




GEOTECHNICAL ENGINEER



DocuSigned by:
Thein T. Zan 2/18/2015

44388808C1947Z
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

NOTES:

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

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 AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL (SRW) UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 3.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 1, RETAINING WALL NO. 2 AND RETAINING WALL NO. 3.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 1, RETAINING WALL NO. 2 AND RETAINING WALL NO. 3.

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

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1, RETAINING WALL NO. 2 AND RETAINING WALL NO. 3, SURVEY WALL LOCATIONS AND SUBMIT REVISED WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 355 kPa (FOR WALL NO. 1 & WALL NO. 2)
- 4) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 340 kPa (FOR WALL NO. 3)
- 5) AGGREGATE PARAMETERS:

| AGGREGATE TYPE* | UNIT WEIGHT (γ) kN/m ³ | FRICTION ANGLE (ϕ) DEGREE | COHESION (c) kPa |
|-----------------|--|--|------------------------|
| COARSE | 17.2 | 38 | 0 |
| FINE | 18.0 | 34 | 0 |

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

6) IN-SITU ASSUMED MATERIAL PARAMETERS:

| MATERIAL TYPE | UNIT WEIGHT (γ) kN/m ³ | FRICTION ANGLE (ϕ) DEGREE | COHESION (c) kPa |
|---------------|--|--|------------------------|
| BACKFILL | 18.8 | 30 | 0 |
| FOUNDATION | 18.8 | 28 | 0 |

DESIGN RETAINING WALL NO. 1, RETAINING WALL NO. 2 AND RETAINING WALL NO. 3 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

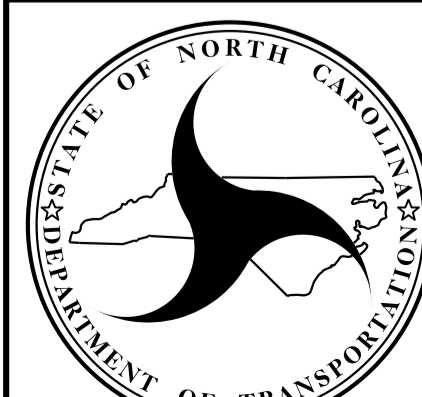
DESIGN RETAINING WALL NO. 3 FOR A PIPE EXTENDING THROUGH THE WALL AS SHOWN. VERIFY PIPE LOCATION AND ELEVATION BEFORE BEGINNING MSE WALL DESIGN OR CONSTRUCTION.

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, RETAINING WALL NO. 2 AND RETAINING WALL NO. 3.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 90+37.493 -LREV_SB- AND END BENT NO. 2 LOCATED AT STATION 90+81.993 -LREV_SB- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND RETAINING WALL NO. 2, RESPECTIVELY. SEE 'FOUNDATION LAYOUT' SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 1, RETAINING WALL NO. 2 AND RETAINING WALL NO. 3, UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

PROJECT NO.: R-2413CA
ROCKINGHAM COUNTY
STATION: VARIES
SHEET 7 OF 8



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

MSE RETAINING WALL NO. 1, 2 & 3
NOTES

| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|-----------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 3 | | | W-8 |
| 2 | | | 4 | | | |

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|-----------------------------|---------------|
| PREPARED BY: THEIN T. ZAN | DATE: 02/2015 |
| REVIEWED BY: JAMES R. BATTS | DATE: 02/2015 |