



7. Fresh Properties of Self-Compacting Concrete Integrating Coal Bottom Ash as a Replacement of Fine Aggregates

Ahmad Farhan Hamzah^{1*}, Mohd Haziman Wan Ibrahim¹, Norwati Jamaluddin¹, Ramadhansyah Putra Jaya², Norul Ernida Zainal Abidin¹

¹Faculty of Civil and Environmental Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor Darul Takzim, MALAYSIA.

²Faculty of Civil Engineering, Universiti Teknologi Malaysia, 81310 Skudai, Johor Darul Takzim, MALAYSIA.

*Email: ahmadfarhanhamzah@gmail.com

Abstract

The influence of coal bottom ash on fresh properties of self-compacting concrete (SCC) were presented in this paper. Self-compacting concrete mixtures were produced by 0.40 water/powder ratio and coal bottom ash as a replacement of fine aggregates in varying percentages of 0%, 10%, 15%, 20%, 25% and 30%. The fresh concretes were tested for the key workability belongings of self-compacting concrete such as passing and filling abilities and segregation resistance. The fresh properties were investigated by slump flow; T500 spread time, sieve segregation and L-box test. It was found that the slump flow decreased whereas the T500 spread time increased with higher coal bottom ash content. The L-box blocking ratios changed from 0.92 to 0.65 and were mostly showed satisfactory blocking ratio. The presence of coal bottom ash improved the stability of SCC mixture and the segregation index obtained from sieve test reduced with greater bottom ash content. It can be concluding that the filling and passing ability of SCC decreased when the amount of coal bottom ash content increased. In addition, the segregation resistance index decreased with higher coal bottom ash content.

Keywords: Self-compacting concrete, coal bottom ash, fresh properties.

Acknowledgements

This study was supported by Universiti Tun Hussein Onn Malaysia and Ministry of Education Malaysia through Fundamental Research Grant Scheme (FRGS) Vot No: 1454.