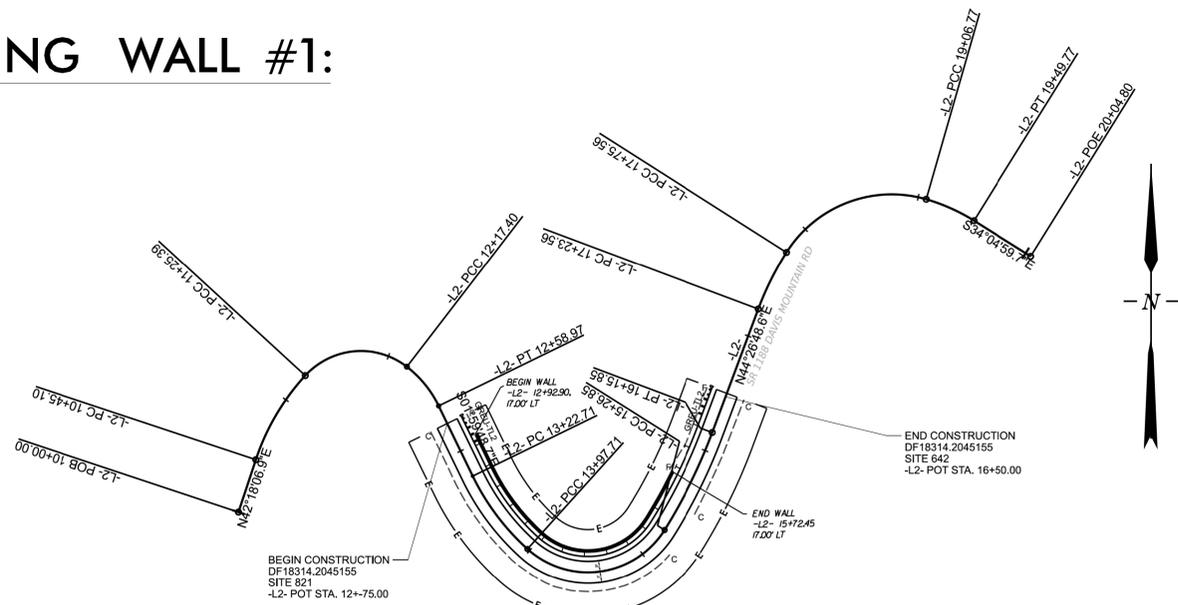
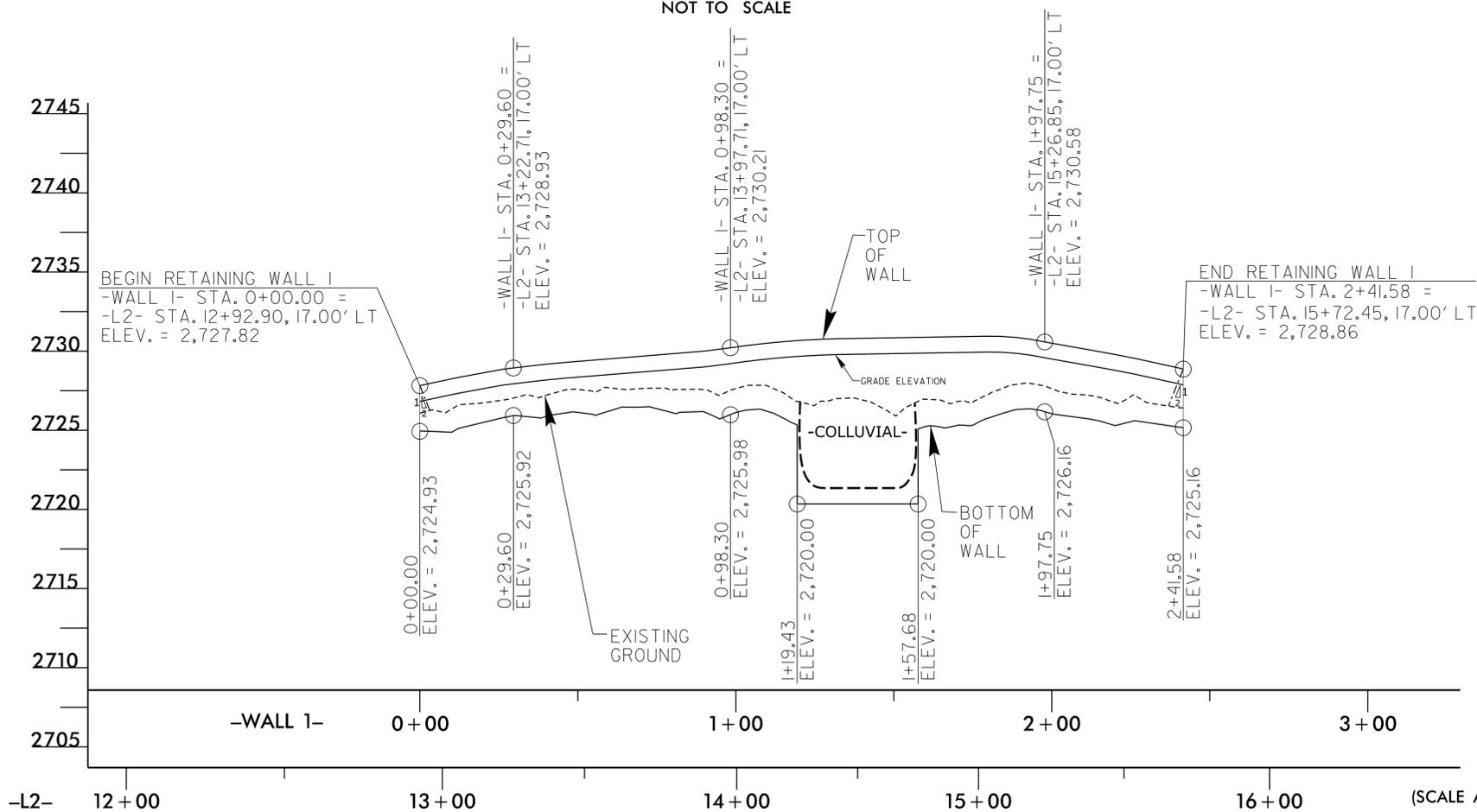


RETAINING WALL #1:



RETAINING WALL #1 – PLAN

NOT TO SCALE



RETAINING WALL #1 – ENVELOPE

NOT TO SCALE
(LOOKING AT FACE OF WALL)

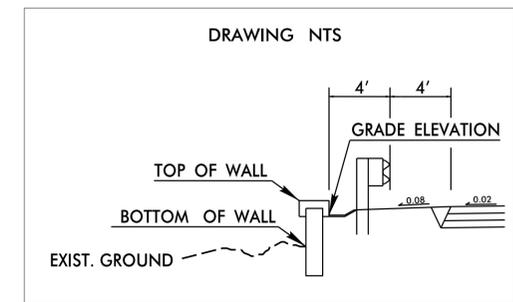
GEOTECHNICAL ENGINEER

ENGINEER

ROBERT E. KRAL
SEAL 042642
ENGINEER

Signed by: *Robert E. Kral* DATE: 02/16/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



RETAINING WALL #1 TYPICAL SECTION
-L2- STA. 12+92.90 TO STA. 15+72.45

SITE 821 RETAINING WALL #1

STA. -L2-	OFFSET	TOP OF WALL ELEVATION (FT)	GRADE ELEVATION (FT)	BOTTOM OF WALL ELEVATION* (FT)	WALL DESIGN HEIGHT "H" (FT)
12+92.90	17.00' LT	2,727.82	2,726.82	2,724.93	1.89
13+22.71	17.00' LT	2,728.93	2,727.93	2,725.92	2.01
13+97.71	17.00' LT	2,730.21	2,729.21	2,725.98	3.23
15+26.85	17.00' LT	2,730.58	2,729.58	2,726.16	3.42
15+72.45	17.00' LT	2,728.86	2,727.86	2,725.16	2.70

*IF ENCOUNTERED, BOTTOM OF WALL SHOULD EXTEND THROUGH COLLUVIAL MATERIAL INTO RESIDUAL MATERIALS AT LEAST 2 FEET. COLLUVIAL MATERIALS WERE OBSERVED BETWEEN -L2- STA. 14+25 TO 14+75. ANTICIPATE BOTTOM OF WALL IN THIS AREA TO BE EL. 2,720 FT.

TOTAL STRUCTURE QUANTITIES - SOLDIER PILE RETAINING WALL #1

SOLDIER PILE RETAINING WALLS	2,600 SQ FT
HORIZONTAL DRAINS (CONTINGENCY)	200 LN FT

PREPARED BY: KND DATE: 12/25
REVIEWED BY: REK DATE: 12/25

RETAINING WALL #1 LAYOUT AND ENVELOPE PROVIDED BY JMT, INC. JULY 23, 2025.

Prepared in the Office of:

CGE CAROLINAS GEOTECHNICAL GROUP

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

PROJECT NO.: W03294
HENDERSON COUNTY
RETAINING WALL #1: -L2- STA. 12+92.90 TO 15+72.45, LT
SHEET 1 OF 4

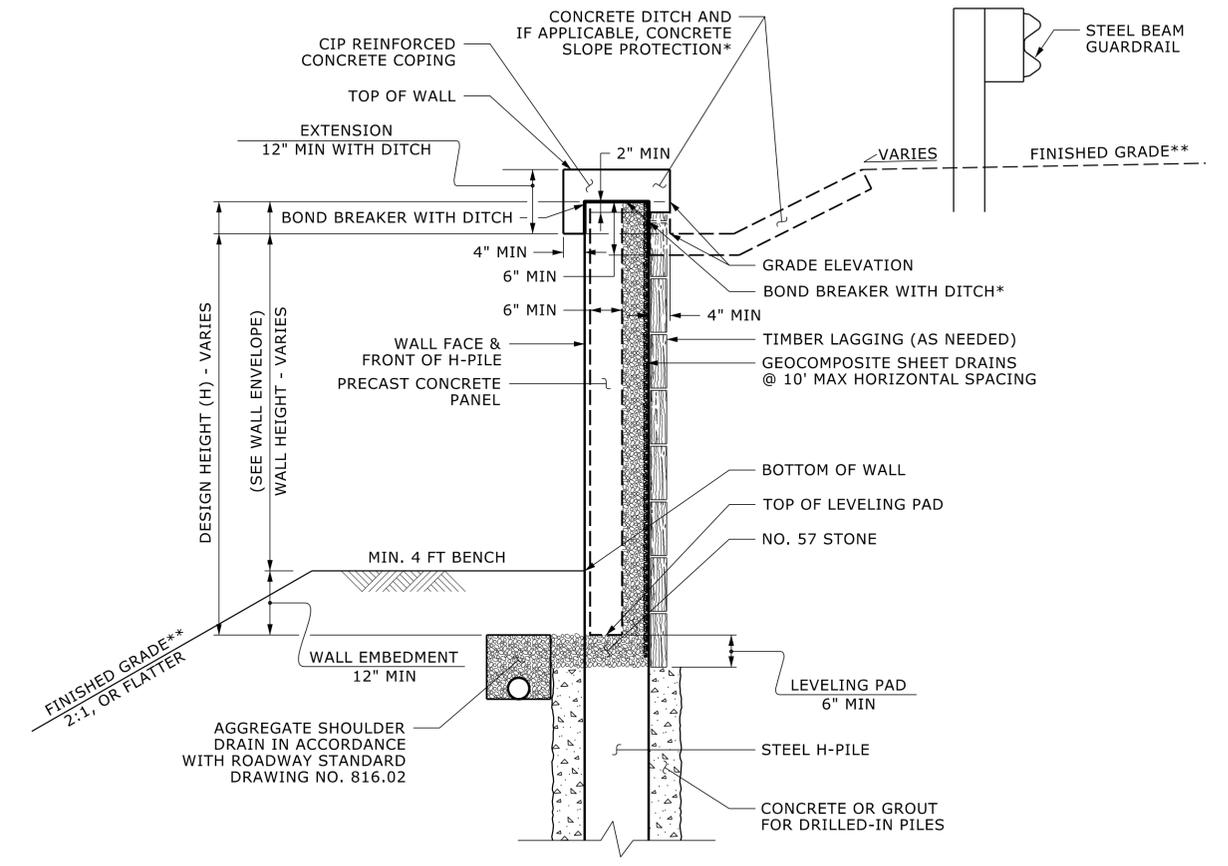
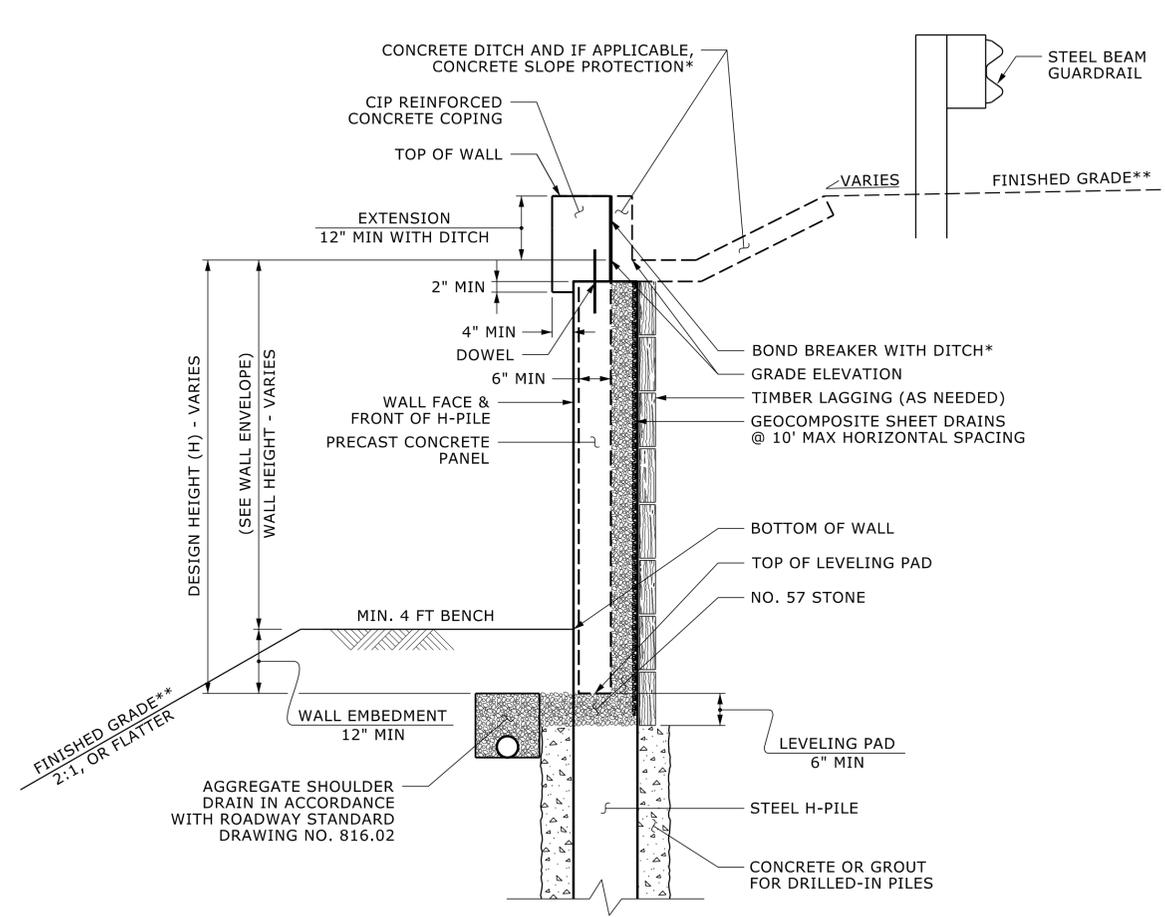
SOLDIER PILE RETAINING WALL #1

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



Signed by: Robert E. Kral
02/16/2026
DATE

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SOLDIER PILE WALL WITH PRECAST PANEL - TYPICAL SECTIONS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS AND PILES.
*SEE CONCRETE DITCH BEHIND WALL DETAILS, SHEET W-4.
**SEE PLANS FOR FINISHED GRADE.

PROJECT NO.: W03294

HENDERSON COUNTY

RETAINING WALL #1: -L2- STA. 12+92.90 TO 15+72.45, LT

SHEET 2 OF 4

Prepared in the Office of:

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

SITE 821 SOLDIER PILE RETAINING WALL 1

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

SHEET NO. W-2

PREPARED BY: KND	DATE: 12/25
REVIEWED BY: REK	DATE: 12/25



Signed by: Robert E. Kral 02/16/2026
 SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR SOLDIER PILE RETAINING WALLS, SEE SOLDIER PILE RETAINING WALLS SPECIAL PROVISION.

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

DRILLED-IN H-PILES ARE REQUIRED FOR RETAINING WALL #1.

USE A SOLDIER PILE RETAINING WALL WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL #1.

BEFORE BEGINNING SOLDIER PILE WALL DESIGN FOR RETAINING WALL #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 #1 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 COLLUVIAL SOIL:
 UNIT WEIGHT, $\gamma = 110$ PCF
 FRICTION ANGLE, $\phi = 26$ 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 WEATHERED ROCK:
 UNIT WEIGHT, $\gamma = 130$ PCF
 FRICTION ANGLE, $\phi = 34$ DEGREES
 COHESION, $c = 500$ PSF
- 8) IN-SITU ASSUMED MATERIAL PARAMETERS CRYSTALLINE ROCK:
 UNIT WEIGHT, $\gamma = 170$ PCF
 FRICTION ANGLE, $\phi = 36$ DEGREES
 COHESION, $c = 1,000$ PSF

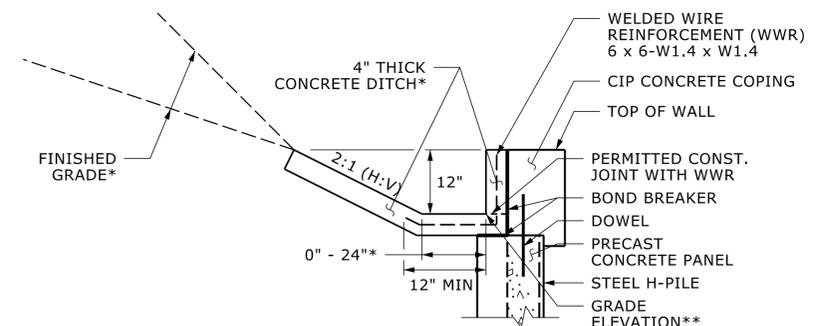
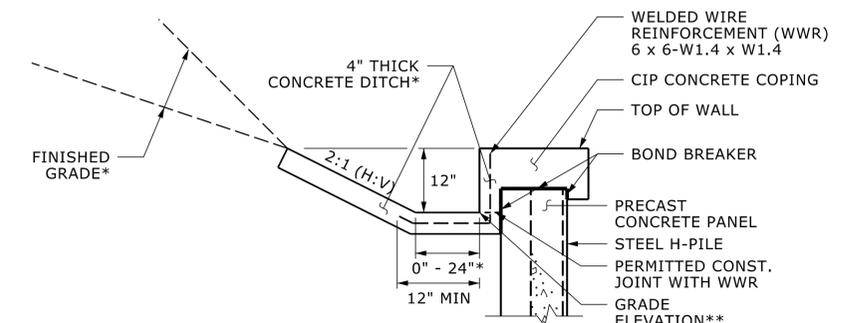
DESIGN RETAINING WALL #1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN RETAINING WALL #1 FOR 300 LB/FT HORIZONTAL TRAFFIC IMPACT LOAD.

AN ISOLATED POCKET OF COLLUVIAL MATERIAL WAS ENCOUNTERED ALONG THE WALL ALIGNMENT BETWEEN -L2- STA. 13+25 AND 15+25. WHERE PRESENT AT THE PROPOSED BOTTOM OF WALL ELEVATION, UNDERCUT THE COLLUVIAL MATERIAL AND EXTEND BOTTOM OF WALL INTO UNDERLYING RESIDUAL MATERIALS BY AT LEAST 2 FEET. WE ESTIMATE 1,400 CY OF UNDERCUT EXCAVATION.

RETAINING WALL #1 CONSTRUCTION WILL REQUIRE GROUND TO BE CREATED TO REACH GRADE ELEVATION AT SOME LOCATIONS ALONG THE WALL ALIGNMENT. CONSTRUCTION OF THE CREATED GROUND SHOULD BE ACCOUNTED FOR IN THE SOLDIER PILE WALL DESIGN.

IF GROUNDWATER IS ENCOUNTERED BEHIND THE FACE OF RETAINING WALL #1, HORIZONTAL DRAINS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER. FOR HORIZONTAL DRAINS, SEE SHEET W-4 AND THE HORIZONTAL DRAINS SPECIAL PROVISION.



CONCRETE DITCH BEHIND WALL WITH CONCRETE COPING

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

PROJECT NO.: W03294

HENDERSON COUNTY

RETAINING WALL #1: -L2- STA. 12+92.90 TO 15+72.45, LT

SHEET 3 OF 4

Prepared in the Office of:

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

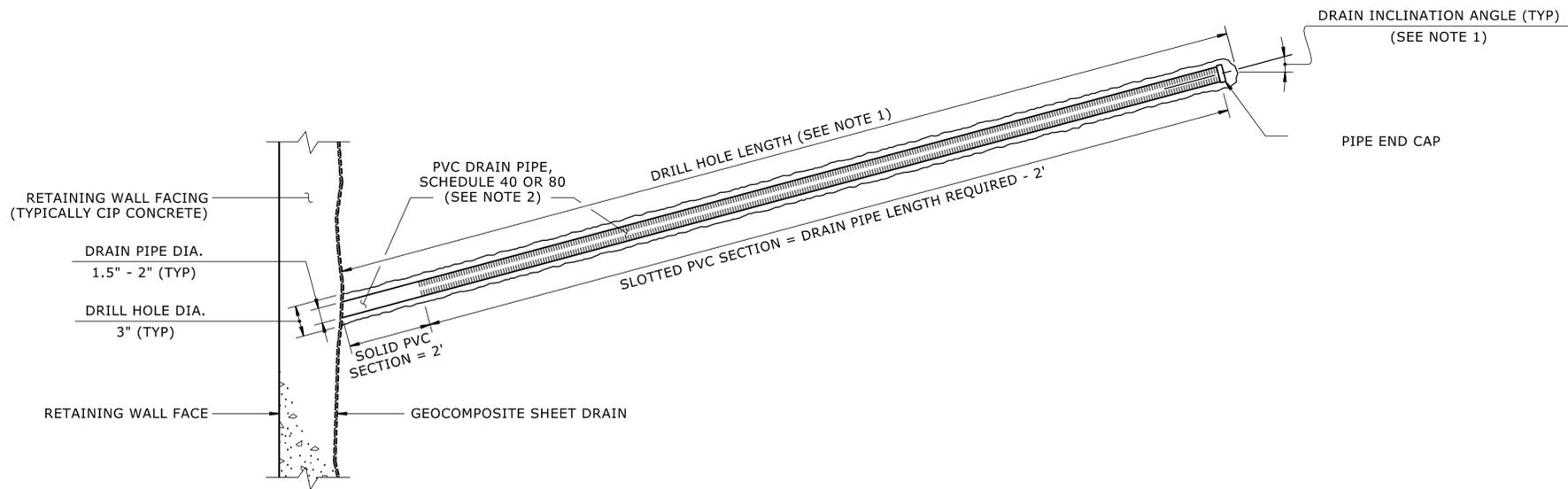
SOLDIER PILE RETAINING WALL #1

REVISIONS

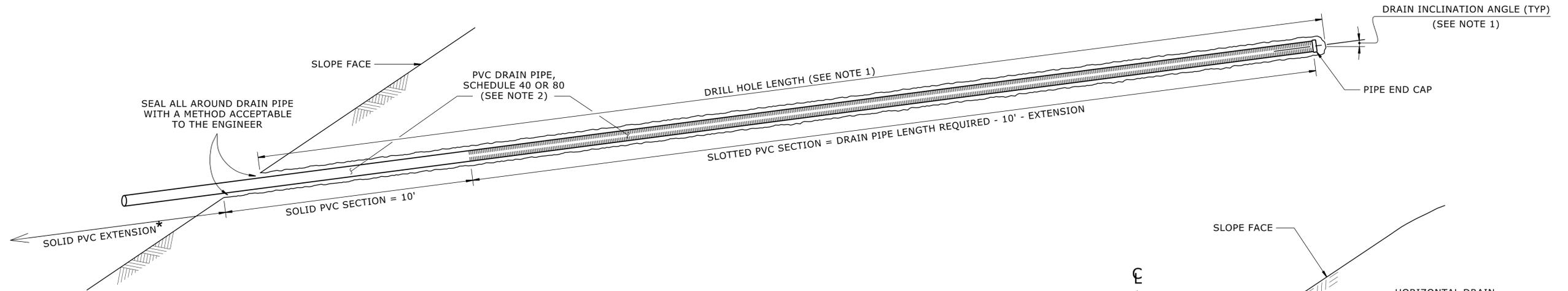
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-3

PREPARED BY: KND	DATE: 12/25
REVIEWED BY: REK	DATE: 12/25

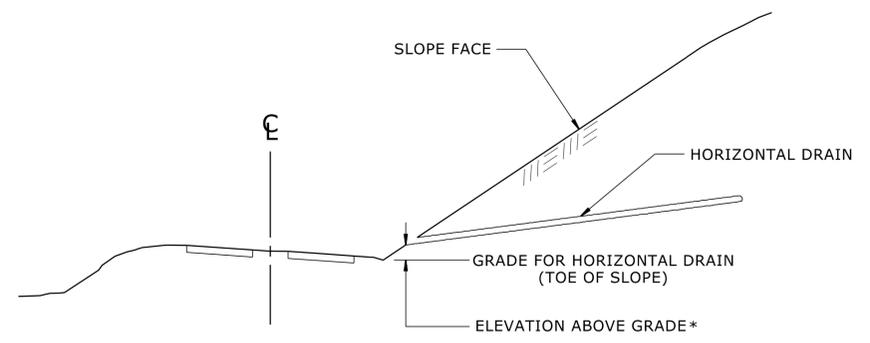


RETAINING WALL HORIZONTAL DRAIN



SLOPE HORIZONTAL DRAIN

*EXTEND SOLID PVC SECTION TO CONNECT PIPE TO A DRAINAGE SYSTEM OR DISCHARGE WATER AS DIRECTED



EXAMPLE CROSS-SECTION WITH SLOPE HORIZONTAL DRAIN

*SEE NOTE 1 FOR DRAIN ELEVATIONS ABOVE (OR BELOW) GRADE

GEOTECHNICAL ENGINEER Robert E. Kral SIGNATURE	ENGINEER DATE 02/16/2026
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NOTES:

- SEE ROADWAY SUMMARY SHEETS FOR APPROXIMATE KNOWN HORIZONTAL DRAIN LOCATIONS, ELEVATIONS, INCLINATION AND LENGTHS. ADDITIONAL DRAINS MAY BE REQUIRED AS DETERMINED BY THE ENGINEER.
- DRAIN PIPES MAY BE OMITTED FOR SOME HORIZONTAL DRAINS. SEE ROADWAY SUMMARY SHEETS FOR DRAIN PIPE REQUIREMENTS INCLUDING THOSE DRAINS WITHOUT PIPES.
- FOR HORIZONTAL DRAINS, SEE HORIZONTAL DRAINS SPECIAL PROVISION.

PROJECT NO.: W03294
 HENDERSON COUNTY
 RETAINING WALL #1: -L2- STA. 12+92.90 TO 15+72.45, LT
 SHEET 4 OF 4

PREPARED BY: KND DATE: 12/25
 REVIEWED BY: REK DATE: 12/25

Prepared in the Office of:

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

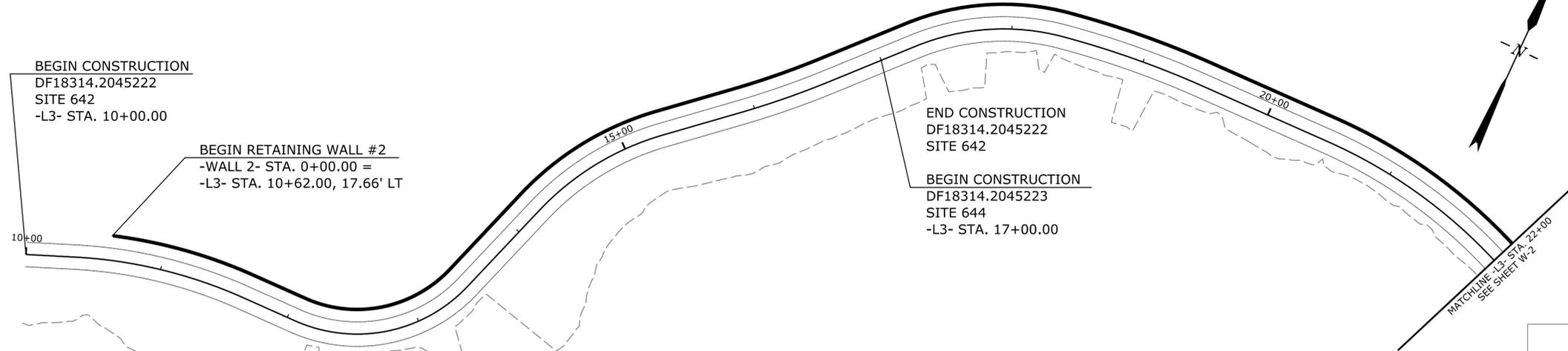
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

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

RETAINING WALL #2:

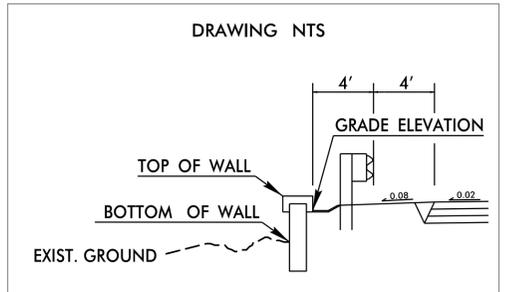
GEOTECHNICAL ENGINEER
 ENGINEER

 Signed by: *Robert E. Kral* 02/16/2026
 DATE: 02/16/2026
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

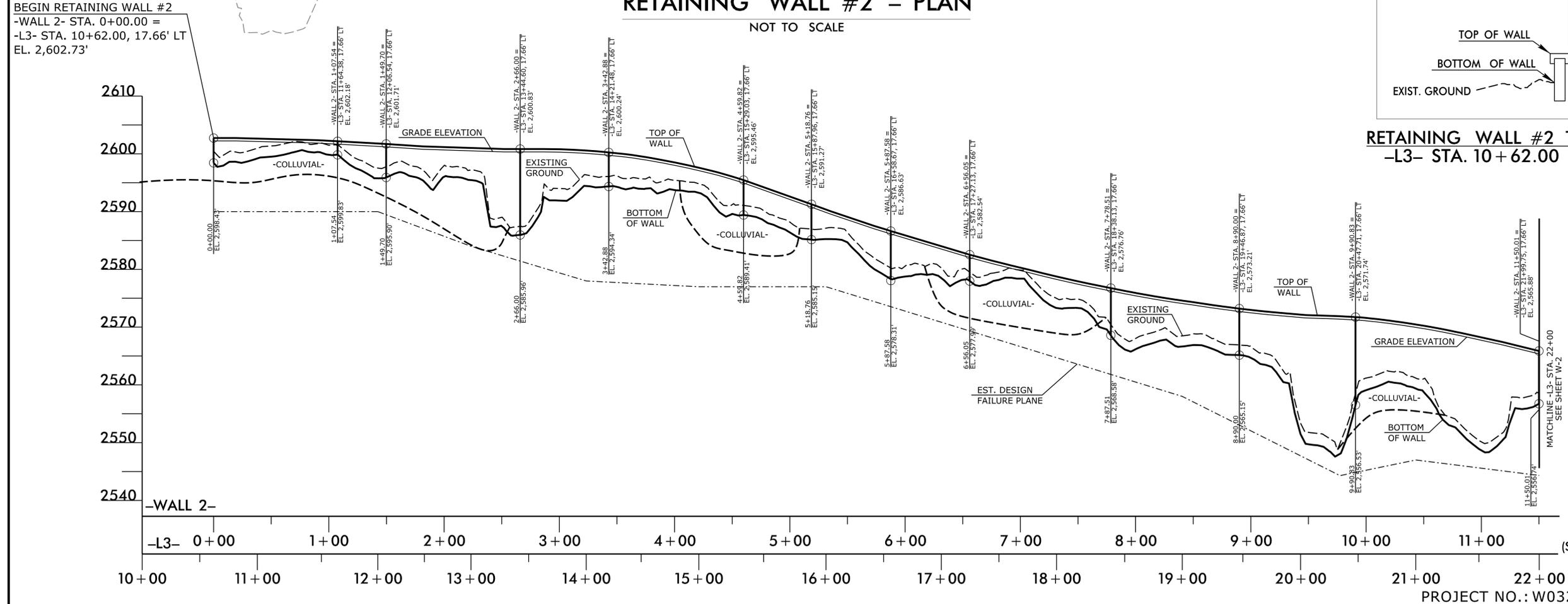


RETAINING WALL #2 - PLAN

NOT TO SCALE



RETAINING WALL #2 TYPICAL SECTION
-L3- STA. 10+62.00 TO 43+28.97



RETAINING WALL #2 - ENVELOPE

NOT TO SCALE

HENDERSON COUNTY
 RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT
 SHEET 1 OF 8

Prepared in the Office of:

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

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

PREPARED BY: KND
 REVIEWED BY: REK
 DATE: 01/26
 DATE: 01/26

RETAINING WALL #2 LAYOUT AND ENVELOPE PROVIDED BY JMT, INC. DECEMBER 8, 2025.

RETAINING WALL #2:

END CONSTRUCTION
DF18314.2045223
SITE 644

BEGIN CONSTRUCTION
DF18314.2045224
SITE 641
-L3- STA. 25+00.00

END CONSTRUCTION
DF18314.2045224
SITE 641

BEGIN CONSTRUCTION
DF18314.2045211
SITE 670
-L3- STA. 31+50.00

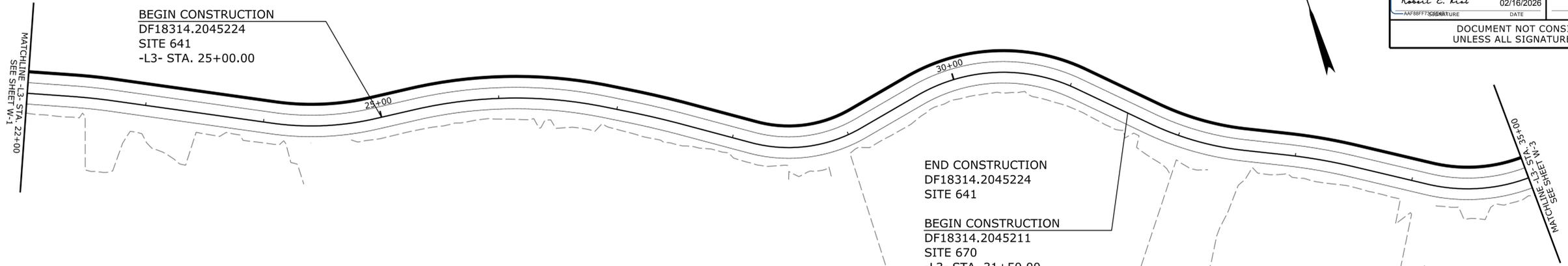
GEOTECHNICAL ENGINEER ENGINEER



Signed by: Robert E. Kral
DATE: 02/16/2026

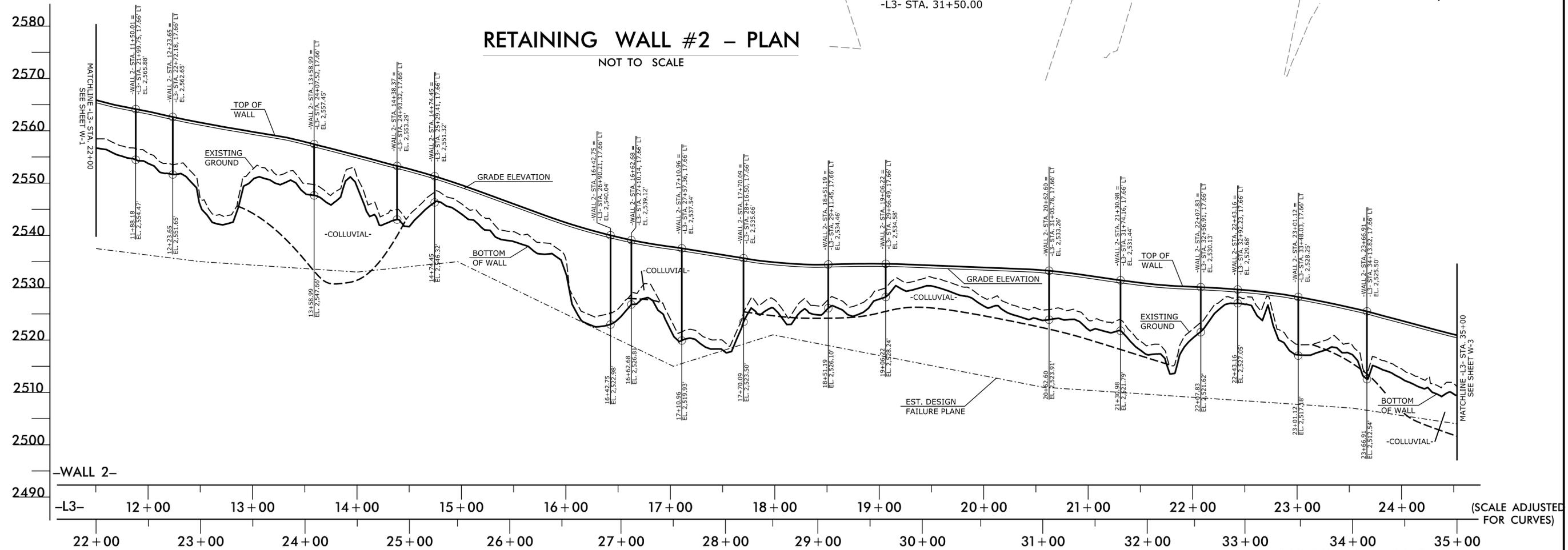
DATE: 02/16/2026

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RETAINING WALL #2 - PLAN

NOT TO SCALE



RETAINING WALL #2 - ENVELOPE

NOT TO SCALE

PROJECT NO.: W03294
HENDERSON COUNTY
RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT
SHEET 2 OF 8

PREPARED BY: KND DATE: 01/26
REVIEWED BY: REK DATE: 01/26

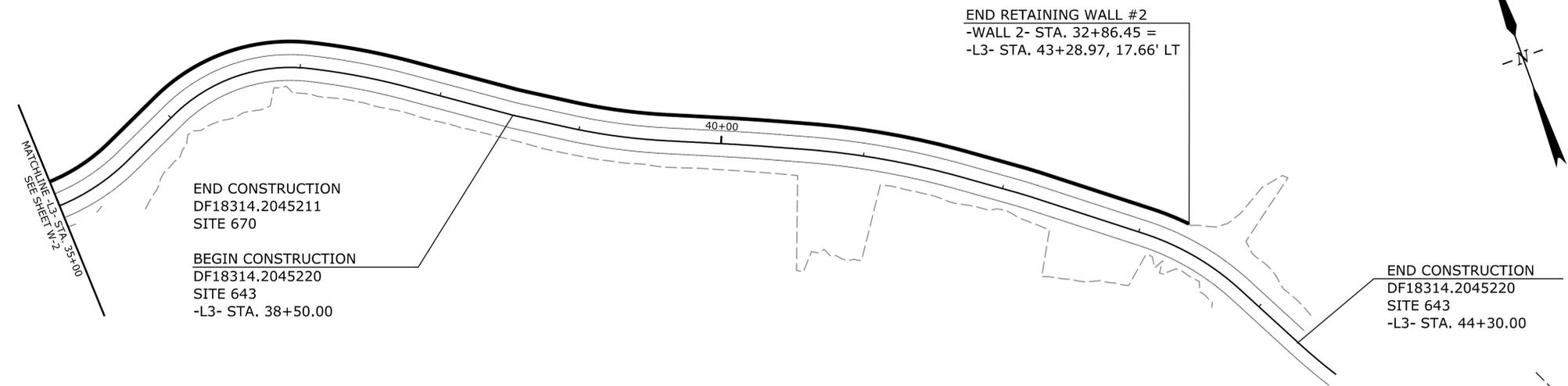
RETAINING WALL #2 LAYOUT AND ENVELOPE PROVIDED BY JMT, INC. DECEMBER 8, 2025.

Prepared in the Office of:
CGP CAROLINAS GEOTECHNICAL GROUP
1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684

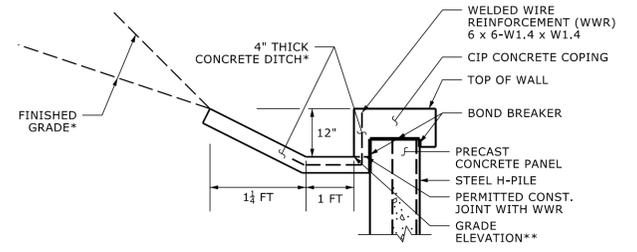
REVISIONS						SHEET NO. W-2
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-2
2			4			

RETAINING WALL #2:

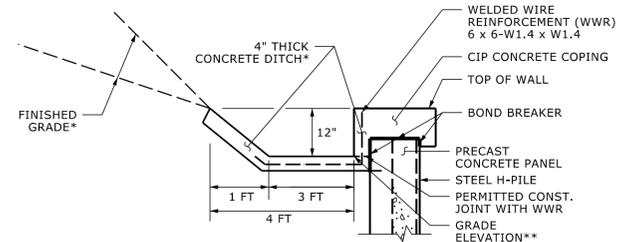
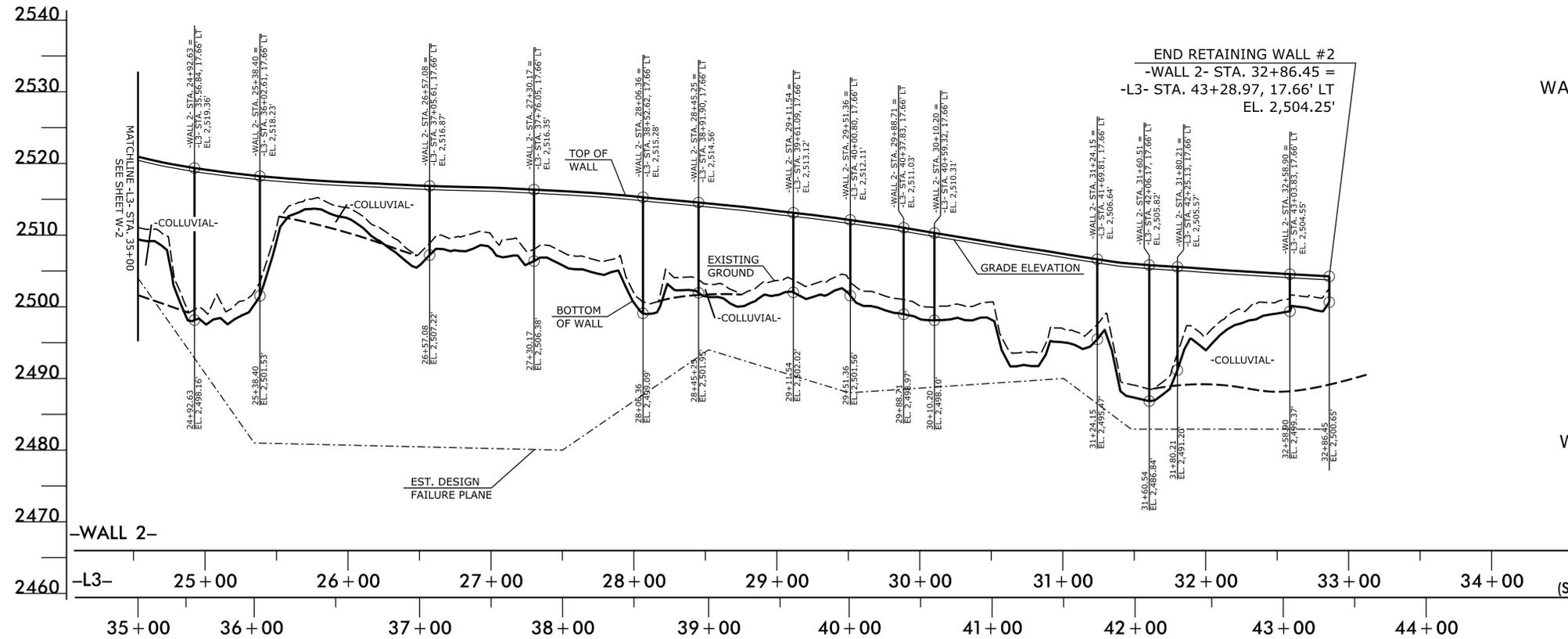
GEOTECHNICAL ENGINEER  Signed by: <i>Robert E. Kral</i> DATE: 02/16/2026	ENGINEER SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



RETAINING WALL #2 – PLAN
 NOT TO SCALE



CONCRETE DITCH BEHIND WALL WITH CONCRETE COPING WITHOUT DRAINAGE BOX
 *SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
 **SEE WALL ENVELOPE FOR GRADE ELEVATIONS.



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

RETAINING WALL #2 – ENVELOPE
 NOT TO SCALE
 (LOOKING AT FACE OF WALL)

Prepared in the Office of:



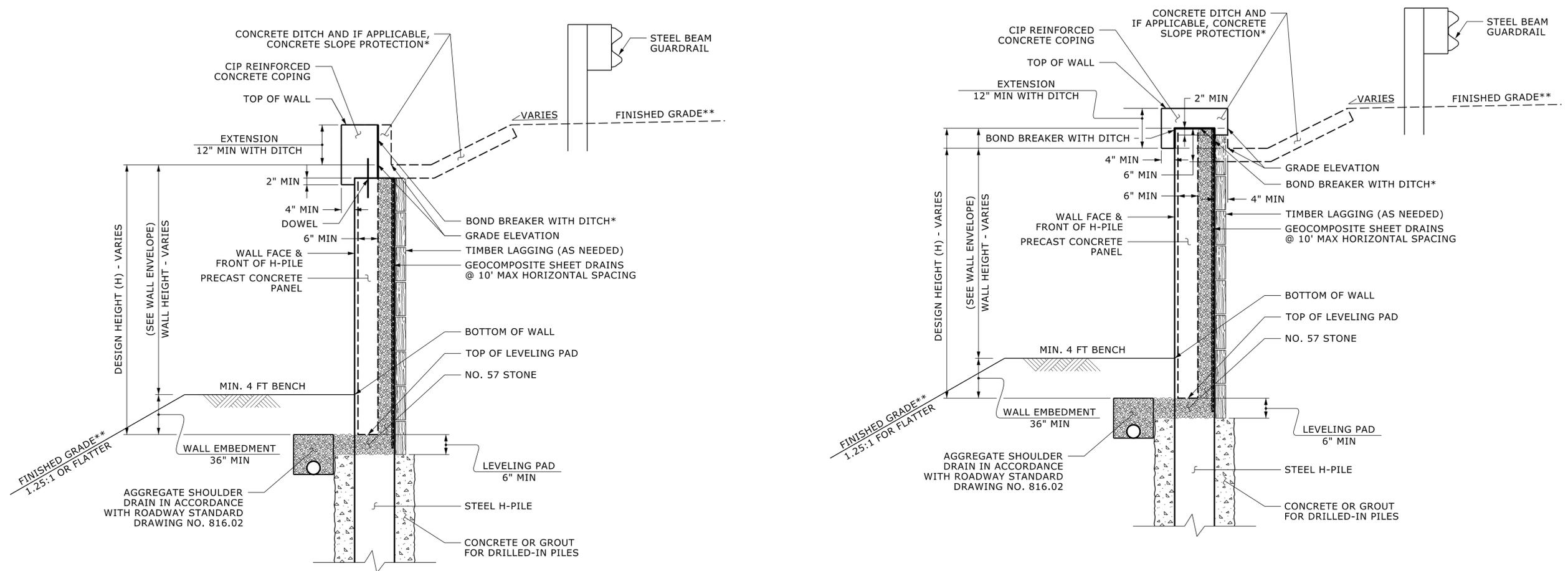
CAROLINAS GEOTECHNICAL GROUP
 1805 SARDIS ROAD NORTH
 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

PROJECT NO.: W03294
 HENDERSON COUNTY
 RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT
 SHEET 3 OF 8

PREPARED BY: KND	DATE: 01/26
REVIEWED BY: REK	DATE: 01/26

RETAINING WALL #2 LAYOUT AND ENVELOPE PROVIDED BY JMT, INC. DECEMBER 8, 2025.

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



SOLDIER PILE WALL WITH PRECAST PANEL - TYPICAL SECTIONS

- L3- STA. 13+50.00 TO 14+50.00
- L3- STA. 15+50.00 TO 18+00.00
- L3- STA. 36+00.00 TO 38+00.00

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS AND PILES.
 *SEE CONCRETE DITCH BEHIND WALL DETAILS, SHEET W-3.
 **SEE PLANS FOR FINISHED GRADE.

PROJECT NO.: W03294
 HENDERSON COUNTY
 RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT
 SHEET 4 OF 8

PREPARED BY: KND	DATE: 01/26
REVIEWED BY: REK	DATE: 01/26

Prepared in the Office of:

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

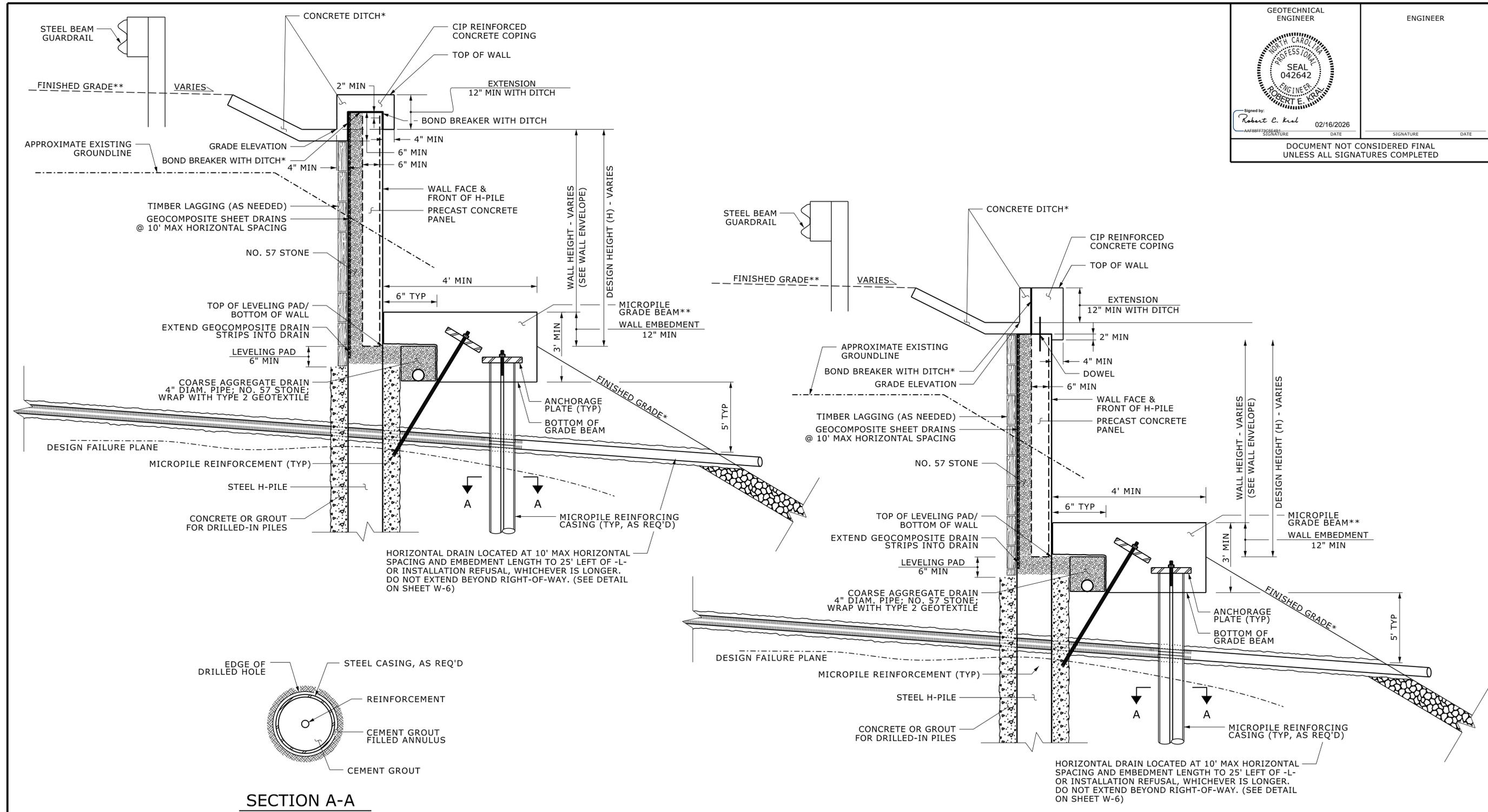
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SOLDIER PILE RETAINING WALL #2

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

SHEET NO. W-4



CANTILEVER SOLDIER PILE RETAINING WALL WITH PRECAST PANEL & MICROPILE SLOPE STABILIZATION - TYPICAL SECTION

- L3- STA. 10+62.00 TO 13+50.00
- L3- STA. 14+50.00 TO 15+50.00
- L3- STA. 18+00.00 TO 36+00.00
- L3- STA. 38+00.00 TO 43+28.97

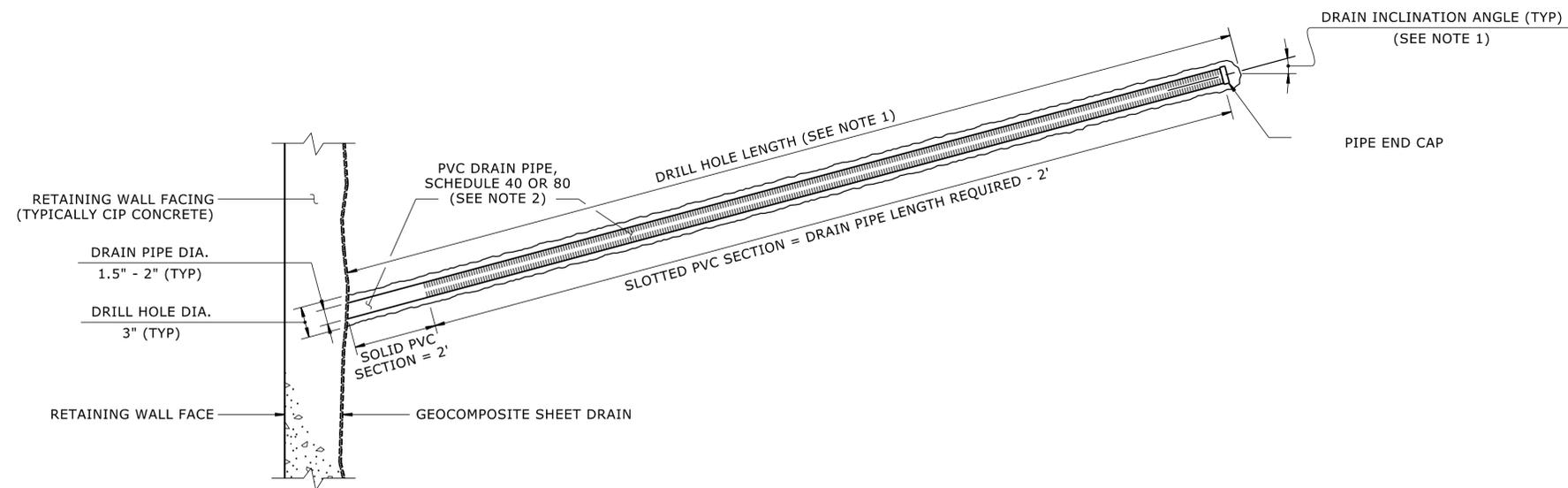
PROJECT NO.: W03294
 HENDERSON COUNTY
 RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT
 SHEET 5 OF 8

PREPARED BY: KND
 REVIEWED BY: REK
 DATE: 01/26
 DATE: 01/26

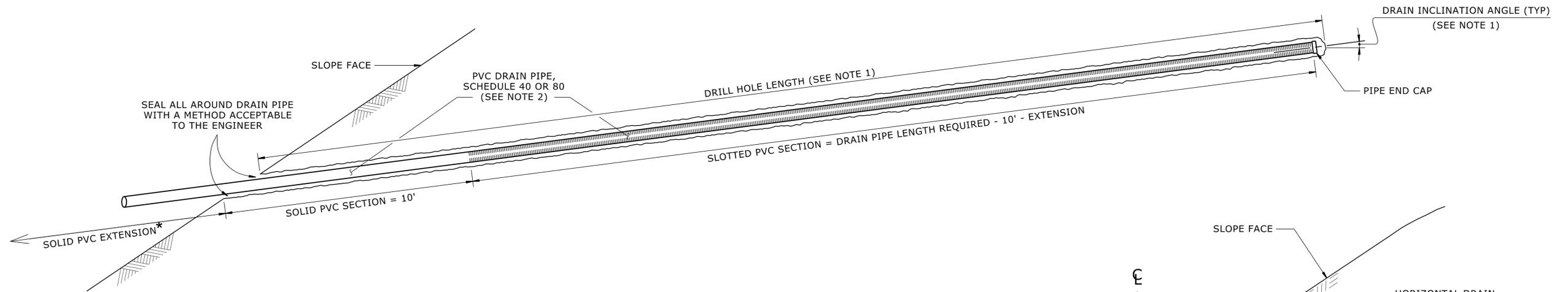
Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
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 SUITE 100
 CHARLOTTE, NC 28270
 (980) 339-8684

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

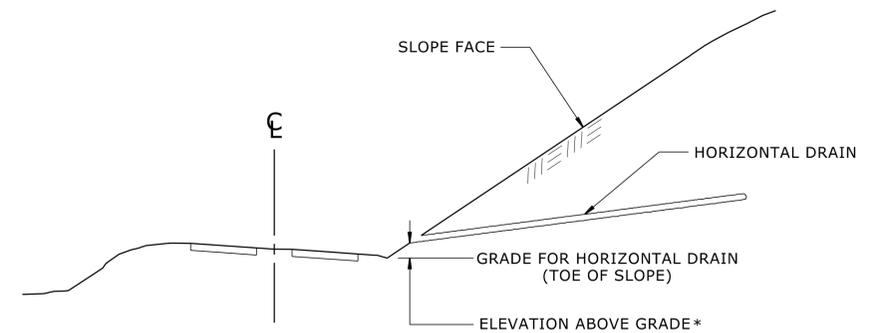


RETAINING WALL HORIZONTAL DRAIN



SLOPE HORIZONTAL DRAIN

*EXTEND SOLID PVC SECTION TO CONNECT PIPE TO A DRAINAGE SYSTEM OR DISCHARGE WATER AS DIRECTED



EXAMPLE CROSS-SECTION WITH SLOPE HORIZONTAL DRAIN

*SEE NOTE 1 FOR DRAIN ELEVATIONS ABOVE (OR BELOW) GRADE

NOTES:

1. SEE ROADWAY SUMMARY SHEETS FOR APPROXIMATE KNOWN HORIZONTAL DRAIN LOCATIONS, ELEVATIONS, INCLINATION AND LENGTHS. ADDITIONAL DRAINS MAY BE REQUIRED AS DETERMINED BY THE ENGINEER.
2. DRAIN PIPES MAY BE OMITTED FOR SOME HORIZONTAL DRAINS. SEE ROADWAY SUMMARY SHEETS FOR DRAIN PIPE REQUIREMENTS INCLUDING THOSE DRAINS WITHOUT PIPES.
3. FOR HORIZONTAL DRAINS, SEE HORIZONTAL DRAINS SPECIAL PROVISION.

PROJECT NO.: W03294

HENDERSON COUNTY

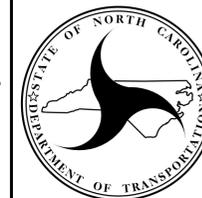
RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT

SHEET 7 OF 8

SOLDIER PILE RETAINING WALL #2

PREPARED BY: KND DATE: 01/26
REVIEWED BY: REK DATE: 01/26

Prepared in the Office of:
CGE 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**

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

<p>GEOTECHNICAL ENGINEER</p> <p>Signed by: Robert E. Kral DATE: 02/16/2026</p>	<p>ENGINEER</p> <p>SIGNATURE: _____ DATE: _____</p>
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	

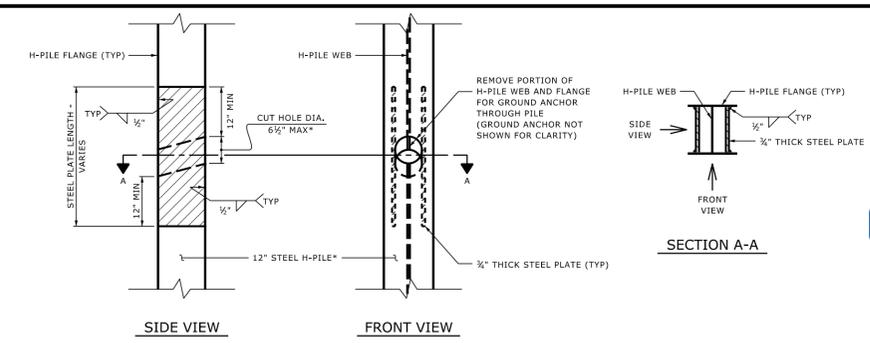
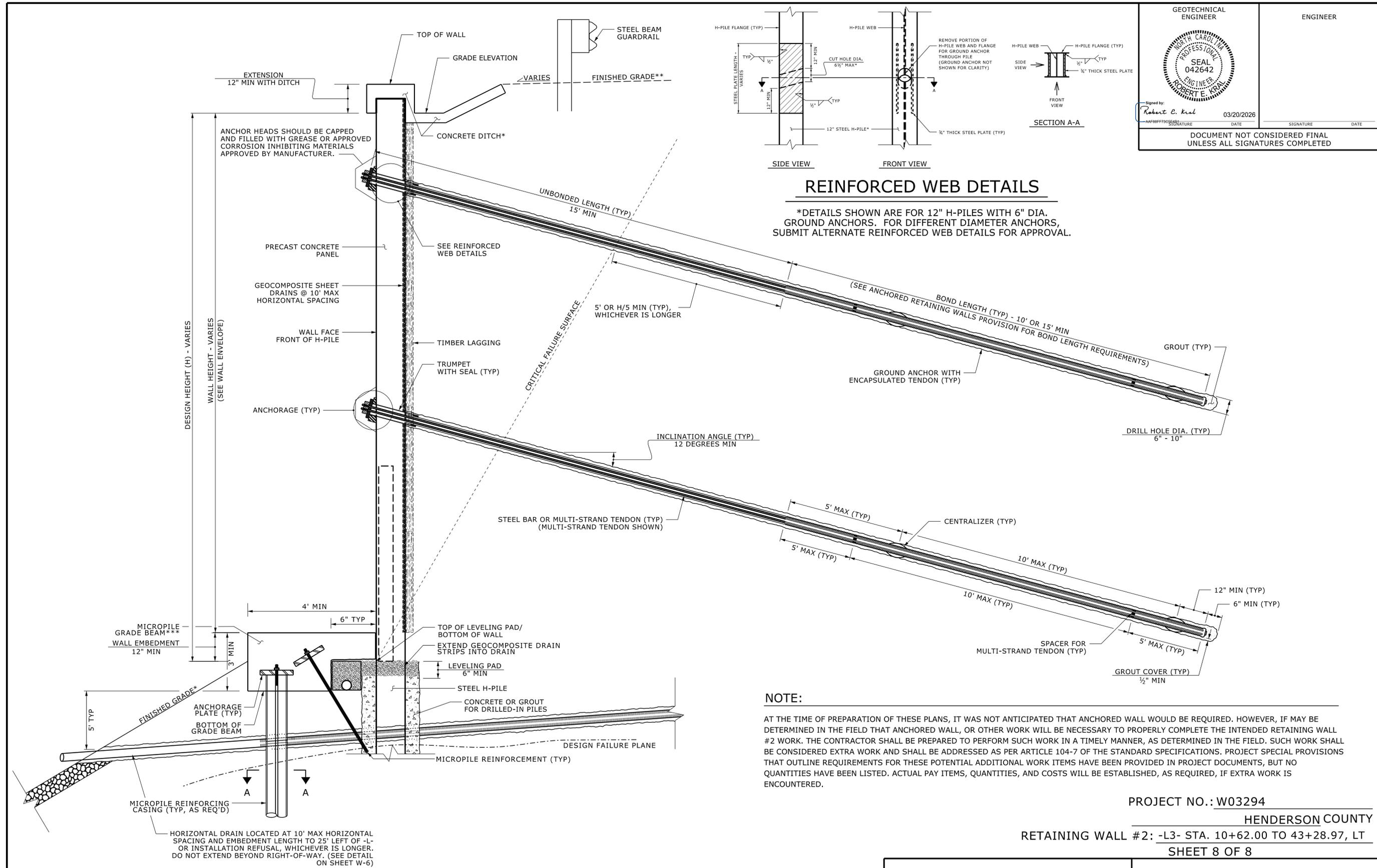
GEOTECHNICAL ENGINEER

ENGINEER

SEAL
042642
ROBERT E. KRAL

Signed by: Robert E. Kral
DATE: 03/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



REINFORCED WEB DETAILS

*DETAILS SHOWN ARE FOR 12" H-PILES WITH 6" DIA. GROUND ANCHORS. FOR DIFFERENT DIAMETER ANCHORS, SUBMIT ALTERNATE REINFORCED WEB DETAILS FOR APPROVAL.

NOTE:

AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THAT ANCHORED WALL WOULD BE REQUIRED. HOWEVER, IF MAY BE DETERMINED IN THE FIELD THAT ANCHORED WALL, OR OTHER WORK WILL BE NECESSARY TO PROPERLY COMPLETE THE INTENDED RETAINING WALL #2 WORK. THE CONTRACTOR SHALL BE PREPARED TO PERFORM SUCH WORK IN A TIMELY MANNER, AS DETERMINED IN THE FIELD. SUCH WORK SHALL BE CONSIDERED EXTRA WORK AND SHALL BE ADDRESSED AS PER ARTICLE 104-7 OF THE STANDARD SPECIFICATIONS. PROJECT SPECIAL PROVISIONS THAT OUTLINE REQUIREMENTS FOR THESE POTENTIAL ADDITIONAL WORK ITEMS HAVE BEEN PROVIDED IN PROJECT DOCUMENTS, BUT NO QUANTITIES HAVE BEEN LISTED. ACTUAL PAY ITEMS, QUANTITIES, AND COSTS WILL BE ESTABLISHED, AS REQUIRED, IF EXTRA WORK IS ENCOUNTERED.

ANCHORED WALL - TYPICAL SECTION

(DOUBLE ROW OF GROUND ANCHORS SHOWN, AS NEEDED)
*SEE ROADWAY PLANS FOR DITCH BEHIND WALL DETAILS.
**SEE PLANS FOR FINISHED GRADE.
***CONCEPTUAL MICROPILE ARRANGEMENT SHOWN.

PREPARED BY: KND	DATE: 03/26
REVIEWED BY: REK	DATE: 03/26

PROJECT NO.: W03294
HENDERSON COUNTY
RETAINING WALL #2: -L3- STA. 10+62.00 TO 43+28.97, LT
SHEET 8 OF 8

Prepared in the Office of:

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