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ABSTRACT

Performance of Hot Mix Asphalt Concrete Produced with Waste Glass Powder Filler

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Previous studies have revealed the beneficial effects of adding Waste Glass Powder Filler (WGPF) to Bitumen Emulsion Mixtures (BEMs). These effects were confirmed for some dense graded mixtures based on recipes currently used for hot asphalt concrete mix and being considered for usage in BEMs. On the other hand, Hot Rolled Asphalt (HRA) which is a gap graded mixture is extensively used for surfacing major roads because it provides a dense, impervious layer, resulting in a weather resistance durable surface able to endure the demands of modern traffic loads and providing good resistance to fatigue cracking. This laboratory study attends to study the performance of asphalt concrete mix, where some of fractional conventional mineral filler is substituted with different percentages of crashed glass materials of 25%, 50%, 75% and 100 %. The specimens were compacted by 75 blows on each side and left to cool at room temperature for 24 hours. Marshall stability and flow tests were performed on each specimen, where the cylindrical specimens were placed in water path at 60 °C for 30 to 40 minutes then compressed on the lateral surface at constant rate of 2 inch/min. (50.8mm/min.) until the maximum load (failure) is reached. The study concluded that satisfactory performance of upper asphalt pavement layers can be achieved by adding waste glass powder with 50% of the conventional mineral filler.