

ANALISIS KOEFISIEN KORELASI KUAT TEKAN DAN KUAT LENTUR BETON MENGGUNAKAN *SPENT BLEACHING EARTH* (SBE) DAN CANGKANG KERANG SEBAGAI SUBSTITUSI SEMEN

Nama Mahasiswa : Yuyun Niyati
Nim : 4204211376
Dosen Pembimbing : Juli Ardita Pribadi R, S.T., M.Eng
M.Gala Garcya, S.T., M.T

ABSTRAK

Penggunaan beton dalam konstruksi terus meningkat, sehingga mendorong inovasi pemanfaatan material ramah lingkungan seperti limbah industri. Penelitian ini bertujuan mengevaluasi pengaruh SBE dan cangkang kerang sebagai substitusi semen terhadap peningkatan kuat tekan dan kuat lentur beton, serta menganalisis hubungan keduanya melalui koefisien efisiensi K. Variasi yang digunakan adalah beton normal (BN) dan beton dengan campuran SBE 4% dan cangkang kerang 3,5% (BSC). Pengujian dilakukan pada umur 7, 28, dan 56 hari dengan media perawatan air tawar dan air laut. Hasil menunjukkan beton BSC memiliki performa mekanis lebih baik dibandingkan beton normal. Kuat tekan maksimum BSC tercatat sebesar 26,31 MPa (28 hari, air tawar), dan 25,23 MPa (28 hari, air laut). Sementara itu, kuat lentur tertinggi diperoleh pada BSC air laut sebesar 4,253 MPa dan BSC air tawar sebesar 4,018 MPa. Beton normal hanya mencapai 3,804 MPa dan 3,661 MPa secara berurutan. Selain itu, koefisien K tertinggi sebesar 0,981 ditemukan pada beton normal air tawar, melebihi nilai teoritis 0,62. Secara keseluruhan, penambahan SBE dan cangkang kerang terbukti mampu meningkatkan sifat mekanis beton dan mendukung pengembangan material konstruksi yang lebih berkelanjutan.

Kata kunci: *Spent Bleaching Earth*, Cangkang Kerang, Kuat Tekan, Kuat Lentur, Koefisien K.

ANALYSIS OF THE CORRELATION BETWEEN COMPRESSIVE AND FLEXURAL STRENGTH OF CONCRETE WITH SPENT BLEACHING EARTH (SBE) AND SEASHELL AS PARTIAL CEMENT SUBSTITUTES

Student Name : Yuyun Niyati
Student ID : 4204211376
Supervisors : Juli Ardita Pribadi R, S.T., M.Eng
M.Gala Garcya, S.T., M.T

ABSTRACT

The increasing use of concrete in construction has driven innovation in utilizing environmentally friendly materials such as industrial waste. This study aims to evaluate the effect of Spent Bleaching Earth (SBE) and seashells as partial cement replacements on the improvement of concrete's compressive and flexural strength, as well as to analyze the relationship between them through the efficiency coefficient K. The variations used include normal concrete (BN) and concrete with a mixture of 4% SBE and 3.5% seashells (BSC). Testing was conducted at 7, 28, and 56 days using freshwater and seawater curing media. The results show that BSC concrete exhibited better mechanical performance than normal concrete. The highest compressive strength of BSC was recorded at 26.31 MPa (28 days, freshwater) and 25.23 MPa (28 days, seawater). Meanwhile, the highest flexural strength was achieved by BSC in seawater at 4.253 MPa and BSC in freshwater at 4.018 MPa. Normal concrete only reached 3.804 MPa and 3.661 MPa, respectively. Additionally, the highest K coefficient of 0.981 was found in normal concrete cured in freshwater, exceeding the theoretical value of 0.62. Overall, the addition of SBE and seashells effectively enhances the mechanical properties of concrete and supports the development of more sustainable construction materials.

Keywords: Spent Bleaching Earth, seashells, compressive strength, flexural strength, K coefficient