



PROGRAMME IN BUILDING SURVEYING

DEPARTMENT OF BUILT ENVIRONMENT STUDIES & TECHNOLOGY

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

UNIVERSITI TEKNOLOGI MARA

PERAK BRANCH

SERI ISKANDAR CAMPUS

MAINTENANCE WORKS AT SMK LANDAS

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BACHELOR OF BUILDING SURVEYING (HONS.)

PRACTICAL TRAINING REPORT

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PROGRAMME IN BUILDING SURVEYING
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This practical training report is a fulfillment of the practical training course.

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ACKNOWLEDGEMENT

ALHAMDULILAH ... In the name of God, Most Gracious, Most Merciful. First of all, I am grateful to Allah SWT for giving me a great opportunity to undergo industrial training at the Public Works Department Hulu Terengganu (JKR) and complete it successfully and i was able to complete this report in the time allowed. Therefore, by HIS grace, I also gained the strength and confidence to complete this task despite having to go through various challenges, obstacles and problems that I had to face to complete this task, as it is mandatory.

First and foremost, I would like to thank my industry supervisor, Encik Ahmad Fazli bin Abd Wahab for his guidance, information and knowledge throughout my training at JKR. In addition, I would also like to thank all the staff here and all other department heads, officials, and also all office staff in the Building Department Maintenance for their unwavering cooperation and support in providing me with the chance and constantly assisting and supporting me in completing a standard report as well as for their willingness to assist me while completing my industrial training.

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ABSTRACT

This report is prepared to provide readers with detailed about the information on my industrial training at the Hulu Terengganu Public Works Department (JKR). Other than that, the industrial training is one of the compulsory that curriculum at Building Surveyor course that must be completed by students whether practical in consultants, factories and companies. This course is designed to equip students with job experience and information before they begin working in the real world. My industrial training is the Public Works Department or known as JKR which provides maintenance and construction work or the like to the public sector in Malaysia.

At the Public Works Department, I was sent to the Building Unit as well as building maintenance. However, in the building unit, there are 3 parts namely Development Project, Maintenance, Electrical Engineer. Throughout my placement, I have learned many new sciences about building maintenance. This knowledge is useful for me in the future and gives me many advantages to prepare myself for future career.

Last but not least, when completing industrial training at JKR, this report should be including an introduction, a brief background of this company, tasks and mini-projects that have been assigned to me, recommendations, and conclusions in detail while undergoing industrial training at JKR.



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LIST OF SYMBOLS / ABBREVIATION

PWD	Public Work Department
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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

An industrial training course of at least 4 months is required in the process of issuing a degree to students because there is no denying the course or field taken, which is the Building Surveying course. Industrial training can help students apply it into classroom educational learning and skills or abilities available from the workplace. Furthermore, this industrial training can help students learn in more detail and handle the situation in the training place. In addition, the industrial training report needs to be completed by the students within the stipulated time as it can help the students reveal the industrial training objectives obtained and new learning from the assignments the students have done for 4 months the students can record it in this report.

1.1.1 DEFINITION THE TERM OF INDUSTRIAL TRAINING

Industrial training can be defined as students doing their training in real - life situations in the workplace and allowing students to apply every knowledge and skill they have learned in class. Industrial training can help students to practice their skills and abilities especially analytical skills for building survey students. This is because every building surveying student needs to develop the skills of defect analysis and maintenance work and needs to learn to build some good skills for maintaining property, buildings, equipment and other environments. It is an opportunity to engage with the professionals they aspire to in a realistic work environment.

However, industrial training is referred to as a program that offers good practical training within a time frame set by the university. It is offered by private companies as well as by government organizations. Industrial training also provides students with essential skills and practical knowledge as well as motivates them to become a professional and successful engineer. Students will acquire theoretical and practical knowledge during



the training period. There are various courses taught under industrial training. The minimum training period is 12 to 14 weeks.

Other than that, industrial training may be defined simply as a process of assisting a student for enhancing efficiency and effectiveness to a particular work area by acquisition of more knowledge and practices. This can be proven when students need to complete their task given by industrial supervisor accurately and normally industrial supervisor will share any tips or advice that can help students to complete their task in fast way but correctly or can be named as efficient work (Introduction of training, 2009).

Industrial training is required at every stage of work and for every student at internship to keep oneself updated with the technologies of system used at the workplace, concepts, values and environment, training plays a vital role. This is because industrial training students did not expert with technology that use at the company because is it using online system at company and adapt with people and environment at workplace that consist of variety kinds of attitude and also variety position in the company (training introduction, 2009).

1.1.2 OBJECTIVE OF INDUSTRIAL TRAINING

The objectives of the industrial training are:

- i. To acquire working experience and develop intellectual knowledge.
- ii. To provide students the opportunity to test their interest in a particular career before permanent commitments are made.
- iii. To expose students to real work environment experience, gain knowledge in writing report in technical works/projects.
- iv. To enhance the ability to improve student's creativity skills and sharing ideas.
- v. To build a good communication skill with group of workers and learn to learn proper behaviour of corporate life in industrial sector.

1.1.3 OBJECTIVE OF THE REPORT

Below are the objectives of the report:

- i. To identify the definition of maintenance works.
- ii. To identify the procedure of maintenance works at SMK Landas.

1.1.4 COMPANY LOCATION

Figures below show the location of Jabatan Kerja Raya Hulu Terengganu. JKR Hulu Terengganu Office is located in a strategic area located in Kuala Berang, Hulu Terengganu near the main route from Kuala Berang City to Kuala Terengganu. Distance from Kuala Terengganu about 30 Kilometre's. Adjacent to Hulu Terengganu District Hospital & has good transport network which is close to the East Coast Highway (LPT) as shown in the figure.



Figure 1: Location Plan



Figure 2: Key Plan

1.1.5 Company Details

Company Name: Pejabat Jurutera Daerah (JKR) Hulu Terengganu

Company Address: Pejabat Jurutera Daerah, JKR, 21700 Kuala Berang, Terengganu

Website: <http://jkrht.terengganu.gov.my/>

1.2 COMPANY PROFILE

1.2.1 Company History



Figure 3:Pejabat Jurutera Daerah (JKR) Hulu Terengganu

The Public Works Department was established in 1872 and has provided better infrastructure and environment for daily life for the people. Aside from that, the Terengganu Public Works Department (JKR) has been operating as a technical agency for the Terengganu Government since 1921. Roads, buildings, airports, ports and jetties are among the infrastructure development and maintenance projects responsible for various Terengganu JKR agencies, statutory organizations, and the government. state.

However, JKR Hulu Terengganu District led by En. Alif Zuwairi bin Baharuddin as a District Engineer. JKR Hulu Terengganu District is the implementing department and development pulse for Hulu Terengganu District. Apart from planning, designing, implementing, supervising and monitoring federal and state development and maintenance projects.

1.2.2 Corporate Logo



Figure 4: JKR Corporate Logo

Description

1. The logo, in general, displayed reflects the diversity of work areas entrusted to the Public Works Department (JKR).
2. The black curved line symbolizes the work of supplying clean water and illustrates JKR is a dynamic organization.
3. The dark black arch -shaped line symbolizes work related to the construction and maintenance of the bridge and also reflects JKR as an organization entrusted as the country's main leader to carry out engineering work.
4. The black straight line above the arch -shaped line symbolizes the commitment to implement the national road network.
5. The fourteen lines lying on a straight line symbolize the involvement to carry out building work covering 14 states and federal territories in Malaysia.

Color

1. Yellow symbolizes the maturity of the JKR brand as one of the oldest organizations created and reflects a mature image in achieving its objectives.
2. Black symbolizes the strength or quality unity of the branches in the JKR's organization that are entrusted to implement development projects.
3. Grey symbolizes the existence of values of the noble values of human capital in providing services.



1.2.3 Vision, Mission and Objectives

JKR manifests the country's aspirations in providing the best service to the people through the department's vision and mission, which are as follows:

1.2.3.1 Vision

We will be a world class service provides and centre of excellence in asset management and engineering services for the development of the nation's infrastructure through creative and innovative human capital and the latest technology.

1.2.3.2 Mission

PWD contributes to the development of the country through:

- Assist clients in delivering policy and service outcomes through.
- Standardization of processes and systems for consistent delivery of results.
- Provide effective and innovative asset and project management.
- Strengthen existing engineering competencies.
- Develop new human capital and competencies.
- Maintain integrity in providing services.
- Build a harmonious relationship with the community.
- Preserve the environment in service delivery.

1.2.3.3 Objectives

The objectives of Public Works Department's as the Government of Malaysia's Lead Consultant are to:

- “Deliver products and perform maintenance services on time, quality and cost set to achieve optimal asset benefits”.

1.2.4 CLIENT CHARTER

Below shows the client charter of Malaysian Public Works Department



PIAGAM PELANGGAN

JABATAN KERJA RAYA MALAYSIA 

DEPARTMENT OF MALAYSIAN PUBLIC WORKS

JALAN SULTAN SALAHUDDIN, KUALA LUMPUR

Tel: 603-2615 8100 • F: 603-2615 8101 • E: kcr@jkr.gov.my • W: https://jkr.gov.my

1.0 PENGURUSAN PROJEK

FASA PRA-PEMBIANAN

Terdapat kepada syor awal syor, serta masalah tapak, perancangan yang merincikan, jenis projek yang dilakukan oleh Unit Perancang Teknikal (JPT), JPM dan pelaksanaan Value Assessment (VA) dalam operasi, tempoh perancangan hingga siap adalah seperti berikut.

Projek	Jenis	Rehabilitasi dan Tempoh
a) Bangunan	Pelan PDR hingga selesai	Lain-lain Paka & Sina
		4 Bulan, 10 Bulan, 4 Bulan

FASA PEMBIANAN

Terdapat kepada syor awal syor semua pengiraan baik tanah hasil seliaan, baik halangan di atas tapak syor dan perancangan disahkan sehingga dapat tempoh kontrak, projek dalam pembiaran akan ditetapkan seperti berikut.

Projek	Kod dan Tempoh
a) Bangunan	RMD000 dan ke bawah: 12 Bulan, 24 Bulan, 36 Bulan, 48 Bulan
b) Jalan dan Infrastruktur	RMD000 dan ke bawah: 9 Bulan, 22 Bulan, 36 Bulan, 42 Bulan
c) Projek Kompleks (Jalan, Cerun, Bangunan, Pengangkutan Udara, Melayan, Pengangkutan Darat dll.)	RMD000 dan ke bawah: 12 Bulan, 24 Bulan, 36 Bulan, 48 Bulan
d) Projek Kompleks (Jalan, Cerun, Bangunan, Pengangkutan Udara, Melayan, Pengangkutan Darat dll.)	RMD000 dan ke bawah: 12 Bulan, 24 Bulan, 36 Bulan, 48 Bulan
e) Hospital	70 hari, 120 hari, 200 hari, 300 hari (Paka & Sina)
	36 Bulan, 42 Bulan, 48 Bulan

2.0 SENGGARA ASET

JALAN PERKERUTAN DAN NEDERI

- a. Tindakan pembaikan sementara (barang laluan) (perbaikan) 11 hari
- b. Tindakan pembaikan kekal akan dilaksanakan selepas dihantar paati atau diterima 21 hari
- c. Sebarang perkara berkaitan yang menganggu keselamatan atau keselamatan awam, seperti projek lumpur atau tanah runtuh, tindakan akan diambil selaras dengan paati atau diterima 24 jam
- d. Selak pembaikan bertulis akan ditunjukkan melalui media massa sebelum kerja-kerja dijalankan 21 hari

BANGUNAN PERKERUTAN DAN NEDERI

- a. Tindakan pembaikan sementara (barang laluan) (perbaikan) 11 hari
- b. Tindakan pembaikan kekal akan diterima selepas dihantar paati atau diterima 21 hari
- c. Tindakan pembaikan kekal akan diterima selepas dihantar paati atau diterima 21 hari

MEKANIKAL

- a. Tindakan awal terhadap aduan berkaitan dengan perkhidmatan mekanikal 11 hari
- b. Kerja pembaikan besar (major work) / pembaikan badan bangunan 31 hari
- c. Kerja pembaikan kecil (minor work) 31 hari
- d. Penggantian pengaliran (air) 17 hari
- e. Penggantian paip air (air) 17 hari

ELEKTRIK

- a. Tindakan awal terhadap aduan berkaitan dengan perkhidmatan elektrik 11 hari
- b. Mengganti insiden pembaikan berkaitan elektrik 7 hari

3.0 KHIDMAT NASIHAT TEKNIKAL

KEAJURUTERAN CERUN

- a) Runtuh cerun bertempak besar:
 - 1. Lawatan tapak habilitasi dibuat dalam tempoh 24 jam dari maklumat diterima
 - 2. Laporan awal disediakan dalam tempoh 2 hari bekerja dan tarikh lawatan tapak
 - 3. Runtuh cerun bertempak kecil:
 - 1. Laporan syor pembaikan akan disediakan dalam tempoh berikut
 - 2. 1 bulan
 - 3. Usaharaya kecil kepada pemohonan pengangkutan melalui Laporan Teknikal yang diterima daripada PPRM. Kerja-kerja pembaikan akan ditamatkan dalam tempoh 14 hari bekerja selaras dengan tempoh pembaikan di tapak

KEAJURUTERAN SENGGARA

- a) Bangunan:
 - 1. Kejuruteraan kejuruteraan syor membuat value assessment awal tak sah minor bangunan / Persekitaran / Persekitaran dibuat dalam tempoh 14 hari dari tarikh permohonan pemohonan yang berkecuali dengan Unit Kawangan SenGGARA Fasiliti Bangunan, Insulin dan Bilik-bilik
 - 15 Hari
 - 2. Mengemukakan usulan terhadap permohonan pembaikan tapak jalan daripada PPRM dan Tempoh dalam tempoh 2 minggu selepas dokumen permohonan lengkap diterima

KEAJURUTERAN FORENSIK

- a) Bagi kerja-kerja forensik struktur, geoteknik dan jalan:
 - 1. Melakukan insiden hasil pemantauan yang diperlukan di tapak disediakan dalam tempoh 2 hari bekerja selepas tarikh laporan tapak
 - 2. Laporan awal berkaitan perkhidmatan forensik akan disediakan dalam tempoh 7 hari bekerja dan tempoh 7 hari bekerja dan tempoh 2 minggu dari tarikh lawatan tapak masing-masing
 - 3. Laporan akhir berkaitan perkhidmatan forensik dan apa yang diperlukan dalam tempoh 2 bulan selepas dokumen awal dan permohonan di terima
- b) Bagi kerja-kerja forensik struktur, geoteknik dan jalan:
 - 1. Laporan awal berkaitan perkhidmatan forensik akan disediakan dalam tempoh 7 hari bekerja dan tempoh 7 hari bekerja dan tempoh 2 minggu dari tarikh lawatan tapak
 - 2. Laporan akhir berkaitan perkhidmatan forensik dan apa yang diperlukan dalam tempoh 2 bulan

4.0 PENGURUSAN ADUAN

PENGURUSAN ADUAN DI BAWAH TANGKUPAN KAWANAN JKR
Tempoh tindakan standard:

Perkhidmatan	Tempoh
a) Pemohonan Aduan	1 Hari Bekerja
b) Makluman Balas Aduan	7 Hari Bekerja
c) Penutupan Aduan	30 Hari

PENGURUSAN ADUAN BUKAN DI BAWAH TANGKUPAN KAWANAN JKR (KAWANAN DOOR POLICY)
Tempoh tindakan standard:

Perkhidmatan	Tempoh
a) Pemohonan Aduan	1 Hari Bekerja
b) Makluman Balas Aduan	7 Hari Bekerja

5.0 PENGURUSAN KEWANGAN

RAYANAN BEL DIBAYAR DALAM TEMPUH 14 HARI DARI TARIKH DOKUMEN LENGKAP DITERIMA

Figure 6: Client Charter

1.2.5 ORGANIZATION CHART

1.2.5.1 Organization chart of Ministry of Works

Below shows the organization chart of Ministry of Work



Figure 7: Organization Chart of Ministry of Works

1.2.5.2 Organization Chart of JKR Hulu Terengganu

Figure below shows the organization chart for all departments in JKR Hulu Terengganu, including the building, road, and administration departments.

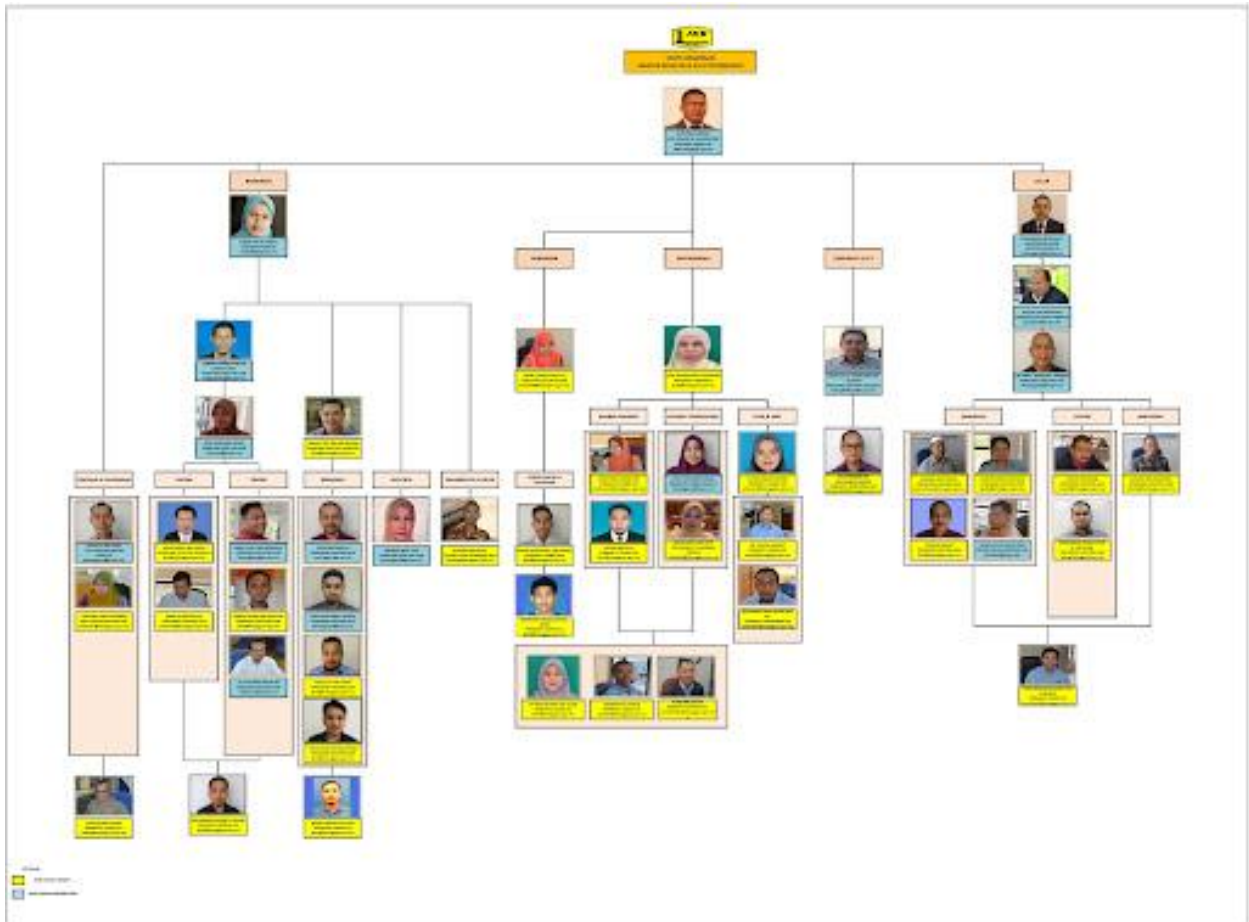


Figure 8: Organization Chart of JKR Hulu Terengganu

1.2.5.3 Organization Chart of Building Department



Figure 9: Organization Chart of Building Department



Objectives of building department

Function of building department

- Plan, control, and supervise the building design work
- Plan, control and supervise the construction of buildings.
- Technical advisory services to government departments and agencies.
- Maintain government buildings.
- Documentation management.
- Responsible for all matters related to electrical work for all development projects as well as maintenance of buildings and roads.
- To plan, control and supervise electrical related design work.

1.2.5.4 Organization Chart of Maintenance Building Department



Figure 11: Organization Chart of Maintenance Building Department

1.2.6 LIST OF MAJOR PROJECTS OF HULU TERENGGANU PUBLIC WORKS DEPARTMENT

1.2.6.1 Construction Projects Under Federal Budget

Table 1: Construction Projects Under Federal Budget

No	No of Contract	Title	Name of Contractor & Price of Contractor	Start Date & Completion Date
1	JKR/IP/CKUB/35/2020	PEMBINAAN 2 BLOK GANTIAN 6 BILIK DARJAH DAN LAIN-LAIN KEMUDAHAN DI SEKOLAH MENENGAH KEBANGSAAN TENGKU AMPUAN INTAN, KUALA BERANG, HULU TERENGGANU, TERENGGANU	ERAT TEMURUN SDN BHD RM 15,425,750.30	30-01-2020 06-10-2021
2	JKR/IP/CKUB/18/2019	TENDER SEMULA PEMBINAAN KOMPLEKS SUKAN HULU TERENGGANU, TERENGGANU	IMMALITE SDN. BHD RM 5,398,749.70	26-02-2019 30-06-2021

1.2.6.2 Construction Project Under State Budget

Table 2: Construction Projects Under State Budget

No	No of Contract	Title	Name of Contractor & Price of Contractor	Start Date & Completion Date
1	JKRNT(T)HT/16/2018	MEMBINA DAN MENYIAPKAN SEBUAH BANGUNAN MASJID DAN LAIN-LAIN KERJA BERKAITAN DI PEKAN AJIL, HULU TERENGGANU, TERENGGANU	M.O. JAYA SDN.BHD RM 10,944,336.18	14-05-2018 21-02-2021
2	JKRNT(T)HT/3/2017	CADANGAN PEMBANGUNAN PUSAT KOMERSIL DAN PERKHIDMATAN DI KAWASAN PERTUMBUHAN BARU KUALA PING, TELEMONG, HULU TERENGGANU, TERENGGANU.	PAMIN CONSTRUCTION SDN. BHD RM26,606,000.00	20-02-2017 19-12-2020
3	JKRNT(T)/HT/12/2015	CADANGAN MEMBINA DAN MENYIAPKAN KOMPLEKS SUKAN YANG MENGANDUNGI: A)1 UNIT GELANGGANG TERTUTUP B)1 UNIT ASTAKA (PADANG BOLA SEPAK) C)1 UNIT ASTAKA (PADANG HOKI) D)1 UNIT PONDOK PENGAWAL E)1 UNIT TNB SUB STESEN F)2 UNIT RUMAH SAMPAH G)1 UNIT RUMAH PAM DAN LAIN-LAIN KEMUDAHAN DI ATAS LOT 51646 KAWASAN PAYA BESAR, MUKIM KUALA BERANG,	TIME FUTURE CONSTRUCTION (M) SDN.BHD RM 46,010,674.61	21-09-2015 05-03-2021

		DAERAH HULU TERENGGANU, TERENGGANU DARUL IMAN.		
4	JKRNT(T)HT/22/2016	MEREKABENTUK, MEMBINA DAN MENYIAPKAN KOMPLEKS PERNIAGAAN, HOTEL DAN DATARAN DI MASJID SULTAN MAHMUD, KUALA BERANG, HULU TERENGGANU, TERENGGANU. (SECARA REKA DAN BINA SERTA RUNDINGAN TERUS DENGAN KAEDAH BAYARAN BERJADUAL)	MSI VISION SDN. BHD RM 25,480,000.00	21-11-2016 28-03-2021
5	JKRNT(T)HT/13/2016	CADANGAN PEMBANGUNAN REKA DAN BINA BAGI KERJA-KERJA PENAMBAKAN TANAH, INFRASTRUKTUR, DEWAN SERBAGUNA DAN 4 UNIT RUMAH KEDAI DI KG. MENERONG, AJIL, HULU TERENGGANU, TERENGGANU.	PETRONINE (M) SDN. BHD RM 9,415,000.00	29-08-2016 26-06-2019

1.3 BUILDING LAYOUT OF JKR HULU TERENGGANU

1.3.1 Ground Floor



Figure 12:Ground Floor

1.3.2 First Floor



Figure 13: First Floor

1.3.3 Second Floor

PELAN LANTAI ZON PENTADBIRAN (ARAS 2)

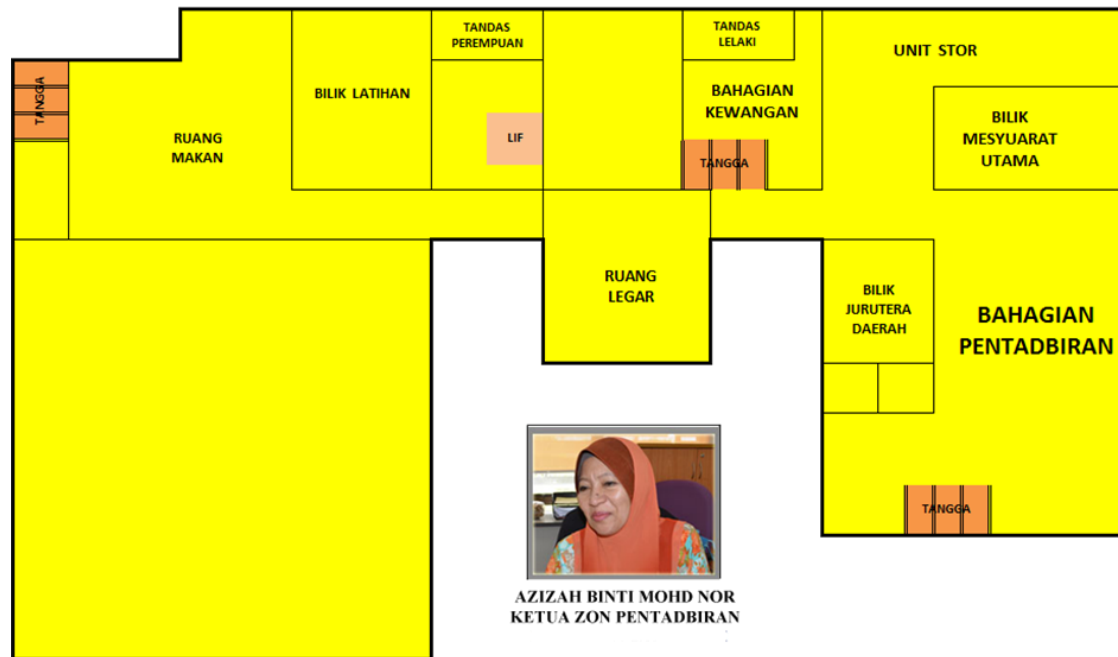


Figure 14: Second Floor

1.4 TIME AND OPERATION

Below shows the time and operation of JKR Hulu Terengganu

Table 3: Time and Operation of JKR Hulu Terengganu

DAYS	WORKING HOURS
Sunday - Thursday	8 am – 5 pm
Weekdays / Public Holiday	Closed

1.5 SCOPE AND RESPONSIBILITIES

Below are the scope and responsibilities of building department of JKR Hulu Terengganu:

1. Plan, control and supervise building design work.
2. Responsible for all matters related to electrical works for all development projects and maintenance of buildings and roads
3. Plan, control and supervise electrical related design work
4. Manage and coordinate the implementation of state & federal building projects
5. Coordinate the maintenance work of state & federal government buildings
6. Carry out minor works requested by other departments
7. Provide technical advisory services to other government departments

CHAPTER 2: LITERITURE REVIEW

2.1 INTRODUCTION OF MAINTENANCE WORK

Generally, maintenance means to hold, keep, sustain or preserve the building or structure to an acceptable standard which is defined as one which sustains the utility and value of the facility. Building maintenance is expensive in terms of both financial and environmental costs, such as operating costs, real estate management, administration, debtors' work and legal services, as well as climate change, greenhouse emissions, and energy efficiency measures. Maintenance is often described as a set of activities carried out to maintain a building's structure and services in order to ensure that they operate as planned during its life cycle.

A maintenance work definition represents the operations, operation items, and resources needed for a maintenance or repair process. In addition, Maintenance work is defined as the repair of existing facilities without changing or extending their size, type, or scope. While painting and decorating are included in the definition of "maintenance," it does not include work such as routine landscape maintenance or janitorial services. In general, maintenance can be defined as the effort put forth to ensure that a machine's condition and performance are always the same as they were when it was first purchased. Maintenance efforts are classified into two categories which is planned maintenance and unplanned maintenance. (Sivaranjith,2019)

Maintenance is the process of preventing deterioration in a building and also repairing damage that has occurred. The damages happen in the building when some part of the building cannot functional well. There are many types of damages in the building such as the electric system, water supply, floor, roof, the drainage system and wall. furthermore, this problem could be solved by performing building maintenance to repair or restore equipment that isn't working properly. Problems that occur in the building will affect the tenants in the building, which is why the maintenance process is very important to ensure that tenants feel comfortable and safe to use the building.

Building maintenance is usually practiced in every country and it is very important in every development to have maintenance management. The work done by someone with experience to keep the building repaired and to ensure that every aspect of the building is well improved is referred to as building maintenance. In order to maintain the building, it must also retain its worth and update its services and surrounds. Building maintenance is also vital in this country since it maintains the building's value, keeps residents safe, and allows the building to be used for longer periods of time.

2.1.1 PURPOSE OF MAINTENANCE WORK

The purpose of maintenance is to ensure the efficiency and availability of production equipment, utilities, and related facilities while keeping costs low and ensuring quality, safety, and environmental protection.

Further, maintenance has long been considered a subordinate function, which involves an inevitable waste of money. There is a tendency to combine it with troubleshooting and repairing machinery that is subject to wear and tear. However, enterprises today realize that maintenance is not just a 'partner' in production and it is an indispensable requirement to produce something of better quality. Its relationship to equipment performance is a question of integrated strategy at the senior management level. As such, the maintenance function becomes the responsibility of management.

2.2 TYPES OF MAINTENANCE WORK

2.2.1 Planned Maintenance

Planned maintenance is a proactive approach to maintenance in which maintenance work is scheduled to take place on a regular basis. The type of work to be done and the frequency varies based on the equipment being maintained, and the environment in which it is operating. The primary objective of scheduled maintenance is to optimize building efficiency by keeping it going as long as possible without it deteriorating or experiencing unplanned outages.

Planned maintenance is a proactive maintenance method that focuses on reducing downtime and cost associated with breakdowns. The process begins with identifying maintenance issues that need to be addressed, such as reducing downtime or extending the life of your assets and equipment. The frequency of assignments depends on the asset you want to maintain and is based on measurable factors, including the number of items produced, equipment running time and travel distance. Once a maintenance schedule is created, it is necessary to place parts and materials, tools and resources to ensure the team completes the work correctly and on time. (Nathan Jeans ,2021)

2.2.2 Unplanned Maintenance

Unplanned maintenance is any maintenance task that occurs unexpectedly. This situation happens when there is no formal strategy in place to address a repair, replacement, or inspection until it is required. Building failure that was not anticipated is a frequent cause of unplanned maintenance. Unplanned maintenance is distinct from unscheduled maintenance in that the latter might have been planned for a certain fiscal year but not yet scheduled for a specific day.

Unplanned maintenance is any maintenance work that occurs unexpectedly and unexpectedly. This type of maintenance is often reactive work to repair equipment or assets and occurs when there is a lack of formal strategies for conducting inspections or repairs before they are needed.

2.2.3 Preventative Maintenance

Preventive maintenance is scheduled maintenance of a building that is intended to extend the life of the building and avoid the need for unplanned maintenance. In order to extend the life of a building, preventive maintenance includes painting, lubrication, cleaning, adjusting, and minor component replacement.

Preventive maintenance was created to overcome the disadvantages of corrective maintenance by reducing the risk of failure and preventing unexpected failure. Preventive maintenance is performed in accordance with a predetermined plan at predetermined times, which could be dependent on for example an operating period. Preventive maintenance has some benefits over corrective maintenance in that it can be planned ahead of time and carried out when it is most convenient for the building's occupants. (MYDIN, 2016)

2.2.4 Corrective Maintenance

Corrective maintenance is the maintenance carried out subsequent to the breakdown that has occurred and projected to reinstate an item to a state in which it can execute its necessitated purpose. Corrective maintenance is a set of technical activities aimed at repairing or replacing building failures. This method of maintenance is used to repair errors in a building that needs to be serviced in order to get it back to its original state. (MYDIN, 2016)

Corrective maintenance refers to operations that are carried out to correct and fix malfunctioning systems and equipment. The purpose of corrective maintenance is used to repair systems that have malfunctioned. Other than that, corrective maintenance can be synonymous with breakdown or reactive maintenance.

2.3 IMPORTANCE OF MAINTENANCE WORKS

According to Zakaria et al. (2002), the importance of building maintenance work is not only to extend the life of a system or equipment but it is also able to prevent any accidents or diseases from occurring. Therefore, the maintenance of the building should cover the safety features as a whole to ensure the safety of users.

Hasnan Abdullah (1994) states that the cause of damage is due to lack of maintenance. When damage occurs, the value of a service will decrease and the cost of repairs increases. Whereas according to Vasuki and Haryati (2011), the importance of building maintenance systems for:

- Retention of the original function and performance of the building
- Retention of building asset value
- Image retention and building design
- Maintenance of safety and comfort aspects.

Therefore, maintenance is important to prevent damage, guarantee the value of a service and reduce repair costs. (Ahmad Ramly, 2004)

The importance of an effective maintenance work cannot be ignored as it plays such an important role as in personal health care insurance, maintenance can be considered as the health care of our manufacturing machinery and equipment. It is needed to reduce waste effectively and run efficient and continuous manufacturing, business or service operations. Therefore, the cost of fixed maintenance is very low when compared to the cost of major damage which at that time was no production.

2.4 MAINTENANCE POLICY

Maintenance policy is a tool for maintenance workers to plan their effective maintenance plans. However, before a maintenance programmed is prepared, maintenance staff and top management are expected to agree on maintenance strategy because it needs strategic directions, as well as funding. The maintenance strategy consists of five main components, and from these components various maintenance techniques are created. Maintenance operations would be in a hazardous order without specifying this policy. The Five Shows

- The period for their present use to be maintained.
- The buildings' living requirements and their equipment and utilities.
- The norm to be maintained by the building and its utilities.
- The time taken for reactions between the occurrence of a defect and the fix.
- Civil and legal conditions are therefore to be taken into account.

2.5 MAINTENANCE PLANNING

Maintenance planning is often described as a comprehensive process that identifies potential problems and outlines plans to resolve them ahead of time. For example, maintenance planning can determine the equipment and services needed for the job. It also ensures that they are readily available and laid out wherever they are needed. A planner's role is to identify the steps involved in completing a project. Some of the key areas to consider in a maintenance plan are parts handling, ordering, staging, breakdown management, and quality control.

To put it another way, maintenance planning means figuring out what work needs to be done, what tools or supplies will be used, and how the work will be completed in a timely and cost-effective manner. The Maintenance Planner's job is to increase workforce to improve the productivity and quality of the workforce by

anticipating and eliminating the possibility of delays through the planning and coordination of workers, parts and materials, and access to equipment while working. Other than that, the management can make more accurate and good planning to carry out maintenance work. It requires a professionally trained Maintenance Planner to plan and schedule work carefully in order to maintain the reliability of the planned equipment. The Maintenance Planner job plans are designed to ensure or extend the life of equipment resulting in a reduction in overall maintenance costs and improved product quality.

2.5.1 Short Term

Short term planning is determined by organizational characteristics such as employee skills. Thus, we can see that in the workplace, the managers will devise strategies on how to improve these characteristics in the short term to meet long term goals. For instance, problems with company equipment such as computers or the quality of content provided by employees need to be addressed to meet the short term time set by management. In addition, short term planning can see from the current company characteristics and devise strategies to improve them such as employee skills and attitudes. However, the condition of production equipment or product quality problems are also a short term concern.

Normally short term maintenance plans are fixed in many aspects. There are set times and dependent operations. The specifications for spare parts and special tools are set, and it is possibly too late to order longer lead time spare parts or book specialized tools in the short term. From a day or two to a month or two into the future, the short-term looks at everything. All the materials and spare parts required to carry out the work orders and projects would have been ordered, or at least the delivery date requirement would have been specified so that the material requirements planning could select

these requirements and produce material purchase orders. Sub-contractors were informed of the specifications for the job. Work is assigned to particular individuals and credentials are reviewed.

2.5.2 Middle Term

The middle term is usually between a month or 2 and a year or two into the future. A medium term view of any maintenance reliability will be implemented and the findings included in the short term plan. The project manager is able to develop a comprehensive plan for the approved project in a long term plan. The details of scheduling for closures will also be done. However, the maintenance estimates will be developed to support these estimates based on the historical or zero budget principle and work orders will be well generated. For example, you probably won't be able to adjust the size of your staff or the equipment you're operating with in the long term, however you would be able to change the expected dates and, most likely, any dependent activities to optimize the schedule around other constraints.

2.5.3 Long Term

The long term is far enough into the future to be able to change any of the factors which could cause a constraint when we get there. The plan is something that basically all the owners or users agree to on how the building is going to be maintained in the future. For maintenance planning, this could imply increasing the number of people you hire, changing the types of equipment you use, outsourcing some of your maintenance, preparing for corporate strategic goals or legislative requirements, or any of a number of other factors with a long lead time. This maintenance plan usually

was planned in the period of 10 years. There will be a huge maintenance within 10 years to prevent the building from major defects. For example, once a year a building generally needs a building wash and this maintenance involves proper budget and costs. Then in a couple of years, depending on the type of cladding, the owner may want to paint the building to change the vibes of the building. In 20 years' time the roof needs to be redone, or in 30 years' time the lift needs to be reconditioned. To manage long-term maintenance, shutdown, and project requirements, a company will typically use Strategy Management or Project and Portfolio Management tools.

CHAPTER 3

CASE STUDY

MAINTENANCE WORKS AT SMK LANDAS

3.1 INTRODUCTION OF PROJECT



Figure 15:View SMK Landas

SMK Landas was first opened in 1971. This school was established to meet the learning needs of the secondary level (Form 1 to Form 5) for students from three FELDA settlement schools, namely SKLKTP Jerangau, SK FELDA Bukit Bading and SK FELDA Jerangau Barat in addition to students - student of SK Peroh. Previously, the students of the school continued their secondary schooling at SMK Tengku Ampuan Intan, Kuala Berang.

Originally the school only consisted of 2 blocks of 2 storey buildings, a canteen and a workshop. To accommodate the increase in students, buildings were added from time to time. In 1975, the school got 1 2 -storey block for classroom rooms, laboratories, Home Science rooms and laboratories. Then, in 1980 the government added 1 2 -storey block for classrooms and resource rooms. In 1989, the school got a 1 -storey



building (prefabricated) for classrooms. Due to the significant increase in students, in 1990 the government added a 3 -storey building to accommodate the two -congregation schooling.

In 2003, the school received an allocation to build 1 block of a 4 -storey laboratory building. Here there are science labs, language labs, computer labs and MPV workshops. Also available is a 3 -storey building block containing classrooms, open halls and association and club activity rooms. The need for new classrooms was particularly evident at the time due to the opening of classes for Form Six students. In the same year, KETENGAH also provided an allocation to fully fund the construction project of 1 large new hall. A new playing field was also completed in the same year. Also in 2003, the government added 1 separate block of computer lab buildings.

As this school has the status of a rural school, this school is one of those who received the allocation for the rural hostel project from the Terengganu State Education Department. SMK Landas Rural Hostel was first opened in 1991 to accommodate 50 male and female students. SMK Landas has seen a significant development and change from 71 students when the school opened, now reaching almost 500 people. There are now 50 teachers and 14 non -teaching staff.

3.2 BACKGROUND OF PROJECT

Table 4: Background of Project

Description	Detail
Project's Title	Repair and Maintenance Work at Smk Landas
Address	Sekolah Menengah Kebangsaan Landas: Km 19, Jalan Jerangau , Ajil , Malaysia · Terengganu Darul Iman
Site Visit	31 October 2021
Price of The Project	RM 473,118.00
Period of Work	1 Year
Validity Period	1 Year
Defect Liability Period (DLP)	6 Month from The Date of Completing
Contractor	DZ BINA UTAMA ENTERPRISE

3.3 SITE LOCATION

Figure below shows the location of SMK Landas



Figure 16:Location Plan



Figure 17:Site Plan

3.4 SCOPE OF WORK

The scope of work of this project includes construction, completion, testing and commissioning of all requirements and structures specified in the scope of work and specifications including but it is also not limited to all required temporary works, repairs, civil works, electrical works and other related works. All the work must be in accordance with the specifications, bill of quantities and work order in the sum of RM 473,118.00 which includes the following:

A. Civil works (Maintenance of Block Al-Biruni, Block Al-Jazri and Block Ibn-Sina)

1. Block Al-Biruni

- Roof opening and remove works.
- Supply and install or replace works any part of the roof frame.
- Supply and installation of metal deck roofing works.
- Supplying and installing work of metal deck rafters.
- Opening and removing work of damaged sawdust.
- Opening and removing work of the existing screen spread.
- Opening and remove work of 6 doors.
- Supplying and installing work of solid wood doors.
- Wash work of old paint from plaster surfaces.
- Opening and removing work of the ceiling.
- Repainting work of the ceiling.
- Opening and removing work of existing tiles.
- Repair work of toilet.
 - Changing work of pipe.
 - Opening and removing work of the entire tile.
 - Opening and disposing work of toilet bowls.
 - Opening and removing work of doors and toilet door frames.

2. Block Al-Jazri

- Roof opening and remove works.
- Supply and install or replace works any part of the roof frame.
- Supply and installation of metal deck roofing works.
- Supplying and installing work of metal deck rafters.
- Opening and removing work of damaged sawdust.
- Opening and removing work of the ceiling.
- Repainting work of the ceiling.
- Opening and remove work of the original door.
- Supplying and installing work of solid wood doors.
- Opening and removing works the damaged nako mirror frame.
- Replacing work of damaged nako mirrors.
- Wash work of old paint from plaster surfaces.

3. Block Ibn-Sina

- Roof opening and remove works.
- Supply and install or replace works any part of the roof frame.
- Supply and installation of metal deck roofing works.
- Supplying and installing work of metal deck rafters.
- Opening and removing work of the ceiling.
- Repainting work of the ceiling.
- Opening and remove work of the original doors.
- Supplying and installing work of solid wood doors.
- Wash work of old paint from plaster surfaces.

B. Others works

1. Repair works on the peeling damage of the concrete slab in the corridor slab soffit and concrete columns in the al-khindi, al-biruni blocks as well as the connecting route between the al-khindi, al-jazri and al-biruni blocks
2. Repair work of water proofing layer for slab on the connecting route between al-khindi, al-jazri and al-biruni blocks.

Parties Involved in The Project

Table 5: Parties Involved in The Project

Client	
Name	PEJABAT PENDIDIKAN DAERAH HULU TERENGGANU 9 (PPDHT)
Address	JALAN BESAR, KAMPUNG BUKIT TOK BAT, 21700 KUALA BERANG, TERENGGANU
Tel.	09-6811344
Fax.	09-681 1422

Contractor	
Name	DZ BINA UTAMA ENTERPRISE
Address	LOT 2553, JALAN TANGKI AIR KG, PAK KANCIL, SETIU, 22100 PERMAISURI, TERENGGANU

3.5 Photo of Site Visit

Observation Before Maintenance Works



*Figure 18: Damaged at
The Column*



Figure 17: Old of Roof



*Figure 18: The Color of
the Building Has Faded*



*Figure 19: Missing of
Mirror Nako*



Figure 20: Old of single leaf wooden door



Figure 21: Damaged of Ceiling

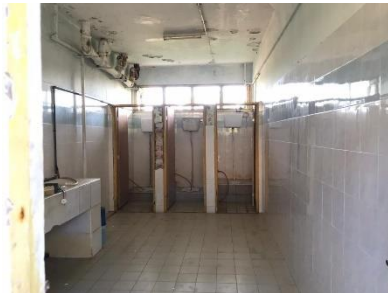


Figure 22: Missing of Tile at Frame Door in Toilet



Figure 23: Leaks On UPVC Pipes

CHAPTER 4

MAINTENANCE WORKS AT SMK LANDAS

4.1 INTRODUCTION

British Standard BS38 11, defines maintenance as a special task embarked on in sequence to remain or reinstate each amenity such as, each part of a site, building, and contents to a satisfactory benchmark (MYDIN, 2016). In addition, BS 3811 also defines maintenance as work undertaken in order to keep or restore every facility for example every part of the site, building, and contents to an acceptable standard.

According to BS 3811, 1964 the term of maintenance refers to a set of actions taken to keep or restore an item to an acceptable state or standard. However, in 1987, BS3811 upgraded the definition to a combination of all technical and administrative actions, including supervision actions. (Rani et al., 2015)

However, according to Anup Kumar Dey (2008), Maintenance is the effort required to keep equipment performing at a level comparable to that of new equipment. Unscheduled downtime due to equipment malfunction is one of the major concerns for industries which calls for billions of dollars of losses each year. Maintenance is important for increasing production by reducing downtime and enhancing equipment efficiency. Maintenance is a set of processes and activities that aid in the efficient and continuing running of assets. The major benefits of maintenance are:

- Equipment and other assets have a longer life expectancy.
- Asset performance optimization.
- Increasing production by reducing unproductive downtime.
- Minimize costs

4.2 PROCEDURE OF MAINTENANCE WORKS AT SMK LANDAS.

Maintenance works procedures are divided into two parts: civil and others work. The appointed contractor must ensure that the repair work of the building, and any additional work required herein shall be carried out in compliance with bill of quantities which has been set and must take into account, that there will be no further change costs involved upon commencement. the duration of the contract or the approved contractor must be responsible for any changes.

4.2.1 Civil Work

4.2.1.1 Block Al-Biruni

- Roof opening and remove works.

To open and remove works the existing roof of the building area of 51m x7.5 m



Figure 24: Newly Installed of Roof

- Supply and install or replace works any part of the roof frame.

To supply and install or replace work any part of the roof frame (wooden truss) of any size that is damaged and replaced with a new one with a building area of 51m x7.5m and other related work.

- Supply and installation of metal deck roofing works.

To supply and installation work of 0.48mm thick metal deck roof with anti-shabby color guarantee for 5 years and anti-rust warranty for 10 years with warranty certificate including installation of a piece of 'bubble foil' on both sides of the fire resistant surface and related equipment as well as other related work.



Figure 25: Installation of New Metal Deck Roof

- Supplying and installing work of metal deck rafters.

To supply and installation work of 'metal deck' with anti-shabby color guarantee for 5 years and anti-rust for 10 years along with warranty certificate and other related work.



Figure 26 Installing of New Metal Deck Rafters

- Opening and removing work of damaged sawdust.

To opening and removing work of damaged sawdust and replacing with new ones.

- Opening and removing work of the existing screen spread.

To open and remove work of the existing screen spread and replaced with a new screen spread. The recommended type of screen spread for this works is Shera board.

- Opening and remove work of 6 doors.

To open and remove works of 6 originals like two leaf wooden doors and new single leaf door including all equipment such as hinges and key systems.



Figure 27: Newly Installed Single Lead and Two Lead Wooden Door

- Supplying and installing work of solid wood doors.

To supply and install work of the two -leaf solid wood door including all fittings such as hinges and locking systems.

- Wash work of old paint from plaster surfaces.

To wash work of old paint from plastered surfaces. wash work of old paint shall comprise of wash and paste all cracks and defective surfaces, apply one coat of paste material on plastered surfaces and apply two coats of emulsion paint on plastered surfaces in the interior of 2-storey buildings including door frames, doors, window frames and windows.

To wash work of old paint from plastered surfaces, wash and paste all cracks and other defective surfaces, apply one coat of paste material on the plastered 2-storey building surface and apply two coats of weather resistance paint on plastered surfaces on the exterior wall of building 2 floors include door frames, doors, window frames, gutters, stairway and screen spread.

- Opening and removing work of the ceiling.

To open and remove work of damaged ceilings and ceiling structures. The recommended the type of ceiling for this works is 4x4 asbestos ceilings in all interior and exterior of the building by replacing the damaged ceilings and ceiling structures with new ones.

- Repainting work of the ceiling.

To repainting work of the entire interior and exterior of the ceiling with 2 coats of paint.

- Opening and removing work of existing tiles.

To open and remove work of existing tiles as well as supply and install new tiles which is sized 300mm x 300mm x 8mm and the type of tile which is sliding barrier ceramic glass tiles.



Figure 28: New laid tiles at the affected areas

- Repair work of toilet.
- Changing work of pipe.

To replace work of existing sewer pipes and replace them with 4 UPVC pipes as well as repair pipe leaks in the walls.

- Opening and removing work of the entire tile.

To open and remove work all existing tiles and replaced with slip barrier type tiles measuring 300mm x 300mm x 8mm on the upper and lower floors including the table top with a toilet area of 7.3m x 2.8m



Figure 29: New laid tiles at the affected areas in the toilet.

- Opening and disposing work of toilet bowls.

To open and remove work of existing toilet bowls on level 1 and ground floor and replace with new ones including toilet system equipment, faucets and all associated works.



Figure 30: Installation of Toilet Bowl

- Opening and removing work of doors and toilet door frames.

To open and remove work of existing toilet door and door frames and replaced with new galvanized steel door frames, PVC doors.

4.2.1.2 Block Al-Jazri

- Roof opening and remove works.

To open and remove works the existing roof of the building area of 36m x7.5 m



Figure 31: Installation of New Roof

- Supply and install or replace works any part of the roof frame.

To supply and install or replace work any part of the roof frame (wooden truss) of any size that is damaged and replaced with a new one with a building area of 36m x7.5m and other related work

- Supply and installation of metal deck roofing works.

To supply and installation work of 0.48mm thick metal deck roof with anti-shabby color guarantee for 5 years and anti-rust warranty for 10 years with warranty certificate including installation of a piece of 'bubble foil' on both sides of the fire resistant surface and related equipment as well as other related work

- Supplying and installing work of metal deck rafters.

To supply and installation work of 'metal deck' with anti-shabby color guarantee for 5 years and anti-rust for 10 years along with warranty certificate and other related work

- Opening and removing work of damaged sawdust.

To opening and removing work of damaged sawdust and replacing with new ones.

- Opening and removing work of the ceiling.

To open and remove work of damaged ceilings and ceiling structures. The recommended the type of ceiling for this works is 4x4 asbestos ceilings in all interior and exterior of the building by replacing the damaged ceilings and ceiling structures with new ones.

- Repainting work of the ceiling.

To repainting work of the entire interior and exterior of the ceiling with 2 coats of paint.

- Opening and remove work of the original door.

To open and remove work of the original two -leaf wooden door including all fittings such as hinges and key systems.



Figure 32: Newly Installed Two Lead Wooden Door

- Supplying and installing work of solid wood doors.

To supply and install work of the two -leaf solid wood door including all fittings such as hinges and locking systems.



Figure 33: Newly Installed Two Leaf Solid Wood Door

- Opening and removing works the damaged Nako mirror frame.

To open and remove work of damaged Nako mirror frames and supply and install existing Nako mirror frames and Nako mirrors in the 2nd floor class building and its equipment.



Figure 34: Newly Installed of Nako mirror

- Replacing work of damaged Nako mirrors.

To replace work of the damaged Nako mirror in the second floor class building and its equipment

- Wash work of old paint from plaster surfaces.

To wash work of old paint from plastered surfaces, wash and paste all cracks and other defective surfaces, apply one coat of paste material on the plastered 2-storey building surface and apply two coats of weather resistance paint on plastered surfaces on the exterior wall of building 2 floors include door frames, doors, window frames, gutters, stairway and screen spread.



Figure 35: Wash out of Old Paint at The Exterior Wall

4.2.1.3 Block Ibn-Sina

- Roof opening and remove works.

To open and remove works the existing roof of the building area of 39m x7.5 m



Figure 36: Installation of New Roof

- Supply and install or replace works any part of the roof frame.

To supply and install or replace work any part of the roof frame (wooden truss) of any size that is damaged and replaced with a new one with a building area of 36m x7.5m and other related work

- Supply and installation of metal deck roofing works.

To supply and installation work of 0.48mm thick metal deck roof with anti-shabby color guarantee for 5 years and anti-rust warranty for 10 years with warranty certificate including installation of a piece of 'bubble foil' on both sides of the fire resistant surface and related equipment as well as other related work

- Supplying and installing work of metal deck rafters.

To supply and installation work of 'metal deck' with anti-shabby color guarantee for 5 years and anti-rust for 10 years along with warranty certificate and other related work

- Opening and removing work of the ceiling.

To open and remove work of damaged ceilings and ceiling structures. The recommended the type of ceiling for this works is 4x4 asbestos ceilings in all interior and exterior of the building by replacing the damaged ceilings and ceiling structures with new ones.

- Repainting work of the ceiling.

To repainting work of the entire interior and exterior of the ceiling with 2 coats of paint.

- Opening and remove work of the original doors.

To open and remove work of the original two -leaf wooden door including all fittings such as hinges and key systems.

- Supplying and installing work of solid wood doors.

To supply and install work of the two -leaf solid wood door including all fittings such as hinges and locking systems.

- Wash work of old paint from plaster surfaces.

To wash work of old paint from plastered surfaces, wash and paste all cracks and other defective surfaces, apply one coat of paste material on the plastered 2-storey building surface and apply two coats of weather resistance paint on plastered surfaces on the exterior wall of building 2 floors include door frames, doors, window frames, gutters, stairway and screen spread.



Figure 37: Water Jet to Remove

4.2.3 Others Works

1. Repair works on the peeling damage of the concrete slab in the corridor slab soffit and concrete columns in the al-khindi, al-biruni blocks as well as the connecting route between the al-khindi, al-jazri and al-biruni blocks. This damage repair method refers to the specifications for formwork pressure grouting
2. Repair work of water proofing layer for slab on the connecting route between al-khindi, al-jazri and al-biruni blocks

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

Finally, it is advisable for the contractor to comply with each maintenance work process to prevent any further damage. therefore, the contractor is important to adhere to the work schedule to complete the work on time and avoid penalties for work delays. As a result, to ensure all work, including civil and electrical works as well as other works, comply with the specifications outlined in the bill of quantities. In addition, personal protective equipment (PPE) is also important. This is necessary to avoid any potential hazards while carrying out the work. This chapter will discuss recommendations and conclusions regarding the work phase, health and safety considerations during the maintenance works.

5.2 PROBLEM AND RECOMMENDATION

Table 6: Problem and Recommendation

NO	PROBLEM	RECOMMENDATION
1.	<p>Personal protective equipment</p> <p>Workers performing construction or maintenance work do not wear personal protective equipment such as safety boots and safety helmets. This is because it will endanger the personal safety of workers in the area.</p>	<p>PPE is something that should be worn by workers to ensure the safety of workers. Site managers need to implement safety precautions to employees on site to prevent any possible bad things from happening. Aside from that, they needed to add SOP of working by wearing PPE every time want to start their work. Make sure that the supervisor need to check every day to make sure they keep their worker safety first.</p>
2.	<p>Not according to the set time</p> <p>Employees do not follow the time set by the executor. This will cause them to need additional time to complete the project.</p>	<p>The supervisor need to make schedule to their work according as the time given so that no needed to paid extras to workers. Next the worker must work properly to avoid from the wasting time.</p>
3.	<p>Poor workmanship</p> <p>Sometimes employees do not do the job properly and</p>	<p>They needed to appoint supervisor that had experience in construction so that they can teach the workers or checked their</p>

	<p>make simple mistakes during the work and it will result in the project not being completed on time. This will result in unsatisfactory work quality results.</p>	<p>work result with tidily.</p>
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5.3 CONCLUSION

In conclusion, maintenance work is very important in every building in order to improve the building performance. However, the first thing that must be understood to complete maintenance work is to identify the cause or type of damage occurring on the building. After making a decision, the building owner or other stakeholders can proceed to the next stage until it is approved. Then, as a guide, they should use the methods and techniques provided during the maintenance work to complete the work. Therefore, any damage after the stipulated period caused by the contractor during the work should be replaced or repaired by the contractor himself with the same or similar specifications and need to be approved.

Finally, based on the experience and observations that have been passed for 4 months at JKR Hulu Terengganu, students can learn a lot about Building Maintenance and building construction work, and this industrial practical training also helps the students expose themselves to the actual construction site. On this industrial practical training also, students have been exposed to machinery, building materials and equipment that will be used in the construction and assessment of specific building conditions. At the end, a lot of knowledge that students can learn and practice in the future. The most important aspect in the execution of work must be discipline, diligence, and trust. Communication skill also plays an important role in reducing the age gap and experience with colleagues and the surrounding community.

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