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

Lamma Power Station Extension
Construction Phase
Monthly Environmental Monitoring & Audit Report

December 2016

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

港燈
HK Electric

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499

ENVIRONMENTAL PERMIT NO. EP-071/2000/C

LAMMA POWER STATION EXTENSION ENVIRONMENTAL MONITORING & AUDIT PROGRAMME AT CONSTRUCTION PHASE

Report Title	Lamma Power Station Extension – Units L10 & L11 Monthly EM&A Report (December 2016)
Date	12 January 2017
Certified by	(Mr. IP Tat-Yan, Environmental Team Leader)
Verified by	Mr. Y T Tang (AECOM Asia Company Limited, Independent Environmental Checker)

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

APPENDICES

EXECUTIVE SUMMARY

This is the 81st 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 December 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.

In September 2016, the Government approved HK Electric to construct the third combined cycle gas-fired generating unit (L11) to implement the 2020 Fuel Mix Target. L11 is planned for commercial operation in 2022 and the associated construction work commenced in November 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	Full core construction work
275kV Switching Station	Bored pile construction work
Unit L10 Civil and Building	Main Station Building (construction of king post), Site Office Building and No.4 Demin. Plant (formwork, steel fixing and concreting), and trending works
Unit L11 Piling	Bored pile construction work

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

EPD officials from Regional Office (South) visited Lamma Power Station on 09/12/2016. EPD inspected the Lamma Extension Construction Site. There was no adverse comment from EPD regarding the construction site.

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-RS1026-16	11/10/16	10/04/17	Contractor	07/10/16
Construction Noise Permit	PP-RS0019-16	26/07/16	19/01/17	Contractor	25/07/16
Construction Noise Permit	GW-RS1299-16	26/12/16	25/06/17	Contractor	22/12/16
WPCO Discharge Licence	WT00023765-2016	07/03/16	31/03/21	Contractor	09/03/16
WPCO Discharge Licence	WT00025747-2016	05/10/16	31/10/21	Contractor	06/10/16
Registration of Chemical Waste Producer	WPN5113-912-S3180-19	21/01/16	-	Contractor	21/01/16
Registration of Chemical Waste Producer	WPN5213-912-P2781-22	22/02/16	-	Contractor	22/02/16
Waste Disposal Billing Account	Account No.: 7024247	03/02/16	-	Contractor	03/02/16
Waste Disposal Billing Account	Account No.: 7026035	06/10/16	-	Contractor	06/12/16

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 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;

275kV Switching Station

- 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 Civil and Building Works

- 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.

Unit L11 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;

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 December 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 activity for Unit L10 piling was full core construction work. Construction activity for 275kV Switching Station was bored pile construction work. Construction activities for Unit L10 civil and building works were carried out for Main Station Building (construction of king post), for Site Office Building and No.4 Demin. Plant (formwork, steel fixing and concreting) and for trenching works. Construction activity for Unit L11 piling was bored pile construction work. 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
Unit L10 Piling Works		
1.	Full core	**Air** – Dust suppression measures implemented. **Noise** – General noise mitigation measures employed at all work sites throughout the construction phase. **Waste Management** – Waste Management Plan submitted and implemented.

Item	Construction Activities	Environmental Mitigation Measures
275kV Switching Station		
2.	Bored pile construction	**Air** – Dust suppression measures implemented in the main haul road. – Using ULSD for PMEs. **Water** – 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. **Noise** – General noise mitigation measures employed at all work sites throughout the construction phase. **Waste Management** – Waste Management Plan submitted and implemented.
Unit L10 Civil and Building Works		
3.	Main Station Building (Construction of King Post)	**Air** – Cylindrical screening was used for dust suppression during drilling. – All regulated machine attached with valid exception/approval NRMM labels. – Water truck was used for water spraying of the haul road. **Noise** – Cylindrical screening was used for noise mitigation measures during drilling. **Wastewater** – Wastewater was reused for drilling. **Waste Management** – Excavated soil was temporary stored for backfilling.

Item	Construction Activities	Environmental Mitigation Measures
4.	Site Office Building and No. 4 Demin. Plant (Formwork, Steel Fixing and Concreting)	**Air** – Excavated slope covered. **Waste Management** – Scrape metal will be recycled. – Timber will be reused as much as possible
5.	Trenching Works	**Air** – Excavated slope covered. **Waste Management** – Excavated soil was temporary stored for backfilling.
Unit L11 Piling Works		
6.	Bored pile construction	**Air** – Dust suppression measures implemented in the main haul road. – Using ULSD for PMEs. – Cover dusty stockpile with tarpaulin and water spraying. **Water** – 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. **Noise** – General noise mitigation measures employed at all work sites throughout the construction phase. **Waste Management** – Waste Management Plan submitted and implemented.

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.

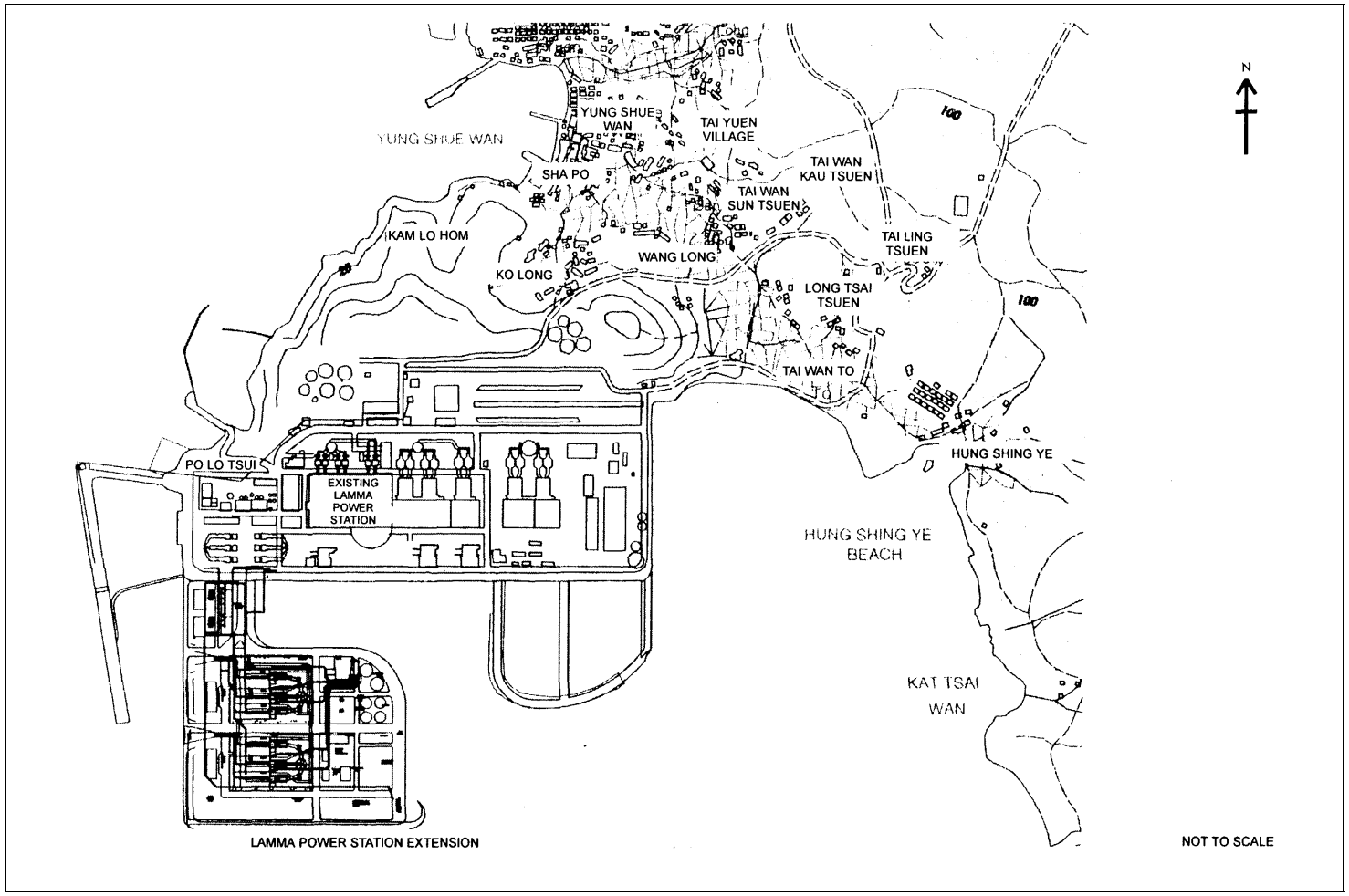


Figure 1.1 Layout of Work Site

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
24-hour sampling:	
HVAS Sampler	Model TE5170x Tisch Environmental Inc.
Continuous TSP Dust Meter	TEOM continuous dust monitor Thermo Scientific
MINIVOL Portable Sampler	AIRMETRICS
1-hour sampling:	
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.

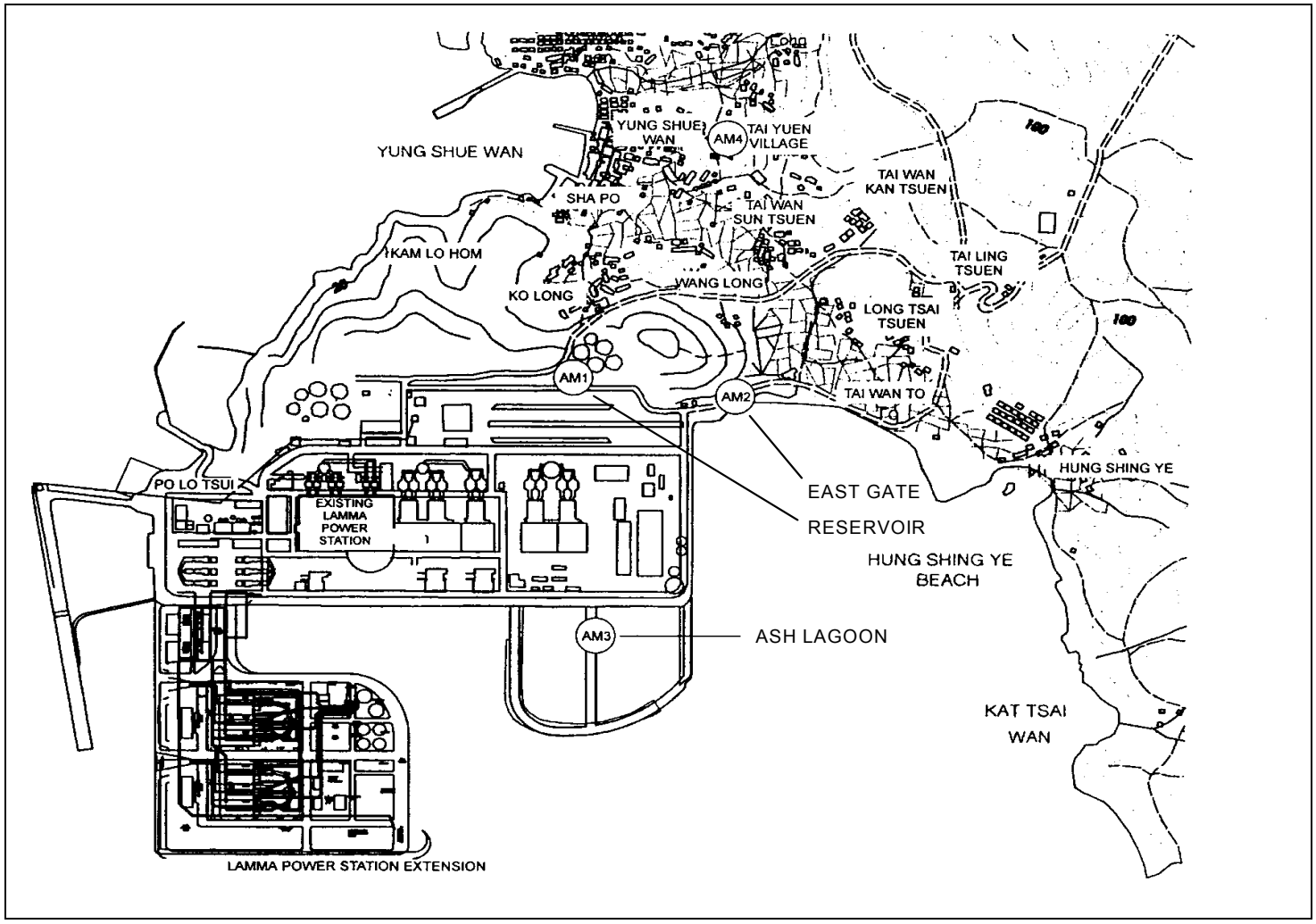


Figure 2.1 Location of Air Quality Monitoring Stations

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 meters	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 Ching Lam	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}
	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.

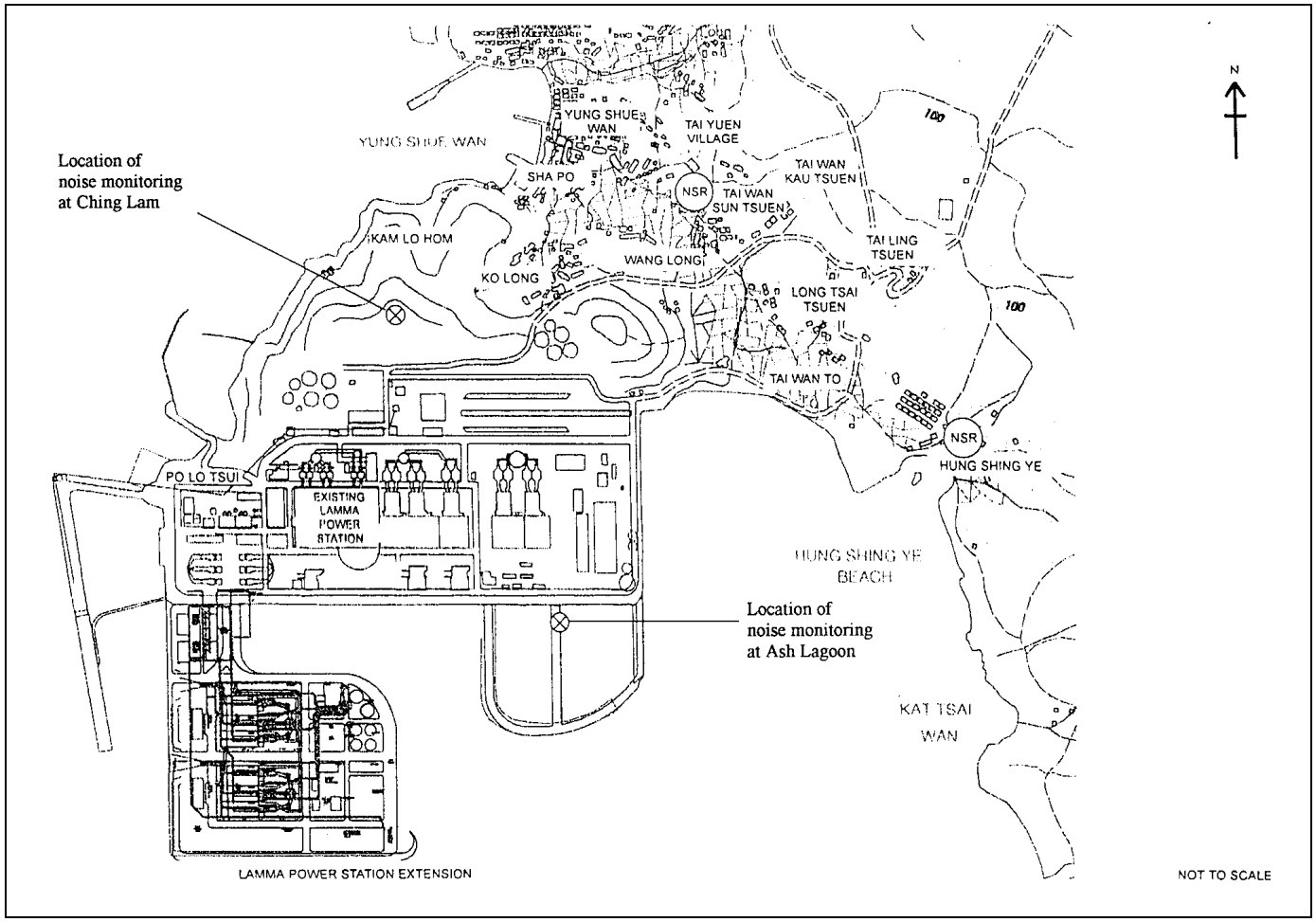


Figure 3.1 Location of Noise Monitoring Stations

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)	01/12/16-31/12/16	0	0	
2	Ambient TSP (1-hour)	01/12/16-31/12/16	0	0	
Noise					
1	Noise level at the critical NSR's predicted by the noise alarm monitoring system	01/12/16-31/12/16	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 December 2016 as shown in Table 4.2.

Table 4.2 Estimated Amounts of Waste in December 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
4827.59 Tonnes	0 Tonnes	0 Tonnes	0 Tonnes

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

4.4 Site Environmental Audit

EPD officials from Regional Office (South) visited Lamma Power Station on 09/12/2016. EPD inspected the Lamma Extension Construction Site. There was no adverse comment from EPD regarding the construction site.

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-RS1026-16	11/10/16	10/04/17	Foundation works for Unit L10 (275kV Switching Station). Operation of PME during restricted hours.	Valid
Construction Noise Permit	PP-RS0019-16	26/07/16	19/01/17	Percussive piling for Unit L10 piling foundation	Valid
Construction Noise Permit	GW-RS1299-16	26/12/16	25/06/17	Civil and Building Works for Unit L10. Operation of PME during restricted hours.	Valid

Description	Permit No.	Valid Period		Highlights	Status
		From	To		
WPCO Discharge Licence*	WT00023765-2016	07/03/16	31/03/21	Foundation works for Unit L10	Valid
WPCO Discharge Licence	WT00025747-2016	05/10/16	31/10/21	The construction site of 275kV Switching Station	Valid
Registration of Chemical Waste Producer	WPN5113-912-S3180-19	21/01/16	-	Foundation works for Unit L10	Valid
Registration of Chemical Waste Producer	WPN5213-912-P2781-22	22/02/16	-	Civil and Building Works for Unit L10	Valid
Waste Disposal Billing Account	Account No.: 7024247	03/02/16	-	Foundation works for Unit L10	Valid
Waste Disposal Billing Account	Account No.: 7026035	06/10/16	-	Civil and Building Works for Unit L10	Valid

Note: *- The last water quality monitoring was carried out in November 2016 and reported under a separate cover by the contractor, and the results were within the allowable limit.

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 December 2016, no complaint against the construction activities was received.

Table 4.4 Environmental Complaints Received in December 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 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.

275kV Switching Station

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 Civil and Building Works

Noise Impact

- 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.

Unit L11 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.

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

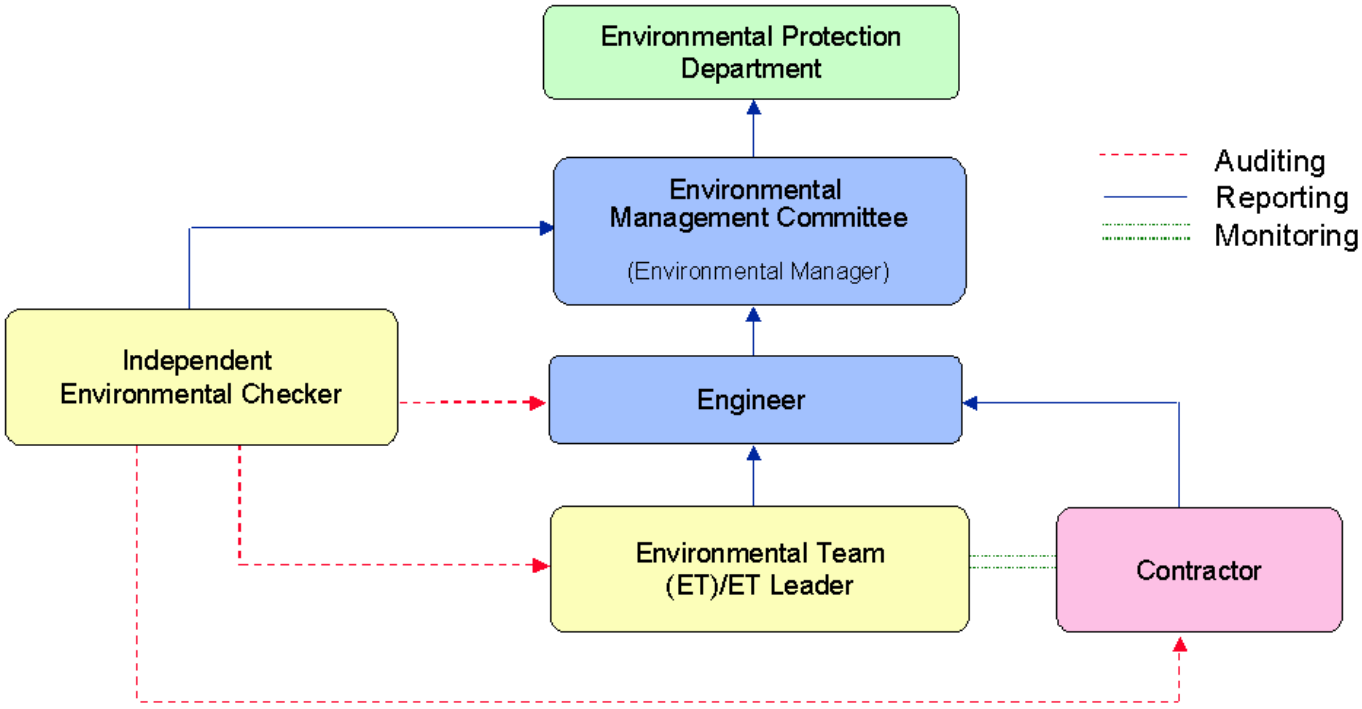


Figure A.1 Organisation of EM&A Programme at Construction Phase

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, $\mu g/m^3$	Limit Level, $\mu g/m^3$
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 $L_{Aeq,30\ min}$ (07:00-19:00 hrs on normal weekdays) (Note 1) 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 $L_{Aeq,5\ min}$ c. subject to statutory control under the Noise Control Ordinance (23:00-07:00 hrs of next day). Set to 45 dB(A) in $L_{Aeq,5\ min}$
Manual noise monitoring at the nearest Pak Kok Tsui residences to cable landing points N4 and N5		
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 (December 2016 to March 2017)

24hr TSP Monitoring	1hr TSP Monitoring
05/Dec/2016	05/Dec/2016 1500hr to 1800hr
11/Dec/2016	11/Dec/2016 1500hr to 1800hr
17/Dec/2016	17/Dec/2016 1500hr to 1800hr
23/Dec/2016	23/Dec/2016 1500hr to 1800hr
29/Dec/2016	29/Dec/2016 1500hr to 1800hr
04/Jan/2017	04/Jan/2017 1500hr to 1800hr
10/Jan/2017	10/Jan/2017 1500hr to 1800hr
16/Jan/2017	16/Jan/2017 1500hr to 1800hr
22/Jan/2017	22/Jan/2017 1500hr to 1800hr
28/Jan/2017	28/Jan/2017 1500hr to 1800hr
03/Feb/2017	03/Feb/2017 1500hr to 1800hr
09/Feb/2017	09/Feb/2017 1500hr to 1800hr
15/Feb/2017	15/Feb/2017 1500hr to 1800hr
21/Feb/2017	21/Feb/2017 1500hr to 1800hr
27/Feb/2017	27/Feb/2017 1500hr to 1800hr
05/Mar/2017	05/Mar/2017 1500hr to 1800hr
11/Mar/2017	11/Mar/2017 1500hr to 1800hr
17/Mar/2017	17/Mar/2017 1500hr to 1800hr
23/Mar/2017	23/Mar/2017 1500hr to 1800hr
29/Mar/2017	29/Mar/2017 1500hr to 1800hr

APPENDIX D AIR QUALITY MONITORING RESULTS

Site: Lamma Power Station Extension

Month: December 2016

24 hour TSP Measurement:-

Date	TSP concentration (μg/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. (°)	Mean R.H. (%)
05/12/2016	89	102	84	72	12.0	60	79
11/12/2016	61	63	48	49	42.8	80	76
17/12/2016	69	81	54	35	31.5	60	68
23/12/2016	47	25	37	53	25.7	30	73
29/12/2016	74	74	56	65	27.8	10	54

1 hour TSP Measurement:-

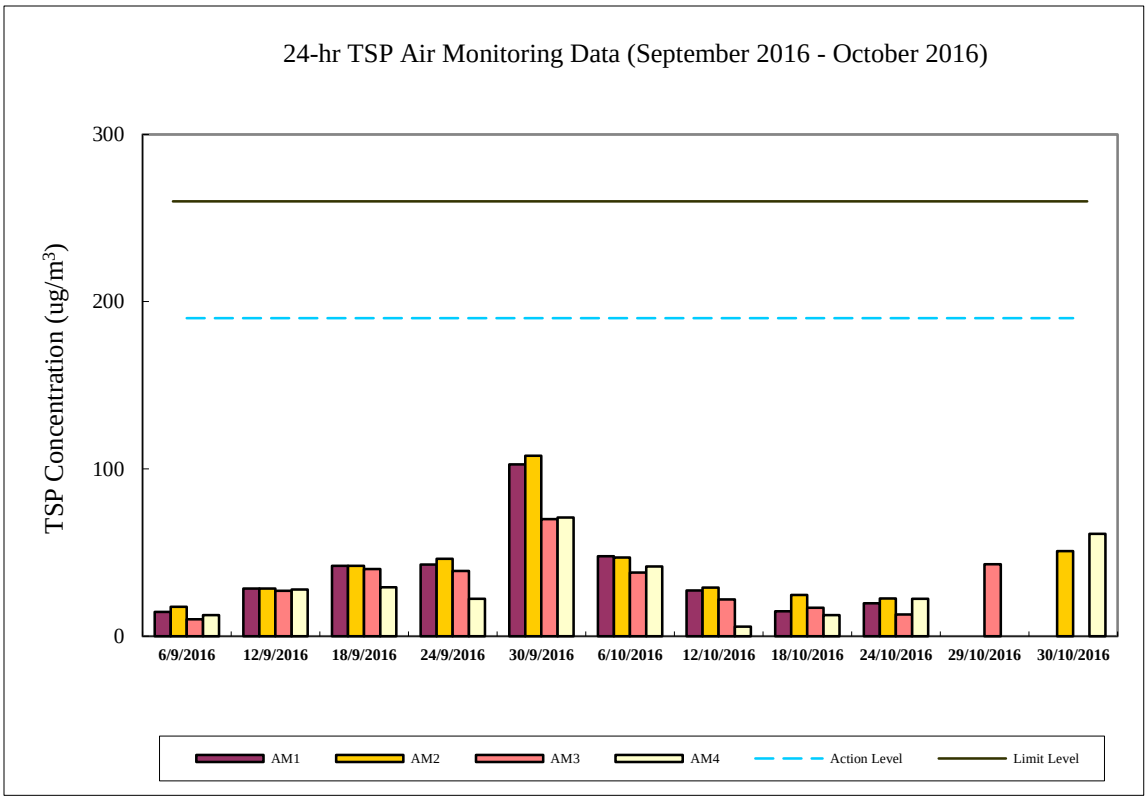
Date	Time	TSP concentration (μg/m^3)		
		Reservoir (AM1)	East Gate (AM2)	Ash Lagoon (AM3)
05/12/2016	15:00-15:59	72	77	63
	16:00-16:59	69	68	74
	17:00-17:59	73	59	73
11/12/2016	15:00-15:59	48	40	44
	16:00-16:59	45	39	45
	17:00-17:59	35	46	45
17/12/2016	15:00-15:59	62	59	50
	16:00-16:59	64	63	51
	17:00-17:59	65	61	50
23/12/2016	15:00-15:59	34	43	39
	16:00-16:59	50	50	46
	17:00-17:59	51	54	46
29/12/2016	15:00-15:59	65	67	56
	16:00-16:59	56	58	49
	17:00-17:59	51	65	59

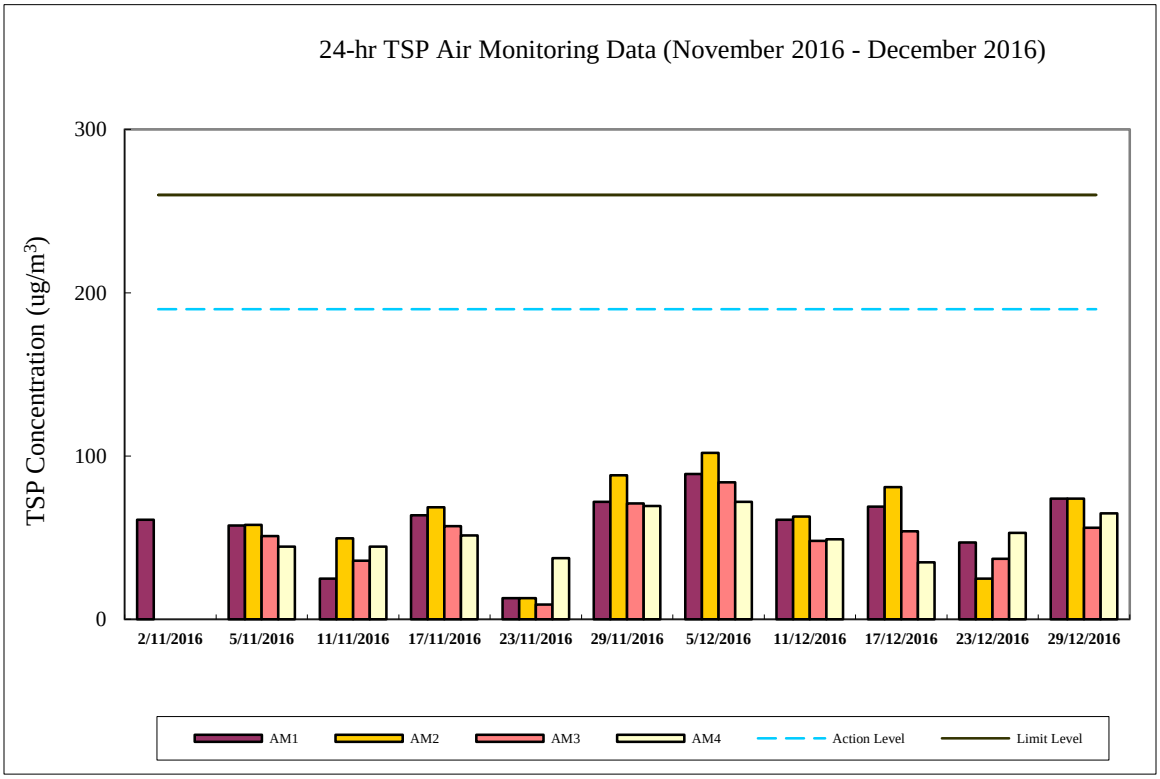
	1-hr TSP (μg/m^3)	24-hr TSP (μg/m^3)
Action Level	340	190
Limit Level	500	260

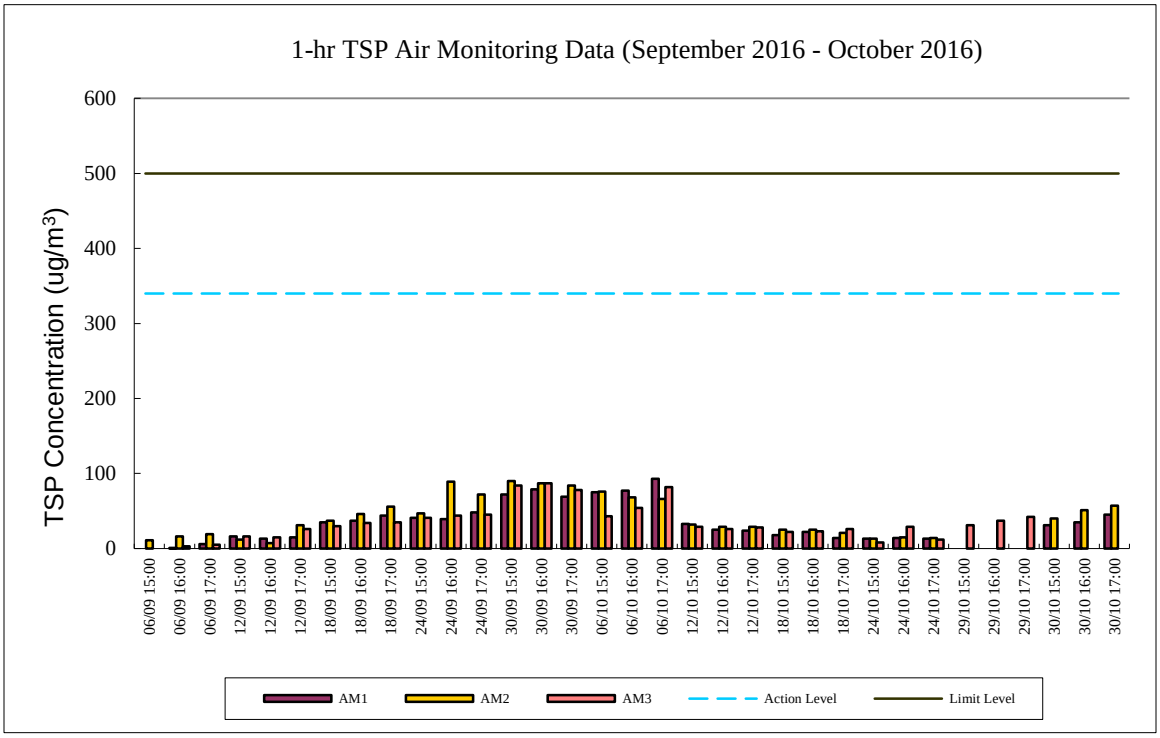
Calibration: Calibration details are shown in appendix F.

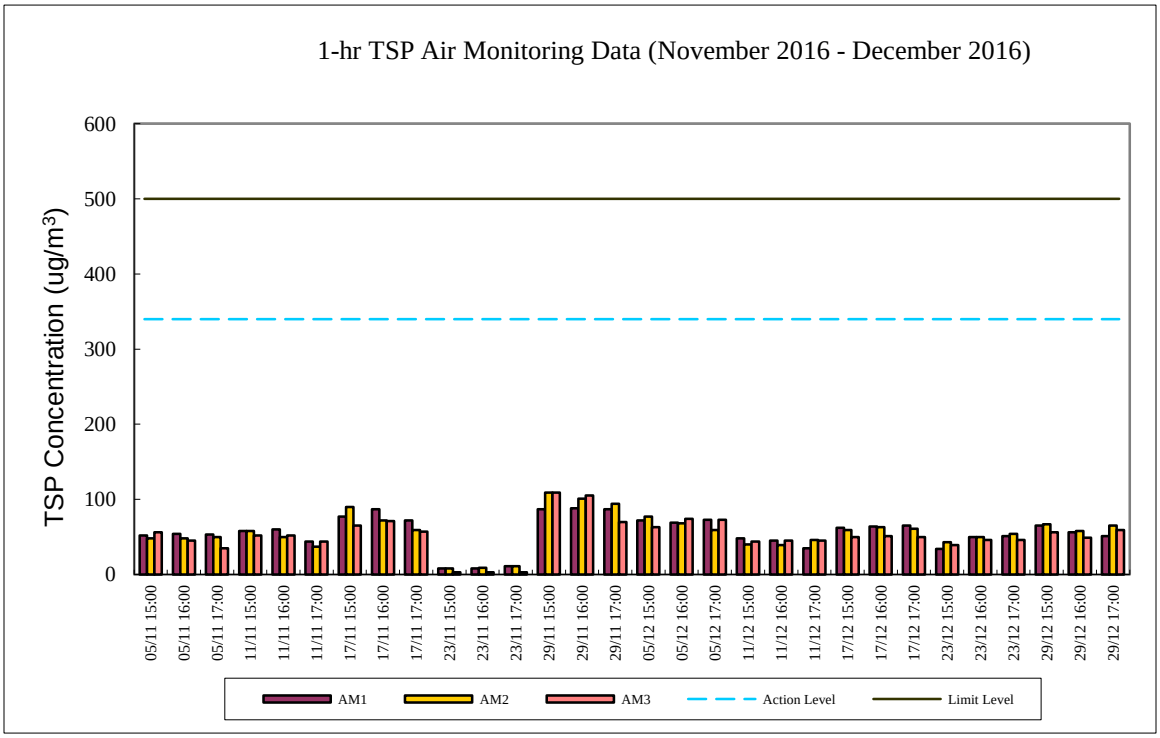
Equipment used:

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 (September 2016 - October 2016)
TSP Concentration (ug/m3)
300
200
100
0
6/9/2016
12/9/2016
18/9/2016
24/9/2016
30/9/2016
6/10/2016
12/10/2016
18/10/2016
24/10/2016
29/10/2016
30/10/2016
AM1
AM2
AM3
AM4
Action Level
Limit Level


24-hr TSP Air Monitoring Data (November 2016 - December 2016)
TSP Concentration (ug/m3)
300
200
100
0
2/11/2016
5/11/2016
11/11/2016
17/11/2016
23/11/2016
29/11/2016
5/12/2016
11/12/2016
17/12/2016
23/12/2016
29/12/2016
AM1
AM2
AM3
AM4
Action Level
Limit Level


1-hr TSP Air Monitoring Data (September 2016 - October 2016)
TSP Concentration (ug/m3)
600
500
400
300
200
100
0
06/09 15:00
06/09 16:00
06/09 17:00
12/09 15:00
12/09 16:00
12/09 17:00
18/09 15:00
18/09 16:00
18/09 17:00
24/09 15:00
24/09 16:00
24/09 17:00
30/09 15:00
30/09 16:00
30/09 17:00
06/10 15:00
06/10 16:00
06/10 17:00
12/10 15:00
12/10 16:00
12/10 17:00
18/10 15:00
18/10 16:00
18/10 17:00
24/10 15:00
24/10 16:00
24/10 17:00
29/10 15:00
29/10 16:00
29/10 17:00
30/10 15:00
30/10 16:00
30/10 17:00
AM1
AM2
AM3
Action Level
Limit Level


1-hr TSP Air Monitoring Data (November 2016 - December 2016)
TSP Concentration (ug/m3)
600
500
400
300
200
100
0
05/11 15:00
05/11 16:00
05/11 17:00
11/11 15:00
11/11 16:00
11/11 17:00
17/11 15:00
17/11 16:00
17/11 17:00
23/11 15:00
23/11 16:00
23/11 17:00
29/11 15:00
29/11 16:00
29/11 17:00
05/12 15:00
05/12 16:00
05/12 17:00
11/12 15:00
11/12 16:00
11/12 17:00
17/12 15:00
17/12 16:00
17/12 17:00
23/12 15:00
23/12 16:00
23/12 17:00
29/12 15:00
29/12 16:00
29/12 17:00
AM1
AM2
AM3
Action Level
Limit Level

Appendix E Continuous Noise Monitoring Results for December 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: B&K 2250 sound level meters and B&K 4231 sound level calibrator
Last Calibration Date: B&K 2250 sound level meters - 09/11/2015 (both Ching Lam & Ash Lagoon (up to 14/12/2016))
- 19/08/2016 (Ash Lagoon (from 15/12/2016 onwards) due to replacement)
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	
01/12/2016	07:00-19:00	---	---	75	---	---	70
01/12/2016	19:00-23:00	---	---	60	---	---	60
01/12/2016	23:00-07:00	---	---	45	29	24	45
02/12/2016	07:00-19:00	---	---	75	---	---	65
02/12/2016	19:00-23:00	---	---	60	32	26	60
02/12/2016	23:00-07:00	---	---	45	---	---	45
03/12/2016	07:00-19:00	---	---	75	---	---	70
03/12/2016	19:00-23:00	---	---	60	30	30	60
03/12/2016	23:00-07:00	---	---	45	35	30	45
04/12/2016	07:00-23:00	---	---	60	20	20	60
04/12/2016	23:00-07:00	---	---	45	32	25	45
05/12/2016	07:00-19:00	---	---	75	---	---	65
05/12/2016	19:00-23:00	---	---	60	---	---	60
05/12/2016	23:00-07:00	---	---	45	32	23	45
06/12/2016	07:00-19:00	---	---	75	---	---	65
06/12/2016	19:00-23:00	---	---	60	---	---	60
06/12/2016	23:00-07:00	---	---	45	29	23	45
07/12/2016	07:00-19:00	---	---	75	---	---	75
07/12/2016	19:00-23:00	---	---	60	---	---	60
07/12/2016	23:00-07:00	---	---	45	29	27	45
08/12/2016	07:00-19:00	---	---	75	---	---	70

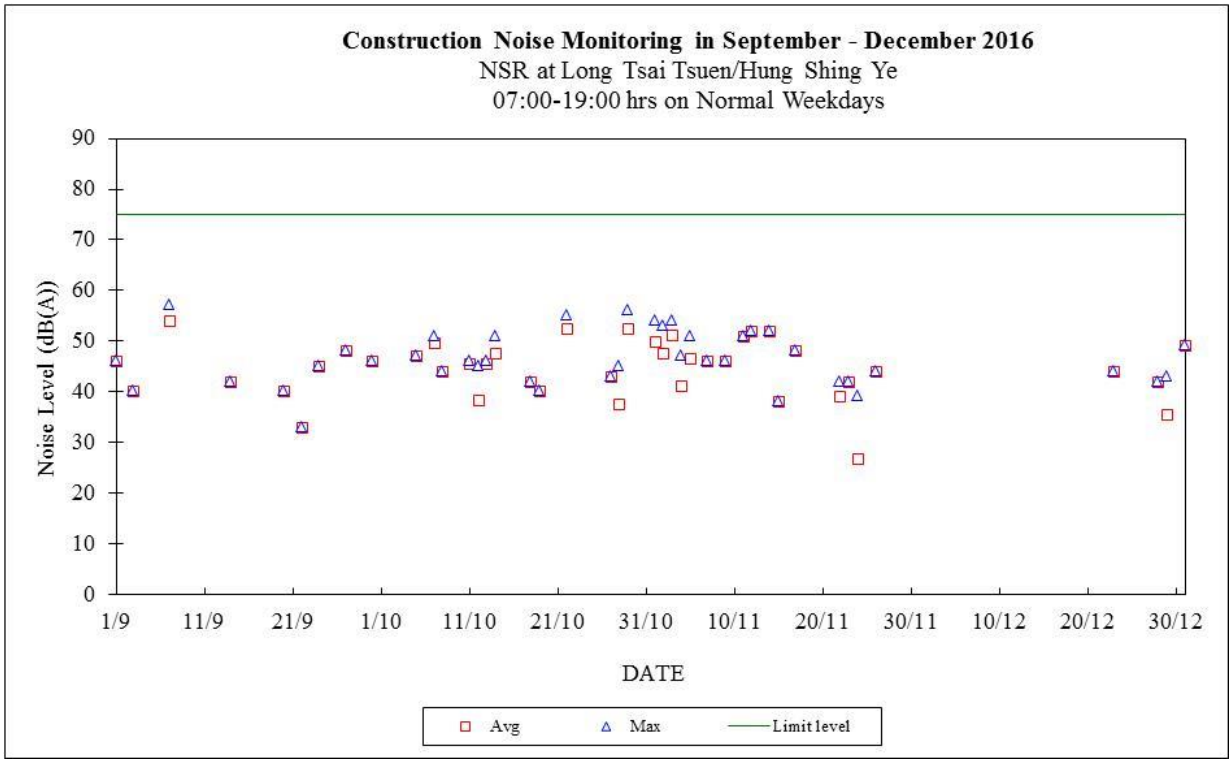
08/12/2016	19:00-23:00	---	---	60	24	24	60
08/12/2016	23:00-07:00	---	---	45	26	21	45
09/12/2016	07:00-19:00	---	---	75	---	---	70
09/12/2016	19:00-23:00	---	---	60	37	35	60
09/12/2016	23:00-07:00	---	---	45	37	34	45
10/12/2016	07:00-19:00	---	---	75	---	---	70
10/12/2016	19:00-23:00	---	---	60	26	26	60
10/12/2016	23:00-07:00	---	---	45	34	25	45
11/12/2016	07:00-23:00	---	---	60	38	25	60
11/12/2016	23:00-07:00	---	---	45	39	30	45
12/12/2016	07:00-19:00	---	---	75	---	---	70
12/12/2016	19:00-23:00	---	---	60	---	---	60
12/12/2016	23:00-07:00	---	---	45	30	27	45
13/12/2016	07:00-19:00	---	---	75	---	---	70
13/12/2016	19:00-23:00	---	---	60	---	---	60
13/12/2016	23:00-07:00	---	---	45	31	22	45
14/12/2016	07:00-19:00	---	---	75	---	---	70
14/12/2016	19:00-23:00	---	---	60	34	28	60
14/12/2016	23:00-07:00	---	---	45	31	21	45
15/12/2016	07:00-19:00	---	---	75	---	---	70
15/12/2016	19:00-23:00	---	---	60	28	28	60
15/12/2016	23:00-07:00	---	---	45	31	24	45
16/12/2016	07:00-19:00	---	---	75	---	---	70
16/12/2016	19:00-23:00	---	---	60	---	---	60
16/12/2016	23:00-07:00	---	---	45	29	21	45
17/12/2016	07:00-19:00	---	---	75	---	---	70
17/12/2016	19:00-23:00	---	---	60	---	---	60
17/12/2016	23:00-07:00	---	---	45	30	25	45
18/12/2016	07:00-23:00	---	---	60	---	---	60
18/12/2016	23:00-07:00	---	---	45	10	10	45
19/12/2016	07:00-19:00	---	---	75	---	---	70
19/12/2016	19:00-23:00	---	---	60	---	---	60
19/12/2016	23:00-07:00	---	---	45	12	12	45
20/12/2016	07:00-19:00	---	---	75	---	---	70
20/12/2016	19:00-23:00	---	---	60	---	---	60
20/12/2016	23:00-07:00	---	---	45	34	25	45
21/12/2016	07:00-19:00	---	---	75	---	---	70
21/12/2016	19:00-23:00	---	---	60	---	---	60
21/12/2016	23:00-07:00	---	---	45	28	23	45
22/12/2016	07:00-19:00	---	---	75	---	---	70
22/12/2016	19:00-23:00	35	33	60	30	28	60
22/12/2016	23:00-07:00	37	32	45	32	27	45
23/12/2016	07:00-19:00	44	44	75	---	---	70
23/12/2016	19:00-23:00	31	27	60	26	22	60
23/12/2016	23:00-07:00	40	33	45	35	29	45
24/12/2016	07:00-19:00	---	---	75	---	---	70
24/12/2016	19:00-23:00	---	---	60	---	---	60

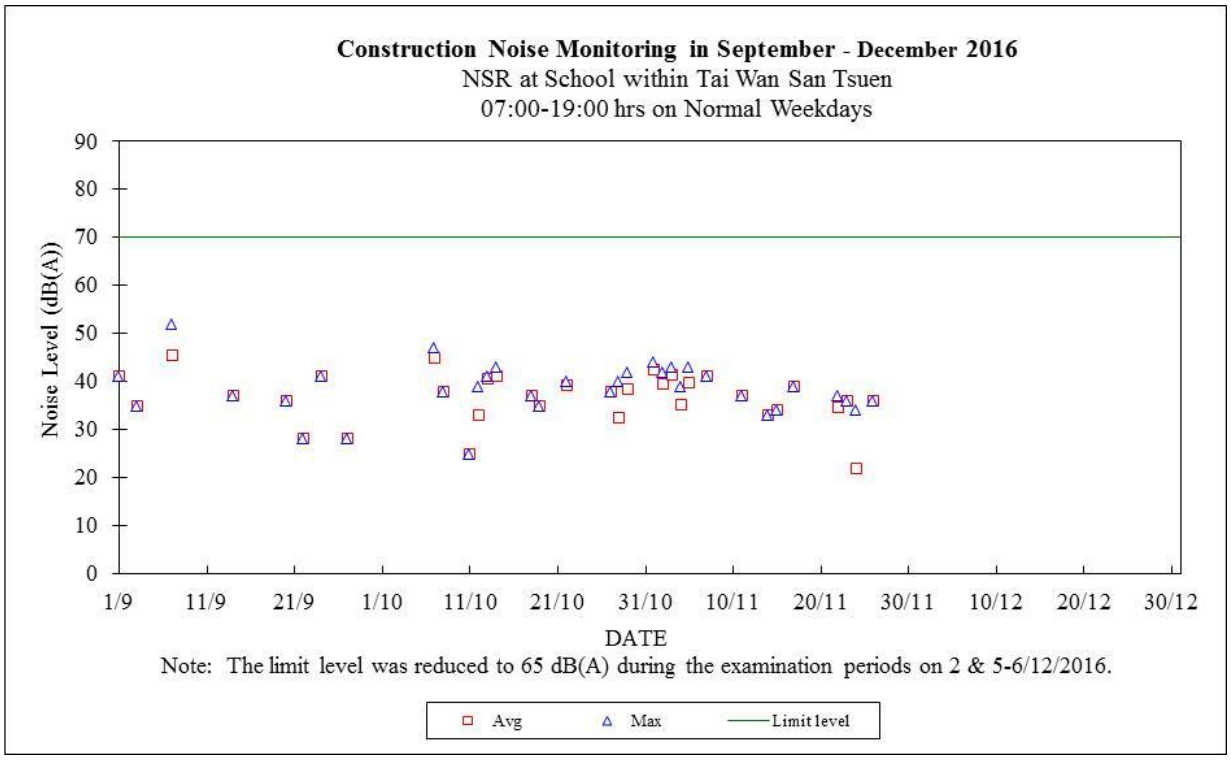
24/12/2016	23:00-07:00	35	27	45	31	22	45
25/12/2016	07:00-23:00	39	34	60	35	29	60
25/12/2016	23:00-07:00	34	31	45	29	26	45
26/12/2016	07:00-23:00	54	37	60	29	25	60
26/12/2016	23:00-07:00	38	28	45	34	24	45
27/12/2016	07:00-23:00	29	26	60	25	25	60
27/12/2016	23:00-07:00	36	29	45	31	24	45
28/12/2016	07:00-19:00	42	42	75	---	---	70
28/12/2016	19:00-23:00	---	---	60	---	---	60
28/12/2016	23:00-07:00	37	26	45	32	21	45
29/12/2016	07:00-19:00	43	35	75	---	---	70
29/12/2016	19:00-23:00	---	---	60	---	---	60
29/12/2016	23:00-07:00	44	31	45	36	25	45
30/12/2016	07:00-19:00	---	---	75	---	---	70
30/12/2016	19:00-23:00	---	---	60	---	---	60
30/12/2016	23:00-07:00	42	33	45	37	28	45
31/12/2016	07:00-19:00	49	49	75	---	---	70
31/12/2016	19:00-23:00	25	25	60	20	20	60
31/12/2016	23:00-07:00	35	28	45	30	24	45

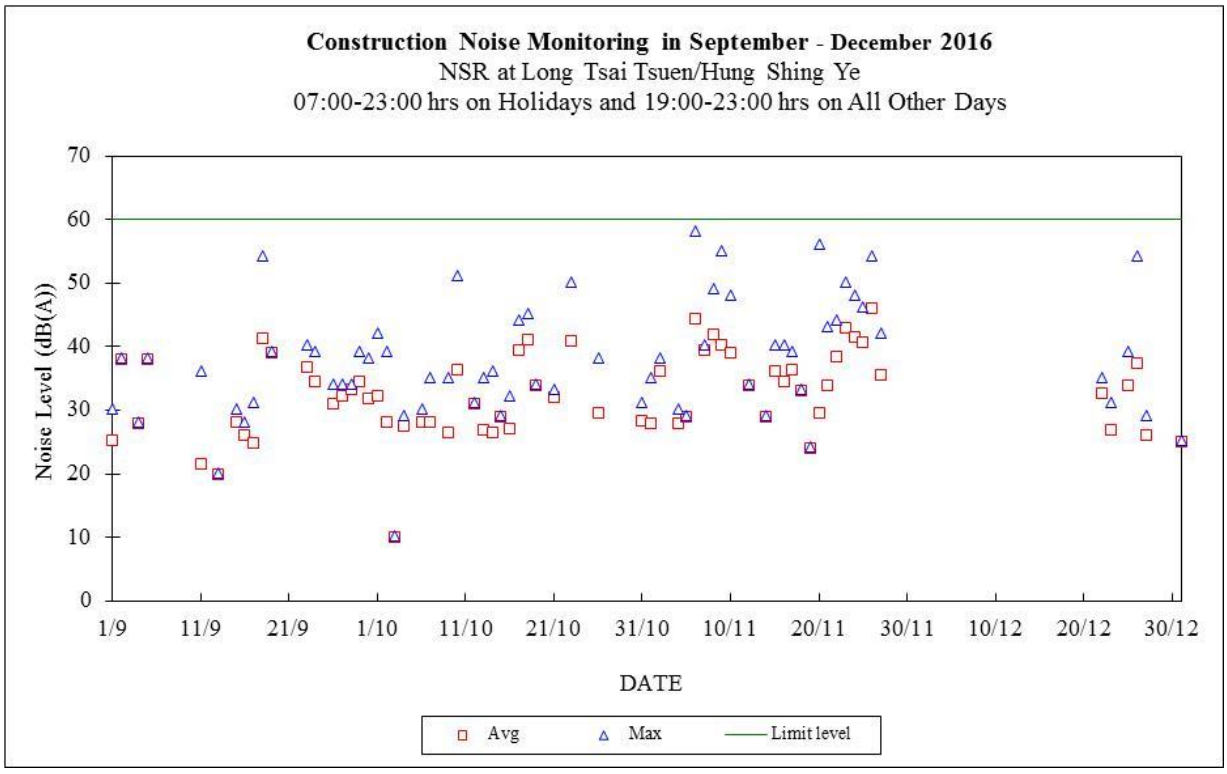
Note:

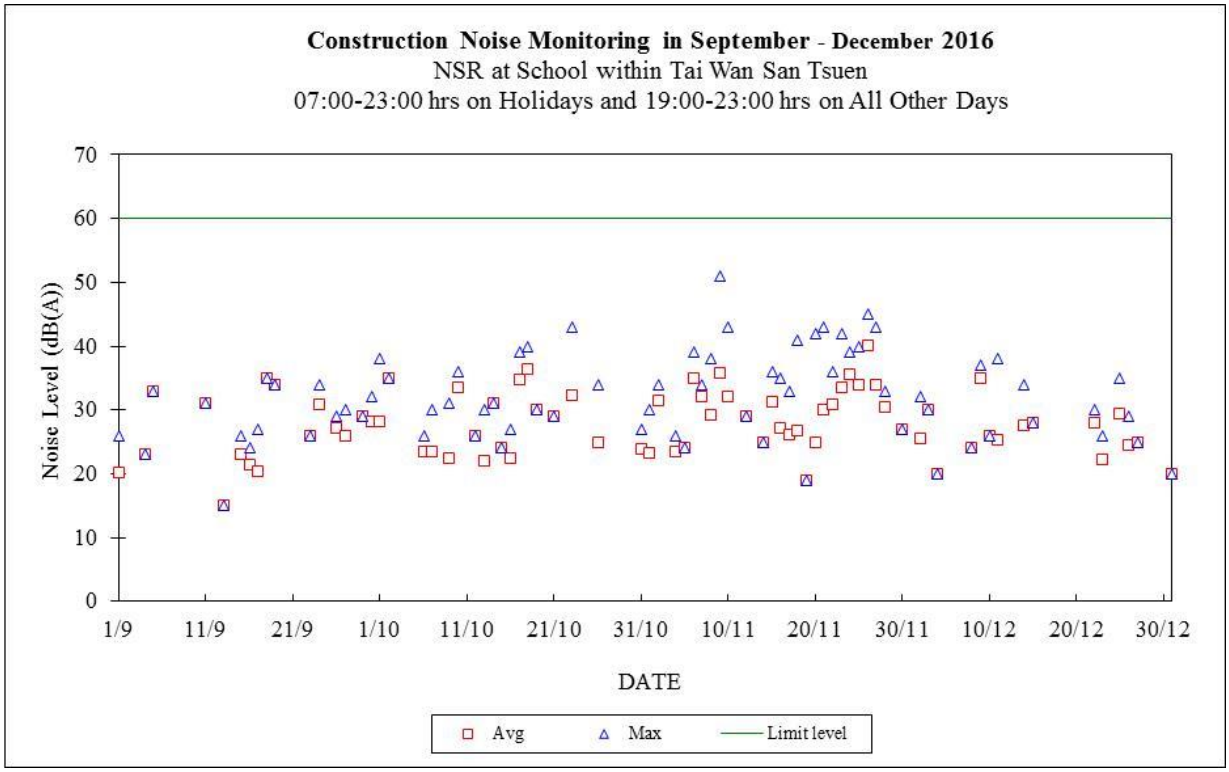
a. "---" represents the measured noise monitoring data lower than the established notional background level, particularly for the period of 01/12/2016 07:00 – 22/12/2016 19:00. The Ash Lagoon noise monitoring station was in normal operation but there were no data of calculated noise level at NSR at Long Tsai Tsuen/Hung Shing Ye.

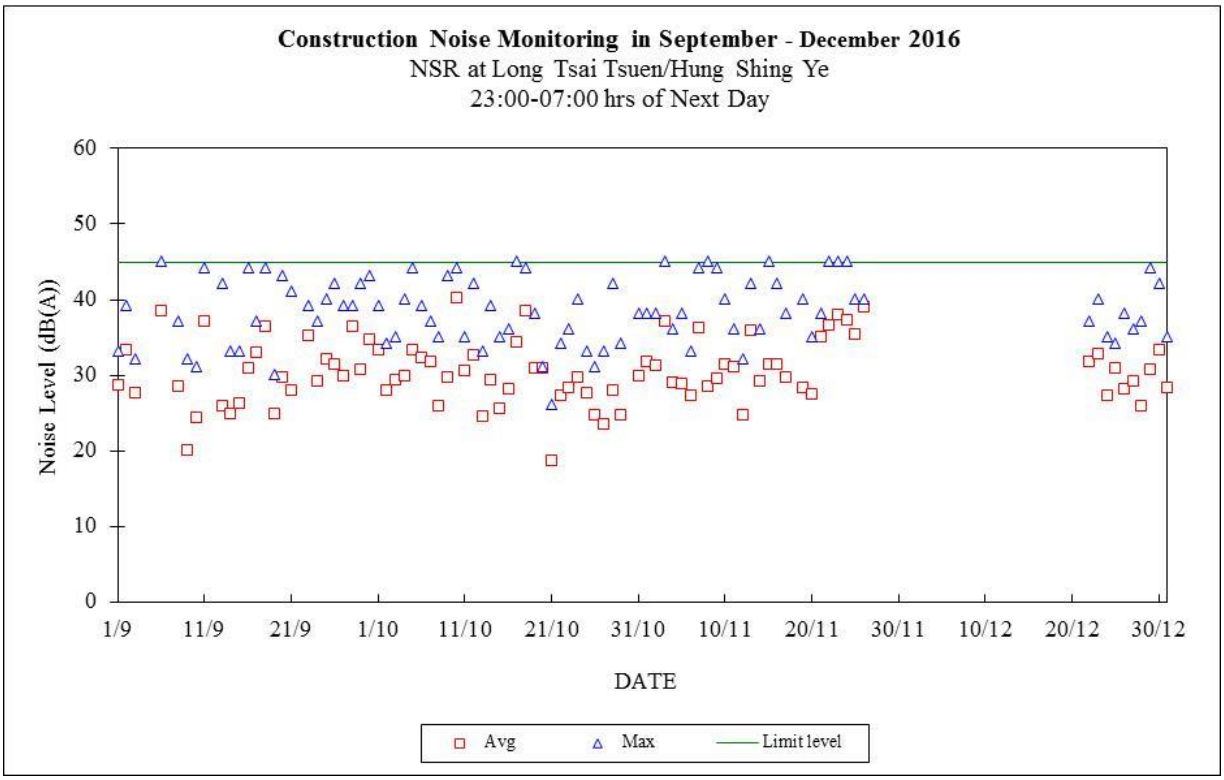
b. Continuous noise monitoring was carried out at holidays & evening-time (07:00-23:00 hrs on holidays and 19:00-23:00 hrs on all other days) and night-time (23:00-07:00 hrs of next day) under construction noise permit.

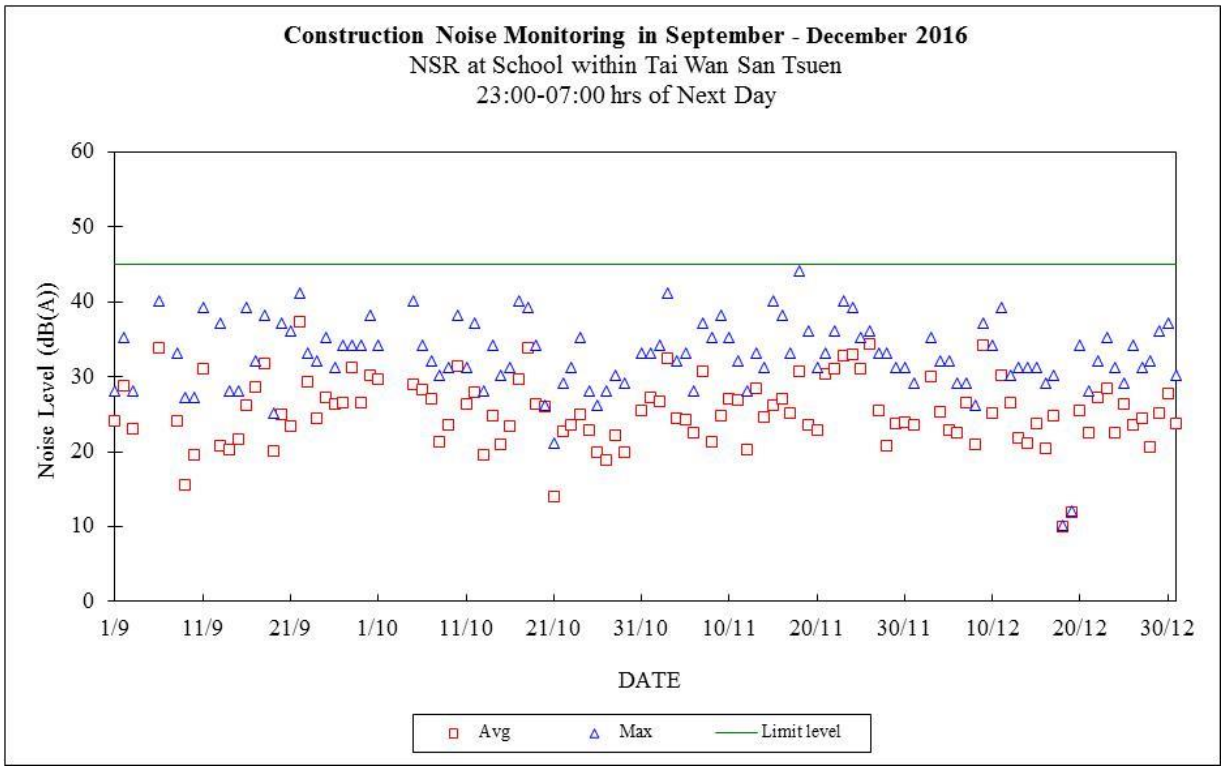

Construction Noise Monitoring in September - December 2016
NSR at Long Tsai Tsuen/Hung Shing Ye
07:00-19:00 hrs on Normal Weekdays
Noise Level (dB(A))
90
80
70
60
50
40
30
20
10
0
1/9
11/9
21/9
1/10
11/10
21/10
31/10
10/11
20/11
30/11
10/12
20/12
30/12
DATE
Avg
Max
Limit level


Construction Noise Monitoring in September - December 2016
NSR at School within Tai Wan San Tsuen
07:00-19:00 hrs on Normal Weekdays
Noise Level (dB(A))
90
80
70
60
50
40
30
20
10
0
1/9
11/9
21/9
1/10
11/10
21/10
31/10
10/11
20/11
30/11
10/12
20/12
30/12
DATE
Note: The limit level was reduced to 65 dB(A) during the examination periods on 2 & 5-6/12/2016.
Avg
Max
Limit level


Construction Noise Monitoring in September - December 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
Noise Level (dB(A))
70
60
50
40
30
20
10
0
1/9
11/9
21/9
1/10
11/10
21/10
31/10
10/11
20/11
30/11
10/12
20/12
30/12
DATE
Avg
Max
Limit level


Construction Noise Monitoring in September - December 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
Noise Level (dB(A))
70
60
50
40
30
20
10
0
1/9
11/9
21/9
1/10
11/10
21/10
31/10
10/11
20/11
30/11
10/12
20/12
30/12
DATE
Avg
Max
Limit level


Construction Noise Monitoring in September - December 2016
NSR at Long Tsai Tsuen/Hung Shing Ye
23:00-07:00 hrs of Next Day
Noise Level (dB(A))
60
50
40
30
20
10
0
1/9
11/9
21/9
1/10
11/10
21/10
31/10
10/11
20/11
30/11
10/12
20/12
30/12
DATE
Avg
Max
Limit level


Construction Noise Monitoring in September - December 2016
NSR at School within Tai Wan San Tsuen
23:00-07:00 hrs of Next Day
Noise Level (dB(A))
60
50
40
30
20
10
0
1/9
11/9
21/9
1/10
11/10
21/10
31/10
10/11
20/11
30/11
10/12
20/12
30/12
DATE
Avg
Max
Limit level

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: December Year: 2016

Reservoir (AM1)				
Date	Frequency (Hz) (240 – 275)	Operation Mode (Mode 4)	Main Flow (l/min) (2.70 – 3.30)	Bypass Flow (l/min) (12.30 – 15.04)
5/12/2016	270.536	4	2.99	13.62
11/12/2016	269.514	4	3.03	13.79
17/12/2016	271.467	4	3.14	14.32
23/12/2016	270.880	4	3.09	14.07
29/12/2016	270.175	4	3.15	14.33

East Gate (AM2)				
Date	Frequency (Hz) (240 – 275)	Operation Mode (Mode 4)	Main Flow (l/min) (2.70 – 3.30)	Bypass Flow (l/min) (12.30 – 15.04)
5/12/2016	253.792	4	3.02	13.73
11/12/2016	252.882	4	3.05	13.88
17/12/2016	252.179	4	3.11	14.15
23/12/2016	260.394	4	3.06	13.90
29/12/2016	259.672	4	3.10	14.11

Ash Lagoon (AM3)				
Date	Frequency (Hz) (240 – 275)	Operation Mode (Mode 4)	Main Flow (l/min) (0.90 – 1.10)	Bypass Flow (l/min) (14.10 – 17.20)
5/12/2016	254.930	4	1.00	15.69
11/12/2016	254.633	4	1.00	15.69
17/12/2016	256.058	4	1.00	15.69
23/12/2016	255.888	4	1.00	15.69
29/12/2016	255.670	4	1.00	15.69

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:

Prepared by : _____

Checked by : _____

HIGH VOLUME AIR SAMPLER
SITE VISIT LOG SHEET

Site Name:	RF	Site No.:	AM2
Date of visit:	12-12-2016	Hour of Visit:	10:15
Staff name:	W.H MAN	HVAS S/N:	0131
Used filter paper no.:	MH57	New filter paper no.:	MH59
Type of filter:	Glass-fibre		

I. Ambient Conditions

Temperature, T_a = 298.1 K Pressure, P_a = 1010.0 mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions corresponds to Q_{STD} = 40 ft^3/min. (inch H_2O)
1534(10/2016)	$H_a = 18.32(T_a/P_a)$ = 5.41

Manometer reading before calibration: 5.20
Adjustment of flow controller (Y/N): Y
Manometer reading after calibration: 5.40

Note: Tolerance Limit of HVAS flow: " 1.0 ft^3/min. Corresponding limits for manometer : " 0.2 inch H_2O

III. General Conditions of HVAS

IV. Remarks

Conducted by: WH MAN Checked by:

File Name: HVASCAL_1535_2016.Doc

HIGH VOLUME AIR SAMPLER
SITE VISIT LOG SHEET

Site Name:	EG	Site No.:	AM2
Date of visit:	12-12-2016	Hour of Visit:	11:15
Staff name:	WHMAN	HVAS S/N:	0132
Used filter paper no.:	MH58	New filter paper no.:	MH60
Type of filter:	Glass-fibre		

I. Ambient Conditions

Temperature, T_a = 298.6 K Pressure, P_a = 1014.5 mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions corresponds to Q_{STD} = 40 ft^3/min. (inch H_2O)
1534(10/2016)	$H_a = 18.32(T_a/P_a)$ = 5.39

Manometer reading before calibration: 5.60
Adjustment of flow controller (Y/N): Y
Manometer reading after calibration: 5.40

Note: Tolerance Limit of HVAS flow: " 1.0 ft^3/min. Corresponding limits for manometer : " 0.2 inch H_2O

III. General Conditions of HVAS

/

IV. Remarks

/

Conducted by: WH MAN Checked by:

File Name: HVASCAL_1535_2016.Doc

MINI VOLUME AIR SAMPLER

SITE VISIT LOG SHEET

Site Name:	Tai Yuen Village	Site No.:	AM4
Date of visit:	12-12-2016	Hour of Visit:	09:45
Staff name:	W.H. MAN	MINIVOL S/N:	3393
Used filter paper no.:	M066	New filter paper no.:	M067

Type of filter: ~~Cellulose~~ / Glass-fibre

(Delete as appropriate)

I. Calibration is performed by using BIOS Flow Meter (S/N: 127823)

5 Sl/min set point is recommended

5.06 Before 5.02 After

II. General Service of Mini Vol Air Sampler

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

III. Remarks

N/A

Conducted by: W.H. MAN Checked by :

f:\den\exchange\air\form\minilogs.doc

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 15-12-2016 Time 10:45 hrs

Equipment B&K 2250 Serial No. 3009916

Staff Attended W.M.TAM / W.H.MAN

1. Calibration

   Acoustic calibrator: B&K4231 (S/N: 2730419)

   Noise level measured in calibration: 93.9 (94±1.0 dBA)

2. Weather Conditions

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

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

3. Beacon

   Function normally (Yes/No): YES

4. Remark/Observation

   The SLM B&K2250 (S/N: 3008903) was replaced by the above SLM.

Note: * - Please delete where inappropriate.

Conducted By: W.M.TAM / W.H.MAN Checked By: Terence Chu

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 15-12-2016 Time 15:45 hrs

Equipment B&K 2250 Serial No. 3008621

Staff Attended W.M TAM / W.H. MAN

1. Calibration

   Acoustic calibrator: B&K 4231 (S/N: 2730419)

   Noise level measured in calibration: 94.9 (94±1.0 dBA)

2. Weather Conditions

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

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

3. Beacon

   Function normally (Yes/No): YES

4. Remark/Observation

   /

Note: * - Please delete where inappropriate.

Conducted By: W.M TAM / W.H MAN Checked By: Terence Chu

June 2016

Appendix G Event/Action Plans

Table G.1 Event and Action Plans for Air Quality

Event	Monitoring		Action	
	ET Leader	**IEC**	**Engineer**	**Contractor**
Action Level				
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
Limit level				
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	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. Repeat measurement to confirm finding Increase monitoring frequency to daily Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented Arrange meeting with Engineer and Contractor to discuss the remedial actions to be taken If exceedance stops, discontinue additional monitoring	ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	failure in writing Checking monitoring data and Contractor's working methods Notify Contractor Discuss proposed remedial actions with ET and Contractor Ensure remedial measures properly implemented 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	avoid further exceedance Submit proposals for remedial actions to Engineer within 3 working days of notifications Implement the agreed proposals Resubmit proposals if problem still not under control Stop the relevant portion of works as determined by the Engineer until the exceedance is abated

Table G.2 Event and Action Plans for Construction Noise

Exceedance	ET Leader	IEC	Engineer	Contractor
Action Level	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.			
Limit Level	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.	Submit proposals for remedial actions to Engineer.
			Discuss with Contractor the remedial actions to be implemented.	Amend proposals if required by the Engineer.
		Verify the implementation of the remedial measures	Keep the Contractor informed of the efficacy of remedial actions.	Implement remedial actions immediately upon instruction from the Engineer.
	Discuss remedial actions required with Engineer.		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	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

Exceedance	ET Leader	IEC	Engineer	Contractor
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

Exceedance	ET Leader	IEC	Engineer	Contractor
	equipment and Contractor's working methods; Discuss mitigation measure with Engineer and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level.		implemented mitigation measures.	within 3 working days and discuss with Engineer; Implement the agreed mitigation measures.
Limit level exceeded by more than one consecutive sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform Contractor, IEC and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measure with Engineer and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	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 implemented mitigation measures; 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.	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 Engineer; Implement the agreed mitigation measures.. As directed by the Engineer, to slow down or to stop all or part of the marine work

Appendix H Summary of Site Audit Findings

L10 Piling Foundation Work (L10 & 275 kV S/S Construction Sites)

Dates of Inspection: 02/12/2016, 9/12/2016, 16/12/2016, 23/12/2016 and 30/12/2016.

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.

L10 Civil & Building Superstructure Work

Dates of Inspection: 09/12/2016, 15/12/2016, 20/12/2016 and 30/12/2016.

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.

L11 Piling Foundation Work

Dates of Inspection: 23/12/2016 and 30/12/2016.

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
	AIR QUALITY	
A1	For general construction works, the dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation shall be complied with, such as:	
	• the haul roads shall be sprayed with water to keep the entire road surface wet.	C
	• the load carried by vehicle shall be covered by impervious sheeting to ensure no leakage of dusty materials from the vehicle.	C
	• the heights from which fill materials are dropped shall be controlled to a practical level to minimise the fugitive dust arising from unloading.	C
A2	For the concrete batching plant, the following control measures are recommended:	
	• loading, unloading, handling, transfer or storage or any dusty materials shall be carried out in a totally enclosed system.	C
	• The materials which may generate airborne dust emissions shall be wetted by water spray system.	C
	• All receiving hoppers shall be enclosed on three sides up to 3m above unloading point.	C
	• All conveyor transfer points shall be totally enclosed.	C
	WATER QUALITY	
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: ** • reducing the number of dredgers working at any one time; • reducing the rate of working of the dredgers; • temporary suspension of operations; • phasing of the works so that dredging / filling is only undertaken at certain stages of the tidal cycle.	N/A

EM&A Log Ref.	Mitigation Measures	Implementation Status
B7	In addition to the above specific measures the following general working procedures shall be adopted. **	
	• fully-enclosed or watertight grabs shall be used to minimise loss of sediment during the raising of loaded grabs through the water column;	N/A
	• the descent speed of grabs shall be controlled to minimise the seabed impact speed and to reduce the volume of over dredging;	N/A
	• barges shall be loaded carefully to avoid splashing of material;	N/A
	• 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;	N/A
	• 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;	N/A
	• the speed of trailer dredgers shall be controlled to prevent propeller wash from stirring up the sea bed sediments;	N/A
	• "rainbowing" sand fill from trailer dredgers shall not be permitted; and	N/A
	• 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.	N/A
B8	Cumulative impacts shall be assessed through EM&A. Co-ordination with the EM&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. **	N/A
	NOISE	
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 PMEs to less sensitive time periods.	C
C3	Mitigate against night time noise from dredging equipment, with silencers or mufflers. **	N/A
	LANDSCAPE & VISUAL IMPACTS	
D1	The following mitigation measures shall be allowed for landscape and visual improvement:	
	• Use rubble mound seawall along south and west edges of the reclamation to provide a more natural look.	N/A
	• Break the mass of main buildings by varying the height/division into smaller units.	N/A
	• Plant trees and vegetation for screening.	N/A
	• Adopt colour scheme to blend the buildings into the scenery.	N/A

EM&A Log Ref.	Mitigation Measures	Implementation Status
	WASTE MANAGEMENT	
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
	Dredging Waste	
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
	Storage, Collection and Transport of Waste	
E3	• Minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers.	C
	• 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.	C
	• Disposal of waste at Licensed sites;	C
	• 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;	C

	• Segregate and sort the waste materials into 3 categories:
	  • public fill (e.g. concrete and rubble) for re-use on-site or disposal at a public filling area;
	  • re-use and/or recycling waste (e.g. steel and other metals);
	  • waste which cannot be re-used and/or recycled (e.g. wood, glass and plastic) for landfill disposal.
	  • 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.
		C

	• Maintain records of the quantities of wastes generated and disposed off-site for each category of waste.	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
	LAND CONTAMINATION	
F1	No land Contamination mitigation measures are required during the construction phase.	N/A
	MARINE ECOLOGY	

EM&A Log Ref.	Mitigation Measures	Implementation Status
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^3 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
	FISHERIES	
H1	No Fisheries-specific mitigation measures are required during the construction phase.	N/A
	RISK ASSESSMENT	
I1	No risk mitigation measures are required during the construction phase.	N/A

Remarks:

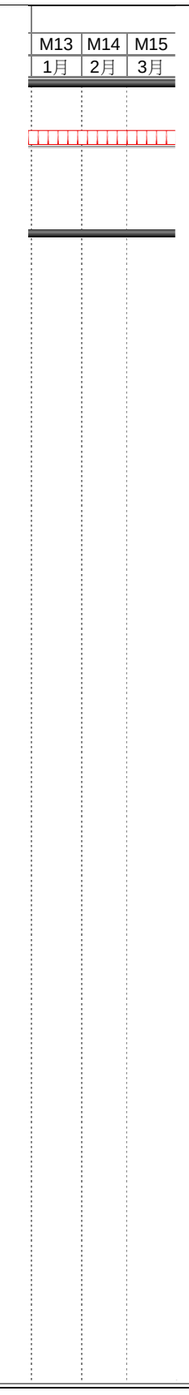
** - No dredging and reclamation work would be involved for L10 construction
C - Compliance with mitigation measure
NC - Non-compliance with mitigation measure
N/A - Not Applicable

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
1	**1**	**Key Date**	**486 days**	**2016/1/1**	**2017/4/30**
2	1.1	Commencement date	0 days	2016/1/1	2016/1/1
3	1.2	Duration of works	486 days	2016/1/1	2017/4/30
4	1.3	Possession date	0 days	2016/1/1	2016/1/1
5	1.4	Completion of the Contract	0 days	2017/4/30	2017/4/30
6					
7	**2**	**Total Contract Period**	**486 days**	**2016/1/1**	**2017/5/1**
8					
9	**2.1**	**Preliminaries**	**37 days**	**2016/1/1**	**2016/2/6**
10	2.1.1	Coordination with utility companies	14 days	2016/1/1	2016/1/14
11	2.1.2	Condition survey	20 days	2016/1/1	2016/1/20
12	2.1.3	Notification of commencement of works to Labour Department	7 days	2016/1/1	2016/1/7
13	2.1.4	Notification of air pollution control for commencement of works to EPD	7 days	2016/1/1	2016/1/7
14	2.1.5	Application of water discharge licence from EPD	7 days	2016/1/1	2016/1/7
15	2.1.6	Application for billing account for disposal of construction waste from EPD	7 days	2016/1/1	2016/1/7
16	2.1.7	CCTV for existing underground drainage pipe around site boundary	21 days	2016/1/1	2016/1/21
17	2.1.8	Utility detection for existing underground cables	20 days	2016/1/1	2016/1/20
18	2.1.9	Site clearance	21 days	2016/1/1	2016/1/21
19	2.1.10	Erection of contractor's site office	21 days	2016/1/1	2016/1/21
20	2.1.11	Installation of monitoring checkpoints	20 days	2016/1/18	2016/2/6
21	2.1.12	Submission of BA10 for ELS & foundation works	0 days	2016/1/1	2016/1/1
22					
23	**2.2**	**Section A**	**305 days**	**2016/1/1**	**2016/10/31**
24	**2.2.1**	**Hoarding**	**90 days**	**2016/1/1**	**2016/3/30**
25	2.2.1.1	Erection of Hoarding	90 days	2016/1/1	2016/3/30
26	**2.2.2**	**Foundation Works at Unit L10**	**295 days**	**2016/1/11**	**2016/10/31**
27	**2.2.2.1**	**Bored Pile - Temporary Steel Casing**	**56 days**	**2016/1/22**	**2016/3/17**
28	2.2.2.1.1	Duration for delivery temporary steel casing	56 days	2016/1/22	2016/3/17
29	**2.2.2.2**	**Bored Pile - Permanent Casing & Double Wall Liner**	**172 days**	**2016/2/24**	**2016/8/13**
30	2.2.2.2.1	Testing for double wall liner	0 days	2016/2/24	2016/2/24
31	2.2.2.2.2	Duration for delivery permanent casing & double wall liner	160 days	2016/3/7	2016/8/13
32	**2.2.2.3**	**Bored Pile - Plant Mobilization**	**56 days**	**2016/1/15**	**2016/3/11**
33	**2.2.2.3.1**	**Crawler Crane**	**53 days**	**2016/1/15**	**2016/3/8**
34	2.2.2.3.1.1	1st & 2nd set	0 days	2016/1/15	2016/1/15
35	2.2.2.3.1.2	3rd set	0 days	2016/2/4	2016/2/4
36	2.2.2.3.1.3	4th & 5th set	0 days	2016/2/19	2016/2/19
37	2.2.2.3.1.4	6th set	0 days	2016/3/8	2016/3/8
38	**2.2.2.3.2**	**Oscillator**	**35 days**	**2016/1/29**	**2016/3/4**
39	2.2.2.3.2.1	1st & 2nd set	0 days	2016/1/29	2016/1/29
40	2.2.2.3.2.2	3rd & 4th set	0 days	2016/2/24	2016/2/24
41	2.2.2.3.2.3	5th set	0 days	2016/3/4	2016/3/4
42	**2.2.2.3.3**	**RCD**	**7 days**	**2016/3/4**	**2016/3/11**
43	2.2.2.3.3.1	1st & 2nd set	0 days	2016/3/4	2016/3/4
44	2.2.2.3.3.2	3rd, 4th & 5th set	0 days	2016/3/11	2016/3/11
45	**2.2.2.4**	**Predrilling**	**60 days**	**2016/1/11**	**2016/3/10**
46	2.2.2.4.1	Predrilling works (38 nos.)	60 days	2016/1/11	2016/3/10
47	**2.2.2.5**	**Bored Pile Construction**	**263 days**	**2016/2/12**	**2016/10/31**
48	2.2.2.5.1	Bored pile construction (38 piles)	215 days	2016/2/12	2016/9/13
49	2.2.2.5.2	Interface & sonic test	30 days	2016/8/25	2016/9/23
50	2.2.2.5.3	Prepare & submit as-built record plan	7 days	2016/9/17	2016/9/23
51	2.2.2.5.4	Submission of BA14	1 day	2016/9/23	2016/9/23
52	2.2.2.5.5	Allow 14 days for selection of pile for concrete full core test	14 days	2016/9/24	2016/10/7



Master Programme Revision 1

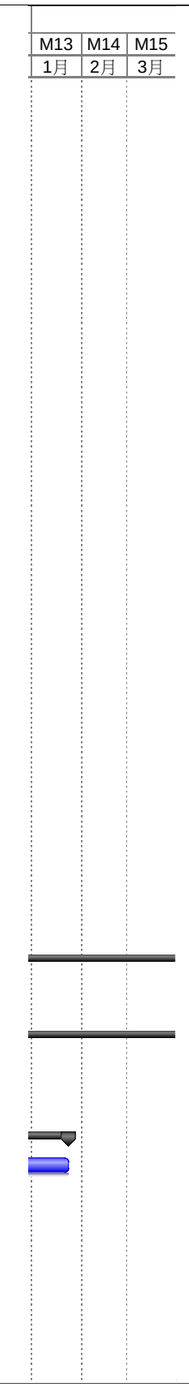
Task | Critical Task | Milestone | Summary

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
53	2.2.2.5.6	Concrete full core test	14 days	2016/10/8	2016/10/21
54	2.2.2.5.7	Compression test for concrete core	7 days	2016/10/22	2016/10/28
55	2.2.2.5.8	Submission of log report & compression test report	4 days	2016/10/28	2016/10/31
56	**2.2.2.6**	**Sheet Pile**	**92 days**	**2016/7/22**	**2016/10/21**
57	2.2.2.6.1	Plant mobilization	0 days	2016/7/31	2016/7/31
58	2.2.2.6.2	Delivery sheet pile material	0 days	2016/7/22	2016/7/22
59	2.2.2.6.3	Installation of sheet pile - Type A (approx. 212 piles)	50 days	2016/8/1	2016/9/19
60	2.2.2.6.4	Installation of sheet pile - Type B (approx. 100 piles)	24 days	2016/9/20	2016/10/13
61	2.2.2.6.5	Prepare & submit as-built record plan	7 days	2016/10/14	2016/10/20
62	2.2.2.6.6	Submission of BA14	1 day	2016/10/21	2016/10/21
63	2.2.2.7	Completion of foundation works at Unit L10	0 days	2016/10/31	2016/10/31
64	**2.2.3**	**New Site Facilities**	**198 days**	**2016/1/1**	**2016/7/16**
65	2.2.3.1	Submission for design of site office A	90 days	2016/1/1	2016/3/30
66	2.2.3.2	Approval for design of site office A	28 days	2016/3/31	2016/4/27
67	2.2.3.3	Erection of site office A	50 days	2016/4/28	2016/6/16
68	2.2.3.4	Erection of wasing facilities with shelter & container shower facilities	20 days	2016/5/28	2016/6/16
69	2.2.3.5	Installation of earthing	30 days	2016/6/7	2016/7/6
70	2.2.3.6	Installation of portable water pipes	30 days	2016/6/17	2016/7/16
71	2.2.3.7	Installation of sewage drain pipes	30 days	2016/6/17	2016/7/16
72	2.2.3.8	Completion of new site facilities	0 days	2016/7/16	2016/7/16
73	2.2.4	Completion of section A	0 days	2016/10/31	2016/10/31
74	2.2.5	Demobilization of plants	0 days	2016/10/21	2016/10/21
75	2.3	Handover of site works area for Section A	0 days	2016/11/1	2016/11/1
76					
77	**2.4**	**Section B**	**121 days**	**2016/1/1**	**2016/4/30**
78	**2.4.1**	**Ground Treatment Works**	**121 days**	**2016/1/1**	**2016/4/30**
79	2.4.1.1	Verification GI works (approx. 20 nos.)	14 days	2016/2/20	2016/3/4
80	2.4.1.2	Plant mobilization	55 days	2016/1/1	2016/2/24
81	2.4.1.3	Trial installation of band drain	5 days	2016/2/25	2016/2/29
82	2.4.1.4	Installation of band drain (approx. 2477 nos.)	45 days	2016/3/1	2016/4/14
83	2.4.1.5	Installation of steel plate & geotextile on existing U-channel	20 days	2016/3/28	2016/4/16
84	2.4.1.6	Filling of surcharge (approx. 21000 m3)	20 days	2016/4/7	2016/4/26
85	2.4.1.7	Installation of ground settlement markers	10 days	2016/4/21	2016/4/30
86	2.4.2	Completion of section B	0 days	2016/4/30	2016/4/30
87					
88	**2.5**	**Section C**	**229 days**	**2016/9/14**	**2017/4/30**
89	**2.5.1**	**Hoarding**	**45 days**	**2016/11/1**	**2016/12/15**
90	2.5.1.1	Erection of Hoarding	45 days	2016/11/1	2016/12/15
91	**2.5.2**	**Foundation Works at 275kV Substation Building**	**229 days**	**2016/9/14**	**2017/4/30**
92	2.5.2.1	Early start milestone	0 days	2016/10/6	2016/10/6
93	**2.5.2.2**	**Bored Pile - Temporary Steel Casing**	**7 days**	**2016/9/14**	**2016/9/20**
94	2.5.2.2.1	Duration for delivery temporary steel casing	7 days	2016/9/14	2016/9/20
95	**2.5.2.3**	**Bored Pile - Permanent Casing & Double Wall Liner**	**120 days**	**2016/9/26**	**2017/1/23**
96	2.5.2.3.1	Duration for delivery permanent casing & double wall liner	120 days	2016/9/26	2017/1/23
97	**2.5.2.4**	**Bored Pile - Plant Mobilization**	**14 days**	**2016/10/1**	**2016/10/15**
98	**2.5.2.4.1**	**Crawler Crane**	**0 days**	**2016/10/1**	**2016/10/1**
99	2.5.2.4.1.1	1st & 2nd set	0 days	2016/10/1	2016/10/1
100	**2.5.2.4.2**	**Oscillator**	**0 days**	**2016/10/5**	**2016/10/5**
101	2.5.2.4.2.1	1st & 2nd set	0 days	2016/10/5	2016/10/5
102	**2.5.2.4.3**	**RCD**	**0 days**	**2016/10/15**	**2016/10/15**
103	2.5.2.4.3.1	1st & 2nd set	0 days	2016/10/15	2016/10/15
104	**2.5.2.5**	**Predrilling**	**21 days**	**2016/11/1**	**2016/11/21**



Master Programme Revision 1

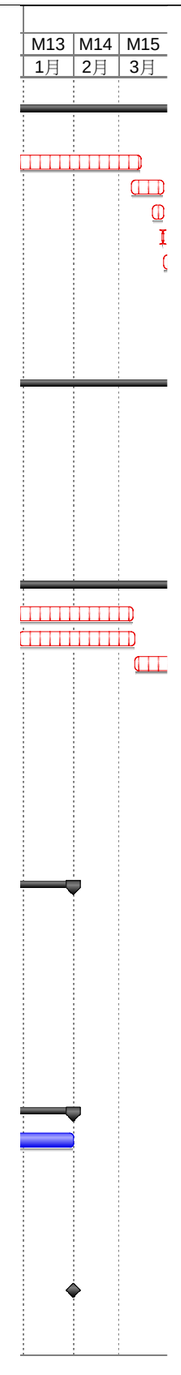
Task | Critical Task | Milestone | Summary

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
105	2.5.2.5.1	Predrilling works (10 nos.)	21 days	2016/11/1	2016/11/21
106	**2.5.2.6**	**Bored Pile**	**181 days**	**2016/11/1**	**2017/4/30**
107	2.5.2.6.1	Installation of monitoring checkpoints	7 days	2016/11/1	2016/11/7
108	2.5.2.6.2	Bored pile construction (10 piles)	125 days	2016/11/10	2017/3/14
109	2.5.2.6.3	Interface & sonic test	20 days	2017/3/9	2017/3/28
110	2.5.2.6.4	Prepare & submit as-built record plan	7 days	2017/3/22	2017/3/28
111	2.5.2.6.5	Submission of BA14	1 day	2017/3/28	2017/3/28
112	2.5.2.6.6	Allow 14 days for selection of pile for concrete full core test	14 days	2017/3/29	2017/4/11
113	2.5.2.6.7	Concrete full core test	10 days	2017/4/12	2017/4/21
114	2.5.2.6.8	Compression test for concrete core	7 days	2017/4/21	2017/4/27
115	2.5.2.6.9	Submission of log report & compression test report	4 days	2017/4/27	2017/4/30
116	2.5.2.7	Completion of foundation works at 275kV substation building	0 days	2017/4/30	2017/4/30
117	**2.5.3**	**Trial Pile**	**212 days**	**2016/10/1**	**2017/4/30**
118	2.5.3.1	Early start milestone	0 days	2016/10/1	2016/10/1
119	2.5.3.2	Submission of BA10 for trial pile	7 days	2016/11/1	2016/11/7
120	**2.5.3.3**	**Predrilling**	**28 days**	**2016/11/8**	**2016/12/5**
121	2.5.3.3.1	Predrilling works (3 nos.)	28 days	2016/11/8	2016/12/5
122	**2.5.3.4**	**Ground Instrumentation**	**24 days**	**2016/11/22**	**2016/12/15**
123	2.5.3.4.1	Installation of magnetic extensometer in predrilled hole (3 nos.)	16 days	2016/11/22	2016/12/7
124	2.5.3.4.2	Installation of settlement plate	10 days	2016/12/6	2016/12/15
125	**2.5.3.5**	**Construction of Trial Pile**	**136 days**	**2016/12/16**	**2017/4/30**
126	2.5.3.5.1	Installation of trial pile (6 piles)	84 days	2016/12/16	2017/3/9
127	2.5.3.5.2	Dynamic pile test	72 days	2016/12/29	2017/3/10
128	2.5.3.5.3	Static load test	42 days	2017/3/11	2017/4/21
129	2.5.3.5.4	Prepare & submit as-built record plan	7 days	2017/4/17	2017/4/23
130	2.5.3.5.5	Submission of BA14	1 day	2017/4/23	2017/4/23
131	2.5.3.5.6	Cut off the piles to level +3.0mPD	7 days	2017/4/24	2017/4/30
132	2.5.3.6	Completion of trial pile	0 days	2017/4/30	2017/4/30
133	2.5.4	Completion of section C	0 days	2017/4/30	2017/4/30
134	2.5.5	Demobilization of plants	0 days	2017/4/30	2017/4/30
135	2.6	Handover of site works area for Section C	0 days	2017/5/1	2017/5/1
136					
137	**2.7**	**Section D**	**383 days**	**2016/1/15**	**2017/1/31**
138	**2.7.1**	**General Site Works**	**36 days**	**2016/3/1**	**2016/4/5**
139	2.7.1.1	Cable duct & draw pit	21 days	2016/3/1	2016/3/21
140	2.7.1.2	Reloaction of lamp pole (5 poles)	20 days	2016/3/17	2016/4/5
141	**2.7.2**	**G.I. Works**	**99 days**	**2016/3/4**	**2016/6/10**
142	2.7.2.1	Submission of BA10 for G.I. works	7 days	2016/3/4	2016/3/10
143	2.7.2.2	Carry out G.I. works (11 nos.)	85 days	2016/3/11	2016/6/3
144	2.7.2.3	Prepare & submit as-built record plan	7 days	2016/6/4	2016/6/10
145	2.7.2.4	Submission of BA14	1 day	2016/6/10	2016/6/10
146	**2.7.3**	**Ground Treatment Time**	**276 days**	**2016/5/1**	**2017/1/31**
147	2.7.3.1	9 months for monitoring settlement after completion of ground treatment	276 days	2016/5/1	2017/1/31
148	**2.7.4**	**External Works**	**227 days**	**2016/1/15**	**2016/8/28**
149	2.7.4.1	Repair & make good site office B & existing latrines	90 days	2016/3/1	2016/5/29
150	2.7.4.2	Removal of the employer's materials stored in E6 area as instructed by the Engineer	90 days	2016/1/15	2016/4/13
151	2.7.4.3	Installation of bund wall of sandbags	60 days	2016/5/1	2016/6/29
152	2.7.4.4	Construction of new type 3 road	60 days	2016/6/30	2016/8/28
153	2.7.5	Completion of section D	0 days	2017/1/31	2017/1/31
154					
155	2.8	Contract completion	0 days	2017/4/30	2017/4/30



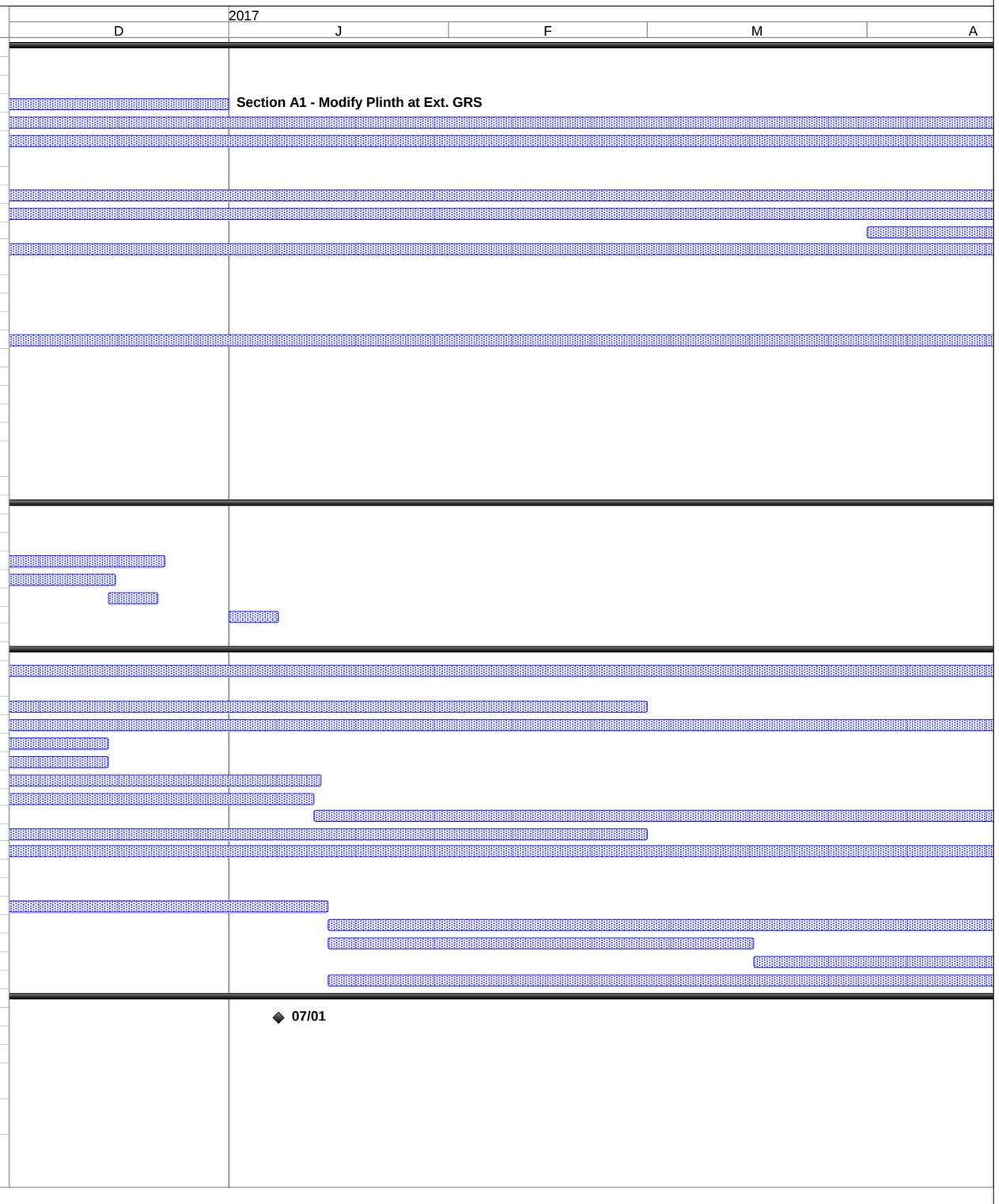
Master Programme Revision 1

Task | Critical Task | Milestone | Summary

Contract No. 16/8002 Lamma Power Station Extension Civil and Building Unit L10

Master Programme

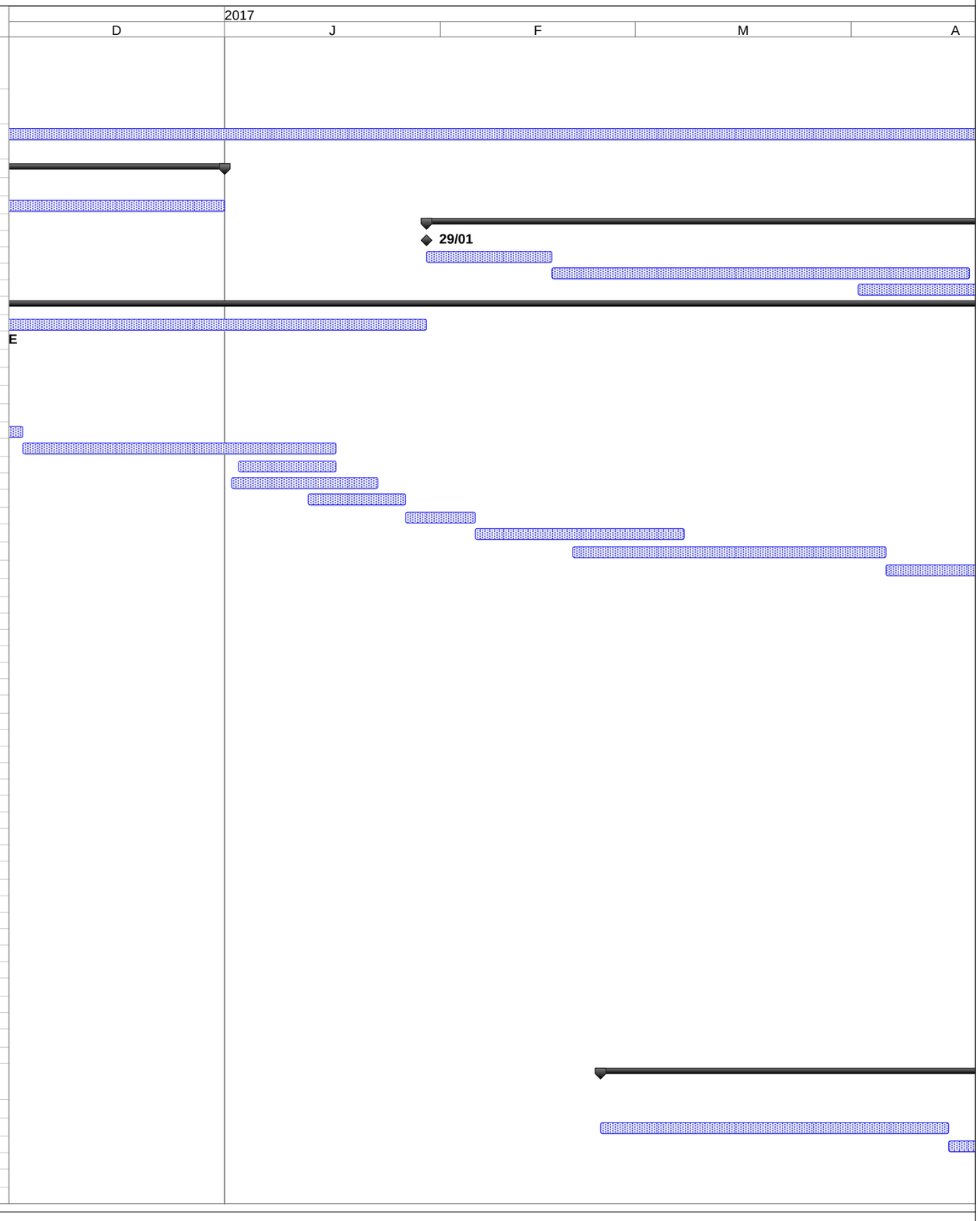
ID	Task Name	Duration	Start	Finish
1	**Contract Key Date**	**1308 days**	**01/11/16**	**31/05/20**
2	**Possession Date**	**1308 days**	**01/11/16**	**31/05/20**
3	Contract Commencement Date	0 days	01/11/16	01/11/16
4	Section A1 - Modify Plinth at Ext. GRS	61 days	01/11/16	31/12/16
5	Section A2 - LPS Site Office Building	410 days	01/11/16	15/12/17
6	Section B1 - Area C1&2 incl. all UG structures & Temp. Access for Empolyer's Specialist	426 days	01/11/16	31/12/17
7	Section B2 - Surcharge relocation & assoicated top-up works	122 days	01/09/17	31/12/17
8	Section C - Area C3, HRSG & MSBU10 for Empolyer's Specialist	457 days	01/11/16	31/01/18
9	Section D - Remaining of MSBU10, HRSG, A&A at L9 & L8, Ext. & Demolish Site Toilet	516 days	01/11/16	31/03/18
10	Section D - CW Pump Equip. Rm No. 4	365 days	01/04/17	31/03/18
11	Section E - Middel Rd & South of L10. Expose & Construction New 275kV Trench at LMX	577 days	01/11/16	31/05/18
12	Section F -Urea Storage & Handling Factilies	488 days	01/05/17	31/08/18
13	Section G - Demin. Plant Road & No.3 Outfall	273 days	01/01/18	30/09/18
14	Section G - Modification at No. 4 CW Intake	122 days	01/03/18	30/06/18
15	Section H1 - Gas Support foundation & trench at Area C11	745 days	01/11/16	15/11/18
16	Section H2 - GRS Improvement work at Area C10	441 days	01/09/17	15/11/18
17	Section H3 - L10 Chimney Flue and A&A L9 & pipe rack formation	319 days	01/01/18	15/11/18
18	Section I1 - Link Bridge & associated A&A	455 days	01/01/18	31/03/19
19	Section I2 - Shunt Reactor SR4 Foundation	90 days	01/01/19	31/03/19
20	Section I3 - All remaining work except deferred works	417 days	08/02/18	31/03/19
21	Section J - Cable Route CPX1&2 cable diversion & whole of work except deferred works to be carried out in DLP	790 days	02/05/17	30/06/19
22	Deferred works during DLP	336 days	01/07/19	31/05/20
23	**General & Preliminary**	**461 days**	**01/11/16**	**04/02/18**
24	Set up Temporary Site Office and Utilities	30 days	01/11/16	30/11/16
25	Full Mobilization	14 days	01/11/16	14/11/16
26	Permit Applications & Statuary Submissions	45 days	08/11/16	22/12/16
27	Existing Utilities scanning & Excavation Permit	45 days	01/11/16	15/12/16
28	Foundation of Tower Crane Construction	7 days	15/12/16	21/12/16
29	Tower Crane Erection	7 days	01/01/17	07/01/17
30	Removal of Tower Crane (Including Foundation)	18 days	18/01/18	04/02/18
31	**Submission and Approval**	**450 days**	**01/11/16**	**24/01/18**
32	Method Statement / Temp Work Submission & Approval from HEC for General Works	240 days	01/11/16	28/06/17
33	BD Approval & Consent (If required)	90 days	01/12/16	28/02/17
34	BIM Model, CSD & CBWD Submission & Approval from HEC	200 days	01/12/16	18/06/17
35	Structure Steelwork Connection Design Submission & BD Approval	30 days	15/11/16	14/12/16
36	Structure Steelwork Shop Drawing & Approval	30 days	15/11/16	14/12/16
37	Metal Cladding, louvre & windows submission & BD Approval	60 days	15/11/16	13/01/17
38	Metal Cladding, louvre & windows shop drawing submission	45 days	29/11/16	12/01/17
39	Order, Off Site Fabrication and Delivery (S. Steel & Cladding & louvres)	180 days	13/01/17	11/07/17
40	CW Culvert (Inlet) ELS BD approval & consent	90 days	01/12/16	28/02/17
41	Sumission & Approval of Steel Flue Assessment Report and Design Drawings	210 days	01/12/16	28/06/17
42	Submission and Approval of Steel Flue Design from BD	60 days	29/06/17	27/08/17
43	Material Fabrication & Delivery for L10 Flue	150 days	28/08/17	24/01/18
44	Folding Shutters Shop Drawing Submission & Approval	45 days	01/12/16	14/01/17
45	Fabrication & Delivery of Foldering Shutters	180 days	15/01/17	13/07/17
46	Sewage Pump System Design submission & Approval	60 days	15/01/17	15/03/17
47	Fabrication & Delivery of Sewage Pump	150 days	16/03/17	12/08/17
48	Other Material Submission & Approval & Deliverys	240 days	15/01/17	11/09/17
49	**Coordination with the Employer's Specialist Contractors**	**730 days**	**01/11/16**	**31/10/18**
50	Puddle Pipes at C.W. Inlet and Outlet Culvert	0 days	07/01/17	07/01/17
51	Template setting in at L10 Turbo Block Foundation	45 days	01/10/17	14/11/17
52	Template setting of holding down bolts at HRSG Column Base	45 days	01/10/17	14/11/17
53	I-beam/ Channel Base Installation on top of Transformer Foundations at Transformer Area	32 days	27/12/17	27/01/18
54	Overhead Crane Erection at Turbine Hall using Access through a Temporary Opening at L10 MSB Roof between GL 10-G to 10-H and 10-2 and 10-6	38 days	12/12/17	18/01/18
55	Condenser Assembly and Erection using Access through a Temporary Opening at L10 MSB below 1/F along GL 10-6 from GL 10-B to 10-C including a Clear Space below 1/F between GL 10-B to 10-C	89 days	01/02/18	30/04/18



Contract No. 16/8002 Lamma Power Station Extension Civil and Building Unit L10

Master Programme

ID	Task Name	Duration	Start	Finish
56	Installation of Power Train Equipment including Air Inlet Duct using Access through a Temporary Façade Opening at L10 MSB below 1/F along GL 10-6 from GL 10-F to 10-H including a Clear Space below 1/F of the above Area	89 days	01/02/18	30/04/18
57	Installation of Equipment in L10 HRSG Area after the Temporary Paving was Removed to Expose the Respective Foundations by the Contractor	78 days	15/08/18	31/10/18
58	Installation of Embedded Materials such as Holding Down Bolts for Equipment Foundation	300 days	01/11/16	27/08/17
59	**Section A1 - Modify Plinth at Ext. GRS**	**61 days**	**01/11/16**	**31/12/16**
60	Existing Plinth Removal	18 days	01/11/16	18/11/16
61	Wall Base & Plinth Construction	45 days	17/11/16	31/12/16
62	**Pipe Rcak at Unit 9 North (VO under EI No. 6)**	**152 days**	**29/01/17**	**30/06/17**
63	Consent and BA10 Submissions	0 days	29/01/17	29/01/17
64	Hoarding & Plant Load Test	18 days	30/01/17	16/02/17
65	Footing Construction & Reinstatement	60 days	17/02/17	17/04/17
66	Structural Steel Fabrication, Delivery & Erection	90 days	02/04/17	30/06/17
67	**Section A2 - LPS Site Office Building**	**410 days**	**01/11/16**	**15/12/17**
68	Submissions of Shop Drawings and Approval	90 days	01/11/16	29/01/17
69	Complete site clearance by HKE	0 days	01/11/16	01/11/16
70	Demolish of existing site office	21 days	01/11/16	21/11/16
71	BA 10 Application	0 days	01/11/16	01/11/16
72	Erection of Hording	7 days	01/11/16	07/11/16
73	Plate Load Test	7 days	08/11/16	14/11/16
74	Installation of Earthing Grid	18 days	15/11/16	02/12/16
75	Construction of pad footing, bearing wall, columns up to G/F	45 days	03/12/16	16/01/17
76	Waterproofing for Liift pit + Water test	14 days	03/01/17	16/01/17
77	UG Drainage within Building	21 days	02/01/17	22/01/17
78	Backfill & Blinding	14 days	13/01/17	26/01/17
79	Chinese New Year	10 days	27/01/17	05/02/17
80	Construct G/F on-grade slab & External Scaffold Erection	30 days	06/02/17	07/03/17
81	RC Walls, Columns and Slab up to 1/F	45 days	20/02/17	05/04/17
82	RC Walls, Columns and Slab up to R/F	45 days	06/04/17	20/05/17
83	Parapet Wall, FS Water Tank, Top Roofs + RC curb, hatch door etc	45 days	21/05/17	04/07/17
84	G/F Window, Louvre, Doors Frame & Shutter Frame	21 days	04/05/17	24/05/17
85	G/F Finishing Works	45 days	18/05/17	01/07/17
86	G/F Plumbing & Drainage Works	30 days	02/07/17	31/07/17
87	G/F Sanitary Fitting and Cubicles	21 days	01/08/17	21/08/17
88	G/F Other sundry metal, railing, etc	45 days	22/08/17	05/10/17
89	G/F Placing Furnitures	10 days	04/12/17	13/12/17
90	1/F Window, Louvre & Door Frames	30 days	18/06/17	17/07/17
91	1/F Finishing Works	30 days	18/07/17	16/08/17
92	1/F Plumbing, Sanitary Fittings & Drainage Works	14 days	17/08/17	30/08/17
93	1/F Other sundry metal, railing, etc	21 days	31/08/17	20/09/17
94	R+UR/F Waterproofing Installation + Testing	60 days	19/07/17	16/09/17
95	R/F Finishing Works (incl. Water Tank & FS Pump Room)	30 days	02/09/17	01/10/17
96	R/F Plumbing Works	14 days	02/10/17	15/10/17
97	R/F Sundry Metal, Handrail & Glazed Railing	30 days	02/10/17	31/10/17
98	Complete RC touch up and handover of lift shaft	7 days	26/07/17	01/08/17
99	Installation of Door a& Shutter leafs	21 days	01/11/17	21/11/17
100	Lift Installation + EMSD Inspection + Issue of Lift Cert	120 days	02/08/17	29/11/17
101	Electrial Installation	90 days	17/08/17	14/11/17
102	Fire Service Installation	90 days	17/08/17	14/11/17
103	MVAC Installation	90 days	17/08/17	14/11/17
104	Testing & Commissioning Works	24 days	15/11/17	08/12/17
105	External Wall Finishing Works	45 days	02/10/17	15/11/17
106	Removal of Scaffolding	14 days	16/11/17	29/11/17
107	External UG P&D and Road Works	145 days	05/07/17	26/11/17
108	WWO046 Completion	0 days	26/11/17	26/11/17
109	FSD Inspection	0 days	08/12/17	08/12/17
110	Submit BA 13 Inspection	14 days	30/11/17	13/12/17
111	Expected OP Issue	0 days	15/12/17	15/12/17
112	**Section B1 - Area C1&2 incl. all UG structures & Temp. Access for Empolyer's Specialist**	**311 days**	**24/02/17**	**31/12/17**
113	**C.W. Culvert System (Area C1 & C2) (~160m)**	**311 days**	**24/02/17**	**31/12/17**
114	Excavation to Formation Level (+1.1mPD)	50 days	24/02/17	14/04/17
115	Construction of Binding & Plinth	21 days	15/04/17	05/05/17
116	Pile Laying	60 days	06/05/17	04/07/17
117	Thrust Box Construction	21 days	05/07/17	25/07/17
118	Water Test	14 days	26/07/17	08/08/17

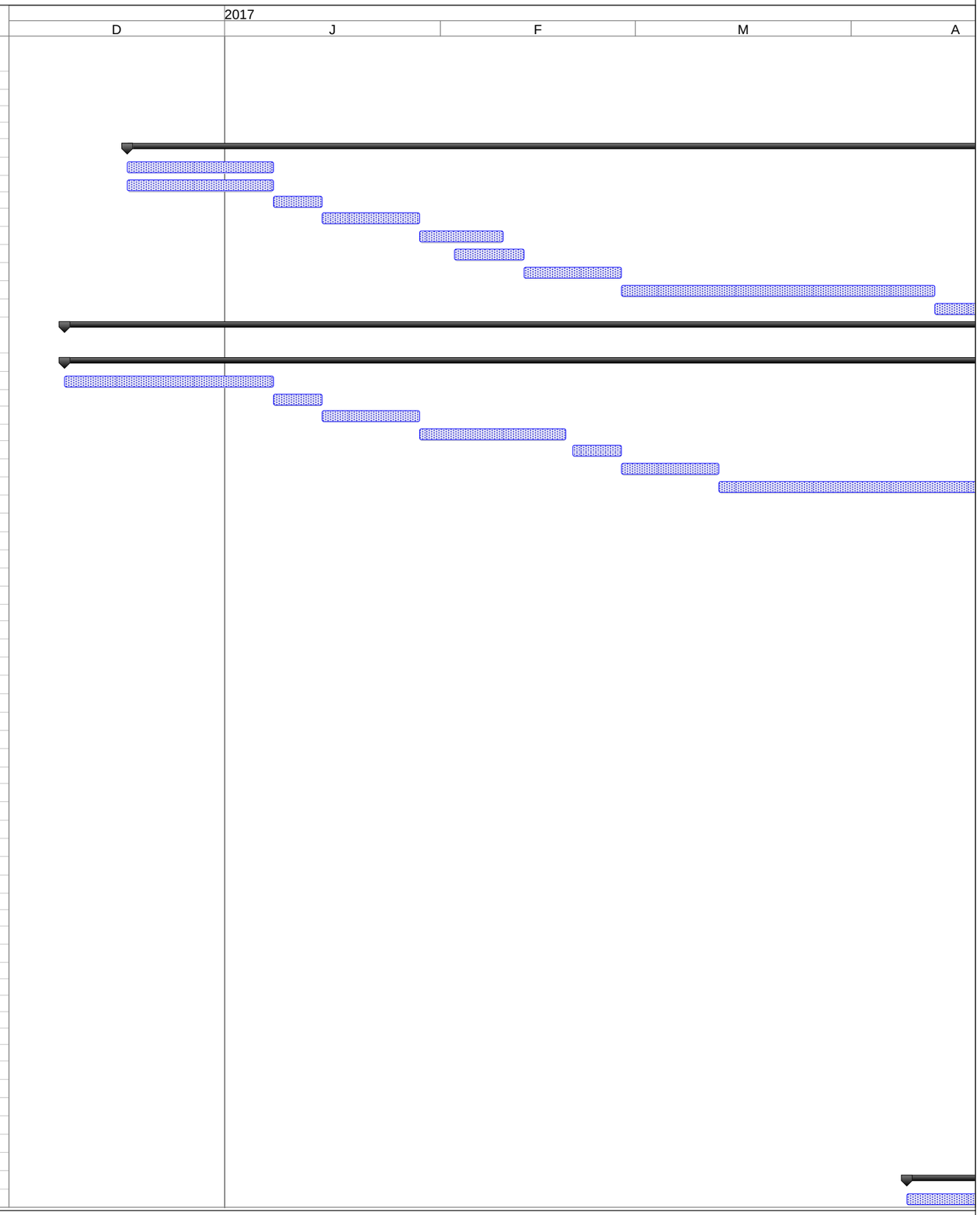


ID	Task Name	Duration	Start	Finish
119	Backfill	21 days	09/08/17	29/08/17
120	Cutting Sheet pile	14 days	30/08/17	12/09/17
121	All underground Utilities	75 days	13/09/17	26/11/17
122	Backfill & Reinstatement & Formation of Access	35 days	27/11/17	31/12/17
123	Supporting Supporting Structure for Overhead Crane	200 days	26/05/17	11/12/17
124	**Section B2 - Surcharge relocation & assoicated top-up works**	**242 days**	**04/05/17**	**31/12/17**
125	**Roadworks and External Works**	**242 days**	**04/05/17**	**31/12/17**
126	Surface Drainage Modification	120 days	04/05/17	31/08/17
127	Remove of Surcharge Fill (~21500 m3)@ Area C2, C10 & C15 to Area B1, B2, D2, D3 and D4	45 days	01/09/17	15/10/17
128	Construction of Access Road	60 days	16/10/17	14/12/17
129	Existing Band Drains Cut-down (2520 nos)	90 days	03/10/17	31/12/17
130	**Section C - Area C3, HRSG & MSBU10 for Empolyer's Specialist**	**457 days**	**01/11/16**	**31/01/18**
131	**HRSG Area Equipment Rm & Fdn - South (Area C7)**	**299 days**	**08/04/17**	**31/01/18**
132	Excavation to Formation Level	18 days	08/04/17	25/04/17
133	Sump Pit, Drain Pit (2no. 1.75m to 4.2m in Height)	45 days	26/04/17	09/06/17
134	Pile Head Treatment (6no.)	14 days	10/06/17	23/06/17
135	Pile Cap & Tie Beam - GL 10-H to 10H-H, 10-H3 to 10-6	60 days	19/06/17	17/08/17
136	Plate Load Test	12 days	18/08/17	29/08/17
137	Raft Foundation (7no.)	45 days	30/08/17	13/10/17
138	All Underground Utilities	60 days	14/10/17	12/12/17
139	Backfill & Reinstatement & Formation of Access Road	50 days	13/12/17	31/01/18
140	**HRSG Equipment Room**	**178 days**	**07/08/17**	**31/01/18**
141	Plate Load Test	10 days	07/08/17	16/08/17
142	Underground Drainage	12 days	17/08/17	28/08/17
143	HRSG Equipment RM Foundation	14 days	29/08/17	11/09/17
144	Backfill	6 days	12/09/17	17/09/17
145	Construct G/F	12 days	18/09/17	29/09/17
146	Roof Construction	21 days	30/09/17	20/10/17
147	Parapet Wall	12 days	21/10/17	01/11/17
148	ABWF Works	30 days	18/11/17	17/12/17
149	Building Service Installations	45 days	18/12/17	31/01/18
150	Ready for BA 13 Application	0 days	31/01/18	31/01/18
151	**Main Station Building Fdn, G/F &1/F**	**433 days**	**01/11/16**	**07/01/18**
152	Installation of Dewatering Well & King Post for Type A	14 days	01/11/16	14/11/16
153	BD Consent for ELS MSBU10 Foundation	0 days	01/11/16	01/11/16
154	Bulk Excavation to approx. +3.0mPD	21 days	15/11/16	05/12/16
155	**Substructure&G/F- GL SC1 to 10-D, 10-1 to 10-6**	**154 days**	**25/11/16**	**27/04/17**
156	Excavation to Formation Level (+1.325mPD)	14 days	25/11/16	08/12/16
157	Cut-down Pile Head & treatment	45 days	29/11/16	12/01/17
158	Pile Cap & Tie Beam Construction	100 days	03/12/16	12/03/17
159	Construction of Transformer Bay Foundations	45 days	17/12/16	30/01/17
160	Excavation, Waling & Struct (Type A & Type C)	30 days	09/12/16	07/01/17
161	Drain Pit /Sump Pit Construction	21 days	08/01/17	28/01/17
162	Arrival of CW Culvert piping materials incl. flexible joint & other cast in materials	0 days	07/01/17	07/01/17
163	Construction of Culvert Outlet Box	30 days	08/01/17	06/02/17
164	Construction of Culvert Inlet Box	30 days	07/02/17	08/03/17
165	Construction of Tie Beam/ Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SCa to SCb)	45 days	27/02/17	12/04/17
166	Bearing Wall, Column Post and G/F Slab Construction	30 days	29/03/17	27/04/17
167	**Substructure & G/F- GL 10-D to 10-H, 10-1 to 10-6**	**395 days**	**09/12/16**	**07/01/18**
168	Excavation to Formation Level (+2.425mPD & 5.025mPD)	45 days	09/12/16	22/01/17
169	Existing Sheet Pile Cut-down	7 days	12/12/16	18/12/16
170	Complete excavation at Type B	14 days	19/12/16	01/01/17
171	Blow Down Sump Construction	45 days	02/01/17	15/02/17
172	Pile Head Treatment (18no.)	30 days	19/12/16	17/01/17
173	Pile Cap & Tie Beam Construction	100 days	29/12/16	07/04/17
174	Bearing Wall, Column Post and G/F Slab Construction	35 days	25/03/17	28/04/17
175	Turbo Block Foundation	45 days	15/07/17	28/08/17
176	Backfill of Turbo Block	14 days	14/08/17	27/08/17
177	Turbo Block Superstructure	90 days	21/09/17	19/12/17
178	Beam & Slabs at G/F Area	90 days	28/08/17	25/11/17
179	Associated ABWF & BS Works for Specialist Access	60 days	09/11/17	07/01/18
180	**G/F & 1/F & Maintenance Floor**	**44 days**	**29/04/17**	**11/06/17**
181	Steel Column & Beam Erections (other than for roof truss)	14 days	29/04/17	12/05/17

Contract No. 16/8002 Lamma Power Station Extension Civil and Building Unit L10

Master Programme

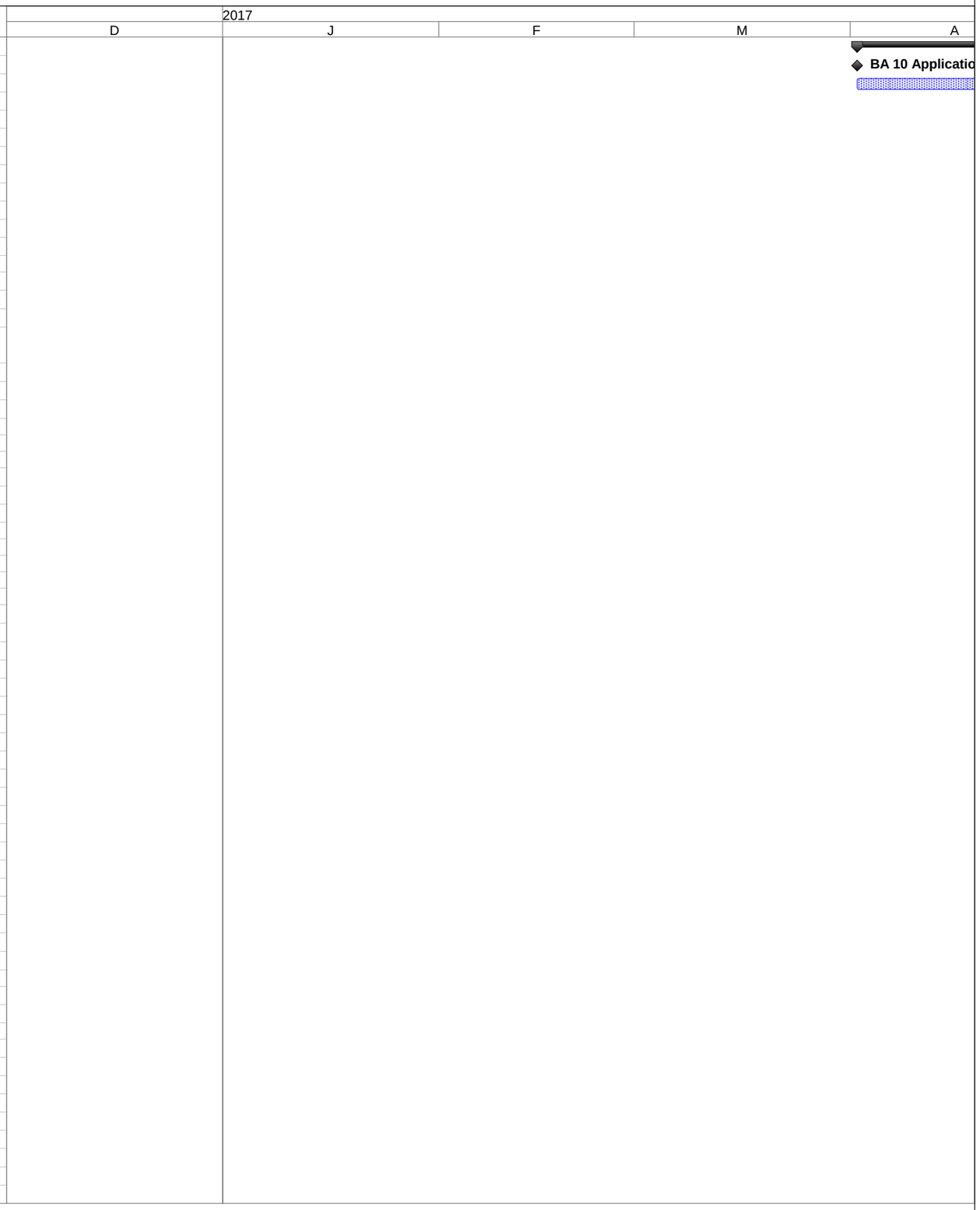
ID	Task Name	Duration	Start	Finish
182	Erection of Steel Column along GL10-2 and 10-6 and 10-C to 10-H (G/F to R/F) for roof truss	14 days	09/05/17	22/05/17
183	R.C. Structure Construction	30 days	13/05/17	11/06/17
184	**Transformer Area**	**111 days**	**07/08/17**	**25/11/17**
185	Wall Construction	90 days	07/08/17	04/11/17
186	Slab & Plinths Construction	21 days	05/11/17	25/11/17
187	**C.W. Culvert System (Area C3)**	**236 days**	**18/12/16**	**10/08/17**
188	Excavation to Formation Level	21 days	18/12/16	07/01/17
189	Penstock Trial & Preparation for connection to existing outlet pipe	21 days	18/12/16	07/01/17
190	Construction of Binding & Plinth	7 days	08/01/17	14/01/17
191	CW Pipe Laying	14 days	15/01/17	28/01/17
192	Thrust Box Construction	12 days	29/01/17	09/02/17
193	Water Test	10 days	03/02/17	12/02/17
194	Backfill	14 days	13/02/17	26/02/17
195	All underground Utilities	45 days	27/02/17	12/04/17
196	Backfill & Reinstatement & Formation of Access	120 days	13/04/17	10/08/17
197	**Section D - Remaining of MSBU10, HRSG, A&A at L9 & L8, CW Pump Equip. Rm No. 4 Ext. & Demolish Site Toilet**	**478 days**	**09/12/16**	**31/03/18**
198	**C.W Culvert System (Area C5)**	**419 days**	**09/12/16**	**31/01/18**
199	Excavation to Formation Level (-2.8mPD) with ELS Installation	30 days	09/12/16	07/01/17
200	Construction of Binding & Plinth	7 days	08/01/17	14/01/17
201	Pipe Laying (2 Pipes)	14 days	15/01/17	28/01/17
202	Construction of Thrust Box	21 days	29/01/17	18/02/17
203	Water Test	7 days	20/02/17	26/02/17
204	Backfill	14 days	27/02/17	12/03/17
205	All underground Utilities	125 days	13/03/17	15/07/17
206	Backfill & Reinstatement & Formation of Access	200 days	16/07/17	31/01/18
207	**HRSG Area Fdn - North (Area C6)**	**340 days**	**26/04/17**	**31/03/18**
208	Excavation to Formation Level	21 days	26/04/17	16/05/17
209	Drain Pit Construction (5no.1.6m to 6m in Height)	45 days	17/05/17	30/06/17
210	Pile Head Treatment (8no.)	16 days	15/06/17	30/06/17
211	MSB Fdn North of HRSG Area GL 10-H to 10H-H, 10-1to 10H-3	150 days	22/06/17	18/11/17
212	All underground Utilities	60 days	19/11/17	17/01/18
213	Plate Load Test	10 days	18/01/18	27/01/18
214	Raft Fdn (1no.)	18 days	28/01/18	14/02/18
215	Backfill & Reinstatement & Formation of Access	45 days	15/02/18	31/03/18
216	**Main Station Building - Unit L10 Superstructure**	**337 days**	**29/04/17**	**31/03/18**
217	**2/F**	**44 days**	**13/05/17**	**25/06/17**
218	Steel Beam Erection	14 days	13/05/17	26/05/17
219	R.C. Structure Construction	14 days	12/06/17	25/06/17
220	**3/F**	**51 days**	**27/05/17**	**16/07/17**
221	Steel Beam Erection	14 days	27/05/17	09/06/17
222	R.C. Structure Construction	21 days	26/06/17	16/07/17
223	**4/F**	**58 days**	**10/06/17**	**06/08/17**
224	Steel Beam Erection	14 days	10/06/17	23/06/17
225	R.C. Structure Construction	21 days	17/07/17	06/08/17
226	**5/F & Roof except GL 10-G to 10-H and 10-2 to 10-6**	**81 days**	**23/05/17**	**11/08/17**
227	Steel Roof Truss Erection (GL 10-D & 10-E)	7 days	23/05/17	29/05/17
228	Steel Roof Truss Erection (GL 10-F & 10-G)	7 days	30/05/17	05/06/17
229	Steel Roof & Crane Rail Erection	21 days	25/05/17	14/06/17
230	Slab Construction	30 days	15/06/17	14/07/17
231	Upper Roof - Steel Roof Erection	30 days	08/07/17	06/08/17
232	Upper roof RC construction	21 days	22/07/17	11/08/17
233	Staircase Constructions	100 days	29/04/17	06/08/17
234	Fendolite Installation to S. Steel Works	90 days	07/08/17	04/11/17
235	External Metal Cladding Installation	120 days	21/08/17	18/12/17
236	Internal ABWF Works	180 days	06/09/17	04/03/18
237	BS Installation	180 days	03/10/17	31/03/18
238	**275kV Cable Trench (Area C5 &C6)**	**180 days**	**16/07/17**	**11/01/18**
239	275kV Cable Trench Excavation(C5 Area)	90 days	16/07/17	13/10/17
240	275kV Cable Trench Excavation(C6 Area)	90 days	14/10/17	11/01/18
241	**MSB UnitL9 - A&A**	**140 days**	**12/06/17**	**29/10/17**
242	Hack-off Lean Concrete	70 days	12/06/17	21/08/17
243	Pipe Rack Support Construction	70 days	21/08/17	29/10/17
244	**MSB UnitL8 - A&A**	**150 days**	**09/04/17**	**06/09/17**
245	A&A Works	150 days	09/04/17	06/09/17



Contract No. 16/8002 Lamma Power Station Extension Civil and Building Unit L10

Master Programme

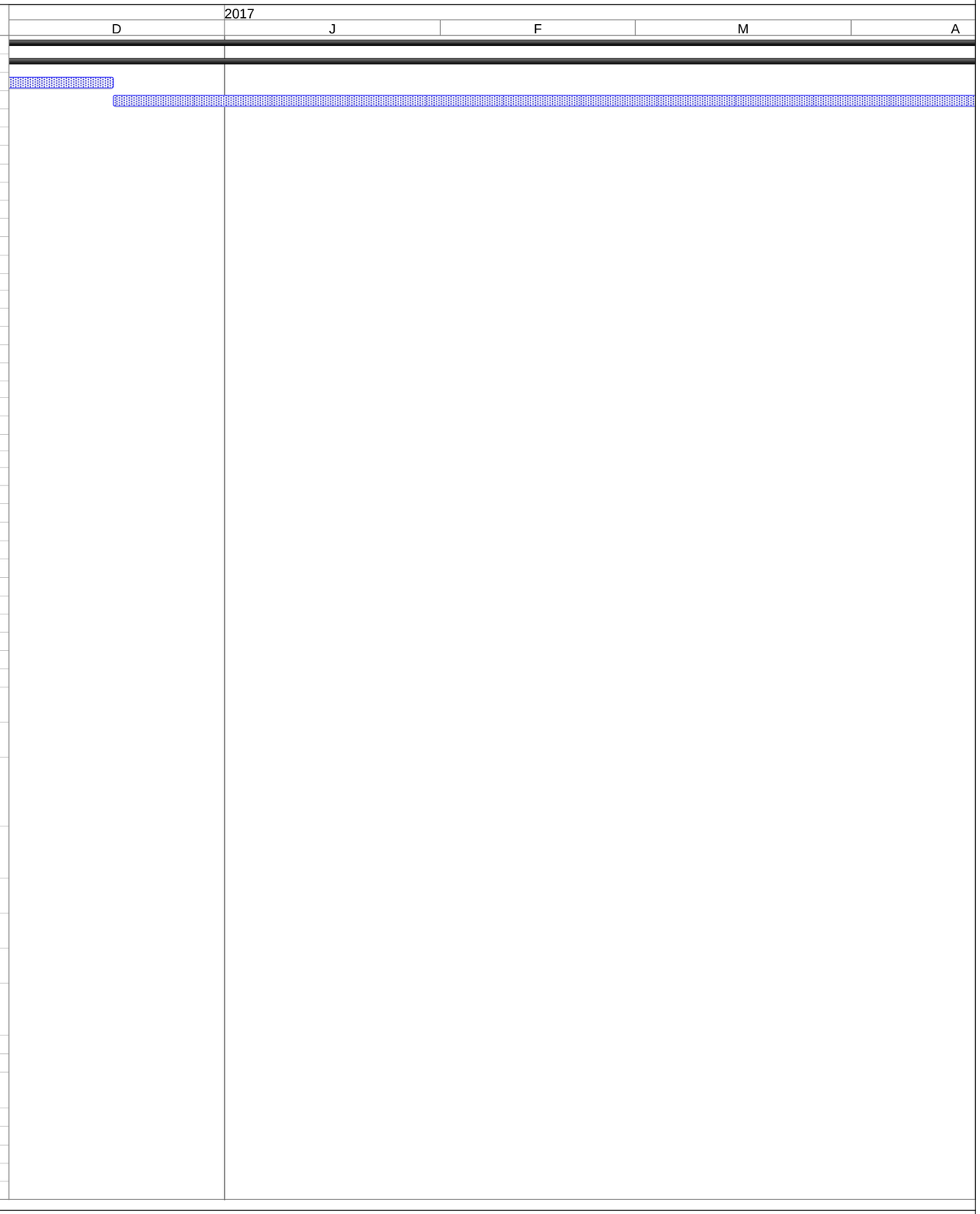
ID	Task Name	Duration	Start	Finish
246	**C.W. Pump Equipment Room**	**364 days**	**01/04/17**	**31/03/18**
247	BA 10 Application	0 days	01/04/17	01/04/17
248	Excavation to + 4.05mPD	21 days	02/04/17	22/04/17
249	Plate Load Test	14 days	23/04/17	06/05/17
250	Raft Foundation Construction	18 days	07/05/17	24/05/17
251	Underground Drainage	21 days	25/05/17	14/06/17
252	Backfill	10 days	15/06/17	24/06/17
253	Construct G/F	21 days	25/06/17	15/07/17
254	Roof Construction	45 days	16/07/17	29/08/17
255	Parapet Wall	18 days	30/08/17	16/09/17
256	ABWF Works	75 days	17/09/17	30/11/17
257	Building Service Installations	75 days	01/12/17	13/02/18
258	Extenal Pipe Rack Extension & Reinstatement Works	90 days	31/12/17	30/03/18
259	Ready for BA 13 Application	0 days	31/03/18	31/03/18
260	**Demolition Work - Temporary Site Toilet**	**60 days**	**08/07/17**	**06/09/17**
261	Demolition of Temp. Site Toilet	60 days	08/07/17	06/09/17
262	**Section E - Middel Rd & South of L10. Expose & Construction New 275kV Trench at LM**	**336 days**	**15/06/17**	**16/05/18**
263	**275kV Cable Trench**	**240 days**	**16/07/17**	**12/03/18**
264	275kV Cable Trench Re-excavation (~172m)	240 days	16/07/17	12/03/18
265	**C.W. Culvert System (Area C9a & C15)**	**336 days**	**15/06/17**	**16/05/18**
266	Removal of existing paving block	12 days	15/06/17	26/06/17
267	Install ELS & Excaavation, Phase 1	45 days	27/06/17	10/08/17
268	Blinding & Construct Plinth	30 days	11/08/17	09/09/17
269	Pipe Laying & Thrust Box	30 days	10/09/17	09/10/17
270	Water Test and Backfill	12 days	10/10/17	21/10/17
271	Underground UU and Reinstatement	45 days	22/10/17	05/12/17
272	Install ELS & Excavation, Phase 2	45 days	06/12/17	19/01/18
273	Blinding & Concrete Plinth	30 days	20/01/18	18/02/18
274	Pipe Laying and Thrust Box	30 days	19/02/18	20/03/18
275	Water Test & Backfill	12 days	21/03/18	01/04/18
276	Underground UU and Reinstatement	45 days	02/04/18	16/05/18
277	**Section F -Urea Storage & Handling Factilies**	**488 days**	**01/05/17**	**31/08/18**
278	**Urea Handling & Storage Plant House, Electrical Room &Pipe Rack**	**488 days**	**01/05/17**	**31/08/18**
279	BA 10 Application	10 days	01/05/17	10/05/17
280	Excavation to Formation Level	14 days	11/05/17	24/05/17
281	Plate Load Test	14 days	25/05/17	07/06/17
282	Raft Foundation (Urea Handlng Rm)	21 days	08/06/17	28/06/17
283	Raft Foundation (Electrical Rm)	30 days	29/06/17	28/07/17
284	Backfill	21 days	29/07/17	18/08/17
285	Construct G/F	45 days	19/08/17	02/10/17
286	Roof Construction	75 days	03/10/17	16/12/17
287	Parapet Wall	21 days	17/12/17	06/01/18
288	ABWF Works	120 days	07/01/18	06/05/18
289	Building Service Installations	120 days	04/05/18	31/08/18
290	Ready for BA 13 Application	0 days	31/08/18	31/08/18
291	Plate Load Test	14 days	25/05/17	07/06/17
292	Pipe Rack Foundation	28 days	08/06/17	05/07/17
293	Supporting Tower (4 no.) (9.55m in Height)	60 days	06/07/17	03/09/17
294	Pipe Rack Truss (3 no.)17.3m Span	60 days	04/09/17	02/11/17
295	**Section G - Demin. Plant Road & Modification at No. 4 CW Intake**	**273 days**	**01/01/18**	**30/09/18**
296	**C.W Culvert System (Area C9b)**	**272 days**	**01/01/18**	**30/09/18**
297	Design, Approval & Consent	0 days	01/01/18	01/01/18
298	Removal of paving block & ELS Installation	30 days	02/01/18	31/01/18
299	Excavation to Formation Level with ELS Installation	45 days	01/02/18	17/03/18
300	Construction of Blinding & Plinth	14 days	18/03/18	31/03/18
301	Pipe Laying (2 pipes x ~45m)	30 days	01/04/18	30/04/18
302	Construction of Thrust Box	14 days	01/05/18	14/05/18
303	Water Test	8 days	15/05/18	22/05/18
304	Backfill	21 days	23/05/18	12/06/18
305	All underground Utilities	50 days	13/06/18	01/08/18
306	Backfill & Reinstatement & Formation of Access	60 days	02/08/18	30/09/18
307	**Modification Works - No. 4 C.W. Intake & No.3 C.W. Outfall**	**181 days**	**01/01/18**	**30/06/18**
308	No. 3 C.W. Outfall Modification	90 days	01/01/18	01/04/18
309	No. 4 C.W. Intake Modification	122 days	01/03/18	30/06/18



Contract No. 16/8002 Lamma Power Station Extension Civil and Building Unit L10

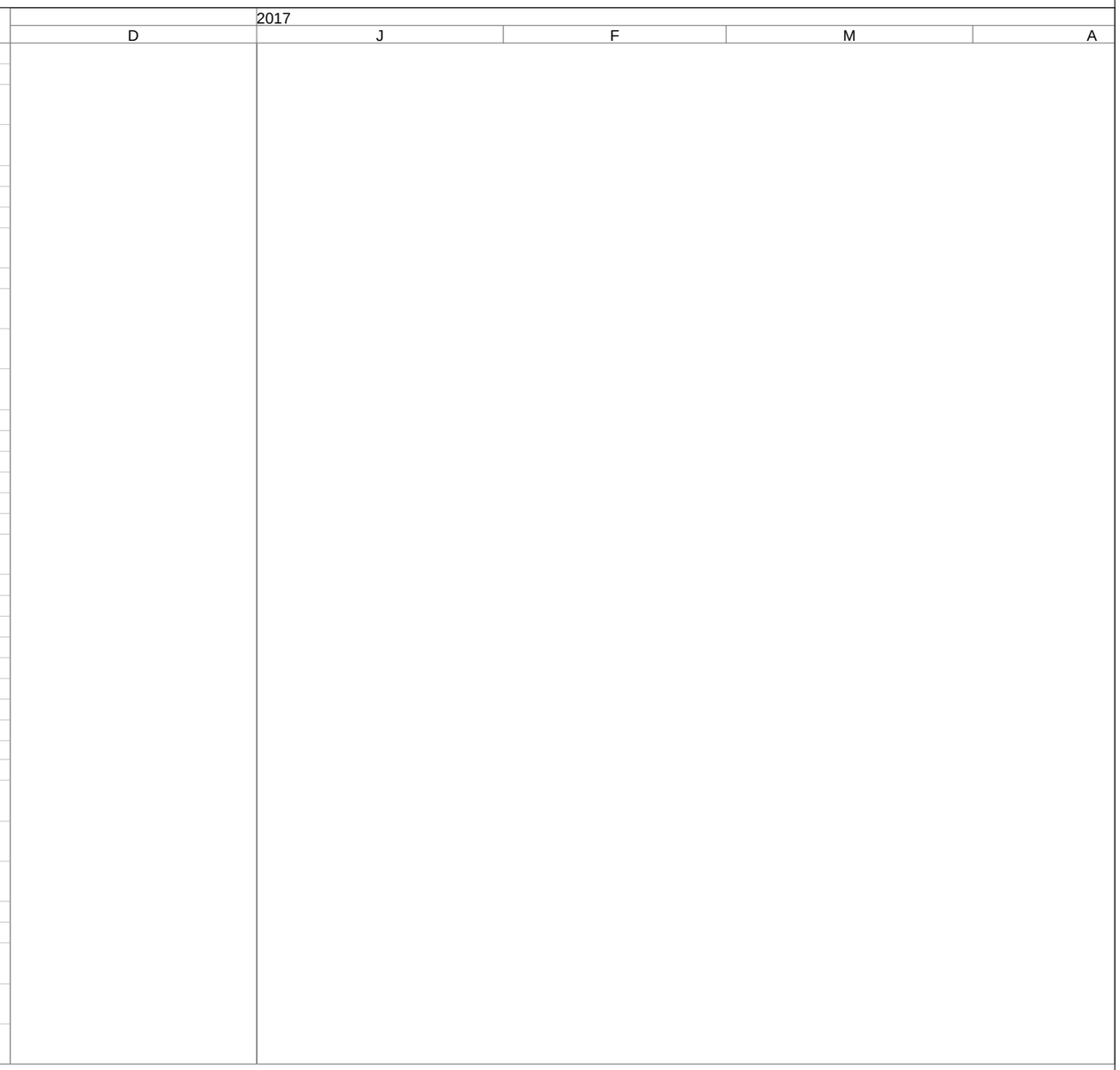
Master Programme

ID	Task Name	Duration	Start	Finish
310	**Section H1 - Gas Support foundation & trench at Area C11**	**405 days**	**01/11/16**	**10/12/17**
311	**GRS Support Foundation**	**405 days**	**01/11/16**	**10/12/17**
312	Temporary Protection, advance work etc	45 days	01/11/16	15/12/16
313	Gas Pipe Footing	180 days	16/12/16	13/06/17
314	Gas Pipe Trench	180 days	14/06/17	10/12/17
315	**Section H2 - GRS Improvement work at Area C10**	**441 days**	**01/09/17**	**15/11/18**
316	**GRS Area Improvement Works**	**441 days**	**01/09/17**	**15/11/18**
317	Retaining Wall Construction	90 days	01/09/17	29/11/17
318	Removal of Surcharge and Backfill	45 days	30/11/17	13/01/18
319	Footing Construction	240 days	14/01/18	10/09/18
320	Topping up, finish and Misc. Works	66 days	11/09/18	15/11/18
321	**Section H3 - L10 Chimney Flue and A&A L9 & pipe rack formation**	**318 days**	**01/01/18**	**15/11/18**
322	**No.4 Chimney Steel Flue**	**318 days**	**01/01/18**	**15/11/18**
323	Consent, documentation and site preparation	0 days	01/01/18	01/01/18
324	Steel Flue Preparation & installation	150 days	02/01/18	31/05/18
325	Install Steel Cover at Windshield	45 days	01/06/18	15/07/18
326	Install Steel Cover at Roof	30 days	16/07/18	14/08/18
327	Modification & Reinstatement Works	55 days	15/08/18	08/10/18
328	E & M Installation	38 days	09/10/18	15/11/18
329	MSB Unit 9 Pipe Rack Construction	90 days	01/04/18	29/06/18
330	**Section I1 - Link Bridge & associated A&A**	**455 days**	**01/01/18**	**31/03/19**
331	**Link Bridge**	**455 days**	**01/01/18**	**31/03/19**
332	Design & Shop Drawings	90 days	01/01/18	31/03/18
333	Access	0 days	17/11/18	17/11/18
334	Site preparation	14 days	18/11/18	01/12/18
335	Link Bridge between Unit L9 & L10	120 days	02/12/18	31/03/19
336	**Section I2 - Shunt Reactor SR4 Foundation**	**90 days**	**01/01/19**	**31/03/19**
337	**Shunt Reactor Compound SR4**	**90 days**	**01/01/19**	**31/03/19**
338	Modification Work at Shunt Reactor SR4	90 days	01/01/19	31/03/19
339	**Section I3 - All remaining work except deferred works**	**417 days**	**08/02/18**	**31/03/19**
340	**Remaining Works**	**417 days**	**08/02/18**	**31/03/19**
341	Demolition of Canopy @ Jetty Guard Hose & Toilet)	30 days	02/08/18	31/08/18
342	Demolition of Existing Contractor Shed	60 days	01/09/18	30/10/18
343	Seurity Fence Erection	20 days	31/10/18	19/11/18
344	All External Works & Road Works	417 days	08/02/18	31/03/19
345	**Deferred Works - L10 MSB and HRSG**	**417 days**	**08/02/18**	**31/03/19**
346	Construction of L10 MSB Roof BetweenGL 10-G to 10-H and 10-2 to 10-6 After the Overhead Crane Installation	52 days	08/02/18	31/03/18
347	Construction of Walls and Ceilings of Lube Oil Tank Room at L10 MSB	92 days	01/05/18	31/07/18
348	Construction of Walls of L10 MSB Below Level +18mPD along GL10-6 form GL10-F to 10-H and Walls of L10 MSB along GL10-H from GL10-5 to 10-6 including the associated Building Elements	92 days	01/05/18	31/07/18
349	Construction of Walls of L10 MSB Below 1/F along GL10-6 from GL10-B to10-C and the associated Staircases including the Enclosure Walls between G/F and 1/F.	184 days	01/05/18	31/10/18
350	Construction of Internal Partition Wall at 1/F of L10 MSB along GL10-C from GL10-2 to 10-3	32 days	15/05/18	15/06/18
351	Removal of Temporary Paving Within L10 HRSG Area to Expose all respective Equipment Foundations	14 days	01/08/18	14/08/18
352	Construction of Foundation Plinths and Walls of Lube Oil Storage Tank	93 days	15/08/18	15/11/18
353	Construction of Metal Fence and the associated Fire Services Installations and Installation of Removable Shelter Transformer Area	121 days	01/12/18	31/03/19
354	**Deferred Works - External Works**	**151 days**	**01/11/18**	**31/03/19**
355	Final Reinstatement of Access Roads and Pavement Surrounding and within L10 MSB a	151 days	01/11/18	31/03/19
356	**Section J - Cable Route CPX1&2 cable diversion & whole of work except deferred works to be carried out in DLP**	**1127 days**	**01/05/17**	**31/05/20**
357	**275kV Cable Diversion**	**1127 days**	**01/05/17**	**31/05/20**
358	**Part I (1km in Length, 1.1m to 1.5m Deep) (Works in existing Trench)**	**426 days**	**01/05/17**	**30/06/18**
359	Tentative Commencement Date Of Civil Works	0 days	01/05/17	01/05/17
360	Implementation of TTA	7 days	01/05/17	07/05/17
361	Remove the Concrete Road Cover	60 days	08/05/17	06/07/17



Task Split Milestone Summary

ID	Task Name	Duration	Start	Finish
362	Cable Trench Re-excavation	208 days	07/06/17	31/12/17
363	Completion Date of Trench Excavation for Site Handover	0 days	31/12/17	31/12/17
364	Tentative Period for Backfilling and Road Reinstatement (Excluding Joint Bay and Trench at Station Road)	91 days	01/04/18	30/06/18
365	**Part II (630m in Length, 1.1m to 1.5m Deep) (Works in existing Trench)**	**485 days**	**01/11/17**	**28/02/19**
366	Tentative Commencement Date Of Civil Works	0 days	01/11/17	01/11/17
367	Implementation of TTA	7 days	01/11/17	07/11/17
368	Remove the Concrete Road Cover	32 days	08/11/17	09/12/17
369	Trench Excavation and Installation of Road Decking at Joint Bay (Including Part I & II)	90 days	25/11/17	22/02/18
370	Cable Trench Re-excavation	190 days	23/02/18	31/08/18
371	Completion Date of Trench Excavation for Site Handover	0 days	31/08/18	31/08/18
372	Tentative Period for Backfilling and Road Reinstatement (Including Joint Bay at Part I, but excluding Joint Bay SJ3)	90 days	01/12/18	28/02/19
373	**Part III (400m in Length, 1.3m to 1.5m Deep) (Works in New Trench)**	**518 days**	**01/07/18**	**30/11/19**
374	Tentative Commencement Date Of Civil Works	0 days	01/07/18	01/07/18
375	Implementation of TTA	7 days	01/07/18	07/07/18
376	Remove the Concrete Road Cover	30 days	08/07/18	06/08/18
377	Cable Trench Excavation with shoring	270 days	07/08/18	03/05/19
378	Construction of New Joint Bay	28 days	04/05/19	31/05/19
379	Completion Date of Trench Excavation for Site Handover	0 days	31/05/19	31/05/19
380	Tentative Period for Backfilling and Road Reinstatement (excluding new slab but including SJ3)	91 days	01/09/19	30/11/19
381	**Part IV (Hand Dig Tunnel)**	**701 days**	**01/07/18**	**31/05/20**
382	Tentative Commencement Date Of Civil Works	0 days	01/07/18	01/07/18
383	Excavation to Approx. +5mPD	30 days	01/07/18	30/07/18
384	Existing Drainage Diversion	50 days	31/07/18	18/09/18
385	Construction of New Cable Joint Bay	30 days	19/09/18	18/10/18
386	Ramp Trench	75 days	19/10/18	01/01/19
387	Formation of Temp. Cable Pit	45 days	02/01/19	15/02/19
388	Hand Dig Tunel (17.6m) (0.2~0.3m/day)	75 days	16/02/19	01/05/19
389	Excavation for Duct Bank Construction	60 days	02/05/19	30/06/19
390	Completion Date of Trench Excavation for Site Handover	0 days	30/06/19	30/06/19
391	**Deferred Works - Cable Diversion CPX1 and CPX2 (during DLP)**	**274 days**	**01/09/19**	**31/05/20**
392	Formation of Wall Opening between existing trench CPX1 and new Joint Bay	7 days	01/09/19	07/09/19
393	Breaking up for Road Paving and Excavation down to Cable Tiles of Existing Trench CPX2	31 days	01/12/19	31/12/19
394	Demolition of Existing Trench CPX1 and CPX2	30 days	01/04/20	30/04/20
395	Final Reinstatement of the CPX1 and CPX2 Areas	31 days	01/05/20	31/05/20
396	**Deferred Works - Shunt Reactor Compound SR4 (during DLP)**	**153 days**	**01/07/19**	**30/11/19**
397	Trench Re-excavation and Cable Supports Installation for Shunt Reactor Compound SR4	62 days	01/07/19	31/08/19
398	Backfilling and Road Re-instatement of Shunt Reactor SR4 and Associated Trench	30 days	01/11/19	30/11/19

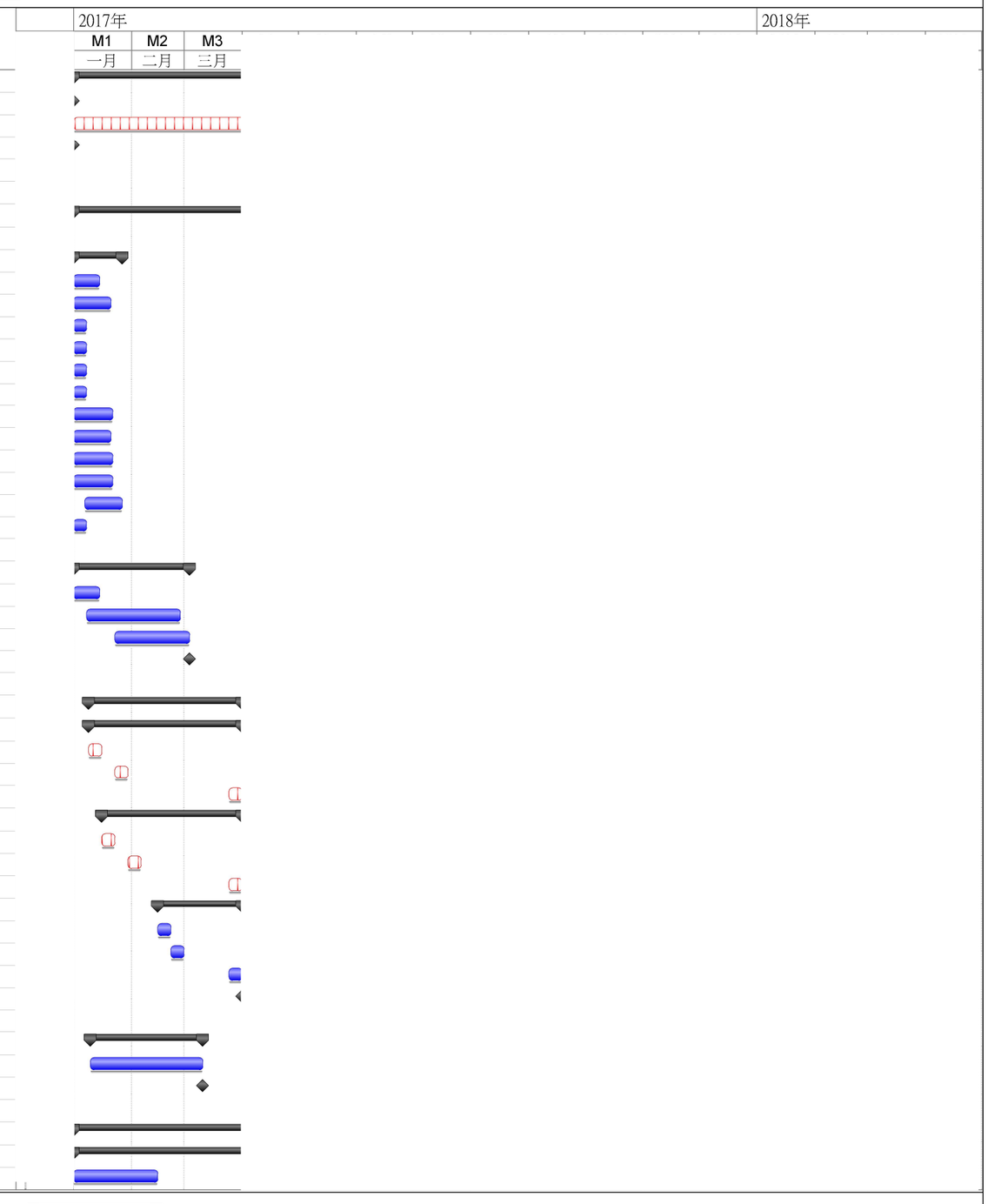


SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

Contract No. 16/8015 - Lamma Power Station Extension Foundation Works for Unit L11

Master Programme

ID	Task Name	Duration	Start	Finish
1	**Key Date**	**455 days**	**2017/1/1**	**2018/3/31**
2	Commencement date	0 days	2017/1/1	2017/1/1
3	Duration of works	455 days	2017/1/1	2018/3/31
4	Site possession date	0 days	2017/1/1	2017/1/1
5	Completion of the Contract	0 days	2018/3/31	2018/3/31
6				
7	**Total Contract Period**	**455 days**	**2017/1/1**	**2018/3/31**
8				
9	**Preliminaries**	**26 days**	**2017/1/1**	**2017/1/26**
10	Coordination with utility companies	14 days	2017/1/1	2017/1/14
11	Condition survey	20 days	2017/1/1	2017/1/20
12	Notification of commencement of works to Labour Department	7 days	2017/1/1	2017/1/7
13	Notification of air pollution control for commencement of works to EPD	7 days	2017/1/1	2017/1/7
14	Application of water discharge licence from EPD	7 days	2017/1/1	2017/1/7
15	Application for billing account for disposal of construction waste from EPD	7 days	2017/1/1	2017/1/7
16	CCTV for existing underground drainage pipe around site boundary	21 days	2017/1/1	2017/1/21
17	Utility detection for existing underground cables	20 days	2017/1/1	2017/1/20
18	Site clearance	21 days	2017/1/1	2017/1/21
19	Erection of contractor's site office	21 days	2017/1/1	2017/1/21
20	Installation of monitoring checkpoints	20 days	2017/1/7	2017/1/26
21	Submission of BA10 for ELS & foundation works	7 days	2017/1/1	2017/1/7
22				
23	**Predrilling Works**	**62 days**	**2017/1/1**	**2017/3/3**
24	Drilling rigs mobilization (8 rigs) (8 operators & 8 labours)	14 days	2017/1/1	2017/1/14
25	Predrilling works (39 holes)	50 days	2017/1/8	2017/2/26
26	Submission of predrill logs	40 days	2017/1/23	2017/3/3
27	Completion of predrilling works	0 days	2017/3/3	2017/3/3
28				
29	**Plant Mobilization for Bored Pile Construction**	**82 days**	**2017/1/9**	**2017/3/31**
30	**Crawler Crane**	**82 days**	**2017/1/9**	**2017/3/31**
31	1st & 2nd set	7 days	2017/1/9	2017/1/15
32	3rd & 4th set	7 days	2017/1/23	2017/1/29
33	5th & 6th set	7 days	2017/3/25	2017/3/31
34	**Oscillator**	**75 days**	**2017/1/16**	**2017/3/31**
35	1st & 2nd set	7 days	2017/1/16	2017/1/22
36	3rd & 4th set	7 days	2017/1/30	2017/2/5
37	5th & 6th set	7 days	2017/3/25	2017/3/31
38	**RCD**	**45 days**	**2017/2/15**	**2017/3/31**
39	1st & 2nd set	7 days	2017/2/15	2017/2/21
40	3rd & 4th set	7 days	2017/2/22	2017/2/28
41	5th & 6th set	7 days	2017/3/25	2017/3/31
42	Completion of plant mobilization for bored pile construction	0 days	2017/3/31	2017/3/31
43				
44	**Delivery of Temporary Steel Casing for Bored Pile Construction**	**60 days**	**2017/1/10**	**2017/3/10**
45	Duration for delivery of temporary steel casing	60 days	2017/1/10	2017/3/10
46	Completion of delivery of temporary steel casing for bored pile construction	0 days	2017/3/10	2017/3/10
47				
48	**Section A**	**304 days**	**2017/1/1**	**2017/10/31**
49	**Delivery of Permanent Casing & Double Wall Liner**	**258 days**	**2017/1/1**	**2017/9/15**
50	Testing for double wall liner	45 days	2017/1/1	2017/2/14



Master Programme
MP-01 (6 Dec 16)

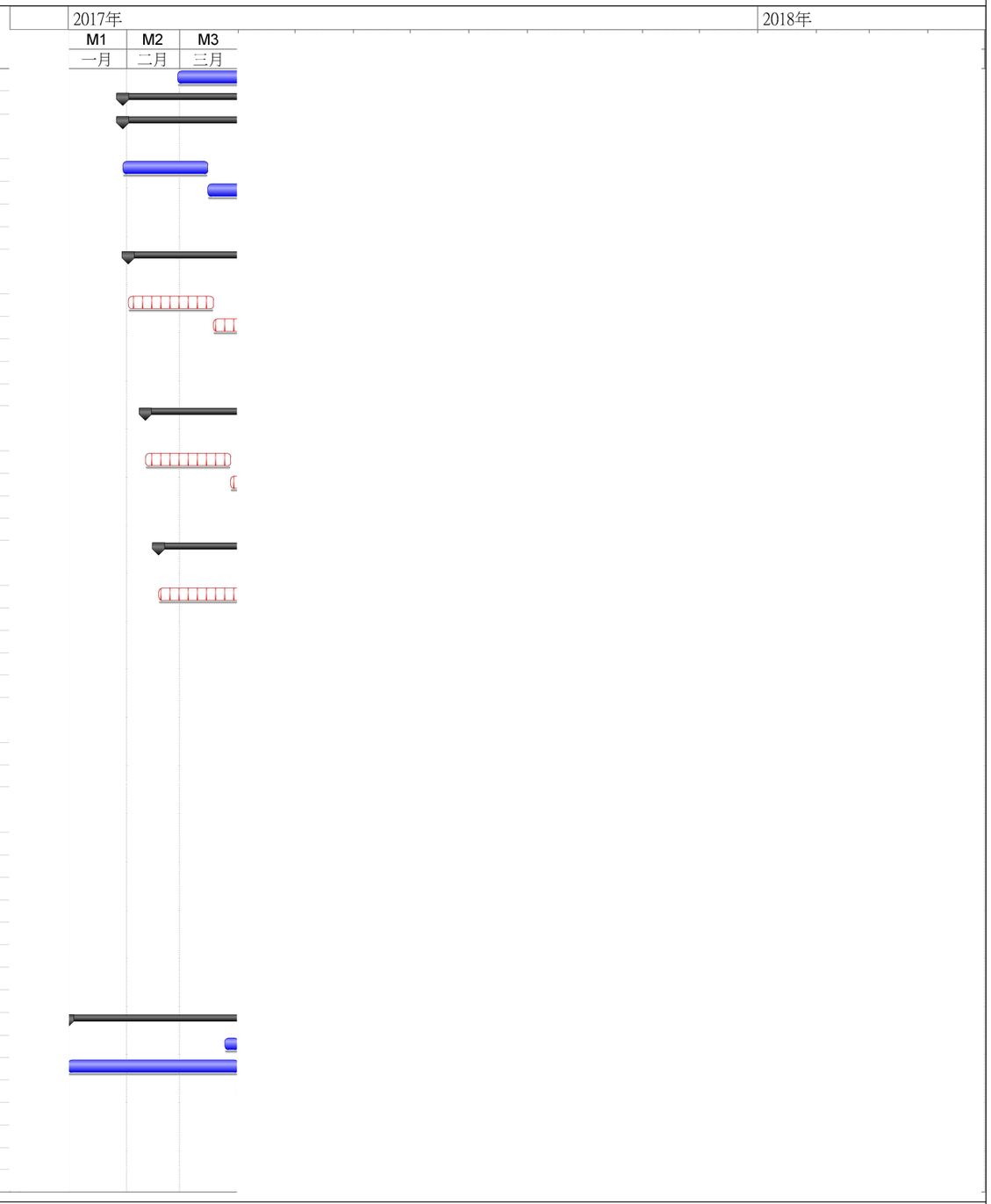
Task | Critical Task | Milestone | Summary

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

Contract No. 16/8015 - Lamma Power Station Extension Foundation Works for Unit L11

Master Programme

ID	Task Name	Duration	Start	Finish
51	Duration for delivery of permanent casing & double wall liner	200 days	2017/2/28	2017/9/15
52	**Bored Pile Construction (22 piles)**	**275 days**	**2017/1/30**	**2017/10/31**
53	**1st set - G2 > BP1 > BP9 > G1 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**180 days**	**2017/1/30**	**2017/7/28**
54	G2	45 days	2017/1/30	2017/3/15
55	BP1	45 days	2017/3/16	2017/4/29
56	BP9	45 days	2017/4/30	2017/6/13
57	G1	45 days	2017/6/14	2017/7/28
58	**2nd set - BP5 > G6 > BP13 > G4 > G3 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**225 days**	**2017/2/2**	**2017/9/14**
59	BP5	45 days	2017/2/2	2017/3/18
60	G6	45 days	2017/3/19	2017/5/2
61	BP13	45 days	2017/5/3	2017/6/16
62	G4	45 days	2017/6/17	2017/7/31
63	G3	45 days	2017/8/1	2017/9/14
64	**3rd set - G10 > BP17 > G8 > G5 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**180 days**	**2017/2/11**	**2017/8/9**
65	G10	45 days	2017/2/11	2017/3/27
66	BP17	45 days	2017/3/28	2017/5/11
67	G8	45 days	2017/5/12	2017/6/25
68	G5	45 days	2017/6/26	2017/8/9
69	**4th set - G7 > BP26 > G9 > BP20 > BP23 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**225 days**	**2017/2/18**	**2017/9/30**
70	G7	45 days	2017/2/18	2017/4/3
71	BP26	45 days	2017/4/4	2017/5/18
72	G9	45 days	2017/5/19	2017/7/2
73	BP20	45 days	2017/7/3	2017/8/16
74	BP23	45 days	2017/8/17	2017/9/30
75	**5th set - BP4 > BP8 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**90 days**	**2017/6/30**	**2017/9/27**
76	BP4	45 days	2017/6/30	2017/8/13
77	BP8	45 days	2017/8/14	2017/9/27
78	**6th set - BP12 > BP16 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**90 days**	**2017/7/2**	**2017/9/29**
79	BP12	45 days	2017/7/2	2017/8/15
80	BP16	45 days	2017/8/16	2017/9/29
81	Interface & sonic test	30 days	2017/9/8	2017/10/7
82	Prepare & submit as-built record plan	7 days	2017/10/1	2017/10/7
83	Submission of BA14	1 day	2017/10/7	2017/10/7
84	Allow 14 days for selection of pile for concrete full core test	14 days	2017/10/8	2017/10/21
85	Concrete full core test	10 days	2017/10/22	2017/10/31
86	Completion of bored pile construction	0 days	2017/10/31	2017/10/31
87	**Sheet Pile**	**118 days**	**2017/1/1**	**2017/4/28**
88	Plant mobilization (1 rig) (1 operator, 4 riggers & 4 welders)	7 days	2017/3/25	2017/3/31
89	Delivery of sheet pile material	90 days	2017/1/1	2017/3/31
90	Installation of sheet pile - Type B (approx. 80 piles)	20 days	2017/4/1	2017/4/20
91	Prepare & submit as-built record plan	7 days	2017/4/21	2017/4/27
92	Submission of BA14	1 day	2017/4/28	2017/4/28
93	Completion of sheet pile	0 days	2017/4/28	2017/4/28
94	Completion of section A	0 days	2017/10/31	2017/10/31



Master Programme
MP-01 (6 Dec 16)

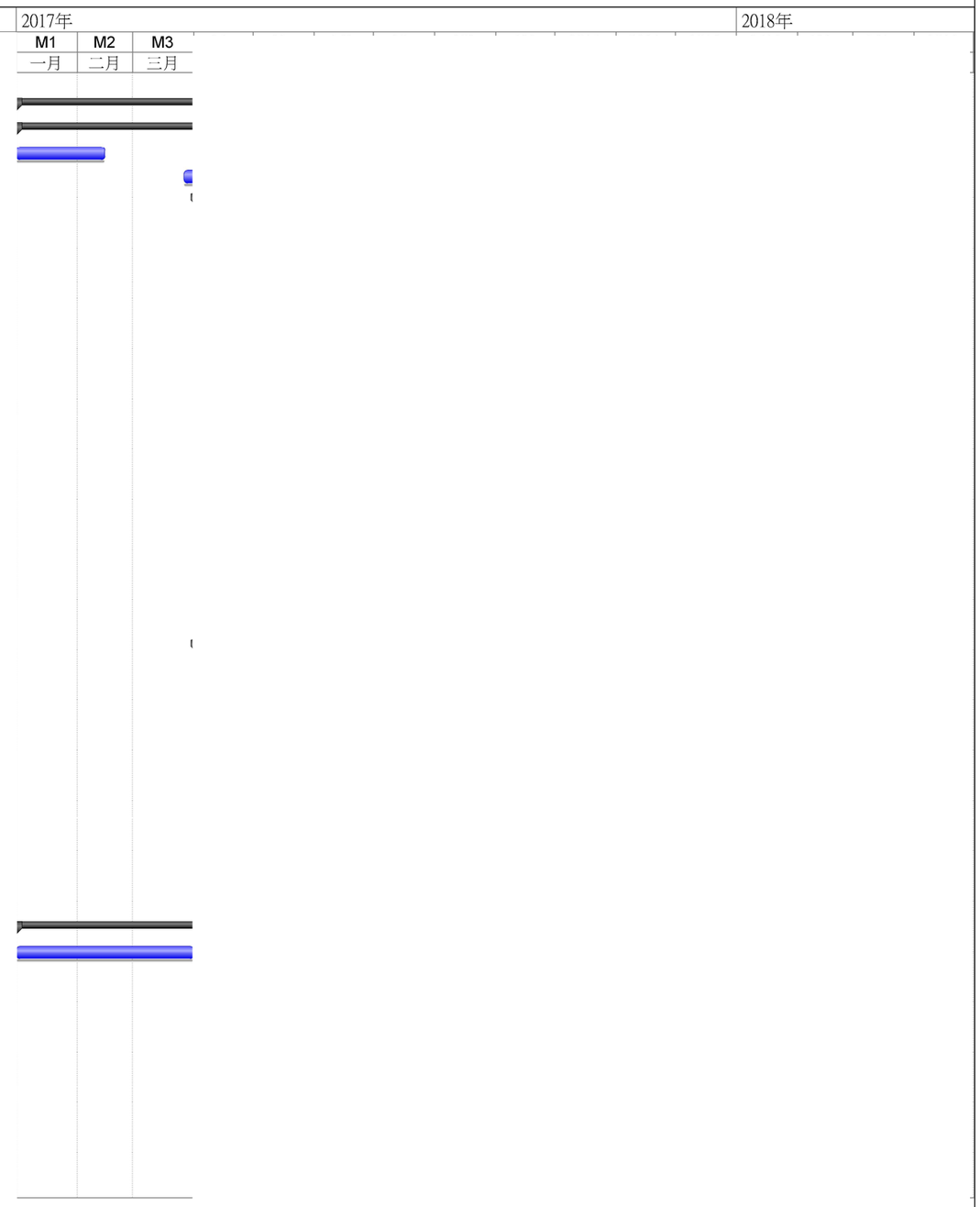
Task | Critical Task | Milestone | Summary

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

Contract No. 16/8015 - Lamma Power Station Extension Foundation Works for Unit L11

Master Programme

ID	Task Name	Duration	Start	Finish
95				
96	**Section B**	**455 days**	**2017/1/1**	**2018/3/31**
97	**Delivery of Permanent Casing & Double Wall Liner**	**375 days**	**2017/1/1**	**2018/1/10**
98	Testing for double wall liner	45 days	2017/1/1	2017/2/14
99	Duration for delivery of permanent casing & double wall liner	290 days	2017/3/27	2018/1/10
100	**Bored Pile Construction (16 piles)**	**363 days**	**2017/4/3**	**2018/3/31**
101	**1st set - BP21 > BP22 > BP18 > BP19 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**180 days**	**2017/7/31**	**2018/1/26**
102	BP21	45 days	2017/7/31	2017/9/13
103	BP22	45 days	2017/9/14	2017/10/28
104	BP18	45 days	2017/10/29	2017/12/12
105	BP19	45 days	2017/12/13	2018/1/26
106	**3rd set - BP27 > BP28 > BP25 > BP24 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**180 days**	**2017/8/10**	**2018/2/5**
107	BP27	45 days	2017/8/10	2017/9/23
108	BP28	45 days	2017/9/24	2017/11/7
109	BP25	45 days	2017/11/8	2017/12/22
110	BP24	45 days	2017/12/23	2018/2/5
111	**5th set - BP3 > BP6 > BP29 > BP10 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**270 days**	**2017/5/16**	**2018/2/9**
112	BP3	45 days	2017/5/16	2017/6/29
113	BP6	45 days	2017/9/28	2017/11/11
114	BP29	45 days	2017/11/12	2017/12/26
115	BP10	45 days	2017/12/27	2018/2/9
116	**6th set - BP7 > BP11 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**270 days**	**2017/4/3**	**2017/12/28**
117	BP7	45 days	2017/4/3	2017/5/17
118	BP11	45 days	2017/5/18	2017/7/1
119	BP14	45 days	2017/9/30	2017/11/13
120	BP15	45 days	2017/11/14	2017/12/28
121	Interface & sonic test	30 days	2018/1/29	2018/2/27
122	Prepare & submit as-built record plan	7 days	2018/2/28	2018/3/6
123	Submission of BA14	1 day	2018/3/7	2018/3/7
124	Allow 14 days for selection of pile for concrete full core test	14 days	2018/3/8	2018/3/21
125	Concrete full core test	10 days	2018/3/22	2018/3/31
126	Completion of bored pile construction	0 days	2018/3/31	2018/3/31
127	**Sheet Pile**	**239 days**	**2017/1/1**	**2017/8/27**
128	Delivery of sheet pile material	90 days	2017/1/1	2017/3/31
129	Installation of sheet pile - Type A (approx. 192 piles) (1 rig mobilized after completion of sheet pile of Type B) (1 operator, 4 riggers & 4 welders)	45 days	2017/4/21	2017/6/4
130	Installation of sheet pile - Type C (approx. 325 piles) (1 rig mobilized after completion of sheet pile of Type A) (1 operator, 4 riggers & 4 welders)	76 days	2017/6/5	2017/8/19
131	Prepare & submit as-built record plan	7 days	2017/8/20	2017/8/26
132	Submission of BA14	1 day	2017/8/27	2017/8/27
133	Completion of sheet pile	0 days	2017/8/27	2017/8/27
134	Completion of section B	0 days	2018/3/31	2018/3/31
135				
136	Contract completion	0 days	2018/3/31	2018/3/31



Master Programme
MP-01 (6 Dec 16)

Task | Critical Task | Milestone | Summary

Monthly Waste Flow Table for December 2016

Project: Foundation Works for Lamma 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										
	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	Metals (steel bar / metal strip) (1)	Metals (aluminum can) (1)	Paper / cardboard packaging (1)	Plastics (1) & (4)	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	(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
May-16	7139.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90
Jun-16	6095.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Jul-16	6122.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00
Aug-16	7009.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76
Sep-16	7871.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26
Oct-16	3287.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.46
Nov-16	3142.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.36
Dec-16	4826.16	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
Total	51765.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.80

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
51765.14 tonnes	0.00 tonnes	38.80 tonnes	0.00 tonnes

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 51765.14 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 51765.14 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 Contractt.
(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.

Monthly Waste Flow Table for December 2016

Project: Lamma Power Station Extension - Civil and Building Works for Unit L10

Contractor: Paul Y. Construction Company, Limited

Record by: Ben Lam

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										
	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	Metals (steel bar / metal strip) (1)	Metals (aluminum can) (1)	Paper / cardboard packaging (1)	Plastics (1) & (4)	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	(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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb 2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar-2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jun-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jul-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sep-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oct-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov-16	1779.48	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
Dec-16	0.00	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-17														
Total	1779.48	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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
1780.91 tonnes	0.00 tonnes	0.00 tonnes	0.00 tonnes

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 1780.91 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 1780.91 tonnes were disposed as public fill to Fill Banks / Sorting Facilities.

(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 Contractt.
(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.

Monthly Waste Flow Table for December 2016

Project: Foundation Works for Lamma Power Station Extension Unit L11

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										
	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	Metals (steel bar / metal strip) (1)	Metals (aluminum can) (1)	Paper / cardboard packaging (1)	Plastics (1) & (4)	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	(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)
Nov-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
Dec-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
Total	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

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
0 tonnes	0 tonnes	0 tonnes	0 tonnes

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 0.00 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 0.00 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 Contractt.
(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.