B) FRONT COVER

DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

THE CONSTRUCTION OF FOOTING (PAD FOUNDATION)

Prepared by:

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DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

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(PERAK)

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It is recommended that the report of this practical training provided

By

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entitled

THE CONSTRUCTION OF PAD FOOTING

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)

JANUARY 2022

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 January 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.

…….

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Date : 7 January 2022

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

I would like to extend my heartfelt gratitude for the guidance, advice and help rendered throughout the period of training by the following group of amazing individuals. First and foremost, I would like to thank Encik Afiq and Encik Hafiz for the opportunity given, to conduct my training in his esteem company. His team of professionals comprising of draughtman Mary Cheldira, Fatin Idayu Inspector , Cik Nureeen Afrina as a purchaser, Encik Kamil Bin Ramlee, Encik Erfan Affandy as photographer and content creator, Cik Nysa as graphic designer and Cik Aliya Batrisya as a customer services, have enabled me to learn and develop my understanding, knowledge and feel of real time projects, and the theory involved in analysis of structures, building and technical works. They are also responsible towards streamlining and assessing my training. . It is an honour for me to be given the opportunity to ‘work’ with all of you.

Besides, I would also like to thank ALL the UiTM lectures that have taught and nurtured me during my studies. It is always a pleasure to remind the fine people in the UiTM for their sincere guidance I received to uphold my practical. To Ts. Wan Nur Syazwani Binti Wan Mohammad , Supervising Lecturer, Ts. Muhammad Naim Bin Mahyuddin, Evalution Lecturer, Miss Azizah Talkis and Ts. Muhammad Naim Bin Mahyuddin, Practical Training Cooprdinator, DR. Dzulkarnaean 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. Last but not least, my special thanks to my beloved parents for their sacrifices over the years.

Thank you so much.

ABSTRACT

Footing are one of the most important structure elements of a building. It is the core structure of a building and the head structure. Its constructed by digging hole to the ground, fit and finish with concrete and land filling .However, currently there is limited research conducted on proper construction of pad footing especially in residential building. Therefore, this report will discuss about work for the pad footing of the residential building. This report was conducted for The Construction of One Storey Bunglow House at No 14, Jalan Utaman, Felcra Nasaruddin 32600 Bota, Perak Darul Ridzuan that owned by Tuan Ali Osman.The objectives of this report is to describe the construction method of pad footing, to analyze time and cost for construction of foundation/footing and to determine the problem and solutions taken to solve the problem. In addition this study also using 3 appropriate method for example observation, interview, documentation analysis and internet research. As a result to construct the pad footing there are 9 steps to follow. These are planning, site clearance, crafting work, setting out, reinforcement bar and formwork installation, concreting work, stump and back filling.However, there are problem during the construct the pad footing for example the problem related with weather and workers. As the conclusion, the pad footing are important to the building because it is the core structure. Therefore knowing the proper construction of pad footing is required for contractor and workers to construct pad footing accordingly to achieve time,cost ,quality and safety.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

Footing is the sub-element in structural work for any construction. It is the first sub-element before ground beam and it is one of the most important parts of the structure that function to transfer the load from the building to the underlying soil. (Jeasika Jeyakumar 2016).Secondly, as a resist frost which preventing the building from moving.(Tahir et al. 2019) There are 2 types of foundations shallow and deep. Deep foundation commonly use for large construction and they are pile and drilled shaft. Another type is shallow foundation like isolated footing, combine footing, strip footing, spread footing, raft footing, strapped. To be detailed, isolated footing can be pad footing, stepped and sloped. (Ravin Desai 2020)

Each of the footing has a different uses. So strip footing base on load bearing wall also known as wall footing. The width footing of the load bearing wall wider than the wall. The advantages of this type footing are very simple in designing and not required for expensive tools and material to construct.However the disadvantages of strip is low durability and high cost in construction. Plus, inability to make monolithic binding of the floor to the basement.(Ravin Desai 2020) Isolated footing can be pad, stepped and sloped. Square , rectangular or in circular shape. Stepped are design purpose to keep the metal from corrosive in the way preventing contact from direct to the soil. Combined footing are 2 or more column supported by a single footing. But in need consider when to use it if when the column close to another and could be overlapping, the soil is low bearing capacity and need more area under individual footing and other case if the column end is located near the property line and the footing cant extend. Raft is type foundation that cover the whole area under the structure (RCC slab).Used when heavy structure on a soft ground and other name is mat foundation. (Tahir et al. 2019)

However there are precaution in designing the footing. The combined dead load, imposed load, and wind load should all be transmitted to the ground by the foundation. The total amount of pressure applied to the soil should not exceed its safe bearing capacity. To avoid structural damage, the foundation should be constructed so that ground settling is limited and uniform throughout the building(Jeasika Jeyakumar 2016). To achieve economy in construction work, the entire design of the foundation, superstructure, and ground conditions should be studied. Other than that, the precautions for foundation work excavation. The foundation's depth and width should be determined by the structural design. The foundation's depth should not be less than 1 meter. The center line and level marked on the buries should be used to assess the length, width, and depth of the excavation. The excavated earth/material should be dumped 1 meter away from the edges. Work should be carried out on dry ground(Tahir et al. 2019). For pumping out rain water, a water pump should be set up. The foundation's lowest layer should be compressed. There should be no soft spots in the foundation caused by roots or other factors. Any soft or faulty areas should be excavated and filled with concrete or hard mate. So based on information above, a lot of types of footing and foundation but the aim of this study to discover the construction of pad footing from planning, construct until land filling.(Jeasika Jeyakumar 2016)

1.2 Objective

The major goal of industrial training is to get students to experience and understanding real-life scenarios in industrial organizations and their surrounding environments as well as to speed up the learning process of how their information may be applied practically. In addition, industrial training provides the exposure to practice and apply the skill we have learned in university at industrial training place so that we can sharpen more our skill and we also can gain new knowledge. While doing industrial training, the student can apply the skill they have learned and explore when they are in university to industrial training place. Students also can experience how to make decisions and solutions in handling a situation. Students also can develop a sense of responsibility toward society. They can also gain new knowledge and more exposure to real-life work. With industrial training, a student can get to know work ethics and develop communication skills while doing industrial training. With this,students can sharpen more skills.

The objective of case study :

1- To describe the method construction of pad footing
2- To analyze time and cost for construction of pad footing
3- To determine the problem occurred and solutions taken to solve the problem

1.3 Scope of Study

The case study was carried out in site located at Felcra Nasarudin (Tuan Ali Osman).To be specific based on the document, No 14, Jalan Utama, Felcra Nasaruddin, 32600, Bota, Perak Darul Ridzuan. It is project for construct premium house single storey bungalow house with 1910 square feet. Focusing on foundation on buildings, this type of footing is pad foundation. The material use for footing high tensile steel (y10) and mild tensile steel (r6) for the reinforcement bar. Concrete ready mix plus with hardener, G.I wire, backhoe.

1.4 Methods of Study

The method of studies that involve in this industrial training is by observation, interview, documentation and internet research. It is spontaneous when there are some of thinking or questioning in mind across. The interview or conversations are with supervisors and workers that cooperating while trainees internship. Some research by document or internet are for more info and facts.

1- Observation – The observation involve how to construct the pad footing by taking some notes, pictures and video and getting information from supervisor and workers at site. This observation are along the period of time I n internship in this company NH Ivory Home Sdn. Bhd.

2- Interview – To obtain more information on how the work on site, the interview was conducted by Chief Operation Officer by asking information for example the maximum length from footing to another footing. What are the types of stump used if the plan of the house not suitable. By knowing that, certain problem can be solve by it should be. Asking all information in detail.

3- Document analysis - To find facts and specification on constructing by reading and skimming office operation department notes prepared by Chief Operation Officer NH Ivory Home Mr.Afiq for example reinforcement bar specification, the drawing, calculations and formula, total cost and duration estimated.

4- Internet searching - searching from the internet for find the solutions for the problem occur for certain circumstances. To getting more information related to the construction of pad footing. The knowledge about pad footing are discovered by browsing video on how to construct the pad footing.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

Figure 2.1 : NH Ivory Home SDN BHD

NH Ivory Home Sdn. Bhd. is a company based in Seri Iskandar started officially in 2017. Although just begun to have a foothold in these field in the industry, over 30 houses was constructed under the company. So the company was registered in Malaysia under companies act on 25 January 2017. Their main principal are construction – based private construction in civil, electrical, sewerage and material. NH Ivory Home main focus are construction based latest technology and strengthen in terms of systematically and the best quality also detailing that could gain trust from all the customer that dealing with the company. NH Ivory Home builds homes based on the client desires 'From Concept To Creation'. (NH Ivory Home SDN. BHD. 2017)

Basically, this company do residential house as it name NH Ivory Home. So to be in detail, NH Ivory Home more focusing on premium houses build and they are not prefer to build a low budget house because base on the rate of ceiling price, package and specification given to the client. Moreover, the main targeted client are who wants to build their dream homes with their own concept. Some might prefer to modern tempo concept and based on their idea, will create a real plan to present.(NH Ivory Home SDN. BHD. 2017)

Company's sub-con is An Nafiz Global Enterpries.Mostly, workers in site for NH Ivory Home from Jawa, Indonesia and least from Madura. Every single site has 1 head workers like Agustus, Dalbo, Kuat Darwan and others, 1 semi-skilled worker and 1- 3 unskilled worker depend on their team. However staff in the office were divided by 2 team marketing and operation. Marketing jobs is to find project

quarter by quarter to reach KPI. Operation is the team that execute after marketing team closed project. That is little bit how the modus operandi of NH Ivory Home flow work.(NH Ivory Home SDN. BHD. 2017)

2.2 Company Profile

The company registered as NH Ivory Home Sdn. Bhd. (202001012873) (1369193-H). Head quarters or the base is located second floor in No 70A, Persiaran SIBC 4, Pusat Perniagaan Seri Iskandar, 32610 Bandar Baru Seri Iskandar, Perak Darul Ridzuan. In Lembaga Industri Pembinaan Dan Pembangunan Malaysia, this company is G2 (Specialization BO4, CE21) (0120210118-W066824) and leaded by 2 young entrepreneur 24 years old both. Encik Muhammad Alhafiz is the Chief Executive Officer (CEO) and Encik Muhammad Afiq Arif is the Chief Operation Officer (COO) of NH Ivory Home Sdn. Bhd. which both are very intelligence and ambitious aiming to break the monopoly also sceptical thinking people about youngsters. The vision NH Ivory Home are to be the leader in private housing in the field of construction of exclusive bungalows and premium property developers with competitive prices and designs to suit customers desire by the year of 2023. The steps to achieve that is the missions of the company, will have 50 employee and full equipped facility also infrastructure in construction by 31st December 2023. The company's sales will reach RM 25, 000.00 and also NH IVORY HOME will have 3 branch in Perak, Kedah and Selangor.(citation)

Table 2.1 : Company profile

Company	NH Ivory Home Sdn. Bhd.
Company Manager	CEO Muhammad Hafiz, COO Muhammad Afiq
Registration No	(202001012873) 1369193-H
Address	No 70A, Persiaran SIBC 4, Pusat Perniagaan Seri Iskandar, 32610 Bandar Baru Seri Iskandar, Perak
Contact	
Email	nhivoryhome@gmail.com
Company Ownership	100% Bumiputera

2.3 Company Organisation Chart

The organization chart of NH Ivory Home Sdn. Bhd. details about the position and their roles, responsibilities, connection between staff and interaction with one and other.

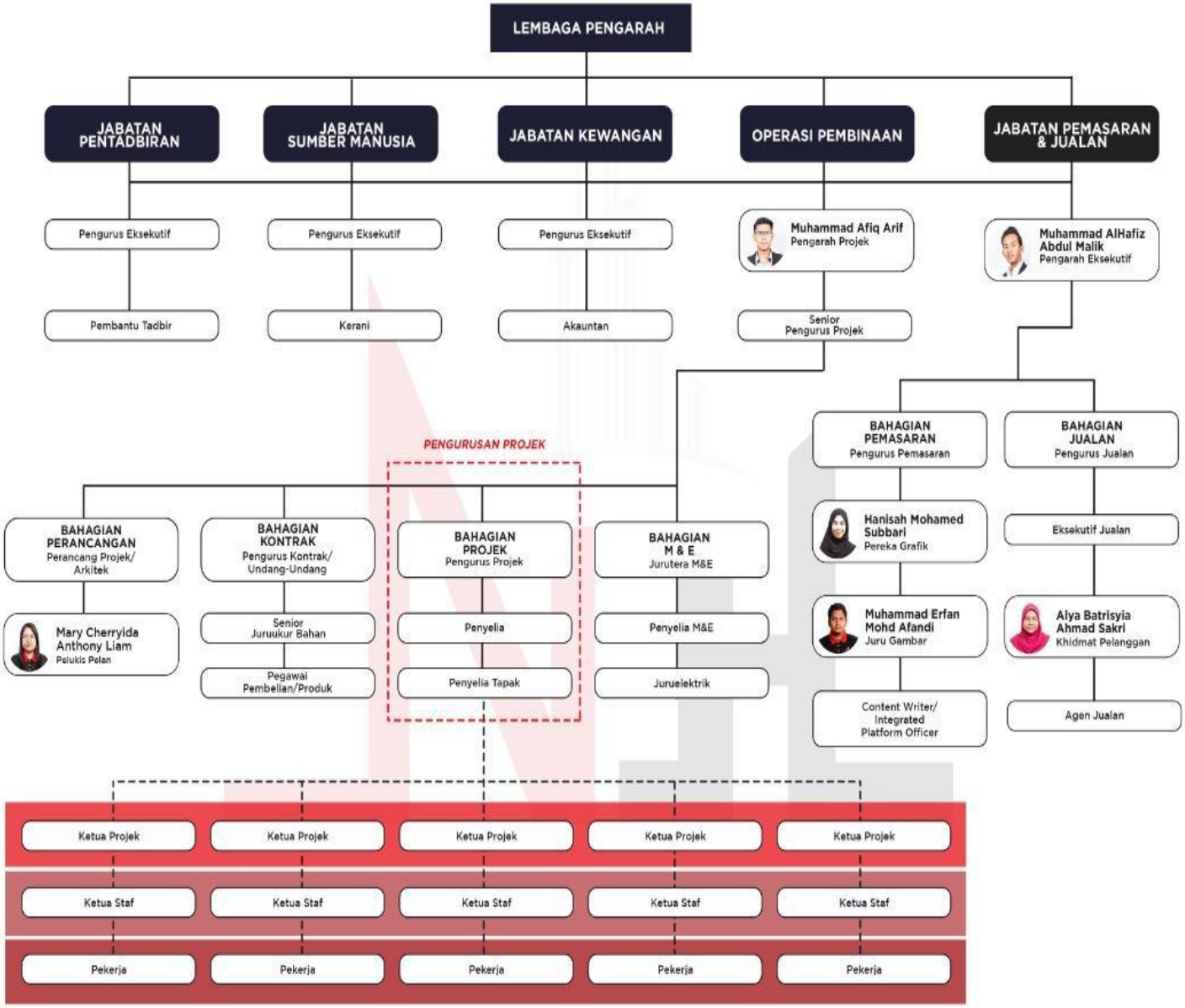

Figure 2.2 : Organization chart

Position and responsibility

Table 2.2 : Staff position and role

No	Name	Position & Job scope
1	Muhammad AlHafiz Abdul Malik	● **CEO of NH Ivory Home** -Share partner of the company -Overseeing ongoing projects. -Head marketing team -Closed project
2	Muhammad Afiq Bin Arif	● **COO NH Ivory Home** -Share partner of the company -Overseeing ongoing projects. -Head of operation team -Monitor project to make sure everything going as planning
3	Mary Cherrylda	● **Draughtman** -Make loor plan, make 3D plan for workers, staff and client -Redraw client plan to creation. -Doing new design for package.
4	Alya Batrisyia Ahmad Zakri	● **Customer service** -Interact with client -Arrange meeting between client and boss
5	Erfan Affandi	● **Photographer & Content creator** -Making content in socmed -Video editor
6	Hanisah Mohamed Subbari	● **Graphic designer** -Poster, editor, talent

2.4 List of Projects

Table below shows list of projects both completed and on going.

2.4.1 Completed Projects

Table 2.3.1 : Completed projects

No.	Project Title	Project Value	Start Date	Completion Date	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, PERSK DARUL RIDZUAN.	RM165,000.00	9/11/2020	9/3/2021	4 months	PN. KAMARUZIAH BINTI ISHAK

2.4.2 Project in Progress

Table 2.3.2 : On going projects

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 1 TINGKAT BANGLO EKSKLUSIF DI NO.291, JALAN BUNGA TERATAI 1, FELCRA NASARUDDIN 32600 BOTA, PERAK DARUL RIDZUAN.	RM189,810.00	NA	DIYANA BINTI AHMAD

CHAPTER 3.0

THE CONSTRUCTION OF PAD FOOTING

3.1 Introduction to Case Study

The case study is about pad footing construction. The project was started on 14 September 2021 and based on target it should be complete by 3 March 2022. The cost or quotation for this project are RM 296,050.00 excluded variation order (VO). The project still on going currently.The study will explained how actually construction of footing including the machinery and tools, the time that have been carry out and the problem and solution of the construction. However, this study case not focusing on manpower and costing but more on the way construct.

Figure 3.1 : Key plan

Sources : Google map

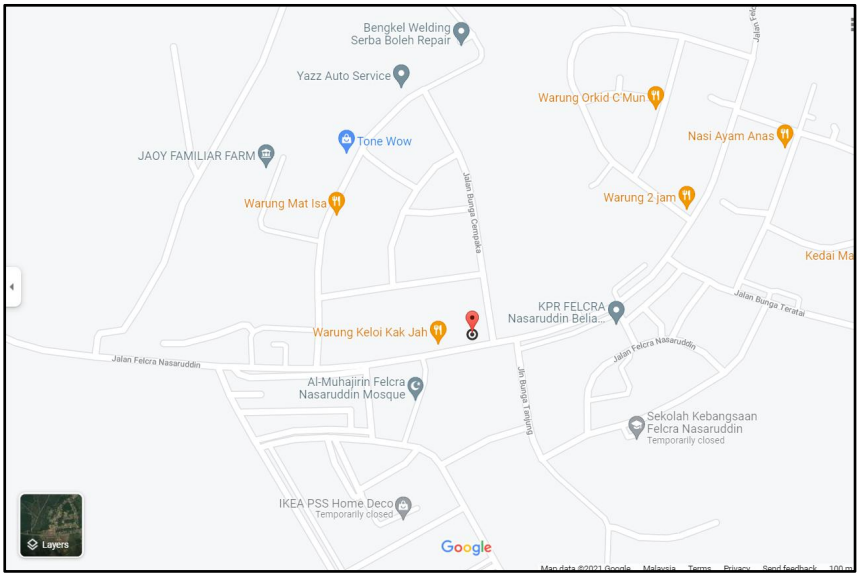

Figure 3.2 : Location plan

Sources : Google map

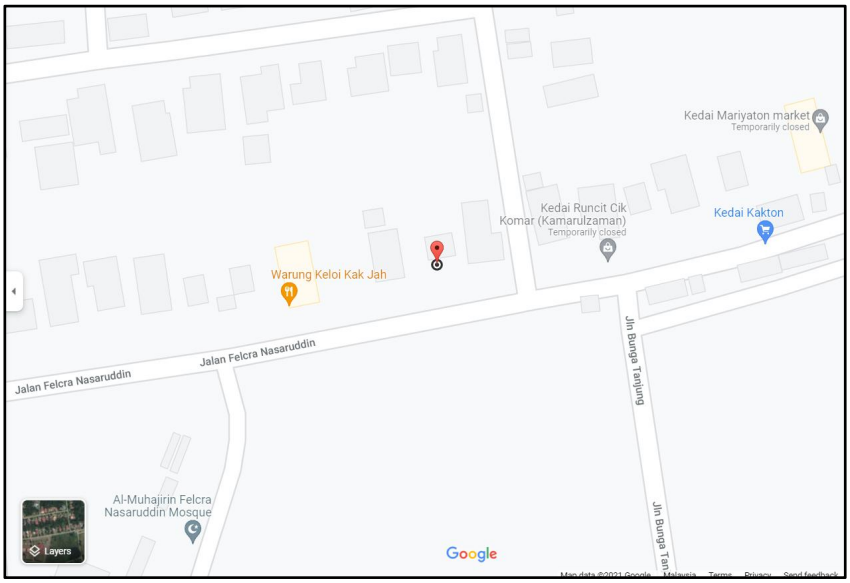

Figure 3.3 : Site plan

Sources : Google map

The project construction located at No 14, Jalan Utama , Felcra Nasaruddin , Perak Darul Ridzuan. This construction area is facing the main road of Felcra Nazaruddin. The area is quite secluded as it is still surrounded by palm field and in a rural area. The main buildings close to this construction area are Masjid Felcra Nasaruddin that just 20 meter from the site and Sekolah Kebangsaan Felcra. There are several existing housing buildings close to the construction area.

The activities that have been carry out on the site is setting out for footing. This technical work handled by head or line leader and also skilled workers to get a perfect footing construction. Head workers need to identify and read the plan to study the located points according to the plan.The skill worker also help to setting out the place and decide where to dump the soil after excavation process according to the several spots in the plan.with unskilled worker or called as 'kong'.The machineries and tools that involved in this construction are divided by 2 crafting and constructing. Crafting work need to have bar bender, hooker, steel wire, cutter, measurement tape, concrete mixer, leveling ink (maktau), hammer and wheel barrow. Machineries that used are concrete ready mix, mobile crane and backhoe.

Last but not least, the problems of footing construction will be determines throughout the process. The solutions of the problems also will be state after determine the problem of the process. This chapter will be focused on the method of footing (pad foundation), the time that have been use for footing process and the problem also the solution.

3.2 The construction methods of pad footing

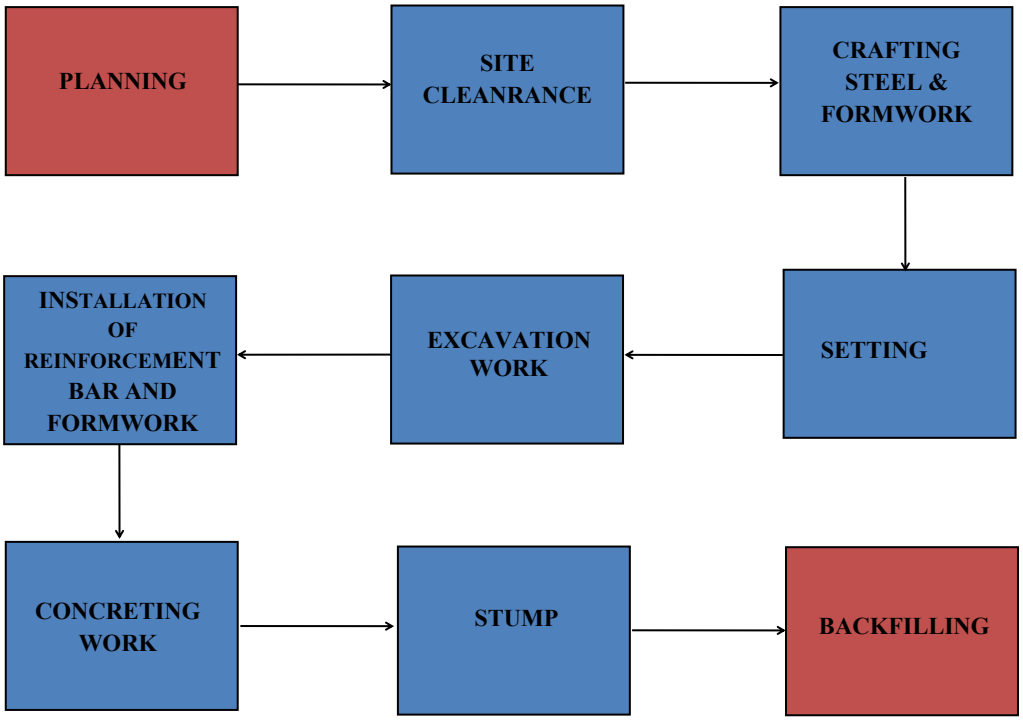

Figure 3.4.1 : Flow chart

1. Planning

Plan out the building lay out by referred the floor plan. Identify the load from the 3D plan and roof plan. Footing located and the spot drawn were used to be. The load calculated then present to the head department for approval with the budget. It delivered to make several copy for workers and staff. So what inside the calculation was amount of reinforcement bar used, concrete ready mix and duration of construction. Next phase purchase the right type and amount of the footing at the hardware according to the calculation. The type of steel use are high tensile Y10 and mild tensile R6, steel wire. The plan presented to the workers and get set to proceed to the field work.

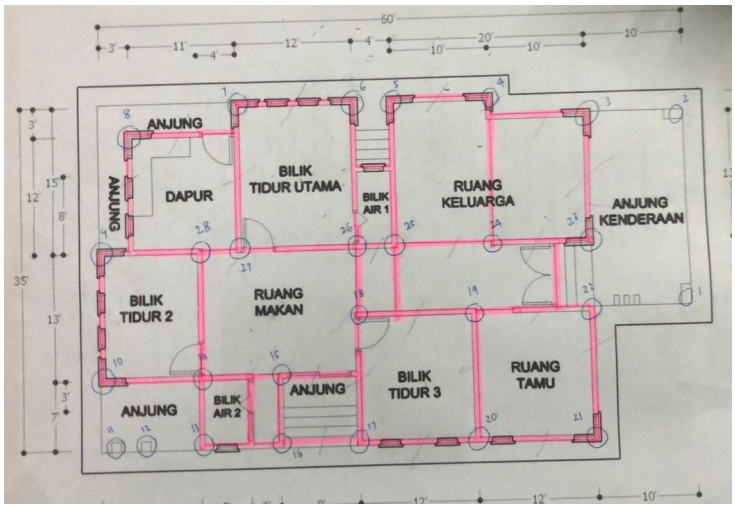

Figure 3.4.2: Footing planning

Figure 3.4.3 : Prelim material

2. Site clearance

Determine the project need to be piling or not and in this case no piling required. Proceed to the site clearance. The site must be free from debris and obstacles that disturb the entire process. Backhoe used to clear up anything and level the ground so the surface will be flat. Site clearance is very important because this is the phase where the core structure was constructed and the head of structure building. Moreover, site clearance is need to ease the workers so there is no obstacle during setting out.

Figure 3.4.4 : Site position

Figure 3.4.5 : Site clearance

3. Crafting steel and formwork

The materials that used was plywood 12mm thick, timber wood 1x2 inch 10 feet length maple type, wood nails, leveling remarks, saw, hammer and measurement tape. Based on the planning, the specification for the pad foundation was determined for 3x3x1.5 feet. To be exact 1m x 1m x 0.4m. Those materials is used to make formwork for footing with size 1m x 1m x 1m.

Figure 3.4.6 : Formwork for pad footing

Figure 3.4.7 : Reinforcement bar used Y10

4. Setting out

Used timber 1x2 feet maple to setting out making border perimeter. Based on the floor plan discussed and approved by top management,using measurement tape and brick string spot the footing points according to the plan. Using spray can red colour make square 3x3 and total spotted 28 points

Figure 3.4.8 : Setting out point

Figure 3.4.9 : Setting out

5. Excavation work

Backhoe with 3 feet bucket used to excavate 3 feet x 3 feet x 3 feet size footing hole. During the process, head workers and supervisor need to monitor and supervise his work because it must be precise. If not it will ruin the next process like calculation and steel measurement. Some how it will lead to loss in time and costing if an accurate calculation and measurement. The steel can be break and the concrete will be less or over than should be.

Figure 3.4.10: Footing hole

Figure 3.4.11 : Excavate work

6. Installation reinforcement bar and formwork

After excavation are carried out , the installation of reinforcement bar and formwork are continue. Reinforcement bar will be put in the excavated hole, and spacer block under the reinforcement bar to prevent contact the reinforcement bar and the ground. Formwork size 3x3x1.5 feet installed. The process repeated until all the points done. During this process, ready mix and mobile crane booked for the concrete day.

Figure 3.4.12 : Reinforcement bar installation

7. Concreting work

The core of the structure must be super strong and hard. Its very recommended to use ready mix concrete because of the hardener and mixture in it and also efficient in terms of time and cost. For low building like house, the load need to support is the dead load, roof and live load. The range of the grade can be use from G20 until G30. G20 is enough but to be safe it is better to be a higher grade. G30 is very good but for low building its over budget because it is higher price. The suitable based on cost and strength is G25. So 1m x 1m x 0.4m are 0.4m3 per point. 28 points x 0.4m3 are 11.4m3 ~ 12m3 included wastage. Crane used to lift up from ready mix and poured into the formwork.

Figure 3.4.13 : Concreting work

8. Stump

Stump is constructed after dismantle of formwork and the curing process of the foundations. Smaller formwork used with size 1ft x 1ft x 1ft and concrete above the pad foundation. The purpose stump is use to prevent the steel from breaking. Backhoe used for back filling process after curing and dismantle process done for stump.

Figure 3.4.14 : Stump

9. Back filling

Backhoe is used to back filling work, excavated soil into the footing. The soil will be level back and compacted. Pad footing used backhoe 3 times for site clearance, excavation and back filling.

Figure 3.4.15 : Back filling

3.3 The duration and costing of pad footing construction

Time for completion is an important concept in any contract. Because to avoid EOT or Extension of time, workers need to deliver work base on the target has been set by operation. In a single contract, there is a form that call CPM, Critical Path Method that use to track each progress every single site. There are 2 file for each project and they are gantt chart as a target and dummy file. Second file called as tracking gantt where this file are moving update according the work at site. This file will show if the project are ahead or delay base on the variance show. Basically, to construct pad footing need 1 week maximum. So in this case took only 4 days and excluded curing and dismantling.

PAD FOUNDATION	**4 days**	**Sat 25/9/21**	**Tue 28/9/21**	**Wed 22/9/21**	**Tue 28/9/21**	**3 days**	**0 days**	**-3 days**	**100%**
EXCAVATION	1 day	Sat 25/9/21	Sat 25/9/21	Wed 22/9/21	Wed 22/9/21	3 days	3 days	0 days	100%
FORMWORK	2 days	Sun 26/9/21	Mon 27/9/21	Thu 23/9/21	Fri 24/9/21	3 days	3 days	0 days	100%
LEAN CONCR	1 day	Sun 26/9/21	Sun 26/9/21	Sat 25/9/21	Sat 25/9/21	1 day	1 day	0 days	100%
RE-BAR INST	2 days	Sun 26/9/21	Mon 27/9/21	Sat 25/9/21	Sun 26/9/21	1 day	1 day	0 days	100%
CONCRETINC	1 day	Mon 27/9/21	Mon 27/9/21	Mon 27/9/21	Mon 27/9/21	0 days	0 days	0 days	100%
DISMANTLIN	1 day	Tue 28/9/21	Tue 28/9/21	Tue 28/9/21	Tue 28/9/21	0 days	0 days	0 days	100%
STUMP	**3 days**	**Sun 26/9/21**	**Tue 28/9/21**	**Wed 29/9/21**	**Sat 9/10/21**	**-3 days**	**-11 days**	**-8 days**	**100%**
GROUND BEAM	**24 days**	**Tue 28/9/21**	**Thu 21/10/21**	**Sun 3/10/21**	**Sat 23/10/21**	**-5 days**	**-2 days**	**3 days**	**100%**
GROUND SLAB	**8 days**	**Sat 9/10/21**	**Sat 16/10/21**	**Sun 10/10/21**	**Mon 18/10/21**	**-1 day**	**-2 days**	**-1 day**	**100%**
COLUMN	**18 days**	**Sat 16/10/21**	**Tue 2/11/21**	**Tue 19/10/21**	**Mon 8/11/21**	**-3 days**	**-6 days**	**-3 days**	**100%**
ROOF BEAM	**32 days**	**Mon 1/11/21**	**Thu 2/12/21**	**Sun 14/11/21**	**Fri 26/11/21**	**-13 days**	**6 days**	**19 days**	**100%**
ROOF STRUCTURE	**19.5 days**	**Mon 6/12/21**	**Sat 25/12/21**	**Sat 20/11/21**	**Tue 14/12/21**	**16 days**	**10.5 days**	**-5.5 days**	**78%**

Figure 3.5 : Tracking Gantt

But somehow there are several of reasons why the work has been delayed, and it is not always the contractor's fault. It can be caused, for example, nature can often be an causes of the delay. In construction ,there is no efficient if rainy days.So the workers cant do anything. What workers can do is to forecast the weather and work on sunny day especially on excavation and concreting work.

About the costing, calculation need to be carried out to avoid excessive wastage especially concrete. Reinforcement bar and timber are not a problem because it can use for next element like ground beam and so on. So rebar were using y10 high tensile steel, r6 mild tensile steel as links and steel wired.For concrete ready mix G25 RM 175 at LTH Ready Mix 12m3 will cost RM 2100.00 included wastage.

Next table shows the approximate cost for pad footing :

Table 3.1 : Costing

ITEM	PRICE per UNIT (RM)	Quantity	TOTAL (RM)
Backhoe	**400.00**	**3**	**1200.00**
Concrete ready mix (G25)	**175.00**	**12m3**	**2100.00**
Plywood 12 mm thk.	**55.00**	**20**	**1100.00**
Timber wood 1x2.	**5.84**	**100**	**584.00**
Steel Y10, R6, steel wire	**27.32**	**56**	**1529.92**
	10.00	**5**	**50.00**
	8.00	**10**	**80.00**
Nails (12kg)	**65.00**	**1**	**65.00**
Total			**3728.92**

3.4 Problems and solutions regarding construction of pad footing

The problem is indeed there and there is no denying as a contractor always facing experienced problem at any circumstances that beyond of their control. Its normal but the more important is how to deal with the problem in an efficient way.

The problem that NH Ivory Home face when constructing the footing is the weather. Footing cant be concrete if the excavate soil fully with the rain water. In addition, in this case the house was construct in the quarter 3 of the year which is rainy season. As a solution, use water pump to pump out and clear the water and let the footing hole completely dry. Before that, look the forecast weather and try to find the best day to concrete which is 3-4 days free out from rain.

The other problem during the construction work, the hardware schedule. Hardware deliver material not on time. It will disturb the process of constructing in terms of duration and time because every site has a tracking form it self that need to follow. So to overcome this, supervisor need to forecast ahead next element so the order and deliver can make in time which mean no delay. The method use is Purchase Order or PO every element.

CHAPTER 4.0

CONCLUSION

Structure phase is the most important part and need to construct it very carefully and perfect. In structure element has footing,ground beam, ground slab, column, roof beam, roof structure.Its not delicate as finishing work but more like to be perfect.Why ? Because the structure phase element is linking with each other.The good at first the rest will be fine.So, the footing are important to the building because it is the core structure of a building.. The footing construction must be planned out earlier starting with calculate load, planning and draw points spot, setting out with picket and spray, excavate, reinforcement bar and formwork installation, concreting, stump and last but not least back filling. The aim of this report to create a proper method of constructing pad footing to apply for upcoming projects

The process took around 7 days starting from Wednesday 22 September 2021 until Tuesday 28 September 2021 until back fill according to target gantt chart. The footing construction delayed a few days because of hardware schedule.The solutions to make is forecasting ahead to make it smooth along the work days by doing Purchase Order form every single element. Also the weather is not good like rainy days during the work. So forecast weather and find the best day to work on.

The construction of pad footing are common method and it similar to the theoretical study. There is nothing new that are carried out differently during the construction of pad footing but it differ according to their types of foundation. . There is no toleration happen if the problem related to the pad footing has not been solve earlier which might cause others problem in the future. It is hope that this report is valuable to the contractors to obtain knowledge regarding the proper construction of pad footing for their upcoming projects.

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