

Experimental Investigation of the Effect of Glass Granulated Blast Furnace Slag on Pavement Quality Concrete Pavement Made of Recycled Asphalt Pavement Material

Authors : Imran Altaf Wasil, Dinesh Ganvir

Abstract : Due to a scarcity of virgin aggregates, the use of reclaimed asphalt pavement (RAP) as a substitute for natural aggregates has gained popularity. Despite the fact that RAP is recycled in asphalt pavement, there is still excess RAP, and its use in concrete pavements has expanded in recent years. According to a survey, 98 percent of India's pavements are flexible. As a result, the maintenance and reconstruction of such pavements generate RAP, which can be reused in concrete pavements as well as surface course, base course, and sub-base of flexible pavements. Various studies on the properties of reclaimed asphalt pavement and its optimal requirements for usage in concrete has been conducted throughout the years. In this study a total of four different mixes were prepared by partially replacing natural aggregates by RAP in different proportions. It was found that with the increase in the replacement level of Natural aggregates by RAP the mechanical and durability properties got reduced. In order to increase the mechanical strength of mixes 40% Glass Granulated Blast Furnace Slag (GGBS) was used and it was found that with replacement of cement by 40% of GGBS, there was an enhancement in the mechanical and durability properties of RAP inclusive PQC mixes. The reason behind the improvement in the properties is due to the processing technique used in order to remove the contaminant layers present in the coarse RAP aggregates. The replacement level of Natural aggregate with RAP was done in proportions of 20%, 40% and 60% along with the partial replacement of cement by 40% GGBS. It was found that all the mixes surpassed the design target value of 40 MPa in compression and 4.5 MPa in flexure making it much more economical and feasible.

Keywords : reclaimed asphalt pavement, pavement quality concrete, glass granulated blast furnace slag, mechanical and durability properties

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