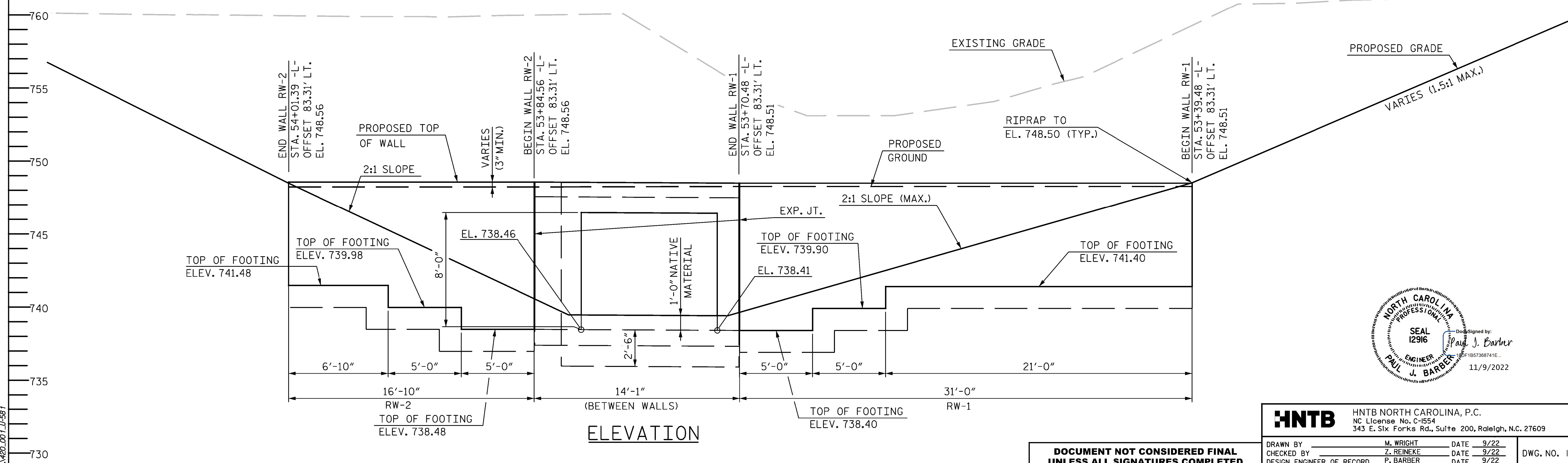
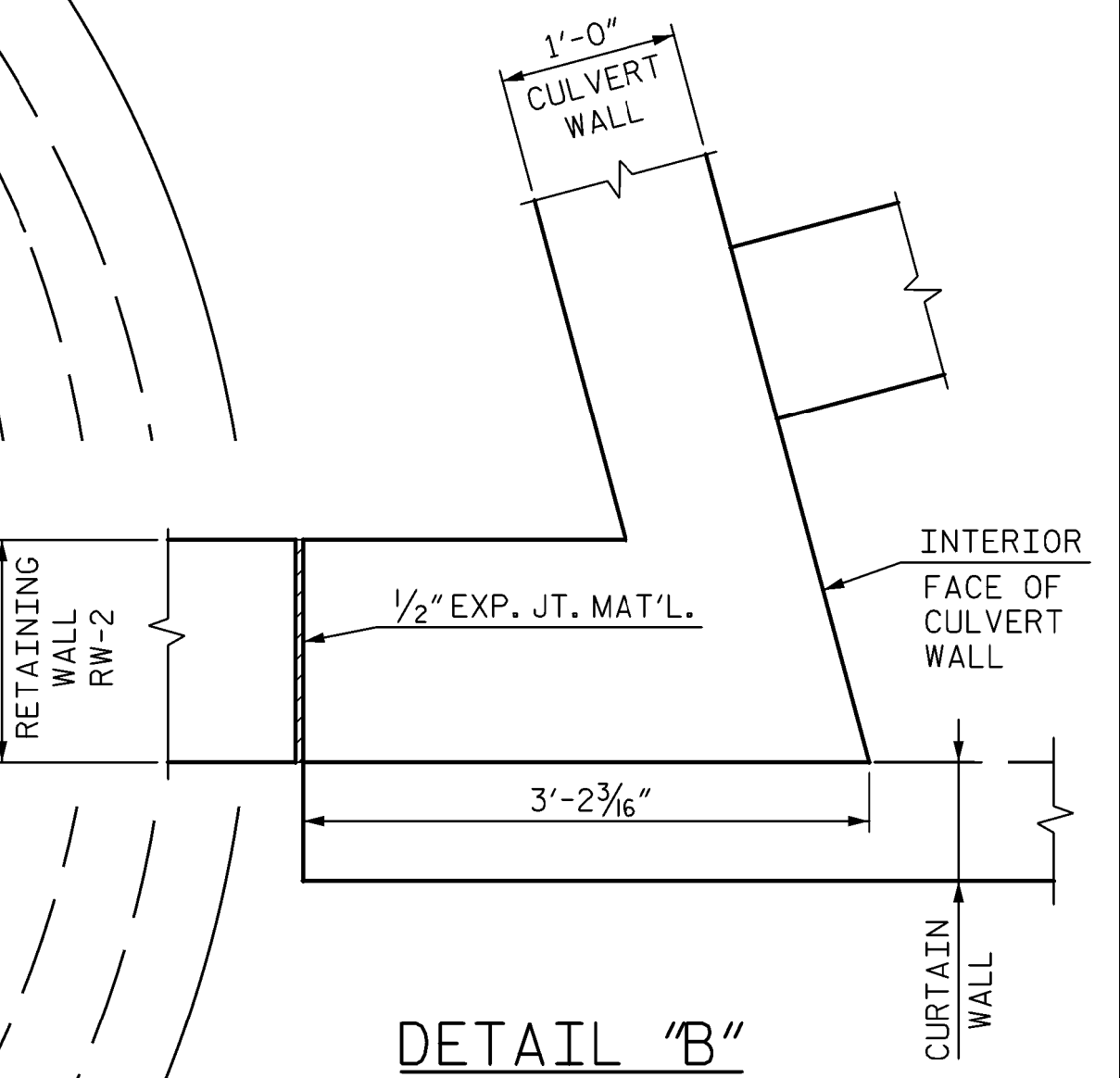


PLAN

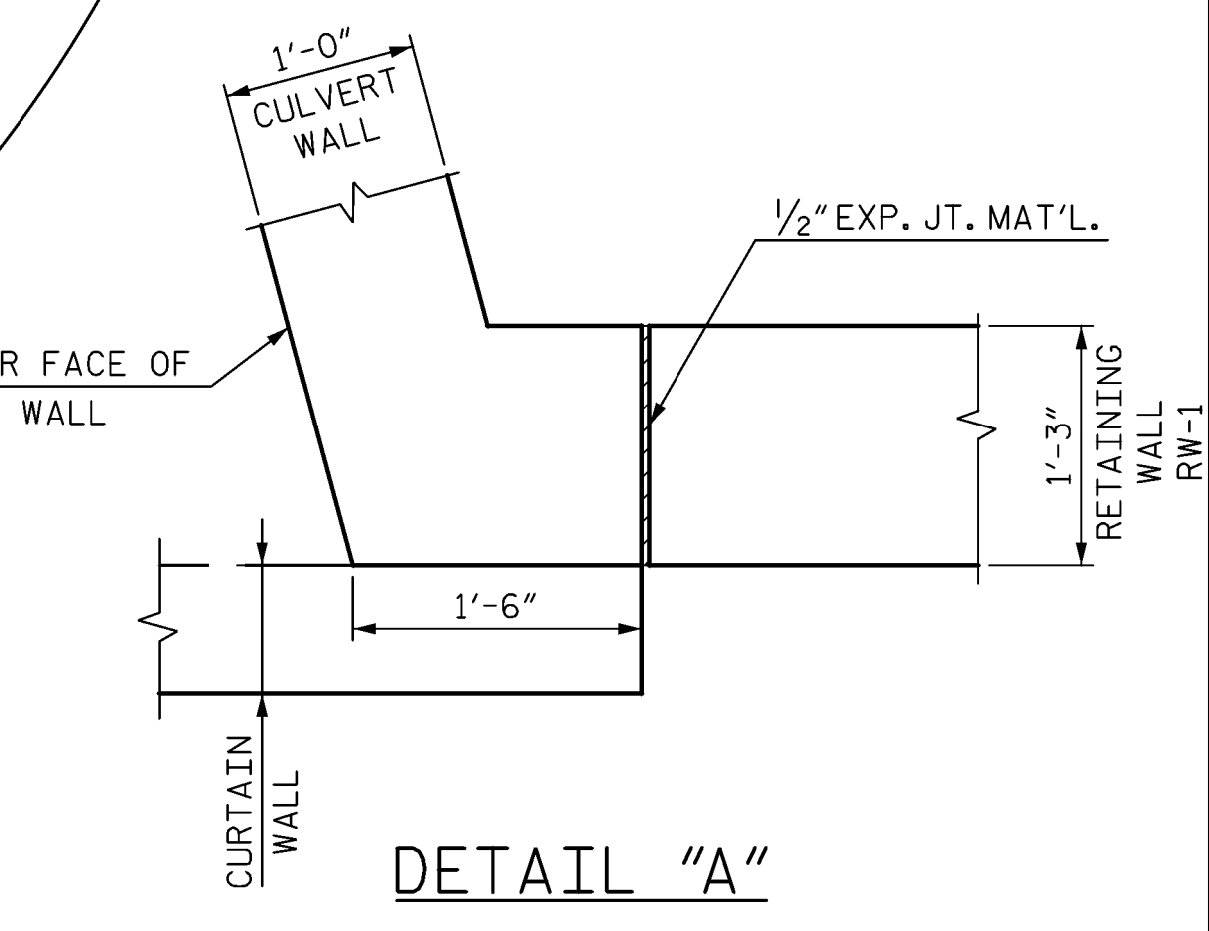


ELEVATION

FOR WALL NOTES, SEE SHEET RW-3.



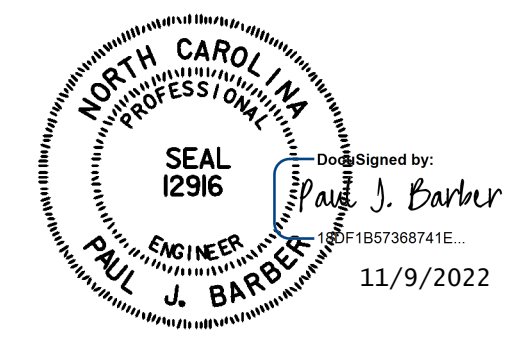
DETAIL "B"



DETAIL "A"

PROJECT NO. U-5813
 COUNTY RANDOLPH
 STATION: 53+99.00 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 RETAINING WALL PLAN
 FOR RW-1 AND RW-2



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

DESIGNED BY: M. WRIGHT DATE: 9/22
 CHECKED BY: Z. REINEKE DATE: 9/22
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 9/22

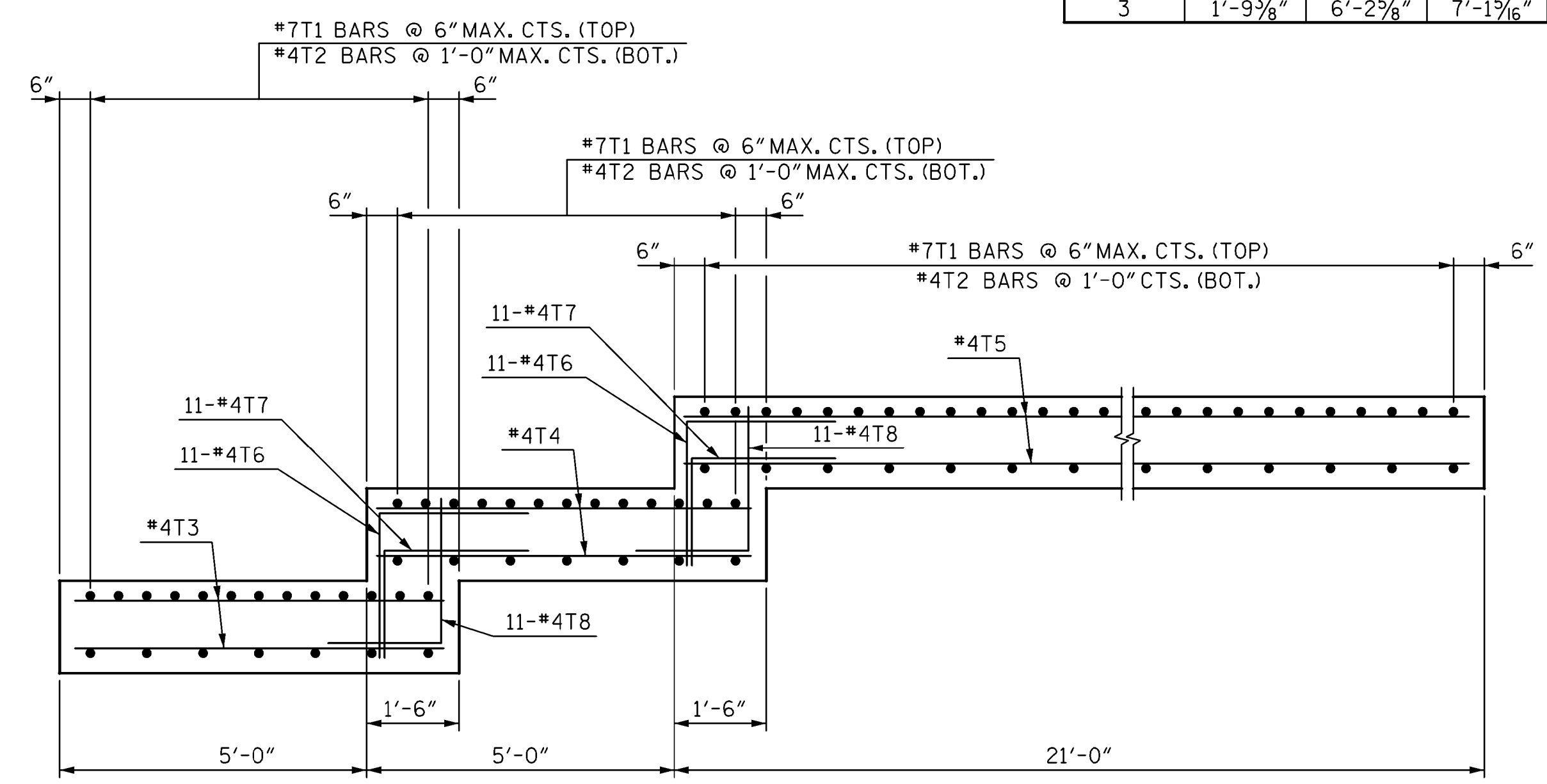
DWG. NO. 1

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

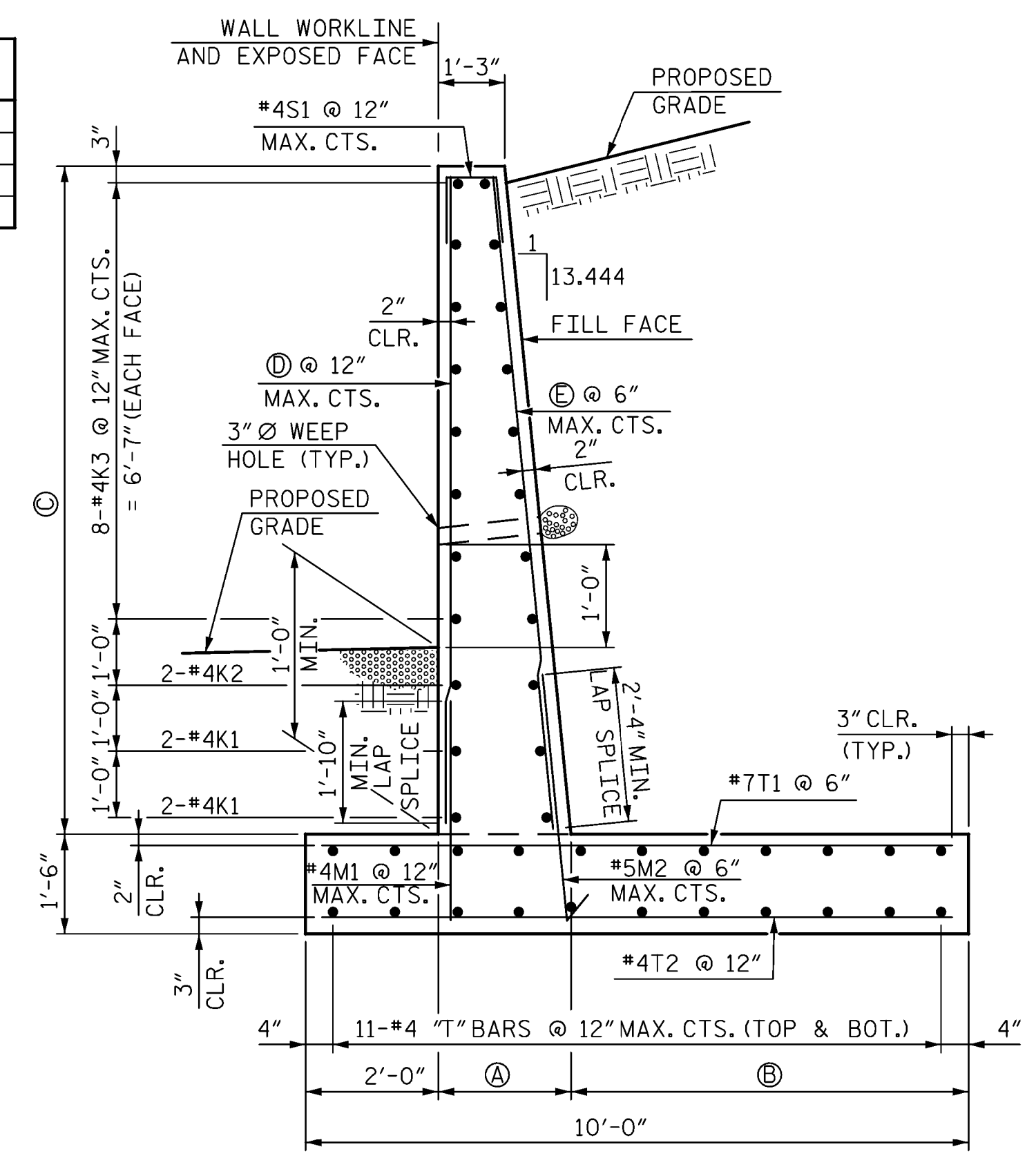
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

FOR WALL NOTES, SEE SHEET RW-3.

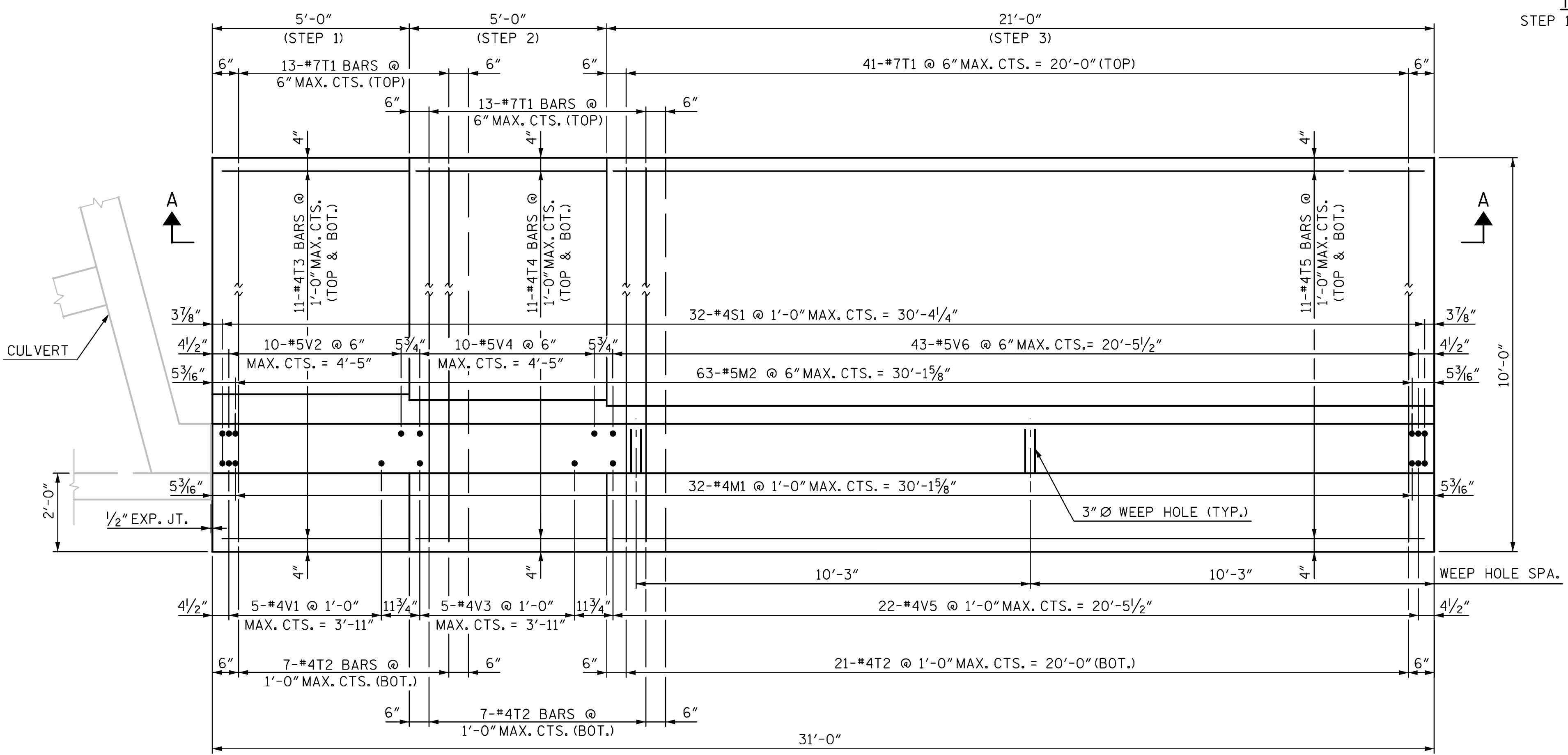
WALL TABLE					
STEP	A	B	C	D	E
1	2'-0"	6'-0"	10'-1 5/16"	#4V1	#5V2
2	1'-10 1/16"	6'-1 5/16"	8'-7 5/16"	#4V3	#5V4
3	1'-9 3/8"	6'-2 5/8"	7'-1 5/16"	#4V5	#5V6



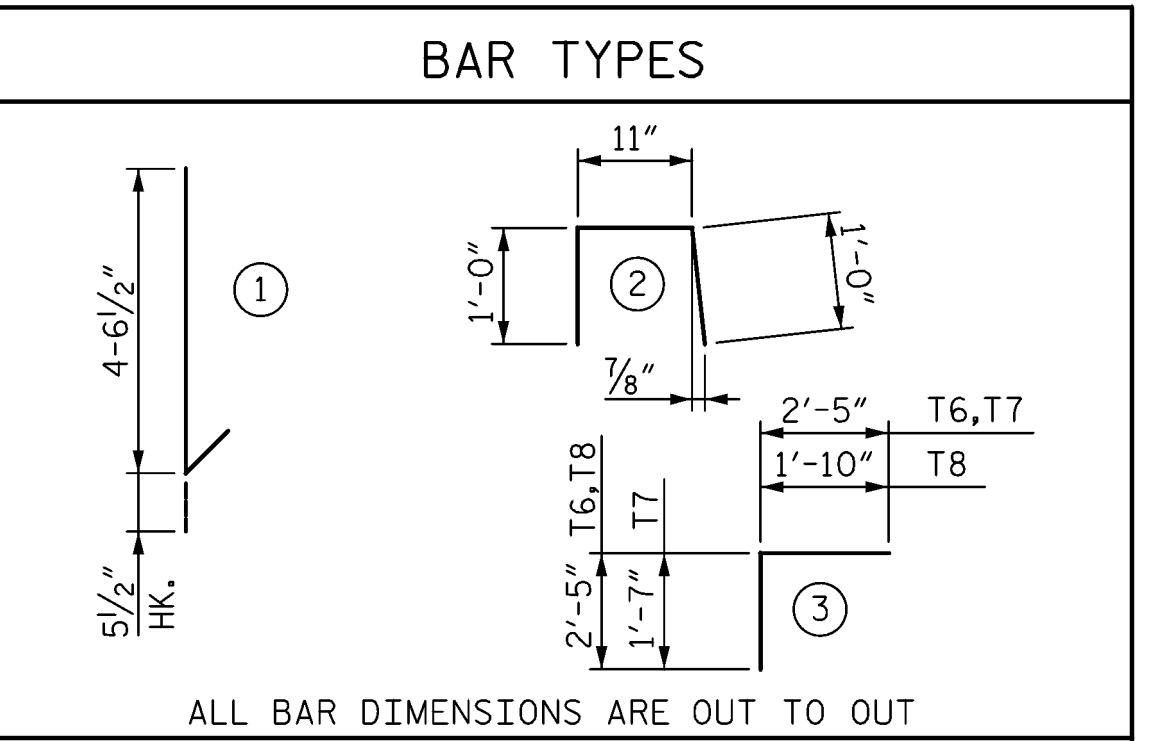
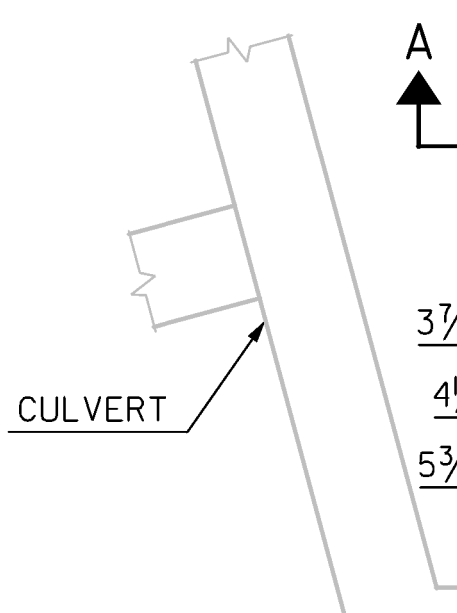
SECTION A-A



TYPICAL SECTION
STEP 1 SHOWN. STEPS 2 AND 3 SIMILAR.



PLAN - RW1



BILL OF REINFORCING

RW-1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
K1	4	4	STR	4'-8"	12
K2	2	4	STR	9'-8"	13
K3	16	4	STR	30'-8"	328
M1	32	4	STR	4'-2"	89
M2	63	5	1	5'-0"	329
S1	32	4	2	2'-11"	62
T1	67	7	STR	9'-6"	1,301
T2	35	4	STR	9'-6"	222
T3	22	4	STR	6'-0"	88
T4	22	4	STR	6'-0"	88
T5	22	4	STR	20'-7"	302
T6	22	4	3	4'-10"	71
T7	22	4	3	4'-0"	59
T8	22	4	3	4'-3"	62
V1	5	4	STR	9'-10"	33
V2	10	5	STR	9'-10"	103
V3	5	4	STR	8'-4"	28
V4	10	5	STR	8'-4"	87
V5	22	4	STR	6'-10"	100
V6	43	5	STR	6'-10"	306

QUANTITIES

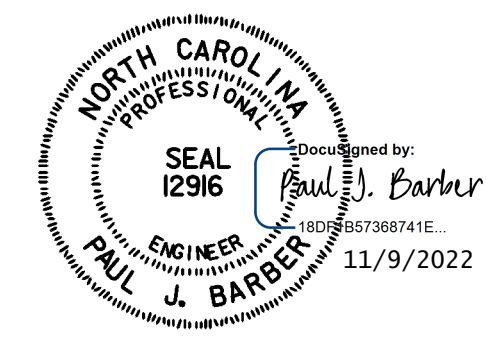
REINFORCING STEEL - RW-1	LBS.	3,683
CLASS A CONCRETE - RW-1		
FOOTING POUR 1	CU. YDS.	18.9
WALL POUR 2	CU. YDS.	13.9
TOTAL	CU. YDS.	32.8
FOUNDATION EXCAVATION RETAINING WALL	CU. YDS.	185.0

PROJECT NO. U-5813
 RANDOLPH COUNTY
 STATION: 53+99.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**RETAINING WALL
 RW-1 DETAILS**



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

DESIGNED BY: M. WRIGHT DATE: 9/22
 CHECKED BY: Z. REINEKE DATE: 9/22
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 9/22

DWG. NO. 2

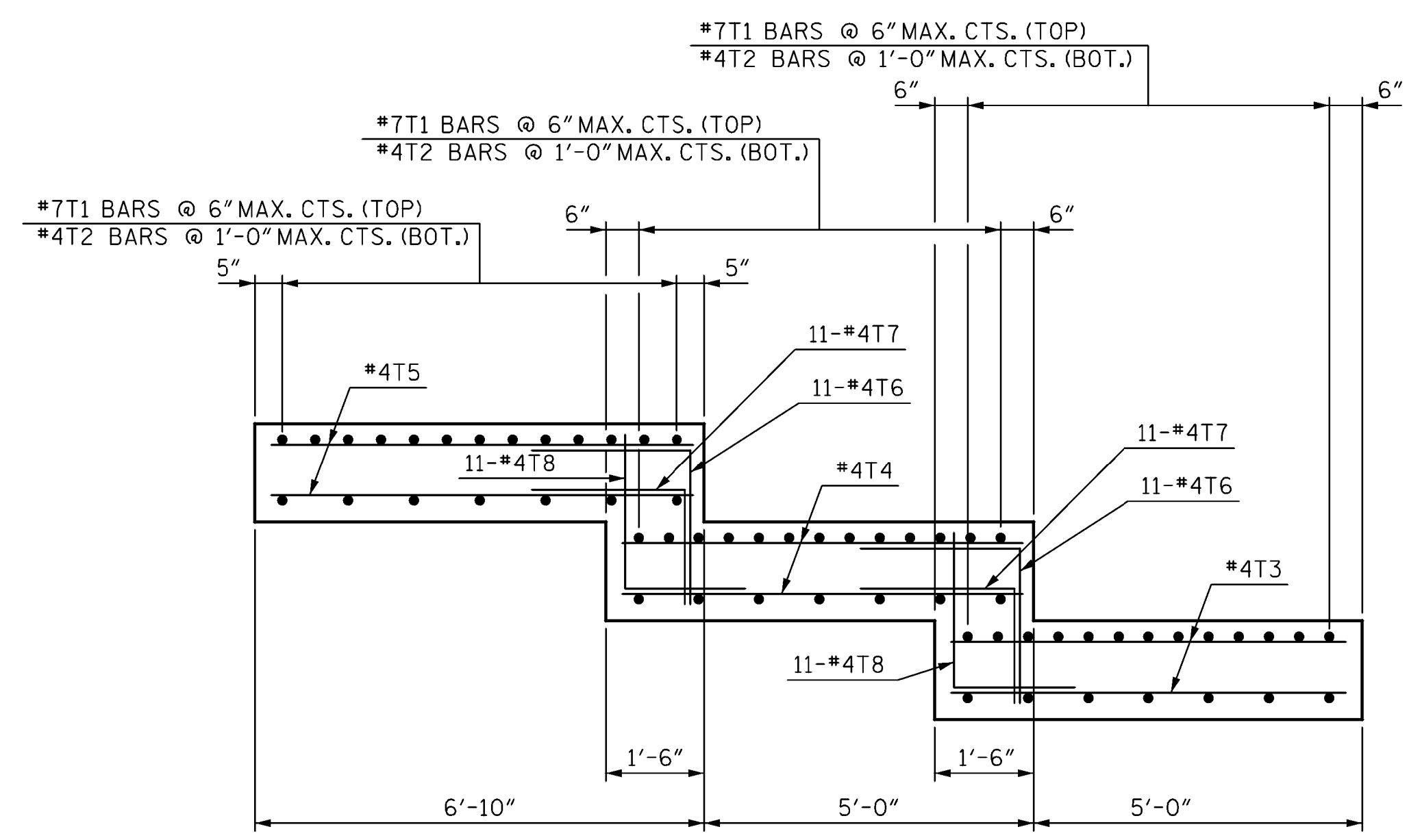
DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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

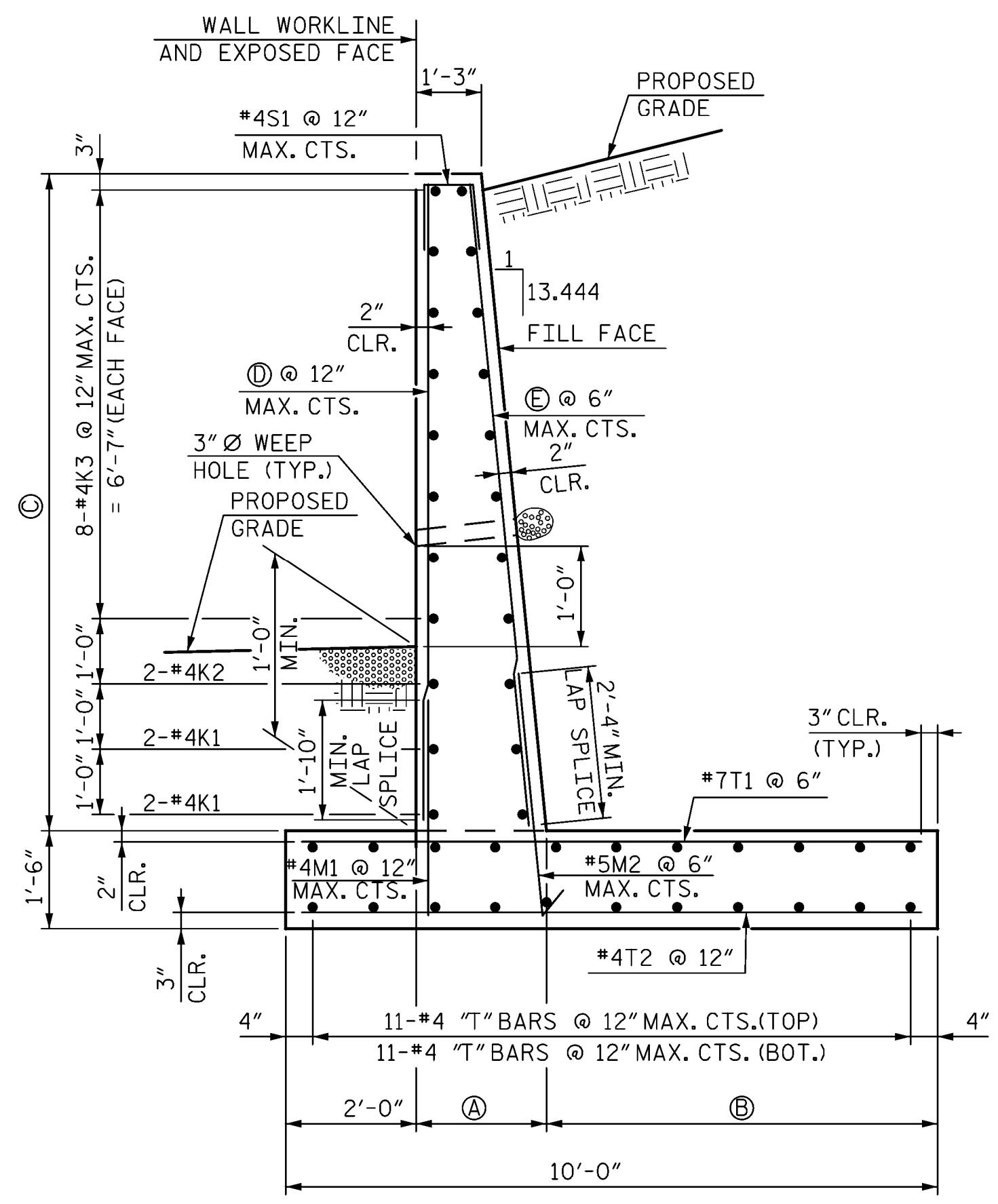
SHEET NO. RW-2
 TOTAL SHEETS 3

11/9/2022 15:02:41 PM REV. 001 U-5813

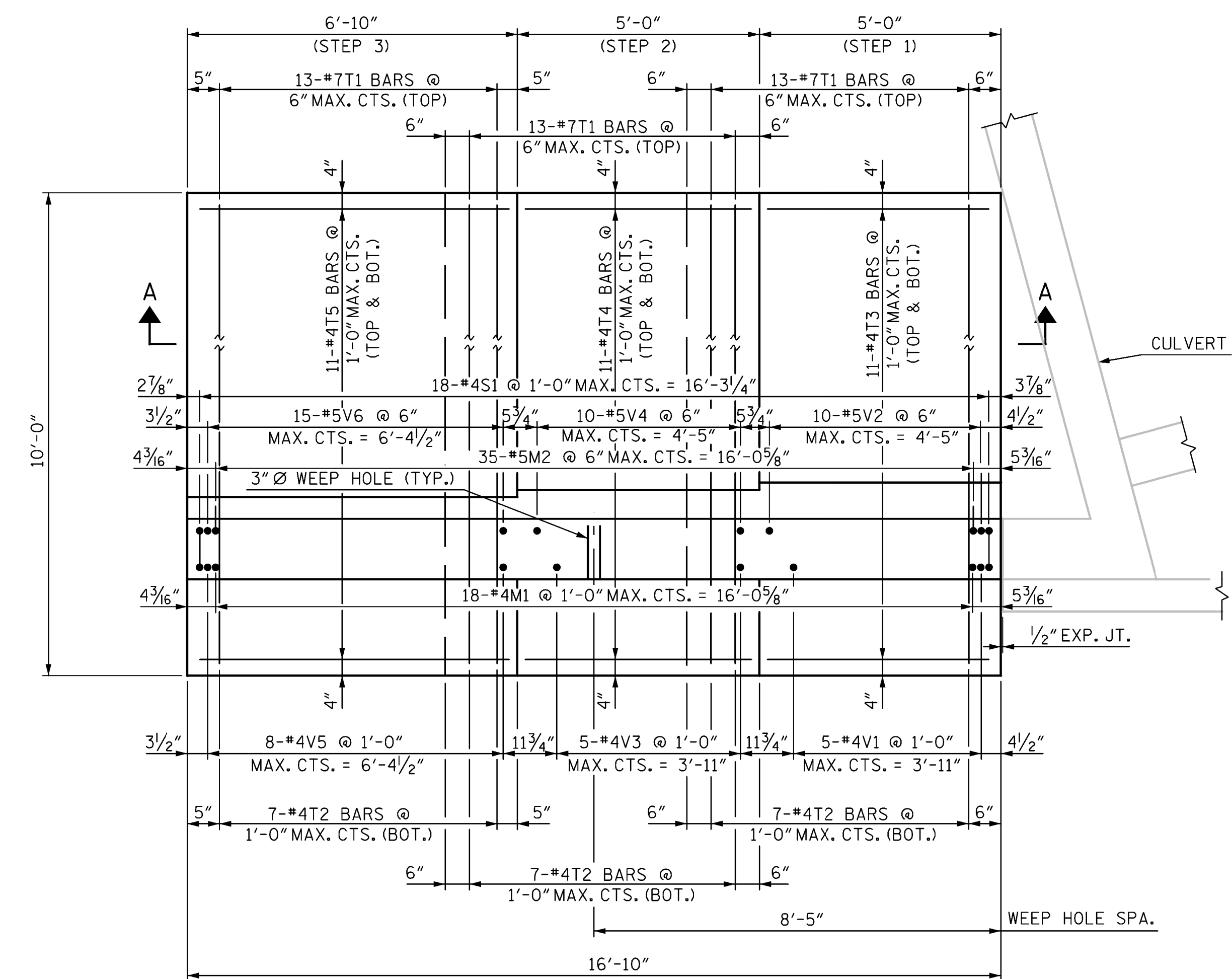
WALL TABLE					
STEP	A	B	C	D	E
1	2'-0"	6'-0"	10'-1"	#4V1	#5V2
2	1'-10 1/16"	6'-1 5/16"	8'-7"	#4V3	#5V4
3	1'-9 5/16"	6'-2 1/16"	7'-1"	#4V5	#5V6



SECTION A-A



TYPICAL SECTION
STEP 1 SHOWN, STEPS 2 AND 3 SIMILAR.



PLAN - RW2
NOTE: "K" BARS NOT SHOWN.

NOTES:

FOR SUBSURFACE DRAINAGE AT WEEP HOLES, SEE ARTICLE 414-8 OF THE STANDARD SPECIFICATIONS.

CIP RETAINING WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 UNIT WEIGHT = 120 LB/CF
 K_a=0.66
 K_p=3.25
 COHESION, c = 0 LB/SF
 MAX FACTORED BEARING RESISTANCE (AT OR BELOW ROCK LEVEL) = 10,000 PSF

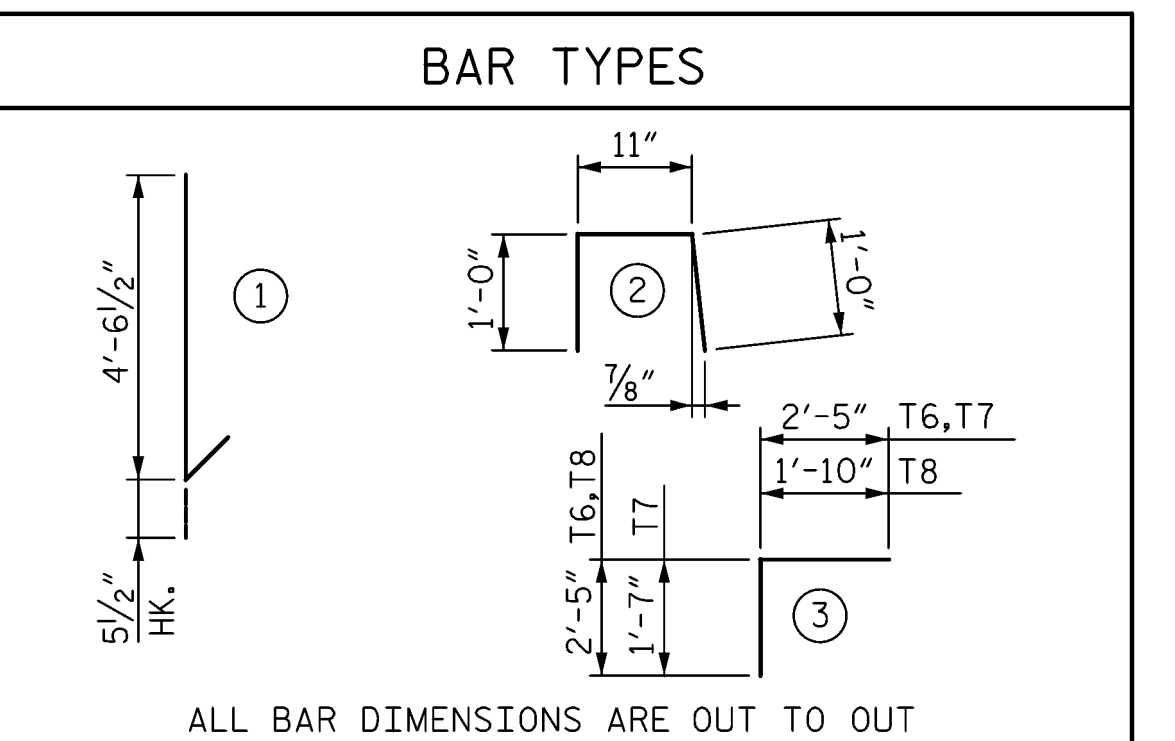
DO NOT USE CIP RETAINING WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE TO SITE CONDITIONS.

DO NOT USE CIP RETAINING WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW WALLS.

DO NOT PLACE CONCRETE FOR FOOTINGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

TOP OF ROCK LAYER IS ESTIMATED AT ELEVATION 740.00' FOR RW-1 AND 742.00' FOR RW-2. FOOTINGS SHALL BEAR ON ROCK. THE ENGINEER OF RECORD SHALL BE NOTIFIED IF THE TOP OF ROCK LAYER IS MORE THAN 1 FT LOWER THAN THE ESTIMATED ROCK ELEVATION. 'M' BARS HAVE BEEN DETAILED FOR THE 1 FOOT ALLOWANCE. WALL TABLE IS BASED ON THE ESTIMATED ROCK ELEVATIONS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WALL COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT AT JUNCTION WITH CULVERT.



BILL OF REINFORCING					
RW-2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
K1	4	4	STR	4'-8"	12
K2	2	4	STR	9'-8"	13
K3	16	4	STR	16'-6"	176
M1	18	4	STR	4'-2"	50
M2	35	5	1	5'-0"	183
S1	18	4	2	2'-11"	35
T1	39	7	STR	9'-6"	757
T2	21	4	STR	9'-6"	133
T3	22	4	STR	6'-0"	88
T4	22	4	STR	6'-0"	88
T5	22	4	STR	6'-4"	93
T6	22	4	3	4'-10"	71
T7	22	4	3	4'-0"	59
T8	22	4	3	4'-3"	62
V1	5	4	STR	9'-10"	33
V2	10	5	STR	9'-10"	103
V3	5	4	STR	8'-4"	28
V4	10	5	STR	8'-4"	87
V5	8	4	STR	6'-10"	37
V6	15	5	STR	6'-10"	107

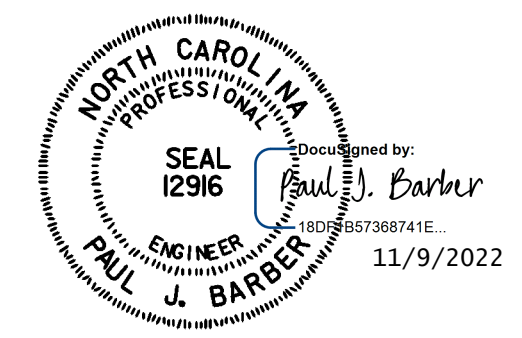
QUANTITIES		
REINFORCING STEEL - RW-2	LBS.	2,216
CLASS A CONCRETE - RW-2		
FOOTING POUR 1	CU. YDS.	11.0
WALL POUR 2	CU. YDS.	8.1
TOTAL	CU. YDS.	19.1
FOUNDATION EXCAVATION RETAINING WALL	CU. YDS.	135.0

PROJECT NO. U-5813
 RANDOLPH COUNTY
 STATION: 53+99.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RETAINING WALL
 RW-2 DETAILS

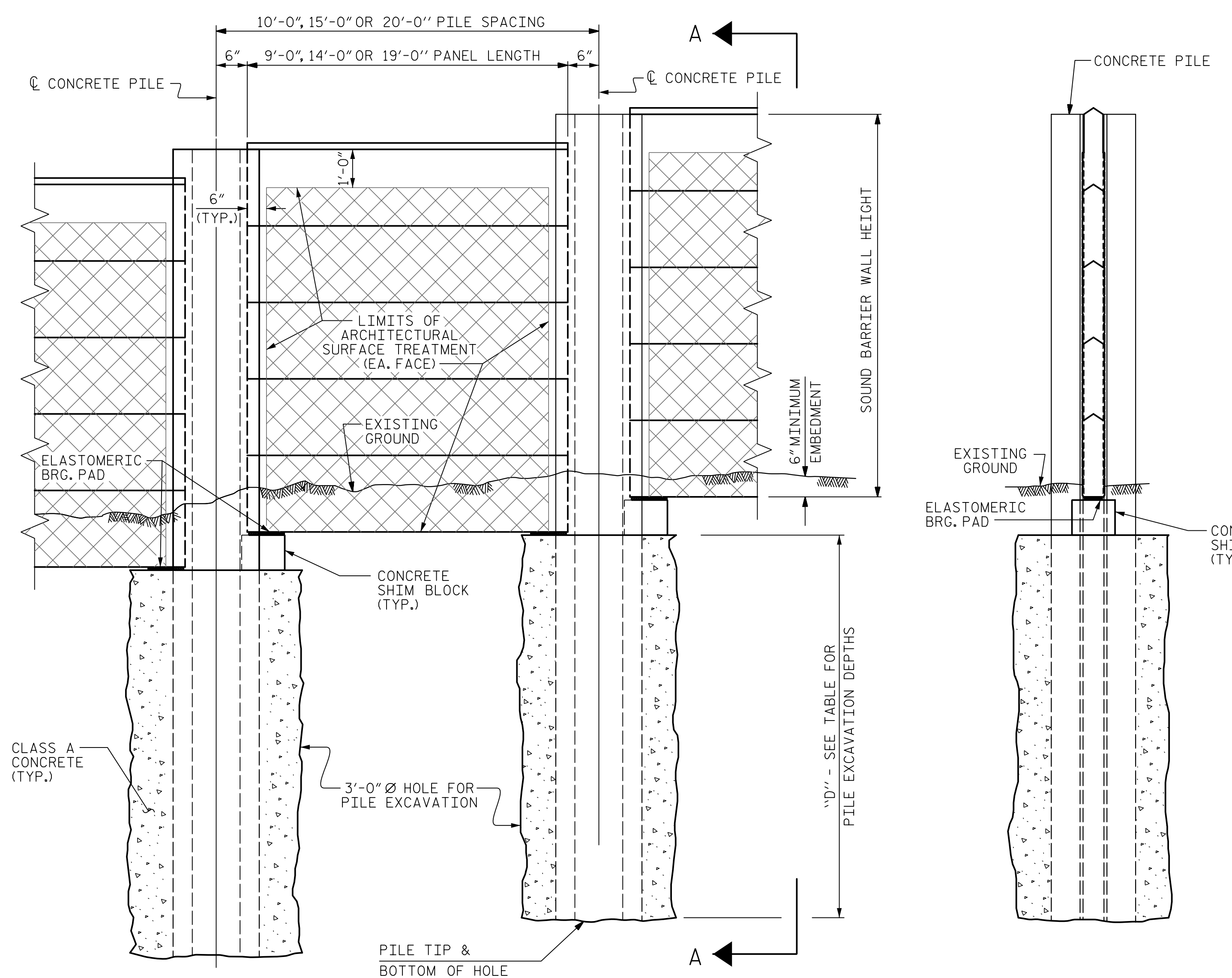


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DESIGNED BY: M. WRIGHT DATE: 9/22
 CHECKED BY: Z. REINEKE DATE: 9/22
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 9/22

DWG. NO. 3

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



ELEVATION

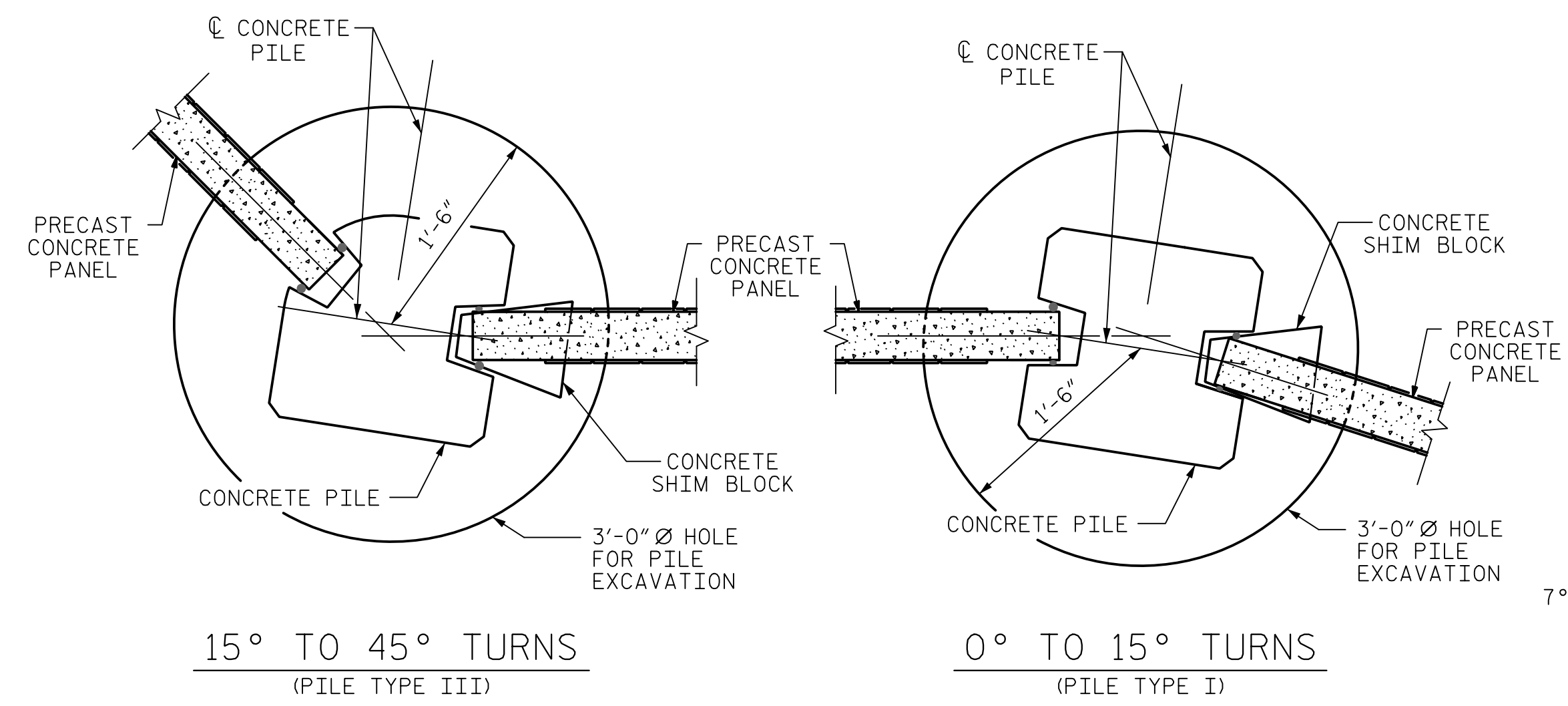
SECTION A-A

PILE EXCAVATION DEPTHS "D"						
WALL NW3.1B	3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
			H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'	
			10'-0"	10'-0"	12'-0"	13'-0"
			15'-0"	11'-0"	13'-0"	16'-0"
WALL NW3.1B	3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
			H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'	
			10'-0"	8'-0"	10'-0"	11'-0"
			15'-0"	9'-0"	11'-0"	13'-0"
WALL NW3.1B	3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
			H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'	
			10'-0"	7'-0"	9'-0"	10'-0"
			15'-0"	8'-0"	10'-0"	12'-0"
WALL NW3.1B	3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
			H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'	
			10'-0"	9'-0"	11'-0"	13'-0"
			15'-0"	8'-0"	10'-0"	12'-0"

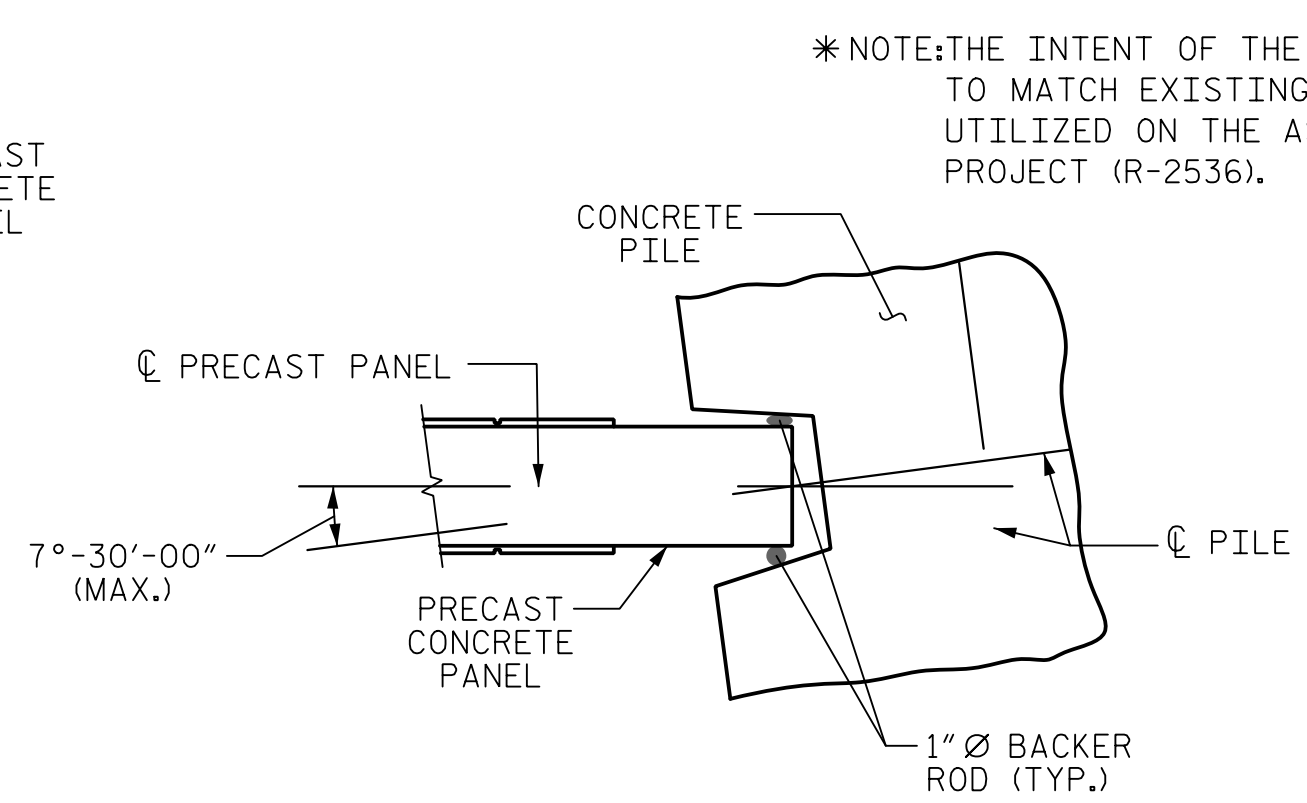
NOTES

- FOR SOUND BARRIER WALL, SEE SPECIAL PROVISIONS.
- CONSTRUCT SOUND BARRIER WALL TO LINES AND GRADES SHOWN ON THE ROADWAY PLANS.
- PROVIDE PANELS WITH A FLAT BOTTOM.
- VERIFY THE LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING HOLES TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.
- ADJUST PILE EXCAVATION ELEVATIONS TO MAINTAIN 6" MINIMUM EMBEDMENT OF THE BOTTOM PANEL.
- USE CLASS AA FOR PANELS AND CLASS A CONCRETE PILE EXCAVATION BACKFILL, IN ACCORDANCE WITH ARTICLE 1000-4 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION, USE 10'-0", 15'-0", OR 20'-0" PILE SPACINGS. STANDARD PRECAST CONCRETE PANELS MAY BE USED WITH THE 10'-0" AND 15'-0" PILE SPACING. FOR 20'-0" PILE SPACING, PANELS DESIGNED AND MANUFACTURED BY A THIRD PARTY VENDOR SHALL BE USED.
- FOR SOUND BARRIER WALL STATIONS, OFFSETS, AND WALL ENVELOPE, SEE ROADWAY PLANS.
- PLACE 1" Ø BACKER RODS FULL HEIGHT ON EACH SIDE OF THE PRECAST PANELS. SET AND SEAL THE BACKER ROD IN PLACE WITH SEALANT THAT CONFORMS WITH ARTICLE 1028-3 OF THE STANDARD SPECIFICATIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- GROUND WATER TABLE WAS SURVEYED ABOVE BOTTOM OF HOLE FOR PANEL 40 THRU 48. SEE SPECIAL PROVISIONS.

PILE REINFORCING STEEL DESIGN WIND PRESSURE = 40 PSF							
PILE TYPE I				PILE TYPE III			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES	PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
10'-0"	H ≤ 25'	4 - #8 EA. FACE	#3 @ 1'-4" CTS.	10'-0"	H ≤ 25'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 1'-4" CTS.
	H ≤ 20'	4 - #8 EA. FACE	#3 @ 1'-4" CTS.		15'-0"	H ≤ 20'	3 - #9 SHORT FACE 4 - #9 LONG FACE
15'-0"	20' < H ≤ 25'	4 - #10 EA. FACE	#3 @ 1'-4" CTS.	15'-0"		20' < H ≤ 25'	3 - #11 SHORT FACE 4 - #11 LONG FACE
	20'-0"	H ≤ 20'	4 - #9 EA. FACE		#3 @ 1'-4" CTS.	20'-0"	H ≤ 20'
20' < H ≤ 25'		4 - #11 EA. FACE	#3 @ 1'-4" CTS.				
PILE TYPE II				PILE TYPE III ALT.			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES	PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
10'-0"	H ≤ 25'	4 - #6 EA. FACE	#3 @ 1'-4" CTS.	10'-0"	H ≤ 25'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 1'-4" CTS.
	H ≤ 20'	4 - #6 EA. FACE	#3 @ 1'-4" CTS.		15'-0"	H ≤ 20'	3 - #9 SHORT FACE 4 - #9 LONG FACE
15'-0"	20' < H ≤ 25'	4 - #7 EA. FACE	#3 @ 1'-4" CTS.	15'-0"		20' < H ≤ 25'	3 - #11 SHORT FACE 4 - #11 LONG FACE
	20'-0"	H ≤ 20'	4 - #6 EA. FACE		#3 @ 1'-4" CTS.	20'-0"	H ≤ 20'
20' < H ≤ 25'		4 - #8 EA. FACE	#3 @ 1'-4" CTS.				



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

(ROTATE THE CONCRETE PILE ±7°-30'-00" TO ACCOMMODATE WALL TURN.)

BILL OF MATERIAL	
SOUND BARRIER WALL	12,277 S.F.
ARCHITECTURAL SURFACE TREATMENT	19,994 S.F.
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	
*ARCHITECTURAL SURFACE TREATMENT	
TEXTURE OPTION:	STACKED STONE
STAIN OPTION:	TRI-COLOR EARTH TONE

PROJECT NO. U-5813
RANDOLPH COUNTY
 STATION: 15+71.81 -RPC- =
10+00.00 -NW3.1B-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SOUND BARRIER WALL
 No. -NW3.1B-

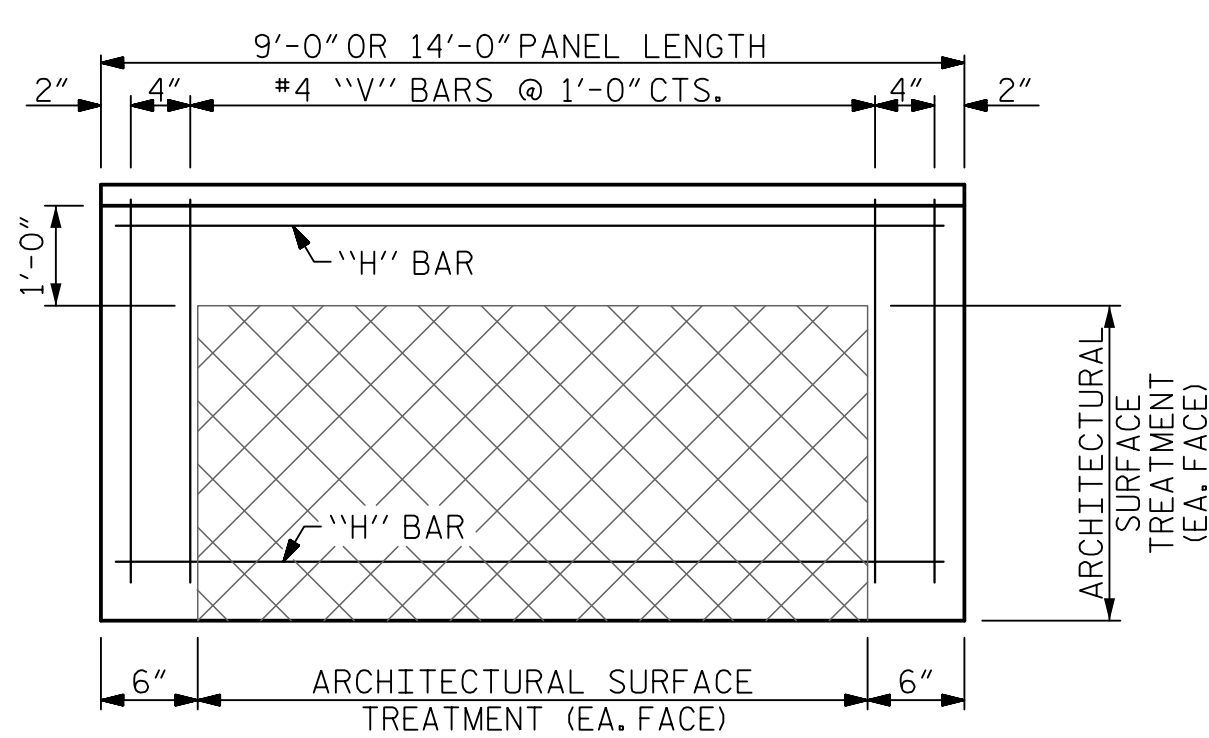
HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT	DATE: 3/22
CHECKED BY: P. BARBER	DATE: 3/22
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 3/22
DWG. NO. 1	

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

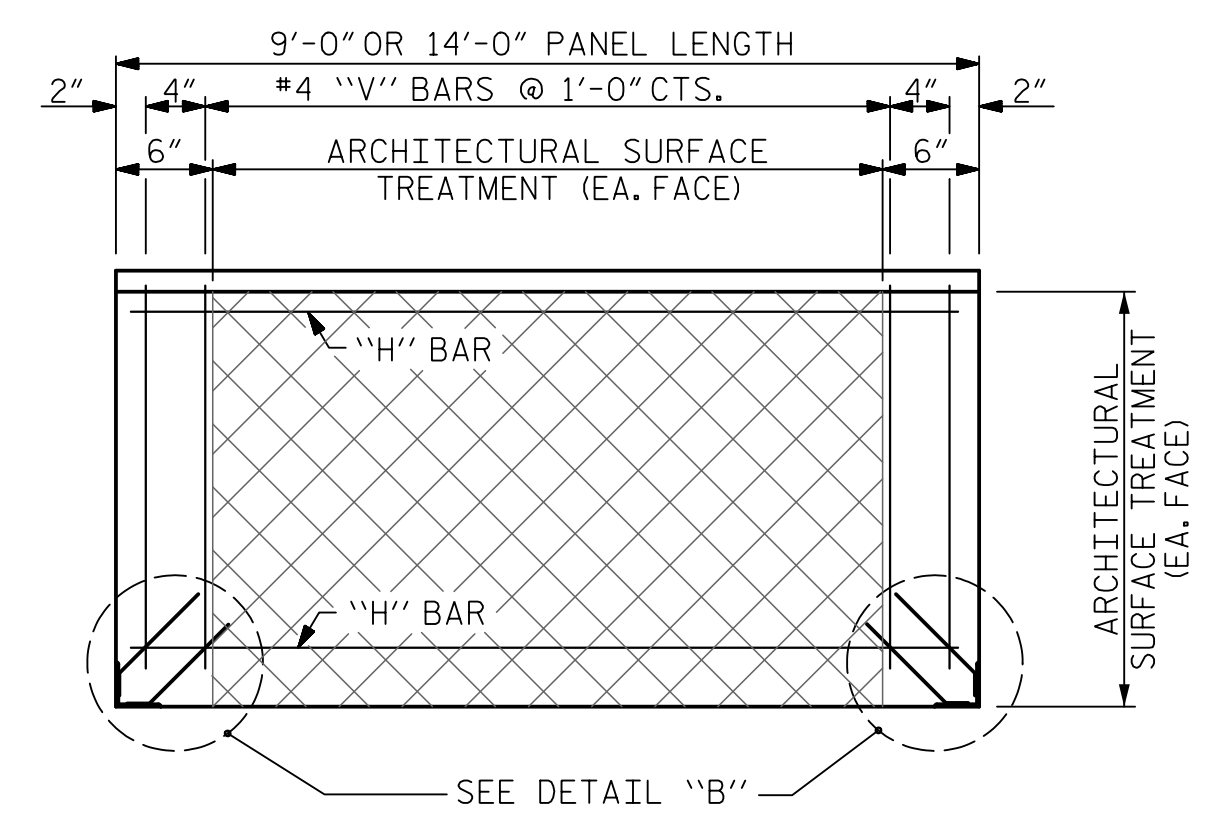
TOTAL SHEETS: 3

ASSEMBLED BY: MEW	DATE: 3/22
CHECKED BY: PJB	DATE: 3/22
DRAWN BY: MAA 6/11	REV. 9/26/14 MAA/TMG
CHECKED BY: GM 6/11	REV. 10/17 MAA/THC
	REV. 5/18 MAA/THC

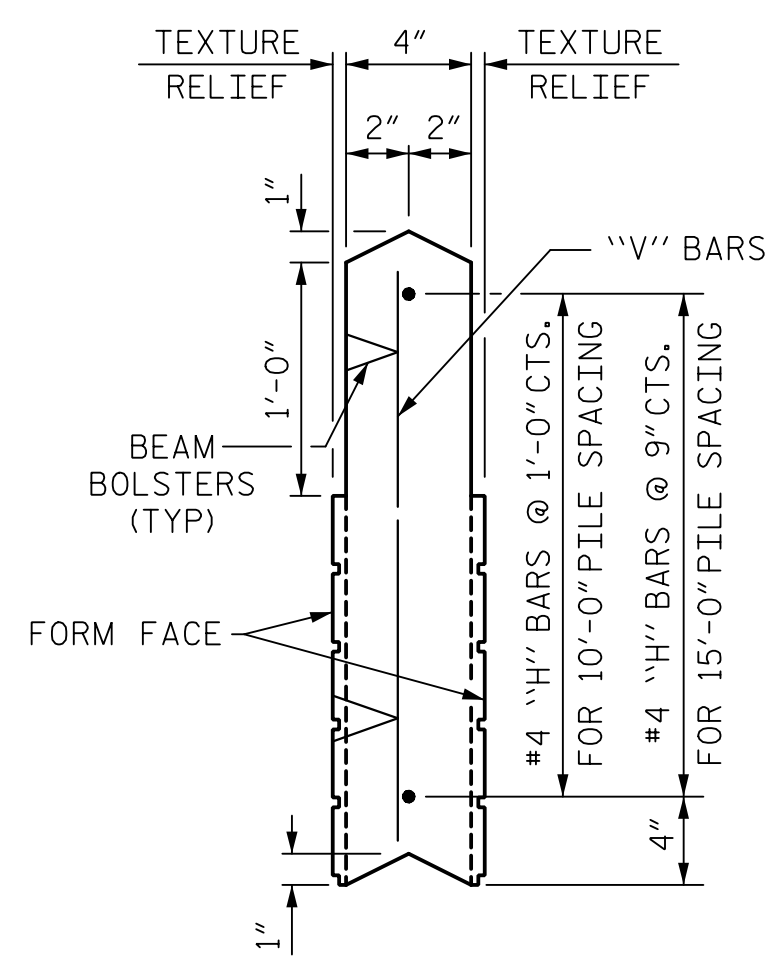
DOCUMENT NOT CONSIDERED FINAL
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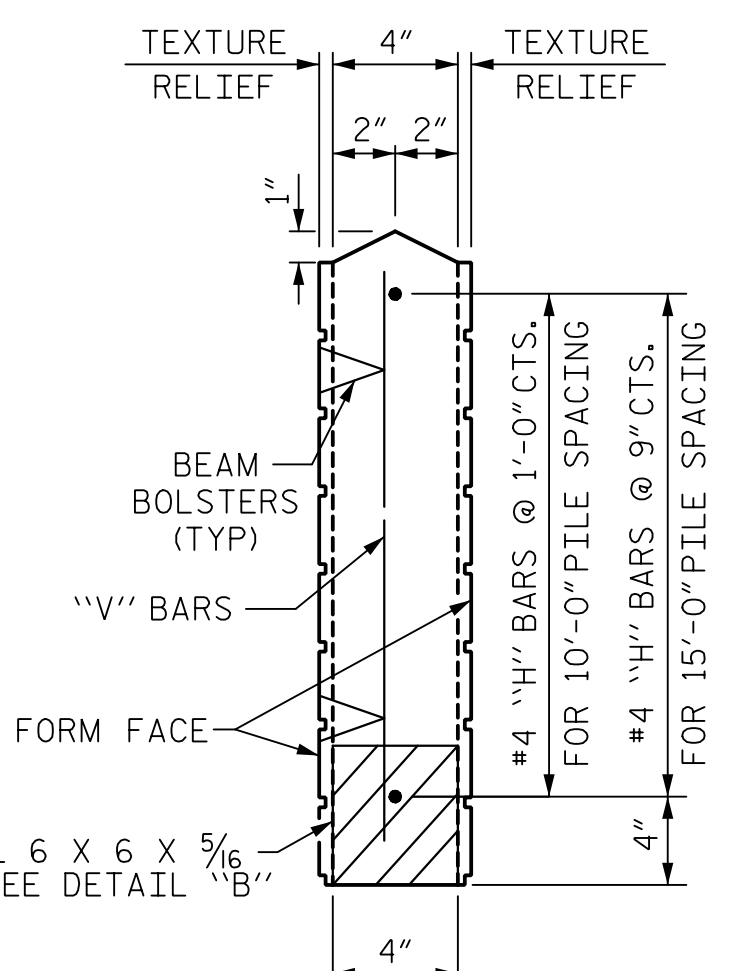
FRONT ELEVATION OF UPPER PRECAST PANEL



FRONT ELEVATION OF BOTTOM PRECAST PANEL

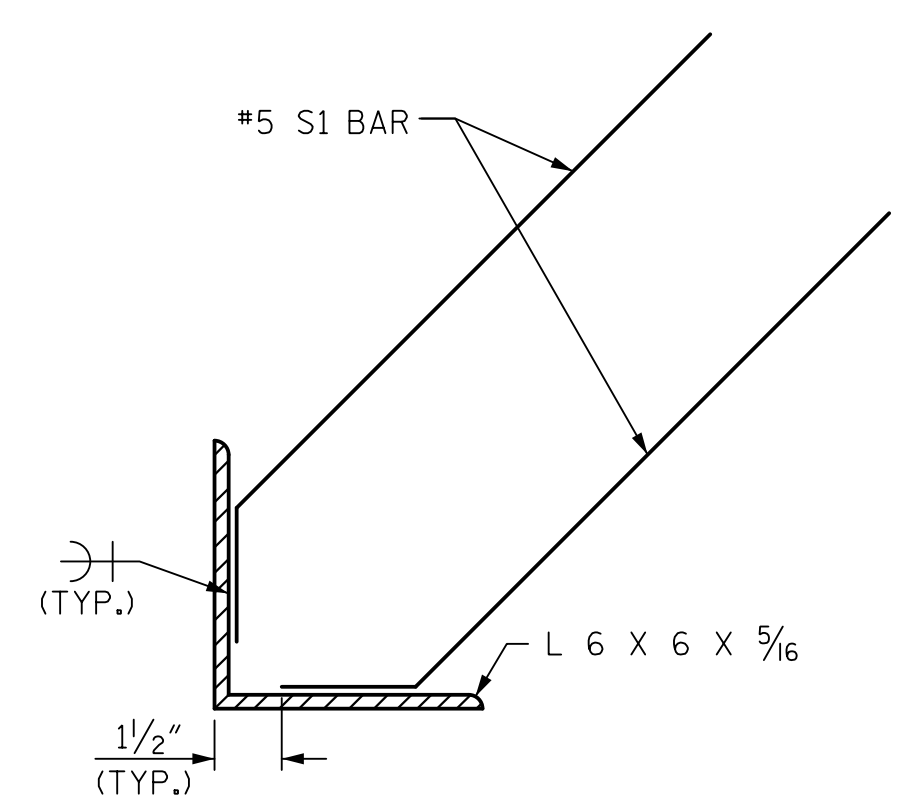


UPPER PANEL



BOTTOM PANEL

SECTION THROUGH PRECAST PANELS



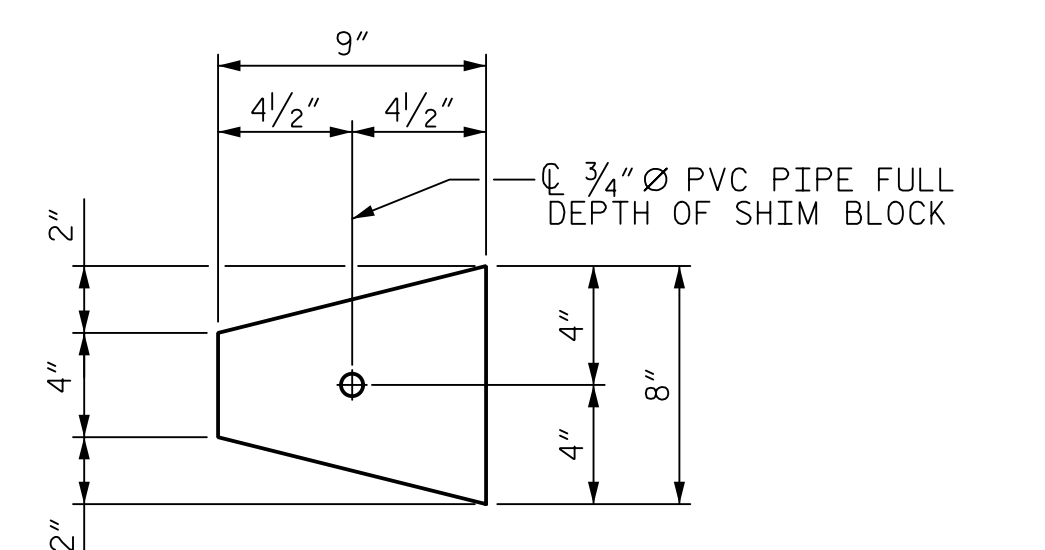
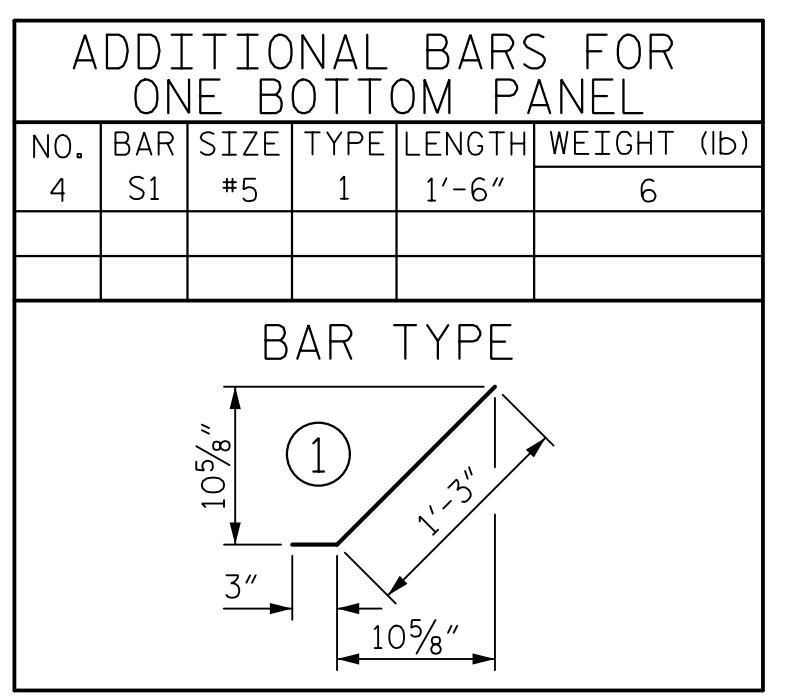
DETAIL "B"

QUANTITIES FOR ONE PRECAST PANEL (FOR 10'-0" PILE SPACING)

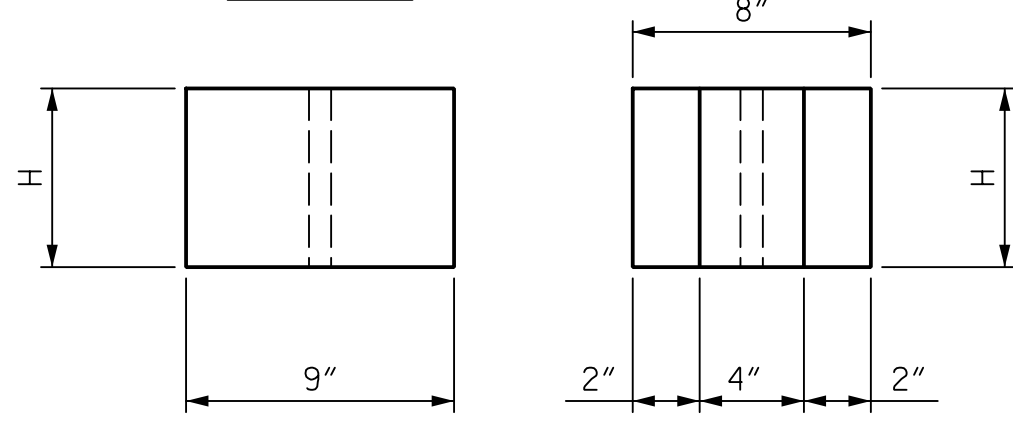
PANEL HEIGHT	CLASS AA CONCRETE C.Y.	BAR TYPES											
		HORIZONTAL						VERTICAL					
		NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)
2'-0"	0.22	3	H1	#4	STR	8'-8"	17	11	V1	#4	STR	1'-8"	12
3'-0"	0.33	4	H2	#4	STR	8'-8"	23	11	V2	#4	STR	2'-8"	20
4'-0"	0.44	5	H3	#4	STR	8'-8"	29	11	V3	#4	STR	3'-8"	27

QUANTITIES FOR ONE PRECAST PANEL (FOR 15'-0" PILE SPACING)

PANEL HEIGHT	CLASS AA CONCRETE C.Y.	BAR TYPES											
		HORIZONTAL						VERTICAL					
		NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)
3'-0"	0.52	5	H1	#4	STR	13'-8"	46	16	V1	#4	STR	2'-8"	29
4'-0"	0.69	6	H2	#4	STR	13'-8"	55	16	V2	#4	STR	3'-8"	39
5'-0"	0.86	7	H3	#4	STR	13'-8"	64	16	V3	#4	STR	4'-8"	50
6'-0"	1.04	8	H4	#4	STR	13'-8"	73	16	V4	#4	STR	5'-8"	61



PLAN

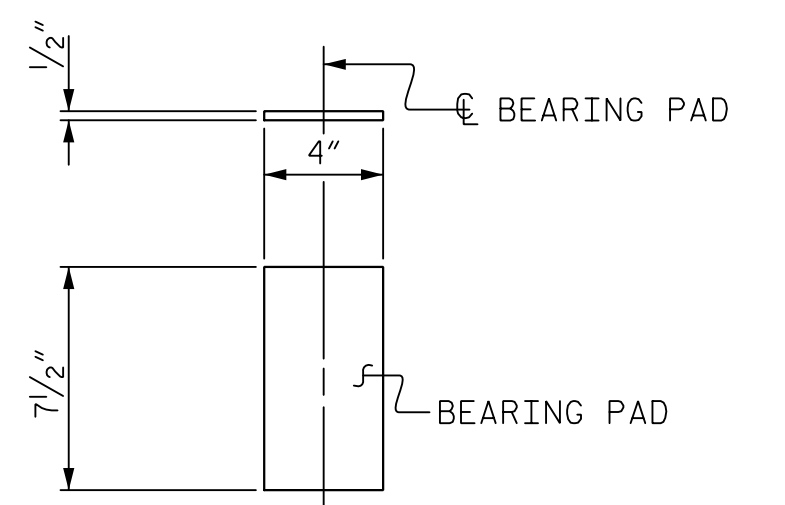


ELEVATION

END

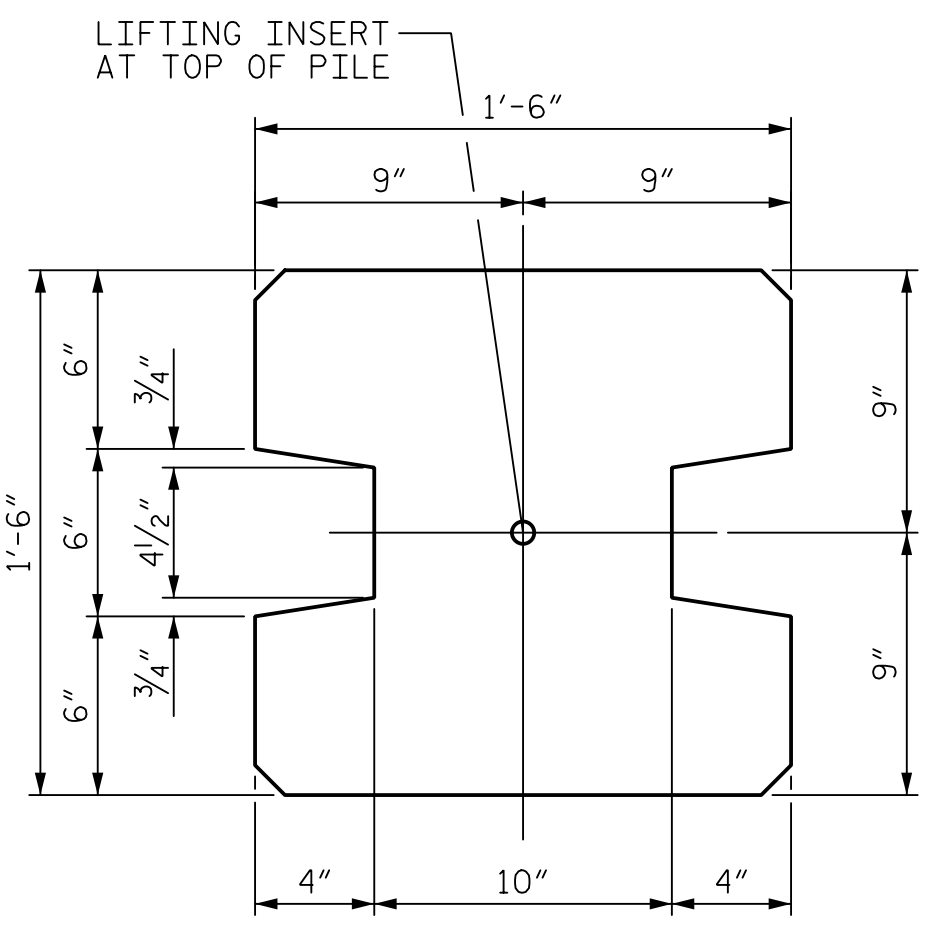
CONCRETE SHIM BLOCK

H = 3", 6" or 1'-0"

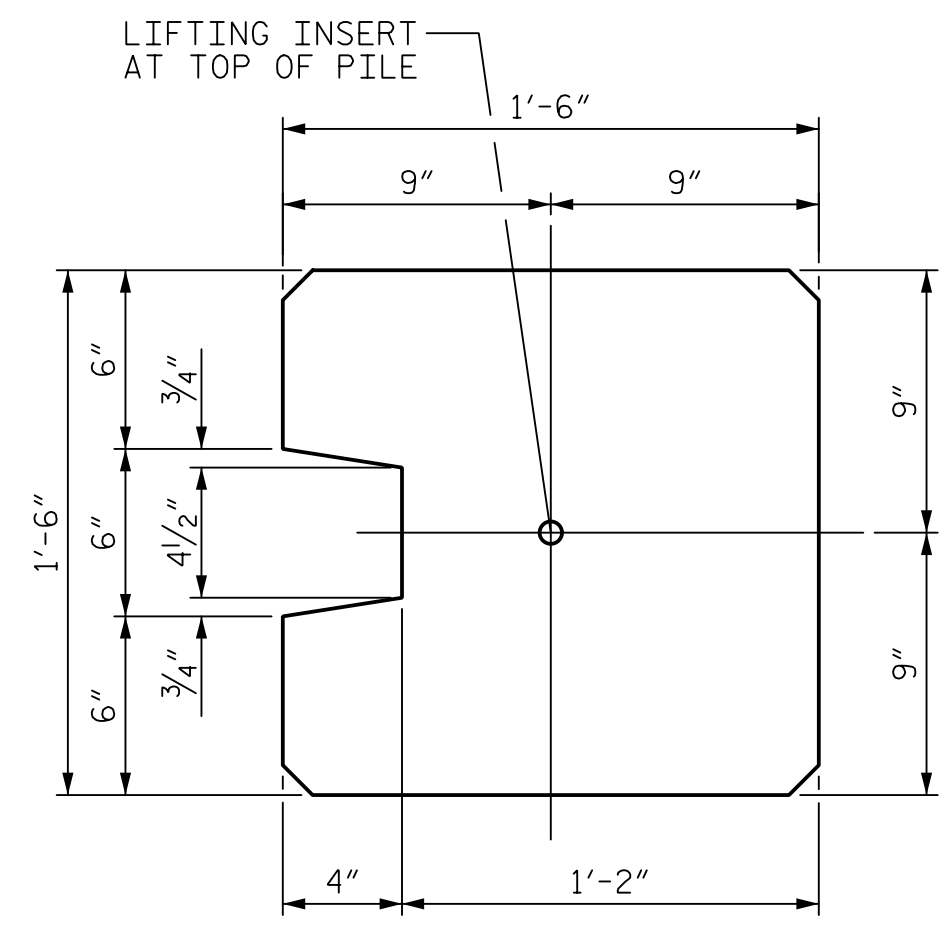


ELASTOMERIC BEARING DETAILS

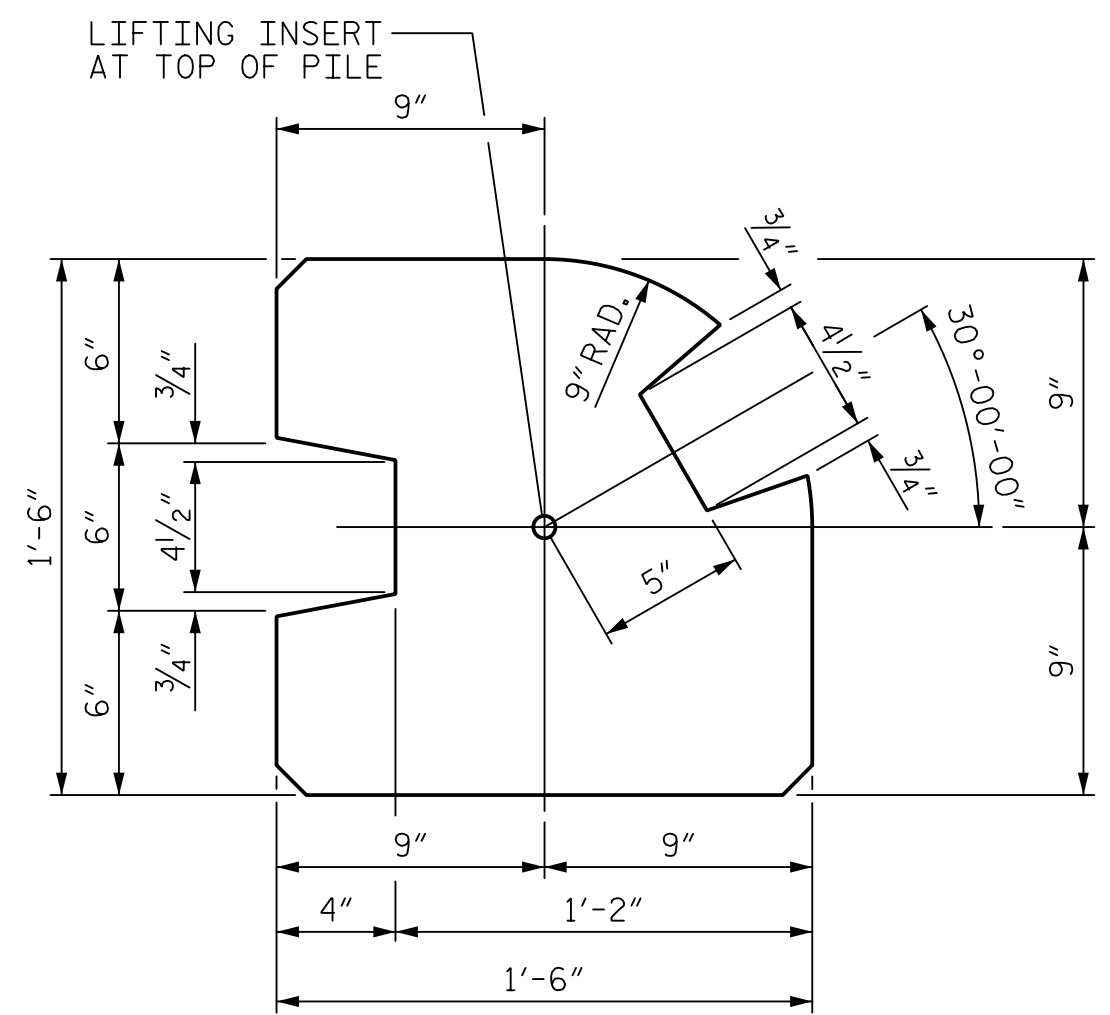
ELASTOMER IN BEARINGS SHALL BE 50 DUROMETER HARDNESS.



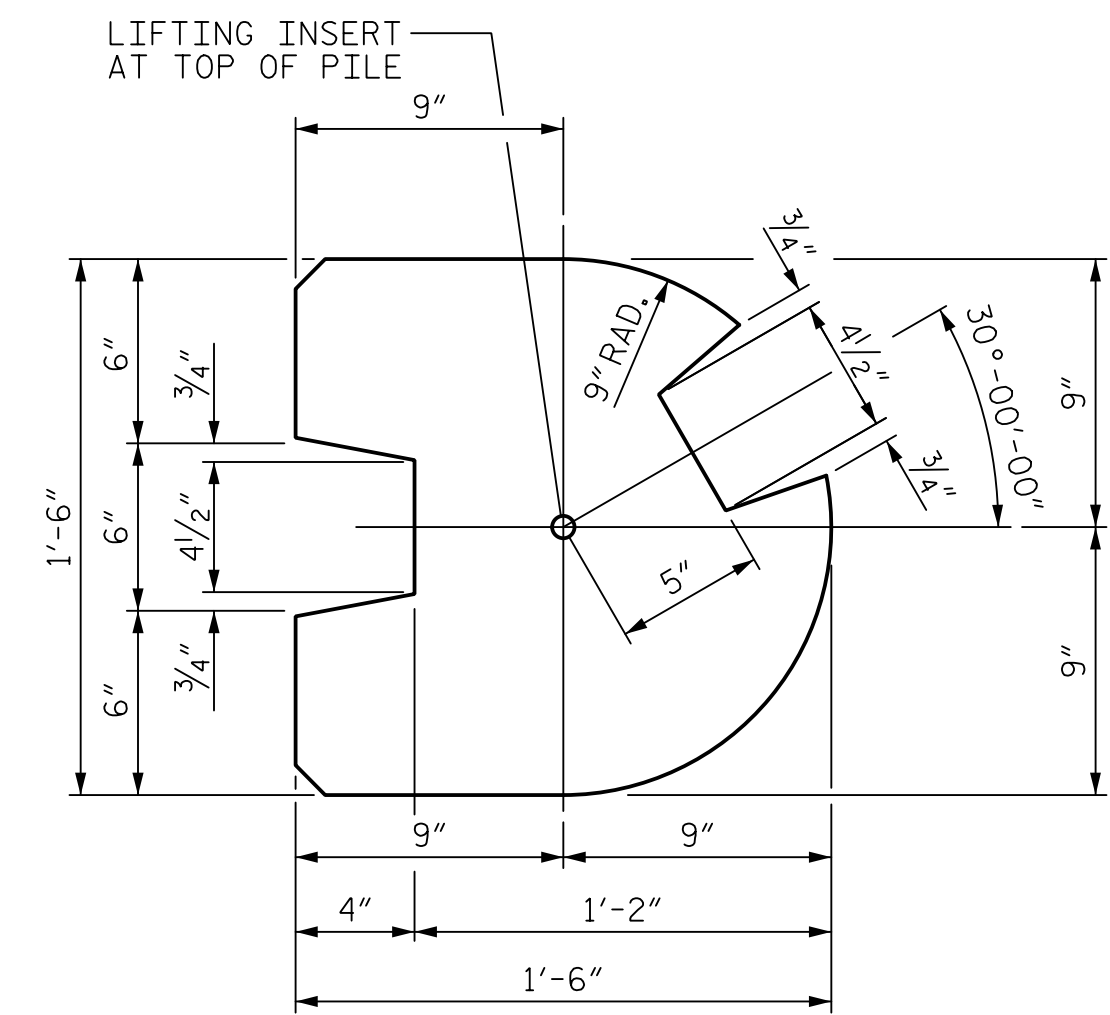
TYPE - I
(AREA = 1.9444 SQ. FT.)



TYPE - II
(AREA = 2.0903 SQ. FT.)



TYPE - III
(AREA = 1.8336 SQ. FT.)



TYPE - III (ALT.)
(AREA = 1.7163 SQ. FT.)

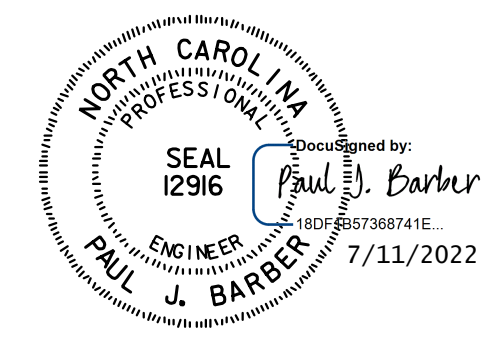
PILE DETAIL

(ALL CORNERS TO BE CHAMFERED 1")

PROJECT NO. U-5813
 RANDOLPH COUNTY
 STATION: 15+71.81 -RPC- =
 10+00.00 -NW3.1B-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SOUND BARRIER WALL
 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	M. WRIGHT	DATE	3/22
CHECKED BY	P. BARBER	DATE	3/22
DESIGN ENGINEER OF RECORD	P. BARBER	DATE	3/22

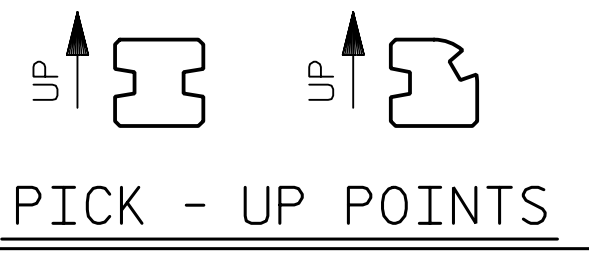
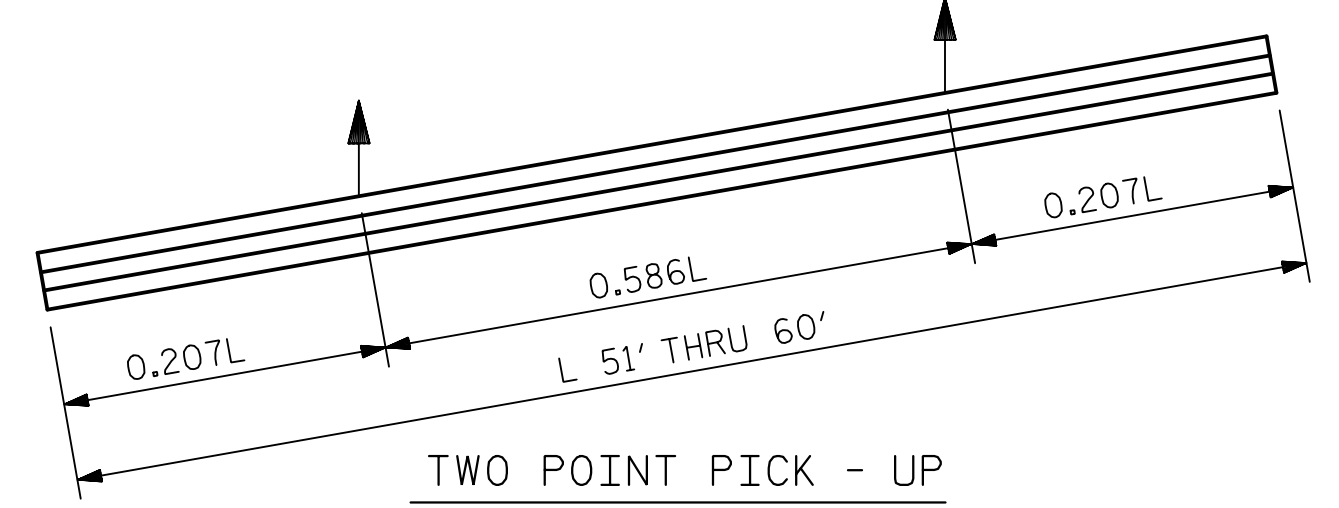
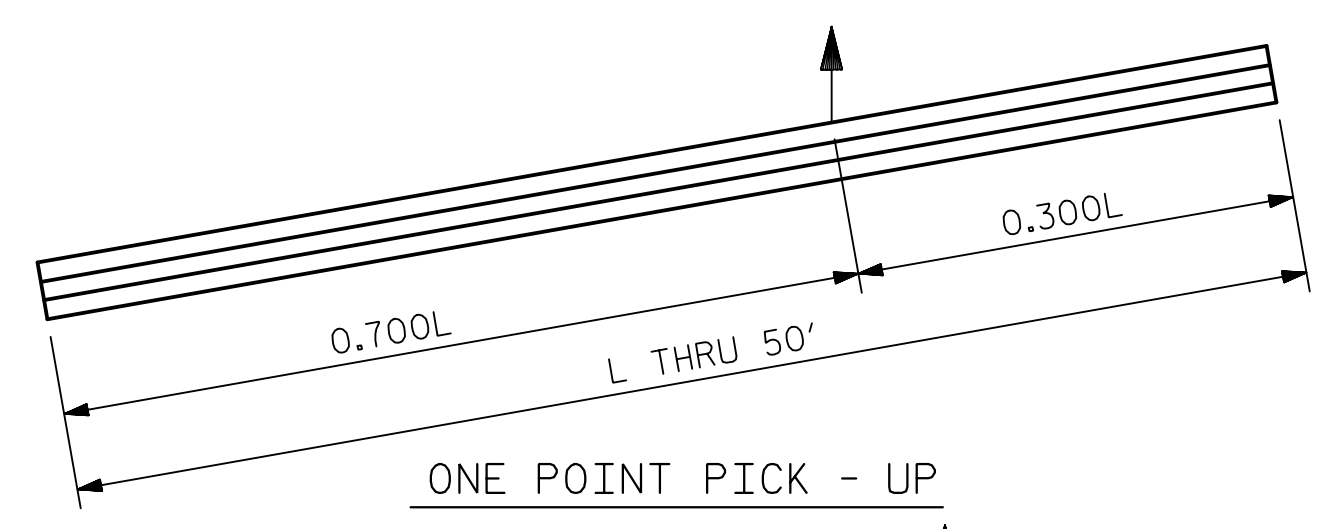
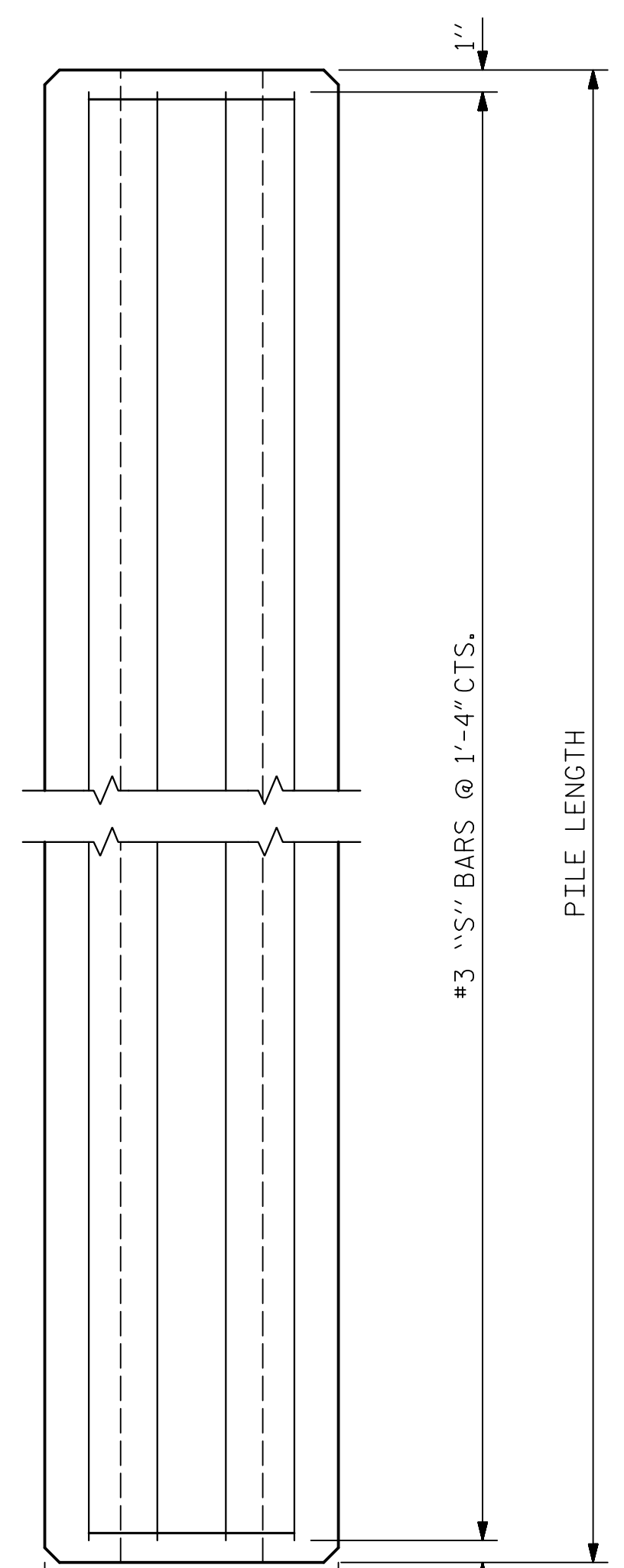
DWG. NO. 2

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

TOTAL SHEETS: 3

ASSEMBLED BY : MEW	DATE : 3/22
CHECKED BY : PJB	DATE : 3/22
DRAWN BY : MAA 6/11	REV. 1/15/14 RWW/TMG
CHECKED BY : GM 6/11	REV. 10/17 MAA/THC
	REV. 5/18 MAA/THC

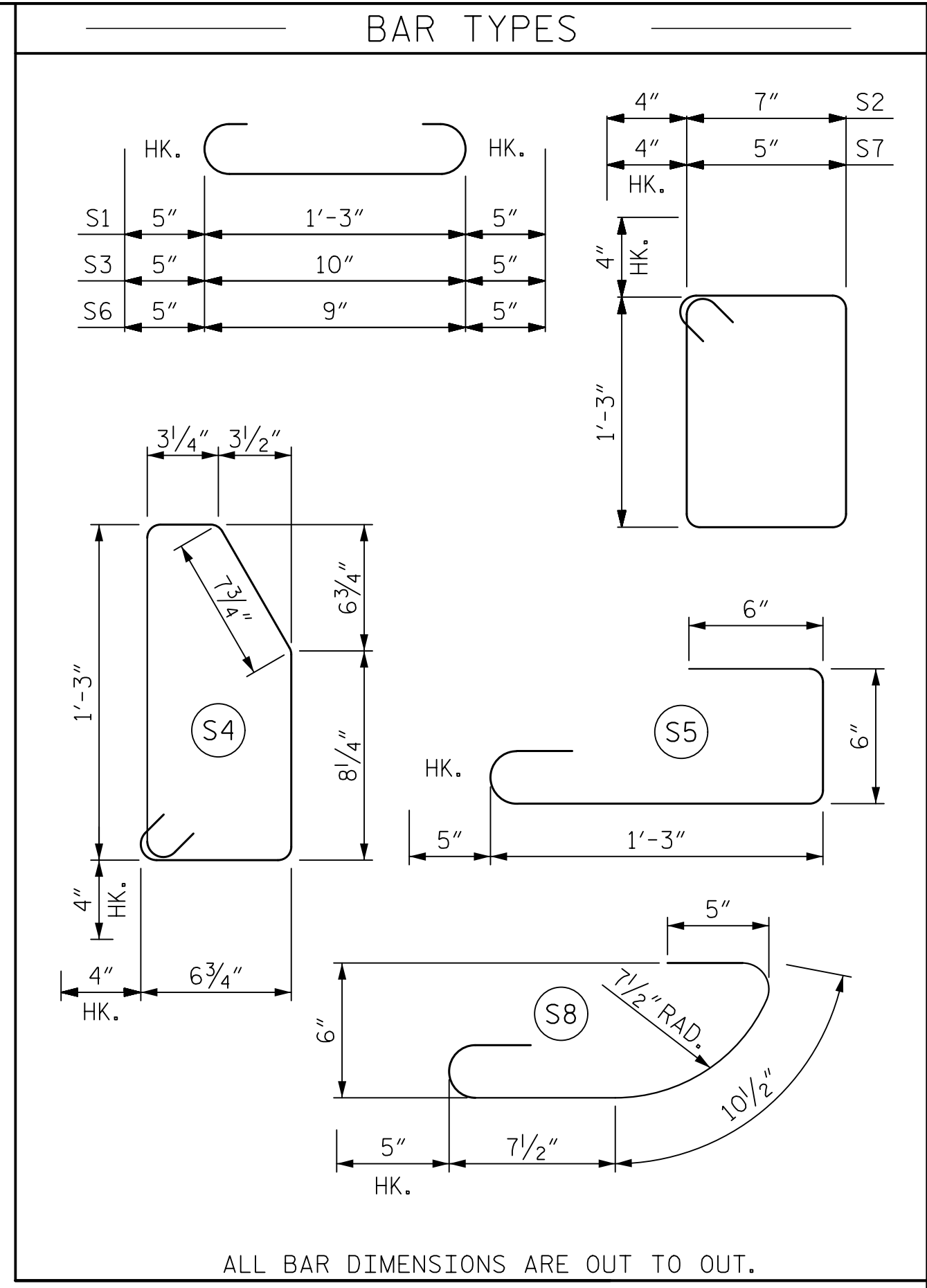
DOCUMENT NOT CONSIDERED FINAL
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NOTES

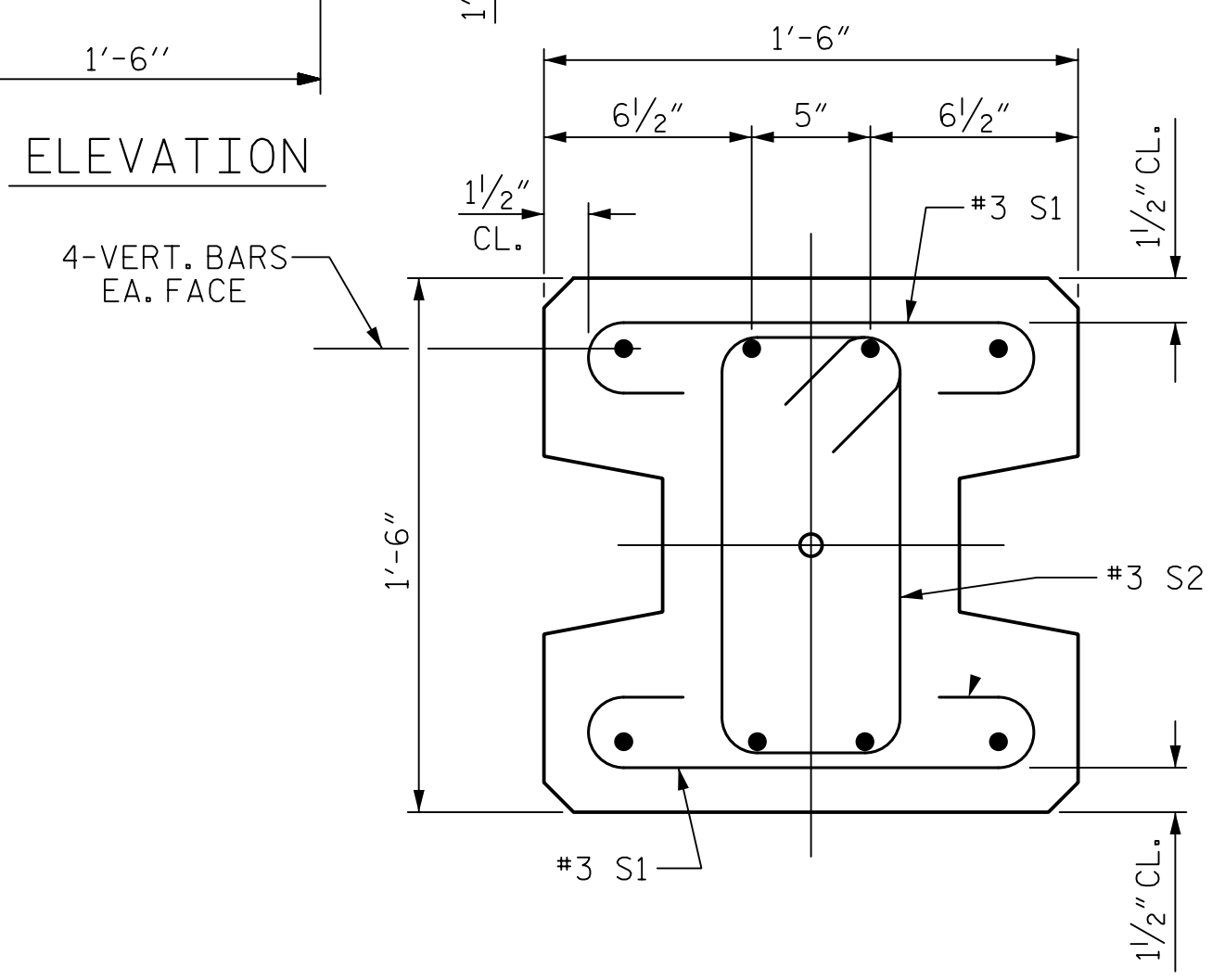
CONCRETE DESIGN DATA : $f'_c = 5,000$ PSI
 PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.
 WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS TO BE INDICATED WITH A BLACK MARK 2" WIDE.
 THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.
 ALL CORNERS TO BE CHAMFERED 1".

LENGTH	APPROX. PILE WT. TONS	ONE PICK-UP POINT		TWO PICK-UP POINT	
		0.300L	0.700L	0.207L	0.586L
10'-0"	1.56	3'-0"	7'-0"		
15'-0"	2.35	4'-6"	10'-6"		
20'-0"	3.14	6'-0"	14'-0"		
25'-0"	3.93	7'-6"	17'-6"		
30'-0"	4.70	9'-0"	21'-0"		
35'-0"	5.49	10'-6"	24'-6"		
40'-0"	6.28	12'-0"	28'-0"		
45'-0"	7.05	13'-6"	31'-6"		
50'-0"	7.84	15'-0"	35'-0"		
55'-0"	8.63			11'-4 1/2"	32'-3"
60'-0"	9.42			12'-5"	35'-2"

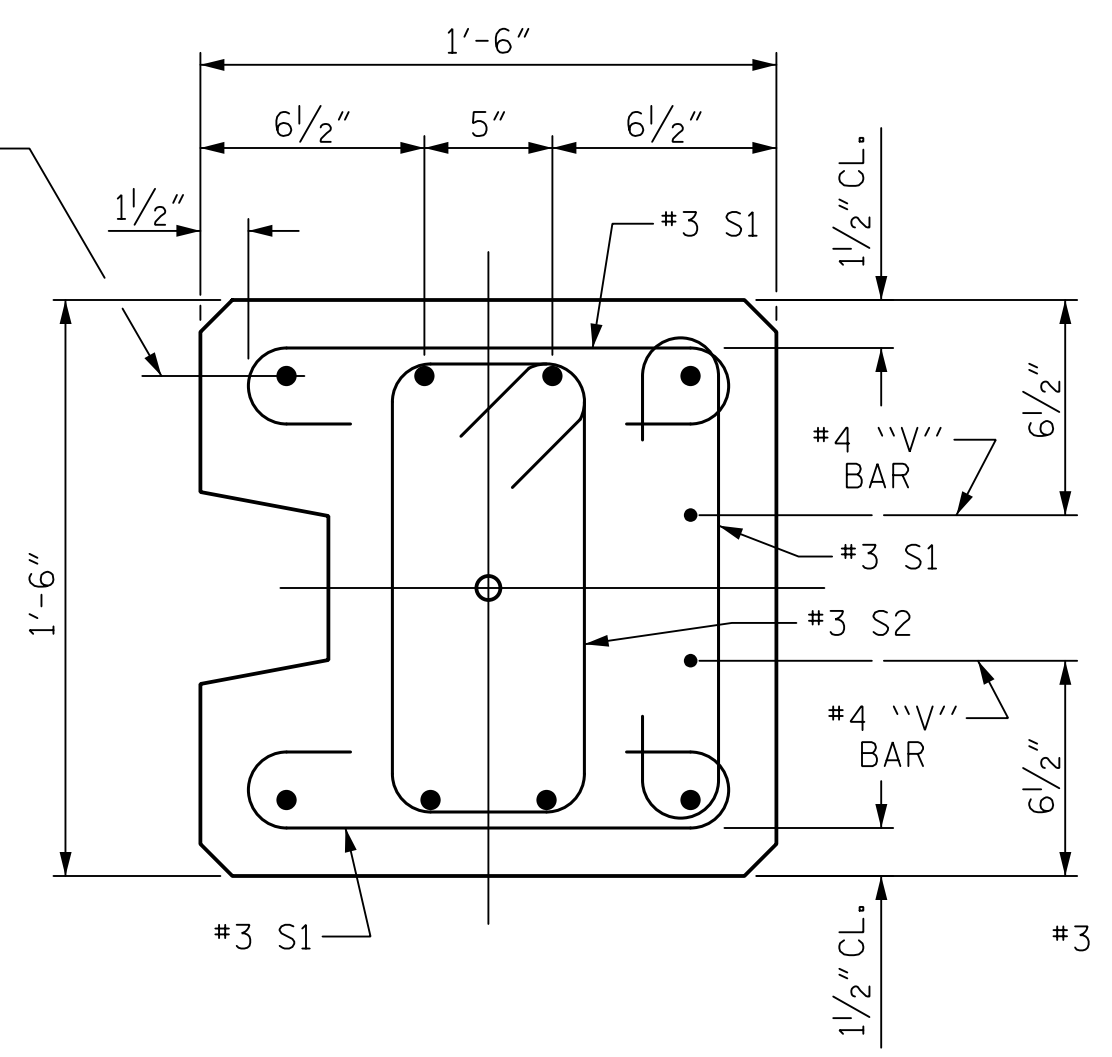


ALL BAR DIMENSIONS ARE OUT TO OUT.

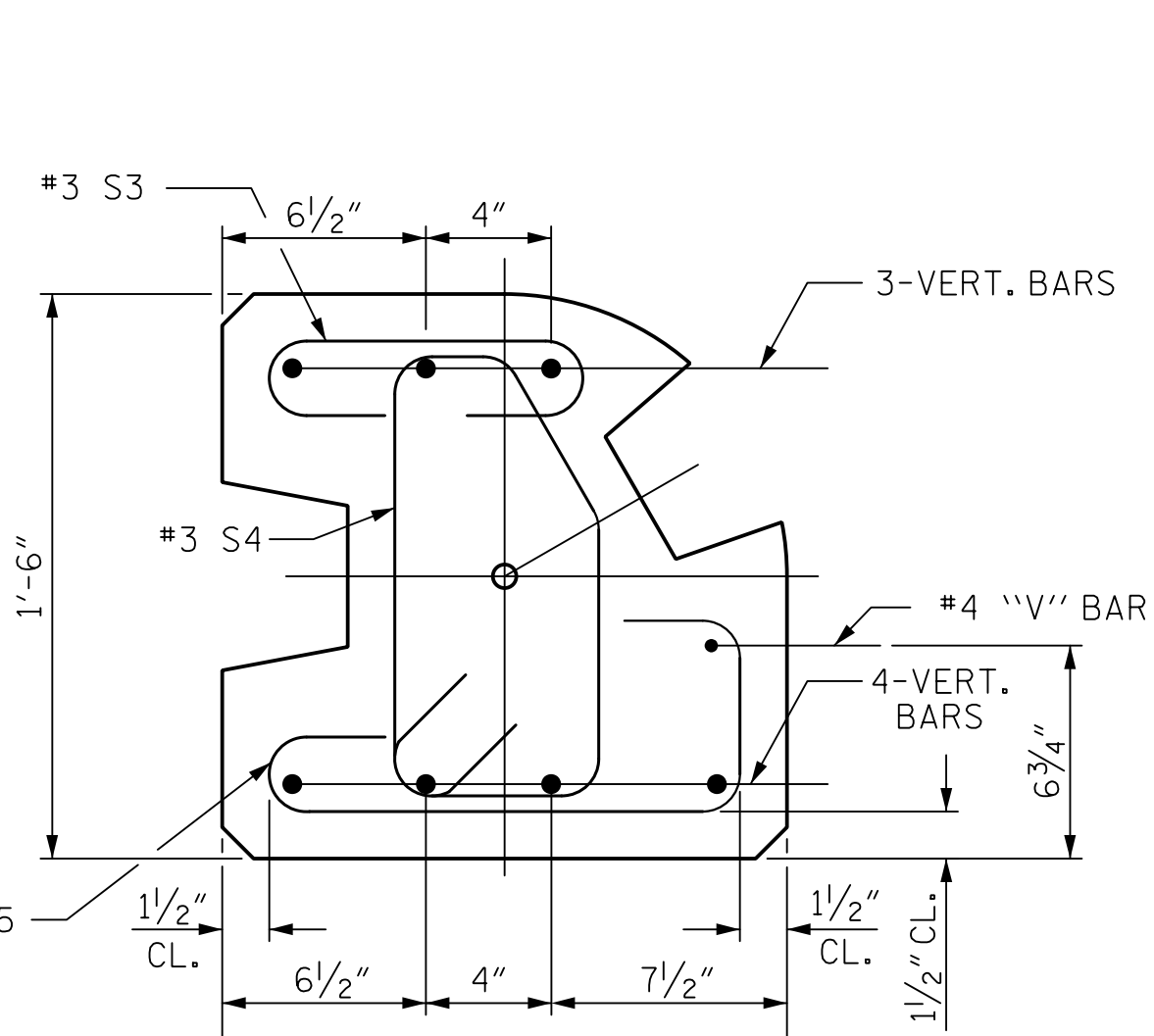
ELEVATION



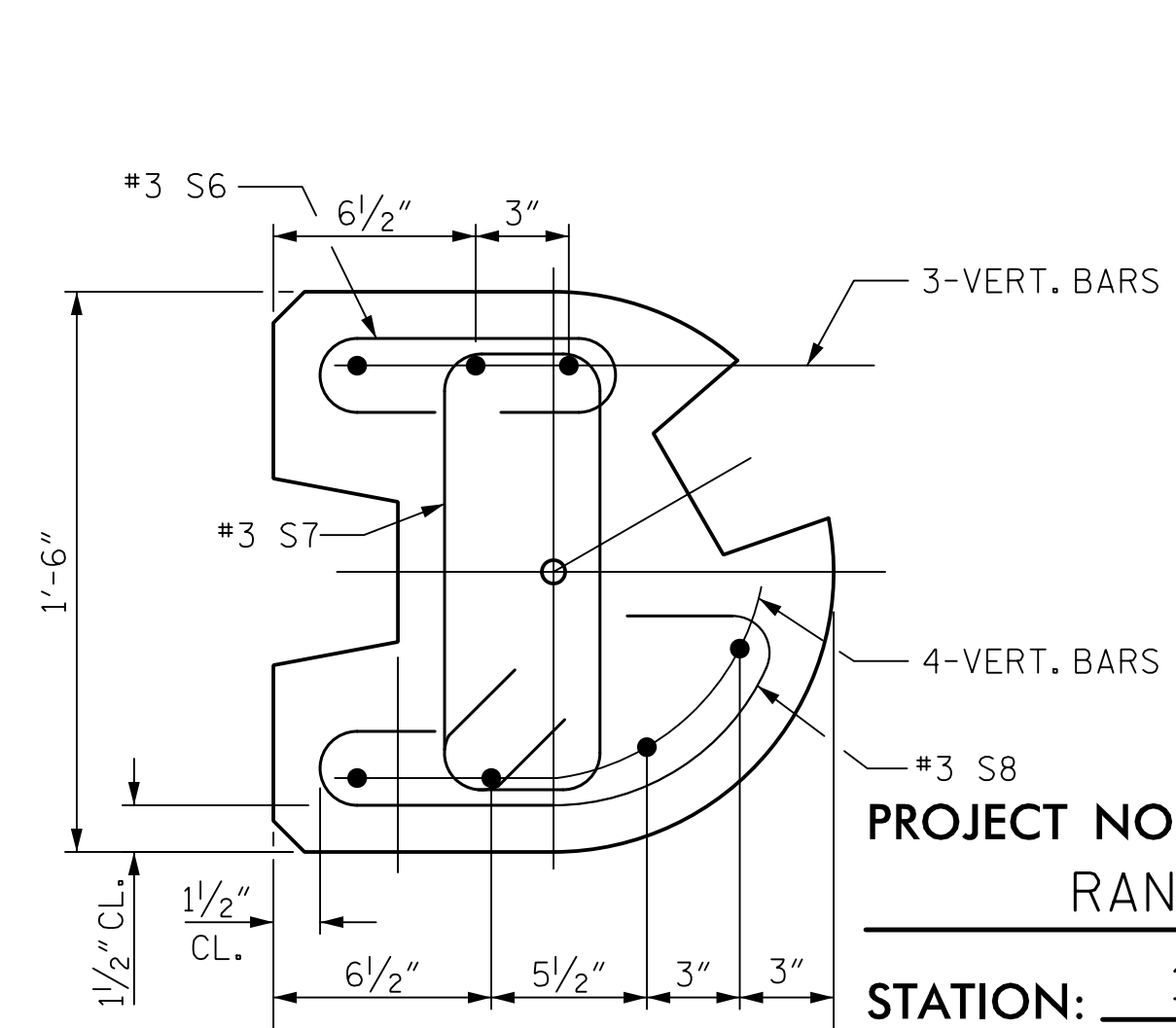
TYPE - I



TYPE - II



TYPE - III



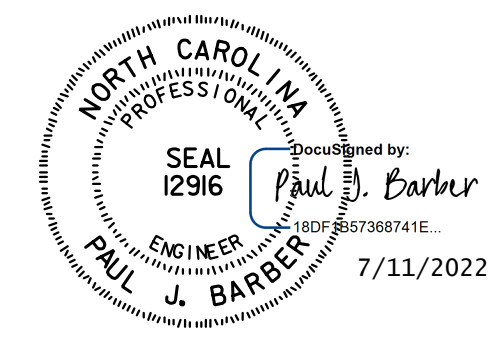
TYPE - III (ALT.)

PILE DETAIL

FOR VERTICAL BAR PILE REINFORCING, SEE SHEET 1 OF 3

PROJECT NO. U-5813
 RANDOLPH COUNTY
 STATION: 15+71.81 -RPC- = 10+00.00 -NW3.1B-

SHEET 3 OF 3



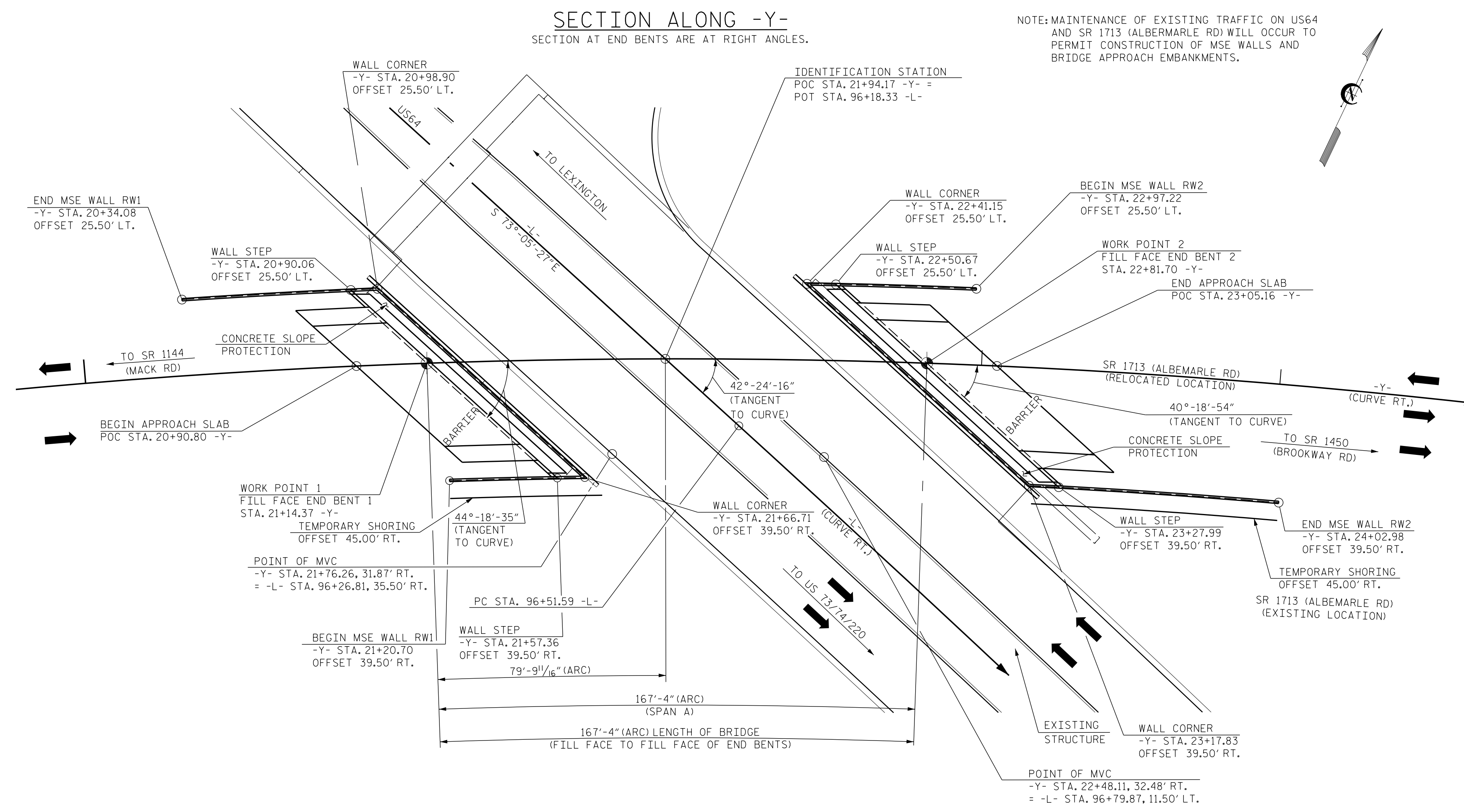
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SOUND BARRIER WALL
 DETAILS

ASSEMBLED BY : MEW	DATE : 3/22
CHECKED BY : PJB	DATE : 3/22
DRAWN BY : MAA 6/11	REV. 1/15/14 RWW/TMG
CHECKED BY : GM 6/11	REV. 12/17 MAA/THC

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 3/22
CHECKED BY	P. BARBER	DATE 3/22
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 3/22

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

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ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 1	2349
MSE RETAINING WALL NO. 2	3155

RETAINING WALL NO. 1 AND NO. 2 PLAN VIEW

PROJECT NO.: U-5813

RANDOLPH COUNTY

STATION: 21+94.17 -Y-

SHEET 1 OF 5

PREPARED BY: C. DRISCOLL DATE: 04/20

REVIEWED BY: T. WELLS DATE: 05/20

Prepared in the Office of:

KLEINFELDER

Bright People. Right Solutions.

422 GALLIMORE DAIRY RD, SUITE B
GREENSBORO, NC 27409
NC FIRM LICENSE NO. F-1312

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALL PLAN VIEW

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

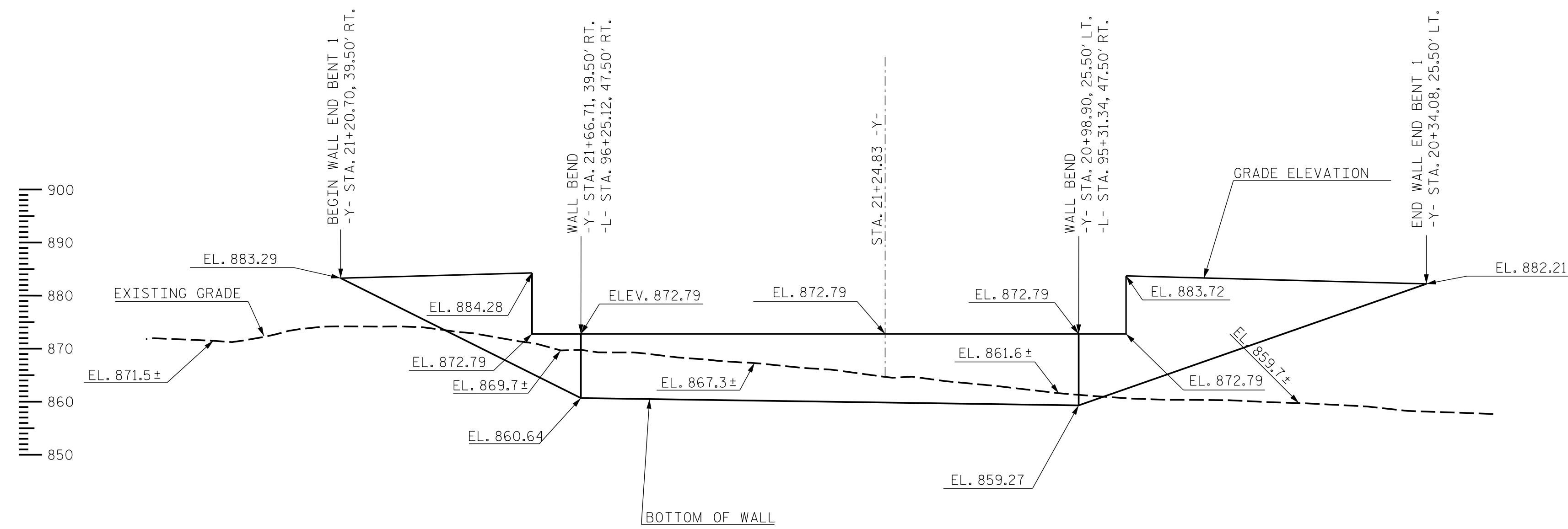
GEOTECHNICAL ENGINEER

ENGINEER

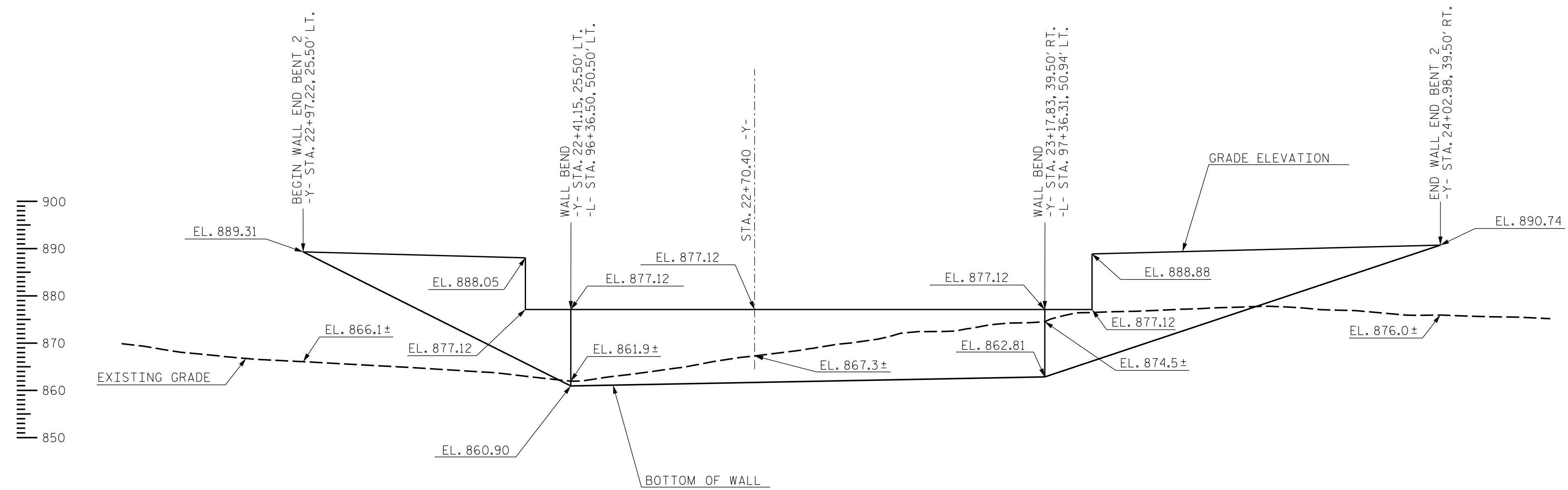
DocuSigned by:
Xavier Barrett 10/10/2023

2000374FA88B403 SIGNATURE DATE

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RETAINING WALL NO. 1 (END BENT NO. 1)
ENVELOPE
(LOOKING AT FRONT FACE OF WALL)



RETAINING WALL NO. 2 (END BENT NO. 2)
ENVELOPE
(LOOKING AT FRONT FACE OF WALL)

PROJECT NO.: U-5813
RANDOLPH COUNTY
STATION: 21+94.17 -Y-
SHEET 2 OF 5

PREPARED BY: C. DRISCOLL DATE: 04/20
REVIEWED BY: T. WELLS DATE: 05/20

Prepared in the Office of:

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**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

**MSE RETAINING WALL
ELEVATIONS**

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

NOTES:

- FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
- FOR TYPE III REINFORCED BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY DETAIL DRAWING NO. 422D10.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 1 AND RETAINING WALL NO. 2.
- A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2.
- A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2.
- BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL NO. FOR THE FOLLOWING:
 - 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 75 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,200 PSF FOR RETAINING WALL NO. 1 AND 5,900 PSF FOR RETAINING WALL NO. 2
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = 3.0 FT FOR RETAINING WALL NO. 1 AND 3.5 FT FOR RETAINING WALL NO. 2
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS FOR RETAINING WALL NO. 1:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	110	30	0

8) IN-SITU ASSUMED MATERIAL PARAMETERS FOR RETAINING WALL NO. 2:

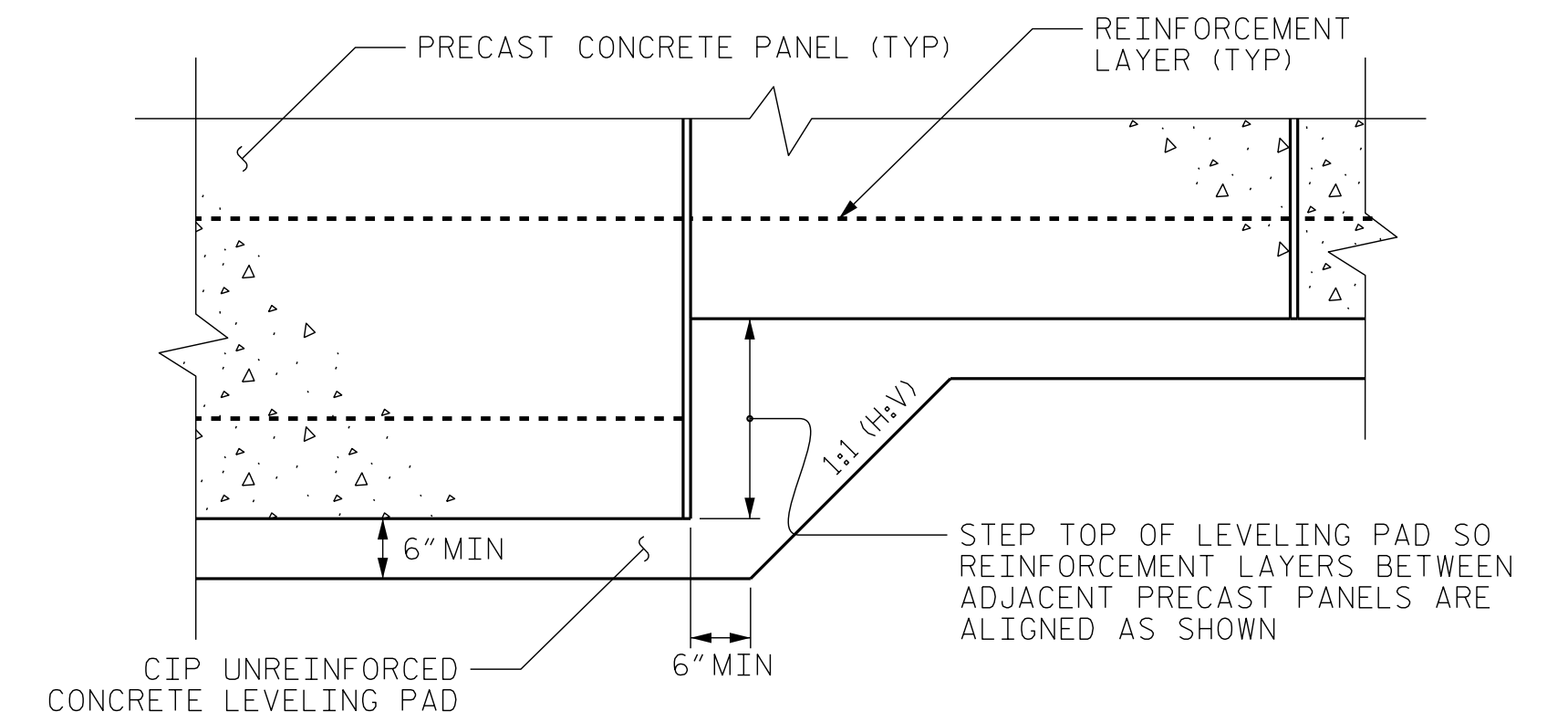
MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	120	32	0

DESIGN RETAINING WALL NO. 1 AND RETAINING WALL NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

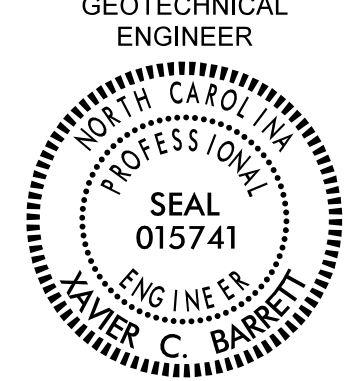
FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 21+14.37 -Y- AND END BENT NO. 2 AT STATION 22+81.70 -Y- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

"TEMPORARY SHORING" IS REQUIRED FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY AND STRUCTURE PLANS.



PRECAST PANELS
LEVELING PAD STEP DETAIL

GEOTECHNICAL ENGINEER  SEAL 015741 XAVIER C. BARRETT ENGINEER	ENGINEER
DocuSigned by: Xavier Barrett 2003745	10/10/2023 DATE
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PROJECT NO.: U-5813
 RANDOLPH COUNTY
 STATION: 21+94.17 -Y-
 SHEET 3 OF 5

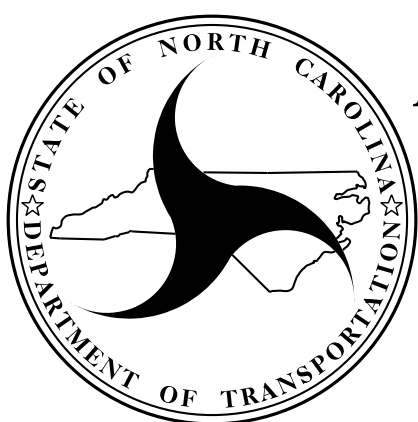
PREPARED BY: C. DRISCOLL	DATE: 04/20
REVIEWED BY: T. WELLS	DATE: 05/20

Prepared in the Office of:



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NC FIRM LICENSE NO. F-1312



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

**MSE RETAINING WALL
NOTES**

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

GEOTECHNICAL ENGINEER

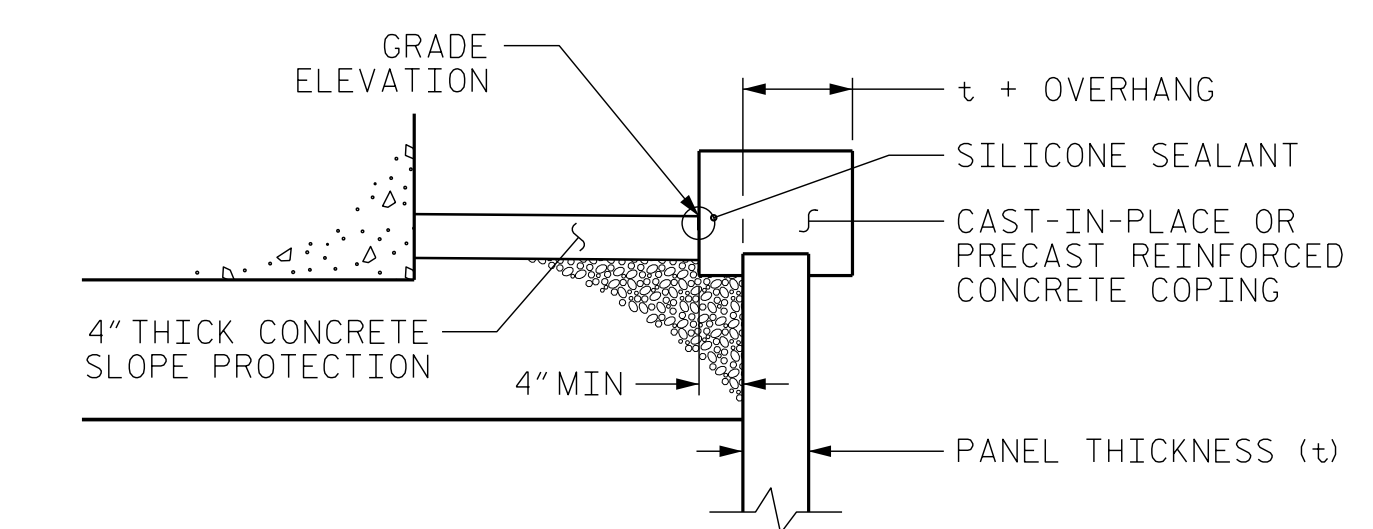
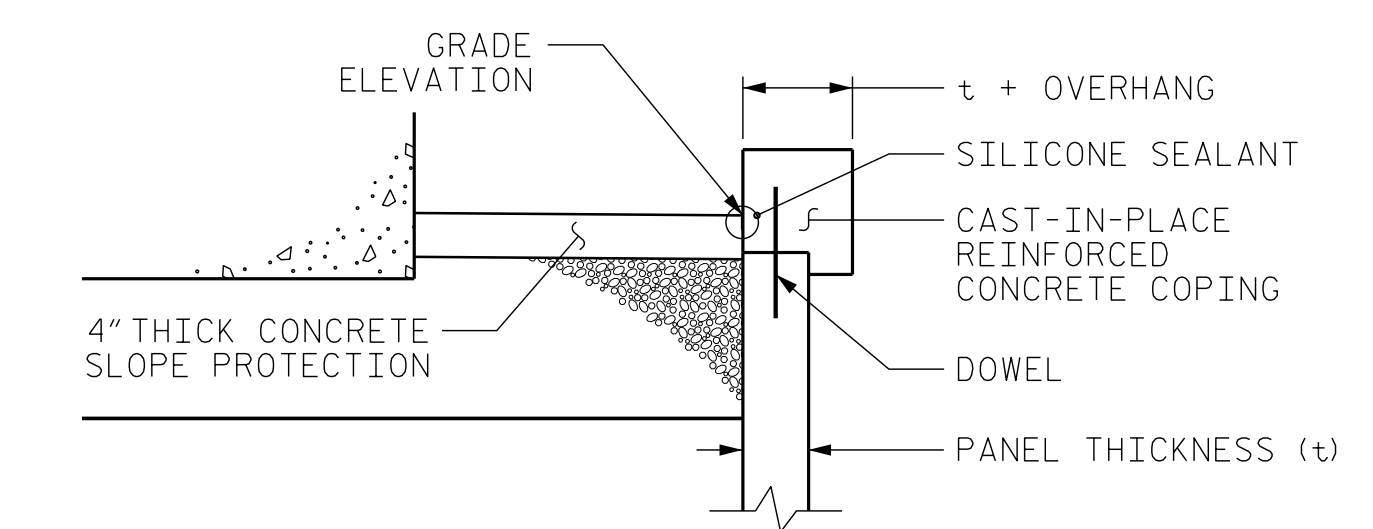
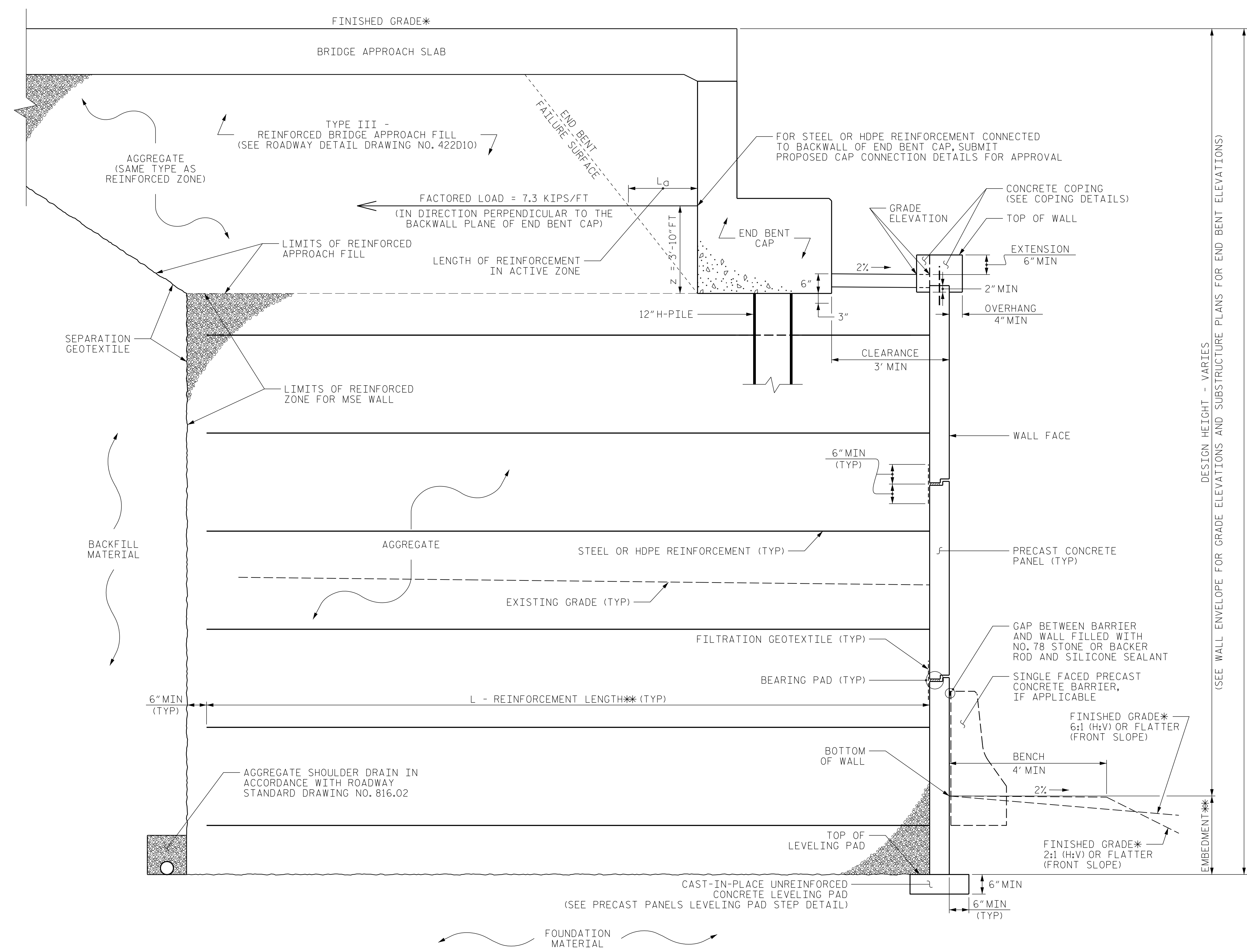
ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 015741
 XAVIER C. BARNETT

DocuSigned by:
 Xavier Barnett 10/10/2023

20003146888411
 SIGNATURE DATE SIGNATURE DATE

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COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: U-5813
 RANDOLPH COUNTY
 STATION: 21+94.17 -Y-
 SHEET 4 OF 5

PREPARED BY: C. DRISCOLL DATE: 04/20
 REVIEWED BY: T. WELLS DATE: 05/20

Prepared in the Office of:

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 NC FIRM LICENSE NO. F-1312

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

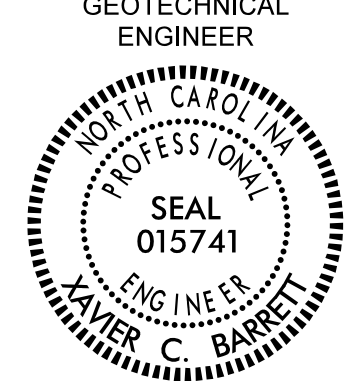
GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALL TYPICAL SECTION

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

GEOTECHNICAL ENGINEER

ENGINEER

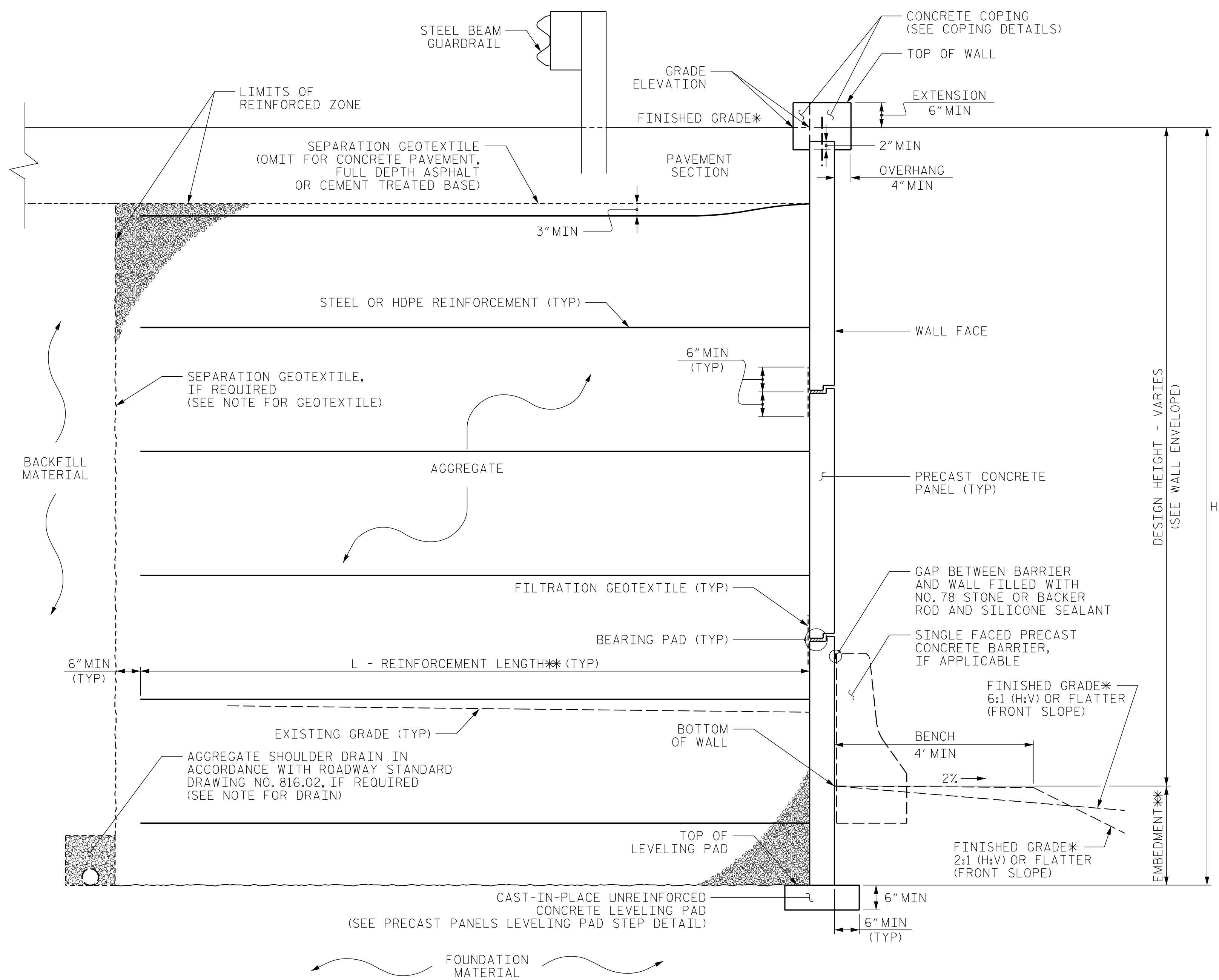


DocuSigned by:
Xavier Barrett
2000374E688407
SIGNATURE

10/10/2023
DATE

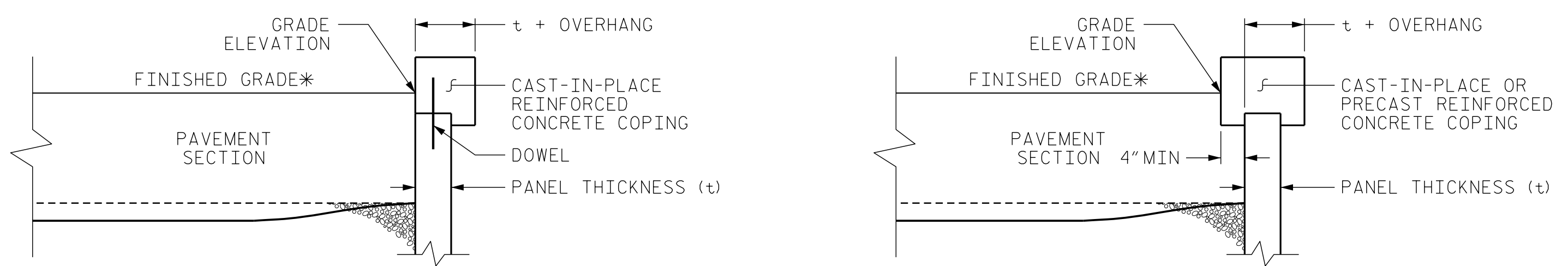
SIGNATURE DATE

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MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
*SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

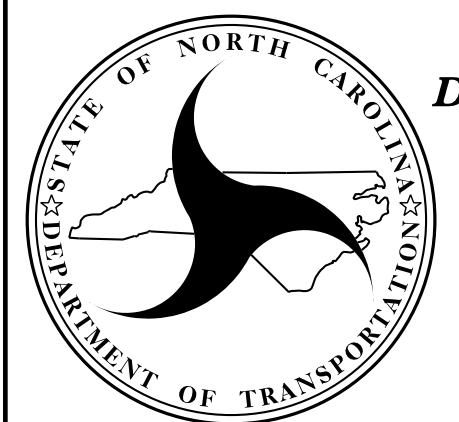
PROJECT NO.: U-5813
RANDOLPH COUNTY
STATION: 21+94.17 -Y-
SHEET 5 OF 5

PREPARED BY: C. DRISCOLL
REVIEWED BY: T. WELLS
DATE: 04/20
DATE: 05/20

Prepared in the Office of:



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422 GALLIMORE DAIRY RD, SUITE B
GREENSBORO, NC 27409
NC FIRM LICENSE NO. F-1312



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

**MSE RETAINING WALL
TYPICAL SECTION**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-5
2			4			