NOTES: *(Include these notes with section shown on Dwg. No. 3.2.2)*

1. MEMBRANE WATERPROOFING AND 8"x16"x2", 4000 PSI, $\frac{3}{4}$ IN, 610 CEMENT CONCRETE BLOCKS LAID IN MORTAR OR OTHER WATERPROOFING PROTECTIVE COURSE, MIN. 2" THICK AS SPECIFIED IN MHD STANDARD SPECIFICATIONS.

2. 4" ø WEEP HOLES 10'−0" O.C. (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.

3. ALL CONCRETE SHALL BE 4000 PSI, $1\frac{1}{2}$ IN, 565 CEMENT CONCRETE.

4. EXTEND EVERY Xth BAR FULL LENGTH AS SHOWN. *(specify X as req'd by design)*

For Spread Footings:

5. THE FACTORED BEARING PRESSURE = XXX KSF AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION. *(Designer to specify the Limit State and the Group Load Combination that produce the highest pressure)*

   FACTORED BEARING RESISTANCE = XXX KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.XX.

For Piles:

5. THE FACTORED AXIAL DESIGN LOAD PER PILE IS X KIPS AS PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS STRENGTH I LOAD COMBINATION. *(Designer to specify the Limit State and the Group Load Combination that produce the highest axial load)*

   THE FACTORED STRUCTURAL RESISTANCE PER PILE IS X KIPS AND IS THE PRODUCT OF THE NOMINAL STRUCTURAL RESISTANCE OF X KIPS AND A RESISTANCE FACTOR OF 0.XX.

6a. THE FACTORED GEOTECHNICAL PILE RESISTANCE IS X KIPS AND IS THE PRODUCT OF THE NOMINAL GEOTECHNICAL RESISTANCE OF X KIPS AND A RESISTANCE FACTOR OF 0.XX. THE ESTIMATED TIP ELEVATION IS XXX FEET. *(Use this note only when the Factored Geotechnical Pile Resistance controls the pile axial resistance, such as from friction or friction and end bearing as specified in the Geotechnical Report.)*

6b. THE MINIMUM TIP ELEVATION IS XXX FEET. *(Use this note only when the required pile length is not determined by the required axial resistance, i.e., lateral loading, scour resistance, or other factors, as recommended in the Geotechnical Report, determine the pile length.)*

6c. PILES SHALL BE DRIVEN TO BEDROCK WITH AN ESTIMATED TIP ELEVATION OF XXX FEET. HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER. *(Include this note only when the Factored Structural Resistance controls the pile axial resistance due to end bearing on rock as specified in the Geotechnical Report.)*

7. DETERMINATION OF THE DRIVEN PILE RESISTANCE, PILE DRIVING CRITERIA, AND PILE INTEGRITY SHALL BE PERFORMED USING THE XX *(Designer to specify the Formula Method, WEAP, PDA, Static−Cyclic (Express) Load Test, Static Load Test, or other method, as recommended in the Geotechnical Report.)* DRIVING/TESTING METHOD WITH A RESISTANCE FACTOR OF 0.XX. PILES SHALL BE INSTALLED TO ACHIEVE A FACTORED DRIVEN RESISTANCE EQUAL TO OR GREATER THAN THE FACTORED AXIAL DESIGN LOAD.

8. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING/TESTING PLAN FOR REVIEW AND APPROVAL OF THE ENGINEER.

NOTES: (Continued from Dwg. No. 3.2.2)

8. *Reinforcing steel in back of wall shall be designed for bending and direct stress and shall conform to AASHTO M 31 Grade 60.*

9. *Where piles are used, see Section 3.6.*

10. *Consult the Director of Bridges and Structures for concrete protection strategies in marine environments.*

11. *Design base width including any live load surcharge and the effects of sloping backfill.*

12. *Where design height H is greater than 30 feet, consider a counterfort design.*

13. *Where height of walls varies between expansion joints, the design of that segment of retaining wall may be based on the geometry of a section taken through the 1/4 point of the segment adjacent to the highest end of the wall.*

massDOT Highway Division — LRFD BRIDGE MANUAL, PART II	CONSTRUCTION NOTES FOR CANTILEVER RETAINING WALL — WINGWALL DETAILS	DATE OF ISSUE: JUNE 2013
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