DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

INSTALLATION OF U-DRAIN

Prepared by:

MUHAMAD AMIRUL SHADIQ BIN ABU BAKAR

2019246824

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

AUGUST 2021

By

MUHAMAD AMIRUL SHADIQ BIN ABU BAKAR

2019246824

Entitled

INSTALLATION OF U-DRAIN

		_____
Report Supervisor	:	Ts Azira Binti Ibrahim
		_____
Practical Training Coordinator	:	Dr. Nor Asma Hafizah Binti Hadzaman
		_____
Programme Coordinator	:	Dr. Dzulkarnaen Bin Ismail.

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

AUGUST 2021

STUDENT'S DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at HAFIZAL CONSTRUCTION for duration of 20 weeks starting from 23 August 2021 and ended on 7 January 2022. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

……

Name : MUHAMAD AMIRUL SHADIQ BIN ABU BAKAR

UiTM ID No : 2019246824

Date : 10/1/2021

ACKNOWLEDGEMENT

Alhamdulillah, thank God for His bounty, I was able to complete the report and successfully completemy industrial training.

First of all, I am Muhamad Amirul Shadiq bin Abu Bakar, an industrial training trainee would like to thank both my parents who have given me a lot of encouragement and support until I am at my current level. All their good deeds I will remember forever. Throughout my involvement in the Industrial Training program and the production of this report, I have received cooperation, contributions and assistance in terms of advice, moral and spiritual support, and technical assistance. The highest appreciation and thanks are extended to Mrs. Rafidah Binti Ismail for taking me to undergo IndustrialTraining at Hafizal Construction. She has given me a lot of guidance about the company and guidance
on the work on this building that I am involved in.

I would also like to give a huge credit to the lecturers of UiTM that have taught me for5 semester and forming me to become a better student and person in life for now and in the future. I take this opportunity to extend my deepest gratitude to the lecturers whoare directly involved during my training period. The list goes on, starting from the Supervising Lecturer, Ts Azira Binti Ibrahim, Practical Training Coordinator, Dr. Nor Asma Hafizah Binti Hadzaman and Programme Coordinator, DrDzulkarnaean Bin Ismail. I cannot thank you enough for the incredible support and help in answering our questions in completing this report. Without the guidance and knowledge to conduct me, this report would not have been possible.

ABSTRACT

Subsurface drainage systems in regions with poor-quality, shallow ground water collect water that potentially may have adverse effects on the environment. In semiarid regions, the poor-quality ground water may result from evaporative salinization, leaching of the soil root zone from excess irrigation, or some combination of these two processes. Traditional subsurface drainage system design procedures do not consider the water-quality aspects associated with the depth and spacing of drains in a particular hydrogeologic setting. The aim of this report was conducted for the maintenance works including the removal and theinstallation of the u-drain unit throughout the required road five block in Taman Bukit Perdana, Batu Pahat, Johor. The objective of this report is to study the maintenance process of drainage system as well as to determine the problems and solutions for each complaints received. The study will focus on the procedures andthe types of drain units involved including the method used for each maintenance works. In addition, this report also took a huge aspect regarding the element of damages and the status of work priority within the maintenance period to solve the problems.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

A drain is the primary vessel or conduit for unwanted water or waste liquids to be flumed away, either to a more useful area, funneled into a receptacle, or run into sewers or stormwater mains as waste discharge to be released or processed. Drain design and installation parameters are engineered to ensure drain functionality for its intended purpose, allowing for variances in volume, matter to be conveyed and maintenance requirements. Drain installation takes into account principles related to gravity, vacuum, grade, human exposure safety to biological agents and resistance to functional failure. Also incorporated in drain design are requirements for drain maintenance and repair of a blocked drain. *Drain (plumbing)*. (2021, November 18). Wikipedia. https://en.wikipedia.org/wiki/Drain_(plumbing).

A drainage system will include all the components needed to ensure that the substructure is properly drained, and may be formed of components such as open ditches, closed ditches with pipe drains and drainage through stormwater drainage pipes, channels and culverts. Where there are changes in the terrain or water flow (e.g., where streams are diverted), the drainage system must be planned with particular care. Overloading can result in major damage in the form of erosion and landslides. One of the drainage system's functions is to collect surface water and/or ground water and direct it away, thereby keeping the ballast bed drained. The drainage system must also protect the substructure from erosion, from becoming sodden, and from losing its load-bearing capacity and stability. Editorial Note. (1968). *Ergonomics*, *11*(2), pdf no. 107. https://doi.org/10.1080/00140136808930948

Hafizal Construction has chosen a u-drain with a size of 450mm x 450mm based on the specs set by MPBP Batu Pahat for the five blocks located in Taman Bukit Perdana. This type of drain was chosen because based on the area and the shape of the terrain in the area that is needed to replace the original drain which is a v-drain.

The benefits by using this drain is U-drain is a simple, low maintenance and cost-effective solution for concrete floor drainage. It is a non-grated, pre-engineered trench drain that is installed into a concrete floor prior to pour. It is designed to efficiently remove surface water through a single slot that opens into a trench that directs drainage to a connected sump. The basic u-drain system consists of pre-sloped and/or neutral sections, an adapter plate/end cap and a sump. Each of these components is bolt-together to provide user-friendly assembly and installation. *U-Drain Products – U-Drain Concrete Floor Drainage Solution by Norstar Industries*. (n.d.). Environmental Expert, S.L.

There are many different types of drains that are widely use in this entire world and there are some uses in Malaysia. Nonetheless, throughout my internship at Hafizal Construction, I will concentrate on construction of U-drain that was utilized for the project at Taman Bukit Perdana.

1.2 Objectives

i) To analyze the methods of installation u-drain in Taman Bukit Perdana, Batu Pahat, Johor.

ii) To identify the problems and the solution taken to solve problem in Taman Bukit Perdana, Batu Pahat, Johor.

1.3 Scope of Study

The Taman Bukit Perdana, which is located at Batu Pahat 83000, Johor, has been designated as the location for the study. The installation of u-drain is the primary focus of this investigation. Throughout this report, the student will examine the methods of installation, such as the materials that are being used, the cost and time required to complete the u-drain installation from beginning to finish, and finally, the unpredictable problems that may arise during the construction process, as well as the most appropriate solutions to avoid any hazardous or dangerous situations from occurring.

1.4 Methods of Study

1) Observation

   Visiting the construction site to observe workers install the u-drain and record their work with a photo taken with my phone.

2) Document review

   By referring to the BQ of the currently under construction building that was provided by Practical Supervisor, the construction flow can be easily understood.

3) Refer Supervisor for information

   Any information that was not grasped during construction will be explained by the supervisor in order to acquire new knowledge.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

Figure 2.1 Hafizal Construction logo

HAFIZAL CONSTRUCTION was established on 01 NOVEMBER 1985 as a wholly Bumiputera Owned company specializing in business in the field of construction of civil engineering works. HAFIZAL CONSTRUCTION was founded by Tuan Haji Zainal Abidin Bin Haji Atan.

The main objective of the establishment of this company is to further expand the business in addition to responding to the challenges of the government that wants the involvement of Bumiputera entrepreneurs in the field of construction.

This company also has an efficient workforce and staff with extensive experience in the field of construction as well as having its own machines and machinery. Therefore, we always maintain the quality of work and present the best results.

2.2 Company Profile

COMPANY	Hafizal Construction
COMPANY OWNER	Tuan Haji Zainal Abidin Bin Atan
COMPANY REGISTERED ADDRESS	No.20-2A, Tingkat 1, Bangunan MCA, Jalan Tanjung Labuh, 83000 Batu Pahat, Johor
NO.COMPANY REGISTRATION	JM0088118-X
NO.PKK REGISTRATION	1960820-JH 004354 (0101J860185)
NO.CIDB REGISTRATION	1960820-JH 04354
NO.SKJ REGISTRATION	JCCD/SKJ/20/01/00021
CLASS/GRADE	G3
REGISTERED SPECIALIZATION	B (B14, B24, B04) CE (CE21, CE01, CE36, CE34, CE14, CE4 ME(M15)
NO.KKM REGISTRATION	357-02045358
BANK	CIMB Bank Berhad
BANK ADRESS	39A, Jalan Rahmat, 83000 Batu Pahat.
NO. ACCOUNT	80-0581669-6

Table 2.2 Company profile of Hafizal Construction

2.3 Company Organisation Chart

ORGANIZATION CHART

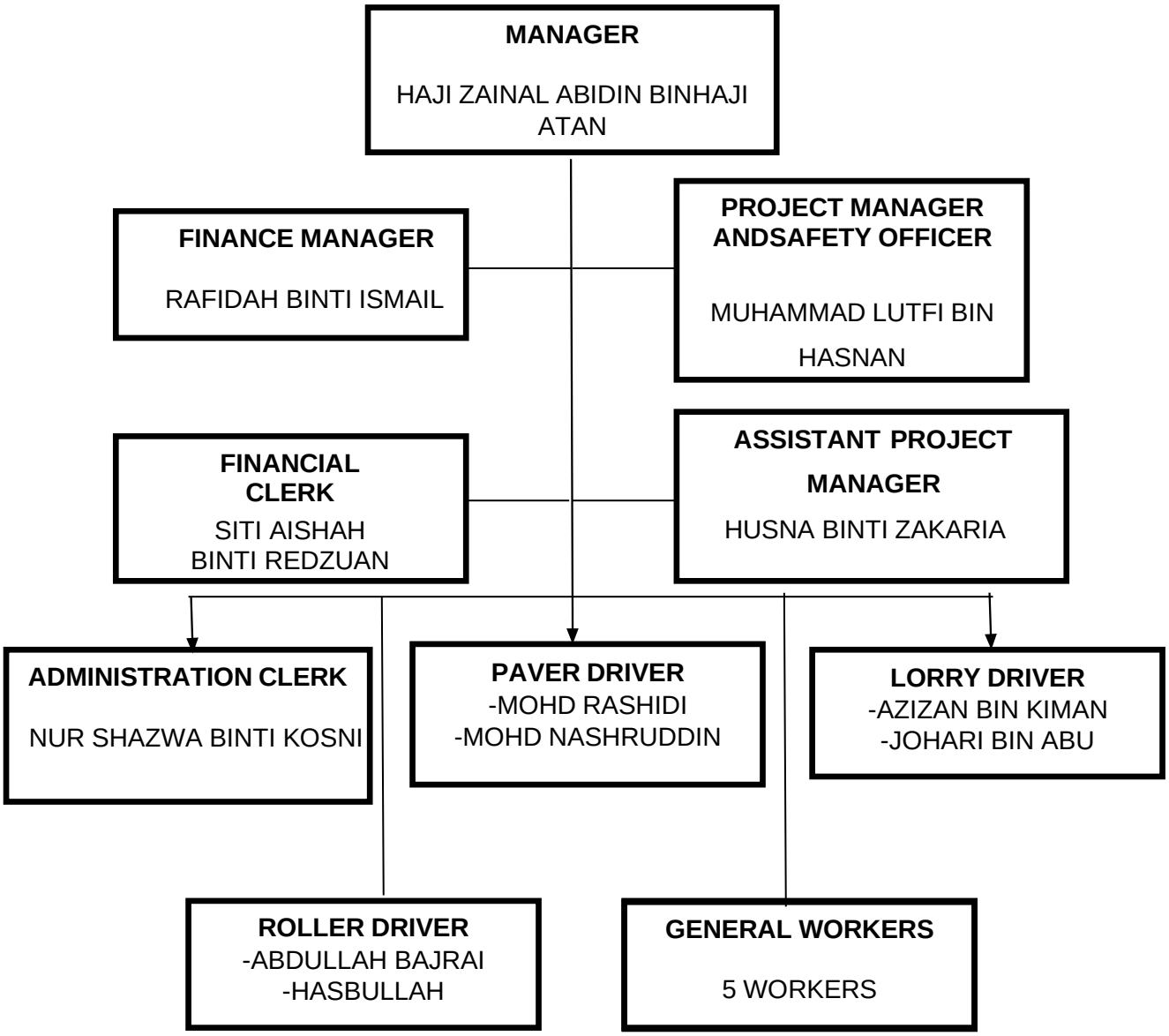


Figure 2.3 Company Organization Chart

2.4 List of Project

2.4.1 Completed Projects

No	Project Title	Contract Value (RM)	Start Date	Completion Date	Project Duration	Client
1	Periodic Maintenance Work At Route J197 Jalan Pt. Warijo	475,219.41			1 month	Amona Infra Care Sdn Bhd
2	Menaiktaraf Lorong Belakang Jalan Berlian 2 & 3 , Taman Berlian	20,000.00			2 weeks	Majlis Daerah Yong Peng
3	Kerja-Kerja Menurap Semula Dengan Premix Di Jalan Susur Ampuan, Batu Pahat	151,192.04			2 weeks	Majlis Perbandaran Batu Pahat
4	Perlaksanaan Penyelenggaraan Jalan-Jalan Kampung Di Negeri Johor	88,850.40			12 months	Infra Desa (Johor) Sdn Bhd
5	Perlaksanaan Penyelenggaraan Jalan-Jalan Kampung Di Johor	346,360.00			I month	Infra Desa (Johor) Sdn Bhd
6	Projek Menaiktaraf Dan Melebar Jalan-Jalan Kampung Sedia Ada Termasuk Pembinaan Jalan Kampung Yang Baru Diseluruh Negeri Johor	110,415.57			1 month	Azacon Enterprise
7	Projek Menaiktaraf Dan Melebar Jalan-Jalan Kampung Sedia Ada Termasuk Pembinaan Jalan Kampung Yang Baru Diseluruh Negeri Johor	89,470.89			1 month	Aqsi Enterprise

8	Projek Menaiktaraf Dan Melebar Jalan-Jalan Kampung Sedia Ada Termasuk Pembinaan Jalan Kampung Yang Baru Diseluruh Negeri Johor	121,108.47			1 month	Pembinaan Tasek Jaya
9	Projek Menaiktaraf Dan Melebar Jalan-Jalan Kampung Sedia Ada Termasuk Pembinaan Jalan Kampung Yang Baru Diseluruh Negeri Johor	128,540.00			1 month	Teto Engineering Sdn Bhd
10	Perlaksanaan Penyelenggaraan Jalan-Jalan Kampung Di Johor	186,875.00			1 month	Infra Desa (Johor) Sdn Bhd
11	Perlaksanaan Penyelenggaraan Jalan-Jalan Kampung Di Johor	45,327.03			1 month	Urusbina Gigih Enterprise
12	Menurap Tar Di Lorong Hj. Abdullah, Kampung Pt. Bakong Pos 25 Senggarang	20,000.00			2 weeks	JKR Batu Pahat
13	Menurap Tar Di Jalan Wakaf Kubur Pt Mahang, Senggarang	18,000.00			2 weeks	Liawani Enterprise
14	Kerja-Kerja Menurap Tar Di Lorong Hj. Harun, Kampung Pt. Kemang, Senggarang	12,190.00			2 weeks	Urusbina Gigih Enterprise
15	Kerja-Kerja Menurap Tar Di Lorong Surau, Kampung Sungai Lurus, Senggarang	13,038.00			2 weeks	Alur Bina
16	Kerja-Kerja Menurap Tar Di Lorong Karimon, kampong Pt. Kadir, Senggarang	13,038.00			2 weeks	Eddie Construction

17	Kerja Menurap Tar Di Lorong Hj. Harun Kampung Sungai Berong, Rengit	13,038.00			2 weeks	S.L. Nur Construction Enterprise
18	Kerja-Kerja Menghampar Kasaran Di Jalan AC Line Jambi Darat	12,720.00			2 weeks	Perniagaan Al Basyar
19	Kerja-Kerja Menurap Tar Dan Kasaran Jalan Hj. Salim Kg. Sg. Buluh, Senggarang	10,000.00			2 weeks	Jati Bina
20	Kerja-Kerja Menurap Tar Dan Kasaran Lorong Jambi 1, Kg. Sg. Jambi Tambak	14,310.00			2 weeks	Sanifa Enterprise
21	Kerja-Kerja Menurap Premix Semula Dan Menyelenggara Rumah Jurutera Daerah	33,920.00			2 weeks	Mutiara Idaman
22	Projek Menaiktaraf Dan Melebar Jalan-Jalan Kampung Sedia Ada Termasuk Pembinaan Jalan Kampung Yang Baru	96,948.34			1 month	Aqsi Enterprise
23	Projek Menaiktaraf Dan Melebar Jalan-Jalan Kampung Sedia Ada Termasuk Pembinaan Jalan Kampung Yang Baru	47,128.26			1 month	Kahfi Development Sdn Bhd
24	Kerja-Kerja Penyelenggaraan Jalan-Jalan Di Negeri Johor	132,542.40			6 months	Amona Infra Care Sdn Bhd
25	Kerja-Kerja Penyelenggaraan Jalan-Jalan Di Negeri Johor	132,542.40			6 months	Amona Infra Care Sdn Bhd

Table 2.4.1 Completed Project of Hafizal Construction

2.4.2 Project in Progress

No	Project Title	Contract Value (RM)	Start Date	Completion Date	Project Duration	Client
1.	Projek Menaiktaraf Longkang Di Taman Bukit Perdana	173,139.10	25/8/2021	25/12/2021	4 months	SAFWA Sdn Bhd

Table 2.4.2 Project in Progress

CHAPTER 3.0

CASE STUDY

3.1 Introduction to Case Study

The case study is about installing u-drain and the maintenance process held to solve the problems from the report taken by city Council. The maintenance works started on 25 Augusts 2021and completed on 25 December 2021. The cost of the works approximately one hundred seventy-three thousand one hundred thirty-nine and ten cent Ringgit Malaysia (RM 173, 139.10). As the works had been completed. 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 needs of maintenance works. All the works were run by Hafizal Construction. The maintenance process took place at Jalan Perdana 2/7, Jalan Perdana 20a and three block at Jalan Perdana 2/32, located in Taman Bukit Perdana, Batu Pahat 83000, Johor.

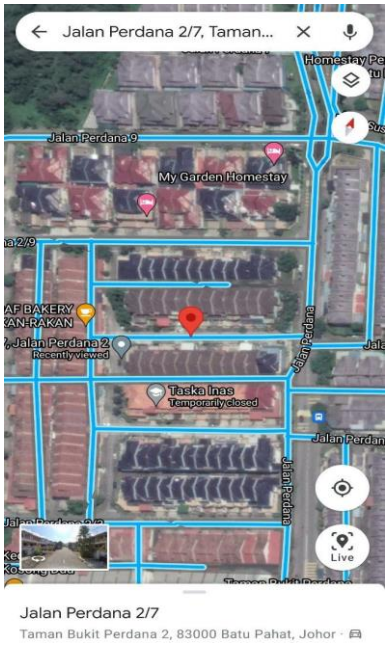


Figure 3.1(1) Jalan Perdana 2/7

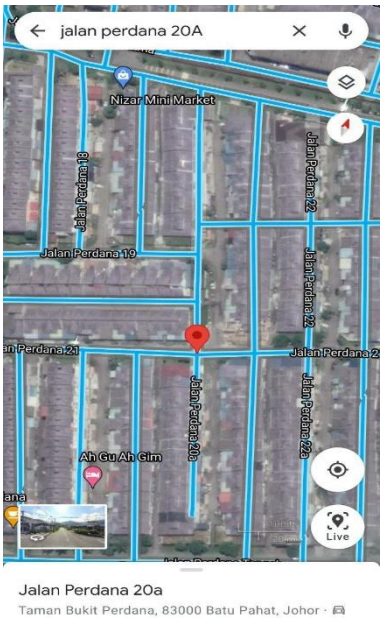


Figure 3.1(2) Jalan Perdana 20a

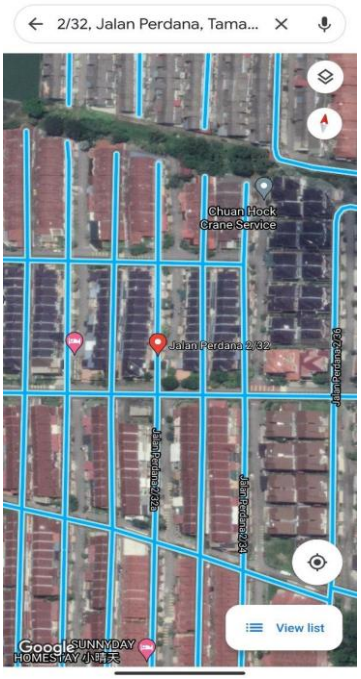


Figure 3.1(3) Jalan Perdana 2/32

The maintenance work located at Jalan Perdana2/7, Jalan Perdana 20a and three block in Jalan Perdana 2/32 so, there are five blocks that maintenance works are carried out. This maintenance work is carried out behind the terrace house on the street. This maintenance work is carried out due to complaints from the surrounding residents about the damage and often clogging due to the increase in population. This complaint was submitted to the city Council. Therefore, the city council has agreed to give this project to Hafizal Construction to carry out maintenance works.

The activities that have been carry out is within the replacement of previous v-drain and installation of new u-drain. The maintenance work carried out on Jalan Perdana 2/7 using u-drain measuring 300x300 and 450x450 while on Jalan Perdana 20a and Jalan Perdana 2/32 use a 450x450 u-drain. These specs are set by the city Council which is the consultant for the project. To achieve a perfect result, this difficult task must be handled by skilled workers. There are also several helpers within the same engineering company that assist in finishing the maintenance works and saves the timeof the whole process. The machineries and tools that involved in this construction are backhoe loader, truck, mixture truck, mixture, hammer, plywood board, wood, water level, scope, plaster spoon, breaker and pipe. The time taken to complete this project is 4 months. even so, with 8 manpower two groups were formed to carry out the two-block project simultaneously. Each group is led by a skilled craftsman. It aims to complete the project on the set date.

SAFWA GLOBAL VENTURE (M) SDN BHD
201101035634
(963768-P)

Maintenance

Ruj. Kami : SGV/PBT/LOI/MPBP/PV/Y2/09/003 (1)
Tarikh :

Kepada

PEMBINAAN SRI KENANGAN
Company No : JM 0342476-K
NO 21-2A TINGKAT 1 BAGUNAN MCA,
JALAN TANJUNG LABUH,
83000 BATU PAHAT JOHOR
Tel : 07 438 5003
Email : pembinaansrikenangan@gmail.com

ASAL

SURAT NIAT

Tuan,

PENGURUSAN DAN PENYELENGGARAAN JALAN-JALAN PIHAK BERKUASA TEMPATAN SECARA BERSEPADU DI SELURUH NEGERI JOHOR
PAKEJ NO. : SGV/PBT/MPBP/PV/Y2/09/003

Dengan segala hormatnya kami merujuk kepada perkara yang di atas.

Sukacita dimaklumkan bahawa kami berhasrat untuk melantik tuan bagi melaksanakan projek yang tersebut di atas seperti di perincian pakej di bawah:

No.	Perkara	Butiran
1.	Nombor Pakej	SGV/PBT/MPBP/PV/Y2/09/003
2.	Nombor Jalan PBT	Seperti di lampiran
3.	Nama Jalan	Seperti di lampiran
4.	Pihak Berkuasa Tempatan	Majlis Perbandaran Batu Pahat
5.	Kos (Anggaran)	RM 173,139.10

Surat niat ini bukan dimaksudkan sebagai surat perlantikan yang membenarkan pihak tuan untuk melaksanakan kerja-kerja di tapak dan sebagai sandaran di mana-mana Institusi Kewangan serta badan-badan pemberi dana. Segala perubahan di dalam perlantikan syarikat tuan untuk melaksanakan kerja-kerja di tapak tertakluk kepada Surat Perlantikan kepada syarikat tuan.

Untuk makluman tuan, pihak kami berhak menarik balik tawaran ini tanpa alasan dan segala kos yang ditanggung oleh pihak tuan tidak boleh dituntut daripada pihak kami (jika ada).

Sila ambil perhatian bahawa surat ini adalah **SULIT** dan tidak boleh disebarkan kepada mana-mana pihak lain.

Sekian, terima kasih.

Yang Ikhlas,
SAFWA GLOBAL VENTURE (M) SDN BHD

JAMILULLAIL BIN MD. SAPIE
Pengarah Eksekutif

Akuan terima:

Dengan ini saya (seperti nama dibawah) bersetuju dan menerima tawaran seperti yang terkandung di dalam surat niat ini, berdasarkan terma dan syarat-syarat yang ditetapkan oleh pihak **SAFWA GLOBAL VENTURE (M) SDN BHD.**

Nama :
No. K/P : 631204-01-6284
Tanda Tangan: Rohana Bnt Arffin
Tel. No : **PEMBINAAN SRI KENANGAN**
Cop Syarikat : Company No : JM 0342476-K
NO 21-2A TINGKAT 1 BAGUNAN MCA,
JALAN TANJUNG LABUH,
83000 BATU PAHAT JOHOR
Tel : 07 438 5003
Email : pembinaansrikenangan@gmail.com

infracity.com.my
No.1, Jalan Iskandar Putri 1/5, Taman Nusantara Prima, 79250 Iskandar Puteri, Johor.
07-509 9686
07-509 9682

Figure 3.1(4) Letter of intent by SAFWA

SAFWA GLOBAL VENTURE (M) SDN. BHD.

No. 1, Jalan Iskandar Putri 1/5, Taman Nusantara Prima, Iskandar Putri, 79250 Johor Bahru, Johor

PENGURUSAN DAN PENYELENGGARAAN JALAN-JALAN PIHAK BERKUASA TEMPATAN SECARA BERSEPADU DI SELURUH NEGERI JOHOR

Package Number	SGV/PBT/MPBP/PV/Y2/09/003
Sub-Contractor	PEMBINAAN SRI KENANGAN
Commencement Date	-
Completion Date	-

SUMMARY OF QUANTITIES

Scope of Work				Unit	Qty	Amount (RM)	
Item	**Sub-Item**	**Item ID**	**Item Descriptions**			**Rate**	**Amount**
Pavement And Shoulder	Scarify	1.2.1	Marks, scarify, remove and dispose 10mm thick of existing pavement surface including clean and prepare the surface to receive tack coat by using excavator.	m2	2,040	1.50	3,060.00
Pavement And Shoulder	Resurfacing	1.6.1	Supply and apply bituminous tack coat uniformly including cleaning the surface of pavement prior to application.	m2	2,040	1.20	2,448.00
Pavement And Shoulder	Resurfacing	1.6.2	Supply, lay, spread, level and compact Asphaltic Concrete 14 Wearing Course (AC 14).	m3	102	500.00	51,000.00
Drainage	Precast Concrete Pipe Culvert	5.1.4	Sawn formwork.	m2	550	31.20	17,160.00
Drainage	Precast Concrete Pipe Culvert	5.1.5	Excavate trenches in all material other than rock for precast concrete pipe culvert, backfill and remove surplus spoil to a tip to be provided by the Contractor away from work site within 5 km radius including all necessary timbering - not exceeding 1.50	m3	305	5.70	1,738.50
Drainage	Precast Concrete Pipe Culvert	5.1.11	Supply and lay site mix Grade 20 concrete (1 : 2 : 4) as bedding.	m3	65	226.40	14,716.00
Drainage	Precast Concrete Pipe Culvert	5.1.17	Supply, fabricate and lay steel bar reinforcement of the following size : 12 mm dia. High tensile steel.	MT	4	2,800.00	11,200.00
Drainage	Precast Concrete Pipe Culvert	5.1.50	Supply and lay 20mm thick cement and sand (1 : 3) plastering.	m2	975	12.80	12,480.00
Drainage	Precast Concrete Pipe Culvert	5.1.79	Supply, lay, level and compact earth fills to formation level.	m3	131	33.60	4,401.60
Drainage	Precast Concrete Pipe Culvert	5.1.80	Supply, lay, level and compact crushed aggregate to formation level.	m3	48	70.00	3,360.00
Drainage	Precast Concrete U-Shaped Drain without Dry Weather Flow	5.3.54	Supply and lay precast reinforced concrete U-Shaped Drain without Dry Weather Flow for the following sizes :- 450mm width x 450mm height	m	661	75.00	49,575.00
Scheme Traffic Management Plan	Traffic Management Plan	14.1.1	Supply and apply traffic management scheme at site including cone, temporary signboard, blinkers and signalman at site not exceeding 500m	Day	2	1,000.00	2,000.00
TOTAL							**173,139.10**

Figure 3.1(5) Summary of quantities by SAFWA

SAFWA GLOBAL VENTURE (M) SDN. BHD.

PACKAGE/ROUTE	
Package Number	478
Sub-Contractor	
Residential	TAMAN BANDAR
Route Name	J LEDANG

BILL OF QUANTITY

Scope of Work				Unit	Qty	Rate	Amount (RM)
Item	Sub-Item	Item ID	Description				
Drainage	Precast Concrete Pipe Culvert	5.1.4	Sawn formwork.	m2	244.00	31.20	7,612.80
Drainage	Precast Concrete Pipe Culvert	5.1.5	Excavate trenches in all material other than rock for precast concrete pipe culvert, backfill and remove surplus spoil to a tip to be provided by the Contractor away from work site within 5 km radius including all necessary timbering - not exceeding 1.50	m3	172.00	5.70	980.40
Drainage	Precast Concrete Pipe Culvert	5.1.11	Supply and lay site mix Grade 20 concrete (1 : 2 : 4) as bedding.	m3	19.00	226.40	4,301.60
Drainage	Precast Concrete Pipe Culvert	5.1.17	Supply, fabricate and lay steel bar reinforcement of the following size : 12 mm dia. High tensile steel.	MT	3.00	2800.00	8,400.00
Drainage	Precast Concrete Pipe Culvert	5.1.50	Supply and lay 20mm thick cement and sand (1 : 3) plastering.	m2	975.00	12.80	12,480.00
Drainage	Precast Concrete Pipe Culvert	5.1.79	Supply, lay, level and compact earth fills to formation level.	m3	90.00	33.60	3,024.00
Drainage	Precast Concrete Pipe Culvert	5.1.80	Supply, lay, level and compact crushed aggregate to formation level.	m3	27.00	70.00	1,890.00
Drainage	Precast Concrete U-Shaped Drain without Dry Weather Flow	5.3.54	Supply and lay precast reinforced concrete U-Shaped Drain without Dry Weather Flow for the following sizes :- 450mm width x 450mm height	m	406.00	75.00	30,450.00
Scheme Traffic Management Plan	Traffic Management Plan	14.1.1	Supply and apply traffic management scheme at site including cone, temporary signboard, blinkers and signalman at site not exceeding 500m	Day	1.00	1000.00	1,000.00
TOTAL							70,138.80

Figure 3.1(6) Bill of quantity by SAFWA

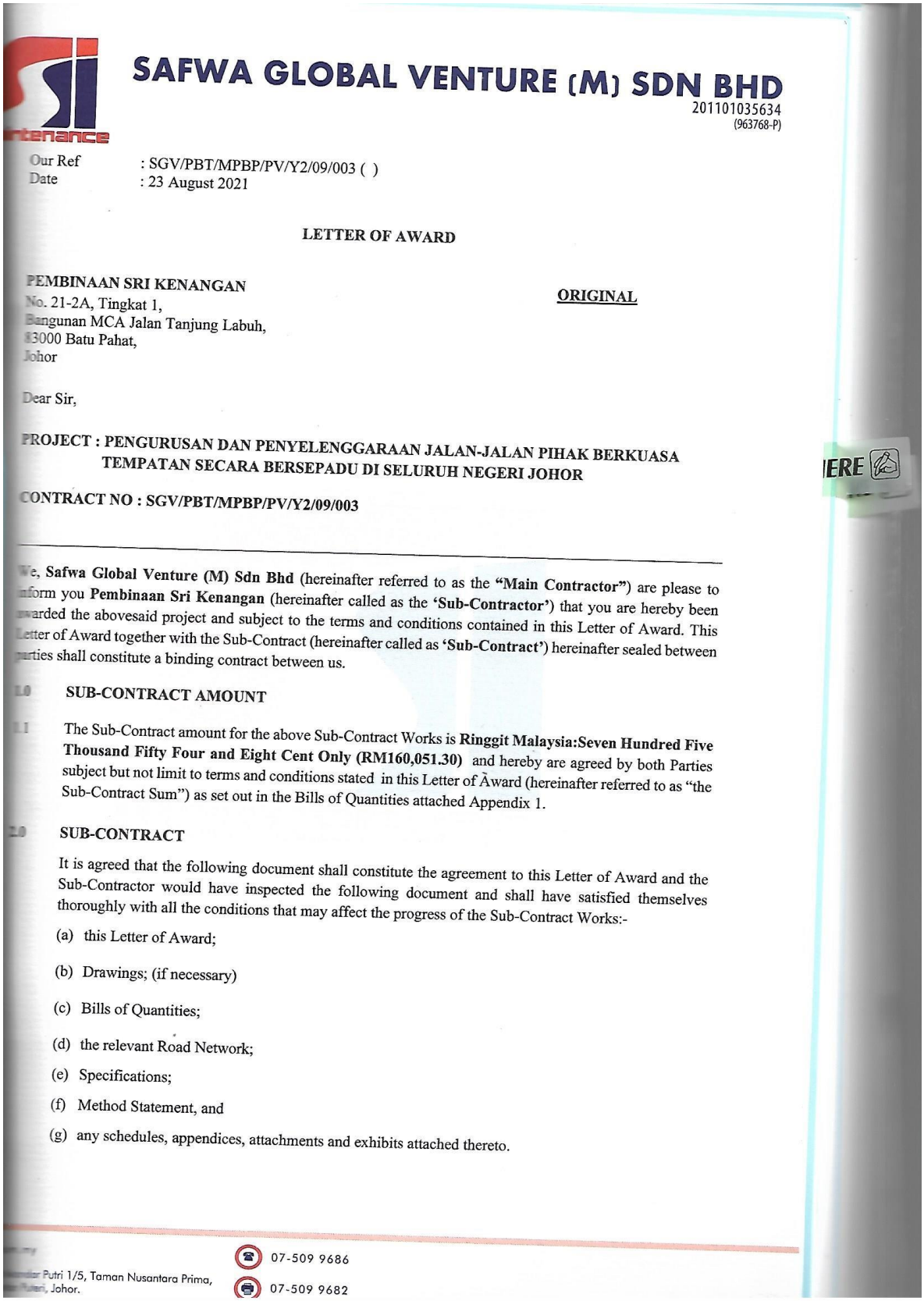
SAFWA GLOBAL VENTURE (M) SDN. BHD.

PACKAGE/ROUTE	
Package Number	478
Sub-Contractor	
Residential	TAMAN BANDAR
Route Name	J TITIWANGSA

BILL OF QUANTITY

Scope of Work				Unit	Qty	Rate	Amount (RM)
Item	**Sub-Item**	**Item ID**	**Description**				
Pavement And Shoulder	Scarify	1.2.1	Marks, scarify, remove and dispose 10mm thick of existing pavement surface including clean and prepare the surface to receive tack coat by using excavator.	m2	2040.00	1.50	3,060.00
Pavement And Shoulder	Resurfacing	1.6.1	Supply and apply bituminous tack coat uniformly including cleaning the surface of pavement prior to application.	m2	2040.00	1.20	2,448.00
Pavement And Shoulder	Resurfacing	1.6.2	Supply, lay, spread, level and compact Asphaltic Concrete 14 Wearing Course (AC 14).	m3	102.00	500.00	51,000.00
Drainage	Precast Concrete Pipe Culvert	5.1.4	Sawn formwork.	m2	306.00	31.20	9,547.20
Drainage	Precast Concrete Pipe Culvert	5.1.5	Excavate trenches in all material other than rock for precast concrete pipe culvert, backfill and remove surplus spoil to a tip to be provided by the Contractor away from work site within 5 km radius including all necessary timbering - not exceeding 1.50	m3	133.00	5.70	758.10
Drainage	Precast Concrete Pipe Culvert	5.1.11	Supply and lay site mix Grade 20 concrete (1 : 2 : 4) as bedding.	m3	46.00	226.40	10,414.40
Drainage	Precast Concrete Pipe Culvert	5.1.17	Supply, fabricate and lay steel bar reinforcement of the following size : 12 mm dia. High tensile steel.	MT	1.00	2800.00	2,800.00
Drainage	Precast Concrete Pipe Culvert	5.1.79	Supply, lay, level and compact earth fills to formation level.	m3	41.00	33.60	1,377.60
Drainage	Precast Concrete Pipe Culvert	5.1.80	Supply, lay, level and compact crushed aggregate to formation level.	m3	21.00	70.00	1,470.00
Drainage	Precast Concrete U-Shaped Drain without Dry Weather Flow	5.3.54	Supply and lay precast reinforced concrete U-Shaped Drain without Dry Weather Flow for the following sizes :- 450mm width x 450mm height	m	255.00	75.00	19,125.00
Scheme Traffic Management Plan	Traffic Management Plan	14.1.1	Supply and apply traffic management scheme at site including cone, temporary signboard, blinkers and signalman at site not exceeding 500m	Day	1.00	1000.00	1,000.00
TOTAL							**103,000.30**

Figure 3.1(7) Bill of quantity SAFWA



SAFWA GLOBAL VENTURE (M) SDN BHD
201101035634
(963768-P)

Our Ref : SGV/PBT/MPBP/PV/Y2/09/003 ( )
Date : 23 August 2021

LETTER OF AWARD

PEMBINAAN SRI KENANGAN
No. 21-2A, Tingkat 1,
Bangunan MCA Jalan Tanjung Labuh,
83000 Batu Pahat,
Johor

ORIGINAL

Dear Sir,

PROJECT : PENGURUSAN DAN PENYELENGGARAAN JALAN-JALAN PIHAK BERKUASA TEMPATAN SECARA BERSEPADU DI SELURUH NEGERI JOHOR

CONTRACT NO : SGV/PBT/MPBP/PV/Y2/09/003

We, **Safwa Global Venture (M) Sdn Bhd** (hereinafter referred to as the **"Main Contractor"**) are please to inform you **Pembinaan Sri Kenangan** (hereinafter called as the **'Sub-Contractor'**) that you are hereby been awarded the abovesaid project and subject to the terms and conditions contained in this Letter of Award. This Letter of Award together with the Sub-Contract (hereinafter called as **'Sub-Contract'**) hereinafter sealed between parties shall constitute a binding contract between us.

1.0 SUB-CONTRACT AMOUNT

1.1 The Sub-Contract amount for the above Sub-Contract Works is **Ringgit Malaysia:Seven Hundred Five Thousand Fifty Four and Eight Cent Only (RM160,051.30)** and hereby are agreed by both Parties subject but not limit to terms and conditions stated in this Letter of Award (hereinafter referred to as "the Sub-Contract Sum") as set out in the Bills of Quantities attached Appendix 1.

2.0 SUB-CONTRACT

It is agreed that the following document shall constitute the agreement to this Letter of Award and the Sub-Contractor would have inspected the following document and shall have satisfied themselves thoroughly with all the conditions that may affect the progress of the Sub-Contract Works:-

(a) this Letter of Award;

(b) Drawings; (if necessary)

(c) Bills of Quantities;

(d) the relevant Road Network;

(e) Specifications;

(f) Method Statement, and

(g) any schedules, appendices, attachments and exhibits attached thereto.

Putri 1/5, Taman Nusantara Prima,
Johor.

07-509 9686
07-509 9682

Figure 3.1(8) Letter of award by SAFWA

3.2 To analyze the methods of installation u-drain

3.2.1 Remove the v-drain

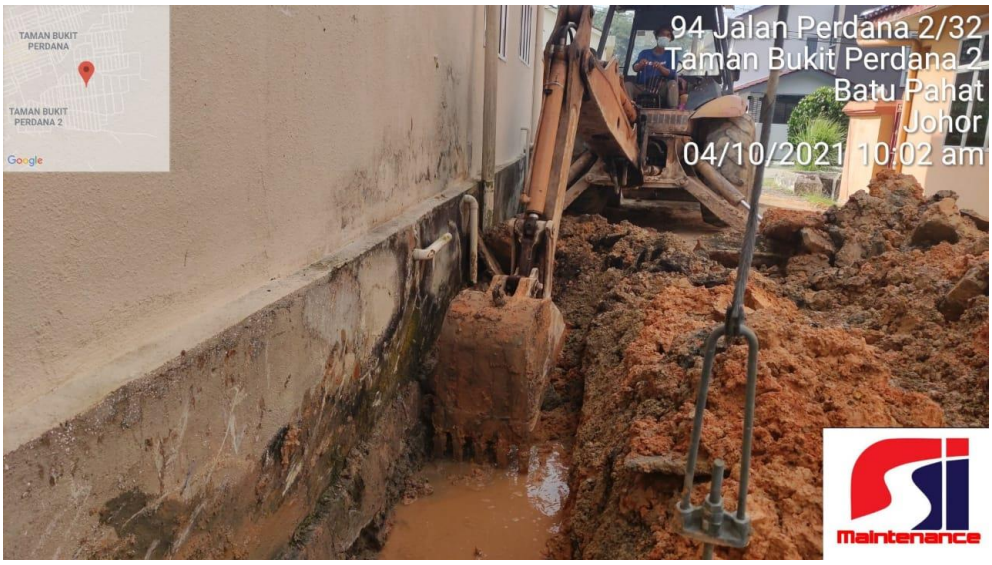


Figure 3.2.1 Excavation work

The old beam is broken using a breaker and hammer to pull out the old drain. A v-drain is removed in each block by using a lifting chain. Thereafter, the area is excavated according to size in terms of height and width of the new drain. If there is an obstacle such as a ladder or slab it will be broken as well.

3.2.2 Install the u-drain

Figure 3.2.2 Installing the drain

U-drain is installed by using backhoe loader. This drain is lifted using a lifting chain according to the size of the drain. At Jalan Perdana 2/7 and Jalan Perdana 20a u-drain is installed in tiers. This is because the area is a hilly area. In that way, it can reduce the speed of the water when it rains heavily. in the Jalan Perdana 2/32 area, the u-drain is installed sloping in all three blocks. Water level is used to ensure that the installed drain is stable and not tilted. Three manpower is required for this work to run smoothly.

3.2.3 Plaster drain

Figure 3.2.3(1) Plaster around the pipe

Figure 3.2.3(2) Plaster the gap between drain

There was some damage to the drain caused by the pipe installation. Therefore, the area should be closed to prevent water from escaping from the area. In addition, there is space between the drain and the drain also needs to be closed. This work uses lime and a mixture of fine sand and cement.

3.2.4 Install the formwork and concrete for beam

Figure 3.2.4(1) install the formwork

Figure 3.2.4(2) concrete the beam

This formwork installation work is done by a skilled craftsman. This is because, to ensure the beam is not tilted and in accordance with the set height. The height for concrete beam is two inches more than the road. For concrete work, concrete will be brought by a mixture truck ordered by a nearby concrete company. For this work requires 8 manpower to ensure the work runs smoothly.

Figure 3.2.4(3) remove the formwork

After two days, the formwork can be opened because the concrete has hardened completely. The board that has been opened can be used to install other formwork beams.

3.2.5 Method project

Figure 3.2.5 method of project

3.3 To determine the problems and solutions for during maintenance process

. While undergoing industrial training this site, the student experience some problems. At first ask for the task that will be assigned by the supervisorso that the student can find out what is going on and the task assigned to them. The task that student faced was the problem of keeping traffic during the installation of the drain at the Jalan Perdana 2/7. This is because the area is connected to the main road used by road users. The solution method is to take the cones and warning signs of the work in front and keep the traffic while the draininstallation is made so that there are no accidents involving the public on the site. In addition, there are also problems during concrete work. the problem encountered when concrete is poured into the formwork there is a spill of concrete attached to the drain wall. Therefore, the solution is to clean the drain using a chisel. This is because, if there is too much concrete spill will cause water cannot pass through the drain smoothly and will cause food waste or garbage will be deposited in the drain. This will cause the drain to become clogged.

CHAPTER 4.0

4.1 CONCLUSION

The drainage system is important in our daily life. This is because, A drainage system is accountable for getting rid of the surplus water either on the floor's surface or the root area of any property. It is also possible for surplus water to accumulate from the rainwater or the usage of an excessive amount of irrigation water. It is imperative to drain the water for clearing the system as well as pipes since it might otherwise lead to leaking, flooding, filthy smells, slow draining, in addition to water damage.

The whole maintenance process in this area took around 4 months for the works held at Taman Bukit Perdana, Batu Pahat, Johor**.** The works started 25 August 2021 until 25 December 2021. All the works completed within the time estimated by the consultant.

All the method used during the case study and maintenance works were similar to the common method and theory that taught. There is no different and complicated methods usedas all the workers were skillful in completing their tasks. To conclude, all the problems regarding the installation of u-drain throughout Taman Bukit Perdana were easily solved by the professional to ensure that there is always solution to every problem.

References

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