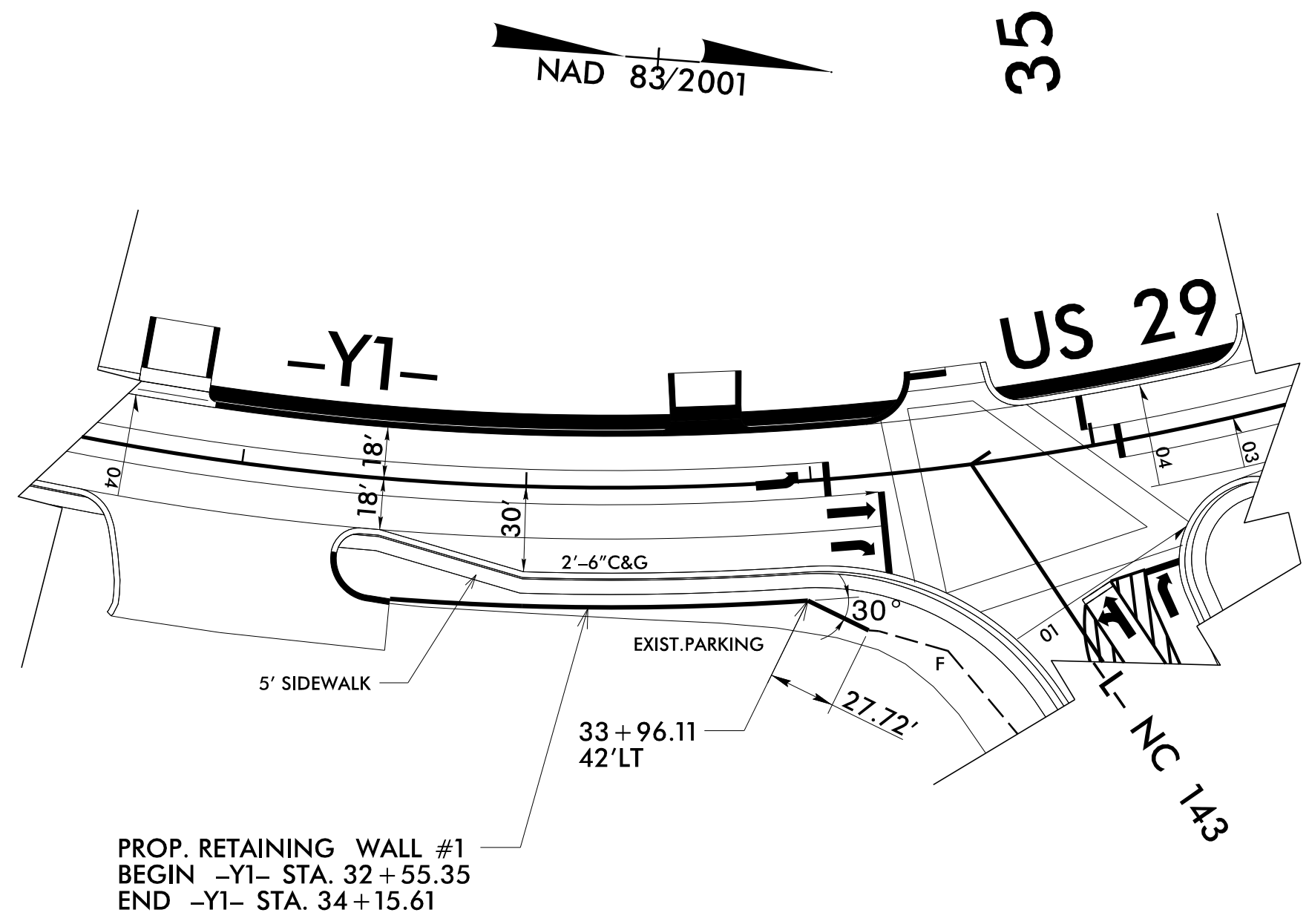
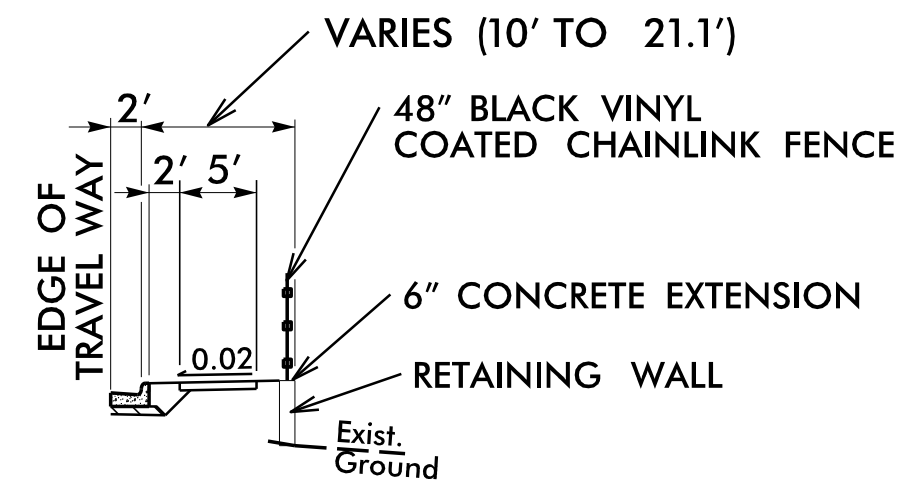


RETAINING WALL #1:



RETAINING WALL #1 ENVELOPE AND WALL LAYOUT PROVIDED BY TGS ENGINEERS, INC.

ESTIMATED RETAINING WALL QUANTITY (SQUARE FEET)	
CAST-IN-PLACE (CIP) GRAVITY RETAINING WALL #1	895 SF

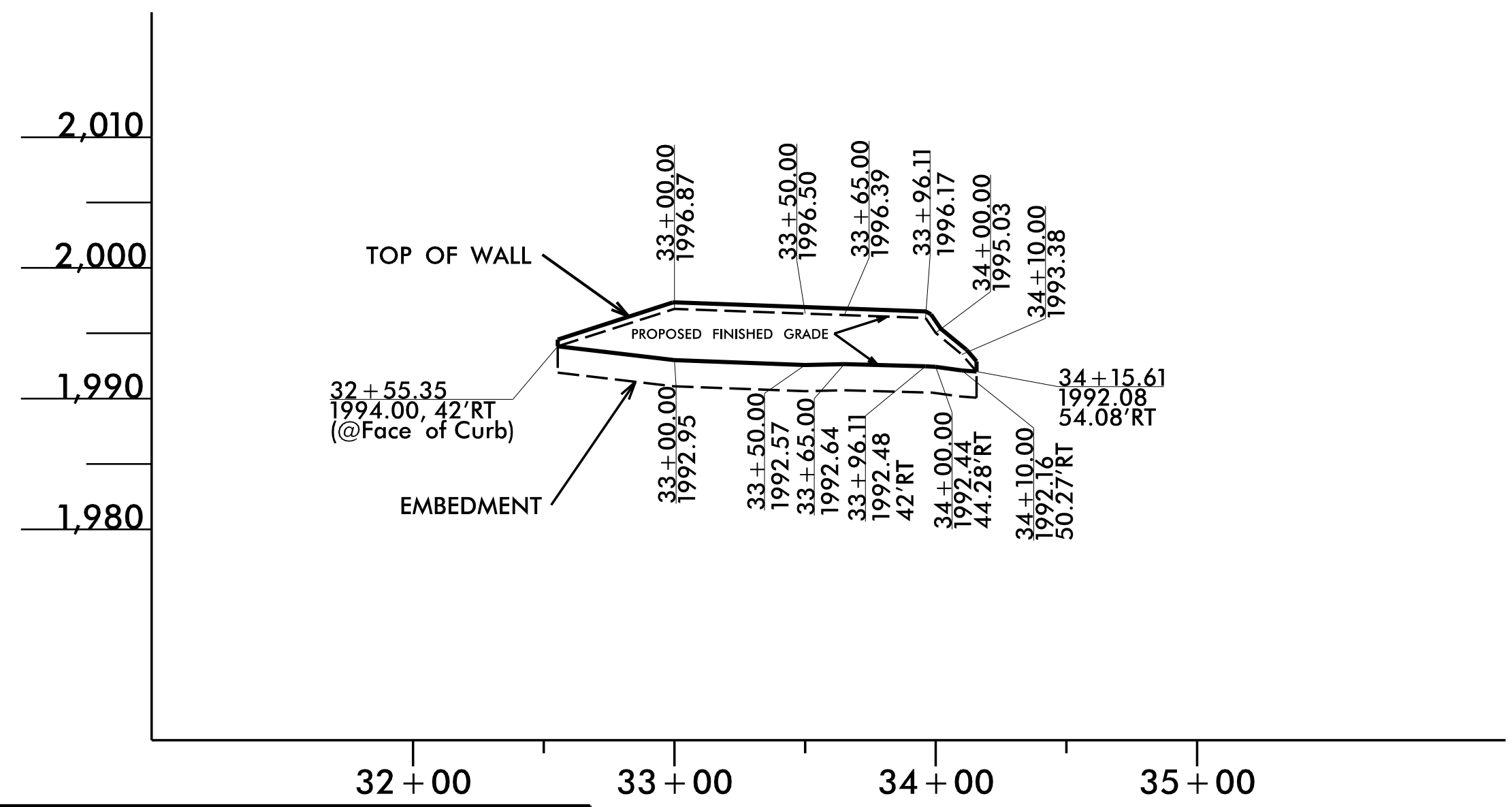


DETAIL FOR WALL #1

NOT TO SCALE
 -Y1- STA. 32+55.35 TO -Y1- STA. 34+15.61, RT
 THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL WALL FACE OF WALL #1
 AT THE FOLLOWING LOCATION:
 -Y1- STA. 33+96.11 TO 34+15.61, RT

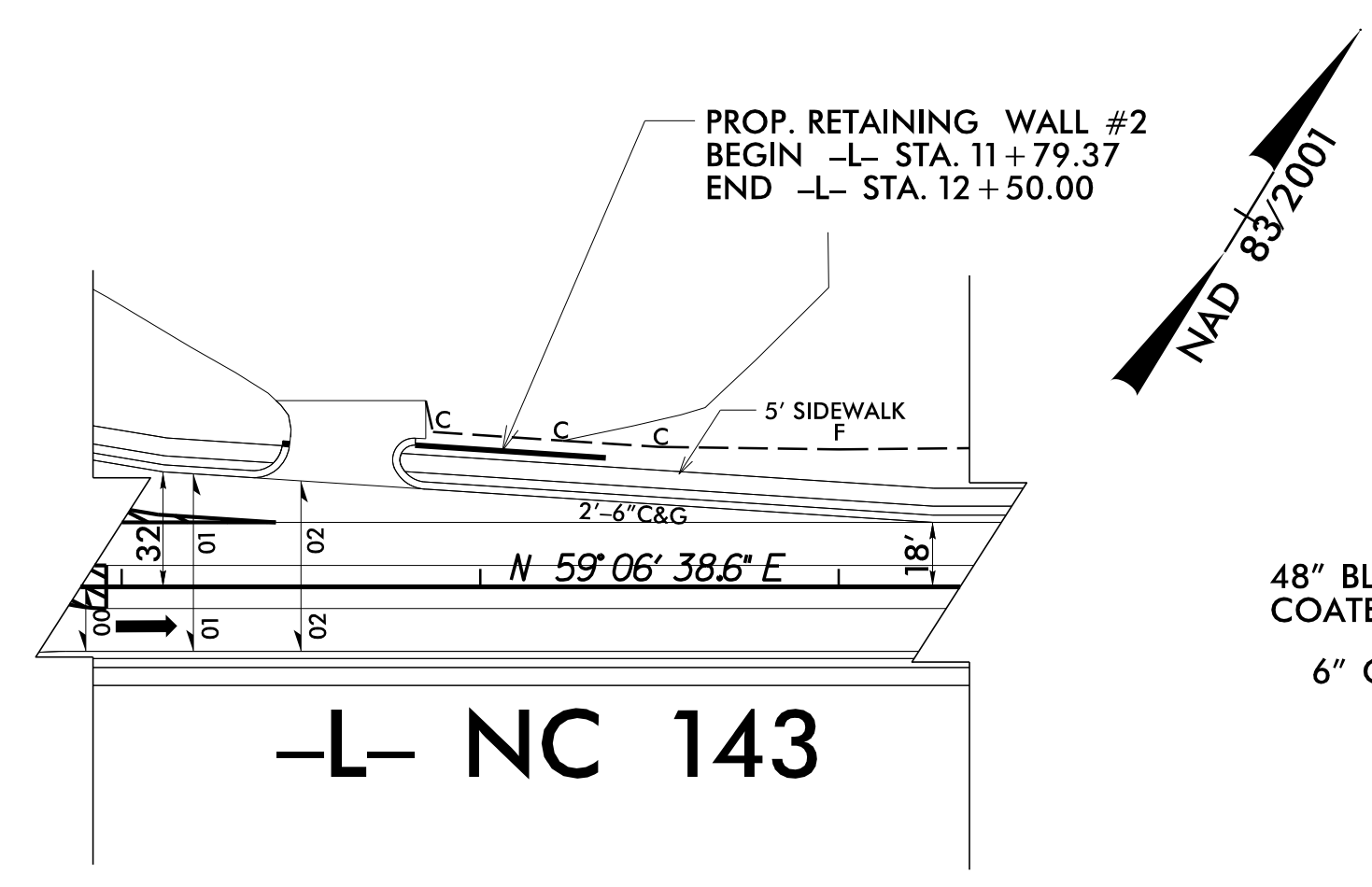
RETAINING WALL #1:

NOT TO SCALE (LOOKING AT FACE OF WALL)



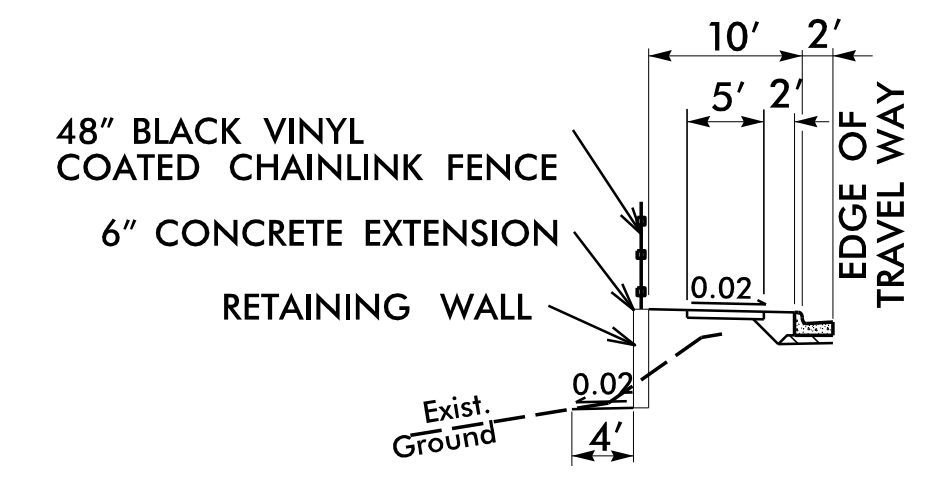
PREPARED BY: R. KRAL	DATE: 4/28/2022
REVIEWED BY: M. BREWER	DATE: 4/28/2022

RETAINING WALL #2



ESTIMATED RETAINING WALL QUANTITY (SQUARE FEET)	
CAST-IN-PLACE (CIP) GRAVITY RETAINING WALL #2	495 SF

GEOTECHNICAL ENGINEER ROBERT E. KRAL	ENGINEER
DocuSigned by: MAD708B8A8A6A SIGNATURE	4/28/22 DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

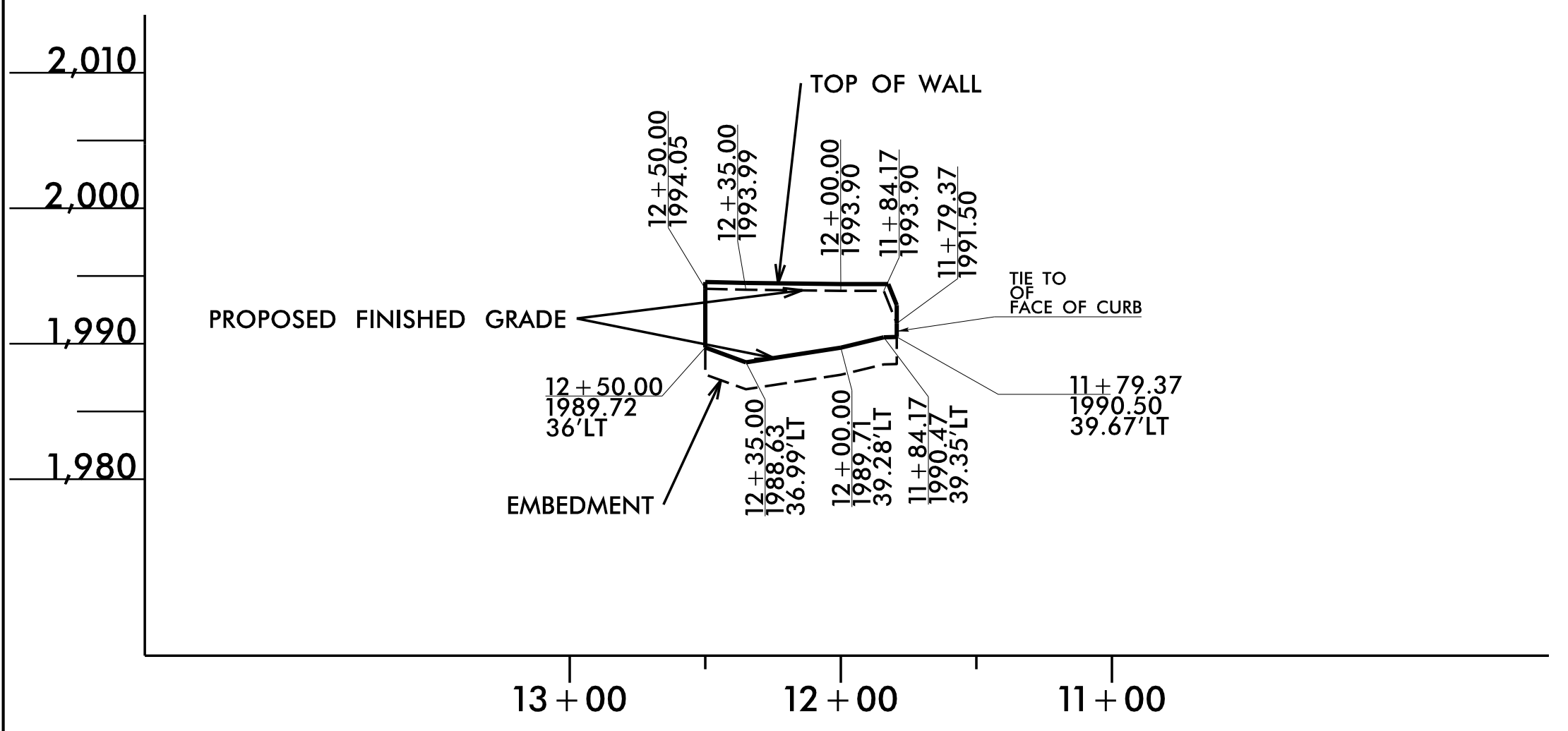


DETAIL FOR WALL #2

NOT TO SCALE
 -L- STA. 11+79.37 TO -L- STA. 12+50.00, LT
 THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL WALL FACE OF WALL #2
 AT THE FOLLOWING LOCATION:
 -L- STA. 11+79.37 TO 12+50.00, LT

RETAINING WALL #2:

NOT TO SCALE (LOOKING AT FACE OF WALL)



PROJECT NO.: A-0009CA
 GRAHAM COUNTY
 RETAINING WALL #1: -Y1- 32+55, 42' RT TO 34+15, 54' RT
 RETAINING WALL #2: -L- 11+79, 39' LT TO 12+50, 36' LT

SHEET 1 OF 2

Prepared in the Office of:

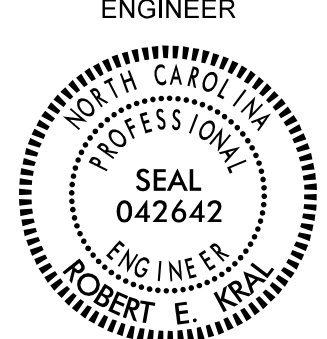
CAROLINAS GEOTECHNICAL GROUP
 2400 CROWNPOINT EXECUTIVE DRIVE
 SUITE 800
 CHARLOTTE, NC 28227
 (980) 339-8684

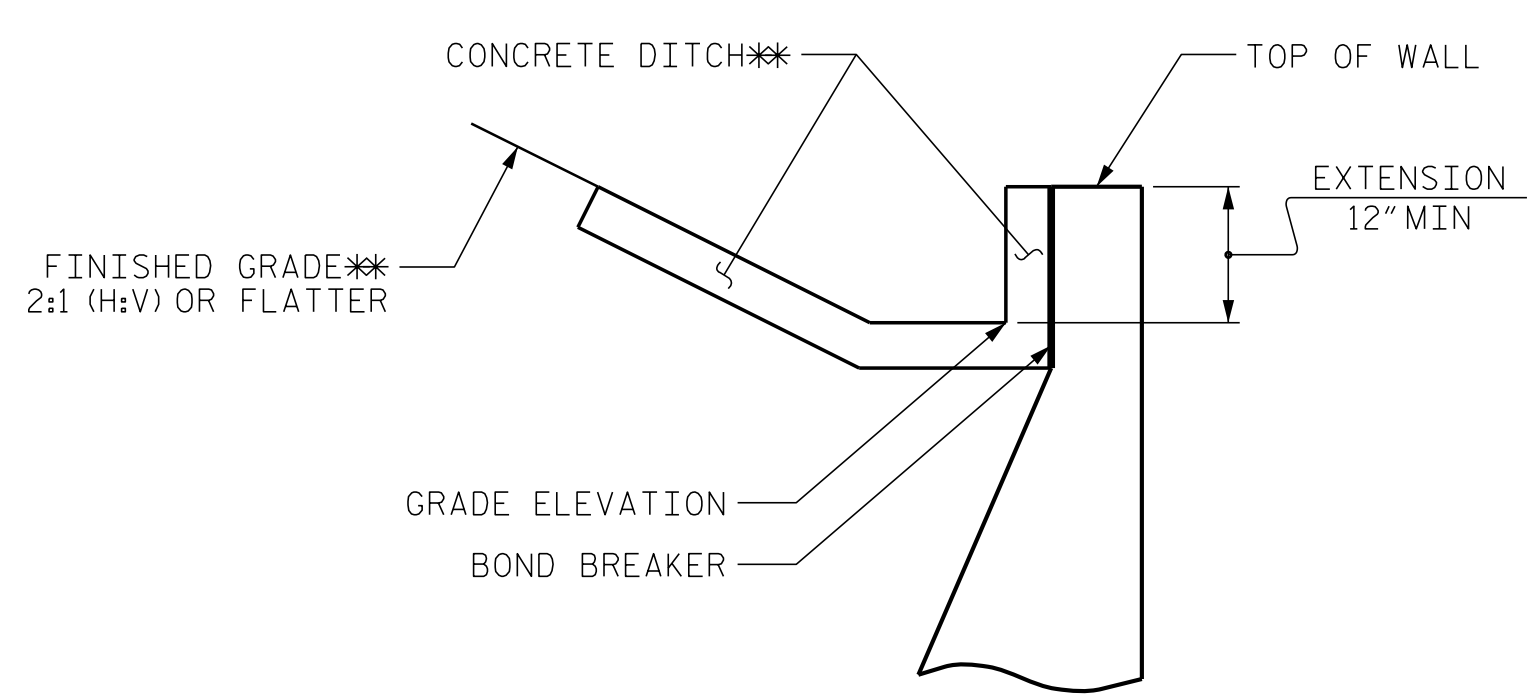
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
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2			4		

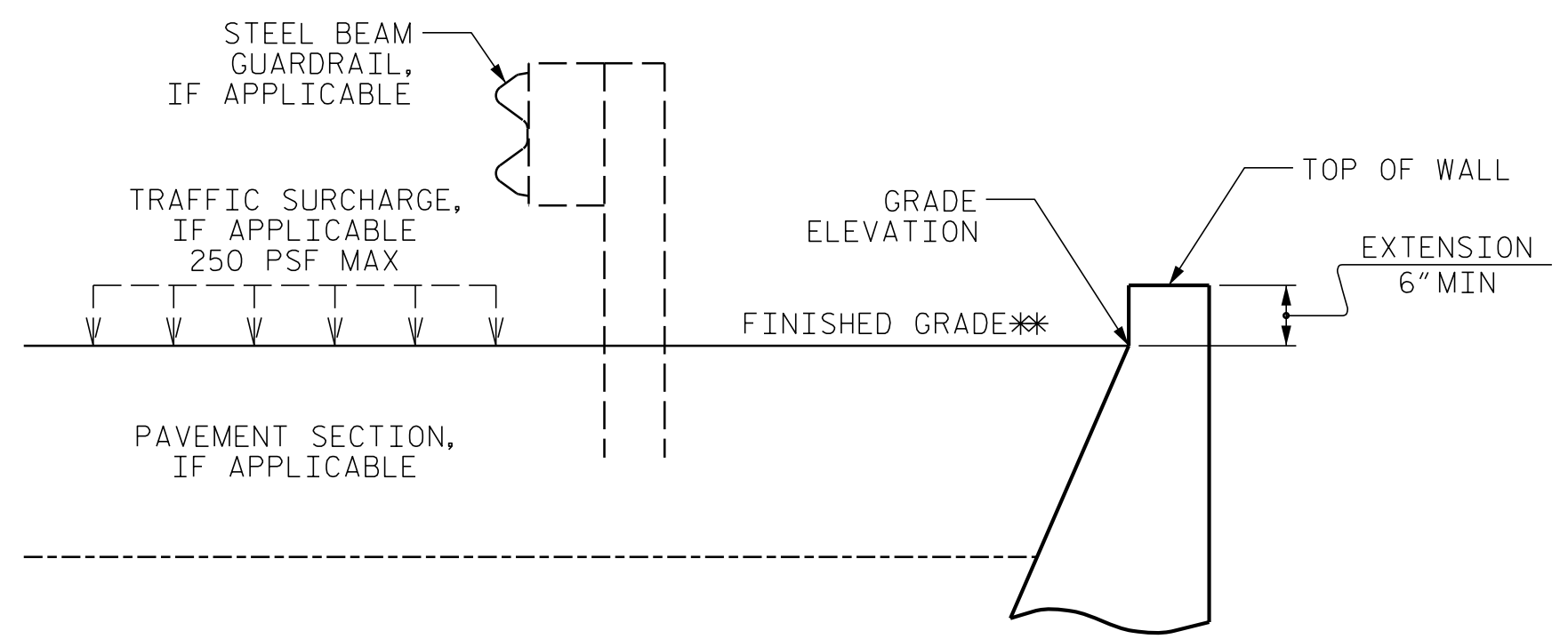
SHEET NO. W11/W2-1

GEOTECHNICAL ENGINEER  ROBERT E. KRAL	ENGINEER _____ SIGNATURE
DateSigned by: _____ MADT00838486 SIGNATURE	4/28/22 DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



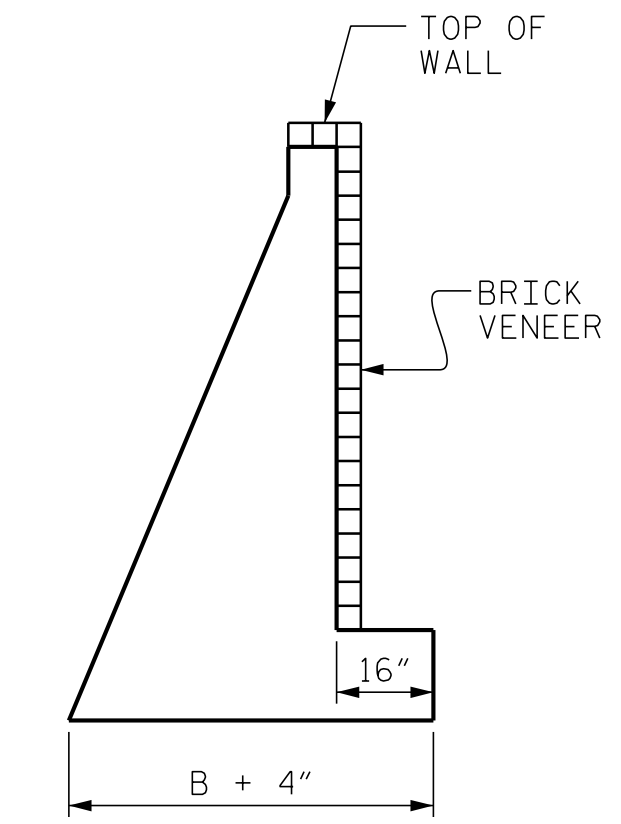
SLOPE CASE

**SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.



NO SLOPE CASE

**SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

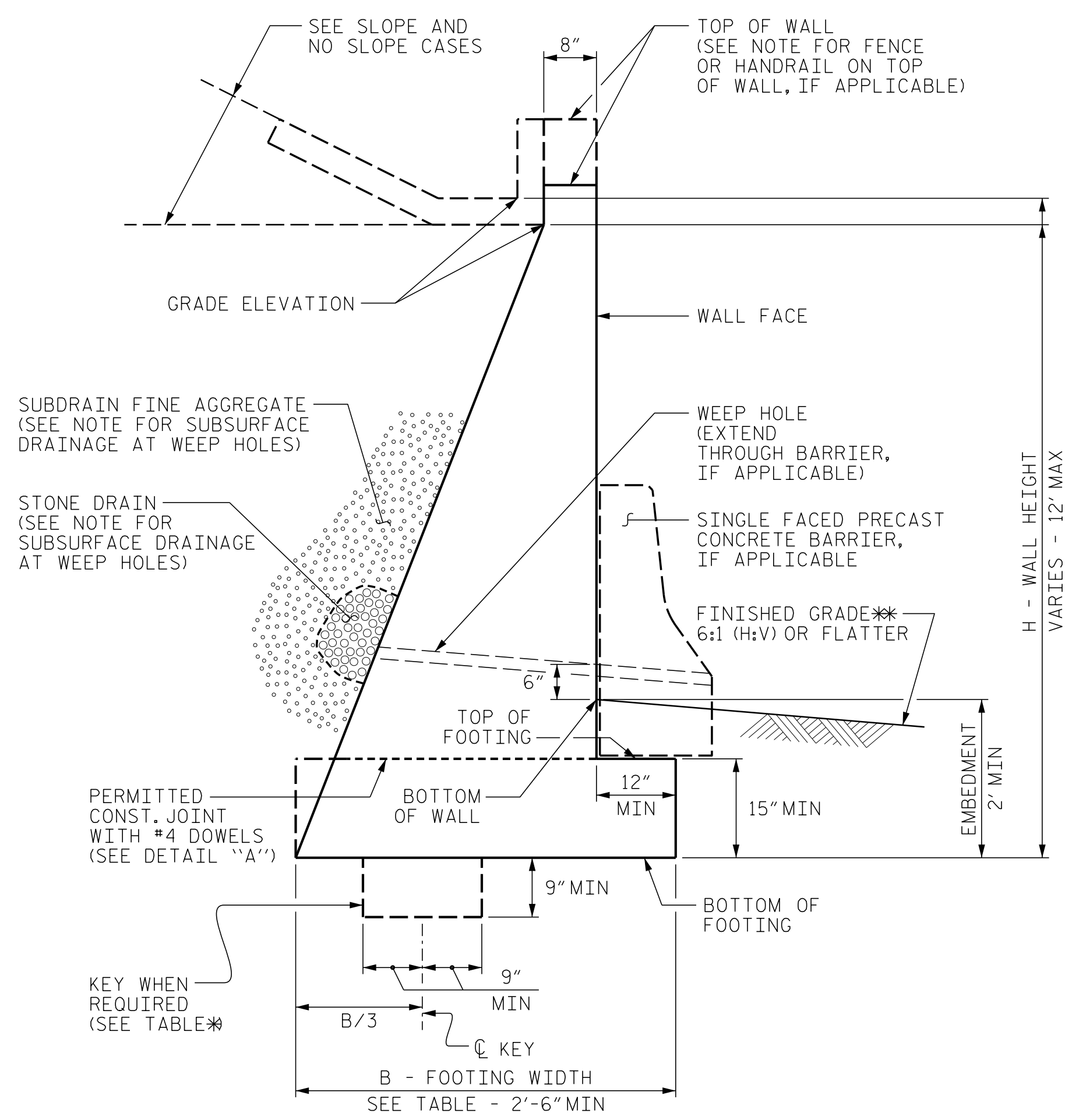


BRICK VENEER DETAIL

(WHEN APPLICABLE)

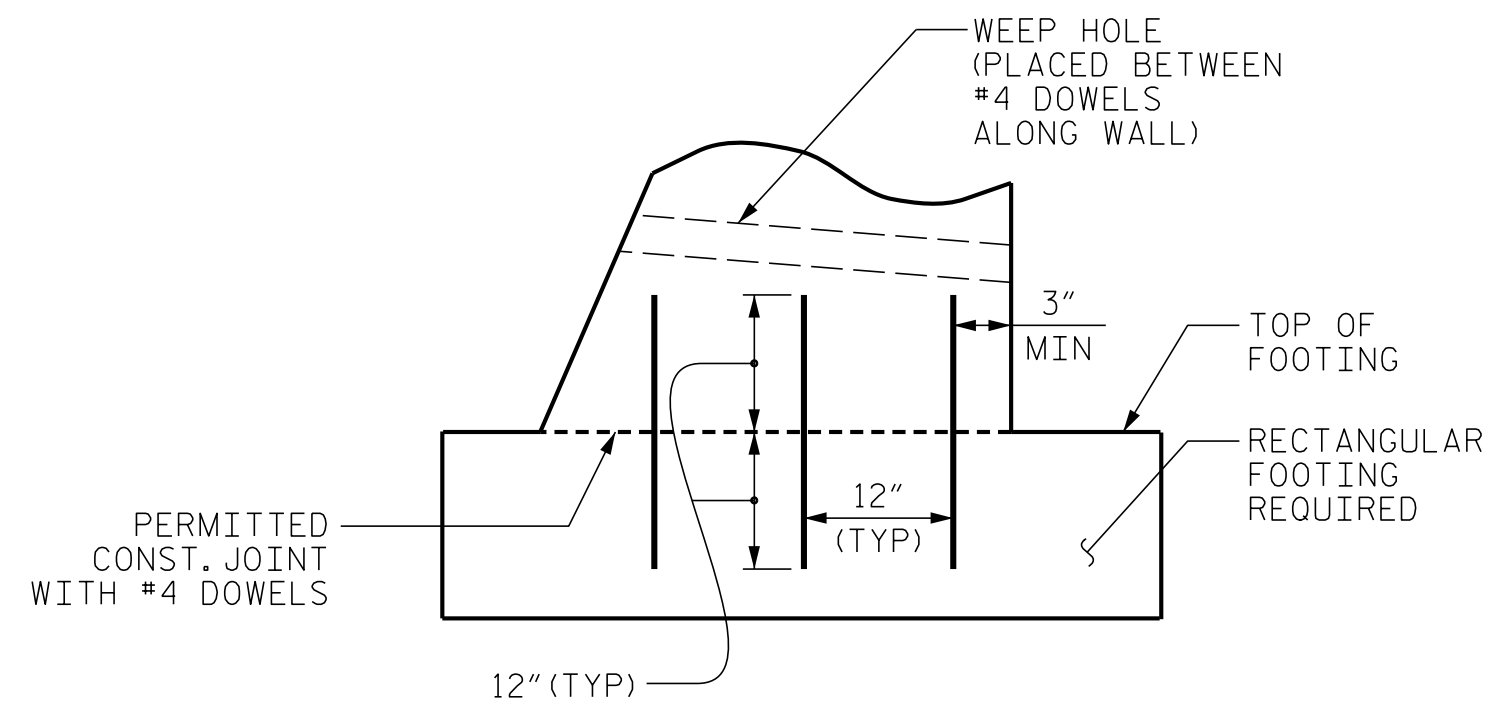
NOTES:

- FOR STANDARD CIP GRAVITY RETAINING WALLS, SEE SECTION 453 OF THE STANDARD SPECIFICATIONS.
- 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.
- FOR FENCES OR HANDRAILS ON TOP OF WALLS, SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
- FOR SUBSURFACE DRAINAGE AT WEEP HOLES, SEE ARTICLE 414-8 OF THE STANDARD SPECIFICATIONS.
- STANDARD CIP GRAVITY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 UNIT WEIGHT, $\gamma = 120$ PCF
 FRICTION ANGLE, $\phi = 35$ DEGREES (GROUNDWATER WITHIN 7' OF BOTTOM OF FOOTING)
 FRICTION ANGLE, $\phi = 30$ DEGREES (GROUNDWATER MORE THAN 7' BELOW BOTTOM OF FOOTING)
 COHESION, $c = 0$ PSF



STANDARD CIP GRAVITY WALL

**SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



DETAIL "A"

H (FT)	3 - < 6	6 - 9	> 9 - 12
SLOPE CASE	.66	.70*	.75*
NO SLOPE CASE WITH TRAFFIC SURCHARGE	.80	.75*	.70*
NO SLOPE CASE WITHOUT TRAFFIC SURCHARGE	.60	.60	.60

B/H RATIO (B = 2'-6" MIN)

*KEY IS REQUIRED FOR "SLOPE CASE" OR "NO SLOPE CASE WITH TRAFFIC SURCHARGE" WHEN H IS 6' OR GREATER.

AT THE DISCRETION OF THE ENGINEER, IF VERY LOOSE OR SOFT SOILS ARE BELOW THE BOTTOM OF WALL, UNDERCUT UP TO THREE FEET BELOW BOTTOM OF FOOTING ELEVATION AND BACKFILL WITH SELECT GRANULAR MATERIAL IN ACCORDANCE WITH THE UNDERCUT FOR EMBANKMENT STABILITY RECOMMENDATIONS INCLUDED IN THE ROADWAY RECOMMENDATIONS REPORT.

BEFORE BEGINNING STANDARD CIP GRAVITY WALL CONSTRUCTION, SURVEY WALL LOCATIONS AND SUBMIT WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. FOR WALL ENVELOPES, INCLUDE BOTTOM OF WALL, EXISTING GROUND AND GRADE ELEVATIONS AND OTHER ELEVATIONS AS NEEDED AT INTERVALS OF 25' OR LESS ALONG WALLS. DO NOT START WALL CONSTRUCTION UNTIL WALL ENVELOPES ARE ACCEPTED.

FOR BRICK VENEERS, SUBMIT BRICK SAMPLES FOR APPROVAL BEFORE BEGINNING STANDARD CIP GRAVITY WALL CONSTRUCTION.

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

WHEN CONSTRUCTING STANDARD CIP GRAVITY WALLS WITH A CONSTRUCTION JOINT AS SHOWN IN DETAIL "A", PROVIDE A MINIMUM OF 3 EQUALLY SPACED #4 DOWELS AT INTERVALS OF 1'-6" ALONG WALLS.

PROJECT NO.: A-0009CA

GRAHAM COUNTY

RETAINING WALL #1: -Y1- 32+55, 42' RT TO 34+15, 54' RT

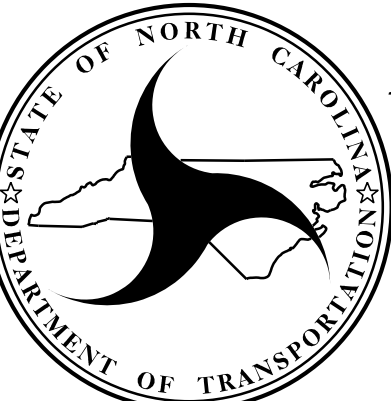
RETAINING WALL #2: -L- 11+79, 39' LT TO 12+50, 36' LT

SHEET 2 OF 2

Prepared in the Office of:



CAROLINAS GEOTECHNICAL GROUP
 2400 CROWNPOINT EXECUTIVE DRIVE
 SUITE 800
 CHARLOTTE, NC 28227
 (980) 339-8684



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

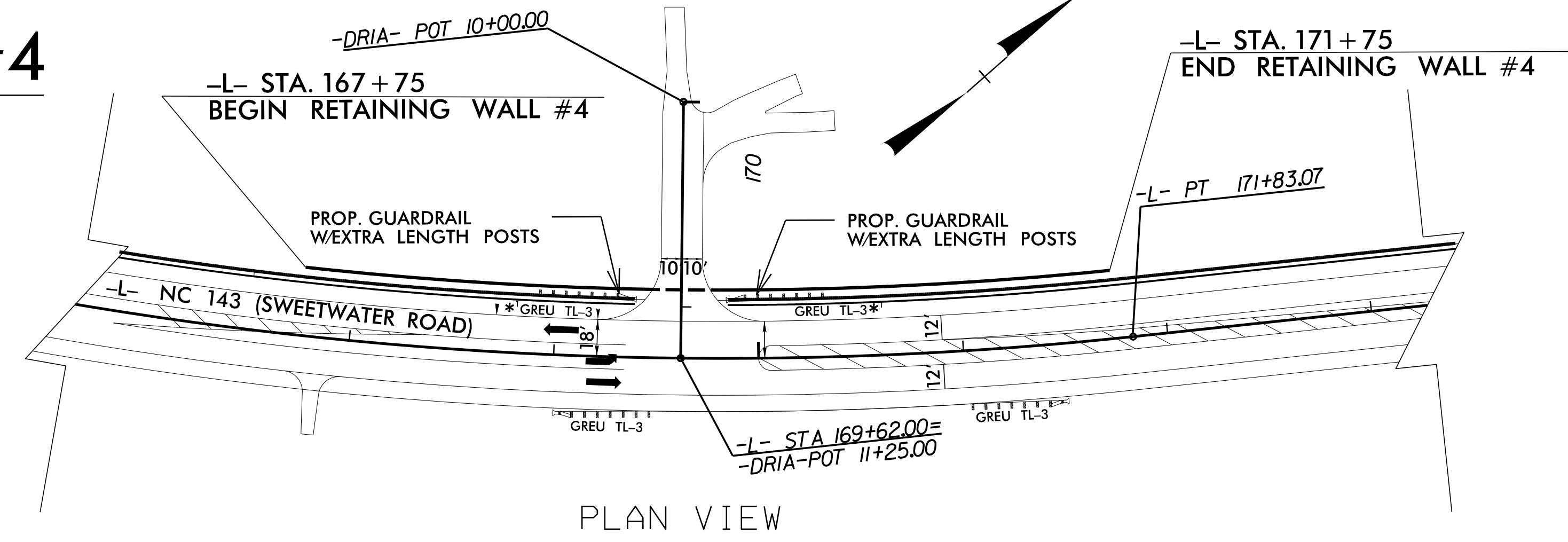
STANDARD DETAIL NO. 453.01

STANDARD CAST-IN-PLACE (CIP) GRAVITY RETAINING WALL

DATE: 1-16-18

SHEET NO. W11M2-2

RETAINING WALL #4



GEOTECHNICAL ENGINEER

ENGINEER

PROFESSIONAL SEAL 041986

D. MATTHEW BREWER

DocuSigned by: D. Matthew Brewer 4/28/2022

38812500A0C1460

SIGNATURE DATE SIGNATURE DATE

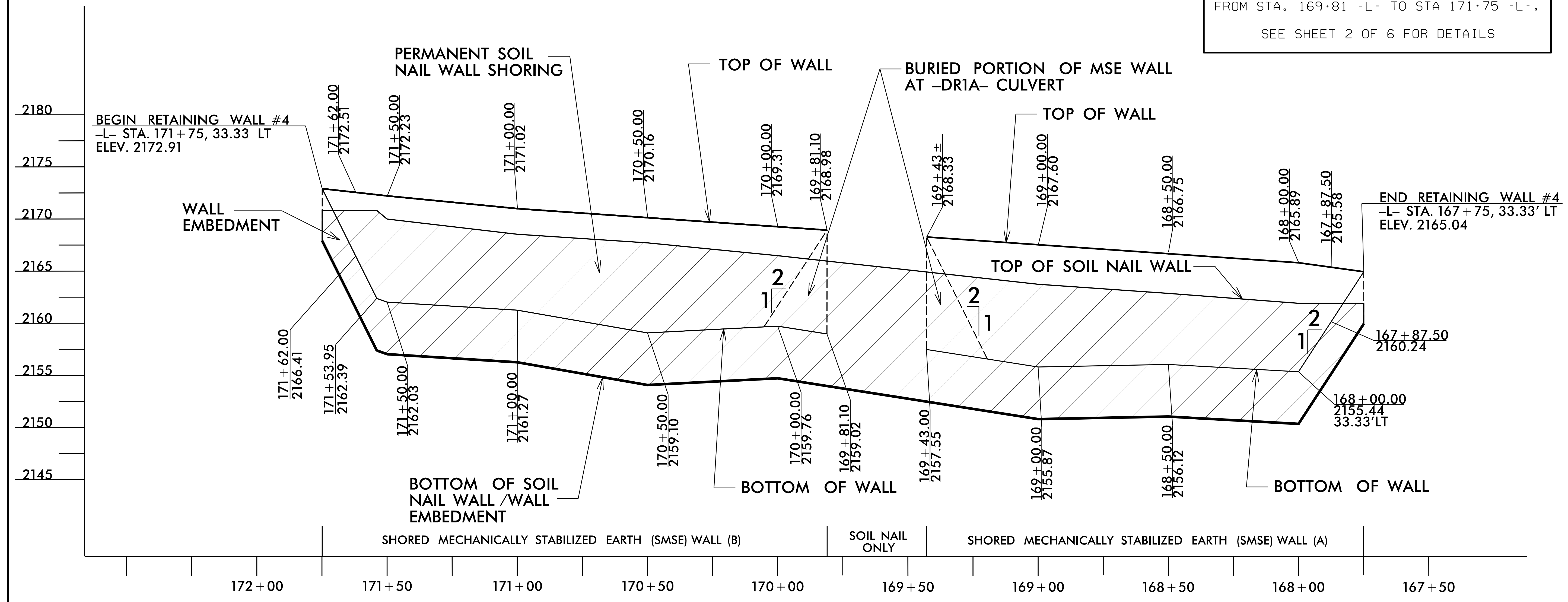
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE:

THE SOIL NAIL WALL LIMITS ARE FROM STA. 167+75 -L- TO STA. 171+75 -L-.

THE SMSE WALL LIMITS ARE FROM STA. 167+75 -L- TO STA. 169+43 -L- AND FROM STA. 169+81 -L- TO STA 171+75 -L-.

SEE SHEET 2 OF 6 FOR DETAILS



ESTIMATED SMSE WALL #4 QUANTITIES

SHORED MSE RETAINING WALL #4 (A)	2,650	SQ. FT.
SHORED MSE RETAINING WALL #4 (B)	2,950	SQ. FT.
TOTAL SHORED MSE RETAINING WALL #4	5,600	SQ. FT.

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL #	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
4	4,800*	3	15

* INCLUDES RETAINING WALL EMBEDMENT

Prepared in the Office of:

CG2 CAROLINAS GEOTECHNICAL GROUP

2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

PROJECT NO.: A-0009CA

GRAHAM COUNTY

STATION: -L-167+75, 33' LT TO 171+75, 33' LT

SHEET 1 OF 5

SHORED MECHANICALLY STABILIZED EARTH (SMSE) RETAINING WALL #4

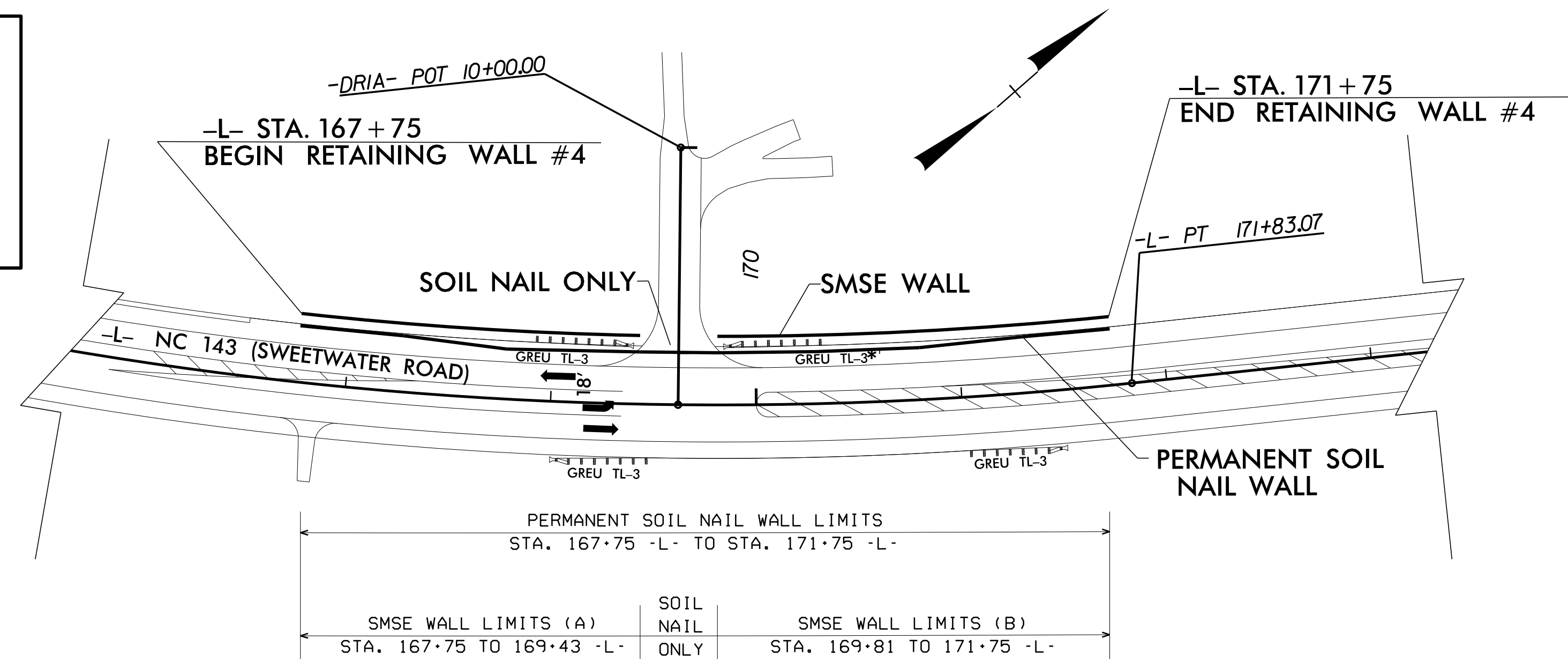
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W4-1

PREPARED BY: DMB DATE: 4/28/2022

REVIEWED BY: REK DATE: 4/28/2022

NOTE:
 THE SOIL NAIL WALL LIMITS ARE FROM STA. 167+75 -L- TO STA. 171+75 -L-.
 THE SMSE WALL LIMITS ARE FROM STA. 167+75 -L- TO STA. 169+43 -L- AND FROM STA. 169+81 -L- TO STA 171+75 -L-.



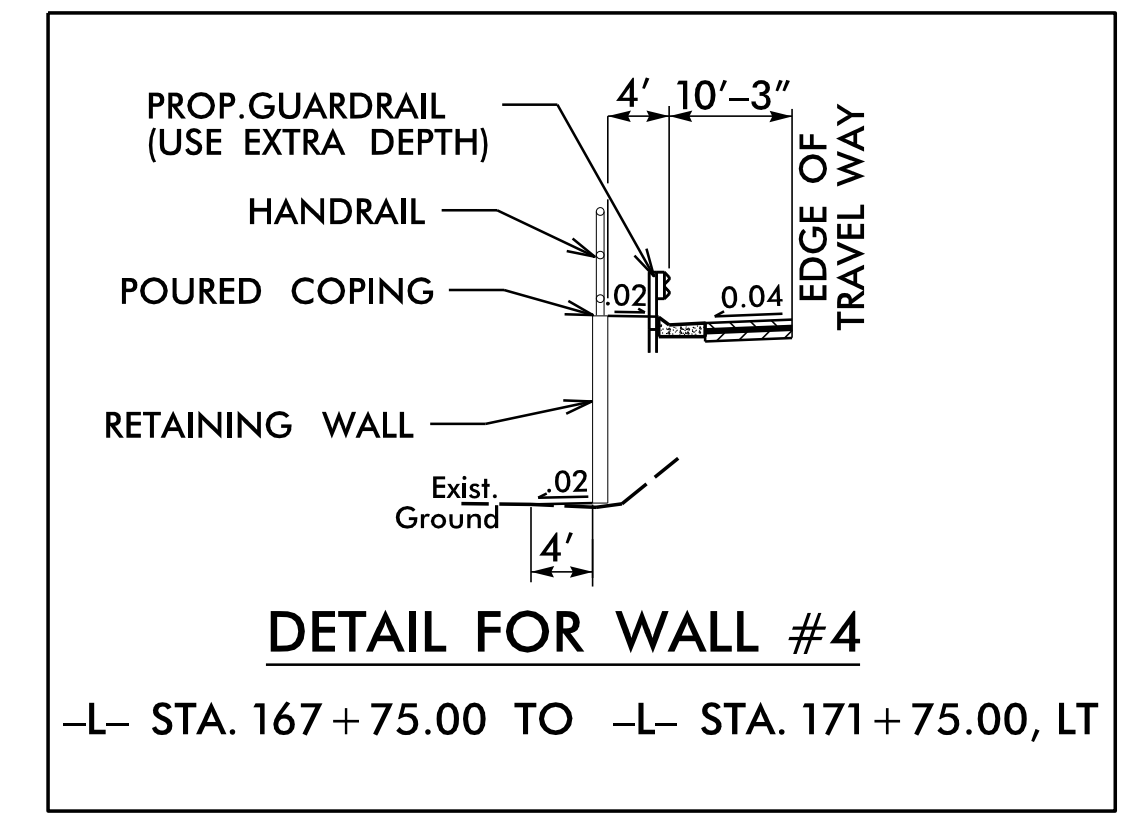
WALL LIMITS SKETCH
 NOT TO SCALE

GEOTECHNICAL ENGINEER
 ENGINEER

SEAL 041986
 D. Matthew Brewer
 ENGINEER

DocuSigned by:
 D. Matthew Brewer 4/28/2022

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DETAIL FOR WALL #4
 -L- STA. 167+75.00 TO -L- STA. 171+75.00, LT
 TYPICAL WALL SECTION
 NOT TO SCALE

SMSE RETAINING WALL #4 INFORMATION									
STA. -L-	OFFSET LT FROM CL TO WALL FACE	TOP OF WALL	BOTTOM OF WALL	MINIMUM TOP OF LEVELING PAD	ESTIMATED MINIMUM SMSE WALL EMBEDMENT	* DESIGN SMSE WALL HEIGHT "H"	TOP OF SOIL NAIL WALL	APPROX. SOIL NAIL WALL HEIGHT	WALL REINFORCEMENT (MSE STRAP) LENGTH 'L'
167+75.00	33.33	2165.04	2165.04	2160.04	5.00	5.00	2162.72	2.68	0.7XH OR 6 FT (MIN)
167+87.50	33.33	2165.58	2160.24	2155.24	5.00	10.34	2162.72	7.48	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
168+00.00	33.33	2165.89	2155.44	2105.44	5.00	15.45	2162.72	12.28	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
168+50.00	33.33	2166.75	2156.12	2151.12	5.00	15.63	2163.67	12.55	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
169+00.00	33.33	2167.60	2155.87	2150.87	5.00	16.73	2164.55	13.68	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
169+43.00	33.33	2168.33	2157.55	2152.55	5.00	15.78	2165.73	13.18	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
169+81.10	33.33	2168.98	2159.02	2154.02	5.00	14.96	2166.77	12.75	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
170+00.00	33.33	2169.31	2159.76	2154.76	5.00	14.55	2167.29	12.53	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
170+50.00	33.33	2170.16	2159.10	2154.10	5.00	16.06	2168.52	14.42	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
171+00.00	33.33	2171.02	2161.27	2156.27	5.00	14.75	2169.35	13.08	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
171+50.00	33.33	2172.23	2162.03	2157.03	5.00	15.20	2170.81	13.78	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
171+53.95	33.33	2172.34	2162.39	2157.39	5.00	14.95	2171.09	13.70	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
171+62.00	33.33	2172.51	2166.41	2161.41	5.00	11.10	2171.09	9.68	LOWER: 0.5XH OR 6 FT (MIN) UPPER: 0.7XH OR 10 FT (MIN)
171+75.00	33.33	2172.91	2172.91	2167.91	5.00	5.00	2171.09	3.18	0.7XH OR 6 FT (MIN)

* FOR DESIGN WALL HEIGHT "H" AND ADDITIONAL CONSTRUCTION DETAILS, SEE SHEETS 3 THRU 5
 ALL TABLE DIMENSIONS ARE GIVEN IN FEET

FRONT SLOPE WALL EMBEDMENT		
SLOPE IN FRONT OF STRUCTURES		MINIMUM EMBEDMENT DEPTH
HORIZONTAL	FOR WALLS	H/20
	FOR ABUTMENTS	H/10
3.0H+1.0V	WALLS	H/10
2.5H+1.0V	WALLS	H/8.5
2.0H+1.0V	WALLS	H/7
1.5H+1.0V	WALLS	H/5
1.25H+1.0V	WALLS	H/4
1.0H+1.0V	WALLS	H/3

NOTE:
 1) MAINTAIN A MINIMUM BENCH WIDTH OF 4.0 FT IN FRONT OF THE WALL FOR ITS ENTIRE LENGTH.
 2) MINIMUM EMBEDMENT DEPTH OF 5 FT, UNLESS LARGER DEPTHS DICTATED BY ABOVE TABLE.
 3) MAXIMUM SLOPE OF 1H:1V WILL BE MAINTAINED ON FRONT SLOPES FOR THE ENTIRE LENGTH OF THE WALL.
 4) SUBMIT WITH THE WALL DESIGN INTERNAL, EXTERNAL, AND GLOBAL STABILITY ANALYSES.
 5) FRONT SLOPE OF WALL SHALL HAVE GABION EROSION PROTECTION FROM BOTTOM OF WALL TO STREAM WATER ELEVATION ALONG FULL LENGTH OF WALL. REFERENCE ROADWAY RECOMMENDATIONS REPORT FOR SPECIAL PROVISION, DETAILS, AND QUANTITIES.
 REFERENCE SPECIAL PROVISION GT-3 FOR SMSE WALL.

PROJECT NO.: A-0009CA
 GRAHAM COUNTY
 STATION: -L-167+75, 33' LT TO 171+75, 33' LT
 SHEET 2 OF 5

Prepared in the Office of:

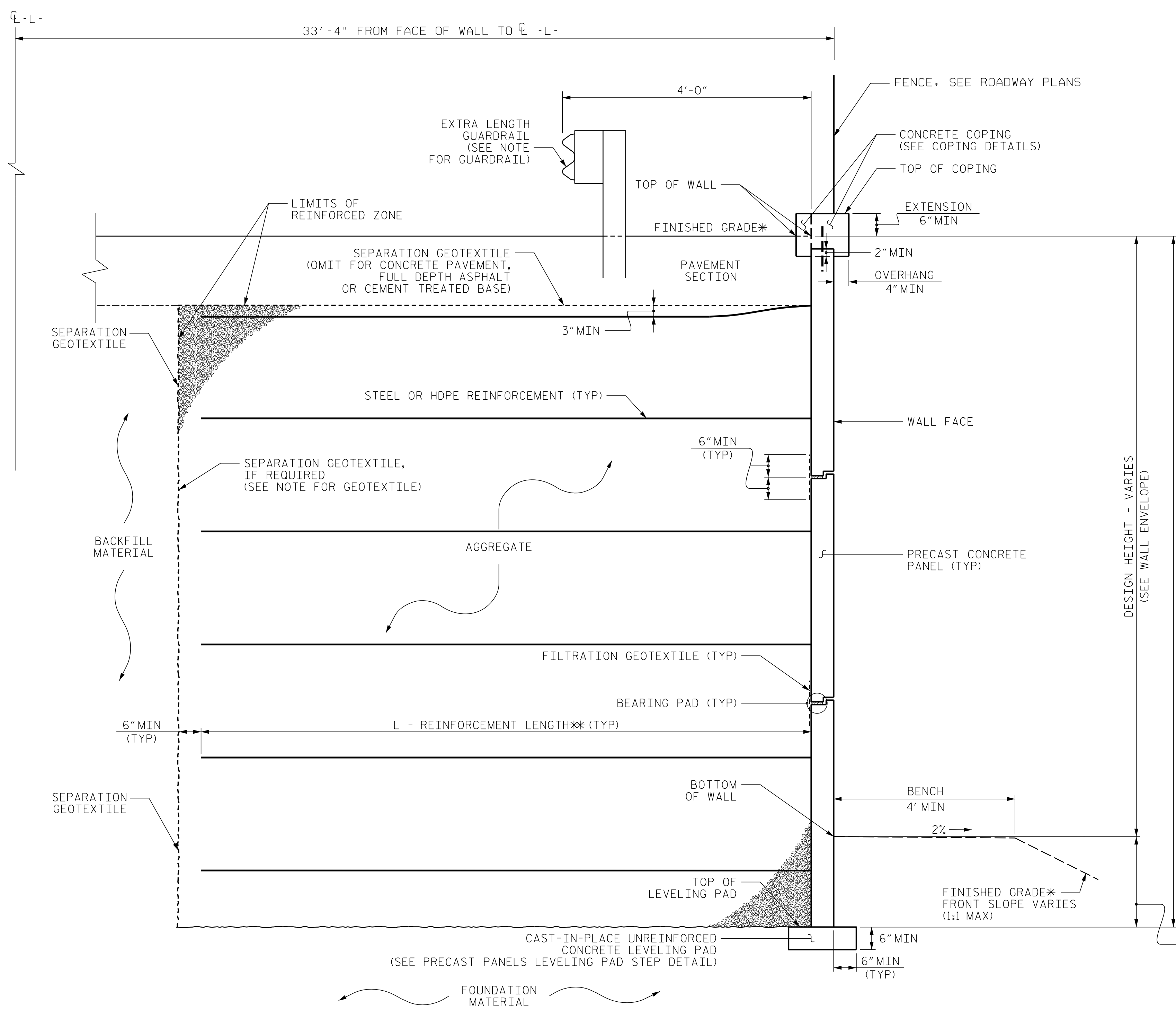
CGE CAROLINAS GEOTECHNICAL GROUP
 2400 CROWNPOINT EXECUTIVE DRIVE
 SUITE 800
 CHARLOTTE, NC 28227
 (980) 339-8684

SHORED MECHANICALLY STABILIZED EARTH (SMSE) RETAINING WALL #4

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

SHEET NO. W4-2

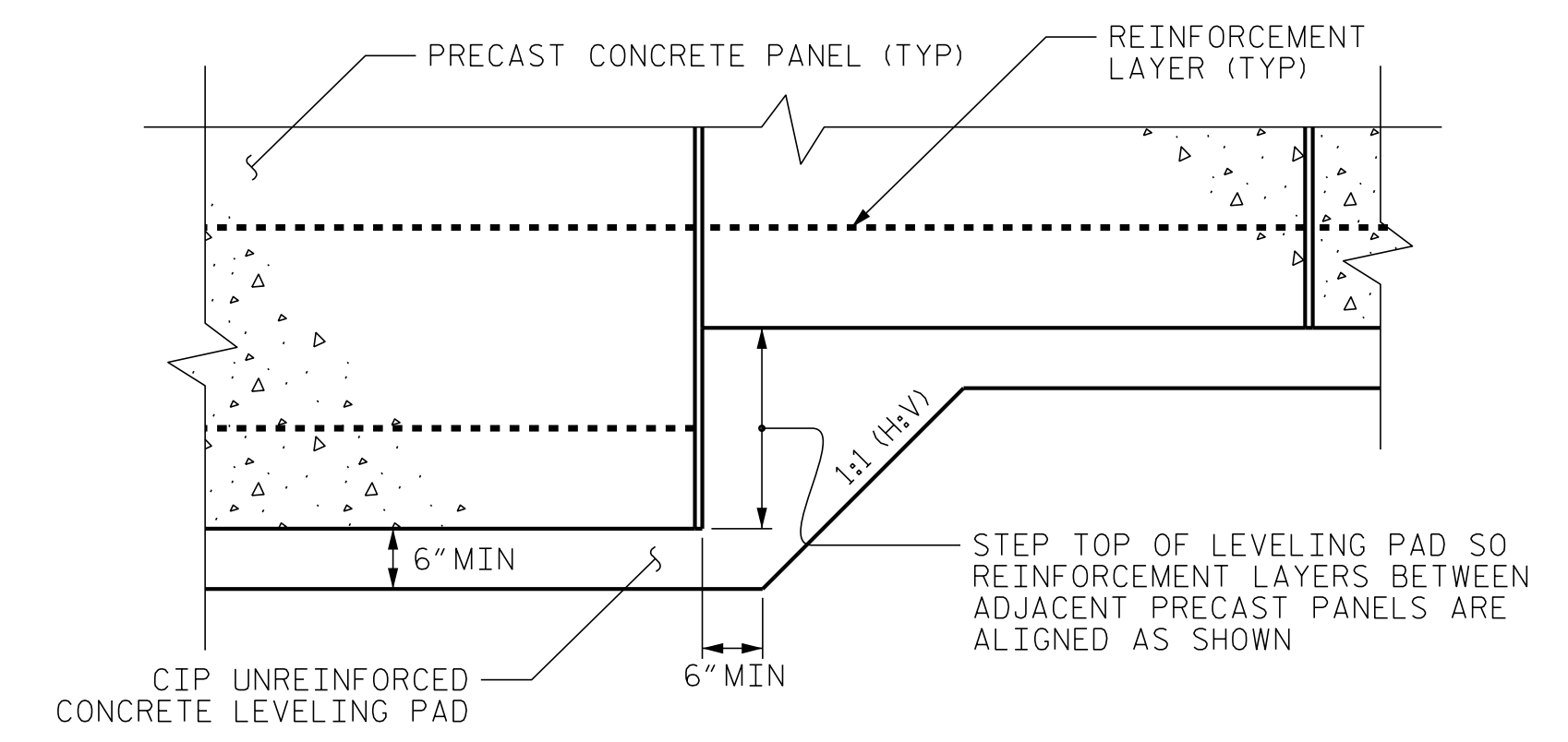
PREPARED BY: DMB	DATE: 4/28/2022
REVIEWED BY: REK	DATE: 4/28/2022



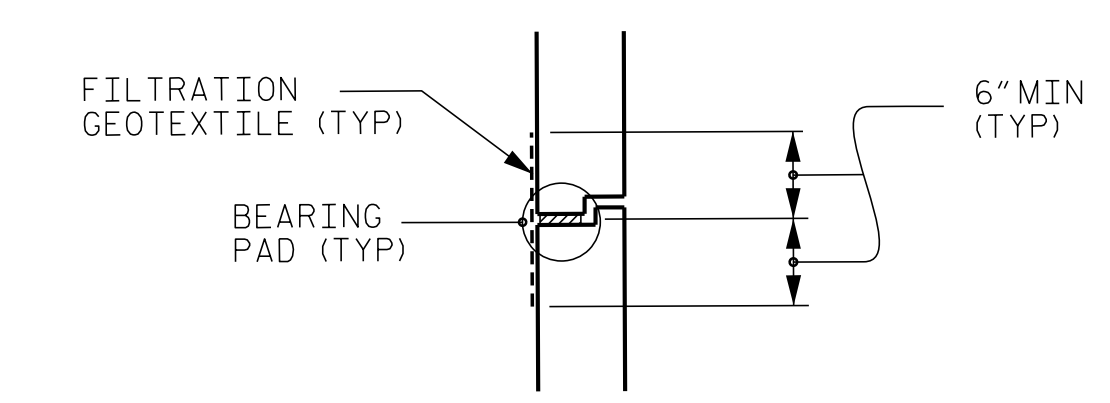
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

-L- STATION 167+75 TO 169+43 AND STATION 169+81 TO 171+75
 FOR AREAS WHERE PERMANENT SHORING IS NOT USED
 *SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE SMSE RETAINING WALLS SPECIAL PROVISION AND IF APPLICABLE, SMSE WALL NOTES REINFORCEMENT LENGTH REQUIREMENTS.

GEOTECHNICAL ENGINEER D. Matthew Brewer 4/28/2022 SIGNATURE DATE	ENGINEER SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**PRECAST PANELS
 LEVELING PAD STEP DETAIL**
 NOT TO SCALE



**PRECAST PANEL
 JOINT DETAILS**
 NOT TO SCALE

PREPARED BY: DMB	DATE: 4/28/2022
REVIEWED BY: REK	DATE: 4/28/2022

Prepared in the Office of:

**CAROLINAS
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 GROUP**
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 CHARLOTTE, NC 28227
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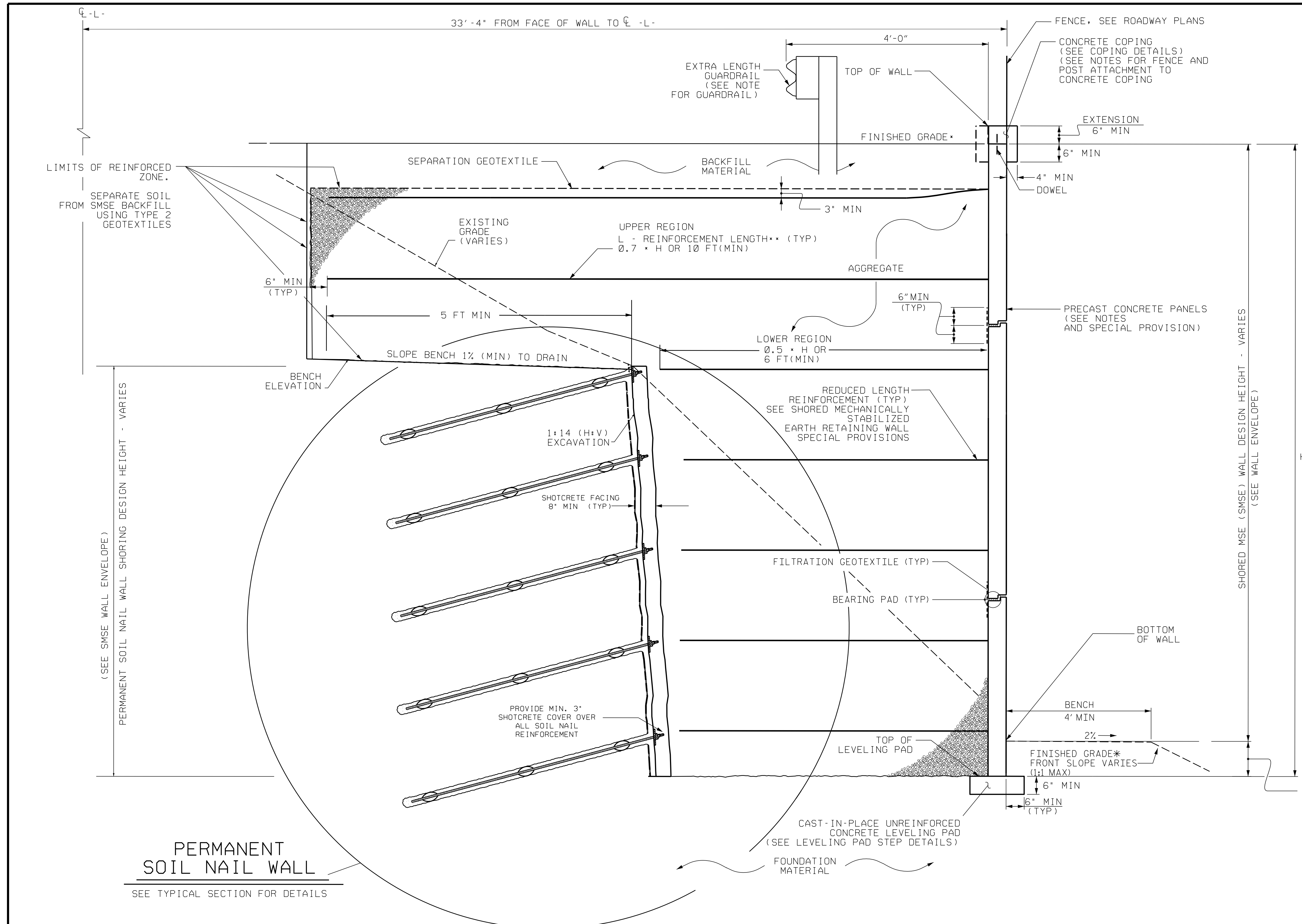
**NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS**

**GEOTECHNICAL
 ENGINEERING UNIT**

PROJECT NO.: A-0009CA
 GRAHAM COUNTY
 STATION: -L-167+75, 33' LT TO 171+75, 33' LT
 SHEET 3 OF 5

MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL #4					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W4-3



LIMITS OF REINFORCED ZONE.
SEPARATE SOIL SMSE BACKFILL USING TYPE 2 GEOTEXTILES

PERMANENT SOIL NAIL WALL SHORING DESIGN HEIGHT - VARIES
(SEE SMSE WALL ENVELOPE)

PERMANENT SOIL NAIL WALL
SEE TYPICAL SECTION FOR DETAILS

SMSE WALL WITH SOIL NAIL WALL > 2/3 H

-L- STATION 167+75 TO 169+43 AND STATION 169+81 TO 171+75
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE SMSE RETAINING WALLS SPECIAL PROVISION REINFORCEMENT LENGTH REQUIREMENTS.

GEOTECHNICAL ENGINEER D. Matthew Brewer 38812500A04C1460 SIGNATURE DATE	ENGINEER SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PROJECT NO.: A-0009CA
GRAHAM COUNTY
STATION: -L-167+75, 33' LT TO 171+75, 33' LT
SHEET 4 OF 5

PREPARED BY: DMB	DATE: 4/28/2022
REVIEWED BY: REK	DATE: 4/28/2022

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SHORED MECHANICALLY STABILIZED EARTH (SMSE) RETAINING WALL #4					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W4-4

NOTES:

FOR SHORED MECHANICALLY STABILIZED EARTH (SMSE) RETAINING WALLS, SEE SHORED MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.
 FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
 FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 USE AN SMSE WALL SYSTEM WITH PRECAST PANELS FOR THIS RETAINING WALL.
 DO NOT USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL #4.
 A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL #4.
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL #4.

BEFORE BEGINNING SMSE WALL DESIGN FOR RETAINING WALL #4, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
 DESIGN RETAINING WALL #4 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN FINISHED GRADE/TOP OF WALL ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).

- DESIGN RETAINING WALL #4 FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT + EMBEDMENT
 2) DESIGN LIFE = 75 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,000 PSF
 4) MINIMUM MSE REINFORCEMENT LENGTH (L) = VARIES, SEE TABLE ON SHEET W4-2
 5) MINIMUM SOIL NAIL REINFORCEMENT LENGTHS ARE BASED ON SNAIL.
 6) MINIMUM EMBEDMENT DEPTH = 5 FT (MIN), SEE TABLE ON SHEET W4-2
 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.

9) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (C) PSF
BACKFILL	120	30	0
FOUNDATION	120	29	0

DESIGN RETAINING WALL #4 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH MSE AND SOIL NAIL REINFORCEMENT FOR RETAINING WALL #4.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR MSE WALL PORTION OF RETAINING WALL #4 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL #4. SEE SMSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

FOR FENCES OR HANDRAILS ON THE TOP OF THE RETAINING WALL, SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

FOR SOIL NAIL RETAINING WALLS, SEE SMSE RETAINING WALL SPECIAL PROVISION.

THE SMSE WALL DESIGNER SHALL CONSULT WITH THE SOIL NAIL WALL DESIGNER TO VERIFY LOCATIONS WHERE "TEMPORARY SHORING" MAY BE REQUIRED FOR THE RETAINING WALL IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE TRAFFIC CONTROL PLANS. IN LOCATIONS WHERE "PERMANENT SOIL NAIL WALL" IS USED, PAYMENT WILL NOT BE MADE FOR "TEMPORARY SHORING" FOR TRAFFIC CONTROL.

THE PERMANENT SOIL NAIL WALL HEIGHT IS AN ESTIMATE ONLY, THAT IS BASED ON THE ANTICIPATED EXCAVATION PLUS THE MINIMUM EMBEDMENT LISTED.

WHERE APPLICABLE, DESIGN SOIL NAIL WALL REINFORCEMENT INCLINATION TO ACCOUNT FOR EXISTING OR FUTURE UTILITY CONFLICTS BEHIND THE SOIL NAIL WALL. VERIFY UTILITY LOCATION AND ELEVATION BEFORE BEGINNING SOIL NAIL WALL DESIGN OR CONSTRUCTION.

"TOP OF SOIL NAIL WALL" AS SHOWN IN THE WALL ENVELOPE REPRESENTS THE APPROXIMATE GRADE ELEVATION AT A DISTANCE OF 0.5 TIMES THE PROPOSED WALL HEIGHT ("H") AT THAT STATION.

THE ESTIMATED SOIL NAIL WALL QUANTITY IS BASED ON 0.5 TIMES "H" (SMSE DESIGN HEIGHT) INCLUDING THE MINIMUM EMBEDMENT LISTED IN THE DESIGN TABLE ON SHEET W4-2. THESE VALUES ARE PROVIDED AS AN ESTIMATE ONLY AND MAY VARY DUE TO SITE CONDITIONS.

THE SOIL NAIL WALL DESIGNER IS RESPONSIBLE FOR DETERMINING GLOBAL STABILITY BASED ON THE FINISHED SMSE WALL. A MINIMUM FACTOR OF SAFETY OF 1.35 IS REQUIRED FOR GLOBAL STABILITY. SUBMIT THESE RESULTS WITH THE WALL DESIGN PACKAGE. VERIFY UTILITY LOCATIONS AND ELEVATIONS BEFORE BEGINNING MSE WALL DESIGN OR CONSTRUCTION.

CONTRACTOR SHALL BE MADE AWARE THAT GRAVELLY SOILS AND BOULDER FILL WERE USED IN THE EXISTING ROADWAY EMBANKMENT AND MAY BE ENCOUNTERED DURING SOIL NAIL WALL CONSTRUCTION.

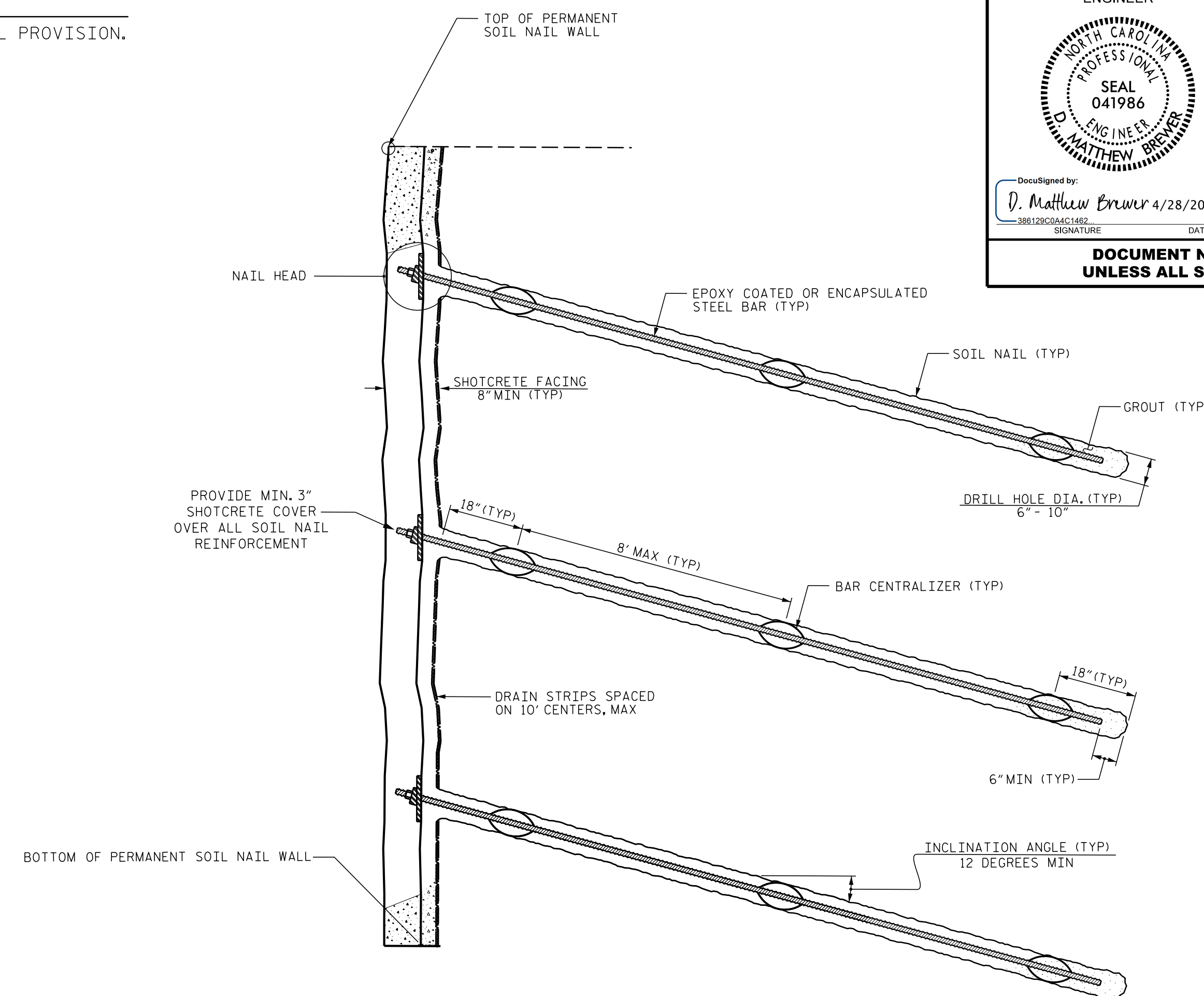
SPECIAL NOTES:

UNDERCUTTING SOFT AND/OR WET SOILS IN THE VICINITY OF THE REINFORCED ZONE AND LEVELING PAD MAY BE REQUIRED. IF REQUIRED BY THE ENGINEER, USE UNDERCUT EXCAVATION TO REMOVE SOFT SOILS AS DIRECTED BY THE ENGINEER. UNDERCUT TO SUITABLE FOUNDATION SOILS OR TO A DEPTH NO GREATER THAN 3 FEET BELOW THE TOP OF LEVELING PAD ELEVATION, WHICHEVER OCCURS FIRST. PLACE GEOTEXTILE FOR SOIL STABILIZATION IN THE BOTTOM OF THE EXCAVATION AND BACKFILL WITH SELECT GRANULAR MATERIAL. FOR UNDERCUT EXCAVATION AND SELECT GRANULAR MATERIAL SEE STANDARD SPECIFICATIONS. UNDERCUT EXCAVATION, SELECT GRANULAR MATERIAL, AND GEOTEXTILE FOR SOIL STABILIZATION WILL BE PAID AS SEPARATE ADDITIONAL QUANTITIES.

EXTEND SOIL NAIL WALL TO BOTTOM OF EXCAVATION AS REQUIRED. ADDITIONAL SOIL NAIL WALL DUE TO UNDERCUT EXCAVATION WILL BE PAID AS ADDITIONAL WORK IN ACCORDANCE WITH THE SHORED MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.

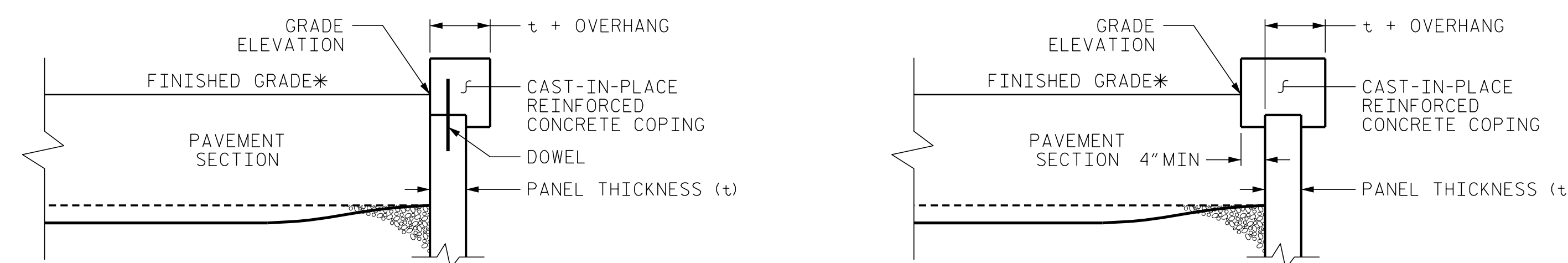
GABION EROSION PROTECTION IS REQUIRED ON THE FRONT SLOPE OF THE WALL AT ALL LOCATIONS. REFERENCE GABION EROSION PROTECTION SPECIAL PROVISION AND DETAIL 2G-3 THROUGH 2G-5 FOR QUANTITIES AND DETAILS.

GROUNDWATER MAY BE ENCOUNTERED ABOVE THE TOP OF LEVELING PAD ELEVATION. CONTRACTOR SHOULD BE PREPARED TO DEWATER, IF REQUIRED.



SOIL NAIL WALL - TYPICAL SECTION

-L- STATION 167+75 TO 171+75



COPING DETAILS

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

GEOTECHNICAL ENGINEER D. Matthew Brewer 38812500A04C1460 SIGNATURE DATE	ENGINEER SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PROJECT NO.: A-0009CA
 GRAHAM COUNTY
 STATION: -L-167+75, 33' LT TO 171+75, 33' LT
 SHEET 5 OF 5

PREPARED BY: DMB	DATE: 4/28/2022
REVIEWED BY: REK	DATE: 4/28/2022

Prepared in the Office of:

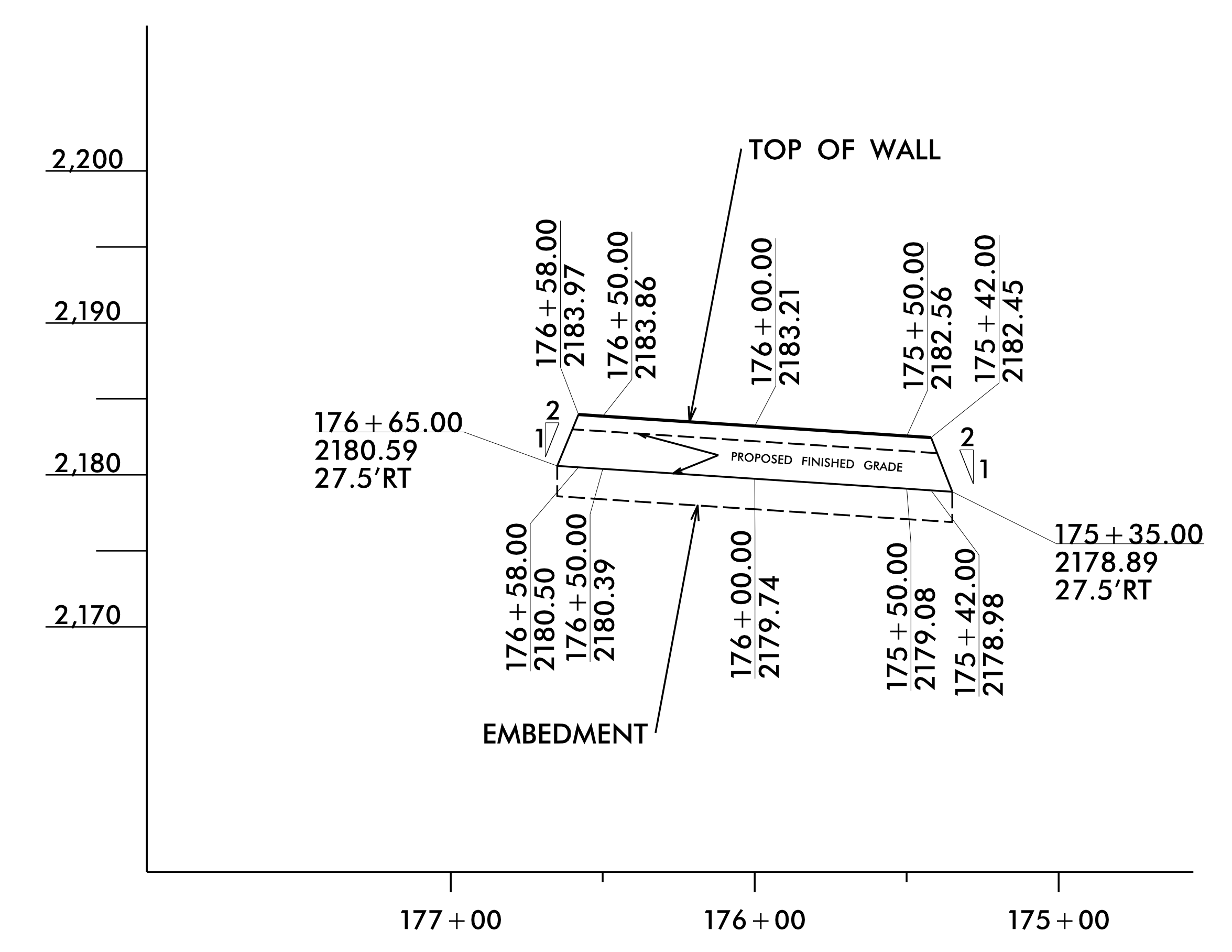
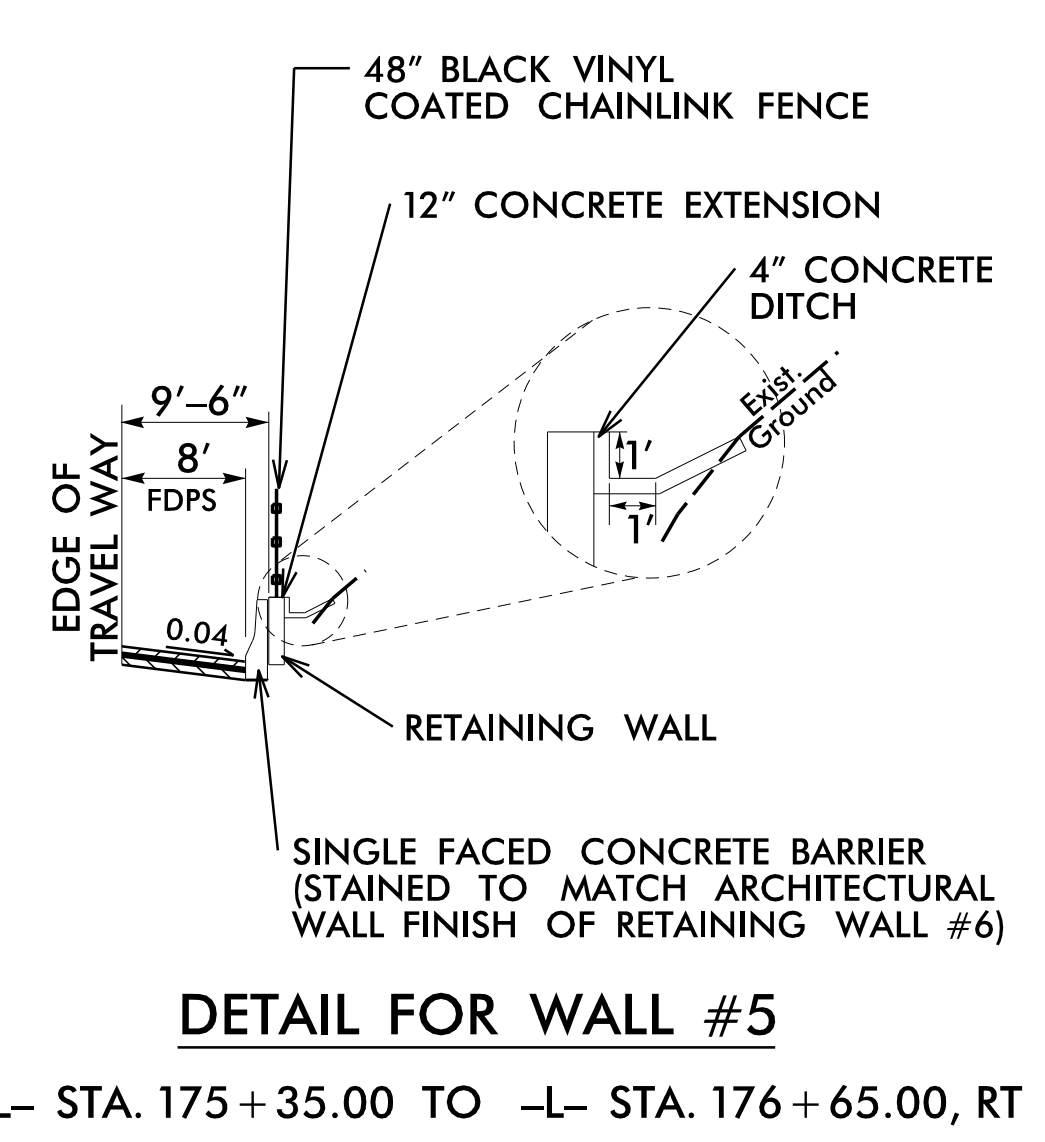
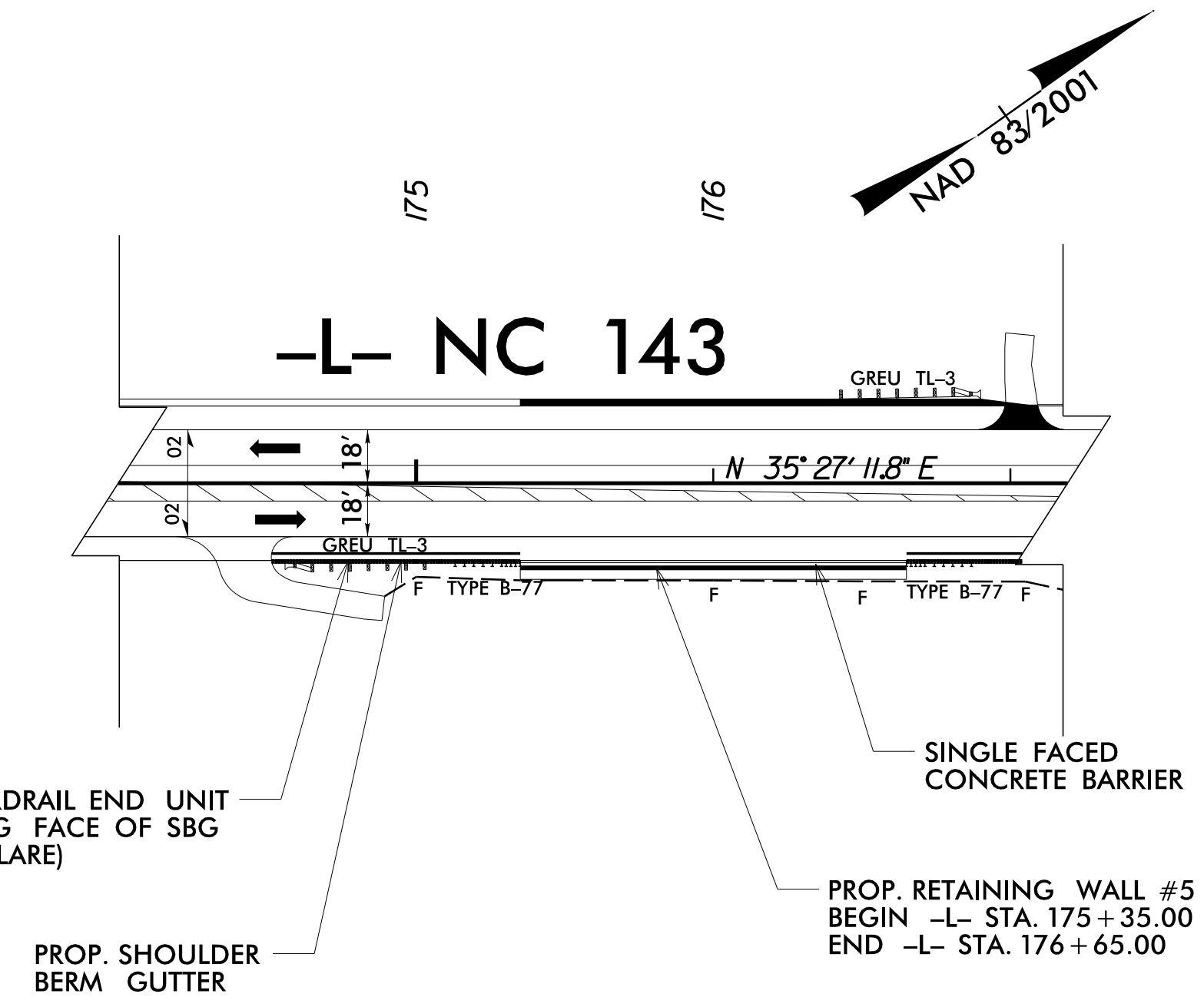
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

**GEOTECHNICAL
 ENGINEERING UNIT**

SHORED MECHANICALLY STABILIZED EARTH (SMSE) RETAINING WALL #4					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W4-5

RETAINING WALL #5:



RETAINING WALL #5:
NOT TO SCALE
(LOOKING AT FACE OF WALL)

GEOTECHNICAL ENGINEER Documented by: SA070385AB46E4 SIGNATURE	ENGINEER DATE: 06/23/2022 SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

ESTIMATED RETAINING WALL QUANTITY (SQUARE FEET)	
NON-STANDARD CIP GRAVITY RETAINING WALL #5	690 SF
FORM LINER ARCHITECTURAL FINISH*	50 SF

* AREA OF EXPOSED WALL FACE BETWEEN TOP OF SINGLE FACED CONCRETE BARRIER AND TOP OF WALL.

PROJECT NO.: A-0009CA
GRAHAM COUNTY
RETAINING WALL #5: -L- 175+35, 27' RT TO 176+65, 27' RT
SHEET 1 OF 2

PREPARED BY: R. KRAL	DATE: 6/23/2022
REVIEWED BY: M. BREWER	DATE: 6/23/2022

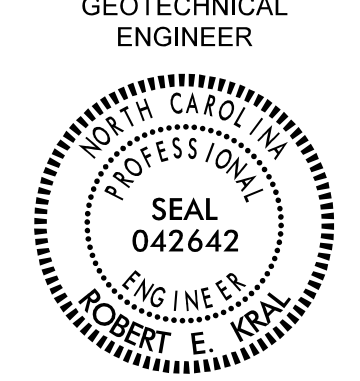
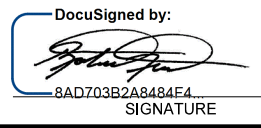
RETAINING WALL #5 ENVELOPE AND WALL LAYOUT PROVIDED BY TGS ENGINEERS, INC.

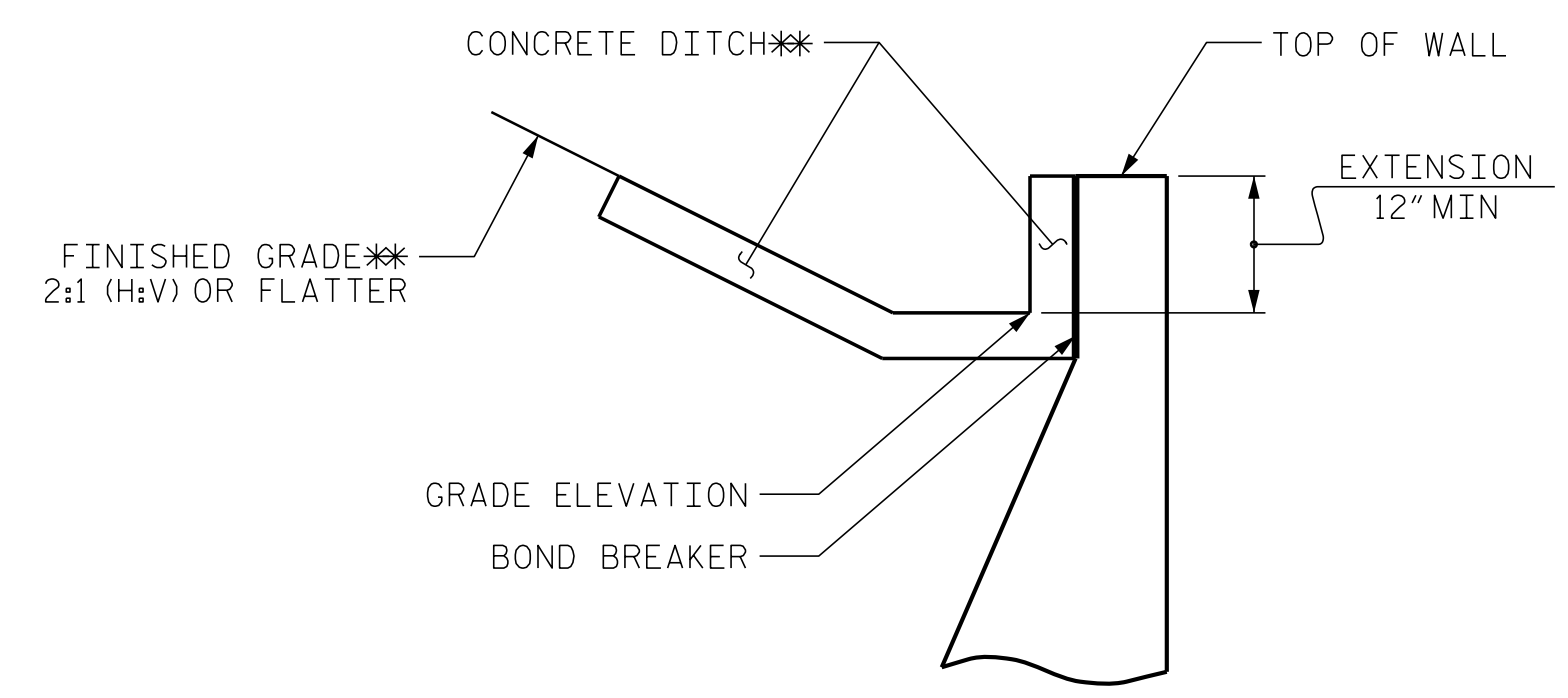
Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

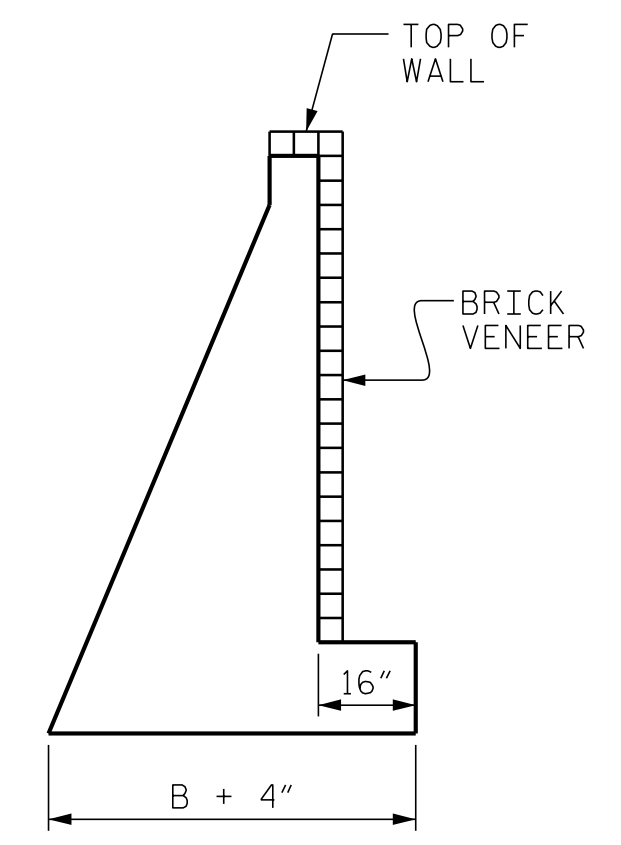
RETAINING WALL #5 NON-STANDARD CIP GRAVITY RETAINING WALL					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

GEOTECHNICAL ENGINEER  Documented by:  DATE: 06/23/2022 SIGNATURE: _____ DATE: _____	ENGINEER SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SLOPE CASE

**SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.



BRICK VENEER DETAIL

(WHEN APPLICABLE)

NOTES:

FOR NON-STANDARD CIP GRAVITY RETAINING WALLS, SEE NON-STANDARD CIP GRAVITY RETAINING WALLS SPECIAL SPECIFICATIONS.

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.

FOR FENCES OR HANDRAILS ON TOP OF WALLS, SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

FOR ANY EXPOSED FACE, A FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP GRAVITY RETAINING WALL #5. THE CONTRACTOR SHALL PROVIDE THE REQUESTED FINISH BEFORE BEGINNING CIP GRAVITY RETAINING WALL CONSTRUCTION. THE APPEARANCE (STONE SIZE AND SHAPE, STONE COLOR, AND STONE TEXTURE, PATTERN, AND RELIEF) SHOULD MATCH NATURAL STONE AND ROCK. FOR FORM LINER ARCHITECTURAL FINISH, SEE THE SIMULATED STONE FORM LINER FINISH SPECIAL PROVISION.

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

NON-STANDARD CIP GRAVITY WALLS ARE BASED ON THE FOLLOWING:
 IN-SITU ASSUMED RETAINED SOIL PARAMETERS:
 UNIT WEIGHT, $\gamma = 120$ PCF
 FRICTION ANGLE, $\phi = 40$ DEGREES
 COHESION, $c = 0$ PSF

IN-SITU ASSUMED FOUNDATION SOIL PARAMETERS:
 UNIT WEIGHT, $\gamma = 120$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF

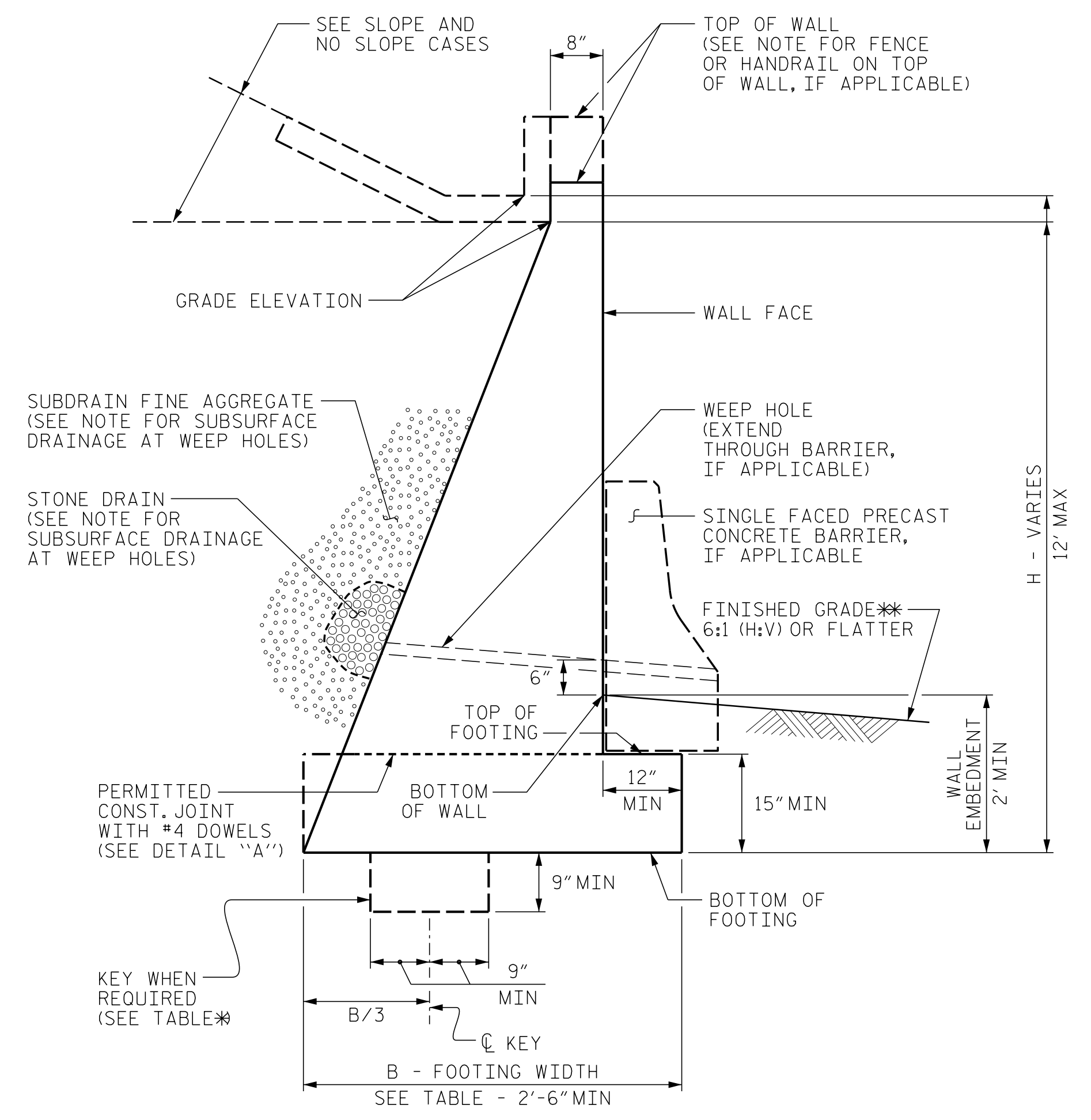
A MINIMUM BEARING RESISTANCE OF 1.0 TSF IS REQUIRED FOR RETAINING WALL #5.

UNDERCUTTING SOFT AND/OR WET SOILS IN THE VICINITY OF THE WALL FOUNDATION MAY BE REQUIRED TO IMPROVE BEARING RESISTANCE. THE ENGINEER WILL DETERMINE THE SOILS BEARING RESISTANCE AFTER THE WALL FOOTING IS EXCAVATED TO BEARING GRADE. IF REQUIRED BY THE ENGINEER, USE UNDERCUT EXCAVATION TO REMOVE SOFT AND/OR WET SOILS. UNDERCUT TO SUITABLE FOUNDATION SOILS OR TO A DEPTH NO GREATER THAN 3 FEET BELOW THE BOTTOM OF FOOTING ELEVATION, WHICHEVER OCCURS FIRST. PLACE GEOTEXTILE FOR SOIL STABILIZATION IN THE BOTTOM OF THE EXCAVATION AND BACKFILL WITH SELECT GRANULAR MATERIAL. FOR UNDERCUT EXCAVATION AND SELECT GRANULAR MATERIAL SEE STANDARD SPECIFICATIONS. UNDERCUT EXCAVATION, SELECT GRANULAR MATERIAL, AND GEOTEXTILE FOR SOIL STABILIZATION WILL BE PAID AS SEPARATE ADDITIONAL QUANTITIES.

BEFORE BEGINNING NON-STANDARD CIP GRAVITY WALL CONSTRUCTION, SURVEY WALL LOCATIONS AND SUBMIT WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. FOR WALL ENVELOPES, INCLUDE BOTTOM OF WALL, EXISTING GROUND AND GRADE ELEVATIONS, AND SLOPE ELEVATIONS BEHIND THE WALL AT INTERVALS OF 25' OR LESS ALONG WALLS. DO NOT START WALL CONSTRUCTION UNTIL WALL ENVELOPES ARE ACCEPTED.

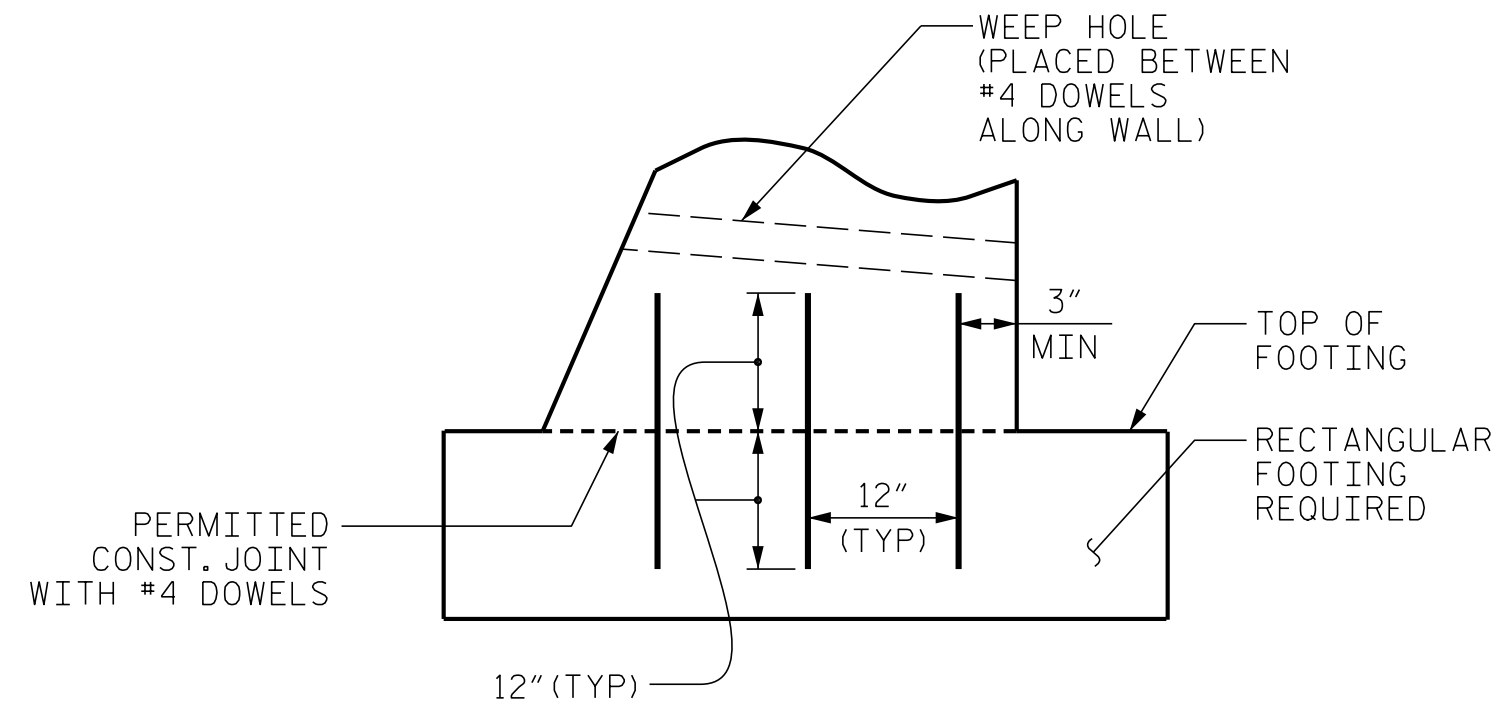
DO NOT PLACE CONCRETE FOR FOOTINGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

WHEN CONSTRUCTING NON-STANDARD CIP GRAVITY WALLS WITH A CONSTRUCTION JOINT AS SHOWN IN DETAIL "A", PROVIDE A MINIMUM OF 3 EQUALLY SPACED #4 DOWELS AT INTERVALS OF 1'-6" ALONG WALLS.



NON-STANDARD CIP GRAVITY WALL

**SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



DETAIL "A"

H (FT)	3 - < 6	6 - 9	> 9 - 12
SLOPE CASE	.66	.70*	.75*
NO SLOPE CASE WITH TRAFFIC SURCHARGE	.80	.75*	.70*
NO SLOPE CASE WITHOUT TRAFFIC SURCHARGE	.60	.60	.60

B/H RATIO (B = 2'-6" MIN)

*KEY IS REQUIRED FOR "SLOPE CASE" OR "NO SLOPE CASE WITH TRAFFIC SURCHARGE" WHEN H IS 6' OR GREATER.

PROJECT NO.: A-0009CA

GRAHAM COUNTY

RETAINING WALL #5: -L- 175+35, 27' RT TO 176+65, 27' RT

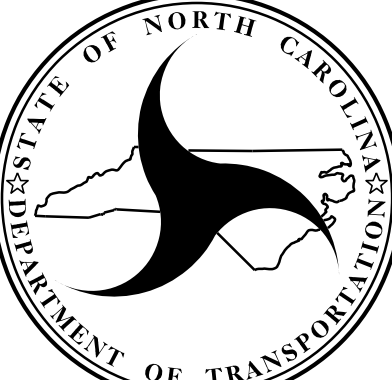
SHEET 2 OF 2

PREPARED BY: R. KRAL	DATE: 6/23/2022
REVIEWED BY: M. BREWER	DATE: 6/23/2022

Prepared in the Office of:



**CAROLINAS
GEOTECHNICAL
GROUP**
 2400 CROWNPOINT EXECUTIVE DRIVE
 SUITE 800
 CHARLOTTE, NC 28227
 (980) 339-8684



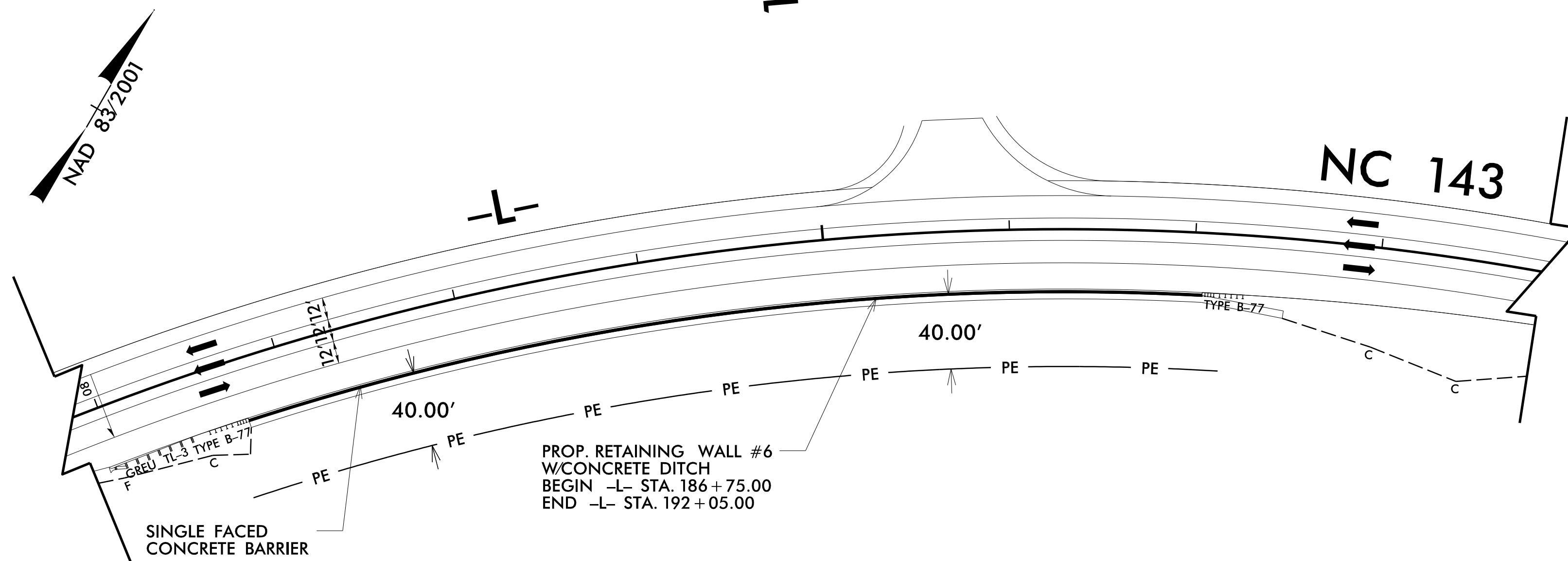
**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

**RETAINING WALL #5
NON-STANDARD
CIP GRAVITY
RETAINING WALL**

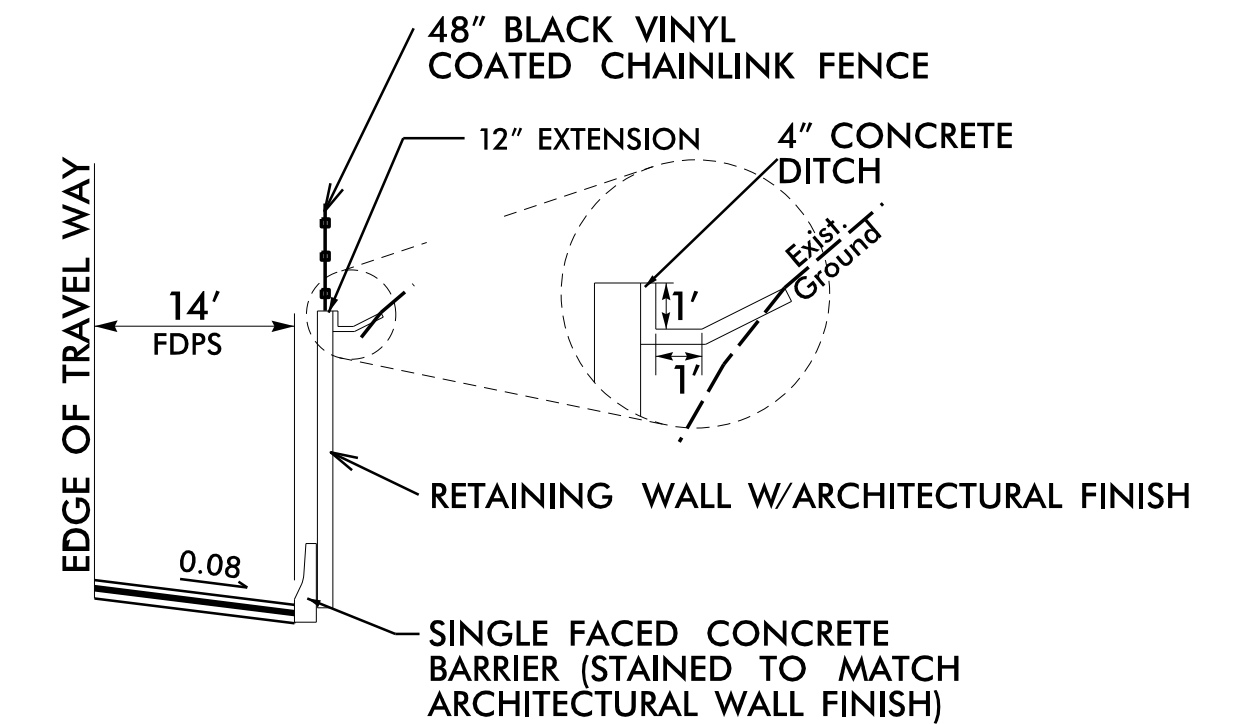
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W5-2
2			4			

RETAINING WALL #6:



RETAINING WALL #6 - PLAN

NOT TO SCALE



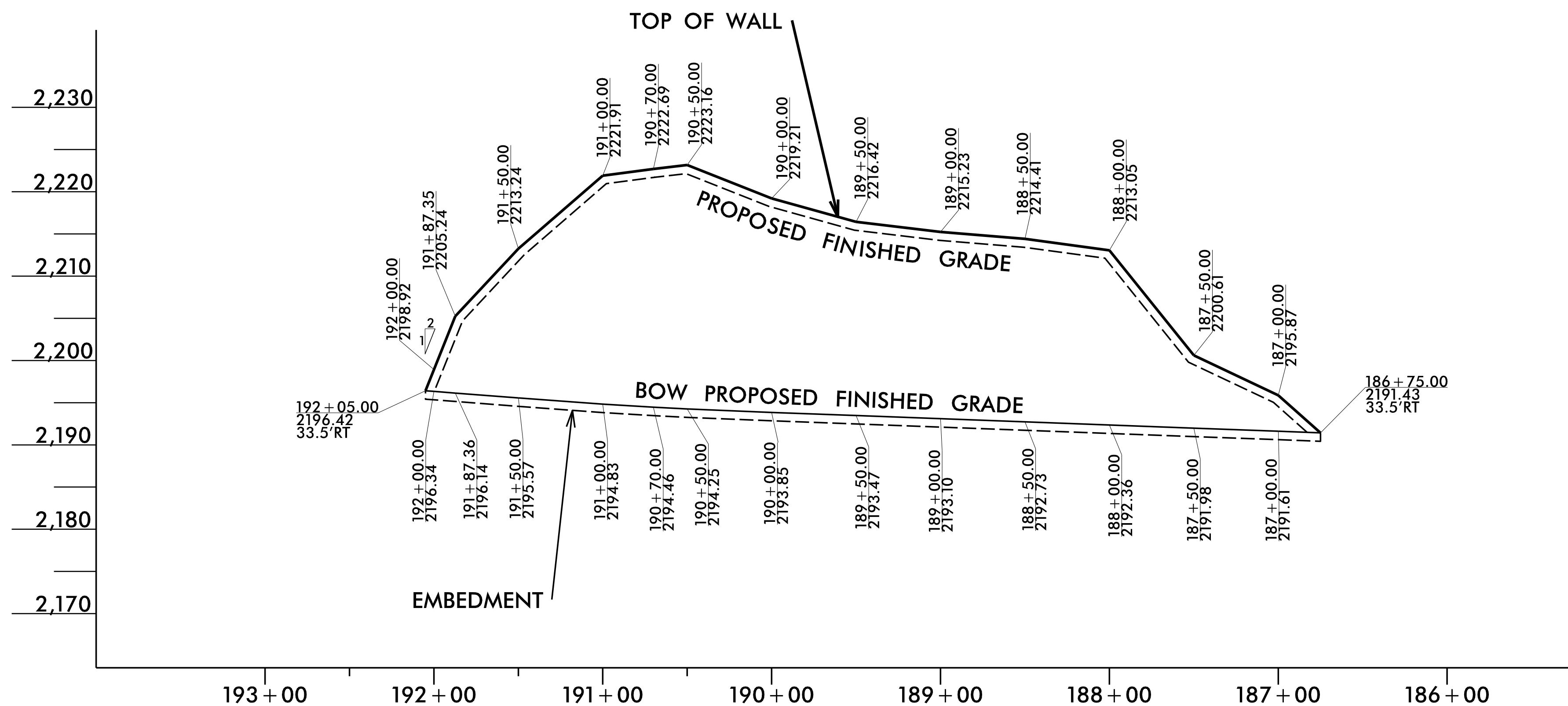
DETAIL FOR WALL #6

NOT TO SCALE

-L- STA. 186+75.00 TO -L- STA. 192+05.00, RT

ESTIMATED SOIL NAIL WALL QUANTITIES			
RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQ. FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
6	10,590*	5	30
FORM LINER ARCHITECTURAL FINISH			10,590* SF

*INCLUDES RETAINING WALL EMBEDMENT



RETAINING WALL #6 - ENVELOPE

NOT TO SCALE
BOW = BOTTOM OF WALL
(LOOKING AT FACE OF WALL)

SOIL NAIL RETAINING WALL #6						
STA. -L-	OFFSET FROM -L- (RT) FT.	ELEV. @ TOP OF WALL	BOW PROPOSED FINISHED GRADE	TOP OF LEVELING PAD	ESTIMATED WALL EMBEDMENT FT.	WALL DESIGN HEIGHT "H"
186+75.00	33.50	2191.43	2191.43	2190.43	1.00	1.00
187+00.00	33.50	2195.87	2191.61	2190.61	1.00	4.26
187+50.00	33.50	2200.61	2191.98	2090.98	1.00	8.63
188+00.00	33.50	2213.05	2192.36	2191.36	1.00	20.69
188+50.00	33.50	2214.41	2192.73	2191.73	1.00	21.68
189+00.00	33.50	2215.23	2193.10	2192.10	1.00	22.13
189+50.00	33.50	2216.42	2193.47	2192.47	1.00	22.95
190+00.00	33.50	2219.21	2193.85	2192.85	1.00	25.36
190+50.00	33.50	2223.16	2194.25	2193.25	1.00	28.91
190+70.00	33.50	2222.69	2194.46	2193.46	1.00	28.23
191+00.00	33.50	2221.91	2194.83	2193.83	1.00	27.08
191+50.00	33.50	2213.24	2195.57	2194.57	1.00	17.67
191+87.36	33.50	2205.24	2196.14	2195.14	1.00	9.10
192+00.00	33.50	2198.92	2196.34	2195.34	1.00	2.58
192+05.00	33.50	2196.42	2196.42	2195.42	1.00	1.00

PROJECT NO.: A-0009CA

GRAHAM COUNTY

RETAINING WALL #6: -L- 186+75, 33' RT TO 192+05, 33' RT

SHEET 1 OF 2

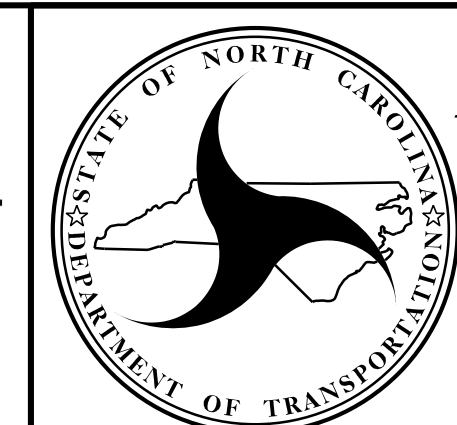
PREPARED BY: R. KRAL
REVIEWED BY: M. BREWER

DATE: 4/28/2022
DATE: 4/28/2022

RETAINING WALL # 6 ENVELOPE AND WALL LAYOUT PROVIDED BY TGS ENGINEERS, INC.

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

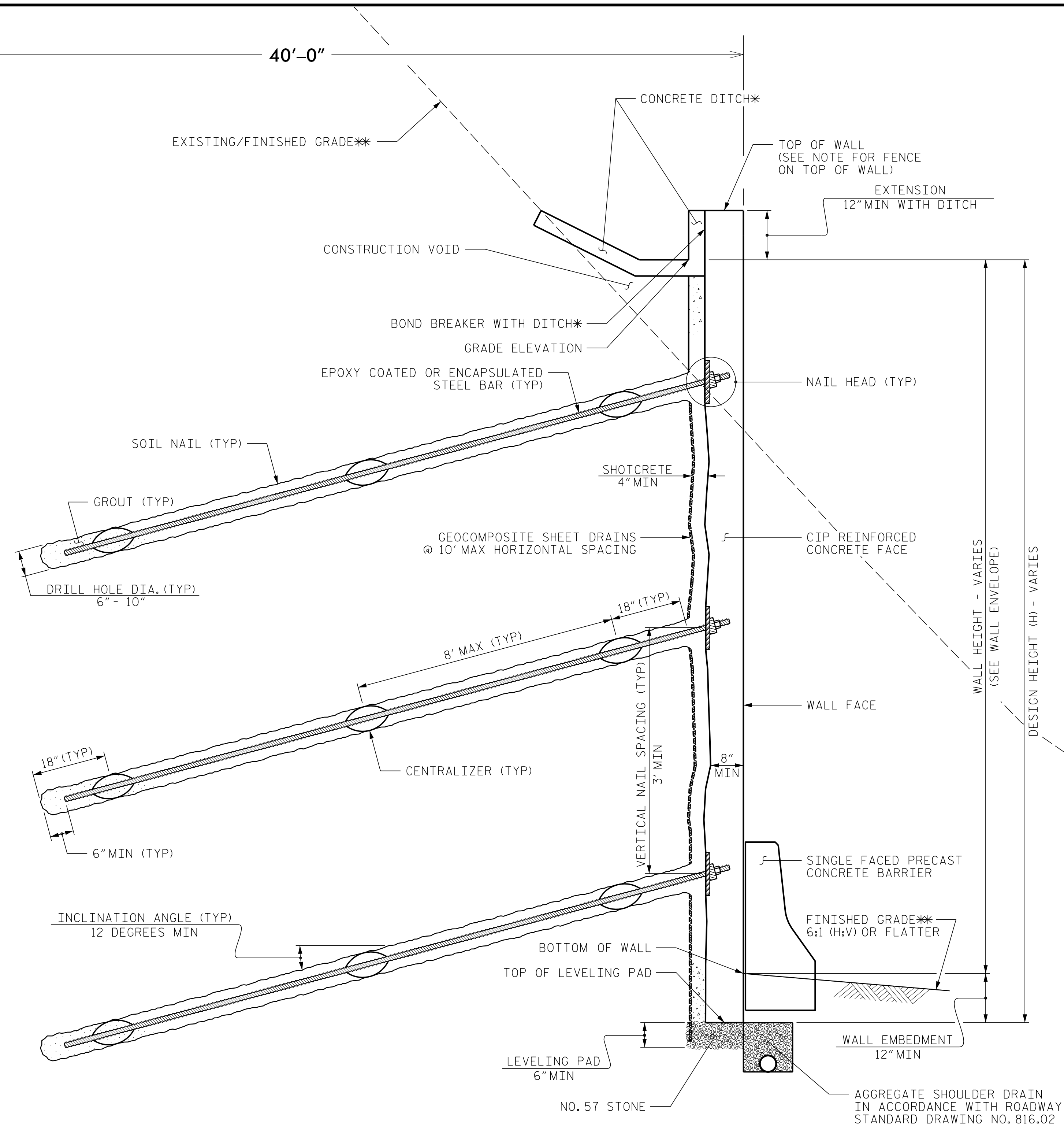
RETAINING WALL #6 SOIL NAIL RETAINING WALL

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

SHEET NO. W6-1

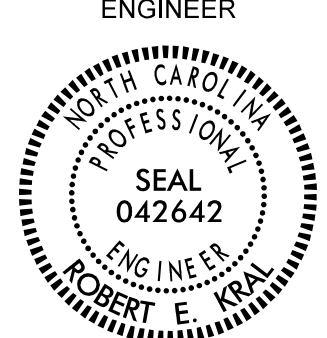
PERMANENT EASEMENT OR RIGHT OF WAY

PE
PE
PE
PE
PE



SOIL NAIL WALL - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL DETAILS.
**SEE PLANS FOR FINISHED GRADE.

<p>GEOTECHNICAL ENGINEER</p>  <p>ROBERT E. KRAL</p>	<p>ENGINEER</p>
<p>DocuSigned by: <i>Robert E. Kral</i> MAD708284846 SIGNATURE</p>	<p>4/28/22 DATE</p>
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	

NOTES:

- FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.
- FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
- A FENCE IS REQUIRED ON TOP OF RETAINING WALL #6. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.
- A FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL #6. THE CONTRACTOR SHALL PROVIDE THE REQUESTED FINISH BEFORE BEGINNING CIP REINFORCED CONCRETE FACE CONSTRUCTION. THE APPEARANCE (STONE SIZE AND SHAPE, STONE COLOR, AND STONE TEXTURE, PATTERN, AND RELIEF) SHOULD MATCH NATURAL STONE AND ROCK AND BE DETERMINED BY THE ENGINEER.
- BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL #6, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL #6 FOR THE FOLLOWING:
 - 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 75 YEARS
 - 3) MINIMUM WALL EMBEDMENT ELEVATION = VARIES (MIN. 1 FT BELOW PROPOSED FINISHED GRADE ELEVATION)
 - 4) IN-SITU ASSUMED RESIDUAL SOIL PARAMETERS:
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 32$ DEGREES
 - COHESION, $c = 0$ PSF
 - 5) IN-SITU ASSUMED WEATHERED ROCK (METASANDSTONE) PARAMETERS:
 - UNIT WEIGHT, $\gamma = 135$ PCF
 - FRICTION ANGLE, $\phi = 32$ DEGREES
 - COHESION, $c = 500$ PSF
 - 6) IN-SITU ASSUMED CRYSTALLINE ROCK (METASANDSTONE) PARAMETERS:
 - UNIT WEIGHT, $\gamma = 170$ PCF
 - FRICTION ANGLE, $\phi = 34$ DEGREES
 - COHESION, $c = 1,000$ PSF
- 7) WHERE ROCK IS ENCOUNTERED IN THE WALL ENVELOPE, DESIGNERS SHOULD REFER TO THE FHWA PRESUMPTIVE STRENGTH PARAMETERS OR OTHER REPRESENTATIVE AND REPEATABLE VALUES AND PROVIDE SOURCE REFERENCES IN THEIR DESIGN SUBMITTAL.
- BASED ON THE VARIABLE BLOCK SIZES PRESENT ON THE PROJECT, A MINIMUM NAIL LENGTH OF 15 FEET IN THE ROCK MASS WILL BE REQUIRED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- WHEN ANALYZING FOR INFINITE SLOPE CONDITIONS, DESIGNERS SHOULD ANALYZE UP TO TWO (2) TIMES THE WALL HEIGHT BEHIND THE WALL FACE FOR FAILURE PLANE SEARCHES. THIS INFORMATION SHOULD BE INCLUDED WITH THE DESIGN SUBMITTAL.
- EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL #6.
- THE PROPOSED PERMANENT EASEMENT (PE) BOUNDARY IS 40 FT FROM THE FACE OF RETAINING WALL #6. SOIL NAILS MAY NOT BE INSTALLED BEYOND THE PE BOUNDARY. SEE "SOIL NAIL WALL - TYPICAL SECTION" DETAIL.
- IF GROUNDWATER IS ENCOUNTERED BEHIND THE FACE OF RETAINING WALL #6, HORIZONTAL DRAINS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
- WHERE ROCK IS PRESENT IN THE WALL ENVELOPE, CONTROLLED BLASTING IS RECOMMENDED, BUT NOT REQUIRED, TO MAINTAIN THE NEAT EXCAVATION LINE. VOIDS, RESULTING FROM BLASTING OR EXCAVATING, THAT EXTEND BEYOND THE NEAT LINES ARE TO BE FILLED WITH A COMBINATION OF SHORT SOIL NAILS, WELDED WIRE, AND SHOTCRETE, AT THE DISCRETION OF THE ENGINEER. THE COSTS ASSOCIATED WITH THIS WORK WILL BE CONSIDERED INCIDENTAL TO WALL CONSTRUCTION AND NO ADDITIONAL COMPENSATION WILL BE MADE. FOR BLASTING, SEE THE BLASTING PROVISION.
- WHERE CONSTRUCTION VOIDS EXIST ALONG THE TOP OF RETAINING WALL #6, THE CONTRACTOR SHOULD BE PREPARED TO FORM THE CANTILEVERED SECTION OF THE CIP REINFORCED CONCRETE FACE TO THE TOP OF WALL ELEVATION. THE CONSTRUCTION VOID SHOULD BE FILLED WITH CONCRETE OR SHOTCRETE PRIOR TO CONSTRUCTION OF THE CONCRETE DITCH. ADDITIONAL WALL FACE REINFORCEMENT OR SOIL NAILS MAY BE REQUIRED FOR TALLER THAN TYPICAL CANTILEVER FACE HEIGHTS.

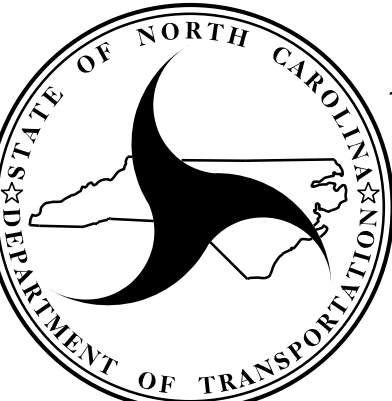
PROJECT NO.: A-0009CA
GRAHAM COUNTY
RETAINING WALL #6: -L- 186+75, 33' RT TO 192+05, 33' RT
SHEET 2 OF 2

PREPARED BY: R. KRAL	DATE: 4/28/2022
REVIEWED BY: M. BREWER	DATE: 4/28/2022

Prepared in the Office of:



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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

REVISIONS						SHEET NO. W6-2
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			