

Design and Optimisation of Cold Asphalt Emulsion Mixtures

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Background

Road structures are important to the survival of any nation. As costs for the rehabilitation and maintenance of highways soar, civil engineers and administrators face the difficult task of meeting current resurfacing, restoration and rehabilitation needs. The deterioration of road structures under growing traffic weight and volume is occurring faster than agencies and administrators initially envisaged and the new materials required for rehabilitation and maintenance are increasingly scarce and expensive. It is now apparent that for planning, design and construction of road structures, the most efficient and cost effective process, materials and practices available must be appropriately considered. This project focuses on the design and optimisation of Cold Asphalt Emulsion Mixtures (CAEMs) in order to produce mixtures that have sound mechanical and performance properties comparable to hot mixtures and are also sustainable, environmentally friendly and economical.

Aim

The major aim of this research is to study, investigate and examine CAEMs in order to produce guidelines for better design and optimisation of these mixture types with respect to their mechanical and performance characteristics. The research highlights the role that aggregate type, gradation and bitumen emulsion play in the behavioural and performance characteristics of the mixtures produced.

Objectives

- Material selection and evaluation.
- Evaluation of mix design and structural design procedures.

- Investigate the mechanical and performance characteristics of CAEMs.
- Understand and develop strength – maturity relationships.
- Structural design and analysis.

Materials

The materials used for the research include:

- Reclaimed Asphalt Pavements (RAP).
- Sharp sand.
- Limestone aggregate.
- Bitumen emulsion.
- Cement.



Cold Asphalt Emulsion Mixtures used in recycling an asphalt pavement layer

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