



DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)

CONCRETE GROUND FLOOR SLAB CONSTRUCTION

Prepared by:

MUHAMMAD RAZIF DINNIE BIN MOHD TARMIZI

2019284738

DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
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By

Muhammad Razif Dinnie Bin Mohd Tarmizi

2019284738

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Concrete Ground Floor Slab Construction

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

Report Supervisor : _____
Pn Siti Jamiah Tun Binti Jamil

Practical Training Coordinator : _____
Dr Nor Asma Hafizah Binti Hadzaman

Programme Coordinator : _____
Dr. Dzulkarnaen Bin Ismail

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

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STUDENT'S DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at MN Power SDN BHD 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 fulfilment of the requirements for obtaining the Diploma in Building.

.....

Name : Muhammad Razif Dinnie Bin Mohd Tarmizi

UiTM ID No : 2019284738

Date : 10/1/2021

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Thank you so much.

ABSTRACT

Slabs are a basic component in a construction, no matter how many levels the building is, there must be a slab. This component is vital in the construction of a basement because it serves as a transition between the ground and the structure. Non-load-bearing basement floor slabs must be distinguished from so-called bottom floor slabs. The latter play an essential part in the building's statics. Therefore, this report will discuss about concrete ground floor slab construction. This report was conducted for the building of Two Storey Surau at La Cottage, Taman Putra Perdana, Puchong Selangor that owned by Surau La Cottage Management. The objective of this report is to analyse the construction of ground floor slab and how it carried out. It will focus on the whole process and progress of concrete ground floor slab construction. It also investigates the equipment and machinery utilised in ground floor slab construction, as well as the time spent on construction. Other than that, this report also will show what material that will be used on the construction also the exactly amount of material that required and pre-determined measurements according to the plan.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

In the building construction, the floor slab conceals a slab-shaped foundation. It is considered the constructive and static basis of the transition between the structure and the ground. Floor slabs are the basic requirements for the comprehensive stability of the building and are always built according to a standardised scheme. This includes the founding, the drainage including laying the drainage pipes, the insertion of the spacers, the sheathing and laying of the reinforcement and finally the concreting. In addition to floor slabs in the form of foundation slabs, there are also strip foundations as well as point foundations for support columns. Lem Bingley (2019, March 12)

The phrase 'floor slab' usually refers to a floor that has been created using concrete (and frequently steel reinforcement) and may be part of a building's structure. It can be used to construct the floor of a basement, ground level, or upper level. It will generally be reinforced with rebar or steel fibres and can be produced on-site or prefabricated. A timber or other material floor is not referred to as a floor slab. Joe Bousquin (2019, January 5)

Concrete slabs are common materials for new residential and commercial construction. Rather than constructing on stilts or stumps, a concrete foundation improves thermal efficiency, ensures structural stability, and allows for a larger and heavier structure. The preparation of formwork, compaction of a slab bed, placement of reinforcing, pouring, compacting, finishing the concrete, removing formwork, and curing the concrete slab are all part of the concrete slab building process. Garry Boulard (2020, April 6)

They are many types of floor slab, such as a horizontal flat layer of concrete (often 100mm), supported on two or more sides by concrete or steel beams. When viewed from the level below, the bottom of the set concrete (if an upper floor) will be visible and may show the markings of the formwork (or shuttering) that was employed to give temporary support. Then, a horizontal flat layer of concrete supported by profiled steel-ribbed sheeting (decking).

The steel reinforces the concrete and offers both temporary and permanent support. A steel ceiling (or soffit) may be seen from the underside, which may contain niches for hangars to support ducts and other services. Such slabs are sometimes referred to as 'composite,' since the resulting structural efficiency of the floor slab exceeds the total efficiency of the steel and concrete. Other than that, a waffle slab is created by pouring concrete over a sequence of plastic formers, resulting in an egg-crate-style (waffle-like) configuration on the slab's bottom. Despite the fact that such structures often have thicknesses of 500mm or more, the hollow regions make the structure lighter, more inexpensive, and structurally efficient. Lastly, a horizontal flat layer of concrete topping poured in-situ over a beam and block foundation or a hollow-rib system with rebar and pre-cast concrete slab supported by a steel frame (especially in a high-rise building). Joe Bousquin (2019, January 5)

There's a advantage why concrete ground floor slab is employed in industrial settings and high-traffic commercial facilities. The material is incredibly durable and can survive nearly any condition, including heavy furniture, high temperatures, and the possibility of scratches on its surface from sharp heels or dogs' claws. Using polished concrete floors inside a home provides peace of mind since it will endure for years with no upkeep, unlike other materials such as vinyl, ceramic, or wooden floors, which are more prone to scratches, cracks, and rips and must be replaced every few years. Beside than that, concrete floors are low-maintenance and have beautiful design option. K. McCusker (2020, March 9)

There are many types of floor slab, however, the aim of this is to discover the construction of concrete ground floor slab basement at a conjected area in Surau La Cottage, Taman Putra Perdana.

1.2 Objectives

There are several objectives have been developed from this construction as follow;

- i. To identify the method of ground floor slab construction
- ii. To determine difficulties throughout the ground floor slab construction
- iii. To identify the material and machinery used in ground floor slab construction

1.3 Scope of Study

The scope of study has been conducted out in Surau La Cottage, Taman Putra Perdana in Puchong, Selangor. The project began in 1 October 2020 and will be completed on 22 September 2022 the cost of the two-story Surau building is RM 819 754. The project is presently under progress. The study's primary goal is to discover how the concrete ground floor slab building procedure for the first-floor slab is carried out. As a result, the study will describe not only the procedure of concrete ground floor slab process, but also the benefits of concrete ground floor slab in construction, the process before installing the BRC reinforcement, machinery and tools. This study also includes the difficulties throughout the whole progress. There were three methods need to be carried out which is observation, interview, and document reviews. In conclusion, all further explanation relating the above method were explained as below.

1.4 Method of Study

1.4.1 Observation

The observation in the construction site is to collect as much data as possible. The observation is about how the concrete ground floor slab process starting from the backfill after the ground beam done until all the ground floor slab formwork can be removed. All the observation recorded by write on the site diary report and submitted to the site supervisor to check, confirming and sign the report. Then, all the progress must be captured and filmed using smartphone and it will be used in the daily work report progress for the company and self-report.

1.4.2 Interviews

The interview is one of the methods to collect the construction data by doing the structured or semi structured interview with the trusted person for the project. The interviews that have been conducted mostly been with site supervisors throughout the time. Lot of question such as how long it will take to done the certain process should be asked. Other than that, spent time a lot with the main contractor to interview about the workers, how the machinery works and how the work process should be done is also important. Then, ask sub-contractor about how he conduct the workers, what skill needed to have on the certain work, how long it takes on the certain progress using the certain number of workers and based on logic compared to the theory. Lastly, interview the labour to ask about the difficulty in doing some work and what skilled for them to acquire to complete the construction work.

1.4.3 Document Review

The documents review that have been used to collect all the data for the construction is company profile, construction drawing, standard operating procedures, progress report and the pictures that taken by other workers. First of all, the first document must be refered before enter the site work is building quantity (BQ) so the whole process will be understood. Other than that, referring to the construction drawing plan to identify certain work part on the construction site. The drawing plan will show me the detail about the composition, quantity and the detail measurement for the construction work. Next, referring to the picture that has been taken by the site supervisor or sub-contractor that observed the construction site.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

MN POWER SERVICES is a contractor company that was founded on June 29, 2007 and is registered with the Malaysian Commission Company. It is entirely owned and operated by Bumiputeras. MN POWER SERVICES operations are focused in the mechanical, electrical, and civil domains. Our services include maintenance, installation, supply, repair, and labour connected to the company's activities. To ensure the success of the company's activities, the company will strive to broaden its experience by utilising existing skills to attract interest and trust from government, private, and public parties individually by entering or purchasing a quotation, tenders, projects, or direct negotiations with customers. To keep up with the governments and private sector's quick development plans, skilled, exceptional, wonderful, and distinguished contractors are needed.

2.2 Company Profile

MN Power Services is an electrical and construction services firm. On June 29, 2007, the corporation was successfully registered. This company's management office is located at No.8, Jalan Putra Perdana 3/2, Taman Putra Perdana, 47130 Puchong, Selangor. The firm is also registered with CIDB and the Suruhanjaya Tenaga Malaysia (STM). Mr. Mohd Hasmely Bin Ismail owns the firm. This company's management team is entirely composed of bumiputera.

Figure 1 shows the MN Power Services company logo.



Figure 1: Company Logo

Figure 2 shows the MN Power Services location on map.

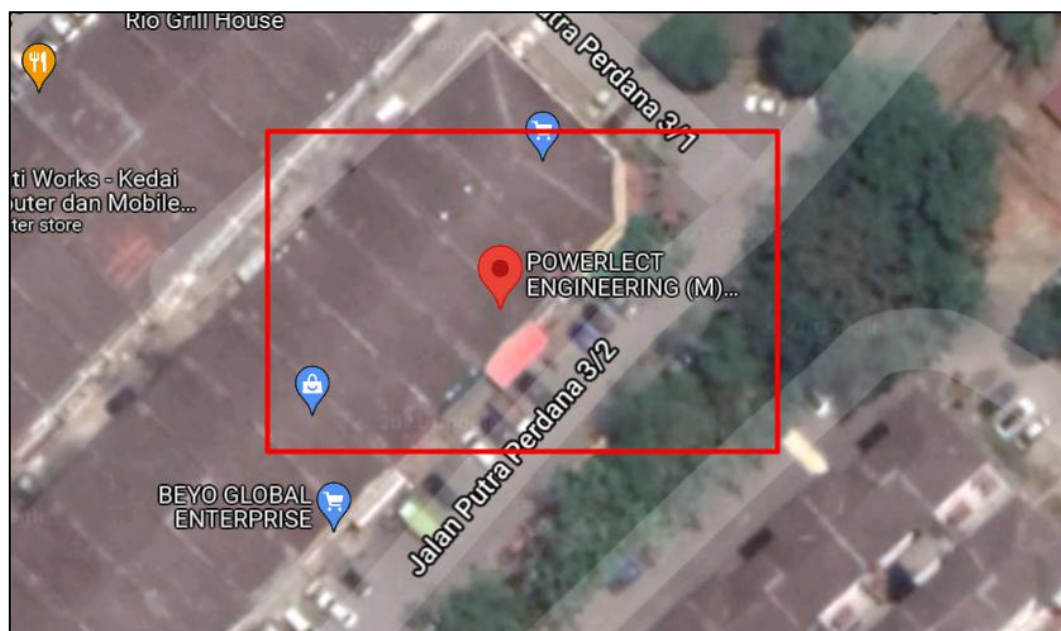


Figure 2: Company location based on satellite google map

2.3 Company Organisation Chart

Figure 3 shows the MN Power Services company organisation chart.

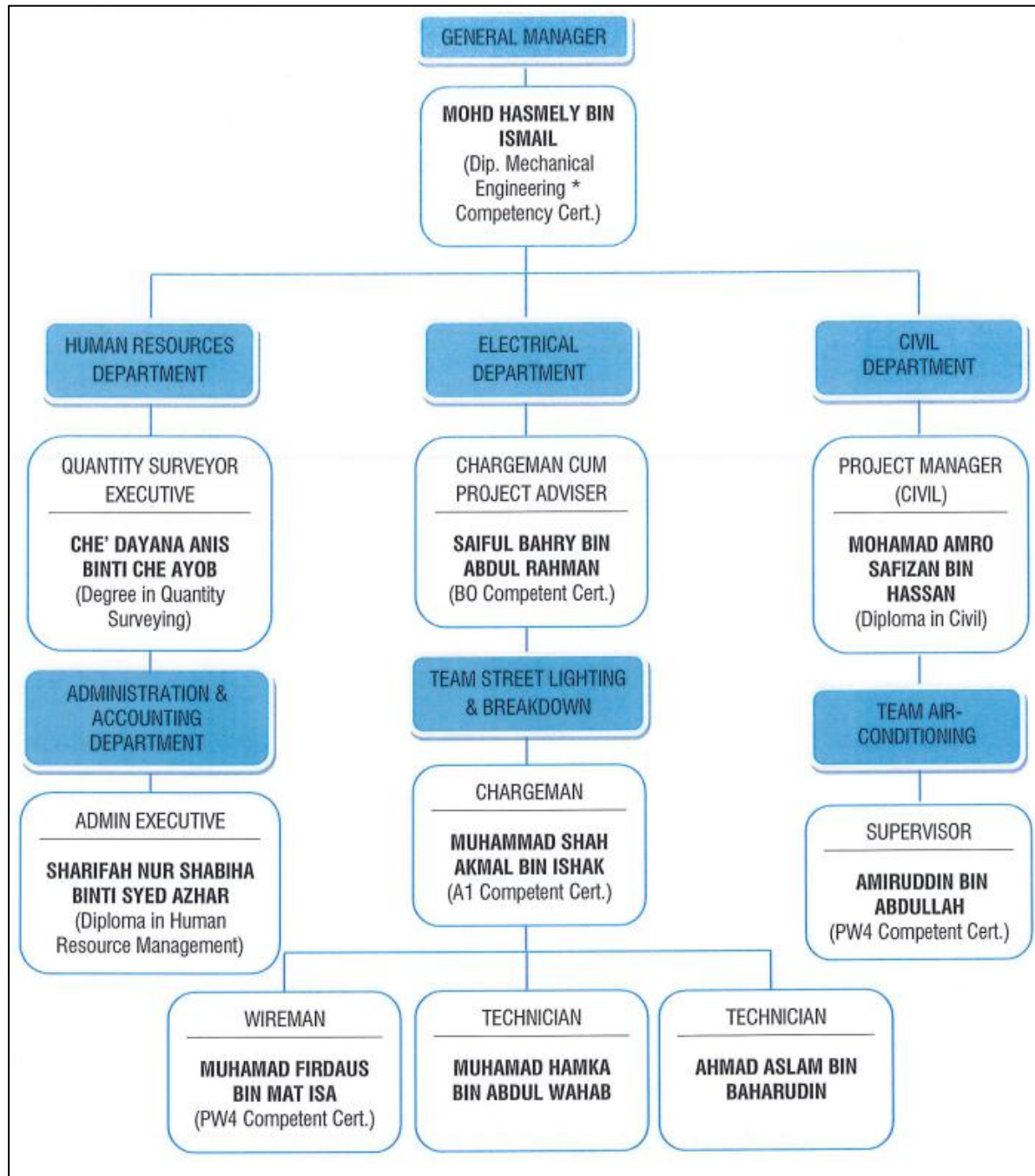


Figure 3: Organisation Chart for MN POWER SDN BHD

2.4 List of Projects

Table 2.4.1 shows the completed project for MN Power Services company.

2.4.1 Completed Projects

Table 1: Completed Project

No.	Project Title	Project Value	Start and Completion Date	Project Duration	Client
1	KERJA MEMBEKAL DAN MEMASANG PAPAN SUIS UTAMA BANGUNAN ANNEXE, JANAKUASA TUNGGUSEDIA DAN SISTEM HAWA DINGIN (ACPU) AUDITORIUM SULTAN AHMAD SHAH DI IBU PEJABAT RISDA, JALAN AMPANG, KUALA LUMPUR	RM 164 194	21 MAC 2017 - 28 APRIL 2017	4 weeks	RISDA
2	KERJA-KERJA MEMBEKAL, MENGGANTI, MEMBAIKPULIH DAN MENKALIBRASI SEMULA SENSOR DAN ALAT INSTRUMENTASI	RM 332 000	31 AUGUST 2017 - 22 NOVEMBER 2017	12 weeks	PERBADANAN PUTRAJAYA

	BAGI PEMBAIKAN KECACATAN KERJA DI LOJI RAWATAN KUMBAHAN 2 MODUL 2, PRESINT 5, WILAYAH PERSEKUTUAN PUTRAJAYA				
3	KERJA-KERJA PEMBAIKAN DAN PENYELENGGARA AN ELEKTRIK DI SK PADANG JAWA. DAERAH PETALING SELANGOR DARUL EHSAN	RM 50 000	2 AUGUST 2017 - 30 AUGUST 2017	4 weeks	JKR SELANGOR
4	CADANGAN KERJA-KERJA PEMASANGAN BARU LAMPU ISYARAT DAN KERJA-KERJA BERKAITAN DI PERSIARAN KUALA LANGAT/PERSIARA N HULU LANGAT, SEKSYEN 27. SHAH ALAM UNTUK MAILIS BANDARAYA SHAH ALAM	RM 172 281	23 OCTOBER 2017	5 weeks	MAJLIS BANDARAYA SHAH ALAM

5	SEBUTHARGA BAGI MEMBEKAL BAHAN GUNA HABIS LATIHAN BAGI SESI 1/2018 DI PUSAT LATIHAN TEKNOLOGI TINGGI (ADTEC)SHAH ALAM.	RM 54 450	10 AUGUST 2018	4 weeks	ADTEC SHAH ALAM
6	PENYELENGGARA AN TAHUNAN SISTEM PENGHAWA DINGIN IBU PEJABAT MPSJ DI BP 1 BAGI TAHUN 2018 UNTUK MAJLIS PERBANDARAN SUBANG JAYA, SELANGOR DARUL EHSAN	RM 371 000	31 OCTOBER 2018	6 months	MAJLIS PEMBANDARAN SUBANG JAYA
7	CADANGAN MENYIAPKAN BAKI KERJA SATU (1) BLOK BANGUNAN TEMPAT LETAK KERETA BERTINGKAT (MWCP3 DI ATAS SEBAHAGIAN LOT	RM 786 014	1 DECEMBER 2019	2 months	TECHNOLOGY PARK MALAYSIA CORPORATION SDN BHD

	PT 13802, FASA 1, TECHNOLOGY PARK MALAYSIA, BUKIT JALIL, MUKIM PETALING, KUALA LUMPUR PAKEJ 2 (KERJA- KERJA KALIS AIR DAN BANGUNAN DI TINGKAT 2)				
8	PERKHIDMATAN PENYELENGGARA AN FASILITY/FACILITY ENGINEERING MAINTENANCE SERVICES (FEMS) DI KLINIK PERGIGIAN SENTUL UNTUK BAHAGIAN KESIHATAN PERGIGIAN, JABATAN KESIHATAN WILAYAH PERSEKUTUAN KUALA LUMPUR & P PUTRAJAYA	RM 48 110	22 SEPTEMBER 2019	2 months	JABATAN KESIHATAN BAHAGIAN PERGIGIAN (WPKL&WPP)
9	KERJA-KERJA PENYELENGGARA AN LAMPU JALAN DAN LAMPU	RM 500 000	8 DECEMBER 2020	1 Year	MAJLIS PEMBANDARAN SUBANG JAYA

	TAMAN BAGI TAHUN 2020 DI ZON BP1.2B UNTUK MAJLIS PERBANDARAN SUBANG JAYA, SELANGOR				
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Table 2.4.1 shows the completed project for MN Power Services company.

2.4.2 Project in Progress

Table 2: Project in Progress

No	Project Title	Project Value	Start and Completion Date	Project Duration	Client
1	MENAIKTARAF, MEREKA BENTUK, MEMBINA DAN MENYIAPKAN SEMULA SURAU LA COTTAGE DI ATAS LOT 25829, TAMAN PUTRA PERDANA, 47130, PUCHONG, SELANGOR	RM 819 754	1 OCTOBER 2020 - 22 SEPTEMBER 2022	96 weeks	SURAU LA COTTAGE
2	CADANGAN KERJA-KERJA PENINGKATAN LAMAN SANTAI DAN BANGUNAN BPKP 26 DI WISMA PERWIRA RAJD KUALA LUMPUR, KEM BATU KENTOMEN, KUALA LUMPUR	RM 624 179	4 NOVEMBER 2021 - 26 JANUARY 2022	12 weeks	MARKAS ANGKATAN TENTERA MALAYSIA
3	KERJA-KERJA OPERASI DAN PENYELENGGARAAN SISTEM MEKANIKAL DAN ELEKTRIK SECARA KOMPREHENSIF DI	RM 787 786	26 JANUARY 2021 - 26 JANUARY 2022	1 year	MAHKAMAH SEKSYEN DAN MAJISTRET SHAH ALAM

	BANGUNAN KOMPLEKS MAHKAMAH KLANG BAGI TEMPOH SATU (1) TAHUN				
4	CADANGAN KERJA- KERJA PENYELENGGARAAN SISTEM PERALATAN ELEKTRIK UNTUK UNIT SEWA DAN JUAL DI KAWASAN PERUMAHAN DEWAN BANDARAYA KUALA LUMPUR BAGI TEMPOH DUA (2) TAHUN	RM 1 000 000	14 JULY 2020 - 14 JULY 2022	2 years	DEWAN BANDARAYA KUALA LUMPUR

CHAPTER 3.0

CASE STUDY (BASED ON TOPIC OF THE REPORT)

3.1 Introduction to Case Study

The case study is about concrete ground floor slab. The project where has started the construction in 1 October 2020 and predictions will be completed on 22 September 2022. The cost of construction approximately RM 819 754. Currently, the project progress is still on going. Thus, the study will be explained not only regarding work progress but including the machinery and tools, the problem and solution of the construction. The site location took place at the Surau La Cottage, Taman Putra Perdana, Puchong Selangor.

Figure 4 shows the construction site location on map.

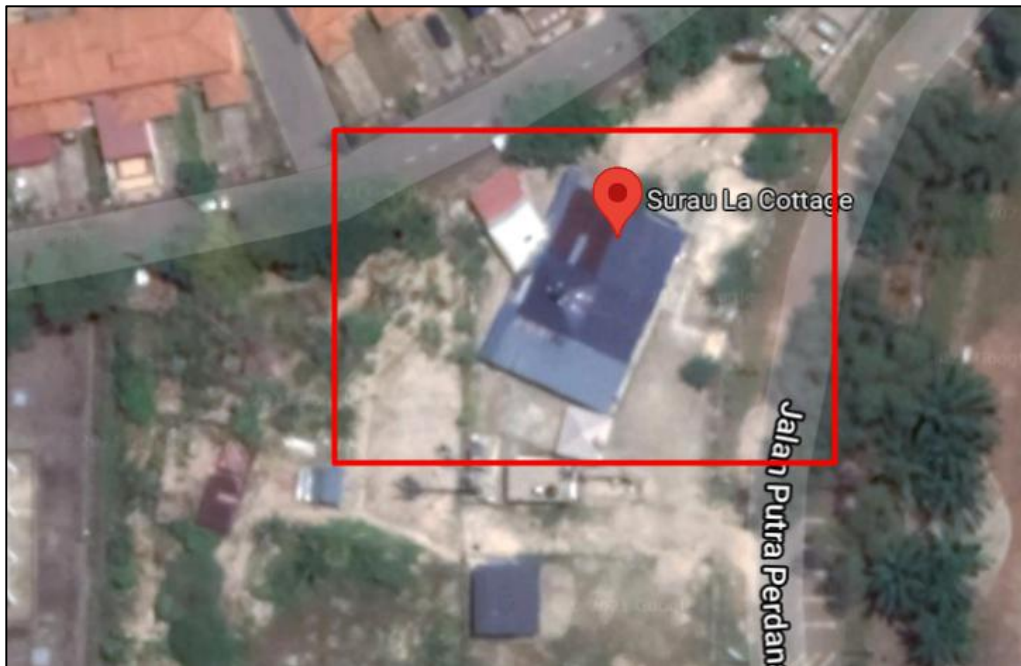


Figure 4: Construction site location based on satellite google map

[illegible]

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3.2 Method of Ground Floor Slab Construction

3.2.1 BACKFILL WORK

After the ground beam formwork removed, proceed with the backfill process. The backfill process should be done throughout the floor area referring to the floor plan that has been prepared. The machinery used in this work is a one backhoe, it will take the provided soil supply and fill to the floor area. The general worker that controls the machinery must be careful to minimize damage to the reinforcement bars that are on the beam. This is to reduce the time to repair the ground beam reinforcement bar. Figure 6 shows general worker doing backfill work using backhoe.



Figure 6: Backhoe carried out backfill work

After the backhoe is finished carrying out the task of filling the soil in the floor area. 6 workers have to tidy up the filled soil using a hoe. They need to make sure there is little space left at the top of the ground for lean concrete work. Figure 7 shows 5 ground workers tidying up the soil.



Figure 7: Workers do the work of tidying up the soil that has been filled

3.2.2 LAYERING GROUND WITH SAND AND AGGREGATE

Next step is layering ground with 2 tonne sand and aggregate. This process is to make sure the ground become flatter and more compact because the soil used in this project is too soft. The sand aggregate will help to make the ground surface more compact and flatter to avoid floor slab crack after concrete. Figure 8 shows 3 ground workers refilling wheelbarrow with sand.



Figure 8: Layering ground with sand and aggregate process

Figure 9 shows one ground worker carrying sand to the specific area.



Figure 9: Workers carrying sand and aggregate to the specific area

3.2.3 COMPACTING GROUND

After the layering work done, continue to the compacting ground work using plate compactor. They are 3 workers involved in this work. Around 9000 square feet ground area should be compacted. This process is to make sure the ground fully compacted to avoid any soil sediment. The floor slab concrete will crack if the soil is too soft. Make sure this work is done carefully so that there are no worse effects in the future.



Figure 10: Workers doing compacting ground work



Figure 11: Ground view after compacting work done

3.2.4 PEST CONTROL

Before continue to the next step, there is one important work that must be done that is pest control for the construction site. Pest control will be done to the entire land area at the construction site. For this 9000 square feet site, amount for the pesticides is 70 litre to cover the entire area. Pest control is very important because it is to ensure that the soil used is not contaminated with termites, cockroaches or other pests that can cause damage to the building in the future. The quality of the floor slab part greatly affects the structure of the building in the future. Figure 12 shows two general workers spray the pesticides on the ground area.



Figure 12: Workers spraying the ground with pesticides

3.2.5 COVER THE GROUND AREA WITH POLYETHYLENE SHEET

The entire ground floor slab area needs to be covered with polyethylene sheet. The polyethylene plastic sheet function is to separate the ground and the concrete. This is because the concrete will damage if in contact with the ground. The workers should cover the entire ground area with the plastic neatly. They are two workers involved in this process. For every 20 square feet, there must be two sheet of polyethelene sheet and the sheet must be cut by scissor. Figure 13 shows two general workers covering ground with polyethelene sheet.



Figure 13: Workers covering ground area with polyethylene sheet

Figure 13 shows two covering ground with polythelene sheet in progress.



Figure 14: Covering ground with polyethylene sheet in progress

3.2.6 LAYERING GROUND WITH LEAN CONCRETE

Lean concrete is a process before we continue to install BRC reinforcement. Six workers involved in this process to mix the cement and layering on the polyethylene sheet. Level the cement thoroughly entire the floor slab area. Main function of the lean concrete is to provide the uniform surface to the foundation concrete and to prevent the direct contact of foundation concrete from the soil. Lean concrete is used under the foundations. Lean concrete thickness must be 5cm. The material used for lean concrete is sand, cement, water and aggregate. Figure 15 shows after layering ground with lean concrete done.



Figure 15: Ground floor slab area after lean concrete done

3.2.7 INSTALLING BRC REINFORCEMENT

Installing BRC reinforcement is the one of important process while doing a slab. It does not matter how many floor the building is, BRC is one of the main materials to be the structure for the slab. To install the BRC, the worker must refer to the drawing plan to knows the position and measurement for the BRC. Some part of the BRC will be layered to stabilize the tension and compression to the structure for the slab. The BRC size is 1.7m × 4m × 6.00mm and must be cut depends on the ground area. Figure 16 shows six workers carrying BRC to the specific area.



Figure 16: Installing BRC reinforcement in progress

Figure 17 shows the ground area after installing BRC process done.



Figure 17: Floor slab area after all the layer of BRC done

Figure 18 and 19 shows the drawing plan as a reference to install the BRC.

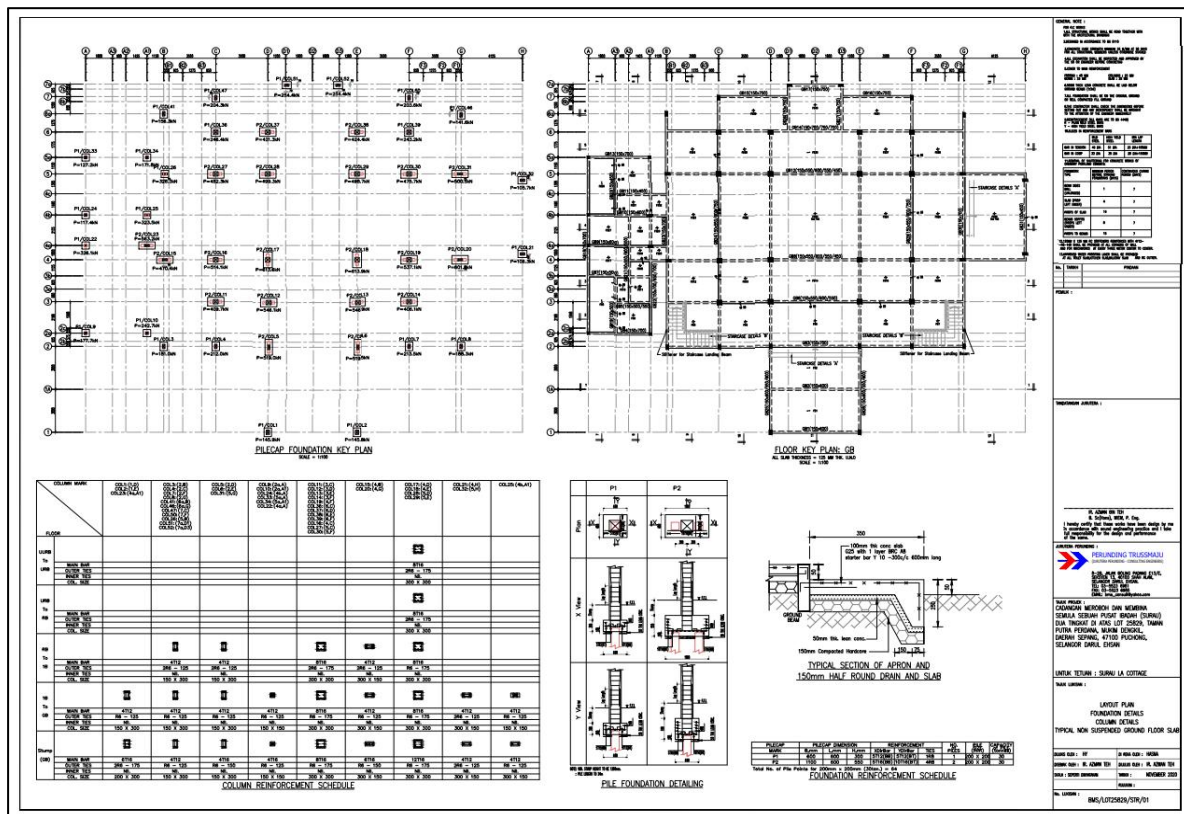


Figure 18: Layout plan for foundation, column and ground floor slab

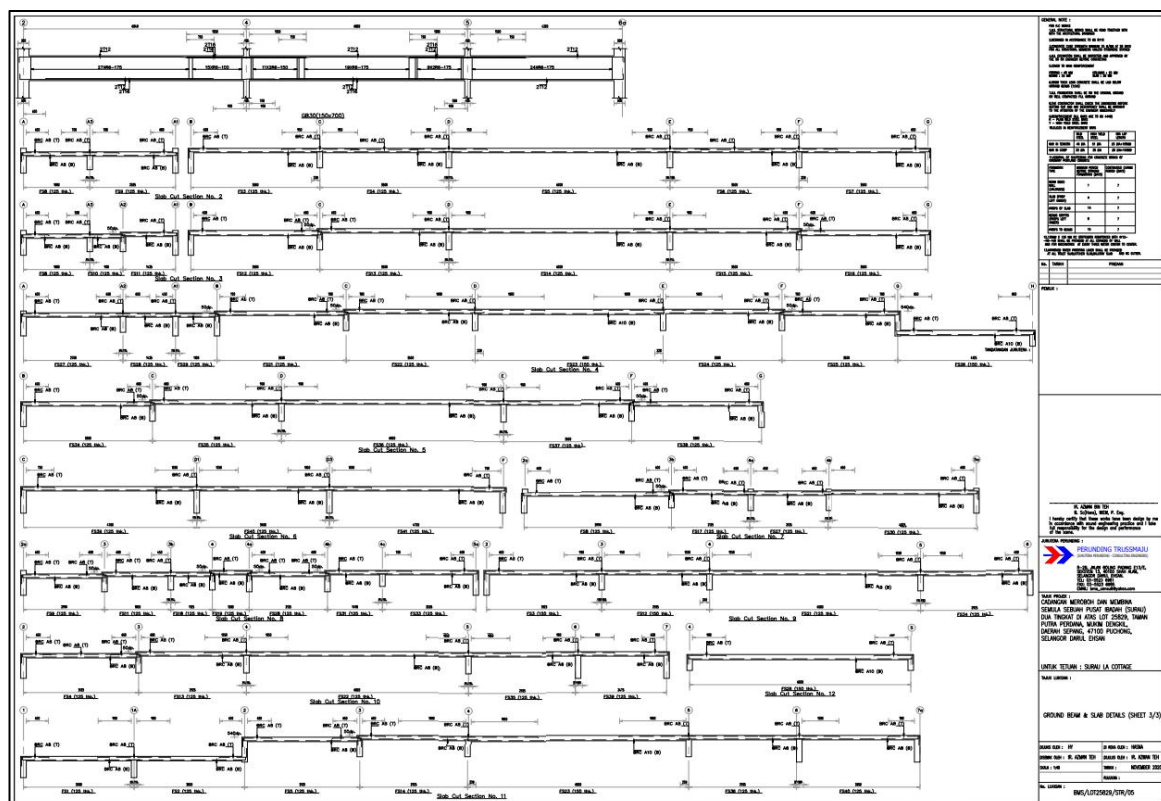


Figure 19: Drawing plan for slab details

3.2.8 INSTALLING SPACER BLOCK

While doing an installation for BRC, the general worker should make a spacer bar. Before layering the BRC, spacer bar needs to be installed at the bottom of the BRC. A spacer bar is a device that attaches reinforcing steel, or "rebar," in reinforced concrete constructions as it is built prior to the final concrete pour. The spacers are kept in place during the pour to hold the reinforcing in place, and they form a permanent part of the construction. Sapcer bar size should be 5cm height and for the 20 square feet it must be around 40 block. Figure 20 shows the general worker making sapcer bar.



Figure 20: The making of spacer bar

Figure 21 shows the spacer bar after being installed at the bottom of the BRC.



Figure 21: BRC reinforcement after the spacer bar installed

3.2.9 PIPEWORK AND DRAINAGE INSTALLATION

For the toilet area, all the installation work for drainage and pipework needs to be done before continue to layering the BRC reinforcement. Pipe worker must do all the pipework such as floor trap, sink drainage pipe and drainage of water from latrines. Piper worker have to make sure the water can flow smoothly from the main pipe to the floor trap and from the latrines to the drain pipe. Figure 22 shows the installation pipework by the pipe worker in progress.



Figure 22: Pipework and drainage installation at toilet area in progress

Figure 23 shows the toilet area location based on the drawing plan.

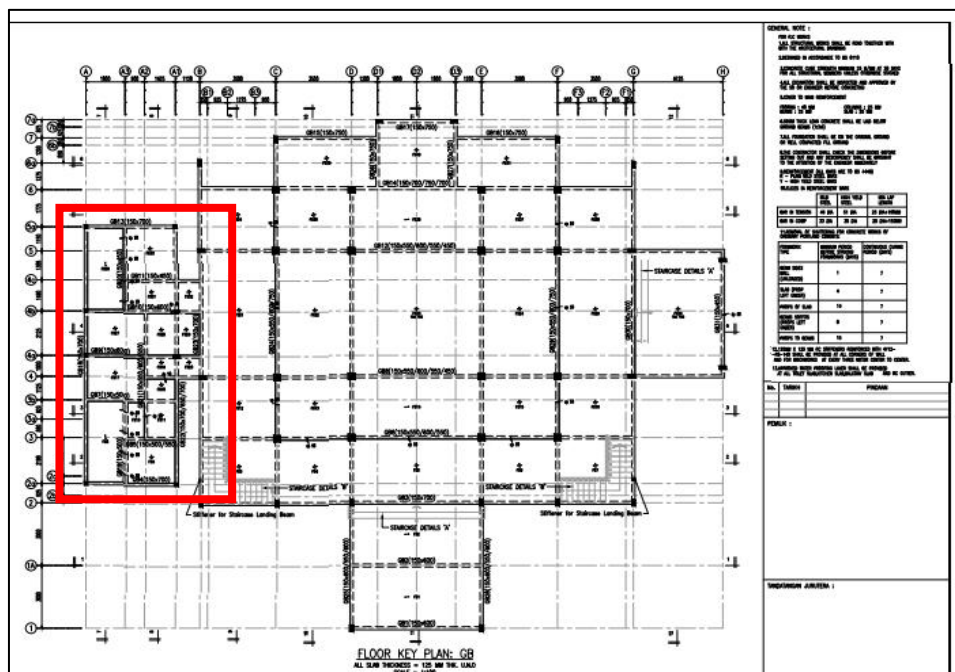


Figure 23: Toilet area loaction on the drawing plan

3.2.10 INSTALLING FORMWORK FOR DROP AND SLAB

For the ground floor slab, it just needed a small amount of formwork in the perimeter. The drop need to installed based on the drawing plan, worker should make sure the drop area is exactly the same measurement and position as in the drawing plan. Drop will be 4inch at the mid area.



Figure 24: Installation of ground floor slab formwork



Figure 25: Installation of ground floor slab drop

3.2.11 POUR, COMPACT AND FINISHING CONCRETE FLOOR SLAB

After all the BRC reinforcement has been done installed, ready to pouring the concrete on the slab area. Begin laying concrete along the perimeter of the floor slab at one end of the job, with each batch set against previously dispatched concrete. To avoid segregation, concrete should be put at ultimate position as practicable. As a result, placing concrete in enormous, distinct heaps and then transferring them horizontally into final position must be avoided. Furthermore, the site engineer must adequately supervise concreting and seek for symptoms of issues. In addition, cracking, excessive deflection, level and plumb, and any movement must be evaluated and addressed to avoid additional issues. Additionally, fresh concrete should be sufficiently compressed in order to shape it inside the forms and around implanted objects and reinforcement, as well as to eliminate stone pockets, honeycomb, and entrapped air. Vibration, either internal or external, is the most often utilised method for concrete consolidation.



Figure 26: Pouring concrete with right placement using concrete bucket carried by mobile crane



Figure 27: Compacting concrete in progress

3.2.12 CURING CONCRETE AND REMOVE FORMWORK

After finishing is complete, an appropriate process must be utilised to effectively cure the concrete. Slab curing methods include water cure, when the concrete is flooded, ponded, or misted. In addition to the water-retaining approach of using canvas to keep the slab surface moist all the time. In terms of curing, refer to the plan based on concrete grade 25 formworks can be removed after 14 days. Figure 28 shows during the removing formwork progress.



Figure 28: The concrete process is complete and formwork can be removed

3.3 Difficulties Throughout The Ground Floor Slab Construction

Ground floor slab construction is critical in the construction of a structure. In this project, the technique of constructing the building floor is the one that is always utilised in Malaysia. The total time required to finish this task is around three weeks and it based on the site area. If there are no delays, this three-week work procedure will go easily. It will take longer to accomplish this task if there are any unavoidable complications, such as problems with the contractor, weather, and materials requested from the supplier arriving late. A wet day is an illustration of one of the problems experienced in this undertaking. As a result, extra work, such as pumping water, will be completed before any other work is completed. Since of the severe rain, it is difficult for the backhoe operator to operate because the soil conditions are so soft that the machinery cannot move. If an issue is discovered during the supervisor's inspection, it will take some time. Every error that happens must be repaired so that it does not harm the future. The number of employees participating in the working day is also crucial in accomplishing this task. If workers are absent due to illness or return to the village, the work process will be slowed even further. Below are some of the difficulties encountered while carrying out this work.

3.3.1 SOIL CONDITION

Figure 29 shows soil condition on the site.



Figure 29: Wet soil condition on the construction site

Difficulties for this construction project is soil condition. With the wet soil, the backhoe cannot go to the middle on the slab area. It will make the progress for backfill become slow. The progress will start after the soil becomes more hard and the general worker can carried out the backhoe to continue doing backfill. Figure 30 shows backhoe cannot enter into the middle of the slab area because of the wet soil condition.



Figure 30: Backhoe carried out backfill work

3.3.2 WEATHER CONDITION

Weather condition is one of the important aspect in carrying out ground for slab progress. Heavy rain is the problem to be faced in this work, when its rain it can cause the slab area in the middle of the ground beam become a stagnant. Because of that, general worker should pump out the water from the stagnant at the slab area. When the soil becomes wet because of the stagnant it can causes sedimentation. Sedimentation can cause crack on the concrete ground floor slab in future. Figure 31 shows general worker discharging water from the stagnant areas.



Figure 31: General worker is discharging reservoir water in stagnant areas

3.3.3 WORKER'S ATTENDANCE

Manpower attendance is important throughout the whole progress. Sometimes, workers are not present because of health problem and family problem. This will slowing down the progress to complete ground floor slab. Not enough manpower can cause delay on the complete date.

3.3.3 MATERIAL DELIVERY

The delay of the material arriving also plays an important role in the completion of this work. When the material arriving late, it can cause delay on the completion date for complete ground floor slab.

3.4 Material and Machinery used in Ground Floor Slab Construction

An product, material, or supply brought to the construction site by the Contractor or a subcontractor for inclusion into the structure or work is referred to as a construction material. A preassembled object transported to the site from products, materials, or supplies is also included in the definition. However, discrete systems incorporated into a public building or work and produced as complete systems, such as emergency lighting, fire alarm, and audio evacuation systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Supplies, not construction materials, are acquired directly by the government. Below will explain each of the machines and materials used in each of the work progress.

3.4.1 BACKFILL

The material used in carrying out backfill work is soil. The machinery used in doing this work is a backhoe and sometimes we use mobile cranes and sand buckets to fill the soil in areas that are too far away for the backhoe to enter. Backhoe must be rent from the supplier, and the rental payment for 1 day is RM480 including the driver. In this progress just one backhoe is used. Figure 32 shows one backhoe that has been used in backfill work.



Figure 32: Backhoe used in carrying out backfill work

The next machinery that has been rented is mobile crane. Mobile crane will be used when the area to backfill is too far from the backhoe. Rental payment for mobile crane is RM700 including the driver for one day. Figure 33 shows the mobile crane used for backfill work.



Figure 33: Mobile crane used in carrying out sand bucket to the far area

3.4.2 LAYERING GROUND WITH SAND AND AGGREGATE

Material used for this work is sand and aggregate. The machinery used is plate compactor to flatten and compact the ground. Sand and aggregate that be used in this progress is one tonne. The general worker needed in this progress is six people. Two general worker will fill the wheelbarrow, two will carrying out the sand and aggregate to the specific place and two worker will layering the ground. Figure 34 shows sand and aggregate that use in this progress.



Figure 34: Sand and aggregate

The next machinery that been used in this progress is plate compactor. Plate compactor will be rent for 1 week. The rental for this machine is RM450 a week. The worker needed in this work is two people. Figure 35 shows the plate compactor that used in this progress.



Figure 35: Plate Compactor

3.4.3 PEST CONTROL

This process material used is pesticides. The machinery used is pest control sprayer. The materials and machinery used belong to the company that offers this pest control service. The rental is including two worker. Pesticides used in this work is 70 litre. Figure 36 shows the worker preparing all the machine and material to be used in pest control work.



Figure 36: Machines and materials are prepared to carry out the pest control work

3.4.4 COVER THE GROUND AREA WITH POLYETHYLENE SHEET

Material used in this process are polyethylene sheet. This sheet or plastic used just for construction purposed only. Polyethylene must be bought from the hardware supplier. There was three manpower needed in this work. Figure 37 shows the covering ground area with polyethylene sheet in progress.



Figure 37: Polyethylene sheet

3.4.5 LAYERING GROUND WITH LEAN CONCRETE

The material used in this work is just handmade cement. It will be layered on the polyethylene sheet.

3.4.6 INSTALLING BRC REINFORCEMENT

For this work, the material used is BRC reinforcement bar. Other than that, the spacer bar used to make the space between bar and ground surface. BRC reinforcement bar should be bought from the hardware supplier. The manpower needed in this work is 7 people. Figure 38 shows the BRC reinforcement that used in this work.



Figure 38: British Reinforcement Company (BRC)

3.4.7 PIPEWORK AND DRAINAGE INSTALLATION

Material that be used in this ground work is PVC pipe. The most duitable material to be used for building. PVC pipe should be bought from the hardware supplier. There is 3 manpower needed in this progress. Figure 39 shows installation pipework in progress.



Figure 39: PVC Pipe

3.4.8 INSTALLING FORMWORK FOR DROP AND SLAB

For the formwork for ground floor slab, material that be used is plywood. Then the material used for drop is red meranti wood. Plywood and red meranti wood should be bought from the hardware supplier. The manpower needed in this work is 4 carpenter. Figure 40 shows the formwork has been done handmade by the carpenter.



Figure 40: Formwork

Figure 41 shows the red meranti wood arrive from the supplier to the site.



Figure 41: Red Meranti Wood

3.4.9 POUR, COMPACT AND FINISHING CONCRETE FLOOR SLAB

This is one of the important materials in the whole process which is concrete Grade 30. The machineries used for this work is mobile crane, lorry mixer and concrete vibrator. The manpower needed in this work is 7 concreter. The concrete should be bought from the supplier based by meter³. One lorry bring about 5-6 meter³. The concrete price is RM215 per meter³ for grade 25. For grade 30 is RM230 per meter³. Total concrete needed in this work is 52 meter³ include the 10% additional for waste. Figure 42 shows the lorry mixer sent concrete to the site.



Figure 42: Lorry Mixer

For the mobile crane, it should be rent from the supplier. Payment rental for mobile crane is RM700 per day include the driver. Mobile crane used to carrying the concrete bucket into the specific area on the site. Figure 43 shows the mobile crane carrying out the concreting progress.



Figure 49: Mobile Crane

CHAPTER 4.0

CONCLUSION

Concrete slabs are common materials for new residential and commercial construction. The preparation of formwork, compaction of a slab bed, placement of reinforcing, pouring, compacting, finishing the concrete, removing formwork, and curing the concrete slab are all part of the concrete slab building process. Such slabs are sometimes referred to as 'composite,' since the resulting structural efficiency of the floor slab exceeds the total efficiency of the steel and concrete. There is an advantage why concrete ground floor slab is employed in industrial settings and high-traffic commercial facilities.

For the method of ground floor beam construction, they need to make sure there is little space left at the top of the ground for lean concrete work. Consequently, the sand aggregate will help to make the ground surface more compact and flatter to avoid floor slab crack after concrete. The floor slab concrete will crack if the soil is too soft. The entire ground floor slab area needs to be covered with polyethylene sheet. Lean concrete is a process before we continue to install BRC reinforcement. Main function of the lean concrete is to provide the uniform surface to the foundation concrete and to prevent the direct contact of foundation concrete from the soil. Installing BRC reinforcement is the one of important process while doing a slab. A spacer bar is a device that attaches reinforcing steel, or "rebar," in reinforced concrete constructions as it is built prior to the final concrete pour. For the toilet area, all the installation work for drainage and pipework needs to be done before continue to layering the BRC reinforcement. After all the BRC reinforcement has been done installed, we are ready to pouring the concrete on the slab area. Begin laying concrete along the perimeter of the floor slab at one end of the job, with each batch set against previously dispatched concrete.

The total time required to finish this work is around three weeks. If there are no delays, this three-week work procedure will go easily. It will take longer if there are any unavoidable complications, such as problems with the contractor, weather, and materials requested from the supplier arriving late.

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