FIBROUS LIGHTWEIGHT GEOPOLYMER PASTE WITH BASED CALCINED SIDOARJO MUD AND FLY ASH WITH 1 : 3 RATIO USED FOAM AS A FOAMING AGENT

ABSTRACT

Name: Hanif Nurul Ardi Baehaki
NRP: 3110106027
Departments: Civil Engineering FTSP-ITS
Guidance Lecturer: Prof. Dr. Ir. Triwulan, DEA
Dr. Eng. Januarti Jaya Ekaputri ST., MT.

Geopolymer concrete is concrete which not use portland cement as fixing-agent, fly ash and calcined mud is some alternative material as a substitute for portland cement and used sodium hydroksida (NaOH) dan sodium silikat (Na$_2$SO$_3$) as an activator (Davidovits, 1994). Geopolymer concrete begin to introduced as a green concrete as a solution to reduce CO$_2$ emition from portland cement uses.

In this research were made three experiment, the first experiment is to find the optimum value from geopolymer paste which use additive in the mixture paste with ratio of sidoarjo mud and fly ash 1 : 3 and Na$_2$SiO$_3$/NaOH = 2,5 with molarity 14 M. The second is to find the optimum value from lightweight geopolymer paste which use foam in the mixture. The third is to find the optimum value from fibrous lightweight geopolymer paste which use nature fiber in the mixture.

The test result refer that the geopolymer paste has 63,47 MPa of optimum compressive strength and volume weight 1931 kg/m$^3$ at age 14 day with 3 hours steam curing. The lightweight geopolymer paste has 2,85 MPa of optimum compressive strength and volume weight 738 kg/m$^3$ at age 21 day with 6 hours steam curing. The fibrous lightweight geopolymer paste has 4,96 MPa of optimum compressive strength and volume weight 923 kg/m$^3$. From the analysis can we get conclusion that calcinated sidoarjo
mud, fly ash, foam, and nature fiber can uses as a mixture for fibrous lightweight geopolymer paste.

**Keyword**: geopolymer paste, fly ash, foam, Sidoarjo mud, fiber.