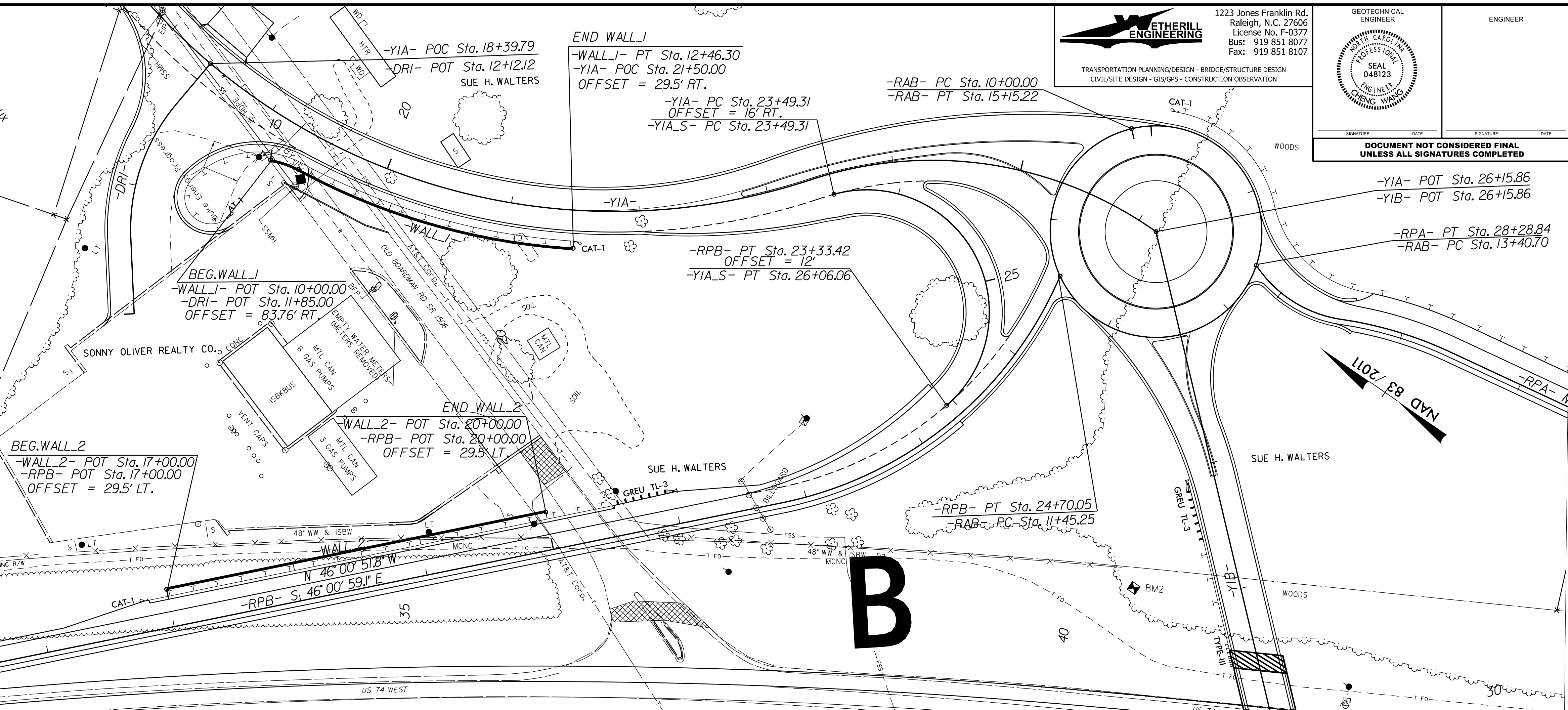
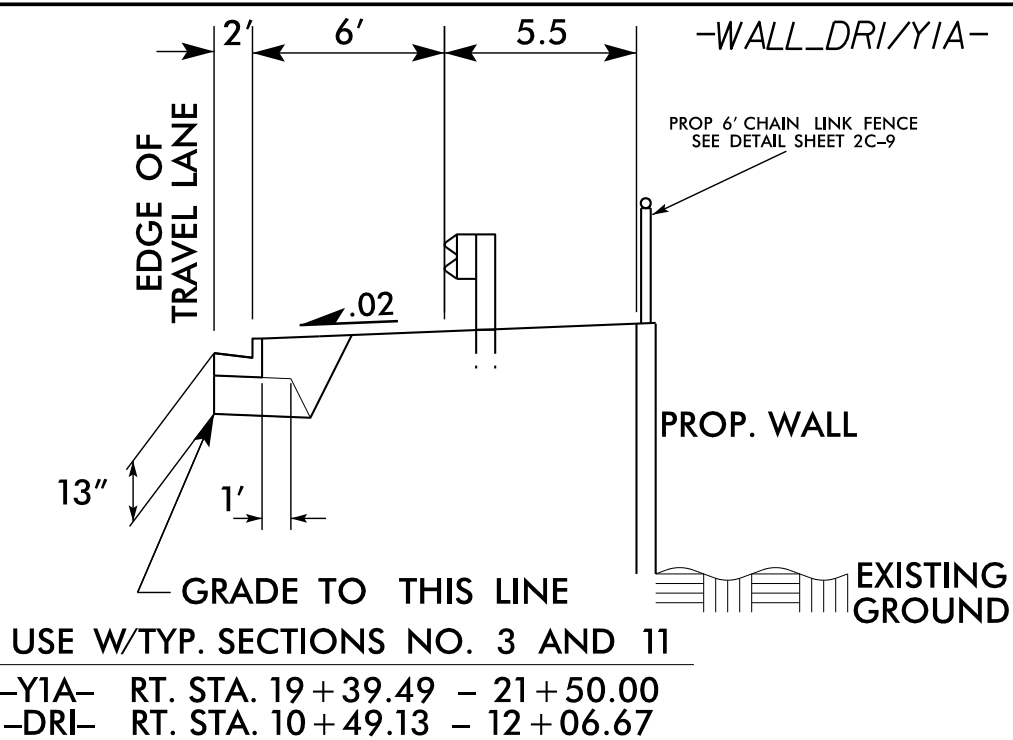
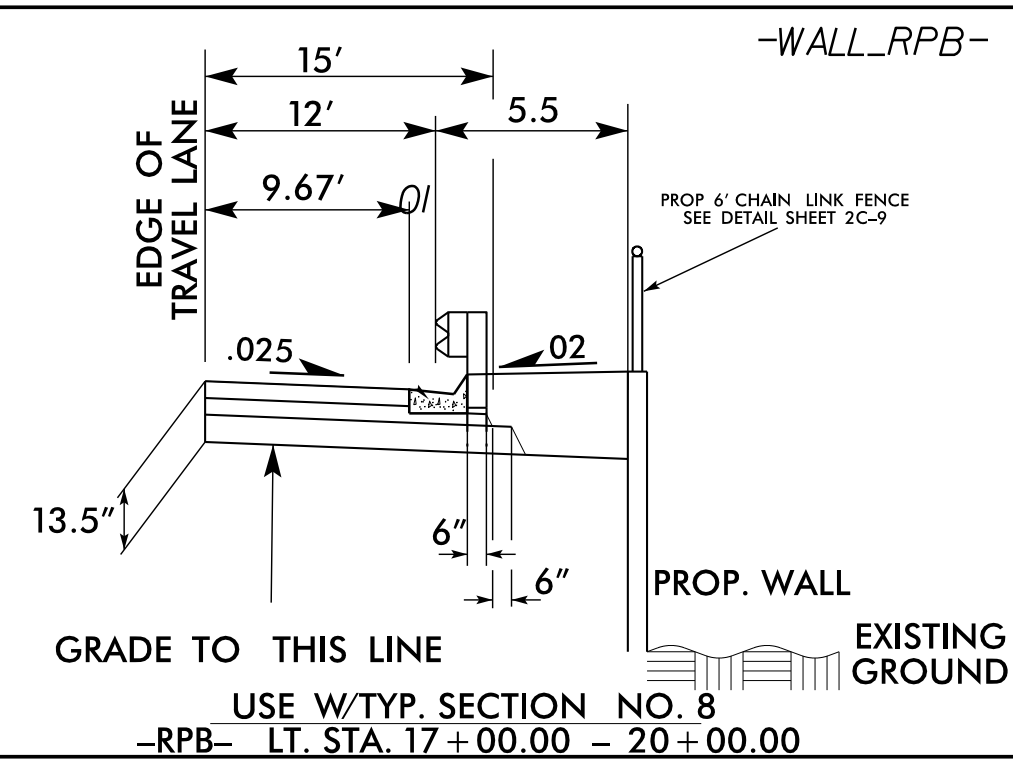


8/17/99
 20-FEB-2020 10:06:56V-9246 (WEI-R-5797) Columbia Co Task 2\NR-5797.GEO_RDWY\CADD_GEO\TECH\S\te&Sub\Retaining Walls\Wall Rec-Detail\R-5797_Rdy_PSH_WALL_r.ecadgn
 17-18-19-20

-WALL J-
 PI Sta. 10+11.61 PI Sta. 11+36.43
 $\Delta = 19^\circ 48' 25.4" (RT)$ $\Delta = 24^\circ 52' 08.8" (LT)$
 $D = 86^\circ 09' 32.6"$ $D = 11^\circ 08' 10.3"$
 $L = 22.99'$ $L = 223.32'$
 $T = 11.61'$ $T = 113.45'$
 $R = 66.50'$ $R = 514.50'$



ETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

GEOTECHNICAL ENGINEER
 SEAL 048123
 STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEERING BOARD

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

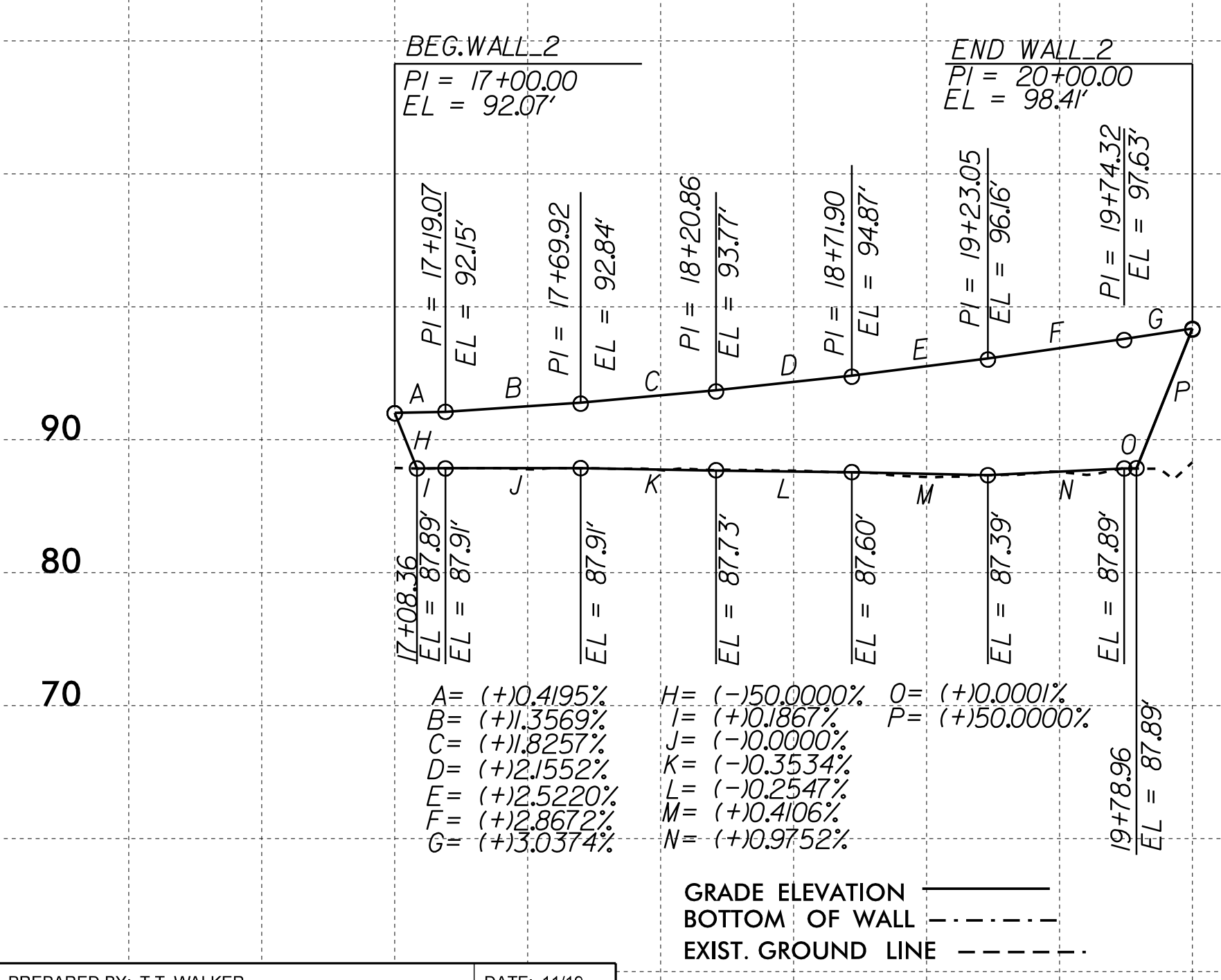
ENGINEER
 SIGNATURE _____ DATE _____
 SIGNATURE _____ DATE _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WALL 2

Approximate Wall Face Area = 2071.3 SQ. FT.

THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL



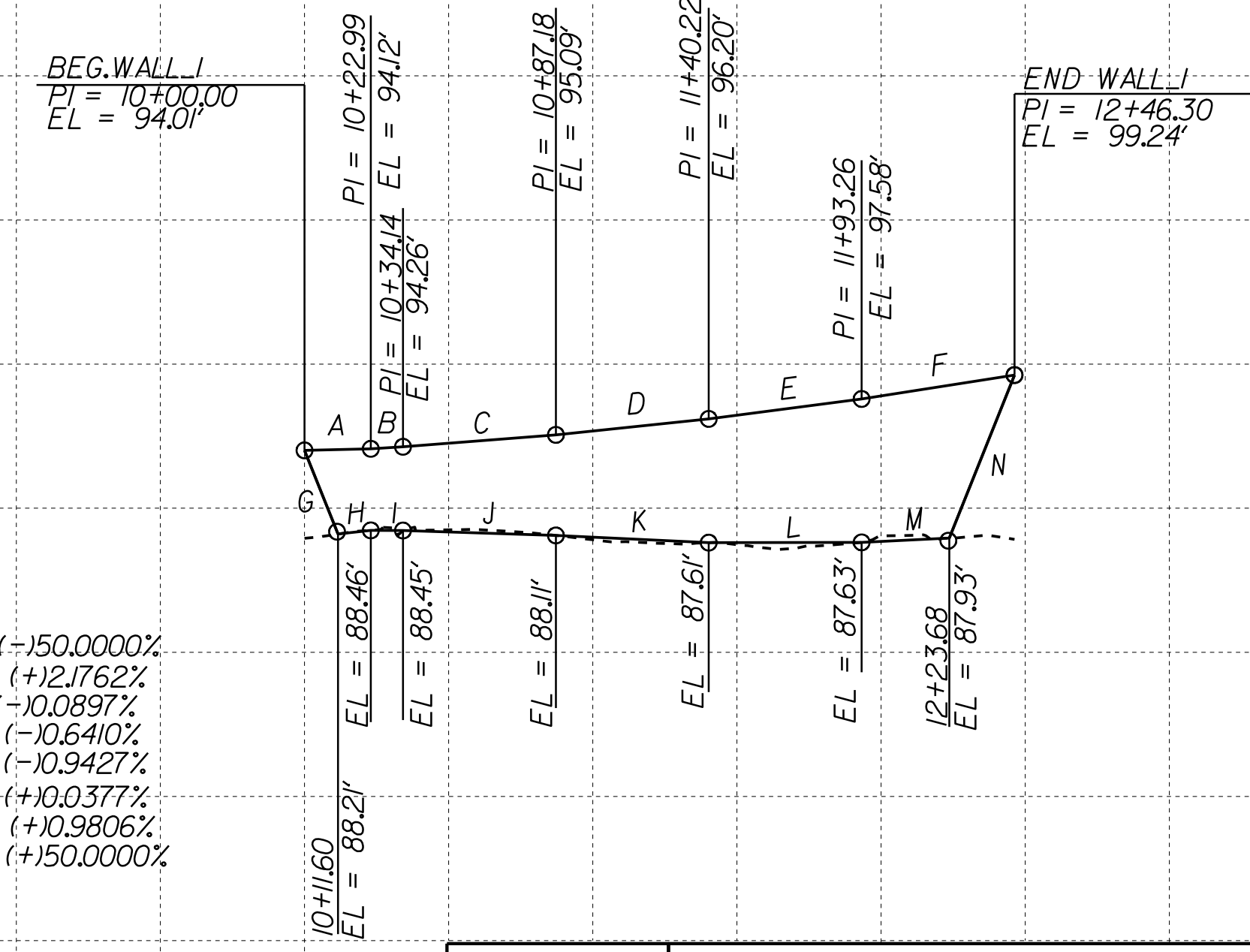
A = (+)0.4195%	H = (-)50.0000%	O = (+)0.0001%
B = (+)1.3569%	I = (+)0.1867%	P = (+)50.0000%
C = (+)1.8257%	J = (-)0.0000%	
D = (+)2.1552%	K = (-)0.3534%	
E = (+)2.5220%	L = (-)0.2547%	
F = (+)2.8672%	M = (+)0.4106%	
G = (+)3.0374%	N = (+)0.9752%	

GRADE ELEVATION ———
 BOTTOM OF WALL - - - - -
 EXIST. GROUND LINE - - - - -

WALL 1

Approximate Wall Face Area = 2006.8 SQ. FT.

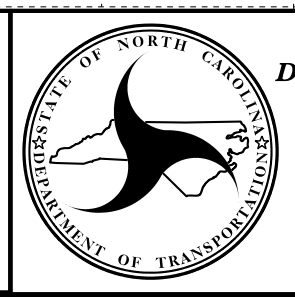
THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL



A = (+)0.4692%	G = (-)50.0000%
B = (+)1.2556%	H = (+)2.1762%
C = (+)1.5649%	I = (-)0.0897%
D = (+)2.0928%	J = (-)0.6410%
E = (+)2.6018%	K = (-)0.9427%
F = (+)3.1297%	L = (+)0.0377%
	M = (+)0.9806%
	N = (+)50.0000%

GRADE ELEVATION ———
 BOTTOM OF WALL - - - - -
 EXIST. GROUND LINE - - - - -

PREPARED BY: T.T. WALKER	DATE: 11/19
REVIEWED BY: C. WANG	DATE: 11/19



NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.: R-5797
 COUNTY: COLUMBUS
 SHEET 1 OF 4

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

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
 FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
 FOR CHAIN LINK FENCE, SEE DETAIL SHEET 2C-9 FOR FENCE ATTACHMENT TO RETAINING WALL.
 CIP REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO.1 & NO.2
 THE CONTRACTOR SHALL DESIGN THE CONNECTION FOR THE FENCE MOUNTED TO THE WALL COPING. THE DETAIL SHALL BE SUBMITTED TO THE RESIDENT ENGINEER FOR APPROVAL.
 AT THE CONTRACTOR'S OPTION, USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL (SRW) UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO.1 & NO.2.
 A DRY STACK STONE TEXTURE WITH STAIN OPTION 36270 ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS NO.1 & NO.2. SEE SPECIAL PROVISION FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1 & NO.2.
 A DRAIN IS REQUIRED FOR RETAINING WALL NO.1 & NO.2.
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1 & NO.2, SURVEY WALL LOCATIONS 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 & NO.2 FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT + EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,350 PSF
 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.8H OR 6 FT, WHICHEVER IS LONGER
 5) MINIMUM EMBEDMENT DEPTH = 2 FT
 6) REINFORCED ZONE AGGREGATE PARAMETERS:


AGGREGATE TYPE*	UNIT WEIGHT (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


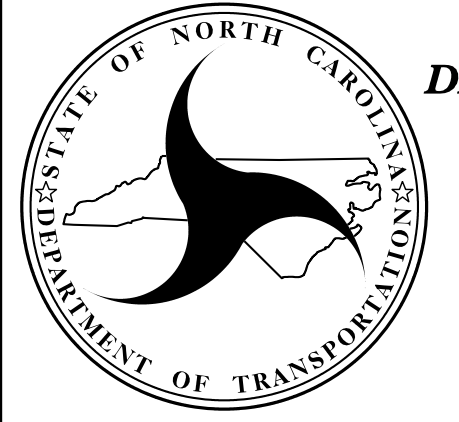
DESIGN RETAINING WALL NO.1 & NO.2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
 EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 & NO.2.
 DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 & NO.2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

GEOTECHNICAL ENGINEER  SIGNATURE _____ DATE _____	ENGINEER SIGNATURE _____ DATE _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO.1	2,623 SF
MSE RETAINING WALL NO.2	2,822 SF

PROJECT NO.: R-5797
 COUNTY COLUMBUS
 SHEET 2 OF 4

PREPARED BY: T.T. WALKER	DATE: 11/19
REVIEWED BY: C. WANG	DATE: 11/19

SINCE  1881	 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT
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MSE RETAINING WALLS (NOTES)						SHEET NO. W-2
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

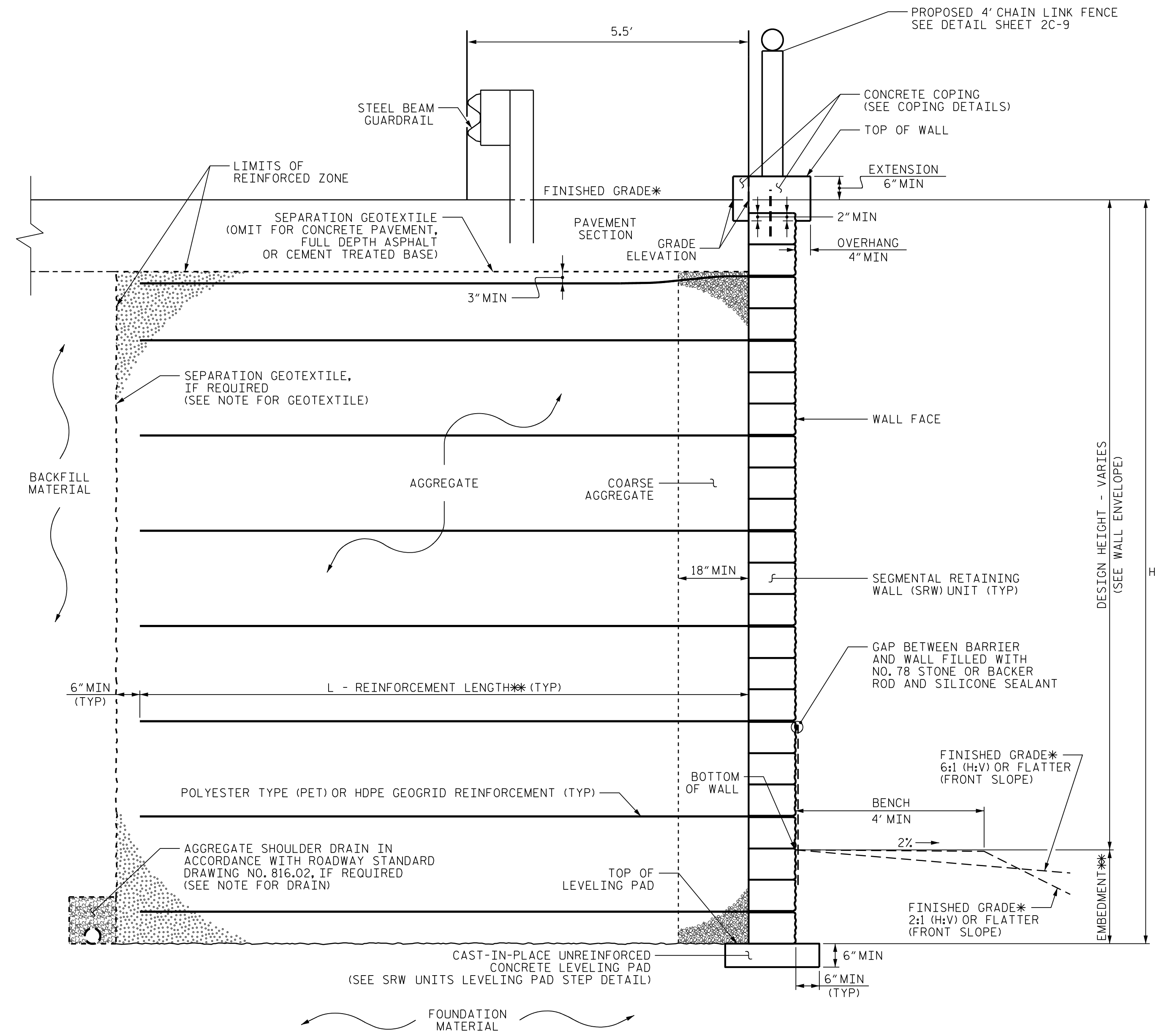


ENGINEER

SIGNATURE _____ DATE _____

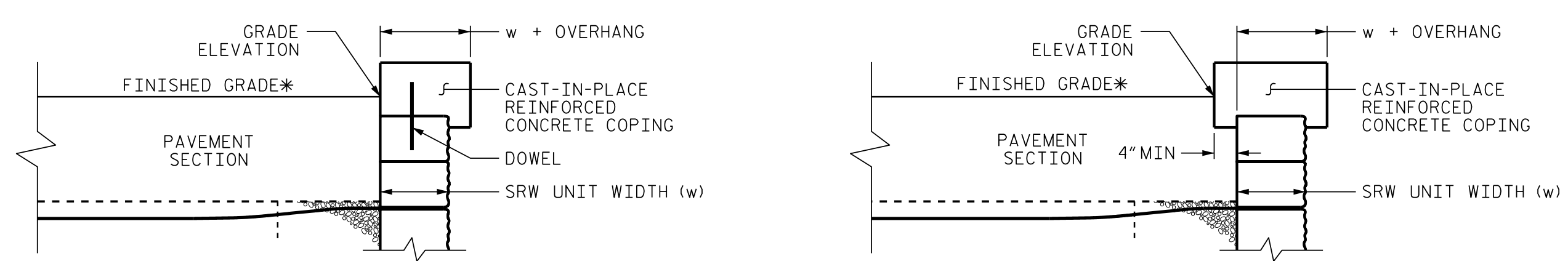
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UNLESS ALL SIGNATURES COMPLETED**



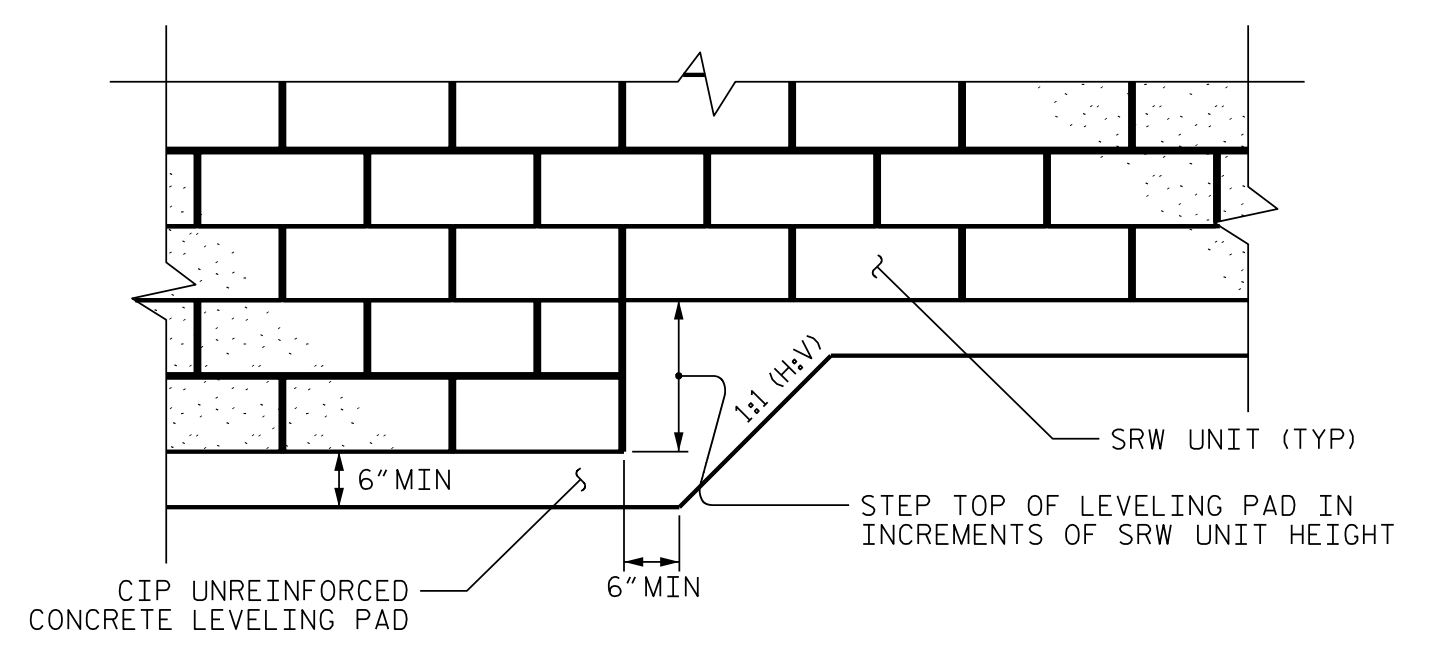
MSE WALL WITH SRW UNITS - TYPICAL SECTION

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



COPING DETAILS

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



SRW UNITS LEVELING PAD STEP DETAIL

ESTIMATED ARCHITECTURAL CONCRETE SURFACE TREATMENT QUANTITIES (SQUARE FEET)

MSE RETAINING WALL NO.1	2,623 SF
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ESTIMATED ARCHITECTURAL CONCRETE SURFACE TREATMENT QUANTITIES (SQUARE FEET)

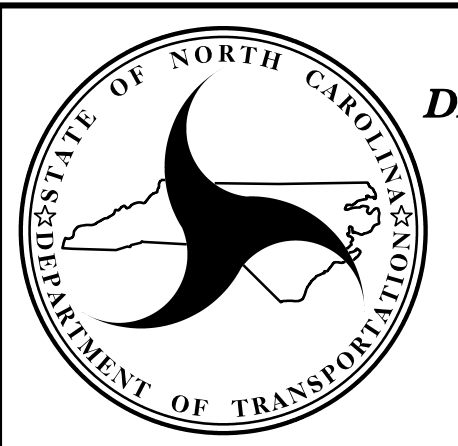
MSE RETAINING WALL NO.2	2,822 SF
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PROJECT NO.: R-5797

COUNTY COLUMBUS

SHEET 3 OF 4

PREPARED BY: T.T. WALKER DATE: 03/21
REVIEWED BY: C. WANG DATE: 03/21

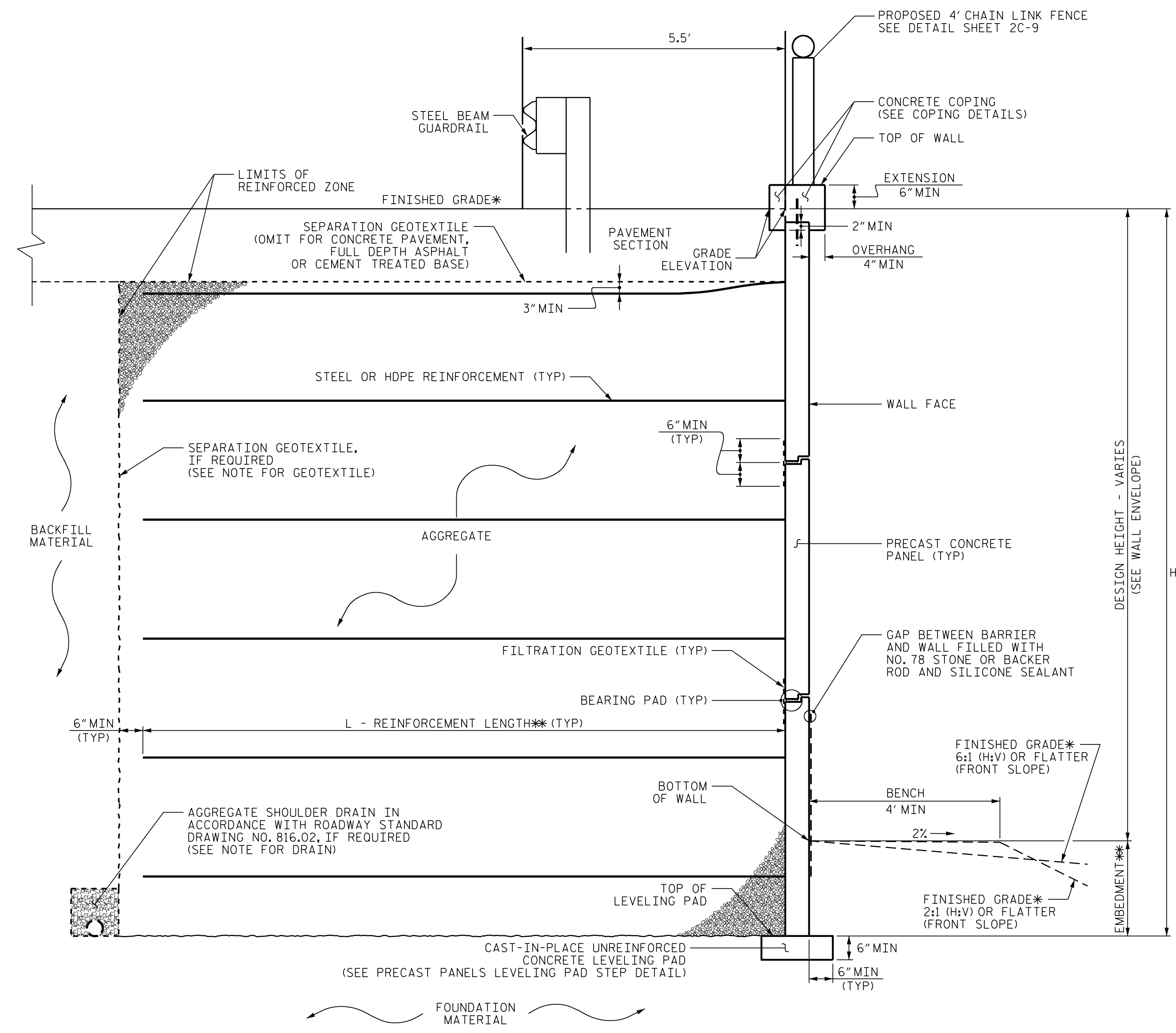


**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

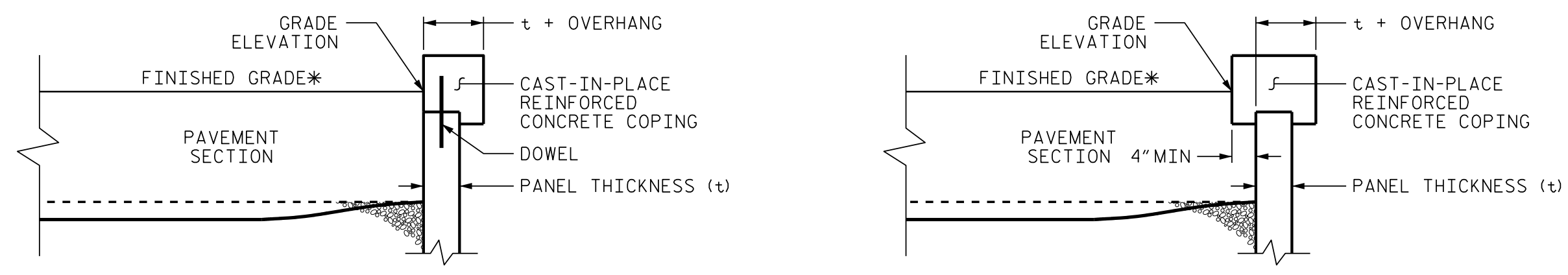
**MSE RETAINING WALLS
TYPICAL SECTION
(SRW UNITS)**

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



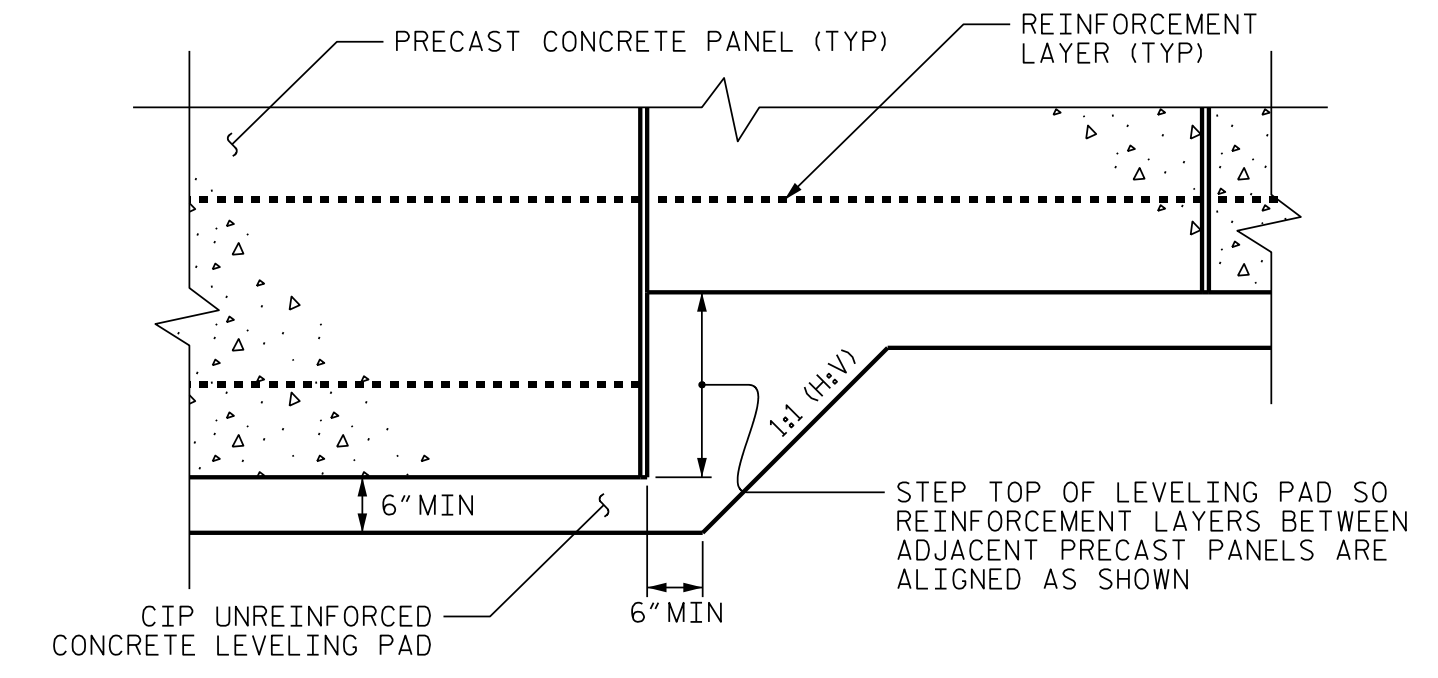
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

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



COPING DETAILS

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

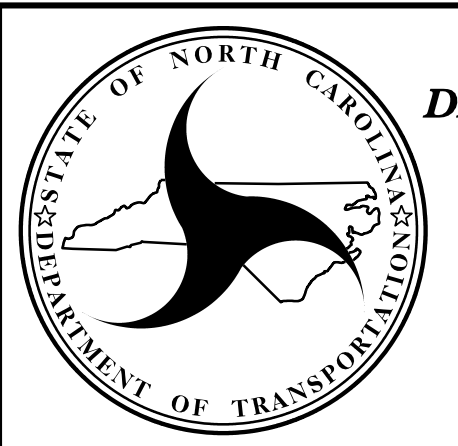


PRECAST PANELS LEVELING PAD STEP DETAIL

ESTIMATED ARCHITECTURAL CONCRETE SURFACE TREATMENT QUANTITIES (SQURE FEET)	
MSE RETAINING WALL NO. 1	2,623 SF

ESTIMATED ARCHITECTURAL CONCRETE SURFACE TREATMENT QUANTITIES (SQURE FEET)	
MSE RETAINING WALL NO. 2	2,822 SF

PROJECT NO.: R-5797
 COUNTY COLUMBUS
 SHEET 4 OF 4



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

MSE RETAINING WALLS TYPICAL SECTION (PANELS)					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-4