



**DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

**METHOD OF RECTIFYING DEFECTS
(FLOORING, WALL CRACK AND WINDOW LEAKING)**

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

DECEMBER 2019

It is recommended that the report of this practical training provided

By

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2017206788

Entitled

METHOD OF RECTIFYING DEFECTS

(FLOORING, WALL CRACK AND WINDOW LEAKING)

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

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DECEMBER 2019

STUDENT 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 Kengwinston Sdn.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 fulfilment of the requirements for obtaining the Diploma in Building.

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Last but not least, my special thanks to my beloved parents for their sacrifices over the years.

Thank you so much.

ABSTRACT

A defect is a building flaw or design mistake that reduces the value of the building and causes a dangerous condition who stayed in the building. A construction defect can arise due to many factors, such as poor workmanship or the use of inferior materials. Building defects do not appear to have been minimized despite recent advancements in building technology. Some common defects caused by agents such as atmospheric pollution, poor workmanship or the use of inferior materials and climatic conditions are more frequent. This report was conducted for the building of 'HAVRE BUKIT JALIL' that already completed but still in defects liability period for 2 years. The objective of this report is to show how the rectifying work process that majorly reported and describing in how important the rectifying process to avoid any accident happened. Last but not least, from my observation for this building, there are a lot of defects that occur and mostly in major.

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CHAPTER 1.0

INTRODUCTION

1.1 Background and Scope of Study

In this modern era, there are more and more-high rise buildings being developed by the clients or contractors due to the reason of insufficient land use and high population of people. New buildings mean different thing to different people. In fact, there is not exact definition for what is meant by new building. However, the definition is Centre around the age of the buildings. While some might consider building less than five years old as new building some might considered building less than ten years old as new. In this research project, new building is defined as building within the defect's liability period. In Malaysia, the defects liability period is from 12 months to 24 months which is 1 to 2 years (Minter, 2016). After that, the buildings will be defined as new which is free from DLP.

Building defect is one of the major components of building problems that significantly needed attention. When a building fails to function as it should, we must immediately seek for the determination. Building defect occurs to either the new building or old ones. Defect within new buildings is maybe of non-compliance with Building Code and published acceptable tolerances and standards. Menwhile, the older buildings or building out of warranty period may not comply with these standards but must be judged against the standard at the time of construction or refurbishment. Defects and deterioration are common problems in any built structures. However, various defects are common in an old structure. Defects are defined as the deterioration of building features and services to unsatisfactory quality levels of requirement of the users.

Furthermore, a building is a place where people accommodate and work together or for an organization to conduct its work (Seeley, 1987 in Olanrewaju & Abdul-Aziz, 2015). Moreover, the purpose of a building is to give a comfortable and healthy surrounding for people to conduct activities, to provide security, sustain load and environmental shelter or control (Olli, 2004). Besides that, buildings can be differentiated by its function, number of stories, purposes and there are various types of buildings. For example, residential building, commercial building, educational building, industrial building, 2 government building and etc. However, there is occurrence of defects and failures in the buildings due to various causes and building defects are still

One of the major issues which construction industry need to deal with (Ahmad, 2004). For instance, honeycombs, hairline cracks at beams, faulty design, construction materials, structural cracks in walls, reinforcement bars of columns became rusty due to expose to sunlight and rainwater and etc. Apart from that, unnecessary effort was needed in order to correct the construction error which is rework (Josephson et. al., 2002). Rework will affect the performance and also the cost for construction industry. According to research from the Construction Industry Institute (CII), it shows that the direct costs cause by the rework is amount to 5% of total construction costs (CII, 2005). Therefore, this research's aim is to evaluate the causes of defects in Malaysia buildings and this chapter contain the objectives which are to identify the causes, types and solutions for defects in new buildings.

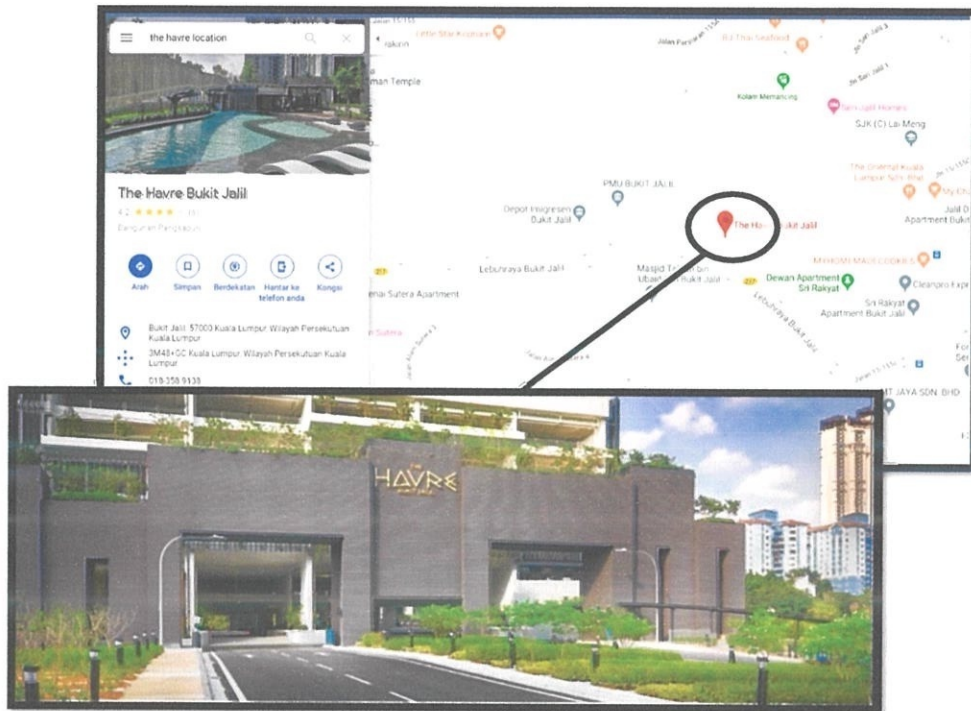


Figure 1.1
Site Location

This case study was conducted at The Havre Bukit Jalil as figure 1.1 shows the location of The Havre, Bukit Jalil. The main objective or scope for this case study is to identify defects occur in the building and explain how rectification process for this completed project.

1.2 OBJECTIVE

- i. To determine the causes of building defects.
- ii. To explain method of rectification works.

1.3 METHODS OF STUDY

I. Interview

Interview sessions with several people who incharge on the site. Those people are the project manager, supervisor, main contractor, sub-contractor, skilled worker, unskilled worker and others.

II. Internet

Research on the nternet was made to increase knowledge or infioration about this report topic. For example, explore google website and youtube that is related to rectifying works such as how to rectify hollow tiles, tiles polish and more.

III. Observation

Observation was made during the practical training period. I observed how skilled and unskilled workers do the rectification works and also how project manager deals with defects issue and how to settle it.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

Kenwingston Sdn.Bhd is a construction company in Malaysia. This company was established since 13th July 2010. The head office located at address of No.82, Jalan Wangsa Delima 6, Pusat Bandar Wangsa Maju (KLSC), Seksyen 5, Wangsa Maju, 53000 Kuala Lumpur. Figure 2.1 shows the headquarters of Kenwingston Sdn Bhd. This company is under Suruhanjaya Syarikat Malaysia and CIDB.

The year, 2018, marks the new Kenwingston as a property developer. Construction, which used to be their main area of business, now able supports their property development activity. Kenwingston decided to move from construction to development is, because of their expertise in property construction has empowered them to build even more quality products to achieve a higher level of customer satisfaction. Kenwingston are continually working hard to deliver luxurious homes and they want their customers to feel proud buying properties developed by Kenwingston and to feel a sense of belonging as a Kenwingston community.

The Managing Director of Kenwingston Sdn.Bhd is Dato' Lam Lovis Kong Tang, followed by Executive Director which are Mr. Eddie Lim Eng and Mr. KC Lau and fellow project directors which are Mr.Lew Kok Sin, Mr. Yeoh Boon Lim, Mr. Ryan Tang Seng Wai, Mr. Jimmy and Mr. Edward Lim Wei Chuan.



Figure 2.1
Kenwingston Sdn.Bhd in Wangsa Maju, Kuala Lumpur

2.2 Company Profile

Date of incorporation:	13th July 2010
Registration No:	0907815P
Paid up capital:	RM 16,000,000.00
Address:	Wisma Kenwingston, No 82, Jalan Wangsa Delima 6, Pusat Bandar Wangsa Maju, Seksyen 5, Wangsa Maju, 53300, Kuala Lumpur
Phone / Fax:	
Email:	kenwingston.my@gmail.com
Board of Directors: Managing Director Executive Directors Directors	Dato' Lovis Lam Kong Tang Eddie Lim Kim Eng Kc Lau Ryan Tang Seng Wai Edward Lim Wei Chuan Jimmy Chia Hue Chian Lew Kok Sin Yeoh Boon Lim
Company Logo	

Table 2.1
Company Profile

2.3 Organization Chart

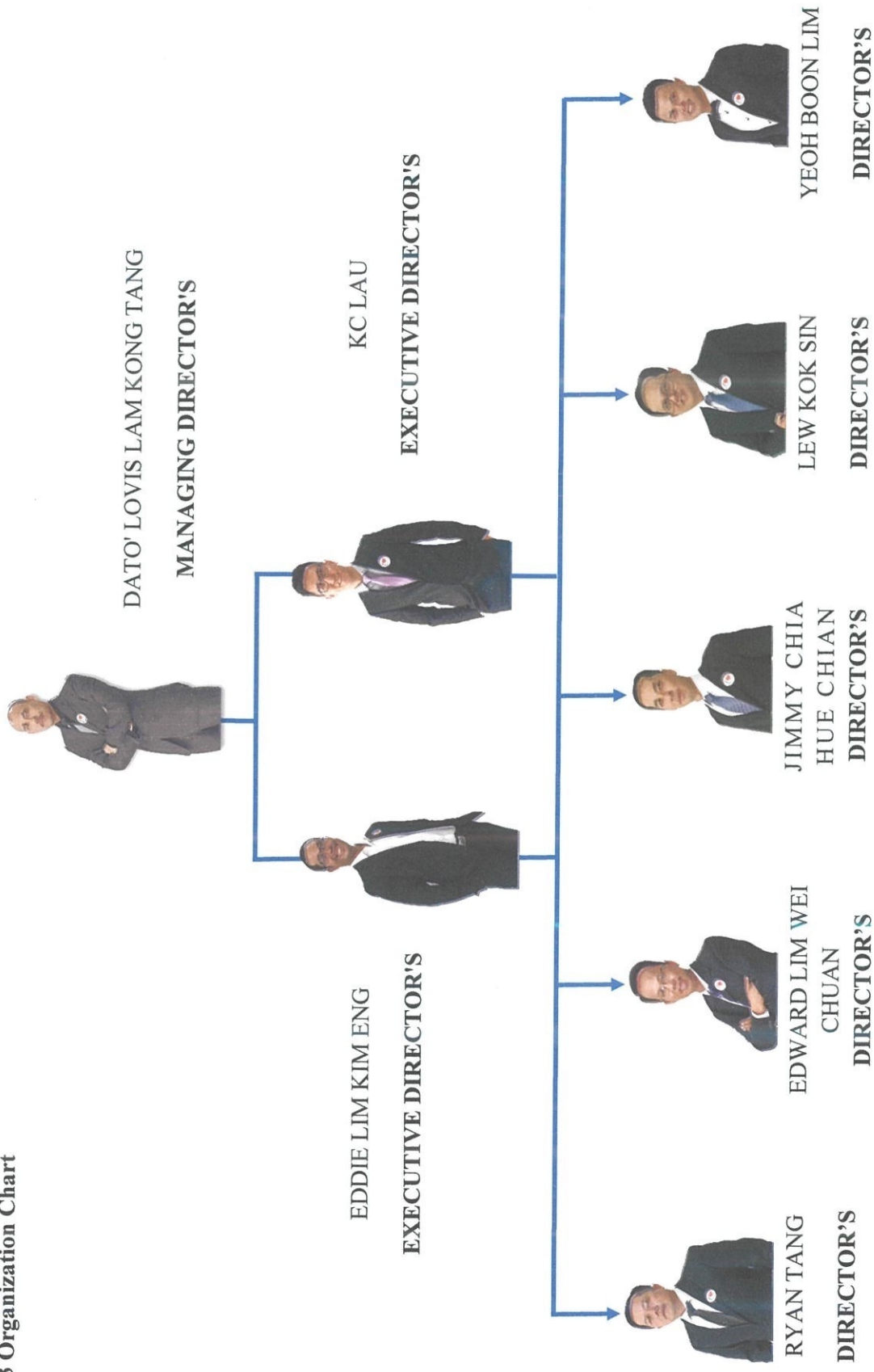


Figure 2.3 (a) Organization Chart of Kenwingston Sdn.Bhd

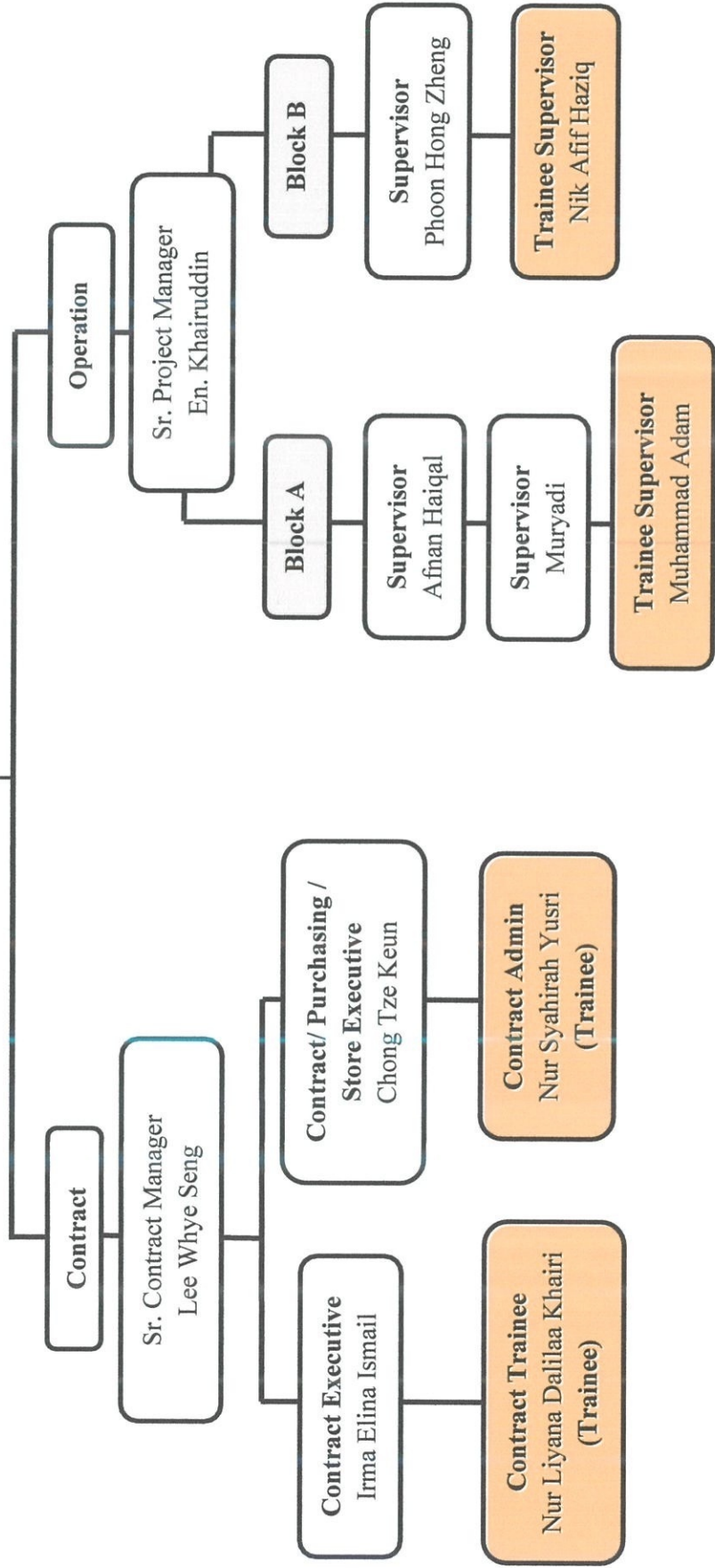
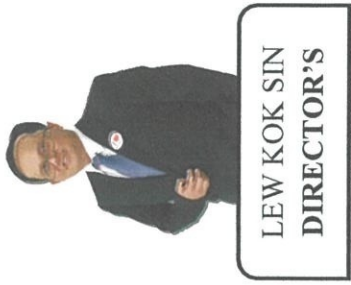


Figure 2.3 (b) Organization Chart of The Havre Project

2.4 List of Project

2.4.1 List of Completed Project

Table 2.1 Completed project

No.	Name	Location	Project
1.	Era Wangsa	Shah Alam, Selangor Darul Ehsan	27 Units of Terrace link (3 Storey)
2.	Seri Wirani	Bandar Baru Bangi,	115 Units of Terrace link (2.5 Storey)
3.	VUE Residences	Jalan Pahang, Kuala Lumpur	Service Apartment with 272 Units (24 Floors)
4.	The Wharf Residence	Taman Tasik Prima, Puchong, Mukim Petaling, Daerah Petaling, Selangor.	Service Apartment of 1002 units (29 Floors)
5.	De Centrum	Taman Unipark Suria, Jalan Ikram- Uiten, Mukim Dengkil, Daerah Sepang, Selangor Darul Ehsan	Small Office Home Office (SOHO) that consist of 19 Storey
6.	Almyra Residence	Bandar Putra Mahkota, 43000 Bangi, Selangor	Mix Development with 669 units of service apartment
7.	PRIMA	PRIMA, Putrajaya	Perumahan Penjawat Awam
8.	Seasons Garden	Wangsa Maju, Mukim Setapak. Kuala Lumpur.	1 Malaysia with 846 units Service apartment of 1502 units
9.	Conezion	Mukim Dengkil, Daerah Sepang, Selangor	Apartment (864 units)
10.	Kuala Lumpur Traders Square	Gombak, Kuala Lumpur	Mix Development with 31000 units of apartment
11.	Parkhill	Bukit Jalil, Kuala Lumpur	4 high rise apartment towers on podium with 2600 units
12.	The Henge Residence	Taman Metropolitan, Kepong, Kuala Lumpur	Mix Development (2986 units apartment)
13.	The Havre	Lebuhraya Bukit Jalil, Bukit Jalil	Apartment with 2 Blocks that consist of 1052 Units
14.	Jalilmas	Lebuhraya Bukit Jalil, Bukit Jalil	Apartment with 2 blocks that consist of 1050 units

2.4.2 List of InProgress Project

Table 2.2 InProgress Project

No.	Name	Location	Project
1.	The Societe	Desa Sri Hartamas, Sri Hartamas, Kuala Lumpur	Mix Development
2.	Square Garden	Cyber 9, Cyberjaya	Mix Development
3.	Skylofts	Subang Jaya, Selangor	Service apartment with 869 units
4.	Avenue	Sungai Besi, Kuala Lumpur	Service apartment with 619 units
5.	Platz Project	Gombak, Selangor	Mix Development

CHAPTER 3.0

CASE STUDY

3.1 INTRODUCTION OF CASE STUDY

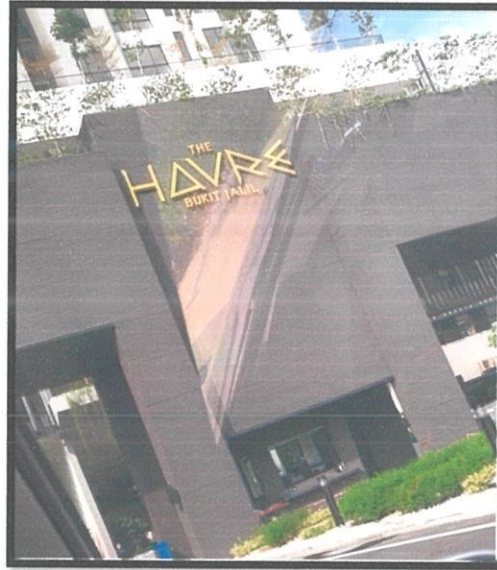


Figure 3.1
Location of Case Study

All construction projects that newly completed will have their defects. Construction defects are generally defined as defects in design, workmanship, and in materials or systems used in a project that result in failure of parts of a building or structure and cause damage to humans or property. When this happens technically it requires us to identify the defect itself in the case of the type or cause of the defect as well as the corrective work we need to choose to fix the defect. For my case study, the defects that commonly happened and reported by the owner are flooring, wall crack and leaking.

This project consists of 2 phases which is Phase 1 and Phase 2. Phase 1 consists of 2 blocks of affordable apartments which comprising of 1050 units. Block A with 39 floor, 525 units and Block B with 39 level consisting of 525 units. This phase 1 project also consist of many facilities including 8 levels of parking podium with resident facilities, electrical substation, refuse chamber and guard house.

Phase 2 consists of 2 blocks of apartment which is Block A with 34 floors consisting of 525 units and 34 floors with 543 units for Block B. This phase 2 project also consist of many facilities including 6 levels of parking podium, 3 level of underground car park, with facilities swimming pool, sky garden, multifunction hall, games room, electrical substation, refuse chamber as well as guard house. This project located on Lot 15252, 6.847 acre, Lebuhraya Bukit Jalil, Bukit Jalil, Mukim Petaling, Daerah Kuala Lumpur.

In my case study, I will explain how the rectifying process begins and completed for flooring defects, wall cracking and leaking. This process was carried out at The Havre, Block B as I was assigned to manage the defects from level 17 to 27 for this block.

3.2 Flooring (Hollow Tiles)

Flooring is the general term for a permanent covering of a floor, or for the work of installing such a floor covering. Floor covering is a term to generically describe any finish material applied over a floor structure to provide a walking surface. Materials almost always classified as flooring include carpet, laminate, tile and vinyl. For Havre project the major issues of flooring reported by the owner is hollow tiles. Owner will usually call Inspector or check for hollow tiles by themselves. After hollow tiles had been identified, owner will put stickers on the tiles and post them in Alfred Application as shown in figure 3.2 and figure 3.3. After supervisors received the report in the Alfred Apps from the owner, supervisor or skilled workers will check again the tiles with stickers to ensure its ruly hollow by using tapping rod (sweeping it not knock) as shown in figure 3.4. Hollow tiles usually happen due to a deficiency of screeding materials (ordinary portland cement + course sand) as shown in figure 3.5 and less compact of adhesive cement Sika 288MY (during construction) before installing tiles. Thus, it will affect the hollowness of tiles and need to be rectified to avoid tiles from poop out from the floor and wall.



Figure 3.2
The owner put stickers on the tiles are hollow

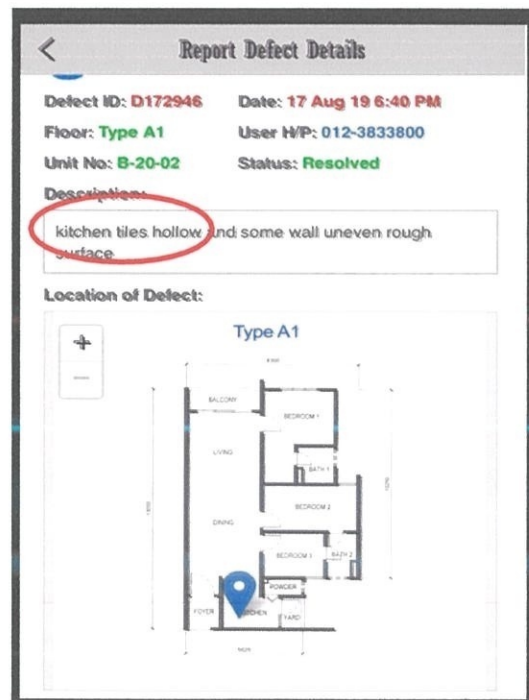


Figure 3.3
The owner submits complain in Alfred Apps




Figure 3.4
Supervisor check the hollow tiles
put sticker by the owner






Figure 3.5
Deficiency of screeding


3.2 Method Statement (Hollow tiles)

No	Operation	Diagram	Labour	Equipment	Duration
1.	<p>Checking the tiles using “tapping rod” by sweeping it on the tiles and sound will be obtained if the tiles are hollow based on Qlassic Standard.</p>		<p>Supervisor Skilled workers</p>	<p>Tapping rod</p>	<p>10min</p>

No	Operation	Diagram	Labour	Equipment	Duration
2.	Grinder the grouting of the tiles that hollow and knock out the tiles from the floor or wall	 <p>The diagram consists of four photographs arranged in a 2x2 grid. The top-left photo shows a worker in a green shirt using a grinder on a tiled floor. The top-right photo shows a worker in a dark shirt using a hammer to remove a tile. The bottom-left photo shows a worker in a dark shirt using a chisel to remove a tile from a wall. The bottom-right photo shows a worker in a blue striped shirt using a hammer to remove a tile from a wall.</p>	2 Skilled Workers	Grinder Hammer Chissel metal	30min

No	Operation	Diagram	Labour	Equipment	Duration
3.	<p>Pour water into the hollow area and put some portland cement around the area and left it to 15 minutes until it becomes solid (For Floor) before installing the tiles.</p> <p>Apply Sika Cement 288MY (adhesive) to the wall tiles hollow and left it 15 minutes until it becomes solid (For Wall) before installing the tiles.</p>	 <p>The diagram consists of four photographs arranged in a 2x2 grid. The top-left photo shows a worker in a green shirt pouring water from a white bucket into a hole in a concrete floor. The top-right photo shows a rectangular area of dark grey cement being applied to a light-colored wall. The bottom-left photo shows a hand holding a bucket of grey adhesive, pouring it into a hole in a wall. The bottom-right photo shows a hand using a trowel to spread the grey adhesive on a wall surface.</p>	<p>1 Unskilled Workers 1 Skilled Workers</p>	<p>Water Portland Cement Sika Cement Scraper Trowel</p>	<p>15min</p>

No	Operation	Diagram	Labour	Equipment	Duration
4.	Mix sika cement 5.5–6.0 Liter of water per 25 kg bag		1 skilled workers 1 unskilled workers	Sika Cement 288MY Water Mortar mixer	3 min
5.	Apply Sika Cement (adhesive) on the floor or wall tiles in wavy and fix it according to other tiles and ensure all the gaps between each tile 2mm using tile spacer	<p data-bbox="491 1496 523 1585">Apply:</p>   <p data-bbox="874 1532 906 1585">Fix:</p>  	2 skilled workers	Sika Cement 288MY Scraper Rubber hammer Tile spacer	15 min (for 1 tiles)

No	Operation	Diagram	Labour	Equipment	Duration
6.	After all the tiles fix, left it 15 min then apply new grouting to the tiles that rectified and hollow tiles are done rectified		1 unskilled workers	Portland cement Scraper Sponge	3min (for 1 tiles)

3.3 Wall cracking

Cracks in the walls and ceiling of residential buildings can be a source of concern to homeowners, as cracking may indicate serious structural problems and give a building an unsightly look. For Havre project the commonly be reported by the owner or security is wall crack around corridor and inside their units as figure 3.6 and figure 3.7. There are few common reasons why the cracks can occur on walls. The reasons are because of contraction and expansion, weather forecast problem, low-quality paint, impatience during plasterwork and poor paint job. Here are a few methods of rectifying the wall cracks.

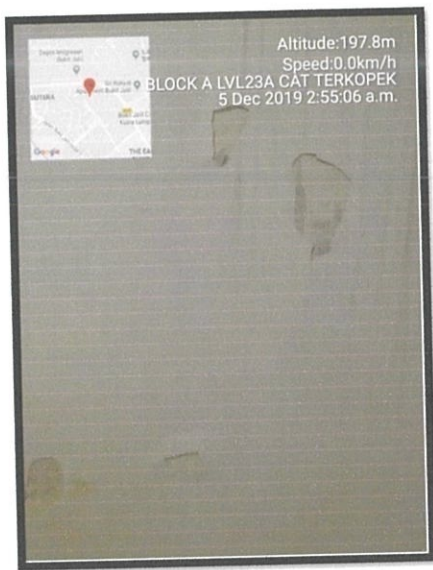


Photo 3.6
Crack wall (Corridor)

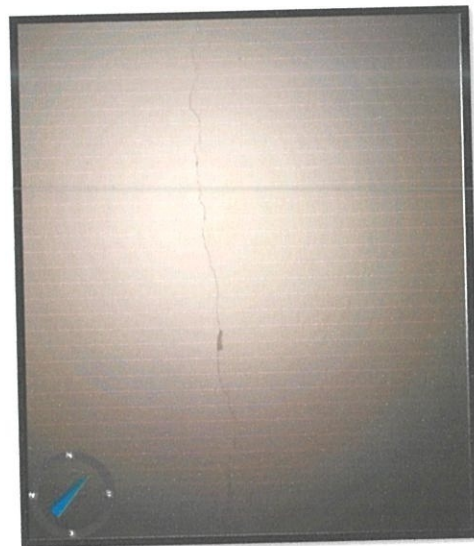

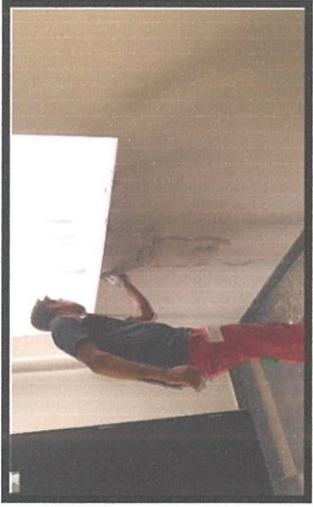

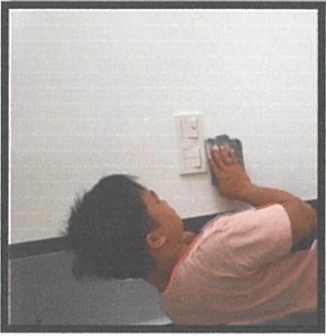



Photo 3.7
Crack wall (Owner unit)

3.3 Method Statement (Wall Cracking)

No	Operation	Diagram	Labour	Equipment	Duration
1.	<p>Enlarge and create a deeper the hairline crack before starting the repair work. Reasons why make it more opens is for it easily clean out the loose concrete, paint, debris before rectify and it helps the filling properly fill the insides of the crack</p>		1 skilled / unskilled workers	Scraper Brush	10min

No	Operation	Diagram	Labour	Equipment	Duration
2.	<p>After cleaning the crack, the crack area was primed with a concrete bonding adhesive. At this site, we use “cement-gluе” as the adhesive. Multiple coat of cement glue was applied and let dry</p>		1 skilled workers	Scraper Sand paper Sika cement 288MY	12 hours
3.	<p>Apply (ASG) by using flexible putty knife. At the end remove excess and flatten it on the wall with the help of paint scrapper. ASG is specially formulated for quality finishing of drywall joints.</p>		1 skilled workers	ASG Putty knife Paint scrapper	30min

No	Operation	Diagram	Labour	Equipment	Duration
4.	Smooth the patch surface by using fine grade sand paper and make sure its level with surrounding surface. If there is still have gap between crack layer and surrounding, just apply second coat. Once it gets dry, apply with sand paper again.		1 Unskilled Workers	Sand paper	15min
5.	Then, apply paint after the patch dried. Always ensure the first coat paint has properly dried before applying second coats		1 skilled workers	Brush roller paint	15min

3.4 Leaking

“Leak” means to allow light or fluid to escape, or to enter or escape as though through a hole. Light can leak in through the curtains, water can leak out of an almost-closed faucet, or information can leak to the press. A leak is almost always a bad thing it indicates that something that should be contained has broken out or escaped. Leaking could be many meanings. For construction industry, the major problem that always is facing is water leaking from an unknown source and it so worrying. In Havre site, the common issues reported by the owner during heavy rain are water stress in from window and water seepage as figure 3.8. The reason why this happened is because of improper plaster, the gap from rubber of the glass and crack from the outside of the window as figure 3.9. Water stress into the unit from the window will affect the surrounding wall near the window (bubble, watermark, and paint peeling off) and sometimes it causes timber floor damaged as figure 4.0. The action had been taken from Subcon is to cover all improper plaster, the gap from rubber of the glass and crack apply colourless silicon 4mm aligned the window.

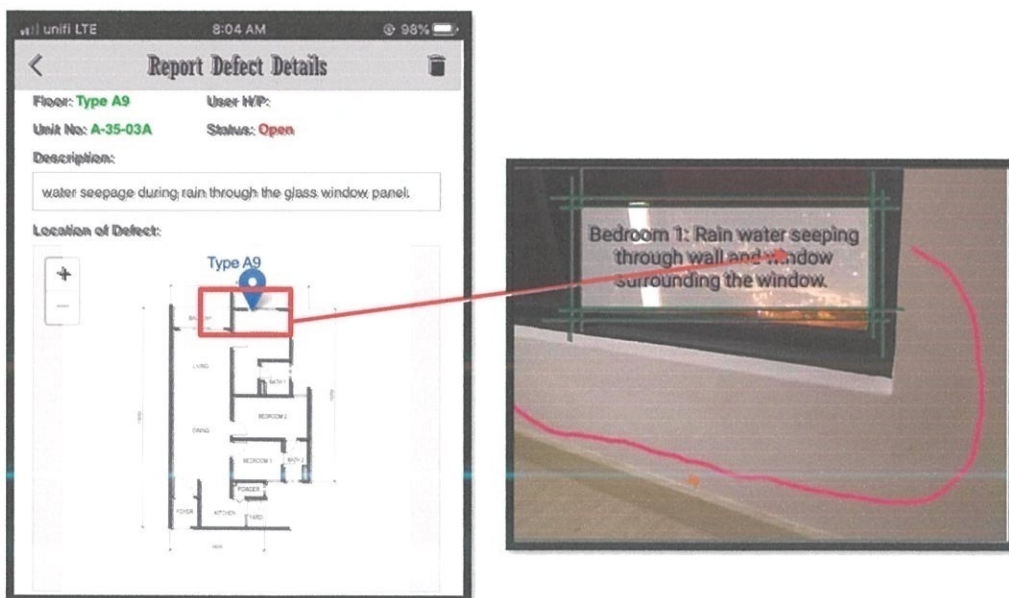


Figure 3.8

The owner complains water seepage during heavy rain

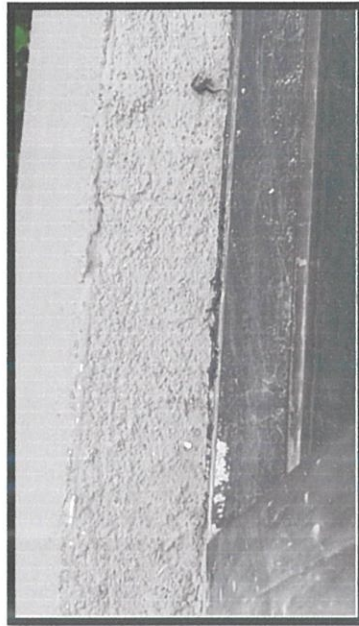


Figure 3.9
Crack/hole from the outside
of the window

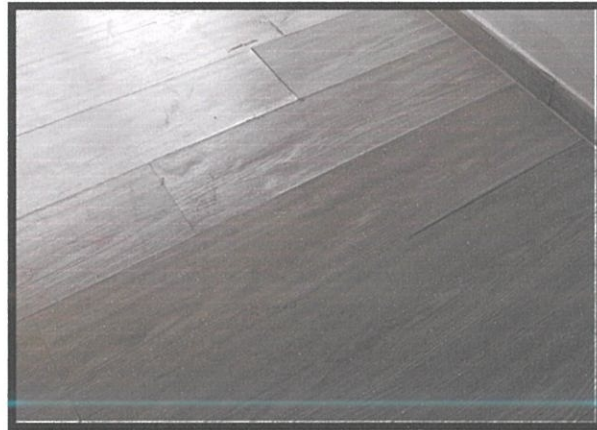
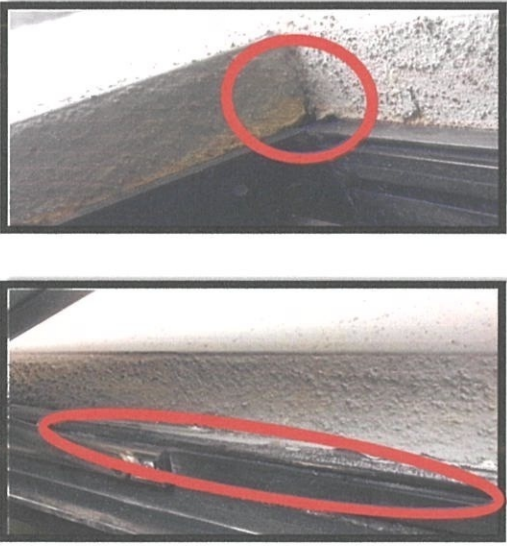
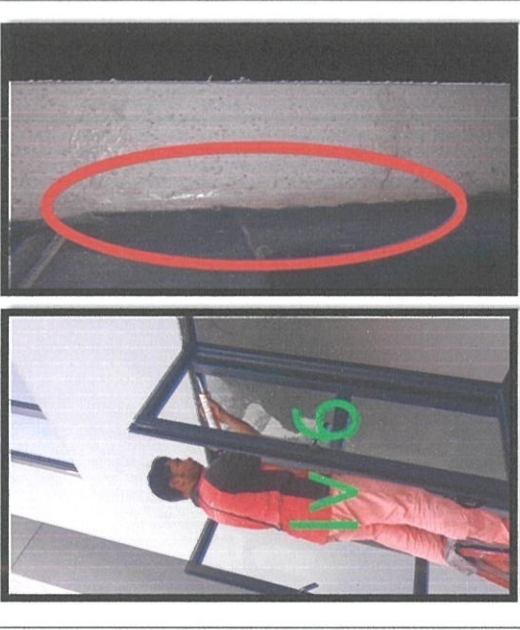


Figure 4.0
Timber floor damaged due water
stress in from window

3.4 Method Statement (Window Leaking)

No	Operation	Diagram	Labour	Equipment	Duration
1.	Identify first where the source water come in, is it from improper plaster, crack or gap/broken rubber glass.		1 skilled workers	Silicon	10min

No	Operation	Diagram	Labour	Equipment	Duration
2.	<p>After know, the leaking sources, apply colorless silicon 4mm aligned at the point and left it until dry. After apply, monitor for 2 days.</p>		1 skilled workers	Silicon Silicon Gun	10min

CHAPTER 4.0

CONCLUSION

4.1 CONCLUSION

In conclusion, defects can be classified as major and minor type and it can occur anytime, anywhere and not only for a new building but for the old building and it can be a serious problem to the building. A building defect can arise due to many factors such as poor of workmanship. Defects that occurred in the building need to be rectified perfectly in order to avoid them from reoccurring at the next time especially for major defects such as hollow tiles and leaking. The reasons why the major defects need to put focus and rectified in proper way is because, it will harm to ourselves and other people that stayed in the building. In this report, all the methods of rectifying defects which are major problems that always be issued by the owner explained in detailed. For this site the defect liability only two years and a lot of experience that I gain from this practical training which is how to identify and rectify the defects.

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