

## IMPLEMENTATION PLAN

### FIELD INVESTIGATION OF GEOSYNTHETICS USED FOR SUBGRADE STABILIZATION

Montana Department of Transportation (MDT) has used both geotextiles and geogrids for subgrade stabilization and supported this research project because currently there is a lack of: 1) a universally accepted standard design technique that incorporates non-proprietary material properties of geosynthetics when used as subgrade stabilization, and 2) agreement as to which geosynthetic properties are most relevant in these cases for purposes of specification development. Therefore, this research was initiated to help provide an understanding of which properties are most relevant as MDT seeks to update its specifications to more broadly encompass materials with which it has had good experience, as well as open up the application to other suitable materials. This is particularly important since new geosynthetics and manufacturing processes are regularly introduced into the market. To accomplish these goals, test sections were uniformly constructed, trafficked, and monitored at a transportation research facility to compare the relative performance of 12 test sections, ten with geosynthetics and two control sections without geosynthetics.

The results of the study are summarized in the report Field Investigation of Geosynthetics Used For Subgrade Stabilization. The results for this specific project showed that the welded geogrids, woven geogrids and the stronger integrally-formed geogrid product seemed to provide the best overall performance, while the two geotextile products and the weaker integrally-formed geogrid provided less stabilization benefit based on the normalized rutting performance at 50, 75 and 100 mm of longitudinal rut data. The research also provided an assessment of two design methodologies' ability to predict rutting performance using the test section parameters as design inputs. It is clear from the results of these test sections that both of the design methodologies were unable to predict rutting performance of the constructed test sections. Additional work is needed to more fully understand which geosynthetic material parameters are most relevant in these situations as well as the inability of the design methods to predict rutting performance.

The results of the research have been used in conjunction with recent guidance and publications from FHWA, research into other state specifications, and other geogrid performance research to revise the MDT geogrid subgrade stabilization material specifications. The revised specifications for geogrid will enable more manufacturers to provide their products on MDT projects and thus increase competition and potentially decrease costs for these products without jeopardizing quality. The research results have provided some insight into what geogrid properties appear to be the most relevant for subgrade stabilization applications, however additional research is required to definitively determine which geosynthetic material properties most directly relate to stabilization of weak subgrade soils. Thus, MDT geogrid specifications will be continually evaluated as additional research and published information becomes available.