PTTEP

PTTEP INTERNATIONAL LIMITED (YANGON BRANCH)

ENVIRONMENTAL MONITORING REPORT FOR IEE'S OF YANGON OFFICE BUILDING CONSTRUCTION (DEMOLITION PHASE)

JUNE 2018

TOTAL BUSINESS SOLUTION CO., LTD.

Environmental Monitoring Report

PTTEPI's New Office Building Construction (Demolition Phase)

Prepared by; Total Business Solution Co., Ltd.

To our knowledge, all information contained in this report is accurate and truthful presentation of all findings as relating to the project.

Approved by: Dr Soe Moe Kyaw Win

Sign:

Position: Managing Director

Date:

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EXECUTIVE SUMMARY

1. Introduction

PTTEPI and TBS Co., Ltd. (Independent Consultant) conducted compliance audit and monitoring program for PTTEPI's new office building construction (Demolition Phase) in accordance with the Environmental Management Plan (EMP) stated in Initial Environmental Examination (IEE) Report.

The objective of the audit and monitoring was to evaluate the effectiveness of the implementation of the environmental management program. Reporting of observed problems, obstacles and recommendations for issued identified during the review were provided in order to improve the effectiveness of the existing environmental mitigation measure and monitoring program.

The compliance audit and monitoring program were implemented in compliance with the EIA Procedures. Results of audit and monitoring were incorporated in the monitoring report and submitted to Environmental Conservation Department (ECD) as a biannual basis (six months interval).

2. Summary of Project Description

The PTTEPI's New Yangon Office Building is the replacement of the existing buildings which are located at No.2, Sei-Myaung Yeiktha Street, 8 ½ Mile, Mayangone Township, Yangon. The new building will replace 4 existing buildings (Building 1, 2, 4, 5) including car parking space.

The new office building has12 ½ stories with total height of 52.82 m, functional area of 18,760.0 m^2 and internal packing space for 110 car.

In order to proceed with new construction, existing 4 buildings were demolished. Demolition started in February 2018 and completed in March 2018. During the demolition phase, various monitoring were conducted based on recommendations from IEE for PTTEPI's Yangon office building construction.

3. Summary of monitoring result

The environmental quality monitoring included air quality monitoring (TSP & PM_{10}) and noise level measurement during the demolition phase. The monitoring also included Environmental, Health and Safety (EHS) program during the demolition phase.

Air quality monitoring was carried out in 4 locations, 2 within demolition site and 2 outside of the demolition site. Monitoring was carried out for continuous 48 hours at each site. Each monitoring point include both working day and non-working day. Summary of air quality result is presented in Table 1-1. Based on the monitoring results, TSP results ranged from average 90 to 287. Monitored TSP results are within the WHO guidelines. PM_{10} results are higher than the guidelines provided in National Environmental Quality (Emission) Guideline (NEQG).

There could be a short-term dust generated at project area due to demolition activities. Vehicle traffic increase during demolition phase was only in a short time and expected to produce minor change in air quality levels in the project area. Potential air

quality impact was small and receptor's sensitivity was low. The residual significance was considered as minor as the result of mitigation measures which were implemented during the demolition phase.

Table 1-1 Air quality monitoring result during demolition phase

Station	Parameter	Date	Day	Results	Units	WHO 1979 (WHO Guidelines)[1]	NEQG[3]	Average Period
A1	TSP ($\mu g/m^3$)	4.2.2018-5.2.2108	Sun-Mon	112.64	$\mu g/m^3$	150-230	-	24-hour
		5.2.2018-6.2.2018	Mon-Tue	131.69				
	PM_{10} ($\mu g/m^3$)	4.2.2018-5.2.2108	Sun-Mon	81.163		-	50	
		5.2.2018-6.2.2018	Mon-Tue	110.54				
A2	TSP ($\mu g/m^3$)	9.2.2018-10.2.2108	Fri-Sat	133.89	$\mu g/m^3$	150-230	-	24-hour
		10.2.2018-11.2.2018	Sat-Sun	146.88				
	PM_{10} ($\mu g/m^3$)	9.2.2018-10.2.2108	Fri-Sat	124.982		-	50	
		10.2.2018-11.2.2018	Sat-Sun	110.863				
A3	TSP ($\mu g/m^3$)	4.2.2018-5.2.2108	Sun-Mon	90.66	$\mu g/m^3$	150-230	-	24-hour
		5.2.2018-6.2.2018	Mon-Tue	109.95				
	PM_{10} ($\mu g/m^3$)	4.2.2018-5.2.2108	Sun-Mon	33.7157		-	50	
		5.2.2018-6.2.2018	Mon-Tue	56.5095				
A4	TSP ($\mu g/m^3$)	9.2.2018-10.2.2108	Fri-Sat	109.13	$\mu g/m^3$	150-230	-	24-hour
		10.2.2018-11.2.2018	Sat-Sun	287.23				
	PM_{10} ($\mu g/m^3$)	9.2.2018-10.2.2108	Fri-Sat	299.16		-	50	
		10.2.2018-11.2.2018	Sat-Sun	303.096				

Noise monitoring was carried out in 4 locations, 2 within the demolition site and 2 outside of the demolition site. Noise was measured for both daytime and nighttime based on NEQG requirement. Summary of noise level measurement is presented in Table 1-2.

Daytime noise monitoring result (hourly average) ranged from 54 to 68 dBA and nighttime monitoring (hourly average) ranged from 47 to 59 dBA. Daytime noise monitoring result (hourly maximum) ranged from 56 to 74 dBA and nighttime monitoring (hourly maximum) ranged from 50 to 62 dBA.

The residual significance for noise was considered negligible as mitigation measures were implemented during the demolition phase.

Table 1-2 Result of noise level measurement

Measurement Station	Measurement Date	Noise Level (dBA)	
		Day time	Night-time
N1	4.2.2018-5.2.2018	60*/63**	59*/61**
	9.2.2018-10.2.2018	60*/64**	54*/56**
N2	4.2.2018-5.2.2018	63*/68**	56*/58**
	9.2.2018-10.2.2018	64*/68**	55*/59**
N3	4.2.2018-5.2.2018	54*/56**	52*/54**
	9.2.2018-10.2.2018	68*/74**	58*/62**
N4	4.2.2018-5.2.2018	60*/66**	47*/50**
	9.2.2018-10.2.2018	60*/64**	58*/60**
NEQG standard	**Receptor**		
	Residential, Institutional, educational	**55**	**45**
	Industrial, commercial	**70**	**70**

*Average equivalent for one hour

**Average maximum for one hour

4. Summary of auditing

PTTEPI is responsible to implement monitoring program and mitigation measures during the demolition phase. Following mitigation measures were implemented during the demolition phase.

(a) Dust emission prevention plan

(b) Noise control plan

(c) Standard of working condition

(d) Safety accident prevention plan include speed limit rules

(e) Complain plan of intensive machineries operation

PTTEPI and TBS is pleased to submit the monitoring report of PTTEP's New Yangon Office Building Construction (Demolition phase) to ECD according to EIA procedures.

CHAPTER 1
INTRODUCTION

PTTEP International Limited (PTTPEI) is constructing new office building at No. 2, Sei-Myaung Yeiktha Street, 8 ½ Mile Mayagone Township, Yangon (Figure 1-1). The new building is the replacement for the existing buildings. The new building will replace 4 existing buildings (Building 1, Building 2, Building 4, Building 5 including car park. The rented area of existing building 3, Building 6 and Building 7 will be returned to the landowner.

TEAM Consulting Engineering and Management Co., Ltd. (TEAM) and Total Business Solution Co., Ltd. (TBS) was assigned by PTTEPI to conduct Initial Environmental Examination (IEE) for the new office building construction project and the report was approved by ECD on 1st November 2017. IEE report included Environmental Monitoring Plans (EMP) for demolition, construction and operation phases.

To comply with EMP, PTTEPI is responsible for conducting compliance audit and monitoring program. The compliance audit aims to review the effectiveness implementation of mitigation measures while the monitoring program aims to evaluate the potential environmental impact from project activities. PTTEPI has conducted the compliance audit and has engaged TBS to conducted monitoring program for demolition phase. The result of audit and monitoring shall be incorporated in monitoring report and submitted to ECD. The report also includes any potential problems or obstacles and propose recommendation for improvement to ensure the effectiveness of the mitigation measures if required.

1.1. SUMMARY OF SITE DESCRIPTION

The project consists of a $12^{1/2}$ stories office building with total height of 52.85 m., function area of 18,760.0 m^2. and internal parking area for 110 acres. The project building is located on Sei-Myaung Yeiktha Street. The street's width is 7.0 m. It branches off from Pyay road.

Pyay Road is situated 134.8 m. east of the project site. Ministry of Agricultural Live Stock and Irrigation Department is situated 64.4 m. northwest of the project site. Yoma Hotel is located at the east boundary of the project site. Lucky Seven Restaurant is situated 69.2 m. east of the project site. The location map of project area is shown in Figure 1-1.

The building has been designed with consideration on seismic risk and safety. Moreover, the design is modern, easy maintenance, compatible with surrounding physical context and environmental friendly.

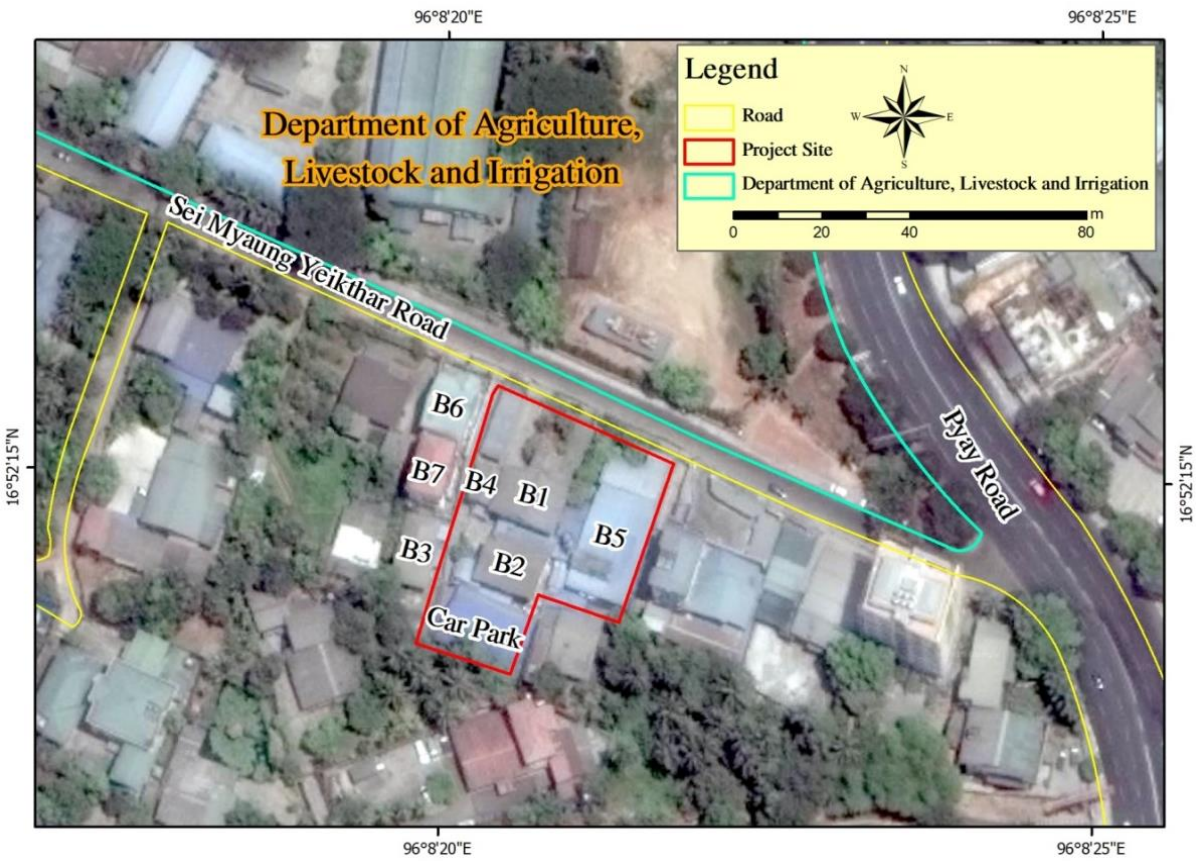


Figure 1-1 Location map of PTTEPI's office building construction site area

1.2. STATUS OF DEMOLITION PHASE

In order to proceed with new construction, existing 4 building were demolished. Demolition started in February 2018 and completed in March 2018. During the demolition phase, various monitoring were conducted based on recommendations from Initial Environmental Examination (IEE) for PTTEPI's Yangon office building construction (Table 3-1). Demolition activities photo is shown in Figure 1-2.

Figure 1-2 Demolition Activities

1.2.1. Machinery and Equipment for Demolition

Types and quantities of heavy machinery and equipment uses during demolition activities are presented in Table 1-1.

Table 1-1 Machinery and equipment list

Item	Unit
Truck for debris transportation	10
Back Hole	2
Hammer drill	2
Crane	1
Generator	1
Air Compressor	1

1.2.2. Worker and Worker Campsite

Total manpower during demolition phase was 30 workers. The main contractor is responsible for demolition work to be complied with laws and standards. The worker accommodations were provided outside of the project site.

1.3. THE ENVIRONMENTAL COMPLIANCE AUDIT AND MONITORING TEAM

Environmental compliance audit and monitoring team for demolition phase is presented in Table 1-2 and Table 1-3. The task of TBS involves review of the available data, conduct environmental monitoring and communication with PTTEPI.

Table 1-2 PTTEP Environmental Compliance audit Team

Name	Position
Rolanda Zwin	SSHE Engineer
Pwint Myue	SSHE Engineer
Suthat Kanjanakanti	Senior Engineer, Environment

Table 1-3 TBS Environmental Monitoring Team

Name	Position
Dr. Soe Moe Kyaw Win	Managing Director
Mr. Thien Tun Oo	Manager
Mr. Lin Htet Sein	Environmental Geologist
Mr. Htun Lin Kyaw	Environmental Geologist
Mr. Paing Zin Oo	GIS specialist

CHAPTER 2
COMPLIANCE AUDIT

2.1. COMPLIANCE STATUS

PTTEPI's complied with most of the mitigation measures prescribed in the EMP. Main issues are summarized below.

- Transportation and traffic were managed in order to ensure the safety and to reduce potential impact to the road and nuisance to community by strictly control the speed limit, journey management, provision of sign identifying the working area.
- PTTEPI's conducted the engagement and evaluation under the construction contractor management process to ensure that the demolition had minimized the hazards and environmental impacts potentially occurred from project activity, by installing the safety equipment and pollution control unit (e.g. septic tank) and developing the appropriately administrative control to ensure the effectiveness of implementation.
- PTTEPI's emergency management plan was in place for handling the emergency situations, covering environmental accident, logistic related incident, occupational incident. The specific emergency response team and reporting flow were clearly established and emergency drill was conducted.
- PTTEPI engaged communities in nearby project site through demolition phase to ensure the good relationship and perception.

This section presents the implementation results of the prescribed environmental mitigation measures of the demolition phase. Evidences of project operation were reviewed using the approach as described in Table 2-1. Audit evidences are presented in **Appendix A.**

Table 2-1 Summary of compliance audits status during demolition phase

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
Air Pollution	Impacts on air quality from dust dispersion resulting from demolition of decorative parts, utilities, structures and transportation activities cause adverse effected to the communities nearby the construction site and along the transportation route	Water spraying twice a day at and around the construction areas	✓	Workers provide water spraying at demolition area to reduce dust dispersion.	-
		Temporary shield/sheet shall be provided for specific demolition area where generated dust	✓	Temporary sheet is provided to cover all demolition area.	-
		Cover construction materials by tarpaulin during transportation, materials should be dampened, if necessary, before transportation	✓	Materials and debris are covered by tarpaulin during transportation.	-
		Restore, resurface, and rehabilitate the disturbed areas as soon as practicable after completion of construction or disturbance	Not applicable	The demolition activities are limited within project boundary and no disturbance on outside area.	-
		Dust masks should be provided (where applicable) to specified construction workers	✓	PPE is provided to workers i.e. helmet, safety glasses, dust mask, ear plugs, gloves, safety shoes.	-
Excessive Noise	Impacts on excessive noise from demolition of decorative parts, utilities and structures to disturb	Provide noise protection equipment such as ear muffs, ear plugs to the construction workers working in the area	✓	PPE is provided to workers i.e. helmet, safety glasses, dust mask, ear plugs, gloves, safety shoes.	-

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
	the nearby communities	Try to carry out demolition activities with high noise level at day time. For some activities needed to be carried out in the nighttime, the surrounding communities should be informed in advance	✓	Most of demolition activities are carried out in daytime. Only transportation of debris is allowed in nighttime as per YCDC regulation.	-
		Install metal sheet as temporary noise barrier at construction site to reduce noise impact on nearby communities	✓	Metal sheet is installed to reduce noise impact to neighbor.	-
Traffic	The increasing number of vehicle especially heavy truck for debris transportation at day time may cause traffic congestion	Inform concerned authorities and local people about the demolition plan with transportation route to disposal area	✓	Provide letter to inform MOGE about disposal of scrap materials and concrete.	-
		All Project drivers and transportation activities have to follow the laws related to transportation of Myanmar and follow PTTEPI's driving Policy which include vehicle safety rules and journey management	✓	Journey Management and Transportation Safety Procedure are prepared to align with Myanmar laws. Journey Management Plan is reviewed every time before transportation. Vehicle inspection is provided as weekly basis.	-

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
		Install warning signs that can be clearly seen to show the access road and construction area	✓	Warning signs are posted in front of demolition area.	-
		Prepare security guard and signal man at guard house close to access road to give the sign in and out of vehicle from project area	✓	Security guard is standby 24hr at demolition area.	-
		Carry out regular, routine check and maintenance of vehicles following safety instruction	✓	Vehicle inspections are maintained as routine basis.	-
		Strictly control on over loading of heavy truck to prevent damage on road surface	✓	Vehicle loading is strictly controlled.	-
		Cover construction materials by tarpaulin during transportation to prevent falling and spreading of materials	✓	Materials and debris are covered by tarpaulin during transportation.	-
		In case of accident, the concerned sections must promptly follow the emergency response plan	✓	Emergency Response Procedure is prepared to identify the implementation in case of incident. Lists of emergency contact are in place.	-

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
Solid waste	Improper management of demolition waste will caused the adverse effect to the environmental	Prepare proper waste bins or containers covered with garbage bag for waste collection	✓	Waste bins are provided with separate color for each type of waste.	-
		Inform Yangon City Development Committee (YCDC) to collect and dispose of waste every day	✓	Waste is frequently collected by YCDC.	-
		Prohibit open burning waste in the project area	✓	Waste is collected in proper waste bin and sent for disposal by YCDC. No burn allowed.	-
		If possible, residue waste from demolition of old building such as wood, steel, roof tile would be reused	✓	Concrete debris is used for land leveling in MOGE compound	-
		Residue waste from demolition of old building such as cement, brick will be collected and transported at the prepared site about 20 km. far from the project site by truck covered with tarpaulin for land levelling	✓	Concrete debris is transported to MOGE's land leveling area. The debris is covered by tarpaulin along the way during transportation.	-

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
Wastewater	Improper management of sanitary system within the site will caused the adverse effect to the environmental	***1) Wastewater from workers*** Provide appropriate sanitary facilities in construction site and properly maintained for construction workers	✓	Sanitary toilet is provided to workers with proper maintenance	-
		2) Surface runoff Provide temporary drainage system to hold wastewater before being discharged out of the project	✓	Wastewater from toilet is stored in temporary storage and discharged to public drainage	-
		Prohibit to throw and dispose of waste from demolition close to drainage system to obstruct the flow of surface runoff	✓	Waste is collected in proper waste bin and sent for disposal by YCDC. Concrete debris is transported to MOGE's land levelling area. No waste to obstruct surface runoff.	-
Social and economic	***Positive impact*** • The project would contribute to the creation of the economic activities in local community, and this would lead to increasing of employment in the area ***Negative impact***	Inform the workers about regulations during demolition period in order to prevent the conflict between workers and nearby communities	✓	Workers are informed about rules and regulations through SSHE induction.	-
		Promote relationship between the project and nearby communities	✓	PTTEP and contractor clean the public drainage at nearby project area to promote relationship between project and communities.	-

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
	• Fugitive dust, excess noise and transportation of materials during demolition would cause inconveniences to the livelihood of the residents living nearby the Project site • There might be problem arising from conflicts between the host and the workers	Distribute project information to people for their better understanding and positive attitude towards the project	✓	Neighbors were informed about project information and schedule on 16 Jan before demolition activities start. All of them are accepted with project.	-
		Implement all measures to mitigate dust, excess noise and transportation	✓	All mitigation measures related to dust, excess noise and transportation are strictly implemented	-
		Provide skillful and experienced engineers to closely inspect demolition of these structures, and on duty permanently during the entire demolition period	✓	Engineers. Site Supervisor and foreman are working permanently throughout demolition period	-
Public and occupational health and safety	***On Local People nearby Project Site*** Improper management of demolition activities might have impact on local people health due to pollution and accident. They are: • Dust diffusion, increase of noise level, and	Strictly implement mitigation measures for Air Quality, Noise, Waste Management and Transportation during demolition phase	✓	All mitigation measures related air quality, excess noise, waste management and transportation are strictly implemented	-
		Training of workers on safety and health at work site	✓	Workers are trained on safety and health though various training courses e.g. SSHE induction, work at height, environmental awareness, etc.	-

Environmental Issues	Potential Impacts	Mitigation Measures	Compliance Status	Findings/ Evidence	Corrective Action
	improper waste management during demolition activities; and • Accident from transportation ***On Workers*** • Dust would cause adverse effects to the personal health of workers • Carelessness of workers might cause common injuries such as slip and fall, dehydration, over exertion, and/or death	Provide all concerned staff with Personal Protective Equipment (PPE) such as helmets, safety shoes, glasses, gloves, etc	✓	PPE is provided to workers i.e. helmet, safety glasses, dust mask, ear plugs, gloves, safety shoes.	-
		Install appropriate warning signs, markings and safety signs	✓	Warning signs are posted in front of demolition area	-
		Provide sufficient first aid kids at the work site and coordinate with nearby hospital for admission in case of accidents	✓	First aid kits are provided onsite. Project has contracted Victoria Hospital to transfer IP in case of incidents	-
		Regular checking all equipment to ensure that it can be used without defect	✓	Equipment and vehicle are inspected regularly	-
		No smoking in area that collect residue wood and source of fire and provide firefighting equipment and portable fire extinguishers in demolition area	✓	Smoking area are provided separately from demolition area to avoid unplanned incidents	-

CHAPTER 3
ENVIRONMENTAL MANAGEMENT PLAN

Environmental management plan was adopted to manage and control potential adverse impacts associated with the demolition activities. Environmental and social monitoring program is presented in Table 3-1.

Table 3-1 Environmental and Social Monitoring Program during Demolition Phase

Issue	Parameter to be monitored	Duration/Frequency of monitored	Monitoring Location
Environmental Issue			
Fugitive dust	Total Suspended Particulate (TSP) Particulate Matter less than 10 micro meter (PM10)	Duration 2 consecutive days during demolition period including weekday and weekend Frequency 1 time during demolition period	2 stations at demolition site 2 station at buildings nearby demolition site
Noise	Leq-1 hr (day time) Leq-1 hr (night time)	Duration 2 consecutive days during demolition period including weekday and holiday Frequency 1 time during demolition period	2 stations at demolition site 2 station at buildings nearby demolition site
Social Issue			
Grievance Mechanism	Complaints for stakeholders/neighbours Complaints resolution is undertaken in a timely manner	Throughout demolition period	House nearby demolition site
Public occupational health and safety	Incident/Accident record	Throughout demolition period	Demolition site and working area House nearby demolition site

3.1. DUST EMISSION MANAGEMNT

The main impact of fugitive dust is from project demolition activities. Dust emission preventive measures were implemented throughout the duration of demolition phase. Dust emission monitoring activities are present in below.

3.1.1. Dust Emission Monitoring during Demolition Phase

Particles of various sizes are suspended in the air and can give it a hazy appearance. Particles are monitored and reported in size-released categories. Total suspended particulates (TSP) include all particles up to 50 micrometers (µm) in diameter. Particulate matter less than 10 µm in diameter is known as PM10.

3.1.2. **Approach of monitoring measure**

Air quality monitoring stations were developed at demolition site and house nearby demolition site from February 4-6 and 9-11, 2018 to collect ambient air monitoring data along with TSP and PM10. These data are compared with the applicable standards such as National Environmental Quality (Emission) Guideline (NEQG) and World Health Organization Guideline (WHO).

3.1.3. **Sampling methods**

Particulates matter as TSP and PM10 was measured using high volume samplers (TISCH Air Pollution Monitoring Equipment). The samplers draw air through a filter paper at a known constant rate for 24 hours. The resulting increase in the weight of the filter paper is expressed as the particulate concentration.

3.1.3.1. TSP

TSP were collected on a glass fiber filter over a continuous 24-hours period at 2 consecutive days (weekdays and holidays). Sampling point is located at two stations of demolition site, house behind the site and in front of PTTEPI building 7 (now ATT office building) beside the site was conducted at 8-day interval) and at a flow rate of approximately 1.4 m^3/minute. After each 24-hour period the filter was removed and weighed.

3.1.3.2. PM10

PM10 for particulate matter less than 10 µm, 24-hour samples were collected in a PM10 high volume sampler and processed as for TSP. The airflow rate through the sampler is 1.13 m^3/minute. The equipment consists of a high volume sampler to which a 10 µm size-selective inlet (10 µm SSI) has been attached. The 10 µm SSI makes use of inertial separation of particles to ensure that only those with an equivalent aerodynamic diameter (EAD) less than 10 µm are collected.

High-Volume air sampler, manufactured by TISCH Air Pollution Monitoring Equipment was carried out 24 hours continuous at each station. The sampling analysis methods used were those recommended by US. Environmental Protective Agency (USEPA).

3.1.4. **Monitoring points**

PTTEPI new office building construction site is located on the 8.5 miles, Mayangone Township, Yangon. Ambient air monitoring was conducted at 4 stations during February 4-11, 2018 which comprising of 2 stations within the demolition site, at station A1 and A4. Other 2 stations which expected to be affected by the demolish activities, are A2 and A3 (PTTEPI Building 7(now ATT office building is A2 and House behind the site is A3). The location map is shown in Figure 3-1, and sampling information is summarized in Table 3-2.

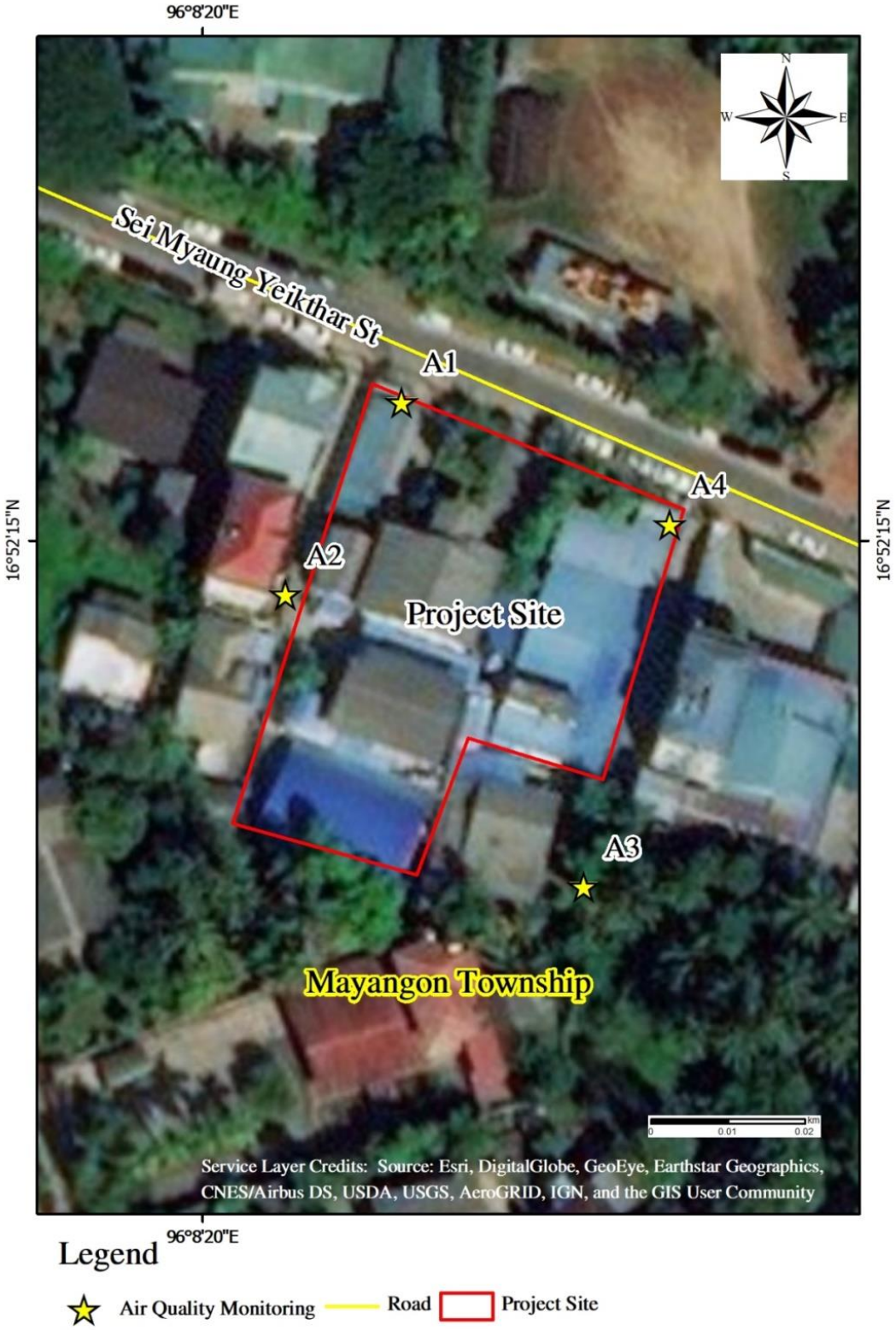


Figure 3-1 Location map of ambient air quality monitoring station

Table 3-2 Information of air quality measurement station

Station	Location	Date		Frequency/ Timing	Ref: Coordinate	Photo	Air emission source
		Holidays	Weekdays				
A1	Demolition Site(S1)	4-5, 2, 2018	5-6, 2, 2018	24 hours	16°52'15.58"N 96° 8'20.84"E		Building demolish activities
A3	House behind the site	4-5, 2, 2018	5-6, 2, 2018	24 hours	16°52'13.55"N 96° 8'21.60"E		Community activities and side effect of demolition activities
A2	PTTEPI building 7 (now ATT office building)	9-10, 2, 2018	10-11,2, 2018	24 hours	16°52'14.77"N 96° 8'20.35"E		Community activities and side effect of demolition activities

Station	Location	Date		Frequency/ Timing	Ref: Coordinate	Photo	Air emission source
		Holidays	Weekdays				
A4	Demolition site (S2)	9-10, 2, 2018	10-11,2, 2018	24 hours	16°52'15.07"N 96° 8'21.97"E		Building demolish activities

3.1.5. Monitoring standard

The measurement parameters consist of TSP-24 hr. and PM10- 24 hr. Laboratory test result is shown in **Appendix B** The measurement results will be compared with National Environmental Quality (Emission) Guidelines of Myanmar (NEQG), 2015, and World Health Organization (WHO) Ambient Air Quality Guidelines stated on Environmental, Health, and Safety Guidelines: Environment Air Emissions and Ambient Air Quality of International Finance Corporation, 2007 as presented in Table 3-3 below;

Table 3-3 Maximum concentration of TSP and PM10 on worldwide standard

Sampling Station	Average Hour	TSP (µg/m3)	PM10 (µg/m3)
WHO 1979 (WHO Guidelines)1	24 hours 1 year	150-230 60-90	-
NEQG3	24 hour 1 year	-	50 20

3.1.6. Mitigation Measures

3.1.6.1. Water spraying

Water was sprayed on the site regularly during the demolition phase. Water was sprayed on access road, debris and demolish buildings to minimize the dust creation.

3.1.6.2. Speed Limit at Site Access

Speed of vehicle access was limited to 40 km/hr to avoid excessive dust creation as well as to minimize the air pollution.

3.1.7. Monitoring results of dust emission during demolition phase

The result of air quality measurements are summarized in Table 3-4. 24-hour average of TSP concentration is met with WHO guidelines and PM10 concentration is over limit by NEQG.

Table 3-4 Air quality monitoring result during demolition phase

Station	Parameter	Date	Day	Results	Units	WHO 1979 (WHO Guidelines)[1]	NEQG[3]	Average Period
A1	TSP ($\mu g/m^3$)	4.2.2018-5.2.2108	Sun-Mon	112.64	$\mu g/m^3$	150-230	-	24-hour
		5.2.2018-6.2.2018	Mon-Tue	131.69				
	PM_{10} ($\mu g/m^3$)	4.2.2018-5.2.2108	Sun-Mon	81.163		-	50	
		5.2.2018-6.2.2018	Mon-Tue	110.54				
A2	TSP ($\mu g/m^3$)	9.2.2018-10.2.2108	Fri-Sat	133.89	$\mu g/m^3$	150-230	-	24-hour

Station	Parameter	Date	Day	Results	Units	WHO 1979 (WHO Guidelines)[1]	NEQG[3]	Average Period
		10.2.2018-11.2.2018	Sat-Sun	146.88				
	PM_{10} (µg/m^3)	9.2.2018-10.2.2108	Fri-Sat	124.982		-	50	
		10.2.2018-11.2.2018	Sat-Sun	110.863				
A3	TSP (µg/m^3)	4.2.2018-5.2.2108	Sun-Mon	90.66	µg/m^3	150-230	-	24-hour
		5.2.2018-6.2.2018	Mon-Tue	109.95				
	PM_{10} (µg/m^3)	4.2.2018-5.2.2108	Sun-Mon	33.7157		-	50	
		5.2.2018-6.2.2018	Mon-Tue	56.5095				
A4	TSP (µg/m^3)	9.2.2018-10.2.2108	Fri-Sat	109.13	µg/m^3	150-230	-	24-hour
		10.2.2018-11.2.2018	Sat-Sun	287.23				
	PM_{10} (µg/m^3)	9.2.2018-10.2.2108	Fri-Sat	299.16		-	50	
		10.2.2018-11.2.2018	Sat-Sun	303.096				

TSP results ranged from average 90 to 287. Monitored TSP results are within the WHO guidelines. PM_{10} results are higher than the guidelines provided in National Environmental Quality (Emission) Guideline (NEQG).

There could be a short-term dust generated at project area due to demolition activities. Vehicle traffic increase during demolition phase was only in a short time and expected to produce minor change in air quality levels in the project area. Potential air quality impact was small and receptor's sensitivity was low. The residual significance was considered as minor as the result of mitigation measures which were implemented during the demolition phase.

3.2. NOISE

Noise was generated from vehicles such as backhoes and trucks. It was considered that the magnitude of potential noise impact was small and receptor's sensitivity was considerately medium. During demolition, noise level monitoring activities are shown in below.

3.2.1. **Methodology**

The noise level was measurement and recorded continuously for 24 hours using a sound level meter. Noise measurement can measure the environmental noise. MONREC has issued NEQG to provide the basis for regulation and control of noise level. Noise impact should not exceed the levels presented in Table 3-5.

Table 3-5 Noise Level Standard

Receptor	**One Hour LAeq (dBA)a**	
	Daytime 07:00-22:00 (10:00-22:00 for Public holidays)	**Nighttime 22:00 – 07:00 (22:00 – 10:00 for Public Holidays)**
Residential, Institutional, educational	55	45
Industrial, commercial	70	70

Demolition phase noise resulting to noise pollution has many reasons such as construction being close to human habitats which prevent the noise from decaying before it reaches human ear. The purpose of this project is to reveal not only the existing baseline noise quality but also to ascertain the noise quality being produced by the current demolition phase.

3.2.2. **Monitoring Point**

The noise level measurement was conducted for two consecutive days (Covering weekdays and holidays) during February 4-6 and 9-11, 2018 which comprising of 2 stations within the demolition site, at station N1 and N4. Other 2 stations which expected to be affected by the demolish activities, are N2 and N3 (PTTEPI Building 7 (now ATT office building) is N2 and House behind the site is N3). The location map is shown in Figure 3-2, and Information of the noise sampling measurements is summarized below Table 3-6.

Table 3-6 Information of noise sampling measurements

Station	Location	Date		Frequency Timing	Reference Coordinate	Photo	Sampling Period	Equipment
		Holidays	Weekdays					
N1	Demolition Site(S1)	4-5/ 2/ 2018	5-6/ 2/ 2018	24 hours	16°52'15.42"N 96° 8'20.73"E		48 hours	Sound level meter
N3	House behind the site	4-5/ 2/ 2018	5-6/ 2/ 2018	24 hours	16°52'13.36"N 96° 8'21.38"E		48 hours	Sound level meter
N2	PTTEPI building 7 (now ATT office building)	Weekdays 9-10/ 2/ 2018	Holidays 10-11/2/ 2018	24 hours	16°52'14.99"N 96° 8'20.37"E		48 hours	Sound level meter

Station	Location	Date		Frequency Timing	Reference Coordinate	Photo	Sampling Period	Equipment
		Holidays	Weekdays					
N4	Demolition Site (S2)	9-10/ 2/ 2018	10-11/ 2/ 2018	24 hours	16°52'14.90"N 96° 8'21.89"E		48 hours	Sound level meter

Figure 3-2 Location of noise measurement point

3.2.3. **Results of the study**

3.2.3.1. N1: Demolition site (S1)

The Leq 1-hr average ranged of Laeq 60 and LAmax 63 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 59 and LAmax 61 of night time result is exceed residential receptor standard by NEQG, 2015 at 4.2.2018 to 5.2.2018.

The Leq 1-hr average ranged of Laeq 60 and LAmax 64 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 54 and LAmax 56 of night time result is exceed residential receptor standard by NEQG, 2015 at 5.2.2018 to 6.2.2018.

These might be caused by the construction activities and traffic vehicle on the nearby road which located about 4 m. away from the measurement station and birds chattering in the early morning.

3.2.3.2. N2: PTTEPI Building 7 (Now ATT office building)

The Leq 1-hr average ranged of Laeq 63 and LAmax 68 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 56 and LAmax 58 of night time result is exceed residential receptor standard by NEQG, 2015 at 9.2.2018 to 10.2.2018.

The Leq 1-hr average ranged of Laeq 64 and LAmax 68 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 55 and LAmax 59 of night time result is exceed residential receptor standard by NEQG, 2015 at 10.2.2018 to 11.2.2018.

These might be caused by the traffic vehicle on the nearby road which located about 4 m. away from the measurement station and birds chattering in the early morning.

3.2.3.3. N3: House behind the site

The Leq 1-hr average ranged of Laeq 54 and LAmax 56 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 52 and LAmax 54 of night time result is exceed residential receptor standard by NEQG, 2015 at 4.2.2018 to 5.2.2018.

The Leq 1-hr average ranged of Laeq 68 and LAmax 74 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 58 and LAmax 62 of night time result is exceed residential receptor standard by NEQG, 2015 at 5.2.2018 to 6.2.2018.

These might be caused by the traffic vehicle on the nearby road which located about 17 m. away from the measurement station and birds chattering in the early morning.

3.2.3.4. N4: Demolition site (S2)

The Leq 1-hr average ranged of Laeq 60 and LAmax 66 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 47 and LAmax 50 of night time result is exceed residential receptor standard by NEQG, 2015 at 9.2.2018 to 10.2.2018.

The Leq 1-hr average ranged of Laeq 60 and LAmax 64 of daytime result is exceed residential receptor standard by NEQG,2015 and ranged Laeq 58 and LAmax 60 of night

time result is exceed residential receptor standard by NEQG, 2015 at 10.2.2018 to 11.2.2018.

These might be caused by the construction activities and the traffic vehicle on the nearby road which located about 4 m away from the measurement station and birds chattering in the early morning. The results of noise level measurements are shown in Table 3-7.

Table 3-7 Result of noise level measurement

Measurement Station	Measurement Date	Noise Level (dBA)	
		Leq 1 hr (Day time)	Leq 1 hr (Nighttime)
N1	4.2.2018-5.2.2018	60*/63**	59*/61**
	9.2.2018-10.2.2018	60*/64**	54*/56**
N2	4.2.2018-5.2.2018	63*/68**	56*/58**
	9.2.2018-10.2.2018	64*/68**	55*/59**
N3	4.2.2018-5.2.2018	54*/56**	52*/54**
	9.2.2018-10.2.2018	68*/74**	58*/62**
N4	4.2.2018-5.2.2018	60*/66**	47*/50**
	9.2.2018-10.2.2018	60*/64**	58*/60**
NEQG standard	**Receptor**		
	Residential, Institutional, educational	**55**	**45**
	Industrial, commercial	**70**	**70**

*Average equivalent for one hour

**Average maximum for one hour

Daytime noise monitoring result (hourly average) ranged from 54 to 68 dBA and nighttime monitoring (hourly average) ranged from 47 to 59 dBA. Daytime noise monitoring result (hourly maximum) ranged from 56 to 74 dBA and nighttime monitoring (hourly maximum) ranged from 50 to 62 dBA. The residual significance for noise was considered negligible as mitigation measures were implemented during the demolition phase.

3.3. TRAFFIC CONTROL

PTTEPI and contractor has journey management plan to ensure the safety transportation. Trucks and heavy vehicle were limited the weight to comply with laws. Residual wastes were transported from the project site to the dispose area by avoiding the time of high traffic congestion. Contractor informed authorities and local people about the demolition plan with transportation routes.

3.4. SOLID WASTE MANAGEMENT

Wastes generated from the project activities were managed according to the PTTEPI's procedure and YCDC recommendation. The disposal method was agreed with the local government and advised by MOGE.

3.4.1. Waste segregation

All wastes were segregated at source and divided into four main types, including food waste, non-hazardous waste, recyclable waste and hazardous waste.

3.4.2. Waste collection and storage

Waste containers were provided base on waste types. Label was provided on waste container to identify waste type. The segregated waste was collected and separately stored for further disposal at the designated area.

3.4.3. Waste disposal

The non-hazardous wastes were disposed at YCDC allocated area while debris was disposed at MOGE allocated area.

3.5. WASTEWATER MANAGEMENT

Demolition phase does not produce any wastewater. Temporary toilets were provided at demolition site.

Temporary drainage system was provided for surface runoff water and domestic wastewater to hold wastewater before being discharged out of the project.

APPENDIX A
Evidences and Activities Photo

Evidences

Evidence 1: Letter to inform MOGE about disposal of scrap materials & concrete

KST
Group of Companies Limited

306, Yuzana Business Tower,
Damazaydi Road,
Sanchaung Township,
Yangon, Myanmar.

အထွေထွေမန်နေဂျာ
သဂေတာအခြေစိုက်စခန်း
မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း
လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန

ရက်စွဲ - ၂၀၁၈ ခုနှစ်၊ ဇန်နဝါရီလ ၂၉ရက်
စာအမှတ် - KST/MOGE/001

အကြောင်းအရာ။ ။ PTTEPI Yangon Branch ရုံးဟောင်းဖြိုဖျက်ခြင်းမှ ထွက်ရှိလာသော Scrap Material များအား ပုံချခွင့်ပြုပါရန်ကိစ္စ။

ရည်ညွှန်းချက် ။ ။ Letter No MD-(100) 3/6 (1158) 2017

ကျွန်တော် များ KST Group of Companies Limited သည် မြန်မာ့ရေနံ နှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း နှင့် ဖက်စပ်လုပ်ကိုင်လျှက်ရှိသော PTTEPI International Limited ၏ Yangon Branch New Office တည်ဆောက်ရေး လုပ်ငန်များ အား လုပ်ကိုင်ဆောင်ရွက်ခွင့် ရရှိထားသော Contractor ဖြစ်ပါသည်။ ယခုအခါတွင် ကျွန်တော်များ ကုမ္ပဏီမှ အဆောက်အဦး ဖြိုဖျက်ခြင်းလုပ်ငန်းများ ဆောင်ရွက်လျှက်ရှိပြီး ၎င်းလုပ်ငန်းများ ထွက်ရှိလာသော Scarp Material များဖြစ်သော Concrete ၊ အုတ်ကျိုးမြေကြီး စသည်တို့.ကို မြေသယ်ယာဉ်များဖြင့် ဘေးကင်းလုံခြုံရေး အစီအမံများအားထားရှိကာ ခန့်.မှန်းအားဖြင့် ၂၀၁၈ ခုနှစ်၊ ဇန်နဝါရီလ ၃၀ ရက် နေ့ခန့်.တွင် သယ်ယူပို.ဆောင် ပုံချတော့မည်ဖြစ်ပါသည်။

သို.ဖြစ်ပါ၍ ၎င်းပစ္စည်းများအား MOGE ၏ Facilities တစ်ခုဖြစ်သော Ywama Gas Station တွင် ပုံချခွင့် ပြုပါရန် နှင့် ပုံချနေစဉ်အတွင်း ဘေးကင်းလုံခြုံရေးအတွက် လျှပ်စစ် မီးအသုံးပြုခွင့် ပြုပါရန် လေးစားစွာလျှောက်ထားအပ်ပါသည်။

Kyaw Sit Thway Group of Companies Limited
No.
Date.

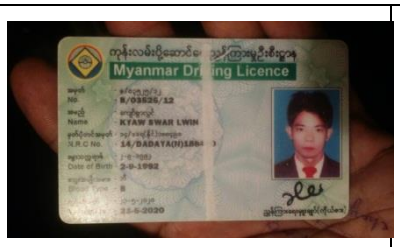
ရဲညွှန်
မန်နေးဂျင်းဒါရိုက်တာ
KST Group of Companies Limited

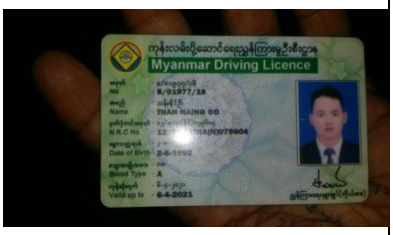
CC: ဦးသီဟလင်း Construction Engineer (MOGE)

Tel: +95-1-513 805/ 516 540
Fax: +95-1-539 568

E mail: kstconstruction1984@gmail.com
Website: www.kstcompany.com

Evidence 2: Driving license of all drivers





Evidence 3: Example of drug and alcohol test result

Quality Care

KST Urine Drugs Report

9.4.2018

No	Date	PRN	Name	Age	Sex	Summary
1	3.4.2018	252499	U Aung Pyae Sone Htun	23	M	URINE DRUGS - NEGATIVE
2	3.4.2018	252498	U Thein Soe Oo	24	M	URINE DRUGS - NEGATIVE
3	3.4.2018	252497	U Rathine	39	M	URINE DRUGS - NEGATIVE
4	3.4.2018	252487	U Tun Naing	38	M	URINE DRUGS - NEGATIVE
5	3.4.2018	252488	U Myo Ko Ko	26	M	URINE DRUGS - NEGATIVE
6	3.4.2018	252489	U Lin Latt Thu	21	M	URINE DRUGS - NEGATIVE
7	3.4.2018	252495	U Zan Paing Oo	25	M	URINE DRUGS - NEGATIVE
8	3.4.2018	252486	U Aung Myo Naing	35	M	URINE DRUGS - NEGATIVE
9	3.4.2018	252485	U Ye Myo Latt	22	M	URINE DRUGS - NEGATIVE
10	3.4.2018	252483	U Wai Lin Htet	19	M	URINE DRUGS - NEGATIVE

CONFIDENTIAL

Daw Su Su Thaw
Sales & Marketing Manager
09-795625644
Victoria Hospital

WITORIYA GENERAL HOSPITAL
No.(68), Tawwin Street,
9 Mile, Mayangone Township,
Yangon, Myanmar.

Tel: 01 -9 666 141
Fax: 01 -9 666 135
email:info@witoriyahospital.com

KST Co;Ltd.

Alcohol Testing Record

NO.	Name	Company	Result	Date
1	Aung Pyae Min		0-00	12-03-2018
2	Kyaw Naing Khine		0-00	"
3	Ye min		0-00	"
4	Tun Naing		0-00	"
5	Kyaw Ye Tun		0-00	"
6	Mya hein		0-00	"
7	myint naing		0-00	"
8	Htet Aung		0-00	"

Evidence 4: Record of vehicle, hand tool and heavy equipment inspection

KST

Daily Vehicle Inspection Checklist

Project	PTTEP NEW OFFICE PROJECT	Date	07 FEB 2018
Vehicle ID Number	3C-2150	Driver Name	Kyaw Ko Ko
Vehicle Type	HIAX SURF	Last Inspected Date	07 FEB 2018

Sr.No.	Inspection	Condition	Remark
1	Check engine oil level and top-up if necessary.	✓	
2	Check fuel system for leakage at all connections.	✓	
3	Check the air cleaner element and clean if necessary.	✓	
4	Check the cooling system for leakage on radiator and connections.	✓	
5	Check brake/ clutch fluid level and the leakage at the connections.	✓	
6	Inspect tires' condition and inflation pressure.	✓	
7	Check and retighten disc wheel bolts and nuts.	✓	
8	Check battery condition and electrical system.	✓	
9	Adjust the hand brake, brake and clutch.	✓	
10	Check leakage of all transmission system.	✓	
11	Inspect steering system, tie-rod, ball joint clearance.	✓	
12	Check all guages in panel board (oil, temp., charging, etc).	✓	
13	Inspect the condition of body and frame chasis.	✓	
14	Inspect the condition of Seat Belts.	✓	
15	Check for First Aid Kit, Fire Extinguisher and house keeping.	✓	

Checked by:		Approved by:	
Sign		Sign	
Name	KO KO	Name	Thiha Kyaw
Designation	Driver	Designation	S.O

KST

HAND TOOL CHECKLIST

Inspector Name: MYO NYUNT (safety supervisor)

Company Name: [illegible]

The inspection of the hand tools should include at least the following:

1. Right tool being used for the job
2. Handles in good condition
3. Handles firmly attached to the heads
4. Heads in good condition: no mushrooming, chisels sharp...
5. Hand tools stored correctly, not left lying around

Inspection items must be marked "OK" if in good condition, "X" if damaged, or "N/A" if not applicable.

Items marked "X" may not be used and must be removed from site.

	DESCRIPTION OF EQUIPMENT (hammers, chisels, screwdrivers etc..)	DATE OF INSPECTION								
		23	24	25	26	27	28	29	30	31
1	[illegible] - 9 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
2	[illegible] - 7 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
3	[illegible] - 7 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
4	[illegible] - 2 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
5	[illegible] - 2 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
6	[illegible] - 10 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
7	[illegible] - 8 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
8	[illegible] - 3 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
9	[illegible] - 1 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
10	[illegible] - 2 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
11	[illegible] - 3 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
12	[illegible] - 1 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
13	[illegible] - 4 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
14	[illegible] - 3 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
15	[illegible] - 9 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
16	[illegible] - 7 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
17	[illegible] - 1 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
18	[illegible] - 2 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
19	[illegible] - 7 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	
20	[illegible] - 4 [illegible]	ok	ok	ok	ok	ok	ok	ok	ok	

KST

Heavy Equipment Inspection Checklist

Project	PTTEP NEW OFFICE	Date	31.01.2018 31-01-2018
Vehicle ID Number	PC-228	Operator's Name	YE AUNG
Vehicle Type	Excavator	Last Inspected Date	

NA - Not Applicable OK - No Repairs Needed RR - Requires Repair

Inspection	Condition NA	Condition OK	Condition RR
Engine Compartment			
Battery Cable		✓	
Fan Belt		✓	
Hoses		✓	
Air Filter		✓	
Guards		✓	
Outside			
Lights		✓	
Steps/ Hand Rails		✓	
Tires/ Tracks		✓	
Exhaust		✓	
Fenders		✓	
Bucket		✓	
Cutting Edge/ Teeth		✓	
Lifting Mechanism		✓	
Hoses		✓	
Fittings Greased		✓	
Hitch/ Coupler		✓	
Wipers		✓	

Inspection	Condition NA	Condition OK	Condition RR
Inside Cab			
Brake		✓	
Backup Alarm		✓	
Fire Extinguisher		✓	
Gauges		✓	
Horn			
Hydraulic Controls		✓	
Glass (all sides)		✓	
Mirror		✓	
Roll Over Protection		✓	
Seat Belt/ Seat/ / Door		✓	
Steering		✓	
Fluids			
Visible Leaks		✓	
Oil Level/ Pressure		✓	
Coolant Level		✓	
Hydraulic Oil Level		✓	
Trasmission Fluid Level		✓	
Fuel Level		✓	

Comments:

Checked by:		Approved by:	
Sign	YE	Sign	myo
Name	YE AUNG	Name	myo nyunt
Designation	operator	Designation	safety (supervisor)

Evidence 5: KST Emergency Response Procedure

QHSE

KST
GROUP OF COMPANIES LIMITED

EMERGENCY
RESPONSE PROCEDURE

	KST Group of Companies Limited	Issue Date: 01-06-2015	KST/CON/HSE/004 Issue : 1.0
Emergency Response Procedure		Effective Date: 01-07-2015	Page 1 of 8

DOCUMENT TITLE:	**EMERGENCY RESPONSE PROCEDURE**
DOCUMENT NO:	**KST/CON/HSE/004**
REVISION NO :	**0**

DESCRIPTION	NAME	TITLE	SIGNATURE	DATE
Prepared by:	Mr. Kyaw Zin Htun	Safety Officer		15.12.2015
Reviewed by:	Mr. Ye Kyaw Aung	Senior Manager		15.12.2015
Approved by:	Mr. Ye Nyunt	Managing Director		15.12.2015

	KST Group of Companies Limited	Issue Date: 01-06-2015	KST/CON/HSE/004 Issue : 1.0
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1. Objective

The Emergency Response Procedure describes the system set up within KST Group of Companies Limited to ensure a timely adequate response to a crisis or emergency situation.

The Project Site Manager plays a pivotal role in the response to any emergencies that may arise. It is therefore essential that the system described in this procedure is known and understood by each member of KST Managers and other personnel in the event of an emergency incident.

2. Definition/ Terms used

2.1 Accident

Any event or chain of events which has caused injury or illness. Such an event may also involve fire, Property damage/ Environmental damage, product loss or interruption of work etc.

2.2 Emergency

An emergency means a situation arising out of or as a result of any type of hazards like fire & explosion, uncontrolled gas release, or chemical spill which is likely to adversely affect the persons or population working on or near the site, or residing in the adjacent or nearby areas around the work site.

3. Emergency Procedures:

3.1. Emergency Mustering

- The muster point area is to be designated and clearly identify able at the work site safe area.
- In an Emergency an accurate and speedy muster must be obtained, verified and reported to the Project Site Manager or line authorized person. Search and rescue operations can be investigated as soon as possible to find miss/unaccounted for personnel if site personnel can carry out it safely.

3.2. Roles and Responsibilities

3.2.1. Project Site Manager

Project Site Manager will be in charge of the emergency response at the worksite if there be any

emergency which he is unable to handle with the assistance of site personnel. Then He shall;

- Get the detail information and data at emergency place.
- The information should include as follows;
- Ensure strict accounting of all personnel at the worksite and their safety
- How the Emergency happened?
- Patient, injuries, illness name, NRC number, position
- How many patients to be sent Hospital
- Situation of the Patient
- ETD (Estimated time of Departure) from worksite to hospital
- ETA (Estimated time of Arrival) to hospital according to patient conditions.

3.2.2. Safety Officer

- Ensure that all key personnel are oriented in the implementation of this procedure.
- Provide administrative support to the Medical team on the project.
- Ensure periodic audits and inspections to ensure effective implementation of the procedure.
- Conduct accident investigation for all injuries and accidents.
- Reports and Documentation are prepared and issued as per Accident/ Incident Investigation and Reporting Procedure.

3.2.3. Medic

- Ensure that the Medical facilities are equipped with the equipment and consumables to accommodate trauma and emergency cases and capable of stabilizing patients and sustaining life.
- Be the ultimate authority on the project to take Medical Decisions independent of administration issues.
- Collate information and lessons learned gained from field experiences implementing this procedure and initiate periodic audits to identify opportunities for improvement.
- Assist the Safety Officer in concluding the investigation and compiling the Medical sections for the Reports.

- Compile reports on all Medical Evacuation Cases.
- Ensure that all necessary forms and reports are filled out and documented. Copies of these reports to be sent to the Safety Officer / Project Management / Personnel and Administration as per the Accident / incident investigation and reporting procedure.
- Report all major medical cases and MEDEVAC cases to the Safety Officer, Project Site Manager and Personnel department immediately.
- Take the decision to MEDEVAC patients. This decision has to be coordinated with the Project Management and Personnel and Administration Departments. This Decision is a medical decision and is based on but not limited to the following criteria:
  - Category of Medical Emergency
  - Urgency of the case
  - Evacuation method and route
  - Designate the Team to accompany the patient
- Shall ensure that patient is under complete medical control at all times.
- Manage the medical team for the preparation and implementations of the MEDEVAC actions.

3.2.4. First Aider

- Shall be responsible to assist the attending physician in administering all medical treatments and preparations necessary to successfully prepare and MEDEVAC patients to the destination medical center.
- Shall be responsible for the treatment of any all casualties at worksite and reports to Project Site Manager or site authorized person who will communicate with incident coordinator if he needs additional assistance from the Medic.

3.2.5. Logistics Manager

- Responsible to ensure all logistics and transportation requirements in country and out-of-country are managed from an administration section. Ensure all the logistics and requirements for a successful medevac are implemented.
- Ensure all licenses and permits for all Medical Vehicles (Ambulances) or others are acquired and updated as necessary.

3.2.6. Security

- Ensure evacuation route is viable and advise the accompanying crew of any possible threats or risks.
- Provide as necessary a non-medical (security) escort.

4. The Emergency Procedure for Medevac

To receive the complete information from the responsible person of the worksite, the information should be included as below;

- Occurrence in brief
- Ambulance/ Stand by vehicle Estimated time of Departure (ETD) work site.
- Ambulance / Stand by vehicle Estimated Time of Arrival (ETA)
- Number of Patients
- Patient's Conditions
- Patient's Conditions
- Patient's Name, Badge Number, Position, Blood Group.

5. What to Do in the Event of the Site Incident:

5.1. **Incident: Establish** the facts / assess the situation, what is the immediate response? ***Where*** are you? ***What*** has happened? ***What*** assistance do you need?

5.2. **Fire Actions**: Notify the Fire. Provide as much information to the Project Safety Officer as possible. Ensure You Are Safe - Report to the Muster Point, do not collect personal belongings - Do not leave until advised to do so by the Project Safety Officer or nominee. The Project Safety Officer or nominee will take a head count and identify missing persons

5.3. **First Aid Actions:** Apply First Aid [First Aid Box], Call the Site Emergency Services. Inform the Project Site Manager and Safety Officer as soon as Possible.

5.4. **Report:** the Facts and details of missing persons to the Emergency Responders when they arrive.

5.5. **Contingency:** Know the locations of the Muster Point & the Emergency Routes, Fire Extinguishers, First Aid Box, Update your Cell phone with the Phone Emergency Numbers

Note: the First Aid Box is only to be used for an Emergency, do not take items for minor injuries in such cases report to the site Medical Centre.

5.6. **Accommodation Fire:** Fight the Fire. Clear the building.

- **Actions**: Report to the Muster Point. Do not leave until advised it is safe to do so, report missing persons to the Emergency Services - Call the Safety Officer. Do not go back into the building until informed it is safe to do so.
- **Contingency:** Know the locations of the Muster Point, Emergency Routes, provided Emergency equipment, Fire Extinguishers, Torch, First Aid Box, Update your Cell phone with the Project Phone Emergency Numbers.

5.7. **Vehicle Accident:** Is someone injured? Call the Emergency Services & Apply first aid if trained. Is there a Fire? Call the Emergency Services Fight the Fire. Do not leave the scene of a car accident. Call the Safety Officer.

- **Actions:** Collect details of other drivers, if safe to do so, take photographs, of the location and vehicle positions and damage. Move the vehicles if they are creating a hazard. If it is too dangerous near the vehicle stand off the road in a safe location
- **Contingency:** Carry Project Emergency Contact, Plan your travel, fully charged cell phone.

5.8. **Injury / Serious Illness (Medical Evacuation):** Is someone injured or sick? Call Site Medical Centre, or Call the Duty Officer, no matter what time it is, who will mobilize responders to assist you. If duty officer is not available, to go straight to contact level 1 and so on.

- **Actions:** Emergency Response Team is responsible for this case.

When the incident happened on operation,

- ERT will forward message to assigned Medical Centre which is Victoria Hospital.
- KST will organize for Ambulance and to transfer patient to Duty Medical Officer, Victoria Hospital.

Before arrival,

- ERT and Duty Medical Officer, Victoria Hospital will get contact directly to prepare necessary requirement for the patient.
- Duty Medical Officer has to be informed priority and then internal process shall have to be followed.

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Emergency Response Procedure		Effective Date: 01-07-2015	Page 7 of 8

6. Emergency Response Team Contact List

The following emergency response team members shall assist for the operation.

NAME	DESIGNATION	PHONE NUMBER
	Project Management Team	
Ye Nyunt	Managing Director	09-5125 000
Ye Kyaw Aung	Project Director	09-7931 09125
Ei Shwe War Myint	Financial Director	09-4500 56339
Dr. Soe Thein	Senior Project Engineer	09-4210 20391
Tin Moe	Deputy Project Manager	09-7634 92303
Win Htut Ko	Director	09-4501 00007
Soe Thura Zaw	Project Engineer	09-4402 84048
Sithu Kyaw Zaww	Project Engineer	09-402713417
	SSHE Team	
Nay Soe Oo	Safety Manager	09-259164830
Kyaw Zin Tun	Safety Officer	09-4311 5917
Thiha Kyaw	Safety Officer	09-9788 83818
Myo Nyuat	Safety Supervisor	09-780955355
Thu Ya aung	Safety Supervisor	09-781885802
Kyaw Soe	Medic	09-2634 63644
Than Aye	Medic	09-2631 34141
	Security	
Nay Soe Oo	Safety Manager	09-259164830
Thu Ya aung	Safety Supervisor	09-781885802
U Hla Thein	Security	09-969700936
U Myat Kyaw	Security	09-769708627
U Tun Tun	Security	09-263491893
U Aung Myit	Security	09-444525897
Victoria Hospital		
Emergency Contact	01 966 6141	
Fire Stations		
Mayangone Township	01-661 501 , 09-7697 35358	
Hlaing Township	01-519 578 , 09-7903 71358	
Insein Township	01-640 070 , 01-640 987	
Police Stations		
Insein Station	01-645 824 , 01-645 819 , 01-645 821	
Alone Station	01-220 793 , 01-220 794	
Mayangone	01660352	
KST EMERGENCY NUMBER		
Emergency contact	09-443309872	

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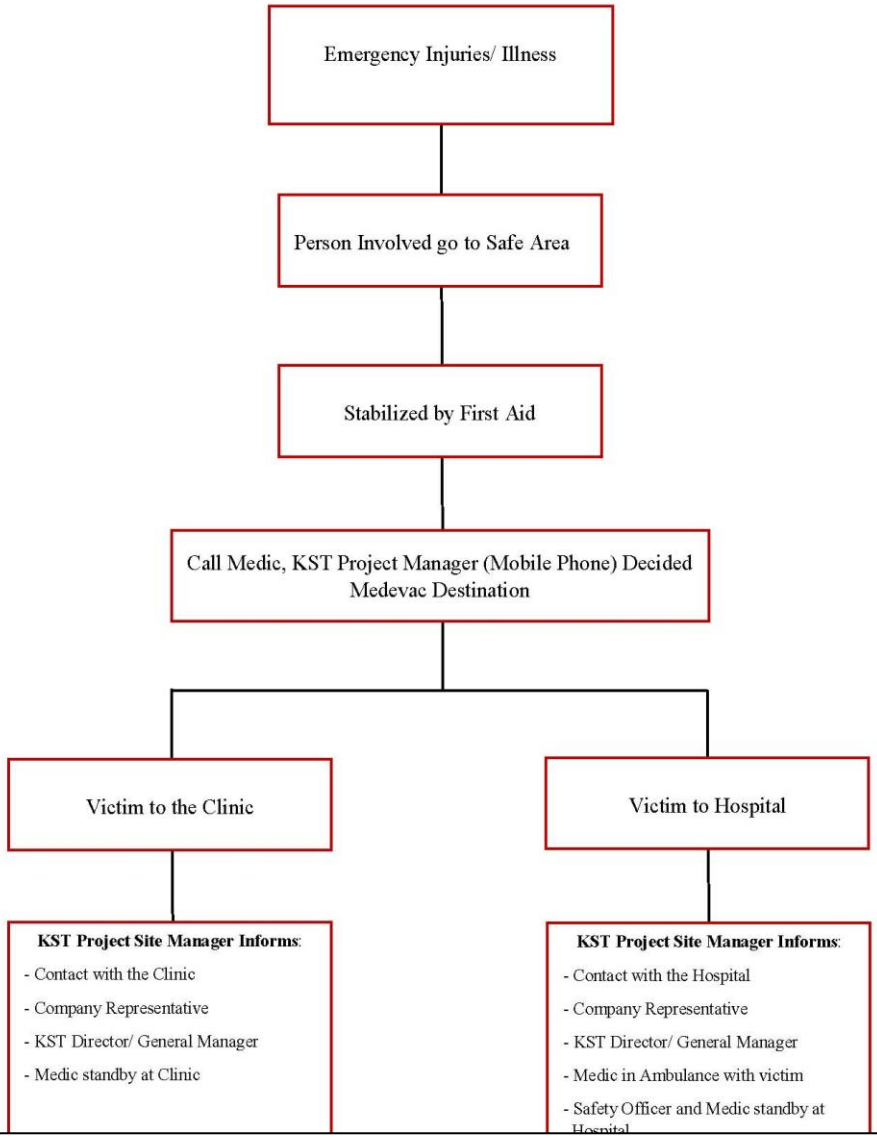
EMERGENCY RESPONSE PLAN (ERP) CHART



Evidence 6: Request YCDC for waste disposal

KST
Group of Companies Limited

306, Yuzana Business Tower,
Damazaydi Road,
Sanchaung Township,
Yangon, Myanmar.

20.3.2018

AA 6259.

KST Co, Ltd 20.3.18. (11.54). YCDC မှ အမှိုက်သယ်

ခွင့်ပြု တောင်းခံ.

2 x 350,000 ကျပ် = 70,000 ကျပ်.

ကျေးဇူးတင်စွာ.

YCDC (ပတ်သက်.) ဒေါ်

09.42386 0127.

Ma Aye Aye Point
Account.
KST Group of Co, Ltd.

Tel: +95-1-513805/ 516540
Fax: +95-1-539 568
E mail: kstconstruction1984@gmail.com
Website: www.kstcompany.com

Evidence 7: SSHE Induction Training Record

KST

TRAINING ATTENDANT LIST

Training Program	SSHE Induction Training		
Conducted by:	SO - Kyaw Zin Htun & Thiha Kyaw	Date :	10:00 AM, 15-1-2018
		Revenue :	KST Head Office
Project :	PTTEP New Office Construction in Yangon, Myanmar.		

Sr. No.	Name	Company	Designation	Signature	Remark
1.	U Ye Myint	KST	MD		
2.	Ye Kyaw Aung	KST	PD		
3.	Ei Shwe War Myint	KST	Director		
4	Tin MOE	KST	Dy. PM		
5.	Soe Thura Zaw	KST	P.E		
6.	Saw Ko Lwin	KST	D.P.E		
7.	Hsu Myat Thwe Lin	KST	Engineer		
8.	May Myo Than	KST	Engineer	May Myo	
9.	Kyi Pyar Ngwe Thein	KST	Account		
10	Tin Mar Soe	KST	Store		
11	Aye Aye Point	KST	Account		
12	Phyu Phyu Win	KST	Technical Ass		
13.	Thein Tun	K.ST.	Logistic Manager		
14.	U Win Myint	KST.	Proj. Manager		
15.	U Kyaw Soe.	KST	Medic		
16.	Yee Yee Htwe	KST	Finance.		
17.	Nway Thiri Myaing	KST	Engineer	Nway	
18.	Ye Myo Latt	KST	Site Supervisor		

KST

TRAINING ATTENDANT LIST

Training Program	Safety Induction training		
Conducted by:	Thiha Kyaw (s.O)	Date :	02/02/2018
		Revenue :	KST Meeting room
Project :			

Sr. No.	Name	Company	Designation	Signature	Remark
01	KYAW THU HEIN	KST	ARCHITECT		
02	Thri Aung	KST	SE		
03	Paing Thu.	KST	E.P.		
04	Thida Oo	KST	HR		
05	Thinza Oo	KST	PC	02.02.18	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
06	Zin Hnowe Than	KST	S.E		
07	U Si Thu Kyaw Zaw	KST	P.E		

Evidence 8: Safety Training Record

KST

TRAINING ATTENDANT LIST

Training Program	Permit to work		
Conducted by:	Thiha Kyaw (S.O)	**Date :**	06, FEB, 2018
		Revenue :	KST Meeting room
Project :	PTTEP NEW OFFICE CONSTRUCTION PROJECT		

Sr. No.	Name	Company	Designation	Signature	Remark
1.	Ko Nyi Tin Htut	KST	SE		
2.	Ma Thiri Aung	KST	SAE		
3.	Phyu Phyu Win	KST	T.A		
4.	U Si Thu Kyaw Zaww	KST	PE		
5.	Ma Nyein Aye Zin	ATT	CE		
6.	Ma Su Su Aye	ATT	Project Secretary		
7.	Ko Si Thu Aung	ATT	Civil inspector.		
8.	Ko Htet.	ATT.	mechanical inspector		
9	WILLIAM	PTT	SAFETY		
10	Soe Thura Zaw	KST	Project Engr.		

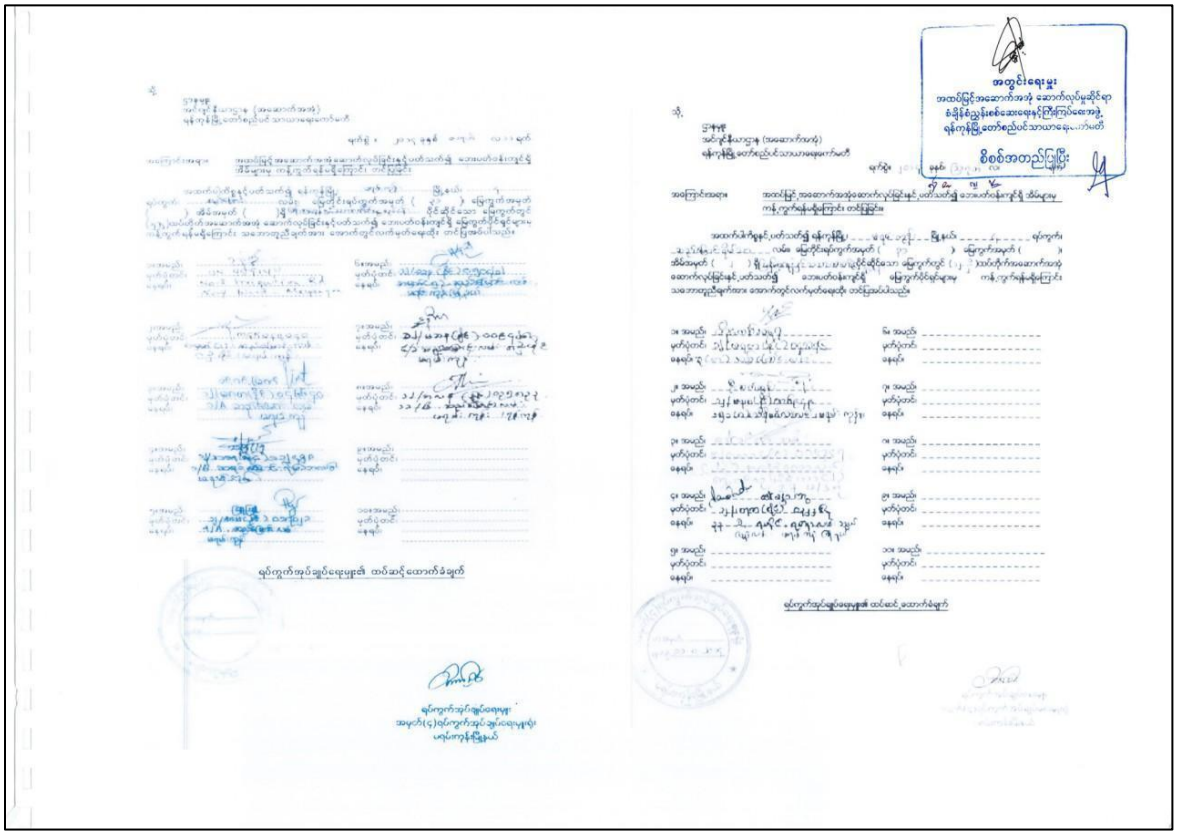
KST

TRAINING ATTENDANT LIST

Training Program	Hight safety, working at height, PPE.		
Conducted by:	Thiha Kyaw (officer)	Date:	02.02.2018
		Revenue:	
Project:	PTTEP NEW OFFICE		

Sr. No.	Name	Company	Designation	Signature	Remark
1	[illegible]	UIE	Site Eng	[illegible]	
2	[illegible]	"		[illegible]	
3	[illegible]			[illegible]	
4	[illegible]			[illegible]	
5	[illegible]			[illegible]	
6	[illegible]			[illegible]	
7	[illegible]	.		[illegible]	
8	[illegible]			[illegible]	
9	[illegible]			[illegible]	
10	[illegible]			[illegible]	
11	[illegible]	—	(supervisor)	[illegible]	
12	[illegible]			[illegible]	
13	[illegible]			[illegible]	
14	[illegible]			[illegible]	
15	[illegible]			[illegible]	
16	[illegible]			[illegible]	
17	[illegible]			[illegible]	
18	[illegible]			[illegible]	
19	[illegible]			[illegible]	
20					

Evidence 9: Project acceptance by neighbor



Audit Photo

Water spray to control fugitive dust	Demolish activity
Cover with Tarpaulin during Transportation	Water spray to control fugitive dust
Provide PVC mesh sheet	Notice

Security	Notice board
Provide waste bin	Toilet
Water spray to control fugitive dust	Community Inform

Provide the medicine and First Aid Box	Notice

APPENDIX B
Laboratory Results of Air Monitoring

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့.ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R / 02123

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-1, Construction Site, TSP (4.2.2018)	နမူနာအမှတ်/ Sample ID	3431	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-1, Construction Site, TSP (4.2.2018)	METTLER (Weighting Balance)	0.219 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
Daw May Myat Khine Lab. Technician II Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Aye Win Project Team Leader Ecological Laboratory ALARM

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A-2, Kan Street, Hlaing Township, 11051, Yangon, Myanmar. Tel: +95 1 503301 | Fax: +95 1 503302
Email: alarm.myanmar@gmail.com | website: www.myanmaraffairs.com

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စိမ်းလန်းအဓိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R / 02124

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-1, Construction Site, TSP (6.2.2018)	နမူနာအမှတ်/ Sample ID	3432	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-1, Construction Site, TSP (6.2.2018)	METTLER (Weighting Balance)	0.256 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
Daw May Myat Khine Lab. Technician II Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Aye Win Project Team Leader Ecological Laboratory

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A-2, Kan Street, Hlaing Township, 11051, Yangon, Myanmar. Tel: +95 1 503301 | Fax: +95 1 503302
Email: alarm.myanmar@gmail.com | website: www.myanmaraffairs.com

ဂေတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R / 02125

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-1, Construction Site, PM-10 (4.2.2018)	နမူနာအမှတ်/ Sample ID	3433	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့, နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့, နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-1, Construction Site, PM-10 (4.2.2018)	METTLER (Weighting Balance)	0.163 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02126

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-1, Construction Site, PM-10 (6.2.2018)	နမူနာအမှတ်/ Sample ID	3434	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
ဧနရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-1, Construction Site, PM-10 (6.2.2018)	METTLER (Weighting Balance)	0.222 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02121

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-2, TSP (9.2.2018)	နမူနာအမှတ်/ Sample ID	3429	
နေရာ (မြို့.နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-2, TSP (9.2.2018)	METTLER (Weighting Balance)	0.231 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02122

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-2, TSP (10/11.2.2018)	နမူနာအမှတ်/ Sample ID	3430	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့, နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့, နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-2, TSP (10/11.2.2018)	METTLER (Weighting Balance)	0.608 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02119

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-2, PM-10 (9.2.2018)	နမူနာအမှတ်/ Sample ID	3427	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-2, PM-10 (9.2.2018)	METTLER (Weighting Balance)	0.234 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02120

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-2, PM-10 (10/11.2.2018)	နမူနာအမှတ်/ Sample ID	3428	
နေရာ (မြို့.နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့, နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့, နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-2, PM-10 (10/11.2.2018)	METTLER (Weighting Balance)	0.616 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02129

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-3, TSP (4.2.2018)	နမူနာအမှတ်/ Sample ID	3437	
နေရာ (မြို့.နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-3, TSP (4.2.2018)	METTLER (Weighting Balance)	0.188 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02130

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-3, TSP (6.2.2018)	နမူနာအမှတ်/ Sample ID	3438	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-3, TSP (6.2.2018)	METTLER (Weighting Balance)	0.228 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02127

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-3, PM-10 (4.2.2018)	နမူနာအမှတ်/ Sample ID	3435	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-3, PM-10 (4.2.2018)	METTLER (Weighting Balance)	0.071 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
Daw May Myat Khine Lab. Technician II Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Aye Win Project Team Leader Ecological Laboratory ALARM

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Reference Number/ စာအမှတ်: EL-R / 02128

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-3, PM-10 (6.2.2018)	နမူနာအမှတ်/ Sample ID	3436	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-3, PM-10 (6.2.2018)	METTLER (Weighting Balance)	0.119 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02117

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-4 Construction Site TSP (9.2.2018)	နမူနာအမှတ်/ Sample ID	3425	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-4 Construction Site TSP (9.2.2018)	METTLER (Weighting Balance)	0.268 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02118

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-4 Construction Site TSP (10/11.2.2018)	နမူနာအမှတ်/ Sample ID	3426	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-4 Construction Site TSP (10/11.2.2018)	METTLER (Weighting Balance)	0.294 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R / 02115

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-4 Construction Site PM-10 (9.2.2018)	နမူနာအမှတ်/ Sample ID	3423	
နေရာ (မြို့နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့, နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့, နာရီ) Arriving Time (Date, Time)	15.2.2018	

(This laboratory analysis report is based solely on the sample submitted by the customer)
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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-4 Construction Site PM-10 (9.2.2018)	METTLER (Weighting Balance)	0.239 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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Reference Number/ စာအမှတ်: EL-R / 02116

Date / နေ့စွဲ: 19 February, 2018

Laboratory Analysis Report /ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ

Sample Profileနမူနာရာဇဝင်

နမူနာအမည် /Sample Name	Filter Weight, A-4 Construction Site PM-10 (10/11.2.2018)	နမူနာအမှတ်/ Sample ID	3424	
နေရာ (မြို့.နယ်) Location (Township)	မရမ်းကုန်း	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Division/State)	ရန်ကုန်	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် Sender Name	PTTEPI Office Building Demolation Phase (TBS)	နမူနာကောက်ယူချိန် (နေ့, နာရီ) Sampling Time (Date, Time)		
အဖွဲ့အစည်းOrganisation	-			
ဆက်သွယ်ရန် Contact	-	နမူနာရောက်ရှိချိန် (နေ့, နာရီ) Arriving Time (Date, Time)	15.2.2018	

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Analysis Results စမ်းသပ်ချက်အဖြေ

Pure filter weight= 2.698 g

စဉ် Sr.	Sample Name	နည်းစဉ် Method	ရလဒ်အဖြေ (Results)
1.	A-4 Construction Site PM-10 (10/11.2.2018)	METTLER (Weighting Balance)	0.212 g

* Myanmar Emission Guideline 2015 NG=No Guideline ND= Not Detected

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံApproved by
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