Studi sifat mekanik paving block terbuat dari campuran limbah adukan beton dan serat kelapa = Study of the mechanical behavior of paving block made of concrete sludge waste csw and coconut fiber

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Abstrak

The study was conducted to explore the feasibility of using concrete sludge waste (CSW) and coconut fiber to manufacture paving blocks. The CSW were collected from a ready-mix concrete plant, while the coconut fibers were sourced from a coconut husk processing plant. The CSW was sun-dried for two days and only aggregates passing the No. 4 sieve were used to replace natural sand at replacement levels of 25%, 50% and 100% by weight with an aggregate/cement ratio of 1:3. The untreated coconut fibers were manually cut into a fiber length of 5 cm and were used in the paving block mix at proportions of 0%, 1%, 2% and 3% by weight of cement. The compressive strength, flexural strength, absorption and abrasion resistance of the resulting paving block specimens were tested to study whether or not the paving blocks has sufficient mechanical properties that allow them to have a quality classification grade under Indonesian national standards. The results of the study indicate that the paving blocks show sufficient compressive strength and abrasion properties to achieve a quality grade of A and B, respectively. However, the absorption level turned out to be the limiting constraint, where all of the paving block specimens resulted in an absorption level above the maximum allowable level under national standards.
<hr>Studi ini dilakukan untuk meninjau kelayakan penggunaan limbah adukan beton (CSW) dan serat kelapa untuk memproduksi paving block. CSW diambil dari pabrik beton ready-mix, dijemur selama dua hari dan hanya aggregat yang melewati saring No. 4 digunakan sebagai subtitusi pasir alam pada tingkatan 25%, 50% dan 100% dengan rasio aggregat-semen 1:3. Serat kelapa dipotong secara manual menjadi panjang 5 cm dan digunakan dalam campuran paving block pada proporsi 0%, 1%, 2% dan 3% dari berat semen. Sifat mekanik paving block yang diuji meliputi kuat tekan, kuat lentur, absorpsi dan ketahanan aus. Hasil penelitian menunjukkan bahwa paving block yang dihasilkan menunjukkan kuat tekan dan ketahanan aus yang cukup untuk mencapai kualitas kelas A dan B, berdasarkan SNI 03-0691-1996. Namun, semua spesimen paving block yang dihasilkan menghasilkan absorpsi di atas batas yang ditentukan SNI 03-0691-1996.