

ABSTRACT

ARTIFICIAL CALCIUM CARBONATE CONTENT OPTIMIZATION AS PARTIAL PORTLAND CEMENT REPLACEMENT IN THE COMPRESSIVE STRENGTH OF CONCRETE

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The aim of this this final project is to optimize artificial calcium carbonate content as partial of cement replacement on the compressive strength of concrete.

The percentage of calcium carbonate levels in this study was 3%. This final project was started with the grain fineness modulus and water content testing of artificial calcium carbonate and then proceeds with testing of raw and fine agregate. The next step was the manufacture of concrete cylinders test specimens 15 x 30 dimension with 9 cylinders, for the concrete without artificial calcium carbonate and concrete made with artificial calcium carbonate. There were 2 testing for the concrete which were Hammer Test and compressive test. The tests were carried out at the time the concrete of 14, 21, and 28 days.

The results showed that the compressive strength of concrete without artificial calcium carbonate was 14.4166 MPa. While the concrete with 3%artificial calcium carbonate has compressive strength of 14.537 MPa. Based on the correlation of the quadratic equation from the previous data which were 3%, 5%, and 10%, for concrete made with 15% artificial calcium carbonate, it was predicted with charts the concretes' compressive strength was 9.74 MPa. This final project showed that the concretes' compressive strength predicted at levels of 15% with a compressive strength data of concrete made of artificial calcium carbonate content of 3%, 5%, and 10%. And optimization of artificial calcium carbonate content of 7.6% predictable with 17.908 MPa compressive strength based on concrete mix between 3%, 5%, and 10% levels.

Key words: concrete, calcium carbonate, compressive strength, optimization; Portland cement