
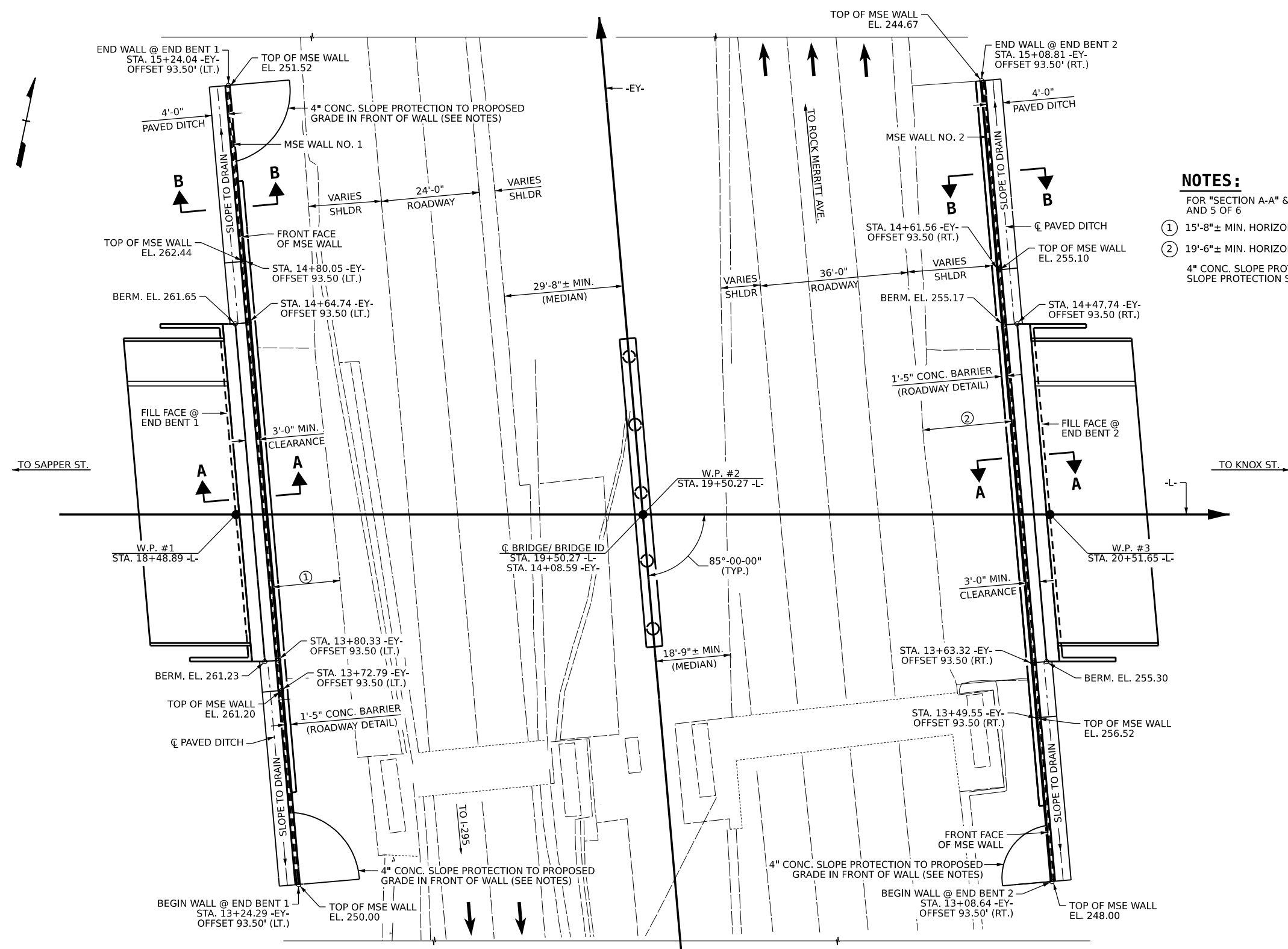


GEOTECHNICAL ENGINEER   DocuSigned by: Michael J Simpson 3/16/2026	ENGINEER   _____ DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



- NOTES:**
- FOR "SECTION A-A" & "SECTION B-B", SEE SHEET 4 AND 5 OF 6
- ① 15'-8"± MIN. HORIZONTAL CL. FROM E.O.P TO MSE WALL.
  - ② 19'-6"± MIN. HORIZONTAL CL. FROM E.O.P TO MSE WALL.
- 4" CONC. SLOPE PROTECTION IS INCIDENTAL TO THE 4" INCH SLOPE PROTECTION STRUCTURES PAY ITEM.

**PLAN**

PROJECT NO.: 49218.26  
 CUMBERLAND COUNTY  
 STATION: 19+50.27 -L-  
 SHEET 1 OF 6

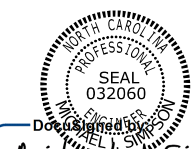
PREPARED BY: E. BENSON      DATE: 01/26  
 REVIEWED BY: M. SIMPSON      DATE: 01/26

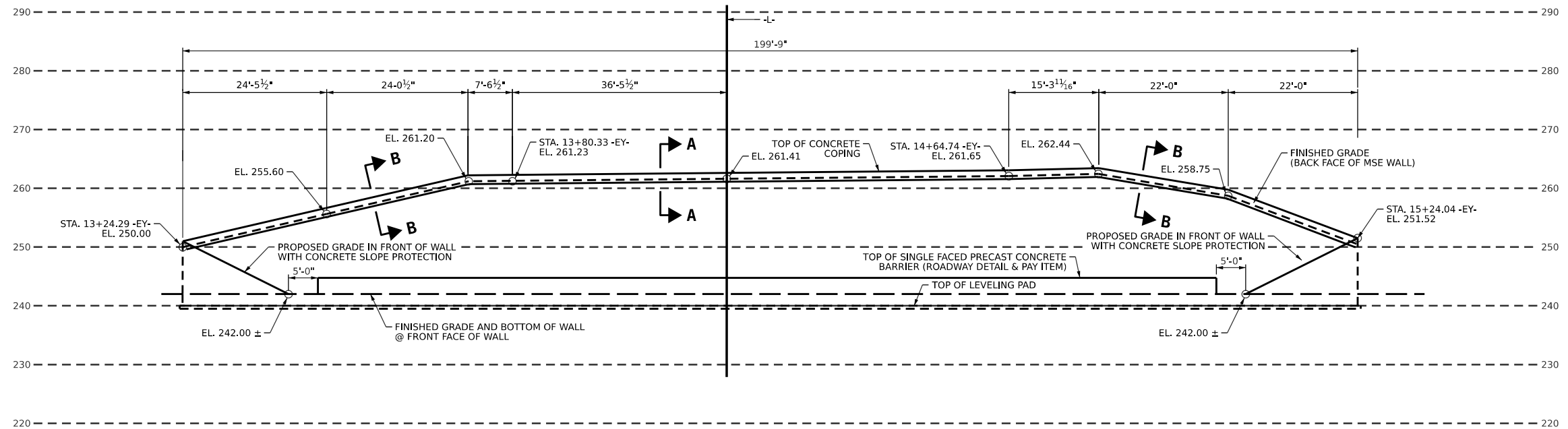


NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GEOTECHNICAL  
 ENGINEERING UNIT

MSE WALL NO. 1 AT END BENT NO. 1 & MSE WALL NO. 2 AT END BENT NO. 2					
PLAN VIEW					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-1

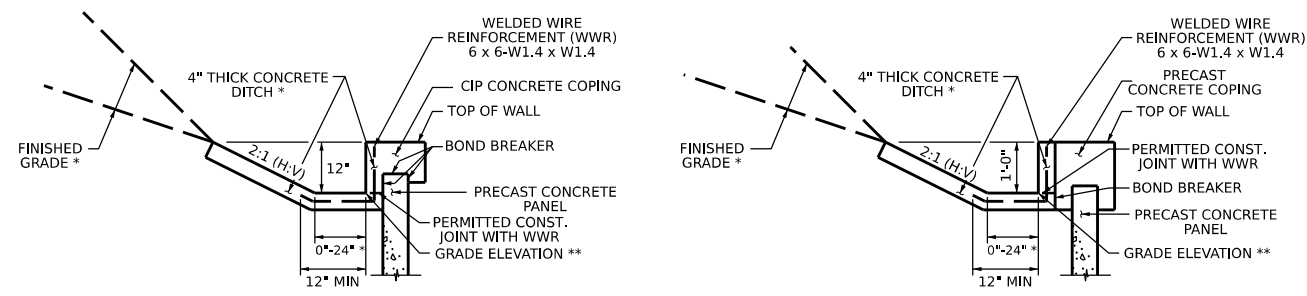
GEOTECHNICAL ENGINEER  Do Not Sign Here Michael A. Simpson 691547DDAF244E1... DATE SIGNATURE DATE	ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**LOOKING DOWNSTATION (-L-) @ FRONT FACE OF MSE WALL @ END BENT 1**

**NOTES:**

- FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.
- FOR ADDITIONAL MSE WALL AND COPING DETAILS, SEE SHEETS 4 AND 5 OF 6.
- FOR LOCATION OF CONST JOINTS & OTHER NOTES, SEE "MSE WALL NOTES", SHEET 6 OF 6.
- FOR QUANTITIES SEE SHEET 3 OF 6.



**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.: 49218.26  
 CUMBERLAND COUNTY  
 STATION: 19+50.27 -L-  
 SHEET 2 OF 6


PREPARED BY: E. BENSON	DATE: 01/26
REVIEWED BY: M. SIMPSON	DATE: 01/26

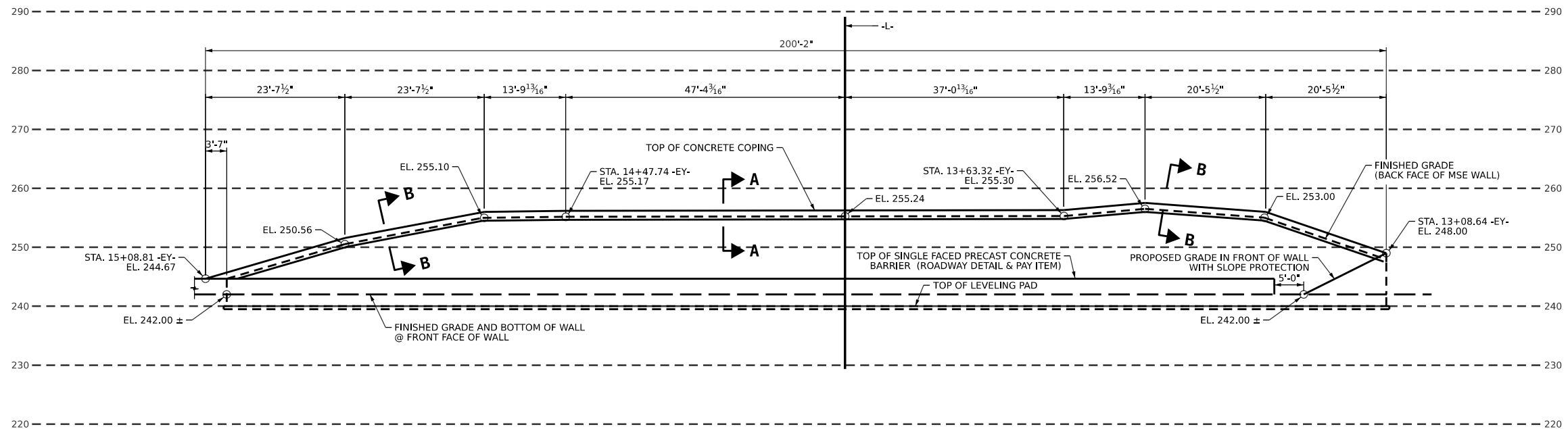


NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GEOTECHNICAL  
 ENGINEERING UNIT

FRONT FACE OF MSE WALL NO. 1 AT END BENT NO. 1 WALL ENVELOPE					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO.  
W-2

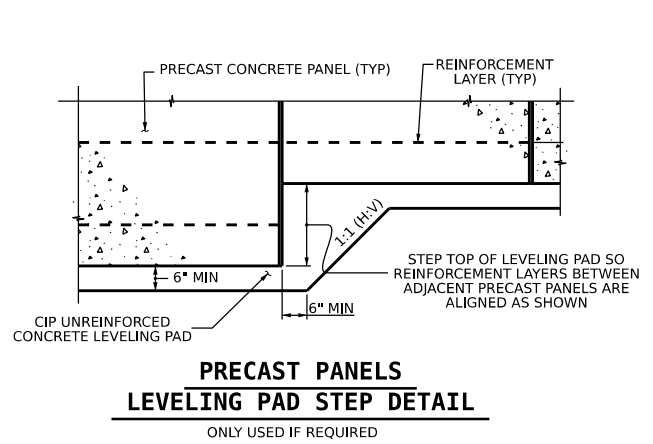
GEOTECHNICAL ENGINEER  Doc designed by: <i>Michael J Simpson</i> DATE: 3/16/2026	ENGINEER SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**LOOKING UPSTATION (-L-) @ FRONT FACE OF MSE WALL @ END BENT 2**

ESTIMATED MSE WALL QUANTITIES (SQ. FEET)*	
WALL NO. 1	3,890
WALL NO. 2	2,695

\*QUANTITY INCLUDES EMBEDMENT AND EXTENSION

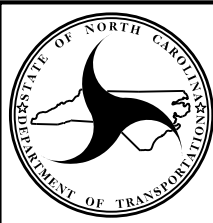


PROJECT NO.: 49218.26  
 CUMBERLAND COUNTY  
 STATION: 19+50.27 -L-  
 SHEET 3 OF 6

PREPARED BY: E. BENSON DATE: 01/26  
 REVIEWED BY: M. SIMPSON DATE: 01/26

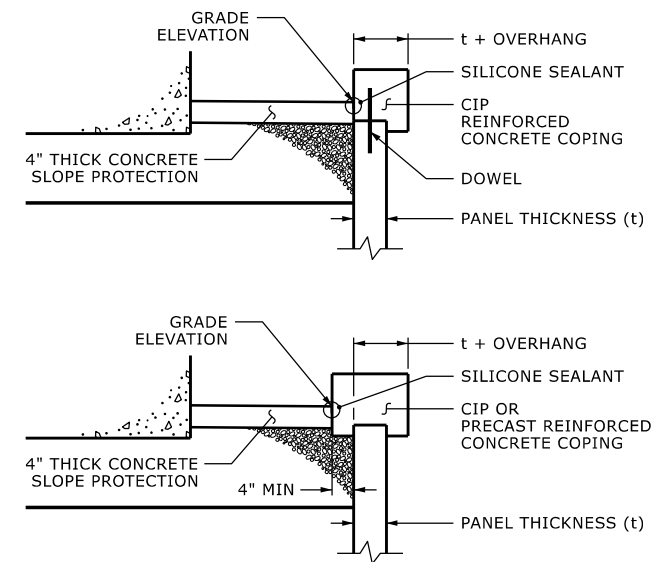
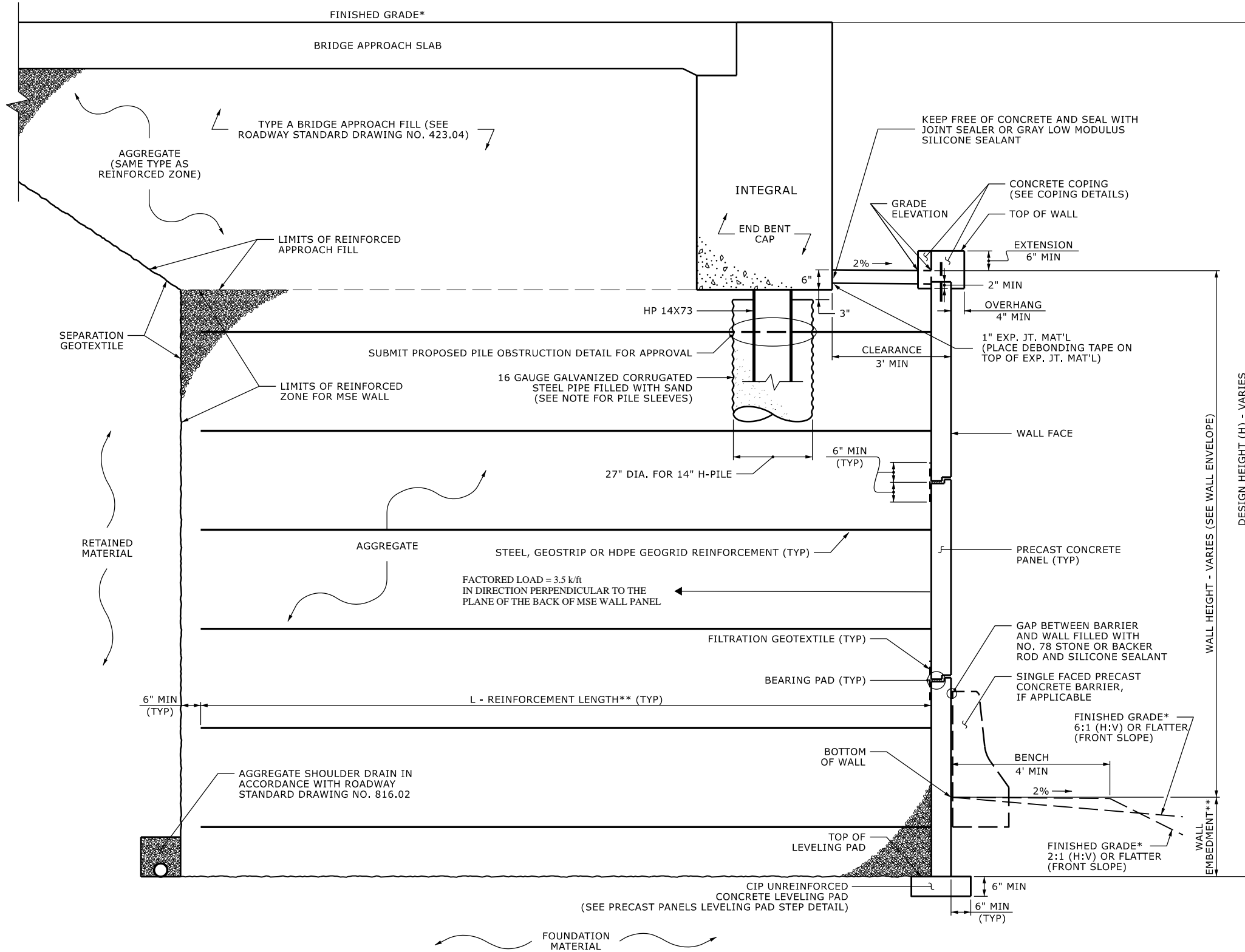


NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GEOTECHNICAL  
 ENGINEERING UNIT



FRONT FACE OF MSE WALL NO. 2 AT END BENT NO. 2 WALL ENVELOPE					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-3



**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 (A-A)**

\*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.

PROJECT NO.: 49218.26  
 CUMBERLAND COUNTY  
 STATION: 19+50.27 -L-  
 SHEET 4 OF 6

GEOTECHNICAL ENGINEER  Michael J. Simpson 3/16/2026	ENGINEER _____ SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

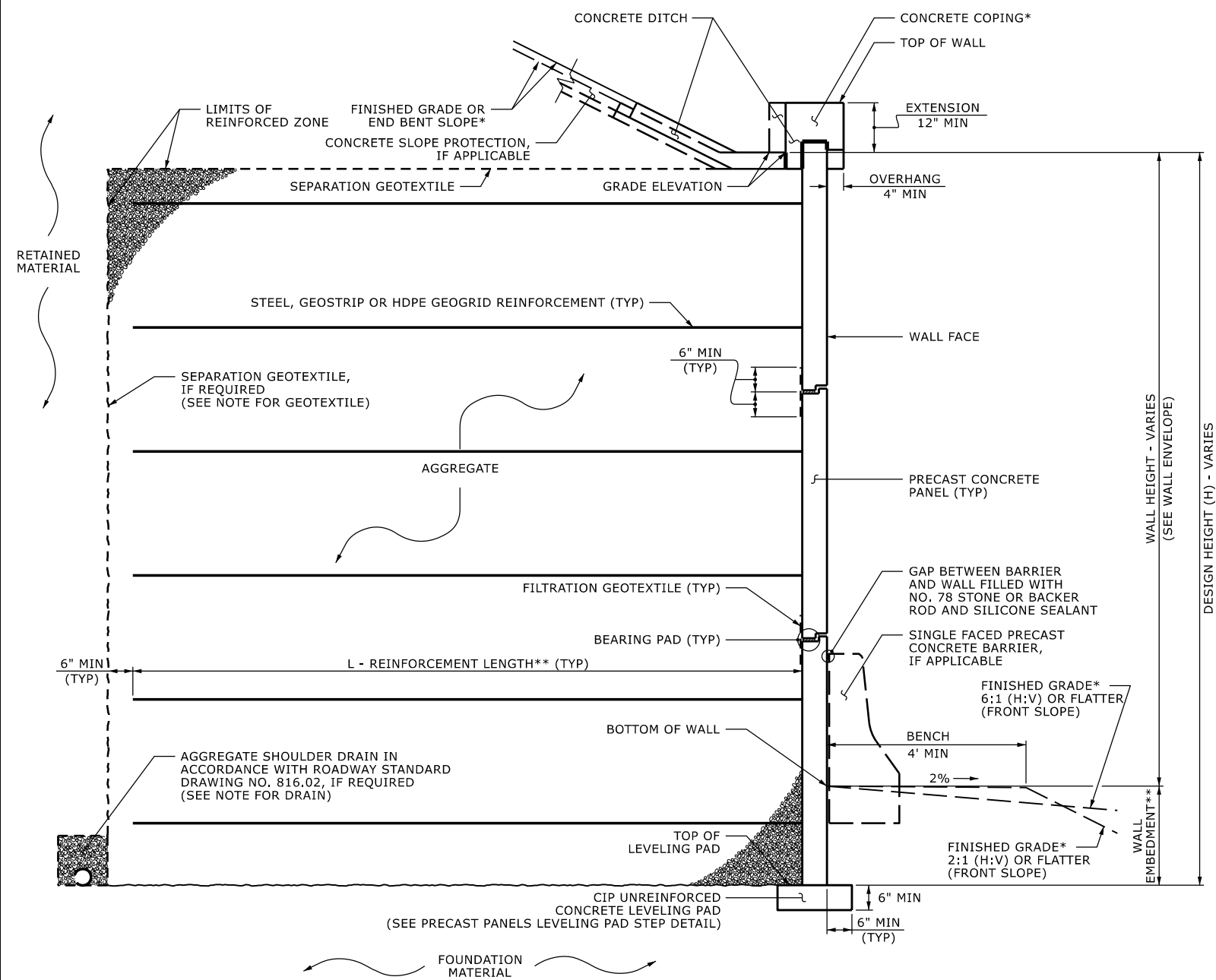
PREPARED BY: E. BENSON	DATE: 01/26
REVIEWED BY: M. SIMPSON	DATE: 01/26



NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 GEOTECHNICAL  
 ENGINEERING UNIT

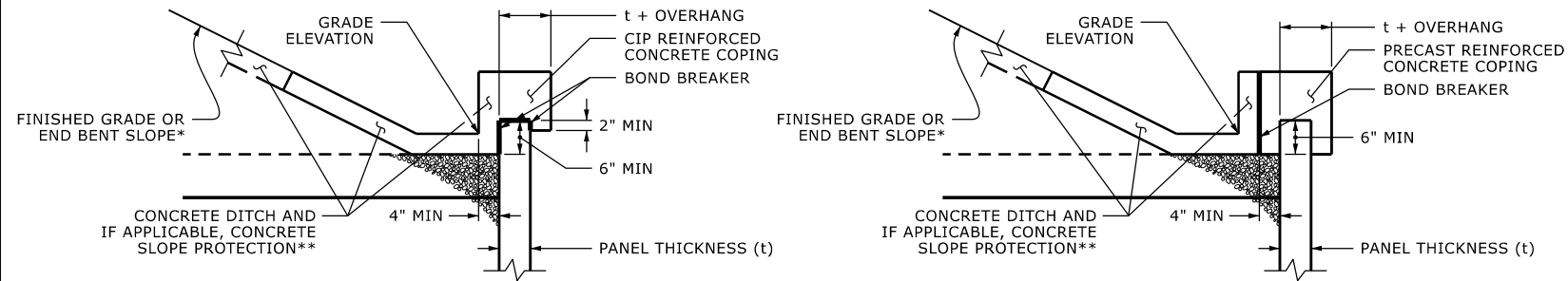
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-4



**MSE WALL WITH PRECAST PANELS - TYPICAL SECTION (B-B)**

\*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.

GEOTECHNICAL ENGINEER  Michael J. Simpson DATE: 3/16/2026	ENGINEER _____ SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	


PROJECT NO.: 49218.26  
 CUMBERLAND COUNTY  
 STATION: 19+50.27 -L-  
 SHEET 5 OF 6

PREPARED BY: E. BENSON DATE: 01/26  
 REVIEWED BY: M. SIMPSON DATE: 01/26



NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 GEOTECHNICAL  
 ENGINEERING UNIT

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

GEOTECHNICAL ENGINEER  Documented by: <u>Michael J. Simpson</u> 3/16/2026 _____ SIGNATURE DATE	ENGINEER _____ SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

**MSE WALL NOTES:**

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.  
 FOR TYPE 2A BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY STANDARD DRAWING NO. 423.04  
 FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.  
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS AT WALL NO. 1 AND WALL NO. 2  
 A DRAIN IS REQUIRED FOR RETAINING WALLS AT WALL NO. 1 AND WALL NO. 2.  
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR WALL NO. 1 AND WALL NO. 2 LOCATED AT STATIONS 18+48.89 AND 20+51.65 -L-, RESPECTIVELY.  
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 AND WALL NO. 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 WALLS AT WALL NO. 1 AND WALL NO. 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 SHALL BE AS SHOWN BELOW. MINIMUM REINFORCEMENT LENGTH (L) SHALL BE AS SHOWN BELOW OR 6 FT, WHICHEVER IS LONGER.

WALL NO.	WALL STATION -EY-	REINFORCEMENT LENGTH RATIO	MAXIMUM FACTORED PRESSURE ON FOUNDATION MATERIAL (KSF)
1	13+24.29 TO 15+24.04	0.75H	6.1
2	13+08.64 TO 15+08.81	0.7H	4.9

4) MINIMUM EMBEDMENT DEPTH = H/10 OR 2 FT BELOW PROPOSED GRADE, WHICHEVER IS GREATER.

5) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
COARSE	110	38	0

\*SEE MSE RETAINING WALLS PROVISION FOR COARSE AGGREGATE MATERIAL REQUIREMENTS.

6) IN-SITU ASSUMED MATERIAL PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION AT MSE WALL NO. 1	110	31	0
FOUNDATION AT MSE WALL NO. 2	110	30	0

**MSE WALL NOTES CONTINUED:**

DESIGN RETAINING WALLS AT WALL NO. 1 AND WALL NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.  
 FOUNDATIONS FOR SIGNS OR LIGHTING MAY BE LOCATED BEHIND RETAINING WALL NO. 1 AND WALL NO. 2, AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.  
 EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND WALL NO. 2. THE CONTRACTOR SHALL INSTALL DRAINAGE BOXES, PIPES, AND OTHER PLANNED OBSTRUCTIONS LOCATED WITHIN THE REINFORCED ZONE ONCE THE REINFORCED ZONE REACHES THE PLANNED ELEVATION FOR THE OBSTRUCTION.  
 FOUNDATIONS FOR END BENT NO. 1 AND NO. 2 LOCATED AT STATIONS 18+48.89 AND 20+51.65 -L-, RESPECTIVELY, WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.  
 DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 1 AND WALL NO. 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIALS ARE APPROVED BY THE GEOTECHNICAL ENGINEER.  
 INSTALLATION OF SLEEVES OR CORRUGATED PIPES MAY BE NECESSARY FOR PLANNED VERTICAL OBSTRUCTIONS WITHIN THE REINFORCED ZONE. STRAPS SHALL BE INSTALLED AROUND OBSTRUCTIONS AS RECOMMENDED BY THE WALL DESIGNER AND APPROVED BY THE ENGINEER.  
 INSTALLATION OF 27-INCH DIAMETER CORRUGATED METAL CANS AROUND THE PILES AFTER THEY ARE DRIVEN FROM THE BOTTOM OF THE PILE CAP TO THE LEVELING PAD ELEVATION IS REQUIRED FOR PILES AT END BENTS NO. 1 AND NO. 2.  
 THE CORRUGATED METAL CANS SHALL BE DESIGNED TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILL WITHOUT DISTORTION. AT A MINIMUM, CORRUGATED METAL CANS SHALL BE 16-GUAGE WITH A WALL THICKNESS OF 0.064 INCHES.  
 LOOSELY BACKFILL CORRUGATED METAL CANS USING THE SAME MATERIAL AS MSE REINFORCED ZONE AFTER ANY WAITING PERIOD AND PRIOR TO CONSTRUCTION OF THE END BENT PILE CAP. DO NOT COMPACT MATERIAL WITHIN THE CAN.  
 INSTALL PILES AT END BENTS BEFORE CONSTRUCTING MSE ABUTMENT WALL.  
 SLIP JOINTS ARE REQUIRED APPROXIMATELY EVERY 80 FEET OF WALL FACE.  
 COASTAL PLAIN CLAY SOILS MAY BE ENCOUNTERED AT WALL NO. 1. THE GEOTECHNICAL ENGINEER SHOULD EVALUATE THE FOUNDATION SOILS PRIOR TO FILL PLACEMENT AT END BENT NO. 1.  
 DESIGN RETAINING WALL NO. 1 AND WALL NO. 2 FOR A LATERAL LOAD FROM FOUNDATIONS LOCATED BEHIND THE MSE WALL APPLIED AS A FACTORED UNIFORM PRESSURE OF 830 PSF TO THE BACK OF PANELS APPLIED FROM THE BOTTOM OF CAP TO APPROXIMATELY 10 FEET BELOW THE BOTTOM OF CAP.

PROJECT NO.: 49218.26  
 CUMBERLAND COUNTY  
 STATION: 19+50.27 -L-  
 SHEET 6 OF 6

PREPARED BY: E. BENSON	DATE: 01/26
REVIEWED BY: M. SIMPSON	DATE: 01/26



NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GEOTECHNICAL  
 ENGINEERING UNIT

MSE WALL NOTES

REVISIONS						SHEET NO. W-6
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			