Vertical Geosynthetic-Reinforced MSE Solution for Electric Rail

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INTRODUCTION

Project Summary

An electric light rail expansion project in the Pacific Northwest U.S. involving elevated structures and a parking garage, also included the need for MSE walls and gabion veneers with specific finished aesthetics and interesting challenges for the MSE backfill zone.

Unique Challenges

The owner's requirements posed some unique design parameters for the MSE wall. Bidding requirements included a vertical batter, 100-year design life, non-galvanized wire facing with exposed aggregate, and electrical interconnections due to stray current concerns. Non-galvanized wire for a 100-year design life isn't typically a problem, but combined with connecting a wire facing to soil reinforcements while also avoiding stray current and associated potential for corrosion required a unique project-specific design.

MSE SOLUTION

To achieve the desired aesthetics, and also meet the design criteria for this wall, a pre-fabricated gabion basket facing system was supplied along with geogrid soil reinforcements. Geogrid was chosen due to the aforementioned concern with stray currents. The gabions were specially manufactured with open-bottoms and prongs that were vertically interconnected at the face. The back sides of the gabions were left unattached so that during installation the geogrid could be wrapped up through the basket and then 4' back into the backfill zone. The spiral binders used to permanently attach the back side of the gabions also connected the geogrid wrap to the gabion facing. The geogrid soil reinforcements were horizontally spaced in 3' lifts. See Figure 1 on the following page showing a sequential cross-section of the geosynthetic-reinforced gabion wall, and Figure 2 on the following page showing a photo of the finished wall.

CONCLUSION

The pre-manufactured components aided in the contractor's successful installation of over 10,000 SF of gabion-faced MSE wall for this application. The owner is pleased with the finished wall appearance, and the contractor was able to meet all the design and installation requirements. The 3' spaced geogrid lifts have proven to be adequate for the wall design as well as the actual field performance.

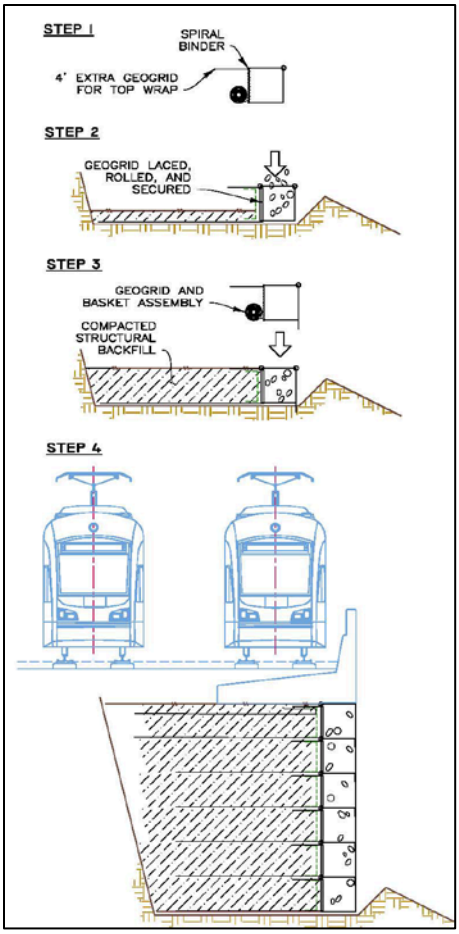

Figure 1. MSE Cross-Section

Figure 2. Finished Wall Photo