

Investigations on ballastless tracks in tunnel without reinforcement

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ABSTRACT: Ballastless track systems have delivered an optimal performance in the past decades. This ideal comes from the Continuously Reinforced Concrete Pavement or the Jointed Plain Concrete Pavement in road design. It can be deduced that a well-proved system for road pavement is applicable to ballastless track design after certain modifications, which could save materials and simplify the construction work as well. In this paper, a feasibility study of ballastless track forms, in which neither reinforcement nor dowel bars shall be applied have been investigated using Finite Element Analysis. The results show that this idea is feasible in long tunnel with hard and stabile substructure, if a joint spacing less than 4 m can be realized. Meanwhile, these kinds of systems cannot be applied for track with soft substructures such as mass-spring-systems, in which continuous double-layer-reinforcement and sufficient thickness of the track concrete layer are required.

Keywords: Ballastless Track, Reinforcement, Finite Element Analysis