

Mix design method of granular packing for high performance concrete with natural pozzolans

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Abstract – This study presents an enhanced mix design method for High performance concrete (HPC) with Natural Pozzolans (NP) content that considers material packing theory. Seven HPC mixes with different NP replacement levels of 0, 5, 10, 15, 20, 25, 30% by volume were conducted to investigate the effect of NP on the rheological and mechanical properties of HPC. A basic water demand experiment was designed to obtain the granular packing and packing density of mortar. Furthermore, the equivalent packing density was defined and calibrated to represent the effect of NP, And the bilinear interpolation method was used to analyses the HPC properties. The results show that the relative accuracies of the improved method are higher than 15% to the initial method. The HPC mixtures with NP was also assessed and shown to be within the optimum area.

Keywords – : High Performance Concrete, Natural Pozzolans, Packing, Properties Rheological, Mechanical Properties.