-L-	-Y9-	-Y9RPA-
PI Sta 213+20.68 △ = 32° 01' 53.3" (RT) D = 0° 59' 16.3" L = 3,242.52' T = 1,664.85' R = 5,800.00' SE = 0.040 FT/FT	PI Sta 14+80.44 △ = 0° 35' 42.5" (RT) D = 0° 03' 43.0" L = 960.87' T = 480.44' R = 92,504.82' SE = NC	PI Sta 22+56.53 △ = 17° 14' 15.9" (LT) D = 2° 51' 53.2" L = 601.71' T = 303.15' R = 2,000.00' SE = 0.050 FT/FT

-Y9RPC-		-Y9RPD-
PIs Sta 22+08.88 Θs = 2° 17' 30.6" Ls = 160.00' LT = 106.68' ST = 53.34'	PI Sta 23+68.66 △ = 6° 05' 38.8" (LT) D = 2° 51' 53.2" L = 212.72' T = 106.46' R = 2,000.00' SE = 0.050 FT/FT	PIs Sta 21+86.90 Θs = 1° 28' 08.8" Ls = 200.00' LT = 133.34' ST = 66.67'

GEOTECHNICAL ENGINEER — SEAL 033758 — W. PATRICK ALTON

ENGINEER

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PROJECT NO.: W-5600

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SHEET 1 OF 6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALLS TYPICAL SECTION (PANELS)

SHEET NO. W-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033758 PATRICK ALTON

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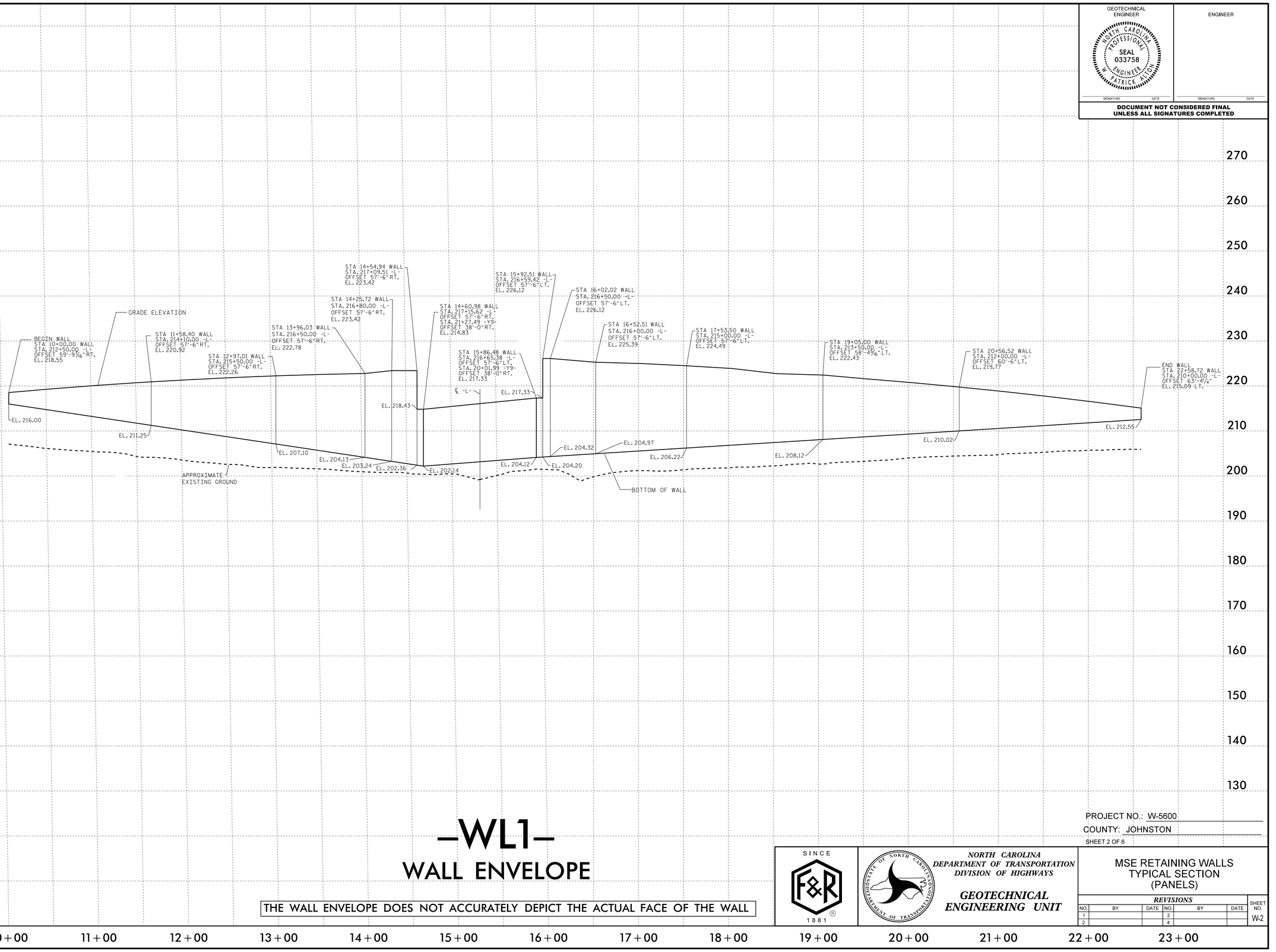

–WL1–

WALL ENVELOPE

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

SINCE 1881

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALLS
TYPICAL SECTION
(PANELS)

PROJECT NO.: W-5600

COUNTY: JOHNSTON

SHEET 2 OF 6

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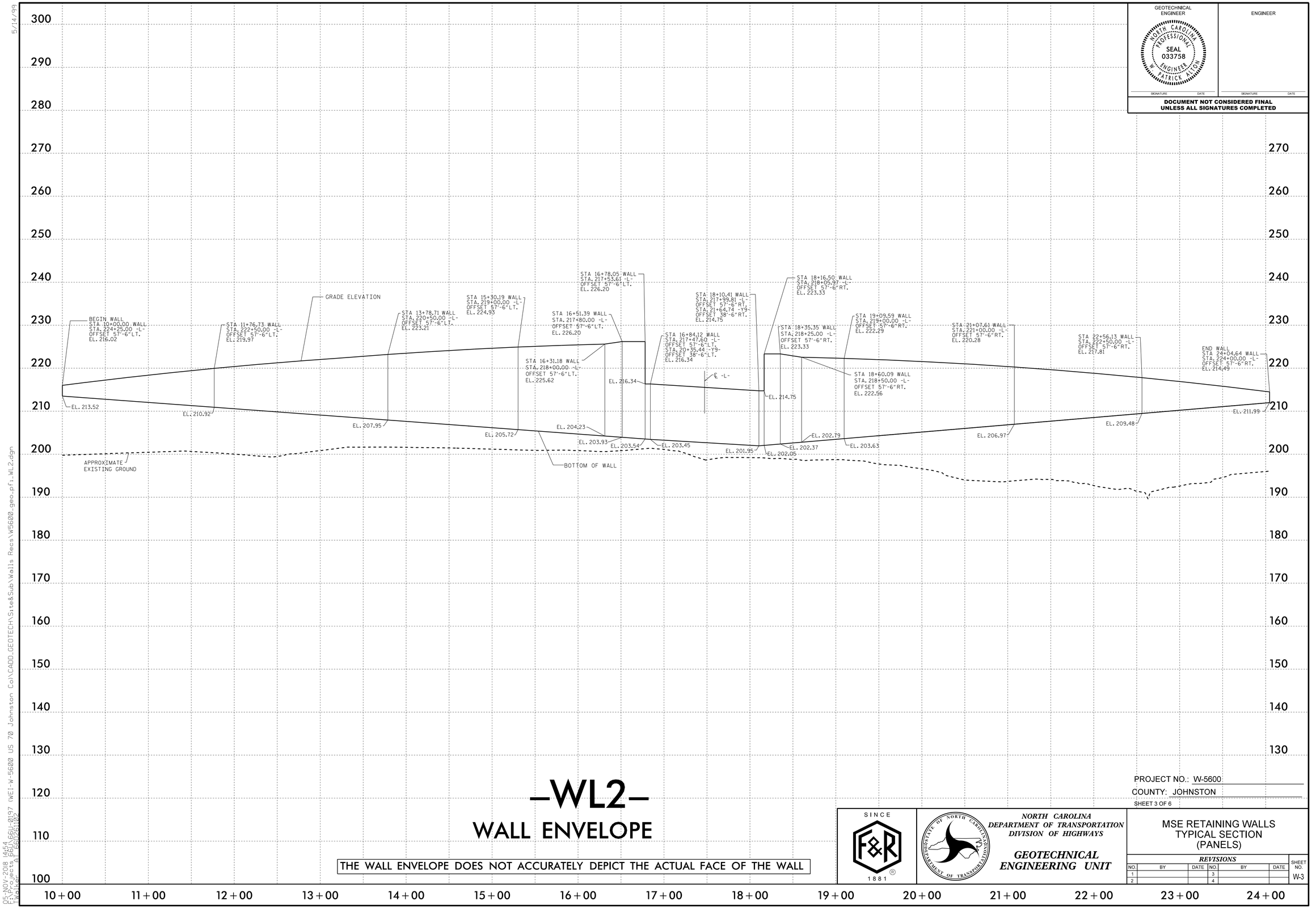
SHEET NO. W-2



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–WL2–

WALL ENVELOPE

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

PROJECT NO.: W-5600

COUNTY: JOHNSTON

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALLS
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(PANELS)

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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033758 ENGINEER PATRICK ALTON W

SIGNATURE DATE

ENGINEER

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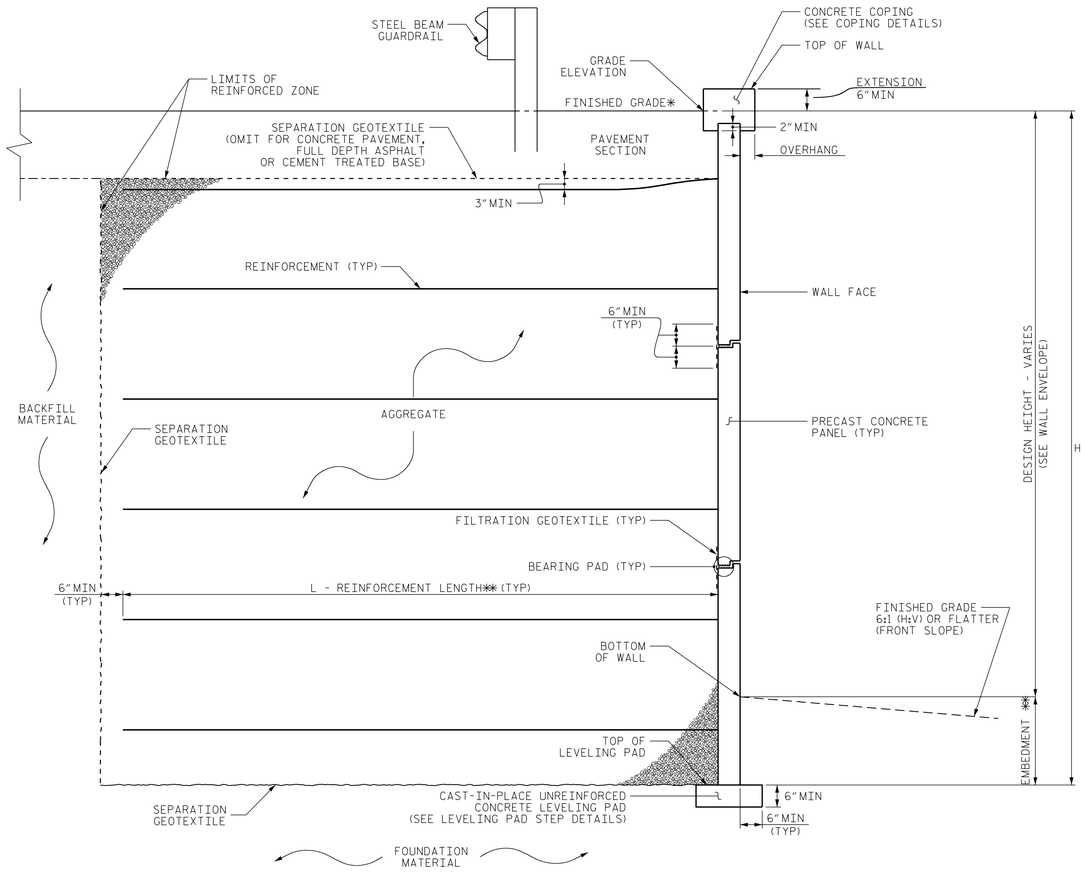
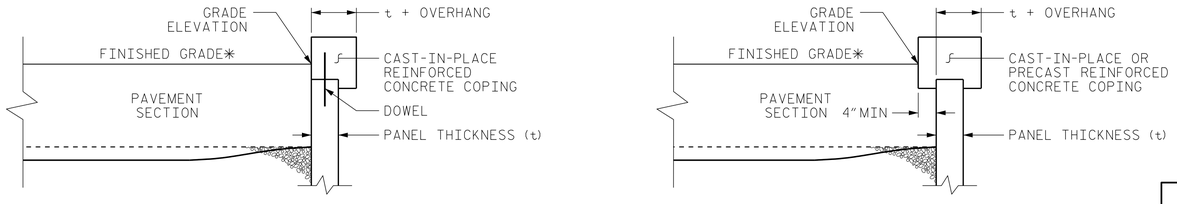


MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*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.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALLS TYPICAL SECTION (PANELS)

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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033758 ENGINEER PATRICK ALLEN W.

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ENGINEER

SIGNATURE DATE

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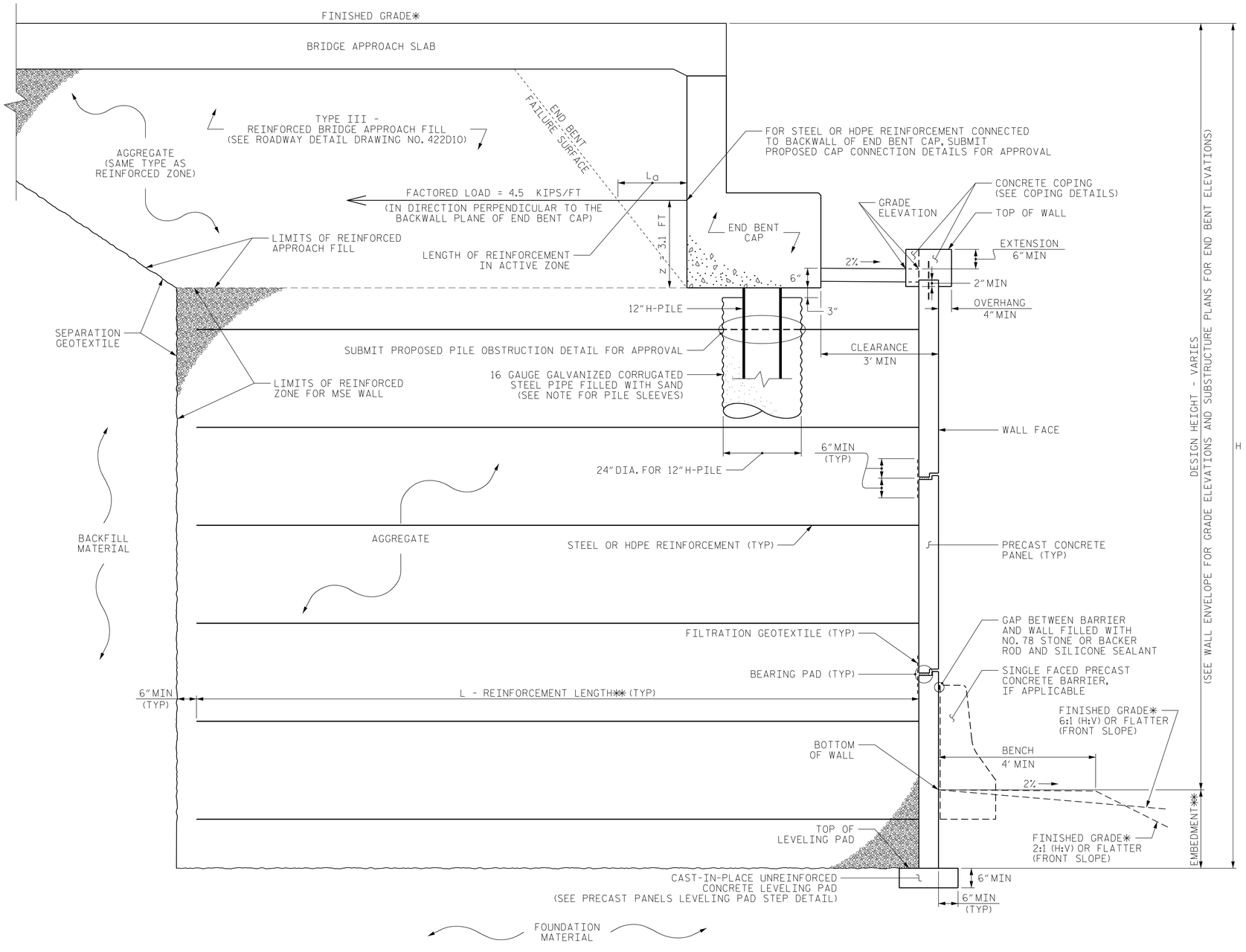
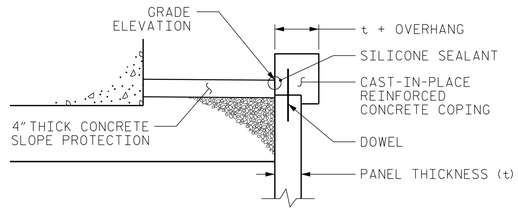
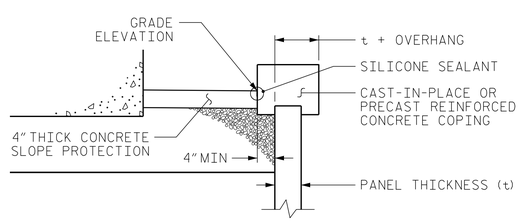


MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

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

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SHEET 5 OF 6

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALLS TYPICAL SECTION (PANELS)

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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 STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

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

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1 & 2.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO. 1 LOCATED AT STATION -L- 216+76.59 AT THE LEFT LANE BRIDGE AND 216+89.65 AT THE RIGHT LANE BRIDGE.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO. 2 LOCATED AT STATION -L- 217+73.79 AT THE LEFT LANE BRIDGE AND 217+87.45 AT THE RIGHT LANE BRIDGE.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 & 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.

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

DESIGN RETAINING WALL NO. 1 & 2 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 1400 PSF BASED ON H ≤ 5'.
4) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3000 PSF BASED ON H ≤ 10'.
5) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 4200 PSF BASED ON H ≤ 15'.
6) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 4400 PSF BASED ON H ≤ 22'.
7) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER
8) 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
MATERIAL REQUIREMENTS.			

9) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	115	29	0

DESIGN RETAINING WALL NO. 1 & 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_a) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION -L- 216+76.59 AT THE LEFT LANE BRIDGE AND 216+89.65 AT THE RIGHT LANE BRIDGE. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 2 LOCATED AT STATION -L- 217+73.79 AT THE LEFT LANE BRIDGE AND 217+87.45 AT THE RIGHT LANE BRIDGE. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 & 2.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION -L- 216+76.59 AT THE LEFT LANE BRIDGE AND 216+89.65 AT THE RIGHT LANE BRIDGE. MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION -L- 217+73.79 AT THE LEFT LANE BRIDGE AND 217+87.45 AT THE RIGHT LANE BRIDGE. MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NO. 1 LOCATED AT STATION -L- 216+76.59 AT THE LEFT LANE BRIDGE AND 216+89.65 AT THE RIGHT LANE BRIDGE. WHILE CONSTRUCTING RETAINING WALL 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.

INSTALL PILE SLEEVES FOR END BENT NO. 2 LOCATED AT STATION -L- 217+73.79 AT THE LEFT LANE BRIDGE AND 217+87.45 AT THE RIGHT LANE BRIDGE. WHILE CONSTRUCTING RETAINING WALL 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.

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

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 1	19,233 SF
MSE RETAINING WALL NO. 2	21,981 SF

NORTH CAROLINA PROFESSIONAL SEAL 033758 ENGINEER PATRICK ALTON

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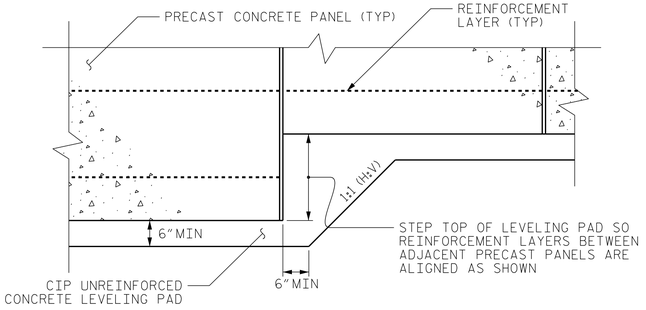

PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: W-5600

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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALLS
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(PANELS)

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