

0400DEL-P30

RETAINING WALL GENERAL NOTES

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

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEETS SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS 1, 2, AND 3.

DRIVE PILES AT END BENT 1 BEFORE CONSTRUCTING RETAINING WALL 3;
DRIVE PILES AT END BENT 2 BEFORE CONSTRUCTING RETAINING WALL 1.

USE OF PILE SLEEVES (YELLOW JACKET™ OR SIMILAR) OR INSTALLATION OF CORRUGATED METAL CANS AROUND THE PILES FROM THE TOP OF THE LEVELING PAD ELEVATION TO BOTTOM OF THE PILE CAP IS REQUIRED FOR PILES AT END BENTS 1 AND 2. THE CANS SHALL BE DESIGNED TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILL WITHOUT DISTORTION.

A DRAIN IS REQUIRED FOR RETAINING WALLS NO. 1, 2, AND 3.

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 1 LOCATED AT STATION 20+05.51 -L- AND FOR END BENT 2 LOCATED AT STATION 28+51.63 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL 1, 2, OR 3 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED BY THE GEOTECHNICAL ENGINEER.

FOUNDATIONS FOR END BENT 1 LOCATED AT STATION 20+05.51 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL 3. FOUNDATIONS FOR END BENT 2 LOCATED AT STATION 28+51.63 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS. A MINIMUM CLEARANCE OF 2 INCHES SHALL BE MAINTAINED BETWEEN THE MSE WALL STEEL REINFORCING AND THE CANS.

SLOPES IN FRONT OF THE MSE WALLS SHOULD BE 6:1 (H:V) OR FLATTER.

UNDERCUT SILTY CLAY MATERIAL (AASHTO CLASSIFICATION A-7-6/A-7-5) IF ENCOUNTERED AT THE LEVELING PAD BEARING ELEVATION DURING WALL CONSTRUCTION. UNDERCUTTING SHALL BE PERFORMED TO A DEPTH OF 2 FEET BELOW THE LOWEST LEVELING PAD ELEVATION. BACKFILLING SHALL CONTINUE UNTIL THE LEVELING PAD ELEVATIONS ARE ACHIEVED. BACKFILL MATERIAL SHALL MEET THE REQUIREMENTS PRESENTED IN THE STANDARD SPECIFICATIONS, SECTION 1016 SELECT MATERIAL CLASS III TYPE 2.

MSE WALLS WITH RECTANGULAR PANELS WITH VERTICAL JOINTS LINED UP FROM TOP TO BOTTOM SHALL BE USED FOR RETAINING WALLS 1, 2, AND 3.

INSTALL GEOTEXTILE FOR SEPARATION BETWEEN COARSE AGGREGATE IN THE MSE REINFORCED ZONE AND RETAINED ROADWAY EMBANKMENT SOIL AT RETAINING WALLS 1 AND 2. GEOTEXTILE SHALL MEET THE REQUIREMENTS OF NCDOT STANDARD SPECIFICATIONS SECTION 1056, TYPE 2.

A HANDRAIL IS REQUIRED ON TOP OF RETAINING WALL 2. SEE PLANS FOR HANDRAIL ATTACHMENT DETAILS.

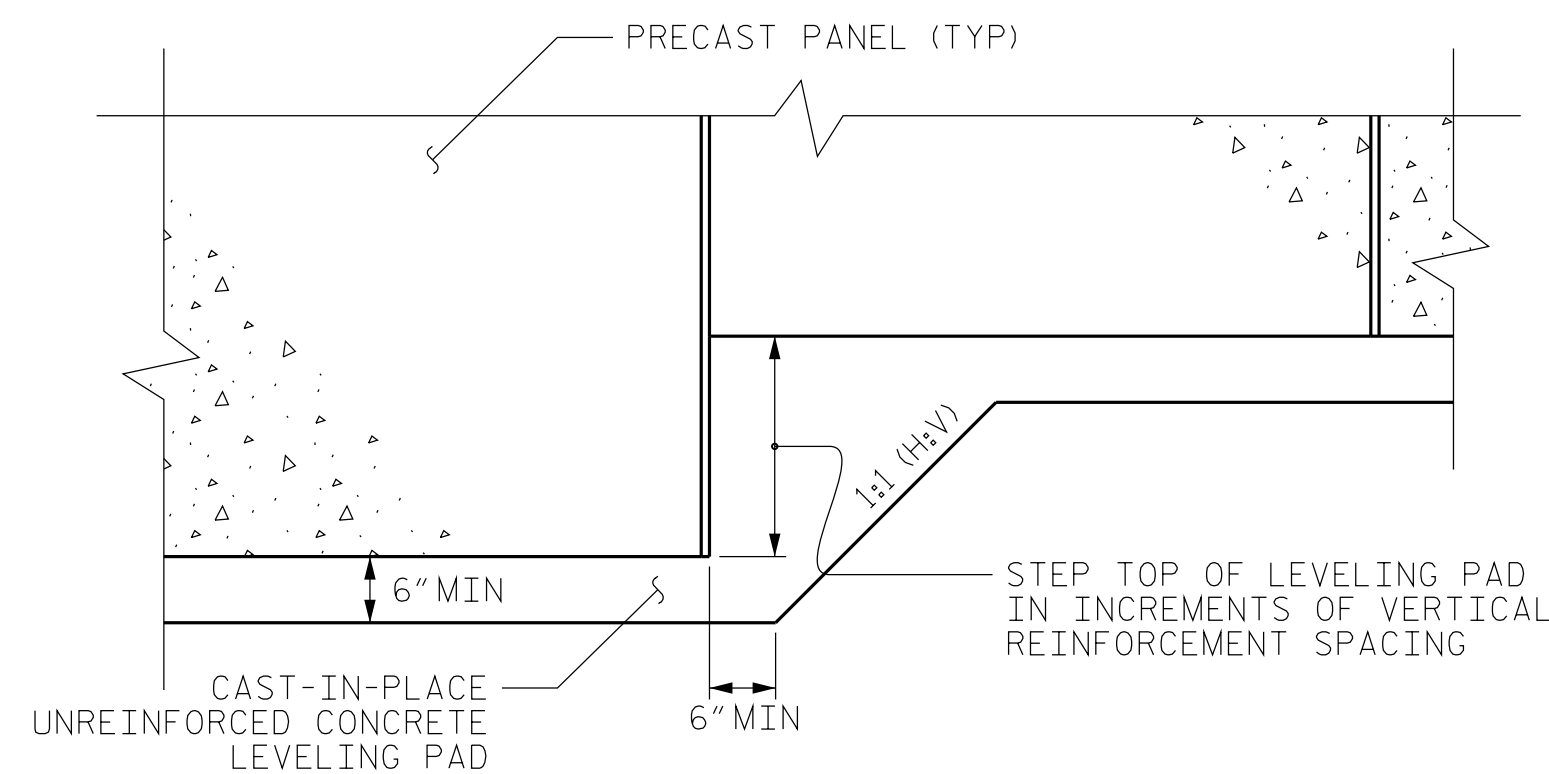
A CONCRETE PARAPET WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALLS 1, 2, AND 3. SEE PLANS FOR CONCRETE PARAPET WITH MOMENT SLAB DETAILS.

FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS 1, 2, OR 3.

FOR ARCHITECTURAL CONCRETE SURFACE FINISH, SEE SPECIAL PROVISIONS.

FOR ANTI-GRAFFITI COATING, SEE SPECIAL PROVISIONS.

WHERE ELECTRICAL AND LIGHTING CONDUIT IS REQUIRED, THE COPING AND MOMENT SLAB SHALL BE CAST-IN-PLACE.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

RETAINING WALL 1 NOTES

DESIGN MSE RETAINING WALLS FOR THE FOLLOWING:

- A) H = DESIGN HEIGHT + EMBEDMENT
- B) MINIMUM DESIGN LIFE = 100 YEARS
- C) MAXIMUM FACTORED BEARING VERTICAL STRESS ON FOUNDATION MATERIAL SHALL BE AS SHOWN IN THE TABLE BELOW.
- D) MSE WALLS SOIL REINFORCEMENT LENGTH SHALL BE AS SHOWN IN THE TABLE BELOW TO SATISFY EXTERNAL AND GLOBAL STABILITY.

STATION		REINFORCEMENT LENGTH RATIO	MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL	REQUIRED EMBEDMENT DEPTH RATIO
FROM	TO		PSF	
-WALL1-10+00	-WALL1-10+75	1.0H	3,000	GREATER OF 2 FEET OR H/10
-WALL1-10+75	-WALL1-16+47.37	GREATER OF 8 FEET OR 1.0H	5,000	GREATER OF 2 FEET OR H/10

E) AGGREGATE PARAMETERS:

AGGREGATE TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (C) PSF
COARSE AGGREGATE	110	38	0

F) IN-SITU ASSUMED MATERIAL PROPERTIES:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE NCDOT STANDARD SPECIFICATIONS)	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (C) PSF
RANDOM BACKFILL	120	30	0

G) FOUNDATION SOILS:

STATION		UNIT WEIGHT (γ) PCF	DRAINED FRICTION ANGLE (φ') DEGREES	DRAINED COHESION (C') PSF	UNDRAINED SHEAR STRENGTH (Su) PSF
FROM	TO				
-WALL1-10+00	-WALL1-10+75	110	28	0	900
-WALL1-10+75	-WALL1-13+25	115	28	0	1500
-WALL1-13+25	-WALL1-16+47.37	115	30	0	-

H) DESIGN RETAINING WALL 1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

CONSTRUCTION OF MSE RETAINING WALL NO.1 SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

- A) CONSTRUCT THE PRECAST WALL PANELS TO THE FINAL DESIGN HEIGHT. THE GRADE BEHIND THE WALL PANELS INCLUDING THE REINFORCED ZONE AND THE EMBANKMENT SHALL BE AT THE ELEVATION OF THE BOTTOM OF THE PROPOSED PAVEMENT STRUCTURE.
- B) PERFORM SETTLEMENT MONITORING AS SPECIFIED IN THE NOTES BELOW. A 1-MONTH WAITING PERIOD IS ANTICIPATED TO ACHIEVE THE ESTIMATED SETTLEMENT OF 1.5 TO 3.5 INCHES BENEATH THE MSE WALL.
- C) CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR MSE WALL 1. CONSTRUCT COPING, PERFORM FINAL GRADING AND PAVING OPERATIONS AFTER THE WAITING PERIOD HAS ENDED FOLLOWING THE PROCEDURES IN THE NOTES BELOW WITH THE APPROVAL OF GEOTECHNICAL ENGINEER.

INSTALL SETTLEMENT MONITORING PLATES AT THE LEVELING PAD BEARING ELEVATION.

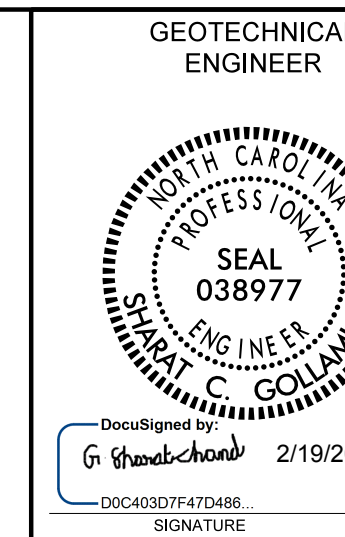
SETTLEMENT PLATES SHALL BE INSTALLED AT APPROXIMATE STATIONS -L-28+65, 10 FT LEFT AND -L- 28+65, 10 FT RIGHT TO MONITOR SETTLEMENTS DURING THE CONSTRUCTION AND WAITING PERIOD.

CONTINUE SETTLEMENT MONITORING DURING CONSTRUCTION AND RECORD READINGS USING THE EMBANKMENT SETTLEMENT GAUGE FORM PROVIDED BY NCDOT. THE INFORMATION SHOULD INCLUDE TOP OF EXISTING PIPE AND TOP OF NEW PIPE WHENEVER AN EXTENSION IS ADDED, EMBANKMENT ELEVATION AT TIME OF PIPE EXTENSION AND EMBANKMENT ELEVATION AT TIME OF EACH SETTLEMENT READING.

THE FOLLOWING MINIMUM SETTLEMENT READINGS SHALL BE OBTAINED BY THE PROJECT SURVEYOR AND PROVIDED TO THE GEOTECHNICAL ENGINEER TO DETERMINE WHEN THE WAITING PERIOD MAY BE STOPPED.

- (A) IMMEDIATELY AFTER PLATE INSTALLATION
- (B) WHEN HALF OF THE MSE WALL FILL IS PLACED
- (C) ONCE A WEEK DURING THE WAITING PERIOD

SETTLEMENT MONITORING DEVICES SHALL BE PROTECTED AT ALL TIMES AGAINST DAMAGE BY CONSTRUCTION EQUIPMENT, VEHICLES AND PERSONNEL.



ENGINEER

MSE RETAINING WALLS	
-WALL 1-	8,695 SF
-WALL 2-	1,810 SF
-WALL 3-	7,745 SF
TOTAL AREA	18,250 SF

ANTI-GRAFFITI COATING	
-WALL 1-	8,695 SF
-WALL 2-	1,810 SF
-WALL 3-	7,745 SF
TOTAL AREA	18,250 SF

PROJECT NO.: U-5008
MECKLENBURG COUNTY
STATION: 20+45.05 -L- P.O.T = 14+54.24 -Y4- P.O.T.

AMEC E&I, Inc.
4021 STIRRUP CREEK DRIVE, SUITE 100
DURHAM, NORTH CAROLINA 27703
(919) 381-9900
NC Engineering F-1253 NC Geology C-247

MSE RETAINING WALL NOTES AND DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-4
1			3			TOTAL SHEETS
2			4			19

2-FEB-2015 10:17
 C:\Users\rahaie\Documents\Projects\U5008_GEO_RWAL\CADD_GEO\TECH\Foundation Recomm Dispos\SH82_U-5008_SD_RW_1.dgn
 \$\$\$USERNAME\$\$\$

DRAWN BY:	E. C. DECOLA	DATE:	10/22/14
CHECKED BY:	R. C. LARSON	DATE:	10/22/14
PREPARED BY:	R. RAHIE	DATE:	01/07/15
REVIEWED BY:	S. C. GOLLAMUDI	DATE:	01/07/15