



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

INSTALLATION OF THE PRECAST U-DRAINAGE

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DECEMBER 2019

by

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entitled

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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 are stated herein, prepared during a practical training session that I underwent at Mekarima Sdn Bhd for a duration of 20 weeks starting from 5 August 2019 and ended on 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.

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Lastly, I also indebted to my family, and friends due to their continuous encouragement throughout my practical training. Thank you so much.

ABSTRACT

This report briefly explained regarding precast U-drainage for housing project situated at Santai, Parit Unas, Mukim Parit Bakar Muar, Johor. The aimed of this report to investigate on how the installation of precast U-drainage was carried out. Apart of that, the problems and the solution were explained together. The findings revealed that there was the method statement of precast U-drainage was conducted. The methods to achieve the objectives above is the planning of precast U-drainage before carried out the installation process, determine the installation process of the precast U-drainage. Therefore, the finding revealed is on how the installation of precast U-drainage and when is the right situation to install it. So, this topic is investigated based on the installation work which is the precast U-drainage on the site.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Precast U-drainage is one of the common types in the building construction. There is a few important of having a drainage system. If the drainage system is improperly installed, so that possibility and the high potential of the sanitary system problem can be happen. Then, the sanitation system will be failed to flow. The purpose of install the precast U-drainage is to ensure waste and other water will flow easily. when the drainage system fails to flow, the stagnant water conditions create an unpleasant surrounding from nearby people.

The precast U-drainage had several standard sizes. The standard sizes consist of between 600mm to 1800mm and with width between 2100mm and 3600mm in length of 1 metre. As a small size also is available for nominal width between 300mm and 450mm in length of 1.2 metre. Besides, precast U-drainage also is available in both with and without Dry Weather Flow (DWF). Dry weather flow refers to the wastewater flow in a sewer system during periods of dry weather with minimum infiltration. The consequences of the lower flow apply to both combined sewer systems and to separate sanitary sewer systems. It easy in handling and laying. Precast U-drainage allows for fast construction of waterways open drains in using high quality factory cast units with a minimum of wet concrete works.

However, for this report focus on the installation method of the precast U-drainage common method in the construction to install precast U-drainage system. Therefore, the aim of this study to identify and investigate on how the precast U-drainage is installed. Installation U-drainage as one of the objectives below.

1.1 Objectives

The objectives of this report are:

1. To describe the planning of precast U-drainage before carried out the installation process.
2. To determine the installation process of the precast U-drainage
3. To identify the problem occurred and the solutions to solve the problems during installation process is carried out.

1.2 Scope of Study

This study was conducted for residential project situated in Santai Parit Unas Muar, Johor for 8 units single storey of semi-detached house. This study focuses on the planning, the installation process of precast U-drainage as well as the problems and the solutions. This study also explained on quantity of workers involved also machinery and equipment involved. Then, for the installation process required skilled workers and used. This is because there are a few precast U-drainage which is have the large sizes. After that, here are a few machineries and equipment used in this work which is backhoe or excavator of machinery.

1.3 Research Methods

There were 3 research methods were conducted:

a. Observation

The observation is carried out at the construction site. The observation regarding on how installation precast U-drainage was undertaken including machinery, tools as well as the quantity of workers. During the observation, the data was collected using a camera and voice recorder because we just have only recorder. This observation will be discuss about all the data collected from the site which is including an overview of techniques that are commonly used, a few problems on site, time duration of installation of the u-drain took, the drain types and cost of those techniques. The observation was conducted about 1 week. The data was collected during the observation in the form of written notes and capture a picture.

b. Interviews

An unstructured interview was conducted at the office of Mekarima Sdn Bhd and construction site. Several interview sessions have been carried out with Director, Site Supervisor and Workers. Each of interview was took for about 10 minutes. Then, all the detailed information was taken in written notes and compiled it together to be presented in case study section.

c. Document reviews

Several documents were also been reviewed such as company profile, progress report and drawing of precast U-drainage as well.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Company Profile

Name of company is Mekarima Realty Sdn. Bhd. Date of Incorporation is 5th March 2012. The company located at No 6, Tingkat 1, Jalan Sejahtera 1, Taman Sri Temenggong, Jalan Temenggong Ahmad, 84000 Muar Johor Darul Takzim.

The company consists few Director which is En. Ahmad Farid Bin Haji Omar, En. Ahmad Bin Bachok, En. Mohd Salleh Bin Akram, En. Zolkaffli Bin Hassan, En. Jawati Bin Abu Naim.

Mekarima Sdn. Bhd incorporated on 15th May 2006. It is carried on the business of property developer. Then, Mekarima Bina Sdn. Bhd is a latest company just incorporated on 23rd November 2016 until now. So, the directors of this company consists En. Hadi Hasnor Bin Hasanuddin and En. Ibrahim Bin Mohd Bajrai. This company was carried on as main contractor for construction works, structural, civil, mechanical, electrical engineering, plumbing and sanitary works.

2.1 Completed Projects

Table 2.1 show the completed project of Mekarima Realty Sdn. Bhd.

(Source: Mekarima Realty profile)

PROJECT	DATE	COST (RM)
Anjung, Muar - Development of 26 units single storey semi-d house at Parit Samsu, Muar	May 2011	RM5,070,000.00
Cerana, Muar - Development of 26 units double storey semi-d house in Taman Temenggong, Mukim Bandar, Muar Johor.	February 2014	RM7,282,000.00
Serambi, Muar - Proposed Development of 26 units single storey semi-d house at Parit Raja, Muar Johor.	March 2016	RM7,691,800.00

2.2 Organization Chart

CORPORATE INFORMATION

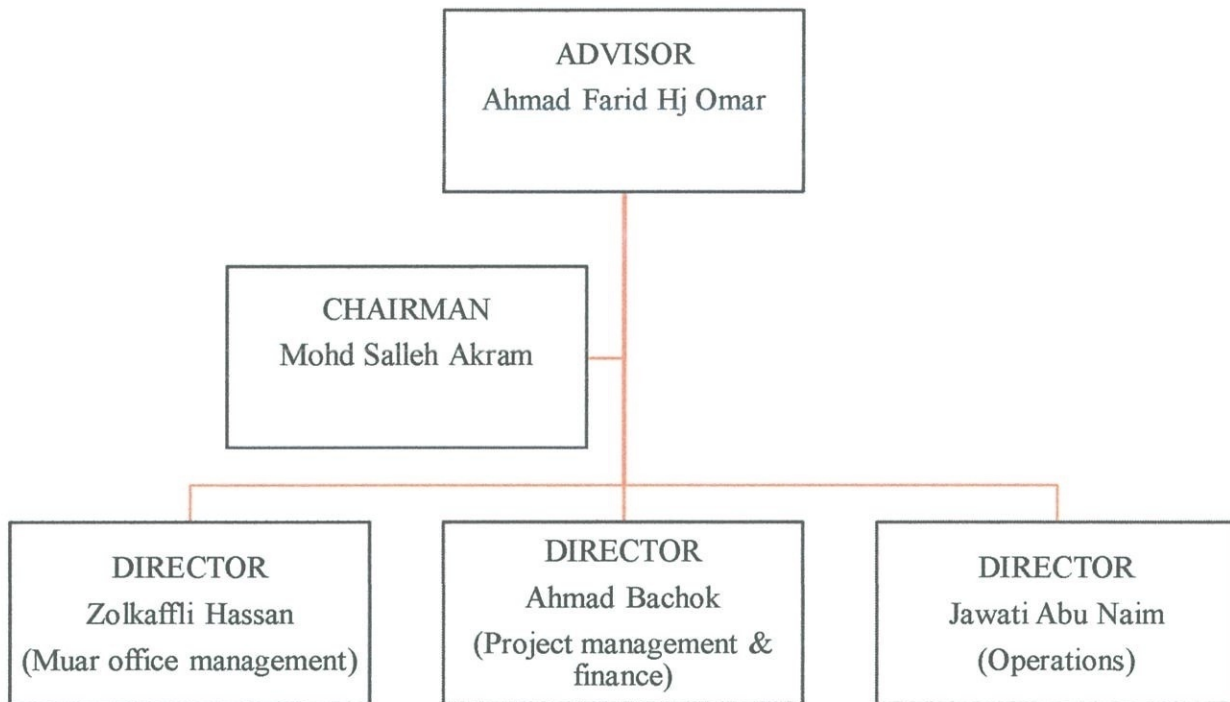


Figure 2.1 show the organization chart of the all Director.

This is an organization chart of the Mekarima Realty shareholders and members. Firstly, En. Ahmad Farid Bin Hj Ahmad as an Advisor for this company. Next, the chairman under advisor is En. Mohd Salleh Akram which is much needed in this company. Then, another director is En. Zolkafli Hassan as Muar office management. He manages all the administration in Muar. Next, En. Ahmad Bachok as a Project management and finance. And lastly, En. Jawati Abu Naim as Operations in Mekarima Realty Sdn. Bhd.

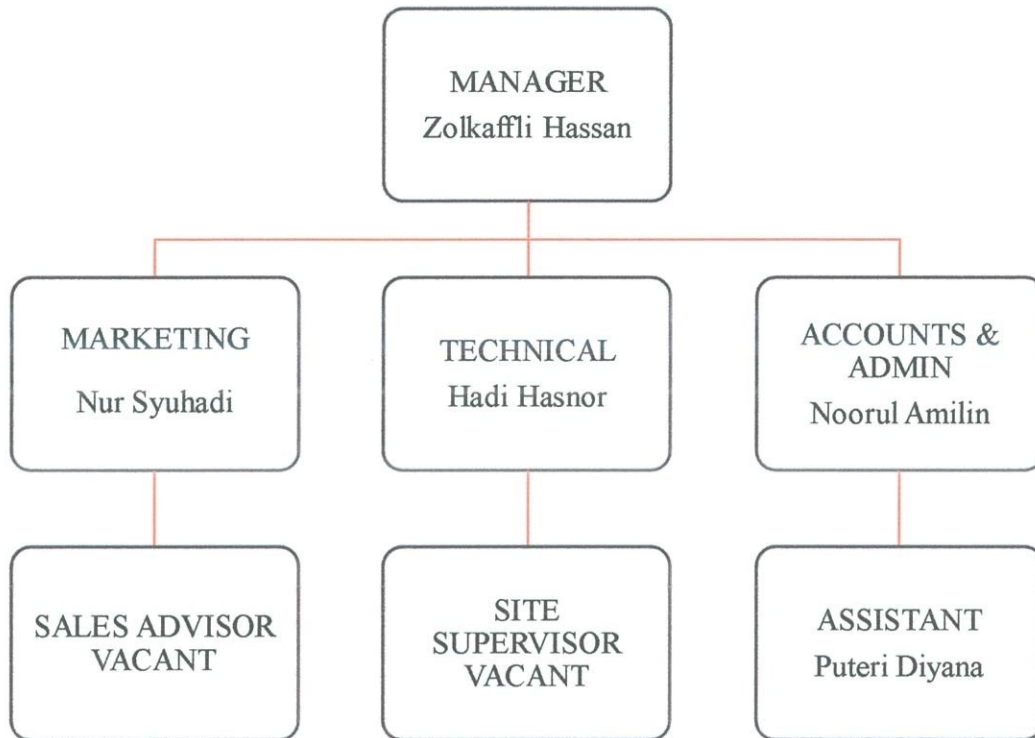


Figure 2.2 show the organization chart in Muar Department.

This is an organization chart of corporate information in Muar. All staff under Mekarima Realty Sdn. Bhd. Then, manager in Muar is Encik Zolkafli Hassan. This company has a marketing. Nur Syuhadi as a Sales Advisor in marketing and Encik Hadi Hasnor as Technical in Mekarima Bina Sdn.Bhd. Next, Puan Noorul Amilin as an accountant and administration. And the lastly, Puteri Diyana as assistant accountant.

CHAPTER 3

CASE STUDY: PRECAST U-DRAINAGE

3.0 Introduction of Case Study

The case study was undertaken for the development of 8 units single-storey Semi-detached housing located at Kampung Parit Unas, Muar, Johor. The total cost of this project is approximately about RM1.3 million. This project commenced from 5th June 2018 and will be completed in 31st January 2020.

Focus of this report is installation of the precast U-drainage. For this project, there were several sizes used such as 450mm x 450mm, 750mm x 750mm, 600mm x 600mm, 1200mm x 1200mm and 1500mm x 1500mm. However, the one shown in the case study which is used size 750mm x 750mm. The supplier who supplied the precast u-drainage was from GSC company that situated in Mukim Rawang, Tangkak.

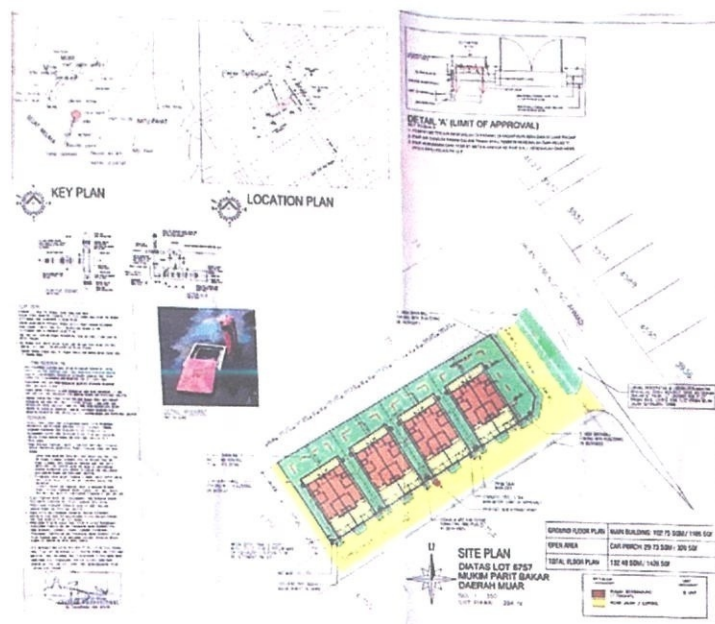


Figure 3.1 show the site plan below shows all the plan which is the size of the road, size of each unit and the reserved area.

3.1 Planning Work

3.1.1 Preparation of setting out

Firstly, setting out to mark the location to be excavated need to be carried out beforehand. Figure 3.2 demonstrated on how two workers marked the site which is a location of precast U-drainage will be install in sizes 750mm x 750mm. The marking was done along the area of housing project.



Figure 3.2 indicates two workers had done setting out by marking using sledge hammer.

Once the workers had confirmed the area to be marked, they used several tools such as hammer, measuring tape, threads and pegging either in steel or timber material as portrayed in Figure 3.3. Then, the workers knocked the pegging using hammer in a shallow depth.

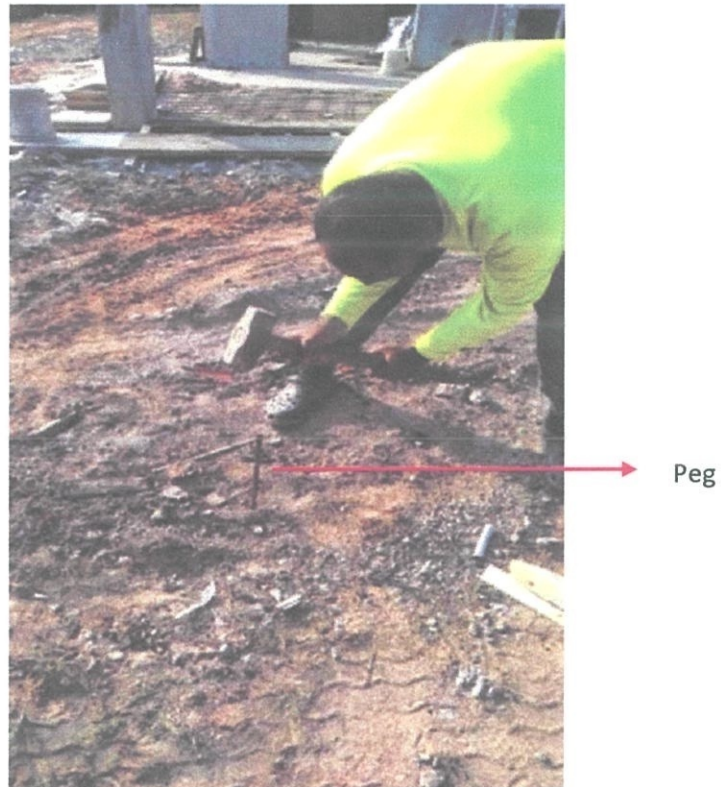


Figure 3.3 show the marking use a hammer and a pegging.

3.1.2 Levelling

There are 2 ways to conduct levelling either use a laser level or using water tube. However, the water tube is a conventional way which is high possibility of mistakes may be occur but that still relevant until now. As shown in figures 3.4, the workers were conducted a levelling along the area of housing project. Both workers used a water tube about 10 meters.

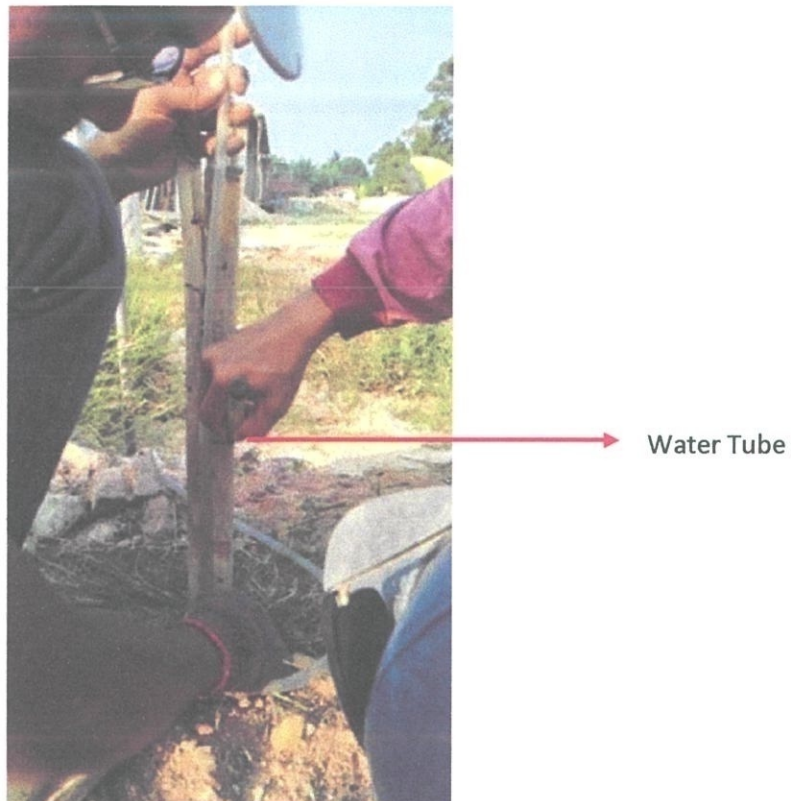


Figure 3.4 show how to use conventional methods.

After all the marked and levelling has been done throughout the housing area, then the installation of precast U-drainage can be started as explained below.

3.2 The construction method statement of the precast U-drainage

The excavation work was carried out based on the marking has been set before. The process of precast u-drainage was undertaken after 70% of current progress at the site achieved. One operator was in-charged for excavation work using backhoe. But on this project site using a backhoe to dig in this figure 3.5



Figure 3.5 show the backhoe is digging

The depth that was excavated to form the length around the housing area with approximately in 914 mm accordance with the size of the U-drainage. In addition, the excavation process for the U-drainage was carried out follow the gradient which is range 5 to 10 degree.

The depth of the
drainage size



Figure 3.6 show depth of the drainage in size 750mm x 750mm.

Upon completion of the excavation work, the precast U-drainage will be placed into the excavated ditch. There were several precast U-drainage as mentioned in section 3.1. However, Figure 3.7 demonstrated the installation process for the size of 750mm x 750mm.



Figure 3.7 show the installation of the precast U-drainage in sizes 750mm x 750mm.

Installation of the precast U-drainage requires 5 members of workers. One of the advantages of needing skilled workers to carry out precast u drainage work is that installation work will be easier and faster. Then, when there are insufficient workers, the installation process the precast U-drainage becomes difficult.



There are 5 members of workers

Figure 3.8 show the number of workers.

After completed all the precast u-drainage, the workers put some grouting to fill the gaps between each U-drainage. This is to ensure that each of U-drainage was not moving and strengthen the drainage structure for not easily to collapse or damage due to water flow pressure to prevent the u-



Figure 3.9 show the grouting between the precast U-drainage.

So, there are 66 precast U-drainage that have been installed using the machineries, tools as well as the workers and also according the flow of installation of the precast U-drainage in sizes 750mm x 750mm.

3.3 The problem occurred when installation the drainage in the site.

However, there were some problems encountered during installation U-drainage at the construction site. **Does not have base gravel** in the bottom of the precast U-drainage during the installation process of precast U-drainage. This is an improper way to install the precast U-drainage. They do not include the gravel before installation because the management in the site also not properly. In this case, solution of this problem which is site supervisor or workers need to be alert and observe during the installation process. In addition, as a site supervisor need to manage and control the management in the site properly.



Figure 3.10 show the does not have any gravel during installation process.

In addition, **weather and a soil condition** also a common problem when at construction site because of unexpected rainfall. Then, when it rains, the soil becomes moisture and wet that could affect of on excavation work. The excavation work would occur some problem because of the moist soil. As a result, the installation of precast U-drainage 750mm x 750mm will slow down as the soil is hard to dig. Some of the solutions used for the installation U-drainage should be extended to another day.



Figure 3.11 show the condition of the soil.

CHAPTER 4.0

CONCLUSIONS

In conclusion, the case study in chapter 3 which is the installation of the precast U-drainage in size 750mm x 750mm. The methods used for the work of precast U-drainage installation work are very different compare with another methods. Among them is the absence of a base gravel of the bottom precast U-drainage. this problem occurs in all sizes at the construction site. Thus, the supervisor could be alert and observe about that problem. And also, the other problem is weather and a soil condition also a common problem when installing precast U-drainage at construction site because of unexpected rainfall during installation process. Then, when it rains often, the soil becomes moisture and wet. The excavation work will be difficult because of the moist soil.

REFERENCES

Kamaruddin, volume 28, (2016) Malaysian Journal of Civil Engineering, UTM,
DETERMINATION OF U-SHAPED CONCRETE PANEL FOR LOW BEARING
CAPACITY SUBGRADE

Land Transport Authority (2014), Standard Details of Road Elements

MDC PUBLISHERS SON BHD (2006) "UNIFORM BUILDING BY LAW". KUALA
LUMPUR, Fourteenth Edition 2006, National Printers Malaysia Berhad.

OKA CORPORATION BHD, (catalogue) (2009)

[oka.com.my/index.asp?LanguagesID=1&TitleReferenceID=1212&CompanyID= 9](http://oka.com.my/index.asp?LanguagesID=1&TitleReferenceID=1212&CompanyID=9)

U-DRAIN™ OVERVIEW Retrieved December 2, 2019, from www.u-drain.ca/what-is-u-drain.html