Experimental Behavior of Model Rigid Pavements Supported on Typical Representative Sub grades of Oman

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Abstract

The main objective of this work is to study experimentally the behavior of rigid pavements under different loading conditions using different types of soils representing the local conditions in the Sultanate of Oman. The investigation included the study of the deflection load transfer efficiency for different types of joints. The methodology and scope of work of this project included the study of the properties of fine sand and coarse aggregate used in the sub grade material and the properties of the concrete materials used in manufacturing the proposed slabs. The experimental program of this work includes manufacturing and testing of six rigid slab samples of size 900 x 1760 x 100 mm. Three types of joints were tested including continuous (no joint), contraction joints, and contraction joints with dowels. First, each sample was tested within the uncracked elastic stage using different loading positions. After that, the sample was tested incrementally until failure for the critical load position. The results of this study indicate that the use of the joints in rigid slabs allows transferring apart of the applied load to unloaded slab. In general, the joints used have a significant reduction in deflection and strains. The performance of the contraction joints with dowels was found better than the contraction joint in transferring the load and reducing the deflections. The use of a fine sand subgrade was found better in reducing the deflection of the rigid slabs at the time of loading.