

## ABSTRACT

### **THE EFFECT OF PUMICE STONE SUBSTITUTION ON GEOPOLYMER CONCRETE IN SPECIFIC GRAVITY AND COMPRESSIVE STRENGTH OF CONCRETE**

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*This research was conducted to determine the effect of pumice stone as a substitute for coarse aggregate in the manufacture of lightweight concrete. The specimens used in this research is geopolymer concrete that uses 100% Fly Ash as a substitute for cement. The specimens used in this study is a cylinder with a 150 mm diameter and 300 mm height. This study used variations in the percentage of pumice stone of 0%, 20%, 40%, 60%, 80% and 100%. All specimens aged 1 day will be treated with hot steam at a temperature of 85°C for 3 hours and further treatment will be carried out at room temperature. The compressive strength test is carried out after all the test objects are weighed to determine the specific gravity of each test object. The results obtained from the research of 28 days old concrete with 20% pumice got the highest average compressive strength value, i.e 20.03 MPa, while the smallest average compressive strength value is 7.44 MPa achieved by 100% pumice. The specimens with 20% pumice have specific gravity amount 2251.47 kg/m<sup>3</sup> and the smallest density achieved by 100% pumice i.e 1458.83 kg/m<sup>3</sup>. Based on the analysis, the specimens with 100% pumice can be classified as lightweight concrete but it can only be used as non-structural concrete, because its average compressive strength is below 20 MPa. However specimens with 20% pumice has density 5.1% lighter than normal concrete, and still can be classified as a structural concrete.*

*Keywords : pumice, geopolymer, concrete, compressive strength, density, hot steam*

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