DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

WALL CONSTRUCTIONS

(LOAD BEARING WALL)

Prepared by:

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DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

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AUGUST 2021

It is recommended that the report of this practical training provided

By

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WALL CONSTRUCTIONS

(LOAD BEARING WALL)

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

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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 here in, prepared during a practical training session that I underwent at KS MUMTAZ JAYA ENTERPRISE 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.

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ACKNOWLEDGMENT

Alhamdullillah, praise to ALLAH SWT, the Most Merciful, the Most Graceful.

I would like to extend my heartfelt gratitude for the guidance, advice and help rendered throughout the period of training at the company, KS MUMTAZ JAYA Enterprise. First and foremost, I would like to give my thanks to Encik Kadis for his generous to give me opportunity to conduct my training at his company. I also like to express my thanks and gratitude to the supervisor in charge of me, Encik Azhar, who has guided me during my training at this company despite his busy time dealing with his work duties. Therefore, I feel lucky to have a great and an understanding supervisor who always often took times to hear questions about things I do not know and guides me if I make a mistake while doing a job. It is an honor for me to be given the opportunity to training with this company.

I would also like to thank ALL the UiTM lecturers that have taught and nurtured me in becoming a better student and person. I would also like to extend my deepest appreciation to the lecturers who are directly involved during my training stint. To Ts Azira binti Ibrahim, Supervising Lecturer, DR Nor Asma Hafizah Binti Hadzaman, Practical Training Coordinator and Dr. Dzulkarnaean Bin Ismail, Programme Coordinator, I value the time, effort, encouragement and ideas that they have contributed towards the successful completion of my training, this report and the valuable knowledge that have been shared over the last few semesters.

Last but not least, my special thanks to my beloved parents and and all of my friend who keep supporting me over the years.

ABSTRACT

Walls is very important structure in buildings. It have many function such as, to enclose, divide and separate the area, to provide shelter and protection from weather and also to provide privacy for the people living in it. This report will discuss about wall construction for the load bearing wall of the building. This report was conducted for the construction of one storey house at Jalan Rumbia, Kampung Sijangkang, Telok Panglima Garang, Selangor Darul Ehsan. The objective of this report is the whole process and method for wall construction for load bearing wall. It is also focus on how many time it take to complete the wall construction. This report also look at the problem occurred and solution taken in wall constructions.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

In this case study, the elements of building that we will focus is wall. A wall is a structural element that separates a room into two rooms, as well as providing safety and shelter. Wall is also been constructed to acts as sound barrier from outside noise and to ensure the privacy for the user.

Wall are divided into two types, namely load bearing wall and non-load bearing wall. The focus of this study is about load bearing wall. Load bearing wall are categorised as structural element because its carries a house's weight from the roof and upper floors all the way down to the foundation. Load bearing wall also support other structural members such as beams slab and wall on above floors. Load bearing wall can be construct as interior wall or exterior wall.

There are many types of load bearing wall such as precast concrete wall, retaining wall, masonry wall, pre penalized load bearing metal stud walls and engineering brick wall stone wall. The type that use in the construction for project Jalan Rumbia is masonary wall. Masonry refers to the use of mortar as a binding material for individual units of bricks, stones, marbles, granites, concrete blocks, tiles, and other materials.

The wall at the Jalan Rumbia project are using a cement sand brick. Cement sand brick is a brick made from a mixture of cement and sand, molded under pressure and cured under steam. The cement sand brick is commonly used in modern structures because of the price is cheaper than other type of bricks.

Generally, there are many type of load bearing wall. However, the aim of this is to discover the construction of wall for a resident house.

1.2 Objectives

There are several objectives that can be derived from this construction, such as:

I. To identify the methods of wall constructions
II. To identify the time of wall constructions
III. To identify the problem occurred and solution taken in wall constructions

1.3 Scope of Study

The scope of study has been done in site located at Jalan Rumbia, Kampung Sijangkang, Telok Panglima Garang, Selangor Darul Ehsan. The project had been started in 28 August 2021 and will end in 28 January 2022. The project is a construction of bungalow house with three bedroom and three bathroom. The project is still ongoing. The focus of the study is about wall construction for load bearing wall. The study will explain about the methods and process of wall constructions including bricklaying process until the finishes of the wall. There are a lot of machinery and tools used in these constructions. The important of this study is to know the time it take to finishes the wall construction without relating it with the number of worker in the construction. Furthermore, the study also included the problem and solution that occurred while in the process of wall construction. In conclusion, the study were important to shows that if knowledgeable then the work will be done easily.

1.4 Methods of Study

1.4.1 Observations

There are some way of collecting data and one of them is through observation. The observations is about wall construction process of load bearing wall. This observation starts from the bricklaying process until the finishes of the wall. For the bricklaying process, it took about 3 week to finish all of the wall construction and take an estimate time of 1 to 2 hours for a single wall construction depending on the length and height of the wall. For the finishes of the wall, it take 1week to complete all of the interior and exterior wall. The wall finishing process is done quickly because of the many skilled workers work together. The wall construction process that are being observe had been recorded by smartphone and notes.

1.4.2 Interview

The data also been collected by doing some interviews with the person who involved in the project. This interview was conducted while doing work on the site. The interview begins with the supervisor in charge and manages the project on the site. This interview contain some question and thing that related to the project and report. The interview was also done to the construction worker at the construction site.

1.4.3 Document Reviews

Document review is also use to collect the data for the study. The document that been review are company profile, construction drawing plan and many more document.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

KR MUMTAZ SDN BHD is a company registered under the Malaysian Construction Industry Development Board (CIDB). This company is registered in grade G2 in category B (building construction) for specialization B04 and CE (civil engineering) for CE21 specialization under CIDB. Apart from being registered under CIDB, this company also registered under SSM Business Registration Certificate (1139223-W). KR MUMTAZ has been the construction contractor for private housing since 2007. This company have been providing their quality services for over 14 years. This company are providing their specialty for housing in Selangor area.

2.2 Company Profile

KR MUMTAZ SDN BHD has been established and started operations in 7 April 2015. This company is experienced in making new houses, rental houses, house renovations, low cost houses, gazebos, wiring, earth embankments, patterned front fences, drawing plans and installing water meters. KR comes from the name (Kadis bin Ringan). This company is located at Lot 1961, Jalan Melati,Kg Sijangkang, 42500, Telok Panglima Garang, Selangor

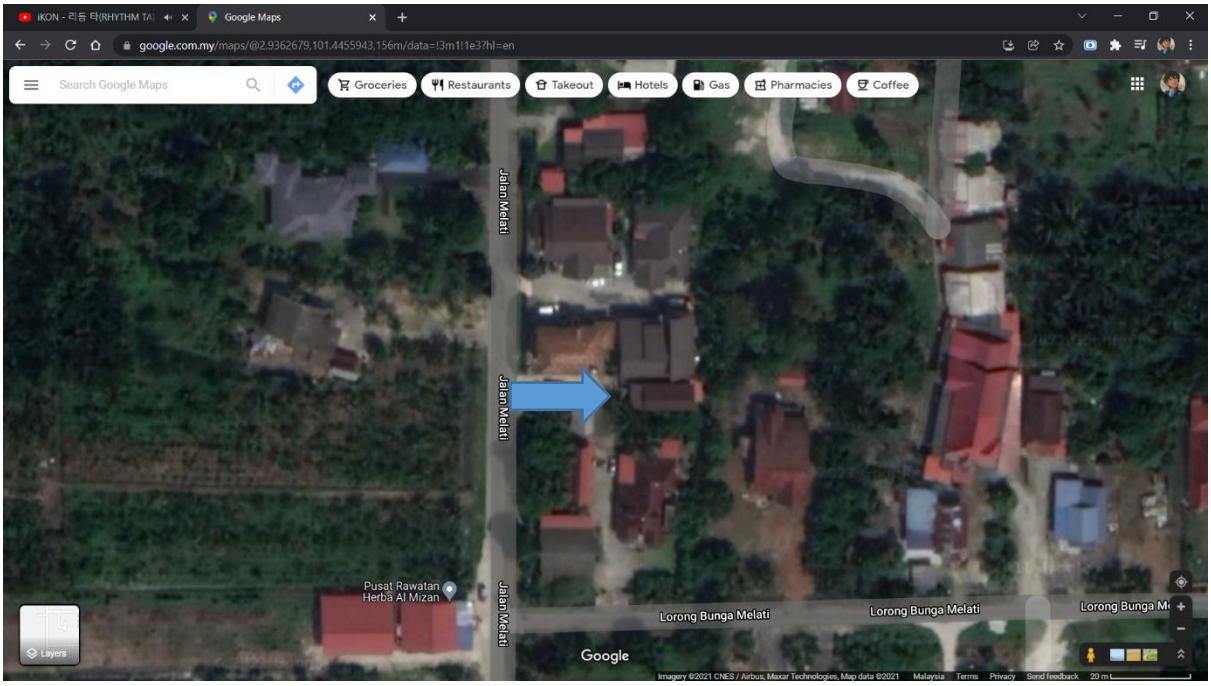

Figure 2.1 Location of the company based on the satellite map

Source : https://www.google.com.my/maps

KR MUMTAZ SDN BHD can be contacted via email at krmumtazjaya@gmail.com, or can be contacted directly to the company number (+6013 233 2330) or Encik Kadis number (+6012 340 0062).

2.3 Company Organization Chart

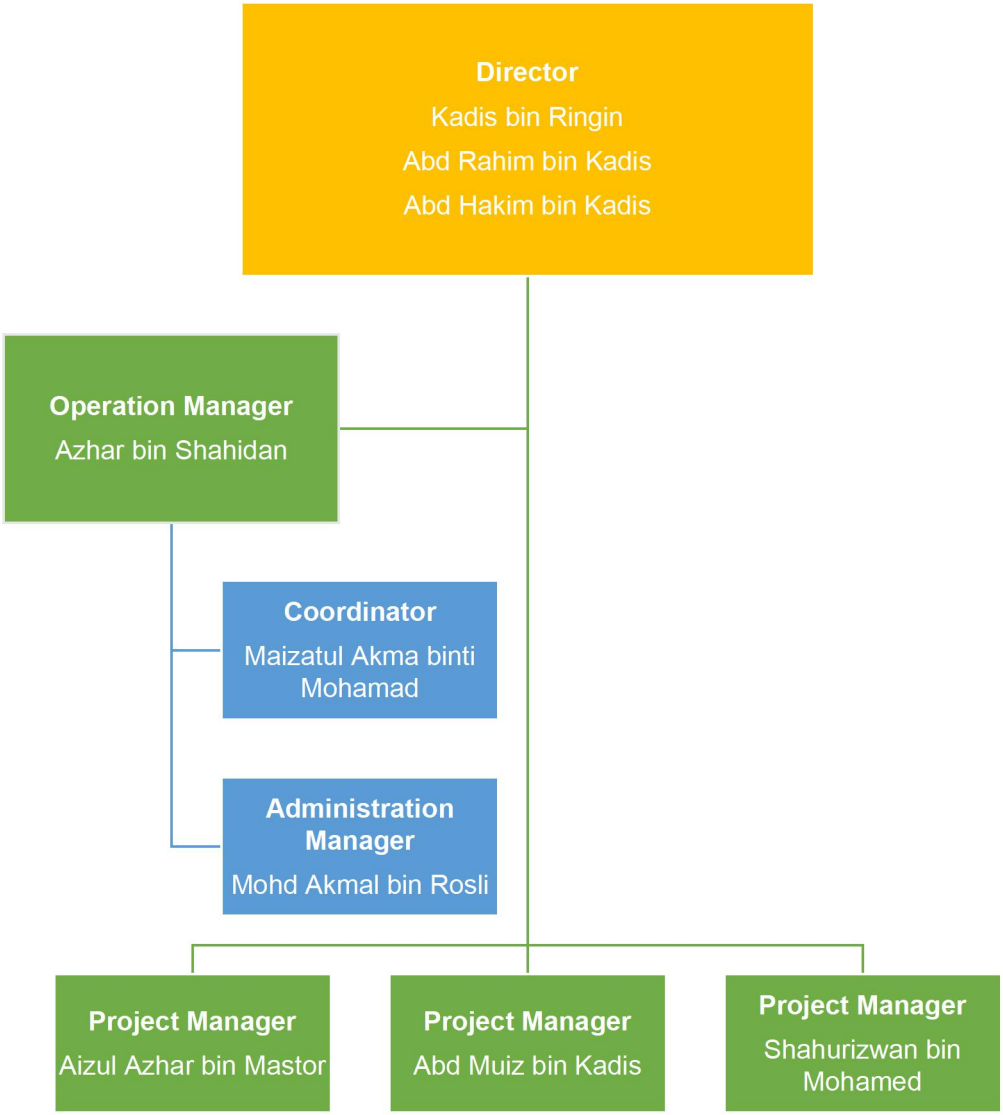

Figure 2.3 Company Organization

2.4 List of Project

2.4.1 Completed Project

No.	Project Title	Location	Compilation Date	Project Value	Client
1.	Cadangan Membina Rumah Banglow 1 Tingkat.	Jalan Bunga Raya 1	2021	RM 190,000.00	Encik Amin
2.	Cadangan Membina Rumah Banglow 2 Tingkat.	Kampung Limau Manis	2021	RM750,000.00	Encik Azman
3.	Cadangan Membina Rumah Banglow 1 Tingkat.	Hulu Langat	2020	RM 256,000.00	Encik Zakaria
4.	Cadangan membina rumah banglow 1 tingkat	Sungai Merab	2018	RM280,000.00	Puan Rohana

2.4.2 Project In Progress

No.	Project Title	Location	Completion Date	Project Value	Client
1.	Cadangan Membina Sebuah Rumah Banglo 1 Tingkat.	Jalan Rumbia, Kampung Sijangkang	2022	RM130,000.00	Encik
2.	Cadangan Membina Sebuah Rumah Banglo 2 Tingkat.	Tiang 41, Jalan Sandora, Kampung Sijangkang	2023	RM850,000.00	Puan
3.	Cadangan Membina Rumah Banglow 1 Tingkat	Jalan Ros, Kampung Sjiangakang	2021	RM124,000	Puan Emie

Chapter 3.0

CASE STUDY

3.1 Introduction To Case Study

The case study is about wall construction (load bearing wall). This project has started during 28th August 2021, and it will be completed by 28th February 2022. The cost of the construction is RM. The construction are being handled by the company itself with a few of subcontractor. The company also provides labour for the construction of the project. The study will not only explain about the installation of wall, but also include the machinery and tools, the amount of time to finish the wall construction, and the problem occurred and solution while doing the wall constructions. However, the study does not focus on manpower and cost of the construction.

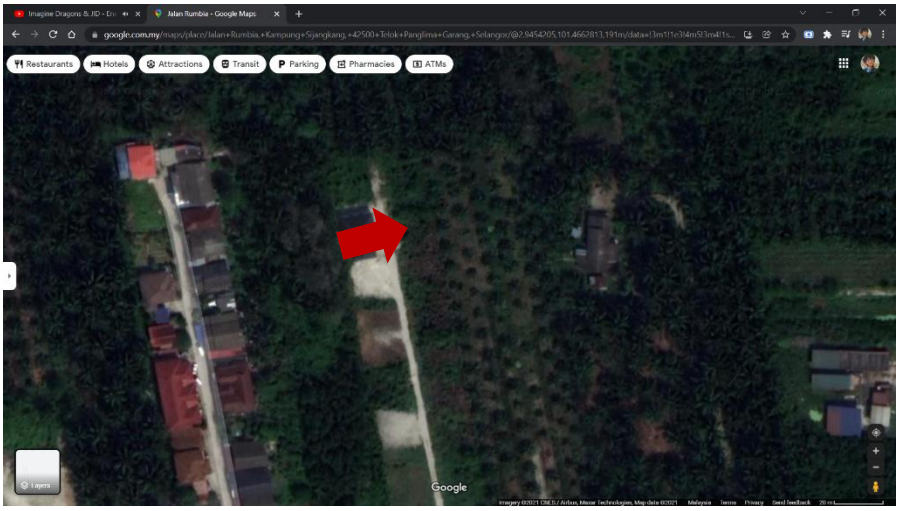

Figure 3.1 Location of the site based on satellite map

Source: https://www.google.com.my/maps

The project site is located at Jalan Rumbia, Telok Panglima Garang, Selangor Darul Ehsan. The project site is quite remote and schedule as it is surrounded by forest and have some houses that are under construction. There some existing building close to the site project and at the entrance of the site project road.

The activities that have been carry out on the site of the project is wall construction. The construction team consist of two skilled worker for bricklaying work and five worker for the finishes of the wall. The project is being supervised by the project manager so it will run smoothly and according to plan. The tools and machinery that been used for the project are measuring tape, wheelbarrow, trowels, spirit level, concrete mixer, shovel, scaffolding and thread.

Next, the key for the success of a construction is time. This project has started a bit late because of unpredictable weather, such as sudden rains which caused the project to be disrupted.

Finally, the problem that occurred during the process of the wall construction are determined throughout the construction process. The solution for the problem that occurred during the wall construction will being stated after determining what the problem was. This section will be focusing of the wall construction, the time to take for the construction and the problems and solutions for the wall construction.

3.2 To Identify The Methods Of Wall Constructions

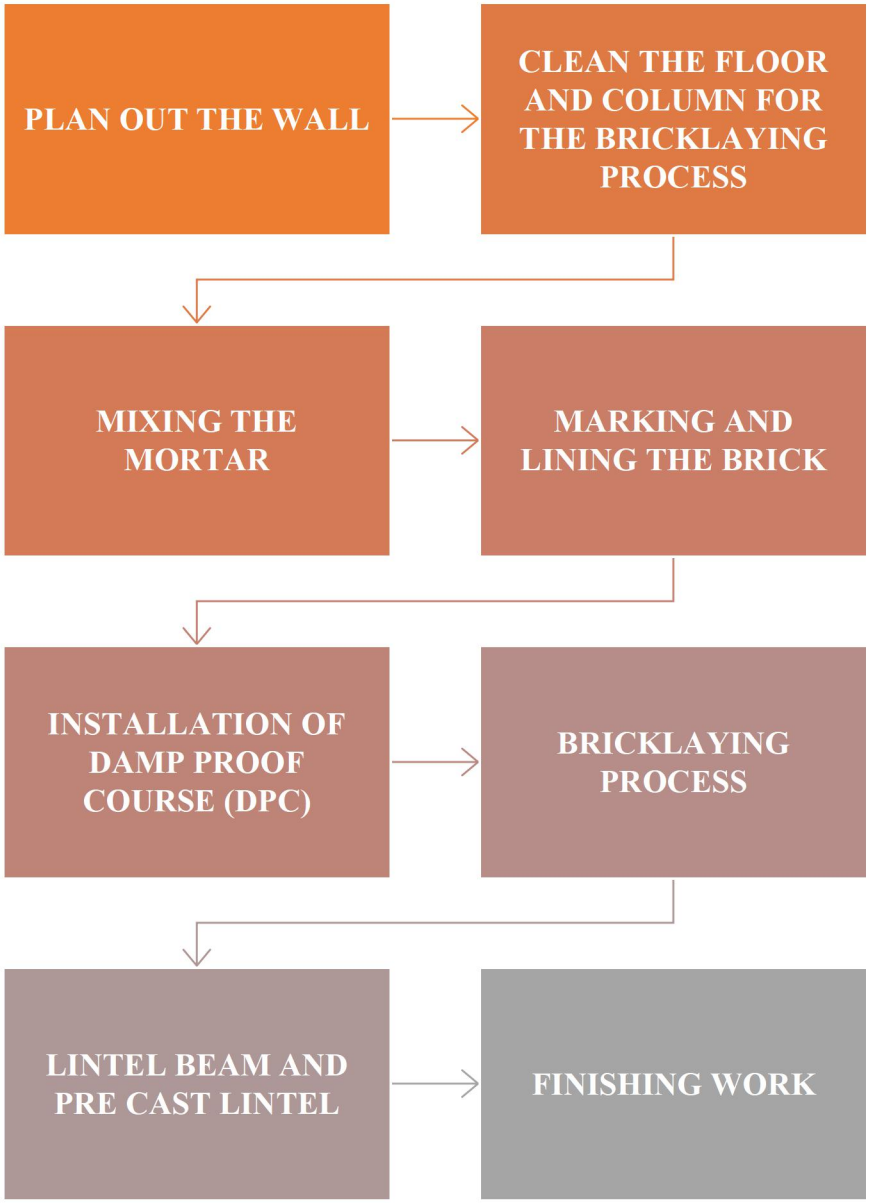

Figure 3.2 Methods of wall construction

3.2.1 PLAN OUT THE WALL

Figure 3.2.1: Brick that been used for the construction

The first thing to do before starting the construction of the wall is to make out a plan for the construction. The wall have to be constructed based on the plan. The wall height, width and size have to be same as what the plan are. The material that been used for the wall construction is sand brick with commonly used sizes.

3.2.2 CLEAN THE FLOOR AND COLUMN FOR THE BRICKLAYING PROCESS

Figure 3.2.2 Process of cleaning the column and the floor

Before the process of wall construction, the column and the floor are being cleaned from the waste of wood or concrete or nail or other waste. A clean floor and column make the process of bricklaying smooth and fast.

3.2.3 MIXING THE MORTAR

Figure 3.2.3 Mortar are being mixed with concrete mixer

The bricklaying process start with making the mortar for the bricklaying. Water, cement and sand are material that been used to produce mortar with volume ratio of 1:2:3. After the mortar are being mixed with the cement mixer, the mortar are being transferred to the site using wheelbarrow

3.2.4 MARKING AND LINING THE BRICK

Figure 3.2.4 String that been tied between two column

Before starting to bricklaying, the first thing to do is tied a string between two column using a nail at each column. The string are used as a guide to ensure the brick are stacked straight. The process of bricklaying start with a line of brick being lay down with mortar using a hawk.

3.2.5 INSTALLATION OF DAMP PROOF COURSE (DPC)

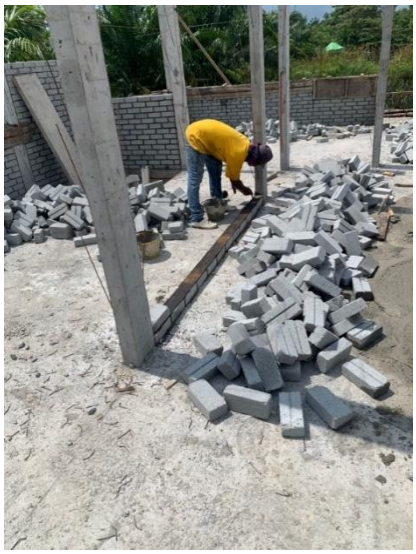

Figure 3.2.5 The process of installation of damp proof course (DPC)

After one line of brick has been lay down, a layer of damp proof course (DPC) are installed above it. The damp proof course (DPC) are being installed to restrict the movement of moisture through walls and floors. Then mortar are being placed above the damp proof course (DPC) and the bricklaying process are resume.

3.2.6 BRICKLAYING PROCESS

Figure 3.2.6 The bricklaying process of wall

Bricklaying process began with some mortar mix being placed above the damp proof course (DPC). After that, the brick are being lined straight one by one with a little gap for the mortar mix to binding the brick to the brick next to it. The bricks are pressed slowly to straighten the brick and any excessive of mortar mix from the press can be reused. This step is continued until it reaches the required height for the wall.

3.2.7 Lintel Beam and Pre Cast Lintel

Figure 3.2.7(a) Lintel beam at the bottom of windows part

Figure 3.2.7(b) The pre cast lintels that been used at the bottom and top of opening part

For the opening parts such as windows and doors, some of the window are support by lintel beam and some window and door are being supported by pre cast lintels. The beam and lintels was made on the site. Function of the beam and the lintels are to carry the weight of the structure over the opening.

3.2.8 FINISHING WORK

Figure 3.2.8(a): Plastering the wall for the finishes

Figure 3.2.8(b): The wall after plastering process

Plastering are used for the finishes of the wall. The plastering was done from external wall and then continue to the internal wall. Plastering process was done by skilled worker to ensure that the plastering for the finishes are neat and smooth.

3.3 To Determine The Time Of Wall Construction.

In this scope of work, time take an important role to the success of the contract with client. Delay in completing work on time without reasonable cause is a breach of contract. Unreasonable delays can make clients lack trust in the company that manages the construction.

The work that has been done this time, there was nothing that caused it to run slow except some unexpected things happened. Among the things is the unpredictable weather that sometimes rains suddenly.

For the wall construction process usually for the bricklaying process it takes approximately 3 weeks and for the finishing process of the wall it take 1 week. During the construction, there are some delayed that cause from sudden rain causing the work to be stop until the rain stop or until the next day.

The wall construction process for the site at Jalan Rumbia, Kampung Sijangkang, Telok Panglima Garang, Selangor started at 13th September 2021 until 7th November 2021. The time and the picture for the wall construction are being record by the smartphones. Floor plan are being used as a references during the process of the measurement of the wall.

The timeline of the construction of the wall:

The construction of wall started at 13th September 2021 and end at 7th November 2021

13th September 2021- 15th September 2021

- Bricklaying process for external wall until the beam under window for kitchen, bedroom and living room.

Figure 3.3.1 bedroom wall

Figure 3.3.2 living room wall

15th September 2021

Lintel beam process

Figure 3.3.4 lintel beam are being made in-situ with cement, sand and gravel mix

16th September 2021 - 17th September 2021

Continue the bricklaying process for the external wall until reach the required height of the wall after the beam has completely hard

Figure 3.3.5 the wall part of the living room.

18th September 2021 – 23rd September 2021

Bricklaying process for the internal wall

Figure 3.3.6 bricklaying process for internal wall of bedroom

Figure 3.3.7 lintel was put above opening parts such as doors.

31st October 2021 – 7th November 2021

Plastering process

Figure 3.3.8 Process of plastering the entire wall of the houses.

3.4 To Identify The Problem And Solution For The Wall Construction

Problem: Brick are not stacked straight and neatly

- Wall must be straight and strong to carry the load from the above to the ground. Sometimes when doing the bricklaying, the worker sometimes relying on the eye to see the straightness of the stacked bricks. This made the stacked bricks not straight and had to be redone.

Solution: use a levelling tool

- The problem can be fixed using a levelling tool such as spirit level. A spirit level can indicates that the surface is inclined or straight. When finish a stacked of bricks, worker will use the spirit level to indicate either it straight or tilted.

Problem: Untidy wall finishes

- Wall finishes function is to enhance the interior and exterior look of a structure. An untidy wall finishes can be eyesore to look. Cause of the untidy wall finishes are wall finishing work is done by people without observation from skilled worker.

Solution: reviews or teachings from a skilled worker.

- A skilled worker must be at the site when the finishing of the wall happened. The skilled worker can teach unskilled worker the right way to do it. The skilled worker also can inform unskilled worker if any mistakes occur during the wall finishing process.

4 Conclusion

In the end of the chapter, it is clear that the wall constructions at Jalan Rumbia were built using the usual method. From bricklaying to the finishes of the wall, KR Mumtaz SDN BHD is using the recent method of wall construction such as same from any construction out there. In observation, KR Mumtaz shown the success of having a good communication between their contractor and their labour. The result is the work are being done quickly and smooth with a good teamwork.

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