

**A STUDY OF COMPRESSIVE STRENGTH ON
ROLLER COMPACTED CONCRETE (RCC) USING SLAG AS
CEMENT REPLACEMENT MATERIAL**

BY

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Report is submitted as
the requirement for the degree of
Bachelor Engineering (Hons) (Civil)

**UNIVERSITI TEKNOLOGI MARA
OCTOBER 2005**

ACKNOWLEDGEMENTS

In the name of the Almighty God, The Most Gracious and The Most Merciful.

I would like to give a great thanks and deepest appreciation to Madam Clotilda Cindy Petrus as my supervisor for her willingness to supervise me to conduct the study throughout the semester until I finally completed my research study.

I would like to thank to Dr. Shanker Kumar Sinnakaundan for teaching the basic of research methodology and introduced many tips and ideas on how to do the research study.

Greatest thanks to Madam Goh Lyn Dee as one of my lecturer and panel for her invaluable information about the slag material for my study and showing me the way to find the material.

My appreciation is also extended to all my panels such as En. Amer Bin Yusuff @ MD Yusuff, Pn. Normaslina Bt Mohsan and Madam Goh Lyn Dee for giving their positive comments, decisions and panelized my research study.

Big thanks also to the UiTM's heavy structure lab and Geotechnics lab department's staffs for their helps and guidance during the concrete handling and testing works at the lab.

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ABSTRACT

Roller Compacted Concrete (RCC) has almost no slump (zero slump concrete) which makes the RCC mix design different from conventional mix design concrete (CMC). The use of slag (Ground granulated blast-furnace slag) is quite common for RCC projects and generally reduces cost and heat generation, but the percentage of slag used is very important to as it will effect the concrete strength in RCC. This study used 0%, 10%, 20%, 30% and 70% cement replacement.

The objective of the project is to investigate the compressive strength of the RCC.

Compressive strength is one of the important properties of concrete. The strength in compression has a definite relationship with all the other properties of concrete. It means to say that, the other properties are improved with the improvement in the compressive strength.

In this study, RCC mix design was based on the US Army Corps engineering manual (EM 1110-2-2006). The process of the specimen preparation method used was the drop hammer method. This study also tests for slump and compressive strength.

The chosen characteristic strength used was Grade 25 (25 N/mm^2 at 28 days) which was designed with different percentages of slag.

CHAPTER 1

INTRODUCTION

1.1 Background

Malaysia is a country having many constructions. In addition to what have been done, such as roads, buildings, bridges and dams. As a developing country, Malaysia needs a large sum of fund to complete all of these facilities. The technology which can give benefits like saving time and cost is of paramount importance to affect this goal.

Roller compacted concrete (RCC) technology is one of the best solution in regards to saving cost and time. Roller compacted concrete is a new concept, in which concrete of almost no slump (zero slump concrete) consistency is transported, placed and compacted by external vibration using vibratory rollers (*EM 1110-2-2006*). It is capable of providing concrete with the relatively same strength and durability to conventionally compacted concrete. Its engineering behaviour is similar to that of the conventional mass concrete, the only difference being the proportions of constituents.

Roller compacted concrete took its name from the construction method used to build it. It is placed with high density pavers, and then compacted with rollers. RCC have the same basic ingredients as conventional concrete such as cement,