

**UNIVERSITI TEKNOLOGI MARA
PERAK BRANCH**

**SELF-
CLIMBING
SCAFFOLDING**

NOR AINAA NABILAH BINTI RAZAKI


BSc

August 2021

AUTHOR'S DECLARATION

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

In the event that my innovation project report, be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Student : Nor Ainaa Nabilah Binti Razaki
Student I.D. No. : 2019455446
Programme : Bachelor of Science (Hons.) Construction Technology
Faculty : Architecture, Planning & Surveying
Innovation Title : Self-Climbing Scaffolding
Signature of Student : 
Date : July 2021

ACKNOWLEDGEMENT

Alhamdulillah, praise to Allah, the Most Merciful and the Most Graceful. It is my pleasure to acknowledge the roles of several individuals who were instrumental for the completion of my degree research.

First and foremost, I would like to express my gratitude to my supervisor, Ir Raja Nurulhaiza Raja Nhari who encouraged me to pursue this project and taught me throughout the production process of this report. I truly enjoyed working in research environment that stimulates original thinking and initiative, which she created.

On the other hand, I'd like to thank Dr. Siti Akhtar Mahayuddin and Dr Asmat Ismail for her substantial contributions to many talks and lectures that helped shape this project from the first brainstorming of ideas to the structural drafting of this report.

In addition, I would want to express my gratitude to my family, particularly my mother, for her financial and spiritual assistance in completing this final report.

Last but not least, this report would not materialize without support and guidance from my classmates which is from class AP2566A. My classmates are being very helpful in giving opinions and guidance with open arms since the day we met each other. It was a pleasure working with them and I appreciate their ideas, helps and good humour for all these years.

TABLE OF CONTENTS

Contents	Page Number
Author's Declaration.....	i
Acknowledgement	ii
Table of Contents.....	iii
List of Tables	vi
List of Figure.....	vii
Abstract	viii
CHAPTER 1	1
1.0 INTRODUCTION.....	1
1.1 Background of Study	1
1.2 Problem Statement	5
1.3 Research Question.....	6
1.4 Aims and Objective of the Study	7
1.5 Scope of Study	7
1.6 Limitation of Study	8
1.7 Significant of Study	8
1.8 Outline of Report	9
CHAPTER 2.....	11
2.0 LITERATURE REVIEW.....	11
2.1 Introduction.....	11
2.2 Overview of the Construction Site in Malaysia	11
2.3 Material Handling in Construction.....	13
2.4 The Challenges in Handling of Frame Steel Structure.....	15
2.5 Previous and Current Research Related to Material Handling of Frame Steel Structure.....	17
2.5.1 Tower Crane Supporting Frame Suspension Disassembly Technology	18
2.5.2 Suspended Scaffolding.....	19
2.5.3 Automatic Welding Technology	21
2.6 Problem Related to Existing Method of Handling of Frame Steel Structure.....	22
2.7 Development of the Innovation Idea.....	24

Abstract

High-rise buildings became achievable with the invention of the technology, less expensive and more plentiful building materials. Many of the high-rise building nowadays used a steel frame as a structure, while residential blocks are usually constructed of concrete or IBS panel. The construction of high-rises especially in the urban area is not simple. Construction of high rise building is very challenging especially when there is work to lift materials. The current method requires a lot of time and workers. It also requires a large amount of space. A new method should be able to solve this problem for the construction industry needs to be developed. The aims of this study is to design an innovative product to simplify the material handling of frame steel structure process and reduce the risk that can occurred by identifying what is the best method used for material handling of frame steel structure in the construction industry. The overview of the construction site in Malaysia is elaborated with the support from other researcher. Self-Climbing Scaffolding was created in response to the identification of current issues and problems in the handling of frame steel structures. Issues include time delay, labour consumption, limited spaces, and safety issues. Self-Climbing Scaffolding is equipped with features that assure high accuracy while ensuring a safe working environment. The Self-Climbing Scaffolding has the potential to be sold to potential IBS users, particularly IBS contractors. Based on the responses to an online questionnaire survey, the marketability potential of the ideas has been determined.