

**PARTIAL SUBSTITUTION OF ASPHALT BINDER WITH REPROCESSED
POLYETHYLENE WATER SACHETS.**

BY

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ABSTRACT

An economic analysis of the partial replacement of optimum bitumen content (*OBC*) with re-processed polyethylene water sachets (*PWS*) in the production of asphalt mixes as a cost saving measure in road works as well as its application as a pollution control strategy in an environment invested with non-degradable waste materials is reported in this paper. The *OBC* was first determined according to Marshall method for a heavy traffic binder course. The *PWS* emulsion, (prepared from 1:3 parts, by weight, of reprocessed *PWS* and a solvent at a temperature of 120°C) was partially substituted for the optimum bitumen in the hot mix asphalt. The respective Marshall Stability for the unmodified and modified binder was 1400 kg and 1150 kg with corresponding flows of 2.6 mm and 3.2 mm. A 15% partial replacement of the *OBC*, that is; the proportion of the emulsion (percentage addition to optimum bitumen binder content) in the ratio of 1% reprocessed *PWS*: 5% of the bitumen had no adverse effect on the desired Marshall properties of the binder course for a heavy traffic; and indeed a financial saving as much as 3.75% in the cost of asphalt concrete mix is also possible. These values proved that bitumen can partially be replaced with a reprocessed pure water sachet for economic advantage of road works while at the same time can facilitate the liberation Of the environment of polyethylene wastes

Keywords: Solvent, Optimum binder content, Reprocessed pure water sachet, Marshall Stability, and Flow