FINAL PROJECT

UTILIZATION OF DEAD CORAL REEFS FROM KAMPUNG LOBUK AS COARSE AGGREGATE IN NON-STRUCTURAL CONCRETE

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CIVIL ENGINEERING STUDY PROGRAM
FACULTY OF ENGINEERING
UNIVERSITAS 17 AGUSTUS 1945 SURABAYA

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CIVIL ENGINEERING STUDY PROGRAM
FACULTY OF ENGINEERING
UNIVERSITAS 17 AGUSTUS 1945 SURABAYA

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Declare that the **"FINAL PROJECT"** that I made to fulfill the requirements for graduation of Strata 1 (S1) Civil Engineering - Undergraduate Program - Universitas 17 Agustus 1945 Surabaya with the title:

"Utilization of Dead Coral Reefs from Kampung Lobuk as Coarse Aggregate in Non-structural Concrete"

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Surabaya, 2024

Ach. Barizi

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PREFACE

The author praise and pray for the presence of Allah SWT because of His grace and guidance the author can complete the writing of the final project entitled **"Utilization of Dead Coral Reefs from Kampung Lobuk as Coarse Aggregate in Non-Structural Concrete"**.

Making of this Final Project is one of the requirements that must be met to complete undergraduate education at the Faculty of Civil Engineering Study Program at the Universitas 17 Agustus 1945 Surabaya and intended to be able to add insight into the field of Concrete Technology.

The preparation of this proposal could not have been completed properly without the assistance, guidance, and support of various parties. Therefore, with humility and respect the author would like to thank to:

1. The author's parents who have support and prayers for the author.
2. Mrs. Faradlillah Saves. ST., MT, as Head of Civil Engineering Study Program of the Universitas 17 Agustus 1945 Surabaya.
3. Mrs. Nurul Rochmah, ST., MT., M.Sc, as Supervisor who has to provide knowledge and guidance in every problem faced in fulfilling this final project.
4. All Lecturers of Universitas 17 Agustus 1945 Surabaya, who have to provide knowledge during the process of teaching and learning activities in the lecture.

The author realizes that this final project proposal is still far from perfect. Therefore, criticism and suggestions are highly expected for future improvement. The author hopes that this proposal can provide benefits for the development of science.

Surabaya, 20th May 2024

Ach. Barizi

The author

PEMANFAATAN TERUMBU KARANG MATI DARI KAMPUNG LOBUK SEBAGAI AGREGAT KASAR PADA BETON NON-STRUKTURAL

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ABSTRAK

Di pesisir pantai Kampung Lobuk pulau Madura, banyak ditemukan batu karang yang sudah mati. Beberapa penduduk setempat Kampung Lobuk menjadikan bahan dari pantai seperti pasir dan batu karang mati untuk membangun bangunan sederhana. Masyarakat akan dibuat dilema dengan jauhnya pertambangan/penyediaan material untuk memenuhi kebutuhan pembangunan/konstruksi. Semakin jauh penyedia material yang diinginkan, maka semakin banyak biaya yang dibutuhkan. Beton non-struktural adalah kategori beton untuk bangunan non-struktural atau bangunan yang tidak bertulang.

Dalam penelitian ini ingin memanfaatkan batu karang yang sudah mati sebagai bahan substitusi agregat kasar pada beton. penelitian bertujuan untuk mengetahui banyaknya komposisi batu karang mati yang dapat dimanfaatkan sebagai alternatif agregat kasar pada beton. campuran beton direncanakan berdasarkan SNI 03-2834-2000. Kuat tekan (f'c) rencana 14,5 MPa. Prosentase batu karang yang digunakan sebagai pengganti kerikil adalah 0%, 25%, 50%, 60% dan 75% dari berat kebutuhan kerikil batu pecah. Pengujian kuat tekan dilakukan pada umur beton 14 dan 28 hari

Dari hasil penelitian, diperoleh beton dengan agregat karang menghasilkan nilai slump tertinggi yaitu 15 cm, rata-rata berat isi terendah pada prosentase karang 75% sebesar 2138.198 Kg/m^3, Dan kuat tekan variasi 25%, 50%, 60%, dan 75% batu karang berurutan sebesar 10,355 MPa, 10,077 MPa, 9,523 MPa, dan 8,413 MPa. Dari nilai kuat tekan tersebut, beton dengan komposisi agregat karang 25% dan 50% memenuhi persyaratan beton non struktural yang digunakan sebagai lantai kerja dan bahan timbunan beton yaitu 10 MPa ≤ f'c. Dari hasil penelitian disimpulkan bahwa penggantian kerikil batu pecah dengan menggunakan agregat terumbu karang membuat beton mengalami penurunan mutu beton.

Kata Kunci : Agregat Terumbu Karang, Beton Non-Struktural

UTILIZATION OF DEAD CORAL REEFS FROM KAMPUNG LOBUK AS COARSE AGGREGATE IN NON-STRUCTURAL CONCRETE

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ABSTRACT

On the coast of Kampung Lobuk, Madura Island, many dead coral rocks are found. Some local people of Kampung Lobuk use materials from the beach such as sand and dead coral to build simple buildings. People will be made a dilemma by the distance of mining or provision of materials to meet the needs of development or construction. The farther away the desired material provider is, the more costs are required. Non-structural concrete is a category of concrete for non-structural or unreinforced buildings.

In this study wanted to utilize dead coral as a substitute for coarse aggregate in concrete. the study aims to determine the amount of composition of dead coral that can be used as an alternative to coarse aggregate in concrete. concrete mix is designed based on SNI 03-2834-2000. The compressive strength (f'c) target is 14.5 MPa. The percentage of coral reef used as a gravel replacement was 0%, 25%, 50%, 60% and 75% by weight of the crushed gravel requirement. Compressive strength testing is carried out at the age of 14 and 28 days of concrete.

From the results of the study, it was found that concrete with coral aggregate produced the highest slump value of 15 cm, the lowest average content weight at 75% coral percentage of 2138.198 Kg/m3, and the compressive strength of 25%, 50%, 60%, and 75% coral aggregate variations sequentially of 10.355 MPa, 10.077 MPa, 9.523 MPa, and 8.413 MPa. From these compressive strength values, concrete with 25% and 50% coral aggregate composition meets the requirements of non-structural concrete used as a working floor and concrete backfill material, namely 10 MPa ≤ f'c. From the results of the study, it is concluded that the replacement of crushed gravel by using coral aggregate makes the concrete experience a decrease in concrete quality.

Keywords: Coral Reef Aggregate, Non-Structural Concrete

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