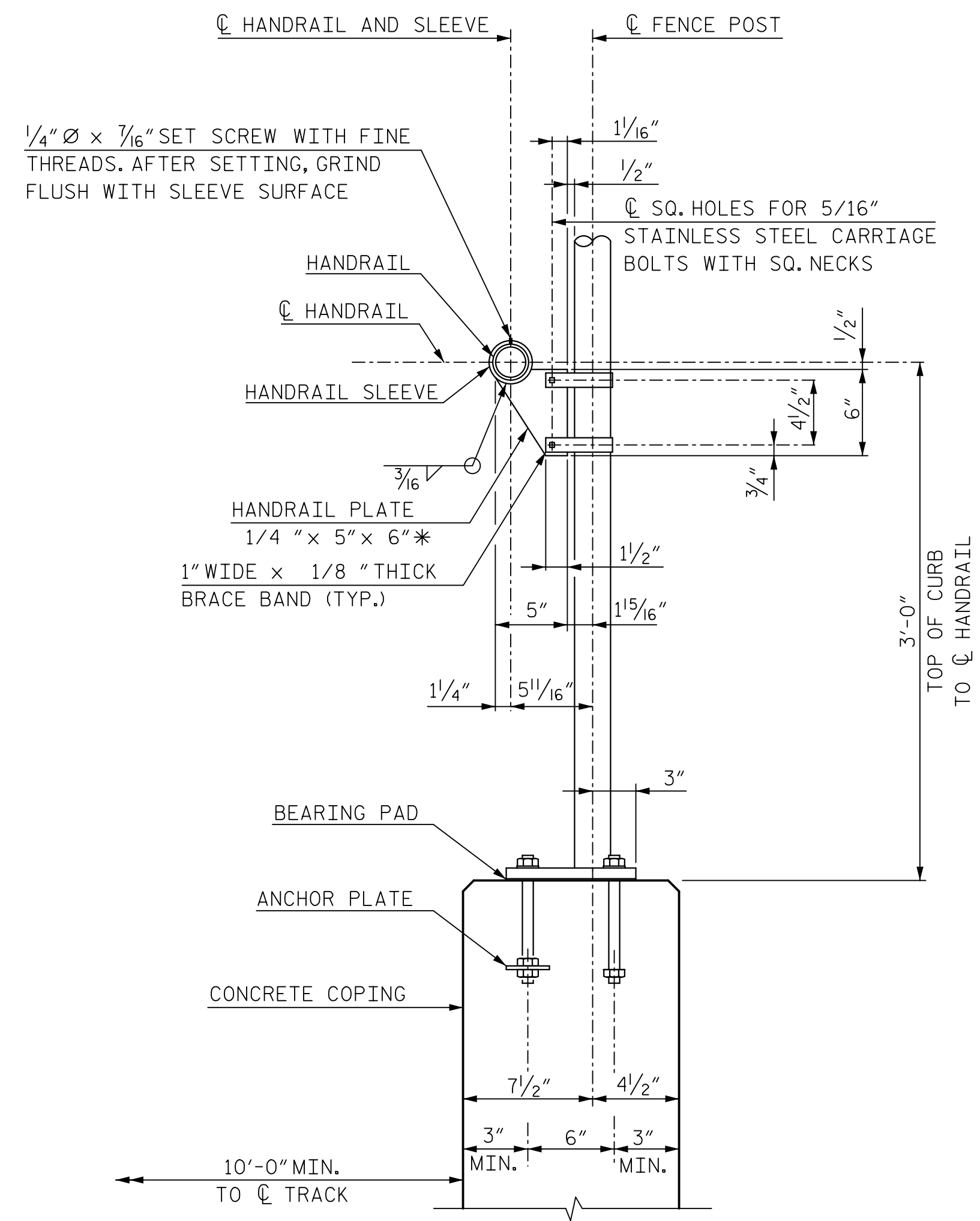
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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

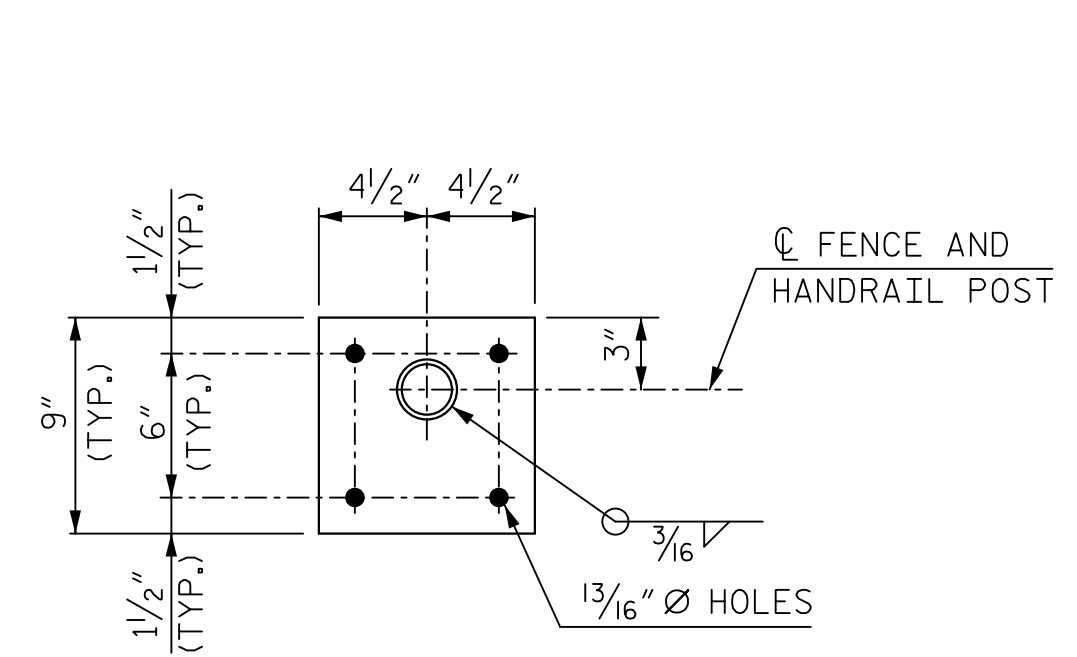
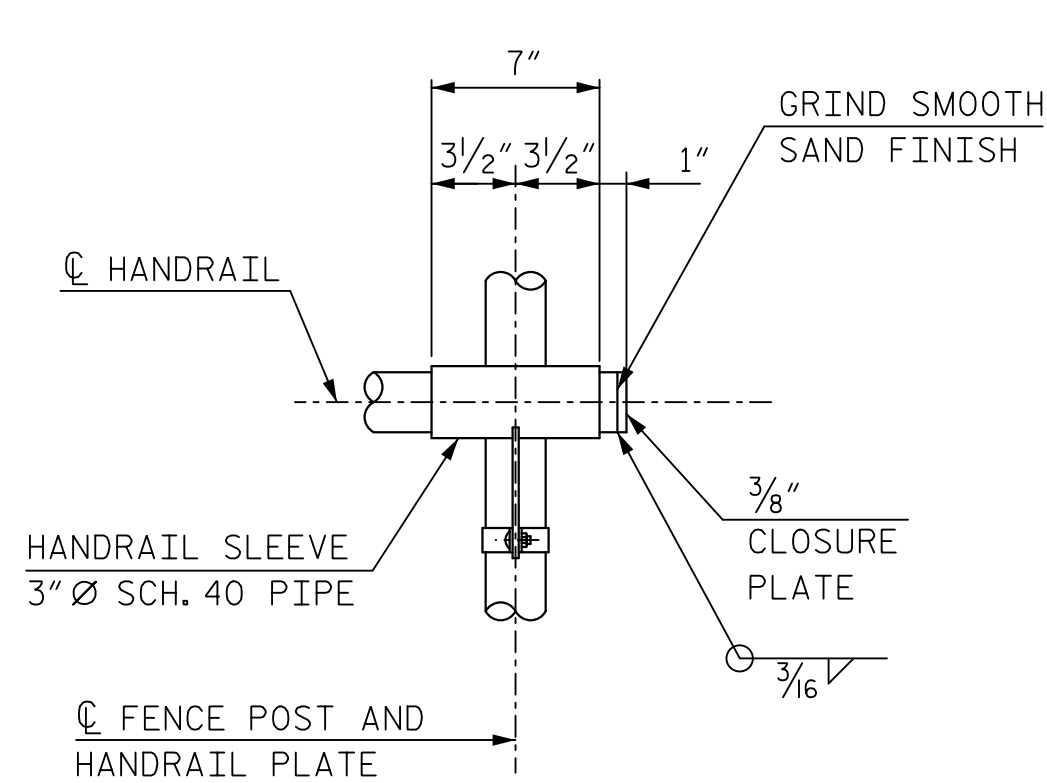
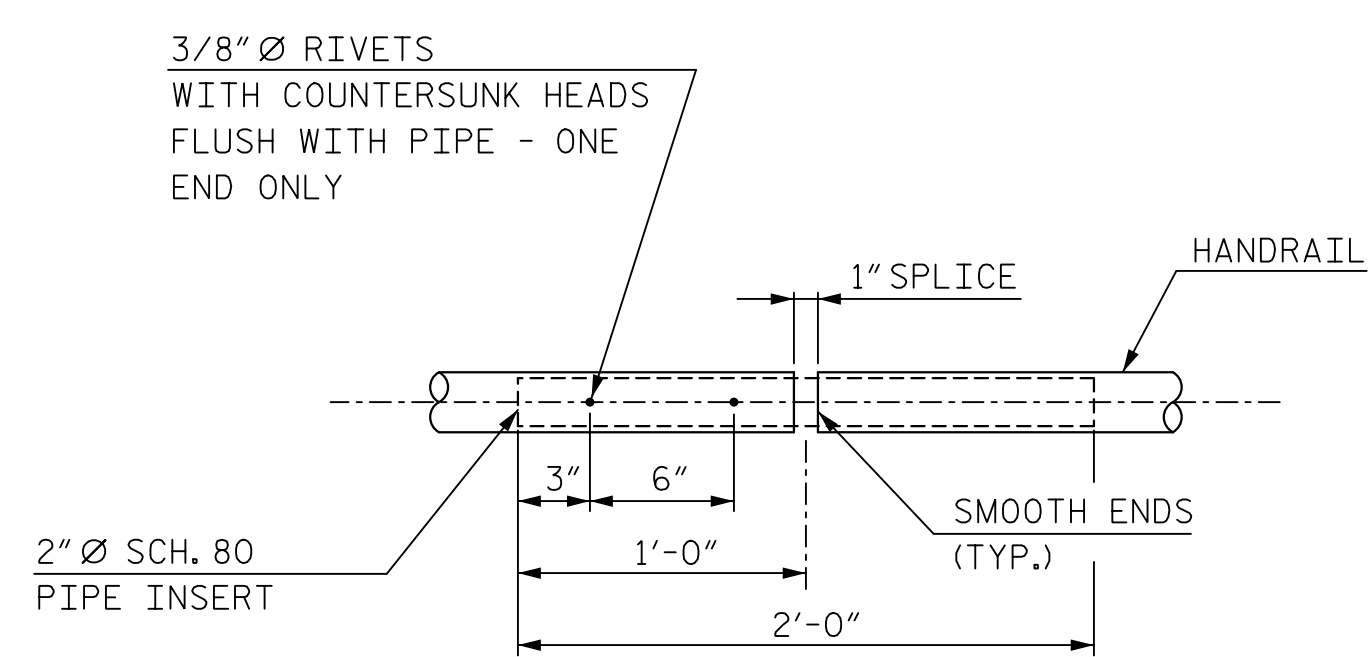
WALL MOUNTED  
FENCE AND  
HANDRAIL DETAILS

<b>HNTB</b> 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	W-15
	1			3			TOTAL SHEETS
DRAWN BY <u>M. WRIGHT</u> DATE <u>10/17</u> CHECKED BY <u>D. HAWKINS</u> DATE <u>10/17</u> DWG. NO. 15			2			17	





DETAILS FOR PIPE RAILING

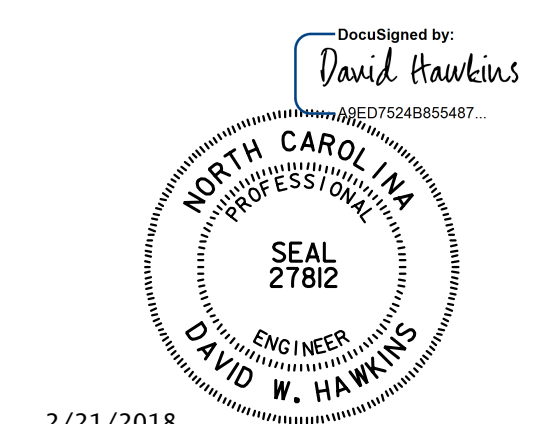


NOTES:

- SEE FENCE AND HANDRAIL POST SPACING DETAIL ON RETAINING WALL ELEVATIONS FOR JOINT IN HANDRAIL SPACING.
- ALL HANDRAIL PIPE, SLEEVES, AND EXPANSION JOINTS TO BE SMOOTH AND FREE OF SHARP EDGES.
- HANDRAIL PIPE SHALL BE SCHEDULE 40 STEEL PIPE IN ACCORDANCE WITH ASTM F-1043.
- STAINLESS STEEL BOLTS, NUTS, AND ANCHOR RODS TO BE ASTM A-276, TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A-276, TYPE 302. ANCHOR ROD THREADS SHALL BE ROLLED, NOT CUT.
- POST TO BE SET PERPENDICULAR TO TOP OF WALL AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE WALL.
- CERTIFIED MILL REPORTS ARE REQUIRED FOR POST AND RAIL. SHOP INSPECTION IS NOT REQUIRED.
- AFTER ANCHOR BOLT AND OTHER BOLT NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE NICKED TO LOCK NUTS.
- THE BRACE BANDS USED TO SECURE HANDRAIL SLEEVE SHALL BE OF SUCH SIZE NECESSARY TO CLAMP TIGHTLY TO FENCE POST.
- WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS BRIDGE WELDING CODE.
- ANCHOR PLATE SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.
- UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OF 304 STAINLESS STEEL.
- LOWER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A307.
- HANDRAIL, HANDRAIL SLEEVES, AND ALL SUPPORT COMPONENTS TO HAVE A FUSION BONDED BLACK VINYL COATING IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM F-1043.

METAL RAIL (STEEL) AND FENCE PAY LENGTH	
WALL	LENGTH
RW-2	307.4'
RW-3	317.9'
RW-4	694.8'

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: STA. 19+44.29 -S2-  
STA. 24+29.66 -S2-  
STA. 28+78.65 -S2-

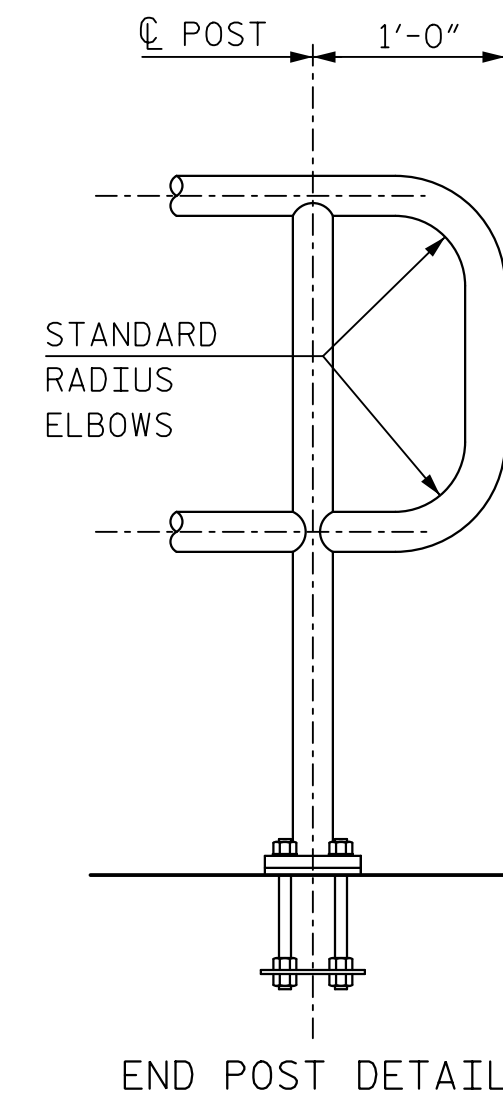
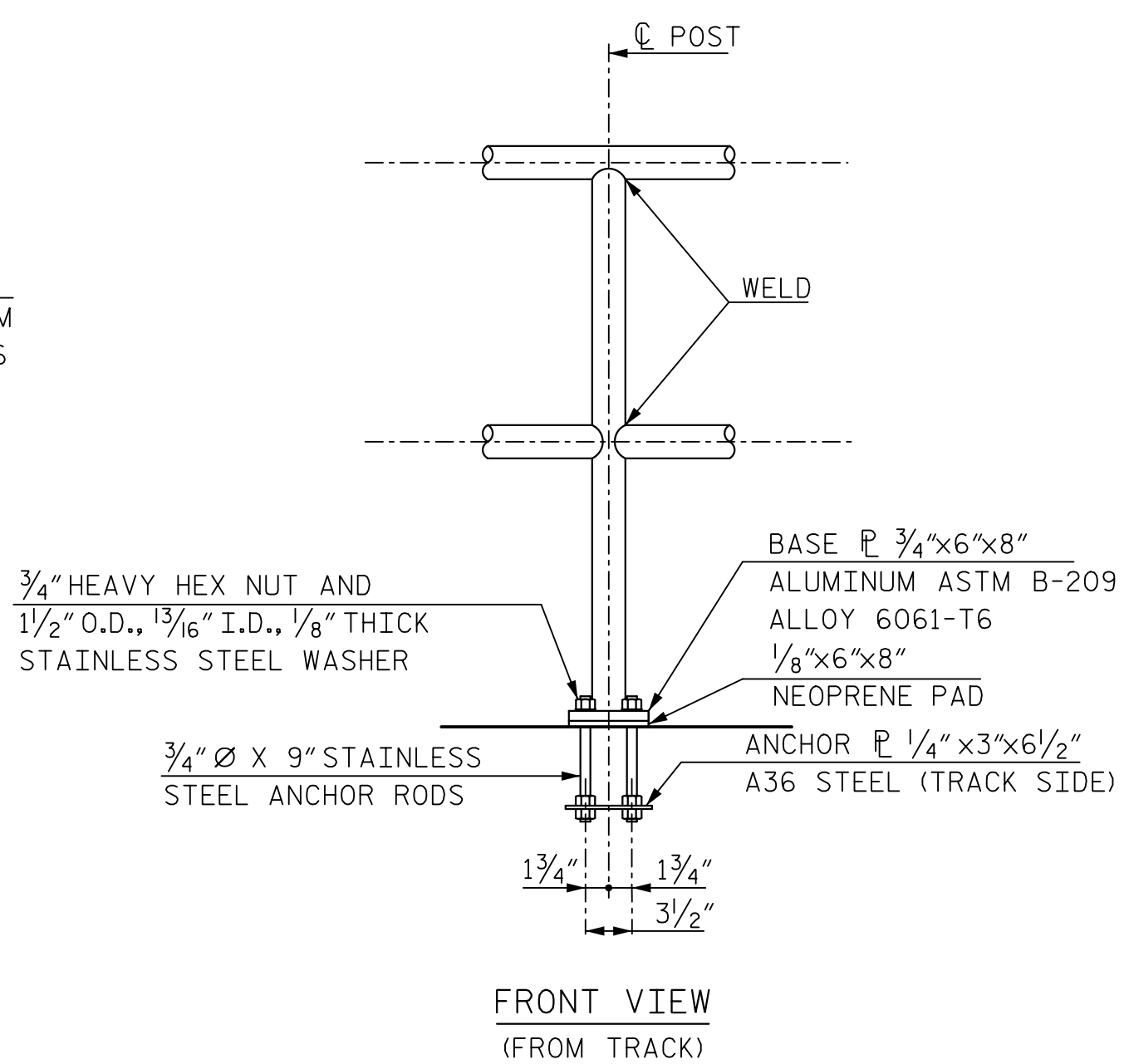
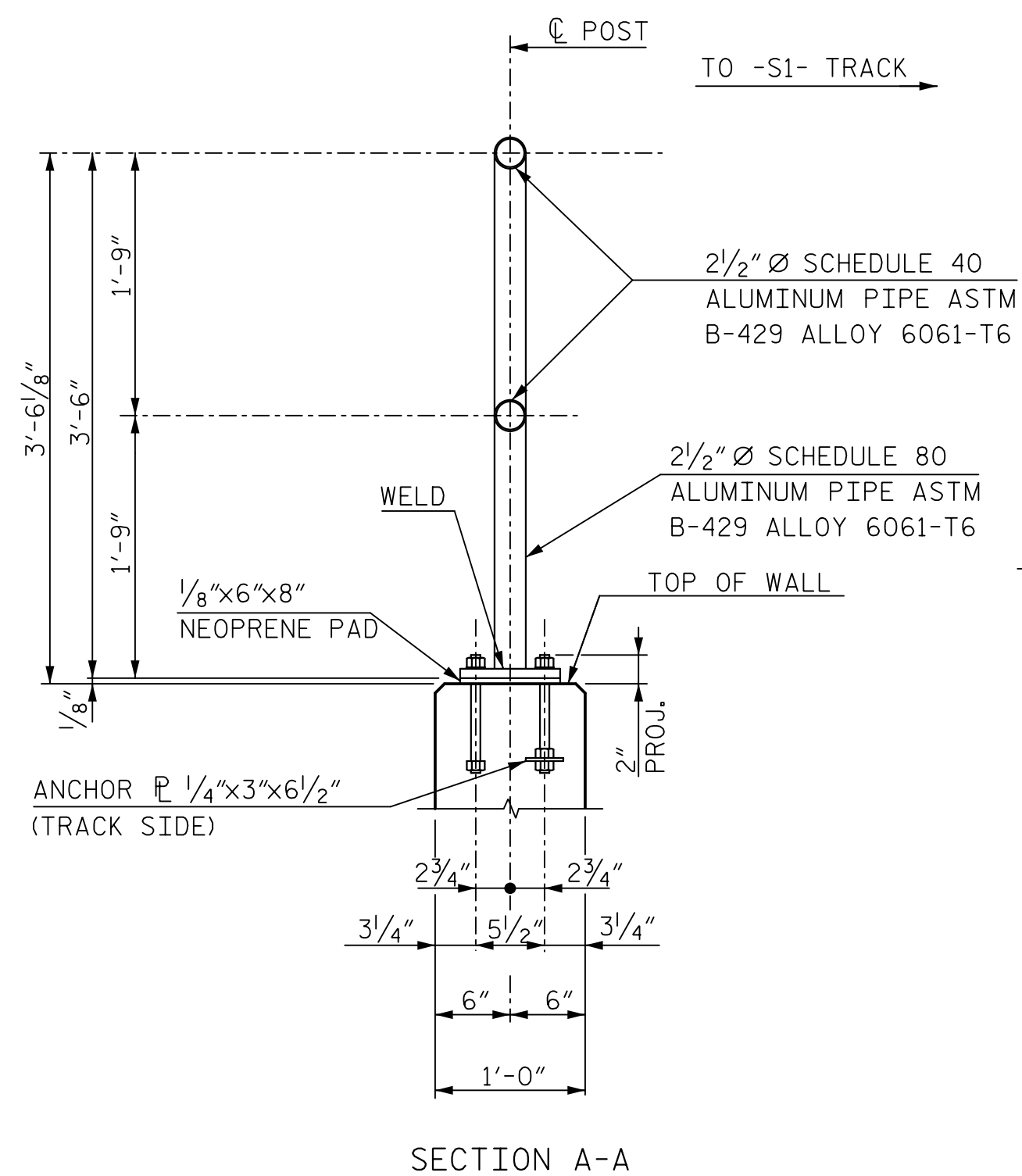


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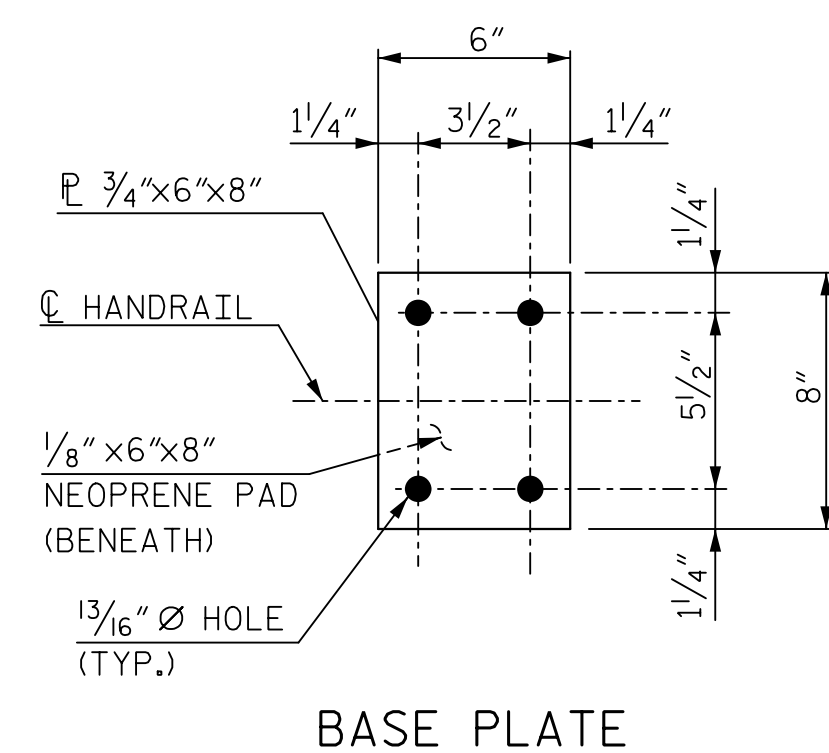
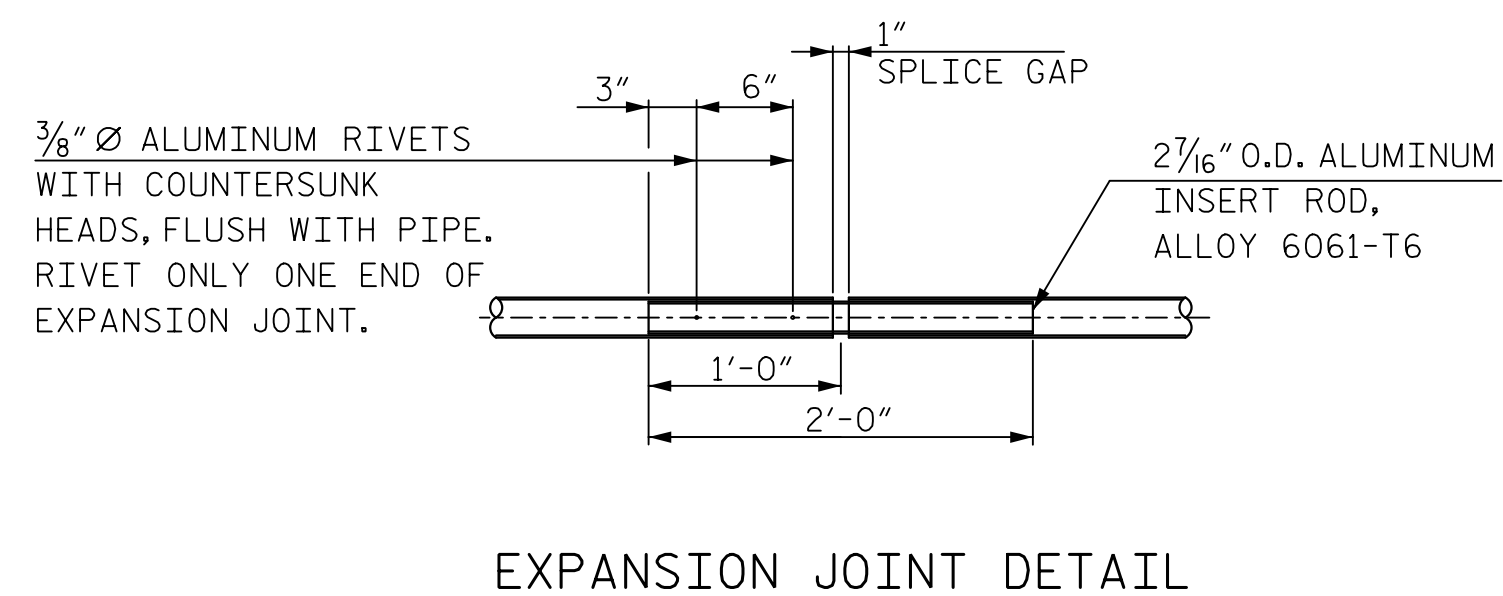
<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS					SHEET NO. W-16 TOTAL SHEETS 17	
	NO.	BY	DATE	NO.	BY		DATE
	1		10/17	3			
DRAWN BY <u>M. WRIGHT</u> DATE <u>10/17</u> CHECKED BY <u>D. HAWKINS</u> DATE <u>10/17</u> DWG. NO. 16							

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

WALL MOUNTED  
 FENCE AND  
 HANDRAIL DETAILS



ALUMINUM HANDRAIL AND POST



NOTES:

JOINTS IN RAILING (SPlice GAP) SHALL BE LOCATED AS SHOWN IN WALL ELEVATIONS.

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 WALL AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE WALL.

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 SCORED 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.

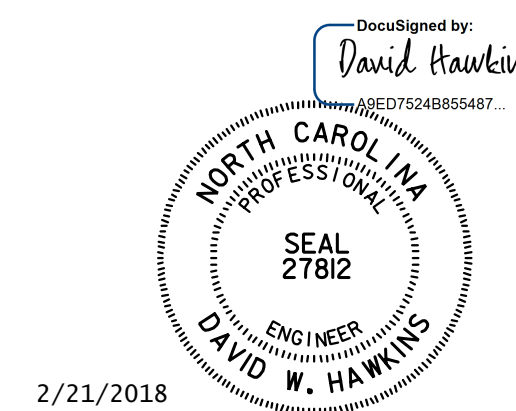
THE LENGTH OF METAL RAIL TO BE PAID FOR SHALL BE THE CONTINUOUS LENGTH MEASURED FROM END TO END OF RAIL, ALONG THE TOP RAIL.

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

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

METAL RAIL (ALUMINUM) PAY LENGTH	
WALL	LENGTH (L.F.)
RW-1	131.0
RW-5	191.7
RW-7	271.7

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: STA. 38+59.08 -A1-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

METAL HANDRAIL  
 DETAILS

<b>HNTB</b> 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	W-17
	1		10/17	3			TOTAL SHEETS
DRAWN BY <u>M. WRIGHT</u>	DATE <u>10/17</u>	DWG. NO. <u>17</u>	2		4		17
CHECKED BY <u>D. HAWKINS</u>	DATE <u>10/17</u>						