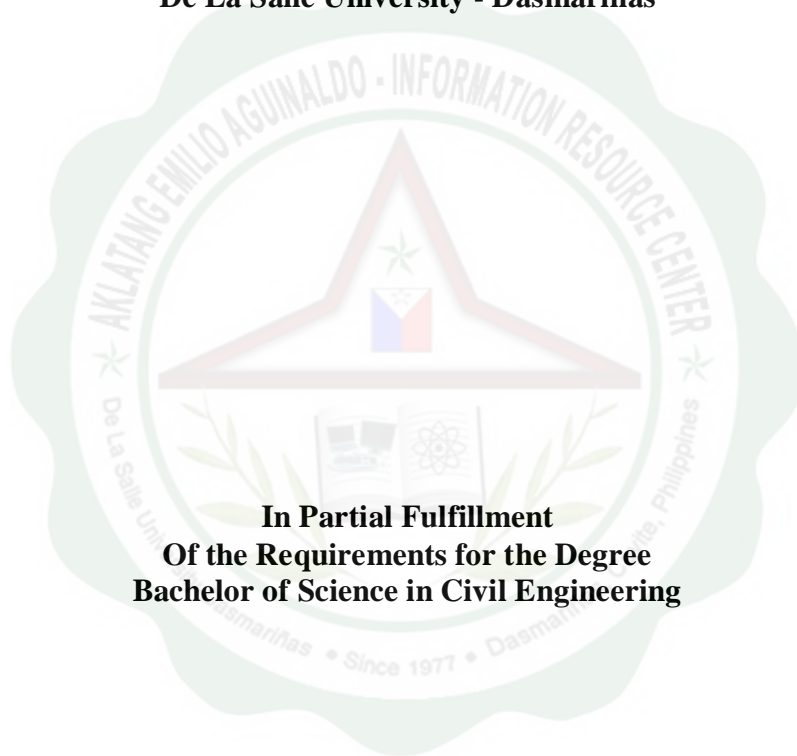


Partial Replacement of Crumbed Rubber Tire as Fine Aggregate on Mortar

**A Thesis Proposal Presented to
The Faculty of the College of Engineering, Architecture, and Technology
Civil Engineering
De La Salle University - Dasmariñas**



**In Partial Fulfillment
Of the Requirements for the Degree
Bachelor of Science in Civil Engineering**

**Jan Erickzon M. Evangelista
Jayson L. Tan
Fahad R. Aquino**

October 2013

ABSTRACT

The study entitled, Crumbed Rubber Tire for Fine Aggregate on a Mortar aims to maximize the use of waste material specially the rubber tire. Nowadays, the demand for transportation is increasing, for this reason the number of used rubber tire is also increasing and the disposal of rubber tire is becoming a problem. Used rubber tire can be a threat in the environment especially when it is burned causing air pollution. There are only limited ways to recycle rubber tire, One purpose of this study is to find another effective way to use the rubber tire. The researcher also wants to find an alternative material for fine aggregates that can be used in making mortar. Another is to give knowledge to others about the use of Crumbed Rubber Tire (CRT) as fine aggregates.

In this study, the researchers compare the flexural strength, linear expansion, and acoustics factors of the mortar with different percentage of CRT that substitute to sand as fine aggregates. The data shows that the flexural strength was inversely proportional to the percentage of the CRT. There was no difference in linear expansion between mortars with and without CRT. On sound level it shows that mortar with CRT will absorb the sound.

TABLE OF CONTENTS

	Page
Chapter 1	1
1.1 Introduction.....	1
1.2 Statement of the Problem.....	3
1.3 Objectives of the Study.....	3
1.4 Scope and Limitations of the Study	4
1.5 Significance of the Study	5
1.6 Conceptual Framework.....	6
1.7 Definition of Terms.....	7
Chapter 2	8
2.1 Mortar.....	8
2.2 Cement.....	8
2.3 Waste Rubber Tire.....	8
2.3.1 Properties of Rubber Tire.....	9
2.3.1.1 Unit weight.....	9
2.3.1.2 Toughness and Failure.....	10
2.3.1.3 Impact Resistance and Heat Insulation.....	10
2.3.1.4 Water Absorption.....	11
2.3.2 Effects of Rubber on Concrete.....	11
2.4 Testing for Rubber on Mortar.....	12
2.4.1 Flexural Test.....	12

2.4.2	Thermal Linear Expansion.....	13
2.4.3	Sound Insulation Test.....	14
2.5	Acoustic.....	14
Chapter 3.....		16
3.1	Methodological Framework.....	16
3.2	Materials and Preparations.....	17
3.3	Mixing of Mortar.....	17
3.4	Testing.....	17
3.4.1	Flexural Test.....	17
3.4.2	Sound Level Test.....	18
3.4.3	Linear Expansion Test.....	18
3.4.4	Mixing Mortar for Other Test.....	18
3.5	Cost Analysis.....	19
3.6	Statistical Analysis.....	19
Chapter 4.....		20
4.1	Flexural Strength Test Result	20
4.2	Percentage Difference	23
4.2	Slump Test	24
4.3	Linear Expansion	25
4.4	Sound Level Test Result	27

4.5	Results and Criteria of the Test	28
4.6	Cost and Other Comparisons.....	29
4.7	Analysis	29
Chapter 5	30
5.1	Findings and observations	30
5.2	Conclusions.....	30
5.3	Recommendations	31
Appendixes	32
	Noise Reduction Table (appendix A)	32
	ANOVA (appendix B)	33
	Design strength (appendix C)	35
	Pictures (appendix D)	36
	PREPARING OF MATERIALS	36
	MIXING OF MORTAR BEAMS	37
	SLUMP TEST & FLEXURAL STRENGTH TEST	38
	MIXING FOR LINEAR EXPANSION AND SOUND TEST	39
	SOUND TEST AND LINEAR EXPANSION TEST	39
	Bibliography.....	41

List of Figures

Figure 1.6 Conceptual Framework.....	6
Figure 3.1 Methodological Framework.....	16
Figure 4.1 % of CRT vs flexural strength.....	21
Figure 4.2 % of CRT vs Weight	22

