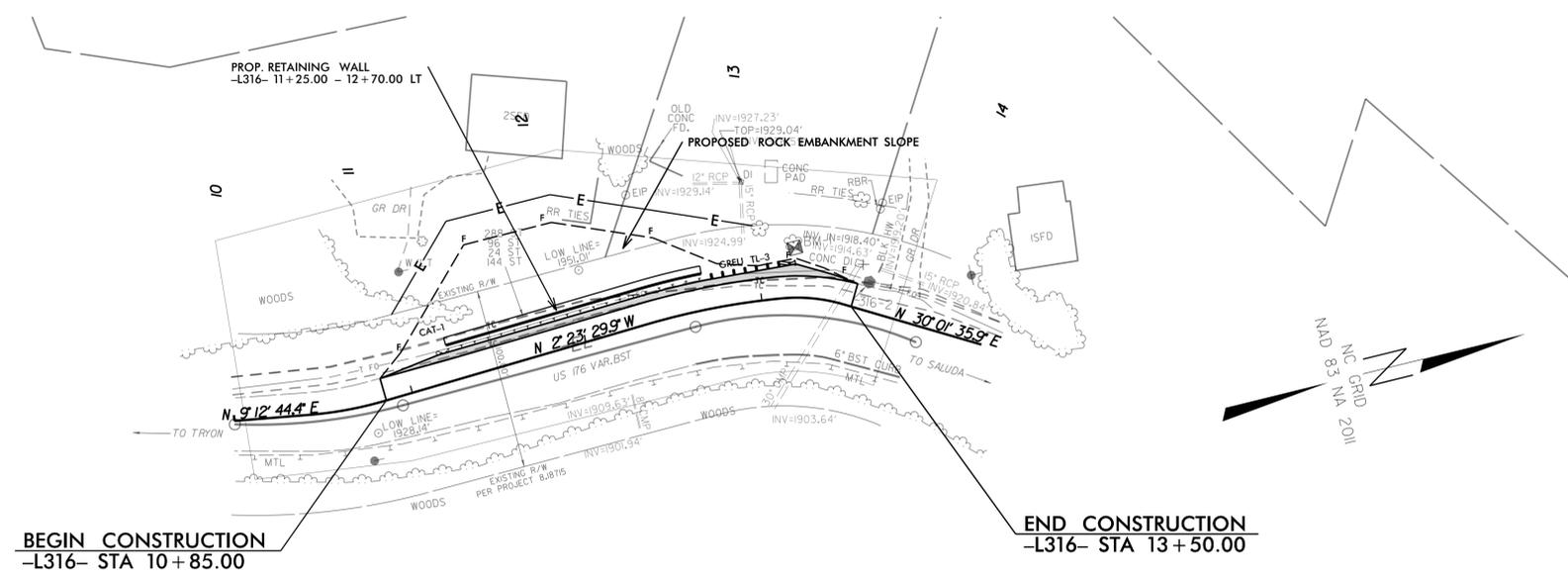
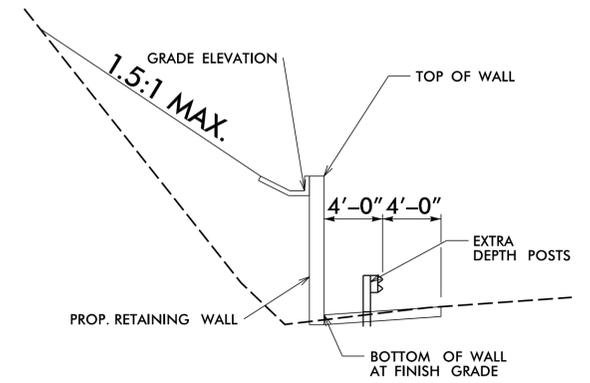


SITE 316 RETAINING WALL:

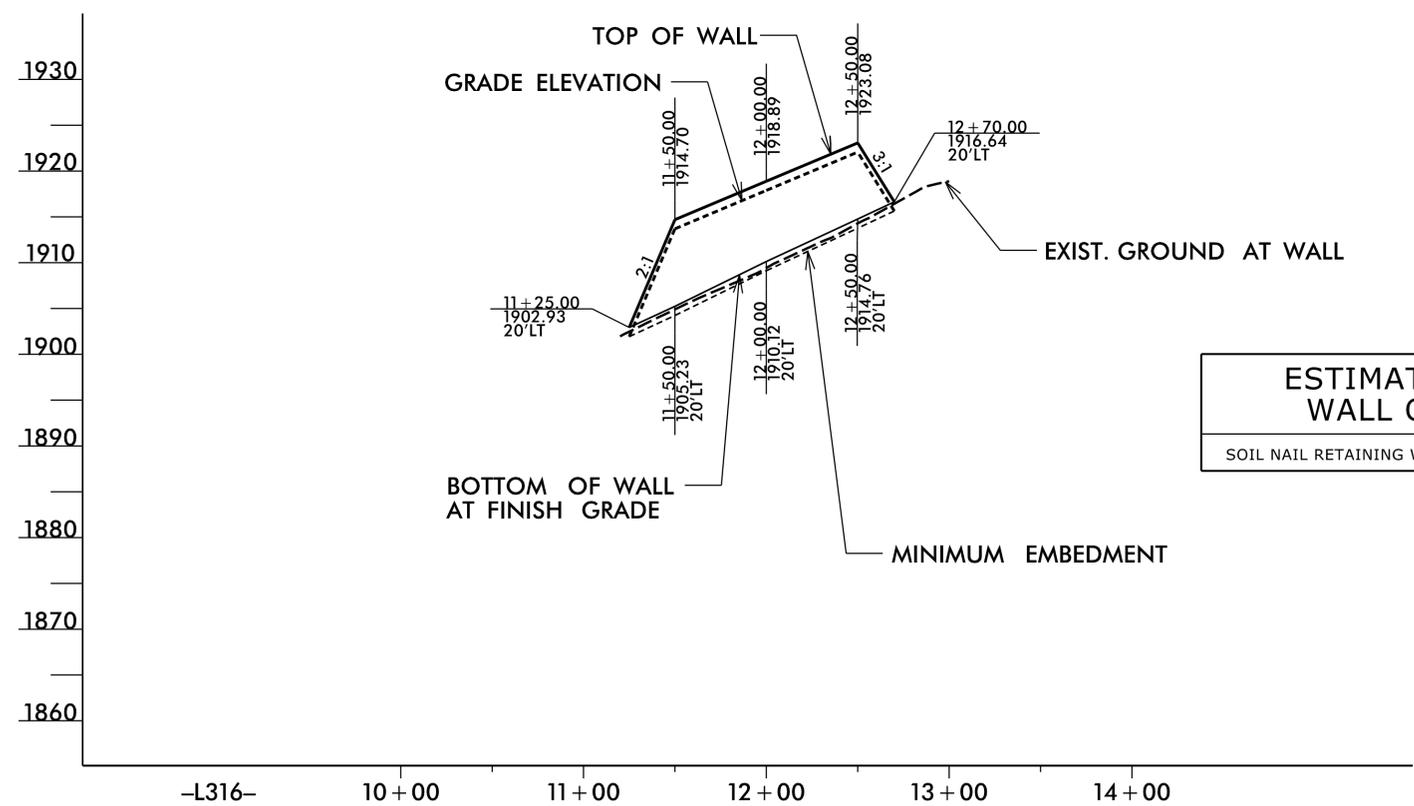
GEOTECHNICAL ENGINEER  Robert E. Kral 12/2/2025 DATE	ENGINEER _____ SIGNATURE _____ DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SITE 316 RETAINING WALL – PLAN
NOT TO SCALE



SECTION THROUGH RETAINING WALL
-L316- STA. 11+25.00, LT TO STA. 12+70.00, LT



ESTIMATED SITE 316 WALL QUANTITIES	
SOIL NAIL RETAINING WALL	1,090 SF

SITE 316 RETAINING WALL			
STA. -L316-	GRADE ELEVATION (FT)	BOTTOM OF WALL ELEVATION (FT)	WALL DESIGN HEIGHT "H" (FT)
11+25.00	1901.93	1901.93	0.00
11+50.00	1913.70	1905.23	8.47
12+00.00	1917.89	1910.12	7.77
12+50.00	1923.08	1914.76	8.32
12+70.00	1915.64	1915.64	0.00

SITE 316 RETAINING WALL – ENVELOPE
NOT TO SCALE
(LOOKING AT FACE OF WALL)

PROJECT NO.: W03293
POLK COUNTY
RETAINING WALL: -L316- STA. 11+25.00 TO 17+70.00, LT
SHEET 1 OF 3

PREPARED BY: KND DATE: 10/25
REVIEWED BY: REK DATE: 10/25

RETAINING WALL ENVELOPE AND WALL LAYOUT PROVIDED TGS JULY 16, 2025.

Prepared in the Office of:

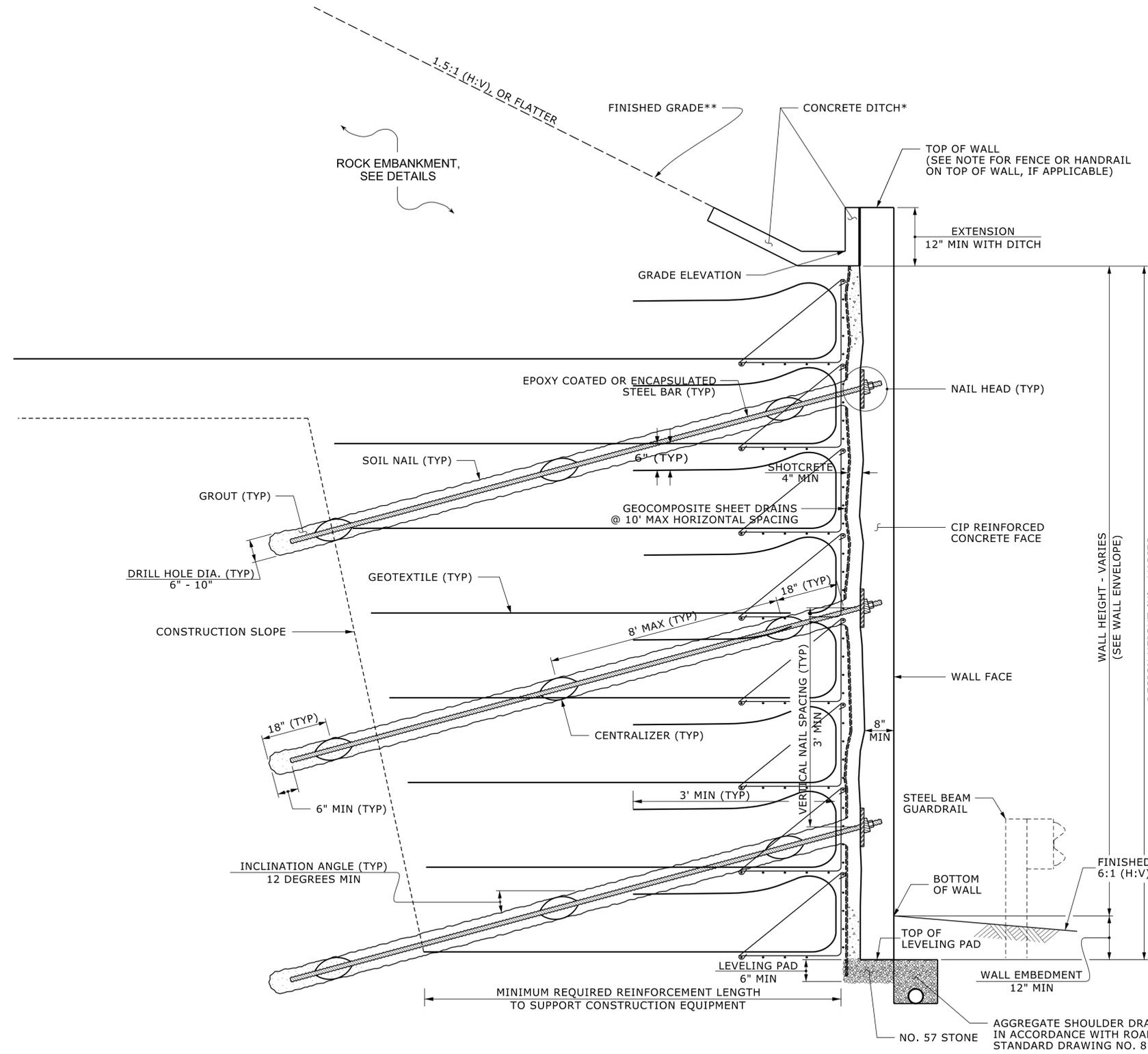


**CAROLINAS
GEOTECHNICAL
GROUP**
1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684

SITE 316 RETAINING WALL SOIL NAIL RETAINING WALL					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-1

GEOTECHNICAL ENGINEER  SEAL 042642 ROBERT E. KRAL	ENGINEER SIGNATURE _____ DATE _____
Signed by: <i>Robert E. Kral</i> 12/2/2025 DATE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



NOTES:

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

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

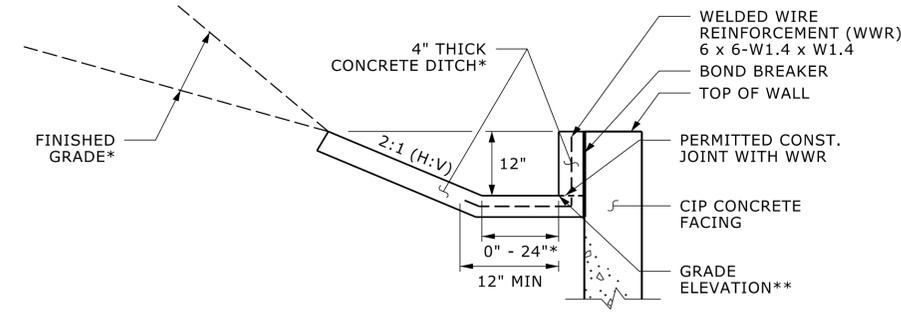
BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR SITE 316 RETAINING WALL, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN SITE 316 RETAINING WALL FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 75 YEARS
- 3) MINIMUM WALL EMBEDMENT DEPTH = 1 FT
- 4) ROCK EMBANKMENT PARAMETERS, UNIT WEIGHT, $\gamma = 135$ PCF, FRICTION ANGLE, $\phi = 42$ DEGREES, COHESION, $c = 0$ PSF
- 5) ASSUMED BORROW MATERIAL PARAMETERS, SEE SECTION 1018 OF THE STANDARD SPECIFICATIONS, UNIT WEIGHT, $\gamma = 120$ PCF, FRICTION ANGLE, $\phi = 30$ DEGREES, COHESION, $c = 0$ PSF
- 6) IN-SITU ASSUMED MATERIAL PARAMETERS RESIDUAL SOIL: UNIT WEIGHT, $\gamma = 120$ PCF, FRICTION ANGLE, $\phi = 30$ DEGREES, COHESION, $c = 0$ PSF
- 7) IN-SITU ASSUMED MATERIAL PARAMETERS CRYSTALLINE ROCK: UNIT WEIGHT, $\gamma = 170$ PCF, FRICTION ANGLE, $\phi = 34$ DEGREES, COHESION, $c = 1,000$ PSF

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR SITE 316 RETAINING WALL.

"TEMPORARY SHORING" MAY BE REQUIRED FOR SITE 316 RETAINING WALL IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY OR TRAFFIC CONTROL PLANS.



CONCRETE DITCH BEHIND WALL WITH CONCRETE FACING

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

SOIL NAIL WALL - TYPICAL SECTION
 *SEE CONCRETE DITCH BEHIND WALL DETAILS.
 **SEE PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.

PROJECT NO.: W03293
 POLK COUNTY
 RETAINING WALL: -L316- STA. 11+25.00 TO 17+70.00, LT
 SHEET 2 OF 3

PREPARED BY: KND	DATE: 10/25
REVIEWED BY: REK	DATE: 10/25

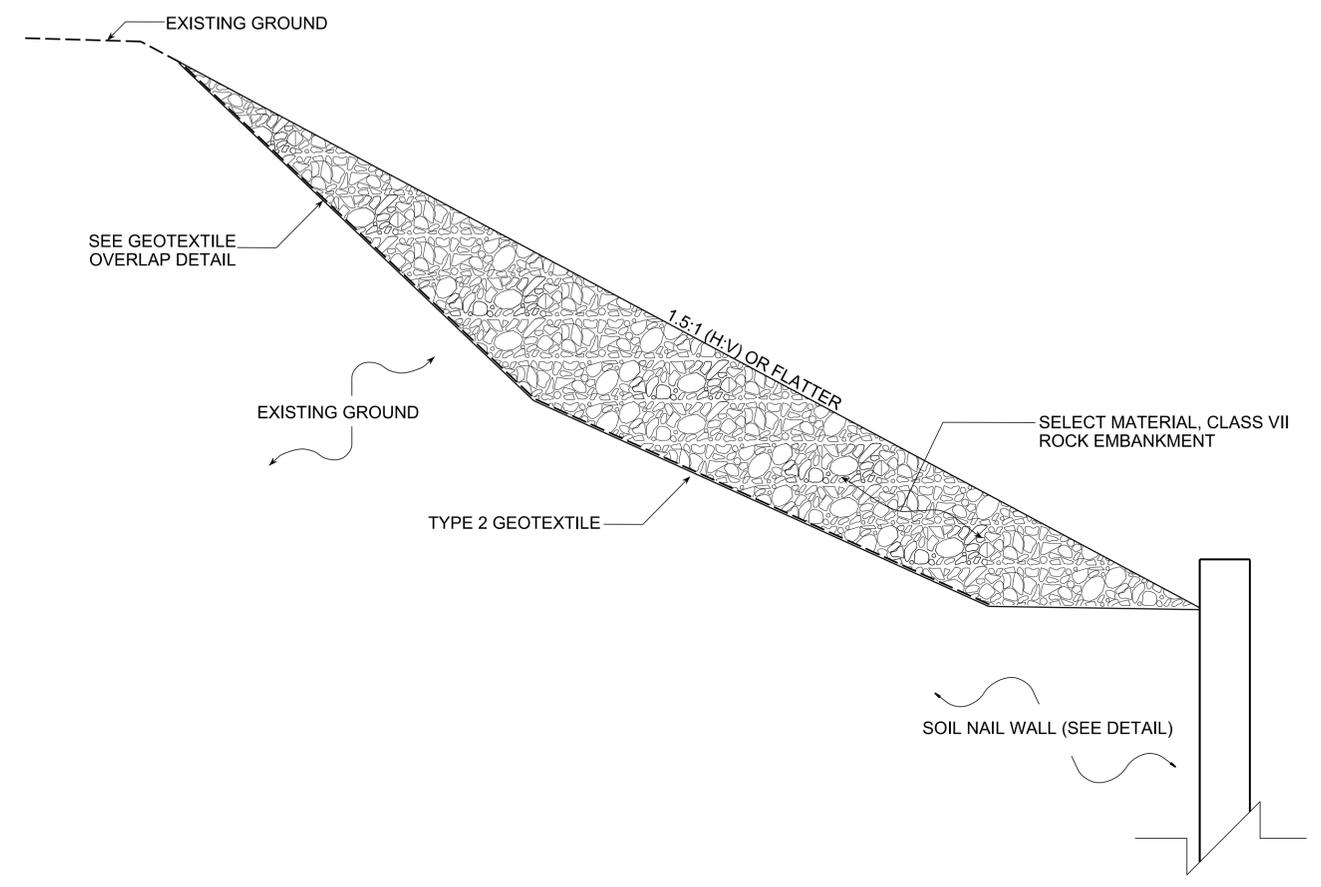
Prepared in the Office of:



CAROLINAS GEOTECHNICAL GROUP
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

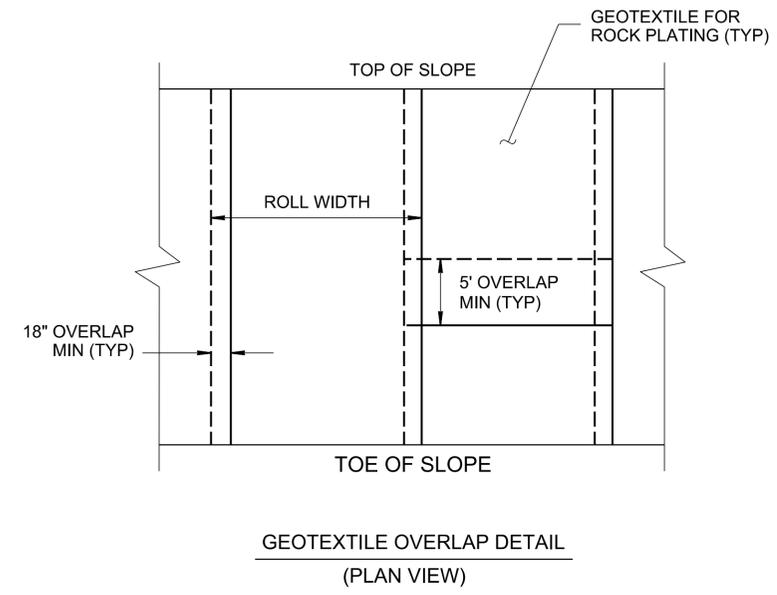
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-2
2			4			

GEOTECHNICAL ENGINEER  Signed by: <i>Robert E. Kral</i> 12/2/2025 DATE	ENGINEER SIGNATURE _____ DATE _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



ROCK EMBANKMENT DETAIL
(NOT TO SCALE)

ROCK EMBANKMENTS



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)

NOTES:

1. THE MAXIMUM ALLOWABLE HEIGHT FOR THE ROCK EMBANKMENT DETAIL IS 80'.
2. FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.

PROJECT NO.: W03293

POLK COUNTY

RETAINING WALL: -L316- STA. 11+25.00 TO 17+70.00, LT

SHEET 3 OF 3

PREPARED BY: KND	DATE: 10/25
REVIEWED BY: REK	DATE: 10/25

Prepared in the Office of:

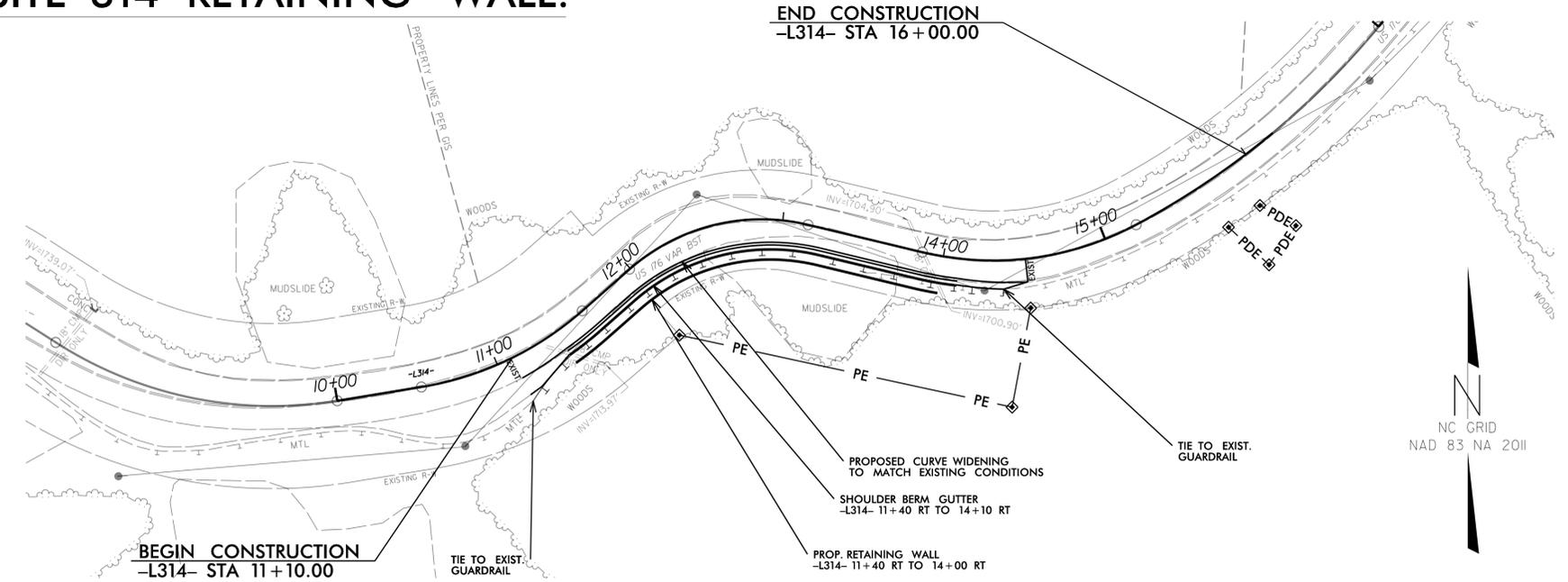


**CAROLINAS
GEOTECHNICAL
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1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684

SITE 316 RETAINING WALL
SOIL NAIL RETAINING WALL

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

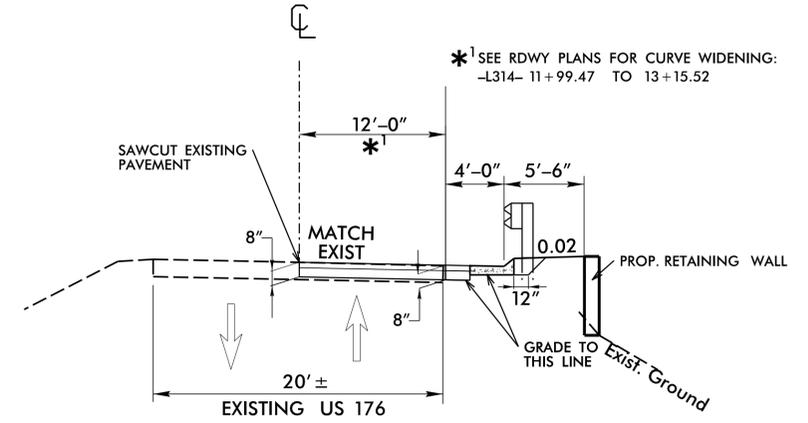
SITE 314 RETAINING WALL:



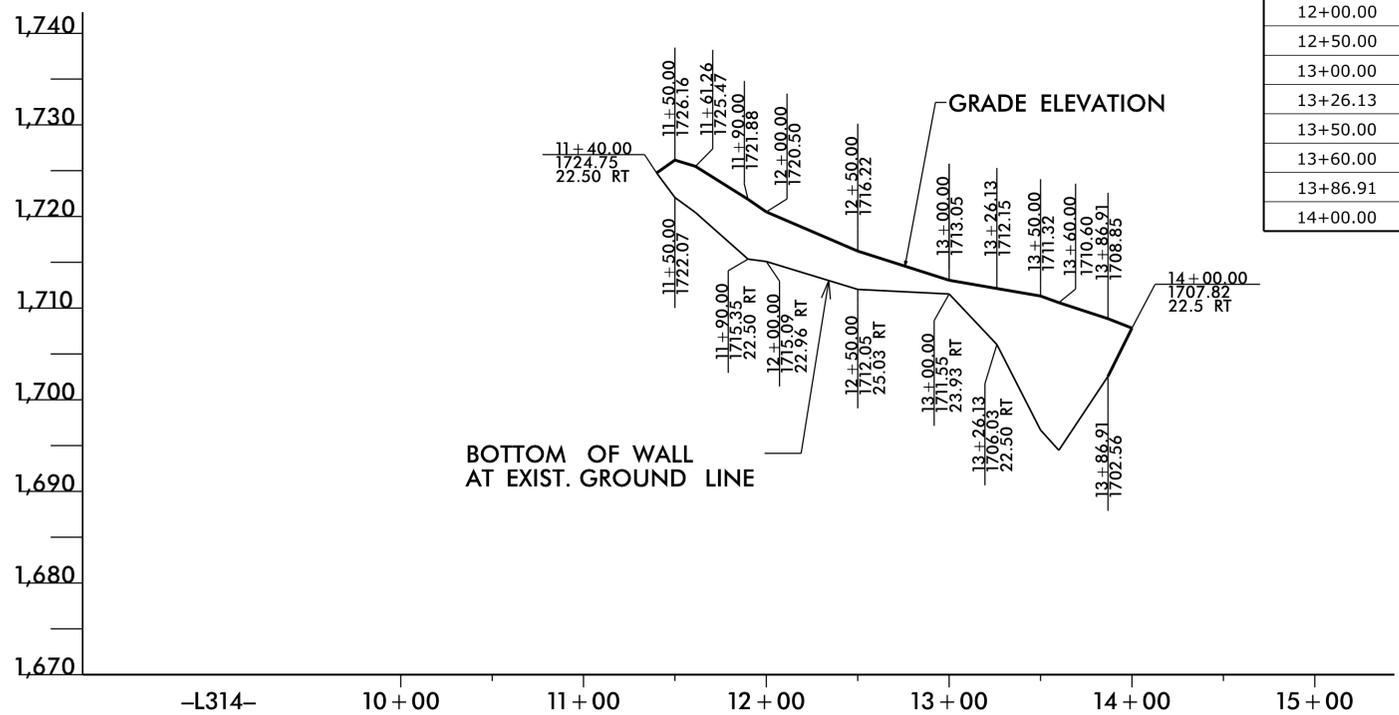
SITE 314 RETAINING WALL – PLAN
NOT TO SCALE

ESTIMATED SITE 314 WALL QUANTITIES	
SOIL NAIL RETAINING WALL	1,530 SF
MICROPILE GRADE BEAM	260 LF

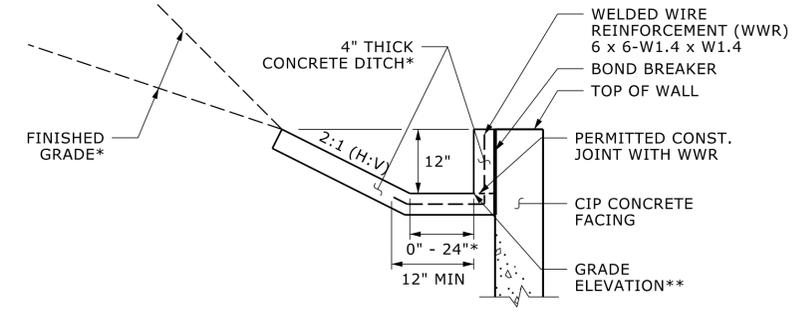
SITE 314 RETAINING WALL			
STA. -L314-	GRADE ELEVATION (FT)	BOTTOM OF WALL ELEVATION (FT)	WALL DESIGN HEIGHT "H" (FT)
11+40.00	1,724.75	1,724.75	0.00
11+50.00	1,726.16	1,722.07	4.09
11+90.00	1,721.88	1,715.35	6.53
12+00.00	1,720.50	1,715.09	5.41
12+50.00	1,716.22	1,712.05	3.72
13+00.00	1,713.05	1,711.55	1.50
13+26.13	1,712.15	1,706.03	6.12
13+50.00	1,711.32	1,696.69	14.63
13+60.00	1,710.60	1,694.48	16.12
13+86.91	1,708.85	1,702.56	6.29
14+00.00	1,707.82	1,707.82	0.00



SECTION THROUGH RETAINING WALL
-L314- STA. 11+40.00, RT TO STA. 14+00.00, RT



SITE 314 RETAINING WALL – ENVELOPE
NOT TO SCALE
(LOOKING AT FACE OF WALL)



CONCRETE DITCH BEHIND WALL WITH CONCRETE FACING
*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
**SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

PROJECT NO.: W03293
POLK COUNTY
RETAINING WALL: -L314- STA. 11+40.00 TO 14+00.00, RT
SHEET 1 OF 2

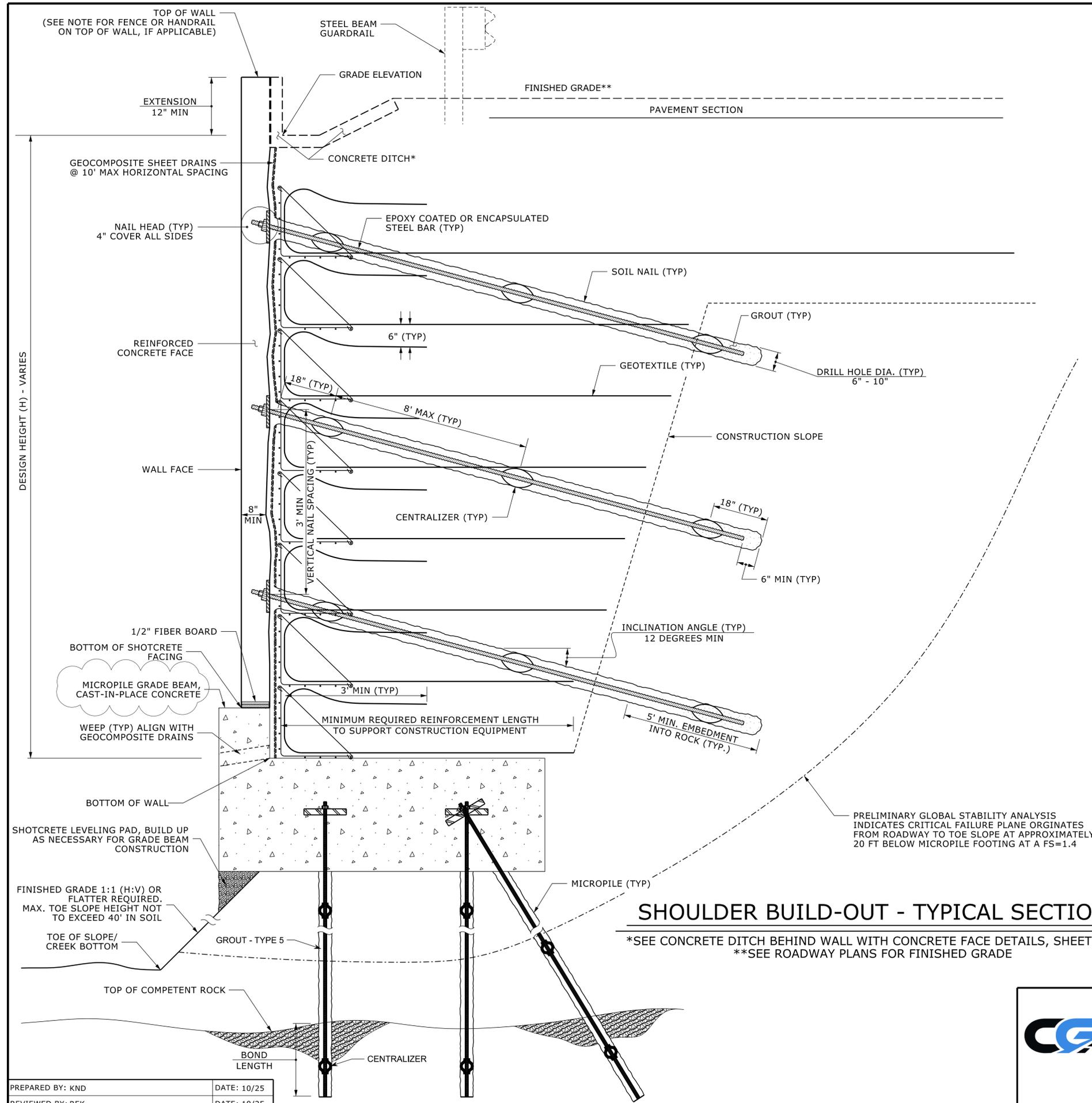
PREPARED BY: KND DATE: 10/25
REVIEWED BY: REK DATE: 10/25

RETAINING WALL ENVELOPE AND WALL LAYOUT PROVIDED TGS JUNE 18, 2025.

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684

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



SHOULDER BUILD-OUT - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL WITH CONCRETE FACE DETAILS, SHEET W-1
 **SEE ROADWAY PLANS FOR FINISHED GRADE

PRELIMINARY GLOBAL STABILITY ANALYSIS INDICATES CRITICAL FAILURE PLANE ORIGINATES FROM ROADWAY TO TOE SLOPE AT APPROXIMATELY 20 FT BELOW MICROPILE FOOTING AT A FS=1.4

GEOTECHNICAL ENGINEER Robert E. Kral <small>DATE</small> 03/13/2026 <small>SIGNATURE</small>	ENGINEER <small>SIGNATURE</small> <small>DATE</small>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NOTES:

- FOR SOIL NAIL SHOULDER BUILD-OUT, SEE SOIL NAIL RETAINING WALLS SPECIAL PROVISION.
- FOR MICROPILE GRADE BEAM, SEE MICROPILE GRADE BEAM SPECIAL PROVISION.
- FOR MICROPILES, SEE MICROPILE GRADE BEAM SPECIAL PROVISION.
- DESIGN MICROPILE GRADE BEAM FOR A MINIMUM OF 5 FEET OF GROUND LOSS BELOW GRADE BEAM.
- MICROPILE CASING MAY BE REQUIRED.
- ESTABLISH THE BACK OF SOIL NAIL WALL FACE AT A 3.5' OR GREATER OFFSET FROM THE BACK OF THE EXISTING OR PROPOSED GUARDRAIL POST.
- EXTEND THE TOP TWO LAYERS OF GEOTEXTILE TO CENTERLINE OF ROAD.
- FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS SPECIAL PROVISION.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR SITE 314 RETAINING WALL, 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 SITE 314 RETAINING WALL FOR THE FOLLOWING:
 - 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 75 YEARS
 - 3) MINIMUM WALL EMBEDMENT DEPTH = 1 FT
 - 4) ASSUMED BORROW MATERIAL PARAMETERS, SEE SECTION 1018 OF THE STANDARD SPECIFICATIONS
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - 5) IN-SITU ASSUMED MATERIAL PARAMETERS RESIDUAL SOIL:
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - 6) IN-SITU ASSUMED MATERIAL PARAMETERS CRYSTALLINE ROCK:
 - UNIT WEIGHT, $\gamma = 170$ PCF
 - FRICTION ANGLE, $\phi = 34$ DEGREES
 - COHESION, $c = 1,000$ PSF
- EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR SITE 314 RETAINING WALL.
- "TEMPORARY SHORING" MAY BE REQUIRED FOR SITE 314 RETAINING WALL IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY OR TRAFFIC CONTROL PLANS.

PROJECT NO.: W03293
 POLK COUNTY
 RETAINING WALL: -L314- STA. 11+40.00 TO 14+00.00, RT
 SHEET 2 OF 2

Prepared in the Office of:

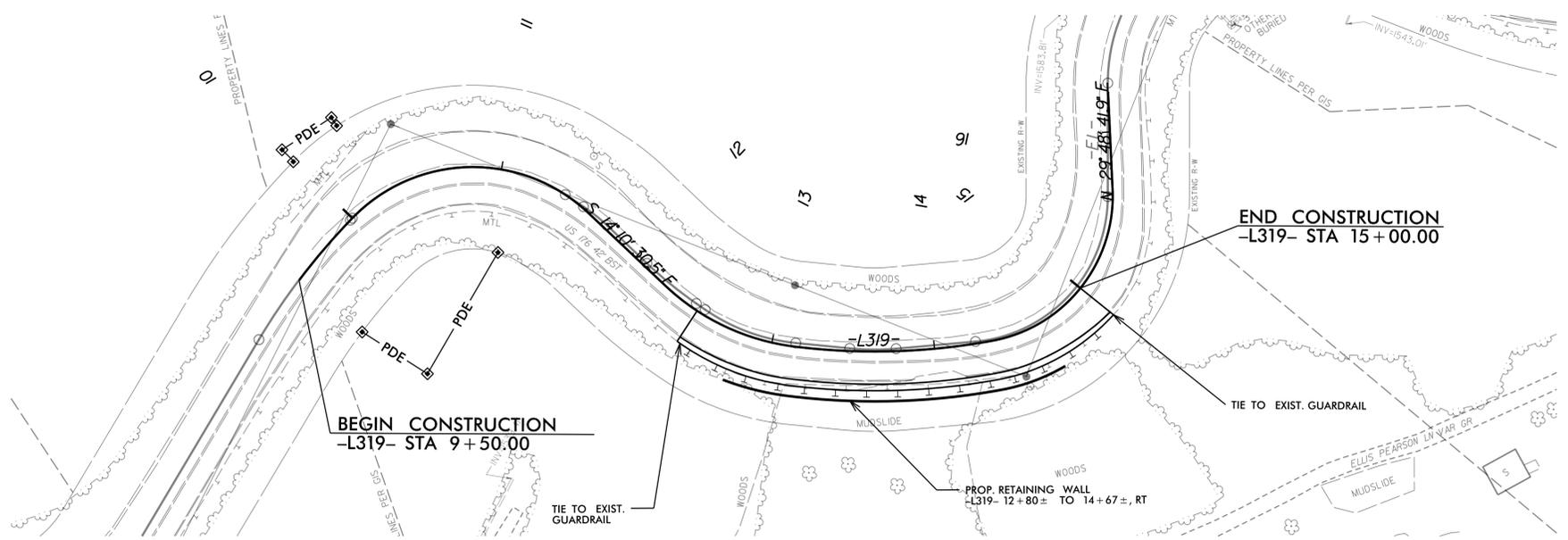
CAROLINAS GEOTECHNICAL GROUP
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

REVISIONS						SHEET NO. W-5
NO.	BY	DATE	NO.	BY	DATE	
1	KND	03/26	3			
2			4			

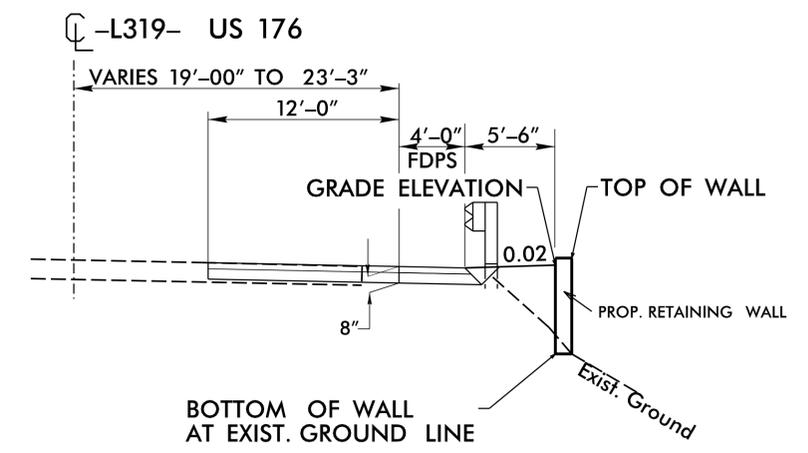
PREPARED BY: KND	DATE: 10/25
REVIEWED BY: REK	DATE: 10/25

SITE 319 RETAINING WALL:

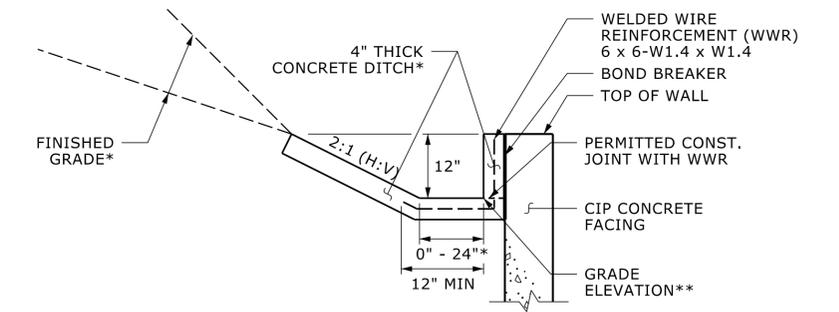
GEOTECHNICAL ENGINEER  Robert E. Kral 12/2/2025 DATE	ENGINEER _____ SIGNATURE _____ DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SITE 319 RETAINING WALL - PLAN
NOT TO SCALE



SECTION THROUGH RETAINING WALL
-L319- STA. 12+80.00, RT TO STA. 14+67.25, RT

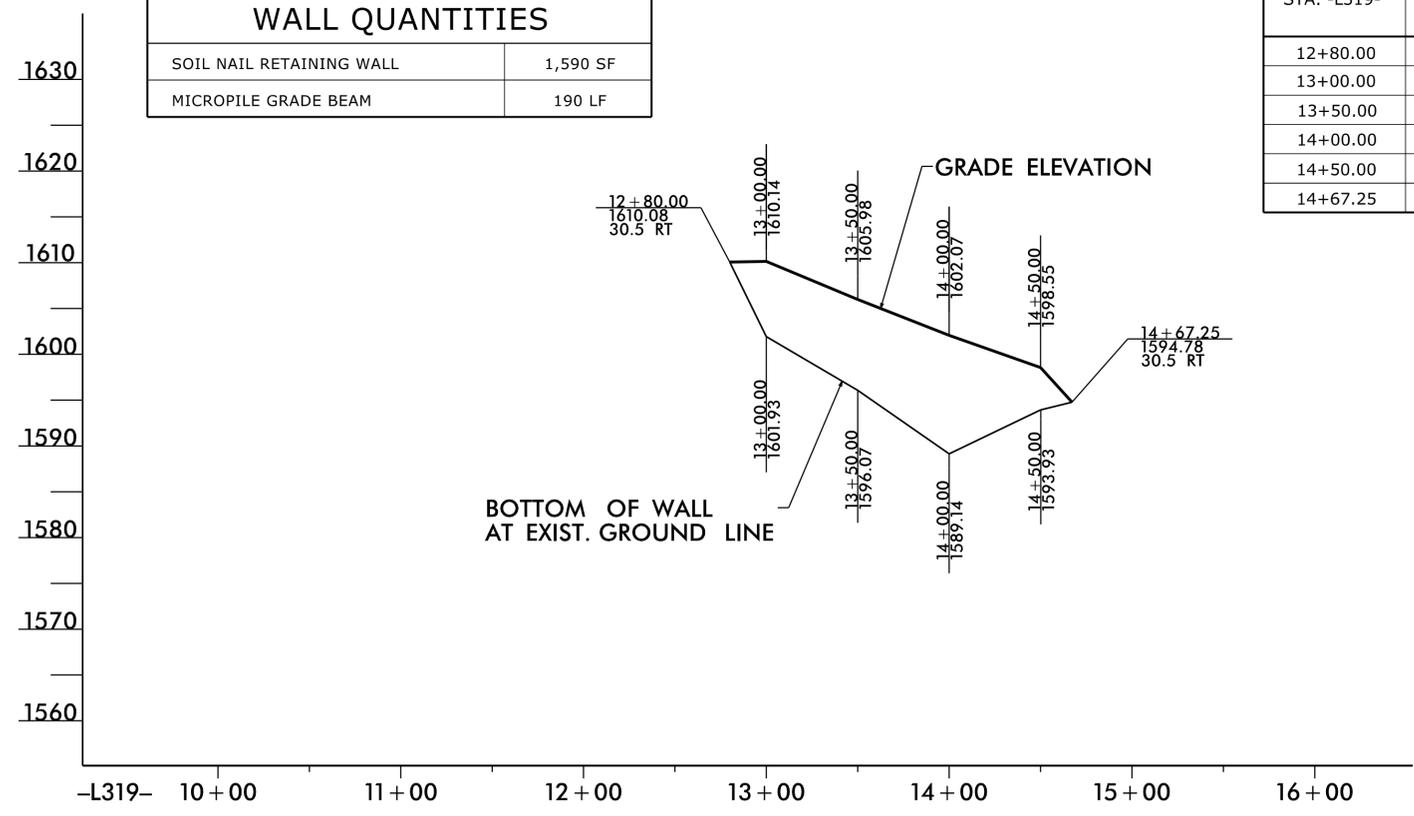


CONCRETE DITCH BEHIND WALL WITH CONCRETE FACING

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

ESTIMATED SITE 319 WALL QUANTITIES	
SOIL NAIL RETAINING WALL	1,590 SF
MICROPILE GRADE BEAM	190 LF

SITE 319 RETAINING WALL			
STA. -L319-	GRADE ELEVATION (FT)	BOTTOM OF WALL ELEVATION (FT)	WALL DESIGN HEIGHT "H" (FT)
12+80.00	1610.08	1610.08	0.00
13+00.00	1610.14	1601.93	8.21
13+50.00	1605.98	1596.07	9.91
14+00.00	1602.07	1589.14	12.93
14+50.00	1598.55	1593.93	4.62
14+67.25	1594.78	1594.78	0.00



SITE 319 RETAINING WALL - ENVELOPE
NOT TO SCALE
(LOOKING AT FACE OF WALL)

PROJECT NO.: W03293
POLK COUNTY
RETAINING WALL: -L319- STA. 12+80.00 TO 14+67.25, RT
SHEET 1 OF 2

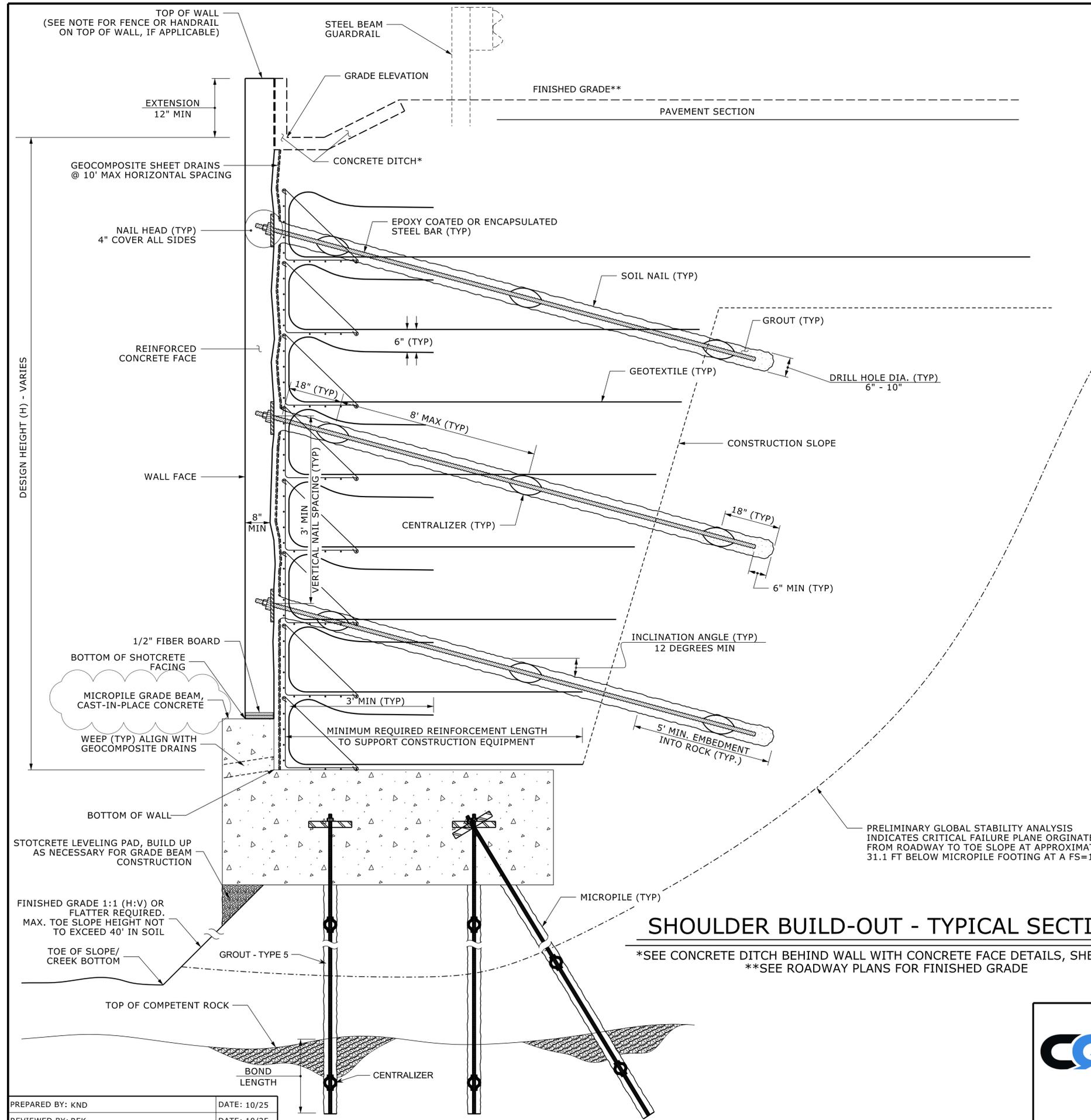
PREPARED BY: KND DATE: 10/25
REVIEWED BY: REK DATE: 10/25

RETAINING WALL ENVELOPE AND WALL LAYOUT PROVIDED TGS JUNE 18, 2025.

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

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



SHOULDER BUILD-OUT - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL WITH CONCRETE FACE DETAILS, SHEET W-1
 **SEE ROADWAY PLANS FOR FINISHED GRADE

GEOTECHNICAL ENGINEER Robert E. Kral SIGNATURE	ENGINEER DATE 03/13/2026
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

- NOTES:**
- FOR SOIL NAIL SHOULDER BUILD-OUT, SEE SOIL NAIL RETAINING WALLS SPECIAL PROVISION.
 - FOR MICROPILE GRADE BEAM, SEE MICROPILE GRADE BEAM SPECIAL PROVISION.
 - FOR MICROPILES, SEE MICROPILE GRADE BEAM SPECIAL PROVISION.
 - DESIGN MICROPILE GRADE BEAM FOR A MINIMUM OF 5 FEET OF GROUND LOSS BELOW GRADE BEAM.
 - MICROPILE CASING MAY BE REQUIRED.
 - ESTABLISH THE BACK OF SOIL NAIL WALL FACE AT A 3.5' OR GREATER OFFSET FROM THE BACK OF THE EXISTING OR PROPOSED GUARDRAIL POST.
 - EXTEND THE TOP TWO LAYERS OF GEOTEXTILE TO CENTERLINE OF ROAD.
 - FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS SPECIAL PROVISION.
 - FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 - BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR SITE 319 RETAINING WALL, 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 SITE 319 RETAINING WALL FOR THE FOLLOWING:
 - 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 75 YEARS
 - 3) MINIMUM WALL EMBEDMENT DEPTH = 1 FT
 - 4) ASSUMED BORROW MATERIAL PARAMETERS, SEE SECTION 1018 OF THE STANDARD SPECIFICATIONS
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - 5) IN-SITU ASSUMED MATERIAL PARAMETERS RESIDUAL SOIL:
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - 6) IN-SITU ASSUMED MATERIAL PARAMETERS CRYSTALLINE ROCK:
 - UNIT WEIGHT, $\gamma = 170$ PCF
 - FRICTION ANGLE, $\phi = 34$ DEGREES
 - COHESION, $c = 1,000$ PSF
 - EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR SITE 319 RETAINING WALL.
 - "TEMPORARY SHORING" MAY BE REQUIRED FOR SITE 319 RETAINING WALL IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY OR TRAFFIC CONTROL PLANS.

PROJECT NO.: W03293
 POLK COUNTY
 RETAINING WALL: -L319- STA. 12+80.00 TO 14+67.25, RT
 SHEET 2 OF 2

Prepared in the Office of:

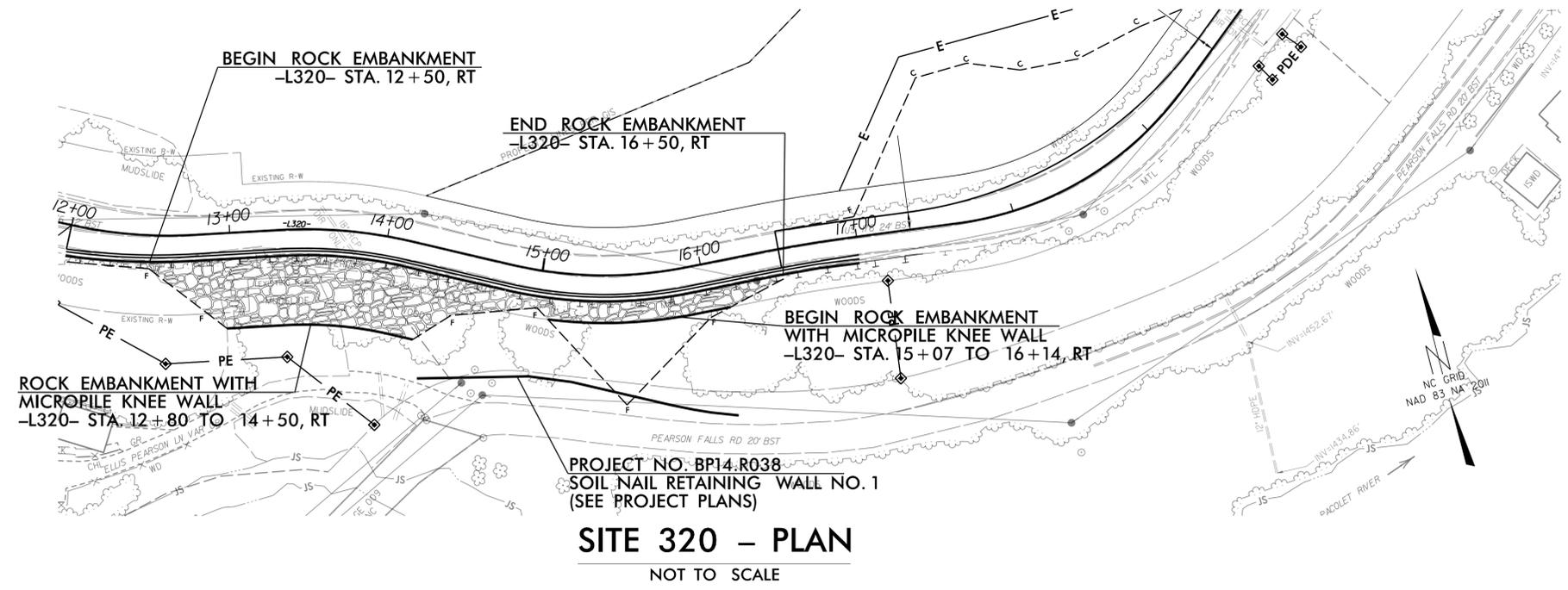
CAROLINAS GEOTECHNICAL GROUP
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	KND	03/26	3			W-7
2			4			

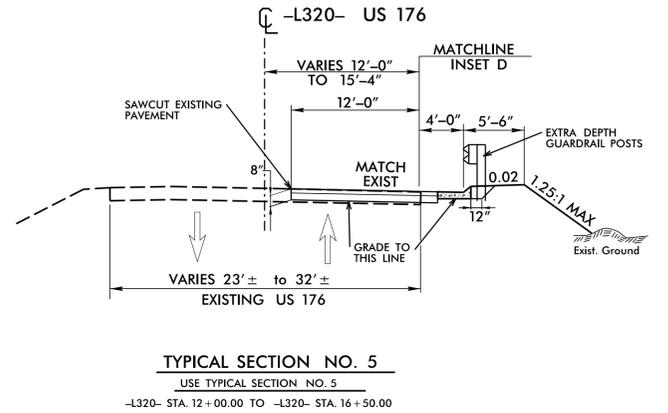
PREPARED BY: KND DATE: 10/25
 REVIEWED BY: REK DATE: 10/25

SITE 320 RETAINING WALL:

GEOTECHNICAL ENGINEER  SEAL 042642 ENGINEER ROBERT E. KRALL	ENGINEER SIGNATURE _____ DATE _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

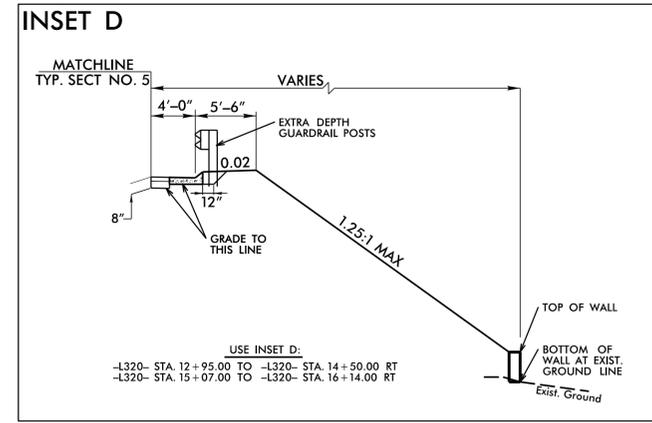


SITE 320 - PLAN
NOT TO SCALE



ESTIMATED QUANTITIES - SITE 320	
ROCK EMBANKMENTS	8,000 TON
GEOTEXTILE FOR ROCK EMBANKMENTS	2,600 SY
MICROPILE GRADE BEAM	280 LF

ROCK EMBANKMENT WITH MICROPILE KNEE WALL					
STA. -L320-	TOP OF SLOPE OFFSET	TOP OF SLOPE ELEVATION (FT)	TOP OF WALL OFFSET	TOP OF WALL ELEVATION	BOTTOM OF WALL ELEVATION (FT)
12+80.00	17.3' RT	1541.3	42.6' RT	1521.1	1521.1
13+00.00	17.3' RT	1540.1	60.0' RT	1508.6	1504.4
13+50.00	17.3' RT	1536.5	60.0' RT	1504.8	1494.2
14+00.00	17.3' RT	1533.5	60.0' RT	1501.8	1490.2
14+50.00	17.3' RT	1530.8	39.8' RT	1512.9	1512.9
15+50.00	17.3' RT	1524.3	30.0' RT	1516.6	1512.1
16+00.00	17.3' RT	1520.5	30.0' RT	1513.5	1509.5



PROJECT NO.: W03293
 POLK COUNTY
 STATION: -L320- STA. 12+50 TO STA. 16+50, RT
 SHEET 1 OF 3

Prepared in the Office of:



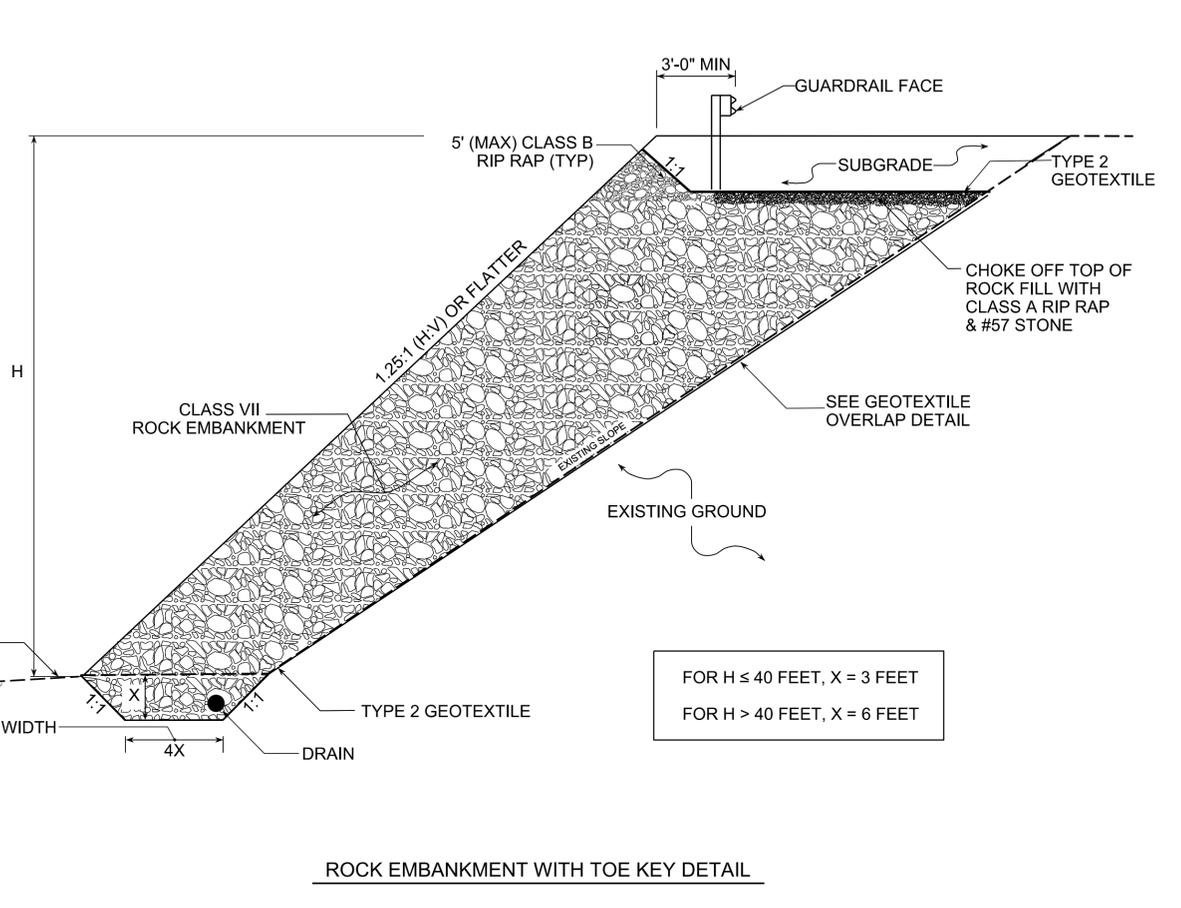
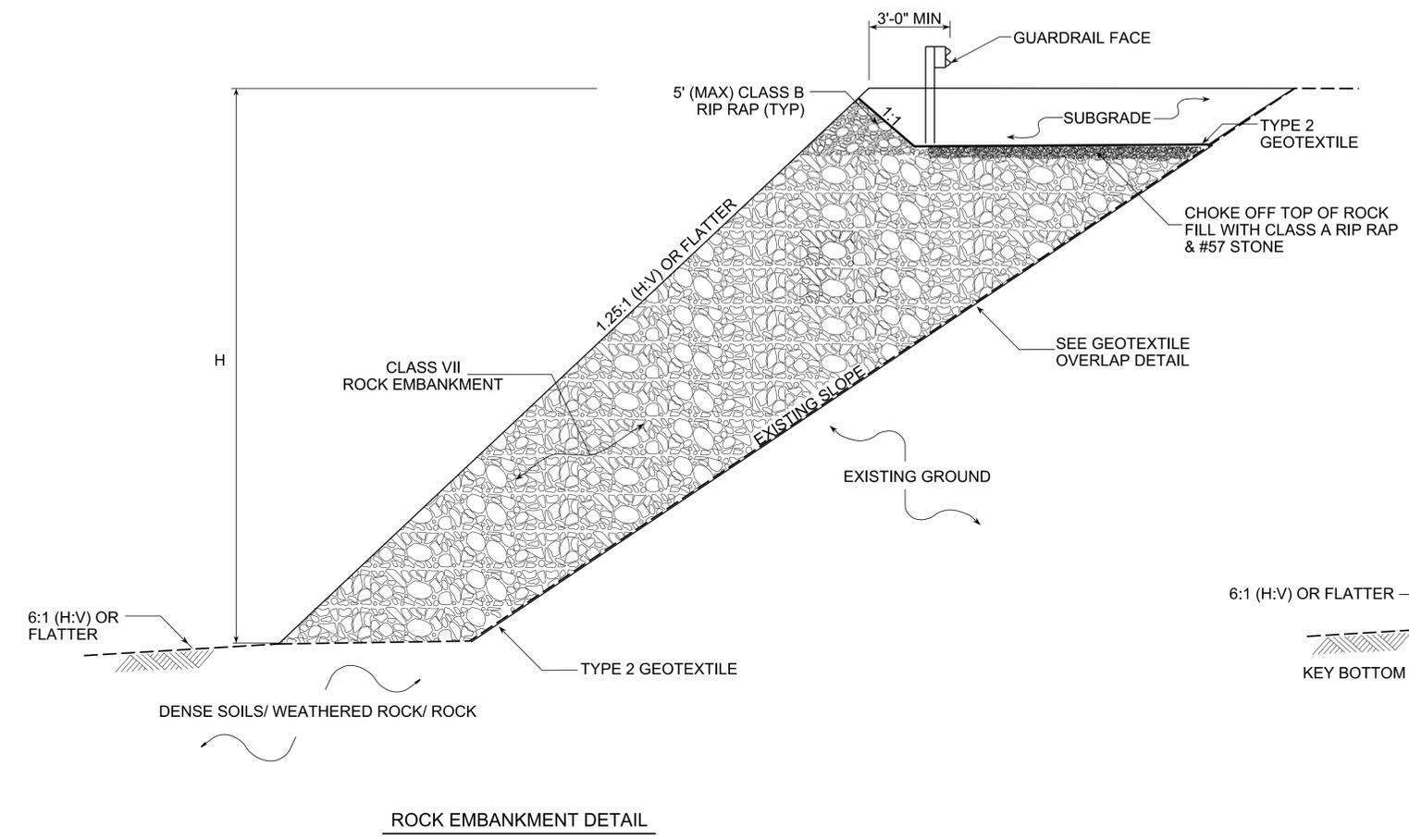
**CAROLINAS
GEOTECHNICAL
GROUP**
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

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

PREPARED BY: KND DATE: 10/25
 REVIEWED BY: REK DATE: 10/25

RETAINING WALL ENVELOPE HAS BEEN ESTIMATED BASED ON ROADWAY TYPICAL SECTIONS, CROSS SECTIONS, AND DESIGN LAYOUT PROVIDED TGS JULY 16, 2025.

GEOTECHNICAL ENGINEER  SEAL 042642 ENGINEER ROBERT E. KRUL	ENGINEER _____ SIGNATURE _____ DATE
Signed by: <i>Robert E. Krul</i> 12/2/2025 _____ SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



- NOTES:**
1. THE MAXIMUM ALLOWABLE HEIGHT FOR THE ROCK EMBANKMENT DETAIL IS 80'.
 2. FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
 3. FOR MICROPILE KNEE WALL, SEE MICROPILE AND GRADE BEAM SPECIAL PROVISION.
 4. FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION.

ROCK EMBANKMENT							
BEGIN STA. -L320-	TOP OFFSET	BOT. OFFSET	INCLINATION (H:V)	END STA.	TOP OFFSET	BOT. OFFSET	INCLINATION (H:V)
12+50.00	17.3' RT	21.0' RT	1.25:1, OR FLATTER	12+80.00	17.3' RT	42.6' RT	1.25:1, OR FLATTER
16+14.00	17.3' RT	30.0' RT	1.25:1, OR FLATTER	16+50.00	17.3' RT	19.1' RT	1.25:1, OR FLATTER

PROJECT NO.: W03293
 POLK COUNTY
 STATION: -L320- STA. 12+50 TO STA. 16+50, RT
 SHEET 2 OF 3

PREPARED BY: KND	DATE: 10/25
REVIEWED BY: REK	DATE: 10/25

Prepared in the Office of:



**CAROLINAS
GEOTECHNICAL
GROUP**
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684



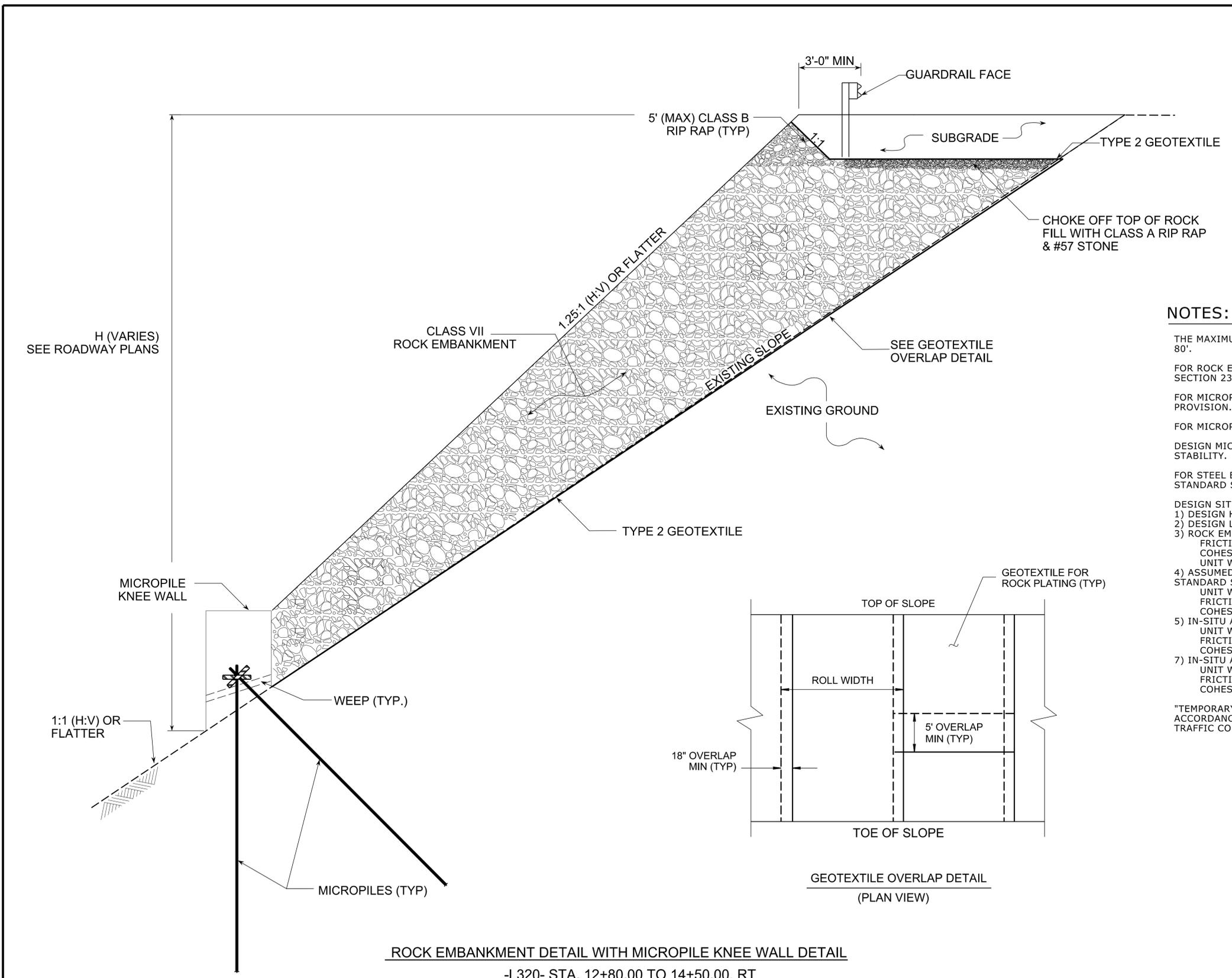
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

SITE 320 RETAINING WALL
 ROCK EMBANKMENT &
 ROCK EMBANKMENT WITH
 MICROPILE KNEE WALL

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

GEOTECHNICAL ENGINEER  Signed by: <i>Robert E. Krul</i> 12/2/2025 <small>AAFBFF7588 SIGNATURE DATE</small>	ENGINEER SIGNATURE _____ DATE _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



- NOTES:**
- THE MAXIMUM ALLOWABLE HEIGHT FOR THE ROCK EMBANKMENT DETAIL IS 80'.
 - FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
 - FOR MICROPILE KNEE WALL, SEE THE MICROPILE GRADE BEAM SPECIAL PROVISION.
 - FOR MICROPILES, SEE MICROPILE GRADE BEAM SPECIAL PROVISION.
 - DESIGN MICROPILE KNEE WALL FOR INTERNAL, EXTERNAL, AND GLOBAL STABILITY.
 - FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 - DESIGN SITE 320 FOR THE FOLLOWING:
 - DESIGN HEIGHT (H) = WALL HEIGHT + HEIGHT OF ROCK EMBANKMENT
 - DESIGN LIFE = 75 YEARS
 - ROCK EMBANKMENT PARAMETERS:
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - ASSUMED BORROW MATERIAL PARAMETERS, SEE SECTION 1018 OF THE STANDARD SPECIFICATIONS
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - IN-SITU ASSUMED MATERIAL PARAMETERS RESIDUAL SOIL:
 - UNIT WEIGHT, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF
 - IN-SITU ASSUMED MATERIAL PARAMETERS CRYSTALLINE ROCK:
 - UNIT WEIGHT, $\gamma = 170$ PCF
 - FRICTION ANGLE, $\phi = 34$ DEGREES
 - COHESION, $c = 1,000$ PSF
- "TEMPORARY SHORING" MAY BE REQUIRED FOR SITE 320 RETAINING WALL IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY OR TRAFFIC CONTROL PLANS.

PROJECT NO.: W03293
 POLK COUNTY
 STATION: -L320- STA. 12+50 TO STA. 16+50, RT
 SHEET 3 OF 3

PREPARED BY: KND	DATE: 10/25
REVIEWED BY: REK	DATE: 10/25

Prepared in the Office of:



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 1805 SARDIS ROAD NORTH
 SUITE 100
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 (980) 339-8684



NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

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