

**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.  
 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 FOR RETAINING WALL NOS.1 AND 2.  
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NOS.1 AND 2.  
 A DRAIN IS REQUIRED FOR RETAINING WALL NOS.1 AND 2.  
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NOS.1 AND 2, SURVEY WALL LOCATION AND SUBMIT A REVISED 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 NOS.1 AND 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.  
 EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE, OR HANDRAIL POSTS, PAVEMENT PIPES, INLETS, OR UTILITIES WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS.1 AND 2.  
 PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.1 LOCATED AT STATION 18+52.99 -L- AND END BENT NO.2 LOCATED AT STATION 20+66.99 -L-.  
 INSTALL PILE SLEEVES FOR END BENT NO.1 LOCATION AT STATION 18+52.99 -L- WHILE CONSTRUCTING RETAINING WALL NO.1. 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.  
 INSTALL PILE SLEEVES FOR END BENT NO.2 LOCATED AT STATION 20+60.99 -L- WHILE CONSTRUCTING RETAINING WALL NO.2. AFTER RETAINING WALL CONSTRUCTION, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING THE END BENT CAPS.

- DESIGN RETAINING WALL NO.1 AND RETAINING WALL NO.2 FOR THE FOLLOWING:  
 1) H = DESIGN HEIGHT + EMBEDMENT  
 2) DESIGN LIFE = 100 YEARS  
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,200 PSF AT END BENT 1 AND 5,600 PSF AT END BENT 2  
 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER  
 5) MINIMUM EMBEDMENT DEPTH = 2 FT  
 6) REINFORCED ZONE AGGREGATE PARAMETERS:

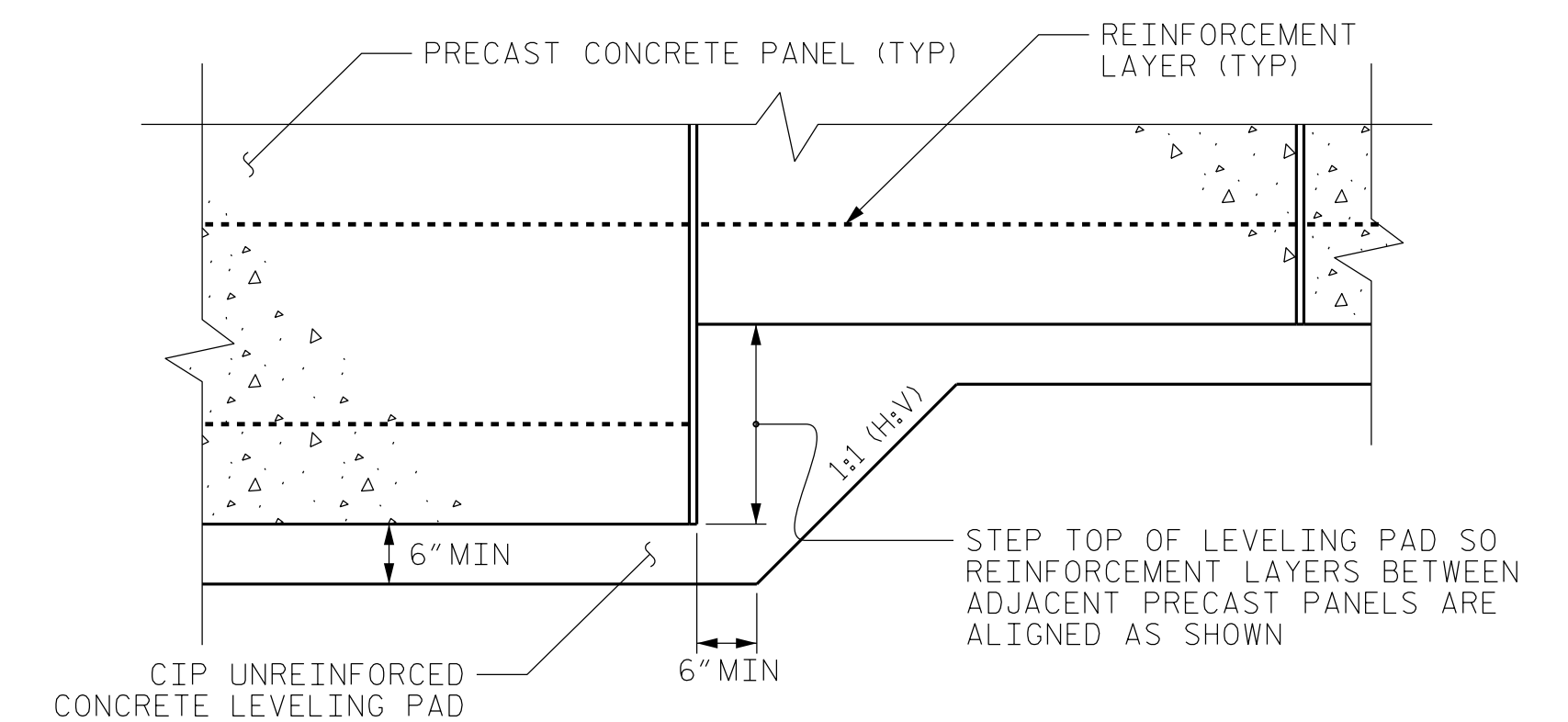
AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0

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

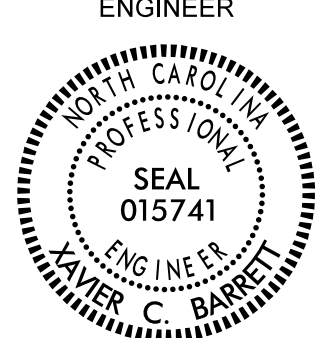
7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	110	30	0

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NOS.1 AND 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<sub>a</sub>) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 LOCATED AT STATION 18+52.99 -L- AND END BENT NO.2. LOCATED AT STATION 20+60.99 -L- MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.  
 FOUNDATIONS FOR END BENT NOS.1 LOCATED AT STATION 18+52.99 -L- AND 2 LOCATED AT STATION 20+60.99 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS.1 AND 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.  
 TEMPORARY SHORING IS REQUIRED FOR RETAINING WALL NOS.1 AND 2 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE STRUCTURE PLANS.



**PRECAST PANELS  
LEVELING PAD STEP DETAIL**

GEOTECHNICAL ENGINEER  SEAL 015741 XAVIER C. BARRETT	ENGINEER
DocuSigned by: Xavier Barrett 9/9/2019	DATE: 9/9/2019 SIGNATURE: _____ DATE: _____
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

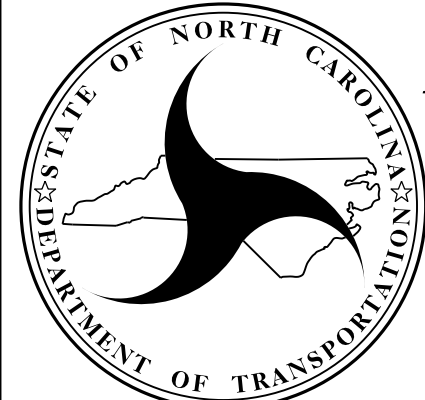
PROJECT NO.: BR-0042  
 ROCKINGHAM COUNTY  
 STATION: 19+56.99 -L-  
 SHEET 3 OF 4

PREPARED BY: T. WELLS	DATE: 09/19
REVIEWED BY: X. BARRETT	DATE: 09/19

Prepared in the Office of:



**KLEINFELDER**  
 Bright People. Right Solutions.  
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 GREENSBORO, NC 27410  
 NC FIRM LICENSE NO. F-1312



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

**GEOTECHNICAL  
ENGINEERING UNIT**

**MSE RETAINING WALL  
NOTES**

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