Evaluation of Effects of Roadbed Stiffness on Deformation Properties of Ballasted Track with DDA

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This paper proposes a new analytical procedure applying discontinuous analysis to estimate the deformation properties of railroad ballast. To examine the applicability of the procedure, a series of numerical simulations of static loading tests for 1/5 scale model of real ballasted track were performed with DDA that regards a particle of crushed stone as an irregular polygon. Based on the comparison of analytical results with experimental results, the effect of roadbed stiffness on the deformation properties of railroad ballast was examined. As the result, it has been revealed that the roadbed stiffness has a great influence on the deformation properties of railroad ballast, and that discontinuous analysis is an effective method to simulate the mechanical behavior of railroad ballast if the roadbed which behaves as a continuum can be modelled as a discontinuous body.