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# Microanalysis of a New Cementitious System Containing High Calcium Fly Ash and Waste Material by Scanning Electron Microscopy (SEM)

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**Abstract :** Fast-curing cold bituminous emulsion mixture (CBEM) including active filler from high calcium fly ash (HCFA) and waste material (LJMU-A2) has been developed in this study. This will overcome the difficulties related with the use of hot mix asphalt such as greenhouse gases emissions and problems in keeping the temperature when transporting long distance. The aim of this study is to employ petrographic examinations using scanning electron microscopy (SEM) for characterizing the hydrates microstructure, in a new binary blended cement filler (BBCF) system. The new BBCF has been used as a replacement to traditional mineral filler in cold bituminous emulsion mixtures (CBEMs), comprises supplementary cementitious materials containing high calcium fly ash (HCFA) and a waste material (LJMU-A2). SEM analysis demonstrated the formation of hydrates after varying curing ages within the BBCF. The accelerated activation of HCFA by LJMU-A2 within the BBCF was revealed and as a consequence early and later stiffness was developed in novel CBEM.

**Keywords :** cold bituminous emulsion mixtures, indirect tensile stiffness modulus, scanning electron microscopy (SEM), and high calcium fly ash
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