

# Determination of the elastic modulus of fly ash-based stabilizer applied in the trackbed

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**Abstract.** This paper describes a unique application of a fly ash-based stabilizer in the trackbed of a railway main line. The key goals of the stabilizer application are to protect the subgrade against the ingress of rain water, to increase the frost resistance and to remediate the natural ground constituted of weathered rock. The stabilizer was designed as a mixture of fly ash, generated as a waste material from coal plants, gypsum, calcium oxide and water. The mixture recipe was developed in a laboratory over several years. In 2005, a trial section of a railway line with subgrade consisting of clay limestone (weathered marlite) was built in the municipality of Smiřice. Since then, periodical measurements including collection of samples for laboratory evaluation of the fly ash-based stabilizer have taken place. Over the time span of the measurements, changes in mineral composition and development of fly ash transforming structures leading to the formation of C-A-S-H gel were detected. This paper describes the experimental laboratory investigation of the influence of dynamic loading on the elastic modulus of fly ash stabilizer samples and the development of permanent deformation of the samples with increasing number of loading cycles.