

ABSTRAK

Nama : Hanif Aulian Fiery
NIM : 41121110048
Program Studi : Teknik Sipil
Judul Skripsi : Pemanfaatan Limbah Botol Kaca dan Limbah Granit sebagai Substitusi Agregat Kasar dengan Penambahan SikaCim pada Kuat Tekan Beton
Dosen Pembimbing : Agyanata Tua Munthe, S.T., M.T.

Perkembangan dunia industri konstruksi selalu menarik untuk diikuti. Salah satunya mengenai material beton. Industri beton dituntut dengan adanya inovasi yang biasa disebut dengan *green concrete* yang merupakan konsep beton dengan memasukkan unsur lingkungan di dalamnya sehingga dapat mengurangi dampak negatif yang terjadi. Salah satunya adalah dengan substitusi sebagian agregat kasar dengan limbah botol kaca dan limbah granit serta penambahan SikaCim agar penggunaan air dan semen dapat dikurangi. Oleh karenanya dalam penelitian ini akan dilakukan metode eksperimental penggunaan limbah botol kaca (LBK) dan limbah granit (LG) sebagai substitusi agregat kasar dengan penambahan SikaCim (SC) pada beton yang bertujuan untuk mengetahui pengaruhnya pada kuat tekan beton, nilai *slump*, dan daya serap air beton. Ada 5 (lima) macam *trial mix* yang dilakukan, yaitu TM 1 (beton normal), TM 2 (3% LBK, 3% LG + 0.7% SC), TM 3 (3% LBK, 5% LG + 0.7% SC), TM 4 (3% LBK, 8% LG + 0.7% SC), dan TM 5 (3% LBK, 10% LG + 0.7% SC). Mutu rencana adalah f'_c 20 MPa dengan benda uji silinder berdiameter 15 cm dan tinggi 30 cm. Hasil kuat tekan pada umur 28 hari tertinggi pada TM 1 sebesar 26.6 MPa, dan terendah pada TM 5 sebesar 20.7 MPa. Hasil nilai *slump* terendah pada TM 1 sebesar 12 cm, dan tertinggi pada TM 5 sebesar 14 cm. Hasil daya serap air beton tertinggi pada TM 1 sebesar 1.67%, dan terendah pada TM 5 sebesar 0.88%. Dari hasil penelitian, dapat disimpulkan bahwa dengan substitusi 3% LBK dan semakin tinggi persentase substitusi LG terhadap agregat kasar serta dengan penambahan 0.7% SC, maka kuat tekan beton semakin rendah, nilai *slump* semakin tinggi, dan daya serap air beton semakin rendah.

Kata Kunci: limbah botol kaca, limbah granit, SikaCim, kuat tekan beton, *slump*, daya serap air beton.

ABSTRACT

Name : Hanif Aulian Fiery
NIM : 41121110048
Study Program : Civil Engineering
Report Title : Utilization of Glass Bottle Waste and Granite Waste as a Substitute for Coarse Aggregate with the Addition of SikaCim to the Compressive Strength of Concrete
Counsellor : Agyanata Tua Munthe, S.T., M.T.

Developments in the construction industry are always interesting to follow. One of them concerns about concrete material. The concrete industry is required to innovate what is usually called green concrete, which is a concrete concept that includes environmental elements in it so that it can reduce negative impacts that occur. One form is by substituting some of the coarse aggregate with glass bottle waste and granite waste also adding SikaCim so that the use of water and cement can be reduced. Therefore, in this research, an experimental method will be carried out using glass bottle waste (LBK) and granite waste (LG) as a substitute for coarse aggregate with the addition of SikaCim (SC) to concrete with the aim of determining its effect on concrete compressive strength, slump value and water absorption capacity of the concrete. There are 5 (five) types of trial mix carried out, namely TM 1 (normal concrete), TM 2 (3% LBK, 3% LG + 0.7% SC), TM 3 (3% LBK, 5% LG + 0.7% SC), TM 4 (3% LBK, 8% LG + 0.7% SC), and TM 5 (3% LBK, 10% LG + 0.7% SC). The design quality used is f'_c 20 MPa with a cylindrical test object with a diameter of 15 cm and a height of 30 cm. The compressive strength results at 28 days were highest at TM 1 at 26.6 MPa, and the lowest at TM 5 at 20.7 MPa. The lowest slump value results were at TM 1 at 12 cm, and the highest at TM 5 at 14 cm. The highest water absorption capacity of the concrete results were at TM 1 at 1.67%, and the lowest at TM 5 at 0.88%. From the research results, it can be concluded that with the substitution of 3% LBK and the higher the percentage of LG in the coarse aggregate and with the addition of 0.7% SC, the compressive strength of the concrete will be lower, the slump value will be higher, and the water absorption capacity of the concrete will be lower.

Keywords: glass bottle waste, granite waste, SikaCim, concrete compressive strength, slump, water absorption capacity of the concrete.