

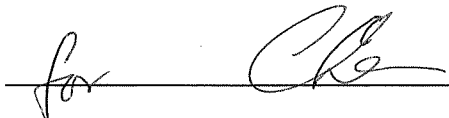

香港電燈有限公司  
The Hongkong Electric Co., Ltd.



**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499**

**ENVIRONMENTAL PERMIT NO. EP-071/2000/C**

**LAMMA POWER STATION EXTENSION  
ENVIRONMENTAL MONITORING & AUDIT PROGRAMME  
AT OPERATIONAL PHASE**

Report Title	<u>Monthly EM&amp;A Report (April 2016)</u>
Date	<u>11 May 2016</u>
Certified by	<u></u> (Mr. IP Tat-Yan, Environmental Team Leader)
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## EXECUTIVE SUMMARY

This is the 73<sup>rd</sup> monthly Environmental Monitoring and Audit (EM&A) report for the Project “Construction of Lamma Power Station Extension” prepared by the Environmental Team (ET). This report presents the results of impact monitoring on air quality and noise for the said project in April 2016.

The reclamation and submarine pipeline works were completed with the first gas-fired combined cycle unit (viz. Unit L9) commissioned in October 2006, working currently on base load operation. To cope with the scheduled retirement of the existing units at Lamma Power Station, the second gas-fired combined cycle unit (viz. Unit L10) is planned for commercial operation in early 2020 and the associated construction work commenced in January 2016.

Air and noise monitoring were performed. The results were checked against the established Action/Limit (AL) levels. An on-site audit was conducted once per week. The implementation status of the environmental mitigation measures, Event/Action Plan and environmental complaint handling procedures were also checked.

### Construction Activities Undertaken

Construction activities for Lamma Extension during the reporting month are tabulated as follows:

Item	Construction Activities
Unit L10 Piling Works	Pre-drilling, grab excavation and bored pile construction works
Unit L10 Ground Treatment Works	Band drain construction works

### Environmental Monitoring Works

All monitoring work at designated stations was performed as scheduled satisfactorily.

#### *Air Quality*

No exceedance of Action/Limit levels on 1-hour TSP and 24-hour TSP for air quality was recorded in the month.

#### *Noise*

Construction work for Lamma Extension was carried out during the restricted hours including evening-time, holidays and night-time under valid Construction Noise Permit. No exceedance of Action and Limit levels for noise arising from the construction of Lamma Extension was recorded in the month.

## Site Environmental Audit

Site audits were carried out on a weekly basis to monitor environmental issues on the construction site. The site conditions were generally satisfactory. All required mitigation measures were implemented.

### Environmental Licensing and Permitting

Description	Permit No.	Valid Period		Issued To	Date of Issuance
		From	To		
Varied Environmental Permit	EP-071/2000/C	18/05/05	-	HEC	18/05/05
Construction Noise Permit	GW-RS0104-16 (superseded by GW-RS0379-16)	05/02/16	31/07/16	Contractor	05/02/16
Construction Noise Permit	GW-RS0379-16	19/04/16	18/10/16	Contractor	19/04/16
WPCO Discharge Licence	WT00023765-2016	07/03/16	31/03/21	Contractor	09/03/16
Waste Disposal Billing Account	Account No.: 7024247	03/02/16	-	Contractor	03/02/16

### Implementation Status of Environmental Mitigation Measures

Environmental mitigation measures for the construction activities as recommended in the EM&A manual were implemented in the reporting month.

### Environmental Complaints

No complaint against the construction activities was received in the reporting month.

### Future Key Issues

The future key issues to be considered in the coming month are as follows:

#### Unit L10 Piling Works

- to continue monitoring the noise level during construction and to ensure compliance with the CNP's already obtained;
- to continue executing the preventive measures for avoiding noise exceedance and keep monitoring/ reviewing the performance;
- to monitor and review the sufficiency of the dust suppression measures provided and increase the resources accordingly if necessary;
- to recycle and reuse wastewater from bored pipe construction work and to ensure compliance with the WPCO discharge licence already obtained.

#### Unit L10 Ground Treatment Works

- to continue monitoring the noise level during construction and to ensure compliance with the CNP's already obtained;
- to continue executing the preventive measures for avoiding noise exceedance and keep monitoring/ reviewing the performance;

- to monitor and review the sufficiency of the dust suppression measures provided and increase the resources accordingly if necessary.

**Concluding Remarks**

The environmental performance of the project was generally satisfactory.

## **1. INTRODUCTION**

### **1.1 Background**

The Environmental Team (hereinafter called the “ET”) was formed within the Hongkong Electric Co. Ltd (HEC) to undertake Environmental Monitoring and Audit for “Construction of Lamma Power Station Extension” (hereinafter called the “Project”). Under the requirements of Section 6 of Environmental Permit EP-071/2000/C, an EM&A programme for impact environmental monitoring set out in the EM&A Manual (Construction Phase) is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of air quality, noise and water quality and regular environmental audits are required for the Project. With the completion of reclamation and submarine pipeline works, no further marine water quality monitoring would be required.

The Project involves the construction of a gas-fired power station employing combined cycled gas turbine technology, forming an extension to the existing Lamma Power Station. The key elements of the Project including the construction activities associated with the transmission system and submarine gas pipeline are outlined as follows.

- dredging and reclamation to form approximately 22 hectares of usable area;
- construction of six 300MW class gas-fired combined cycle units;
- construction of a gas receiving station;
- construction of a transmission system linking the Lamma Extension to load centres on Hong Kong Island;
- laying of a gas pipeline for the supply of natural gas to the new power station

This report summarizes the environmental monitoring and audit work for the Project for the month of April 2016.

### **1.2 Project Organisation**

An Environmental Management Committee (EMC) has been set up in HEC to oversee the Project. The management structure includes the following:

- Environmental Protection Department (The Authority);
- Environmental Manager (The Chairman of the Environmental Management Committee);
- Engineer;
- Independent Environmental Checker (IEC);
- Environmental Team (ET);
- Contractor.

The project organisation chart for the construction EM&A programme is shown in Appendix A.

### 1.3 Construction Works undertaken during the Reporting Month

Construction activities for Unit L10 piling works were pre-drilling, grab excavation and bored pile construction works. Construction activities for Unit L10 ground treatment works were band drain construction works. Layout plan for construction site is shown in Figure 1.1.

The main construction activities carried out during the reporting month and the corresponding environmental mitigation measures are summarized in Table 1.1. The implementation of major mitigation measures in the month is provided in Appendix I.

Table 1.1 Construction Activities and Their Corresponding Environmental Mitigation Measures

Item	Construction Activities	Environmental Mitigation Measures
<b>Unit L10 Piling Works</b>		
1.	Pre-drilling Works	<p><b>Air</b></p> <ul style="list-style-type: none"> <li>– Dust suppression measures implemented.</li> </ul> <p><b>Noise</b></p> <ul style="list-style-type: none"> <li>– General noise mitigation measures employed at all work sites throughout the construction phase.</li> </ul> <p><b>Waste Management</b></p> <ul style="list-style-type: none"> <li>– Waste Management Plan submitted and implemented.</li> </ul>
2.	Grab excavation works	<p><b>Air</b></p> <ul style="list-style-type: none"> <li>– Dust suppression measures implemented.</li> </ul> <p><b>Noise</b></p> <ul style="list-style-type: none"> <li>– General noise mitigation measures employed at all work sites throughout the construction phase.</li> </ul> <p><b>Waste Management</b></p> <ul style="list-style-type: none"> <li>– Waste Management Plan submitted and implemented.</li> </ul>



Item	Construction Activities	Environmental Mitigation Measures
3.	Bored pile construction	<p><b>Water</b></p> <ul style="list-style-type: none"> <li>- All wastewater will be pumped to the sedimentation ponds for desilting process. After that, wastewater will be re-used for construction activities or pumped for storage. Discharging to communal storm drain is the last priority.</li> </ul> <p><b>Noise</b></p> <ul style="list-style-type: none"> <li>- General noise mitigation measures employed at all work sites throughout the construction phase.</li> </ul>
<b>Unit L10 Ground Treatment Works</b>		
4.	Band drain construction	<p><b>Air</b></p> <ul style="list-style-type: none"> <li>- Dust suppression measures implemented.</li> </ul> <p><b>Noise</b></p> <ul style="list-style-type: none"> <li>- General noise mitigation measures employed at all work sites throughout the construction phase.</li> </ul> <p><b>Waste Management</b></p> <ul style="list-style-type: none"> <li>- Waste Management Plan submitted and implemented.</li> </ul>

#### 1.4 Summary of EM&A Requirements

The detailed EM&A monitoring work for air quality and noise are described in Sections 2 and 3 respectively. Regular environmental site audits for air quality, noise, water quality and waste management were carried out.

The following environmental audits are summarized in Section 4 of this report:

- Environmental monitoring results;
- Waste Management Records;
- Weekly site audit results;
- The status of environmental licensing and permits for the Project;
- The implementation status of environmental protection and pollution control/mitigation measures.

Future key issues will be reported in Section 5 of this report.

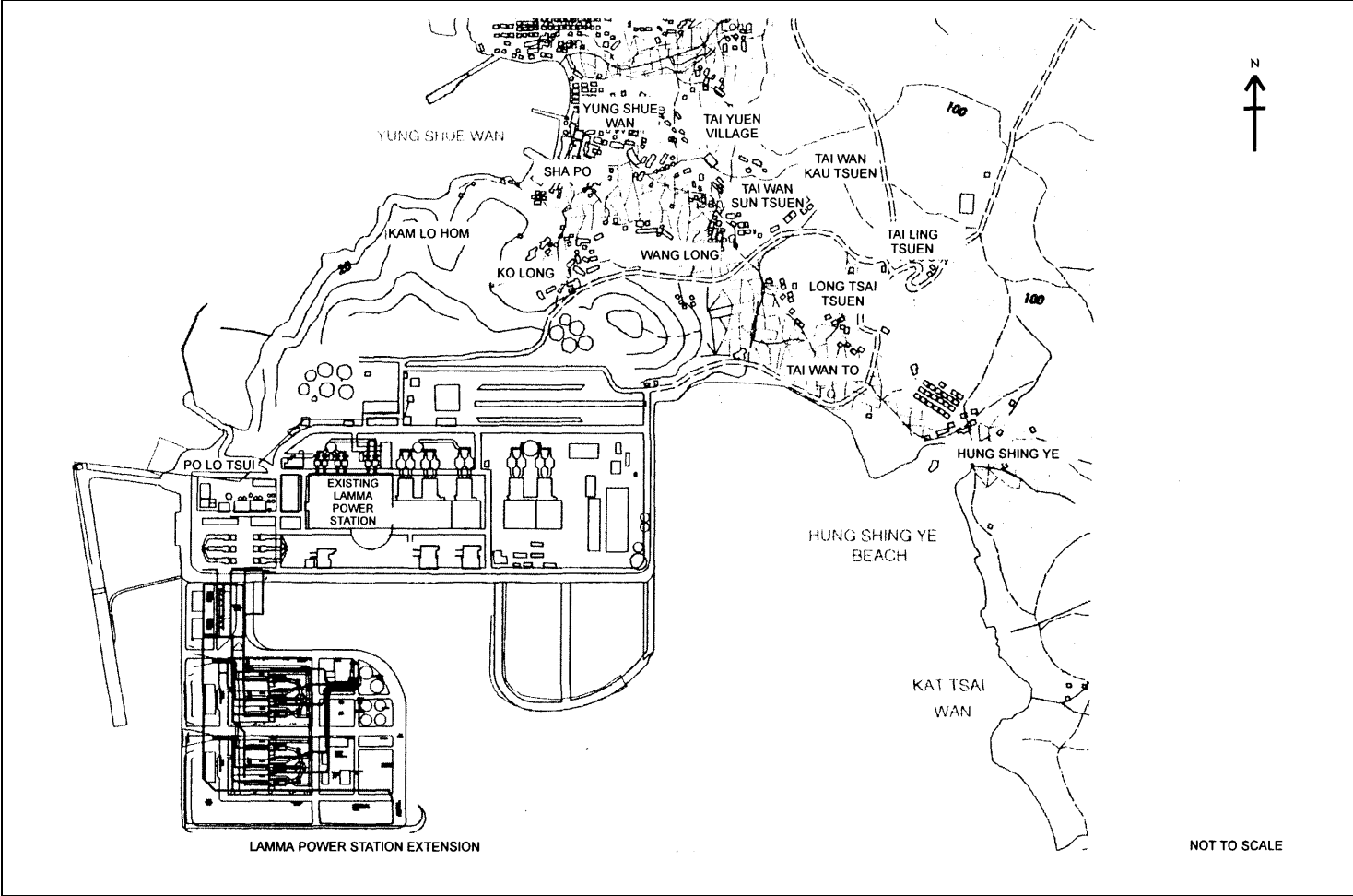


Figure 1.1 Layout of Work Site

## 2. AIR QUALITY

### 2.1 Monitoring Requirements

1-hour and 24-hour TSP monitoring at agreed frequencies were conducted to monitor air quality. The impact monitoring data were checked against the Action/Limit Levels as determined in the Baseline Monitoring Report (Construction Phase). Appendix B shows the established Action/Limit Levels for Air Quality.

### 2.2 Monitoring Locations

Three dust monitoring locations were selected for 1-hour TSP sampling (AM1, AM2 & AM3) while four monitoring locations were selected for 24-hour TSP sampling (AM1, AM2, AM3 and AM4). Table 2.1 tabulates the monitoring stations. The locations of the monitoring stations are shown in Figure 2.1.

Table 2.1 Air Quality Monitoring Locations

Location I.D.	Description
AM1	Reservoir
AM2	East Gate
AM3	Ash Lagoon
AM4	Tai Yuen Village

### 2.3 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was performed using the High Volume Air Samplers (HVAS), TEOM continuous dust monitor and the MINIVOL Portable Sampler at AM1&2, AM3 and AM4 respectively. TEOM continuous dust monitors were used to carry out 1-hour TSP monitoring at AM1, AM2 and AM3. Table 2.2 summarises the equipment used in dust monitoring.

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make
<i>24-hour sampling:</i> HVAS Sampler	Model TE5170x Tisch Environmental Inc.
Continuous TSP Dust Meter	TEOM continuous dust monitor Thermo Scientific
MINIVOL Portable Sampler	AIRMETRICS
<i>1-hour sampling:</i> Continuous TSP Dust Meter	TEOM continuous dust monitor Thermo Scientific

## 2.4 Monitoring Parameters, Frequency and Duration

Table 2.3 summarises the monitoring parameters, duration and frequency of air quality monitoring. The monitoring schedule for the reporting month is shown in Appendix C.

Table 2.3 Air Quality Monitoring Parameter, Duration and Frequency

Monitoring Stations	Parameter	Duration	Frequency
AM1	1-hour TSP	1	3 hourly samples every 6 days
	24-hour TSP	24	Once every 6 days
AM2	1-hour TSP	1	3 hourly samples every 6 days
	24-hour TSP	24	Once every 6 days
AM3	1-hour TSP	1	3 hourly samples every 6 days
	24-hour TSP	24	Once every 6 days
AM4	24-hour TSP	24	Once every 6 days

## 2.5 Monitoring Procedures and Calibration Details

HVAS and MINIVOL (24- hour TSP Monitoring):

### *Preparation of Filter Papers*

- Visual inspection of filter papers was carried out to ensure that there were no pinholes, tears and creases;
- The filter papers were then labeled before sampling.
- The filter papers were equilibrated at room temperature and relative humidity < 50% for at least 24 hours before weighing.

### *Field Monitoring*

- During collection of the sampled filter paper, the information on the elapse timer was logged. Site observations around the monitoring stations, which might have affected the monitoring results, were also recorded. Major pollution sources, if any, would be identified and reported. The flow record chart for the previous sampling was checked to see if there was any abnormality.
- The post-sampling filter papers were removed carefully from the filter holder and folded to avoid loss of fibres or dust particles from the filter papers;
- The filter holder and its surrounding were cleaned;
- A pre-weighed blank filter paper for the next sampling was put in place and aligned carefully. The filter holder was then tightened firmly to avoid leakage;
- A new flow record chart was loaded into the flow recorder;
- The programmable timer was set for the next 24 hrs sampling period;
- The post-sampling filter papers were equilibrated at room temperature and relative humidity < 50% for at least 24 hours before weighing.

TEOM continuous dust monitor (24- hour TSP and 1- hour TSP Monitoring):

- The following parameters of the TEOM model dust meters are regularly checked to ensure proper functionality:
  - Operation Mode;
  - Frequency of the tapered element;
  - Main flow;
  - Bypass flow.

### *Maintenance & Calibration*

- The monitoring equipment and their accessories are maintained in good working conditions.
- Monitoring equipment is calibrated at monthly intervals. Calibration details are shown in Appendix F.

## **2.6 Results and Observations**

All dust monitoring works were conducted on schedule. All monitoring data and graphical presentation of the monitoring results are provided in Appendix D. Key findings and observations are provided below:

### *1-hour TSP*

No exceedance of 1-hour TSP Action/Limit Level was recorded in the month.

### *24-hour TSP*

No exceedance of 24-hour TSP Action/Limit Level was recorded in the month.

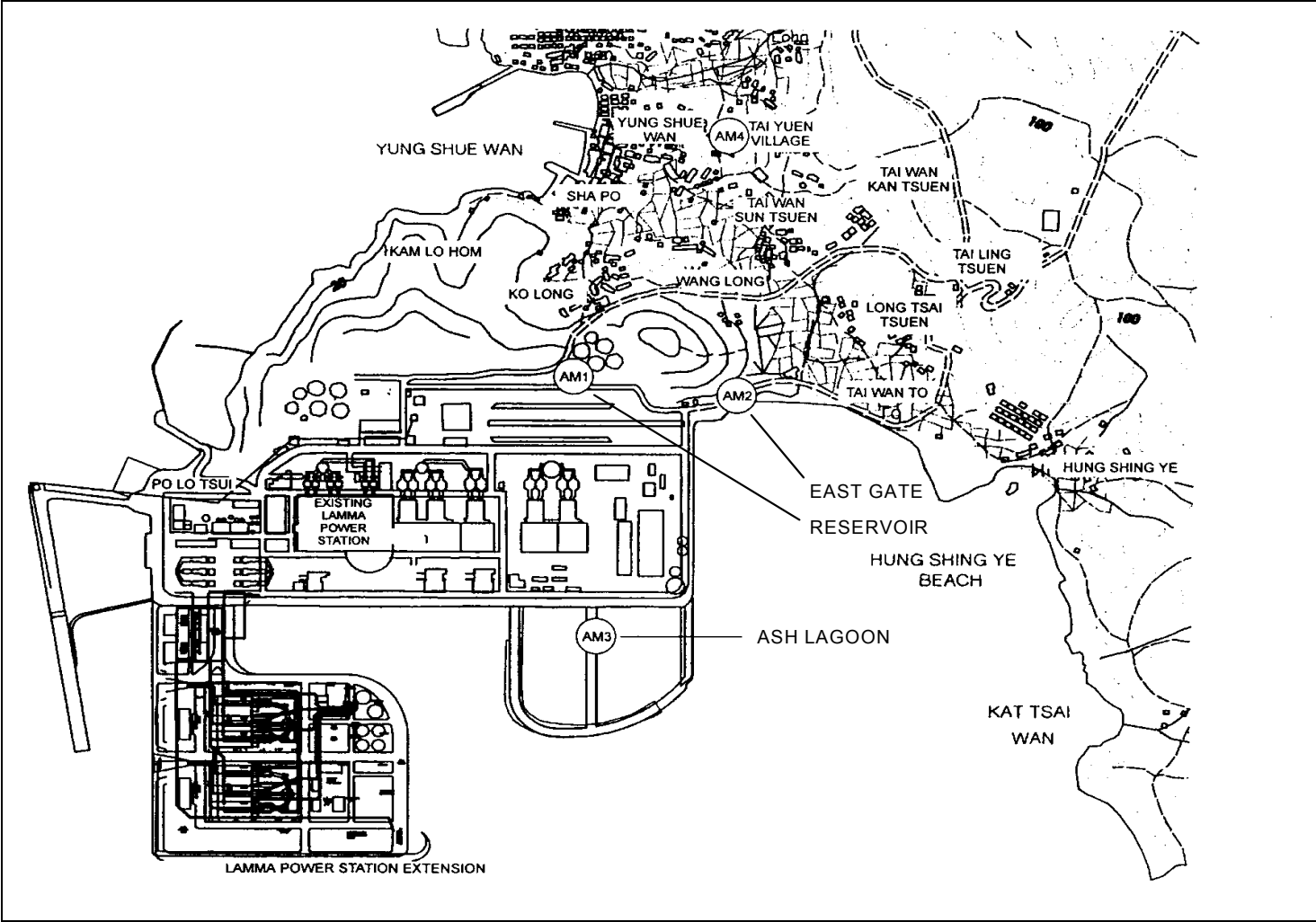


Figure 2.1 Location of Air Quality Monitoring Stations

### 3. NOISE

#### 3.1 Monitoring Requirements

Continuous noise alarm monitoring at Ash Lagoon/Ching Lam were carried out to calculate the noise contributed by the construction activities at the two critical NSR's, viz. Long Tsai Tsuen/Hung Shing Ye and the school within the village of Tai Wan San Tsuen. The impact monitoring data for construction noise were checked against the limit levels specified in the EM&A Manual. With the availability of the construction noise permits, impact monitoring for the construction work during the restricted hours was also carried out. Section 4 presents the details of the construction noise permits.

The impact noise monitoring data were checked against the limit levels specified in the EM&A Manual. Appendix B shows the established Action/Limit Levels for noise.

#### 3.2 Monitoring Locations

In accordance with the EM&A manual, the identified noise monitoring locations of Ash Lagoon and Ching Lam are shown in Figure 3.1.

#### 3.3 Monitoring Equipment

The sound level meters used for noise monitoring complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The noise monitoring equipment used is shown in Table 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Model
Sound level meter	Rion NA-27 / B&K 2250
Sound level calibrator	B&K 4231

#### 3.4 Monitoring Parameters, Frequency and Duration

Continuous alarm monitoring was carried out at Ash Lagoon and Ching Lam. The measurement duration and parameter of noise monitoring were presented in Table 3.2 as follows:

Table 3.2 Noise Monitoring Duration and Parameter

Location	Time Period	Frequency	Parameter
Ash Lagoon	Daytime: 0700-1900 hrs on normal weekdays	Daytime: 30 minutes	30-min $L_{Aeq}$
	Evening-time & holidays: 0700-2300 hrs on holidays; and 1900-2300 hrs on all other days	Evening-time & holidays: 5 minutes	5-min $L_{Aeq}$
Ching Lam	Night-time: 2300-0700 hrs of next day	Night-time: 5 minutes	5-min $L_{Aeq}$

### 3.5 Monitoring Procedures and Calibration Details

#### *Monitoring Procedures*

##### *Continuous Noise Monitoring for Lamma Extension Construction*

The measured noise levels (MNL's) were collected at the noise alarm monitoring stations at Ash Lagoon and Ching Lam. The notional background noise levels (viz. baseline noise data at Ash Lagoon and Ching Lam) were applied to correct the corresponding MNL's in 30-min/5-min  $L_{Aeq}$ .

A wind speed sensor was installed at Station Building Rooftop. The wind speed signal was used to determine whether the data from Ash Lagoon and Ching Lam noise alarm monitoring stations were affected. The instantaneous data was discarded in case the instantaneous wind speed exceeded 10 m/s. The 30-min/5-min  $L_{Aeq}$  was considered valid only if the amount of valid data was equal to or above 70%.

#### *Equipment Calibration*

The sound level meters and calibrators have been verified by the manufacturer or accredited laboratory. Equipment for continuous noise monitoring was calibrated at least once per month.



### **3.6 Results and Observations**

Continuous noise monitoring was conducted at the two monitoring stations at Ash Lagoon and Ching Lam.

All monitoring results and their graphical presentations are provided in Appendix E. No exceedance of noise Action/Limit Level was recorded in the month.

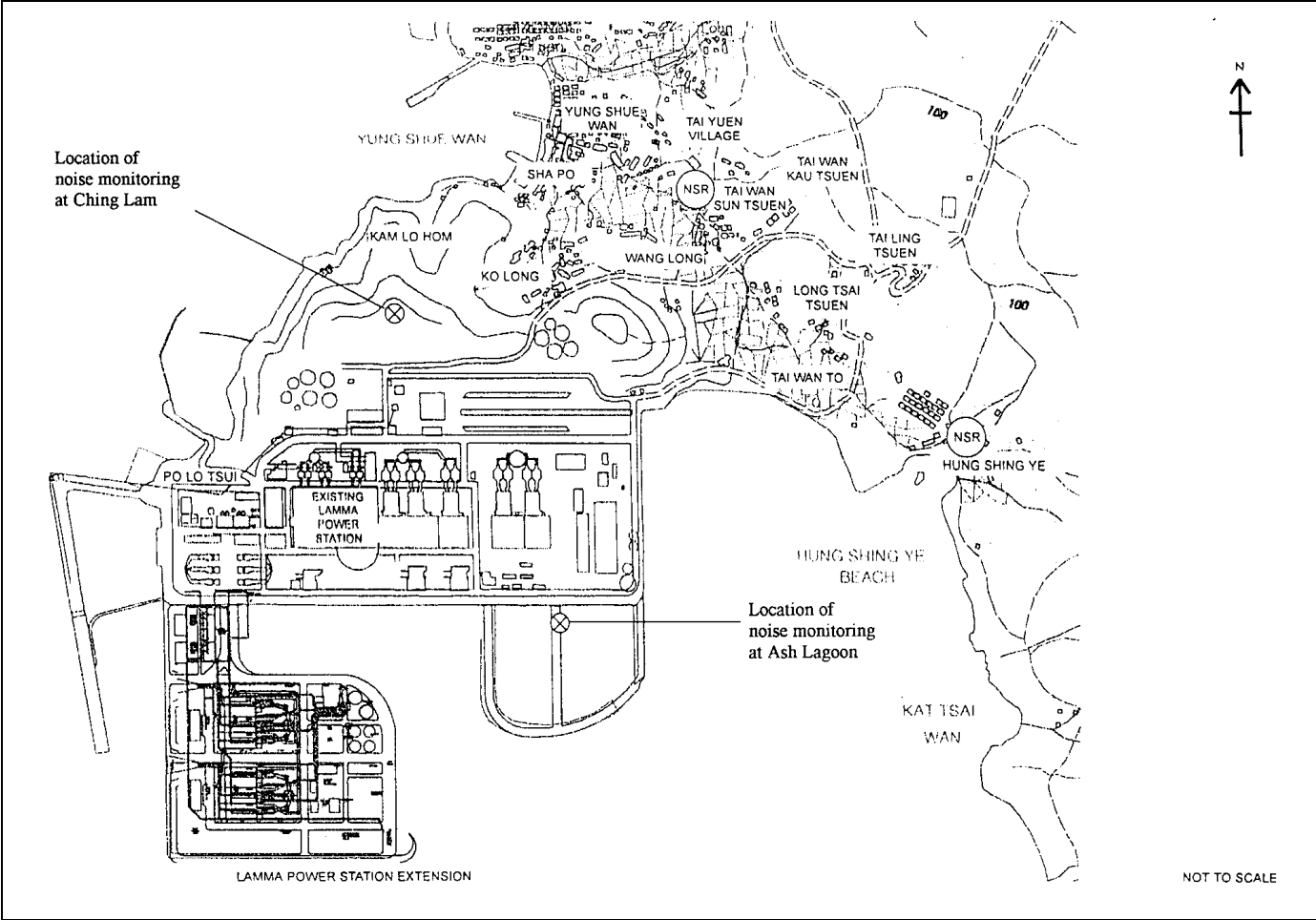


Figure 3.1 Location of Noise Monitoring Stations

## 4. ENVIRONMENTAL AUDIT

### 4.1 Review of Environmental Monitoring Procedures

The environmental monitoring procedures were regularly reviewed by the Environmental Team. No modification to the existing monitoring procedures was recommended.

### 4.2 Assessment of Environmental Monitoring Results

#### *Monitoring results for Air Quality and Noise*

The environmental monitoring results for Air Quality and Noise in the reporting month presented in sections 2, 3 and 4 respectively are summarized in Table 4.1.

Table 4.1 Summary of AL Level Exceedances on Monitoring Parameters

Item	Parameter Monitored	Monitoring Period	No. of Exceedances In		Event/Action Plan Implementation Status and Results
			Action Level	Limit Level	
Air					
1	Ambient TSP (24-hour)	01/04/16-30/04/16	0	0	
2	Ambient TSP (1-hour)	01/04/16-30/04/16	0	0	
Noise					
1	Noise level at the critical NSR's predicted by the noise alarm monitoring system	01/04/16-30/04/16	0	0	

### 4.3 Waste Management

Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. Inert C&D materials comprise excavated materials and broken concrete. Non-inert C&D materials comprise general refuse, metals and paper/ cardboard packaging, plastics, chemical waste, etc.

No inert C&D material nor non-inert C&D material were disposed of in April 2016 as shown in Table 4.2.

Table 4.2 Estimated Amounts of Waste in April 2016

Total Inert C&D Waste Materials	Non-inert C&D Materials		
	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
3888.21 Tonnes	0 Tonnes	2.70 Tonnes	0 Tonnes

The monthly waste flow table prepared by the contractor is attached in Appendix K.

#### 4.4 Site Environmental Audit

Site audits were carried out by ET on a weekly basis to monitor environmental issues at the construction sites to ensure that all mitigation measures were implemented timely and properly. The site audit findings for the reporting month are summarized in Appendix H. The site conditions were generally satisfactory. All required mitigation measures were implemented.

#### 4.5 Status of Environmental Licensing and Permitting

All permits/licenses obtained for the project are summarised in Table 4.3.

Table 4.3 Summary of Environmental Licensing and Permit Status

Description	Permit No.	Valid Period		Highlights	Status
		From	To		
Varied Environmental Permit	EP-071/2000/C	18/05/05	-	The whole construction work site	Valid
Construction Noise Permit	GW-RS0104-16 (superseded by GW-RS0379-16)	05/02/16	31/07/16	Operation of PME during restricted hours (0000-2400 hrs. on general holidays (including Sundays), 0000-0700 hrs. and 1900-2400 hrs on any day not being a general holiday).	Superseded

Description	Permit No.	Valid Period		Highlights	Status
		From	To		
Construction Noise Permit	GW-RS0379-16	19/04/16	18/10/16	Operation of PME during restricted hours (0000-2400 hrs. on general holidays (including Sundays), 0000-0700 hrs. and 1900-2400 hrs on any day not being a general holiday).	Valid
WPCO Discharge Licence	WT00023765-2016	07/03/16	31/03/21	Foundation works for Unit L10	Valid
Waste Disposal Billing Account	Account No.: 7024247	03/02/16	-	Foundation works for Unit L10	Valid

#### 4.6 Implementation Status of Environmental Mitigation Measures

Mitigation measures detailed in the permits and the EM&A Manual (Construction Phase) are required to be implemented. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in Appendix I.

#### 4.7 Implementation Status of Event/Action Plans

The Event/Action Plans extracted from the EM&A Manual (Construction Phase) are presented in Appendix G.

#### 4.8 Implementation Status of Environmental Complaint Handling Procedures

In April 2016, no complaint against the construction activities was received.

Table 4.4 Environmental Complaints Received in April 2016

Case Reference / Date, Time Received / Date, Time Concerned	Descriptions /Actions Taken	Conclusion / Status
Nil	N/A	N/A

Table 4.5 Outstanding Environmental Complaints Carried Over

Case Reference / Date, Time Received / Date, Time Concerned	Descriptions /Actions Taken	Conclusion / Status
Nil	N/A	N/A

## **5. FUTURE KEY ISSUES**

### **5.1 Key Issues for the Coming Month**

Key issues to be considered in the coming month include:

#### Unit L10 Piling Works

##### *Noise Impact*

- To continue monitoring the noise level during construction and to ensure compliance with the CNP's already obtained.
- To continue executing the preventive measures for avoiding noise exceedance and keep monitoring/ reviewing the noise performance.

##### *Air Impact*

- To monitor and review the sufficiency of the dust suppression measures provided and increase the resources accordingly if necessary.

##### *Water Impact*

- To recycle and reuse wastewater from bored pipe construction work and to ensure compliance in accordance with the WPCO discharge licence already obtained.

#### Unit L10 Ground Treatment Works

##### *Noise Impact*

- To continue monitoring the noise level during construction and to ensure compliance with the CNP's already obtained.
- To continue executing the preventive measures for avoiding noise exceedance and keep monitoring/ reviewing the noise performance.

##### *Air Impact*

- To monitor and review the sufficiency of the dust suppression measures provided and increase the resources accordingly if necessary.

### **5.2 Monitoring Schedules for the Next 3 Months**

The tentative environmental monitoring schedules for the next 3 months are shown in Appendix C.

### **5.3 Construction Program for the Next 3 Months**

The tentative construction programs for the next 3 months are shown in Appendix J.

## **6. CONCLUSION**

All monitoring work at designated stations was performed as scheduled satisfactorily. The environmental monitoring works and site inspection were performed as scheduled in the reporting month. All monitoring results were checked and reviewed.

No Action/Limit level exceedance on 1-hour and 24-hour TSP level was recorded in the reporting month.

No Action/Limit level exceedance on noise was recorded in the reporting month.

Environmental mitigation measures recommended in the EM&A manual for the construction activities were implemented in the reporting month. No complaint against the construction activities was received in the reporting month. No prosecution was received for this Project in the reporting period.

The environmental performance of the Project was generally satisfactory.



Appendix A Organization Chart

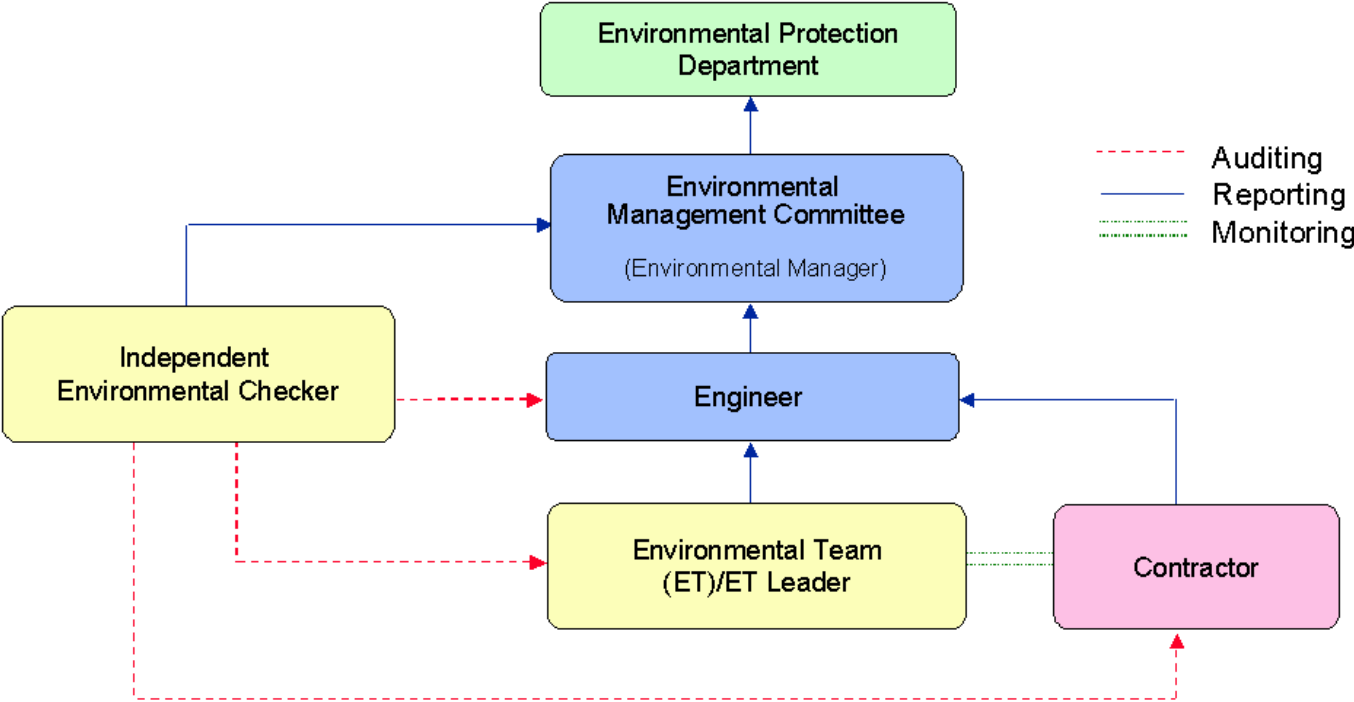


Figure A.1 Organisation of EM&A Programme at Construction Phase

## Appendix B Action and Limit Levels for Air Quality and Noise Monitoring

### B.1. Air

Table B.1 Action and Limit Levels for 1-hour and 24-hour TSP

	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
1-hour TSP*	340	500
24-hour TSP	190	260

\* No Action/Limit Level for 1-hour TSP is applied to AM4 where no real time dust monitor is installed.

### B.2. Noise

Table B.2 AL Levels for Construction Noise (Other than Percussive Piling)

Parameters	Action	Limit
Noise Levels at the NSR's at Long Tsai Tsuen/Hung Shing Ye and school within the village of Tai Wan San Tsuen predicted by the noise alarm monitoring system	When one or more documented complaints are received	a. 75 dB(A) in $L_{Aeq,30 \text{ min}}$ (07:00-19:00 hrs on normal weekdays) (Note 1)
Manual noise monitoring at the nearest Pak Kok Tsui residences to cable landing points N4 and N5		b. subject to statutory control under the Noise Control Ordinance (07:00-23:00 hrs on holidays and 19:00-23:00 hrs on all other days). Set to 60 dB(A) in $L_{Aeq,5 \text{ min}}$
Note:		
1. For educational institution, the limit level shall be 70 dB(A), reduced to 65 dB(A) during examination periods.		

## Appendix C Environmental Monitoring Schedule

Table C.1 Monitoring schedule for 24hr and 1hr TSP monitoring for Lamma Extension Construction (April 2016 to July 2016)

24hr TSP Monitoring	1hr TSP Monitoring
03/Apr/2016	03/Apr/2016 1500hr to 1800hr
09/Apr/2016	09/Apr/2016 1500hr to 1800hr
15/Apr/2016	15/Apr/2016 1500hr to 1800hr
21/Apr/2016	21/Apr/2016 1500hr to 1800hr
27/Apr/2016	27/Apr/2016 1500hr to 1800hr
03/May/2016	03/May/2016 1500hr to 1800hr
09/May/2016	09/May/2016 1500hr to 1800hr
15/May/2016	15/May/2016 1500hr to 1800hr
21/May/2016	21/May/2016 1500hr to 1800hr
27/May/2016	27/May/2016 1500hr to 1800hr
02/Jun/2016	02/Jun/2016 1500hr to 1800hr
08/Jun/2016	08/Jun/2016 1500hr to 1800hr
14/Jun/2016	14/Jun/2016 1500hr to 1800hr
20/Jun/2016	20/Jun/2016 1500hr to 1800hr
26/Jun/2016	26/Jun/2016 1500hr to 1800hr
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08/Jul/2016	08/Jul/2016 1500hr to 1800hr
14/Jul/2016	14/Jul/2016 1500hr to 1800hr
20/Jul/2016	20/Jul/2016 1500hr to 1800hr
26/Jul/2016	26/Jul/2016 1500hr to 1800hr

## APPENDIX D AIR QUALITY MONITORING RESULTS

Site: Lamma Power Station Extension

Month: April 2016

24 hour TSP Measurement:-

Date	TSP concentration ( $\mu\text{g}/\text{m}^3$ )				Weather Information (From Hong Kong Observatory)		
	Reservoir (AM1)	East Gate (AM2)	Ash Lagoon (AM3)	Tai Yuen Village (AM4)	Mean Wind Speed (km/hr)	Prevailing Wind Dir. ( $^{\circ}$ )	Mean R.H. (%)
03/04/2016	33	33	35	53	9.2	050	87
09/04/2016	25	25	21	32	17.3	200	86
15/04/2016	33	29	27	43	20.0	030	97
21/04/2016	71	44	34	21	7.3	030	87
27/04/2016	42	43	30	31	20.2	230	85

1 hour TSP Measurement:-

Date	Time	TSP concentration ( $\mu\text{g}/\text{m}^3$ )		
		Reservoir (AM1)	East Gate (AM2)	Ash Lagoon (AM3)
03/04/2016	15:00-15:59	28	30	25
	16:00-16:59	34	38	32
	17:00-17:59	42	38	34
09/04/2016	15:00-15:59	37	39	30
	16:00-16:59	43	36	32
	17:00-17:59	28	21	12
15/04/2016	15:00-15:59	31	34	20
	16:00-16:59	36	26	16
	17:00-17:59	15	29	23
21/04/2016	15:00-15:59	137	25	22
	16:00-16:59	37	23	23
	17:00-17:59	29	26	28
27/04/2016	15:00-15:59	50	30	22
	16:00-16:59	27	33	29
	17:00-17:59	28	41	41

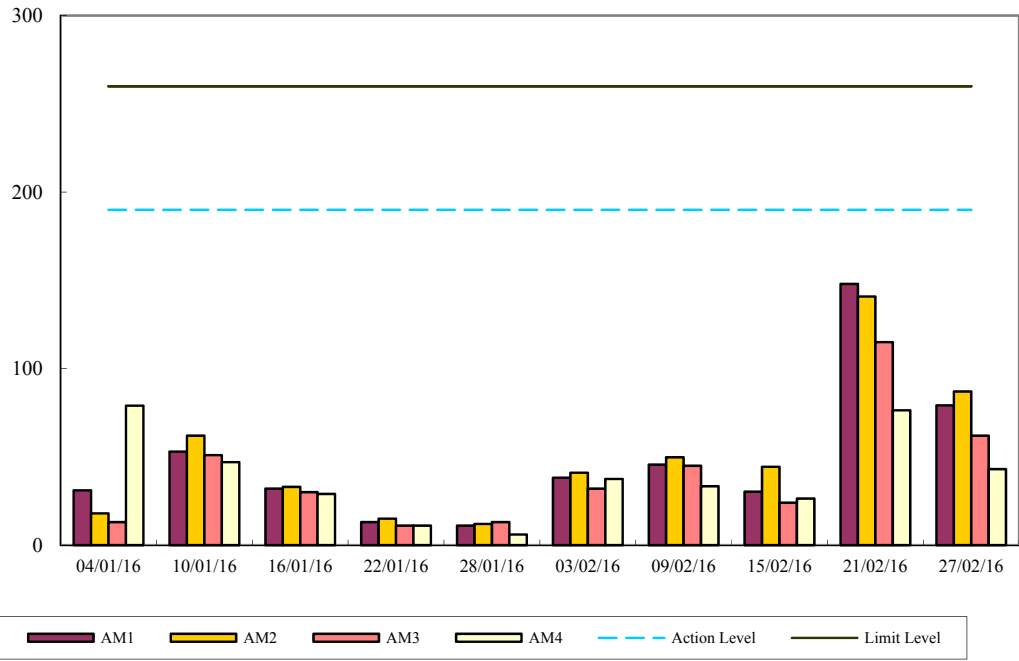
	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )
Action Level	340	190
Limit Level	500	260

Calibration: Calibration details are shown in appendix F.

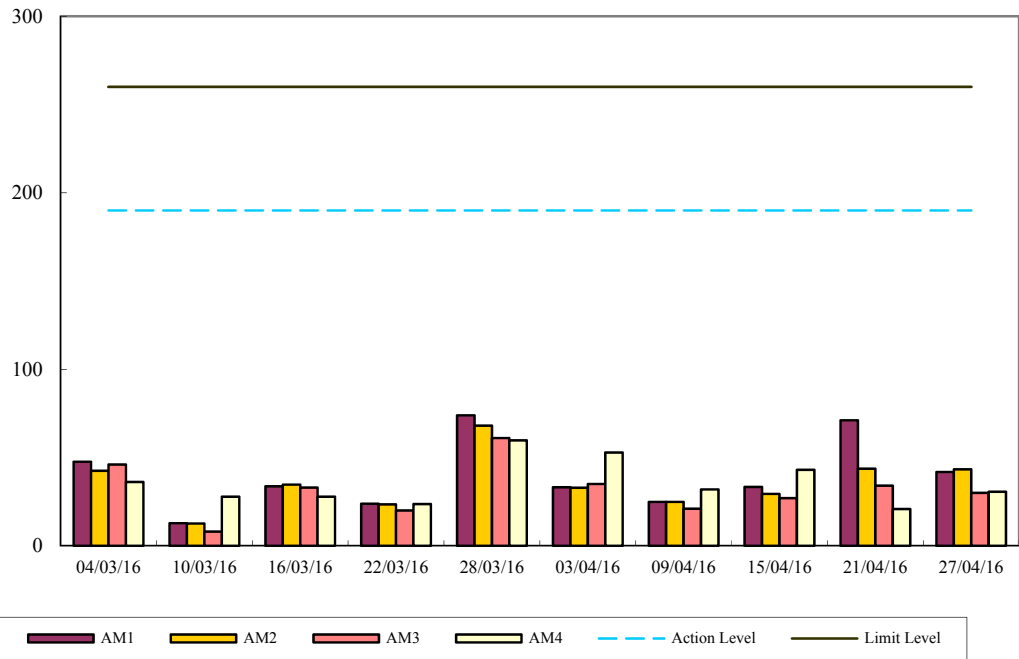
Equipment used:

Location	1-hr TSP	24-hr TSP
Reservoir and East Gate	TEOM	High Volume Air Sampler
Ash Lagoon	TEOM	TEOM
Tai Yuen Village	-	MINIVOL Portable Sampler

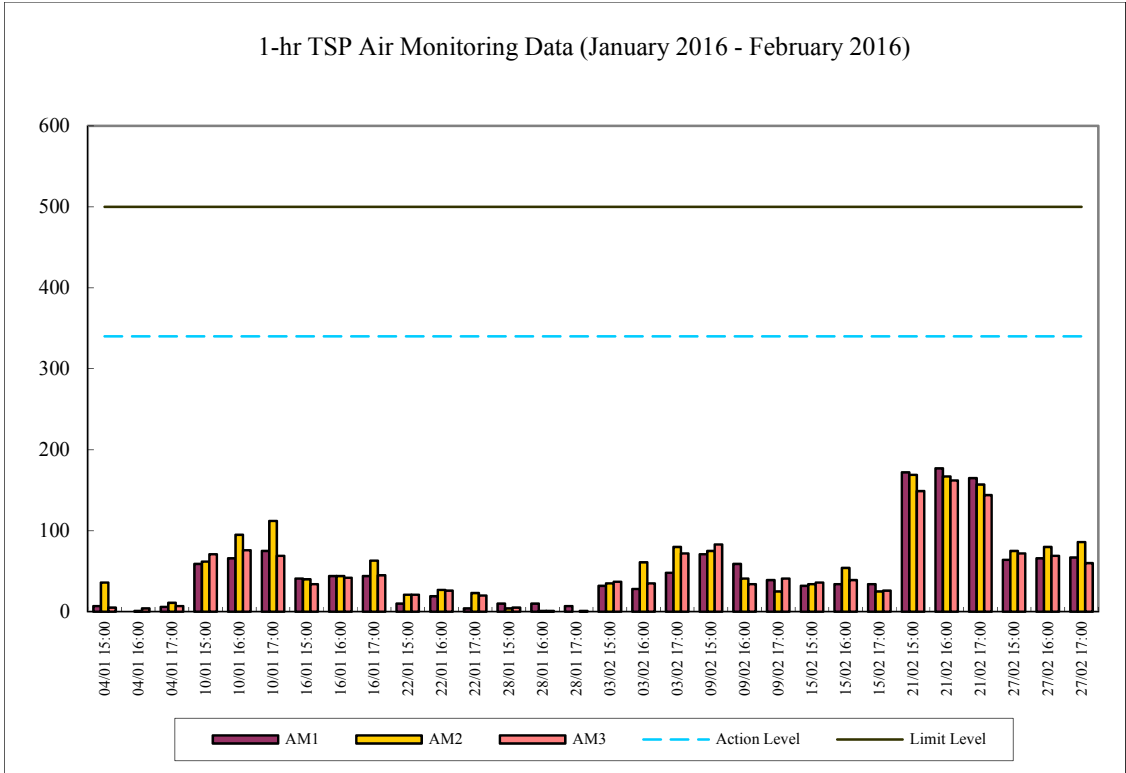
24-hr TSP Air Monitoring Data (January 2016 - February 2016)



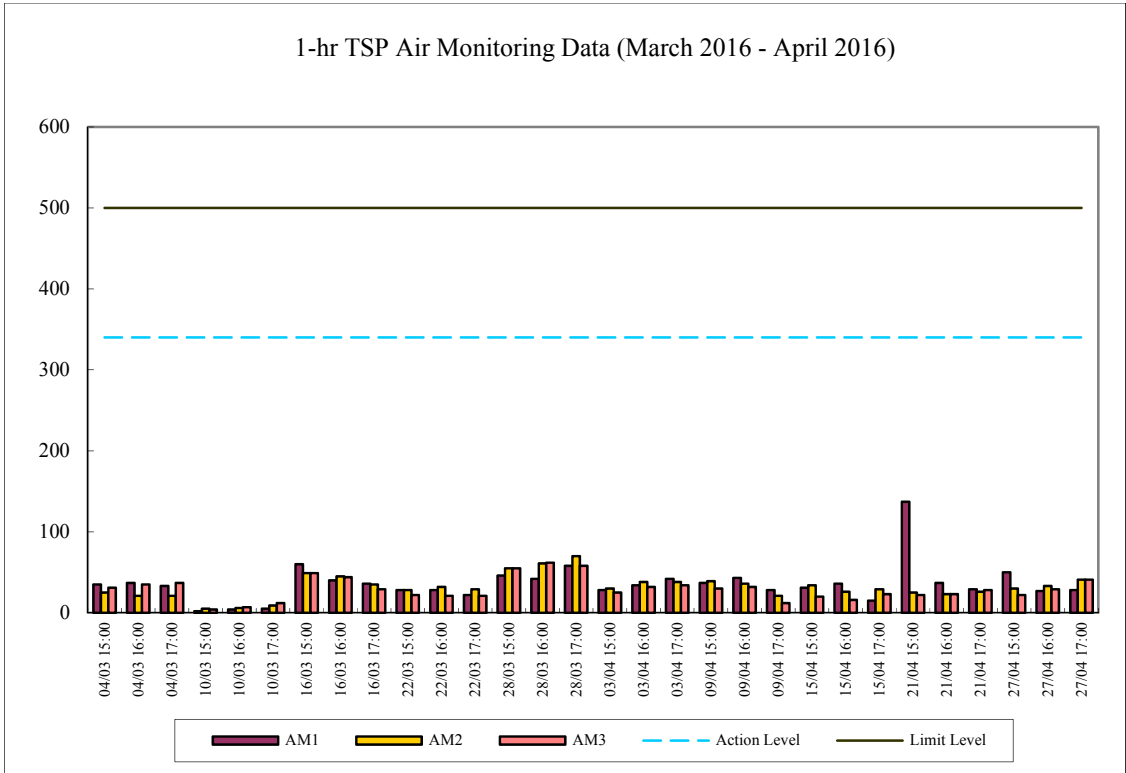
24-hr TSP Air Monitoring Data (March 2016 - April 2016)



1-hr TSP Air Monitoring Data (January 2016 - February 2016)



1-hr TSP Air Monitoring Data (March 2016 - April 2016)



## Appendix E

## Continuous Noise Monitoring Results for April 2016

Site: Lamma Power Station Extension Construction  
 Measurement Location: Ash Lagoon and Ching Lam  
 Measurement Parameter: 30-min Leq (07:00-19:00 hrs on normal weekdays)  
 5-min Leq (07:00-23:00 hrs on holidays and  
 19:00-23:00 hrs on all other days, and 23:00-  
 07:00 hrs of next day)  
 Noise Equipment Used: Rion NA-27 (Ash Lagoon) and B&K 2250 (Ching  
 Lam) sound level meters and B&K 4231 sound  
 level calibrator  
 Last Calibration Date: Rion NA-27 sound level meter - 12/11/2014  
 B&K 2250 sound level meter - 09/11/2015  
 B&K 4231 calibrator - 07/04/2016

Date	Time	Calculated Noise Level at NSR at Long Tsai Tsuen/Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))	Calculated Noise Level at NSR at the school within Tai Wan San Tsuen (dB(A))		Limit Noise Level (dB(A))
		Max	Avg		Max	Avg	
01/04/2016	07:00-19:00	38	38	75	34	34	70
01/04/2016	19:00-23:00	32	28	60	27	23	60
01/04/2016	23:00-07:00	36	30	45	31	25	45
02/04/2016	07:00-19:00	---	---	75	---	---	70
02/04/2016	19:00-23:00	35	27	60	30	23	60
02/04/2016	23:00-07:00	37	29	45	32	26	45
03/04/2016	07:00-23:00	49	31	60	32	22	60
03/04/2016	23:00-07:00	35	27	45	30	22	45
04/04/2016	07:00-23:00	49	31	60	36	26	60
04/04/2016	23:00-07:00	43	35	45	38	30	45
05/04/2016	07:00-19:00	---	---	75	---	---	70
05/04/2016	19:00-23:00	32	26	60	27	21	60
05/04/2016	23:00-07:00	39	31	45	34	26	45

Date	Time	Calculated Noise Level at NSR at Long Tsai Tsuen/Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))	Calculated Noise Level at NSR at the school within Tai Wan San Tsuen (dB(A))		Limit Noise Level (dB(A))
		Max	Avg		Max	Avg	
06/04/2016	07:00-19:00	44	41	75	39	36	70
06/04/2016	19:00-23:00	31	22	60	27	18	60
06/04/2016	23:00-07:00	36	29	45	31	25	45
07/04/2016	07:00-19:00	46	41	75	41	36	75
07/04/2016	19:00-23:00	32	27	60	27	21	60
07/04/2016	23:00-07:00	45	31	45	40	27	45
08/04/2016	07:00-19:00	44	41	75	39	36	70
08/04/2016	19:00-23:00	35	32	60	30	28	60
08/04/2016	23:00-07:00	35	31	45	31	26	45
09/04/2016	07:00-19:00	31	31	75	27	27	70
09/04/2016	19:00-23:00	---	---	60	---	---	60
09/04/2016	23:00-07:00	26	23	45	22	19	45
10/04/2016	07:00-23:00	48	31	60	44	26	60
10/04/2016	23:00-07:00	45	31	45	40	26	45
11/04/2016	07:00-19:00	---	---	75	---	---	70
11/04/2016	19:00-23:00	44	37	60	39	32	60
11/04/2016	23:00-07:00	38	32	45	34	28	45
12/04/2016	07:00-19:00	---	---	75	---	---	70
12/04/2016	19:00-23:00	33	27	60	28	23	60
12/04/2016	23:00-07:00	34	26	45	29	21	45
13/04/2016	07:00-19:00	48	45	75	43	40	70
13/04/2016	19:00-23:00	25	23	60	20	18	60



Date	Time	Calculated Noise Level at NSR at Long Tsai Tsuen/Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))	Calculated Noise Level at NSR at the school within Tai Wan San Tsuen (dB(A))		Limit Noise Level (dB(A))
		Max	Avg		Max	Avg	
13/04/2016	23:00-07:00	33	26	45	28	21	45
14/04/2016	07:00-19:00	---	---	75	---	---	70
14/04/2016	19:00-23:00	33	30	60	28	25	60
14/04/2016	23:00-07:00	36	27	45	31	22	45
15/04/2016	07:00-19:00	---	---	75	---	---	70
15/04/2016	19:00-23:00	37	29	60	32	24	60
15/04/2016	23:00-07:00	36	31	45	31	27	45
16/04/2016	07:00-19:00	---	---	75	---	---	70
16/04/2016	19:00-23:00	---	---	60	---	---	60
16/04/2016	23:00-07:00	36	27	45	31	22	45
17/04/2016	07:00-23:00	33	31	60	29	27	60
17/04/2016	23:00-07:00	44	31	45	31	26	45
18/04/2016	07:00-19:00	---	---	75	---	---	70
18/04/2016	19:00-23:00	36	30	60	32	26	60
18/04/2016	23:00-07:00	40	36	45	36	31	45
19/04/2016	07:00-19:00	41	39	75	33	33	70
19/04/2016	19:00-23:00	42	39	60	37	34	60
19/04/2016	23:00-07:00	41	36	45	36	31	45
20/04/2016	07:00-19:00	---	---	75	---	---	70
20/04/2016	19:00-23:00	35	29	60	30	25	60
20/04/2016	23:00-07:00	39	31	45	34	27	45
21/04/2016	07:00-19:00	*	*	75	*	*	70

Date	Time	Calculated Noise Level at NSR at Long Tsai Tsuen/Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))	Calculated Noise Level at NSR at the school within Tai Wan San Tsuen (dB(A))		Limit Noise Level (dB(A))
		Max	Avg		Max	Avg	
21/04/2016	19:00-23:00	*	*	60	*	*	60
21/04/2016	23:00-07:00	*	*	45	*	*	45
22/04/2016	07:00-19:00	*	*	75	*	*	70
22/04/2016	19:00-23:00	*	*	60	*	*	60
22/04/2016	23:00-07:00	*	*	45	*	*	45
23/04/2016	07:00-19:00	*	*	75	*	*	70
23/04/2016	19:00-23:00	*	*	60	*	*	60
23/04/2016	23:00-07:00	*	*	45	*	*	45
24/04/2016	07:00-23:00	*	*	60	*	*	60
24/04/2016	23:00-07:00	*	*	45	*	*	45
25/04/2016	07:00-19:00	*	*	75	*	*	70
25/04/2016	19:00-23:00	*	*	60	*	*	60
25/04/2016	23:00-07:00	*	*	45	*	*	45
26/04/2016	07:00-19:00	*	*	75	*	*	70
26/04/2016	19:00-23:00	*	*	60	*	*	60
26/04/2016	23:00-07:00	44	36	45	37	27	45
27/04/2016	07:00-19:00	28	28	75	---	---	70
27/04/2016	19:00-23:00	31	25	60	24	19	60
27/04/2016	23:00-07:00	35	31	45	31	27	45
28/04/2016	07:00-19:00	34	34	75	---	---	70
28/04/2016	19:00-23:00	32	26	60	28	21	60
28/04/2016	23:00-07:00	36	28	45	31	23	45

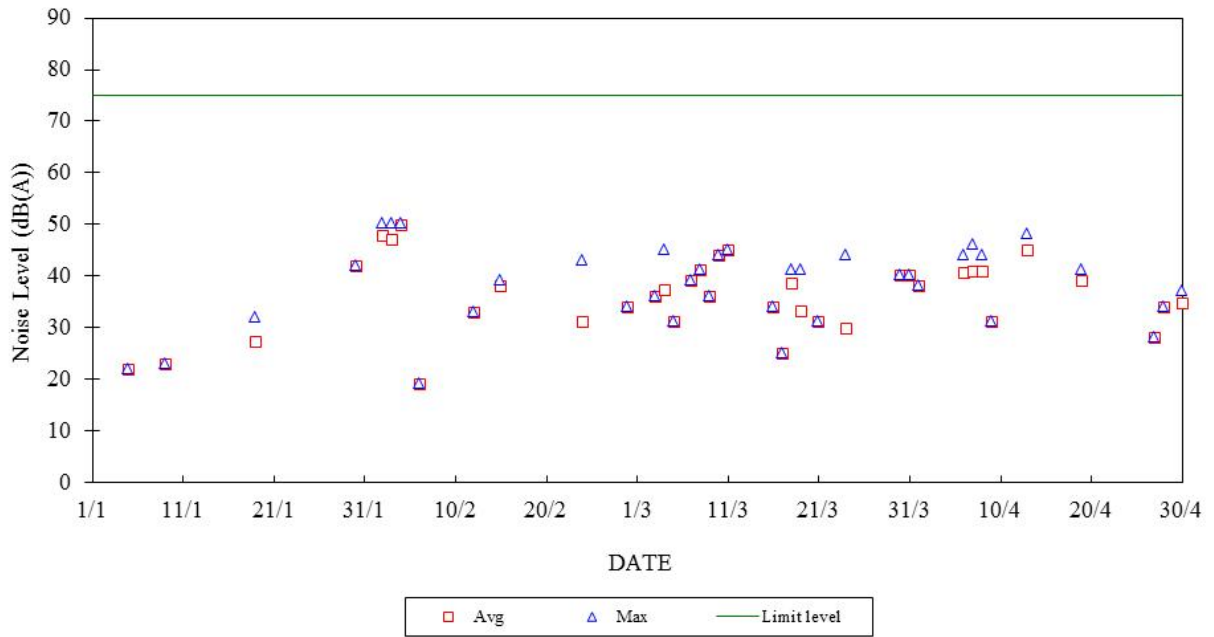
Date	Time	Calculated Noise Level at NSR at Long Tsai Tsuen/Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))	Calculated Noise Level at NSR at the school within Tai Wan San Tsuen (dB(A))		Limit Noise Level (dB(A))
		Max	Avg		Max	Avg	
29/04/2016	07:00-19:00	---	---	75	---	---	70
29/04/2016	19:00-23:00	33	24	60	28	21	60
29/04/2016	23:00-07:00	37	29	45	32	24	45
30/04/2016	07:00-19:00	37	35	75	29	29	70
30/04/2016	19:00-23:00	43	36	60	38	32	60
30/04/2016	23:00-07:00	42	30	45	34	29	45

Note:

- a. "---" represents the measured noise monitoring data lower than the established notional background level/discarded under strong wind.
- b. "\*\*" represents the noise data lost due to computer defect.
- c. Due to construction noise permit commencing from 05/02/2016 19:00, continuous noise monitoring was carried out at holidays & evening-time (07:00-23:00 hrs on holidays and 19:00-23:00 hrs on all other days) and night-time (23:00-07:00 hrs of next day).

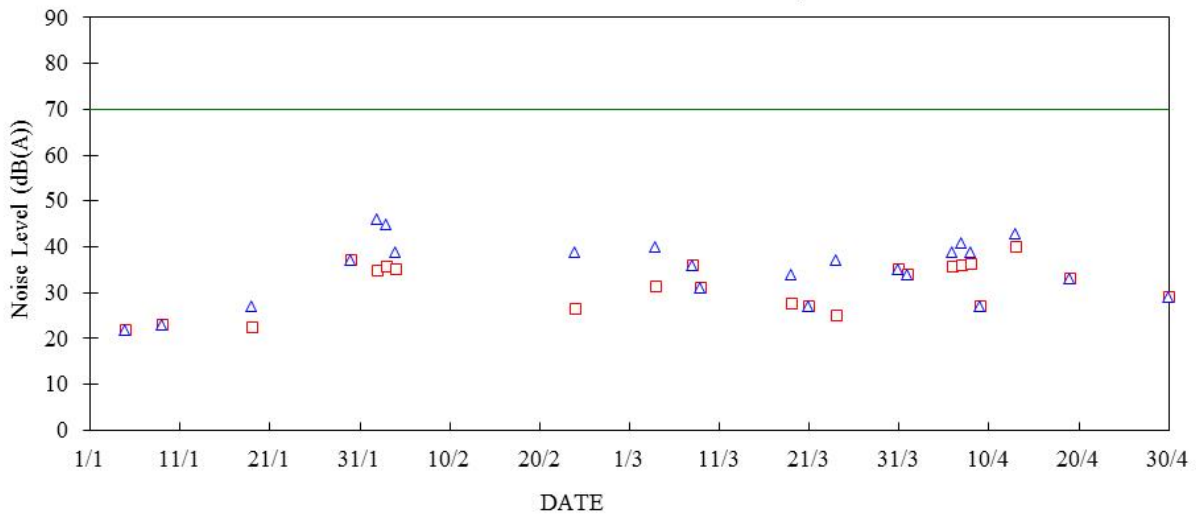
**Construction Noise Monitoring in January - April 2016**

NSR at Long Tsai Tsuen/Hung Shing Ye  
07:00-19:00 hrs on Normal Weekdays

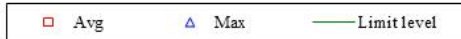


**Construction Noise Monitoring in January - April 2016**

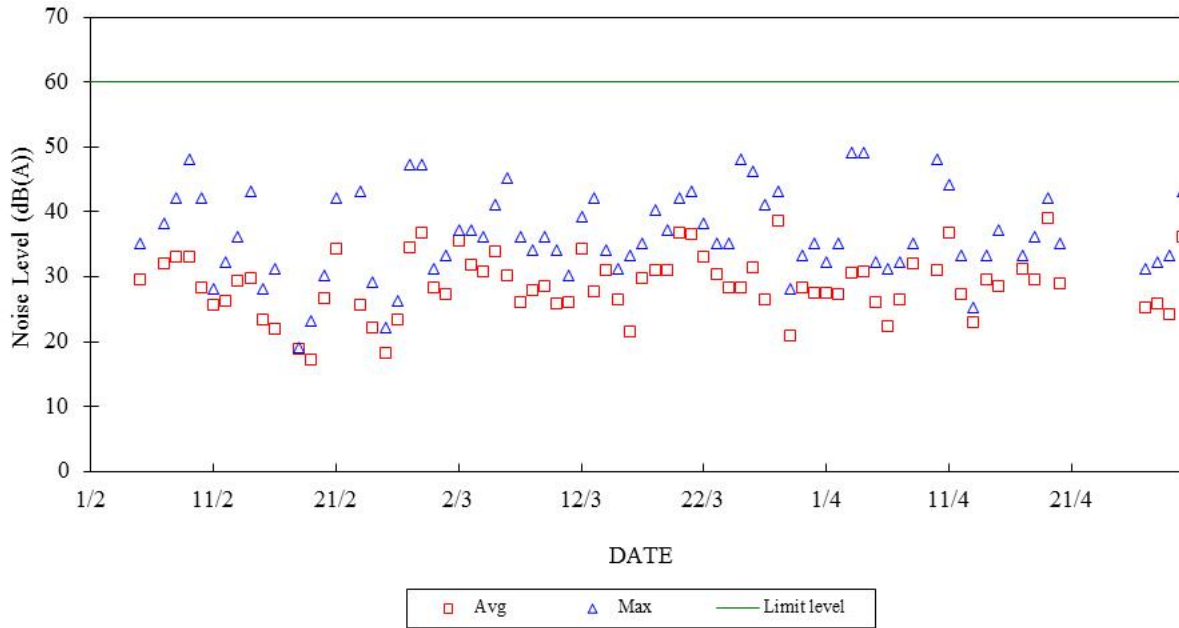
NSR at School within Tai Wan San Tsuen  
07:00-19:00 hrs on Normal Weekdays



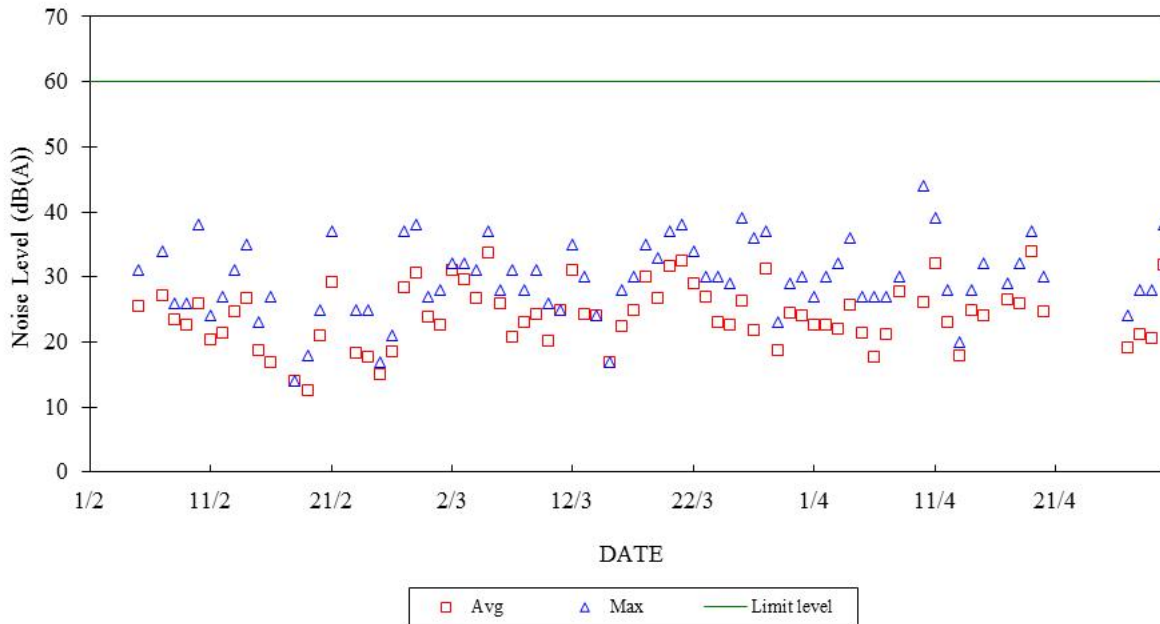
Note: The limit level was reduced to 65 dB(A) during the examination periods on 12-15/1/2016 and 12-15/4/2016.



**Construction Noise Monitoring in February - April 2016**  
NSR at Long Tsai Tsuen/Hung Shing Ye  
07:00-23:00 hrs on Holidays and 19:00-23:00 hrs on All Other Days



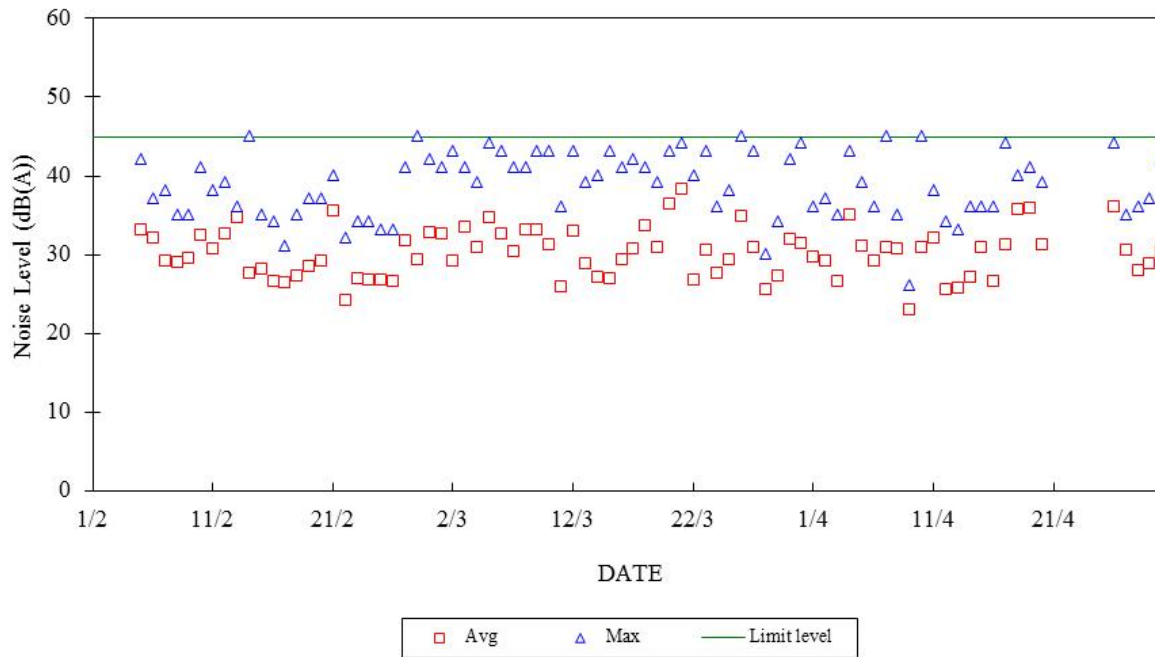
**Construction Noise Monitoring in February - April 2016**  
NSR at School within Tai Wan San Tsuen  
07:00-23:00 hrs on Holidays and 19:00-23:00 hrs on All Other Days



### Construction Noise Monitoring in February - April 2016

NSR at Long Tsai Tsuen/Hung Shing Ye

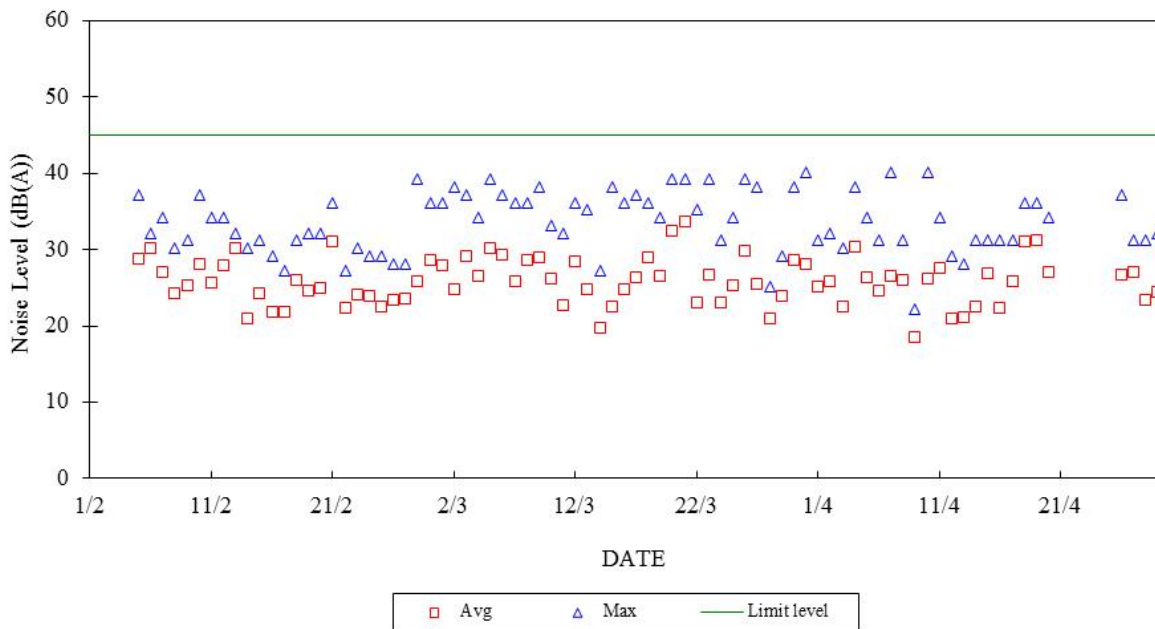
23:00-07:00 hrs of Next Day



### Construction Noise Monitoring in February - April 2016

NSR at School within Tai Wan San Tsuen

23:00-07:00 hrs of Next Day



# Appendix F

## The QA/QC Procedures and Results

**THE HONGKONG ELECTRIC CO., LTD.**  
**LAMMA POWER STATION EXTENSION**  
**TEOM CONTINUOUS DUST MONITOR**  
**DATA QUALITY ASSURANCE LOG SHEET**

Month: April

Year: 2016

Reservoir (AM1)				
Date	Frequency (Hz) (240 – 270)	Operation Mode (Mode 4)	Main Flow (l/min) (2.70 – 3.30)	Bypass Flow (l/min) (12.30 – 15.04)
3/4/2016	259.844	4	3.02	13.77
9/4/2016	260.656	4	3.01	13.70
15/4/2016	260.362	4	3.05	13.89
21/4/2016	259.948	4	3.00	13.68
27/4/2016	259.558	4	2.99	13.64

East Gate (AM2)				
Date	Frequency (Hz) (240 – 270)	Operation Mode (Mode 4)	Main Flow (l/min) (2.70 – 3.30)	Bypass Flow (l/min) (12.30 – 15.04)
3/4/2016	254.226	4	3.03	13.78
9/4/2016	257.963	4	3.03	13.75
15/4/2016	257.599	4	3.05	13.91
21/4/2016	257.168	4	3.05	13.74
27/4/2016	258.302	4	3.00	13.65

Ash Lagoon (AM3)				
Date	Frequency (Hz) (240 – 270)	Operation Mode (Mode 4)	Main Flow (l/min) (0.90 – 1.10)	Bypass Flow (l/min) (14.10 – 17.20)
3/4/2016	264.759	4	1.00	15.36
9/4/2016	264.662	4	1.00	15.70
15/4/2016	264.562	4	1.00	15.70
21/4/2016	264.413	4	1.00	15.70
27/4/2016	264.296	4	1.00	15.70

Maintenance Record			
	Reservoir	East Gate	Ash Lagoon
TEOM Filter Exchange	✓	✓	✓
Clean TSP Inlet	✓	✓	✓
Replace flow in-line filter			
Pump Repair			
Leak Check	✓		
Flow Audit	✓		
Flow Controller Calibration			
A/C filter cleaning	✓	✓	✓

Remarks:

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Prepared by :           *Ala*          

Checked by :           *Ma*



HIGH VOLUME AIR SAMPLER  
SITE VISIT LOG SHEET

Site Name: R.E. Site No.: AM1  
 Date of visit: 19-4-2016 Hour of Visit: 10:02  
 Staff name: W.H.MAN/H.F.Lo HVAS S/N: 0131  
 Used filter paper no.: MG74 New filter paper no.: MG76  
 Type of filter: Glass-fibre

I. Ambient Conditions

Temperature,  $T_a = 294.5$  K Pressure,  $P_a = 1012.3$  mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions corresponds to $Q_{STD} = 40$ ft <sup>3</sup> /min. (inch H <sub>2</sub> O)
1535(10/2015)	$H_a = 17.93(T_a/P_a) = 5.21$

Manometer reading before calibration: 5.1  
 Adjustment of flow controller (Y/N): Y  
 Manometer reading after calibration: 5.2

Note: Tolerance Limit of HVAS flow: " 1.0 ft<sup>3</sup>/min. Corresponding limits for manometer: " 0.2 inch H<sub>2</sub>O

III. General Conditions of HVAS

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

IV. Remarks

\_\_\_\_\_  
 \_\_\_\_\_

Conducted by: W.H.MAN/H.F.Lo Checked by: [Signature]

**HIGH VOLUME AIR SAMPLER  
SITE VISIT LOG SHEET**

Site Name: E.G. Site No.: AM2  
 Date of visit: 19-4-2016 Hour of Visit: 10:45  
 Staff name: W.H.MAN/H.F.L. HVAS S/N: 0132  
 Used filter paper no.: M675 New filter paper no.: M677  
 Type of filter: Glass-fibre

I. Ambient Conditions

Temperature,  $T_a = 295.2$  K Pressure,  $P_a = 1016.3$  mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions corresponds to $Q_{STD} = 40$ ft <sup>3</sup> /min. (inch H <sub>2</sub> O)
1535(10/2015)	$H_a = 17.93(T_a/P_a) = 5.21$

Manometer reading before calibration: 5.0  
 Adjustment of flow controller (Y/N): Y  
 Manometer reading after calibration: 5.3

Note: Tolerance Limit of HVAS flow: " 1.0 ft<sup>3</sup>/min. Corresponding limits for manometer: " 0.2 inch H<sub>2</sub>O

III. General Conditions of HVAS

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

IV. Remarks

\_\_\_\_\_  
 \_\_\_\_\_

Conducted by: W.H.MAN/H.F.L. Checked by: [Signature]

MINI VOLUME AIR SAMPLER  
SITE VISIT LOG SHEET

Site Name: TYV Site No.: AM4  
Date of visit: 19-4-2016 Hour of Visit: 11:24  
Staff name: W.H.MAN/H.F.Lo MINIVOL S/N: 3393  
Used filter paper no.: M025 New filter paper no.: M026

Type of filter: ~~Cellulose~~ / Glass-fibre  
(Delete as appropriate)

I. Calibration is performed by using Drycal DC-2 Flow Calibrator

5 Sl/min set point is recommended

4.9 Before 5.05 After

II. General Service of Mini Vol Air Sampler

1. Clean Rotameter:
2. Clean / replace Pump Valves:
3. Clean / ~~replace~~ Pump Diaphragms:
4. Clean Impaction Inlet:
5. Replace Timer Battery Every 6 months:
6. Replace Inlet Filter:

III. Remarks

/  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Conducted by: W.H.MAN/H.F.Lo

Checked by: [Signature]

THE HONGKONG ELECTRIC CO., LTD.  
LAMMA POWER STATION AND LAMMA EXTENSION  
NOISE MONITORING STATIONS  
SITE VISIT LOG SHEET

Location ~~Station Building Rooftop/Reservoir Area/Ching Lam/~~  
~~Ash Lagoon/No.2 Limestone Silo Roof/Hung Shing Ye\*~~

Date 12-4-2016 Time 10:55

Equipment RION NA-27 Serial No. 00111465

Staff Attended H.K. TSANG / H.F. LO

1. Calibration

Acoustic calibrator

B&K Type 4231 S/N: 2730419

Noise level measured in calibration 94.0 (94±1.0 dBA)

2. Weather Conditions

a. ~~Sunny/fine/cloudy/showery/heavy rain\*~~

b. Strong wind/breeze/calm\*

3. Remark/Observation

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Note: \* - Please delete where inappropriate.

Conducted By: Ky / H.F. LO Checked By: Terence Chu

28/12/2007

THE HONGKONG ELECTRIC CO., LTD.  
LAMMA POWER STATION AND LAMMA EXTENSION  
NOISE MONITORING STATIONS  
SITE VISIT LOG SHEET

Location Station Building Rooftop/Reservoir Area/Ching Lam/  
Ash Lagoon/No.2 Limestone Silo Roof/Hung Shing Ye\*

Date 14-4-2016 Time 15:23

Equipment B&K 2250 Serial No. 3008621

Staff Attended H.K. TSANG / H.F. Lo

1. Calibration

Acoustic calibrator B&K Type 231 S/N: 2730419

Noise level measured in calibration 94.0 (94±1.0 dBA)

2. Weather Conditions

a. ~~Sunny/fine/cloudy/showery/heavy rain\*~~

b. ~~Strong wind/breeze/calm\*~~

3. Remark/Observation

/  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Note: \* - Please delete where inappropriate.

Conducted By: H.F. Lo Checked By: Terence Chin

## Appendix G Event/Action Plans

Table G.1 Event and Action Plans for Air Quality

Event	Monitoring		Action	
	ET Leader	IEC	Engineer	Contractor
<b>Action Level</b>				
Exceedance of one sample	Identify source Inform Engineer and IEC verbally Repeat measurement to confirm finding	Check monitoring data submitted by ET and advise Engineer.	Notify Contractor Checking monitoring data and contractor's working methods	Rectify any unacceptable practice amend any working methods if appropriate
Exceedance of two or more consecutive samples	Identify source Inform Engineer and IEC verbally Repeat measurement to confirm finding Increase monitoring frequency Discuss with Engineer and Contractor on remedial actions required If exceedance continues, arrange meeting with Engineer If exceedance stops, discontinue additional monitoring	Check monitoring data submitted by ET and advise Engineer. Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Confirm receipt of notification of failure in writing Notify contractor Checking monitoring data and contractor's working methods Discuss proposed remedial actions with the ET and Contractor Ensure remedial actions properly implemented	Submit proposals for remedial actions to Engineer within 3 working days of notifications Implement the agreed proposals Amend proposal if appropriate
<b>Limit level</b>				
Exceedance of one sample	Repeat measurement to confirm finding. Identify the source(s) of the impact. If the exceedance is found to be valid and due to the Construction works, verbally advise the Contractor, Engineer and IEC, and inform the EPD of the exceedance, as soon as practicable. Increase monitoring frequency to daily Assess the effectiveness of the contractor's remedial actions and keep Engineer, IEC and EPD informed of the results	Check monitoring data submitted by ET and advise Engineer Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Confirm receipt of notification of failure in writing Notify Contractor Checking monitoring data and Contractor's working method Discuss with ET and Contractor on remedial actions to be provided Ensure remedial measures properly implemented	Take immediate action to avoid further exceedance Submit proposals for remedial actions to Engineer within 3 working days of notifications Implement the agreed proposals Amend proposal if appropriate
Exceedance of two or more	Identify source	Provide feedback to the Engineer on the remedial actions proposed by the	Confirm receipt of notification of	Take immediate action to

Event	Monitoring			Action		
	ET Leader	IEC	Engineer	Contractor		
consecutive samples	<p>If the exceedance is found to be valid and due to the construction works, verbally advise the Contractor, Engineer and IEC, and inform the EPD of the exceedance as soon as practicable.</p> <p>Repeat measurement to confirm finding</p> <p>Increase monitoring frequency to daily</p> <p>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</p> <p>Arrange meeting with Engineer and Contractor to discuss the remedial actions to be taken</p> <p>If exceedance stops, discontinue additional monitoring</p>	<p>ET / Contractor</p> <p>Advise Engineer on the effectiveness of the proposed remedial measures</p> <p>Verify the implementation of the remedial measures</p>	<p>failure in writing</p> <p>Checking monitoring data and Contractor's working methods</p> <p>Notify Contractor</p> <p>Discuss proposed remedial actions with ET and Contractor</p> <p>Ensure remedial measures properly implemented</p> <p>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop the portion of work until the exceedance is abated</p>	<p>avoid further exceedance</p> <p>Submit proposals for remedial actions to Engineer within 3 working days of notifications</p> <p>Implement the agreed proposals</p> <p>Resubmit proposals if problem still not under control</p> <p>Stop the relevant portion of works as determined by the Engineer until the exceedance is abated</p>		

Table G.2 Event and Action Plans for Construction Noise

Exceedance	ET Leader	IEC	Engineer	Contractor
<b>Action Level</b>	Undertake noise measurement/check monitoring data to establish validity of complaint.	Review the analysed results submitted by the ET.	Notify Contractor of the complaint if proven.	Submit proposals for remedial actions to Engineer.
	If the complaint is valid, inform Engineer and IEC verbally.	Review the remedial measures proposed by the Contractor and advise the Engineer and ET accordingly.	Check Contractor's working methods and advise IEC and ET accordingly.	Amend proposals if required by the Engineer.
	Identify the source(s) of the noise.	Verify the implementation of the remedial measures.	Remind the Contractor of his contractual obligations and discuss remedial actions.	Implement the remedial actions immediately upon instruction from the Engineer.
	Discuss remedial actions required with Contractor and Engineer.		Keep the Contractor informed of the efficacy of remedial actions.	Liaise with the Engineer to optimise the effectiveness of the agreed mitigation.
	Increase manual monitoring frequency to assess efficacy of remedial measures.			
	If exceedance continues, review implementation of appropriate mitigation measures.			
<b>Limit Level</b>	Repeat manual measurement/check monitoring data to confirm findings.	Agree potential remedial actions with Engineer, ET and Contractor.	Notify Contractor of exceedance.	Take immediate action to avoid further exceedance.
	Identify the source(s) of the impact. If the exceedance is found to be valid and due to the Construction works, verbally advise the Contractor, Engineer and IEC, and inform the EPD of the exceedance, as soon as practicable.	Review Contractor's remedial actions / measures to ensure their effectiveness and advise the Engineer and ET accordingly.	Check Contractor's working methods and advise IEC and ET accordingly.  Discuss with Contractor the remedial actions to be implemented.	Submit proposals for remedial actions to Engineer.  Amend proposals if required by the Engineer.
	Discuss remedial actions required with Engineer.	Verify the implementation of the remedial measures	Keep the Contractor informed of the efficacy of remedial actions. If the exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop the portion of work until the exceedance is abated	Implement remedial actions immediately upon instruction from the Engineer. If the exceedance continues, consider what portion of the work is responsible and, as instructed by the Engineer, stop the portion of work until the exceedance is abated
	Increase manual monitoring frequency to assess efficacy of remedial measures.			



Table G.3 Event and Action Plans for Water Quality

<b>Exceedance</b>	<b>ET Leader</b>	<b>IEC</b>	<b>Engineer</b>	<b>Contractor</b>
Action level exceeded on one sampling day	Verbally inform the Contractor, and IEC. Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with Engineer and Contractor; Repeat measurement on next day of exceedance.	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with Contractor the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose and discuss mitigation measures with Engineer; Implement the agreed mitigation measures.
Action level exceeded on more than one consecutive sampling day	Repeat in-situ measurements to confirm findings; Identify source(s) of impact; Inform Contractor and IEC; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measure with Engineer and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; Repeat measurement on next day of exceedance.	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with ET and Contractor on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose mitigation measures to Engineer within 3 working days and discuss with ET and Engineer; Implement the agreed mitigation measures.
Limit level exceeded on one sampling day	Verbally inform the Contractor, IEC and the EPD of the exceedance; Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Check monitoring data, all plant,	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose mitigation measures to Engineer

<b>Exceedance</b>	<b>ET Leader</b>	<b>IEC</b>	<b>Engineer</b>	<b>Contractor</b>
	<p>equipment and Contractor's working methods;</p> <p>Discuss mitigation measure with Engineer and Contractor;</p> <p>Ensure mitigation measures are implemented;</p> <p>Increase the monitoring frequency to daily until no exceedance of Limit level.</p>		<p>implemented mitigation measures.</p>	<p>within 3 working days and discuss with Engineer;</p> <p>Implement the agreed mitigation measures.</p>
<p>Limit level exceeded by more than one consecutive sampling day</p>	<p>Repeat in-situ measurement to confirm findings;</p> <p>Identify source(s) of impact;</p> <p>Inform Contractor, IEC and EPD;</p> <p>Check monitoring data, all plant, equipment and Contractor's working methods;</p> <p>Discuss mitigation measure with Engineer and Contractor;</p> <p>Ensure mitigation measures are implemented;</p> <p>Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</p>	<p>Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor</p> <p>Advise Engineer on the effectiveness of the proposed remedial measures</p> <p>Verify the implementation of the remedial measures</p>	<p>Discuss with Contractor on the proposed mitigation measures;</p> <p>Request Contractor to critically review the working methods;</p> <p>Make agreement on the mitigation measures to be implemented;</p> <p>Assess the effectiveness of the implemented mitigation measures;</p> <p>Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine works until no exceedance of the Limit Level.</p>	<p>Inform the Engineer and confirm notification of the non-compliance in writing;</p> <p>Rectify unacceptable practice;</p> <p>Check all plant and equipment; Consider changes of working methods;</p> <p>Propose mitigation measures to Engineer within 3 working days and discuss with Engineer;</p> <p>Implement the agreed mitigation measures..</p> <p>As directed by the Engineer, to slow down or to stop all or part of the marine work</p>

## **Appendix H Summary of Site Audit Findings**

### Dates of Inspection

01/04/2016, 08/04/2016, 15/04/2016 22/04/2016 and 29/04/2016.

### Summary of Findings

#### *General*

- No environmental deficiency identified.

#### *Air Quality*

- No environmental deficiency identified.

#### *Noise*

- No environmental deficiency identified.

#### *Water Quality*

- No environmental deficiency identified.

#### *Waste Management*

- No environmental deficiency identified.

## Summary of EMIS

### Power Station – (Part B of EIA Report)

#### Construction Phase Mitigation Measures and their Implementation

EM&A Log Ref.	Mitigation Measures	Implementation Status
	<b>AIR QUALITY</b>	
A1	For general construction works, the dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation shall be complied with, such as: <ul style="list-style-type: none"> <li>the haul roads shall be sprayed with water to keep the entire road surface wet.</li> <li>the load carried by vehicle shall be covered by impervious sheeting to ensure no leakage of dusty materials from the vehicle.</li> <li>the heights from which fill materials are dropped shall be controlled to a practical level to minimise the fugitive dust arising from unloading.</li> </ul>	C C C
A2	For the concrete batching plant, the following control measures are recommended: <ul style="list-style-type: none"> <li>loading, unloading, handling, transfer or storage of any dusty materials shall be carried out in a totally enclosed system.</li> <li>The materials which may generate airborne dust emissions shall be wetted by water spray system.</li> <li>All receiving hoppers shall be enclosed on three sides up to 3m above unloading point.</li> <li>All conveyor transfer points shall be totally enclosed.</li> </ul>	C C C C
	<b>WATER QUALITY</b>	
B1	Silt curtains shall be installed on the eastern, southern and north western sides of the reclamation site during dredging for the reclamation construction. This is a required mitigation measure for the construction works and shall be implemented prior to the commencement of bulk dredging. **	N/A
B3	As a necessary operational constraint combined bulk dredging and sand filling for site formation shall not be permitted at any time. In addition, sand filling for site platform shall take place behind constructed sea walls which pierce the water surface. **	N/A
B4	HEC shall ensure design to divert all storm drains away from Hung Shing Ye Bay. **	N/A
B5	Sand fill for the rubble mound seawalls shall be placed by controlled pumping down the trailer arm. **	N/A
B6	EM&A shall confirm the acceptability of any impacts during construction and should any unacceptable impacts be found then one or more of the following mitigation measures shall be implemented: ** <ul style="list-style-type: none"> <li>reducing the number of dredgers working at any one time;</li> <li>reducing the rate of working of the dredgers;</li> <li>temporary suspension of operations;</li> <li>phasing of the works so that dredging / filling is only undertaken at certain stages of the tidal cycle.</li> </ul>	N/A

EM&A Log Ref.	Mitigation Measures	Implementation Status
B7	<p>In addition to the above specific measures the following general working procedures shall be adopted. **</p> <ul style="list-style-type: none"> <li>• fully-enclosed or watertight grabs shall be used to minimise loss of sediment during the raising of loaded grabs through the water column;</li> <li>• the descent speed of grabs shall be controlled to minimise the seabed impact speed and to reduce the volume of over dredging;</li> <li>• barges shall be loaded carefully to avoid splashing of material;</li> <li>• all barges used for the transport of dredged materials shall be fitted with tight bottom seals in order to prevent leakage of material during loading and transport;</li> <li>• all barges shall be filled to a level which ensures that material does not spill over during loading and transport to the disposal site and that adequate freeboard is maintained to ensure that the decks are not washed by wave action;</li> <li>• the speed of trailer dredgers shall be controlled to prevent propeller wash from stirring up the sea bed sediments;</li> <li>• "rainbowing" sand fill from trailer dredgers shall not be permitted; and</li> <li>• the works shall cause no visible foam, oil, grease or litter or other objectionable matter to be present in the water within and adjacent to the dredging site and along the route to the disposal site.</li> </ul>	          
B8	<p>Cumulative impacts shall be assessed through EM&amp;A. Co-ordination with the EM&amp;A consultants for other projects to determine if any exceedances are caused by the other projects or by HEC's activities. Should monitoring results indicate exceedances at sensitive receivers due to HEC's activities, then the above described mitigation measures shall be implemented until impacts reduce to acceptable levels. **</p>	N/A
<b>NOISE</b>		
C1	General noise mitigation measures shall be employed at all work sites throughout the construction phase.	C
C2	Mitigate against general construction noise during Sunday's and public holidays, either at source with portable noise barriers, or by rescheduling of some PME's to less sensitive time periods.	C
C3	Mitigate against night time noise from dredging equipment, with silencers or mufflers. **	N/A
<b>LANDSCAPE &amp; VISUAL IMPACTS</b>		
D1	<p>The following mitigation measures shall be allowed for landscape and visual improvement:</p> <ul style="list-style-type: none"> <li>• Use rubble mound seawall along south and west edges of the reclamation to provide a more natural look.</li> <li>• Break the mass of main buildings by varying the height/division into smaller units.</li> <li>• Plant trees and vegetation for screening.</li> <li>• Adopt colour scheme to blend the buildings into the scenery.</li> </ul>	    

EM&A Log Ref.	Mitigation Measures	Implementation Status
<b>WASTE MANAGEMENT</b>		
E1	HEC to submit a Waste Management Plan for the construction phase to EPD. The Plan shall be verified by the IEC and shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommendations of the EIA report.	C
<i>Dredging Waste</i>		
E2	All vessels for marine transportation of dredged sediment shall be fitted with tight fitting seals to their bottom openings to prevent leakage of materials. In addition, loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water, and barges or hoppers should under no circumstances be filled to a level which shall cause the overflowing of materials or polluted water during loading or transportation**	N/A
<i>Storage, Collection and Transport of Waste</i>		
E3	<ul style="list-style-type: none"> <li>• Minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers.</li> </ul>	C
	<ul style="list-style-type: none"> <li>• Obtain the necessary waste disposal permits from the appropriate authorities, if they are required, in accordance with the Waste Disposal Ordinance (Cap.354), Waste Disposal (Chemical Waste) (General) Regulation (Cap.354), the Crown Land Ordinance (Cap 28), Dumping at Sea Ordinance (Cap 466) and Work Branch Technical Circular No. 22/92, Marine Disposal of Dredged Mud.</li> </ul>	C
	<ul style="list-style-type: none"> <li>• Disposal of waste at Licensed sites;</li> </ul>	C
	<ul style="list-style-type: none"> <li>• Develop procedures such as a ticketing system to facilitate tracking of marine mud and chemical waste, and to ensure that illegal disposal does not occur;</li> </ul>	C
	<ul style="list-style-type: none"> <li>• Segregate and sort the waste materials into 3 categories:               <ul style="list-style-type: none"> <li>• public fill (e.g. concrete and rubble) for re-use on-site or disposal at a public filling area;</li> <li>• re-use and/or recycling waste (e.g. steel and other metals);</li> <li>• waste which cannot be re-used and/or recycled (e.g. wood, glass and plastic) for landfill disposal.</li> <li>• The sorting process shall be carefully monitored to avoid missing of the 3 categories. Different types of wastes shall be stockpiled and stored in different containers or skips to enhance re-use or recycling of materials and their proper disposal.</li> </ul> </li> <li>• Maintain records of the quantities of wastes generated and disposed off-site for each category of waste.</li> </ul>	C
E4	Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes	C
<b>LAND CONTAMINATION</b>		
F1	No land Contamination mitigation measures are required during the construction phase.	N/A
<b>MARINE ECOLOGY</b>		

<b>EM&amp;A Log Ref.</b>	<b>Mitigation Measures</b>	<b>Implementation Status</b>
G1	All percussive piling works shall be conducted on reclaimed land to avoid noise impact to marine mammals**	N/A
G2	All construction related vessels shall approach the extension site from the north and via the East Lamma Channel to avoid disturbance to the finless porpoise**	N/A
G3	Rubble mound seawall to the south and west edges of the reclamation to enhance recolonisation of marine organisms**	N/A
G4	Artificial Reefs of a volume not less than 400 m <sup>3</sup> shall be deployed in a location to be decided upon consultation with the Director of Agriculture and Fisheries to serve the purpose of an Additional Habitat Enhancement Measure.**	N/A
<b>FISHERIES</b>		
H1	No Fisheries-specific mitigation measures are required during the construction phase.	N/A
<b>RISK ASSESSMENT</b>		
I1	No risk mitigation measures are required during the construction phase.	N/A

## Remarks:

- \*\* - No dredging and reclamation work would be involved for L10 construction
- C - Compliance with mitigation measure
- NC - Non-compliance with mitigation measure
- N/A - Not Applicable

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

Contract No. 15/8009 - Lamma Power Station Extension Foundation Works for Unit L10

Master Programme Revision 1

ID	Item	Task Name	Duration	Start	Finish	2016年		
						M5 5月	M6 6月	M7 7月
1		<b>1 Key Date</b>	<b>486 days</b>	<b>1月1日星期五</b>	<b>4月30日星期日</b>			
2	1.1	Commencement date	0 days	1月1日星期五	1月1日星期五			
3	1.2	Duration of works	486 days	1月1日星期五	4月30日星期日			
4	1.3	Possession date	0 days	1月1日星期五	1月1日星期五			
5	1.4	Completion of the Contract	0 days	4月30日星期日	4月30日星期日			
6								
7		<b>2 Total Contract Period</b>	<b>486 days</b>	<b>1月1日星期五</b>	<b>5月1日星期一</b>			
8								
9	2.1	<b>Preliminaries</b>	<b>37 days</b>	<b>1月1日星期五</b>	<b>2月6日星期六</b>			
10	2.1.1	Coordination with utility companies	14 days	1月1日星期五	1月14日星期四			
11	2.1.2	Condition survey	20 days	1月1日星期五	1月20日星期三			
12	2.1.3	Notification of commencement of works to Labour Department	7 days	1月1日星期五	1月7日星期四			
13	2.1.4	Notification of air pollution control for commencement of works to EPD	7 days	1月1日星期五	1月7日星期四			
14	2.1.5	Application of water discharge licence from EPD	7 days	1月1日星期五	1月7日星期四			
15	2.1.6	Application for billing account for disposal of construction waste from EPD	7 days	1月1日星期五	1月7日星期四			
16	2.1.7	CCTV for existing underground drainage pipe around site boundary	21 days	1月1日星期五	1月21日星期四			
17	2.1.8	Utility detection for existing underground cables	20 days	1月1日星期五	1月20日星期三			
18	2.1.9	Site clearance	21 days	1月1日星期五	1月21日星期四			
19	2.1.10	Erection of contractor's site office	21 days	1月1日星期五	1月21日星期四			
20	2.1.11	Installation of monitoring checkpoints	20 days	1月18日星期一	2月6日星期六			
21	2.1.12	Submission of BA10 for ELS & foundation works	0 days	1月1日星期五	1月1日星期五			
22								
23	2.2	<b>Section A</b>	<b>305 days</b>	<b>1月1日星期五</b>	<b>10月31日星期一</b>			
24	2.2.1	<b>Hoarding</b>	<b>90 days</b>	<b>1月1日星期五</b>	<b>3月30日星期三</b>			
25	2.2.1.1	Erection of Hoarding	90 days	1月1日星期五	3月30日星期三			
26	2.2.2	<b>Foundation Works at Unit L10</b>	<b>295 days</b>	<b>1月11日星期一</b>	<b>10月31日星期一</b>			
27	2.2.2.1	<b>Bored Pile - Temporary Steel Casing</b>	<b>56 days</b>	<b>1月22日星期五</b>	<b>3月17日星期四</b>			
28	2.2.2.1.1	Duration for delivery temporary steel casing	56 days	1月22日星期五	3月17日星期四			
29	2.2.2.2	<b>Bored Pile - Permanent Casing &amp; Double Wall Liner</b>	<b>172 days</b>	<b>2月24日星期三</b>	<b>8月13日星期六</b>			
30	2.2.2.2.1	Testing for double wall liner	0 days	2月24日星期三	2月24日星期三			
31	2.2.2.2.2	Duration for delivery permanent casing & double wall liner	160 days	3月7日星期一	8月13日星期六			
32	2.2.2.3	<b>Bored Pile - Plant Mobilization</b>	<b>56 days</b>	<b>1月15日星期五</b>	<b>3月11日星期五</b>			
33	2.2.2.3.1	<b>Crawler Crane</b>	<b>53 days</b>	<b>1月15日星期五</b>	<b>3月8日星期二</b>			
34	2.2.2.3.1.1	1st & 2nd set	0 days	1月15日星期五	1月15日星期五			
35	2.2.2.3.1.2	3rd set	0 days	2月4日星期四	2月4日星期四			
36	2.2.2.3.1.3	4th & 5th set	0 days	2月19日星期五	2月19日星期五			
37	2.2.2.3.1.4	6th set	0 days	3月8日星期二	3月8日星期二			
38	2.2.2.3.2	<b>Oscillator</b>	<b>35 days</b>	<b>1月29日星期五</b>	<b>3月4日星期五</b>			
39	2.2.2.3.2.1	1st & 2nd set	0 days	1月29日星期五	1月29日星期五			
40	2.2.2.3.2.2	3rd & 4th set	0 days	2月24日星期三	2月24日星期三			
41	2.2.2.3.2.3	5th set	0 days	3月4日星期五	3月4日星期五			
42	2.2.2.3.3	<b>RCD</b>	<b>7 days</b>	<b>3月4日星期五</b>	<b>3月11日星期五</b>			
43	2.2.2.3.3.1	1st & 2nd set	0 days	3月4日星期五	3月4日星期五			
44	2.2.2.3.3.2	3rd, 4th & 5th set	0 days	3月11日星期五	3月11日星期五			
45	2.2.2.4	<b>Predrilling</b>	<b>60 days</b>	<b>1月11日星期一</b>	<b>3月10日星期四</b>			
46	2.2.2.4.1	Predrilling works (38 nos.)	60 days	1月11日星期一	3月10日星期四			
47	2.2.2.5	<b>Bored Pile Construction</b>	<b>263 days</b>	<b>2月12日星期五</b>	<b>10月31日星期一</b>			
48	2.2.2.5.1	Bored pile construction (38 piles)	215 days	2月12日星期五	9月13日星期二			
49	2.2.2.5.2	Interface & sonic test	30 days	8月25日星期四	9月23日星期五			
50	2.2.2.5.3	Prepare & submit as-built record plan	7 days	9月17日星期六	9月23日星期五			
51	2.2.2.5.4	Submission of BA14	1 day	9月23日星期五	9月23日星期五			
52	2.2.2.5.5	Allow 14 days for selection of pile for concrete full core test	14 days	9月24日星期六	10月7日星期五			
53	2.2.2.5.6	Concrete full core test	14 days	10月8日星期六	10月21日星期五			
54	2.2.2.5.7	Compression test for concrete core	7 days	10月22日星期六	10月28日星期五			
55	2.2.2.5.8	Submission of log report & compression test report	4 days	10月28日星期五	10月31日星期一			
56	2.2.2.6	<b>Sheet Pile</b>	<b>92 days</b>	<b>7月22日星期五</b>	<b>10月21日星期五</b>			
57	2.2.2.6.1	Plant mobilization	0 days	7月31日星期日	7月31日星期日			
58	2.2.2.6.2	Delivery sheet pile material	0 days	7月22日星期五	7月22日星期五			
59	2.2.2.6.3	Installation of sheet pile - Type A (approx. 212 piles)	50 days	8月1日星期一	9月19日星期一			
60	2.2.2.6.4	Installation of sheet pile - Type B (approx. 100 piles)	24 days	9月20日星期二	10月13日星期四			
61	2.2.2.6.5	Prepare & submit as-built record plan	7 days	10月14日星期五	10月20日星期四			

Master Programme  
Revision 1

Task Critical Task Milestone Summary

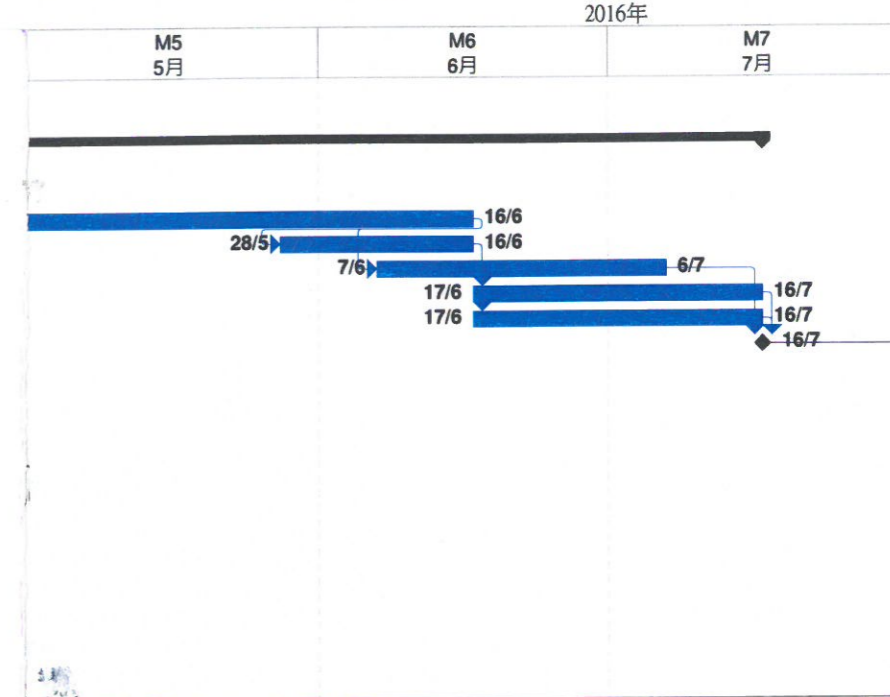


SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

Contract No. 15/8009 - Lamma Power Station Extension Foundation Works for Unit L10

Master Programme Revision 1

ID	Item	Task Name	Duration	Start	Finish	2016年		
						M5 5月	M6 6月	M7 7月
62	2.2.2.6.6	Submission of BA14	1 day	10月21日 星期五	10月21日 星期五			
63	2.2.2.7	Completion of foundation works at Unit L10	0 days	10月31日 星期一	10月31日 星期一			
64	2.2.3	<b>New Site Facilities</b>	198 days	1月1日 星期五	7月16日 星期六			
65	2.2.3.1	Submission for design of site office A	90 days	1月1日 星期五	3月30日 星期三			
66	2.2.3.2	Approval for design of site office A	28 days	3月31日 星期四	4月27日 星期三			
67	2.2.3.3	Erection of site office A	50 days	4月28日 星期四	6月16日 星期四			
68	2.2.3.4	Erection of washing facilities with shelter & container shower facilities	20 days	5月28日 星期六	6月16日 星期四			
69	2.2.3.5	Installation of earthing	30 days	6月7日 星期二	7月6日 星期三			
70	2.2.3.6	Installation of portable water pipes	30 days	6月17日 星期五	7月16日 星期六			
71	2.2.3.7	Installation of sewage drain pipes	30 days	6月17日 星期五	7月16日 星期六			
72	2.2.3.8	Completion of new site facilities	0 days	7月16日 星期六	7月16日 星期六			
73	2.2.4	Completion of section A	0 days	10月31日 星期一	10月31日 星期一			
74	2.2.5	Demobilization of plants	0 days	10月21日 星期五	10月21日 星期五			
75	2.3	Handover of site works area for Section A	0 days	11月1日 星期二	11月1日 星期二			
76								
77	2.4	<b>Section B</b>	121 days	1月1日 星期五	4月30日 星期六			
78	2.4.1	<b>Ground Treatment Works</b>	121 days	1月1日 星期五	4月30日 星期六			
79	2.4.1.1	Verification GI works (approx. 20 nos.)	14 days	2月20日 星期六	3月4日 星期五			
80	2.4.1.2	Plant mobilization	55 days	1月1日 星期五	2月24日 星期三			
81	2.4.1.3	Trial installation of band drain	5 days	2月25日 星期四	2月29日 星期一			
82	2.4.1.4	Installation of band drain (approx. 2477 nos.)	45 days	3月1日 星期二	4月14日 星期四			
83	2.4.1.5	Installation of steel plate & geotextile on existing U-channel	20 days	3月28日 星期一	4月16日 星期六			
84	2.4.1.6	Filling of surcharge (approx. 21000 m3)	20 days	4月7日 星期四	4月26日 星期二			
85	2.4.1.7	Installation of ground settlement markers	10 days	4月21日 星期四	4月30日 星期六			
86	2.4.2	Completion of section B	0 days	4月30日 星期六	4月30日 星期六			
87								
88	2.5	<b>Section C</b>	229 days	9月14日 星期三	4月30日 星期日			
89	2.5.1	<b>Hoarding</b>	45 days	11月1日 星期二	12月15日 星期四			
90	2.5.1.1	Erection of Hoarding	45 days	11月1日 星期二	12月15日 星期四			
91	2.5.2	<b>Foundation Works at 275kV Substation Building</b>	229 days	9月14日 星期三	4月30日 星期日			
92	2.5.2.1	Early start milestone	0 days	10月6日 星期四	10月6日 星期四			
93	2.5.2.2	<b>Bored Pile - Temporary Steel Casing</b>	7 days	9月14日 星期三	9月20日 星期二			
94	2.5.2.2.1	Duration for delivery temporary steel casing	7 days	9月14日 星期三	9月20日 星期二			
95	2.5.2.3	<b>Bored Pile - Permanent Casing &amp; Double Wall Liner</b>	120 days	9月26日 星期一	1月23日 星期一			
96	2.5.2.3.1	Duration for delivery permanent casing & double wall liner	120 days	9月26日 星期一	1月23日 星期一			
97	2.5.2.4	<b>Bored Pile - Plant Mobilization</b>	14 days	10月1日 星期六	10月15日 星期六			
98	2.5.2.4.1	<b>Crawler Crane</b>	0 days	10月1日 星期六	10月1日 星期六			
99	2.5.2.4.1.1	1st & 2nd set	0 days	10月1日 星期六	10月1日 星期六			
100	2.5.2.4.2	<b>Oscillator</b>	0 days	10月5日 星期三	10月5日 星期三			
101	2.5.2.4.2.1	1st & 2nd set	0 days	10月5日 星期三	10月5日 星期三			
102	2.5.2.4.3	<b>RCD</b>	0 days	10月15日 星期六	10月15日 星期六			
103	2.5.2.4.3.1	1st & 2nd set	0 days	10月15日 星期六	10月15日 星期六			
104	2.5.2.5	<b>Predrilling</b>	21 days	11月1日 星期二	11月21日 星期一			
105	2.5.2.5.1	Predrilling works (10 nos.)	21 days	11月1日 星期二	11月21日 星期一			
106	2.5.2.6	<b>Bored Pile</b>	181 days	11月1日 星期二	4月30日 星期日			
107	2.5.2.6.1	Installation of monitoring checkpoints	7 days	11月1日 星期二	11月7日 星期一			
108	2.5.2.6.2	Bored pile construction (10 piles)	125 days	11月10日 星期四	3月14日 星期二			
109	2.5.2.6.3	Interface & sonic test	20 days	3月9日 星期四	3月28日 星期二			
110	2.5.2.6.4	Prepare & submit as-built record plan	7 days	3月22日 星期三	3月28日 星期二			
111	2.5.2.6.5	Submission of BA14	1 day	3月28日 星期二	3月28日 星期二			
112	2.5.2.6.6	Allow 14 days for selection of pile for concrete full core test	14 days	3月29日 星期三	4月11日 星期二			
113	2.5.2.6.7	Concrete full core test	10 days	4月12日 星期三	4月21日 星期五			
114	2.5.2.6.8	Compression test for concrete core	7 days	4月21日 星期五	4月27日 星期四			
115	2.5.2.6.9	Submission of log report & compression test report	4 days	4月27日 星期四	4月30日 星期日			
116	2.5.2.7	Completion of foundation works at 275kV substation building	0 days	4月30日 星期日	4月30日 星期日			
117	2.5.3	<b>Trial Pile</b>	212 days	10月1日 星期六	4月30日 星期日			
118	2.5.3.1	Early start milestone	0 days	10月1日 星期六	10月1日 星期六			
119	2.5.3.2	Submission of BA10 for trial pile	7 days	11月1日 星期二	11月7日 星期一			
120	2.5.3.3	<b>Predrilling</b>	28 days	11月8日 星期二	12月5日 星期一			
121	2.5.3.3.1	Predrilling works (3 nos.)	28 days	11月8日 星期二	12月5日 星期一			
122	2.5.3.4	<b>Ground Instrumentation</b>	24 days	11月22日 星期二	12月15日 星期四			



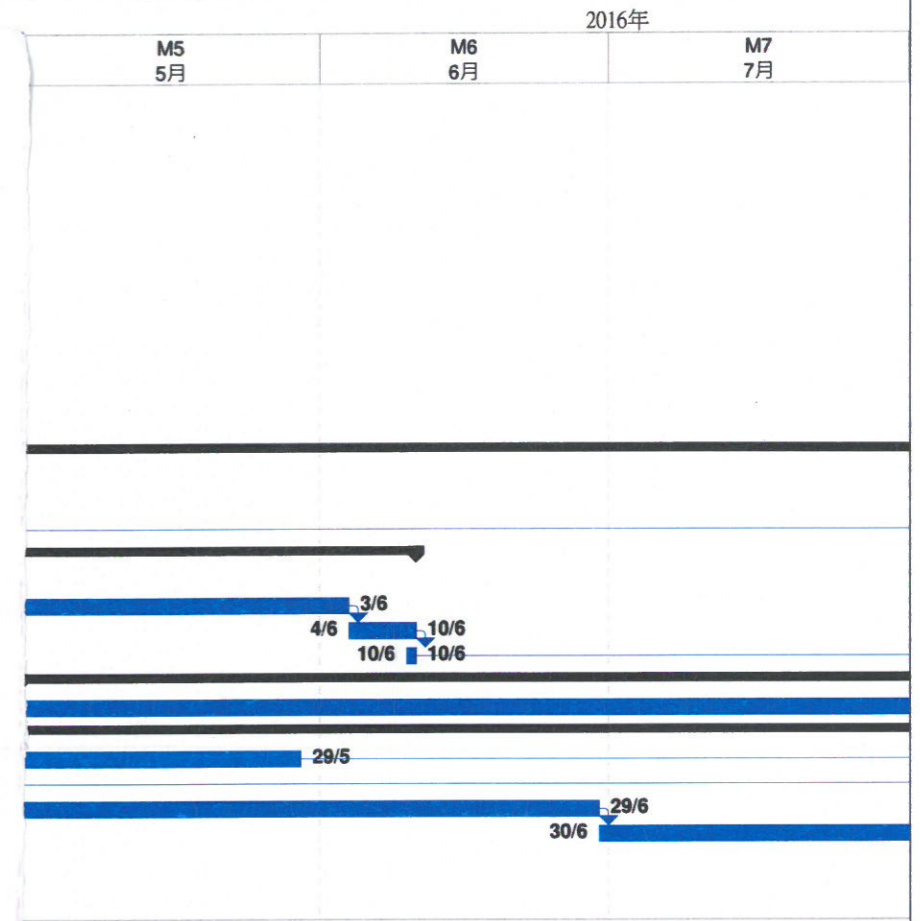
Master Programme  
Revision 1

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

Contract No. 15/8009 - Lamma Power Station Extension Foundation Works for Unit L10

Master Programme Revision 1

ID	Item	Task Name	Duration	Start	Finish	2016年		
						M5 5月	M6 6月	M7 7月
123	2.5.3.4.1	Installation of magnetic extensometer in predrilled hole (3 nos.)	16 days	11月22日星期二	12月7日星期三			
124	2.5.3.4.2	Installation of settlement plate	10 days	12月6日星期二	12月15日星期四			
125	2.5.3.5	<b>Construction of Trial Pile</b>	<b>136 days</b>	<b>12月16日星期五</b>	<b>4月30日星期日</b>			
126	2.5.3.5.1	Installation of trial pile (6 piles)	84 days	12月16日星期五	3月9日星期四			
127	2.5.3.5.2	Dynamic pile test	72 days	12月29日星期四	3月10日星期五			
128	2.5.3.5.3	Static load test	42 days	3月11日星期六	4月21日星期五			
129	2.5.3.5.4	Prepare & submit as-built record plan	7 days	4月17日星期一	4月23日星期日			
130	2.5.3.5.5	Submission of BA14	1 day	4月23日星期日	4月23日星期日			
131	2.5.3.5.6	Cut off the piles to level +3.0mPD	7 days	4月24日星期一	4月30日星期日			
132	2.5.3.6	Completion of trial pile	0 days	4月30日星期日	4月30日星期日			
133	2.5.4	Completion of section C	0 days	4月30日星期日	4月30日星期日			
134	2.5.5	Demobilization of plants	0 days	4月30日星期日	4月30日星期日			
135	2.6	Handover of site works area for Section C	0 days	5月1日星期一	5月1日星期一			
136								
137	2.7	<b>Section D</b>	<b>383 days</b>	<b>1月15日星期五</b>	<b>1月31日星期二</b>			
138	2.7.1	<b>General Site Works</b>	<b>36 days</b>	<b>3月1日星期二</b>	<b>4月5日星期二</b>			
139	2.7.1.1	Cable duct & draw pit	21 days	3月1日星期二	3月21日星期一			
140	2.7.1.2	Reloaction of lamp pole (5 poles)	20 days	3月17日星期四	4月5日星期二			
141	2.7.2	<b>G.I. Works</b>	<b>99 days</b>	<b>3月4日星期五</b>	<b>6月10日星期五</b>			
142	2.7.2.1	Submission of BA10 for G.I. works	7 days	3月4日星期五	3月10日星期四			
143	2.7.2.2	Carry out G.I. works (11 nos.)	85 days	3月11日星期五	6月3日星期五			
144	2.7.2.3	Prepare & submit as-built record plan	7 days	6月4日星期六	6月10日星期五			
145	2.7.2.4	Submission of BA14	1 day	6月10日星期五	6月10日星期五			
146	2.7.3	<b>Ground Treatment Time</b>	<b>276 days</b>	<b>5月1日星期日</b>	<b>1月31日星期二</b>			
147	2.7.3.1	9 months for monitoring settlement after completion of ground treatment	276 days	5月1日星期日	1月31日星期二			
148	2.7.4	<b>External Works</b>	<b>227 days</b>	<b>1月15日星期五</b>	<b>8月28日星期日</b>			
149	2.7.4.1	Repair & make good site office B & existing latrines	90 days	3月1日星期二	5月29日星期日			
150	2.7.4.2	Removal of the employer's materials stored in E6 area as instructed by the Engin	90 days	1月15日星期五	4月13日星期三			
151	2.7.4.3	Installation of bund wall of sandbags	60 days	5月1日星期日	6月29日星期三			
152	2.7.4.4	Construction of new type 3 road	60 days	6月30日星期四	8月28日星期日			
153	2.7.5	Completion of section D	0 days	1月31日星期二	1月31日星期二			
154								
155	2.8	Contract completion	0 days	4月30日星期日	4月30日星期日			



Master Programme  
Revision 1

Task Critical Task Milestone Summary

Monthly Waste Flow Table for April 2016

Project: Foundation Works for Lamna Power Station Extension Unit L10

Contractor: Sunley Engineering & Construction Co Ltd

Record by: Andy Fan

Year of Record: 2016

MM.YYYY	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Materials Generated Monthly					
	Excavated Materials			Non-excavated Materials					Metals (steel bar / metal strip) <sup>(1)</sup>	Metals (aluminum can) <sup>(1)</sup>	Paper / cardboard packaging <sup>(1)</sup>	Plastics <sup>(1) &amp; (4)</sup>	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	Disposed in Public Fill	Disposed in Sorting Facilities	Others (e.g Reused in the Contract / Other Projects)	Broken Concrete or Construction Waste Collected by Recycled Company	Reused in the Contract	Reused in other Projects	Disposed in Public Fill	Disposed in Sorting Facilities						
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	
Jan 2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb 2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.86
Mar-2016	2382.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50
Apr-16	3888.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70
Total	6270.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.06

Total Inert C&D Waste Materials Generated	Non-inert C&D Materials		
	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
6270.28 tonnes	0 tonnes	8.06 tonnes	0 tonnes

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 6270.28 tonnes of inert C&D material were generated from the Project, of which 0 tonnes were reused in this and other contracts, and the remaining 6270.28 tonnes were disposed as public fill to Fill Banks.

(b) Non-inert C&D materials (construction wastes) include metals, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Metals generated from the Project were grouped into construction wastes as the materials were not disposed of with others at the public fill.

(c) 0 kg of metals, 0 kg of papers/ cardboard packing and 0 kg of plastics were sent to recyclers for recycling during the reporting period.

(d) Construction wastes other than metals, paper/cardboard packaging, plastics and chemicals were disposed of at Landfill.

- Notes:
- (1) metal, paper & plastic were collected by recycler
  - (2) The performance target of waste recycling are specified in the Contract.
  - (3) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (4) Plastics refer to plastic bottles/ containers, plastic/ foam from packaging material.
  - (5) Broken concrete for recycling into aggregates.
  - (6) Disposal of inert waste to public fill or sorting facilities will NOT be considered as recycled waste.