

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan faktor air semen maksimum (FAS max) terhadap kuat tekan beton mutu K-225. Metode yang digunakan adalah metode DOE (Department of Environment) berdasarkan SNI 03-2834-2000. Benda uji berbentuk kubus berukuran $15 \times 15 \times 15$ cm sebanyak 25 sampel diuji pada umur 3, 7, 14, 21, dan 28 hari. Material yang digunakan meliputi semen PCC Dynamix, agregat halus dari Lubuk Alung, agregat kasar dari Kalumbuak, dan air bersih sumur. Hasil perencanaan Job Mix Formula (JMF) menggunakan FAS maksimum 0,60 menghasilkan proporsi campuran per m³: semen 316,6 kg, air 190 kg, agregat halus 864,2 kg, dan agregat kasar 994,2 kg. Hasil pengujian menunjukkan kuat tekan rata-rata konversi umur 28 hari sebesar 239,301 kg/cm² (K-155), di bawah target K-225. Faktor utama penurunan kuat tekan disebabkan oleh tingginya nilai FAS dan ketidak sempurnaan proses pemadatan benda uji. Penelitian ini menegaskan bahwa kontrol FAS dan prosedur pemadatan sangat penting untuk mencapai mutu beton yang direncanakan.

Kata kunci: Beton K-225, Faktor Air Semen, Kuat Tekan, DOE, SNI 03-2834-2000

Abstract

This study aims to analyze the effect of using the maximum water-cement ratio (FAS max) on the compressive strength of K-225 grade concrete. The research employed the DOE (Department of Environment) method based on SNI 03-2834-2000. Cube specimens measuring $15 \times 15 \times 15$ cm, totaling 25 samples, were tested at the ages of 3, 7, 14, 21, and 28 days. The materials used were PCC Dynamix cement, fine aggregate from Lubuk Alung, coarse aggregate from Kalumbuak, and clean well water. The Job Mix Formula (JMF) with a maximum water-cement ratio of 0.60 resulted in a mix proportion per m^3 of 316.6 kg cement, 190 kg water, 864.2 kg fine aggregate, and 994.2 kg coarse aggregate. Test results showed an average compressive strength (converted to 28 days) of 239.301 kg/cm^2 (K-155), below the target K-225. The main causes of the reduced strength were the high water-cement ratio and imperfections in the specimen compaction process. This research highlights the critical role of controlling the water-cement ratio and ensuring proper compaction to achieve the planned concrete quality.

Keywords: *K-225 Concrete, Water-Cement Ratio, Compressive Strength, DOE, SNI 03-2834-2000*