DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

# THE DEFECTS IN HOUSING PROJECT

**PREPARED BY:**

**FATIN SABIHA BINTI ABDULLAH**

**UiTM ID NO:**

**2017208764**

**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**

**Fatin Sabiha Binti Abdullah**

**2017208764**

**entitled**

**The Defects In Housing Project**

be accepted in partial fulfillment of the requirement for obtaining the Diploma In Building.

| | | |
|---|---|---|
| Report Supervisor | : | Puan Normila Binti Ahmad |
| Practical Training Coordinator | : | En. Muhammad Naim Bin Mahyuddin. |
| Programme Coordinator | : | Dr. Dzulkarnaen Bin Ismail. |

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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 Syarikat Kejuruteraan Kenali 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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Name : FATIN SABIHA BT ABDULLAH

UiTM ID No : 2017208764

Date : DECEMBER 2019

## ACKNOWLEDGEMENT

Alhamdulillah, thanks to Allah S.W.T for His willing to give me the opportunity and good health upon completing my practical training.

First of all I want to send my earnest gratitude to both of my parents that had been such a help by providing accommodations and allowance upon completing my practical training. It has been 20 weeks filled with knowledge and precious experience which will be treasured the most. My hard work seems paid off when I saw this completed report had finished in time. I will ensure that this report can express on my legit knowledge during my internship period at Syarikat Kejuruteraan Kenali Sdn. Bhd.

Moreover, I would like to highlight my outmost appreciation to those who had guided me through completing this report. A special gratitude I give to my practical training lecturer adviser, Puan Normila Binti Ahmad who is responsible in guiding and giving encouragement regarding my report writing. I would also want to extend my appreciation towards my practical coordinator, En. Muhammad Naim Bin Mahyuddin that had been carried her duty well as the one who is responsible to organize the practical training flow starting from the first step on finding company and solving all practical student problems. Not to be forgotten, my fellow friends who willing to give me a hand and guided me while this report is still in progress, their company and support would never can be repay by myself.

Furthermore, I would like to give my deepest appreciation to the crucial role played by the staffs and members of Syarikat Kejuruteraan Kenali Sdn.Bhd. who gave the permission to use all required and the necessary materials to be insert in my report. On top of all, I am sincerely grateful for having my industry supervisor, En. Nik Ahmad Hatem Bin Nik Mohd Zaid, Pn. Hasnah Binti Zakaria and Pn. Azila Binti Awang because of their advices and supervised me whole-heartedly.

Thank you so much.

## ABSTRACT

Defect is a building flaw or design mistake that reduces the value of the building, and causes a dangerous condition. A construction defect can arise due to many factors, such as poor workmanship or the use of inferior materials. Therefore, this report will discuss about the defects that usually can be found in any building project. The site visit for this report had been carried at Taman Salman, Kuala Krai, Kelantan. In advance, the usual defects that occur in a house are hairline cracking. It can be said that hairline cracking are the most famous defects that attack houses in every states around Malaysia. The reason why it happened is because of the weather changes that make the wall contract and expend which causes the hairline to form. This had leaded it to be a nightmare to the developers as it would cost a lot to do the redemption and also required a longer time to be completed.

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# CHAPTER 1.0

# INTRODUCTION

## 1.1 Background and Scope of Study

Defect is a physical, functional, or aesthetic value of a product or service showing some failed part of the building structures to meet one of the desired specifications that had been fix by the law of the building. Defects have existed since human's first find out how to build a structure starting from wood materials up to concrete, glass and others (Bremer Whyte Brown & O'Meara,2018). It then continued to be an occurrence even though the technology that had been used been upgraded through the years but up until now it seem not be resolved yet. For those who love to take this matter lightly and tend to neglect the after effect by not following the rules and regulation just to save the budget and so on, beware of it future results. Even though, some of the construction defect cannot be seen by the time the project finished and it seem to be a perfect masterpiece, it is commonly that it can backfire years after the construction project has been completed. So, to ensure that things like that would never take place, construction contractors and project manager have to be more responsible and wise in handling every project that had been assign under them in order to prevent lawsuit or worse people's life .

Construction defects are very wide but to be more specific it can be dividing into four types of categories which are material deficiencies, design deficiencies, construction deficiencies, and failures in operations and maintenance. In general, there have several building defects which usually occur to building parts such as roofs, walls, floors, ceiling, toilets, doors and windows (Tan Wei Cheun, 2008). Defects have plagued buildings for decades if not centuries, and even more so in the post war era of the private developer and with the emergence of the 'design and construct' project- the sister act of development as a private system of creation of our titled buildings.(Doctor Jonathan Drane, 2015).

The biggest problem with construction defects is the amount of litigation involved. Construction defect litigation is a long, complex, and costly process – not unlike other types of construction litigation. Depending on the defect, a lawsuit can include numerous defendants, varying insurance policy coverage, anti-indemnity statutes, and fact-intensive discovery procedures (Alex Benarroche, 2019). These broad categories of construction defects help illustrate that each aspect of construction can result in a defect claim. It is only through the diligence of the contractors and subcontractors that defective construction is totally avoided. That being said, construction defects are relatively common place, particularly in areas of rapid urban growth and sprawl where construction projects and turnaround times are fast paced. (Bremer Whyte Brown & O'Meara, 2018).

## 1.2 Objectives

There are a few objective that will be point out in this report. Below, are the objectives of this report:

- To identify the method used for the defects checking.
- To study all the defects occurs in the construction of the terrace house building.
- To understand the factors of the defects that exists in the building.

## 1.3 Methods of Study

Upon completing this practical report, there are numerous type of study that had been conducted which all had been done during my practical training period. First of all is observation method. This is the crucial part in completing my report as by doing observation, it can make the eyes open wider by experiencing the true situation and see with my own eyes on how the defects effected the building. A tour around the housing units had been done and some pictures are also been taken. There are several defects that can be found in the housing unit there such as wall cracking, leaking on the ceiling, tiles crack and more. The site had been delayed for 5 months and the process of opening it to the buyers was far behind the schedule just to amend the occurring damage.

Secondly, interview is also one of my methods of study just to collect more knowledge from the one who is very common in handling these matters. Encik Saleh who is the contractor for the site had been interviewed to collect some information regarding this site . He is the one who responsible in handling all the defects repair regarding the proposed houses and also the one who bring me to the site.

Lastly is document review. There are a lot of things to gain and learn about the company and project just by reviewing the document fail that had been given permission by the company to look at. There are a site plan drawing, the site progress, minute meeting paper, the landlord and buyers details, company profile and more. There are a few information had been jot down and insert picture in the report for some of the allowed contents.

# Chapter 2.0

# Company Background

## 2.1 Introduction of Company

Syarikat Kejuruteraan Kenali Sdn. Bhd. is an enterprise based in Malaysia. Its main office is in Kubang Kerian, Kota Bharu. The enterprise currently operates in the other Activities Related to Real Estate sector. The enterprise was incorporated on August 01, 1984. There was a net sales revenue drop of 76.23% reported in Syarikat Kejuruteraan Kenali Sdn. Bhd's. latest financial highlights for 2017. The company total assets decreased by 26.07% over the same period. The net profit margin of Syarikat Kejuruteraan Kenali Sdn. Bhd. increased by 10.27% in 2017.

The main objective of the company establishment is to develop and grow as a leader in the building civil engineering construction and property industry with the aim of becoming a public company in the near future so that it can contribute towards making VISION 2020 a reality.


Figure 2.1 : Location of Syarikat Kejuruteraan Kenali (*Source:google satelite*)

## 2.2 Company Profile

Syarikat Kejuruteraan Kenali Sdn. Bhd. (SKKSB) is a bumiputra company, established on 1st of August 1983. This company is a housing developer and venture in building construction. Their operations have been expanded since established which made it well-known as a reliable property developer.

The company is founded in 1967 by Hj. Nik Taib Bin Hj. Mohamed as Kubang Kerian Brick factory also known as Syarikat Kilang Bata Kubang Kerian, a brick manufacturer before soon change to housing developer and building construction. Since he died on 1990, his sons, Hj. Nik Mohd Zaid Bin Nik Hj. Nik Taib and Nik Mohd. Yusoff Bin Hj. Nik Taib are entrusted to take over the company. This company also being run up under their own blood line which is one of them is my supervisor, Encik Nik Ahmad Hatem Bin Hj. Nik Mohd Zaid. So, this company run under no superior system as they were all handling their own position as a manager.

This company aspire to build an entrepreneurs in the culture of the tradition of the beloved Prophet SAW in order to seek Barakah from the owner of the Rizk, Allah SWT. The company also stress more on tarbiah through performance of prayers, propagate kindness and goodness amongst all and spent more of the resources in the paths of Allah SWT. The company also enjoin Syura and Muhasabah system in strengthening the integrity. This is the nature of the company working ethics and culture that reflects the degree of commitment to deliver tasks and assignments of any size and magnitude on time without sacrificing quality and satisfaction of the demanding needs of the clients.

## 2.3 Vision and Mission

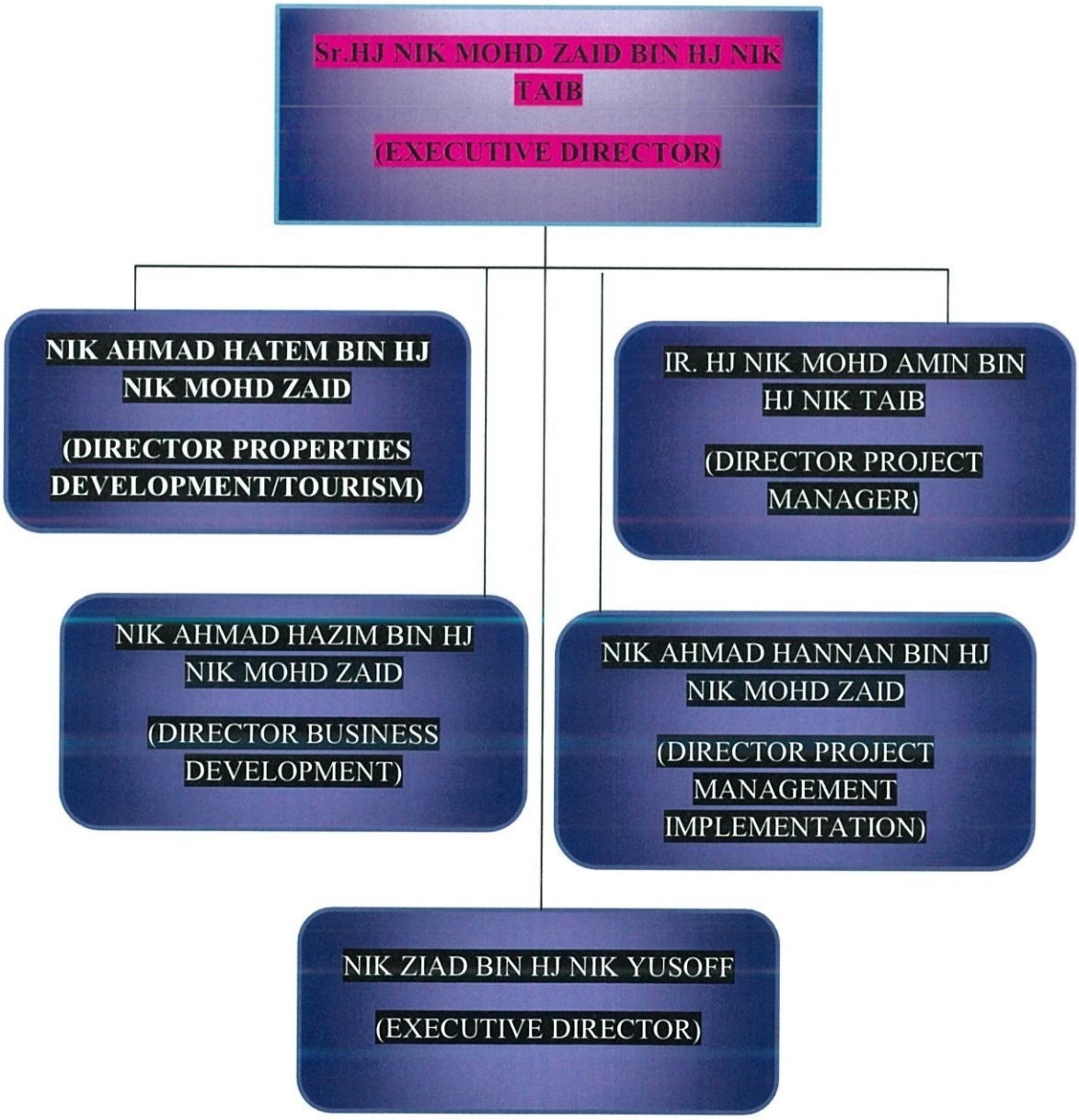
Syarikat Kejuruteraan Kenali Sdn. Bhd. (SKKSB) vision is to strive to be an efficient builder and to offer the customers a prompt, courteous and effective delivery services. They are commited to provide a high standard of quality in all aspects of its operation and to continually satisfy the expectations of their customers.

Syarikat Kejuruteraan Kenali Sdn. Bhd. (SKKSB) mission is aspires to provide the best possible services to the clients in particular and the public in general by continuing to participate itself in the provision of quality construction and civil engineering works with emphasis on delivering products of exceptionally high quality and deliver value for money.

## 2.4 Organization Chart

Syarikat Kejuruteraan Kenali run under 6 director which play their own parts in keeping the company well establish and quite well known by Kelantan citizen. In the first place, Hj. Nik Mohd Zaid and Nik Mohd Yusoff are the one who are responsible of handling this company. Unfortunately, Nik Mohd Yusoff had passed away last year so the company are now fully under Hj. Nik Mohd Zaid. Below are the organization chart for this company.

Figure 2.2 The organization chart



## 2.5 List of Project

For these past 2 years, Syarikat Kejuruteraan Kenali had been focusing on their 3 housing project which located at Kelantan and Terengganu. One of the project had completed last year and two more project are still under construction. All of their housing project are more focusing on affordable houses for Bumiputera in Malaysia. Below are the list of project for this company in this last 2 years.

### 2.5.1 List of Completed Project

This is the completed project which had been taken 3 years to be finish. It is located at Kuala Krai, Kelantan.

| No. | Name of Project | Location | Picture | Duration | Start | End |
|---|---|---|---|---|---|---|
| 1. | Cadangan membina dan menyiapkan 96 unit rumah teres satu tingkat (batu), di atas lot PT 7130 – PT 7225 (TAMAN HAMZAH) | Mukim Kenor, Daerah Mengkebang, Jajahan Kuala Krai, Kelantan Darul Naim. |  | 3 years | 2016 | 2018 |

### 2.5.2 List of On-going Project

This is the two project that are still on the track and it can be said that 90% of the house are actually finish. It is just a couple of wiring that need to be done and the defects repairing process which is so crucial that had been impacting on the project delay.

| No. | Name of Project | Location | Picture | Duration | Start | End |
|---|---|---|---|---|---|---|
| 1.. | Permohonan serentak kebenaran merancang pelan bangunan dan pelan infrastruktur 25 unit teres 1 tingkat di atas lot PT 3640 – PT 3653, lot PT 3656 – PT 3658 dan 4 unit teres 2 tingkat di atas lot PT 3839, lot PT 3854, lot PT 3855 & PT 3867. (TAMAN HUZAIFAH 1) | Mukim Pelagat, Daerah Besut, Terengganu Darul Iman. |  | 2 years | 2018 | 2019 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2. | Permohonan kebenaran merancang bagi cadangan membina dan menyiapkan 69 unit rumah teres satu tingkat di atas lot PT 2034 – 2045, 2048 – 2058, 2061 – 2071, 2074 – 2085, 2089 – 2101 & 2104 – 2113 Dan 9 unit rumah teres dua tingkat di atas lot 2033, 2046, 2047, 2059, 2060, 2072, 2073, 2086 & 2102. (TAMAN SALMAN AL FARISI FASA 1) | Mukim Batu Mengkebang, Daerah Batu Mengkebang, Jajahan Kuala Krai, Kelantan Darul Naim. |  | 3 years | 2017 | 2019 |

# CHAPTER 3.0

# CASE STUDY

# (THE DEFECTS IN A HOUSING PROJECT)

## 3.1 Introduction to Case Study

The study was carried out at Taman Salman Al Farisi which is located at Kampung Batu Mengkebang, Kuala Krai, Kelantan. In Figure 3.1 below shows the area of the defect studies being conducted. The total unit's houses there are 78 units consist 69 single and 9 double storey terrace houses. The size of the project is a large scale. This site commencement at the end of 2017 and the site certificate of completion and compliance (CCC) had just been release on October 10, 2019.


Figure 3.1 The proposed site for inspection

In this case study, it will be focused more on the defects occurrence in the site. So, a site visit had been done to make the study relevant and more detailed in its specification aspects that need to be highlighted. For the site visit, Encik Saleh was the one who responsible for taking practical student to the proposed site using the company car. Once arriving at the site, there are a few workers who was busy doing

some redemption and renovation for the houses there. As the houses were 90% finished, the owner of the houses there are just waiting their time to collect their houses key with the developer and do some paperwork to be signs.

At the site, a tour had been taken which consist 6 blocks of houses for an inspection. Three days are taken to finish the inspection and a report of the defects in the house also need to be submit for my supervisor to review it. Other than that, a list of houses is also available which had been provide by Puan Azila, who is the head management team. While observing and checking every last corner of the listed house, all the defects and problems had been jot down in the notebook for future references.

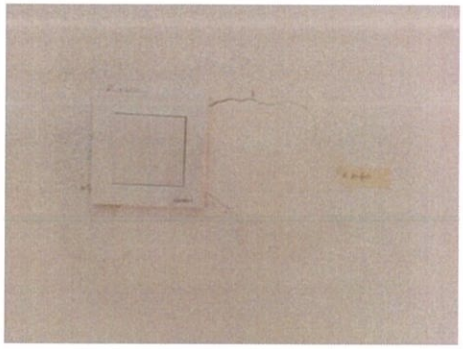
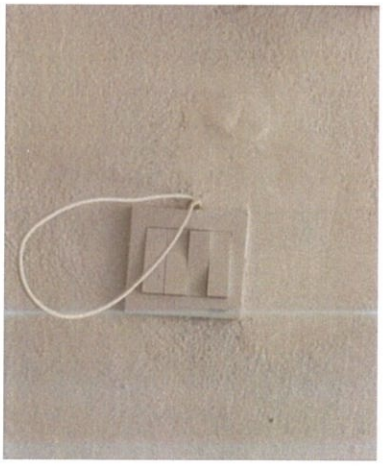
### 3.2 The method used for the defects checking.

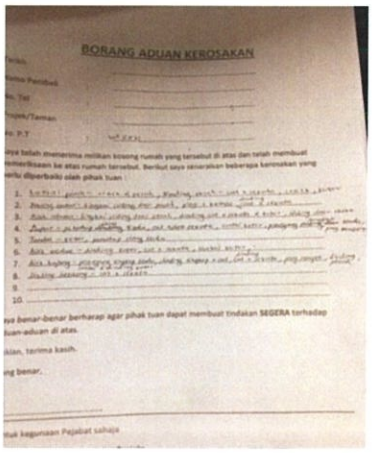
Upon doing this defects reports, a defects checking had been done at Taman Salman Al Farisi. A total of 78 units of houses been checked in 3 days in a row. Below is the method that had been used in performing the activity which consist item used and the procedure along with some pictures.

Items used:

1) Pen – To write down the defects details in the defects form that had been provided.
2) Pencil – To be used on the masking tape for writing the defects types
3) Housing defects complain form – To jot down the defect details and write down the houses lot number.
4) Masking tape – To be put on beside the defects as a defects marking
5) Camera – To be used as a references when writing a report

| Procedure | Picture |
|---|---|
| 1) Firstly, the house number lot was jotted down on the housing defects complain form before undergoing an inspection. This is to make sure that the house are correctly in order to be checked and also not to be blend by others house defects. |   |
| 2) Then, a meticulous tour around the house was been taken to spot the damaged area. Once, the defects being found, a masking tape was taped beside it with a marked sign | |

| | |
|---|---|
| about the problem such as leaking, cracking and others. This to make sure that the workers who had being doing rectification work can easily spot the problematic areas. |  <br>  |
| 3) All of the defects pictures was taken by a phone camera based on the house defects for future references. |  |

| | |
|---|---|
| 4) After that, write down into the defects complain form about the defects occur with more details just to make it more cleared and to be shown to the site supervisor. |  <br>BORANG ADUAN KEROSAKAN |
| 5) Continue doing so until all the houses had been checked. | - |

### 3.3 The defects that occurs in the building.

Defect are a common things that happened in a construction of any type of building. Even if at the first place it never show it sign, eventually it will arise when the building get older. Defects can be categorized in many types. Below are some of the types in building defects.

1) Cracking on the wall

Figure 3.2 The example of cracking that can be found at Taman Salman

One of the cracking problems occur at the wall is cracking of compound wall shown in figure 3.2. This happened because of the upward thrust on portion of the building where the new lumber contains a high level of moisture and it tends to move slightly as it dries out, so small wall cracks are common in newly built homes. It is a good idea to wait a year after the house was completed before repairing any cracks. This gives the wood time to dry completely.

2) Cracking on the floor

Figure 3.3 The form of cracking on the floor at the house porch

Besides, other cracking problem is settlement cracks in a slab are as shown in figure 3.3, which indicate inadequate site preparation where the compact fill on the poured concrete slab was failed. This also involves tensile stresses being loaded onto the concrete make the cracks occur when the force exceeds its maximum tensile strength. If steel reinforcing bars are close to the surface and insufficiently covered with concrete, the concrete bends back around the restraint and cracks at the apex. Deeper sections of concrete lead to greater separation between the sediment and the water, so it is important to ensure that it cover all superficial restraints adequately to reduce the amount of cracking.

3) Discoloration of wall and ceiling form mold

Figure 3.4 Discoloration of the concrete outside of the houses

The others damage occurs are the discoloration around the edges of the crack that indicates a leak as shown in figure 3.4. This happened due to water leaking from the roof or even leaky attic water lines that can run down inside a wall's framing and saturate the drywall, which then softens and deteriorates. This can create a crack with noticeable yellow or brownish stains. If the leak is fresh such as from a recent rain, the area might also feel damp to the touch.

4) Corrosion and decay

Figure 3.5 The affected gate and gasket by corrosion defect

A corrosion defects also occurs in the proposed building which is at the lock gate and the sink gasket as shown in figure 3.5. Corrosion of structural steel is an electrochemical process that requires the simultaneous presence of moisture and oxygen. Essentially, the iron in the steel is oxidised to produce rust, which occupies approximately six times the volume of the original material. The picture above shows the lock gate already corroded and weakened because it had been exposed to harsh weather. The corrosion can be defined as its degrading from a reaction with its environment. This degradation can cause weakening of the metal by reducing its cross section, changing its crystalline structure or by a gradual chemical reaction converting the metal to a compound with less strength. So this lock gate needs to be fixed as soon as possible before it fully weakened by corrosion that makes it no longer function.

5) Deterioration of timber

Figure 3.6 The front and back door condition due to deterioration

Other than that, the figure above shown about the defects that occur at timber located at the door as shown in figure 3.6. There are two type of detrition which at the first picture was weathering and the second is wood wrapping. All of these phenomena just cause an eye sore to the buyers if they went for an inspection to their houses and this should immediately being fixed by the developer to prevent problems in the future. In the inspection, the defects only affected the bottom of the door which being called as panel. It is a framework that responsible for holding the whole door. Composed of stiles (sides) and rails (top and bottom). The wooden doors swell up during 'rainy season' because of a process known as imbibition. 'Imbibition' is a type of modified diffusion where water molecules are absorbed by solid particles known as colloids without forming as solution. This results in increase in volume of the solid substance. During rainy season the humidity or the 'moisture content' of the atmosphere increases. This water is taken up by the hydrophilic wood and as a result, the volume of the 'wood increases'.

6) Water leakage from ceiling

Figure 3.7 Water leakage condition

The leakage from the ceiling can be spot on as it can be seen on the floor of the dripping water fallen from the ceiling as shown in figure 3.7. This had been the common defects that can struck any of the housing projects. It would not just affect the view but also harm the safety of the clients if it is not fixed as soon as possible. The ceiling can crumble due to the water seepage from the rainfall. Besides, it can also cause the floor to be slippery and if it had been ignored for a long period of time it can be infected by a mold.

### 3.4 The factors of the defects that exists in the building.

In order to prevent defects in the future, it is important to find out about the factors that influence the defects. Below are some of the factors that had been highlighted in understanding the existence of this defect.

#### 3.4.1 CRACKING ON THE WALL

The most common defects that usually appear because of the poor installation technic are cracking on the wall. This situation always leaving the client in blues. Below are the reasons to answer the question on how the cracking on wall can take place in the first place.

- **Weather changes.**

When the temperature gets warmer, the homes structural materials expand, and when the temperature drops, they shrink. Because of this movement, cracks may begin to form on the walls.

- **Settling.**

Settlement occurs when unstable soil causes the home above it to sink, or settle. This downward movement can cause cracks to form in walls, especially near the ceiling and above door frames.

- **Heavy objects.**

In this factor, it can be said that sometimes cracking start to form in the walls for the reason of bearing too much weight. Hanging extremely heavy objects from a wall may cause it to crack due to stress. All of these cracks can be found hidden by the object itself and do not become discovered until it is moved or falls off the wall.

- **Poor drywall installation.**

During installation, the seams between drywall sheets must be properly taped, smoothed, and sealed. If not, cracks in the drywall will likely form.

- Often, cracks in the interior walls are not too dangerous. However, if it involved any of these sign, it can be a serious issues:
  - ✓ Cracks run horizontally, not vertically
  - ✓ Doors and windows do not properly shut in their frames
  - ✓ Cracks are forming frequently and in large amounts

### 3.4.2 CRACKING ON THE FLOOR

Floor can be said as the most important part in house that need to be in their best condition because it is the place that we step our foot daily. If there was a cracking at the first place, how can we ensure that in the future it would not became bigger which can affect the aesthetic of the house and also increase the chance for the owner to fall. Below are some factors that will lead to the floor cracking.

- **Not using BRC reinforcement**

In the terms of cutting the cost and saving times, the developers just used the cement, water and sand mix and spur it at the porch slab without any installation of BRC first. RM's (BRC) wire mesh is machine-made, with joints at the intersections of the main and cross wires made by special electrical resistance welding processes. This is to provide shear resistance at the joints complying with the MS 145:2006 standard. So, this had been the results of the existed cracking in the slab.

- **Excess water in the mix**

Concrete for residential floors tend to own excess water as a result of this makes the concrete easier to install. The problem is that it greatly reduces the concrete's strength, creating it at risk of cracking. With an awfully wet combine, the concrete can shrink because the excess water evaporates the wetter or soupier the mix the greater the shrinkage are going to be inflicting cracking. A concrete slab will shrink by the maximum amount as 1/2 inch per each 100 feet. This shrinkage impact causes forces within the concrete that may virtually pull the slab apart. Cracks are simply the tip result of these forces. So it needs to be concerned for.

- **Concrete drying out too quick**

When concrete dries instead of cures it considerably will increase the probability of it cracking. The chemical action that happens to permit concrete to cure or go from being liquid to being solid takes solely some hours, however the chemical action, or association, can continue for up to thirty days. If the concrete floor is allowed to dry out, then this reaction could stop and therefore the floor won't gain its full potential strength to occur for days and weeks once the concrete being poured.

- **Using the incorrect strength concrete for the duty**

Cement pulverized or concrete is out there in many alternative strengths and it depends on the specifications of the duty that strength or explicit mixture of cement in wish. Thus it's necessary to verify with the engineer or designer that mixture has to be used for the job. After getting the right mixture by those experts, the process of concreting can be completed perfectly without any further worries for cracking to take place.

### 3.4.3 DISCOLORATION OF WALL AND CEILING FROM MOLD

For the mold to grow, 6 elements are needed to present. Associate degree omission of deficiency in any condition can end in mold cultures not having the ability to require hold or flourish. Additionally, this can cause a mold colony to die if one or a lot of parts are removed once mold organization has been established. Reducing or removing these parts is the core strategy for preventing mold. Below are the six factors that cause and contribute to a mold irruption.

- **Mold Spores.**

The first part is that the mold spores themselves. This can be exhausting to stop, as mold microorganisms are prolific and nearly universally gift throughout the globe. Spores are invisible to the eyes and frequently enter houses from the outside. The air movement of spores is the commonest methodology for spreading, followed by being introduced through contaminated materials. Removing mold spores from the house is much not possible. Keeping conditions in restraint is the solely recourse. The sole places on earth that mold cannot occur is within the deserts and also the ice lands, which are way too dry and cold. Mold additionally doesn't happen in lakes or below the ocean as a result of the dearth of air. However, wherever ensuing 5 parts occur, simply expecting optimum conditions to create the mold.

- **Moisture.**

Without wetness, mold cannot probably thrive. Water is that the key to all or any living things that exist, and mold is not any exception. There's no specific water content or wetness threshold wherever mold cannot survive. It depends on a mix of all parts. Wherever it is extremely wet or perhaps slightly damp, it would be able to make certain it a possible mold nursery. The much longer wet conditions exist, the higher of probability for mold to start its growth. Mold usually starts in places humans can't even noticed such as in the ceilings wherever drips from roof leaks aren't caught. Mold additionally takes foot within walls thanks to the mechanical device from water lines, drain-waste and ventilation plumbing pipes that have cracked or separated. Moistness can even happen from condensation wherever

plumbing lines are chilled, and a high-humidity surrounding makes them sweat. It doesn't have to be compelled to be standing water by any means offers enough wetness to line mold into life. Moisture is the primary part necessary for mold to exist. If the sources of wetness are taken away, the fight against mold is over.

- **Food supply.**

Because mold may be a life form, it desires food to survive and reproduce. Food sources outdoors are limitless wherever vegetation and alternative organic materials abound. A housing area is a special story. The mold would feed off the organic materials contained in wood panels or on flat solid. It's additionally feeding on minuscule amounts of dirt and regardless of however well it been cleaned. Mold takes hold of all kinds of things around the house. It will go after the insulation in the attic or walls, and it will go after the rear of the mineral gypsum board. Mold additionally gets food from the air. Spores aren't the sole issue that microscopically gifts within the air that circulates around home which being inhale by humans. There are myriad mobile particles mold will go after, like dirt and pollen. Air even contains the spores of alternative mold species that contribute to their diet. Removing food sources for mold is neither sensible nor potential. The trick is in dominant alternative parts, particularly the nice and cozy, dim and wet places wherever mold likes to hide.

- **Gas Supply prevent mold with ventilation.**

Mold can't live with no gases available as it desires air to grow and reproduce. If there is no gas, mold can't perform the process wherever it divides cells and forms mass. Air doesn't simply contribute to mold's physical, chemical and biological growth. Air movement is that the principle carrier for mold spores so that they will move locations. That unfolds would possibly simply be an inch or 2 inside a good corner, or it's going to preferably be across the ground, between rooms or concerning the whole house. Be aware that it doesn't take massive amounts of air to assist mold prosper. Air remains a gift within wall cavities and below the insulation. As food sources, it's just about not possible to get rid of air in places wherever mold can culture.

- **Lack of daylight.**

Direct daylight exposure is deadly to mold. The ultraviolet rays in natural daylight destroy mold's cellular structure. Indoor lighting doesn't have a constant devastating impact on mold. The spectrum of artificial lighting is different from daylight and doesn't emit constant kind of photons that kill mold and stop its advancement. Whereas mold prefers restricted lightweight or perhaps dark, it still grows within homes wherever incandescent or fluorescent lights are burning. Mold goes to require hold in those inevitable places wherever lightweight is proscribed however heat and wet conditions abound. Having the correct temperature makes matters a lot of for mold to require off.

- **Optimum Temperature.**

Mold doesn't tolerate conditions that are too cold or too hot. Temperature reduction can destroy mold or a minimum of creating it dormant. Burning it additionally destructs mold's cellular structure, preventing it from growing and multiplying. Temperature levels within most residences are at optimum levels for mold cultures to measure. Temperatures between 22°C to 27°C are good for mold to grow, particularly as climate in Malaysia are sunny around February to September and rainy during October to January. Mold spores will take hold close to the melting point however can survive well higher than temperatures that are uncomfortable for humans. Relative humidity levels also are a very important considers permitting musty conditions. High wetness offers that damp surroundings which encourage mold growth. Though the optimum temperature is a component of the six-element equation that lets mold exist, it's a minor player compared to wetness.

### 3.4.4 CORROSION AND DECAY

The corrosion and decay usually attack the metal part of the house. Below are the reasons of why it can occur in a new built house which it can be rarely found as corrosion mostly take place in a house that had been used by the owner.

- **Crevice corrosion**

Crevice corrosion is one of the types of localized corrosion. This corrosion attacks only portions of a metal structure. It only occurs in stagnant locations such as those found under gaskets. Crevices can be formed by design detailing, welding, surface debris, etc. Available oxygen in the crevice is quickly used by the corrosion process and, because of limited access, cannot be replaced. The entrance to the crevice becomes cathode, since it can satisfy the oxygen-demanding cathode reaction. The tip of the crevice becomes a localised anode and high corrosion rates occur at this point.

- **Moisture**

This is the proportion of total time during which the surface is wet, due to rainfall, condensation and others. Therefore, for unprotected steel in dry environments such as inside heated buildings, corrosion will be minimal due to the low availability of water. The requirement for the application of paints or coatings becomes unnecessary other than for appearance or fire protection purposes. The corrosion of iron is limited to the availability of water in the environment. So, the exposure to rains is the most common reason for rusting.

- **Acid**

If the pH of the environment surrounding the metal is low, the rusting process is quickened. The rusting iron speeds up when it is exposed to acid rains. Higher pH inhibits the corrosion of iron.

Table 3.1 Atmospheric corrosively categories and examples of typical environments

| Corrocitivity | Low-carbon | Examples of typical environments (informative only) | |
|---|---|---|---|
| | | Exterior | Interior |
| C1 Very low | ≤ 1.3 | - | Heated buildings with clean atmospheres, e.g. offices, shops, schools, hotels |
| C2 Low | > 1.3 to 25 | Atmospheres with low level of pollution: mostly rural areas | Unheated buildings where condensation can occur, e.g. depots, sports halls |
| C3 Medium | > 25 to 50 | Urban and industrial atmospheres, moderate sulphur dioxide pollution; coastal area with low salinity | Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries, dairies |
| C4 High | > 50 to 80 | Industrial areas and coastal areas with moderate salinity | Chemical plants, swimming pools, coastal ship and boatyards |
| C5 Very high | > 80 to 200 | Industrial areas with high humidity and aggressive atmosphere and coastal areas with high salinity | Buildings or areas with almost permanent condensation and high pollution |
| CX Extreme | > 200 to 700 | Offshore areas with high salinity and industrial areas with extreme humidity and aggressive atmosphere and sub-tropical and tropical atmospheres | Industrial areas with extreme humidity and aggressive atmosphere |

Notes:

- 1μm (1 micron) = 0.001mm
- [a] The thickness loss values are after the first year of exposure. Losses may reduce over subsequent years.

### 3.4.5 DETERIORATION OF TIMBER

The problem of deterioration of timber arise when there is a wooden parts on the house just like the windows and doors that their proper care need had been neglecting by the contractor. Below are the main reasons which making the condition even worse.

- **Sunlight penetration**

Sunlight is the main purpose of harm to a number of materials, including plastics, textile, wood, coatings, and different natural materials. The sort of harm, which includes loss of gloss, chalking, elasticity, adhesion, and coloration change, varies relying on the cloth sensitivity and the spectrum of daylight. Spectral sensitivity varies from fabric to material. One factor of sunlight is ultraviolet light, usually known as UV. UV light is accountable for maximum harm to expose timber as it adjustments or destroys the timber's lignin, an issue of wooden that hardens and strengthens the cell partitions. In extra medical phrases this process is referred to as photograph-oxidation. The colorants contained in the colour coats are chargeable for soaking up UV light. The extra colorant an end contains the much less UV light will get through to the wooden itself.

- **Moisture.**

Over time, the door would begin to warp or bow slightly, allowing air, and heat to escape or enter the house. This is all can be blamed to the moisture content especially that came from rainfall. This had been one of the most challenging things to combat against entirely. In areas that are particularly wet or humid like our country, Malaysia it will obviously have more issues than in dry and or tepid areas. As with warping or bowing, another possible result of moisture getting into the wooden doors could be door expansion or swelling, which are less aesthetically damaging than warping, but arguably more structurally damaging. Wood is porous, especially if it is not protected properly, and that means that it will generally contract in dry air and expand in humidity. This can be the possibilities of why the front door and bathroom door have

the tightest fits in the house. In that case, it is necessary to pay attention to wooden doors elsewhere in the home though.

Table 3.2: Types of wood wraps

| Types of Wood Warp | | |
|---|---|---|
| **Type** | **Description** | **Image** |
| **Bow** | A form of warp in which the lumber deviates from flatness lengthwise, but not across the face |  |
| **Kink** | A form of warp in which the lumber deviates edgewise from a straight-line from end to end |  |
| **Twist/wind** | A form of warp in which the turning of four corners of any face of a board is no longer in the same plane |  |
| **Cup** | A form of warp in which the lumber deviates from a straight line across the width of the wood |  |
| **Crook** | A form of warp where there is movement along one edge of the lumber |  |

### 3.4.6 WATER LEAKAGE FROM CEILING

The water break can become a serious problem as in houses especially in the ceiling area as it got an electrical appliance such as lamp and fan which can be broke or worse an electrical shock to the house owner if they touch it without concern that their lamp or fan broke down because it had been expose to water. Below are some of the reasons why water leakage can happen in the beginning.

- Roofing system leaks

If there are signs and symptoms of water harm or dripping water coming from the ceiling that locate exactly below an attic space or directly underneath the roof surface itself, there may be almost absolute confidence that the proper cause is a hollow or another kind of harm in the shingles and other roofing cloth that make up the roof machine. There are not often any plumbing pipes or furnishings jogging via an attic, so signs and symptoms of water harm in a ceiling underneath an attic or roof are constantly because of a roof problem.

- ✓ The leaking takes place throughout or rapidly after rainfall. It may additionally take some time for the water to appear however, if it seems throughout or after a rain, the roof is the area to search for the source.
- ✓ If there is active water dripping, it will frequently be brown or dirty if it comes from the roof. Water making its manner into home often selections up dirt and impurities along the way.
- ✓ In the attic, find damp and soggy insulation. Look for regions of insulation that show signs of wetness. Do not predict that the roof damage is directly above this part of the attic, because water can flow for pretty some distance down alongside a roof rafter before it drips down onto the insulation and through it to the ceiling floor. If there is a damp insulation, pull it back and look at the drywall or plaster lathe beneath.

- **Plumbing systems damage**

Another major source of leaks coming from the ceiling is a problem with plumbing pipes or plumbing fixtures in the property. If the leaking ceiling or available water damage appears underneath a rest room, kitchen, or internal ceiling spaces where plumbing pipes are placed, there's a superb risk that the supply of the hassle lays both with water supply pipes or drain pipes which have developed leaks. Water leaking from the ceiling is regularly clean water, rather than brown and dirty, if a faulty plumbing pipe is the culprit.

- ✓ Leaking will commonly be pretty consistent if the ceiling leak is plumbing-related. Especially if a water-supply pipe is responsible, the water dripping from the ceiling may be in no way-ending. Problems with drain pipes may additionally reason greater intermittent leaking, but in contrast to roof leaks, there may be no correlation to weather situations.

- Even though the cracks cannot clearly be seen but the stained with peeled paint start to appear under this concrete slab hence creating problem. It is worsen when the leak water start to penetrate the electrical lighting as well as the wiring. This is the typical interior scene when the top slab failed and leads to unwanted hazards involving electric shocks.

# CHAPTER 4.0 CONCLUSION

## 4.1 Conclusion

From this study, it can be said that mostly 90% of the defects occurred because of the exposer towards the weather. The other 10% of the defects are from the lacking skills of construction works and the work are being done in a hurried ways. Regarding of the weather factors, it is a common thing at Malaysia as the climate is being categorized as equatorial as it is located near the equator which has a tropical rainforest climate. This had leaded the weather here to be hot and humid throughout the year. From the Met Malaysia official website, it is stated that the mean annual rainfall in Kelantan is between 2000mm to 3500mm depends on the month. Furthermore, the average for sunlight being received in Malaysia is 6 hours per days and to be more specified, in Kelantan received around 7 hours per day. On behalf of that, it is very clear that weather play a crucial role in affecting the defects growth in any housing projects all around Malaysia. From this report, the developers can study about the defects factors and surely can take an early caution to prevent from the defects affecting their housing project in the future. As for the workers, they need to be more disciplined and trustworthy toward their works and if they lacks in skills, they need to attend a seminar on the construction works in the sake of enhancing their skills better. Last but not least, it is advisable to take caution early just to prevent future failure.

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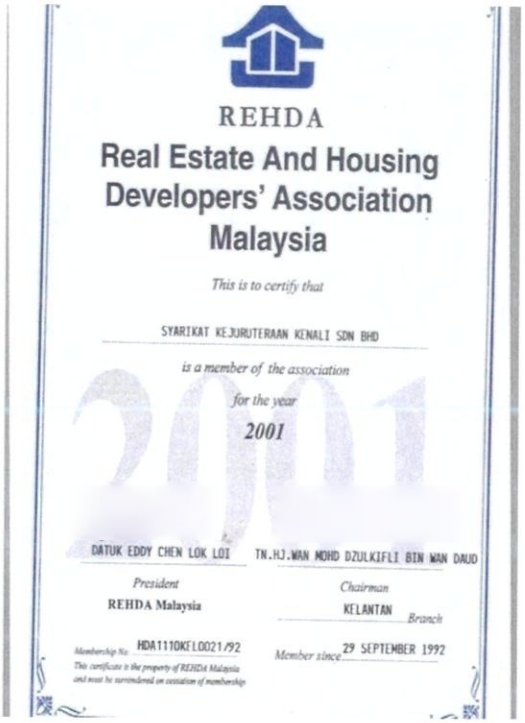
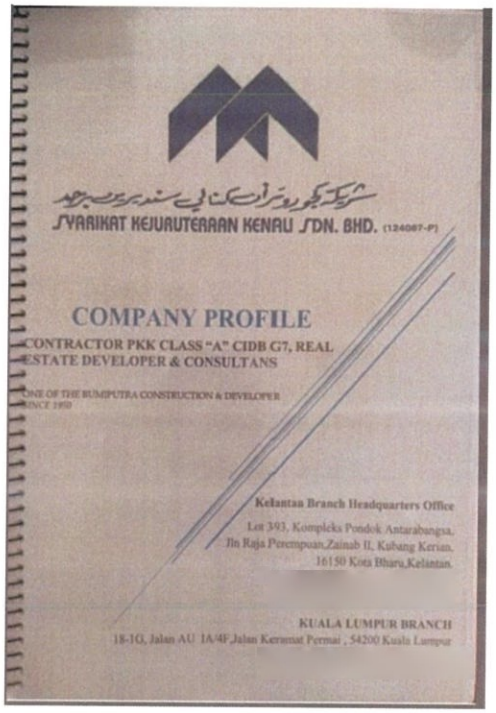
## APPENDIX

Company's Certificate



Company's profile




## LIST OF COMPANY

| BIL | COMPANY | DESCRIPTION | YEARS |
|---|---|---|---|
| 1 | Syarikat Kejuruteraan Kenali Sdn.Bhd **(Main Company)** | CONTRACTOR PKK CLASS "A" CIDB G7, REAL ESTATE DEVELOPER & CONSULTANS<br>- Teras dan Teraju<br>- Founder 1984<br>- Cidb G7 Class "A"<br>- Pr1ma Housing Development<br>- Yayasan Al Khairiah Foundation<br>- Iso 9001-2008<br>- Completed Project 243 project years 1984 -To date | 1984'S |
| 2 | Yayasan Al-Khairiah | Al-Khairiah Foundation is to enable | 1984's |
| 3 | Kenali Holdings Sdn.Bhd | Properties & Housing Development | |
| 4 | Mrt Developmets Sdn.Bhd | Properties & Housing Development | 1997's |
| 5 | Sunwise Angle Sdn.Bhd | Properties & Housing Development | 2000's |
| 6 | Teamanco Resources Sdn.Bhd | Properties & Housing Development | 1994's |
| 7 | Five Star Cement | Properties & Housing Development | 2003's |
| 8 | Nusa Cergas Sdn.Dhd | Properties & Housing Development | 1991's |
| 9 | Syarikat Binaan Kenali Sdn.Bhd | Properties & Housing Development | 1980's |
| 10 | Arasiaplus Heritage Sdn Bhd | Properties & Housing Development | 1993's |
| 11 | Batu Rakit Development Sdn.Bhd | Properties & Housing Development | 2001's |
| 12 | Kenali Properties Sdn.Bhd | Properties & Housing Development | 1991's |
| 13 | Kenali Group Travel | Travel Tourism Hospitality & Properties | 2014's |
| 14 | Nh Island Hopping | Perhentian Island | 2010's |
| 15 | Kenali Conglomerates Sdn.Bhd | Development & Properties | 2017's |
| 16 | Syarikat Kilang Bata Kubang Kerian Sdn.Bhd | Development | 1950's |

Site plan of Taman Salman