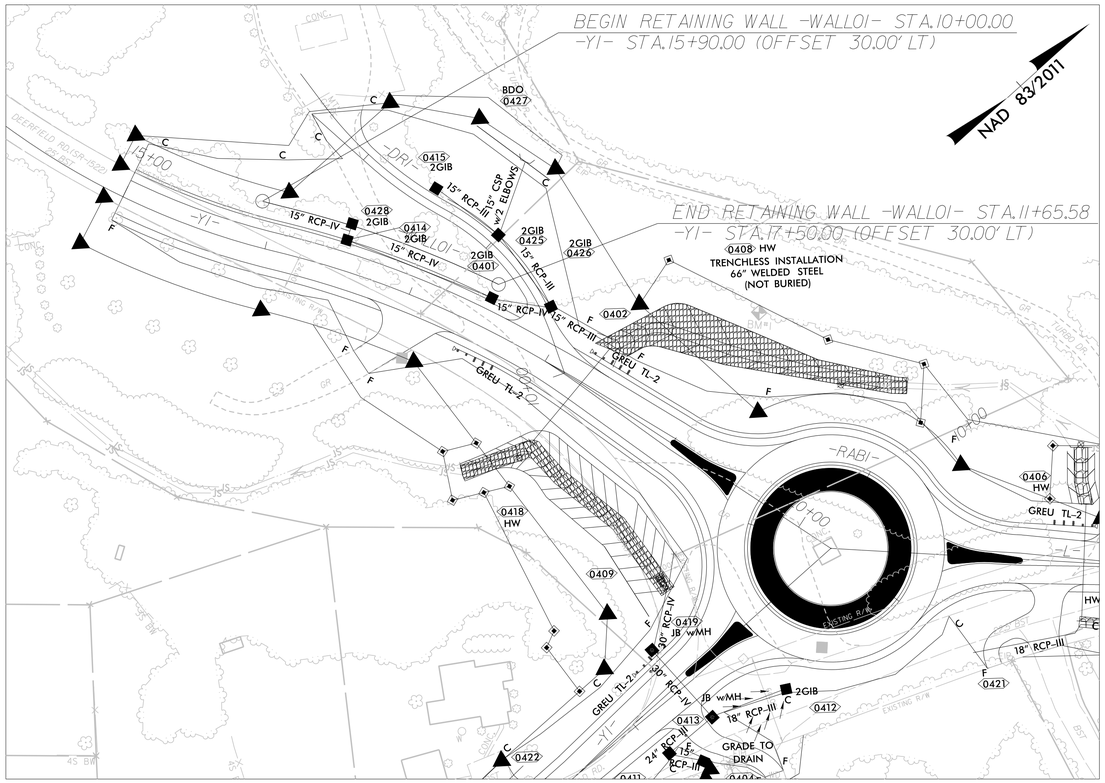
RETAINING WALL #1 PLAN VIEW



ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
1	1,396	1,396	2	3

*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

POINT NO.	-Y1- STATION	-WALL01- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	15+90.00	10+00.00	3,171.30	3,171.30
2	16+00.00	10+09.40	3,172.07	3,165.98
3	16+50.00	10+60.96	3,176.28	3,167.90
4	17+00.00	11+13.27	3,177.90	3,169.37
5	17+42.60	11+57.84	3,177.77	3,169.91
6	17+50.00	11+65.58	3,177.74	3,177.74

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA68BB83F449F...

6/16/2026

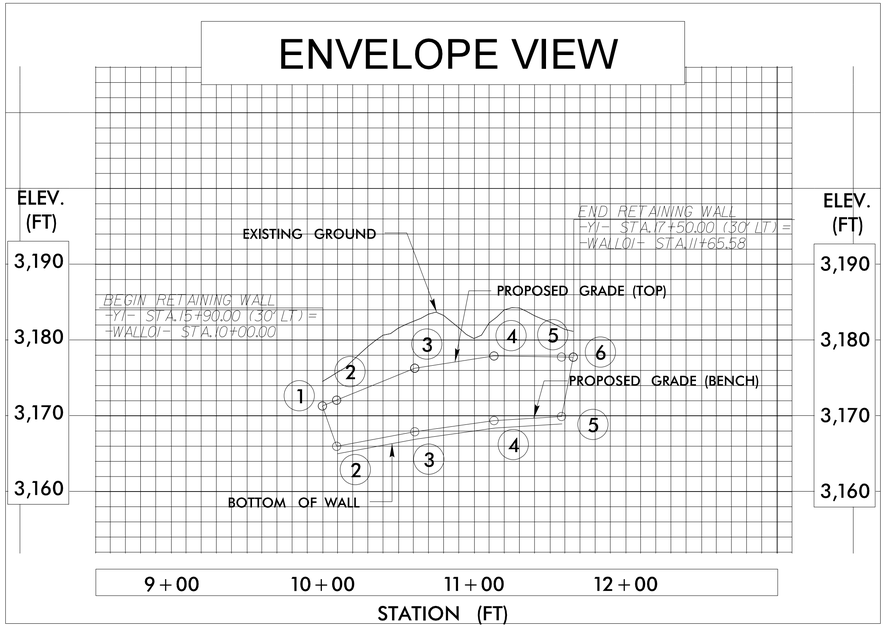
SIGNATURE DATE

ENGINEER

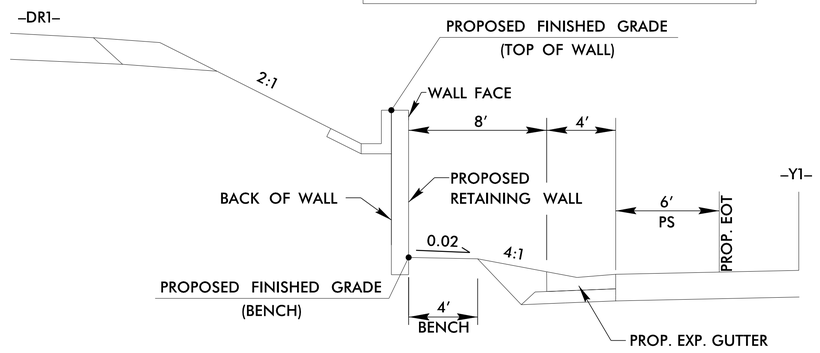
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENVELOPE VIEW



TYPICAL SECTION



ELEVATION LOCATIONS
N.T.S.

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL01- STA. 10+00 TO 11+65.58

SHEET 1 OF 2 WALL ID RW-1

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

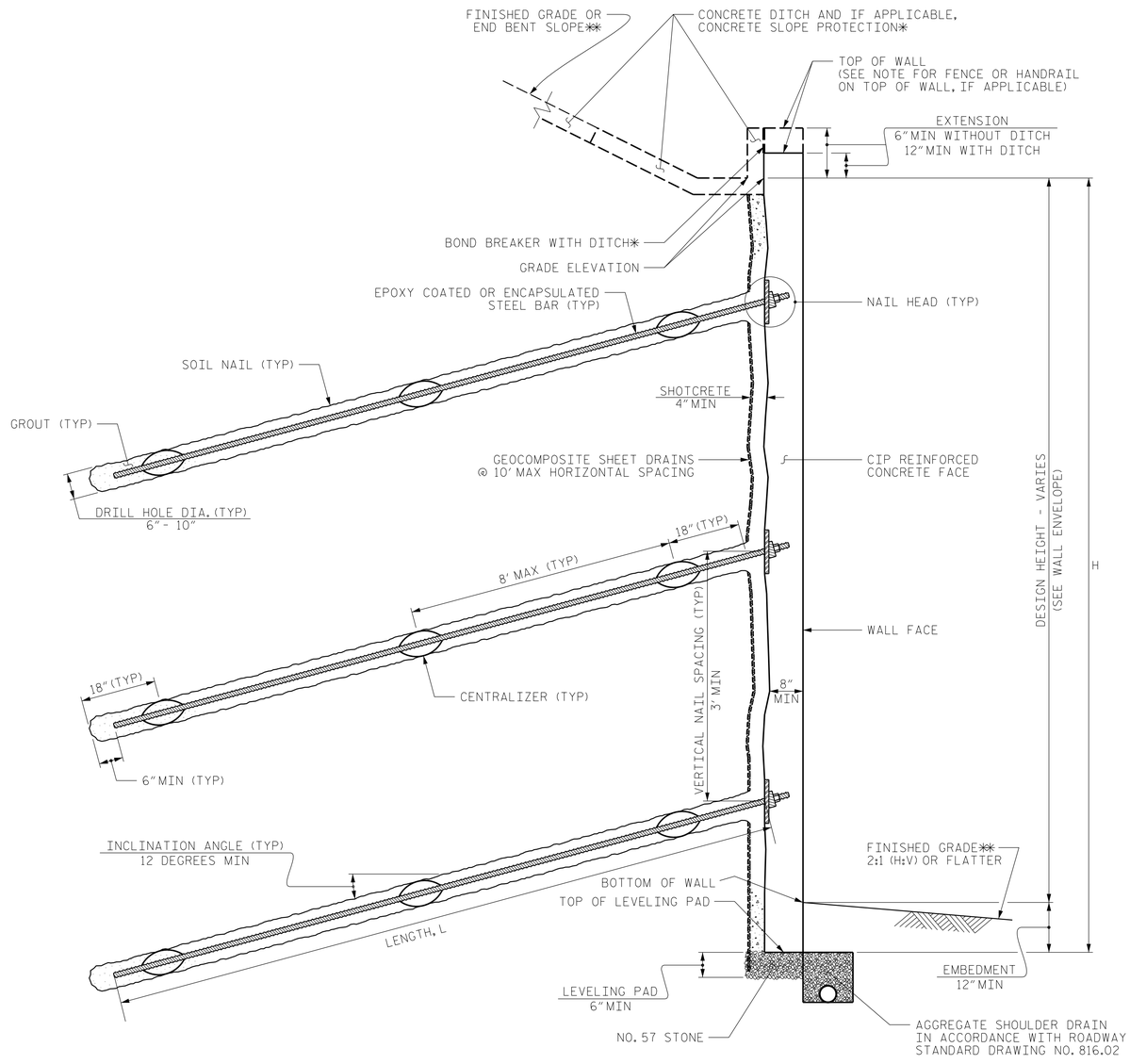
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 1
PLAN, ENVELOPE, TYPICAL SECTION VIEWS

REVISIONS

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

SHEET NO. W-1



SOIL NAIL WALL - TYPICAL SECTION

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 1, 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 NO. 1 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MINIMUM EMBEDMENT DEPTH = 12 INCHES
4) MINIMUM SOIL NAIL LENGTH = 1.2H OR 10 FEET, WHICHEVER IS LONGER
5) IN-SITU ASSUMED RESIDUAL MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
6) IN-SITU ASSUMED WEATHERED ROCK MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 145 PCF
   FRICTION ANGLE, ϕ = 38 DEGREES
   COHESION, c = 200 PSF

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 1. SEE WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH SPECIAL PROVISION.

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

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL01- STA. 10+00 TO 11+65.58

SHEET 2 OF 2 WALL ID RW-1

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

8848 RED OAK BLVD., SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

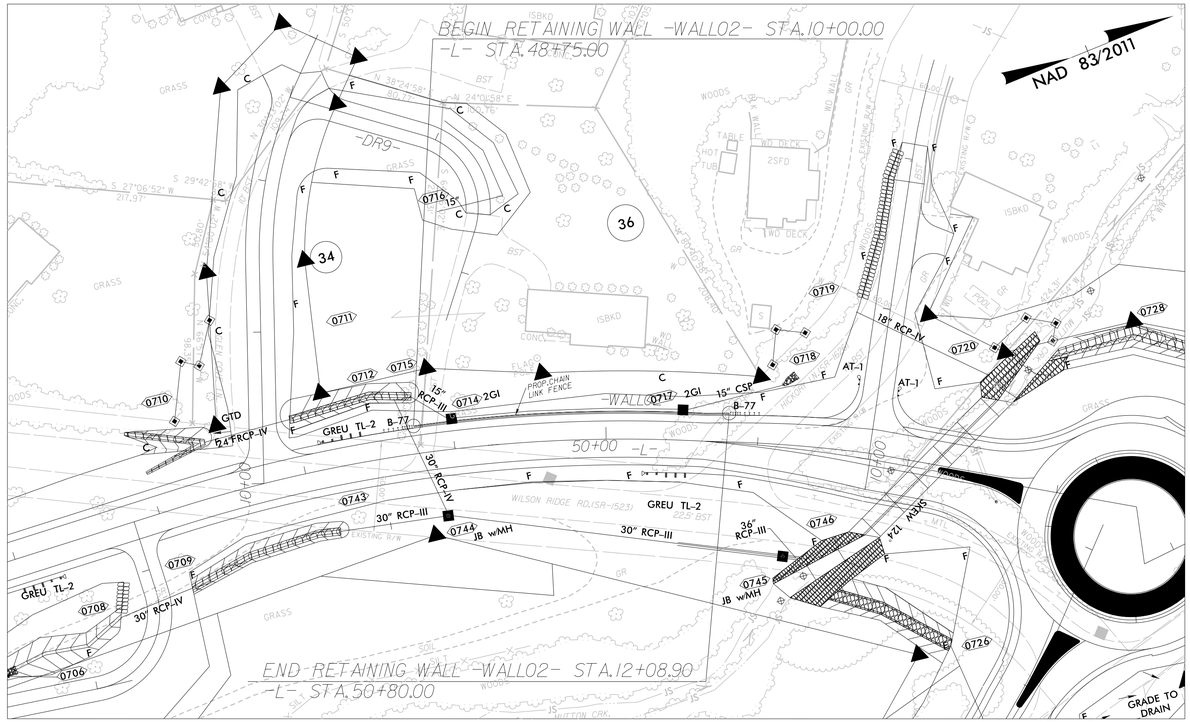
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 1 TYPICAL SECTION AND NOTES

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

RETAINING WALL #2 PLAN VIEW



GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA8B883F449F...

6/16/2026

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

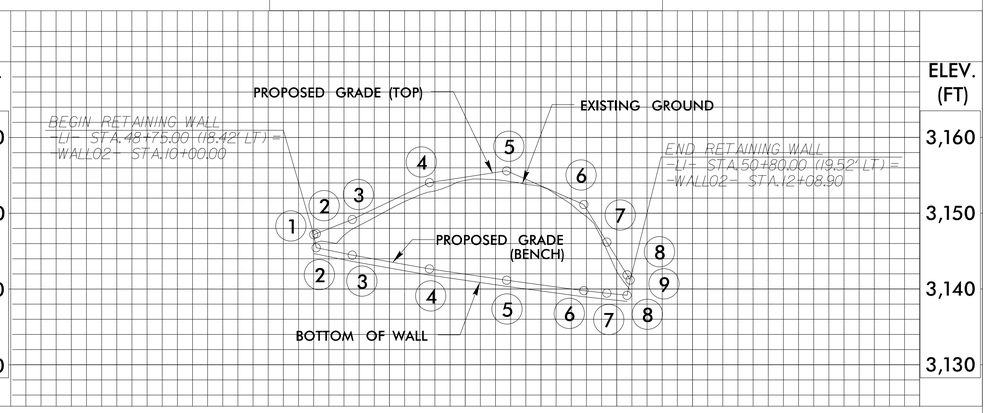
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
2	2,010	2,010	2	6

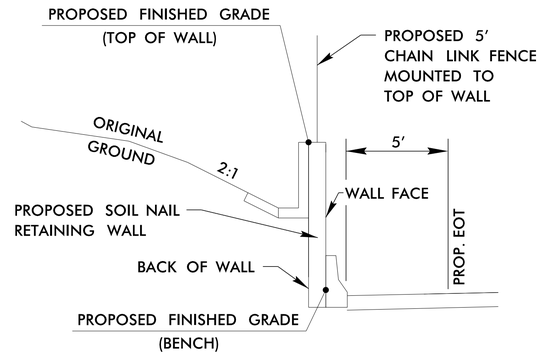
*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

POINT NO.	-L1- STATION	-WALL02- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	48+75.00	10+00.00	3,147.08	3,147.08
2	48+76.63	10+01.66	3,147.22	3,145.35
3	49+00.00	10+25.47	3,149.09	3,144.38
4	49+50.00	10+76.41	3,153.96	3,142.56
5	50+00.00	11+27.35	3,155.51	3,141.07
6	50+50.00	11+78.29	3,151.06	3,139.70
7	50+64.93	11+93.50	3,146.11	3,139.37
8	50+77.98	12+06.83	3,141.78	3,139.08
9	50+80.00	12+08.90	3,141.11	3,141.11

ENVELOPE VIEW



TYPICAL SECTION



ELEVATION LOCATIONS
N.T.S.

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL02- STA. 10+00 TO 12+08.90

SHEET 1 OF 2 WALL ID RW-2

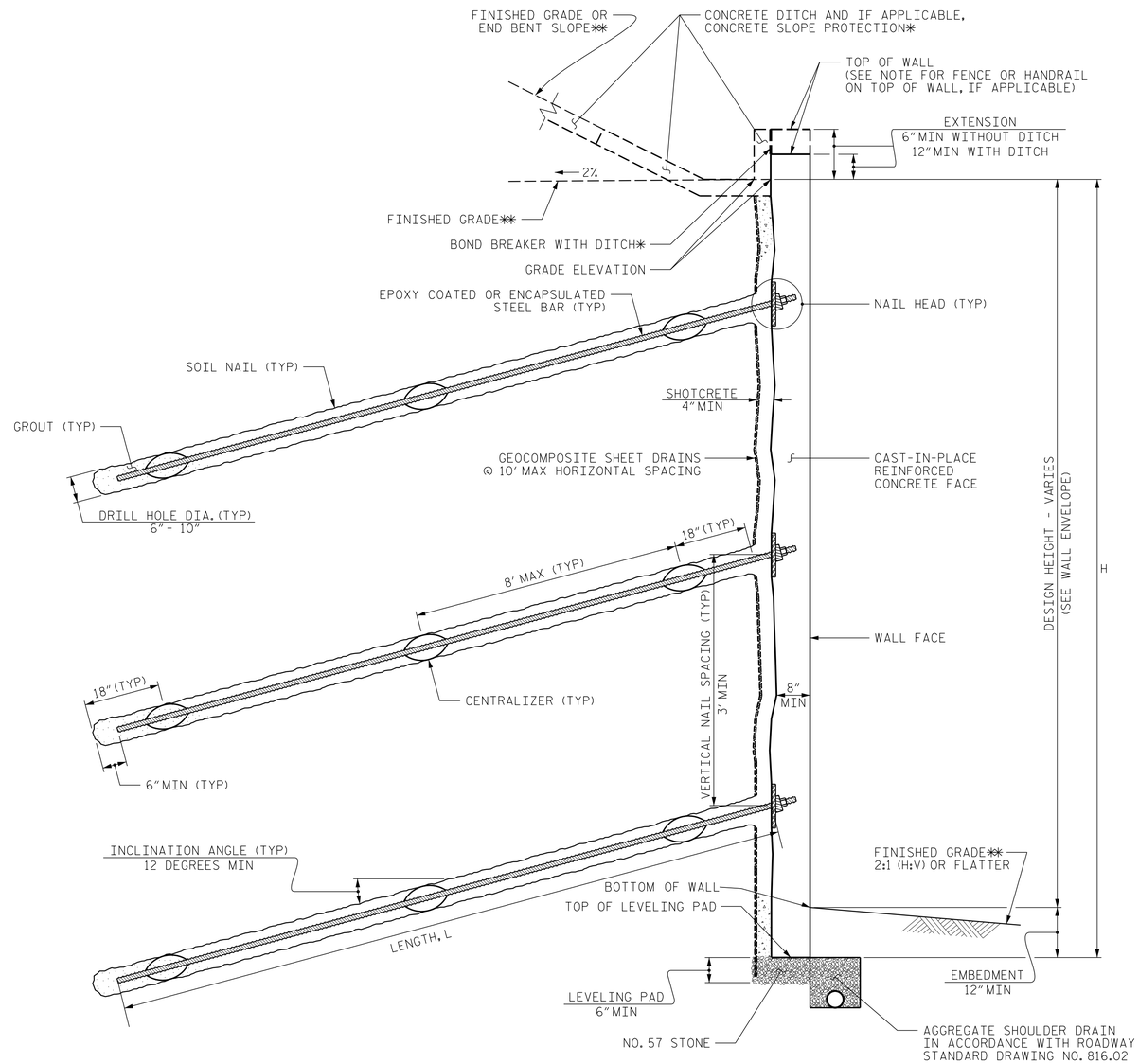
PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 2
PLAN, ENVELOPE, TYPICAL SECTION VIEWS

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



SOIL NAIL WALL - TYPICAL SECTION

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

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 2, 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 NO. 2 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MINIMUM EMBEDMENT DEPTH = 12 INCHES
4) MINIMUM SOIL NAIL LENGTH = 1.2H OR 10 FEET, WHICHEVER IS LONGER
5) IN-SITU ASSUMED ROADWAY EMBANKMENT MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 115 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
5) IN-SITU ASSUMED RESIDUAL MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
6) IN-SITU ASSUMED WEATHERED ROCK MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 145 PCF
   FRICTION ANGLE, ϕ = 38 DEGREES
   COHESION, c = 200 PSF

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 2. SEE WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH SPECIAL PROVISION.

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY	
DocuSigned by: Thomas J. Daily F29CA6B883F449F... 6/16/2026	
SIGNATURE DATE	SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO.: U-5810
WATAUGA COUNTY
STATION: -WALL02- STA 10+00 TO 12+08.90

SHEET 2 OF 2 WALL ID RW-2-

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

8848 RED OAK BLVD., SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

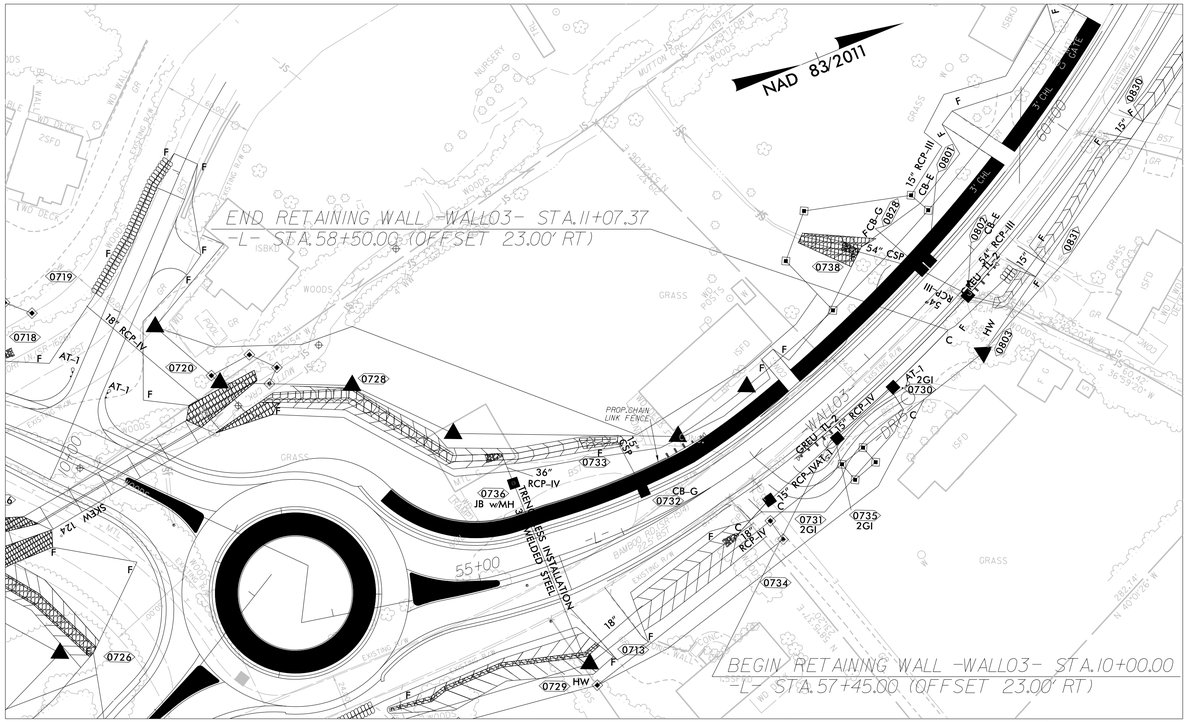
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 2
TYPICAL SECTION AND NOTES

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

RETAINING WALL #3 PLAN VIEW



ESTIMATED GRAVITY WALL QUANTITIES		
RETAINING WALL NO.	GRAVITY RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*
3	320	320

*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

POINT NO.	-L2- STATION	-WALL03- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	57+45.00	10+00.00	3132.90	3,132.90
2	57+50.00	10+05.11	3135.24	3,132.84
3	58+00.00	10+56.24	3137.49	3,132.55
4	58+50.00	11+07.37	3132.40	3,132.40

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045672 THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BBB3F449F...

6/16/2026

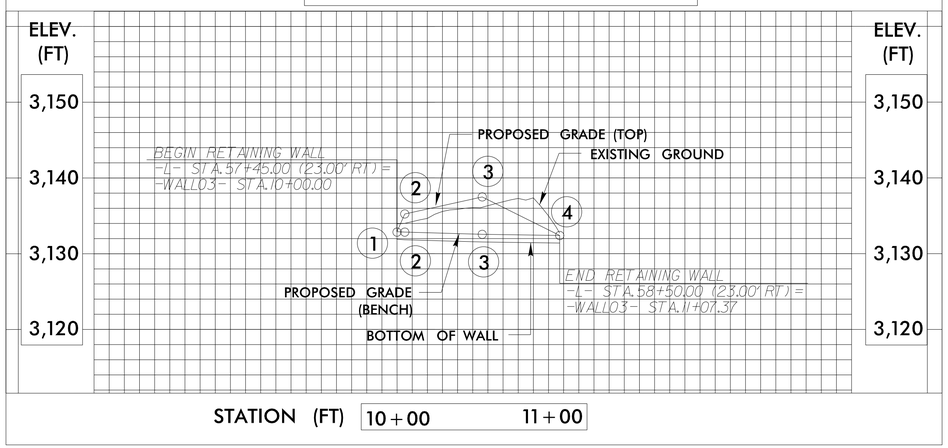
SIGNATURE DATE

ENGINEER

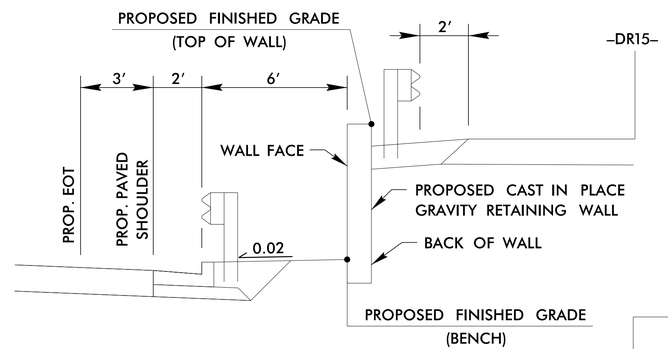
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENVELOPE VIEW



TYPICAL SECTION



ELEVATION LOCATIONS
N.T.S.

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL03- STA. 10+00 TO 11+07.37

SHEET 1 OF 2 WALL ID RW-3

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 3 PLAN, ENVELOPE, TYPICAL SECTION VIEWS

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

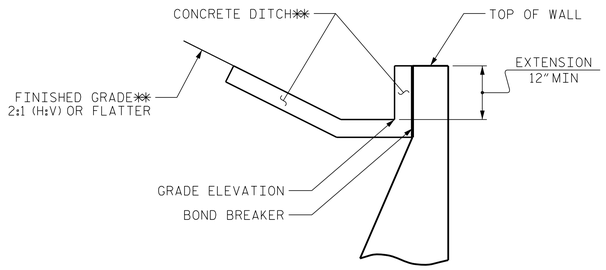
DocuSigned by: Thomas J. Daily F29CA6B883F449F... 6/16/2026

SIGNATURE DATE

ENGINEER

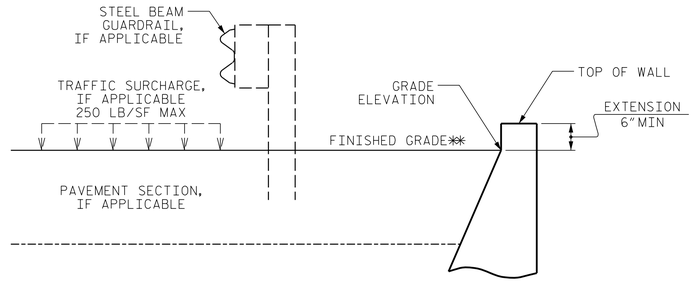
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



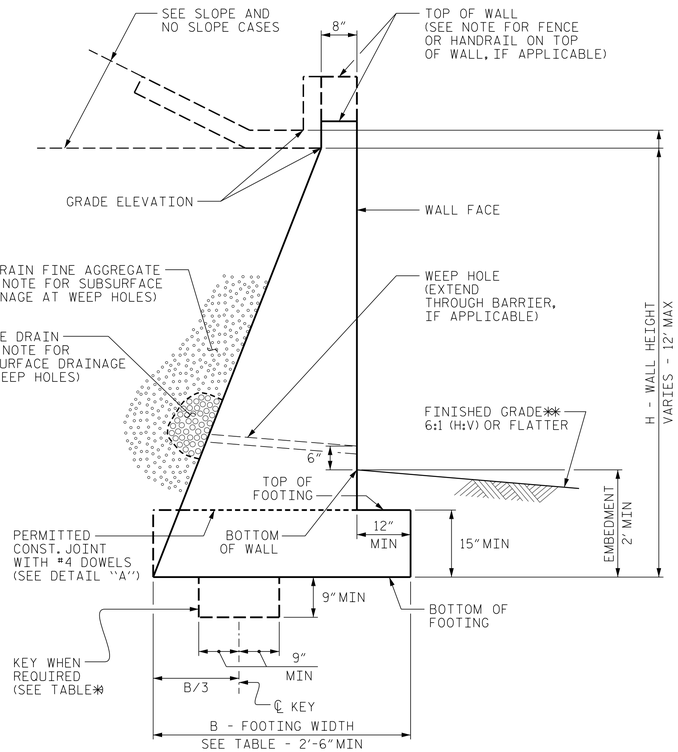
SLOPE CASE

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



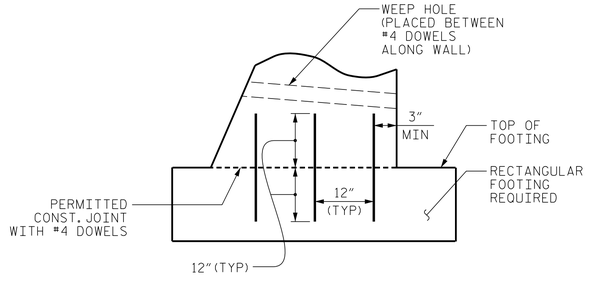
NO SLOPE CASE

**SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



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.

NOTES:

FOR STANDARD CAST-IN-PLACE (CIP) GRAVITY RETAINING WALLS, SEE CAST-IN-PLACE GRAVITY RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

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 RESIDUAL SOIL PARAMETERS:
- UNIT WEIGHT, γ = 110 LB/CF
- FRICTION ANGLE, ϕ = 30 DEGREES
- COHESION, c = 0 LB/SF

DO NOT USE STANDARD CIP GRAVITY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE BOTTOM OF FOOTING.

DO NOT USE STANDARD CIP GRAVITY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW WALLS.

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.

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 3. SEE WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH SPECIAL PROVISION.

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.: U-5810

WATAUGA COUNTY

STATION: -WALL03- STA 10+00.00 TO 11+07.37

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 3 TYPICAL SECTION AND NOTES

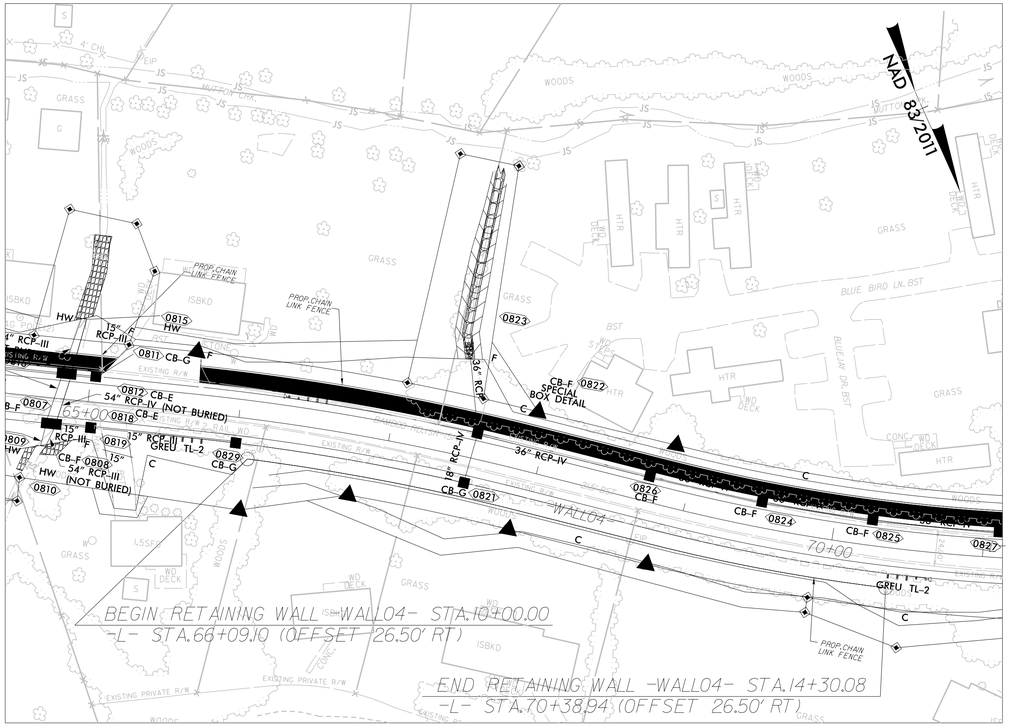
DATE: 5-16-17

SHEET NO. W-6

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY DocuSigned by: Thomas J. Daily F29CA6BBB3F449F... 6/16/2026	
SIGNATURE DATE	SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL #4 PLAN VIEW



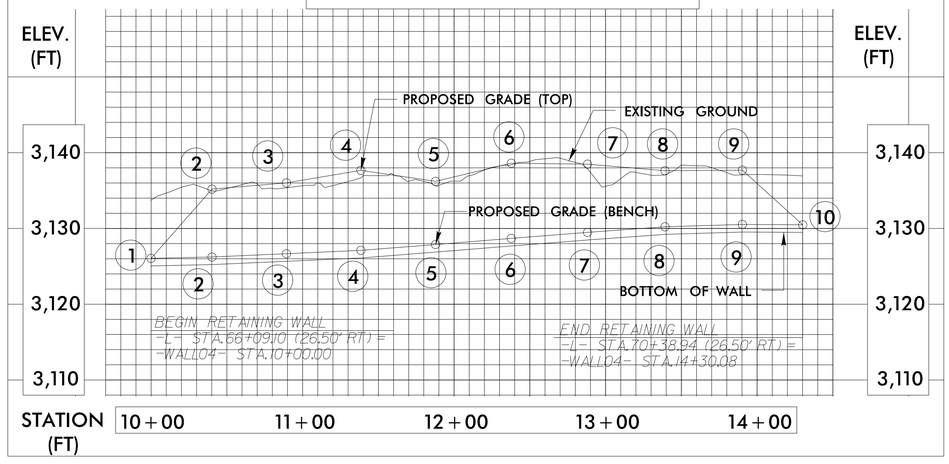
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
4	3,451	3,451	2	9

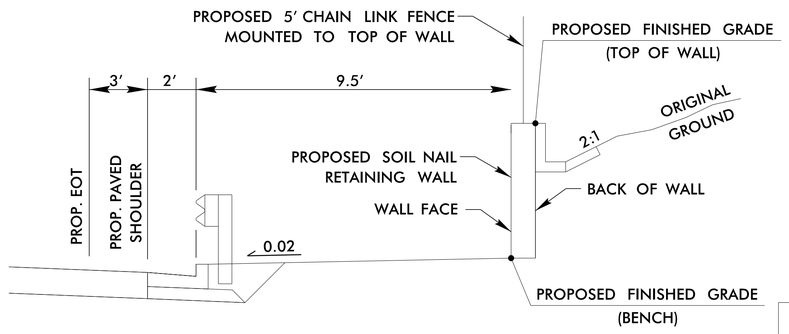
*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

POINT NO.	-L2- STATION	-WALL04- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	66+09.10	10+00.00	3,126.06	3,126.06
2	66+50.00	10+40.19	3,135.19	3,126.23
3	67+00.00	10+89.33	3,136.01	3,126.66
4	67+50.00	11+38.46	3,137.66	3,127.11
5	68+00.00	11+87.75	3,136.22	3,127.88
6	68+50.00	12+37.75	3,138.61	3,128.69
7	69+00.00	12+88.08	3,138.49	3,129.48
8	69+50.00	13+39.18	3,137.62	3,130.22
9	70+00.00	13+90.29	3,137.69	3,130.53
10	70+38.94	14+30.08	3,130.48	3,130.48

ENVELOPE VIEW



TYPICAL SECTION



ELEVATION LOCATIONS
N.T.S.

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL04- STA. 10+00 TO 14+30.08

SHEET 1 OF 2 WALL ID RW-4

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

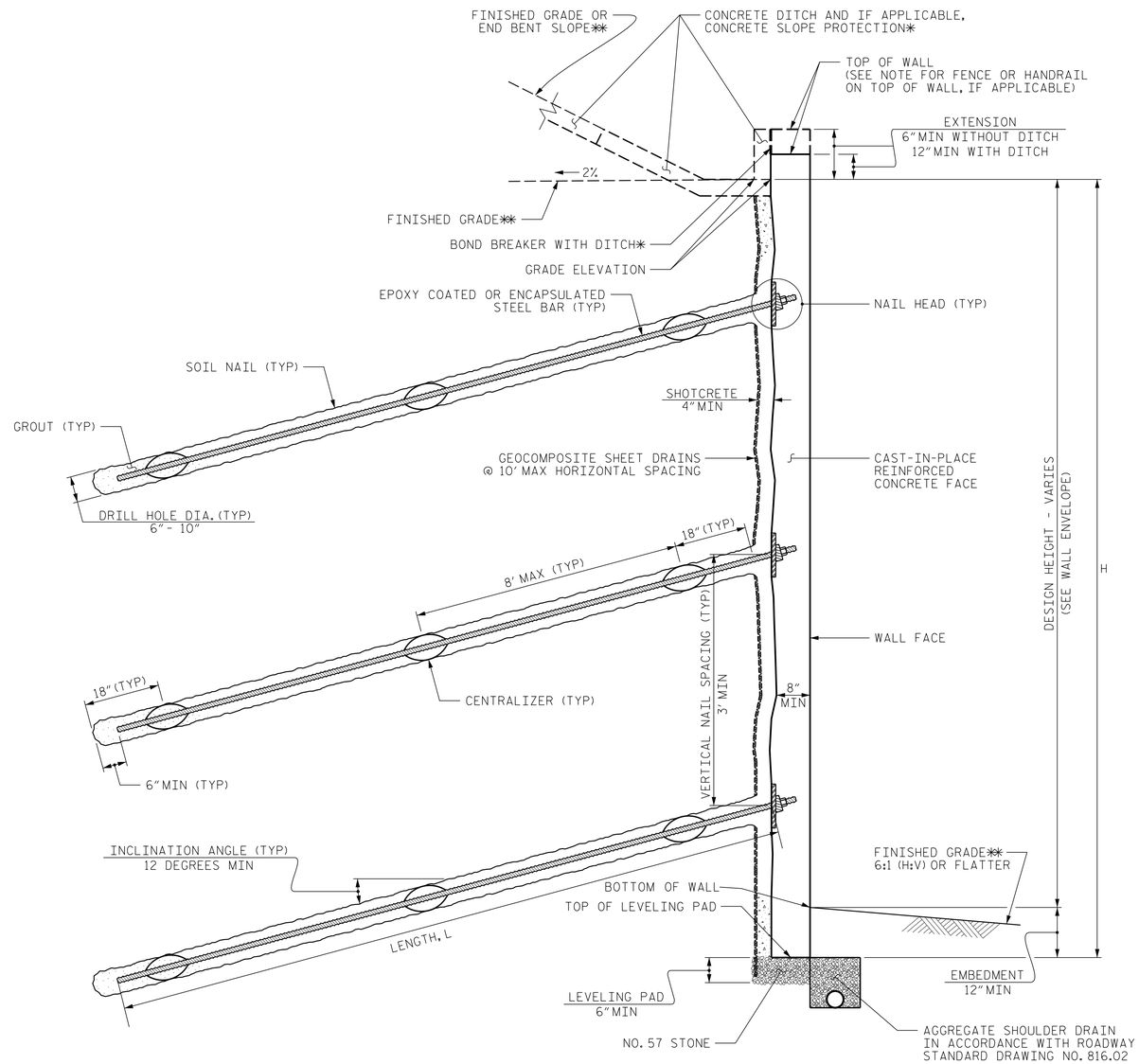
8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 4 PLAN, ENVELOPE, TYPICAL SECTION VIEWS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-7
2			4			



SOIL NAIL WALL - TYPICAL SECTION

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 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 NO. 4 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MINIMUM EMBEDMENT DEPTH = 12 INCHES
4) MINIMUM SOIL NAIL LENGTH = 1.1H OR 10 FEET, WHICHEVER IS LONGER
5) IN-SITU ASSUMED RESIDUAL MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
6) IN-SITU ASSUMED WEATHERED ROCK MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 145 PCF
   FRICTION ANGLE, ϕ = 38 DEGREES
   COHESION, c = 200 PSF

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 4. SEE WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH SPECIAL PROVISION.

A FENCE IS REQUIRED ON TOP OF RETAINING WALL NO. 4. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL04- STA 10+00.00 TO 14+30.08

SHEET 2 OF 2 WALL ID RW-4

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

9751 SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 4 TYPICAL SECTION AND NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-8
1			3			
2			4			

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

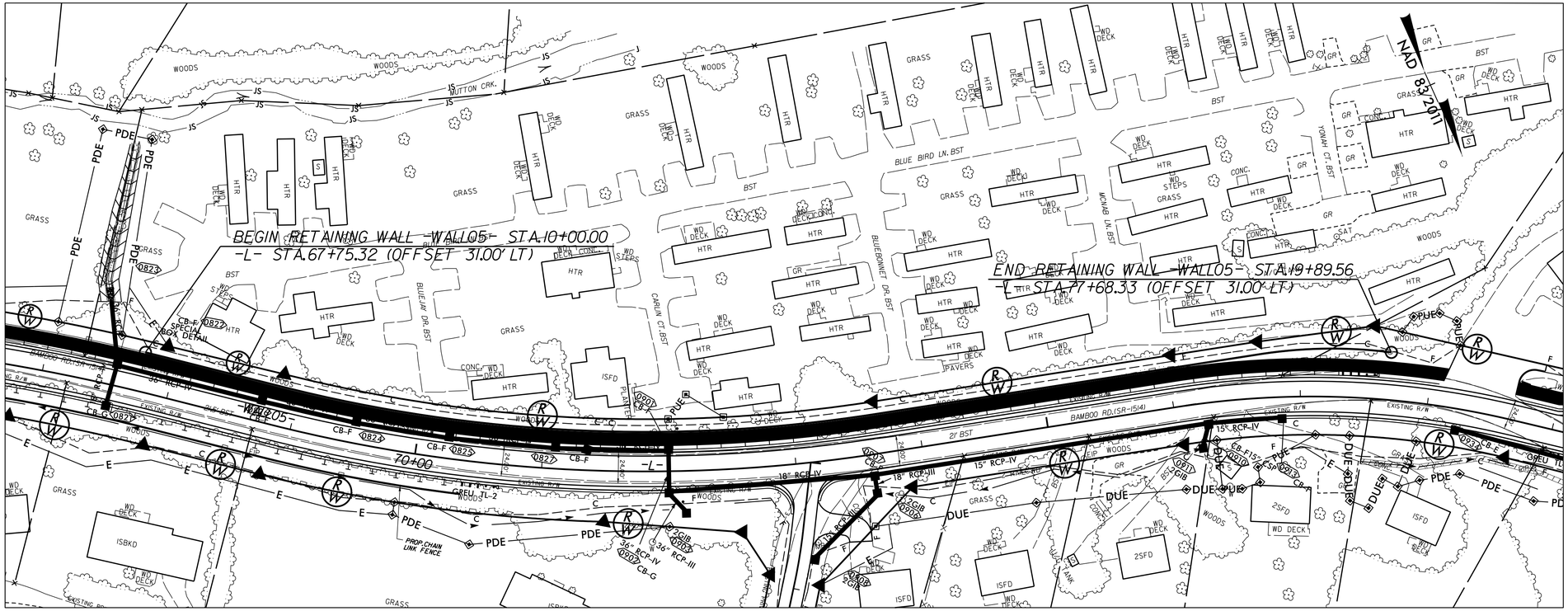
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL #5 PLAN VIEW



PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL05- STA. 10+00 TO 19+89.56

SHEET 1 OF 6 WALL ID RW-5

PREPARED BY: JOEY DAILY	DATE: 1/28/25
REVIEWED BY: KRISTEN HILL	DATE: 1/28/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 5
PLAN VIEW

REVISIONS

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

SHEET NO. W-9

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F446F... 6/16/2026

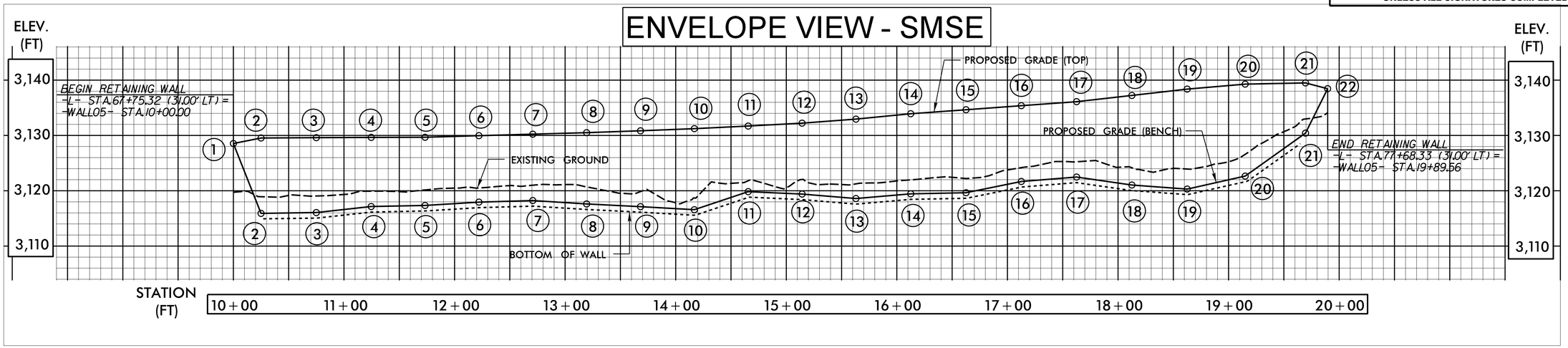
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENVELOPE VIEW - SMSE



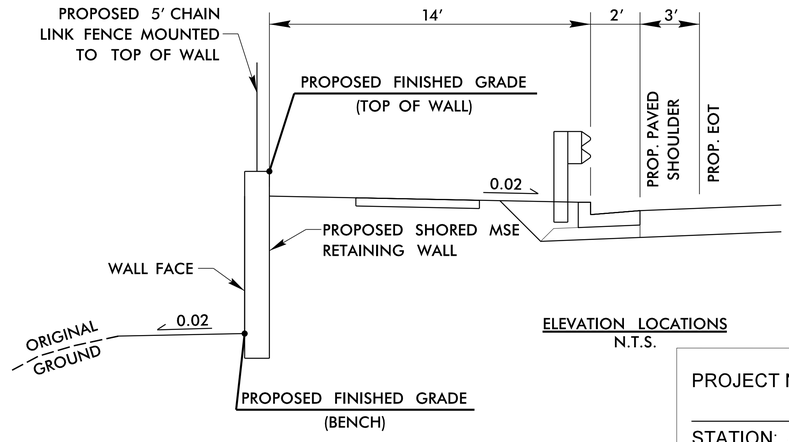
ESTIMATED SMSE WALL QUANTITIES
(SQUARE FEET)

SMSE RETAINING WALL NO. 5	13,308 SF
WEATHER CUT ASHLAR FORM LINER FINISH (SF)*	13,308 SF

*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

POINT NO.	-L2- STATION	-WALL05- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	67+75.32	10+00.00	3,128.54	3,128.54
2	68+00.00	10+25.00	3,129.54	3,115.90
3	68+50.00	10+75.00	3,129.60	3,116.05
4	69+00.00	11+24.62	3,129.65	3,117.15
5	69+50.00	11+73.33	3,129.67	3,117.34
6	70+00.00	12+22.04	3,129.96	3,117.94
7	70+50.00	12+70.74	3,130.23	3,118.22
8	71+00.00	13+19.45	3,130.50	3,117.61
9	71+50.00	13+68.16	3,130.84	3,117.13
10	72+00.00	14+16.87	3,131.23	3,116.58
11	72+50.00	14+65.58	3,131.70	3,119.84
12	73+00.00	15+14.29	3,132.23	3,119.40
13	73+50.00	15+62.99	3,132.95	3,118.59
14	74+00.00	16+12.54	3,133.93	3,119.44
15	74+50.00	16+62.54	3,134.65	3,119.64
16	75+00.00	17+12.54	3,135.38	3,121.68
17	75+50.00	17+62.54	3,136.11	3,122.48
18	76+00.00	18+12.54	3,137.23	3,121.03
19	76+50.00	18+62.72	3,138.38	3,120.30
20	77+00.00	19+17.44	3,139.28	3,122.65
21	77+50.00	19+70.23	3,139.50	3,130.42
22	77+68.31	19+89.56	3,138.45	3,138.45

TYPICAL SECTION



ELEVATION LOCATIONS
N.T.S.

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL05- STA. 10+00 TO 19+89.56

SHEET 2 OF 6 WALL ID RW-5

PREPARED BY: JOEY DAILY	DATE: 2/27/25
REVIEWED BY: KRISTEN HILL	DATE: 2/27/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 5 - SMSE ENVELOPE AND TYPICAL SECTION VIEWS - SMSE

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F... 6/16/2026

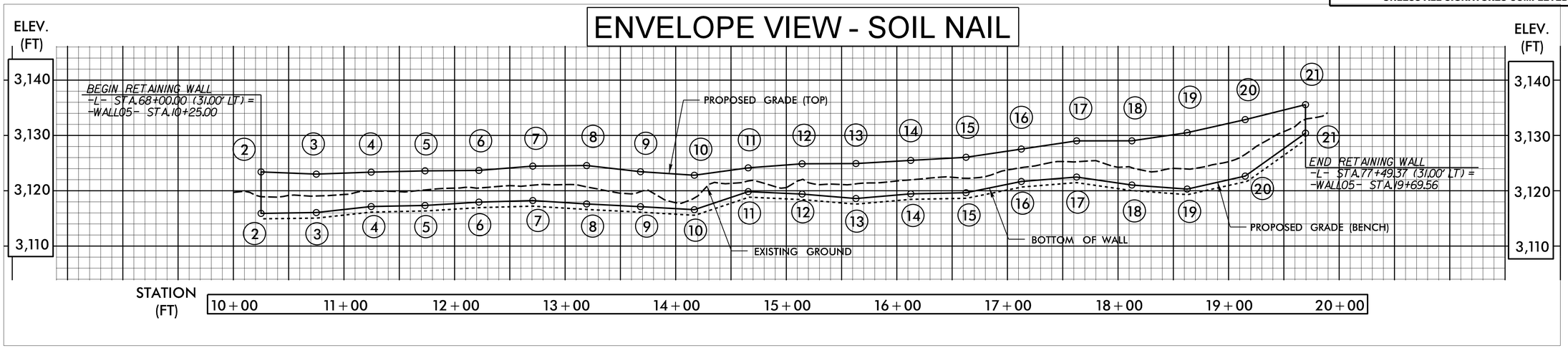
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

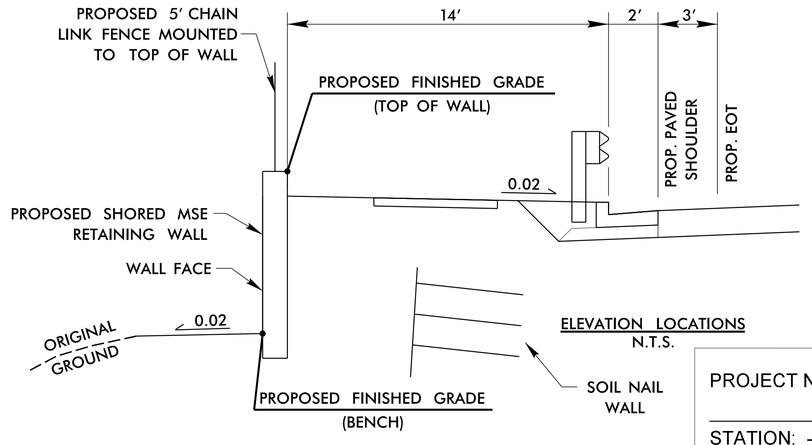
ENVELOPE VIEW - SOIL NAIL



SHORED SOIL NAIL QUANTITIES (FOR BIDDING PURPOSES ONLY)			
RETAINING WALL NO.	SHORED MSE RETAINING WALLS (SF)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
5	6,315	3	20

POINT NO.	-L2- STATION	-WALL05- STATION (SOIL NAIL PORTION)	PROPOSED GRADE (TOP)	PROPOSED GRADE (BOTTOM)
1	67+75.32	10+00.00	0.00	0.00
2	68+00.00	10+25.00	3123.41	3115.90
3	68+50.00	10+75.00	3123.00	3116.05
4	69+00.00	11+24.61	3123.36	3117.15
5	69+50.00	11+73.32	3123.60	3117.34
6	70+00.00	12+22.03	3123.68	3117.94
7	70+50.00	12+70.74	3124.45	3118.22
8	71+00.00	13+19.45	3124.56	3117.61
9	71+50.00	13+68.16	3123.44	3117.13
10	72+00.00	14+16.86	3122.80	3116.58
11	72+50.00	14+65.57	3124.14	3119.84
12	73+00.00	15+14.28	3124.88	3119.40
13	73+50.00	15+62.99	3124.92	3118.59
14	74+00.00	16+12.54	3125.49	3119.44
15	74+50.00	16+62.54	3126.05	3119.64
16	75+00.00	17+12.54	3127.54	3121.68
17	75+50.00	17+62.54	3129.02	3122.48
18	76+00.00	18+12.54	3129.03	3121.03
19	76+50.00	18+62.54	3130.50	3120.30
20	77+00.00	19+15.00	3132.87	3122.65
21	77+50.00	19+69.56	3135.57	3130.42
22	77+68.31	19+89.56	0.00	0.00

TYPICAL SECTION



PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL05- STA. 10+00 TO 19+89.56

SHEET 3 OF 6 WALL ID RW-5

PREPARED BY: JOEY DAILY DATE: 2/27/25

REVIEWED BY: KRISTEN HILL DATE: 2/27/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 5 - SMSE ENVELOPE AND TYPICAL SECTION VIEWS - SOIL NAIL

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA68B83F449F... 6/16/2026

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ENGINEER

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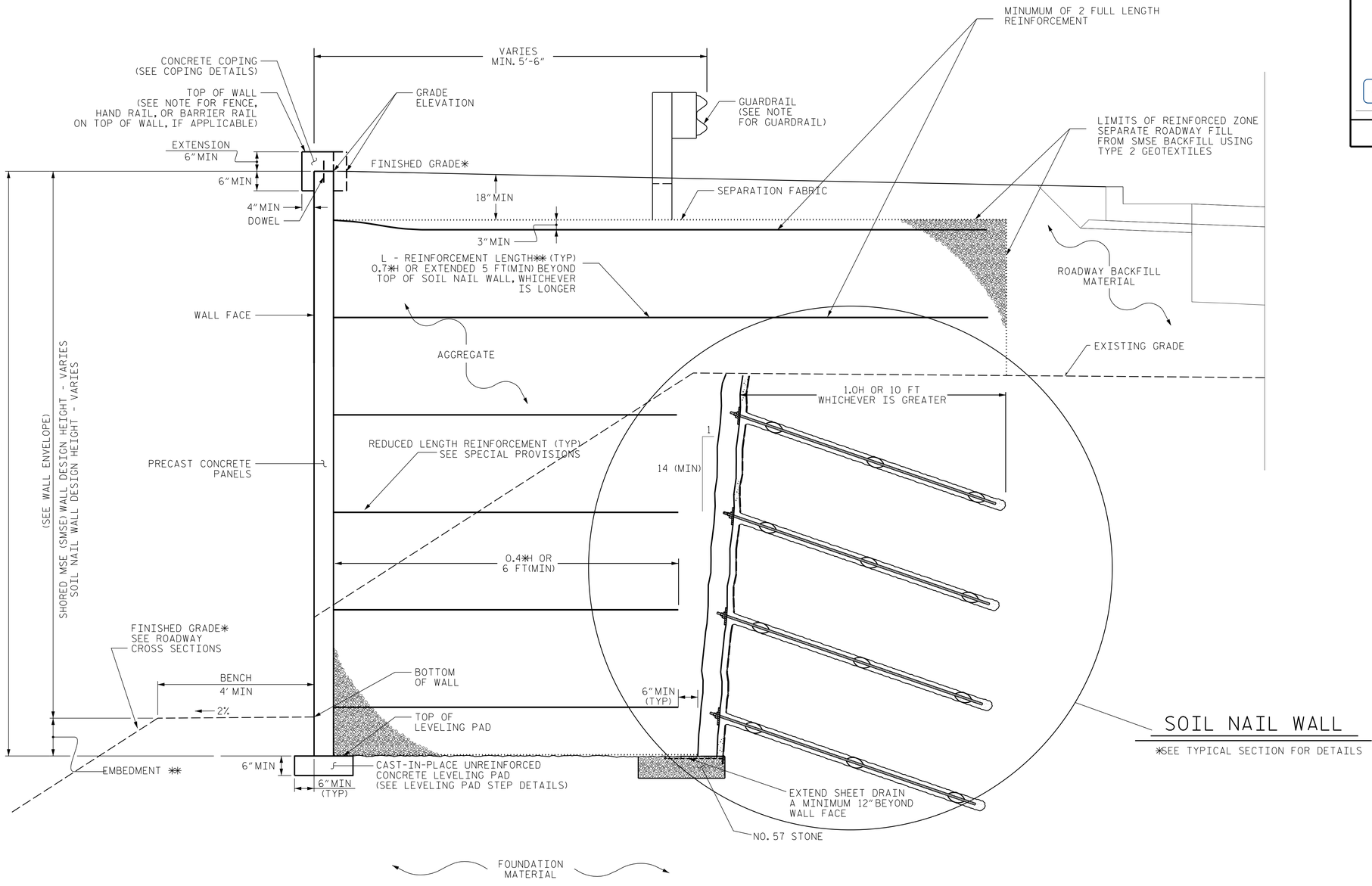


SMSE WALL WITH PRECAST PANELS TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE SMSE RETAINING WALLS PROVISION FOR EMBEDMENT REQUIREMENTS.

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL05- STA. 10+00 TO 19+89.56

8848 RED OAK BLVD., SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 5

PREPARED BY: J. DAILY	DATE: 1/17/25
REVIEWED BY: K. HILL	DATE: 1/17/25

REVISIONS

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

SHEET NO. W-12

GEOTECHNICAL ENGINEER

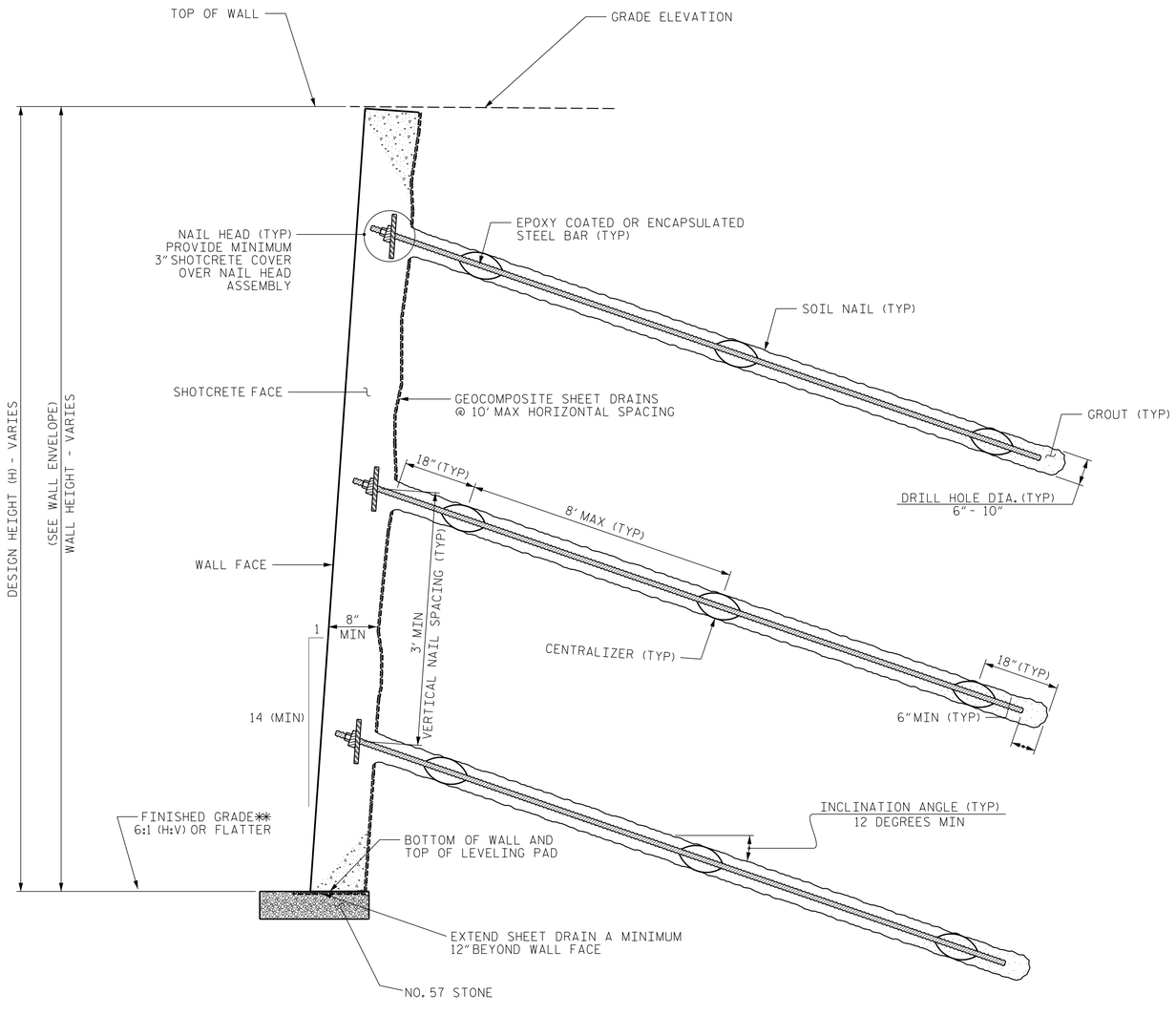
NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F... 6/16/2026

SIGNATURE DATE

ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SOIL NAIL WALL - TYPICAL SECTION

**SEE PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.

NOTES:

FOR SOIL NAIL RETAINING WALL, SEE SMSE SPECIAL PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 5, 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 SOIL NAIL RETAINING WALL NO. 5 FOR THE FOLLOWING:
1) SOIL NAIL WALL DESIGN HEIGHT (H) = SMSE WALL DESIGN HEIGHT
2) DESIGN LIFE = 100 YEARS
3) MINIMUM WALL EMBEDMENT DEPTH = TOP OF SMSE WALL LEVELING PAD
4) IN-SITU ASSUMED RESIDUAL MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF

DESIGN RETAINING WALL NO. 5 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 SOIL NAILS FOR RETAINING WALL NO. 5.

THE ESTIMATED SOIL NAIL WALL QUANTITY IS BASED ON 0.4H OR 6 FEET BEHIND THE FINISHED FACE OF THE SMSE AND THE TOP OF LEVLEING PAD OF THE SOIL NAIL WALL. 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 FULLY EXCAVATED CUT AND THE SMSE WALL. SUBMIT THESE RESULTS WITH THE WALL DESIGN PACKAGE.

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL05- STA. 10+00 TO 19+89.56

8848 RED OAK BLVD., SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

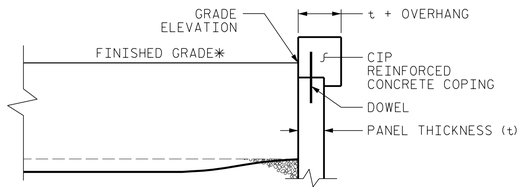
RETAINING WALL NO. 5

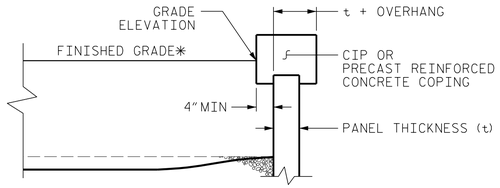
PREPARED BY: J. DAILY	DATE: 1/17/25
REVIEWED BY: K. HILL	DATE: 1/17/25

REVISIONS

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

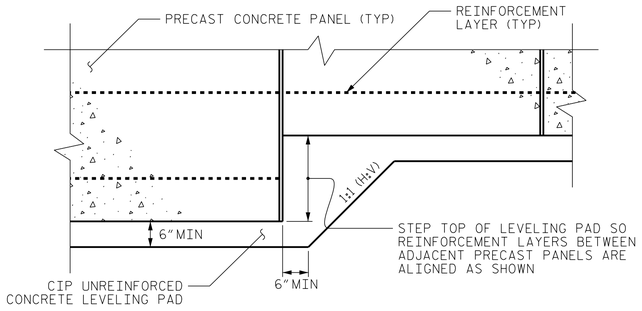
SHEET NO. W-13





PRECAST PANEL 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.



PRECAST PANELS LEVELING PAD STEP DETAIL

NOTES:

FOR SHORED MECHANICALLY STABILIZED EARTH (SMSE) RETAINING WALLS, SEE SHORED MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 5. SEE WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH SPECIAL PROVISION.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 5.

A SEPARATION GEOTEXTILE IS NOT REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 5.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 5.

BEFORE BEGINNING SMSE WALL DESIGN FOR RETAINING WALL NO. 5, 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 NO. 5 FOR THE FOLLOWING:
1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 4,500 PSF
4) MINIMUM REINFORCEMENT LENGTH (L) = 0.4H OR 6 FT, WHICHEVER IS LONGER
5) MINIMUM EMBEDMENT ELEVATION = SEE SMSE WALL SCHEDULE AND EMBEDMENT TABLE
6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0
*SEE SMSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
RETAINED	30	120	0
FOUNDATION	30	120	0

DESIGN RETAINING WALL NO. 5 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 5 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

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

THE PERMANENT SHORING HEIGHT IS AN ESTIMATE ONLY, HEIGHT IS BASED THE DIFFERENCE BETWEEN THE SLOPE HINGE POINT AND TOP OF SMSE WALL LEVELING PAD.

THE SOIL NAIL WALL DESIGNER IS RESPONSIBLE FOR DETERMINING GLOBAL STABILITY BASED ON THE FULLY EXCAVATED CUT AND THE SMSE WALL. SUBMIT THESE RESULTS WITH THE WALL DESIGN PACKAGE.

SUBMIT SMSE WALL AND SOIL NAIL WALL DESIGNS AT THE SAME TIME.

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL05- STA. 10+00 TO 19+89.56

8848 RED OAK BLVD., SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 5

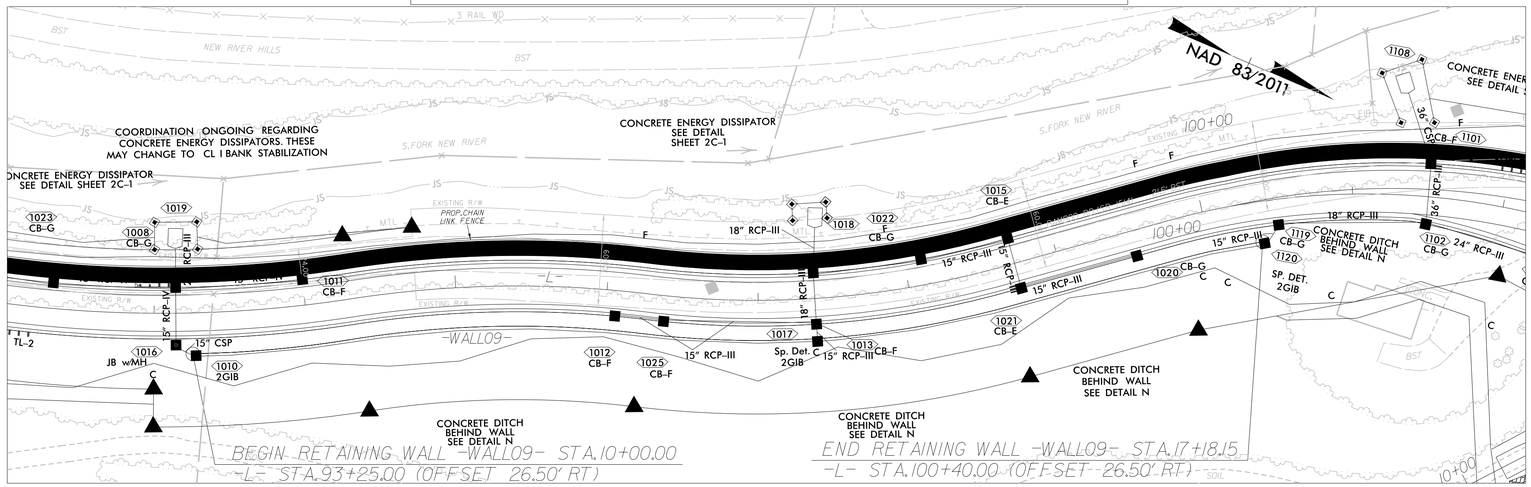
PREPARED BY: J. DAILY	DATE: 1/17/25
REVIEWED BY: K. HILL	DATE: 1/17/25

REVISIONS

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

SHEET NO. W-14

RETAINING WALL #9 PLAN VIEW



GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY DocuSigned by: Thomas J. Daily F29CA6B883F449F... 6/16/2026	
SIGNATURE DATE	SIGNATURE DATE

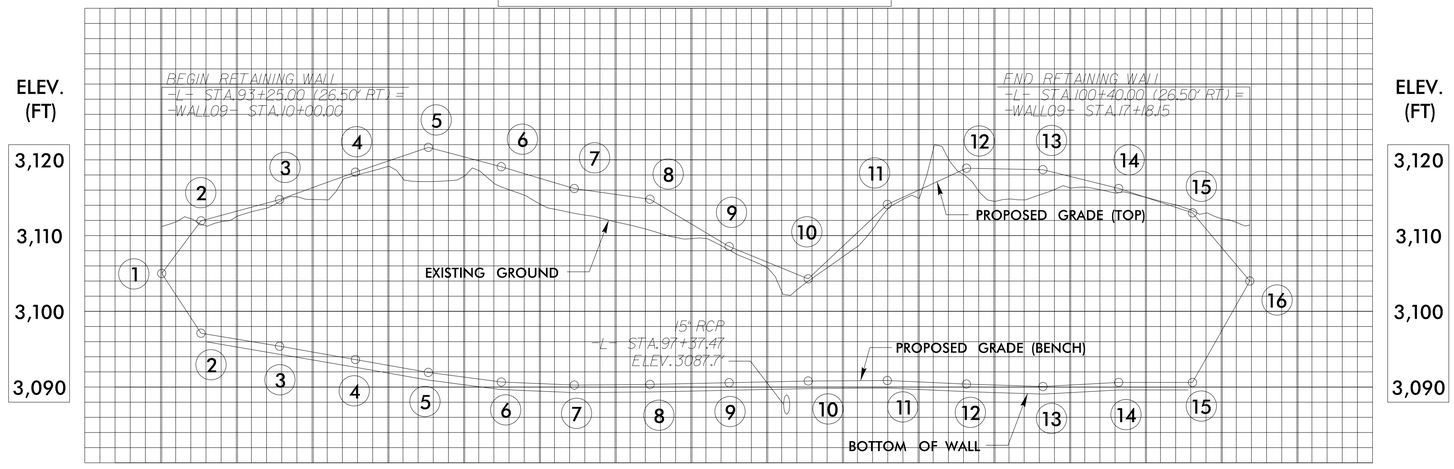
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
9	16,746	16,746	2	36

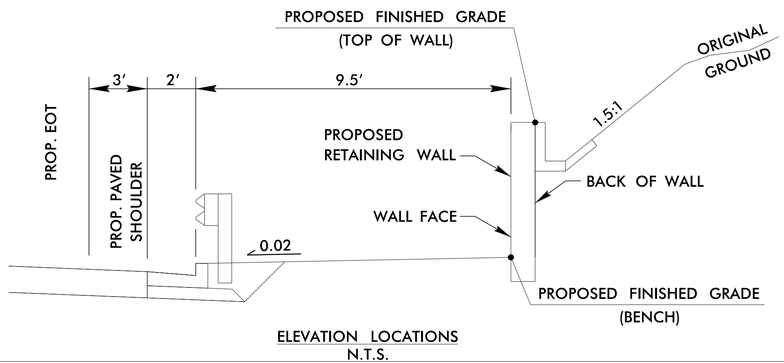
*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

ENVELOPE VIEW



POINT NO.	-L3- STATION	-WALL09- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	93+24.97	10+00.00	3102.63	3105.00
2	93+50.00	10+25.85	3111.70	3097.11
3	94+00.00	10+77.50	3128.20	3095.40
4	94+50.00	11+27.82	3142.11	3093.64
5	95+00.00	11+75.96	3140.77	3091.94
6	95+50.00	12+24.11	3140.39	3090.67
7	96+00.00	12+72.26	3134.55	3090.27
8	96+50.00	13+22.28	3115.78	3090.35
9	97+00.00	13+74.48	3112.08	3090.58
10	97+50.00	14+26.69	3114.96	3090.80
11	98+00.00	14+78.90	3118.30	3090.87
12	98+50.00	15+31.11	3117.63	3090.40
13	99+00.00	15+81.61	3116.26	3090.08
14	99+50.00	16+31.61	3113.04	3090.61
15	100+00.00	16+80.35	3110.69	3090.61
16	100+40.00	17+18.15	3108.67	3104.00

TYPICAL SECTION



PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL09- STA. 10+00 TO 17+18.15

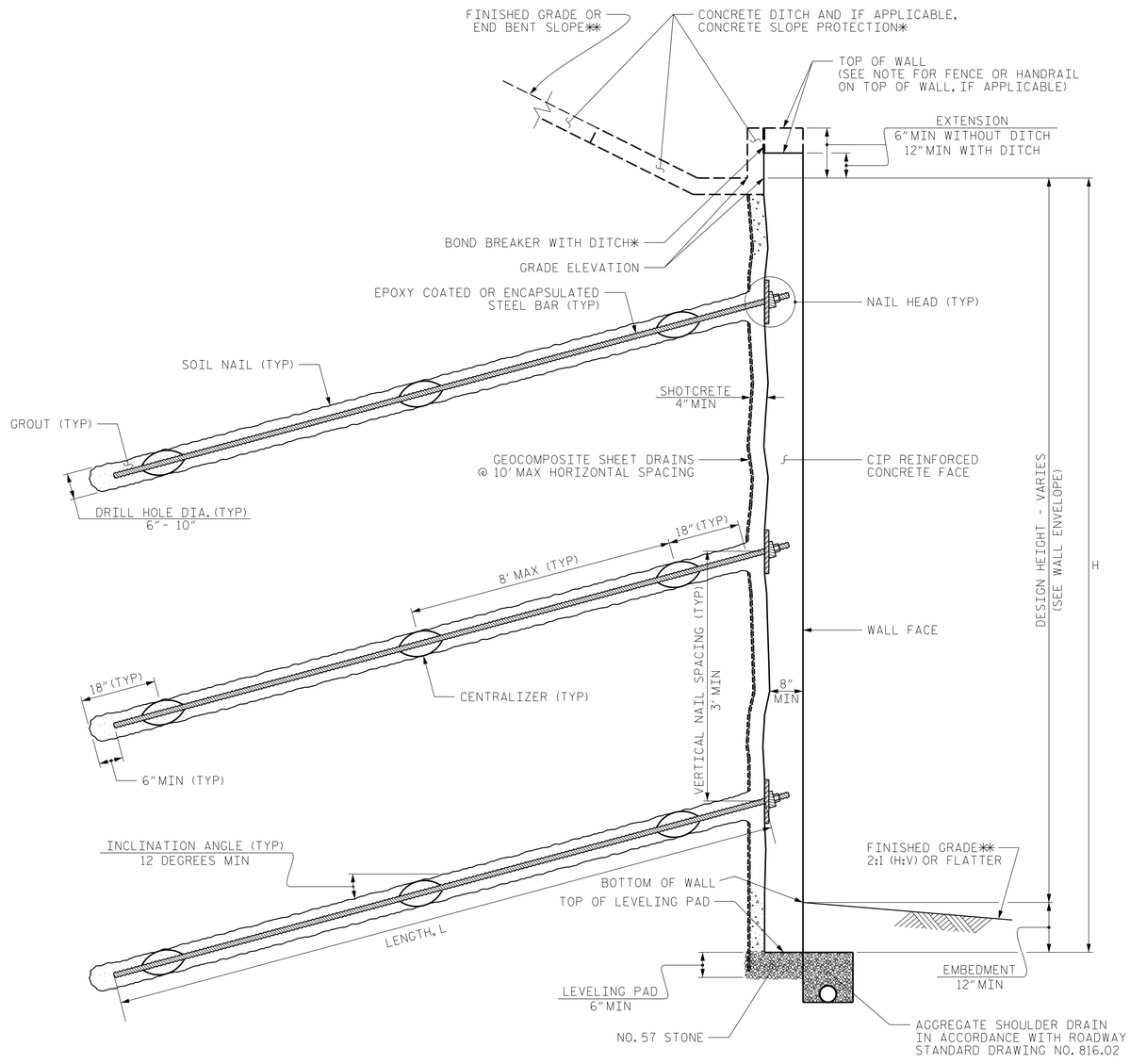
SHEET 1 OF 2 WALL ID RW-9

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 9
PLAN, ENVELOPE, TYPICAL SECTION VIEWS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-15
2			4			



SOIL NAIL WALL - TYPICAL SECTION

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 9, 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 NO. 9 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MINIMUM EMBEDMENT DEPTH = 12 INCHES
4) IN-SITU ASSUMED RESIDUAL MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
5) MINIMUM LENGTH, L = 1.4H or 10 FEET, WHICHEVER IS LONGER.

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 9. SEE WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH SPECIAL PROVISION.

DRAINAGE BOXES OR PIPING WILL BE LOCATED BEHIND RETAINING WALL NO. 9, AND MAY INTERFERE WITH THE SOIL NAILS. SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE ITEMS WITH THE SOIL NAIL WALL CONSTRUCTION PLAN.

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL09- STA. 10+00.00 TO 17+18.15

SHEET 2 OF 2 WALL ID RW-9

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 9 TYPICAL SECTION AND NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-16
1			3			
2			4			

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

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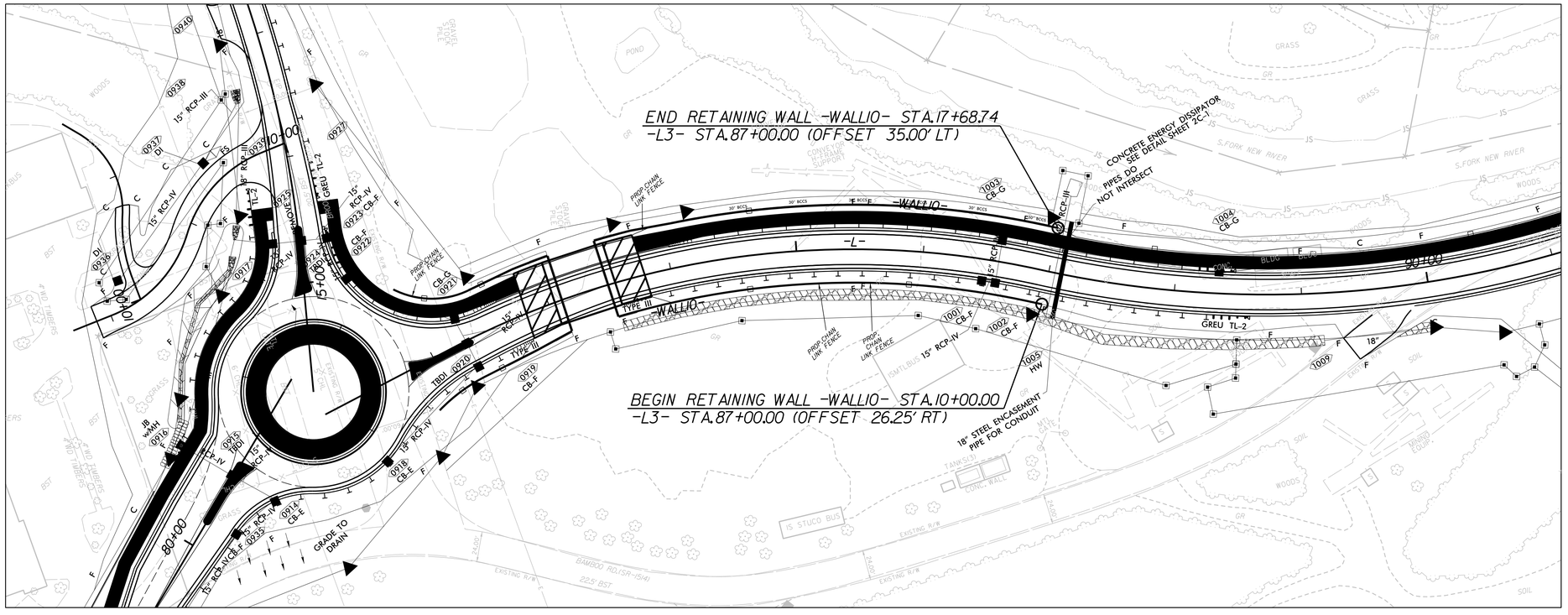
NAD 83/2011

RETAINING WALL #10 PLAN VIEW



PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL10- STA. 10+00 TO 17+68.74

SHEET 1 OF 6 WALL ID RW-10

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 10 PLAN VIEW

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-17
1			3			
2			4			

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

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6/16/2026

SIGNATURE DATE

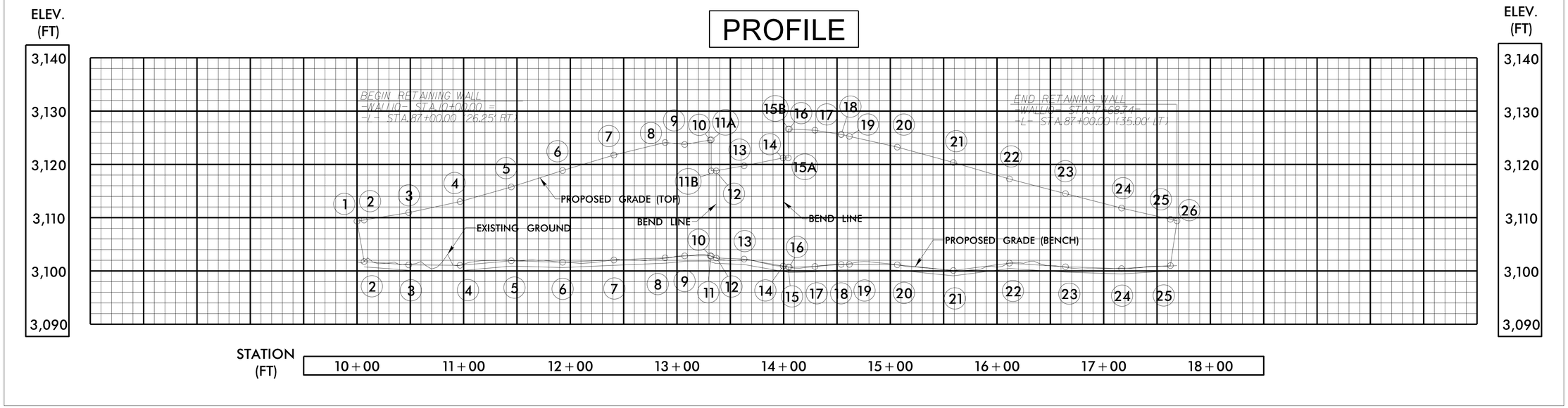
ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

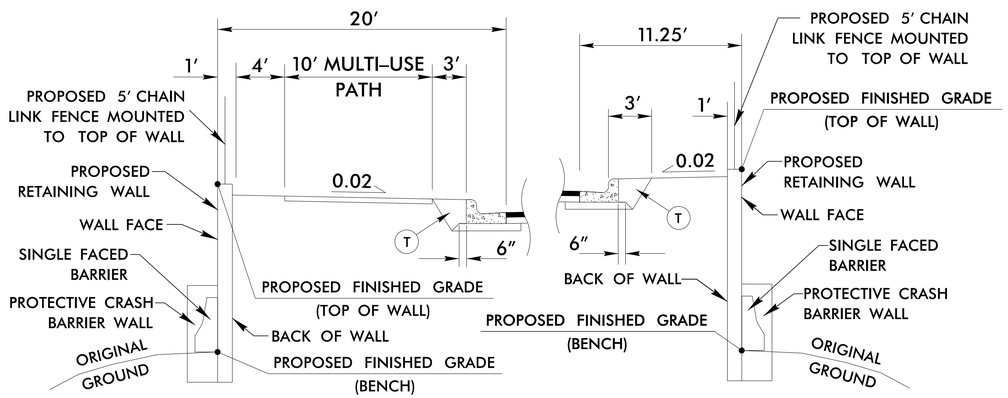
RETAINING WALL #10 ENVELOPE VIEW

PROFILE



POINT NO.	-WALL10- STATION	-L- STATION	-L- OFFSET	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	10+00.00	87+00.00	26.25	3,109.39	3,109.39
2	10+06.68	86+93.52	26.25	3,109.61	3,101.82
3	10+48.53	86+50.00	26.25	3,111.00	3,101.19
4	10+96.60	86+00.00	26.25	3,113.07	3,101.11
5	11+44.67	85+50.00	26.25	3,115.81	3,101.96
6	11+92.74	85+00.00	26.25	3,118.90	3,101.69
7	12+40.81	84+50.00	26.25	3,121.80	3,102.11
8	12+88.88	84+00.00	26.25	3,124.15	3,102.51
9	13+07.19	83+80.95	26.25	3,123.79	3,102.88
10	13+31.06	83+56.12	26.25	3,124.62	3,102.91
11A	13+32.07	83+55.07	26.25	3,124.62	3,102.83
11B	13+32.07	83+55.07	26.25	3,118.86	3,102.83
12	13+36.82	83+50.13	26.25	3,118.86	3,102.48
13	13+62.89	83+49.36	0.19	3,119.80	3,102.28
14	13+99.51	83+48.38	-36.42	3,121.26	3,100.97
15A	14+04.27	83+52.89	-36.42	3,121.26	3,100.81
15B	14+04.27	83+52.89	-36.42	3,126.69	3,100.81
16	14+05.27	83+53.84	-36.42	3,126.69	3,100.77
17	14+29.33	83+76.68	-36.42	3,126.45	3,100.89
18	14+53.91	84+00.00	-35.20	3,125.66	3,101.29
19	14+61.55	84+07.26	-35.00	3,125.31	3,101.28
20	15+06.48	84+50.00	-35.00	3,123.29	3,101.21
21	15+59.06	85+00.00	-35.00	3,120.40	3,100.14
22	16+11.63	85+50.00	-35.00	3,117.31	3,101.52
23	16+64.20	86+00.00	-35.00	3,114.56	3,100.83
24	17+16.78	86+50.00	-35.00	3,111.85	3,100.50
25	17+62.54	86+93.52	-35.00	3,109.75	3,101.06
26	17+68.74	87+00.00	-35.00	3,109.46	3,109.46

TYPICAL SECTIONS



ESTIMATED MSE WALL QUANTITIES		
RETAINING WALL NO.	MSE RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*
10	12,827	12,827

*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

SEE SHEET 2B-6 FOR TYPE AND LOCATION OF BARRIER

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL10- STA. 10+00 TO 17+68.74

PREPARED BY: JOEY DAILY DATE: 8/14/25

REVIEWED BY: KRISTEN HILL DATE: 8/14/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

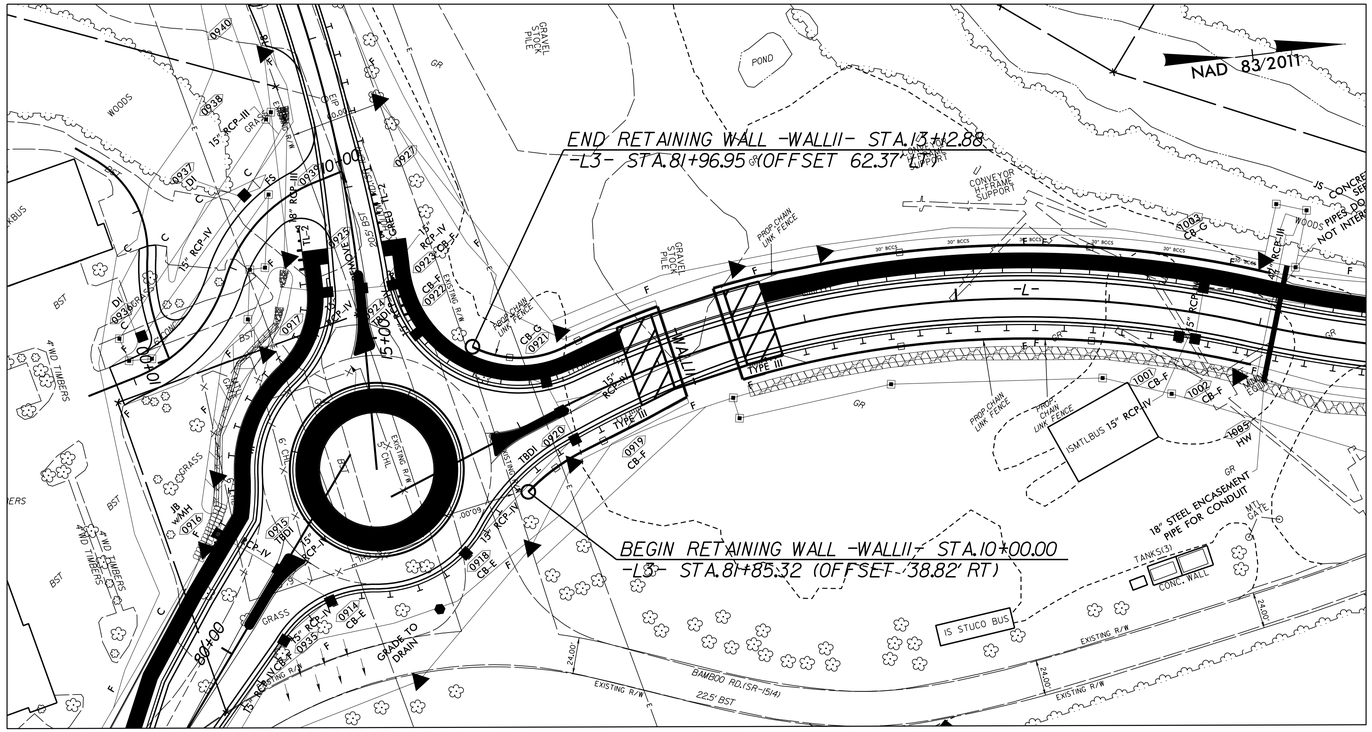
RETAINING WALL NO. 10 ENVELOPE, TYPICAL SECTION VIEWS

REVISIONS

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

SHEET NO. W-18

RETAINING WALL #11 PLAN VIEW



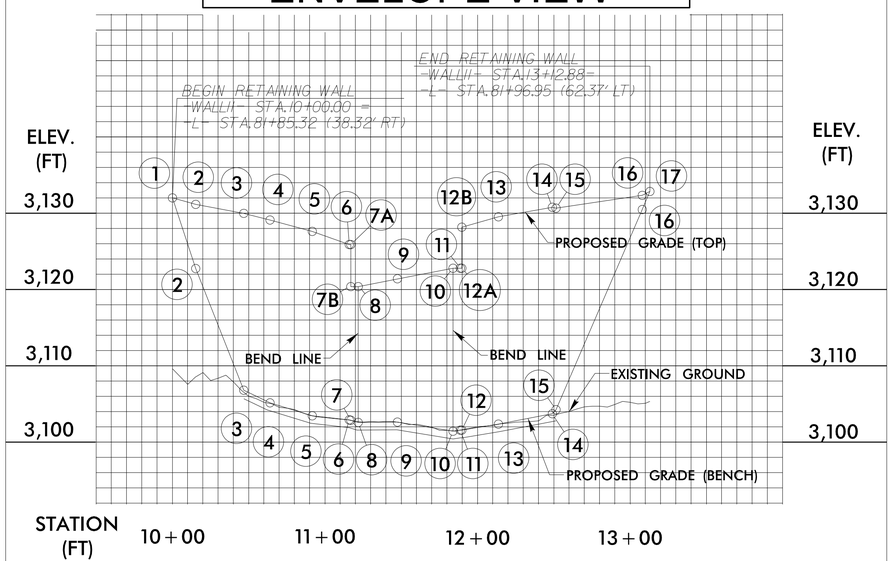
POINT NO.	-WALL11- STATION	-L- STATION	-L- OFFSET	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	10+00.00	81+85.32	38.82	3,132.05	3,132.05
2	10+15.22	82+00.00	34.83	3,131.20	3,122.79
3	10+46.73	82+31.98	31.75	3,130.02	3,106.84
4	10+63.91	82+50.00	31.33	3,129.15	3,105.19
5	10+91.61	82+78.95	29.70	3,127.66	3,103.49
6	11+15.86	83+04.04	26.60	3,125.93	3,102.95
7A	11+16.88	83+05.09	26.45	3,125.93	3,102.91
7B	11+16.88	83+05.09	26.45	3,120.42	3,102.91
8	11+21.71	83+10.06	25.72	3,120.42	3,102.62
9	11+47.42	83+10.81	0.02	3,121.42	3,102.66
10	11+83.87	83+11.79	-36.42	3,122.83	3,101.47
11	11+88.62	83+07.28	-36.42	3,122.83	3,101.61
12A	11+89.63	83+06.33	-36.42	3,122.83	3,101.61
12B	11+89.63	83+06.33	-36.42	3,128.21	3,101.61
13	12+13.62	82+83.56	-36.42	3,129.57	3,102.40
14	12+48.97	82+50.00	-35.03	3,130.81	3,103.76
15	12+51.37	82+47.71	-35.00	3,130.70	3,104.29
16	13+07.89	82+00.00	-58.41	3,132.38	3,130.52
17	13+12.88	81+96.95	-62.37	3,132.89	3,132.89

ESTIMATED MSE WALL QUANTITIES

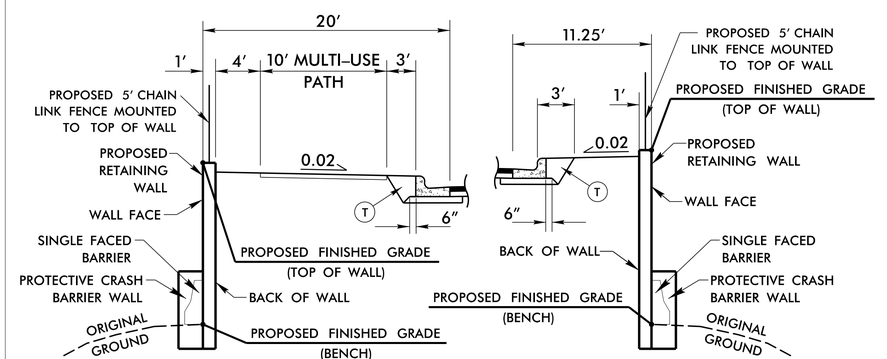
RETAINING WALL NO.	MSE RETAINING WALLS (SF)	WEATHER CUT ASHLAR FORM LINER FINISH (SF)*
11	6,108	6,108

*THE WEATHER CUT ASHLAR FORM LINER FINISH IS INCIDENTAL AND SHOULD BE INCLUDED IN THE COST OF THE WALL.

ENVELOPE VIEW



TYPICAL SECTIONS



SEE SHEET 2B-6 FOR TYPE AND LOCATION OF BARRIER

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO.: U-5810

WATAGUA COUNTY

STATION: -WALL11- STA. 10+00 TO 13+12.88

PREPARED BY: JOEY DAILY	DATE: 8/14/25
REVIEWED BY: KRISTEN HILL	DATE: 8/14/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 11 PLAN, ENVELOPE, TYPICAL SECTION VIEWS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-19
2			4			

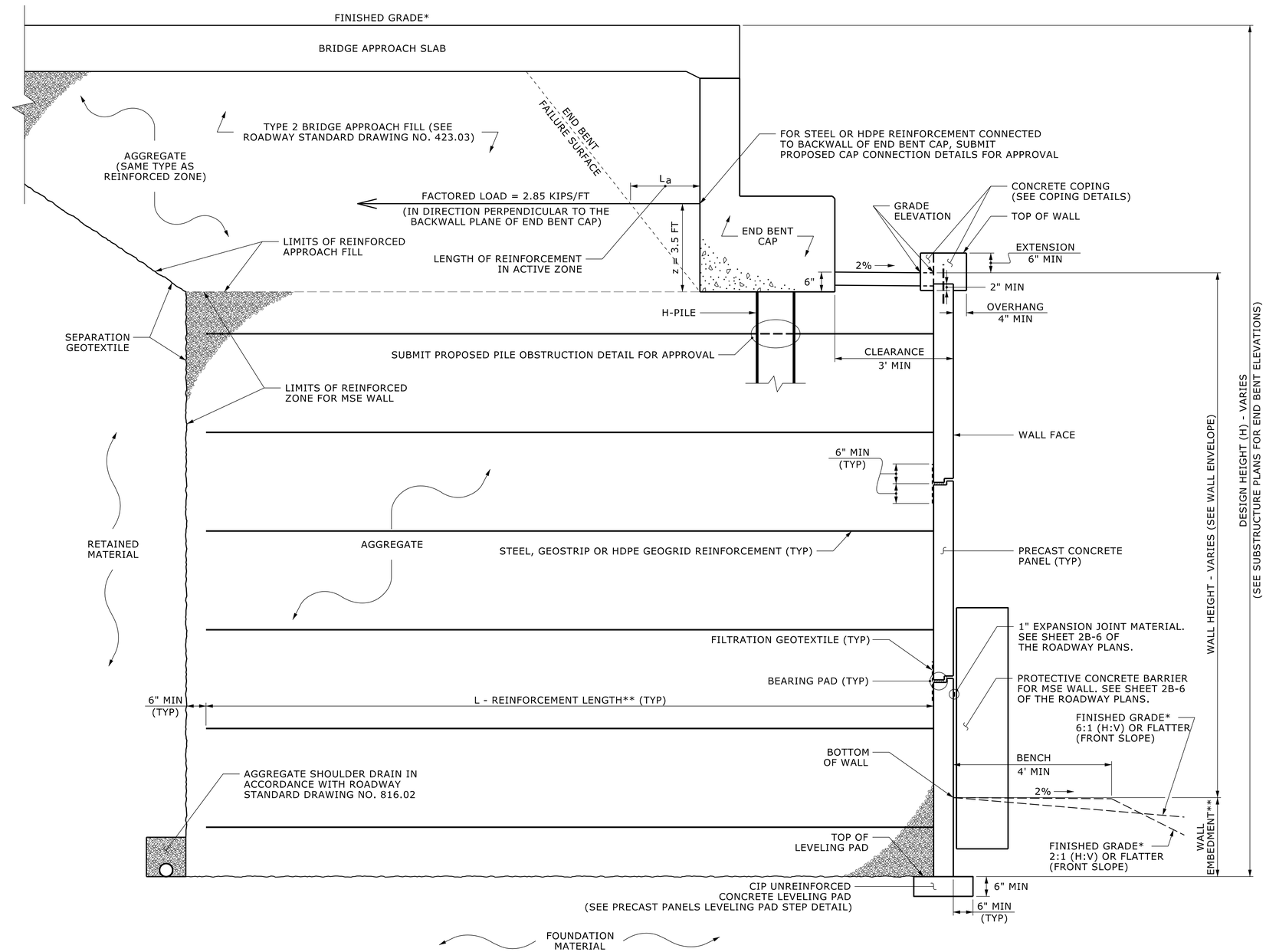
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F20CA6BB83F449F... SIGNATURE 6/16/2026 DATE

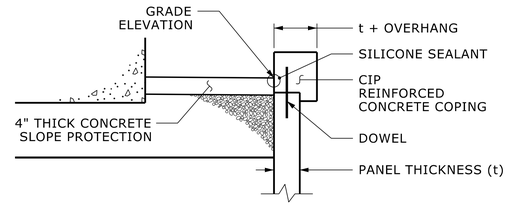
ENGINEER SIGNATURE DATE

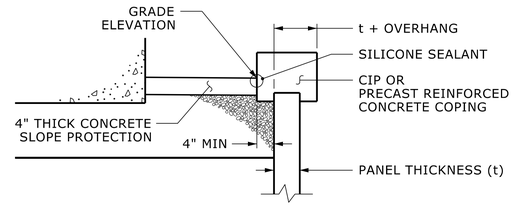
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



MSE ABUTMENT 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 WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.





COPING DETAILS

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

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL10- STA. 10+00.00 TO 17+68.74

-WALL11- STA. 10+00.00 TO 13+12.88

SHEET 4 OF 6 WALL ID RW-10-11

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 10
AND
RETAINING WALL NO. 11
TYPICAL SECTION

PREPARED BY: JOEY DAILY	DATE: 2/28/25
REVIEWED BY: KRISTEN HILL	DATE: 2/28/25

REVISIONS

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

SHEET NO. W-20

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F440F...

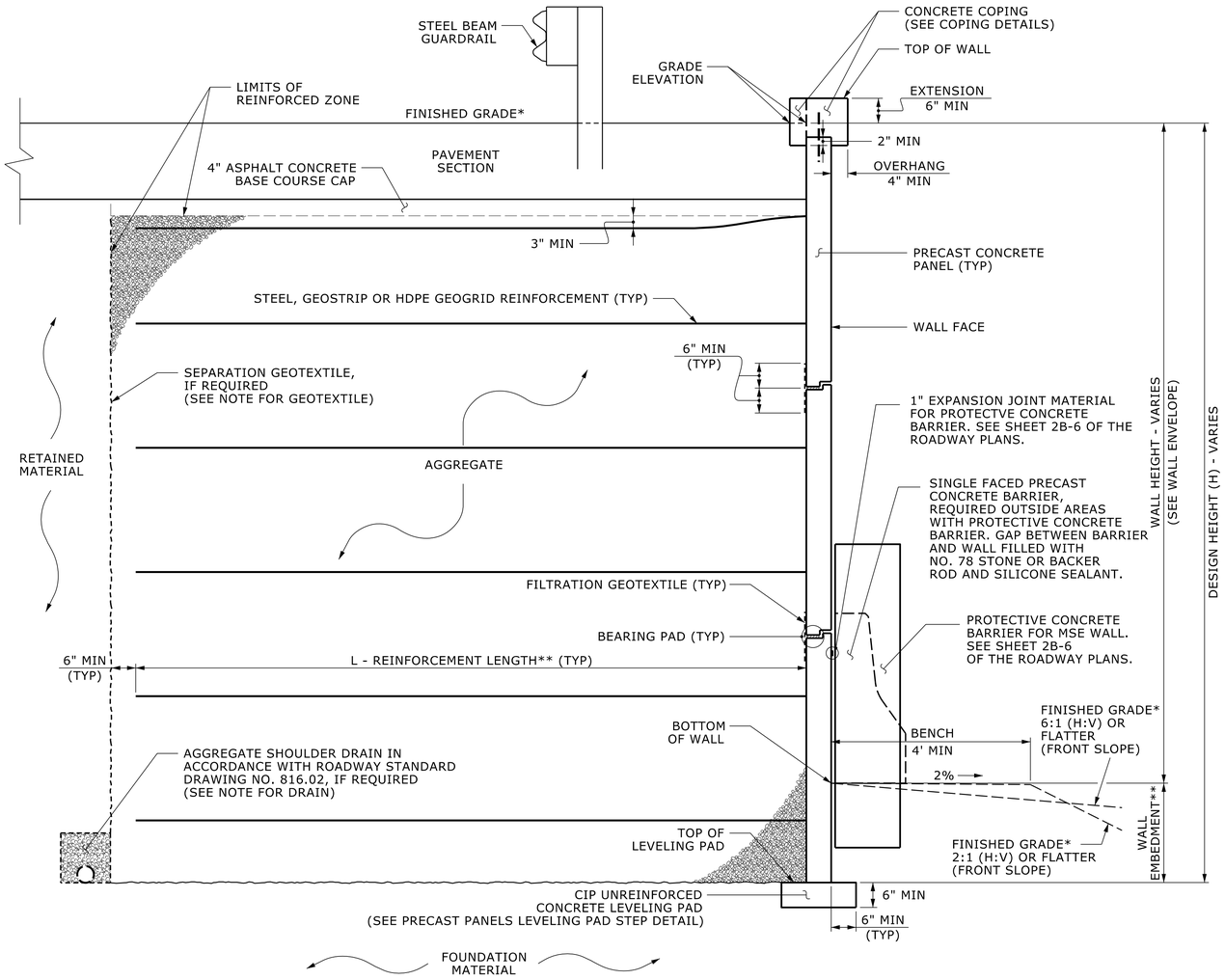
6/16/2026

SIGNATURE DATE

ENGINEER

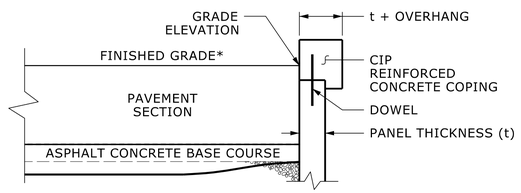
SIGNATURE DATE

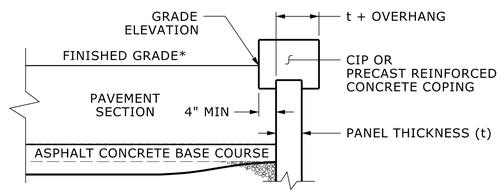
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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 WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.





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.

PREPARED BY: JOEY DAILY	DATE: 2/28/25
REVIEWED BY: KRISTEN HILL	DATE: 2/28/25

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL10- STA. 10+00.00 TO 17+68.74

-WALL11- STA. 10+00.00 TO 13+12.88

SHEET 5 OF 6 WALL ID RW-10-11

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 10 AND RETAINING WALL NO. 11 TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-21
2			4			

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by: Thomas J. Daily F29CA6BB83F449F...

6/16/2026

SIGNATURE DATE

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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

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

FOR TYPE 2 BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY STANDARD DRAWING NO. 423.03.

A PROTECTIVE CONCRETE BARRIER IS REQUIRED FOR THE ABUMENT WALL AND PORTIONS OF THE WING WALLS, SEE SHEET 2B-6 OF THE ROADWAY PLANS.
FOR ALL OTHER MSE WALL AREAS, USE A STANDARD SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 10 AND RETAINING WALL NO. 11.

CIP REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO 10 AND RETAINING WALL NO. 11.

A WEATHER CUT ASHLAR FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 10 AND RETAINING WALL NO. 11.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 10 RETAINING WALL NO. 11.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 10 AND RETAINING WALL NO. 11.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 10 AND RETAINING WALL NO. 11, 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 NO. 10 AND RETAINING WALL NO. 11 FOR THE FOLLOWING:
1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,000 PSF
4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 10 FT, WHICHEVER IS LONGER
5) MINIMUM EMBEDMENT DEPTH = 2 FT
6) 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.			

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
RETAINED	120	30	0
FOUNDATION	120	30	0

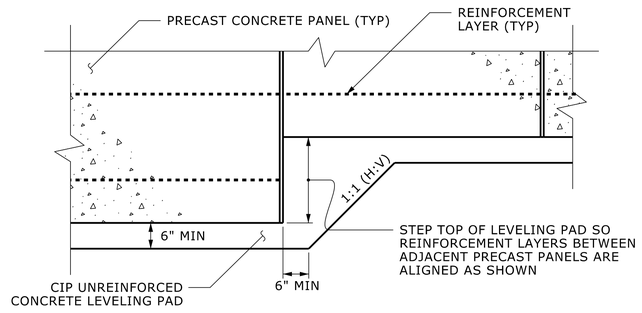
DESIGN RETAINING WALL NO. 10 AND RETAINING WALL NO. 11 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION -L3- 83+05.06 AND END BENT NO. 2 LOCATED AT STATION -L3- 83+55.11. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

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. 10 AND RETAINING WALL NO. 11.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION -L3- 83+05.06 AND END BENT NO. 2 LOCATED AT STATION -L3- 83+55.11 MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 10 AND RETAINING WALL NO. 11.
SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 10 AND RETAINING WAL NO. 11 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: U-5810

WATAUGA COUNTY

STATION: -WALL10- STA. 10+00.00 TO 17+68.74

-WALL11- STA. 10+00.00 TO 13+12.88

SHEET 6 OF 6 WALL ID RW-10-11

8848 RED OAK BLVD, SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

PREPARED BY: JOEY DAILY	DATE: 2/28/25
REVIEWED BY: KRISTEN HILL	DATE: 2/28/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 10 AND RETAINING WALL NO. 11 DETAIL AND NOTES

REVISIONS

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

SHEET NO. W-22