

GEOTECHNICAL ENGINEER

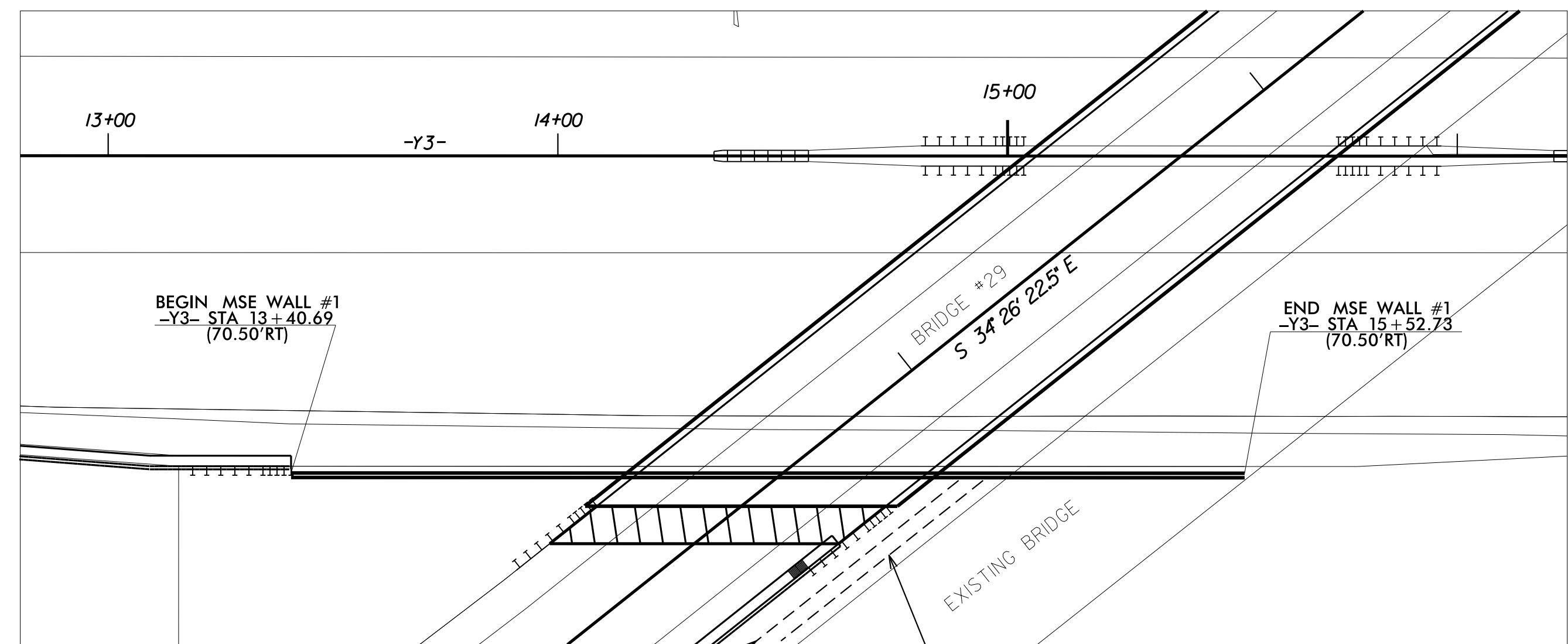
ENGINEER

SEAL 028893

DocuSigned by: *M. H. Stephens* 09/15/2022

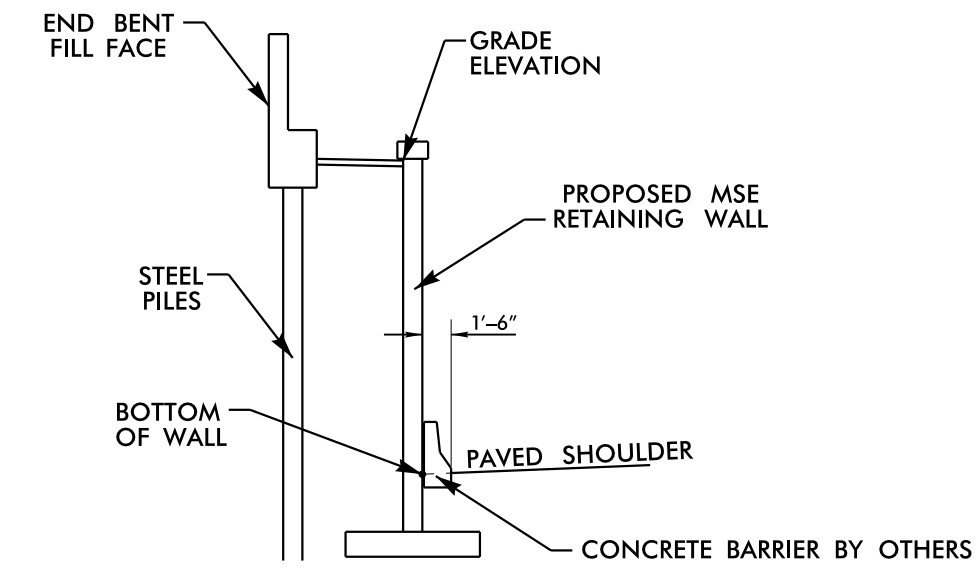
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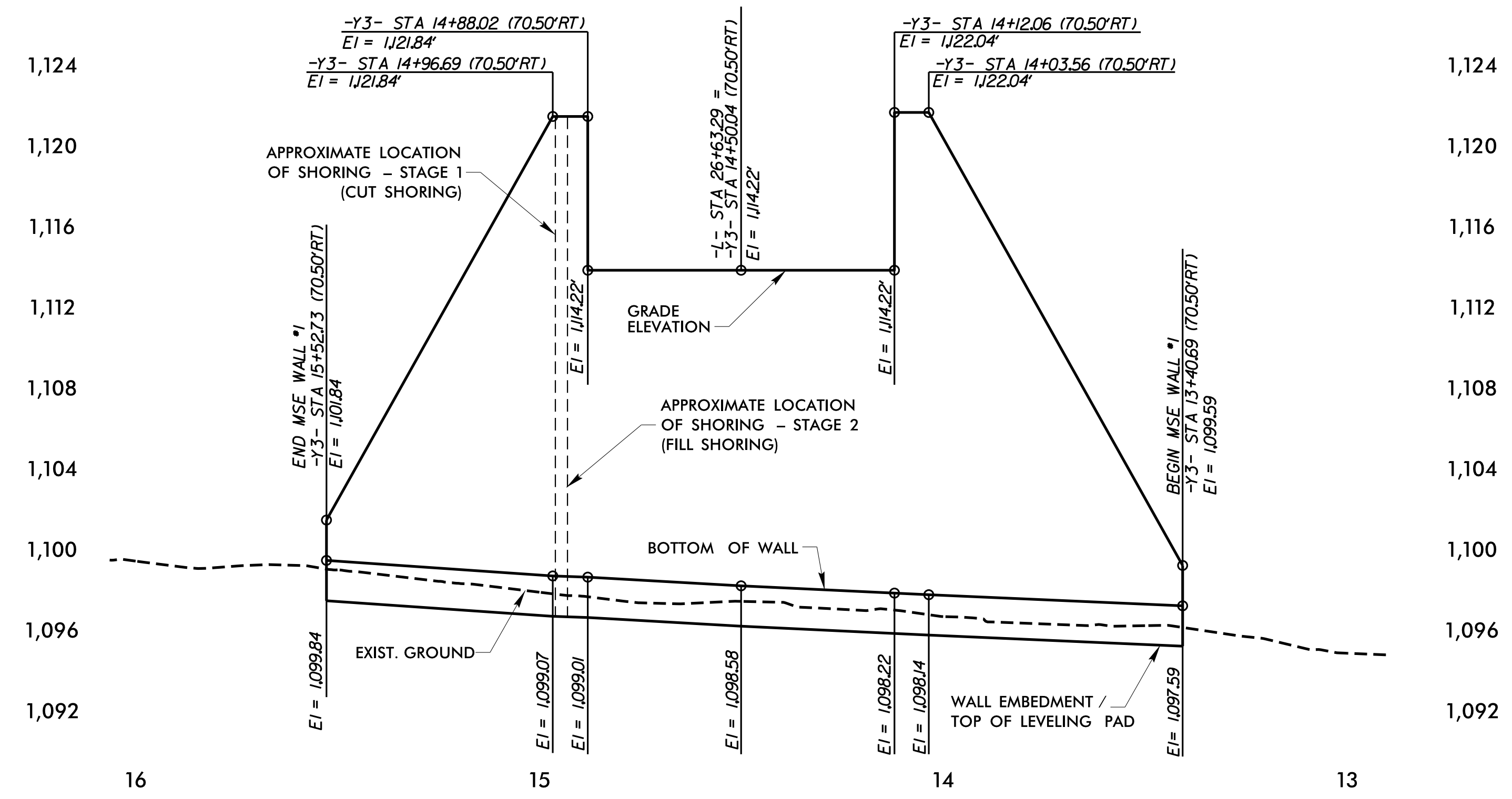


APPROXIMATE LOCATION OF STAGE 2 SHORING. LINE SHOWN IS FOR INFORMATION PURPOSES ONLY, SEE TRAFFIC CONTROL PLANS FOR LOCATIONS. (FILL SHORING)

APPROXIMATE LOCATION OF STAGE 1 SHORING. LINE SHOWN IS FOR INFORMATION PURPOSES ONLY, SEE TRAFFIC CONTROL PLANS FOR LOCATIONS. (CUT SHORING)



RETAINING WALL TYPICAL SECTION (N.T.S.)



WALL ENVELOPE (LOOKING AT FACE OF WALL)

| ESTIMATED MSE WALL QUANTITY (SQUARE FEET) |          |
|---|----------|
| MSE RETAINING WALL NO. 1                  | 3,520 SF |

PROJECT NO.: 45786.1.2 (B-5833)

YADKIN COUNTY

STATION: -Y3- STA 14+50.04

SHEET 1 OF 5 WALL RW-1

PREPARED BY: MHS DATE: 9/14/22

REVIEWED BY: SCC DATE: 9/14/22

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

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

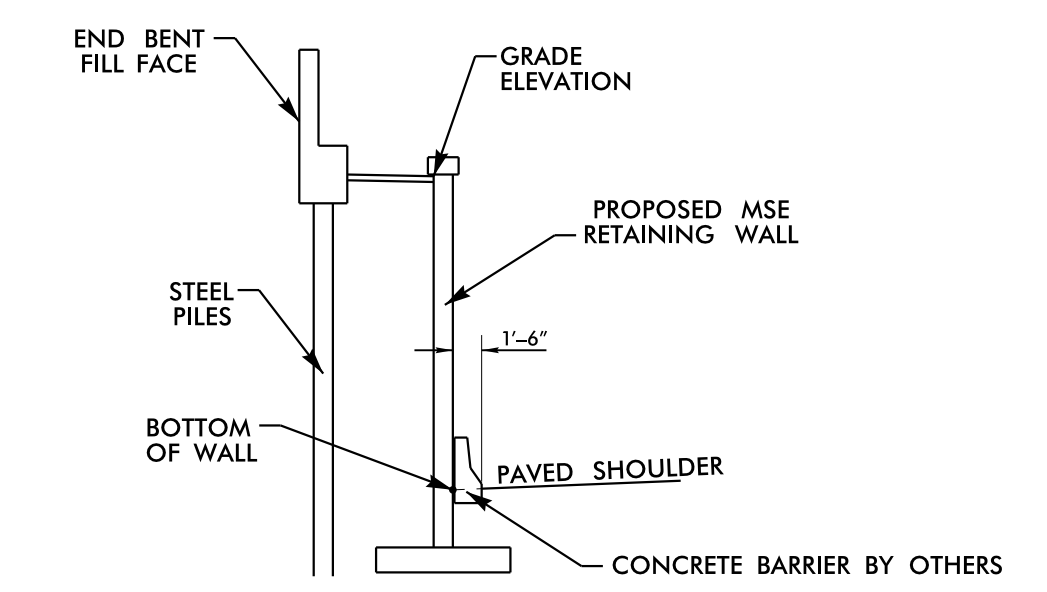
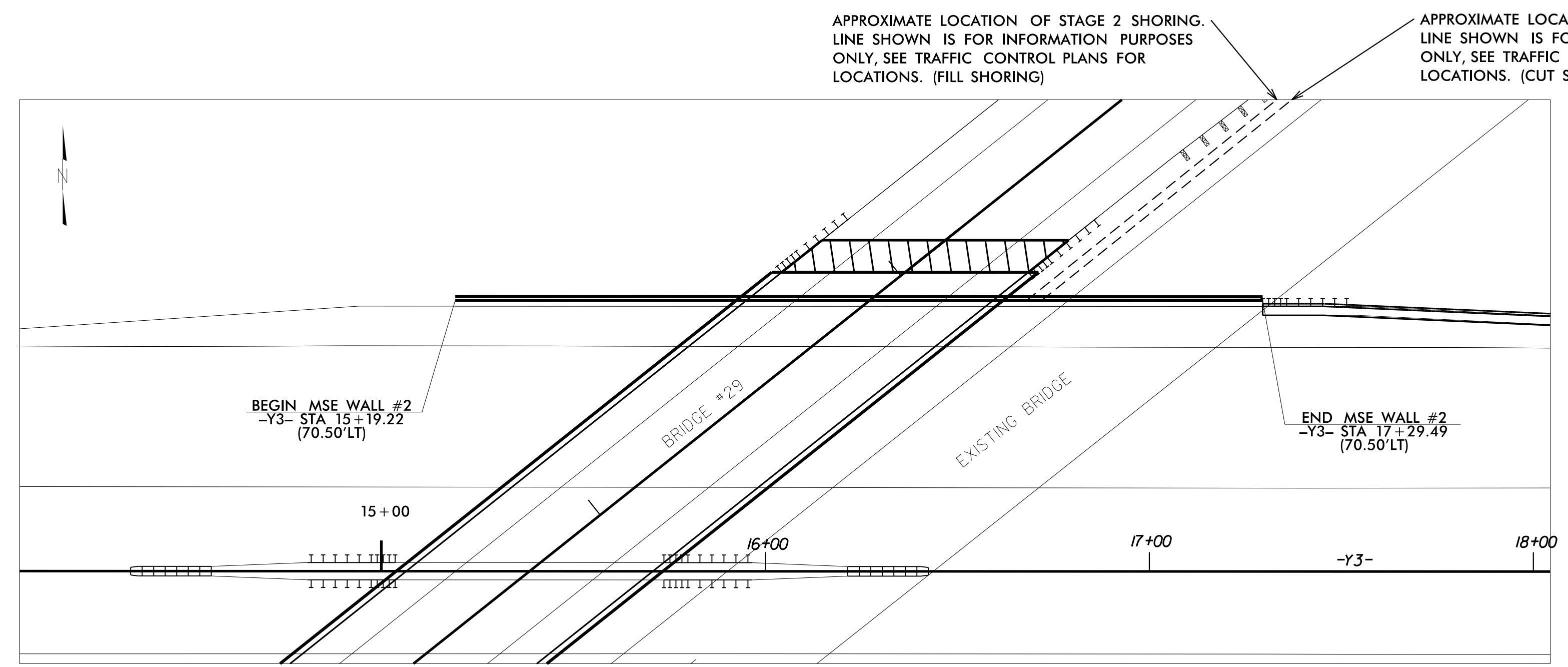
GEOTECHNICAL ENGINEER

ENGINEER

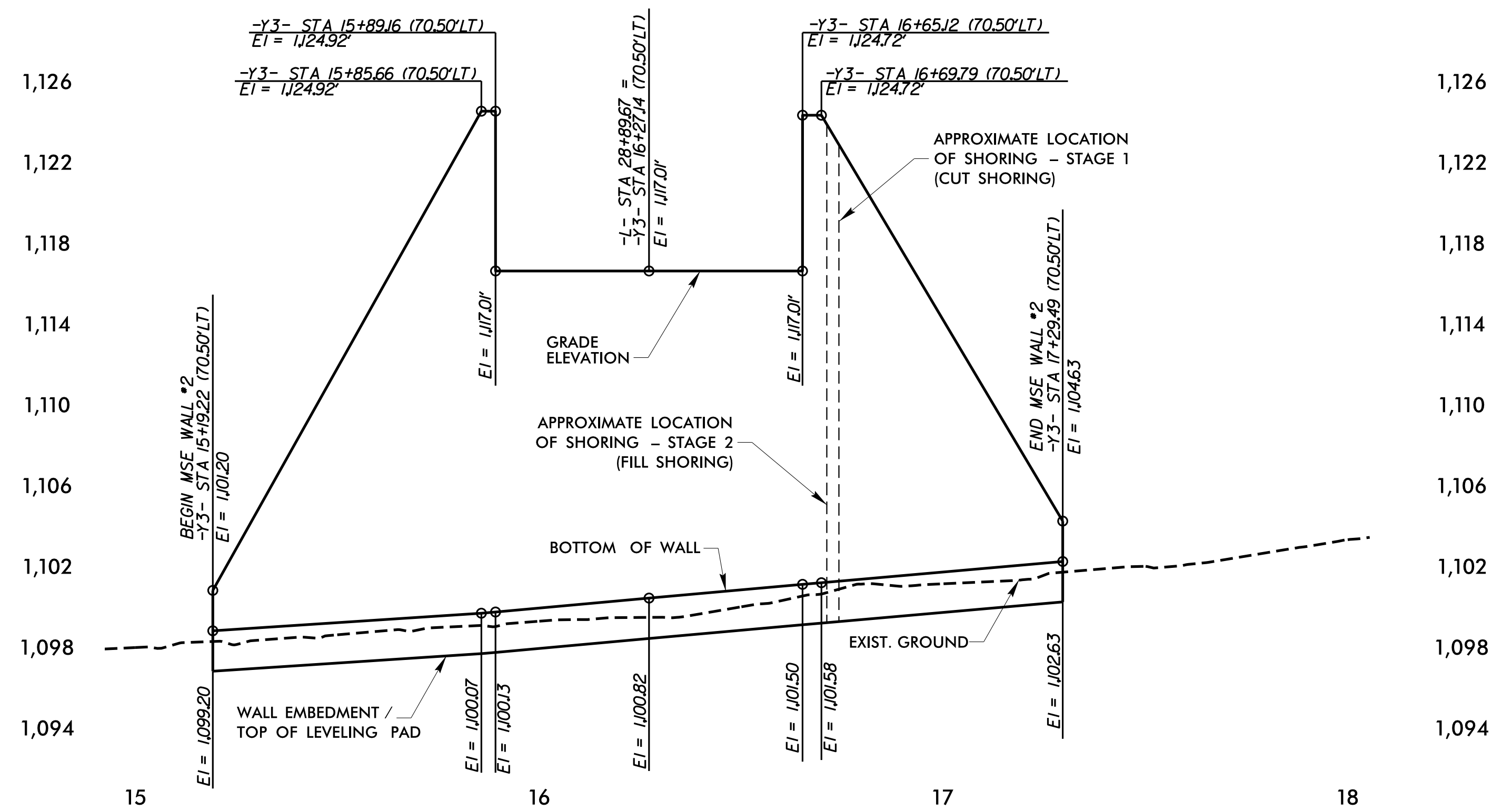
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DocuSigned by: *Michael H. Stephens* 09/15/2022

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RETAINING WALL TYPICAL SECTION (N.T.S.)



WALL ENVELOPE (LOOKING AT FACE OF WALL)

| ESTIMATED MSE WALL QUANTITY (SQUARE FEET) |          |
|---|----------|
| MSE RETAINING WALL NO. 2                  | 3,490 SF |

PROJECT NO.: 45786.1.2 (B-5833)

YADKIN COUNTY

STATION: -Y3- STA 16+27.14

SHEET 2 OF 5 WALL RW-2

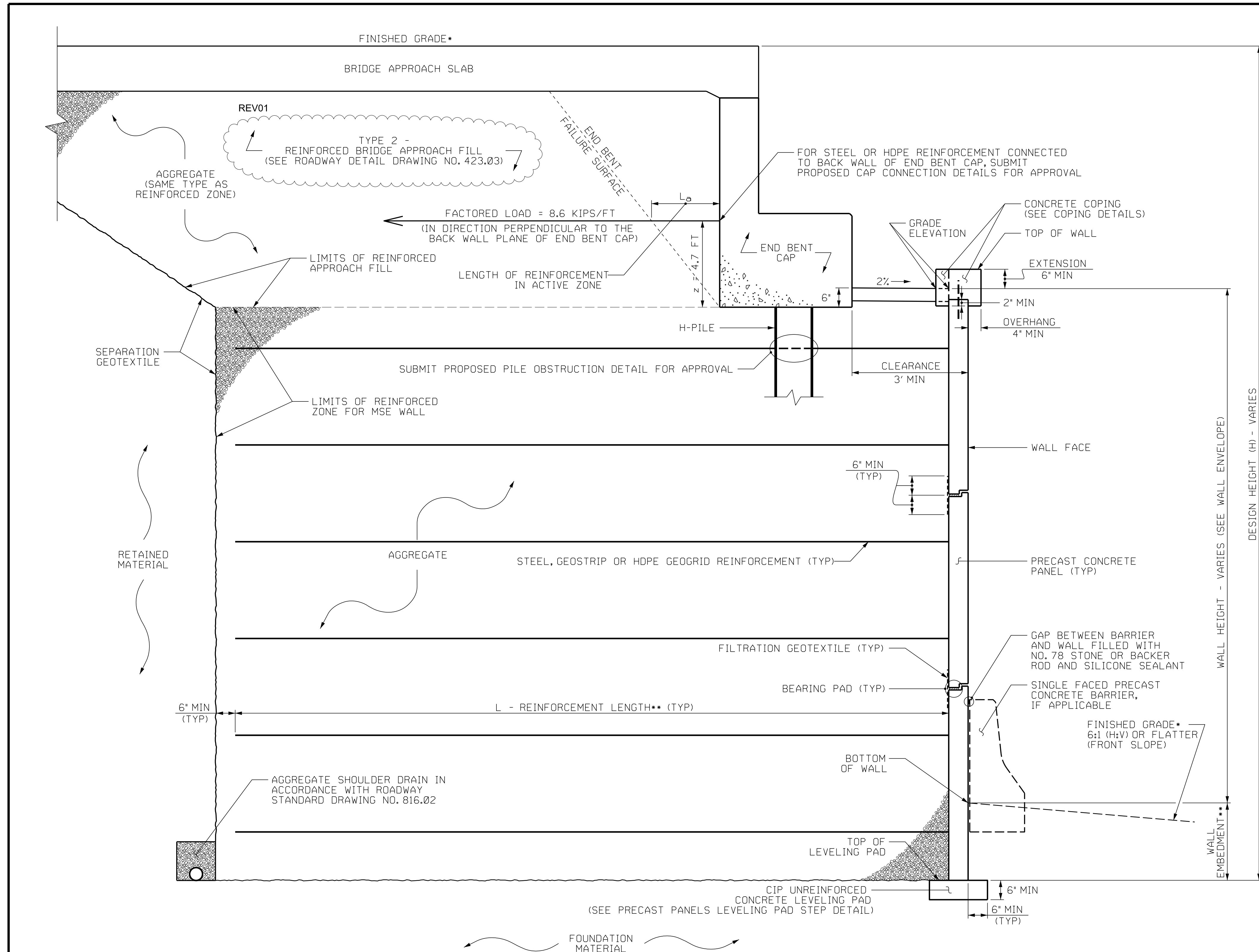
PREPARED BY: MHS DATE: 9/14/22

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

| REVISIONS |    |      |     |    |      | SHEET NO. |
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| 2         |    |      | 4   |    |      |           |



**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 WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

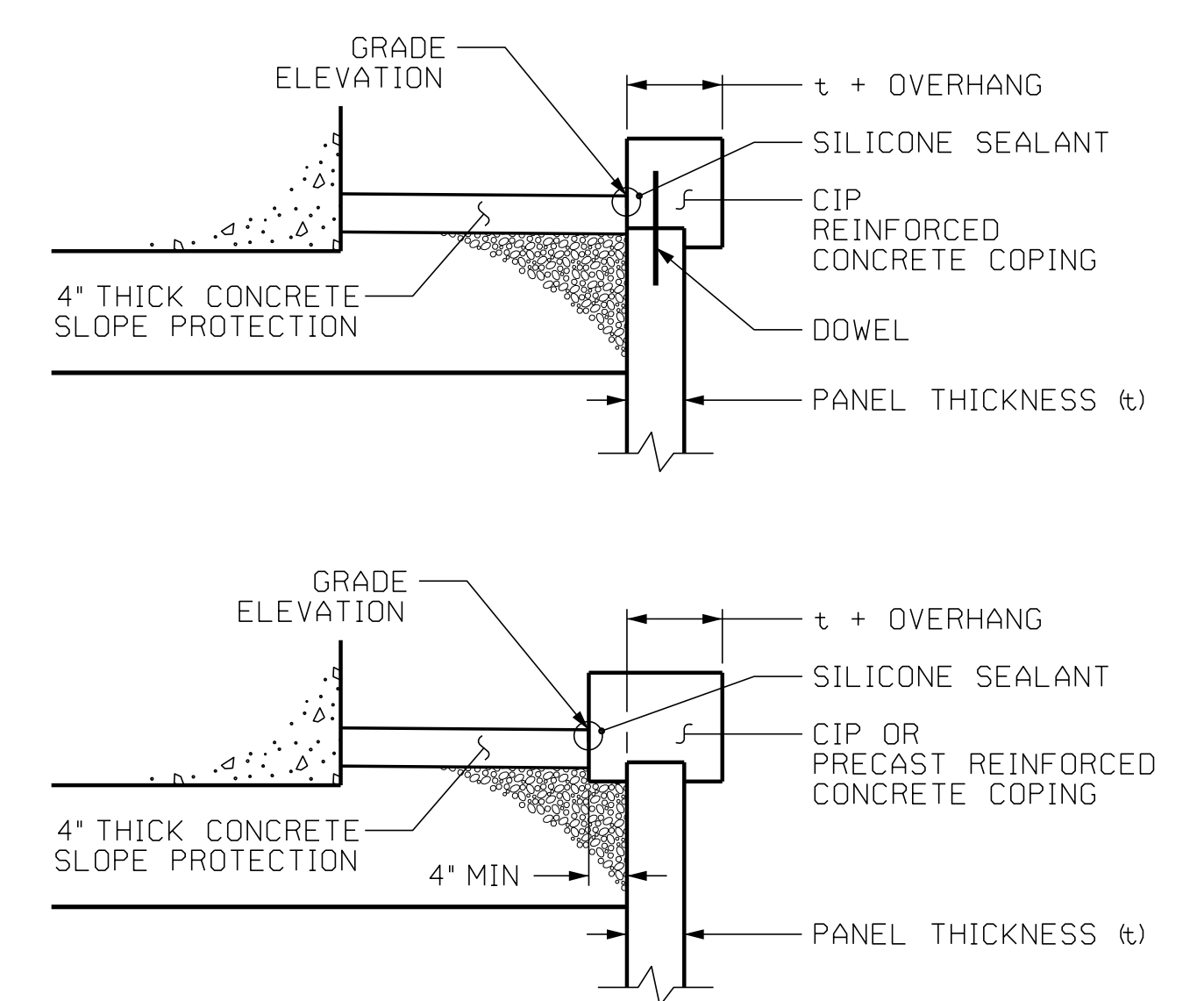
GEOTECHNICAL ENGINEER

ENGINEER

**PROFESSIONAL SEAL**  
 NORTH CAROLINA  
 028893  
 MICHAEL H. STEPHENS

Signed by: *Michael H. Stephens* 02/26/2026  
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**COPING DETAILS**

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

PROJECT NO.: 45786.1.2 (B-5833)  
 YADKIN COUNTY  
 STATION: RW-1 AND RW-2  
 SHEET 3 OF 5

NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS

**GEOTECHNICAL ENGINEERING UNIT**

MSE ABUTMENT WALL WITH PANELS AND H-PILES TYPICAL SECTION AND COPING DETAILS

| REVISIONS |     |      |     |    |      |
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| NO.       | BY  | DATE | NO. | BY | DATE |
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SHEET NO. W-3

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| PREPARED BY: MHS | DATE: 9/14/22 |
| REVIEWED BY: SCC | DATE: 9/14/22 |

GEOTECHNICAL ENGINEER

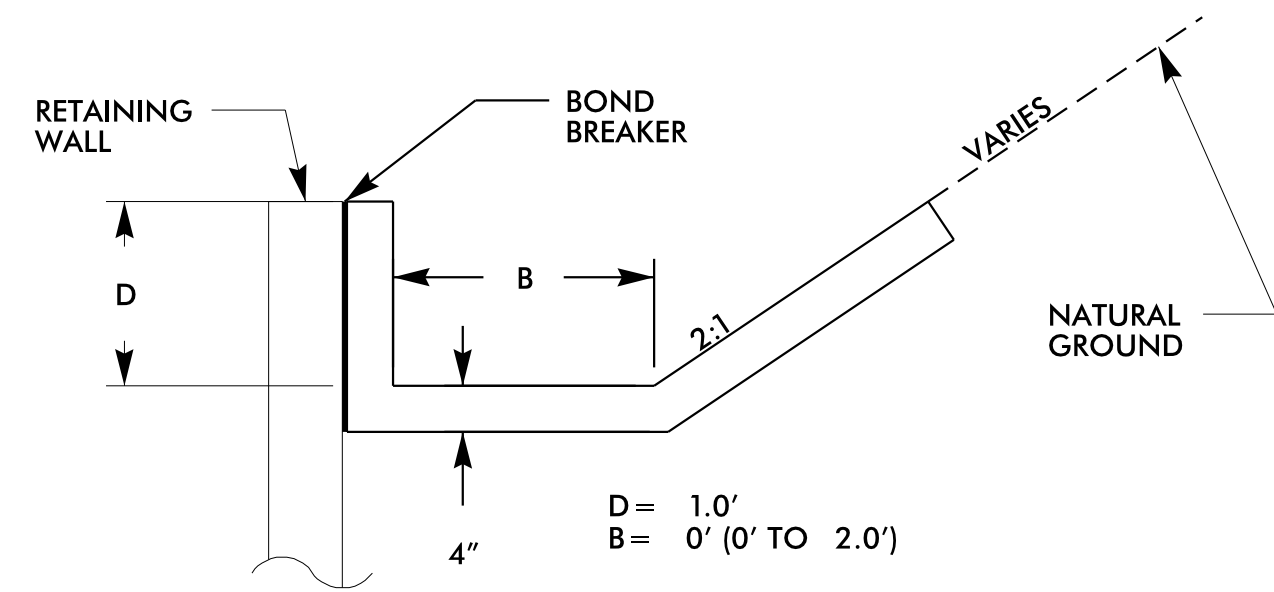
ENGINEER

SEAL 028893

DocuSigned by: *Michael H. Stephens* 09/15/2022

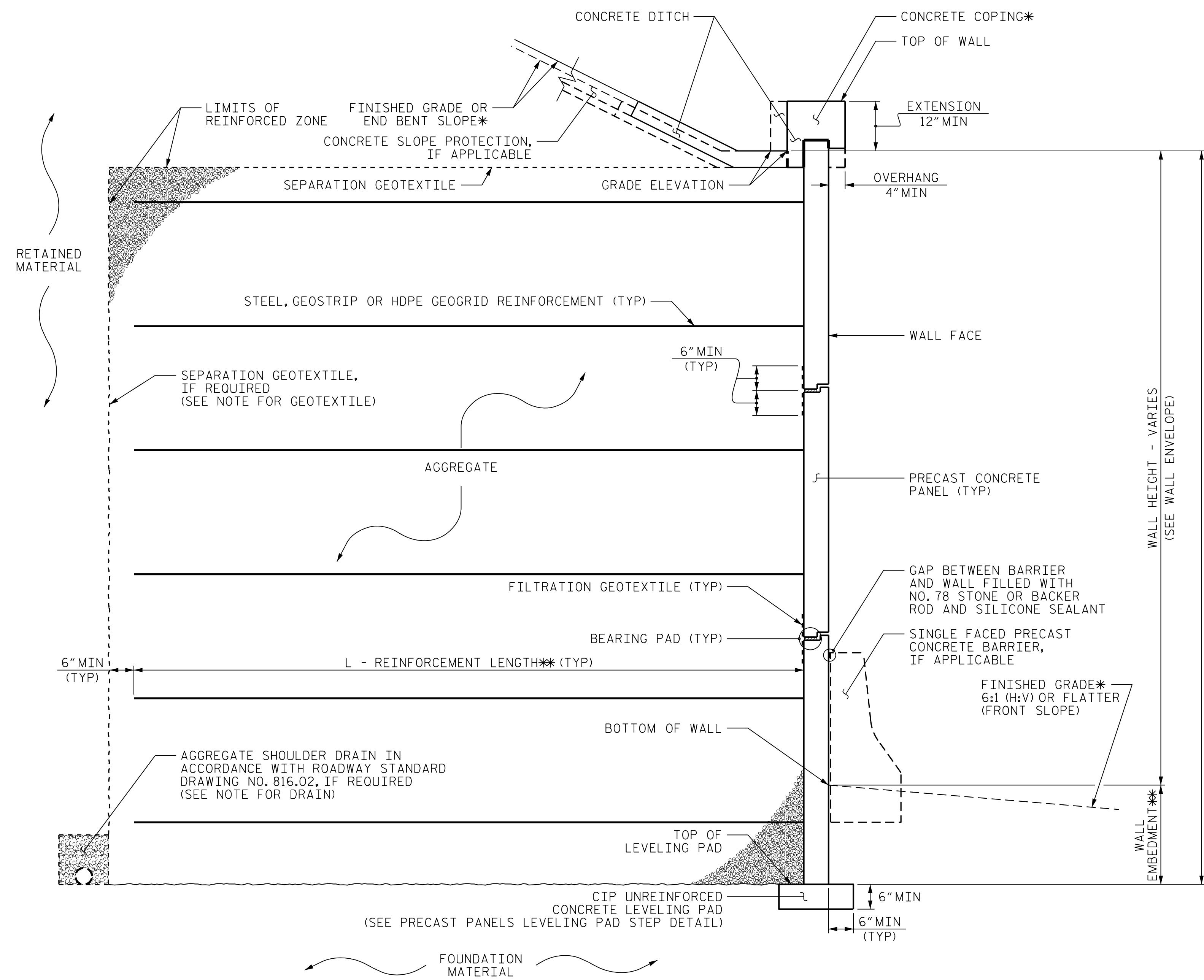
DATE: 09/15/2022

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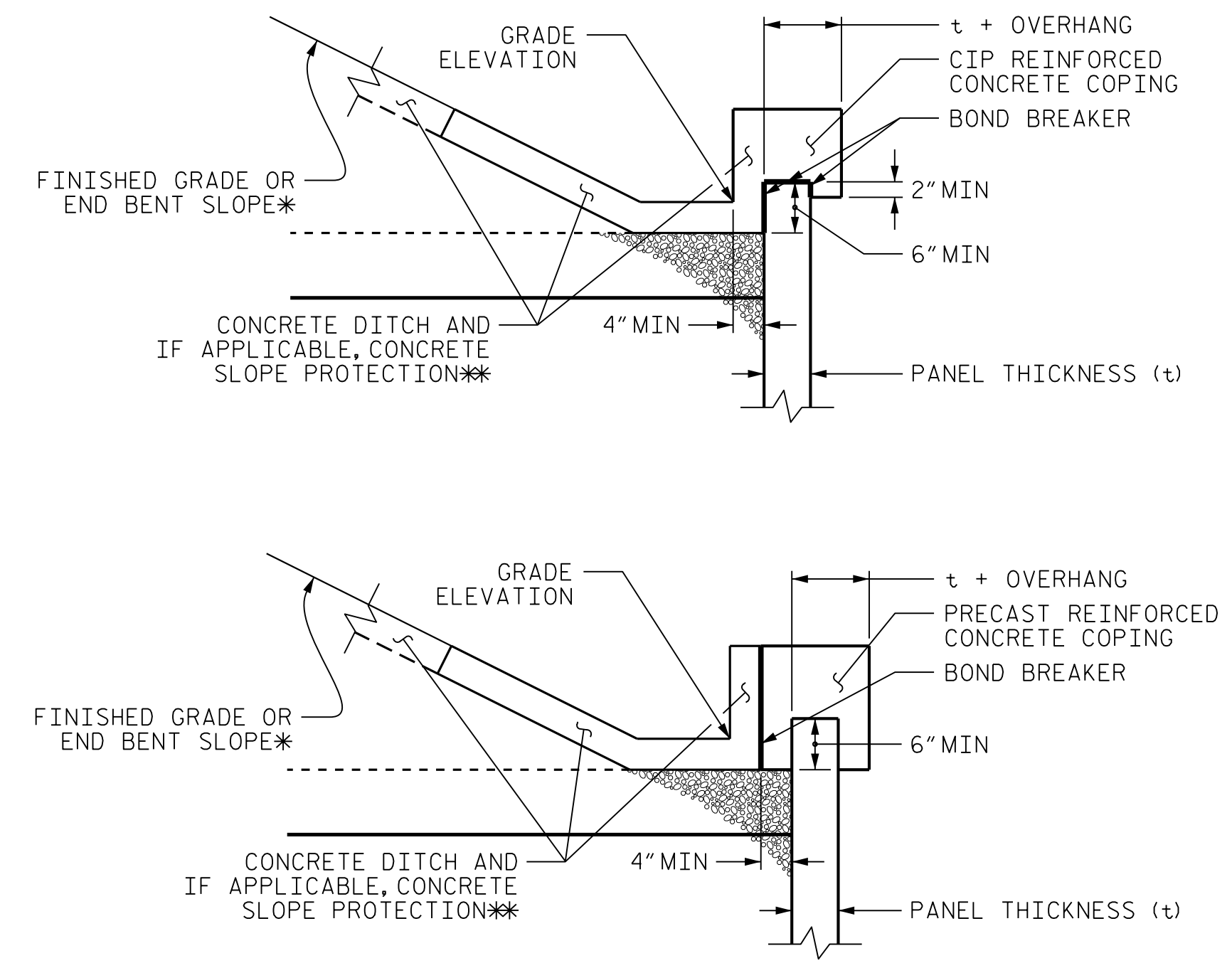
**DETAIL 9**  
**CONCRETE DITCH BEHIND RETAINING WALL**  
 (Not to Scale)

-Y3- STA. 13+41 TO STA. 14+12 RT  
 -Y3- STA. 14+88 TO STA. 15+53 RT  
 -Y3- STA. 15+19 TO STA. 15+89 LT  
 -Y3- STA. 16+65 TO STA. 17+29 LT



**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.

PROJECT NO.: 45786.1.2 (B-5833)  
 YADKIN COUNTY  
 STATION: \_\_\_\_\_  
 SHEET 4 OF 5 RW-1 AND RW-2

NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS

GEOTECHNICAL  
 ENGINEERING UNIT

**MSE WALL WITH PANELS AND BACK SLOPE TYPICAL SECTION AND COPING DETAILS**

| REVISIONS |    |      |     |    |      |
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| 1         |    |      | 3   |    |      |
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SHEET NO. W-4

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| PREPARED BY: MHS | DATE: 9/14/22 |
| REVIEWED BY: SCC | DATE: 9/14/22 |

GEOTECHNICAL ENGINEER

ENGINEER

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DocuSigned by: *M. Stephens* 09/15/2022

SIGNATURE DATE SIGNATURE DATE

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**NOTES:**

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

FOR TYPE III REINFORCED BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY DETAIL DRAWING NO. 422D10.

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

MSE WALL PANELS WILL BE RECTANGULAR OR SQUARE AND CONSTRUCTED WITH ALL VERTICAL JOINTS ALIGNED.

MSE WALL VERTICAL SLIP JOINTS WILL BE REQUIRED AT THE STAGING LOCATIONS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF 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.

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) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
  - 2) DESIGN LIFE = 100 YEARS
  - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 4,400 PSF
  - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8H OR 6 FT, WHICHEVER IS LONGER
  - 5) MINIMUM EMBEDMENT DEPTH = 2 FT
  - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

| AGGREGATE TYPE* | UNIT WEIGHT<br>( $\gamma$ )<br>PCF | FRICTION ANGLE<br>( $\phi$ )<br>DEGREES | COHESION<br>(c)<br>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<br>( $\gamma$ )<br>PCF | FRICTION ANGLE<br>( $\phi$ )<br>DEGREES | COHESION<br>(c)<br>PSF |
|---------------|------------------------------------|---|------------------------|
| RETAINED      | 115                                | 29                                      | 0                      |
| FOUNDATION    | 120                                | 30                                      | 0                      |

THE WALL SITE FOR RETAINING WALL NOS. 1 AND 2 LOCATED AT END BENT NOS. 1 AND 2 IS CLASSIFIED AS AASHTO SITE CLASS D.

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

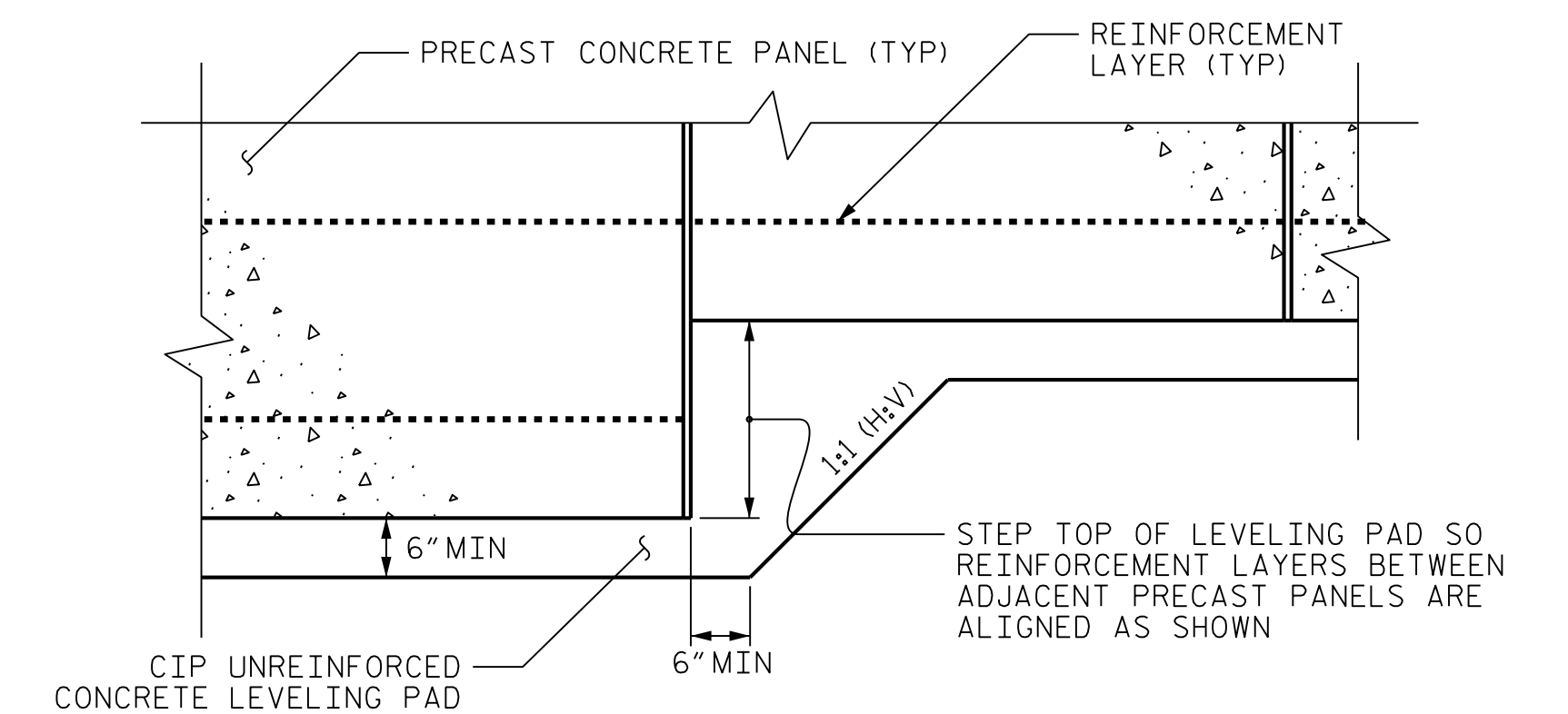
DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE ( $L_a$ ) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACK WALL FOR END BENT NOS. 1 AND 2 LOCATED AT STATIONS STA 26+51.48 -L- AND STA 29+01.48 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR 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.

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

"TEMPORARY SHORING" IS REQUIRED FOR RETAINING WALL NOS. 1 AND 2 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE STRUCTURE, ROADWAY, AND TRAFFIC CONTROL PLANS.

TEMPORARY SHORING SHOWN ARE FOR INFORMATION PURPOSES ONLY. SHORING IS REQUIRED FOR THE MAINTENSE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS FOR LOCATION AND QUANTITIES.



**PRECAST PANELS  
LEVELING PAD STEP DETAIL**

PROJECT NO.: 45786.1.2 (B-5833)

YADKIN COUNTY

STATION: \_\_\_\_\_

SHEET 5 OF 5 RW-1 AND RW-2

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

**GEOTECHNICAL  
ENGINEERING UNIT**

**MSE WALL NOTES  
AND PRECAST PANELS  
LEVELING PAD STEP DETAIL**

| REVISIONS |    |      |     |    |      | SHEET NO.<br>W-5 |
|-----------|----|------|-----|----|------|------------------|
| NO.       | BY | DATE | NO. | BY | DATE |                  |
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