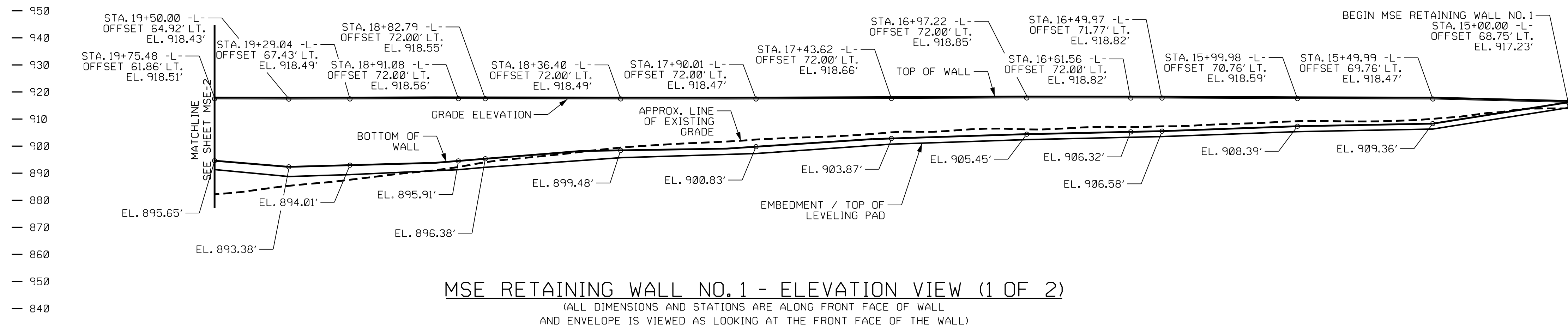
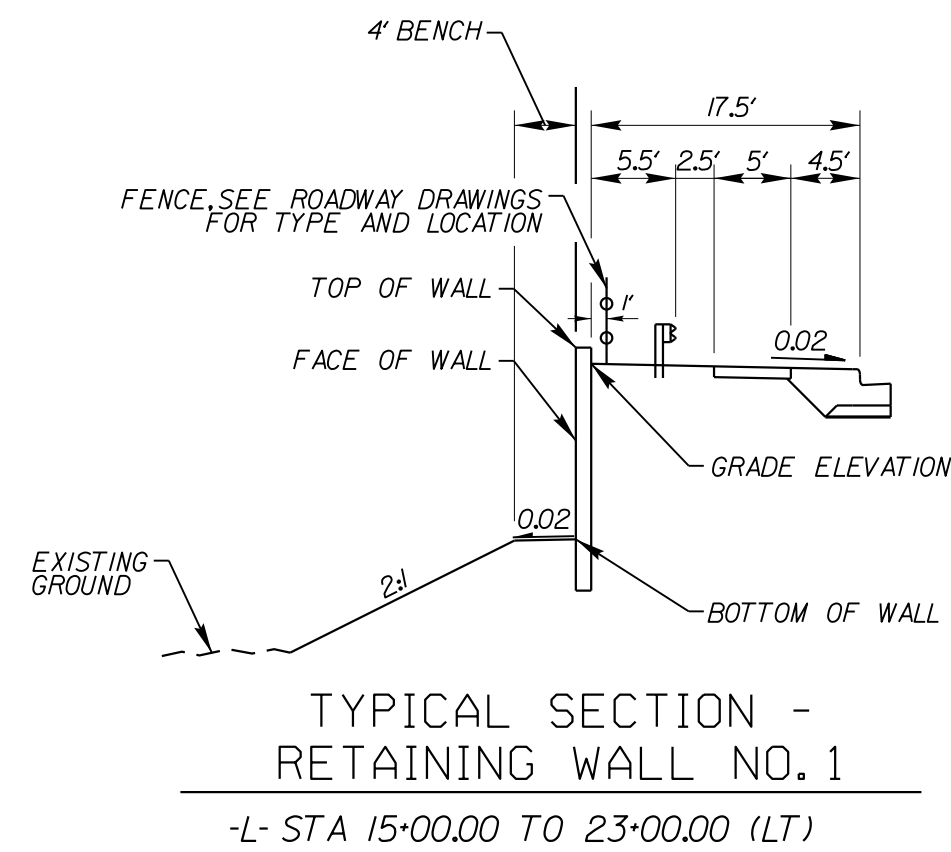
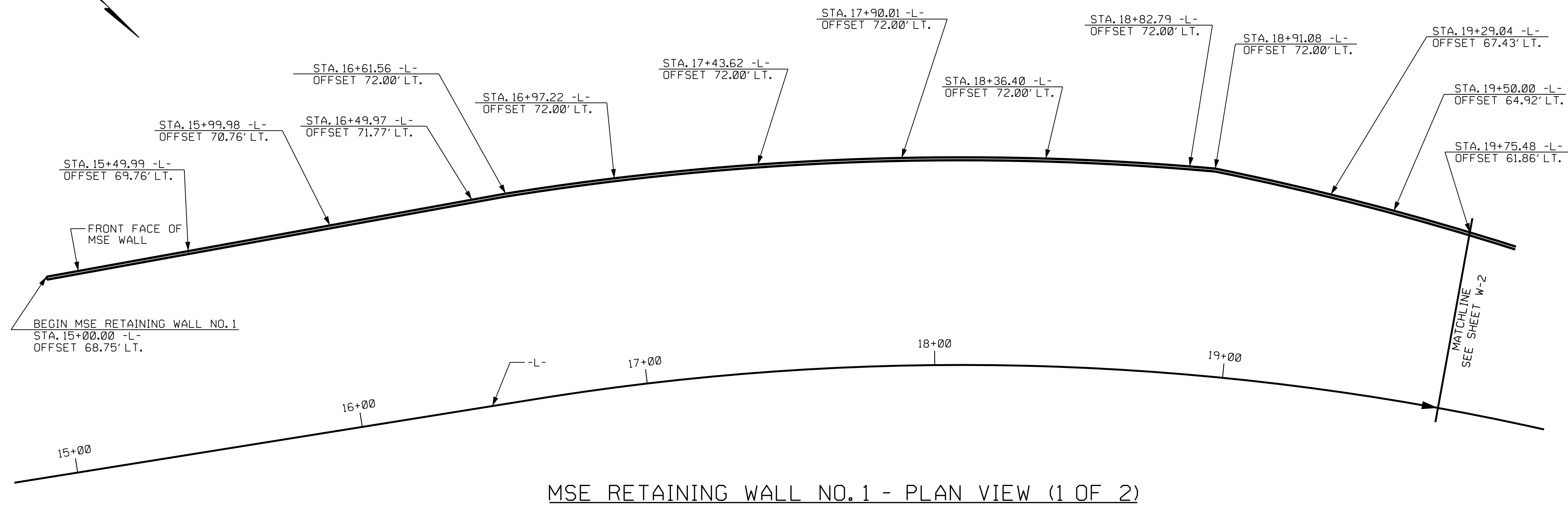


GEOTECHNICAL
ENGINEER

Signed by:
C44768205231ACC
12/17/2024
SIGNATURE DATE

ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 1	15,200 SF

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

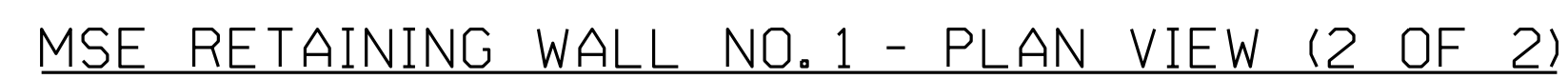
PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 15+00.00 -L-
SHEET 1 OF 14

RETAINING WALL NO. 1
MSE WALL PLAN AND
ENVELOPE VIEWS

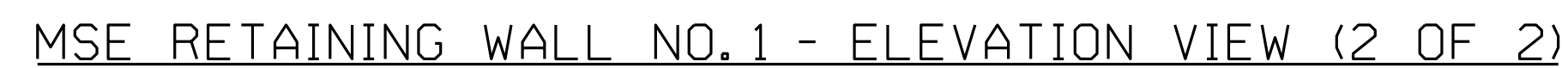
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-1
2			4			



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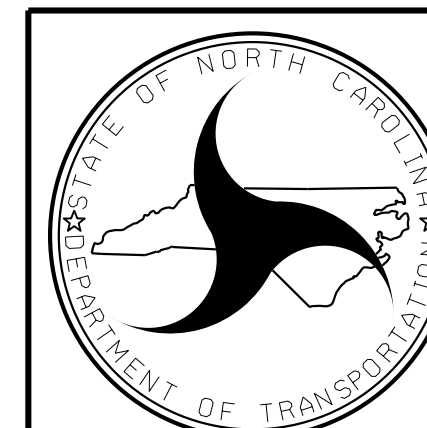
-L- STA 15+00.00 TO 23+00.00 (LT)



(ALL DIMENSIONS AND STATIONS ARE ALONG FRONT FACE OF WALL
AND ENVELOPE IS VIEWED AS LOOKING AT THE FRONT FACE OF THE WALL)

RETAINING WALL NO.1
MSE WALL PLAN AND
ENVELOPE VIEWS

REVISIONS						SHEET NO. W-2
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			
2			4			



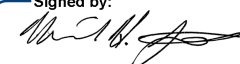
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

PREPARED BY: MHS	DATE: 9/24
REVIEWED BY: SCC	DATE: 9/24

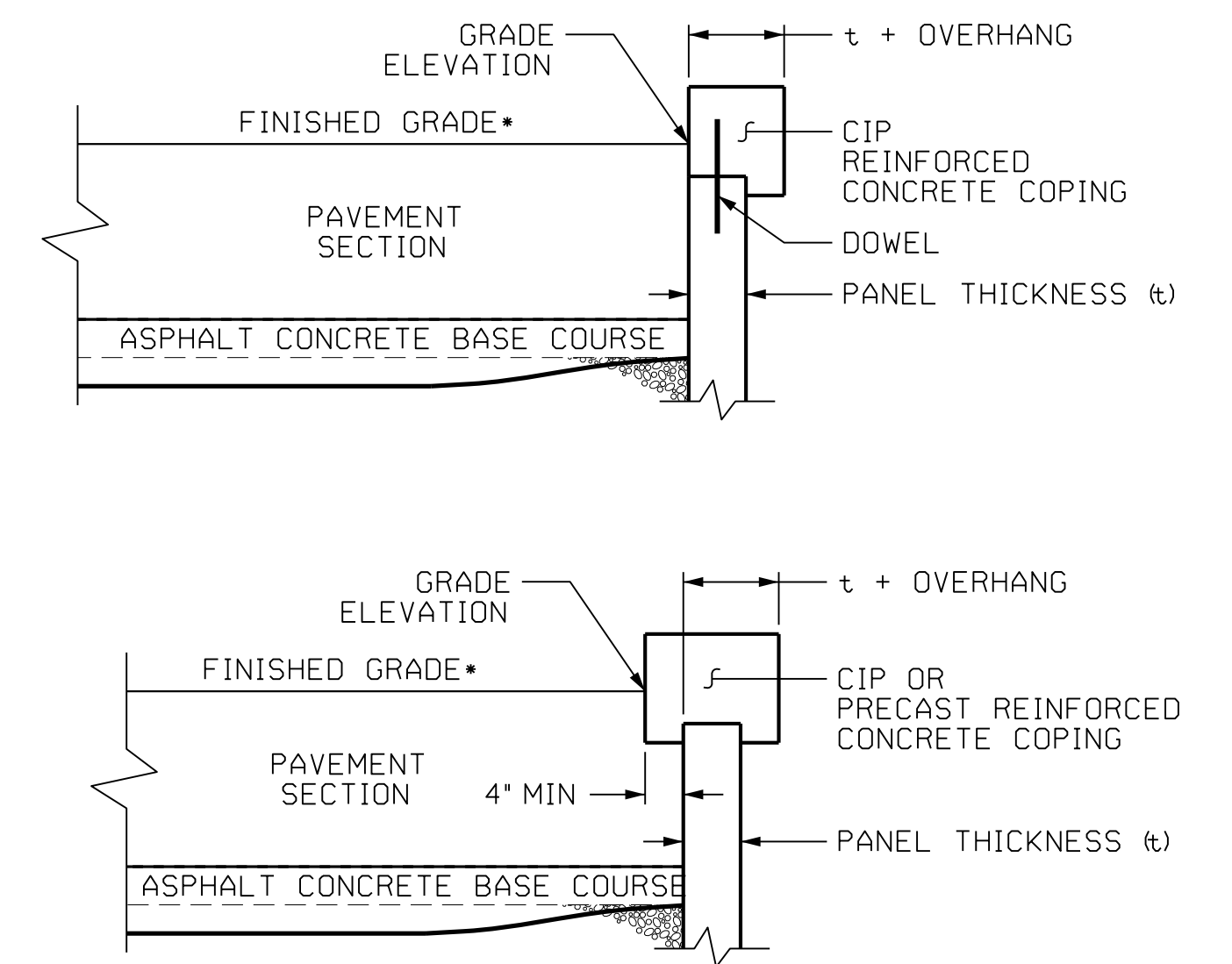
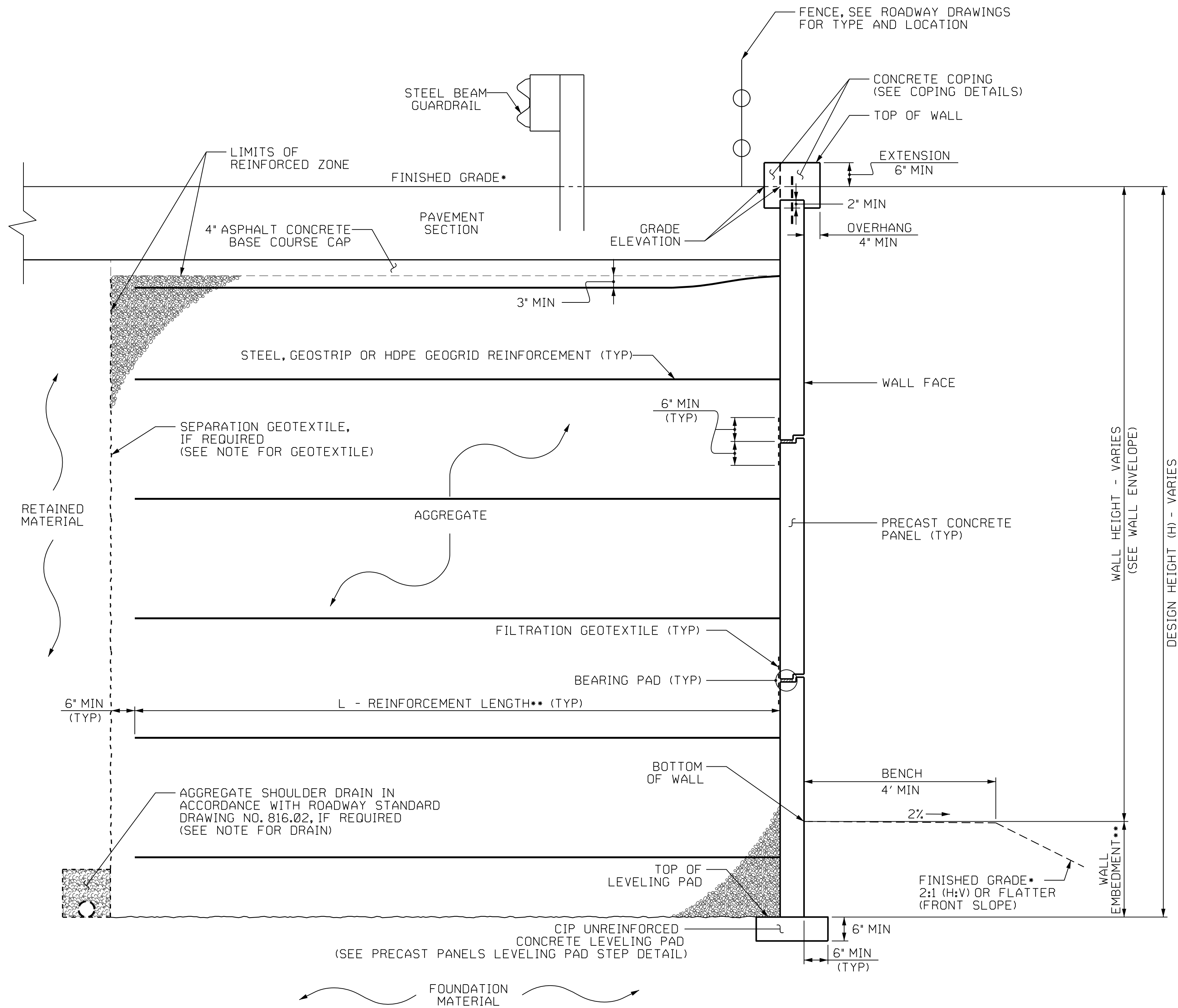
GEOTECHNICAL
ENGINEER



Signed by:  12/17/2024
C447682092346CC
SIGNATURE DATE

ENGINEER

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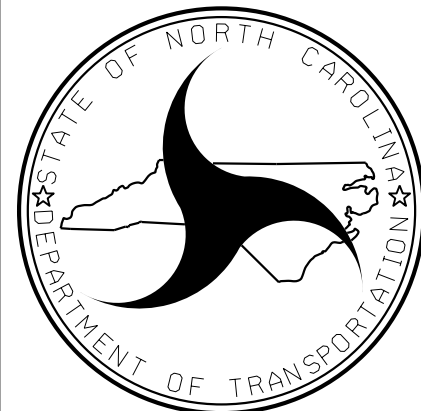
COPING DETAILS

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.

MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

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

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 19+03.91 -L-
SHEET 3 OF 14



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

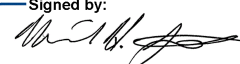
RETAINING WALL NO. 1
MSE WALL - TYPICAL
SECTION AND COPING DETAIL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-3
2			4			

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24

GEOTECHNICAL
ENGINEER



Signed by:  12/17/2024
C44788209231 SCC
SIGNATURE DATE

ENGINEER

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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.
- AT THE 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.
- 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) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,000 PSF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = 2 FT OR H/7, WHICHEVER IS DEEPER
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

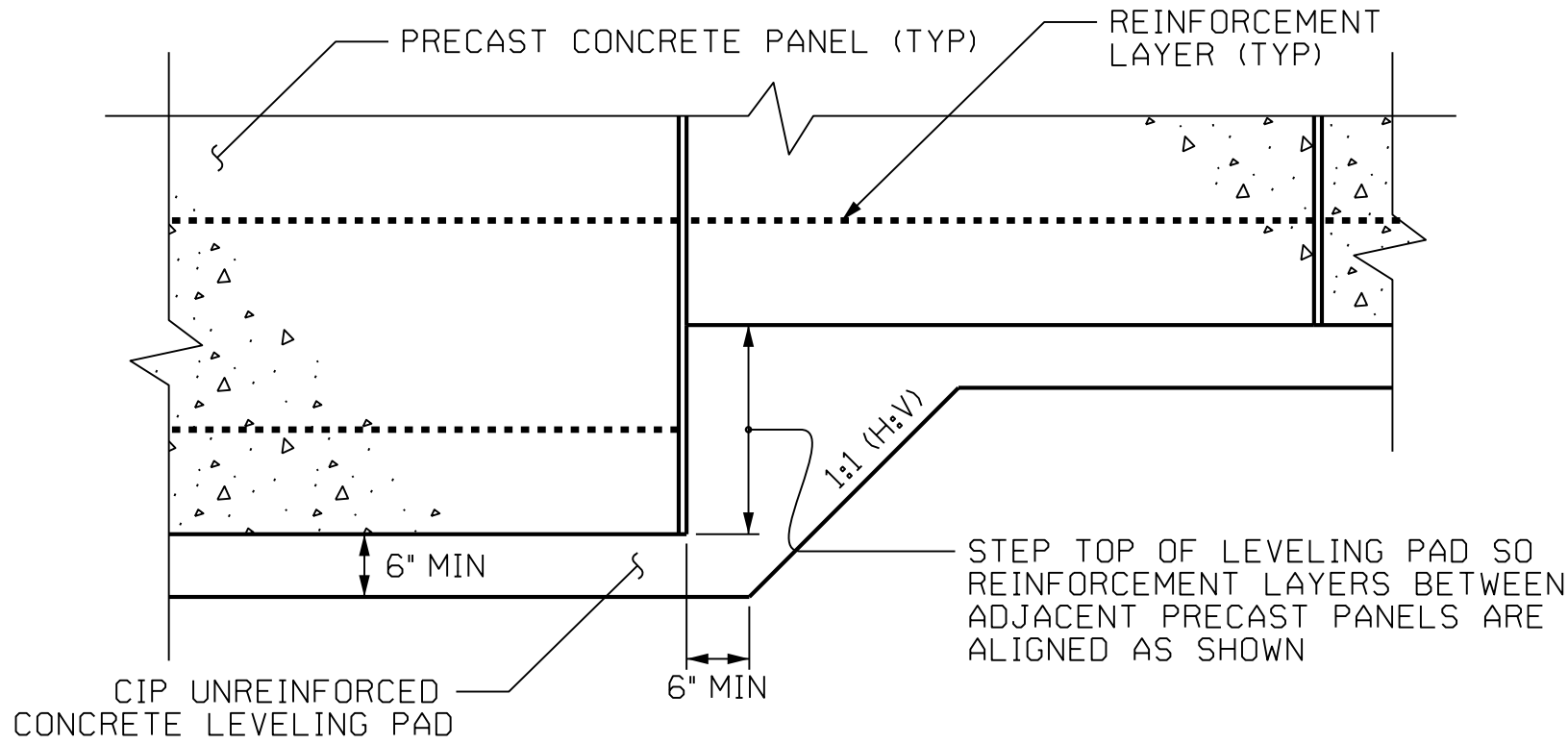
AGGREGATE TYPE*	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
RETAINED	120	30	0
FOUNDATION	120	30	0

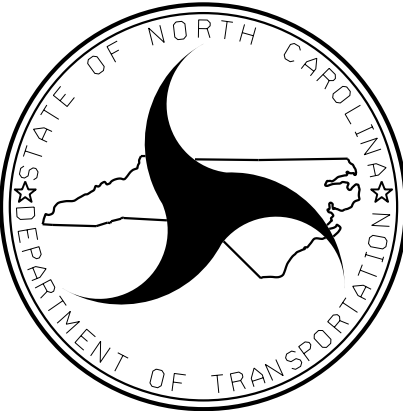
DESIGN RETAINING WALL NO. 1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

- 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.



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 19+03.91 -L-
SHEET 4 OF 14



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

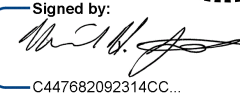
RETAINING WALL NO. 1
MSE WALL NOTES AND
LEVELING PAD STEP DETAIL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-4
2			4			

PREPARED BY:	MHS	DATE: 9/24
REVIEWED BY:	SCC	DATE: 9/24

GEOTECHNICAL
ENGINEER

NORTH CAROLINA
PROFESSIONAL
SEAL
028893
ENGINEER

Signed by:  12/17/2024

C447682002314CC

SIGNATURE

DATE

ENGINEER

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PLAN OF MSE RETAINING WALL NO. 2A
(BRIDGE SUPERSTRUCTURE NOT SHOWN FOR CLARITY)

Key features and labels:

- BEGIN RETAINING WALL NO. 2A
STA. 26+31.48 -L-
OFFSET 112.44' RT.
- STA. 26+44.50 -L-
OFFSET 98.48' RT.
- STA. 26+54.51 -L-
OFFSET 87.74' RT.
- STA. 26+60.75 -L-
OFFSET 81.05' RT.
- STA. 26+60.75 -L-
OFFSET 55.50' RT.
- STA. 26+60.75 -L-
OFFSET 48.25' RT.
- W.P. #1
FILL FACE @ END BENT 1
STA. 26+55.01 -L-
- FRONT FACE OF MSE WALL
STA. 26+60.75 -L-
OFFSET 0.00'
- STA. 26+60.75 -L-
OFFSET 55.50' LT.
- STA. 26+60.75 -L-
OFFSET 48.25' LT.
- END RETAINING WALL NO. 2A
STA. 26+60.75 -L-
OFFSET 115.00' LT.
- STA. 26+60.75 -L-
OFFSET 100.19' LT.
- DITCH NOT REQUIRED
- L-

SECTION @ END BENT 1

Key features and labels:

- FINISHED GRADE
- GRADE ELEVATION
- END BENT CAP
- TOP OF WALL
- WALL FACE
- BOTTOM OF WALL
- H-PILE

ELEVATION OF MSE RETAINING WALL NO. 2A
LOOKING DOWNSTATION
(ALL DIMENSIONS AND STATIONS ARE ALONG FRONT FACE OF WALL)

Key features and labels:

- STA. 26+60.75 -L-
OFFSET 81.05' RT.
EL. 933.80'
- STA. 26+54.51 -L-
OFFSET 87.74' RT.
EL. 933.50'
- STA. 26+44.50 -L-
OFFSET 98.48' RT.
EL. 930.45'
- BEGIN RETAINING WALL NO. 2A
STA. 26+31.48 -L-
OFFSET 112.44' RT.
EL. 924.18'
- EL. 920.93'
- EL. 918.66'
- EL. 917.21'
- EL. 917.11'
- EL. 916.20'
- EL. 915.29'
- EL. 915.19'
- EL. 914.38'
- EL. 919.25'
- EL. 932.23'
- EL. 936.43'
- EL. 930.30'
- EL. 936.43'
- EL. 938.36'
- EL. 931.27'
- EL. 938.36'
- TOP OF WALL
- END RETAINING WALL NO. 2A
STA. 26+60.75 -L-
OFFSET 115.00' LT.
EL. 911.84'
- STA. 26+60.75 -L-
OFFSET 100.19' LT.
EL. 919.25'
- FACE OF WALL
- GRADE ELEVATION
- BOTTOM OF WALL
- APPROX. LINE OF EXISTING GROUND
- EMBEDMENT / TOP OF LEVELING PAD

TYPICAL SECTION -
RETAINING WALL NOS. 2A AND 2B

Key features and labels:

- FENCE, SEE ROADWAY DRAWINGS FOR TYPE AND LOCATION
- 4" BENCH
- TOP OF WALL
- FACE OF WALL
- GRADE ELEVATION
- BOTTOM OF WALL
- 0.02
- 3/1 (MAX)

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 2A	3,750 SF

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 26+31.48 -L-
SHEET 5 OF 14

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-5
2			4			

GEOTECHNICAL
ENGINEER

NORTH CAROLINA
PROFESSIONAL
SEAL
028893
ENGINEER

Signed by:
C4478820201400

12/17/2024

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ENGINEER

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UNLESS ALL SIGNATURES COMPLETED

PLAN OF MSE RETAINING WALL NO. 2B
(BRIDGE SUPERSTRUCTURE NOT SHOWN FOR CLARITY)

Key features and stationing:

- BEGIN RETAINING WALL NO. 2B STA. 28+63.19 -L- OFFSET 153.20' LT.
- STA. 28+33.38 -L- OFFSET 121.24' LT.
- STA. 28+20.01 -L- OFFSET 106.90' LT.
- STA. 28+13.76 -L- OFFSET 100.19' LT.
- STA. 28+13.76 -L- OFFSET 55.50' LT.
- STA. 28+13.76 -L- OFFSET 48.25' LT.
- W.P. #2 FILL FACE @ END BENT 2 STA. 28+20.01 -L-
- FRONT FACE OF MSE WALL STA. 28+13.76 -L- OFFSET 0.00'
- STA. 28+13.76 -L- OFFSET 55.50' RT.
- STA. 28+13.76 -L- OFFSET 48.25' RT.
- END OF RETAINING WALL NO. 2B STA. 28+13.76 -L- OFFSET 106.00' RT.

SECTION @ END BENT 2

Labels: END BENT CAP, TOP OF WALL, WALL FACE, BOTTOM OF WALL, FINISHED GRADE, GRADE ELEVATION, H-PILE.

ELEVATION OF MSE RETAINING WALL NO. 2B
LOOKING UPSTATION
(ALL DIMENSIONS AND STATIONS ARE ALONG FRONT FACE OF WALL)

Key elevations and features:

- Grade Elevation: EL. 934.52', EL. 942.65', EL. 936.52', EL. 940.72', EL. 934.59'
- Top of Wall: EL. 931.38', EL. 934.75', EL. 942.65', EL. 935.56', EL. 940.72', EL. 918.61'
- Bottom of Wall: EL. 918.55', EL. 914.60', EL. 914.61', EL. 914.98', EL. 915.85', EL. 916.72', EL. 916.91'
- Existing Ground: EL. 914.98', EL. 915.85', EL. 916.72', EL. 916.91'
- Embedment / Top of Leveling Pad: EL. 914.98', EL. 915.85', EL. 916.72', EL. 916.91'

TYPICAL SECTION -
RETAINING WALL NOS. 2A AND 2B

Labels: FENCE, SEE ROADWAY DRAWINGS FOR TYPE AND LOCATION, 4" BENCH, TOP OF WALL, FACE OF WALL, GRADE ELEVATION, BOTTOM OF WALL, 0.02, 3" (MAX).

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 2B	5,300 SF

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24

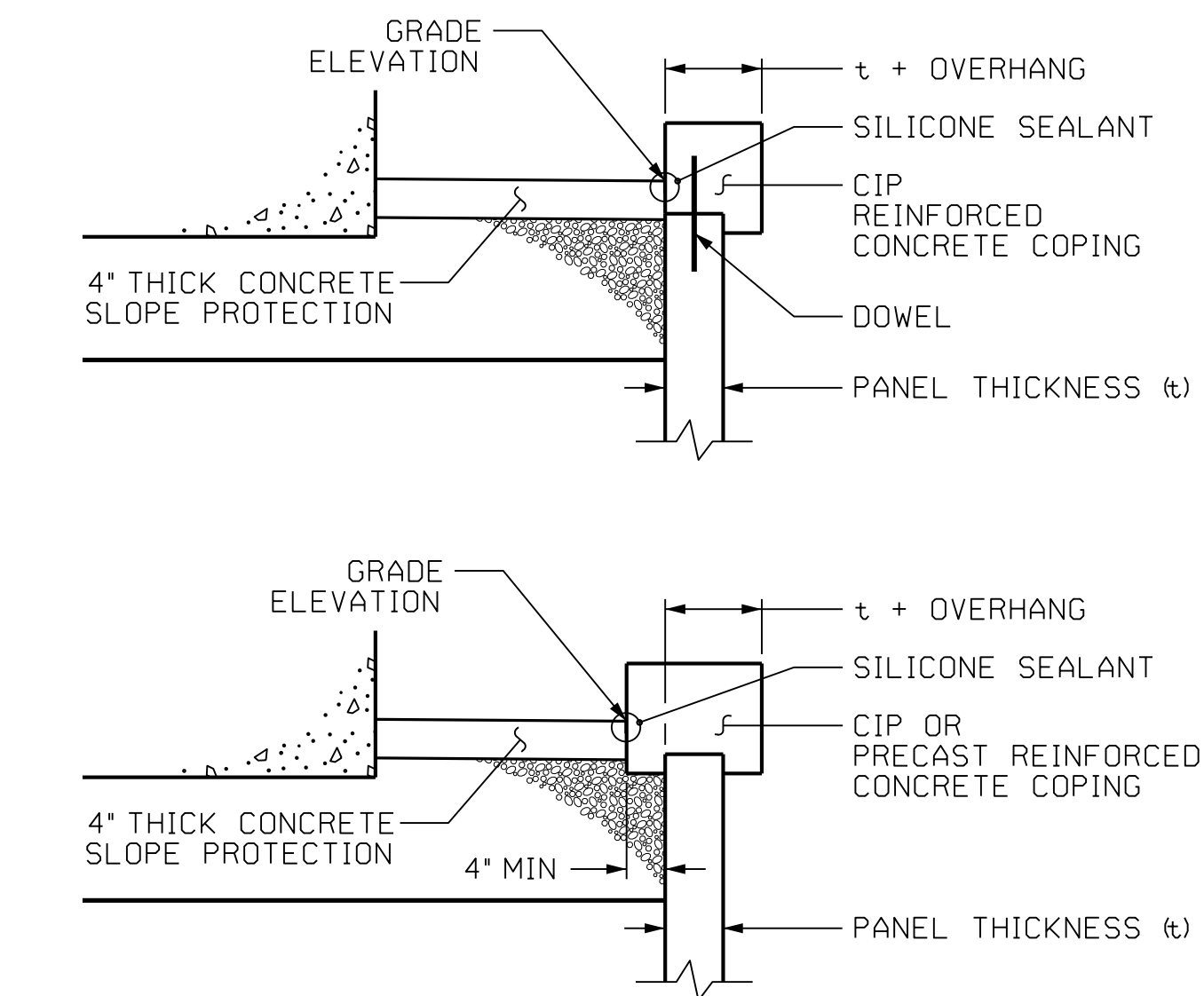
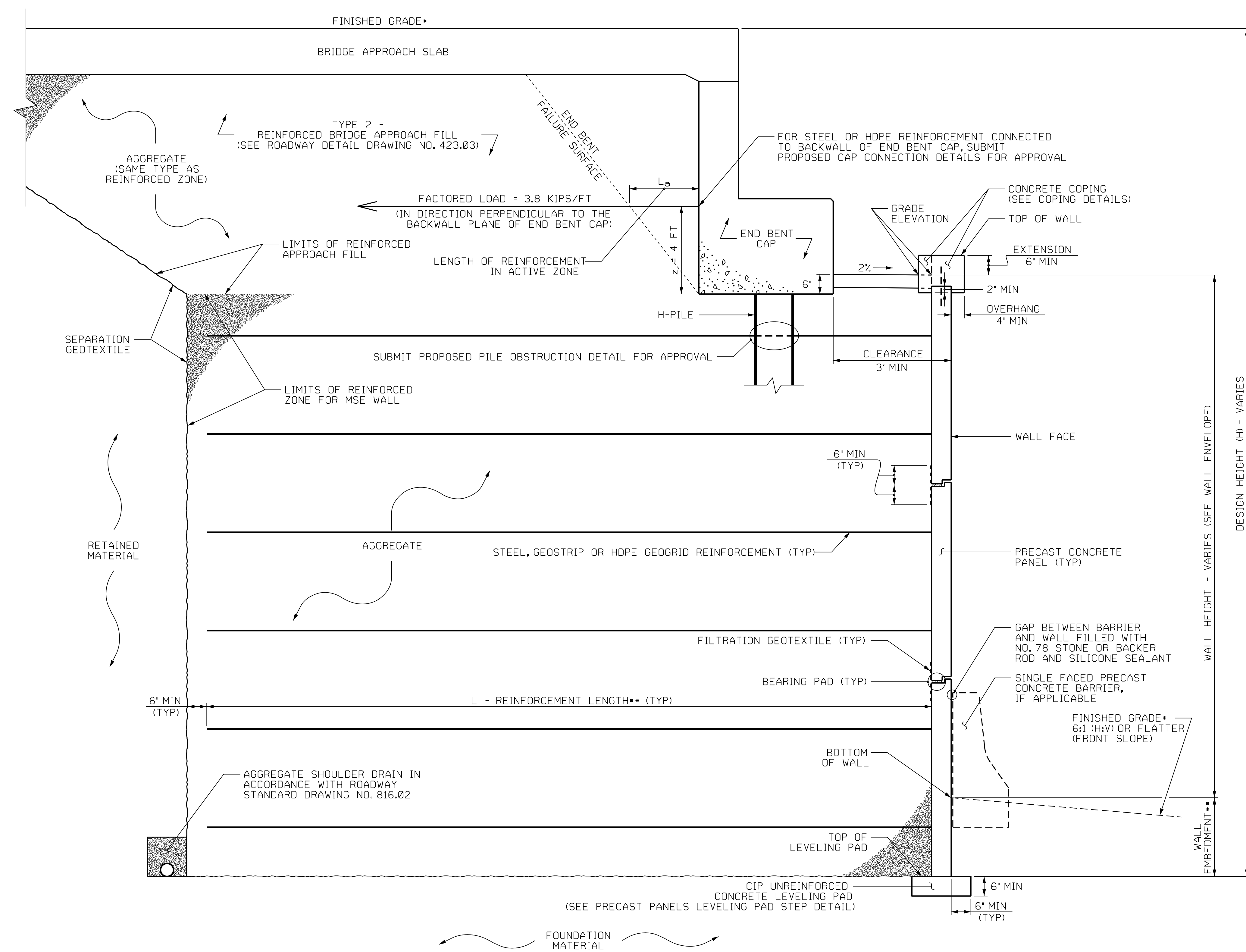
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 26+63.19 -L-
SHEET 6 OF 14

RETAINING WALL NO. 2B
BRIDGE 751 END BENT NO. 2
MSE WALL PLAN AND
ENVELOPE VIEWS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-6
2			4			



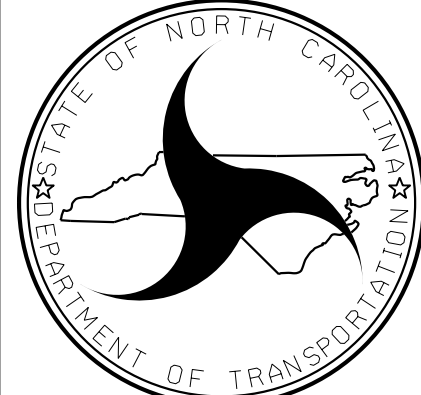
COPING DETAILS

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 WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION:--
SHEET 7 OF 14

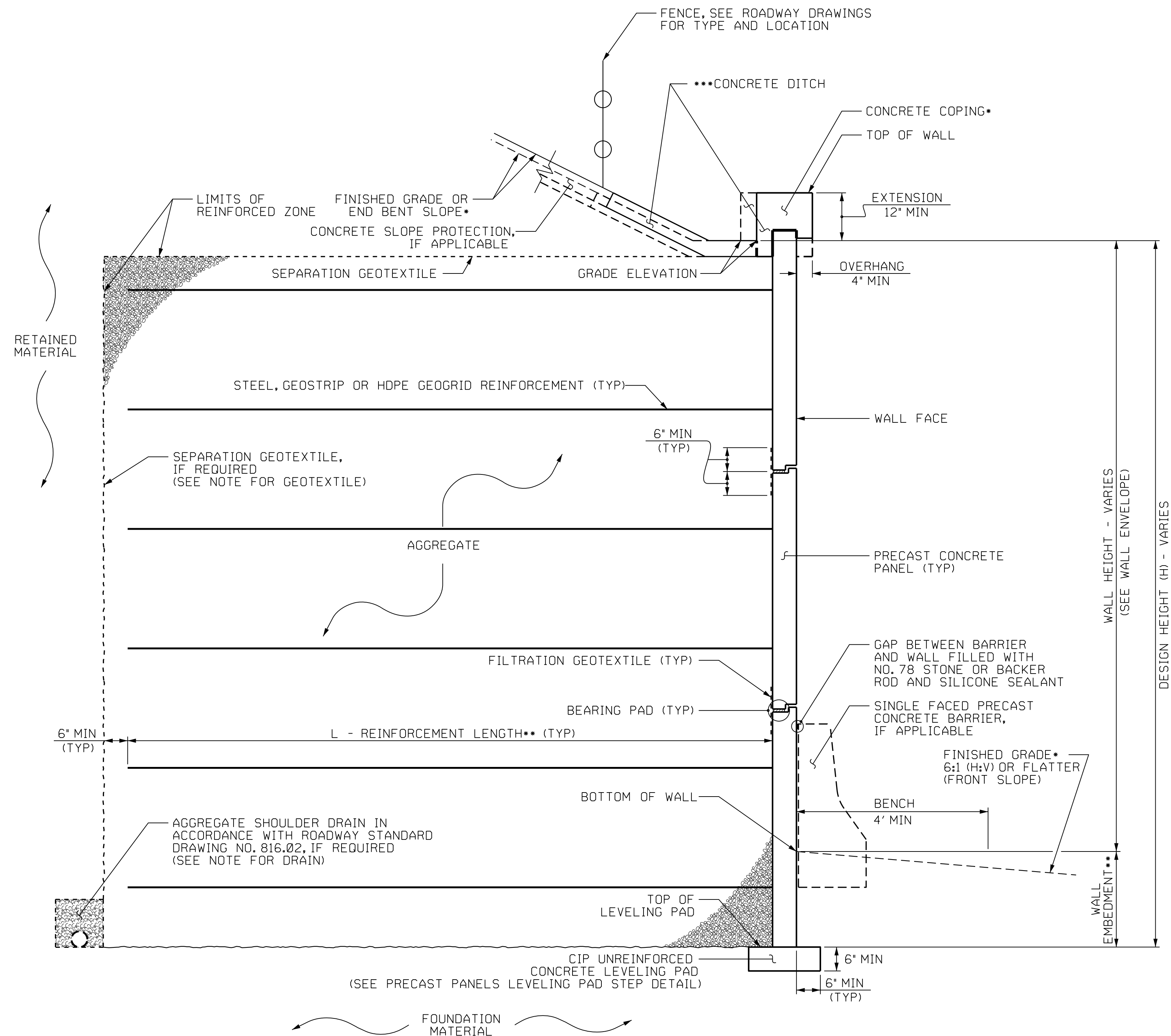


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-7
2			4			

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

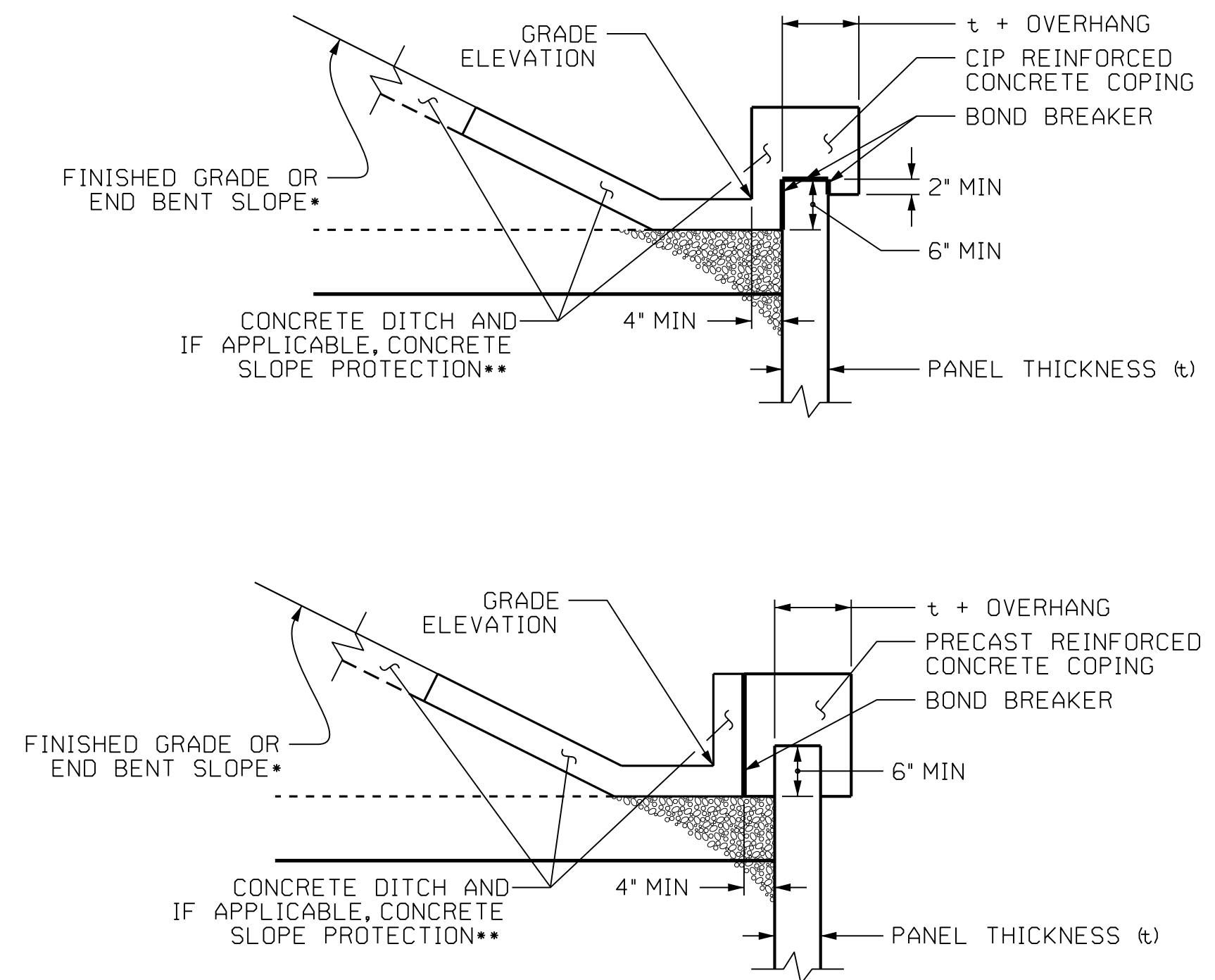
*SEE COPING DETAILS AND PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.
***CONCRETE DITCH IS NOT REQUIRED AT RETAINING WALL NO. 2A FROM STA. 26+60.75 -L- 48.25' LT TO STA. 26+60.75 -L- 115.00' LT. AND AT RETAINING WALL NO. 2B FROM STA. 28+13.76 -L- 48.25' RT TO STA. 28+13.76 -L- 106.00' RT.

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COPING DETAILS

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

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION:--
SHEET 8 OF 14

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

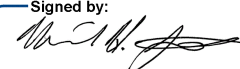
RETAINING WALL NOS. 2A
& 2B, MSE WALL
TYPICAL SECTION AND
COPING DETAIL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-8
2			4			

PREPARED BY: MHS DATE: 9/24
REVIEWED BY: SCC DATE: 9/24

GEOTECHNICAL
ENGINEER



Signed by: 
C447682092314CC
12/17/2024

SIGNATUREDATE

ENGINEER

SIGNATUREDATE

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NOTES:

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

FOR TYPE 2 REINFORCED BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY DETAIL DRAWING NO. 423.03.

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. 2A AND 2B.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NOS. 2A AND 2B.

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

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NOS. 2A AND 2B, 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. 2A AND 2B FOR THE FOLLOWING:
- 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 4,500 PSF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = 2 FT OR H/10, WHICHEVER IS DEEPER
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

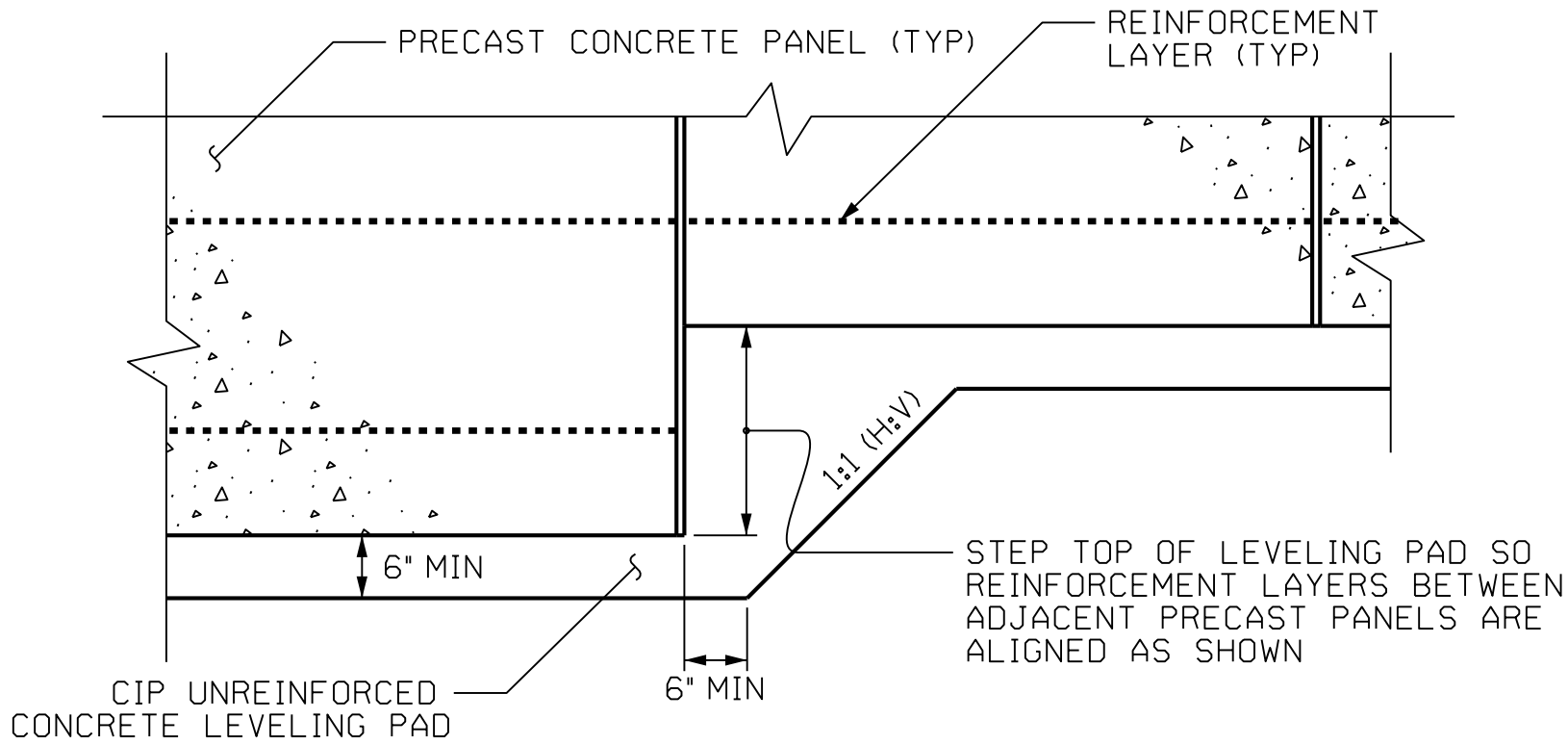
7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
RETAINED	120	30	0
FOUNDATION	120	30	0

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

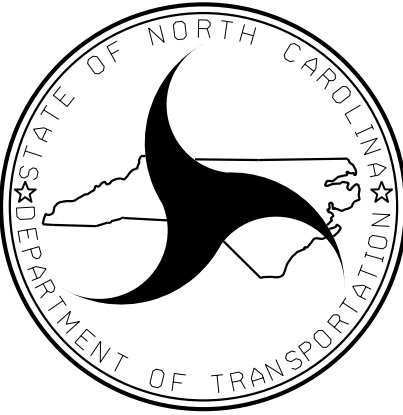
FOUNDATIONS FOR END BENT NOS. 1 AND 2 WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS. 2A AND 2B. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

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



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION:--
SHEET 9 OF 14



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

RETAINING WALL NOS. 2A
& 2B, MSE WALL NOTES AND
LEVELING PAD STEP DETAIL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-9
2			4			

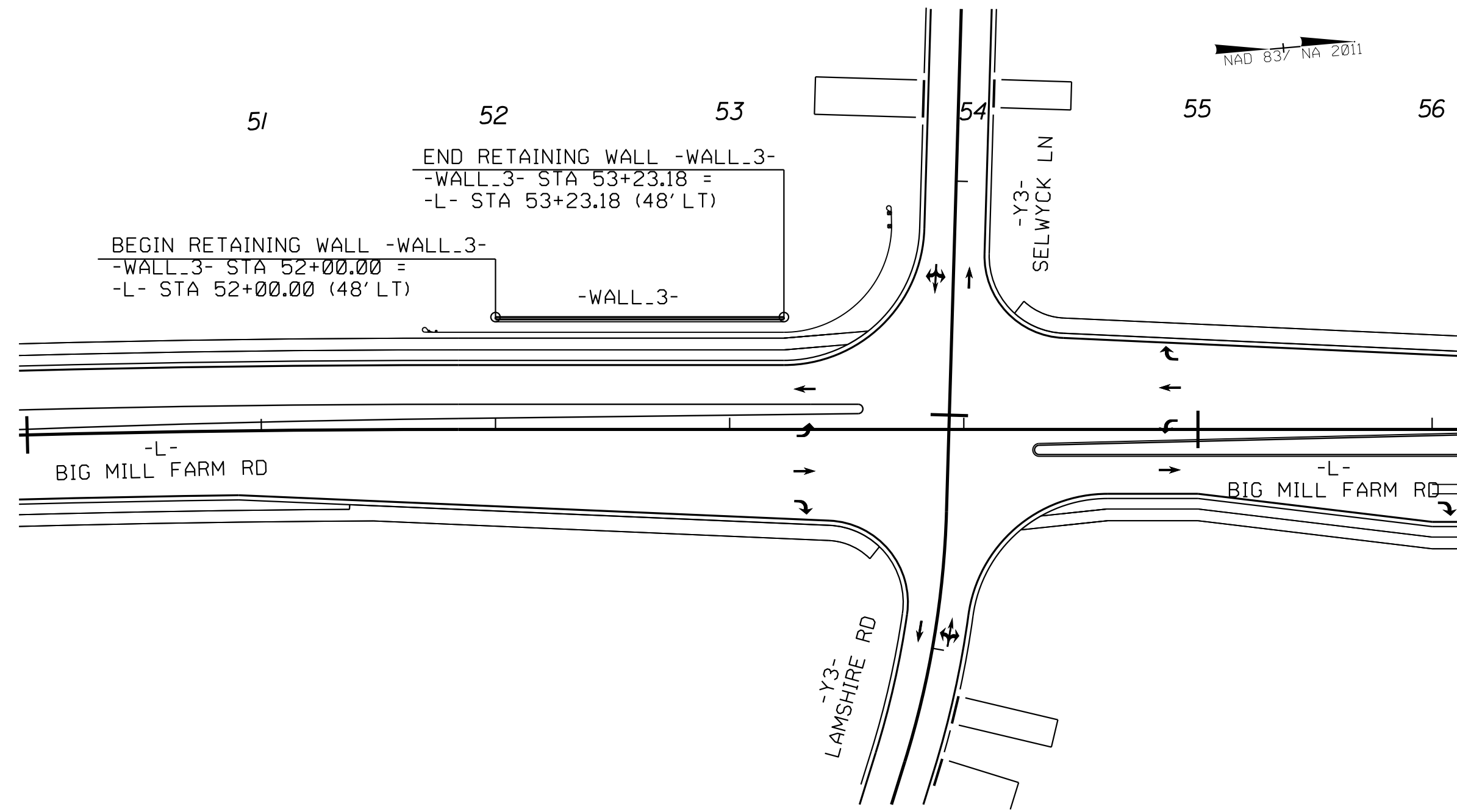
PREPARED BY:	MHS	DATE: 9/24
REVIEWED BY:	SCC	DATE: 9/24

GEOTECHNICAL
ENGINEER

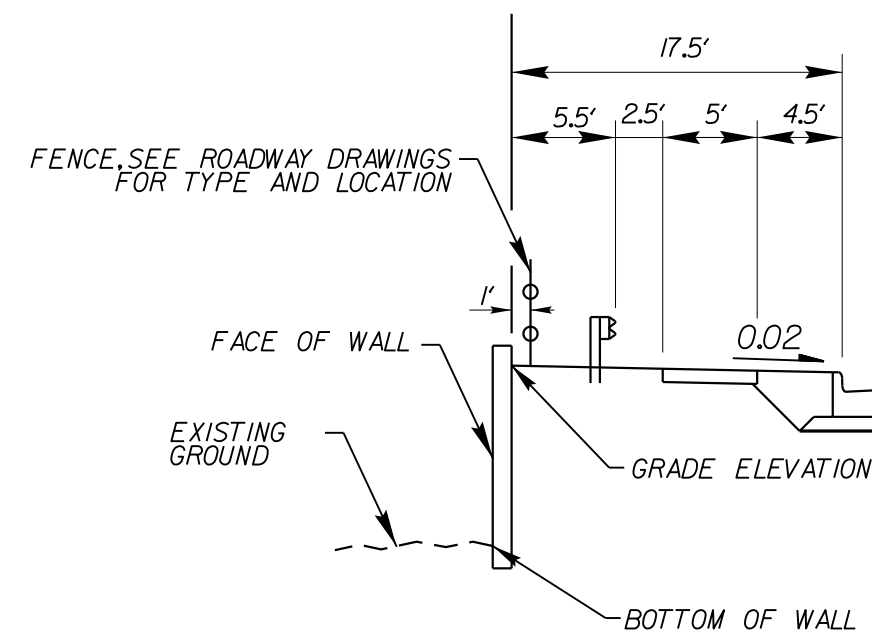
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12/17/2024
SIGNATURE DATE

ENGINEER

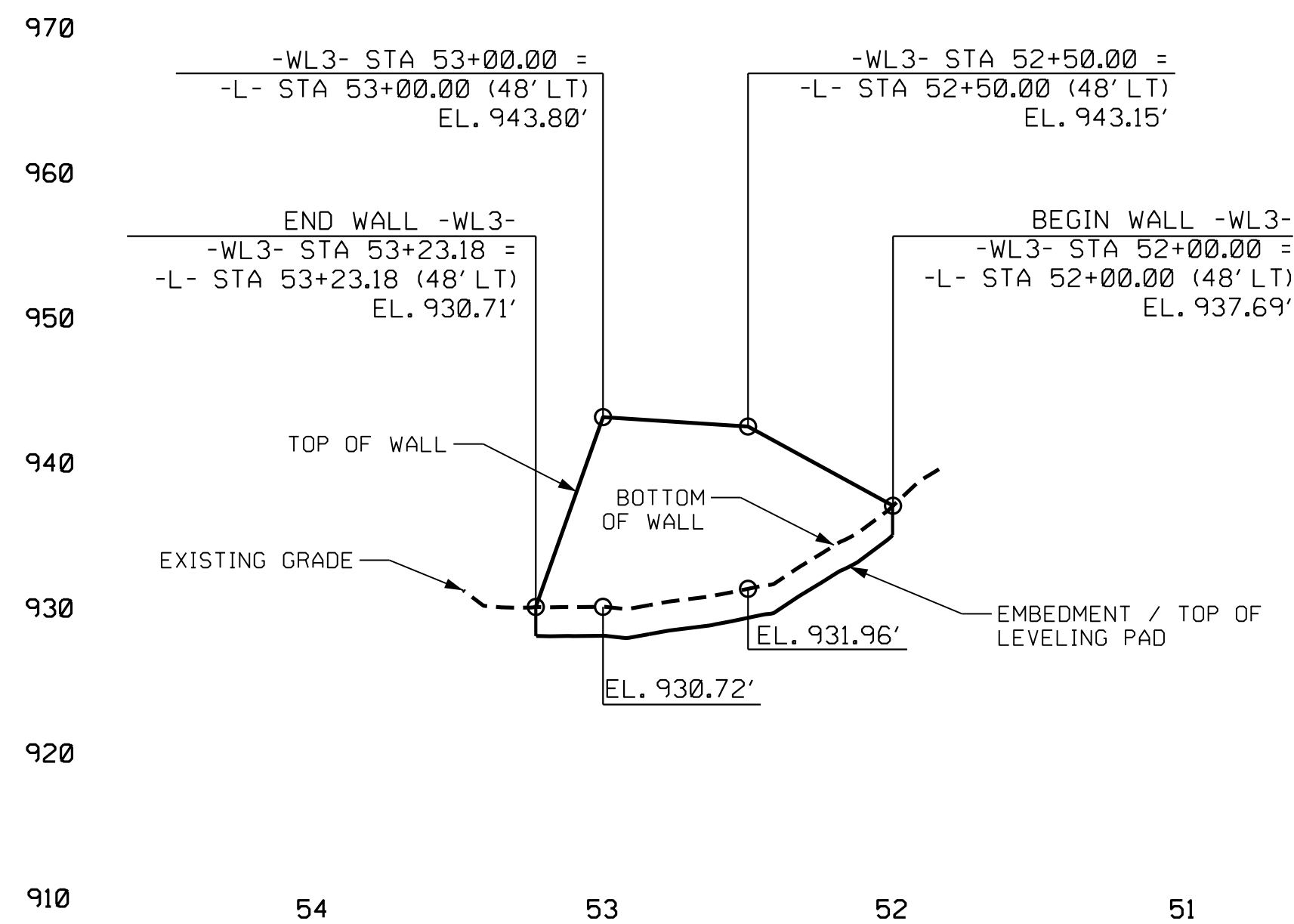
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UNLESS ALL SIGNATURES COMPLETED



RETAINING WALL NO. 3 - PLAN VIEW



TYPICAL SECTION -
RETAINING WALL NO. 3
-L- STA 52+00.00 TO 53+23.18 (LT)



RETAINING WALL NO. 3 - ENVELOPE VIEW

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 3	1,320 SF

PREPARED BY: MHS	DATE: 9/24
REVIEWED BY: SCC	DATE: 9/24

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 52+00.00 -L-
SHEET 10 OF 14

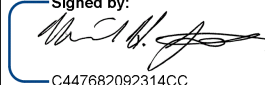
RETAINING WALL NO. 3
MSE WALL PLAN AND
ENVELOPE VIEWS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-10
2			4			

GEOTECHNICAL
ENGINEER

SEAL
028893

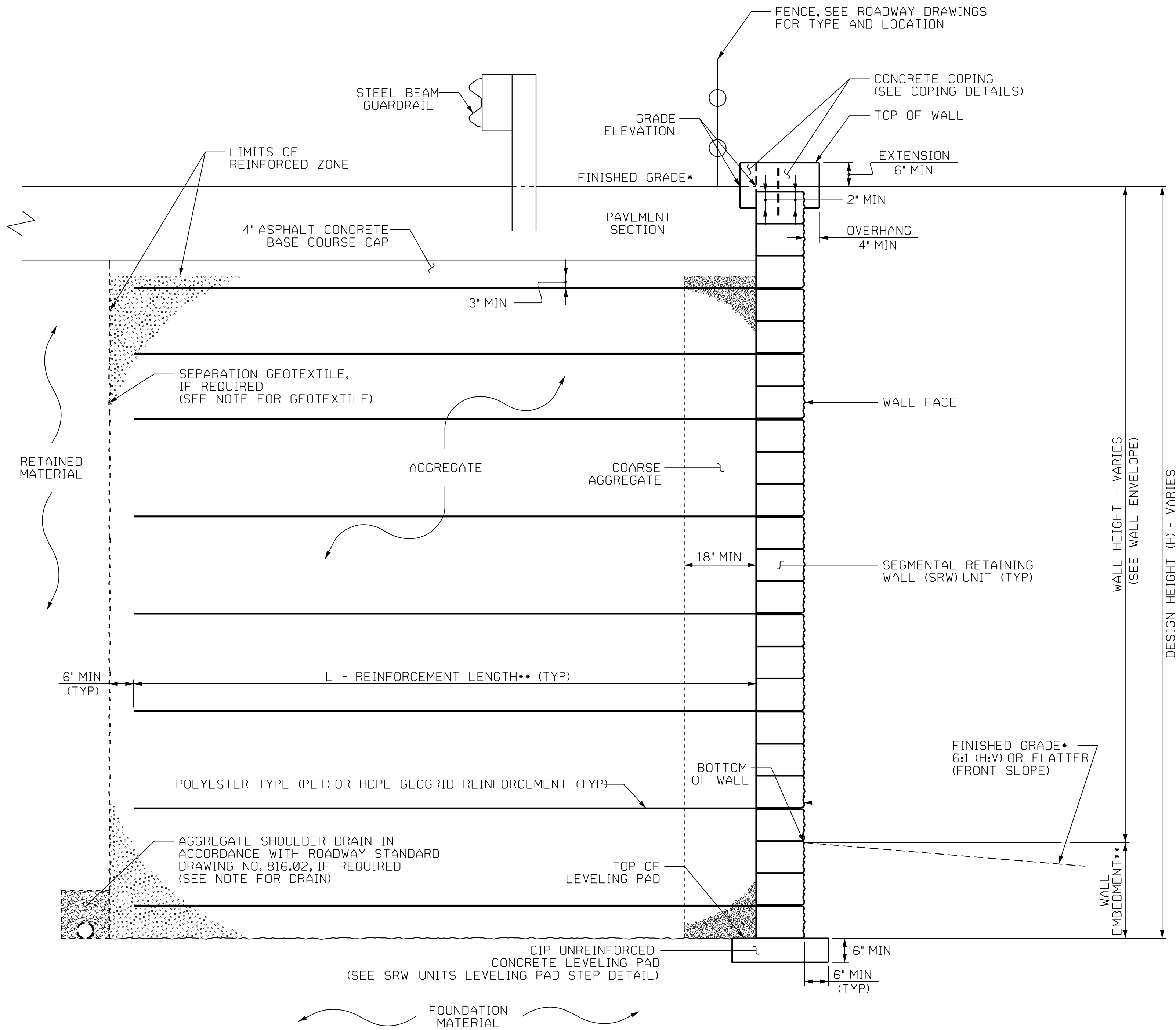
ENGINEER

Signed by:  12/17/2024
C44768209234ACC
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

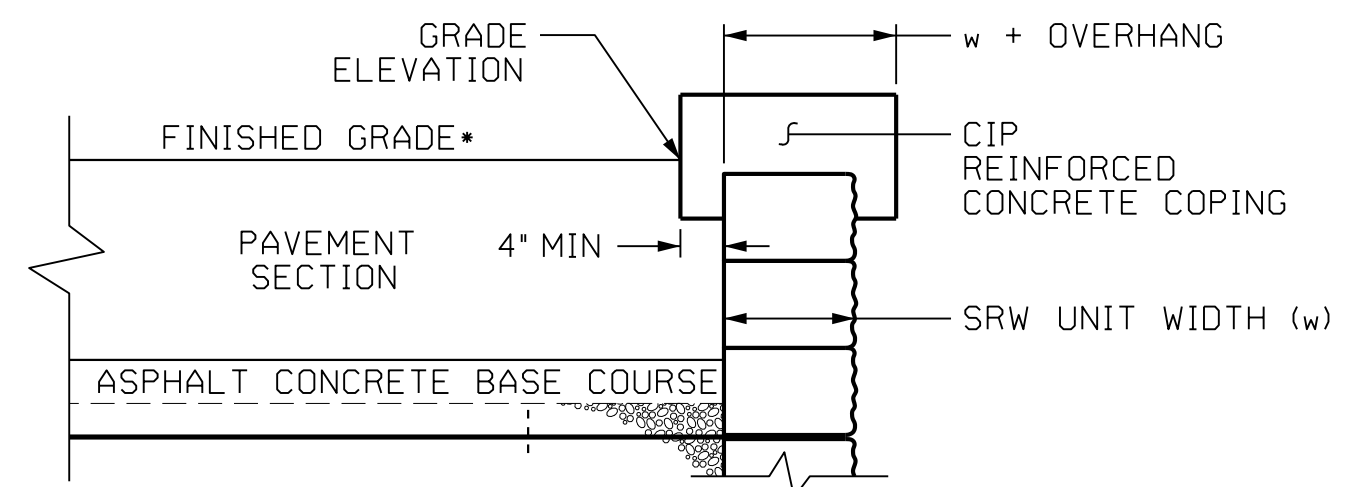
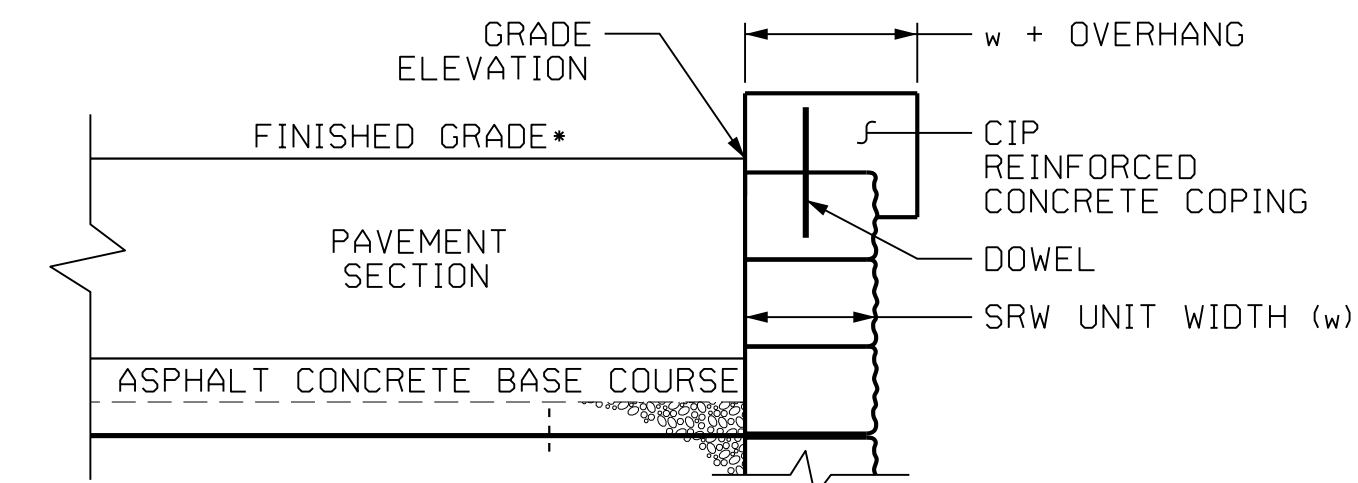
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UNLESS ALL SIGNATURES COMPLETED



MSE WALL WITH SRW UNITS - TYPICAL SECTION

••SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE,MSE WALL NOTES FOR WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

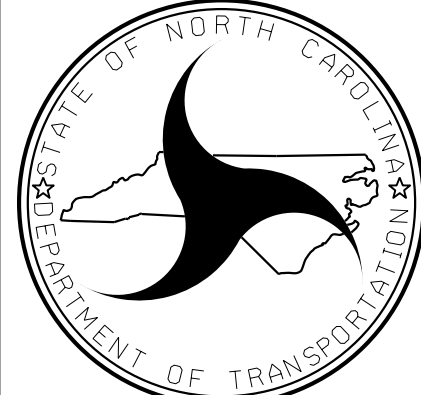
•SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION,CONNECT COPING TO SRW UNITS WITH DOWELS OR EXTEND COPING DOWN BACK OF SRW UNITS.
•SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 52+00.00 -L-
SHEET 11 OF 14



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

RETAINING WALL NO.3
MSE WALL TYPICAL SECTION
AND COPING DETAIL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1	MHS	12/24	3			W-11
2			4			

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24

GEOTECHNICAL
ENGINEER



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C447682092346CC
SIGNATURE

12/17/2024
DATE

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.

USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS (SRW) UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 3.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 3.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 3.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 3.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 3, 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. 3 FOR THE FOLLOWING:
- 1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,100 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 (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

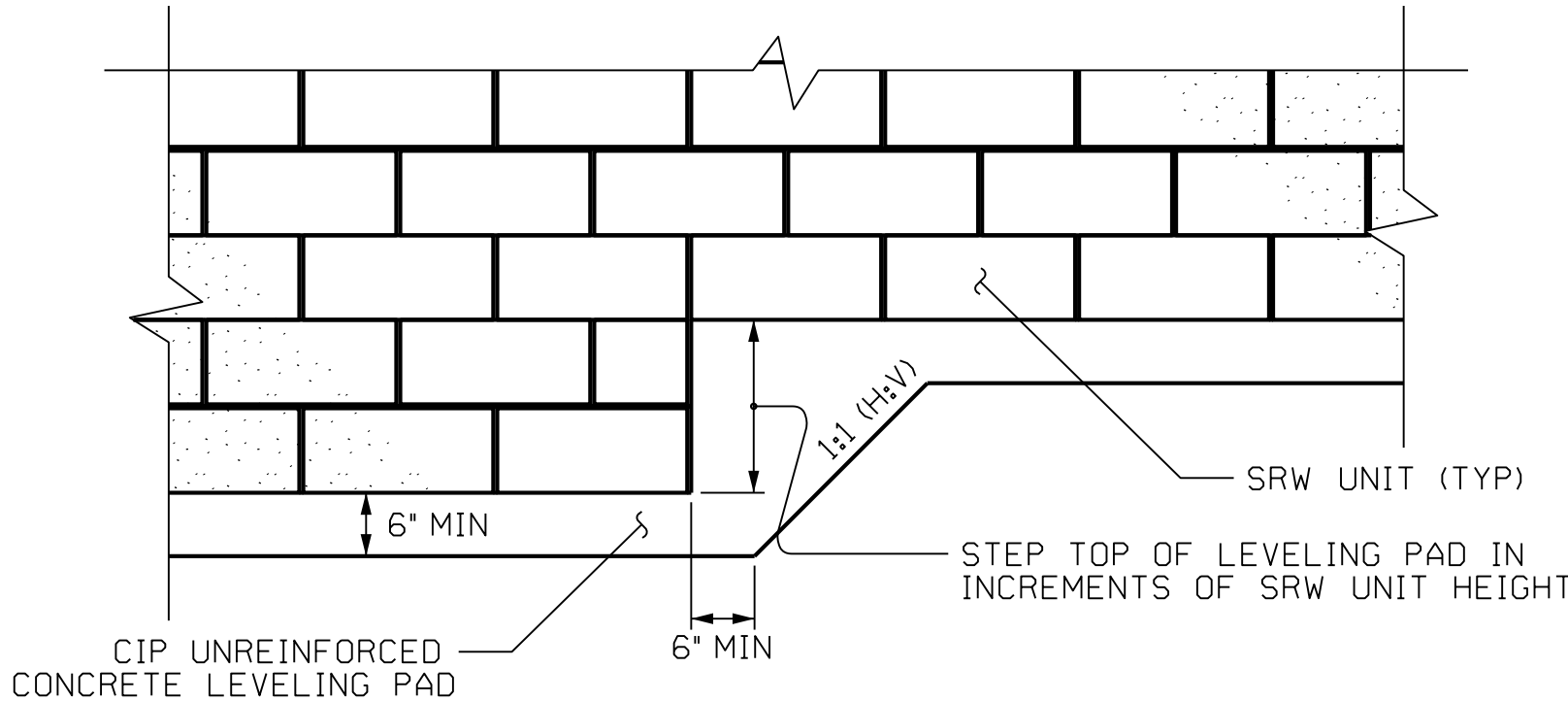
- 7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (g) PCF	FRICTION ANGLE (f) DEGREES	COHESION (c) PSF
RETAINED	120	30	0
FOUNDATION	120	30	0

DESIGN RETAINING WALL NO. 3 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

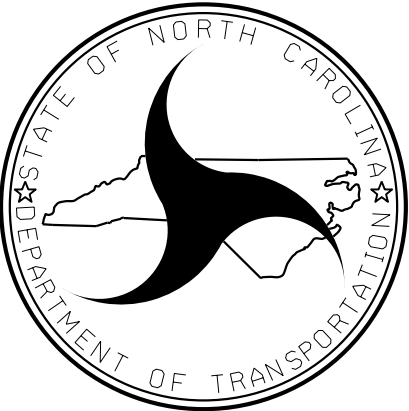
EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 3.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 3 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.



SRW UNITS LEVELING PAD STEP DETAIL

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 52+00.00 -L-
SHEET 12 OF 14



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

RETAINING WALL NO. 3
MSE WALL NOTES AND
LEVELING PAD STEP DETAIL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-12
2			4			

PREPARED BY:	MHS	DATE: 9/24
REVIEWED BY:	SCC	DATE: 9/24

GEOTECHNICAL
ENGINEER

SEAL
028893
NORTH CAROLINA
PROFESSIONAL
ENGINEER

Signed by: 12/17/2024

C447682092314CC

SIGNATURE

DATE

SIGNATURE

DATE

ENGINEER

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RETAINING WALL NO. 4 - PLAN VIEW

TYPICAL SECTION -
RETAINING WALL NO. 4
-L- STA 117+25.00 TO 118+22.00 (RT)

RETAINING WALL NO. 4 - ENVELOPE VIEW

ESTIMATED SEGMENTAL GRAVITY
RETAINING WALL QUANTITIES
(SQUARE FEET)

RETAINING WALL NO. 4 260 SF

PREPARED BY:	MHS	DATE:	9/24
REVIEWED BY:	SCC	DATE:	9/24

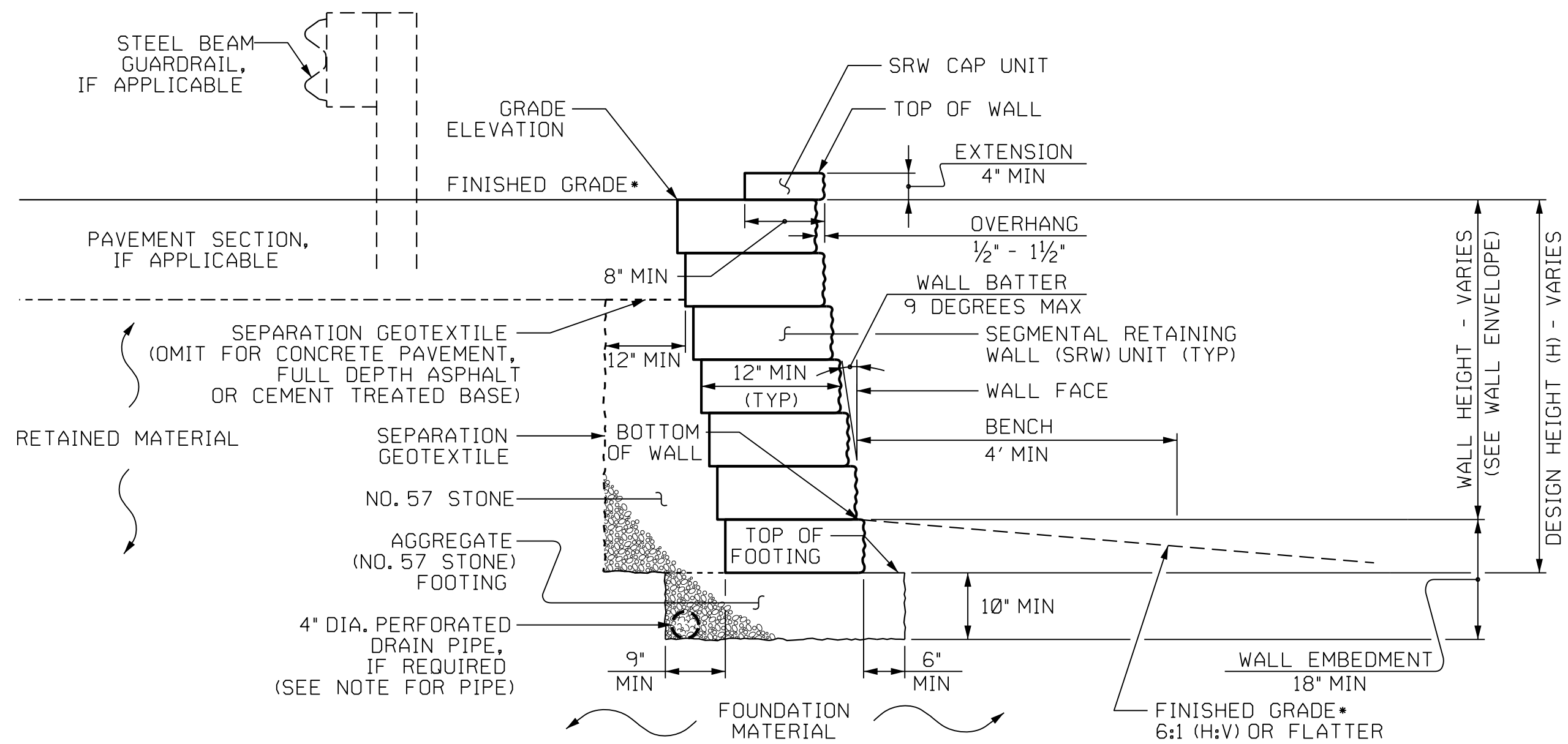
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 117+25.00 -L-
SHEET 13 OF 14

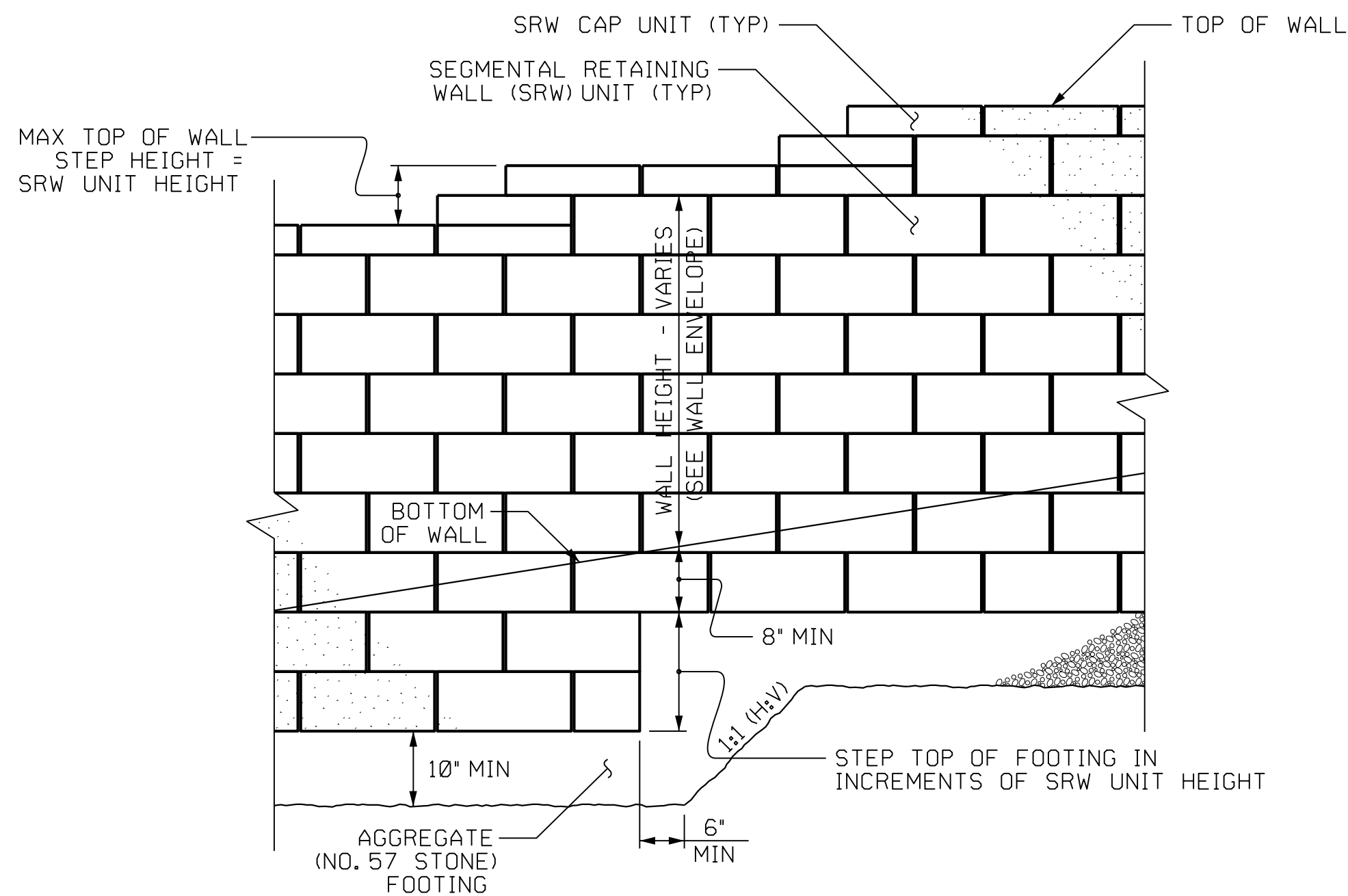
RETAINING WALL NO. 4
SEGMENTAL GRAVITY WALL
PLAN AND ENVELOPE VIEWS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MHS	12/24	3			W-13
2			4			



SEGMENTAL GRAVITY WALL - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



SEGMENTAL GRAVITY WALL - TYPICAL ELEVATION

GEOTECHNICAL
ENGINEER

Signed by:
C447682092314CC
SIGNATURE

12/17/2024
DATE

ENGINEER

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR SEGMENTAL GRAVITY RETAINING WALLS, SEE SECTION 454 OF THE STANDARD SPECIFICATIONS.

BEFORE BEGINNING SEGMENTAL GRAVITY WALL DESIGN FOR RETAINING WALL NO. 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 NO. 4 FOR DESIGN HEIGHTS EQUAL TO THE WALL HEIGHT PLUS DEPTH TO TOP OF FOOTING (DIFFERENCE BETWEEN GRADE ELEVATION AND TOP OF FOOTING ELEVATION).

DESIGN RETAINING WALL NO. 4 FOR THE FOLLOWING:

- 1) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 1,500 PSF
- 2) MINIMUM WALL EMBEDMENT ELEVATION = 18 IN (INCLUDES FOOTING)
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
RETAINED	120	30	0
FOUNDATION	120	30	0

DO NOT PLACE NO. 57 STONE FOR FOOTINGS FOR RETAINING WALL NO. 4 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

PROJECT NO.: U-5760
FORSYTH COUNTY
STATION: 117+25.00 -L-
SHEET 14 OF 14

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

RETAINING WALL NO. 4
SEGMENTAL GRAVITY WALL
NOTES AND TYPICAL
SECTIONS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1	MHS	12/24	3			W-14
2			4			

PREPARED BY: MHS	DATE: 9/24
REVIEWED BY: SCC	DATE: 9/24