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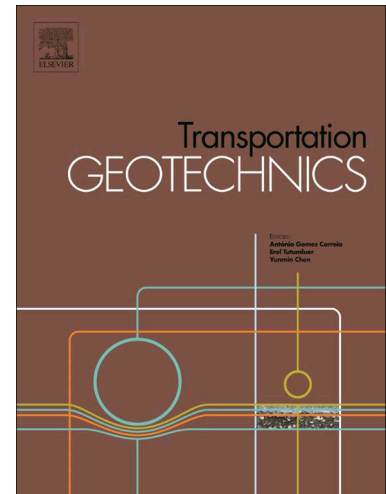
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EFFECT OF GROUNDWATER TABLE RISING ON THE PERFORMANCE OF A SWEDISH-DESIGNED GRAVEL ROAD

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Abstract

Sweden has a wide network of gravel roads. When the water table levels rise during the freeze-thaw and wet seasons, the bearing capacity of the roads will decrease and rut depths increase. The road will suffer a small deterioration every time a vehicle travel over it. Therefore, it has been decided to investigate the long-term performance of a Swedish designed gravel road using an accelerated pavement testing facility.

A trial gravel road was constructed and exposed to various levels of ground water table which simulate the weather changes in Sweden. The structure of the trial gravel road consisted of 15 cm (base and surface layer), 20 cm sub-base layer and 260 cm subgrade soil. The trial road was tested using the Heavy Vehicle Simulator (HVS) and the vertical surface deformations and the vertical dynamic deformations were measured by means of laser profile measurement and ϵ MU coils respectively. At the end of 85000 HVS passes, the tested road suffered from serious deformations as discussed in details in this paper. Furthermore, a transverse trench section was excavated at the end of HVS trafficking in order to investigate the possible mechanism contributing to the tested road failure.

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Keywords: Accelerating loading testing, rut depth, Swedish-designed gravel road, vertical dynamic strains, vertical surface deformations.

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