



GeoTesting
EXPRESS

Full-Scale Geosynthetic-Reinforced Pavement Testing

Project Description
Geosynthetic reinforced pavement has become more popular over the last decade for improved pavement support. As a part of the study to develop mechanistic-empirical design methods for geosynthetic reinforced flexible pavements, a laboratory-based, full-scale pavement test box in which pavement layers were placed and loaded according to field conditions was constructed. In this study, eleven pavement sections were constructed using a CH clay as subgrade. Seven of these sections were reinforced with different styles of geosynthetics. The pavement sections were fully instrumented with strain gages on the geosynthetics and with LVDTs, stress cells, and strain gages in different layers of the pavement. In addition to these instruments, pore pressure transducers were installed in most of the pavement sections.

GeoTesting's Role
Based on the protocol provided by Montana State University, GTX constructed a full-scale (6 ft. x 6 ft. x 5 ft.) pavement test box and installed,

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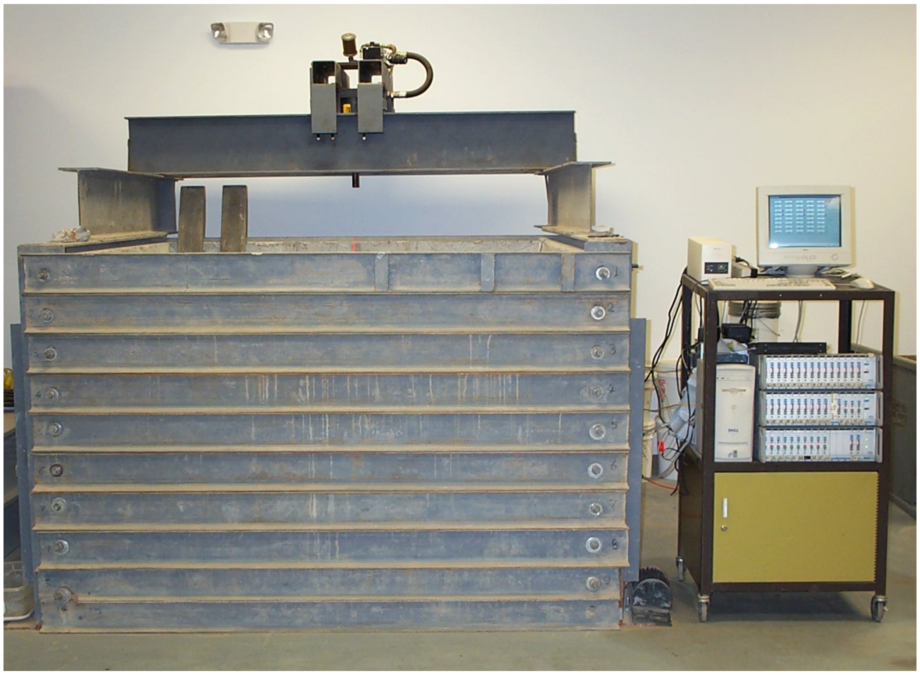

Full-scale pavement test box

Projects

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- WATER AND WASTEWATER FACILITIES

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monitored, and evaluated the performance of geosynthetic reinforced pavement sections under simulated traffic loads through a series of LVDTs, load cells, pore pressure transducers, and strain gages.

Benefits to Client

Test results from this project provided insight to the performance of geosynthetic reinforced pavement sections and parameters necessary for the mechanistic-empirical pavement design method. The results were used in a recently completed project for the Federal Highway Administration by Montana State University: a mechanistic-empirical design method for geosynthetic reinforced pavements was developed and uses the NCHRP 1-37A Project design guideline as its basis (Perkins et al., 2004). This design method incorporates what will eventually become state-of-the-practice mechanistic-empirical pavement design principles and novel techniques for accounting for the effects of reinforcement on the confinement of unbound aggregate materials.

A major finding in the GTX tests was the influence of pore water pressure developed in the subgrade during construction and subsequent loading on pavement performance. More recent tests by GTX in the pavement test box have been focused on the evaluation of geosynthetics in subgrade stabilization of wet silt type soils and the development of mechanistic-empirical design input parameters for unpaved roads.

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