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UNIVERSITI
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DEPARTMENT OF BUILDING
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UNIVERSITI TEKNOLOGI MARA
PERAK

NOVEMBER 2010

Recommended where the Practical Report is prepared

By

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Title

METHOD OF INSTALLATION SEPTIC TANK

accepted as to fulfill some of the conditions for receiving Diploma in Building

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**DEPARTMENT OF BUILDING
FACULTY ARCHITECTURE, PLANNING DAN SURVEYING
UNIVERSITI TEKNOLOGI MARA
PERAK**

NOVEMBER 2010

STUDENT CONFESS

Here is my practical training report that was completely written by me through practical training that I had trained for 6 months from 17 May 2010 until 16 November 2010. The project I have been followed during the internship is developing a new Terrace House area at Kuala Berang with Nafas Permata Sdn Bhd company. As to fulfill the condition or requirement to pass BLD 299 subject and allow me to receive Diploma in Building I should write anything that related to building courses during the placement.

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ACKNOWLEDGEMENTS

Alhamdulillah, thanks to merciful Allah S.W.T for giving bless to me to finish up this report with successfully as to fulfill the conditions for receiving Diploma in Building.

First of all, I would like to take this opportunity to give high acknowledgment and thankfulness to all people who always helping me either direct or indirect in order to complete this report. I am indebted to say a lot of thanks especially to my lecturer, Cik Rafizah Mohamed Nordin with her sincere heart, support and kindness in way to make me success to finish up this report.

Unforgettable also pointed to my internship company IJM Sdn Bhd because provide opportunity to gain some valuable knowledge and experienced in construction industry by placing me at site and office. Besides, I am also glad to say thanks to all supervisors who are in charged by teaching me a lot of things during my practical training along 6 months. I would like to say thanks to them because the guidance and useful knowledge that they gave is means a lot to me.

To my beloved family members especially to my mom and dad and also fellow friends, thank you so much because always understand and give moral support in all aspects and cheer me up when I feel upset. All good deeds that I have now will be in my memory and without them I maybe not used to complete this practical training report perfectly.

Thank You

ABSTRACT

This report is a brief discussion about the an installation method of septic tank of the type polysept ps3, which is made of fiber reinforced plastic. This practical report is produced based on the experience that has passed by me for 6 months practical training at the build site housing 114 units of terrace houses, at Kuala Berang, Terengganu Darul Iman. This report is divided into several sections and begin with the background of the company and project. I have to undergo practical training at company Nafas Permata Sdn . Bhd. which is a subsidiary company to Gemilang Mega Sdn Bhd. The main purposed of this study is to understand the real work happens at a construction site where the topics I choose are related to installation work from beginning phase of installation septic tank ready to install. After several months of my practical training at a construction site, I find the most appropriate title in the title of the report made. In this report there are also explained briefly about the types of septic tanks commonly used type of fiber reinforced polymer (FRP), concrete, and plastic material. during installation work is carried out a number of septic tank problems associated with the installation of septic tanks have been identified and this report has ended with several recommendations to resolve the perceived problems identified. In conclusion, this report can be expected to explain in more detail to their readers on how to install a septic tank from the start of work until it complete all.

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ABBREVIATION

IWK	Indah Water Konsuntrium
IST	Individual Septic Tank
PKK	Pusat Khidmat Kontraktor
CIDB	Construction Industry Development Board
RISDA	Rubber Industry Smallholders Development Authority
Ps3	Polysept3
IT	Imhoff Tank
PE	Population Equivalent
FRP	Fiber Reinforced Polymer
Upvc	Unplasticised Plymer
HIDPE	High Density Polyethylene

CHAPTER 1

INTRODUCTION

1.1 Introduction

Wastewater is one of the sources of polluted water in Malaysia and it has bad side effects to human life. Before the rapid development of the country, people are not paying enough attention to the sewerage system until it was found that sewage waste can be dangerous, especially to the river and human health. Therefore, people need to realize that waste water is important to be treated accordingly in order to ensure a continuous supply of clean water for generations to come. On the development of more advanced countries, Malaysia now has a better sewer system and modern (Nur Iryani 2008). However, this system does not run in some residential areas or population, particularly in rural areas. In these areas, sewage is to be channelled directly into rivers. This will cause pollution to the river becomes more serious

This effluent means the mixture of waste and human waste from residential areas to be treated to prevent pollution of water, whether underground water or surface water. This treatment is important for reducing disease risk through the spread of pathogens and organisms that are found in the effluent. Therefore, the sewerage system has been instigated to reduce the risk of contamination and disease outbreaks.

Sewerage system can be defined as a process that consists:

1. Sewer Network
2. Disposal Pipe
3. Pumping Systems
4. Treatment plant for sewerage and other places used for collecting, pumping and treating sewage in a safe before it is released into the river.

The system is very important to reduce the concentration of certain pollutants at a higher level and the level of sewage will not affect the environment.

Most people in Malaysia do not think about or being conscious about water treatment until the problem interfere with their daily life. They ignore problems until the bacteria have been polluting the their main water supply, including drinking water and cause water to smell like waste water during the day. Therefore, all people should be responsible for the sewerage system in their respective areas, including public areas and leisure centres.

In addition, the operation of sewage systems as well as essential not only to human health but the environment should also be taken into account. A sewerage service suitable for an area requires strategy and planning. Many problems arise in developing regions where operating costs are extremely high sewer system but the system does not work very well but the more difficult problems existing.

1.2 Selection of report title

During this practical training I was assigned as assistant supervisor of construction work for the terrace houses of 114 units of housing that consists of 13 blocks, infuriated at the estuary, Terengganu. Throughout the site I was impressed with the work of building services is still underway, particularly the installation of sewerage system that uses individual septic tank (ist). In addition to the installation of septic tank plumbing work is also progressing well since it is preliminary work to be done carefully without any errors. As such, I've been involved in supervising and monitoring the work of building services, particularly septic tank sewage system in which each block will provide a septic tank. In the same time I have been studying methods of work for the installation of septic tank from the beginning to the completion of work. Although the use of septic tanks fabricated from this factory, it is not easy to install a septic tank, as the need to follow the correct specifications to avoid any errors due to the installation of a septic tank cost is quite high because it involves the use of machinery and labour backhoe. In addition, I want to add more

knowledge and experience of the septic systems as the delivery of information was quite limited during the process of learning in the classroom. To learn and lead themselves to the management of the construction project in more depth. Thus, the title of the method of installation septic tanks is chosen as a subject of practical reports.

1.3 Objectives of Study

- I. To identifying the main components (with materials specs) of the individual septic tank.
- II. To identifying methods of installing individual septic tank.
- III. To identifying problems encountered during the installation of the septic tank.

1.4 Scope of Study

The scope of study includes the construction and installation of individual septic tanks at construction sites in particular locations in the trees house in the start project and finishing. And addition it also describes the work and the matters should be pursued in a more profound point about the construction of septic tanks. Septic tank used is a model of POLYSEPT PS3 from Loyal Wastewater brand made from fibber glass and plastic.

1.5 Research Methods

Source of references in a study is not subject to the observation site only. The use of other media also helped in the search for information research. Research methods should be identified and used as possible to produce good research. In general, the report prepared by using observation

1) Books

Overall, the methodology of this report was carried out according to the reference books. Reference is to theoretical and what is in it depends on the facts. Explanation with photographs in a book usually be done neatly and in proper order, it is intended to provide understanding and approach on a job more easily and simple to understand. With this method it can facilitate the process of finding information

2) Print media

Reference through print media also important method of preparing this report. In addition, the reference using print media is a more effective method. Examples of this method is as magazine and catalog. Through these materials also can learn something step theoretical construction.

3) Electronic media

Reference use of electronic media is a method that is faster and faster. In addition, the information obtained from electronic media and more effective. Examples of this method is the Internet. The materials are usually obtained from the global Internet. It is useful in studying the new technologies that may be related to the study. The difficulty for this type of method was found to explain the general nature and not exhaustive.

4) Interviews

Interviews are one of the most efficient methods and effective for obtaining information. This method should be interviewed workers or specialists such as engineers, the site has a deeper experience for more information. In this study, the authors have interviewed the project supervisor, En Abd Fatah Bin Abdul Latif and interviewed many workers involved in the installation of septic tanks. Finally, we interviews my subcontractor En Lee Kok Wing, for a handling to the finishes the method of installation septic tank.

5) Observation

Observation requires a long time to get accurate information. This method also requires care to avoid missing important information and result in less accurate information is received. This method helps in understanding some of the machinery involved in building and construction methods that do the actual construction revealed. This method provides opportunities and experiences, to understand the method of communicating between employees at work.

CHAPTER 2

COMPANY PROFILE

2.1 Introduction

Nafas Permata Sdn Bhd is a company fully owned by indigenous writers placed for practical training for six months starting from 17 May 2010 until 16 November 2010. The purpose of practical training is conducted to meet the learning syllabus Diploma of Building (AP116).

Nafas Permata Sdn Bhd is one of the contractors class 'B' the indigenous name of the day getting jumped up in front of the construction industry today. Nafas Permata Sdn Bhd .Ltd is located at Lot 242 Tingkat Atas, Jalan Astaka , 21700 Kuala Berang, Terengganu.

Nafas Permata Sdn Bhd. Ltd is a company active in the residential construction industry. Expertise, experience and strong financial is an important aspect that led to the success of several projects in Malaysia. Staff in the organization of an efficient group and has extensive experience.

The company is supported and assisted by an efficient management team, experienced sub-contractors and suppliers of high calibre. With this reason the project could be completed successfully by the progress that has been planned and ensure client satisfaction and needs.

2.2 Company History

Nafas Permata Sdn Bhd was established on June 19, 2008, founded by En. Zulkefli Bin Ismail. This company is a subsidiary of the Company Gemilag Mega Sdn Bhd which operates with at Lot 242 Tingkat Atas, Jalan Astaka, Kuala Berang, Terengganu.

The company is a company 100% owned by resident registered with the Contractor Service Centre (PKK) as a class 'B', under the Construction Industry Board (CIDB) is

a grade 'G6' and with the Ministry of Finance. Modus operandi of these companies are in the construction industry, services, agriculture and engineering.

With a career record of excellence, Nafas Permata Sdn Bhd has been able to gain trust in various government departments and private for yield and quality of the company. Based on the performance and increase the financial capacity and staff trained, professional, and efficient, the company hopes to make it more competitive for projects that will come.

2.3 Objectives of the Company

The objectives of the Company Nafas Permata Sdn Bhd are:

1. To carry relationship in the construction period long.
2. To obtain the cooperation towards the quality of employees, suppliers, subcontractors and consultants to Nafas Permata Sdn Bhd.
3. To develop, implement and maintain a quality management system in accordance with MS ISO 9001:2000.
4. To make the management of quality and performance to meet the essence of corporate culture.

2.4 Corporate Information

Company name	:	Nafas Permata Sdn Bhd
Company No	:	822225-U
Date Established	:	19 JUN 2008
Address	:	Lot 242 Tingkat Atas, Padang Astaka, 21700 Kuala Berang, Terengganu.
Company H/P.	:	
Telephone	:	
Fax	:	09-6812971
Registration	:	a. Pusat Khidmat Kontraktor (PKK) – Kelas B b. Kementerian Kewangan c. CIDB – Gred G6
Authorized Capital	:	RM 500,000.00
Paid Capital	:	RM 500,000.00
Board member	:	Nabilah Farahanah Bt Zulkefli
Director	:	Nosita Bt Ali
Status	:	100% Bumiputra
Company Secretary	:	MCM CORPORATE SERVICES SDN. BHD (LS 06130)
Bank address	:	Public Bank, Branch Kuala Terengganu.

2.5 Organization Chart

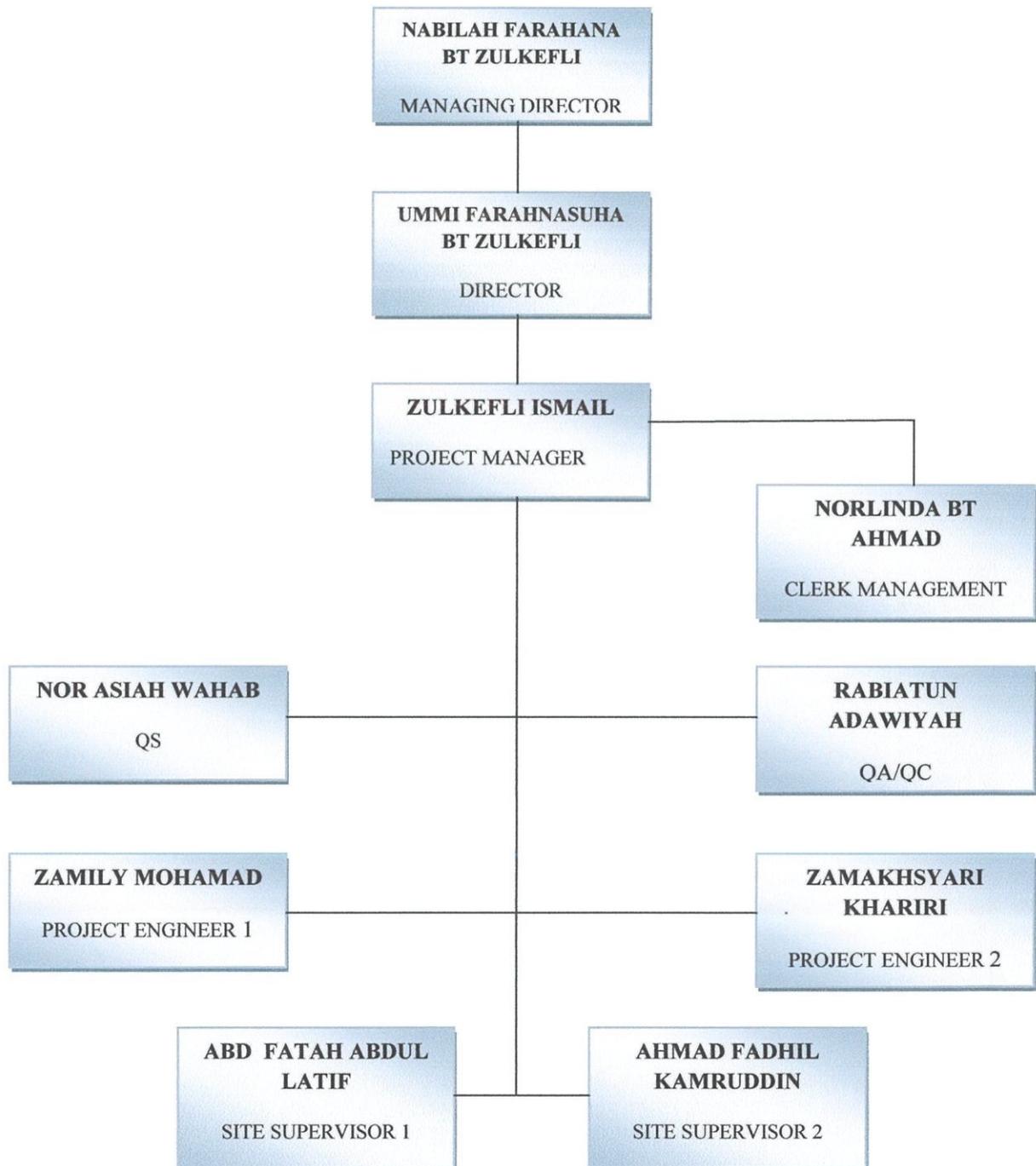


CHART 2.5: Organisation Chart

Sources: Nafas Permata Sdn Bhd company's profile

2.6 List of Previous Project

Table 2.1: List of previous project

BIL	PROJECT NAME	OWNER	DATE / PERIOD OF CONTRACT	CONTRACT VALUE (RM)	REMARK
1.	Site work and land fill at Public Transport , Kuala Berang	Gemilang Mega Sdn Bhd	2008	500,000.00	completed
2.	Build and complete of road at Mini Farm Estate Gerdong	Koperasi RISDA Kuala Berang	2008	450,000.00	completed
3.	Proposed Construction of Complex istana Baru Terengganu at Bukit Chendering, Kuala Terengganu	AHT (NORLAN UNITED) & CARRIAGE SDN BHD	2008	7,520,901.34	completed

BAB 3.0

THEORITICAL OF SEPTIC TANK

3.1 Introduction

Sewerage system may be called as well as a system of sewerage network, or in other words is one of the drainage systems, sewerage drain sewage from the building to the sewerage system. Sewerage drainage system must be in good condition and functioning during the period of time used, so that the failure of sewerage system in with overall is avoided. Hence, a good sewerage system equipment, it will secure the cleanliness and health of residents and environmental hygiene in the services.

Sewerage system in Malaysia started to appear in 1950 with toilet has of drainage pumps were introduced together with sewage directly into the septic tank. sewerage system serves to receive all the materials are removed and discharged sewage in a pipe system clean and efficient manner directly into the septic tank. Next, based on the context it sewerage system services to the two conditions, namely connected sewerage services system and sewerage system, the individual and the public.

3.1.1 Connected sewerage services

Plan and operation of sewerage system plays a role in enhancing the effectiveness of the A system. Therefore, Connected sewerage services system is essential in ensuring that sewage water can be drained well and right without giving effect to the environment. This system consists of connection of underground pipes, pumping stations, sewage treatment plant-plant and sludge treatment facilities according work gravity (IWK, 2006). There are two types of services connected to the sewer;

a) Sewage treatment plants

This treatment plant is located through channels often out catchment areas draining to plant-plant can accept sewage flows easily without the need for expensive pump.

b) Pipe connection to the premises.

This system is a system that uses the pipeline to the premises directly to sewerage treatment plant, additional it was upgraded from individual septic tank connected to the sewerage system.

3.1.2 Individual sewerage system Services

Under the system of individual sewers, septic tank sewerage individual. individual system itself is used in almost all residential premises in Australia, for residential premises such as apartments and flats, it uses the *Imhoff* tank effluent into a major place issued. There are to facilitate the treatment can be carried out for the rise of housing such as flats and apartments. With the collection system in the main tank waste, sewage will be drained from the apartment

3.1.3 Public sewerage system Services

Sewerage system was conducted in rural areas to classification as a system that is less developed than the town. We can see the lack of sewage system processing systematic in rural areas. As to lack of processing system will be effect the environment and cause problems to people because influent only released to the ground. With the release influent into the soil condition will cause more problems where bacteria are present will affect the life surrounding its close proximity to the (ist) said.

3.2 Septic tank

Individual septic tank (IST) is a simple sewage system such as *Imhoff* tank (it), but they differ in the cost of construction and maintenance of the tank. Figure 3.1 shows two sections the real picture IST commonly used for housing type ps3.



Figure 3.1: Two sections the real picture IST commonly used for housing type ps3

It's very suitable for a residential or individual building in comparison population (PE) up to 150, where the area has no centralized sewage system and the flow effluent will give negative impact to the environment (IWK, 2006) Figure 3.2 shows the actual situation that occurred in the septic tank.

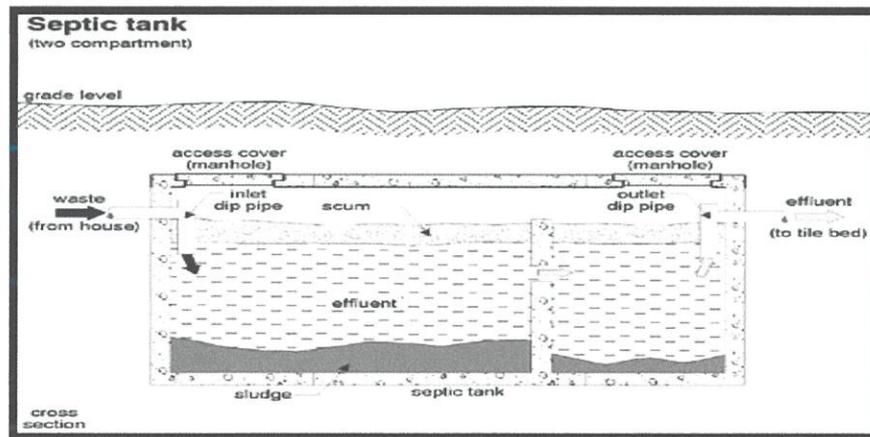


Figure3.2: The actual situation that occurred in the septic tank

source: <http://www.septicyellowpages.com>

in this tank has two spaces connected in series, the first chamber and second chamber, where it does not treat sewage with overall. Both these spaces function as a sedimentation tank, and should be emptied while the schedule set by IWK. Usually, the sludge will be maximum in IST is a third of its size. (IWK, 2006).

When the influent into the wastewater system, it will be the first space in which the solids from the wastewater will settle to form sludge or sewage. At the same time, grease and oils will float on the water surface and form a scum. Then, the effluent is between scum and sludge will flow into the second chamber. In this space next deposition will occur. Effluent will flow into the second chamber to the deposition and will and the next past to drain or allowed to absorb into the ground (IWK, 2006).

urther, the layers that exist on the surface of the water in the IST will prevent oxygen from dissolved in water. This will result in anaerobic digestion process will occur, where it is converted to more stable organic compounds and gases such as carbon dioxide (CO₂), methane (CH₄) and hydrogen sulfide (H₂S) by the untreated wastewater should be treated at least 24 hours prior to the anaerobic pollution sewage (Nur Syafiza 2005)

According to the IWK in the storage capacity of a septic tank is in a period of two years. After the Adequate storage at time and passed two years it will emptied the septic tank, scum and state that the sludge can be prevented from being out of the septic tank.

3.2.1 Type of Model Septic Tank and Dimension

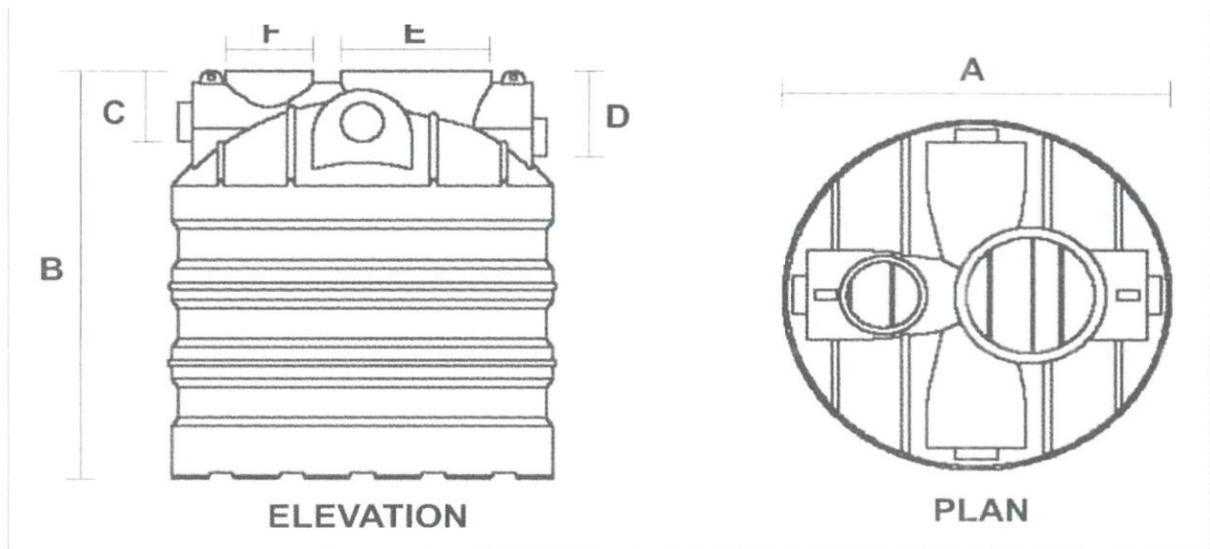


Figure 3.3: Type of Model Septic Tank and Dimension

Source: <http://www.gallentsuplire.com>

Table 3.1: Type of model and Dimension

Model	Ps-3	Ps-5c2	Ps-5	Ps-10	Ps-40c1
Population equivalent	10	12	15	25	30
EFFECTIVE VOLUME liters	>2200	>2700	>3400	>5800	>6800
INLET/OUTLET DIAMETER mm	100	100	100	100	100/150
DETENTION TIME hours	>24	>24	>25	>25	>24
DIMENSION					
A mm diameter	1450	1625	1850	2150	2270
B mm	1760	1740	1730	2020	2190
C mm	210	220	220	210	200
D mm	260	270	270	270	260
E mm	510 dia	530 dia	530 dia	530x630	530x694
F mm	310 dia	310 dia	310 dia	310 dia	310 dia

Source: Effluent to STANDARD B- environmental quality (sewage and industrial effluents) regulation 1979.

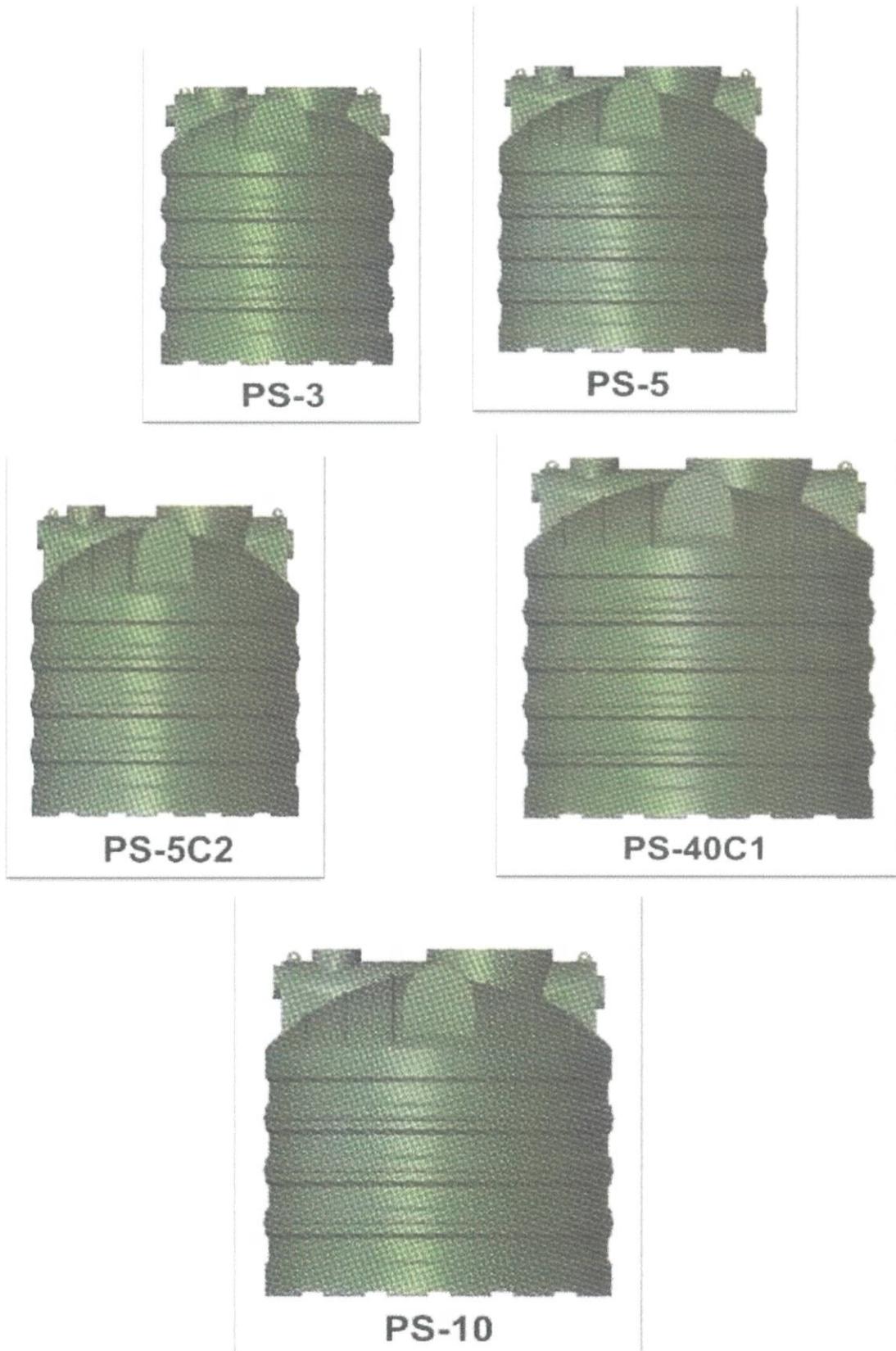


Figure 3.4: Type of model septic tanks

Source: www.gallentsupplier.com

3.3 Type of material used for septic tank

3.3.1 Fibre reinforced polymer (FRP)

Fibre reinforced polymer composites or fibre reinforced polymer (FRP) composite materials is one which began to be used as one of the important materials in the construction industry in particular septic tank. FRP is a combination of fibre and polymer matrix. Fibre is usually made up of carbon, glass or agamid. The nature of this material is similar to concrete fibre reinforcement material where the rod is as reinforcement and resin as to concrete. In the present material (FRP) was introduced in the construction of the septic tank, because it is lightweight and does not rust. Figure 3.3 shows an example septic tank made of materials (FRP).



Figure 3.5: Fibre reinforced polymer (FRP)

Source: <http://www.wastewater.itrademarket.com> fact

3.3.2 Reinforcement concrete tank

Concrete is one that uses a mixture of water, sand, cement, aggregates, stone, small or large. It could be a number of grade such as grade 25. In the construction industry it is widely used more this material has more advantage of strength and not rusty. With the rate of mixed concrete materials will form a coalition composition soft solid and easily done. concrete is used to make a septic tank where it is made in the form of the various efficient . For the construction of septic tank it should be add the reinforcement to increase strength concrete. Figure 3.5 clearly lead to more examples of the septic tank is made of a mixture of concrete and steel, concrete reinforcement, called septic tank.

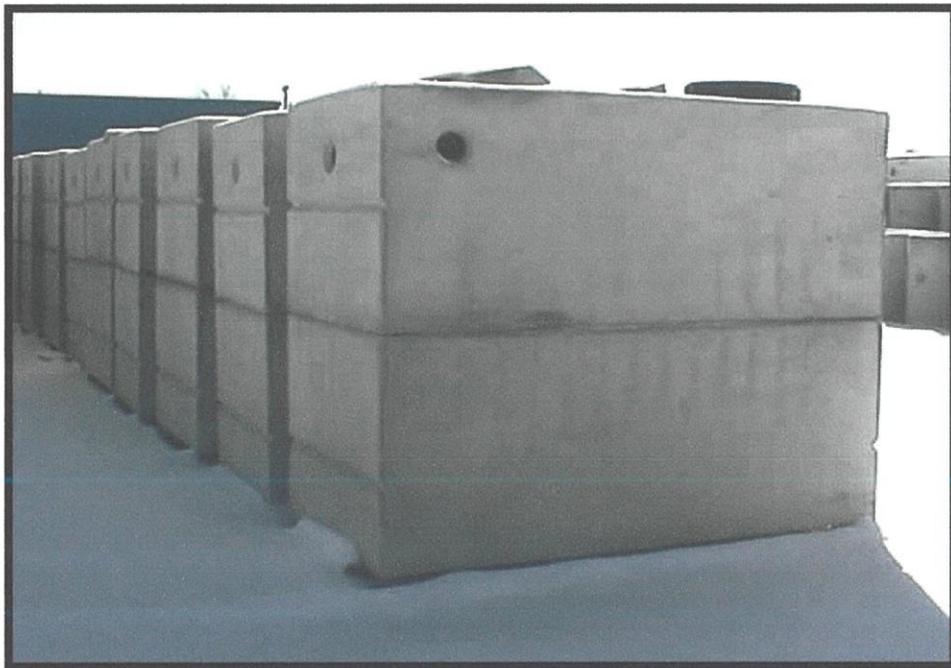


Figure 3.6: Reinforcement concrete tank

Source: <http://www.enviromental.com>

3.3.3 Plastic

Plastic is a material of light and not rusty, it more used in our lives. Now materials are used in various plastic materials especially in the construction industry. Figure 3.7 shows examples of tank made of plastic. This plastic tank more advantages compared with concrete because it is lightweight, no rust and no cracks. In addition, during the installation works plastic tank it should wore done with carefully because it is easily dented. With good design and good that it can withstand the load around.



Figure 3.7: Plastic material

Source: <http://www.septicsystem.com/fact>

3.4 Function of the septic tank

While relatively simple in construction and operation, the septic tank provides a number of important function through a complex interaction of physical and biological processes. The essential function of the septic tank are to;

1. receive all wastewater from the house
2. separate solids form the wastewater flow
3. cause reduction and decomposition of accumulated solids
4. provide storage for the separated solids (sludge and scum)
5. pass the clarified wastewater (effluent) out to the drain field for final treatment and disposal

3.5 Procedure of installation septic tank

Septic tank installation procedure is provided to indicate the specific measures detailed in the installation according to the technical specifications for individual septic tanks. This installation procedure is based on the approved drawings and in accordance with contract specifications to ensure the implementation of the installation of septic tanks is progressing well and according to the stipulated time without any problems.

3.5.1 Initial Preparation

a) Materials

Some of the materials and equipment needed in the installation of septic tanks must be adequately prepared. Materials must be certified and based on drawings and act to ensure that sewerage construction and installation process can be carried out in accordance with the specifications and rules that have been set.

- i. Septic tank
- ii. Reinforced concrete foundations
- iii. Water filled into the tank

iv. Materials suitable reload (land)

150 mm diameter UPVC pipe for incoming and outgoing channels

3.5.2 Septic Tank Construction

a) Determining the Location

Determining the location septic tank placement should be in detail based on the existing plans for placement location (ist) in exactly the right thing. This matter should be taken into account prior before to excavation work done.

b) Dredging

During the excavation works, there are several procedures that should be followed to ensure no problems and misery that will arise during the dredging work carried out. Among the procedures in the dredging process are:

- i. Identify locations based on detailed drawings.
- ii. Mark the locations for dredging works
- iii. Do dredging based on the level required for placement of septic tanks.
- iv. Mark the level of the septic tank right to the home position, to ensure proper flow of sewage

c) Measuring the Level

Level measurement is done to identify the level and depth required for placement of septic tanks and other components involved. In addition, measuring the level necessary to get a good flow and effective sewerage. Among the measures to be taken is the length, width and height septic tank. Make sure the hole match is larger than the size of tanks and septic tanks are used match hole must be cleared of any material or hard objects such as tree roots and rock. Next, determine the level of septic tank will be done by using the level of floor finishes using tensed thread horizontal on the ground.

d) Site Preparing Basic Concrete

After complete do the work, a concrete basis to build a septic tank liners. The first step, provide a layer of Lean concrete 50 mm thick. Then, a layer of 150mm thick concrete reinforced with BRC A10 performed on Lean Concrete. Concrete mix ratio is 1:2:4 which is Grade 20. anchor hook will be added to the site where the water retention rate is high as a binder septic tank

e) Installation of Septic Tank

Step 1: The site should be clearing side of the hole first by removing all foreign materials such as pebbles, sand, soil surface and the hole wall face so resistant materials can be avoid including into the hole during the work placement septic tank. Then, enter the septic tank carefully into the hole that was to excavation. Place the tank at the location indicated on the concrete foundation has been hard.

Step 2: Once the tank is placed, Fill the septic tank with water until $\frac{3}{4}$ full into the semi-septic tank by 70%. The main purpose is to fill water from the septic tank prevent the floating in the event of rain, water will start to stagnate in the hole excavation.

Step 3: Next the hole on the septic tank and inlet and outlet closed the abolition to used plywood board cut hole size according septic tank. Enter the above to hold the filling a hole in the side tank septic tank up to a distance of 100 mm at the channel inlet and outlet pipe socket tank. Just make sure the landfill is filled with dense of the side of the septic tank

Step 4: remove the plug of stuffed or plywood board on top of the septic tank and on the side of septic tank inlet and outlet channels. Connect the inlet pipes, outlet pipes and ventilation base on detailed engineering drawing.

Step 5: Next, when the work is complete the connection pipe inlet and outlet channels. Sand will be included in the side surface of the pipeline up to the septic

tank, so that work can be done in brick bond at the surface as septic tank septic tank manhole cover sealed inspection chambers.

Step 6: Examination of the workability of septic tanks in place to see if there are any leak or blockage in the septic tank problem.

CHAPTER 4.0

METHOD OF INSTALLATION SEPTIC TANK

4.1 Introduction of Septic Tank

Terraced houses built in this project, wastewater sewerage system selected is an individual septic tank system tanks using tank type polysept septic tank ps3. In this project it only uses the septic tank is just the kind made from fiber reinforced plastic (FRP) as shown in figure 4.1



Figure 4.1: Type of tank polysept ps-3

Septic tank is now widely used irrespective of the rural and urban areas, the addition of this tank is to clarification in shapes and sizes. In determining the size of the septic tank use is it depends on the size of the building seta uniformity of the population (PE). In this project he used a total of 114 nose polysept ps3.

4.1.1. Detail of a Septic Tank with overall size and others components.

Table 4.1: Septic tank ps-3

MODEL	PS -3
DIMENSIONS	
Height (H)	1760
Width (mm)	1450
Inlet paip diameter (mm)	100
Outlet pipe diameter (mm)	100
Ventilation pipe (mm)	20
Detention time (HRS)	>24
Volume to water level (L)	>2200
Tank body material	Fibre Reinforced Plastic (FRP)
Filter Media Material	Polypropylene / PVC
Pipe material	PVC
Manhole Cover material	Cast Iron
Population Equivalent Served (PE)	22-30
Maximum population equivalent (All waste)	10

Source: Project septic tank System and Details of Connection to Drain and base on the Malaysian standard MS 1228: 1991 at project build terrace house at Kuala Terengganu

4.2 Procedure an installation of septic tank

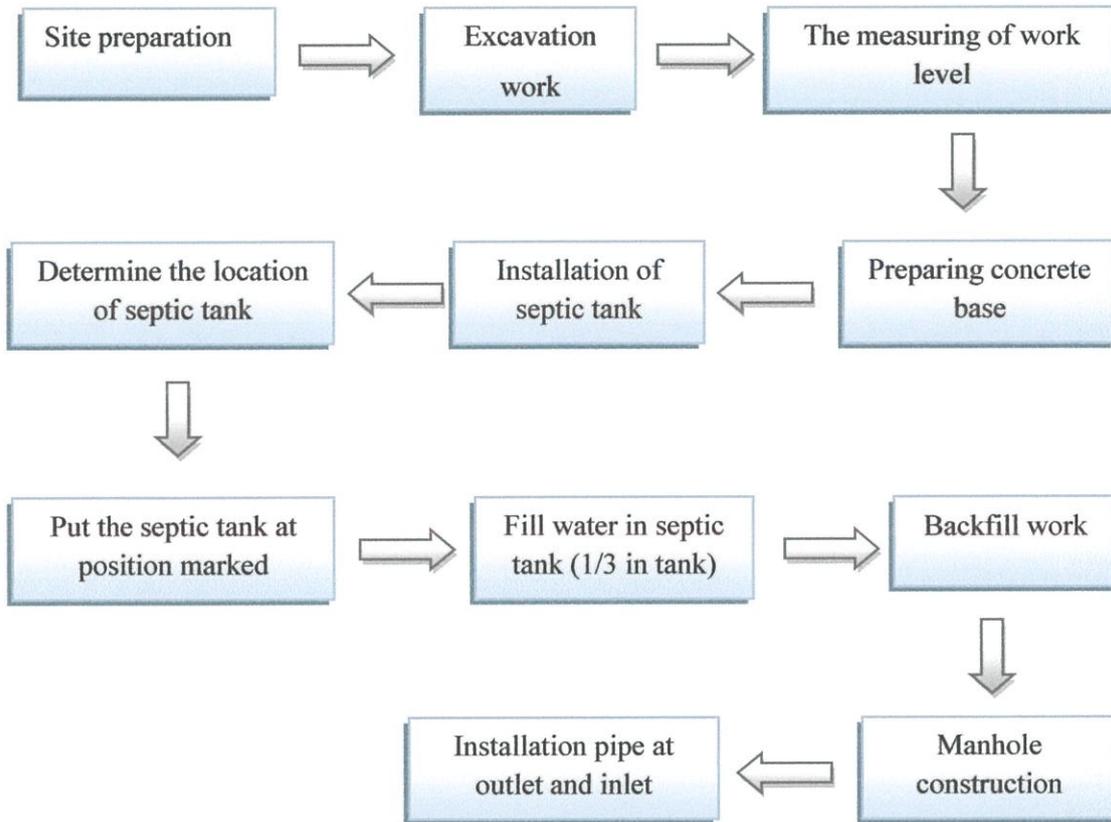


Chart 4.2: Procedure an installation of septic tank

4.2.1 Site preparation

Preliminary work to be done during site preparation is to clean the construction area by Using a bulldozer or other suitable machinery. At the same time it seeks to ensure that the site is to a pointed septic tank timber, and to level using the same string with the actual floor level to be uses indicators measure the level of the septic tank during the foundation work digging done.

first step will be in the process of site preparation for construction of a septic tank is working it is aimed at setting out the position of each every component in this system. it is to find the septic tank boundaries separate stems from the foundation site. Once finished wood pile with a pointed to mark the border demarcation process for septic tanks will be dug in the ground by standing out in the plan.

After the completion of the work carried setting out the timber will be tied with

string that stretched horizontally on the actual level of floor finishes to be used as the basis of the size of the reference level, such as septic tanks in the diagram (4.2). This will be drawn horizontally on the ground and it in line with other septic tank arrangement.



Figure 4.2: Marking the horizontal line for measure concrete base

4.2.2 Work dredged

After complete work setting out, excavation work will be done by marking that has been made. It is executed by using either labour or the use of more efficient machinery. Use of the labour force for the purpose of dredging is more focused on the temporary use of small construction machinery will be saving time and costs for construction projects large and time-consuming to complete. In the work of dredging the land, there are several works that have followed the rules to ensure no problems and accidents arising during the dredging work carried out. Among the work rules in the excavation process are:

- i .Identify locations based on detailed drawings.
- ii. Mark the locations for Dredging works
- iii. Do Dredging based on the level required for placement of septic tanks.
- iv. Mark the level of the septic tank right to the home position, to ensure proper

flow of sewage

and the next work of dredging the land done by machines, the dredging must be done carefully and care safety first should prioritize the safety of all parties, especially workers handling the dredging works, except that this excavation work must be done together with level measurement during the dredging done.

i. Identify Locations Based on Detailed Drawings

The main aspects to handle before any work is done is the placement of septic tanks to choose an appropriate location to ensure the workability and effectiveness of the sewage system, and the aspect should be taken into account, namely:

- a) The location of the tank must be placed near the toilet area that will be use
- b) The location of the tank must be placed near the toilet area that will be use
- c) The location of these tanks also must not interfere with traffic and public places
- d) The location of this placement is not located near areas with large trees, because tree roots can damage the cord is a septic tank in the near future
- e) not placement at the building site and parking areas.

The location of the septic tank for the title of this study is close to the toilet and Located in the back row of terraced houses and 3 meters away from the toilet.

ii. Mark the location dredging work

Marking process should be done after identifying the location of the septic tank placement. the marking function to facilitate the work done for the land dredged errors can be avoided. Usually the marking is made by using wood setting out , and rope nylon to serve as foundation septic tank level. In figure 4.4 below is a sample size levelling measure from nylon level.



Figure 4.3: measuring level of base septic tank construct

iii. carry out dredging works in accordance with the level required for the placement of septic tank

Dredging will be conducted in accordance with the required level of septic tanks using machinery, the dredging will be done gradually and subsequently reviewed every level of depth to achieve the desired depth. During the excavation was carried out work it should be done with caution for the wall in the excavated hole will not collapse easily. Extension of the land is also the result of local compaction at hole in the side, to be used again when closing the soil around the septic tank.

4.2.3 The measuring of work level

During work placement is a septic tank, measure the level of work is the most important aspect is done so it does not error. Tank level must be carefully measured the hole where the septic tank inlet is in line with the stool of a pipeline that supplied vessels to the toilet. If the channel and the remaining waste is not properly and will cause problems unclean water reservoir will cause many problems for consumers.

Hence, the excavation had to be done again and this will cause the loss of time and cost. Among the measures to be taken in advance of;

- I. Height and width of septic tank
- II. Length and width overall
- III. The direction of the position of inlet and outlet channels



Figure 4.4: Review of jobs in the hole size to find the right level



Figure 4.5: Mark level with wood packing

4.2.4 Preparing concrete base for septic tank

Before the work placement septic tank concrete base is an important aspect should be made to the basic tank liners are made. Base is made using concrete grade 25 and is accompanied by the BRC. Before the concrete work is done one layer of sand will be placed in advance as in figure 4.7.

The main function of this foundation is built is designed to accommodate the septic tank and septic tank prevent the deposited. In addition, with the concrete foundation of a strong and powerful it will prevent the septic tank is leaking from the affected from stone or wood at the bottom of the septic tank site, the basic preparation steps sites are as follows;

I. areas outside of the wall and dug a hole that must be cleaned of harmful substances during the process of concrete for the foundation they need to be cleaned of rocks, wood and water if there is to pump water out of the hole for the work Concrete can be made.

II. After cleaning the site, site preparation work carried out concrete. The first step, provide a layer of 50mm thick lean concrete or just use a layer of sand. Then, a layer of 150mm thick reinforced concrete used on the BRC A7 lean concrete is prepared. Concrete mix ratio is 1:2:4 which is Grade 20. Add anchor hook on the site where the reservoir is high as the binding of septic tanks.



Figure 4.6: Land flatten work

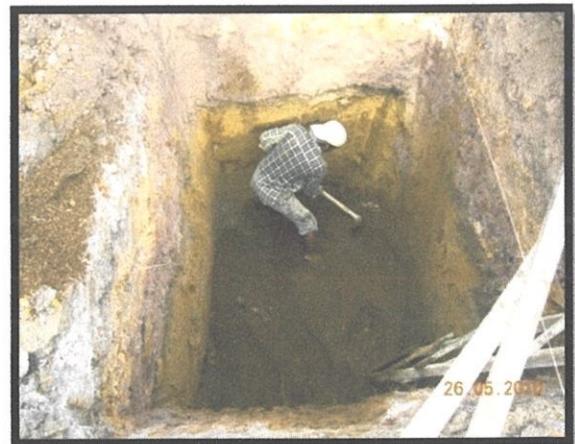


Figure 4.7: Sand flatten work

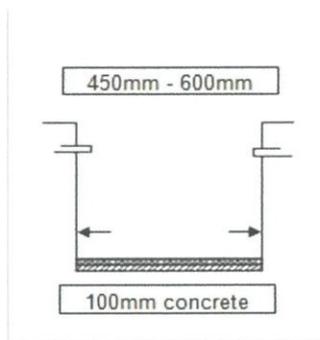


Figure 4.8: Reinforced concrete works are in progress

After completing the concrete work will be left for the day before the septic tank is located. Septic tank must be to handling with backhoe and labour at time installation work done.

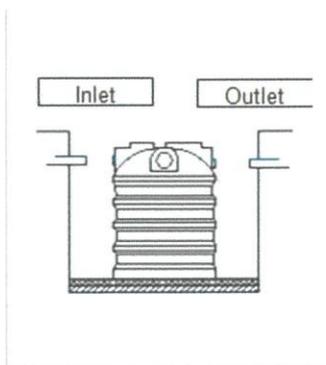
4.2.5 Installation of septic and guide line.

Once the site concrete work is completed, it will be left to harden for a day so that the concrete thoroughly. Next tank will be lifted by using excavators, which will then be placed on concrete foundations that have been mature enough today. The exact sequence of steps and should be taken into account to ensure that the installation of septic tank systems running smoothly and properly. Between the installation step are:



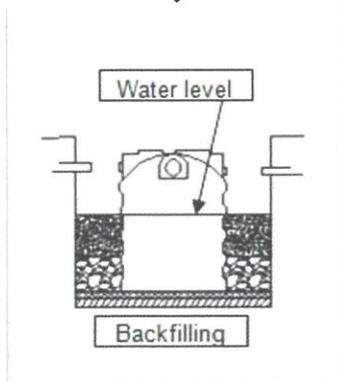
-The 100mm thickness slab with manhole openings to be laid over the septic tank. The slab consists of 1:2:4 concrete reinforced with 1 layer of BRC-A8 wire mesh

-Neck connection up to the specified level to be constructed with bricks. Cast iron to be used as manhole cover.



septic tank will be placed on a concrete base using backhoe and 2 labourers.

-Placement of the septic tank must be done carefully to avoid septic tank from dental.



Working space around the septic tank shall be backfill with sand and gravel (compacted), up to the opening lids. Septic tank must be filled in with water in equal proportion to the backfill

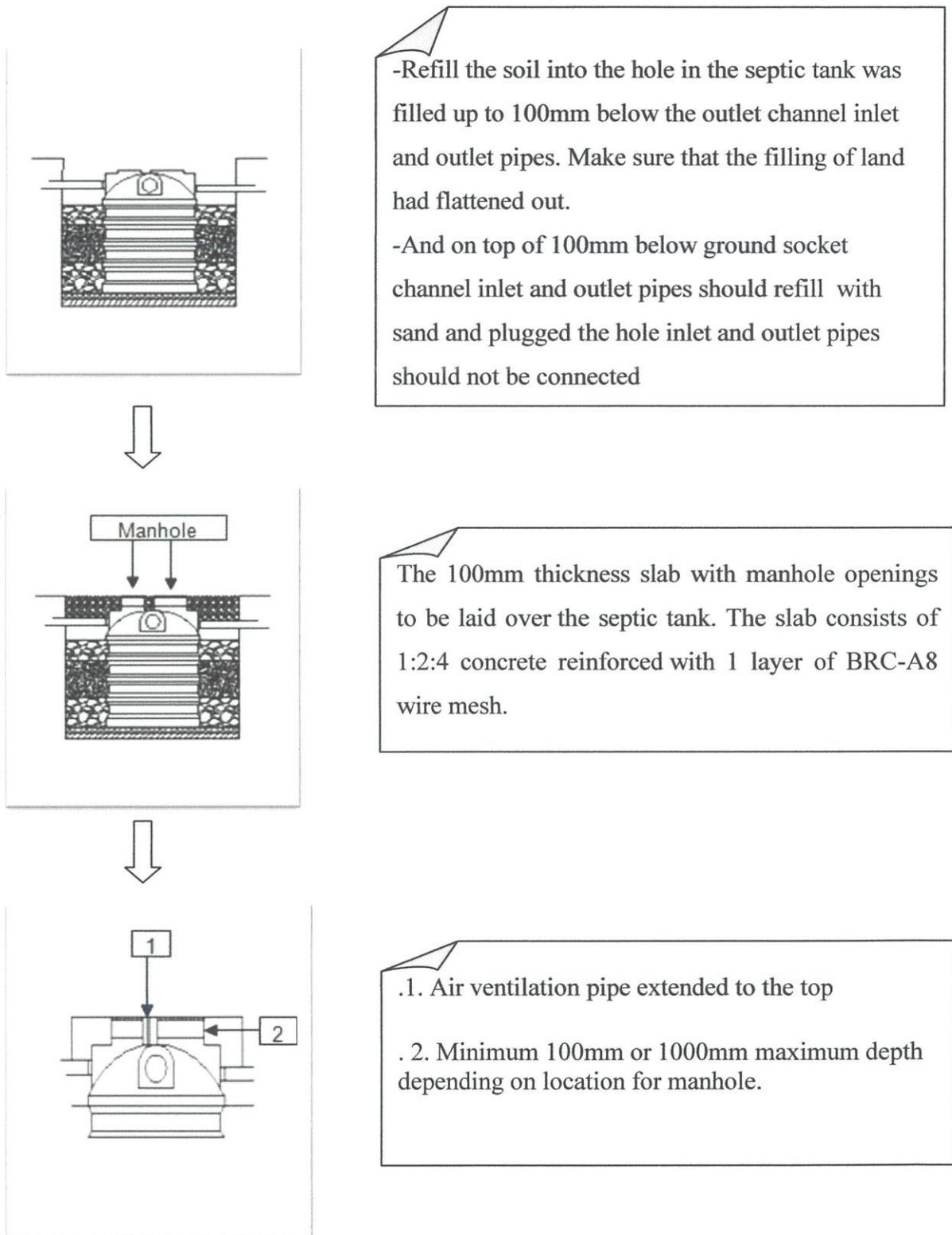


Figure 4.9: Installation Septic Tank guide line

Source: <http://www.septic tank php. com>

4.2.5.1 Determine the location of septic tank.

The first step before any work is done installing a septic tank septic tank position is marked in accordance with detailed drawings of Engineers. Marking must be done by the relevant parties to ensure no errors occur. This is to ensure that the placement of septic tanks are in accordance with the specifications and the placement of the tank by the carrier machines can run smoothly even though there is no monitoring of the contractor.

4.2.5.1 Put the septic tank at position marked.

Once marking is completed on the basis of concrete in the direction of the rope nylon or have crossed, the works raise the septic tank into the hole may be carried out. Septic tanks will be placed on a concrete foundation that has been marked by mechanized backhoe with the help of the labour force. This work should be done carefully and should avoid a septic tank or the violation of hitting a hard object that can cause leaks and septic tanks from dented



Figure 4.10: Photo lift works backhoe using a septic tank



Figure 4:11: Septic Tank will be adjusted properly when insert into the hole



Figure 4.12: Septic Tank will be moved to the use of wood for proper septic tank with at mark position.

4.2.6 Works to fill water into the septic tank

After the position septic tank is placed with the correct position, it will filled $\frac{3}{4}$ of water into the tank before any work is carried out soil and sand filling. With the water in the septic tank will significantly increase the stability of the septic tank from moving during the field work the land. In addition it also avoids the septic tank of a kick out of the ground or with other words it will float during heavy end.



Figure 4:13: Work to fill water in the septic tank in quantity $\frac{3}{4}$

4.2.7 Backfill work

Work backfilling or compacting the soil and sand is a work made for the septic tank cover. Backfilling work was done by using machinery or labour.

After the position septic tank by filling water stable work of land reclamation will be done as soon as possible as a first step to prevent water stagnation due to heavy rainfall. Land that had been dug to be used again. Before the land reclamation carried out, some steps should be taken among all of the hole inlet and outlet of the septic tank must be closed as well as the holes on the manhole. The aim is to prevent foreign materials such as stone and sand from entering into the septic tank. Figure (4.15).



Figure 4.14: Plywood lined board in exchange for covering the hole before filling the ground work

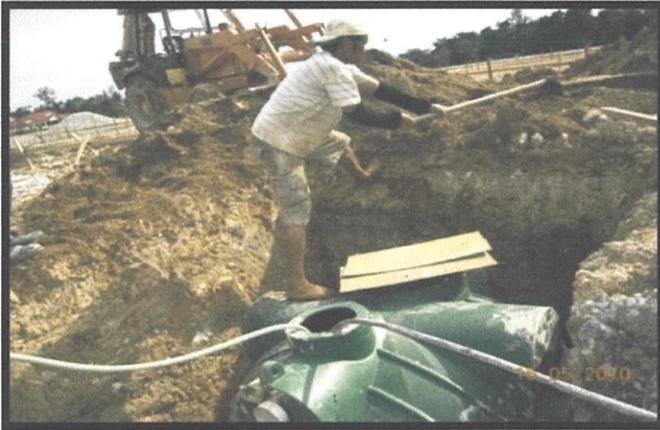


Figure 4.15: Land filling works done in the edge of space the septic tank

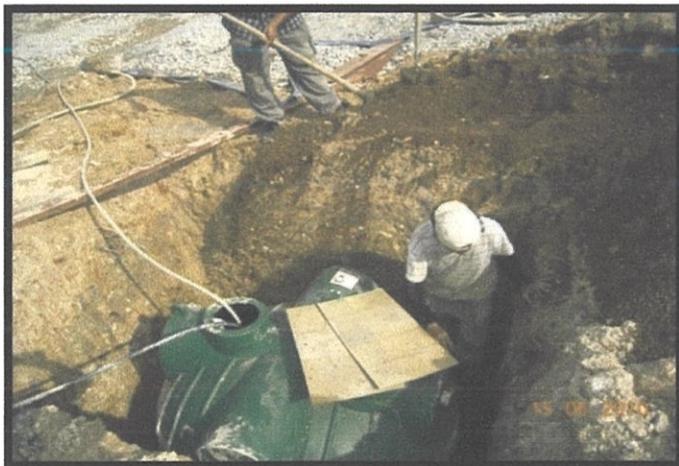


Figure 4.16: Photo pressing work the land and the sand on either side septic tank to make it more compact and tidy

4.2.8 Manhole construction

If there is a big difference between the level of private sewer or drain and the public, reducing the use of the manhole to manhole and reducing the cost of providing the back. At a time when manhole at the site used to limit the steep slope of the drain. It does not need to be done and the drain can be installed on the same slope with the ground. Manhole chamber after completion of site inspection. Manhole is a place where the waste water and sewage inspection chamber will be drained from the house last manhole to manhole and then into the septic tank.

Dredging works for the supply of manhole is using backhoe. Work on the preparation of the concrete slab is a manhole base. Concrete grade is a grade 20 and The BRC A7 as steel reinforcements.



Figure 4.17: Preparation of lean concrete

After the reinforced concrete base is provided, bond brick work done. Manhole are usually constructed using a single thickness of brick. Construction is using English bond. During the bond brick work done, the hole provided for the supply of pipes for drainage of wastewater from the building next to the manhole.

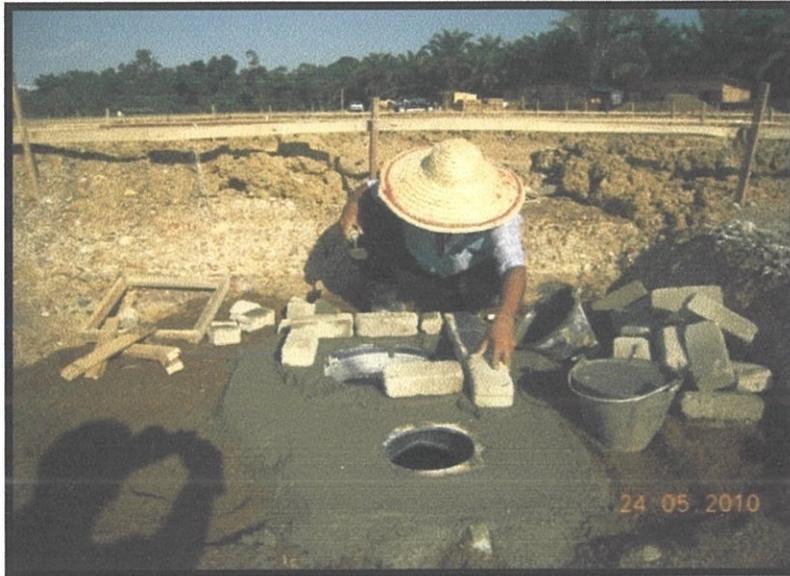


Figure 4.18: Job brick tie



Figure 4.19: Job Brick tile type english bond

After completion of the brick ties to manhole, the inside will be plastered using *almina* manhole cement, the cement is specially designed for use in areas where water and moisture. The outside is not allowed to re-plastered as it filled with soil.

Finally, the installation work done with slab cover iron manhole cover as a marker manhole the top of the septic tank.



Figure 4.20: Open the iron manhole cover



Figure 4.21: Close the iron manhole cover

4.2.9 Installation pipe *UnPlasticised Polyvinyl Chloride (UPVC)* and *High Density Polyethylene (HDPE)* Inlet and Outlet In Septic Tank.

For this low-cost housing projects outlet and inlet plumbing, is the final process for the installation of sewer and septic tank is the type of pipe used in sewer systems are septic tanks the UPVC pipes and HDPE pipes. These pipes are used as a sewer drain pipe from the building until the septic tank. This pipe in the channel inlet and outlet of the septic tank is the last work done for the passage for sewage into the septic tank, so installation should be done carefully to avoid any leaks, especially in the pipeline to another pipeline, and the connection to the inlet and outlet tank.

BAB 5.0

PROBLEM ARISED AND SOLUTION TO OVERCOME

5.1 Research Problem

During the process method of installation septic tank sewerage system is at my practical site, there are some problems which have arisen which have caused the process to complete the sewerage system is a big delay and disturb the proceedings. There are several factors which this happens are:

5.1.1 The weather factor

Weather is one of the important factors that determine the progress of work at a construction site. In the course of a project launched there were circumstances that would affect the progress of a project that is sunny or rainy.

In this case, the wet weather which often caused a hole dug for the placement of septic tanks have been impounding the rain water. In addition, the presence of spring water also cause an increase in the stagnant water in the hole. So, the work provides a concrete base and the installation of septic tank and briefly interrupted excluded from the set design. So, the work had to bring water with pump from the hole made by the workers to launch and the planned schedule.

5.1.2 Soil Structure

The condition of soil structure have a possibility to give impact in each of the excavations carried out. Soil structure is not stable, hollow and wet due to the rain can cause soil to be excavated ruins the experience. This will complicate the work and excavations have been performed repeatedly for a predetermined level. Among

the factors that cause the loose soil structure is like the action of Groundwater, soil and sand.

In this case, the location of the construction of a septic tank has a sandy soil structure. While digging the septic tank hole is carried out, the dredged soil walls have collapsed and the excavation had to be carried out carefully and thoroughly. had more comfortable situation because only part of the only sandy soil, while the inside is solid. Assistance of workers also used to obtain the basic flat land before the construction work carried out the concrete foundation.



Figure 5.1: The structure of the land bank collapse



Figure 5.2: Presence of underground water

5.1.3 Presence of underground water

presence of underground water also rates have a major impact in the things collapse not hold it but it will work cause the basic concrete septic tank will be hampered, the presence of groundwater occur suddenly excavation work done, in the case This is time consuming to wait for water and waste water then dry completely new concrete work to be done the base work.

5.1.4 The presence of a stick in the ground

The presence of wooden wheel in the ground will Cause a lot of work to be Improved and Further delaying the work, because the housing site is a water catchment area has fattened Which land area of 12 Pickles. With the presence of wooden wheel embedded in the ground big should it be removed by using the chainsaw.

5.1.5 Use of Less-Skilled Labour

The labour force is the force behind the construction industry in Malaysia, use the pen with less skilled labour Cause u can also rates Arising problems Sulawesi construction work a septic tank system. Because this is labour-unskilled labour does not have the experience and expertise in managing construction. Negligence is also rates a major Factor why the problem is often the case.

Now the use of foreign labour is very high energy used by contractor in construction industry. However the contractor does not look serious about the rules for the provision of Permits to foreign workers as established by the Authorities. They do not bother about the rules set and still use the foreign workers who do not have a permit. This is Because They regard the matter as trivial and burdensome in terms of management.

5.2 Solution to overcome

Each problem must have a method or solution either easy or difficult. For the problems faced in this project, the solution to solve the problem is as follows:

5.2.1 Weather factor

The party responsible for carrying out the project should take the initiative to investigate and explore of weather forecasting in the area. In other words the background of the site should be taken into account if the area is an area that received more rain. This study aims to design work that will occur in the construction site.

If the site is an area that receives much rain, the work must be carried out over time. Employees should be to work if needed to work at night where there is no rain. This measure is intended to avoid delays on a project

5.2.2 Soil Structure

In such situations, a loose soil structure, the resolution measures to be taken is to install the piles cliff in the area with loose soil structure in order to avoid land around the collapse. This action is effective if the heavy rain that could cause the edge of the excavated hole erosion.

5.2.3 Presence of Underground Water

Groundwater is the source of water that occurs suddenly during dredging work carried out land, the presence of underground water sources will significantly interfere with the basic concrete work Septic tank. water pump should be prepared beforehand so that the water in the hole can be removed quickly and allow the concrete foundation work is done

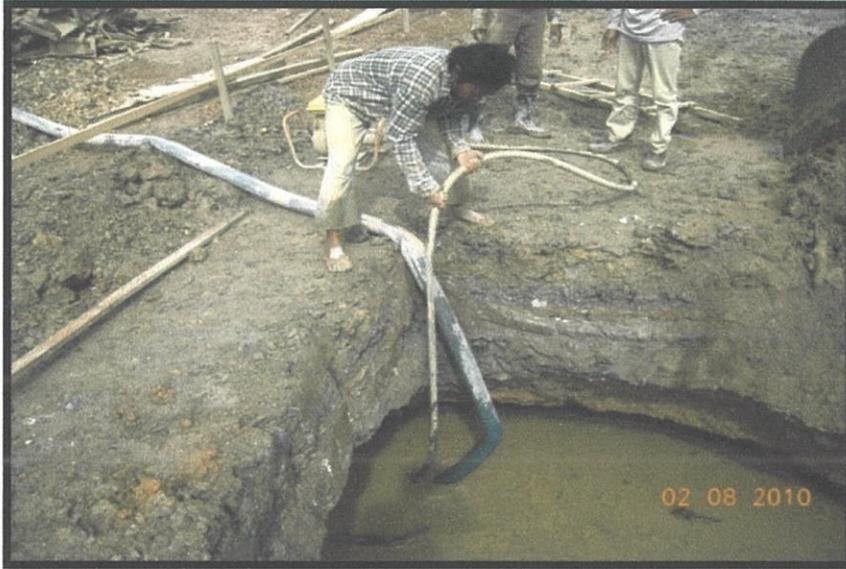


Figure 5.3: Water pump works in the hole to be removed

5.2.4 The Presence of a Stick in the Ground

In this case, can not be broadly known of the existence of stone or other object that obstructs the construction process in the soil for a seemingly invisible. Therefore, early action needs to be done as do the initial investigation of the location of the construction site and soil conditions found around the construction area.

5.2.5 Use of Less Skilled Labour

As all know, the use of less skilled workers will affect the quality of work produced. Most of the labourers who work in construction projects are foreigners, mostly unskilled. Therefore, the contractor should use an experienced worker and had Control works to ensure quality and customer satisfaction.

To overcome the problem of foreign workers, the contractors should be more Concerned about the permit regulations set by the local authorities. This is to avoid disruption of the project to be carried out due to the operation carried out by certain

parties. In addition, the authorities should monitor more frequently to the site to ensure that contractors comply with the rules established are always concerned with a work permit.

BAB 6

CONCLUSION AND RECOMMENDATION

6.0 Conclusion

Overall, these studies can describe the sewerage system or sewage system is a particularly important aspect of the facilities in the building, the use of Septic tank is to be taken into account in advance on population equivalent (pe) in a building. Therefore, the contractor must make planning more efficient and perform as best as possible to avoid damage during or after construction work setup. Preliminary steps should be taken to ensure that this work can be completed without any problems and did not give back impression that could bring harm to the occupants of a building. Among the preliminary steps to be taken is to perform construction work in accordance with the contract documents, specifications stipulated and in accordance with the contract drawings that have been provided. In addition, the parties are given the responsibility as an architect, an engineer so the contractors will have to play their respective roles in carrying out the duties of a good quality and not just solely concerned with profits.

Finally, a good quality of work supervision and with a sense responsible for any problems would not exist and the use of quality materials should also be emphasized in order to produce the proper quality of construction a functioning properly.

6.1 Recommendation

During my practical training at the Nafas Permata Sdn Bhd, i proposed a Solve problem in the construction requires the participation of all parties, especially the contractors, namely though:

1. The contractor must appoint and provide the workers and supervisor who are responsible and qualified to carry out construction work. Project implementation should always be supervised on a continuous basis until the project is completed.
2. The contractor has to select workers that have highly skilled, knowledgeable and experience in to produce quality of work
3. All construction work is done must be placed and use the proper construction standards and specifications prescribed. Therefore, the appointment of contractors registered with the corporate quality control should be given priority.
4. Review in detail all the specifications of work to be done. each contractor must be qualified and able to carry out construction projects undertaken
5. And finally, the contractor should also provide feedback as soon as possible if the instructions or things cannot be implemented at the construction site for some reason. If there is any dispute or confusion, then the contractor should be referred immediately to the Consultant or Designer or Project Manager.

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