



**DEPARTMENT OF BUILDING  
UNIVERSITI TEKNOLOGI MARA  
(PERAK)**

**PRACTICAL REPORT TITLE:  
THE CONSTRUCTION OF FLAT  
SLAB**

**Prepared by:**

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**UiTM ID NO**

2019425396



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**DEPARTMENT OF BUILDING  
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING  
UNIVERSITI TEKNOLOGI MARA  
(PERAK)**

**FEBRUARY 2022**

It is recommended that the report of this practical training provided

**By**

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**entitled**

**THE CONSTRUCTION OF FLAT SLAB**

be accepted in partial fulfillment of requirement has for obtaining Diploma in Building.

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**DEPARTMENT OF BUILDING  
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING  
UNIVERSITI TEKNOLOGI MARA  
(PERAK)**

**AUGUST 2021**

**STUDENT'S DECLARATION**

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at NH IVORY HOME Sdn Bhd for duration of 20 weeks starting from 23 August 2021 and ended on 7 Jan 2022. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

.....  
Name : Nurfarah Hanim BT Mohammad Fadzil  
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Date : 10 JANUARY 2022

## **ACKNOWLEDGEMENT**

Alhamdulillah, praise to Allah, the Most Merciful, the Most Graceful.

In my internship, I have put forth effort. Nevertheless, it would not have been feasible without the generous support and assistance of many people. I'd want to convey my heartfelt gratitude to the following group of incredible people for their guidance, counsel, and assistance throughout the training period. First and foremost, I would like to thank En Alhafiz and En Afiq for the chance to undertake my training in their prestigious firm. His team of professionals comprising of Erfan Afandi, Alya Batrisyia, Hanisah Subbari and Mary Cherryid have allowed me to have a better understanding, knowledge, and feel for real-world projects, as well as the theory involved in structural, building, and civil engineering analyses. They are also responsible for assessing my training. They extended their cooperation and support to help me improve my knowledge in the areas of construction and site administration.

I would also like to thank ALL the UiTM lecturers that have taught and nurtured me in becoming a better student and person. I would also like to extend my deepest appreciation to the lecturers who are directly involved during my training stint. To Ts. Nur Syazwani Binti Wan Mohammad as my Supervising Lecturer. Evaluation Lecturer and Practical Training Coordinator, DR Nor Asma Hafizah BT Hadzaman and Dr. Dzulkarnaen Bin Ismail, Programme Coordinator, I value the time, effort, encouragement and ideas that they have contributed towards the successful completion of my training, this report and the valuable knowledge that have been shared over the last few semesters.

In addition, I'd want to express my gratitude to my fellow interns for their encouragement throughout the internship and for those who volunteered to assist me with their skills.

Last but not least, I want to express my gratitude to my loving parents for all of their efforts over the years. In exchange, I will work hard in this course to succeed and make them pleased of our good marks, and in order to do so, I will put 100% effort into all I do. Thank you, a lot.

## **ABSTRACT**

A flat slab is a two-way reinforced concrete slab that typically lacks beams and girders and transfers loads directly to the supporting concrete columns. However, there is currently limited research into flat slab construction for residential buildings. Therefore, this report will discuss about the construction of flat slab and conducted at No.14, Jalan Utama, Felcra Nasaruddin 32600 Bota, Perak Darul Ridzuan. The objectives of this report are to describe the methods of flat slab and to investigate the problems occurred and solutions taken to solve the problems during the flat slab construction. Furthermore, this study is conducted by using three appropriate method such as observation, interview, referencing book, journal, notes and internet. As a result, there are 5 methods to construct flat slab and so, the first step on how to construct flat slab is Excavation and landfill and lastly finishes. However, there are three problems occurred during the process of constructing flat slab. As a conclusion, knowing the proper and details of constructing flat slab is required especially for contractors that are ready to start working on a project right away.

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## CHAPTER 1.0

### INTRODUCTION

#### 1.1 Background of Study

A flat slab is a two-way reinforced concrete slab that typically lacks beams and girders and transfers loads directly to the supporting concrete columns. This type of construction may be called as beam-slab construction. Flat slab also called beamless-slab, in which the slab is supported directly by columns without the use of beams. In the easiest way to explain, flat slab is a reinforced concrete slab that is supported directly by concrete columns without the use of intermediate beams. (S.S. Patil, 2014)



*(Figure 1.1 Flat slab on progress)*

There are four types of flat slab generally used in buildings, Simple flat slab, Flat slab additional drop, Flat slab with column head and Flat slab added drop with column head. There are indeed many types of flat slab, however the aim of this study is to discover the construction of simple flat slab. They have numerous advantages in terms of architectural flexibility, space utilisation, formwork ease, and construction speed (ELNASHAI, 2019). Flat-slab construction has a number of advantages over traditional slab-beam-column building, and it is widely used throughout the Middle East and Mediterranean. However, the flat-slab construction's structural efficiency is hampered by its low performance towards earthquake hazard. (M. Altug ERBERIK, 2014). As a result, it's much more essential to study the construction of flat slab.

## **1.2 Objectives**

The main objectives in this study are:

- 1) To describe the methods of flat slab.
- 2) To investigate the problems occurred and solutions taken to solve the problems during the flat slab construction.

## **1.3 Scope of Study**

This study is carried out at No.14, Jalan Utama, Felcra Nasaruddin 32600 Bota, Perak Darul Ridzuan. This project was primarily started on 10<sup>th</sup> of September 2021. It consists a one storey bungalow and the focus of this study is the construction of simple flat slab. Throughout this report this study will be about the methods of installation. Such as materials and machineries used, the time and cost to complete the flat slab from before the installation until it finished, specifically for this site since it located in rural area. Last but not least the problems that may and will occurred and the solutions to counter the problems.

## **1.4 Methods of Study**

- 1) Observation

The observation done by observing the methods of constructing the slab for eight days with phone and camera to record all the steps. While laptop, tablet and notebook used to write notes that may not be taken by the camera.

- 2) Interviews

To obtain specifics information, CEO and COO of NH Ivory Home will be interviewed. The interview will be about what type of BRC did the company used, how many days for this project will be taken to complete a slab and from where do the company ordered the materials they needed. To understand more about flat slab, skilled worker will be

asked at site about the details. It can be in constructed interviewers and unconstructed interviews. The details were about how to set up the formwork, how to pour the concrete and what grade of concrete used and what machineries involved in order to completing the slab for this project.

### 3) Document Reviews

By referring company profile that have been published since 2014 and updated 2021 version. The company agreement was reviewed in order to gathered the ongoing projects and completed projects details. The construction drawings of the chosen site which is Felcra Nasaruddin's site was chosen instead of architect's plan since it easier to understand. Progress report that has been done by the site supervisor in charge and not forget to mention, the report also by referring Critical Path Method (CPM).

## **CHAPTER 2.0**

### **COMPANY BACKGROUND**

#### **2.1 Introduction of Company**

NH IVORY HOME SDN.BHD is a new company started in 2017. Despite being a new company, they already have built more than 30 houses. The company's focus is to involve in construction based on the latest technology as well as strength in terms of systematic and high quality of houses. In order to help the company, gain trust from various customers who will and deal with them. NH IVORY HOME also build houses based on the customer's taste from scratch. (Nh Ivory Home, 2021)

The company only build exclusive home with high quality hotel-like specs. In the living room, the specs will be L-Box as the finishes, T5 lamp, and fixed aluminium window. As for the bathroom, there will be 3 in 1 shower head, smooth tiles decorative type from floor to ceilings, toilet and the floor will used rough tiles. (Nh Ivory Home, 2021)

Every once in a month, the company will hold an event called "Launching" to attract clients and customers. Those events would be contest and online floor plan consultation. Many targeted clients were hooked on online floorplan consultation as it a very easy way for them to communicate and less time and money wasted just for a consultation.

Nh Ivory Home focused on social media to broaden their wings in business world. The social media used by the company are Facebook, Telegram, Instagram, Tiktok, Youtube and most important one is Whatsapp. Mainly, many customers came from Facebook page because most of the customers were in their 40s until 60s. Older people preferred Facebook other than any other apps to search anything and everything, that's why social media has been the most important marketplace for Nh Ivory Home.

## 2.2 Company Profile



*Figure 2.1: Nh Ivory Home Sdn Bhd Official Logo*

**Company Name** : Nh Ivory Home Sdn Bhd.  
**Company Register Number:** 20200101283 (1369193 - H)  
**CIDB Grade** : G2  
**Registered Address** : NO 70 A, Persiaran SIBC 4, Pusat perniagaan Seri Iskandar,  
32610 Bandar Baru Seri Iskandar, Perak Darul Ridzuan.  
**Telephone** : 019 8131 185  
**Email** : [nhivoryhomehr@gmail.com](mailto:nhivoryhomehr@gmail.com)

NH IVORY HOME SDN BHD is located at NO 70 A, Persiaran SIBC 4, Pusat perniagaan Seri Iskandar, 32610 Bandar Baru Seri Iskandar, Perak Darul Ridzuan. The company is a Gred 2 in construction and have two founder the CEO and the COO. The CEO is En. Muhammad Alhafiz and the CEO is En. Muhammad Afiq also the most interesting part is both of them are 24 years old, young and ambitious men who wants to help youngsters like them to work and gain knowledge. That was the reason why the company only have young people in it. (Nh Ivory Home, 2021)

The company' Vision is to be leader in private housing in the field of construction of exclusive bungalows and premium property developers with competitive prices and designs to suit customers' tastes by the year of 2023. As for the Mission, the company will have 50 employee and full equipped facility also infrastructure in construction. Then the company's sales will reach RM 25, 000.00 and lastly NH IVORY HOME will have 3 branches in Perak, Kedah and Selangor. (Nh Ivory Home, 2021)

Two division were divided to run this company and it were Marketing and Operation. As for marketing it will be lead by Encik Hafiz while operation will be lead by Encik Afiq. With two head the company can ran the company smoothly and easier since they both can focused on one thing.

## 2.3 Company Organization Chart

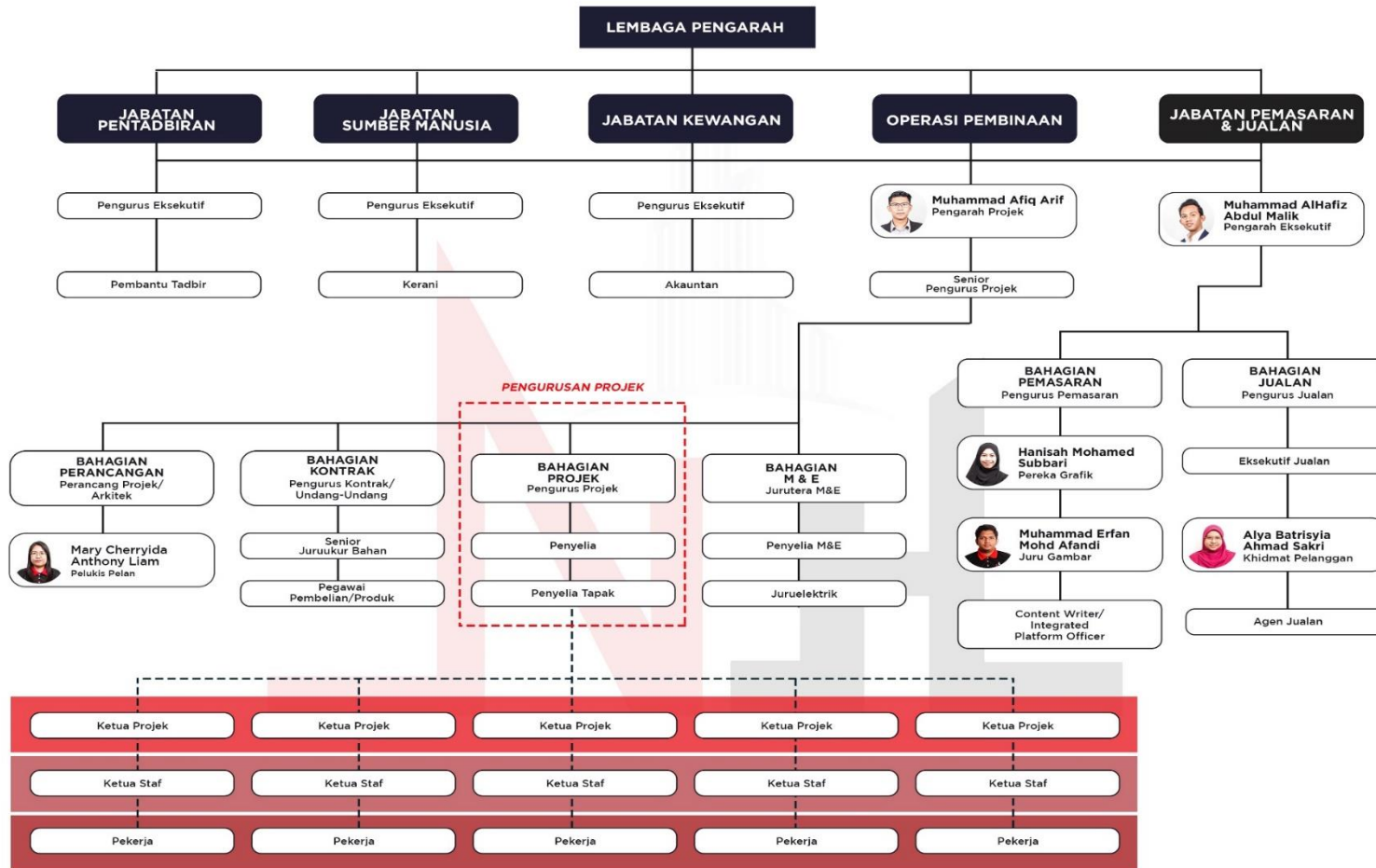


Figure 2.2 Organization Chart



## 2.4 List of Projects

There are two completed projects along my journey of practical training in Nh Ivory Home. In one more month, there will be three more completed project.

### 2.4.1- Completed Projects

No.	Project Title	Project Value	Start Date	Completion Time	Project Duration	Client
1	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI NO.1, KAMPUNG SUNGAI WANGI, 32400 AYER TAWAR, PERAK DARUL RIDZUAN.	RM195,000.00	16/12/2020	16/4/2021	4 MONTHS	ABDUL HASIF BIN ABDUL HALIM
2	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI LOT 11568, RPT ALOR BAKONG, 36200 LANGKAP, PERAK DARUL RIDZUAN.	RM165,000.00	9/11/2020	9/3/2021	4 MONTHS	PN. KAMARUZIAH BINTI ISHAK

### 2.4.1- Project in Progress

Currently there are nine projects in total and there will be five more projects for the first month of 2022.

No.	Project Title	Project Value	Start Date	Client
1	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI KG ANAK KURAU, BATU KURAU, 34500 TAIPING, PERAK DARUL RIDZUAN.	RM272,000.00	5/1/2021	YUSRI BIN ZANUDIN
2	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI NO.14, JALAN UTAMA, FELCRA NASARUDDIN 32600 BOTA, PERAK DARUL RIDZUAN.	RM252,340.00	10/9/2021	ALI OSMAN BIN HAJI LAHAKIM

3	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 2 TINGKAT BANGLO EKSKLUSIF DI 316, JALAN MELOR, FELDA TROLAK SELATAN, 35600 SUNGKAI, PERAK DARUL RIDZUAN.	RM167,500.00	6/10/2021	HANIF BIN ABDUL RAHMAN @ ABDUL RADZI
4	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT SETENGAH BANGLO EKSKLUSIF DI LOT 1434, NO.22, LORONG MASJID 4, KAMPUNG BAHAGIA 36000 TELUK INTAN, PERAK DARUL RIDZUAN.	RM281,500.00	26/4/2021	HAJI ABDUL NASSIR BIN OTHMAN
5	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI LORONG SRI SAGA, 36600 CHENDERONG BALAI, PERAK DARUL RIDZUAN.	RM184,950.00	27/5/2021	MUHAMMAD FERDAUS BIN SELAMAT

6	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH BANGLO EKSKLUSIF SATU TINGKAT DI LOT NO.8085, PERSIARAN WIRA JAYA BARAT 50, DESA PERWIRA, 31500 IPOH, PERAK DARUL RIDZUAN.	RM111,900.00	12/10/2021	SULAIMAN BIN HAMZAH
7	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI LOT 15835, JALAN LINGKARAN AMAN, RPT DESA SERISIKANDAR, 32600 SERI ISKANDAR, PERAK DARUL RIDZUAN.	RM193,185.00	3/11/2021	ZETY AZNIN BINTI AZMI
8	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 2 TINGKAT BANGLO EKSKLUSIF DI 316, JALAN MELOR, FELDA TROLAK SELATAM, 35600 SUNGKAI, PERAK DARUL RIDZUAN.	RM165,000.00	6/10/2021	HANIF BIN ABDUL RAHMAN

9	CADANGAN MEMBINA DAN MENYIAPKAN RUMAH KEDIAMAN 1 TINGKAT BANGLO EKSKLUSIF DI LOT 359056, TANJUNG DAMAI 12, RPT TANJUNG DAMAI, 31150 ULU KINTA, PERAK DARUL RIDZUAN.	RM169,000.00	30/11/21	SITI HASIMAH BINTI HARUN
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## CHAPTER 3.0

### THE CONSTRUCTION OF FLAT SLAB

#### 3.1 Introduction to Case Study

The project take part at No.14, Jalan Utama, Felcra Nasaruddin 32600 Bota, Perak Darul Ridzuan. This project is to build a single-storey house marked as Exclusive Bungalow. This project started on 10<sup>th</sup> of September 2021 and will be finished on 3<sup>th</sup> of March 2022, exactly 171 days and the cost for this project is RM252,340.00 cash. In this study will explain and describe all methods of construction of simple flat slab. It will involve the method statement, design by structure, specification of the flat slab, machineries and equipment, details and work involve also recommendation use in this construction. Below is the location of the site.



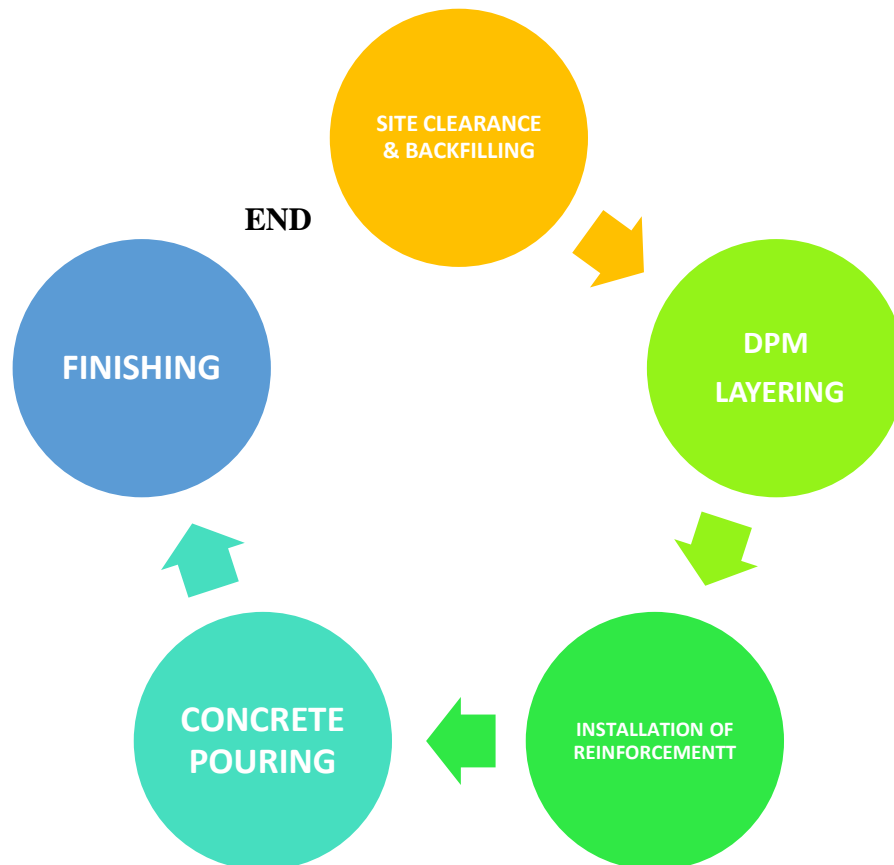
*Figure 3.1: Site Map*



*Figure 3.2: Site front view*

### 3.2 Method of Constructing Flat Slab

Flat slabs, also known as beamless slabs, are slabs in which the floor slab is supported directly on columns rather than by beams or girders. Flat slab construction is one of the quickest ways accessible. Because this is one of the most prevalent types of building, lead times are relatively short. Constructing a flat slab is easy but it needed to be precise or else it will crack.



*Figure 3.3 Method of constructing flat slab*

### 3.2.1 Site Clearance & Back Filling

Site clearance carried out as part of enabling works to prepare a site for construction. In this process it involves the removal of vegetation and surface soil, as well as the levelling and preparation of the ground for the planned construction works. The project taken at sites that still have trees and an old house, so it needs to be clear first in order to do the next step. In this process, it requires heavy equipment such as backhoe.

As for back filling, it's a process of reusing and putting back the soil that have been put aside during excavation work. The soil needs to be compacted in order for it to not moving and to make the process of constructing slab easier. This process also using backhoe to do the work.

Not to forget anti-termite that will come after back filling to keep the soil safe and killed all the unwanted bugs that one day will destroy the house.

It took 5 days in total and cost RM530.00.



*Figure 3.4: Site clearance*



### 3.2.2 DPM Layering

Damp proof membrane or DPM is a material that applied before concreting to prevent moisture transference. Without it, the water that came from the soil will damaged the concrete and will bring danger to the house owner. It is not enough without DPM, so this process is really important so it won't bring any hazard in the future.

The site's soil is a red soil so the moisture content of it is a lot so by putting the DPM the water will be secured and will not bring danger to the concrete. The correct way to laid DPM is by seal it with gas-proof tape, this is stated by the Building Regulations requirement. It will protect from any gases in between the DPM and soil.

DPM Layering took a day to lay and it cost RM470.00.



*Figure 3.5: DPM Layering*

### 3.2.3 Installation of Reinforcement Bar

In this process, BRC wire mesh A7 used as the reinforcement. It helps increase the efficiency of the building. The workers would just put the BRC down on top of the DPM. It is easier to install since it welded and don't need to tied together using wires, so it won't need many manpower and can cut cost and time from there.

The workers at this site are very skilled and can done all the process of work within two days.

2 days has been taken to install reinforcement bar and it cost RM760.



*Figure 3.6: Rebar Installation*



### 3.2.4 Concrete Pouring

When the DPM is in the positioned, Grade 25 concrete used to pour on it. The concrete was ordered from LTH Group Holdings SDN BHD. In order to pour the concrete, machineries involved in this step was mobile crane. The concrete is poured onto the reinforcement, and the workers distribute the concrete.

It took a day to do the work and it cost Rm2750.00.



*Figure 3.7: Concrete Pouring*



*Figure 3.8: Mobile Crane to pour the concrete*

### 3.2.5 Finishes

After the concrete has dried half way, cement powder and water are poured to create the finishing layer of the concrete and the curing part will start for one whole week.



*Figure 3.9 Finishes*



*Figure 3.10 Finishes*

Overall, all the methods took about 10 Days not included curing because in order for the concrete not hardened way too fast, the workers will do any other job because it takes a week or two to wait for the concrete to mature enough. 14 days is way much better. Total cost to construct flat slab for 1910 sqft house is RM4510.00 in total.

### **3.2 Problems occurred and solutions to solve the problems.**

The problems that were faced during the construction of flat slab was cancelled concrete that have been done by the site's worker. They cancelled the concrete without telling anyone and bring major problem to purchaser. This is because, purchaser afraid to lose trust from the concrete's company. That day was supposed to be concreting day. To solve this problem, site supervisor go met the worker right away to clear all the misunderstanding. Apparently, the worker ordered concrete too from the same company but ordered through the owner of the project's house since the owner knew concrete's company better and can make it way faster. The site officer in charge reported it to COO of NH Ivory Home and everything is settled. Nothing delayed and followed the requirements.

Next problem that occurred during the construction of flat slab was rain. It was raining during anti-termite step. So, it was delayed for another day, that's why it takes 2 days for anti-termite. The solutions for this problem are to read the weather forecast first so the worker and the materials used won't get wasted because for one tank (4 liter) anti-termite is RM80.

Lastly, hardware supplier doesn't want to cooperate until the payment got done first. It delayed and dragging the time. The worker for this site is very strict about time, they wanted it to be fast so they can do the work faster that's why sometimes they ordered it from the project's owner. The solution for this kind of problem is simple, to make the payment faster so that the things for constructing flat slab can reached the site faster too.

## **CHAPTER 4.0**

### **CONCLUSION**

The highlighted purpose of this five-month long study was to focus on the construction of flat slab, the methods, the time and cost to complete flat slab and the problems occurred and solutions taken to solve the problems during the flat slab construction. The objective as indicated from chapter 1 have been met greatly. There are 5 methods to constructing flat slab from excavation and backfilling to finishes. Also, there were an extra information and that is about soil. Few types of soil that have been existed around Malaysia but for this study's project the soil that have been learned was red soil and its dampness. It is very important to truly understand the process of flat slab. To make sure no mistakes can be made during constructing and bring hazard in the future and results to structure failure.

To summaries, the construction of flat slab must adhere to standard specifications while incorporating a variety of additional materials to avoid problems. Even though the construction still has to comply with the requirements, doing so could lead to issues and possibly even a bad reputation for the contractor. It took 10 days for flat slab to finished and the total cost for it is RM 45100.00. Overall, there only three small problems occurred and mostly on miscommunicating with site workers but every problem must have ways and so there are also three solutions for each of the problems.

NH Ivory Home Sdn Bhd motivated to deliver the best quality of work and build the highest-quality walkway for clients. Lastly. this study permitted the contractor or construction expert to read in order to get valuable knowledge that might be applied to future projects.



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