

WALL DESIGN

1. FINAL DRAWINGS SHOWING PROPOSED PANEL SIZE, THE REQUIRED NUMBER OF REINFORCEMENT ELEMENTS PER PANEL, THE REINFORCEMENT ELEMENT LENGTHS, REINFORCEMENT ELEMENT LAYOUT, CONCRETE PANEL REINFORCEMENT DETAILS, PANEL TIE-IN DETAILS WITH COPING AND LEVELING PAD SHALL ALL BE PREPARED BY THE FABRICATOR AND SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL. ALL MATERIALS WITHIN THE MECHANICALLY STABILIZED EARTH (MSE) VOLUME, METHODS OF CONSTRUCTION, AND THE QUALITY OF PREFABRICATED MATERIALS SHALL MEET THE REQUIREMENTS OF THE SPECIAL PROVISIONS FOR THIS PROJECT.

2. DESIGN CRITERIA:

SOIL PARAMETERS FOR DESIGN OF MSE WALLS:

GRANULAR BORROW - SUBSECTION 703.04

EXISTING IN-SITU SOILS - SILT & CLAY DEPOSITS

NOMINAL BEARING RESISTANCE, q_n :	600 kPa
DENSITY:	-- - kN/m ³
INTERNAL SOIL FRICTION ANGLE, ϕ :	20°
COHESION, C :	27.0 kPa

SELECT FILL MATERIAL FOR MSE WALLS AND ABUTMENTS:

NOMINAL BEARING RESISTANCE, q_n :	600 kPa
DENSITY:	22.0 kN/m ³
INTERNAL SOIL FRICTION ANGLE, ϕ :	34°
ACTIVE EARTH PRESSURE COEFFICIENT, K_a :	0.28

ABUTMENT DESIGN LOADS (PER METER ALONG WALL) (UNFACTORED) :

VERTICAL LOADS

DEAD LOAD FROM SUPERSTRUCTURE:	225.39 kN/M
DEAD LOAD FROM APPROACH SLAB:	27.30 kN/M
LIVE LOAD FROM SUPERSTRUCTURE:	122.30 kN/M

HORIZONTAL LOADS

LONGITUDINAL FORCES:	2.38 kN/M
R+S+T:	44.40 kN/M

(NOTE: THE HORIZONTAL FORCES ACT PARALLEL TO THE MAJOR CHORD.)

3. AFTER THE MSE WALLS HAVE BEEN CONSTRUCTED TO THE BOTTOM OF FOOTING ELEVATION OF ABUTMENT NO.1 AND NO.2. A SURCHARGE LOAD SHALL BE APPLIED. THE MSE WALL DESIGN SHALL ACCOUNT FOR THE SURCHARGE LOADING, A DIFFERENTIAL SETTLEMENT OF 100 mm ALONG THE FACE OF ABUTMENT NO.1 AND NO.2, AND ANY ROTATION AS A RESULT OF THE DIFFERENTIAL SETTLEMENT. SEE SHEET 75 FOR DETAILS.

WALL CONSTRUCTION

4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE MSE VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH GRANULAR BORROW OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
5. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS FOR MSE WALLS TO A LEVEL OF THE CENTER OF THE REINFORCEMENT ELEMENT CONNECTIONS +/- 50. INSTALLATION OF REINFORCING ELEMENTS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
6. BACKFILL COMPACTION AND EQUIPMENT OPERATION SHALL BE KEPT TO A MINIMUM FOR A DISTANCE OF 1 METER FROM THE BACK FACE OF THE MSE PANELS. COMPACTION WITHIN 1 METER OF THE PANELS SHALL BE ACHIEVED WITH A MINIMUM OF THREE PASSES OF A LIGHTWEIGHT MECHANICAL TAMPER, ROLLER OR VIBRATORY SYSTEM APPROVED BY THE RESIDENT ENGINEER.

7. THE CONTRACTOR SHALL ACCOMMODATE ANY PIPES, GEOMEMBRANE LINER, DRAINAGE STRUCTURES, FOUNDATIONS, RAILING POSTS, AND ANY OTHER SUCH APPURTENANCES THAT ARE WITHIN THE DESIGNED MSE VOLUME.
8. TOP PANELS SHALL HAVE #13 DOWELS PROTRUDING FROM THE TOP EDGE INTO THE CAST IN PLACE COPING ONLY. THE DOWELS SHALL BE CAST INTEGRALLY WITH THE TOP PANELS. THE COST OF THE DOWELS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE ITEM 900.675, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".
9. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING ELEMENTS DOWNWARD TO AVOID CONFLICTS WITH APPROACH SLAB SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO THE EFFECTS OF SUPERELEVATION.
10. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING THE STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORM WATER RUNOFF IS TO BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE REINFORCED BACKFILL.
11. THE REQUIRED HORIZONTAL LIMIT OF SELECT GRANULAR BACKFILL SHALL EXCEED THE NOMINAL REINFORCEMENT ELEMENT LENGTH BY 300 MM.

MATERIAL NOTES

12. THE DRAINAGE AGGREGATE USED BETWEEN THE MSE WALL AND THE ABUTMENT FOOTING SHALL MEET THE REQUIREMENTS OF SECTION 704.16. PAYMENT SHALL BE PAID FOR UNDER THE ITEM 900.675, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".
13. THE PRECAST PANELS FOR THIS PROJECT SHALL MEET THE REQUIREMENTS OF SECTION 540. THE PANELS SHALL HAVE A GEOMETRIC SHAPE WITH MORE THAN FOUR SIDES AND NO ARCHITECTURAL FINISH IS REQUIRED.
14. CONCRETE FOR BOTH THE CAST-IN-PLACE COPING AND THE LEVELING PADS SHALL MEET THE REQUIREMENTS OF CONCRETE, HIGH PERFORMANCE CLASS B. CONCRETE FOR THE COPING SHALL BE PAID FOR UNDER ITEM 501.34 "CONCRETE, HIGH PERFORMANCE CLASS B". REINFORCEMENT IN THE COPING SHALL BE PAID FOR UNDER ITEM 507.17 "EPOXY COATED REINFORCING STEEL". THE COST OF MATERIALS AND INSTALLATION OF THE LEVELING PADS SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 900.675, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".
15. ANY WALL REINFORCING STRIPS LOCATED ABOVE THE GEOMEMBRANE SHALL HAVE A DESIGN LIFE OF 125 YEARS USING THE CORROSION RATES GIVEN IN AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR NON-AGGRESSIVE SOIL.

NOTE TO CONTRACTORS

16. THE FOLLOWING MATERIALS SHALL BE SUPPLIED BY THE MSE WALL SYSTEM MANUFACTURER UNDER THE ITEM 900.675, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".

- PRECAST CONCRETE FACING
- PANEL REINFORCING ELEMENTS
- ANY NECESSARY HARDWARE FOR ATTACHING PRECAST PANELS TO REINFORCING ELEMENTS
- BEARING BLOCKS
- RUBBER SHIMS
- FILTER FABRIC AND ADHESIVE FOR PANEL JOINTS

17. OTHER MSE WALL MATERIALS SPECIFIED IN THE CONTRACT PLANS SHALL BE SUPPLIED BY THE CONTRACTOR. THIS MAY INCLUDE, BUT IS NOT LIMITED TO, ANY JOINT MATERIAL SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE ELEMENTS, SANDBLASTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS, FILTER FABRIC OVER UNDERDRAIN PIPE, AND 30 mil GEOTEXTILE MEMBRANE. ALL MATERIALS SHALL BE PAID FOR UNDER ITEM 900.675, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".
18. THE MSE RETAINING WALL SYSTEM MANUFACTURER SHALL BE RESPONSIBLE FOR DESIGNING AND DETAILING ANY NECESSARY ATTACHMENTS OR REINFORCEMENTS AROUND THE DROP INLET AT STATION 10+160.000. SEE PIPE PROFILE ON SHEET 120. THE COST OF DESIGNING, DETAILING, SUPPLY AND INSTALLATION OF THE MODIFIED REINFORCEMENT WILL BE CONSIDERED INCIDENTAL TO THE ITEM 900.675, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".

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	SHEET: 74 OF 139