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SARAWAK**

**SELF-HEALING BUILDING: LEVEL OF  
AWARENESS ON NANOMATERIALS**

Final Project submitted in partial fulfilment  
of the requirement for the award of  
Bachelor of Quantity Surveying (Honours)

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in an accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledge as references work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Undergraduates, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## **ABSTRACT**

Nanomaterials has become one of the most powerful material in this century for its usage and benefits. However, there are low usage of nanomaterials in our country as the awareness of nanomaterials is more extensive than anticipated. It may because of the contractor's inability to lay off their comfort zone and lack of knowledge on nanomaterials which prone to lack of design, technology and expertise. The aim of this study is to develop strategies in order to regulate the use of nanomaterials in the construction industry. The objectives of this study are to identify the level of awareness towards nanomaterials and to analyze the challenges to implement nanomaterials while recommend the benefits in the construction industry. The research method for this study will be fully based on literature review and questionnaire. The respondent of this study is the building contractors class G7 within Kuching, Sarawak specifically to the middle management of the organization. The findings are expected to give more exposure on the benefits of nanomaterials at once will increase the usage in the construction industry and can be use as advance study for students and academicians. Nanomaterial is considered as a modern material which need an acknowledgement by the people in construction industry.

**Keywords: Nanomaterials, Awareness, Benefits, Implementation, Construction Industry**

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# CHAPTER 1: INTRODUCTION

## 1.1 INTRODUCTION

Construction industry is well-known as one of the premier industry in the world that contribute to economic growth and employment. It is applicable to most of the country which include developing countries such as Malaysia. Malaysia is known as one of the fastest growing economy and development increase in various sectors. The construction industry is doing well as one of the main production in Gross Domestic Products.

However, one of the deficiency in this industry is the maintenance of a building. The life-span of a building is a factor than need to be considered before constructing a building. Hence, a lot of maintenance works need to be done to ensure the longevity of a particular building. Unfortunately, building owners are usually unaware when or which part of the building need a constant maintenance which leads to damage of the building. Adding salt to the wound, most maintenance occurred after the defect liability period in which the developer will not cover for the cost of the damage. Therefore, studies have found a solution to protect the building from damage and decrease the cost of maintenance; nanomaterials.

The nanomaterials revolution is making a ground-breaking impact on diverse science, engineering, and commercial sector including construction industry. It creates possibilities to produce construction materials in novel usage and improved characteristics. Nanomaterials give a lot of advantages to various sector which including construction sector. It produces multifunctional composite material which is durable and considerably modified properties. For instance, nanomaterials produce properties with low electrical resistance, self-cleaning, self-sensing, self-repairing, high ductility, self-