**Research Project Descriptions**

| **UTC Project Information** | |
|---|---|
| Project Title | **Degradation of Mechanically Stabilized Earth Reinforcements Exposed to Different Environmental Conditions** |
| University | University of Texas at El Paso |
| Principal Investigator | PI: Arturo Bronson, University of Texas at El Paso (UTEP) |
| PI Contact Information | abronson@utep.edu; 915-747-6931 |
| Funding Source(s) and Amounts Provided (by each agency or organization) | SPTC: $45,000<br>Texas Department of Transportation: $45,000 |
| Total Project Cost | $90,000 |
| Agency ID or Contract Number | DTRT13-G-UTC36<br>SPTC 15.1-46 |
| Start and End Dates | 11/1/16 - 10/31/17 |
| Brief Description of Research Project | **PROBLEM**: The service life of mechanically stabilized earth (MSE) walls depends on the rate of corrosion of the metallic reinforcements composed primarily of galvanized steel are embedded in soils varying in corrosion susceptibility depending on the concentration of chloride and sulfate ions which appear to segregate toward fines rather than coarse soils. Assessment of corrosion potential requires the accurate evaluation of pH, resistivity, and ionic concentrations of aqueous solutions in contact with the surrounding aggregate. The fines absorb more moisture than coarse soils and as a consequence, the chloride ion content in fines usually increases more than in coarse soils during water drainage. Given the vast environmental conditions of the South West, it is judicious to investigate the impact of the available moisture and the fine and coarse aggregate contents on the estimation of the corrosion rate of MSE reinforcements.<br>**PROPOSED SOLUTION**: This study examines the effect of moisture in the fines in which chlorides tend to segregate and corrode the mechanically stabilized earth (MSE) reinforcements composed of galvanized steel and the methodology of monitoring their degradation. The fines also tend to collect near the MSE wall as a result of construction and migration during water drainage. The study focuses on determining the impact of weather extremes, monitoring of damage resulting from icing and the best construction to resist extreme temperatures. In addition, the dissolved oxygen content within the backfill near and away from MSE wall may develop into oxygen concentration gradients causing corroding |

| | |
|---|---|
| | macrocells. This study responds to the foregoing needs in ensuring and improving the health of the transportation infrastructure. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | |
| Impacts/Benefits of Implementation (actual, not anticipated) | |
| Web Links<br>• Reports<br>• Project website | |