

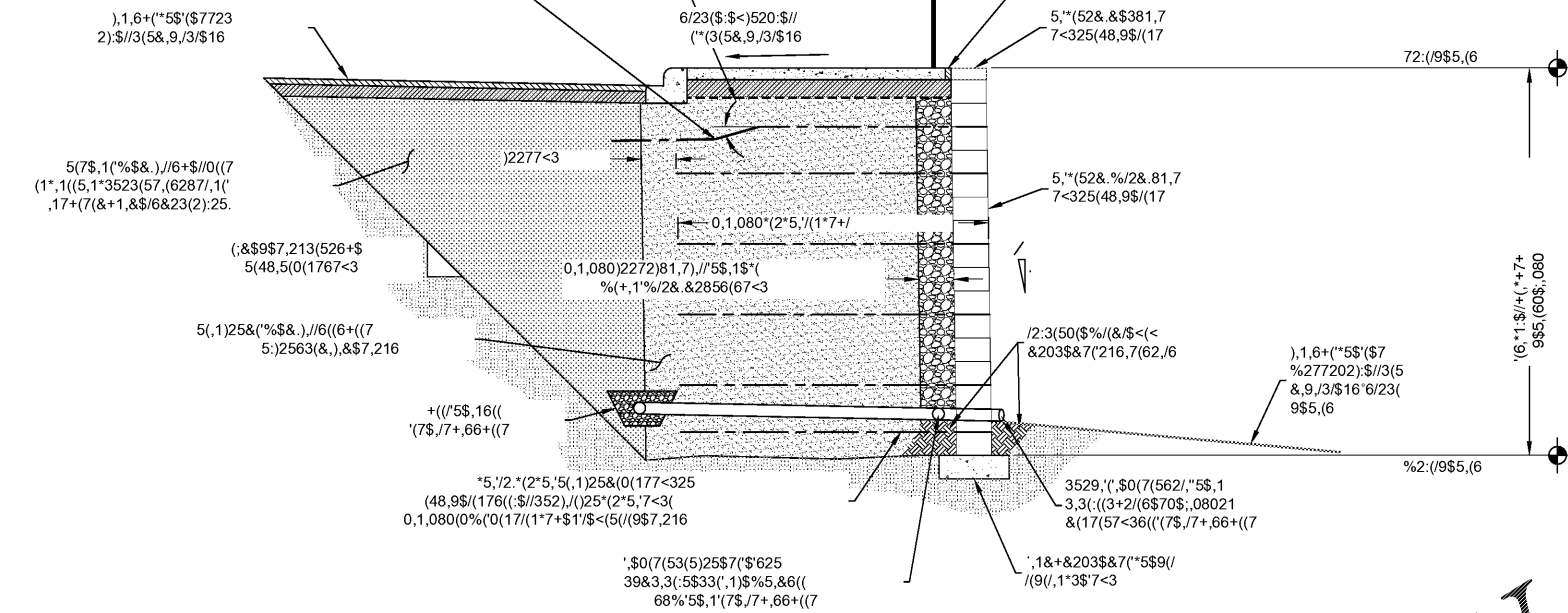


Revisions:
1/19/21 Added Note

Proj. No.: 80702
Date: 11/16/2020

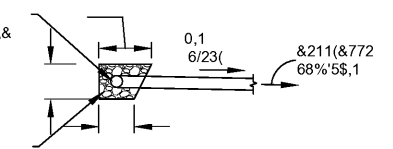
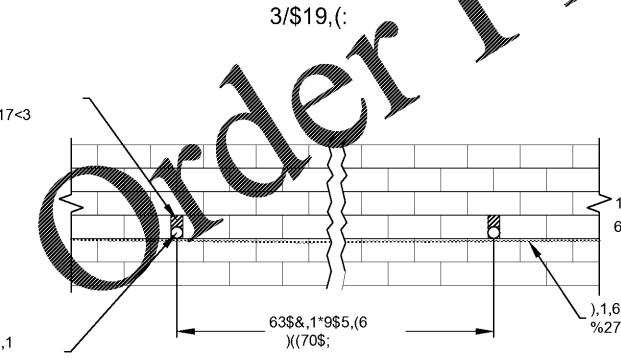
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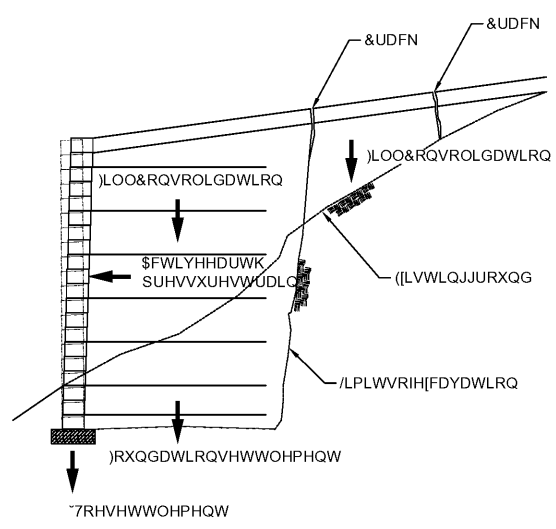
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Backfill Movement and Soil Cracks

Mechanically Stabilized Earth (MSE) retaining walls are flexible reinforced soil masses, which interact with the foundation and retained backfill zones to provide a stable retaining structure. These soil zones have different stress/strain/consolidation properties which can result in differential movements and strain of the reinforced and retained soil matrix.

Relative movement of the soil masses is typically noted in taller wall or tiered structures with small soil cracks occurring behind the wall structure near the boundary of soil zones with different strain properties. Experience has shown that this type of soil cracking is most noticeable after very heavy rainstorms where the additional saturated soil weight and seepage pressure involved can cause slight differential movement of the masses. A wall schematic and possible causes are shown below:



3RVVLEOHFDXVHVVRVLRLOFUDFNLQJ
&RQVROLGDWLRQ UHLQIRUFHQRQH
EDFNLOQAny settlement of reinforced fill relative to adjacent soils may cause cracking at the end of reinforcement. If soils are placed and compacted in dry conditions, water can cause secondary consolidation of the reinforced fill and cracking at the end of the reinforced zone.
&RQVROLGDWLRQHWDLQWLBQZHGJH - Similar to Item 1 causing cracking at the back of fill wedge relative to existing soils.
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&RQVROLGDWLRQHWDLQWLBQZHGJH - Similar to Item 1 causing cracking at the back of fill wedge relative to existing soils.

7RH 6HWWOHPHQW the wall toe can experience more settlement than the wall heel due to the lack of overburden or confining pressure resulting in slight lateral wall movement in the upper wall section and tension cracking at the end of reinforcement.

Soil cracks can also be a sign of global instability or continuing settlement which requires evaluation by a geotechnical engineer. However, most minor soil cracking observed is structurally insignificant to the long term performance of the wall structure but can lead to reflective cracks in pavement sections and/or separation of curbs when of greater magnitude.

Significantly increasing the length of the upper reinforcement levels to help bridge the potential crack zones can be prudent precaution for projects with flexible pavements extending over all zones. High quality backfill, proper backfill placement and compaction, and firm foundations are the best precautions against soil cracking.

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