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| **UTC Project Information** | |
| Project Title | MPC-596 – Measurement of Turbulent Flow Characteristics and Bed Shear Stress in Laboratory Soil Erosion Tests |
| University | South Dakota State University |
| Principal Investigator | Francis Ting, Ph.D., P.E. |
| PI Contact Information | Professor  Department of Civil and Environmental Engineering  South Dakota State University  Phone: (605) 688-5997  Email: francis.ting@sdstate.edu  ORCID: 0000-0001-8524-7691 |
| Funding Source(s) and Amounts Provided (by each agency or organization) | USDOT, Research and Innovative Technology Administration  $74,007  South Dakota State University  $77,887 |
| Total Project Cost | $151,894 |
| Agency ID or Contract Number | 69A3551747108 |
| Start and End Dates | April 11, 2019 to July 31, 2023 |
| Brief Description of Research Project | The objective of this research project is to measure the characteristics of turbulent flow over an eroding soil sample in an erosion function apparatus (EFA) type facility. A gravel bed will be installed in an open-channel flume to produce fully developed turbulent flow over a rough bed. The turbulent flow will pass over a prepared soil sample housed in a floor recess. The velocity profile over the gravel bed and the soil sample will be measured using a Particle Image Velocimetry (PIV) system. PIV measurements will also be conducted with the soil sample replaced by a smooth bed to provide a baseline for comparison purpose. The measured data will be used to quantify the effects of surface roughness and depth of the soil erosion on the induced bed shear stress and soil erosion rates. The outcome of this experimental investigation will be an improved laboratory setup for measuring soil erodibility. A future extension of this project would use the improved EFA facility to develop a soil erodibility chart for South Dakota soils. This information should be useful for assessing the susceptibility of soil erosion and scour in highway projects. |
| Describe Implementation of Research Outcomes (or why not implemented)  Place Any Photos Here |  |
| Impacts/Benefits of Implementation  (actual, not anticipated) |  |
| Web Links   * Reports * Project Website |  |