

Bridge Approaches Supported by MSE Walls with Light Weight Fill: Corrosion Monitoring of Earth Reinforcements

by

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Abstract: Reconstruction of the US Route 17 Bypass/Farrow Parkway Interchange in Myrtle Beach, South Carolina was recently completed including a new bridge/viaduct carrying US 17 over the intersection. The site was underlain by soft clay and the potential for settlements of the bridge foundations, abutments and approaches was mitigated by implementing a number of techniques including ground modification, preloading with wick drains, use of light weight fill, and two-stage construction of the MSE walls supporting the bridge approaches. Lightweight fill (LWF) manufactured from expanded clay was used as embankment fill within the approach sections and as fill for MSE wall construction. The LWF was capped with two to three feet of normal weight granular backfill (GB).

Sampling and testing performed near the end of construction revealed that neither the LWF, or the GB materials, met the specified requirements for electrochemical properties intended to mitigate the potential for corrosion of the earth reinforcements supporting the MSE walls. A program of corrosion monitoring was implemented to study the performance (corrosion rates and metal loss) of galvanized steel reinforcements embedded within the MSE wall fills at this site and to check if the targeted service life of the MSE walls could be expected given the as-built conditions.

This presentation will describe the corrosion monitoring plan and implementation, data collected as part of the corrosion monitoring plan, data analyses and interpretations, and conclusions about the observed performance of galvanized steel reinforcements and characterization of the steel corrosion potential of LWF and GB used at this site.