

ABSTRAK

Greycy K Tampubolon, NIM 4193540001(2019), Analisis Sifat Fisika Bata Ringan Dengan Metode CLC (*Cellular Lightweight Concrete*) Dengan Penambahan Komposisi Pasir Merah Labuhan Batu Selatan.

Peningkatan kebutuhan di bidang konstruksi dimana beton menjadi salah satu bahan utamanya. Beton memiliki banyak kelemahan salah satunya berdasarkan berat jenisnya. Beton ringan menjadi salah satu solusi yang menjanjikan dalam pembangunan. Aplikasi beton ringan dalam pembangunan adalah pada dinding yaitu menggunakan bata ringan. Maka, dalam penelitian ini akan dilakukan peningkatan kualitas bata ringan melalui komposisi pembuatnya. Dilakukan evaluasi terhadap sifat fisik bata ringan CLC dengan penambahan pasir merah Labuhan Batu Selatan. Tujuan penelitian ini adalah untuk mengetahui pengaruh variasi komposisi pasir merah terhadap nilai kuat tekan, daya serap air dan massa jenis bata ringan CLC. Metode penelitian yang digunakan adalah eksperimen dengan membuat bata ringan CLC dengan substitusi pasir merah terhadap pasir sungai sebesar 0%,25%,50%,75% dan 100% yang telah di rawat selama 14 hari kemudian diuji sifat fisik bata ringan CLC, seperti berat jenis, kekuatan tekan, penyerapan air, SEM, XRD dan *furnance*. Hasil penelitian didapatkan bahwa seiring dengan penambahan pasir merah nilai massa jenisnya semakin berkurang atau semakin ringan namun kurang mampu meningkatkan kuat tekan bata ringan dimana pada variasi 100% pasir merah nilai kuat tekannya sangat menurun yaitu 0,16 MPa. Kandungan CaCO_3 memiliki intensitas tertinggi, yang dapat menyebabkan bata ringan menjadi rapuh. Selain itu, penambahan pasir merah juga menyebabkan bata ringan CLC memiliki daya serap air yang tinggi, yang berpotensi menurunkan kuat tekan material. Meskipun penambahan pasir merah dapat menurunkan nilai massa jenis bata ringan CLC, namun hasil ini belum dapat memenuhi kuat tekan yang diharapkan. Oleh karena itu, penelitian ini menyarankan untuk lebih memperhatikan setiap proses pembuatan, pengadukan dan pencampuran bahan dapat mencapai distribusi yang merata.

Kata Kunci: beton ringan; bata ringan CLC; pasir merah; massa jenis, kuat tekan, daya serap air



ABSTRAC

Greycy K Tampubolon, NIM 4193540001 (2019), Analysis of the Physical Properties of Lightweight Concrete Blocks Using CLC (*Cellular Lightweight Concrete*) Method with the Addition of Labuhan Batu Selatan Red Sand Composition.

The increasing demand in the construction industry, where concrete is one of the main materials used, has led to the need for lightweight concrete as a promising solution. One application of lightweight concrete in construction is in walls, using lightweight bricks. Therefore, this study aims to improve the quality of lightweight bricks through the composition of its constituents. An evaluation of the physical properties of lightweight bricks, specifically Cellular Lightweight Concrete (CLC), with the addition of Labuhan Batu Selatan red sand, will be conducted. The objective of this research is to determine the effect of variations in the composition of red sand on the compressive strength, water absorption, and density of CLC lightweight bricks. The research method employed is experimental, involving the production of CLC lightweight bricks by substituting red sand for river sand at 0%, 25%, 50%, 75%, and 100% proportions. These bricks were then cured for 14 days and subjected to physical property tests such as density, compressive strength, water absorption, SEM, XRD, and furnace tests. The results of the study indicate that as the proportion of red sand increases, the density of the lightweight bricks decreases, making them lighter. However, this also results in a decrease in the compressive strength of the lightweight bricks. In the case of the 100% red sand variation, the compressive strength significantly dropped to 0.16 MPa. The presence of a high intensity of CaCO₃ content can cause the lightweight bricks to become brittle. Additionally, the addition of red sand also leads to a higher water absorption capacity of the CLC lightweight bricks, which potentially reduces the material's compressive strength. Although the addition of red sand can reduce the density of CLC lightweight bricks, the results obtained in this study did not meet the expected compressive strength. Therefore, this research suggests paying closer attention to every step of the manufacturing process, including mixing and blending the materials, in order to achieve a more uniform distribution

Keywords: lightweight concrete; CLC lightweight bricks; red sand; compressive strength; water absorption