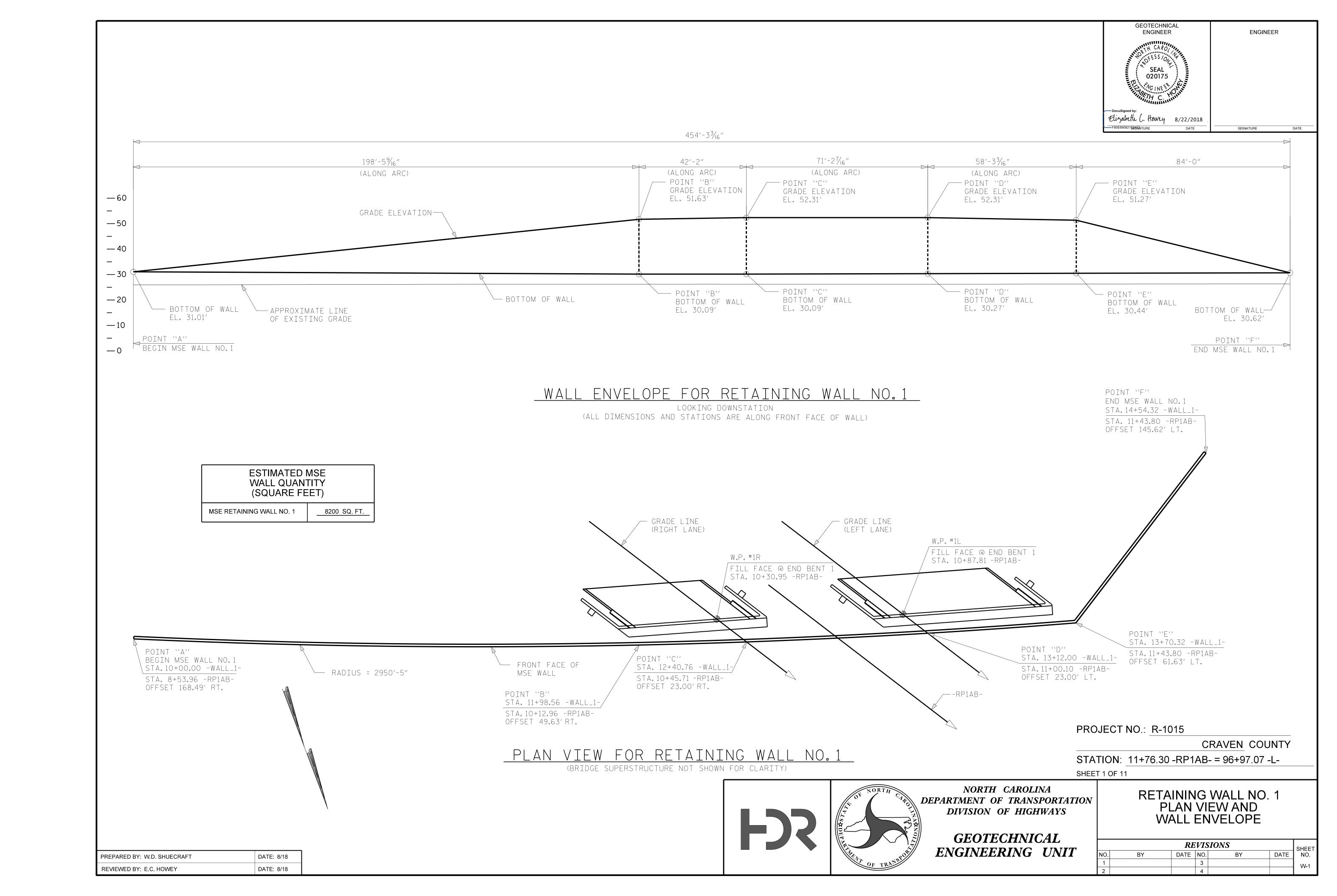
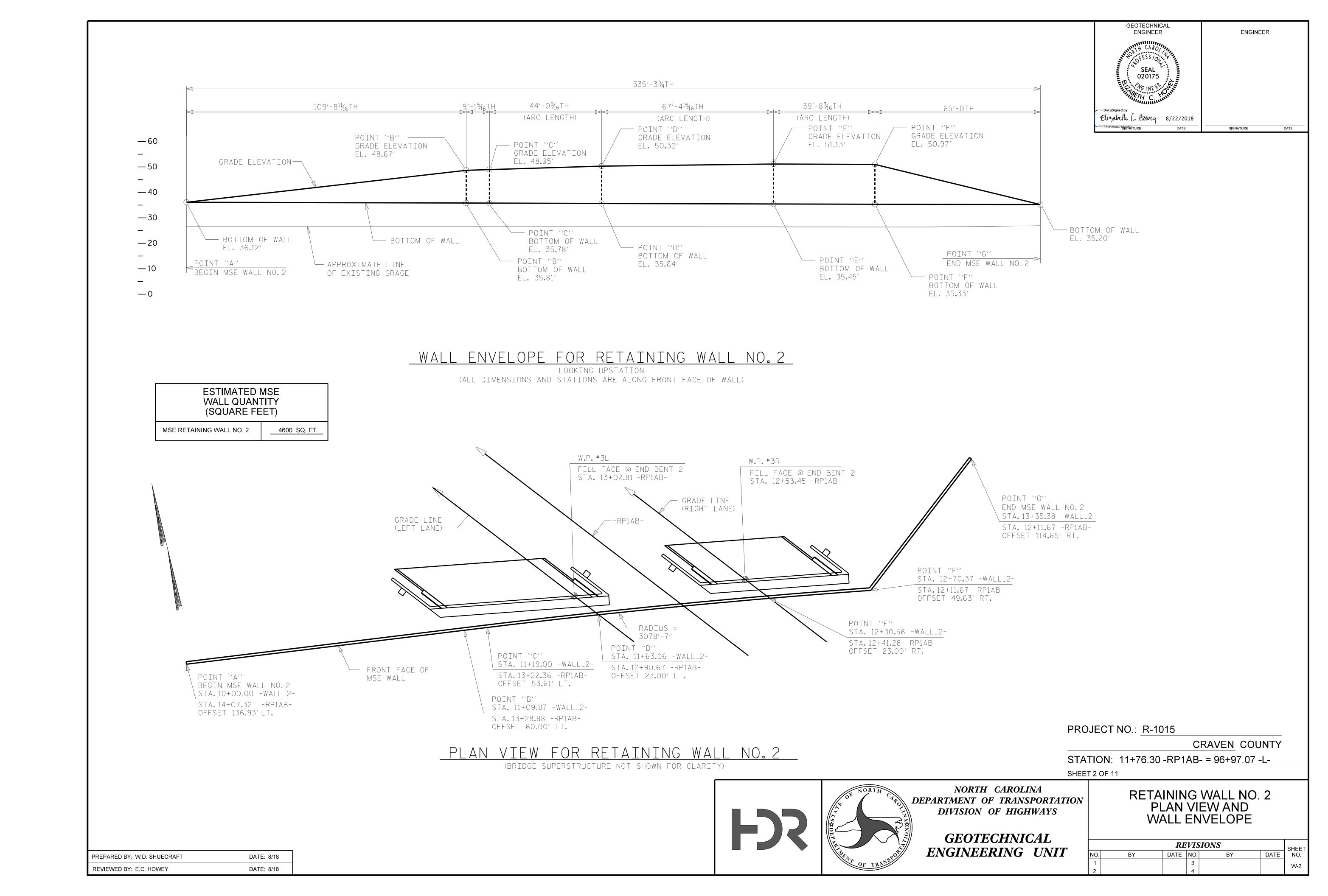
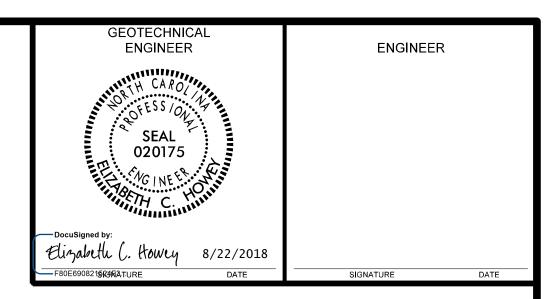
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NOTES FOR WALL NO. 1:

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

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

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

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.1 LL LOCATED AT STATION 10+87.81 -RP1AB- AND END BENT NO.1 RL LOCATED AT STATION 10+30.95 -RP1AB-.

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) H = DESIGN HEIGHT + EMBEDMENT

2) DESIGN LIFE = 100 YEARS

REQUIREMENTS.

3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 6,650 LB/SF

4) MINIMUM REINFORCEMENT LENGTH (L)=0.95H UNDER AND BETWEEN END BENT CAPS. MINIMUM REINFORCEMENT LENGTH = 0.70H OR 6 FEET WHICHEVER IS LONGER OUTSIDE CAP AREA ALONG WALL WINGS.

5) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ø) degrees	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0
*SEE MSE RETAINING WA	ALLS PROVISION FO	R COARSE AGGREGATE	MATERIAL

6) 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	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 MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1.

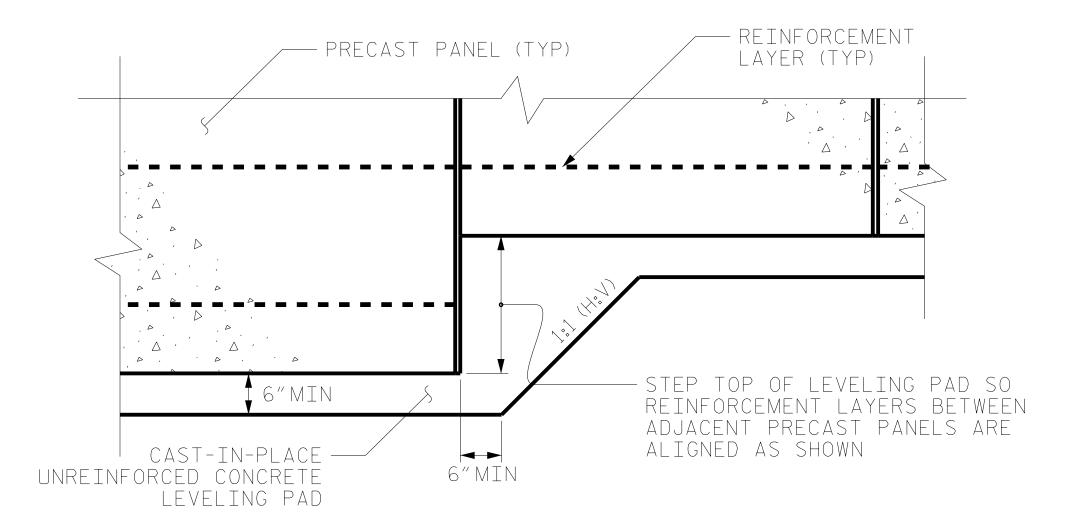
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L.) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LL AT STATION 10+87.81 -RP1AB AND END BENT NO.1 RL LOCATED AT STATION 10+30.95 -RP1AB-. MAINTAIN A CLEARANCE OF AT LEAST 3"BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR END BENT NO.1 LL LOCATED AT STATION 10+87.81 -RP1AB- AND END BENT NO.1 RL LOCATED AT STATION 10+30.95 -RP1AB-, WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NO.1 LL AT STATION 10+87.81 -RP1AB- AND END BENT NO.1 RL LOCATED AT STATION 10+30.95 -RP1AB- WHILE CONSTRUCTING RETAINING WALL NO.1. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BÉFORE CONSTRUCTING END BENT CAPS. UNDERCUT IS REQUIRED BENEATH A PORTION OF RETAINING WALL NO.1 PRIOR TO MSE WALL CONSTRUCTION. SEE ROADWAY PLANS FOR LIMITS OF UNDERCUT.

THE BOTTOM OF RETAINING WALL NO.1 IS LOCATED NEAR THE GROUNDWATER TABLE AND DEWATERING MAY BE REQUIRED.



PRECAST CONCRETE PANELS

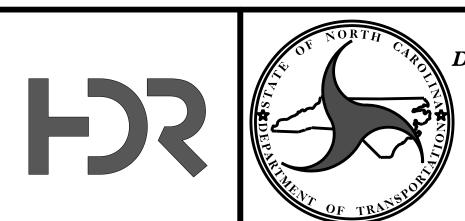
LEVELING PAD STEP DETAILS

PROJECT NO.: R-1015

CRAVEN COUNTY

STATION: 11+76.30 -RP1AB- = 96+97.07 -L-

SHEET 3 OF 11

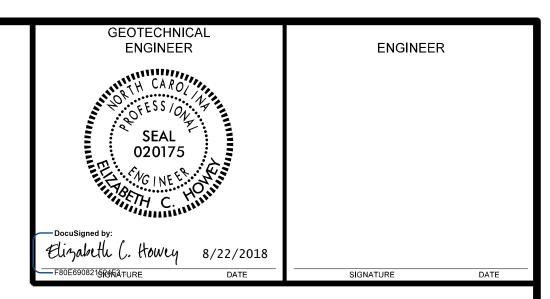


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT **RETAINING WALL NO. 1** NOTES AND LEVELING PAD STEP DETAILS

REVISIONS DATE NO. DATE NO.

PREPARED BY: W.D. SHUECRAFT DATE: 8/18 DATE: 8/18 REVIEWED BY: E.C. HOWEY



NOTES FOR WALL NO. 2:

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

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

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

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

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

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 2.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.2 LL LOCATED AT STATION 13+02.81 -RP1AB- AND END BENT NO.2 RL LOCATED AT STATION 12+53.45 -RP1AB-.

BEFORE BEGINNING MSE 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 = DESIGN HEIGHT + EMBEDMENT

2) DESIGN LIFE = 100 YEARS

REQUIREMENTS.

3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 5,950 LB/SF

4) MINIMUM REINFORCEMENT LENGTH (L)=0.70H OR 6 FT, WHICHEVER IS LONGER

5) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (þ) degrees	COHESION (c) LB/SF		
COARSE	110	38	0		
FINE	115	34	0		
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AGGREGATE MATERIAL					

6) 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	120	30	0

DESIGN RETAINING WALL NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

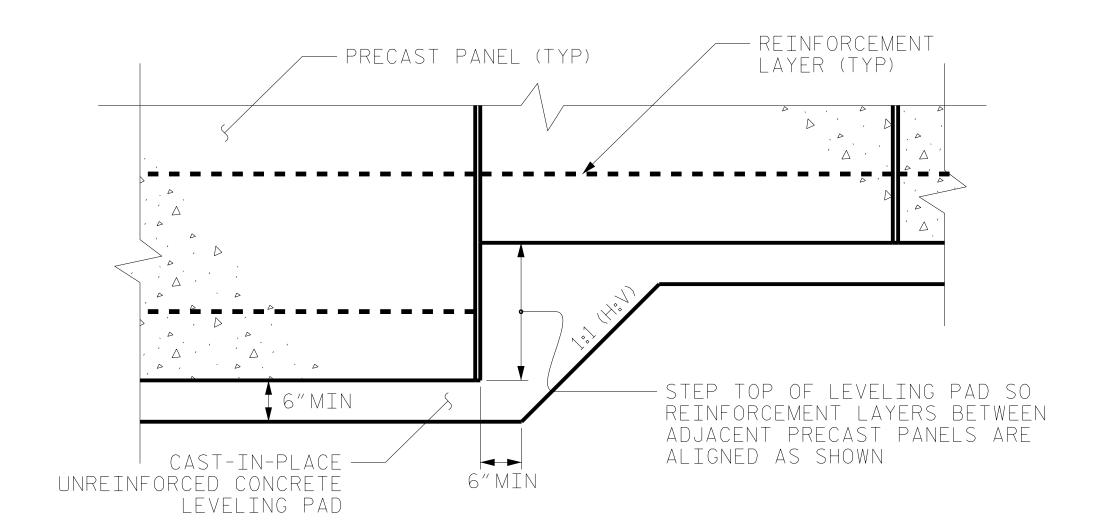
EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 2.

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

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 2 LL AT STATION 13+02.81 -RP1AB- AND END BENT NO. 2 RL LOCATED AT STATION 12+53.45 -RP1AB-. MAINTAIN A CLEARANCE OF AT LEAST 3"BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR END BENT NO.2 LL LOCATED AT STATION 13+02.81 -RP1AB- AND END BENT NO.2 RL LOCATED AT STATION 12+53.45 -RP1AB-, WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NO.2 LL AT STATION 13+02.81 -RP1AB- AND END BENT NO.2 RL LOCATED AT STATION 12+53.45 -RP1AB- WHILE CONSTRUCTING RETAINING WALL NO.2. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS.



PRECAST CONCRETE PANELS

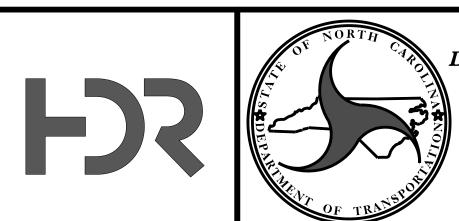
LEVELING PAD STEP DETAILS

PROJECT NO.: R-1015

CRAVEN COUNTY

STATION: 11+76.30 -RP1AB- = 96+97.07 -L-

SHEET 4 OF 11



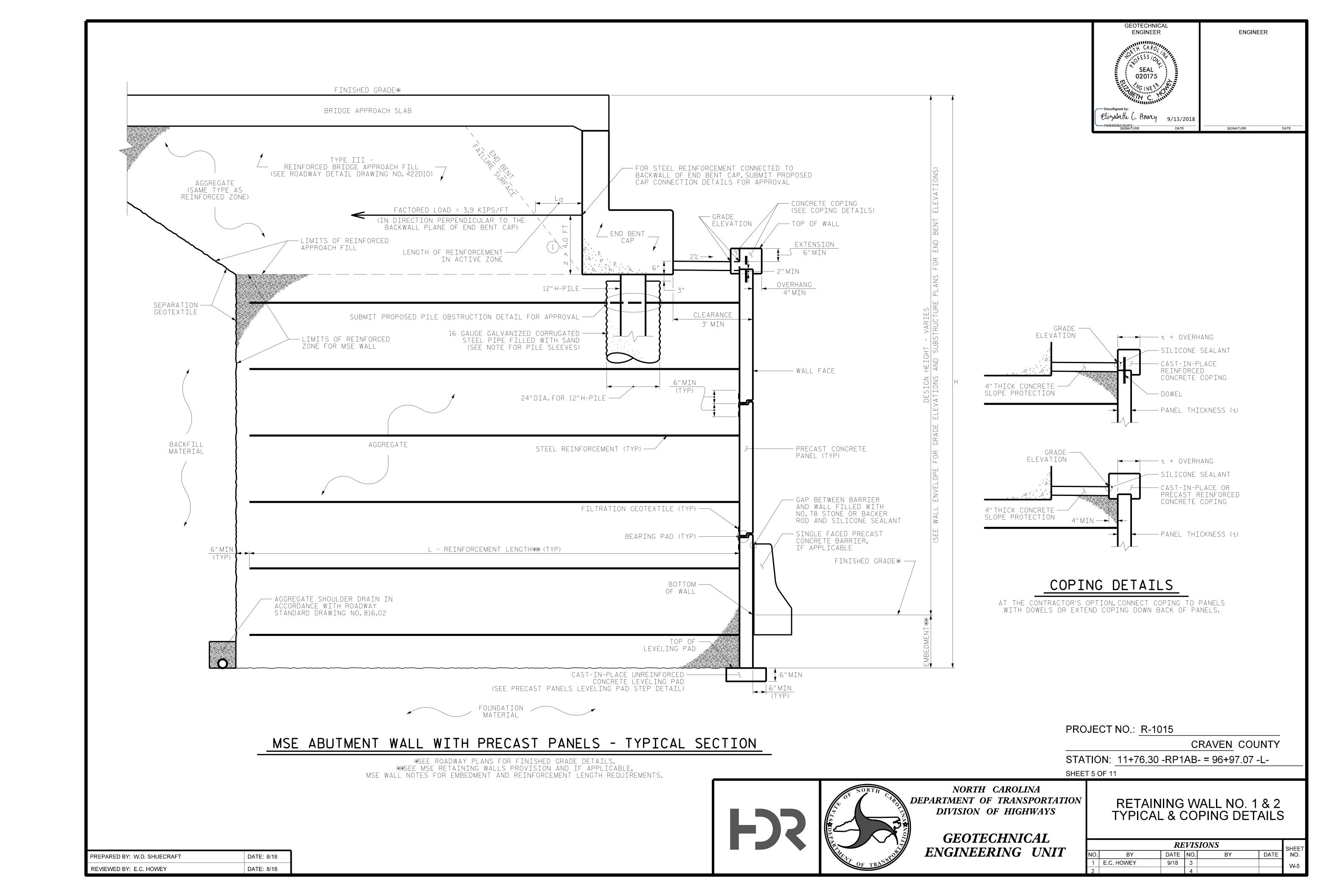
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

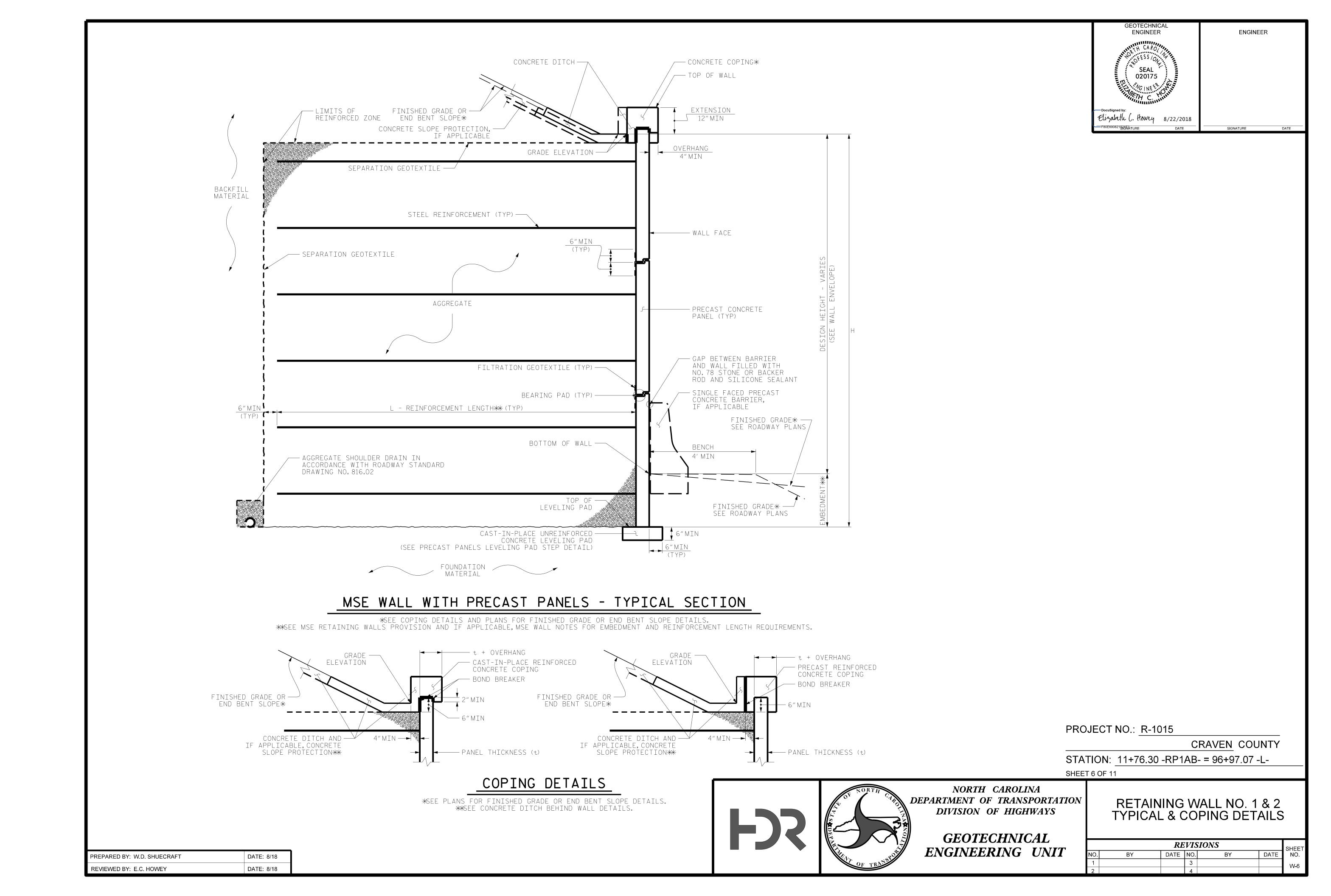
GEOTECHNICAL ENGINEERING UNIT RETAINING WALL NO. 2 NOTES AND LEVELING PAD STEP DETAILS

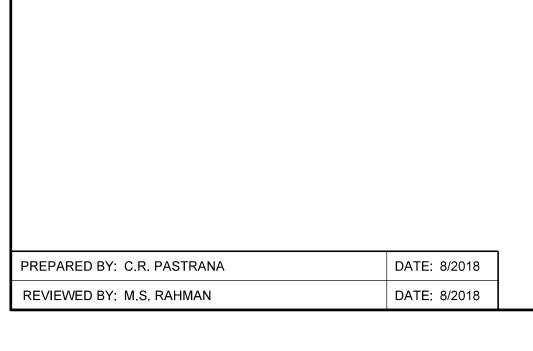
REVISIONS						SHEET
9.	BY	DATE	NO.	BY	DATE	NO.
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PREPARED BY: W.D. SHUECRAFT DATE: 8/18

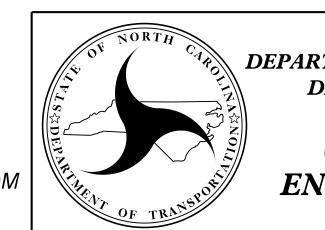
REVIEWED BY: E.C. HOWEY DATE: 8/18











DIVISION OF HIG

67'-0"

POINT "E"
GRADE ELEVATION

EL. 47.23′

GEOTECHNICAL ENGINEERING UNIT

REVISIONS DATE NO. DATE NO. 3 4

GEOTECHNICAL ENGINEER

SEAL 7 033500

Muhammad Shafiq Rahman8/28/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ACC34C7C83Fd4A2FtURE

ENGINEER

BOTTOM OF WALL EL. 29.69' POINT ''A''	— BOTTOM OF WALL APPROXIMATE LINE OF EXISTING GRADE	POINT "B" BOTTOM OF WALL EL. 30.37'	POINT "C" BOTTOM OF WALL EL. 30.77'	POINT "D" BOTTOM OF WALL EL. 31.22'	POINT "E" BOTTOM OF WALL EL. 31.70' BOTTOM OF WALL EL. 32.13'	
BEGIN MSE WALL NO.3					POINT "F" END MSE WALL NO.	<u>3</u> ►
		ENVELOPE FOR R Looking do all dimensions and stations	DWNSTATION			
		ALL DIMENSIONS AND STATIONS	AND ADDITION FACE OF WAL	/		
						ESTIMATED MSE WALL QUANTITY (SQUARE FEET) MSE RETAINING WALL NO. 3 6,400 SF
		GRADE LIN (RIGHT LAN	E GRADE LI (LEFT LA	INE NE)		
			W.P. #1R FILL FACE @ END BENT 1 STA. 515+86.84 -L-	W.P. #1L FILL FACE @ END BENT 1 STA. 516+19.62 -L-		POINT "F"
				318.13.02 L		END MSE WALL NO. 3 STA. 13+83.68 -WALL_3- STA. 516+64.81 -L-
						OFFSET 138.63' LT.
POINT "A"		POINT "C"		POINT "D" STA. 12+56.52 -WAL	POINT "E" STA. 13+16.68 -WALL_3-	
BEGIN MSE WALL NO. 3 STA. 10+00.00 -WALL_3- STA. 514+84.43 -L-	FRONT FACE OF MSE WALL	STA. 11+99.98 -WALL_3- / STA. 515+96.06 -L- OFFSET 23.00' RT.		STA. 516+28.94 -L- OFFSET 23.00' LT.	<u> </u>	
OFFSET 186.81' RT.	POINT "B" STA. 11+50.33 -WALL_3-					
	STA. 515+67.84 -L- OFFSET 63.62'RT.			-L-		
			- A T N I T N I			PROJECT NO.: R-1015
	<u>PLA</u>	N VIEW FOR RET	NOT SHOWN FOR CLARITY)	<u> </u>		CRAVEN COUNTY STATION: 516+87.37 -L- / 69+02.79 -RP2AC-
				O B TO	NORTH CAROLINA	SHEET 7 OF 11
			ESP ASSOCIATE 7011 ALBERT PI	ES, INC CK RD	DEPARTMENT OF TRANSPORTATE DIVISION OF HIGHWAYS	RETAINING WALL NO. 3 PLAN VIEW AND WALL ENVELOPE

POINT "B" GRADE ELEVATION EL. 51.61" — POINT ``C'' GRADE ELEVATION EL. 49.75'

56′-6½″

60′-1¹⁵⁄₁₆″

POINT "D"
GRADE ELEVATION

EL. 49.55′

383′-8¾6″

49'-7¾"

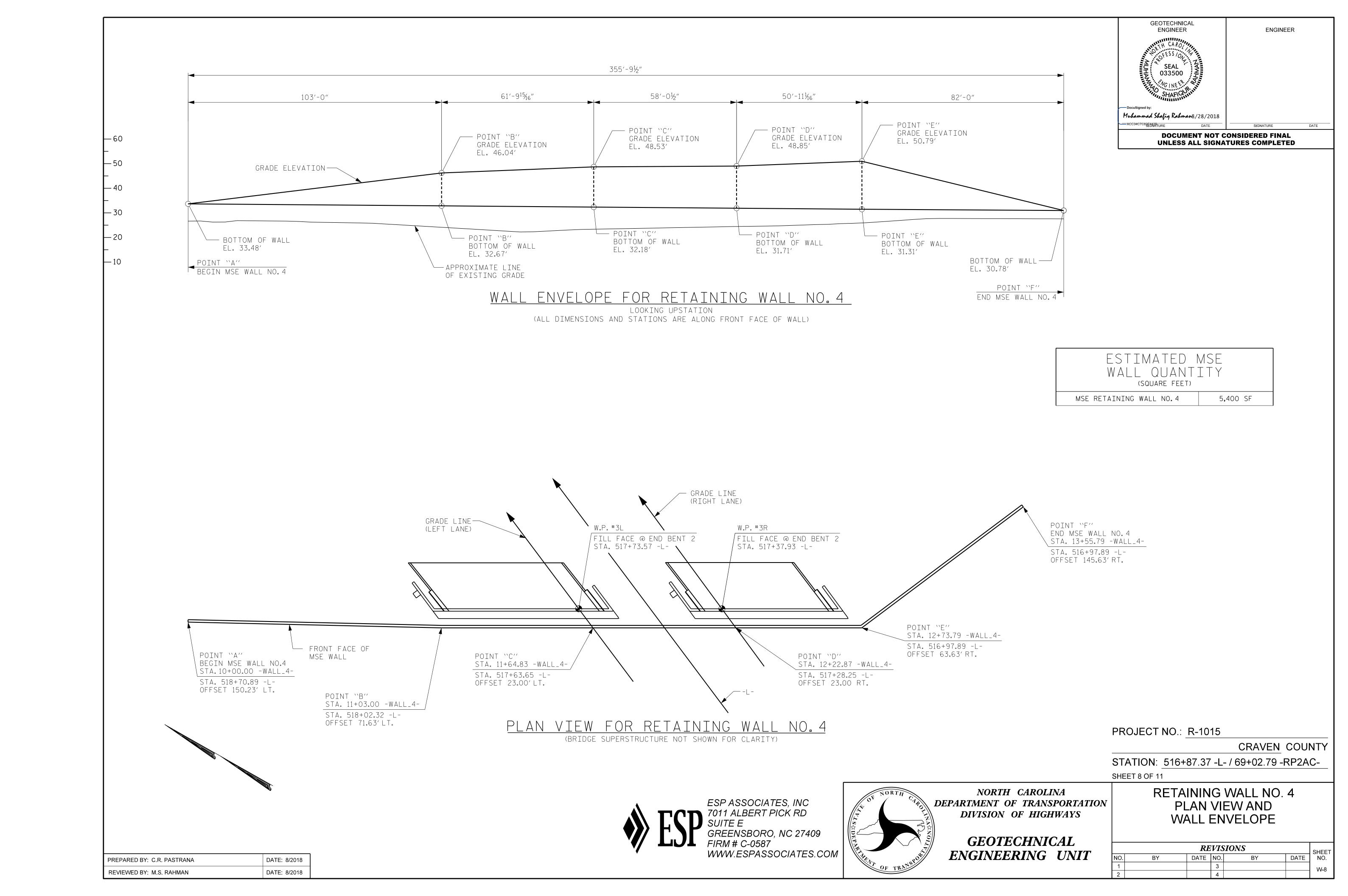
150'-4"

GRADE ELEVATION —

-- 60

- 50

- 40



NOTES:

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

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

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

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

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

A DRAIN IS REQUIRED FOR RETAINING WALL NO.3 AND WALL NO.4.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.1 (LL) LOCATED AT STATION 516+19.62 -L- AND END BENT NO.1 (RL) LOCATED AT STATION 515+86.84 -L-.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO. 2 (LL) LOCATED AT STATION 517.73.57 -L- AND

END BENT NO. 2 (RL) LOCATED AT STATION 517+37.93 -L-.

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

1) H = DESIGN HEIGHT + EMBEDMENT

2) DESTGN | TEF = 100 YEARS

3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL =7.5KSF (WALL NO. 3) AND 7.0 KSF (WALL NO. 4).

4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8H (WALL NO.3) AND 0.85H (WALL NO.4) OR 6 FT, WHICHEVER IS LONGER

5) MINIMUM EMBEDMENT DEPTH FOR = H/10 OR 2.0 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:

THE STITE ASSOCIATION WITH THE TANKWELLING.						
MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) Degrees	COHESION (c) PSF			
BACKFILL	120	30	0			
FOUNDATION FOR WALL NO. 3	118	29	0			
FOUNDATION FOR WALL NO. 4	117	27	0			

DESIGN RETAINING WALL NO. 3 AND 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. 3 AND WALL NO. 4.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (La) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 (LL) LOCATED AT STATION 516+19.62 -L-, END BENT NO.1 (RL) LOCATED AT STATION 515+86.84 -L-, END BENT NO.2 (LL) LOCATED AT STATION 517+73.57 -L- AND END BENT NO.2 (RL) LOCATED AT STATION 517+37.93. MAINTATIN A CLEARANCE OF AT LEAST 3"BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR END BENT NO.1 (LL) LOCATED AT STATION 516+19.62 -L- AND END BENT NO. 1 (RL) LOCATED AT STATION 515+86.84 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.3. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

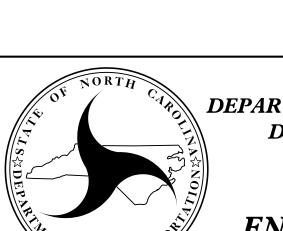
FOUNDATIONS FOR END BENT NO.2 (LL)LOCATED AT STATION 517+73.57 -L- AND END BENT NO. 2 (RL)LOCATED AT STATION 517+37.93 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.4. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NO.1 (LL) LOCATED AT STATION 516+19.62 -L- AND END BENT NO.1 (RL) LOCATED AT STATION 515+86.64 -L- WHILE CONSTRUCTING RETAINING WALL NO.3. 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.

INSTALL PILE SLEEVES FOR END BENT NO.2 (LL) LOCATED AT STATION 517+73.57 -L-, AND END BENT NO.2 (RL) LOCATED AT STATION 517+37.93 -L- WHILE CONSTRUCTING RETAINING WALL NO.4. 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.

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





NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT GEOTECHNICAL
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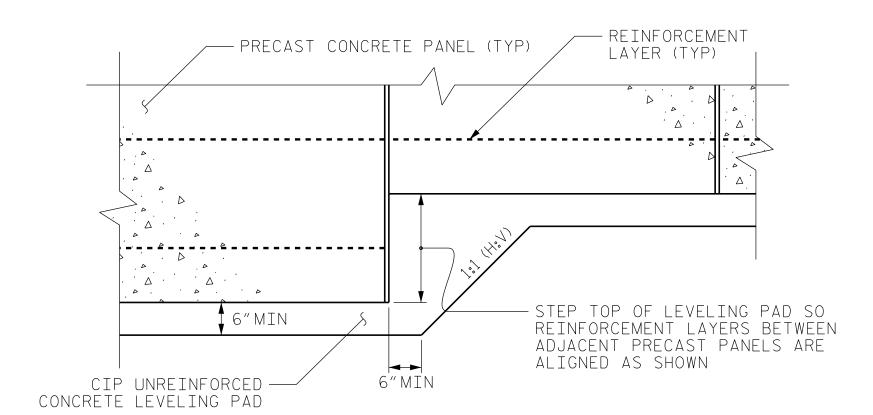
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DocuSigned by:

Muhammad Shahiq Rahman8/28/2018

DOCUMENT NOT CONSIDERED FINAL

UNLESS ALL SIGNATURES COMPLETED



PRECAST PANELS LEVELING PAD STEP DETAIL

PROJECT NO.: R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L- / 69+02.79 -RP2AC-

SHEET 9 OF 11

RETAINING WALL NO. 3 & 4 NOTES & LEVELING PAD STEP DETAIL

REVISIONS					SHEET	
10.	BY	DATE	NO.	BY	DATE	NO.
1			3			W-9
2			4			V V-3

PREPARED BY: C.R. PASTRANA DATE: 8/2018

REVIEWED BY: M.S. RAHMAN DATE: 8/2018

