

FINAL PROJECT

UTILIZATION OF FLY ASH IN HIGH STRENGTH CONCRETE AS A ADDITIONAL MATERIAL FOR CONCRETE MIXTURE



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FACULTY OF ENGINEERING
UNIVERSITAS 17 AGUSTUS 1945 SURABAYA
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” Utilization Of Fly Ash In High Strength Concrete As A Additional Material For Concrete Mixture”

Is the result of my own work and not a duplication of someone else's work. Furthermore, if in the future claims from other parties are not the responsibility of the supervisor and or program manager, but are my own responsibility.

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Surabaya, 23th June 2022



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FOREWORD

All praise and thanks to God Almighty who has bestowed all His Grace and Hidayah so that we can complete the final project with the title "UTILIZATION OF FLY ASH FOR HIGH STRENGTH CONCRETE AS A ADDITIONAL MATERIAL FOR CONCRETE MIXTURE".

This Final Project was prepared by going through several stages which would not have been completed without the guidance, advice and guidance of various parties. For that I would like to thank:

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6. Someone I can't name, who has given me support and been my support system in any case.

The author realizes that in the process of preparing this report there are still many shortcomings and are not completely perfect. Therefore, the author hopes that the criticism received can be used as an improvement in the process of this final project.

Finally, the author apologizes if there are errors in the writing of this final project. The author hopes that this final project can be useful for everyone in need as a reference in the future.

Sidoarjo, 23th June 2022



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UTILIZATION OF FLY ASH IN HIGH STRENGTH CONCRETE AS A ADDITIONAL MATERIAL FOR CONCRETE MIXTURE

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ABSTRACT

High-strength concrete is concrete that has a compressive strength of more than 41.4 MPa. High strength concrete is often used for precast concrete, especially for the construction of buildings, bridges, and also roads with wide spans. One of the materials used in this research is the addition of fly ash for concrete mixtures. This research aims to analyze each proportion of fly ash used and also to determine the effect of using fly ash added on the slump, unit weight, water absorption, and compressive strength of concrete.

Fly ash is the residue from burning coal produced from Steam Power Plants. The properties of fly ash are almost the same as the properties of cement, namely it has pozzolanic properties. not only that, but fly ash also contains calcium silica (CSH) where the reaction is obtained when mixed with concrete and can increase the strength of the concrete. Therefore, the reuse of fly ash waste is very beneficial and has a good impact on the surrounding environment

the proportions of fly ash used were 0%, 5%, 10%, 12%, 15%, 20% using 0.32 phase and also 0.4% superplasticizer level used. The results obtained during the study with the highest value for the slump test were 21.5 cm, Unit weight of wet and dry were 2554.42 Kg/cm³ and 2535.54 Kg/cm³, water absorption were 2.88%, and the compressive strength were 52.01 MPa. It can be concluded that the addition of fly ash has an effect on high strength concrete mixtures.

Keywords : Compressive Strength, Fly Ash, High Strength Concrete

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NOTATION LIST

A	= Area cross section (cm ²)
B	= Amount of water
C	= Amount of fine aggregate
Ca	= Water absorption in fine aggregate
Ck	= Water content in fine aggregate
D	= Unit Weight (Kg/m ³)
D	= Amount of coarse aggregate
Da	= Water absorption in coarse aggregate
Dk	= Water content in coarse aggregate
F'c	= compressive strength of concrete (MPa)
F'cr	= Average compressive strength
M	= added value
Mj	= Saturated mass of water (grams)
Mk	= dry mass (grams)
n	= Number of test specimen
P	= Load maximum (N)
SD	= Standard Deviation (MPa)
Sr	= Plan standard deviation (MPa)
SSD	= Saturated Surface Dry
WA	= Water absorption (%)
WCR	= Water Cement Ratio
xi	= compressive strength of concrete obtained from the test object
1.64	= Statistical constant