

Investigation of the Cyclic Response of Mudrock

Authors : Shaymaa Kennedy, Sam Clark, Paul Shaply

Abstract : With the upcoming construction of high-speed rail HS2 in the UK, a number of issues surrounding the construction technology and track design need to be answered. In this paper performance of subsoil subjected to dynamic loads were studied. The material of study is Mudrock backfill, a weak prevalent rock which response under indicative loading of high-speed rail line is unknown. This paper aims to investigate the use of different track types and the influence they will have on the underlying soil, in order to evaluate the behaviour of it. Ballstless track is a well-established concept in Europe, and the investigation the benefit of the form of construction due to its known savings in maintenance costs. Physical test using a triaxial cyclic loading machine was conducted to assess the expected mechanical behaviour of mudrock under a range of dynamic loads which could be generated beneath different track constructions. Some further parameters are required to frame the problem including determining the stress change with depth and cyclic response are vital to determine the residual plastic strain which is a major concern. In addition, Stress level is discussed in this paper, which are applied to recreate conditions of soil in the laboratory. Results indicate that stress levels are highly influential on the performance of soil at shallower depth and become insignificant with increasing depth.

Keywords : stress level, dynamic load, residual plastic strain, high speed railway

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