

Use of Geosynthetics as Reinforcement Elements in Unpaved Tertiary Roads

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Abstract : In Colombia, most of the roads of the national tertiary road network are unpaved roads with granular rolling surface. These are very important ways of guaranteeing the mobility of people, products, and inputs from the agricultural sector from the most remote areas to urban centers; however, it has not paid much attention to the search for alternatives to avoid the occurrence of deteriorations that occur shortly after its commissioning. In recent years, geosynthetics have been used satisfactorily to reinforce unpaved roads on soft soils, with geotextiles and geogrids being the most widely used. The interaction of the geogrid and the aggregate minimizes the lateral movement of the aggregate particles and increases the load capacity of the material, which leads to a better distribution of the vertical stresses, consequently reducing the vertical deformations in the subgrade. Taking into account the above, the research aimed at the mechanical behavior of the granular material, used in unpaved roads with and without the presence of geogrids, from the development of laboratory tests through the loaded wheel tester (LWT). For comparison purposes, the reinforced conditions and traffic conditions to which this type of material can be accessed in practice were simulated. In total four types of geogrids, were tested with granular material; this means that five test sets, the reinforced material and the non-reinforced control sample were evaluated. The results of the numbers of load cycles and depth rutting supported by each test body showed the influence of the properties of the reinforcement on the mechanical behavior of the assembly and the significant increases in the number of load cycles of the reinforced specimens in relation to those without reinforcement.

Keywords : geosynthetics, load wheel tester LWT, tertiary roads, unpaved road, vertical deformation

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