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Mechanical Properties of Ordinary Portland Cement Modified Cold Bitumen Emulsion Mixture

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Abstract : Cold bitumen emulsion mixture (CBEM) offers a series benefits as compared with hot mix asphalt (HMA); these include environmental factors, energy saving, the resolution of logistical challenges that can characterise hot mix, and the potential to reserve funds. However, this mixture has some problems similar to any bituminous mixtures as it has low early strength, long curing time that needed to obtain the maximum performance, high air voids and considered inferior to HMA. Thus, CBEM has been used in limited applications such as lightly trafficked roads, footways and reinstatements. This laboratory study describes the development of CBEM using ordinary Portland cement (OPC) instead of the traditional mineral filler. Stiffness modulus, moisture damage and temperature sensitivity tests were used to evaluate the mechanical properties of the produced mixtures. The study concluded that there is a substantial improvement in the mechanical properties and moisture damage resistance of CBEMs containing OPC. Also, the produced cement modified CBEM shows a considerable lower thermal sensitivity than the conventional CBEM.

Keywords : cold bitumen emulsion mixture, moisture damage, OPC, stiffness modulus, temperature sensitivity
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