Statistical mix design method for self-compacting concrete with limestone fillers

Brahim Nécira[1,*], Samir Djireb[2] and Mounia Belkacem[3]

[1]*Department of Civil Engineering, Djelfa University, Algeria*
[2]*Department of Civil and Hydraulic Engineering, Ouargla University, Algeria*
[3]*Department of Civil and Hydraulic Engineering, Biskra University, Algeria*

* *b.necira@univ-djelfa.dz*

Abstract – This study presents a statistical mix design method for self-compacting concrete (SCC) with limestone fillers (LF) content that considers mortar rheological properties and material packing characteristics. The effect of LF on the rheological properties of SCC was investigated through seven SCC mixes with different LF replacement levels. A basic water demand experiment was designed to obtain the packing density of mortar, and the equivalent packing density was defined and calibrated to represent the effect of LF. The relative spread and relative flow formula were modified based on the equivalent packing density, and the bilinear interpolation method was used to analyses the mortar results.

Keywords – Statistical Mix Design, Self-Compacting Concrete, Limestone Fillers, Mortar Rheological Properties, Packing Density