

Application of Geosynthetics for the Recovery of Located Road on Geological Failure

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Abstract : The present work deals with the use of drainage geo-composite as a deep drainage and geogrid element to reinforce the base of the body of the landfill destined to the road pavement on geological faults in the stretch of the TO-342 Highway, between the cities of Miracema and Miranorte, in the State of Tocantins / TO, Brazil, which for many years was the main link between TO-010 and BR-153, after the city of Palmas, also in the state of Tocantins / TO, Brazil. For this application, geotechnical and geological studies were carried out by means of SPT percussion drilling, drilling and rotary drilling, to understand the problem, identifying the type of faults, filling material and the definition of the water table. According to the geological and geotechnical studies carried out, the area where the route was defined, passes through a zone of longitudinal fault to the runway, with strong breaking / fracturing, with presence of voids, intense alteration and with advanced argilization of the rock and with the filling up parts of the faults by organic and compressible soils leachate from other horizons. This geology presents as a geotechnical aggravating agent a medium of high hydraulic load and very low resistance to penetration. For more than 20 years, the region presented constant excessive deformations in the upper layers of the pavement, which after routine services of regularization, reconfiguration, re-compaction of the layers and application of the asphalt coating. The faults were quickly propagated to the surface of the asphalt pavement, generating a longitudinal shear, forming steps (unevenness), close to 40 cm, causing numerous accidents and discomfort to the drivers, since the geometric positioning was in a horizontal curve. Several projects were presented to the region's highway department to solve the problem. Due to the need for partial closure of the runway, the short time for execution, the use of geosynthetics was proposed and the most adequate solution for the problem was taken into account the movement of existing geological faults and the position of the water level in relation to several Layers of pavement and failure. In order to avoid any flow of water in the body of the landfill and in the filling material of the faults, a drainage curtain solution was used, carried out at 4.0 meters depth, with drainage geo-composite and as reinforcement element and inhibitor of the possible A geogrid of 200 kN / m of resistance was inserted at the base of the reconstituted landfill. Recent evaluations, after 13 years of application of the solution, show the efficiency of the technique used, supported by the geotechnical studies carried out in the area.

Keywords : geosynthetics, geocomposite, geogrid, road, recovery, geological failure

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