

CONSIDERING WHAT TYPE OF FACING PANELS TO USE

Differential Settlement of MSE Walls

MSE walls are routinely designed with discrete facing panels that measure about 5 ft. by 5 ft. and have $\frac{3}{4}$ inch joints all around. This type of facing allows the wall to be nearly as flexible as the reinforced soil itself. This inherent flexibility allows the wall system (and facing) to be constructed on compressible foundation soils such that differential settlements up to one (1) percent can be accommodated by the wall facing without showing signs of distress.

On the other hand, walls with full height facing panels should only be constructed on firm foundation soils in which little or no differential settlement is anticipated. The permissible differential settlement for the proposed structures, with full height facing panels up to 17 ft. in height, may be limited to about 0.25 percent for satisfactory performance of the wall facing.

Difficulty and Risk of Tilt Up Construction

MSE walls constructed with conventional facing panels are relatively simple to construct. The bottom course of panels is braced until stabilized by the reinforced soil. Subsequent lifts of panels, gang off of the stabilized panels below and are simply wedged and clamped in place. Conventional MSE wall construction is well documented and recognized as a relatively safe construction practice.

Construction of walls with full height facing panels requires special lifting equipment and procedures to lift, rotate and tilt up the relatively large facing units into place. A significant bracing system is required for each and every panel to safely secure each panel in position. Special Care must be exercised by the construction crew and equipment operators to keep the wall construction safe.

Facing Panel Performance During Backfilling

For conventional MSE wall construction with discrete facing panels, each lift of panels is battered back into the fill about $\frac{3}{4}$ inch over a height of 4 feet. The panel batter gradually comes out during backfilling of the panel and subsequent lifts of panels above. The amount of batter to use is well understood based on extensive experience with conventional MSE wall construction.

The required batter of full height facing panels to compensate for backfilling and compaction operations is not well defined due to minimal experience with this type of wall construction. This concern is compounded when Geosynthetic (plastic) earth reinforcements are used due to the extensible nature of these materials. Therefore, the recommended batter will be a guess based on the type of earth reinforcement and backfill used. In addition, cracking of full height panels during construction is possible due to flexural stresses that develop during handling, backfilling, due to settlement, and due to inherent construction displacements. Cracking of full height facing panels is not uncommon for this type of construction.

Recommendation

Conventional MSE wall construction using discrete facing panels is recommended for construction of all MSE walls.