

Behavior of Rail Ballast Layer Using Mortar Foam with LISA-FEA

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ABSTRACT

In the development of railroads, geosynthetics can be introduced in or under the stabilizer layer or sub ballast, foam mortar has become one of the trends in the construction sector in replacing the foundation layer as an excellent alternative. Researchers conducted a comparative analysis on railroad ballasts using a substitute for conventional railroad ballast, namely granular material and replaced with mortar foam, each material was modeled based on a typical standard rail track geometry using the same size and thickness, analyzed using software. The finite element method is LISA FEA V.8 to get the values of the stresses that occur and the value of the decrease that occurs in the ballast with the two materials. From the results of the analysis of this study, it was found that there was an increase in the ability of ballast with mortar foam material compared to granular material, the decrease in stress that occurred and deformation in the deformation value in railroad construction gave an option to use conventional ballast substitutes. It can be seen that the decrease in ballast with granular material is 86.1 mm, while the foam mortar with 2000 kPa q_u is 0.022 mm. While the stresses that occur in the two ballast layers are explained as follows, in the ballast layer there is a stress of 38.09 N/mm² which is smaller than the result of the ballast layer with granular material, which is 104.73 N/mm².

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1. INTRODUCTION

It has been expressed that geosynthetics can give significant choices to further develop track support adjustment what's more, in this way lessen track support costs and working expenses. In railroad development, geosynthetics can be introduced inside or under a layer of stabilizer or subballast [1]. Ballast degradation and the resulting deterioration of the track geometry [2].

The use of mortar foam has become one of the trends in the construction sector in replacing the top layer of foundation as an excellent alternative. Mortar foam has a low thickness and great usefulness, which has been generally utilized in development applications [3].

Lisa Fea Manual

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The Nation, 1924

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