



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

**BUILDING PERFORMANCE ASSESSMENT (BPA) OF JKR SELANGOR
MECHANICAL ENGINEERING BRANCH OFFICE**

NIK NURUL SYAHIRAH BINTI NIK MOHAMAD
(2018223896)

BACHELOR OF BUILDING SURVEYING (HONS.)

PRACTICAL TRAINING REPORT

FEBRUARY 2021

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 PERFORMANCE ASSESSMENT (BPA) OF JKR SELANGOR
MECHANICAL ENGINEERING BRANCH OFFICE

FEBRUARY 2021

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

PREPARED BY

NAME : NIK NURUL SYAHIRAH BINTI NIK MOHAMAD

SIGNATURE :

SUPERVISING LECTURER

NAME : DR. ANNISHA NUR WELLIANA BINTI ABD RASED

SIGNATURE :

DATE :

ACKNOWLEDGEMENT

In the name of Allah, the Most Beneficent, the Most Merciful. All praised to the Prophet Muhammad SAW. Firstly, thankful to Allah SWT for gave me this great chance to go through industrial training in Jabatan Kerja Raya (JKR) and finish it successfully.

First and foremost, I would like to thank my industrial supervisor, Puan Nurul Diyana Binti Mohd Dahari for guidance, information and knowledge during completing my training in JKR. Besides from that, I also want to thank Mr. Muhamad Norhaizar Bin Hairaman as Senior Assistant during my training for their guidance, knowledge and support. Apart from that, I also want to convey gratitude to all the staffs and technicians here for their kindness in helping me while completing my industrial training.

In addition, it is important to have teamwork during my training and here I really want to thank my colleagues for their kindness, exchange ideas and knowledge during my training even though we came from different universities. Then, I want to convey my appreciation to my University of Technology MARA lecturers and supervisor, Dr. An Nisha Nur Welliana Binti Abd Rased.

Last but not least, I want to thank my family for their love, motivation and support during my industrial training in JKR. Thanks for all the ideas, opinion, knowledge and suggestion that have given to me in order for me to complete this report.

TABLE OF CONTENT

NO.	CONTENTS	PAGE
1.	DECLARATION BY STUDENTS AND SV	
2.	ACKNOWLEDGEMENT	1
3.	TABLE OF CONTENTS	2
4.	ABSTRACT	3
5.	CHAPTER 1: INTRODUCTION	
	1.1 Introduction	4
	1.1.1 Defining the term of Industrial Training	4
	1.1.2 Objective of the Industrial Training	5
	1.1.3 Objective of Final Report	6
	1.1.4 Company Location	6
	1.1.5 Company Details	7
	1.2 Company Profile	7
	1.2.1 Company History	8
	1.2.2 Corporate Logo	8
	1.2.3 Vision, Mission and Objectives	9
	1.2.4 Organization Chart of JKR Selangor	10
	1.2.5 Past Projects	13
	1.2.6 Details of Industrial Supervisor	14
6.	CHAPTER 2: LITERATURE REVIEW	
	2.1 Introduction	16
	2.2 Definition of Building Performance Assessment (BPA)	17
	2.3 Work Process of BPA	19
	2.4 Methods of BPA	20
	2.5 Rating Classification	29
	2.6 Basic Inspection Equipment	30
	2.7 Summary	32
7.	CHAPTER 3: CASE STUDY	
	3.1 Introduction	33
	3.2 Project Background	33
	3.3 Project Location	35
	3.4 Purpose of the Project	37
	3.5 Scope of Work	38
	3.6 Result of Assessment Inspection	43
	3.7 Conclusion	45
8.	CHAPTER 4: PROBLEMS AND RECOMMENDATION	
	4.1 Introduction	46
	4.2 Problems and Recommendations	47
9.	CHAPTER 5: CONCLUSION	49
10.	REFERENCES	50
11.	APPENDICES	51

ABSTRACT

This report is set out to give the reader full information about my industrial training in Jabatan Kerja Raya (JKR) in Selangor. Industrial training is one of the compulsory curriculums in UiTM Seri Iskandar which students need to complete whether in consultant, factory and company. This course is sets up for student in order to give them experience and gain knowledge in working environment before going through the real working life. My industrial training is Jabatan Kerja Raya or known as JKR which provide maintenance and construction to the public sectors in Malaysia.

In Jabatan Kerja Raya, I have been sent to Building Unit. At this unit, I have been assigned to construction, building maintenance and project. In building unit, there are four section which are Development Project, Maintenance, Mechanical Engineer and Administration. During my placement, I have learned a lot new knowledge about building maintenance. These knowledges are useful for me in future and gives me a lot of advantageous to prepare myself for my future career.

Last but not least, in this report included the introduction, brief background about this company, task and mini project I have been assigned, recommendations and conclusion in details during my industrial training in JKR.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In the process of attaining the award of the degree by students, the least 4 months is required to be spent on industrial training program because it is undeniable for courses or field taken which is Building Surveying course. Industrial training can help students to use their in-class education learning and skill or ability to workplace. Industrial training can help students to know details and handle situation at the internship place. Industrial training report need to complete by students because it can help student to reveal the objective of the industrial training and the new learning from task those students had done for 4 months students can record it in this report.

1.1.1 Defining the term of Industrial Training

Industrial training can be defined as students doing their training in real situation of workplace and allowing students to use each knowledge and skills that they had learn in the class. Industrial training can help students to practicing their skills and ability especially analysis skills for building surveying students. It is because every building surveying students need to develop the skills to analysis defects and maintenance works and need to learn to build a good skills for maintaining property, buildings, equipment and other environments. It is an opportunity to engage with the professional which they aspire in a realistic work environment.

Aside from 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 the Industrial Training

The main objective of Industrial Training is to expose students to a real-world working situation while also enhancing their knowledge and skills from university. Another goal of this program is to instill in each internship student the values of honesty, accountability, and self-confidence. Next, industrial training program allows students to relate theoretical knowledge with its application in the manufacturing industry (Objective purpose of industrial training education essay, 2015).

Other than that, objective of industrial training is internship will increase a student's sense of responsibility and good work habits. This is because students had trained the real situation of working in industrial that related to their course for many months and students will automatically doing their responsibility and their working habit will be in good conditions. Students also can-do variety task in a month that helps them to increase their responsibilities to finish their task with efficiently.

In addition, objective of industrial training is to build a good communication skill with group of workers and learn to learn proper behavior of corporate life in industrial sector. This can be proved when students need to communicate with variety staff from different position because in the company have different of position. Student also need to learn or can learned about protocol to talk with high management and staff around them at the company. This can help students improve their communication style and also differentiate the way they communicate with people (viginesjohn).

1.1.3 Objectives of Final Report

The major goal of the final report is to generate a student who is accountable for their work by giving sufficient evidence-based papers. This can help a student become more responsible, particularly when it comes to their own duty. Writing a final report might encourage students to write out the specifics of the tasks they completed during their internship, as well as the comprehensive proof for each task's document.

Aside from that, the final report's goal is to teach the students how to write a decent document. This goal can assist internship students in learning more about the firm and learning how to properly compose the specifics of each document. A properly written document or information may help students understand more about the specifics, and a properly written document can help anybody understand more about the details, and a well written document can help anyone comprehend the primary point of the document.

The final report's objective is to serve as certified confirmation of industrial training. This is due to the fact that training reports assist students in remembering and writing down each and every activity and new item they encounter during their training. It can also help pupils recall all of the tasks they've completed and record them in a report for formal purposes. Official report evidence may also assist every student in writing their report appropriately and sharing their expertise with others.

1.1.4 Company Location

Figures below shows the location of Jabatan Kerja Raya Selangor. The company situated at Seksyen 17 Shah Alam, as shown in the figure.



Figure 1: Site Plan

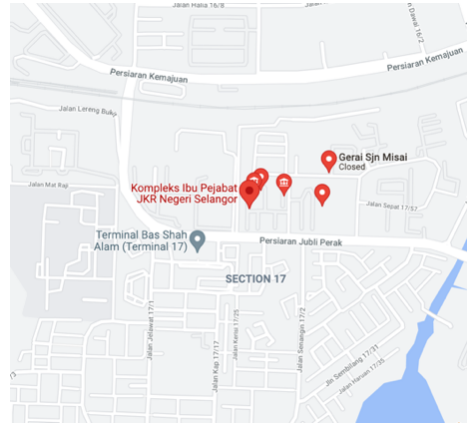


Figure 2: Key Plan



Figure 3: Location Plan

1.1.5 Company Details

Company Name: Jabatan Kerja Raya Selangor

Company Address: Kompleks Ibu Pejabat JKR Negeri Selangor, Persiaran Jubli Perak, Seksyen 17, 40200 Shah Alam, Selangor Darul Ehsan.

Website: <http://www.jkr.selangor.gov.my>

1.2 Company Profile

1.2.1 Company History



Figure 4: Jabatan Kerja Raya HQ Office

Jabatan Kerja Raya (JKR) formerly known as the Public Works Department (PWD) has a long history since the beginning of a physical development in the country which carried out by British colonialists. JKR is the oldest government department in the country. For more than a century, Public Works Department (PWD) Malaysia has influenced many aspects of the country's life. It has existed since the orderly and largescale roads construction began in the county after the Malay states one by one were placed under the British colonial administration because of British intervention in 1784.

PWD was established in Perak, Selangor, Negeri Sembilan and Pahang. PWD grew rapidly after the British colonialists formed the Federate Malay States (FMS) in 1895. At that time, the PWD administration was consolidated into PWD FMS.

In 1914, all the Malay states were under the British colonial rule when the states of Kelantan, Terengganu, Kedah and Perlis were handed over by the Siamese government to the British government in 1909 and Johor was placed under British in 1914. These Malay states are not affiliated with the FMS and are called Unfederated Malay States (UFMS).

History of the Jabatan Kerja Raya (JKR) in 1914, all the Malay states were under the auspices of the British colonialists when the states of Kelantan, Terengganu, Kedah and Perlis were handed over by the Siamese government in 1909 and Johor was paced under British auspices in 1914. The Malay states were not affiliated with the FMS and were called Unfederated Malay.

1.2.2 Corporate Logo



Figure 5: JKR Corporate Logo

Description

1. The logo, in general, represents the numerous domains of work that the Public Works Department is responsible for.
2. The curving black lines at the bottom represent waterworks and also indicate the Public Works Department as a dynamic agency.
3. The prominent black arch-shaped lines represents bridge work as well as the Public Works Department as an entity that primarily does engineering work.
4. The straight black line that ran over the arch-shaped lines represented road construction.

Color

1. Yellow symbolizes the maturity of the JKR as one of the oldest organizations in existence, portrays a mature image in achieving its objectives
2. Black represents the strength / quality unity of the JKR's organization branches entrusted to implement development projects
3. Grey symbolizes the existence of values – the noble values of human capital in providing services

1.2.3 Vision, Mission and Objectives

In order to achieve the country's aspirations in providing the best service to the people, JKR manifest it through the vision and mission of this department, namely:

1.2.3.1 Vision

To provide a world-class service and a center of excellence in the fields of asset management, project management, and engineering for the development of national infrastructure, utilizing creative and inventive human resources and cutting-edge technology.

1.2.3.2 Mission

JKR's mission is to contribute to the development of the country by:

- Help our clients realize policy information and deliver services through collaboration as strategic partners.
- Standardize our processes and systems to provide consistent service results
- Provide asset and project management services that are both effective and inventive
- Enhance current engineering skillsets
- Create new human resources and competencies
- Prioritize integrity in providing services
- Build a harmonious relationship with the community
- Preserve the environment in service delivery

1.2.3.3 Objectives

To provide infrastructure and public facilities, especially Roads, Buildings, Airports, Ports and Bases to meet the development needs of the country by always emphasizing on:

- Timeline as soon as possible
- The cost is economical
- The best design and quality

1.2.4 Organization Chart of JKR

1.2.4.1 Organization Chart of JKR (Head Quarters)

Jabatan Kerja Raya Malaysia is led by a Chief Director of Public Works, assisted by three Deputy Chief Director of Public Works. Administration of the Public Works Department obscures the whole country except for Sabah and Sarawak. Please refer to our organisational structure. For administrative functions, JKR Malaysia is divided into two which is at the level of Headquarters and State.



Figure 6: Organization Chart of JKR (Head Quarters)

1.2.4.2 Organization Chart of JKR

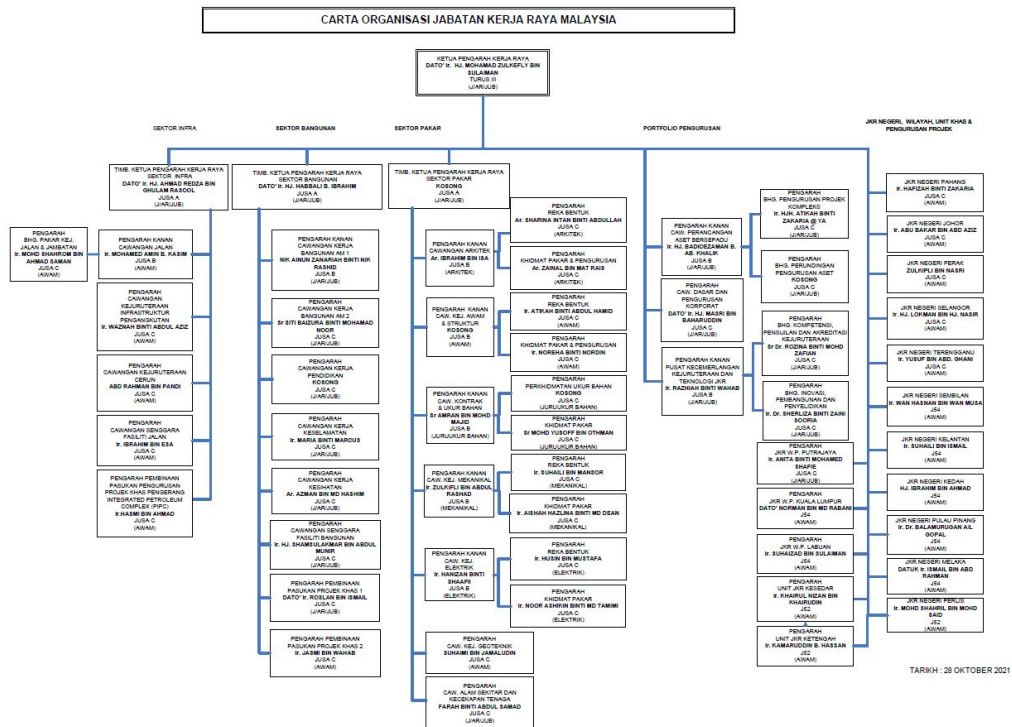


Figure 7: Organization Chart of JKR

At Headquarters, departments are handled by three major business segments with 14 branches below it. For more information about the business sectors, management and specialists and its branches are as follows:

Business Sectors

- Road Branch
- General Building Works Branch
- Education Branch
- Contract and Quantity Surveying Branch
- Health Branch
- Security Branch

Management Sector

- Corporate Management Branch
- Maintenance Engineering Branch
- Federal PWD
- Kesedar PWD
- State PWD

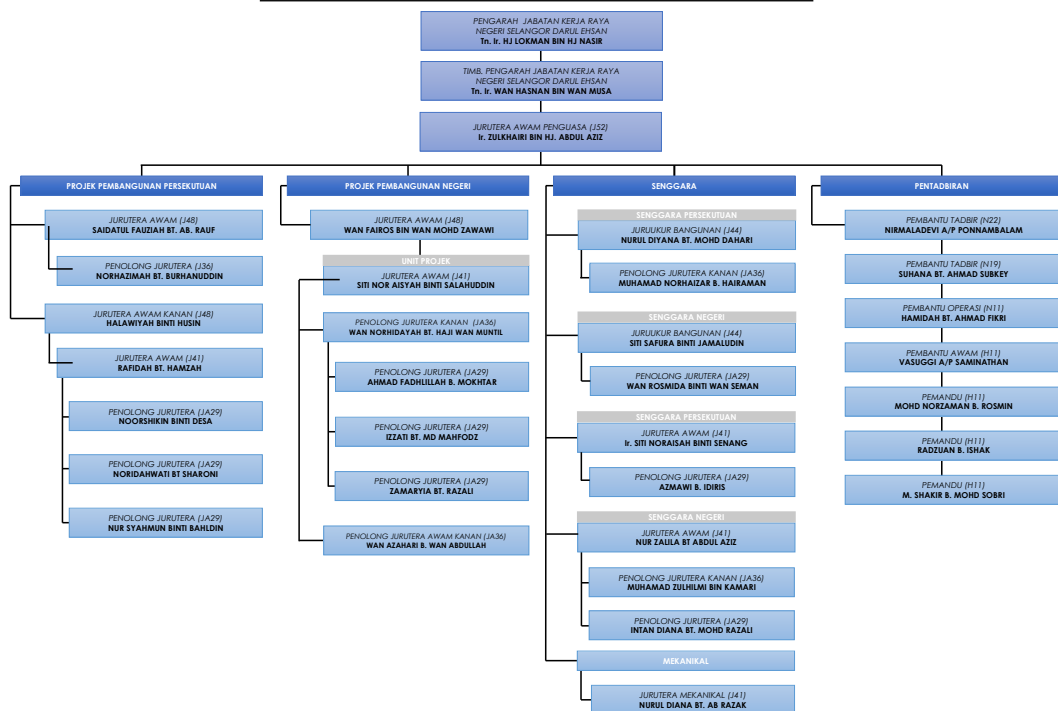
Specialist Sector

- Architecture Branch
- Civil Engineering, Structural & Bridge Branch
- Mechanical Engineering Branch
- Electrical Engineering Branch
- Air Base and Maritime Branch
- Environment & Energy Efficiency Branch

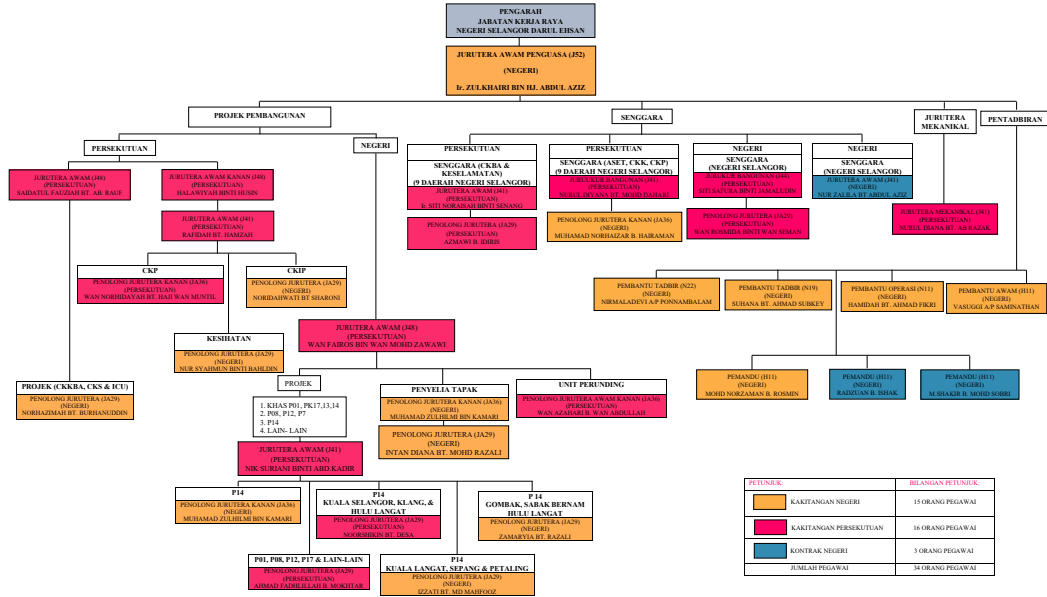
PWD Headquarters is trustworthy for the planning and design of expansion projects, observe the implementation of projects, and the provision of policies, guidelines and technical opinion to the State PWDs, Federal PWDs, State Department of Water Affairs and PWD Special Unit.

1.2.4.3 Organization Chart of Building Department JKR

CARTA ORGANISASI BAHAGIAN BANGUNAN JKR SELANGOR 2021



CARTA ORGANISASI KAKITANGAN
BAHAGIAN BANGUNAN JKR SELANGOR 2021



Rajah 1.3 (a): Carta Organisasi Bangunan

Figure 8: Organization Chart of Building Department JKR

Objectives of Building Department

To provide buildings and infrastructure as well as engineering services in accordance with the National Development Policy and the Selangor State Government which focuses on:

- Submit 100% of the project according to the Q-Plan timetable, with a 10% variance
- Complete 100% the project according to the approved cost with a 10% of variance
- Spend 100% of the annual allocation with a 10% variance
- Towards high-quality products that exceed 70% customer satisfaction

Functions of Building Department

- Monitor and coordinate Federal and State projects
- Implement and coordinate the maintenance of the state buildings
- Provide technical advisory services to government agencies from time to time

1.2.5 Past Project

- I. Penyelenggaraan dan Pembaikpulihan Bangunan Pendidikan di Selangor

- Daerah Sepang
 - Daerah Hulu Selangor
 - Daerah Kuala Langat
 - Daerah Petaling
 - Daerah Klang
- II. Menaiktaraf Infrastruktur & Prasarana Politeknik Sultan Idris Shah (PSPS) Daerah Sabak Bernam
- III. Syor Meroboh Bangunan
- Daerah Klang
 - Daerah Gombak
 - Daerah Sepang
 - Daerah Hulu Selangor
 - Daerah Kuala Langat
 - Daerah Petaling
 - Daerah Klang
- IV. Pembangunan Akademi Bola Sepak di U15, Puncak Alam
- V. Jabatan Kehakiman Syariah (JAKESS)
- Pembaikan 8 Buah Kompleks Ibu Pejabat Mahkamah di Negeri Selangor
- VI. Penyelenggaraan dan Pembaikan Masjid Sultan Salahuddin Abdul Aziz Shah (MSSAAS)
- VII. Syor Meroboh di Selangor
- VIII. Kerja Pembaikan Bangunan Terbakar Politeknik (PSSAAS) Daerah Petaling
- Kerosakan Struktur Akibat Kebakaran
 - Blok Asrama tingkat 2 dan 3

1.2.6 Details of Industrial Supervisor

Name : Nurul Diyana binti Mohd Dahari

Age : 35 years old

Date of Birth : 27/11/1986

Contact No : +60 17-239 3475

Email : nuruldiyana@gmail.com

Position : Juruukur Bangunan JKR Selangor

Education Background:

- I. University Teknologi MARA
 - Master of Science (M.Sc.)
 - Facilities Management
- II. Universiti Teknologi MARA
 - Bachelor's Degree

- Building Surveying

Work Experience :

- I. Mobility Manchester United Kingdom
 - One Central Park
 - 2010
- II. Penolong Jurutera Awam
 - Perunding Teknik Padu Sdn. Bhd.
 - Jan 2008 – Dec 2008
- III. Freelance
 - Drafting Drawing CAD, Model Marking and Props
 - 2 Years

Award:

- I. Best Conference Paper Award
- II. Paper Presentation/ Proceedings
- III. Anugerah Ketua Jabatan

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A completed building must be able to perform its functions in the manner that will ensure satisfaction to its occupants. Generally, regular maintenance programmes are conducted after the building has been occupied to ensure that the building is functioning well at all times. By execution of maintenance programmes, the occupants will be able to use and utilize the facilities as the provision of facilities supports the business operations by the building occupants. In short, the building facilities and services must be fit for the purpose of the users.

The main objective of BPA is to identify the level of performance of government buildings to determine the relevant follow-up actions by the Ministry, Department or agency and give rating to the building based on the level of performance. The evaluation is made based on 5 parameters consisting of physical condition, operational efficiency, space utilization, sustainability and asset value which brings the score to 100%. The implementation of the Building Performance Assessment (BPA) rating can ensure that Government assets are always good and functional as well as can optimize the lifespan of assets and support the core business of the Government, Department or agency.

The public sector considers the continuous inter-relationship between an asset's capacity and utilization, budget and actual expenditure and depreciated value as criteria for integrated performance measurement and benchmarking. A systematic, objective assessment of efficiency, effectiveness and compliance of a service or part of a service (AAMCoG, 2008). According to Queensland Government, PWD (2018) BPA is a systematic approach to managing the performance of building assets to meet service delivery requirement.

2.2 DEFINITION OF BUILDING PERFORMANCE ASSESSMENT (BPA)

Building performance can be described as the practice of thinking and working in terms of ends (Gibson, 1982) also defines building performance as "delivering the functional intent of each zone of the building while accounting for the energy and cost of delivering this functional intent. de Wilde (2018) asserts that "building performance is a concept that describes, in a quantifiable way, how well a building and its systems provide the tasks and functions expected of that building". These definitions seek to interpret the concept of building performance in relation to a building as an amalgamation of various parts that integrate to deliver on its expected function and suggests that the process of evaluation as being procedural.

The engineering view relates to how well a building fulfils its functions with respect to the quality inherent in its functions, the workload capacity which Preiser and Nasar (2008) explains relates to how much a building can do as well as resource saving in terms of energy performance. The process view considers buildings as an output of a process and relates to the sequence of construction activities and expressed in terms of the management of cost, time, quality, safety, waste reduction and customer satisfaction. The performance of buildings is managed by a facility management (FM) team, who should consider a set of processes that operate at three levels: strategic, tactical and operational (CEN, 2006; 2011).

Building performance assessment at the early design stage involves implementing an iterative process in which continually assess how the building is performing, what is driving that performance, and what to do to influence it (Lutheran, 2019). Building Performance Assessment (BPA) is a systematic approach in managing building performance to meet the quality of service delivery, the need for asset owners to ensure the building is at the optimum level and high performance building provides the best benefits to users (AAMCoG, 2008).

2.2.1 PURPOSE OF BUILDING PERFORMANCE ASSESSMENT (BPA)

Purpose of Building Performance Assessment (BPA) are:

- a) To identify the level of performance of the government buildings to determine follow up action by the Ministry, Department or Agency
- b) To give a rating to buildings owned by the Ministry, Department or agency based on the level of performance

2.2.2 IMPORTANCE OF BUILDING PERFORMANCE ASSESSMENT (BPA)

Importance of Building Performance Assessment (BPA) are:

- a) Assist in creation of a more accurate and effective annual budget
- b) The basis of the asset planning plan in addition to facilitating operation and maintenance activities
- c) Decision making tools whether the building needs to be maintained, restoration/renovation/upgrade, disposal and others
- d) Optimal utilization of assets through good governance and application of sustainability features
- e) More systematic data collection through the use of uniform forms

2.2.3 PRE-CONDITION OF BUILDING PERFORMANCE ASSESSMENT (BPA)

We must follow the Pre-Condition of Building Performance Assessment (BPA) as below:

- a) The building blocks have been registered in mySPATA
- b) The building blocks had expired DLP (for new buildings) and operate for at least 3 years
- c) The building blocks has undergone Building Condition Assessment (BCA)
- d) The building blocks has undergone a Post-Occupancy Evaluation (POE)

2.4 WORK PROCESS OF BUILDING PERFORMANCE ASSESSMENT (BPA)

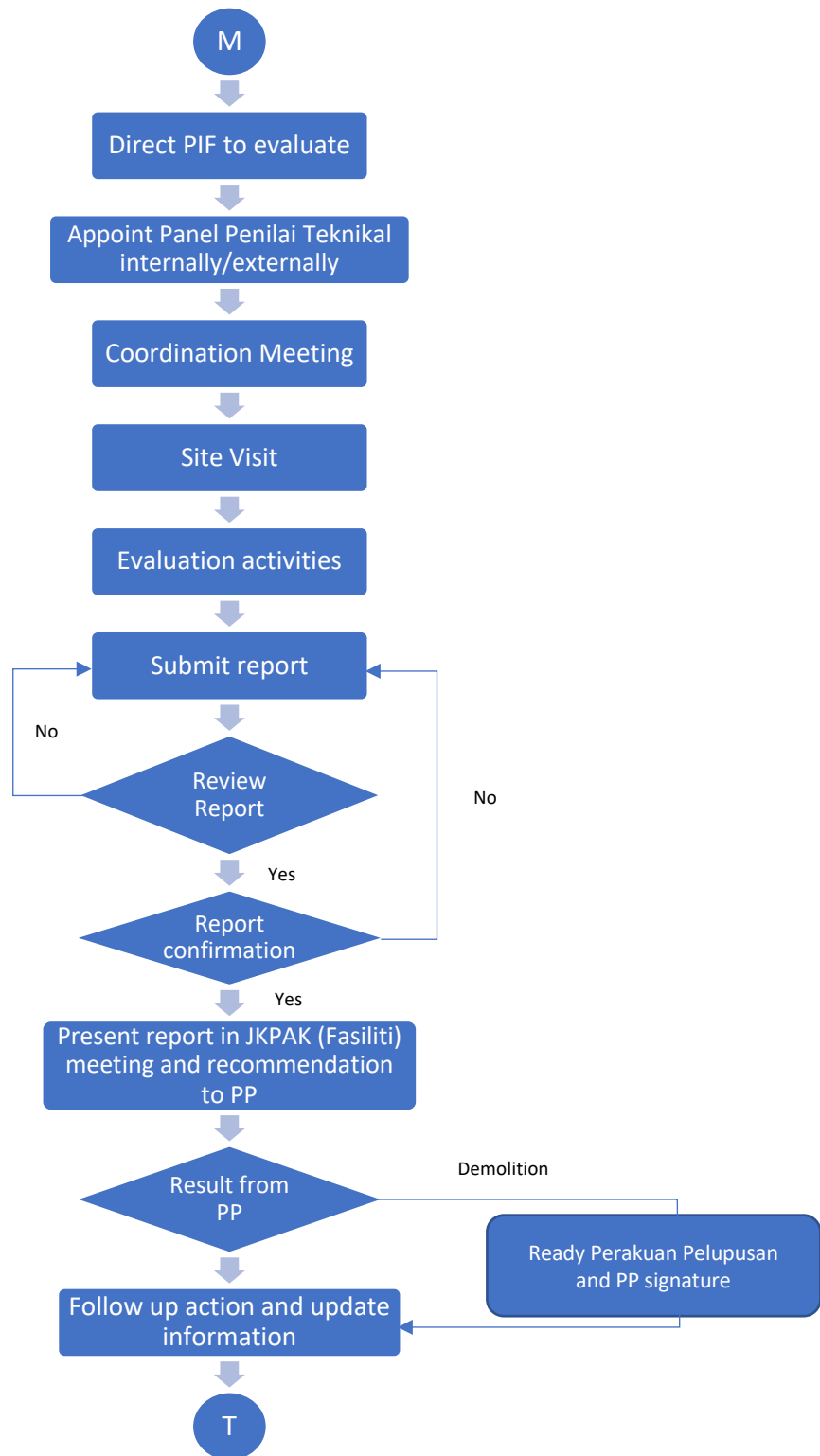


Figure 9: Flowchart of Procedure of BPA (Guidelines of Building Performance Assessment JKR, 2019)

2.5 METHODS OF BUILDING PERFORMANCE ASSESSMENT (BPA)

2.5.1 Level of assessment in general

Table no 2: Level of BPA (Guidelines of Building Performance Assessment JKR,2019)

LEVEL	DESCRIPTION
3 Good	No defect or damages, component well maintained, performing as intended
2 Fair	Minor defects or damages, moderate condition, still can functioning with supervision
1 Poor	Major or minor defect, critical, not functioning as agreed service level

However, the level of the assessment specifically for each parameter and the example for the assessment process are shown in the User Manual Part B.

2.5.2 Methods of Evaluation Matrix in Value Management used to determine the weightage for each parameter

Table no 3: Value of Weightage for each parameter (Guidelines of Building Performance Assessment JKR,2019)

PARAMETER	WEIGHTAGE (%)
Physical Condition	33
Operational Efficiency	27
Space Usage	20
Sustainability	13
Asset Value	7
Total	100

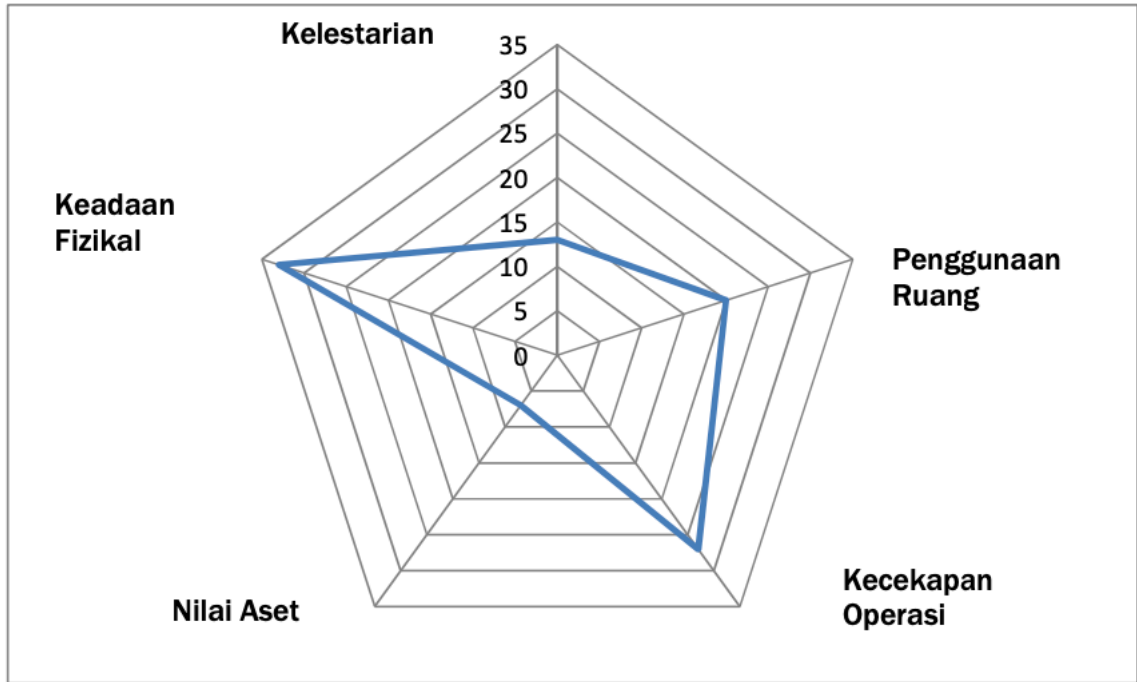


Figure 10: Radar Chart for each Five (5) Parameter (Guidelines of Building Performance Assessment JKR,2019)

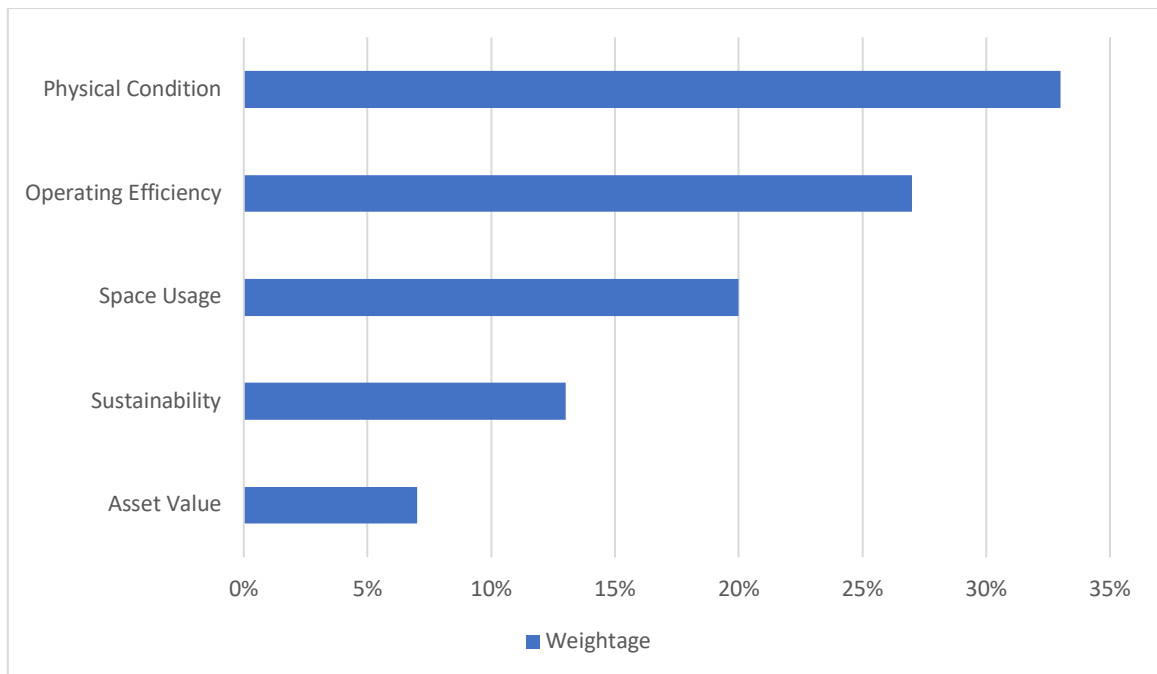


Figure 11: Parameter and Weightage (Guidelines of Building Performance Assessment JKR,2019)

a) Parameter 1: Physical Condition

- Inspection is carried out visually (protocol 1)
- Inspection work involves:

- a. Physical condition of the building
 - b. Structural condition of the building
 - c. Addition or alterations that affect the structure of the building
 - d. Occupant safety based on the purpose of the building being built
- The example of calculation:
 - BCA score = 11.8
 - Total calculation of marks for physical condition:

$$=(25-\text{BCA marks}/25) \times \text{Weightage for physical condition}$$

$$=(25-11.8/25) \times 33\%$$
 - Total marks for physical condition = 17.42

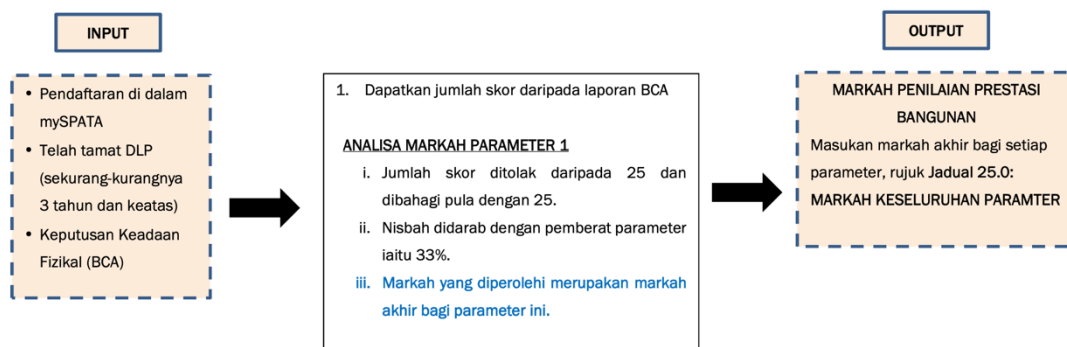


Figure 12: Work Process for Parameter 1

b) Parameter 2: Operational Efficiency

- Operational efficiency consist of 2 sub parameters:
 - a. Cost effectiveness
 - b. Achievement of KPI maintenance

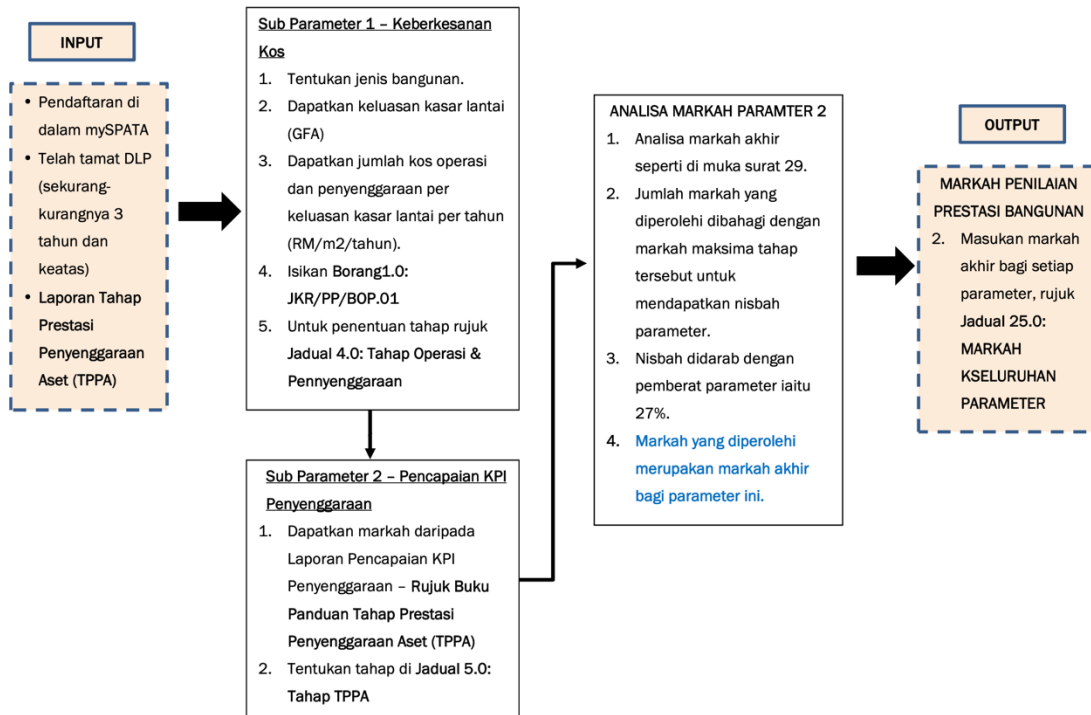


Figure 13: Work Process for Parameter 2

Operation Efficiency have 2 sub parameter:-

c) Parameter 3: Space Usage

- Space usage refers to the following sub-parameter:
 - a. Compliance with space standard (all spaces-based on compliance with EPU standard)
 - Example of calculation:
 - Total space = 50 space
 - After inspection, 40 spaces complied the determined area in EPU Guideline. So, the percentage of compliant space are:
 - $= (40/50) \times 100$
 - =80%
 - b. Space occupancy rate (active and inactive space)
 - c. Space frequency rate (common space)
 - d. Post-occupancy Assessment Level 1 (POE level 1)

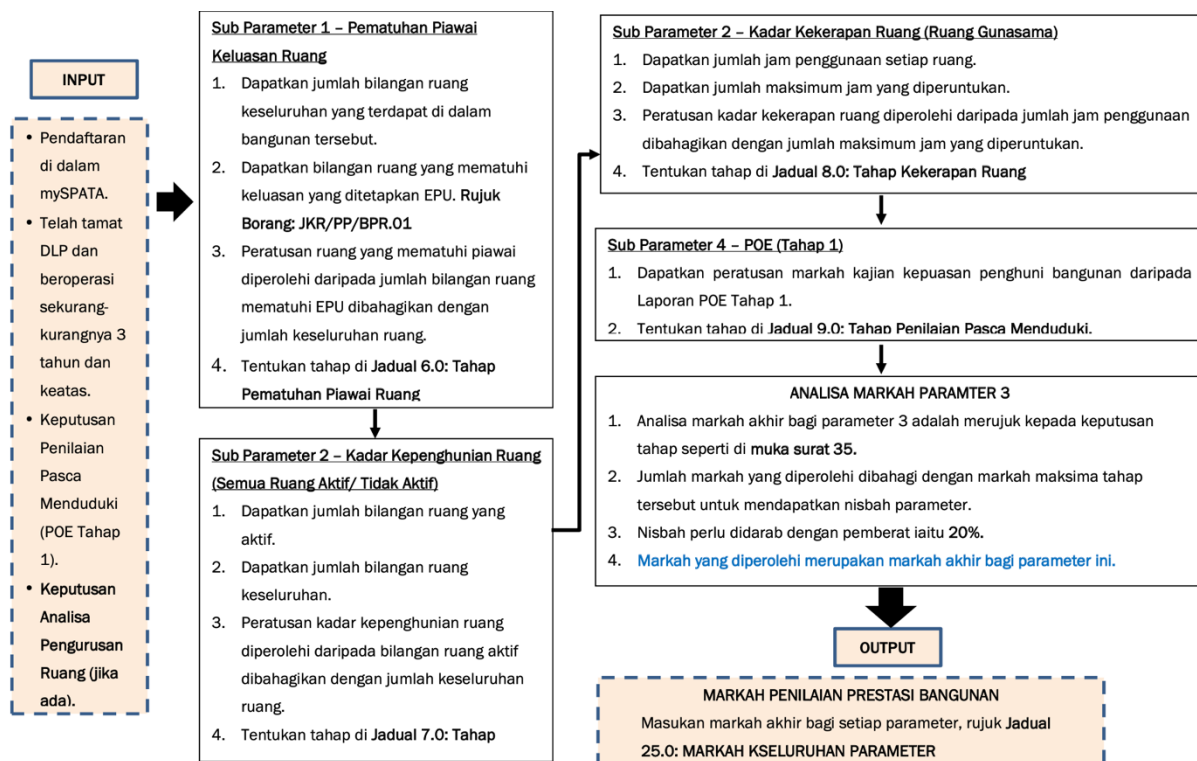


Figure 14: Work Process of Parameter 3 (Guidelines of BPA JKR)

d) Parameter 4: Sustainability

- Energy Efficiency
- Internal Environment Quality
- Sustainable Asset Management
- Water use Efficiency
- Statutory Maintenance

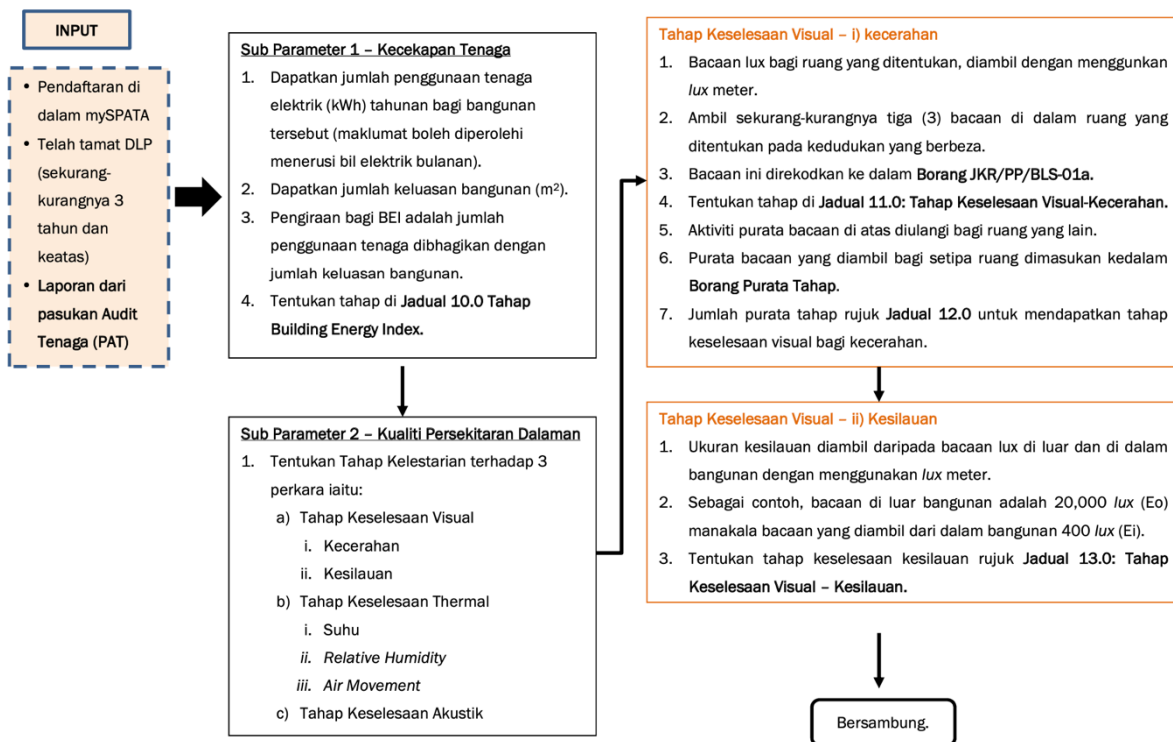


Figure 15: Work Process of Parameter 4

e) Parameter 5: Asset Value

- Facilities inside, outside and near the premises provide benefits
 - a. Facilities and Support Services
 - i. Facilities to the community
 - ii. Public Transport
 - iii. Other facilities
 - b. Customer Satisfaction Survey
 - i. Internal customer questionnaires
 - ii. External customer questionnaires

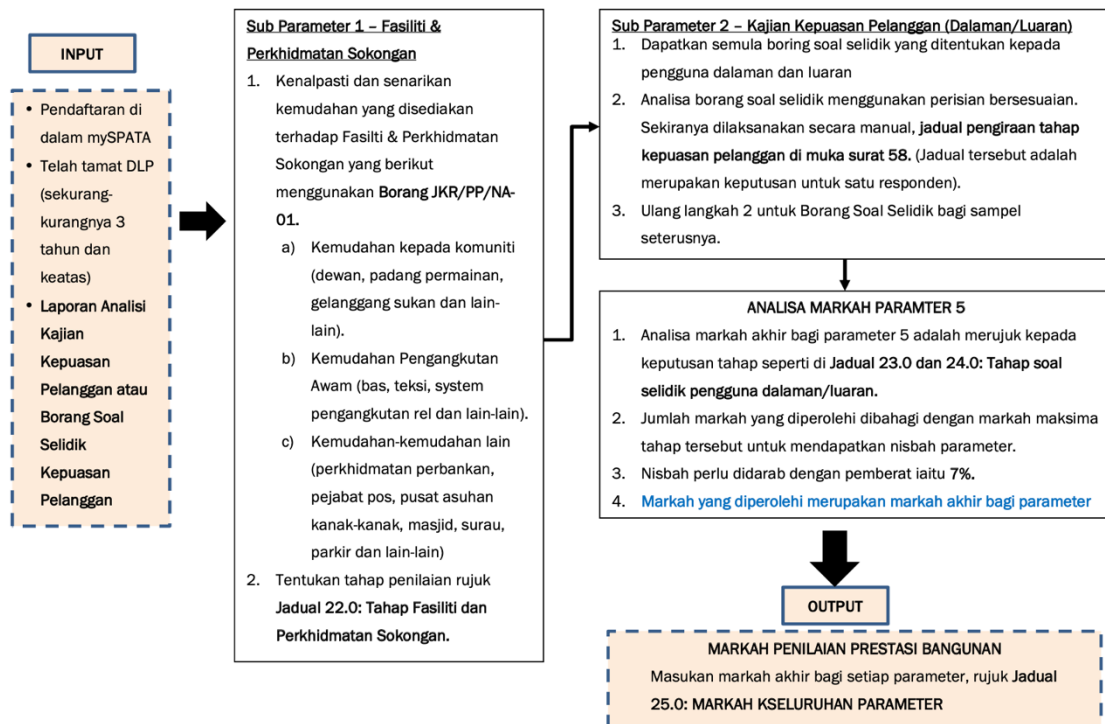


Figure 16: Work Process of Parameter 5

No.	Item	Skala				
Faktor Keboleharapan						
(a)	Ketersediaan fasiliti fizikal digunakan pada bila-bila masa	1	②	3	4	5
(b)	Masalah kerosakan fasiliti diatasi mengikut masa yang ditetapkan	1	2	3	④	5
(c)	Masalah kerosakan yang telah dibaiki tidak berulang	1	2	③	4	5
Faktor Responsif						
(a)	Keberkesanan dan tindakan pusat khidmat pelanggan dalam menangani permintaan dan aduan pengguna	1	2	3	④	5
(b)	Keutamaan kerja-kerja pembaikan adalah berdasarkan tahap kerosakan fasiliti dan perkhidmatan yang diberikan	1	2	3	④	5
(c)	Pengguna menerima makluman atau notis berkaitan tempoh pembaikan kerosakan fasiliti tersebut	1	2	③	4	5
Faktor Nyata						
(a)	Keadaan persekitaran pejabat adalah baik dan menarik	1	②	3	4	5
(b)	Keadaan fasiliti fizikal yang disediakan adalah dalam keadaan baik dan teratur	1	2	③	4	5

Figure 17: The example of Questionnaire Form

(c)	Staf pengurusan penyediaan perkhidmatan penyenggaraan fasiliti berpakaian kemas / korporat semasa menjalankan tugas	1	②	3	4	5
(d)	Pihak penyedia perkhidmatan menggunakan peralatan / sistem terkini sesuai dengan perkembangan teknologi	1	2	③	4	5
Faktor Jaminan						
(a)	Penyedia perkhidmatan penyenggaraan fasiliti mempunyai pengetahuan dan kemahiran yang baik semasa bertugas	1	2	3	④	5
(b)	Penyedia perkhidmatan penyenggaraan fasiliti mempunyai sikap yang baik semasa berurusan dengan pengguna	1	2	③	4	5
(c)	Pusat khidmat pelanggan melayan aduan pengguna dengan sopan dan berhemah	1	②	3	4	5
(d)	Perkhidmatan pengurusan penyenggaraan fasiliti yang diberikan adalah boleh dipercayai dan mencapai tahap perkhidmatan yang dipersetujui	1	2	3	4	⑤
(e)	Staf penyedia perkhidmatan pengurusan penyenggaraan fasiliti adalah jujur semasa menjalankan tugas	1	2	3	④	5
(f)	Fasiliti yang disediakan adalah mengikut piawaian yang ditetapkan dan berkualiti	1	②	3	4	5
(g)	Kerja-kerja operasi dan penyenggaraan peralatan asset adalah selamat, memenuhi keperluan perundangan dan peraturan	1	2	③	4	5
Faktor Empati						
(a)	Pihak penyedia perkhidmatan penyenggaraan fasiliti berupaya mendengar serta memahami keperluan pengguna berkaitan dengan perkhidmatan disediakan	①	2	3	4	5
(b)	Pihak penyedia perkhidmatan pengurusan penyenggaraan/fasiliti sentiasa bersedia apabila pengguna memerlukan maklumat, melaporkan kerosakan, kemalangan dan lain-lain	1	②	3	4	5
(c)	Pihak penyedia perkhidmatan pengurusan penyenggaraan/fasiliti menyediakan talian hotline dan alamat emel untuk kemudahan pengguna	1	2	3	④	5
(d)	Penyedia perkhidmatan pengurusan penyenggaraan/fasiliti berkomunikasi secara profesional, jelas dan maklumat diberikan lengkap dan tepat samada secara bertulis	1	2	3	④	5

Figure 18: The example of Questionnaires Form

2.6 RATING CLASSIFICATION

2.6.1 Rating for building blocks are determine thru rating star based on total marks of the assessment. Table below shows the classification of Building Rating used in the Guidelines.

Table 13: The classification of Building Rating















MARKS	DESCRIPTION	
> 90		The assets are in excellent condition, function to meet design and legal purposes, have high sustainability features, excellent level of security, economic level as well as optimal use of assets.
70 < M < 90		Assets are in good condition, function to meet design and legal purposes, have satisfactory sustainability features, high level of security, economic level as well as good use of assets.
50 < M < 70		Assets are in a moderate condition, serve to meet design and legal purposes, have the features of sustainability, a moderate level of security, economic level and moderate use of assets.
40 < M < 50		Assets are weak, function to meet design and legal purposes, lack sustainability features, low level of security, economic level and poor use of assets.
< 40		Assets are in a very weak condition, do not function to meet design and legal purposes, lack of sustainability features, very low level of security, economic level as well as very weak use of assets.

Figure 19: The Classification of Building Rating

2.7 BASIC INSPECTION EQUIPMENT

Building Performance Assessment (BPA) procedure will use equipment or tools listed in the table below:

Equipment	Image	Function
i. Laser Distance		<ul style="list-style-type: none"> • Sends a pulse of laser light to the target and measures the time it takes for the reflection to return • Allows the device to add, subtract, calculate areas and volumes and to triangulate • Can measure distances at a distance
ii. As Built Drawing		<ul style="list-style-type: none"> • Prepared by the contractor which shows the actual locations of the building components and changes to the original contract documents
iii. Digital Camera		<ul style="list-style-type: none"> • Takes photographs of defects and store image as data on memory card
iv. Compass		<ul style="list-style-type: none"> • Indicates direction • One of most important instrument for navigation
v. Thermometer		<ul style="list-style-type: none"> • Instrument that measures temperature
vi. Lux Meter		<ul style="list-style-type: none"> • Device for measuring brightness which the brightness appears for human eye • Works by using a photo cell to capture light

<p>vii. Temperature Humidity Meter</p>		<ul style="list-style-type: none"> • To measure relative humidity or air humidity as well as air temperature, dew point temperature and wet-bulb temperature • Portable meter allows for quick and easy detection of environmental conditions
<p>viii. Sound Pressure Level Meter</p>		<ul style="list-style-type: none"> • Measuring instruments used to assess noise or sound levels by measuring sound pressure • Used a microphone to capture sound
<p>ix. Air Velocity Meter</p>		<ul style="list-style-type: none"> • Used to measure the speed or volume of air movement • To determine the speed of wind

2.8 SUMMARY

To sum up, this topic covers on the overview of Building Performance Assessment (BPA). A building survey done by a Professional Building Surveyor is an inspection of the existing structural condition of the surrounding buildings and structures before the commencement of a demolition, construction or development. All prominent defects in the form of cracks, settlement, movement, water seepage, spalling concrete, distortion, subsidence and other building defects will be recorded in photographs together with notes.

Besides that, surveyors are expected to have a working knowledge of the law relating to their profession to enable them to perform their duties adequately. Moreover, the purpose of building survey is to record the condition of a property at a given point in time, generally prior to works being conducted on a site adjacent or nearby the surveyed property. The inspection report will serve as an accurate baseline of the condition of the property pre works. In the event that damage is caused during the works, a second building inspection can be conducted so that the “before” and “after” property condition can be accurately compared, based on independent expert assessments.

Overall, the dilapidation survey are highly beneficial for all parties related to a property transaction such as the buyer or investor, seller and even the developer or builder working on the construction project on or nearby the property in question.

CHAPTER 3 CASE STUDY

3.1 INTRODUCTION

CKM JKR Selangor Office is a building selected/ planned for the implementation of Building Performance Assessment (BPA) of Government Assets. The Head of Department responsible for this building is the Director of JKR Selangor. Building Performance Assessment (BPA) works was carried out on CKM JKR Selangor Office on 6th November 2021 to 31st November 2021 by the Panel Penilai Teknikal (PPT) appointed and consist of officers from Bahagian Bangunan, Cawangan Kejuruteraan Elektrik (CKE) JKR Selangor and Cawangan Kejuruteraan Mekanikal (CKM) JKR Selangor.

3.2 PROJECT BACKGROUND

The following shows the information of the building being evaluated:



Figure 20: JKR CKM Selangor Office

Table 1: Information of CKM JKR Selangor Office

Name of Premises	JKR CKM Selangor Office
Number of DPA	1105102MYS.100800.BD0001
Building Owner	Director of JKR Negeri Selangor
Address of the Premises	Cawangan Kejuruteraan Mekanikal JKR Selangor, Persiaran Jubli Perak, Seksyen 17, 40200 Shah Alam, Selangor
Ministry/Department/Agency	Kementerian Kerja Raya/ Jabatan Kerja Raya Negeri Selangor
GPS Coordinate (Main Entrance)	3.0489750652845684, 101.50572816340144
Name of Block	Office
Gross Floor Area, GFA (m ²)	1,140.0 m ²
Net Floor Area, NFA (m ²)	2,280.0 m ²
Year of Completion	1986
Number of Floor	2

Number of Parking	114
Name of Officer	Mr. Ameyrullah bin Arshad
Telephone Number	012-6106481
Existing Maintenance	Tidak Terancang
Name of Team Members	<ol style="list-style-type: none">1. Ir. Zulkhairi bin Hj. Abdul Aziz (PTF)2. Nurul Diyana binti Mohd Dahari (PIF)3. Ameyrullah bin Arshad (PPT Mekanikal)4. Azman bin Abdul Latib (PPT Mekanikal)5. Mohd Zamri bin Yunos (PPT Mekanikal)6. Norhasimah binti Abd Hamid (PPT Elektrikal)7. Jurawati binti Jantan (PPT Elektrikal)8. Zuazrin bin Mohd Zubir (PPT Elektrikal)

3.3 PROJECT LOCATION

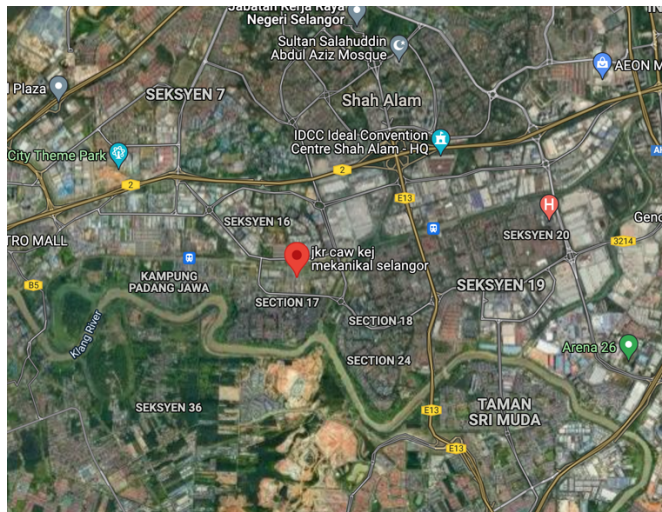


Figure 21: Key Plan of the Inspected Area

Based on Figure 2 above shows the key plan of Seksyen 17 which located at Shah Alam, Selangor. This area is located near with Seksyen 18 and Kampung Padang Jawa

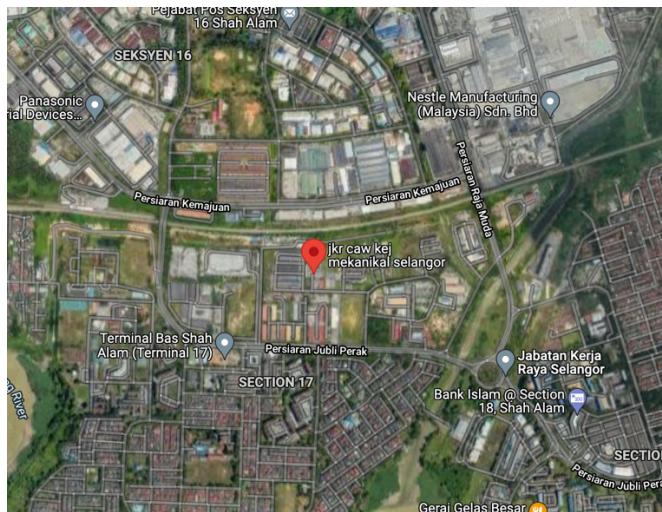


Figure 22: Location Plan of the of Inspected Area

Based on Figure 3 above shows the location plan of Persiaran Jubli Perak which located at Seksyen 17, Shah Alam. This area is located near with Persiaran Raja Muda and Persiaran Kemajuan.



Figure 23: Site Plan of the Inspected Area

Based on figure 4 above shows the site plan of JKR Cawangan Kejuruteraan Mekanikal Selangor which located at Seksyen 17, Shah Alam. This area is located near with Kompleks Ibu Pejabat JKR Negeri Selangor.

3.4 PURPOSE OF THE PROJECT

The report on the Building Performance Assessment (BPA) for CKM JKR Selangor Office is being issued in order to identify the level of building performance to determine follow up action or improvement on related areas and give ratings to government buildings based on performance levels.

The implementation of BPA of this building will have an impact on the Ministry/ Department/ Agency :

- i. Assist in formulating more accurate and effective annual budgets
- ii. As a basis for asset planning plans in addition to facilitating the operations and maintenance activities
- iii. Fulfill the government's goals in providing the best service to the people and improving the public service's image

3.5 SCOPE OF WORK

The scope of work of Building Performance Assessment (BPA) involves the CKM JKR Selangor and the evaluation is based on five (5) parameters, including the weights that have been set, namely:

PARAMETER	WEIGHTAGE (%)
Physical Condition	33
Operational Efficiency	27
Space Usage	20
Sustainability	13
Asset Value	7
Total	100

3.6 RESULT OF ASSESSMENT/ INSPECTION



Assessment for CKM JKR Selangor analysed using level scale assessment. Assessment marks given are the marks for sub-parameter. Based on the total of the marks, the building will be given certification based on star classification. The general level of assessment based on table below:

Table No 3.6: Level of Assessment

LEVEL	DESCRIPTION
3 Good	No defect or damages, component well maintained, performing as intended
2 Fair	Minor defects or damages, moderate condition, still can functioning with supervision
1 Poor	Major or minor defect, critical, not functioning as agreed service level

However, the level of assessment in details for every parameter based on assessment analysis, include full report on Appendix 1. Table below shows the classification of the assessment based on final marks obtained and description.

Table No: Classification of Rating


MARKS	DESCRIPTION
> 90	 The assets are in excellent condition, function to meet design and legal purposes, have high sustainability features, excellent level of security, economic level as well as optimal use of assets.
70 < M < 90	 Assets are in good condition, function to meet design and legal purposes, have satisfactory sustainability features, high level of security, economic level as well as good use of assets.
50 < M < 70	 Assets are in a moderate condition, serve to meet design and legal purposes, have the features of sustainability, a moderate level of security, economic level and moderate use of assets.
40 < M < 50	 Assets are weak, function to meet design and legal purposes, lack sustainability features, low level of security, economic level and poor use of assets.
< 40	 Assets are in a very weak condition, do not function to meet design and legal purposes, lack of sustainability

		features, very low level of security, economic level as well as very weak use of assets.
--	--	--

Table below shows the summary of level and final marks obtained for each parameter. Total final marks is 72.64% and certification obtained is 4 stars.

Table No: The Summary of Government Immovable Asset Rating Performance for CKM JKR Selangor

NO	PARAMETER	LEVEL	TOTAL MARKS (%)
1	Physical Condition [(25-8.18)/25]*33		26.46
2	Operational Efficiency 2.1 Cost Efficiency 2.2 Maintenance KPI Achievement	3 3	27.00
3	Space Usage 3.1 Compliance with EPU Standards Area 3.2 Space Occupancy Rate 3.3 Space Frequency Rate 3.4 Post-Occupancy Assessment Level 1	1 3 1 2	11.67
4	Sustainability 4.1 Energy Efficiency – BEI 4.2 Internal Environment Quality 4.2.1 Visual Comfort- Brightness 4.2.2 Visual Comfort- Glare 4.2.3 Thermal Comfort- Temperature 4.2.4 Thermal Comfort- Relative Humidity 4.2.5 Thermal Comfort- Air Movement 4.2.6 Acoustic Comfort 4.3 Sustainability Asset Management 4.3.1 OKU Facilities 4.3.2 Building System Management 4.3.3 Solid Waste Management/ Schedule 4.4 Water Usage Efficiency 4.4.1 Rainwater Collection and Reuse System 4.4.2 Water Efficiency Products 4.4.3 Wastewater Cycling 4.5 Statutory Maintenance	3 2 3 3 3 3 3 2 1 2 1 1 1 3	9.60
5	Asset Value 5.1 Facilities and Support Service		

5.1.1 Facilities for Community	3	6.53
5.1.2 Transportation Facility	3	
5.1.3 Other Facilities	3	
5.2 Customer Satisfaction Survey		
5.2.1 Internal User	2	
5.2.2 External User	3	
Total Marks	81.25%	
Certification		

3.6.1 Physical Condition

Building Condition Assessment (BCA) for CKM JKR Selangor was conducted on 06.10.2021 – 31.10.2021. The result from the Building Condition Assessment (BCA) was used to analyse the physical condition parameter. From the report, Building Condition Assessment Rating System (BCARS) for CKM JKR Selangor is 4.96 which **Very Good**.

Based on the findings, action need to be done is maintenance based on condition with estimate cost which is RM78,000.00.

3.6.2 Operational Efficiency

Cost Efficiency include operation and maintenance cost in within 1 year. Total operation and maintenance cost is RM86,899.28/year. Maintenance cost also include external area of the office as mentioned.

The details for cost efficiency as Table 4. Furthermore, operation and maintenance cost per GFA per year is rm38.11/m2/year, was at **Level 3 (Good)** under low-rise without lift category.

- a) The maintenance is scheduled accordingly to a routine daily, weekly, monthly and yearly.
- b) All complaints and responses from maintenance unit CKM JKR Selangor must be completed swiftly. Number of complaints and percentage of respondent satisfaction influence on the operational efficiency maintenance of every premises.
- c) The contractor's service assessment was rated as very satisfy by the maintenance team in Customer Satisfaction Survey (CSS).
- d) The annual maintenance budget must be allocated each year One-Off to ensure operational efficiency meets the KPI Standard.

3.6.3 Space Utilisation

Space audit activities at CKM JKR Selangor has been conducted on 06.10.2021 – 31.10.2021. as the conclusion, the findings on space utilization parameter are as follows:

- a) 11 number of space does not comply which more than 115%, also 14 space does not comply below 85% than standard guideline's and "Peraturan Bagi Perancangan Bangunan oleh Jawatankuasa Standard dan Kos Edisi 2015"
- b) 62 of space are fully used. Furthermore, the percentage of space utilization is at **Level 3 (Good)**
- c) The percentage of compliance space area standard is 41%, which is **Level 1 (weak)**. While hallway area and M&E area not comply with the standard
- d) Percentage of space frequency rate is 26.71% which at **Level 1 (weak)**. All meeting rooms not used optimally because of Work From Home (WFH) caused by Covid-19 pandemic
- e) From the analysis, the marks given for POE 1 is 72.3% which is **Level 2 (Fair)**. The highest POE aspect is the building's Location which 80% of the respondent was satisfied. While lowest POE aspect is Architectural Design, Mechanical & Electrical which is 64.2%

3.6.4 Sustainability

Sustainability audit activities has been conducted on 06.10.2021-31.10.2021. overall, findings on sustainability parameter are as below:

- a) The building's BEI is 98.52 kWh/m²/year, assessment scale obtained is at **Level 3 (Good)**
- b) The level of visual comfort for brightness is **Level 2 (Fair)**
- c) The level of visual comfort for glairiness is **Level 3 (Good)**
- d) The level of thermal comfort for temperature is **Level 3 (Good)**
- e) The level of thermal comfort for relative humidity is **Level 3 (Good)**
- f) The level of thermal comfort for air movement is **Level 3 (Good)**
- g) The level of acoustic comfort is **Level 3 (Good)**
- h) The level of OKU facilities for this building is **Level 2 (Fair)**
- i) No building management system used. So the building is at **Level 1 (Weak)**
- j) This building has two facilities in practicing 3R which is "Ekosistem Kondusif Sektor Awam (EKSA)" and space for waste management. So the building at **Level 2 (Fair)**
- k) This building not use "Sistem Pengumpulan & Penggunaan Semula Air Hujan (SPAH) for irrigation landscape. So the SPAH is at **Level 1 (Weak)**
- l) There is no water efficiency products. So that water efficiency is at **Level 1 (Weak)**
- m) No waste water recycling in this building. So that waste water recycling for this building is at **Level 1 (Weak)**
- n) There is more than 2 standard used. So the statutory maintenance is at **Level 3 (Good)**

3.6.5 Asset Value

Asset Value Parameter used to identify external facilities including user satisfaction internal and external towards the building. This building has few facilities which is:

- I. Facilities towards community- Level 3 (Good):
 - a) Community Hall
 - b) Mini Stadium
 - c) Sport Centre
- II. Public Transport- Level 3 (Good):
 - a) Bus Station and taxi
 - b) Bus Stop
 - c) E-Hailing Service
- III. Other Facilities- Level 3(Good):
 - a) Bankin Service
 - b) Post Office
 - c) Care Centre

The overall customer satisfaction survey (Internal and External) is evaluated based on the Perceptions and Satisfaction of Staff/ Users on the Performance of Office Buildings Occupied for 30 respondent. The percentage of level of internal customer satisfaction is 76.51%, the scale gained is Level 2 (Fair) and the percentage of level of external user satisfaction is 80%, the scale gained is Level 3 (Good).

Table 6: Total Marks for all Parameters

PARAMETER	WEIGHTAGE (%)	MARKS (%)
Physical Condition	33	25.46
Operational Efficiency	27	27.00
Space Usage	20	11.67
Sustainability	13	9.60
Asset Value	7	6.53
Total	100	81.25

3.7 BUILDING ASSESSMENT RATING SYSTEM (BARIS)

No.	Element	Component	Defect	Condition	Priority	Matrix	Defect No.	Location
1	Structure	Floor	Broken	3	5	15	A23	Level 2 (044)
2	Opening and Binaan Ruang	Paint	Not followed specification	3	2	6	A24	Level 2 (044)
3	Opening and Binaan Ruang	Ceiling Panel	Dirty	3	4	12	A25	Level 2 (044)
4	Opening and Binaan Ruang	Paint	Not followed specification	3	3	9	A50	Level 2 (039)
5	Structure	Carpet	Dull/Fade	3	4	12	A53	Level 2 (037)
6	Structure	Tiles	Water ponding	2	2	4	A66	Level 2 (056)
7	Opening and Binaan Ruang	Keylock	Rocking	3	3	9	A70	Level 2 (035)
8	Structure	Tiles	Fade of colour	3	2	6	A80	Level 2 (047)
9	Opening and Binaan Ruang	Door leaf	Fade of colour	3	4	12	A104	Level 2 (028)
10	Opening and Binaan Ruang	Paint	Flaking	3	4	12	A140	Level 1 (005)
11	Opening and Binaan Ruang	Ceiling panel	Loose	3	2	6	A215	Level 1 (030)
12	Opening and Binaan Ruang	Ceiling panel	Loose	3	3	9	A228	Level 1 (033)

13	Opening and Binaan Ruang	Paint	Crack	3	3	9	A275	Level 1 (023)
14	Accessory	Shutters	Water stains	3	3	9	A299	Level 1 (027)
15	Structure	Tiles	Fall out	3	3	9	A526	Level 1 (030)
16	Lighting System	Lamps	Not functioning	2	2	4	E09	Level 1 (017)
17	Lighting System	Lamps	Not functioning	3	5	15	E30	Level 2 (028)
18	Air conditioning system	Indoor unit	Water ponding	2	1	2	M27	Level 1 (003)
19	Air conditioning system	Package unit	Dirty	2	1	2	M50	Level 1 (027)

3.7 CONCLUSION AND RECOMMENDATION

Based on above findings, the rating of this building block is determined through a star rating based on the final score of the rating. The total score of this evaluation is 81.25% which is a 4 star rating where the building is in the good condition, serves the purpose of design and legislation, has satisfactory sustainability features, high level of security, economic level and good use of assets.

For the improvements, the Building Management Unit need to give attention towards all parameter. Recommendation to sure the assets is in a good condition, function well as serves to meet design and legislative purposes, meets the characteristics of sustainability, good safety, economic level and optimum use of assets as below:

- i. Perform maintenance works for damage/ defects that require repair/ replacement
- ii. Perform regular maintenance/planned maintenance to help operational efficiency and further improve building performance
- iii. It is recommended that the cubical workspace be improved to comply with EPU space area standards. Excess space can be assessed for its potential for the provision of workspace if there is a change or addition of position later. Photocopy room space can be removed and placed in a common use space (printer space). The photocopy room space can be used as a file room/officer room/storage room in the future
- iv. Improvements to facilities for the disabled

CHAPTER 4


PROBLEMS AND RECOMMENDATIONS

4.1 INTRODUCTION

In this chapter will discuss about the problem that have been identify during practical training period. This chapter focus on how to overcome the problem with research method for suitable recommendation based on BPA survey that practiced by Jabatan Kerja Raya Negeri Selangor. The problem that have been identify could be the minor problem and some could be the major problem.

The objective is to identify the problem and recommendation that are have been overcome is to make sure the visual inspections were done carefully toward each of the infrastructure and internal and/or external physical parts of the buildings that accessible and can be seen from and on the premise in order to record any existing discrepancies and defects in the future. It is important to identify the problems and overcome it.

4.2 PROBLEMS AND RECOMMENDATION

NO.	PROBLEM	RECOMMENDATION
<p>1.</p>	<p><u>Building Defects</u> Improper condition that may cause impact to the building structure, leading to low quality and performance of the building. Defect that occurred will not only cause aesthetic problems but also will affects the safety of the users</p> 	<p>v. Perform maintenance works for damage/ defects that require repair/ replacement</p> <p>vi. Enhance the quality of strict supervision or regular maintenance of the building so that problem can be identified and the remedy work can be executed immediately</p>
<p>2.</p>	<p><u>Asset Management</u> Assets have failure modes that can be prevented (and not increased) with regular maintenance and have a likelihood of failure that increases with time or use.</p>	<p>i. Perform regular maintenance/planned maintenance to help operational efficiency and further improve building performance</p>
<p>3.</p>	<p><u>Space Management</u> 11 number of space does not comply which more than 115%, also 14 space does not comply below 85% than standard guidelines. The percentage of compliance space area standard is 41%, which is Level 1 (weak).</p>	<p>i. It is recommended that the cubical workspace be improved to comply with EPU space area standards. Excess space can be assessed for its potential for the provision of workspace if there is a change or addition of position later. Photocopy room space can be</p>



removed and placed in a common use space (printer space). The photocopy room space can be used as a file room/officer room/storage room in the future

4. **Facilities for Disabled**

There is still lack of availability in term of accessible accommodation or facilities for disabled people.



- i. Improvements to facilities for the disabled
- ii. Widening doorways to allow a wheelchair to pass through easily
- iii. Replacing steps with ramps
- iv. Providing accessible toilet facilities for disabled employees/visitors

CHAPTER 5

CONCLUSION

To sum up, based on the inspection and above findings, the rating of this building block is determined through a star rating based on the final score of the rating. The total score of this evaluation is 81.25% which is a 4 star rating where the building is in the good condition, serves the purpose of design and legislation, has satisfactory sustainability features, high level of security, economic level and good use of assets.

For the improvements, the Building Management Unit need to give attention towards all parameter. Recommendation to sure the assets is in a good condition, function well as serves to meet design and legislative purposes, meets the characteristics of sustainability, good safety, economic level and optimum use of assets as below:

- vii. Perform maintenance works for damage/ defects that require repair/ replacement
- viii. Perform regular maintenance/planned maintenance to help operational efficiency and further improve building performance
- ix. It is recommended that the cubical workspace be improved to comply with EPU space area standards. Excess space can be assessed for its potential for the provision of workspace if there is a change or addition of position later. Photocopy room space can be removed and placed in a common use space (printer space). The photocopy room space can be used as a file room/officer room/storage room in the future
- x. Improvements to facilities for the disabled

REFERENCES

Building Inspection Houspect (2017, January 27). Dilapidation Building Inspections – What, Why, When And Who. Retrieved on 24th March 2019 from <https://www.houspect.com.au/wa/dilapidation-building-inspections/>

Douglas, J. & Ransom, W. (2007). Understanding Building Failures. (3rd ed.). London: Taylor & Francis.

Hollis, M. (1988). Surveying for Dilapidations. London: Estates Gazette. Hollis, M. (2005). Surveying Buildings. (5th ed.). London: RICS Books.

James Douglas and Edward A. Noy (2011). Building Surveys and Reports. (4th ed.). United Kingdom: Wiley-Blackwell.

Maryborough / Hervey Bay Building and Pest Inspections. Dilapidation Surveys. Retrieved on 24th March 2019 from <http://buildinginspectionsherveybay.com.au/services/dilapidation-surveys/>

Ramly, A. (2006). Panduan Kerja-kerja Pemeriksaan Kecacatan Bangunan. Malaysia: Hizi Print Sdn Bhd.

Wordsworth, P. Lee's. (2001). Building Maintenance Management. (4th ed.) London: Oxford Blackwell Science Ltd.

Yacob, S, Ali A.S, and Au Yong, C.P. (2016). Building Condition Assessment: Lesson Learnt from Pilot Projects. Proceeding of International Building Control Conference (IBCC 2016), Kuala Lumpur .

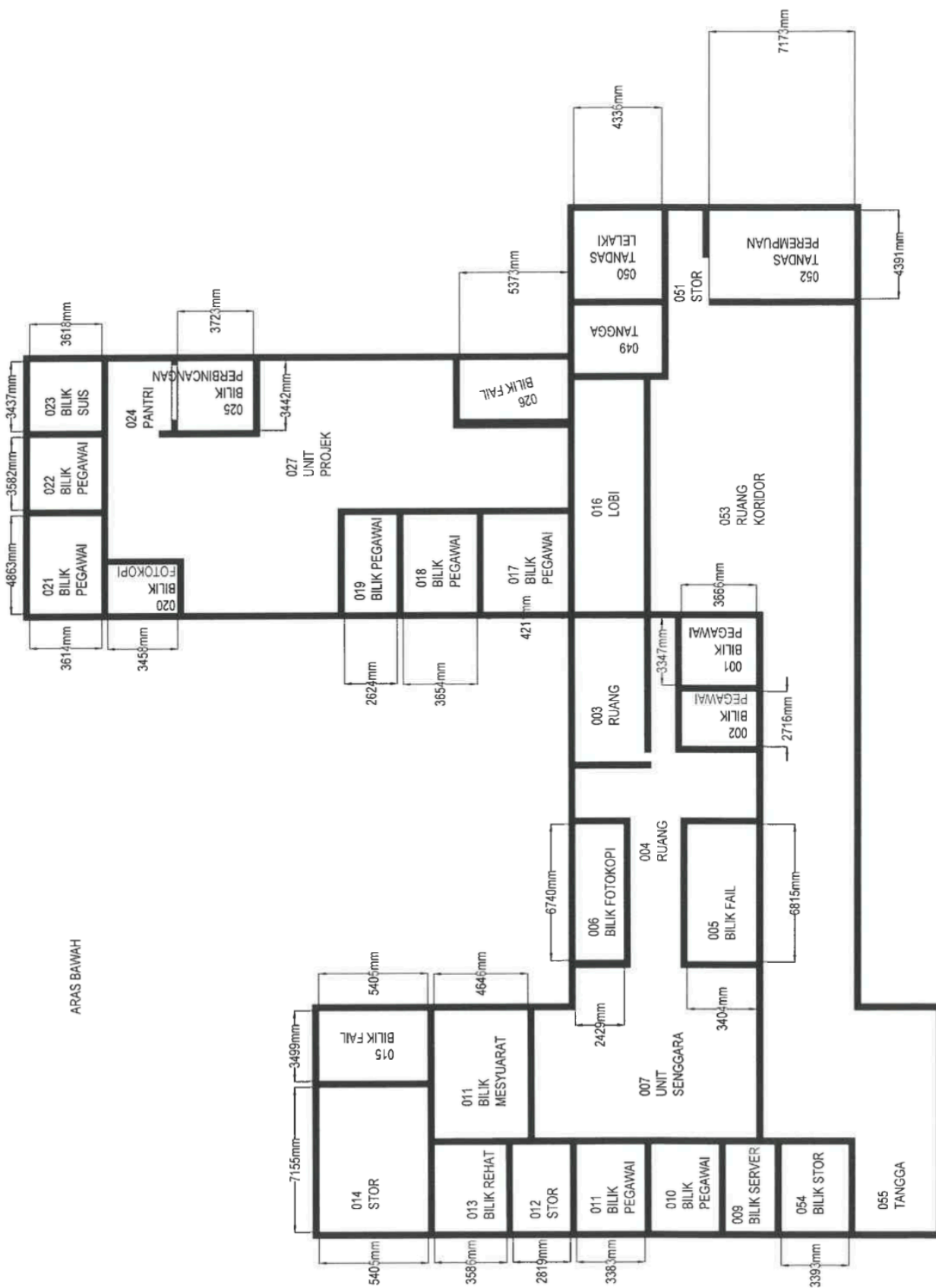
Garis Panduan Penilaian Prestasi dan Penarafan Bangunan (2018)

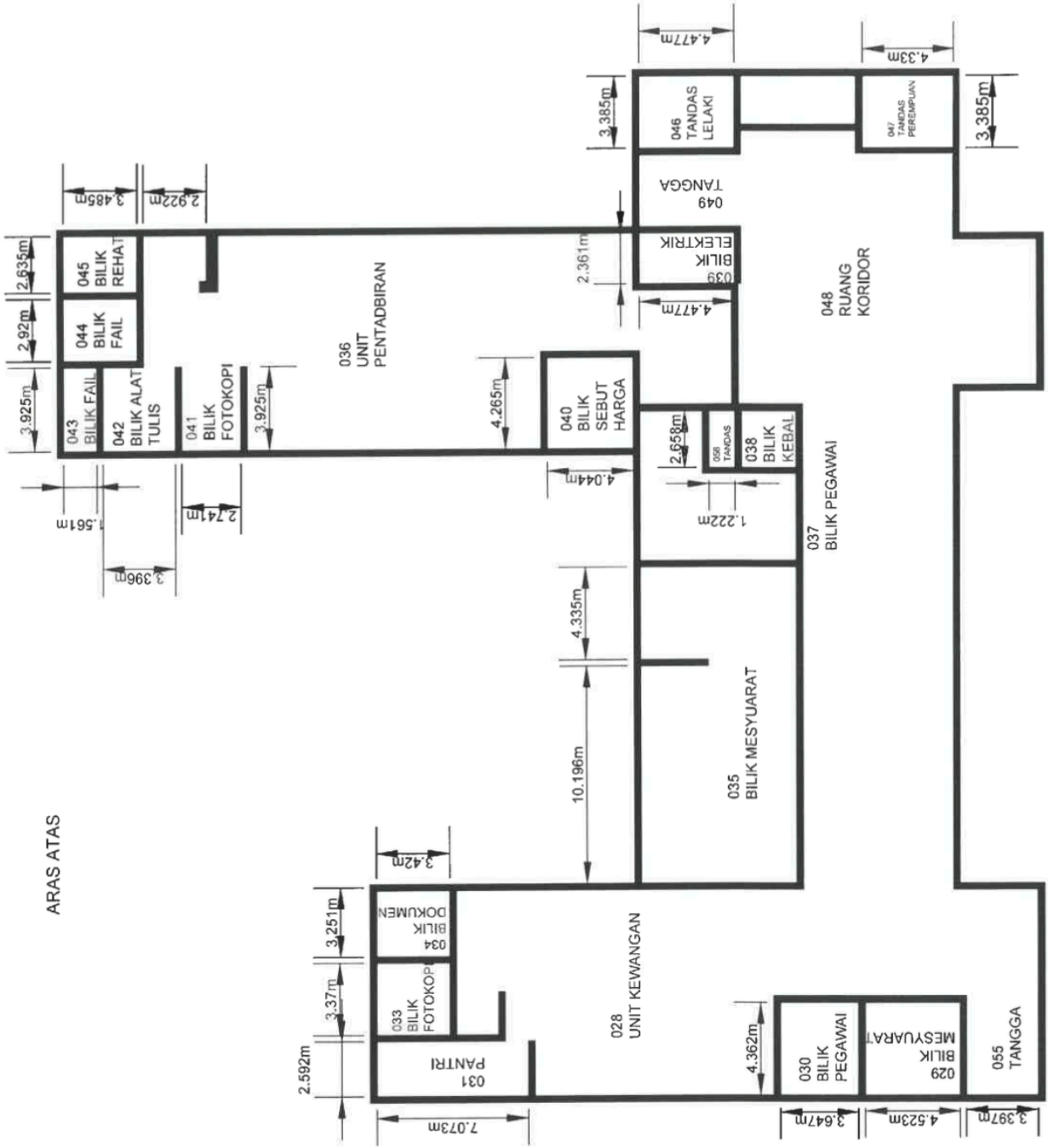
Garis Panduan Penilaian Keadaan Bangunan (2013)

Tatacara Pengurusan Aset Tak Alih Kerajaan (2012)

APPENDICES

7.1 Building Plan





7.2 Internal and External Customer Satisfaction Survey

KAJIAN KEPUASAN PELANGGAN DALAMAN

No.	Item	Markah					Markah	Jumlah responden	Markah responden (%)
		1 (20%)	2(40%)	3(60%)	4(80%)	5(100%)			
1.0 Faktor Keboleharapan									
1.1	Ketersediaan fasiliti fizikal digunakan pada bila-bila masa	0	0	2	27	1	2380	30	79.33
1.2	Masalah kerosakan fasiliti diatasi mengikut masa yang ditetapkan	1	2	1	26	0	2240	30	74.67
1.3	Masalah kerosakan yang telah dibaiki tidak berulang	0	2	6	21	1	2220	30	74.00
2.0 Faktor Responsif									
2.1	Keberkesanan dan tindakan pusat khidmat pelanggan dalam menangani permintaan dan aduan pengguna	1	1	4	23	1	2240	30	74.67
2.2	Keutamaan kerja-kerja pembaikan adalah berdasarkan tahap kerosakan fasiliti dan perkhidmatan yang diberikan	2	1	2	24	1	2220	30	74.00
2.3	Pengguna menerima makluman atau notis berkaitan tempoh pembaikan kerosakan fasiliti tersebut	1	1	3	24	11	3260	40	81.50
3.0 Faktor Nyata									
3.1	Keadaan persekitaran pejabat adalah baik dan menarik	0	1	3	25	1	2320	30	77.33
3.2	Keadaan fasiliti fizikal yang disediakan adalah dalam keadaan baik dan teratur	0	1	5	22	2	2300	30	76.67
3.3	Staf pengurusan penyediaan perkhidmatan penyenggaraan fasiliti berpakaian kemas / korporat semasa menjalankan tugas	0	1	4	23	2	2320	30	77.33
3.4	Pihak penyedia perkhidmatan menggunakan peralatan / sistem terkini sesuai dengan perkembangan teknologi	0	1	7	20	2	2260	30	75.33
4.0 Faktor Jaminan									
4.1	Penyedia perkhidmatan penyenggaraan fasiliti mempunyai pengetahuan dan kemahiran yang baik	1	0	2	25	2	2340	30	78.00
4.2	Penyedia perkhidmatan penyenggaraan fasiliti mempunyai sikap yang baik semasa berurusan dengan pengguna	1	0	1	26	2	2360	30	78.67
4.3	Pusat khidmat pelanggan melayan aduan pengguna dengan sopan dan berhemah	0	0	4	25	1	2340	30	78.00
4.4	Perkhidmatan pengurusan	0	0	6	22	2	2320	30	77.33
4.5	Staf penyedia perkhidmatan pengurusan penyenggaraan fasiliti adalah jujur semasa menjalankan tugas	0	1	5	23	1	2280	30	76.00
5.6	Fasiliti yang disediakan adalah mengikut piawaian yang ditetapkan dan berkualiti	1	1	4	22	2	2260	30	75.33
4.7	Kerjasama operasi dan	1	1	2	24	2	2300	30	76.67

5.0 Faktor Empati									
5.1	Pihak penyedia perkhidmatan	1	1	3	24	1	2260	30	75.33
5.2	Pihak penyedia perkhidmatan	1	1	4	23	1	2240	30	74.67
5.3	Pihak penyedia perkhidmatan pengurusan penyenggaraan/fasiliti menyediakan talian hotline dan alamat emel untuk kemudahan pengguna	1	1	7	19	2	2200	30	73.33
5.4	Penyedia perkhidmatan pengurusan penyenggaraan/fasiliti berkomunikasi secara profesional, jelas dan maklumat diberikan lengkap dan tepat samada secara bertulis ataupun lisan berkaitan perkhidmatan diberikan	0	1	5	22	2	2300	30	76.67
5.5	Penyedia perkhidmatan menyediakan polisi, prosedur dan proses yang jelas untuk memastikan keberkesanan komunikasi dengan pengguna	0	1	4	24	1	2300	30	76.67
JUMLAH KESELURUHAN							51,260.00	670.00	76.51

TAHAP = 2

KAJIAN KEPUASAN PELANGGAN DALAMAN

No.	Item	Markah					Markah	Jumlah responden	Markah responden (%)
		1 (20%)	2(40%)	3(60%)	4(80%)	5(100%)			
1.0 Faktor Keboleharapan									
1.1	Perkhidmatan seperti yang dijanjikan	0	1	1	26	2	2380	30	79.33
1.2	Ikhtis dalam menyelesaikan masalah	0	0	1	28	1	2400	30	80.00
1.3	Perkhidmatan diterima mengikut masa yang ditetapkan	0	1	1	26	2	2380	30	79.33
2.0 Faktor Responsif									
2.1	Kakitangan sedia membantu	0	0	4	20	6	2440	30	81.33
2.2	Masa berurusan adalah tidak terlalu lama	0	0	4	21	5	2420	30	80.67
2.3	Pelanggan diberitahu mengenai maklumat dikehendaki	0	0	3	21	6	2460	30	82.00
3.0 Faktor Nyata									
3.1	Kebersihan	0	0	3	24	3	2400	30	80.00
3.2	Keselesaan pejabat	0	0	3	24	3	2400	30	80.00
3.3	Penampilan kakitangan	0	0	2	26	2	2400	30	80.00
4.0 Faktor Jaminan									
4.1	Kakitangan pejabat adalah kompeten	0	0	4	23	3	2380	30	79.33
4.2	Kakitangan pejabat berbudi bahasa	0	0	5	23	2	2340	30	78.00
4.3	Pelanggan yakin dengan perkhidmatan yang diberikan	0	0	5	23	2	2340	30	78.00
5.0 Faktor Empati									
5.1	Keselesaan berurusan	0	0	4	22	4	2400	30	80.00
5.2	Kakitangan pejabat memahami keperluan pelanggan	0	0	2	24	4	2440	30	81.33
5.3	Pelanggan rasa dihargai	0	0	3	23	4	2420	30	80.67
JUMLAH KESELURUHAN							36,000.00	450.00	80.00

TAHAP = 3

7.3 Risk Assessment



**LAPORAN PENUH – PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN
PERMOHONAN PENGGUNAAN APLIKASI MUDAH ALIH BCARS (BUILDING CONDITION ASSESSMENT RATING) UNTUK PEMERIKSAAN DAN
PENILAIAN KEADAAN BANGUNAN SEDIA ADA (BCA) BAGI PELAKSANAAN PENILAIAN PRESTASI DAN PENARAFAN BANGUNAN (BPA) DI
PEJABAT JKR CAWANGAN KEJURUTERAAN MEKANIKAL SELANGOR**

E024	1	010	Lengkapan Lampu	Mekanikal dan Elektrik	3	2	1	B - Baik	1	1	1 - Tiada Risiko
E025	1	012	Lengkapan Lampu	Mekanikal dan Elektrik	3	2	1	B - Baik	1	1	1 - Tiada Risiko
E026	1	013	Lengkapan Lampu	Mekanikal dan Elektrik	3	2	1	B - Baik	1	1	1 - Tiada Risiko
E027	1	014	Lengkapan Lampu	Mekanikal dan Elektrik	2	2	1	A - Sangat Baik	1	1	1 - Tiada Risiko
E028	2	37	Suis/ Panel Kawalan	Mekanikal dan Elektrik	3	3	1	B - Baik	1	1	1 - Tiada Risiko
E029	1	015	Lengkapan Lampu	Mekanikal dan Elektrik	3	2	1	B - Baik	1	1	1 - Tiada Risiko
E030	2	028	Lengkapan Lampu	Mekanikal dan Elektrik	3	5	2	C - Sederhana	1	2	2 - Risiko Rendah
E031	2	038	Earth Chamber	-	Pilih	Pilih			Pilih		0 - Tiada Risiko
E032	2	029	Lengkapan Lampu	Mekanikal dan Elektrik	3	2	1	B - Baik	1	1	1 - Tiada Risiko
E033	2	030	Lengkapan Lampu	Mekanikal dan Elektrik	3	2	1	B - Baik	1	1	1 - Tiada Risiko
E034	2	047	Lengkapan Lampu	Mekanikal dan Elektrik	3	5	1	C - Sederhana	1	1	1 - Tiada Risiko
E035	2	031	Lengkapan Lampu	Mekanikal dan Elektrik	3	5	1	C - Sederhana	1	1	1 - Tiada Risiko
E036	2	034	Lengkapan Lampu	Mekanikal dan Elektrik	3	4	1	C - Sederhana	1	1	1 - Tiada Risiko
E037	2	046	Lengkapan Lampu	Mekanikal dan Elektrik	3	4	1	C - Sederhana	1	1	1 - Tiada Risiko
E038	2	032	Lengkapan Lampu	Mekanikal dan Elektrik	2	2	1	A - Sangat Baik	1	1	1 - Tiada Risiko

**LAPORAN PENUH – PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN
PERMOHONAN PENGGUNAAN APLIKASI MUDAH ALIH BCARS (BUILDING CONDITION ASSESSMENT RATING) UNTUK PEMERIKSAAN DAN
PENILAIAN KEADAAN BANGUNAN SEDIA ADA (BCA) BAGI PELAKSANAAN PENILAIAN PRESTASI DAN PENARAFAN BANGUNAN (BPA) DI
PEJABAT JKR CAWANGAN KEJURUTERAAN MEKANIKAL SELANGOR**


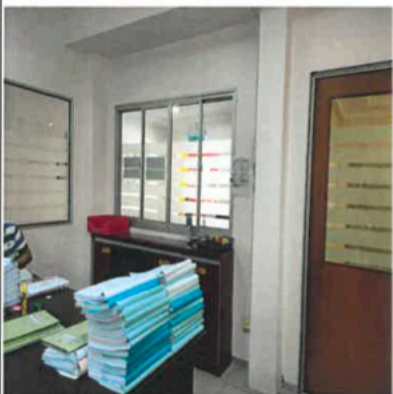
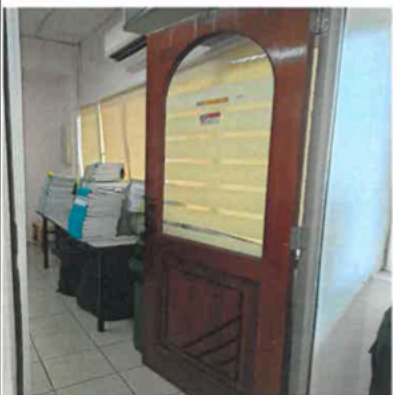


A217	1	030	Cat	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A218	1	030	Lengkapan	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A220	1	030	Bidai	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A221	1	031	Daun Pintu	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A222	1	031	Jubin	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A223	1	031	Panel Siling	Awam dan Senibina	3	3	B - Baik	1	1	1 - Tiada Risiko
A224	1	031	Cat	Awam dan Senibina	2	2	A - Sangat Baik	1	1	1 - Tiada Risiko
A225	1	031	Jubin	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A226	1	031	Cat	Awam dan Senibina	2	2	A - Sangat Baik	1	1	1 - Tiada Risiko
A227	1	033	Jubin	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A228	1	033	Panel Siling	Awam dan Senibina	3	3	B - Baik	1	1	1 - Tiada Risiko
A229	1	033	Daun Pintu	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A230	1	033	Lengkapan	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A231	1	033	Jubin	Awam dan Senibina	3	2	B - Baik	1	1	1 - Tiada Risiko
A232	1	033	Cat	Awam dan Senibina	3	3	B - Baik	1	1	1 - Tiada Risiko

7.4 Defects Sheet




LAPORAN PENUH - PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN PERMOHONAN PENGGUNAAN APLIKASI MUDAH ALIH BCARS (BUILDING CONDITION ASSESSMENT RATING) UNTUK PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN SEDIA ADA (BCA) BAGI PELAKSANAAN PENILAIAN PRESTASI DAN PENARAFAN BANGUNAN (BPA) DI PEJABAT JKR CAWANGAN KEJURUTERAAN MEKANIKAL SELANGOR



No. Pelan Indikasi Kecacatan	A07	Blok / Aras	2		
	Lokasi	040			
	Sistem / Komponen	Bukaan & Binaan Ruang / Lengkapan			
	PENEMUAN KEADAAN FIZIKAL				
	Kondisi	Keutamaan	Matrik	Warna	
	2	1	2		
	PENILAIAN RISIKO PENEMUAN				
	1	1	1		
	Keterangan Kecacatan/kerusakan				
	Berkeadaan Baik				
	Punca Kecacatan/kerusakan				
Tiada					
No. Pelan Indikasi Kecacatan	A08	Blok / Aras	2		
	Lokasi	040			
	Sistem / Komponen	Bukaan & Binaan Ruang / Lengkapan			
	PENEMUAN KEADAAN FIZIKAL				
	Kondisi	Keutamaan	Matrik	Warna	
	2	1	2		
	PENILAIAN RISIKO PENEMUAN				
	1	1	1		
	Keterangan Kecacatan/kerusakan				
	Berkeadaan Baik				
	Punca Kecacatan/kerusakan				
Tiada					
No. Pelan Indikasi Kecacatan	A09	Blok / Aras	2		
	Lokasi	040			
	Sistem / Komponen	Bukaan & Binaan Ruang / Daun Pintu			
	PENEMUAN KEADAAN FIZIKAL				
	Kondisi	Keutamaan	Matrik	Warna	
	2	2	4		
	PENILAIAN RISIKO PENEMUAN				
	1	1	1		
	Keterangan Kecacatan/kerusakan				
	Berkeadaan Baik				
	Punca Kecacatan/kerusakan				
Tiada					

LAPORAN PENUH – PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN
 PERMOHONAN PENGGUNAAN APLIKASI MUDAH ALIH BCARS (BUILDING CONDITION
 ASSESSMENT RATING) UNTUK PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN SEDIA
 ADA (BCA) BAGI PELAKSANAAN PENILAIAN PRESTASI DAN PENARAFAN BANGUNAN (BPA) DI
 PEJABAT JKR CAWANGAN KEJURUTERAAN MEKANIKAL SELANGOR



No. Pelan Indikasi Kecacatan A10	Blok / Aras	2		
	Lokasi	041		
	Sistem / Komponen	Aksesori / Gelanggang		
	PENEMUAN KEADAAN FIZIKAL			
	Kondisi	Keutamaan	Matrik	Warna
	2	2	4	
	PENILAIAN RISIKO PENEMUAN			
	1	1	1	
	Keterangan Kecacatan/kerosakan			
	Berkeadaan Baik			
	Punca Kecacatan/kerosakan			
Tiada				
No. Pelan Indikasi Kecacatan A11	Blok / Aras	2		
	Lokasi	041		
	Sistem / Komponen	Bukaan & Binaan Ruang / Cat		
	PENEMUAN KEADAAN FIZIKAL			
	Kondisi	Keutamaan	Matrik	Warna
	2	2	4	
	PENILAIAN RISIKO PENEMUAN			
	1	1	1	
	Keterangan Kecacatan/kerosakan			
	Berkeadaan Baik			
	Punca Kecacatan/kerosakan			
Tiada				
No. Pelan Indikasi Kecacatan A12	Blok / Aras	2		
	Lokasi	040		
	Sistem / Komponen	Bukaan & Binaan Ruang / Cat		
	PENEMUAN KEADAAN FIZIKAL			
	Kondisi	Keutamaan	Matrik	Warna
	2	2	4	
	PENILAIAN RISIKO PENEMUAN			
	1	1	1	
	Keterangan Kecacatan/kerosakan			
	Berkeadaan Baik			
	Punca Kecacatan/kerosakan			
Tiada				

LAPORAN PENUH - PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN
 PERMOHONAN PENGGUNAAN APLIKASI MUDAH ALIH BCARS (BUILDING CONDITION
 ASSESSMENT RATING) UNTUK PEMERIKSAAN DAN PENILAIAN KEADAAN BANGUNAN SEDIA
 ADA (BCA) BAGI PELAKSANAAN PENILAIAN PRESTASI DAN PENARAFAN BANGUNAN (BPA) DI
 PEJABAT JKR CAWANGAN KEJURUTERAAN MEKANIKAL SELANGOR



No. Pelan Indikasi Kecacatan	A22	Blok / Aras	2			
		Lokasi	043			
		Sistem / Komponen	Aksesori / Gelanggang			
		PENEMUAN KEADAAN FIZIKAL				
		Kondisi	Keutamaan	Matrik	Warna	
		2	2		4	
		PENILAIAN RISIKO PENEMUAN				
		1	1		1	
		Keterangan Kecacatan/kerosakan				
		Berkeadaan Baik				
		Punca Kecacatan/kerosakan				
Tiada						
No. Pelan Indikasi Kecacatan	A23	Blok / Aras	2			
		Lokasi	044			
		Sistem / Komponen	Struktur / Kemasan lantai			
		PENEMUAN KEADAAN FIZIKAL				
		Kondisi	Keutamaan	Matrik	Warna	
		3	5		15	
		PENILAIAN RISIKO PENEMUAN				
		1	1		1	
		Keterangan Kecacatan/kerosakan				
		Rosak				
		Punca Kecacatan/kerosakan				
Penggunaan (Tempoh)						
No. Pelan Indikasi Kecacatan	A24	Blok / Aras	2			
		Lokasi	044			
		Sistem / Komponen	Bukaan & Binaan Ruang / Cat			
		PENEMUAN KEADAAN FIZIKAL				
		Kondisi	Keutamaan	Matrik	Warna	
		3	2		6	
		PENILAIAN RISIKO PENEMUAN				
		1	1		1	
		Keterangan Kecacatan/kerosakan				
		Tidak mengikut spesifikasi				
		Punca Kecacatan/kerosakan				
Spesifikasi						