

ELEVATION

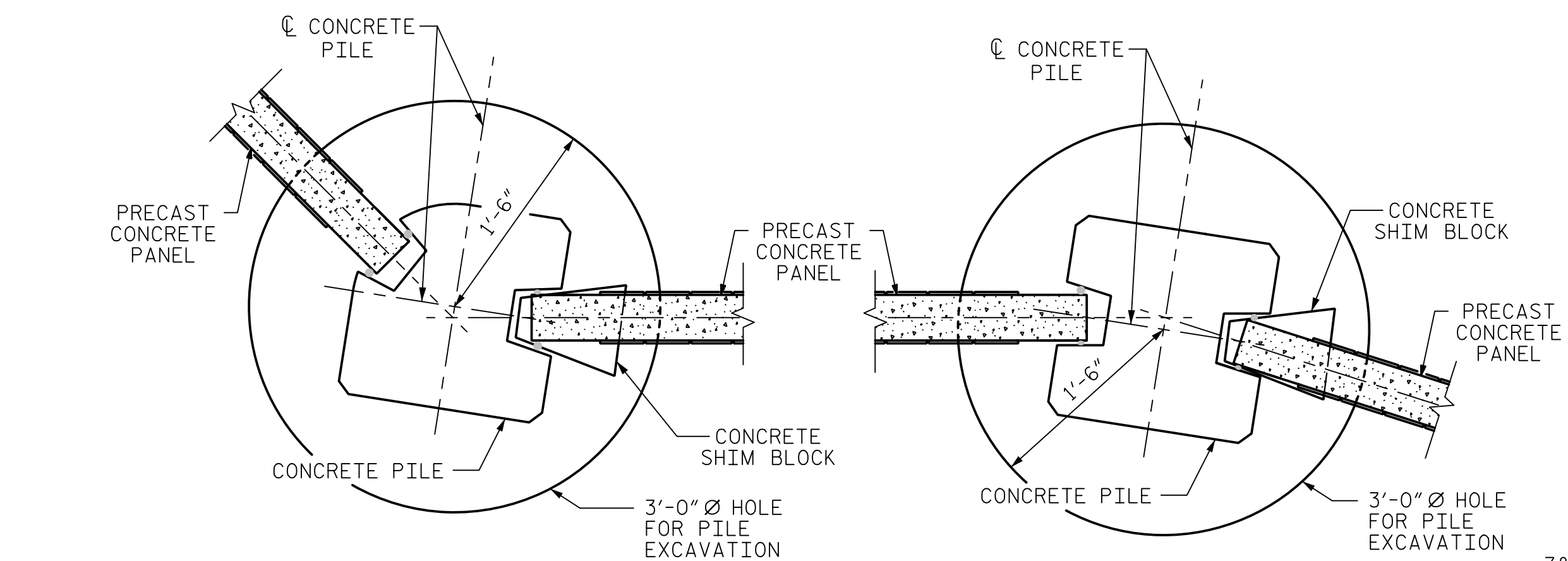
SECTION A-A

PILE EXCAVATION DEPTHS "D"					
WALL -NW6.1-		FROM : STA. 10+00.00 TO : STA. 11+81.29			
3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
		H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'	
		10'-0"	10'	12'	13'
		15'-0"	11'	13'	16'
20'-0"	12'	15'	18'		
WALL -NW6.1-		FROM : STA. 13+32.71 TO : STA. 25+02.00			
3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
		H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'	
		10'-0"	10'	12'	13'
		15'-0"	11'	13'	16'
20'-0"	12'	15'	18'		

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.
- FOR SOUND BARRIER WALL (BRIDGE MOUNTED), SEE BRIDGE PLANS.

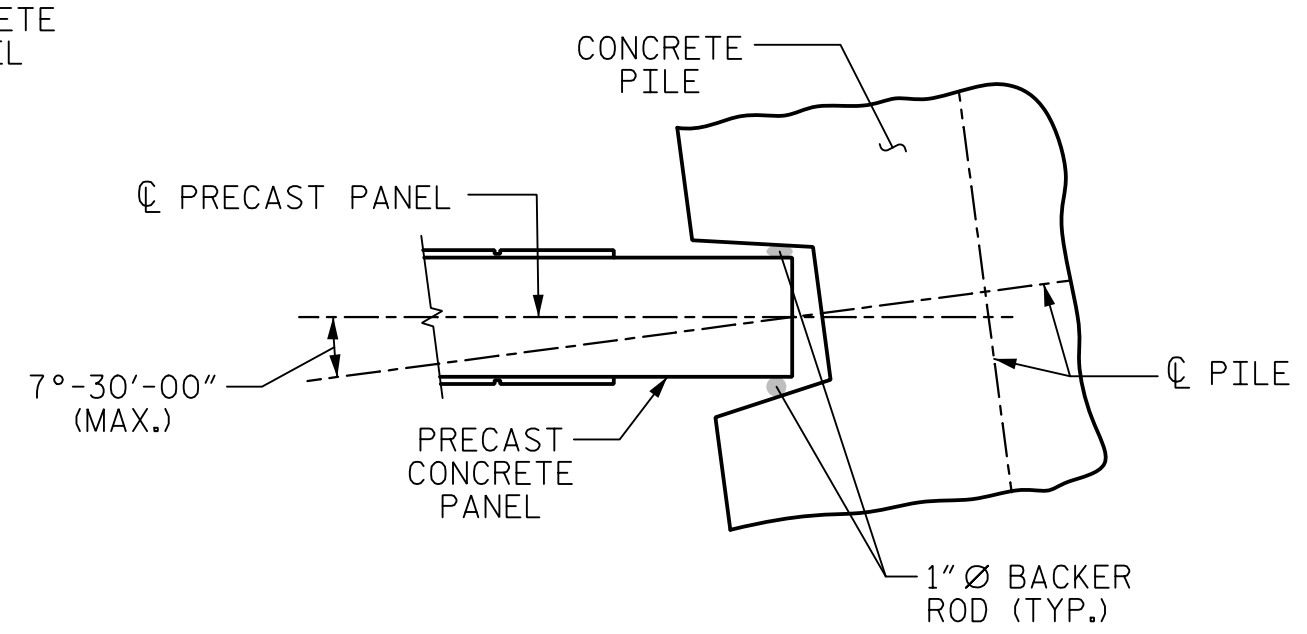
PILE REINFORCING STEEL DESIGN WIND PRESSURE = 40 PSF							
PILE TYPE I				PILE TYPE III			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES	PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
10'-0"	H ≤ 25'	4 - #8 EA. FACE	#3 @ 1'-4" CTS.	10'-0"	H ≤ 25'	3 - #9 SHORT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



15° TO 45° TURNS  
(PILE TYPE III)

0° TO 15° TURNS  
(PILE TYPE I)

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	30,058 S.F.
ARCHITECTURAL SURFACE TREATMENT	53,482 S.F.
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	
ARCHITECTURAL SURFACE TREATMENT	
TEXTURE OPTION:	DRystack
STAIN OPTION:	GRAY (FS36173)

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: 910+99.92 -WBL- =  
10+00.00 -NW6.1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SOUND BARRIER WALL  
 No. -NW6.1-

ASSEMBLED BY : M. WRIGHT	DATE : 4/19
CHECKED BY : J. BARCOMB	DATE : 4/19
DRAWN BY : MAA 6/II	REV. 9/26/14 MAA/TMG
CHECKED BY : GM 6/II	REV. 10/17 MAA/THC
	REV. 5/18 MAA/THC

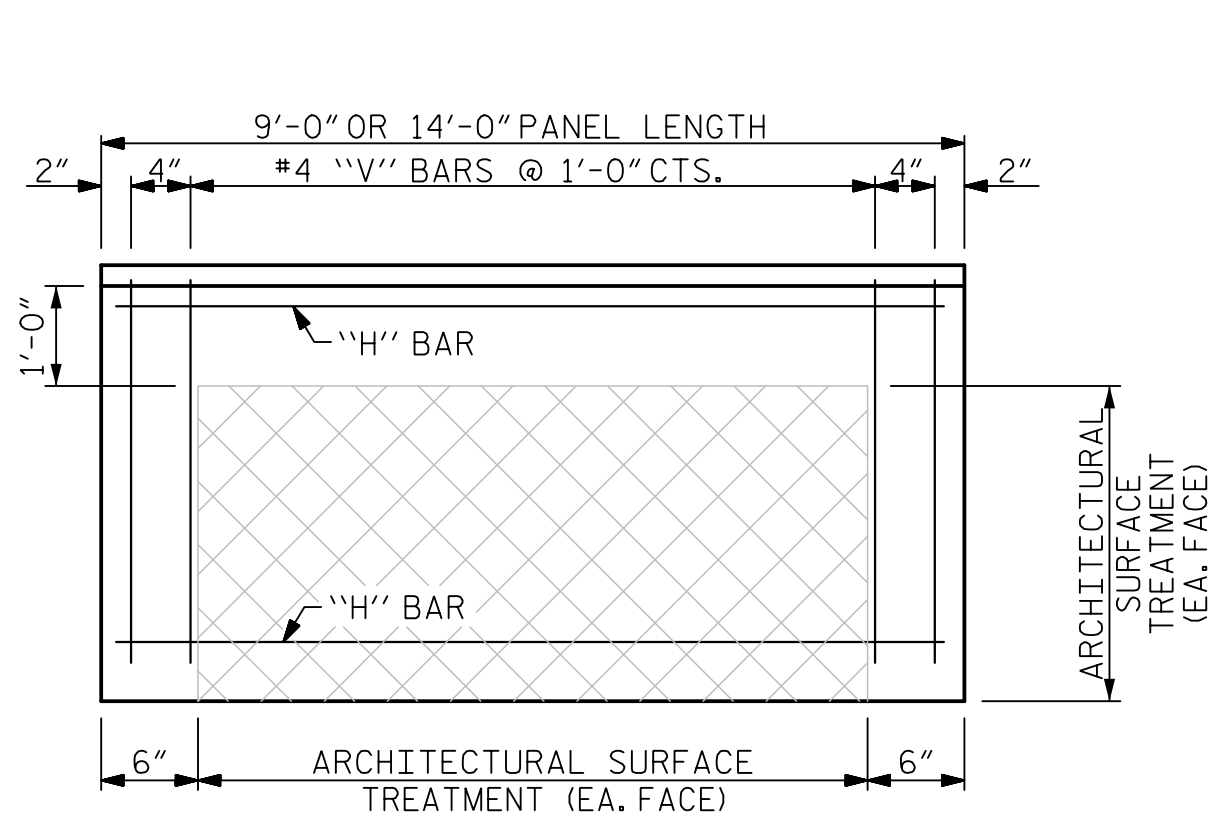
**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY : M. WRIGHT	DATE : 4/19
CHECKED BY : J. BARCOMB	DATE : 4/19
DESIGN ENGINEER OF RECORD : J. BARCOMB	DATE : 4/19

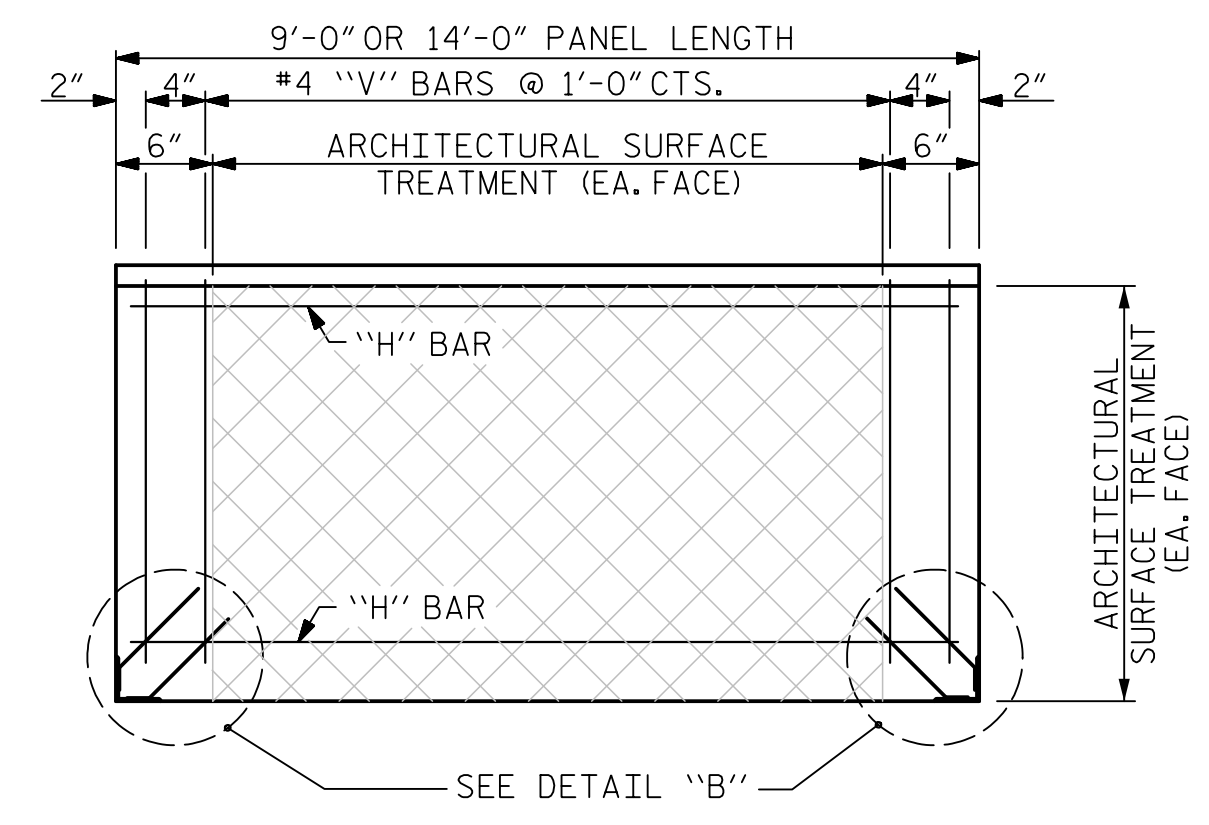
DWG. NO. 1

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

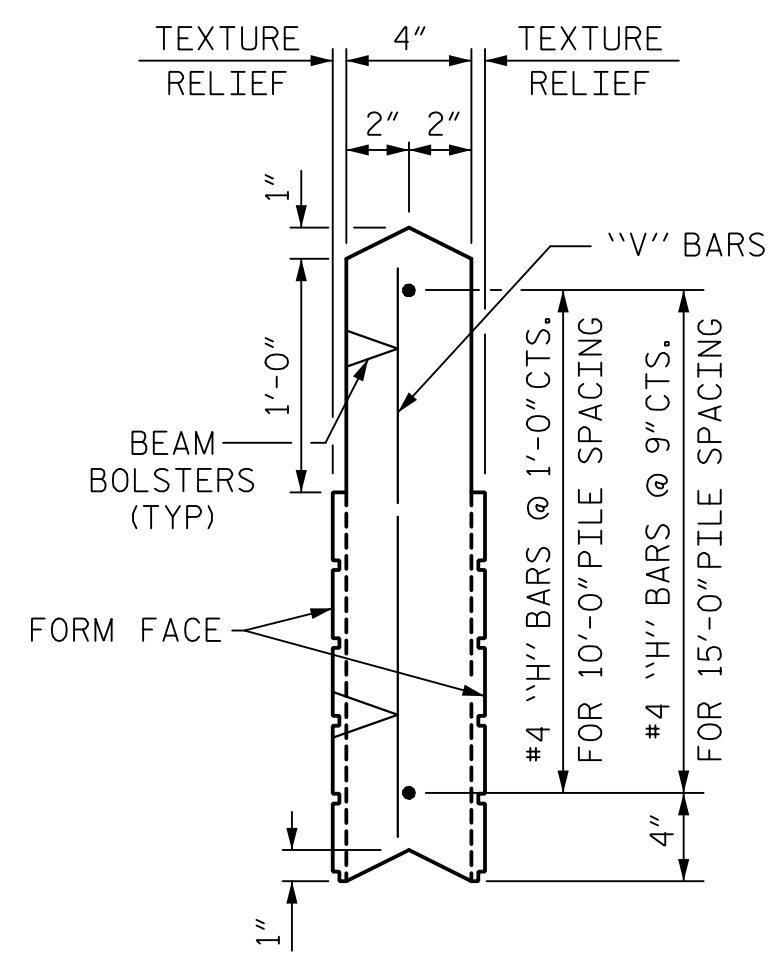




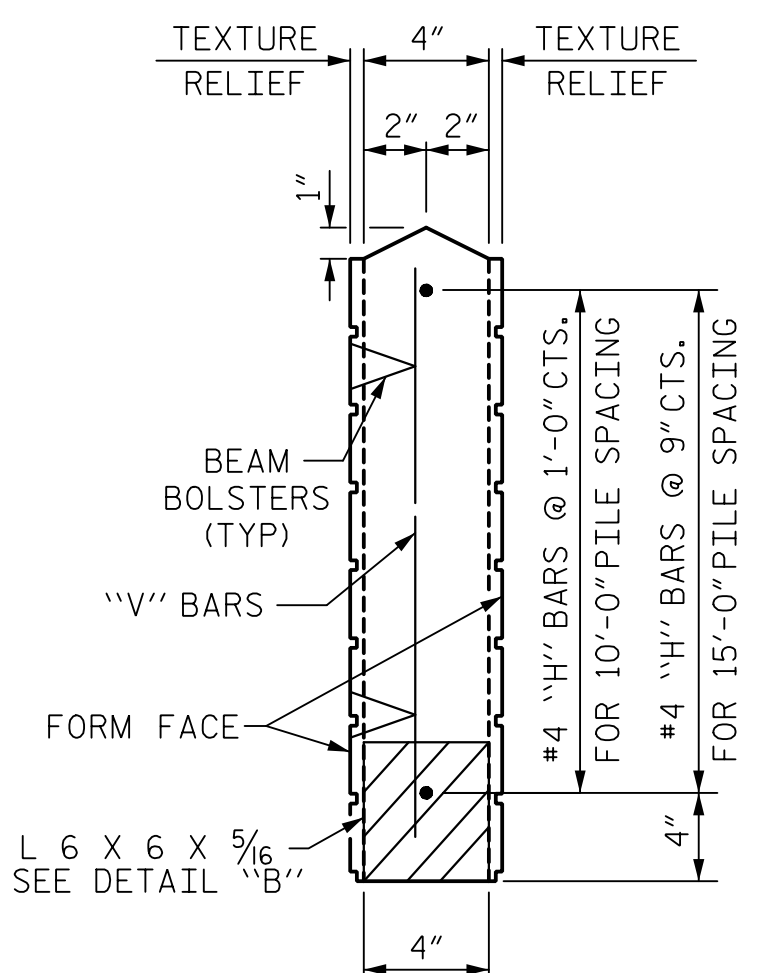
FRONT ELEVATION OF UPPER PRECAST PANEL



FRONT ELEVATION OF BOTTOM PRECAST PANEL

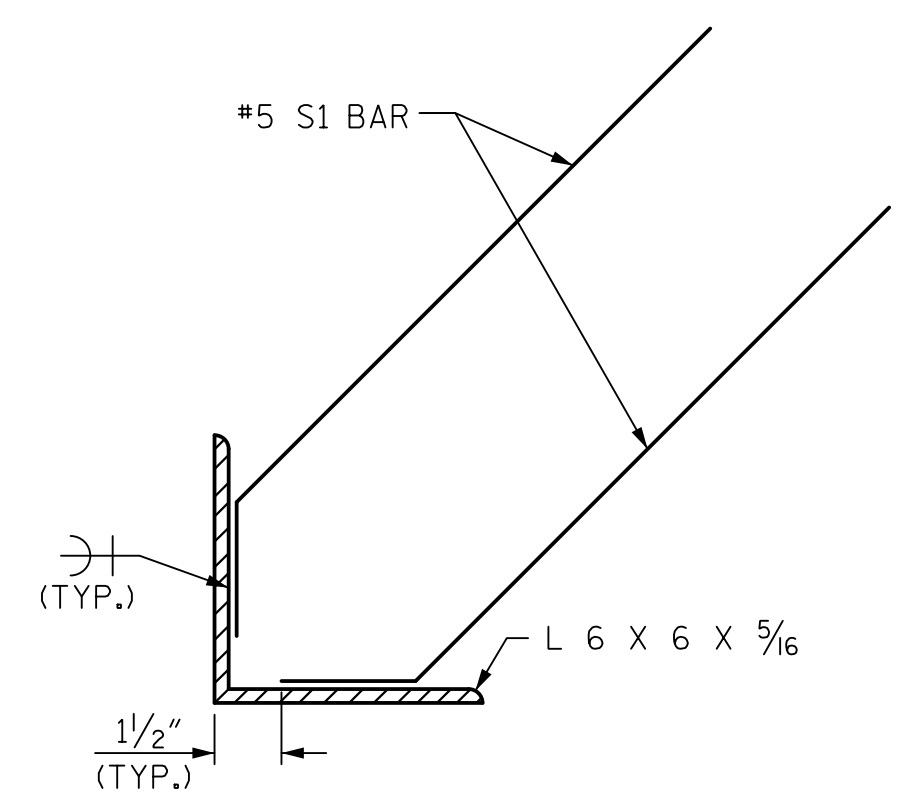


UPPER PANEL



BOTTOM PANEL

SECTION THROUGH PRECAST PANELS



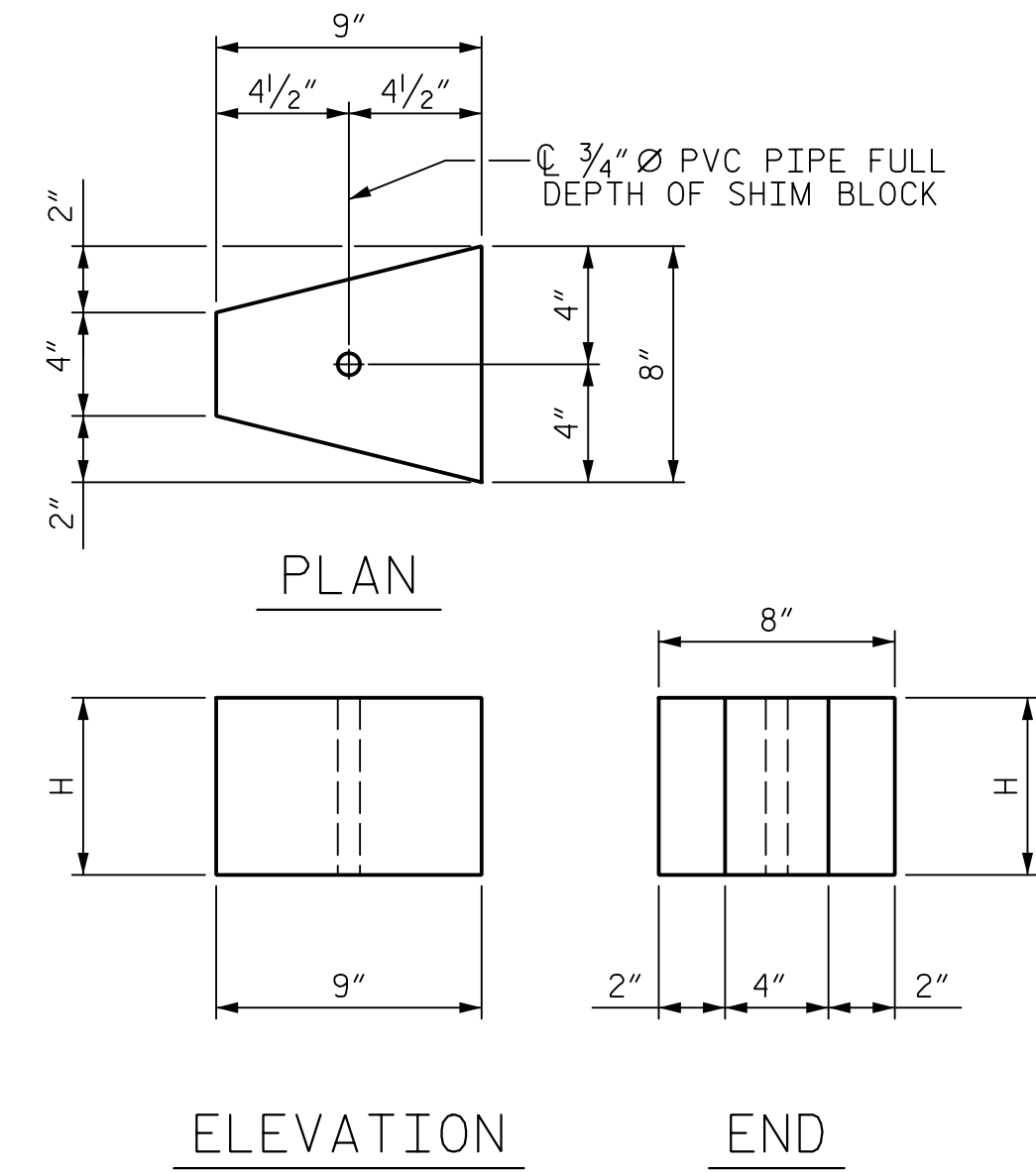
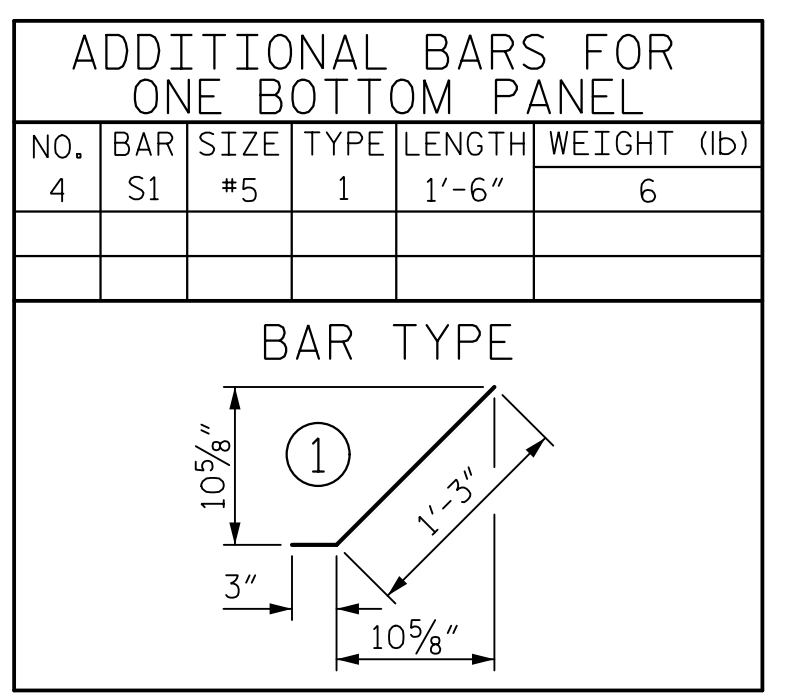
DETAIL "B"

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

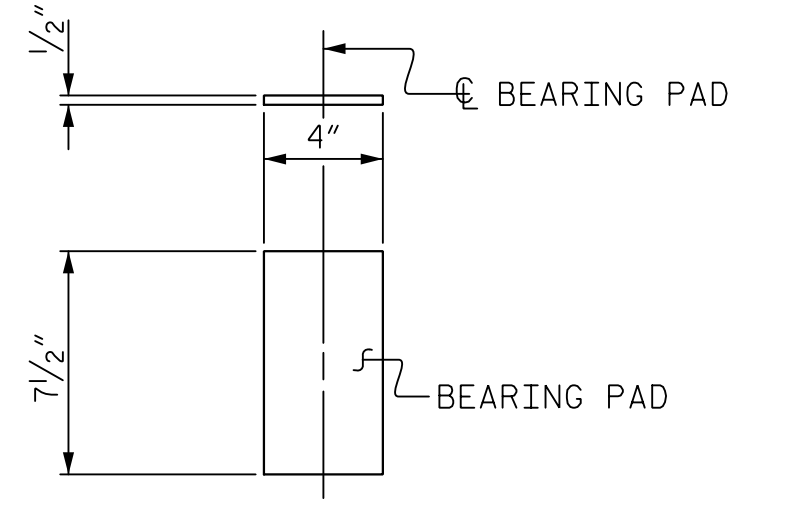
QUANTITIES FOR ONE PRECAST PANEL (FOR 15'-0" PILE SPACING)

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



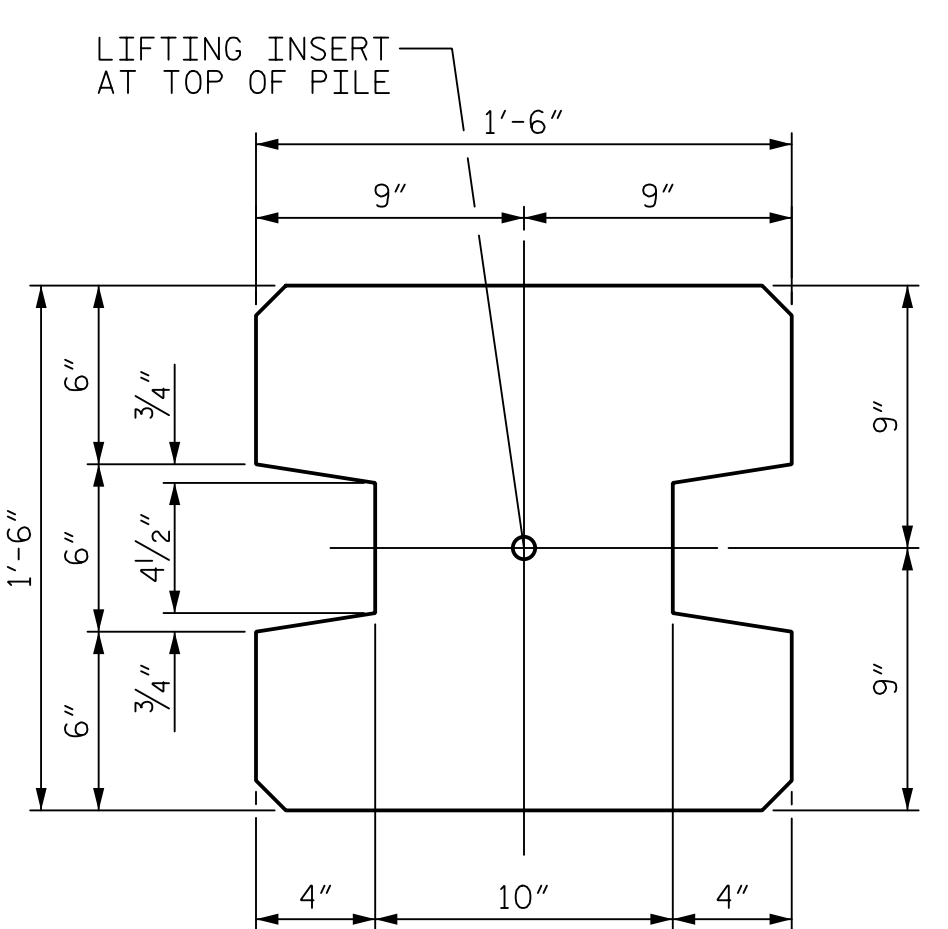
CONCRETE SHIM BLOCK

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

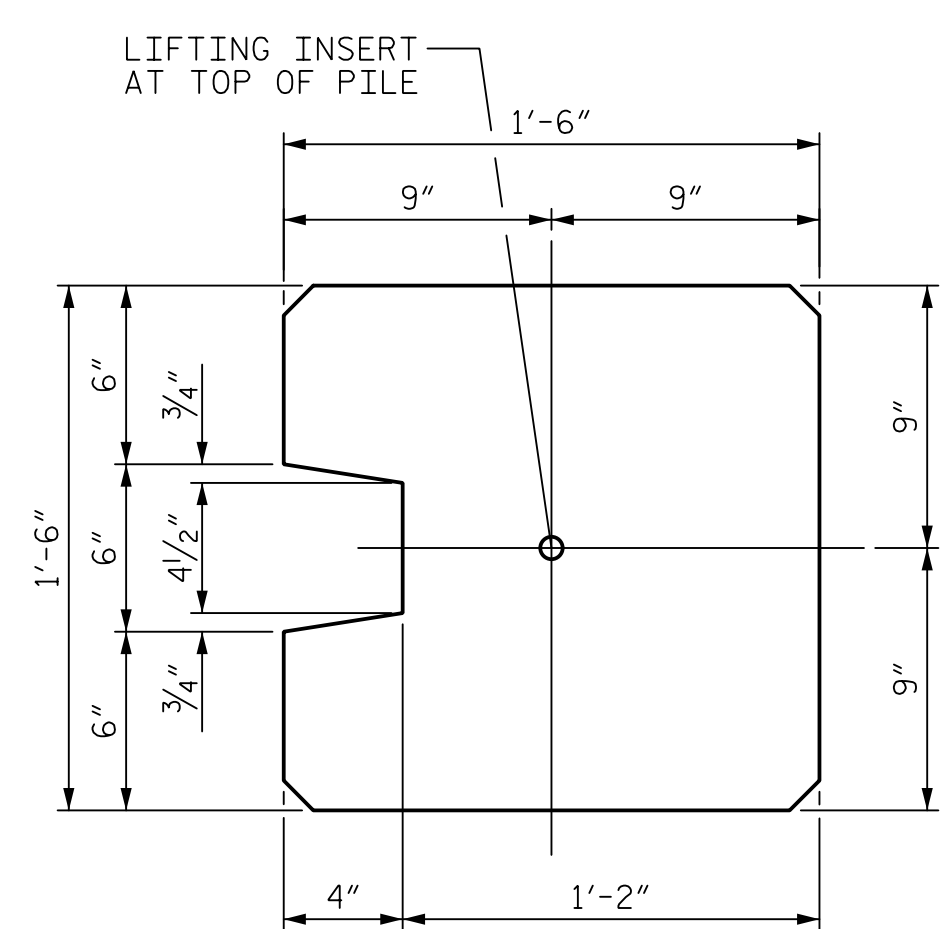


ELASTOMERIC BEARING DETAILS

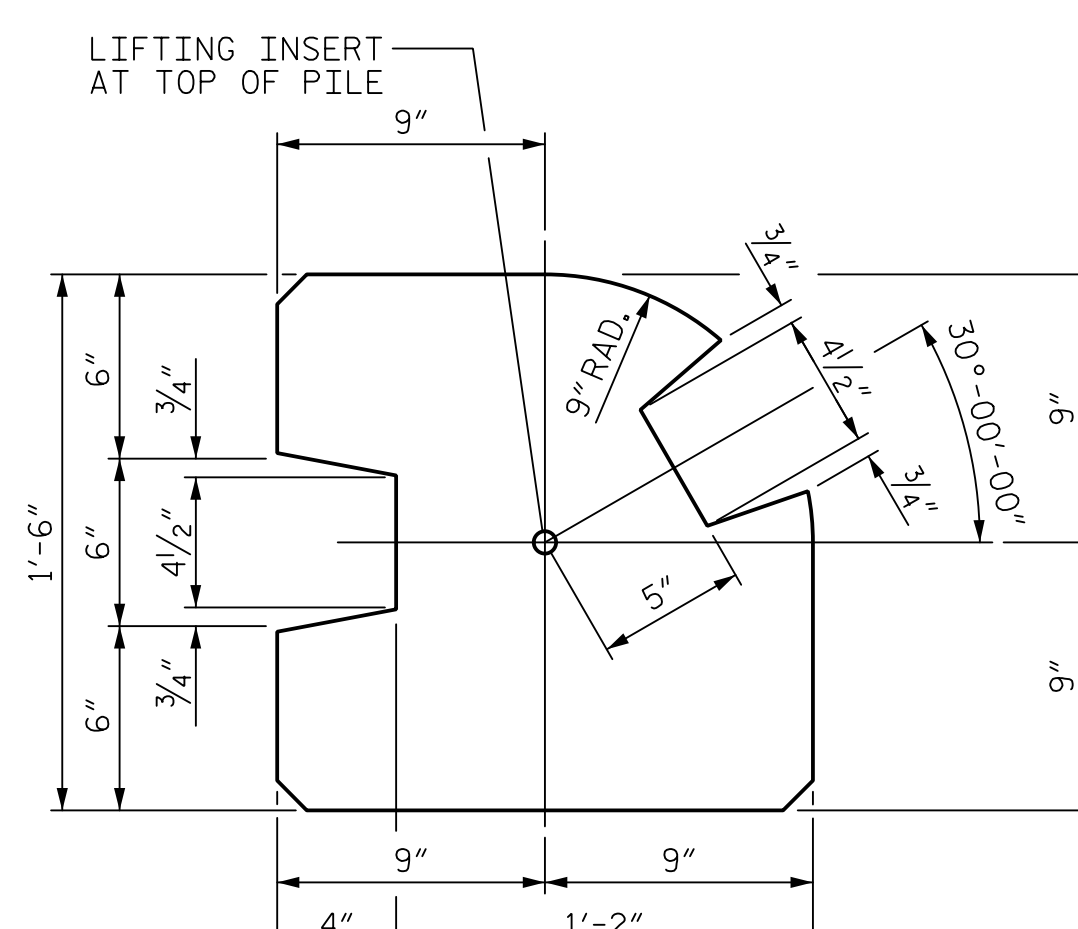
ELASTOMER IN BEARINGS SHALL BE 50 DUROMETER HARDNESS.



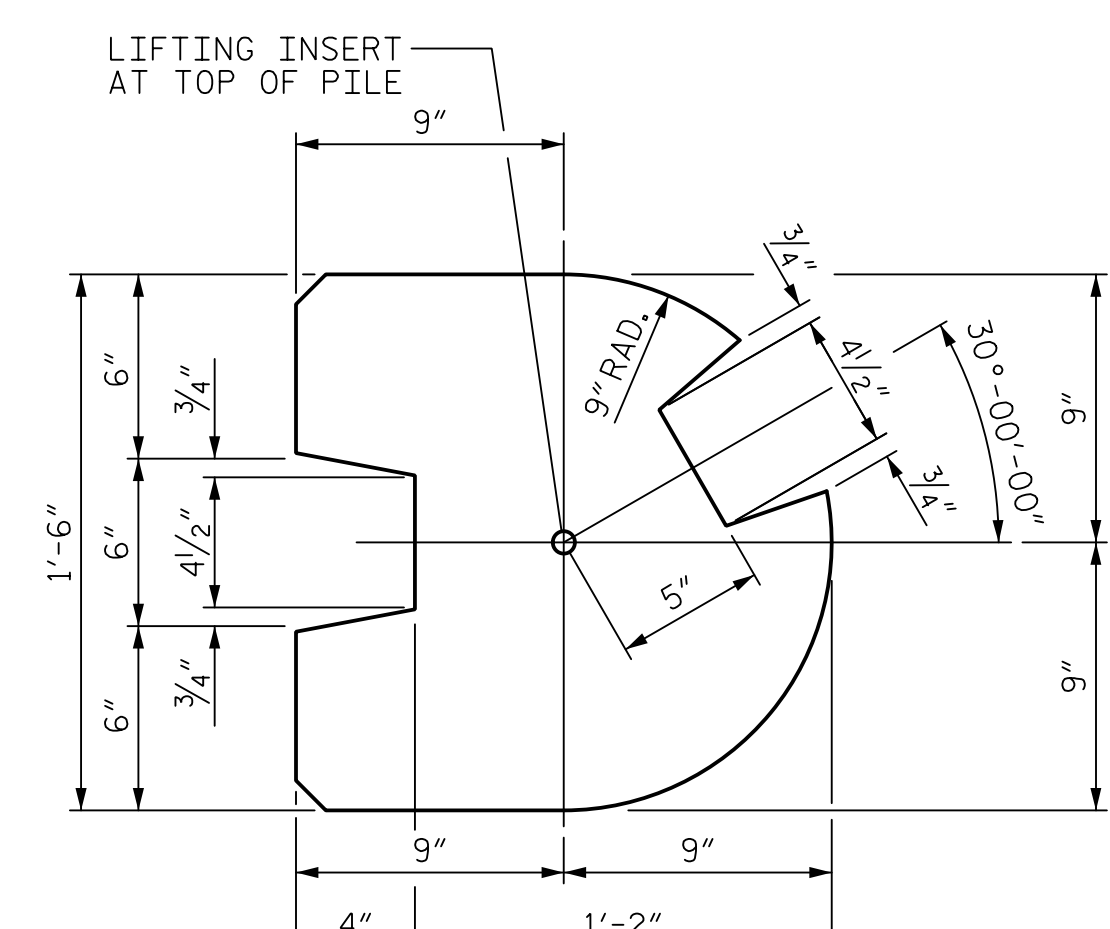
TYPE - I (AREA = 1.9444 SQ. FT.)



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



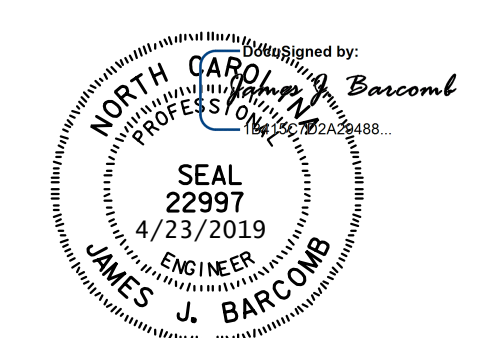
TYPE - III (AREA = 1.8336 SQ. FT.)



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

PILE DETAIL

(ALL CORNERS TO BE CHAMFERED 1")



PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: 910+99.92 -WBL- =  
10+00.00 -NW6.1-

SHEET 2 OF 4

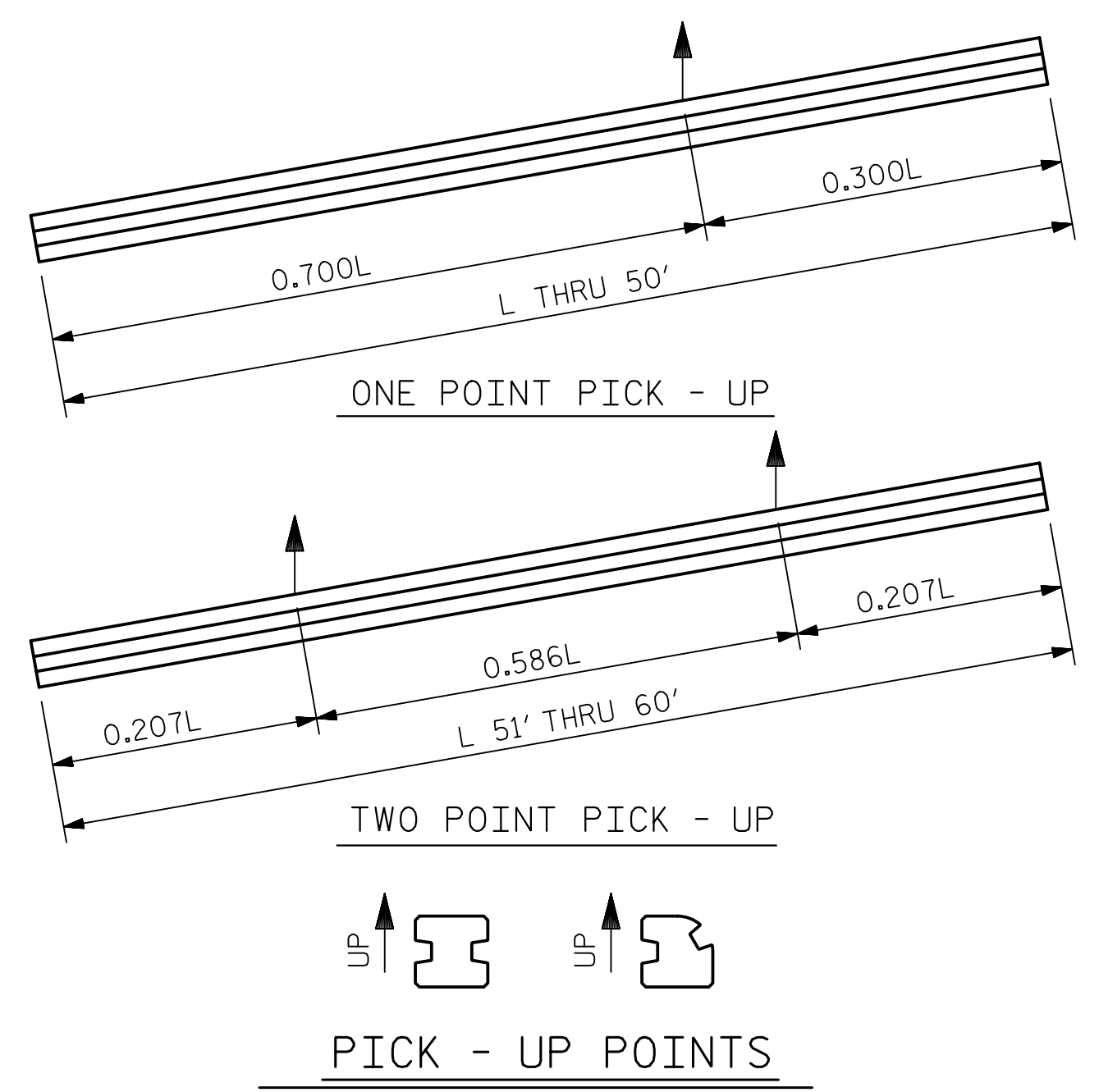
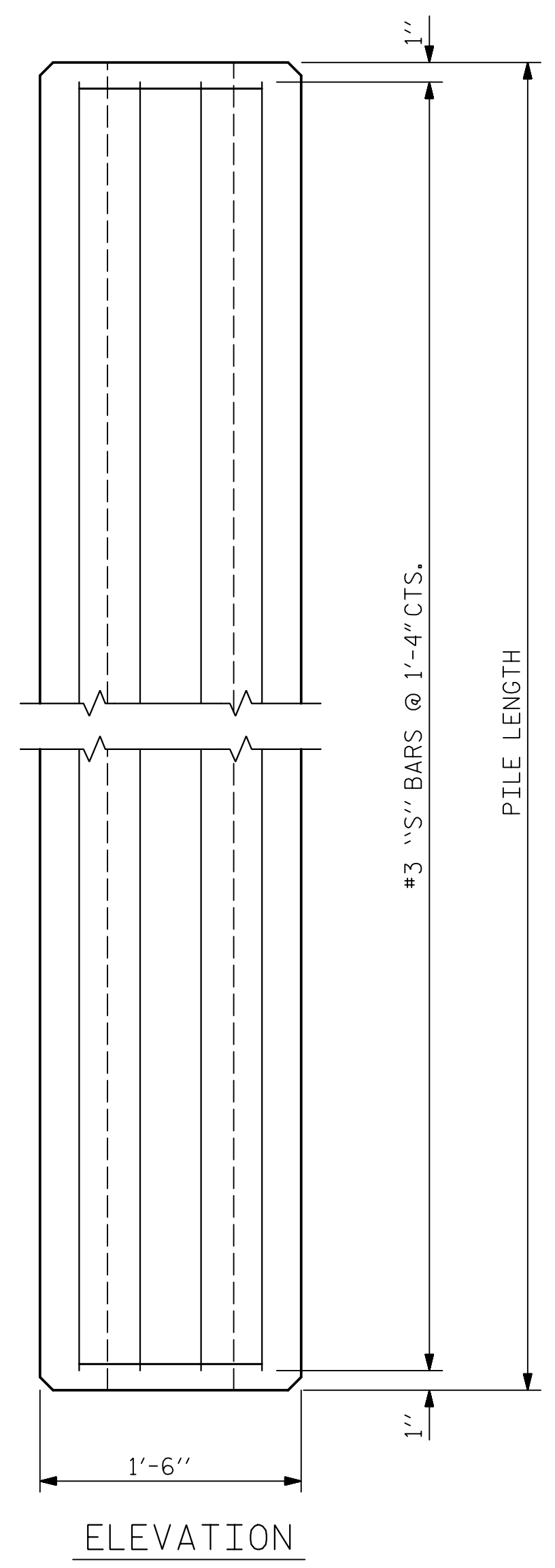
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SOUND BARRIER WALL  
 DETAILS  
 No. -NW6.1-

ASSEMBLED BY : M. WRIGHT	DATE : 4/19
CHECKED BY : J. BARCOMB	DATE : 4/19
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

<b>HNTB</b>		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 : 4/19	DWG. NO. : 2	
CHECKED BY : J. BARCOMB	DATE : 4/19		
DESIGN ENGINEER OF RECORD : J. BARCOMB	DATE : 4/19		

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

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QUANTITIES FOR ONE PRECAST CONCRETE PILE

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"

NOTES

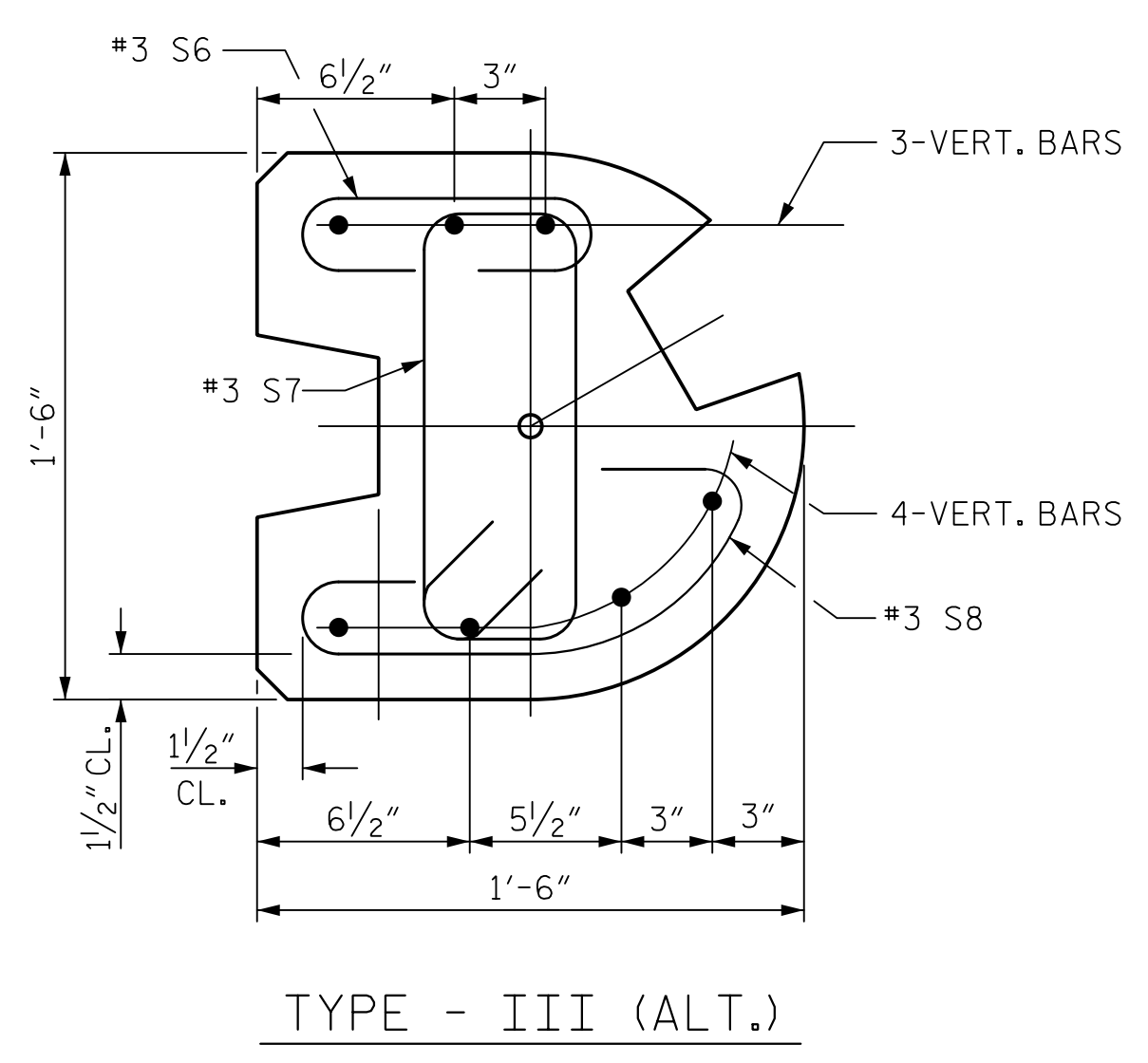
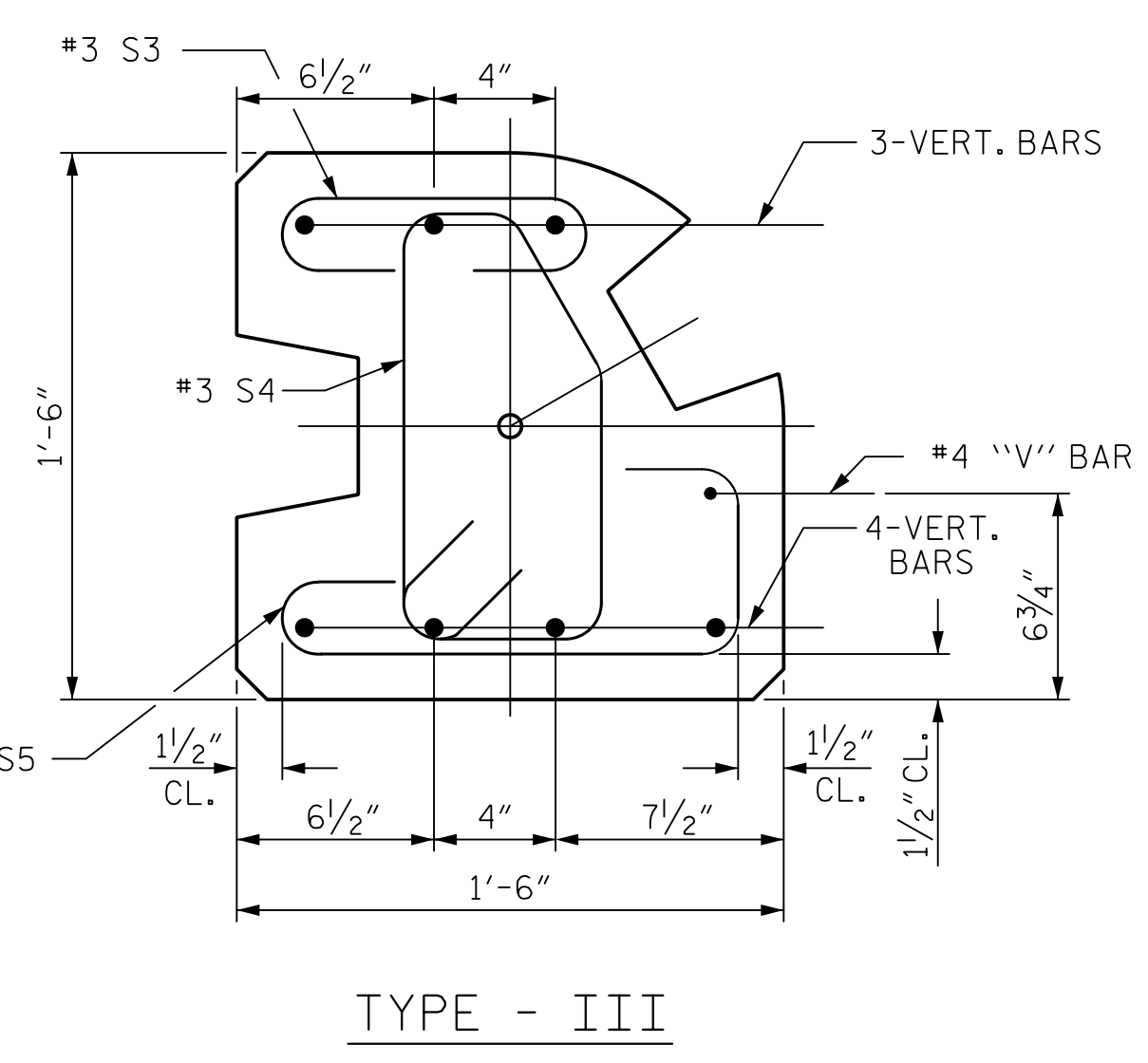
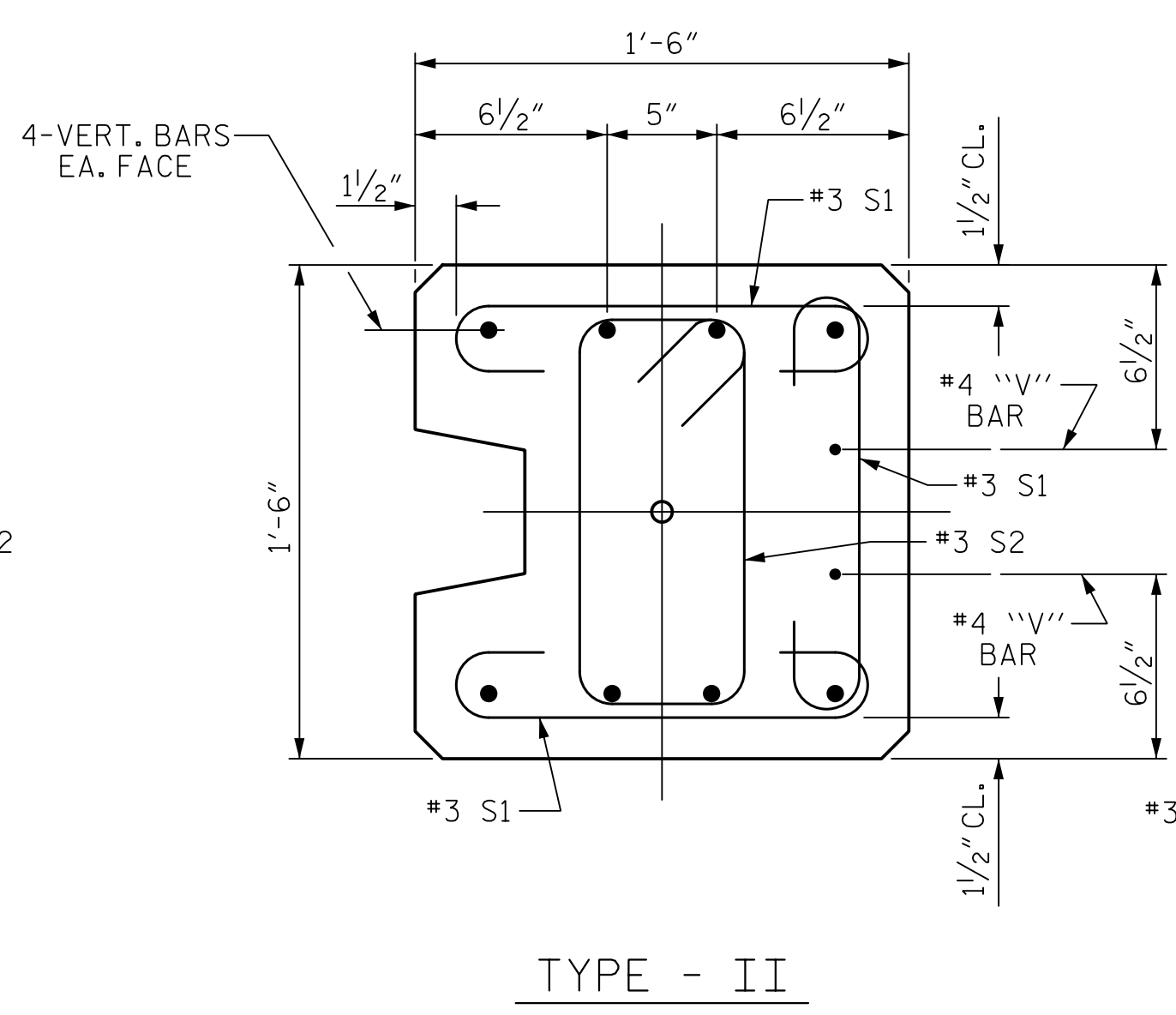
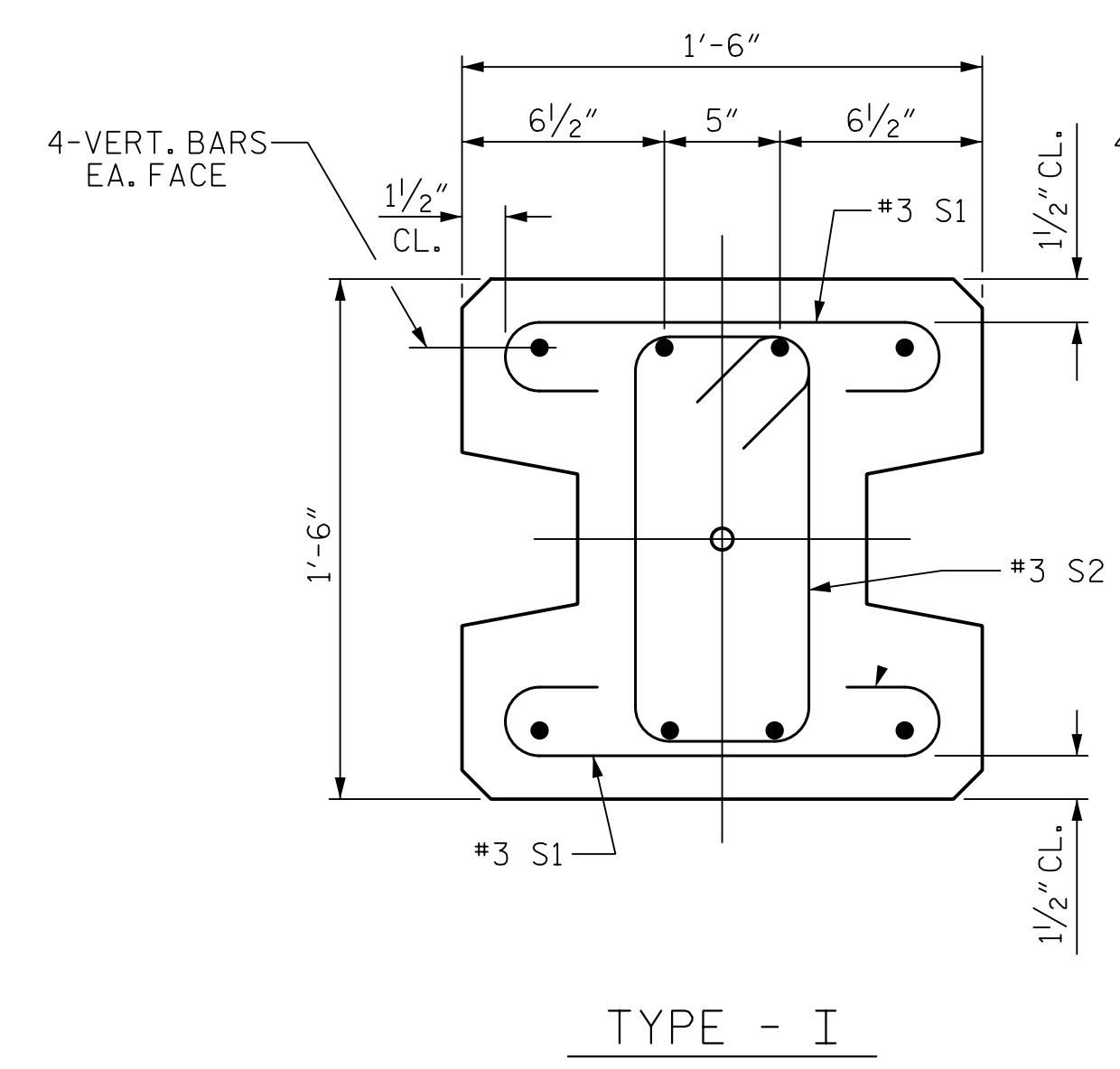
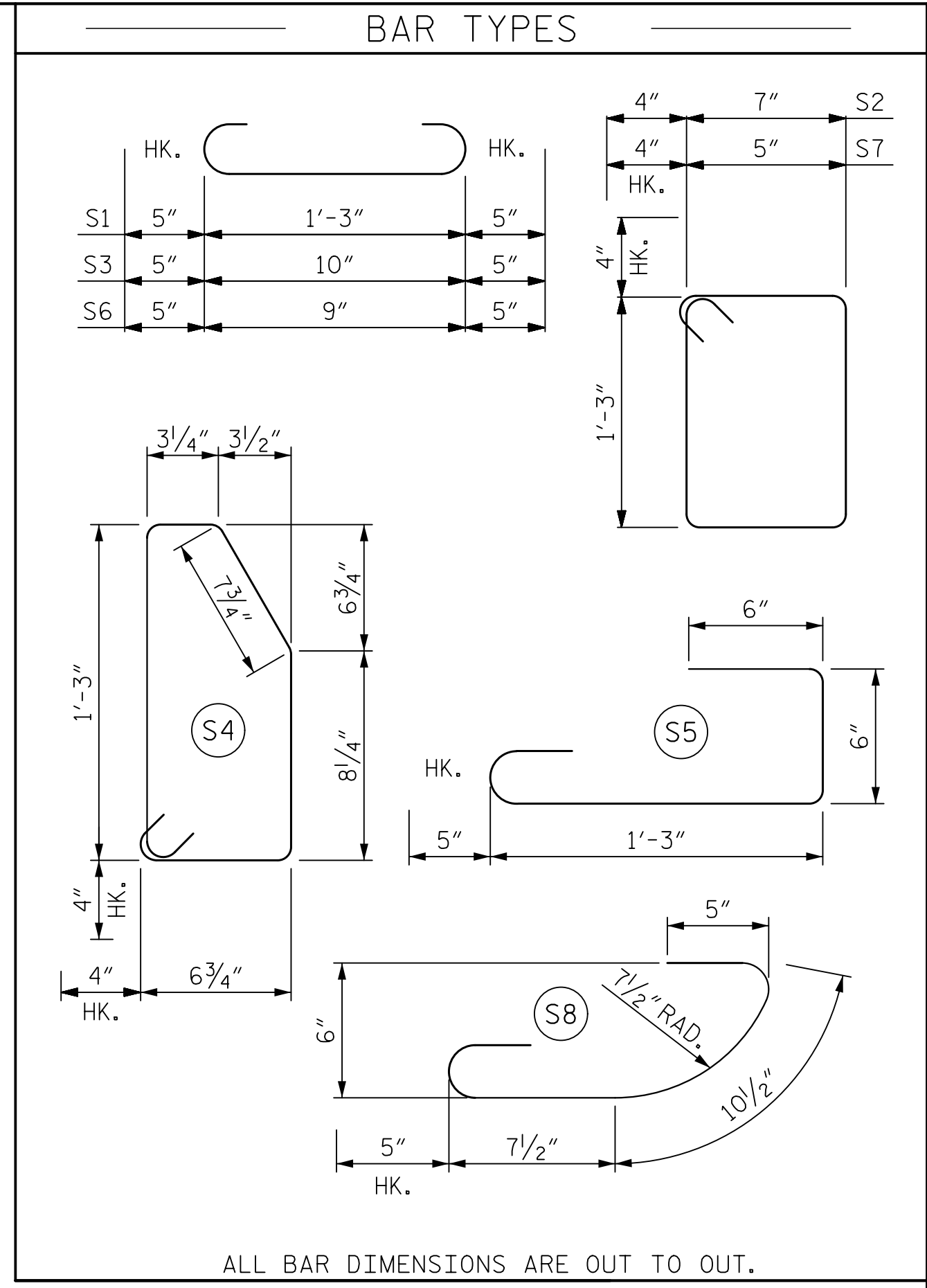
CONCRETE DESIGN DATA :  $f'c = 5,000$  PSI

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.

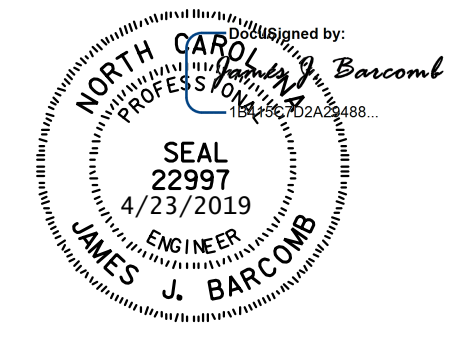
THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

ALL CORNERS TO BE CHAMFERED 1".



PILE DETAIL

FOR VERTICAL BAR PILE REINFORCING, SEE SHEET 1 OF 3



PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: 910+99.92 -WBL- =  
10+00.00 -NW6.1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SOUND BARRIER WALL  
 DETAILS  
 No. -NW6.1-

ASSEMBLED BY : M. WRIGHT DATE : 4/19  
 CHECKED BY : J. BARCOMB DATE : 4/19  
 DRAWN BY : MAA 6/11 REV. 1/15/14 RWW/TMG  
 CHECKED BY : GM 6/11 REV. 12/17 MAA/THC

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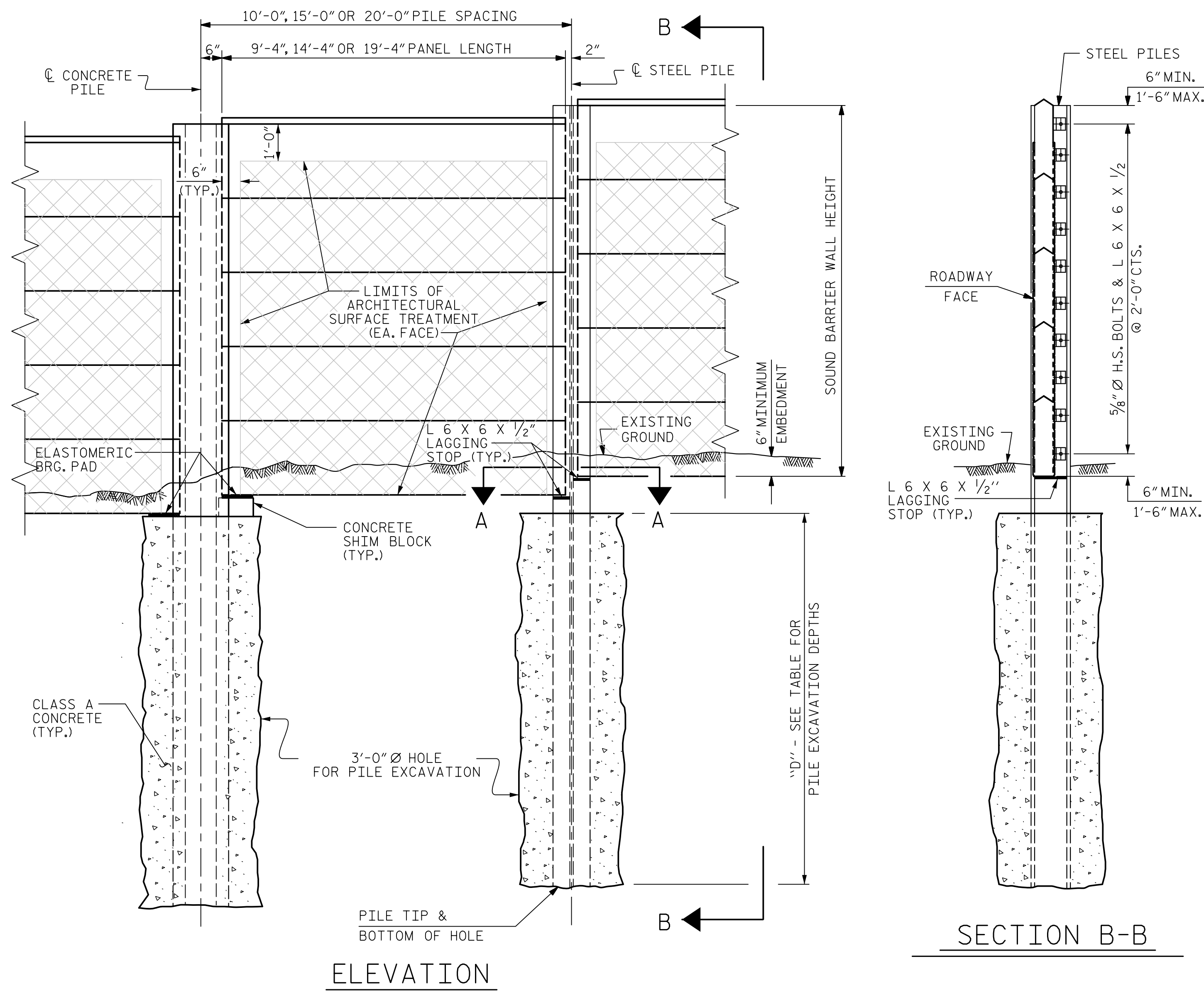
DRAWN BY : M. WRIGHT DATE : 4/19  
 CHECKED BY : J. BARCOMB DATE : 4/19  
 DESIGN ENGINEER OF RECORD : J. BARCOMB DATE : 4/19

DWG. NO. 3

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

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 UNLESS ALL SIGNATURES COMPLETED





PILE EXCAVATION DEPTH "D"					
WALL -NW6.1-		AT: STA. 11+81.29			
3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
		H ≤ 15'	10'	12'	13'
		15' < H ≤ 20'	11'	13'	16'
20'-0"	12'	15'	18'		

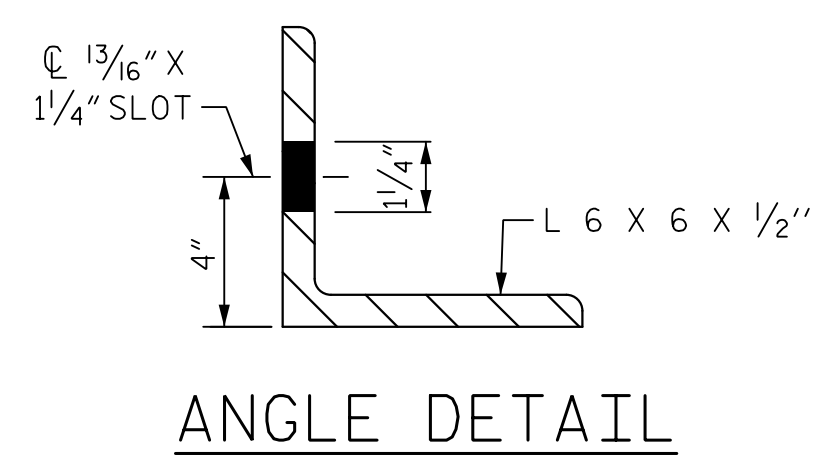
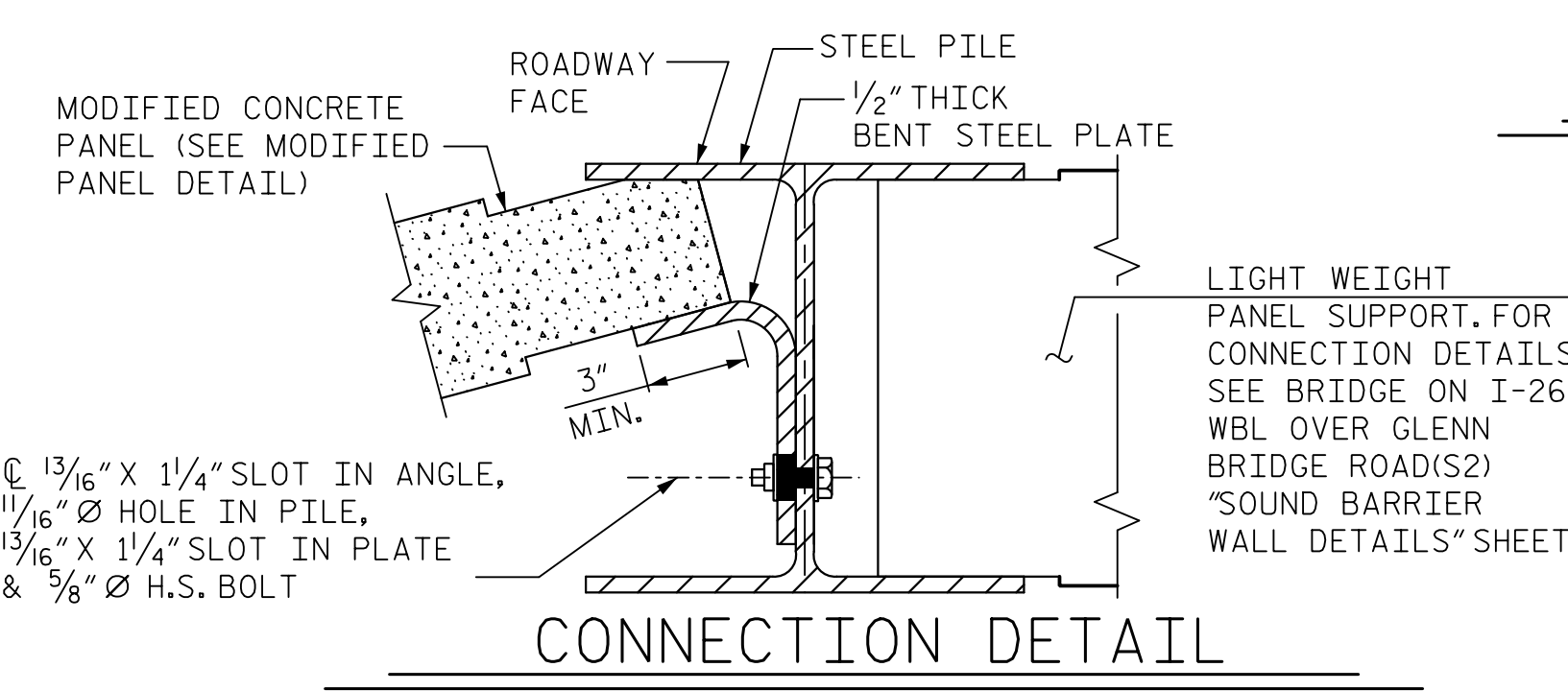
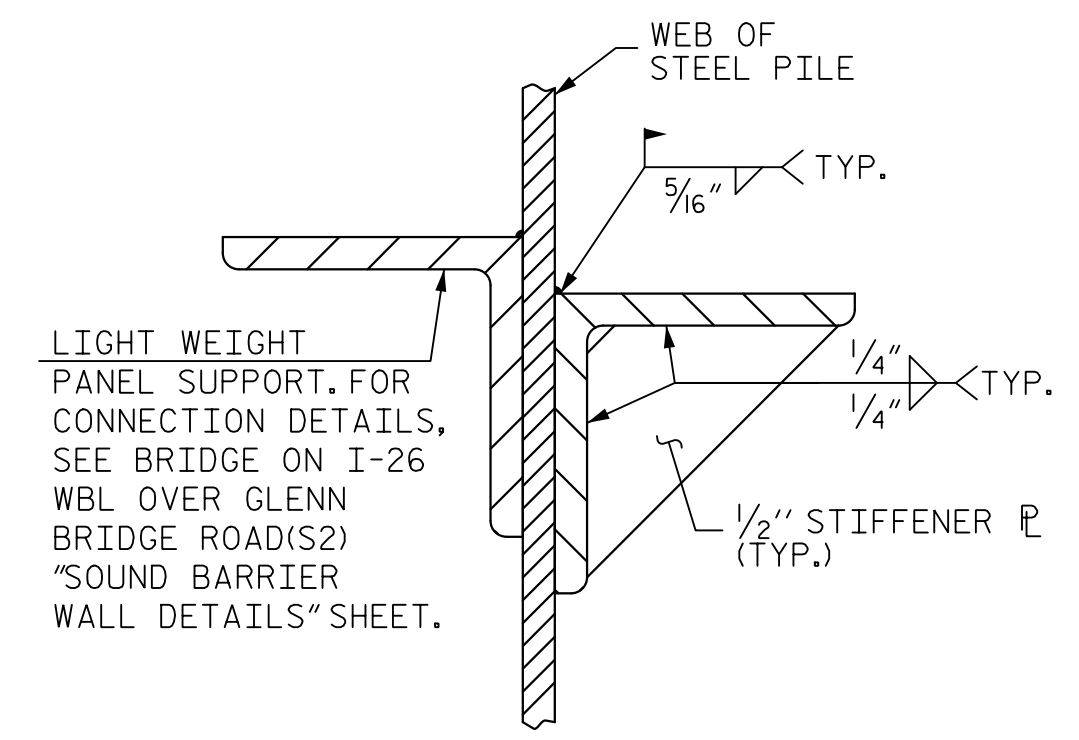
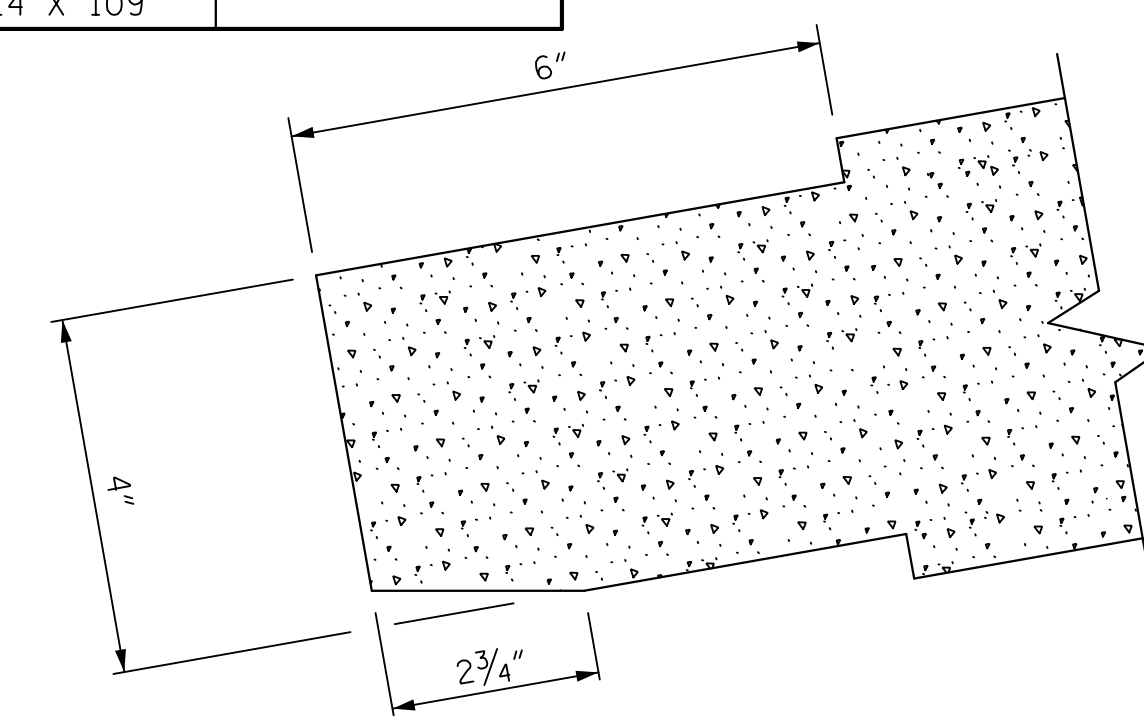
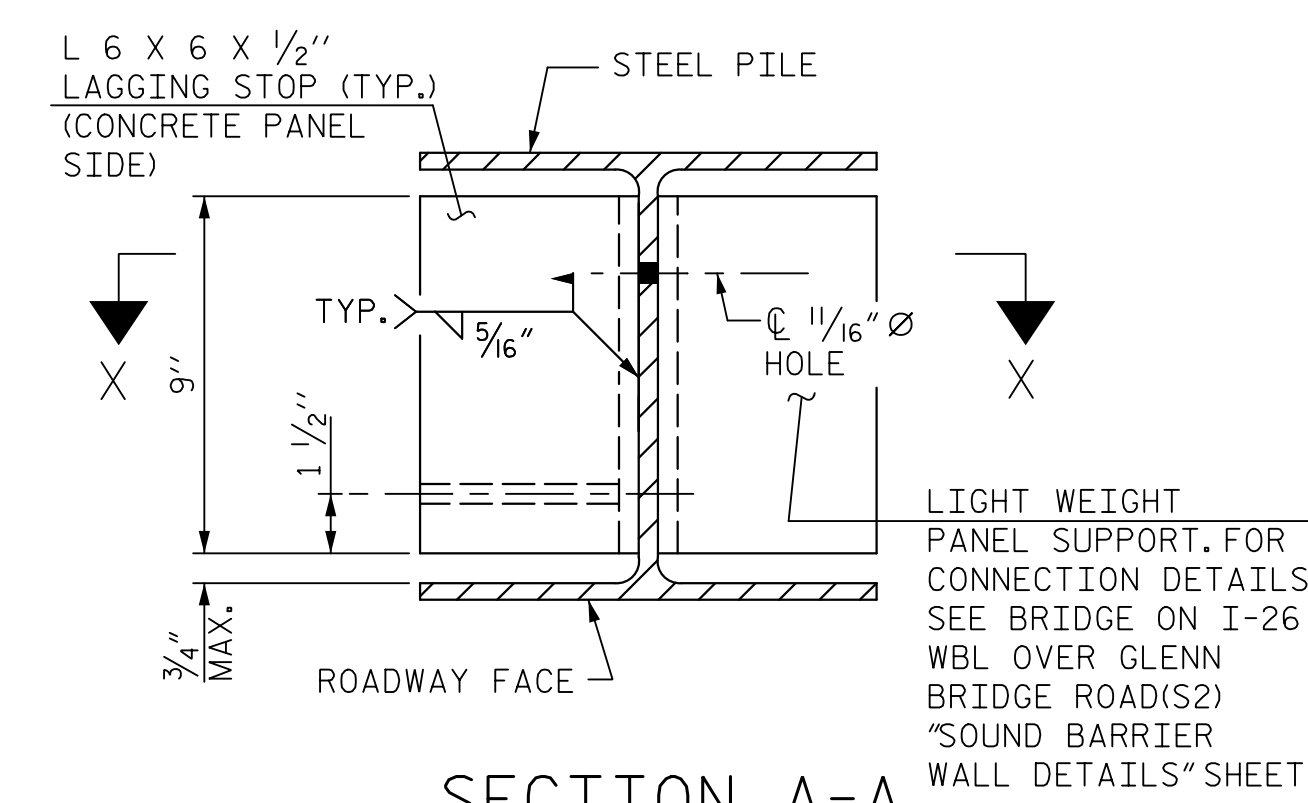
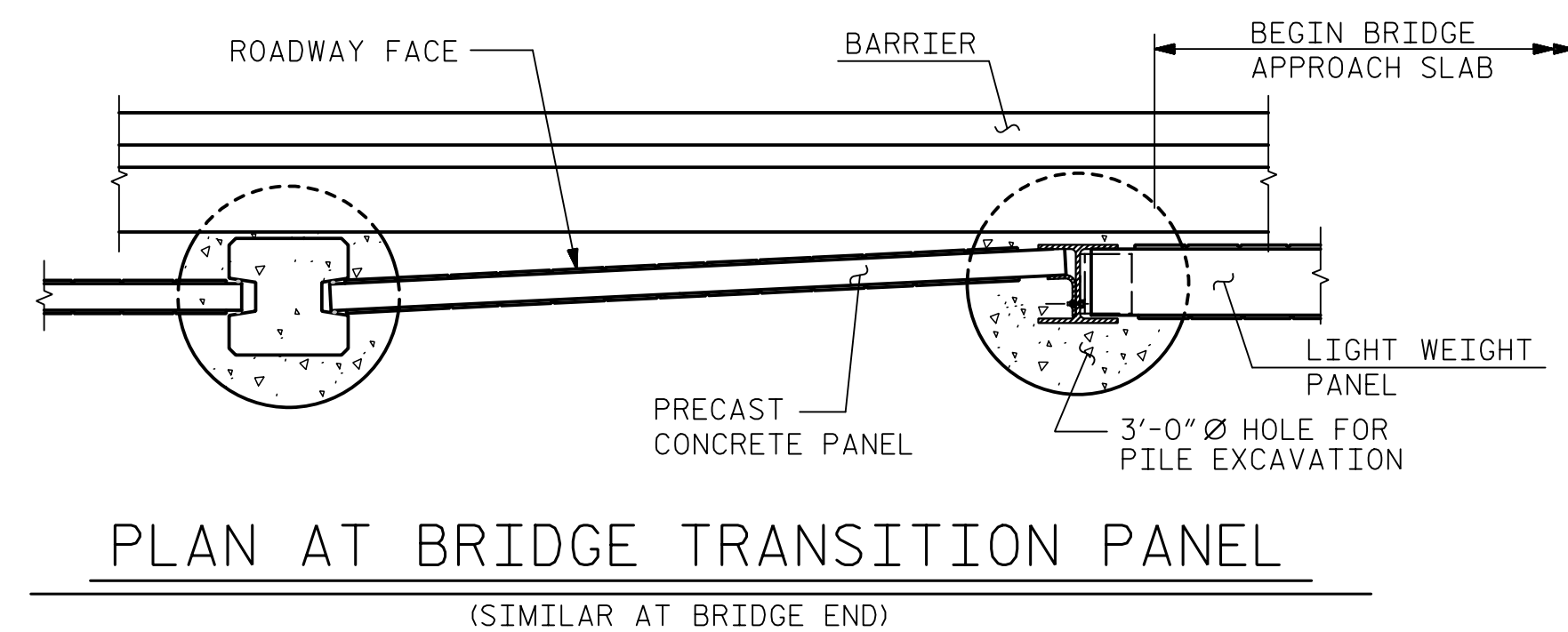
  

WALL -NW6.1-		AT: STA. 13+32.71			
3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT			
		H ≤ 15'	10'	12'	13'
		15' < H ≤ 20'	11'	13'	16'
20'-0"	12'	15'	18'		

STEEL PILES DESIGN WIND PRESSURE = 40 PSF			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	MINIMUM W SIZE STEEL PILES	MINIMUM HP SIZE STEEL PILES
10'-0"	H ≤ 15'	W 12 X 40 W 14 X 48	HP 12 X 53 HP 14 X 73
	15' < H ≤ 20'	W 12 X 45 W 14 X 48	HP 12 X 53 HP 14 X 73
	20' < H ≤ 25'	W 12 X 65 W 14 X 61	HP 12 X 53 HP 14 X 73
15'-0"	H ≤ 15'	W 12 X 87 W 14 X 90	HP 14 X 73
	15' < H ≤ 20'	W 12 X 53 W 14 X 61	HP 12 X 53 HP 14 X 73
	20' < H ≤ 25'	W 12 X 72 W 14 X 90	HP 12 X 74 HP 14 X 73
20'-0"	H ≤ 15'	W 12 X 120 W 14 X 90	HP 14 X 89
	15' < H ≤ 20'	W 12 X 58 W 14 X 61	HP 12 X 63 HP 14 X 73
	20' < H ≤ 25'	W 12 X 96 W 14 X 90	HP 14 X 89
	25' < H ≤ 29'	W 12 X 152 W 14 X 109	HP 14 X 117

**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.
- USE STEEL PILES, ANGLES, AND LAGGING STOPS MEETING THE REQUIREMENTS OF AASHTO M270, GRADE 50. GALVANIZE ALL STEEL COMPONENTS INCLUDING PILES, ANGLES, LAGGING STOPS, BOLTS, NUTS, AND WASHERS IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. REPAIR ANY DAMAGED GALVANIZATION IN ACCORDANCE WITH ARTICLE 1076-7 OF THE STANDARD SPECIFICATIONS.
- VERIFY THE LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING HOLES TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.
- AT THE CONTRACTOR'S OPTION, USE AN APPROVED NON-SHRINK NON-METALLIC GROUT BETWEEN THE FLANGES OF THE STEEL PILES TO SUPPORT THE BOTTOM PANEL IN LIEU OF LAGGING STOPS.
- 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.
- PROVIDE PLATES AND ANGLES TO SECURE PANELS 6" LONG AS MEASURED ALONG THE STEEL PILE.
- AT THE CONTRACTOR'S OPTION, USE EITHER 'W' OR 'HP' PILES THAT SATISFY THE MINIMUM PILE SIZE REQUIRED IN THE "STEEL PILES" TABLE. PILES SMALLER THAN W12 OR HP12 ARE NOT PERMITTED. AT TURNS WITH A 3'-0" DIAMETER HOLE FOR PILE EXCAVATION, USE ONLY W12 OR HP12 PILES, AS SHOWN.
- AT THE CONTRACTOR'S OPTION, USE 10'-0", 15'-0", OR 20'-0" PILE SPACINGS, AND EITHER 2'-6" OR 3'-0" DIAMETER HOLES FOR PILE EXCAVATION. 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.
- DO NOT SPLICE STEEL PILES.
- FOR SOUND BARRIER WALL STATIONS, OFFSETS, AND WALL ENVELOPE, SEE ROADWAY PLANS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.



**SECTION X-X**  
 PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: 910+99.92 -WBL- =  
10+00.00 -NW6.1-

**MODIFIED PANEL DETAIL**  
 (USE ONLY FOR TURNS 15° OR LESS, CONVEX TOWARD ROADWAY)

ASSEMBLED BY : M. WRIGHT DATE : 4/19  
 CHECKED BY : N. HART DATE : 4/19  
 DRAWN BY : JAD 5/01 REV. 9/26/14 MAA/THC  
 CHECKED BY : RDR 5/01 REV. 10/17 MAA/THC  
 REV. 5/18 MAA/THC

**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 M. WRIGHT DATE 4/19  
 N. HART DATE 4/19  
 J. BARCOMB DATE 4/19  
 DWG. NO. 4

SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
SOUND BARRIER WALL (STEEL PILES)					
No. -NW6.1-					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 4

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 UNLESS ALL SIGNATURES COMPLETED**