STANDARD MSE WALL NOTES ON PLANS **(5-16-17)**

(Instructions for use are in parentheses after each note, if applicable and choices are in italics.)

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 SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO. ____. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS. (When using this note, add a concrete barrier rail with moment slab plan sheet from the geotechnical design cell library to the wall plans.)

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. ____. (Use this note per the MSE Wall Policy or other situations when SRW units are an 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. ____.

WHEN USING AN MSE WALL SYSTEM WITH SRW UNITS FOR RETAINING WALL NO. ____, FREEZE-THAW DURABLE SRW UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS ARE REQUIRED. (Use this note for MSE walls with SRW units exposed to repeated freeze-thaw conditions and significant deicing chemicals such as walls facing roads in urban areas and Divisions 11, 13 and 14.)

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. ____. (Use this note per the MSE Wall Policy or other situations when fine aggregate is an option.)

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO. ____.

A _____ ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO. ____.

USE SRW UNITS WITH A _____ FACE FOR RETAINING WALL NO. ____.

USE SRW UNITS WITH A _____ COLOR FOR RETAINING WALL NO. ____.

A SEPARATION GEOTEXTILE *IS or IS NOT* REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. ____.

A DRAIN *IS or IS NOT* REQUIRED FOR RETAINING WALL NO. ____.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO. ____ LOCATED AT STATION _____. (Use this note for MSE abutment walls when pile sleeves are required to reduce the downdrag load on piles from the aggregate in the reinforced zone. When using this note, add an MSE abutment wall typical with pile sleeves from the geotechnical design cell library to the wall plans.)

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. ____, 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.

DESIGN RETAINING WALL NO. ____ FOR THE FOLLOWING:

1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = *75 or 100* YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = ____ LB/SF
4) MINIMUM REINFORCEMENT LENGTH (L) = ___H OR __ FT, WHICHEVER IS LONGER
5) MINIMUM EMBEDMENT ELEVATION = ____ FT
6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
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) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
BACKFILL	___	__	___
FOUNDATION	___	__	___

(Use 100-year design life for MSE walls supporting or adjacent to structures not owned by the Department or walls for routes or bridges (abutment walls) classified as Regional Tier facilities or higher per the North Carolina Multimodal Investment Network (NCMIN). Use 75-year design life for all other MSE walls. Modify No. 3 through 7 as necessary for variable wall heights and conditions. No. 4 and 5 are optional. Use No. 4 when more than the minimum reinforcement length of 0.7H or 6 ft is necessary such as for global stability. Use No. 5 when more than the minimum embedment in accordance with the provision is necessary such as MSE walls subject to scour. Replace “ELEVATION” with “DEPTH” in No. 5 to require a constant

embedment depth below the bottom of wall elevation instead of a fixed top of leveling pad elevation. Delete second row from table in No. 6 when fine aggregate is not an option.)

THE MINIMUM EMBEDMENT ELEVATION FOR RETAINING WALL NO. ____ INCLUDES EMBEDMENT FOR SCOUR.

DESIGN RETAINING WALL NO. ____ FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN RETAINING WALL NO. ____ FOR THE *POINT, LINE or STRIP* SURCHARGE LOAD SHOWN.

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

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. ____ LOCATED AT STATION _____. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR *SIGNS, LIGHTING or SIGNALS* WILL BE LOCATED BEHIND RETAINING WALL NO. ____ AND *WILL or MAY* INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES *WILL or MAY* INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. ____.

FOUNDATIONS FOR END BENT NO. ____ LOCATED AT STATION _____ *WILL or MAY* INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. ____. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DESIGN RETAINING WALL NO. ____ FOR A LATERAL LOAD FROM FOUNDATIONS LOCATED BEHIND THE MSE WALL APPLIED AS A FACTORED UNIFORM PRESSURE OF ____ LB/SF TO THE BACK OF PANELS *OR SRW UNITS*. (Use "OR SRW UNITS" when SRW units are an option.)

INSTALL PILE SLEEVES FOR END BENT NO. ____ LOCATED AT STATION _____ WHILE CONSTRUCTING RETAINING WALL NO. ____. OBSERVE A ___ 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. (Use this note for

MSE abutment walls with pile sleeves. Remove 2nd sentence from note if no waiting period is required.)

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

"TEMPORARY SHORING" *IS or MAY BE* REQUIRED FOR RETAINING WALL NO. ____ IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE *ROADWAY, STRUCTURE or TRAFFIC CONTROL* PLANS.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO. ____. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION. (Use this note when temporary shoring is not shown in the plans or required by the Engineer but may be used for OSHA reasons or the Contractor's convenience. For example, when constructing an MSE wall in a cut and traffic is diverted away or the location is a new alignment, the Contractor may choose to use temporary shoring for wall construction instead of temporary slopes to excavate for the wall.)