



PROGRAMME IN BUILDING SURVEYING DEPARTMENT OF BUILT
ENVIRONMENT STUDIES AND TECNOLOGY
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
PERAK BRANCH
SERI ISKANDAR CAMPUS

**BUILDING DEMOLITION AT IBU PEJABAT POLIS
KONTIJEN (IPK) CONSTRUCTION SITE KUALA
TERENGGANU**

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BACHELOR OF BUILDING SURVEYING (HONS.)

PRACTICAL TRAINING REPORT

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

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ACKNOWLEDGMENT

In the name of Allah, the Most Gracious and the Most Merciful Alhamdulillah, all praise to Allah for the strength and His blessing to me in completing this practical report. First and foremost, I also would like to expand my deepest gratitude to all those who have directly and indirectly guided me to finish this assignment.

First and foremost, I would like to sincerely thank my lecturer, Dr. An Nisha Nur Welliana Abd Rased for his guidance, understanding, patience and most importantly, he has provided positive encouragement and a warm spirit to finish this assignment. It has been a great pleasure and honour to have her as my lecturer.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Industry Training is a prerequisite for students in certain programs at all levels of higher education at the Institute of Higher Learning (IPT). To increase the level of the work of the graduates, the program was introduced to empower industrial training competency required. LI courses provide students with learning opportunities in the workplace to receive practical experience in order to improve.

This course provides exposure and experience to the students in terms of technology development, effective communication, teamwork practices, policies, procedures and regulations, professional perspective and reporting. This course will build enthusiasm and proactive attitude among students and increase their confidence to be an excellent coach.

Overall, industrial training provides many advantages and benefits to student. During the training period, students are exposed to a variety of activities in the field of duties, even though the job is not done entirely by students for the purpose of security or regular students were briefed and clear guidance and useful enough as a general knowledge, as well as exposed to the real working environment and can learn social skills such as communication and social relationships.

For this semester, I, Nur Maisarah binti Che Zakaria (2018206066) has started working at IPK Construction Site under Kubang Batang Puspa-Sari Sdn. Bhd. as an internship student from 11th October 2021 until 30th January 2022.

1.2 Objective of Compulsory Practical Training Report.

Some objectives can be defined and made known in this practical training report are described as follows:

- i. Be evidence that the student has been training period by a predetermined time period.
- ii. Record all activities during the training period.
- iii. A reference in the future.
- iv. It proves that students understand and appreciate the work done anything during the Practical Training.
- v. As a reference after the training period in the firm after completed their studies.

1.3 Company Background



Picture 1: Company Logo

Company Name	Kubang Batang Puspa-Sari Sdn Bhd
Company Number	323549-W
Status	Bumiputera – Kelas 'A' & Gred G7
Registration Certificate	Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB)
Registration Number	1961101-KN011512
Address	Lot 827, Tingkat 1 & 2 Jalan Sri Cemerlang, Seksyen 27 15300 Kota Bharu, Kelantan
Telephone Number	09-748 2240, 747 3879
Fax Number	09-747 3979
Bank Account	MALAYAN BANKING BERHAD Cawangan Wakaf Siku 5493, D & E, Jalan Sultan Yahya Petra 15200 Kota Bharu, Kelantan
Account Number	003033-619990

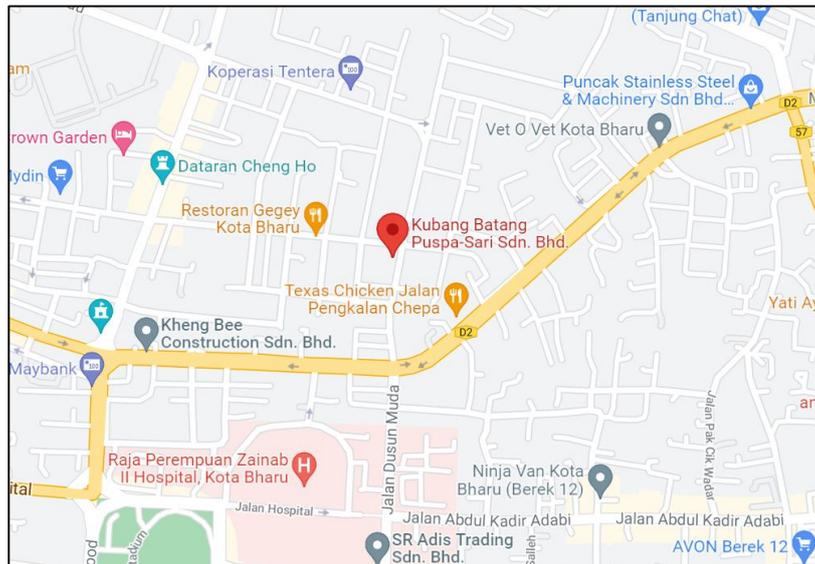
Table 1: Company Information



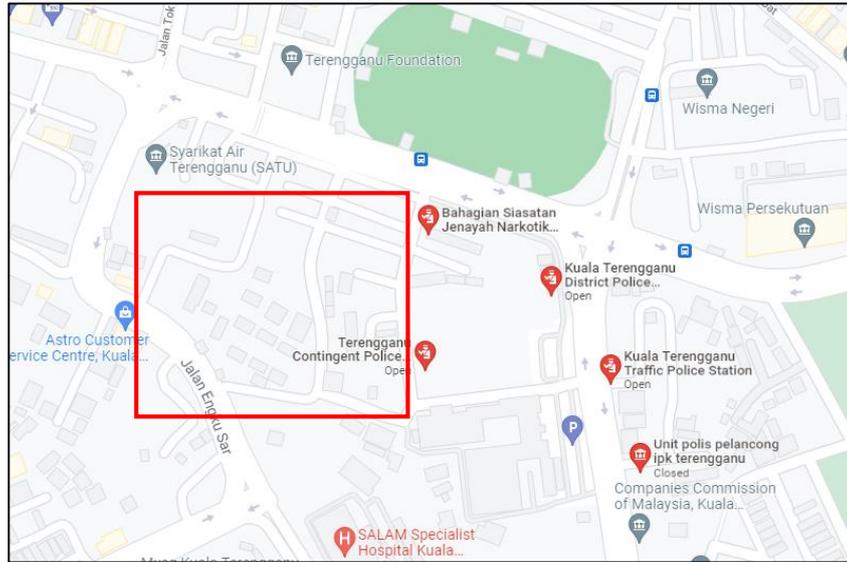
Picture 2: Kubang Batang Puspa-Sari Main Office

Kubang Batang Puspa-Sari Sdn.Bhd. is an enterprise in Malaysia, with the main office in Kota Bharu. The company operates in the Heavy and Civil Engineering Construction industry. The enterprise was incorporated on November 15, 1994. Kubang Batang Puspa-Sari Sdn. Bhd. is located at Lot 827, Jalan Seri Cemerlang, Seksyen 27, 15300 Kota Bharu, Kelantan.

1.3.1 Location Plan



Picture 3: Main Office Location Plan



Picture 4: Construction Site Location Plan

The location of my internship place are located at Lot 3673 & 2011, Jalan Sultan Ismail, Mukim Batu Buruk, Kuala Terengganu, Terengganu Darul Iman, which is Ibu Pejabat Polis Kontijen (IPK) Terengganu site construction project. This construction site is located at the center of Kuala Terengganu city. My practical training here starts from 11th October 2021 until 30th January 2022.

The training area given to me is in development and construction management. The scope of work that I was assigned for is project construction management and site supervision including quality control of works and materials. I also take this practical training opportunity to learn more specifically about taking off quantities and estimating of the project also, preparation and checking of plan drawing.

1.3.2 Organization Chart

KUBANG BATANG PUSPA SARI SDN BHD ORGANIZATION CHART

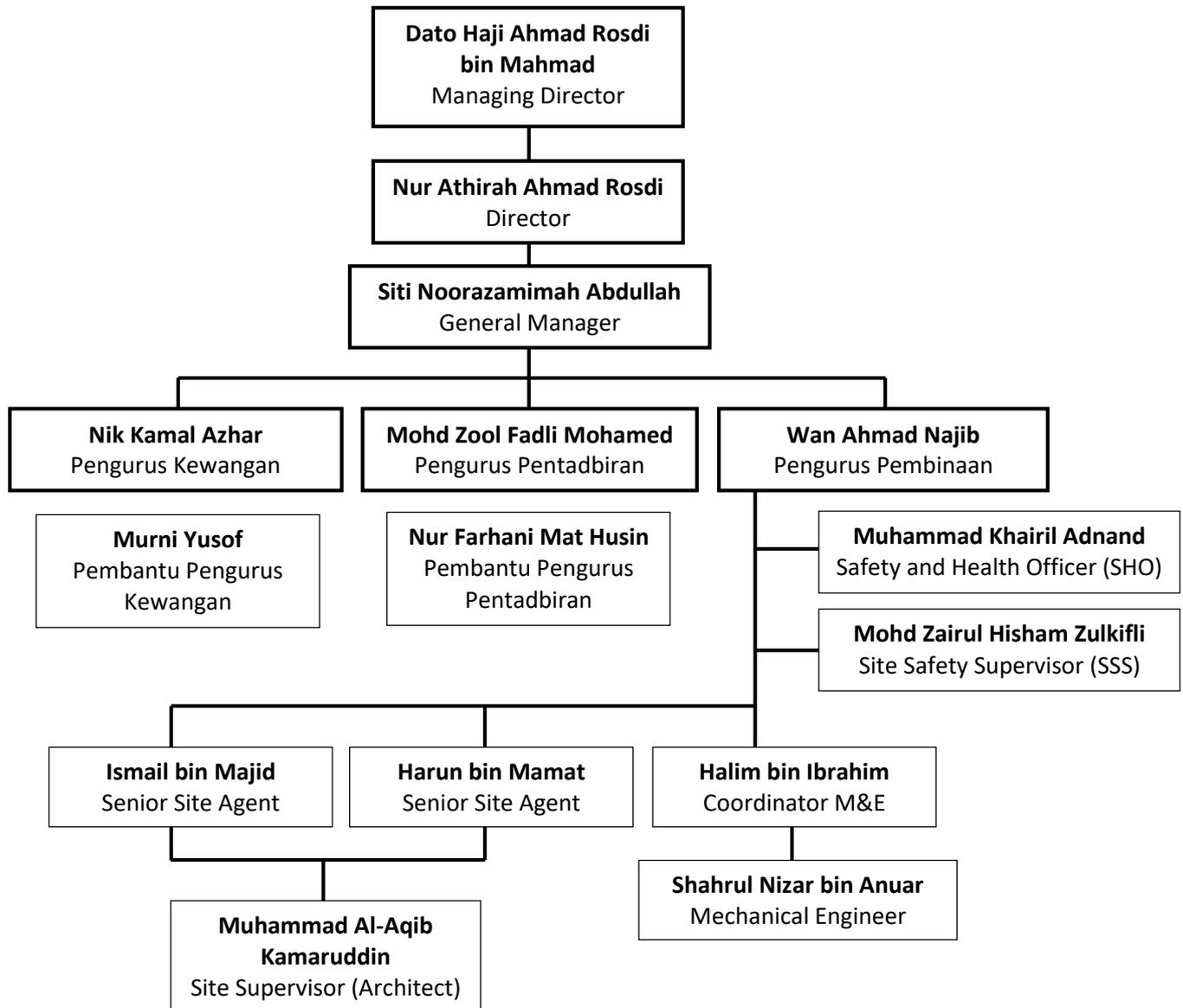


Figure 1: Organization Chart (KBPS Sdn. Bhd)
(KBPS Company Profile, 2021)

1.3.3 KBPS Past and Ongoing Project

BIL.	PROJECT	YEAR
1.	Bangunan Gantian Satu Blok 10 Bilik darjah SMK Tan Sri Mohamed Yaakob Batu Gajah, Tanah Merah, Kelantan	Ongoing
2.	Perkhidmatan Membekal Gangsum Penerbangan Bagi Kegunaan Krew Pesawat Udara, Agensi Penguatkuasaan Maritim Malaysia (JPM)	Ongoing
3.	Membina dan Menyiapkan Ibu Pejabat Polis Kontijen (IPK) Terengganu Serta Kemudahan Berkaitan, Kuala Terengganu, Terengganu	Ongoing
4.	Membina dan Menyiapkan Pembinaan Industri yang Mengandungi Kilang Pemprosesan dan Penyimpanan I MEDIKEL Pharmaceutical Sdn Bhd, Kota Bharu, Kelantan	Ongoing
5.	Meroboh Bangunan Sedia Ada dan Membina Semula Masjid Baru Termasuk Bangunan Tambahan Untuk Masjid Kubang Batang (Masjid Ar-Rahman), Tumpat, Kelantan	2019
6.	Pembinaan Bangunan Canselori dan Gunasama, Universiti Malaysia Kelantan (UMK) Kampus Bachok	2018
7.	Pembinaan Jalan Utama, Jaringan Jalan Dalam Kampus dan Kerja-Kerja Infrastruktur Universiti Malaysia Kelantan (UMK) Kampus Jeli	2017

8.	Membina dan Menyiapkan Sebuah Kompleks Jabatan Pelajaran Negeri Kelantan (JPN) Kota Bharu, Kelantan	2013
9.	Kerja-Kerja Bangunan dan Infrastruktur Bagi Cadangan Membina dan Menyiapkan Sekolah Menengah Kebangsaan Kg. Dangar, Pasir Mas, Kelantan	2010
10.	Menaikkan Taraf Jalan Paloh 2 – Paloh 3, Gua Musang, Kelantan	2009
11.	Pembangunan Ibu Pejabat Polis Daerah Kota Bharu Serta Komponennya dan Kuarters, Polis Diraja Malaysia, Kota Bharu, Kelantan	2008

Table 2: KBPS Past and Ongoing Project
(KBPS Company Profile, 2021)

CHAPTER 2: BUILDING DEMOLITION



Picture 5: Building Demolition Work

2.1 Demolition Work

Building demolition work in Malaysia is more than just swinging a sledgehammer or ramming a hydraulic breaker onto old concrete structures. It's an engineered process of removing a variety of structures safely and efficiently. Over the years, many developed countries have outgrown its own land management in congested areas especially in the cities. Older buildings and even poorly designed buildings that have a Low Plot Ratio is destined for demolition.

Demolition of buildings and structures are required for various reasons. Demolition methods and processes for buildings and other structures are described. As we know that every design of a building or a structure has a lifespan know as design life. The building is designed considering a span of life, say 80 -100 years. When this design life of the building is over, the structure is not safe for living and neighbouring buildings. There can be more reasons for demolition of a building, old structures are to be replaced by new ones. The structure lost its stability or having any structural damage. Small structures are demolished to build big structures etc.

Every demolition works site has unique characteristics. Basically, demolition works involve many activities such as dismantling, razing, destroying or wrecking any building or structure, waste management and so on. As demolition works is the reverse activities of construction works, an appropriate planning and method need to be based on thorough risk assessment study and under the supervision of designated person. This to

ensure that the liveability of the general public is preserved by controlling any possible nuisance without declining quality of life and causing any environment impact (Abdullah, 2008).

2.2 Type of Demolition Work

i. Total Demolition

The demolition of an entire structure or site. This would be most common in the case of community re-structure; for example, if there was an old retail centre that was not benefiting an area, the land could be used to build a housing estate, to provide additional housing for the community, and therefore demolition would be instructed.

ii. Selective Demolition

Removing specific parts of a building. Some old buildings stand the test of time and others don't. In this case, perhaps there is a really old section of a workplace or local amenity that is not performing as it should, but the entire building is not at a state of concern. Or perhaps it is a listed building, therefore you may be restricted as to what and how much you can demolish (Abdullah, 2008). So you could select a particular section of the building to demolish and build up from scratch. This also can add value to a current building too by performing construction in stages.

iii. Interior Demolition

Demolition particular parts of the inside of a building, while protecting and maintaining the exterior structure. For example; partitions, walls, ceilings, etc. A great option for creating more space inside of a building or removing troubled areas.

iv. Dismantling or Deconstruction

This method involves the careful dismantlement or deconstruction of a building or structure in order to preserve parts for reuse, refurbishment or recycling. Dismantling structures is a lot more labour intensive than the total or explosive demolition.

v. Explosive Demolition

A highly specialised type of demolition, explosive demolition involves using explosives to bring down high reach building structures. This type of demolition work will target the structural support of a building so that it collapses in on itself.

2.3 Building Demolition Process

Based on (Fauzey et al., 2015) different steps are involved in the process of demolition of building structures which are:

1. Surveying
2. Removal of hazardous materials
3. Preparation of plan
4. Safety measures

1. Surveying of Buildings for Demolition

Surveying means study of different parameters of the structure and its surroundings. There are two types of surveying are mainly conducted. They are

i. Building surveying

In survey of buildings for demolition, following process are carried out:

- Types of construction material used.
- Usage of building prior and present during demolition.
- The presence of wastewater, hazardous materials, matters arising from toxic chemicals, flammable or explosive and radioactive materials, etc.
- Drainage conditions and possible problems on water pollution, flooding and erosion.
- Shared facilities with adjoining building, including common staircases, partition walls.
- Adjoining pedestrian and vehicular traffic conditions
- The sensitivity of neighbourhood with respect to noise, dust, vibration and traffic impact.

ii. Structural surveying

In structural survey, following process are involved in demolition:

- The method of construction.
- The structural system and structural conditions of basements, underground tanks or underground vaults.
- The original structural system employed in the design.
- The condition of the building.

2. Removal of Hazardous Materials

If hazardous materials like asbestos minerals, petroleum contamination, and radioactive metals are found in the investigation of site for demolition. Specialized personals are called for the removal of the hazardous materials from the site prior to the demolition of structure.

3. Preparation of Demolition Plan for Structures

A detailed demolition plan is made which illustrates the different process involved and they are:

- The location of the building to be demolished.
- The distances from the building to be demolished to its adjacent buildings, streets, structures and significant street furniture.
- The structural support systems of the building.
- A plan showing the procedure for the demolition of the building; detailed sequence of demolishing structural members; and the method of demolition to be adopted.
- A plan showing all precautionary measures for the protection of the public including hoardings, covered walkways, catch platforms, catch fans, scaffolding, protective screens and safety nets.
- Method of handling demolished building debris.
- Time required for the complete demolition process etc.

4. Safety Measures during Demolition of Building Structures

All the workers, site supervisors and engineers including plant and equipment operators are briefed with the potential hazards and process of demolitions. All goods that are flammable are removed from the site unless it is used in the work involved. All the flammable materials like wood, timber, fuels etc. are stored in proper storage facilities.

Firefighting appliances are stationed in the demolition site till the process is completed. Due to the demolition of structure, many problems are faced by the workers, such as. exposure to dust, chemical exposure, heat stress and ventilation, noise exposure, medical and first aid facilities, sanitation and occupational diseases. To overcome these problems suitable measures are undertaken (Abas, 2010).

2.4 Demolition Methods for Buildings

There are two types of demolition methods used for buildings and structures (Selaiman, 2017).

1. Non-explosive demolition

It means the demolition of a structure done with some equipment without the use of any explosive. Different equipment's used for the demolition activity are:

a) Sledge hammer

It is a small handheld hammer used for the demolition of small wall or single column.



Picture 6: Sledge Hammer

b) Excavators and Bulldozers

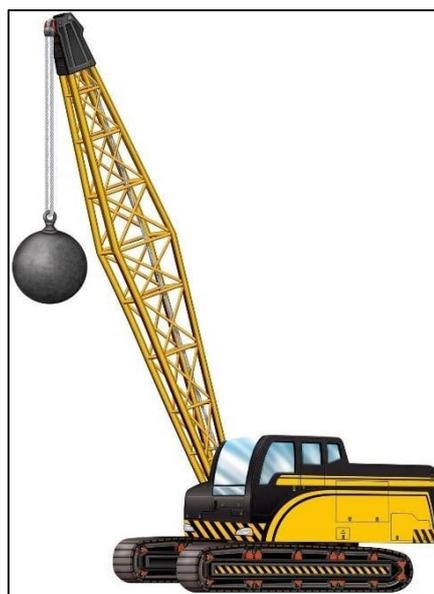
These are big machines used to demolish buildings of small sizes. They are used for excavation of soil or transferring of debris to trucks etc.



Picture 7: Excavator and Bulldozer

c) Wrecking Balls

The building with the greater height up to (6-7 story) cannot be demolished with the help of excavators or bulldozers. In such cases crane with wrecking balls are used to perform the demolition activity. The wrecking ball crane is attached with a huge steel ball hanging from a steel rope. The steel ball is pulled and released towards the building. The steel ball with force strikes the building and the part of the building is demolished. This method is not recommended as the trajectory of the steel ball cannot be controlled after it strikes the structure.



Picture 8: Wrecking Balls Crane

d) High Reach Excavators

High Reach Excavator machines are used in the demolition of tall building where demolition by explosion is not possible. The building of height up to 300ft can be demolished by this type of machine. High reach excavators can be used for different use by doing some attachments such as:

- Excavators with shear attachments - excavators with shear attachments.
- Hydraulic hammers - Hydraulic hammers and remove steel reinforcement.



Picture 9: High Reach Excavators

2. Explosive demolition.

Implosion Method of Building Demolition

Implosion is the process of demolition of a building using explosives. If the supports of the building are removed, the structure collapses. Using implosion technique, the main supports of the buildings such as column's, beams and slab are fixed with explosives. When these explosives are detonated, the column collapse and so is the structure. Depending how the structure falls, there are two types of implosion:

a. Falling like a tree



Picture 10: Building Demolition

In this type of implosion, the building is made to fall like a tree to the sideward. This is the commonly used type of implosion. When free space is available besides the building, this type of demolition is prescribed. If the free space is available on the left side of the building, the explosives are set on the lower level of the building on the left side columns. As the explosives are detonated, the columns bursts, the building tends to falls towards the left side. Steel cables are tied to the building to control the falling direction of the building.

b. Falling into its own footprint

When the free spaces are not available around the building and the structure around the building are to be protected. This type of demolition is used. In this type of demolition, explosives are set in the floor below the middle part of the building.



Picture 11: Structure Demolition

These explosives are to be heavy as the explosion must demolish the building at once. If one-part blast and followed by another. Then the building falls towards the first blasted part. So only less companies in the world are experienced in this type of demolition. As the explosions are detonated, the upper part of building destroys and falls upon the lower building. Due to the heavy load and force the lower part of the building also collapses and falls on its own footprint.

CHAPTER 3

THE PROJECT

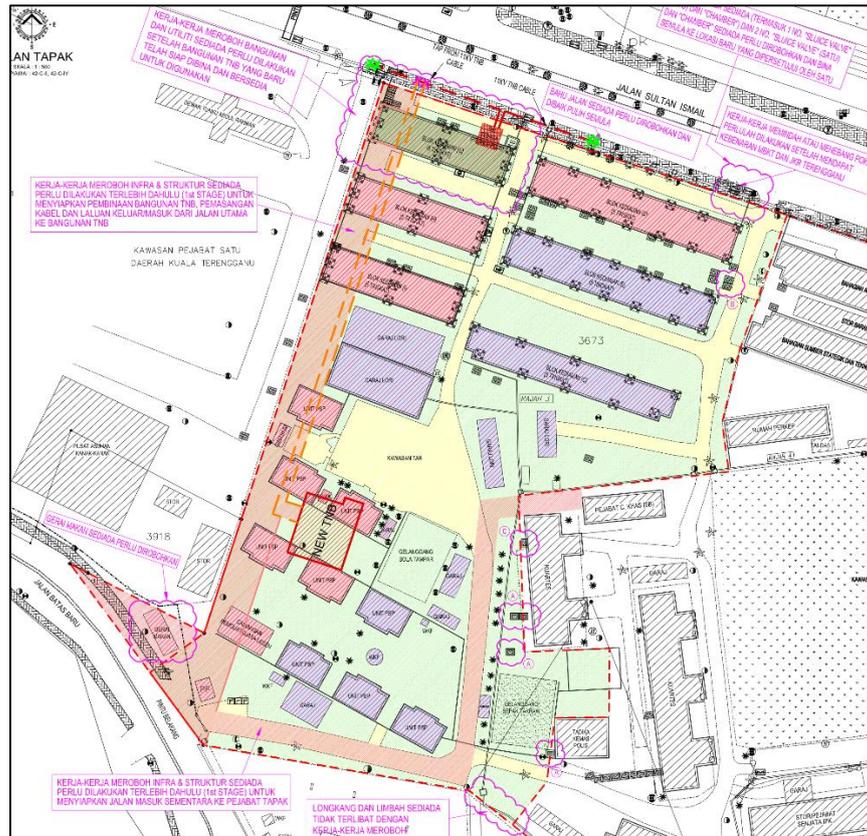
3.1 Case Study: Ibu Pejabat Polis Kontinjen Terengganu (IPK) Site Construction



Picture 12: IPK Site Construction

The demolition work for this IPK site construction start at 12 October 2021 (Tuesday). The demolition work for this project started from the small building which is 'Unit Pasukan Simpanan Persekutuan (PSP)' at the main entrance road. The highest existing building at this construction site that going to be demolish is a 5-storey building which was used as the police residence 10 to 15 years back.

Jamal Deraman leads a demolition squad of four workers, including two operators, Kaven and Hassan. Another worker, Abdullah, will be in charge of the water pump in order to avoid dust from the demolition activity from polluting the surrounding air. The demolition activity has ended on 27 December 2021 (Thursday) and the total cost for demolition work is approximately RM 717,000 in total.



Picture 13: Demolish Work Layout Plan

Based on the picture above which is demolish work layout plan, all of the coloured building in the plan is the existing building that will be demolish. There are 3 different stages of demolish work here which is first stage, second stage, and third stage. The purple colour coded building is the first stage existing building that going to be demolish.

The second stage is the pink colour coded building which the demolition work for this stage will be start after the first stage existing building are fully demolish and the last stage of demolition work are the green colour coded of existing building or structure that will be start after the first and second stage of demolition work is done.

3.2 Demolition Method

Deconstruction or Top Down

Deconstruction, also known as the top down technique, is a demolition process that works its way down from the roof to the ground. There are specific demolition sequences that vary depending on the site conditions and structural elements to be removed.

It is the process of deconstructing a structure in order to salvage structural members for material reuse and recovery, and it is routinely practised by both machines and hand demolition methods but we only used machineries in this demolition activity. The top down approach is suitable for most sites, especially those in congested urban locations.

3.3 Machinery

There are a few machineries used to demolish this existing building as the following below:

1. Demolition Excavator



Picture14: Demolish Excavator
(Google Picture)

The Demolish Excavator is used to demolish the low level building that can be reach by this excavator. Using the Excavator Grapple, the operator will crush the concrete structure and cutting the steel bar.

2. Long-reach Excavator



Picture 15: Long-reach Excavator
(Google Picture)

At this construction project, Long-reach Excavator is used to demolish the high part of building that can't be reach by a normal demolish excavator. This Long-reach Excavator is less noise and vibration by using the hydraulic crusher to crush the concrete structure and cutting of steel bar.

3. Backhoe



Picture 16: Backhoe Excavator
(Google Picture)

Backhoe Excavator are used to dislocate the crushed concrete and steel bar after the demolition activity by transferring the concrete into Dumper Truck. Backhoe Excavator also functioning as a machinery to excavate the underground concrete and pile cap after the demolition on the superstructure is done.

4. Dumper Truck



Picture 17: Dumper Truck
(Google Picture)

At this construction site, Dumper Truck is used to transfer the crushed concrete and steel bar in the right place that have been given by Majlis Bandaraya Kuala Terengganu (MBKT) that were given to RD PAPERS Sdn. Bhd. to be managed.

5. Water Pump



Picture 18: Water Pump
(Google Picture)

Water pump are used in demolition activity in order to prevent the dust from building demolition activity from polluting the environment air around the construction site. Water pump also helps the machine operators to see more clearly to do their job.

3.4 Safety Requirement

The purpose of the site safety elements is to prioritise public safety, particularly for pedestrians, site personnel, vehicular traffic, and adjacent property. At this IPK Construction Site, we are using hoarding, warning signs, and protective enclosures. A thorough safety and emergency strategy, as well as the availability of first aid medical supplies, are essential in a demolition operation.



Picture 19: Hoarding photo from construction site

- Hoarding – Placed around the perimeter of the demolition site, as well as any other precautions required to prevent unwanted entry or trespassing during the demolition process.
- Warning signs – Warning signs are placed in strategic locations and be easily visible. The warning signage are brief, precise, and understandable in order to make civilians passing around that area know about the hazard that might occur.
- Protective enclosures – The reinforced plastic sheeting and screen netting are added to the hoarding in order to protect the environmental and debris enclosure. The protective enclosures are designed to take account the loads of projected materials as well as wind load.

3.5 Weather Conditions

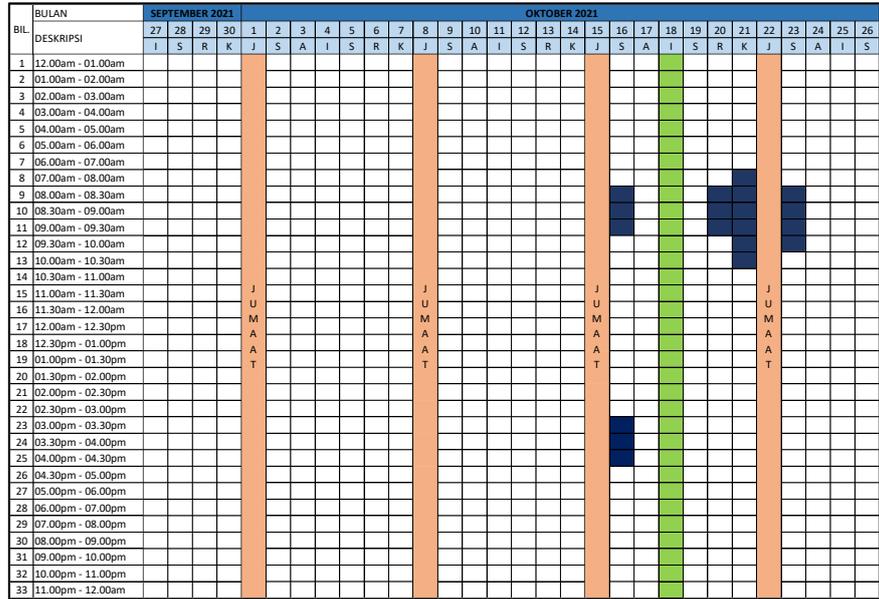


Figure 2: September and October Weather

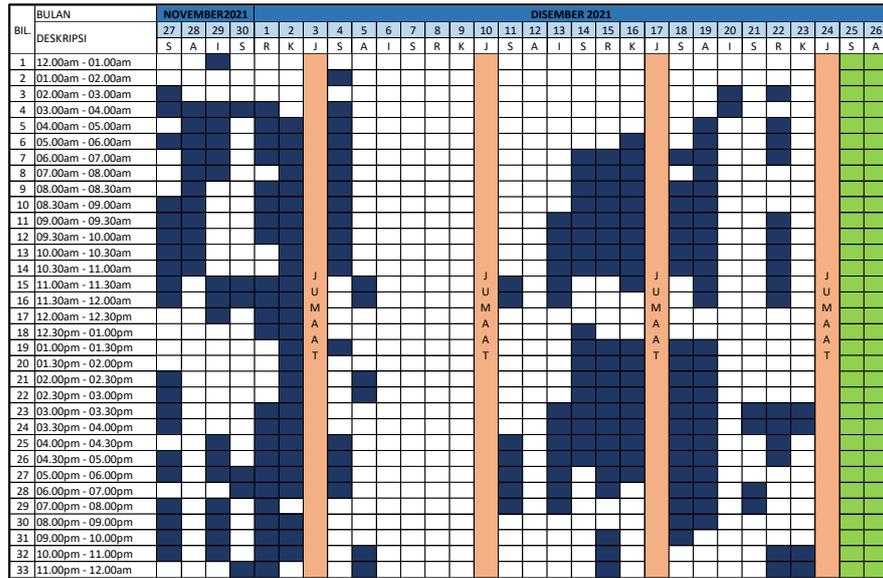


Figure 3: November and December Weather

From the figure above which is weather schedule from site monthly report, we can see from the blue colour that there is a rainy day mostly in November and December. Rainy day is a good weather condition to do a demolition activity because the dust from the results of demolition activity will be rid by the rain itself and the air pollution will be avoided. These rainy conditions will make the demolition work even easier for the excavator operator to do his job. The green colour found in the figure above indicates a public holiday where demolition work is not allowed to do.

CHAPTER 4

PROBLEM IDENTIFY

4.1 Problem Identification

4.1.1 Water Reticulation



Picture 20: Water Reticulation Pipe
(Google Picture)

A water reticulation system helps water move from the original source to the consumer. Another aspect to consider while planning and developing the system is the amount of water required. When changing elevations, the water must overcome whatever resistance it encounters. The aforementioned aspects should be considered because they can have an impact on the operating costs.

This movement can be aided by gravity, which is advantageous in terms of cost. The water will flow from the elevated reservoirs to the valves, where it will be dispersed and controlled. Gravity flow systems are often favoured and seen to be reliable. Pumps, tanks, and other system components, as well as other materials, are easily replaceable.

Pipes that have been buried are used for a longer period of time. PVC, polythene, galvanised and/or black steel, and copper are common materials utilised in the construction of these systems. When choosing a pipe, consider the pipe's life expectancy, its safe operating pressure, its ease of bending and installation, the cost, and the type of pipe connection that will be required. It's also a good idea to choose a pipe that can withstand corrosion, soil movement, and vehicle loads (Johan et. al., 2018).



Picture 21: Water Reticulation Leakage

The water reticulation pipe at this construction site have been buried for a long period of time. The pipe is now easily broken or leakage due to the lifetime of the pipe itself. When the demolition activity is ongoing, the existing concrete that have been crash are fall and hit some of the underground water reticulation pipe. this leads to the leakage of the water reticulation pipe.

The water reticulation pipe at this construction site is still connected to the used building beside the demolition building which is 'Unit Jenayah'. When the water reticulation pipe from inside the site construction is leaking, there is no water from 'Unit Jenayah" and we have to stop the demolition work because the leaking water reticulation pipe need to be repaired first.



Picture 22: Water Reticulation Repair Work

This procedure usually takes 1 to 2 working days depend on the damages. This cause the delayed of the demolition activity and also a waste of money because the water reticulation pipe must be repaired by the skilled worker which is from Syarikat Air Terengganu (SATU).

4.1.2 Machinery Breakdown



Picture 23: Long-reach Excavator Breakdown

From 12 October 2021 to 27 December 2021, the excavator machine used especially the Long-reach excavator have been breakdown several times. This happened due to a few unknown reason and this breakdown are causes such a delay for the demolition activity.

The excavator reparation work usually takes 3 to 4 working days and sometimes take a week to repair the excavator depends on the damages. The demolition work will start right after the reparation work is done. This is one of the reason that can causes a delayed to the demolition activity.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

As for the recommendation for demolition problems, the main contractor which is Kubang Batang Puspa-Sari Sdn. Bhd. can take precaution measures against the occurrence of the water reticulation pipe leakage by speeding up the demolition waste clearance. With this way, the path for excavators will be more clear and the area where there is the existing water reticulation pipe can be avoided. This can reduce the risk of leakage to the water reticulation pipe. As for machinery breakdown, there's not much that we can control except for doing a regular service to all the machineries.

In conclusion, I benefited a lot in this practical training in a way that I managed to apply the theoretical knowledge that I learn from university into practice through so many activities and task. After complete my industrial training, I had been exposed to a Project Management and Site Supervision life. Throughout my internship, I could understand more about the definition of a project management and prepare myself to become a responsible and innovative worker in future. Along my training period, I realize that observation and communication is a main element to make something successful because site construction is where the colleagues are working as a team. Not only for my internship but daily activities too.

During my internship, I cooperate with my colleagues and project manager to learn and work on new things that I didn't experience in my student life. Moreover, the internship indirectly helps me to learn independently, discipline myself, be considerate/patient, self-trust, take initiative and the ability to solve problems. Besides, my communication skills are strengthening as well when communicating with others. During my training period, I have received criticism and advice from my project manager and all my colleagues when mistakes were made. However, those advices are useful guidance for me to change myself and avoid myself making the same mistakes again.

In sum, the activities that I had learned during industrial training really are useful for me in future to face challenges in a working environment. I would like to once again appreciate everyone who has made my industrial training a superb experience.

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APPENDICES



Picture 24: Demolition Work Activity



Picture 25: Demolition Work Activity



Picture 26: Existing Building



Picture 27: Water Reticulation Pipe Reparation Work



Picture 28: Long-reach Excavator Demolition



Picture 29: Demolition Work Progress



Picture 30: Long-reach Excavator Breakdown



Picture 31: Safety Cone Restrictions