ABSTRAK

Teddy Cahyadi (00000025844)

PERANCANGAN BALOK *FOAMED CONCRETE*
Skripsi, Fakultas Sains dan Teknologi (2020).

(xiv + 81 halaman; 46 gambar; 15 tabel; 1 lampiran)

Beton merupakan suatu struktur bangunan yang memiliki keunggulan seperti kuat tekan tinggi, mudah dibentuk, tahan panas dan biaya rendah. Beton terbagi menjadi 3 jenis berdasarkan berat jenisnya, yaitu beton berat, beton normal dan beton ringan. Untuk memudahkan proses pekerjaan dan pengangkutan, maka solusi yang bisa digunakan adalah beton ringan. Berdasarkan bahan material beton ringan, ada 3 bahan material yang dapat digunakan, yaitu batu apung, *fly ash* dan *foam.* Pada penelitian ini, digunakan bahan *foam* sebagai bahan material beton untuk perancangan balok *foamed concrete.* Tujuan pada penelitian ini yaitu untuk meneliti pengaplikasian *foamed concrete* pada struktur balok dengan membandingkan hasil uji lentur balok dengan beton normal. Metode pengecoran yang digunakan yaitu pengadukan beton dan *foam agent* selesai pada waktu bersamaan dan metode *curing* menggunakan perendaman penuh, serta pengecoran dibagi menjadi 2 kali karena keterbatasan alat. Didapatkan berat jenis *foamed concrete* sebesar 1902 kg/m^3 dan berat jenis beton normal sebesar 2022 kg/m^3. Hasil uji lentur balok didapatkan, balok *foamed concrete* 1 memiliki momen *ultimate* teoritis 13,77 kN.m dan momen *ultimate* actual 14,51 kN.m. Balok beton normal 1 memiliki momen *ultimate* teoritis 12,71 kN.m dan momen *ultimate* actual 13,5 kN.m. Balok *foamed concrete* 2 memiliki momen *ultimate* teoritis 13,71 kN.m dan momen *ultimate* aktual 14,01 kN.m. Balok beton normal 2 memiliki momen *ultimate* teoritis 12,89 kN.m dan momen *ultimate* aktual 12,99 kN.m. Perbandingan uji tekan silinder *foamed concrete* dan beton normal menunjukkan bahwa hasil kuat tekan *foamed concrete* mencapai 21 MPa di hari ke-28, sedangkan beton normal hanya mencapai 13,4 MPa. Setelah dilakukan uji lentur, semua balok beton mengalami retak lentur dan pola retak yang terjadi antara *foamed concrete* dan beton normal adalah pola retak geser.

Kata Kunci : *foamed concrete*, balok beton, karakteristik, kuat tekan, kuat lentur

Referensi : 25 (2002-2020)

ABSTRACT

Teddy Cahyadi (00000025844)

FOAMED CONCRETE BEAM DESIGN
Thesis, Faculty of Science and Technology (2020).

(xiv + 81 pages; 46 figures; 15 tables; 1 appendices)

Concrete is a building structure that has advantages such as strong high press, easy to set up, heat resistance and low cost. Concrete is divided into 3 types based on its own type of weight, namely heavy concrete, normal concrete and light concrete. To facilitate the process of work and transportation, the solution that can be used is the use of lightweight concrete. Based on light concrete materials, there are 3 materials that can be used, namely pumice, fly ash and foam. In this study, used foam material as concrete material for the design of block foamed concrete. The purpose of this research is to examine the application of foamed concrete on beam structures by comparing the results of block bending test with normal concrete. The method of casting used is concrete stirring and foam agent completed at the same time and curing method using full immersion, as well as casting is divided into 2 times because of the limited tools available. It also obtained the result of foamed concrete type weight of 1902 kg/m3 and normal concrete type weight of 2022 kg/m3. Beam bending test results obtained, the foamed concrete beam 1 has the ultimate theoretical moment of 13.77 kN. M and the actual ultimate moment of 14.51 kN. M. Normal concrete beam 1 has the ultimate theoretical moment of 12.71 kN. M and the actual ultimate moment of 13.5 kN. M. Foamed concrete beam 2 has the ultimate theoretical moment of 13.71 kN. M and the actual ultimate moment of 14.01 kN. M. Normal concrete beam 2 has the ultimate theoretical moment of 12.89 kN. M and the actual ultimate moment of 12.99 kN. M. Foamed concrete as well as normal concrete has a comparison of theoretical ultimate moments and almost the same actual ultimate moments. Comparison of the strong press test cylinder foamed concrete with normal concrete shows that the results of foamed concrete is higher than normal concrete, with a strong press foamed concrete reaches 21 MPa in the 28th day, while the normal concrete only reaches 13.4 MPa. After a flexible test, all concrete beams experience a bending crack and a crack pattern that occurs between foamed concrete and normal concrete is almost the same as the sliding crack pattern.

Keywords : *foamed concrete*, concrete beam, characteristics, compressive strength, bending test

References : 25 (2002-2020)