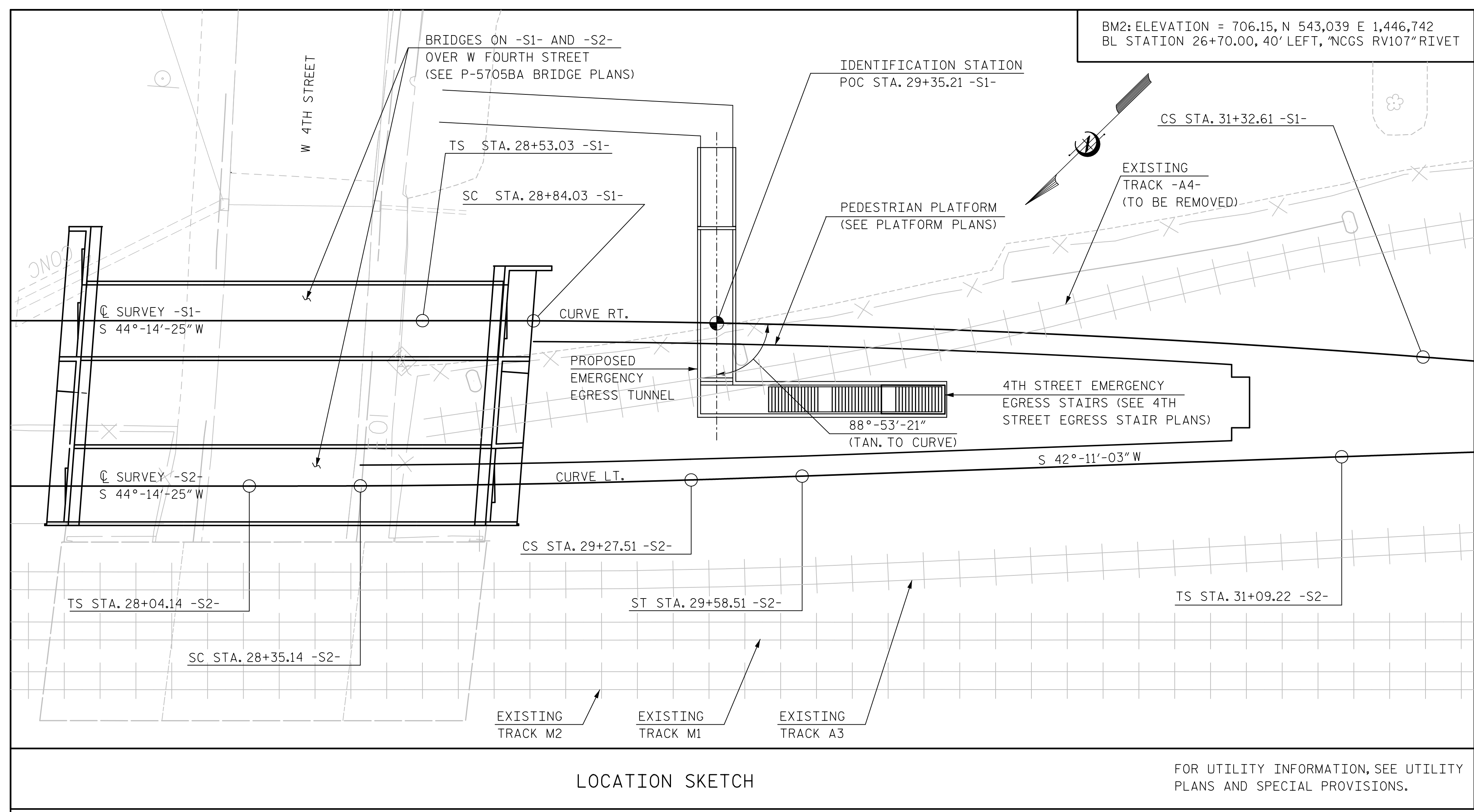


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0012DEL_P28



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES:

ASSUMED LIVE LOAD = AREMA E-80

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

DESIGN FILL = 7.98' (BASE OF RAIL TO TOP OF STRUCTURE)

FOR OTHER DESIGN DATA AND NOTES SEE STRUCTURE STANDARD NOTE SHEET.

TUNNEL SHALL BE CONSTRUCTED USING CLASS AA CONCRETE WITH $f'c = 4,500$ psi.

CONCRETE IN TUNNEL TO BE POURED IN THE FOLLOWING ORDER:

1. FLOOR SLAB INCLUDING CUTOFF WALLS AND 2" OF VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

NO BACKFILLING OF EXTERIOR WALLS SHALL BE PERMITTED UNTIL TOP SLAB HAS BEEN PLACED AND CURED. CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARILY BRACING WALLS UNTIL TOP SLAB IS COMPLETED.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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.

WATERPROOFING SHALL BE APPLIED IN ACCORDANCE WITH THE PLANS, STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

WATERPROOFING: TOP SURFACE AREA OF TOP SLAB AND EXTERIOR FACES OF WALLS. CONTRACTOR SHALL SUBMIT WATERPROOFING SYSTEM AND DETAILS TO THE ENGINEER, INCLUDING WATERPROOFING DETAIL FOR EXPANSION JOINTS, FOR REVIEW AND APPROVAL.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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 BACKFILL AROUND STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR WATERSTOPS, SEE SPECIAL PROVISIONS.

FOR FOUNDATION LAYOUT AND FOUNDATION NOTES, SEE 4TH STREET EMERGENCY EGRESS TUNNEL DETAILS (SHEET 5 OF 5)

TOTAL BILL OF MATERIAL				
	CULVERT EXCAVATION AT STATION 29+35.21 -S1-	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	PDA TESTING	CLASS AA CONCRETE
	LUMP SUM	TON	EACH	CU. YDS.
EGRESS TUNNEL	LUMP SUM	51	1	121.3

	REINFORCING STEEL	WATERPROOFING	HP 14x73 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 STEEL PILES
	LBS.	SQ. YARDS	NO.	L.F.
EGRESS TUNNEL	30,186	220.2	14	490

INDEX OF DRAWINGS

- 1 GENERAL DRAWING: EMERGENCY EGRESS TUNNEL (SHEET 1 OF 5)
- 2 EMERGENCY EGRESS TUNNEL DETAILS (SHEET 2 OF 5)
- 3 EMERGENCY EGRESS TUNNEL DETAILS (SHEET 3 OF 5)
- 4 EMERGENCY EGRESS TUNNEL DETAILS (SHEET 4 OF 5)
- 5 EMERGENCY EGRESS TUNNEL DETAILS (SHEET 5 OF 5)

GRADE DATA

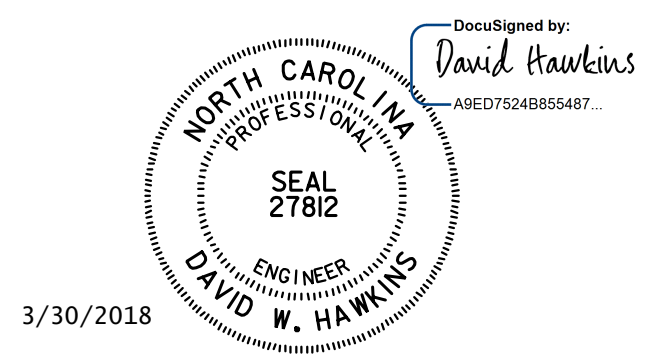
TOP OF RAIL EL. @ STA. 29+35.21 -S1- = 743.79

TUNNEL INVERT EL. @ STA. 29+35.21 -S1- = 723.89

PROJECT NO. P-5705BB
MECKLENBURG COUNTY
 STATION: POC STA. 29+35.21 -S1-

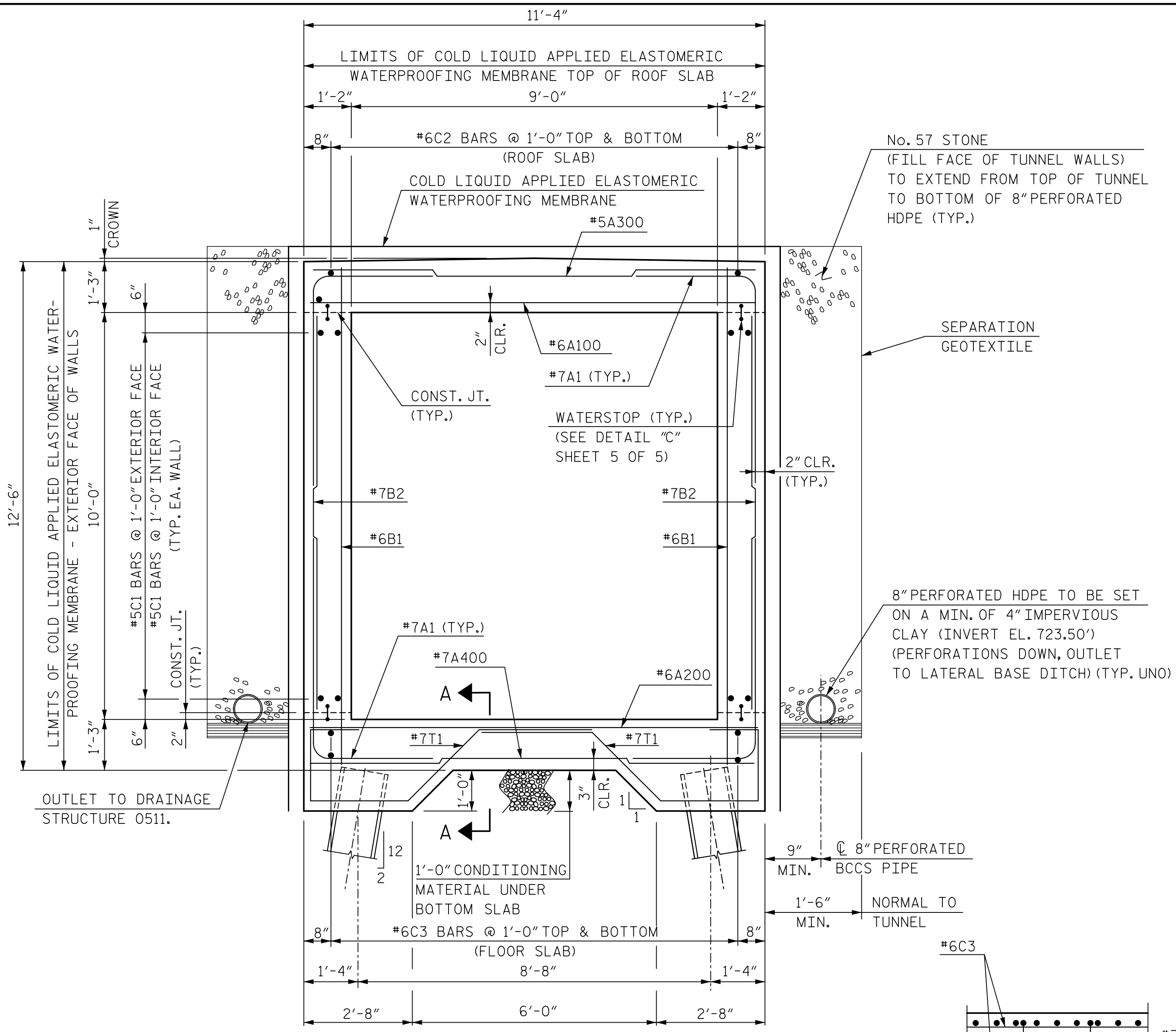
SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 4TH STREET
 EMERGENCY
 EGRESS TUNNEL

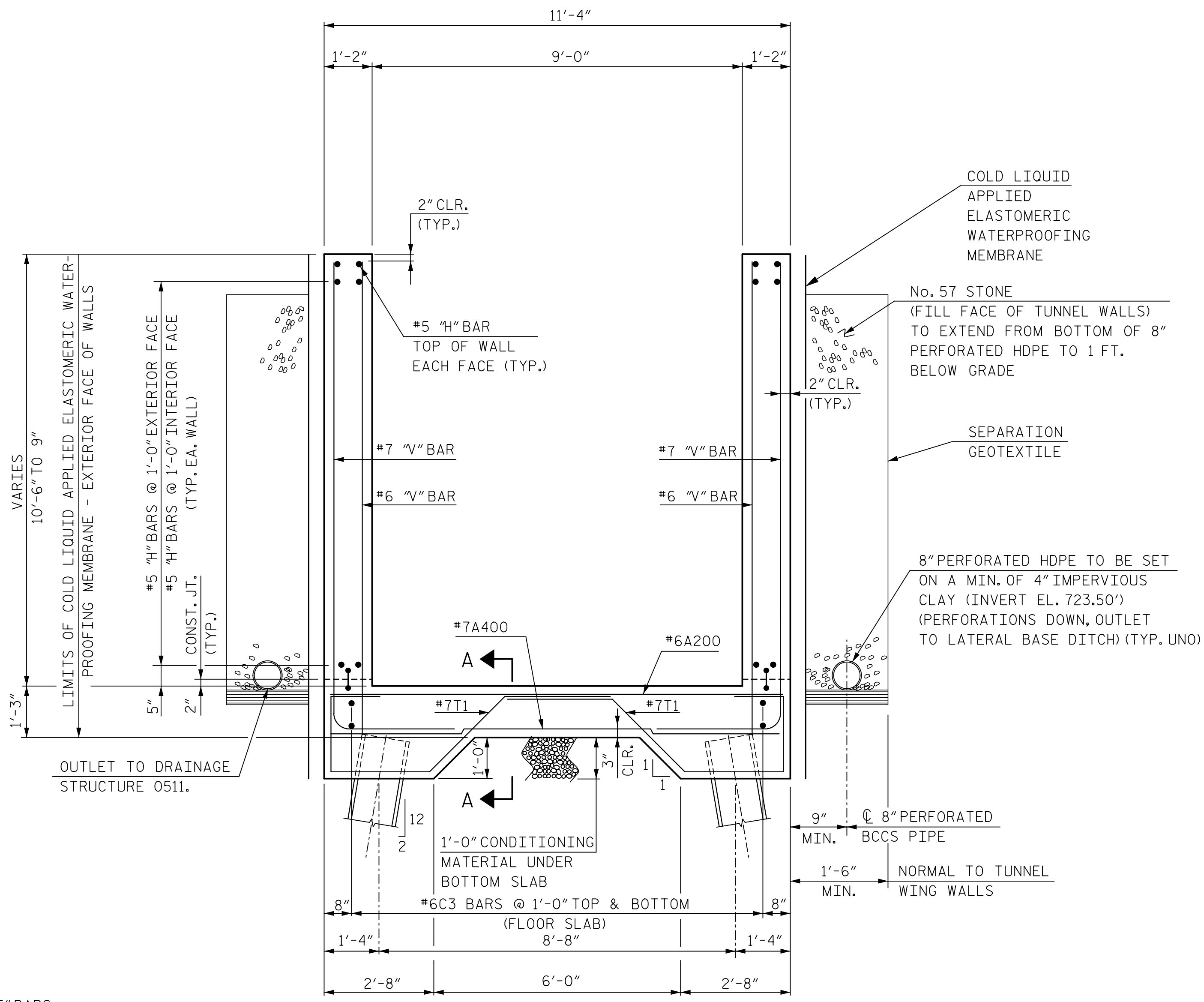


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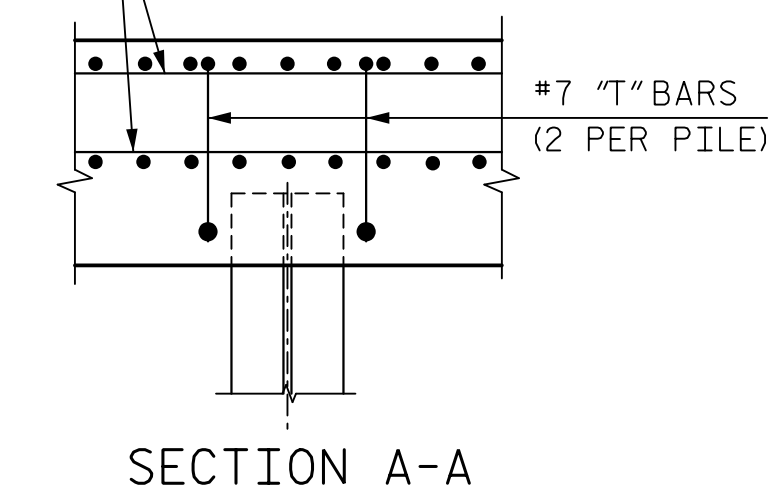
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS					SHEET NO. S12-1
	DRAWN BY: J. BAYNE CHECKED BY: D. HAWKINS	DATE: 2/18 DATE: 2/18	DWG. NO. 1	NO. 1 BY: [] DATE: []	NO. 2 BY: [] DATE: []	
					TOTAL SHEETS	5



SECTION D-D

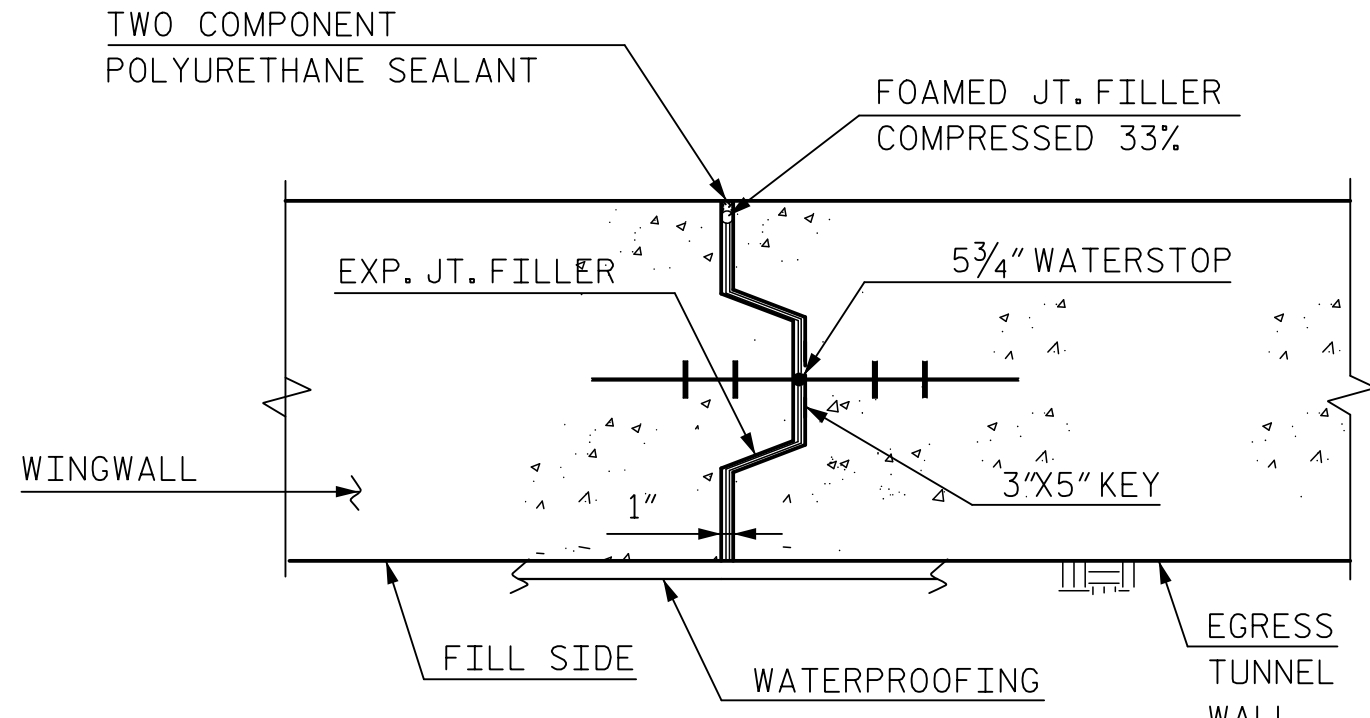


SECTION E-E



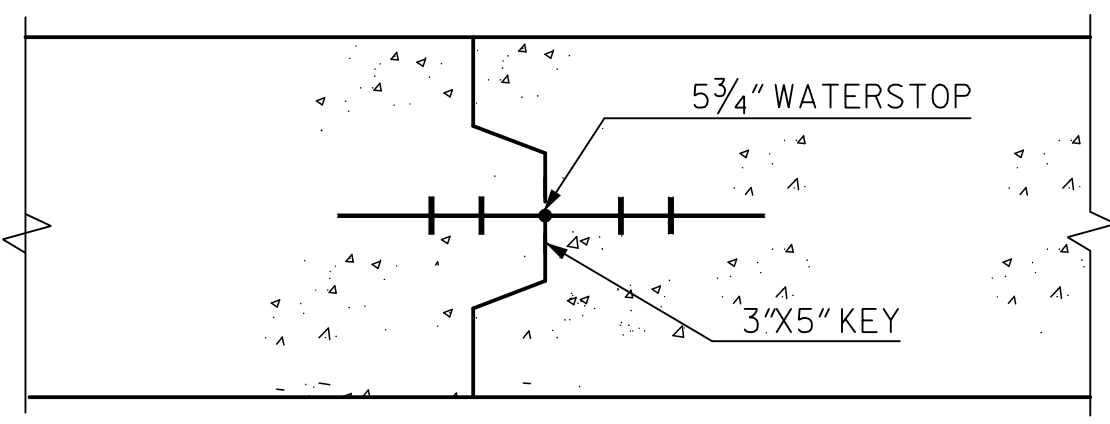
SECTION A-A

NOTE: PAYMENT FOR DRAIN AND ALL INCIDENTAL ITEMS SHALL BE INCLUDED IN THE LUMP SUM PAY ITEM FOR CULVERT EXCAVATION AT STATION 29+35.21 -S1-. SEPARATION GEOTEXTILE SHALL BE TYPE I GEOTEXTILE IN ACCORDANCE WITH SECTION 1056 OF THE STANDARD SPECIFICATIONS.

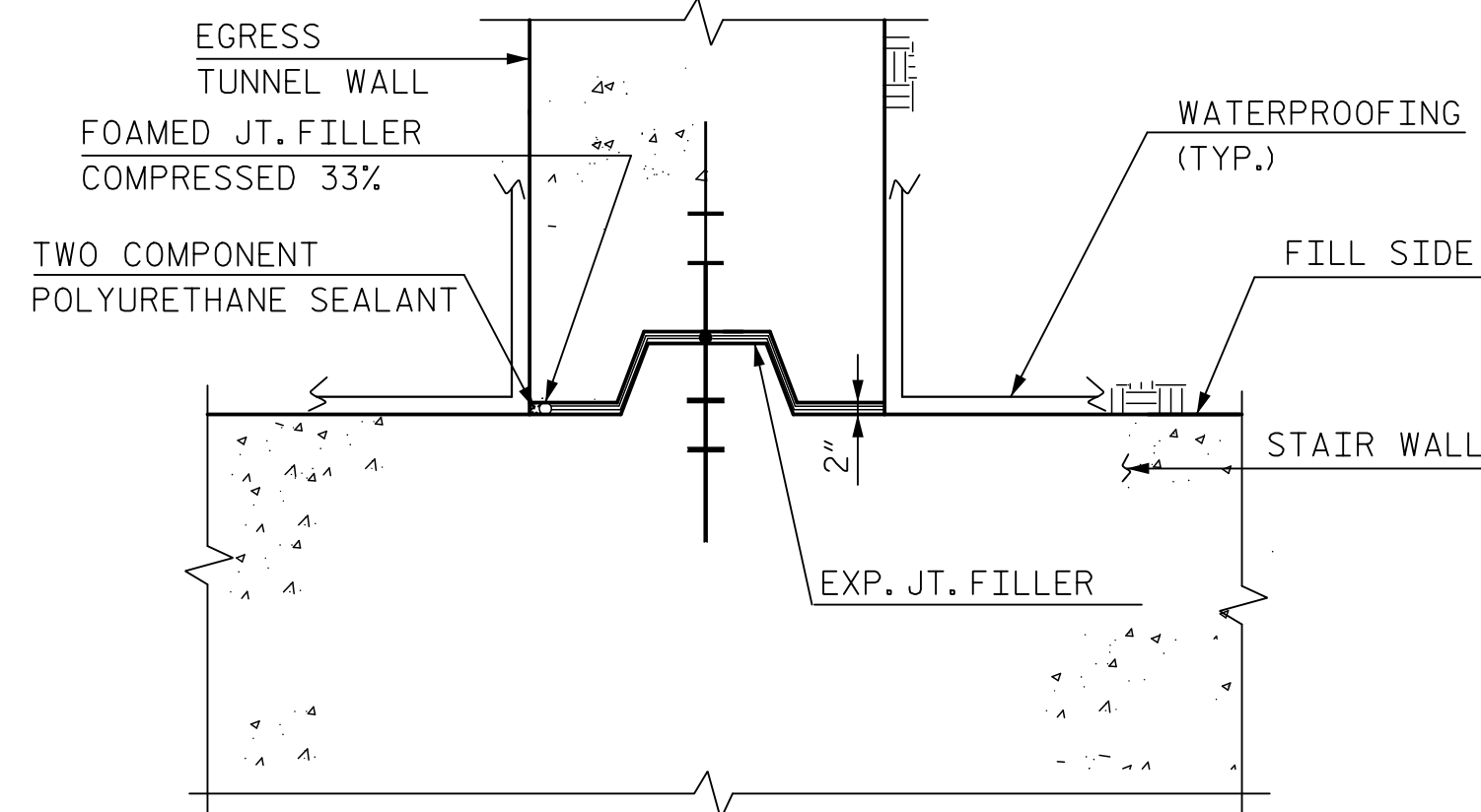


EXPANSION JOINT - DETAIL "A"

(WINGWALL TO EGRESS TUNNEL WALL)

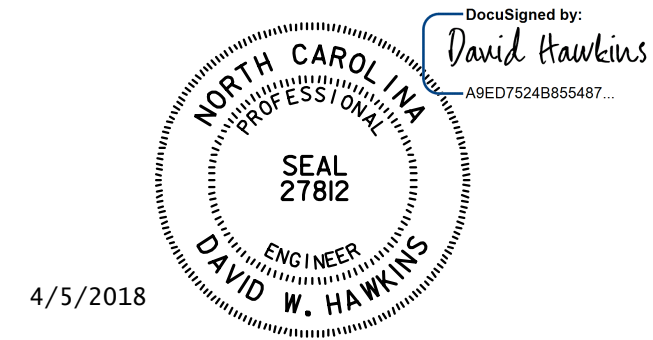


TYPICAL CONSTRUCTION JOINT - DETAIL "C"



EXPANSION JOINT - DETAIL "B"

(STAIR RETAINING WALL TO EGRESS TUNNEL WALL)



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PROJECT NO. P-5705BB
 MECKLENBURG COUNTY
 STATION: POC STA. 29+35.21 -S1-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

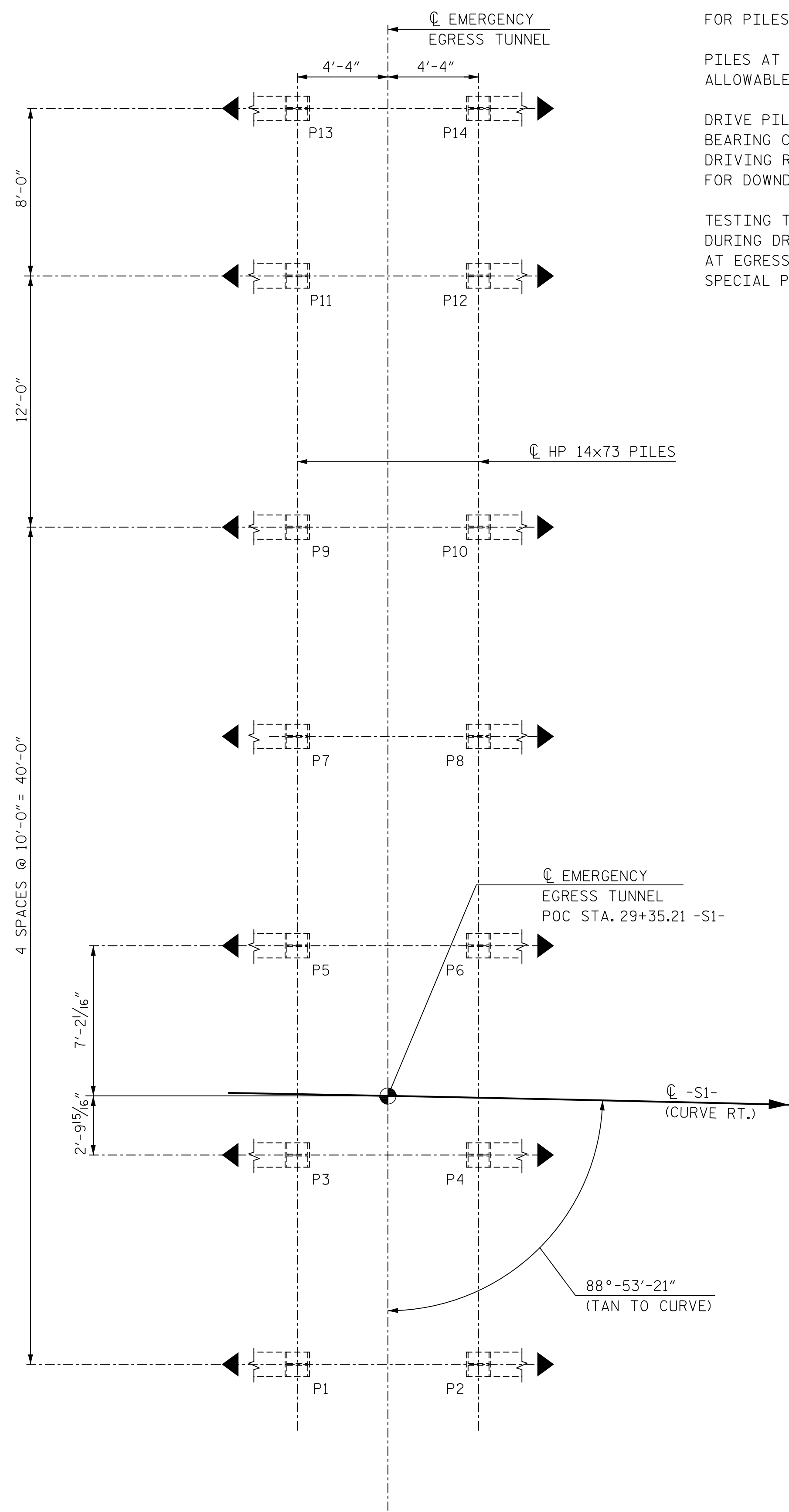
4TH STREET
 EMERGENCY EGRESS
 TUNNEL DETAILS

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

DRAWN BY: J. BAYNE DATE: 2/18
 CHECKED BY: D. HAWKINS DATE: 2/18

DWG. NO. 4

REVISIONS						SHEET NO. S12-4
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 5
2			4			



FOUNDATION LAYOUT

FOUNDATION NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS.

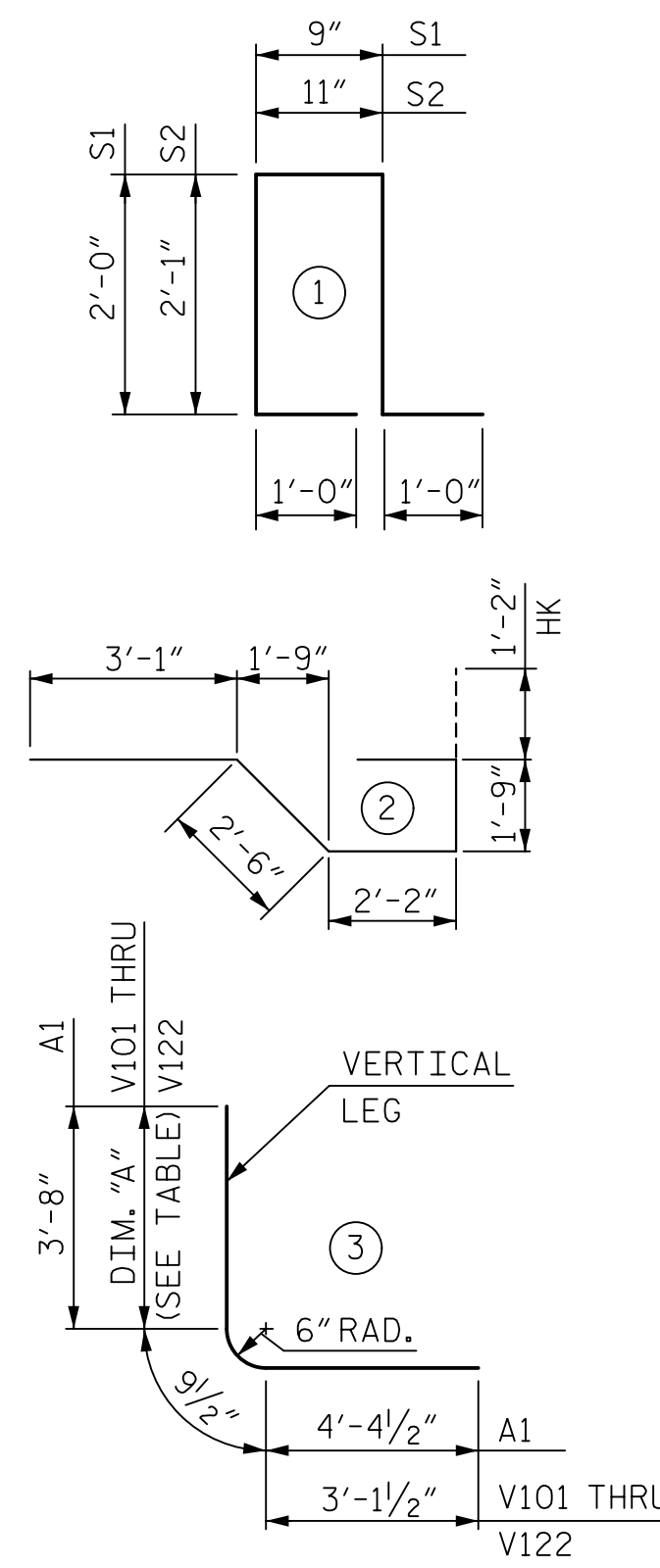
PILES AT EGRESS TUNNEL ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 100 TONS PER PILE.

DRIVE PILES AT EGRESS TUNNEL TO A REQUIRED BEARING CAPACITY OF 250 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT EGRESS TUNNEL. FOR PDA TESTING, SEE GEOTECHNICAL SPECIAL PROVISIONS.

TOP OF PILE ELEVATION	
PILE	ELEVATION
P1, P2	722.73
P3, P4	722.66
P5, P6	722.59
P7, P8	722.51
P9, P10	722.44
P11, P12	722.37
P13, P14	722.30

BAR TYPES



BAR	DIM. "A"	BAR	DIM. "A"	BAR	DIM. "A"
V101	1'-2"	V109	5'-2"	V117	9'-2"
V102	1'-8"	V110	5'-8"	V118	9'-8"
V103	2'-2"	V111	6'-2"	V119	10'-2"
V104	2'-8"	V112	6'-8"	V120	10'-8"
V105	3'-2"	V113	7'-2"	V121	11'-2"
V106	3'-8"	V114	7'-8"	V122	11'-7"
V107	4'-2"	V115	8'-2"		
V108	4'-8"	V116	8'-8"		

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
EGRESS TUNNEL AND WINGWALLS					
A1	332	7	3	9'-0"	6,107
A100	83	6	STR	11'-0"	1,371
A200	127	6	STR	11'-0"	2,098
A300	83	5	STR	11'-0"	952
A400	127	7	STR	11'-0"	2,855
B1	166	6	STR	12'-1"	3,013
B2	166	7	STR	9'-8"	3,280
C1	40	5	STR	41'-3"	1,721
C2	22	6	STR	41'-3"	1,363
C3	44	6	STR	33'-6"	2,214
G1	16	6	STR	11'-0"	264
H1	4	5	STR	2'-2"	9
H2	4	5	STR	4'-2"	17
H3	4	5	STR	6'-2"	26
H4	4	5	STR	8'-2"	34
H5	4	5	STR	10'-2"	42
H6	4	5	STR	12'-2"	51
H7	4	5	STR	14'-2"	59
H8	4	5	STR	16'-2"	67
H9	4	5	STR	18'-2"	76
H10	4	5	STR	20'-2"	84
H11	4	5	STR	21'-8"	90
H12	4	5	STR	23'-4"	97
S1	44	6	1	6'-9"	446
S2	44	6	1	7'-1"	468
T1	28	7	2	10'-8"	610

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
EGRESS TUNNEL AND WINGWALLS					
V1	4	6	STR	1'-8"	10
V2	4	6	STR	2'-2"	13
V3	4	6	STR	2'-8"	16
V4	4	6	STR	3'-2"	19
V5	4	6	STR	3'-8"	22
V6	4	6	STR	4'-2"	25
V7	4	6	STR	4'-8"	28
V8	4	6	STR	5'-2"	31
V9	4	6	STR	5'-8"	34
V10	4	6	STR	6'-2"	37
V11	4	6	STR	6'-8"	40
V12	4	6	STR	7'-2"	43
V13	4	6	STR	7'-8"	46
V14	4	6	STR	8'-2"	49
V15	4	6	STR	8'-8"	52
V16	4	6	STR	9'-2"	55
V17	4	6	STR	9'-8"	58
V18	4	6	STR	10'-2"	61
V19	4	6	STR	10'-8"	64
V20	4	6	STR	11'-2"	67
V21	4	6	STR	11'-8"	70
V22	4	6	STR	12'-1"	73
V101	4	7	3	5'-1"	42
V102	4	7	3	5'-7"	46
V103	4	7	3	6'-1"	50
V104	4	7	3	6'-7"	54
V105	4	7	3	7'-1"	58
V106	4	7	3	7'-7"	62
V107	4	7	3	8'-1"	66
V108	4	7	3	8'-7"	70
V109	4	7	3	9'-1"	74
V110	4	7	3	9'-7"	78
V111	4	7	3	10'-1"	82
V112	4	7	3	10'-7"	87
V113	4	7	3	11'-1"	91
V114	4	7	3	11'-7"	95
V115	4	7	3	12'-1"	99
V116	4	7	3	12'-7"	103
V117	4	7	3	13'-1"	107
V118	4	7	3	13'-7"	111
V119	4	7	3	14'-1"	115
V120	4	7	3	14'-7"	119
V121	4	7	3	15'-1"	123
V122	4	7	3	15'-6"	127

QUANTITIES

REINFORCING STEEL	LBS.	30,186
CLASS AA CONCRETE BREAKDOWN		
BOTTOM SLAB AND CUTOFF WALLS	CU. YDS.	50.5
WALLS	CU. YDS.	47.0
TOP SLAB AND HEADWALLS	CU. YDS.	23.8
	TOTAL	121.3
HP 14x73 STEEL PILES	NO.	14
	L.F.	490.0

SPLICE LENGTH CHART

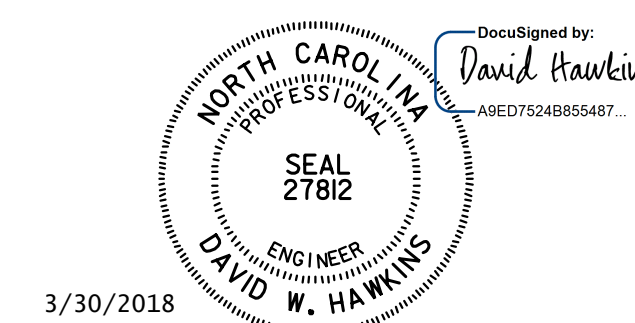
BAR SIZE	SPLICE LENGTH
#5	3'-0"
#6 TOP BAR	3'-8"
#6	2'-8"
#7 TOP BAR	4'-4"
#7	3'-1"

PROJECT NO. P-5705BB
 MECKLENBURG COUNTY
 STATION: POC STA. 29+35.21 -S1-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

4TH STREET
 EMERGENCY EGRESS
 TUNNEL DETAILS



3/30/2018

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DRAWN BY: J. BAYNE	DATE: 2/18
CHECKED BY: D. HAWKINS	DATE: 2/18
DWG. NO. 5	

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

TOTAL SHEETS
5