DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

PERAK

INSTALLATION OF FLOOR FINISHES

Prepared by:

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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

Nurul Izzah Binti Mohd Nawawi

2017206796

entitled

Installation

Of

Floor Finishes

be accepted in partial fulfillment of the requirement for obtaining the 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 are stated herein, prepared during a practical training session that I underwent at Grand Dinamic Builders Sdn Bhd for a 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.

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ACKNOWLEDGEMENT

Alhamdullillah, praise to Allah, the Most Merciful, the Most Graceful.

First and foremost, thanks to my parent for giving encouragement, enthusiasm and invaluable assistance to me. Without all this, I might not be able to complete this industrial training properly.

The industrial training opportunity I had with Grand Dynamic Builders Sdn Bhd was a great chance for learning and professional development. Therefore, I consider myself as a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me though this industrial training period.

I would like to thank Mr. Alexander Lo, Executive Director of Grand Dinamic Builder Sdn Bhd for the opportunity given, to conduct my training in his esteem company. His team of professionals comprising of Mr. Lian Chee Kian the Project Manager of Aira Residence site project, Mr. Tan Chung Chai the Head of Department Tower B, En. Muhammad Khairil Fahmi the Arch Supervisor and En. Azlan Bin Mohd Satar the Project Coordinator who is also my supervisor during my industrial training in Aira Residence Site Project. They have enabled me to learn and develop my understanding and knowledge here. They are also responsible towards streamlining and assessing my training.

I would also like to thank the rest of the Grand Dinamic Builder Sdn Bhd staff for their support and guidance which helped me to overcome the challenges I faced during my time in Grand Dinamic Builder Sdn Bhd.

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Last but not least, special thanks to all my friends and seniors for sharing their experiences, time and commitment especially during finishing this industrial training program. I am grateful because I have a lot of friends who were always there for me to help and support me throughout the course of completing the internship program.

The time I spent in Grand Dinamic Builder Sdn Bhd as an intern from 5 August 2019 to 20 December 2019 was a memorable one for me as it was rich in experience sharing and helped me discover my potential. I have had so many rich experiences and opportunities that I personally believe will forever shape and influence my professional life while fostering personal growth and development.

Finally, I apologize all other unnamed who helped me in various ways to have a good training. A paper is not enough for me too express the support and guidance I received from them almost for all the work I did there.

ABSTRACT

A floor finish is a general term for a permanent covering of a floor. It is expected to protect and extend the life of the floor while providing an attractive appearance and slip resistant surface. Therefore this report will discuss about floor finishes for every unit in Tower B at Aira Residence. This report was conducted for the floor finishes in every unit at Tower B in Aira Residence project. The objective of this report is to identify all the type of floor finishes used for all unit of Tower B in this project, to investigate the installation process for the floor finishes and to determine the problem occurred and solutions taken to solve the problems. This report will also look at the installation method based on the method statement given from company that responsible for the trade.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

Floors are horizontal elements of building structures which divide building into different levels for the purpose of creating more accommodation with in the restricted space, one above the other and also provide support to the occupants, furniture and equipment of a building.

A floor finish is a general term for a permanent covering of a floor. It is expected to protect and extend the life of the floor while providing an attractive appearance and slip resistant surface. A floor finish is a liquid which is applied to a resilient tile floor and dries to a hard, durable and smooth film. This film is about the thickness of waxed paper and is expected to protect and extend the life of the floor while providing an attractive appearance and slip resistant surface.

A finish floor or floor covering also is the ultimate top layer of all of the flooring layers. A finish floor or floor covering is the layer that you walk on and it is the decorative layer.

Usually, floor covering is a more precise term, since the flooring tends to cover another, structural layer of flooring. Also, finish floor can be confused with the finish of a floor, such as stains and lacquers.

The term 'flooring' also refers to the lower enclosing surface of spaces within buildings. This may be part of the floor structure, such as the upper surface of a concrete slab or floor boards, but typically it is a permanent covering laid over the floor. 'Flooring' can also be used to describe the process of laying flooring material.

When choosing a floor finish, we need to consider how slippery or smooth it is. Plus, do not use very smooth finishes in bathrooms and balconies. Next, consider how abrasion resistant it is. Do not use soft, quick wearing finishes in areas with heavy foot traffic. Marble and wood have low abrasion resistance, for example, and granite and cement tiles have high abrasion resistance. Then, consider whether it is chemically neutral. It is because some finishes react with acids, and should not be used in kitchens.

In a nutshell, flooring is an important part in finishing that will determine the interior design. The floor finishing also require detail in choosing it and need to handle it properly.

1.2 Scope of Study

Geographically, the study area covered by is perched atop Jalan Batai in Damansara Heights on a 3-acre parcel of freehold land. The scope of study for this report is focusing on floor finishes. This scope of study focusing on all the type of floor finishes used for all unit of Tower B in this project, the process of installation, and problem & solution taken for the floor finishes construction for all unit in tower B at Aira Residence.

1.3 Objectives of the Study

i. To identify all the type of floor finishes used for all unit of Tower B in this project.

ii. To determine the installation process for the floor finishes.

iii. To observe the problem occurred and solutions taken to solve the problems.

1.4 **Method of Study**

The research methods involved the administration of questionnaires and industrial training at Aira Residence Project, Damansara Height on a task of title Floor finishes. This section outlines the observation, interviews and document reviews.

a) Observation

In this report, we will be discussing about all the data collected from the industrial training which includes all the type of floor finishes used for all unit of Tower B in this project, the process & method statement and problem & solution taken for the floor finishes construction for tower B at Aira Residence. The observation was conducted during practical training which is on 5th August 2019 until 20th December 2019, located at Aira Residence Project, Damansara Height at Jalan Batai in Damansara Heights, Kuala Lumpur. The data collected during observation is collected in the form of written notes, pictures, recording video and also audio.

b) Interviews

There are two type of interviews that were used such as semi-structured and unstructured interviews. Semi-structured interviews which questions are prepared beforehand. The question was already prepared before and after the working hours. While the unstructured interviews are questions that are questioned throughout the industrial training. The questions are answered by Construction Manager, Site Supervisor, Project Co-ordinator of Tower B for Aira Residence project and other Grand Dynamic Builders' staff in the Aira residence project. The interview was conducted in Malay language.

c) Document Reviews

For this report, the research method I use is document reviews. For my industrial training, as I was assigned under project team for Tower B, the document I refer includes construction drawing of Tower B, floor plan for all unit of tower B, progress report of Tower B, company profile and more.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

Grand Dynamic Builders Sdn. Bhd. is an enterprise in Malaysia, with the main office in Puchong. The main office is located in No.1-45, Jalan Puteri 4/8, Bandar Puteri,47100 Puchong, Selangor.

The enterprise currently operates in the Construction of Buildings sector. The company was established on December 13, 2005. Grand Dynamic Builders Sdn Bhd is a full-fledged building construction firm commencing its operation on May 2013. Grand Dynamic Builders Sdn Bhd is founded on a platform of expertise and competencies in terms of its people, technical know-how and construction innovation towards Quality, Safety and Environment.

Grand Dynamic Builders' vision of being reputable among players in the Malaysian construction industry in building foundations of success for all their stakeholders is pillared by a team of experienced construction personnel with years of exposure in delivering iconic and award-winning structures in building and infrastructure construction projects.

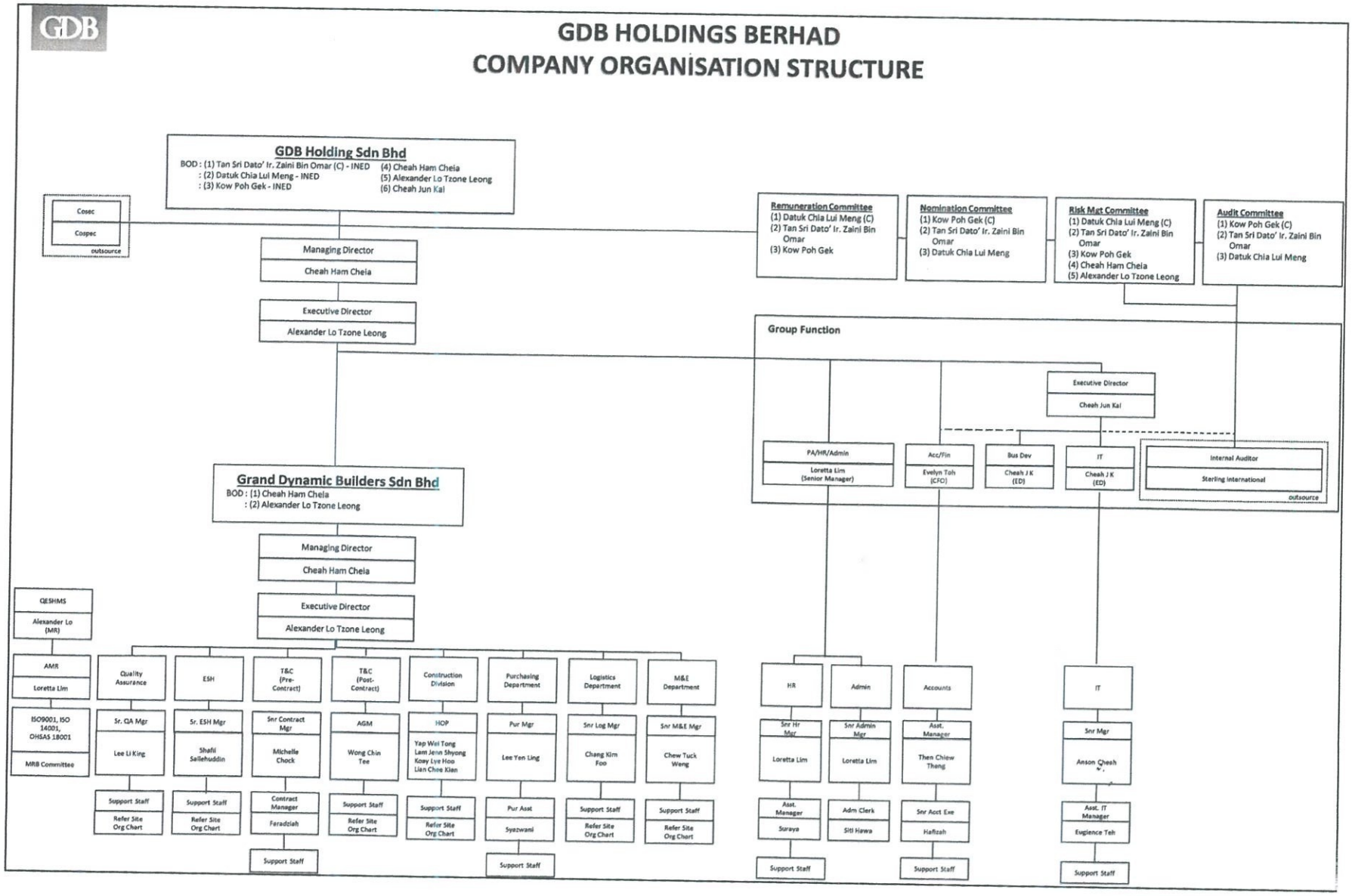


Figure 2.1: HEADQUATERS ORGANISATION CHART

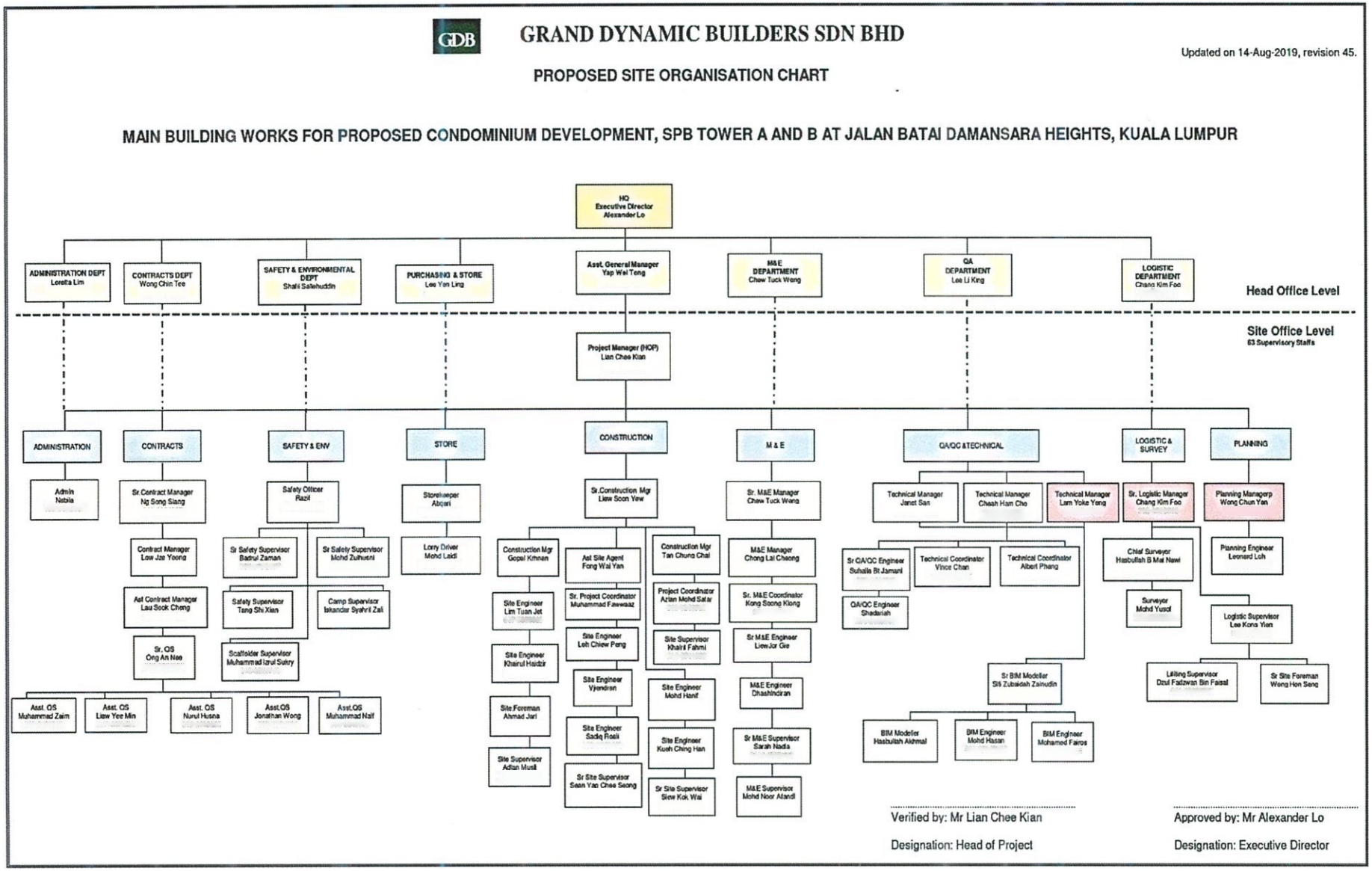


Figure 2.2: AIRA RESIDENCE PROJECT ORGANISATION CHART

2.3 List of Projects

2.4.1 Completed Project

Table 2.1: Completed Project

NO	PROJECT	DURATION	COMMENCEMENT DATE	COMPLETION DATE
1.	**KL ECO CITY** • **Project 1 – Section 1** • **Project 1 – Section 2A (Part 1)** • **Project 1 – Section 2A (Part 2) and Section 2B** • **Project 2**	1 YEARS 11 MONTH 2 YEARS 11 MONTH 3 YEARS 2 MONTH 3 YEARS 7 MONTH	7 April 2014 7 April 2014 7 April 2014 7 April 2014	15 February 2016 14 February 2017 17 May 2017 2 October 2017
2.	**ETIQA OFFICE TOWER**	2 YEARS	01 August 2016	13 July 2018
3.	**WESTSIDE III**	2 YEARS 9 MONTH	21 December 2015	20 October 2018
4.	**DEMENTIA CARE CENTRE**	43 DAYS	17 December 2018	28 January 2019

2.4.2 Project in Progress

Table 2.2: Project in Progress

NO	PROJECT	DEVELOPER	COMMENCEMENT DATE	CONTRACTUAL COMPLETION DATE
1.	**Aira Residence**	SELANGOR PROPERTIES BERHAD	10 August 2017	9 August 2020
2.	**Menara Hap Seng 3**	Hap Seng Land Development (Puchong) Sdn Bhd	1 Nov 2017	31st Dec 2019
3.	**Perla Ara Sentral**	Trans Resources Corporation Sdn. Bhd. (a subsidiary of TRC Synergy Berhad)	16 April 2019	15 Oct 2021
4.	**Park Regent**	Cloudvest Sdn.Bhd	2nd Dec 2019	1st Jan 2023

CHAPTER 3.0

INSTALLATION OF FLOOR FINISHES

3.1 Introduction of Case Study

For this case study report, Aira Residence project that located at Jalan Batai Damansara Heights Kuala Lumpur have been choosen.

The focus of this case study is to identify every type of floor finish for every unit house in tower B at Aira Residence, installation method, problem and solution for the floor finishes.

Therefore, the reason of this industrial training to explore, learn about the construction process of the floor finishes and gain experience in construction industry with the help of the management team of the site.

In this case study, all the requirement needed and elaborates it according to the theory as a guidance have been recorded. Figure 3.1 shows side view of Tower A and Tower B Aira Residence Project.

Figure 3.1: Aira Residence side view

The Aira Residence project is developed by Selangor Properties Berhad. Aira Residence is a luxury condominium conveniently and prestigiously situated at the top of Jalan Batai in coveted lands of Damansara Heights. Aira Residence is a masterpiece orchestrated by three award-winning international designers: Piet Boon from Studio Piet Boon for interior design; Franklin Po from Tierra Design for landscape architecture; and Alen Nikolovski from Aedas as the lead design consultant.

Consist two towers for this project which is Tower A and Tower B. Tower A, with 105 units, and Tower B, with total of 49 units.

Figure 3.2: Aira Residence Tower B side view

Tower B is an old building which in this project tower B are demolished and being upgraded. Been appointed to Tower B operation team. Figure 3.2 shows Tower B of Aira Residence side of view. Therefore for this report, the topic that will be focusing on is Tower B floor finishes for every unit. With only 4 units on each level, every Tower B apartment is a corner unit delighting in the cooling hill-top cross-breezes. Consist 49 units and each unit are 1,894 sq ft. There are two types of unit in Tower B which is type G and type H, type G consist 3 rooms and 2 bathrooms and Type H consist 3+1 rooms and 3 bathrooms.

3.2 Type of Floor Finishes Used

Floor finishes in tower B unit consist of 3 type of floor finishes which is floor marble, tiles, timber. Marble finishes are applied at common are, master bathroom, bathroom 2 and common area. While timber finishes are applied to living area, step at living area and all bedroom. Furthermore, tiles finishes are applied to bathroom 3 and balcony.

3.2.1 Marble

A Marble is a metamorphic rock formed by alteration of limestone or dolomite, often irregularly colored by impurities and used especially in architecture and sculpture. Marble floor tile are also used for both interior and exterior flooring applications. Marble comes in endless colors and patterns. Some of the different colors of marble are red, black, white mottled and banded, gray, pink, and green. It is extensively used for all types of commercial buildings and residential spaces. It is also used for high quality daily use products such as bath tubs, wash basins and souvenirs such as statues.

Type of Marble Used

Botticino marble

Figure 3.4: Marble floor finishes

Area used: Common area, Master bathroom & bathroom 2

Botticino marble is a natural Italian stone with a very fine grain and beige color, sometimes presenting golden accents. Botticino marble is also distinguished, based by quarry of

provenience and block, by splendid shades of lighter color and darker veining, which offer personality and make this marble a perfect one for classical print projects and for Mediterranean styled ones.

Botticino marble is suitable for carrying out projects for interior design as marble staircases and floorings, interior decorations and objects for daily use, facings for luxurious bathrooms and countertops for contemporary kitchens. This elegant and precious Italian marble is also suitable for exterior designs and the finishing that best express its beauty are polished, honed, sanded and brushed.

3.2.2 Tile

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 table tops. 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.

Tiles are often used to form wall and floor coverings, and can range from simple square tiles to complex or mosaics. Tiles are most often made of ceramic, typically glazed for internal uses and unglazed for roofing, but other materials are also commonly used, such as glass, cork, concrete and other composite materials, and stone. Tiling stone is typically marble, onyx, granite or slate. Thinner tiles can be used on walls than on floors, which require more durable surfaces that will resist impacts.

Type of Tiles Used

1) Niro Granite tiles

The series features a seemingly unfinished, concrete effect that strips away all airs of pretension and excessiveness, thereby unlocking the beauty in its essence. Though edgy, the glossy-like surface and neutral colour scheme soften its intensity, keeping an understated look and refined without being overly formal.

- **GMY 01** 600MM x 600MM
- Area used : Maid toilet (wall & floor)

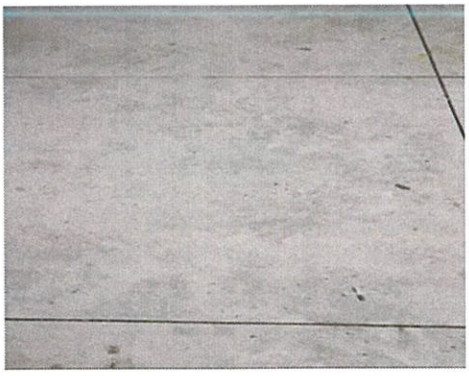


Figure 3.5 Niro Granite

- **GMR 81** 600MM x 600MM
- Area used: Balcony floor

Figure 3.6 Niro Granite

3.2.3 Timber

Wood flooring is any product manufactured from timber that is designed for use as flooring, either structural or aesthetic. Wood flooring refers to finish floors that can be in strips or parquet and nailed or glued to a subfloor. Wood flooring is considered an aesthetic plus to homes. It also offers long life and fairly easy maintenance.

Type of Timber Used

i) Solid Timber

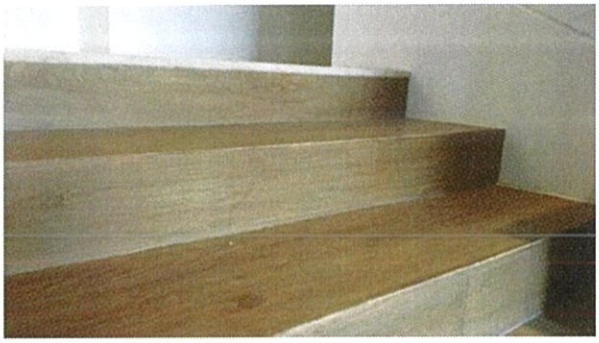


Figure 3.7: Solid Timber Floor

Area use: Step in living room

Solid timber is timber cut directly from the tree in length form. Due to its natural state, it still contains the knots and imperfections that you would expect. The timber is then cut to remove knots and imperfections in the wood. This is usually done by machine. The pieces are then joined back together in an interlinked fashion called finger jointing. Again, this gives the timber added strength.

Hard timber is becoming scarce and expensive due to logging and the long periods of time it takes for most trees to grow. There are many different timbers on the market that range in price, characteristics and strength.

ii) Engineered Timber

Figure 3.8: Engineered Timber Floor

Use for: living room area & all bedroom

Engineered hardwood is made using three to four layers of wood glued together to produce a 14 mm thick plank. A real wood surface about 4 mm in thickness is applied to the top to allow it to be sanded and refinished a certain number of times to remove signs of damage, wear, and tear.

Engineered hardwood construction produces a more stable product. The greater stability means it is less prone to changes from temperature and humidity conditions in the room. This type of flooring is more attractive than a laminate floor, but it is also less expensive than solid hardwood floors.

3.3 Installation Process of the Floor Finishes

3.3.1 Marble & Tiling Installation Method

Table 3.1: Marble & Tiling Installation

NO.	STEP	PICTURE
i.	Wipe & clear dust to make sure no dust or particles during installation at adhesive.	 Figure 3.9 Dust are swipe before installation
ii.	Wet the floor	 Figure 3.10 Wet the floor before putting adhesive
iii.	Apply adhesive behind of the stone or tile. Spread adhesive uniformly over the back of each tile to a thickness as required.	 Figure 3.11 Adhesive applied at the back of tile

Table 3.1: Marble & Tiling Installation

NO.	STEP	PICTURE
iv	Apply adhesive to the floor with a trowel	 Figure 3.12 Adhesive applied on the floor
v	Lay the tiles on to the adhesive on the floor. Adjust the position and press firmly to the floor. Install the stone or tile follow as setting out.	 Figure 3.13 Tile are laid on the floor
vi	Use a spirit level to check the level of the marble & tiles. Also, check the width and straightness of the joints. Check slope level at area necessary with spirit level (Area at: bathroom, balcony, refuse room). Ensure the floor tiles are laid to fall towards the floor traps.	 Figure 3.14 Level checked using spirit level

Table 3.1: Marble & Tiling Installation

NO.	STEP	PICTURE
vii	Brush off loose adhesive and wash adhesive stains on the tiles with clean water. Remove excessive water with dry cloth	 Figure 3.15 Loose adhesive are removed
viii	Fill in full of adhesive in every stone or tile's edge	 Figure 3.16 Adhesive filled
ix	Repeat the process until the whole floor area is done.	 Figure 3.17 Process repeated until area done

Table 3.1: Marble & Tiling Installation

NO.	STEP	PICTURE
x	Put spacers at every stone or tile's joint after laying	 Figure 3.18 Spacers are put at every tile joints

Grouting Works for Marble/ Tile Installation

Table 3.2: Grouting Works for Marble/Tile

NO.	STEP	PICTURE
i.	After marbles is completely dry, remove every spacer from the gaps. Then, use scrapper to clear out all cement debris at every joint.	 Figure 3.19 Spacers removed and scrapper used to clear debris at joint
ii.	Mix cement grouting and apply it at the gaps. Use grout floats to press in to every joint.	 Figure 3.20 Cement grouting are applied

3.3.2 Timber Floor Installation

Table 3.3: Timber Floor Installation

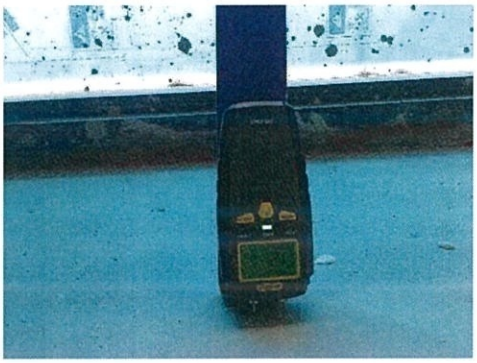
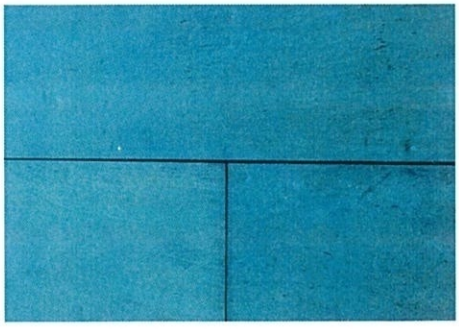
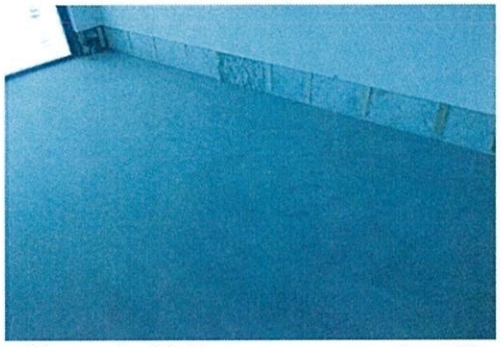
NO.	STEP	PICTURE
i	Clean and dry the sub-base before installation, with moisture content not exceeding 12%.	 Figure 3.21 moisture content are measured
ii	Apply adhesive across the sub floors to cover the whole area in the room. Lay the plywood on the top of the adhesive layer.	 Figure 3.22 Adhesive applied to the floor
iii	Nail down on plywood to screed floor will be apply with concrete nail. Spacing of concrete nail between each other will be varies depends on site condition. First concrete nail from the edge of plywood will be 50mm away	 Figure 3.23 Concrete nail are nailed to plywood

Table 3.3: Timber Floor Installation

NO.	STEP	PICTURE
iv	Snap a chalk line on the underlay.	 Figure 3.24 Chalk line applied
v	Continue spreading adhesive and place row into place.	 Figure 3.25 Adhesive applied at the back of timber layer
vi	Use tapping block or puller to make sure the pieces are fully engaged. Continue the process down the second row and for each new row	 Figure 3.26 Tapping block used

Table 3.3: Timber Floor Installation

NO.	STEP	PICTURE
vii	Nail the timber floor to plywood using nail gun.	 Figure 3.27 Nail gun is used to nail timber floor
viii	Repeat the steps until the floor fully complete.	 Figure 3. 28 Step are repeated until done

3.4 Problem Occurred and Solution Taken

Table 3.4: Problem Occurred and Solution

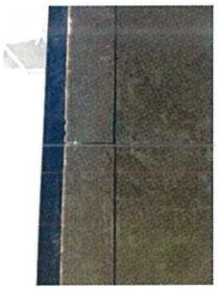
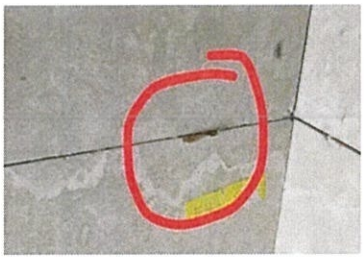
NO.	PROBLEM OCCURED	SOLUTION TAKEN
i.	**Marble/Tile Out of alignment** Due to cutting issue. Manually cut the marble will affect the alignment as the marble were cut using machine at the factory. But workers still install the marble/tile. Workers use unacceptable spacer such as paper. Then the space between the marble/tile will be inconsistent.    Figure 3.29 Marble out of alignment Figure 3.30 Marble out of alignment Figure 3.31 Paper used as spacers	Marble/tile will be re-align and skilled worker will be used for the installation
ii.	**Marble/Tiles Cracks** Cutting and poor handling Damage by other trade after laying it unprotected   Figure 3.32 Marble cracks Figure 3.33 Marble cracks	Marble/tile will be replaced with the new one. If the company who in charge for marble/tile managed to catch the company who caused the cracks, they will back charge them for the cost to replace the new marble/tile.

Table 3.4: Problem Occurred and Solution

NO	PROBLEM OCCURED	SOLUTION TAKEN
iii.	**Marble/Tiles Chipping/jagged edges** Cutting and poor handling Damage by other trade after laying it unprotected  Figure 3.34 Marble chipped	Marble/tile will be replaced with the new one. If the company who in charge for marble/tile managed to catch the company who caused the cracks, they will back charge them for the cost to replace the new marble/tile.
iv.	**Marble/Tiles Inconsistent tonality** After installation, chipped or crack marble/tile will be replaced with the new marble/tile but the colour from new batch of the marble/tile will be slightly different.    Figure 3.35 Inconstant tonality of marble Figure 3.36 Inconstant tonality of marble Figure 3.37 Inconstant tonality of marble	Will refer to the architect the inconsistent tonality is acceptable or not. Architect will decide if the marble need to be replace or not.

Table 3.4: Problem Occurred and Solution

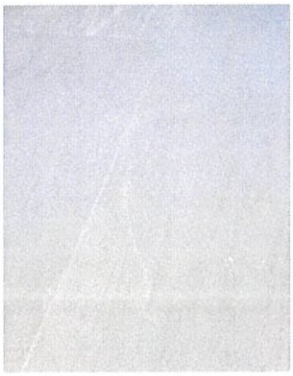
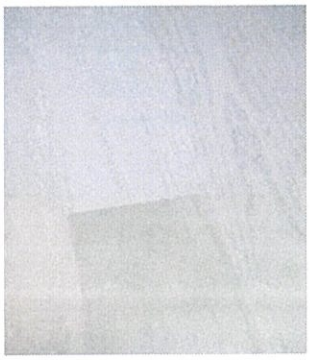
NO	PROBLEM OCCURED	SOLUTION TAKEN
v.	**Timber are Scratched & Dented** Scratched & dented caused by other trade   Figure 3.38 Timber Scratched Figure 3.39 Timber Dented	Use proper protection after installation
vi.	**Visible Gaps Between Timber Strips** Timber shrinkage due to prolonged exposure to dry environment Dimensional defects of timber  Figure 3.40 Visible gaps between timbers	Avoid extreme environment changes Check moisture content properly before installation Check dimensional defects when receive timber

Table 3.4: Problem Occurred and Solution

NO	PROBLEM OCCURED	SOLUTION TAKEN
vii.	**Timber Floor Inconsistent tonality** Miss out during sorting out process.  Figure 3.41 Inconstant tonality of timber	Ensure timber strips tonality are even before installation

CHAPTER 4.0

CONCLUSION

There are many types of floor finishes, but in this project, the floor finishes used in every unit in Tower B are marble, tiles and timber only. In this report, the type of every floor finishes in every unit in tower B at Aira Residence Site, the installation of floor finishes, the problem occurred and solution for the floor finishes is discovered.

The method used during installation is similar to the theory, but as the tower B is an old building, light weight screeding is used rather than normal screeding for the layer before installing the floor finishes. Plus some area needs to be adjusted the size due to existing structure that cannot be demolish.

The marble finishes enhance any room and upgrades the look and quality of spaces. This natural stone needs less maintenance, but the handling techniques are a bit hard as the stone can crack, chipped and so on. The handling and storage need to be in a proper way.

Wood flooring tends to last the lifetime of the house. But, the problem on the site is the installation is a little bit delay cause there are leaking and hacking work in skirting area. As the timber will be affected if it is exposed to water, the installation is delayed. Wood flooring needs to be maintained with care and need to be cleaned using a vacuum and with a damp cloth. Other trade work is still ongoing so the wooden floor that has been installed need to be put protection as the dust or material from other trade will affect the wooden floor and the maintenance will be hard.

It takes more than flooring type to create a great floor. The work that was done before installing the floor finishes ensures that the floor finishes will last for decades and be free from cracks, chipped, squeaks, creaks and common flooring problems.

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