

Effect of Blast Furnace Iron Slag on the Mechanical Performance of Hot Mix Asphalt (HMA)

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Abstract : This paper discusses the effect of using blast furnace iron slag as a part of fine aggregate on the mechanical performance of hot mix asphalt (HMA). The mechanical performance was evaluated based on various mechanical properties that include; Marshall/stiffness, indirect tensile strength and unconfined compressive strength. The effect of iron slag content on the mechanical properties of the mixtures was also investigated. Four HMA with various iron slag contents, namely; 0%, 5%, 10% and 15% by weight of total mixture were studied. Laboratory testing has revealed an enhancement in the compressive strength of HMA when iron slag was used. Within the tested range of iron slag content, a considerable increase in the compressive strength of the mixtures was observed with the increase of slag content. No significant improvement on Marshall/stiffness and indirect tensile strength of the mixtures was observed when slag was used. Even so, blast furnace iron slag can still be used in asphalt paving for environmental advantages.

Keywords : blast furnace iron slag, compressive strength, HMA, indirect tensile strength, marshall/stiffness, mechanical performance, mechanical properties

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