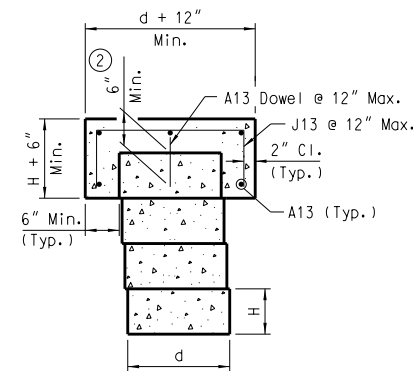
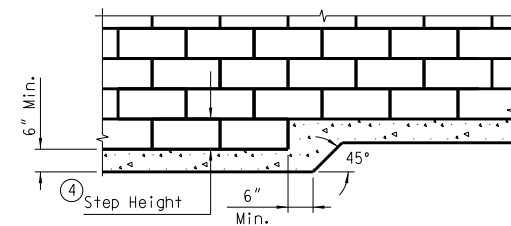


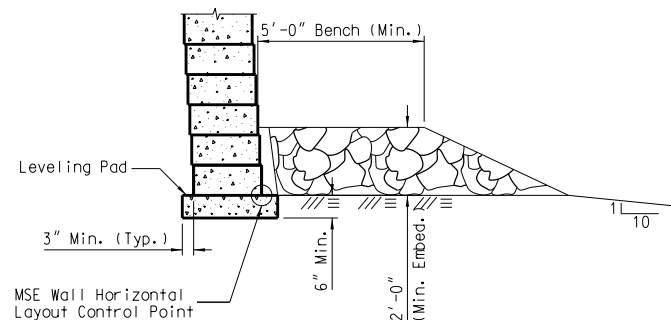
**TYPICAL SECTION**



**COPING DETAILS**



**LEVELING PAD STEP DETAIL**



**LEVELING PAD DETAIL**

- ① Extend top two layers of soil reinforcement 5 feet beyond the end of the lower layers of soil reinforcement.
- ② Dowel to be embedded in Class 4000 concrete placed in void. Required minimum depth of concrete in void for dowel embedment is 8".
- ③ Maximum vertical spacing of soil reinforcement is every other level of block vertically not to exceed 18".
- ④ Limit step height for modular concrete block facing to the height of a single block.
- ⑤ Angle to be determined by the Contractor based on site conditions and the method of construction used. Excavation and/or shoring of retained backfill to permit construction of the MSE wall is considered incidental to the MSE wall construction and is not paid for as a separate item.
- ⑥ Unsuitable soil to be removed and replaced with Stone Bridge Lift as directed by RCE. Stone Bridge Lift to conform to requirements of Bridge Lift Supplemental Specification.
- ⑦ Use B3 geogrid that meets the requirements of Supplemental Technical Specification SC-M-203-2.
- ⑧ Pay limit is from top of leveling pad elevation to top of wall. See MSE wall profiles. Wall height limited to 7'-6" or less.
- ⑨ Geosynthetic Materials for Separation and Stabilization SC-M-203-1 use non-woven geotextile for moderate survivability.

**MSE Wall Notes:**

1. Design in accordance with the SCDOT Supplemental Design criteria for Low Volume Bridge Replacement Projects. Construct wall in accordance with Sections 3 and 4 of Supplemental Technical Specification SC-M-713. Use Sections 5 and 6 of SC-M-713 for determining measurement and payment.
2. Design Methodology: LRF Design
3. Design Life: Permanent structures = 100 years.
4. Reinforced Backfill Material:  
 Granular Backfill:  
 Internal Friction Angle (deg) = 32  
 Total Unit Weight = 120 pcf

Use granular backfill material with a gradation in accordance with the following

Sieve Size	Percent Passing
3/4"	100
NO. 40	0-60
NO. 200	0-15

Use AASHTO T27 to determine gradation.

Ensure that the granular back fill and block fill have the following properties:

pH Values between 3.0 and 9.0 for polyester, and pH values greater than 3.0 for polypropylene and high density polyethylene. For granular backfill, determine pH values in accordance with AASHTO T289. For block fill, prepare sample as follows: Obtain approximately 2-1/2 pounds of representative material. Transfer the sample into a 1 gallon wide mouth plastic jug. Add an equal weight of deionized or distilled water to the sample and let the mixture sit for approximately 30 minutes. At the end of this period, place a lid on the container and vigorously agitate the mixture for 3 minutes. Repeat agitation 2 hours after the initial agitation and again 4 hours after the initial agitation. After the agitation at the 4-hour time interval, allow the sample to sit for approximately 20 hours to allow for any solids to settle out. After the sampler sits for 20 hours, remove a sufficient amount of the solution and filter through a coarse paper (such as Fisher Q8) to obtain the supernate to be analyzed. Analyze the supernate according to ASTM D1293 and ASTM D1125

Organic content not to exceed 1.0 percent (weight of organic material to weight of total sample) as determined by AASHTO T267 for material finer than NO. 10 sieve.

Internal friction angle not less than 32 degrees as determined by the standard direct shear test (AASHTO T236) or the triaxial test (AASHTO T297) on the portion passing the NO. 10 sieve. Compact material test samples to 95% (AASHTO T99, Method C or D) of maximum density at optimum moisture content. For granular material, Coefficient of uniformity,  $C_u$ , that is greater than 4 but less than 20. Compute the Coefficient of uniformity,  $C_u$ , as follows:

$$C_u = D_{60}/D_{10}$$

Plasticity Index (PI) less than or equal to 6 and the Liquid Limit (LL) less than or equal to 30 as determined by AASHTO T90

Classified as well-graded in accordance with the Unified Soil Classification System (USCS) in ASTM D2487. The reinforced backfill material shall not be gap-graded.

5. For leveling pad, provide Class 2500 concrete.
6. For 4" concrete slope protection ditches, provide Class 2500 concrete.
7. Any portion of wall coping sloped at 2H:1V or steeper must be cast-in-place concrete and anchored with dowels. In accordance with STS-M-713
8. Do not attach traffic barrier, pedestrian railing, or moment slab to MSE wall facing or wall coping.
9. Do not place guardrail posts through soil reinforcement. No vertical obstructions are allowed in the Reinforced Backfill. If vertical obstructions are required in Reinforced Backfill then this design is no longer applicable.
10. To ensure that the wall does not have a negative slope or batter (Slope outward from the face) after completion of construction, use a batter of 1 inch (horizontal) in 60 inches (vertical) (1H:60V). Monitor the actual movement of blocks during the placement and compaction of each lift of backfill and adjust the amount of batter as needed according to field conditions. In accordance with Supplemental Technical Specification SC-M-713, walls constructed with negative batter are not acceptable.
11. Do not use if 100 year water level encroaches on wall.

**Note to Designer:**

Provide MSE Wall Plan and Profile Sheet(s) to Preconstruction Support-Geotechnical Design Section (PCS/GDS). PCS/GDS will finalize these plans (not including the Plan and Profile Sheet(s)). The PCS/GDS will return these final plans signed and sealed for inclusion into the construction plans.

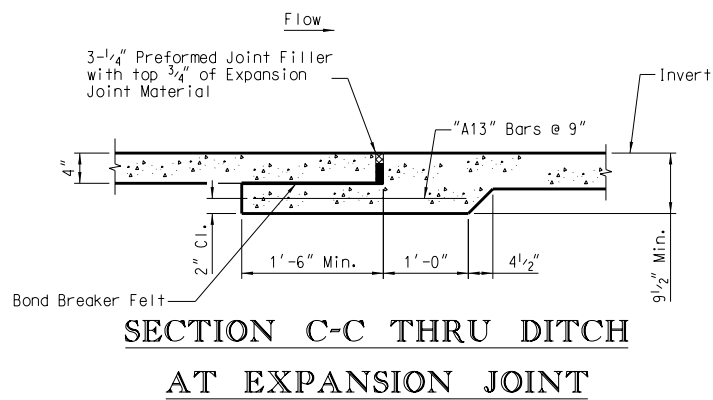
BAR SIZE DESIGNATION

US. CUSTOMARY	METRIC
#3	10
#4	13
#5	16

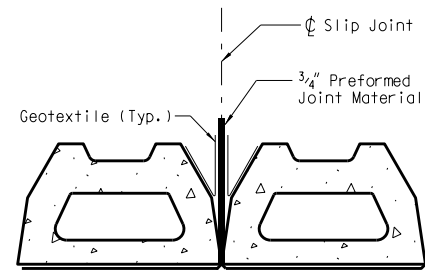
Note: For bar bending details see SCDOT Reinforcing Bending Bars Details Bridge DWG

REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION  FLEXIBLE GRAVITY WALL WITH BLOCK FACE FOR LOW VOLUME BRIDGE REPLACEMENTS (1 OF 5)			
REV.							
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REVIEWED							
QUAN.							
DR.	ACB	NEH	03-18	COUNTY	XXXXXXXX	ROUTE	XXXXXX
DES.				BY	CHK.	DATE	

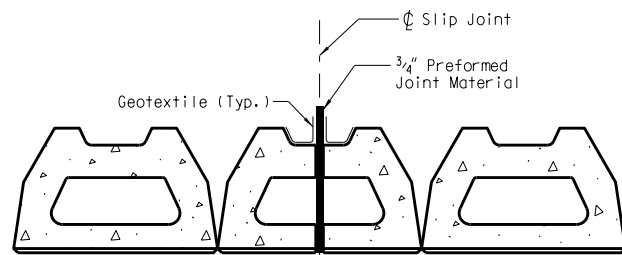




**SECTION C-C THRU DITCH  
AT EXPANSION JOINT**

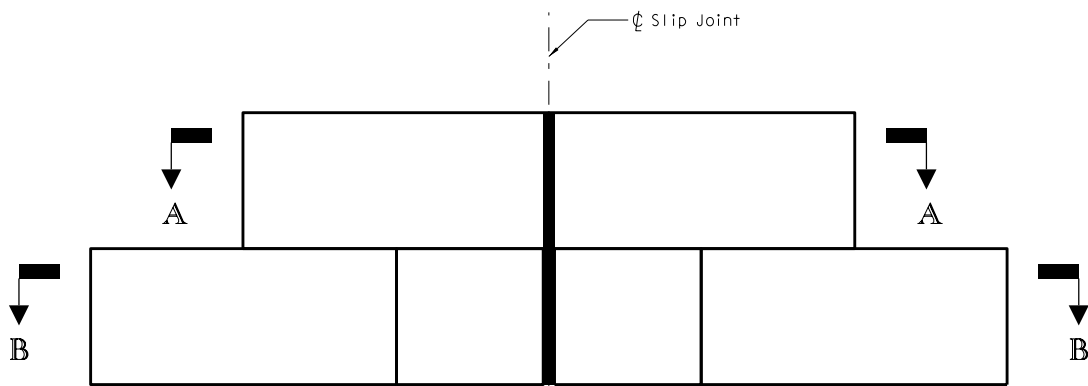


**SECTION A-A  
(Not To Scale)**

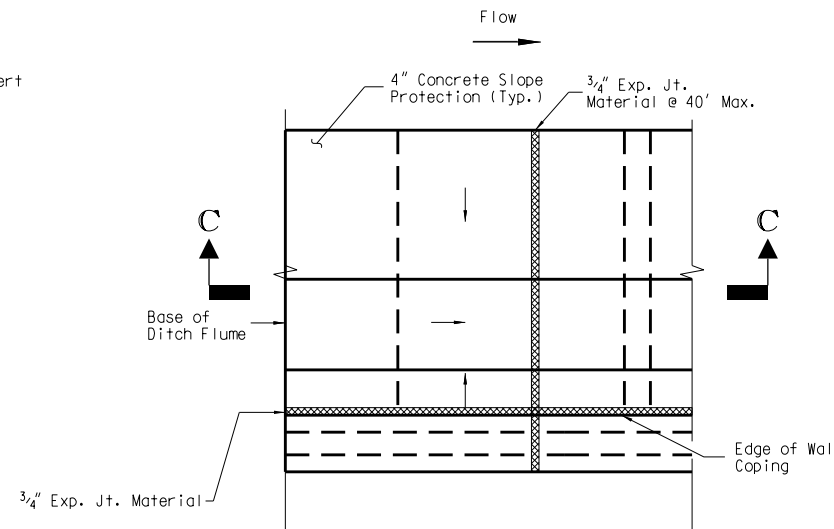


**SECTION B-B  
(Not To Scale)**

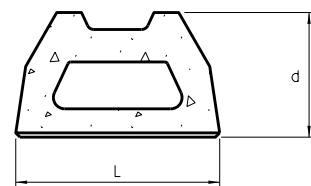
Use prefabricated half size block or field cut facing unit at slip joint location



**SLIP JOINT DETAIL - BLOCK FACING**



**PARTIAL PLAN OF DITCH  
AT EXPANSION JOINT  
(Plan View)**



**BLOCK UNIT (TYPICAL)  
(Not To Scale)**

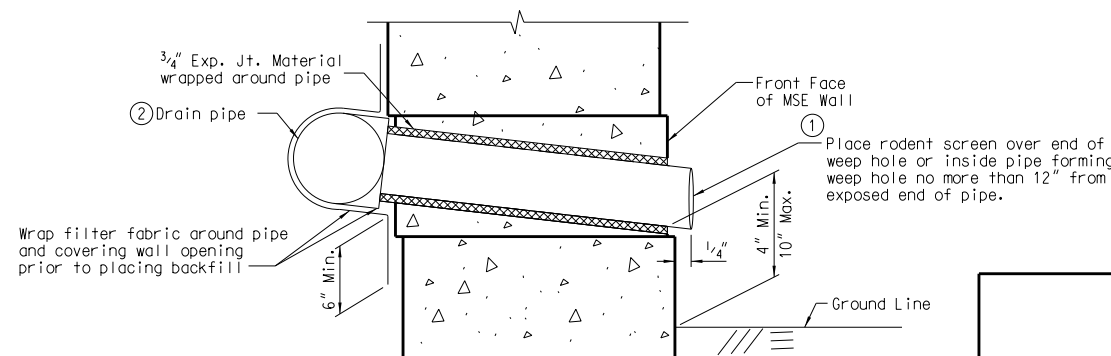


MSE Wall With Modular Concrete Block Facings

- Modular Concrete Block Facing**  
Submit a manufacturer's certification to the RCE that the modular concrete blocks for each lot shipped are in conformance with following specifications. For each particular lot shipped, ensure that the certification for each shipment lists the date manufacture, type of block, the average compressive strength, and the water absorption.
- Concrete**  
Use Portland Cement Concrete with a minimum 28 day compressive strength of 4,000 psi. Limit maximum water absorption to 5% in accordance with ASTM C140. Ensure that admixtures conform to the requirements in applicable subsections of Section 701 of the SCDOT Standard Specifications.
- Casting**  
Cast the modular concrete blocks in steel molds and in a manner that will ensure the production of uniform modular concrete blocks. Place the concrete in each block without interruption and consolidate. Steam cure the blocks for a minimum of 24 hours. Make certain the blocks reach a minimum compressive strength of 4,000 psi before being shipped.
- Compressive Strength**  
Acceptance of the modular concrete blocks with respect to compressive strength is determined on a per lot basis. The maximum number of blocks in each lot is the lesser of 2,000 or a single day's production. Randomly sample the lot in accordance with ASTM C140. Have the Wall Manufacturer perform compressive strength tests on test specimens that conform to the saw-cut coupon provisions of Subsection 5.2.4 of ASTM C140. Block lots will be approved when the average compressive strength is 4,000 psi of 3 test coupons and with no individual test having a compressive strength of less than 3,500 psi. Block lots not reaching the above requirements will be rejected.
- Markings**  
Clearly mark on each lot the date of manufacture, lot number, and type of block in accordance with the approved MSE wall Shop plans.
- Finish**  
Unless otherwise indicated in the Plans or directed by the RCE, provide on the front face of the blocks a natural gray roughened surface (granite) finish in accordance with Standard Drawing 701-950-01.
- Tolerances**  
Provide modular concrete blocks manufactured within the following tolerances:  
Ensure that the length (L) and width (d) of each individual block is within 1/8 inch of the specified dimension  
Ensure that hollow units have a minimum wall thickness of 1-1/4 inch.  
Ensure that the height (H) of each individual block is within 1/16 inch of the specified dimension.  
When a broken or fractured face is required, ensure that the horizontal dimensions of the front face is within 1 inch of the theoretical dimension of the individual block shown in the Plans.
- Rejection**  
Modular concrete blocks will be rejected because of failure to meet any of the requirements specified above. In addition, any of the following defects will be sufficient to cause for rejection:  
Defects that indicate imperfect molding.  
Defects indicating honeycomb or open texture concrete.  
Cracks greater than .02 inches in width and longer than 25% of the height of the block.  
Severely chipped or broken blocks.  
Color variation on front face of block due to excess from oil or other reasons.  
Defective or damaged reinforcement connection devices built into the modular concrete block.
- Handling, Storage and Shipping**  
Handle, store, and ship modular concrete blocks in such a manner as to eliminate the dangers of chipping, discoloration, cracks, or fractures.
- Block Fill**  
Furnish block fill consisting of coarse aggregate No. 67 or 6M when the modular concrete block requires a block fill for connection strength or when vertical void spaces exist within the modular concrete block. Obtain coarse aggregate from a source listed on SCDOT Qualified Product List 2.
- Block Coping**  
Place a cast-in-place concrete coping over the upper most level of modular concrete blocks as indicated in the Plans or as shown in the accepted Shop Plans. Provide Class 4000 concrete conforming to applicable subsections of Section 701 of the SCDOT Standard Specifications. Ensure that fabrication and placement of reinforcing steel conforms to the applicable requirements of Section 703. Submit a manufacturer's certification to the RCE that the concrete and reinforcing steel used in the block coping are in conformance with these specifications.

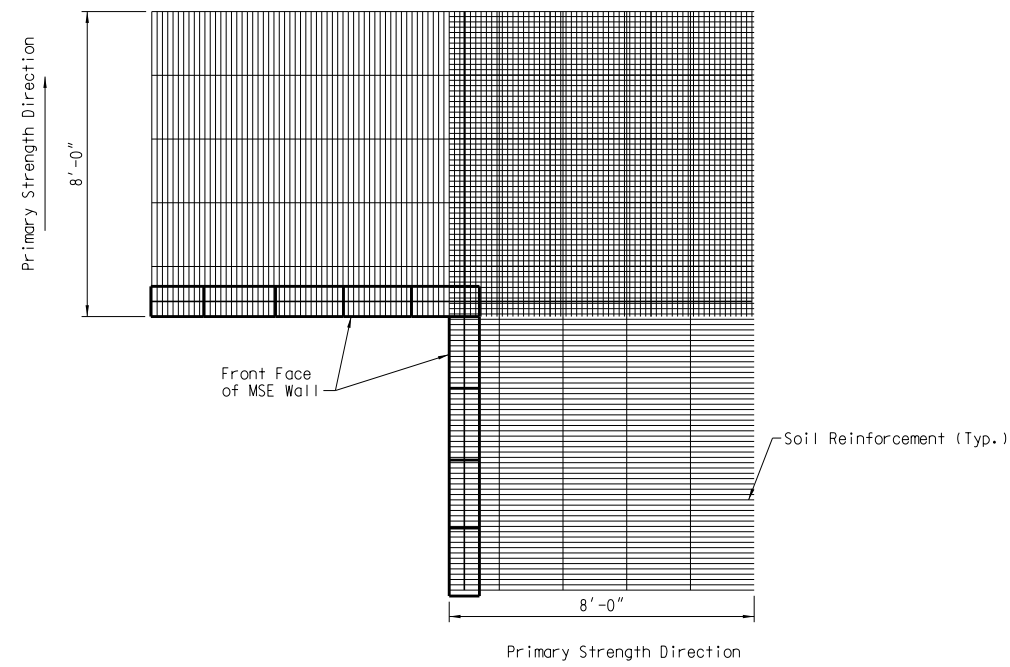
- Provide rodent screen manufactured from T304 stainless steel or galvanized steel with a minimum wire diameter of 0.050". Provide rodent screen with minimum of 2 openings per inch and a maximum of 4 openings per inch.
- Pipe continuous along wall length. Extend pipe 1'-0" beyond last weep hole on both ends and cap.

Note to Designer:  
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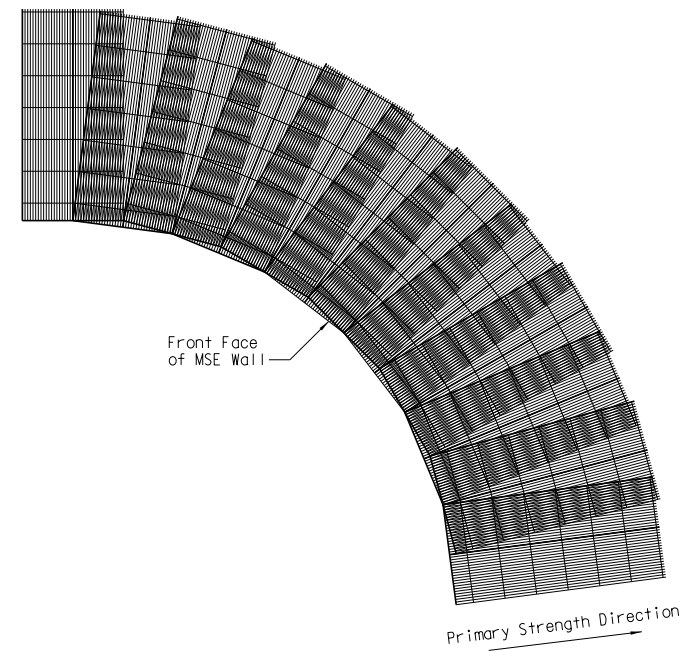
**WEEP HOLE DETAIL**

REV.				<p><b>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION</b></p> <p><b>FLEXIBLE GRAVITY WALL WITH BLOCK FACE FOR LOW VOLUME BRIDGE REPLACEMENTS (3 OF 5)</b></p>	<p>COUNTY XXXXXXXX</p> <p>ROUTE XXXXXX</p>
REV.					
REV.					
REVIEWED					
QUAN.					
DR.	ACB	NEH	03-18		
DES.					
BY	CHK.	DATE			



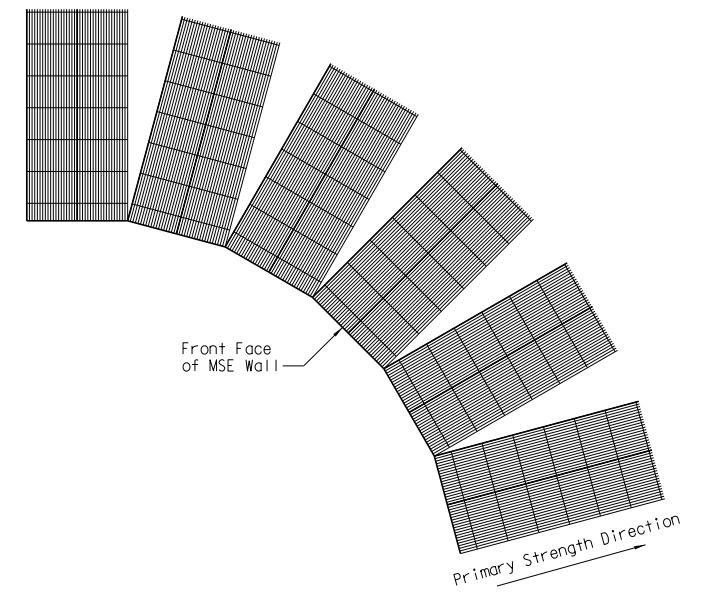
**90 DEGREE INSIDE CORNER DETAIL**

Note:  
Alternate adjacent layers of reinforcement using Layout A and Layout B.

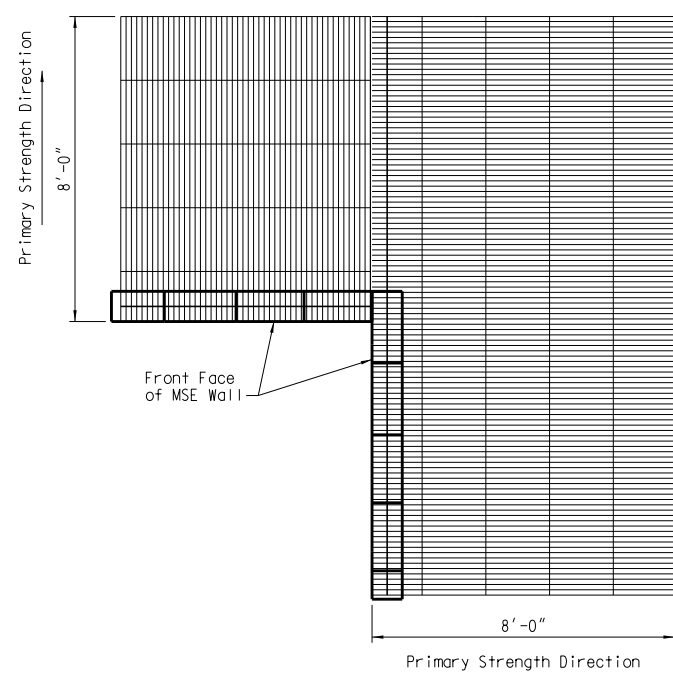


**CURVED INSIDE CORNER DETAIL**

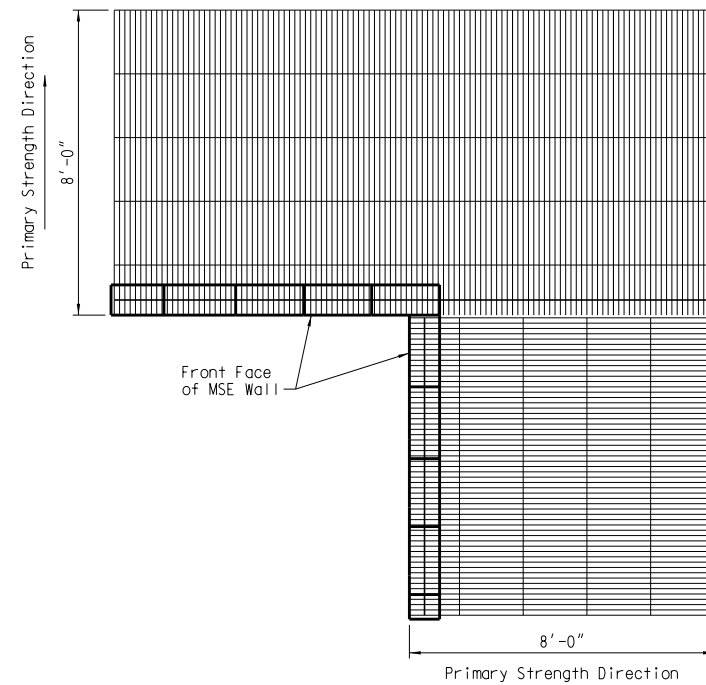
Note:  
Alternate adjacent layers of reinforcement using Layout C and Layout D.



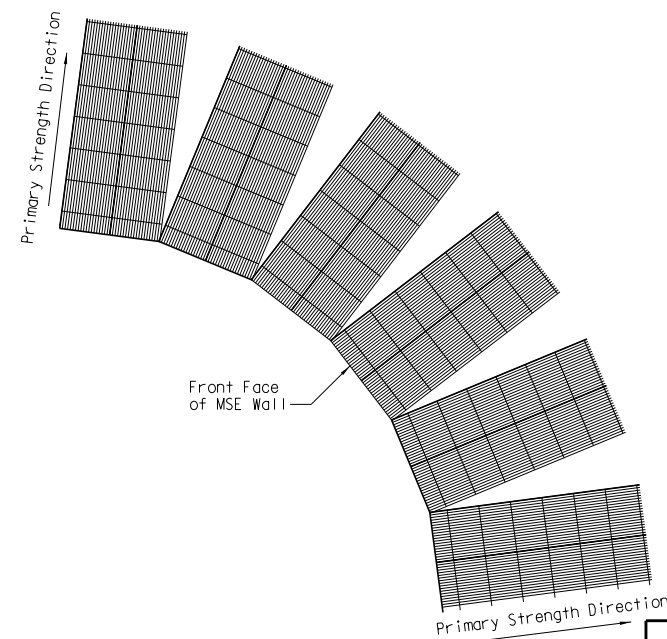
**LAYOUT D**



**LAYOUT A**



**LAYOUT B**



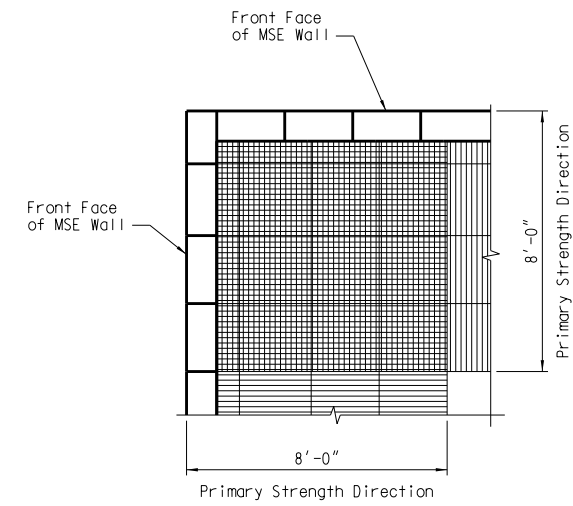
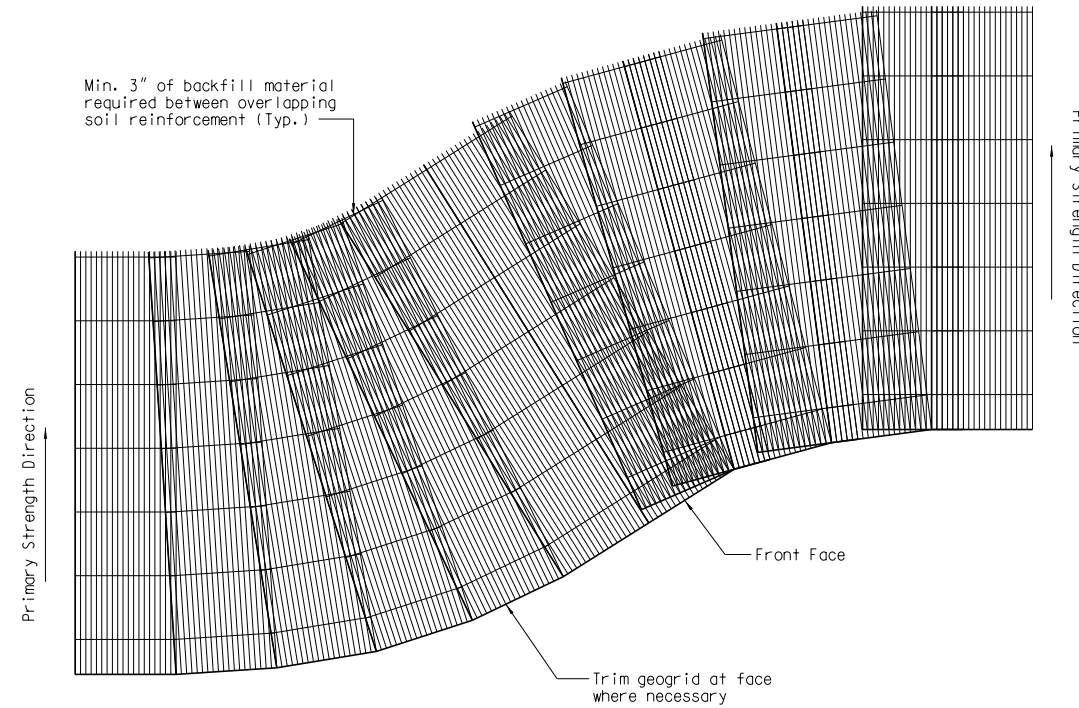
**LAYOUT C**

Note to Designer:  
Provide MSE Wall Plan and Profile Sheet(s) to Preconstruction Support-Geotechnical Design Section (PCS/GDS). PCS/GDS will finalize these plans (not including the Plan and Profile Sheet(s)). The PCS/GDS will return these final plans signed and sealed for inclusion into the construction plans.

REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION  FLEXIBLE GRAVITY WALL WITH BLOCK FACE FOR LOW VOLUME BRIDGE REPLACEMENTS (4 OF 5)
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	ACB	NEH	03-18	COUNTY XXXXXXXX
DES.				ROUTE XXXXXX
BY	CHK.	DATE		

# ALTERNATE MSE WALL DETAILS

BRIDGE PLANS ID	SHEET NO.
XXXXXXXX-BXX	XX

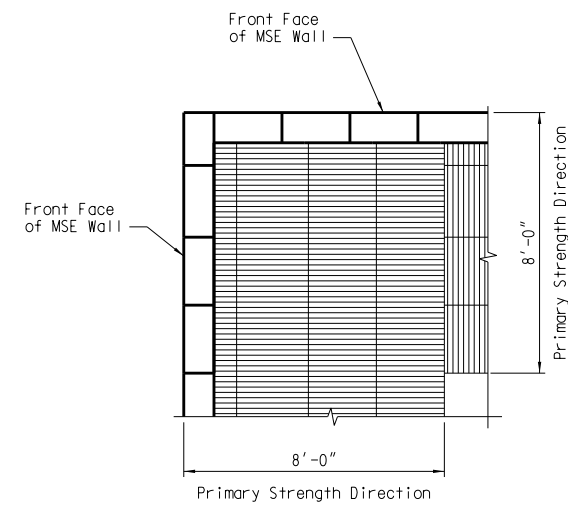
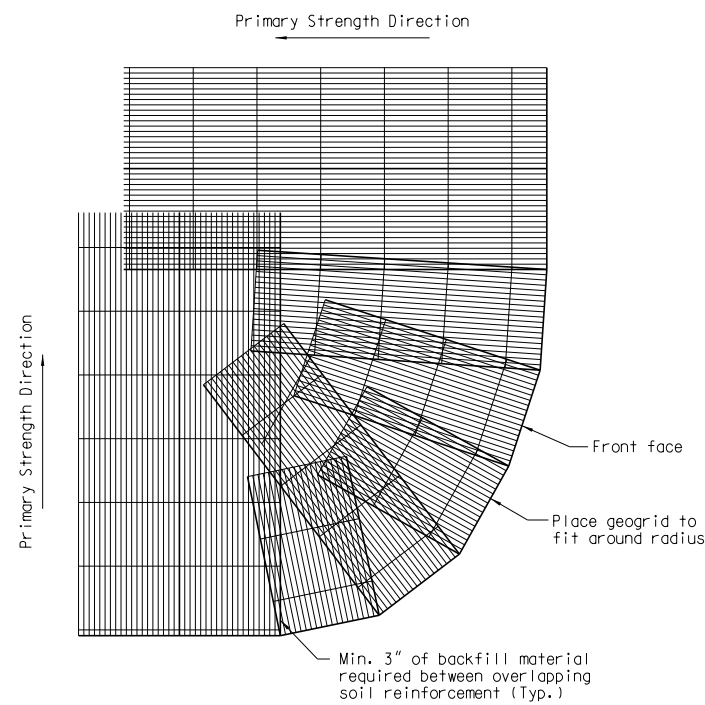


Note to Designer:  
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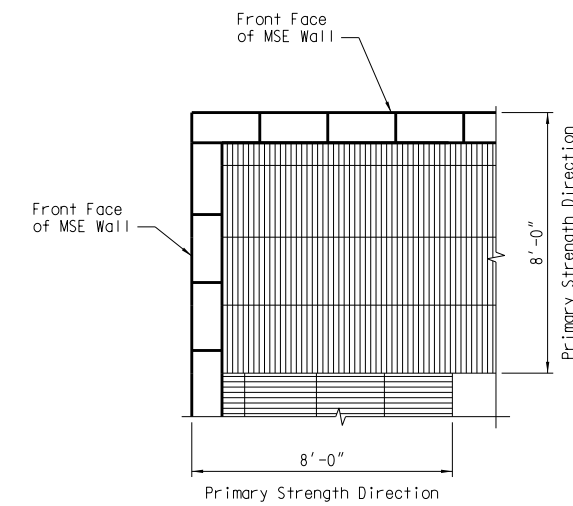
## 90 DEGREE OUTSIDE CORNER DETAIL

Note:  
 Alternate primary strength direction of adjacent soil reinforcement layers using Layout E and Layout F.

## CURVED WALL GEOGRID DETAILS



LAYOUT E



LAYOUT F

## CURVED OUTSIDE CORNER GEOGRID DETAIL

REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION  FLEXIBLE GRAVITY WALL WITH BLOCK FACE FOR LOW VOLUME BRIDGE REPLACEMENTS (5 OF 5)
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	ACB	NEH	03-18	
DES.				
BY	CHK.	DATE	COUNTY	ROUTE
			XXXXXXXXXX	XXXXXX