

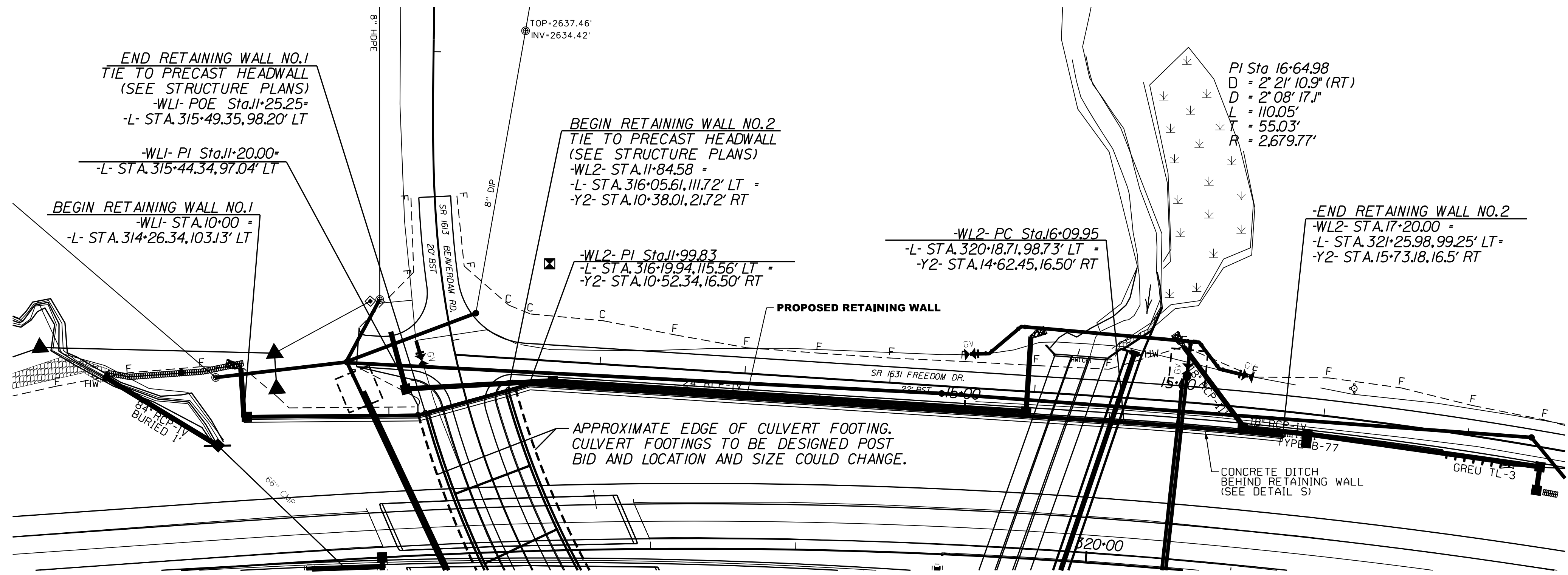
GEOTECHNICAL ENGINEER

ENGINEER

SEAL
028893
NORTH CAROLINA PROFESSIONAL ENGINEER
MICHAEL H. STEPHENS

DocuSigned by:
M.H.S.
12/11/2023

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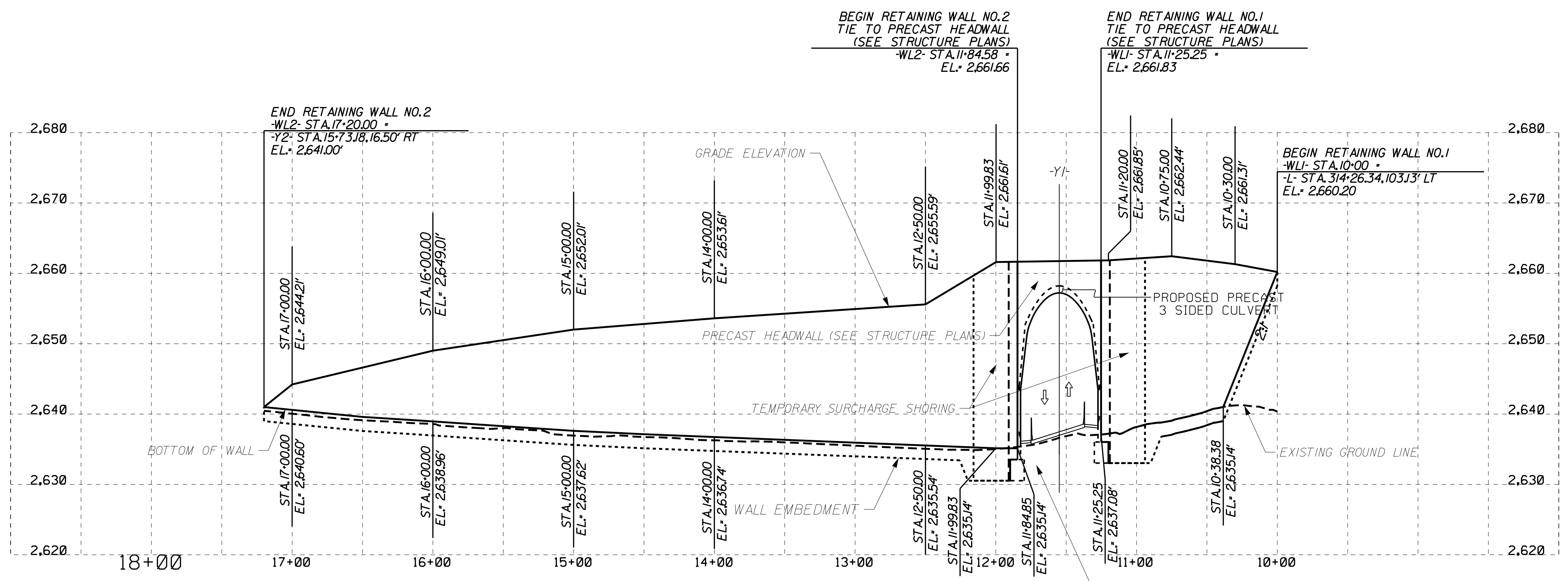


**RETAINING WALL NOS. 1 & 2
PLAN VIEWS**

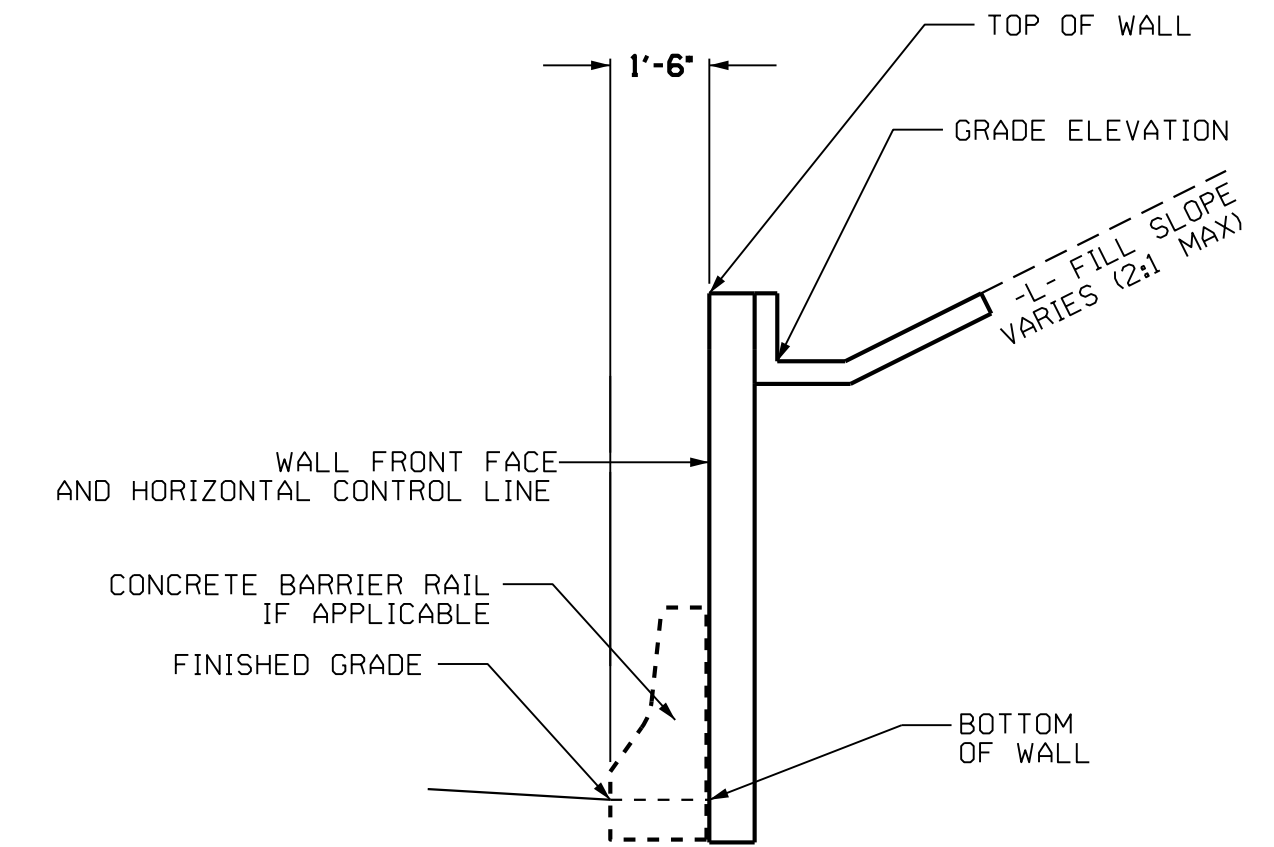
ESTIMATED MSE
WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO.1	2,750 SF
MSE RETAINING WALL NO.2	9,005 SF

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



**RETAINING WALL NOS. 1 & 2
ENVELOPE**



**RETAINING WALLS NOS. 1 AND 2
WALL DETAIL**

PROJECT NO.: 55041.1.1 (HB-0002)
HAYWOOD COUNTY
STATION: SEE ENVELOPE
SHEET 1 OF 4

PREPARED BY: MHS DATE: 12/23

REVIEWED BY: SCC DATE: 12/23

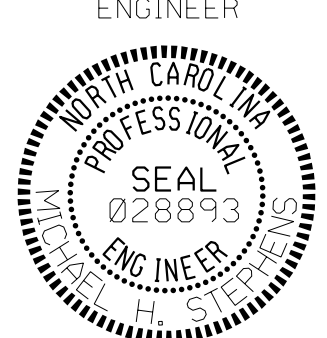
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

RETAINING WALL
NOS. 1 AND 2

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

GEOTECHNICAL ENGINEER

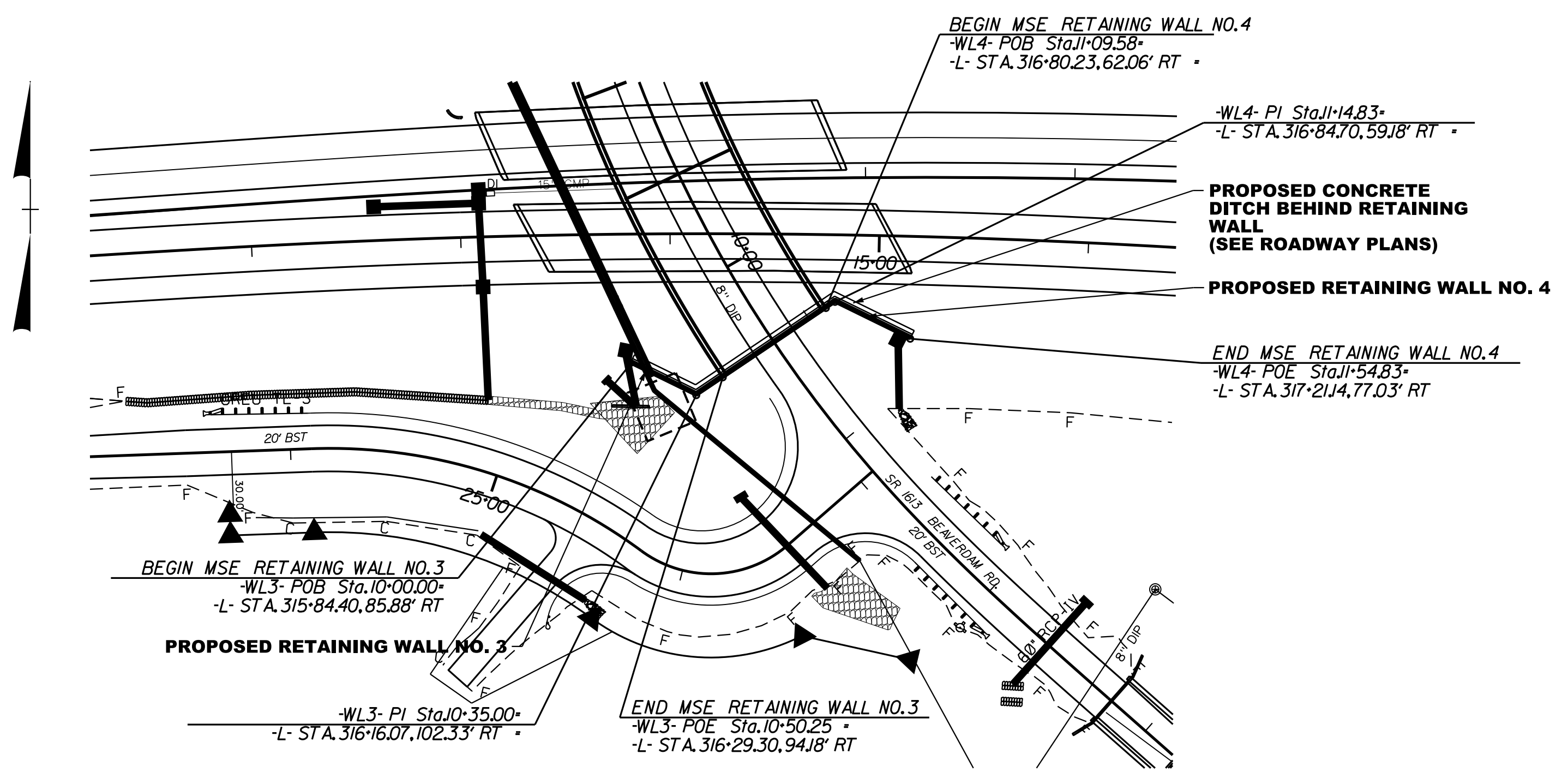


DocuSigned by:
H. Stephenson
12/11/2023

ENGINEER

SIGNATURE DATE

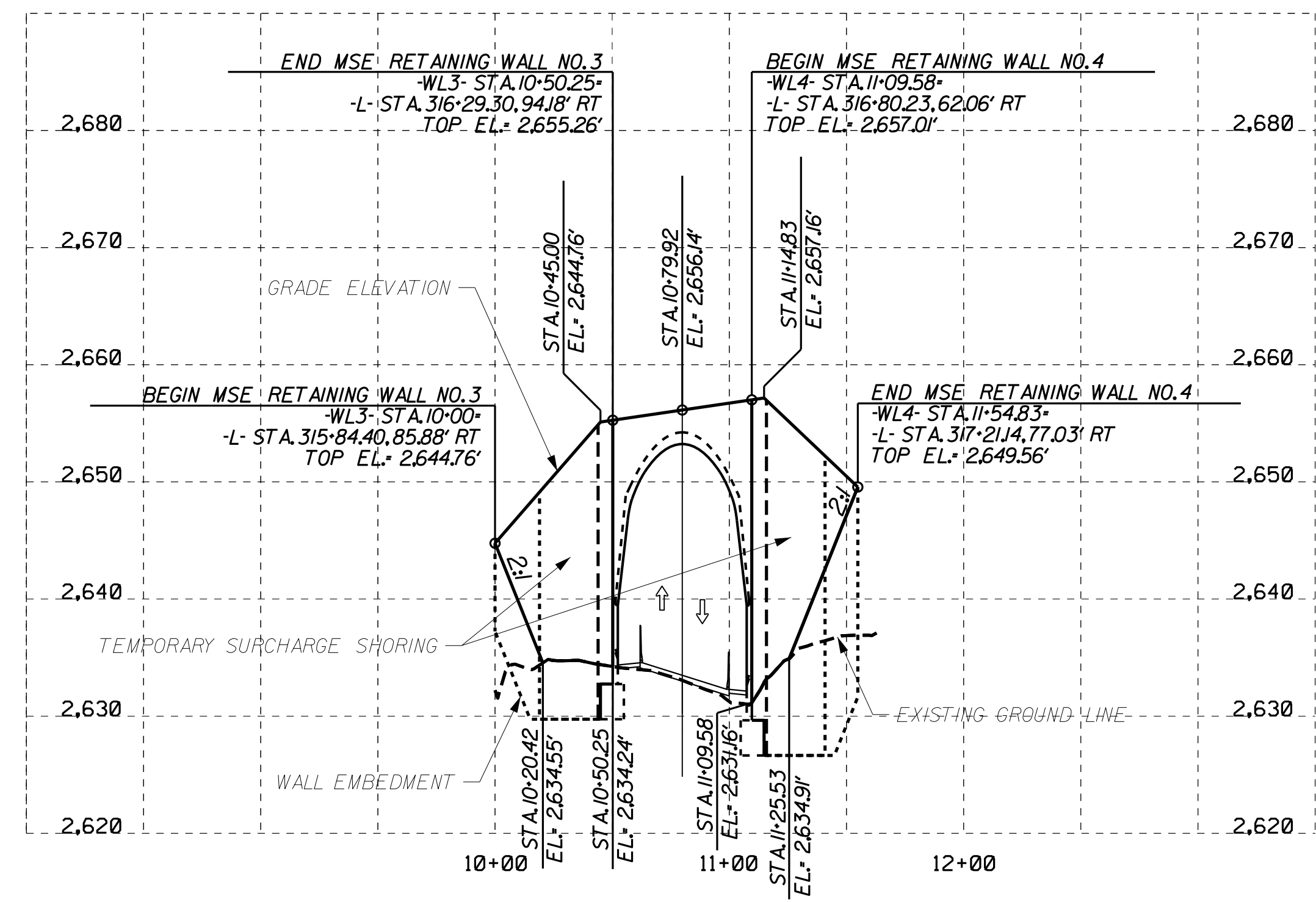
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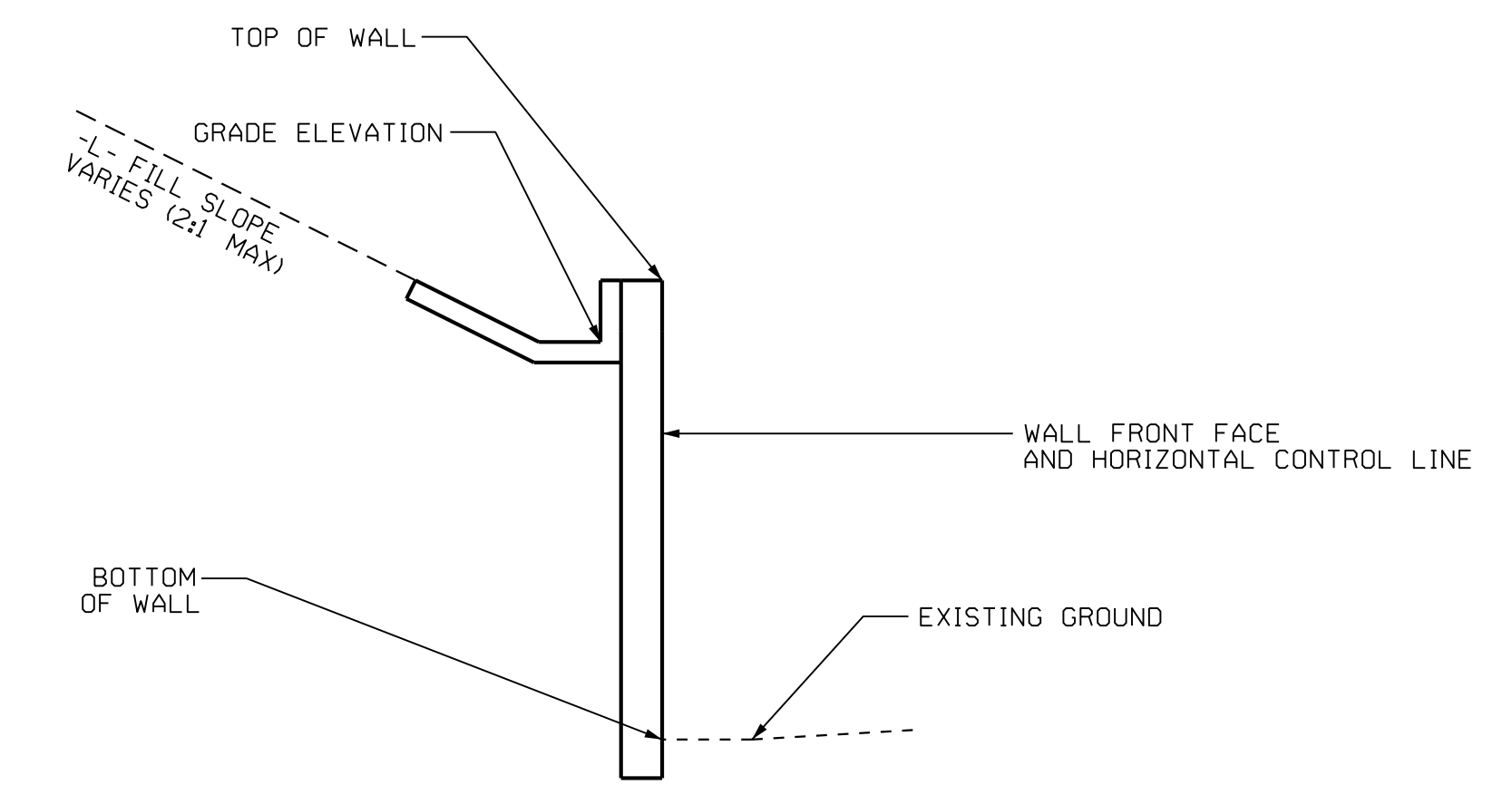
**RETAINING WALL NOS. 3 & 4
PLAN VIEWS**

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 3	970 SF
MSE RETAINING WALL NO. 4	1,190 SF

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



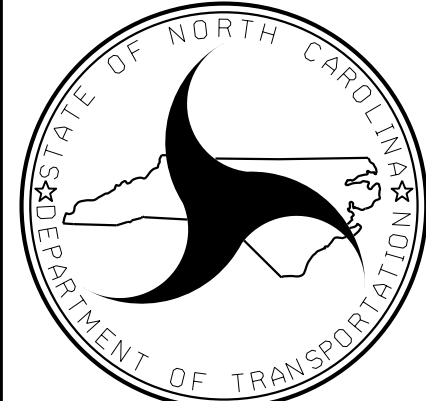
**RETAINING WALL NOS. 3 & 4
ENVELOPE**



**RETAINING WALL NOS. 3 AND 4
WALL DETAIL**

PROJECT NO.: 55041.1.1 (HB-0002)
HAYWOOD COUNTY
STATION: SEE ENVELOPE
SHEET 2 OF 4

PREPARED BY: MHS DATE: 12/23
REVIEWED BY: MHS DATE: 12/23



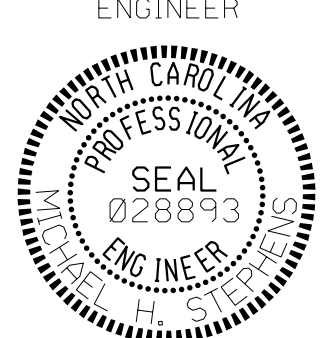
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GEOTECHNICAL
ENGINEERING UNIT

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

GEOTECHNICAL ENGINEER

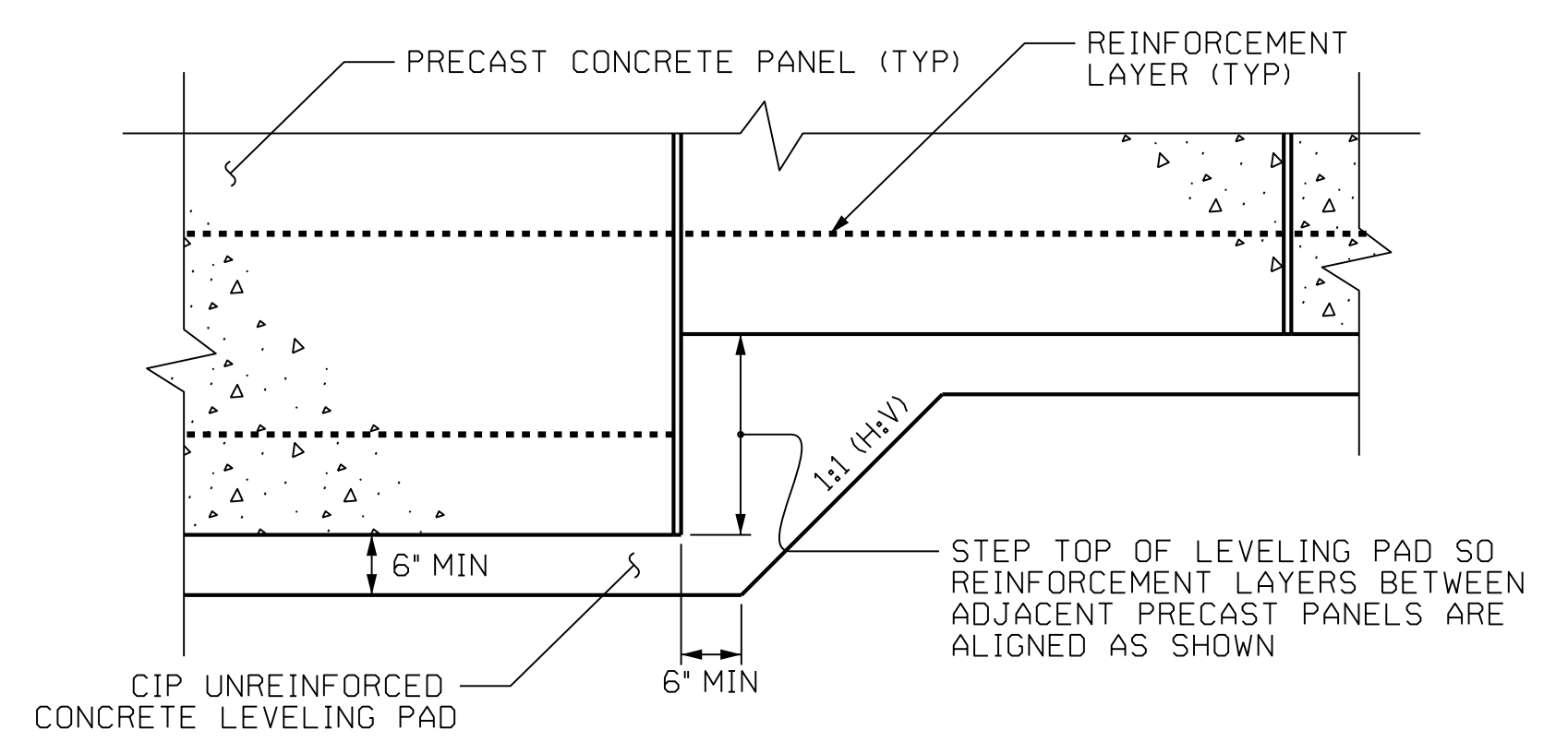
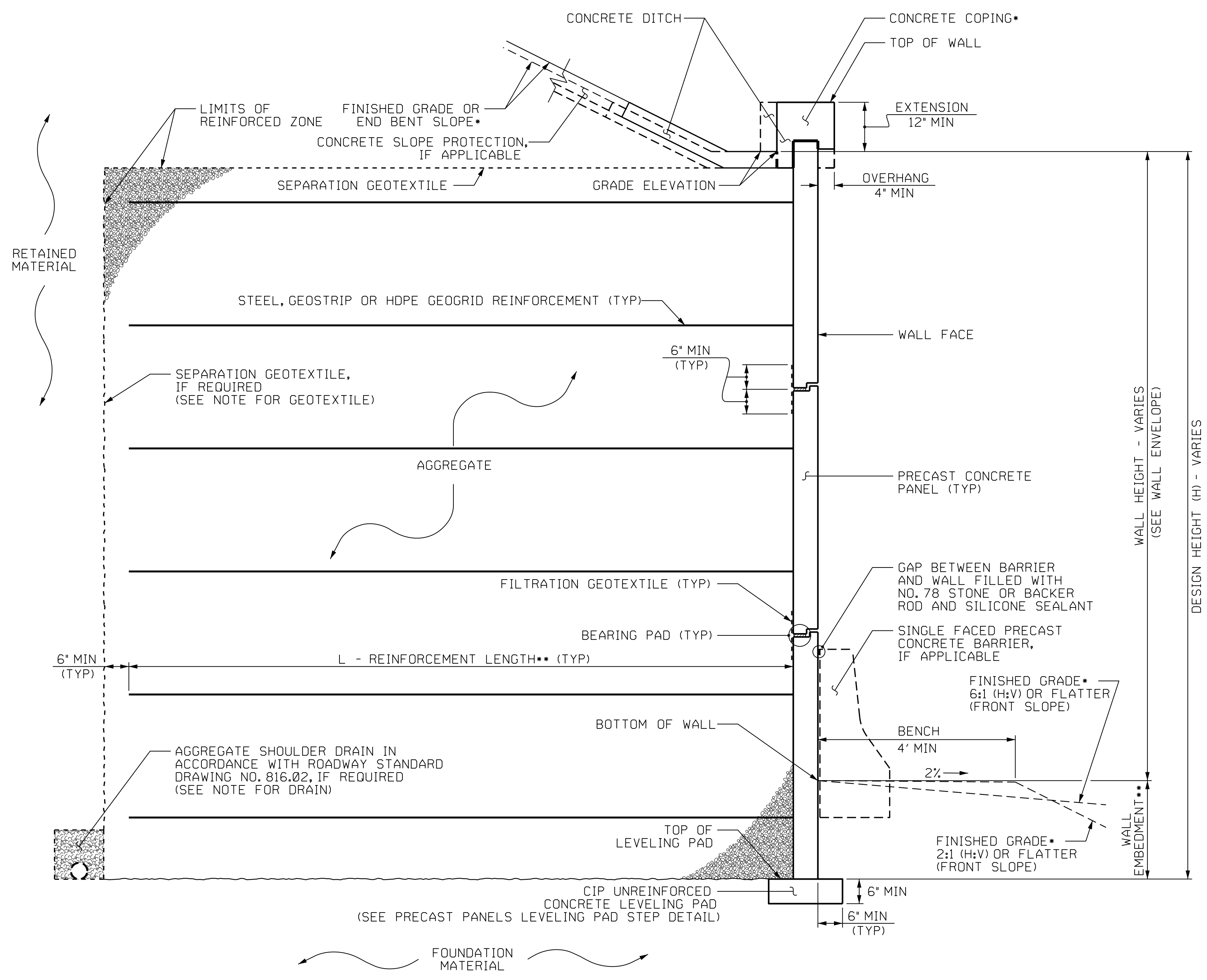
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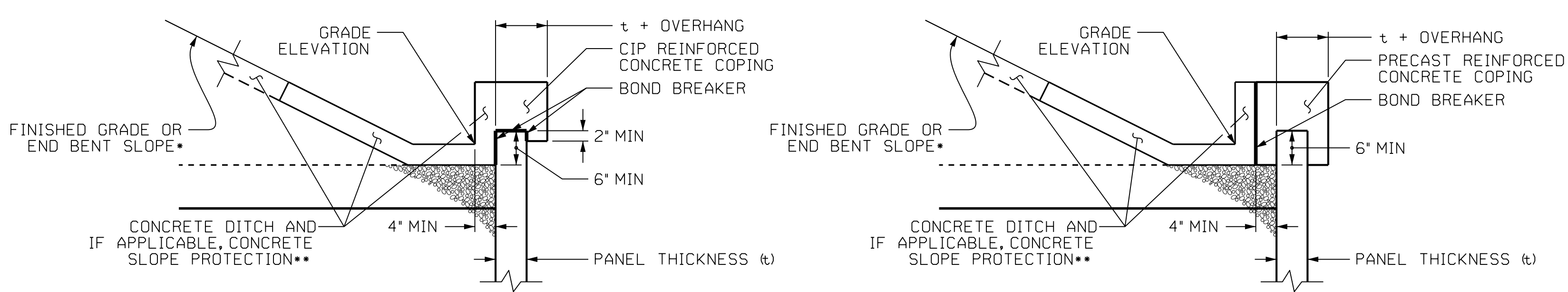
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MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

•SEE COPING DETAILS AND PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.
••SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

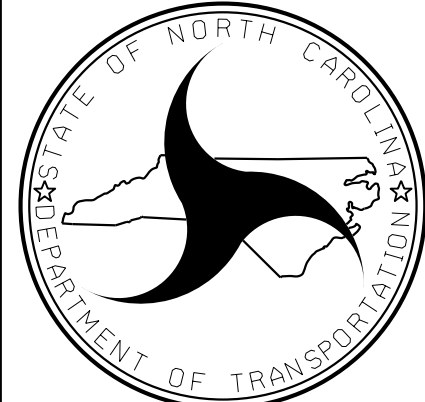


COPING DETAILS

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

**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 55041.1.1 (HB-0002)
HAYWOOD COUNTY
STATION: _____
SHEET 3 OF 4



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

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


RETAINING WALL NOS. 1, 2,
3, AND 4
TYPICAL SECTION AND
DETAILS

PREPARED BY: MHS	DATE: 12/23
REVIEWED BY: SCC	DATE: 12/23

SHEET NO. W-3

GEOTECHNICAL ENGINEER

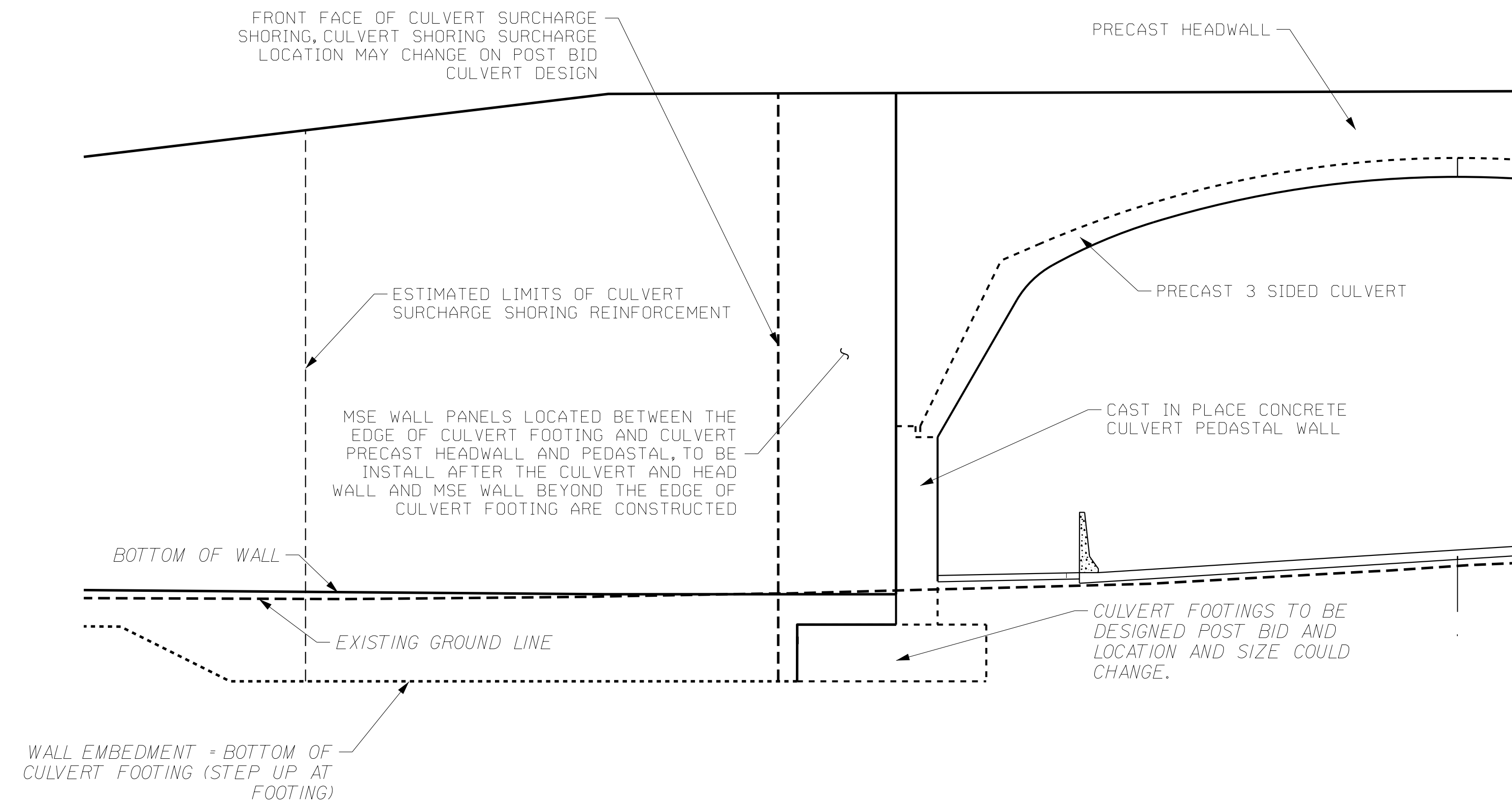
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SIGNATURE DATE SIGNATURE DATE

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**RETAINING WALLS NOS, 1, 2, 3, AND 4
CULVERT TO MSE WALL TYPICAL DETAIL**

NOTES:

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

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NOS. 1, 2, 3, AND 4.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NOS. 1, 2, 3, AND 4.

A DRAIN IS REQUIRED FOR RETAINING WALL NOS. 1, 2, 3, AND 4.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NOS. 1, 2, 3, AND 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 NOS. 1, 2, 3, AND 4 FOR THE FOLLOWING:
- 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,400 PSF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT ELEVATION = 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	115	30	0
FOUNDATION	115	30	0

DESIGN RETAINING WALL NOS. 1, 2, 3, AND 4 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS. 1, 2, 3, AND 4.

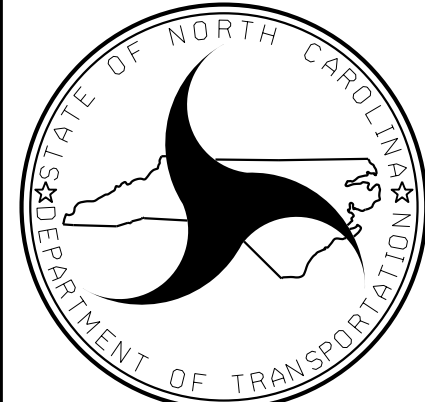
FOR RETAINING WALL NOS. 1, 2, 3, AND 4 DESIGN VERTICAL COPING AT EACH EDGE OF THE CULVERT. SEE POST BID CULVERT DESIGN FOR CULVERT LOCATION, FOOTING LOCATION, AND DEPTH.

FOR RETAINING WALL NOS. 1, 2, 3, AND 4 DESIGN TRANSITIONS BETWEEN CULVERT HEAD WALL AND MSE WALL AND AT THE STAGE CONSTRUCTION LOCATIONS. SEE POST BID CULVERT DESIGN FOR CULVERT LOCATION, FOOTING LOCATION, AND DEPTH.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NOS. 1, 2, 3, AND 4 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

SUBMIT TEMPORARY MSE WALL DESIGNS WITH RETAINING WALL DESIGNS FOR RETAINING WALL NOS. 1, 2, 3, AND 4.

PREPARED BY: MHS DATE: 12/23
REVIEWED BY: SCC DATE: 12/23



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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GEOTECHNICAL
ENGINEERING UNIT

PROJECT NO.: 55041.1.1 (HB-0002)
HAYWOOD COUNTY
STATION: _____
SHEET 4 OF 4

RETAINING WALL NOS. 1,
2, 3, AND 4
CULVERT TO MSE DETAIL
AND NOTES

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