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Cold recycling of reclaimed asphalt pavement towards improved engineering performance

Yangyang Wang¹, Zhen Leng^{2*}, Xi Li³, Chichun Hu⁴

Abstract

Compared with hot recycling of reclaimed asphalt pavement, cold recycling is more environment-friendly, but produces bituminous mixtures with poorer mechanical performance and durability. This study aims to develop a cold recycling method by collectively using multiple additives, including a recycling agent, an emulsifying agent, a polymer modifier, water and cement, to improve the durability of cold recycled mixtures. To achieve this objective, hot mix asphalt was first prepared and aged in lab to produce simulated reclaimed asphalt pavement. Then, both the conventional method by using emulsified asphalt and the proposed method by using multiple additives were applied to produce cold recycled mixtures. Finally, comprehensive laboratory tests, including splitting test, moisture damage resistance test, indirect tensile fatigue test, and immersion asphalt pavement analyzer test, were conducted to evaluate and compare the performances of various cold recycled mixtures. It was found that the proposed cold recycling method provided significantly better overall performance than the conventional method.

Keywords: Reclaimed asphalt pavement; Aged asphalt; Cold recycling; Multiple additives

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