PERILAKU MEKANIK BETON RINGAN SEKAM PADI DENGAN KANDUNGAN SEMEN PORTLAND 250 kg/m^3, 300 kg/m^3, dan 350 kg/m^3

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INTISARI

Penggunaan batu bata dan batako sebagai bahan dinding bangunan sangat populer dan menjadi pilihan utama di Indonesia sampai saat ini. Namun kedua bahan ini mempunyai berat per meter kubik yang cukup besar sehingga akan mempengaruhi beban yang bekerja pada struktur bangunan. Pengambilan bahan batu bata sering dilakukan dari lahan pertanian. Karena itu batu bata dianggap sebagai bahan yang tidak ramah lingkungan. Salah satu bahan yang dapat digunakan sebagai alternatif pengganti batu bata dan batako adalah beton ringan dengan campuran sekam padi. Manfaat penelitian beton ringan dengan campuran sekam padi ini diharapkan dapat menyediakan bahan bangunan yang relatif murah bagi masyarakat.

Penelitian ini dilakukan dengan menguji benda uji berupa silinder beton ukuran 150 mm x 300 mm untuk mengetahui kuat tekan, berat isi, dan modulus elastisitas pada umur 28 hari dengan kondisi perendaman dan tanpa perendaman. Variasi campuran yang digunakan adalah kandungan semen 250 kg, 300 kg, dan 350 kg tiap m^3 beton dengan persentase sekam sebesar 0%, 20%, 40%, 60%, 80%, dan 100%, masing-masing variasi dibuat 6 buah benda uji, 3 buah direndam dan 3 buah tidak direndam, dengan total benda uji sebanyak 108 buah.

Dari hasil penelitian diketahui semua variasi campuran termasuk kategori beton ringan, kecuali beton ringan dengan 0% sekam untuk semua kandungan semen. Berat isi tertinggi dicapai oleh variasi 0% sekam kandungan semen 350 kg/m^3 (direndam) yaitu sebesar 2.207 kg/m^3, terendah variasi 100% sekam kandungan semen 250 kg/m^3 (tidak direndam) sebesar 492 kg/m3. Benda uji yang direndam akan mengalami kenaikan berat isi sedangkan yang tidak direndam akan mengalami penurunan berat isi. Kuat tekan tertinggi dicapai oleh variasi 0% sekam kandungan semen 350 kg/m^3 (direndam) yaitu sebesar 15,7 MPa, terendah variasi 80% sekam kandungan semen 250 kg/m^3 (direndam) sebesar 0,69 MPa. Secara umum beton ringan sekam padi yang tidak direndam menghasilkan kuat tekan yang lebih tinggi daripada yang direndam. Beton ringan sekam padi untuk seluruh variasi campuran dapat digunakan sebagai bahan bangunan khususnya untuk elemen non struktur dan struktur ringan/sangat ringan. Regangan yang dihasilkan jauh di atas beton normal (0,002-0,003) sehingga betonringan sekam padi lebih daktail (tidak getas).

Kata kunci : beton ringan, sekam padi, kuat tekan, murah, dan daktail.

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MECHANICAL BEHAVIOR OF RICE HUSK LIGHT-WEIGHT CONCRETE WITH CEMENT PORTLAND CONTENT 250 KGS/M^3, 300 KGS/M^3, AND 350 KGS/M^3

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ABSTRACT

Nowdays the application of brick and concrete brick as materials of wall structure is very popular and becomes prime choices in Indonesia. However, both type of materials have disadvantages with regard to the weight so it will significantly influence the self weight of the static load of building structure. The material brick is commonly taken from farm land so it is regarded as material which environmentally unfriendliness. One types of material which can be used as alternative substitution of brick and concrete brick is light-weight concrete mixed with rice husk. The advantage of the research of light-weight concrete mixed with rice husk hopefully can supply the cheap material for society.

This research was conducted by testing of concrete cylinder samples of 150 mms x 300 mms in order to determine the compressive strength, the specific gravity, and the Modulus of Elasticity (MOE) of the 28 days-old concrete with submerging and nonsubmerging condition. The variation of blends were 250 kgs, 300 kgs, and 350 kgs of cement content in 1 meter cubic concrete with rice husk percentage of 0%, 20%, 40%, 60%, 80% and 100%, with 6 samples for each variation, which 3 samples were submerged and the other were non-submerged. The total samples were 108 pieces.

The result research showed that all the mixed variation is categorized into the light-weight concrete, except those with 0% of husk for all cement contents. The highest specific gravity was obtained by the variation of 0% husk with 350 kgs/m³ cement content (submerged) that was 2,207 kgs/m³, while the lowest specific gravity was obtained by the variation of 100% husk with 250 kgs/m³ cement content (non submerged) that was 492 kgs/m³. The samples were submerged will increase of specific gravity and samples were not submerged will decrease of specific gravity. The highest compressive strength was obtained by the variation of 0% husk with 350 kgs/m³ cement content (submerged) that was 15.7 MPa, while the lowest compressive strength was obtained by the variation of 80% husk with 250 kgs/m³ cement content (submerged) that was 0.69 MPa. Generally, rice husk light-weight concrete were not submerged result higher of compressive strength than which were submerged. All of the mixed variation of rice husk light-weight concrete can be used for material building specially for non structure and light-weight structure element. The obtained strain was higher than the normal concrete (0.002 – 0.003), so that the rice husk light-weight concrete more ductail.

Keywords: light-weight concrete, rice husk, compressive strength, cheap, and ductail