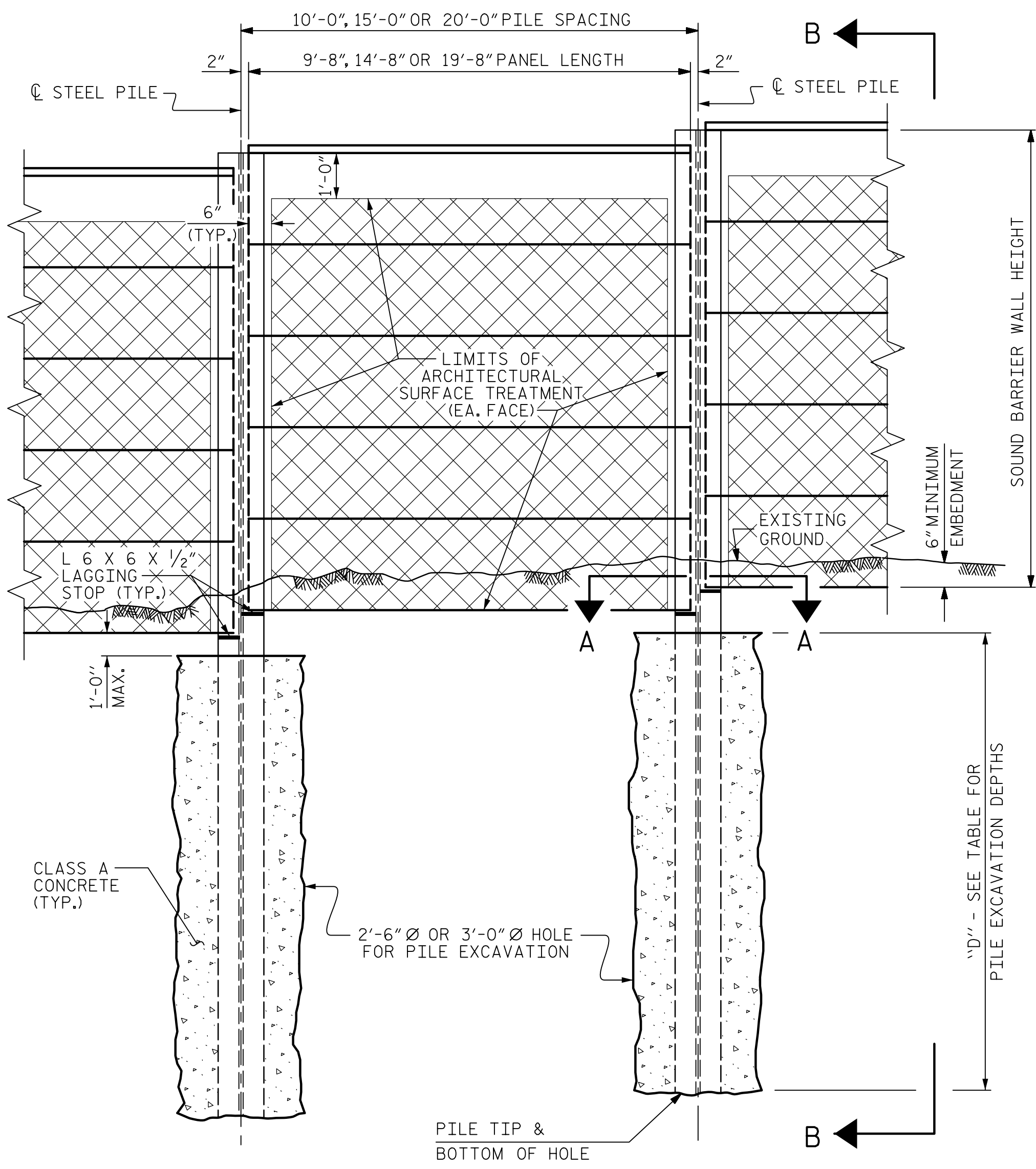


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TIME: 11:56:25 AM

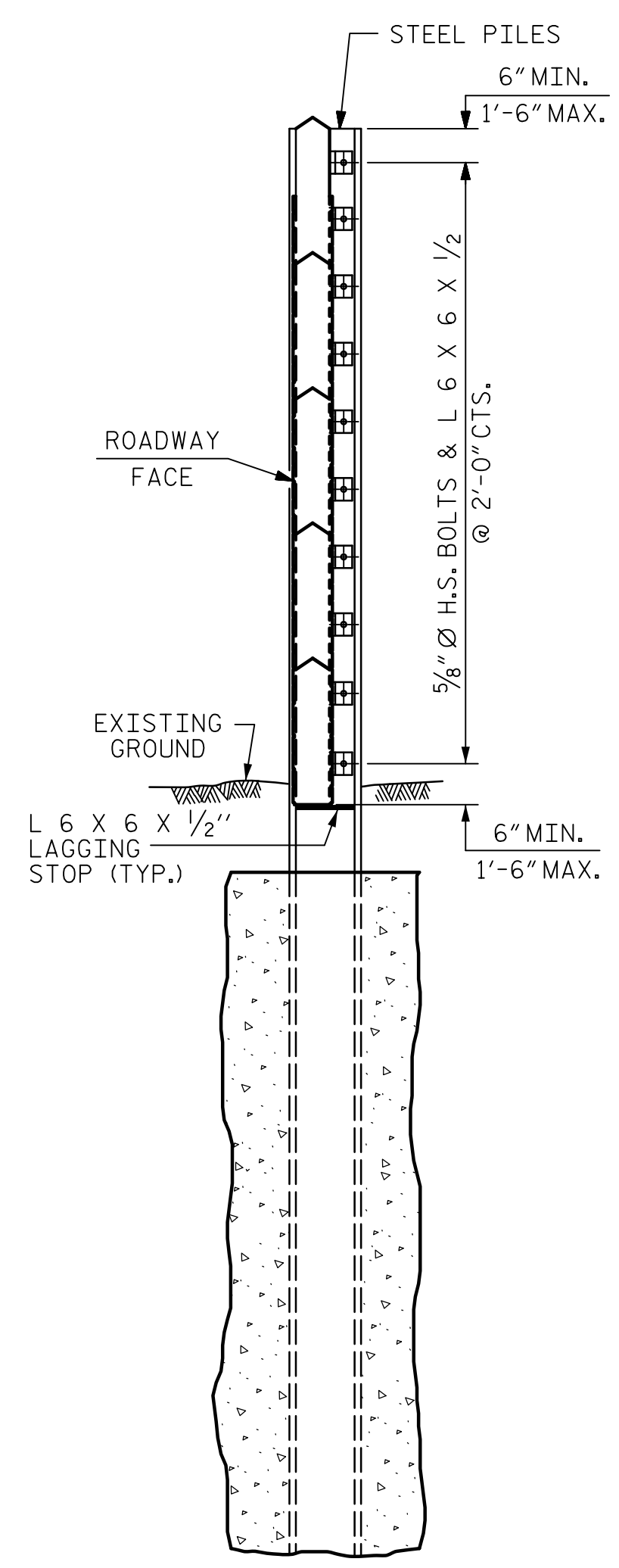
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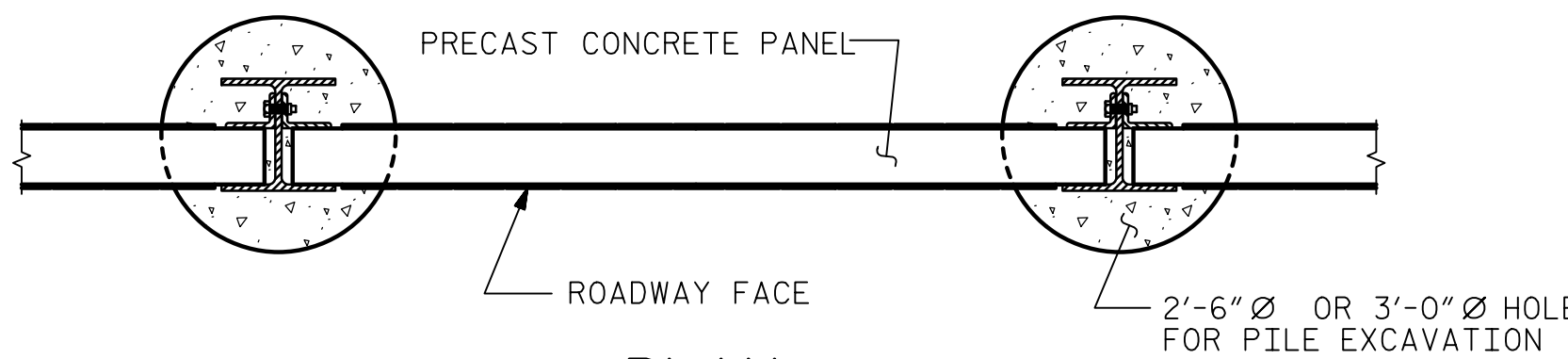
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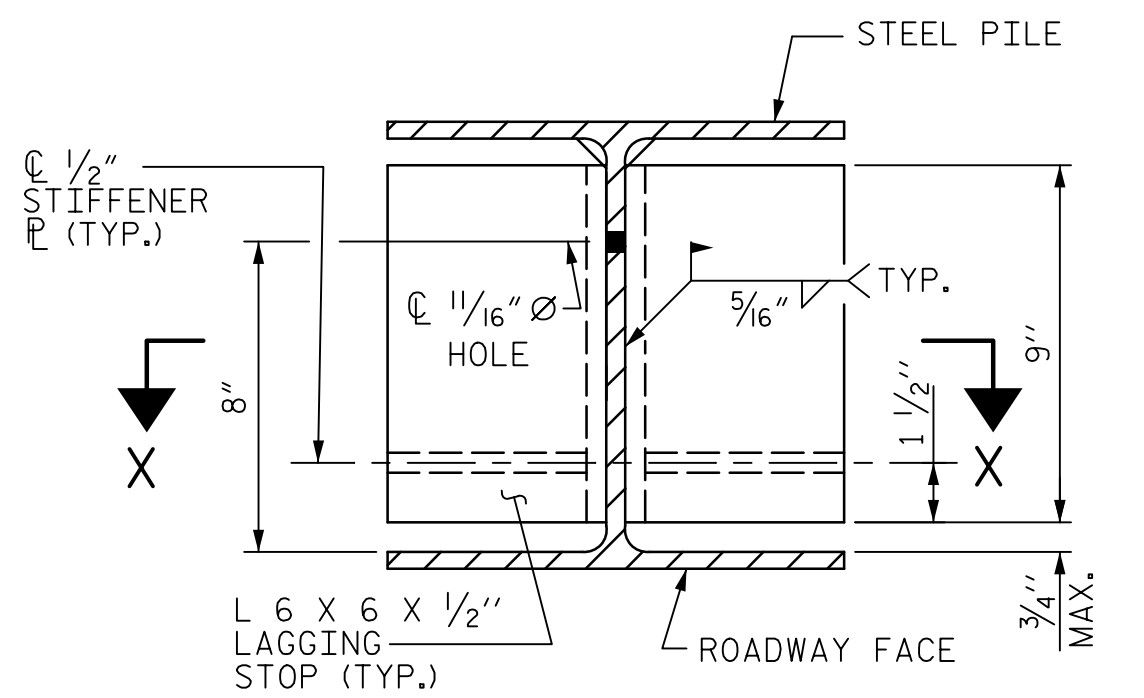
ELEVATION



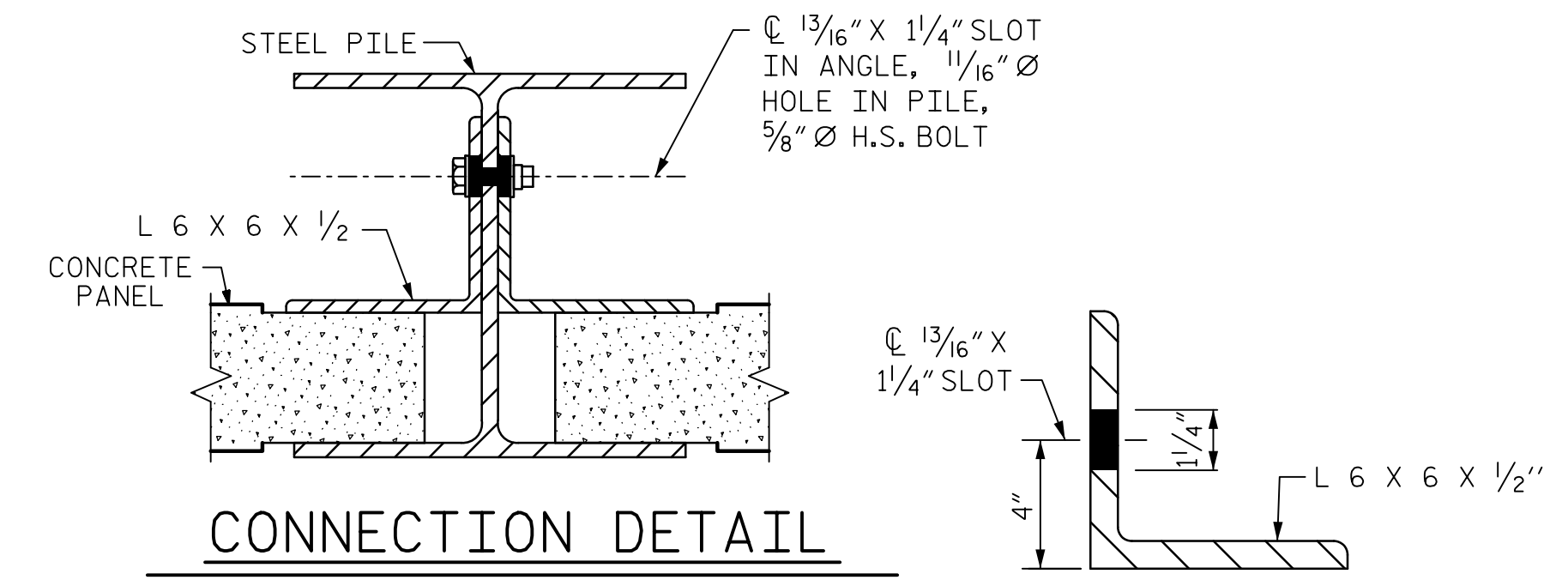
SECTION B-B



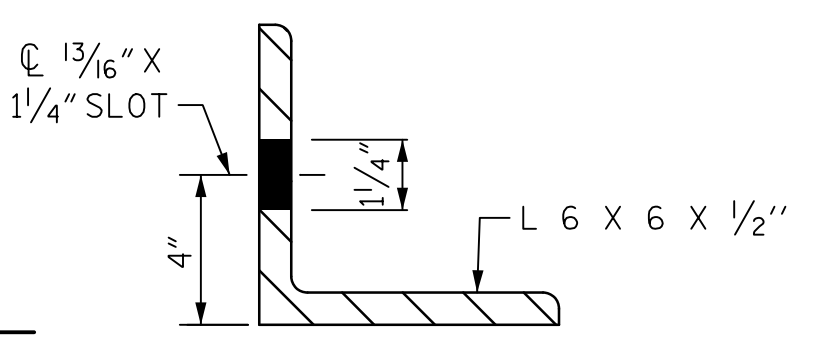
PLAN



SECTION A-A



CONNECTION DETAIL



ANGLE DETAIL

PILE EXCAVATION DEPTH "D"				
WALL #NW4	FROM : STA. 10+00.00 TO	: STA. 23+65.00		
WALL #NW6	FROM : STA. 10+00.00 TO	: STA. 13+00.00		
WALL #NW7	FROM : STA. 10+00.00 TO	: STA. 23+50.00		
3'-0" Ø HOLE	WALL HEIGHT			
	PILE SPACING	H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'
	10'-0"	10'-0"	12'-0"	13'-0"
	15'-0"	11'-0"	13'-0"	16'-0"
20'-0"	12'-0"	15'-0"	18'-0"	

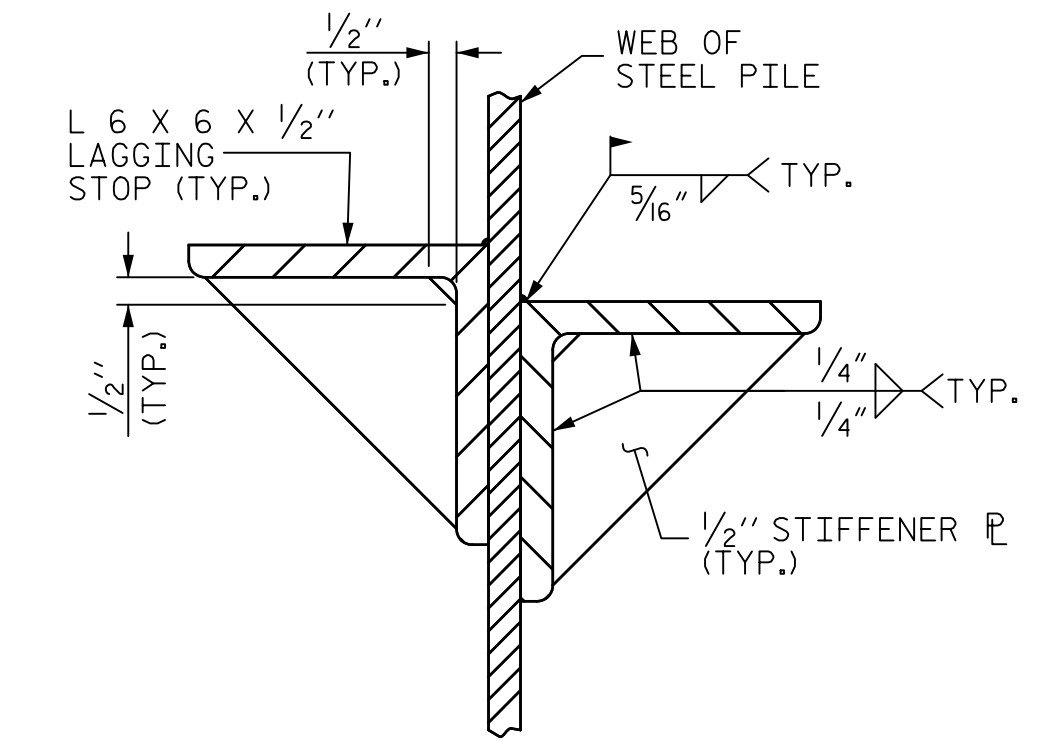
- DESIGN ASSUMPTIONS:
- GROUNDWATER BELOW BOTTOM OF HOLE
  - FRONT SLOPE/FINISHED GRADE 2:1 OR FLATTER
  - FRICTION ANGLE (φ) = 30°, COHESION (c) = 0 PSF, UNIT WEIGHT = 120 PCF
  - PILE SPACING < 20 FT
  - WALL HEIGHT < 25 FT

BILL OF MATERIAL	
SOUND BARRIER WALL #NW4	25,785 S.F.
ARCHITECTURAL SURFACE TREATMENT #NW4	45,382 S.F.
SOUND BARRIER WALL #NW6	4,845 S.F.
ARCHITECTURAL SURFACE TREATMENT #NW6	8,450 S.F.
SOUND BARRIER WALL #NW7	17,625 S.F.
ARCHITECTURAL SURFACE TREATMENT #NW7	30,210 S.F.
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	
ARCHITECTURAL SURFACE TREATMENT	
TEXTURE OPTION:	BUSHMILL HAMMER
STAIN OPTION:	GRAY, TO MATCH EXISTING

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
	25' < H ≤ 29'	W 12 X 87 W 14 X 90	HP 14 X 73
15'-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 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
	25' < H ≤ 29'	W 12 X 120 W 14 X 90	HP 14 X 89
20'-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 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. 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. U-5748  
WAKE COUNTY  
STATION: 24+88.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
SOUND BARRIER WALL  
(STEEL PILES)

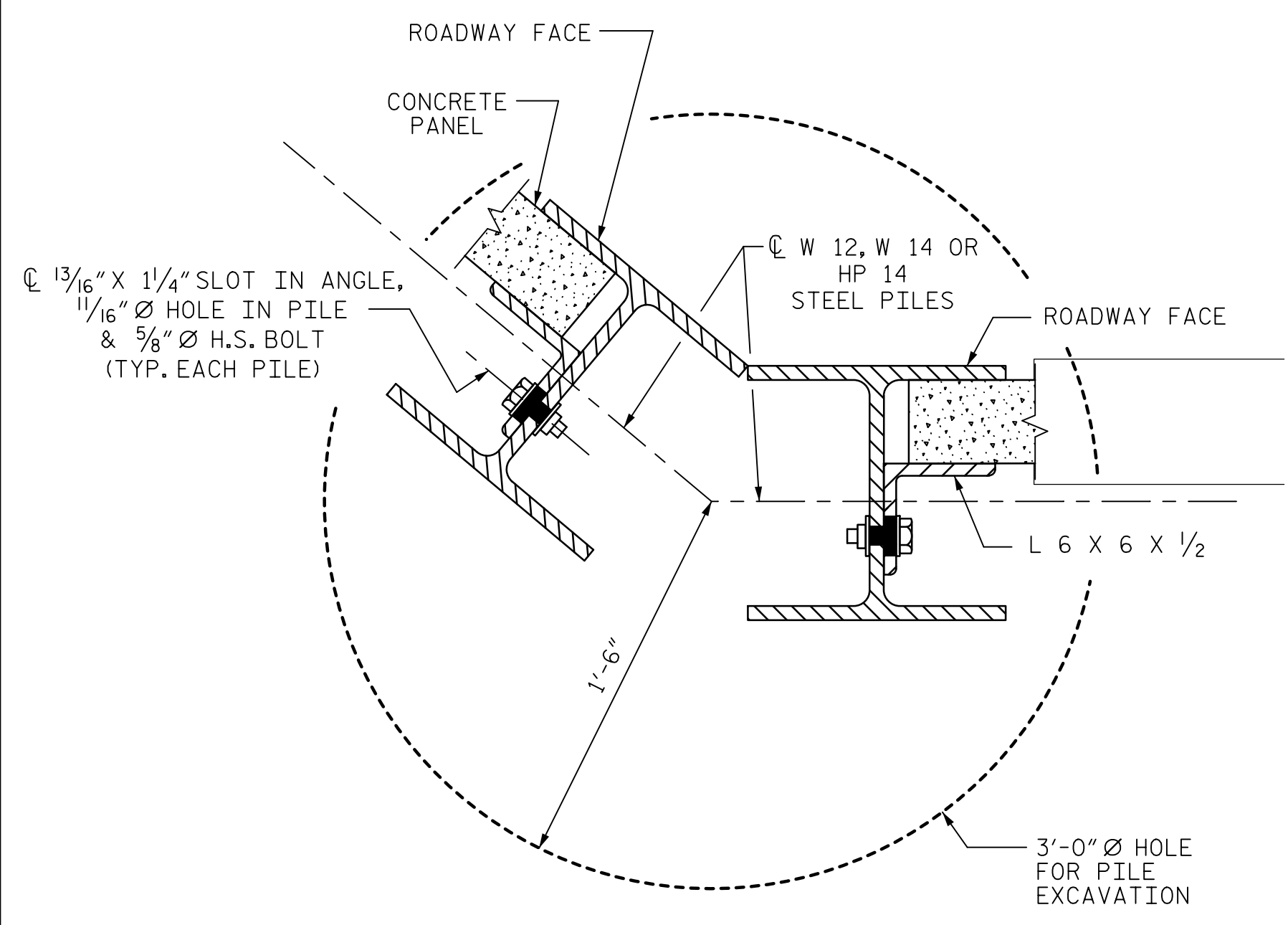
ASSEMBLED BY : M. CATER	DATE : 01/22
CHECKED BY : J.C. MORRISON	DATE : 01/22
DRAWN BY : JAD 5/01	REV. 9/26/14 MAA/TMG
CHECKED BY : RDR 5/01	REV. 10/17 MAA/THC
	REV. 5/18 MAA/THC

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

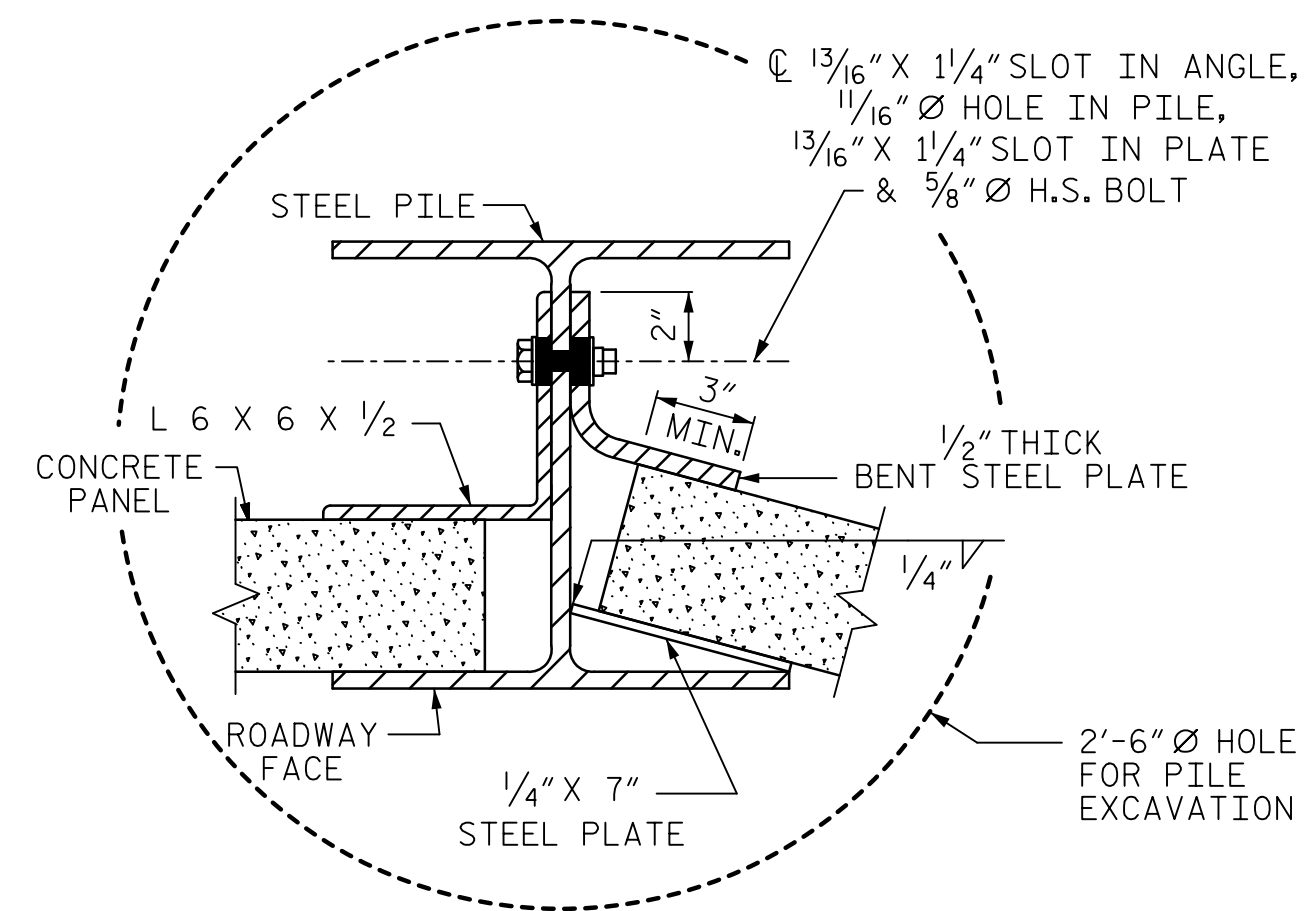
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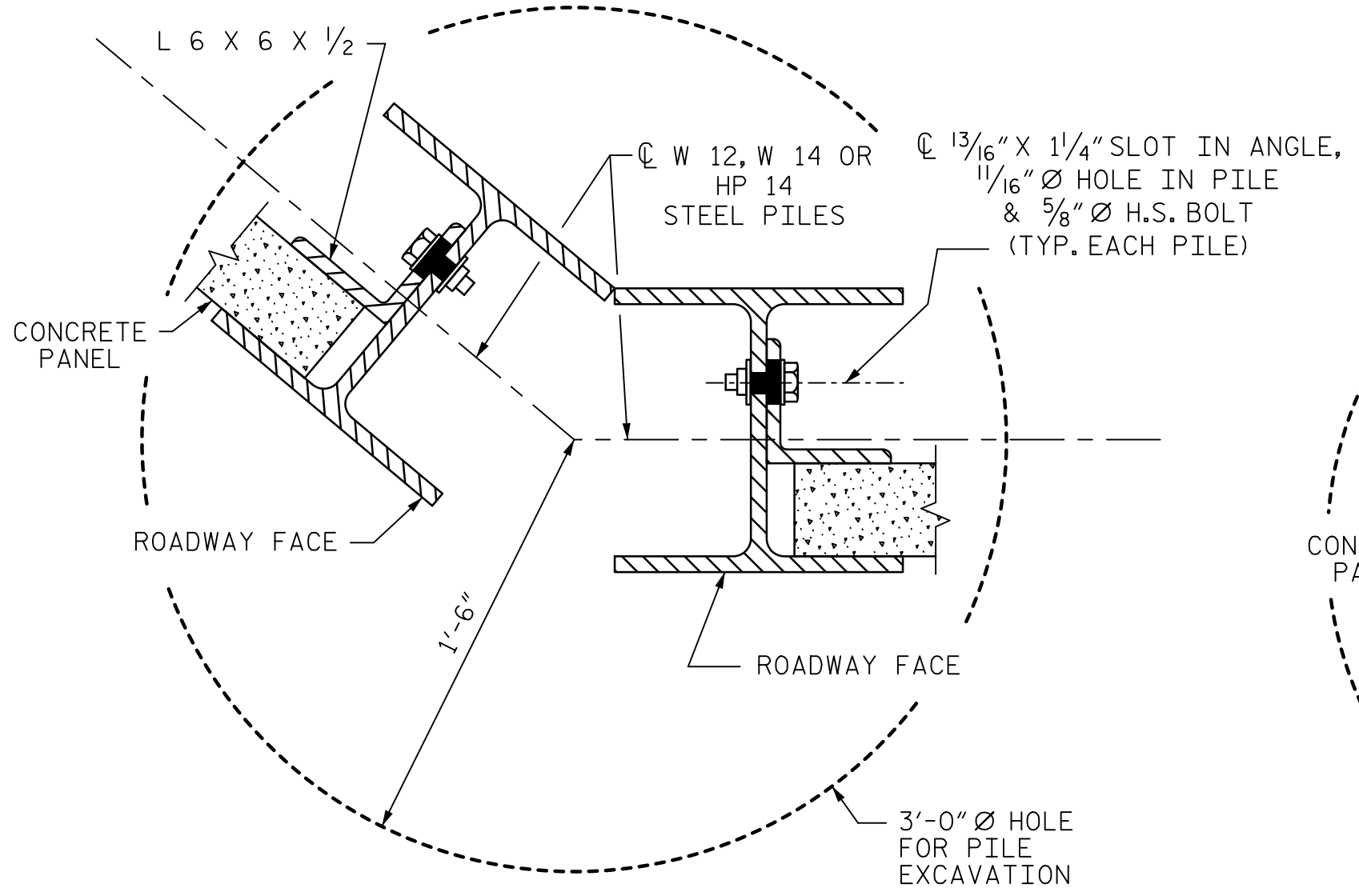
**TYPICAL WALL TURN DETAIL**

(FOR GREATER THAN 15° TURNS, CONCAVE TOWARD ROADWAY)



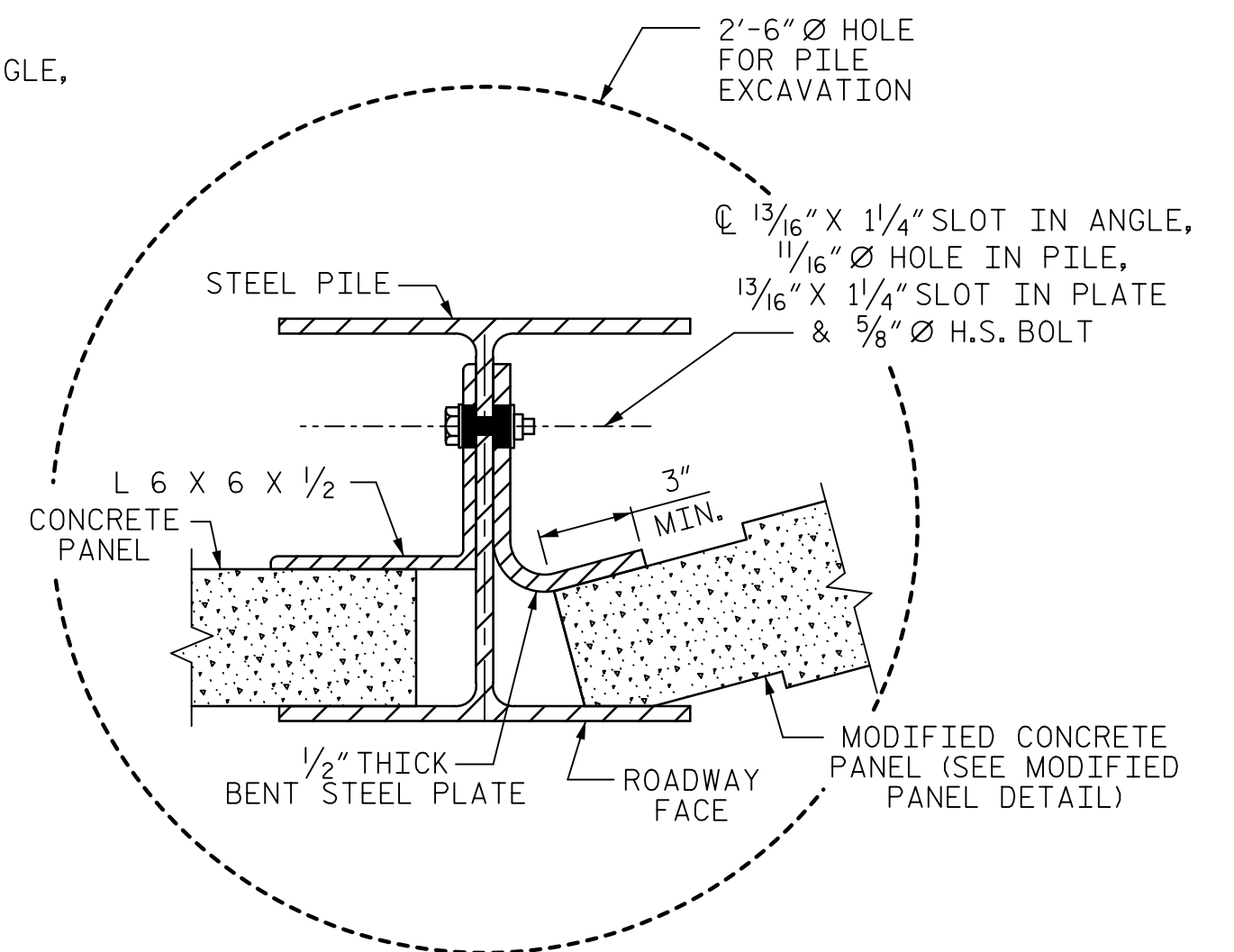
**TYPICAL WALL TURN DETAIL**

(USE ONLY FOR TURNS 15° OR LESS, CONCAVE TOWARD ROADWAY)



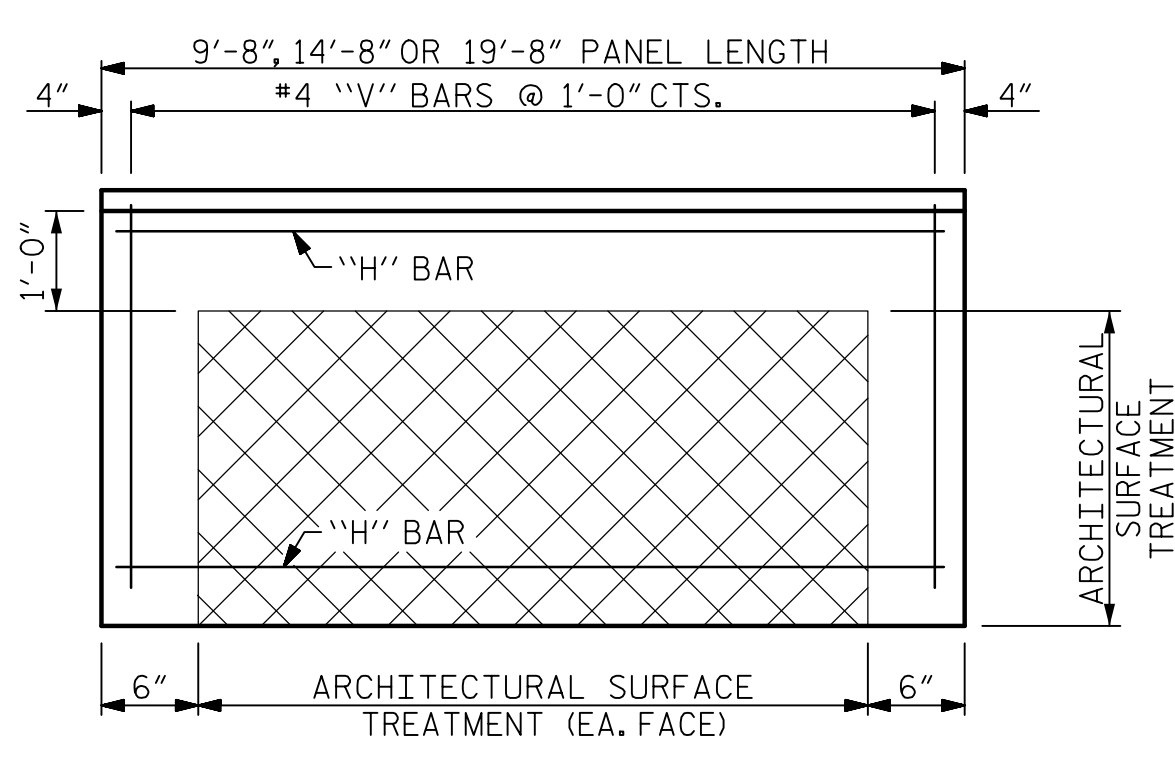
**TYPICAL WALL TURN DETAIL**

(FOR GREATER THAN 15° TURNS, CONVEX TOWARD ROADWAY)

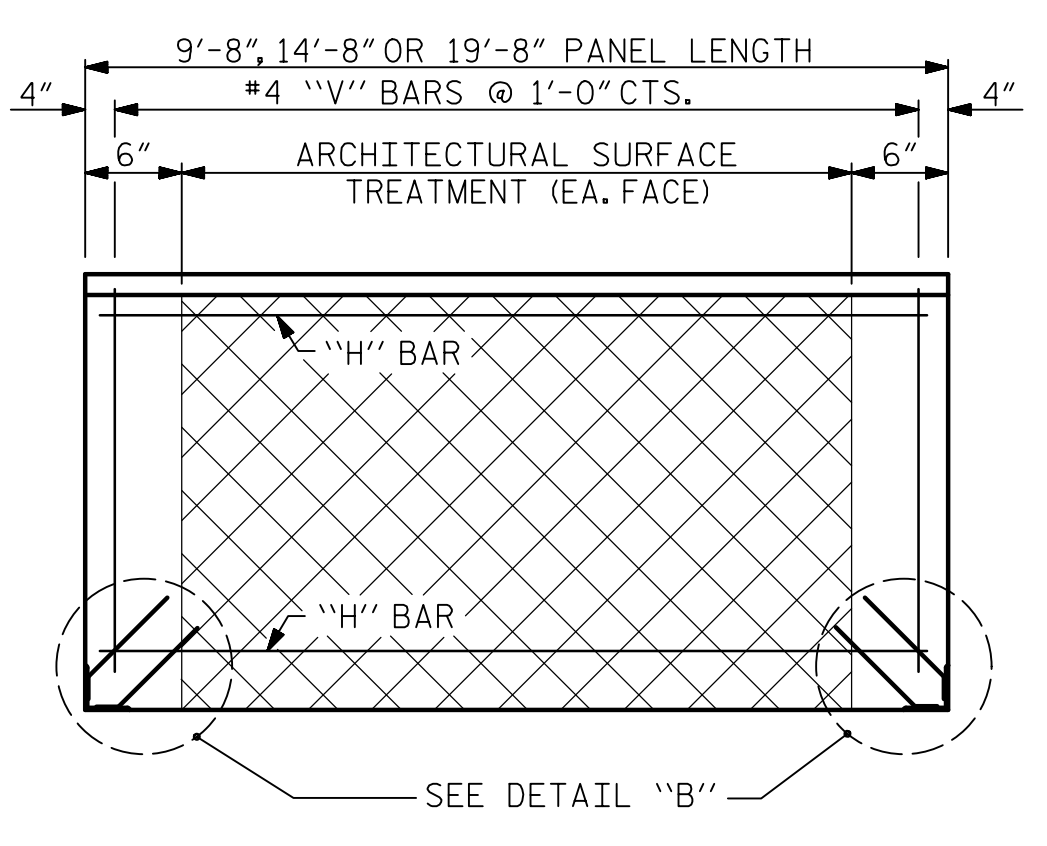


**TYPICAL WALL TURN DETAIL**

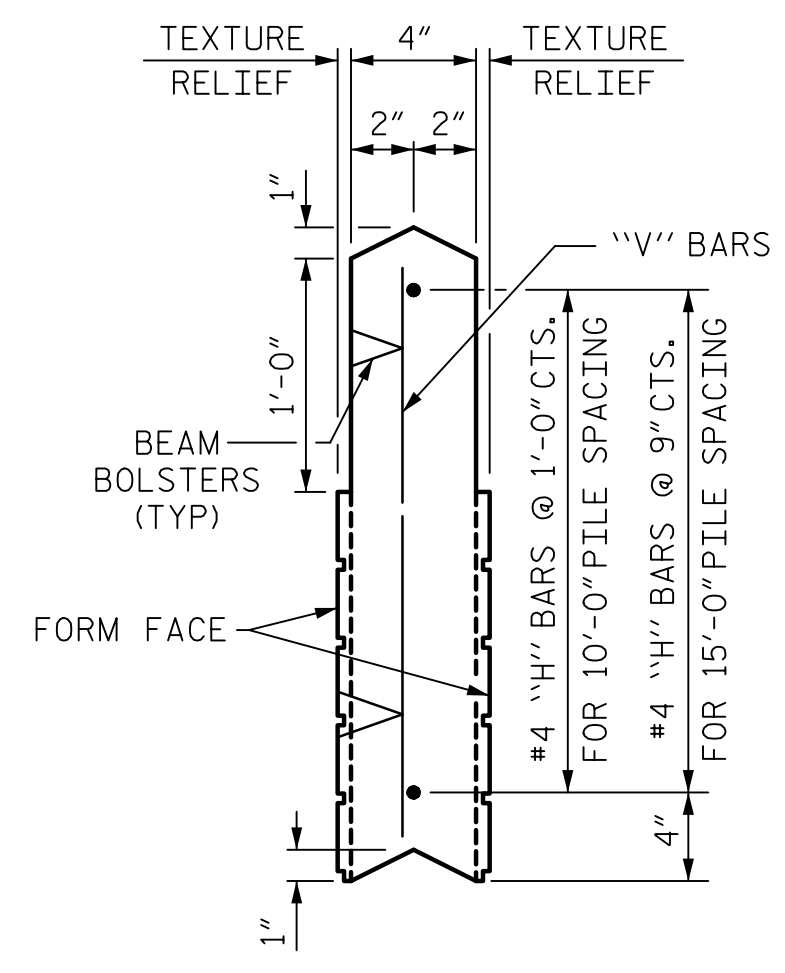
(USE ONLY FOR TURNS 15° OR LESS, CONVEX TOWARD ROADWAY)



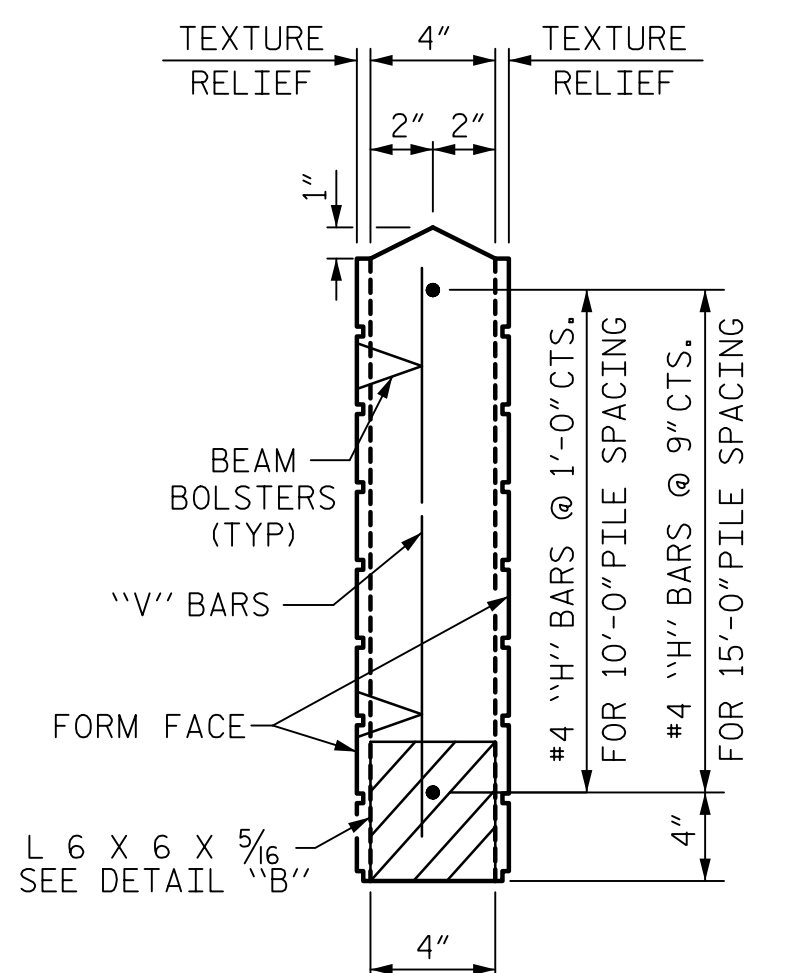
**FRONT ELEVATION OF UPPER PRECAST PANEL**



**FRONT ELEVATION OF BOTTOM PRECAST PANEL**

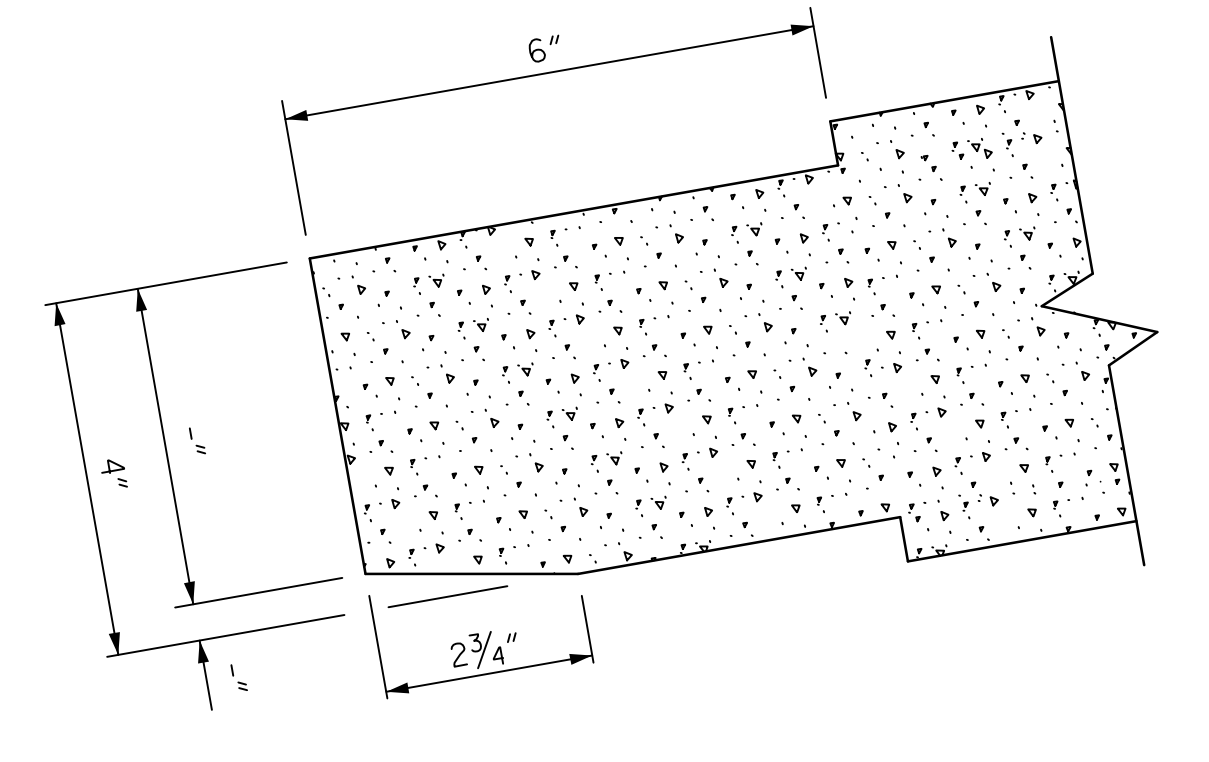


**UPPER PANEL**

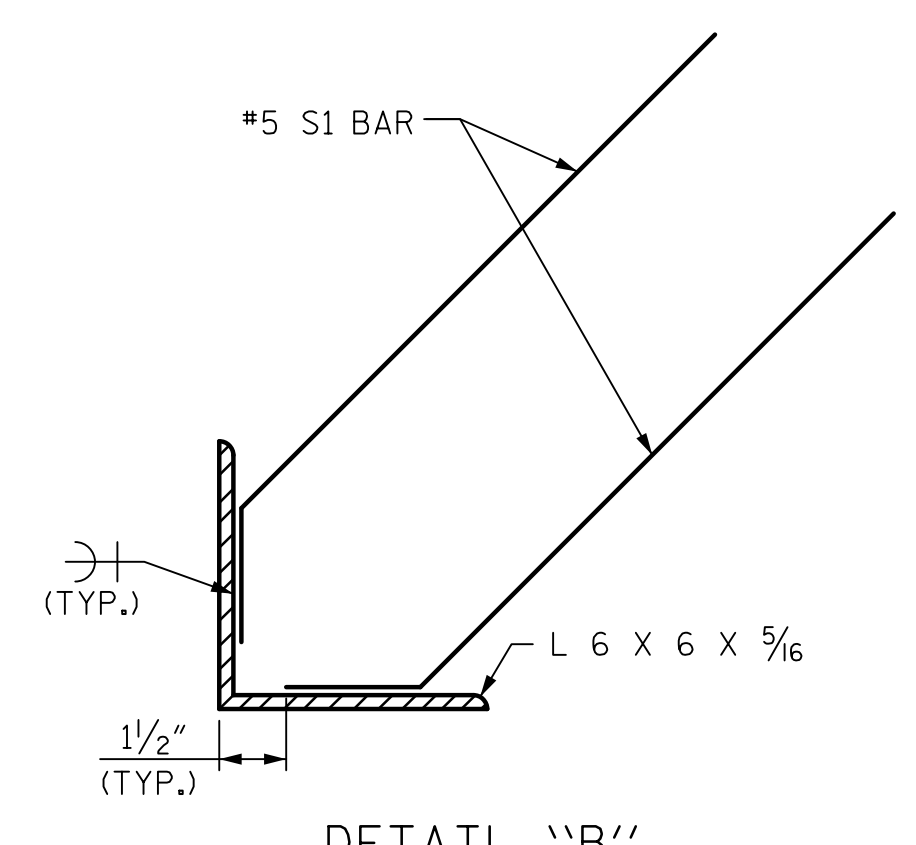


**BOTTOM PANEL**

**SECTION THROUGH PRECAST PANELS**



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



**DETAIL "B"**

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

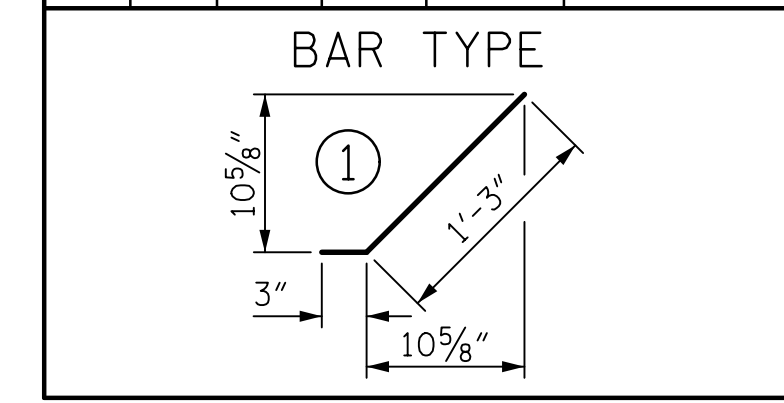
PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES											
		HORIZONTAL					VERTICAL						
C.Y.	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	
2'-0"	0.24	3	H1	#4	STR	9'-4"	19	11	V1	#4	STR	1'-8"	12
3'-0"	0.36	4	H2	#4	STR	9'-4"	25	11	V2	#4	STR	2'-8"	20
4'-0"	0.48	5	H3	#4	STR	9'-4"	31	11	V3	#4	STR	3'-8"	27

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

PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES											
		HORIZONTAL					VERTICAL						
C.Y.	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	
3'-0"	0.54	5	H1	#4	STR	14'-4"	48	16	V1	#4	STR	2'-8"	29
4'-0"	0.72	6	H2	#4	STR	14'-4"	57	16	V2	#4	STR	3'-8"	39
5'-0"	0.91	7	H3	#4	STR	14'-4"	67	16	V3	#4	STR	4'-8"	50
6'-0"	1.09	8	H4	#4	STR	14'-4"	77	16	V4	#4	STR	5'-8"	61

ADDITIONAL BARS FOR ONE BOTTOM PANEL

NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)
4	S1	#5	1	1'-6"	6



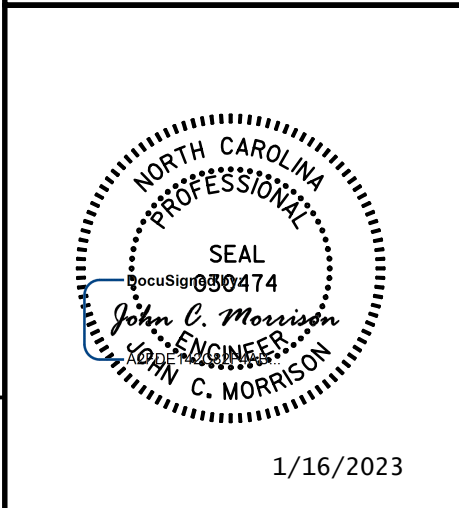
FOR NOTES, SEE SHEET SW-1

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ASSEMBLED BY : M. CATER DATE : 01/22  
CHECKED BY : J.C. MORRISON DATE : 01/22  
DRAWN BY : JAD 5/01 REV. 9/26/14 MAA/TMG  
CHECKED BY : RDR 5/01 REV. 10/17 MAA/THC  
REV. 5/18 MAA/THC

PROJECT NO. U-5748  
WAKE COUNTY  
STATION: 24+88.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

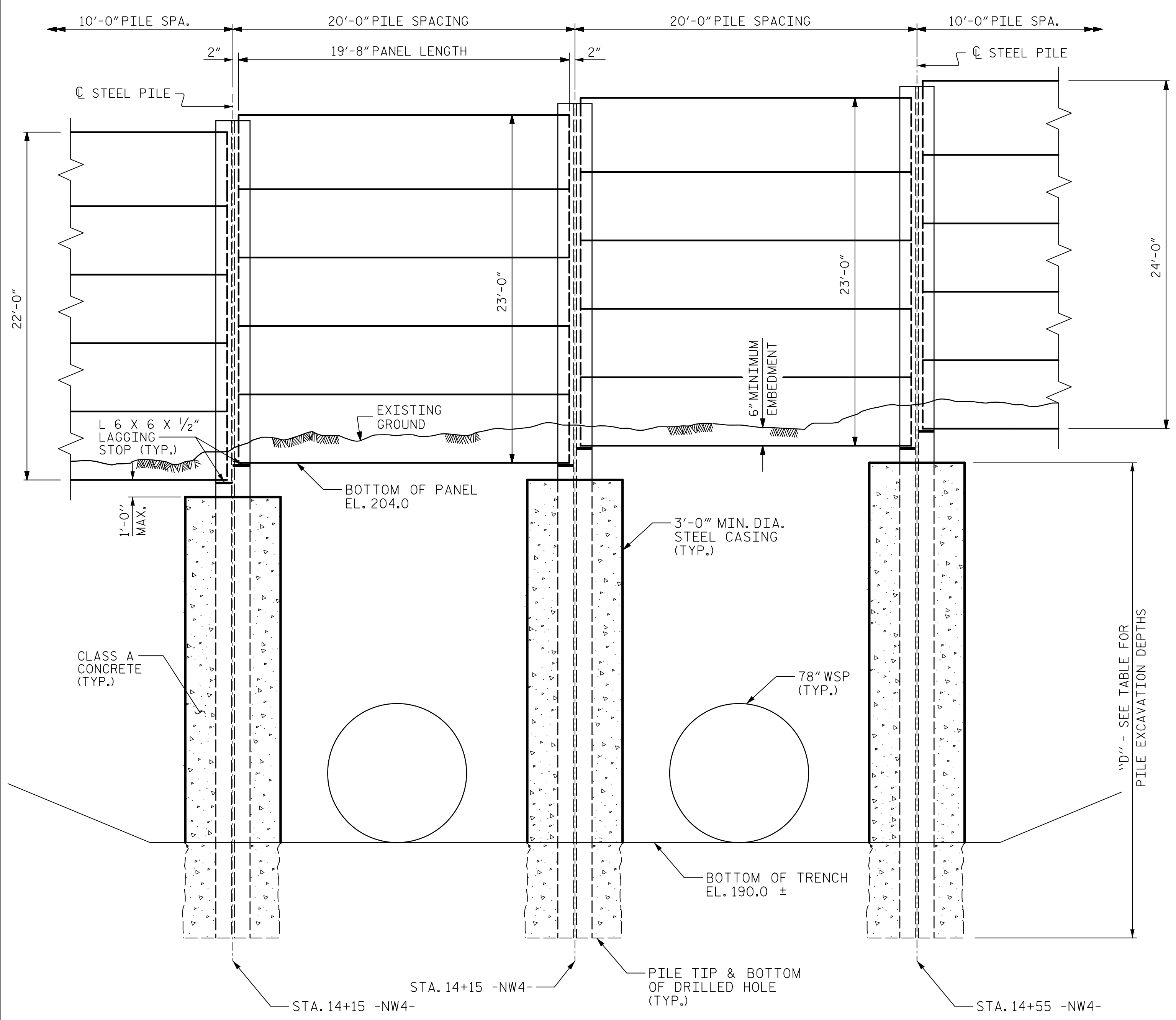
STANDARD  
SOUND BARRIER WALL  
(STEEL PILES)

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

STD. NO. SBW5

DATE: 1/11/2023  
TIME: 11:54:37 AM

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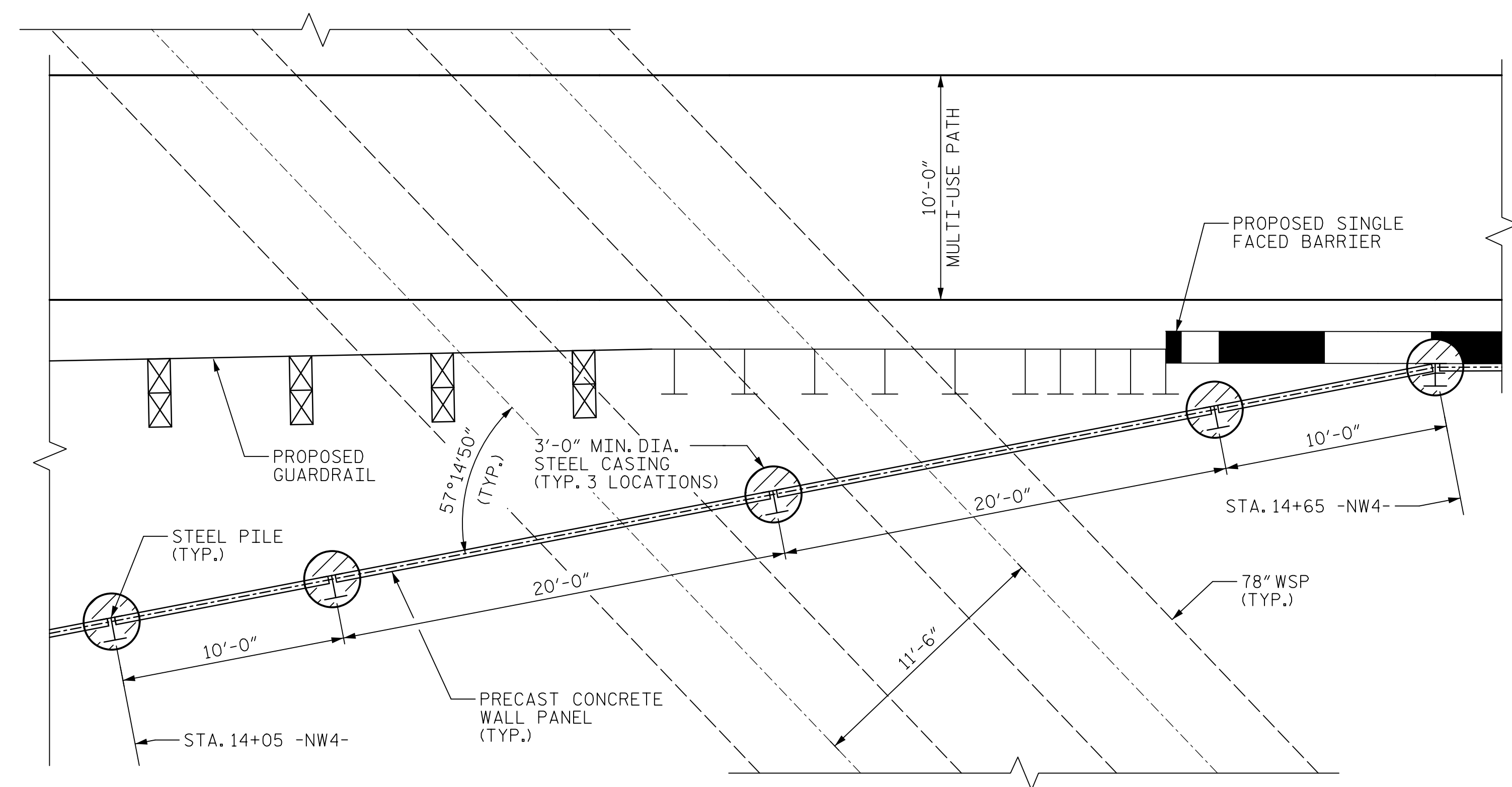


**ELEVATION**  
LOOKING ALONG CL 78" WELDED STEEL PIPES

DRAWN BY : M. CATER	DATE : 02/22
CHECKED BY : J.C. MORRISON	DATE : 02/22
DESIGNED BY : M. CATER	DATE : 02/22
DESIGN CHECKED BY : MORRISON	DATE : 02/22

PILE EXCAVATION		
WALL # NW4	FROM : STA. 14+05	TO : STA. 14+65
PILE SPACING	HOLE Ø	DEPTH "D"
10'-0"	3'-0"	13'-0"
20'-0"	3'-0"	18'-0"

**NOTES:**  
FOR PIPE INVERT ELEVATIONS, SEE DRAINAGE PLANS.  
FOR ADDITIONAL NOTES, SEE SHEETS SW-1 & SW-2.  
FOR STEEL CASING, SEE SOUND BARRIER WALL SPECIAL PROVISIONS.



**PLAN**

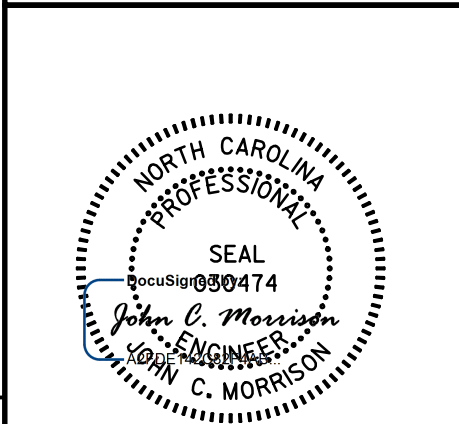
CLASS A CONCRETE

**CONSTRUCTION SEQUENCE**

- OPEN EXCAVATE TO BOTTOM OF TRENCH REQUIRED FOR INSTALLATION OF PIPE CULVERTS.
- DRILL (3) 3'-0" DIAMETER HOLES FOR PILE EXCAVATION IN TRENCH TO REQUIRED PILE TIP & BOTTOM OF DRILLED HOLE ELEVATION. INSTALL STEEL PILES IN EACH HOLE.
- INSTALL CMP ENCASUREMENTS FROM BOTTOM OF TRENCH TO 1'-0" BELOW BOTTOM OF PROPOSED WALL PANEL.
- INSTALL 78" WELDED STEEL PIPES. BACKFILL TRENCH TO FINISHED GRADE WHILE MAINTAINING THE CMP ENCASUREMENT CENTERED ON THE PILES.
- EXCAVATE 3'-0" DIAMETER HOLES FOR REMAINING PILES.
- INSTALL REMAINING STEEL PILES AND BACKFILL EXCAVATION WITH CLASS A CONCRETE.
- INSTALL PRECAST CONCRETE WALL PANELS.

PROJECT NO. U-5748  
WAKE COUNTY  
STATION: 24+88.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
SOUND BARRIER WALL  
CONSTRUCTION DETAILS  
AT PIPE CULVERT  
CROSSING

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

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1/16/2023