Peran Pumice dalam pembuatan Self-Compacting Lightweight Aggregate Concrete= The role of pumice in self-compacting lightweight aggregate concrete manufactured

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Abstrak

Pada dasawarsa ini telah banyak dikembangkan self-compacting lightweight aggregate concrete (SCLWAC) yang diproduksi dengan menggunakan semen Tipe I (Ordinary Portland Cement Type I), namun relatif sedikit pengembangan SCLWAC yang diproduksi dengan menggunakan semen campuran seperti Portland Cement Composite (PCC). Tesis ini membahas peran pumice sebagai agregat ringan kasar dalam pembuatan SCLWAC dimana PCC sebagai matriksnya untuk mengurangi densitas beton tapi kekuatannya tinggi. Memperoleh mix design, sifat beton segar (fresh concrete) seperti slump flow, T500, V-funnel test, Visual Stability Index-VSI, dan sifat beton keras (hardened concrete) seperti kuat tekan (compressive strength), kuat belah (splitting tensile strength), modulus elastisitas umur 3, 7, 28 hari dan densitas umur 28 hari dari SCLWAC-pumice dan SCLWAC-pumice+mikrofiber Poly Vinyl Alcohol (PVA). Telah dilakukan mix trial dalam pembuatan SCLWAC-pumice sebanyak ±39 (tiga puluh sembilan). Dari tiga puluh sembilan mix-trial diambil 4 (empat) mix-trial yang memiliki sifat self-compacting, kemudian dari empat mix-trial (mix A, B, C, D) dipilih satu mix-trial yang memiliki sifat self-compacting dan kuat tekan pada umur 28 hari terbaik dibandingkan lainnya. Mix-trial yang terpilih dijadikan mix design pada tesis ini dan dilakukan uji sifat self-compacting kembali sebanyak 4 (empat) kali sebelum dibuat sampel beton kubus dan silinder. Selanjutnya, dilakukan uji kuat tekan (compressive strength), kuat belah (splitting tensile strength), modulus elastisitas yang mengacu ACI 318 dan pengamatan struktur mikro menggunakan SEM (Scanning Electron Microscope). Hasilnya menunjukkan ligthweight aggregate pumice telah berhasil dimanfaatkan dalam pembuatan SCLWAC yang memiliki propertis beton segar dan beton keras yang baik.
<hr><i>In this decade development of self-compacting lightweight aggregate concrete (SCLWAC) are produced by using Type I cement (Ordinary Portland Cement Type I), but relatively less of SCLWAC produced by using a blended cement such as Portland Composite Cement (PCC). This thesis discusses the role of pumice as lightweight coarse aggregate in the manufacture SCLWAC in which PCC as a matrix to reduce concrete?s density but its compressive strength is high. Obtain mix design, properties of fresh concrete such as slump flow, T500, V-funnel test, Visual Stability Index-VSI, and properties of the hardened concrete such as compressive strength, splitting tensile strength, modulus of elasticity in 3, 7, 28 days and density in 28 days on the SCLWAC-pumice and SCLWACpumice+ microfiber PFA. Trial has been performed in the manufacture pumice-SCLWAC as much as ± 39 (thirty nine). From the thirty nine mix-trial taken 4 (four) mix-trial that have self-compacting properties, then from the four-trial mix (mix A, B, C, D) selected only one mix-trial that have the best self-compacting properties and compressive strength at 28 days than others. Selected Mix-trial are used as mix design in this thesis and self-compacting properties are retested as much as four times before the sample casted in cubes and cylinders mold. Furthermore, the sample tested compressive strength, splitting tensile strength, modulus of elasticity which refers to ACI 318 and the observation of the microstructure using SEM (Scanning Electron Microscope). The results show ligthweight pumice aggregate has been successfully utilized in the manufacture of SCLWAC which has

properties of fresh concrete and hardened concrete is good.</i>