# ABSTRAK

**PEMANFATAAN LIMBAH MARMER DAN LIMBAH GRANIT**

**SEBAGAI SUBSTITUSI SEBAGIAN AGREGAT KASAR**

**TERHADAP KUAT TEKAN BETON NORMAL**

**Fachriza Guniarti, Widya Putri Pratiwi**

Program Studi D-III, Jurusan Teknik Sipil, Politeknik Negeri Sriwijaya

Beton merupakan material konstruksi yang banyak digunakan karena kekuatan dan daya tahannya. Kebutuhan beton yang terus meningkat di bidang konstruksi menyebabkan ketersediaan agregat kasar semakin terbatas. Untuk mengatasi hal ini, limbah marmer dan granit yang belum dimanfaatkan secara optimal dapat dijadikan sebagai substitusi agregat kasar. Penelitian ini bertujuan untuk mengetahui persentase optimal pencampuran limbah marmer dan granit terhadap kuat tekan beton pada umur 28 hari. Variasi yang digunakan meliputi 10% granit, 10% marmer, 20% granit, 20% marmer, serta kombinasi 5% marmer + 5% granit dan 10% marmer + 10% granit dari berat agregat kasar. Pengujian dilakukan pada 63 benda uji berbentuk silinder dengan kuat tekan rencana 20 MPa. Hasil penelitian menunjukkan bahwa kuat tekan meningkat secara bertahap, yaitu beton normal sebesar 23,96 MPa, variasi 10% granit sebesar 26,79 MPa, lalu meningkat pada variasi 10% marmer sebesar 28,29 MPa, dan mencapai nilai tertinggi pada variasi 20% granit sebesar 28,67 MPa. Selanjutnya, variasi 20% marmer sebesar 28,29 MPa, kombinasi marmer + granit 10% sebesar 25,65 MPa, dan kombinasi marmer + granit 20% sebesar 23,11 MPa. Secara keseluruhan, variasi campuran limbah marmer dan granit meningkatkan kuat tekan beton pada umur 28 hari, dengan nilai optimal diperolah pada variasi 20% granit.

Kata kunci: agregat kasar, beton, kuat tekan, limbah granit, limbah marmer

**ABSTRACT**

***THE UTILIZATION OF MARBLE WASTE AND GRANITE WASTE***

***AS PARTIAL SUBSTITUTES FOR COARSE AGGREGATE***

***IN THE COMPRESSIVE STRENGTH OF NORMAL CONCRETE***

**Fachriza Guniarti, Widya Putri Pratiwi**

*Diploma Degree, Civil Engineering Department, State Polytechnic of Sriwijaya*

*Concrete is a widely used construction material due to its strength and durability. The increasing demand for concrete in the construction sector has caused a limited availability of coarse aggregates. To overcome this issue, marble and granite waste, which have not been optimally utilized, can be used as substitutes for coarse aggregates. This study aims to determine the optimal percentage of marble and granite waste mixtures affecting the compressive strength of concrete at 28 days. The variations used include 10% granite, 10% marble, 20% granite, 20% marble, as well as combinations of 5% marble + 5% granite and 10% marble + 10% granite by weight of coarse aggregate. Testing was conducted on 63 cylindrical specimens with a design compressive strength of 20 MPa. The results showed a gradual increase in compressive strength: normal concrete reached 23.96 MPa, the 10% granite variation reached 26.79 MPa, then increased to 28.29 MPa for the 10% marble variation, and achieved the highest value of 28.67 MPa for the 20% granite variation. Furthermore, the 20% marble variation reached 28.29 MPa, the marble + granite 10% combination reached 25.65 MPa, and the marble + granite 20% combination reached 23.11 MPa. Overall, the mixture variations of marble and granite waste increased the compressive strength of concrete at 28 days, with the optimal value obtained at the 20% granite variation.*

*Keywords: coarse aggregate, concrete, compressive strength, granite waste, marble waste*