

**UNIVERSITI TEKNOLOGI MARA
PERAK BRANCH**

**EXTENDABLE FLAT CAGE WITH RFID TAG
FOR SEMI-TRAILER IN TRANSPORTING
PRECAST CONCRETE PANELS (IBS)**

NATRAH MUNIRAH BINTI ROSLI

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 : Natrah Munirah binti Rosli
Student I.D. No. : 2019495398
Programme : Bachelor of Science (Hons) Construction Technology
Faculty : Faculty of Architecture, Planning & Surveying
Innovation Project Title : Extendable Flat Cage With RFID Tag For Semi-Trailer In Transporting Precast Concrete Panels (IBS)
Signature of Student :
Date : August 2021

ACKNOWLEDGEMENT

First and foremost, Alhamdulillah, praise to Allah S.W.T, the Almighty, for bless me with a good health, abilities and gives me courage to perform and complete my work in successful manner and I believe without help of Allah, I was not able to finish this final year project. Even though I faced many difficulties to complete this report, with His strength and guidance, Alhamdulillah I managed to overcome it.

Greatest thanks to my supervisor Sr. Anas Zafiro Bin Abdullah Halim for his constant guidance as well as for providing necessary information, insightful comments, and improvable recommendations throughout completing this report.

I also admire the help and guidance of Dr. Asmat binti Ismail and Prof. Madya. Ts. Dr Siti Akhtar binti Mahayuddin, my lecturers for this innovation courses. Thank you for teaching me the proper writing guidelines to produce a good report. Also to your crucial advice and endless encouragement throughout the semester.

Not to forget, I would like to express my gratitude to my lovely parents for always supporting and encouraging me to not give up. I would not be able to complete this assignment without their physical and mentally supports.

Last but not least, my appreciation also extends to my seniors and fellow classmates for their support, guidance, and valuable information which helped through various parts of this project. Their valuable opinions and suggestions on this project gave me the strength to improve till the end.

TABLE OF CONTENTS

CONTENTS	PAGE NUMBER
Author's Declaration.....	i
Acknowledgement	ii
Table of Contents	iii
List of Tables	viii
List of Figures	ix
List of Abbreviations	xi
Abstract	xii
CHAPTER 1	1
INTRODUCTION	1
1.1 Background of Study.....	1
1.2 Problem Statement	3
1.3 Research Questions	4
1.4 Research aim and Objectives	4
1.5 Scope of the Study.....	5
1.6 Limitation of the Study	6
1.7 Significant of Research	6
1.8 Outline of Report.....	7

ABSTRACT

Transportation in delivering Industrialized Building System (IBS) components from the manufacturing plant to the final project site need a proper carrier especially for precast products as nowadays it very popular in constructing high-rise residential buildings. This stage can influence the efficiency of the whole construction process. The study's aim is to provide a new innovation idea for a transportation logistics system in the construction industry, specifically for IBS products which is precast concrete panels. This study is carried out through literature review research from various articles to analyze transportation issues in delivering precast concrete panels around the world. From the review, it is found that the issues involve the limitations in carrying different types of precast panels such as precast wall and slabs resulting in more than one different trailer needed. Besides that, lack on the security of the precast products during transportation and stability of the existing cage could cause an accident and delay in receiving the components. By identifying all the issues, it provides the opportunity and platform to propose the innovation idea. As an outcome, an innovation proposal is presented to address the highlighted issues while also promoting a sustainable product in achieving SDG and additional technologies is added in parallel to achieve IR4.0. The innovative cage is called Extendable Flat Cage with RFID tag. Furthermore, a simulation is created using SketchUp software to help with the idea's development and visualization in assembling and performances of the product. The marketability of the innovative cage is evaluated by distributing an online questionnaire to the precast manufacturers, contractors, and other players in construction industry. As the outcome, the innovative cage is beneficial to the potential users and has a potential to be marketed.