PENGGUNAAN BATU BASALT SCORIA LAMPUNG SEBAGAI BAHAN PENGISI PADA PORTLAND COMPOSITE CEMENT (PCC)

Oleh : Rajiman

Portland Composite Cement (PCC) is produced from grinding clinker and gypsum with the addition of a filler. Usable fillers such as pozzolan, trass, limestone and slag blass furnace but the population of the third material is reduced, another alternative materials is needed as a substitute for the third material. Basalt scoria is a type of mineral whose chemical composition is dominated by silica, iron, lime and alumina elements which can be used as a filler in the production of cement. The research is expected to be able to solve the problem of consumer demand on quality cement, economical, sustainable and production cost efficiency. The use of basalt scoria as a filler material is expected to increase the amount of cement production. The depletion of lime reserve quantity needs to be replacement of limestone which has quality and quantity that fulfill the raw material of cement. The purpose of this research is to identify the influence of percentage change of basalt scoria of Lampung as filler material to compressive strength, expansion, and smoothness change. Identify the percentage of Si and Ca compounds as elements affecting the compressive strength of mortar. Analyze statistics on the compression test results data, expansion and fineness with the addition of basalt scoria Lampung. Lampung basalt scoria can be used as a filler with a limit of 1-10% proportion resulting in a maximum compressive strength of 394 kg/cm', increasing the compressive strength of 10%, the minimum expansion is 0.5% and the maximum expansion is 7.9% , a maximum blaine is 3,665 cm2/gr with minimum blaine is 2,983 cm2/g. Scanning Electron Microscopy (SEM) test showed that basalt addition of 3% was dominated by Si element while 5% basalt addition was dominated Ca element with Ca = 55,24% and Si = 2,92%. The addition of basalt 3% was increased in compressive strength while in addition of basalt 5% had no effect on compressive strength. The result of statistic analysis of data of percentage change of pozzolan and basalt scoria at 95% confidence interval significantly influence the compressive strength of age 3, 7 and 28 days, and blaine.

Keywords: basalt scoria, pozzoland, limestone, PCC cement, compressive strength.