



**DEPARTMENT OF BUILDING  
UNIVERSITI TEKNOLOGI MARA  
(SERI ISKANDAR, PERAK)**

**PRACTICAL REPORT  
(INSTALLATION OF PORCELAIN FLOOR TILE FINISHES)**

**Prepared by:  
MOHAMAD HAIRI DANIEL BIN ARBA'I  
2019204546**

**DEPARTMENT OF BUILDING**  
**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING**  
**UNIVERSITI TEKNOLOGI MARA**  
**PERAK CAWANGAN SERI ISKANDAR.**

**10 JANUARY 2022**

**By**

**MOHAMAD HAIRI DANIEL BIN ARBA'I**

**2019204546**

**Entitled**

**INSTALLATION OF PORCELAIN FLOOR TILES FINISHES**

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

Report Supervisor : \_\_\_\_\_  
DR. HASNI SURYANI BINTI MAT HASAN

Practical Training Coordinator : \_\_\_\_\_  
DR. NOR ASMA HAFIZAH BINTI HADZMAN

Programme Coordinator : \_\_\_\_\_  
DR. DZULKARNAEN BIN ISMAIL

**DEPARTMENT OF BUILDING**  
**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING**  
**UNIVERSITI TEKNOLOGI MARA**  
**PERAK CAWANGAN SERI ISKANDAR.**

**AUG – FEB (2021 – 2022)**

**STUDENT'S DECLARATION**

Except for the extracts and summaries for which the original references are provided above, I hereby declare that this report is my own work, written during a practical training session that I go through at BW Assets Management Sdn. Bhd for duration of 15 weeks starting from October 6, 2021 until January 14, 2022. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

Name : MOHAMAD HAIRI DANIEL BIN ARBA'I

UiTM ID No : 2019204546

Date : 6 OCTOBER 2021

## ACKNOWLEDGEMENT

First and foremost, Alhamdulillah, praise to Allah, the Most Graceful, the Most Merciful. I would like to express my sincere appreciation gratitude for the guidance, advice and help rendered throughout the period of practical training by the following group of amazing individuals. I am grateful and thankful to Mr. Salleh Bin Tukiran as a manager and contractor for the acceptance and the opportunity given, to supervise my practical training in his esteem company. His team of professionalism and hardworking comprising of Mr. Zailani Bin Bahari, Mr. Azizan, Puan Rabiah Binti Tukiran, Puan Hasnah Binti Tukiran and Arissa Natasya Binti Yusni, which are enabled me to learn and develop my understanding and knowledge. Otherwise, also feel of real time projects and theory involved in analysis of subcontractor, civil works while additionally and landscaping part. The responsible is almost perfect towards streamlining and assessing my practical training in here. Moreover, to the site personnel in both understanding in detailed about flow in construction, maintenance services, landscaping and administration work, site safety and best practices in this industry. It is also an honour for me to give very expertise opportunity to work with them. I would also like to thank all the lectures in building departments that have taught and develop me in becoming a better student and also especially as a person. Moreover, I would like to explode my deepest appreciation to lectures who are directly involved and becoming important part to my successful practical training during that period. For Miss Nor Azizah Binti Talkis, as a supervising lecturer, Dr. Hasni Suryani Binti Mat Hasan, as an evaluation lecturer, TS. Encik Muhamad Naim Bin Mahyuddin, as a Practical Training Coordinator and Dr. Dzulkarnaen Bin Ismail, programme coordinator, I really value the time, effort, encouragement and ideas that they have contributed more than enough towards the successful completion of my practical training, this report and valuable knowledge that had been shared over the last few semesters. Last but not least, my special thanks to my beloved parents and my family for the sacrifices over the years. Thank you.

## **ABSTRACT**

As a result, this report will go through how to install porcelain floor tiles, what equipment and tools to use, and how to maintain porcelain floor tiles. Finishes are particularly significant in our homes for a variety of reasons, including comfort and enhanced look. The objective of this report on case study are to determine the installation of porcelain floor tile finishes, the equipment and tools required to install porcelain floor tile finishes, and finally, the maintenance required while utilising porcelain floor tile finishes. For this case study, there are two methodologies which are primary and secondary methods. This approach was used to obtain information on tile installation, tools used, and tile maintenance. The primer is divided into two methods, which are observations and interview method. The observations were come through from the site visit to project site. Additionally, for the interview method part, interviewed the person who was in charged to install porcelain floor tiles which are site experienced, supervisor and the contractor. The finding of this report includes how to install that floor tiles finishes type which are starts setting out, rendering floor, set up layout, apply adhesive and lay mortar, set the tile, cut the tiles if needed, place spacers, grouting joints part and cleaning part. Then, the tools used for the installation such as trowels, tiles cutter, tile mortar mixer, grout floats, tile spacers, measuring tape, and identify maintenances using the porcelain floor tiles finishes. Hopefully, the reader of this report obtains some knowledge and advantages on how to install floor tiles finishes and the tools required for installation that tiles type, as well as how to maintain them.

<b>CONTENTS</b>	<b>PAGE NO.</b>
Acknowledgements	I
Abstract	II
Contents	III – IV
List of Tables	V
List of Figures	VI
List of Photos	VII – IX

**CHAPTER 1.0 INTRODUCTION**

1.1	Introduction	1
1.2	Objectives	1
1.3	Scope of Study	2
1.4	Methods of Study	2 – 3

**CHAPTER 2.0 COMPANY BACKGROUND**

2.1	Introduction of Company	4
2.2	Company Profile	
	2.2.1 Company Information	5 – 6
	2.2.2 Appendix	7 – 12
2.3	Organization Chart	13
2.4	List of Project	
	2.4.1 Completed and Current Projects	14 – 18

**CHAPTER 3.0 CASE STUDY**

3.1	Introduction	19
3.2	Background of Project	20
3.3	Installation of Porcelain Floor Tiles Finishes	
	3.3.1 Installation of porcelain floor tiles finishes	21
	3.3.1.1 Setting Out	22
	3.3.1.2 Rendering Floor	23 – 27
	3.3.1.3 Installation Tiles Process	
	3.3.1.3.1 Setting layout	28

	3.3.1.3.2	Apply the Adhesive	29 – 30
	3.3.1.3.3	Set tile for Installation	31 – 32
	3.3.1.3.4	Grouting Joints	33 – 34
	3.3.1.3.5	Cleaning	35
	3.3.2	An equipment and tools needed for installation of Porcelain floor tiles finishes	36 – 52
	3.3.3	The maintenance using porcelain floor tiles finishes	53 – 60
<b>CHAPTER</b>	<b>4.0</b>	<b>CONCLUSION AND RECOMMENDATION</b>	
	4.1	Conclusion	61
	4.2	Recommendation	62
<b>REFERENCES</b>			63

## LIST OF TABLES

Table 2.1	List of Work Done	6
Table 2.2	Organization chart of BW Assets Management Sdn. Bhd	13
Table 2.3	List of Completed and Current Projects	14



## LIST OF FIGURES

Figure 2.1	Installation method of Porcelain Granite Tiles Finishes	21
------------	---	----

## LIST OF PHOTOS

Photo 2.1	Certificate of Contractor	7
Photo 2.2	Certificate of registration with CIDB	8
Photo 2.3	Government procurement certificates work	9
Photo 2.4	Certificate registration company with the Ministry of Finance Malaysia	10
Photo 2.5	Certificates Registration of Business Act (SSM)	11
Photo 2.6	Certificate of Johor Centre for Construction Development (JCCD)	12
Photo 2.7	Side Elevation of Bangunan Menara Kastam Negeri Johor	15
Photo 2.8	Front Elevation of Bangunan Menara Kastam Negeri Johor	16
Photo 2.9	15% of completion of futsal court at Plot A, Rumah Iskandar Malaysia	16
Photo 2.10	Maintenance Support Services Report Monthly	17
Photo 2.11	Repair of the Wall tiles and Electrical	17
Photo 2.12	Pruning trees that approaching the building structure, shading, And other obstruct access needed	18
Photo 2.13	Shaping and Trimming the trees to naturalize the growth	18
Photo 3.1	Floor Plan and Area (in yellow colour) for Setting Out of Installation Floor Tiles Finishes	22
Photo 3.2	Prepare the cement render with the right ratio	23
Photo 3.3	Measure of spot pegging marking 20mm	24
Photo 3.4	Mortar spot pegging are prepared to provide correct levels	25
Photo 3.5	Mortar spot pegging are prepared to provide correct levels	25

Photo 3.6	Laid Cement Render which are the Mixture of the four Material Combine	26
Photo 3.7	Further level the surface condition	26
Photo 3.8	Finished the Cement Render	27
Photo 3.9	Finished the Cement Render before Installation tiles	27
Photo 3.10	Identify the Centre Point on the Floor Plan of the Surau Facility	28
Photo 3.11	Lay Mortar and Adhesive	29
Photo 3.12	Apply and laying the SikaCeram–88 adhesive type	30
Photo 3.13	Set tile for Installation	31
Photo 3.14	Spacers between the tiles for same spacing and levelling	32
Photo 3.15	Spacers between tiles for same spacing and levelling	32
Photo 3.16	Spreading the grout joints process	33
Photo 3.17	Spreading the grout joints process	34
Photo 3.18	Cleaning up after Installation	35
Photo 3.19	Cleaning up after Installation	35
Photo 3.20	Measuring tape is one of the Vital Tools for Installation	36
Photo 3.21	Cutting tiles manually using Tile Cutter	37
Photo 3.22	Rubber Bucket	38
Photo 3.23	The grout float	39
Photo 3.24	Handheld Tile Saw used to cut tiles	40
Photo 3.25	Tile trowels	41
Photo 3.26	Tile Mortar Mixer	42
Photo 3.27	Rubber Hammers to make sure the Surface Tiles Level	43
Photo 3.28	Spirit Level in order to check the Surfaces are Level	44
Photo 3.29	Tile Spacers are the new technology for identical Spacing Between Tiles	45
Photo 3.30	Shovel is the Multi-Purpose Tools that Vital for this Project	46

Photo 3.31	Spatula Trowels	47
Photo 3.32	Trolley Construction have multi-function	48
Photo 3.33	Cement Brand used for this Installation	49
Photo 3.34	SikaCeram-88 used as the Adhesive	50
Photo 3.35	Pointing Mortar Gun Tile Grout that fill in with SikaBond	51
Photo 3.36	SikaTop Seal is One of Suitable Waterproofing for this Installation	52
Photo 3.37	Routine Cleaning of Porcelain Granite Tile	54
Photo 3.38	Scratches on Porcelain Granite Tile	55
Photo 3.39	Stain on Porcelain Tiles	56
Photo 3.40	Fila Cleaner products for Periodic Deep Cleaning Maintenance	57
Photo 3.41	Grout Haze Remover products Recommendation	58
Photo 3.42	Sealing the grout	59
Photo 3.43	Sealing the grout	59
Photo 3.44	Restoration of Grout	60

## **CHAPTER 1.0**

### **INTRODUCTION**

#### **1.1 Background Study**

Flooring is a term that refers to a number of materials that are used to cover a floor permanently. Commercial flooring, residential flooring, and industrial flooring are the three primary kinds of flooring goods. Carpet, laminate flooring, or ceramic tile are commonly used in commercial designs such as educational, office, retail, and other commercial spaces. Furthermore, bathroom, house officers, kitchens, and living rooms are typically designed in residential. Ceramic tile, laminates, granite, and wood floors are among the products available. The industrial category, which includes vinyl tiles, granite, and ceramic tile items, is created specifically for factories, garages, and warehouses.

In addition, everything, including tile flooring, has advantages and disadvantages. The pros or advantages of employing flooring tile in our house assets include durability, ease of installation and cleaning, water resistance, minimal maintenance, and, most importantly, environmental friendliness. Every benefit will be attracted to the inhabitants of using flooring tile finishes, and every benefit will be attracted to the occupants of using flooring tile finishes (Jim Postell, 2011).

#### **1.2 Objectives of Study**

The objectives of this report are as follow:

- i. To identify installation of porcelain floor tiles finishes.
- ii. To identify the equipment or tools used for installation of porcelain floor tiles finishes.
- iii. To determine the maintenance of porcelain floor tiles finishes.

### **1.3 Scope of Study**

The scope of study was carried out on focusing how to install finishing porcelain floor tiles that are constructed at Plot B, Jalan Prisma 2, Rumah Iskandar Malaysia, 81550, Gelang Patah, Johor Bahru for the Surau facility. Otherwise, focusing on identify the equipment and tools used for installation and some of the maintenance when using porcelain granite as the floor tiles finishes.

### **1.4 Method of Study**

Two research methods were utilized to gather information and details for this report. There are two types of methods which are primary and secondary. Primary sources are materials that have not been processed or printed and are still in their original condition. These resources are unique and have not been interpreted.

#### **i. Observation Method**

This method of observation is carried out directly, in other words through site visits. The use of photography also supports these observations. At the maintenance site, photographs are essential for gathering additional information such as the supervisor or other workers performing their repair services, the progress of the work, and many more.

#### **ii. Interview method**

The interviews are another option for gathering material for this report. This method is more accurate and allows for a fuller explanation into the project's details. This strategy is carried out through an interview or by constantly seeking advice from a supervisor and contractor who are more knowledgeable and experienced.

Then, for the secondary sources, which is made up of items or documents that have been read and reviewed. The journals, articles, blogs and also that project documentation are examples of the secondary sources. Moreover, the drawing or documentation may be referred to for additional details and information. Otherwise, the secondary sources will be obtained through referring to articles, books, journals, the internet, and any other references related to the construction industry that would be called as the secondary sources.

i. Journals

One of the reading materials created by a person is a journal. The use of a journal can provide you with a wealth of knowledge. Journals are normally kept for individual work, although they can also be kept for a small group.

ii. Books

In this project, the book has been used as a secondary source to get more information about the installation or construction for ceramic floor tiles finishes. There are several books that have been used to obtain information. These types of books are available from the internet and also from internet technology which is websites google books.

iii. Project Documentation

The process of capturing critical project details and providing the documents needed to successfully implement that known as project documentation. Project documents are one of the reading materials generated by BW Assets Management administrative. They range the project file status or progress and also the photography progress. The documentation would be the report as an approved that the maintenance services are completion that included in that record.

## CHAPTER 2

### COMPANY BACKGROUND

#### 2.1 INTRODUCTION

Company name : BW ASSETS MANAGEMENT SDN. BHD

Registration no. : 1356732-A

Registration date : AUGUST, 29, 2007

Company address : G-10 (ARAS BAWAH), BANGUNAN PIJ,  
JALAN REBANA, KEBUN TEH, 80250,  
JOHOR BAHRU, JOHOR.

No. Tel : 07-338119

No. Fax : 07-3327792

Business : GENERAL CONTRACTOR, LANDSCAPING &  
MAINTENANCES SERVICES

Business status : PARTNERSHIP

Owner : ENCIK SALLEH BIN TUKIRAN  
013-7277792



## **2.2 COMPANY PROFILE**

### **2.2.1 Company Information**

#### **2.2.1.1 Contractor registration system (CIDB) formally known as SPKK**

2.2.1.1.1 Registration SPKK/CIDB 0120051219-JH107511  
Validity: 19/1/2017 until 16/5/2019

2.2.1.1.2 G3 – B – B24, B14, B04  
G3 – CE – CE01, CE06, CE21, CE34, CE36, CE43  
G3 – ME – M15

#### **2.2.1.2 JOHOR CENTRE FOR CONSTRUCTION DEVELOPMENT (JCCD)**

2.2.1.4.1 Registration no. : JCCD/SKJ/20/02/02312 Validity:  
1/7/2021 until 31/12/2023

2.2.1.4.2 G3 – B – B04, B14, B24  
G3 – CE – CE01, CE06, CE21, CE34, CE36, CE43  
G3 – ME – M15

#### **2.2.1.3 CIDB**

2.2.1.3.1 Registration CIDB: 0120051219 – JH107511  
(GRED G3)  
Validity: 19/1/2017 until 16/5/2019

#### **2.2.1.4 SURUHANJAYA SYARIKAT MALAYSIA (SSM)**

2.2.1.5.1 Registration no. : JM0313907 – P  
Validity: 23 October 2016 until 26 November 2021

### 2.2.1.5 Bumiputra

2.2.1.6.1 Registration reference: 0120051219 – JH107511  
(Bumiputra status)

2.2.1.6.2 The recognition: 16/5/2019

### 2.2.1.6 Ministry of Finance

2.2.1.2.1 Financial registration: 357 – 02252747 (Bumiputra  
status)

Validity: 14/5/2019 until 13/5/2022

**Table 2.1** List of work done

040102	Raw Material Services
221001	Building and Office Cleaning
221002	Area Cleaning
221003	Garbage Lifting
221005	Pool Cleaning
221010	Plumbing and Sewage Pool Treatment
221104	Labour
221401	Interior Building Decoration
221402	Decorative Street and Area
221503	Machinery and Transportation
222302	Domestic Services
221510	Car Park Services
221506	Building and Store Services

**Table 2.1** List of Work Done

**Source:** BW Assets Management Sdn. Bhd

## 2.2.2 Appendix



No. Siri: TB 206611

**BAHAGIAN PEMBANGUNAN KONTRAKTOR DAN USAHAWAN**  
(Dahulu dikenali sebagai Pusat Khidmat Kontraktor)  
KEMENTERIAN KERJA RAYA MALAYSIA

**SIJIL KONTRAKTOR KERJA  
TARAF BUMIPUTERA**

Adalah dengan ini syarikat tuan seperti tercatat di dalam Sijil ini diiktiraf sebagai kontraktor kerja bertaraf Bumiputera. Pemberian pengiktirafan ini adalah tertakluk kepada syarat - syarat termaktuk di belakang sijil.

<b>NO. SIJIL PENDAFTARAN</b> 0120051219-JH107511	<b>GRED PENDAFTARAN</b> G3 (Bumiputera)	<b>TEMPOH SAH LAKU</b> DARI 17/05/2016 HINGGA 16/05/2019
---	--	--

**NAMA DAN ALAMAT BERDAFTAR**  
BINA WANG C E  
LOT 3A, TINGKAT 1  
BANGUNAN PJ  
80250 JOHOR BAHRU  
JOHOR

<b>PEGAWAI SYARIKAT YANG DITAUHIAHKAN</b> TUKIRAN BIN KEMAT MD SALEH BIN TUKIRAN *****	<b>NO K/P</b> 440123015421 810401015145 *****
---	--

(FATIMAH BINTI ZAKARIA)  
b.p. Setiausaha Bahagian  
Bahagian Pembangunan Kontraktor Dan Usahawan  
Kementerian Kerja Raya Malaysia

Tarikh Cetak: 11/05/2017

**Photo 2.1** Certificate contractor

**Source:** BW Assets Management Sdn. Bhd

# PERAKUAN PENDAFTARAN

Adalah dengan ini diperakui bahawa kontraktor yang dinyatakan di bawah ini telah berdaftar dengan Lembaga mengikut Bahagian VI Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994. Pendaftaran ini adalah tertakluk kepada syarat-syarat yang telah ditetapkan di belakang Perakuan ini

No Pendaftaran: 0120051219-JH107511

Nama Kontraktor: BINA WANG C E

Alamat Berdaftar: LOT 3A, TINGKAT 1  
BANGUNAN PIJ  
80250 JOHOR BAHRU  
JOHOR

Gred, kategori dan pengkhususan berdaftar

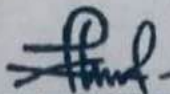
G3	B	B24	B14	B04			
G3	CE	CE21	CE06	CE36	CE01	CE43	CE34
G3	ME	M15					

Tarikh Mula Berkuatkuasa: 19 JAN 2017

Tarikh Habis Tempoh Perakuan: 16 MAY 2019\*

*\*Perakuan ini hendaklah diperbaharui seawat-loatnya 60 hari sebelum tarikh habia tempoh.*

**STATUS: AKTIF** - Kontraktor yang diawardkan projek semasa perakuan pendaftaran ini dikeluarkan.



( OTHMAN BIN SAFAR )

b.p. Ketua Eksekutif

Bertarikh: 19 JAN 2017



Photo 2.2 Certificate of registration with CIDB

Source: BW Assets Management Sdn. Bhd

# Sijil Perolehan Kerja Kerajaan

NO. SIJIL PENDAFTARAN  
0120051219-JH107511

Adalah disahkan Syarikat/Firma seperti butir-butir berdaftar dengan Lembaga Pembangunan Industri Pembinaan Malaysia dan tertakluk kepada syarat-syarat termaktub di belakang sijil.

Tarikh Mula Berdaftar Dengan CIDB : 19/12/2005

NAMA DAN ALAMAT BERDAFTAR

BINA WANG C E  
LOT 3A, TINGKAT 1  
BANGUNAN PJ  
80250 JOHOR BAHRU  
JOHOR

TEMPOH SAH LAKU :

DARI : 19/01/2017  
HINGGA: 16/05/2019

GRED

G3  
G3  
G3

KATEGORI

B (Pembinaan Bangunan )  
CE (Pembinaan Kejuruteraan Awam )  
ME (Mekanikal Dan Elektrikal )

PEGAWAI SYARIKAT YANG DITAULIAHKAN

TUKIRAN BIN KEMAT  
MD SALEH BIN TUKIRAN

NO. K/P

440123-01-5421  
810401-01-5145

(  )  
OTHMAN BIN SAFAR  
b.p. Ketua Eksekutif  
Bertarikh: 19 JAN 2017



**Photo 2.3** Government procurement certificates work

Source: BW Assets Management Sdn. Bhd



## KEMENTERIAN KEWANGAN MALAYSIA

### SIJIL AKUAN PENDAFTARAN SYARIKAT

NO. SIJIL : K66300948572240335  
NO. RUJUKAN PENDAFTARAN : 357-02252747  
TEMPOH SAH LAKU : 14/05/2019 - 13/05/2022

Bahawa dengan ini diperakui syarikat :

BINA WANG CE ( JM0313907P )

LOT 3A, TINGKAT 1,  
BANGUNAN PERBADANAN ISLAM JOHOR  
JALAN REBANA, KEBUN TEH  
JOHOR BAHRU  
80250 JOHOR BAHRU  
JOHOR, MALAYSIA

Telah berdaftar dengan Kementerian Kewangan Malaysia dalam bidang bekalan/perkhidmatan di bawah sektor, bidang dan sub-bidang seperti di Lampiran A. Kelulusan ini adalah tertakluk kepada syarat-syarat seperti yang dinyatakan di Lampiran B. Individu yang diberi kuasa oleh syarikat bagi urusan perolehan Kerajaan adalah seperti berikut :

MD SALEH BIN TUKIRAN

810401015145

KONGSI UTAMA

t.t

DATO' ZAMZURI BIN ABDUL AZIZ

Perbendaharaan Malaysia Semenanjung

b.p. Ketua Setiausaha Perbendaharaan

Kementerian Kewangan Malaysia

Tarikh Berdaftar Dengan Kementerian Kewangan Malaysia : 14/05/2019

(Sijil ini adalah cetakan komputer dan tidak memerlukan tandatangan)

**Photo 2.4** Certificate Company Registration with the Ministry of Finance Malaysia

**Source:** BW Assets Management Sdn. Bhd



SURUHANJAYA SYARIKAT MALAYSIA  
COMPANIES COMMISSION OF MALAYSIA  
(Agensi di bawah KPNRP)

FORM D (RULE 13)



**CERTIFICATE OF REGISTRATION  
THE REGISTRATION OF BUSINESSES ACT 1956  
(ACT 197)**

This is to certify that the Business carried on under the name

**BINA WANG CE  
REGISTRATION NO. : 200003028474 (JM0313907-P)**

has this day been registered until **26 NOVEMBER 2021** in accordance with the provisions of the Registration of Business Act 1956, with its principle place of business at **LOT 3A, TINGKAT 1, BANGUNAN PIJ, 80250 JOHOR BAHRU JOHOR.**

**Number of branches: ONE (1)**

Dated at **JOHOR BAHRU** this **23 OCTOBER 2016.**



MY2005182799188

**NOR AZIMAH BINTI ABDUL AZIZ**  
Registrar of Businesses  
Peninsular of Malaysia



Id: MDSALEH

Date: Mon May 18 12:02:45 2020

Printing Date: 18/05/20

**Photo 2.5** Certificates Registration of Business Act (SSM)

**Source:** BW Assets Management Sdn. Bhd

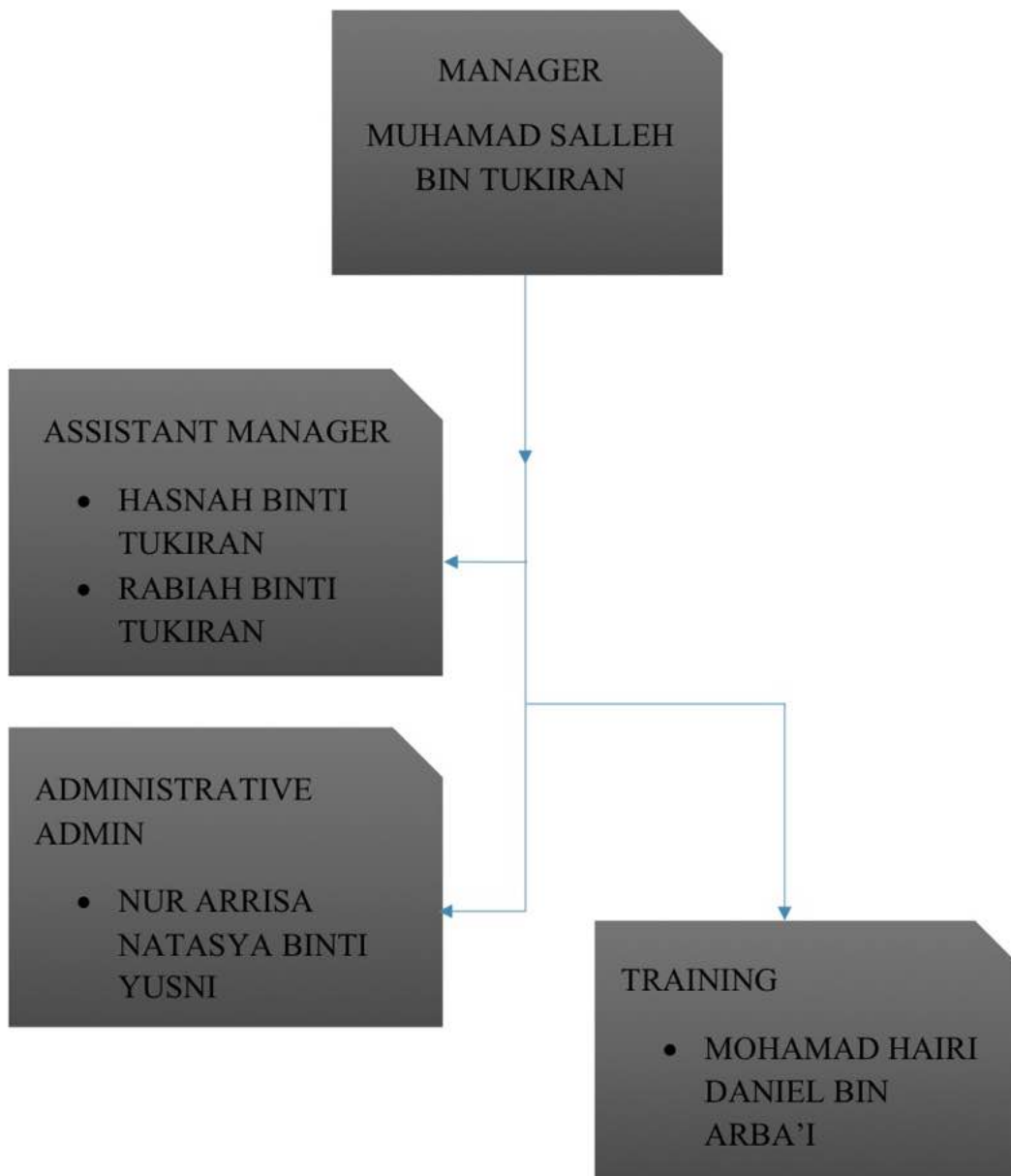


**Photo 2.6** Certificate of Johor Centre for Construction Development (JCCD)

**Source:** BW Assets Management Sdn. Bhd



### 2.3 CHART ORGANIZATION



**Table 2.2** Organization chart of BW Assets Management Sdn. Bhd

**Source:** BW Assets Management Sdn. Bhd

## 2.4 LIST OF PROJECTS

**Table 2.2** Maintenance and Landscaping Services Project List

BIL	(PROJECT)	STATUS
	UNDER KASTAM NEGERI JOHOR	
1.	KAMPUNG KASTAM (66 HOUSE UNIT)	COMPLETE
2.	TAMAN BAKTI (31 HOUSE UNIT)	COMPLETE
3.	TAMAN PELANGI (14 HOUSE UNIT)	INCOMPLETE
4.	TAMAN KENANGA (42 HOUSE UNIT)	INCOMPLETE
5.	TAMAN MELATI (25 HOUSE UNIT)	COMPLETE
6.	SUNGAI PULAI (22 HOUSE UNIT)	INCOMPLETE
7.	PASIR GOGOK (2 HOUSE UNIT)	INCOMPLETE
8.	BANDAR PENAWAR (18 HOUSE UNIT)	INCOMPLETE
9.	PENGERANG (25 HOUSE UNIT)	INCOMPLETE
10.	PONTIAN (KUKUP) (5 HOUSE UNIT)	COMPLETED
11.	BANGUNAN MENARA KASTAM NEGERI JOHOR (RENOVATION – PAINTING)	INCOMPLETED
	(OTHER PROJECT)	
12.	RESIDENTIAL RUMAH ISKANDAR MALAYSIA (LANDSCAPING & MAINTENANCE)	CONTRACT (3 & 5 YEARS)
13.	FUTSAL COURT	INCOMPLETED

**Table 2.3** List of Progressing Projects

**Source:** BW Assets Management Sdn. Bhd

## 2.4.1 Completed and Current Projects

### i. High Rise Building

The maintenance for high rise building that located at Bangunan Menara Kastam Negeri Johor, Johor Bahru. Upgrading with the new design for condition on wall of building paint. The progress for this project were about 60% to complete and the agreement for this completion project around one and half month.



**Photo 2.7** Side Elevation of Bangunan Menara Kastam Negeri Johor



**Photo 2.8** Front Elevation of Bangunan Menara Kastam Negeri Johor

ii. Futsal Court Construction

Proposed to maintenance and completion of futsal court that located at behind PIC Prisma Harta Sdn. Bhd, Plot A, Rumah Iskandar Malaysia, Gelang Patah, Johor Bahru. Upgrading the surface court and also surrounding of that site project. Otherwise, maintenance and renovation for residential apartment and also facilities provided there.



**Photo 2.9** 15% of completion of futsal court project at Plot A, Rumah Iskandar Malaysia.

iii. Maintenance and Renovation

Projects maintenances and renovation services located at Plot A and B, Rumah Iskandar Malaysia, Gelang Patah, Johor Bahru, which is for residential apartment. The project would provide in some maintenances department such are plumbing, electrical and construction. It is to further improve the standard of comfort for the residents there which is a major issue and needed from the clients, Prisma Harta Sdn. Bhd.



**Photo 2.10** Example of Maintenance Support Services Report Monthly



**Photo 2.11** Repair of the Wall tiles and Electrical

iv. Landscaping Maintenance Services

Project maintenances services of landscaping around the environment that located at Plot A and B, Rumah Iskandar Malaysia, Gelang Patah, Johor Bahru. The agreement for the both side which are BWAM Sdn. Bhd and Prisma Harta Sdn. Bhd, in a three years contract that have requirements and specifications of landscaping with the terms and condition.



**Photo 2.12** Pruning trees that approaching the building structure, shading, and other obstruct access needed



**Photo 2.13** Shaping and Trimming the trees to naturalise the growth

## CHAPTER 3

### INSTALLATION OF PORCELAIN FLOOR TILES

#### 3.1 Introduction

This study case describes the whole method or process to construct the installation of porcelain floor tiles finishes and equipment or tools used in the installation of that floor tiles finishes type. Generally, in Malaysia, there are many types of floor finishes with features, but for this case study only focused on the ways or method of installation the porcelain granite floor tiles finishes type. The location of this case study Plot B, Jalan Prisma 2, Rumah Iskandar Malaysia, 81550, Gelang Patah, Johor Bahru for the Surau facility. In addition, this case study also focused on the equipment and tools used while the maintenance on using the porcelain floor tiles finishes. Then, the conclusions and recommendation of that installation tiles type.

Porcelain floor tile finishes is flooring solution made from very dense clay which is fired at higher temperatures than standard ceramic tile flooring. Porcelain tile accomplishes this by employing finer-grained clays fired at a higher temperature, resulting in a harder, less porous surface than regular ceramic tiles. Moreover, it is recognized for being non-porous and exceedingly uniform in construction. This makes it a more reliable option for radiant heating solutions in spaces with changing temperatures. Porcelain floor tiles, on the other hand, can be a little more fragile than normal ceramic tiles, and they share some of the same disadvantages as ceramic tiles, such as their heavy weight, coldness, and hardness underfoot (The Civil Engineer Article, 2012).

### **3.2 Project Background**

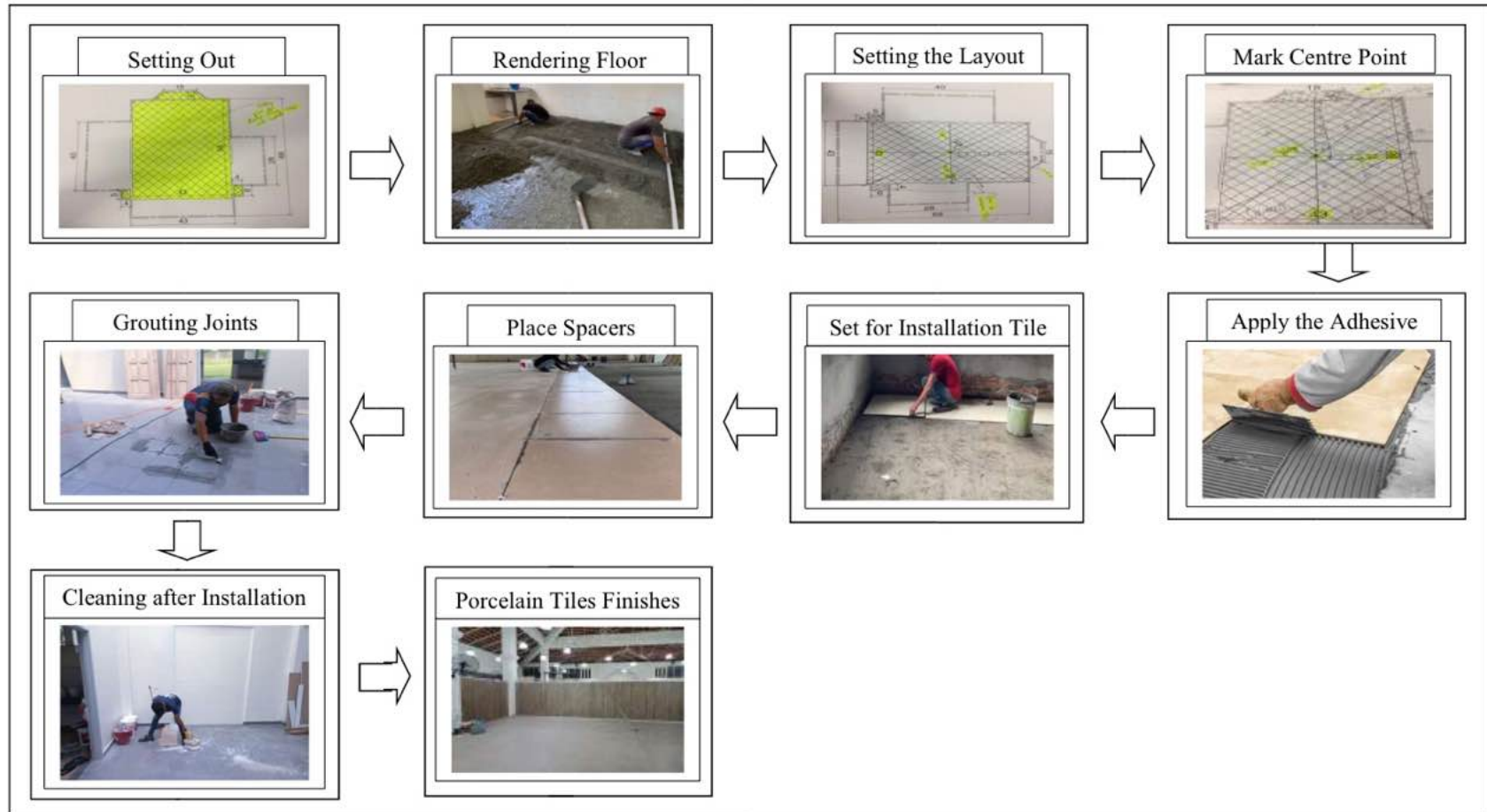
Based on case studies, the project was carried out in practical training is project maintenances services and completion of apartment resident and facilities provided of Rumah Iskandar Malaysia, Gelang Patah, Johor Bahru, Johor. The specific address for the maintenance services for installation of porcelain floor tiles finishes located at Plot B, Jalan Prisma 2, Rumah Iskandar Malaysia, 81550, Gelang Patah, Johor Bahru. The installation of porcelain floor tiles finishes assume to take one or two week for completion. The maintenance services are also constantly improving the facilities so that the occupants can use them better and more pleasantly. Furthermore, the contract length for this maintenance services project is approximately five years, beginning in September 2019 and ending in August 2024 (BW Assets Management Sdn. Bhd Documentation).

In this installation project, there are parties involved directly and responsible for the completion and through smoothly. The parties involved in this project on installation of floor tiles finishes is Muhammad Salleh Bin Tukiran as contractor and also Mr. Azizan as a subcontractor. Then, the other individual that involved for this maintenance services project which is Muhammad Rasul and the team with leading supervised by Mr. Zailani Bin Bahari. Otherwise, parties involved that very important which is Prisma Harta Sdn, Bhd as a client.



### 3.3 CASE STUDY

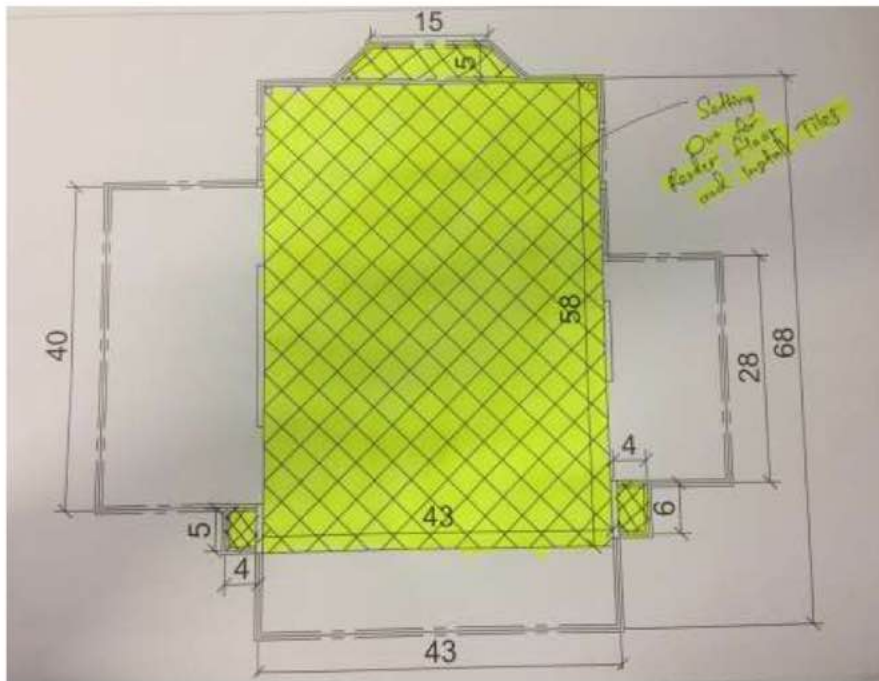
#### 3.3.1 Installation of Porcelain Granite Floor Tiles Finishes



**Figure 3.1** Installation method of Porcelain Floor Tiles Finishes

### 3.3.1.1 Setting Out

The construction of the installation porcelain floor tile finishes is in the process of being laid out. In each project, including this one, the process is critical before beginning construction or any other operation. It is the establishment of the line and marks section in order to determine the position and extent of any elements in order to make the installation easier and avoid any harm. To do the installation floor tiles, measure the length and width of the area that will be covered by the tiles. The size of the based area that will be laid out first in this project is 43' x 58'. Besides, there are two area that included to install floor tiles finishes which are area A (4' x 5'), area B (4' x 6') and area C (23 x 15 x 5) in size. Furthermore, there will be two parties participating in this setting up project which are employees and contractors. Additionally, before installing floor tiles, the floor must first be rendered to ensure a smooth or textured surface. Otherwise, the setting out purpose is to get the actual dimension of the area needed to install before start the next process.



**Photo 3.1** Floor Plan and Area (in yellow colour) for Setting out of Installation Floor Tiles Finishes

### 3.3.1.2 Render Flooring Process

- i) In the rendering floor before installing tiles finishes for Surau Plot B, the method of the rendering floor for this project is cement render that mixture of cement, sand, water, and that cement powders which is SikaTop-107 brand which as addition material with the right ratio. The addition material where also placed on the surface in this project.



**Photo 3.2** Prepare the cement render with the right ratio

ii) Then, make sure that the proper minor fall is towards the edge of the balcony or outside area. This is critical to avoid water ponding on the balcony or outside area, especially when it rains. Between the interior space and the outer area or corridor flooring, the spot pegging marker drops 20mm. Then, make sure to drop to every single border of the space in the region that was built according to the architect's plans. The specified drop height for this project is 20mm, which has been accurately measured.



**Photo 3.3** Measure or spot pegging marking 20mm

iii) The next process in this construct rendering floor is to install spot pegging in the mortar. The finished residential floor level is utilised as a drop reference level. As a result, all of these pegging will be used to ensure that the final cement render levels are proper.



**Photo 3.4** Mortar spot pegging are prepared to provide correct levels



**Photo 3.5** Mortar spot pegging are prepared to provide correct levels

- iv) After spot the pegging, on surface of the newly laid cement render with mixture of cement of cement, sand, water and the additional cement powders are placed on the surface before smoothen by trowelling. Otherwise, it is also poured first prior to placing mortar.



**Photo 3.6** Laid Cement Render which are the Mixture of that four Material Combine



**Photo 3.7** Further level the surface condition

- v) Finished the area that rendering floor needed before installing the floor tiles finishes which is porcelain granite tiles.



**Photo 3.8** Finished the Cement Render



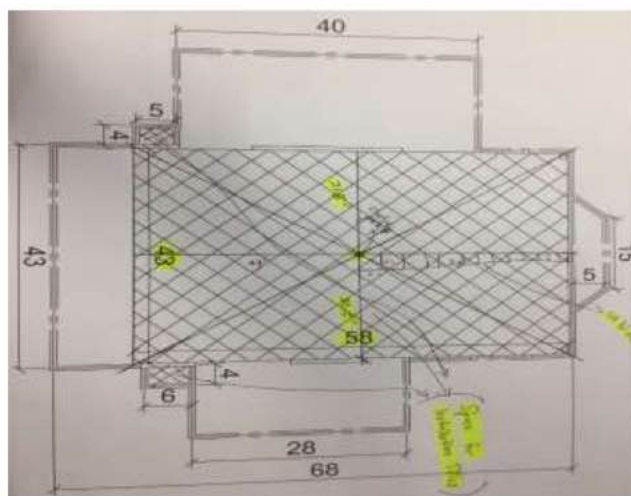
**Photo 3.9** Finished the Cement Render before Installation tiles

### 3.3.1.3 Installing Porcelain Granite Tiles

#### 3.3.1.3.1 Setting the Layout

First of all, the client had been choosing the type of tiles which is porcelain granite tiles for the floor finishes. This type of tiles is very suitable for application on this facilities site project. The size of tiles is 60 cm x 60 cm length, width. From the delivery order receipt (DO), the quantity that had been ordered are 908 pieces. This porcelain tiles type is one of the harder and durable tiles that suitable for the facilities that have a variety or multi-function of activities to carry out which is Surau facilities.

Then, find the centre point of this facility space. Jot down tiles dimension which is 2' x 2' and know exactly length and width dimension. The facility space needed measure across the space then mark the centre. Otherwise, also can find length of the space from the corner to the other corner. Measure the wall using the same units as the tiles. Next, marking the centre point of each of the walls in that space which are 58' length, then the centre point would be 29'. To mark the centre of the space, draw chalk lines between the centre points of opposite walls. Adjust as needed to ensure that the intersection produces ideal squares.



**Photo 3.10** Identify the Centre Point on the Floor Plan of the Surau Facility



### 3.3.1.3.2 Apply The Adhesive

Before applying the adhesive, repeat the process on the shorter walls of that space. Mark the halfway of each remaining floor space by measuring its length. As a general rule, the adhesive should be mixed within 30 minutes of use. Spread a quarter coat on the surface of one grid area with the flat side of the tiles trowel type. Spread out no more than 15 minutes worth of material. Other than that, hold the edge of the tile trowel at about 45-degree angle to the floor, then apply it to the floor. The adhesive for this project is SikaCeram-88 type that had been recommend by contractor and also manufacturer. Moreover, it is used to adhere tiles in thin, continuous layers up to 10 mm thick. It is quite easy to work with, while also great consistency in workability and adhesion to common surfaces.



**Photo 3.11** Lay mortar and Adhesive



**Photo 3.12** Apply and laying the SikaCeram-88 adhesive type

### 3.3.1.3.3 Set for installing tile

Lay a row of loose tiles along the centre lines in both directions, starting at the centre point at each of the four corners, using tile spacers as you go for even, uniform joints. The two tiles, on the other hand, are not too close together and show the minimum space between each tile for the grouting line. Once it is gotten to the walls, need to cut the tiles to fit properly as if that necessarily. Otherwise, use rubber hammer for ensure sure they are level by tapping them with a mallet. As a result, these rubber hammers are used to gently tap the tiles until they are absolutely level.

Then, place the remaining tiles in place. Install the remaining tiles along those straight lines, using the centre tiles as a reference point. Moreover, arrange the tiles so that they face the wall. Lay out the remaining tiles in a straight line until you reach the wall, starting with the four middle tiles. Then, to construct a single row, return to the centre and work your way toward the opposing wall of that space.

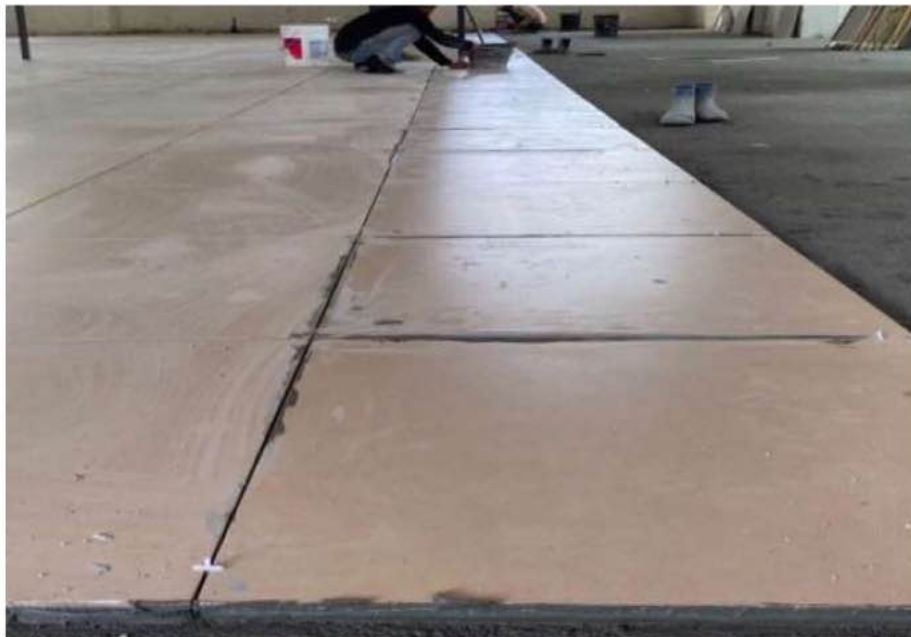
Then, between the tiles, use spacers to ensure that the grout lines are straight. Then it guarantees that each tile has the same spacing between them, as well as a symmetrical finish on the surface.



**Photo 3.13** Set tile for installation



**Photo 3.14** Spacers between the tiles for same spacing and levelling



**Photo 3.15** Spacers between the tiles for same spacing and levelling

#### 3.3.1.3.4 Grouting Joints

Next, allow the adhesive to cure overnight or for 24 hours after all of the tiles have been installed. The grouting or filling of the joints is the next stage. Aside from that, a simple method is to mix the grout into a peanut butter-like consistency. Before the adhesive dries, remove the tile spacers. For this process which is grouting joints, the rubber grout float and additional with SikaBond are the most important and very suitable tools. Scoop some grout onto the tiles with those tools and force it into the joints. It is also made only enough to use in 30 minutes period. Otherwise, the grout spread with the float at an angle to grout lines and force it as far as possible into the joints. Allow 15 to 30 minutes for the grout to set before removing any dirt from the surface and smoothing the grout joints with a moist sponge.



**Photo 3.16** Spreading the grout joints process



**Photo 3.17** Spreading the grout joints process

### 3.3.1.3.5 Cleaning Tile after Installation

After the grouting joints process, it may have the cleaning part. Cleaning up the grout haze can be as simple as wiping it away with a dry cheesecloth if you get to it quickly enough. Before this process, make sure the grout has dried for at least 24 hours and also would not the grout lines harm. Simply use the cloth to loosen the grout on the tile faces, then sweep or vacuum off the dust. In other way, if the haze is not removed by the dry cheesecloth, wet the cheesecloth and cleaning up again and also make sure only little damp, not dripping wet. The water may cause the grout to get moist again, allowing it to be released from the tile. Lastly, cleaning and rearrange tools that have been used on installing floor tiles finishes.



**Photo 3.18** Cleaning up after Installation



**Photo 3.19** Cleaning up after Installation

### 3.3.2 Equipment and Tools used for Installation

For construct on installation of floor tiles finishes, there have some equipment and tools needed for completion of this case study project.

#### 3.3.2.1 Tools

##### i) Measuring tape



**Photo 3.20** Measuring tape is one of the Vital Tools for installation

For this installation floor tiles finishes project, measuring up precisely is possibly the most critical chore for it after all, once those tiles have been cut and adhered to your substrate, there is no turning back. From the setting layout, the tape measure is the important that needed for installation while make sure you have a good quality tape measure with no obtrusive marks. The measure both the surfaces which is plan to tile and the tiles themselves before moving on to the next operation.



ii) **Tile Cutter**



**Photo 3.21** Cutting tiles manually using Tile Cutter

For tile cutter, when at some point the floors are absolutely not level, trim part process needed for a few tiles to make sure the installation would more at ease. Some of the more durable tiles that may require a wet wheel cutter, but the majority of them may be cut precisely using this tools rail cutter. Moreover, most versions of these simple devices include a scribe wheel, which is a wheel made of hard material such as tungsten carbide that is dragged over the tile to nailed it. Then after scribing, the breaking arm is pulled down to break the tile along the straight mark. Rail tile cutters come in a range of sizes, so no matter how big or little your tiles are, it would able to cut the variation type of tiles to the exact measurements needed for the installation.

iii) **Bucket**



**Photo 3.22** Rubber Bucket

The good old rubber bucket is one of the most essential tile installation tools that is often disregarded. So was the bucket required for mixing and transporting the mortar, but it is also easier to clean than the plastic bucket. It is also more robust and adaptable, with buckets serving as good tools in addition to the must-have tools in this case study section, which is floor tile finish installation.

iv) **Grout Float**



**Photo 3.23** The grout float

A grout float is a trowel that has a flat rubber base and a handle that is used to press grout into the spaces between newly installed tiles. The characteristics itself include a robust turning point with a flexible rubber pad coupled to a C-shape grip. Otherwise, the rubber piece acts almost like a wiper while applying grout and is created of that particular composition to protect the tiles. They will wear out over time and will need to be replaced. Moreover, it also can optimise for us to the different levels of hardness and thickness, so that would in advanced delivered the best finish while used it during the installation.

v) **Handheld Tile Saw**



**Photo 3.24** Handheld Tile Saw used to cut tiles

A tile saw is a power tool that has been built expressly for the purpose of cutting tile. A tile saw must meet a number of requirements, and this specialised equipment are particularly handy for anyone who wish to work with tile. Some hardware stores rent out tile saws to persons working on home improvement projects who don't want to invest in one, and tile saws can also be purchased if you know you'll be doing a lot of tiles cutting. While cutting tile using hand tools is doable, using a tile saw is far easier, safer, and more enjoyable.

vi) **Tile Trowels**



**Photo 3.25** Tile trowels

When it comes to tile trowels, make sure they are acceptable and that you obtain the perfect size so it would receive proper and thorough coverage when used it. As a result, the trowels would also come in a variety of sizes, and it would constantly be cleaned of any residues before being used again. This trowel is mostly used to apply tile adhesive. Use margin trowels to load the tile adhesive onto the float, then distributed it on the floor with the straight side. Otherwise, it also must have to comb the adhesive a few times with semi-circular movements to get the proper bed one.

vii) **Tile Mortar Mixer**



**Photo 3.26** Tile Mortar Mixer

One of the most essential instruments for installing floor tiles is the tile mortar mixer. In short, the effects are long-term or long-lasting for installation while assisting in the formation of a strong link. This equipment also included elements like as speeds and motors that are suitable for mixing mortar, cement, adhesive, and other materials. Then, even though it will not make the entire process easier, a high-quality tile mortar mixer is required.

viii) **Rubber hammers**



**Photo 3.27** Rubber Hammers to make sure the Surface Tiles Level

Rubber hammers are useful tools. When putting floor tiles, ensure sure they are level by tapping them with a mallet. As a result, these rubber hammers are used to gently tap the tiles until they are absolutely level.

ix) **Spirit Level**



**Photo 3.28** Spirit Level in order to check the Surfaces are Level

This tool is actually used in different ways or content that is only needed. In order to check if the floor is level, the spirit level is needed and also a basic tool which proves to be essential when installing floor tiles. Place the level on the tiles in every direction to check if the tiles that are installed are horizontal or plumb. Other than that, it helps to assess the quality of the installation. In any case, if the surface is not level, remove the tiles again using a trowel.



x) **Tile Spacers**



**Photo 3.29** Tile Spacers are the new technology for identical Spacing between Tiles

Tile spacer tools are plastic pieces in the shape of a T or a cross that are inserted between the tiles to keep the spacing between them regular and consistent. The spacer creates a gap that is then filled with grout, giving the surface a symmetrical finish. Then, apply a layer of adhesive to the prepared surface before placing the tiles. Place the spacers in each of the tile's corners now. Press the tiles together until the spacers are thoroughly bonded to each tile edge, then place the tile spacers directly on the tile corners. This process guarantees that the spacing between each tile is the same.

xi) **Shovel**



**Photo 3.30** Shovel is the Multi-Purpose Tools that Vital for this Project

A shovel is a tool that is used to dig, lift, and carry bulk goods such as dirt, sand, and cement for this floor tile installation process. The bulk of shovels are hand tools with a medium-length handle and a wide blade. Shovel blades are often made of sheet steel or strong polymers and are extremely robust. Shovel handles are often made of wood, particularly certain varieties such as ash or maple, or glass-reinforced plastic. A folded seam or hem on the back of a sheet steel hand shovel blade creates a socket for the handle. This fold is also utilised to provide rigidity to the blade. The handles are, of course, riveted in place. Where the shovel is designed to move earth and heavy objects, a T-piece is usually attached to the end of the handle to improve grip and control. All of these designs are easily mass-produced.

xii) **Spatula Trowels**



**Photo 3.31** Spatula trowels

This tool is used to level, mix, remove, and model all forms of building materials such as concrete, plaster, and especially mortar for this installation project. Metal spatulas with wooden handles are also available in this feature, as well as spatulas made entirely of plastic.

xiii) **Trolley**



**Photo 3.32** Trolley Construction that have many Function

Single-wheel trolleys are commonly used in construction to transport cement bags, sand, bricks, stones, and other building materials such as concrete. Because of the one wheel, moving the single wheel trolley in any direction is simple.

xiv) **Portland Fly Ash Cement**



**Photo 3.33** Cement Brand used for this Installation

HOLCIM Top Standard Cement is a Portland Fly Ash cement with a high-quality silica-rich coal fly ash that meets all of the CEM II/B-M 32.5 N standards as stated by MS EN 197-1:2007. In the manufacturing of Portland cement concrete, fly ash is utilised as a supplemental cementitious material (SCM). When employed in conjunction with Portland cement, a supplementary cementitious ingredient contributes to the qualities of the hardened concrete by hydraulic, pozzolanic activity, and for both. Otherwise, this type also has a very low shrinkage rate. Concrete with fly ash has a good workability, durability, and that finish.

xv) **Tile Adhesive (SikaCeram – 88)**



**Photo 3.34** SikaCeram – 88 used as the Adhesive

This adhesive is a one-pack premixed cementitious tile adhesive with cement, polymers, quartz mineral, and additives that can be used to bond ceramic, porcelain, and mosaic tiles to floors. Otherwise, it is being used to adhere tiles in thin, continuous layers up to 10mm thick. It is indeed simple to use, with excellent consistency in workability and excellent adhesion to typical surfaces. Also, with normal adhesion classification C1 at air-cured temperature for this adhesive type.

xvi) **Pointing Mortar Gun Tile Grout (SikaBond)**



**Photo 3.35** Pointing Mortar Gun Tile Grout that fill in with SikaBond



**Photo 3.36** SikaTop Seal is One of Suitable Waterproofing for this Installation

SikaTop Seal-107 is the waterproofing that suitable and choose for the mix as the waterproofing for the installation of porcelain granite floor tiles finishes. It is a two-part polymer modified cementitious waterproof mortar slurry comprising of a liquid polymer and a cement-based mix incorporating special admixtures. Then, that would apply to concrete and mortar to prevent water infiltration. Otherwise, de-icing salts, freeze-thaw attack, as well as interior and external waterproofing and damp-proofing of concrete structures. Furthermore, the exterior walls and floors of basements in new construction or renovation. Furthermore, it is simple to prepare and apply, protects against concrete carbonation and water penetration, is nontoxic, and does not degrade steel or iron.



### **3.3.3 Maintenances of Using Porcelain Tiles**

For this purpose, we will primarily concentrate on the cleaning and maintenance of porcelain tiles, which includes a variety of cleaning procedures for various types of natural stone. The performance and aesthetics of the tiles chosen for the project, as well as the project's technical needs, are highly dependent on proper cleaning and upkeep of floor tiles. Poor installation practises, disregard of upkeep, or an inadequate cleaning regimen caused occupiers or consumers to be dissatisfied with their freshly installed tiles. Otherwise, the interior design industry will have to continue to educate and advise our clients on proper maintenance and cleaning techniques. Some complaints for damage to maintenance have been detected, such as discoloration, unclean ability with any products, and smoky floor tiles.

The porcelain tiles should be cleaned on a regular and frequent basis to avoid the build-up of filth, grease, residue sealers, moisture, and liquid dirt, all of which are necessary for keeping the tiles clean and reducing the risk of slipping. Porcelain tiles require very little maintenance in common. There are also provided the maintenance for each department were given back any knowledge about this porcelain tiles maintain and easily have a decade – long lifespan.

### 3.3.3.1 Routine Cleaning

Firstly, clear water or a pH neutral liquid cleaner can be used to clean either it is soapless. To avoid film development, rinse with clear water and wipe dry. Spilled liquids, like most porcelain tile, can stain light-coloured objects if they are not cleaned up right away. Moreover, gently everyday multipurpose spray cleaner to remove any dirt, soap scum, hard water deposits and also mildew. Cleaning agents that contain acids or ammonia are not suitable. The porcelain tiles in the grout and the glazed surface might be damaged by these types of materials. As a result, the goods must be compatible with the grout in order to prevent any damage or discoloration. Then, following a routine cleaning, make sure that the porcelain tiles are completely dry.



**Photo 3.37** Routine Cleaning of Porcelain Granite Tile

### 3.3.3.2 Preventing Stains and Scratches

In other way, while porcelain tiles are scratching, etching, and staining resistant, it is not impervious to damage. Avoid using permanent inks or dyes on porcelain since they may not be reversible. If permanent marker or dye has been used on porcelain surfaces, rinse the area as quickly as possible with water before using an approved cleaning product. Rinse and dry completely. Although porcelain is stained resistant to coffee or other foods, it is best to wipe up spills as soon as possible to avoid stains. Use a cutting board while chopping vegetables, slicing bread, or preparing other items with sharp instruments on a porcelain countertop. Non-abrasive cleaning products and equipment should be used. Prior to cleaning, sweep or vacuum the tile to eliminate any dust or dirt.



**Photo 3.38** Scratches on Porcelain Granite Tile



**Photo 3.39** Stain on Porcelain Tiles

#### **3.3.3.3** Grout Maintenance

Grout has two purposes which is to fills the gap between the tiles and allows the tiles to flex. It reduces tile breakage and becomes a permanent, essential part of the completed installation. One of the more difficult aspects of keeping a porcelain tile floor is the grout. It is prone to absorbing dirt and darkening with time. Cleaning and maintenance are more difficult than with tile.

### 3.3.3.3.1 Periodic Deep Cleaning

It is more easily and can be followed by the residents who have a very hectic lifestyle for this periodic deep cleaning. In this maintenance, the products that should be used are simply called as porcelain tile cleaner which is Fila Cleaner brand. It is not soap based that offer a safer tile in the long run while deep cleaning maintenance, while there are no soap residues left dry on the tiles surface. The floor is also given a nice scrub during this periodic deep cleaning. Aside from that, it was much more necessary if mops were used in a daily or regular cleaning routine. Using the stronger products, the floor will be scrubbed and any carbon or dirt build-up will be removed. Then, focusing attention to the edges and corners of the grout joints to ensure that all residues have been removed and the porcelain granite tiles have been restored. Rinse the floor with clean water to ensure it is spotless.



**Photo 3.40** Fila Cleaner products for Periodic Deep Cleaning Maintenance

### 3.3.3.3.2 Grouting haze remover

During any remaining construction, the new installation should be covered with brown paper that to protect it from debris and allow for moisture evaporation immediately after tile has been laid and grouted. During the first seven days, dampen the grout joints with clear water using a clean sponge or mop. This process speeds up the grout cure time and improves colour retention. Then, haze is film that left behind on the tile after it has been grouted. After the grout has set for 12-24 hours, use a sulfamic acid-based grout haze remover to buff it off the surface. It is available in powder form, which must be blended with water to reach the desired strength. The cementitious grout haze is broken down with this type of cleaning. If your grout is epoxy-based, epoxy haze cleaners are designed specifically for this type of grout. Both haze cleaners are suitable to use on grout and tile, but not natural stone.



**Photo 3.41** Grout Haze Remover products Recommendation

### 3.3.3.3.3 Sealing

The next maintenance of porcelain tiles is sealing that cementitious grout should be sealed after installation. A non-silicone penetrating and impregnating sealer improves its grout resistance to spills, stains, and moisture absorption while also helping it retain to its original colour and lowering maintenance. Grout sealers should be reapplied on a regular basis such as glazed tile does not need to be sealed. Some sealers will endure for several years but the frequency of application will be determined by traffic patterns and normal maintenance. After installation, the grout should be sealed 72 hours later in assuming for that maintenance.



**Photo 3.42** Sealing the grout



**Photo 3.43** Sealing the grout

#### 3.3.3.3.4 Grout Restoration

When grout has become stained to the point where it can no longer be maintained or restored to its natural colour, a grout stain can be used. Grout stains are epoxy-based materials that are designed to permeate the grout and leave a lasting colour on the surface. There is no need to seal the grout with a penetrating or impregnating sealer after it has been tinted. Before staining, clean the grout joint completely with a professional grade tile and grout cleaner to remove any dirt, oils, grease, or sealers. This can be acquired at most home centres or through a professional floor covering vendor in your area.



**Photo 3.44** Restoration of grout



## CHAPTER 4

### CONCLUSIONS AND RECOMMENDATION

#### 4.1 Conclusion

The conclusion of this report is about installation of floor tiles finishes in Surau facility that used porcelain granite tiles, located at Plot B, Jalan Prisma 2, Rumah Iskandar Malaysia, 81550, Gelang Patah, Johor Bahru. The objective of this report is to identify the installation of porcelain floor tiles finishes, as well as the equipment or tools used to install porcelain floor tiles finishes. The third objective, which is maintenance on using porcelain tiles finishes. This report will undoubtedly show the installation process, which starts with setting out, rendering flooring, laying out the layout, determining the centre point, applying adhesive, installing the tiles, placing spacers, grouting joints, and finally cleaning when the installation is complete. Aside from that, the equipment and tools are easier to install due to the descriptions on each tool in this report. In addition, define the porcelain floor tile finishes maintenance, including the use of the appropriate substances or admixtures, as well as methods for preventing stains and scratches, and also routine cleaning. Moreover, in grout maintenance, there are several method such as sealing, grout restoration, grout haze remover and periodic deep cleaning. The process of installation of porcelain granite floor tiles and what equipment and tools should be used for the installation and maintenance of a porcelain tiles may be observed more clearly through the installation of this projects on the site.

## **4.2 Recommendation**

In the future report, it is suggested that conduct research on alternative floor finishes in the interior construction industry. Timber floor finishes, carpet finishes, vinyl floor finishes, and other types of tiles are just a few examples of floor finishes. Furthermore, all of them have a variety of unique features in addition to the benefit of being easy to install in a building. That would be fascinating because the installation process, material, admixtures, as well as the equipment and tools required would all be different to gain more knowledge.

## REFERENCES

Jim Postell, (2011), Materiality and Interior Construction. Retrieved on 20 November 2021,  
from <https://books.google.com.my/>

Pete Brown (2013), a Book about Tile. Retrieved on 20 November 2021,  
form <https://books.google.com.my/>

Gambhir (2014), Building and Construction Materials. Retrieved on 20 November 2021,  
from <https://books.google.com.my/>

Daltile Article (2020), How to Care and Maintain Porcelain Tile. Retrieved on 3 December  
2021,  
from <https://www.daltile.com/how-to/how-to-care-for-and-maintain-tile/how-to-care-for-and-maintain-porcelain-tile>

Building Construction III (Notes), Floor Finishes Part I, II, III, Retrieved on 18 December  
2021.

Anatolia Article, Porcelain and Ceramic Tiles Maintenance, Retrieved on 4 December  
2021,  
from <https://www.anatoliatile.com/>

The Civil Engineer Article (2012), Various Types of Floor Finishes, Retrieved on 20  
December 2021,  
from <https://constructionduniya.blogspot.com/>