



DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)

TILES INSTALLATION AT 3-STOREY BUNGALOW

Prepared by:

Nurfarhana Binti Ahmad Fauzi

2017208796

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

DECEMBER 2019

It is recommended that the report of this practical training provided

By

Nurfarhana binti Ahmad Fauzi

2017208796

entitled

TILES INSTALLATION AT 3-STOREY BUNGALOW

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

Report Supervisor : _____
Dr. Asmat binti Ismail

Practical Training Coordinator : _____
En. Muhammad Naim Bin Mahyuddin

Program Coordinator : _____
Dr. Dzulkarnaen Bin Ismail

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FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
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DECEMBER 2019

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 MAG Builders Sdh Bhd for duration of 20 weeks starting from 5 August 2019 and ended on 20 December 2019. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

.....

Name :NURFARHANA BINTI AHMAD FAUZI
UiTM ID No :2017208796
Date : December 2019

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Alhamdulillah, praise to Allah S.W.T our creator. I am so blessed that I have managed to put the end to my internship session successfully with Allah's blessings I would like to thank him for giving me good health and ability to go through my internship peacefully and well.

I would like to thank Mr Muhsin Bin Abdul Ghani the director of MAG Builders for managing my placement in the company. Thank you to my practical training supervisor Miss Dayang Ku Hanizah bt. Abdul Hanif from the construction department of Mag Builders Sdn Bhd for supervising and instructing. Thank you to Miss Nurul Aida bt Saad from the hr department for giving a complete and clear description of the work on the construction site and for taking me to the construction site I would also like to thank all the staff at Mag Builders for providing me with very special and helpful guidance. Thank you to my industry peers for contributing my ideas and insights during my industry training.

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It was a great and pleasure experience to undergo my practical training in Mag Architect therefore I would like to express my gratitude to all the staffs and officers who were exceptionally forth coming and proactive in sharing information and knowledge as well as accepting and guiding me throughout the practical training there. I am grateful to my family who have been so supportive during my intern and have not given up on encouraging words so that I can remain steadfast in facing any challenges that may come.

ABSTRACT

Tile is a thin object usually square or rectangular in shape. Tile is a manufactured piece of hard-wearing material such as ceramic, stone, metal, baked clay, or even glass, generally used for covering roofs, floors, walls, or other objects such as tabletops. Practical training is one of the conditions that have been compulsory for every student of Universiti Teknologi Mara Seri Iskandar Perak branch. The objective of this practical training is can provide early exposure and experience to students before stepping to the real world of work. It can form a positive identity and cultivate trustworthiness be responsible and confident in each student or trainer herself. Also, can make student more particular in managing their time in prepare report practical during working hour. This report describes the activities that I have undertaken throughout the practice undergoing practical training from 5 August to 20 December 2019 at Mag Builders Sdn. Bhd. It is the private company in Malaysia in the construction sector. In this report describes in detail the company background and the case study on the installation process of ceramic tiles for Bukit Jelutong. This report describes in the detail the company background and highlighted the case study on the installation process of ceramic tiles for Bukit Jelutong. The tiles installation works in this project will be carried out accordingly to the construction methodology approved by the safety officer and consultant's engineer.

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INTRODUCTION

In Malaysia, one of the necessary packaging in a new building is the installation of tiles such as the installation of floor tile in the building. There are various types of floor tiles including ceramic tiles, porcelain tiles, granite tiles and these are based on user applications and requirements. Among the favourite tiles are ceramic tiles because of its easy maintenance, high load and reliable (Baharudin,2007).

A tile is a thin object usually square or rectangular in shape. Tile is a manufactured piece of hard-wearing material such as ceramic, stone, metal, baked clay, or even glass, generally used for covering roofs, floors, walls, or other objects such as tabletops. Alternatively, tile can sometimes refer to similar units made from lightweight materials such as perlite, wood, and mineral wool, typically used for wall and ceiling applications. In another sense, a tile is a construction tile or similar object, such as rectangular counters used in playing games (see tile-based game). The word is derived from the French word tuile, which is, in turn, from the Latin word tegula, meaning a roof tile composed of fired clay (Wikipedia,2019).

Ceramic tiles and their installation is important because the building industry is faced with high demand for buildings supply of materials. The result is a movement toward buildings that are thinner and more flexible. Unfortunately, a decrease in the amount of material required for the building leads to an increase in the amount of materials required for the tile portion of the construction (Byrne, 2009).

For example, when buildings were made primarily from masses of masonry or concrete, tiles simply could be applied directly to the concrete or masonry surfaces because they were so strong. Now that buildings are designed to be flexible, tile installations require new setting-bed materials and protective-membrane systems. The cost of installing protective membranes has led to the development of lightweight tile backer boards. Made completely from recycled and melted nylon, the backer boards do not require special construction or membranes. They simplify tile installation and eliminate the need for extra layers of flooring, membrane systems and other special materials (Byrne, 2009).

An added bonus is that the backer boards simultaneously help rid landfills of discarded nylon carpet. The nylon fiber's in carpet began throwing away in the mid-1950s still are fresh, flexible and can be turned into durable materials rather than useless scrap. Independent studies have proven the reliability of re-melted, recycled nylon building materials when they are exposed to UV. When covered with tile, adhesive and grout, nylon backer boards easily should outlast the life of any building in which they are installed (Byrne, 2009).

1.1 Objectives of the Study

- i. To study the method of installation ceramic tiles
- ii. Determine problem happened and solution for the problem

1.2 Scope of study

The study was carried out at 37 Jalan Anjung u8/34 Bukit jelutong Seksyen u8, 40150 Bukit Jelutong. The construction was almost completely done. The study is focusing on the ceramic tiles' installation. This includes the machinery and tools needed to ensure the installation work smoothly. The problems that happened during ceramic tile installation process are also studied which are can be settle by some solutions that they had been used. The study is including the quantity of labours and the cost and time used to install the tiles.

1.3 Method of Study

1. Observation

The observation is about the installation of ceramic tile. The cases that need to identify is when the problems occur during the construction and solution that have been taken to solve the problems that happened at the site. The observations were recorded by taking some pictures, notes and voice recorder. This way is easier and faster to get the information.

2. Interviews

The preparation for some questions had been done to do semi-structured interviews with a coordinator project that guide during visited the site and also asked more to follow up questions about the research that must be carried out. The coordinator project follows by the director of the project explained more detail about the road construction. The detail about the construction had been understood clearly. The information was taken by some notes and voice recorder so that more information can get easily without missed it.

3. Documents reviews

File of this project on Bukit jelutong had been reviewed to see the progress report work month by month. For the company profile, it had been taken from file of Mag Builders. By referring the report, many information can get to be added in the research.

1.4 Introduction of The Company



MAG ARCHITECT SDN BHD | MAG BUILDERS SDN BHD | MAG DESIGN SDN BHD

Figure 2.1: Company Logo

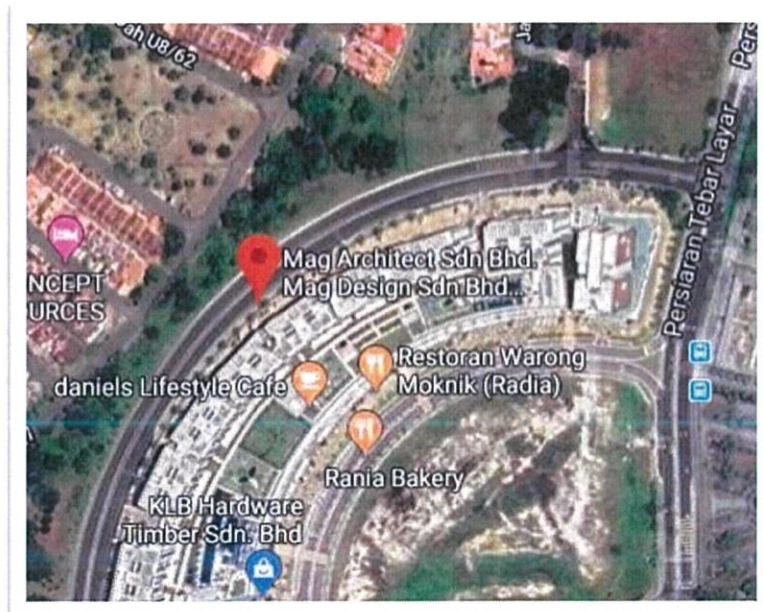


Figure 2.2: Company location on Google Map

Source: Google Map

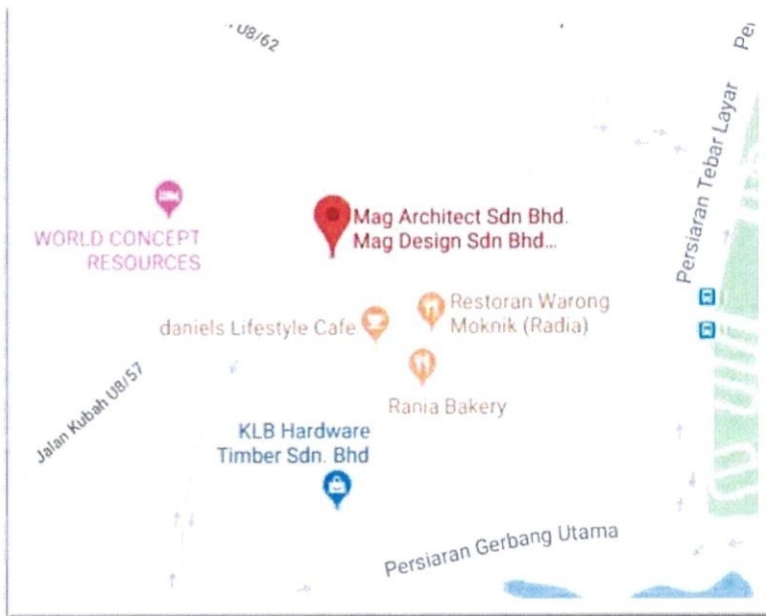


Figure 2.3: Company location on Google Map

Source: Google Map

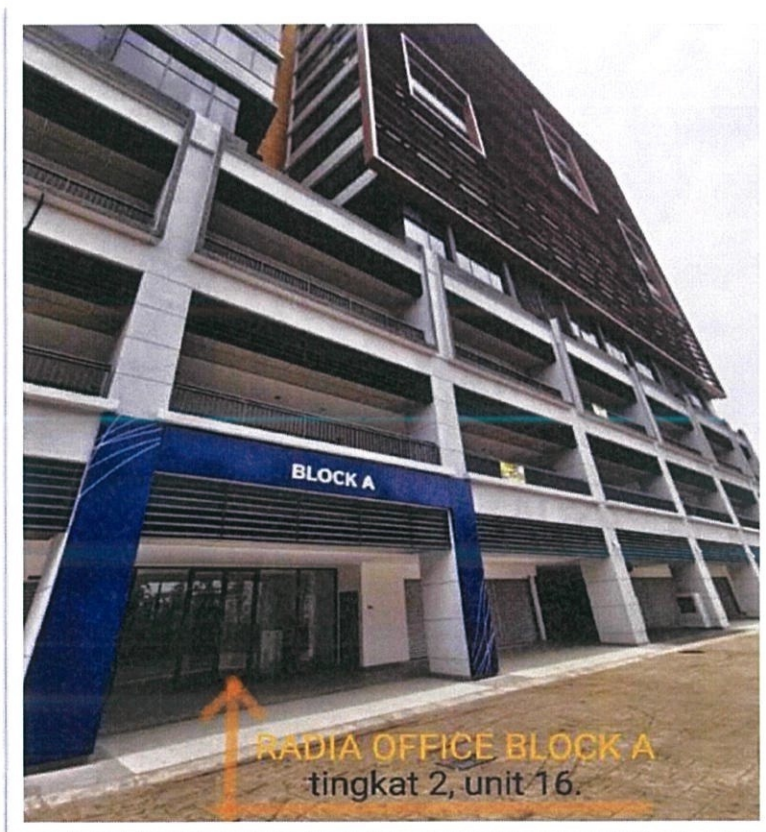


Figure 2.4: The Company Office Block

Source: Mag Builders Sdn Bhd

1.5 Company Profile

Mag Builders Sdn. Bhd. is a construction company. It is located at Bukit Jelutong, Selangor. The company was incorporated on 11th February 2004. It has lots of experienced and has been given the opportunity to implement several projects from many sector. This is because the company has stable and good financial due to their strong, experienced, motivated and skilled employees. This is the main key to ensure that their company's goals will achieve and success to the satisfactions of the customers.

Mag Builders is founded by Muhsin Bin Abdul Ghani. There are 15 employees in the Mag Architect that manages each section and unit not including the site workers. The employees have the calibre and level in their learning to succeed and enhance the company.

Mag Architect is construction and architect company that design and construct many projects. Mag Architect started out as an architect who took a project offer with the developer or government for design and drew up a plan based on the project's offer. However, he then decided to set up his own company and organization where they design and built the building. The organization was established in 2004 the company has experienced various ups and downs to grow the company. However, the company succeeded in getting up and remains strong until today in terms of economy and net income per year.

It all started with an amount of RM5000 given by Mr Muhsin's father as capital. The RM5000 had helped him in many ways, from setting up Mag Builders Sdn Bhd, buying sample stationary, other basic office equipment such as fax machines, printer, computer, name cards etc.

Mag Builders first secured its first job in 2004 worth RM60,000. With some profits drawn from Mag Builder's very first job, the company later managed to operate from a proper small room which was turned into an office space which Mr. Muhsin rented from his cousin.

The company then operated with the help of 2 office staff in charge of preparing basic architecture drawings, administration works and material coordination and support from other 7 foreign workers from Indonesia taking charge of the construction aspect.

It was not too long after its establishment, where the presence of Mag Builders Sdn Bhd was greatly welcome and the company has attained more projects involving teres, link house, semi and bungalow with substantial values ranging from RM60,000, RM260,000 , RM600,000 , RM1,500,000, RM2,700,000, RM 4,500,000 and RM6,000,000+++. To date, Mag Builders Sdn Bhd is an established full-fledged architecture firm providing architectural service, with interior decoration, landscaping, interior decoration, steel mills with a cabinet making factory equipped with modern machines from Germany under one roof, operating with 10 in-house staff, being the office administrator, site coordinator, driver, architects and more then100 site workers.

MISSION:

The company are the inventors of the modern-era Design-Build process. The company have expanded our market presence to become one of the most recognized companies in architecture, engineering and construction. Mag are our clients' most trusted provider of these professional services by consistently exceeding their expectations and bringing the highest value to each relationship that is developed. In pursuit of this Mission and in support of its Values, we:

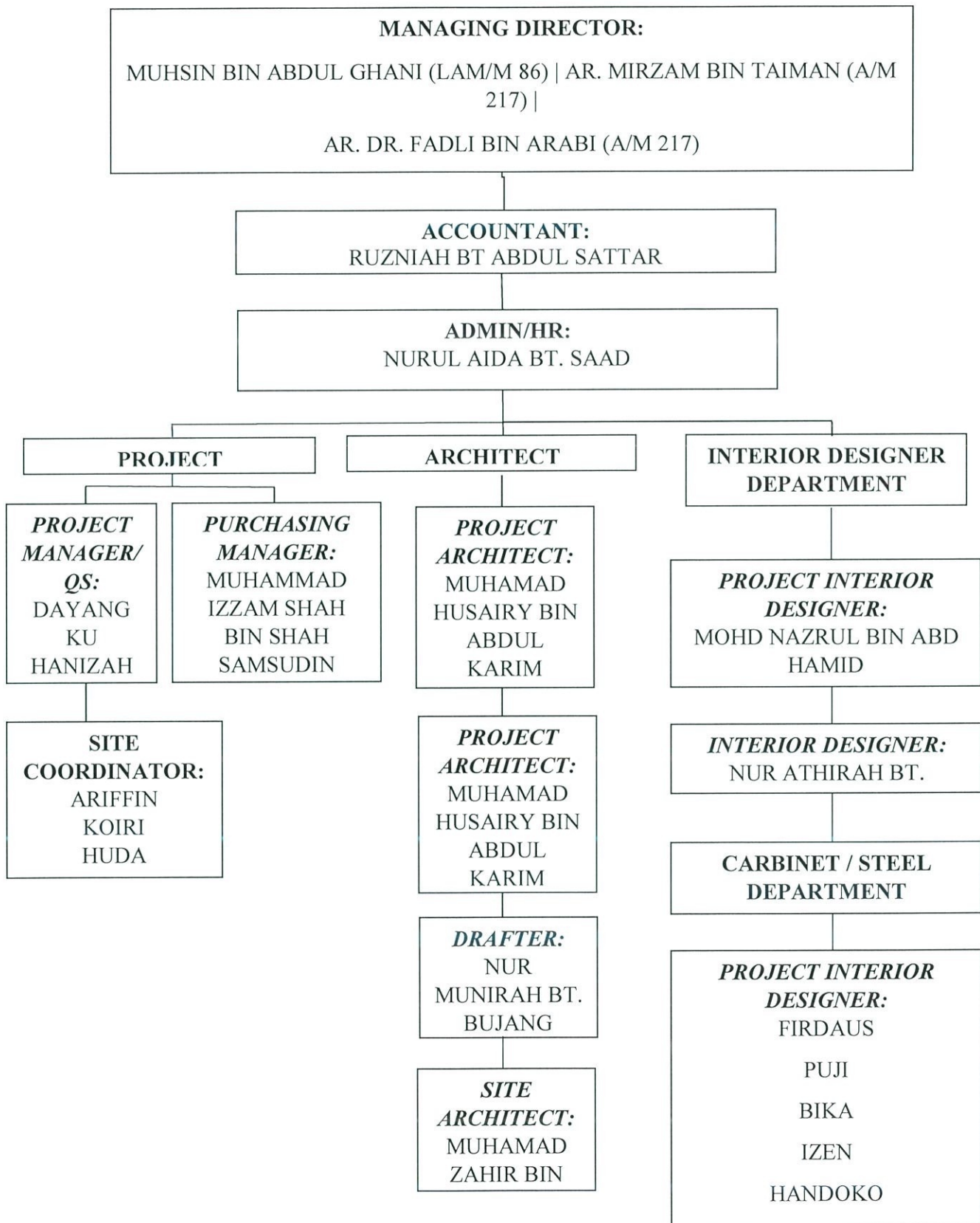
- Provide the highest quality service to our clients by combining highly skilled team members with our proven methodology.
- Strive to support the projects with the most advanced technology to ensure the company take advantage of the efficiency and accuracy that it offers.
- Consistently improve the company deliverables to the clients and add value to their organization.
- Forge lasting relationships with our clients by listening and addressing their needs in a manner which will allow them, as well as this, to be successful.
- Support the employees in a way that fosters learning, growth and recognition for superior performance.
- Operate profitably to support the parent organization and its shareholders.

VISION:

To be viewed as a respected construction architectural firm, providing high quality design and services to our clients with honesty and integrity.

- High quality design grows out of an understanding of the client's functional and programmatic needs. The company design interior that function for our client.
- The company not pre – occupied with creating our own “signature style” but provide design solution that creates each client's unique style, which reflects their taste and personality.
- The company recognized a growing need to work with client in a conducive capacity. The influx in product information can be confusing for a lay person and using a designer as a consultant result in a successful project.
- The company are problem solvers and committed to providing excellent services to the client, who use, visit and inhabit the interior environment that the company create.

1.6 Organization Chart



8.1 List of Project

8.1.1 Completed Project

Table 2.1: Completed Project

BIL	CLIENT	PROJECT	PROJECT COST	COMPLETED
1.	MUHAMAD ARIF ZULKEPELI AND CHE LEHA JAAFAR	REFURBISHMENT 1 UNIT 3 STORY TERES CORNER LOT HOUSE INCLUDING INTERIOR DECORATION AT 60, JALAN 3/5A TAMAN MELATI, SETAPAK, 53100 KUALA LUMPUR, SELANGOR	RM 3,192,798.00	(2015)
2.	MKM TRAVEL	RENOVATION & INTERIOR OF MKM TRAVEL AT STAR AVENUE SUBANG B-29 JALAN ZUHAL U5/178 PUSAT KOMERSIL ARENA BINTANG, SHAH ALAM, SELANGOR	RM 1,133,708.00	(2018)
3.	HAIRULRIZAL BIN SAMURI	CADANGAN MEMBINA TAMBAHAN DAN PINDAAN KEPADA RUMAH BANGLO 2 TINGKAT SEDIA ADA DI NO 44, JALAN PULAU ANGSA U10/2, PERDANA HEIGHT, SEKSYEN U10, 40170, SHAH ALAM, SELANGOR DARUL EHSAN	RM 341,980.59	(2017)

2.4.2 Project in Progress

Table 2.2: Ongoing Project

BIL	CLIENT	PROJECT	PROJECT COST	STATUS
1.	NAWAL AEIDA BINTI ASARUDIN	PROPOSED DESIGN & BUILD OF 3 STOREY BUNGALOW AT 37 JALAN ANJUNG U8/34 BUKIT JELUTONG SEKSYEN U8, 40150 BUKIT JELUTONG	RM 7,000,000.00	ONGOING
2.	NORHALIM BIN YUNUS	CADANGAN MEMBINA DAN MENYIAPKAN 1 UNIT RUMAH SESEBUAH 2 ½ TINGKAT, DI ATAS LOT 21452, JALAN 4/5J, BANDAR BARU BANGI, SEKSYEN 4, 43650 MUKIM KAJANG DAERAH HULU LANGAT, SELANGOR	RM 1,681,200.00	ONGOING
3.	HAFIZ BIN HUSNI	PROPOSED 2 STOREY BUNGALOW AT LOT 45073 LORONG HJ AMIN SG MERAB LUAR 43000 KAJANG SELANGOR	RM 756,500.00	ONGOING
4.	ROHANA AHMAD	PROPOSED RENOVATION OF 2 STOREY TERRACE CORNER LOT HOUSE AT NO 14, JALAN SIERRA 8/7, BANDAR 16 SIERRA 47110 PUCHONG SELANGOR	RM 438,671.00	ONGOING

CHAPTER 3.0

THE PROCESS OF TILES INSTALLATION

9.1 Introduction to the Case Study Project

The PROJECT located at 37 Jalan Anjung U8/34 Bukit Jelutong Seksyen U8, 40150 Bukit Jelutong, under Mag Builders Sdn. Bhd. The bungalow consist 3 storey including roof garden. The duration of the works is 3 years. The project value is RM 7,0000000 with 2 years of the construction period. The project started from 25th June 2017 until 24th December 2019.

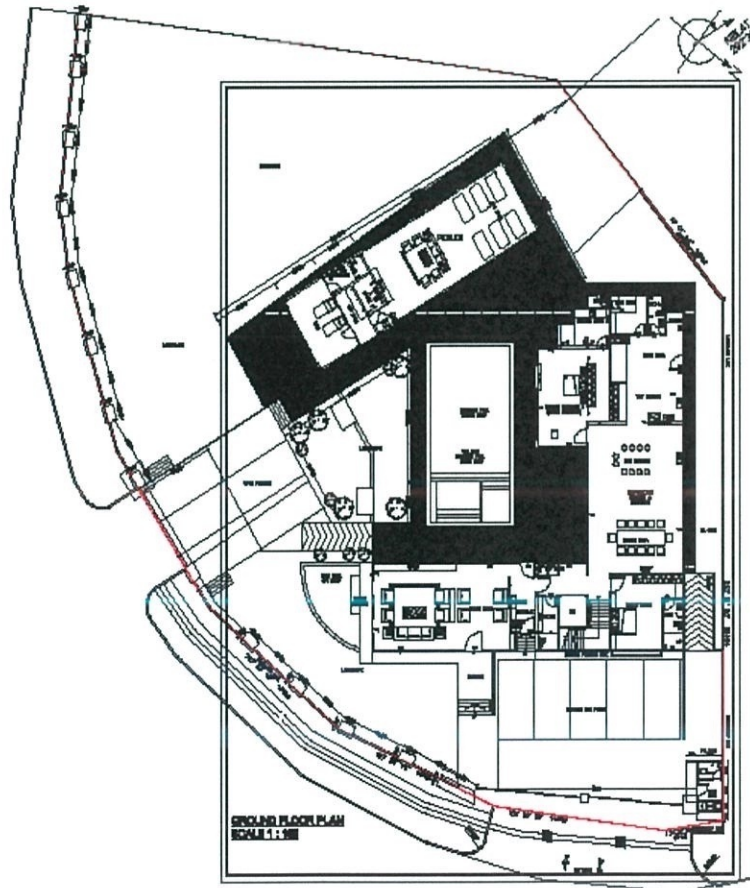


Figure 3.1: Ground Floor Plan

Source: Mag Builders

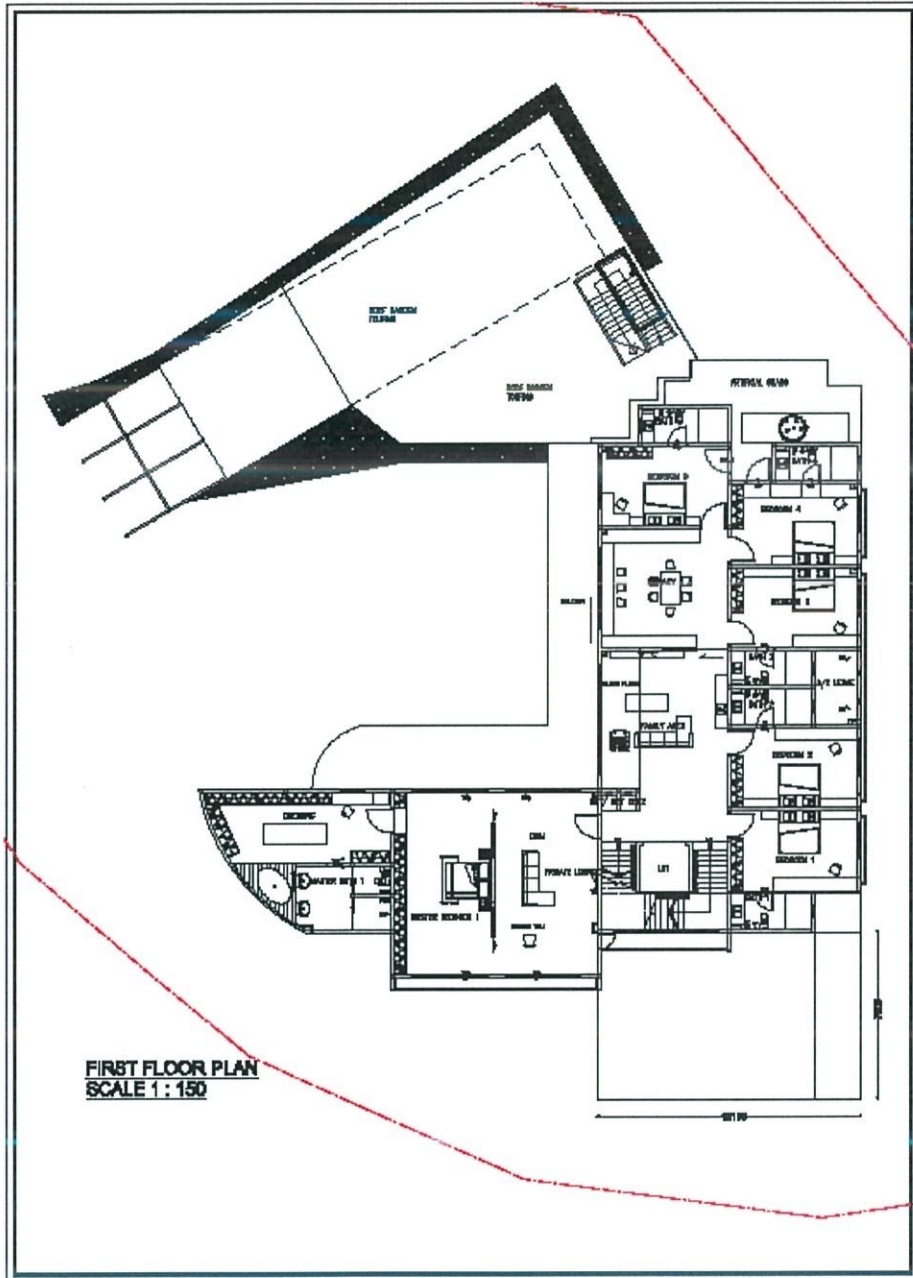


Figure 3.2: First Floor Plan

Source: Mag Builders

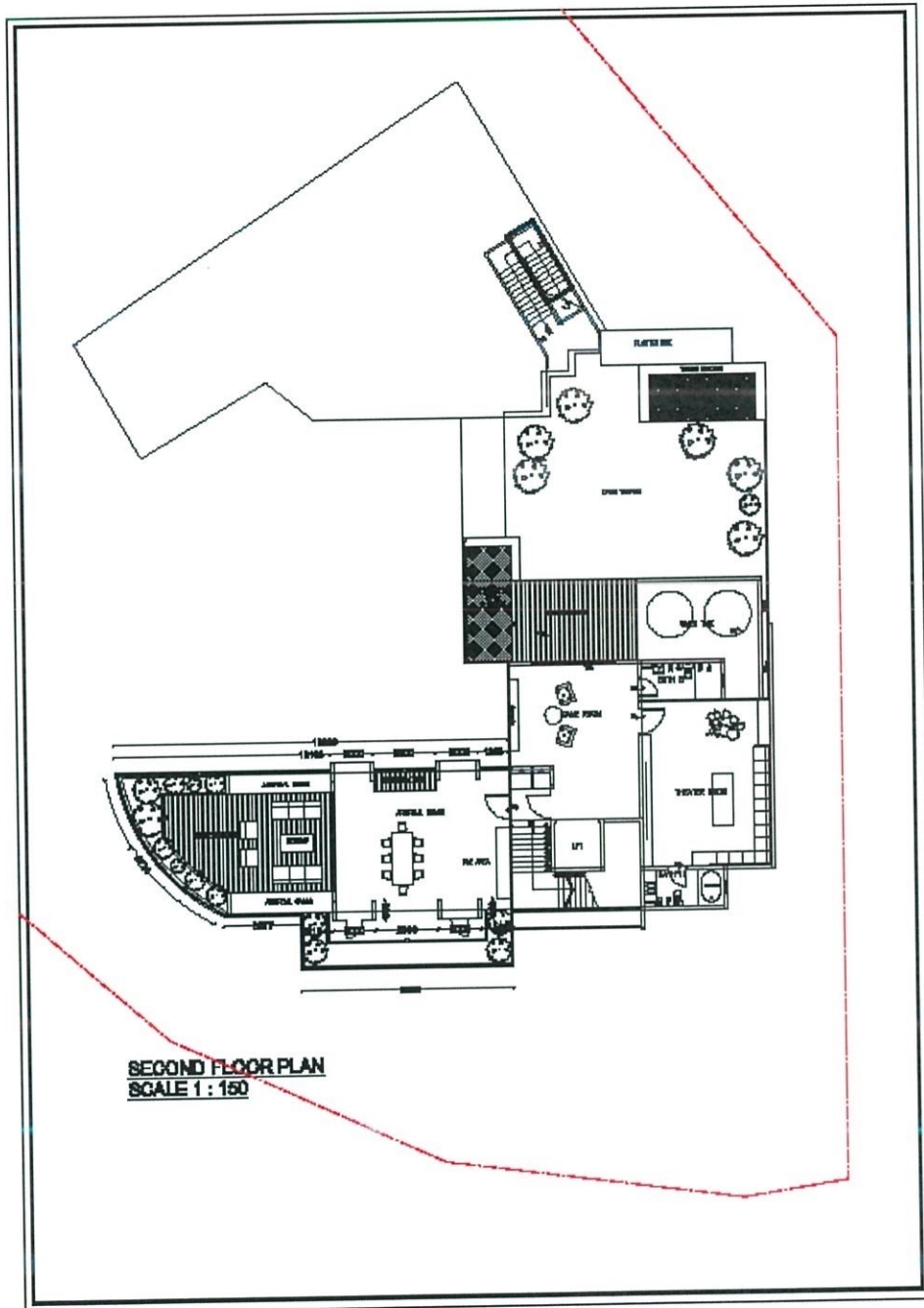


Figure 3.3: Second Floor Plan

Source: Mag Builders



Figure 3.4: Site Location on Google Map

Source: Google Map

9.2 Process of Tiles Installation

The installation of tiles involves several processes. Figure 3.2 shows the flow chart of tiles installation adopted in this project.

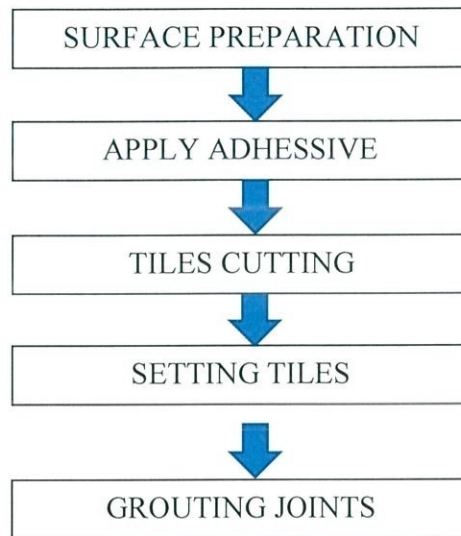


Figure 3.5 Flowchart of Tiles Installation

3.2.1 Surface preparation



Figure 3.6: Surface Preparation

Before beginning, make sure the floors are clean and dry for best results. The surface should be smooth and as flat as possible. Make sure to remove all the dust and dirt. Take some time to repair, patch, and level any damaged or uneven areas. Check repeatedly to make sure the area is free of wax, soap scum, and grease. Identifying those potential complications in advance will help the installation run smoothly. Figure 3.3 shows the surface preparation before installing tiles.

3.2.2. Apply Adhesive



Figure 3.7: Apply Adhesive

To get a better result, it is important to use a waterproof tile adhesive for surfaces that will have contact with water. Be mindful to mix only enough of the adhesive to be used within 30 minutes. Applying adhesive to the floor is so that it covers about 1-meter square (Figure 3.7). Hold the trowel at a 45-degree angle and use the notched side to comb adhesive into standing ridges. When you remove the excess adhesive, you leave behind a uniform, ridged setting bed for your tile. Make sure the position of the first tiles is right formed by the setting out battens at the skirting level. Place plastic spacer between them if the tiles do not have lungs to ensure that the space between grouting is enough.

Wipe away any adhesive from the surface of the tiles using a damp sponge there is another method of using the adhesive which is by using cement. To stick the tiles on the floor surfaces, park near the end of the first rope meet and a row of elongated horizontal line. Take a ready mixed cement (process). Stir the cement until it become thick, the put it on the floor. To get a smooth as well as make corrugated cement us the levelling cement jagged.

3.2.3 Tiles Cutting



Figure 3.8: Tile Cutter

The gap between the adjacent floor need to be fill with the border tiles. The tiles need to be cut to fit the gap. This process will be implemented once the main area has completed.



Figure 3.9: Tile Cutter

. This process will be implemented once the main area has completed. Start by marking carefully measured cuts-to-be with a pencil or felt-tip pen on the tile surface. Use a tile cutter as shown in Figure 3.8 and Figure 3.9 to achieve pinpoint straight or diagonal cuts.

For the best result, make masterful curved cuts with a nipper, chipping away small pieces. For any full-length curved cuts, a rod saw is most properly suited to handle the task. Use a tile sander to smooth over the cut edges of the tiles.

3.2.4 Setting Tiles

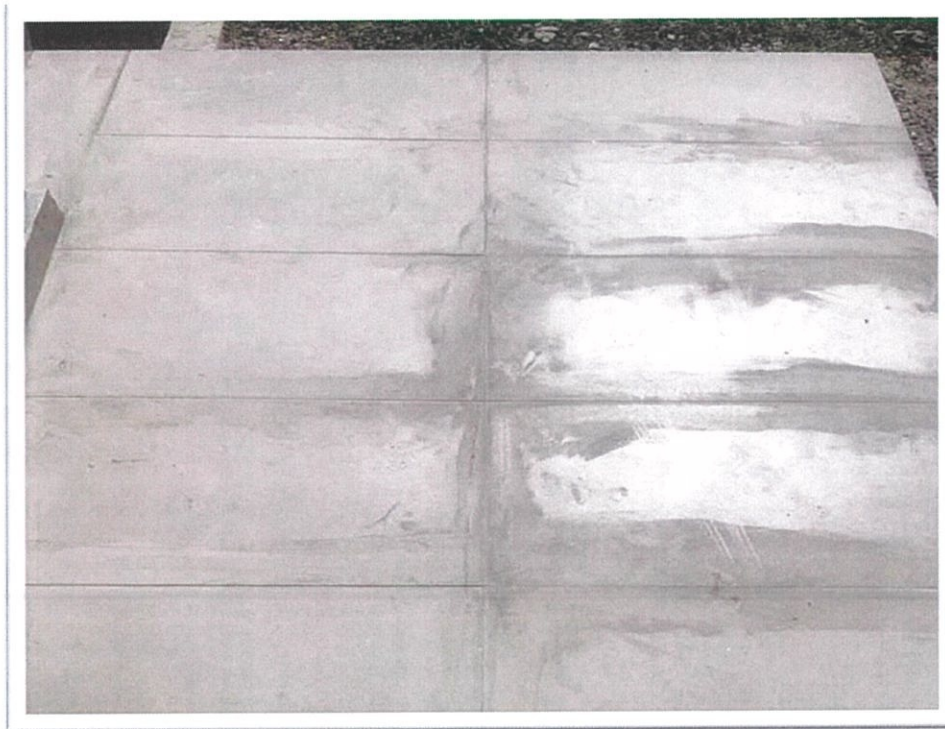


Figure 3.10: Setting Tiles

After primed the surface, created the layout, applied the adhesive, and cut the tile, you are fully prepared for the actual installation of your tile.

Begin by installing tiles in the centre of the room, one grid at a time, finishing each grid before moving on to the next. Within each grid, it will help to start the first tile in the corner and work outward. Using a slight twisting motion, set tiles one at a time and avoid sliding them into place. Be sure to either insert spacers as each tile is set or leave equal joints between tiles. Save the perimeter tiles in each grid for last, leaving a 1/4th inch gap between the tile and wall.

Once a grid is completely installed, tap in all tiles with a rubber mallet or hammer and wood block to ensure a solid bond and level plane. Remove excess adhesive from joints with a putty knife and from tile with a damp sponge to prevent an uneven appearance. Lastly, allow your hard work at least 24 hours to set before walking on it. And of course, take at least 20 minutes to admire the time and care you have put into your new floor. Figure 3.10 shows the setting tiles process.

3.2.5 Grouting Joints







Figure 3.11: Grouting Joints

The last step is to grout or fill the joints and consolidate floor into one mass after the tiles have had 24 hours to set. A grout is a mortar or paste for filling, especially the gaps between wall or floor tiles. It is important to use waterproof grout because the surfaces have contact with water. Grout comes in many colors such as grey, white and brown paste. Choose one that matches the tiles to make the floor have a continuous appearance.

This task is less time-consuming than installing tiles, but it is more important. To ensure that the floor under the tile stays safe from moisture, a proper grout job must be done. After carefully reading and following all instructions and precautions on the grout package, make only enough to use in a 30-minute period. Remove the tile spacers and spread grout on the tile surface as shown in figure 3.11. Spread the grout over a small joint. When the surfaces have dried, use a dry cloth to polish the tile surfaces and leave for a few days. After the grout in the joints has set, remove excess grout on the surfaces. Use a large sponge with water to remove the excess grout. Make sure to rinse your sponge frequently and change the water when needed. Wait a few hours and repeat until all grout is removed. Make a final pass along the grout lines with the damp sponge to make sure the grout lines are smooth.

3.3 Tools and Materials Used for Tiles Installation

TOOLS AND MATERIALS	DESCRIPTION
 <p data-bbox="304 734 655 768">Figure 3.12: Measuring tape</p>	<p data-bbox="778 416 1332 483">A tape measure or measuring tape is a flexible ruler and used to measure distance.</p>
 <p data-bbox="312 1160 644 1193">Figure 3.13: Wheelbarrow</p>	<p data-bbox="778 842 1326 909">This device is mostly used for carrying tiles for the for the construction worker.</p>
 <p data-bbox="316 1585 644 1619">Figure 3.14: Mortar mixer</p>	<p data-bbox="778 1267 1337 1402">The mortar mixer uses to mix the mortar. The importance of having a reliable mortar mixer is that it will reduce the air entrapped in the mortar to increase their strength.</p>
 <p data-bbox="288 1973 671 2007">Figure 3.15: Manual tile cutter</p>	<p data-bbox="778 1693 1337 1760">This hand tools use to the cut manually to fix the odd size gaps that required.</p>





 <p data-bbox="327 600 625 633">Figure 3.16: Spirit level</p>	<p data-bbox="778 280 1337 421">A spirit level is used for determining horizontal and vertical levels. The bubbles at the centre decide either the horizontal surfaces are levelled or not.</p>
 <p data-bbox="343 1025 614 1059">Figure 3.17: Spreader</p>	<p data-bbox="778 705 1337 846">Specifically designed for scooping, spreading, levelling, combing and finishing adhesives and mortars during floor, wall or ceiling installations.</p>
 <p data-bbox="343 1451 614 1485">Figure 3.18: Hammer</p>	<p data-bbox="778 1131 1337 1272">A hammer is a tool consisting of a weighted “head” fixed to a long handle that is swung to deliver an impact to a small area of an object.</p>
 <p data-bbox="295 1910 667 1944">Figure 3.19: Rubber Hammer</p>	<p data-bbox="778 1556 1337 1731">Rubber hammer is ideal for tapping tile into thinnest, as well as many other uses. The rubber hammer is specifically designed for minimum bounce when striking and will not mar surfaces.</p>



Figure 3.20: Bucket

A bucket is used to carry, water, sand, cement and fill the finished mixed cement. The buckets are made from plastic which is light and waterproof.

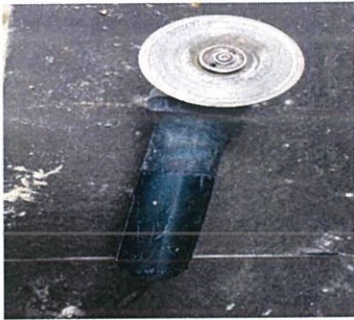


Figure 3.21: Grinder

Grinder will cut clean, accurate circles and squares ceramic tile.



Figure 3.22: Shovel

A tool resembling a spade with a broad blade and typically upturned sides, used for moving cement, sand, or other material.

3.4 Problem Occurred During the Process of Tiles Installation and Solution

1) Visual Tile Defects

The company cannot expect that all tiles ordered to the supplier will be in good condition. The construction workers just take a rough view because the tiles are in the box and there are so many of it. If you want to check it out individually it will take a long time. There are pieces of tile are exhibit visual defects. If that's the case, the tiles should not be installed. The site supervisor will inform the company quantity surveyor, then they will inform the tiles supplier from which the company purchased and ask for the new one.

2) Lack of Workers

The company has a lot of projects so the site workers should be split into several sites. It causes the construction workers in Bukit Jelutong become less. The company has decided to hire specialized subcontractors to perform the installation tiles work so it can save time and chase the project deadlines. Hiring subcontractors is often much more cost effective than bringing on new, full-time employees. A subcontractor is likely to have done similar work before and will be able to get the job done quickly and efficiently.

3) Weather and Climate Problems

Climate conditions can amplify existing health and safety issues and could lead to new unanticipated hazards to the workers. There are many works that need to be done outside so the workers may also be exposed to weather and climate conditions. Malaysia has faced haze problem since September. Air pollutants that are known to affect respiratory health include ground level ozone and particle pollution. The workers were asked to wear respirator so that they can do their work. Respirators work better than surgical masks as they seal better and restrict more polluted air from entering the nose and mouth

CHAPTER 4.0

CONCLUSION

10.1 Conclusion

Tiles finishes are more favourable than other floor finishes even there are many problems can occur within time such as the tiles can crack and others. It is considered economical and easy since there are no waste of time and materials. Tiles finishes can bear heavier load and transfer it to the ground soil. The transportation cost is not high. Ceramic tile is also widely used in Malaysia because of its aesthetic value that gives the floor more beauty to its users as it has many design options. Tiles finishes also has a lot of advantages such as it is durable and can stand heavy and tough activity. Tiles flooring have a hard protective top layer that makes the tiles impervious to water and most stains, making them naturally resistant to the ravages of high humidity conditions. It is also the main reason why tile is preferred. Although the workers have explained on earlier chapter that they faced many challenges, they still managed to keep on working and overcome the problems and grow better.

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Interviewed with Mr. Izzam (Site Supervisor) and Mr. Zahir (Project Manager)