

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

DECEMBER 2019

It is recommended that the report of this practical training provided

by

FARAH HUSNA BINTI AZMI

2017206772

entitled

Construction Of Pad Footing For Semi-Detached Houses Project

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

Report Supervisor : Cik Jannatun Naemah Ismam.

Practical Training Coordinator : En. Muhammad Naim Bin Mahyuddin.

Programme Coordinator : Dr. Dzulkarnaen Bin Ismail.

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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 season that I underwent at Faridaz Development Sdn Bhd for duration 20 weeks starting from 5 August 2019 and ended at 20 December 2019. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfilment of the requirements for obtaining the Diploma in Building.

Name : Farah Husna Binti Azmi

UiTM ID No : 2017206772

Date : 13 December 2019

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Thank you.

ABSTRACT

Specifically, this report described about the installation of pad footing for semi detached house on construction site of “ Membina Dan Menyiapkan 1 Unit Rumah Semi Detached 1 Tingkat Di Atas No Lot 19241, Kampung Padang Air, Mukim Kuala Nerus, Daerah Kuala Terengganu, Negeri Terengganu Darul Iman.” This report was reported based on the observation and experience of five month at the construction project. This report described the criteria of pad footing, the materials involved in pad footing, method of pad footing construction , and and also the company background of Faridaz Development Sdn Bhd. Pad footing are from shallow foundations, but can be deep depending on the ground conditions. They are a form of spread foundation formed by rectangular, square, or sometimes circular concrete pads to support structural columns. The method of footing started with the first step of located the excavation pit on the site to final removal of formwork and finishing works. This report included the substructure works of pad footing and several superstructure works from construction. This report was describe the method of construction until concreting works for the pad and erected the columns. In conclusion, this report explained and described about construction of pad footing.

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LIST OF ABBREVIATIONS

FDSB	Faridaz Development Sdn Bhd
UiTM	Universiti Teknologi MARA
CIDB	Construction Industry Development Board
BRC	British Reinforcement Company

CHAPTER 1.0

INTRODUCTION

1.1 Background And Scope Of Study

Foundation is the lowest part of the building that is in direct contact with the soil. The purpose of the foundation is to provide support to the structure, transfers the loads from the structure to the soil. Before construction, the soil must be analyzed for load bearing capacity depending on considerations, such as the nature of the load requiring support, ground conditions, the presence of water, the durability of the materials, cost, accessibility, Sensitivity to noise and vibration, and proximity to other structures. (Adam,2019)

Foundations can be categorised as shallow foundations or deep foundations. foundations are founded deeply below the finished ground surface for their base bearing capacity to be affected by surface conditions, this is usually at depths >3 m below finished ground level. Deep foundation is required to carry loads from a structure through weak soils or fills on to stronger and less compressible soils or rocks at depth, or for functional reasons.

Shallow foundations are typically used where the loads imposed by a structure low relative to the bearing capacity of the surface soils. Pad foundations are generally shallow foundations, A spread footing also called as isolated footing, pad footing and individual footing. A spread footing is circular, square or rectangular slab of uniform thickness. Sometimes, it is stepped to spread the load over a large area. but can be deep depending on the ground conditions. This load is then spread by the pad to the bearing layer of soil or rock below to support an individual column.

Pad foundations can also be used to support ground beams. If soil is determined to be too loose or incapable of holding proper building weight without sinking, a deep foundation will be used to support loads imposed and so they are transferred to deeper layers with higher bearing capacity.

This report mainly focused on the installation of shallow foundation which is pad footing. Pad footing are generally shallow foundations, but can be deep depending on the ground conditions. They are a form of spread foundation formed by rectangular, square, or sometimes circular concrete 'pads' that support localised single-point loads such as structural columns, groups of columns or framed structures. This load is then spread by the pad to the bearing layer of soil or rock below. Pad foundations can also be used to support ground beams.

Based on site that has been visited, location of the site was located at Kampung Padang Air, Tepoh Kuala Terengganu. This construction is in charged by Faridaz Development Sdn Bhd. The site in charged is on-going using pad footing foundation. The method of construction has been classified by JKR.

1.2 Objectives

The objectives of this report are as the following:

- i. To identify the factors should be considered in pad footing construction for semi detached houses project.
- ii. To describe the construction of pad footing for semi detached houses project.

1.3 Method Of Study

i. Literature Review

This method review is published information several mediums of reading materials. The knowledge collected from books, journal and other reading materials. Literature review also gives clear ideas where it has been patterned in organized way that act as summary. Application of this method commonly applied to discover the uncertain information and where the other methods could not be implemented.

ii. Observation

The first method applied on the site is by observation which is to obtain information on the work done at the site. The writer had been observed on how the workers doing the works on installing the components on the house. Through this method, many knowledge and information about the pile foundation and the method of construction for semi D house from beginner to the end gained.

iii. Interview

Dealing meeting and interview Mr Mohd Bin Harun that was in charge for the site was one of the best ways to gain information and knowledge to accomplish the report. A meeting with site supervisor and the clerk of work about the deep foundation and piling was held several times during the construction. The site supervisor had explained about the task in more details.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction Of Company

The Faridaz Development Sdn Bhd (FDSB) is a Bumiputera wholly owned the company. FDSB is known as Faridaz Marketing (FM) was established on January 2011. FM was founded by Mohamad Farid Bin Aziz that has extensive experience in construction, properties sector and project management.

FDSB has registered with The Construction Industry Development Board (CIDB) as Grade G4 contractor. FDSB Head Office (HQ) is located at the Kuala Ibai Kuala Terengganu and The marketing group is located at Lot 17639, Taman Semarak Bukit Tunggal, 21200 Kuala Terengganu, Terengganu Darul Iman. In the second year of establishment, the company has successfully opened another branch at Berserah, Kuantan on August 2017.

Currently, FDSB core business is providing the construction service for house development, house construction on customer own land, house renovation, interior and exterior design. FDSB is targeting their market on the residents across the East Coast. The company's desire is to expand this service as well as always focus on customer satisfaction, quality and price fit to the customer in line with the company's vision to be a leading developer in providing home and decoration services as achieving the tagline " WE BUILD YOUR DREAM HOUSE" In future, FDSB strive to expand this business into one Malaysia.

2.2 Company Profile

Company Name : Faridaz Development Sdn Bhd

Registration No : 1145909-X

Operation Date : 15 May 2016

Nature Of Business : Development & Building Construction

Bankers : Rhb Bank (M) Berhad
Public Bank Berhad

Headquarter Office : Lot 7102 Jalan Tok Adis, Kuala Ibai, 21060 Kuala
Terengganu.

Tel No :

Faks No :

Branch Office : Taman Semarak, Kampung Bukit Tunggal, 21200
Kuala Terengganu, Terengganu.

Tel No :

Email : faridazdevelopmet@gmail.com

2.2.1 Mission Statement

Faridaz Development Sdn Bhd offer home based on your own design, taste and budget. We provide the modest and large home and interior renovation services. We also offer the sale of our own property that we develop or used property at a reasonable price. Our people are hired and trained to protect the resources of our clients and enhance the surroundings of those we serve.

a) Operation-goal

To provide our people with the tools needed to execute their responsibilities in an efficient and effective manner in order to bring value to our clients.

b) Management and personnel-goal

To attract, develop, and retain high performance people with integrity and enable them to achieve their maximum potential while pursuing our Company's mission.

c) Financial-goal

To maintain strong financial systems to meet or exceed commitments to clients and sufficient to sustain the Company with profitable growth and excess to capital.

d) Sales and Marketing goal

To establish name recognition ,corporate image and growth of our business sufficient to create profits, career growth for our people, and increasing shareholder value.

e) Our Mission

Commitment and dedication in the construction of quality homes in satisfying the satisfaction and realization of customer's dream house with effective and efficient work quality in meeting the specified time frame.

f) Our Vision

To become a progressive lead player in providing housing development,home construction, renovation and decoration services in nationwide.

2.2.2 List of suppliers.

Table 2.1 The List Of Suppliers of Faridaz Development Sdn Bhd

No.	Suppliers
1.	Aik Hoe Home Centre
2.	Alias Bin Salleh (Kayu)
3.	Abm Jazz Resources
4.	Asko enterprise
5.	Aman Vista Enterprise
6.	AD Mega Hardware
7.	Assa Abloy Osm S/B
8.	Aku Big Venture S/B
9.	ASH Hardware
10.	Benang Putih Trading
11.	Bousted Building Materials D/B
12.	CMCM Perniagaan Sdn Bhd
13.	Chuan Huat Industrial
14.	Ex Ngah Enterprise
15.	East Coast Metal S/B
16.	Emum Capital Sdn Bhd
17.	FS Bersatu Teguh
18.	Generasi Bina ENT
19.	Hamzah Ibir
20.	HG Marketing
21.	Hassan Bin Hussin (Sulaiman Store)
22.	Hong Hee Hardware
23.	JM Mumtaz
24.	JYH Ming S/B
25.	J&D Sepakat ENT
26.	Kedai Manir Hardware
27.	KMS Store

No.	Suppliers
28.	KT Paint Trading S/B
29.	KTSPS Trading Sdn Bhd
30.	Kansai Paint Asia Pacific S/B
31.	Kim Guan Trading S/B
32.	KKH Hardware
33.	LNS Hardware
34.	LS Bakti ENT
35.	Mohd Firdaus
36.	Macang Jaya Resources
37.	Mercu Mix Industries
38.	Menara Maju Hardware
39.	Mazni Hardware Trading
40.	Macro Dimension Concrete
41.	Mohas Decorative
42.	MC Maju
43.	Paint Marketing Co (M) Sdn Bhd
44.	Paloh Resources Sdn Bhd
45.	Quik Link S/B
46.	Ready Mix Concrete Consortium (Trg) SB
47.	R&D Trading
48.	Syarikat Mohd Nor (Ready mix)
49.	Saiful Hardware S/B
50.	Tangkas Maju Hardware
51.	THI Hardware (Timur) Sdn Bhd
52.	ZF Ali Enterprise
53.	Timuran Setia Industry (CAT)
54.	Uyin Trading

Source: Faridaz Development Sdn Bhd (2019)

2.2.3 List of Machineries

Table 2.2 The List Of Machineries of Faridaz Marketing Sdn Bhd

No.	Suppliers
1.	Threading machine
2.	Grinder
3.	Drill
4.	Compresser
5.	Generator
6.	Welding machine
7.	Hot torch
8.	Vacuum pump
9.	Air blower
10.	Weighing machine
11.	Water pressure pump
12.	Scaffolding
13.	Vibrator
14.	Compactor

Source : Faridaz Development Sdn Bhd (2019)

2.3 Organization Chart

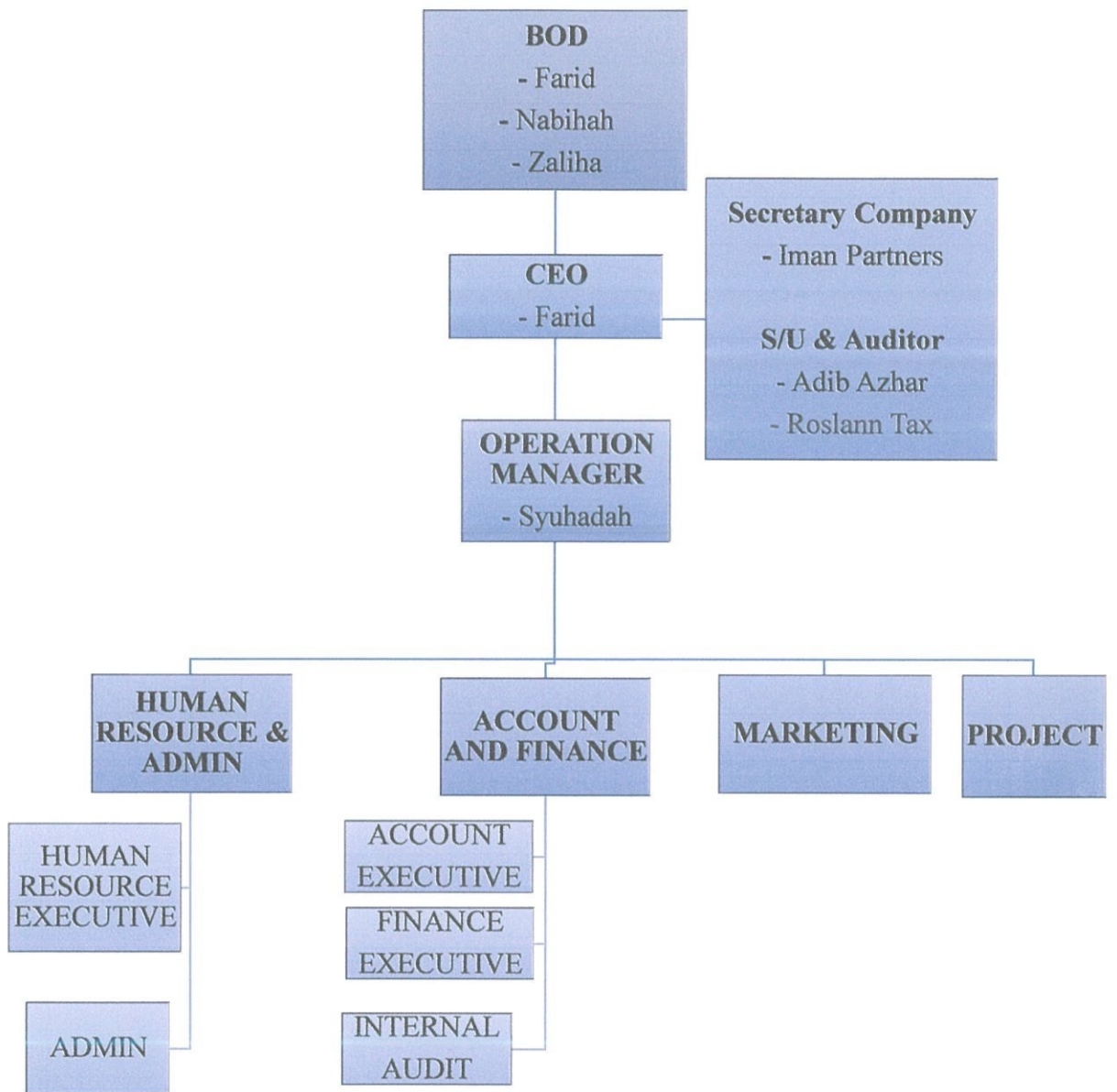


Figure 2.1: Organization chart for Faridaz Development Sdn Bhd

Source: Faridaz Development Sdn Bhd (2019)

2.4 LIST OF PROJECTS

2.4.1 Completed Projects

Table 2.3 The List Of Completed Projects of Faridaz Development Sdn Bhd

PROJECT	PERIOD	STARTED DATE	COMPLETION DATE	CONTRACT AMOUNT
Membina Dan Menyiapkan 1 Unit Rumah Banglo 2 Tingkat Di Atas No Lot 70576 (HM 8800), Kampung Telari, Mukim Belara, Daerah Kuala Terengganu, Negeri Terengganu, Terengganu Darul Iman	6 Months	12/02/2019	27/08/2019	RM268,320
Membina Dan Menyiapkan 1 Unit Rumah Banglo 1 Tingkat Di Atas No Lot 4762 (GM 3171), Kampung Padang Luas, Pelagat, Daerah Besut, Terengganu Darul Iman	6 Months	22/02/2019	14/08/2019	RM290,000

Membina Dan Menyiapkan 1 Unit Rumah Banglo 1 Tingkat Di Atas No Lot 4879(GM 2690) Tasek Baroh Muring, Mukim Alur Limbat, Daerah Marang, Negeri Terengganu, Terengganu Darul Iman.	6 Months	01/04/2019	12/10/2019	RM428,043
Membina Dan Menyiapkan 1 Unit Rumah Banglo 2 Tingkat Di Atas Lot 15742 (HSM 10588), Kampung Padang Kabar, Mukim Alur Limbata, Daerah Marang, Negeri Terengganu, Terengganu Darul Iman.	6 Months	20/11/2018	12/05/2019	RM419,268

Kerja kerja memelas 1 Unit Rumah Banglo 1 Tingkat Di Atas No Lot 31401 (GM 199118), Paya Sebokok, Mukim Kuala Nerus, Daerah Kuala Terengganu, Terengganu Darul Iman.	6 Months	21/09/2018	03/03/2019	RM190,486
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Source: Faridaz Development Sdn Bhd (2019)

2.4.2 Projects In Progress

Table 2.4 The List Of Projects In Progress of Faridaz Development Sdn Bhd

PROJECT	PERIOD	STARTED DATE	COMPLETION DATE	CONTRACT AMOUNT
Membina Dan Menyiapkan 1 Unit Rumah Semi D 1 Tingkat Di Atas No Lot 19241, Kampung Padang Air, Mukim Kuala Nerus, Daerah Kuala Terengganu, Negeri Terengganu Darul Iman.	6 Months	15 August 2019	February 2020	RM291,555
Membina Dan Menyiapkan 1 Unit Rumah Banglo 1 Tingkat Di Atas No 13301(HSM 787), Kampung Mengabang Bakong, Mukim Batu Rakit, Daerah Kuala Nerus, Negeri Terengganu Darul Iman.	6 Months	10 October 2019	April 2020	RM380,000
Membina Dan Menyiapkan 1 Unit Rumah Banglo 1 Tingkat Di Atas No Lot PT 17166 HSM 13923, Kampung Batu 50 ½ Jalan Paka, Mukim Sura, Daerah Dungun, Negeri Terengganu Darul Iman.	6 Months	2 August 2019	February 2020	RM350,811

Membina Dan Menyiapkan 1 Unit Rumah Banglo 1 Tingkat Di Atas No Lot 10178(HSM 3195), Kampung Padang Hagus, Mukim Kuala Nerus, Negeri Terengganu Darul Iman.	6 Months	4 July 2019	Jan 2020	RM116,635
Membina Dan Menyiapkan 2 Unit Rumah Berkembar 1 Tingkat Di Atas No Lot PT 6393 & PT 6394, Banggol Donas, Manir, Kuala Terengganu, Terengganu.	10 Months	6 March 2019	February 2020	RM232,540
Membina Dan Menyiapkan 1 Unit Rumah Banglo 1 Tingkat Di Atas No Lot PT 17076 (HSM 8637), Kampung Kubang Mengkuang, Mukim Bukit Payung, Daerah Marang, Terengganu Darul Iman.	8 Months	24 June 2019	February 2020	RM345,276

Source: Faridaz Development Sdn Bhd (2019)

CHAPTER 3.0

CONSTRUCTION OF PAD FOOTING FOR SEMI DETACHED HOUSE PROJECT

3.1 Introduction Of Project

Faridaz Development Sdn Bhd current project that have been selected for this report was “ Membina Dan Menyiapkan 1 Unit Rumah Semi D 1 Tingkat Di Atas No Lot 19241, Kampung Padang Air, Mukim Kuala Nerus, Daerah Kuala Terengganu, Negeri Terengganu Darul Iman.” This project cost took almost RM300,000.00 and this project was in economy package.

Main parties involved were Faridaz Development Sdn Bhd as the main contractor, Alda Shukri Khairi & Associates as a secretary company and consultant. The client for this project was Madam Fadhilah Hidyani Binti Aslai. The project was assisted by Mrs Syuhadah Binti Bidin, the project manager, Encik Muhammad Bin Harun as the Site Supervisor and several clerk of work.

The project was expected to fully complete and handling over on April 2020 based on the contract. This project was about to construct a semi-detached house. Semi detached house is a single family dwelling house that shares one common wall with the next house. It also mean a house that joined to another house on one side but separate on the other. The name distinguishes this style of house from detached houses, with no shared walls, and terraced houses, with a shared wall on both sides. Often, semi-detached houses are built as pairs in which each house's layout is a mirror image of the others.

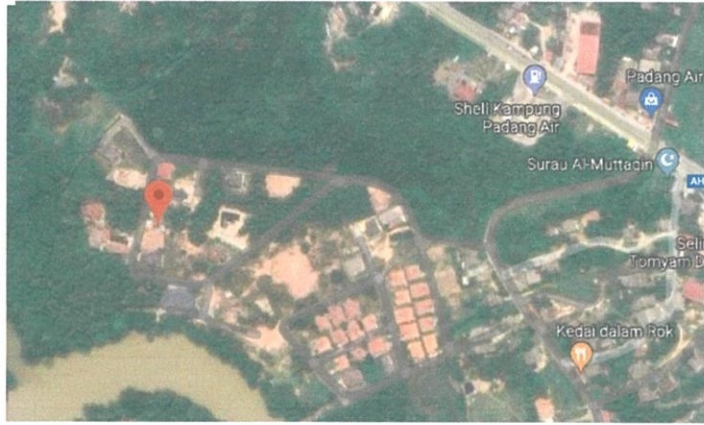


Figure 3.1 :. The key plan of case study at Project Padang Air,
Tepoh Kuala Terengganu
Source: Faridaz Development Sdn Bhd 2019

As a figure 3.1, the location of case study was located at Kg Padang Air, Tepoh 21080 Kuala Terengganu, Terengganu. The location was surrounded by several house and near to shell pump station. It is also located near to the river. The project was constructed Faridaz Development Sdn. Bhd under classification of Kementerian Kerja Raya Malaysia. This project started on the 05th of August 2019 and expected to be done on April 2020.

3.2 Factors Considered In Pad Footing Construction

i. Location of the site

This project was located at Kg Padang Air Tepoh, The ground or soil condition is one of the important factors in foundation design. Before starting to design a foundation, an engineer obtained the required soil information from soil investigation carried out at the proposed site. The type of soil from the site is clay. Its consist the deposits clay, silt and peat. The type of soil textures are more stable than sand textures because they have better structure. Photo 3.1 shows the clay soil at the site during excavation.



Photo 3.1: the clay soil at the site during excavation

ii. Size of pad footing

The size of footing used for this project was 750mm x 750mm. Footings reached to a minimum depth of 300mm, the depth used for this footing was 450mm, every footings should have a minimum width of 300mm.



Photo 3.2: the size of pad footing at the site

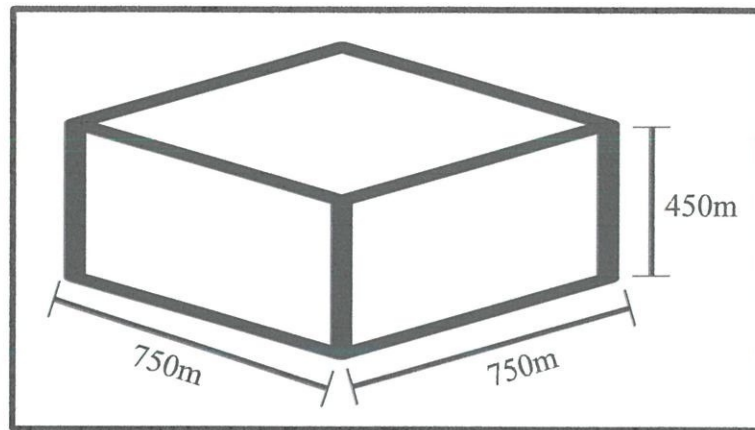


Figure 3.2: The size of pad footing dimension

iii. **Machineries and equipment used for pad footing construction.**

The machineries and equipment are a common fact that has variety of construction machines on every construction sites, which make the construction jobs easy, safe and quicker. Depending on the application, construction machines are classified into various categories which are earthmoving equipment, construction vehicles, material handling equipment and construction equipment. There are many types of equipment used during the construction of pad footing.

a) **Excavators**

Excavators are heavy construction equipment consisting of a boom, stick, bucket and cab on a rotating platform.. The house sits atop of undercarriage with tracks or wheels. Excavators are also called diggers. It is used in many ways:

- i. Digging of trenches,holes, foundations
- ii. Material handling
- iii. Brush cutting with hydraulic attachments
- iv. Demolitions
- v. Landscaping
- vi. Heavy lifts, e. g. lifting and placing pipes
- vii. Mining, especially but not only open-pit mining
- viii. River dredging
- ix. Driving piles

b) Backhoe

Backhoe is also called a rear actor or back actor, is a piece of excavating equipment or digger consisting of a digging bucket on the end of a two-part articulated arm. They are typically mounted on the back of a tractor or front loader.

The section of the arm closest to the vehicle is known as the boom, and the section which carries the bucket is known as the dipper or dipper stick. The boom is attached to the vehicle through a pivot known as the kingpost, which allows the arm to slew left and right. As in photo 3.3 and photo 3.4, the backhoe is used during footing construction and during the excavated of the soil.



Photo 3.3 : the backhoe used for footing construction



Photo 3.4: the backhoe used for excavated the soil

c) Concrete mixer

A concrete mixer is a device that combines cement, aggregate such as sand or gravel, and water to form concrete. A typical concrete mixer uses a revolving drum to mix the components. For smaller volume works portable concrete mixers are often used so that the concrete can be made at the construction site, giving the workers enough time to use the concrete before it hardens.

Special concrete transport trucks in-transit mixers are made to transport and mix concrete up to the construction site. They can be charged with dry material and water, with the mixing occurring during transport. With this process, the material has already been mixing. The concrete mixing transport truck maintains the materials liquid state through agitation, or turning of the drum, until delivery. Photo 3.5 shows the concrete mixer at the site which the method of concrete is manually and photo 3.6 shows the truck mixer used during concreting slab process.



Photo 3.5: the concrete mixer at the site



Photo 3.6: the truck mixer

d) Compactors

A compactor is a machine or mechanism used to reduce the size of waste material or soil through compaction. In construction, there are three main types of compactor: the plate compactor, the “Jumping Jack” and the road roller.

The type of compactor that used for this project was plate compactor, It has a large vibrating base plate and is suited for creating a level grade, while the jumping jack compactor has a smaller foot. Photo 3.7 below shows the plate compactor that used at the site to compressing, kneading, or vibrating the soil to remove air pockets and increase density.



Photo 3.7: the compactor

e) Vibrator

A concrete vibrator is a construction tool typically used on concrete pouring sites. The vibrators are used to ensure that the pour is free of air bubbles and are even. This is so that the concrete remains strong and has a smooth finish even after removal of the formwork. Photo 3.8 shows the vibrator used at the site during the concreting work.



Photo 3.8: the vibrator used to compact the concrete.

iv. Grade of concrete

The grade of concrete that was used during the construction of pad footing was grade M25. This grade of concrete was used for construction in all areas. It was multi-purpose concrete mix and it is commonly used for foundations. As show at photo 3.9, the dry lean concrete from grade M25 was used for pad footing construction.



Photo 3.9 : Dry lean concrete

3.3 Construction Method of Pad Footing

Pad footing are typically made of concrete with rebar reinforcement that has been poured into an excavated trench. The purpose of footings is to support the foundation and prevent settling. The method of footing started with the first step of locating the excavation pit on the site to final removal of formwork and finishing works. Figure 3.2 has show the flow diagram of pad footing method.

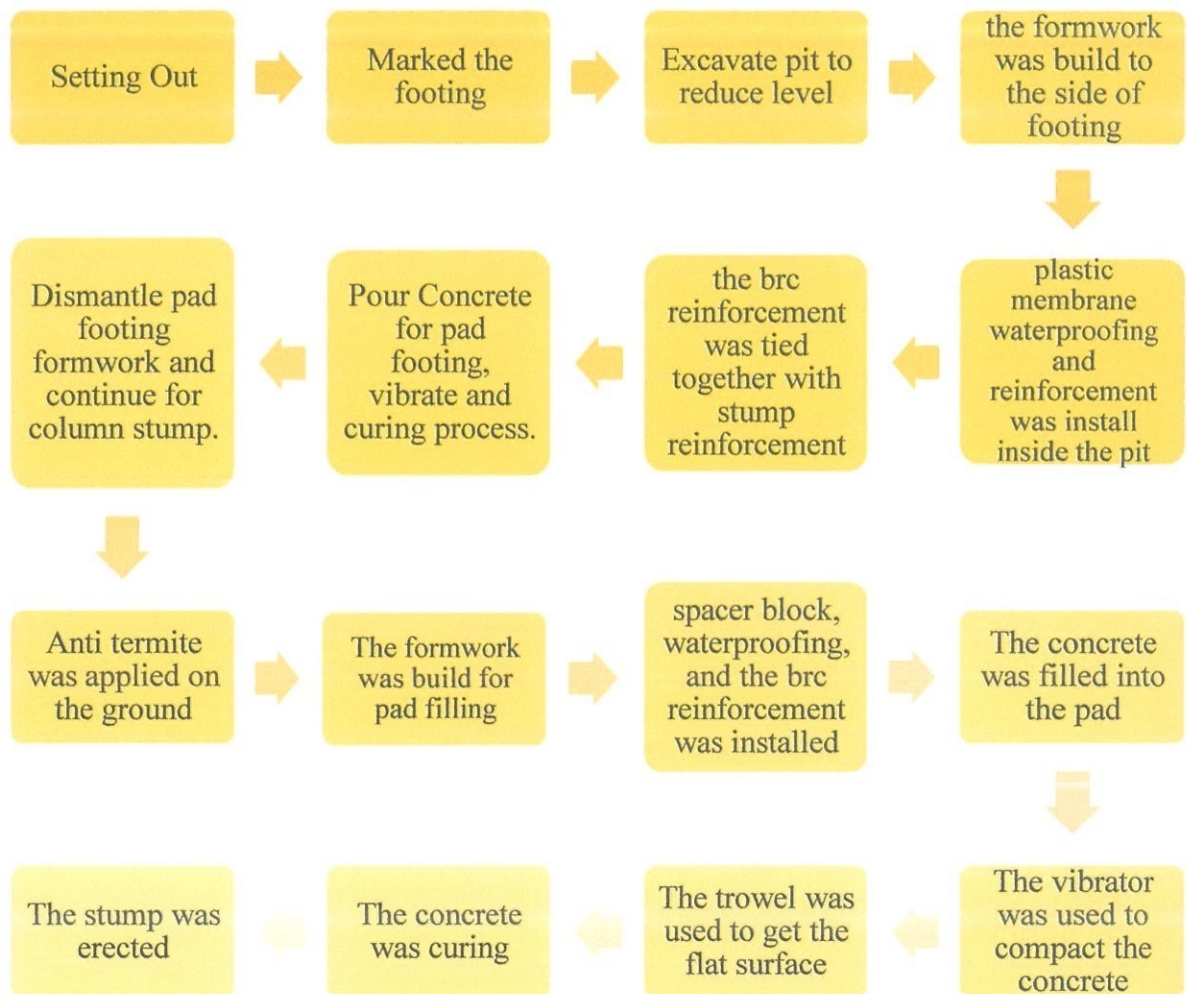


Figure 3.3: The flow of pad footing construction methods

3.3 Method Statement of pad footing construction

i. Setting out

The site was clearing then identify the correct position of a base line according to the site layout plan. Then, the site rail was build by using timber strip as show at photo 3.10 below. 16 timber strip were used at the corner side. Next, Setting out of corner benchmarks. Refer to photo 3.11, The side angle tool was used to give the correct angle of 45 degree. The size bed is 10 feet from the site rail. It has been classified by JKR. The number of labor involved for site railing was 2.



Photo 3.10: site rail



Photo 3.11: side angle tool

ii. Marking the position of pad footing.

The points of each pad footing were marked according to the site layout plan. Then, the point was pegging with correct position of foundation as shown at photo 3.12. The points were marking by the labor and the the site supervisor checked the point base on the detail drawing of the house. The total number of footing used for this house is 30. This work take 2 hours. Total labor involved was 2. Photo 3.13 show the location of pad footing that has been marked.



Photo 3.12: the position of footing was pegged



Photo 3.13: shows the location of the footing that has been marked

iii. Pit excavation.

The pit was excavate to good bearing layer from the reduce level down to the desired level. It is to reduce settlement. The deep of the excavation was 3 feet from the ground as shown at photo 3.15. The holes was excavated using backhoe. The price for backhoe rental was RM400. The total pit was 30 because there were 30 footing used for this house according to the plan refer to photo 3.14. The period of the excavation was one day.



Photo 3.14 : the excavation of footing



Photo 3.15: the depth of the footing is 3 feet

iv. Formwork was built to the side of footing

Formwork used by creating moulds out of wood forms into which the concrete is poured. Timber formwork was formed by timber and plywood to form the moulds for pouring. The labor cut the formwork according to required dimension as shown in the photo 3.16. The boards was supported by braces called studs. The joints and corners of the formwork was made to be tight because neither the concrete or the water be able to leak out. If water leaks out it will weaken the mixture. This method was cheaper than other methods. The labor involved for this work was 3.

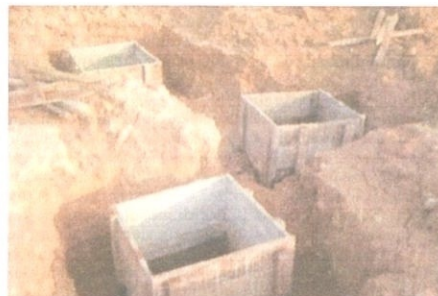


Photo 3.16: the formwork to the side of footing



Photo 3.17: the workers was measured the length of formwork

v. The plastic membrane waterproofing was installed.

Waterproofing was the process of making an object or structure waterproof or water-resistant so that it remains relatively unaffected by water or resisting the entrance of water. Damp proof was laid in the footing. The material used during this method was plastic sheet, mastic asphalt, and mortar with water proofing compounds. The labor involved for this method was 2. This method took half a day to be done.



Photo 3.18 : the plastic membrane damp proofing

vi. The Brc was installed into the footing and stump reinforcement was erected. The length of rebar were extended beyond stump level and act as starter bars for column above. The brc was tied together with stump to locks the rebar together so there is no separation and not move during placement of the concrete as shown at the photo 3.19. The spacer block was put at the brc to provide spacing for foundation. The duration for this method was half a day. The labor involved for this method was 2 workers.



Photo 3.19: the brc and stump were place into the footing

vii. Concrete was poured and curing

The concrete was poured and curing to avoid excessive lost of water during hardening. The material used for concreting was cement, sand and aggregate. The concrete was mixed on a flat surface so that will not absorb water. All three ingredients was mix thoroughly again until the colour is consistent. Then, quantity of water has been measured slowly over the mix, stopped until the mix is consistent in colour and texture. Too much water can caused weak concrete. Then the concrete was poured into the footing . Refer to photo 3.20, the concrete has been dismantled after gained the sufficient strength. The additional ties is provide to formwork. The duration taken for this method was one day. The total labor involved for this method was 4.

The strength and water-tightness of concrete improve with age. Proper curing is important to get the aging process started well. Immediately after the concrete has been set, A wet covering was put over it. The covering should be sprinkled with water 2 or 3 times a day for at least 7 days.



Photo 3.20: a layer of concrete was set

viii. Anti termite treatment is applied to the ground

Anti-termite treatment is a process in which soil treatment is applied to a building in the early stages of its construction. The purpose of anti-termite treatment is to provide the house with a chemical barrier against the termites. The anti termite treatment was applied under footing to protect timber from termites. The Approved Anti-termite Material was used in this method. The labor involved for this method was one. The duration for this method was 2 hours.



Photo 3.21: the workers was applied the anti termite to the ground

ix. The formwork was build for pad filling.

Refer to photo 3.22, The formwork was build and the reinforcement was place including column bars in the formwork and the bars was ties together in the formwork. It is for durability and structural safety to prevent the reinforcing bars from moving out of position during the concreting. The reinforcement was raised at the correct level to maintain the concrete cover

using concrete spacer block to protect the reinforcing bars from corrosion. Spacer blocks were placed before reinforcement is laid. This is to provide sufficient concrete cover for rebars. The total labor involved for this method was 4. Lastly, the duration taken for the formwork was 2 days.

Any debris was removed from forms. The debris were blowing with compressed air or flushing with pressurized water for effective methods. It is to avoid the concrete from contaminating. A release agent was applied to the formwork surface which will be in contact with concrete. It is to facilitate stripping the formwork.



Photo 3.22: The reinforcement were place in the formwork and reinforcement were tied together.

x. The installation of Damp Proof Membrane and Brc reinforcement that have been installed

Next, the waterproofing was laid on th ground to prevent the entrance of water into foundations, then the reinforcement was installed. The extra reinforcement were called starter bar. The spacer block was put at the brc to provide spacing for foundation. The material used was Damp Proof plastic membrane and Brc reinforcement. 4 labor was involved in this method. The duration taken for this method was 1 day. Photo 3.23 shows the waterproofing sheet that has been laid, the brc reinforcement and few spacer block to provide spacing.



Photo 3.23: the waterproofing and the brc reinforcement

xi. The concrete was filled into the pad.

The concrete was poured from a ready-mix mixer truck. The concrete was poured into a wheelbarrow and the workers poured the concrete on the pad. The concrete was poured into the pad from one end of the base to the other until the entire pad has been filled with concrete. The total labor involved for this method was 5 and the duration taken was 1 day. Refer to photo 3.24, the concrete from the mixer truck was poured into a wheelbarrow and photo 3.25 shows the laborers pouring the concrete started at the end of the base.



Photo 3.24 : the concrete was poured into a wheelbarrow

xii. The concrete was compacted using a vibrator

The vibrator was used to compact the concrete for strength and durability purposes. The vibrator was used to ensure that the pour of concrete was free of air bubbles and even. So that the concrete remains strong and has a smooth finish.

even after removal of the formwork. The duration taken for this method was 1 to 2 days. The workers that involved for this method was 5 to 6 labor. As in photo 3.26, the labor was compact the concrete using the vibrator poker.



Photo 3.25 : the workers was compact the concrete using vibrator



Photo 3.26 : the vibrator machine

xiii. The trowel was used to provide a flat bearing surface for the ground. A trowel was used to finish the surface. The trowel was used to smooth out the surface and level it. The used of trowel to finish the surface also help work the tiny rocks concealed in cement to the base of the surface and bring the cement-water mixture at the top. Then a wooden float was used to smooth the surface of the concrete to achieve a consistent mortar finish, which will ensure the concrete is well compacted. The edges of the concrete slab was where an edge trowel

comes in handy. The edge trowel was used to round off the edges of the concrete slab and make a flat margin. The labor involved for this method was 2.

The duration taken for this method was 1 day. Then the concrete was curing by keeping continuously wet for at least 3 days to allow concrete to achieve the design strength. As shown as photo 3.28, the labor used the wooden trowel to create flat surface on concrete.



Photo 3.27 : the workers used wooden trowel to concrete to create flat surface

xiv. The stump reinforcement are erected.

The length of the rebar was extended beyond stump level and act as starter bars for column above. The column bar was lapped to starter bars and the tie beam reinforcing bars are install to help transfer the loads. Then the column was erected with column construction method as shown as photo 3.29.



Photo 3.29 : the column starter bars was erected

CHAPTER 4.0

CONCLUSION

Pad foundations can be used to support ground beams if soil is determined not too loose or capable of holding the building. Pad footing can be deep depending on the ground conditions. They are a form of rectangular, square, or sometimes circular concrete pads spread foundation that support structural columns, groups of columns or framed structures. This load is then spread by the pad to the bearing layer of soil or rock below.

There are few factors that considered in pad footing construction, the first one is the location of pad footing that include the types of soil, clay is the most suitable to construct a house that using pad foundation. Next, The size of pad footing. The size of pad footing used for this project was 750mm x 750mm. Other than that, the machineries used for the project also one of the factors considered in pad footing construction. As example, the excavator and backhoe to digging of trenches,holes, foundations, material handling, brush cutting, demolitions, landscaping, heavy lifts, placing pipes, and mining. The last factors was the grade of concrete. The concrete used for this project was M25 for multipurpose.

Next, there are few stages of pad footing construction started with Setting Out, the setting out process started with the site rail, then marked the footing location. After that, pit was excavated to reduce level and the brc reinforcement was tied together with stump reinforcement, then the plastic membrane waterproofing was laid and reinforcement was install inside the pit. Next, the formwork was build to the side of footing and concrete was poured inside pad, the concrete was vibrated and then curing process. Other than that, the formwork was put and continue erected for column stump. Anti termite was applied on the ground and the formwork was build for pad filing. spacer block are placed, then the waterproofing and the brc reinforcement was installed. After that, the vibrator was used to compact the concrete and the trowel was used to get the flat surface Lastly, the concrete was filled into the pad then concrete was curing and the stump was erected.

As conclusion, The objective of this report have been fulfilled. The writer gets to know more about the structures to construct pad footing including the installation, components used, materials used, machineries used, and also the advantages of using this construction.

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b) Progress claim

JADUAL BAYARAN KEMAJUAN



	<i>Ansuran-ansuran Kena Dibayar</i>	<i>Kesiapan %</i>	<i>Jumlah</i>	<i>Bayaran Kepada</i>	
				<i>Kontraktor</i>	<i>Peguam</i>
1.	Apabila sahaja Perjanjian ini selesai ditandatangani	10	29,155.50	✓	
2.	Dalam tempoh EMPAT BELAS (14) HARI selepas Tuan Punya menerima notis bertulis dari Kontraktor menyatakan siapnya- (a) kerja-kerja asas dan pertapakan Bangunan tersebut.	20	29,155.50	✓	
3.	(b) rangka konkrit bertetulang Bangunan.	35	43,733.25	✓	
4.	(c) dinding-dinding Bangunan berserta rangka-rangka pintu terpasang pada tempatnya. (d) memasang bumbung, rangka-rangka tingkap, dawai elektrik dan saluran paip (tanpa lengkapan)	55	58,311.00	✓	
5.1	(e) kerja melepai di dalam dan di luar Bangunan (f) parit dan kerja-kerja pembentung bagi Bangunan	80	72,888.75	✓	
5.2	Pembayaran penuh kepada Pihak Peguam SEMASA TUNTUTAN KESIAPAN 80% : Pihak Peguam akan membayar kepada Kontraktor apabila selesai serahan Pemilikan Kosong dan sambungan bekalan air dan elektrik sedia pada Bangunan	100	58,311.00		✓
	Semasa penyerahan pemilikan kosong seperti di dalam Butiran (3) dan dipegang oleh Peguamcara Pihak Tuan Punya sebagai pemegang pertaruhan untuk bayaran kepada Kontraktor apabila selepas tamat tempoh ENAM (6) bulan selepas serahan pemilikan kosong seperti berikut:- (a) 2.5 peratus (2.5%) apabila tamat tempoh satu (3) bulan selepas Penyerahan Pemilikan Kosong (b) 2.5% peratus (2.5%) apabila tamat tempoh tiga (6) bulan selepas serahan Penyerahan Pemilikan Kosong				
	JUMLAH	100%	291,555.00		