

PENGARUH PENYERAPAN AIR DAN KUAT TEKAN BATAKO DENGAN SUBSTITUSI LIMBAH BUBUT BESI PERSENTASE 3%, 5%, DAN 7%

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ABSTRAK

Industri besi baja merupakan bahan baku utama industri yang merupakan salah satu penopang pembangunan suatu bangsa. Tingkat produksi besi baja dunia mengalami peningkatan. Semakin tinggi produksi baja suatu negara maka akan berdampak pada tingkat perekonomian suatu bangsa. Namun, industri besi baja menghasilkan produk samping berupa limbah padat mencemari lingkungan. Limbah yang dihasilkan oleh industri besi baja yaitu *slag* besi baja. *Slag* besi baja dikategorikan limbah berbahaya dan beracun berdasarkan Peraturan Pemerintah RI No.101 2014 kode limbah B401 kategori bahaya 2. Limbah berbahaya dan beracun (B3) merupakan bahan yang turut berkontribusi dalam masalah pencemaran lingkungan. Metode yang digunakan dengan peraturan SNI 03-0349-1989 tentang bata beton untuk pasangan dinding. Pembuatan batako ini menggunakan *mix design* mortar menggunakan cara manual dengan substitusi limbah bubuk besi sebagai pengganti semen dengan presentase substitusi 3%, 5% dan 7%. Untuk memperoleh data pengujian kuat tekan dan daya serap air di laksanakan di Laboratorium PT. Aneka Dharma Persada. Tujuan penelitian ini untuk mengetahui daya serap air dan kuat tekan beton batako dengan sistematika limbah bubuk besi dihaluskan menjadi serbuk kemudian dihitung dan dicampurkan sesuai presentase rencana kemudian disubstitusikan ke dalam semen sebagai bahan dari pembuatan batako. Dari hasil pengujian kuat tekan batako normal dan batako substitusi limbah bubuk besi presentase 3%, 5% dan 7% didapatkan kuat tekan maksimal batako normal sebesar 8,4 MPa, kuat tekan maksimal batako substitusi 6,2 MPa di presentase substitusi 3%, kuat tekan maksimal batako substitusi 6,1 MPa di presentase substitusi 5%, dan kuat tekan maksimal batako substitusi 6,6 MPa di presentase substitusi 7%. Untuk hasil pengujian penyerapan air batako normal dan batako substitusi limbah bubuk besi presentase 3%, 5% dan 7% didapat penyerapan air maksimum batako normal sebesar 15,08%, penyerapan air maksimum batako substitusi 11,81% di presentase substitusi 3%, penyerapan air maksimum batako substitusi 11,7% di presentase substitusi 5%, penyerapan air maksimum batako substitusi 13,9% di presentase substitusi 7%. Berdasarkan penelitian yang dilakukan, hasil dari pengujian daya serap air dan kuat tekan batako normal dan batako substitusi menunjukkan bahwa daya serap air dan kuat tekan batako normal lebih tinggi dibandingkan batako substitusi. Sehingga dapat disimpulkan bahwa batako substitusi tidak direkomendasi karena daya serap dan kuat tekan batako kurang maksimal. Pembuatan batako direkomendasikan menggunakan mesin daripada manual agar didapatkan hasil batako yang lebih maksimal.

Kata kunci: Batako, Daya Serap Air, Kuat Tekan, Limbah Besi

EFFECT OF WATER ABSORPTION AND COMPRESSIVE STRENGTH OF BRICKS WITH IRON LATHE WASTE SUBSTITUTION PERCENTAGE 3%, 5%, AND 7%

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ABSTRACT

The steel industry is the main raw material for industry which is one of the pillars of the development of a nation. The level of world steel production has increased. The higher the steel production of a country, the more impact it will have on the economic level of a nation. However, the steel industry produces by-products in the form of solid waste polluting the environment. The waste generated by the steel industry is steel slag. slag is categorized as hazardous and toxic waste based on RI Government Regulation No. 101 2014 waste code B401 hazard category 2. Hazardous and toxic waste (B3) is a material that contributes to environmental pollution problems. The method used is in accordance with SNI 03-0349-1989 regulations concerning concrete bricks for masonry walls. Making this brick using a mix design mortar using a manual method with iron lathe substitution as a substitute for cement with a substitution percentage of 3%, 5% and 7%. To obtain data, the compressive strength and water absorption tests were carried out at the PT. Various Dharma Persada. The purpose of this study was to determine the water absorption and compressive strength of concrete brick with a systematic waste of iron lathe pulverized into powder then calculated and mixed according to the percentage plan then substituted into cement as a material for making bricks. From the results of testing the compressive strength of normal bricks and bricks substituted for iron lathe waste, the percentages are 3%, 5% and 7% di get the maximum compressive strength of normal adobe is 8.4 MPa, the maximum compressive strength of substitution brick is 6.2 MPa at 3% substitution percentage, the maximum compressive strength of substitution brick is 6.1 MPa at 5% substitution percentage, and the maximum compressive strength of substitution brick is 6, 6 MPa at 7% substitution percentage. For the results of testing the water absorption of normal bricks and iron lathe waste substitution bricks with a percentage of 3%, 5% and 7%, it is obtained that the maximum water absorption of normal bricks is 15.08%, the maximum water absorption of substitution bricks is 11.81% at a percentage of 3% substitution, the absorption maximum water absorption of 11.7% substitution brick at 5% substitution percentage, maximum water absorption of 13.9% substitution brick at 7% substitution percentage. Based on the research conducted, the results of testing the water absorption capacity and compressive strength of normal bricks and substitution bricks show that the water absorption capacity and compressive strength of normal bricks are higher than substituted bricks. So it can be concluded that substitution brick is not recommended because the absorption capacity and compressive strength of the brick are not optimal. Making bricks is recommended to use a machine rather than manually in order to get maximum brick results.

Keywords: Brick, Water Absorption, Compressive Strength, Iron Waste