DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

FOUNDATION AND STRUCTURAL INSTALLATION

Prepared by:

MUHAMMAD AMZAR ELHAMIE BIN FAZUNY

2019258938

DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

INSPECTION

(FOUNDATION AND STRUCTURAL WORK INSTALLATION)

Prepared by:

MUHAMMAD AMZAR ELHAMIE BIN FAZUNY

2019258938

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

AUGUST 2021

It is recommended that the report of this practical training provided

by

Muhammad Amzar Elhamie bin Fazuny

2019258938

entitled

Foundation and structural work installation

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

Report Supervisor	:	_____ Mrs. Wan Nordiana Binti Wan Ali
Practical Training Coordinator	:	_____ Dr. Nor Asma Hafizah Hadzaman
Programme Coordinator	:	_____ Dr. Dzulkarnaen Bin Ismail.

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 entirely my own work, with the exception of extracts and summaries for which the original references are cited, and that it was written during a 21-week practical training session at Mahligai Idaman Sdn Bhd, which began on August 23, 2021 and ended on January 7, 2022. It is presented as one of the BGN 310 prerequisite criteria and recognized as a partial fulfilment of the Diploma in Building requirements.

…….

Name : Muhammad Amzar Elhamie Bin Fazuny

UiTM ID No : 2019258938

Date : 28 September 2021

ACKNOWLEDGEMENT

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

I'd want to express my heartfelt gratitude for all of your guidance, advise, and assistance during the course. It's an honour to have a beautiful 20-week internship with Mahligai Idaman Sdn Bhd, a fantastic firm. Great personal contributions were critical in attaining this event. As a result, I consider myself really fortunate to have been given the opportunity to be a part of it. First and foremost, I'd want to express my heartfelt gratitude to En Wan Mohd Syahidin bin Wan Syukri for providing me with the opportunity to undertake my training in his prestigious firm. He also made time out of his busy schedule to listen, guide, and keep me on the right track, allowing me to complete my assignment at their prestigious organisation and continuing throughout the training. It is my joyous mood to express my heartfelt gratitude to the team pros, Miss Hayati and her team, for participating in useful decisions and providing essential counsel and valuable guidance, which were incredibly beneficial to my study both conceptually and practically. It is a privilege for me to be able to 'work' with all of you.

Secondly , I'd like to express my gratitude to ALL of the UiTM professors who have taught and fostered me throughout my studies. It's always a pleasure to thank the wonderful individuals at the UiTM for their candid advice on how to improve my practical skills. I appreciate the time, effort, encouragement, and ideas that Puan Wan Diana, Supervising Lecturer, Pn Noor Shahidah Binti Samsudin, Evalution Lecturer, En Muhammad Naim Bin Mahyuddin, Practical Training Coordinator, and Dr Dzulkarnaean Bin Ismail, Programme Coordinator have contributed to the successful completion of my training, this report, and the valuable knowledge that has been shared.

Last but not least, I'd like to express my gratitude to my wonderful parents and friends for all of their sacrifices throughout the years. I apologise to all those anonymous individuals that assisted me in various ways in order for me to have a decent training. Thank you a lot**.**

ABSTRACT

Supervise building or performing an inspection is one of the important things in construction. A supervise actions plays several functions in the performance of a house and these functions need to be fully understood in order to create suitable and comfortable building as well as providing privacy also as protection from any unwanted hazard. This report will explain a lot about how the inspection was perform and how the process is going. This report was conducted PT392, Bandar Baru Tunjong, Jalan Kuala Krai, 15100 Kota Bharu, Kelantan. The objective of this report is to analyze the construction of all scopes of the house such as pad footing, load-bearing wall, roof beam, piling, column and many more in the future. It will focus on the whole process of the house according to the percentage that it takes. It also investigate the equipment and machinery in the methods of construction through the whole process of the house. This report will also look to at the problem and the solution in inspection.

CONTENTS **PAGE NO**

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

This method requires for mandatory periodical inspection of building are stipulated under the Building Ordinance (Section 27B) 1994. The parties involve in the inspections process are the local authority whose responsibility is to ensure that the inspection are carried out according to the requirements of the Ordinance. The building owner who is responsible for the appointment of an engineer to carry out the inspection and the engineer who is appointed to inspect the building.

The interpretation. Owner in relation to a building exceeding five storeys include the management corperation having control of the building; or the person receiving any rent or change for the maintenance of the common property of the subdivided building. Engineer means a person who is registered as a professional engineer under the Registration of Engineers Act 1967, Act 138.

Building to be inspected. The requirement for the inspection is provided under section 27B of the Building Ordinance 1994. This section shall apply to a building exceeding five storeys. Any storey of the building which is at level lower than the ground storey shall be deemed to be a storey. A building which is physically connected with another building shall, although so connected, be treated as a separate building if it so constructed as to be capable of remaining in position and being used independently of the other building or which require only minor modification as to render it so capable; and shall be treated as a separate building ir it is merely so connected with the other building at or below ground level or by means of a bridge of similar structure. It is therefore acceptable for two separate buildings within the same development to be inspected separately if they have been issued the certificate of fitness of occupation at different times.

Period of inspection. The local authority shall by notice in writing serve on the owner of a building require the building to be inspected after tenth year commencing from the date the first occupation permit was issued in respect of the building; and thereafter at intervals of not more than 10 years from the date of the completion of the last inspection of the building. Notice to owner to carry out inspection. The notice served on the owner of a building to be inspected shall be as in the form in Appendix F. in case where there is no management corporation and the units in a building are owned separately by individuals owners, the local authority shall send separate notices to the individuals owners, the local authority shall send separate notices to the individual owners. As the Ordinance requires the entire building to be inspected as a whole rather than in parts, these individuals owner are advised to liaise among themselves to appoint one engineer for the inspection of the whole building and submit a joint report to the local authority.

Conclusion, Owner should regard maintenance of building structure as an important routine and should have resources and well planned maintenance programmes which are implemented throughout the life span of the buildings. It is also very important for the engineers, who are appointed to take on such periodical inspections, to carry out their duties in a responsible and professional manner.

1.2 Objectives

This internship report aims to achieve some objectives. The objectives are as stated below:

1. **To identify methods of foundation, structural and inspection work.**

2. **To identify the time need to be consume to do the work.**

3. **To identify problems and solution in construction during foundation, structural and inspection.**

1.3 Scope of Study

The scope of study has been carried out at PT 392, Bandar Baru Tunjong, Jalan Kuala Krai, 15100 Kota Bharu, Kelantan. The project had started in 23 August 2021 and will be completed on 7 January 2022. The activity is performed on many houses and most importantly an inspection to each house in order supervise them properly. The project is currently on going. Therefore, the focus of the study is to determine on how to Supervise things at site. Hence, the study will be explained not only about the method of wall bricklaying process but including the advantages of stretcher bond in the construction, finishes for the wall, as well as machinery and tools. Furthermore, the problems and solution also included in this study. Even so, the study do not concentrate on the quantity of manpower or labors, the costs and the duration matters. In order to fulfill the data, there were three methods need to be carried out which is observation, interview, and document reviews. In conclusion, all further explanation relating the above method were explained as below.

1.4 Method of Study

There are several data collection methods used to achieve the objectives of this report:

i. Interviews

The interview is one of the methods for gathering construction data by conducting a structured or semi structured interview with a project's trusted person. They were completed while conducting observations and performing work on the site. The interview was held with the firm manager, who is also the contractor in charge of managing the project on the job site. This interview was also conducted with workers who were working on brick ties at the construction site. Every week in the office, semi-structured interviews with the contractor in charge of the project were performed, which lasted about 10 – 15 minutes on average.

ii. Observations

The observation is a way of collecting data through observing. The observation is about how the method process of each houses starting from 20% to 80%. The average time taken for this observation approximately around 11 – 12 month but only for people who have less complain towards the company. The bigger the houses, the longer it takes for the building to finish and the accessories are the main reason too.

iii. Document Reviews

The documents review that have been used to collect all the data for the construction is company profile, construction drawing, standard operating procedures (SOP), progress report and the pictures that taken by other workers. Drawing plan will be used as the reference at the site that under monitoring for brickwork process. The pictures that belongs to others also the best reference during the document reviews. The time for document reviews will usually take 30 minutes for one drawing plan in a week. This document reviews placed at the office.

CHAPTER 2

COMPANY BACKGROUND

2.1 Introduction of Company

Established in July 2011, MAHLIGAI IDAMAN SERVICES (KT0294993-M) is a company registered with the Commission of Malaysia under the Business Registration Act, 1956 (Amendment 2001). The company was established in partnership and one of the directors of the company, Haji Wan Sukri bin Wan Othman is also a director of MAHLIGAI IDAMAN CONSTRUCTION (KT0247997-T), a house construction company that has been operating in Kelantan since October 2008. Since its inception, the Mahligai Idaman company has been supported by a network of skilled and experienced personnel in the field of real estate and building construction. Armed with these skills and experience, the company is determined and committed to provide effective and viable services that in turn can provide satisfaction to its customers. Mahligai Idaman development Sdn Bhd is supported by a strong and highly experienced management team comprising people with a wealth of technical experience of handling major projects and possessing advanced machinery to enable it to undertake various complex projects. We are committed to contributing positively to the construction industry, always providing innovative solutions and construction services of the highest quality in a safe and responsible manner.

2.2 Company Profile

Mahligai Idaman Sdn Bhd was established and started operating in 2014, and currently active in residential housing manufacturing, renovation, government project work tenders and other related work. This company based in Seremban located at Lot 9701/196, Jalan Bunga Raya Kampung Baru Blok C, Ampangan 70400 Seremban Negeri Sembilan. PT392, Pusat Perniagaan Bandar Baru Tunjong, Jalan Kuala Krai, 16010 Kota Bharu, Kelantan.

Figure 1.0 : Office location

Location : Kota Bharu, Kelantan

The scope of this project is to build and covers all about structural and infrastructure work. Thus, this project also explain about the pad foundation to roof work. This project has begun built on July 20, 2020 and was expected to be completed by April 25, 2020. Now, the project of the drainage has achieved 60% of work progress.

2.3 Company Organisation Chart

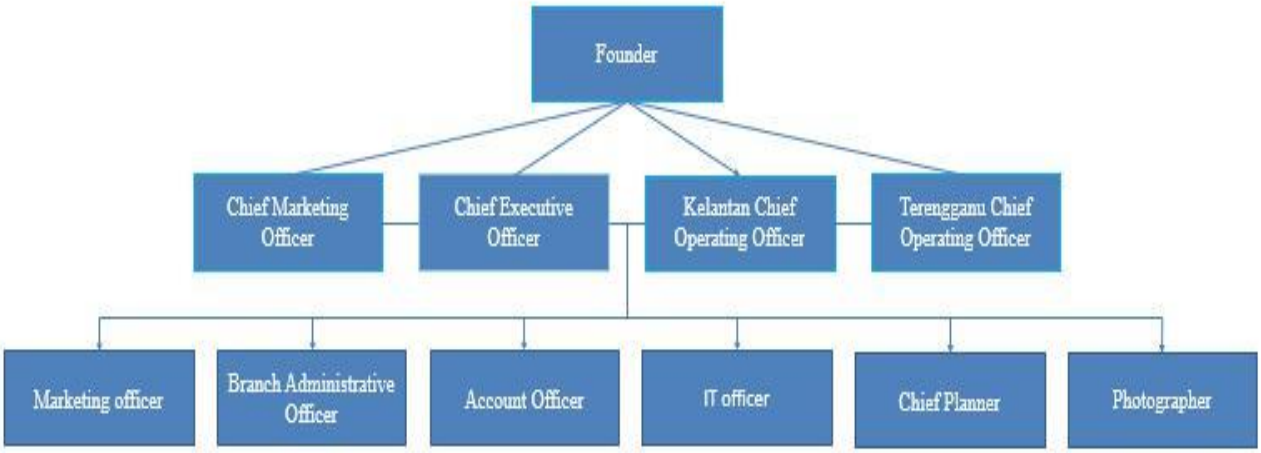

Figure 2.0 : Company Organization Chart

Mahligai Idaman Development Sdn. Bhd. Organization

2.4 List of Projects

2.4.1 Completed Projects

2.4.1.1 Completed Projects

No.	Project Title	Project Value	Finished work (Date)	Client
1.	(CADANGAN MEMBINA RUMAH) – PT 1691 H.S(M)762, MUKIM LEMBU, JAJAHAN KOTA BHARU (HASMANONI BINTI HAMZAH)	RM501,000.00	25/08/2019	HASMANONI BINTI HAMZAH
2.	(CADANGAN MEMBINA RUMAH) – PT 271 H.S(M) 135, MUKIM DUSUN RENDAH, JAJAHAN KOTA BHARU (MOHAMAD HAFIZ BIN MAZLAN)	RM280,000.00	26/05/2019	MOHAMAD HAFIZ BIN MAZLAN

3.	(CADANGAN MEMBINA RUMAH) – LOT 300 (GM 858), KG BATU 30, MUKIM TENGAH, DAERAH PANYIT, JAJAHAN MACHANG (MOHD ROSDI BIN DAUD)	RM540,000.00	19/11/2019	MOHD ROSDI BIN DAUD
4.	(CADANGAN MEMBINGA RUMAH) – LOT 13270 (GM3366), MUKIM PASIR PUTEH, JAJAHAN PASIR PUTEH	RM252,000.00	08/08/2019	NIK MOHD NOR AZHAR BIN NIK ISMAIL
5.	(CADANGAN MEMBINA RUMAH) – PT 1405 H.S(M) 1109, MUKIM TELOK BHARU, JAJAHAN KOTA BHARU. (NOOR ILIANI BINTI ILIAS)	RM422,500.00	09/05/2019	NOOR ILIANI BINTI ALIAS

Table 1 : Completed Projects

2.4.2 Project in Progress

No.	Project Title	Project Value	Start Date	Completion Date(Assumed)	Project Duration	Client
1.	(CADANGAN MEMBINA RUMAH) – LOT 1672 (GM 1280), KAMPUNG JAYA, MUKIM PASIR HA, JAJAHAN KOTA BHARU (WAN ROGIAH BINTI WAN MOHAMAD	RM230,500.00	11 OCOTBER 2020	11 OCTOBER 2022	2020-2022	WAN ROGIAH BINTI WAN MOHAMAD
2.	(CADANGAN MEMBINA RUMAH) – GM 2675, LOT 15255, MUKIM TELEKONG, JAJAHAN KUALA KRAI (AB SALAM BIN YUSUF)	RM324,600.00	15 JANUARY 2021	30 APRIL 2022	2021-2022	SEE SONG & SONS SDB BHD
3.	(CADANGAN MEMBINA RUMAH 1 UNIT) – LOT 2131 (GM 225),BENDANG CHERANG HANGUS, MUKIM KUBANG KETAM, JAJAHAN PASIR MAS.	RM233,500.00	11 AUGUST 2020	11 AUGUST 2022	2020-2022	MOHD KHAIRUL AL HAFIZ BIN YAJID
4.	(CADANGAN MEMBINA RUMAH) – H.S(M) 190, PT 330, MUKIM DUSUN RENDAH, JAJAHAN KOTA BHARU.	RM411,00.00	26 AUGUST 2020	26 AUGUST 2022	2020 - 2022	SUHAIZAM BIN MAT HASSAN

5.	(CADANGAN MEMBINA RUMAH) – GM 2072, LOT 2935, MUKIM LABOK, JAJAHAN MACHANG	RM305,000.00	16 JANUARY 2020	19 JANUARY 2022	2020-2022	MOHD HAMIDI BIN CHE AWANG

Table 2 : Project in Progress

CHAPTER 3.0

CASE STUDY

3.1 Introduction of Case Study

The case study in about site inspection (foundation and structural work). The project of the construction has started in 23 September 2021 and prediction that it will be done is in 23 September 2022. The cost of construction approximately Six hundred and sixty thousand Ringgit Malaysia (RM 660,000). Currently, the project progress is still on going. Thus, the study will be explained not only regarding installation but including the machinery and tools, the time that have been carry out and the problem and solution of the construction. Nevertheless, the study do not concentrate on cost matters and manpower. The site location took place at the Daerah Panji, Jajahan Kota Bharu, Kelantan.

The nature of work was civil engineering construction and management. At Mahligai Idaman Development Sdn. Bhd., they provide a complete range of professional constructions services through all stages of development of engineering projects. construction supervision. Most of the works done here are for the construction stage of project. Mahligai Idaman act as a main contractor involve in every stages of construction such as foundation, structure works, infrastructure, roof and finishes.

During the industrial training, what I acquire the most was the engineering planning and detail design where I was exposed to different design methods for house construction of civil engineering. It can be easily divided into infrastructure and structural designs. I was also able to learn different softwares throughout the industrial training such as BricsCad, AutoCAD, and calculate different designs. However, I do not into calculation most than the documentation.

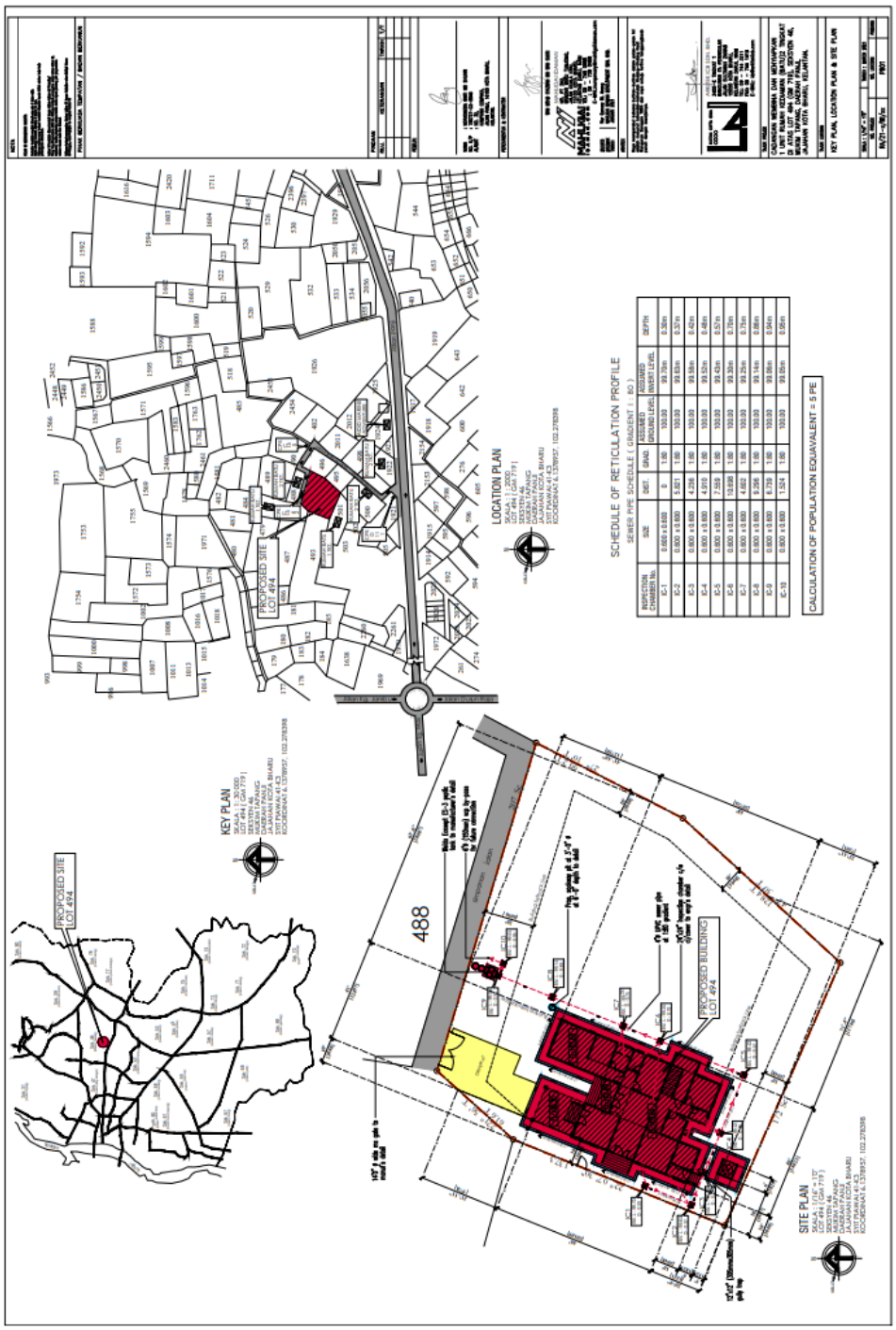

Figure 3.0 : Site plan (cadangan membina rumah)

The project construction located at Lot 494 (GM 719), Seksyen 46, Mukim Tapang, Daerah Panji, Jajahan Kota Bharu, Kelantan. This construction area is facing the main road of simpanan jalan panji. The area is quite secluded as it is still located besides big highway. There are several existing housing buildings close to the construction area. There are also existing residential areas near the construction area, which is currently doing some renovation for gates in kampung panji.

The activities that have been carry out on the site are foundation and structural installation. This uneasy work need to be handle by skilled workers to get a perfect measurement and smooth result. There are also several unskilled workers that help mix the mortar and bring it with the bricks to the construction site to save the time of bricklaying process. The activities also include inspection to check if the work is well done. The machineries and tools that involved in this construction are wheelbarrow, trowels, hawks, scaffolding, spirit levels, concrete mixers, brick bolsters, bucket, brick line and pins, brick hammer, shovels and measurement tape.

First and foremost, foundation design is required for all structures to ensure that the loads imposed on the underlying soil will not cause shear failures or damaging settlements. The two major types of foundations used for transportation structures can be categorized as “shallow” and “deep” foundations. This chapter first discusses the general approach to foundation design including consideration of alternative foundations to select the most cost-effective foundation. Following the general discussion, the chapter then concentrates on the topic of shallow foundations. The duty of the foundation design specialist is to establish the most economical design that safely conforms to prescribed structural criteria and properly accounts for the intended function of the structure. Essential to the foundation engineer’s study is a rational method of design, whereby various foundation types are systematically evaluated and the optimum alternative selected

Secondly, structural system, in building construction, the particular method of assembling and constructing structural elements of a building so that they support and transmit applied loads safely to the ground without exceeding the allowable stresses in the members. A structural framework designed to provide support and strength to a roof, a truss is essential as the roof's frame. They bridge the space above rooms and occur at regular intervals, held by longitudinal posts for support. Basically, they are triangular wooden structures designed to keep the integrity of a roof. You can usually find trusses supporting the roofs of airports, auditoriums, stadiums, stations, and theatres. A roof truss is comprised of three main components: top chords, bottom chords, and web bracing. The framework consists of posts, struts, and rafters. The sizes of these parts are determined by load, spacing, and span. A truss is placed under compression and tension but is designed not to bend. It can also handle and sustain inclined, horizontal, and vertical loads. It will stand the test of time and provide a multitude of structural benefits to commercial and residential buildings. A group of construction operations relating to the exterior and interior finishing of buildings and structures to enhance their service and aesthetic qualities. Finishing work Is the cncluding stage of construction; in many cases, the overall quality of a building or structure being put into service depends on the quality of its execution. The main types of finishing work include facing, plastering, flooring (and parquetry), painting, wallpapering, and glazing.

3.2 Method of Statement

3.2.1 Method Statement of Foundation work

A foundation is a lower portion of building structure that transfers its gravity loads to the earth. Foundations are generally broken into two categories: shallow foundations and deep foundations. A tall building must have a strong foundation if it is to stand for a long time. But in our scope of work, we only use shallow foundation which is pad footing. During the foundation work, they will excavate the ground using backhoe at the marking location according to the RC plan provided. After that, they will install the pad footing and stump reinforcement and hold them in position. Next, they will do the concreting for pad footing using ready mix concrete and transfer the concrete using crane. Lastly, they will make formwork for the stump and concreting for the stump. The duration before removing the formwork is 20-23 days.

Figure 4.0 : Making the foundation position

Figure 5.0 : Excavation of foundation

Figure 6.0 : Positioning reinforcement of footing and stump

Figure 7.0 : Ready mix concrete

Figure 7.0 : Concreting and footing

3.2.2 Method Statement of Structural work

Structural works consist of beam, column, slab and brick wall. For beam usually the size of a regular beam is 400x250mm used in Mahligai Idaman. The size also depends on the structure that is supported, if suspended beam usually the depth is higher than non-suspended beam. For Column usually the dimension of column used is 3-inch x 4 inch. The concrete grade use for concreting of the structure is Grade 25. The starter bar also installed at every 3 feet of the column. Meanwhile for the slab design, the thickness of slab for houses is thinner than building which is 100mm. in the slab works they usually use ready mix concrete with the help of crane to transport it. Lastly for brick wall, usually arrang zigzag and not in lined with the other brick to make sure more strength. After 4 or 5 stacks of bricks, ex-met mesh wire usually installed to make sure that if there is settlement the brick will settle simultaneously to avoid cracking

Figure 8.0 : Beam formwork and concreting

Figure 9.0 : Concreting formwork and column

Figure 10.0 : Concreting and formwork for slab

3.2.3 Infrastructure work

Infrastructure work is very important for every house construction work. Infrastructure consists of drainage, water supply, m&e work and manhole. This is very important to make sure that the facility of the housework smoothly and according to client's demand such as electrical appliance and shower. The bathroom package usually given free by Mahligai Idaman with Morvan Brand.

Figure 11.0 : Piping work

Figure 12.0 : Drainage work

Figure 13.0 : Drainage work

3.4 Problems and Solutions

3.4.1 Foundation work

PROBLEM	SOLUTION
 • Foundation crack Because of a variety of factors, your structure's foundation may move over time. Your foundation may move as a result, and gaps may become a significant issue. The problem is frequently caused by expanding and contracting soils, as well as harsh weather.	To ensure that the foundation didn't crack, you must check the hole first. Usually, workers didn't check the hole weather it clear or not. Sometimes a little garbage or air space of the concrete will effect the hole foundation concrete.
 • Door cant be open or closed properly If you've noticed that your doors are sticking, that's frequently an indication there is some sort of problem with your foundation. When interior doors are affected, they tend to stick or drag at the top. Exterior doors with foundation issues are more likely to drag at the threshold or hang down at the top and appear uneven	If this kind of problems happened, you cant change the condition of the foundation. However, you can concrete the tiles properly and follow the door when they open and close. This was, the door will never be stuck and can be use properly.

Table 3.0: Problem and solution through foundation work

3.4.2 Structural and inspection work

PROBLEM	SOLUTION
• When your foundation settles, the basement floor sinks, leaving the posts that support the level above with minimal support. As a result of the battle to support the weight of the structure above, the posts and beams may flex or curve. It is far more difficult for the posts to remain stable under the weight of the house if the floor underneath them is not solid or even.	Another solution for beam and post problems is to use wall anchors to close wall cracks that may have occurred due to bowing or leaning foundation walls. These cracks provide an entry point for water leakage – by closing them, the water will no longer be able to enter the basement area. Any beam and posts problems in your home should be taken care of by a professional foundation repair contractor.
• If you installed your windows, you should first inspect the state of the installation. This condition may go unnoticed for months if you don't open or close them frequently. When summer arrives, you may find that your windows are difficult to open, or that they are completely shut. This problem is usually resolved by replacing damaged or malfunctioning mechanical components. Rusty hinges and damaged frames are two common indicators that your windows aren't working properly.	In this context, you have to fix the place that has a problem to the window. Usually in mahligai idaman always have window problem and they solve it by replacing the new panels of the window. This way, the window can be open and close without worrying a water could go in.

Table 4.0 : Problems and Solutions for Structural and inspection work

CHAPTER 4

CONCLUSION

In conclusion, foundation and structural work play an important role in the development of a society. Those method could effect the house entirely if the workers take those things trivial . In short, if workers don't take those things seriously, it will make the house look hideous and cause many defects. As for structural work, it must be done perfectly to precent any structural problem such as cracks and sewerage problem. During performing these work, we have to hired a high skilled workers so that the customers are safe and they are satisfied with the work. Moreover, inspection is also an important case as it will ensure the safety of the customers. If the inspection was not done, probability of having a disaster is high. Hiring a knowledgeable people will increase the safety of the customers. In this report, all the methods of correcting the defects which are the main problems that are always issued by the owners are explained in detail.

REFERENCES

Website:

(*What Is Classed as Structural Work?*, n.d.). Causes of Beam & Post Problems. (n.d.). *My Foundation Repairs*. Retrieved January 9, 2022, from https://www.myfoundationrepairs.com/beam-post-problems-2/

Foundation Cracks: Causes, Seriousness and When To Worry. (2017, November 2). Buyers Ask. https://buyersask.com/structural/foundation-cracks-causes-seriousness-and-when-to-worry/

Geotechnical Engineering Shallow Foundations R1.pdf. (n.d.). Retrieved January 9, 2022, from https://www.cedengineering.com/userfiles/Geotechnical%20Engineering%20Shallow%20Foundations%20R1.pdf

Identify 8 Common Signs of Foundation Problems. (2021, December 7). HD Foundations. https://hdfoundationrepair.com/how-to-identify-8-common-signs-of-foundation-problems-in-houses-or-commercial-buildings/

Method Statement for Structural Steel Erection. (n.d.). ProMoxBuzz. Retrieved January 9, 2022, from http://promoxbuzz.blogspot.com/2016/01/method-statement-for-structural-steel.html

What is classed as structural work? (n.d.). Retrieved January 9, 2022, from https://askinglot.com/what-is-classed-as-structural-work