

**UNIVERSITI TEKNOLOGI MARA
PERAK BRANCH**

**THE APPLICATION OF ICE FLAKES IN
PRECAST CONCRETE SLAB**

AIMI WAHIDAH BINTI MUZAMMIL

Innovation project report submitted in partial fulfilment
of the requirements for the degree of
Bachelor of Science (Hons.) Construction Technology

Department of Built Environment Studies and Technologies

AUGUST 2022

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 : Aimi Wahidah Binti Muzammil
Student I.D. No : 2020869342
Programme : Bachelor of Science (Hons.) Construction Technology
Faculty : Department of Built Environment Studies and
Technologies
Innovation Title : The Application of Ice Flakes in Precast Concrete Slab
Signature of Student :
Date : August 2022

ACKNOWLEDGEMENT

Alhamdulillah, praise to Allah, the Most Merciful, the Most Graceful. Firstly, I would like to thank to Dr. Asmat Binti Ismail and Dr. Suryani Binti Ahmad the lecturer of UiTM Perak Branch Seri Iskandar campus for giving the opportunity to finish this final report which is BCT654 for this Semester 6. Besides that, I also want to expand the deepest gratitude for those who are allocating their time to help. Therefore, I have learned something about the course. In addition, I am also grateful that my friends have given valuable information about this assignment. They also show good communication and cooperation by always being happy and willing to help in any confusions about the innovation approach by the Industrialised Building System (IBS).

Therefore, I would like to thank the Department of Built Environment Studies and Technology UiTM Perak Branch Seri Iskandar, especially the lecturer that taught and gave their comments about the assignment to make it clear and easy to elaborate the details of this assignment as well. Not to forget also, a million thanks to family members that have supported and motivated me to finish this report. They also share their ideas about this topic and give suggestions to improve the assignment. Lastly, thank you so much for those who are involved in completing this assignment, without them I cannot accomplish this report on time.

TABLE OF CONTENT

Author's Declaration	ii
Acknowledgement	iii
List of Figures	vi
List of Tables	vii
Abstract	viii
CHAPTER 1.0 INTRODUCTION	
1.1 Background of Study	2
1.2 Problem Statement	3
1.2.1 Strength of Concrete	4
1.3 Research Question	5
1.4 Research Objective	5
1.5 Scope of Study	6
1.6 Limitation of Study	6
1.7 Significant of Innovation Idea	7
CHAPTER 2.0 LITERATURE REVIEW	
2.1 Introduction	9
2.2 Innovation Approaches	10
2.2.1 Expanded Polystyrene	11
2.2.2 Wood Based Concrete	13
2.2.3 Concrete Slab with Bubbles	15
2.2.4 Steel Concrete Composite Slabs System	17
2.3 Development of Innovation Idea	19
CHAPTER 3.0 MATERIALS AND METHODS	
3.1 Introduction	20
3.2 Innovation Design Framework	22
3.3 Data Collection Methods	23
3.3.1 Secondary Data Collection	23

ABSTRACT

The expansion of Malaysia's economy is now greatly influenced by the construction sector. A rather common occurrence in concrete constructions is crack development, which allows water and different types of mixture into the concrete and affects its durability and strength. Ice flakes are utilised to address the issue of cracks. It helps in slowing down the cement hydration process and improves the durability and strength of concrete. (Manaratain, 2020) Additionally, the prefabrication technique is replacing conventional processes in the Malaysian construction sector in favour of ones that are more methodical and mechanized. Prefabrication is also known as Industrialized Building Systems (IBS). It is currently becoming more significant in the building sector, exceeding all traditional approaches. Enhancing the strength and quality of concrete is the focus of the study on concrete innovation. The objective of this study is to determine whether there was a precast concrete defect in the Industrialised Building System (IBS). Next, to identify strategies for producing replacement materials at a precast concrete building site and overcoming defects. Last but not least, to analyse the marketing potential of the proposal materials in concrete.