

CHAPTER I

INTRODUCTION

A. Background

Concrete is a composite material (mixture) from some materials, which the main ingredient consist of a mixture of cement, fine aggregate, coarse aggregate, water and or whitout other added ingredients with a certain ratio. Because the concrete is a composite, the quality of the concrete depends on the quality of each material (Kardiyono Tjokrodimulyo, 2007). The use of concrete as the main ingredient of the current construction is no doubt it's superiority. Concrete is now experiencing many developments, both in the manufacture of concrete mixes and in the construction. Because the technology is getting better then the use of concrete is required to increase in terms of quality and quantity, so it takes a way to increase the strength of concrete. The quicker the concrete will harden it can reduce over high cost and speed up the work process in the implementation of construction work with qualified quality.

Improvement of the quality of concrete can be done by providing added ingredients, from some of the added ingredients such as rice husk ash in addition to improving the quality of concrete, can also affect the stress and strain on the concrete. Rice husk ash has been studied by some researchers who claim that rice husk ash contains a high enough element of silica. Malawi (1996) conducted research on the potential of rice husk ash as pozzolan material on cement mortar. Pozzolan is a material that has a high silica content. Rice husk ash contains silica compound (SiO_2) of 88.92% so it can be classified as pozzollan (Dharma Putra, 2006).

Based on the above description, this study will use rice husk ash as a substitute of cement with a percentage of 0%, 7%, 9%, 11%, 13%, and 15% with concrete age is 1 day and 28 days to comparasion.

B. Problem Statement

Research on high quality concrete with age of 1 day and 28 days is taken problem formulation as follows:

1. How is the compressive strength of concrete at the age of 1 day and 28 days with a variety of mixture 0%, 7%, 9%, 11%, 13%, and 15% using rice husk ash additive?
2. How much is the optimum of compressive strength at the age of 1 day and 28 days with a variation of mixture of 0%, 7%, 9%, 11%, 13%, and 15% using rice husk ash additive?
3. What is the effect of adding rice husk ash to the compressive strength of concrete?

C. Objective of the Research

The purpose of this study as follows:

1. Analyzing the compressive strength of concrete at the age of 1 day and 28 days with a variety of mix 0%, 7%, 9%, 11%, 13%, and 15% using rice husk ash additive.
2. Analyzing the optimum of compressive strength at the age of 1 day and 28 days with a variation of mixture of 0%, 7%, 9%, 11%, 13%, and 15% using rice husk ash additive.
3. To looking for the effect of adding rice husk ash to the compressive strength of concrete.

D. Benefit of the Research

This research is expected to contribute ideas for planning the manufacture of concrete economical with the use of rice husk ash additive.

E. Scope of the Research

To anticipate the discussion going on outside issues, therefore it is defined the problem as follows:

1. The cement used was Portland cement of Gresik brand.
2. Coarse aggregate used a gravel with maximum diameter size of 20 mm comes from Kulon Progo, Yogyakarta.
3. The fine aggregate comes from Muntilan, Sleman, Yogyakarta.

4. Rice husk ash comes from Baki, Sukoharjo, Central Java.
5. The water was from Civil Engineering Laboratory of University Muhammadiyah Surakarta.
6. The compressive strength concrete is planned $f'_c = 20$ MPa mixed planning method The British Design for 1 day age of concrete.
7. Fresh concrete testing conducted with slump test.
8. Rice husk ash additives to replace 0%, 7%, 9%, 11%, 13%, and 15% of the weight of cement.
9. Water cement ratio design is 0,3.
10. The compressive strength with a cylindrical specimen with a diameter of 15 cm and 30 cm high with concrete testing at the age of 1 day and 28 days.

F. Authenticity of the Research

Research on the effect of rice husk ash on the compressive strength of concrete has been done by Sriyadi (2010) concerning the additive ingredients of rice husk ash and bestmittel which resulted in the addition of optimum compressive strength with the addition of rice husk ash and bestmittel 0.6% of the weight of cement at the value of 0.35 fas at 14 days age of 9.467%, while at age 28 days increased by 2.155% . The research that presents the topic of concrete with rice husk ash has also been done by Kiki Darmawan (2016), analyzed the mechanical properties of concrete High Volume Fly Ash Concrete (HVFAC) with a mixture of rice husk ash (RHA), the mechanical properties of fresh concrete and watertight at the age of 56 days with variation concentrations of fly ash with additive ingredients rice husk ash with the help of chemicals superplasticier.

The writter knowledge analysis of compressive strength concrete with added ingredients rice husk ash with no admixture substance has not been done. So the writter here want to do research in the laboratory civil engineering Universitas Muhammadiyah Surakarta.