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APPROVAL AND DECLARATION SHEET

This project report titled Development Of Cement Composite Reinforced with Coconut Fibre And Expanded Polystyrene Beads was prepared and submitted by Mohamad Irwan Shah Bin Mohd Bakri (Matrix Number: 091201702) and has been found satisfactory in terms of scopes, quality and presentations as partial fulfillment of the requirement for the Bachelor of Engineering (Building Engineering) in Universiti Malaysia Perlis (UniMAP)

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PEMBANGUNAN SIMEN KOMPOSIT DIPERKUKUH DENGAN GENTIAN KELAPA DAN MANIK POLISTIRENA BERKEMBANG

ABSTRAK

Dalam penyelidikan ini, polistirena dan kelapa serat telah diperkenalkan ke dalam konkrit untuk membentuk konkrit bertetulang gentian, di mana polistirena memainkan peranan yang penting untuk mengurangkan berat konkrit manakala gentian kelapa memberi pengukuhan tambahan untuk meningkatkan sifat-sifat konkrit. Dalam projek ini sifat-sifat polistirena dan kelapa serat konkrit telah dikaji. Bahagian yang berbeza daripada polistirena dan serat kelapa adalah reka bentuk untuk mengetahui bahagian yang optimum dan untuk mengkaji kesan bahan mentah kepada sifat-sifat mekanikal dan fizikal konkrit. Buah kelapa adalah ringan, cergas dan sangat tahan air, dan berkembang untuk menyuraikan jarak yang jauh melalui arus laut manakala, polistirena diperbuat daripada petroleum, tidak mampan dan tidak boleh diperbaharui. Serat kelapa diekstrak dari sabut kelapa yang merupakan bahagian yang tidak diingini daripada kelapa setelah dikupas. Bahagian bahan mentah yang berbeza-beza telah diperkenalkan ke dalam konkrit untuk menentukan kadar optimum. Beberapa ujian seperti ketumpatan air penyerapan dan ujian kekuatan mampatan dilakukan untuk mengkaji kesan serat kelapa dan polistirena. Sementara itu, mikroskop optik digunakan untuk melihat struktur konkrit. Dari jadual hasil pada 28 hari, contoh terbaik adalah sampel C iaitu dengan 1.72kg/m³ ketumpatan dan kekuatan mampatan adalah 10.06 MPa. Ini dicapai apabila polistirena diperkenalkan, ketumpatan dikurangkan dan dengan serat kelapa yang memberikan tetulang untuk konkrit yang memberikan kekuatan.

THE DEVELOPMENT OF CEMENT COMPOSITE REINFORCED WITH COCONUT FIBRE AND EXPANDED POLYSTYRENE BEADS

ABSTRACT

In this research, polystyrene and coconut fibre was introduced into the concrete to form fibre reinforced concrete, where the polystyrene plays an important role to reduce the weight of the concrete while the coconut fibre provide additional reinforcement to enhances the properties of the concrete. In this project the properties of the polystyrene and coconut fibre reinforced concrete were studied. Different proportion of polystyrene and coconut fibre was design to know the optimum proportion and to study the effect of the raw material to the mechanical and physical properties of the concrete. Coconut fruit are light, buoyant and highly water resistant, and evolved to disperse significant distances via marine currents while, polystyrene is made from petroleum, non-sustainable and non-renewable. Coconut fibre is extracted from coconut husk which is the unwanted part from the coconut itself after has been peel off. Different proportion of raw material was introduced into the concrete to determine the optimum proportions. Several tests like density water absorption and compressive strength test was done to study the effects of coconut fibre and polystyrene. Meanwhile, optical microscope is used to observe the structure of the concrete. From the table of result at 28 days, the best sample is sample C that is with density 1.72kg/m^3 and compression strength is 10.06 MPa. This is achieved when polystyrene is introduced, the density is reduced and with the coconut fibre that give reinforcement to the concrete that gives strength.

TABLE OF CONTENT

ACKNOWLEDGEMENT	i
APPROVAL AND DECLARATION SHEET	ii
ABSTRACT	iii
ASBTRACT	iv
TABLE OF CONTENT	v
LIST OF FIGURES	viii
LIST OF TABLES	ix

	Page
CHAPTER 1 INTRODUCTION	1
1.1. Background of Study	1
1.2. Problem Statement	2
1.3. Objectives	2
1.4. Scope of Study	3
CHAPTER 2 LITERATURE REVIEW	4
2.1. Introduction	4
2.1.1. History of concrete	4
2.2. Cement composite	5
2.2.1. Ordinary Portland cement	5
2.2.2. Quarry Dust	6
2.3. Fresh Concrete	7
2.3.1. Workability	7

2.3.2	Non Segregation	7
2.3.3	Uniformity	8
2.4	Hardened Concrete	8
2.4.1	Strengths of Concrete	9
2.4.2	Compressive Strength	9
2.5	Lightweight Concrete	9
2.6	Coconut Fibre	10
 CHAPTER 3 METHODOLOGY		12
3.1	Introduction	12
3.2	Ordinary Portland cement	14
3.3	Sand	15
3.4	Quarry Dust	15
3.5	Expanded Polystyrene Beads	16
3.6	Coconut Fibre	17
3.7	Mixture Proportion	18
3.8	Equipment	18
3.8.1	Plastic Shredder Machine	19
3.8.2	Jaws Crusher Machine	20
3.8.3	High Capacity Sieve Shaker	20
3.8.4	Optical Microscope	21
3.8.5	GOTECH Universal Testing Machine	22
 CHAPTER 4 RESULTS AND DISCUSSION		23
4.1	Introduction	23
4.2	Preparation of Raw Material	24
4.2.1	Coconut fibre	24
4.2.2	Coarse Aggregates	24
4.2.3	Quarry Dust	25
4.3.	Raw Material Characterization (X-ray fluorescence)	26
4.4	Determination of Proportion with Its Effect	27
4.4.1	Density	27

4.4.2	Water Absorption	29
4.4.3	Compression Strength Test	30
4.5	Observation of Polystyrene and Coconut Fibre Reinforced Concrete under Optical Microscopic	33
CHAPTER 5 CONCLUSION		38
5.1	Summary	38
5.2	Recommendation for the Future Project	39
REFERENCES		40
APPENDICES		

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LIST OF FIGURES

Figures No.		Page
3.1	Flow chart of the laboratory work	13
3.2	A Bag Of Ordinary Portland Cement (OPC)	14
3.3	Pile of sand	15
3.4	Quarry Dust	16
3.5	Expanded polystyrene beads	16
3.6	Coconut Husk	17
3.7	Plastic Shredder Machine	19
3.8	Jaws Crusher Machine	20
3.9	High Capacity Sieve Shaker	21
3.10	Optical Microscopes	22
3.11	GOTECH Universal Testing Machine	22
4.1	Coconut Fibre	24
4.2	Gravel	25
4.3	Quarry Dust	25
4.4	Density of the Sample	28
4.5	Water Absorption of Sample	29
4.6	Graph of Compression Strength against Curing Period	31
4.7	Graph of Compression Strength against Curing Period	32
4.8	Microscopic Image of Sample NA	33
4.9	Microscopic Image of Sample P1	34
4.10	Microscopic Image of Sample P2	34

4.11	Microscopic Image of Sample P3	35
4.12	Microscopic Image of Sample C1	36
4.13	Microscopic Image of Sample C2	36
4.14	Microscopic Image of Sample C3	37

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LIST OF TABLES

Tables No.		Page
3.1	Raw Material Proportion	18
4.1	XRF result of cement, sand and quarry dust	26
4.2	Result of laboratory test on days 28	32

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