



**DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

**MAINTENANCE WORK AT KUALA LUMPUR
INTERNATIONAL AIRPORT**

Prepared by:

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**DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

DECEMBER 2018

By

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Entitled

Maintenance Work At Kuala Lumpur International Airport

accepted in partial fulfillment of requirement has for obtaining Diploma in Building.

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DEPARTMENT OF BUILDING
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(PERAK)

DECEMBER 2018

STUDENT DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at Mazos Sdn Bhd for duration of 14 weeks starting from 3 September 2018 and ended on 7 December 2018. It is submitted as one of the perquisite requirements of DBG307 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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Date : 18/12/18

ACKNOWLEDGEMENT

Alhamdulillah, praise to Allah, the Most Merciful, the Most Graceful.

I would like to extend my heartfelt gratitude for the guidance advice and help rendered throughout the period of training by the following group of amazing individuals. First and foremost, I would like to thank Dato' Azman for the oppprtunity given, to conduct my training in his esteem company. His team of professionals comprising of En Juhari Bin Husin, Pn Noratika Binti Rahman, Cik Nor Fahima Binti Che Ayob, En Norasri Bin Jamil, and Muhd Adam Bin Amran, have enabled me to learn and develop my understanding, knowledge and feel of real time projects, and the theory involved in analysis of structures, building and civil works. They are also responsible towards streamlining and assessing my training. Also to the site personnel who have extended their cooperation and help to further enhance my ability in understanding the procedures in construction and site administration, tests procedures, site safety and best practices in the industry. It is an honour for me to be given the opportunity to 'work' with all of you.

I would also like to thank ALL the UiTM lecturers that have taught and nurtured me in becoming a better student and person. I would also like to extend my deepest appreciation to the lecturers who are directly involved during my training stint. To Puan Noor Rizallinda Binti Ishak, Supervising Lecturer, En Mohd Najib Bin Abd Rashid, Practical Training Coordinator and Dr. Dzulkarnaen bin Ismail, Programme Coordinator, I value the time, effort, encouragement and ideas that they have contributed towards the successful completion of my training, this report and the valuable knowledge that have been shared over the last few semesters.

Last but not least, my special thanks to my beloved parents for their sacrificies over the years.

Thank you so much.

ABSTRACT

Building maintenance is the act of maintaining the building in its serviceable condition. The act of maintaining may require repair or replacement but the primary objective of maintenance is to avoid as far as practicable the need for repair or replacement of the structural elements, fittings, services, equipment or finishing which collectively make up the building and its environment. This report was conducted for the maintenance work done at Kuala Lumpur International Airport. The objective of this report is to study the methods and problems of the maintenance work and to determine the problems occurred and resolutions taken to solve the problems that commence at Kuala Lumpur International Airport. It will focus on toilets refurbishment, signage and door repairing maintenance for the occupant safety and comforts. Some of the method used are hacking, painting and replacing items that need to be upgrade or replace. This report will also look at the procedure of the maintenance work to make improvement in serviceability whenever required, enhance the serviceability of the building and preserve building and its services in good condition to the occupant of the building. Client will approve the work done on the building when it satisfy their needs and purpose.

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CHAPTER 1.0

INTRODUCTION

1.1 Background and Scope of Study

In BS 3811: 1984, maintenance is described as a combination of any actions carried out to maintain an item in, or refurbish it to a suitable condition. Maintenance is crucial to retain the structural stability, prevent unwanted destruction from weather and can determine the roots of defects. Facilities maintenance management is the process by which an organization make sure that its buildings, system and services support basic operations and processes as well as contribute to succeeding its strategic objectives in changing surroundings.

The study is carried out at Sepang, Selangor which is Main Terminal Building, Contact Pier and Satellite Building, Kuala Lumpur International Airport. The scope of study are concentrating on upgrading work. It includes tiling works, painting works, door fixing and signage works. The purposes of the study are to identify the procedures of upgrading work, methods used for upgrading work and the problems occurred and resolutions taken to solve the problems.

1.2 Objectives

1. To identify the procedure for upgrading work at Kuala Lumpur International Airport
2. To investigate the method of upgrading work at Kuala Lumpur International Airport
3. To determine the problems occurred and resolutions taken to solve the problems

1.3 Research Methods

Primary Methods

1. Observation

The observation can be performed by following timetable or unintentional. The technique and procedure of tiling works, painting works, installing and removing signage and door repairing are observed each time the work is carried out. The observations made are taken in pictures and notes.

2. Interviews

Unstructured interviews regarding the scope of works were questioned with the workers and supervisors in the location throughout the maintenance work is carried out. Semi-structured interviews also take place with the employee of the company by writing up questions such as problems to gain more information about the facilities maintenance works. The information acquired are kept as pictures and notes.

Secondary Methods

1. Document reviews

Company profile, site plan, supporting documents, progress report and pictures belong to the person in charge are reviewed and studied to gain more knowledge and further understanding. The data obtained are saved in notes and pictures.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

MAZOS Sdn Bhd was incorporated on November 12, 2008, as a 100% Bumiputera engineering company. Mazos Sdn Bhd comprises stock owners, technical officers, and employees of the company comprising 100 percent of Malaysians who have a high spirit to compete with other races in the global business industry today. This company is registered with CIDB, Finance Ministry, Malaysia Airports Holding Berhad and statutory bodies.

2.2 Company profile

MAZOS Sdn Bhd is located at Banting, Selangor. Their major field are construction, civil engineering, mechanical or electrical which serve as the basis of national development infrastructure component. They also provide services including building maintenance, signage, door repairing, seat repairing and grass cutting.

Their current on-going project are Facilities Maintenance Of Floor and Wall Finishes, Waterproofing System, Roofing System, Concrete Work, Metal, Ceiling and Glass Works at Main Terminal Building, Contact Pier and Satellite Building, KL International Airport and Facilities Maintenance Of Signage, Airport Seating, Painting Works, Doors and Ironmongeries of Main Terminal Building, Contact Pier and Satellite Building at KL International Airport.

Their aims is to lead the national development industry to the upper level & more professional with other developed countries. They are confident and believe that their company is able to provide all the requirements of customers in a package of major development either in the field of construction, civil engineering, mechanical or electrical which are the core of national growth infrastructure element.

They also committed in improving the quality of services in the globalized businesses world of and eager to mark company name among the top level and the world's best player.

Besides of ensuring the services quality of company guaranteed, the company also emphasized direct and close relationship between clients and employees of the company as a major matter in targeting customer satisfaction is achieved. The company also will ensure the long lasting networking and continue to exist even if the services tendered was completed.

2.3 Organisation Chart



ORGANIZATION CHART (KLIA Operation)

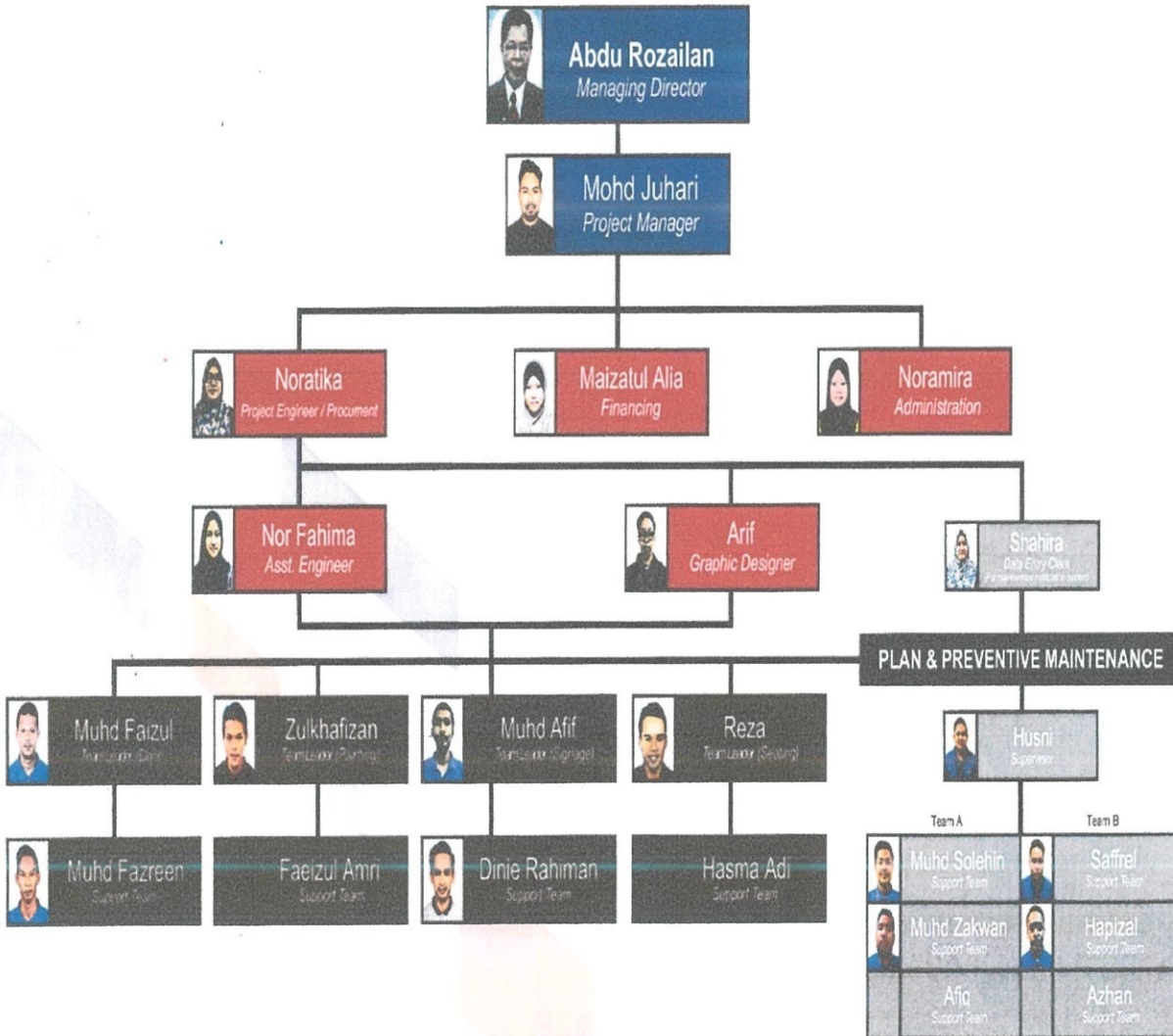


Figure 1.0 The organisation chart of the company.

Source: Mazos Sdn Bhd (2018)

2.4 List of Project

2.4.1 Completed Projects

Table 1.0: Completed projects.

No.	Project	Ministry/Authorities	Year
1.	Installation partition at immigration, work order repainting alucobond damaged B2	Malaysia Airports (Sepang) Sdn Bhd	2017
2.	Installation door for immigration counter, maintenance works on ceiling	Malaysia Airports (Sepang) Sdn Bhd	2017
3.	Repairing workplace screening room avsec	Malaysia Airports (Sepang) Sdn Bhd	2017
4.	Railing damage and dented located, maintenance works on wall glass	Malaysia Airports (Sepang) Sdn Bhd	2017
5.	Work order steel works, work order daily inspection of gate lounge	Malaysia Airports (Sepang) Sdn Bhd	2017
6.	Maintenance of floor & wall at room 75 terminal office	Malaysia Airports (Sepang) Sdn Bhd	2017
7.	Work order rectification work at staffrest room	Malaysia Airports (Sepang) Sdn Bhd	2017
8.	Vinyl flooring at smoking lounge	Malaysia Airports (Sepang) Sdn Bhd	2017
9.	Maintenance of ceiling works at satellite	Malaysia Airports (Sepang) Sdn Bhd	2017
10.	Large scale maintenance for toilet at satellite	Malaysia Airports (Sepang) Sdn Bhd	2017

Source: Mazos Sdn Bhd (2018)

2.4.2 Project in Progress

Table 1.1: Project in Progress.

No.	Project	Ministry/Authorities	Year
1.	Proposed roof leakage rectification works at KLIA air cargo terminal 1 (KACT 1) KL International Airport	Malaysia Airports (Sepang) Sdn Bhd	2018
2.	Manpower supply for sbd baggage tub assistant at KLIA2, KL International Airport	Malaysia Airports (Sepang) Sdn Bhd	2018
3.	Proposed upgrading of toilets at Contact Pier, KL International Airport	Malaysia Airports (Sepang) Sdn Bhd	2018
4.	Facilities maintenance (floor and wall finishes, waterproofing system, roofing system, concrete work, metal, ceiling and glass works) at Main Terminal Building, Contact Pier and Satellite building, KL International Airport	Malaysia Airports (Sepang) Sdn Bhd	2018

Source: Mazos Sdn Bhd (2018)

CHAPTER 3.0

CASE STUDY

3.1 Introduction to Case Study

The title of the project is Refurbishment of Staff Washroom at Main Terminal, Contact Pier and Satellite Building, KL International Airport. This project consists of two phase. This project involved Mazos Sdn Bhd as main contractor, Yusma Bina Sdn Bhd, Urusan Teknologi Wawasan Sdn Bhd and TMR Urusharta (M) Sdn Bhd as sub-contractor. The period of the project is from 16 July 2018 to 16 December 2018. The scope of works are including painting work, tiling work and manpower. Soffit slab, existing wall tile, main door or entrance, cubicle door and panel, cleaner door and toilet duct door are in the scope of painting works meanwhile manpower scope such as dismantle existing metal ceiling, clear clogging and cleaning works. Tiling scope of works are removing existing tiles or hacking existing floor tiles and install new floor tiles.

Next, the project title is Facilities Maintenance of Signage, Airport Seating, Painting Works, Doors and Ironmongeries of Main Terminal Building, Contact Pier and Satellite Building at KL International Airport. Refer Figure 3.1, Figure 3.2 and Figure 3.3 for the layout plan. The completion date of the project is at 31 May 2021, three years from the starting date which is 1 June 2018. These projects are distributed into two operation and maintenance strategy manpower planning.

The types of maintenance involved are corrective maintenance and plan preventive maintenance. Both of the projects are located at the Kuala Lumpur International Airport and the client is Malaysia Airports Holding Berhad. In consideration of the airport is packed with international and local passengers, some of the maintenance works need to be carry out during middle of the night to make sure it will not get in the way of passengers and to ensure the safety of the aircraft passengers.

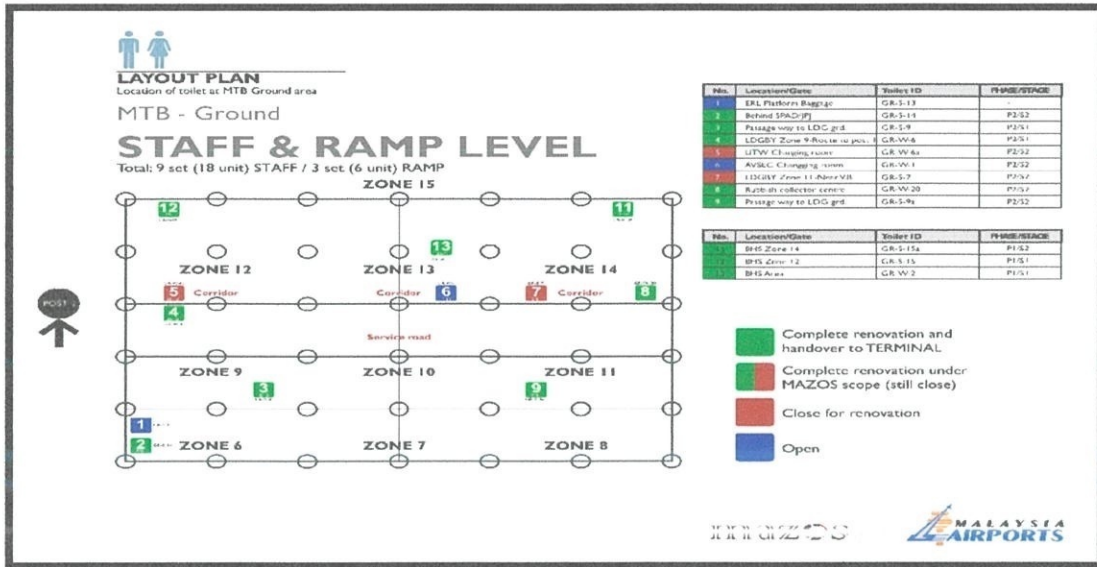


Figure 3.0 Layout Plan of Main Terminal Building

Source: Mazos Sdn Bhd (2018)

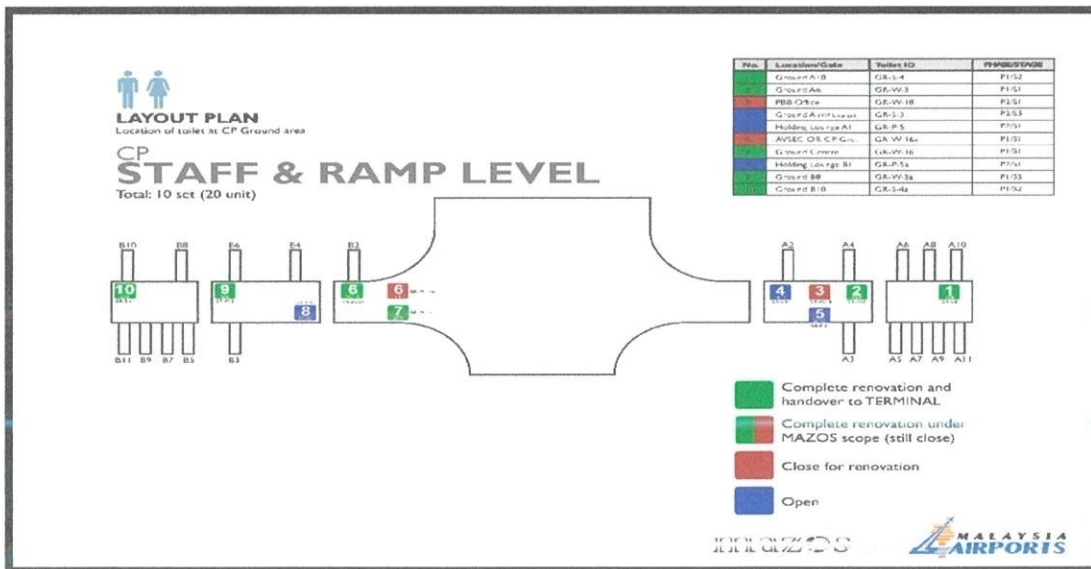


Figure 3.1 Layout Plan of Contact Pier

Source: Mazos Sdn Bhd (2018)

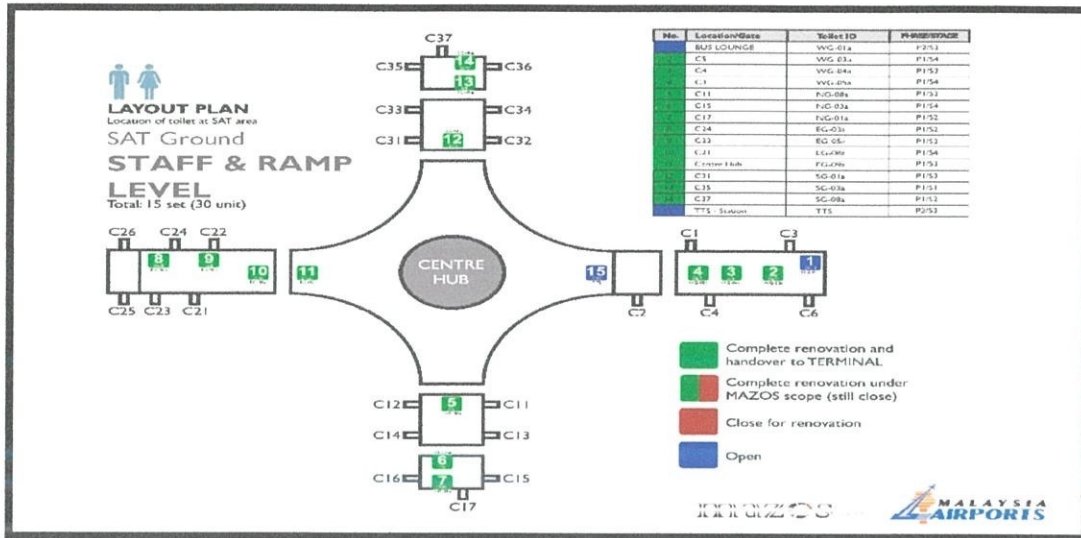


Figure 3.2 Layout Plan of Satellite Building

Source: Mazos Sdn Bhd (2018)

3.2 Procedure of Upgrading Work

Before the upgrading work can be commence, permit to work and hot work permit is requested to the client to carry out the upgrading work. Permit to work is a permit that is inform about the upgrading work between the client and contractor. Figure 3.5 and Figure 3.6 shows the permit to work. Hot work permit is approved by the fireman. The hot work permit is a permit where fireman will inspect and make sure that the area of the upgrading work is safe for equipment that can cause a spark of fire.

Next, the area that involve in the upgrading work will be inspect first to identify defects, area, equipment and materials to be use. The inspection are noted on a pre-inspection checklist form. Refer Figure 3.4 for pre-inspection checklist. Signage notice are put on the entrance of the upgrading work area to inform the occupants of the building that the area is restricted to enter. Figure 3.7 shows the signage notice at the entrance of the upgrading work area. The occupants can use facilities that is provided on the other area where upgrading work is not carry out.

To enter the site of the upgrading work, the workers need to make request a daily pass to the police officer of the airport by writing a letter to give permission to allow them to enter the restricted area. Refer Figure 3.8 for the daily pass. After the completion of the upgrading work, a handover form by the company is pass on other team that is involved in the project and they will sign the form as a proof that the area has been handed over to the client. Refer Figure 3.8 for the handover form.

PRE INSPECTION / HANDOVER CHECKLIST FORM

MAYB CONSTRUCTION (SELANG) SDN. BHD.
TERMINAL 2 BUILDING, KUALA LUMPUR AIRPORT, PUTRAJAYA
KUALA LUMPUR INTERNATIONAL AIRPORT

Date: 24/1/18
Total No: CR-03a (m)
Location: CR-03

No	Item: PAINTING WORK	Quantity	Status	Comment / Notes
1	Soffit slab	-	✓	
2	Metel ceiling	63.75 sq'	✓	
3	Main entrance door	57 sq'	✓	Re-in. katilias hand/door
4	Cleaner door	21' x 11'	✓	
5	Token Cubicle & Panel	51' x 5'	✓	
6	Wall tile (Epoxy coating)	1350 m ²	✓	
7	Table top (Epoxy coating)	29 m ²	✓	
No	Item: TILING WORK	Quantity	Status	Comment / Notes
8	Floor tiles	410 m ²	✓	
9	Floor tiles at new table top	-	X	
10	Wall tiles at inner frame	8 m ²	X	
11	Wall tiles (Replace crack tiles)	L/S	✓	
12	Stainless steel Floor trap	L/S	✓	
No	Item: DOOR	Quantity	Status	Comment / Notes
13	Re-align cubicle	L/S	✓	
14	Make good and filler	L/S	✓	
No	Item: CLEANING	Quantity	Status	Comment / Notes
15	Clogging	L/S	✓	
16	Slating at cubicle and main door	L/S	✓	
17	Floor	L/S	✓	
18	Wall	L/S	✓	
19	Ceiling & Slab	L/S	✓	

Others:

I hereby certify that I have received the following work. In signing of this form, it is hereby acknowledged that this work has been formerly handed over by the MACE Building Services, Engineering Division and accepted by the end user.

Prepare by: MAZOS SOH BHD
Verified by: TSD S.C.
(Terminal Services Division Unit)

Name: MAZOS SOH BHD
Date: 24/1/18

Name: RUSLIAN MARDI J. J. J.
Date: 24/1/18

Figure 3.3 Pre-inspection Checklist Form

MALAYSIA AIRPORTS
MAHS/TEL/OP/PTW/1 Ed 2 Rev 1
Effective date: 04/11/2016

MALAYSIA AIRPORTS (SELANG) SDN. BHD.
PERMIT TO WORK

1. Work Title	MALAYSIA AIRPORTS (SELANG) SDN. BHD. (MACE) BUILDING CONSTRUCTION WORK - METAL CEILING & WALL TILES AT MAIN ENTRANCE BUILDING, CUSTOM PASS & AIRCRAFT BUILDING AT KUALA LUMPUR INTERNATIONAL AIRPORT CONSTRUCTION
2. Location/Area	Please tick (X) <input type="checkbox"/> Landside <input checked="" type="checkbox"/> Airside <input checked="" type="checkbox"/> Terminal
3. Type Of Work	Specific area: _____ <input type="checkbox"/> New Construction <input type="checkbox"/> Renovation <input checked="" type="checkbox"/> On-Off Repair & Maintenance <input type="checkbox"/> Exhibition Others (please specify): _____
4. Start/Completion Date	Start Date: 14/1/2018 Completion Date: 26/1/2018
5. Working Hours	9-6 Hours
6. Other Permit Require (Issued by the contractor)	<input checked="" type="checkbox"/> Hot Work Permit <input type="checkbox"/> Excavation Permit <input type="checkbox"/> Bad Log Permit <input checked="" type="checkbox"/> Airside Driving Permit <input type="checkbox"/> Airside Vehicle Permit
7. Appointed Contractor	Signature: _____ Date: _____ Stamp: _____ Contact: _____
8. Client/tenant's approval	Signature: _____ Date: _____ Stamp: _____ Contact: _____
9. Project Owner approval (MCA Sepang or MAHB responsible unit for the work)	Signature: _____ Date: _____ Stamp: _____ Contact: _____
10. Area Construction approval (MCA Sepang Department responsible unit for the Area)	Signature: _____ Date: _____ Stamp: _____ Contact: _____

Figure 3.4 Permit To Work

MALAYSIA AIRPORTS
 MAHAJALOP/PTW/1 02.3 Rev. 1
 Effective date: 04/11/2016

MALAYSIA AIRPORTS (SELANG) SDN. BHD.
PERMIT TO WORK

Acknowledgement by other MA (Selang) Sdn. Bhd. Unit

Unit :	Unit :
Signature :	Signature :
Date :	Date :
Stamp :	Stamp :
Contact :	Contact :
Remarks :	Remarks :

Unit :	Unit :
Signature :	Signature :
Date :	Date :
Stamp :	Stamp :
Contact :	Contact :
Remarks :	Remarks :

Unit :	Unit :
Signature :	Signature :
Date :	Date :
Stamp :	Stamp :
Contact :	Contact :
Remarks :	Remarks :

APPROVED

Signature : _____
 Date : _____
 Stamp : _____
 Contact : _____

NOTE: PTW 1 is not valid without signature and stamp/initial. PTW 1 A, 2 or PTW 1 B, do not dispense or extend time for completion.

Figure 3.5 Permit To Work



Figure 3.6 Notice of Upgrading Work

MALAYSIA AIRPORTS (SEKANG) SDN BHD 10 SEP 2018
11th Floor, Airport Management Centre, E1, International Level, 43900 Sepang, Selangor

INTER MEMO
BUILDING SERVICES

RECEIVED
 14 SEP 2018
 BUILDING SERVICES

Kepada : Ketua Unit Keselamatan
 Daripada : Engineering Division, Building Services
 Tarikh : 14hb September 2018
 Perkara : **PEMOHONAN PAS KESELAMATAN SEMENTARA UNTUK TUJUAN MAZOS SDN BHD (TEAM TOILET)**

Mengikut kepada perkara di atas,
 2. Subjek ini supaya pihak Tuan dapat melakukan dan menguruskan permohonan tersebut bermula **18.09.2018 hingga 24.09.2018** bagi menjalankan kerja kerja pembaspah dan kemas toilet di kawasan Contact Pier A Satellite Building Kawasan Aron dan Terminal.
 3. Bersempena ini dibenarkan senarai nama dan no. kad pengenalan untuk tindakan tuju selanjutnya.

1 MUR ADLIN KHARINA BINTI AZIZYAN	981207 10 9178
-------------------------------------	----------------

Sekian, terima kasih.
 Yang benar.

NOTES: 1. This form is to be filled out by the user of the equipment. 2. The user must ensure that the equipment is in good working order before using it. 3. The user must ensure that the equipment is used in accordance with the instructions. 4. The user must ensure that the equipment is returned to the store in good working order. 5. The user must ensure that the equipment is not damaged or misused. 6. The user must ensure that the equipment is not used for any other purpose. 7. The user must ensure that the equipment is not used for any illegal or unauthorized purpose. 8. The user must ensure that the equipment is not used for any purpose that is prohibited by the law. 9. The user must ensure that the equipment is not used for any purpose that is prohibited by the company. 10. The user must ensure that the equipment is not used for any purpose that is prohibited by the organization.

MALAYSIA AIRPORTS
 (SEKANG) SDN BHD
 Building Services
 Engineering Division
 Airport Management Centre, E1, International Level, 43900 Sepang, Selangor

Figure 3.7 Daily Pass

MALAYSIA AIRPORTS (SEKANG) SDN BHD
11th Floor, Airport Management Centre, E1, International Level, 43900 Sepang, Selangor

END USER
RECEIPT/HANDOVER FORM

Project Title	REFURBISHMENT OF STAFF WASHROOMS AT MAIN TERMINAL BUILDING, CONTACT PIER AND SATELLITE BUILDING, KL INTERNATIONAL AIRPORT		
Date	3/10/18		
Toilet No.	GRW 2a (M)		
LOCATION	CP Bldg		

Handed over by		Verified by	
MAZOS SDN BHD	TMK UELSHARTA	UTW SDN BHD	BUILDING SERVICES KLIA
Name: <i>MASEOC</i>	Name: <i>Uelsharta</i>	Name: <i>Mur Adlin</i>	Name: <i>Muhammad</i>
Date: <i>2/10/18</i>	Date: <i>2/10/18</i>	Date: <i>3/10/18</i>	Date: <i>3/10/18</i>
Comment/Notes:	Comment/Notes:	Comment/Notes: <i>- To check for key</i>	Comment/Notes:

Taken over by

TERMINAL SERVICE DIVISION KLIA

I hereby certify that I have received the following item. By signing of this form, it is hereby acknowledge that item below has been formally handed over by the MAZOS Building Services, Engineering Division and accepted by the end user.

Name: _____
 Date: _____

Comment/Notes:
pendig TBM - WB (replacment), umel bowl (replacment) by 5/10/2018

BUILDING SERVICES KLIA COPY

Figure 3.8 Handover Form

3.3 Methods of Upgrading Work

1. Painting Work

Preparation before painting work is crucial to make sure the progress can be run efficiently without any problems. Firstly, hardware materials which are already fixed and not to be painted were removed. If the hardware materials cannot be removed, covered or protected properly before surface preparation and painting will commence. Secondly, clean and prepare concrete or cement plaster surfaces to be painted. Efflorescence, chalk, dust, dirt, grease, and oils were removed. Lastly, the surface of the area to be painted would be prepared by removing loose particles, blemishes and deleterious materials by way of sanding.

i. Ceiling

Ceiling is the first to be paint on. Brush is used to paint around the edges where the ceiling meets the walls. By using a roller on the end of an extension pole, the process of painting is quicker. After the paint is dried, second coat of paint is applied to the ceiling. Refer Figure 3.10 and Figure 3.11 for the process of painting the ceiling.

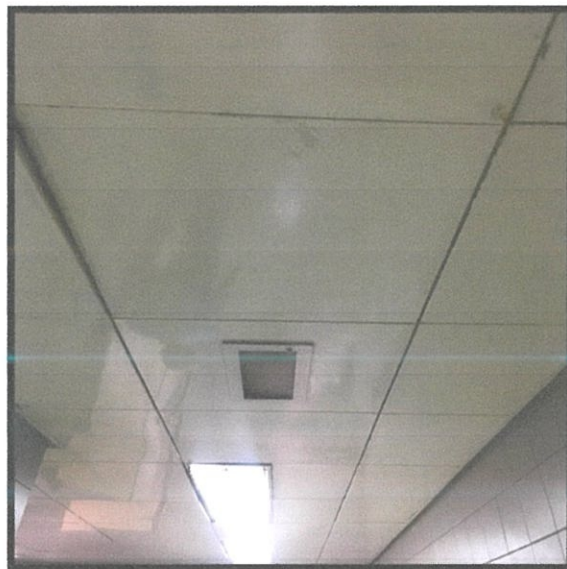


Figure 3.9 Before Paint The Ceiling



Figure 3.10 Painting the Ceiling

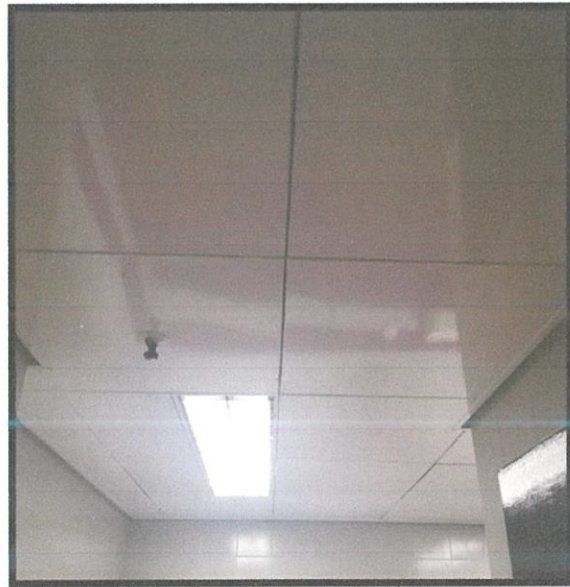


Figure 3.11 After Paint The Ceiling

ii. Wall Tile

Paint application consists of four layers. Those are undercoat, first layer, second layer and final layer. Oil based paint is typically used especially when painting the toilet walls, cubicle door, panel and ceiling. The size of tiles are 8 inch x 8 inch. The oil paint is mixed with hardener to ensure the paint can dry quickly. The oil based paint then mixed with thinner to make it thin so that the paint not lumpy when painting works is carry out and the thinner is also used to clean up after using paint. Refer Figure 3.13 for the mixing of paint with thinner and hardener. The process took at least a week to finish.

The undercoat layer is leave overnight to let it dry. Before the first layer, painter's tape is put on tiles (to separate the color) and cubicle, door and other fittings that can't be removed to avoid dripping paint on these areas. The first layer also leave overnight to let it dry and following by the second layer and finally the final layer leave for a night to let it dry. After the four layers are completed, the inspection request needed to be submitted for checking and approval of client. If the surface after painting is not smooth, the wall is paint for a final touch up. Figure 3.14, Figure 3.15, Figure 3.16 and Figure 3.17 shows the progress of the wall painting.

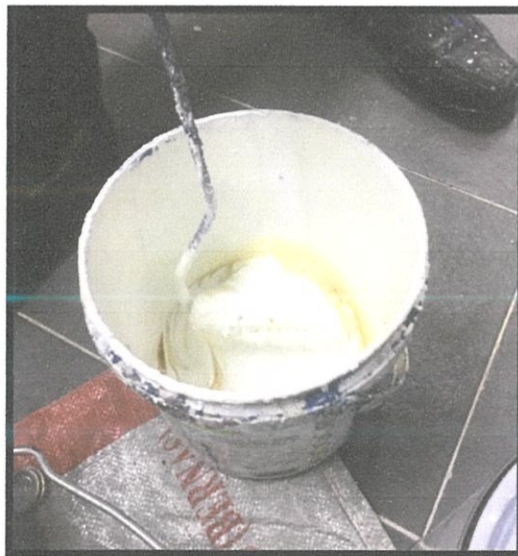


Figure 3.12 Oil Based Paint Are Mixed With Hardener and Thinner

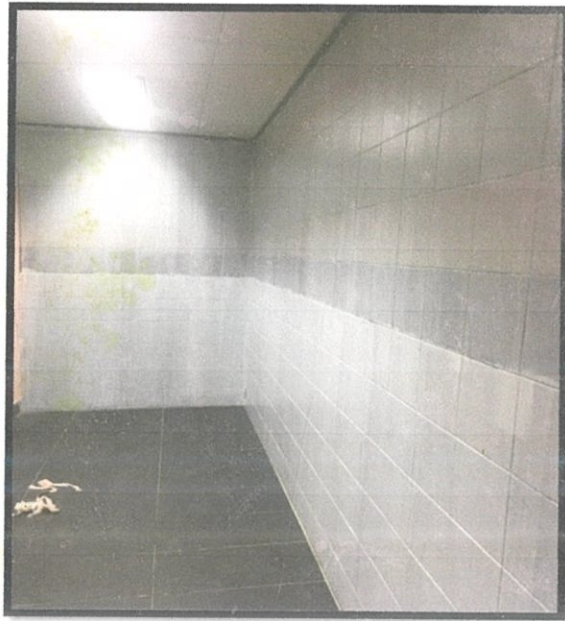


Figure 3.13 Undercoat Layer of Paint



Figure 3.14 First Layer of Paint

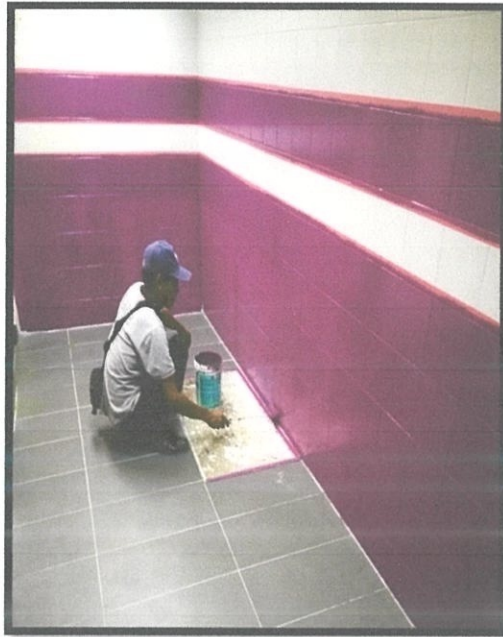


Figure 3.15 Second Layer of Paint



Figure 3.16 Final Layer of Paint

iii. Cubicle Door and Main Door

Areas that don't need to be painted with painter's tape were mask off. Tape is placed around the cubicle frame or main door frame, ironmongeries such as door latch and hinges and the edge where cubicle or door meets the skirting or floor. This will help keep these surfaces from accidentally being painted. A thin coat of primer is applied to the doors. Brush is used to cover the edges with primer, and finish by covering the flat surfaces with a foam paint roller. The primer is let dry overnight so the paint can sit and harden. Apply a coat of paint to the doors and let it dry overnight.

After letting the first layer dry overnight, the paint may has some patchy areas. Second coat is applied by brushing on paint over edges and corners and using a foam roller on flat surfaces. The doors and all of the painted pieces are leave to let it sit undisturbed for a full night. Inspection request needed to be submitted for checking and approval of client. Scratches are patch up by gently sanding and painting over them. Fine grit sandpaper is used to lightly sand the chipped area. Brush with the same paint that's already on the doors is used to paint over the scratch. Figure 3.18 and Figure 3.19 shows before and after applying the paint of the cubicle doors.



Figure 3.17 Before Cubicle Paint



Figure 3.18 After Cubicle Paint

2. Tiling Work

i. Removing Tiles

The area is emptied and take out any fixtures that may disturb the process of removing the tile. Water supply is turned off before removing tiles. A hammer and chisel is used to form a starting point for prying up tiles to break out a tile. Tiles that were attached with mortar possibly will come up easily or need great energy to remove it. The tiles then removed by using electric demolition hammer. From the starting point, Prying up tile is carry on. Tiles are dump in sacks as they are removed to lessen wastes. The sacks then carried on a wheelbarrow to dump it on dumpster. Finally, the mess is clean up with a broom and a dust pan. Shovel can be used to remove large debris.

ii. Installing Tiles

Measuring tape is used to calculate how much tile and mortar will be needed. The tiles size are 1 feet x 2 feet. If using a different trim, edge tile is lay first. Then lay tile in a formation that will use the most whole tiles and best fits the space. Tiles is arrange in position to reduce visibility of tiles that must be cut to size. Once the best arrangement has been finalized, tiles that must be cut are determined to complete coverage. Tile cutter is used to cut tiles required to complete floor. Cement and cement gum is mixed by the 2:1 ratio to form mortar. A thin layer of thin set mortar is spread to floor in small sections using a notched trowel. Replace tiles a few at a time. Tiles surface level can be verified by using a spirit level.

After tiles are completely in position, let mortar to dry for 24 hours before continuing. Once mortar is dry, grout is mix and use a grout float to fully fill spaces between tiles. Once grout has been completely applied, use a damp sponge to rub away excess grout, allowing tiles clean and grout smooth and even. Grout left on tile results in “grout haze” and hard to remove as soon as grout has set. Grout is ready to walk on within 24 hours, although may take several weeks to fully cure. Refer Figure 3.20 and Figure 3.21 for before and after installing new tiles.

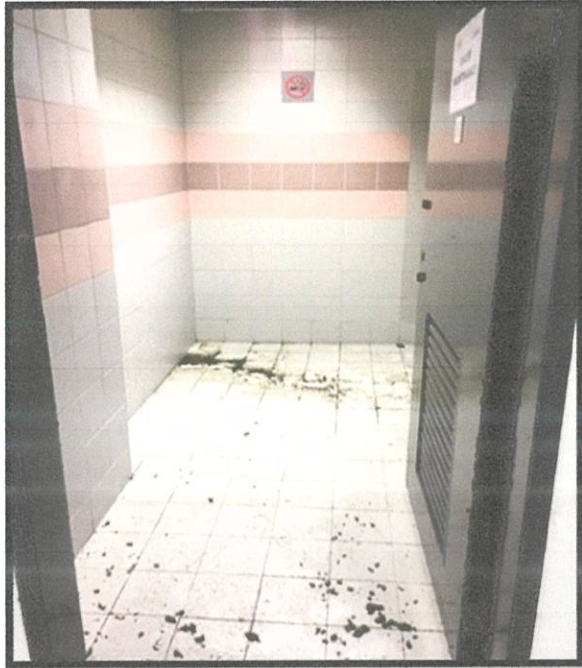


Figure 3.19 Before Removing Tiles



Figure 3.20 After Installing Tiles

3. Signage Work

Client is hiring a consultant to conduct a survey to determine if the signage and way finding at the airport is helping passengers. After that, the design of the signage is proposed to the client and meeting is held. The design that were verified by consultant and client can be commence.

i. Goalpost Light Box Signage

Before set up a goalpost signage, coring work was perform with coring machine. Refer Figure 3.22 for the coring process. The goalpost light box signage is installed at Level 5 of Main Terminal Building which is an area for check in for flight departure. The size of the light box is 5600 mm x 440 mm. The strip ceiling and rock wool above the ceiling below Level 5 was detached by riding a scissor lift to avoid water from the coring activity. The floor thickness is 280mm. After coring, strip ceiling and rock wool are put back in place. Holes for screw are made on the floor by using heavy duty rotary hammer and the goalpost are installed by joining screw at the hole at the bottom of the goalpost to the floor. The process is repeated once more because there are two goalpost. Light box are then installed by riding a scissor lift. Lastly, install rubber at the goalpost. Figure 3.23 and Figure 3.24 shows the process of installation goalpost light box signage.



Figure 3.21 Coring Process



Figure 3.22 The Light Box Installation



Figure 3.23 After Light Box Installation

ii. Inkjet Sticker

The board is sprayed soap water and the back of the sticker to remove the air bubbles when applying the sticker on the board. Sticker is then applied on the board. By using a sponge, the air bubble are removed slowly. If there are air bubbles left, lighter is light lightly to heat the sticker to make it melt a bit thus removing the air bubbles inside. The leftover of the sticker are cut by cutter and then the sticker are wipe to remove the stain of soap water and to ensure the sticker is applied properly. Figure 3.25 and Figure 3.26 shows before and after the installation of the inkjet sticker.



Figure 3.24 The board is Sprayed Soap Water



Figure 3.25 After Installing Inkjet Sticker

4. Door Repairing

Skilled workers are required in the installation process. Door is repair when the alignment of the door is dislocated. Dismantle the door and install butt hinges. Door is installed in its place. If the door is not fitted to its frame, the door leaf is scrape using grinder to reduce its size.

Floor springs is replace for single and double action doors up to 300 kg leaf weight, with adjustable hold-open start point and delayed action. It is featured with hydraulically fully controlled closing cycle and back check door closer. The door leaf is removed from the frame. The door leaf is put on the floor to remove the floor spring at the bottom strap of the door. The floor spring is replaced. The closing speed and height adjustment screw is adjusted. The floor spring is covered and door leaf is reattached to the frame of the door. Figure 3.27, Figure 3.28, Figure 3.29 and Figure 3.30 shows the process of installing new floor spring.



Figure 3.26 The Door Leaf was Remove

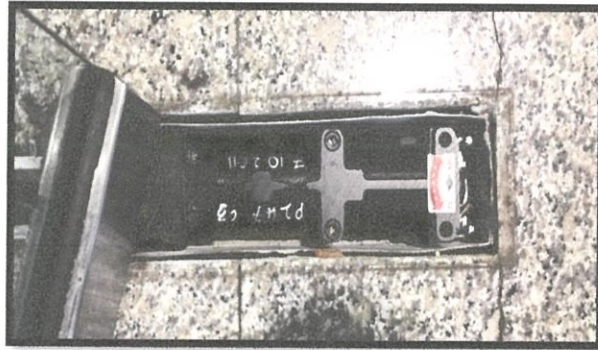


Figure 3.27 Before Replace Floor Spring

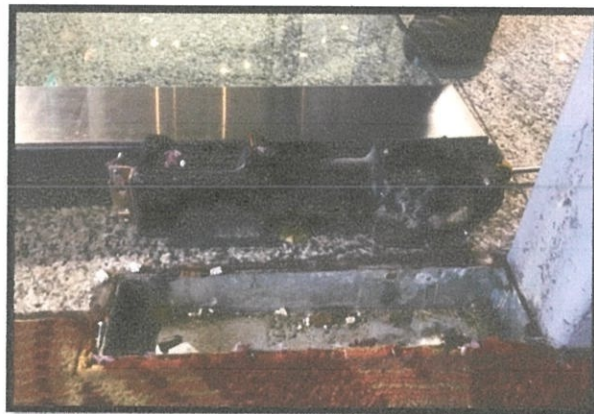


Figure 3.28 The Floor Spring is Remove from Bottom Strap



Figure 3.29 The Floor Spring is Replace

3.4 Problems Occurred and Resolutions Taken to Solve The Problems

1. Painting Work

After painting work is done, especially tile painting, tiles will let dry for one night. Due to the dampness in the toilet, some area of the paint on the tile is not dry properly hence the painting surface looks uneven. After some time, the painting on the table top is peel. The solution to this problem is by re-paint the uneven paint and the peeling paint.

2. Tiling Work

The tiles are move from one place to another place hence it cause some of the tiles are chipping on the edge. By carrying the tiles in a proper way may prevent from chipping. When installing the tiles, the mortar that spread can be uneven distributed causing gap between tiles. When this happened, grout is filled between the tiles.

3. Signage Work

The installation of signage can only be done on night time so the process of installation of them might be time consuming. To avoid the installation work is being dragged, the workers have to professionally focus on the task since they have limited time to complete the task. Fascia board is usually used as a signage. The problem occurs when the process of delivering the fascia by the supplier is not in a good condition so that it will affect the fascia board such as crack on the surface of the fascia. To overcome this situation, a sticker that have a similar color of the fascia is applied to cover up the defect.

4. Door Repairing

The door leaf sometimes cannot fitted into the door frame so action taken to solve the situation is by grinding side of the door leaf using grinder machine. The installation of the door need to be attach on different type of wall surfaces such as wood, concrete and steel. The process of drilling to make new holes for screw on the wall require greater energy if the types of screw or the technique used is not suitable based on the surfaces so the usage of suitable screw will smoothen the installation of the door.

Glass door is consists of many components and one of them is bottom strap. The function of bottom strap is to hold the floor spring. Floor spring weight is up to five to six kilogram which can lead the bottom strap to be damaged when removing the floor spring from the bottom strap. The only solution to face this problem is by replacing with a new bottom strap.

CHAPTER 4.0

CONCLUSION

Building refurbishment and upgrading is a main part of construction activity to ensure the durability of the facilities maintenance done. The procedure of the maintenance may look like an easy task but it actually require time to get approval from client. The maintenance work is usually carried out based on the report received from the client and the schedule that has already planned.

The type of maintenance such as replace or repair can be determined. The methods of the upgrading work can be a complicated process since it involved many people to work with but with skilled worker, the time consume to complete the work can be faster than the original planning. Besides, tools used in the maintenance work is not heavy machine but it use simple tools such as chisel, trowel, wrench, roller and sponge. The important information regarding the life of an equipment or services is automatically given when maintenance work is commence. Although the tools used is simple, maintenance need to be carry out by a skilled worker to get a good result.

Maintenance can keep a building physical and services works properly. By conducting maintenance work, the roots of defects can be identified. An aesthetic look on a building will attract many people hence when maintenance is take place on the physical of the building it could give hint to other problems. Finally, the safety of the occupants in the building are guaranteed since the physical and services of the building has been properly checked through.

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