



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

**THE CONSTRUCTION OF DRIVEWAY**

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**(PERAK)**

**DECEMBER 2018**

It is recommended that the report of this practical training provided

by

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entitled

**THE CONSTRUCTION OF DRIVEWAY**

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

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**DECEMBER 2018**

**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 Ibrahim Mian Sdn Bhd for a duration of 14 weeks starting from 3 September 2018 and ended on 7 December 2018. It is submitted as one of the prerequisite requirements of DBG307 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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After that, is my senior colleague, \_\_\_\_\_, who have helped me quite a lot by showing me some examples from his past works so that I can see where I am going with the report so I would not get lost and clueless, and also my fellows and groupmates who have been with me since the beginning of our current semester to struggle together through the hardships.

Last but not least, my beloved parents and family who have supported me none stop since I was a mere child until now. They provided me with so many sources and energy to keep me going and not give up. May Allah SWT bless them all.

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## **ABSTRACT**

House Car Parking Lot or the term used in construction, Driveway is the place to park vehicles in front of the main door and behind the house gate safely. This is the topic among the overall construction project that the author focused on for his report. This report is to make sure the author fulfills the requirements of the current semester's assignment and to give the output or as a result of his practical training during the three months span. This report is also important as a proof that the author understands completely about the course he is currently going through. The main objective of this report is to observe and determine the method, cost, time, workmanship, types of test used for Driveways, and problems that occurred during the progress and provides solutions. Mainly, for what the author was doing during the construction of the driveway was pin-pointing the position of driveway perimeter, levelling drop point, and laying the layers of the driveway. Lastly, the most important thing for this particular work is accuracy, for it is crucial to make sure the data collected, the input and output data transferring, and markings are accurate and precise so it will not drag and bring problems to the upcoming procedure ahead of the driveway construction. Early mistakes may result in repairs, maintenance, defects, failures, or even damages in the future which will bring more complex issues in variety of kind.

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## CHAPTER 1.0

### INTRODUCTION

#### 1.1 Background and Scope of Study

"A Driveway is a private road way for local acces to one or small group of structures, and is owned and maintained by an individual or a group. Driveways are commonly used as paths to private garages, carports, or houses", (Wikipedia, 2015). In this case, the Driveway to be studied is the house entrance path, from the gate to the main door.

The Driveway is a roadway or a tilted concrete slope along the house parking area. The reasons behind it are to connect the road to the house, also to allow vehicles to enter house parking easily because most houses are commonly built higher than the road level, to flow the waste and rain water through the sewerage and drainage down to the main channel under the road way. So, Driveway is used to connect the two levels. Further ahead, we will go deeper inside the main topic of our report which is the Driveway, to further understand it from the inside.



**Figure 1.1:** Finished Driveway from sample house.

The scope of study will be focused on the construction of Driveway. The aspects that the author includes in the report are the methods and the process of the construction, the needs and requirements, labours involved, instruments used, materials used, the total cost of the structure, time needed, problems and solutions, and also the details of the Driveway, including pictures. All the contents in this report are close enough to the actual facts of the Driveway.

## **1.2 Objectives**

- To observe the methods and sequence of work used to run the process of the construction of the Driveway.
- To determine the item, workmanship, instrument, time, and cost involved during the process.
- To investigate the problems of the construction of the Driveway, thus find the solution and eliminate the problems.
- To examine the types of test for Driveway.

### **1.2.1 Method and sequence of work.**

The methods or ways to construct the Driveway need to be observed and put into this report. The sequence of work of the Driveway construction is also observed.

### **1.2.2 Item, Workmanship, Instruments, Time, and Cost.**

The important information for the Driveway construction is needed as additional tool to further understand the mechanism and the needs of work to be done.

### **1.2.3 Types of test used.**

The types of test to run on the Driveways to make sure they are constructed properly. The types of test are analyzed and recorded for this report.

### **1.2.4 Problems and Solutions.**

The issues that occur during the construction process are investigated in order to create solutions to solve the problems thus proceed to the construction smoothly.

## **Method of Study.**

### **1.3.1 Literature Study**

Literatures and writings are used as reference to get additional information of the Driveway. Sources from the internet are also taken as a reference for more information of the Driveways.

### **1.3.2 Interview**

Despite the wide information that Internet and Books provide, practical knowledge is also important to be learned and noted down directly from experienced workers and staffs. Some information such as price and quantity can only be retrieved from the Managing Department or from data files.

### **1.3.3 Site Visit**

Exploring and experiencing the site itself is the most important part of the study where the author has to learn by doing or supervising the whole process of the particular construction, specifically for this report is the Driveway.

### **1.3.4 Discussion**

The author have discussed with various people to present the report in its best form. The author asked and received many opinions and advices from his groupmates, workmates, staffs, supervisors, lecturers and seniors.

## CHAPTER 2.0

### COMPANY BACKGROUND

#### 2.1 Introduction of Company

Ibrahim Mian Sdn Bhd (IMSB), a 100% Bumiputra Company, was initially established under the name of Pembinaan Wanti in 1990. In view of strong development as well as to secure good contracts and for banking facilities purpose, Ibrahim Mian Sdn. Bhd. was then be established on April 1994.

The company was brought up by two business individuals namely En. Md. Ibrahim and Pn. Roslina Andan whom is husband and wife in relation. The company started off with a modest beginning as a small scale contractor carrying out relatively small projects for government agencies, private and individuals.

Due to their continues hard work and competency, Ibrahim Mian Sdn. Bhd. has been successfully upgraded and presently it hold to an "A" Class contractor from Pusat Khidmat Kontraktor (PKK), Ibrahim Mian Sdn. Bhd., is also one of the contracting companies recognised by Construction Industry Development (CIDB) and Ministry of Finance Malaysia. The company is also one of the 'Sub Kontraktor Berwibawa' for Perbadanan Kemajuan Negeri Selangor (PKNS) under scheme 'Masyarakat Perdagangan dan Perindustrian Bumiputra yang berwibawa'.

Towards the end of 1996, Ibrahim Mian Sdn. Bhd. has secured -a few projects from some reputable company such as Perbadanan Kemajuan Negeri Selangor (PKNS) and Perangsang International Sdn. Bhd. (PISB). This has proven the company's proficiency and their stable financial position, which enable them to grab better tenders and assignments.

Presently, it's authorised capital stands at RM2,000,000.00 and it's paid up capital starts at RM1,000,000.00. The company's performance has also been good and able to sustain it's profitable operation for the past three consecutive financial years.

En. Md. Ibrahim is a product of Mara Institute of Technology who has graduated in 1983 and obtained a Diploma in Civil Engineering.

Upon graduation, he joined Majlis Perbandaran Shah Alam as a Technical Assistant where he involved in multiple Civil Engineering works. Later, he joined a Class "A" contractor namely PKNS Praton Haus Berhad as Assistant Quantity Surveyor where he diversified knowledge in the field of Quantity Survey and Civil Infrastructure works.

During his tenure in the company, he involved in estimation and works, construction of massive earthworks and also took part in planning coordination with the relevant authorities and consultant. This is where he managed to snatch invaluable experience.

Later in 1990, he joined Ng Sin Wah Trading Co., a construction company in Kuala Langat as a Business Manager to manage all their construction project which mainly in infrastructure works. In the same year, he formed a sole proprietor firm known as Pembinaan Wanti to venture into his own business.


Combining with Mohamad Niza Ismail, an experienced architect who has been involved with a lot of building works, they ventured further into the building and interior works.

Based on these resources, with experience and strong commitment in good working relationship, Ibrahim Mian Sdn. Bhd. is now set to take up the challenges of nation building within the contract of vision 2020.



## 2.2 Company Profile

**Table 2.1:** The table shows the information of the company.

Info	Content
Name	IBRAHIM MIAN SDN. BHD.
Logo	 <p><b>Figure 2.1:</b> Company Logo.</p>
Registration Address	No.40 A , Jalan Badminton 13/29 , Tadisma Business Park , Seksyen 13 , 40100 Shah Alam , Selangor.
Telephone No.	
Fax No.	
Company Registration No.	294853 A
Date Incorporated	11 April 1994
Email Address	Ibrahimmian_61@yahoo.com
Company Status	Private Limited Company
Bumiputra Equity	100%
Authorised Capital	RM 2,000,000.
Paid up Capital	RM 1,600,000.
Company Activities	Provision of Building Construction, Civil Engineering, Landscape and Mechanical, and Engineering Services (M&E).
Bankers	<p>Bank Islam Malaysia Berhad</p> <p>Tingkat Bawah, Wisma PKPS, Seksyen 14, Persiaran Perbandaran, 40675 Shah Alam.</p> <p>Account No. : 12038-01-001241-9</p>

Company Auditor	Jamal, Amin Tax Services Sdn. Bhd. which is capitalised at No. 60-D 2nd Floor, Jalan 2/23A, Off Jalan Genting Klang, Taman Danau Kota, Setapak 53300 Kuala Lumpur.
Income Tax No.	C 6879056-02
Company Secretary	Harris Bakar Management Sdn. Bhd. 03-32, Tingkat 3, Kompleks PKNS, 40450 Shah Alam, Selangor.

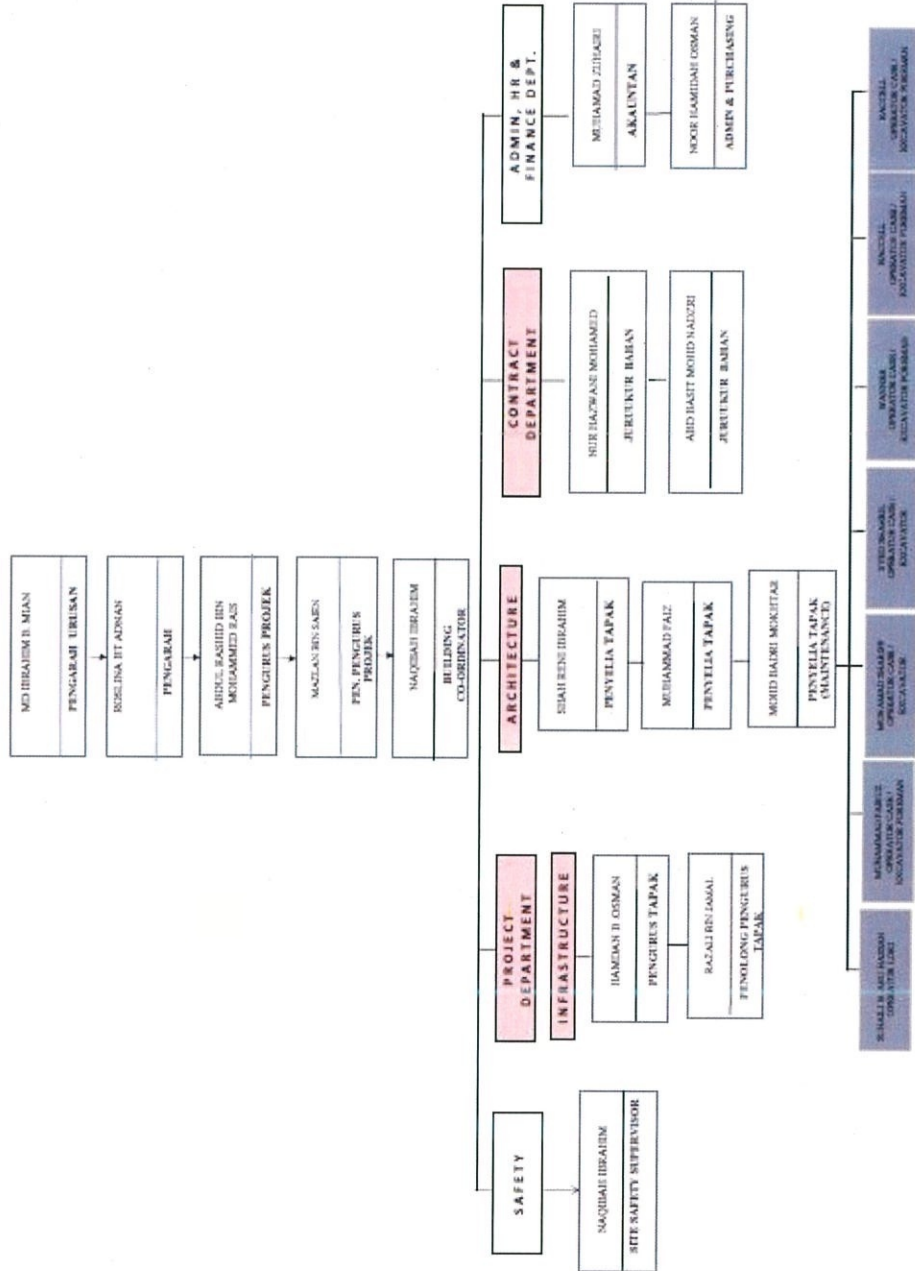
## 2.3 Organization Chart

**Table 2.2:** The table shows the organisation chart of the company.

Role		Person In-Charge
Management Director		Md Ibrahim B. Mian
Director		Roslina Bt. Adnan
Project Manager		Abdul Rashid B. Mohammed Rais
Assistant Project Manager		Mazlan B. Saien
Building Coordinator		Naqibah Bt. Ibrahim
Dept. of Admin, HR, & Finance.	Company Accountant	Muhammad Zuhairi
	Admin & Purchasing	Noor Hamidah Osman
Dept. of Contract.	Quantity Surveyors	<ul style="list-style-type: none"> <li>• Abd Basit Mohd Nadzri</li> <li>• Nur Hazwani Mohamed</li> </ul>
Dept. of Architecture.	Site Supervisor	<ul style="list-style-type: none"> <li>• Shah Reni Ibrahim</li> <li>• Muhammad Faiz</li> </ul>
	Site Maintenance Supervisor	<ul style="list-style-type: none"> <li>• Mohd Badri Mokhtar (Supervisor)</li> </ul>
		<ul style="list-style-type: none"> <li>• Suhaili Bin Abu Hassan (Lorry Operator)</li> <li>• Muhammad Fairuz (Operator for Case &amp; Excavator, Foreman)</li> <li>• Mohammad Shariff (Operator for Case &amp; Excavator)</li> <li>• Syed Shahril (Operator for Case &amp; Excavator)</li> <li>• Wanner (Operator for Case &amp; Excavator, Foreman)</li> <li>• Haccel (Operator for Case &amp;</li> </ul>

		Excavator, Foreman)  <ul style="list-style-type: none"> <li>• Raccel (Operator for Case &amp; Excavator, Foreman</li> </ul>
Dept. of Project for Infrastructure	Site Manager	Hamdan B. Osman
	Assisstant Site Manager	Razali B. Jamal
Dept. of Safety	Site Safety Manager	Naqibah Bt. Ibrahim

**CARTA ORGANISASI  
IBRAHIM MIAN SDN BHD**



**Figure 2.2:** Company Organisation Chart

## 2.4 List of Project

### 2.4.1. Completed Projects.

**Table 2.3:** The Table shows the list of completed projects for the past 2 years.

Project	Value	Client	Due date
Cadangan Membina dan Menyiapkan 10 Unit Rumah Berkembar dan 9 Unit Rumah Sesebuah (Fasa 1), di Presint 12, Seksyen U13, Shah Alam, Selangor.	RM 26,681,708.10	PKNS	May 2012-November 2013. Actual Finished date: October 2016.

REKOD PENGALAMAN KERJA YANG TELAH SIAP DIJALANKAN  
MEMBINA DAN MENYIAPKAN BANGUNAN  
(Senarai semua kerja yang telah disiapkan 2005 - 2015 )

No.	Nama Projek	Sub Trade	Nilai Kontrak	Pemilik / Kontraktor Utama	Tarikh Mula	Tarikh Dijangka Siap	Tarikh Siap Sebenar	Nama & Alamat Majikan
1	Cadangan membina dan menyiapkan 10 Unit Rumah Berkembar dan 9 Unit Rumah Sesebuah (Fasa 1), di Presint 12, Seksyen U13, Shah Alam, Selangor	Kontraktor Utama	26,681,708.10	PKNS	09 Mei 2012	19 Nov 2013	Ok 2016	PKNS
2	Membina dan menyiapkan 34 unit Banglo berkembar 2 tingkat yang mengandungi 24 Unit Jenis A dan 10 Unit Jenis B termasuk kerja-kerja tanah dan lain-lain kerja berkaitan di Jalan Kallian 2/13, Seksyen 24 PKNS/SA/Pyk/Kongjara	Kontraktor Utama	10,556,754.59	PKNS	1 Nov 2011	28 Aug 2013	27 Jan 2015	PKNS
3	Membina dan menyiapkan 8 Unit Rumah Link 2 tingkat (34' x 65' Fasa 1), Sebuah pencawang Elektrik (Double Chamber), kerja-kerja tanah serta infrastruktur yang berkaitan di sebahagian Seksyen 2, Kota Puteri, Mukim. Ramang, Daerah Gombak, Selangor. PKNS/PP/KON-063010	Sub-Kontraktor	27,046,194.00	PKNS Infra Berhad	1 Dec 2010	13 Sept 2012	23 Jan 14	PKNS
4	Cadangan membina dan menyiapkan 22 Unit Rumah Berkembar 3 Tingkat di Jalan Kristal 11/14, Seksyen 7, Shah Alam	Kontraktor Utama	11,621,094.20	IBRAHIM MIAN SDN	08-Sep-09	24 Ogos 2010 (50 minggu)	24 Ogos 2010	PKNS
5	Membina dan menyiapkan 10 unit rumah link (34' x 65') Fasa 2, serta kerja-kerja infrastruktur yang berkaitan di Seksyen 2, Kota Puteri, Daerah Gombak, Selangor	Kontraktor Utama	16,360,000.00	IBRAHIM MIAN SDN	02 Ogos 07	29 Julai 09 (104 minggu)	04-Nov-09	PKNS
6	Membina dan menyiapkan 14 Unit Rumah Banglo 1 Tingkat Di Seksyen 2A, Antara Capi Daerah Hulu Selangor Darul Ehsan.	Kontraktor Utama	2,830,000.00	IBRAHIM MIAN SDN	15-Jun-05	14-Jun-06 (51 minggu)	14-Jun-06	PKNS
			103,045,992.99					

**Figure 2.3:** Past Projects Record.

#### 2.4.2. On-Going Projects.

**Table 2.4:** The Table shows the list of projects currently going on.

Project	Value	Client	Due Date
Cadangan Penyiapan Baki Kerja Bagi 72 Unit Rumah 2 Tingkat, 44 Unit Rumah Berkembar dan 28 Unit Rumah Jenis Cantuman 4 di Fasa 7, Laman 1, Bernam Jaya, Selangor Darul Ehsan.	RM18,578,056.93	PKNS	February 2018-January 2019.

## CHAPTER 3.0

### CASE STUDY

#### 3.1 Introduction to Case Study



**Figure 3.1:** Company Logo.

The case study was done at project Cadangan Penyiapan Baki Kerja Bagi 72 Unit Rumah 2 Tingkat, 44 Unit Rumah Berkembar dan 28 Unit Rumah Jenis Cantuman 4 di Fasa 7, Laman 1, Bernam Jaya, Selangor Darul Ehsan, which is located at Fasa 7, Laman 1, Bernam Jaya, Selangor Darul Ehsan. The project is one of the few more projects around it, owned by Perbadanan Kemajuan Negeri Selangor (PKNS).



**Figure 3.2:** Project signboard.



The project was first given by PKNS to a company named AJ-Corp Sdn. Bhd. to be built. The name of the project was Cadangan Membina dan Menyiapkan 72 Unit Rumah 2 Tingkat, 44 Unit Rumah Berkembar dan 28 Unit Rumah Tersiri Jenis Cantuman 4 di Fasa 7, Laman 1, Bernam Jaya, Selangor Darul Ehsan. The contract was worth RM19,009,459.80. The project started on 20th August 2013 and was expected to finish on 16th February 2015, but somehow the project's due date was delayed onto 13th November 2015. However, the project could not be finished either because of an uncertain issue. Rumor has it that the company was facing economical or money issues that they could not handle. Thus, the company went bankrupt.



**Figure 3.3 & 3.4:** Sky view of site. (Source: Courtesy of IMSB)

Lastly, the project was bid in an open tender. The project was won by and awarded to our company Ibrahim Mian Sdn. Bhd.(IMSB). The contract is now worth RM18,578,056.93. The project was handed over to IMSB on 15th February 2018 and expected to finish on 16 January 2019. Now, the project is currently running and almost finished. Too bad, the author cannot be present on the actual due date as he had already finished his internship before he can see the result of his works.

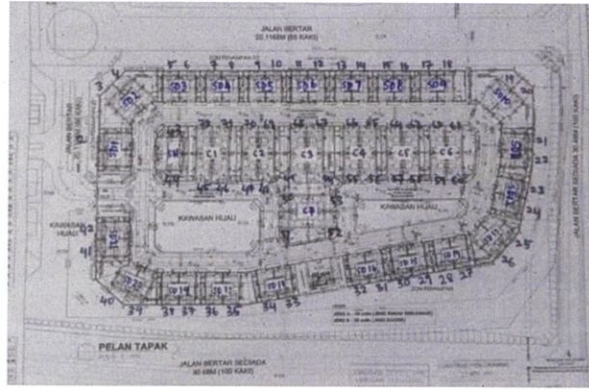


Figure 3.5: Site layout.



Figure 3.6: Safety sign.

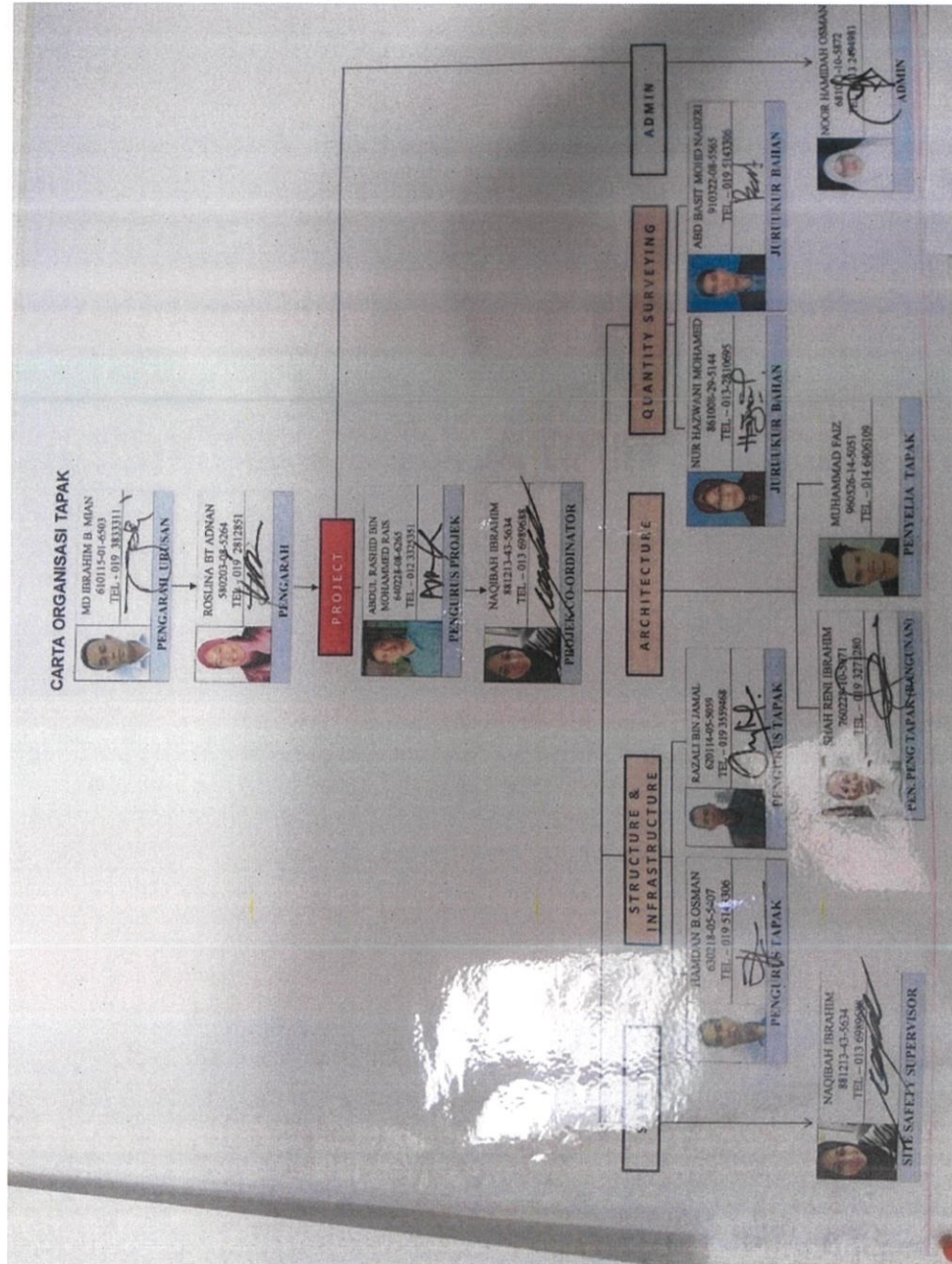


Figure 3.7: Site Organisation.

### 3.2 The process or methods of constructing the Driveway

First of all, some of the houses including the clusters have a bit different driveway shapes, but the author took the regular driveway for his research in this report, refer to Figure 3.8.

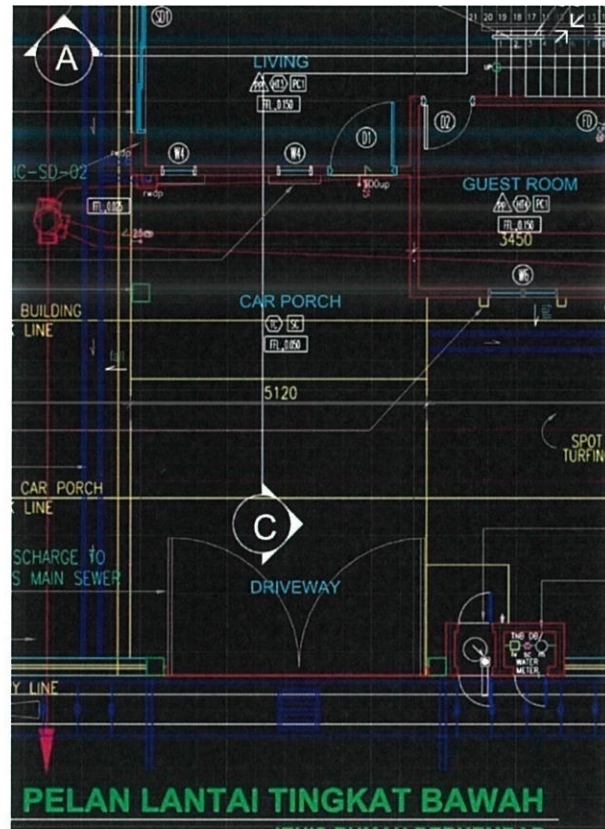


Figure 3.8: Architectural drawing of Driveway.

The Driveway is first constructed by setting up pegs to shape the sides of the driveway according to the design in the architectural drawing plan, refer Figure 3.9. The pegs are hammered into the topsoil as guidance for the excavator operator to see the pegs and excavate the right spot and shape. Then, levelling equipments are set up and the topsoil is levelled from the house floor to the ground for 300mm deep, refer Figure 3.10.



**Figure 3.9:** Setting out pegs.

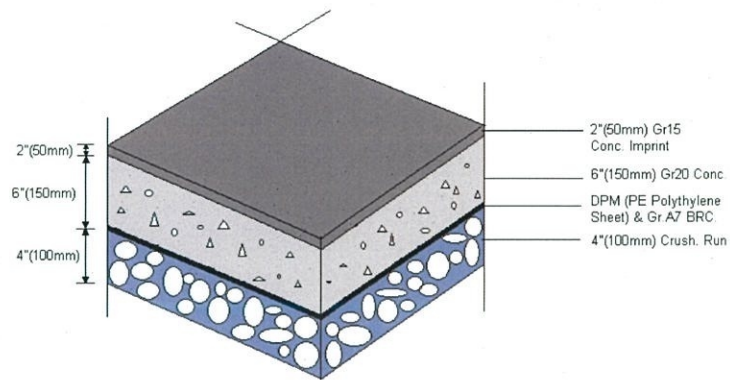


**Figure 3.10:** Levelling Floor level.

Secondly, the pegged area is excavated to the depth of 300mm into the ground which is the total depth of Crusher Run(100mm), Concrete(150mm), and Imprint(50mm), refer Figure 3.11 and Figure 3.12.



**Figure 3.11:** Excavating driveway.



**Figure 3.12:** Layers of Driveway.

Thirdly, the excavated top soil is compacted with Mini Road Roller, refer Figure 3.13. When the topsoil is firm enough, formworks are then set up at both left and right sides of the Driveway to hold the wet materials to be poured, refer Figure 3.14.

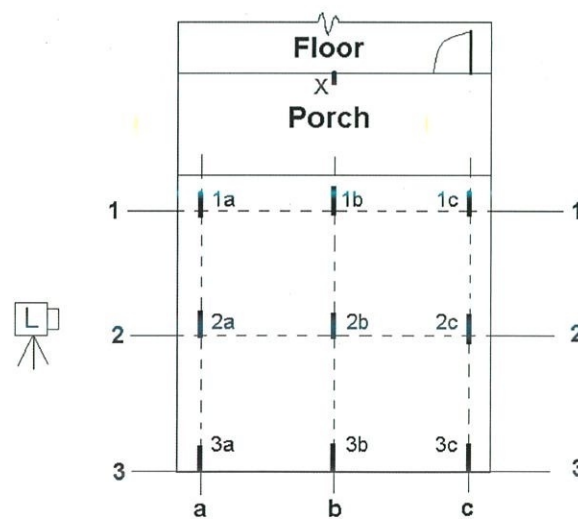


**Figure 3.13:** Mini Road Roller compaction.



**Figure 3.14:** Installation of formwork.

Fourthly, 9 pegs are hammered into the Driveway area in 3x3 arrangement, refer Figure 3.15. Next, levelling instruments are set up at point "L", and Floor is levelled and recorded, refer Figure 3.16. After that, the drop level of Porch is levelled, which should be 150mm below the floor level. Then, it is marked as, point "X", and nailed with a 1 inch(25mm) concrete nail, refer Figure 3.17. Then, the drop level of the peg at the end of Driveway is levelled, which should be 4 inches(100mm) below point "X", marked as point "3b", refer Figure 3.15.



**Figure 3.15:** Driveway schematic 3x3 layout.



**Figure 3.16:** Levelling Floor level.



**Figure 3.17:** Marking drop level of Porch.

The levelled point "3b" is marked with Yellow tape(Concrete height), then mark 6 inches(150mm) below the Yellow tape using Red tape(Crusher run height), refer Figure 3.18. Then, the level of Yellow tape at point "3b" is transferred to points "3a" and "3c", then the Yellow and Red tape is marked along, refer Figure 3.19.





**Figure 3.18:** Yellow tape (Concrete) & Red tape (Crusher Run)



**Figure 3.19:** Transferring level data of point "3b" at point "3a" & "3c".

Next, a trail of string is tied to point "X" and the other end is tied to point "3b" on the Yellow tape, refer Figure 3.20 and Figure 3.21. The gradient of the string shows the slope of the Driveway to be built, refer Figure 3.22. Then, the middle pegs, point "2b" and "1b", which intercept the string are marked with Yellow tape, then Red tape, the same way explained before, refer Figure 3.23.



**Figure 3.20:** String tied to point "X".



**Figure 3.21:** String tied to point "3b".



**Figure 3.22:** Gradient of string.



**Figure 3.23:** Markings for middle pegs, points "2b" & "1b".

Next, the Yellow tape at point "2b" is levelled and transferred to points "2a" and "2c", refer Figure 3.24. The same goes to point "1b" to points "1a" and "1c", refer Figure 3.25. Finally, the Driveway is done with the marking process, refer Figure 3.26.



**Figure 3.24:** Levelling point "2b".



**Figure 3.25:** Levelling point "1b".



**Figure 3.26:** Finished markings.

Fifthly, Crusher Run are poured into the formwork until it reaches the Red tape which is at 100mm height. Then, the Crusher Run layer is compacted with Plate Compactor, refer Figure 3.27.



**Figure 3.27:** Plate Compaction.

Sixthly, Anti-Termite service sprays anti-termite chemical on the Crusher Run surface throughout the whole Driveway area by Jaya Maju subcontractors, to exterminate and to prevent termites or other insects from inhabiting inside the Driveway structure, refer Figure 3.28.



**Figure 3.28:** Spraying anti-termite.

Seventhly, PE Polyethylene sheet is laid throughout the Driveway area as a Damp Proof Membrane (DPM) to waterproof the Driveway from any algae or lives that could grow from the moistures. Plus, to avoid the dampness from rising up to the concrete level which can rust the BRC wire mesh and affect the strength of structure. Next, BRC wire mesh of Grade A7 are laid on the PE Polyethylene sheet to highly improve the tensile strength of concrete. Spacer blocks are placed under the BRC to make sure the whole component will be concreted inside the concrete structure, refer Figure 3.29.



**Figure 3.29:** Waterproofing sheet and BRC wire mesh.

Eightly, Concrete of Grade 20 is poured onto the layers of waterproof and reinforcements until it reaches the height of Yellow tape, 150mm above Crusher Run layer. The concrete are then spread throughout the Driveway area until it fits the formwork, refer Figure 3.30. Then, compactions are done to fill up any void in the wet concrete. Because of the slope is not too tilted and the viscosity of the concrete is very low, the concrete stays with the slope without moving. The curing process takes a day or a night to be hard enough to dismantle the formworks and ready for the next step, refer Figure 3.31.



**Figure 3.30: Concreting.**



**Figure 3.31: Cured concrete.**



Ninethly, Concrete of Grade 15 is laid 50mm thick on the dry concrete to make imprints. Imprint is a method to create a fake surface of a certain material by pressing a steel stamp into the concrete surface, so it takes the shape of the mould and gives an outstanding look without using the actual material. The curing process takes less than 1 day to be matured or hard enough to be stepped on, refer Figure 3.32.



**Figure 3.32:** Finished Driveway.

**3.3 Equipment Material and Machinery, Workmanship, Time, and Material Cost required for 1 Driveway.**

**Table 3.1:** The Table shows the requirements of Driveway.

<p><b>Equipment Material and Machinery</b></p>	<p>Equipment:</p> <p>1. Nail(Concrete 1" &amp; Wood 2½") and Hammer.</p>  <p><b>Figure 3.33:</b> Concrete Nail 1"</p> <p>The concrete nail is used to mark the drop level from the floor to the porch level.</p>  <p><b>Figure 3.34:</b> Wood Nail 2½".</p> <p>The wood nail is used to grip plywood planks together to make formworks.</p>
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**Figure 3.35: Hammer.**

The hammer is used to hammer or pull out nails.

## 2. String.



**Figure 3.36: String.**

The string is used to connect between points and to determine the whether the slope is tilted or flat.

3. Peg.



**Figure 3.37:** Pegs.

The pegs are used to mark every point on the ground.

4. Measuring tape.



**Figure 3.38:** Measuring Tape.

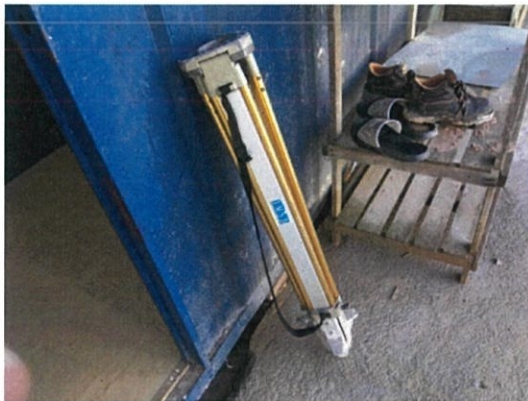
The measuring tape is used to measure the length between 2 points.

## 5. Levelling Instruments.



**Figure 3.39: Level**

The level is used to determine the height of a point from the first reference point. The bubble is stabilized to get an accurate reading.



**Figure 3.40: Tripod Stand.**

The tripod stand is a 3-legged structure to support and hold the level in a fixed position.



**Figure 3.41: Measuring staff.**

The measuring staff is used to measure the level of a point.

6. PVC marking tape. (Red&Yellow)



**Figure 3.42:** Yellow Tape.

The Yellow Tape is used to mark the level of the Grade 20 Concrete.



**Figure 3.43:** Red Tape.

The Red Tape is used to mark the level of Crusher Run.

7. Plywood (12" x 1").



**Figure 3.44:** Plywood (12"x1").

The Plywood is used to make formworks of the Driveway.

8. Struts (2" x 2").



**Figure 3.45:** Struts (2"x2").

The Strut is used to support and hold the formworks in its position from collapsing.

Material:

1. Crusher run.



**Figure 3.46:** Crusher Run.

The Crusher Run is used as a base layer for the Driveway.

2. Anti termite.



**Figure 3.47:** Anti-termite.

The Anti-Termite chemical is sprayed throughout the Driveway area to repel termites and insects from inhabiting inside the Driveway.

### 3. PE Polythylene sheet.



**Figure 3.48:** PE Polythylene Sheet.

The sheet is used as waterproofing substance to block moistures from getting inside and weaken the Driveway structure.

### 4. Grade A7 Wire Mesh (BRC).



**Figure 3.49:** Grade A7 BRC.

The BRC is used as strength reinforcements for the Driveway.

5. Grade 20 & Grade 15 Concrete.



**Figure 3.50:** Grade 20 & Grade 15 Concrete.

The Concrete of Grade 20 is used for 150mm thick of Concrete Slab and Grade 15 for 50mm of Imprint.

Machinery:

1. Excavator.



**Figure 3.51:** Excavator.

The Excavator is used to excavate and remove the topsoil before constructing the Driveway.



2. Plate compactor.



**Figure 3.52:** Plate Compactor.

The Plate Compactor is used to compact the ground by vibration, specifically for the Crusher Run layer to be flattened.

3. Mini road roller.



**Figure 3.53:** Mini Road Roller.


The Mini Road Roller is used to compact the ground by vibrating rollers, specifically for the topsoil to be flattened.

4. Concrete mixer truck.



**Figure 3.54:** Concrete Mixer Truck.

The Concrete Mixer Truck is used to transport the concrete mix to the site.

	<p>4. Concrete mixer truck.</p>  <p><b>Figure 3.54:</b> Concrete Mixer Truck.</p> <p>The Concrete Mixer Truck is used to transport the concrete mix to the site.</p>	
<p><b>Workmanship</b></p>	<p>Labours</p>	<p>NO'S</p>
	<p>Excavator Operator: Skilled Worker: Surveyor:  Anti-termite sprayer:</p>	<p>1 (monthly paid) 3 (monthly paid) 2 (internships including the author)  2 (subcontractor)</p>
<p><b>Time</b></p>	<p>Setting up: Excavation: Compaction: Formwork Installation: Levelling and marking: Compaction: Anti-termite spray: Concreting and curing: Imprinting and curing:  <b>Total gross estimated time to finish 1 Driveway</b></p>	<p>0.5 Hours 0.5Hours 1 Hours 1 Hours 0.5 Hours 0.5 Hours 0.5 Hours 24 Hours 1 Hours  <b>29.5 Hours</b></p>

<b>Material Cost</b>	<p>Because of the workers including operator are paid monthly and can be deployed for extra hours or overtime(OT), and the machinery are owned by the company and the details are unknown, the cost for labors and machinery are excepted in the estimation. Some equipments are also excluded due to irrelevant less usage that does not affect the price of the whole structure. All the information such as material price are received from the Dept. of Quantity Surveyor and Dept. of Human Resources via What's App and are confidential, so invoices were not given.</p> <p>The size of 1 Driveway excluding the Porch is 5120mm x 6495mm. The concrete of Grade 20 and Grade 15, is ready mixed, ordered from a manufacturer. Calculate the total cost of materials for 1 Driveway.</p>
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NO	MATERIAL	UNIT	COST/ UNIT (RM)	UNIT USED/ m <sup>2</sup>	COST/m <sup>2</sup> (RM)
1	Wood Nail	kg	3.58	0.5	1.79
2	Plywood	m	4.33	0.444	1.92
3	Batten	m	2.67	0.444	1.19
4	Crusher Run	tonne	29.00	0.0155	0.45
5	Anti-termite	m <sup>2</sup>	2.00	1	2.00
6	PE Polythylene Sheet	m	6.67	0.154	1.03
7	Grade A7 Wire Mesh (BRC)	m <sup>2</sup>	20.40	1	20.40
8	Grade 20 Concrete	m <sup>3</sup>	175.00	0.15	26.25
9	Grade 15 Concrete	m <sup>3</sup>	170.00	0.05	8.50
Total Material Cost for 1m <sup>2</sup> Driveway					63.53
Size of 1 Driveway (m <sup>2</sup> ) = 33.2544m <sup>2</sup> . Therefore,					
<b>Total Material Cost for 1 Driveway</b> = RM63.53/m <sup>2</sup> x 33.2544m <sup>2</sup>					<b>2112.65</b>

### 3.4 Types of test for Driveway.

Driveway must be built perfectly as other structures to make sure it serves its purpose correctly, which is to move any gravitationally movable object to go down to the bottom of the driveway and out of the house area. In order to do that, the Driveway is tested to make sure the slope of the Driveway is correct and acceptable so it is neither too horizontal or too steep. Too horizontal and the Driveway might functions as a flat ground, if too steep and the Driveway might offer more harm than safety because not every Driveway has imprints to grip our feet from slipping. There are multiple types of test to determine the Driveway is correctly tilted or not.

#### 3.4.1 Ball Testing

Firstly, one of the types of test is by simply putting a ball on the Driveway and let it roll down the slope to see the movements. If it rolls down, then the Driveway is a go. But if it does not, then the Driveway is flat and has to be fixed by hacking all the structure along with the hardworks put in it and build a new one, refer Figure 3.55.



**Figure 3.55:** Ball Testing.

### 3.4.2 Water Testing

Secondly, by pouring water onto the Driveway and see if the water runs down. The concept is just the same as the first one, but the water test is much more accurate as we could pour as much water on the Driveway and see if there is any part of the Driveway was not built correctly, instead of using a ball and take the result as an overall result. Some part of the water might flow aside because that part might be more tilted to the sides instead of down, but it is still acceptable as long as the water runs out of the area. But, if any part of the Driveway is clogged or flooded with an intolerable amount of water, then that part must be fixed, refer Figure 3.56.



**Figure 3.56:** Water Testing.

### 3.4.3 Spirit Level Testing

Thirdly, it can be tested by using a Spirit Level. Spirit Level works as a stabilizer, using bubbles. It can be set so we could know whether the Driveway is tilted or not. And we can even find out how much of a tilt or how much is the gradient of the Driveway is by simply putting the instrument on the Driveway and observe the bubble. However, this method is not as efficient as the second one to see if the whole part of the Driveway is correctly tilted in a single try. But, this method is more precise to determine or to measure the exact gradient of the slope by numbers or magnitude instead of watching the reaction of objects only, refer Figure 3.57.





**Figure 3.57:** Gradient testing.

So, the application of more than one test should be the best to examine the Driveway.

### 3.5 Problems and Solutions for every Driveway construction.

**Table 3.2:** The Table shows the problems and solutions of Driveway construction.

NO	PROBLEMS	SOLUTION
1	<p>Lack of Crusher Run supply, because of uncontrollable issues which comes from the manufacturer's transportation.</p>  <p><b>Figure 3.58:</b> Crusher Run.</p>	<p>The simplest way yet is to order the item such as Crusher Run few weeks or a month earlier to avoid insufficient supply which is bad for the progress of the project.</p>
2	<p>Uncertain weather, specifically heavy rains during these end-of-year months. It results in inability of use of machineries , it floods roadway , and puts workers in an unhealthy condition.</p>  <p><b>Figure 3.59:</b> Flooded by heavy rain.</p>	<p>The most difficult problem it is when it comes to mother nature. Heavy rains stop all outdoor movements and works. So, during hot sunny weather, they strive to do their work quickly. And if there is any heavy item needed around the site, they will prepare and transport the item earlier before the item is needed. Items such as Bricks , Cement , Sand , Aggregates , Paints , etc..</p>



3	<p>Additional:</p> <p>a) Damaged Instruments</p>	<p>Instruments will be checked to make sure it is good to be used. If it is not, it will be sent to a specific mechanic. Every instruments will then be used carefully.</p>
	<p>b) Lack of Workers</p>	<p>Works become harder when there are insufficient workers. So, schedules are made to arrange the workers in the most efficient way possible.</p>
	<p>c) Unexpected changes from the results of meeting with the client due to changes of plan to benefit both sides.</p>	<p>At this rate they just have to do their best to proceed with whatever decision made during the meeting.</p>

## CHAPTER 4.0

### CONCLUSION

#### 4.1 Conclusion

In a nutshell, the study is carried out in the project site where the author was doing his practical training which is at Fasa 7, Laman 1, Bernam Jaya, Selangor Darul Ehsan. The project was a former abandoned project by a company, which was then taken over by Ibrahim Mian Sdn. Bhd. (IMSB) to finish. The project is owned by Perbadanan Kemajuan Negeri Selangor (PKNS). And now, the project is expected to be finished in January 2019, but may be delayed for technical problems faced during the construction process.

Overall, Driveway is a tilted slope from the entry gate going up to the Porch area which is the parking area in front of the main door. Driveway connects two different levels between the house and the road way, in a preferable gradient for this project which is 1:65, where the house floor is 4 inches (200mm) higher than the road way. Driveway helps to make water to flow or objects to roll down to the road way so there would be no clogging and avoid messes around the house. It plays an important role in house constructions where people usually miss to realize or do not even care about. For that, it makes the Driveway an interesting topic for the author to do studies on, and very rare as well. Besides, the construction of Driveway is what the author mostly do and best at during his practical training.

Apart from that, the process of building the Driveway is very important as the main input for this report. Plus, the details of every steps are carefully observed and the data were taken in order to continue with the research. Furthermore, management of the sequence of works should be done from an unexcavated soil to a finished perfectly built Driveway ready to run for tests. Management is very important especially from the overall construction procedures to the smallest things like the Driveway, to make sure that everything goes as much as planned as possible. It is

also to avoid any delays or issues in the progress, otherwise compounds or penalties might be given to the company which involve big amount of money on our heads. Other than that, the importance of precision and accuracy of works is to give the best quality of work and result for the company so it may benefit all sides and most importantly self satisfaction.

After that, the requirements to build the Driveway were determined and recorded for research purposes to fit in this report. Eventhough the Driveway may seem easy to handle, it is never as easy as it looks when it comes to research, where simple things become complicated when being studied. Like the author mentioned in the previous paragraph, management is important to keep the works running. The requirements for the Driveway such as worker, machinery, and material are things that are limited in certain times, which has been explained in Chapter 3. Therefore, problem solving skills are needed to maintain the flow of work without any disruption. Even if it does, must be kept at minimal. The materials needed and costs for every Driveway are examined and taken for research, thus, the material price for 1 Driveway has been calculated which is RM 2112.65, and it takes about 29.5 hours to finish 1 Driveway.

Finally, the slope test for Driveway were observed and examined carefully to make sure the built structure is as good as it should be. The test is simply by putting a ball or pouring water on the Driveway and watch it run down to the main drainage at the end of the Driveway. The main focus is to make sure the test subjects run down and not stopping anywhere along the Driveway.

So, it is always vital to make sure everything runs smoothly and perfectly to avoid any delays and be sure to do something correctly and precisely to prevent any unwanted issue in the future.

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