

PROGRAMME IN BUILDING SURVEYING DEPARTMENT OF BUILT ENVIRONMENT STUDIES AND TECHNOLOGY FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING UNIVERSITY TEKNOLOGI MARA PERAK BRANCH

SERI ISKANDAR CAMPUS

RECOMMENDATIONS FOR IMPROVEMENT BASED ON FIRE INCIDENT CASE AT LOT NO. 4.18B (*RELYSIS COMPUTER*), LEVEL 4, PLAZA PELANGI, TAMAN PELANGI, JOHOR BAHRU, JOHOR

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PRACTICAL TRAINING REPORT

FEBRUARY 2022

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This practical training report is fulfilment of the practical training course.

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CHAPTER 1: INTRODUCTION

The Industrial Training is compulsory for all students of Building Surveying (AP229) for completion of their degree. The purpose of this training is to provide exposure and experience to the students on the real situation of working environment and as an early preparation before the students entering the working world. For the October 2021 – February 2022 session, the training starts on 11 October 2021 until 30 January 2022.

This report is the outcome of a whole semester of industrial training period under PNB Commercial Sdn. Berhad, located at Bangunan Pelangi, 1, Jalan Biru, Taman Pelangi, 80400 Johor Bahru, Johor. However, the training session was carried out at one of the company's client commercial building, Plaza Pelangi, Lot 3.29 & 3.29A, Level, 3, Jalan Kuning, Taman Pelangi, 80400 Johor Bahru, Johor. During the training period, many opportunities were provided to join and learn to be involved in commercial and facilities management matters.

This chapter also consists of the history of PNB Commercial Sdn. Berhad. This chapter also explains regarding the general information of PNB Commercial Sdn. Berhad. Included in this chapter are the company's profile, the organization chart of the PNB Commercial Sdn. Berhad, list of buildings under management of the company, and the scope of work of the company. This chapter also consist of the work scopes, duration, and involvement during the time of industrial training period.

1.1 Company History



Figure 1.1: Official Logo of PNB Commercial Sdn. Berhad

PNB Commercial is wholly owned by Permodalan Nasional Berhad (PNB), one of Malaysia's leading asset managers.

In August 2008, it was known as PNB Property Holdings Sdn. Berhad and subsequently in June 2009, it became PNB Commercial Sdn. Berhad following the corporate exercise by PNB, incorporating companies namely Petaling Garden Berhad, Island & Peninsular Berhad and Pelangi Berhad.

In 2019, pursuant to the harmonization exercise of PNB's property development companies, MIDF Property Berhad (MPB) became a wholly owned subsidiary of PNB Commercial. MPB was previously known Malaysian Industrial Estates Berhad and was incorporated in September 1964 under the auspices of the Ministry of Trade and Industry (MITI) and was then the industrial property development arm of Malaysian Industrial Development Finance Berhad (MIDF). MPB still has a portfolio of industrial properties for sale and rent at various locations in Malaysia.

PNB Commercial Sdn. Berhad (PNB Commercial) focuses on management of commercial and industrial properties located all over Malaysia, with its vision to become a reputable asset management company focusing on asset enhancement initiative (AEI), strong growth, attractive yields, quality portfolios of assets, tenants, and customer-focused work culture.

1.2 Company Profile

NO	ITEM	DESCRIPTION	
1	Name	PNB Commercial Sdn. Berhad (Southern Branch)	
2	Address	Level 8, Bangunan Pelangi, 1, Jalan Biru, Taman Pelangi, 80400 Johor Bahru, Johor	
3	Main Company Function	Commercial & Facilities Management	
	Clients	1.Bangunan Pelangi, Johor	
		2. Plaza Pelangi, Johor	
		3. Menara Pelangi, Johor	
		4. Perling Mall, Johor	
4		5. Pelangi Leisure Mall, Johor	
		6. Johor Bahru City Square (Upper levels)	
		7. Industrial Buildings located in Pasir	
		Gudang, Johor	
5	Year Of Establishment	August 2008	



1.3 Location Plan

<u>Key Plan</u>



Figure 1.2: Key Plan of PNB Commercial Sdn. Berhad (Southern Branch)



Location Plan

Figure 1.3: Location Plan of PNB Commercial Sdn. Berhad (Southern Branch)







1.4 Company's Organization Chart





Figure 1.5: PNB Commercial Sdn. Berhad Organization Structure





Figure 1.6: Project Coordination and Facility Management Organization Structure

1.5 Core Business

The main business of the company is commercial building and facilities management. As of now, there are currently 7 buildings under the management of PNB Commercial Sdn. Berhad. These buildings are listed below:

No	Buildings	Figures
1	Bangunan Pelangi Address: Jalan Biru, Taman Pelangi, 80400 Johor Bahru, Johor	
2	Plaza Pelangi Address: Lot 3.29 & 3.29A, Level, 3, Jalan Kuning, Taman Pelangi, 80400 Johor Bahru, Johor	PLAZA PERMIT
3	Menara Pelangi Address: Jalan Kuning, Taman Pelangi, 80400 Johor Bahru, Johor	

4	Perling Mall Address: 3, Jalan Persisiran Perling, Taman Perling, 81200 Johor Bahru, Johor	
5	Pelangi Leisure Mall Address: Jalan Serampang, Taman Sri Tebrau, 80400 Johor Bahru, Johor	
6	Johor Bahru City Square (Upper levels) Address: KOMTAR JBCC, City Centre, 80000 Johor Bahru, Johor	
7	Industrial Buildings located in Pasir Gudang, Johor	-

Table 1.2: List of Clients under PNB Commercial Sdn. Berhad (Southern

Branch)

1.6 Summary of Chapter

PNB Commercial Sdn. Berhad for Southern Region is a company under PNB, which specialized in commercial and property management for southern region in Malaysia. The company currently manages several commercial buildings such as shopping malls, high rise office buildings, and several industrial buildings located around Johor. The property and facility management department plays an important role in keeping these buildings fully functional as required. They do not just care for the structural integrity of the building, but also covers comprehensively of all aspects of the buildings such as the electrical and mechanical components and equipment within the building. Every and all buildings requires building manager to care and maintain each building. Thus, it is why property and facility management are among the important aspects to be considered ain a well-developing country such as Malaysia.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction to Fire Protection System

The study and practise of minimising the negative consequences of potentially destructive fires is known as fire protection. It includes research and development, production, testing, and deployment of mitigating devices, as well as the study of the behaviour, compartmentalization, suppression, and investigation of fire and related events. Owners and operators of structures, whether land-based, offshore, or even ships, are responsible for maintaining their facilities in compliance with a design-based on rules, such as the local building code and fire code, which are enforced by the authority having jurisdiction.

Buildings must be erected in conformity with the version of the building code in effect at the time a building permit application is submitted. Building inspectors examine if a structure under construction complies with the building code. After construction, a building must be maintained in conformity with the current fire code, which is enforced by local fire department fire prevention officers. Firefighters, fire investigators, and other fire prevention personnel are dispatched in the case of a fire emergency to reduce, investigate, and learn from the damage. Building and fire codes are both written with lessons learnt from fires in mind.

A structure's fire protection is a system that relies on all its components. The architect and other experts developed the building in accordance with the local building and fire codes. Following the local authority's evaluation, a building permit is issued.

Building escape systems, fire alarm systems, and fire suppression systems are examples of fire-protection and life-safety systems. These systems must be maintained and repaired according to fire-prevention requirements. The installation and deployment of structural and operational devices to reduce the impact of fire on persons and property is known as fire protection. There are two types of fire-protection systems: passive fire protection and active fire protection. The use of building components to control or limit a fire is known as passive fire protection. It is possible to design and construct walls, floors, and ceilings that will resist the passage of fire and smoke.

Active fire-fighting measures, which is the focus and will be discussed further in this report, are those that take immediate physical action to slow the spread of a fire or limit smoke migration. Fire sprinkler and smoke-control systems are the most common examples of these systems, which receive manual and automatic signals to accomplish their intended function.

2.2 Passive Fire Protection System

Passive fire protection (PFP) is integrated into the structure to offer stability, as well as into the walls and floors to divide the building into compartments with manageable danger. These places are designed to contain the spread of a fire, allowing inhabitants to flee and firefighters to be protected. The materials used to create the building provide this protection, or it can be added to the structure to improve its fire resistance.

Many building materials have some natural fire resistance and hence come with built-in fire protection. Clay bricks are an example of such a material, which, when used to build a wall, are fire-resistant in and of themselves. Other materials, such as lumber used in the building of a timber floor, may lack this built-in fire safety, and require additional protection, such as fire-resistant boards connected to the underside of the ceiling below.

The employment of additional materials or components, collectively known as passive fire protection, can improve fire resistance.

2.2.1 Main Areas of Passive Fire Protection System

1. Structural Fire Protection

Fire protection for structural components protects them from the impacts of fire. This can be done with a fireproofing material such as spray-on thin-film intumescent, endothermic materials like gypsum-based plasters and cementitious products, mineral wool wraps and insulation, and fireproofing cladding or by using concrete goods to build the structure.

2. Compartmentation



Figure 2.1: Compartmentation in Common Buildings

Compartmentation includes fire barriers, firewalls, fire partitions, and smoke barriers. Fire-resistant walls, floors, and ceilings are examples of fire barriers (often made of concrete, combination wood, gypsum, or masonry). These barriers are intended to keep a fire from spreading across a structure and to allow for safe egress. For complete protection, walls extend from a fire-rated floor to the fire-rated ceiling above and continue into concealed compartments.

3. Opening Protection

To maintain a fire barrier's fire resistance, fire doors and windows are fitted in its openings. Fire-rated glazing/glass and framing are evaluated as a complete assembly to ensure that the fire barrier is maintained. Furthermore, where air ducts pierce fire-rated and/or smoke-resistant assemblies, fire and smoke dampers (typically employed in duct systems) are considered "opening protection" and complete the fire barrier.

4. Firestopping Materials

These materials are used to keep a fire from spreading through a fire barrier's penetrations. While performing their duties, electricians, plumbers, and communications engineers, for example, can leave hidden holes in the barriers. The fire barrier will be rendered less effective if the penetration is not properly sealed and covered with a suitable firestop system, and the fire will spread beyond the compartment of origin.

5. Fire Escape Staircase



Figure 2.2: Fire Escape Staircase

As a special form of emergency, the fire escape staircase exists and plays a crucial role in safely exiting the building during an emergency or any fire hazard. The usage of a fire escape staircase is common in multi-story residential and commercial structures. Every building should include a fire escape stairway to allow inhabitants to safely exit in the event of a fire. Non-combustible materials should be used to create fire escapes.



6. Fire Escape Door

Figure 2.3: Fire Escape Door

A fire door is a door with a fire-resistance rating (also known as a fire protection rating for closures) that is used as part of a passive fire protection system to prevent fire and smoke from spreading between different compartments of a structure and to allow safe egress.

7. Other PFP Related Elements

Cable coating (the application of fire retardants to wire and cable), junction systems (which involve changes in direction between fire-separating elements and the spaces around by those elements), and perimeter fire barriers are other PFP areas worth mentioning (which deal with the perimeter of the floor and the exterior curtainwall).

While passive fire protection can effectively limit fire spread, most experts propose redundancy in fire protection.

2.3 Active Fire Protection System

Active Fire Protection (AFP) refers to a group of systems that, in order to function effectively in the case of a fire, require some movement or action. Actions can be manual, such as a fire extinguisher, or automatic, such as a sprinkler, but they all demand some activity. Fire/smoke alarm systems, sprinkler systems, and fire` extinguishers, as well as personnel, are all included in AFP. Fire/smoke alarm systems detect the presence of fire and/or smoke in a structure. Sprinkler systems are utilized to help contain the fire's spread. To help put out the fire, firefighters and fire extinguishers are deployed.

An active fire protection system indicates that some sort of action is being taken. This operation can be manual, requiring the involvement of a person or people, or automatic, deploying once fire, smoke, or heat is detected.

Active systems are primarily meant to immediately attack the fire and assist in its extinguishment. An example of an active fire suppression system is what the fire department will use once they arrive. In the case of a fire, most buildings are also equipped with active systems that can be deployed on-site.

2.3.1 Components of Active Fire Protection System

1. Fire Alarm System



Figure 2.4: Fire Alarm System

The purpose of the fire alarm system is to notify us of an emergency so that we can take action to safeguard ourselves, our employees, and the general public. When smoke, fire, carbon monoxide, or other fire-related hazards are detected, a fire alarm system sounds an alert. These alarms can be triggered automatically by smoke and heat detectors, or manually by manual fire alarm

activation systems such manual call points or pull stations. Alarms can be either motorized bells or sounders or horns that can be mounted on the wall. They can also be speaker strobes that sound an alert and then play a voice evacuation message warning people not to use the elevators inside the building. Fire alarms can be found in offices, factories, and public buildings; they are an integral part of our daily lives, yet they are sometimes disregarded until an emergency arises, at which point they may save lives. If the alarm is activated, sounders will go off to warn those within the building that there may be a fire and that they should escape. A remote signal system might be included in the fire alarm system, which would then inform the fire department via a central station. Depending on the country and manufacturer of the device, fire alarm sounders can be tuned to different frequencies and tones, such as low, medium, and high.

2. Fireman Intercom Panel



Figure 2.5: Fire Intercom Panel

One of the most important parts of confining and reducing flames is communication amongst firefighters. This communication must be instantaneous and efficient. Installing a fireman intercom system for any building structure is one of the best ways to achieve this. The firefighters can quickly adjust their preparations to combat a fire when buildings are equipped with fireman intercom systems. Because an intercom system can be a lifesaving component of a fire response, every company owner should consider installing one as part of their fire safety plan.

3. Fire Blanket



Figure 2.6: Fire Blanket

A fire blanket is a sheet of fire-resistant material that is used to smother a fire. Small fire blankets are designed for fires in the beginning stages. Typically, they are constructed of fiberglass or Kevlar. Larger versions can be found in laboratories and factories and are designed to wrap around a person whose clothing has caught fire.

4. Fire Extinguisher



Figure 2.7: Fire Extinguishers

One of the most prevalent manual fire suppression equipment, fire extinguishers are needed in all commercial buildings and vehicles. Fire extinguishers are designed for minor, early-stage fires and can be used with little to no training. The ABC extinguisher is the most popular and may be found

in most companies and houses. It can be used to put out ordinary, liquid, and electrical fires. There are additional extinguishers designed specifically for kitchen fires and burning metals.

5. Standpipe



Figure 2.8: Standpipe for Active Fire Protection System

In most multistory buildings, standpipes are placed. Dry and wet standpipes are the two varieties of standpipes. The majority of standpipes are dry systems that are not accessible to the general public. A fire engine is needed to pump water into a dry system. Most dry systems don't come with pre-connected hoses, so firemen must supply their own. There is always water in the pipes with wet systems, and anyone can use them. Wet systems will include hoses so that building inhabitants can attempt to put out fires. As the number of sprinkler systems installed grows, wet systems are becoming less popular.

6. Fire Hose Reel



Figure 2.9: Fire Hose Reel

A fire hose reel is a type of firefighting equipment that is used as a first line of defense. It is intended to be used as a quick-response approach for combating fires in their early stages by any member of the general public. Paper, textiles, wood, most plastics, and rubber on fire are all acceptable to be extinguished with fire hose reels. Because they are connected to the mains water supply, fire hose reels are simple to use and give a virtually infinite supply of water. They should stretch for around 35 meters. Fire Hose reels are made up of a continuous length of non-kinking tubing. They have a main turn on/off valve, a hose guide, and a hose with a nozzle and are permanently attached to a water supply. The operator can direct and control the flow of water to the fire using the control nozzle attached to the end of the hose.

7. Fire Hydrant System



Figure 2.10: Fire Hydrant

A fire hydrant is a device that allows firemen to connect to a water supply. It's a part of active fire suppression. Fire hydrants, also known as fire plugs, are short, stubby iron cylinders with a variety of valves and connecting points that come in a variety of sizes and looks. These devices are frequently spotted on city roadways and sidewalks. In terms of a building's fire prevention system, a fire hydrant system is a set of components designed to give enough water to firefighters. The system's design priorities maintaining a sufficient pressure to ensure water flow. The system is kept charged with pressurized water when not in use, but if a valve is opened, the pressure is likely to drop. A pressure switch detects this and activates booster pumps to increase the available pressure. To maximize effectiveness during a fire, firefighters may bring their own water supplies and pumps. This is frequently accomplished by connecting the fire engine pump to another source of water.

8. Sprinkler System



Figure 2.11: Fire Sprinkler

Commercial and residential buildings alike have fire sprinkler systems installed. They're normally mounted on the ceiling and connected to a stable water supply, which is usually city water. A conventional sprinkler system works when heat from a fire causes a fusible link or glass component in the sprinkler head to fail, allowing water to escape the spray head. This means that only the sprinkler head closest to the fire activates, rather than all the sprinklers on the floor or throughout the building. Sprinkler systems assist in minimizing the spread of a fire, increasing life safety, and limiting building damage.

9. Gaseous Clean Agent



Figure 2.12: CO2 Gas Tanks for Active Fire Protection System

Where water or dry chemical extinguishing agents will cause more harm than good, gaseous clean agents are used. They're typically found in server or computer rooms where water or small dust particles can do significant damage. To break the fire tetrahedron, the system floods a region with an inert or a mixture of inert gases. When it is triggered, the inert gases displace oxygen, posing a suffocating risk. The majority of systems have a short delay to allow people to flee.



10. Fire Roller Shutter

Figure 2.13: Fire Roller Shutter

The main advantage of a fire shutter is that it helps to compartmentalize a fire if it breaks out in your structure. When a fire breaks out and the shutter is closed, the flames will be confined behind it. The time it takes for the fire to be trapped behind the shutter permits the building to be evacuated. Furthermore, keeping the fire contained in this manner lowers the amount of damage it might inflict. It also makes it easier for firefighters to put out the flames. Because the shutters inform firefighters that the fire is trapped in a specific location, they may proceed through the building more swiftly and safely to guarantee that the fire is controlled, and everyone is evacuated.

- 11. Smoke Curtain System

Figure 2.14: Smoke Curtain

Smoke curtains are a great way to keep smoke out of your house. They're simple to install in existing structures and integrate with existing detection and response systems. Smoke curtains, unlike other smoke control equipment like exterior exhaust vents, provide a physical barrier against smoke. Smoke Curtains are active fire solutions that channel or force smoke towards smoke extraction points in a structure, preventing transfer of smoke and heat from one smoke zone to another. These are barriers that are used to provide zone separation in complicated architectural structures, preventing fire from spreading throughout the structure. The smoke curtain will deploy vertically from its housing in the ceiling when it is activated. These curtains can be used to close off doorways and elevators, as well as to create an autonomous perimeter around stairwells and atriums where there are no walls.

2.4 Summary of Chapter

Fire Protection System is one of the critical aspects to be considered and available to any and all buildings. A building without any fire protection system and materials is exposed to multiple fire risks and hazards. The system's type and specification required by each building might varies from one type to another but having the most basic of firefighting and protection system is a rule that must be abided by all buildings. The main type of fire protection system is divided into two, which as active and also passive fire protection. Both types have their own distribution and roles for buildings. Even so, it is very important for buildings to have fully functional fire protection system and always ready to be activated at all times.

CHAPTER 3: CASE STUDY

- 3.1 Introduction to Case Study
- 3.1.1 Brief Information of Case Study



Figure 3.1: Front View of Plaza Pelangi

During the internship period, the case study chosen for the internship is a shopping complex with the name Plaza Pelangi. The building is located at Taman Pelangi, Johor Bahru, Johor. The type of the building is commercial building consisting of nine floors including three basement levels and one roof level. The three basement levels are being used as parking lots with the first floor also consisting of two shop lots. Five of the floor levels, starting from the first floor and all the way up to the fifth floor consist of only shop lots and there are a total of 70 tenants filling up the shop lots within the shopping complex. The last floor is the sixth floor which also the rooftop level of the shopping complex. The office for the management department of the building is located at the first and second basement level, right next to the parking lots of the building.

3.1.2 Location of Case Study

<u>Key Plan</u>



Figure 3.2: Key Plan of Plaza Pelangi



Location Plan

Figure 3.3: Location Plan of Plaza Pelangi





Figure 3.4: Site Plan of Plaza Pelangi

No	Service	Contractor
1.	Energy Manager	One Alpha Electrical Services Sdn Bhd
2.	Water Treatment	Syscorp Water (M) Sdn Bhd
3.	Fire Protection System & Smoke Curtain System	Pahlawan Dinamik Sdn Bhd
4.	Air-Conditioning System	Kejuruteraan Bakti Utama
5.	Cleaning	Mashita Pencuci Hygiene (M) Sdn Bhd
6.	Grease Trap	S Best Management
7.	Sump Pit	
8.	Urinal Bowl Sanitizer	Pluscare Hygiene & Pest Control (Johor) Sdn Bhd
9.	Security	Kawalan Keselamatan Sentral (M) Sdn Bhd
10.	Rubbish Disposal	M&M Recycling Enterprise
11.	Landscape	S Best Management
12.	Electrical Plant Supervision	One Alpha Electrical Services Sdn Bhd
13.	LPG System – Piping	Prima Gas Sdn Bhd
	LPG System – Vaporizer	
14.	Pest Control	Pluscare Hygiene & Pest Control (Johor) Sdn Bhd
15.	Sanitac Services	Pluscare Hygiene & Pest Control (Johor) Sdn Bhd
16.	ССТУ	HBM Networks (M) Sdn Bhd

3.1.3 List of Out-Source Contractors & Maintenance for Case Study

Table 3.1: List of Out-Source Contractors and Maintenance at Plaza Pelangi

3.1.4 Fire Protection System at Case Study

A. Passive Fire Protection System

Description	Figures
Fire Exit Staircase	
Location: Every Floor	
There are a total of 6 fire exit staircases connecting all the floors within Plaza Pelangi. There is also another short staircase located in the basement that only connects the three parking lots level located in the basement.	
Fire Rated Door Location: Every Floor There are fire rated escape doors installed for every designated emergency exits. The fire exit staircases are also fitted with fire rated doors.	

Table 3.2: List of Passive Fire Protection System at Plaza Pelangi

B. Active Fire Protection System

Description	Figures
Fire Alarm System <i>Location: Every Floor</i> There is a fire alarm and fire alarm switch located at every floor of Plaza Pelangi	2 BHSI E
Fire Fighting Pump Location: Every Floor The firefighting pump in this building is purposed with wet riser system that connects to every floor of Plaza Pelangi. The pump is located at Level 1.	
Sprinkler System Location: Every Floor There are sprinklers head installed in every lot and space of Plaza Pelangi. They will automatically burst when the temperature increase within the zone area.	

Fire Hose Reel System

Location: Every Floor

The fire hose reels are also installed in every floor. All of them has been strategically positioned to be able to cover up all the area of Plaza Pelangi



Fire Extinguisher

Location: Every Floor

The fire extinguishers all also put in all the space area of Plaza Pelangi. Most of the fire extinguishers in the building is Powder Type ABC.

However, in some location which is exposed to cases of fire caused by electricity, the available fire extinguishers are of CO2 Type B.

Gaseous Clean Agent (CO2)

Location: LV Switch Room, Transformer 1, 2, 3, 4, 5, LLN Room, HT Room, Generator Room The tanks for the gases are located

at Level 1, in the same room as the Generator Set.

Fireman Intercom Panel

Location: Fire Control Room

The intercom panel is located at Fire Control Room, at Level 1. It is connected to all floors to be used in case of emergencies





Fire-Rated Roller Shutter

Location: Level 1 to 5

This system is installed to only a small area within Plaza Pelangi. This is because it was installed as additional fire protection system.



Smoke Curtain System

Location: Every Floor

This is the one of the main fire protection features installed in Plaza Pelangi. It covers for all floors' atrium and corridor area to enclose the area to allow smokes being flowed out through the exhaust fan.

Smoke Detector Location: Every Floor

The smoke detectors are installed at every floor, but only at large open space area. There are no smoke detectors installed at the corridors or within the tenant lots.

Table 3.3: List of Active Fire Protection System at Plaza Pelangi



3.1.5 Operational Organization Chart for Building Evacuation & Fire Protection at Case Study

Figure 3.5: Operational Organization Chart for Building Evacuation & Fire Protection at Plaza Pelangi

3.2 Fire Incident at Case Study

3.2.1 Brief of Incident



Figure 3.6: (Left) Fire as seen from the front of premise lot, (Right) Condition of premise after the fire has been extinguished.

On 7th of October 2021, at 2115 hrs, a fire incident occurred within the Plaza Pelangi, at Level 4, Lot No. 4.18B, with the premise's name *Relysis Computer*. The incident was first sighted by one of the maintenance departments staff that was patrolling in the area before closing the building for the day. The staff saw some smokes emerging from the fourth floor towards the open area. The staff called for assistance from the remaining other staff that were still at the building to quickly take actions for the sudden incidents. They then unlocked the roller shutter for the premise and saw fires within the premise. They hurriedly acted by extinguishing the fire using nearby fire extinguishers and fire hose reels available. Some of the fire sprinklers within the premise lot were also activated due to the high temperature. The fires were successfully extinguished around 2140 hrs.

3.2.2 Cause of Incident



Figure 3.7: The laptop unit that has caused the sparks of the incident

After investigation has been done by the maintenance department and also the firefighter department, it was found that the cause of the incident is due to uncut power supply to one of the electronic items, a laptop, inside the lot that were left unattended for the night after closing the premise. This has caused the charging battery to overheat which led to the sparks of the fire incident.

3.2.3 Actions Taken During the Incident



Figure 3.8: Maintenance staff using fire hose reel to extinguish fire

The first staff that sighted the smokes called for assistance and reported to the security department regarding the smokes emerging from the fourth floor. Since the premise has been closed for the day, the maintenance staff had to break open the lock for the roller shutter in order to enter the premise to further investigate on the origin of the smokes.



Figure 3.9: Maintenance staffs extinguishing the fire with hose reels

Right after the maintenance staff had opened the roller shutter, a fire was sighted in the back area of the premise lot. The maintenance staffs that had arrived on the scene took a total of five nearby fire extinguishers and another decided to use the closest fire hose reel located to the premise. The fire was completely extinguished after about 30 minutes.

3.2.4 Post Incident



Figure 3.10: (Left) Owner of the premise that was contacted after fire was extinguished, (Right) Premise's staffs checking the condition of the premise lot after incident



Figure 3.11: Owner and staffs of other premises came to check on their premise lots.

Right after the fire was extinguished, the owner of the premise was contacted to come to the premise right away. Several other owners for the shop premises were also contacted as to inform them regarding the occurrence of the fire incident and requesting them to check and inspect on their premises' lot on whether they are affected by the incident or not.



Figure 3.12: Maintenance staff servicing the affected escalator in front of the premise



Figure 3.13: Another escalator that was affected but still operable after servicing works has been done

Two escalators, one located right in front of the involved premise, and another located right below it, was immediately switched off due to water from the fire sprinkler overflowed and seeped into the chamber pit of the two escalators. One of the escalators was severely damaged due to the water and had to be shut down until further repair, meanwhile the other was still operable after servicing works were done upon it.

As for the incident report, the maintenance staffs attending to the case did not make any report to either the police or firefighter as soon as the smokes were detected as they were too alarmed by the sudden fire case in the premise. A report to the police and firefighter was only made after the fire was completely extinguished.



Figure 3.14: Cleaner staffs and maintenance staffs cleaning the corridor in front of premises involved in the incident

Right after the fire has been extinguished, cleaner workers that were still in the building has been tasked to immediately clean the corridor area of the involved premises from all the soot and dust that were mixed with the waters from the fire sprinklers. This is to avoid from the remains and debris to dried out and stain the corridor area such as on the floor tiles and the surrounding wall surfaces.



Figure 3.15: Security staff reporting new daily routine after the incident

After the incident, a new daily routine item has been added to the maintenance schedule of the shopping complex. The added item is to give reminder to all premises that handles electronic items within their premises, to completely turn off and cut off the power supply to these items before closing and leaving the premise for the day. This has been done by the security department staff daily and reported to the building manager as to ensure no such incident reoccurring.

3.3 Fire Protection Measures Involved During the Incidents

A. Fire Extinguishers



Figure 3.16: Fire extinguishers that have been used were collected to be replenished and refilled.

For this fire incident, a total of five units of fire extinguishers of ABC Powder Type were used in order to extinguish the fire.

B. Fire Hose Reel



Figure 3.17: Fire Hose Reel that was used during the fire incident.

One unit of fire hose reel was used for this incident. the hose reel is located at around 50 metres to the premise involved in this incident.

C. Fire Sprinklers



Figure 3.18: Fire sprinkler heads that burst during the incident

A total of six units of fire sprinklers were activated during this incident. The fire sprinklers were located within and in front of the involved premise.

CHAPTER 4: PROBLEMS & RECOMMENDATIONS

4.1 Problems Identified Related to Incident

The incident occurred due to the carelessness of the tenants within the lot. However, the spread of the fire is also caused by some lacking or insufficient equipment within the building or tenant lot to prevent or extinguish fire cases.

Listed below are some of the issues and problems identified during analysis of the fire incident at the tenant lot:

1. Lack of Smoke Detector Unit

Smoke detector units installed within Plaza Pelangi are only located at large open space area. That is to say, small spaces such as walkways, corridors, and inside of tenant lots, there are no smoke detector units installed. This makes it harder for the alarm system to be triggered automatically especially during closed operation hours of the building.

Recommendation: To install more Smoke Detector Units at more distributed locations all throughout Plaza Pelangi especially to tenant lot areas that has higher chance of fire incident risks.

2. Tenants Unaware of Fire Incidents Risks

Within Plaza Pelangi, there are quite a number of tenant lots that carry out repairing or servicing works. However, some of them do not take safety or precautionary actions such as to cut off or switch off all electricity powered devices and equipment within their lot, which exposed them to higher chance of fire incidents.

Recommendation: To add routine reminder given from the building management such as daily or weekly reminder to the tenants to always turn off or cut supply to their electrical tools and equipment located within their premise to avoid or mitigate any possibilities for fire incident risks.

3. Lack of Fire Safety Drill and Training Exercise

Some of the staffs and workers have not gone through proper fire safety drill and exercise as the training drill is only carried out once per year. So, this only includes the available staffs at the moment when the training drill is carried out.

Recommendation: To encourage more of the tenants and staff inside Plaza Pelangi to involve and take part in fire safety drill and training exercise. This safety drill and training teach the tenants regarding fire risks and safety actions to be taken in case of fire incidents.

4. Lack of Specific Workstation Area for Tenant Lots

Almost all of the tenants involving in providing servicing works for electrical equipment such as laptop and PC, lack of specific workstation which specialises in handling and containing electricity sensitive tools and equipment. This makes it harder to control the risk and hazard when it involves these scopes of work area.

Recommendation: To create new specific workstation area in each shop lot that provides services related to electrical appliances that is readily equipped with fire compartment materials and also CO2 fire suppression system.

CHAPTER 5: CONCLUSION

As for conclusion, this report includes the importance of fire protection and prevention system for buildings. To have a fully functional and operational fire protection system that covers up all aspects of the building is a must that have to be abided by the building management. Carrying out the practical training with the commercial and facility management under the building management of the case study has taught me more in the importance of such matter.

A good example can be seen from the case study selected for this report, Plaza Pelangi, which had a minor fire incident due to lacking points in terms of fire prevention system within the building. This has to be taken as a lesson that the need of comprehensive fire protection and prevention system in a building is very important.

Several problems have been identified during the analysis of the fire incident within the case study, and recommendations have also been made in order to improvise or upgrade the efficiency and comprehensiveness of the fire protection and prevention system within the building.

All in all, this practical training period with PNB Commercial Sdn Berhad has taught me many things and provided me with valuable knowledge that I require to be successful in the future. Industrial or practical training is an important experience for students that are about to venture into the world of career life. It will help to determine the career path for the individuals.

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APPENDICES

Fire Incident Report by Security Department of PNB Commercial Sdn Berhad at Plaza Pelangi, Johor



RINGKASAN:

Pada jam L/Kurang 21.15hrs. hari Khamis, 07 October 2021, semasa saya membuat rondaan di Level 1 Plaza Pelangi, terlihat kepulan asap dari level 4 Plaza Pelangi. Saya terus naik ke level 4, kelihatan asap dan api di dalam Lot. 4.18B - Kedai Relisys Computer Sales & Services. Maintenance En. Fauzan dan En. Hishamuddin telah berada di lokasi kejadian cuba memadamkan api tersebut. Kejadian ini telah saya maklumkan kepada En. Razak Tuah. Sekian laporan saya.

SIASATAN:

Hasil siasatan di lokasi kejadian, pada Jam L/kurang 21.15Hrs. hari Khamis, semasa saya sedang membuat rondaan di Level 1 Plaza Pelangi, saya dapati terdapat kepulan asap dari Level 4 Plaza Pelangi. Saya bergegas ke lokasi kejadian bersama Maintenance Hishamuddin dan Fauzan mendapati kepulan asap dan api di kedai Relisys Computer. Kami menggunakan Hose Reel dan ABC untuk memadam kebakaran tersebut tetapi kebakaran berpunca dari dalam kedai. Pihak maintenance telah bertindak memotong kunci kedai tersebut untuk memadamkan kebakaran yang berada di dalam kedai. Semasa sedang memotong kunci pada Roller Shulter Kedai Relisys kami dapati Sprinkler telah pecah kerana air melimpah keluar sehingga memasuki "Step Panel Mitsubishi Escalator", Lot 4.18 & 4.18A IT POINT, 4.19 MINSA, 4.20& 4.21 Stage Makeover Studio dan K4.18 Rainbow House. Jam lebih kurang 21.40hrs. api di dalam kedai tersebut dapat dipadamkan. Saya telah menghubungi Pemilik Kedai Lot 4.18B, En. Chai No. Tel. 012-7377693. Setelah membuat pemeriksaan di dalam Kedai Relisys kebakaran disyaki berpunca dari 1 Unit Komputer yang sedang di charging dan tidak mematikan suisnya di dalam kedai tersebut berdasarkan informasi dari pemilik kedai tersebut iaitu En. Chai. Pihak Mashita Pencuci Hygienic telah membantu mengeringkan air yang melimpah di dalam kedai yang terbabit dan sekitar kawasan tersebut. Maintenance En. Nazry telah menggantikan 6 Unit Sprinkler Head yang pecah dengan yang baru di dalam Kedai Relisys. Terdapat juga resapan air di Level 3. Ini sahaja laporan siasatan saya.

KESIMPULAN DAN CADANGAN:

- Kejadian berpunca dari kecuaian Pekerja kedai yang tidak mematikan suis di setiap unit computer selepas tamat operasi.
- Memaklumkan kepada pekerja kedai agar memeriksa dan mematikan setiap peralatan elektrik di dalam kedai sebelum menutup operasi perniagaan.



Location Plan of the Fire Incident within Plaza Pelangi, Johor.