



307/C

Applicability of use of fly ash in hot mix asphalt concrete

G H I Diyes, M N Tantirimudalige*, K M L A Udamulla

Department of Civil Engineering, The Open University of Sri Lanka, Nawala, Nugegoda

This paper presents the results of experiments on the utilization of fly ash as a replacement for the mineral filler in hot mix asphalt concrete paving mixes used in Sri Lanka. Generally, quarry dust is being used as the mineral filler in hot mixed asphalt concrete in Sri Lanka. Fly ash is found in the Norochcholai coal power plant in the Puttalam district as an industrial waste. This study aims at reducing usage of a depleting resource such as quarry dust and minimizing environmental degradation by making use of fly ash.

The physical properties of fly ash were studied and asphaltic concrete mixes containing 42 % of fly ash was prepared. Six percentages by weight of bitumen were employed for that percentage of fly ash in order to determine the optimum bitumen content suitable for the mix. The Marshall test method was used to evaluate the suitability of the fly ash as a filler in asphaltic concrete wearing courses. The parameters evaluated for conformity were the compacted mix density, the percentage of air voids in the mix, the percentage of voids in the mineral aggregates, the percentage of voids filled with bitumen, Marshall Stability and flow. Samples of varying bitumen contents were tested for stability and flow at 60 °C in order to assess the susceptibility of the mixes to higher temperatures. The results revealed that the required stability value range of the Sri Lankan standard specifications for construction and maintenance of roads and bridges given by the Institute for Construction Training and Development was satisfied by specimens containing 42 % fly ash.

It is expected that these results on the use of fly ash as a mineral filler in hot mix asphalt concrete may be of wide interest and help in partial replacement of quarry dust with fly ash.