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MSE RETAINING WALL NO. W1A PLAN



NOTES:
 FOR 4" SLOPE PROTECTION, SEE "CONCRETE SLOPE PROTECTION" SHEET.
 FOR CONCRETE DITCH, SEE SHEET W-12.

GEOTECHNICAL ENGINEER

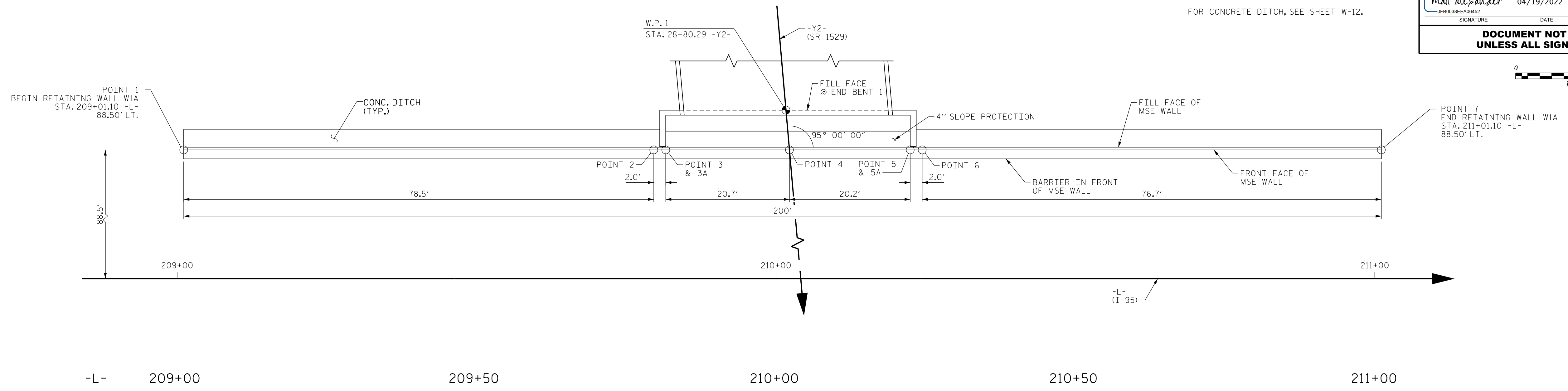
ENGINEER

SEAL 040231

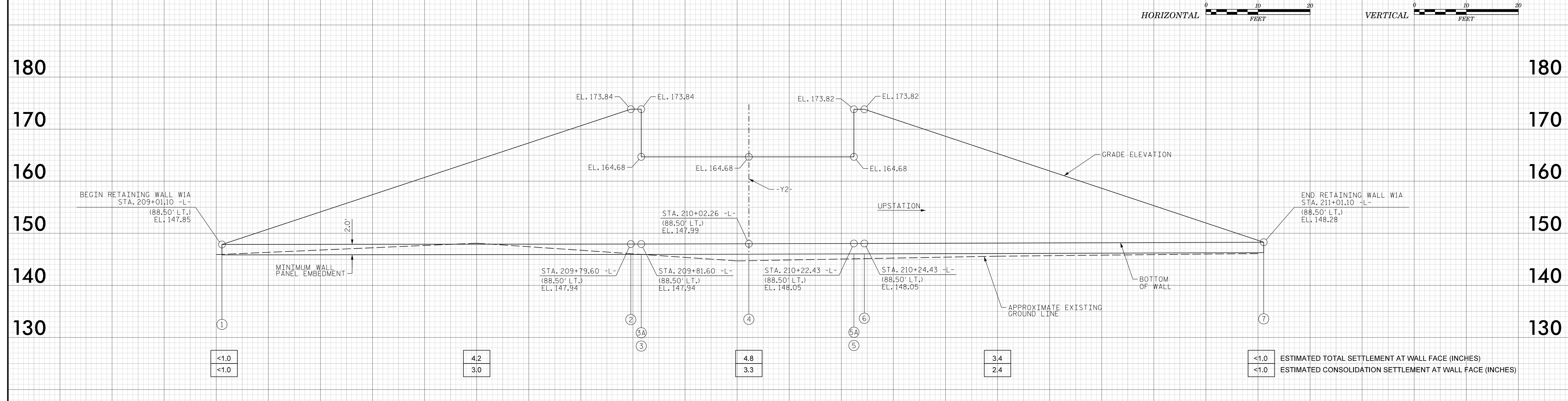
Matthew J. Alexander

04/19/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



MSE RETAINING WALL NO. W1A ENVELOPE



PROJECT NO.: 47533.1.2 (I-5987A)

ROBESON COUNTY

STATION: -Y2- STA 28+80.29

SHEET 1 OF 11 WALL ID NO. W1A

ESTIMATED MSE WALL QUANTITY*

(SQUARE FEET)

MSE RETAINING WALL NO. W1A	3,290 SF
----------------------------	----------

* QUANTITY INCLUDES MINIMUM 2 FT. EMBEDMENT AND 0.5 FT. EXTENSION

Prepared in the Office of:

Terracon

Consulting Engineers and Scientists

2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: F-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

MSE ABUTMENT RETAINING WALL NO. W1A PLAN AND ENVELOPE

REVISIONS

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

PREPARED BY: ALEXANDER, M. J.	DATE: 4/2022
REVIEWED BY: RIGGS, A. F.	DATE: 4/2022

SHEET NO. W-1

MSE RETAINING WALL NO. W1B PLAN

GEOTECHNICAL ENGINEER

ENGINEER

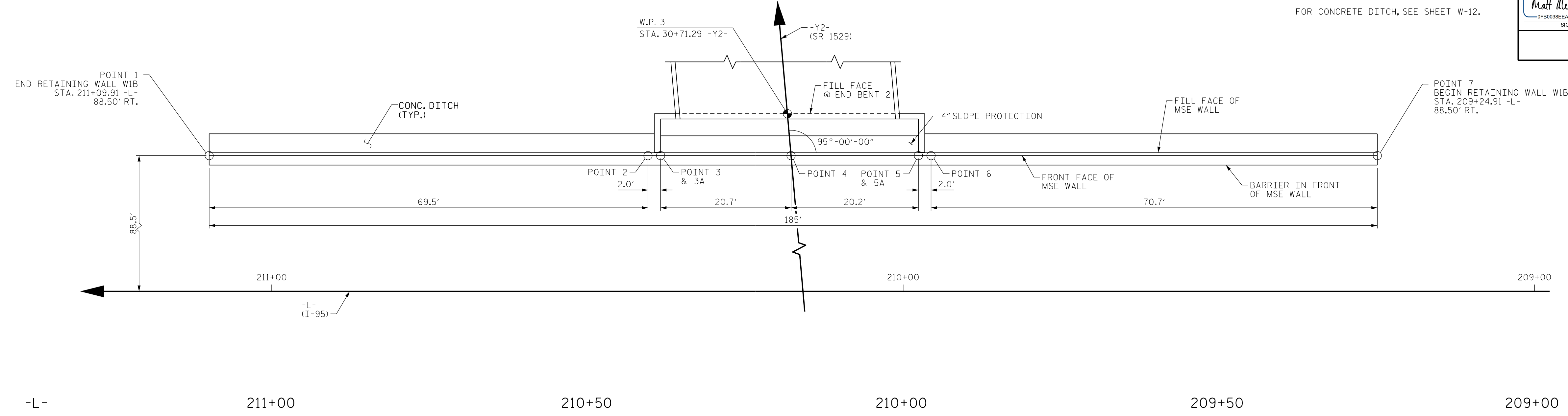
SEAL 040231

Matthew J. Alexander

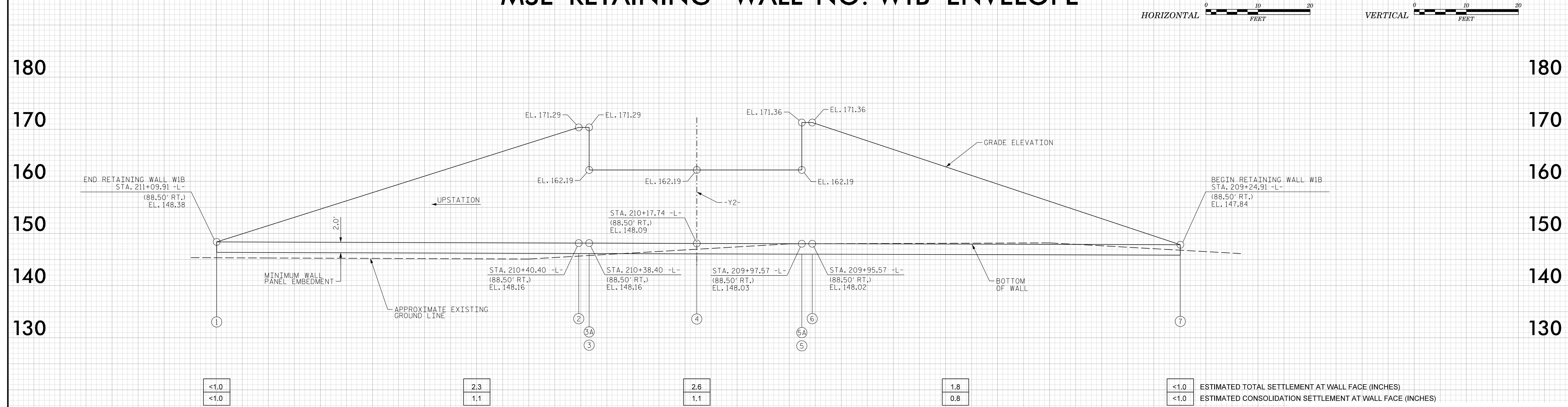
DocuSigned by: Matt Alexander 04/19/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:
 FOR 4" SLOPE PROTECTION, SEE "CONCRETE SLOPE PROTECTION" SHEET.
 FOR CONCRETE DITCH, SEE SHEET W-12.



MSE RETAINING WALL NO. W1B ENVELOPE



PROJECT NO.: 47533.1.2 (I-5987A)

ROBESON COUNTY

STATION: -Y2- STA 30+71.29

SHEET 2 OF 11 WALL ID NO. W1B

ESTIMATED MSE WALL QUANTITY* (SQUARE FEET)	
MSE RETAINING WALL NO. W1B	2,730 SF

* QUANTITY INCLUDES MINIMUM 2 FT. EMBEDMENT AND 0.5 FT. EXTENSION

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2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: F-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

MSE ABUTMENT RETAINING WALL NO. W1B PLAN AND ENVELOPE

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

PREPARED BY: ALEXANDER, M. J.	DATE: 4/2022
REVIEWED BY: RIGGS, A. F.	DATE: 4/2022

SHEET NO. W-2

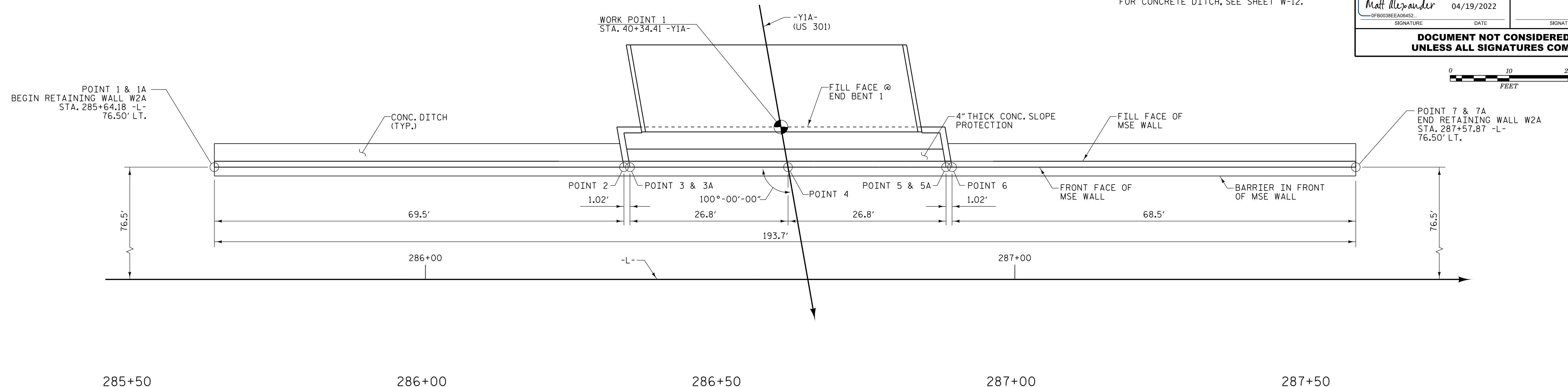
MSE RETAINING WALL NO. W2A PLAN



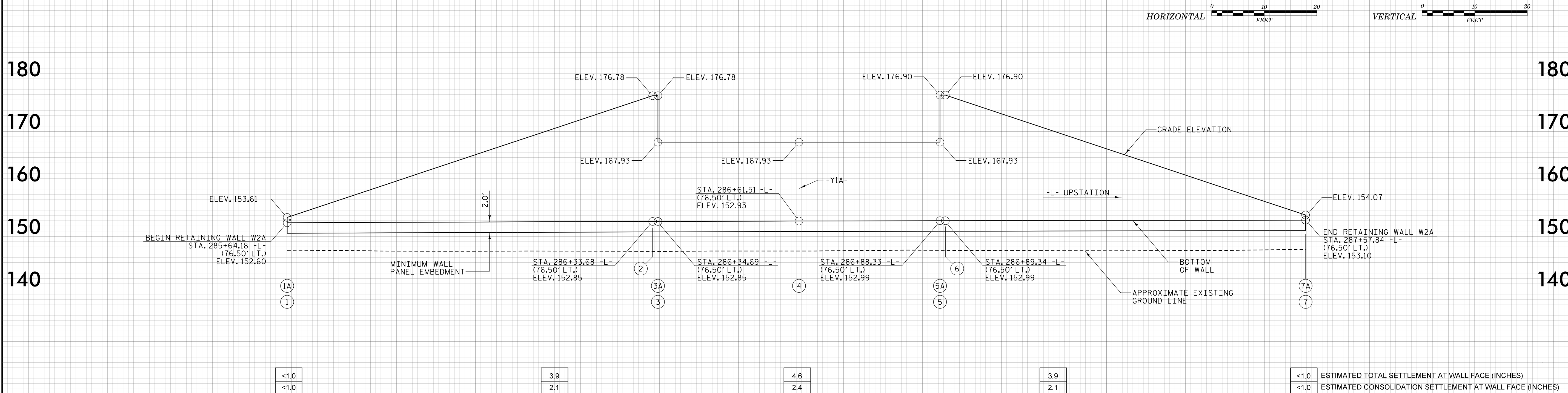
NOTES:

FOR 4" SLOPE PROTECTION, SEE "CONCRETE SLOPE PROTECTION" SHEET.
FOR CONCRETE DITCH, SEE SHEET W-12.

GEOTECHNICAL ENGINEER SEAL 040231 ENGINEER MATTHEW J. ALEXANDER	ENGINEER _____ SIGNATURE DATE
Dec. Signed by: <u>Matthew J. Alexander</u> 04/19/2022 SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MSE RETAINING WALL NO. W2A ENVELOPE



PROJECT NO.: 47533.1.2 (I-5987A)
 ROBESON COUNTY
 STATION: -Y1A- STA 40+34.31
 SHEET 3 OF 11 WALL ID NO. W2A

ESTIMATED MSE WALL QUANTITY*

(SQUARE FEET)

MSE RETAINING WALL NO. W2A	3,070 SF
----------------------------	----------

* QUANTITY INCLUDES MINIMUM 2 FT. EMBEDMENT AND 0.5 FT. EXTENSION

Prepared in the Office of:

Terracon

Consulting Engineers and Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: P-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

MSE ABUTMENT RETAINING WALL NO. W2A PLAN AND ENVELOPE

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

PREPARED BY: ALEXANDER, M. J.	DATE: 4/2022
REVIEWED BY: RIGGS, A. F.	DATE: 4/2022

MSE RETAINING WALL NO. W2B PLAN

GEOTECHNICAL ENGINEER

ENGINEER

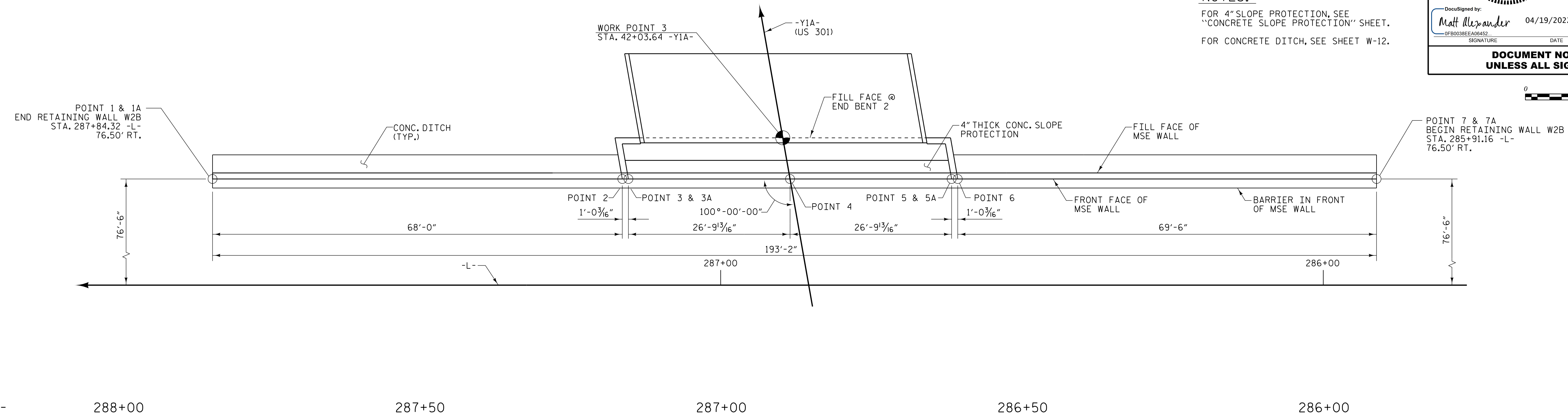
SEAL 040231

Matthew J. Alexander

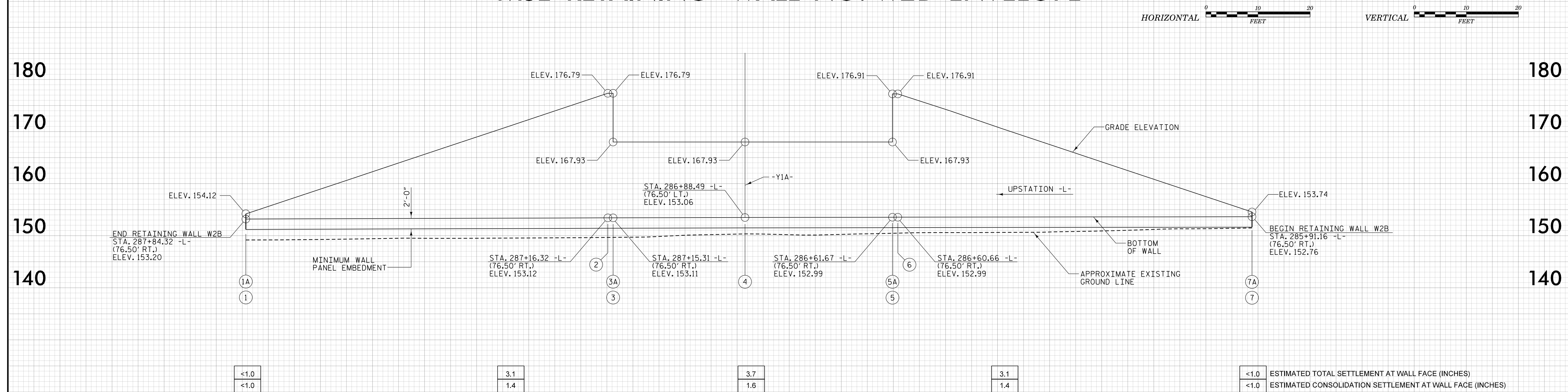
04/19/2022

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NOTES:
 FOR 4" SLOPE PROTECTION, SEE "CONCRETE SLOPE PROTECTION" SHEET.
 FOR CONCRETE DITCH, SEE SHEET W-12.



MSE RETAINING WALL NO. W2B ENVELOPE



PROJECT NO.: 47533.1.2 (I-5987A)

ROBESON COUNTY

STATION: -Y1A- STA 42+03.64

SHEET 4 OF 11 WALL ID NO. W2B

ESTIMATED MSE WALL QUANTITY*	
(SQUARE FEET)	
MSE RETAINING WALL NO. W2B	3,020 SF

* QUANTITY INCLUDES MINIMUM 2 FT. EMBEDMENT AND 0.5 FT. EXTENSION

Prepared in the Office of:

Terracon

Consulting Engineers and Scientists

2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: P-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

MSE ABUTMENT RETAINING WALL NO. W2B PLAN AND ENVELOPE

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

PREPARED BY: ALEXANDER, M. J.	DATE: 4/2022
REVIEWED BY: RIGGS, A. F.	DATE: 4/2022

SHEET NO. W-4

MSE RETAINING WALL NO. W3A PLAN

GEOTECHNICAL ENGINEER

ENGINEER

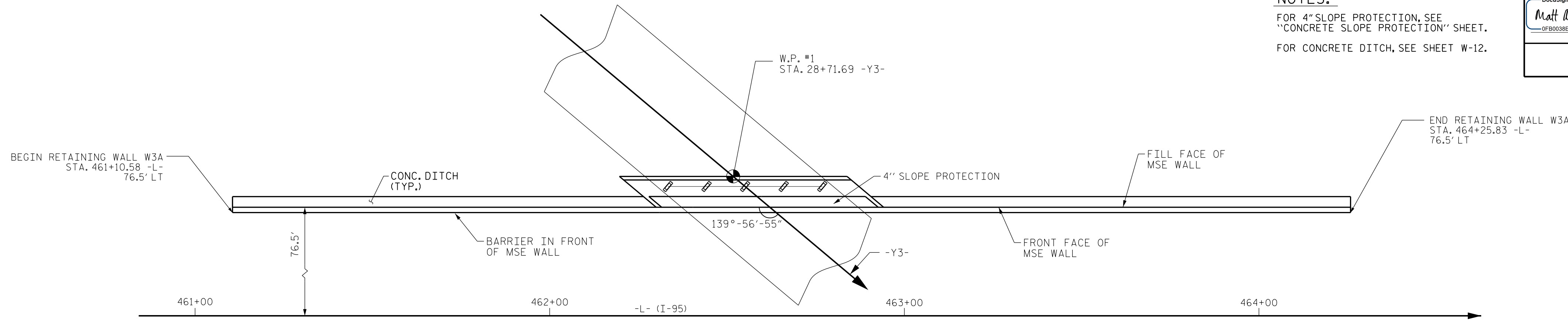
SEAL 040231

Matthew J. Alexander

Dec designed by: *Matthew J. Alexander* 04/19/2022

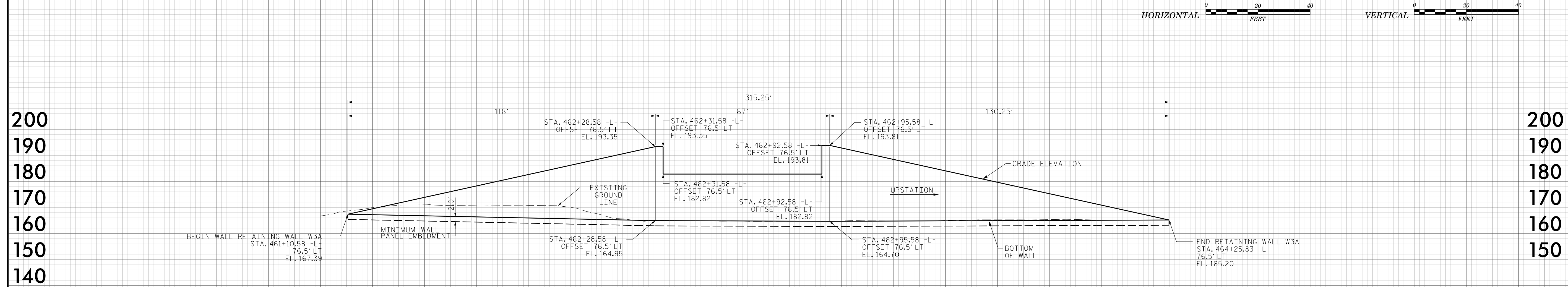
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NOTES:
 FOR 4" SLOPE PROTECTION, SEE "CONCRETE SLOPE PROTECTION" SHEET.
 FOR CONCRETE DITCH, SEE SHEET W-12.



460+00 461+00 462+00 463+00 464+00 465+00 -L-

MSE RETAINING WALL NO. W3A ENVELOPE



<1.0	1.1	1.7	2.0	1.7	1.0	<1.0
0	0	0	0	0	0	0

ESTIMATED TOTAL SETTLEMENT AT WALL FACE (INCHES)
 ESTIMATED CONSOLIDATION SETTLEMENT AT WALL FACE (INCHES)

PROJECT NO.: 47533.1.2 (I-5987A)
 ROBESON COUNTY
 STATION: -Y3- STA 28+71.69
 SHEET 5 OF 11 WALL ID NO. W3A

ESTIMATED MSE WALL QUANTITY*	
(SQUARE FEET)	
MSE RETAINING WALL NO. W3A	5,630 SF

* QUANTITY INCLUDES MINIMUM 2 FT. EMBEDMENT AND 0.5 FT. EXTENSION

Prepared in the Office of:

Terracon

Consulting Engineers and Scientists

2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: P-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

MSE ABUTMENT RETAINING WALL NO. W3A PLAN AND ENVELOPE

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

PREPARED BY: ALEXANDER, M. J.	DATE: 4/2022
REVIEWED BY: RIGGS, A. F.	DATE: 4/2022

SHEET NO. W-5

MSE RETAINING WALL NO. W3B PLAN

GEOTECHNICAL ENGINEER

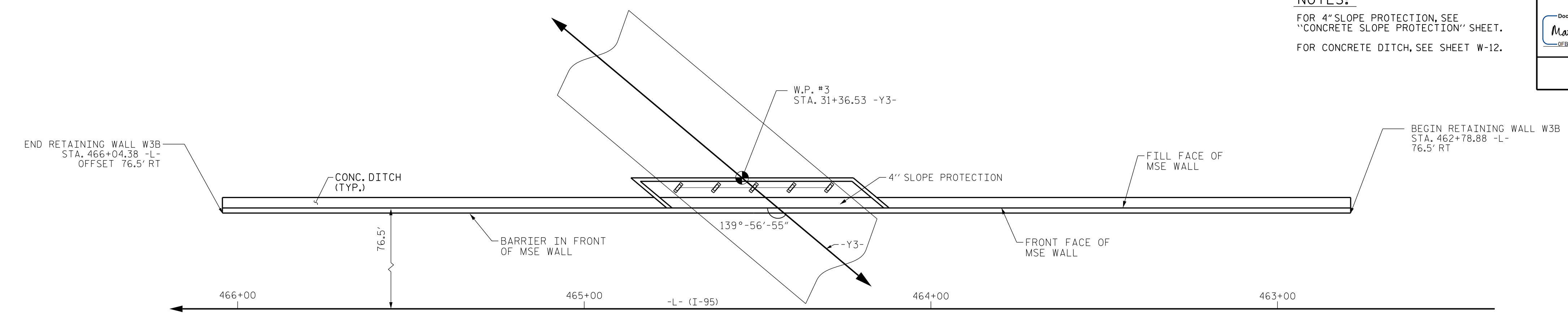
ENGINEER

DocuSigned by:
Matthew J. Alexander 04/19/2022

REB0038EAP0452 SIGNATURE DATE

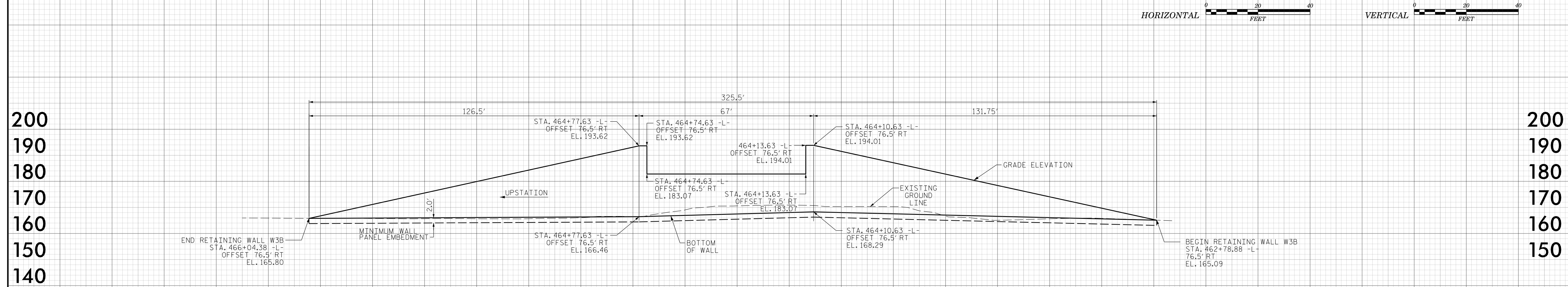
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

NOTES:
 FOR 4" SLOPE PROTECTION, SEE "CONCRETE SLOPE PROTECTION" SHEET.
 FOR CONCRETE DITCH, SEE SHEET W-12.



467+00 466+00 465+00 464+00 463+00 462+00 -L-

MSE RETAINING WALL NO. W3B ENVELOPE



<1.0	0.8	1.4	1.5	1.4	0.9	<1.0	ESTIMATED TOTAL SETTLEMENT AT WALL FACE (INCHES)
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ESTIMATED CONSOLIDATION SETTLEMENT AT WALL FACE (INCHES)

PROJECT NO.: 47533.1.2 (I-5987A)
 ROBESON COUNTY
 STATION: -Y3- STA 31+36.53
 SHEET 6 OF 11 WALL ID NO. W3B

ESTIMATED MSE WALL QUANTITY*	
(SQUARE FEET)	
MSE RETAINING WALL NO. W3B	5,320 SF

* QUANTITY INCLUDES MINIMUM 2 FT. EMBEDMENT AND 0.5 FT. EXTENSION

Prepared in the Office of:

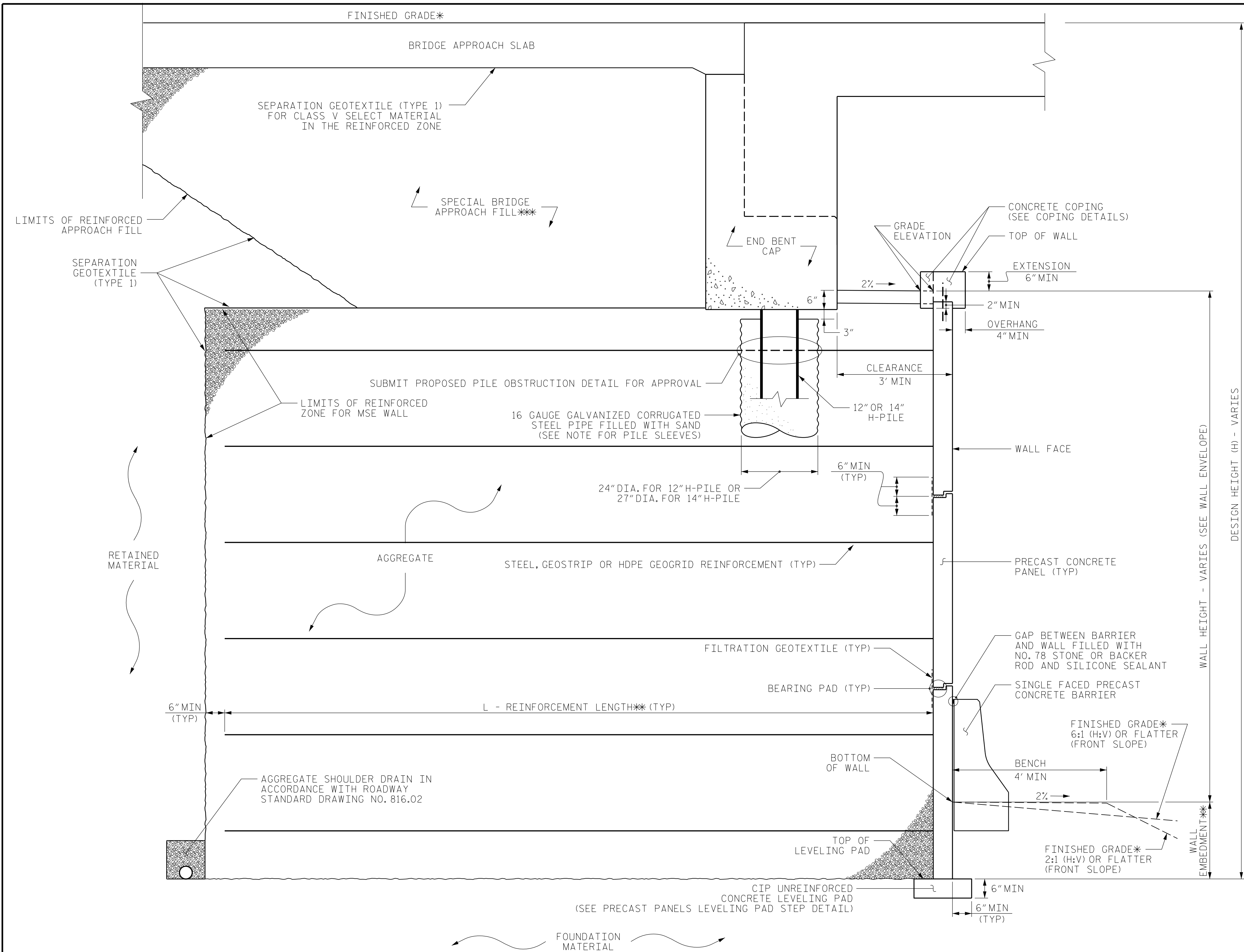
Terracon
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 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: P-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

MSE ABUTMENT RETAINING WALL NO. W3B PLAN AND ENVELOPE

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

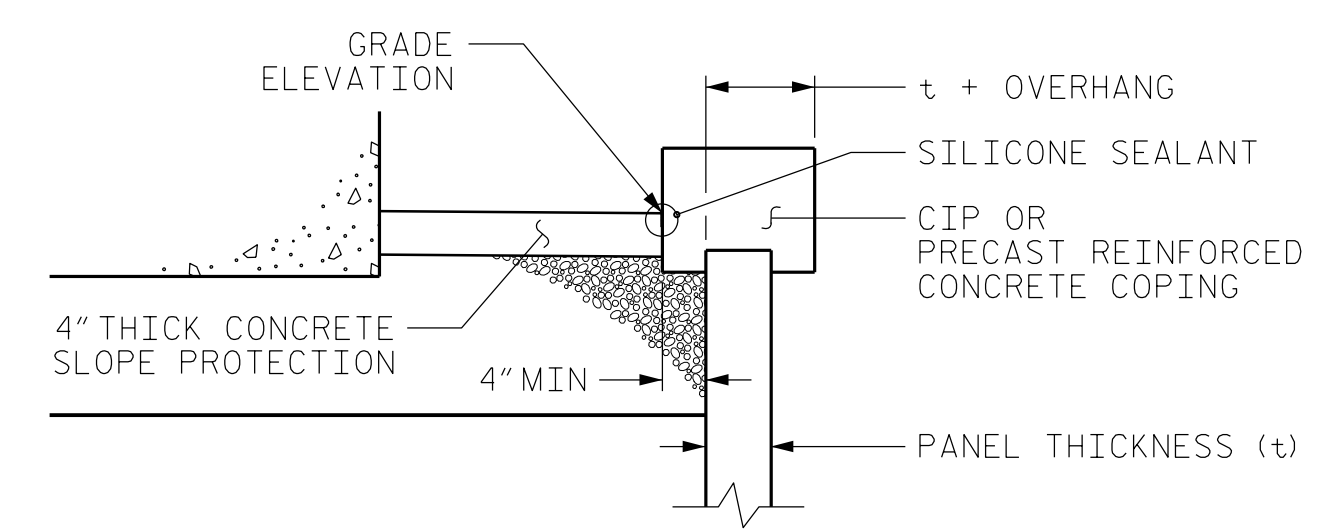
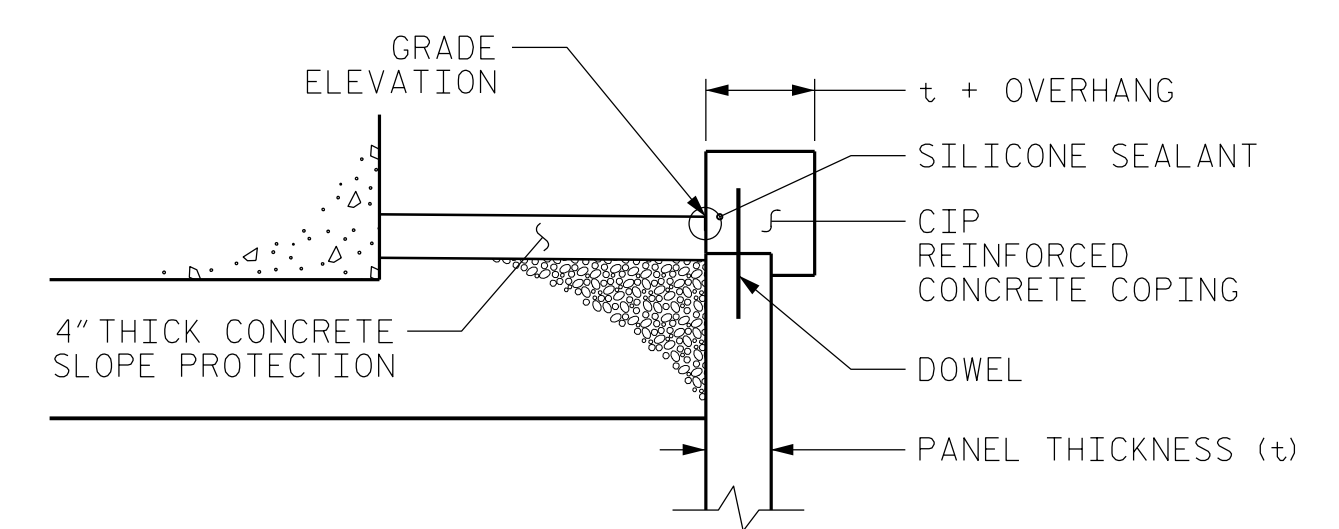
PREPARED BY: ALEXANDER, M. J. DATE: 4/2022
 REVIEWED BY: RIGGS, A. F. DATE: 4/2022

SHEET NO. W-6



MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION AND MSE WALL NOTES FOR WALL EMBEDMENT REQUIREMENTS.
 ***SEE SPECIAL BRIDGE APPROACH FILLS PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS.



COPING DETAILS

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

GEOTECHNICAL ENGINEER

ENGINEER

SEAL 040231

DocuSigned by: **Matt Alexander** 04/19/2022

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PROJECT NO.: 47533.1.2 (I-5987A)

ROBESON COUNTY

STATION: VARIES

SHEET 7 OF 11 WALL ID NO. W1A, W1B, W2A, W2B, W3A, W3B

PREPARED BY: ALEXANDER, M. J. DATE: 04/2022

REVIEWED BY: RIGGS, A. F. DATE: 04/2022

Prepared in the Office of:

Terracon

Consulting Engineers and Scientists

2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: F-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE ABUTMENT RETAINING WALL TYPICAL SECTION AT ABUTMENT

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

SHEET NO. W-7

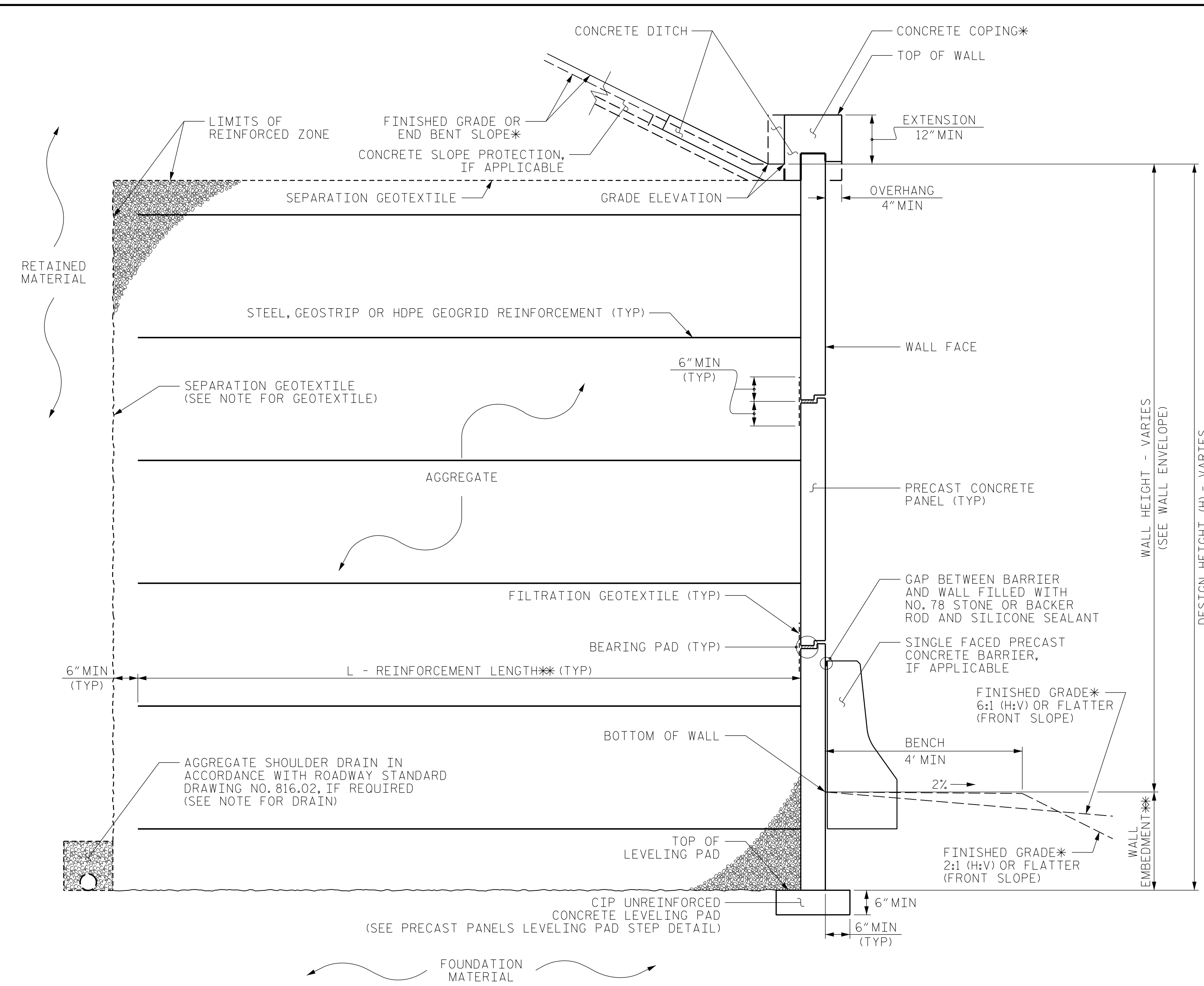
GEOTECHNICAL ENGINEER

ENGINEER

DocuSigned by:
Matthew J. Alexander 04/19/2022

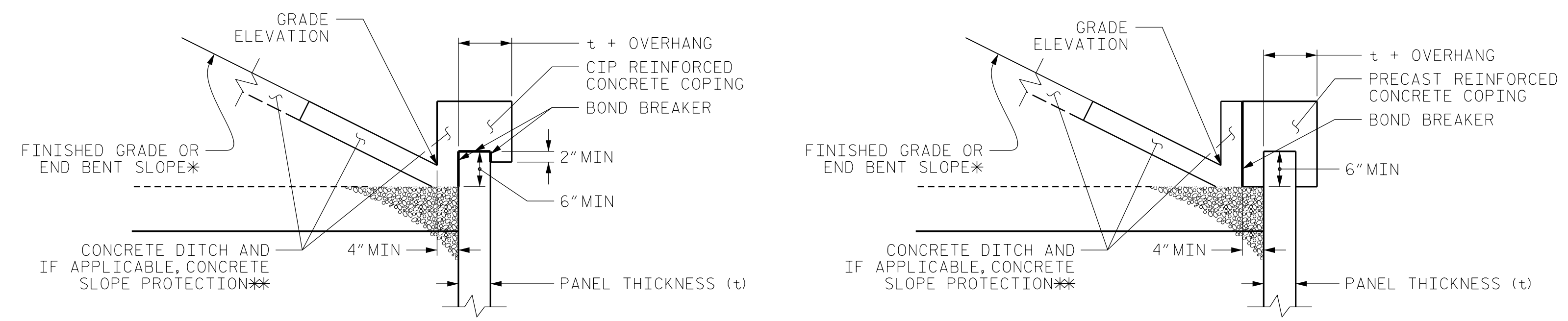
DATE: 04/19/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



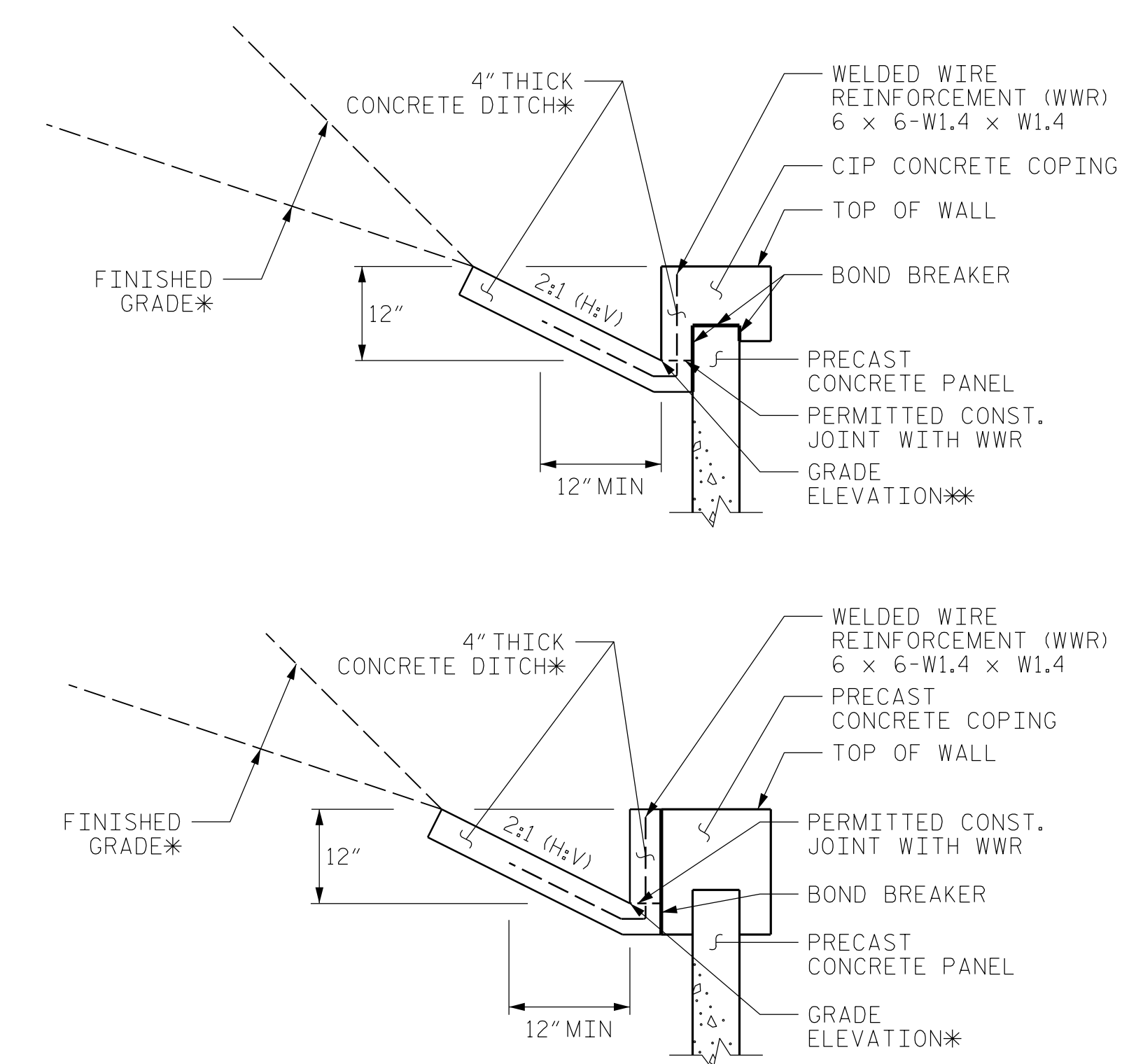
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*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 WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



COPING DETAILS

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



CONCRETE DITCH BEHIND WALL WITH CONCRETE COPING

*SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.

PROJECT NO.: 47533.1.2 (I-5987A)
ROBESON COUNTY
STATION: VARIES
SHEET 8 OF 11 WALL ID NO. W1A, W1B, W2A, W2B, W3A, W3B

PREPARED BY: ALEXANDER, M. J. DATE: 04/2022
REVIEWED BY: RIGGS, A. F. DATE: 04/2022

Prepared in the Office of:

Terracon
Consulting Engineers and Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
NC REGISTERED ENGINEERING FIRM: F-0869
NC REGISTERED GEOLOGIC FIRM: C-367

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

MSE ABUTMENT RETAINING WALL TYPICAL SECTION AWAY FROM ABUTMENT

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

SHEET NO. W-8

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
 FOR BRIDGE APPROACH FILLS, SEE SPECIAL BRIDGE APPROACH FILLS PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS.
 FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
 AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALLS NO. W1A AND W1B.
 AN ASHLAR STONE ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS NO. W1A AND W1B.
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS NO. W1A AND W1B.
 A DRAIN IS REQUIRED FOR RETAINING WALLS NO. W1A AND W1B.
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR SITE 1 END BENT NO.1 LOCATED AT STATION 28+80.29 -Y2-.
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR SITE 1 END BENT NO.2 LOCATED AT STATION 30+71.29 -Y2-.
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS NO. W1A AND W1B, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS NO. W1A AND W1B FOR THE FOLLOWING:
 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL FOR RETAINING WALL NO. W1A = 5,179 PSF
 4) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL FOR RETAINING WALL NO. W1B = 4,671 PSF
 5) MINIMUM REINFORCEMENT LENGTH (L) = 0.85H OR 6 FT, WHICHEVER IS LONGER
 6) MINIMUM EMBEDMENT DEPTH = 2 FT OR H/10, WHICHEVER IS GREATER
 7) REINFORCED ZONE AGGREGATE PARAMETERS:

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

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

B) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
RETAINED	115	34	0
FOUNDATION	115	25	0

THE WALL SITES FOR RETAINING WALLS NO. W1A AND W1B LOCATED AT STATION 28+80.29 -Y2- AND STATION 30+71.29 -Y2-, RESPECTIVELY, ARE CLASSIFIED AS AASHTO SITE CLASS E.

DESIGN RETAINING WALLS NO. W1A AND W1B FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR SIGNS WILL BE LOCATED BEHIND RETAINING WALLS NO. W1A AND W1B AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO. W1A AND W1B.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 28+80.29 -Y2- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. W1A. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 30+71.29 -Y2- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. W1B. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

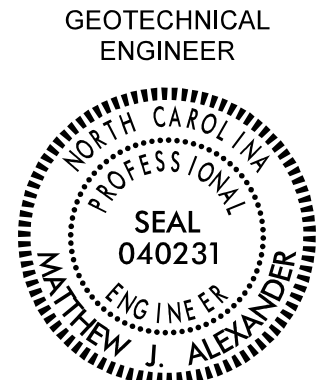
DESIGN RETAINING WALLS NO. W1A AND W1B FOR A LATERAL LOAD FROM FOUNDATIONS LOCATED BEHIND THE MSE WALL APPLIED AS A FACTORED UNIFORM PRESSURE OF 600 PSF TO THE BACK OF PANELS.

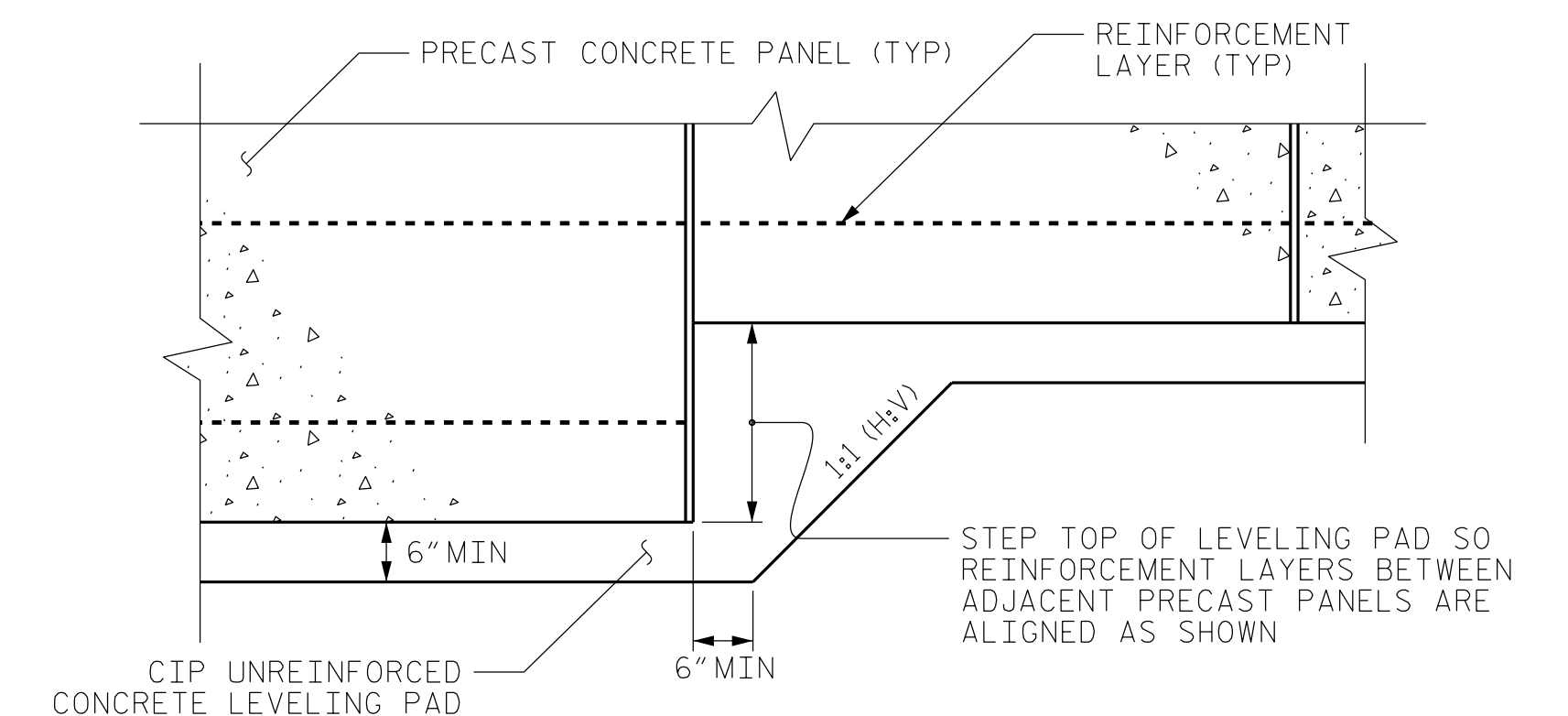
INSTALL PILE SLEEVES FOR END BENT NO.1 LOCATED AT STATION 28+80.29 -Y2- AND END BENT NO.2 LOCATED AT STATION 30+71.29 -Y2- WHILE CONSTRUCTING RETAINING WALLS NO. W1A AND W1B, RESPECTIVELY. OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL AND THE SPECIAL BRIDGE APPROACH FILL. INSTALL PILES THROUGH THE PILE SLEEVES AND FILL PILE SLEEVES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS.

USE SPECIAL BRIDGE APPROACH FILLS AT END BENT NO.1 LOCATED AT STATION 28+80.29 -Y2- AND END BENT NO.2 LOCATED AT STATION 30+71.29 -Y2- TO CONSTRUCT THE EMBANKMENT TO FINISHED GRADE BEFORE OBSERVING THE BRIDGE WAITING PERIODS. SEE SPECIAL BRIDGE APPROACH FILLS PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS FOR BRIDGE APPROACH FILL DETAILS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS NO. W1A OR W1B UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

"TEMPORARY SHORING" MAY BE REQUIRED FOR RETAINING WALLS NO. W1A AND W1B IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE TRAFFIC CONTROL PLANS.

GEOTECHNICAL ENGINEER  SEAL 040231 MATTHEW J. ALEXANDER	ENGINEER
Date Signed by: <u>Matthew J. Alexander</u> 04/19/2022 Signature: _____ Date: _____	Signature: _____ Date: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: 47533.1.2 (I-5987A)
 ROBESON COUNTY
 STATION: VARIES
 SHEET 9 OF 11 WALL ID NO. W1A, W1B

PREPARED BY: ALEXANDER, M. J.	DATE: 04/2022
REVIEWED BY: RIGGS, A. F.	DATE: 04/2022

Prepared in the Office of:

Terracon
 Consulting Engineers and Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: F-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

**MSE ABUTMENT RETAINING
WALLS NO. W1A AND W1B
NOTES AND LEVELING
PAD DETAILS**

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

SHEET NO. W-9

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
 FOR BRIDGE APPROACH FILLS, SEE SPECIAL BRIDGE APPROACH FILLS PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS.
 FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
 AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALLS NO. W2A AND W2B.
 AN ASHLAR STONE ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS NO. W2A AND W2B.
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS NO. W2A AND W2B.
 A DRAIN IS REQUIRED FOR RETAINING WALLS NO. W2A AND W2B.
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR SITE 2 END BENT NO.1 LOCATED AT STATION 40+34.41 -Y1A-.
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR SITE 2 END BENT NO.2 LOCATED AT STATION 42+03.64 -Y1A-.
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS NO. W2A AND W2B, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS NO. W2A AND W2B FOR THE FOLLOWING:
 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL FOR RETAINING WALL NO. W2A = 4,751 PSF
 4) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL FOR RETAINING WALL NO. W2B = 4,704 PSF
 5) MINIMUM REINFORCEMENT LENGTH (L) = 0.85H OR 6 FT, WHICHEVER IS LONGER
 6) MINIMUM EMBEDMENT DEPTH = 2 FT OR H/10, WHICHEVER IS GREATER
 7) REINFORCED ZONE AGGREGATE PARAMETERS:

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

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

B) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
RETAINED	115	34	0
FOUNDATION	115	25	0

THE WALL SITES FOR RETAINING WALLS NO. W2A AND W2B LOCATED AT STATION 40+34.41 -Y1A- AND STA. 42+03.64 -Y1A-, RESPECTIVELY, ARE CLASSIFIED AS AASHTO SITE CLASS E.

DESIGN RETAINING WALLS NO. W2A AND W2B FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR SIGNS WILL BE LOCATED BEHIND RETAINING WALLS NO. W2A AND W2B AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO. W2A AND W2B.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 40+34.41 -Y1A- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. W2A. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

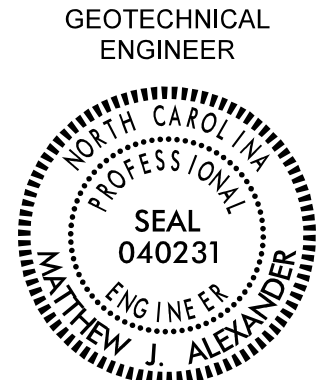
FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 42+03.64 -Y1A- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. W2B. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

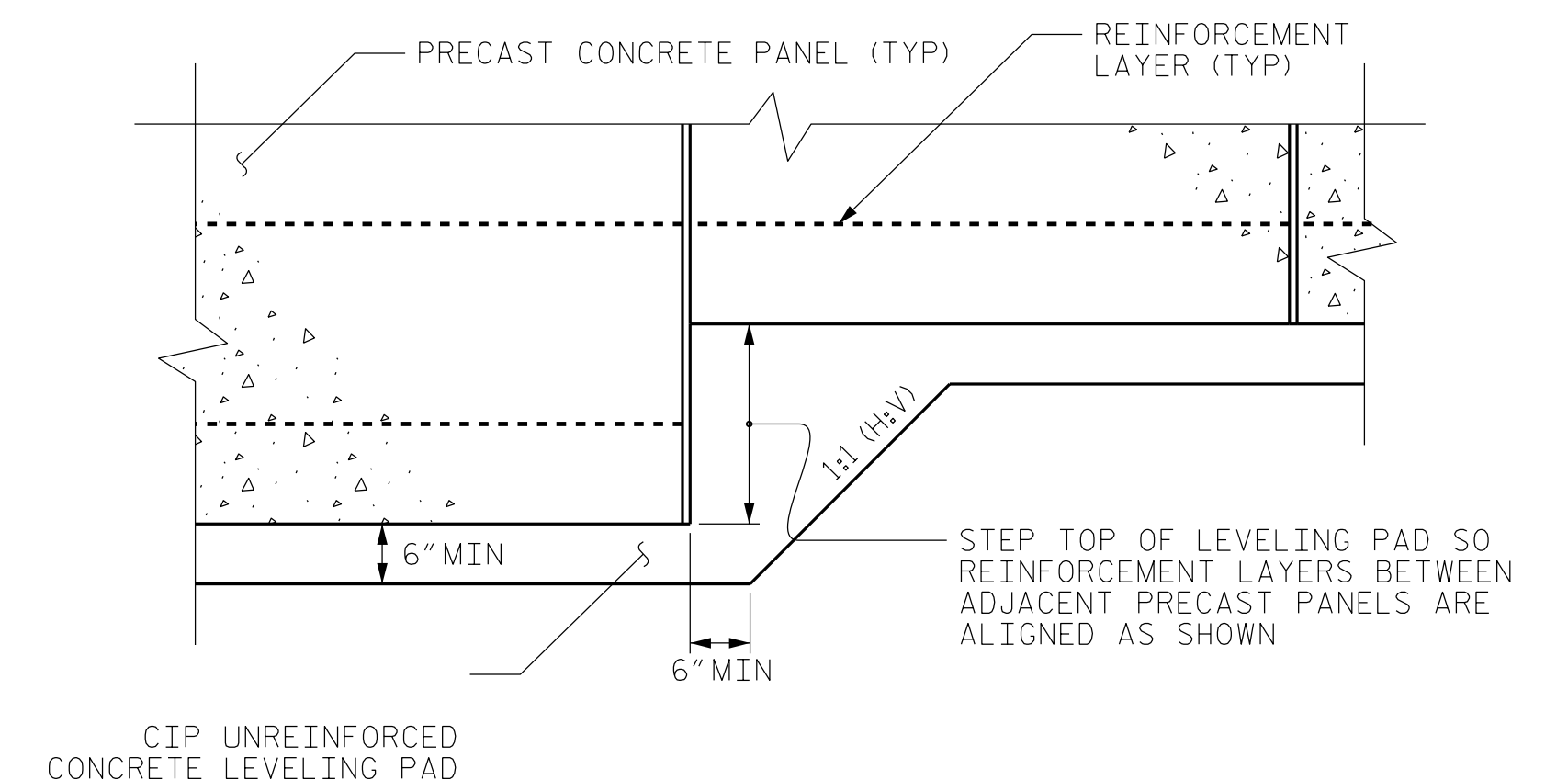
DESIGN RETAINING WALLS NO. W2A AND W2B FOR A LATERAL LOAD FROM FOUNDATIONS LOCATED BEHIND THE MSE WALL APPLIED AS A FACTORED UNIFORM PRESSURE OF 600 PSF TO THE BACK OF PANELS.

INSTALL PILE SLEEVES FOR END BENT NO.1 LOCATED AT STATION 40+34.41 -Y1A- AND END BENT NO.2 LOCATED AT STATION 42+03.64 -Y1A- WHILE CONSTRUCTING RETAINING WALLS NO. W2A AND W2B, RESPECTIVELY. OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL AND THE BRIDGE APPROACH FILL. INSTALL PILES THROUGH THE PILE SLEEVES AND FILL PILE SLEEVES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS.

USE SPECIAL BRIDGE APPROACH FILLS AT END BENT NO.1 LOCATED AT STATION 40+34.41 -Y1A- AND END BENT NO.2 LOCATED AT STATION 42+03.64 -Y1A- TO CONSTRUCT THE EMBANKMENT TO FINISHED GRADE BEFORE OBSERVING THE BRIDGE WAITING PERIODS. SEE SPECIAL BRIDGE APPROACH FILLS PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS FOR SPECIAL BRIDGE APPROACH FILL DETAILS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS NO. W2A OR W2B UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

GEOTECHNICAL ENGINEER  Decided by: Signature: <i>Matthew J. Alexander</i> DATE: 04/19/2022 OF 040231 SIGNATURE DATE	ENGINEER SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 47533.1.2 (I-5987A)
 ROBESON COUNTY
 STATION: VARIES
 SHEET 10 OF 11 WALL ID NO. W2A, W2B

PREPARED BY: ALEXANDER, M. J.	DATE: 04/2022
REVIEWED BY: RIGGS, A. F.	DATE: 04/2022

Prepared in the Office of:

Terracon
 Consulting Engineers and Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: F-0869
 NC REGISTERED GEOLOGIC FIRM: C-367

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

**MSE ABUTMENT RETAINING
WALLS NO. W2A AND W2B
NOTES AND LEVELING
PAD DETAILS**

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

SHEET NO. W-10

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
 FOR BRIDGE APPROACH FILLS, SEE SPECIAL BRIDGE APPROACH FILL PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS.
 FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
 AN ASHLAR STONE ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS NO. W3A AND W3B.
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS NO. W3A AND W3B.
 A DRAIN IS REQUIRED FOR RETAINING WALLS NO. W3A AND W3B.
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR SITE 3 END BENT NO.1 LOCATED AT STATION 28+71.69 -Y3-.
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR SITE 3 END BENT NO.2 LOCATED AT STATION 31+36.53 -Y3-.
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS NO. W3A AND W3B, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS NO. W3A AND W3B FOR THE FOLLOWING:
 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL FOR RETAINING WALL NO. W3A = 5,603 PSF
 4) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL FOR RETAINING WALL NO. W3B = 5,339 PSF
 5) MINIMUM REINFORCEMENT LENGTH (L) = 0.85H OR 6 FT, WHICHEVER IS LONGER
 6) MINIMUM EMBEDMENT DEPTH = 2 FT OR H/10, WHICHEVER IS GREATER
 7) REINFORCED ZONE AGGREGATE PARAMETERS:

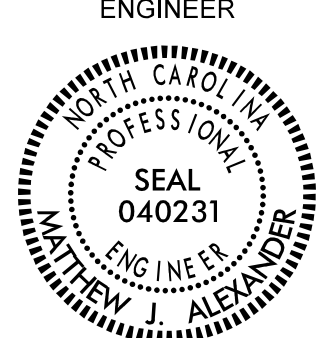
AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (C) PSF
COARSE	110	38	0

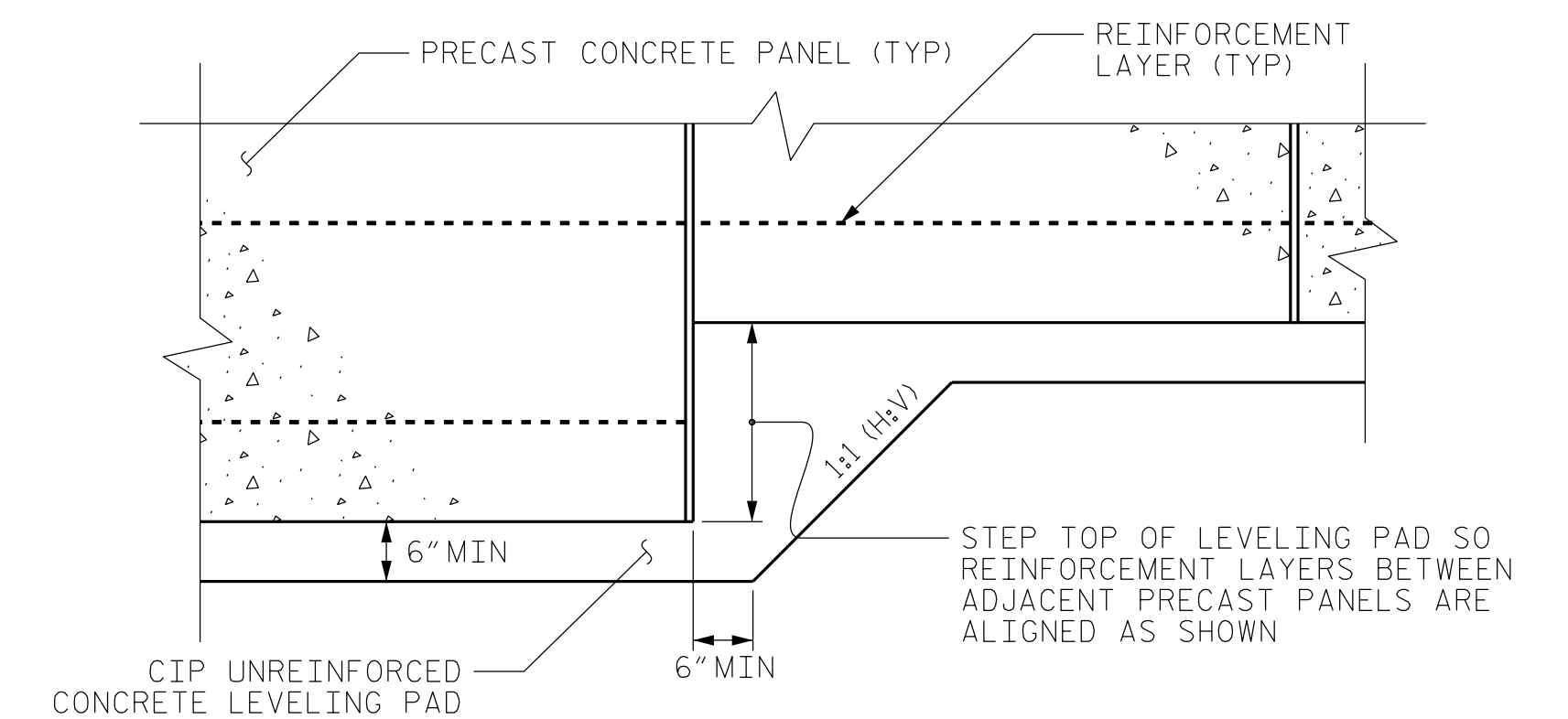
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AGGREGATE MATERIAL REQUIREMENTS.

8) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (C) PSF
RETAINED	115	34	0
FOUNDATION	110	27	0

THE WALL SITES FOR RETAINING WALLS NO. W3A AND W3B LOCATED AT STATION 28+71.69 -Y3- AND STATION 31+36.53 -Y3-, RESPECTIVELY, ARE CLASSIFIED AS AASHTO SITE CLASS E.
 DESIGN RETAINING WALLS NO. W3A AND W3B FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
 FOUNDATIONS FOR SIGNS WILL BE LOCATED BEHIND RETAINING WALLS NO. W3A AND W3B AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.
 FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO. W3A AND W3B.
 FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 28+71.69 -Y3- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. W3A. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.
 FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 31+36.53 -Y3- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. W3B. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.
 DESIGN RETAINING WALLS NO. W3A AND W3B FOR A LATERAL LOAD FROM FOUNDATIONS LOCATED BEHIND THE MSE WALL APPLIED AS A FACTORED UNIFORM PRESSURE OF 200 PSF TO THE BACK OF PANELS.
 INSTALL PILE SLEEVES FOR END BENT NO.1 LOCATED AT STATION 28+71.69 -Y3- AND END BENT NO.2 LOCATED AT STATION 31+36.53 -Y3- WHILE CONSTRUCTING RETAINING WALLS NO. W3A AND W3B, RESPECTIVELY. OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL AND THE BRIDGE APPROACH FILL. INSTALL PILES THROUGH THE PILE SLEEVES AND FILL PILE SLEEVES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS.
 USE SPECIAL BRIDGE APPROACH FILL AT END BENT NO.1 LOCATED AT STATION 28+71.69 -Y3- AND END BENT NO.2 LOCATED AT STATION 31+36.53 -Y3- TO CONSTRUCT THE EMBANKMENT TO FINISHED GRADE BEFORE OBSERVING THE BRIDGE WAITING PERIODS. SEE SPECIAL BRIDGE APPROACH FILL PROVISION AND SHEETS 2G-5 THROUGH 2G-7 OF THE ROADWAY PLANS FOR BRIDGE APPROACH FILL DETAILS.
 DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS NO. W3A OR W3B UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
 "TEMPORARY SHORING" MAY BE REQUIRED FOR RETAINING WALLS NO. W3A AND W3B IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE TRAFFIC CONTROL PLANS.

GEOTECHNICAL ENGINEER  SEAL 040231 MATTHEW J. ALEXANDER ENGINEER	ENGINEER
DocuSigned by: Matt Alexander 04/19/2022 DEB0038EAP06452 SIGNATURE DATE	SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 47533.1.2 (I-5987A)
 ROBESON COUNTY
 STATION: VARIES
 SHEET 11 OF 11 WALL ID NO. W3A, W3B

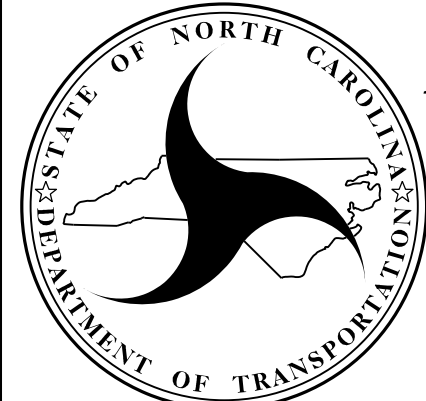
PREPARED BY: ALEXANDER, M. J.	DATE: 04/2022
REVIEWED BY: RIGGS, A. F.	DATE: 04/2022

Prepared in the Office of:

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NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**



**MSE ABUTMENT RETAINING
WALLS NO. W3A AND W3B
NOTES AND LEVELING
PAD DETAILS**

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

SHEET NO. W-11

NOISE WALL #8 PANELS 1 THRU 60

PANEL NO.	START POST STATION -NW8-	LENGTH (FEET)	GROUND ELEV. OF START POST (FEET)	TOP ELEV. OF PANEL (FEET)	RECOMMENDED PANEL HEIGHT (FEET)	AREA (SQ. FT.)	TOP ELEV. OF EXCAVATION (FEET)	PILE EXCAVATION DEPTH "D"	PILE TIP ELEV. & BOTTOM OF HOLE (FEET)
1	10+00.00	15	157.9	167.0	10	150	157.0	11.0	146.0
2	10+15.00	15	157.2	167.0	10	150	157.0	11.0	146.0
3	10+30.00	15	156.8	167.0	11	165	156.0	11.0	145.0
4	10+45.00	15	156.3	167.0	11	165	156.0	11.0	145.0
5	10+60.00	15	155.8	168.0	13	195	155.0	11.0	144.0
6	10+75.00	15	155.4	168.0	13	195	155.0	11.0	144.0
7	10+90.00	15	155.2	168.0	13	195	155.0	11.0	144.0
8	11+05.00	15	154.8	168.0	14	210	154.0	11.0	143.0
9	11+20.00	15	154.4	168.0	14	210	154.0	11.0	143.0
10	11+35.00	15	154.0	168.0	15	225	153.0	11.0	142.0
11	11+50.00	15	153.6	168.0	15	225	153.0	11.0	142.0
12	11+65.00	15	153.2	168.0	15	225	153.0	11.0	142.0
13	11+80.00	15	152.9	168.0	16	240	152.0	13.0	139.0
14	11+95.00	15	152.5	168.0	16	240	152.0	13.0	139.0
15	12+10.00	15	152.3	168.0	16	240	152.0	13.0	139.0
16	12+25.00	15	152.0	168.0	17	255	151.0	13.0	138.0
17	12+40.00	15	151.6	168.0	17	255	151.0	13.0	138.0
18	12+55.00	15	151.4	168.0	17	255	151.0	13.0	138.0
19	12+70.00	15	151.2	168.0	17	255	151.0	13.0	138.0
20	12+85.00	15	151.1	168.0	17	255	151.0	13.0	138.0
21	13+00.00	15	151.0	168.0	18	270	150.0	13.0	137.0
22	13+15.00	15	150.9	168.0	18	270	150.0	13.0	137.0
23	13+30.00	15	150.8	168.0	18	270	150.0	13.0	137.0
24	13+45.00	15	150.7	168.0	18	270	150.0	13.0	137.0
25	13+60.00	15	150.6	168.0	18	270	150.0	13.0	137.0
26	13+75.00	15	150.5	168.0	18	270	150.0	13.0	137.0
27	13+90.00	15	150.5	168.0	18	270	150.0	13.0	137.0
28	14+05.00	15	150.4	168.0	18	270	150.0	13.0	137.0
29	14+20.00	15	150.4	168.0	18	270	150.0	13.0	137.0
30	14+35.00	15	150.5	168.0	18	270	150.0	13.0	137.0
31	14+50.00	15	150.5	168.0	18	270	150.0	13.0	137.0
32	14+65.00	15	150.6	168.0	18	270	150.0	13.0	137.0
33	14+80.00	15	150.6	168.0	18	270	150.0	13.0	137.0
34	14+95.00	15	150.7	168.0	18	270	150.0	13.0	137.0
35	15+10.00	15	150.7	168.0	18	270	150.0	13.0	137.0
36	15+25.00	15	150.7	168.0	18	270	150.0	13.0	137.0
37	15+40.00	15	150.7	168.0	18	270	150.0	13.0	137.0
38	15+55.00	15	150.7	168.0	18	270	150.0	13.0	137.0
39	15+70.00	15	150.6	168.0	18	270	150.0	13.0	137.0
40	15+85.00	15	150.5	168.0	18	270	150.0	13.0	137.0
41	16+00.00	15	150.5	168.0	18	270	150.0	13.0	137.0
42	16+15.00	15	150.5	168.0	18	270	150.0	13.0	137.0
43	16+30.00	15	150.4	168.0	18	270	150.0	13.0	137.0
44	16+45.00	15	150.3	168.0	18	270	150.0	13.0	137.0
45	16+60.00	15	150.2	168.0	18	270	150.0	13.0	137.0
46	16+75.00	15	150.1	168.0	18	270	150.0	13.0	137.0
47	16+90.00	15	150.0	168.0	19	285	149.0	13.0	136.0
48	17+05.00	15	149.9	168.0	19	285	149.0	13.0	136.0
49	17+20.00	15	149.8	168.0	19	285	149.0	13.0	136.0
50	17+35.00	15	149.8	168.0	19	285	149.0	13.0	136.0
51	17+50.00	15	149.8	168.0	19	285	149.0	13.0	136.0
52	17+65.00	15	149.8	168.0	19	285	149.0	13.0	136.0
53	17+80.00	15	149.7	168.0	19	285	149.0	13.0	136.0
54	17+95.00	15	149.7	168.0	19	285	149.0	13.0	136.0
55	18+10.00	15	149.6	168.0	19	285	149.0	13.0	136.0
56	18+25.00	15	149.5	168.0	19	285	149.0	13.0	136.0
57	18+40.00	15	149.4	168.0	19	285	149.0	13.0	136.0
58	18+55.00	15	149.3	168.0	19	285	149.0	13.0	136.0
59	18+70.00	15	149.2	168.0	19	285	149.0	13.0	136.0
60	18+85.00	15	149.1	168.0	19	285	149.0	13.0	136.0

NOISE WALL #8 PANELS 61 THRU 93

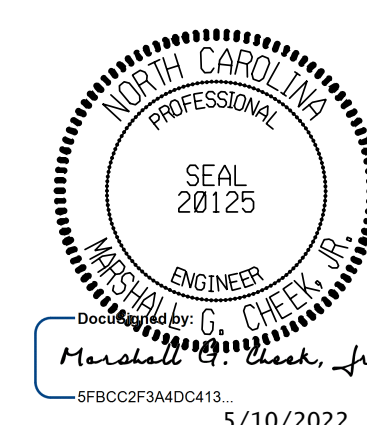
PANEL NO.	START POST STATION -NW8-	LENGTH (FEET)	GROUND ELEV. OF START POST (FEET)	TOP ELEV. OF PANEL (FEET)	RECOMMENDED PANEL HEIGHT (FEET)	AREA (SQ. FT.)	TOP ELEV. OF EXCAVATION (FEET)	PILE EXCAVATION DEPTH "D"	PILE TIP ELEV. & BOTTOM OF HOLE (FEET)
61	19+00.00	15	149.0	168.0	20	300	148.0	13.0	135.0
62	19+15.00	15	148.9	168.0	20	300	148.0	13.0	135.0
63	19+30.00	15	148.8	168.0	20	300	148.0	13.0	135.0
64	19+45.00	15	148.7	168.0	20	300	148.0	13.0	135.0
65	19+60.00	15	148.6	168.0	20	300	148.0	13.0	135.0
66	19+75.00	10	148.5	168.0	20	200	148.0	13.0	135.0
67	19+85.00	15	148.4	168.0	20	300	148.0	13.0	135.0
68	20+00.00	15	148.4	168.0	20	300	148.0	13.0	135.0
69	20+15.00	15	148.3	168.0	20	300	148.0	13.0	135.0
70	20+30.00	15	148.2	168.0	20	300	148.0	13.0	135.0
71	20+45.00	15	148.0	167.0	20	300	147.0	13.0	134.0
72	20+60.00	15	147.9	167.0	20	300	147.0	13.0	134.0
73	20+75.00	15	147.9	167.0	20	300	147.0	13.0	134.0
74	20+90.00	15	148.1	167.0	19	285	148.0	13.0	135.0
75	21+05.00	15	148.0	167.0	20	300	147.0	13.0	134.0
76	21+20.00	15	147.9	167.0	20	300	147.0	13.0	134.0
77	21+35.00	15	147.8	167.0	20	300	147.0	13.0	134.0
78	21+50.00	15	147.7	166.0	19	285	147.0	13.0	134.0
79	21+65.00	15	147.6	166.0	19	285	147.0	13.0	134.0
80	21+80.00	15	147.0	166.0	20	300	146.0	13.0	133.0
81	21+95.00	15	146.9	166.0	20	300	146.0	13.0	133.0
82	22+10.00	15	146.8	165.0	19	285	146.0	13.0	133.0
83	22+25.00	15	146.7	165.0	19	285	146.0	13.0	133.0
84	22+40.00	15	146.6	165.0	19	285	146.0	13.0	133.0
85	22+55.00	15	146.5	165.0	19	285	146.0	13.0	133.0
86	22+70.00	15	146.5	164.0	18	270	146.0	13.0	133.0
87	22+85.00	15	146.5	164.0	18	270	146.0	13.0	133.0
88	23+00.00	15	147.5	164.0	17	255	147.0	13.0	134.0
89	23+15.00	15	147.5	164.0	17	255	147.0	13.0	134.0
90	23+30.00	15	147.4	163.0	16	240	147.0	13.0	134.0
91	23+45.00	15	147.4	163.0	16	240	147.0	13.0	134.0
92	23+60.00	15	147.4	163.0	16	240	147.0	13.0	134.0
93	23+75.00	15	147.4	163.0	16	240	147.0	13.0	134.0

NOTE:

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

FOR BUMP OUT FOR PROPOSED SIGN SUPPORT, SEE SHEETS 2A-7 AND 2N-1 OF THE ROADWAY PLANS.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 10+00.00 -NW8-
20+80.55 -Y1ARPA-
 SHEET 1 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SOUND BARRIER WALL
 -NW8-
 DATA TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.			
TGS ENGINEERS 706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275						NO.	BY:	DATE:	NO.	BY:	DATE:	WB-1
						1			3			TOTAL SHEETS
						2			4			4

DRAWN BY : ZCS DATE : 12/21
 CHECKED BY : MGC DATE : 1/22

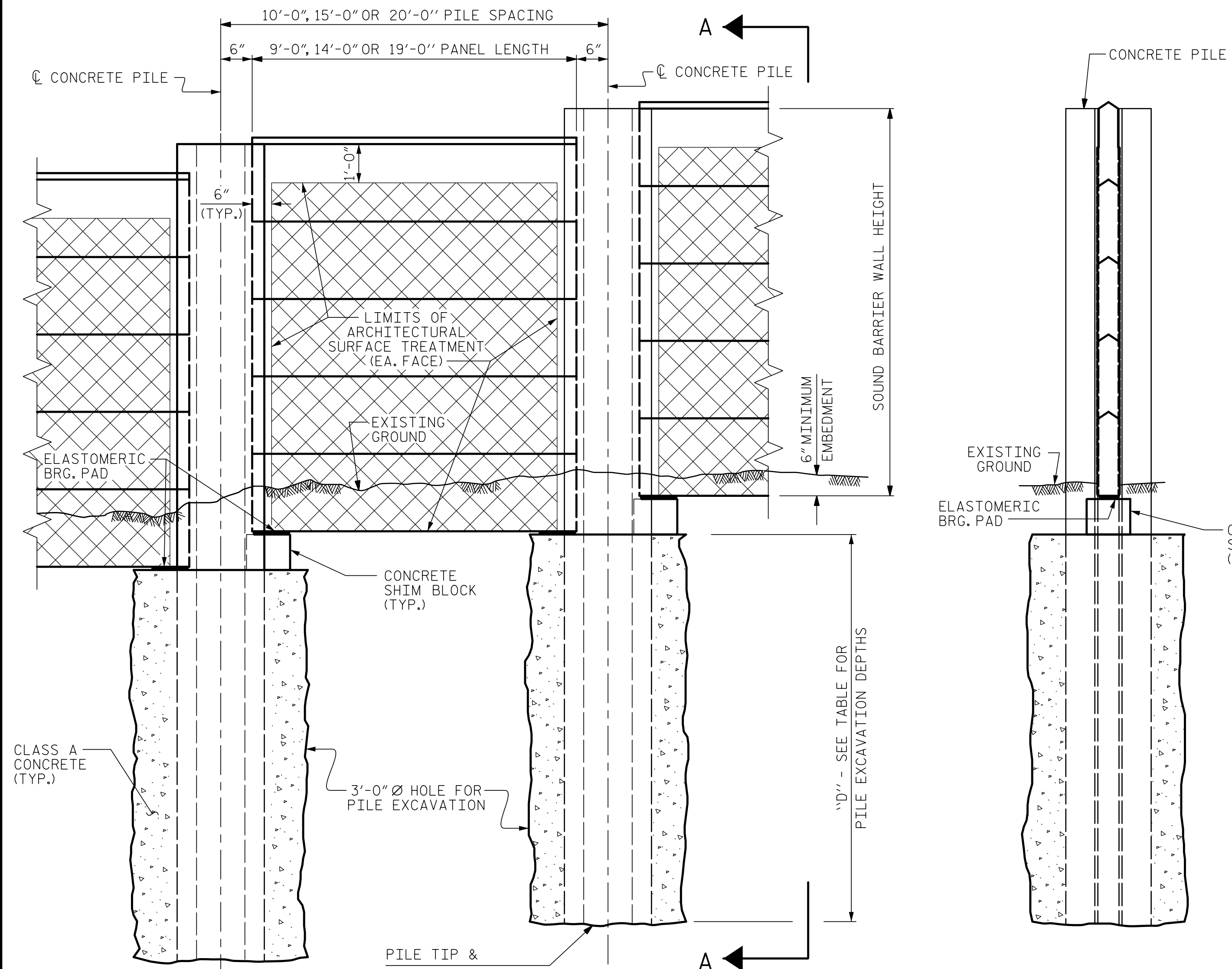
NOTES

- 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.
- 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.
- AT THE CONTRACTOR'S OPTION, CONTINUOUS FLIGHT AUGER PILES MAY BE USED IN LIEU OF PILE EXCAVATION. FOR CONTINUOUS FLIGHT AUGER PILES, SEE SPECIAL PROVISIONS.
- FOR ARCHITECTURAL SURFACE TREATMENT, SEE SOUND BARRIER WALL SPECIAL PROVISIONS.
- AT THE CONTRACTOR'S OPTION, USE 10'-0", 15'-0", OR 20'-0" PILE SPACINGS. STANDARD PRECAST PANELS MAY BE USED WITH THE 10'-0" AND 15'-0" PILE SPACING. FOR 20'-0" PILE SPACING, PANELS DESIGNED AND MANUFACTURED BY A THIRD PARTY VENDOR SHALL BE USED.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PILE EXCAVATION DEPTHS "D"				
NOISE WALL #8		FROM : STA. 10+00 -NW8- TO : STA. 23+90 -NW8-		
3'-0" Ø HOLE	PILE SPACING	WALL HEIGHT		
		H ≤ 15'	15' < H ≤ 20'	20' < H ≤ 25'
	10'-0"	10	12	N/A
	15'-0"	11	13	N/A
20'-0"	12	15	N/A	

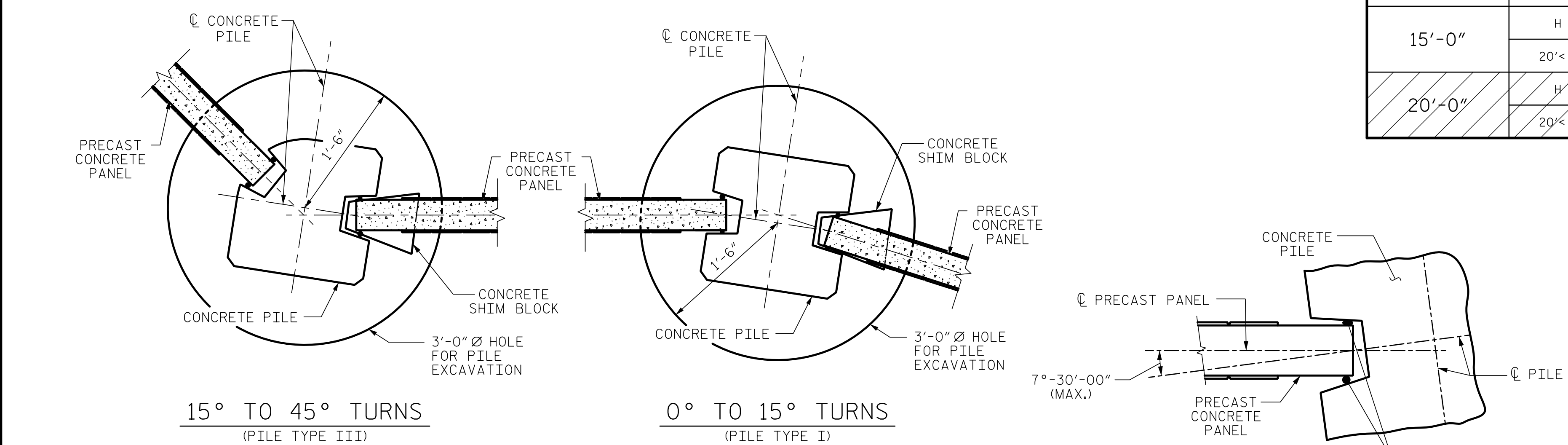
BILL OF MATERIAL	
SOUND BARRIER WALL	24,620 S.F.
ARCHITECTURAL SURFACE TREATMENT	40,240 S.F.
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	
ARCHITECTURAL SURFACE TREATMENT	
TEXTURE OPTION:	ASHLAR STONE
STAIN OPTION:	36270

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



ELEVATION

SECTION A-A



TYPICAL WALL TURN DETAILS

PILE ROTATION LIMIT FOR WALL TURN

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

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 10+00.00 -NW8-
 SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SOUND BARRIER WALL
 -NW8-

3/22/2022
 X:\NCDOT\I-5987A\Structures\Noise Wall\Final Plans\DCN\13C_SMU_SBW_2.dgn
 User:zsmith

3/22/2022
 ASSEMBLED BY : ZCS DATE : 12/21
 CHECKED BY : MGC DATE : 1/22

DRAWN BY : MAA 6/11 REV. 9/26/14 MAA/TMG
 CHECKED BY : GM 6/11 REV. 10/17 MAA/THC
 REV. 5/18 MAA/THC

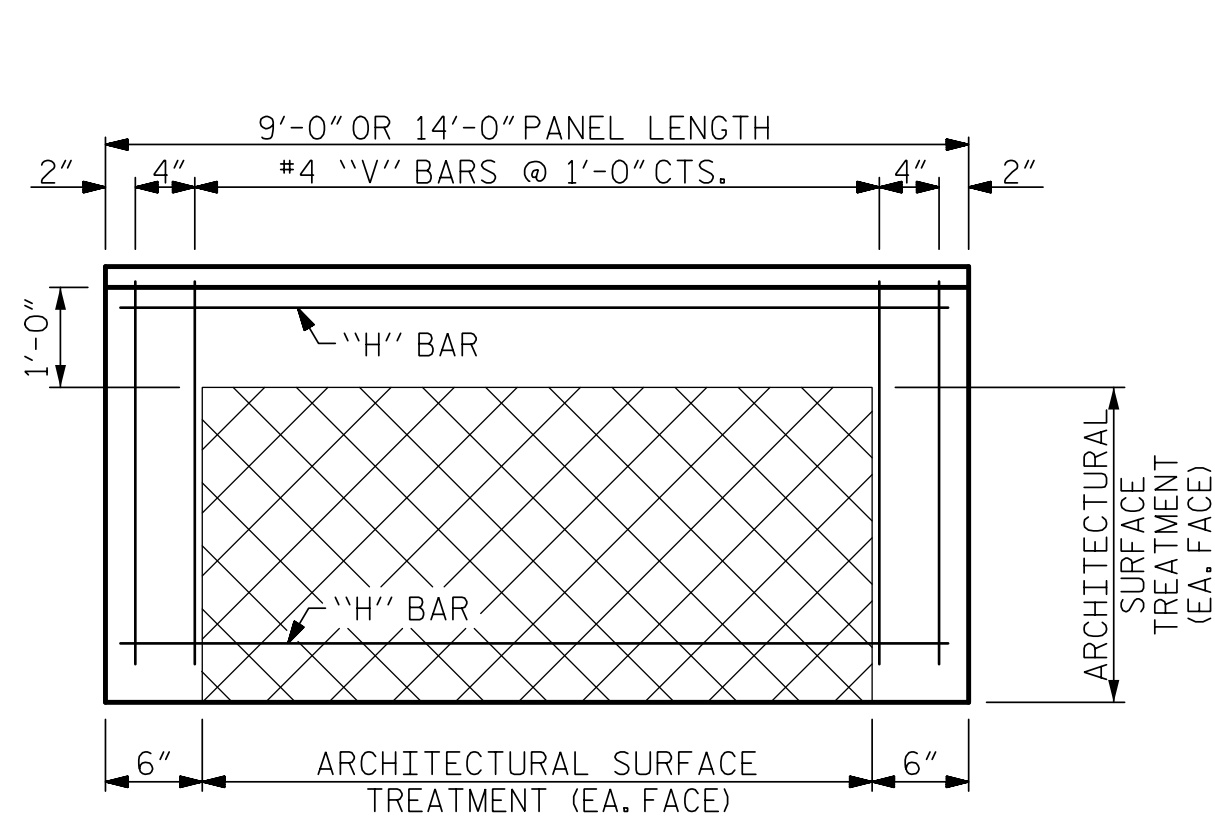
706 HILLSBOROUGH STREET SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

5/10/2022 | 9:42 AM EDT

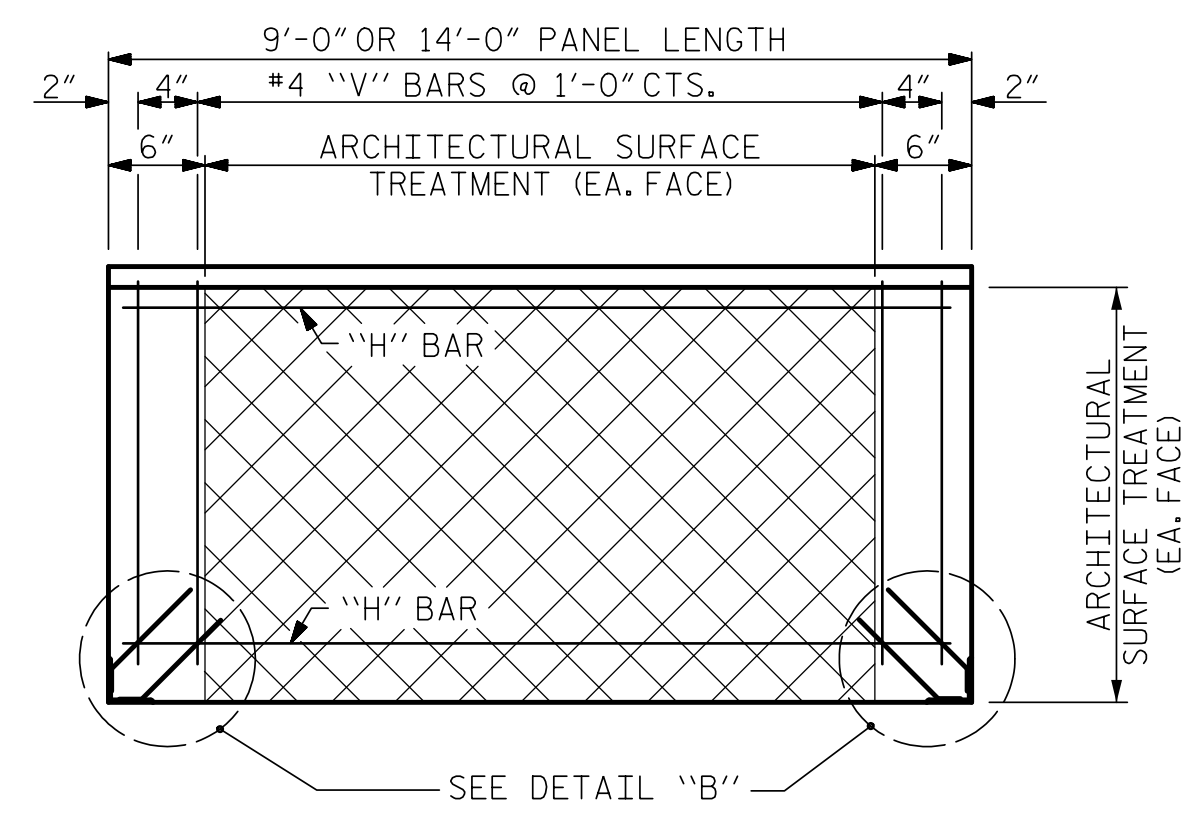
REVISIONS

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

SHEET NO. W8-2
 TOTAL SHEETS 4



FRONT ELEVATION OF UPPER PRECAST PANEL



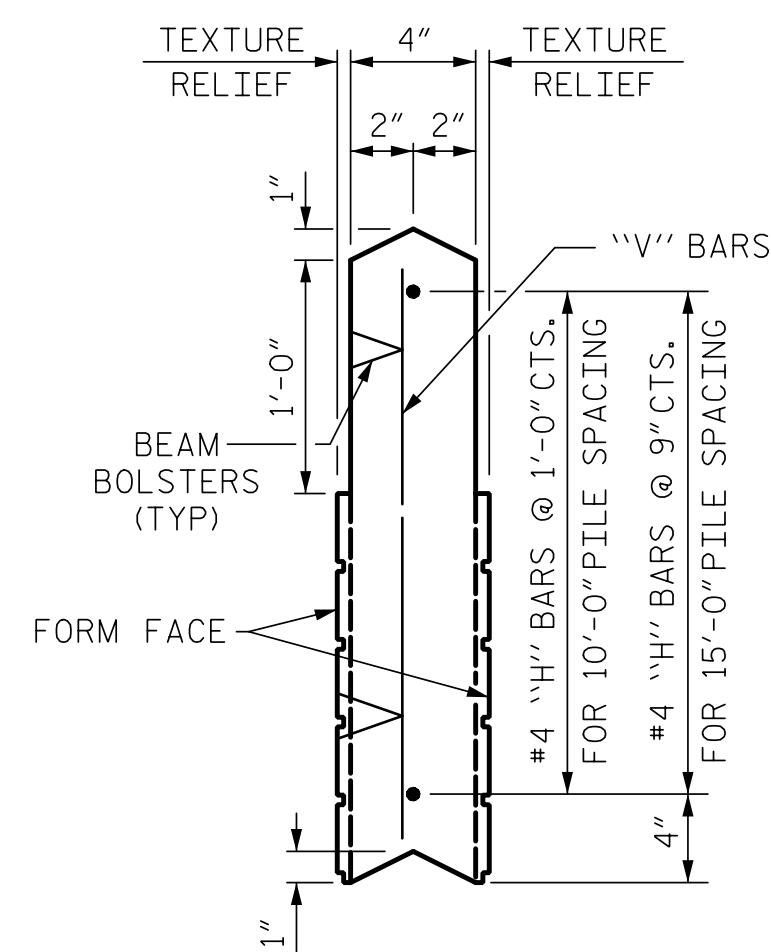
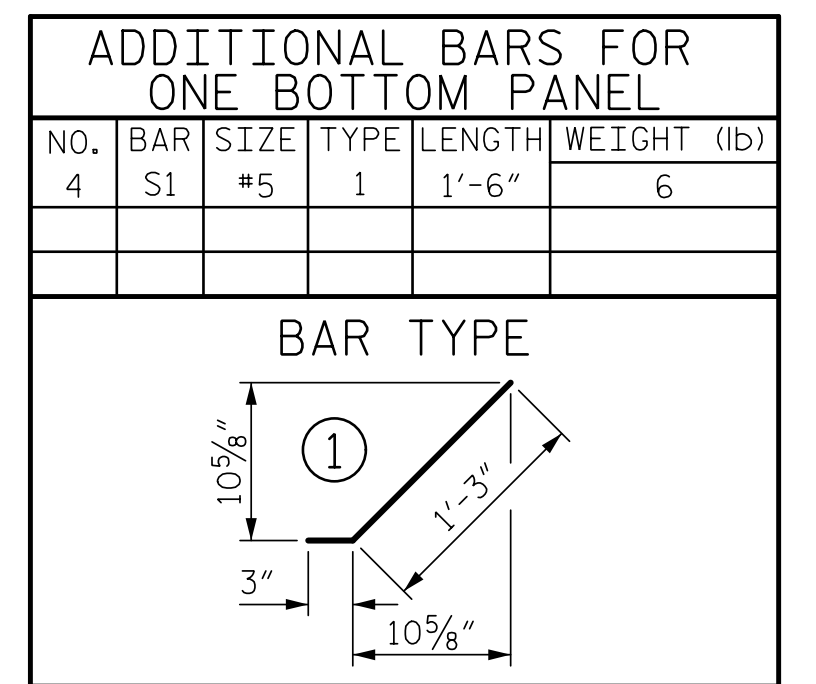
FRONT ELEVATION OF BOTTOM PRECAST PANEL

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

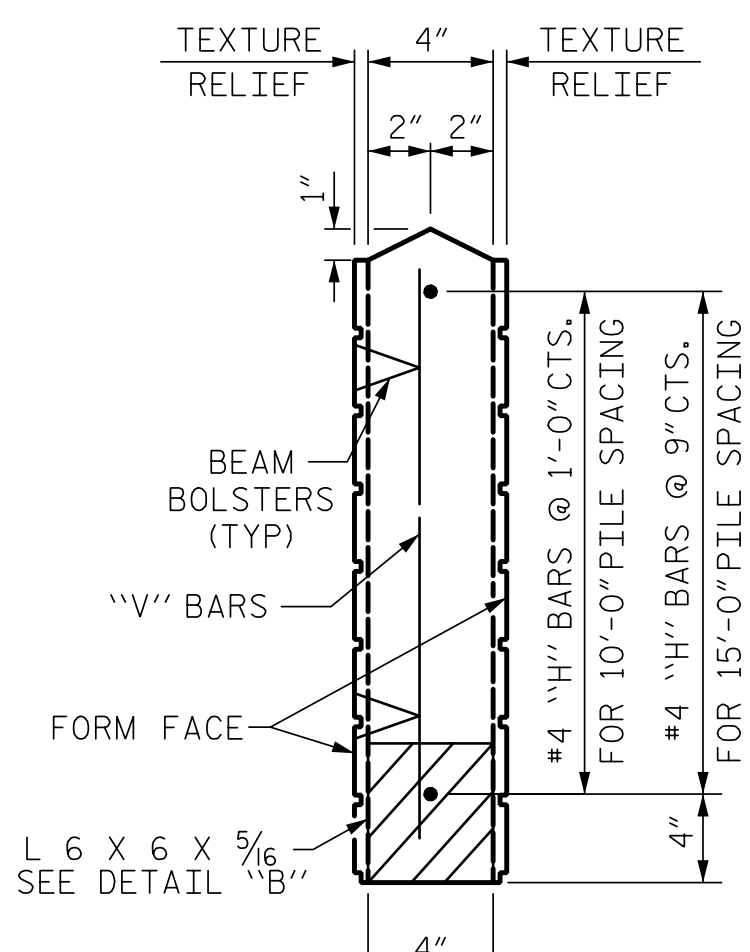
PANEL HEIGHT	CLASS AA CONCRETE C.Y.	BAR TYPES											
		HORIZONTAL						VERTICAL					
		NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)
2'-0"	0.22	3	H1	#4	STR	8'-8"	17	11	V1	#4	STR	1'-8"	12
3'-0"	0.33	4	H2	#4	STR	8'-8"	23	11	V2	#4	STR	2'-8"	20
4'-0"	0.44	5	H3	#4	STR	8'-8"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

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

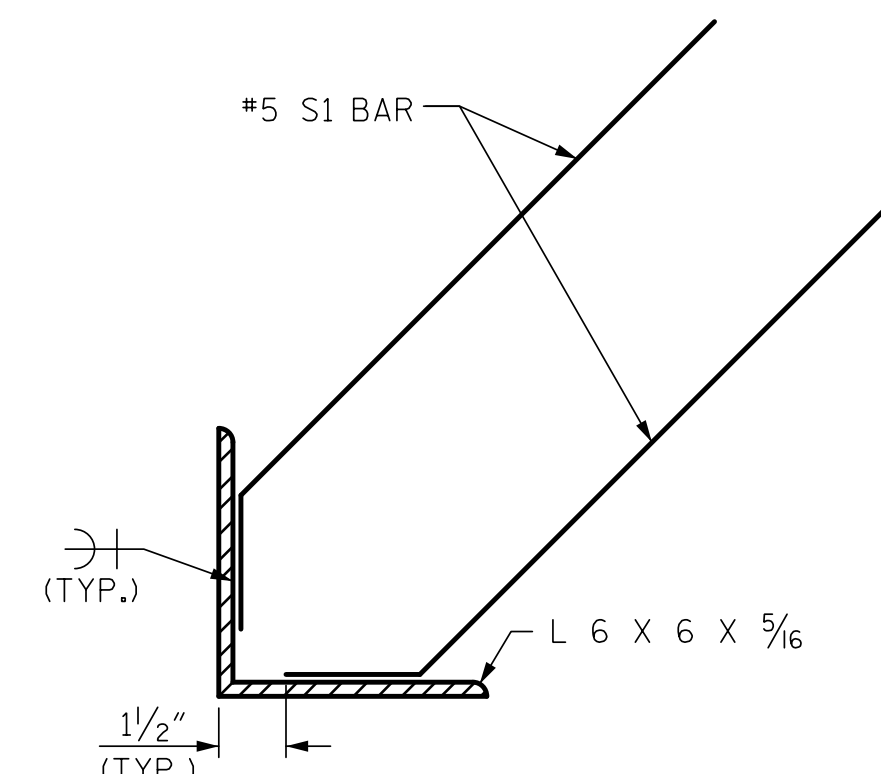
PANEL HEIGHT	CLASS AA CONCRETE C.Y.	BAR TYPES											
		HORIZONTAL						VERTICAL					
		NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR	SIZE	TYPE	LENGTH	WEIGHT (lb)
3'-0"	0.52	5	H1	#4	STR	13'-8"	46	16	V1	#4	STR	2'-8"	29
4'-0"	0.69	6	H2	#4	STR	13'-8"	55	16	V2	#4	STR	3'-8"	39
5'-0"	0.86	7	H3	#4	STR	13'-8"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



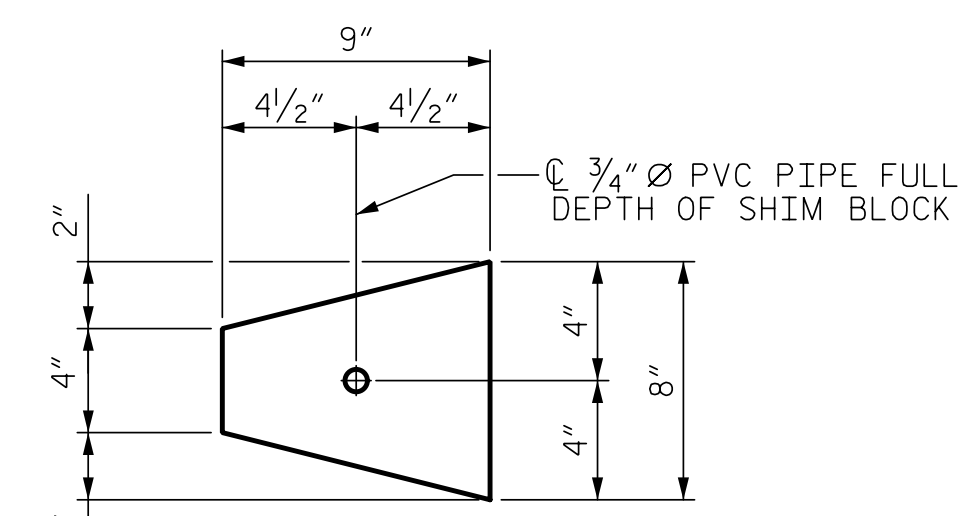
UPPER PANEL



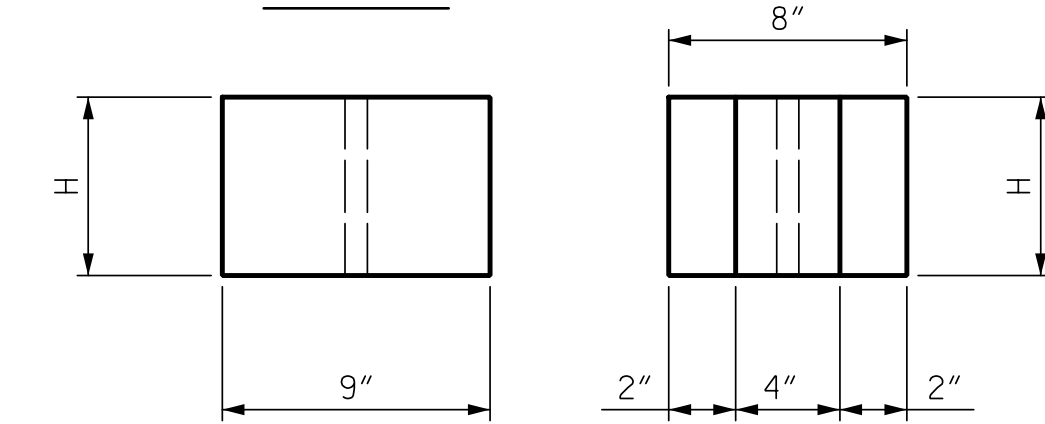
BOTTOM PANEL



DETAIL "B"



PLAN

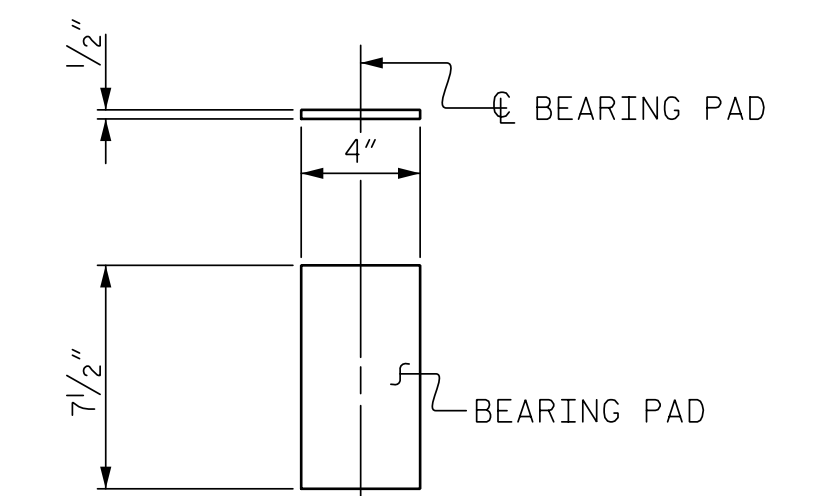


ELEVATION

END

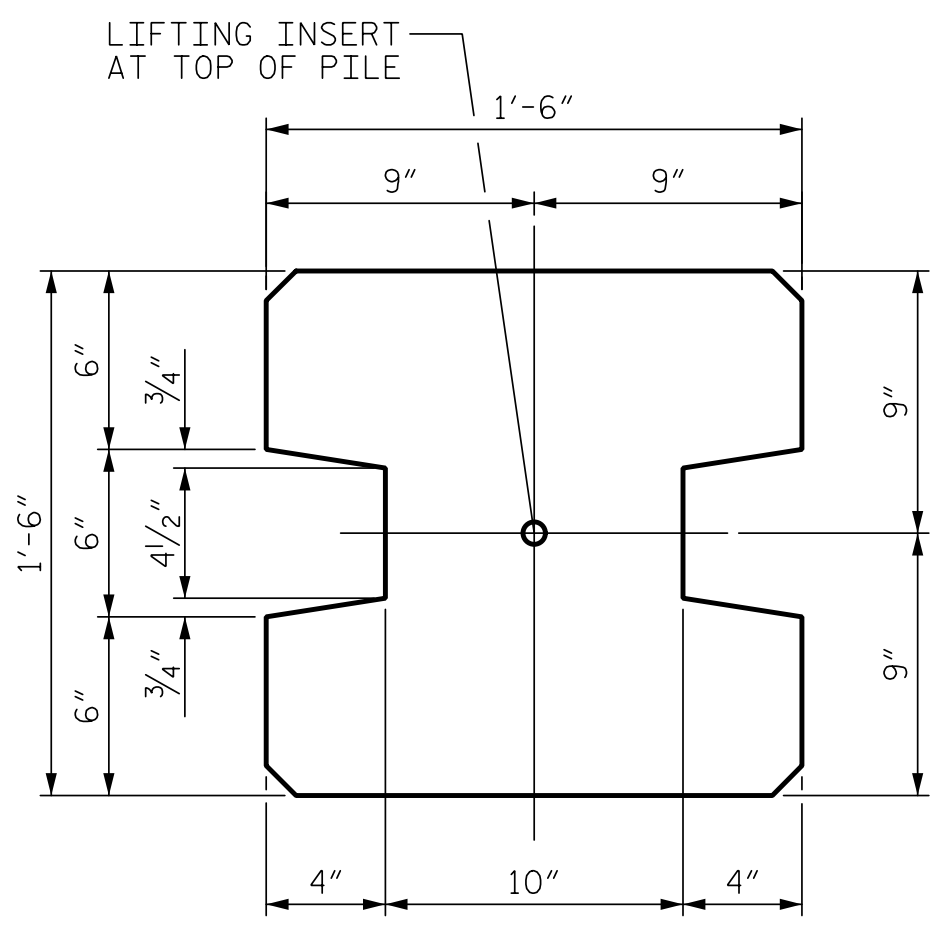
CONCRETE SHIM BLOCK

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

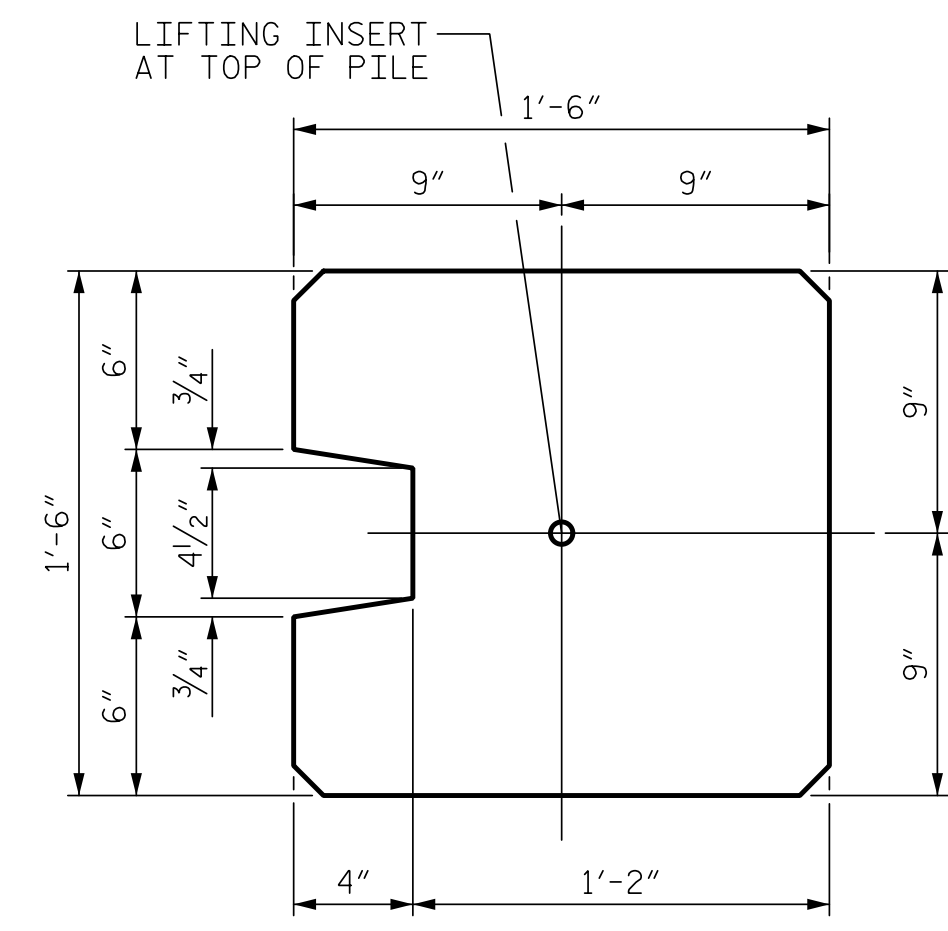


ELASTOMERIC BEARING DETAILS

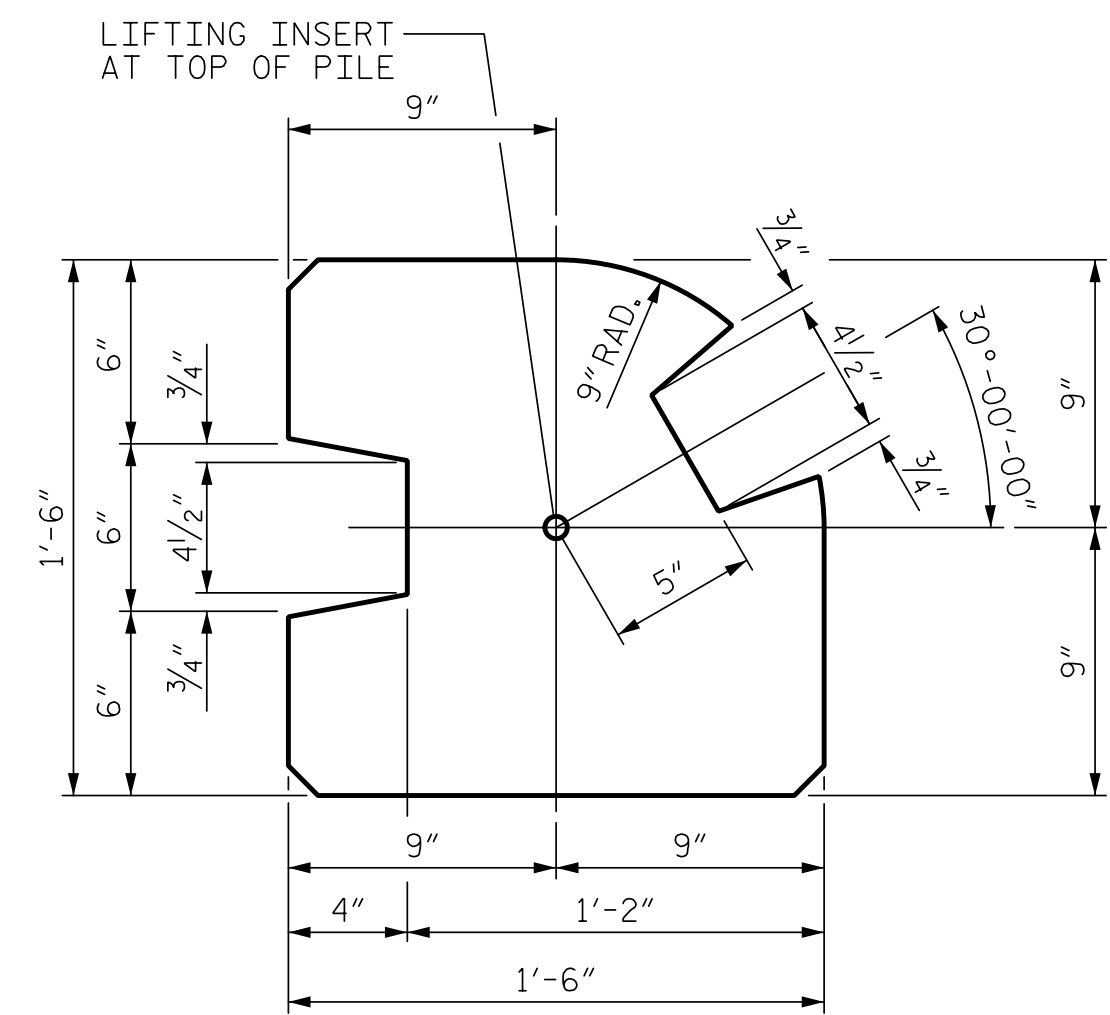
ELASTOMER IN BEARINGS SHALL BE 50 DUROMETER HARDNESS.



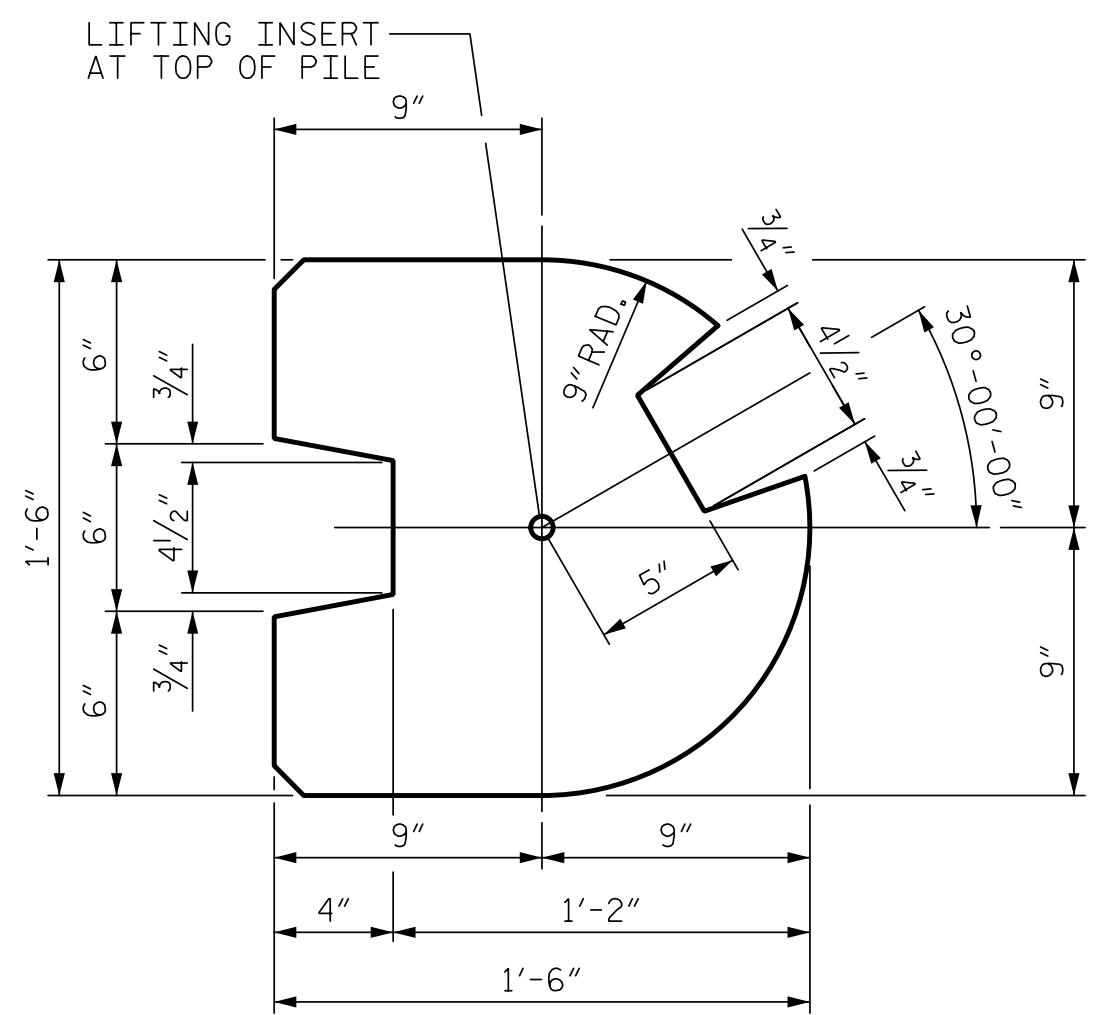
TYPE - I
(AREA = 1.9444 SQ. FT.)



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



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



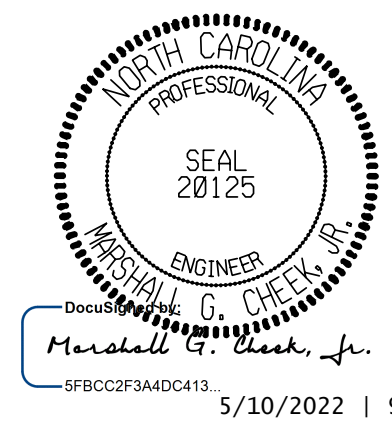
TYPE - III (ALT.)
(AREA = 1.7163 SQ. FT.)

PILE DETAIL

(ALL CORNERS TO BE CHAMFERED 1")

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 10+00.00 -NW8-

SHEET 3 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SOUND BARRIER WALL
-NW8-
DETAILS

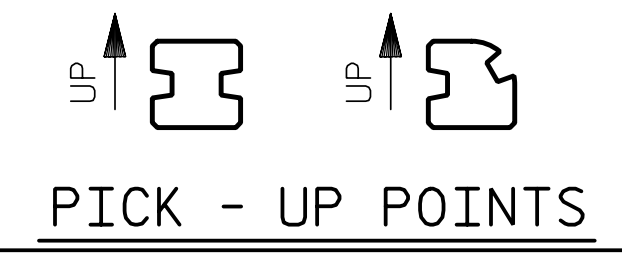
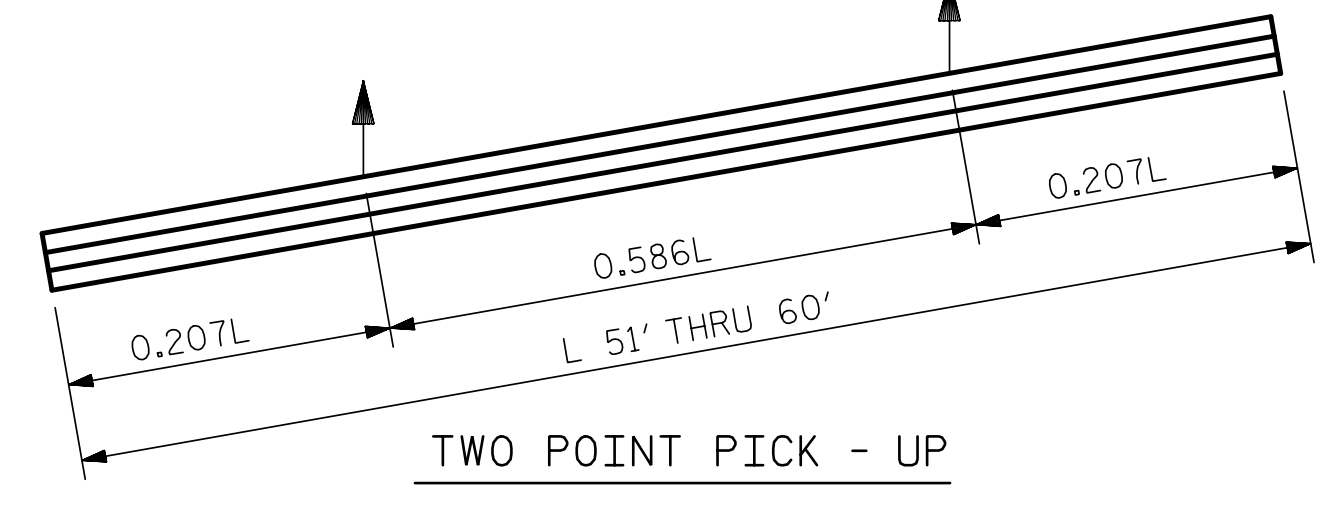
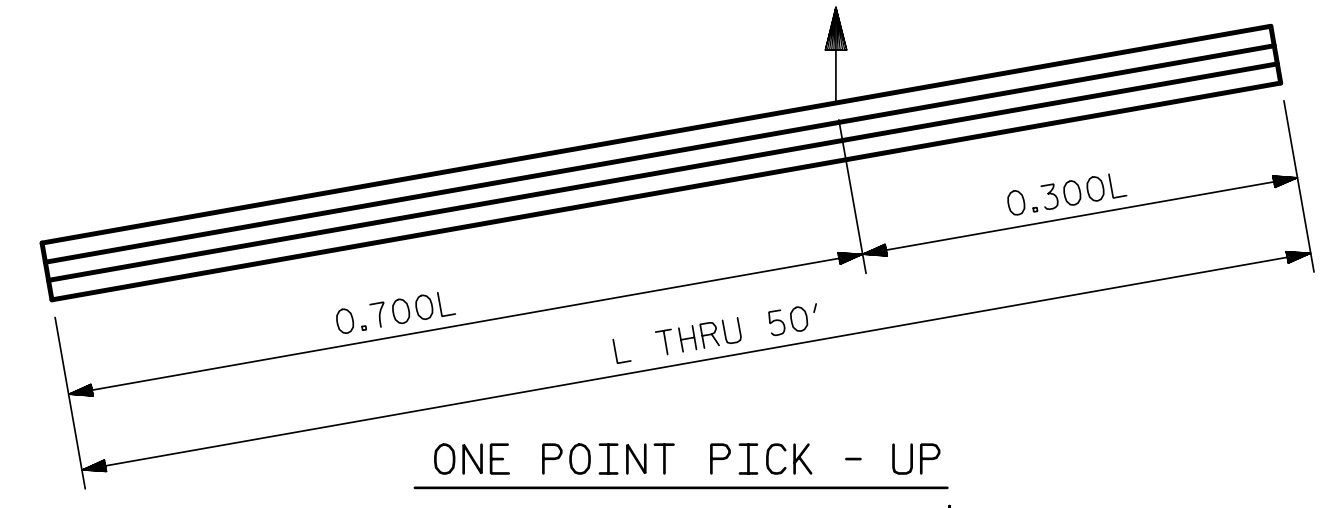
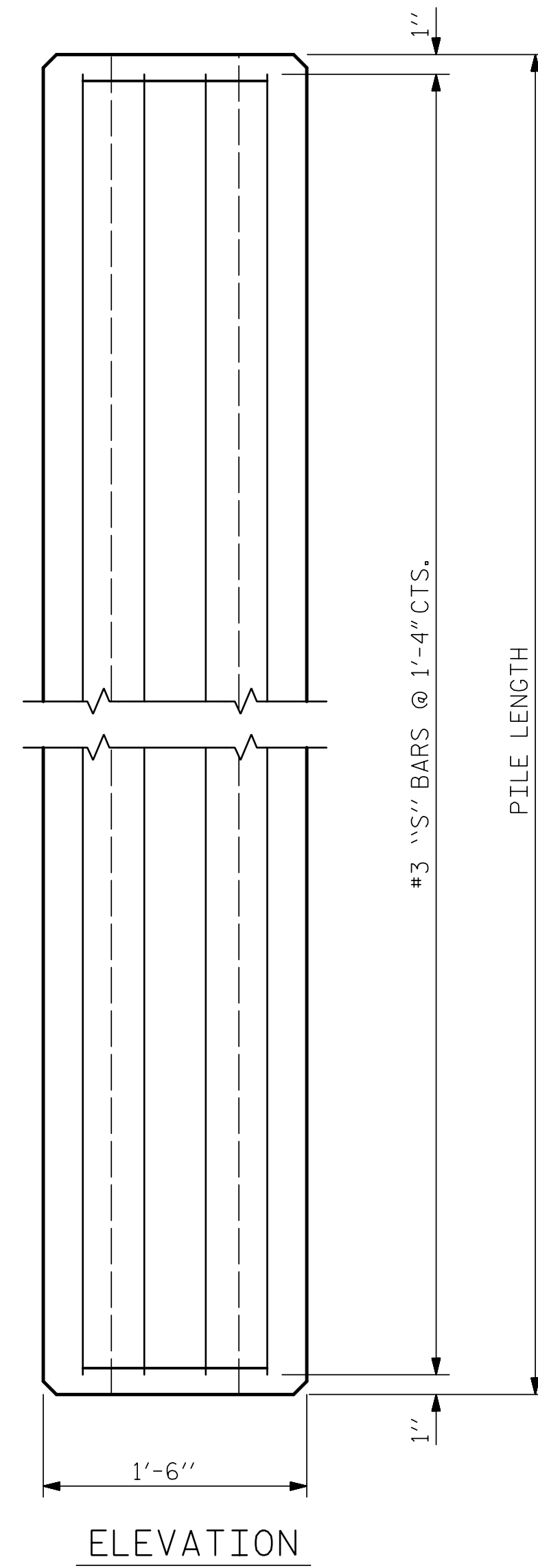
ASSEMBLED BY :	ZCS	DATE :	12/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	MAA 6/11	REV. 1/15/14	RWN/TMG
CHECKED BY :	GM 6/11	REV. 10/17	MAA/THC
		REV. 5/18	MAA/THC

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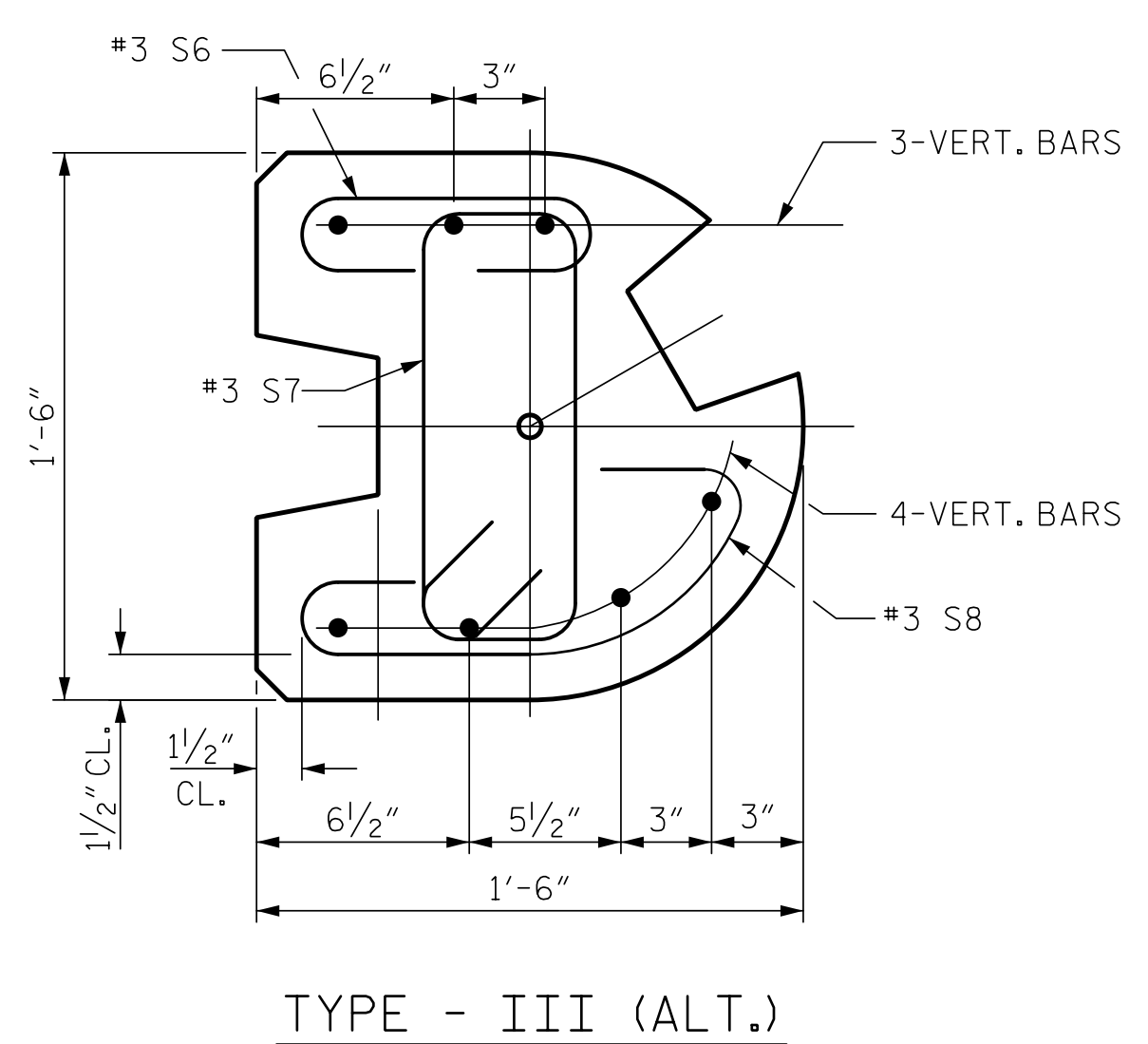
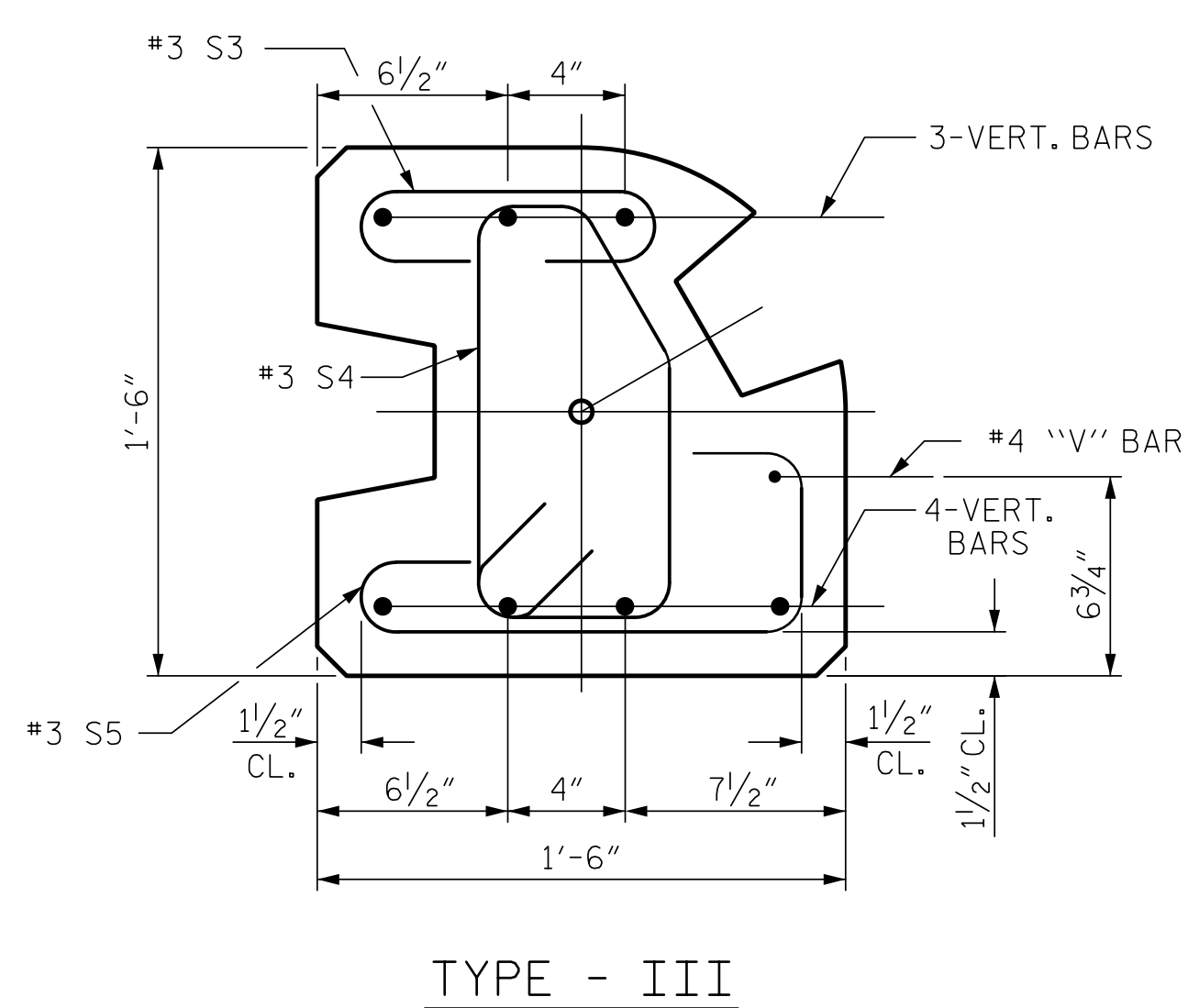
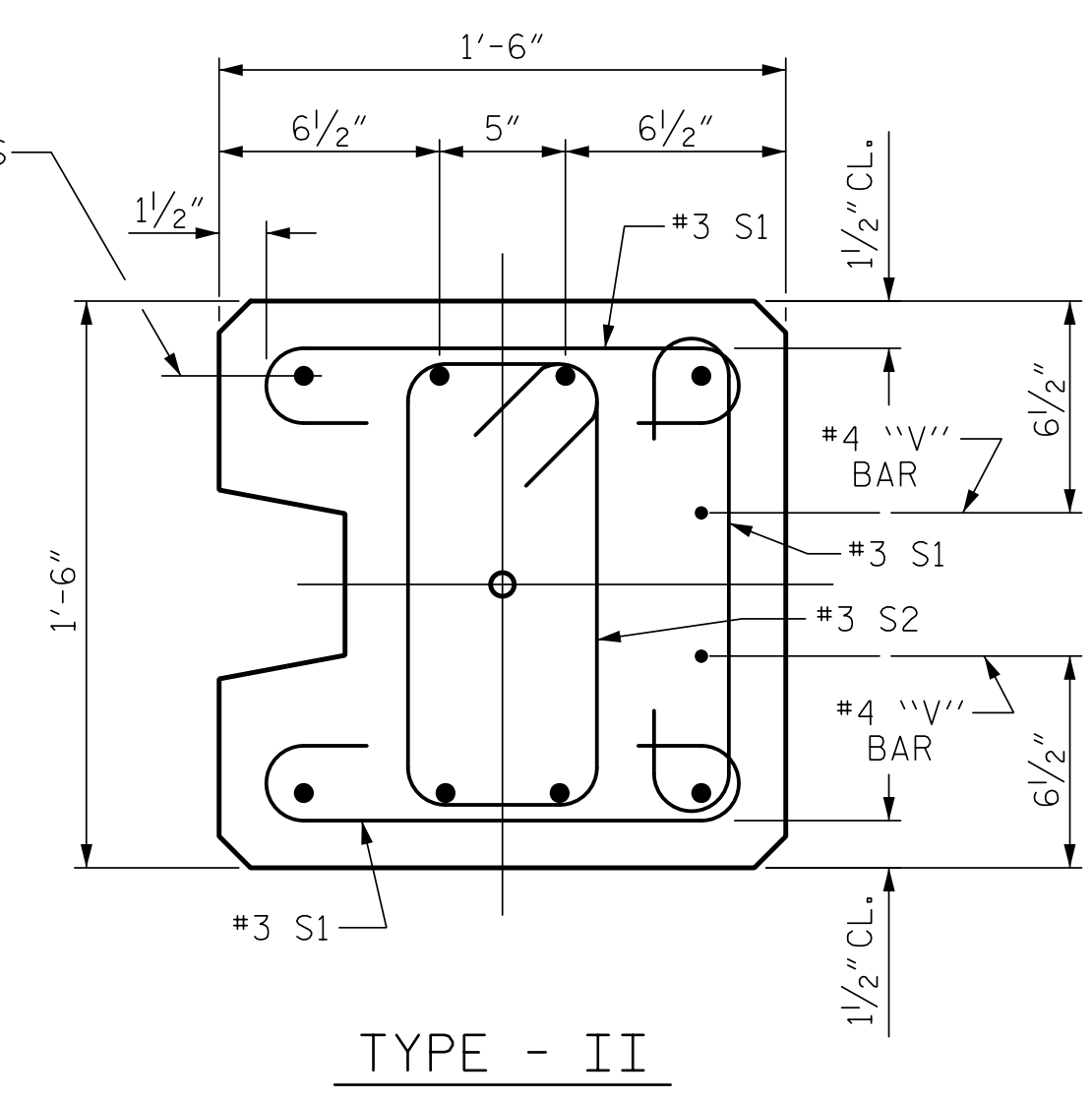
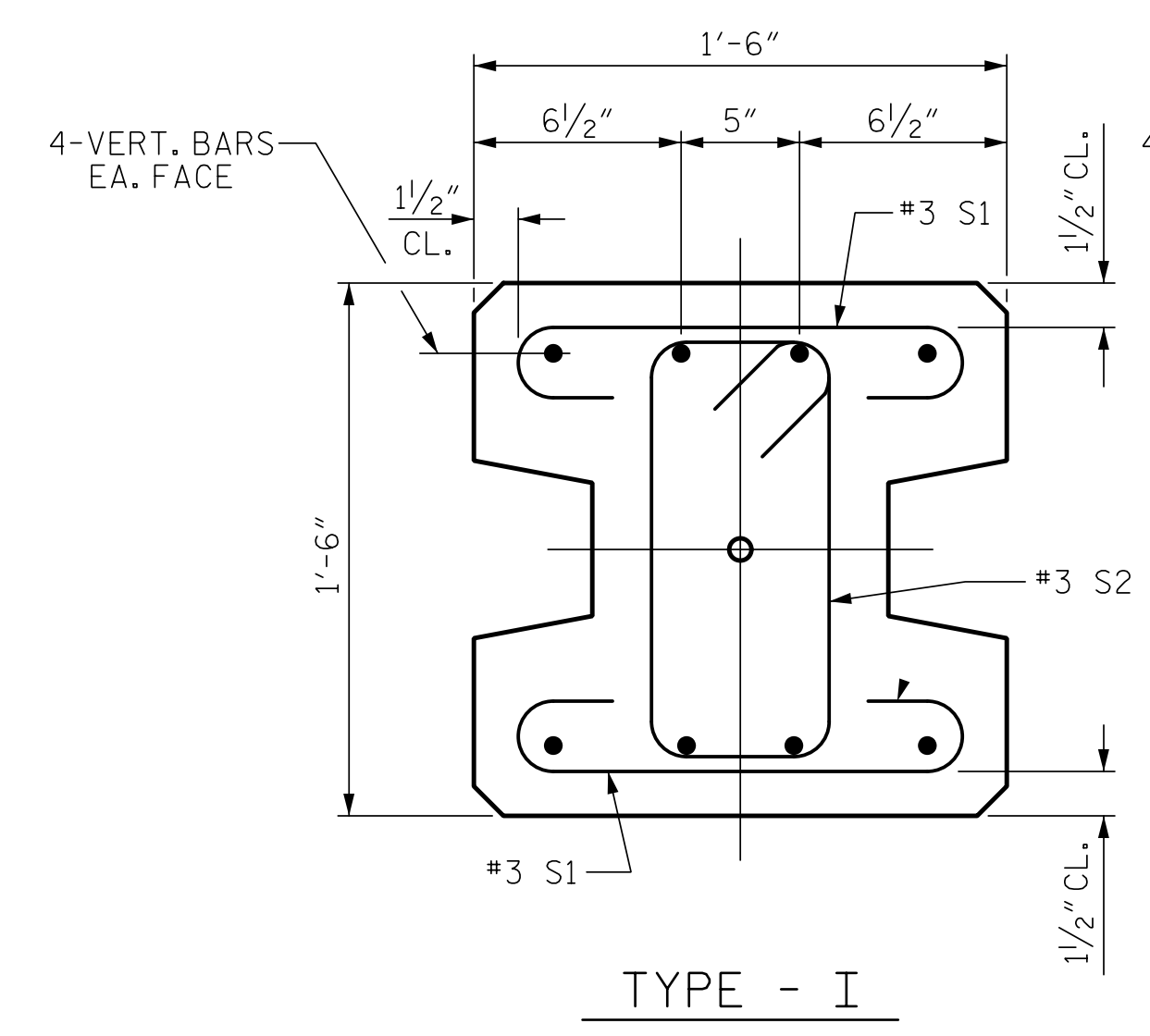
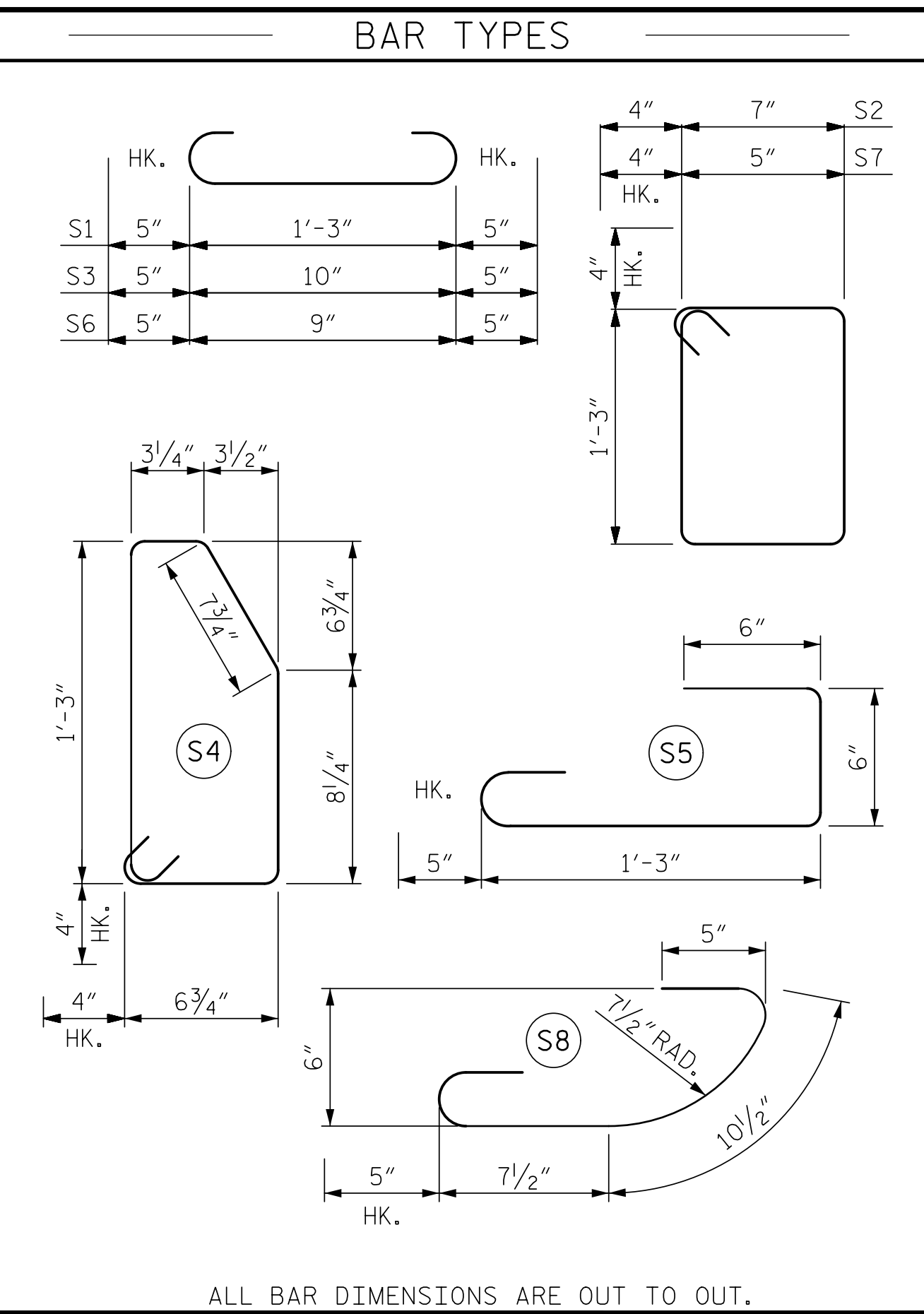
TGS ENGINEERS
706 HILLSBOROUGH STREET
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	W8-3
1			3			TOTAL SHEETS
2			4			4

STD. NO. SBW2



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



NOTES

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

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

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

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

ALL CORNERS TO BE CHAMFERED 1".

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 10+00.00 -NW8-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 SOUND BARRIER WALL
 -NW8-
 DETAILS

3/15/2022 9:42 AM EDT
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TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

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

ASSEMBLED BY :	ZCS	DATE :	12/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	MAA 6/II	REV. 1/15/14	RWW/TMG
CHECKED BY :	GM 6/II	REV. 12/17	MAA/THC