

ABSTRAK

Satria Amanda (NIM. 5183250022) “Pengaruh Penggunaan Abu Vulkanik Gunung Api Sinabung Ssebagai Bahan Tambahan Semen Terhadap Kuat Tekan Beton Porous Silica Fume”

Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan bahan tambah silica fume dan abu vulkanik terhadap kuat tekan beton porous. Beton porous merupakan jenis beton dengan rongga udara yang tinggi, sehingga memiliki permeabilitas tinggi namun kekuatan tekan yang relatif rendah. Untuk meningkatkan performa mekanis beton porous, dilakukan modifikasi campuran dengan penambahan bahan pozzolan berupa silica fume dan abu vulkanik. Penelitian ini menggunakan variasi campuran silica fume 7% dan abu vulkanik sebesar 0%, 10%, 15%, dan 25% terhadap berat semen. Pengujian kuat tekan dilakukan pada benda uji silinder dengan diameter 10 cm dan tinggi 20 cm setelah perawatan selama 28 hari. Hasil penelitian menunjukkan bahwa penambahan silica fume dan abu vulkanik dapat meningkatkan kuat tekan beton porous secara signifikan hingga persentase tertentu. Variasi campuran silica fume 7%, dan Abu Vulkanik 25% memberikan hasil kuat tekan tertinggi sebesar 9,69 MPa. Dalam uji statistik regresi linier didapatkan hasil bahwa variasi silica fume dan abu vulkanik memiliki 89,5% variabilitas pengaruh, dan dinyatakan berpengaruh secara signifikan. Dalam pengujian porositas dapat diketahui bahwa porositas optimum atau persentase porositas paling tinggi terdapat pada sampel beton porous dengan variasi 7% Silica fume dan 25% Abu vulkanik yaitu sebesar 19,6%. Sedangkan nilai porositas terkecil terdapat pada sampel beton porous variasi 7% Silica fume dan 0% Abu vulkanik yaitu sebesar 17,6%. Dengan demikian, kombinasi bahan tambah silica fume dan abu vulkanik dapat menjadi alternatif efektif untuk meningkatkan performa beton porous secara struktural dan berkelanjutan.

Kata Kunci: Beton Porous, Abu Vulkanik, *Silica Fume*, Kuat Tekan

ABSTRACT

Satria Amanda (NIM. 5183250022) “The Effect of Using Volcanic Ash from Mount Sinabung as a Cement Additive on the Compressive Strength of Porous Silica Fume Concrete”

This study aims to analyze the effect of the use of silica fume and volcanic ash additives on the compressive strength of porous concrete. Porous concrete is a type of concrete with high air cavities, so it has high permeability but relatively low compressive strength. To improve the mechanical performance of porous concrete, a mixture modification was carried out by adding pozzolanic materials in the form of silica fume and volcanic ash. This study used variations of a mixture of 7% silica fume and volcanic ash of 0%, 10%, 15%, and 25% of the weight of cement. Compressive strength testing was carried out on cylindrical test specimens with a diameter of 10 cm and a height of 20 cm after curing for 28 days. The results showed that the addition of silica fume and volcanic ash could significantly increase the compressive strength of porous concrete up to a certain percentage. Variations in the mixture of 7% silica fume and 25% volcanic ash gave the highest compressive strength results of 9.69 MPa. In the linear regression statistical test, the results showed that the variation of silica fume and volcanic ash had 89.5% variability of influence, and was stated to have a significant effect. In the porosity test, it can be seen that the optimum porosity or the highest percentage of porosity is found in porous concrete samples with variations of 7% Silica fume and 25% Volcanic ash, which is 19.6%. While the smallest porosity value is found in porous concrete samples with variations of 7% Silica fume and 0% Volcanic ash, which is 17.6%. Thus, the combination of silica fume and volcanic ash additives can be an effective alternative to improve the performance of porous concrete structurally and sustainably.

Keywords: Porous Concrete, Volcanic Ash, Silica Fume, Compressive Strength