

FINAL PROJECT

UTILIZATION OF EGGSHELL POWDER WASTE AS AN ADDED MATERIAL TO MORTAR



By :

R. ARCO HERMAWAN BRAHMASSETYO

1431800149

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

2023

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**Prepared as a Requirement for Obtaining a Bachelor of Engineering
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2023**

**VALIDITY OF CIVIL ENGINEERING STUDY
ENGINEERING DEPARTEMENT
UNIVERSITAS 17 AGUSTUS 1945 SURABAYA**

**VALIDITY SHEET
FINAL PROJECT**

Name : R. Arco Hermawan Brahmassetyo
NBI : 1431800149
Study Program : Civil Engineering
Departement : Engineering
Title : Utilization of Eggshell Powder Waste as an Added Material
to Mortar

Approved By:
Lecturer



Nurul Rochmah, ST, MT., M.Sc
NPP. 20430.15.0644

Knowing :

Dean of Engineering Departement
Universitas 17 Agustus 1945
Surabaya



Dr. Ir. Sajiyo, M. Kes. IPU., ASEAN Eng.
NPP. 20410.90.0197

Head of Civil Engineering Study Program
Universitas 17 Agustus 1945
Surabaya



Faradlillah Saves, S.T., M.T.
NPP. 20430.15.0674



UNIVERSITAS
17 AGUSTUS 1945
SURABAYA

BADAN PERPUSTAKAAN
Jl. SEMOLOWARU 45 SURABAYA
TELP. 031 593 1800 (Ext. 311)
e-mail : perpus@untag-sby.ac.id

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NBI/NPM : 1431800119
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Departement : Civil
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PUBLICATION

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Name : R. Arco Hermawan Brahmassetyo
NBI : 1431800149
Adress : Village Kemantren Rt09 Rw02, District Tulangan , Region Sidoarjo
Phone : 085645765176

State that the "**FINAL PROJECT**" that I made to complete the graduation requirements of Strata (S1) Civil Engineering - Bachelor Program – Universitas 17 Agustus 1945 Surabaya with the title:

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FOREWORD

All praise and thanks be to God Almighty who has bestowed all of His Grace and Hidayah so that we can complete the final project proposal with the title "Utilization of Eggshell Powder Waste as an Additive in Mortar" while writing this Final Project is expected to fulfill one of the requirements to attend the Final Assignment Session of the Civil Engineering Department, Faculty of Engineering, Universitas 17 Agustus 1945 Surabaya.

During the process of preparing this Final Project, the author received a lot of guidance, direction and support from various parties. Therefore, on this occasion the author would like to thank:

1. Mr. Dr. Mulyanto Nugroho, MM. CMA., CPA as Chancellor of the Universitas 17 Agustus 1945 Surabaya.
2. Mr. Dr. Ir. Sajiyo, M.Kes as Dean of the Faculty of Engineering, Universitas 17 Agustus 1945 Surabaya.
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5. Our parents who always support us.
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Finally, I thank you and may God always bestow His Grace and Guidance on all of us so that we can become useful people for Religion, Nation, Country and benefit others and ourselves.

Sidoarjo, 02 January 2023

Writer

UTILIZATION OF EGGHELL POWDER WASTE AS AN ADDED MATERIAL TO MORTAR

Name of Study : R. Arco Hermawan Brahmassetyo
NBI : 1431800149
Lecturer : Nurul Rochmah, ST, MT., M.Sc

ABSTRACT

In the development of increasingly developed technology and the demands of the community's needs for infrastructure facilities, it also affects the development of a construction field. This is also no exception in the manufacture of mortar which is used as a non-structural material in buildings. In making mortar itself, it is also influenced by developing technological developments, one of the types affected is pozzolan mortar. Pozzolan mortar has added materials derived from nature or industrial waste. In Indonesia, waste from eggshells is increasing every year, because eggshells are one of the people's favorite food ingredients. The eggshells have contain calcium carbonate (CaCO_3) compound which is an element than cement. The materials of making the mortar itself are water, cement, and sand. This research aims to utilize egg shell waste as an added material in mortar with variations in the percentage of 0%, 5%, 10%, and 15% eggshell powder. From the results obtained, the addition of eggshell powder at maximum compressive strength lies at a percentage of 15% of 300 kg/cm².

Keywords: mortar, compressive strength of mortar, utilization of eggshell waste

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LIST OF NOTATIONS

A	= Cross-sectional area (cm^2)
Ca	= Calcium
CaO	= calcium oxide
Cm	= centimeters
D	= Unit Weight (Kg/m^3)
F'c	= Compressive strength of mortar (Kg/cm^2)
F'cr	= Average of compressive strength (Kg/cm^2)
kg/m^3	= kilograms per cubic meter
m^3	= cubic meters
m	= meter
SSD	= Saturated Surface Dry
V	= Volumes