

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

**WORKPLACE SAFETY INSPECTION AT PROJECT SITE OF
RENOVATION AND MAINTENANCE WORK**

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STUDENT'S 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 SM Pelangi Sdn Bhd for the duration of 20 weeks starting from 5 August 2019 and ended on 20 December 2019. It is submitted as one of the prerequisite requirements of BGN310 and accepted as partial fulfillment of the requirements for obtaining the Diploma in Building.

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ABSTRACT

Maintenance and renovation work is one of the world's dangerous industries work. The aim of the study is to identify and highlight the common hazards at the project site today. The main objective is to identify potential and actual hazards associated with building equipment, environment, process, and phases done by SM Pelangi Sdn. Bhd. The data collection was carried out through site investigation using the workplace checklist and interview at the project site. The study determines nine (9) types of work at the project site and their common hazards. The works include rendering work, brick installation, concreting, hacking and drill, installing tiles and electric equipment usage. The study was conducted at a building chemical site and the result showed that the most common hazards for the project around the study are associated with protective clothing, manual handling, and hacking work.

Keywords: Physical Hazards, Hazard Control, Work Safety, Safety Assessment

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CHAPTER 1.0

INTRODUCTION

According to (Holt, 2001), safety is the absence of ‘danger’ one says, unhelpfully supplying the entry for danger as absence of safety. Others suggest a state of protection and a condition not involving risk. Perhaps (Holt, 2001) also agree that the best we can do is to agree that there is no arbitrary state of ‘absolute safety’, as there is always a chance - a risk - of something going wrong, however small that chance maybe. The building and construction sector was among the most exposed sectors when it comes to occupational accidents, including serious accidents which are fatal and disabling (Amarjit Singh, 1999). Refer to International Labour Organization (ILO) latest statistic data on occupational accidents and diseases, and work-related deaths on a worldwide level, the construction industry has a disproportionately high rate of recorded accidents. As in Malaysia, Department of Occupational Safety and Health (DOSH) shown construction sector was the highest sector that cause death by Sector 2018. This is due to fact that both management and employees in construction sector have become more careful in reporting the accidents. People in the construction industry not only face the dangers of being the first on a jobsite, but face potential health risks and fatal exposures throughout the building process (Charles D. Resse, 2006).

Health and safety in the workplace is an important corporate responsibility issue. As (Phil Hughes MBE) mentioned in his book, occupational health and safety affects all aspects of work. He said again that there are many barriers to the achievement of good standards. The pressure of production or performance targets, financial constraints and the complexity of the organisation are typical examples of such obstacles.

Job safety and health standards generally consist of rules for avoidance of hazards that have been proven by research and experience to be harmful to personal safety and health (Group, 2007). Therefore, they sometimes apply all employers, as do fire protection standards, for example. An injury is thus a consequence of an incident- but not the only possible one. It has been shown that hundreds of incidents occur in the construction industry for every one that causes injury or loss (holt, 2001, 2005).

(Holt, 2001) said again that unsafe acts and unsafe conditions are often referred to as immediate or primary causes of accidents because they are the most obvious causes and

because they are usually directly involved in present at the moment the accident happens. What is apparent is that the construction industry fails to learn from its mistakes. We understand where deaths, injuries, and to a lesser extent, illness occur in the construction industry but we still fail to prevent them (Rowlinson, 2005).

1.1 Background and Scope of study

This study is carried out to investigate the safety in building renovation and maintenance work which located at the A341 Building. The project is built at BASF Petronas Chemical Sdn. Bhd. Jalan Gebeng, 26100, Kuantan, Pahang. Consequently, the intent of this inspection is to learn more about the health and safety in the renovation workplace, maintenance work, and piping system. In order to focus on the project safety and health, Hazard Identification (HI), Risk Assessment (RA), and Risk Control (RC) are important throughout the practical is being carried on.



Figure 1.1 Location of BASF Petronas Chemical Sdn Bhd

1.2 Objective

1. To identify potential and actual hazards associated with building equipment, environment, process, and phases.
2. To explain hazard, control and safety precautions and procedures.
3. To identify the recommendation in improving safety and health.

1.3 Method of study

- a) **Site Visit** - Site visit about the inspection of safety and health at the site or renovation work which took time for 5 hours on the renovation site. All the site visit results have been recorded in a short note with some pictures such as pictures of workers doing their works by wearing the Personal Protection Equipment (PPE).

- b) **Interview** - Unstructured interviews were done to the supervisors in SM Pelangi, labors and engineers in BASF Petronas Chemical for those renovation works. They are being questioned directly without prepared any questions beforehand.

- c) **Document reviews** - All the existing documents which are provided by the SM Pelangi been collected by reviewing the documents. All the documents such as company profile, analysis, and plan copies arc being given by them as the existing documents

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

SM Pelangi SDN BHD is an enterprise in Malaysia, with the main office in Kuantan. It has evolved as a company from former Syarikat Sri Pelangi that was established in 1982 and operates in the Specialty Trade Contractor industry. Starting with PKK Class F contractor, the company extended the business gradually and the company was recognized as PKK Class A contractor in 1996. The company has a strong determination to be one of the leaders in the construction and development industries.

The main services of this company are Construction of Civil and Structural works including Building, Road, Bridges, Piping and the rest. In line with the determination, the company has set up strategies and aims to be listed in KLSE in the near future. The braches office located in Terengganu and Sabah.



Figure 2.1 Location of SM Pelangi Sdn Bhd Company

2.2 Company Profile



Figure 2.2 SM Pelangi logo

Company Name : SM Pelangi SDN BHD

Address : B68 & 70, Tingkat 1, Jalan Semambu Baru, 25350 Kuantan,
Pahang.

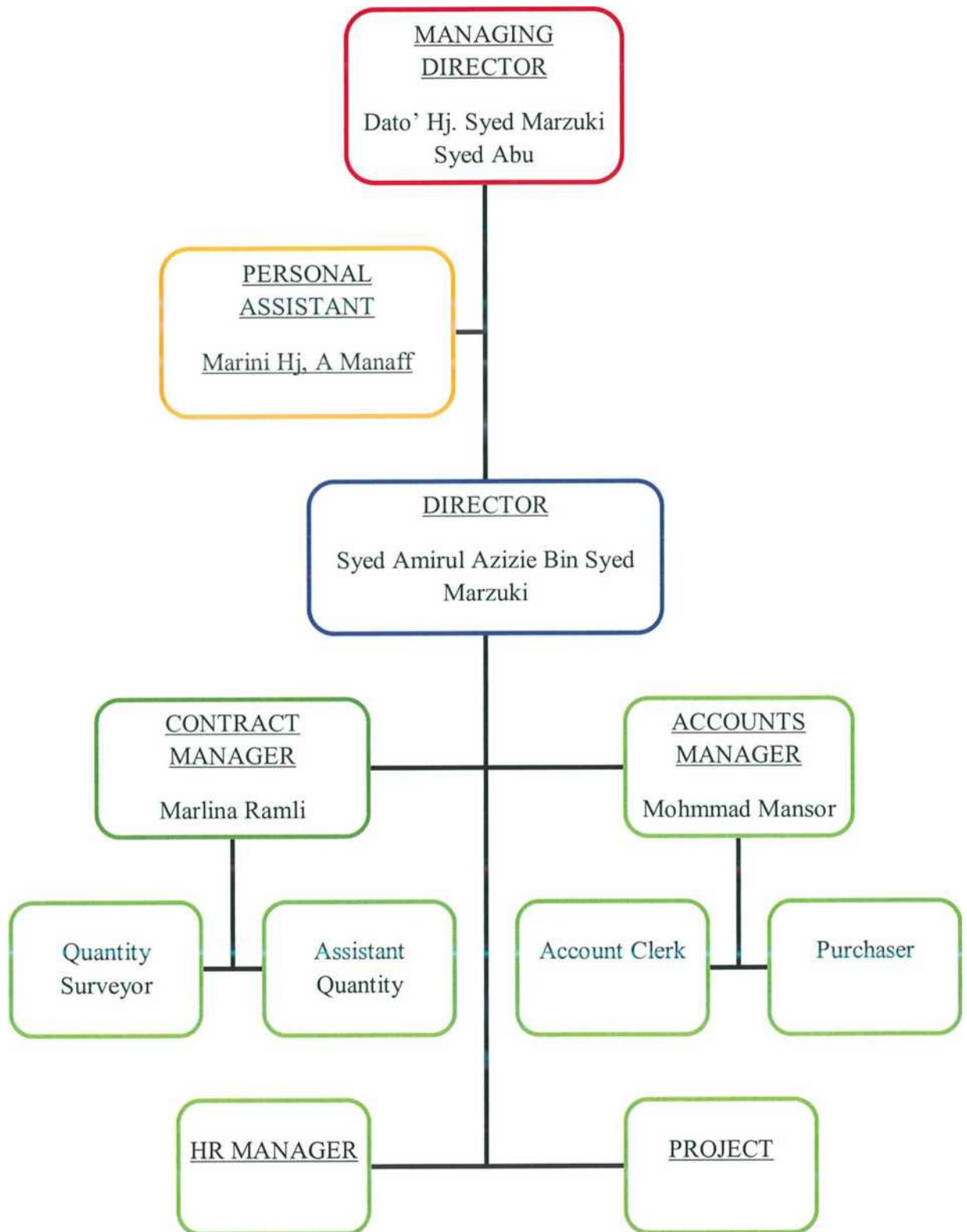
Telephone :

Fax :

Email : smpelangi_sdnbhd@yahoo.com

The vision of the company is to be registered in the Bursa Malaysia, to establish our involvement in diversify business sector and to open up opportunities for Bumiputera. Plus, this company's core mission is to control, supervise and structure the company management by utilization of management tools such as ISO, business planers, align with company work programmed taken into consideration of effective workflow.

2.3 Organization Chart



2.4 List of Project

2.4.1 Completed Projects

No.	Project Name / Location	Contract No	Award Date	Value (RM)	Clients
1.	Membina & Menyiapkan Kampus Perubatan Universiti Islam Antarabangsa Kuantan, Pahang Darul Makmur	IUU: 1B/BIL/1/ 0999	04/05/2000	86,399,147.70	Jab at an Kerja Raya Malaysia & Universiti Islam Antarabangsa Malaysia
2.	Cadangan Membina dan Menyiapkan Projek Sekolah Menengah Bukit Sagu Kuantan, Pahang Darul Makmur	KP/BPPP/ EM/40/20 07	06/05/2007	21,765,200.00	Kementerian Pelajaran Malaysia
3.	Cadangan Ubahsuai & Naiktaraf Asrama Sedia Ada Untuk dijadikan bangunan sementara Fakulti Perubahan Universiti Pertahanan Nasional Malaysia	UPNM/JP P/T/0801	12/12/2007	10,524,988.96	Universiti Pertahanan Nasional Malaysia
4.	Cadangan Pembinaan Pusat Latihan (ADTEC) Pahang, Daerah Jerantutu, Pahang	T/MAIWP /01/2013	18/08/2014	11,486,719.14	Majlis Agama Islam Wilayah Persekutuan

2.4.2 Project in progress

No.	Project Name / Location	Contract No	Award Date	Value (RM)	Clients
1.	Cadangan Membina dan Menyiapkan Projek Sekolah Menengah Bukit Sagu Kuantan, Pahang Darul Makmur	KP/BPP/EM/40/2007	06/05/2007	21,765,200.00	Kementrian Pelajaran Malaysia
2.	Cadangan Membina dan Menyiapkan Projek Sekolah Menengah Bukit Sagu Kuantan, Pahang Darul Makmur	KP/BPP/P EM/40/2007	06/05/2007	21,765,200.00	Kementrian Pelajaran Malaysia
3.	Cadangan Ubahsuai & Naiktaraf Asrama Sedia Ada Untuk dijadikan bangunan sementara	UPNM/JP P/T/0801	12/12/2007	10,524,988.96	Universiti Pertahanan Nasional Malaysia Fakulti Perubahan Universiti Pertahanan Nasional Malaysia

CHAPTER 3.0

3.1 Introduction of Case Study

This project is about renovation work in one of the BASF Petronas Chemicals Building. The cost is about Ringgit Malaysia Twenty-two thousand, five hundred (RM 45,000.00). The area of this project had done inside two buildings which are blok A341 and A250. The approximately 500 square feet of an existing one storey toilet shall be renovated.

The present usage is primarily office, but the arrangement and occupancy shall be evaluated to optimize space and energy utilization. Renovation is expected to be a wall to wall and floor to ceiling demolition, remove and reconstruction on the toilet which is on the first floor leaving the shell intact. The overall toilet systems such as electrical, toilet bowls, plumbing, door frame and squatting toilet type will be replaced with new.

The client of this project is BASF Chemical Sdn. Bhd and the main contractor by Petroreef Sdn. Bhd. Project title of maintenance work of building has started on 19th August 2019 and should be finished all the maintenance works after 3 month. But this project faces delays and disruptions so they would provide Extension of Time (EoT) and there should completely be done on 29th November 2019.



3.2 Identification of potential and actual hazard associated with buildings equipment, environment, process and phases

The maintenance and renovation work was examined with a workplace inspection

Figure 3.1 Work Site Plan

checklist before the work started. Plus, It was a planned event in which the workplace was inspected to identify the potential hazards. Informal or spot inspections were made on a daily basis by the safety officer of BASF Chemical Sdn. Bhd. to check and see what tools, machinery, and equipment were in safe operating conditions and employees were complying with establishing rules.



Figure 3.2 Inspection by Safety Officer during plumbing work

The work activities were classified in accordance with their physical areas within premises, defined task example concreting and drilling work. In other to help integrate accepted safety and health principles and practices into a particular task or job operation, a procedure such as job safety analysis (JSA) must be listed. There were several potential hazards classified in each basic job steps during renovation work. The company has a list of the required gear for every worker. This mean work boots, headgears, gloves, and the works. Construction companies give education to them on how to use the equipment, how to act on site, and what to avoid to be safe.

Basic Work Procedure

1. Apply permit to work

Permit to Work (PTW) was a key part of managing work activities that have inherently higher risks or unique aspects that could lead to a higher level of risk than routine or daily

work activities. It was supported by management policies, procedures, and processes to regulate all work activities and manage risk. Encik Anwar as a PTW receiver and Civil Engineer was responsible for implementing the control and safety precautions. This permit was checked and fill in before the work started.



Figure 3.3 Hot work permit

The issues contributed towards major hazards were wrong information about work required on the work permit, failure to hand-over plant in a safe condition on completion of work or canceling of work permit. Wrong location or relocation was one of the hazards associated with which multiple hazards exist in moving existing equipment, furniture, and personal effects.

2. Condition of tools and equipment

Cordless drill, impact drill, extension cable, grinder, and ladder were often used during renovation work. The type of hazard was an electrical hazard. Electrical hazards will exist during hacking work, remodeling, and construction phases of the project.



Figure 3.4 Impact Drill



Figure 3.5 Impact Drill Sticker

Ladders were often used in renovation and maintenance work and probably potential hazards might happen during work. Ladders were another source of injuries and fatalities among workers during re. There were some injuries and fatalities due to falls on ladders used in work. Nearly half of these injuries were serious enough to require time off job.



Figure 3.6 Ladder

Function failure was one of the potential hazards because the tools and equipment were not to be inspected and approved by STM (E & I) with color-coding. Plus, the ladder also not inspected and approved by BPC Health, Safety, and Environment which was one of the caused of risk to the workers. Safety Officer of BASF Chemical Sdn Bhd has checked all the tools twice a week

during renovation work which to make sure that there was no risk for injury.

3. Replace toilet seating and squatting bowls

The first step for replacement of toilet seating bowl was the water was turned off at the shut off valve silicon or seal was trimmed that attached between bowl base and floor. The washers and nut were losing and be removed. The potential hazards for workers during replacement were hand injury because of the sharp edge of some toilet items. Besides ergonomic hazard was one of the potential hazards too. Ergonomic hazards cause painful and disabling injuries to joints and muscles on the work site.



Figure 3.7 Installing squatting toilet

4. Remove and install new tiles (wall and floor tiles)

Installation of tiles

During hacking work, all the existing tiles were removed by the workers using impact drill and the surfaces were clean, smooth, and dry for the best result. The cement and sand were mixed to make a cement render. After that, the new tiling area rendered. The porcelain granite tiles (30cm x 60cm) were cut by using tiles cutter and the tiles were laid.

Based on this work, workers who set on hacking work were face hazards which is hand injury because there were a lot of broken tiles with a sharp edge. Hand injury may occur if the workers were not using the grinder machine properly. Often these injuries occur when the workers did not wear hand gloves or PPE during hacking and cutting tiles work.



Figure 3.8 Worker is installing tiles
5. Housekeeping

All the materials and tools were arranged properly inside and outside the work area which to prevent it from becoming a hazard to the workers. There were be a lot of waste debris during and after activity at the workplace which might become hazardous. Hazardous waste was generated during the project from the demolition and the renovations in the identified three toilets. Sharp edges, material falling, and combustibles were a risk and injury. The site safety officer was inspecting and concerned about the housekeeping area because it may disturb and risk for other workers and the environment.



Figure 3.9 Tools and Equipments



Figure 3.10 Material arrangement and cement stored

3.3 Hazard, control and safety precautions and procedures

Effective controls protect workers from workplace hazards, help avoid injuries, illnesses, and incidents; minimize or eliminate safety and health risks and help employers provide workers with safe and healthful working conditions. The processes described in this section help employers prevent and control hazards identified. The controls and safety precautions were taken and listed by the potential hazards. The following checklist helped the workers take steps to avoid hazards that cause injuries.

PROJECT: MAINTENANCE WORK AT A341, BASF GEBENG

CONTRACTOR: PETROREEF SDN BHD

ITEM	CHECKLIST	C	NC	NA	REMARKS
A.	MACHINERY				
	1. Certificate of fitness (PMA)				
	2. Certificate of fitness (PMT)		/		
	3. Machinery maintenance tagging	/			
	4. Condition of machinery	/			
B.	SIGNAGES COLOUR CODE				
	1. Mandatory	/			
	2. Prohibition	/			
	3. Warning	/			
	4. Safe	/			
C.	NOTICES				
	1. ER safe escape route	/			
	2. Assembly point	/			
	3. Emergency contact number	/			
	4. Project signboard	/			
D.	VENTILATION	/			
E.	HOUSE KEEPING	/			

	1. Site cleanliness	/			
	2. Material arrangement orderly	/			
	3. Rubbish bins	/			
F.	FIRE PROTECTION				
	1. Portable fire extinguisher	/			
	2. Dry riser		/		
G.	PERSONAL PROTECTIVE EQUIPMENTS				
	1. Safety hard hat/ safety helmet	/			
	2. Safety foot gear	/			

	3. Hand protection	/			
	4. Eye protection	/			
	5. Fall arresters		/		
	6. SCBA			/	
	7. Face shield		/		
	8. Hearing protection	/			
	9. Protective clothing	/			
	10. Respirator	/			
	11. Dust mask	/			
H.	BARRICADES FOR HAZARD AREAS				
	1. Floor/ wall opening			/	
	2. Edges			/	
	3. Trench/ pits			/	
I.	ELECTRICAL SAFETY				
	1. Unsafe act	/			
	2. Unsafe condition	/			
J.	PREVENTION OF FALLING OBJECTS				
	1. Catch platform	/			
	2. Safety net	/			
	3. Perimeter	/			
K.	HAZARDOUS				
	a) Labelling	/			
	b) Storage	/			
L.	SAFETY POLICY	/			
M.	PERIMETER HOARDING		/		
N.	TOILET	/			
O.	FIRST AID	/			
P.	DESIGNED REST AREA	/			
Q.	WATER PONDING	/			
R.	TOTAL SCORE				

C: Compliance

NC: Non-Compliances

NA: Not Applicable

Table 3.1 Workplace Inspection Checklist

Based on the workplace checklist, the potential hazards and safety precautions from working on maintenance and renovation work are:

a) Falling from height

Controls and Safety Precautions

The correct ladder was used for the task. The competent person visually inspected a ladder before use for any defects such as grease, dirt and other contaminants that could cause slips or

falls. The ladders were surely long enough to safely reach the work area and the ladder feet placed on a level, solid surface, ensuring the feet grip. Besides, three points of contact were used while going up and down the stairs and hands-free from carrying any tools.

b) Noise, Flying object, and Dust due to hacking work

Controls and Safety Precautions

Personal Protective Equipment (PPE) was provided by the employer for all workers which act as the first line of defenses against injury. Safety glasses or face shields were worn anytime work operations that can cause foreign objects getting into the eye such as during welding, cutting, grinding, and nailing. Eye and face protection were selected based on anticipated hazards. The employers have provided eye protection where during hacking work that involve dust, the workers can use it to prevent dust from entering the eye.



Figure 3.11 Worker wear face shield during hacking work

Every worker was using the suitable safety foot gears that required to be used while in renovation and maintenance place. Safety foot gears was designed to protect feet against wide variety of injuries such as impact, compression and puncture. The right foot gears can also be choosen according to the types of hazard.



Figure 3.12 Safety boot that worker wear (Source: Google)

Dust mask was required in some situation in construction and it was also provided by the employer for the worker to protect against certain danger as well as to protect the wearer from inhaling dust or sand in a dust storm as the places were about making a renovation and maintenance work which also consist some dust.



Figure 3.13 Dust mask used when the workers need to involve in much of dusty area (Source: Google)

Recommendation and Improvement

1) Enforcing the law

Enforcing the law by imposing a heavier penalty to the workers who are not wearing a fully equipped PPE. Accident on site can be avoided if all the worker wears a proper PPE. However, this matter is often taken lightly by the worker. Thus, inflict a greater fine could make the workers be more concern about wearing a proper PPE while they are on duties.

2) Cleaning Routine

As the construction site are filled with the construction material, it makes the surrounding becomes dirty. This surrounding indirectly exposing various types of illness such as dengue and malaria to workers. By introducing a cleaning routine, the illness was able to be prevented as the site will be cleared at the end of the day.

3) Reducing Hazard

After some renovation work is completed at the site, there will be some leftover material at some part of the construction site. This leftover material can hazardous to the worker if it is not handled properly. Eliminating or removing this material away from the site can be the solution to provide a safer surrounding for the workers.

CHAPTER 4.0

CONCLUSION

The conclusion is that all major hazards have been identified and can be addressed by the means discussed in the attachments. Through the work activities at the project sites and surveys conducted of those areas, the project will remove as many of the hazards as possible to remove the risks associated with those hazards. Plus, health and safety plan is important and involves certain means that would build up a more secure work environment which employees can do their jobs without the fear of injury or death. The employer needs to ensure that employees are safe at work and thus may initiate regulations and policies to guarantee this. It is presently the obligation of workers to verify that they pursue these principles. Everyone in the workplace and who is involved directly with renovation and construction should know how to control and solve the hazards that may be happening. Workplace hazards need to be minimized or eliminated so that it will increase productivity, prevent illness and can reduce days off and save lives. Not have a safety and health plan in the workplace can have a tremendous impact on the project. Otherwise, a company could lose money, workers, clients, productivity, vendors, respect, and potentially entire renovation and construction project.

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