

An Empirical Relationship Between Asphalt and Water Absorption of Coarse Aggregates in HMA

Dr. Talal Hussien Fadhil, Hameed Aswad Mohammed, and Thamier Yousief Ahmed

Abstract

Asphalt absorbed by aggregates; can be determined either using effective specific gravity or using Bulk Impregnated Specific Gravity (BISG), the later has been used in this research. Four types of coarse aggregates, taken from four different quarries in Iraq, have been used. The aggregate types classified into crushed and uncrushed and sub classification according to the aggregate sizes had been done. The aim of this research is to find an empirical relationship between asphalt and water absorption by coarse aggregates brought from different source. To achieve this aim, sixty-two coarse aggregate samples were prepared and tested. In this research, three models were developed to predict asphalt absorption depending on water absorption values. Furthermore, High statistical correlation can be expected due to high acceptable estimated values of the coefficients of determination (R^2) such as the values of (R^2) s are 0.89, 0.87, and 0.76 to predict the amount of asphalt absorption by knowing its water absorption for general, crushed, and natural aggregates respectively. Finally, additional two models were developed to predict bulk impregnated specific gravity depending on the aggregate apparent and bulk specific gravities.