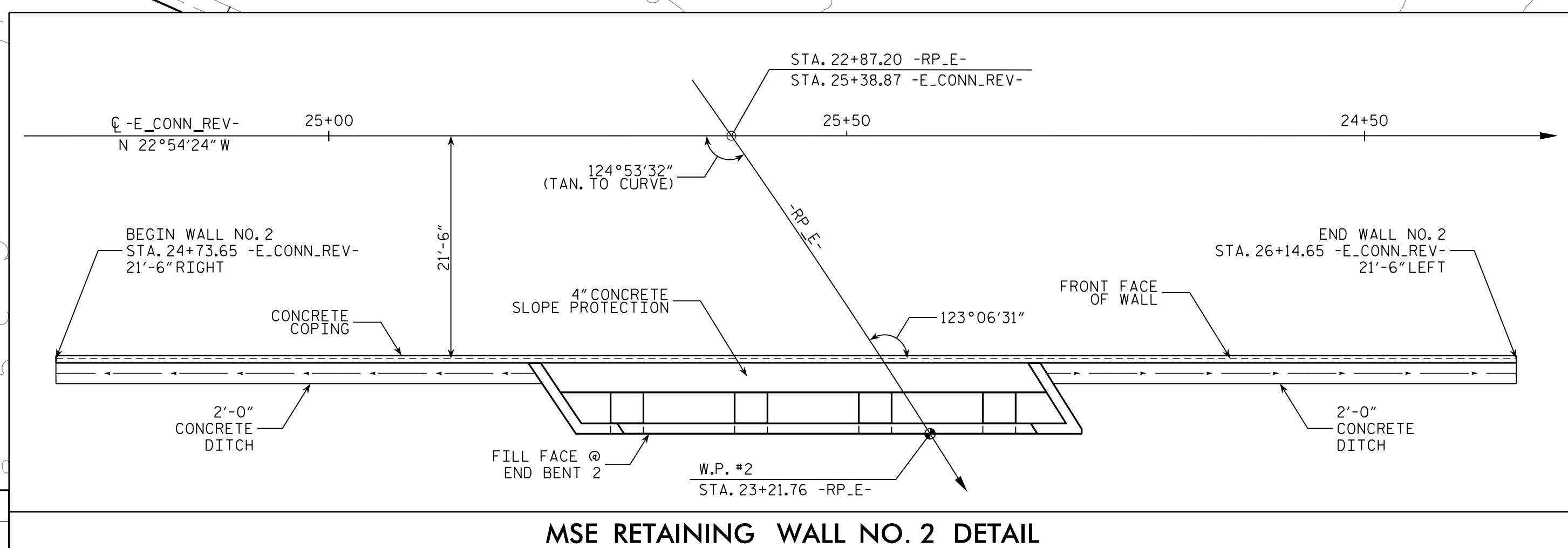
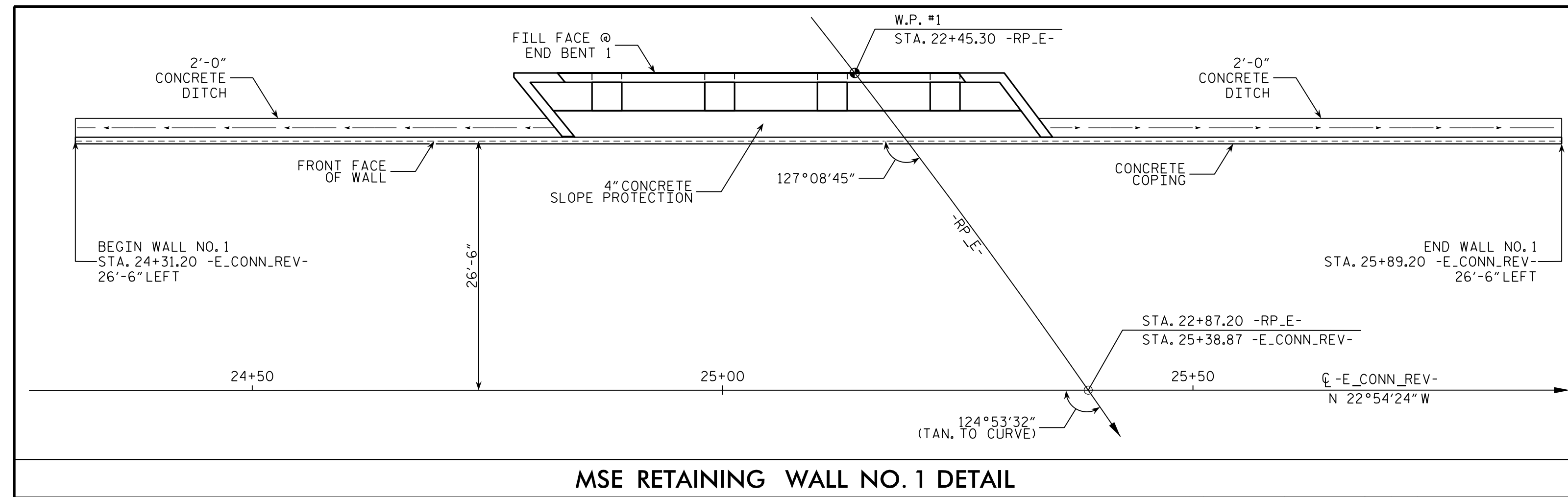
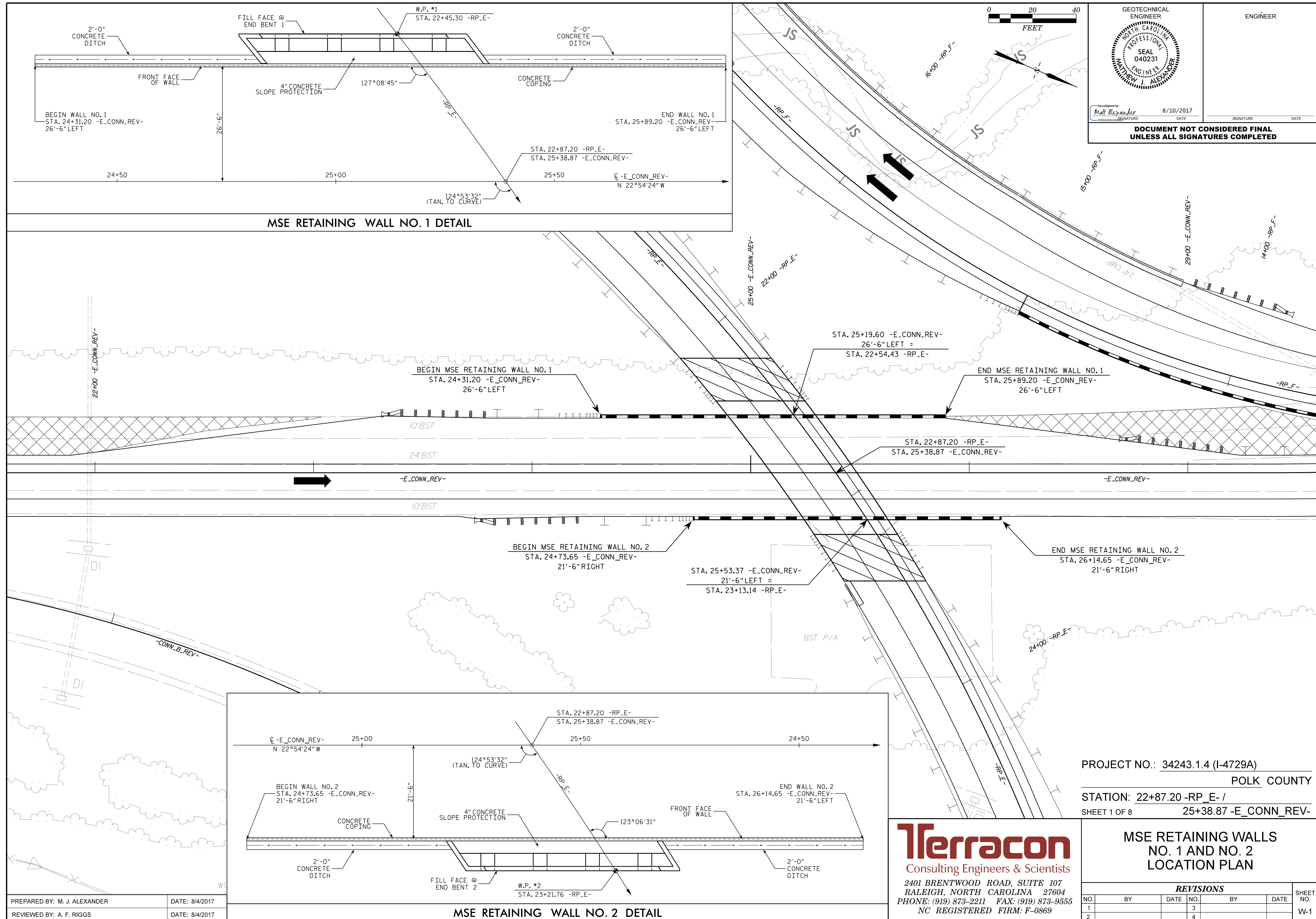


**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**



GEOTECHNICAL ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 040231
 MATTHEW J. ALEXANDER
 ENGINEER
 8/10/2017
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY: M. J. ALEXANDER
 DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS
 DATE: 8/4/2017

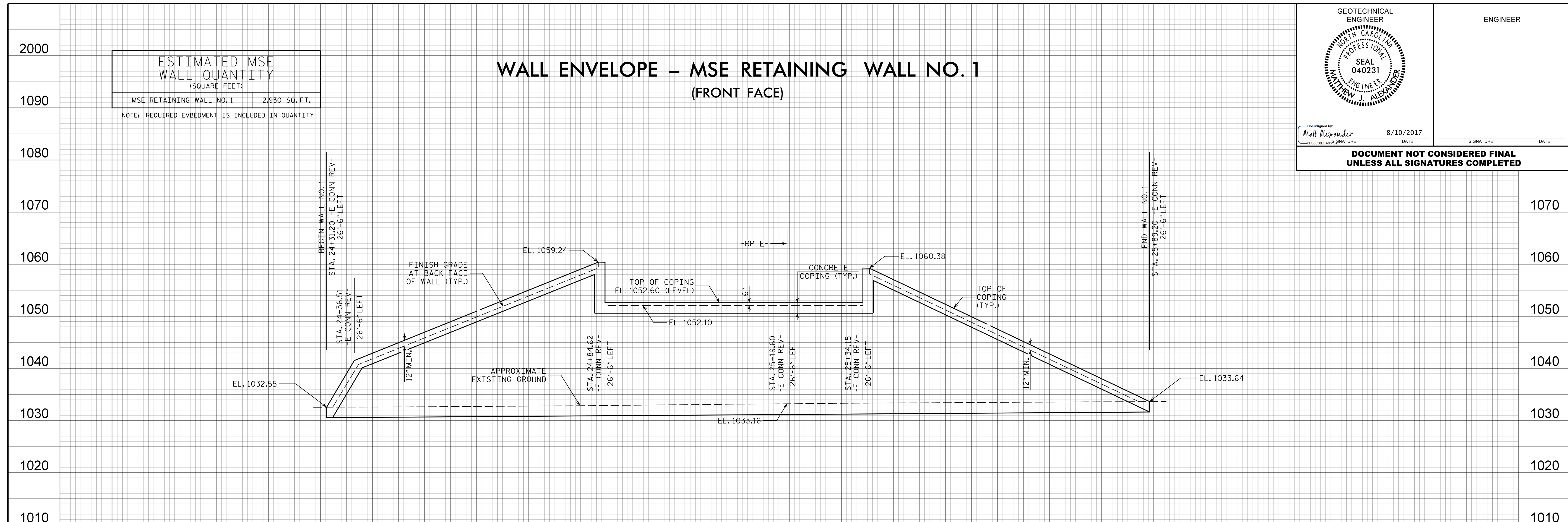
Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 22+87.20 -RP_E- / 25+38.87 -E_CONN_REV-
 SHEET 1 OF 8

MSE RETAINING WALLS NO. 1 AND NO. 2 LOCATION PLAN

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

SHEET NO. W-1



GEOTECHNICAL ENGINEER

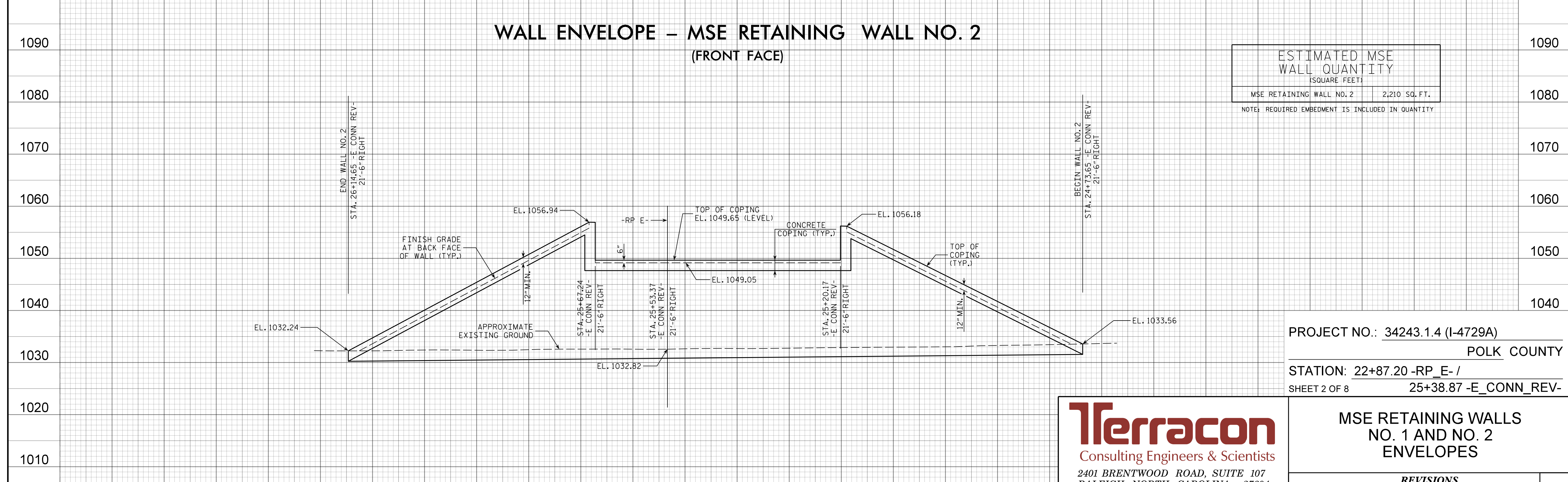
ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL
 040231
 ENGINEER
 MATTHEW J. ALEXANDER

Disciplined by: *Matthew J. Alexander* 8/10/2017
DATE SIGNATURE DATE

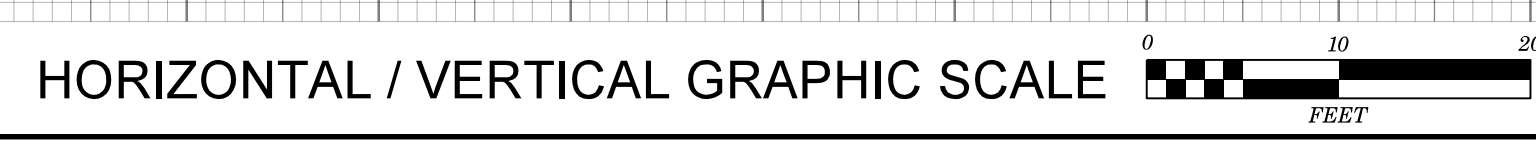
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

-E_CONN_REV-	24+00	24+50	25+00	25+50	26+00	26+50
-E_CONN_REV-	26+50	26+00	25+50	25+00	24+50	24+00



PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 22+87.20 -RP E- /
 SHEET 2 OF 8 25+38.87 -E_CONN_REV-

PREPARED BY: M. J. ALEXANDER DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS DATE: 8/4/2017




Terracon

Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

MSE RETAINING WALLS
NO. 1 AND NO. 2
ENVELOPES

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

SHEET NO. W-2

GEOTECHNICAL ENGINEER  SEAL 040231 MATTHEW J. ALEXANDER ENGINEER	ENGINEER
Designed by: <u>Matthew Alexander</u> 8/10/2017 SIGNATURE DATE	SIGNATURE DATE
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.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALLS NO.1 AND NO. 2.

WALL CONTRACTOR SHALL VERIFY THAT AN ARCHITECTURAL FINISH IS OR IS NOT REQUIRED FOR PRECAST CONCRETE PANELS.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS NO.1 AND NO. 2.

A DRAIN IS NOT REQUIRED FOR RETAINING WALLS NO.1 AND NO. 2.

PILE SLEEVES ARE REQUIRED AROUND THE HP 14X73 PILES FOR END BENT NO.1 OF THE BRIDGE ON -RP_E- OVER -E_CONN_REV- LOCATED AT STATION 22+45.30 -RP_E-.

PILE SLEEVES ARE REQUIRED AROUND THE HP 14X73 PILES FOR END BENT NO.2 OF THE BRIDGE ON -RP_E- OVER -E_CONN_REV- LOCATED AT STATION 23+21.76 -RP_E-.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS NO.1 AND 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 NO.1 AND NO.2 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,050 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.95H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM EMBEDMENT DEPTH BELOW FINISHED GRADE AT FRONT FACE OF WALL = 2 FT
- 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	110	29	0

DESIGN RETAINING WALLS NO.1 AND NO.2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

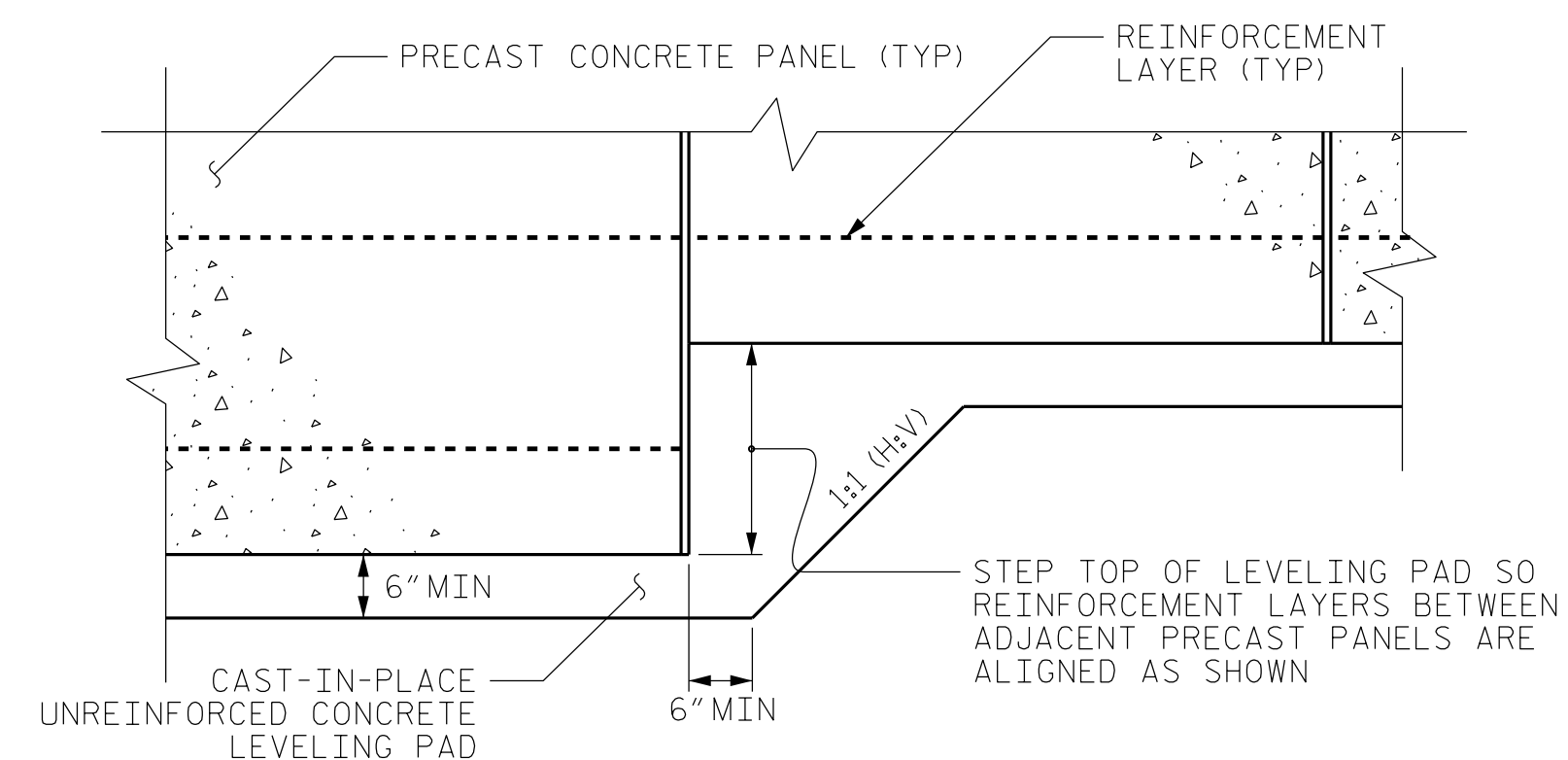
DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 LOCATED AT STATION 22+45.30 -RP_E- AND END BENT NO.2 LOCATED AT STATION 23+21.76 -RP_E-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO.1 AND NO. 2.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 22+45.30 -RP_E- AND END BENT NO.2 LOCATED AT STATION 23+21.76 -RP_F- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO.1 AND 2, RESPECTIVELY. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NO.1 LOCATED AT STATION 22+45.30 -RP_E- AND END BENT NO.2 LOCATED AT STATION 23+21.76 -RP_E- WHILE CONSTRUCTING RETAINING WALLS NO.1 AND NO.2, RESPECTIVELY. OBSERVE A 1 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.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS NO.1 AND NO.2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 22+87.20 -RP_E- /
 SHEET 3 OF 8 25+38.87 -E_CONN_REV-

Terracon

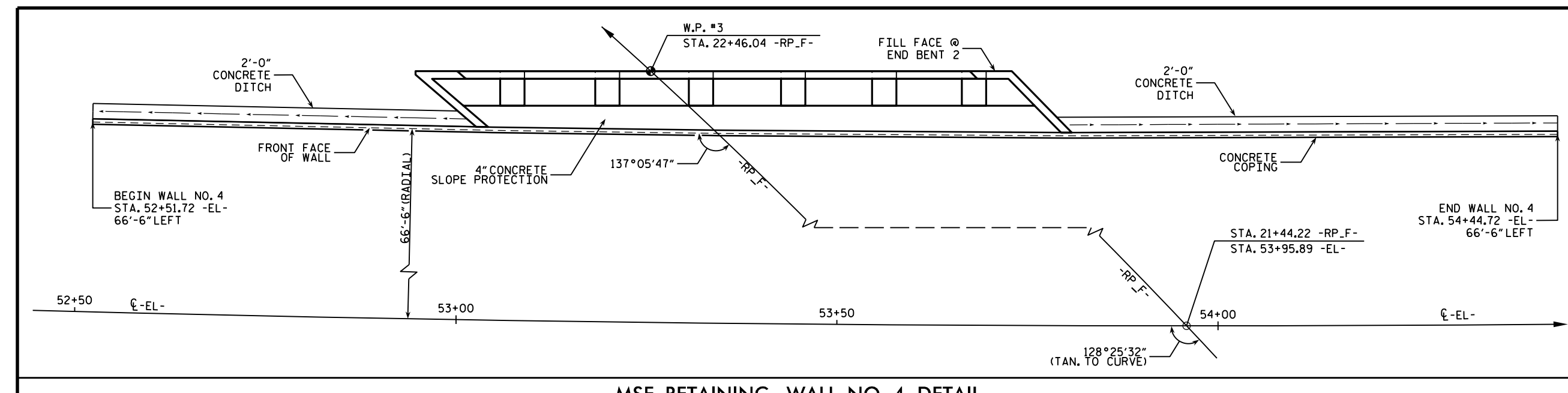
Consulting Engineers & Scientists

2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

**MSE RETAINING WALLS
NO. 1 AND NO. 2 NOTES**

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

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017



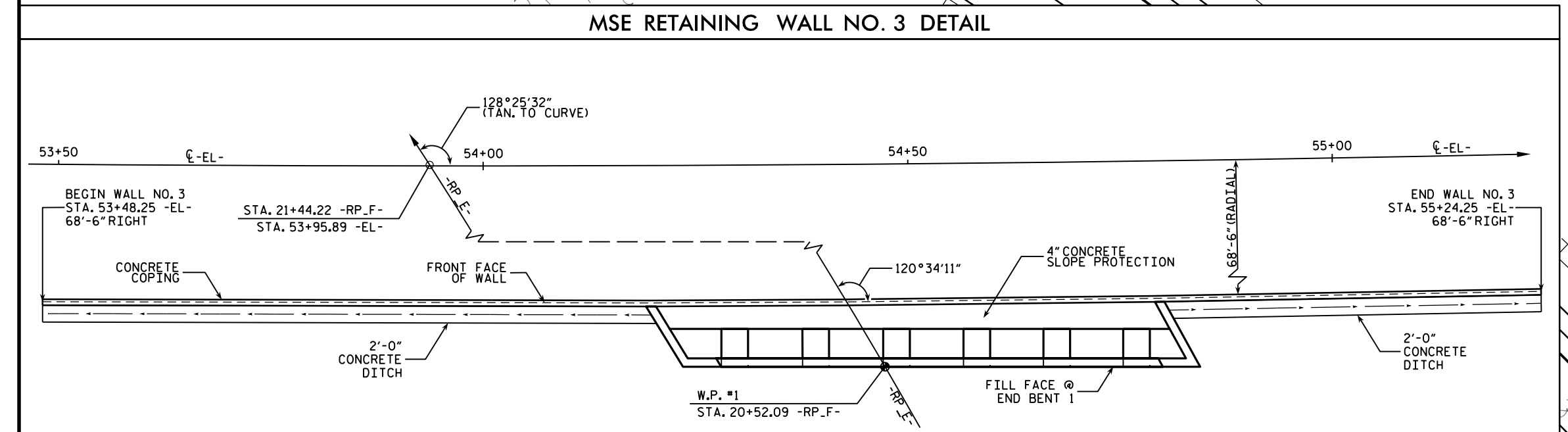
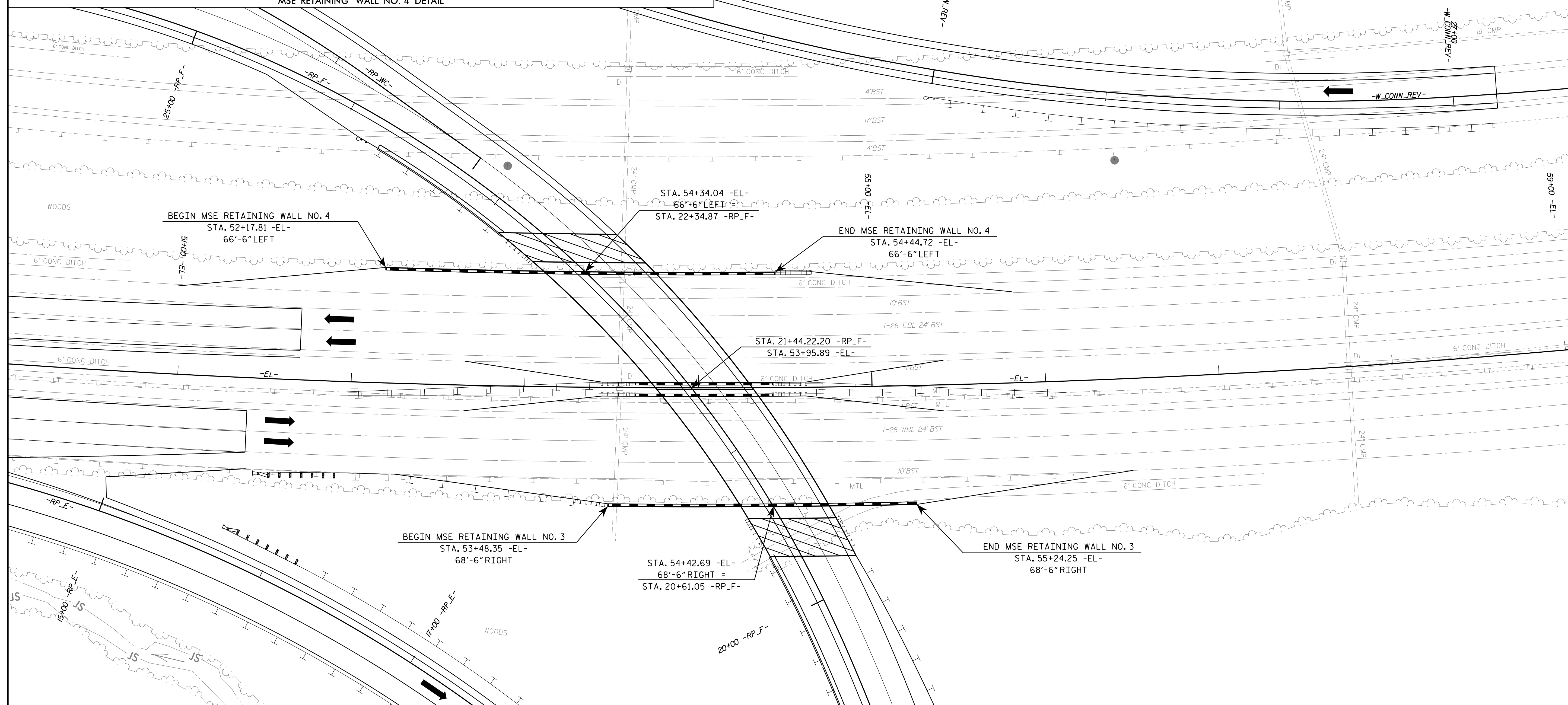
GEOTECHNICAL ENGINEER

ENGINEER

ENGINEER

SIGNATURE _____ DATE _____

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PREPARED BY: M. J. ALEXANDER DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS DATE: 8/4/2017

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 21+44.22 -RP_F- / 53+95.89 -EL-
 SHEET 4 OF 8

Terracon

Consulting Engineers & Scientists

2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

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

ENGINEER

GEOTECHNICAL ENGINEER

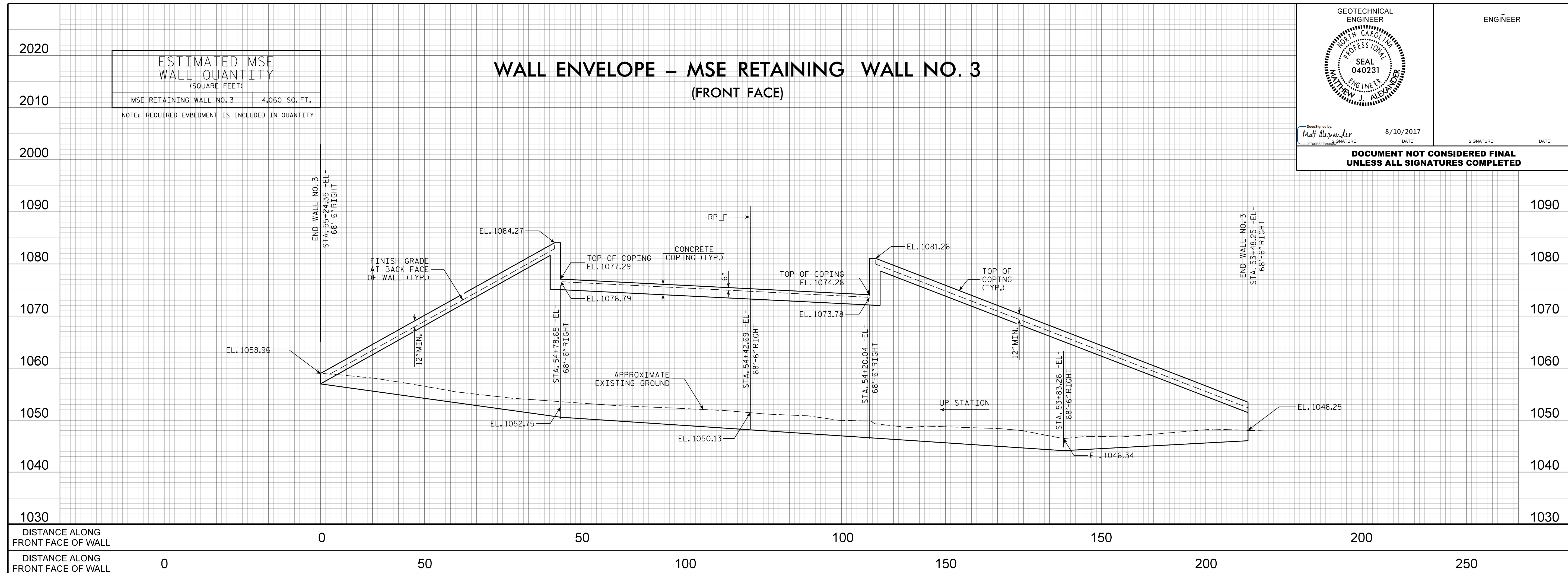
NORTH CAROLINA PROFESSIONAL SEAL
040231
MATTHEW J. ALEXANDER

8/10/2017

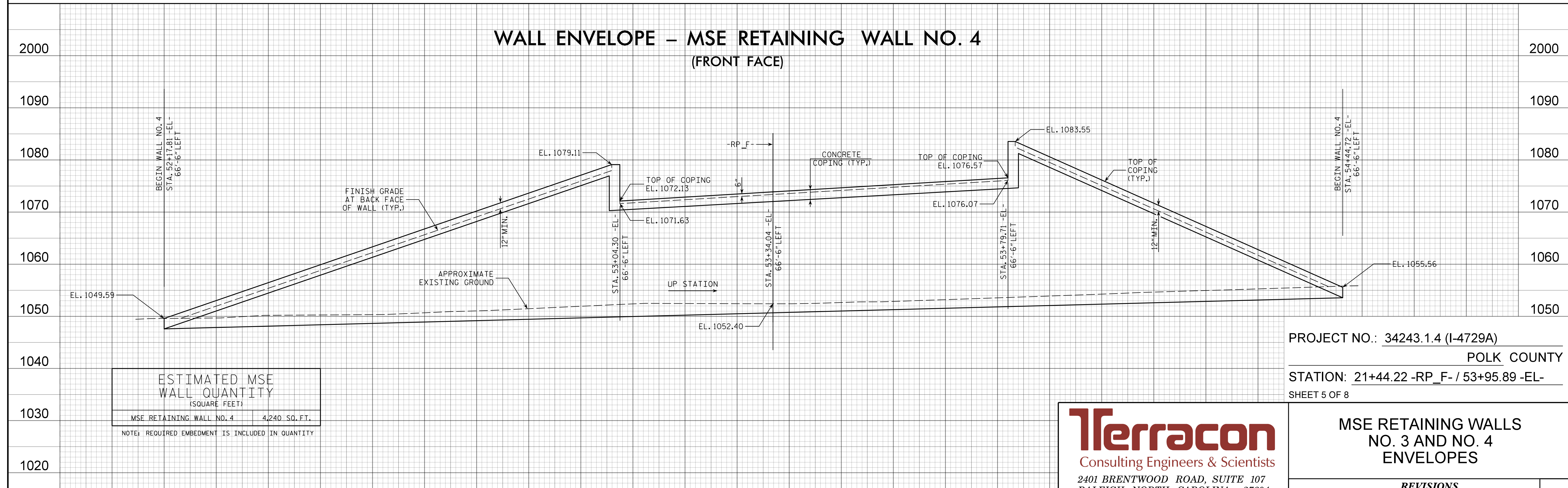
DATE

SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



ESTIMATED MSE WALL QUANTITY (SQUARE FEET)	
MSE RETAINING WALL NO. 3	4,060 SQ. FT.
NOTE: REQUIRED EMBEDMENT IS INCLUDED IN QUANTITY	



ESTIMATED MSE WALL QUANTITY (SQUARE FEET)	
MSE RETAINING WALL NO. 4	4,240 SQ. FT.
NOTE: REQUIRED EMBEDMENT IS INCLUDED IN QUANTITY	

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 21+44.22 -RP_F- / 53+95.89 -EL-
 SHEET 5 OF 8


PREPARED BY: M. J. ALEXANDER DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS DATE: 8/4/2017



Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

MSE RETAINING WALLS NO. 3 AND NO. 4 ENVELOPES					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-5

GEOTECHNICAL ENGINEER  SEAL 040231 ENGINEER MATTHEW J. ALEXANDER	ENGINEER
Designed by: <i>Matthew Alexander</i> SIGNATURE	8/10/2017 DATE
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.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALLS NO. 3 AND NO. 4.

WALL CONTRACTOR SHALL VERIFY THAT AN ARCHITECTURAL FINISH IS OR IS NOT REQUIRED FOR PRECAST CONCRETE PANELS.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS NO. 3 AND NO. 4.

A DRAIN IS NOT REQUIRED FOR RETAINING WALLS NO. 3 AND NO. 4.

PILE SLEEVES ARE REQUIRED AROUND THE HP 14X73 PILES FOR END BENT NO. 1 OF THE BRIDGE ON -RP_F- OVER -EL- LOCATED AT STATION 20+52.09 -RP_E-.

PILE SLEEVES ARE REQUIRED AROUND THE HP 14X73 PILES FOR END BENT NO. 2 OF THE BRIDGE ON -RP_F- OVER -EL- LOCATED AT STATION 22+46.75 -RP_F-.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS NO. 3 AND 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 WALLS NO. 3 AND NO. 4 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,550 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.1H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM EMBEDMENT DEPTH BELOW FINISHED GRADE AT FRONT FACE OF WALL = 2 FT
- 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	115	0	2,000

DESIGN RETAINING WALLS NO. 3 AND NO. 4 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

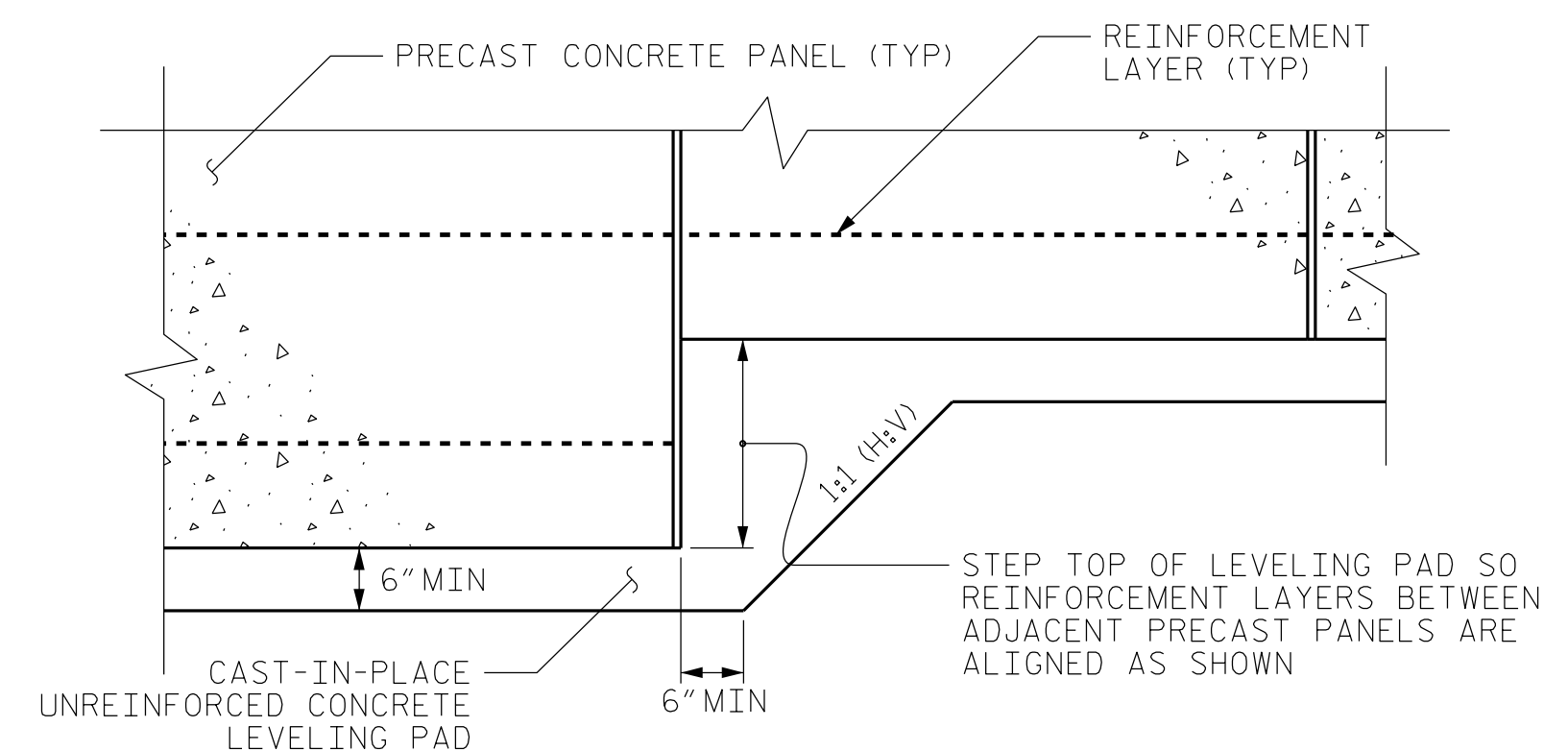
DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION 20+52.09 -RP_F- AND END BENT NO. 2 LOCATED AT STATION 22+46.75 -RP_F-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO. 3 AND NO. 4.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 20+52.09 -RP_F- AND END BENT NO. 2 LOCATED AT STATION 22+46.75 -RP_F- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS NO. 3 AND 4, RESPECTIVELY. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NO. 1 LOCATED AT STATION 20+52.09 -RP_F- AND END BENT NO. 2 LOCATED AT STATION 22+46.75 -RP_F- WHILE CONSTRUCTING RETAINING WALLS NO. 1 AND NO. 2, RESPECTIVELY. OBSERVE A 1 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.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS NO. 3 AND NO. 4 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

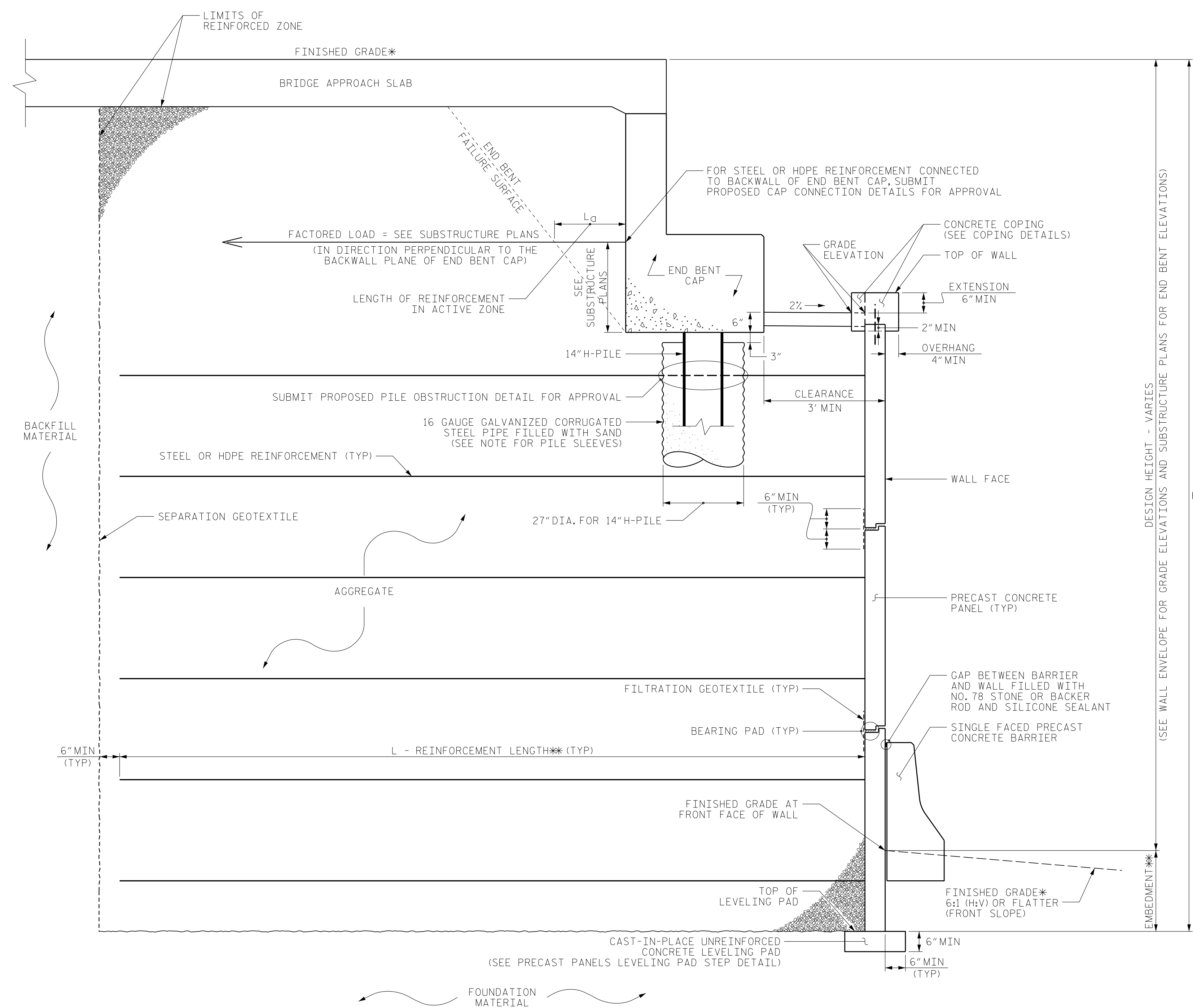
PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 21+44.22 -RP_F- / 53+95.89 -EL-
 SHEET 6 OF 8


Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

**MSE RETAINING WALLS
NO. 3 AND NO. 4 NOTES**

<i>REVISIONS</i>						SHEET NO. W-6
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017



MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

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

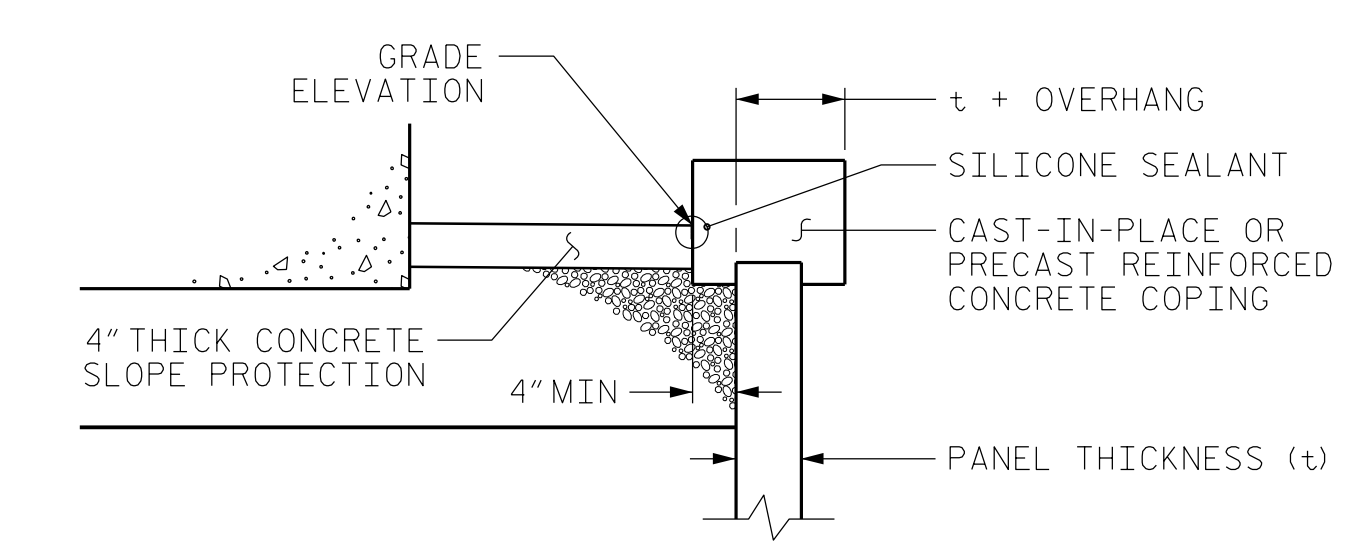
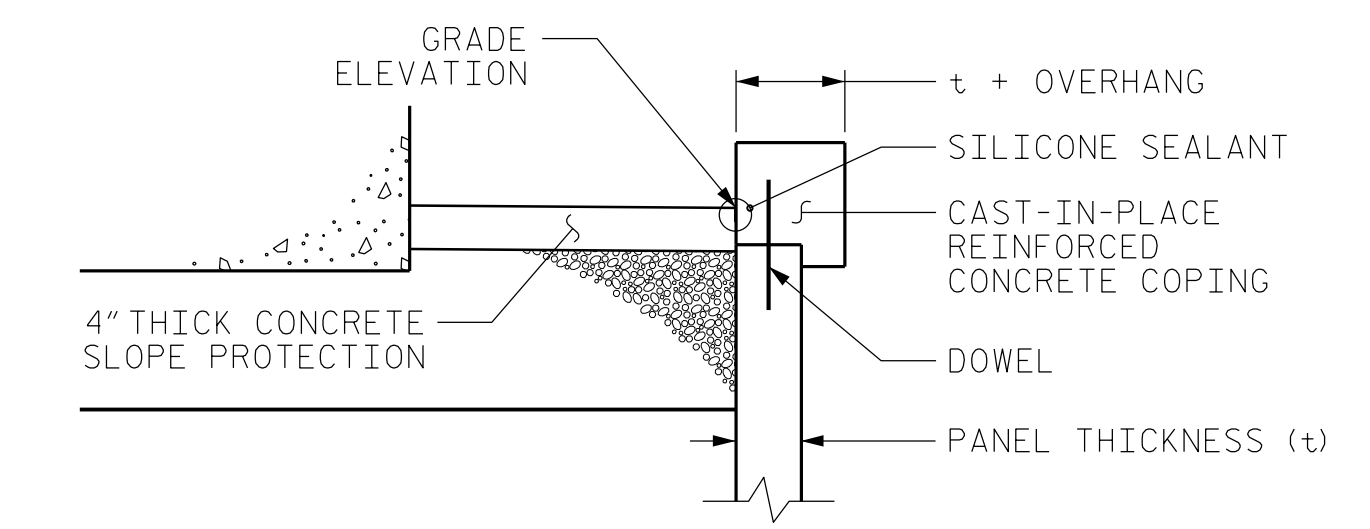
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL
 040231
 MATTHEW J. ALEXANDER

ENGINEER

Designed by: *Matthew Alexander* DATE: 8/10/2017
 DATE: 8/10/2017

**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.

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: VARIES
 SHEET 7 OF 8

Terracon


Consulting Engineers & Scientists

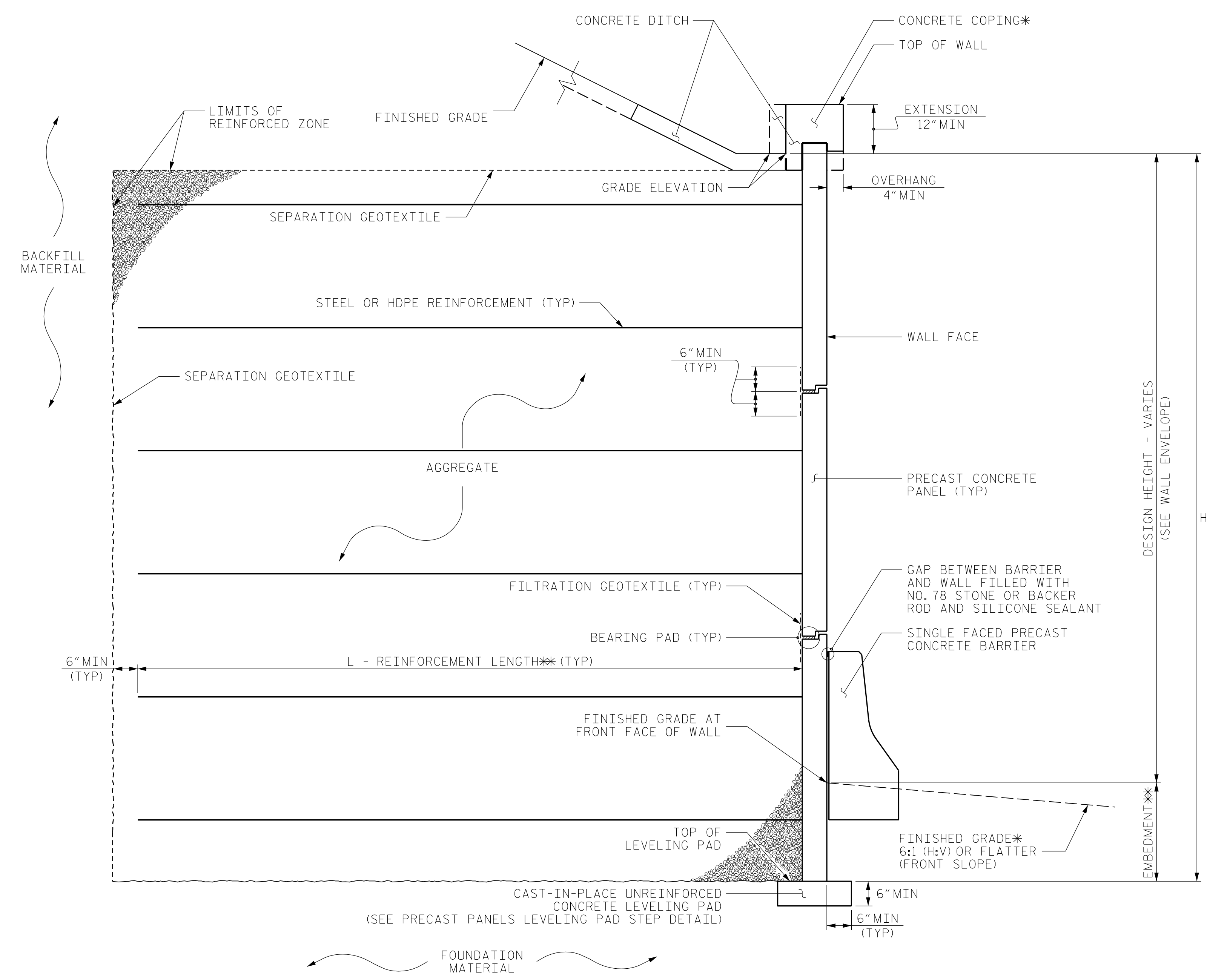
2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

MSE RETAINING WALLS NO. 1, NO. 2, NO. 3, AND NO. 4 TYPICAL SECTION AT BRIDGE ABUTMENT

REVISIONS						SHEET NO. W-7
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

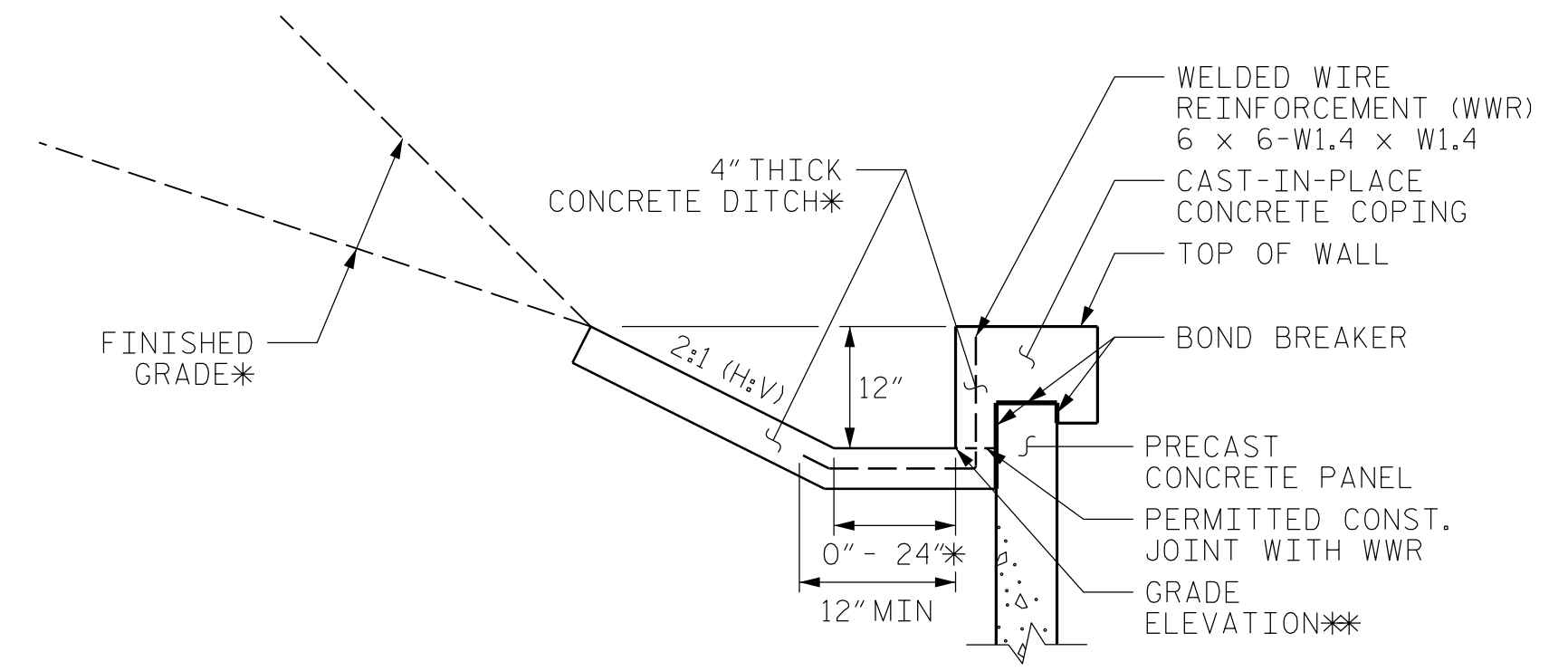
PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017

 <p>GEOTECHNICAL ENGINEER</p>	ENGINEER
<p>Designed by: <i>Matthew Alexander</i> 8/10/2017</p> <p>DATE: 8/10/2017</p>	SIGNATURE: _____ DATE: _____
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

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

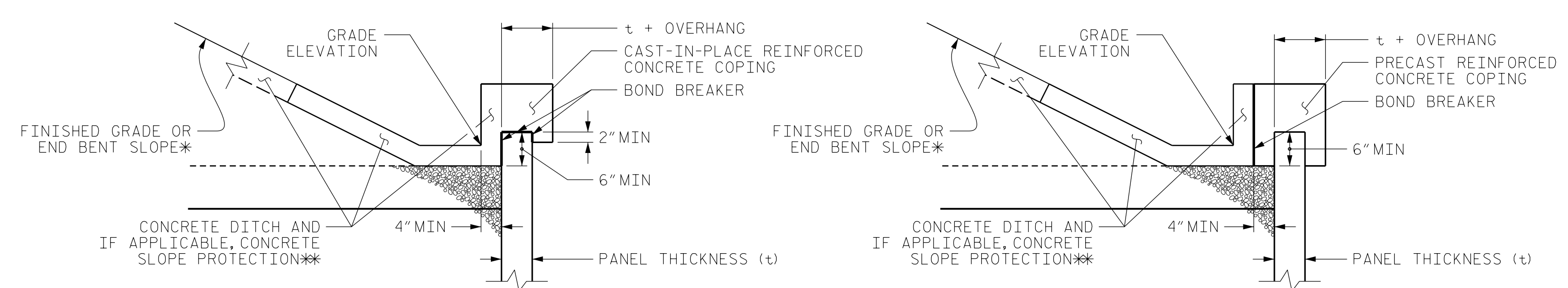


MSE WALL WITH PRECAST PANELS

CONCRETE DITCH BEHIND WALL WITH CONCRETE COPING

*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
 **SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.



COPING DETAILS

*SEE PLANS FOR FINISHED GRADE.
 **SEE CONCRETE DITCH BEHIND WALL DETAILS.

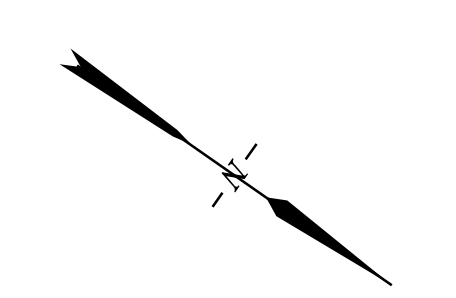
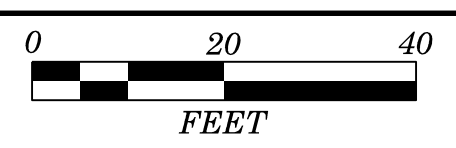
PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: VARIES
 SHEET 8 OF 8

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

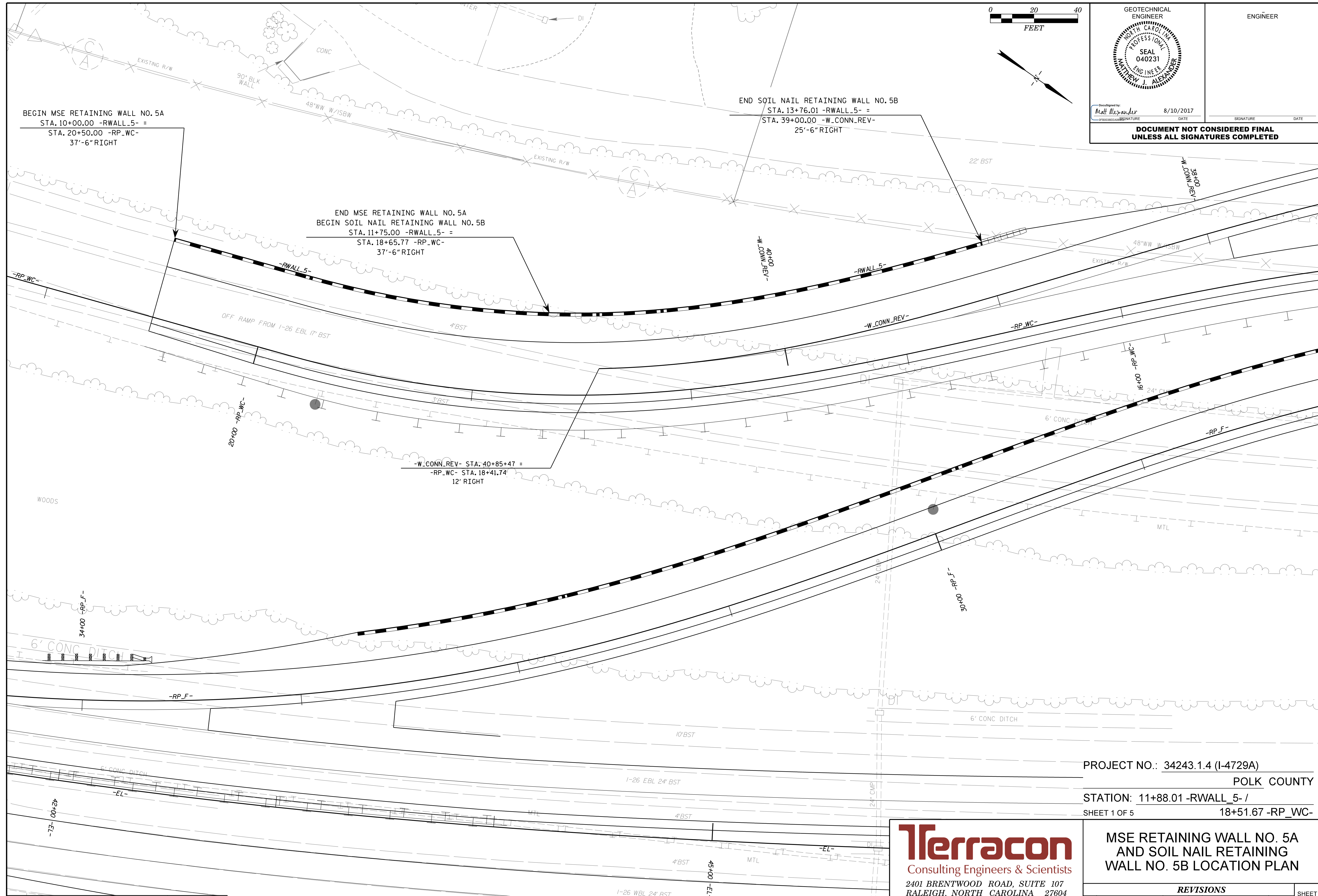
MSE RETAINING WALLS NO. 1, NO. 2, NO. 3, AND NO. 4 TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-8
2			4			

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017



GEOTECHNICAL ENGINEER SEAL 040231 MATTHEW J. ALEXANDER ENGINEER	ENGINEER
	Discussed by: <i>Matthew Alexander</i> DATE: 8/10/2017 SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



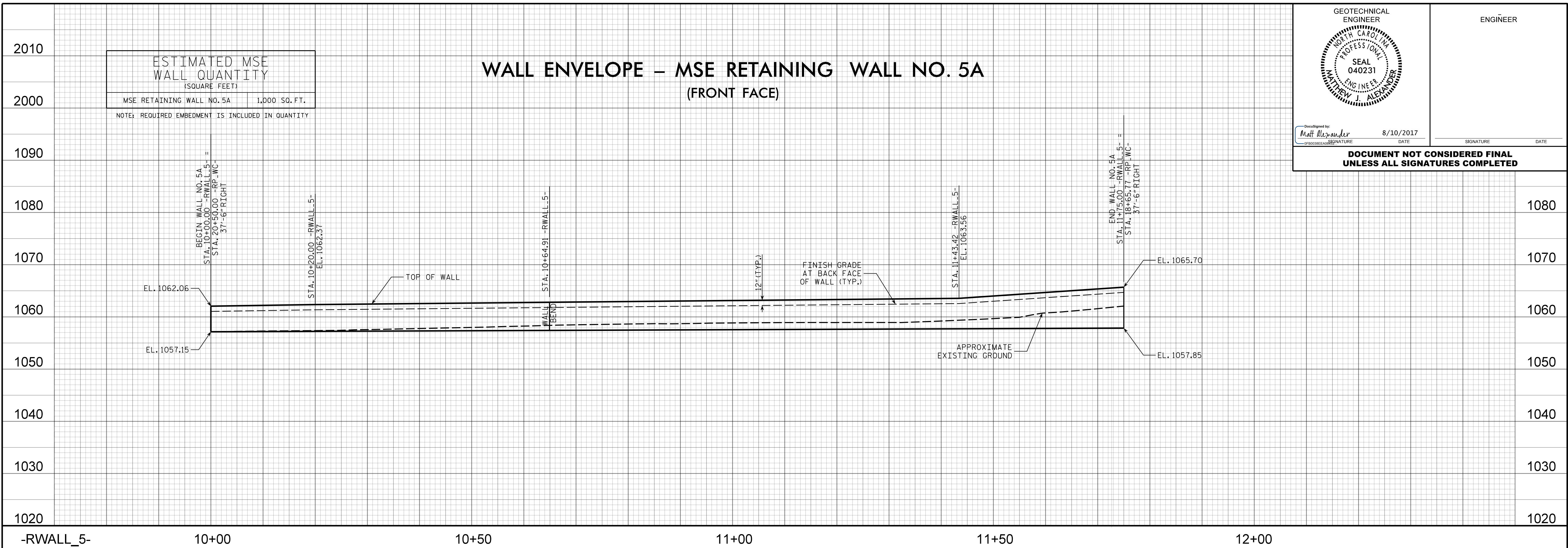
PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 11+88.01 -RWALL_5- /
 SHEET 1 OF 5 18+51.67 -RP_WC-

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

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

PREPARED BY: M. J. ALEXANDER DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS DATE: 8/4/2017

SHEET NO. W-9



GEOTECHNICAL ENGINEER

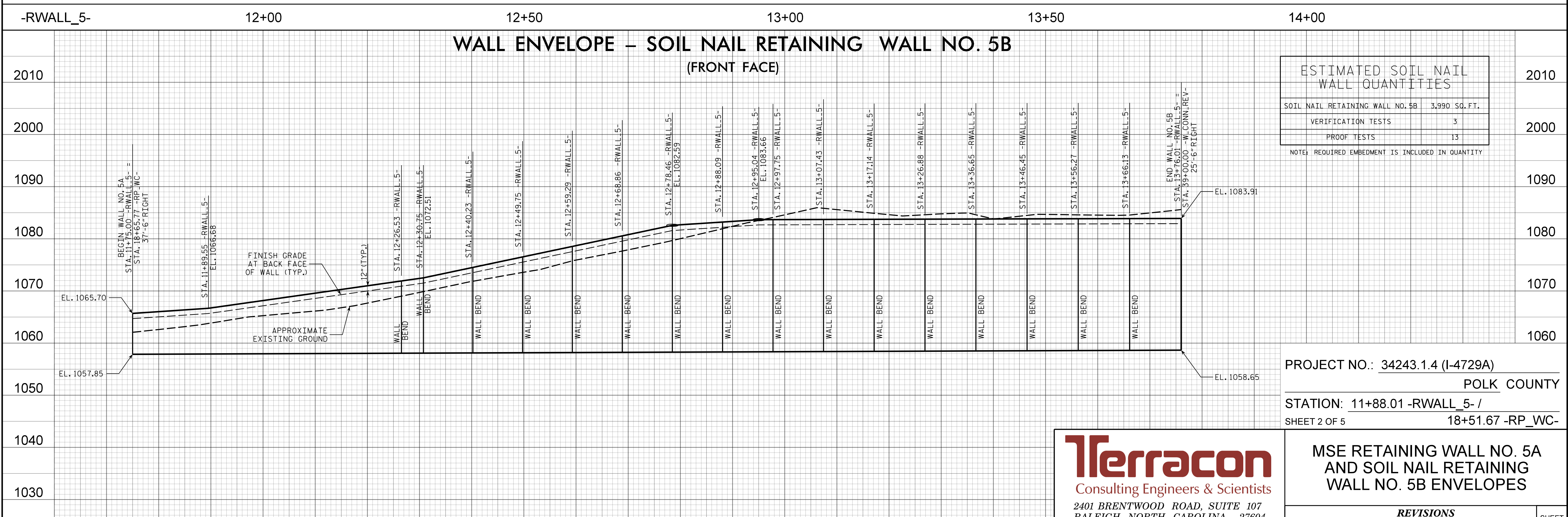
ENGINEER

ENGINEER

Designed by: Matthew J. Alexander DATE: 8/10/2017

DATE: _____ SIGNATURE: _____ DATE: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 11+88.01 -RWALL_5- /
 SHEET 2 OF 5 18+51.67 -RP_WC-

PREPARED BY: M. J. ALEXANDER DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS DATE: 8/4/2017




Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

MSE RETAINING WALL NO. 5A AND SOIL NAIL RETAINING WALL NO. 5B ENVELOPES

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

SHEET NO. V1-10

GEOTECHNICAL ENGINEER  SEAL 040231 ENGINEER MATTHEW J. ALEXANDER	ENGINEER
Digitized by: <i>Matthew Alexander</i> _____ SIGNATURE	8/10/2017 _____ DATE
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.

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

WALL CONTRACTOR SHALL VERIFY IF AN ARCHITECTURAL FINISH IS OR IS NOT REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 5A.

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

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 5A.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 5A, 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. 5A FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT + EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 2,650 LB/SF
 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.4H OR 6 FT, WHICHEVER IS LONGER
 5) MINIMUM EMBEDMENT DEPTH BELOW FINISHED GRADE AT FRONT FACE OF WALL = 2 FT
 6) REINFORCED ZONE AGGREGATE PARAMETERS:

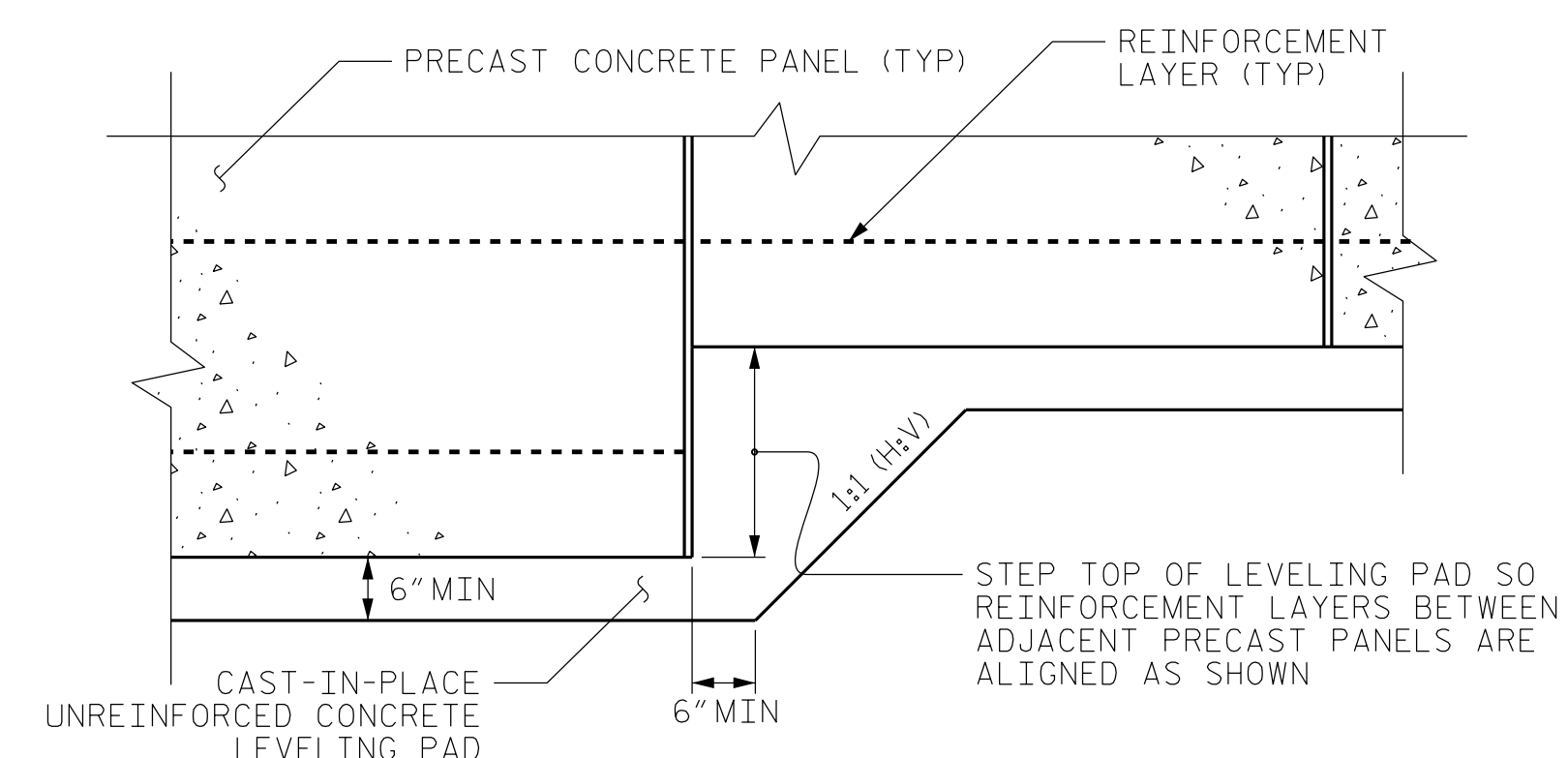
AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*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	34	0
FOUNDATION	115	30	0

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 5A UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
 TEMPORARY SHORING MAY REQUIRED FOR RETAINING WALL NO. 5A IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY PLANS.



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 11+88.01 -RWALL_5- /
 SHEET 3 OF 5 18+51.67 -RP_WC-

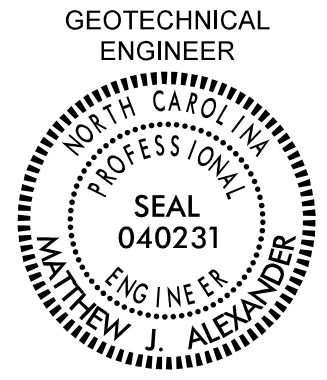

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

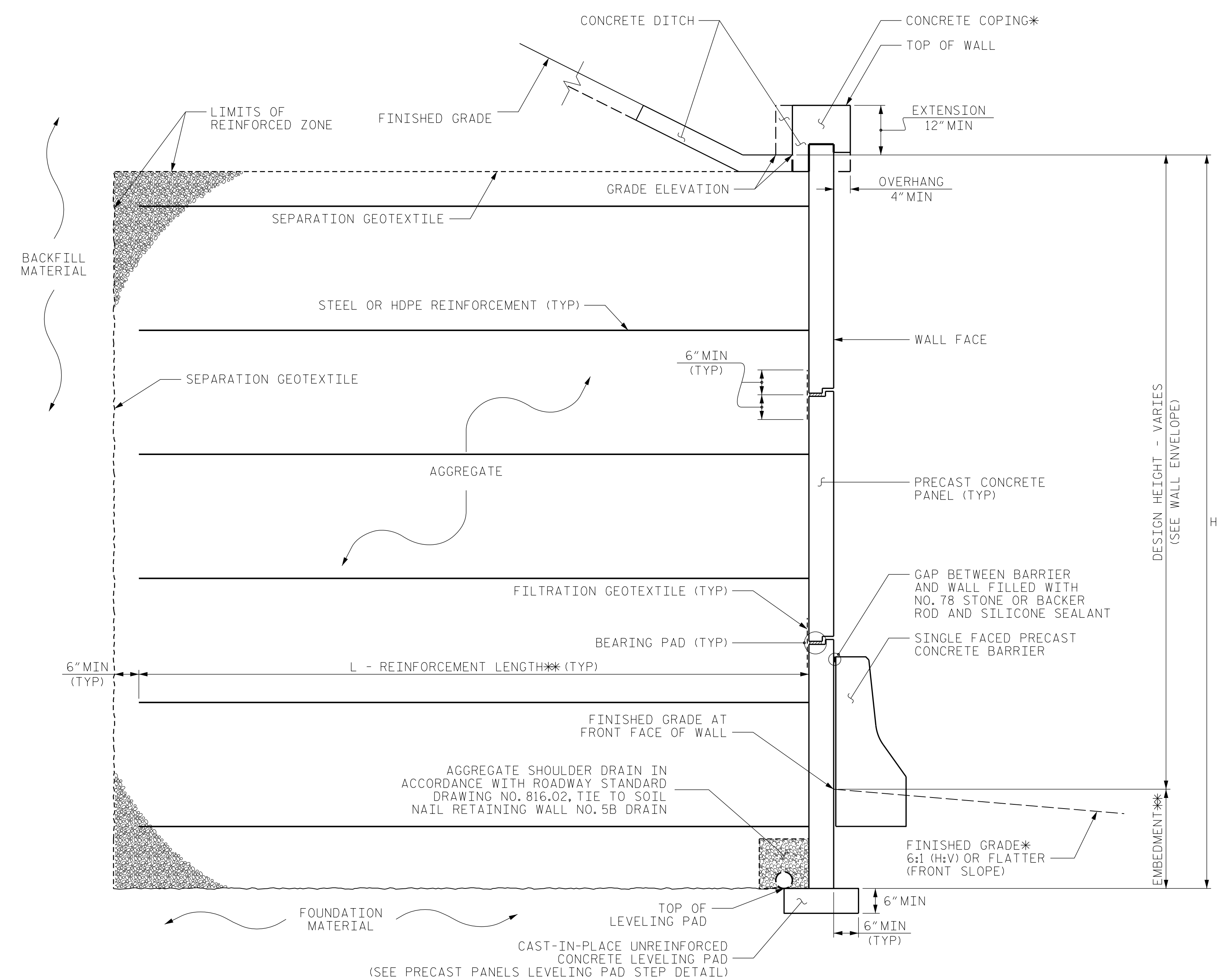
**MSE RETAINING WALL
NO. 5A NOTES**

REVISIONS

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			W-11
2			4			

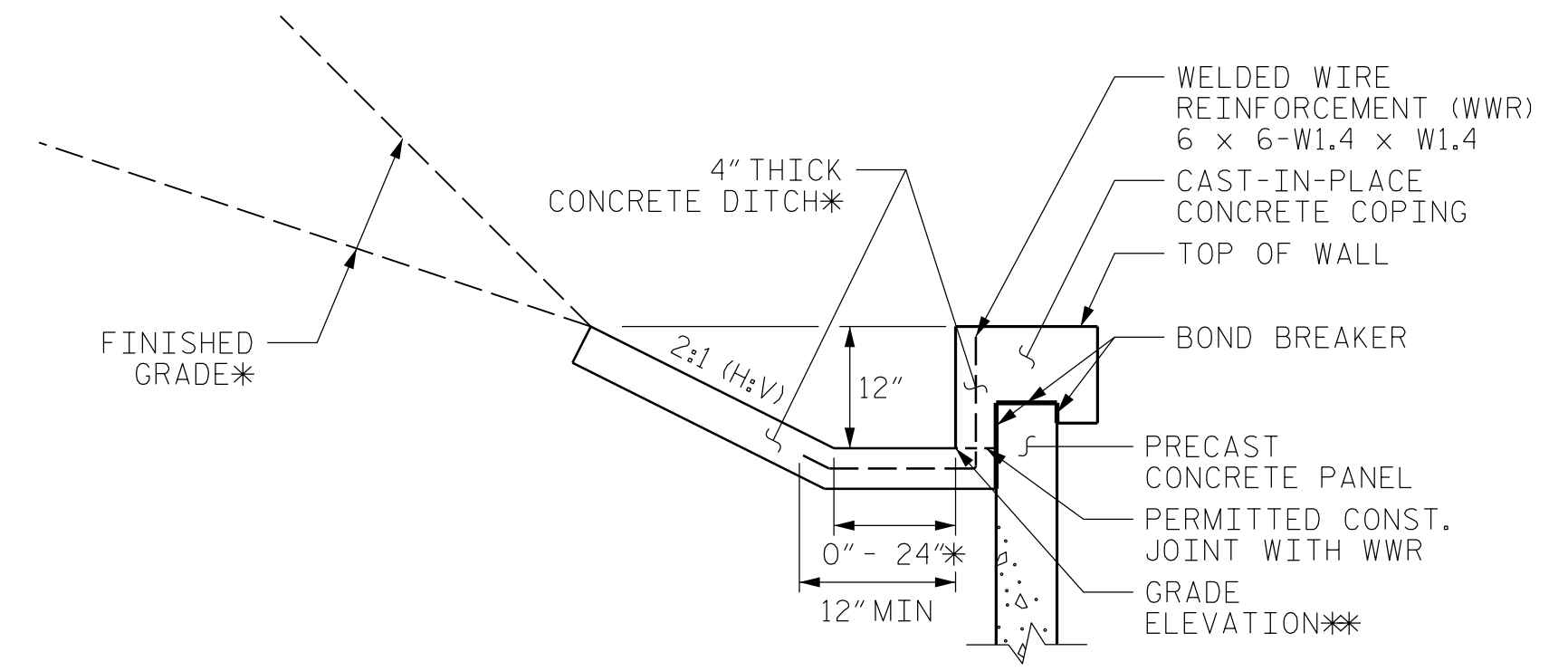
PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017

 <p>GEOTECHNICAL ENGINEER</p>	ENGINEER
<p>Designed by: <i>Matthew Alexander</i> DATE: 8/10/2017</p> <p>DATE: _____ SIGNATURE: _____ DATE: _____</p>	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	

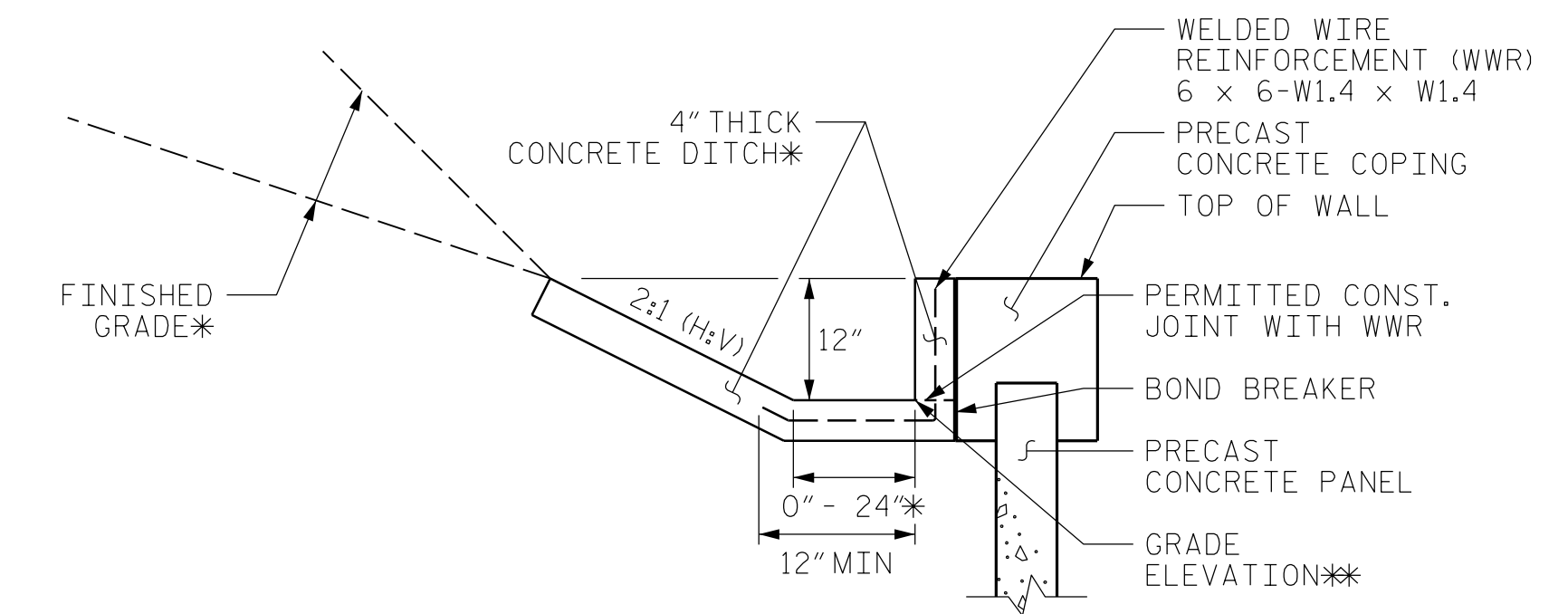


MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

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



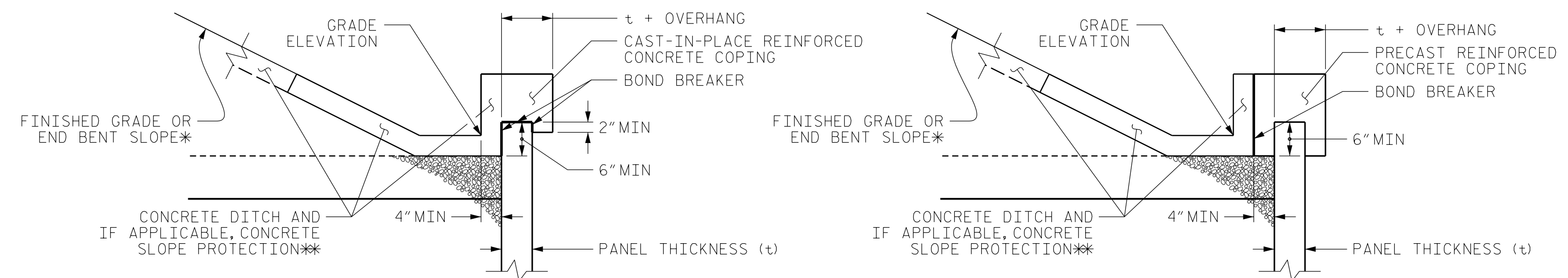
MSE WALL WITH PRECAST PANELS



CONCRETE DITCH BEHIND WALL WITH CONCRETE COPING

*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
 **SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.



COPING DETAILS

*SEE PLANS FOR FINISHED GRADE.
 **SEE CONCRETE DITCH BEHIND WALL DETAILS.

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 11+88.01 -RWALL_5-/
 SHEET 4 OF 5 18+51.67 -RP_WC-

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

MSE RETAINING WALL NO. 5A TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			WI-12
2			4			

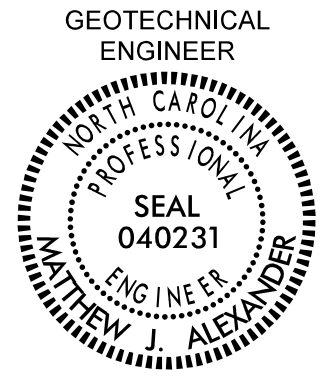
PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017

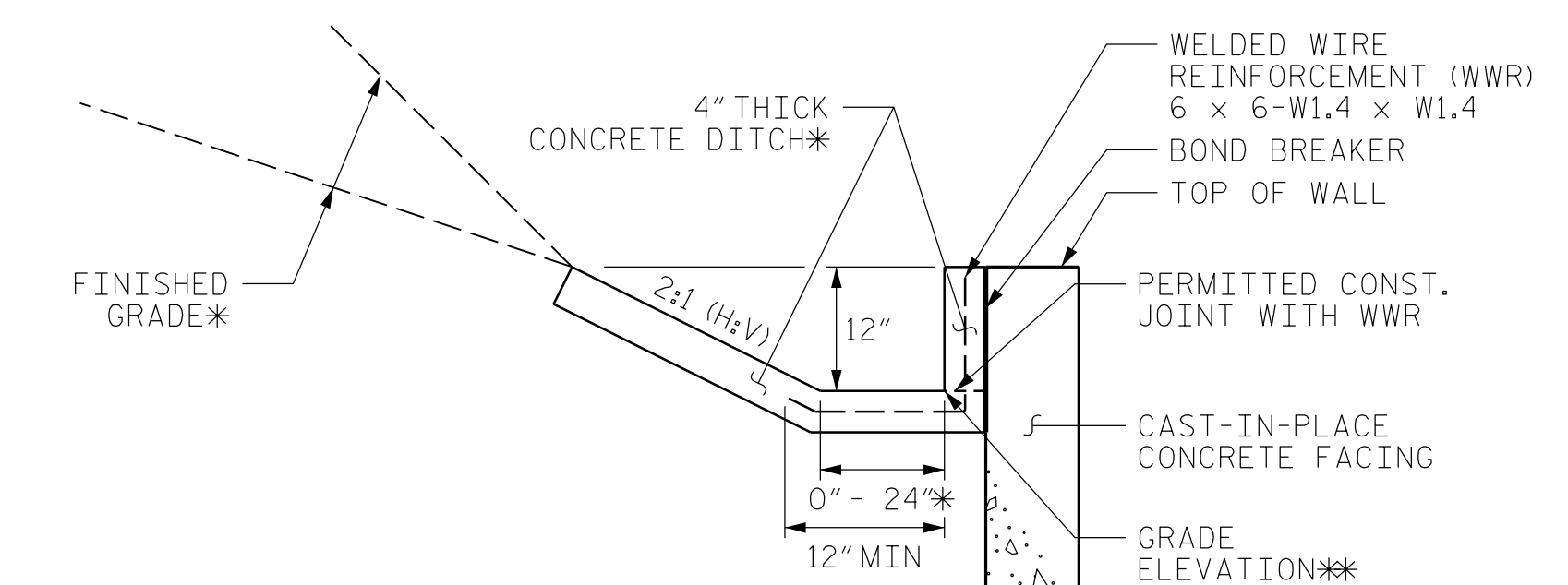
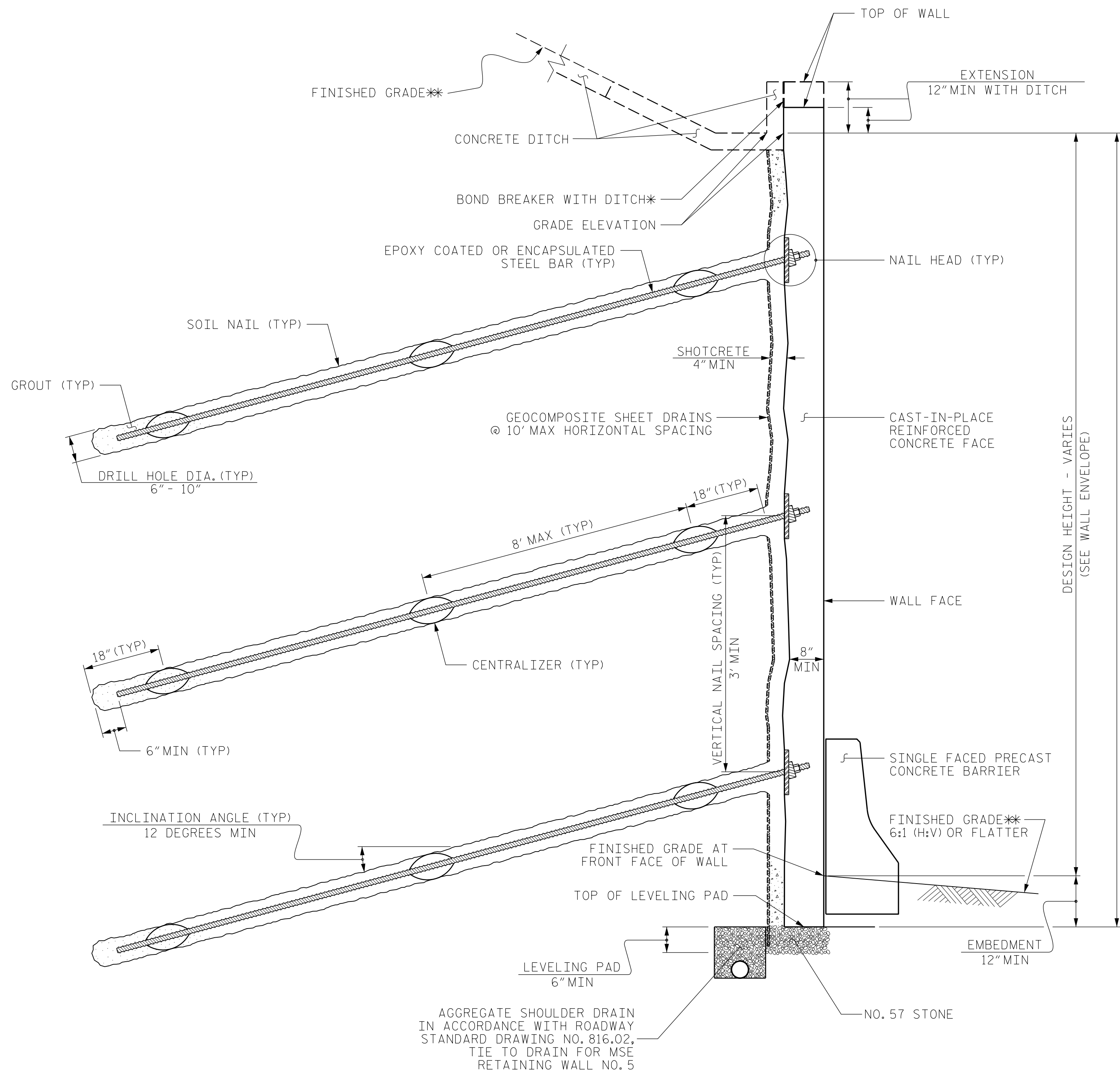
NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.
 FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
 WALL CONTRACTOR SHALL VERIFY IF AN ARCHITECTURAL FINISH IS REQUIRED FOR THE CAST-IN-PLACE REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 5B.
 BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 5B, 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.

GEOTECHNICAL DESIGN PARAMETERS:

DESIGN RETAINING WALL NO. 5B FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT + EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MINIMUM EMBEDMENT DEPTH BELOW FINISHED GRADE AT FRONT FACE = 2 FT FOR STRATIGRAPHY AT WALL LOCATION.
 4A) IN-SITU ASSUMED MATERIAL PARAMETERS FOR SILT (A-4):
 UNIT WEIGHT, $\gamma = 116$ LB/CF
 FRICTION ANGLE, $\phi = 41$ DEGREES
 COHESION, $c = 100$ LB/SF
 4B) IN-SITU ASSUMED MATERIAL PARAMETERS FOR SILTY SAND (A-2-5):
 UNIT WEIGHT, $\gamma = 92$ LB/CF
 FRICTION ANGLE, $\phi = 34$ DEGREES
 COHESION, $c = 100$ LB/SF
 4C) IN-SITU ASSUMED MATERIAL PARAMETERS FOR WEATHERED ROCK:
 UNIT WEIGHT, $\gamma = 135$ LB/CF
 FRICTION ANGLE, $\phi = 41$ DEGREES
 COHESION, $c = 500$ LB/SF

GEOTECHNICAL ENGINEER  SEAL 040231 MATTHEW J. ALEXANDER ENGINEER	ENGINEER _____ SIGNATURE
Discussed by: <i>Matthew Alexander</i> DATE: 8/10/2017	DATE: _____ SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



CONCRETE DITCH BEHIND WALL WITH CONCRETE FACING

*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
 **SEE WALL ENVELOPE FOR GRADE ELEVATIONS.
 FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.

SOIL NAIL WALL - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL DETAILS.
 **SEE PLANS FOR FINISHED GRADE.

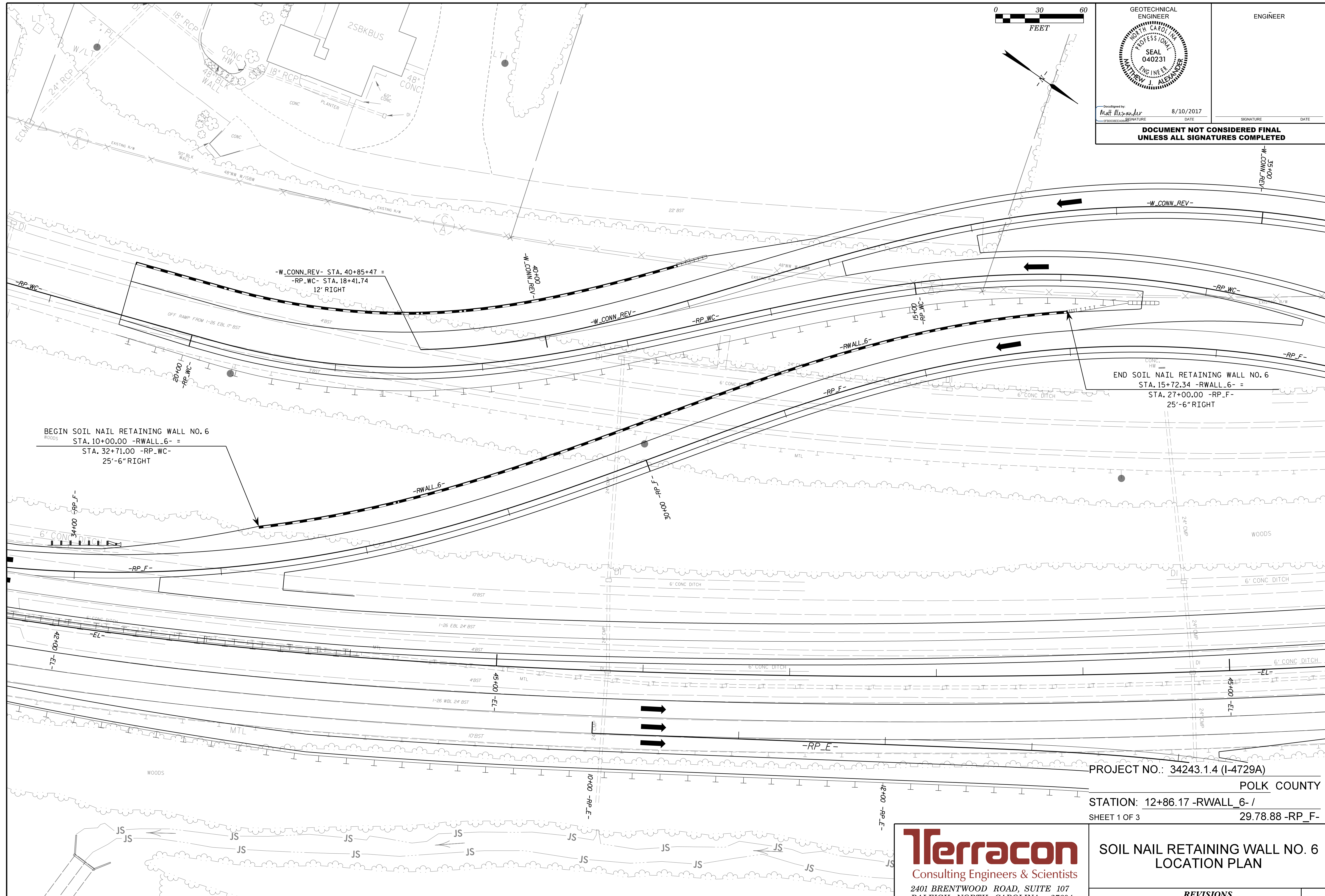
PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 12+86.17 -RWALL_6- /
 SHEET 5 OF 5 29+78.88 -RP_F-

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

SOIL NAIL RETAINING WALL NO. 5B TYPICAL SECTION AND NOTES					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017

SHEET NO. W-13



GEOTECHNICAL ENGINEER SEAL 040231 MATTHEW J. ALEXANDER	ENGINEER
	DEVELOPED BY: <i>Matthew Alexander</i> DATE: 8/10/2017 SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017


Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 12+86.17 -RWALL_6- / 29.78.88 -RP_F-
 SHEET 1 OF 3

**SOIL NAIL RETAINING WALL NO. 6
LOCATION PLAN**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			WI-14
2			4			

GEOTECHNICAL ENGINEER



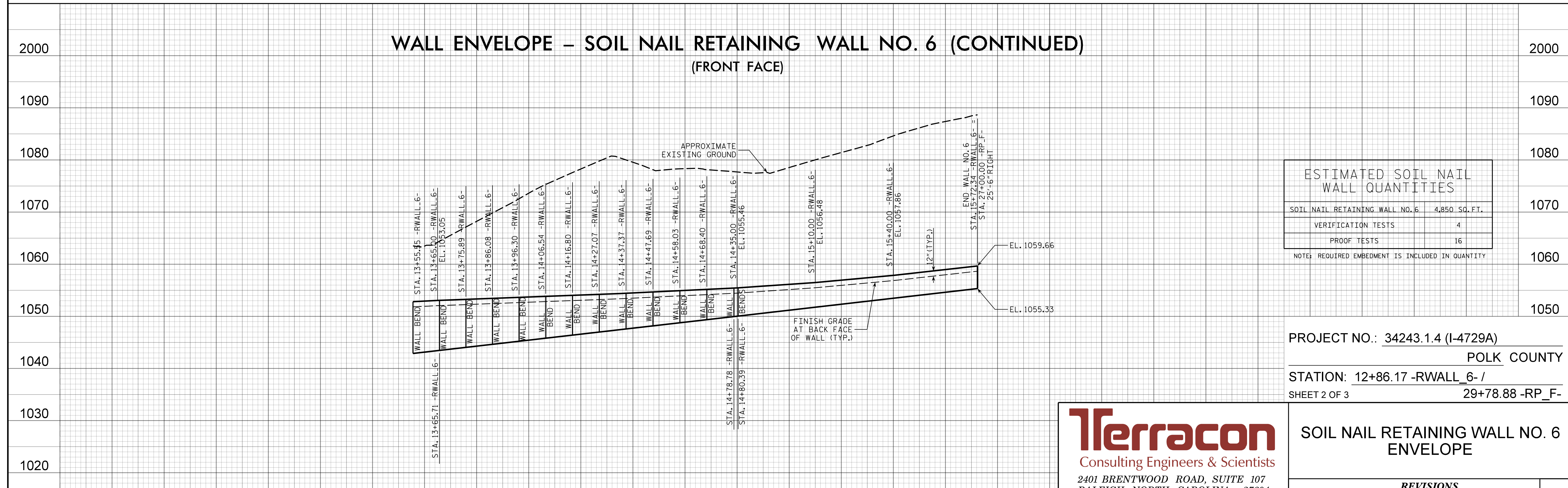
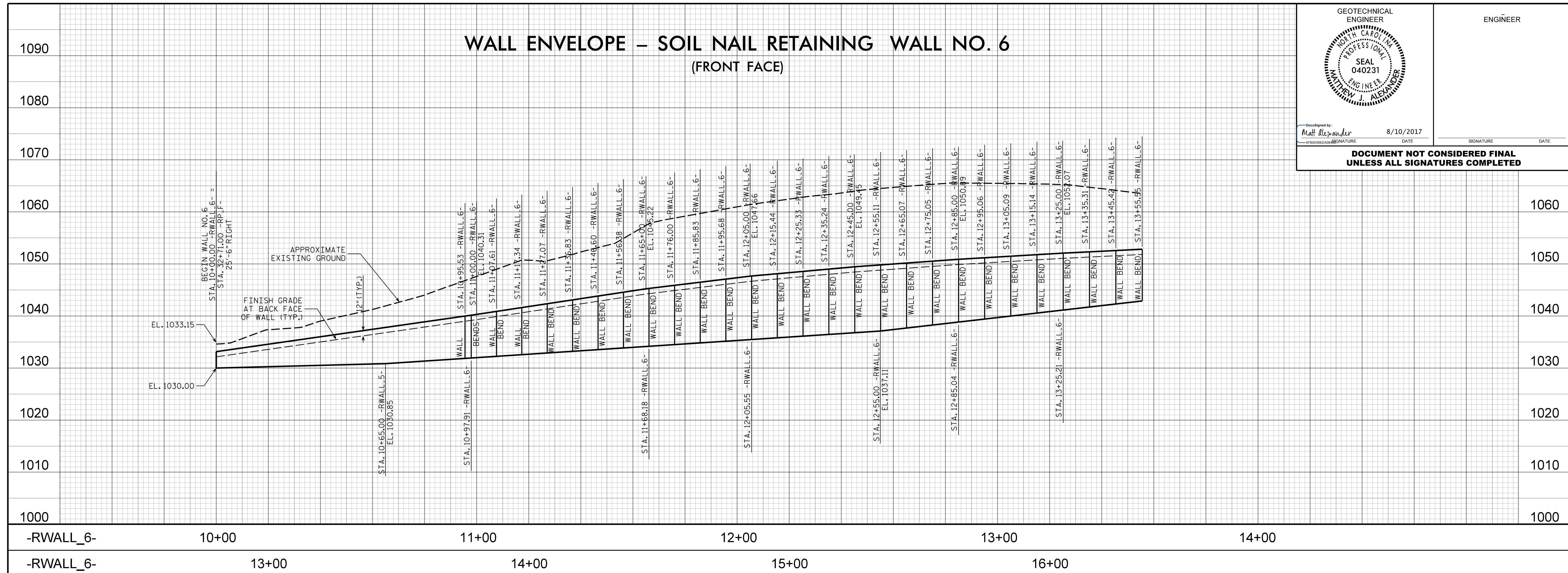
ENGINEER

ENGINEER

Designed by: *Matthew Alexander* DATE: 8/10/2017

SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

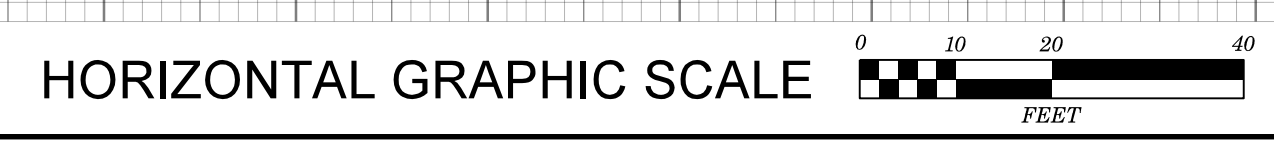


ESTIMATED SOIL NAIL WALL QUANTITIES	
SOIL NAIL RETAINING WALL NO. 6	4,850 SQ. FT.
VERIFICATION TESTS	4
PROOF TESTS	16

NOTE: REQUIRED EMBEDMENT IS INCLUDED IN QUANTITY

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 12+86.17 -RWALL_6- /
 SHEET 2 OF 3 29+78.88 -RP_F-

PREPARED BY: M. J. ALEXANDER DATE: 8/4/2017
 REVIEWED BY: A. F. RIGGS DATE: 8/4/2017



Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

**SOIL NAIL RETAINING WALL NO. 6
 ENVELOPE**

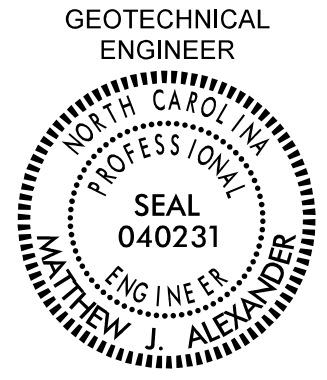
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-15
2			4			

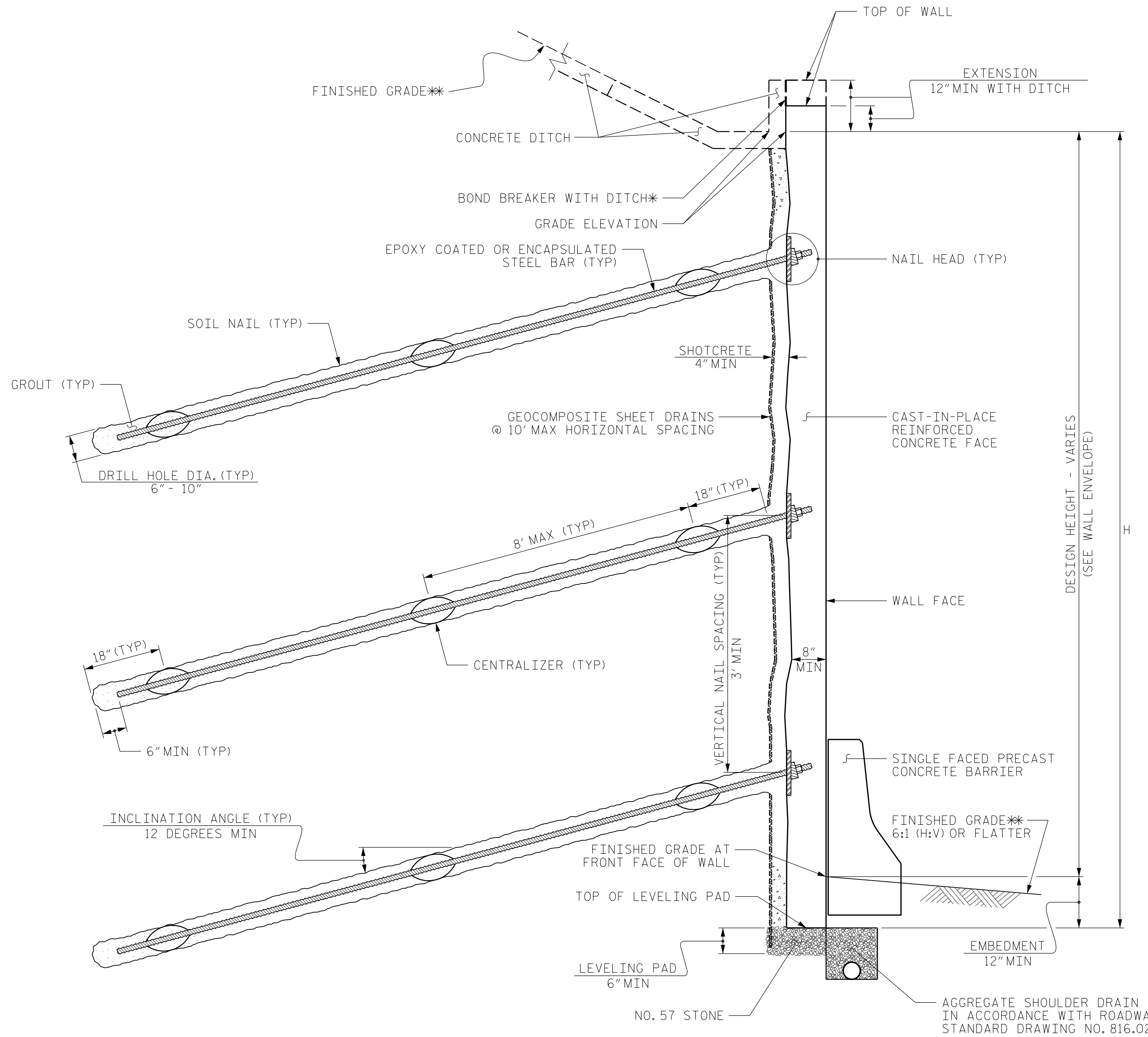
NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.
 FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
 WALL CONTRACTOR SHALL VERIFY IF AN ARCHITECTURAL FINISH IS REQUIRED FOR THE CAST-IN-PLACE REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 6.
 BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 6, 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.

GEOTECHNICAL DESIGN PARAMETERS:

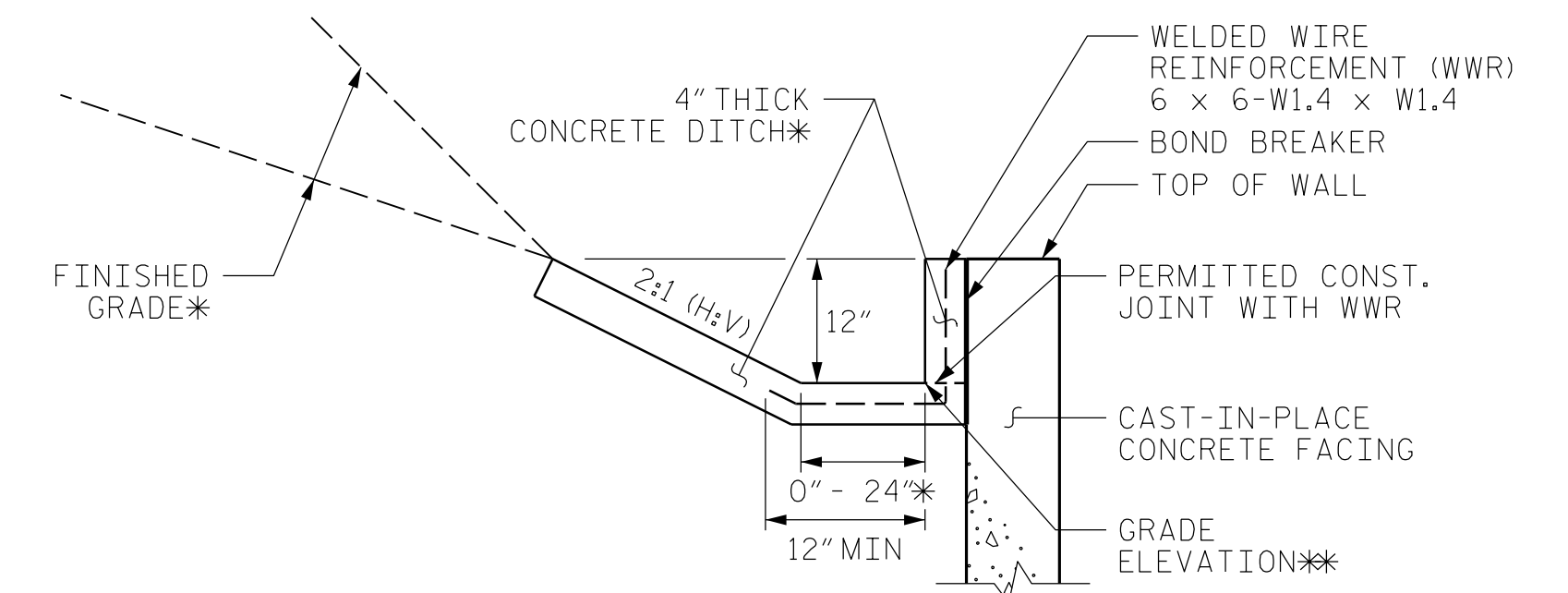
DESIGN RETAINING WALL NO. 6 FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT + EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MINIMUM EMBEDMENT DEPTH BELOW FINISHED GRADE AT FRONT FACE = 2 FT
 4) REFER TO STRUCTURE SUBSURFACE INVESTIGATION INVENTORY REPORT DATED AUGUST 2017 FOR STRATIGRAPHY AT WALL LOCATION.
 4A) IN-SITU ASSUMED MATERIAL PARAMETERS FOR SILT (A-4):
 UNIT WEIGHT, $\gamma = 116$ LB/CF
 FRICTION ANGLE, $\phi = 41$ DEGREES
 COHESION, $c = 100$ LB/SF
 4B) IN-SITU ASSUMED MATERIAL PARAMETERS FOR SILTY SAND (A-2-5):
 UNIT WEIGHT, $\gamma = 92$ LB/CF
 FRICTION ANGLE, $\phi = 34$ DEGREES
 COHESION, $c = 100$ LB/SF
 4C) IN-SITU ASSUMED MATERIAL PARAMETERS FOR WEATHERED ROCK:
 UNIT WEIGHT, $\gamma = 135$ LB/CF
 FRICTION ANGLE, $\phi = 41$ DEGREES
 COHESION, $c = 500$ LB/SF
 4D) IN-SITU ASSUMED MATERIAL PARAMETERS FOR CRYSTALLINE ROCK:
 UNIT WEIGHT, $\gamma = 170$ LB/CF
 FRICTION ANGLE, $\phi = 0$ DEGREES
 COHESION, $c = 510,000$ LB/SF

GEOTECHNICAL ENGINEER  Matthew J. Alexander PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA SEAL NO. 040231	ENGINEER _____ DATE: 8/10/2017 SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SOIL NAIL WALL - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL DETAILS.
 **SEE PLANS FOR FINISHED GRADE.



CONCRETE DITCH BEHIND WALL WITH CONCRETE FACING

*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
 **SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.


PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 12+86.17 -RWALL_6- /
 SHEET 3 OF 3 29+78.88 -RP_F-

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

SOIL NAIL RETAINING WALL NO. 6 TYPICAL SECTION AND NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-16
2			4			

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017

GEOTECHNICAL ENGINEER  SEAL 040231 ENGINEER MATTHEW J. ALEXANDER	ENGINEER
Designed by: <u>Matthew Alexander</u> 8/10/2017 SIGNATURE DATE	SIGNATURE DATE
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. .

THE WALL CONTRACTOR SHALL VERIFY IF AN ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 7.

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

A DRAIN IS NOT REQUIRED FOR RETAINING WALL NO. 7.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. , 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 = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,350 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH BELOW FINISHED GRADE AT FRONT FACE OF WALL = 2 FT
 - 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

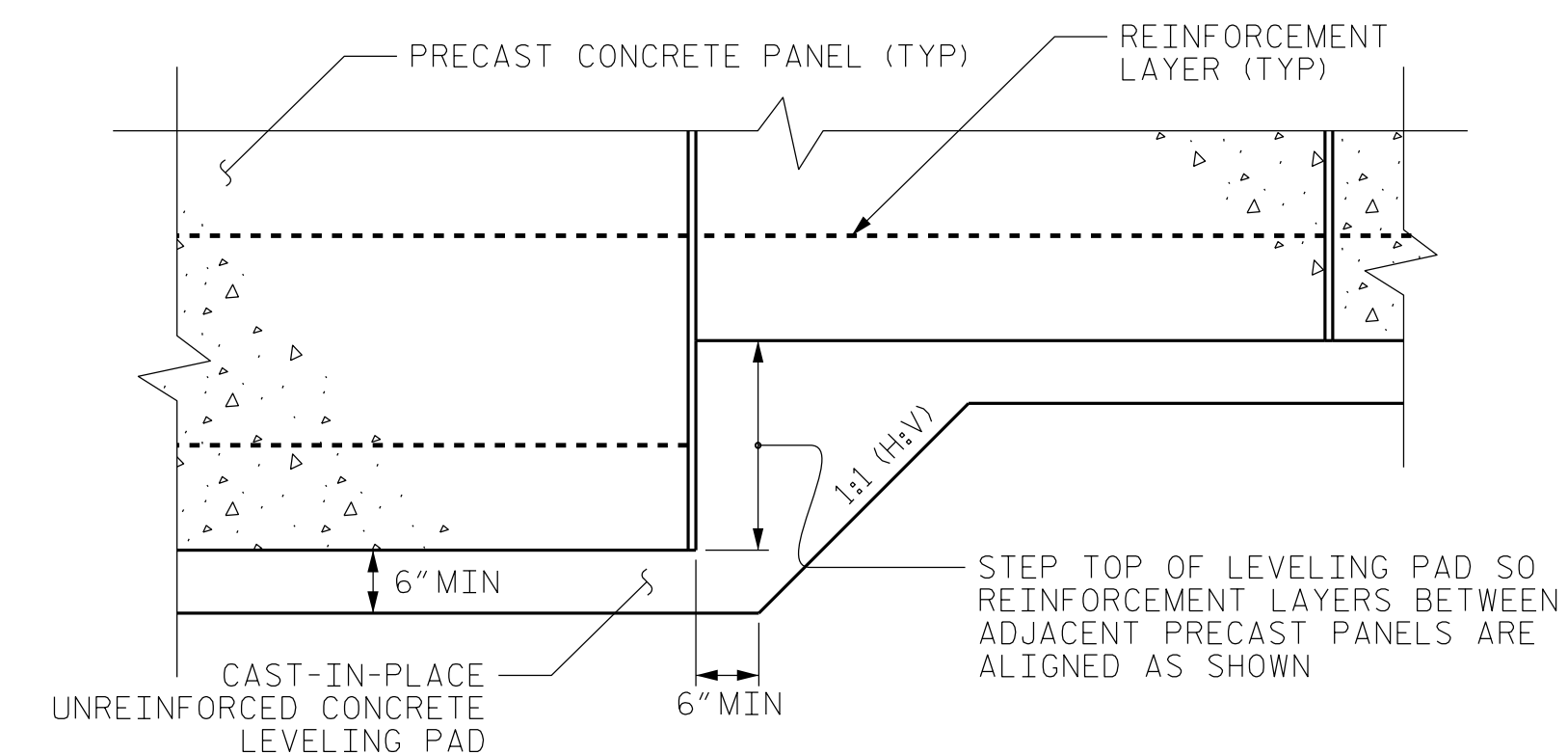
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

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	115	30	0

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

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



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 11+52.84 -RWALL_7- /
 SHEET 2 OF 4 13+50.03 -RP_F-

Terracon

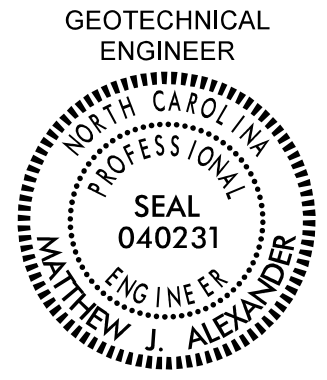
Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

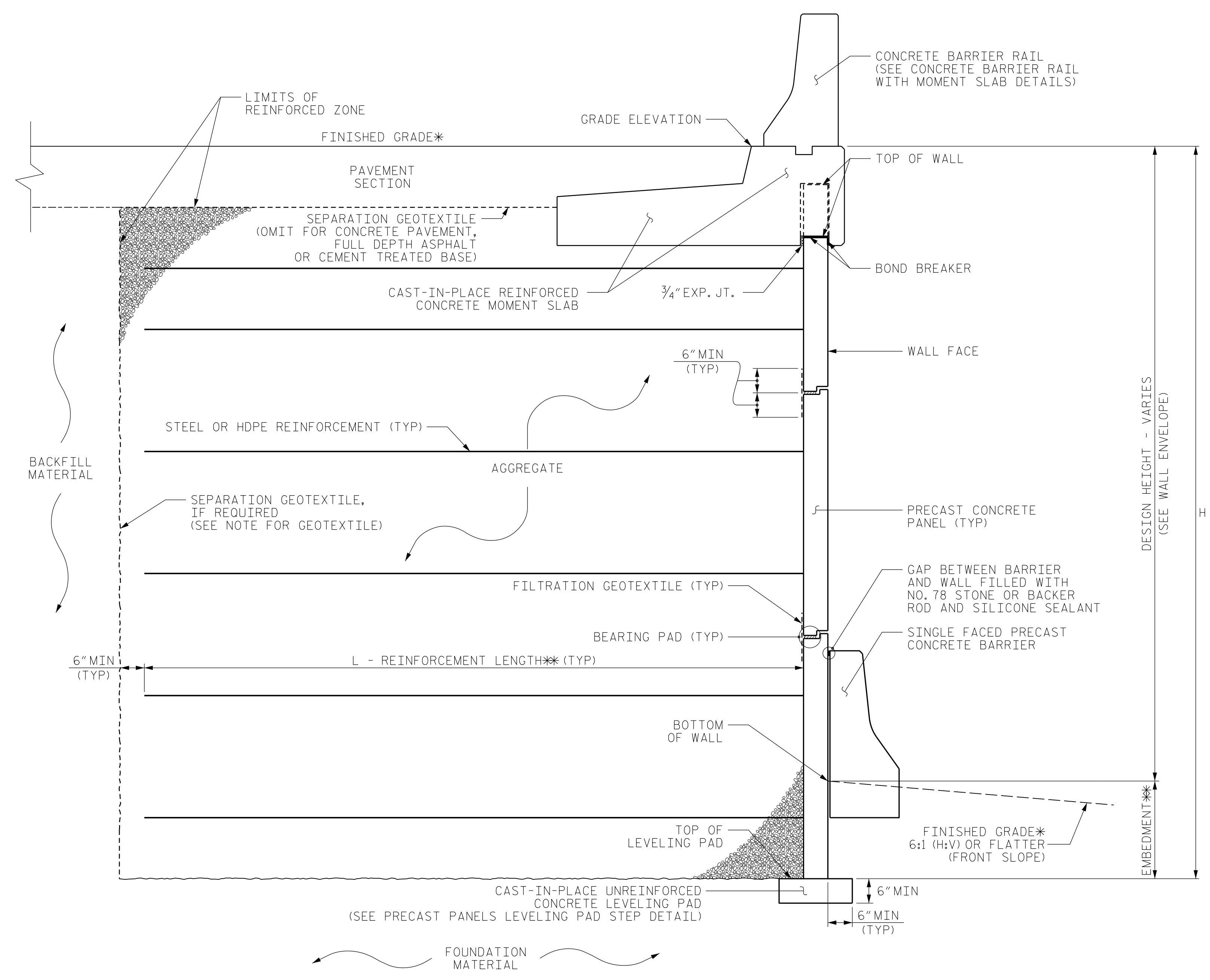
MSE RETAINING WALL NO. 7
NOTES

REVISIONS

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			W-18
2			4			

PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017

GEOTECHNICAL ENGINEER  SEAL 040231 MATTHEW J. ALEXANDER ENGINEER	ENGINEER _____ SIGNATURE DATE
Designed by: <i>Matthew Alexander</i> DATE: 8/10/2017	DATE: _____ SIGNATURE: _____ DATE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

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

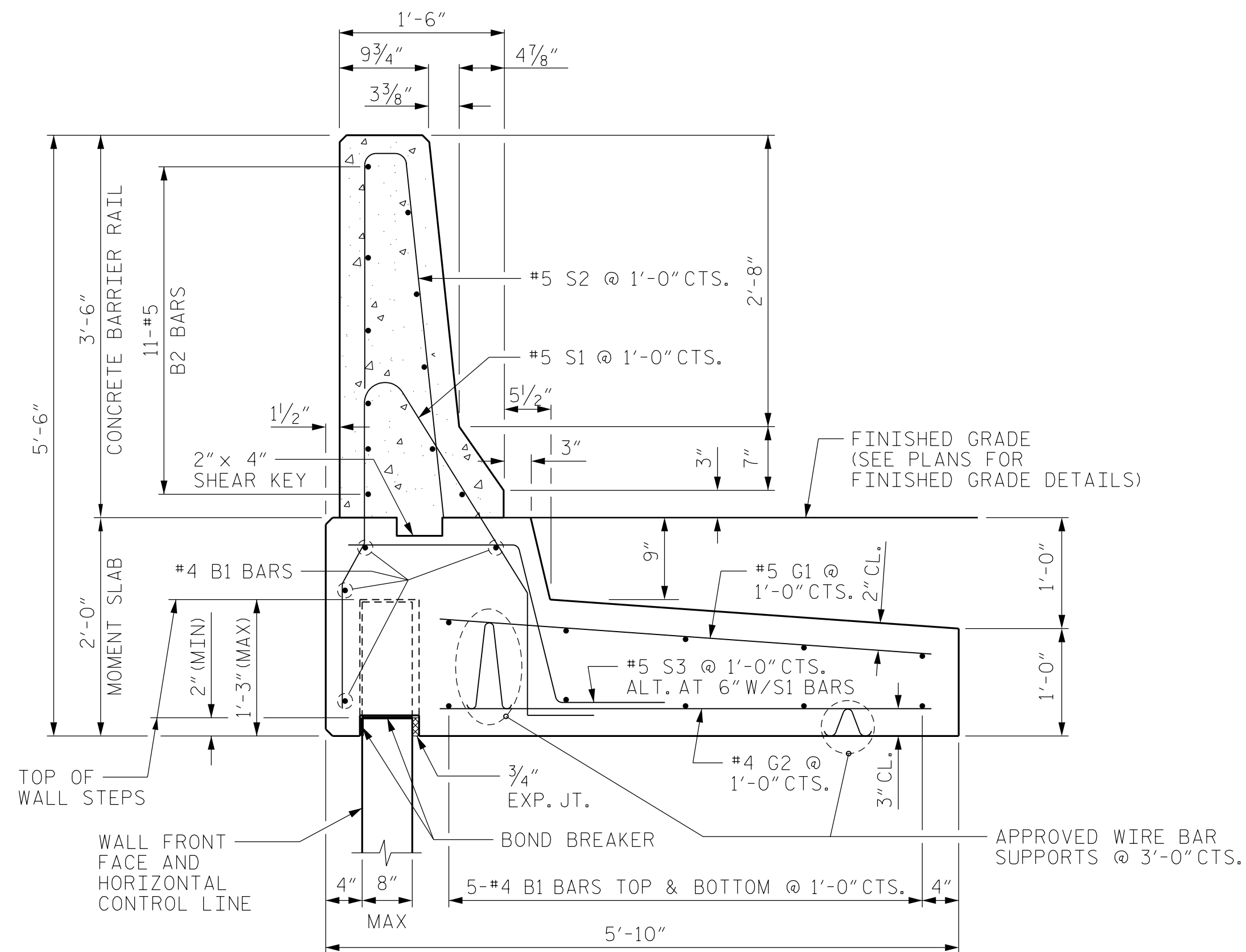
PROJECT NO.: 34243.1.4 (I-4729A)
 POLK COUNTY
 STATION: 11+52.84 -RWALL_7- /
 SHEET 3 OF 4 13+50.03 -RP_F-


Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

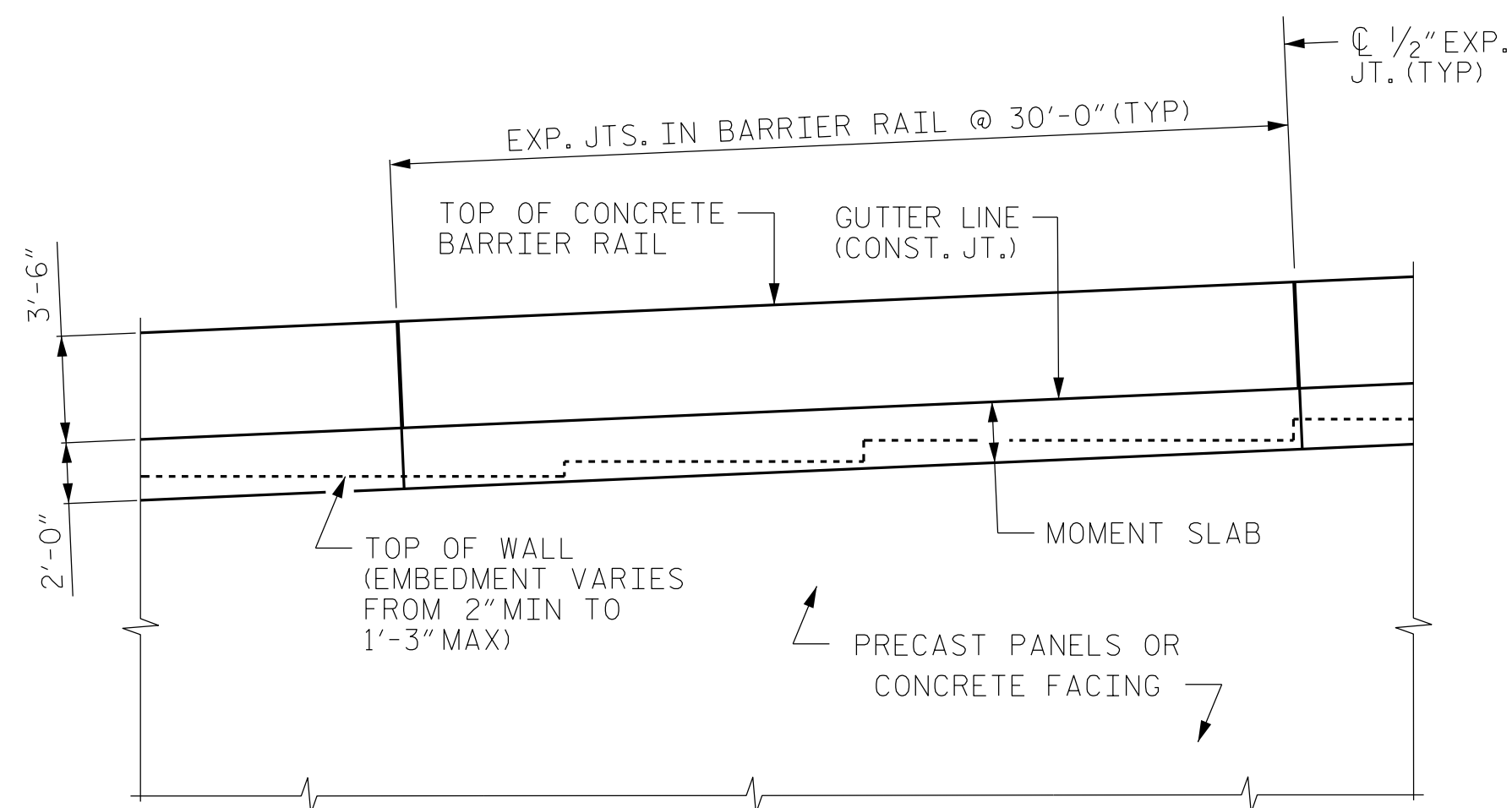
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-19

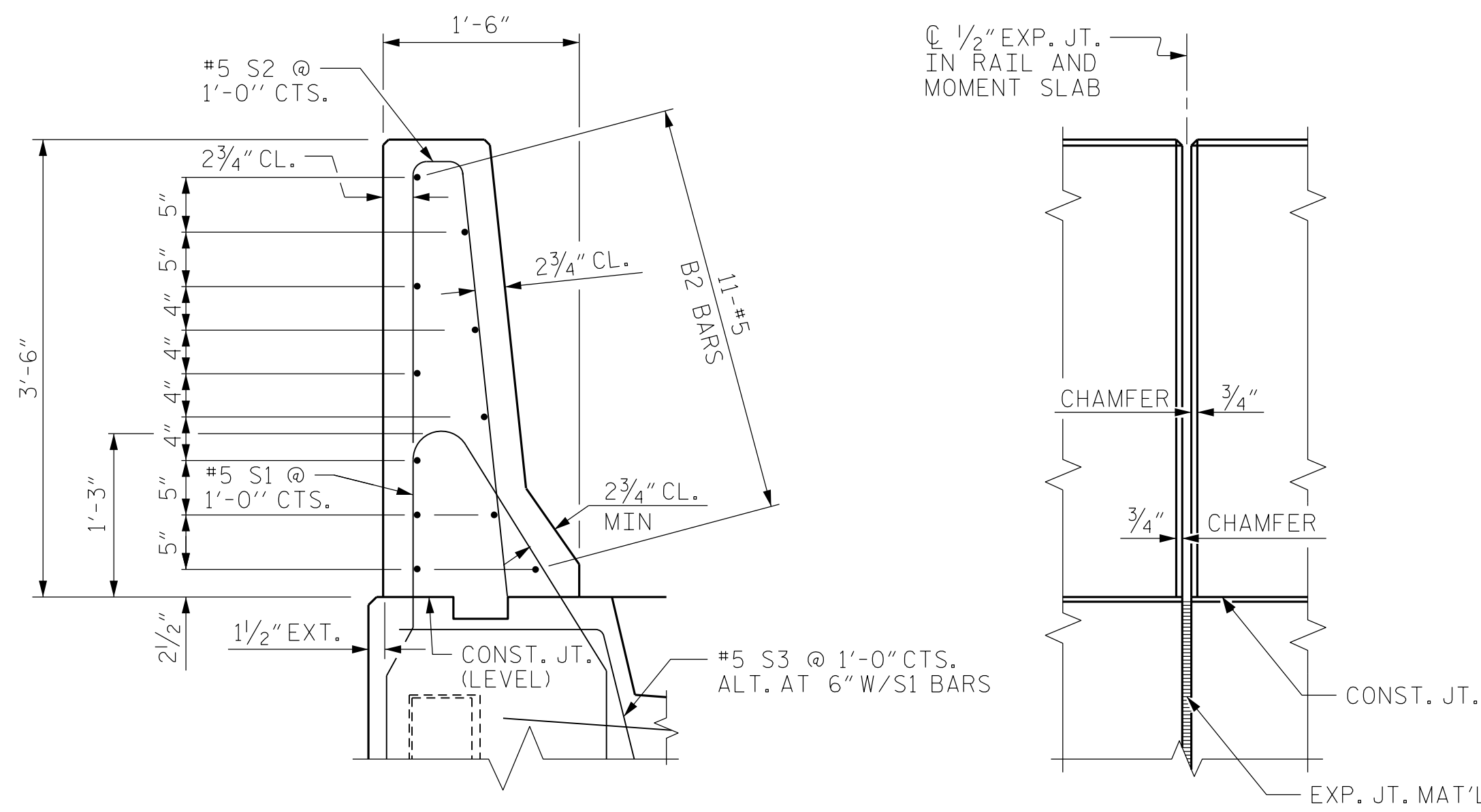
PREPARED BY: M. J. ALEXANDER	DATE: 8/4/2017
REVIEWED BY: A. F. RIGGS	DATE: 8/4/2017



CONCRETE BARRIER RAIL WITH MOMENT SLAB



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION



BARRIER RAIL DETAILS

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE CONCRETE BARRIER RAIL WITH MOMENT SLAB PROVISION.

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.

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.

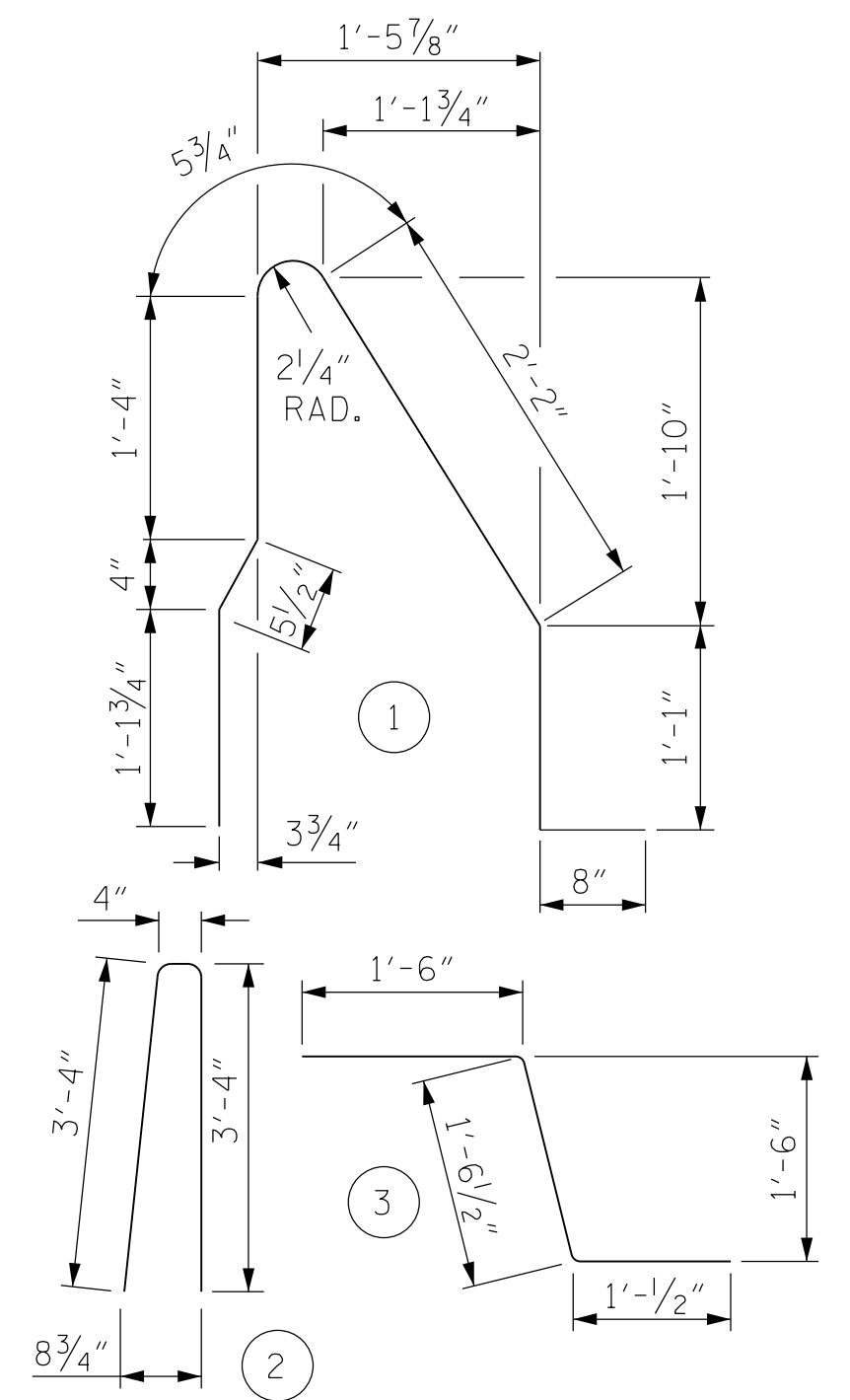
IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

CONCRETE BARRIER RAIL WITH MOMENT SLAB
PAY LENGTH = 570 LIN FT

STRUCTURAL ENGINEER 	ENGINEER _____ SIGNATURE DATE
DocuSigned by: Alan D. Shah 8/10/2017	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BAR TYPES



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.: 34243.1.4 (I-4729A)

POLK COUNTY

STATION: 11+52.84 -RWALL_7- /

SHEET 4 OF 4 13+50.03 -RP_F-

Terracon
 Consulting Engineers & Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 PHONE: (919) 873-2211 FAX: (919) 873-9555
 NC REGISTERED FIRM: F-0869

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

REVISIONS

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

SHEET NO. W-20

PREPARED BY: M. J. ALEXANDER	DATE: 8/10/2017
REVIEWED BY: A. D. SHAH	DATE: 8/10/2017