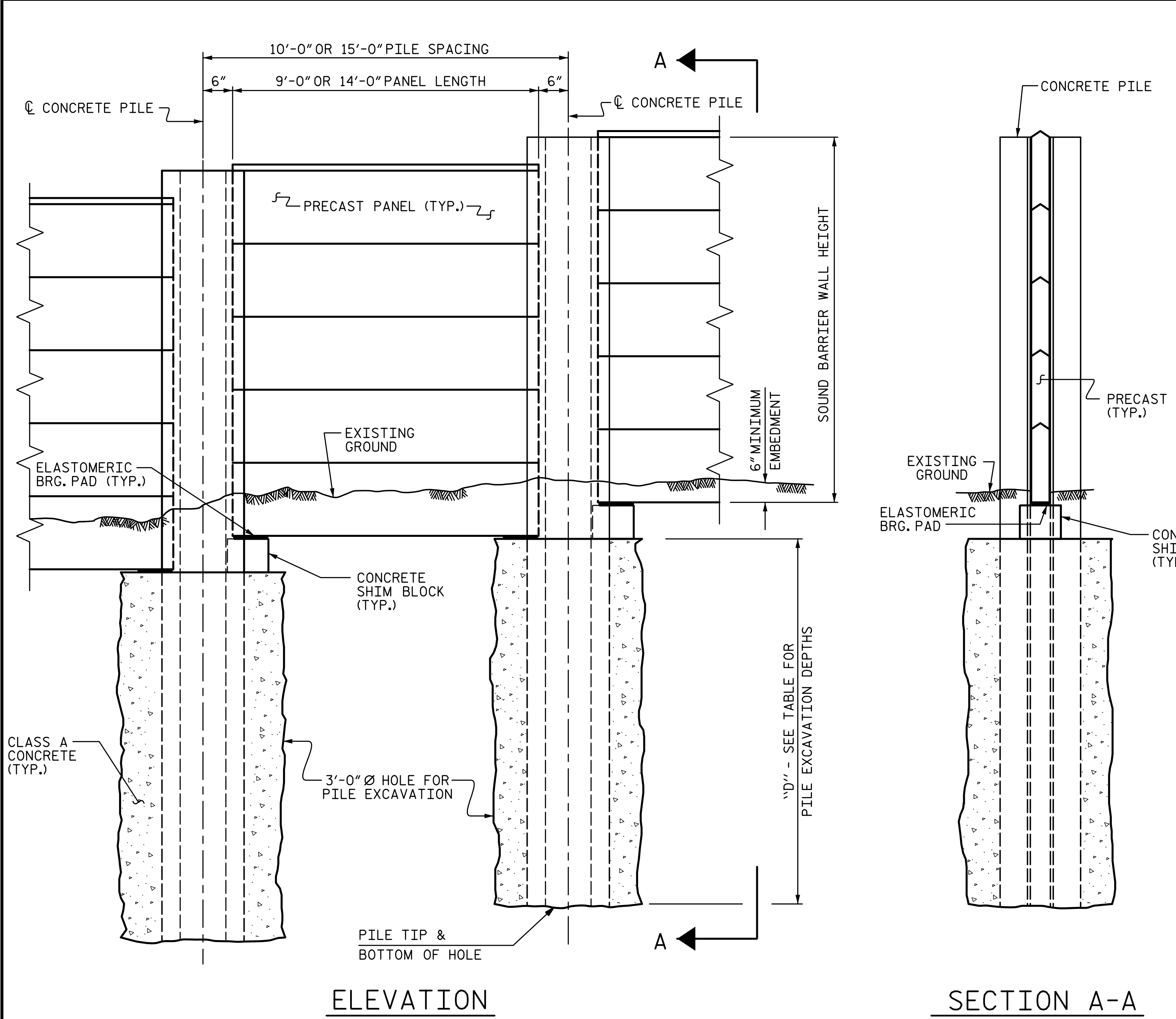


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with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**



PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW1A- (STA. 10+00 TO 14+40 -NW1A-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 12+44.93 -L- TO STA. 16+64.93 -L-	11'-0"	15'-0"	13'-0"
STA. 16+74.93 -L- TO STA. 16+84.93 -L-	8'-0"	10'-0"	11'-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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR * FS30450 STAIN.

ELEVATION

SECTION A-A

**EXPOSURE CATEGORY D
PILE REINFORCING STEEL**

DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')

PILE TYPE I			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
10'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.

PILE TYPE II			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
10'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.

BILL OF MATERIAL -NW1A-	
SOUND BARRIER WALL	S.F. 4,345
ARCHITECTURAL SURFACE TREATMENT	S.F. 3,497
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. U-4751
NEW HANOVER COUNTY
 STATION: 12+44.93 -L- =
10+00.00 -NW1A-

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

8/17/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

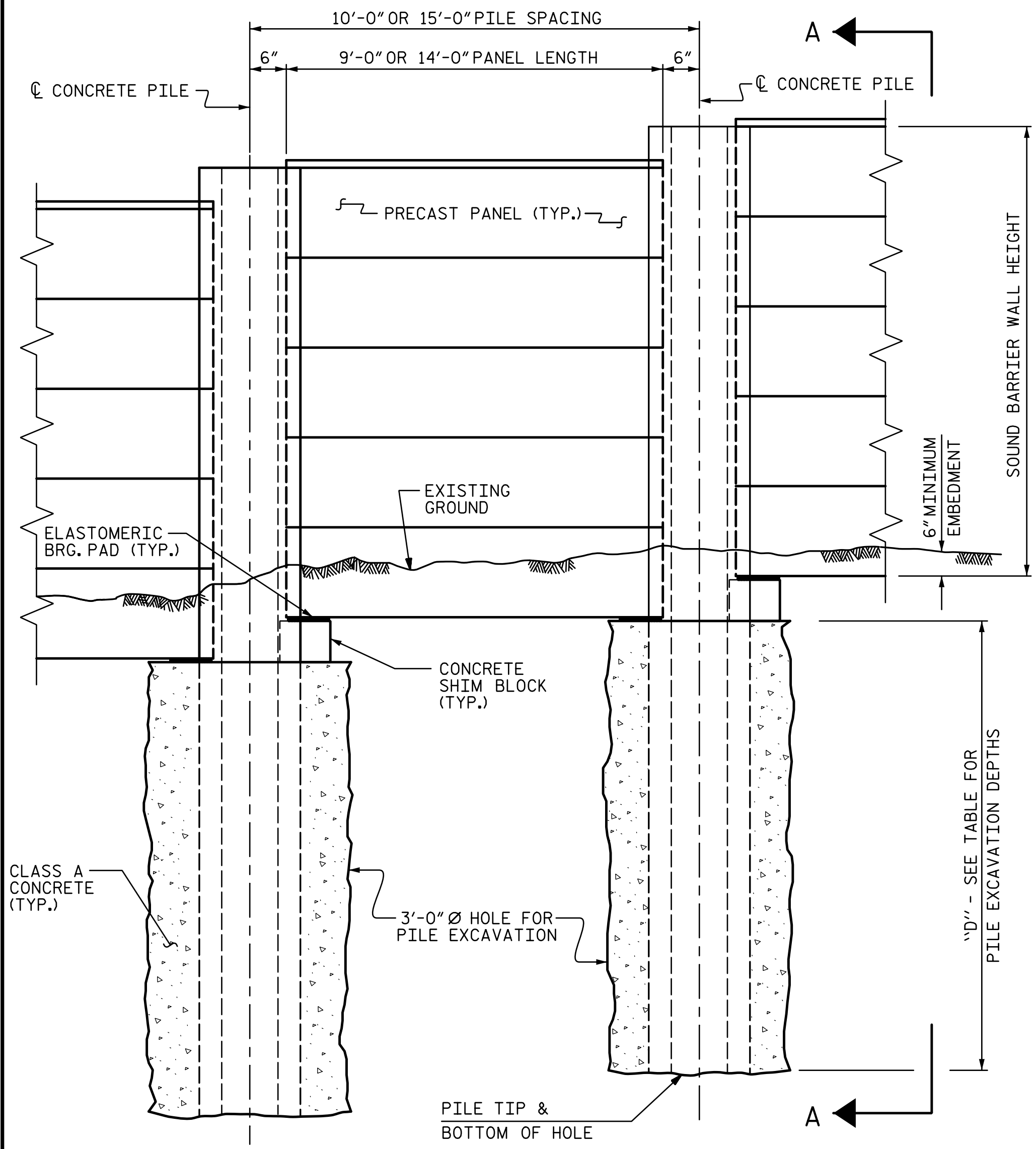
**SOUND BARRIER WALL
NO. -NW1A-**

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

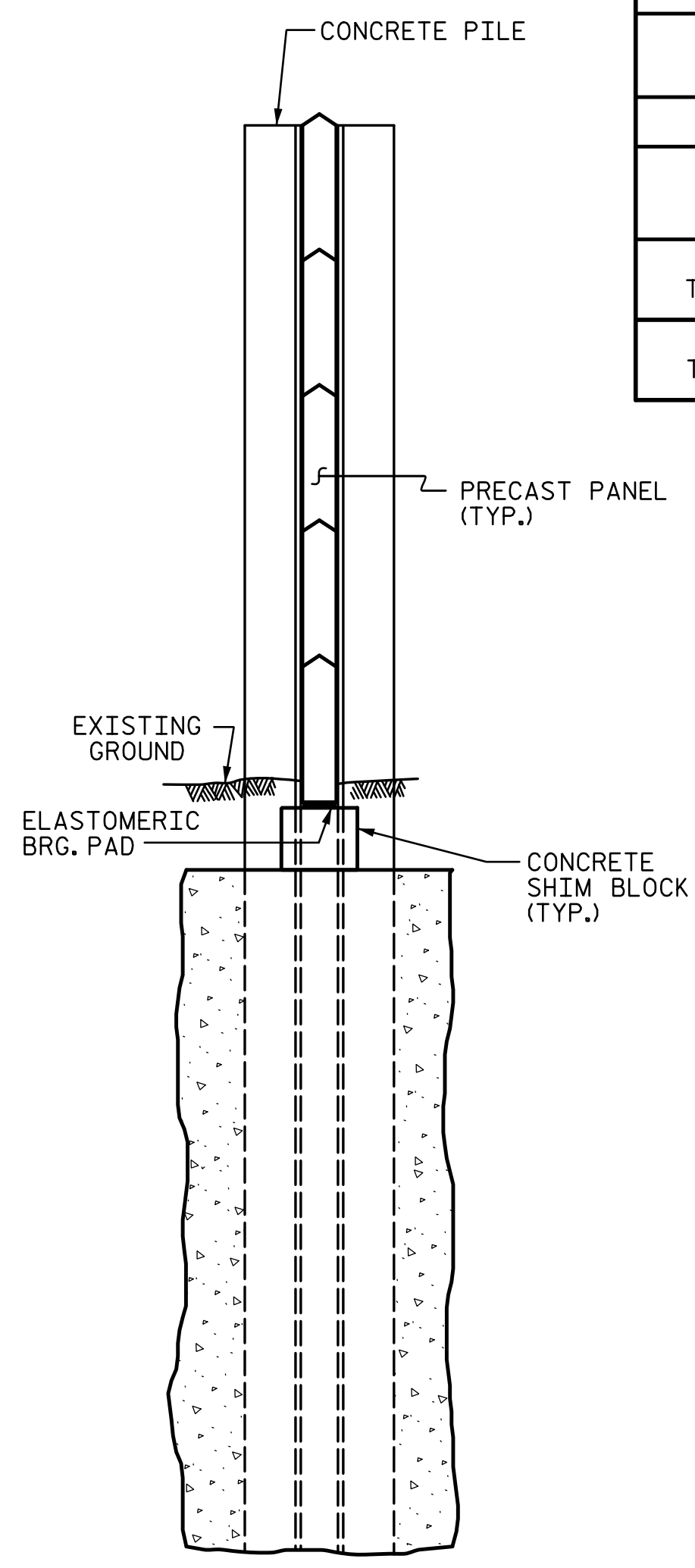
SHEET NO.
NW-1
TOTAL SHEETS
17

DRAWN BY: MBC DATE: 5-17 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17
 CHECKED BY: NML DATE: 5-17

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ELEVATION



SECTION A-A

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW1B- (STA. 10+00 TO 14+10 -NW1B-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 17+56.65 -L- TO STA. 17+66.65 -L-	8'-0"	10'-0"	11'-0"
STA. 17+76.65 -L- TO STA. 21+38.59 -L-	10'-0"	15'-0"	13'-0"

NOTES:

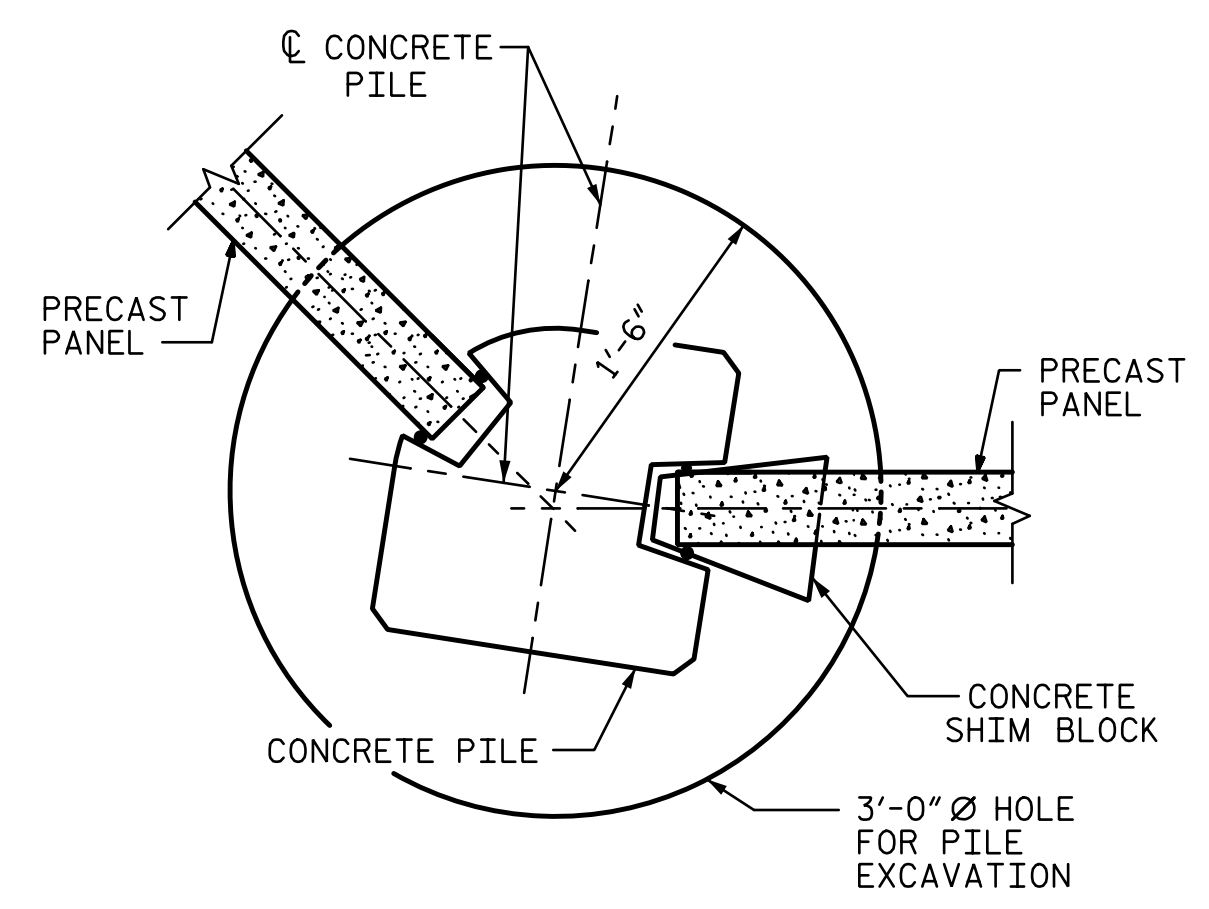
- FOR SOUND BARRIER WALL, SEE SPECIAL PROVISIONS.
- CONSTRUCT SOUND BARRIER WALL TO LINES AND GRADES SHOWN ON THE ROADWAY PLANS.
- PROVIDE PANELS WITH A FLAT BOTTOM.
- VERIFY THE LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING HOLES TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.
- ADJUST PILE EXCAVATION 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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR # FS30450 STAIN.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

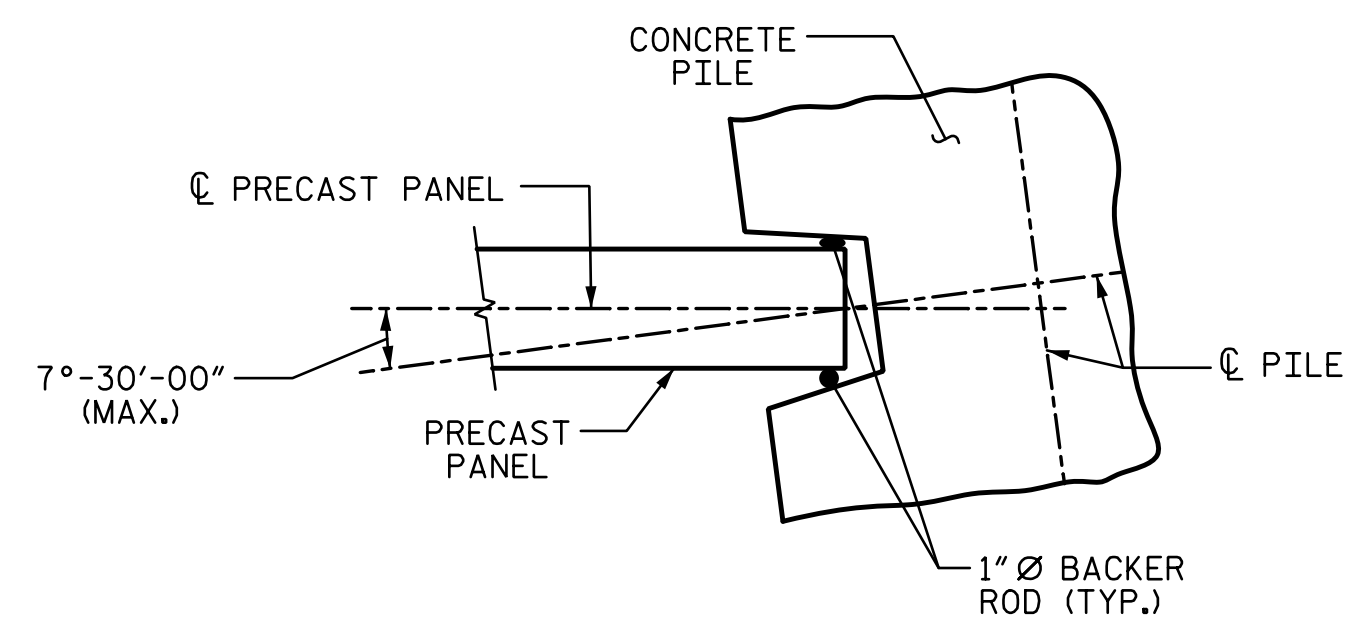
DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')							
PILE TYPE I				PILE TYPE III			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES	PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
10'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.	10'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" 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 ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.	10'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.

BILL OF MATERIAL -NW1B-	
SOUND BARRIER WALL	S.F. 3,653
ARCHITECTURAL SURFACE TREATMENT	S.F. 2,900
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. U-4751
NEW HANOVER COUNTY
 STATION: 17+56.65 -L- =
10+00.00 -NW1B-



15° TO 45° TURNS (PILE TYPE III)
 TYPICAL WALL TURN DETAILS



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

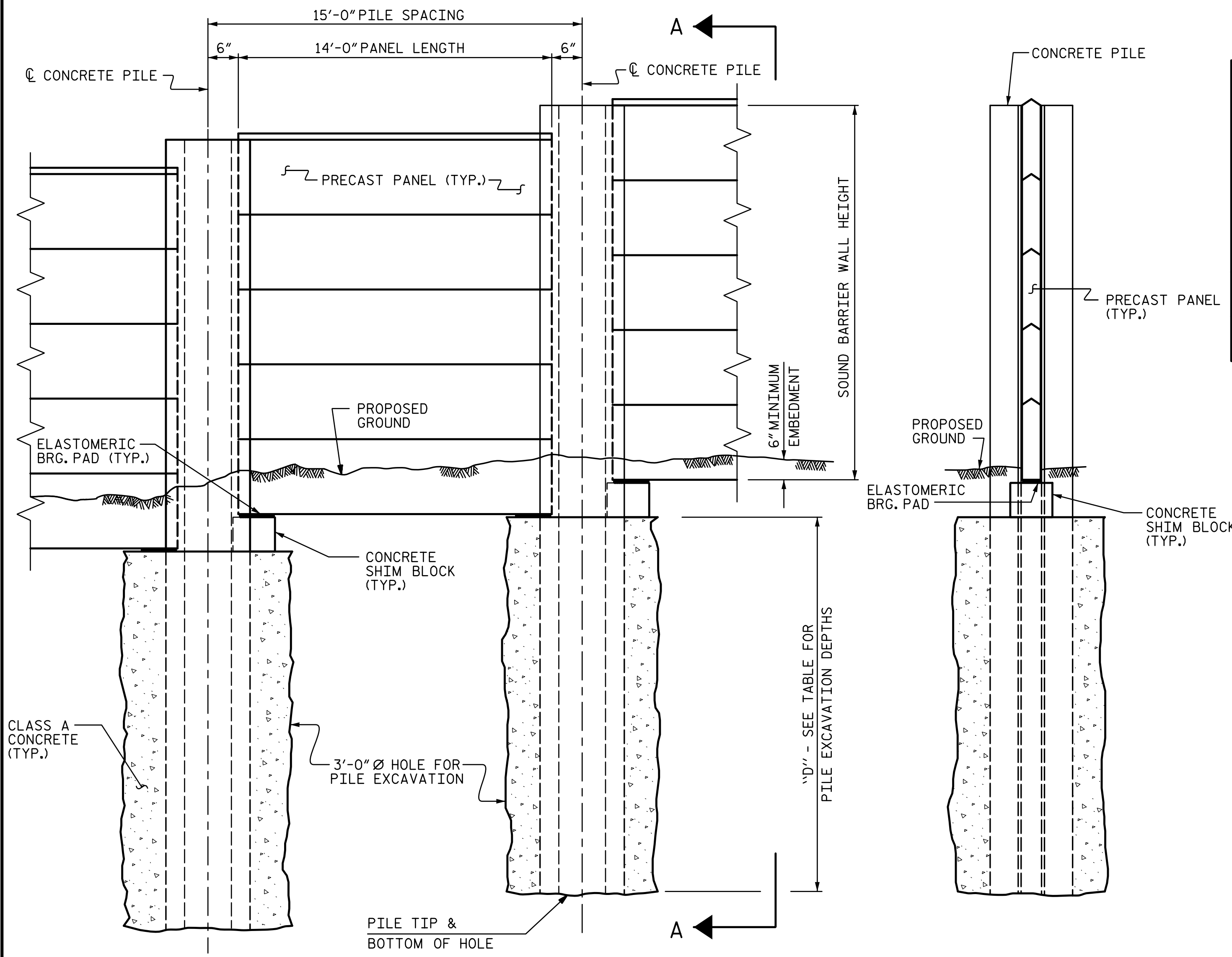
**SOUND BARRIER WALL
 NO. -NW1B-**

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

TOTAL SHEETS: 17

DRAWN BY: MBC DATE: 5-17
 CHECKED BY: NML DATE: 5-17
 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17

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ELEVATION
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

SECTION A-A
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW6- (STA. 10+00 TO 18+85 -NW6-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 84+10.42 -L- TO STA. 84+38.53 -L-	12'-0"	15'-0"	13'-6"
STA. 84+52.59 -L- TO STA. 85+65.02 -L-	13'-0"	15'-0"	13'-0"*
STA. 85+79.08 -L- TO STA. 92+26.33 -L-	15'-0"	15'-0"	14'-6"

* PILE EXCAVATION DEPTH ("D") FOR MSE WALL IS MEASURED FROM THE BOTTOM OF THE MSE WALL REINFORCED ZONE.

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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- DUE TO THE SHALLOW GROUNDWATER TABLE, UNSTABLE OR CAVING SOILS ARE ANTICIPATED AND TEMPORARY STEEL CASING OR SLURRY IS ANTICIPATED TO STABILIZE THE PILE EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS IN THE SOUND BARRIER WALL SPECIAL PROVISION.
- NOTE THAT SOUND BARRIER WALL PILES LOCATED WITHIN THE MSE WALL BACKFILL MUST BE INSTALLED PRIOR TO MSE WALL CONSTRUCTION. THE EMBEDMENT DEPTH PROVIDED IS MEASURED BELOW THE BASE OF THE MSE WALL AND DOES NOT INCLUDE THE LENGTH THROUGH THE REINFORCED ZONE.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR # FS30450 STAIN.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

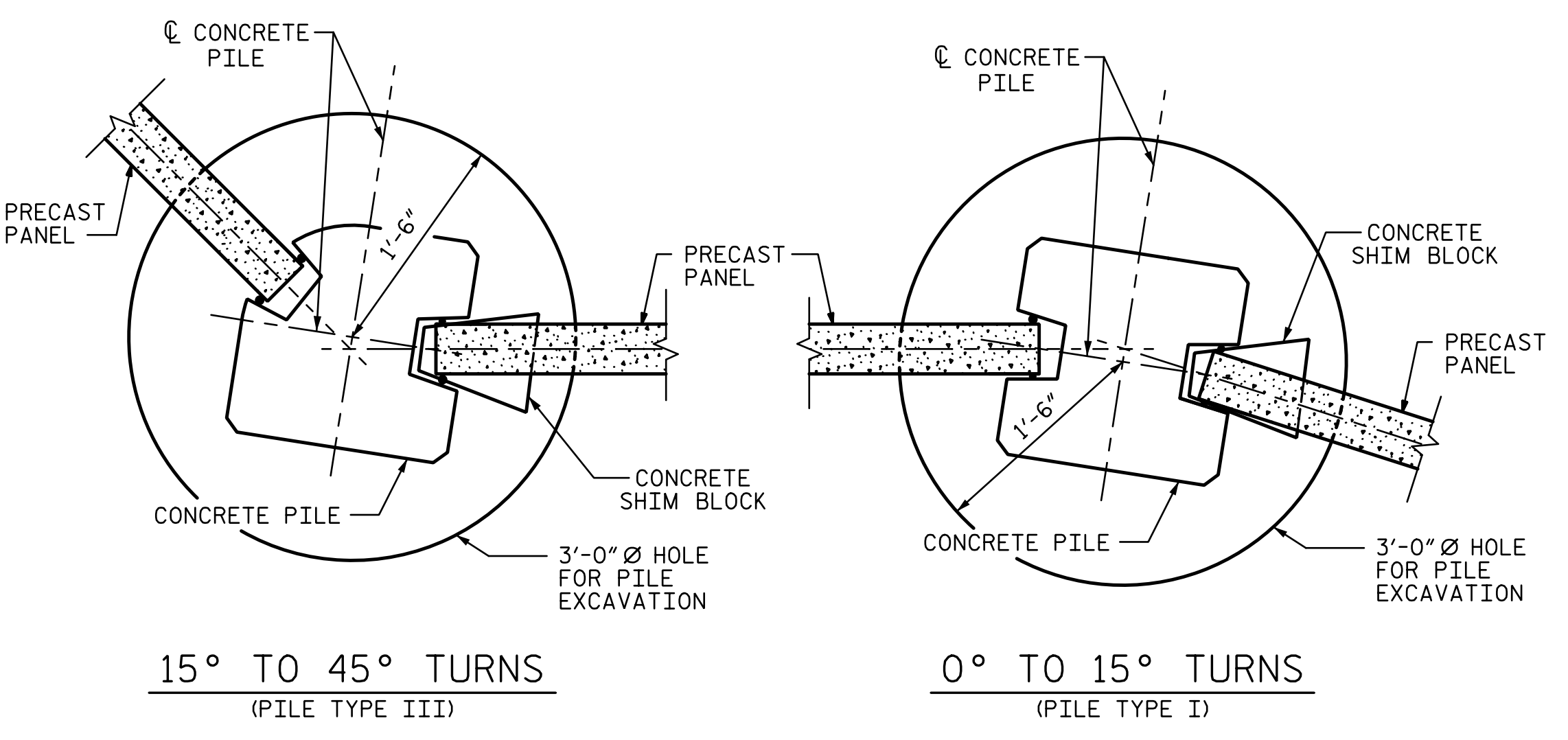
DESIGN WIND PRESSURE = 62 PSF (0' < H < 14'); 71 PSF (14' < H < 25')

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
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11"CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11"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
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11"CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11"CTS.

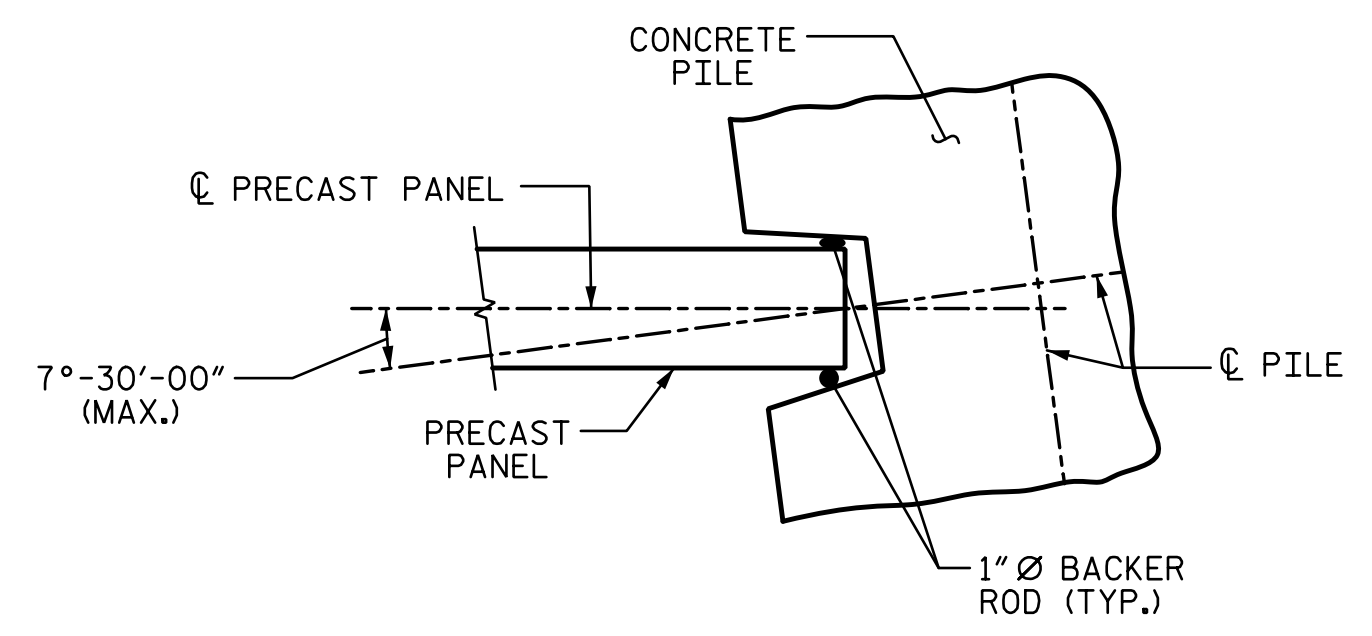
BILL OF MATERIAL -NW6-

SOUND BARRIER WALL	S.F. 11,435
ARCHITECTURAL SURFACE TREATMENT	S.F. 9,476
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 84+10.42 -L- = 10+00.00 -NW6-



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

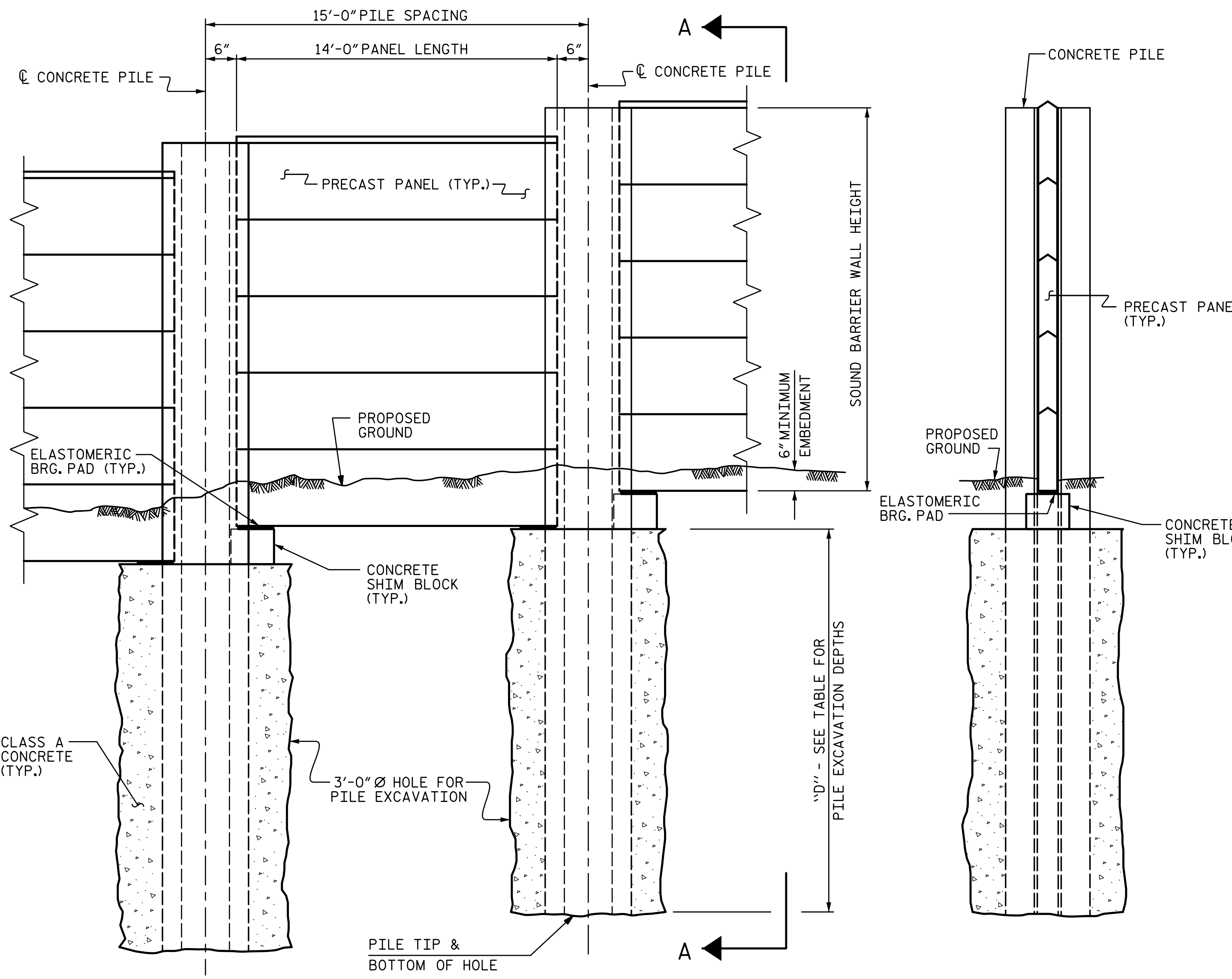
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SOUND BARRIER WALL NO. -NW6-

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

DRAWN BY: MBC DATE: 5-17
 CHECKED BY: NML DATE: 5-17
 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17

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ELEVATION
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

SECTION A-A
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW7- (STA. 10+00 TO 26+65 -NW7-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 71+43.97 -L- TO STA. 72+86.92 -L-	13'-0"	15'-0"	14'-6"
STA. 72+97.68 -L- TO STA. 73+84.88 -L-	15'-0"	15'-0"	15'-6"
STA. 73+99.46 -L- TO STA. 88+48.25 -L-	17'-0"	15'-0"	13'-0"*

* PILE EXCAVATION DEPTH ("D") FOR MSE WALL IS MEASURED FROM THE BOTTOM OF THE MSE WALL REINFORCED ZONE.

NOTES:

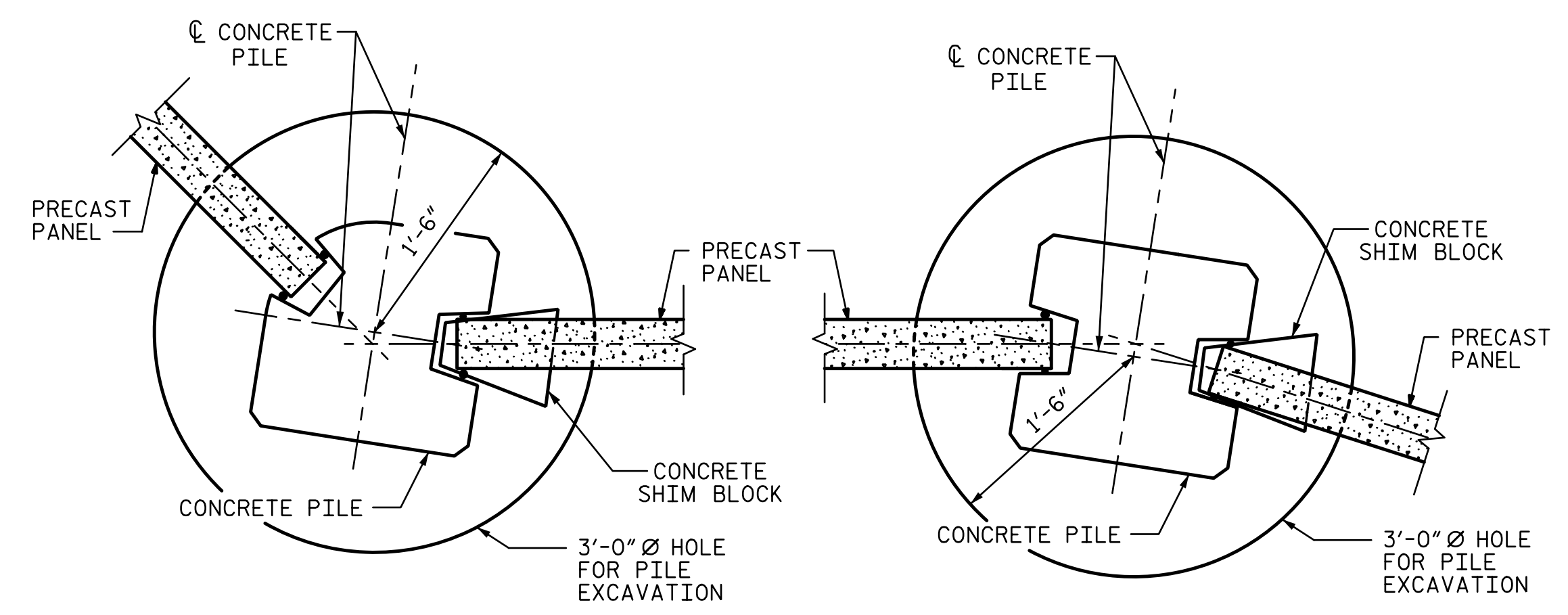
- FOR SOUND BARRIER WALL, SEE SPECIAL PROVISIONS.
- CONSTRUCT SOUND BARRIER WALL TO LINES AND GRADES SHOWN ON THE ROADWAY PLANS.
- PROVIDE PANELS WITH A FLAT BOTTOM.
- VERIFY THE LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING HOLES TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.
- ADJUST PILE EXCAVATION 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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- DUE TO THE SHALLOW GROUNDWATER TABLE, UNSTABLE OR CAVING SOILS ARE ANTICIPATED AND TEMPORARY STEEL CASING OR SLURRY IS ANTICIPATED TO STABILIZE THE PILE EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS IN THE SOUND BARRIER WALL SPECIAL PROVISION.
- NOTE THAT SOUND BARRIER WALL PILES LOCATED WITHIN THE MSE WALL BACKFILL MUST BE INSTALLED PRIOR TO MSE WALL CONSTRUCTION. THE EMBEDMENT DEPTH PROVIDED IS MEASURED BELOW THE BASE OF THE MSE WALL AND DOES NOT INCLUDE THE LENGTH THROUGH THE REINFORCED ZONE.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR * FS30450 STAIN.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

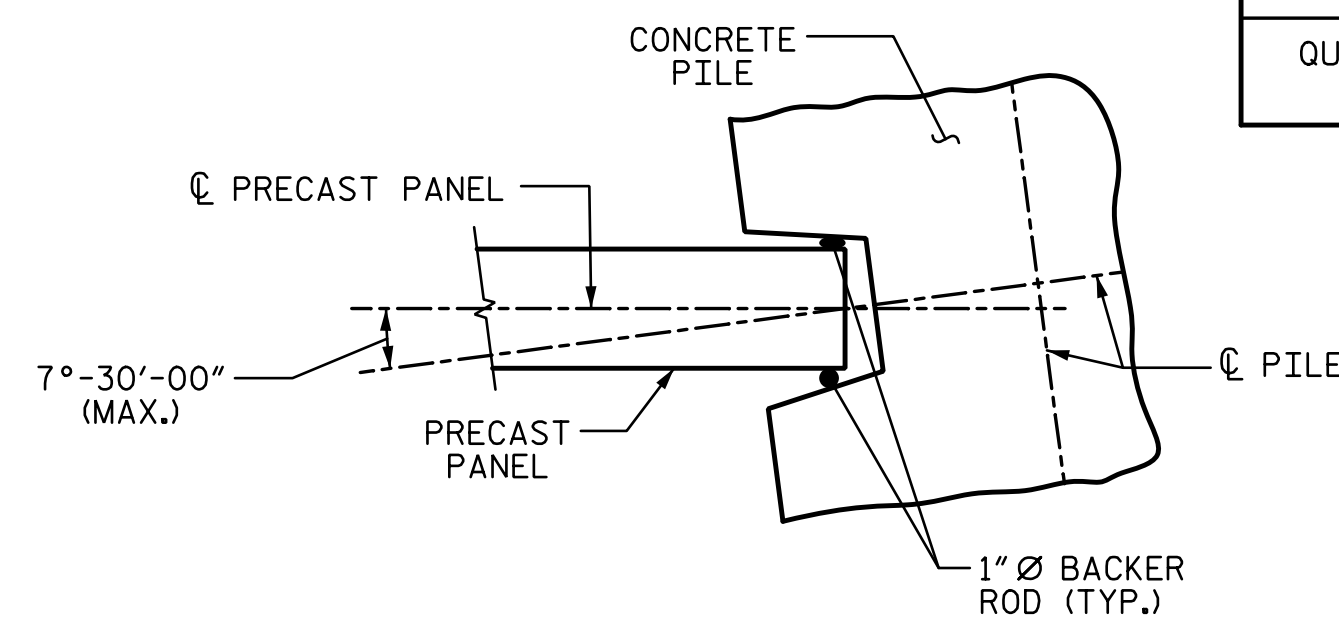
DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')							
PILE TYPE I				PILE TYPE III			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES	PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #10 EA. FACE	#3 @ 10" CTS.	15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" 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
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #8 EA. FACE	#3 @ 10" CTS.	15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" CTS.

BILL OF MATERIAL -NW7-	
SOUND BARRIER WALL	S.F. 25,447
ARCHITECTURAL SURFACE TREATMENT	S.F. 21,382
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 71+43.97 -L- = 10+00.00 -NW7-



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

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

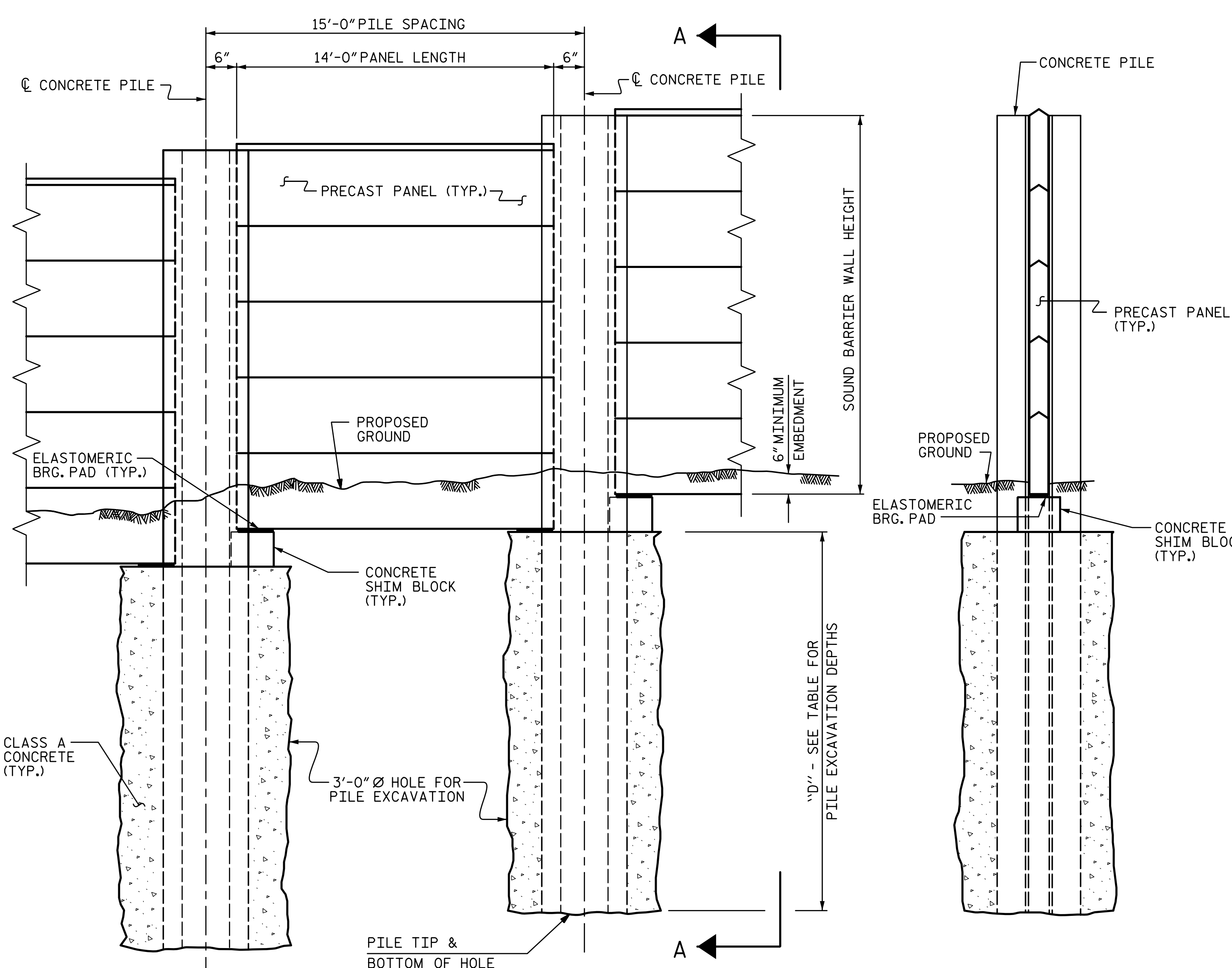
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SOUND BARRIER WALL NO. -NW7-

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

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ELEVATION
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

SECTION A-A
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW8- (STA. 10+00 TO 28+75 -NW8-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT * DEPTH
STA. 92+91.45 -L- TO STA. 93+11.84 -L-	17'-0"	15'-0"	21'-0"
STA. 93+26.65 -L- TO STA. 94+91.71 -L-	14'-0"	15'-0"	19'-0"
STA. 95+06.71 -L- TO STA. 98+80.90 -L-	15'-0"	15'-0"	18'-6"
STA. 98+95.90 -L- TO STA. 102+12.16 -L-	16'-0"	15'-0"	19'-6"
STA. 102+28.21 -L- TO STA. 107+09.28 -L-	16'-0"	15'-0"	20'-0"
STA. 107+25.32 -L- TO STA. 108+58.60 -L-	16'-0"	15'-0"	15'-6"
STA. 108+72.68 -L- TO STA. 111+68.11 -L-	13'-0"	15'-0"	14'-0"

* FOUNDATION EXCAVATION DEPTHS ARE MEASURED FROM 1 FOOT BELOW THE FINISHED GRADE.

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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR * FS30450 STAIN.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')

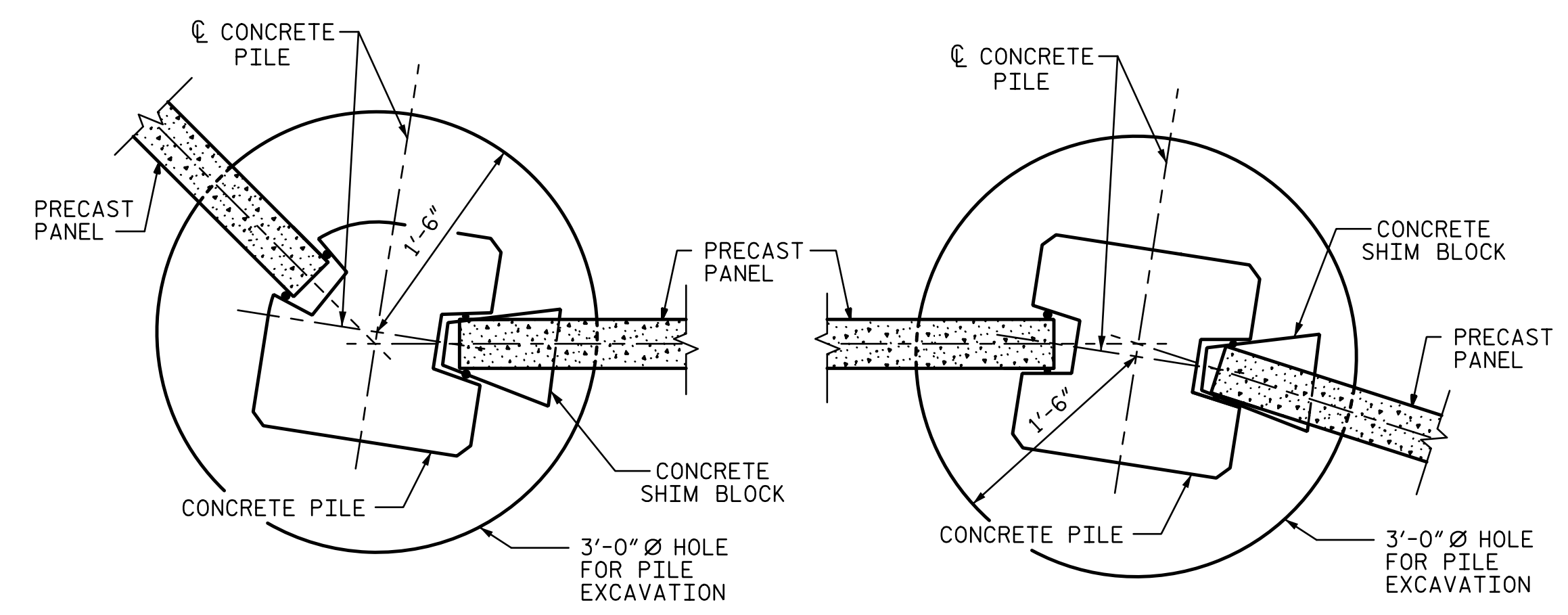
PILE TYPE I				PILE TYPE III			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES	PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #10 EA. FACE	#3 @ 10" CTS.	15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" 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
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #8 EA. FACE	#3 @ 10" CTS.	15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" CTS.

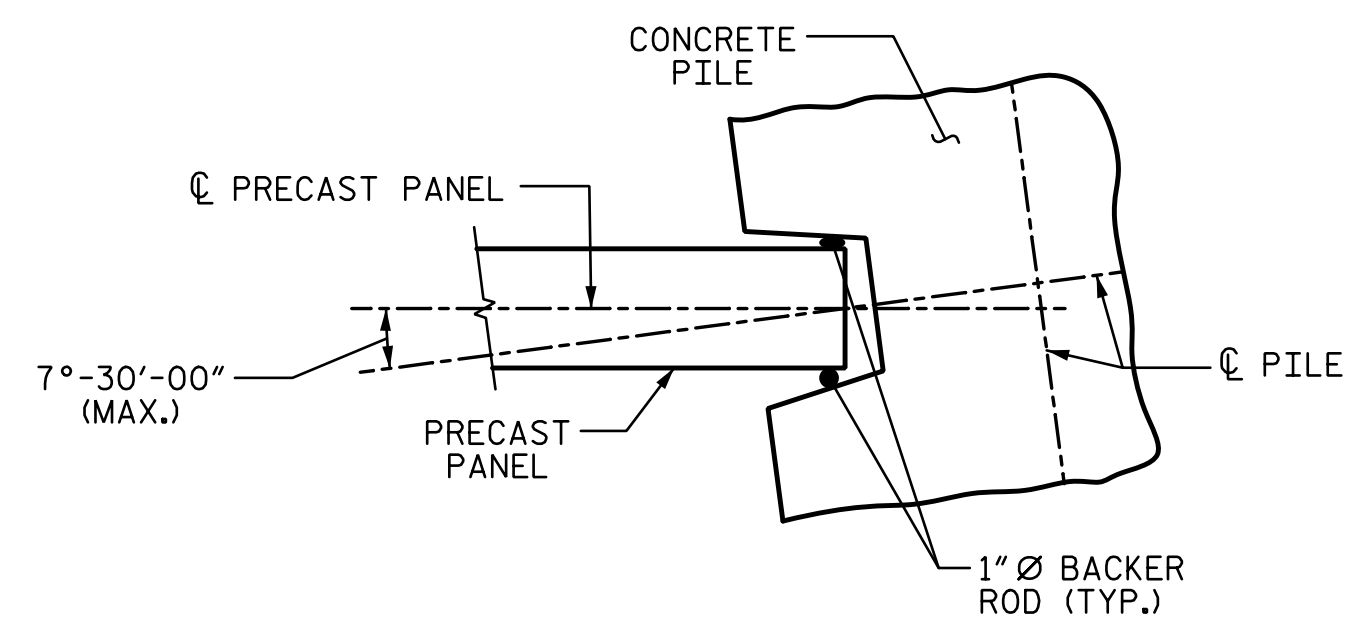
BILL OF MATERIAL -NW8-

SOUND BARRIER WALL	S.F. 27,473
ARCHITECTURAL SURFACE TREATMENT	S.F. 23,021
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. U-4751
NEW HANOVER COUNTY
 STATION: 92+91.45 -L- =
10+00.00 -NW8-



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SOUND BARRIER WALL
NO. -NW8-**

REVISIONS

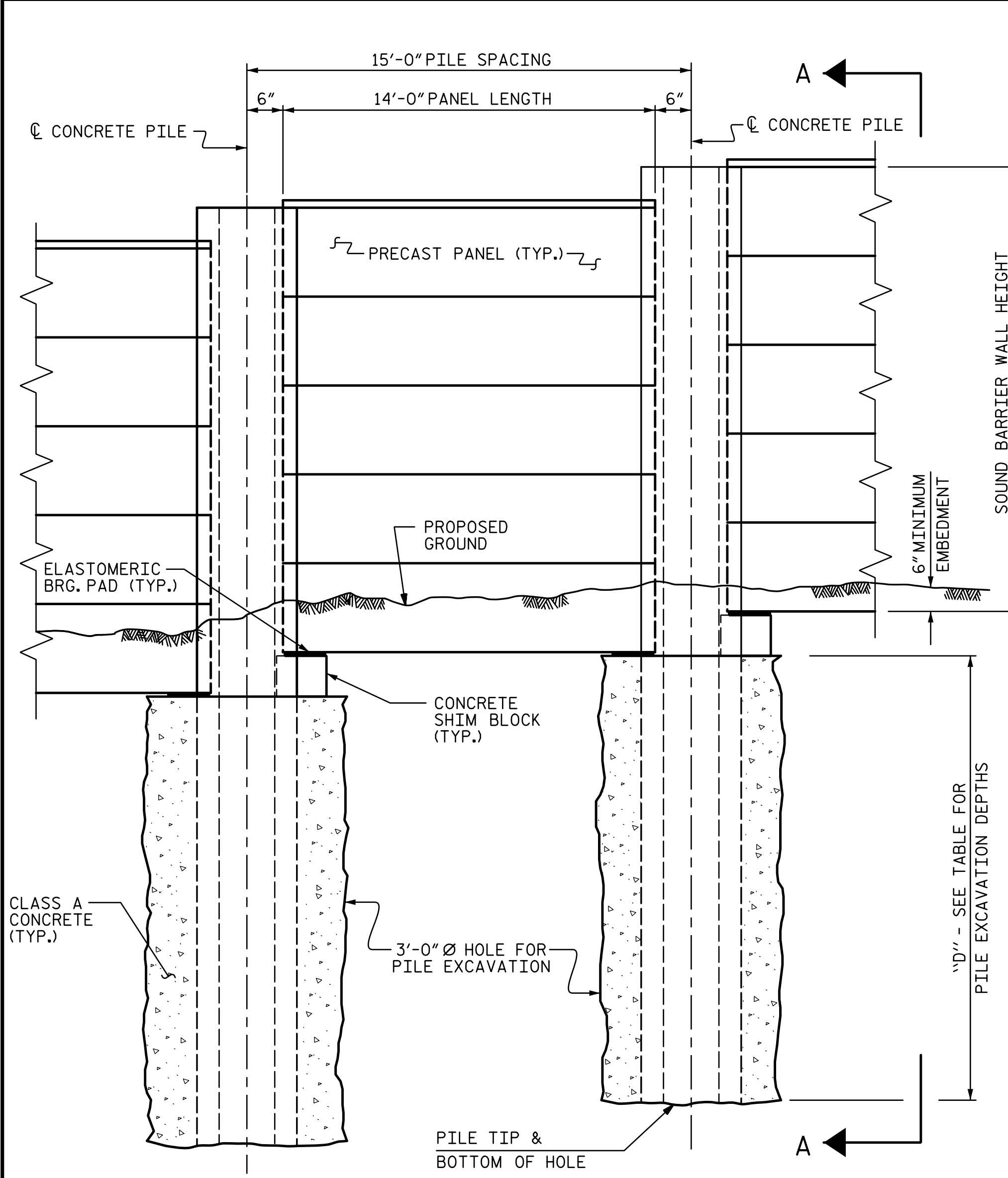
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STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

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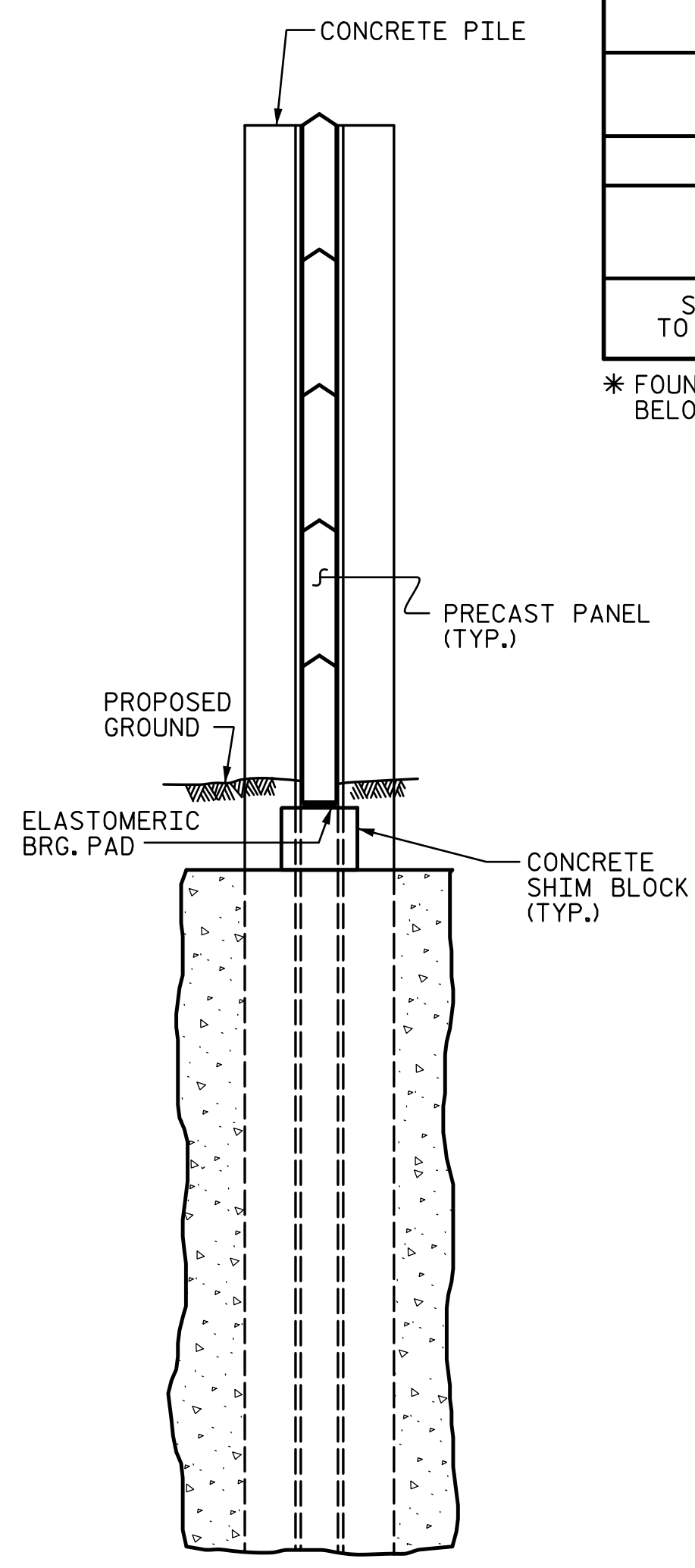
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 CHECKED BY: NML DATE: 5-17
 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17

SHEET NO. NW-5
TOTAL SHEETS 17



ELEVATION

(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)



SECTION A-A

(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW9- (STA. 10+00 TO 13+90 -NW9-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT * DEPTH
STA. 93+91.15 -L- TO STA. 97+81.15 -L-	15'-0"	15'-0"	15'-0"

* FOUNDATION EXCAVATION DEPTHS ARE MEASURED FROM 1 FOOT BELOW THE FINISHED GRADE.

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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR * FS30450 STAIN.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')			
PILE TYPE I			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #8 EA. FACE	*3 @ 11" CTS.
PILE TYPE II			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #6 EA. FACE	*3 @ 11" CTS.

BILL OF MATERIAL -NW9-

SOUND BARRIER WALL	S.F. 5,661
ARCHITECTURAL SURFACE TREATMENT	S.F. 4,725
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. U-4751
NEW HANOVER COUNTY
 STATION: 93+91.15 -L- =
10+00.00 -NW9-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

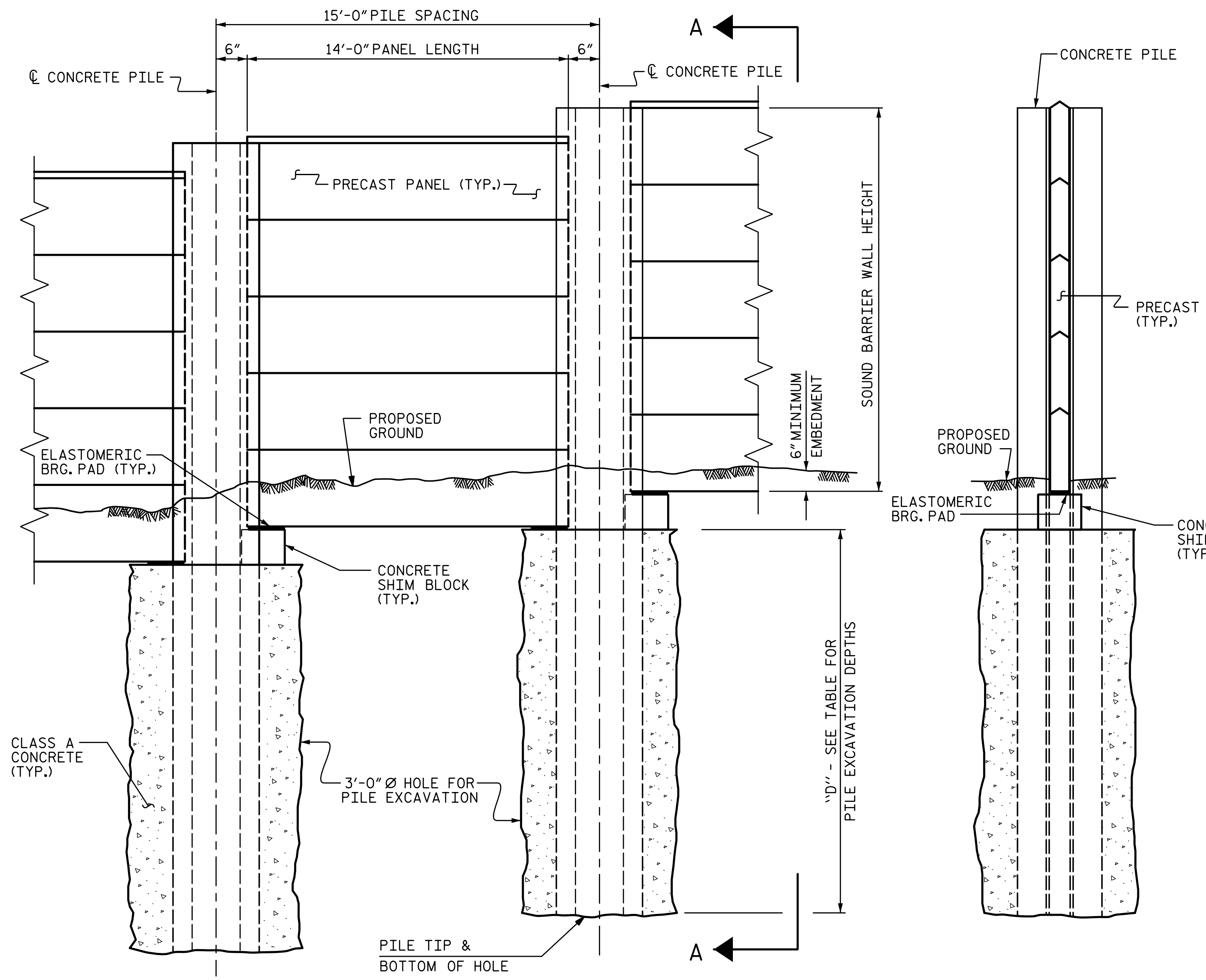
**SOUND BARRIER WALL
 NO. -NW9-**

REVISIONS					
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2			4		

SHEET NO.
 NW-6
 TOTAL SHEETS
 17

DRAWN BY : MBC DATE : 5-17 DESIGN ENGINEER OF RECORD: J. DICHAK DATE : 5-17
 CHECKED BY : JAD DATE : 5-17

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ELEVATION

(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

SECTION A-A

(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW10- (STA. 10+00 TO 17+95 -NW10-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT * DEPTH
STA. 100+12.47 -L- TO STA. 100+23.56 -L-	14'-0"	15'-0"	17'-0"
STA. 100+37.35 -L- TO STA. 102+15.79 -L-	14'-0"	15'-0"	15'-0"
STA. 102+29.87 -L- TO STA. 107+64.53 -L-	14'-0"	15'-0"	18'-0"

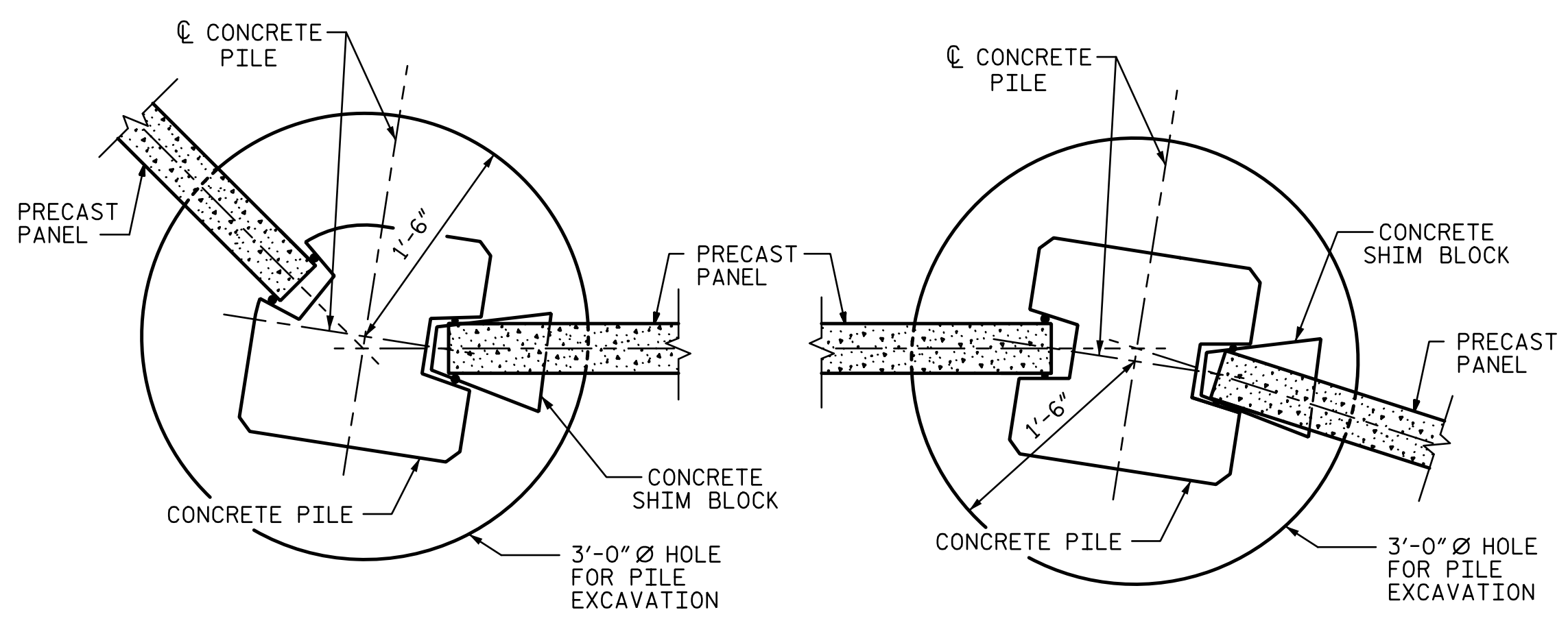
* FOUNDATION EXCAVATION DEPTHS ARE MEASURED FROM 1 FOOT BELOW THE FINISHED GRADE.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

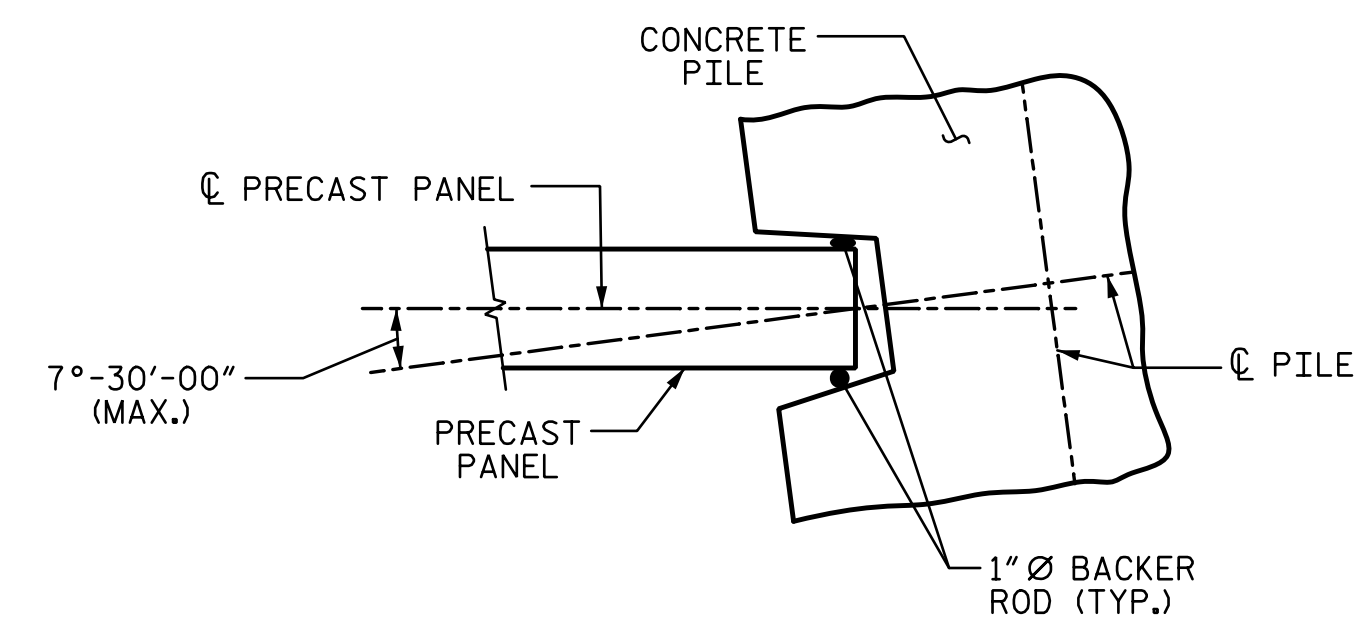
DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')

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
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11"CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11"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
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11"CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11"CTS.

BILL OF MATERIAL -NW10-	
SOUND BARRIER WALL	S.F. 10,701
ARCHITECTURAL SURFACE TREATMENT	S.F. 8,897
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

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

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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR # FS30450 STAIN.

PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 100+12.47 -L- = 10+00.00 -NW10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SOUND BARRIER WALL
NO. -NW10-**

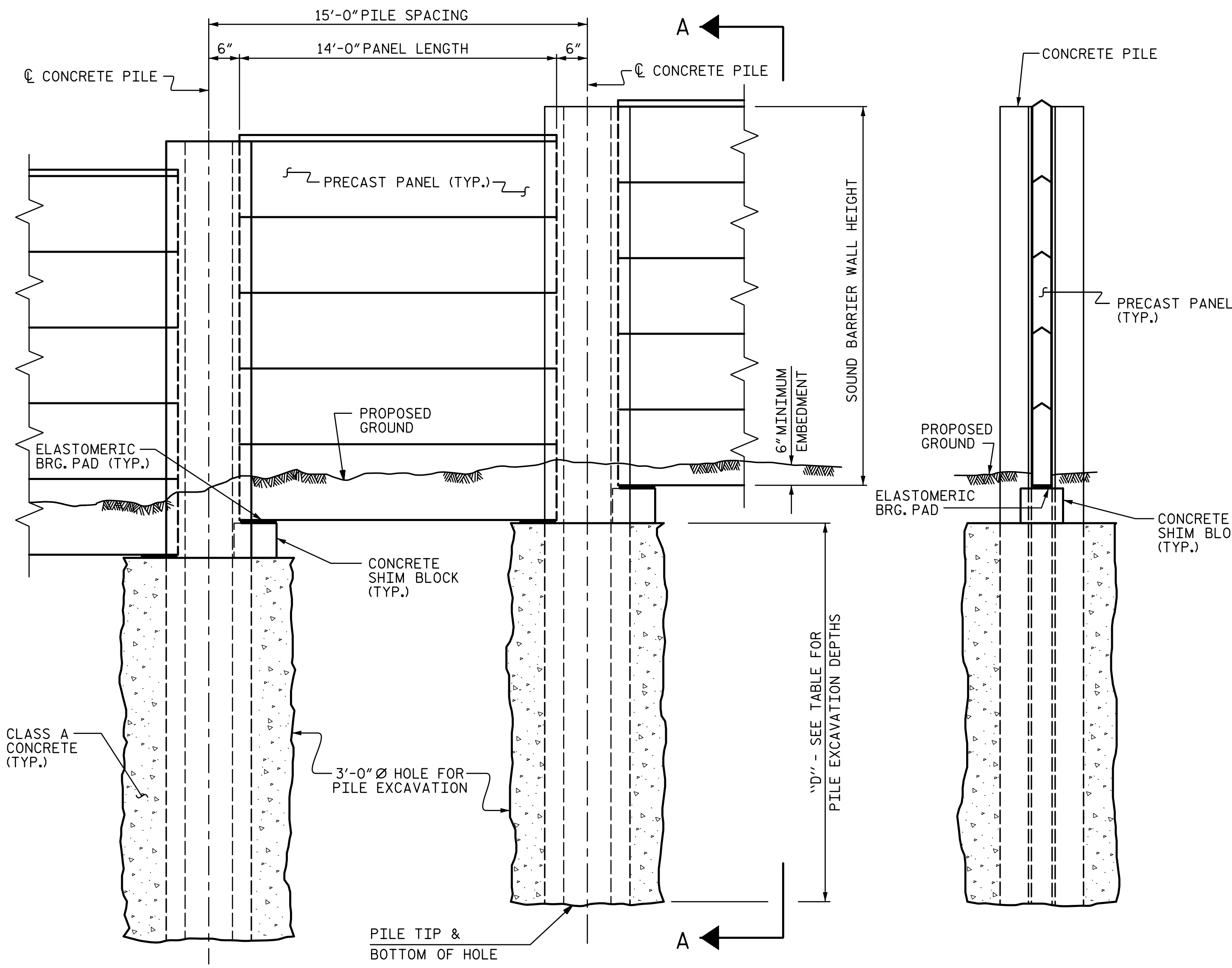
REVISIONS

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SHEET NO. NW-7
TOTAL SHEETS 17

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DRAWN BY: MBC DATE: 5-17
 CHECKED BY: JAD DATE: 5-17
 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17



ELEVATION

(DETAIL APPLIES TO 15' PILE SPACING ONLY. FOR 35' PILE SPACING, SEE SHEET 2 OF 2.)
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

SECTION A-A

(DETAIL APPLIES TO 15' PILE SPACING ONLY. FOR 35' PILE SPACING, SEE SHEET 2 OF 2.)
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW11- (STA. 10+00 TO 24+75 -NW11-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 112+67.84 -L- TO STA. 113+03.41 -L-	17'-0"	15'-0"	16'-0"
STA. 113+17.34 -L- TO STA. 117+47.96 -L-	16'-0"	15'-0"	15'-0"
Δ STA. 117+62.96 -L- TO STA. 117+97.96 -L-	15'-0"	35'-0"	21'-0"
STA. 118+12.96 -L- TO STA. 119+47.96 -L-	14'-0"	15'-0"	15'-0"
STA. 119+62.96 -L- TO STA. 127+27.96 -L-	14'-0"	15'-0"	13'-0"

Δ FOR ELEVATION VIEW AND DETAILS FOR 35' PILE SPACING, SEE SHEET 2 OF 2.
Δ FOR STEEL PILE, SUPPORT BEAM, ANGLES, AND LAGGING STOP NOTES, SEE "SOUND BARRIER WALL DETAILS" SHEET 3 OF 3.

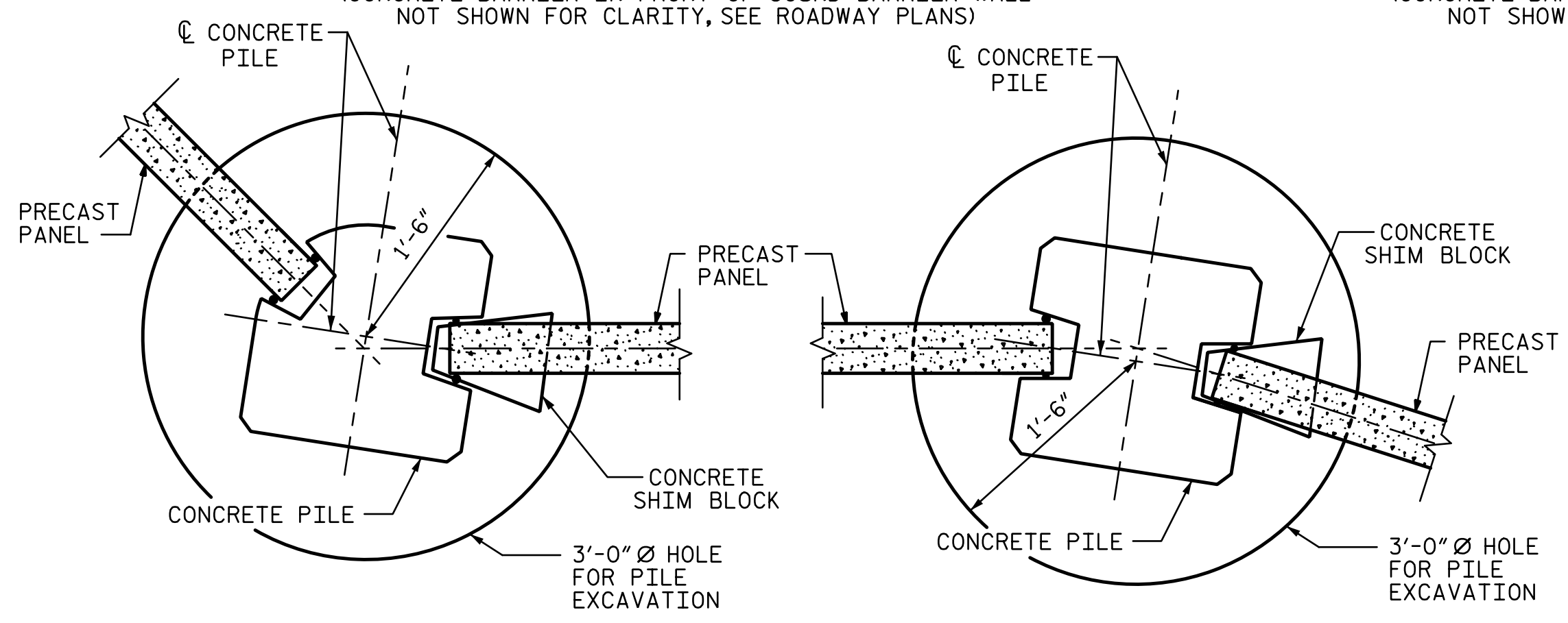
NOTES:

- 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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 & 3 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR # FS30450 STAIN.

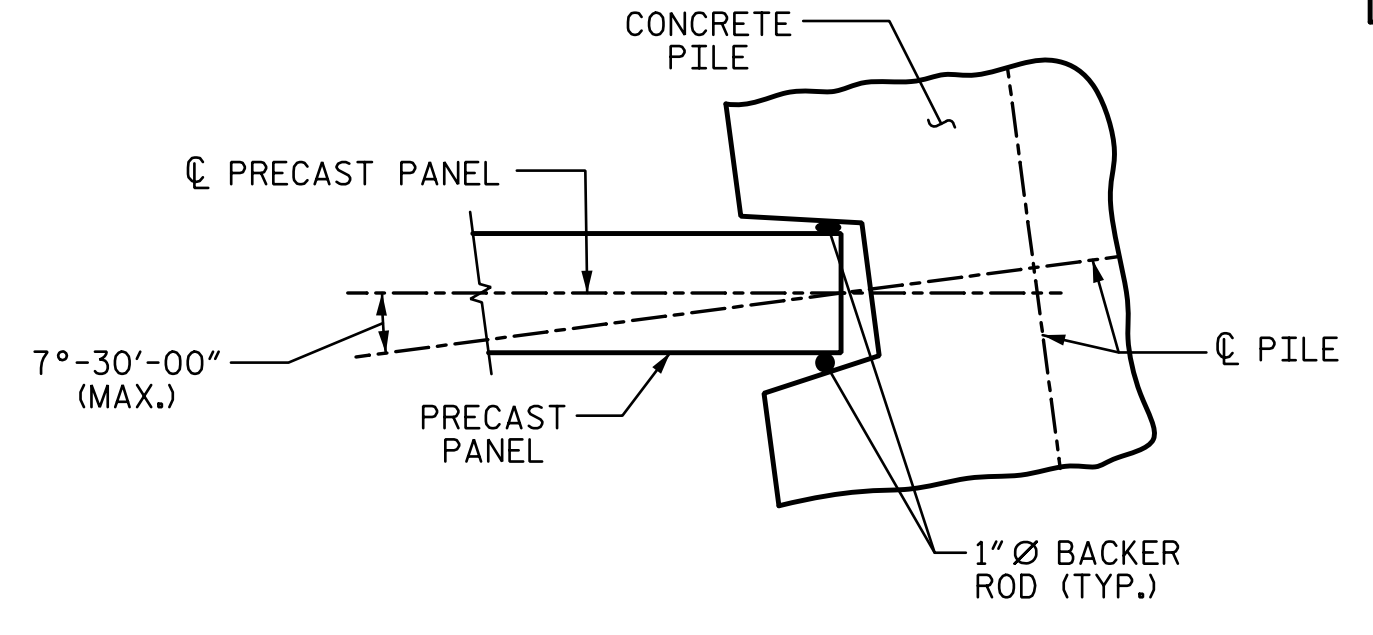
EXPOSURE CATEGORY D - PILE REINFORCING STEEL

DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')							
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
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #10 EA. FACE	#3 @ 10" CTS.	15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" 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
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.	15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #8 EA. FACE	#3 @ 10" CTS.	15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" CTS.

BILL OF MATERIAL -NW11-	
SOUND BARRIER WALL	S.F. 20,769
ARCHITECTURAL SURFACE TREATMENT	S.F. 17,383
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

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

PROJECT NO. U-4751
NEW HANOVER COUNTY
 STATION: 112+67.84 -L- = 10+00.00 -NW11-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

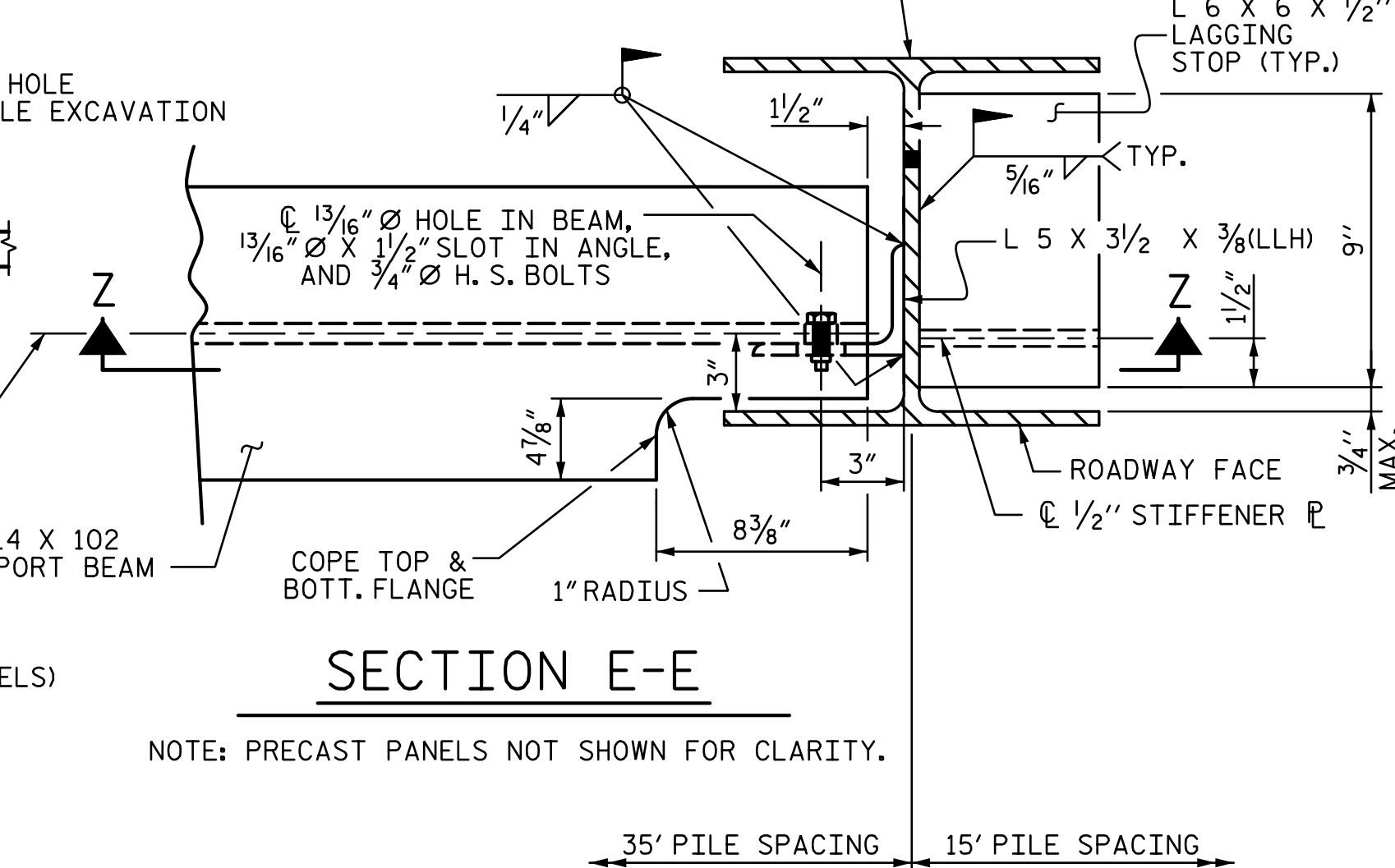
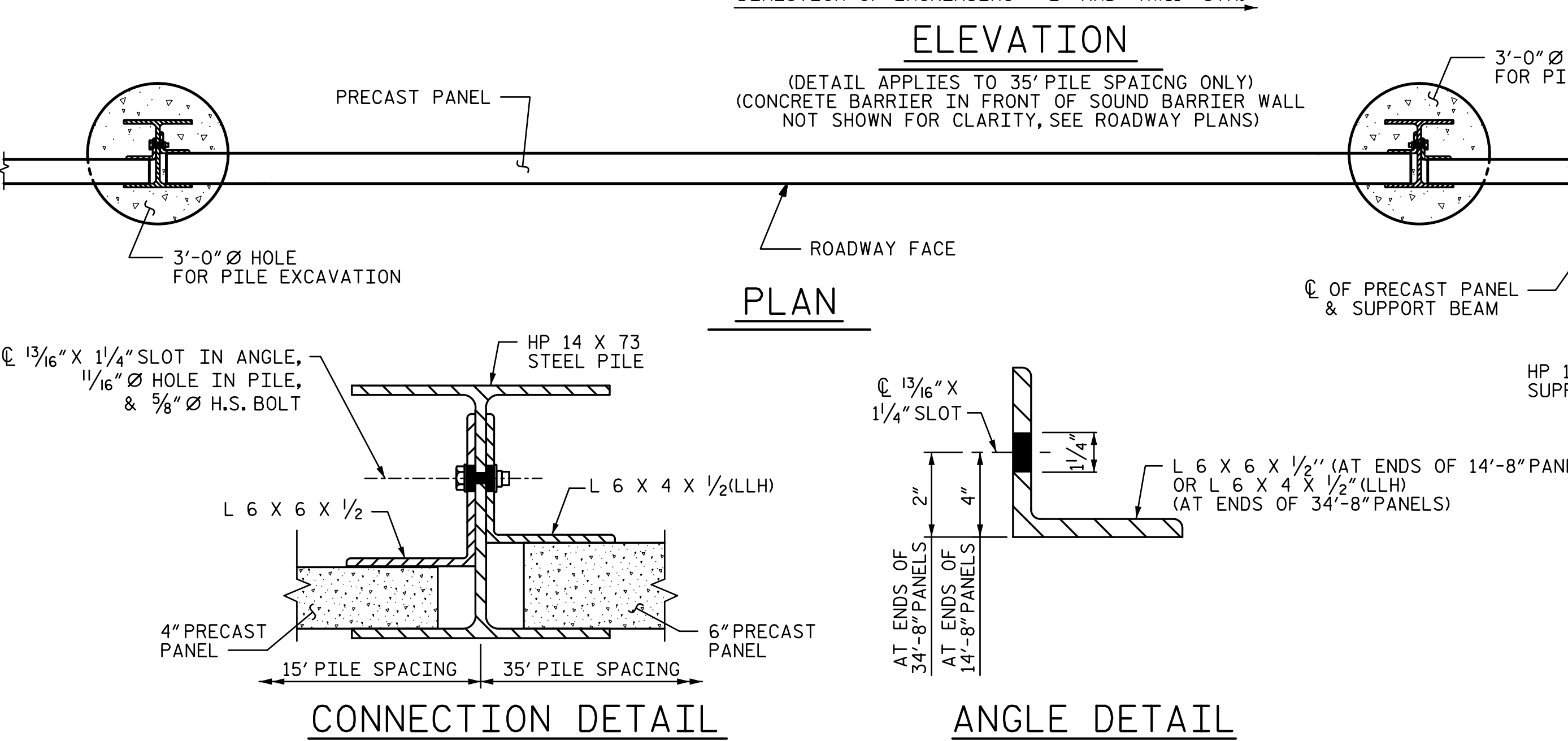
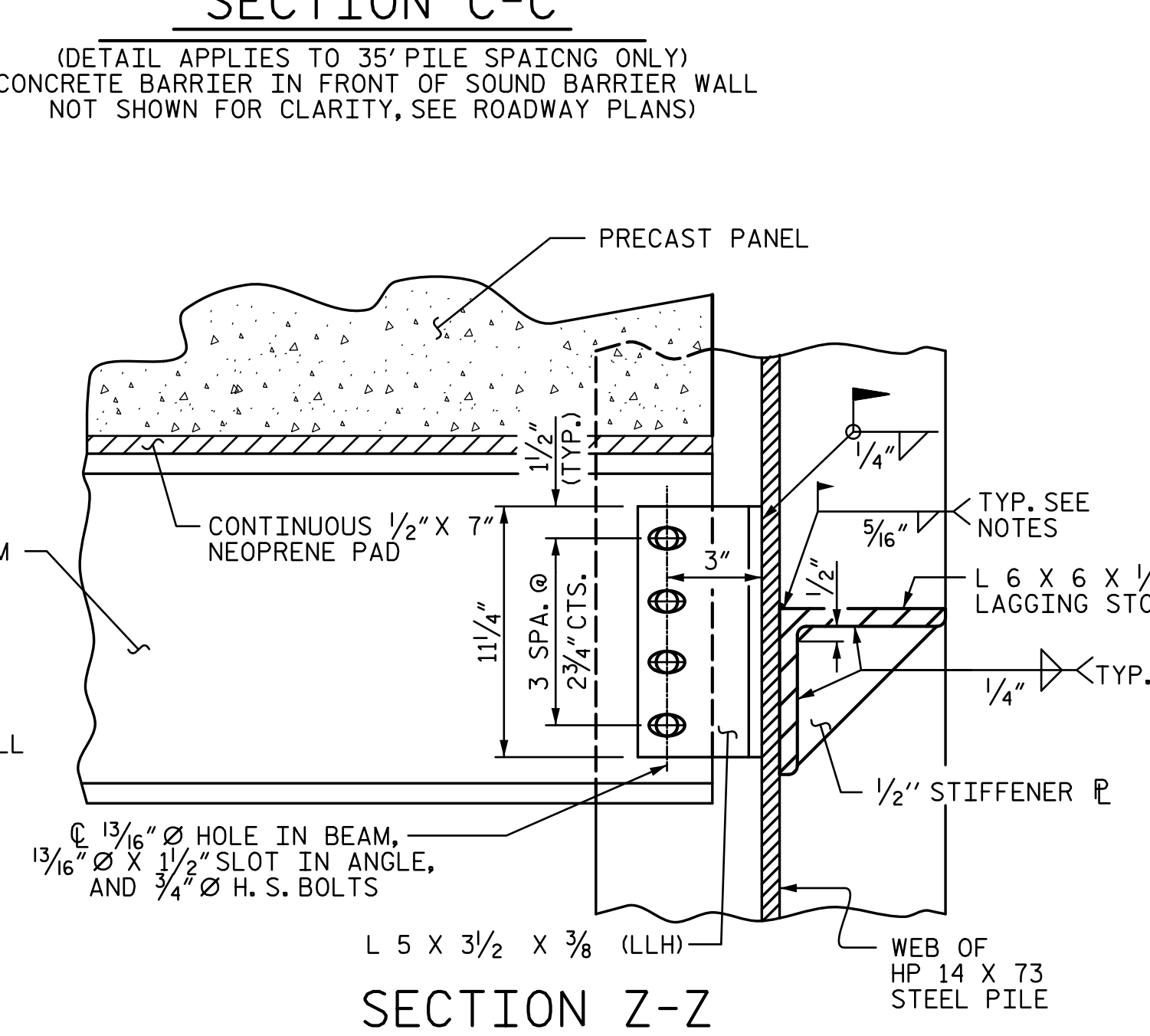
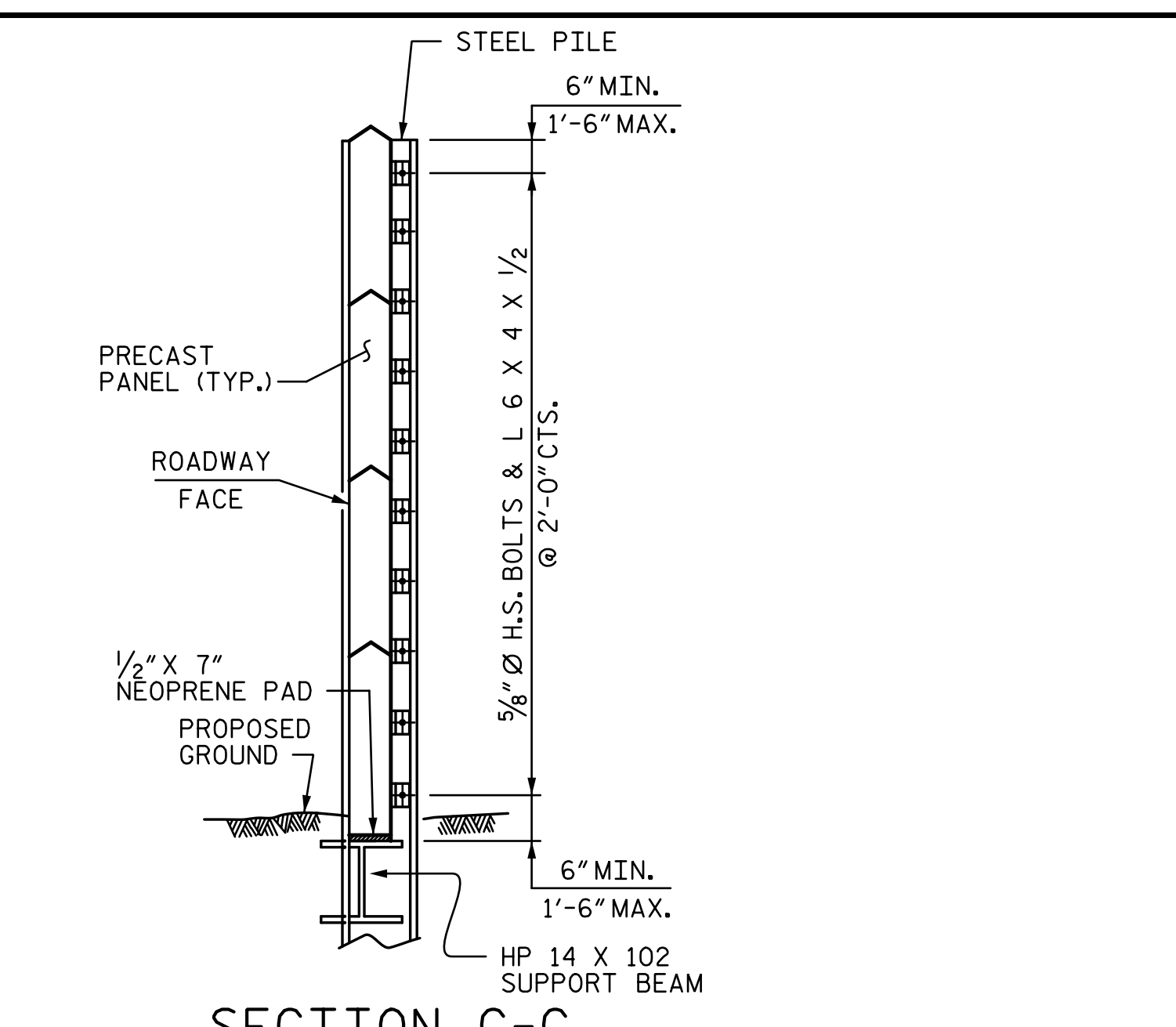
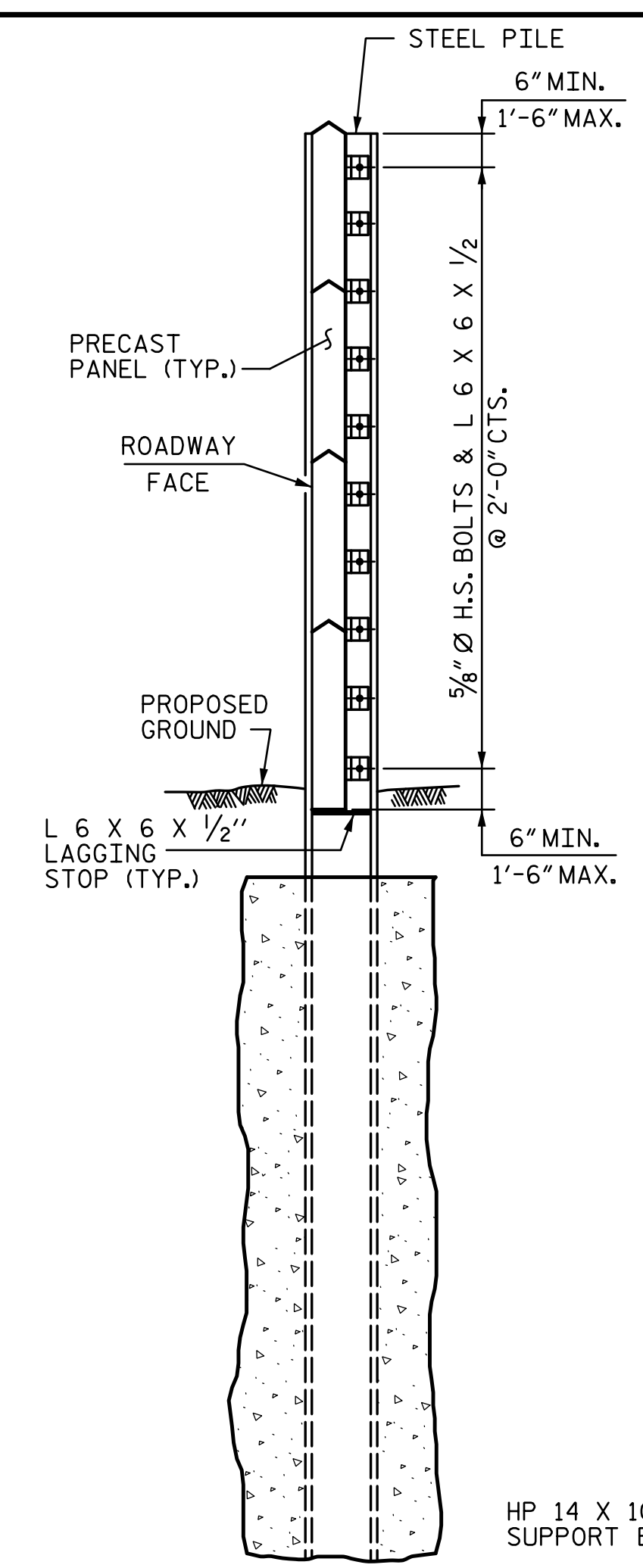
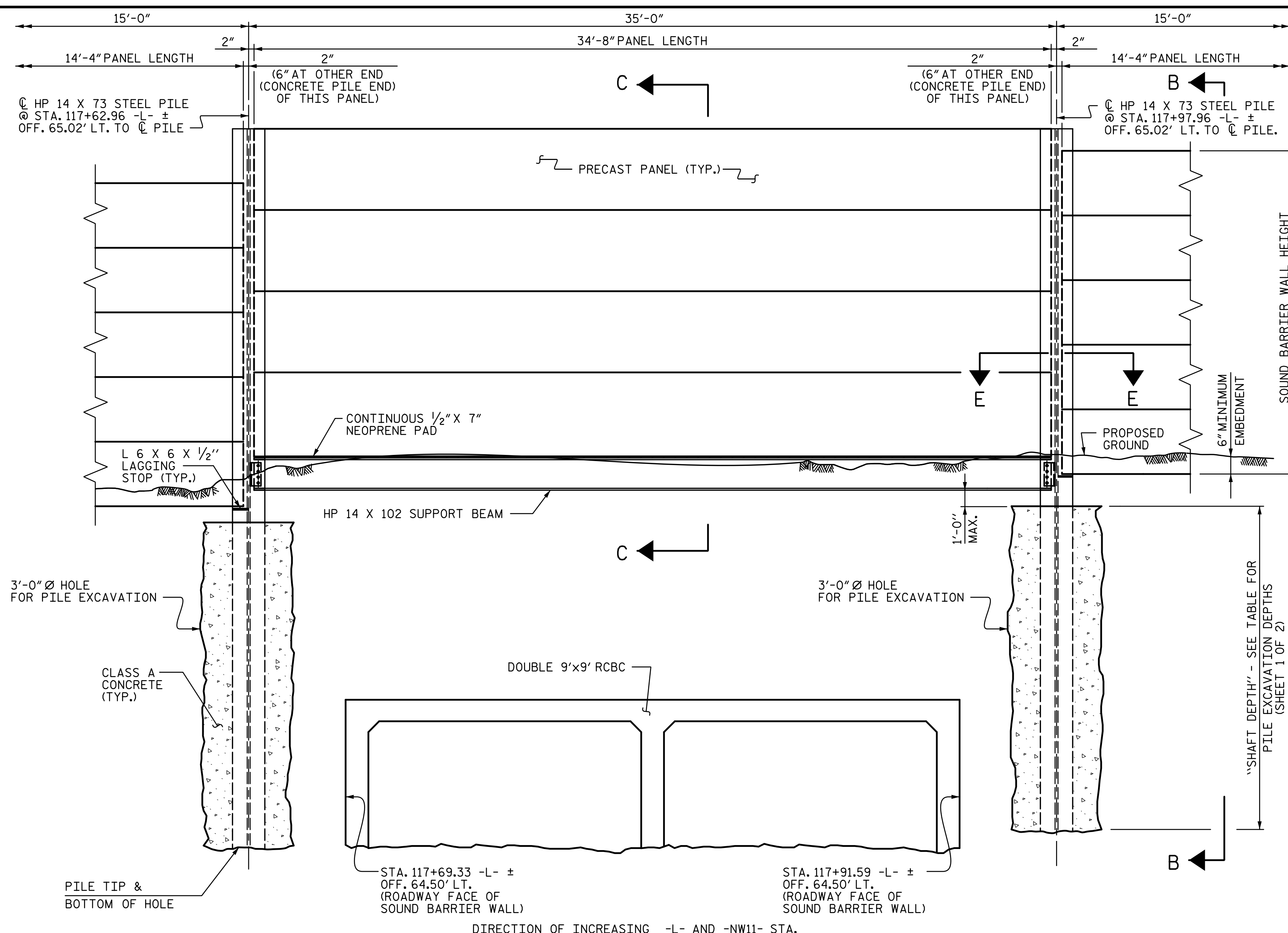
SOUND BARRIER WALL NO. -NW11-

STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

SEAL 023081
 ENGINEER
 JOSEPH A. DICHAK
 8/17/2017

REVISIONS						SHEET NO.
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2			4			17

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PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 112+67.84 -L- =
10+00.00 -NW11-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STV 100 Years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

SEAL
 023081
 ENGINEER
 JOSEPH A. DICHAK
 8/17/2017

**SOUND BARRIER WALL
 NO. -NW11-**

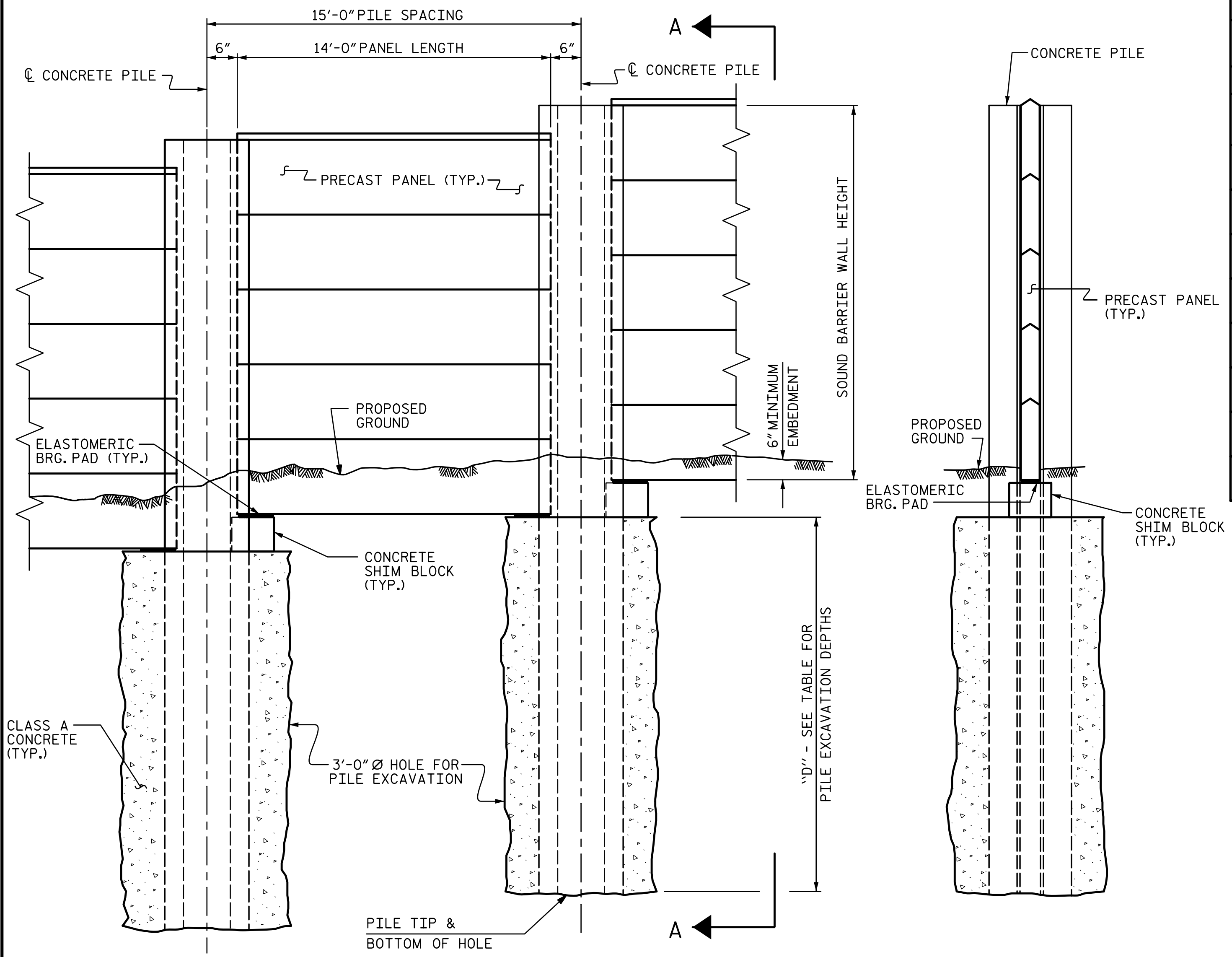
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 17

DRAWN BY: MBC DATE: 5-17 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17
 CHECKED BY: JAD DATE: 5-17

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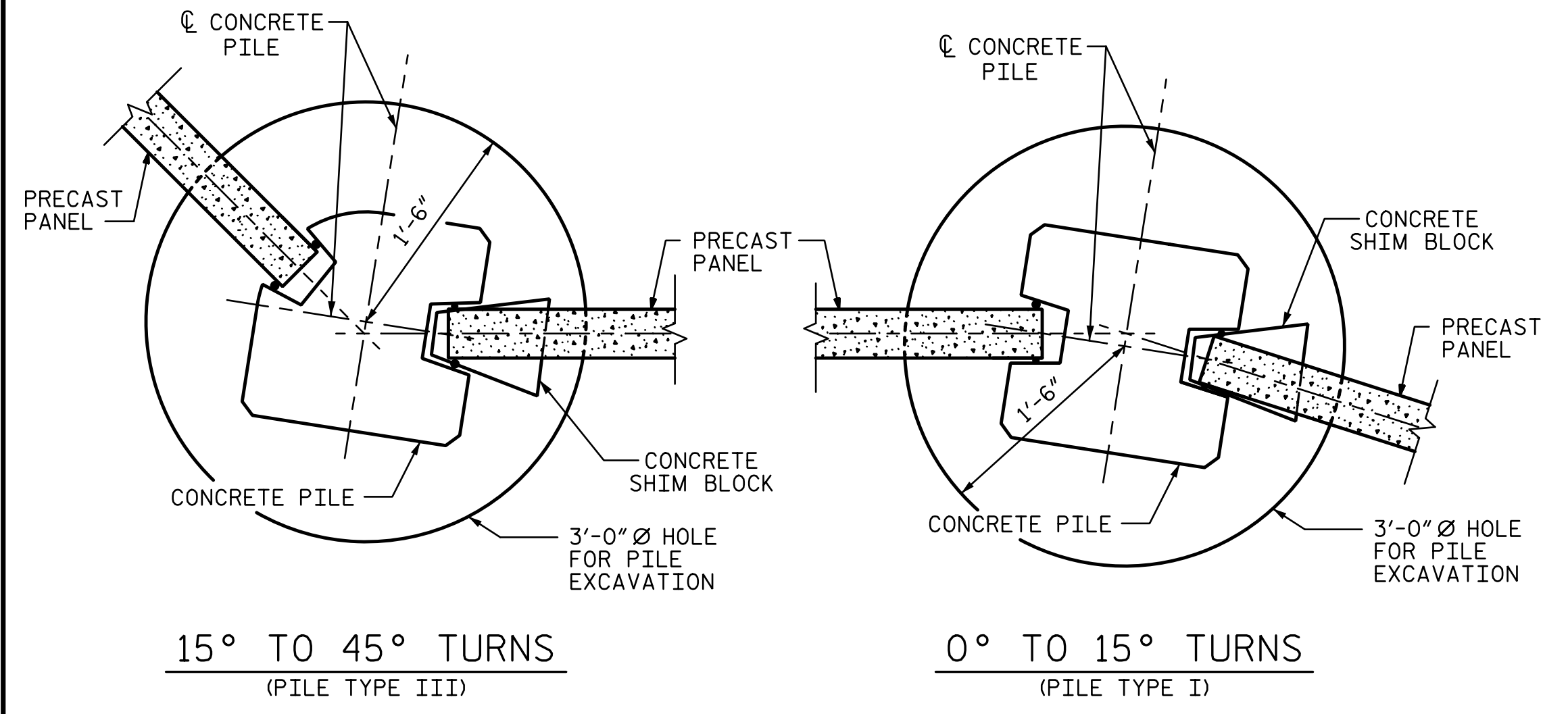


ELEVATION

(DETAIL APPLIES TO 15' PILE SPACING ONLY. FOR 25' PILE SPACING, SEE SHEET 2 OF 3. FOR 38' PILE SPACING, SEE SHEET 3 OF 3.) (CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

SECTION A-A

(DETAIL APPLIES TO 15' PILE SPACING ONLY. FOR 25' PILE SPACING, SEE SHEET 2 OF 3. FOR 38' PILE SPACING, SEE SHEET 3 OF 3.) (CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)



TYPICAL WALL TURN DETAILS

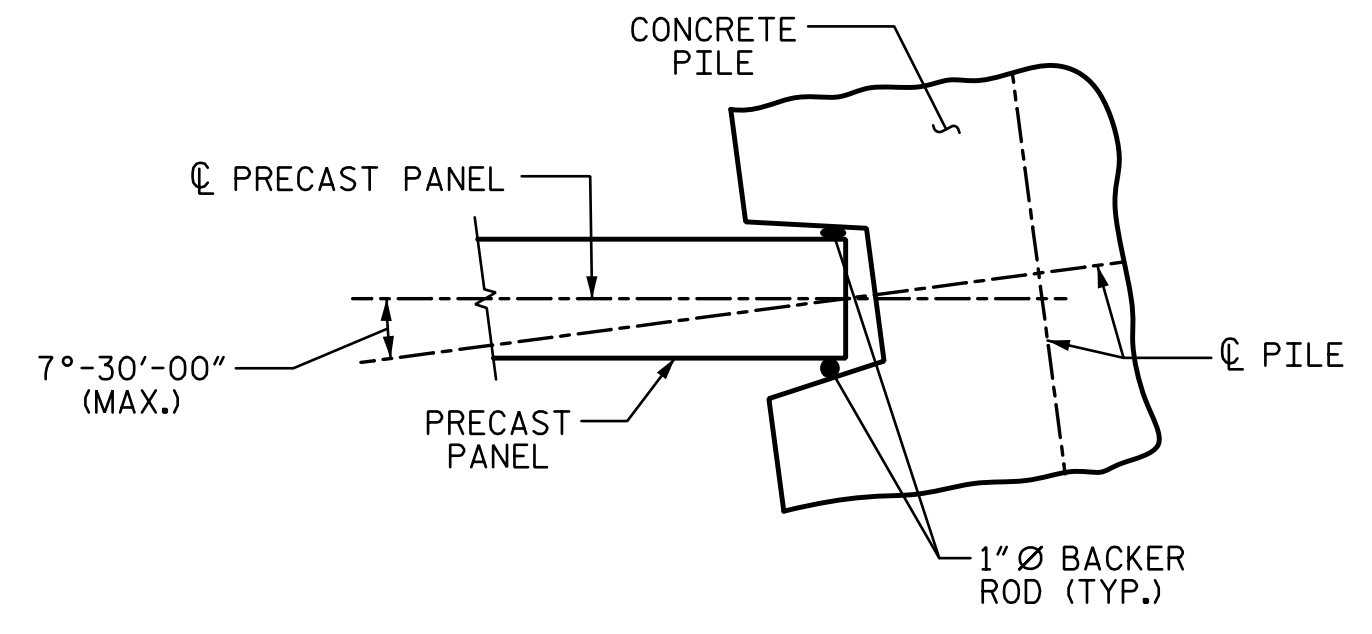
DRAWN BY : MBC	DATE : 5-17	DESIGN ENGINEER OF RECORD : J. DICHAK	DATE : 5-17
CHECKED BY : JAD	DATE : 5-17		

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW13- (STA. 10+00 TO 38+83 -NW13-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 128+33.75 -L- TO STA. 128+48.67 -L-	17'-0"	15'-0"	16'-6"
STA. 128+62.49 -L-	15'-0"	15'-0"	14'-6"
▲ STA. 128+77.49 -L- TO STA. 135+62.14 -L-	17'-0"	15'-0"	13'-0"
▲ STA. 135+77.52 -L- TO STA. 138+54.36 -L-	16'-0"	15'-0"	13'-6"
△ STA. 138+69.74 -L- TO STA. 138+95.37 -L-	16'-0"	25'-0"	17'-0"
STA. 139+10.75 -L- TO STA. 151+62.26 -L-	16'-0"	15'-0"	13'-6"
△ STA. 151+77.64 -L- TO STA. 152+16.61 -L-	16'-0"	38'-0"	20'-0"
STA. 152+31.99 -L- TO STA. 157+54.98 -L-	16'-0"	15'-0"	13'-6"

△ FOR ELEVATION VIEW AND DETAILS FOR 25' AND 38' PILE SPACINGS, SEE SHEETS 2 AND 3 OF 3.
 △ FOR STEEL PILES, SUPPORT BEAM, ANGLES, AND LAGGING STOP NOTES, SEE "SOUND BARRIER WALL DETAILS" SHEET 3 OF 3.

EXPOSURE CATEGORY D - PILE REINFORCING STEEL

DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H ≤ 25')			
PILE TYPE I			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #10 EA. FACE	#3 @ 10" CTS.
PILE TYPE II			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #8 EA. FACE	#3 @ 10" CTS.
PILE TYPE III			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" CTS.
PILE TYPE III ALT.			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	3 - #9 SHORT FACE 4 - #9 LONG FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	3 - #11 SHORT FACE 4 - #11 LONG FACE	#3 @ 10" CTS.



PILE ROTATION LIMIT FOR WALL TURN

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

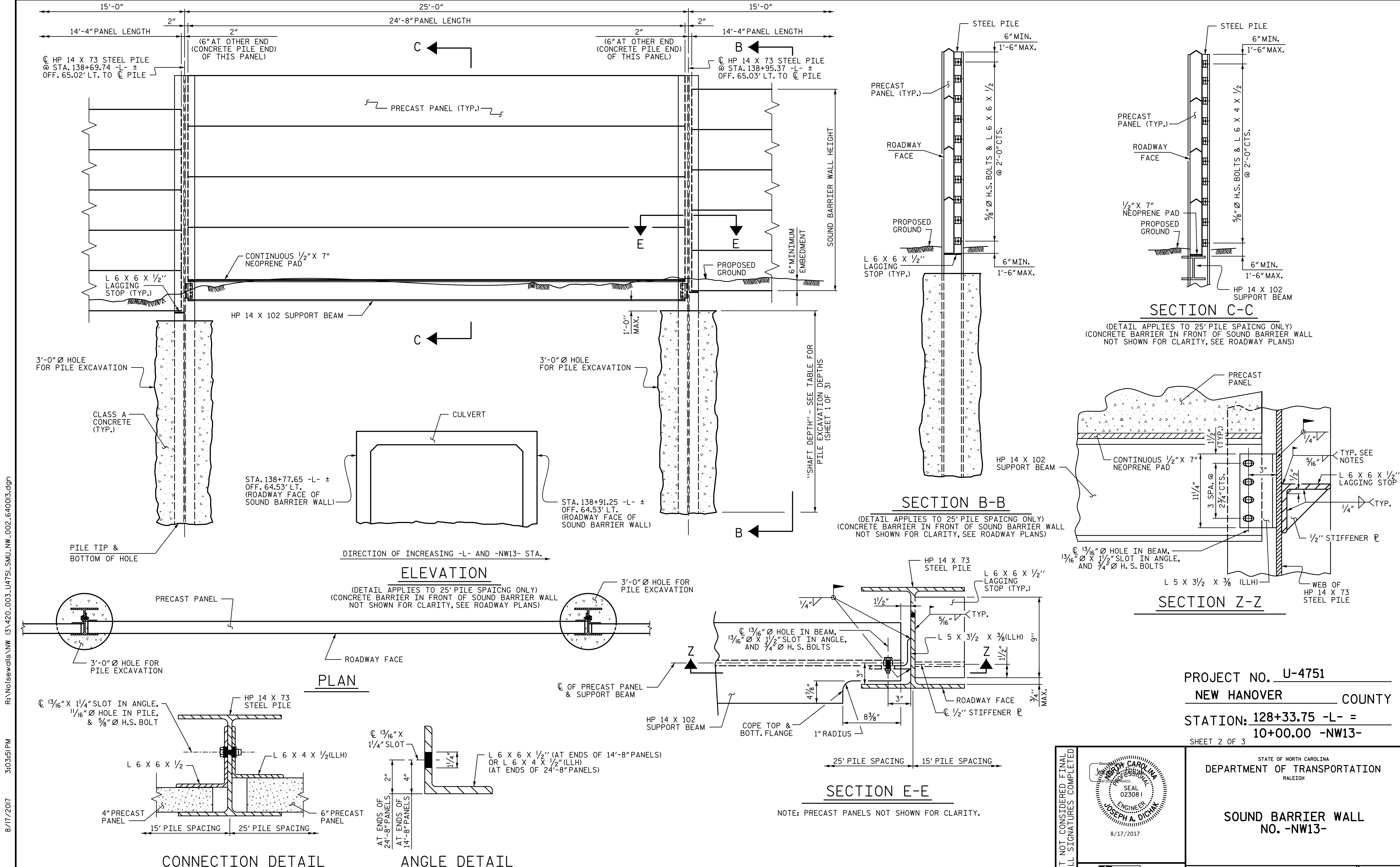
NOTES:

- 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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 & 3 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- NOTE THAT SOUND BARRIER WALL PILES LOCATED WITHIN THE MSE WALL BACKFILL MUST BE INSTALLED PRIOR TO MSE WALL CONSTRUCTION. THE DEPTHS ARE MEASURED FROM THE BOTTOM OF THE MSE WALL REINFORCED ZONE ASSUMING 2 FEET OF WALL EMBEDMENT AND BASED ON THE DIMENSION SHOWN IN THE ROADWAY CROSS SECTIONS.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR * FS30450 STAIN.

BILL OF MATERIAL -NW13-	
SOUND BARRIER WALL	S.F. 44,952
ARCHITECTURAL SURFACE TREATMENT	S.F. 37,911
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	

PROJECT NO. **U-4751**
NEW HANOVER COUNTY
 STATION: **128+33.75 -L- = 10+00.00 -NW13-**
 SHEET 1 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SOUND BARRIER WALL NO. -NW13-																		
	STV 100 years STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991	REVISIONS <table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <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> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
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SHEET NO. NW-10 TOTAL SHEETS 17																				

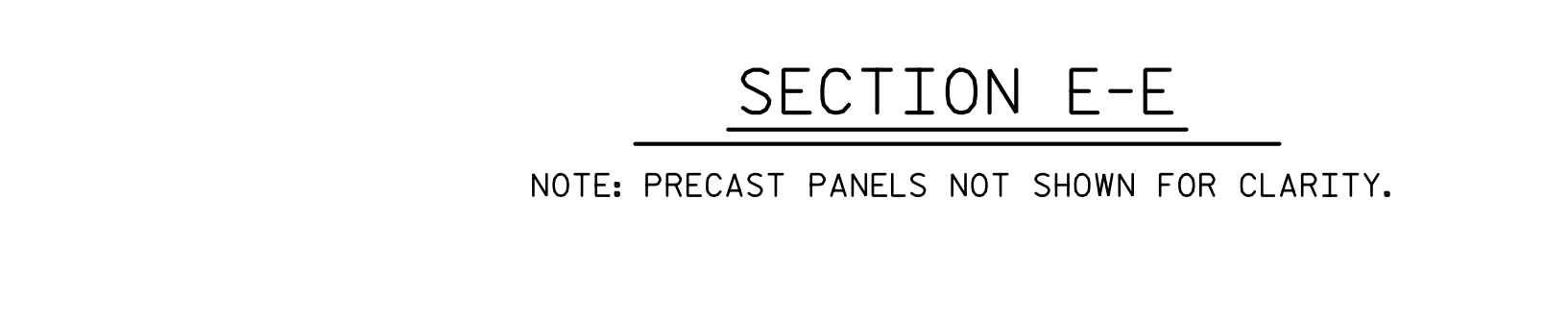
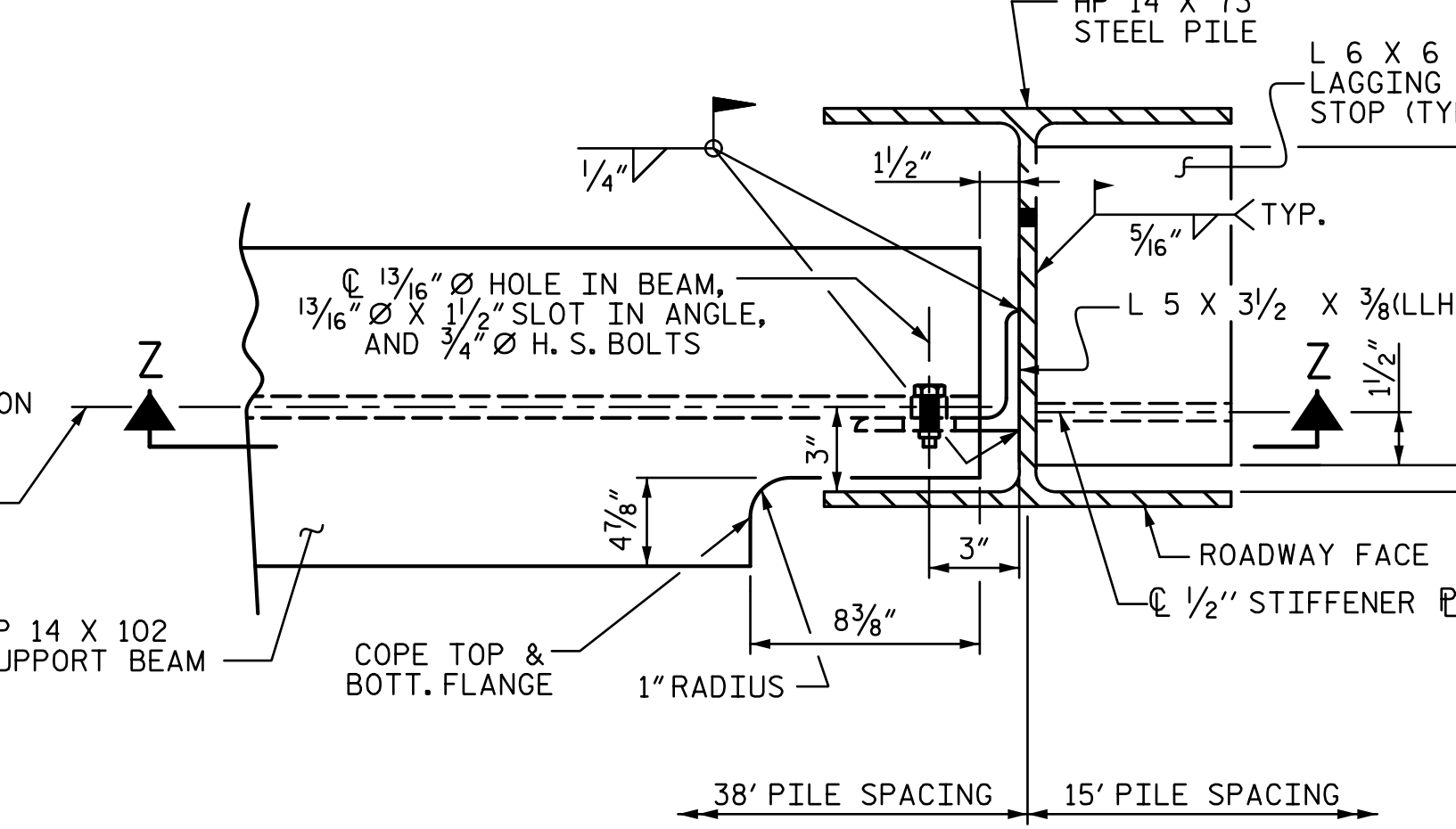
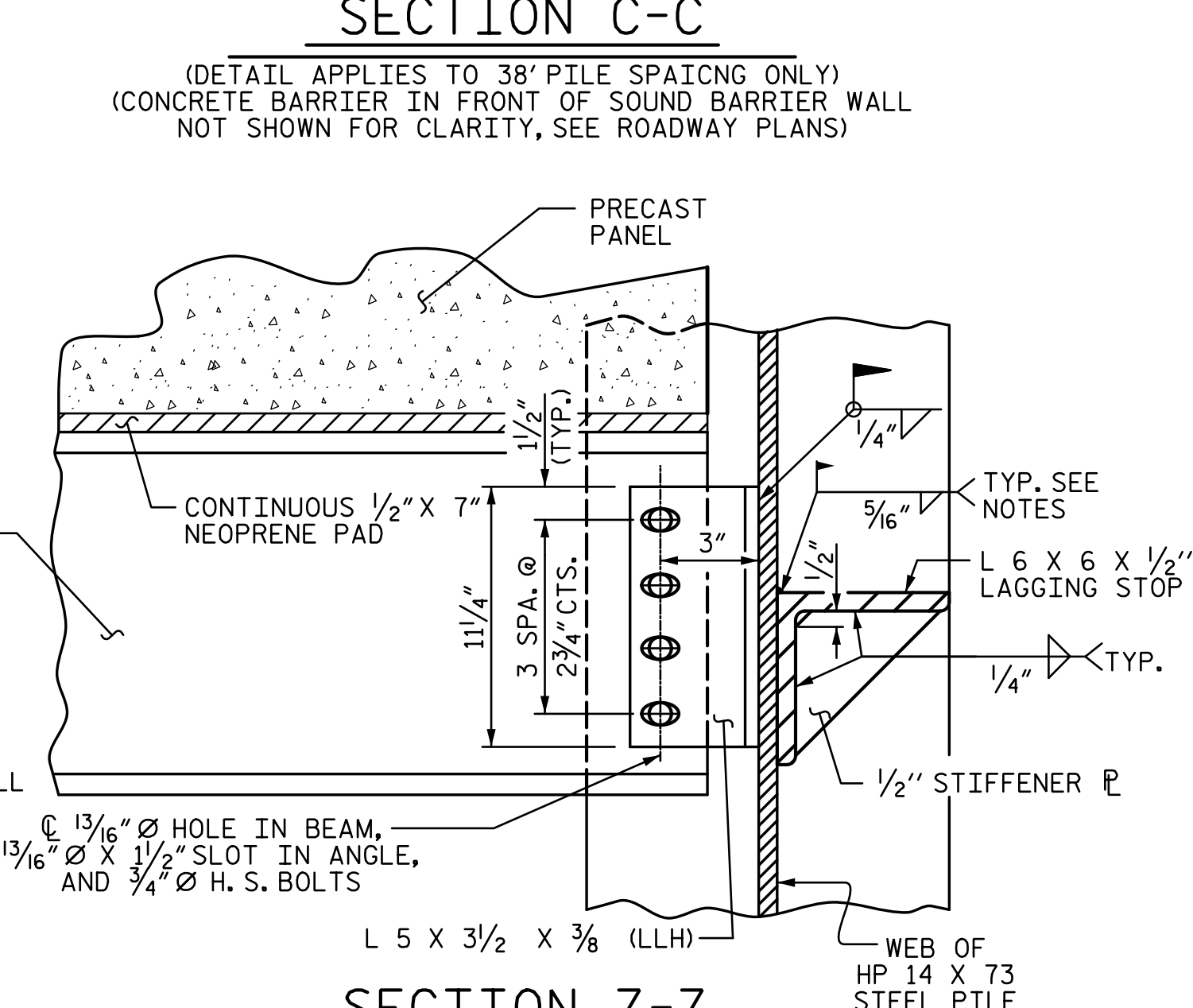
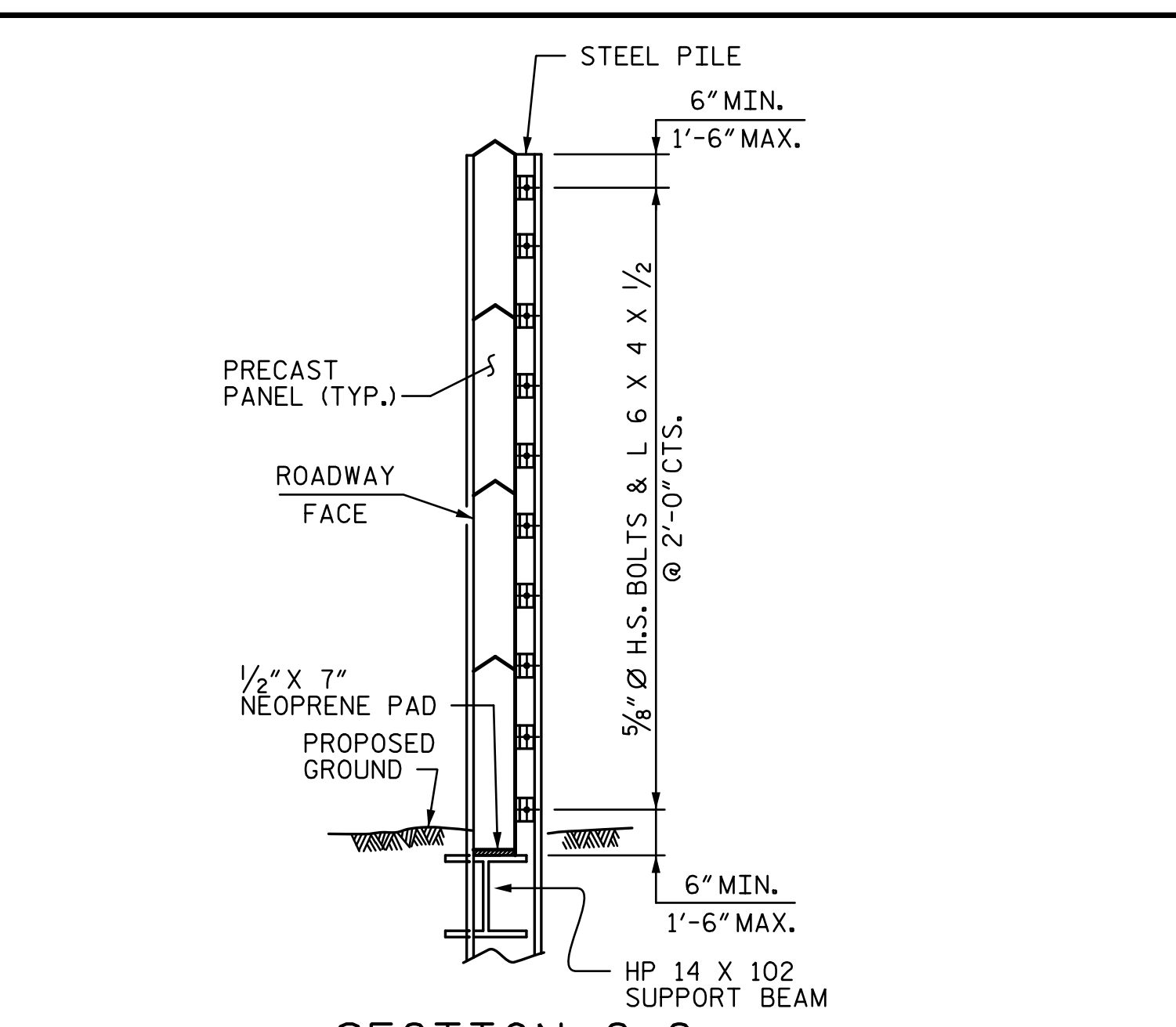
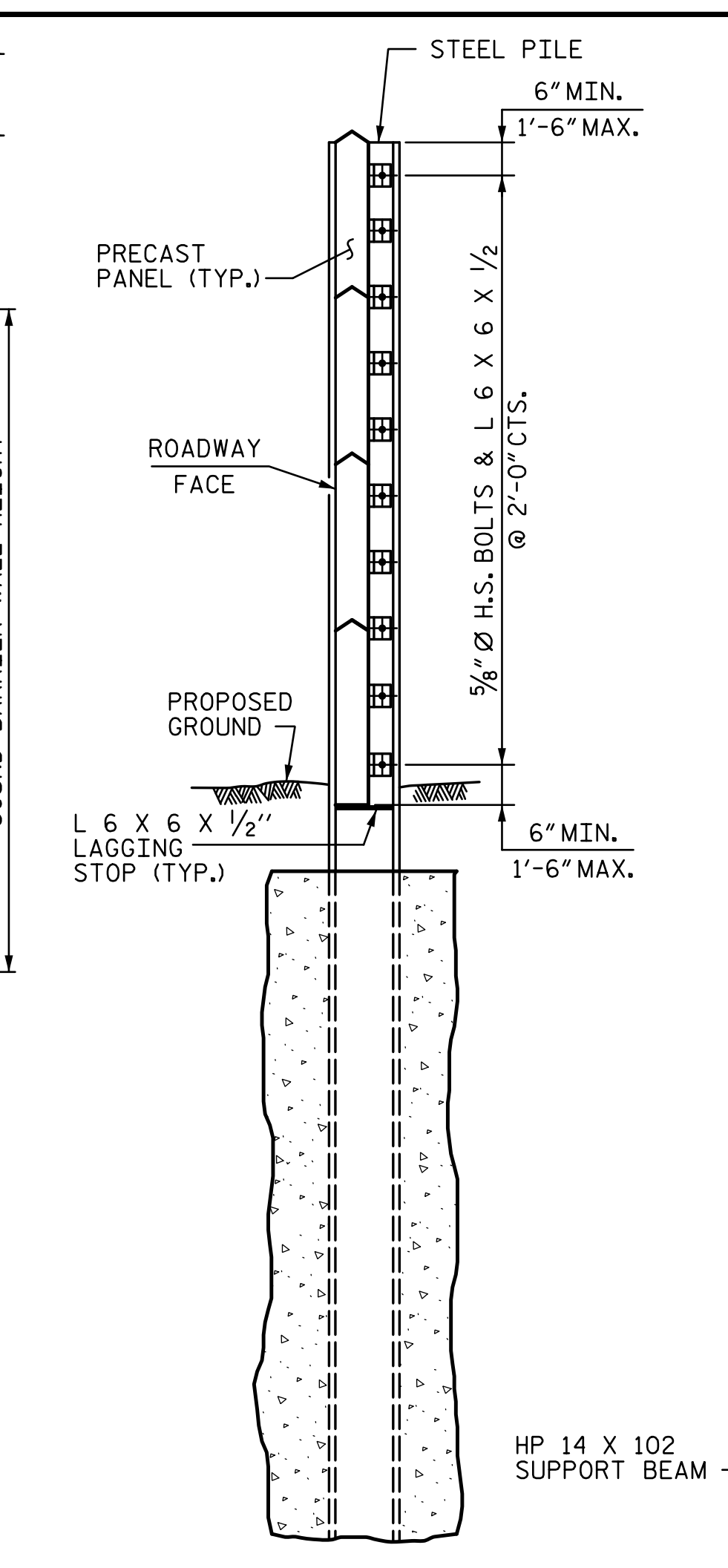
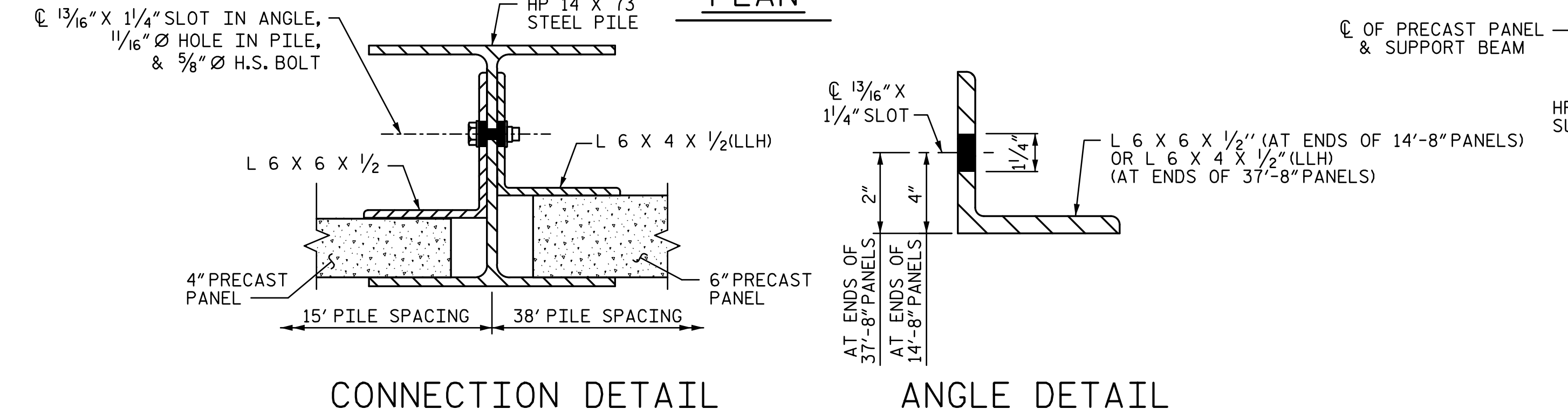
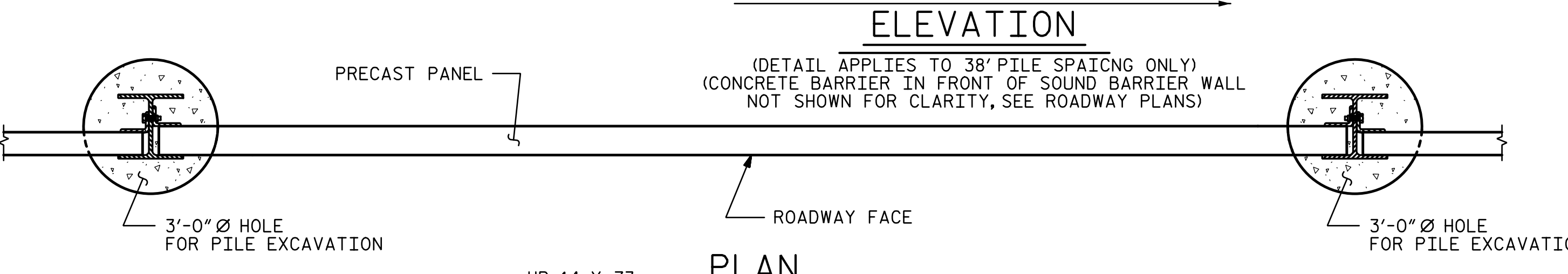
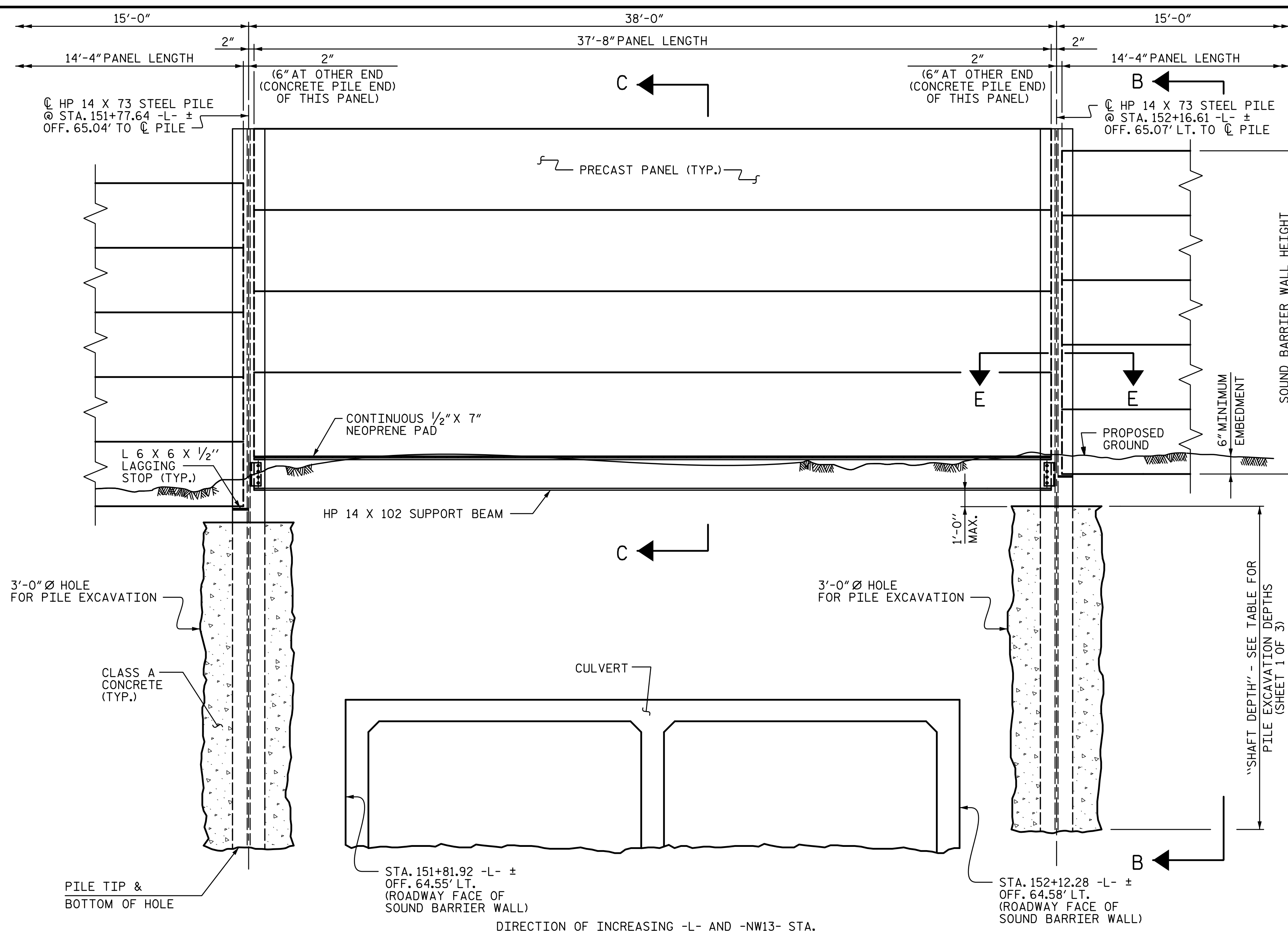


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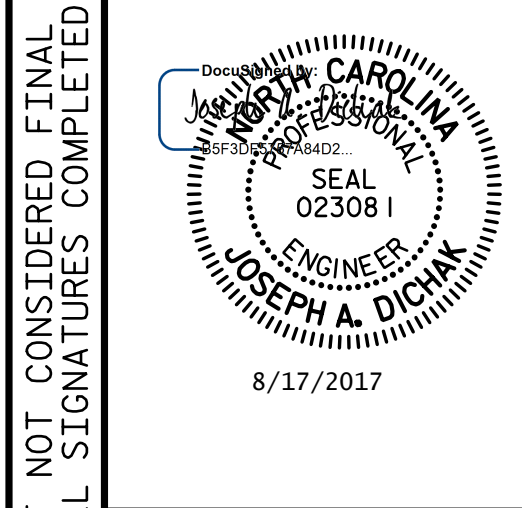
PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 128+33.75 -L- = 10+00.00 -NW13-
 SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SOUND BARRIER WALL NO. -NW13-	
	REVISIONS					
	NO.	BY:	DATE:	NO.		BY:
1			3			NW-11
2			4			TOTAL SHEETS 17

DRAWN BY: MBC DATE: 5-17 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17
 CHECKED BY: JAD DATE: 5-17



PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 128+33.75 -L- = 10+00.00 -NW13-
 SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

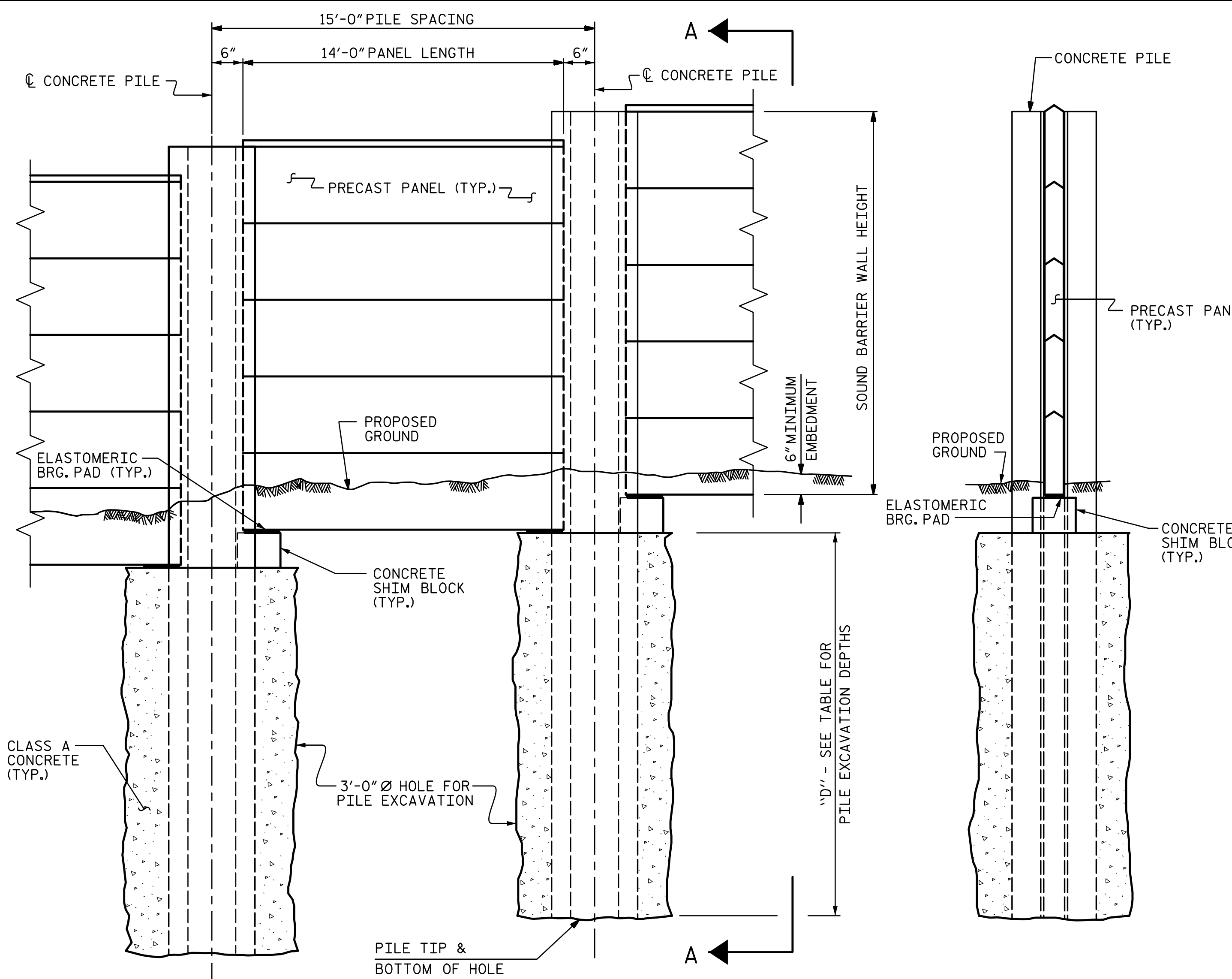
**SOUND BARRIER WALL
 NO. -NW13-**

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CHECKED BY: JAD	DATE: 5-17		

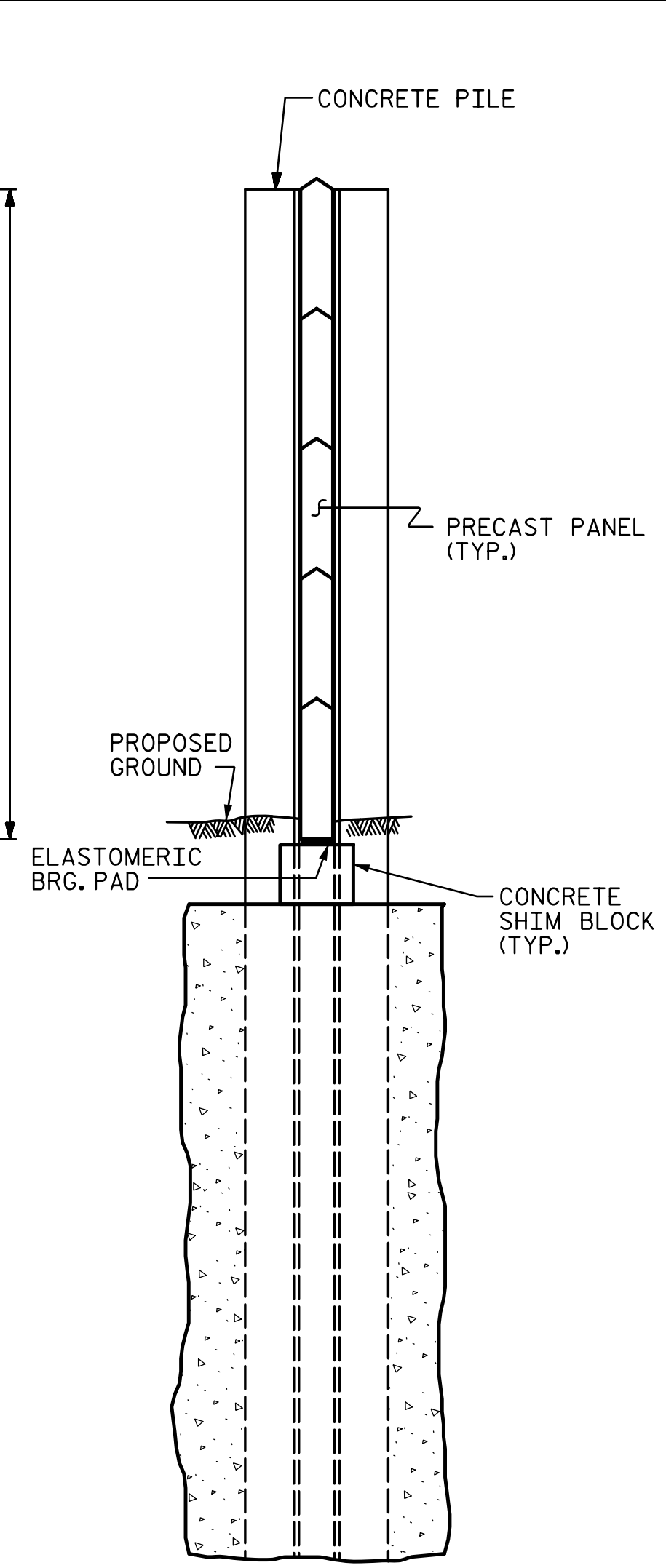
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 17



ELEVATION

(DETAIL APPLIES TO 15' PILE SPACING ONLY.
FOR 25' PILE SPACING, SEE SHEET 2 OF 2.)
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL
NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)



SECTION A-A

(DETAIL APPLIES TO 15' PILE SPACING ONLY.
FOR 25' PILE SPACING, SEE SHEET 2 OF 2.)
(CONCRETE BARRIER IN FRONT OF SOUND BARRIER WALL
NOT SHOWN FOR CLARITY, SEE ROADWAY PLANS)

PILE EXCAVATION DEPTHS "D"			
3'-0" Ø HOLE			
WALL -NW14- (STA. 10+00 TO 21+65 -NW14-)			
STATION	MAX WALL HEIGHT	PILE SPACING	SHAFT DEPTH
STA. 129+24.09 -L- TO STA. 132+51.84 -L-	17'-0"	15'-0"	16'-0"
STA. 132+66.47 -L- TO STA. 138+08.08 -L-	14'-0"	15'-0"	14'-6"
Δ STA. 138+22.72 -L- TO STA. 138+47.12 -L-	13'-0"	25'-0"	17'-0"
STA. 138+61.76 -L- TO STA. 140+66.69 -L-	13'-0"	15'-0"	14'-6"

Δ FOR ELEVATION VIEW AND DETAILS FOR 25' PILE SPACING, SEE SHEET 2 OF 2.
Δ FOR STEEL PILE, SUPPORT BEAM, ANGLES, AND LAGGING STOP NOTES, SEE "SOUND BARRIER WALL DETAILS" SHEET 3 OF 3.

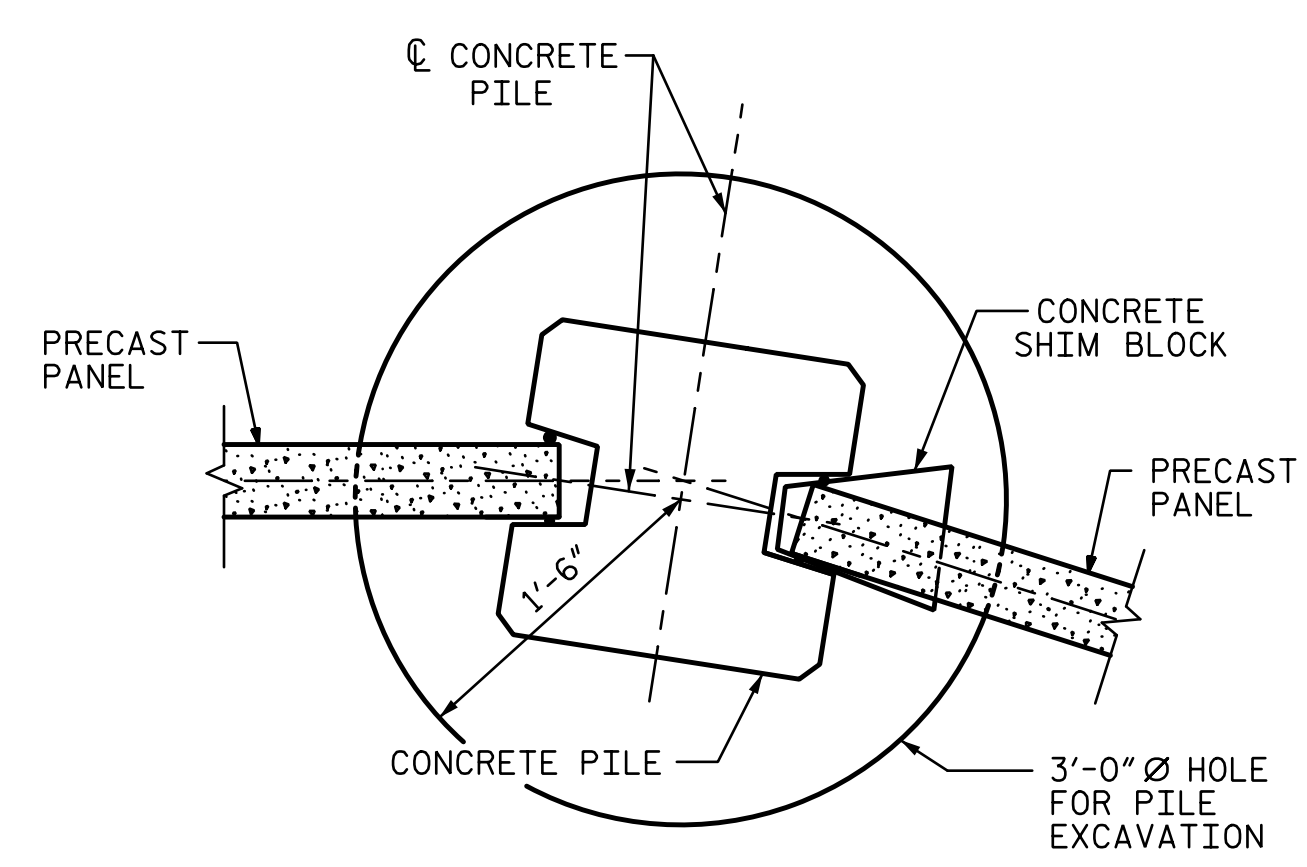
NOTES:

- 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.
- 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 ELASTOMERIC BEARING DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR CONCRETE SHIM BLOCK DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 OF 3.
- FOR PRECAST PANEL DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEET 1 & 3 OF 3.
- FOR CONCRETE PILE DETAILS, SEE "SOUND BARRIER WALL DETAILS" SHEETS 1 & 2 OF 3.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATION. SEE "CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS" SPECIAL PROVISION.
- THE ARCHITECTURAL CONCRETE SURFACE TREATMENT SHALL MATCH THE APPEARANCE (STONE SIZE AND SHAPE, STONE TEXTURE, PATTERN AND RELIEF) OF NATURAL STONE TO RESEMBLE A DRY STACKED STONE PATTERN WITH FEDERAL STANDARD 595 COLOR # F30450 STAIN.

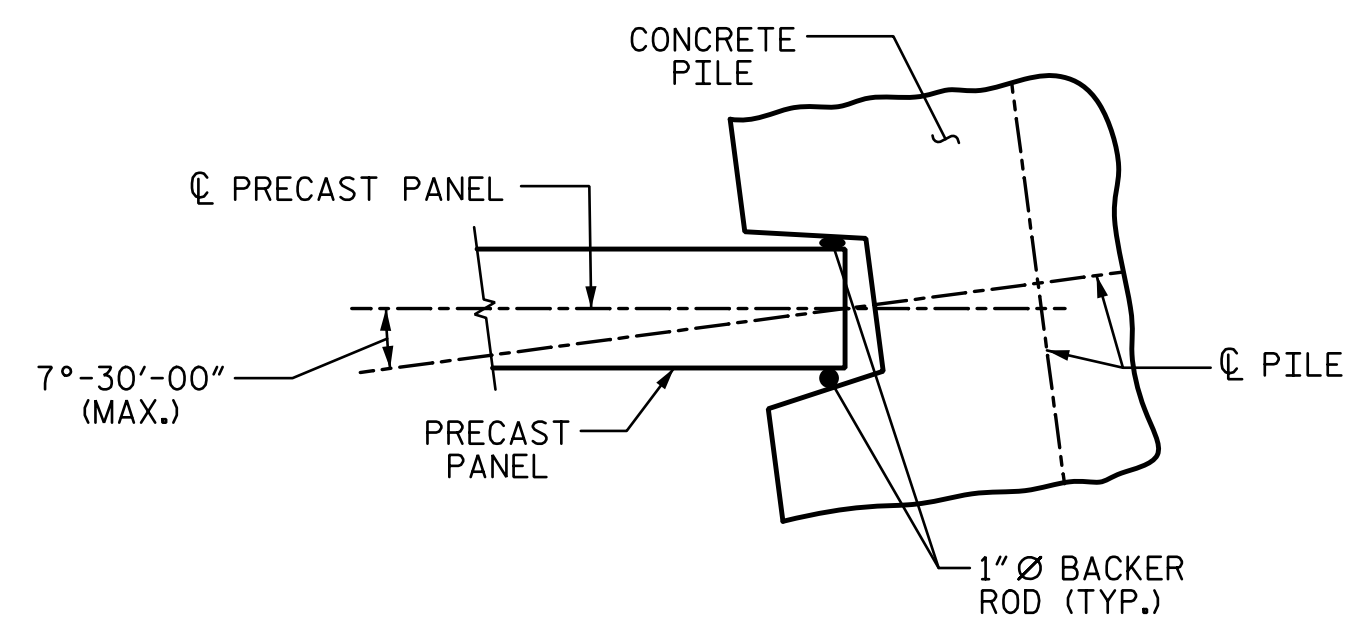
EXPOSURE CATEGORY D - PILE REINFORCING STEEL

DESIGN WIND PRESSURE = 62 PSF (0' < H ≤ 14'); 71 PSF (14' < H < 25')			
PILE TYPE I			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #8 EA. FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #10 EA. FACE	#3 @ 10" CTS.
PILE TYPE II			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	VERTICAL REINFORCING STEEL	TIES
15'-0"	H ≤ 15'	4 - #6 EA. FACE	#3 @ 11" CTS.
15'-0"	15' < H ≤ 20'	4 - #8 EA. FACE	#3 @ 10" CTS.

BILL OF MATERIAL -NW14-	
SOUND BARRIER WALL	S.F. 16,142
ARCHITECTURAL SURFACE TREATMENT	S.F. 13,482
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	



TYPICAL WALL TURN DETAILS



PILE ROTATION LIMIT FOR WALL TURN

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

PROJECT NO. U-4751
NEW HANOVER COUNTY
 STATION: 129+24.09 -L- =
10+00.00 -NW14-
 SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

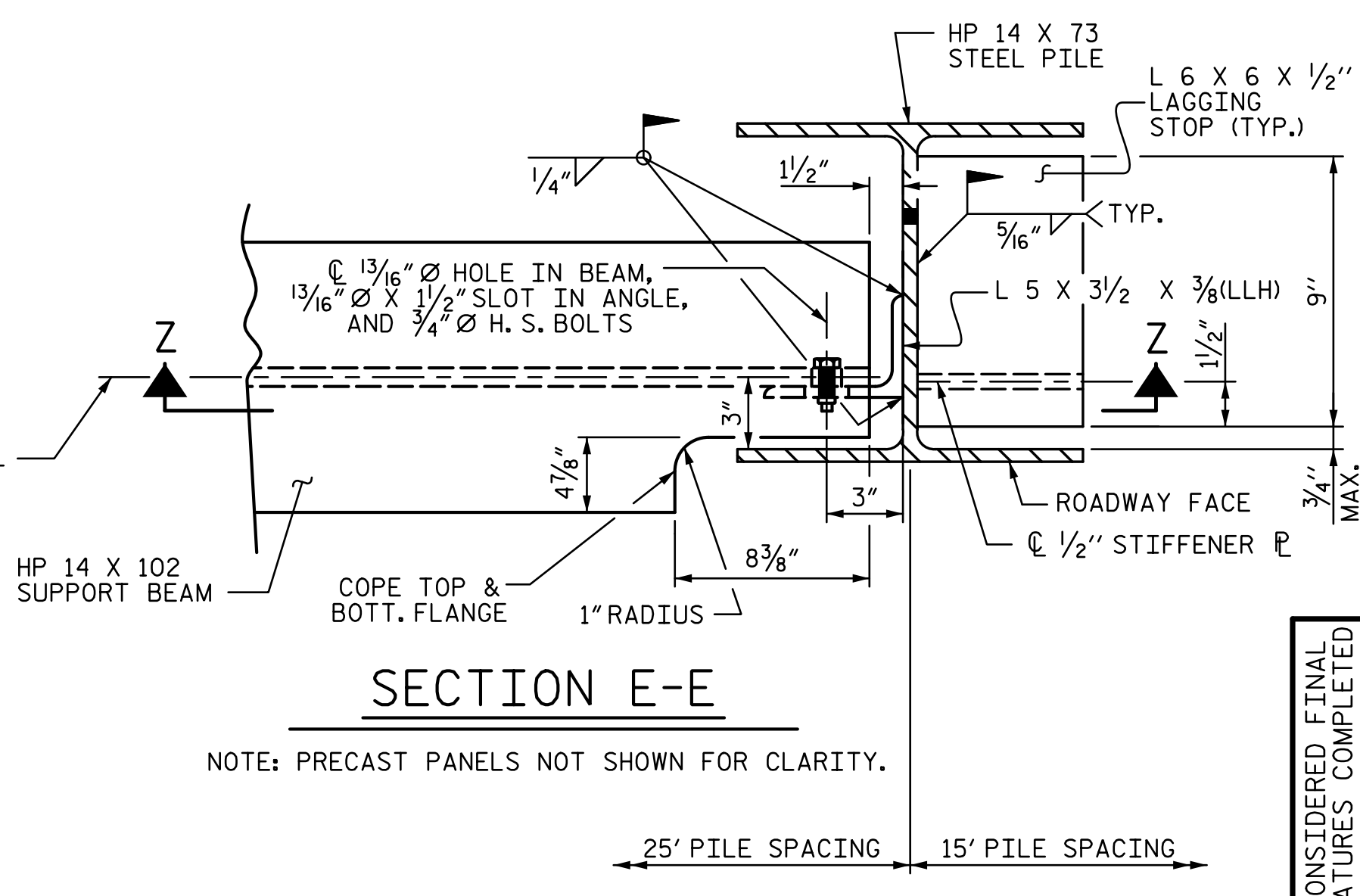
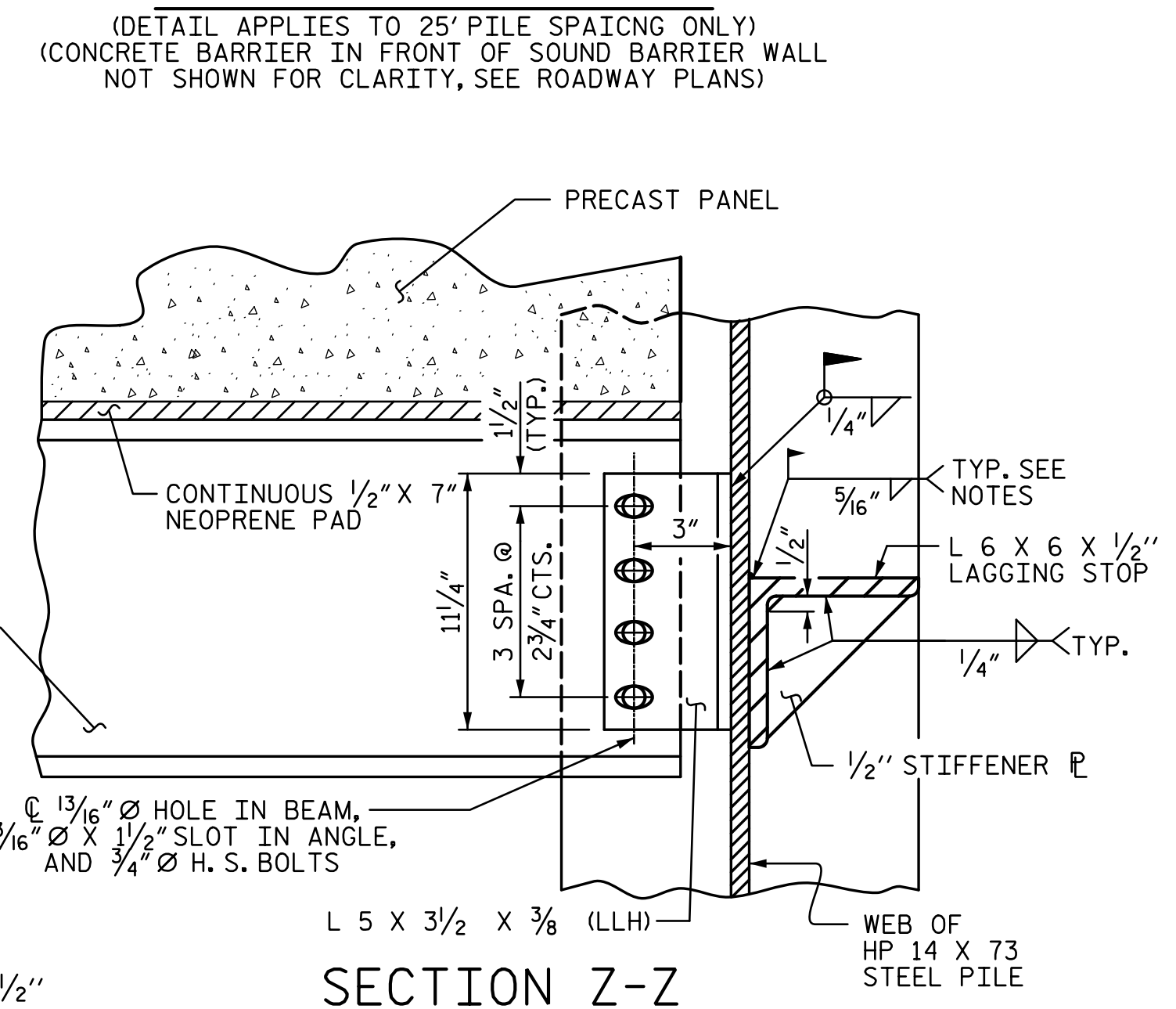
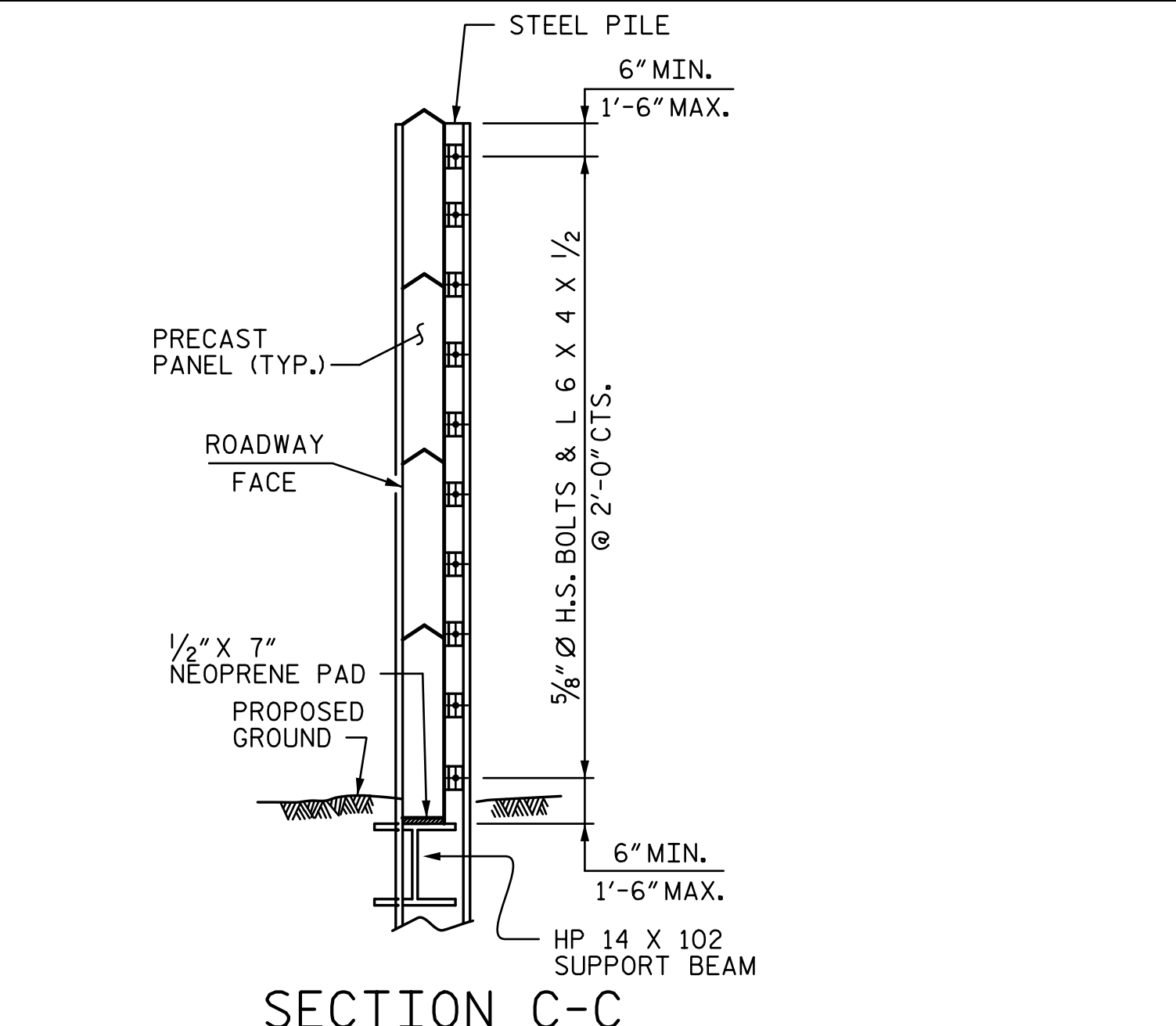
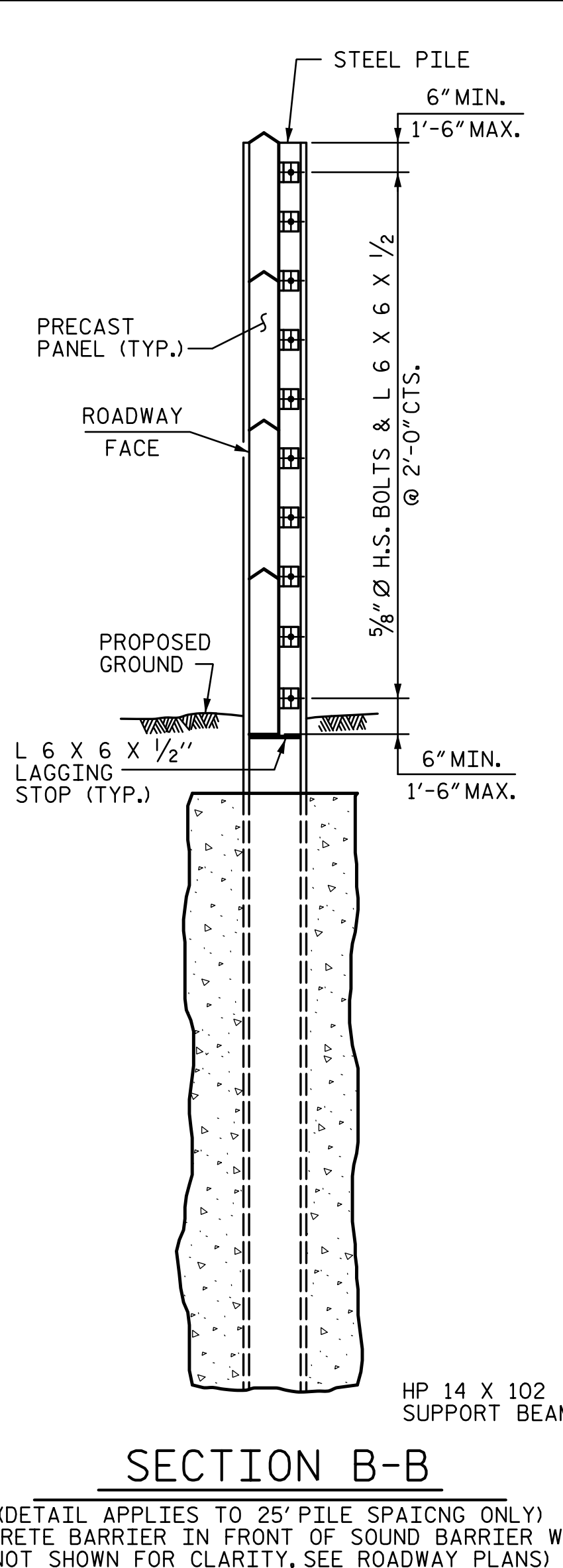
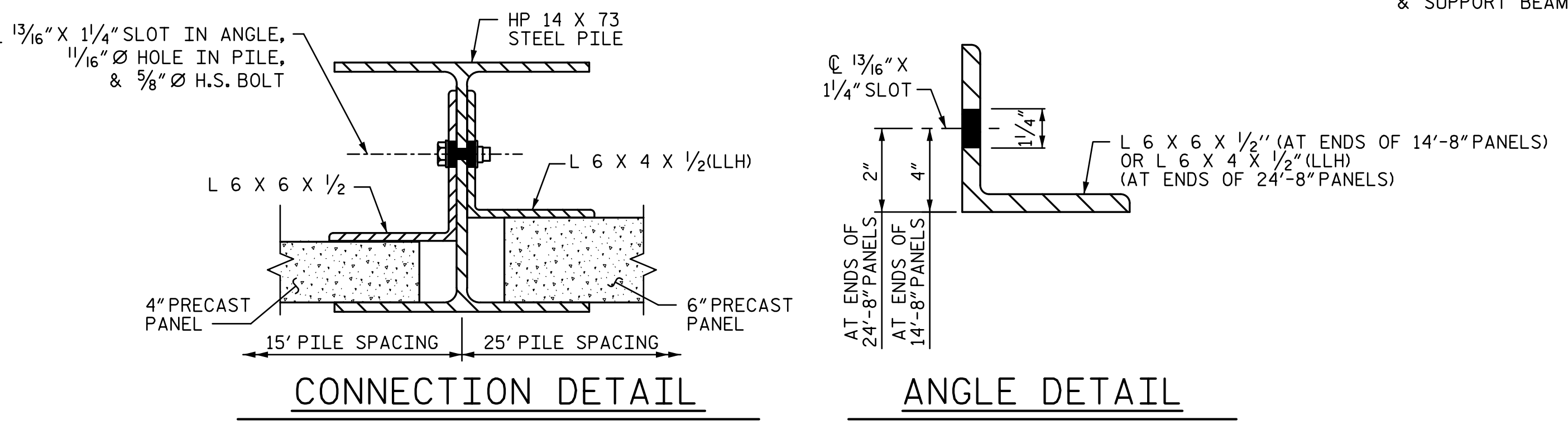
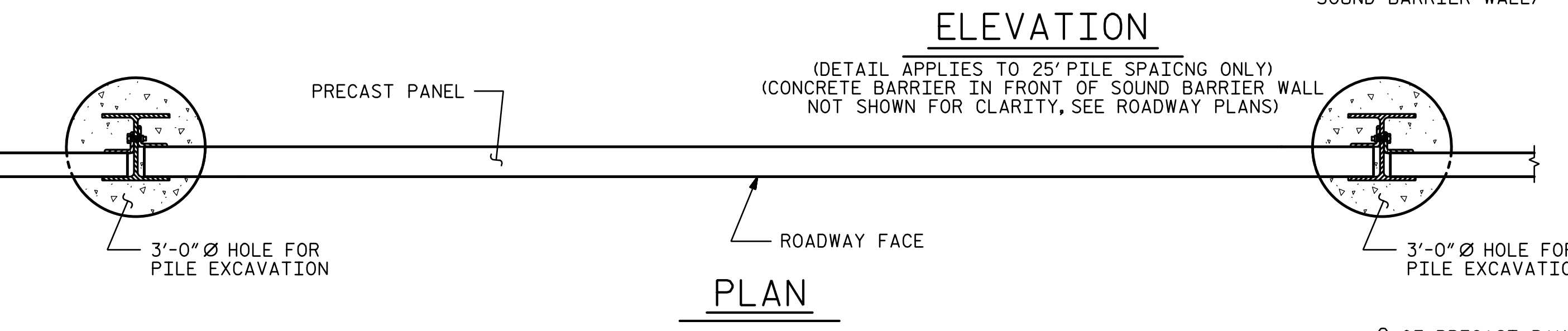
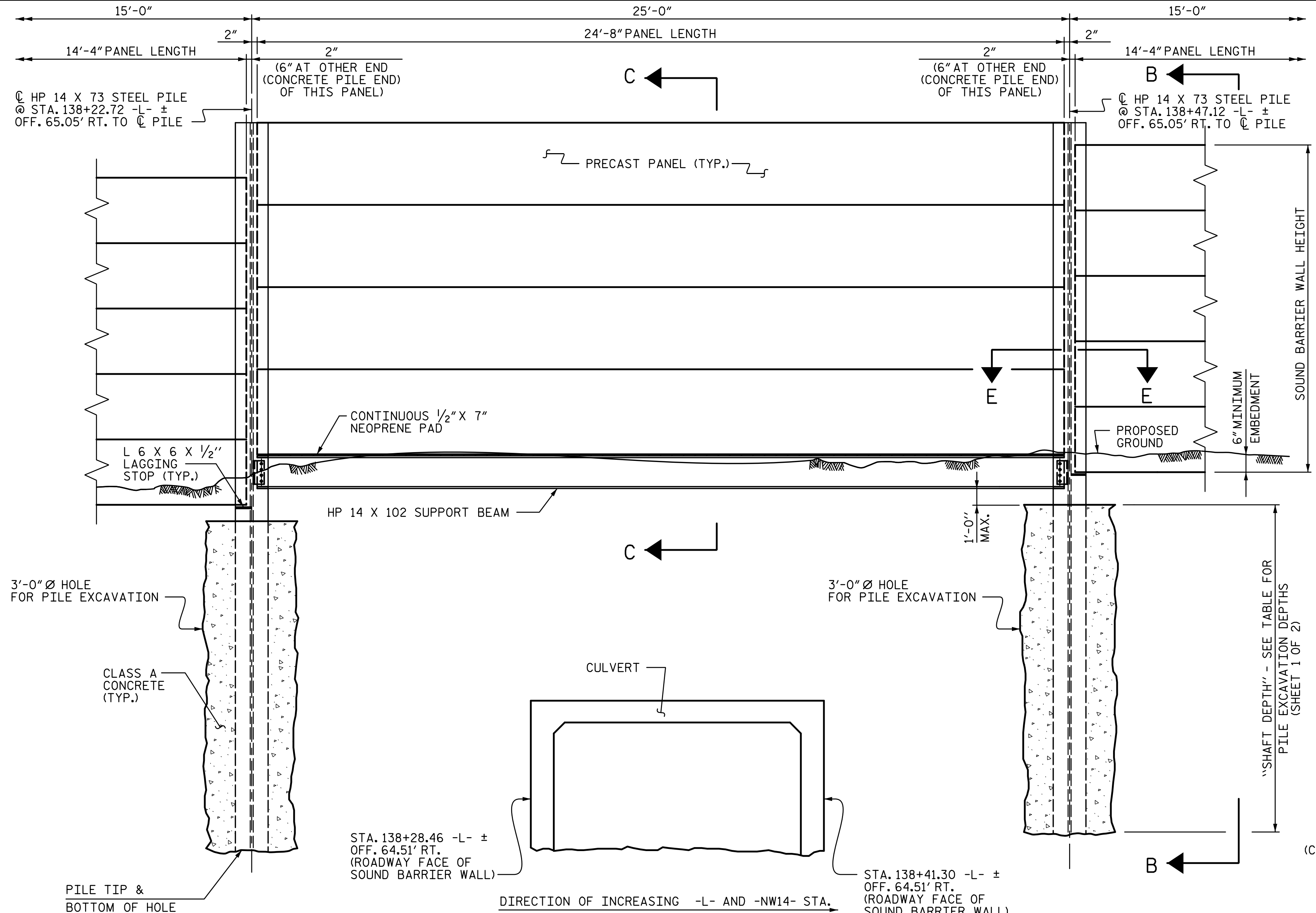
SOUND BARRIER WALL NO. -NW14-

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

NW-13
 TOTAL SHEETS 17

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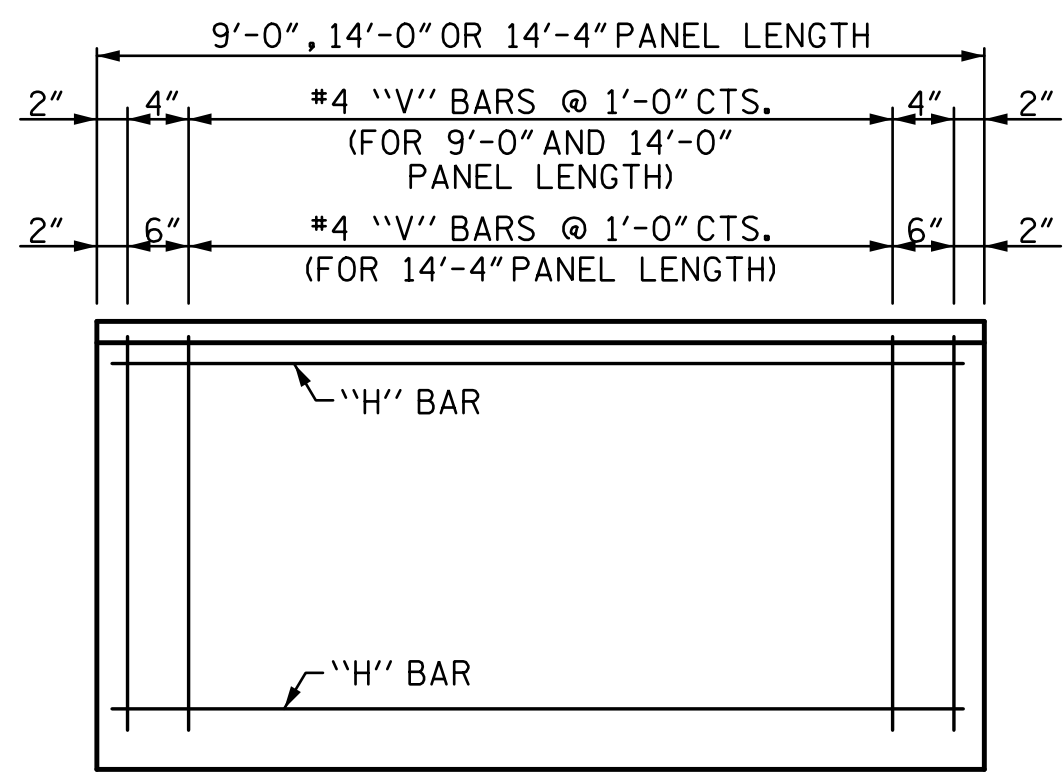


PROJECT NO. U-4751
 NEW HANOVER COUNTY
 STATION: 129+24.09 -L- =
10+00.00 -NW14-
 SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

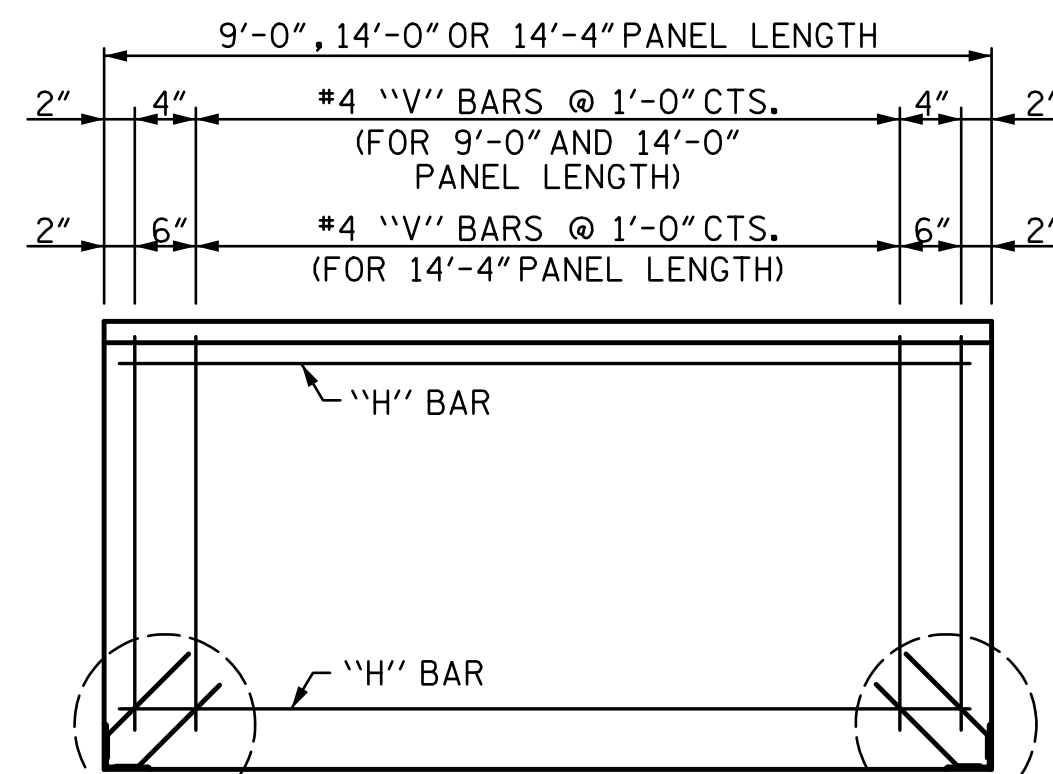
STV 100 years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SOUND BARRIER WALL NO. -NW14-			
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
DRAWN BY: <u>MBC</u> DATE: <u>5-17</u>			DESIGN ENGINEER OF RECORD: <u>J. DICHAK</u> DATE: <u>5-17</u>		
CHECKED BY: <u>JAD</u> DATE: <u>5-17</u>					
SHEET NO. <u>NW-14</u>			TOTAL SHEETS <u>17</u>		



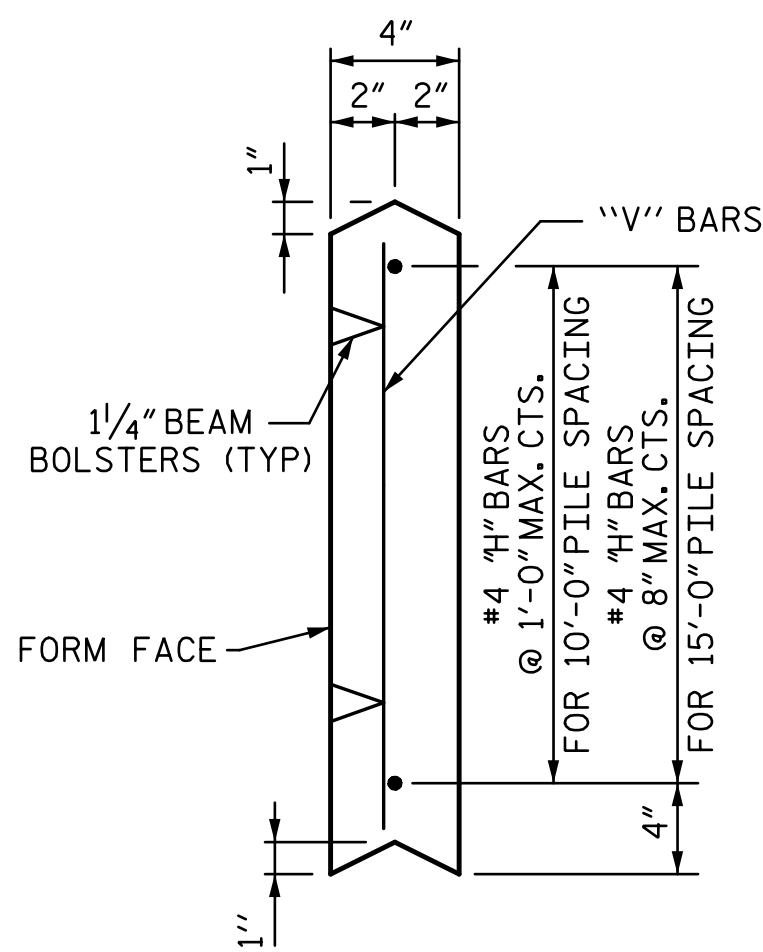
FRONT ELEVATION OF UPPER PRECAST PANELS

(FOR 9'-0", 14'-0" OR 14'-4" PANEL LENGTH)

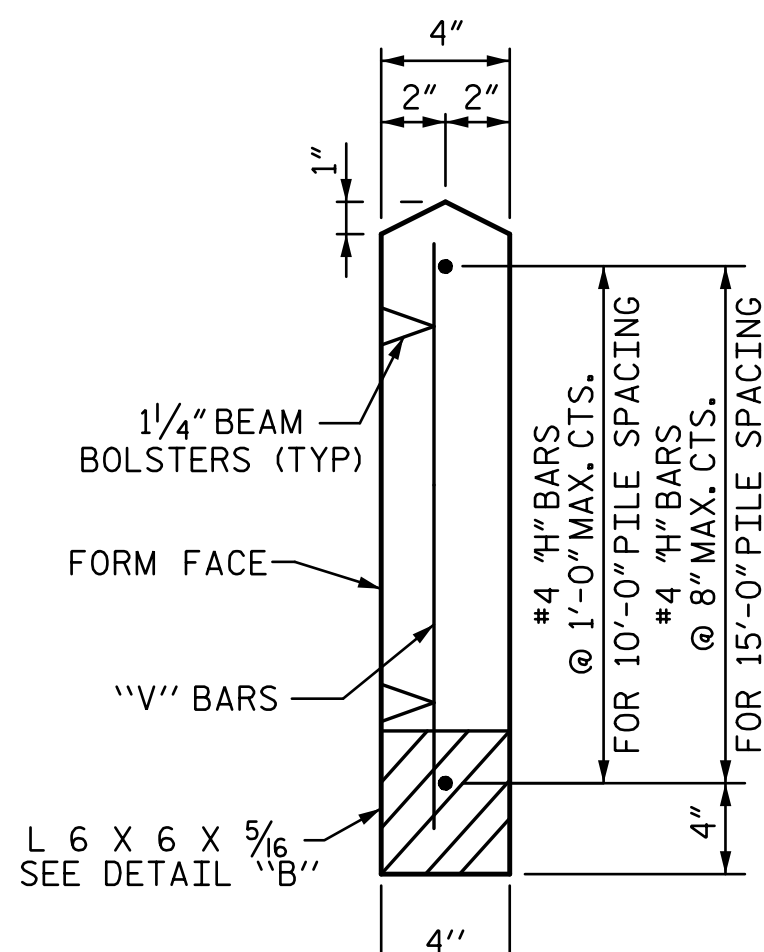


FRONT ELEVATION OF BOTTOM PRECAST PANEL

(FOR 9'-0", 14'-0" OR 14'-4" PANEL LENGTH)



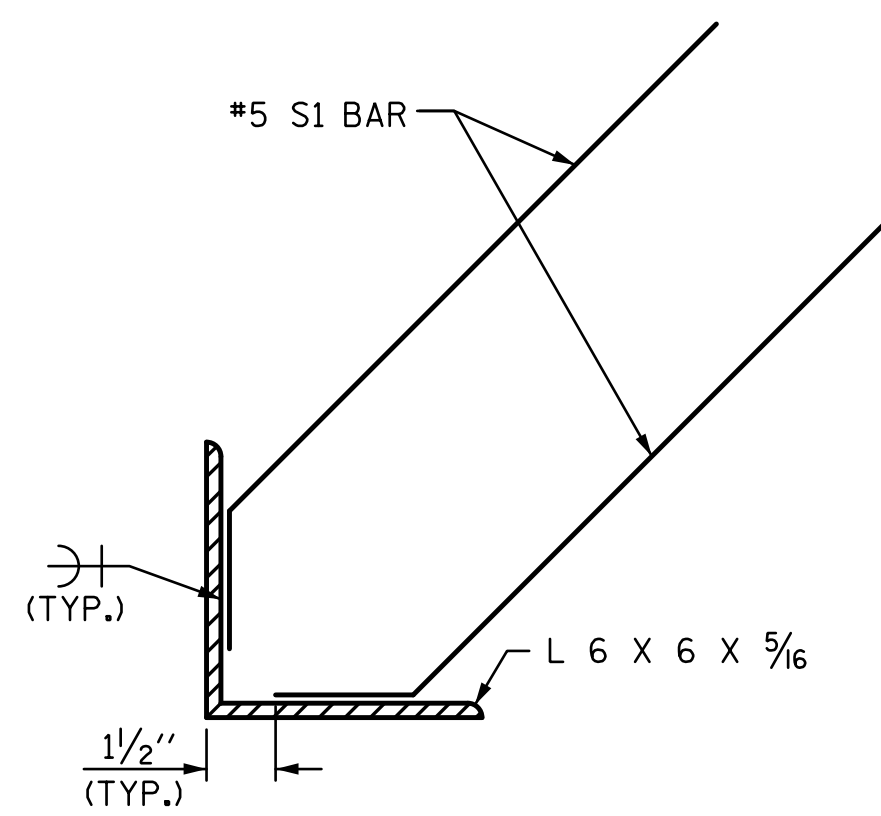
UPPER PANEL



BOTTOM PANEL

SECTION THROUGH PRECAST PANELS

(FOR 9'-0", 14'-0" OR 14'-4" PANEL LENGTH)



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 14'-0" PRECAST PANEL (FOR 15'-0" PILE SPACING)

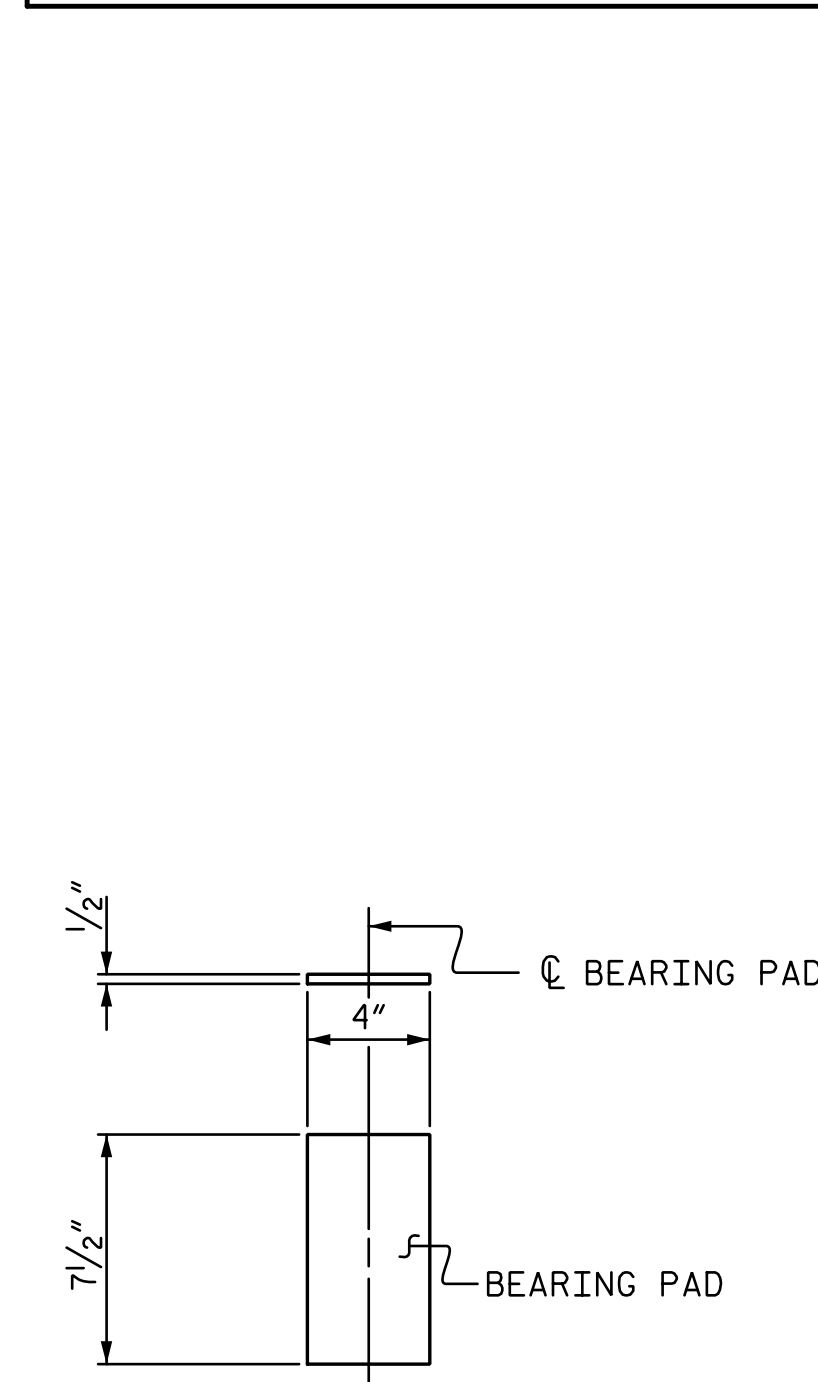
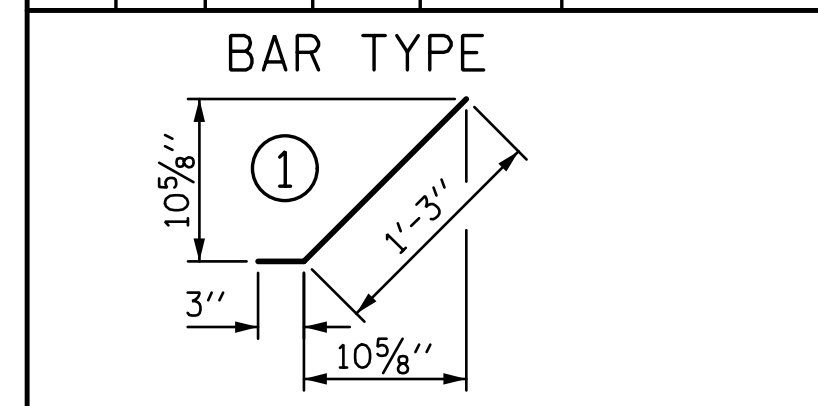
PANEL HEIGHT	CLASS AA CONCRETE C.Y.	BAR TYPES									
		HORIZONTAL				VERTICAL					
		NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)
3'-0"	0.52	5	H1 #4	STR	13'-8"	46	16	V1 #4	STR	2'-8"	29
4'-0"	0.69	7	H2 #4	STR	13'-8"	64	16	V2 #4	STR	3'-8"	39
5'-0"	0.86	8	H3 #4	STR	13'-8"	73	16	V3 #4	STR	4'-8"	50
6'-0"	1.04	10	H4 #4	STR	13'-8"	91	16	V4 #4	STR	5'-8"	61

QUANTITIES FOR ONE 14'-4" 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"	0.53	5	H1 #4	STR	14'-0"	47	16	V1 #4	STR	2'-8"	29
4'-0"	0.71	7	H2 #4	STR	14'-0"	65	16	V2 #4	STR	3'-8"	39
5'-0"	0.88	8	H3 #4	STR	14'-0"	75	16	V3 #4	STR	4'-8"	50
6'-0"	1.06	10	H4 #4	STR	14'-0"	94	16	V4 #4	STR	5'-8"	61

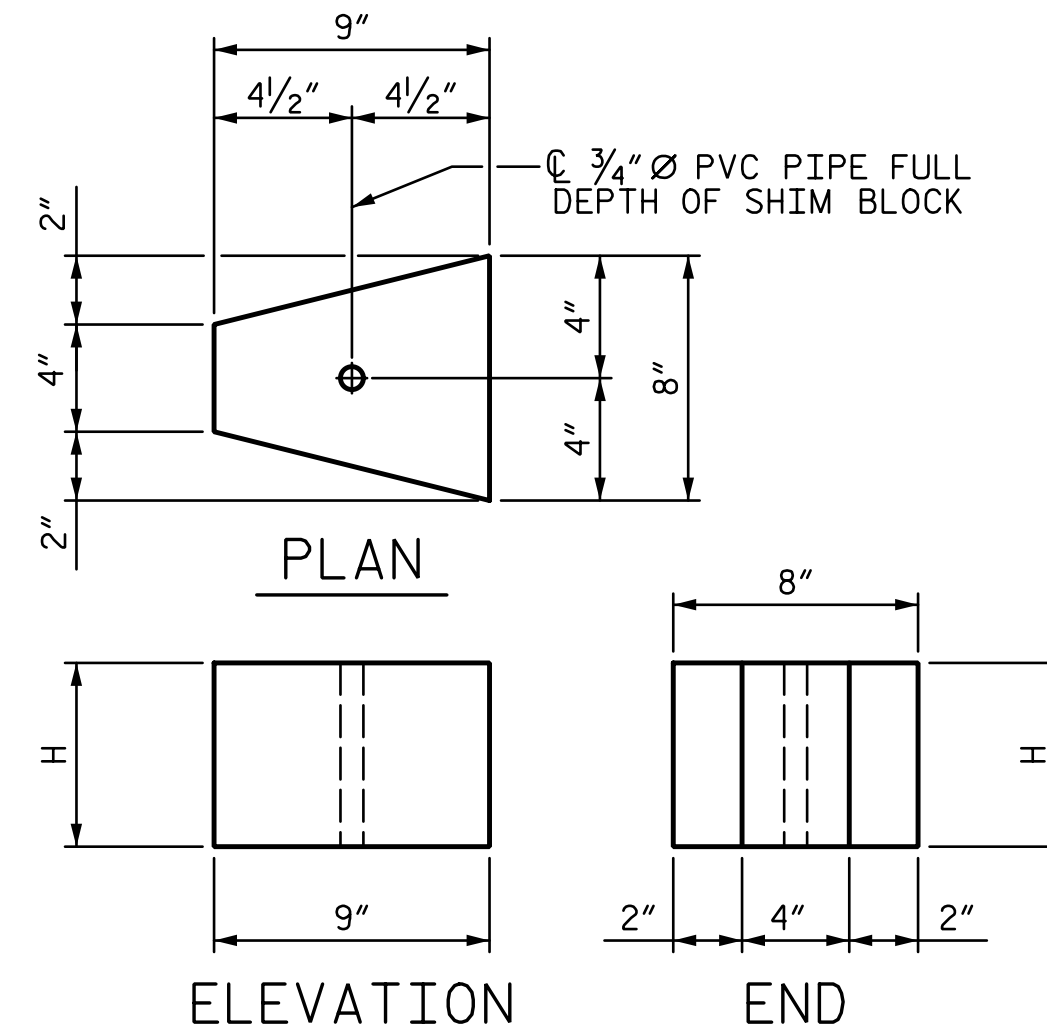
ADDITIONAL BARS FOR ONE BOTTOM PANEL

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



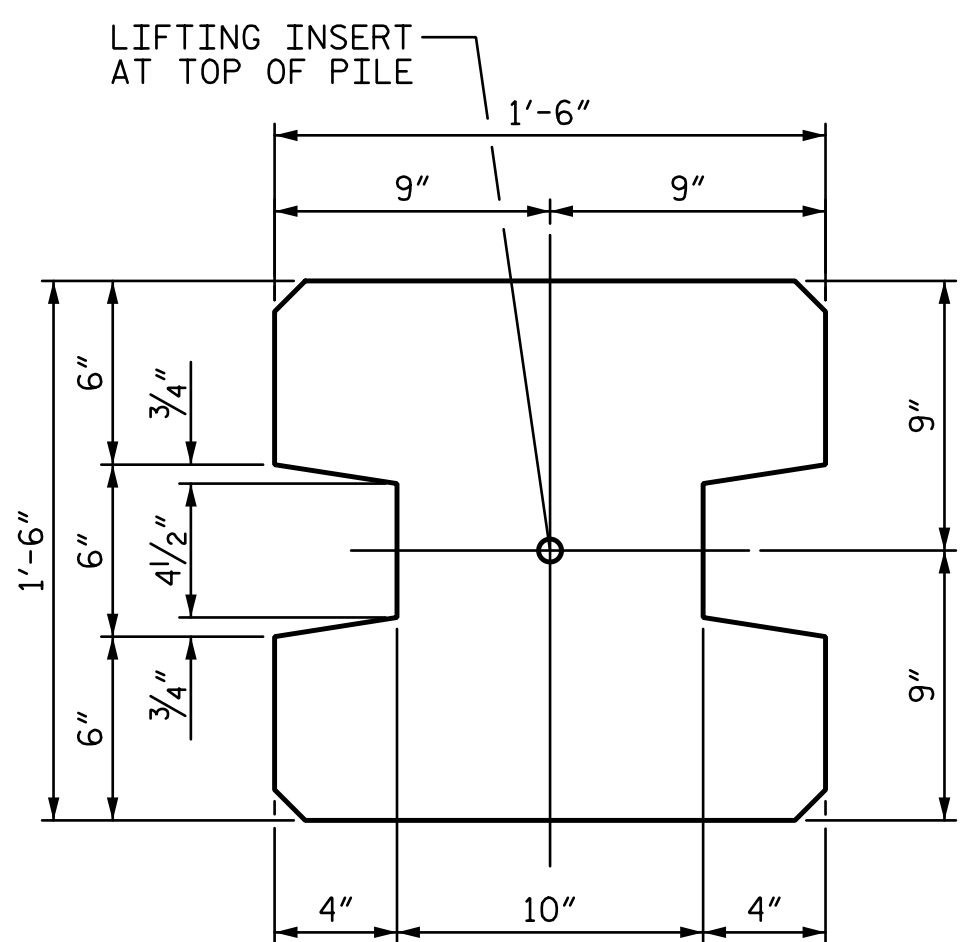
ELASTOMERIC BEARING DETAILS

ELASTOMER IN BEARINGS SHALL BE 50 DUROMETER HARDNESS.

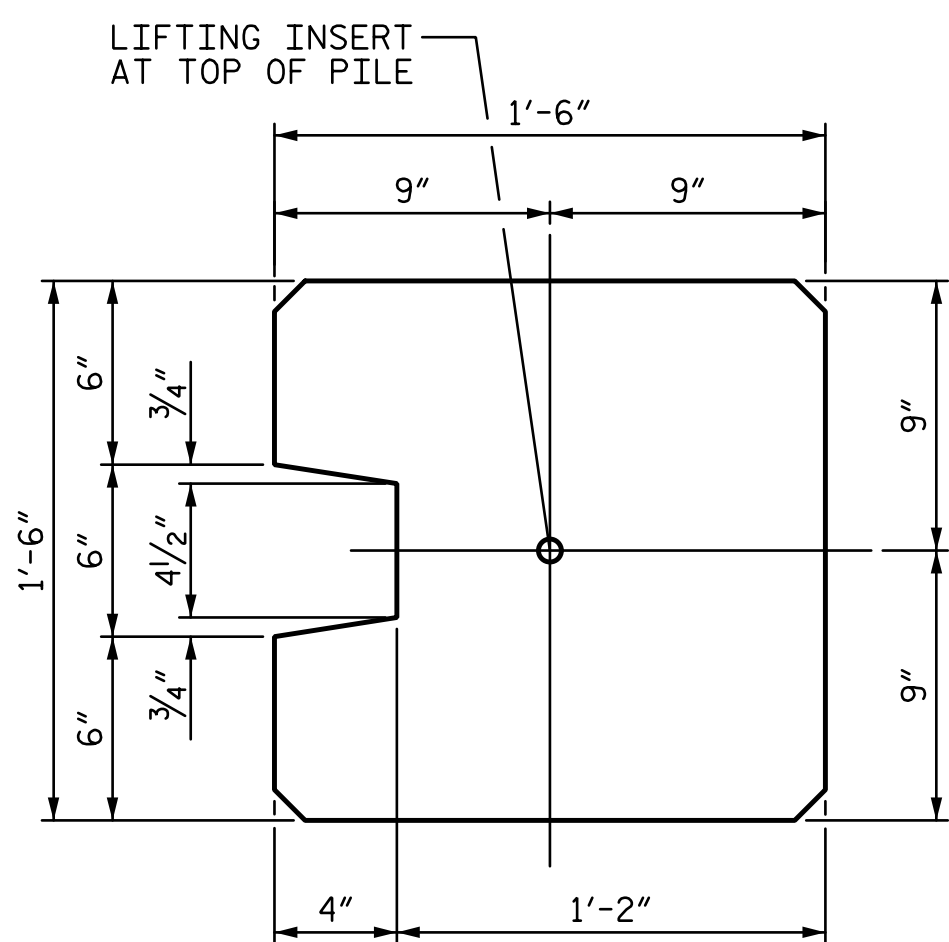


CONCRETE SHIM BLOCK

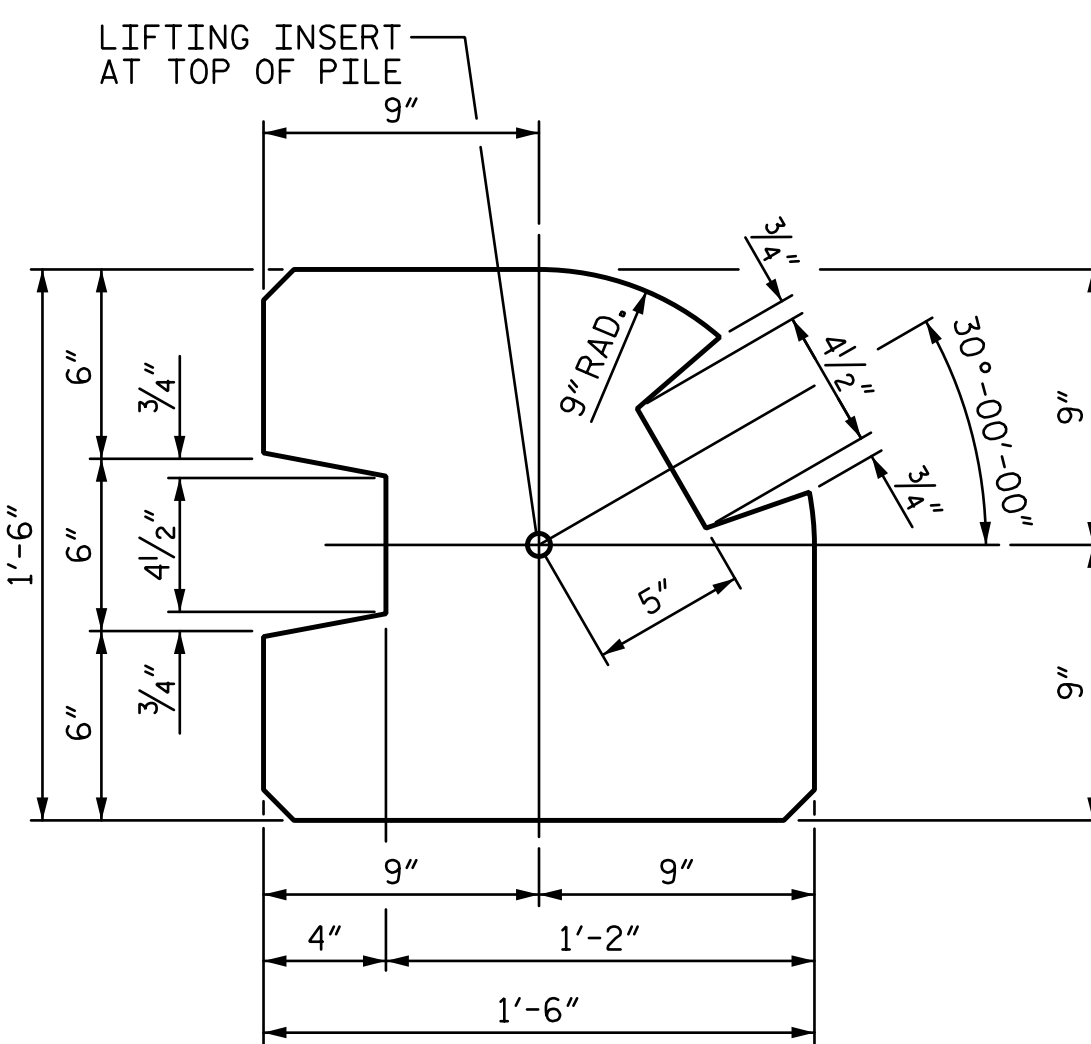
H = 3", 6" or 1'-0"



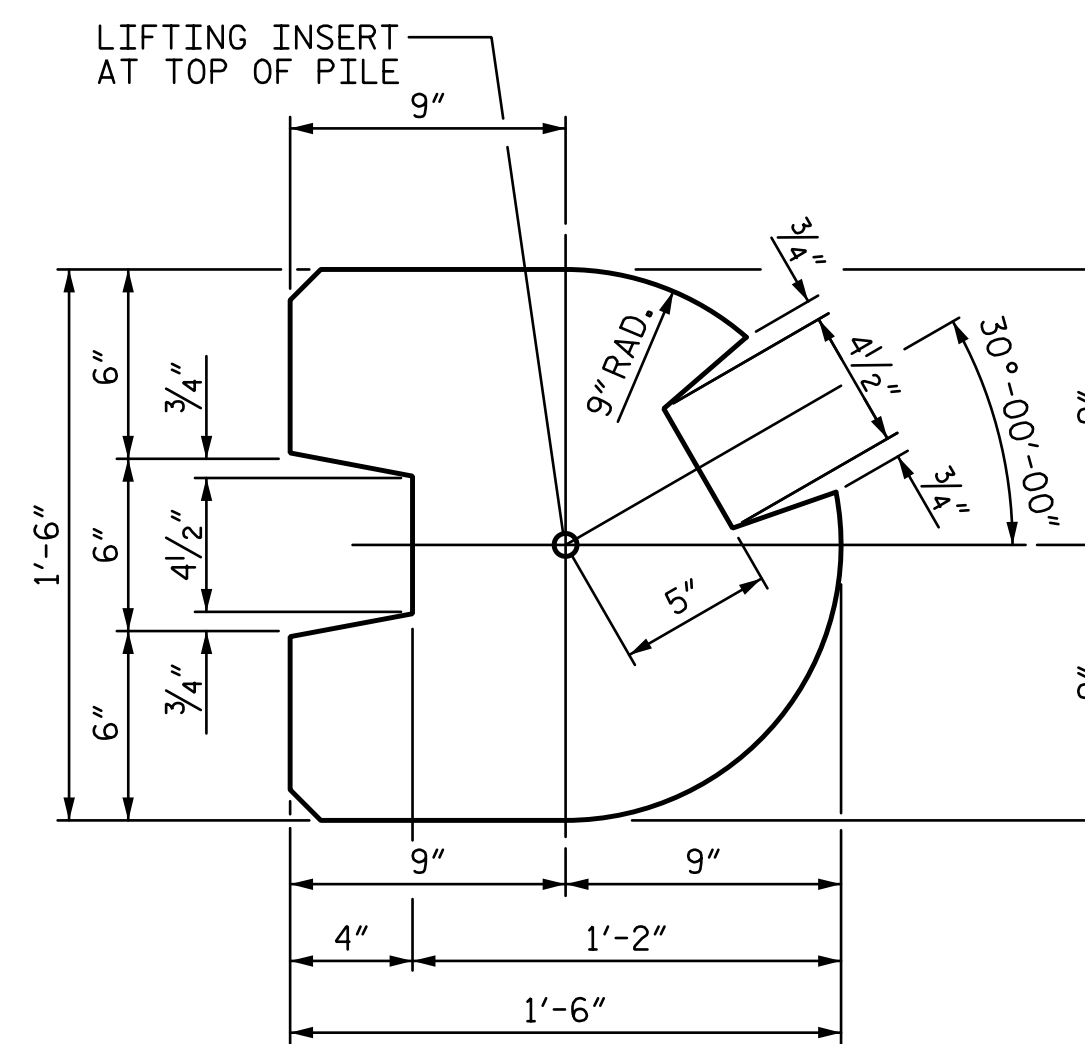
TYPE - I (AREA = 1.9444 SQ. FT.)



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-4751

NEW HANOVER COUNTY

STATION: VARIES

SHEET 1 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

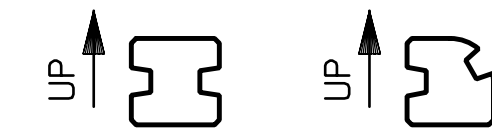
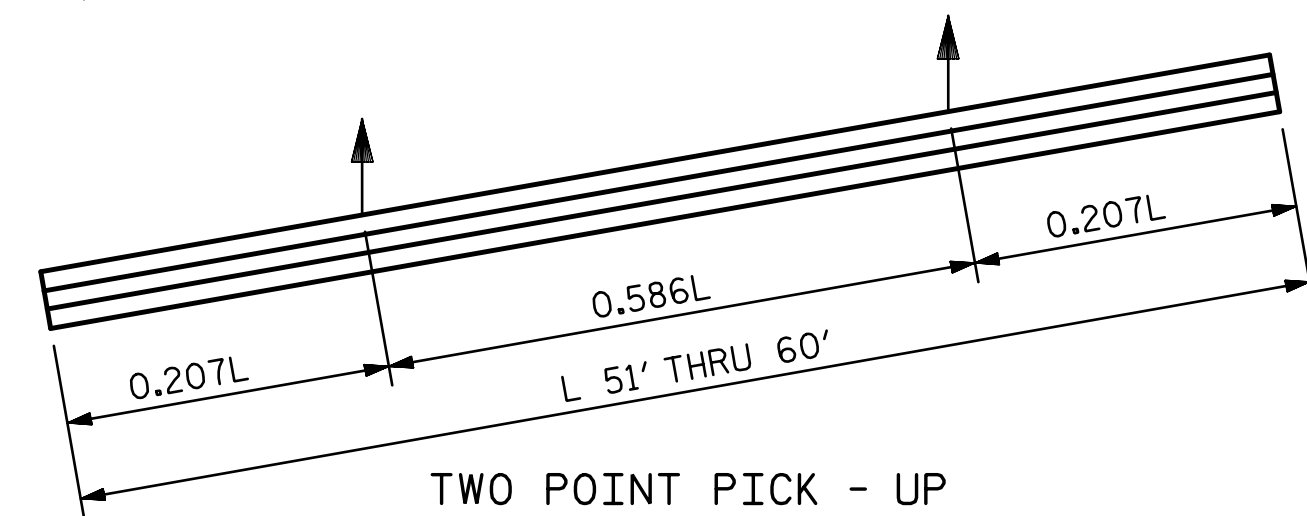
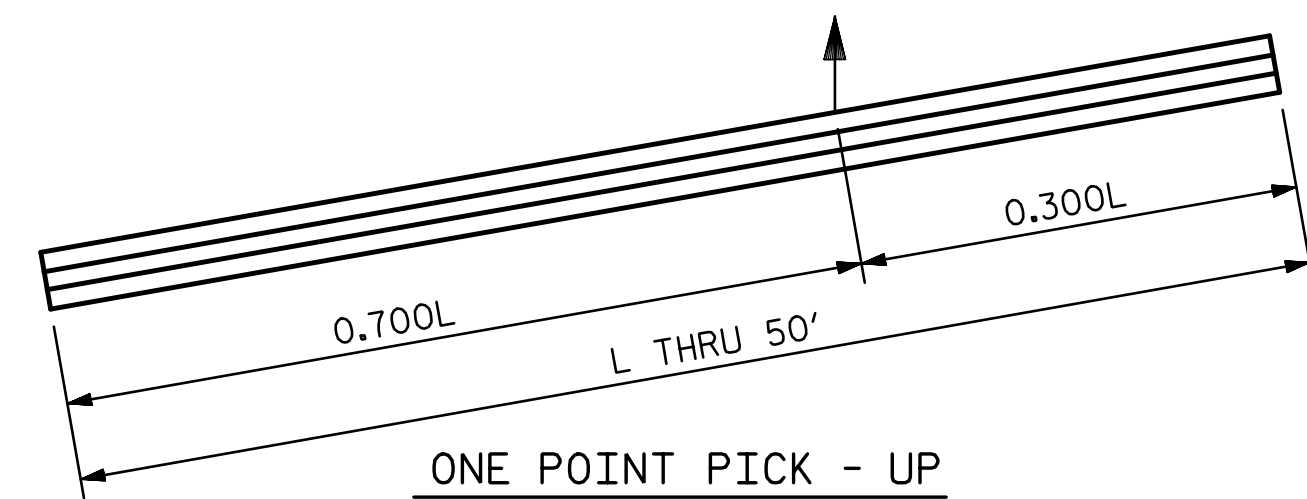
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SOUND BARRIER WALL DETAILS

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

TOTAL SHEETS: 17

8/17/2017 3:04:26 PM R:\no\sewell\420_00\U4751_SML_NW_001_640000.dgn



PICK - UP POINTS

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.

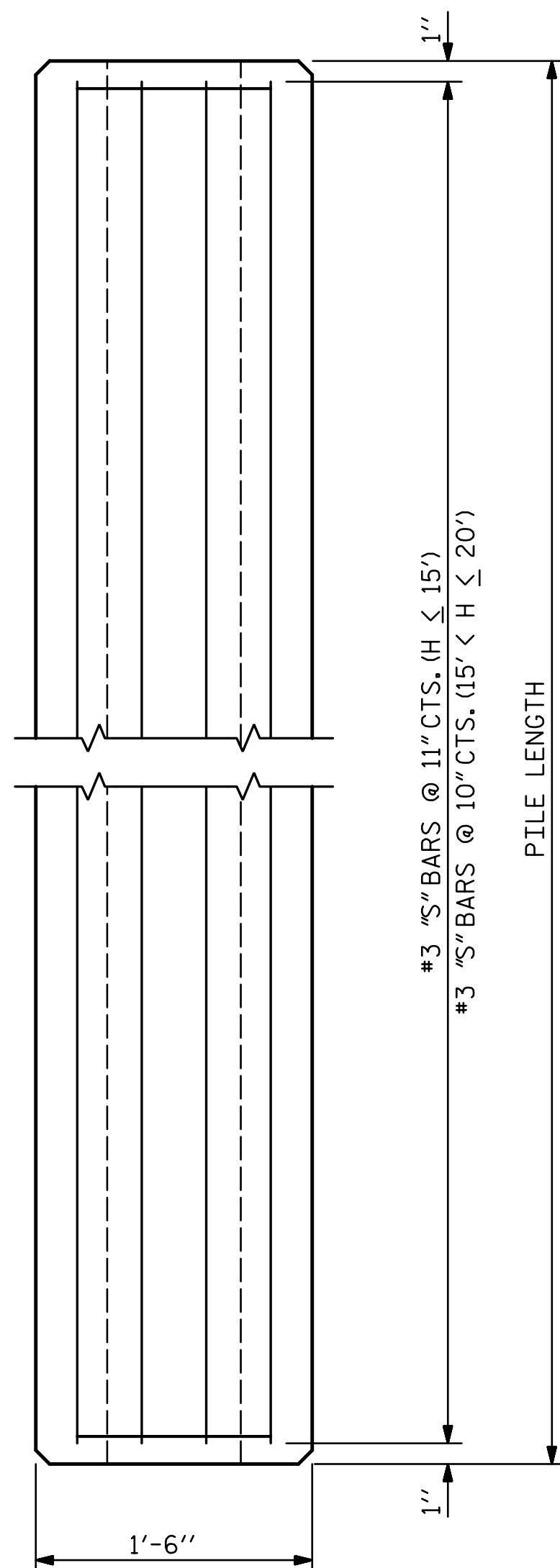
WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS TO BE INDICATED WITH A BLACK MARK 2" WIDE.

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

ALL CORNERS TO BE CHAMFERED 1".

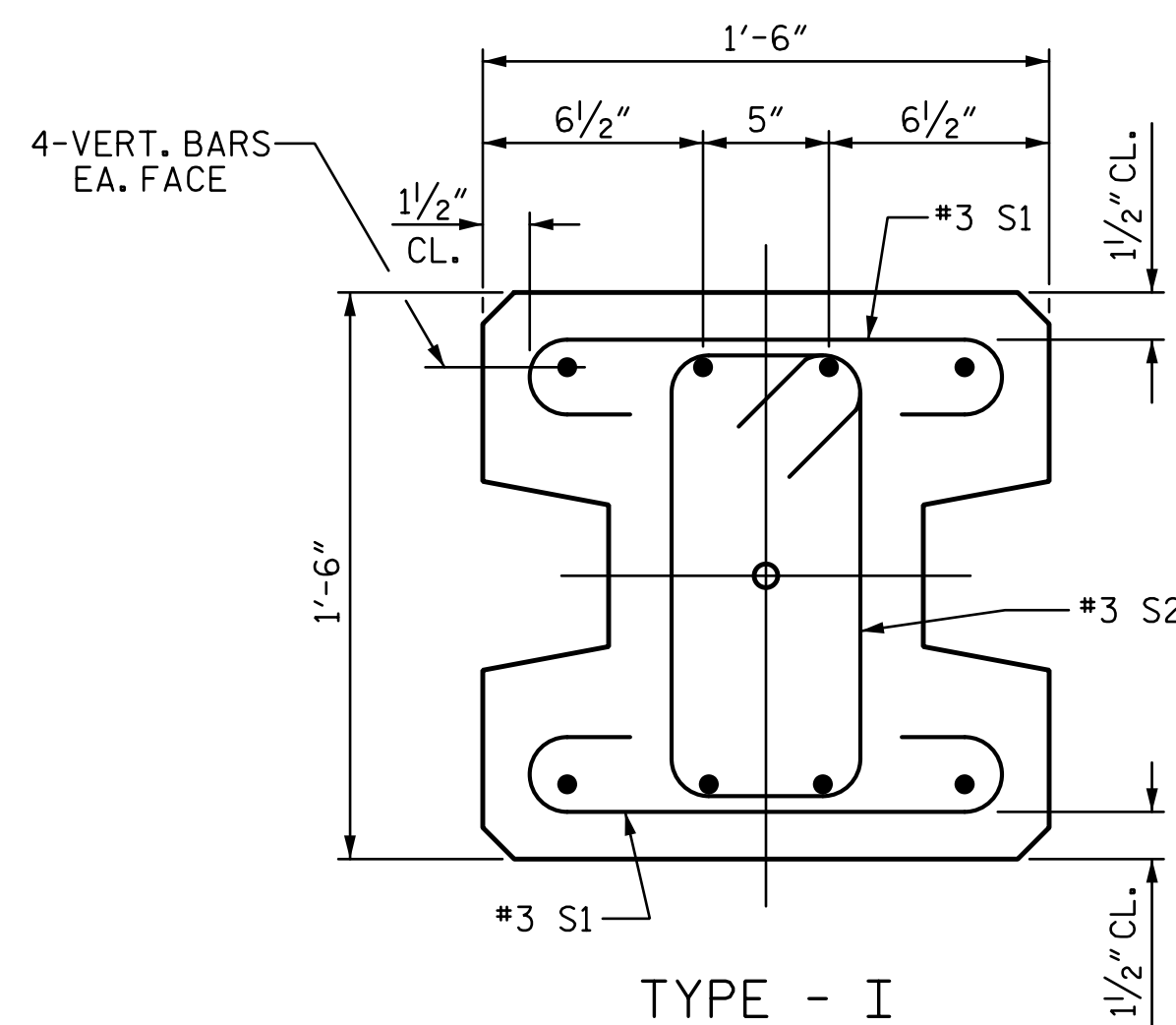
QUANTITIES FOR ONE PRECAST CONCRETE PILE

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"

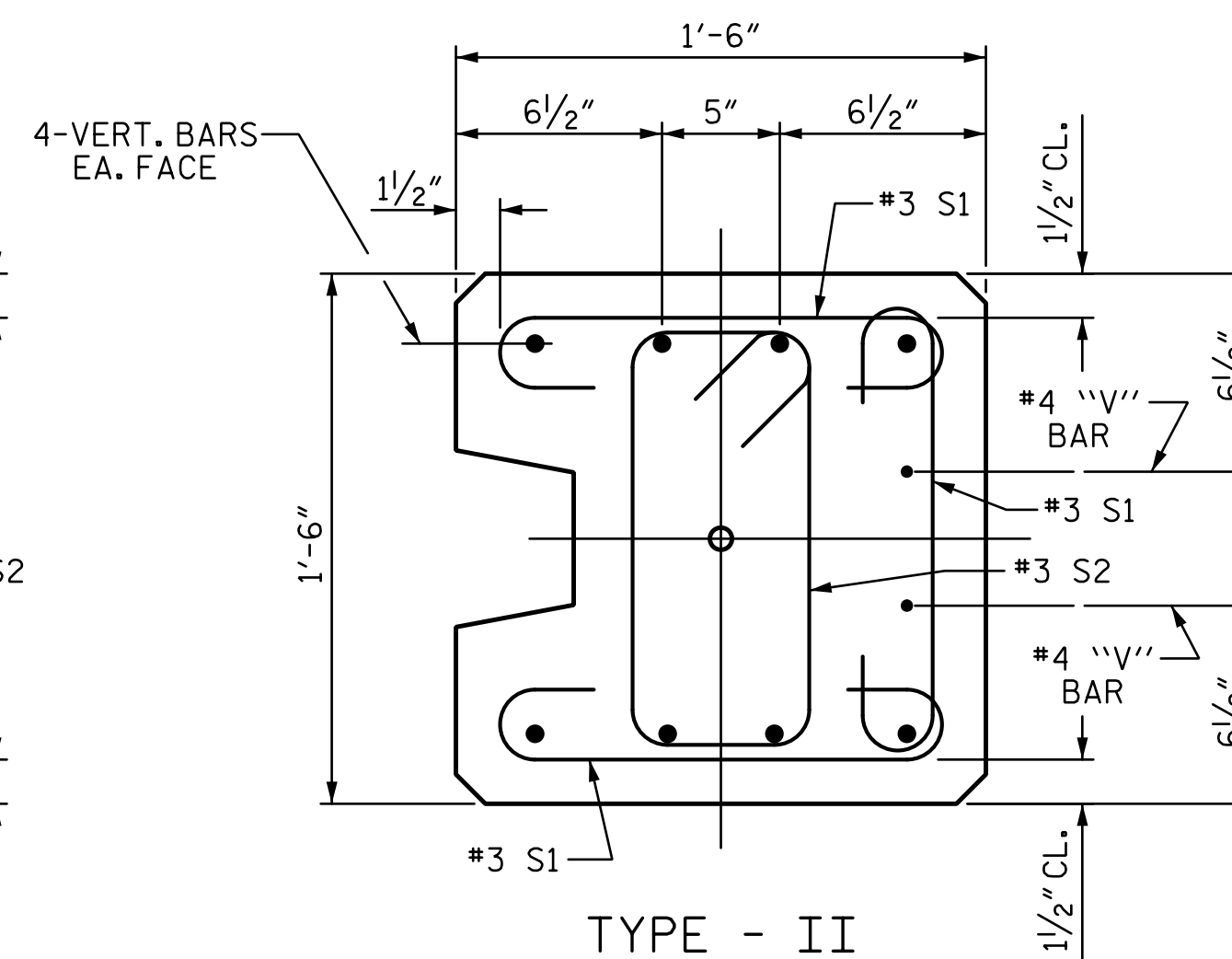


ELEVATION

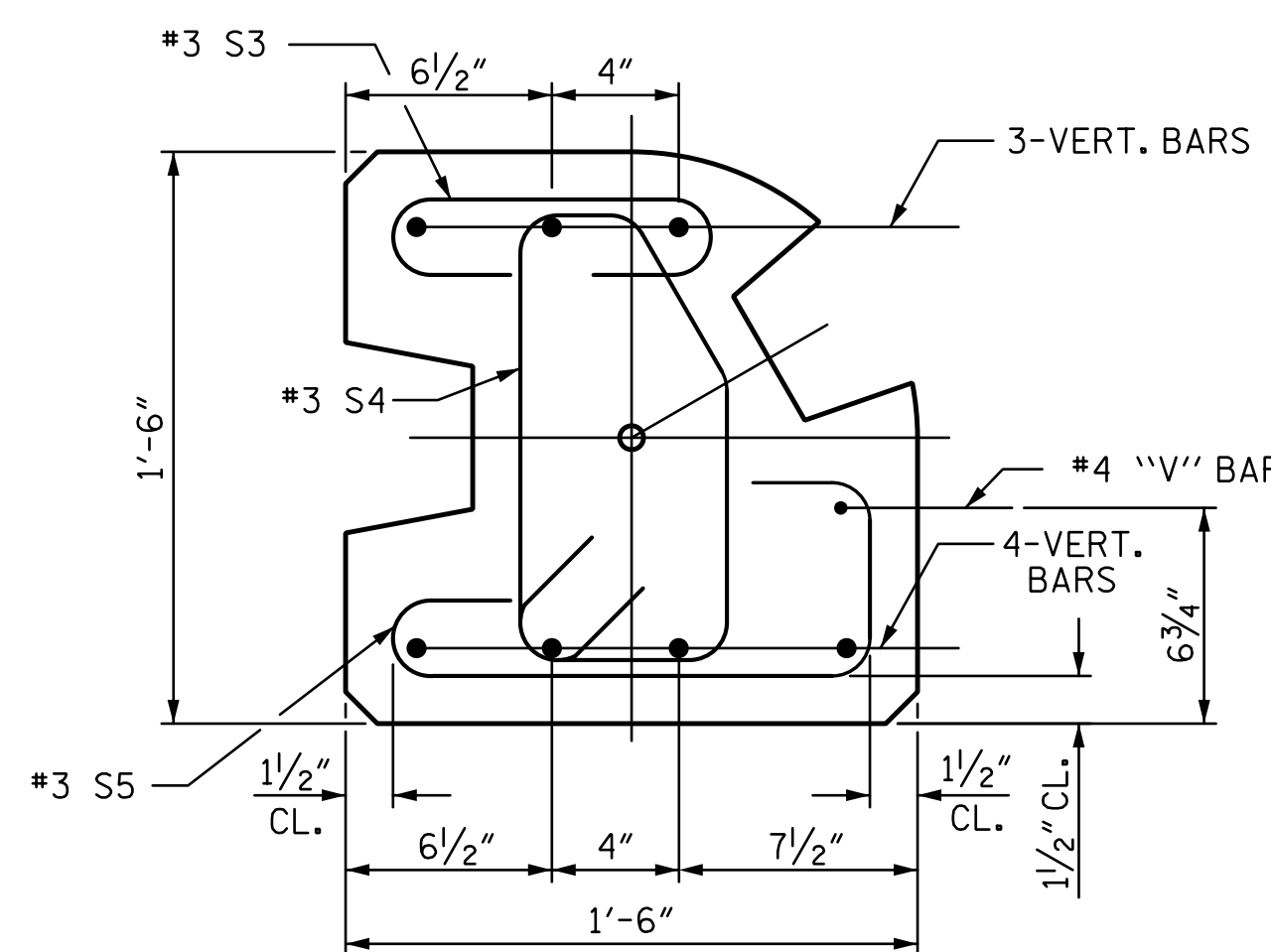
(4" IS SOUND BARRIER WALL HEIGHT, SEE "SOUND BARRIER WALL" SHEETS.)



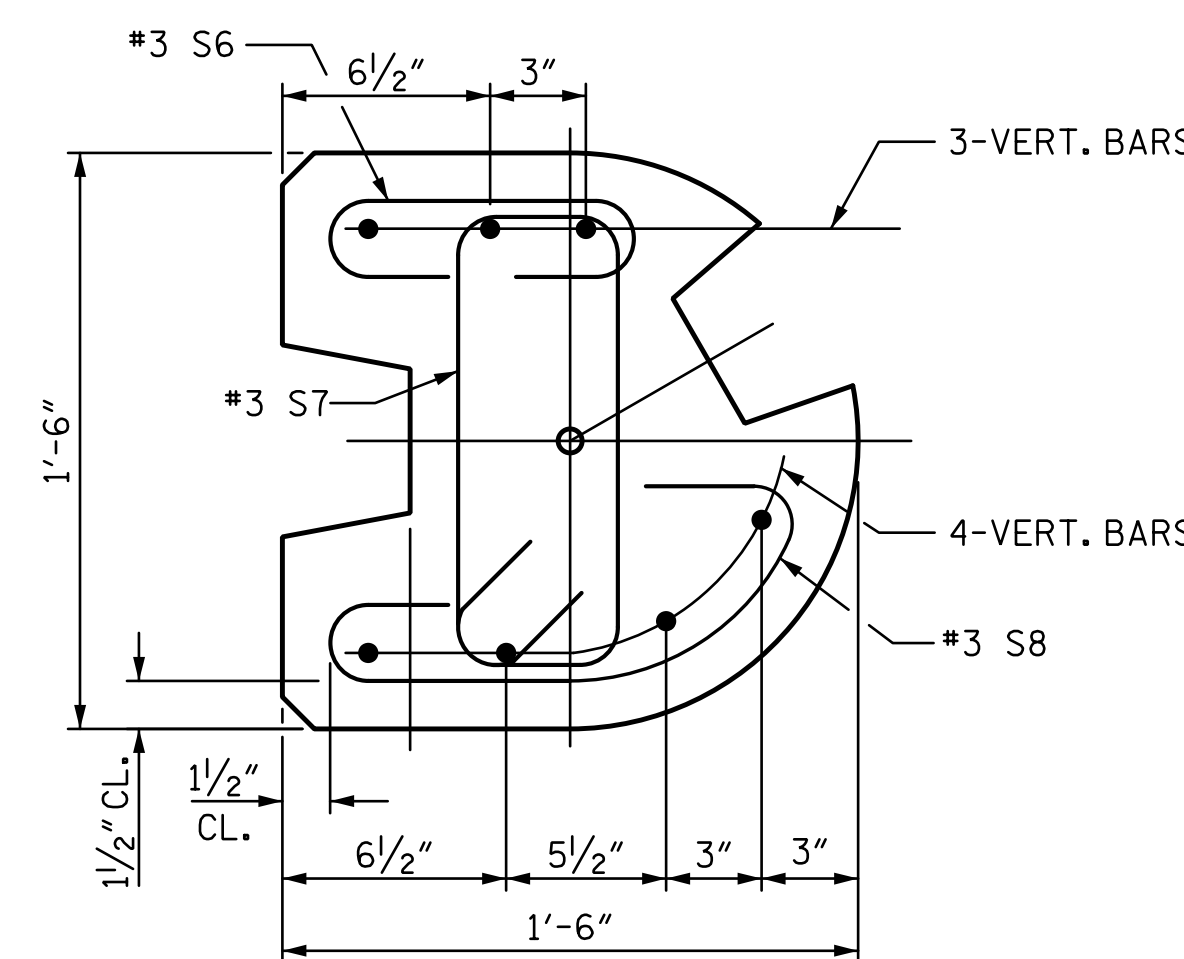
TYPE - I



TYPE - II



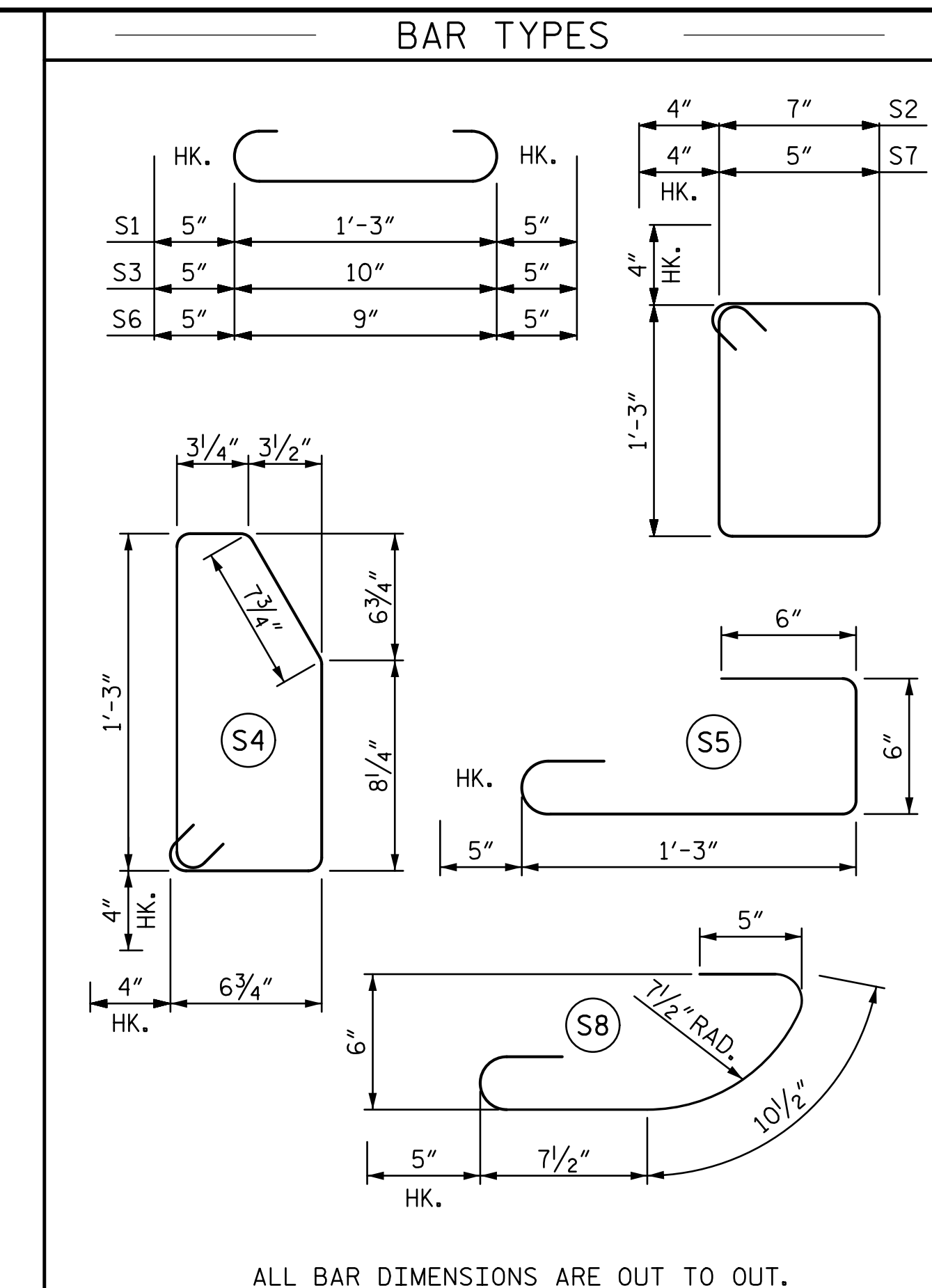
TYPE - III



TYPE - III (ALT.)

PILE REINFORCING STEEL DETAIL

FOR VERTICAL BAR PILE REINFORCING, SEE "SOUND BARRIER WALL" SHEETS.



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. U-4751

NEW HANOVER COUNTY

STATION: VARIES

SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SOUND BARRIER WALL
DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	NW-16
1			3			TOTAL SHEETS
2			4			17

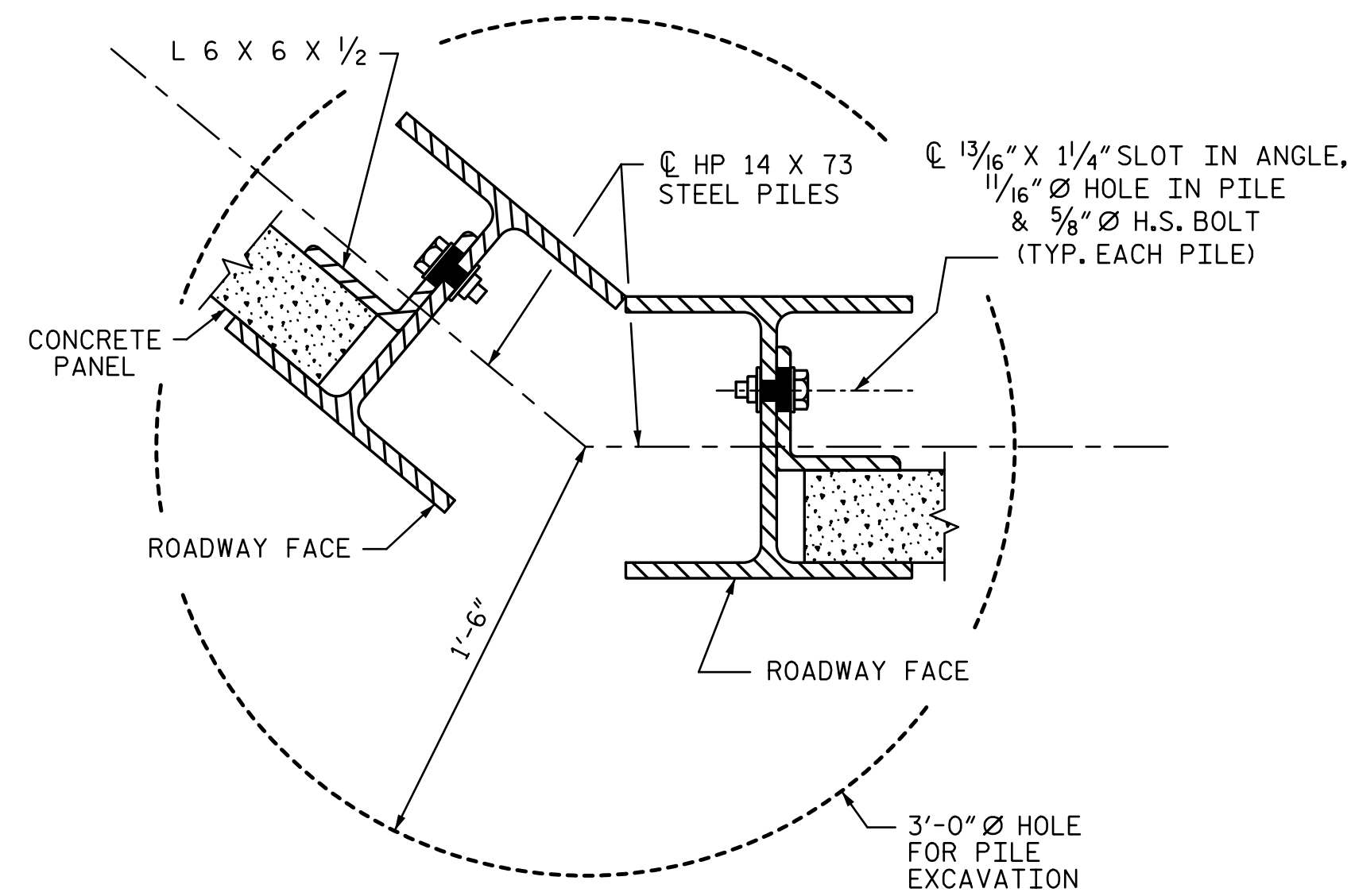
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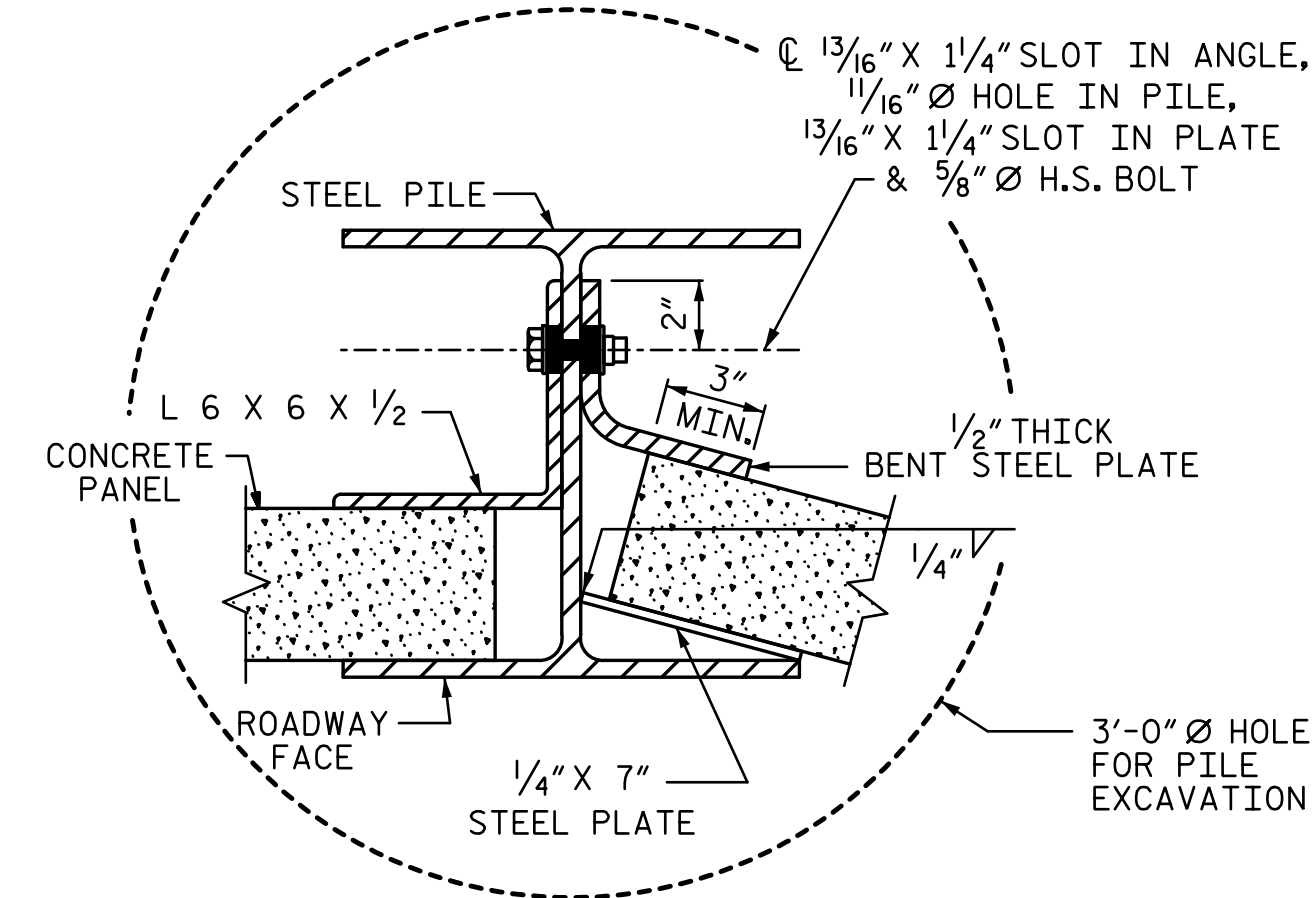
ch1kfhmb

DRAWN BY: MBC DATE: 5-17
 CHECKED BY: NML DATE: 5-17
 DESIGN ENGINEER OF RECORD: J. DICHAK DATE: 5-17



TYPICAL WALL TURN DETAIL

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



TYPICAL WALL TURN DETAIL

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

NOTES:

USE STEEL PILES, SUPPORT BEAMS, ANGLES, AND LAGGING STOPS MEETING THE REQUIREMENTS OF AASHTO M270, GRADE 50, GALVANIZE ALL STEEL COMPONENTS INCLUDING PILES, SUPPORT BEAMS, 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.

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.

PROVIDE PLATES AND ANGLES TO SECURE PANELS 6" LONG AS MEASURED ALONG THE STEEL PILE.

DO NOT SPLICE STEEL PILES.

FOR SOUND BARRIER WALL, SEE SPECIAL PROVISIONS.

CONSTRUCT SOUND BARRIER WALL TO LINES AND GRADES SHOWN ON THE ROADWAY PLANS.

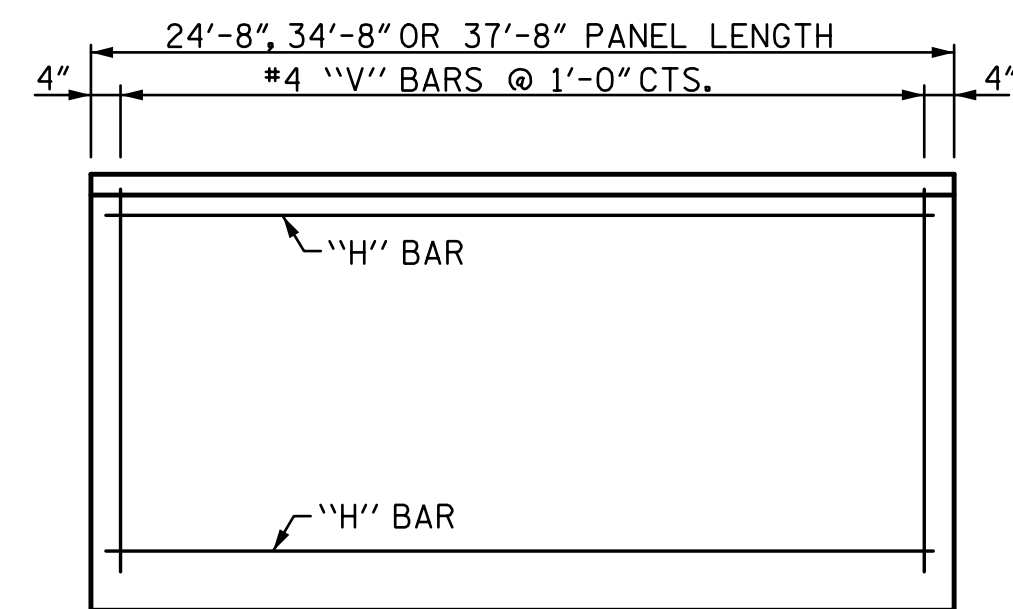
PROVIDE PANELS WITH FLAT BOTTOM.

VERIFY THE LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING HOLES TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.

USE CLASS AA FOR PANELS, IN ACCORDANCE WITH ARTICLE 1000-4 OF THE STANDARD SPECIFICATIONS.

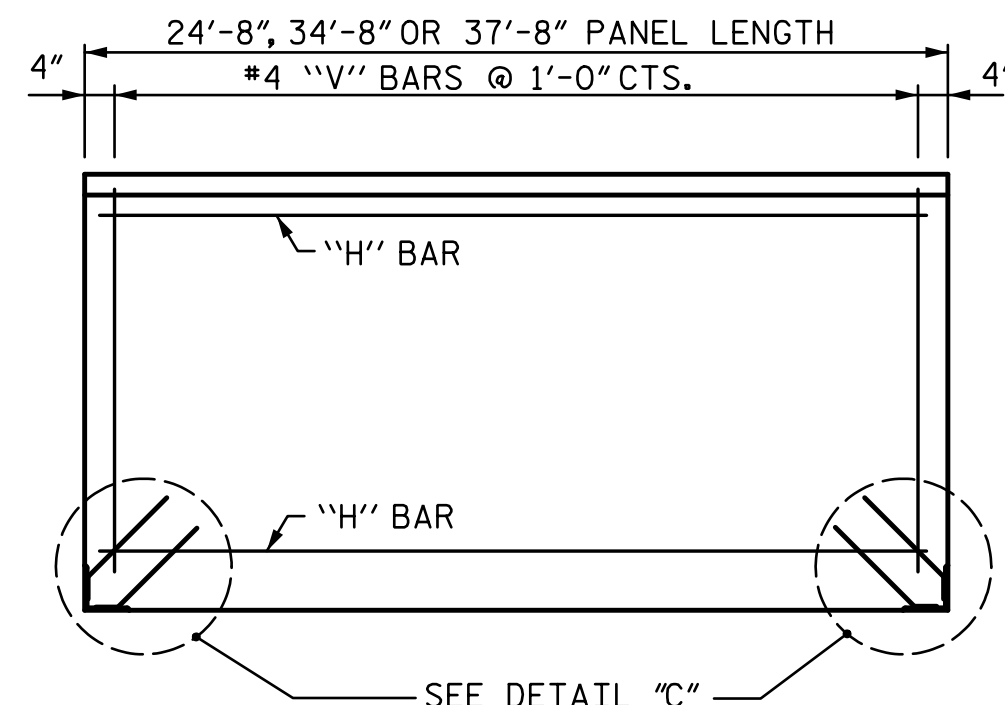
FOR SOUND BARRIER WALL STATIONS, OFFSETS AND WALL ENVELOPE, SEE ROADWAY PLANS.

STEEL PILES, SUPPORT BEAMS, ANGLES, LAGGING STOPS, ATTACHMENTS AND OTHER MISCELLANEOUS STEEL ARE INCIDENTAL, AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "SOUND BARRIER WALL".



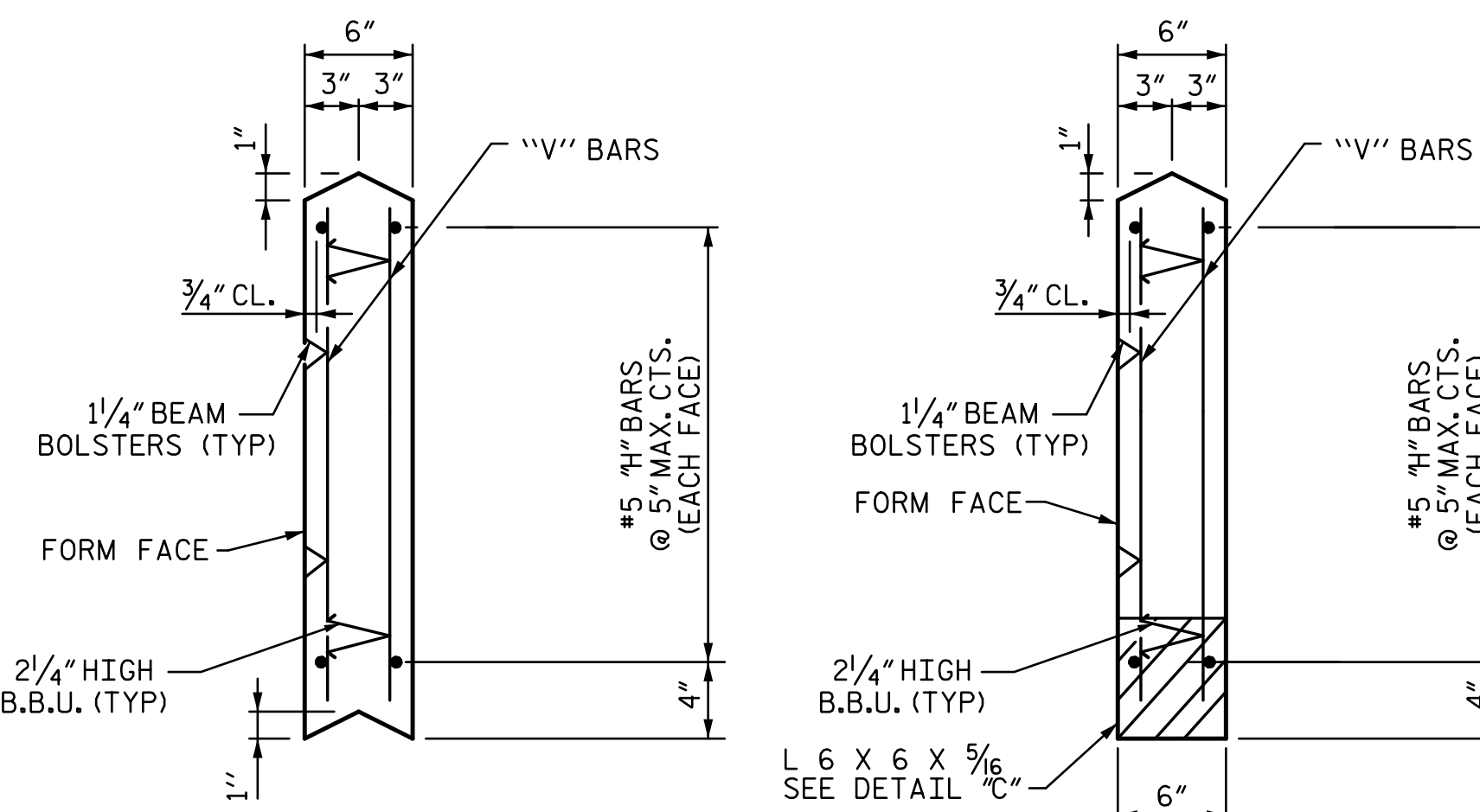
FRONT ELEVATION OF UPPER PRECAST PANELS

(FOR 24'-8\", 34'-8\"/>



FRONT ELEVATION OF BOTTOM PRECAST PANEL

(FOR 24'-8\", 34'-8\"/>

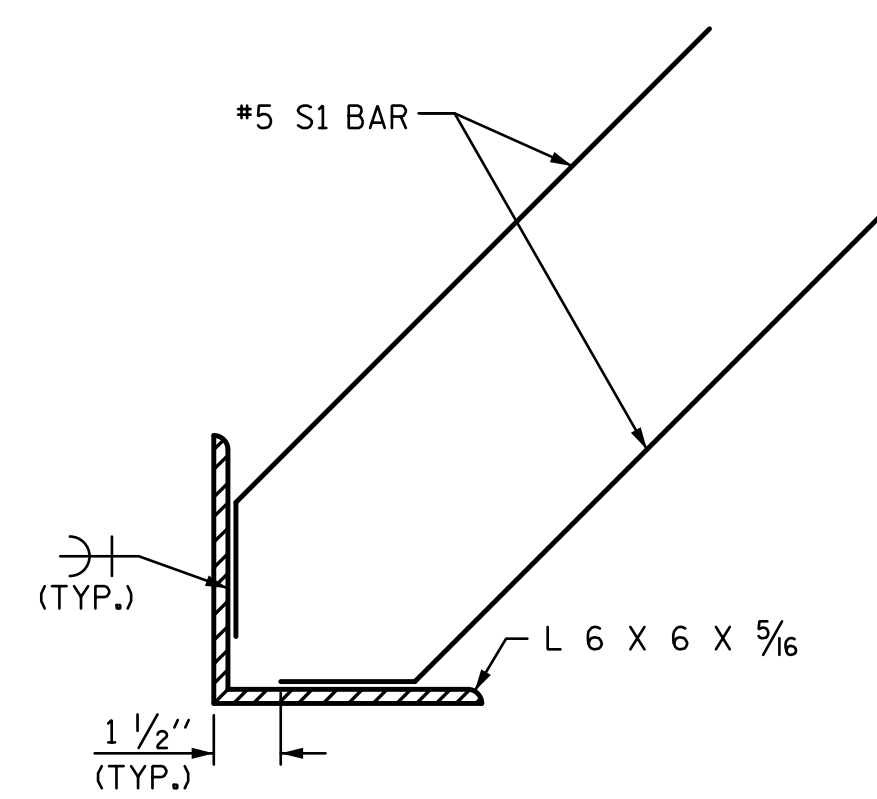


UPPER PANEL

BOTTOM PANEL

SECTION THROUGH PRECAST PANELS

(FOR 24'-8\", 34'-8\"/>



DETAIL "C"

QUANTITIES FOR ONE PRECAST PANEL (FOR 25'-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"	1.37	14	H1	#5	STR	24'-4"	355	50	V1	#4	STR	2'-8"	89
4'-0"	1.83	18	H2	#5	STR	24'-4"	457	50	V1	#4	STR	3'-8"	122

QUANTITIES FOR ONE PRECAST PANEL (FOR 35'-0" PILE SPACING)

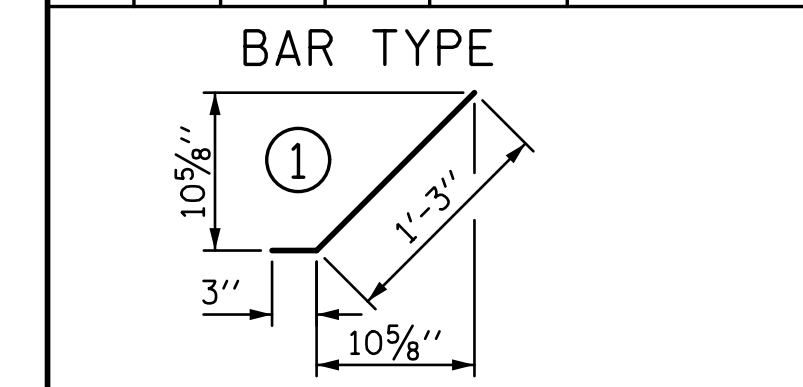
PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES											
		HORIZONTAL						VERTICAL					
		C.Y.	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	
3'-0"	1.93	14	H1	#5	STR	34'-4"	501	70	V1	#4	STR	2'-8"	125
4'-0"	2.57	18	H2	#5	STR	34'-4"	645	70	V1	#4	STR	3'-8"	171

QUANTITIES FOR ONE PRECAST PANEL (FOR 38'-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"	1.93	14	H1	#5	STR	37'-4"	545	76	V1	#4	STR	2'-8"	135
4'-0"	2.57	18	H2	#5	STR	37'-4"	701	76	V1	#4	STR	3'-8"	186

ADDITIONAL BARS FOR ONE BOTTOM PANEL

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



PROJECT NO. U-4751

NEW HANOVER COUNTY

STATION: VARIES

SHEET 3 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH																		
	SOUND BARRIER WALL DETAILS																			
		REVISIONS																		
DRAWN BY: <u>MBC</u> DATE: <u>5-17</u> CHECKED BY: <u>NML</u> DATE: <u>5-17</u>	DESIGN ENGINEER OF RECORD: <u>J. DICHAK</u> DATE: <u>5-17</u>	<table border="1"> <thead> <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>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
NO.	BY:	DATE:	NO.	BY:	DATE:															
1			3																	
2			4																	
SHEET NO. NW-17 TOTAL SHEETS 17																				

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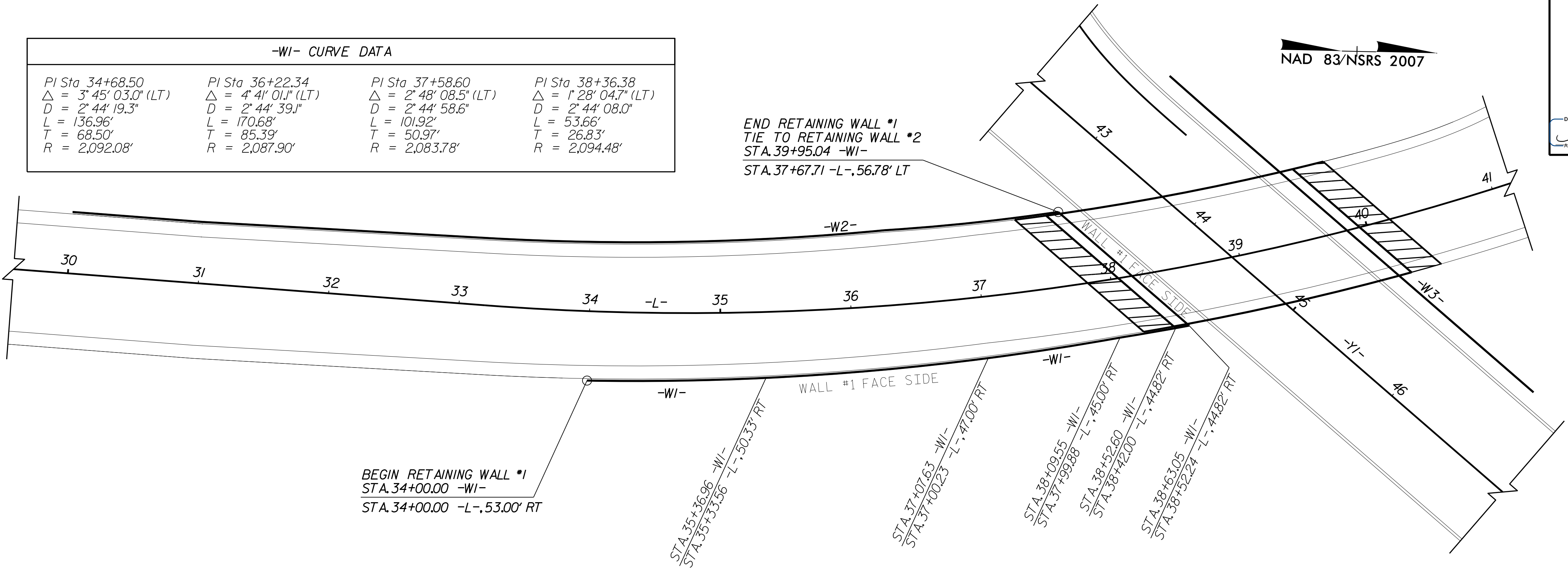


DocuSigned by:
[Signature]
 DATE: 6/5/2017

SIGNATURE DATE

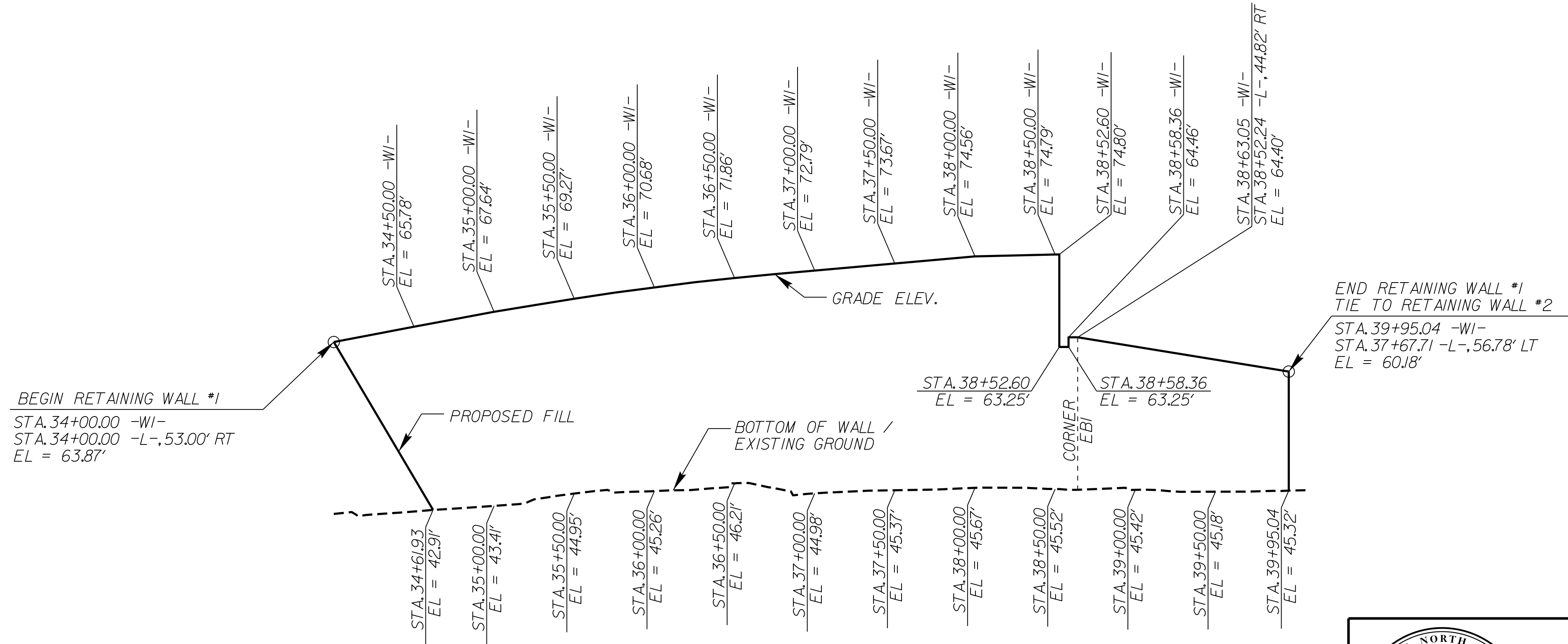
-WI- CURVE DATA			
PI Sta 34+68.50	PI Sta 36+22.34	PI Sta 37+58.60	PI Sta 38+36.38
$\Delta = 3^\circ 45' 03.0''$ (LT)	$\Delta = 4^\circ 41' 01.1''$ (LT)	$\Delta = 2^\circ 48' 08.5''$ (LT)	$\Delta = 1^\circ 28' 04.7''$ (LT)
D = 2' 44" 19.3"	D = 2' 44" 39.1"	D = 2' 44" 58.6"	D = 2' 44" 08.0"
L = 136.96'	L = 170.68'	L = 101.92'	L = 53.66'
T = 68.50'	T = 85.39'	T = 50.97'	T = 26.83'
R = 2,092.08'	R = 2,087.90'	R = 2,083.78'	R = 2,094.48'

NAD 83/NSRS 2007



PLAN VIEW FOR RETAINING WALL NO. 1
 N.T.S.

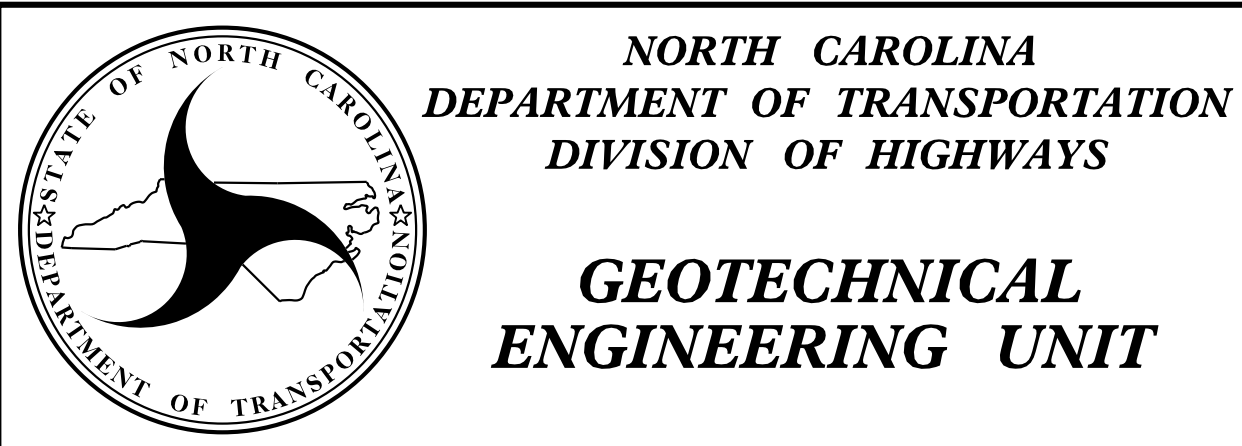
ESTIMATED MSE WALL QUANTITY	
MSE RETAINING WALL NO. 1	15,100 SF



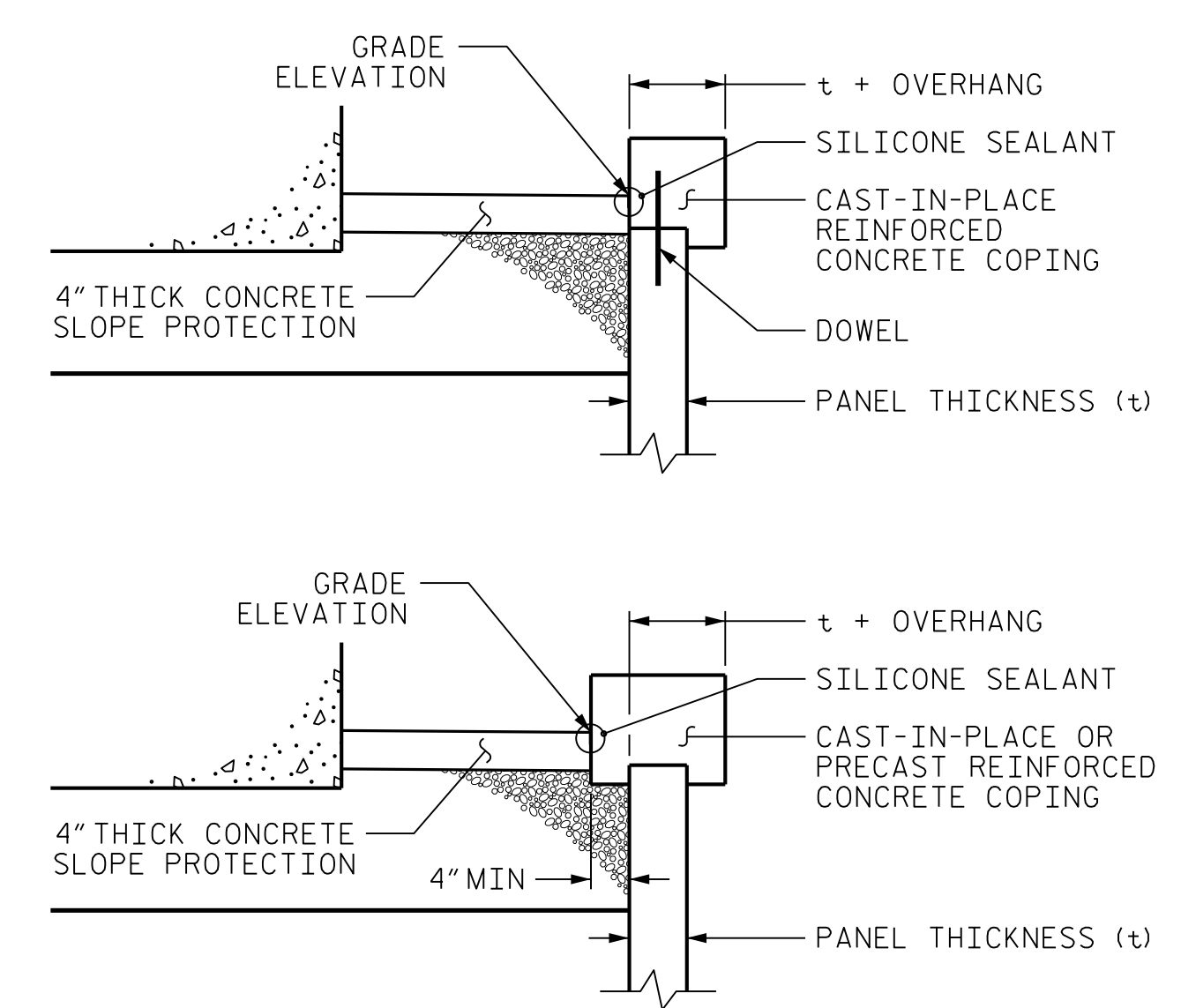
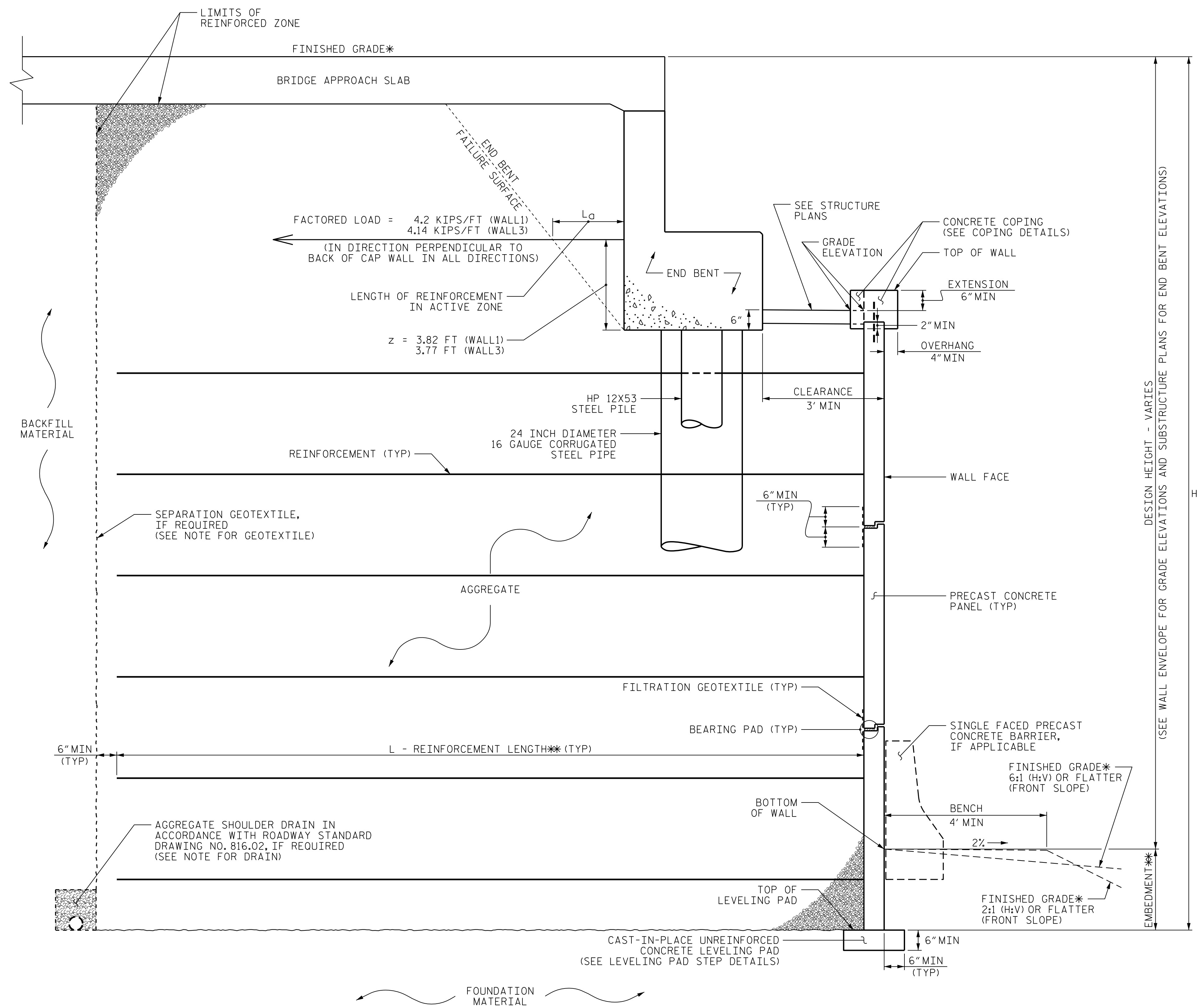
WALL ENVELOPE FOR RETAINING WALL NO. 1

EXPOSED WALL FACE VIEW, N.T.S.
 THE WALL ENVELOPE DOES NOT ACCURATELY
 DEPICT THE ACTUAL FACE OF THE WALL

PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: 34+00.00 -L-
 SHEET 1 OF 13



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

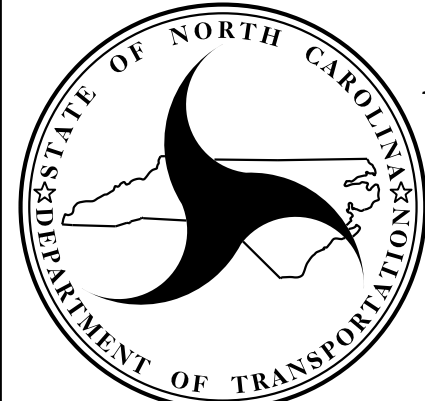


COPING DETAILS
 AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION


*SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.
 *SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 RW1, FROM STA. 38+63.05± -W1- TO STA. 39+95.04 -W1-
 RW3, FROM STA. 44+17.45 -W3- TO STA. 45+49.60 -W3-

PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: RETAINING WALL NO. 1, NO. 3
 SHEET 10 OF 13


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL
ENGINEERING UNIT

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

GEOTECHNICAL ENGINEER

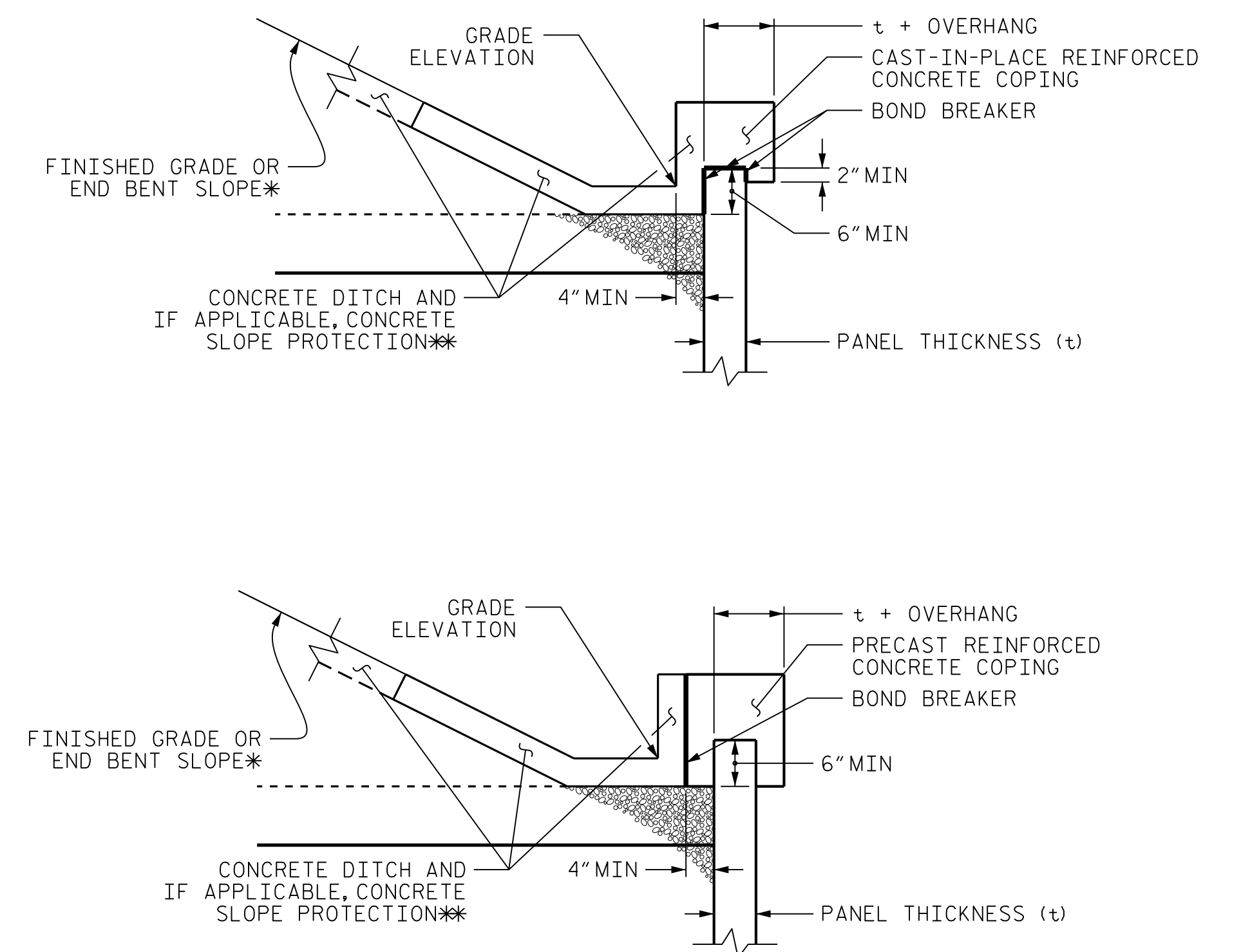
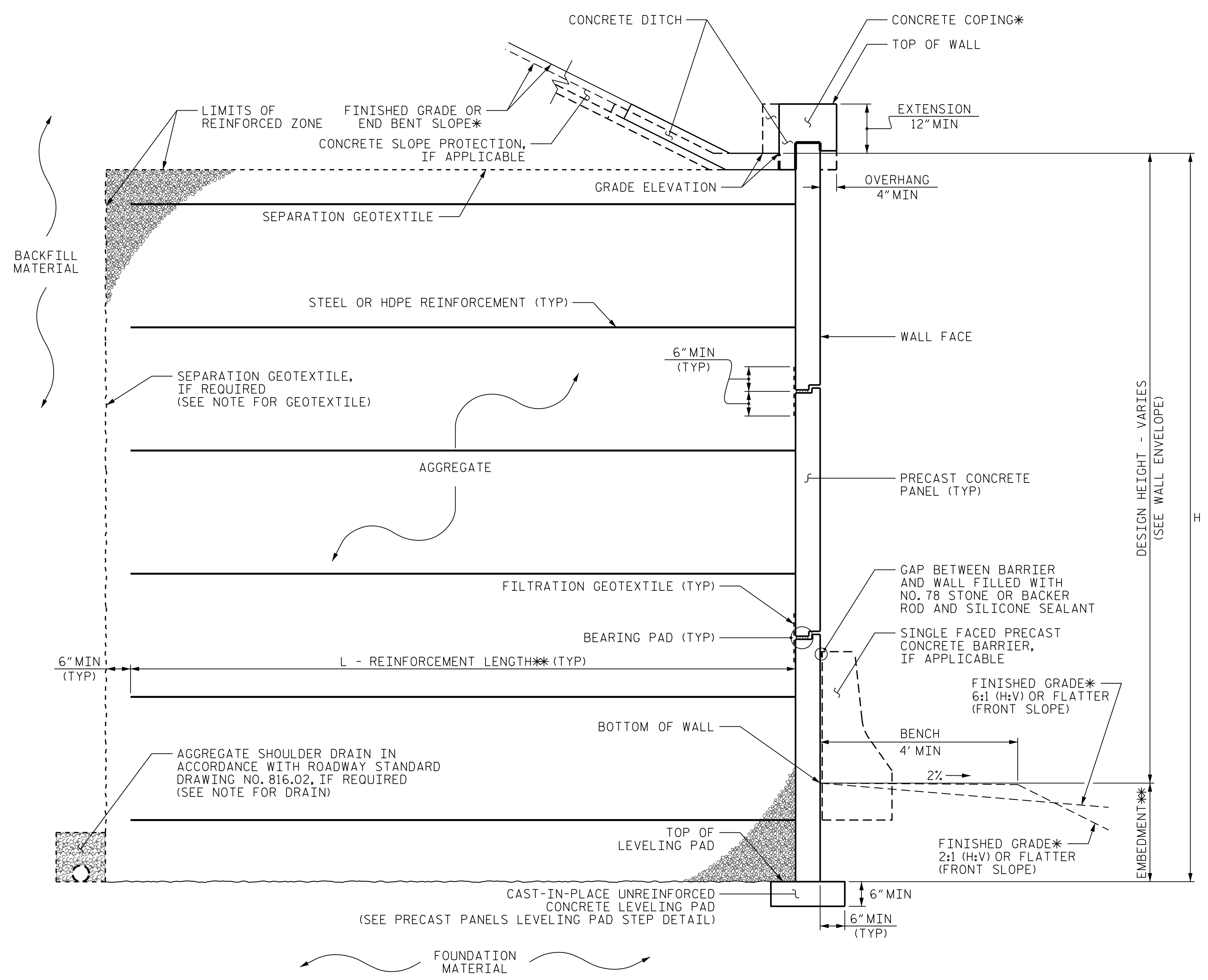


SEAL
032171
ENGINEER
YOUNG PARK

ENGINEER

DocuSigned by: *[Signature]* 6/5/2017

SIGNATURE DATE SIGNATURE DATE



COPING DETAILS

*SEE PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.
*SEE CONCRETE DITCH BEHIND WALL DETAILS.

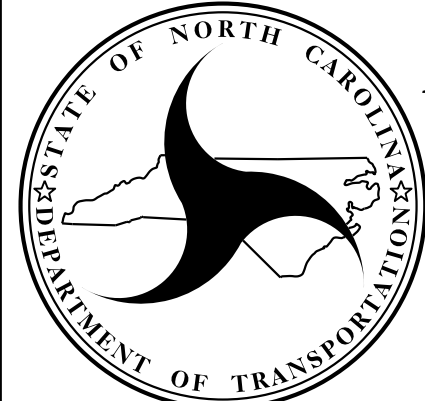
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE COPING DETAILS AND PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

RW3, FROM STA. 43+11.42 -W3- TO STA. 44+17.45 -W3-
RW3, FROM STA. 45+49.60 -W3- TO STA. 46+80.00 -W3-

PROJECT NO.: U-4751
NEW HANOVER COUNTY
STATION: RETAINING WALL NO. 3
SHEET 11 OF 13

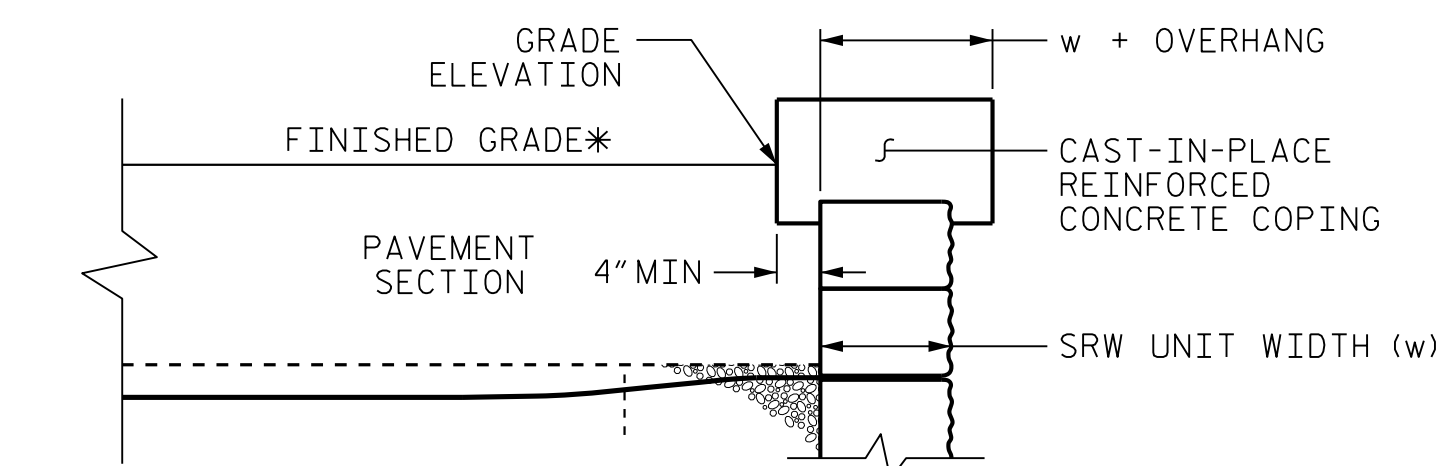
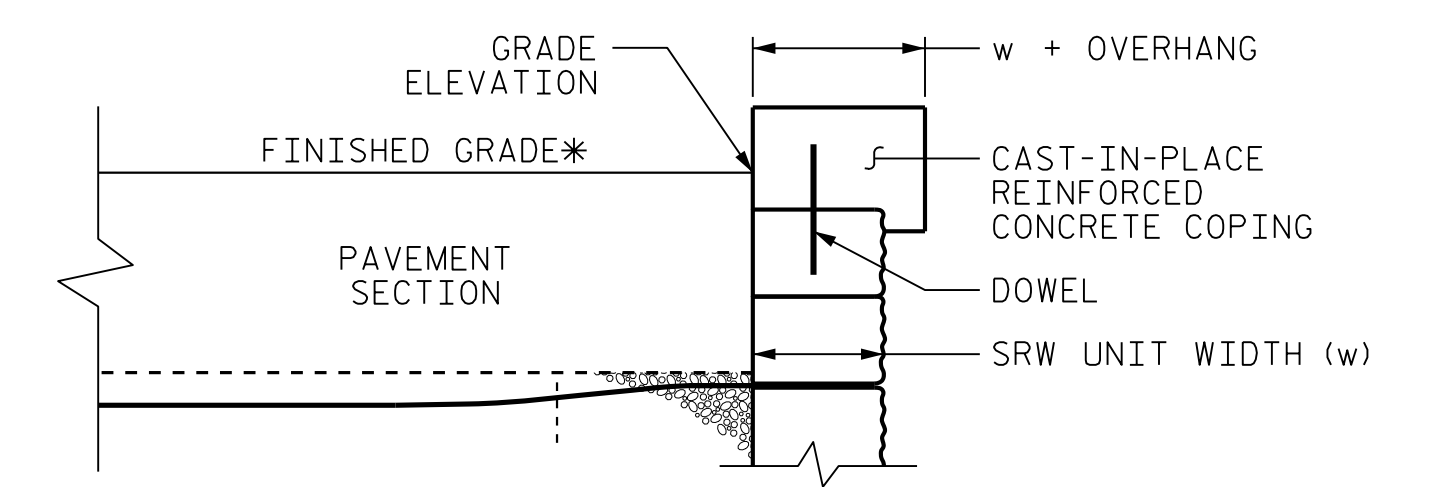
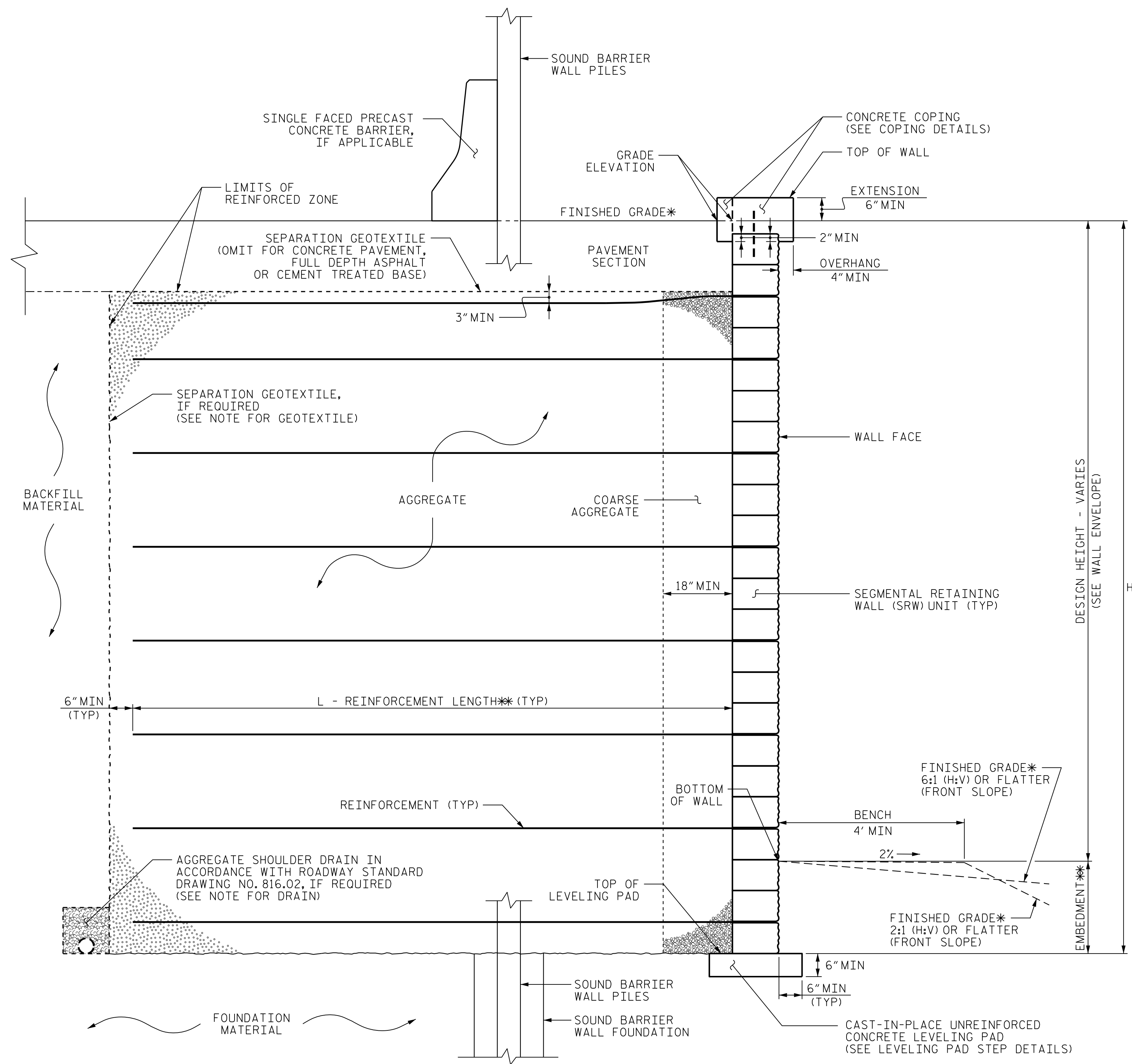
PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017



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

**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	-	-	3	-	-	W-11
2	-	-	4	-	-	



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

MSE WALL WITH SRW UNITS - 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.

RW4, FROM STA. 74+00.00 -W4- TO STA. 87+88.07± -W4-
 RW5, FROM STA. 85+75.00 -W5- TO STA. 87+09.20 -W5-
 RW6, FROM STA. 135+74.32 -W6- TO STA. 142+68.97 -W6-

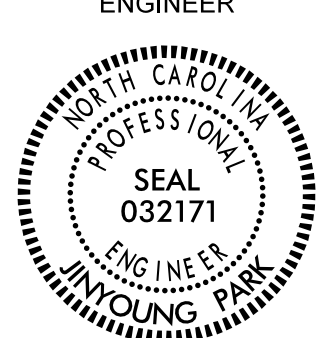
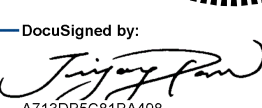
PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: RETAINING WALL NO. 4 TO NO. 6
 SHEET 12 OF 13

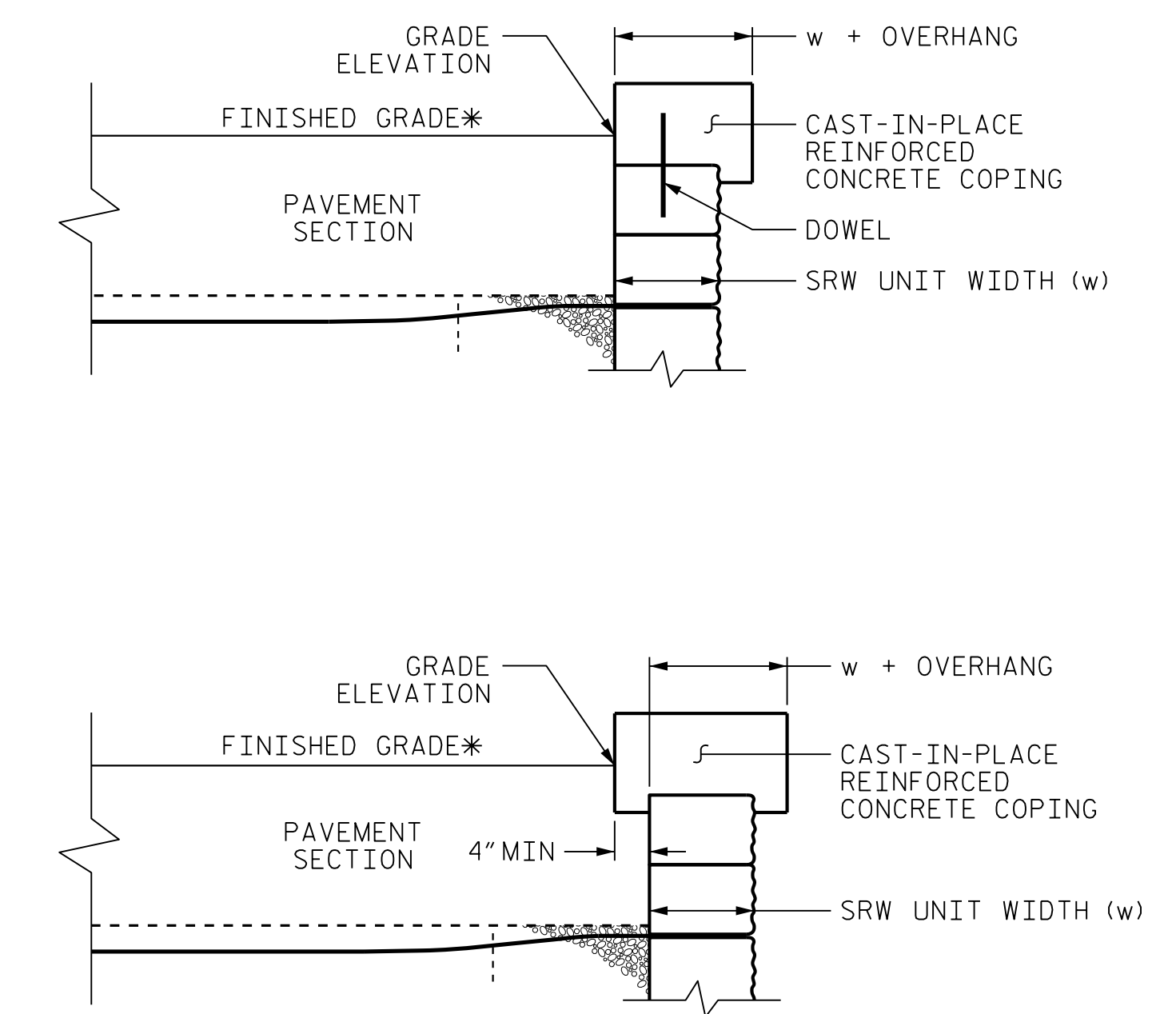
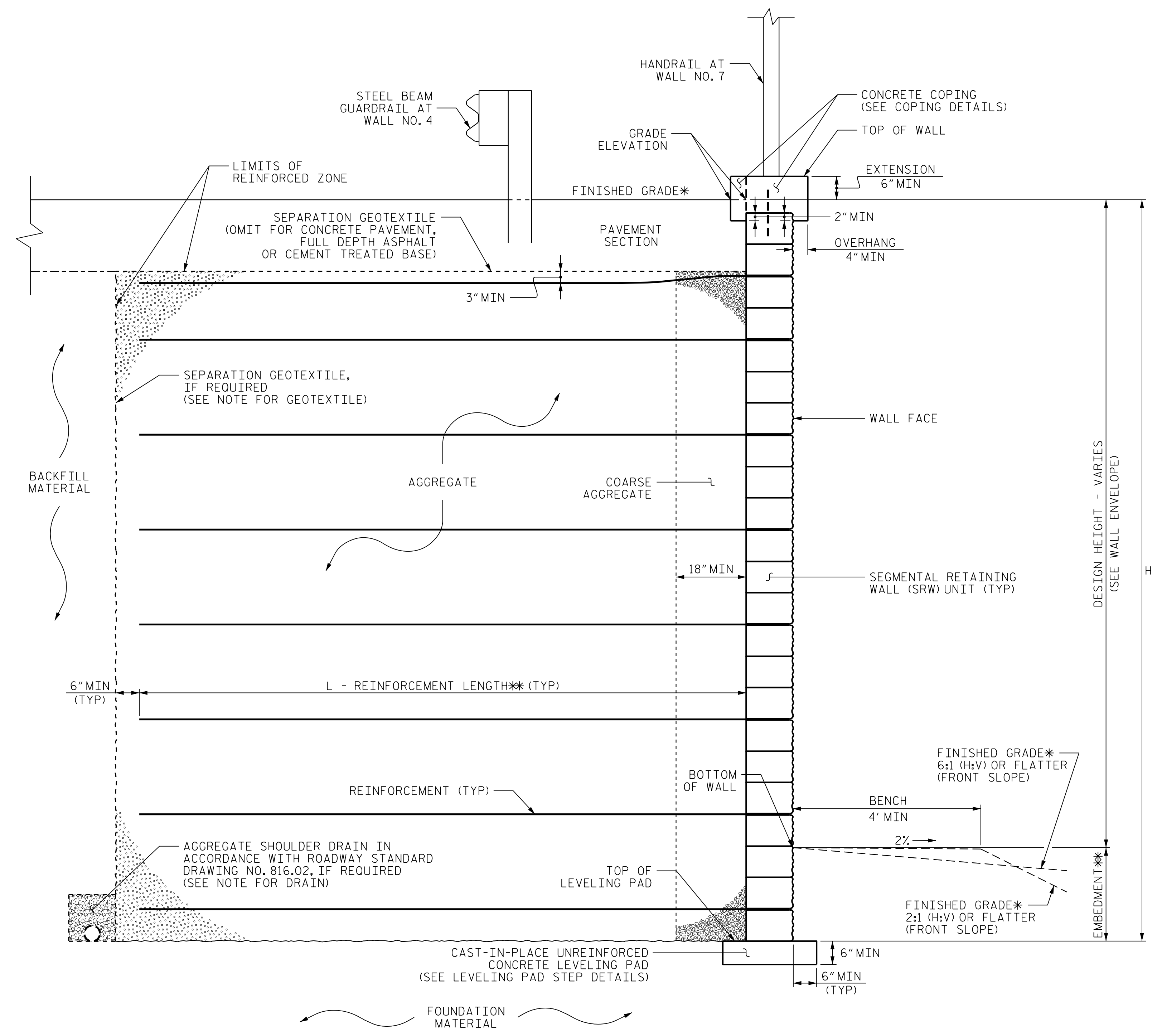
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**GEOTECHNICAL
 ENGINEERING UNIT**

DETAILS FOR MSE RETAINING WALL NO. 4, NO. 5 AND NO. 6

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

PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017

GEOTECHNICAL ENGINEER
 ENGINEER

 DocuSigned by:

 DATE: 6/5/2017
 SIGNATURE: DATE



COPING DETAILS

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

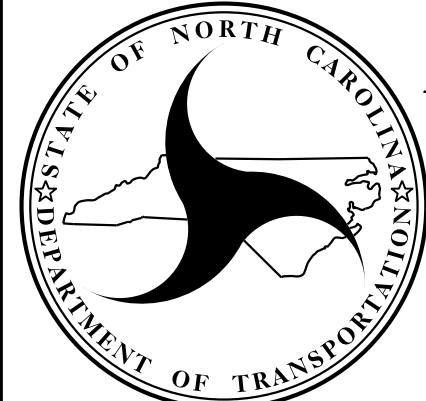
MSE WALL WITH SRW UNITS - TYPICAL SECTION

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

RW4, FROM STA. 87+88.07± -W4- TO STA. 89+28.11 -W4-
 RW7, FROM STA. 68+40.00 -W7- TO STA. 69+56.78 -W7-

PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: RETAINING WALL NO. 4, NO. 7
 SHEET 13 OF 13

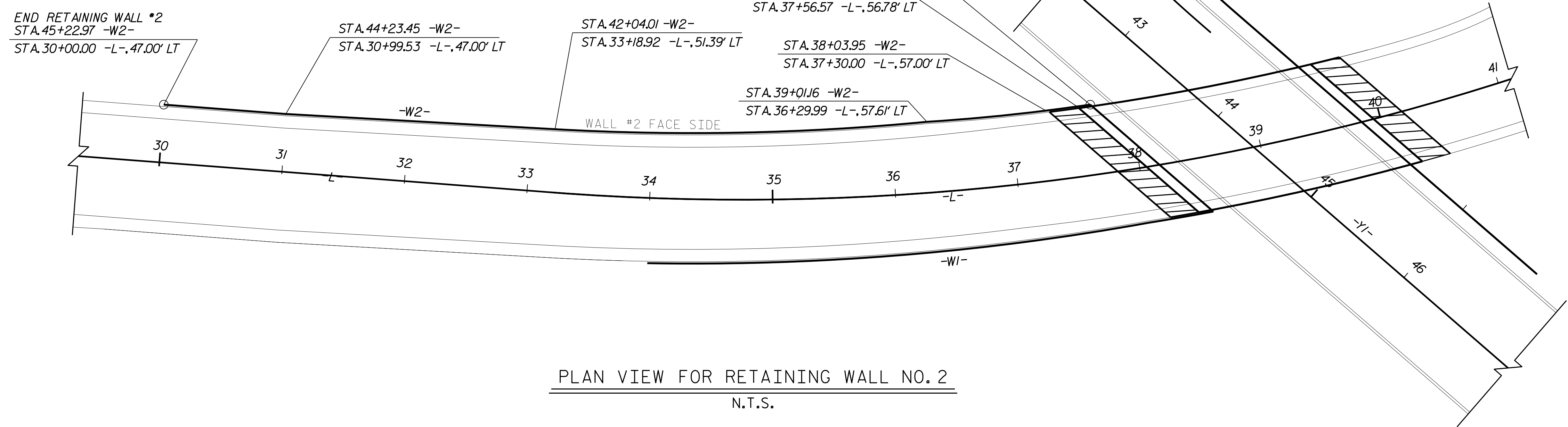
PREPARED BY: J. PARK DATE: 06 / 2017
 REVIEWED BY: J. BATTS DATE: 06 / 2017


 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**GEOTECHNICAL
 ENGINEERING UNIT**

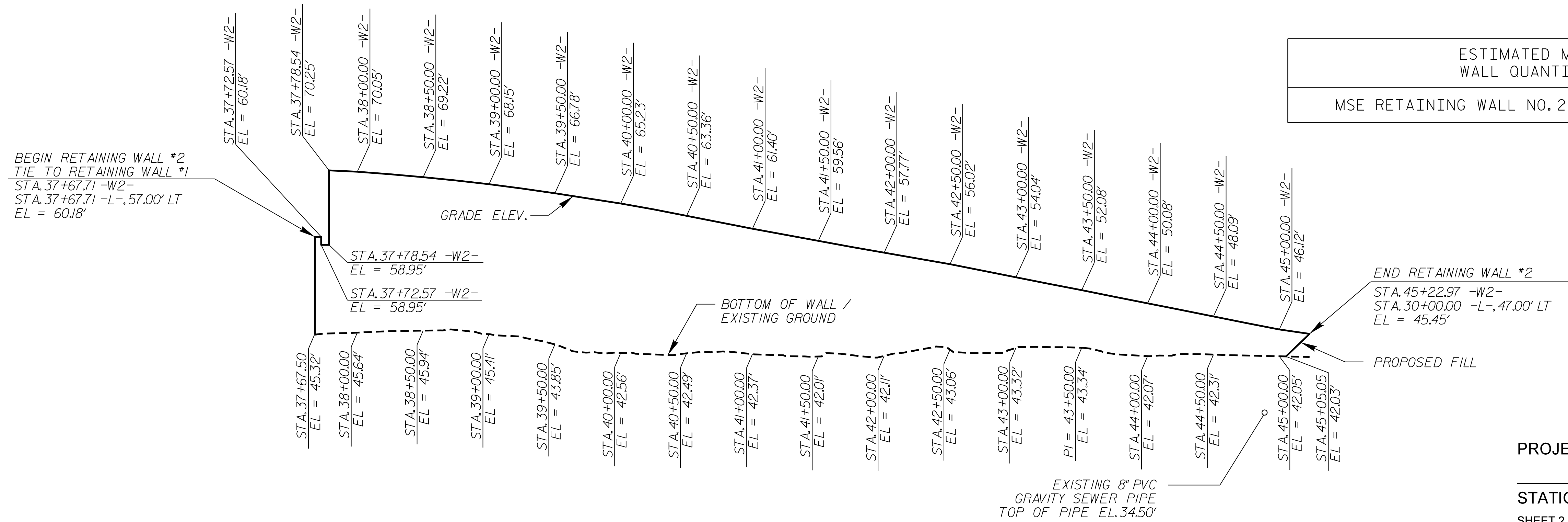
**DETAILS FOR
MSE RETAINING
WALL NO. 4 AND NO. 7**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	-	-	3	-	-	W-13
2	-	-	4	-	-	

-W2- CURVE DATA		
PI Sta 37+85.73	PI Sta 38+52.57	PI Sta 40+52.88
$\Delta = 1^{\circ}03'11.6"$ (RT)	$\Delta = 3^{\circ}31'50.8"$ (RT)	$\Delta = 8^{\circ}44'33.2"$ (RT)
$D = 2^{\circ}53'21.7"$	$D = 3^{\circ}37'56.4"$	$D = 2^{\circ}53'12.3"$
$L = 36.45'$	$L = 97.20'$	$L = 302.85'$
$T = 18.23'$	$T = 48.62'$	$T = 151.72'$
$R = 1,983.00'$	$R = 1,577.38'$	$R = 1,984.78'$



ESTIMATED MSE WALL QUANTITY	
MSE RETAINING WALL NO. 2	13,900 SF



WALL ENVELOPE FOR RETAINING WALL NO. 2
EXPOSED WALL FACE VIEW, N.T.S.
THE WALL ENVELOPE DOES NOT ACCURATELY
DEPICT THE ACTUAL FACE OF THE WALL

PROJECT NO.: U-4751
NEW HANOVER COUNTY
STATION: 30+00.00 -L-
SHEET 2 OF 13

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

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

SHEET NO. W-2

GEOTECHNICAL ENGINEER

ENGINEER

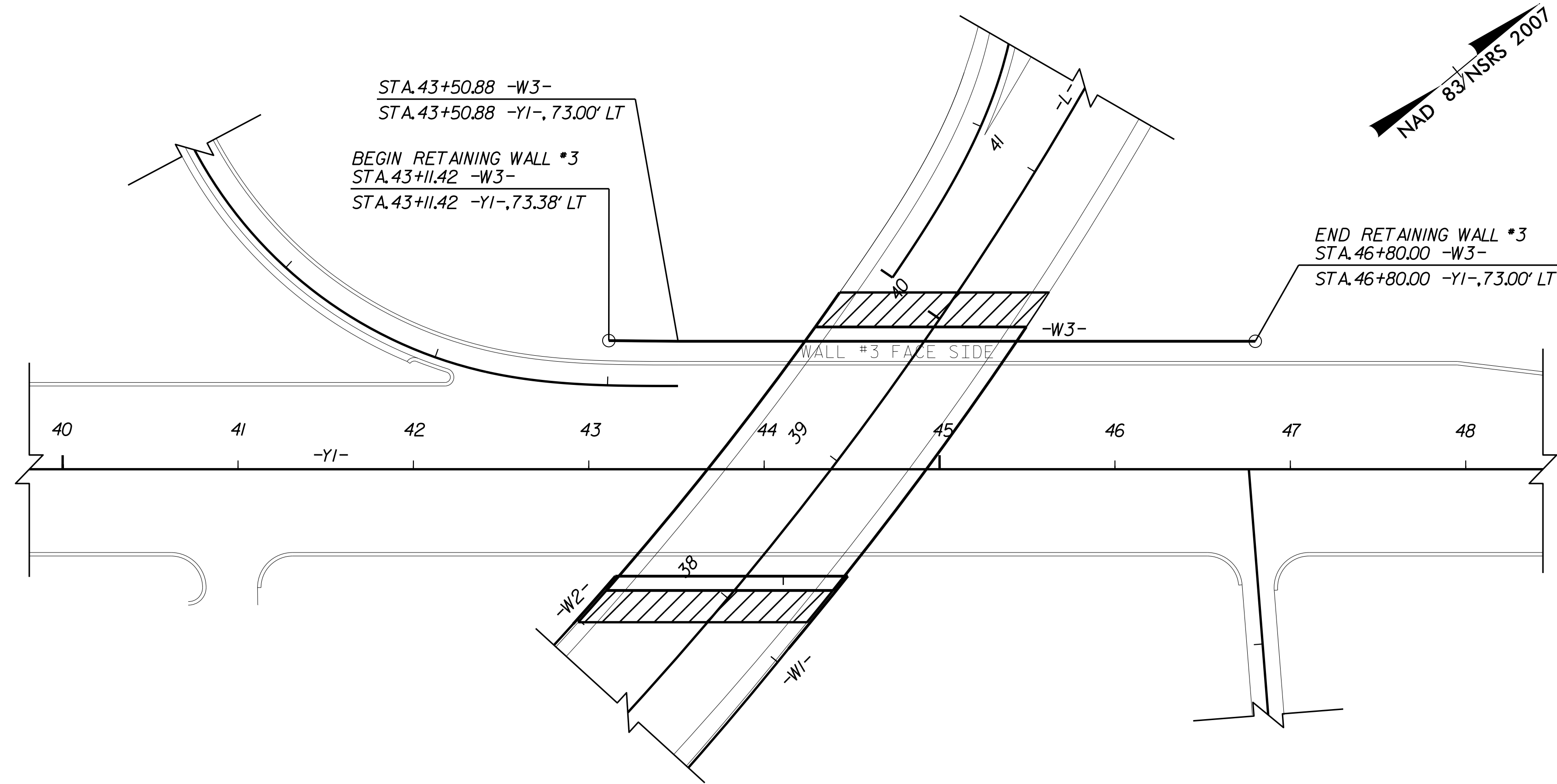
SEAL 032171

6/5/2017

DATE

SIGNATURE

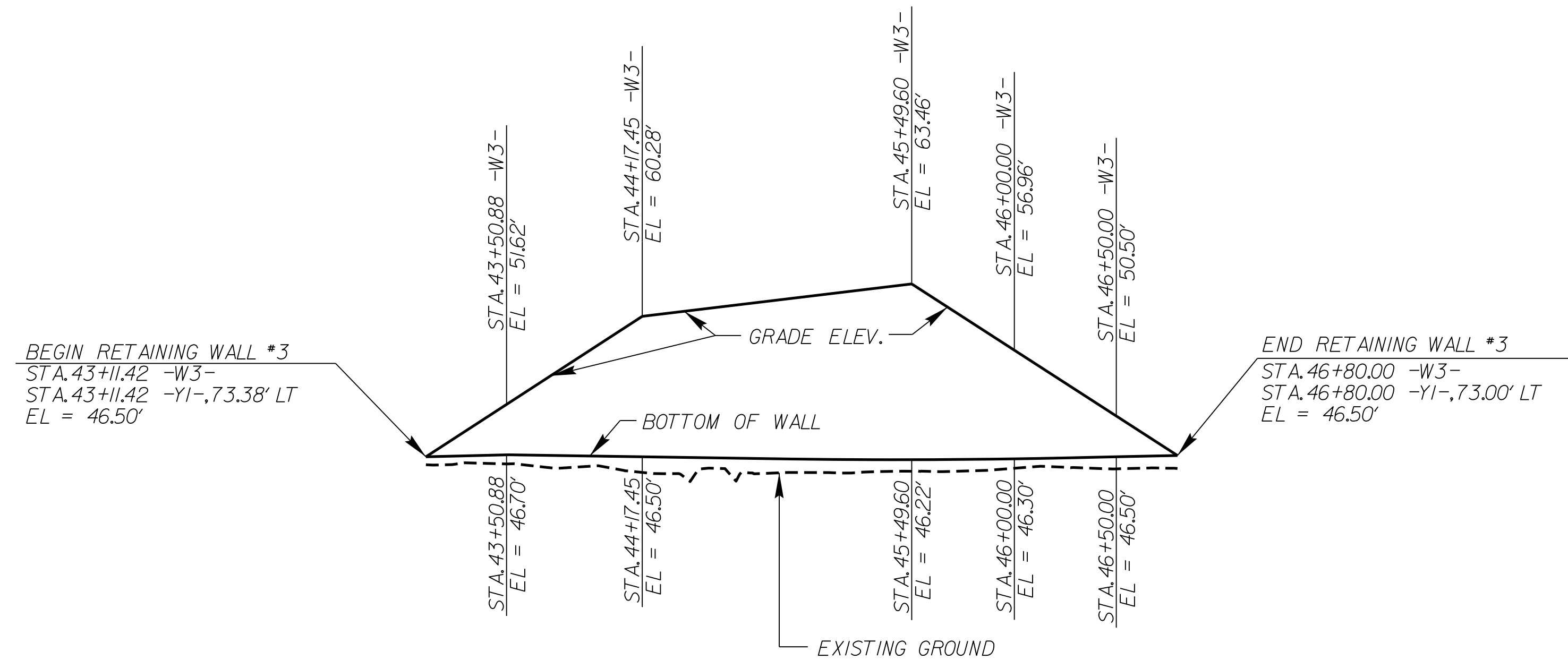
DATE



NAD 83 NSRS 2007

PLAN VIEW FOR RETAINING WALL NO. 3
N.T.S.

ESTIMATED MSE WALL QUANTITY	
MSE RETAINING WALL NO. 3	5,200 SF



WALL ENVELOPE FOR RETAINING WALL NO. 3
EXPOSED WALL FACE VIEW, N.T.S.
THE WALL ENVELOPE DOES NOT ACCURATELY
DEPICT THE ACTUAL FACE OF THE WALL

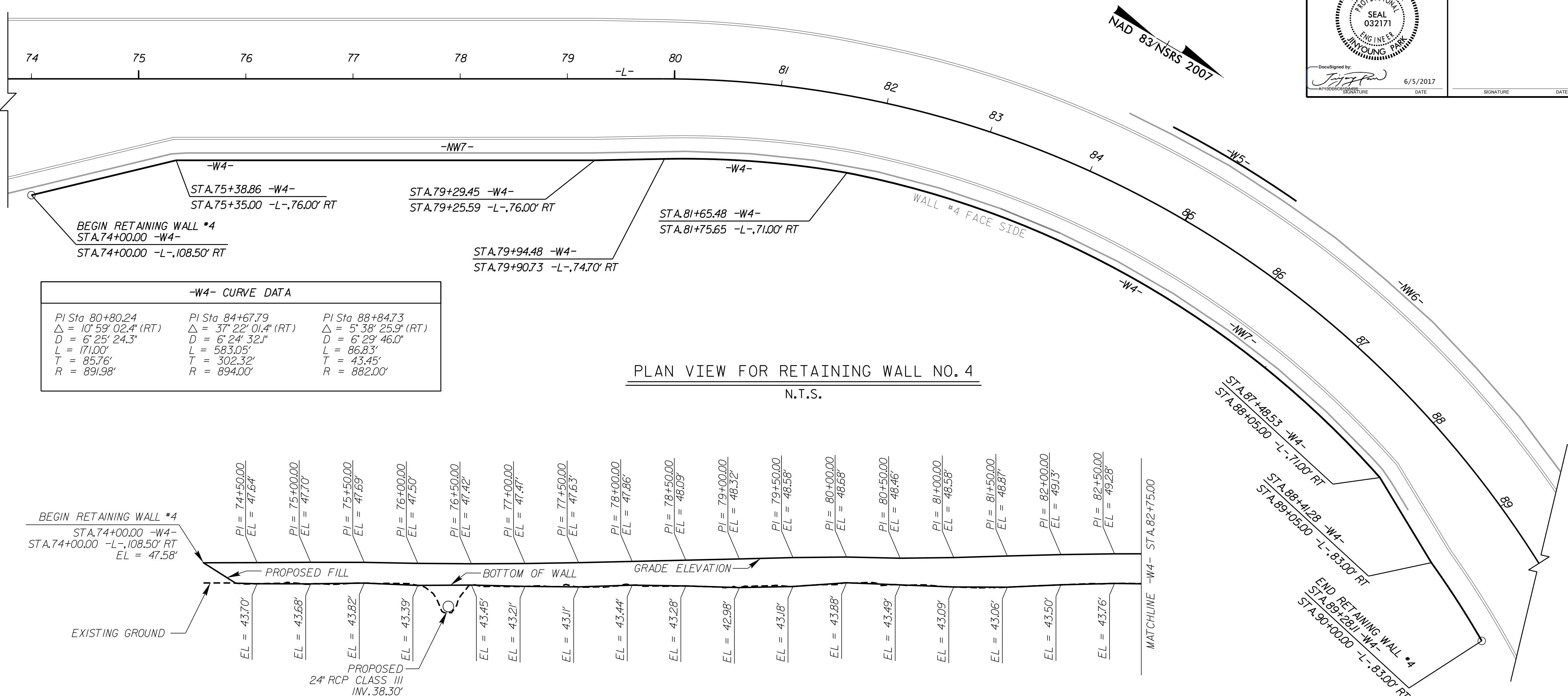
PROJECT NO.: U-4751
NEW HANOVER COUNTY
STATION: 43+50.00 -Y1-
SHEET 3 OF 13

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

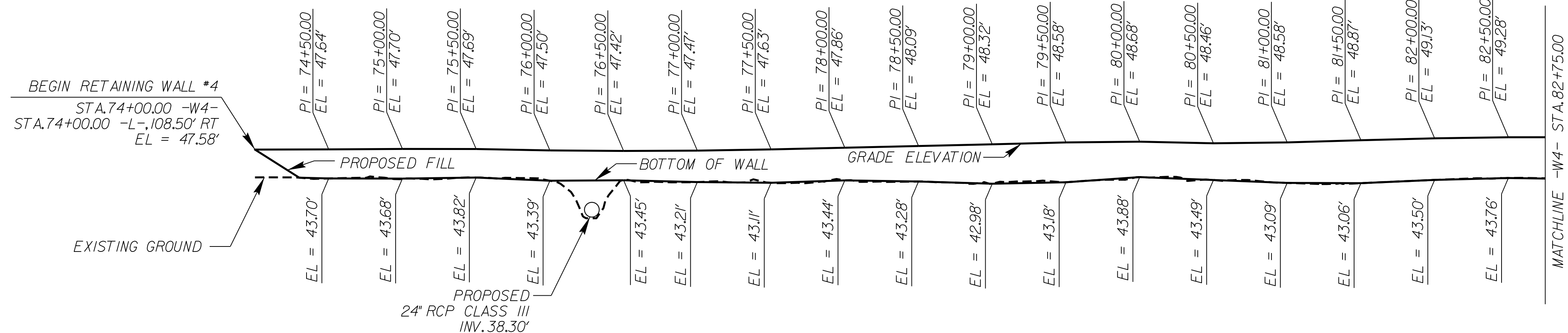
REVISIONS						SHEET NO. W-3
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017



-W4- CURVE DATA

PI Sta 80+80.24 Δ = 10° 59' 02.4" (RT) D = 6' 25' 24.3" L = 171.00' T = 85.76' R = 891.98'	PI Sta 84+67.79 Δ = 37° 22' 01.4" (RT) D = 6' 24' 32.1" L = 583.05' T = 302.32' R = 894.00'	PI Sta 88+84.73 Δ = 5° 38' 25.9" (RT) D = 6' 29' 46.0" L = 86.83' T = 43.45' R = 882.00'
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ESTIMATED MSE WALL QUANTITY

MSE RETAINING WALL NO. 4	9,250 SF
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PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: 74+00.00 -L-
 SHEET 4 OF 13

WALL ENVELOPE FOR RETAINING WALL NO. 4

EXPOSED WALL FACE VIEW, N.T.S.
 THE WALL ENVELOPE DOES NOT ACCURATELY
 DEPICT THE ACTUAL FACE OF THE WALL

PREPARED BY: J. PARK DATE: 06 / 2017
 REVIEWED BY: J. BATTS DATE: 06 / 2017

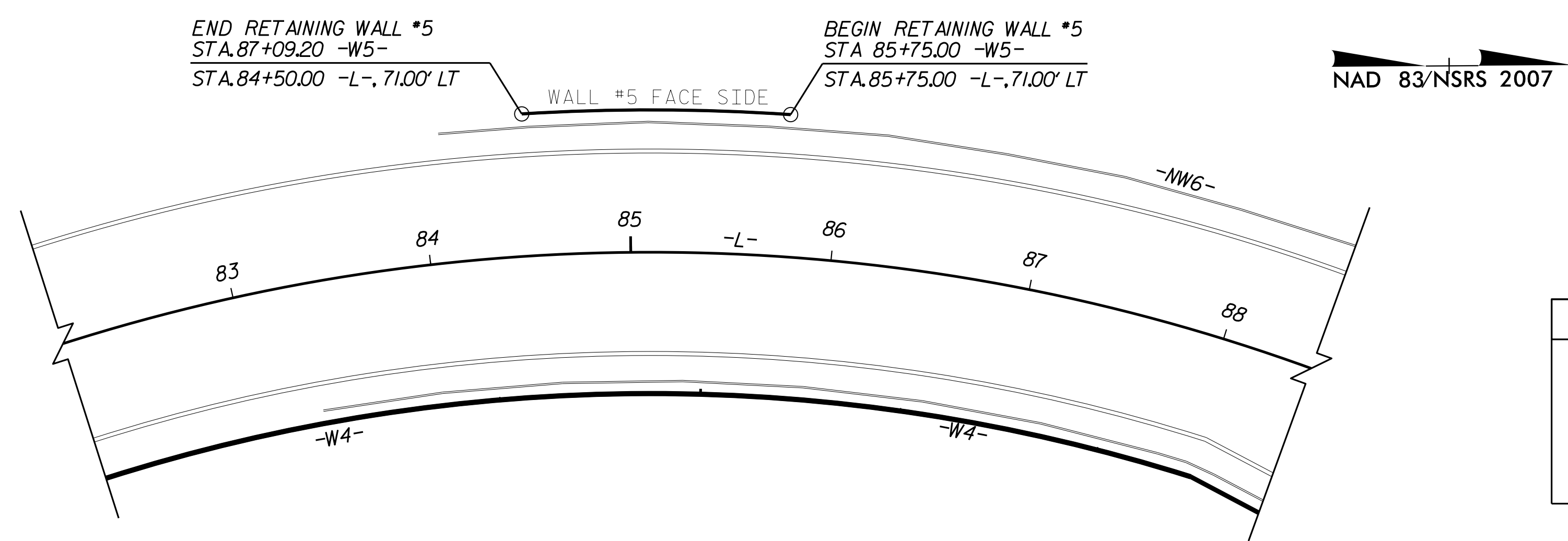


NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**GEOTECHNICAL
 ENGINEERING UNIT**

**MSE RETAINING WALL NO. 4
PLAN VIEW AND
WALL ENVELOPE**

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

GEOTECHNICAL ENGINEER
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 032171
 WILMINGTON, NORTH CAROLINA
 Documented by: *[Signature]* 6/5/2017
 DATE DATE DATE DATE

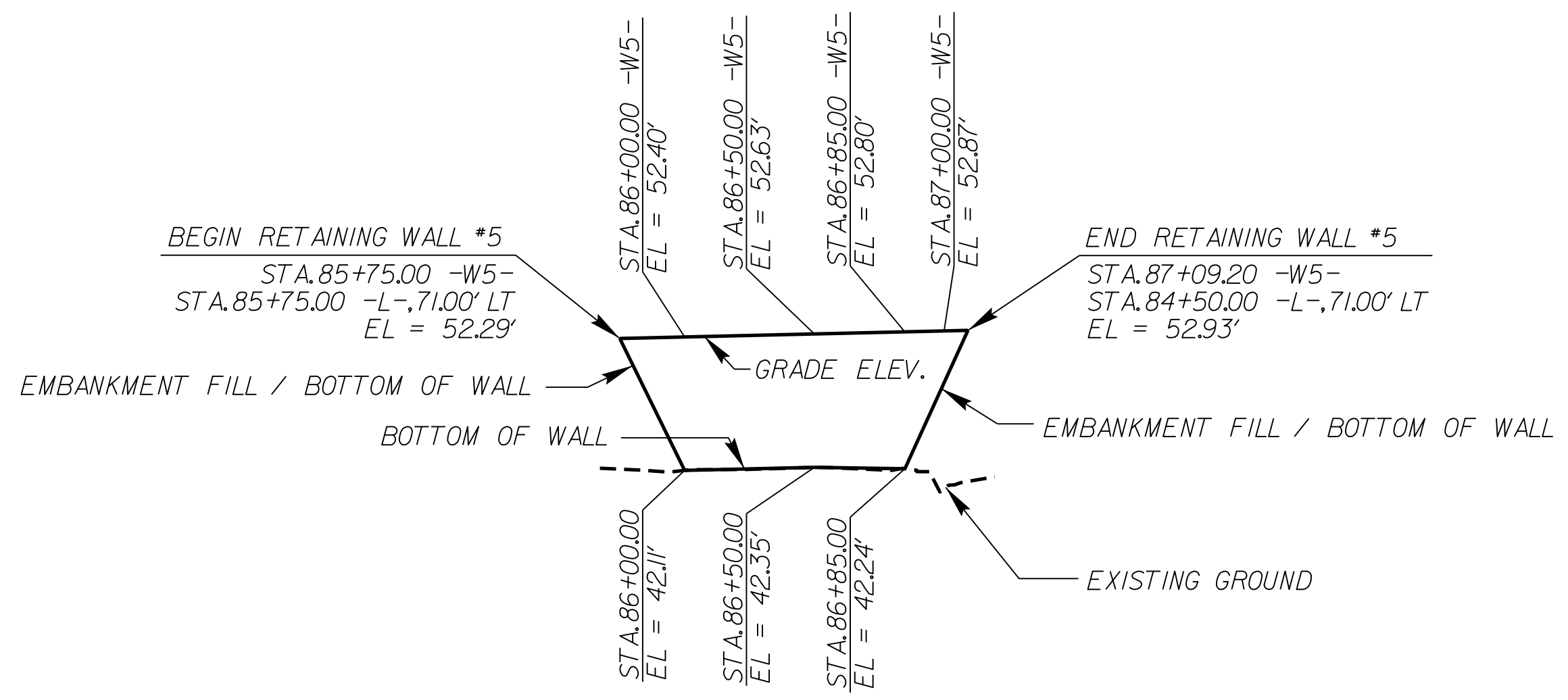


-W5- CURVE DATA

PI Sta 86+42.19
 $\Delta = 7^\circ 25' 18.2''$ (LT)
 $D = 5^\circ 31' 49.7''$
 $L = 134.20'$
 $T = 67.19'$
 $R = 1,036.00'$

PLAN VIEW FOR RETAINING WALL NO. 5
N.T.S.

ESTIMATED MSE WALL QUANTITY	
MSE RETAINING WALL NO. 5	1,500 SF



WALL ENVELOPE FOR RETAINING WALL NO. 5
EXPOSED WALL FACE VIEW, N.T.S.
THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL


PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: 84+50.00 -L-
 SHEET 5 OF 13

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

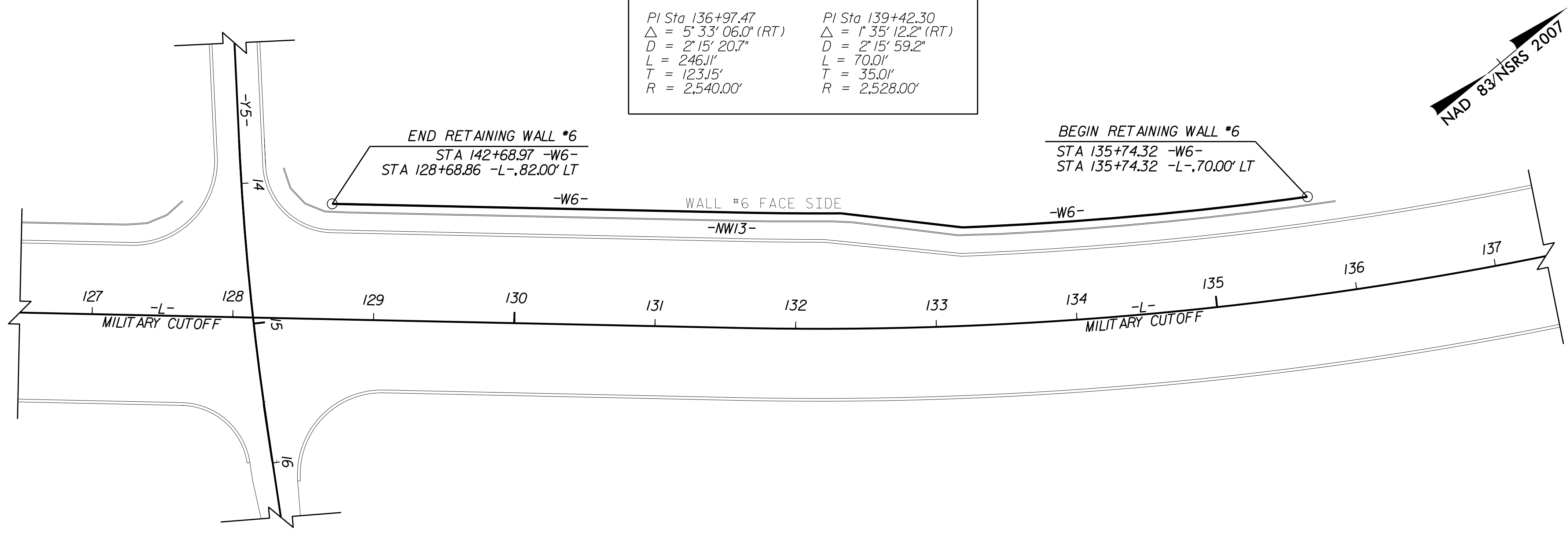
MSE RETAINING WALL NO. 5 PLAN VIEW AND WALL ENVELOPE

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

PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017

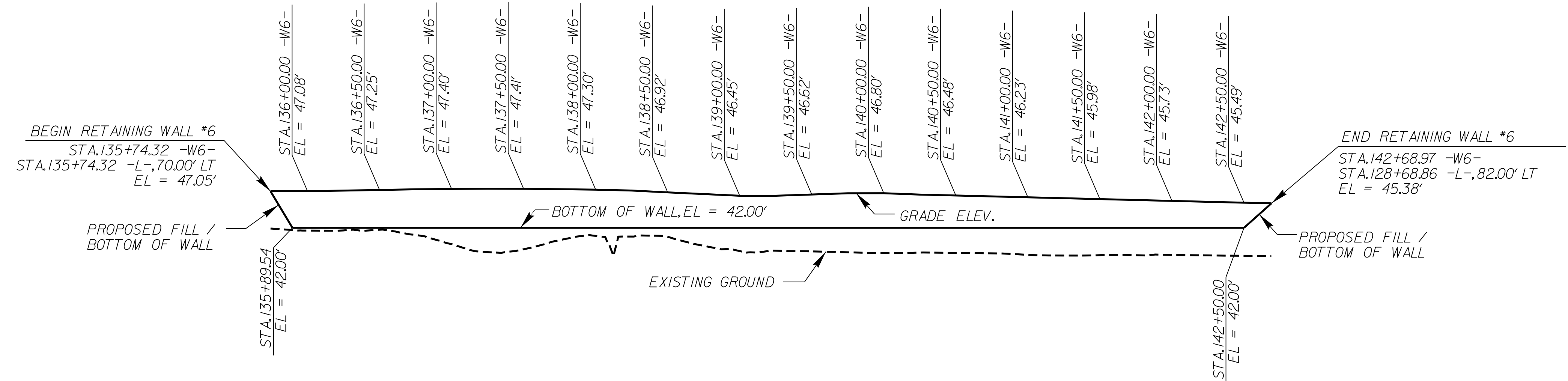
GEOTECHNICAL ENGINEER  SEAL 032171 ENGINEER J. PARK W. YOUNG PARK	ENGINEER DATE: 6/5/2017 SIGNATURE: _____ DATE: _____
--	--

-W6- CURVE DATA	
PI Sta 136+97.47	PI Sta 139+42.30
$\Delta = 5^{\circ} 33' 06.0''$ (RT)	$\Delta = 1^{\circ} 35' 12.2''$ (RT)
$D = 2^{\circ} 15' 20.7''$	$D = 2^{\circ} 15' 59.2''$
$L = 246.11'$	$L = 70.01'$
$T = 123.15'$	$T = 35.01'$
$R = 2,540.00'$	$R = 2,528.00'$



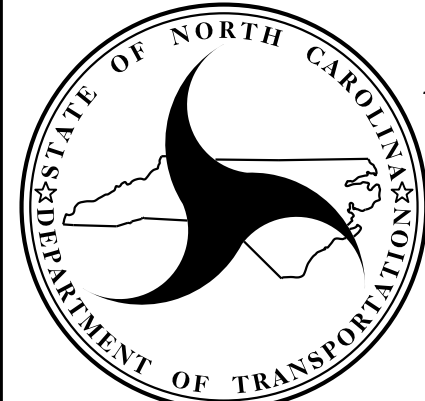
PLAN VIEW FOR RETAINING WALL NO. 6
N.T.S.

ESTIMATED MSE WALL QUANTITY	
MSE RETAINING WALL NO. 6	4,250 SF



WALL ENVELOPE FOR RETAINING WALL NO. 6
EXPOSED WALL FACE VIEW, N.T.S.
THE WALL ENVELOPE DOES NOT ACCURATELY
DEPICT THE ACTUAL FACE OF THE WALL

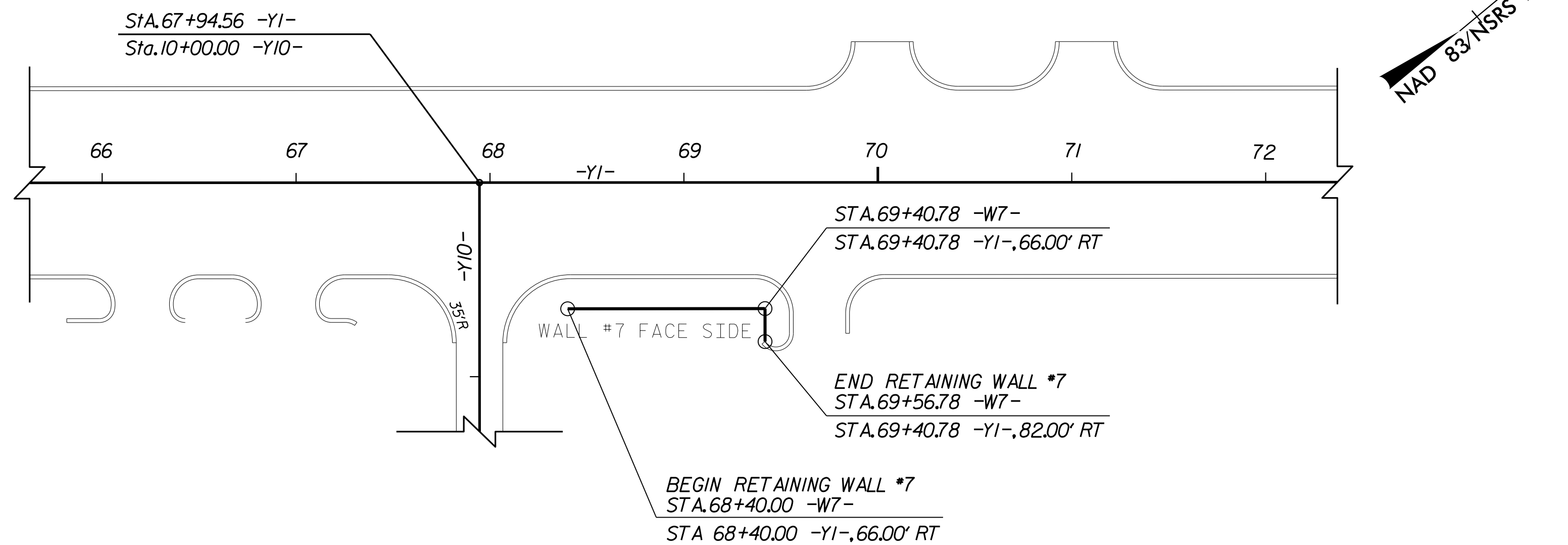
PROJECT NO.: U-4751
NEW HANOVER COUNTY
STATION: 129+00.00 -L-
SHEET 6 OF 13


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL
ENGINEERING UNIT

REVISIONS						SHEET NO. W-6
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

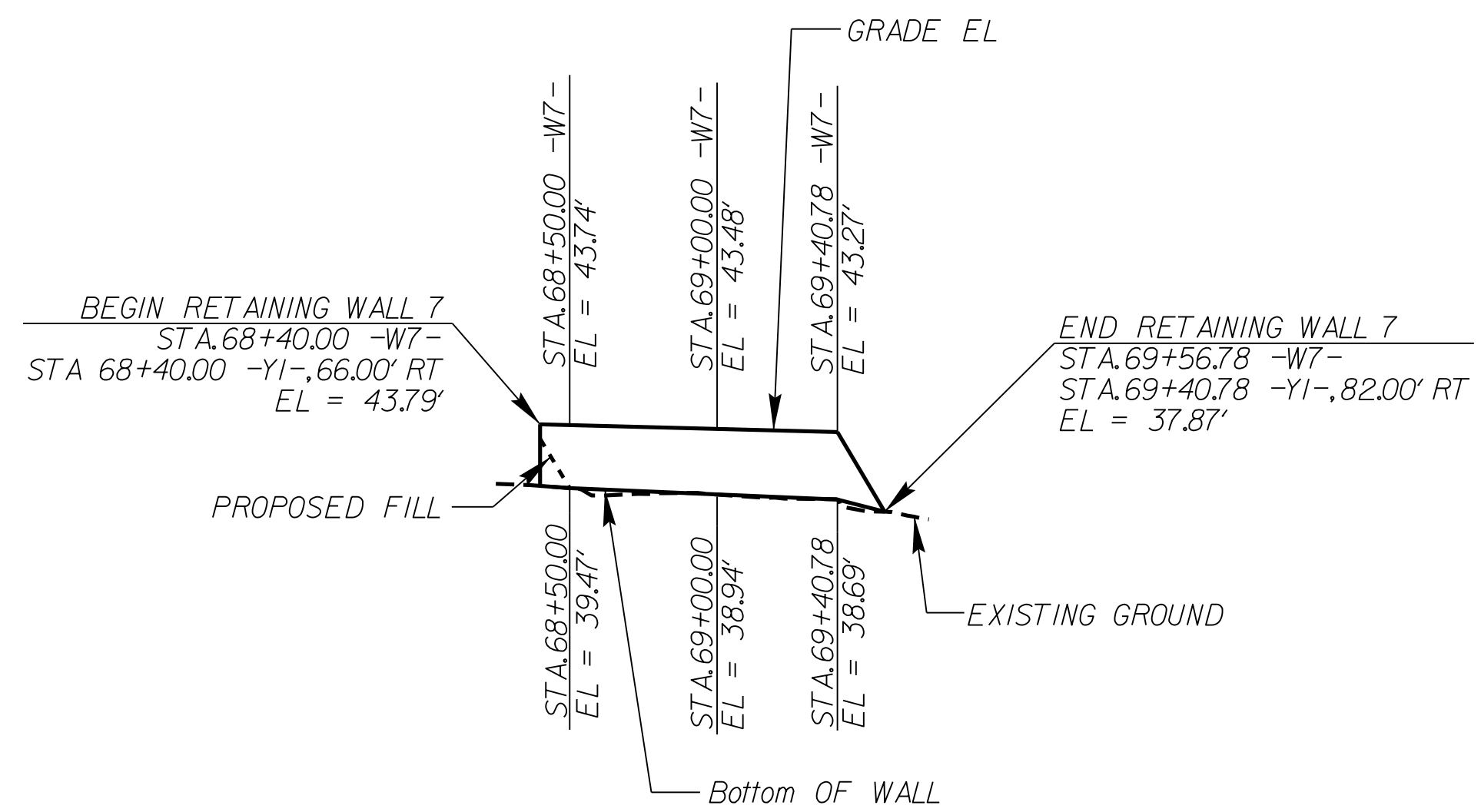
PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017

GEOTECHNICAL ENGINEER
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 032171
 W. YOUNG PARK
 DocuSigned by: *[Signature]* 6/5/2017
 DATE SIGNATURE DATE



PLAN VIEW FOR RETAINING WALL NO. 6
 N.T.S.

ESTIMATED MSE WALL QUANTITY	
MSE RETAINING WALL NO. 7	700 SF



WALL ENVELOPE FOR RETAINING WALL NO. 7
 EXPOSED WALL FACE VIEW, N.T.S.

PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: 68+40.00 -Y1-
 SHEET 7 OF 13

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALL NO. 7
PLAN VIEW AND
WALL ENVELOPE

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

SHEET NO. W-7

PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO.1 FROM -W1- STA. 34+00.00 TO -W1- STA. 38+52.60 AND RETAINING WALL NO. 2. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS (SRW) UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 4 THROUGH NO. 7.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 3 THROUGH NO. 7.

A HANDRAIL IS REQUIRED AT TOP OF RETAINING WALL NO. 7. THE CONTRACTOR SHALL SUBMIT THE DESIGN AND DETAILS OF HANDRAIL. FOR HANDRAIL, SEE ROADWAY PLANS.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO 7.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1 THROUGH NO. 7.

A DRAIN IS REQUIRED FOR RETAINING WALL NO.1 THROUGH NO. 7.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1 THROUGH NO. 7, SURVEY WALL LOCATIONS AND SUBMIT REVISED WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPES ARE ACCEPTED.

DESIGN RETAINING WALL NO.1 THROUGH NO. 7 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,760 LB/SF (RW1), 6,440 LB/SF (RW2), 7,000 LB/SF (RW3), 1,530 LB/SF (RW4), 2,810 LB/SF (RW5), 1,450 LB/SF (RW6), 1,340 LB/SF (RW7)
- 4) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

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

5) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0

DESIGN RETAINING WALL NO.1 THROUGH NO. 3 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN RETAINING WALL NO. 4 FOR A PIPE EXTENDING THROUGH THE WALL AS SHOWN. VERIFY PIPE LOCATION AND ELEVATION BEFORE BEGINNING MSE WALL DESIGN OR CONSTRUCTION.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 LOCATED AT STATION 38+05.73 -L- AND END BENT NO. 2 LOCATED AT STATION 39+94.43 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR SOUND BARRIER WALLS WILL BE LOCATED BEHIND RETAINING WALL NO. 4 THROUGH NO. 6 AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

DESIGN RETAINING WALL NO. 4 THROUGH NO. 6 FOR A LATERAL LOAD FROM FOUNDATION OF THE SOUND BARRIER WALL LOCATED BEHIND THE WALL APPLIED AS FACTORED UNIFORM PRESSURES AS BELOW TO THE BACK OF SRW UNITS.

SOUND BARRIER WALL FOUNDATION SPACING	FACTORED LATERAL LOAD BEHIND WALL (PSF)		
	WALL NO. 4	WALL NO. 5	WALL NO. 6
10 FT.	350	260	650
15 FT.	490	380	760

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 THROUGH NO. 7.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 38+05.73 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 AND RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION 39+94.43 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 3. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

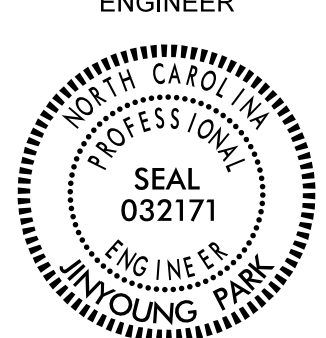
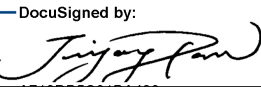
CONSTRUCT RETAINING WALL NO.1 AND RETAINING WALL NO.2 BEFORE INSTALLING FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 38+05.73 -L-.

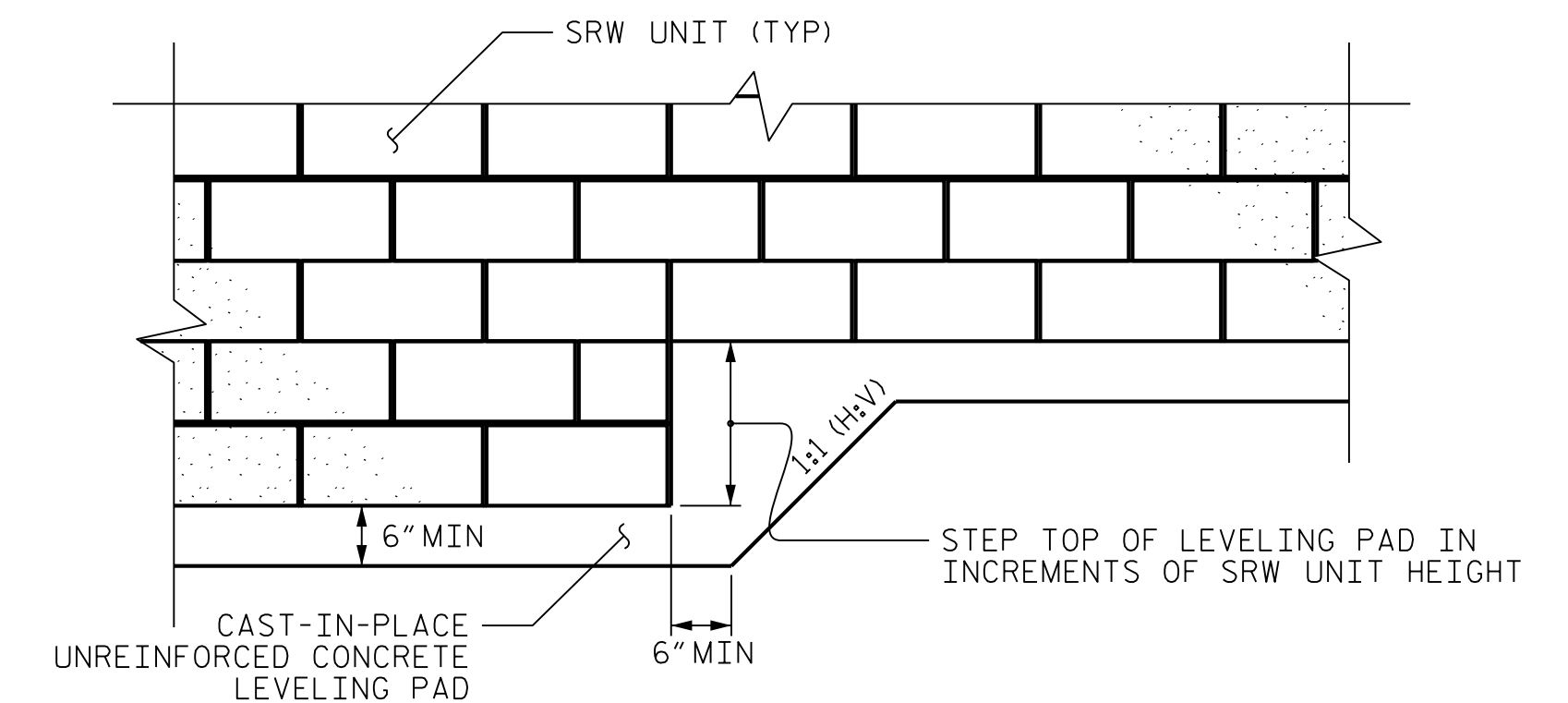
CONSTRUCT RETAINING WALL NO. 3 BEFORE INSTALLING FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 39+94.43 -L-.

INSTALL 24 INCH DIAMETER CORRUGATED STEEL PIPES FOR HP12X53 STEEL PILE FOUNDATIONS AT END BENT NO.1 AND END BENT NO. 2 DURING CONSTRUCTION OF RETAINING WALL NO.1 AND NO. 3. THE CORRUGATED STEEL PIPES SHOULD BE FILLED WITH FLOWABLE MATERIAL AFTER PILES ARE INSTALLED.

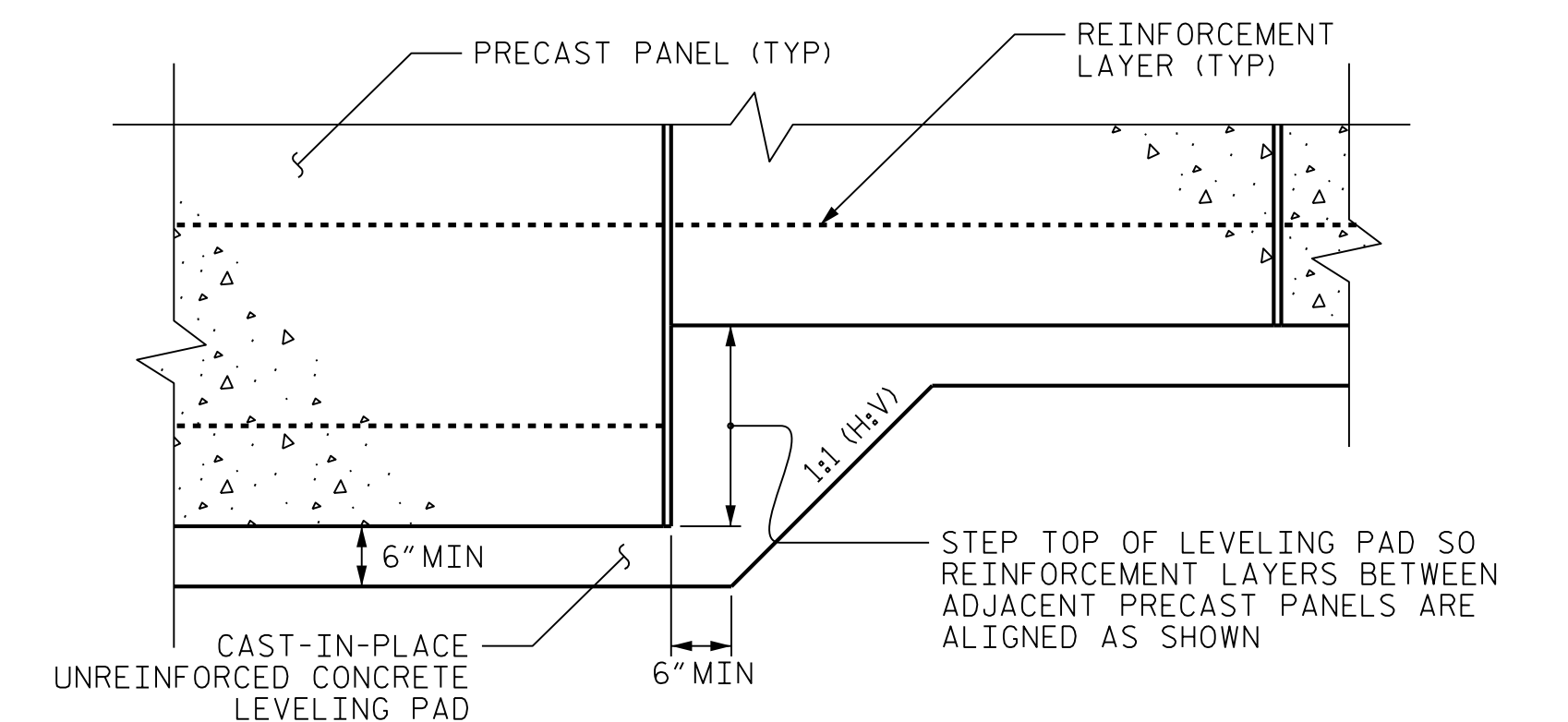
THE COST FOR THE 24 INCH DIAMETER CORRUGATED STEEL PIPES INSTALLED DURING CONSTRUCTION OF RETAINING WALL NO.1 AND NO. 3 IS INCIDENTAL TO MSE RETAINING WALL NO.1 AND NO. 3.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 THROUGH NO. 7 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

GEOTECHNICAL ENGINEER  SEAL 032171 ENGINEER W. YOUNG PARK	ENGINEER
DocuSigned by:  W. YOUNG PARK	DATE: 6/5/2017 SIGNATURE: _____ DATE: _____ SIGNATURE: _____



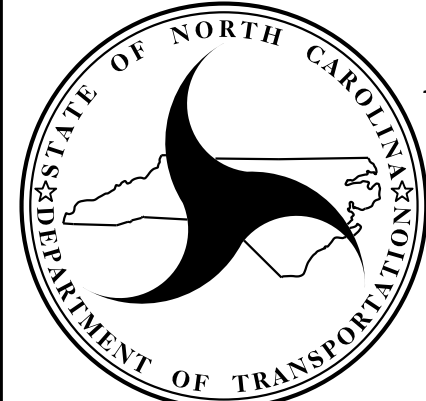
SEGMENTAL RETAINING WALL (SRW) UNITS



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

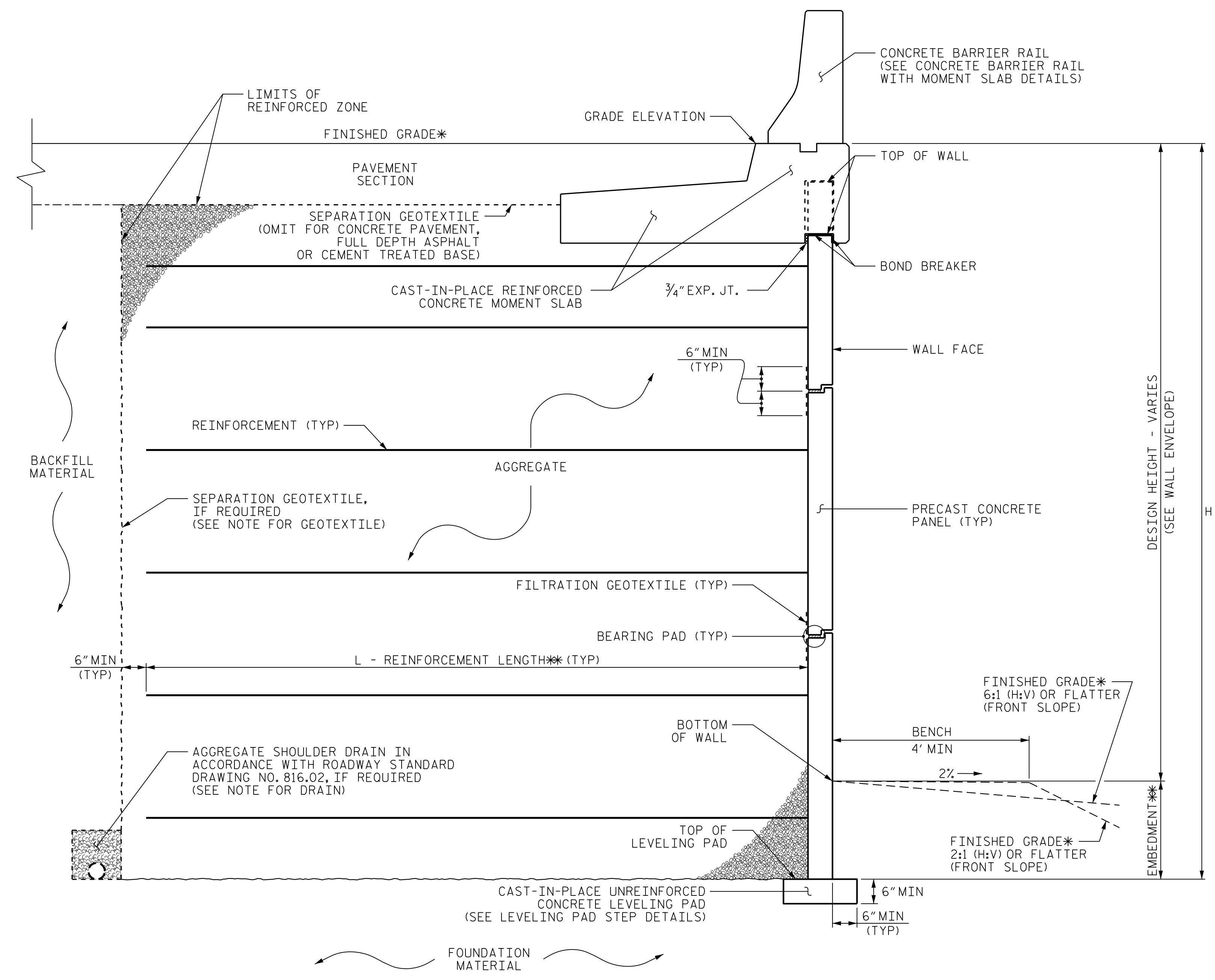
PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: RETAINING WALL NO. 1 - NO. 7
 SHEET 8 OF 13

	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT
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NOTES AND DETAILS FOR MSE RETAINING WALL NO. 1 THROUGH NO. 7					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

SHEET NO. W-8

PREPARED BY: J. PARK	DATE: 06 / 2017
REVIEWED BY: J. BATTS	DATE: 06 / 2017

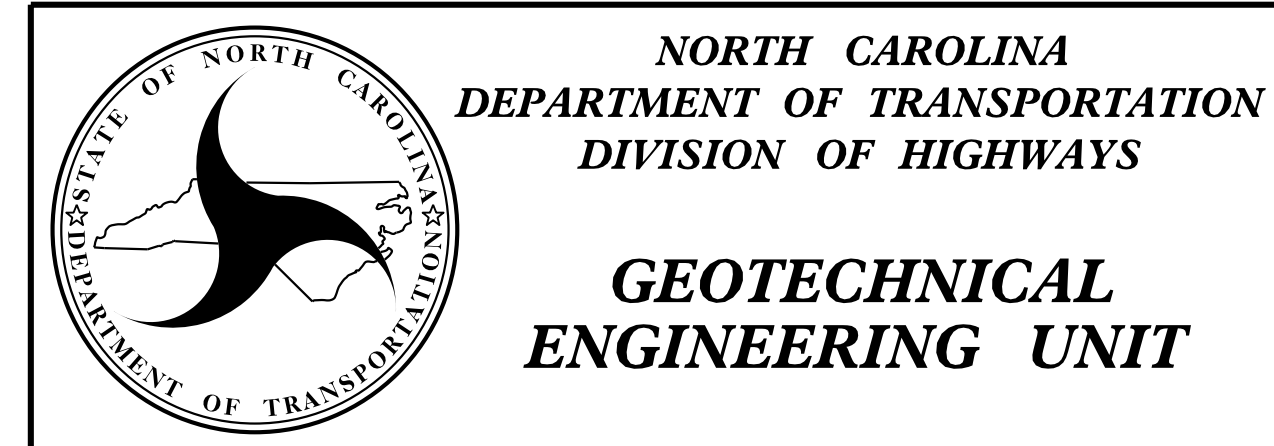


MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.
 RW1, FROM STA. 34+00.00 -W1- TO STA. 38+63.05± -W1-
 RW2, FROM STA. 37+67.71 -W2- TO STA. 45+22.97 -W2-

PROJECT NO.: U-4751
 NEW HANOVER COUNTY
 STATION: RETAINING WALL NO. 1, NO. 2
 SHEET 9 OF 13

PREPARED BY: J. PARK DATE: 06 / 2017
 REVIEWED BY: J. BATTS DATE: 06 / 2017



REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	-	-	3	-	-	W-9
2	-	-	4	-	-	

DETAILS FOR
 MSE RETAINING
 WALL NO.1 AND NO. 2