INVESTIGATION ON COMPRESSIVE CHARACTERISTIC OF WASTE MATERIAL GEOCOMPOSITE

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DECLARATION BY THE CANDIDATES

I Endy Raymond, 2004335355 , confirm that the work is my own and that appropriate credit has been given where reference has been made to the works of others.

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TABLE OF CONTENTS

Acknowledgement		i
Table of Contents		ii
List of Table		v
List of Figure		vi
List of Symbol		vii
Abstract		viii

CHAPTER 1 : INTRODUCTION

1.1	Introduction and Problem Statement	1
1.2	Objectives of Study	2
1.3	Scopes of Study	2
1.4	Significance of Study	3

CHAPTER 2 : LITERATURE REVIEW

2.1	Introduction	4
2.2	Application of Scrap Tire in Civil Engineering	4
2.3	Reported Studies on Scrap Tire Geocomposite	7
2.4	Properties of Scraps Tire Geocomposite	12
	2.4.1 Unit Weight of Scrap Tire Geocomposite	12
	2.4.2 Shear Strength of Scrap Tire Geocomposite	14
	2.4.3 Compressive Characteristic of Scrap Tire Geocomposite	17
2.5	Critical Review	24

CHAPTER 3 : METHODOLOGY

3.1	Introduction	26
3.2	Material Used	28
	3.2.1 Shredded Tire	28
	3.2.2 Ordinary Portland Cement	28
3.3	Preliminary Laboratory Testing	29
	3.3.1 Particle Size Distribution Test	29
	3.3.2 Specific Gravity Test	31
	3.3.3 Minimum Density Test	35
3.4	Laboratory Compressive Strength Investigation	36
3.5	Mix Design and Test Programme	38
3.6	Control On sample preparation And Casting	40

CHAPTER 4 : RESULT AND DATA ANALYSIS

4.1	Introduction	40
4.2	Preliminary Test Result	42
	4.2.1 Particle Size Distribution Test	42
	4.2.2 Minimum Density Test	46
	4.2.3 Specific Gravity Test	47
4.3	Laboratory Compression Test Result	49
	4.3.1 Repeatability Test For Waste Material A	49
	4.3.2 Effect of Exposure on Geocomposite A	50
	4.3.3 Effect of Waste material – OPC ratio on Geocomposite A	51
	4.3.4 Repeatability Test For Geocomposite B	53
	4.3.5 Effect of Exposure of Waste Geocomposite B	54

4.3.6 Effect of Waste material – OPC ratio of Geocomposite B 56

4.3.7 Summary 58

CHAPTER 5 : CONCLUSION AND RECOMMENDATION

5.1 Introduction 59

5.2 Conclusion 59

5.3 Recommendation 62

REFERENCES 63

Abstract

Waste materials have high potential to be recycled in civil engineering application. Many studies have been conducted local and abroad to explore the potential applications of waste material in civil engineering work. Among the applications are as backfill material for retaining wall, lightweight fill and many more. To maximize the recycling of waste material in Malaysia, the engineering properties of the waste material must first be known and characterized. This study therefore attempts to investigate the compressive characteristics of cement (OPC) bound waste material geocomposite. Two different waste materials namely scrap tire (waste material A) and waste plastic (waste material B) were investigated in this project. The specific gravity of waste material A and B were found to be 0.926 and 0.975 respectively. The minimum density of waste material A and B were found to be 0.366 g/cm^3 and 0.423 g/cm^3 respectively. A standard sample preparation and casting procedure for the OPC-waste material geocomposite was then developed in order to ensure the consistency of test result. Subsequently, three series of laboratory compression tests were conducted on the geocomposite involving repeatability testing, investigation on effect of exposure/curing condition and investigation on effect of OPC content. Repeatability testing on both Geocomposite A (OPC-Waste Material A) and Geocomposite B (OPC-Waste Material B) revealed high consistency with less than 3% difference was observed either in terms of geocomposite densities or compressive strength. The compressive stress of geocomposite A and B were found to decrease with severity of exposure condition. It is also observed that increasing OPC content would increase the compressive stress for both Geocomposite A and B. A comparison between Geocomposite A and B revealed that Geocomposite B can withstand higher compressive stress than Geocomposite A.