

Rapahannock Regional Jail

Stafford, VA

Problem: In December of 2006, Balfour Beatty approached GeoStructures (GSI) to develop a design and build proposal for a 23 foot high retaining wall in a cut at the Rapahannock Regional Jail site in Stafford, Virginia. The wall was required to create space for the expansion of the existing detention facility. The site investigation suggested that the existing hillside was composed predominantly of stiff marine clays overlying sedimentary rock formations exhibiting varying degrees of weathering. High groundwater was reported in some of the boring logs and shallow slope failures and perched water in the existing hillside were evident.



Alternatives: Working in partnership with EarthTec, GSI investigated a number of alternative solutions. In preliminary design, it became apparent that the low long-term strength of the marine clay would drive economic viability. GSI developed two options: a post and panel wall and an MSE solution using the EarthTrac HA™ system comprising precast panels and ribbed steel strips.



Innovative Design: To enhance stability while maintaining economy, GeoStructures proposed an innovative L shaped cross section, with longer steel strips near the bottom of the structure. This design detail enhanced sliding stability over the weak marine clay soils.

Cost Effective: Even after accounting for additional excavation and imported stone, GeoStructure's MSE solution saved over \$300,000 compared with the post and panel or other traditional cut wall options.

The GeoStructures Advantage:

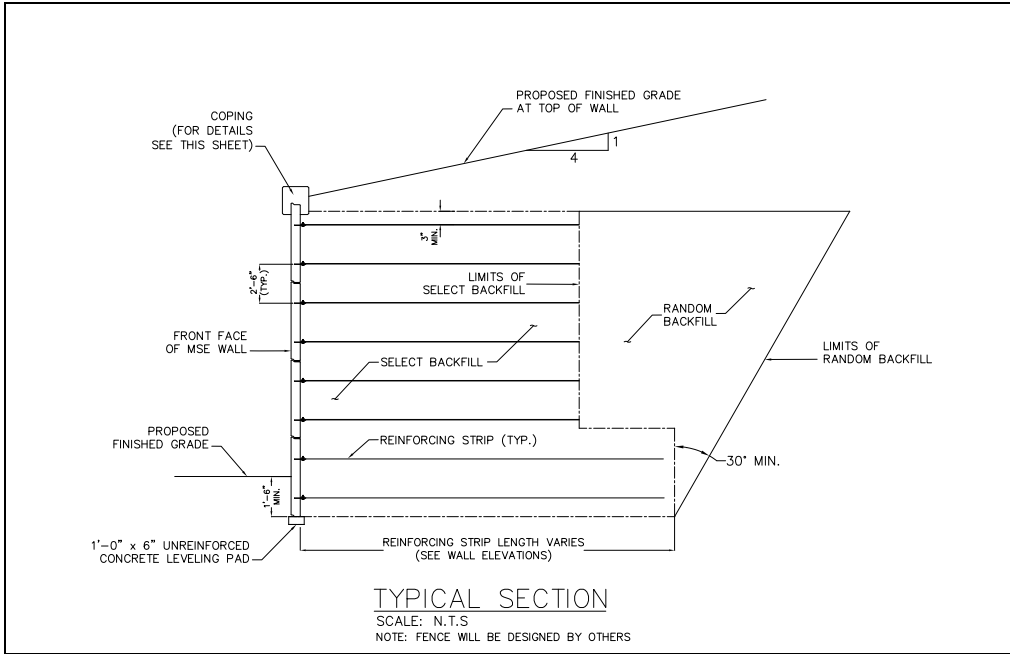
- Engineers recognize that MSE walls are cost effective in fills. This project demonstrates that MSE walls are often a cost effective option in cut applications as well.
- GeoStructures innovative design coupled with its ability to deliver the structure on a turn-key basis proved critical to scheduling and budget.

Client: Rapahannock Regional Jail Authority

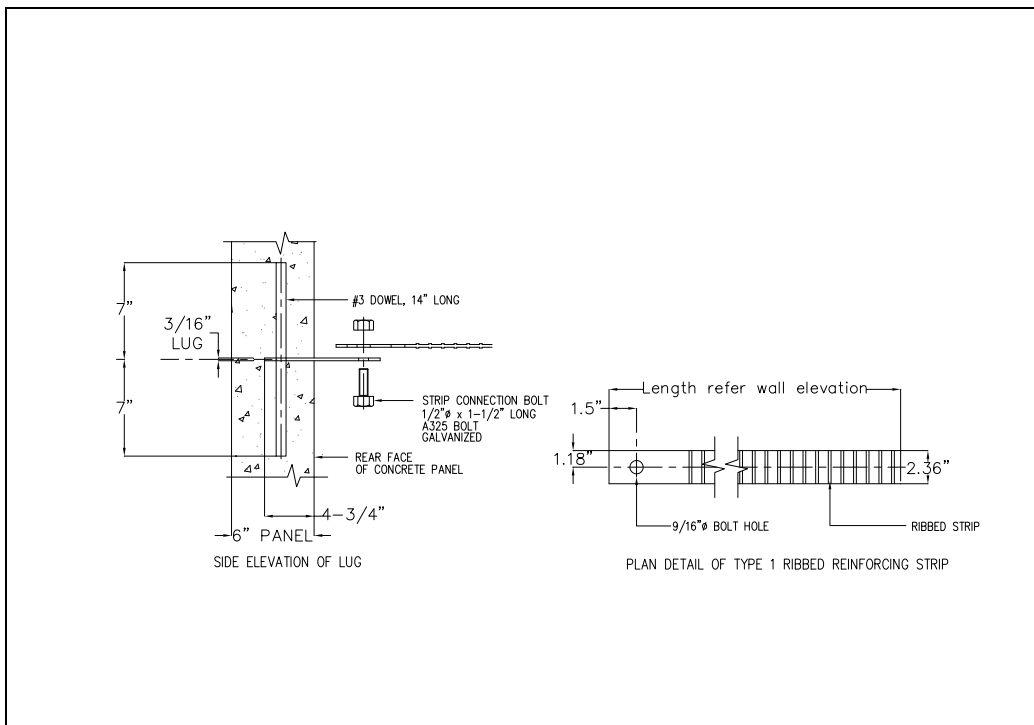
Project Manager: Downey & Scott, LLC

Engineer: Dewberry Davis

MSE Supplier: EarthTec, Inc.



L - SHAPED CROSS SECTION



STRIP AND PANEL CONNECTION DETAILS

Structures, Inc.

Engineered Earth Structures & Foundations

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