

Test Materials:

Presto Geosystems GeoTerra® & GeoTerra® GTO Construction Mats

The Research Facility:

Department of Civil, Environmental & Architectural Engineering, University of Kansas, Lawrence, Kansas.

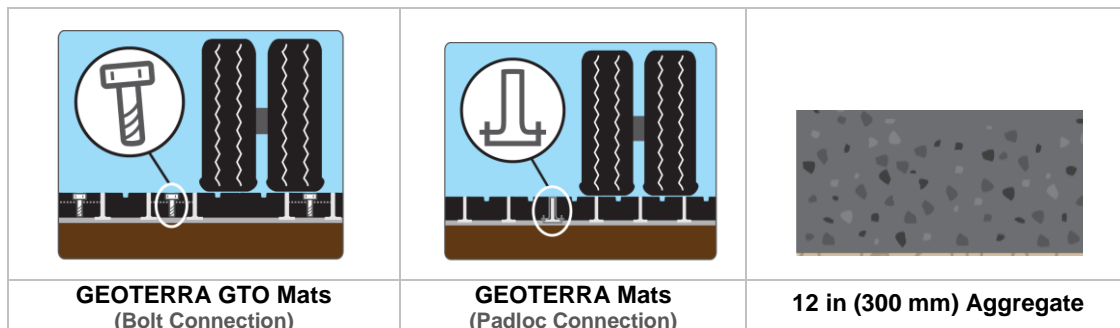
Product Background:

GeoTerra® and GeoTerra® GTO Structural Mats are used to provide a ground-surface reinforcement layer to support heavy loads over soft subgrades or for creating reinforced pavements in less-than-ideal environments. More cost-effective than other reinforcement mat systems, the GeoTerra® Mat Systems can be utilized for either temporary or permanent applications and are reusable. With high crush and flexural strength, the GeoTerra® Mat Systems have demonstrated the ability to handle the forces from some of the heaviest wheeled and tracked vehicles under severe conditions.



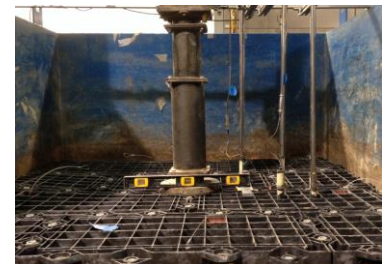
Scope of Test:

Performance testing of the GeoTerra® and GeoTerra® GTO Mat Systems was conducted at the University of Kansas Geotechnical Laboratory over **weak to intermediate subgrades with CBR values ranging from 1% to 4%**. A total of twelve tests were conducted to identify threshold and limit conditions, to create a dataset for modeling, and to determine the equivalent crushed aggregate base. Materials tested are shown below.



Testing Procedure:

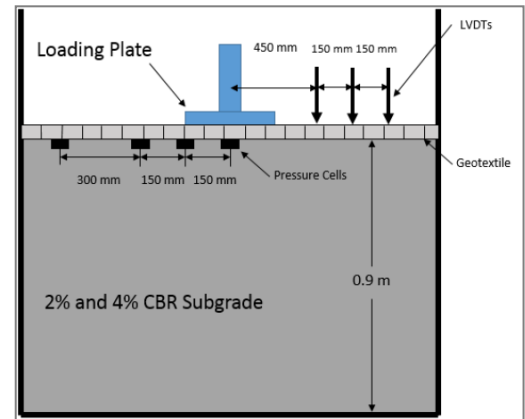
All of the test sections were subjected to **40 kN (9 kip) cyclic loading** on a 300 mm (12 in) diameter plate. Earth pressure cells were placed over of the subgrade to measure vertical interface stress distribution. Loading plate displacements were measured by the displacement transducer inside the actuator.



Test Observations:

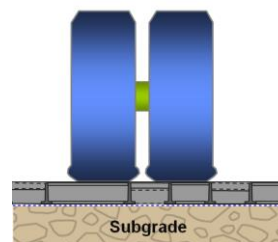
The following conclusions were determined for the GeoTerra® and GeoTerra® GTO Structural Mat Systems:

1. The GeoTerra Mat Systems provide additional support for weak to intermediate subgrade subjected to cyclic loadings by reducing permanent deformations and rate of increase in the permanent deformation of the subgrade.
2. The GeoTerra GTO Mat System was most effective in cases of larger permanent displacement.
3. The vertical interface stresses between the mat and the subgrade close to the center of the loading plate decreased with an increase of loading cycles. This result is different from that for the aggregate base over the subgrade, in which the vertical interface stresses close to the center increased with the number of loading cycles.
4. Both GeoTerra Mat Systems performed similarly to the 12-inch (300 mm) crushed aggregate base over 2% and 4% CBR subgrades.

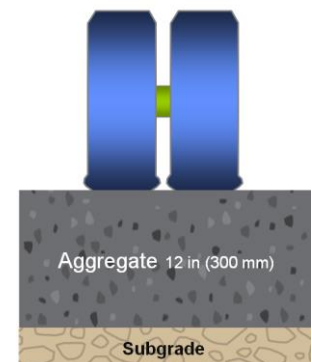


Test Conclusions:

- 1) Both GeoTerra and GeoTerra GTO mat systems decreased interface stresses at the load point, which reduces soil movement and ultimately leads to a significant reduction in rutting.
- 2) Although subjected to rigorous point load testing, the GeoTerra Mat systems received no significant damage.
- 3) The testing data proved that the GeoTerra mat system performed similarly to 12 inches (300 mm) of crushed aggregate base in controlling permanent deformations over 2% and 4% CBR subgrades, with the GeoTerra GTO mat system performing similarly, but slightly better.



GeoTerra Mats with geotextile separation layer over subgrade.



12 inch (300 mm) Aggregate over subgrade.