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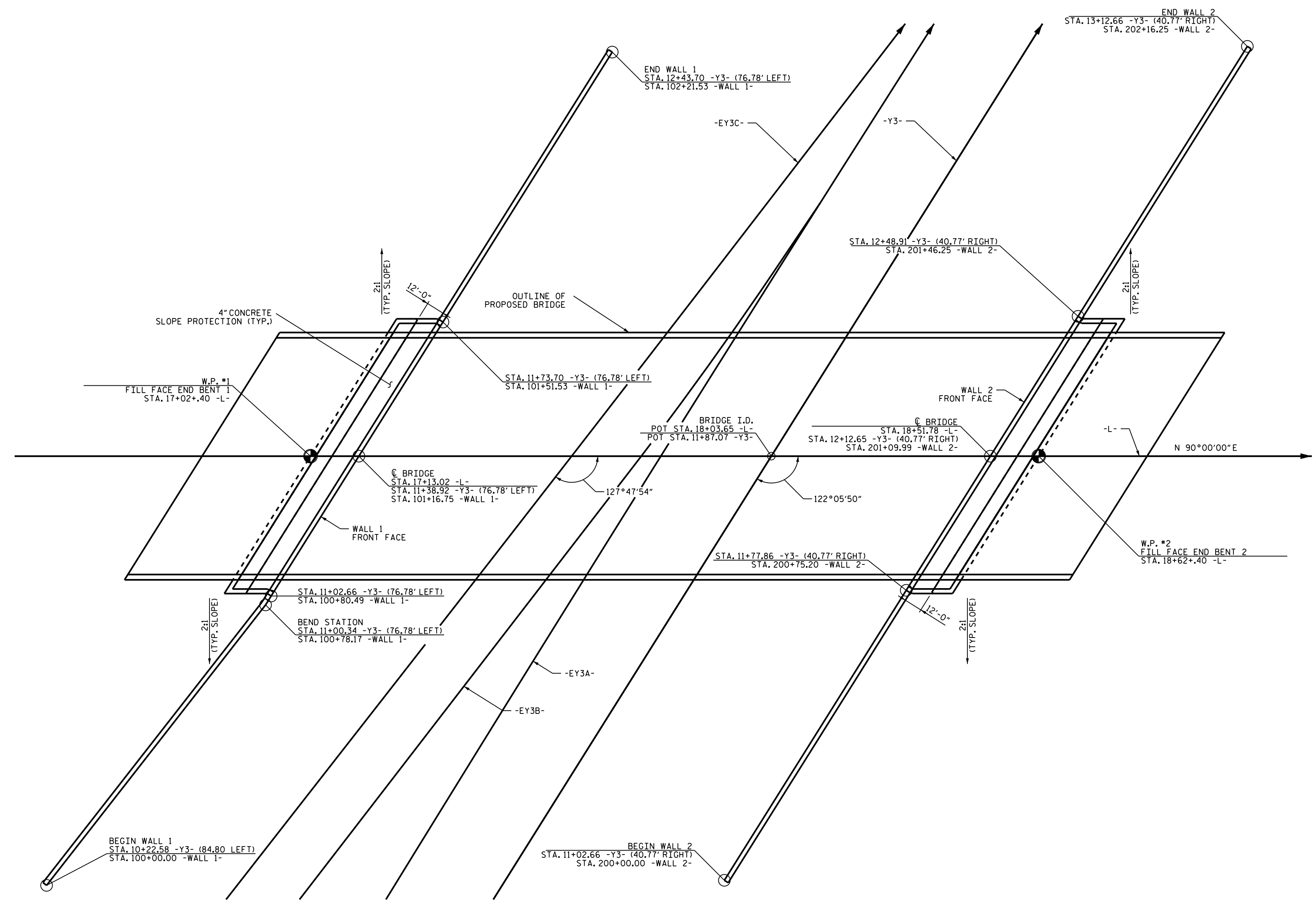
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GEOTECHNICAL ENGINEER

ENGINEER

DocuSigned by:
Michael Stephens 10/14/2016

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ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 1	4,600 SF
MSE RETAINING WALL NO. 2	4,440 SF

* WALL AREA INCLUDES WALL EMBEDMENT

PLAN VIEW - RETAINING WALL NOS. 1 AND 2

NOTE: THE WALL STATIONS AND OFFSETS ARE
AT THE FRONT FACE OF THE WALL.

PROJECT NO.: 38518.1.1 (B-4746)
 FORSYTH COUNTY
 STATION: 18+03.65 -L-
 SHEET 1 OF 5

PREPARED BY: MHS DATE: 10-14-16
 REVIEWED BY: SCC DATE: 10-14-16


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

**GEOTECHNICAL
 ENGINEERING UNIT**

MSE RETAINING WALL NOS. 1 AND 2 FOR BRIDGE NO. 229					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

SHEET NO. W-1

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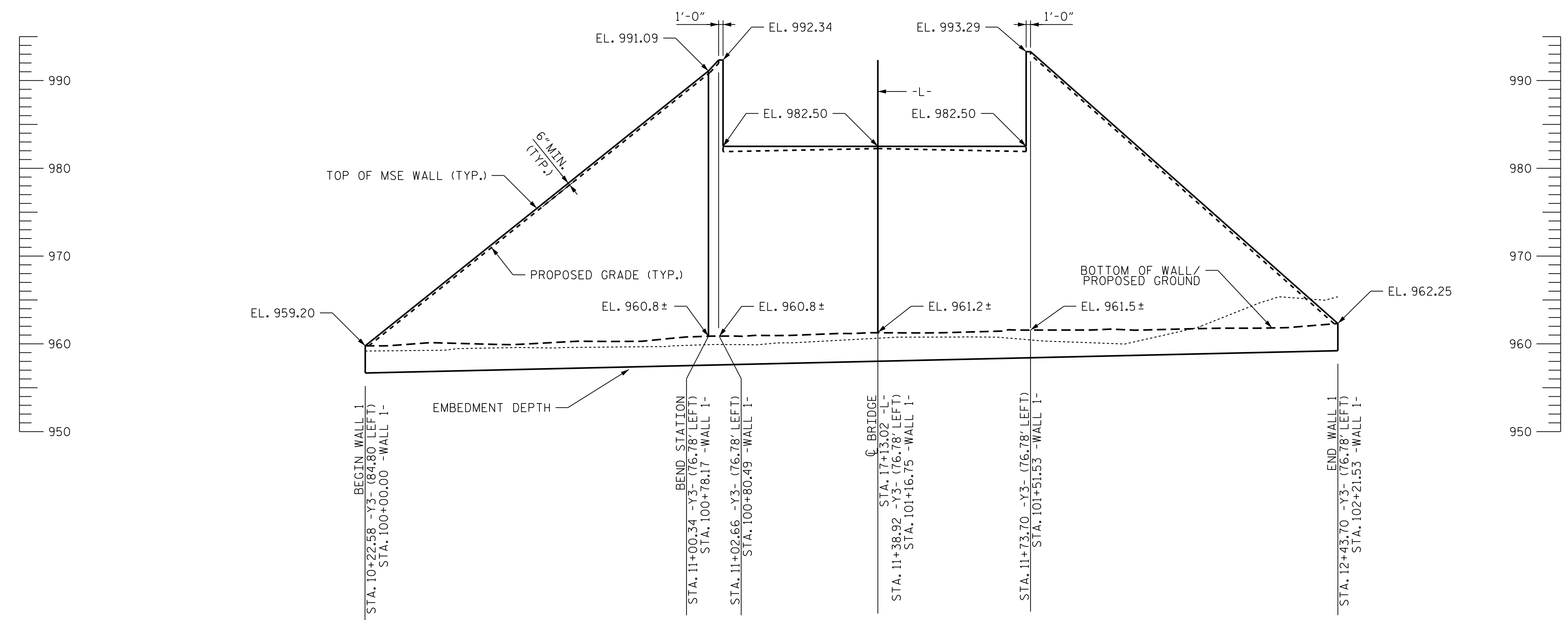


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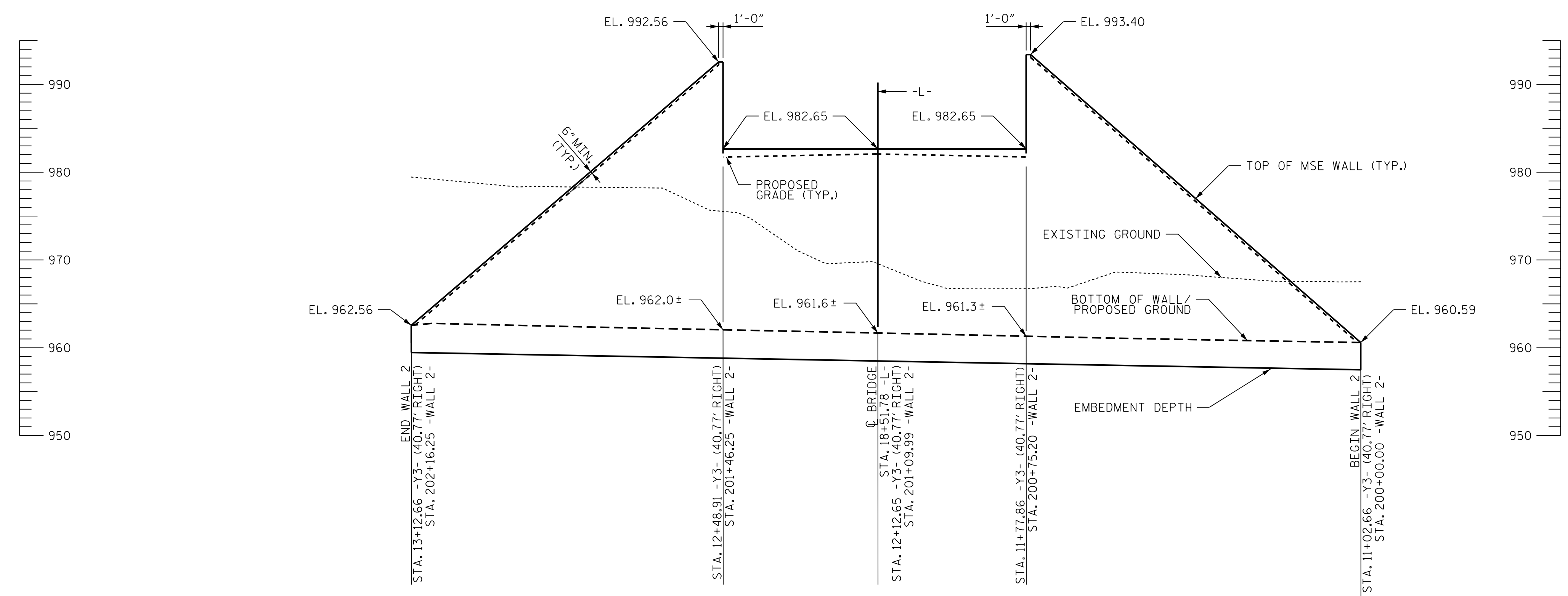
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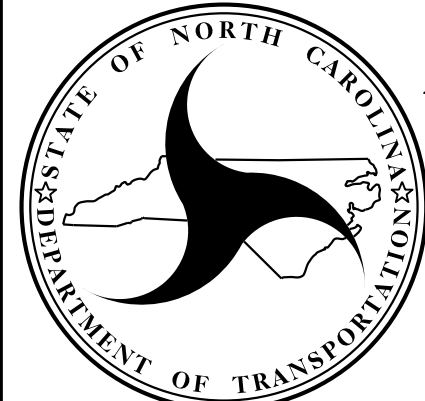


WALL ENVELOPE - RETAINING WALL NO. 1



WALL ENVELOPE - RETAINING WALL NO. 2

PROJECT NO.: 38518.1.1 (B-4746)
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 SHEET 2 OF 5



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1			3		
2			4		

**MSE RETAINING WALL
 NOS. 1 AND 2 FOR
 BRIDGE NO. 229**

PREPARED BY: MHS	DATE: 10-14-16
REVIEWED BY: SCC	DATE: 10-14-16

SHEET NO. W-2

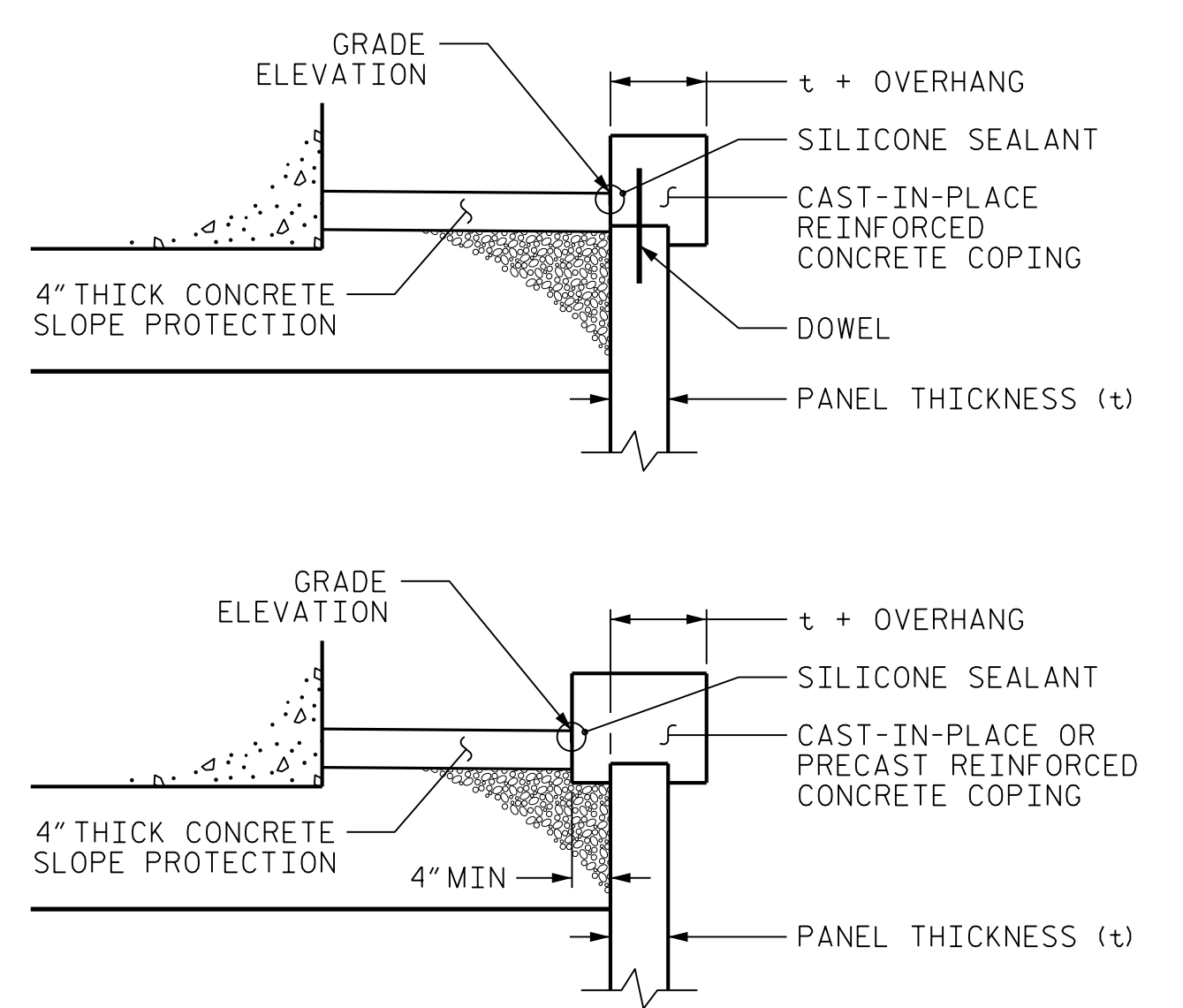
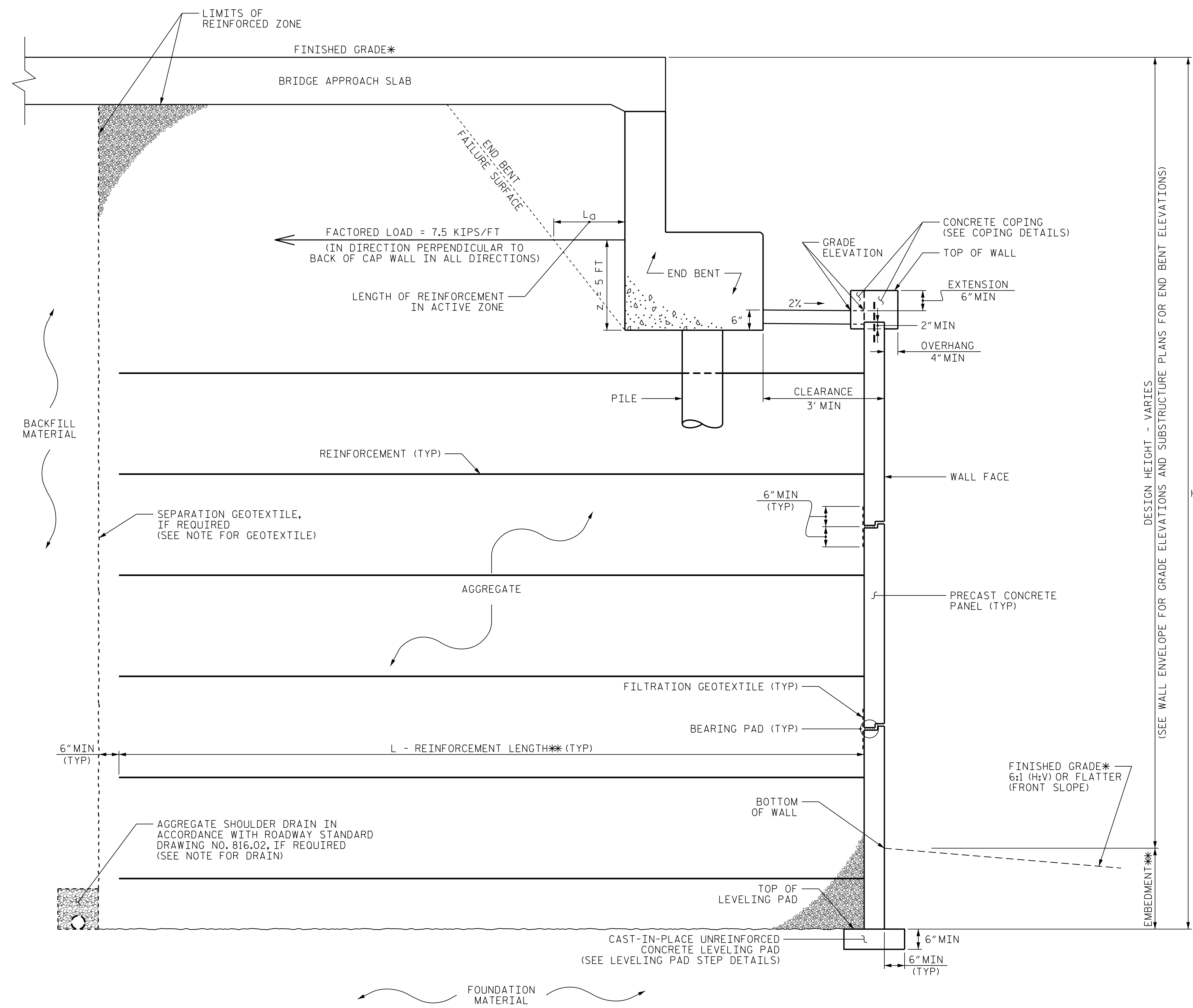
GEOTECHNICAL ENGINEER

ENGINEER

NORTH CAROLINA
PROFESSIONAL
SEAL
028893
ENGINEER
MICHAEL H. STEPHENS

Designed by: Michael Stephens DATE: 10/14/2016

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COPING DETAILS

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

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 EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: 38518.1.1 (B-4746)
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 SHEET 3 OF 5

**NORTH CAROLINA
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REVISIONS						SHEET NO. W-3
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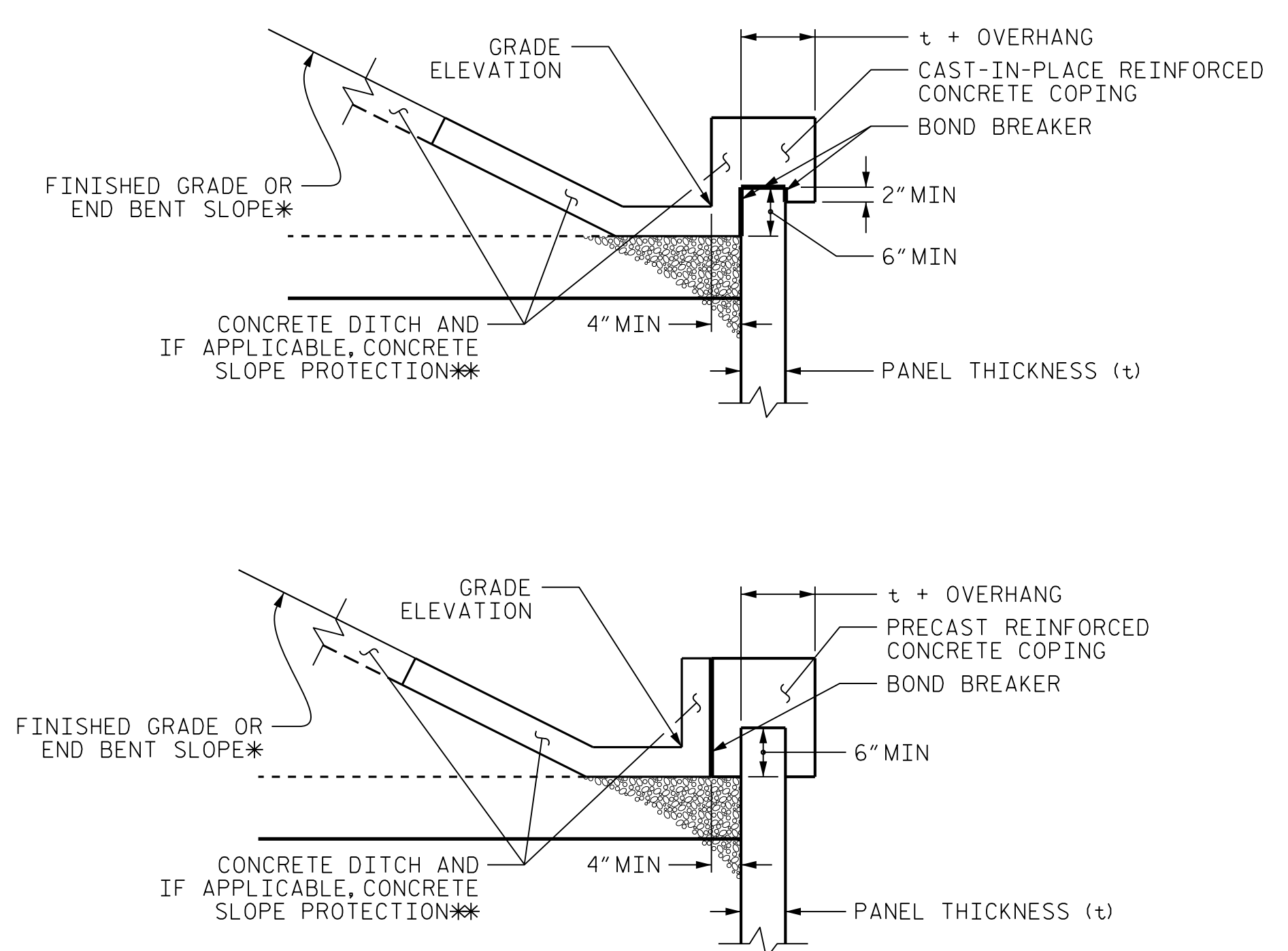
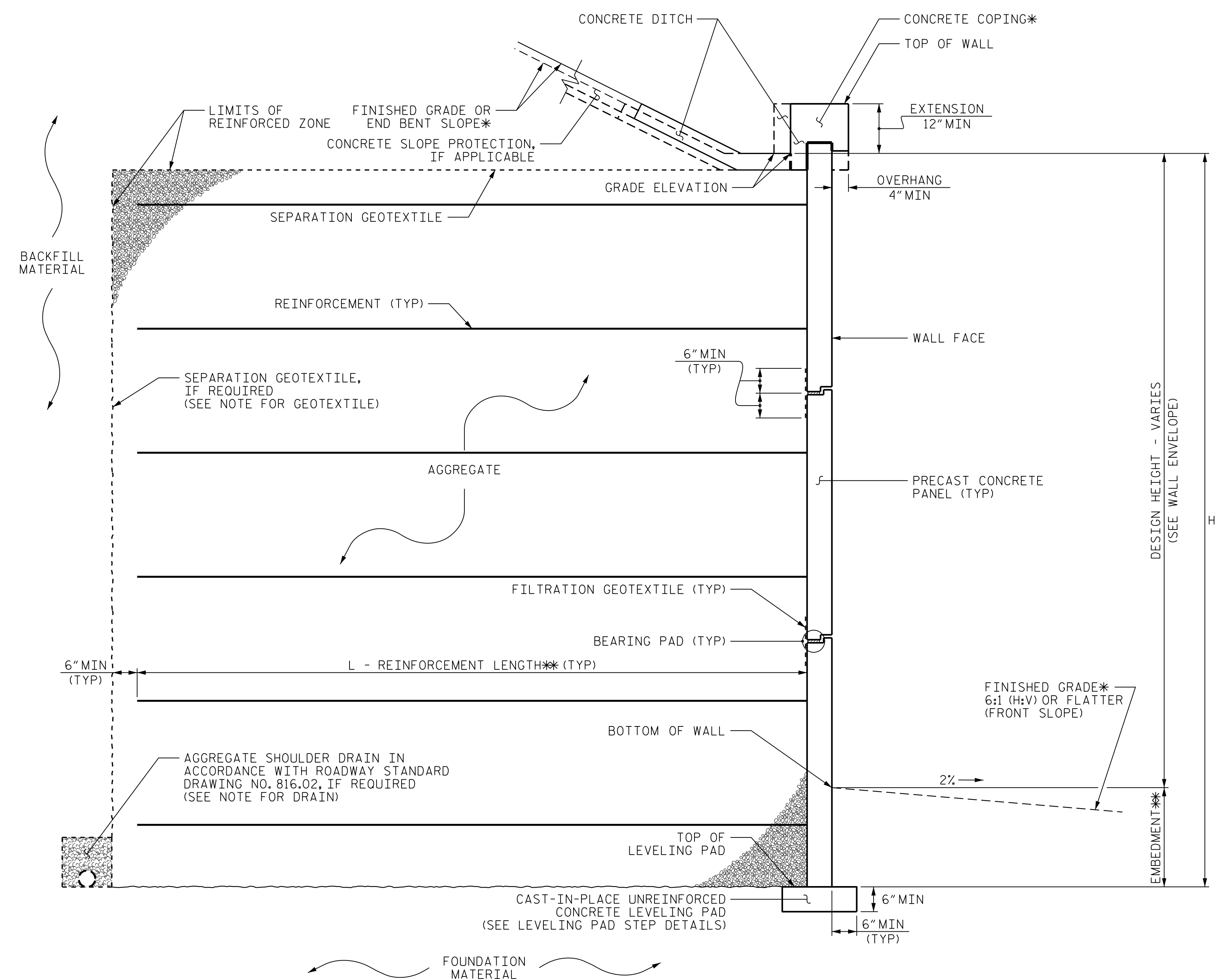
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COPING DETAILS

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

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 EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: 38518.1.1 (B-4746)
 FORSYTH COUNTY
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 SHEET 4 OF 5

PREPARED BY: MHS DATE: 10-14-16
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**NORTH CAROLINA
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**GEOTECHNICAL
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2			4			

GEOTECHNICAL ENGINEER

ENGINEER

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NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION. AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NOS 1 AND 2.

A SQUARE OR RECTANGULAR PANEL IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NOS 1 AND 2.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NOS.1 AND 2 WHEN COARSE AGGREGATE IS USED.

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

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NOS.1 AND 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 NOS 1 AND 2 FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 9,200 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.9 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT ELEVATION = SEE MSE WALL PROVISION
 - 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

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

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NOS.1 AND 2. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

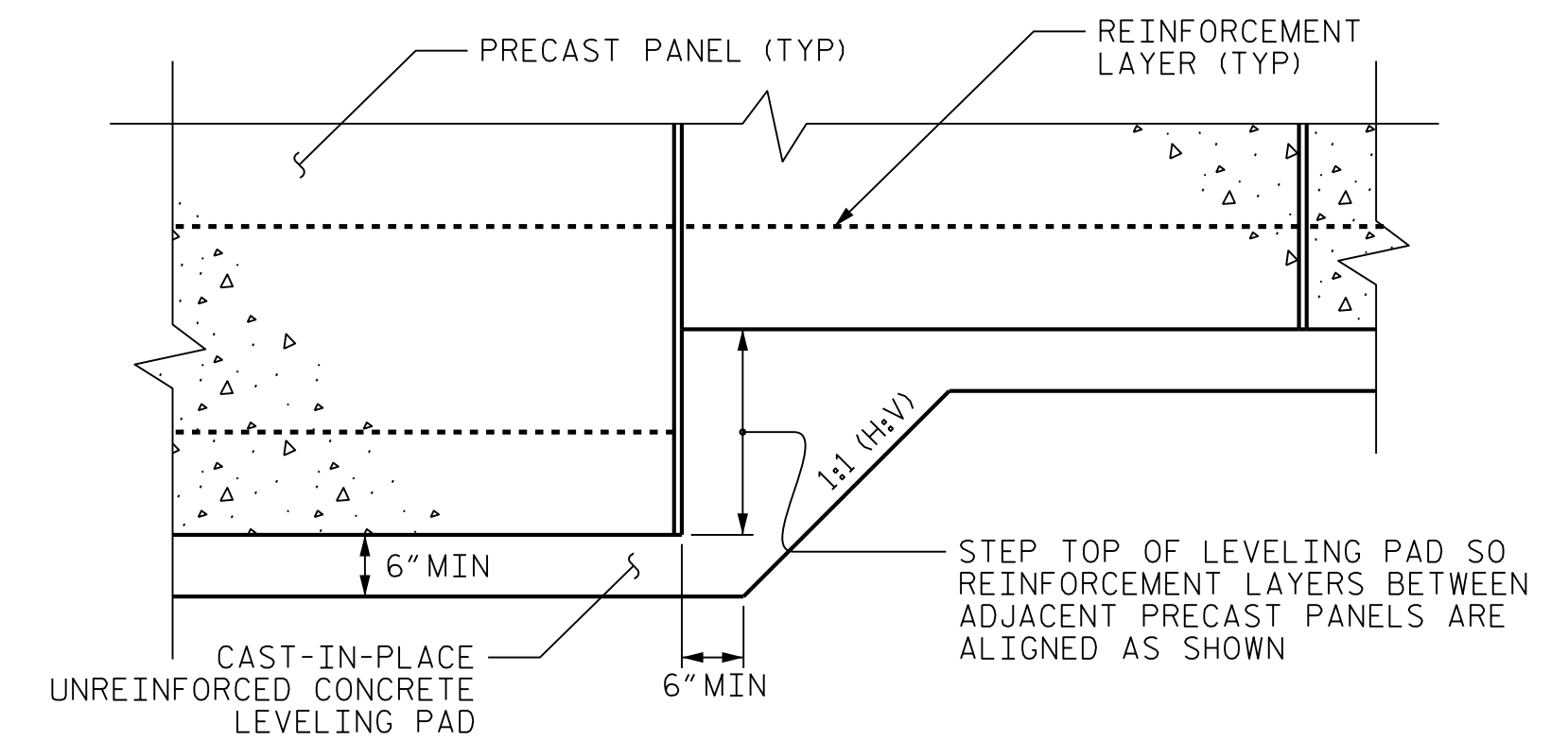
EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS.1 AND 2.

FOUNDATIONS FOR END BENT NOS.1 AND 2 WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS.1 AND 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

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

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NOS.1 AND 2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

SEE STRUCTURE INVENTORY FOR SUBSURFACE INFORMATION.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.: 38518.1.1 (B-4746)
 FORSYTH COUNTY
 STATION: 18+03.65 -L-
 SHEET 5 OF 5

**NORTH CAROLINA
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**GEOTECHNICAL
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