

Properties of lightweight concrete composites with mixture of fly ash and concrete sludge aggregate

Abstract

Lightweight foamed concrete is a concrete made by cement slurry mixed with foam so that foamed concrete that is much lighter than conventional concrete can be produced. The objectives of this study is to develop optimal pre-foamed lightweight foamed concrete and to achieve desired density of lightweight concrete that is below 2400 kg/m^3 . Three samples of concrete were batching with 0%, 25% and 50% of foam respectively under mixing ratio of 1:1:2 and foam dilution ratio 1:5 to obtain optimum result. Based on the result attained, the samples achieved the bulk density ranged from 1943 kg/m^3 to 2305 kg/m^3 . In addition, other physical characteristics of this mixture of materials show that its water absorption for all the samples was increased from 6.508% to 11.889%. This trend of results was obtained if the volume of foam presented in the concrete were increased. Furthermore, the samples achieved compression strength ranged from 22.418 MPa to 32.229 MPa with presence of foam. In summary, with additional of fly ash and concrete sludge as aggregate it can help to produce comparable concrete composites with lighter density.

Keywords; Concrete Sludge Aggregate, Fly Ash, Foamed Concrete, Lightweight, Recycle Material