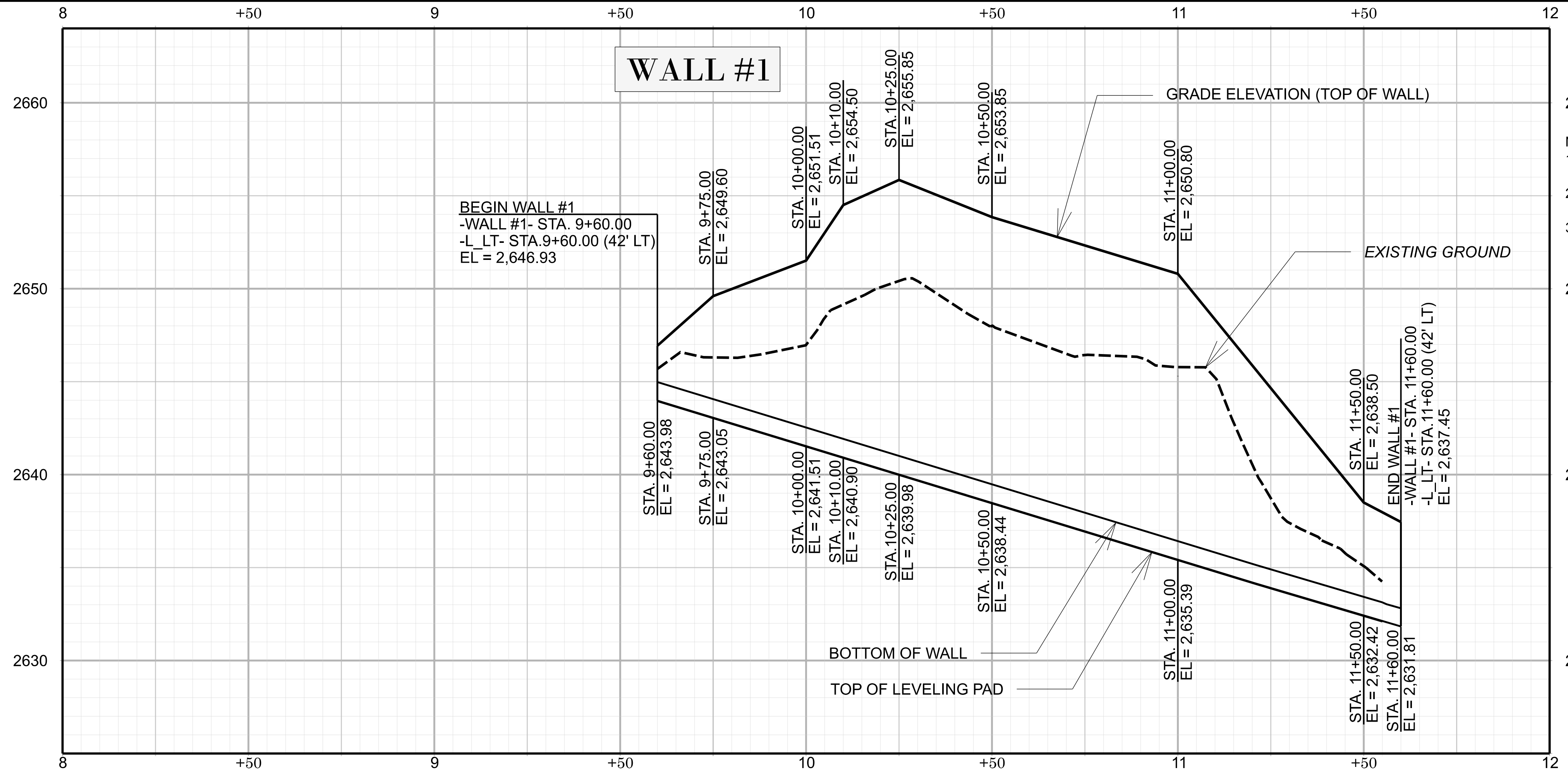
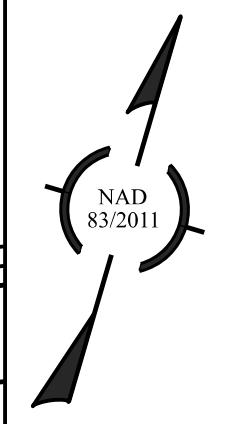
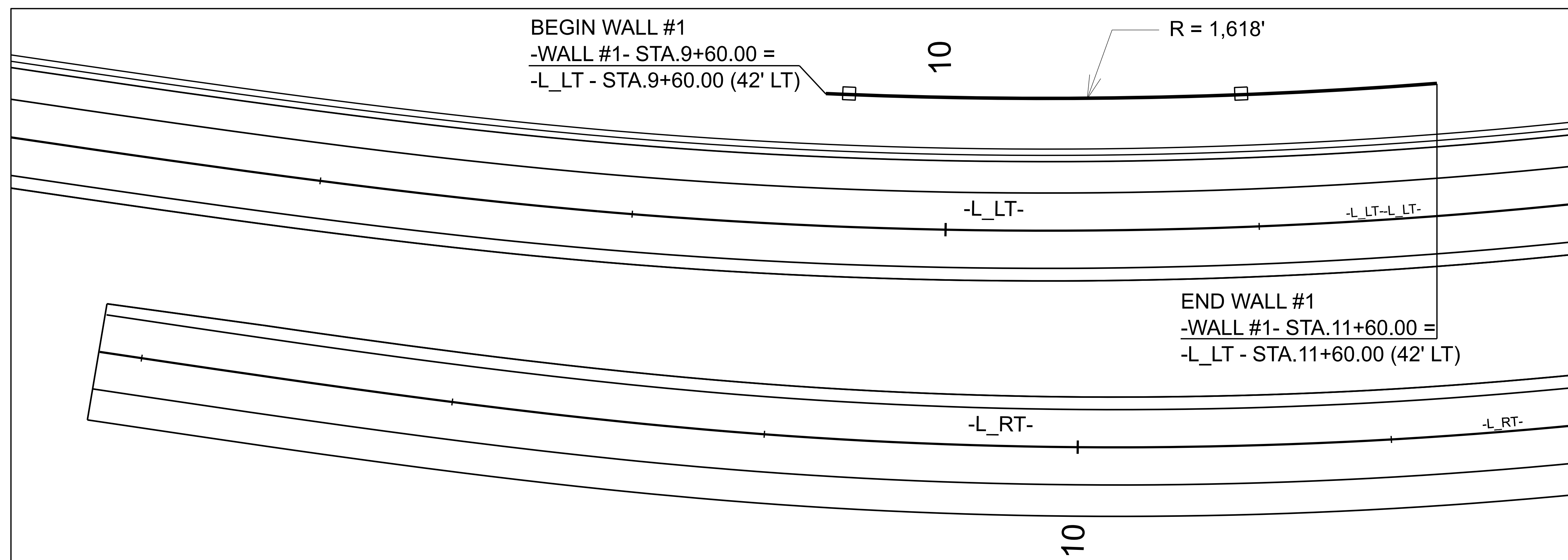


WALL #1 DETAIL SHEET



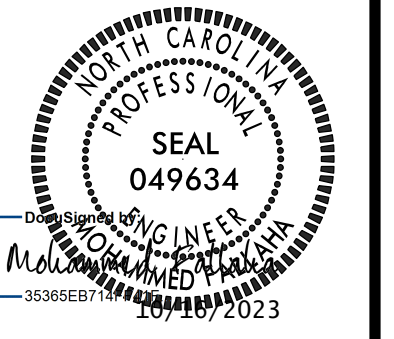
- NOTES:
1. APPROXIMATE WALL LENGTH = 200'
 2. APPROXIMATE WALL AREA = 2,175 SF
 3. TOP OF WALL ELEVATIONS DO NOT INCLUDE COPING

B-3186/B-5898

W-01

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 HAYWOOD COUNTY

ROADWAY DESIGN UNIT
 ROADWAY DESIGN ENGINEER



PREPARED BY
AECOM

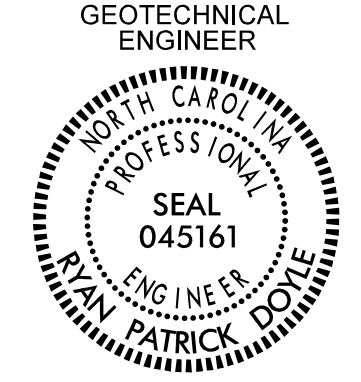
NC FIRM LICENSE No: F-0342
 5438 Wade Park Boulevard, Suite 200
 Raleigh, NC 27603
 (919) 854-6200 (PHONE) 854-6259 (FAX)

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-1A
---------------------------------------	-------------------

GEOTECHNICAL ENGINEER



SEAL
045161
RYAN PATRICK DOYLE
ENGINEER
STATE OF NORTH CAROLINA

DocuSigned by:
Ryan Patrick Doyle 11/9/2023

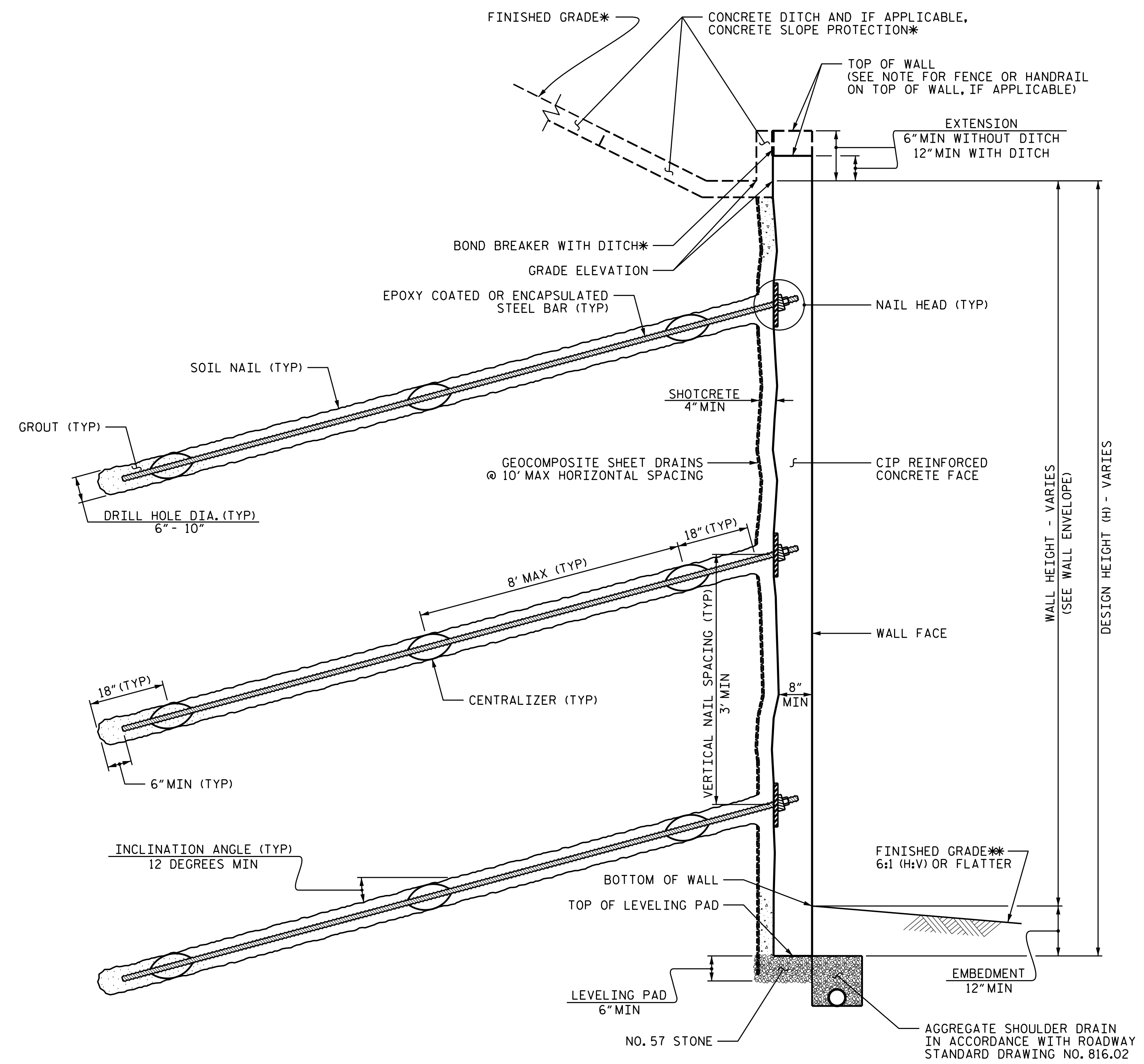
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AECOM

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
1	2,175	2	8



SOIL NAIL WALL (RETAINING WALL NO. 1) - TYPICAL SECTION

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

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

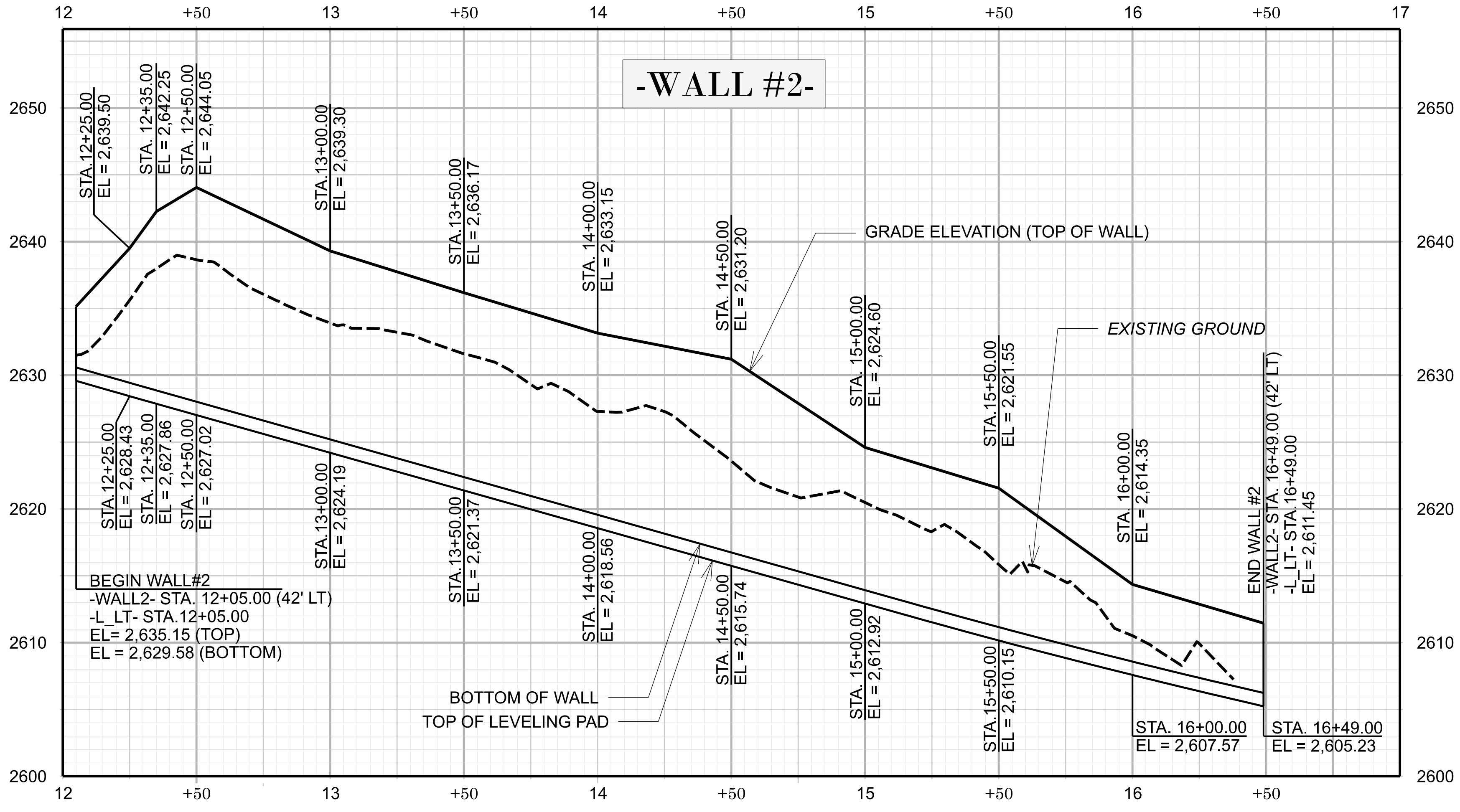
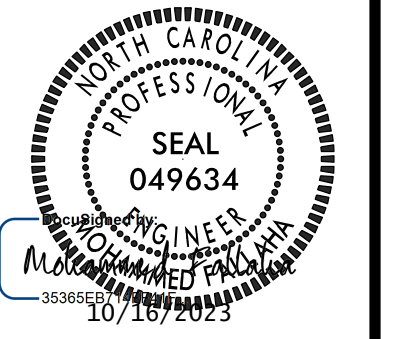
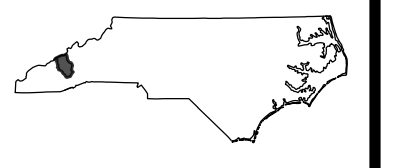
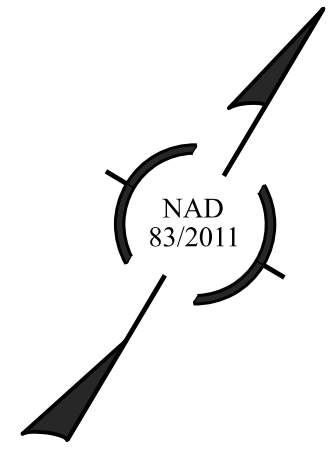
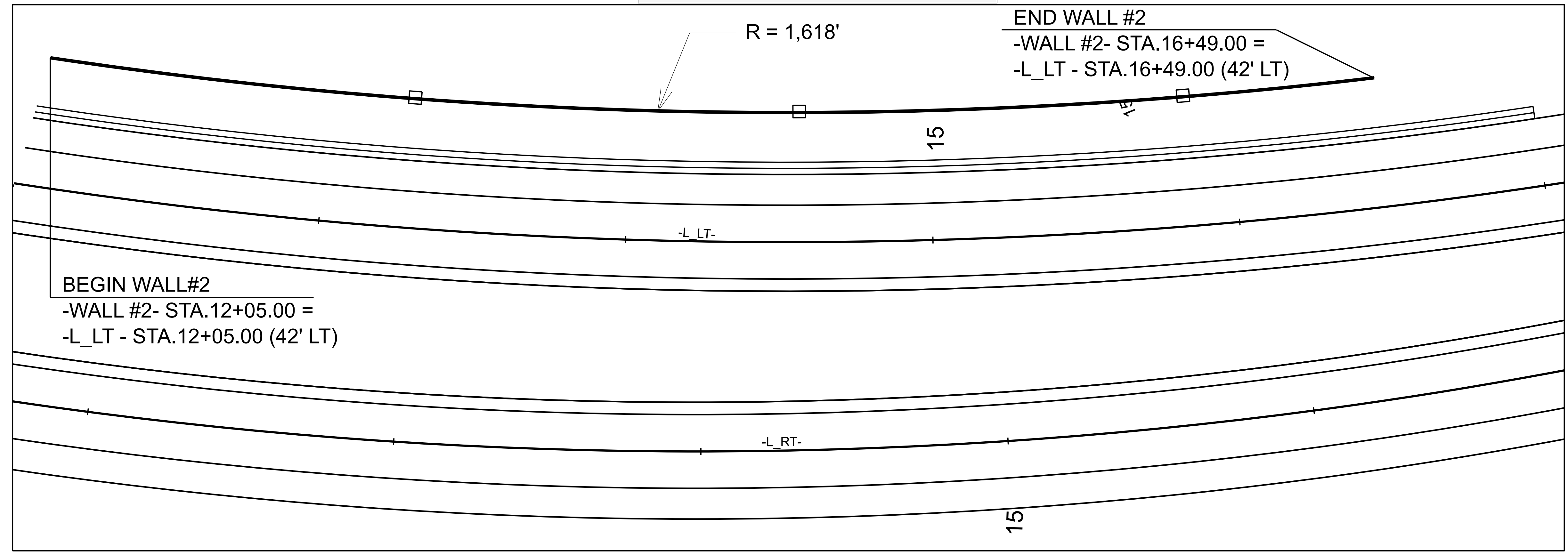
BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 1, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. 1 FOR THE FOLLOWING:

- 1) H = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS, ELEVATION ABOVE 2635 FT:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS BELOW ELEVATION 2635 FT:
UNIT WEIGHT, $\gamma = 115$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ PSF

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL NO. 1.

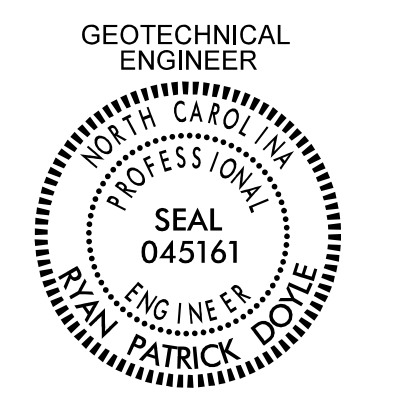
WALL #2 DETAIL SHEET



- NOTES:
1. APPROXIMATE WALL LENGTH = 444'
 2. APPROXIMATE WALL AREA = 5,155 SF
 3. TOP OF WALL ELEVATIONS DO NOT INCLUDE COPING

REVISIONS

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-24
---------------------------------------	-------------------

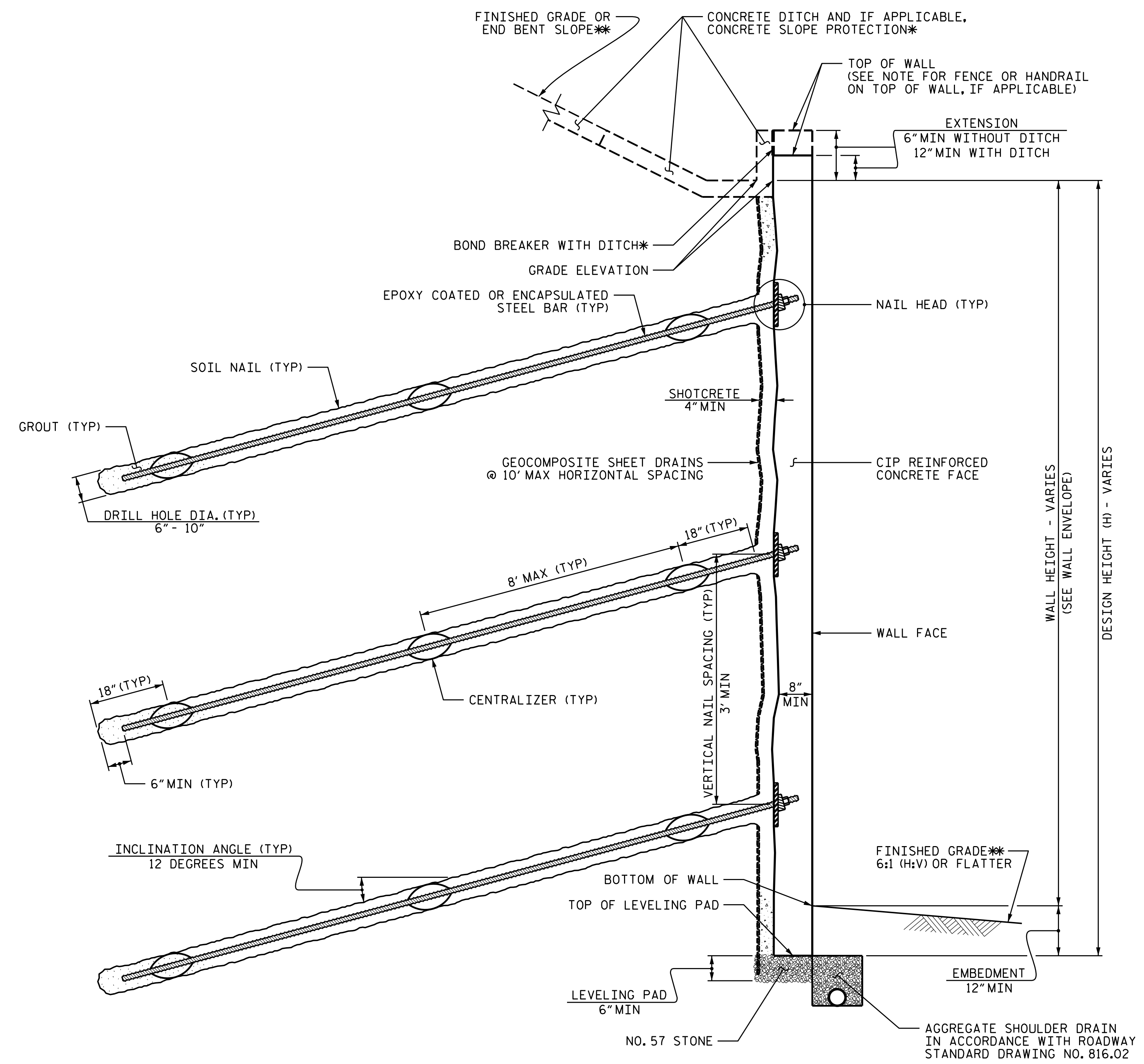
GEOTECHNICAL ENGINEER

 RYAN PATRICK DOYLE
 ENGINEER

DocuSigned by:
 Ryan Patrick Doyle
 11/9/2023

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

AECOM

ESTIMATED SOIL NAIL WALL QUANTITIES			
RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
2	5,155	2	18



NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING 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 WALL NO. 2 FOR THE FOLLOWING:

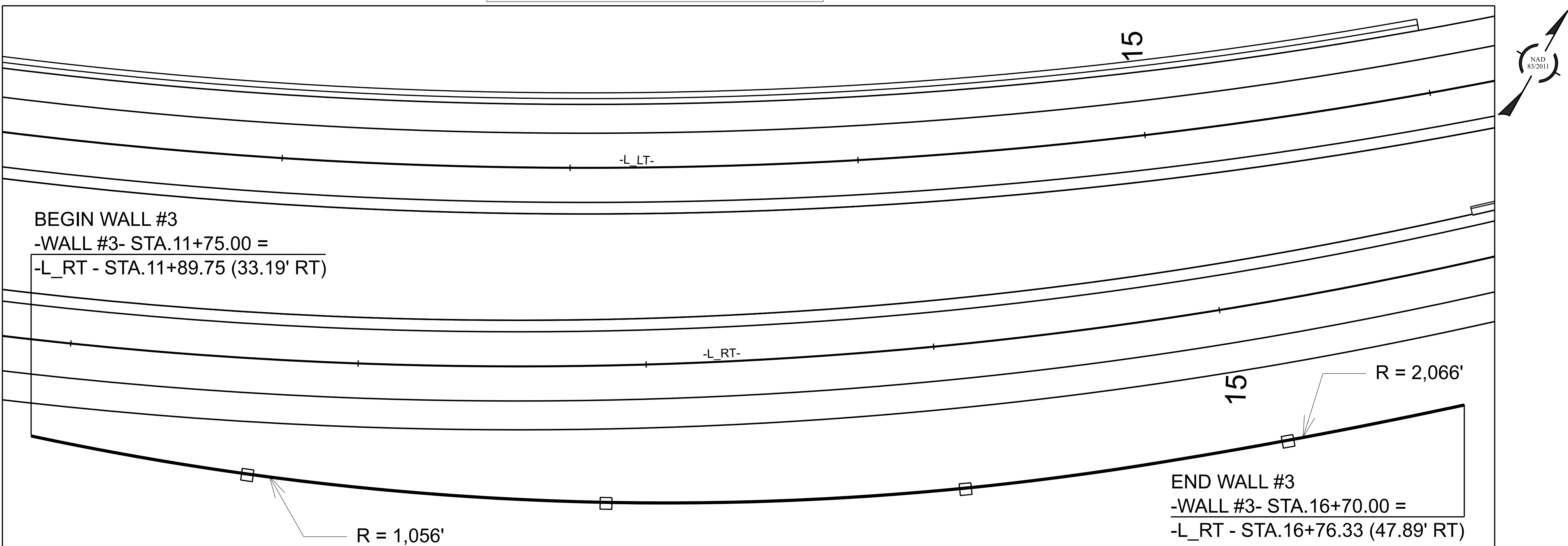
- 1) H = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS, ELEVATION ABOVE 2638 FT:
 UNIT WEIGHT, $\gamma = 110$ PCF
 FRICTION ANGLE, $\phi = 25$ DEGREES
 COHESION, $c = 0$ PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS, ELEVATION FROM 2623 FT TO 2638 FT:
 UNIT WEIGHT, $\gamma = 115$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF
- 5) IN-SITU ASSUMED MATERIAL PARAMETERS BELOW ELEVATION 2623 FT:
 UNIT WEIGHT, $\gamma = 115$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL NO. 2.

SOIL NAIL WALL (RETAINING WALL NO. 2) - TYPICAL SECTION

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

WALL #3 DETAIL SHEET



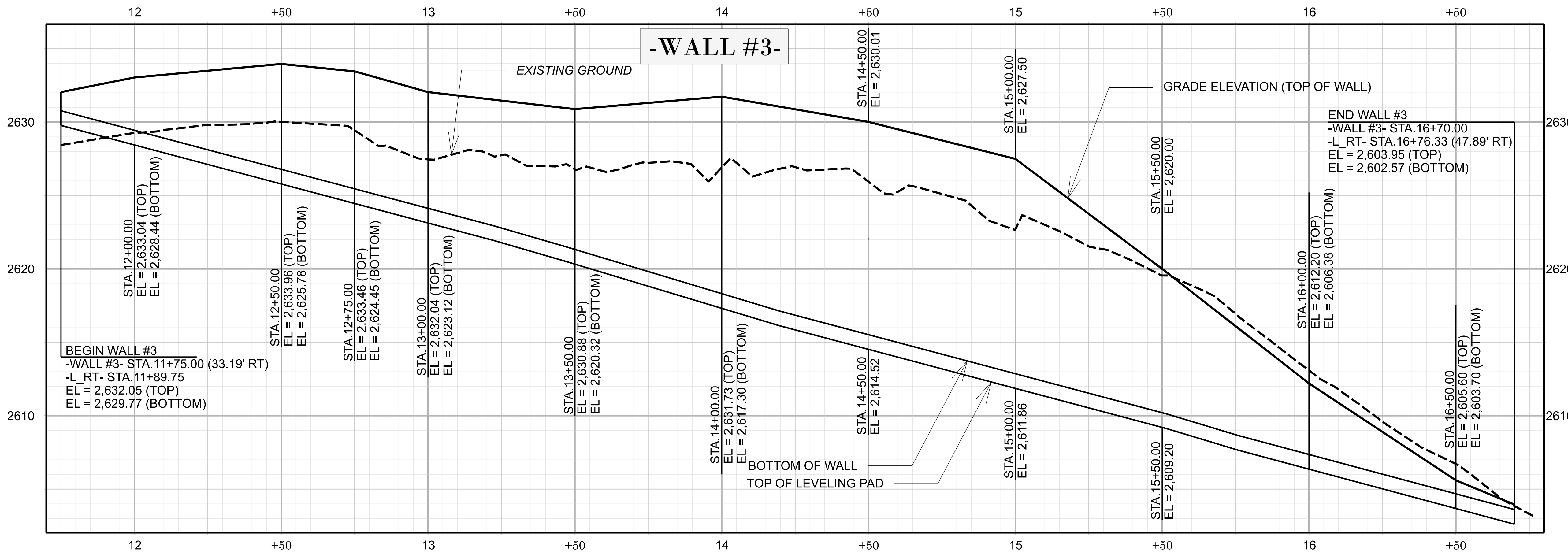
B-3186/B-5898
W-03
 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 HAYWOOD COUNTY

ROADWAY DESIGN UNIT
 ROADWAY DESIGN
 ENGINEER

SEAL
 049634
 10/16/2023

PREPARED BY
AECOM
 NC FIRM LICENSE No: F-0342
 5438 Wade Park Boulevard, Suite 200
 Raleigh, NC 27603
 (919) 854-6200 (TEL) 854-6259 (FAX)

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



- NOTES:
1. APPROXIMATE WALL LENGTH = 495'
 2. APPROXIMATE WALL AREA = 4,295 SF
 3. TOP OF WALL ELEVATIONS DO NOT INCLUDE COPING

REVISIONS

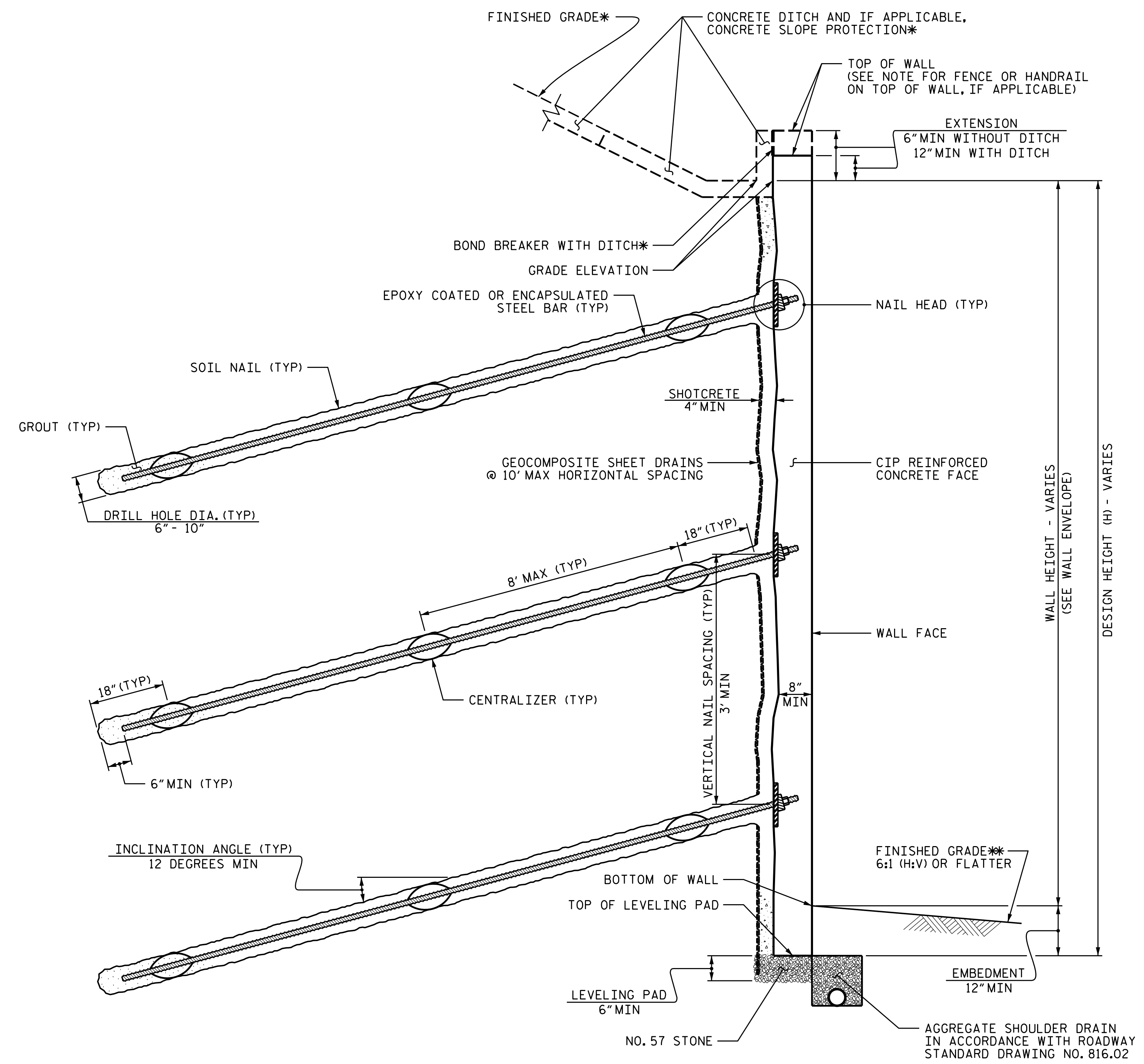
PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-3A
---------------------------------------	-------------------

GEOTECHNICAL ENGINEER
 RYAN PATRICK DOYLE
 SEAL 045161
 PROFESSIONAL ENGINEER
 NORTH CAROLINA

DocuSigned by:
 Ryan Patrick Doyle
 11/9/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
AECOM

ESTIMATED SOIL NAIL WALL QUANTITIES			
RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
3	4,295	2	10



SOIL NAIL WALL (RETAINING WALL NO. 3) - TYPICAL SECTION

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

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

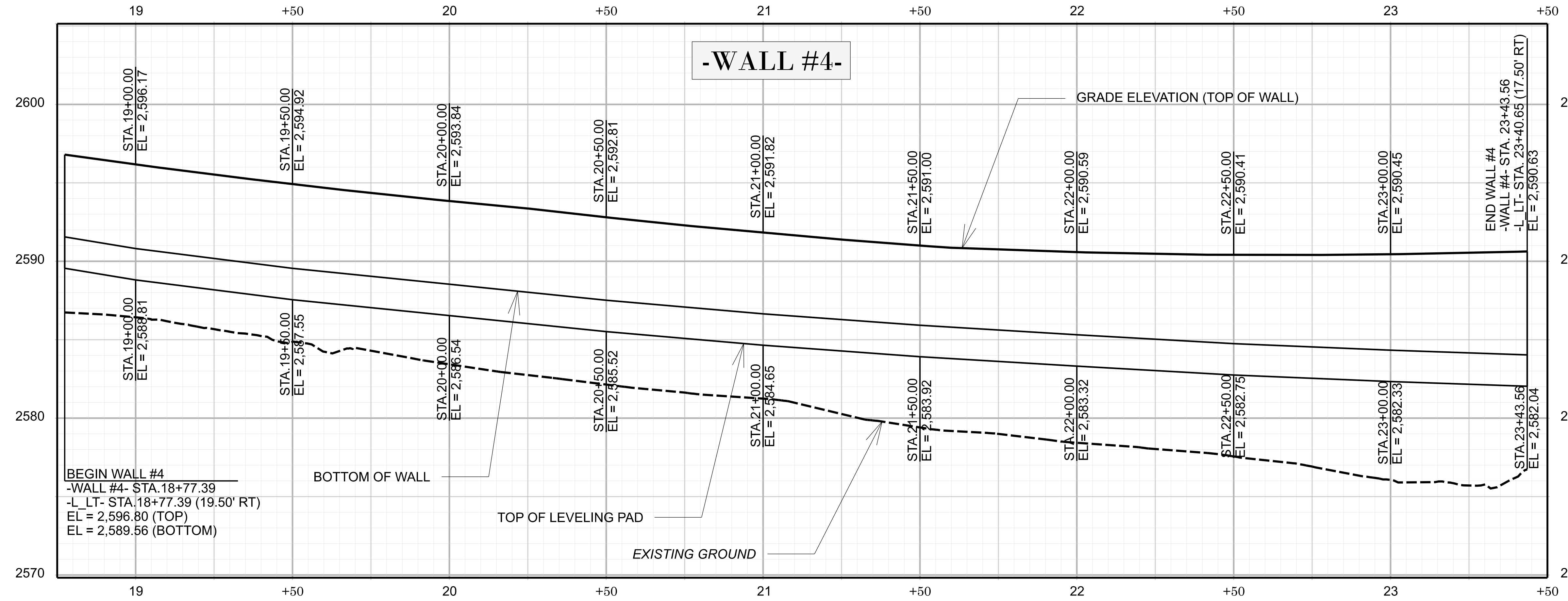
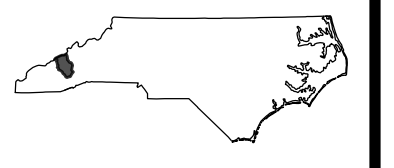
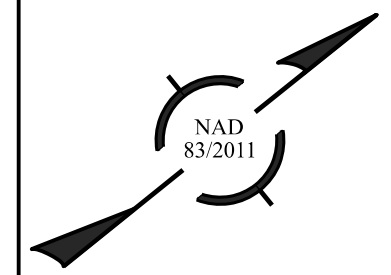
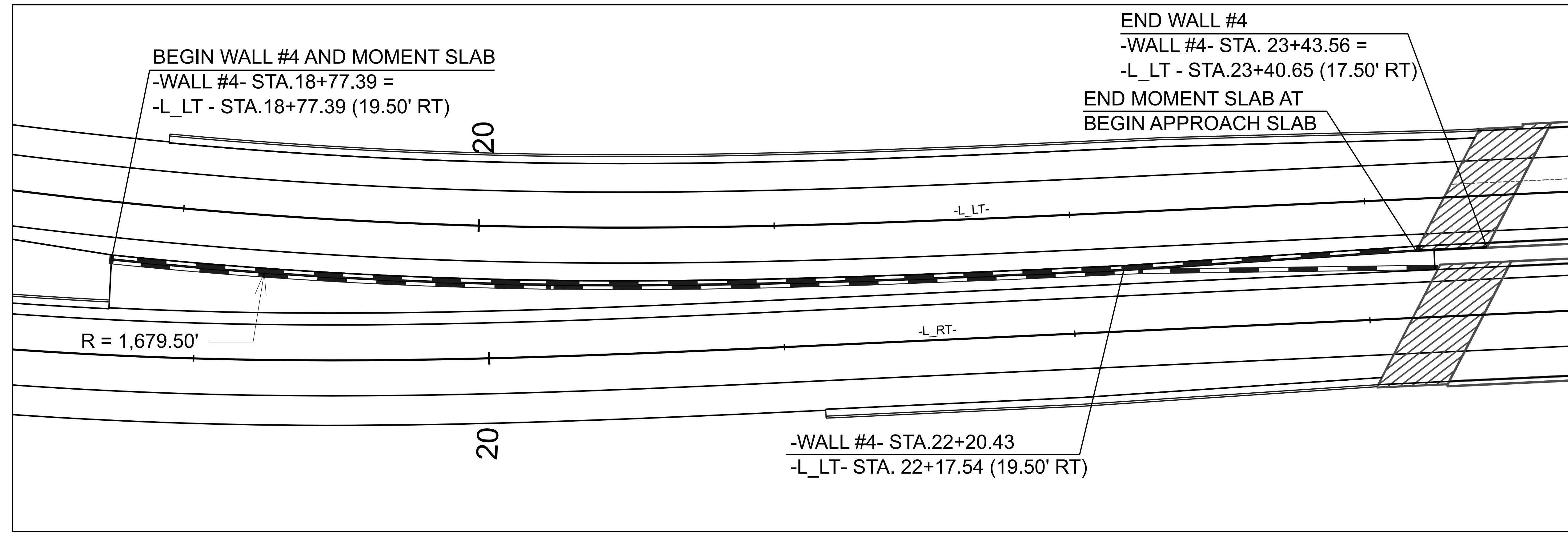
BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 3, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. 3 FOR THE FOLLOWING:

- 1) H = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS, ELEVATION ABOVE 2612 FT:
 UNIT WEIGHT, $\gamma = 115$ PCF
 FRICTION ANGLE, $\phi = 31$ DEGREES
 COHESION, $c = 0$ PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS BELOW ELEVATION 2612 FT:
 UNIT WEIGHT, $\gamma = 115$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF

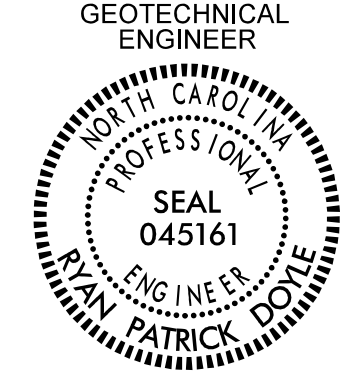

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL NO. 3.

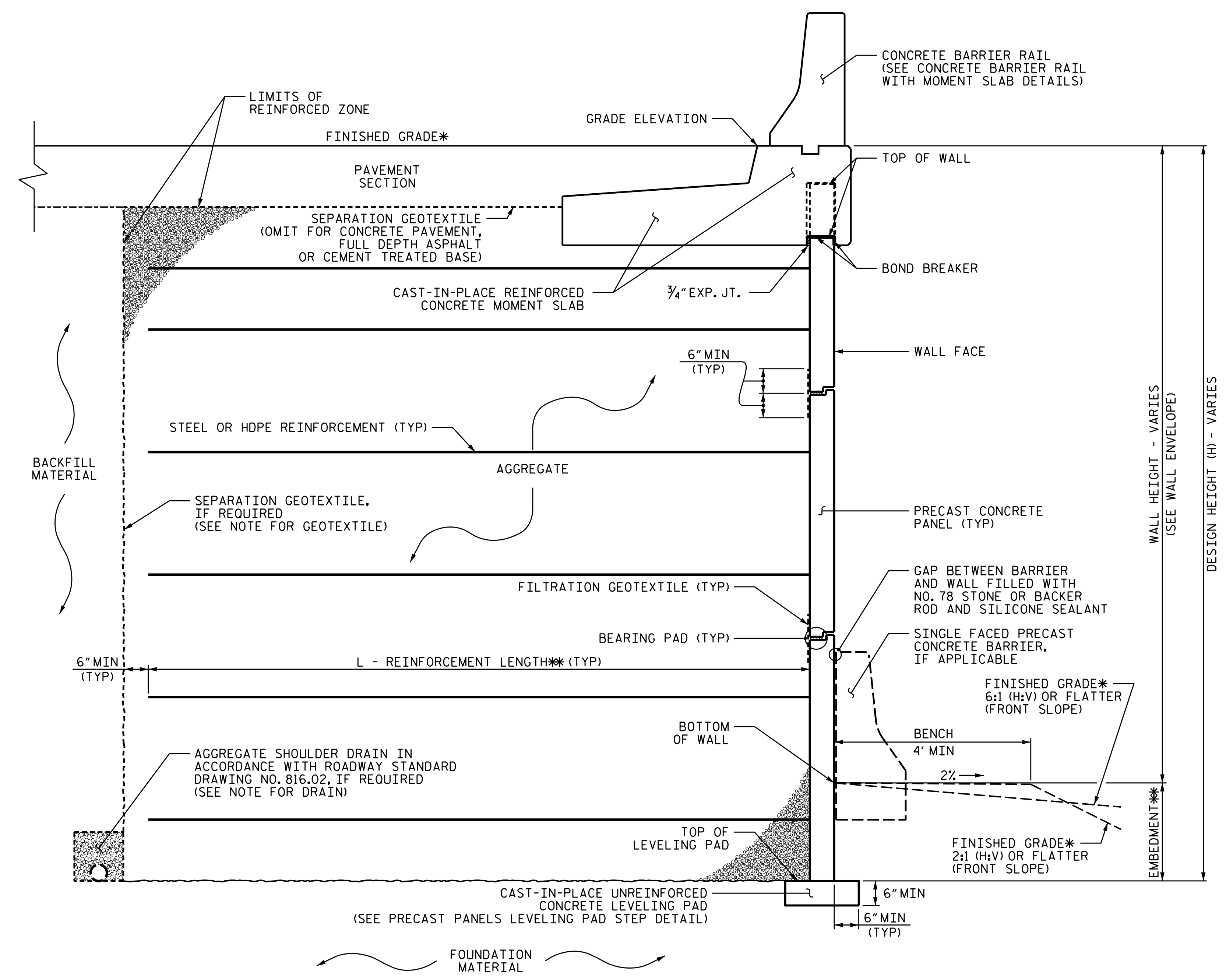
WALL #4 DETAIL SHEET



- NOTES:
1. APPROXIMATE WALL LENGTH = 466'
 2. APPROXIMATE WALL AREA = 2,535 SF
 3. TOP OF WALL ELEVATIONS DO NOT INCLUDE COPING
 4. MOMENT SLAB SHALL BE CONSTRUCTED PHASE IV.

REVISIONS

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-4A
GEOTECHNICAL ENGINEER  SEAL 045161 RYAN PATRICK DOYLE ENGINEER STATE OF NORTH CAROLINA	
DocuSigned by: Ryan Patrick Doyle 10/17/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	



MSE WALL (RETAINING WALL NO. 4) 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 REFERENCE NO. B-5898B-3186	SHEET NO. W-4B
---------------------------------------	-------------------

GEOTECHNICAL ENGINEER
STATE OF NORTH CAROLINA
PROFESSIONAL SEAL
045161
RYAN PATRICK DOYLE

DocuSigned by:
Ryan Patrick Doyle 11/9/2023

DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AECOM

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.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO. 4. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 4.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 4.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 4.

TO PREVENT STAINING AND DAMAGE DURING EXCAVATION OF OVERBUILD FILL, PROTECTION OF WALL FACING PANELS IS REQUIRED FOR RETAINING WALL NO. 4 WHERE PANELS WILL BE TEMPORARILY BURIED DURING CONSTRUCTION.

BEFORE BEGINNING MSE 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 THE FOLLOWING:

- 1) H = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 2425 PSF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.90 H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM WALL EMBEDMENT H/10.0 OR 2 FT, WHICHEVER IS GREATER
- 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
BACKFILL	120	30	0
FOUNDATION	120	30	0

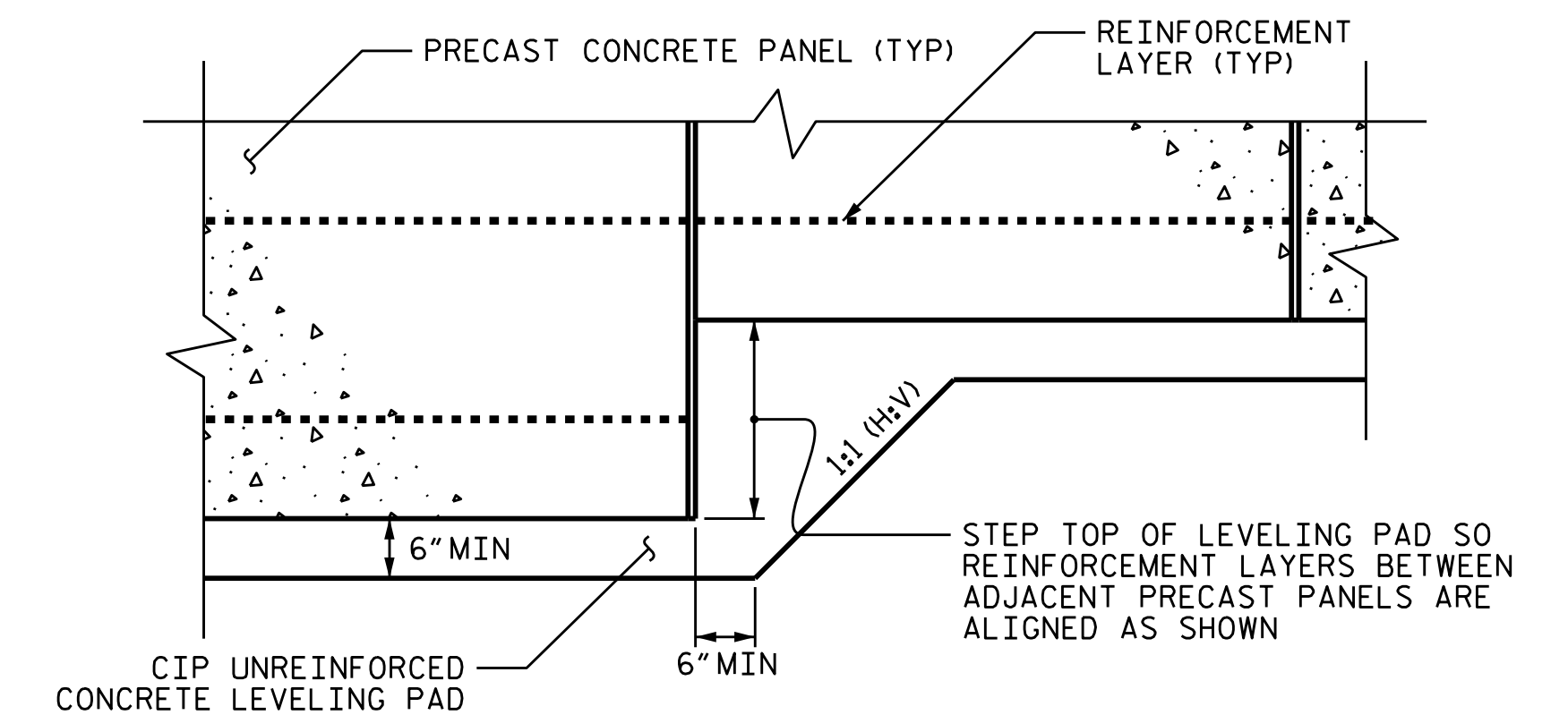
DESIGN RETAINING WALL NO. 4 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 4.

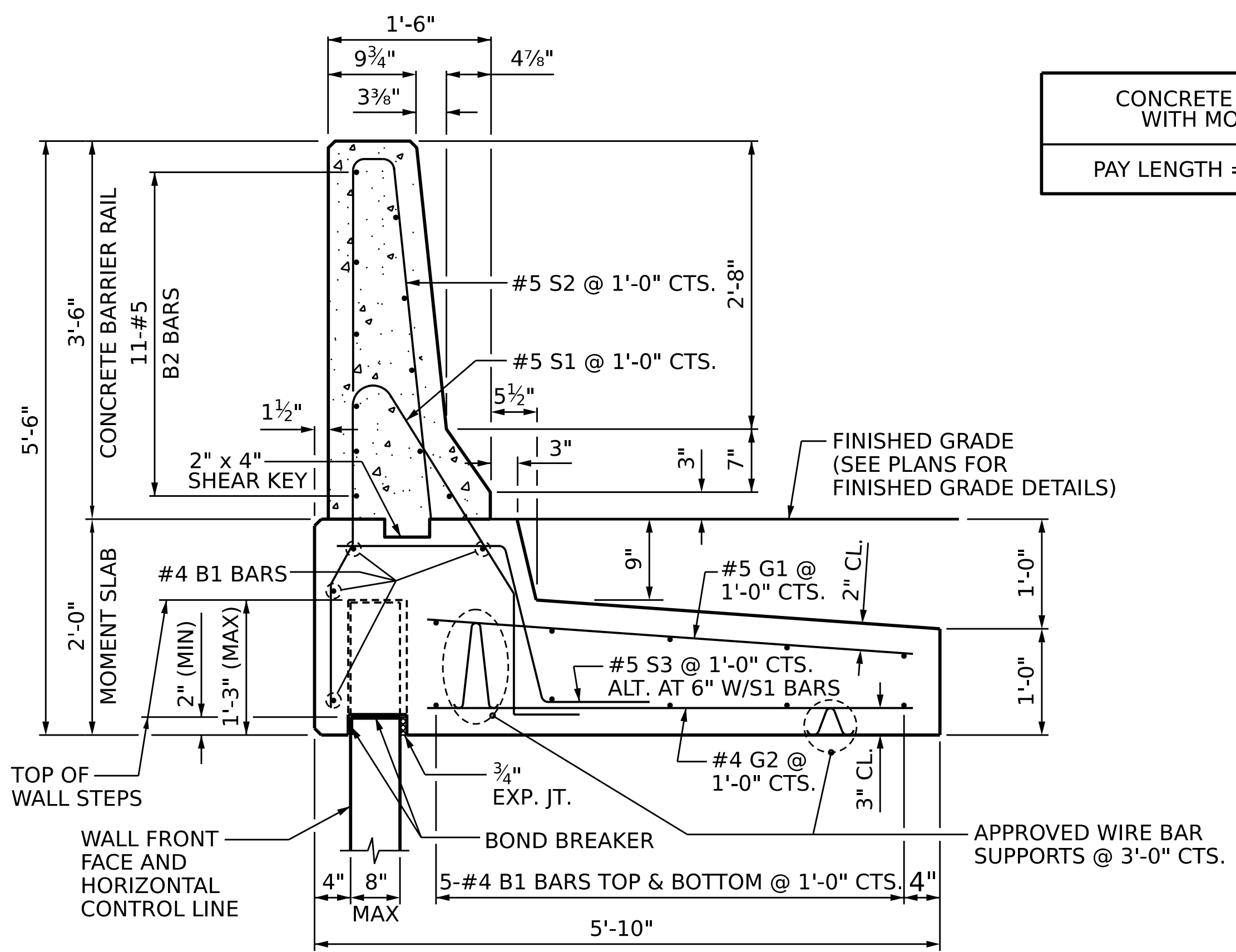
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 4 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO. 4. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 4	2,535

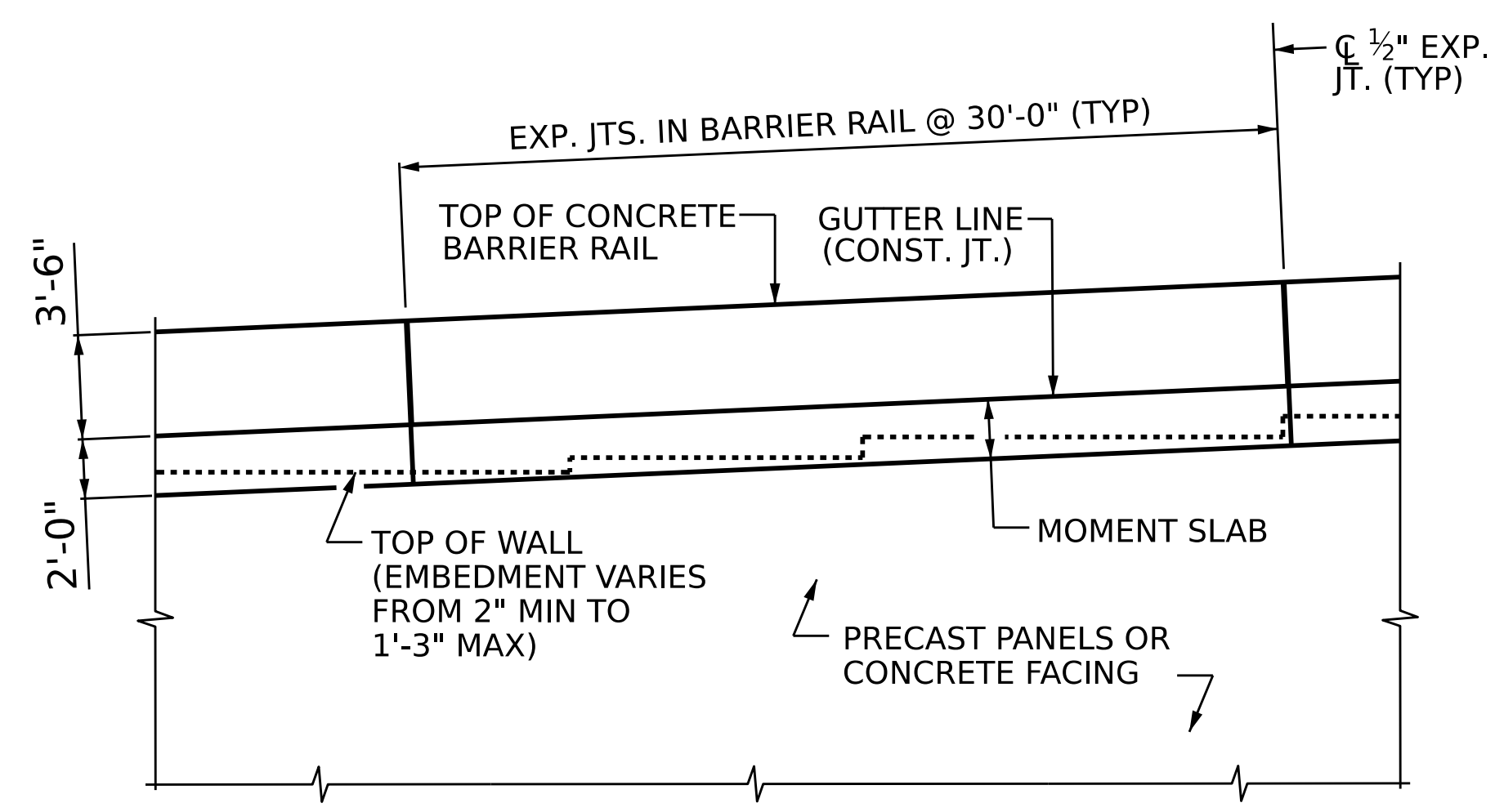


**PRECAST PANELS
LEVELING PAD STEP DETAIL**

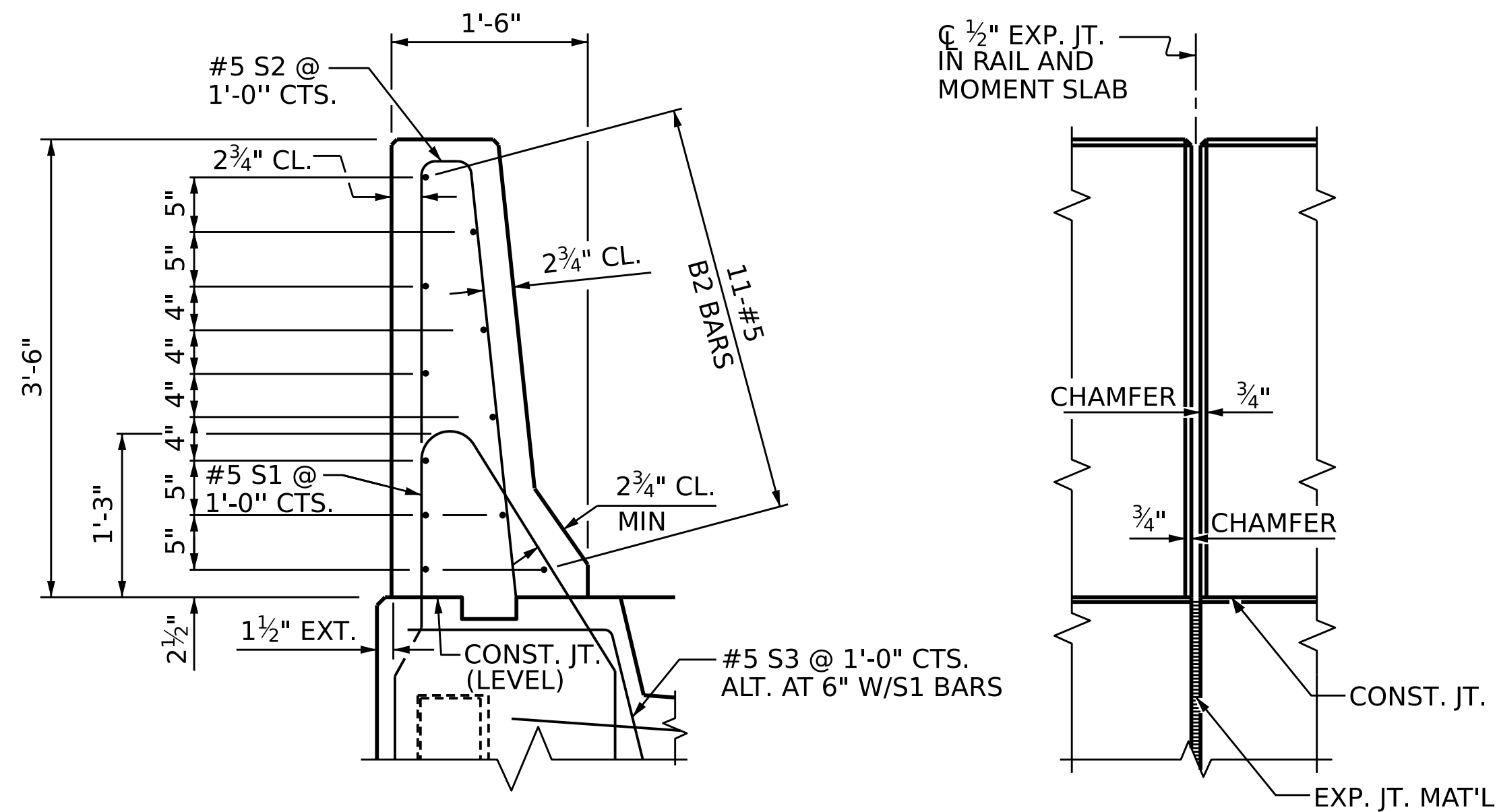


CONCRETE BARRIER RAIL WITH MOMENT SLAB
 PAY LENGTH = 443 LIN FT

CONCRETE BARRIER RAIL WITH MOMENT SLAB



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION



SECTION THRU RAIL

ELEV. @ EXP. JOINTS

BARRIER RAIL DETAILS

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE SECTION 460 OF THE STANDARD SPECIFICATIONS.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AT A MAXIMUM SPACING OF 30'.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

EXPANSION OR CONTRACTION JOINTS IN THE BARRIER RAIL AND MOMENT SLAB SHALL BE ALIGNED WITH JOINTS IN WALL FACING BELOW.

THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

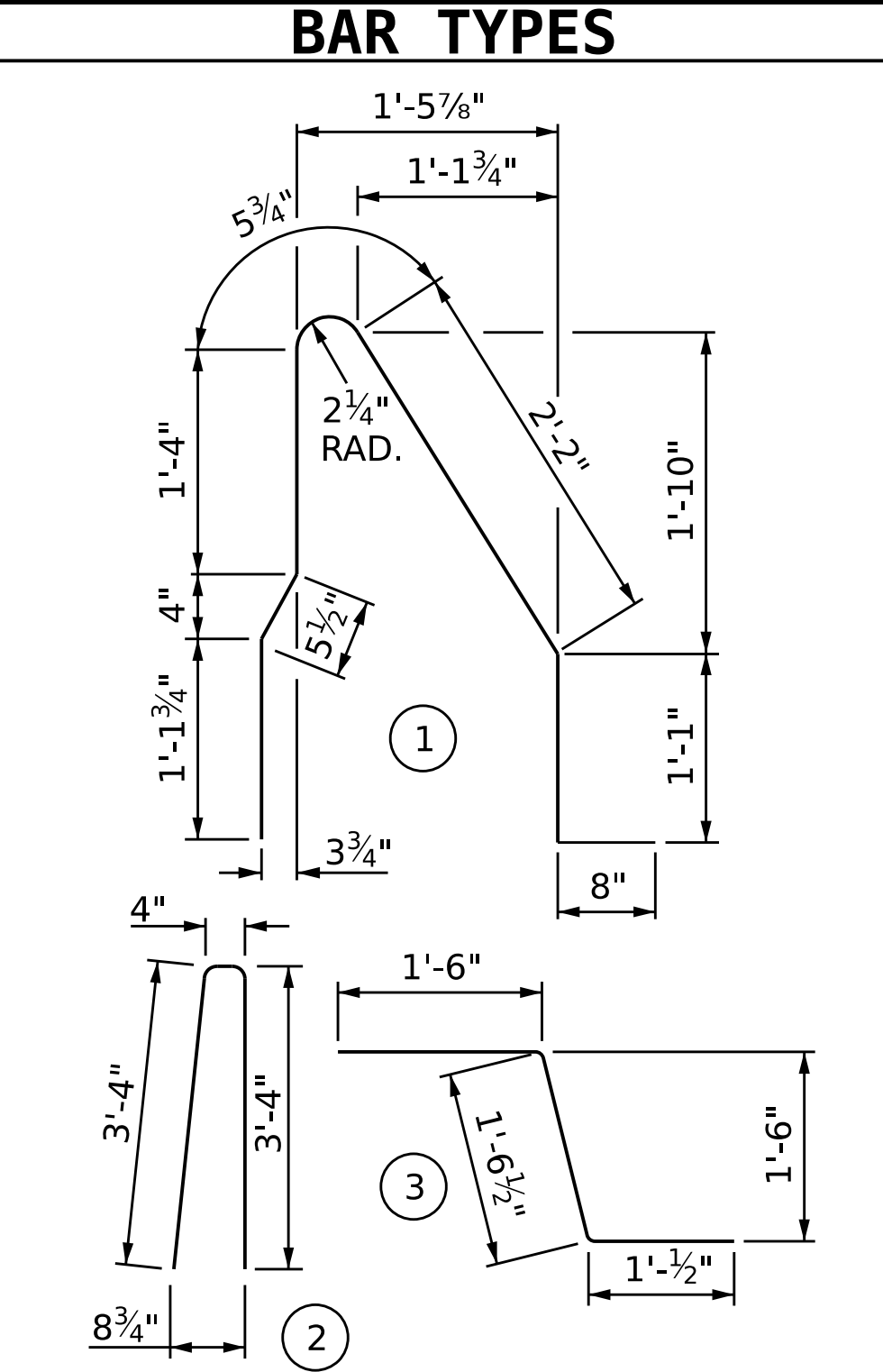
ALL REINFORCING STEEL IN THE BARRIER RAIL SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

MOMENT SLAB AND RAIL SHALL NOT BE CONSTRUCTED UNTIL PHASE IV IN ACCORDANCE WITH THE TMP PLANS. NO ADDITIONAL PAYMENT SHALL BE MADE FOR REMOVAL OF TEMPORARY FILL TO THE TOP OF THE MSE FILL.

STRUCTURE ENGINEER	ENGINEER
DocuSigned by: DATE: 10/16/2023	SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE 30'-0" SECTION OF CONCRETE BARRIER RAIL WITH MOMENT SLAB

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#4	STR	29'-7"	277
*B2	11	#5	STR	29'-7"	339
G1	31	#5	STR	4'-4"	140
G2	31	#4	STR	4'-4"	90
*S1	31	#5	1	7'-4"	237
*S2	31	#5	2	7'-0"	226
S3	30	#5	3	4'-1"	128

REINFORCING STEEL	635 LB
* EPOXY COATED REINFORCING STEEL	802 LB
CLASS AA CONCRETE BARRIER RAIL	4.1 CY
CLASS A CONCRETE MOMENT SLAB	9.1 CY
CONCRETE BARRIER RAIL WITH MOMENT SLAB	30 LIN FT

PROJECT NO.: B-3186/B-5898
HAYWOOD COUNTY
 STATION: 68+82.30 -L_ LT-
 SHEET 3 OF 3 WALL ID RW-4-

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

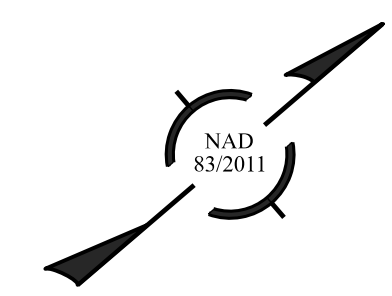
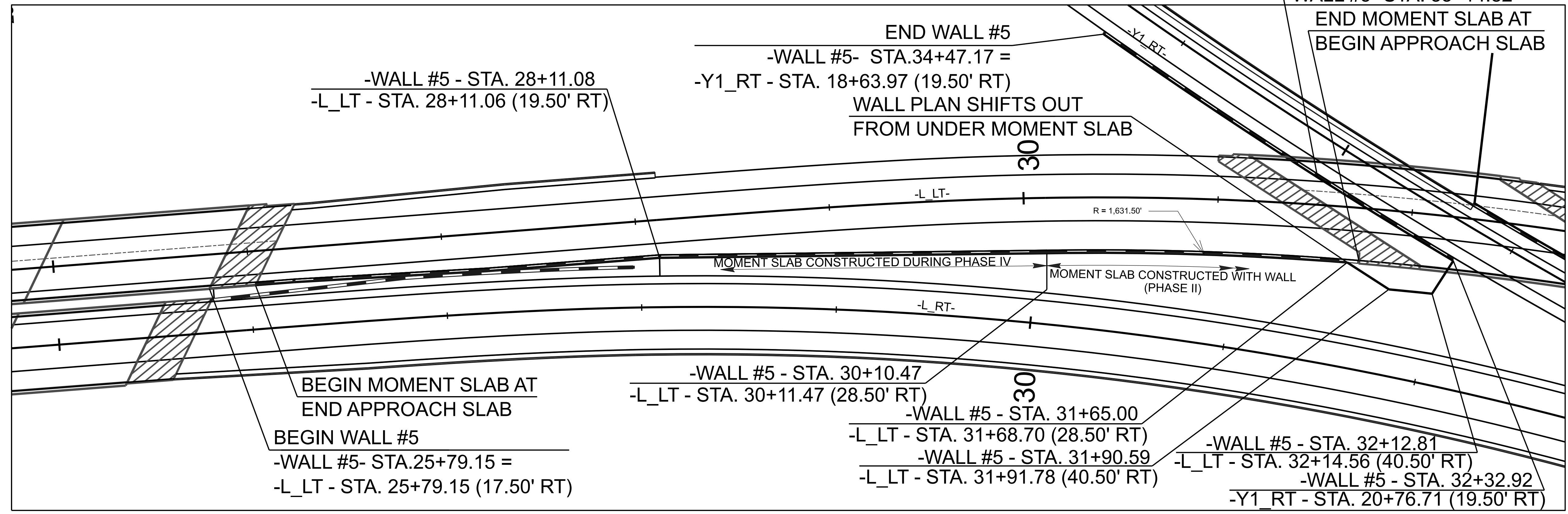
CONCRETE BARRIER RAIL WITH MOMENT SLAB FOR PRECAST PANELS AND CONCRETE FACING

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

PREPARED BY: L. LEE DATE: 07/2023
 REVIEWED BY: G. COLS DATE: 07/2023

WALL #5 DETAIL SHEET

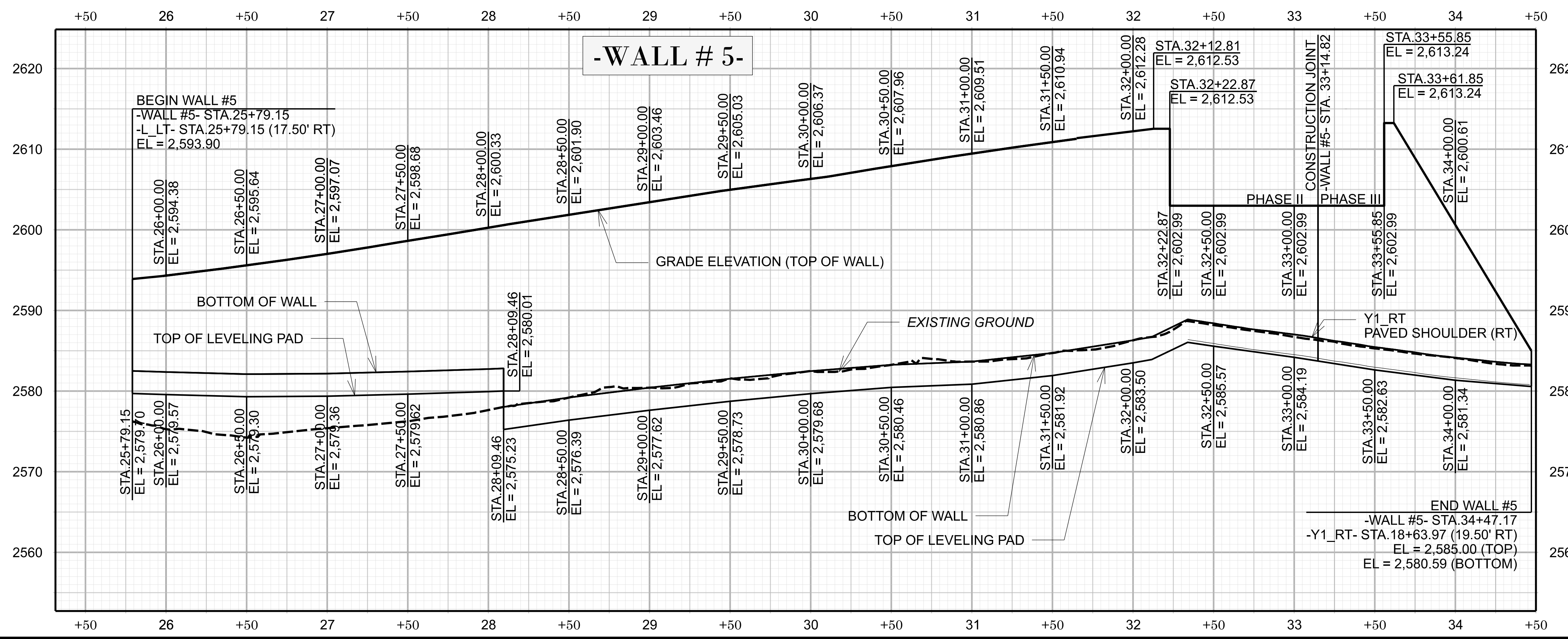
WALL CONSTRUCTION JOINT
-WALL #5- STA. 33+14.82



B-3186/B-5898
W-05
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY
ROADWAY DESIGN UNIT
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 049634
10/10/2023



PREPARED BY
AECOM
NC FIRM LICENSE No: F-0342
5438 Wade Park Boulevard, Suite 200
Raleigh, NC 27603
(919) 854-6200 (TEL) 854-6259 (FAX)

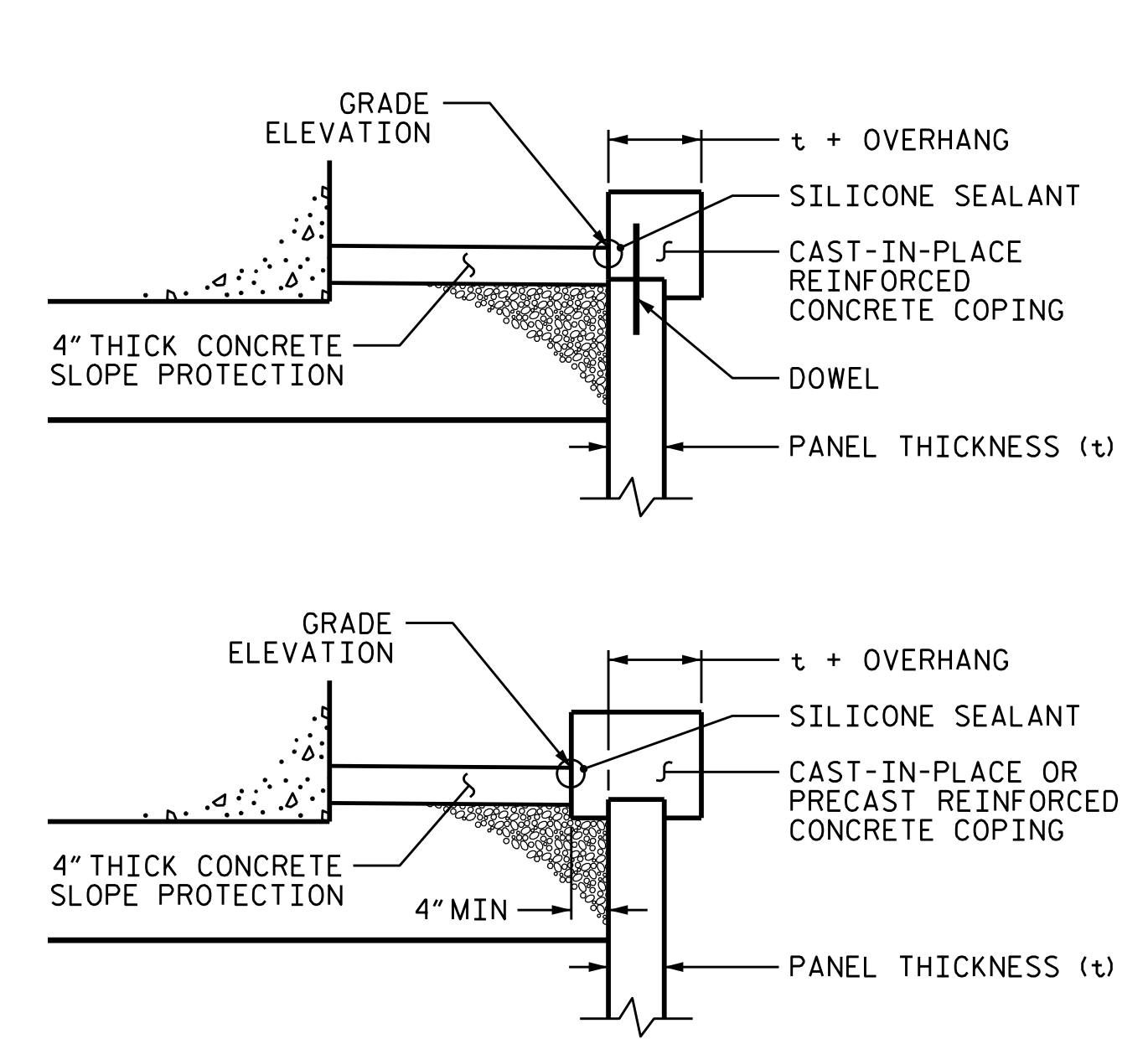
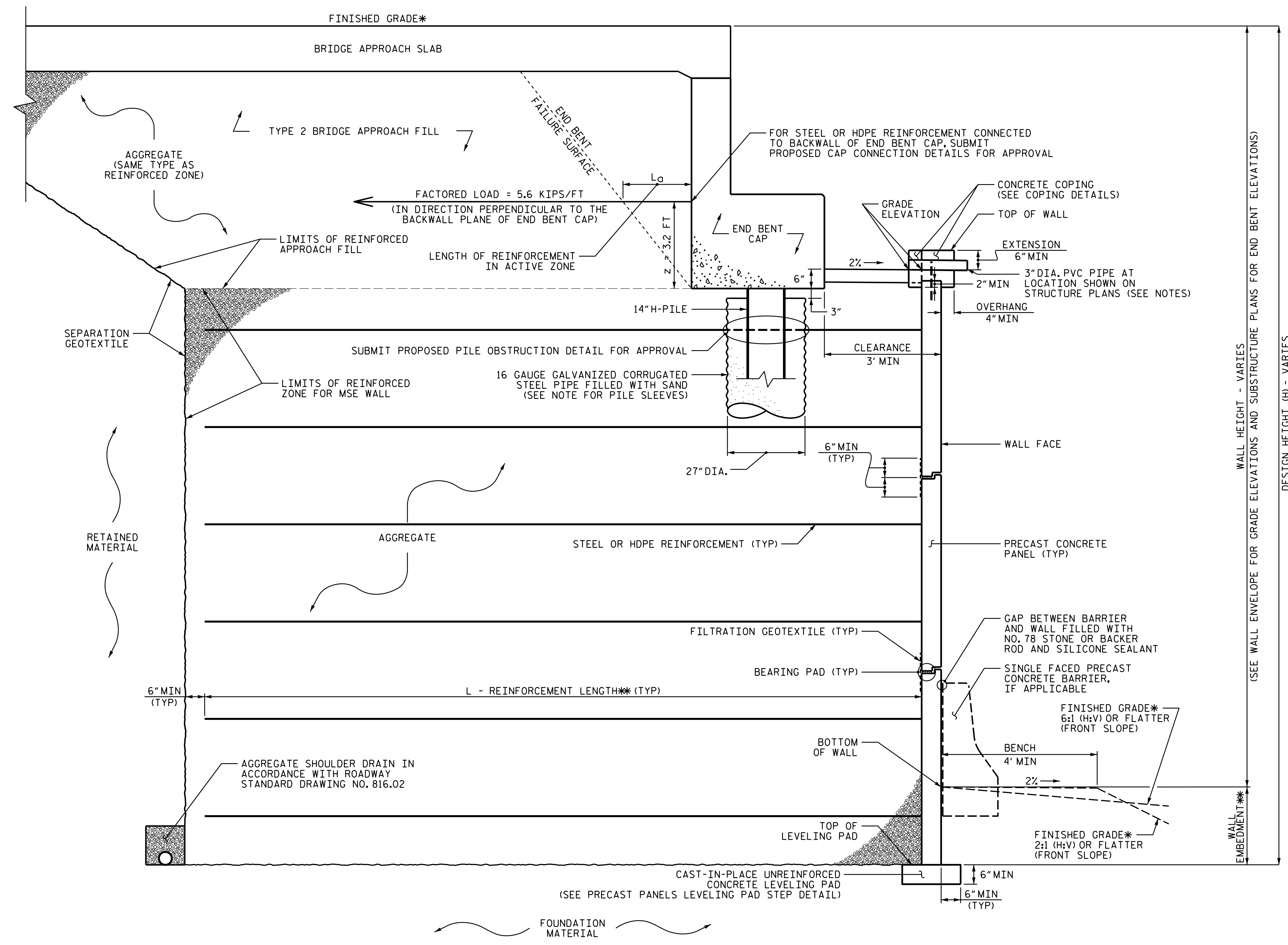
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



- NOTES:
1. APPROXIMATE WALL LENGTH = 868'
 2. APPROXIMATE WALL AREA = 16,980 SF
 3. TOP OF WALL ELEVATIONS DO NOT INCLUDE COPING

REVISIONS

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-5B
GEOTECHNICAL ENGINEER  SEAL 045161 RYAN PATRICK DOYLE	
DocuSigned by: Ryan Patrick Doyle 10/17/2023 <small>DocuSign Envelope ID: BE63BEC1-AB17-443E-BD04-F2007AB2903B</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED 	

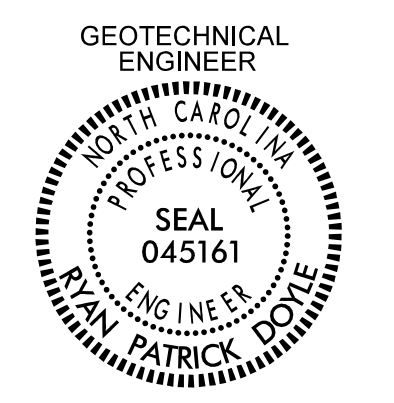



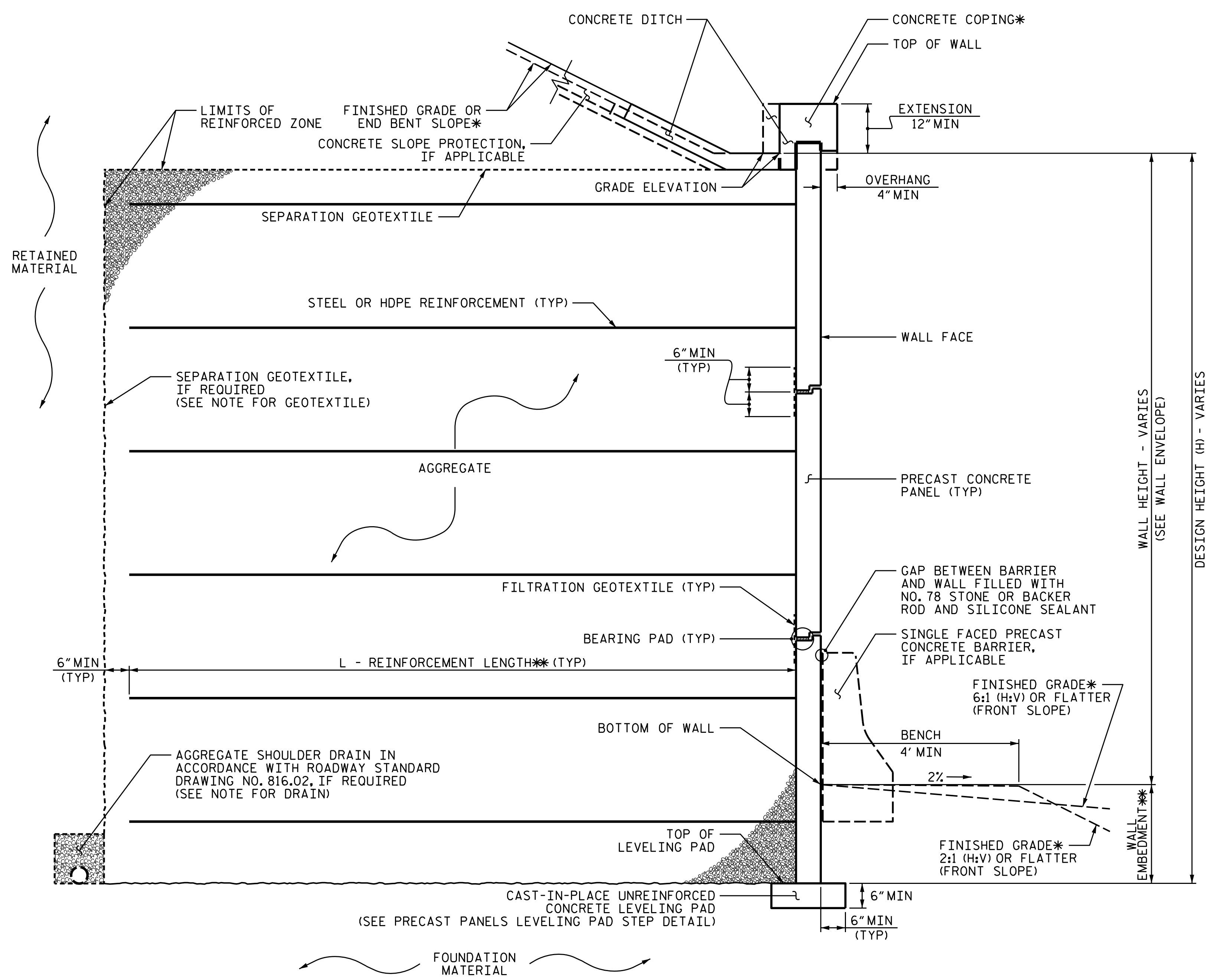
COPING DETAILS

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

MSE ABUTMENT WALL (RETAINING WALL NO. 5) WITH PRECAST PANELS - TYPICAL SECTION

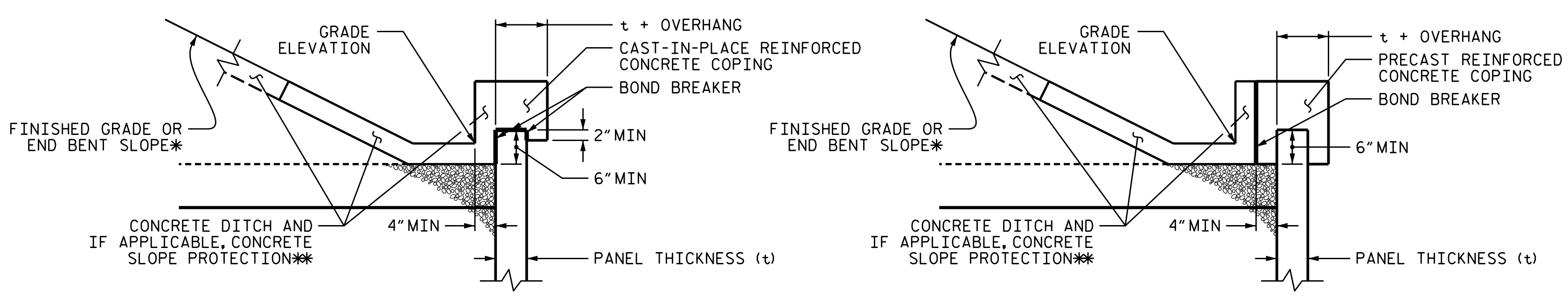
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE,
 MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-5C
GEOTECHNICAL ENGINEER  SEAL 045161 RYAN PATRICK DOYLE ENGINEER	
DocuSigned by: Ryan Patrick Doyle 10/17/2023 SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	



MSE WALL (RETAINING WALL NO. 5) 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.



COPING DETAILS

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

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-5D
---------------------------------------	-------------------

GEOTECHNICAL ENGINEER

PROFESSIONAL SEAL
045161
REG. IN THE STATE OF NORTH CAROLINA
R. PATRICK DOYLE

DocuSigned by:
Ryan Patrick Doyle 11/9/2023

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

AECOM

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.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO. 5. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 5.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 5.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 5.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.1 LOCATED AT STATION 31+56.00.

TO PREVENT STAINING AND DAMAGE DURING EXCAVATION OF OVERBUILD FILL, PROTECTION OF WALL FACING PANELS IS REQUIRED FOR RETAINING WALL NO.5 WHERE PANELS WILL BE TEMPORARILY BURIED DURING CONSTRUCTION.

A TEMPORARY PIEZOMETER SHALL BE INSTALLED IN FRONT OF RETAINING WALL NO.5 TO MONITOR PORE PRESSURE DISSIPATION DURING FILL PLACEMENT AND CONSTRUCTION AT L.LT STA. 31+59 14' LT

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.5, 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.5 FOR THE FOLLOWING:

- 1) H = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6750 PSF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.80 H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM WALL EMBEDMENT H/10.0 OR 2 FT, WHICHEVER IS GREATER
- 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
BACKFILL	120	30	0
FOUNDATION	115	30	0

DESIGN RETAINING WALL NO. 5 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 LOCATED AT STATION 31+56.00. MAINTAIN A CLEARANCE OF AT LEAST 3' BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

INSTALL PILE SLEEVES BEFORE CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AT END BENT NO.1. OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP ELEVATION. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS. FOR PILE SLEEVES, SEE MSE RETAINING WALL PLANS AND PROVISION. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

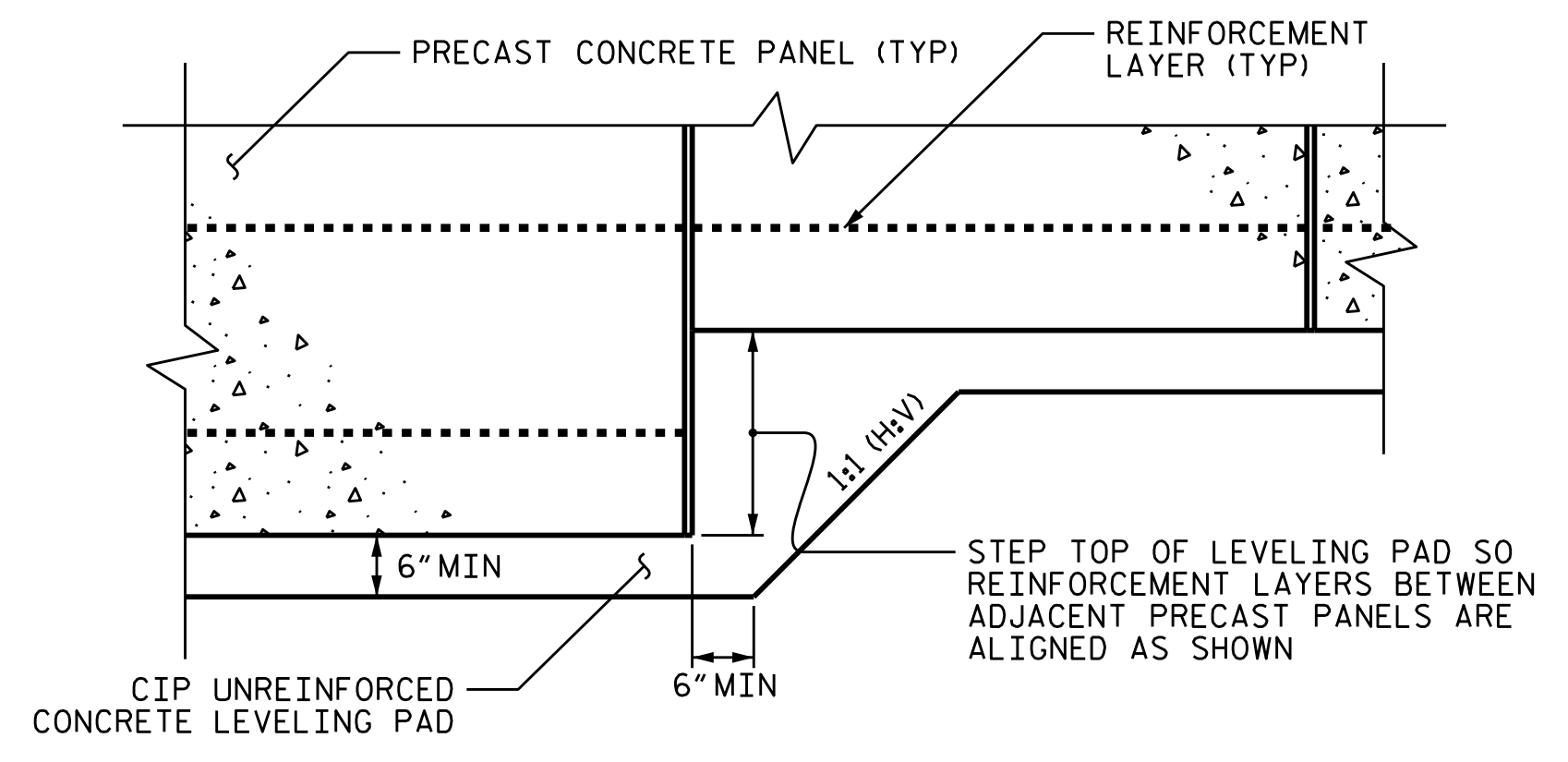
INSTALL PVC PIPE THROUGH MSE WALL COPING AT LOCATIONS SHOWN ON STRUCTURE PLANS. INVERT OF PVC PIPE SHALL BE FLUSH WITH BOTTOM OF PAVED SLOPE PROTECTION. EXTEND PIPE 4" BEYOND FACE OF COPING. PVC PIPE MATERIAL, LABOR, AND INCIDENTALS ARE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE WALL.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 31+56.00 WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 5. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.5 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 NO.5. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

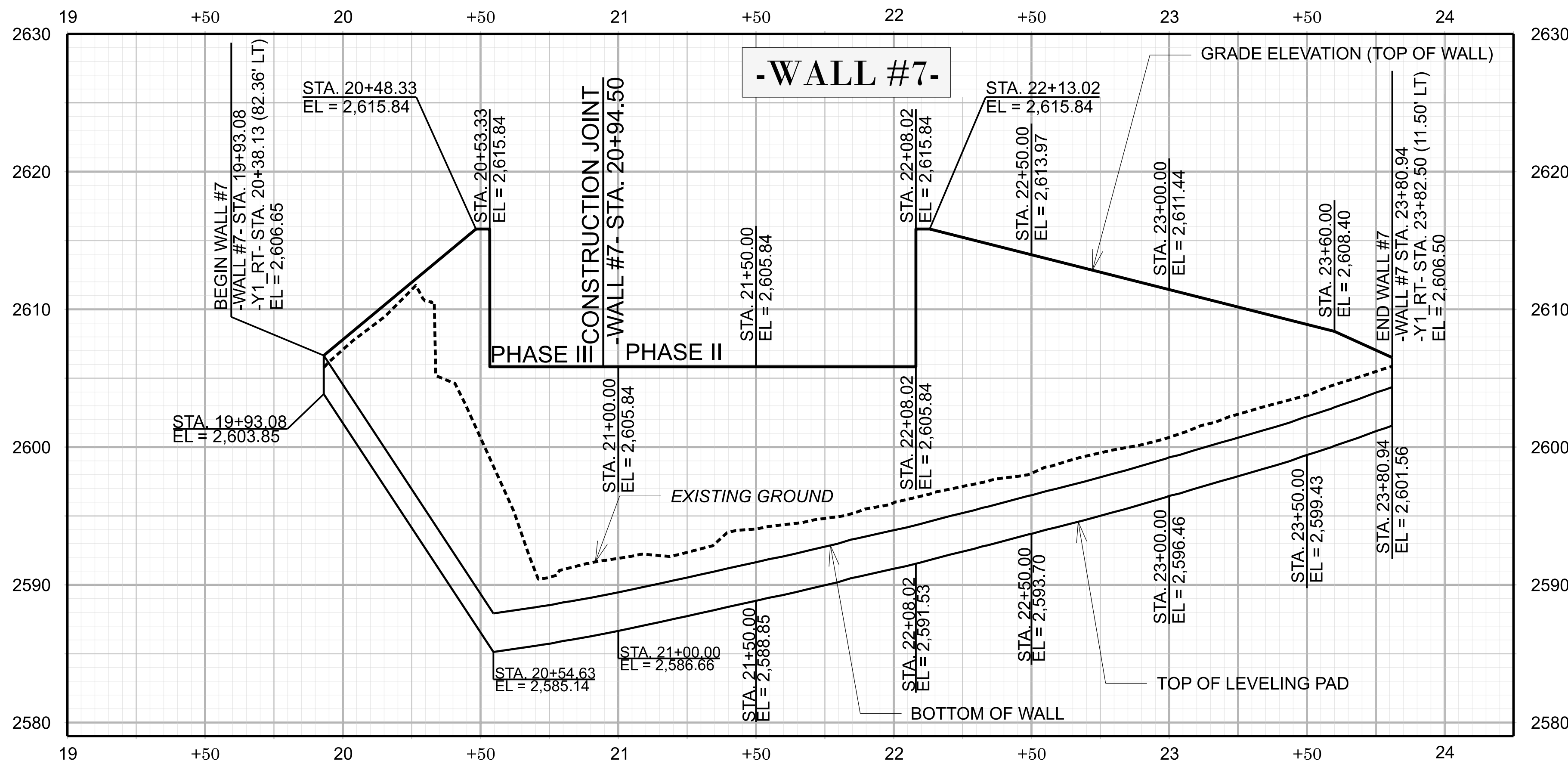
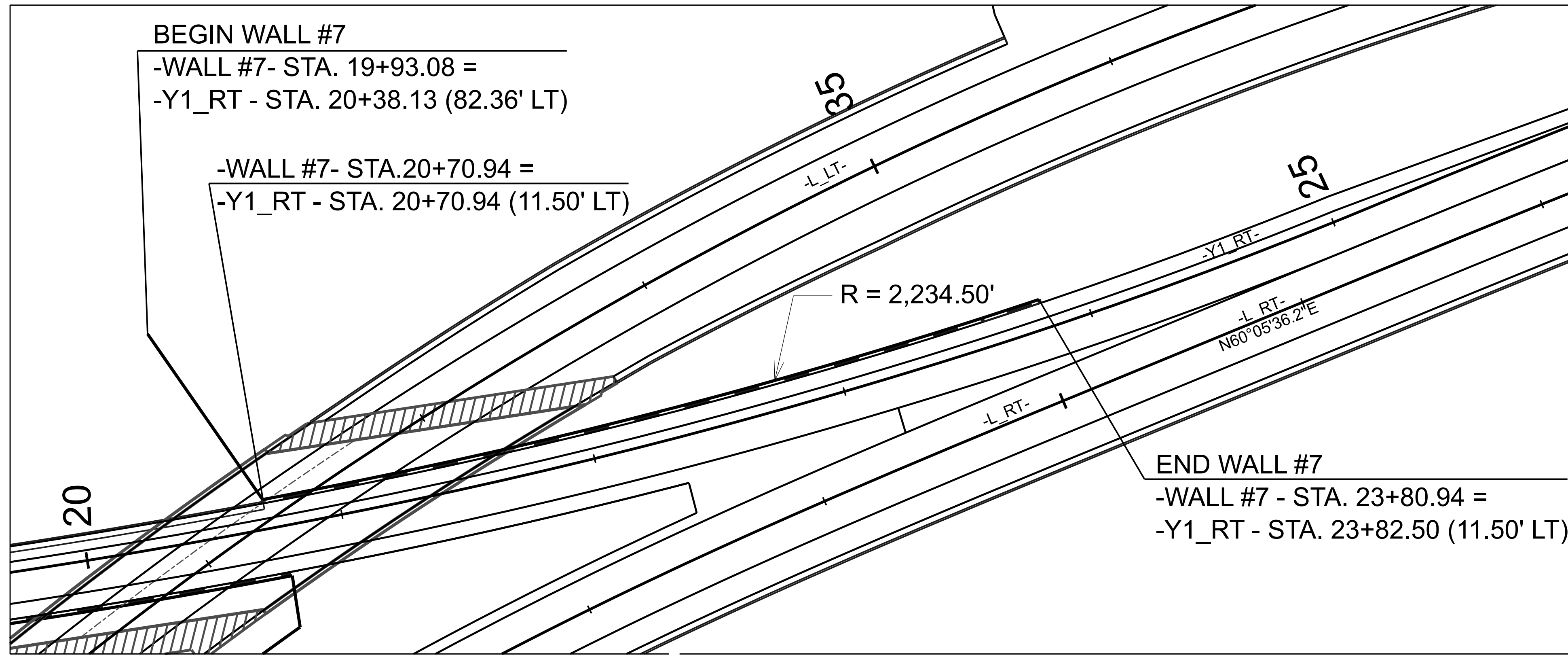
ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 5	16,980



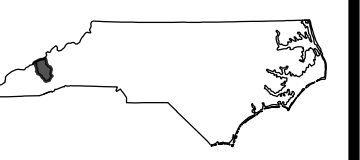
**PRECAST PANELS
LEVELING PAD STEP DETAIL**

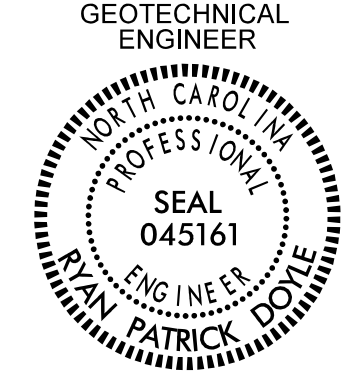

WALL #7 DETAIL SHEET

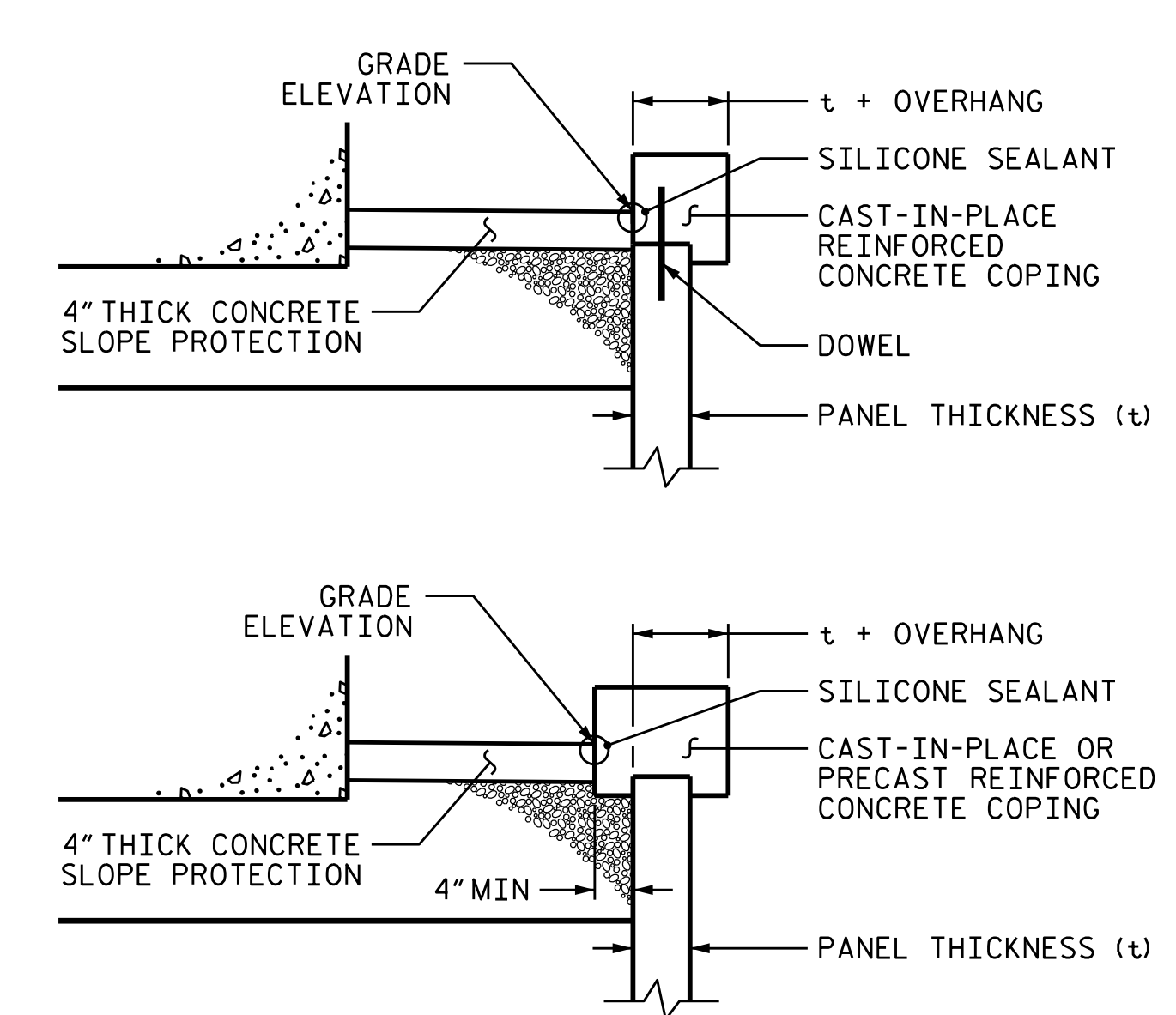
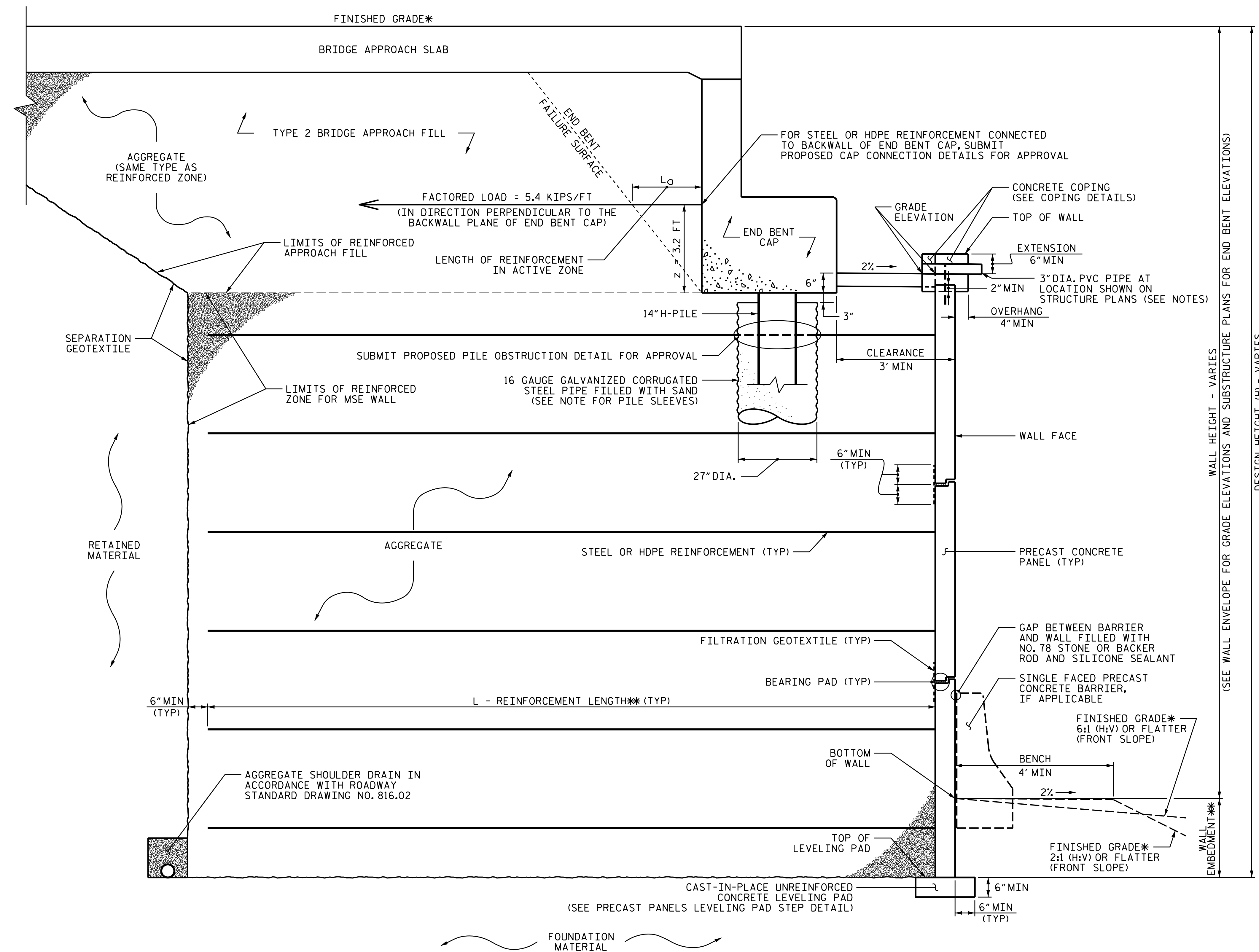
WALL 6 ELIMINATED FROM PROJECT



- NOTES:
1. APPROXIMATE WALL LENGTH = 388'
 2. APPROXIMATE WALL AREA = 5,350 SF
 3. TOP OF WALL ELEVATIONS DO NOT INCLUDE COPING



PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-6A
GEOTECHNICAL ENGINEER  SEAL 045161 RYAN PATRICK DOYLE ENGINEER	
DocuSigned by: Ryan Patrick Doyle 10/17/2023 <small>DocuSign Envelope ID: BE63BEC1-AB17-443E-BD04-F2007AB2903B</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED 	



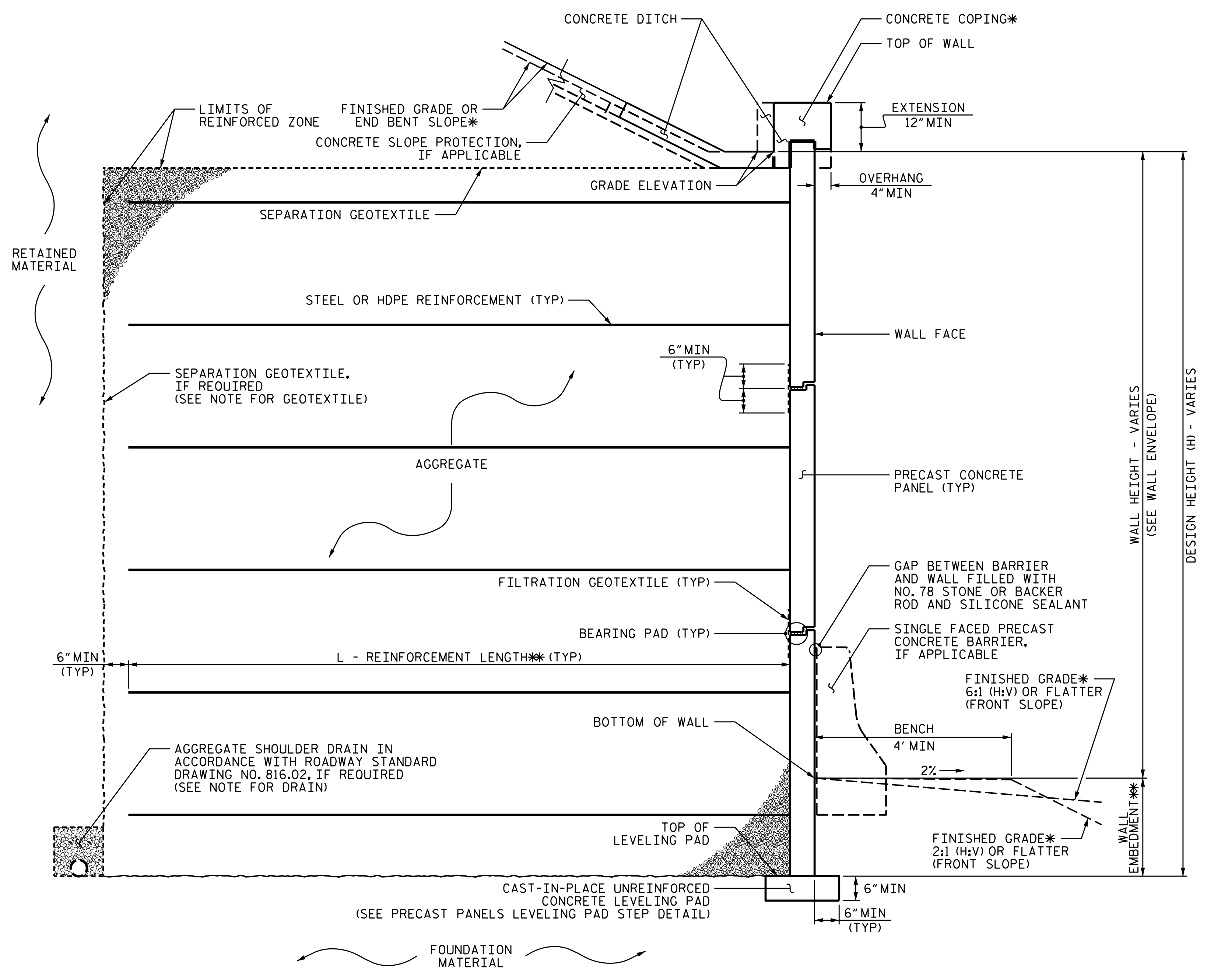
COPING DETAILS

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

MSE ABUTMENT WALL (RETAINING WALL NO. 7) WITH PRECAST PANELS - TYPICAL SECTION

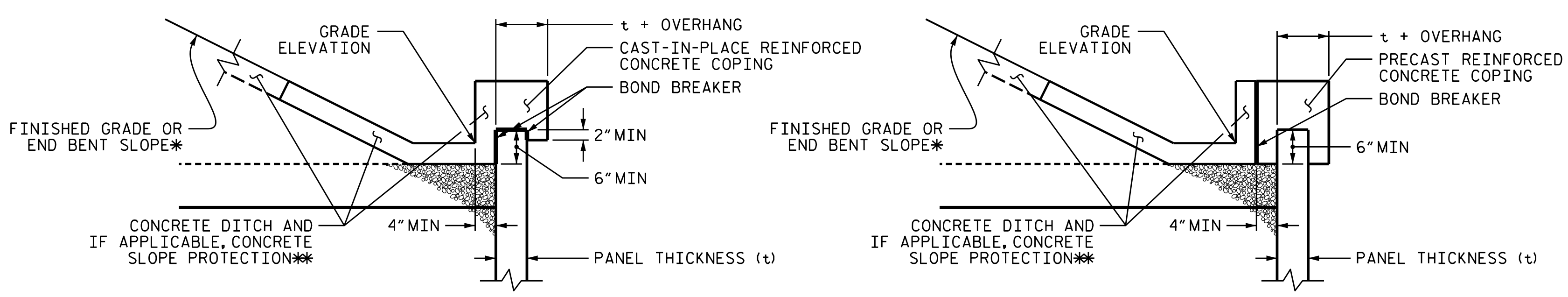
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE,
 MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-6B
GEOTECHNICAL ENGINEER RYAN PATRICK DOYLE SEAL 045161 PROFESSIONAL ENGINEER NORTH CAROLINA	
DocuSigned by: Ryan Patrick Doyle 10/17/2023 SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



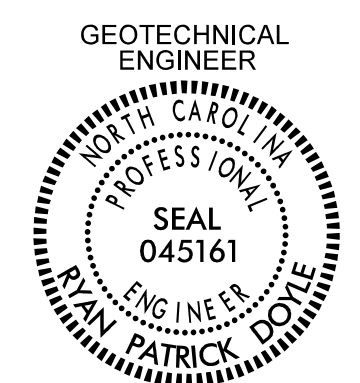

MSE WALL (RETAINING WALL NO. 7) WITH PRECAST PANELS - TYPICAL SECTION

*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.



COPING DETAILS

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

PROJECT REFERENCE NO. B-5898B-3186	SHEET NO. W-6C
GEOTECHNICAL ENGINEER  PROFESSIONAL ENGINEER SEAL 045161 RYAN PATRICK DOYLE	
DocuSigned by: Ryan Patrick Doyle	DATE 11/9/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	

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.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO. 7. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 7.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 7.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 7.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.2 LOCATED AT STATION 32+89.00.

A TEMPORARY PIEZOMETER SHALL BE INSTALLED IN FRONT OF RETAINING WALL NO. 7 TO MONITOR PORE PRESSURE DISSIPATION DURING FILL PLACEMENT AND CONSTRUCTION AT L-LT STA. 32+28 13' LT

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 7, 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. 7 FOR THE FOLLOWING:

- 1) H = WALL HEIGHT + WALL EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6440 PSF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.90 H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM WALL EMBEDMENT H/10.0 OR 2 FT, WHICHEVER IS GREATER
- 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
BACKFILL	120	28	0
FOUNDATION	120	28	0

DESIGN RETAINING WALL NO. 7 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 2 LOCATED AT STATION 32+89.00. MAINTAIN A CLEARANCE OF AT LEAST 3' BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

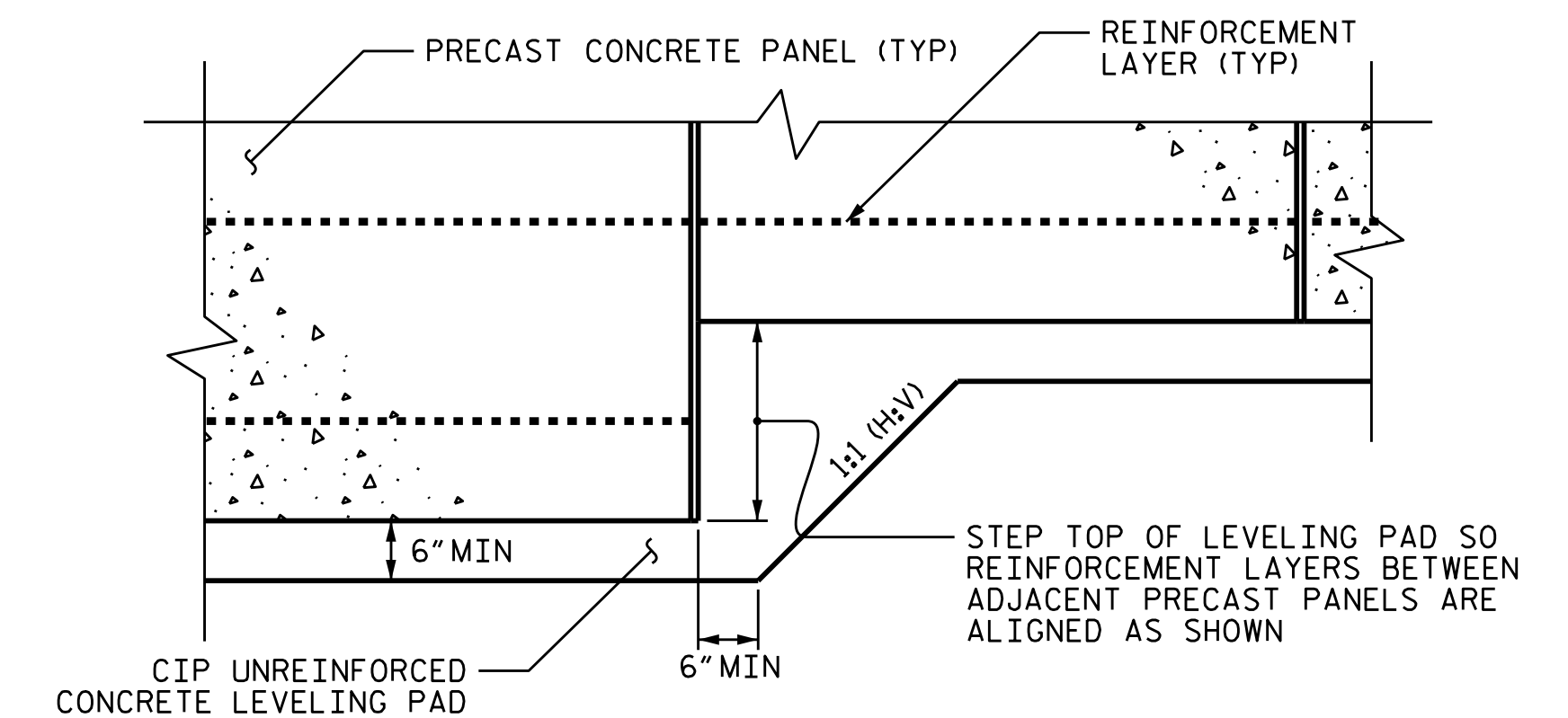
INSTALL PILE SLEEVES BEFORE CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AT END BENT NO. 2. OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP ELEVATION. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS. FOR PILE SLEEVES, SEE MSE RETAINING WALL PLANS AND PROVISION. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

INSTALL PVC PIPE THROUGH MSE WALL COPING AT LOCATIONS SHOWN ON STRUCTURE PLANS. INVERT OF PVC PIPE SHALL BE FLUSH WITH BOTTOM OF PAVED SLOPE PROTECTION. EXTEND PIPE 4" BEYOND FACE OF COPING. PVC PIPE MATERIAL, LABOR, AND INCIDENTALS ARE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE WALL.

FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION 32+89.00 WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 5. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 7 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 7	5,350



**PRECAST PANELS
LEVELING PAD STEP DETAIL**