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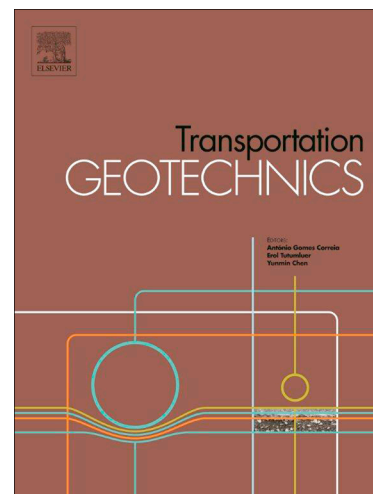
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Strengthening of the railway ballast section shoulder with two-component polymeric binders

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Abstract

The paper reports on the study of variation of horizontal stability of the sleeper base of a ballast section depending on the degree of ballast strengthening with a polyurethane-based two-component RT-CS-001 binder. The studies are performed on an acting section of the railroad. The thickness of the strengthened ballast is determined as a function of the binder flow rate. After GeoComposite thus formed gained full strength, modulus of elasticity of the structure is measured. It is shown that the strengthening of ballast with the binder increases Young's modulus by a factor of four, allowing creating the track sections of varied rigidity both in the construction process and during the current maintenance of railways. Measurements of the lateral resistance of unloaded sleepers in the static mode against the flow rate of the binder fixing the shoulder of the ballast prism are performed. Strengthening of the ballast prism shoulder increases 2.7 times the static lateral resistance to the shift of the sleeper upon application of lateral load without application of vertical load; it does not prevent the use of the machines for deep cleaning of the ballast material during repair and modernization of railway tracks. It is shown that on long railways sections, the flow rate of binder material and the thickness of the resulting GeoComposite can be monitored by the ground penetrating radar (GPR).

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