

**ACHIEVING SUSTAINABLE CONSTRUCTION IN
ELECTRIFIED DOUBLE TRACK PROJECT**

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DEDICATION

For my family, who offered me unconditional love and support throughout the completion of this project. To them I give all my love for supporting me all the way.

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ABSTRACT

Sustainable development is not a new concept in the scenario of our life as it has been discussed widely in United Nation conferences such as Agenda 21 and Habitat Agenda before been introduced in Malaysia . The field of sustainable development can be conceptually broken into three constituent parts: environmental sustainability ,economic sustainability and social sustainability . Malaysia has affirmed its policy on sustainable in the 7th Malaysia Plan in response to the Agenda 21 . This 7th Malaysia Plan describes Malaysia's ability to develop in sustainable manner .Construction has been accused of causing environmental problems ranging from excessive consumption of global resources both in terms of construction and building operation to the pollution of the surrounding environment . This research , therefore , deliberated a focus on Electrified Double Track Project between Ipoh to Padang Besar . The objectives of this research were to identify the awareness of construction personnel in sustainable development and sustainable construction at their works site .The site personnel such as consultant engineer , construction manager , engineers and technical staff were approached to get their response towards the persistence of the construction activities which is contribute impact to environment . The findings of this research identified the causes of problems in construction activities and the proposed solutions and implementation construction principle to improve the current site situation , The recommendation listed provides further enhancement in sustainable construction in Electrified Double Track Project .

ABSTRAK

Pembangunan Lestari atau pembangunan Mampan bukanlah satu konsep baru malah ianya telah dibincangkan dengan terperinci dalam Persidangan Agenda 21 dan Agenda Habitat sebelum ianya diperkenalkan di Malaysia . Pembangunan lestari bolehlah di bahagikan kepada tiga bahagian penting iaitu alam sekitar , ekonomi dan sosial . Kerajaan Malaysia telah memperkenalkan pembangunan lestari ini didalam Rancangan Malaysia ke-Tujuh didalam menyahut tuntutan Agenda 21 . Di dalam Rancangan Malaysia ke -Tujuh ini ia menunjukkan keupayaan Malaysia di dalam membangun selaras dengan kehendak pembangunan mampan . Sektor pembinaan memainkan peranan dalam pembangunan negara tetapi memberi kesan kepada alam sekeitar dan pencemaran alam sekeliling . Justeru itu Kajian ini berkisarkan kepada kesedaran pembinaan lestari di dalam pembinaan jajaran keretapi berkembar elektrik Ipoh ke Padang Besar . Tujuan kajian ini adalah untuk mengenal pasti sejauh manakah kesedaran golongan teknikal dan profesional didalam bidang pembinaan disamping amalan pembinaan berlandaskan pembinaan lestari di tapak pembinaan . Hasil dari kajian ini dapat kita lihat punca permasalahan hingga timbulnya isu pencemaran , keadaan tapak bina yang tidak menyenangkan hingga menimbulkan gangguan kepada masyarakat dan persekitaran . Dalam hal ini beberapa prinsip pembinaan diketengahkan dengan harapan dapat memperbaiki keadaan industri pembinaan terutama didalam projek landasan berkembar khususnya dan industri pembinaan amnya .

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENT	iii
	ABSTRACT	iv
	ABSTRAK	v
	TABLE OF CONTENTS	vi
	LIST OF FIGURES	xii
	LIST OF TABLES	xiii
	LIST OF APPENDICES	xiv
1	INTRODUCTION OF STUDY	1
	1.1 Introduction	1
	1.2 Problem Statement	2
	1.3 Aim of the research	3
	1.4 Objectives of the research	4
	1.5 Research problem	4
	1.6 Brief research methodology	5
	1.7 Structure of Report	7
	1.9 Summary	8
2	SUSTAINABLE DEVELOPMENT	9
	2.1 Introduction	9
	2.2 Elements of sustainable development	12
	2.2.1 Economics Aspects	13

		xiv
	2.2.2 Environmental Aspect.	14
	2.2.3 Social Aspects	15
3	SUSTAINABLE CONSTRUCTION PRINCIPLE	16
3.1	Sustainable construction	
3.2	Process And management issues	18
3.2.1	Sustainable construction principle	19
3.2.2	Design process	19
3.2.3	Environmental quality of construction	20
3.2.4	Re-engineering of the building process	21
3.2.5	Decision Making Process	21
3.2.6	Education	22
3.2.7	Standard and regulations	23
3.2.8	Sustainable development principles in practice	24
3.3	Electrified double track project background	26
3.3.1	Concept of EDTP	30
3.3.2	Main construction packages for proposed project	32
3.3.3	Suppliers and sub contractors involved in the EDTP	33
3.4	Construction activities in EDTP	
3.4.1	earthworks	35
3.4.2	Pile embankment	36
3.4.3	Prefabricated Vertical Drain (PVD)	36
3.4.4	Piling works	38
3.4.5	Stone column	39
3.4.6	Bridges works	40
4	RESEARCH METHODOLOGY	42
4.1	Introduction	42

4.2	Literature Review	43
4.3	Approach of Data Collection	44
4.4	Questionnaire Survey	45
4.5	Preparation of Questionnaire Survey	45
4.6	Distribution of Questionnaire Survey Forms	48
4.7	Interview	48
4.8	Selection of Respondents for Questionnaire Survey	49
4.9	Selection of Respondents for Face to face interview	49
5	DATA COLLECTION AND ANALYSIS	50
5.1	Introduction	50
5.2	Respondent's Background	50
5.2.1	Respondent's experience	51
5.2.2	Rate of Response	52
5.2.3	Total projects supervise by the respondent's	52
5.2.4	Type of ongoing completed projects	53
5.2.5	Interviews	54
5.2.6	Content Analysis	55
5.2.7	Analysis of Data From Questionnaire Survey	56
5.2.8	Awareness of construction personnel in Sustainable development	66
5.2.9	Awareness of construction personnel in sustainable development based on Average Index	66
5.3	The construction activities that contribute impact to surrounding	70
5.3.1	Construction personnel's point of view	70

	based on Total Average Index	
5.4	Earthworks	70
5.5	Stone column	71
5.6	Bridge works	71
5.7	Prefabricated vertical drain	71
5.8	Pile embankment	72
5.9	Application of construction principle in Electrified Double Track Project	81
5.9.1	Construction personnel point of view based on Average Index	81
5.9.2	Design Process	81
5.9.3	Environmental quality of construction	81
5.9.4	Re Engineering of the building process	82
5.9.5	Decision Making Process	82
5.9.6	Education	
6	DISCUSSION OF RESULTS	84
6.1	Introduction	84
6.2	Awareness of Sustainable Development among construction personnel	84
6.2.1	Barriers to sustainable development and sustainable construction	84
6.2.2	Implementation of sustainable development policy	85
6.2.3	Achieving sustainable construction through organization	85
6.2.4	Promoted sustainable development in construction industries	86
6.3	Construction activities in Electrified double tracks –result and discussion	86
6.3.1	Earthworks	86
6.3.2	Stone column	87
6.3.3	Bridge works	87

6.4	Application construction principle to improve sustainable development	88
6.4.1	Design Process	88
6.4.2	Sustainability in decision making	89
6.4.3	Environmental quality of construction	89
6.4.4	Re Engineering of the building process	90
6.4.5	Education and research	91
6.4.6	Standard and regulation	91
7	CONCLUSION	92
7.1	Introduction	92
7.2	Limitations of the Research	93
7.3	Awareness of sustainable development among construction in EDTP	94
7.4	Construction activities in double track	95
7.5	Application of the sustainable construction principle to improve the construction site	97
7.5.1	Design Process	97
7.5.2	Environmental quality of construction	97
7.5.3	Re engineering building process	98
7.5.4	Decision Making	98
7.5.5	Education	99
7.5.6	Standard and regulations	99
7.6	Recommendation for future study	99
7.7	Conclusion	101
	REFERENCES	102
	APPENDICES A-B	104

LIST OF TABLES

TABLE NO	TITLE	PAGE
3.1	Main Construction Packages for proposed project	32
5.1	Composition of respondents by their position in their organization	51
5.2	Respondents experience in international projects	52
5.3	Respondents experience based on number of completed projects	53
5.4	Respondents involvement based on type of projects	54
5.5	Results of interviews-Awareness of SD	57
5.6	Result of interviews – Identification of construction activities	61
5.7	Result of interviews – Application of sustainable construction principle	64
5.8	Responses and Average for awareness of construction personnel on sustainable development	68
5.9	Construction personnel 's point of view based on total average	70
5.10	Identification of construction that have impact to surrounding	73
5.11	Application of sustainable construction principle can improve the construction site-design process	76
5.12	Application of the sustainable construction principle can improve the construction site-Environmental quality of construction	77
5.13	Application of the sustainable construction principle can improve construction site- re engineering of building process	78

5.14	Application of the sustainable construction principle can improve construction site-Decision making	79
5.15	Application of the sustainable construction principle can improve the construction site-Education	79
5.16	Application of sustainable construction principle can improve the construction site –standard regulations	80

LIST OF FIGURES

FIGURES NO	TITLE	PAGE
1.1	Brief Research Methodology Flow Chart	6
2.1	Scheme of sustainable Development	13
3.2	Double tracking alignment Ipoh to Padang Besar	33

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A/1	Questionnaire	104
A/2	Professional background	105
A/3	Professional background , <i>cont'd</i>	106
B/1	Questionnaire survey- awareness of sustainable development among construction personnel	107
B/2	Questionnaire survey – Identification of construction activities that have impact to surrounding	108
B/3	Questionnaire survey –application of sustainable construction principle can improve the construction site	109

CHAPTER 1

INTRODUCTION

1.1 Introduction

This Electrified Double Track Project was proposed in 2002 as a continuation of the Rawang to Ipoh double tracking and electrification project. Initially awarded to two consortiums. The 329km Northern section between Ipoh and Padang Besar was to be handled by a consortium made up of the Indian Railway Construction Company, DRB-Hicom Berhad and Emrail Sdn Bhd. While the Southern section between Seremban and Johor Bahru was to be handled by a consortium made up of the China Railway Engineering Corporation (CRET), DRB-Hicom Berhad and Hikmat Asia Sdn Bhd. However, on 21 October 2003, a letter of award was issued to Gamuda Berhad and Malaysian Mining Corporation Berhad (MMC). The change in contractors was based on the fact that Gamuda-MMC lowered the project cost to RM14.448billion, compared with over RM44billion by the two foreign contractors. Members of the two previous consortium were invited to be sub-contractors and were given the first right of refusal but the invitation was not taken up.

On 17 December 2003, Prime Minister Abdullah Ahmad Badawi announced that the Malaysian government had decided to postpone the project. The government revived the project in 2007 when on March 16, Deputy Prime Minister Mohd Najib Abdul Razak announced that the Cabinet Committee on Public Transport had decided to revive the shelved Northern section double tracking project. On 21 April 2007, Transport Minister Chan Kong Choy confirmed Ircon's participation in the revived double tracking project and that the company undertakes the Seremban to Gemas portion of the Seremban to Johor Baru.

On 6 June 2007, Gamuda Berhad announced to Bursa Malaysia that it had received a letter from the Economic Planning Unit of the Prime Minister's Department that the Malaysian government had agreed to Gamuda-MMC proposal to implement the Northern section of the project on a private financing initiative basis. It added that negotiations on the formal agreement would begin as soon as possible. Transport Minister Chan Kong Choy said work on the Northern section is begin by the end of 2007 and is expected to be completed by January 2013.

On December 14, 2007, Gamuda announced that it together with MMC had received a letter of acceptance dated 13 December 2007 wherein the Malaysian Government accepted the proposal by the Gamuda-MMC joint venture to carry out the Electrified Double Tracking Project from Ipoh to Padang Besar on a design and build basis for a lump sum price of RM12.485billion. The works comprises the design and construction of the infrastructure and system works in respect of the project which is to be completed within 60 months from the commencement date. The project cost has escalated due to rise in oil prices and building materials. The company is undertake only 20 percent of the whole project while the rest of the construction is out sourced to various companies around the country. The project is implemented as a construction contract with progressive payments, instead of private finance initiative envisioned earlier. The design and build contract between the joint venture company and the government of Malaysia is formally signed on July 25, 2008.

The project will consist of two sections, a 171 km stretch from Ipoh to Butterworth and another 158 km stretch from Bukit Mertajam to Padang Besar. It is expected that the Ipoh to Butterworth section give a higher priority as it is a continuation from the Rawang stretch, and eventually shorten the travel time between Kuala Lumpur to Butterworth to three hours. The project also feature a 3.3 km tunnel in Perak, which become the longest rail tunnel in South East Asia.

The government has announced on January 18, 2008 that site possession to Gamuda MMC on January 8, 2008. Work on the site is expected to start immediately thereafter and completed by 2013. It is also noted that the tracks have the design speed of 160 to 180 km/h although the operator is expect to use only 140 to 160 km/h. After six months of the project began, the first wave of outsourced contracts worth RM3.8billion be awarded for the construction of 100 bridges, 30 station buildings, 180 kilometres of culverts and drainage works, 300 kilometres of track works and utilities, Gamuda MMC had appointed a consultants for design and supervision, 32 civil engineering consultant firms, and 16 firms for survey and soil investigation for the project, the railway project also benefit to local contractors involved in providing heavy machinery and equipment, motor vehicles and building materials as well as quarry operators. Main contractors also awarded 16 earthworks and 10 piling contractors worth more than RM1.6billion for the project which requires 1,000 excavators, bulldozers, motor graders and compactors, 4,000 trucks and tippers, 360 cranes and piling rigs, 30 units of concrete batching plant, 2,000 site vehicles. The construction activities that involved in the project such as excavation, ground treatment, cut and fill, piling works, pile embankment, stone column, sand drain, station, road over bridge, bridges and road works.

1.2 Problem Statement

In general, the process of implemented sustainable construction in Electrified Double Track Project (EDTP) is slow and not encouraging. Some of the factors that contribute to the barrier in sustainable development are lack of awareness on sustainable construction of construction personnel such as the consultant engineer, contractors and workers and lack of supervision by contractors itself that had impact to surrounding such to environment, social and economy along the construction site.

1.3 Objectives of the Research

The objective of this study is to identify the level of awareness among the construction personnel in sustainable construction and to recommend the construction principle to improve the construction site and mainly focus on the following objectives:

- i. To identify the awareness of the sustainable construction among construction personnel.
- ii. To identify the construction activities that has contribute impact to the surrounding.
- iii. To improve construction site by implementing sustainable construction principle for Double Track Project.

1.4 Scope and Limitations of the Study

This study is focused on the awareness of construction personnel in implementing sustainable construction site and identifies the construction activities that have impact to surrounding.

The scope of this study is confined within the following aspects:

- i. It's only focusing on factors the awareness of construction personnel in sustainable construction in order to improve the site by implementing construction principle.
- ii. The respondents comprised of consultant engineer and contractors who involved in construction of EDTP.
- iii. The data collected from respondent that have experience in construction project only.

1.5 Brief Research Methodology

The flowchart indicate the flow of research work that have been conducted and present in Figure 1.1

Flow Chart of Brief Research Methodology

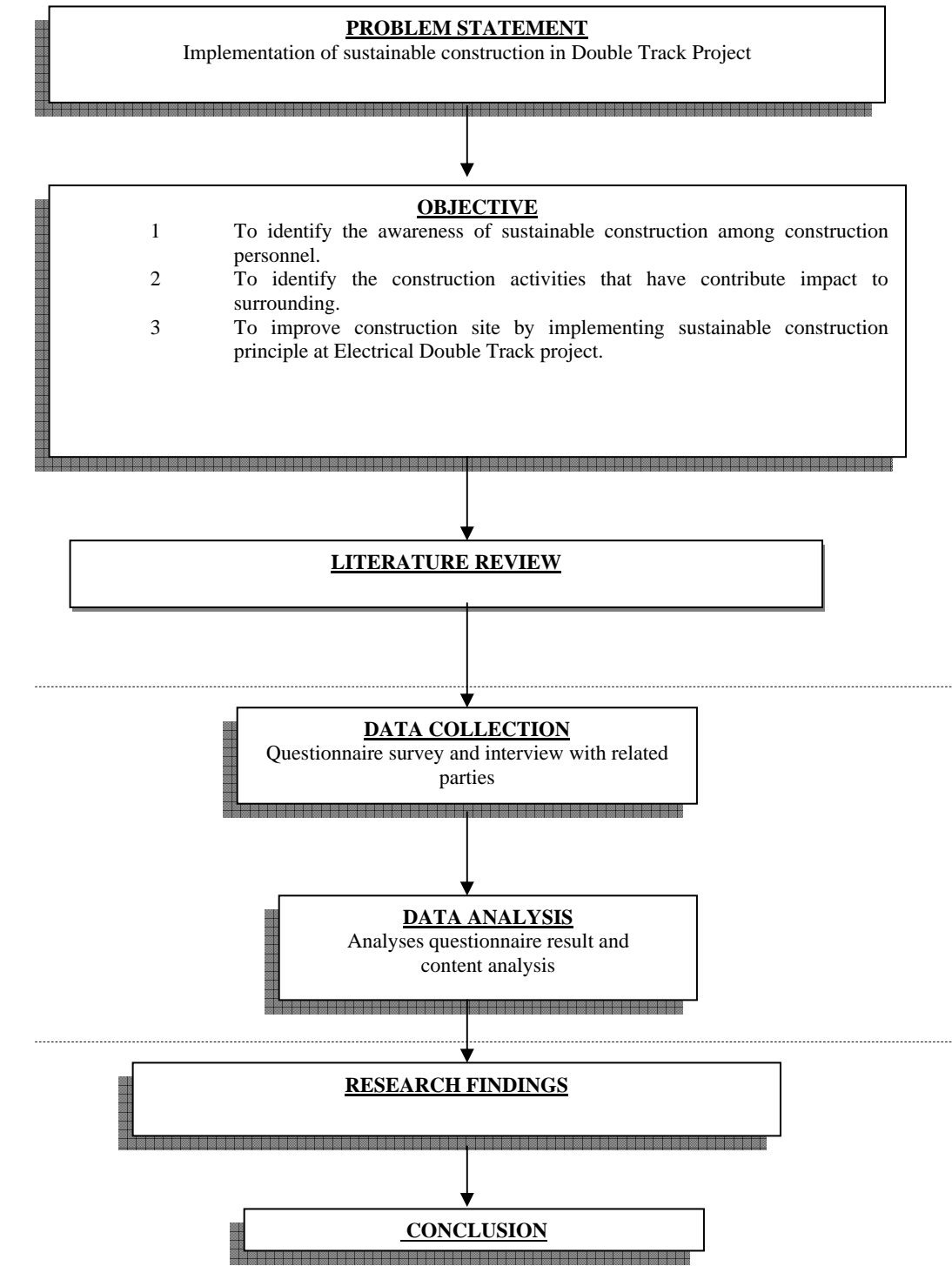


Figure 1.1 Brief Research Methodology Flow Chart

1.6 Structure of Report

Chapter 1, discussed on the problem statement, objectives, scope, and limitation of the study and brief methodology to be adopted, in order to achieve the objectives of the study.

Chapter 2, Literature review on sustainable development. In the first part of the literature review, this chapter defines the words used in sustainable development. Various means have been used to get the suitable, acceptable and nearest meanings of the terms used in this research. Also key elements of sustainable development, social, economic and environmental, are explained in order to get the total understanding in doing the study.

Chapter 3, Literature review on sustainable construction in order to follow the directives and guidelines provide by the United Nations as stated and describe in Agenda 21.

Chapter 4, Research methodology used to achieve the objectives of the study. Description on the detail of each methodology adopted which includes questionnaire survey a flowchart of the methodology is presented, which includes the target group, questionnaire design, interviews and analysis method.

Chapter 5, Data analysis from questionnaire survey and interviews.

Chapter 6, Discussion on research findings.

Chapter 7, Conclusion of the study.

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APPENDIX A/1