

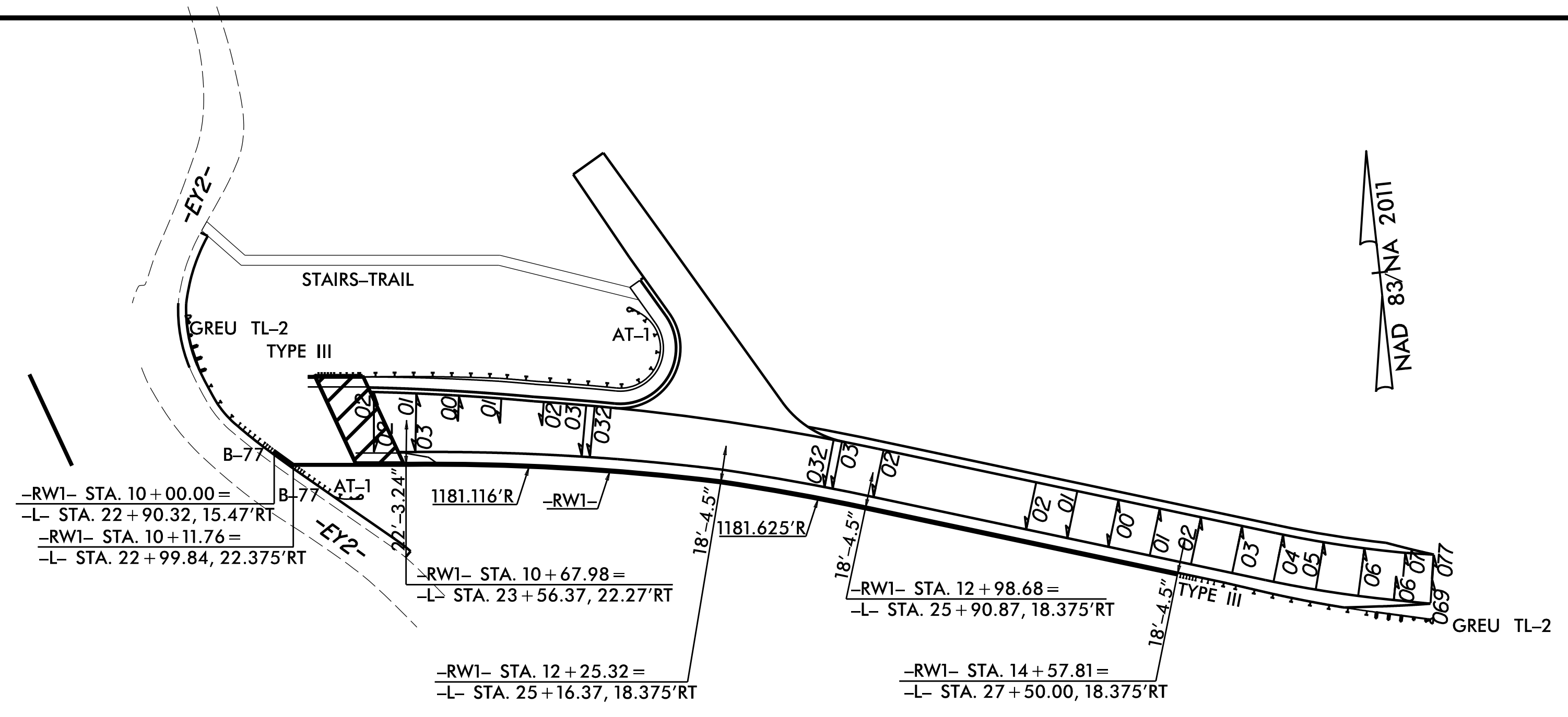
GEOTECHNICAL ENGINEER

ENGINEER

DocuSigned by: Shipping Yang 02/28/2025

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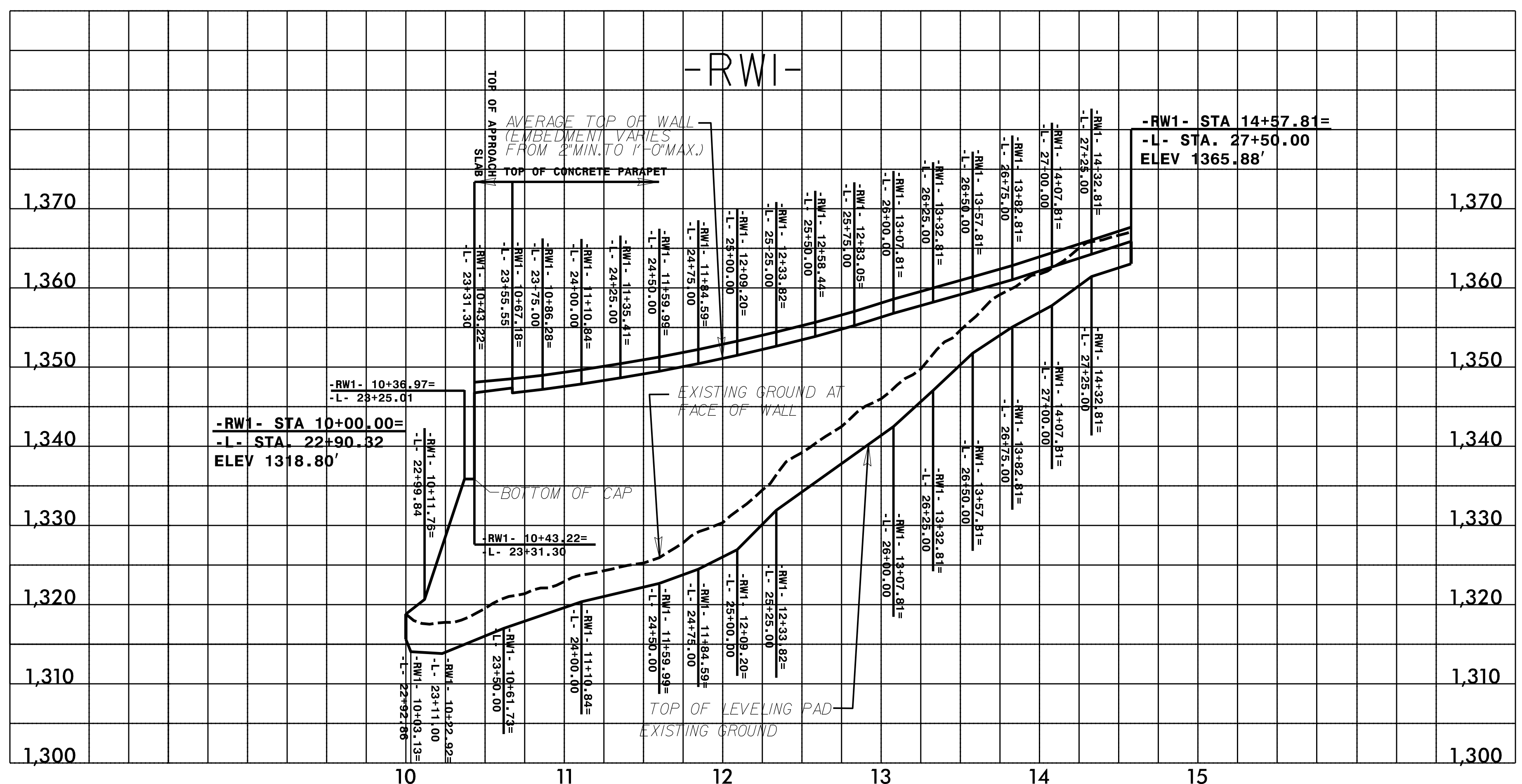
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PLAN VIEW - RETAINING WALL NO. 1

MSE RETAINING WALL QUANTITIES	
RETAINING WALL NO. 1	* 8003 SQUARE FEET
ARCHITECTURAL CONCRETE SURFACE TREATMENT	8003 SQUARE FEET

* WALL AREA IS MEASURED USING THE DESIGN HEIGHT "H"



WALL ENVELOPE - RETAINING WALL NO. 1

NOTE: 1) OFFSET DIMENSIONS ARE FROM FACE OF WALL
2) THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL

WALL ELEVATION TABLE				
LINE	STATION	TOP OF WALL	AVERAGE TOP OF WALL	BOTTOM OF WALL
-L-	2290.32	1318.80		1318.80
-L-	2299.84	1320.65		1317.60
-L-	2325.01	1335.87		1318.20
-L-	2331.30	1346.76		1318.80
-L-	2355.55		1346.74	1321.09
-L-	2375.00		1347.18	1322.10
-L-	2400.00		1347.87	1323.73
-L-	2425.00		1348.64	1324.76
-L-	2450.00		1349.48	1325.68
-L-	2475.00		1350.44	1327.48
-L-	2500.00		1351.50	1329.94
-L-	2525.00		1352.65	1333.93
-L-	2550.00		1353.87	1337.58
-L-	2575.00		1355.25	1341.44
-L-	2600.00		1356.80	1344.49
-L-	2625.00		1358.20	1349.05
-L-	2650.00		1359.61	1353.76
-L-	2675.00		1361.04	1357.07
-L-	2700.00		1362.65	1359.78
-L-	2725.00		1364.26	1363.43
-L-	2750.00		1365.88	1365.05

PROJECT NO.: B-5895

MADISON COUNTY

STATION: 22+90.32 TO 27+50.00 -L-

SHEET 1 OF 4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS


GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALL PLAN AND ENVELOPE					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SY	03/2023	3	SY	02/2025
2	SY	09/2024	4		

SHEET NO. W-1

PREPARED BY: SY	DATE: 5/2022
REVIEWED BY: SCC	DATE: 5/2022

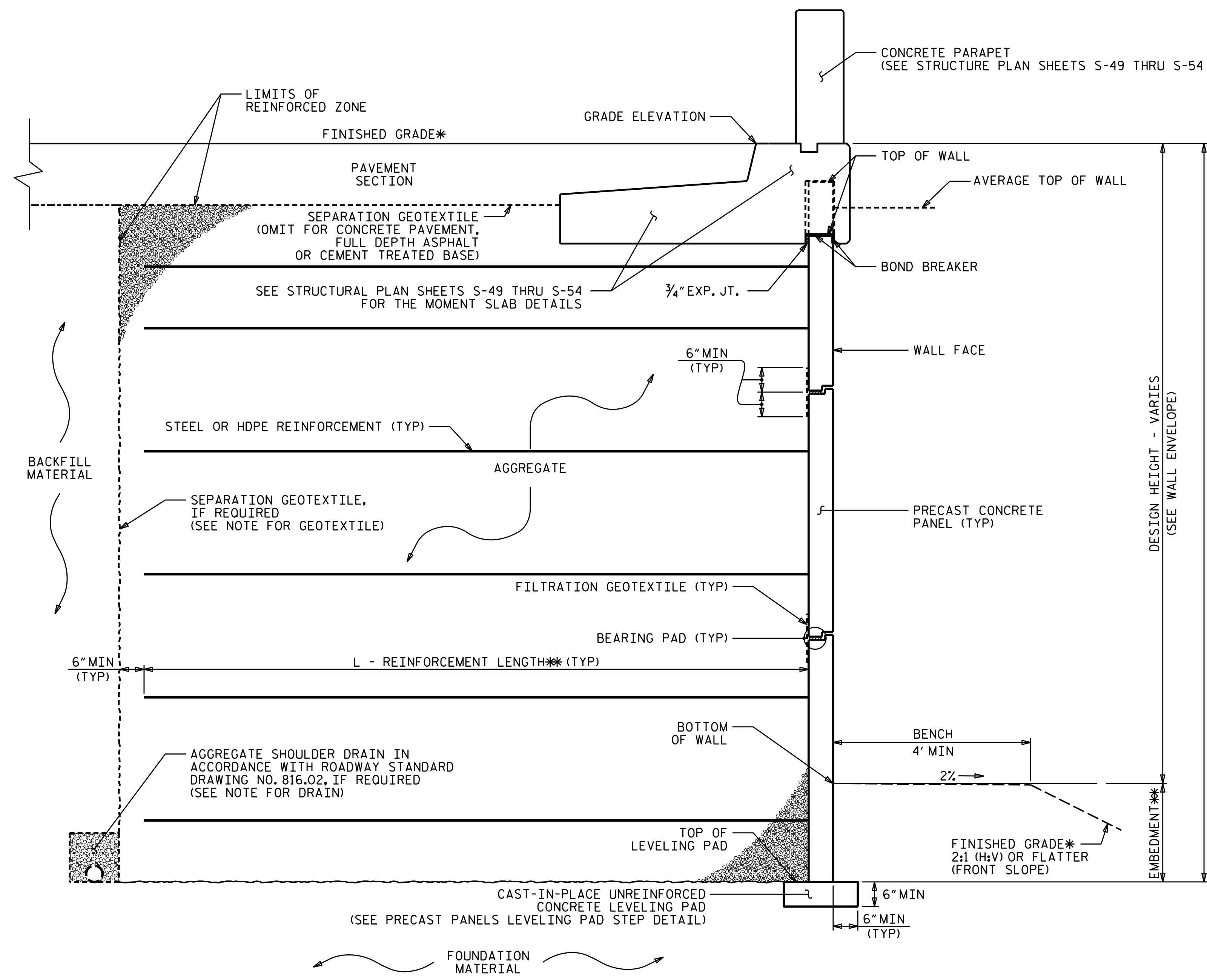
GEOTECHNICAL ENGINEER



Shipping Yang
02/28/2025

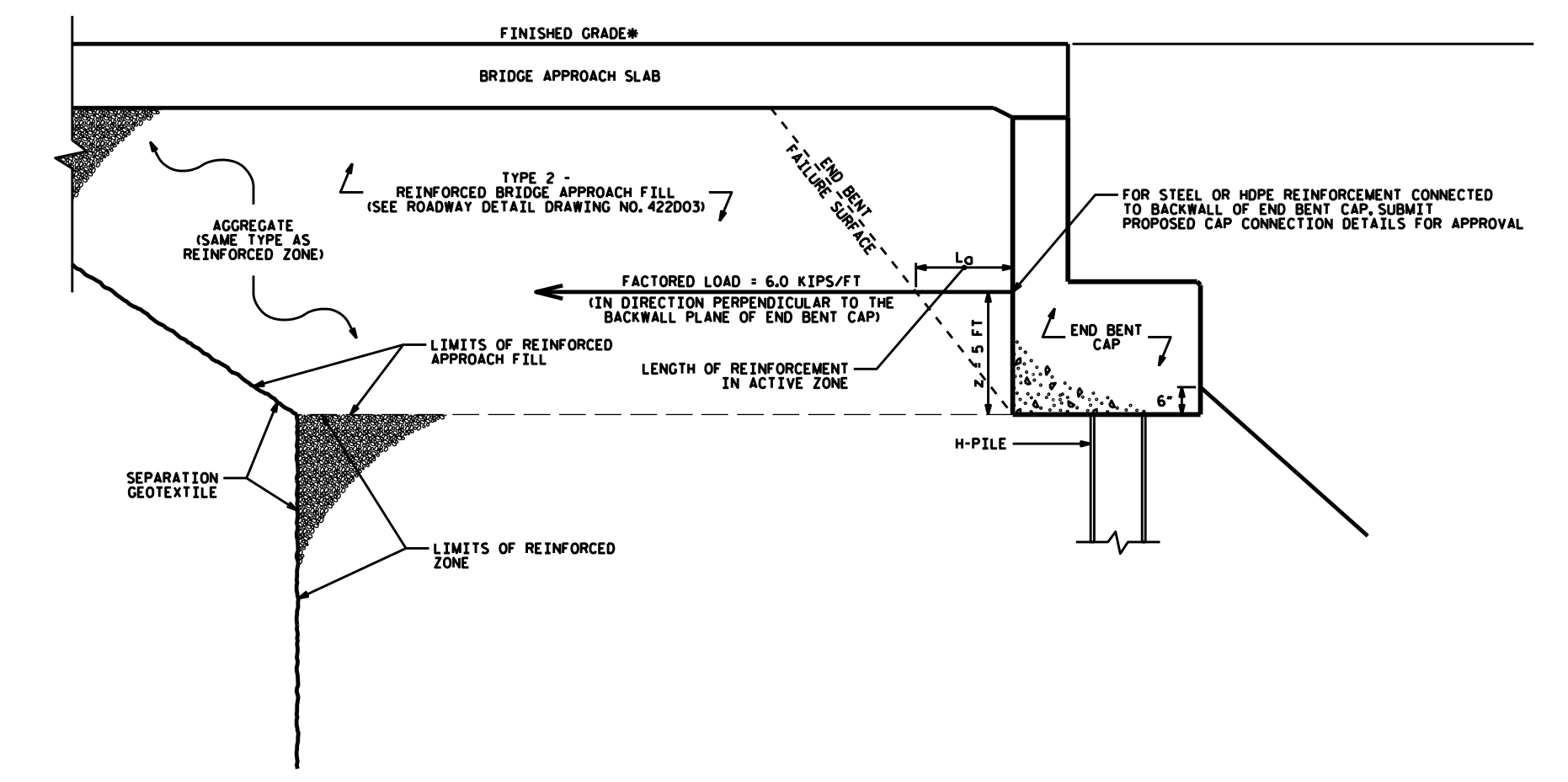
ENGINEER

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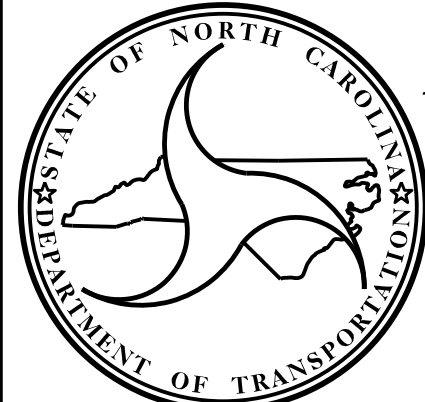
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION 1

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



SECTION AT END BENTS 1&2
END BENT STRAP DETAILS

PROJECT NO.: B-5895
MADISON COUNTY
STATION: 23+31.30 TO 27+50.00 -L-
SHEET 2 OF 4



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS						SHEET NO. W-2
NO.	BY	DATE	NO.	BY	DATE	
1	SY	03/2023	3	SY	02/2025	
2	SY	09/2024	4			

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REVIEWED BY: SCC	DATE: 5/2022

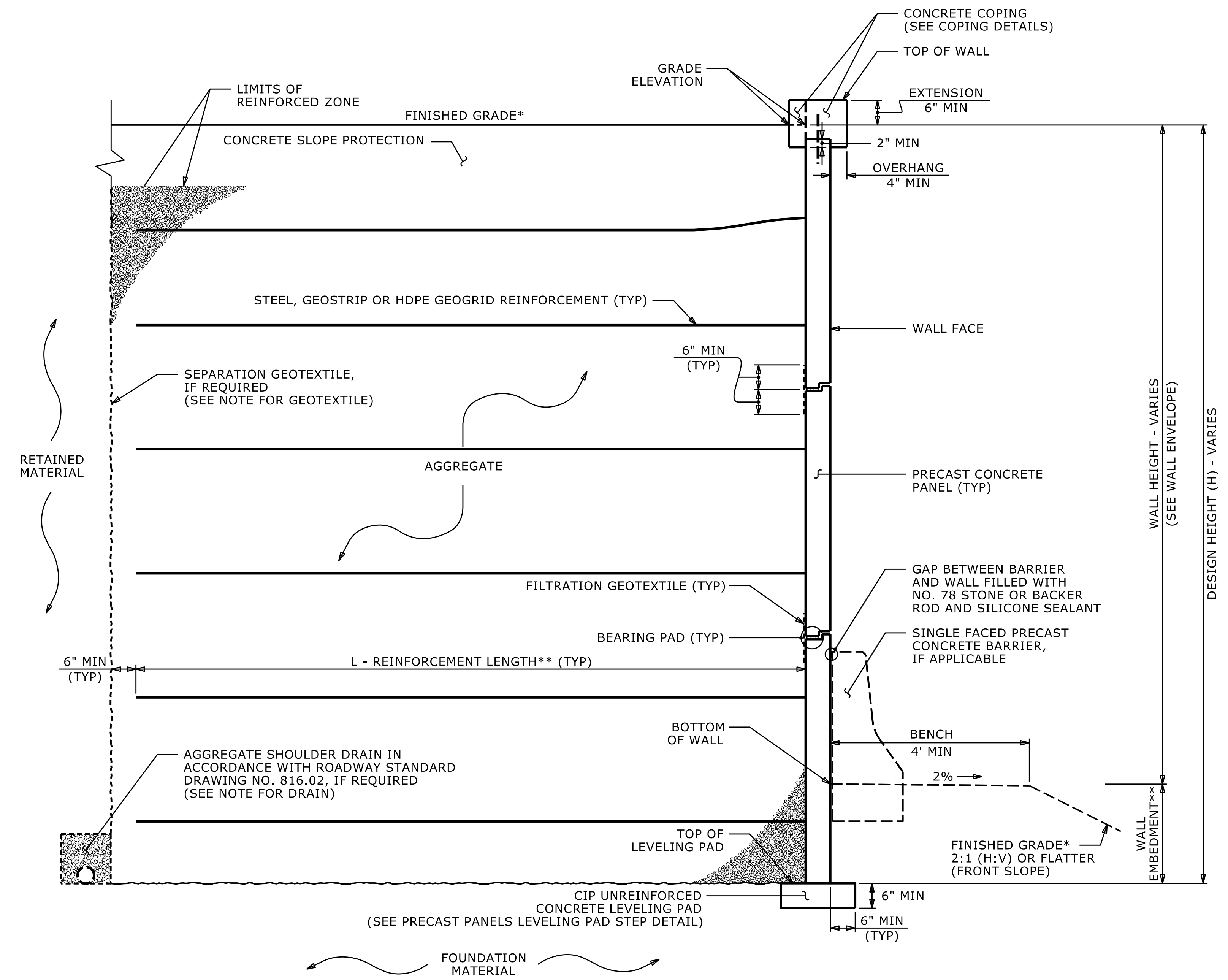
GEOTECHNICAL ENGINEER

Shaping Yang
02/28/2025

ENGINEER

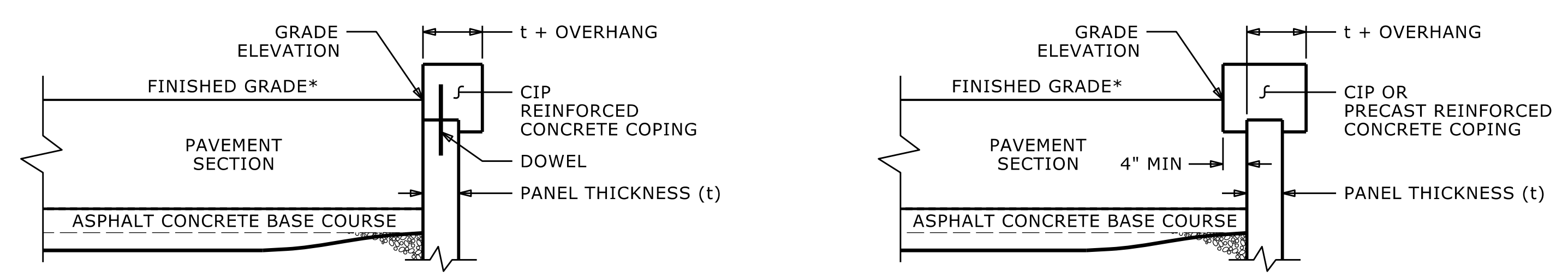
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MSE WALL WITH PRECAST PANELS - TYPICAL SECTION 2

*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.

PROJECT NO.: B-5895
MADISON COUNTY
STATION: 22+90.32 TO 23+31.30 -L-
SHEET 3 OF 4

NORTH CAROLINA
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GEOTECHNICAL
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REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SY	03/2023	3	SY	02/2025
2	SY	09/2024	4		

**MSE RETAINING WALL
TYPICAL 2**

PREPARED BY: SY	DATE: 5/2022
REVIEWED BY: SCC	DATE: 5/2022

SHEET NO. W-3

GEOTECHNICAL ENGINEER  Shiping Yang <small>DocuSigned by: Shiping Yang 02/28/2025</small> <small>7A7310E6F76411...</small>	ENGINEER SIGNATURE _____ DATE _____
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NOTES:

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

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO.1.

A FENCE MAY BE REQUIRED ON TOP OF RETAINING WALL NO.1. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.

AN ASHLAR ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO.1. SEE WEATHER CUT ASHLAR FORM LINER SPECIAL PROVISION.

CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 1.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1 IF COARSE AGGREGATE IS USED.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1.

BEFORE BEGINNING MSE 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) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 7,200 LB/SF
 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8H OR 6 FT, WHICHEVER IS LONGER
 5) MINIMUM EMBEDMENT ELEVATION = SEE WALL EMBEDMENT TABLE
 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
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) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0

CAST-IN-PLACE VERTICAL COPING IS REQUIRED BETWEEN THE WING WALL AND THE RETAINING WALL.

DESIGN RETAINING WALL NO.1 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 17+57.29 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

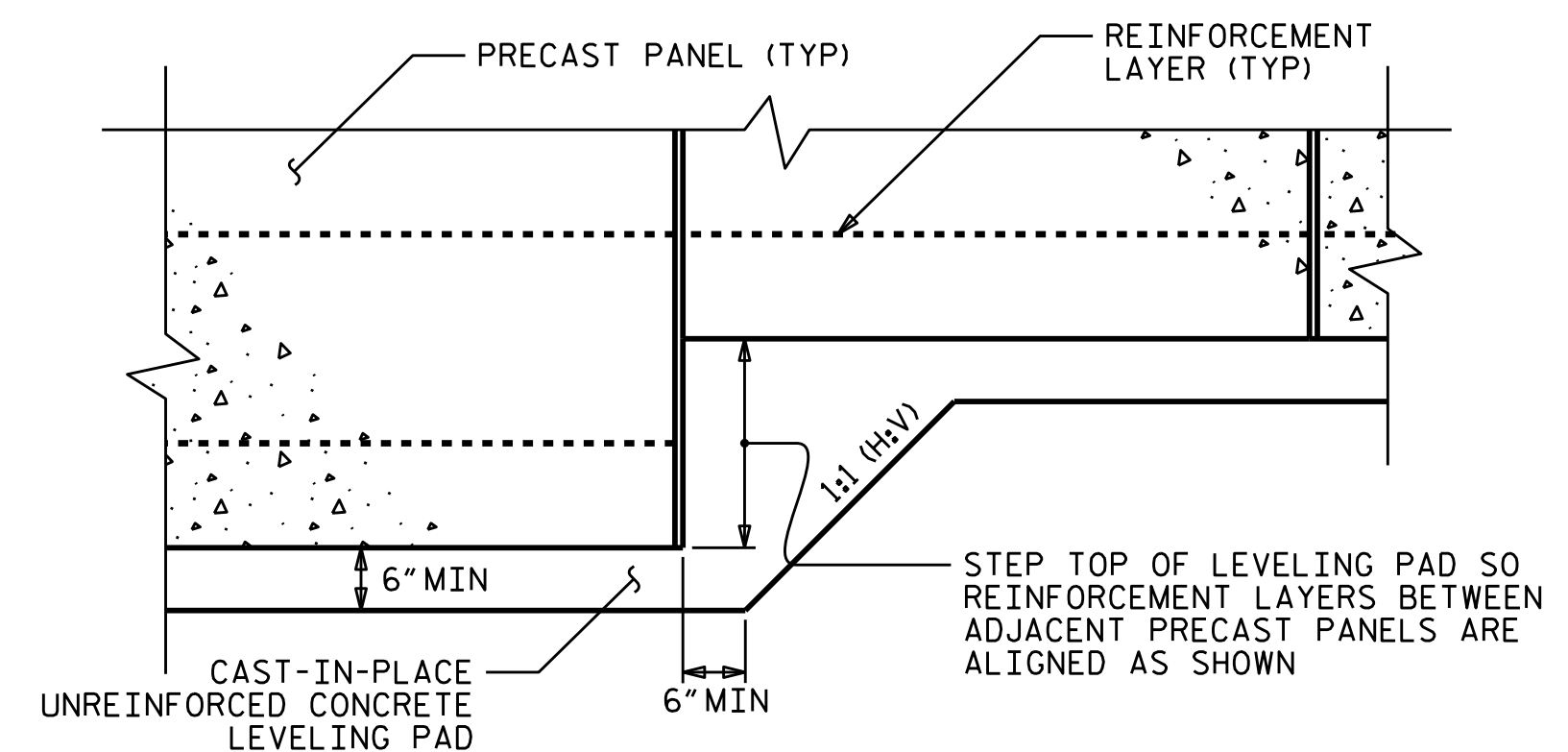
DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO.2 LOCATED AT STATION 23+20.45 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

REFER TO STRUCTURE PLAN SHEET S-49 THRU S-54 FOR THE MOMENT SLAB DETAILS PREPARED BY WSP USA, INC.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

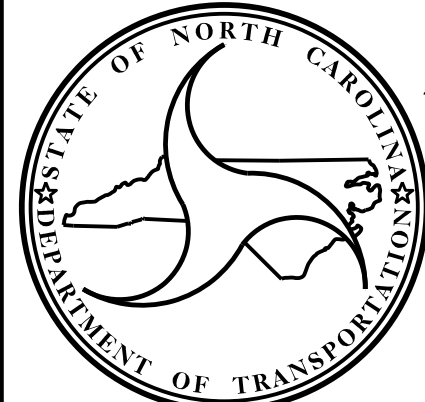
"TEMPORARY SHORING" MAY BE REQUIRED FOR RETAINING WALL NO.1 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY TRAFFIC CONTROL PLANS.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.: B-5895
MADISON COUNTY
 STATION: 22+90.32 TO 27+50.00 -L-
 SHEET 4 OF 4


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

**GEOTECHNICAL
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REVISIONS						SHEET NO. W-4
NO.	BY	DATE	NO.	BY	DATE	
1	SY	03/2023	3	SY	02/2025	
2	SY	09/2024	4			

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