

ABSTRACT

Geotextile made of coir are ideally suited for low cost applications because coir is available in our country in abundance at very low price compared to other synthetic geotextiles. These geotextile can be applied in the construction of unpaved roads where they can be effectively serving the purposes of reinforcement, separation, filtration and drainage.

This study examines the improvement in the performance of unpaved roads constructed on silty soils using coir geotextile reinforcement through a number of model tests. The strength aspects of non woven and woven coir geotextile have been studied by performing CBR tests and Plate Load Tests.

The reinforcement aspects of coir geotextile were studied through CBR tests on four different types of soil. The position of reinforcement is varied in the test. A number of CBR tests were performed to understand the influence of the coir geotextile on the soil subgrade.

The separator aspects of coir geotextile have been studied by performing plate load model tests within a test tank. The tests were conducted by applying static loads on base course through a plate of 200mm diameter. The test was repeated by placing geotextile at the interface between soil and base course. The test was conducted with woven and nonwoven coir geotextile.

The result of the study indicates that the CBR value of the soil reinforced with coir has improved and also non woven coir showing better result than woven coir geotextile. From the plate load test also it is found that the settlement can be reduced with non woven coir geotextile and woven coir geotextile and the better performance is with nonwoven coir.

Chapter 10

SUMMARY

The following points in connection with use of coir geotextile to aid in support of traffic loads is established.

- *Base (or Subbase) Reinforcement* - the use of a coir geotextile as a tensile element at the bottom of a base (or subbase) or within a base course to:
 - 1) improve the service life, and/or
 - 2) obtain equivalent performance with a reduced structural section.

Base reinforcement is applicable for the support of vehicular traffic over the life of the pavement and is designed to address the pavement distress mode of permanent surface deformation or rutting

- *Subgrade Restraint* - the use of a geosynthetic at the subgrade/subbase or subgrade/base interface to increase the support of construction equipment over a weak or low strength subgrade.

The primary result of this application is increased bearing capacity. Lateral restraint and/or tension membrane effects may also contribute to load-carrying capacity. Subgrade restraint is the reinforcing component of stabilization.

- The following benefits of using coir geotextile in unpaved roadways are identified:
 1. Reducing the intensity of stress on the subgrade (function: separation).
 2. Preventing subgrade fines from pumping into the base (function: filtration).
 3. Preventing contamination of the base materials allowing more open-graded, free-draining aggregates to be considered in the design (function: filtration).
 4. Reducing the depth of excavation required for the removal of unsuitable subgrade materials (function: separation and reinforcement).

5. Reducing the thickness of aggregate required to stabilize the subgrade (function: separation and reinforcement).
6. Minimizing disturbance of the subgrade during construction (function: separation and reinforcement).
7. Assisting the increase in subgrade strength over time (function: filtration).
8. Minimizing the differential settlement of the roadway, which helps maintain pavement integrity and uniformity (function: reinforcement).
9. Minimizing maintenance and extending the life of the pavement (functions: all).

FURTHER STUDIES

In continuation of above work, studies are going on to analyse the unpaved road behaviour under moving traffic loads as a second phase.