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



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

January 2017

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



ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499

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

Report Title	Lamma Power Station Extension – Unit L10 Monthly EM&A Report (January 2017)			
Date	13 February 2017			
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EXECUTIVE SUMMARY

This is the 82nd 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 January 2017.

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
275kV Switching Station	Bored pile construction work
Unit L10 Civil and Building	Main Station Building (excavation and concrete breaking of pile head), 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

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.

Description	Permit No.	Valid Period		Issued To	Date of
		From	То		Issuance
Varied Environmental	EP-071/2000/C	18/05/05	-	HEC	18/05/05
Permit					
Construction Noise	GW-RS1026-16	11/10/16	10/04/17	Contractor	07/10/16
Permit					
Construction Noise	PP-RS0019-16	26/07/16	19/01/17	Contractor	25/07/16
Permit					
Construction Noise	GW-RS1299-16	26/12/16	25/06/17	Contractor	22/12/16
Permit					
Construction Noise	GW-RS1318-16	26/12/16	26/06/17	Contractor	23/12/16
Permit					
WPCO Discharge	WT00023765-2016	07/03/16	31/03/21	Contractor	09/03/16
Licence	(Cancelled on				
	16/1/17)				
WPCO Discharge	WT00025747-2016	05/10/16	31/10/21	Contractor	06/10/16
Licence					
Registration of	WPN5113-912-	21/01/16	-	Contractor	21/01/16
Chemical Waste	S3180-19				
Producer					
Registration of	WPN5213-912-	22/02/16	-	Contractor	22/02/16
Chemical Waste	P2781-22				
Producer					
Waste Disposal	Account No.:	03/02/16	-	Contractor	03/02/16
Billing Account	7024247				
Waste Disposal	Account No.:	06/10/16	-	Contractor	06/12/16
Billing Account	7026035				

Environmental Licensing and Permitting

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:

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 January 2017.

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 275kV Switching Station was bored pile construction work. Construction activities for Unit L10 civil and building works were carried out for Main Station Building (excavation and concrete breaking of pile head), 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	
275kV S	Switching Station		
1.	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. 	

Item	Construction Activities	Environmental Mitigation Measures			
Unit L1	Unit L10 Civil and Building Works				
2.	Main Station Building (Excavation and concrete breaking of pile head)	 Air All regulated machine attached with valid exception/approval NRMM labels. Water truck was used for water spraying of the haul road. Compaction was conducted for soil platform 			
		 Noise Cylindrical screening was used for noise mitigation measures during drilling. Wastewater Sump pit and sedimentation tanks were set up for 			
		wastewater reuse Waste Management – Excavated soil was temporary stored for backfilling.			
3.	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 			
4.	Trenching Works	 Air Excavated slope covered. Waste Management Excavated soil was temporary stored for backfilling. 			
Unit L1	1 Piling Works	1			

Item	Construction Activities	Environmental Mitigation Measures
5.	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.

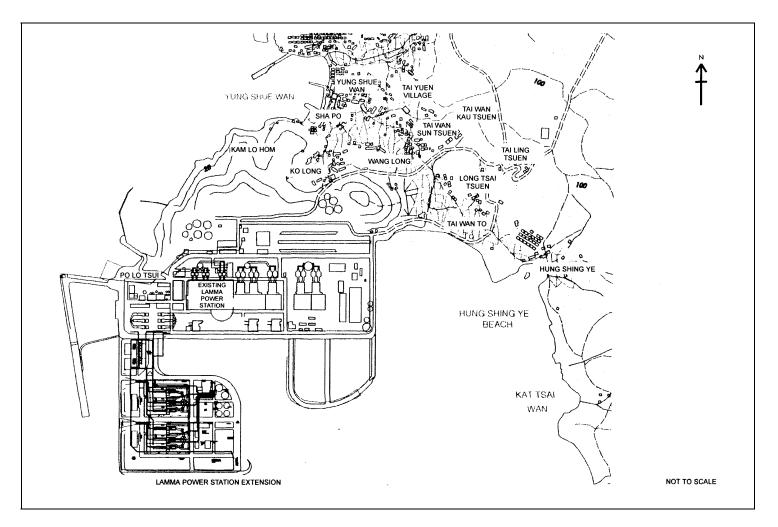


Figure 1.1 Layout of Work Site

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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.

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

 Table 2.1
 Air Quality Monitoring Locations

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.

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.

Monitoring Stations	Parameter	Duration	Frequency
A N/ 1	1-hour TSP	1	3 hourly samples every 6 days
AM1	24-hour TSP	24	Once every 6 days
4342	1-hour TSP	1	3 hourly samples every 6 days
AM2	24-hour TSP	24	Once every 6 days
AM3	1-hour TSP	1	3 hourly samples every 6 days
AMS	24-hour TSP	24	Once every 6 days
AM4	24-hour TSP	24	Once every 6 days

 Table 2.3
 Air Quality Monitoring Parameter, Duration and Frequency

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;
 - o Main flow;
 - o 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.

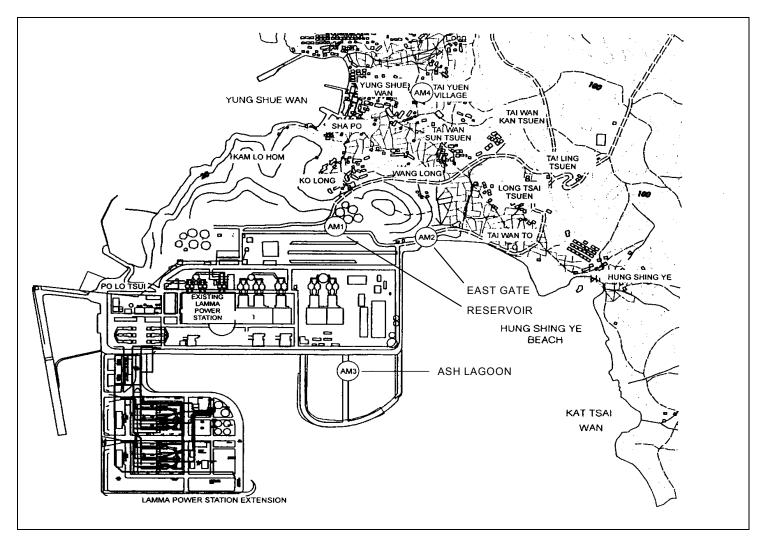


Figure 2.1 Location of Air Quality Monitoring Stations

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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.

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:

Location	Time Period	Frequency	Parameter
	Daytime: 0700-1900 hrs on normal weekdays	Daytime: 30 minutes	30-min L _{Aeq}
Ash Lagoon	5		
Ching Lam	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}

Table 3.2	Noise Monitoring Duration and Parameter
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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.

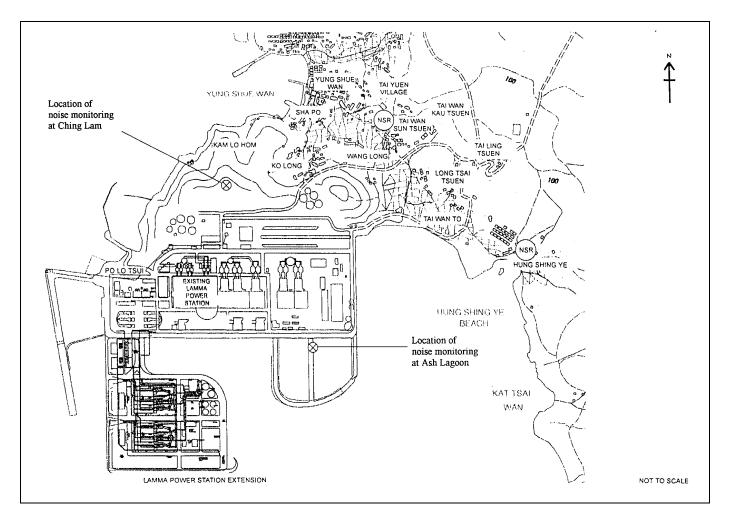


Figure 3.1 Location of Noise Monitoring Stations

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.

Item	Parameter Monitored	Monitoring Period	No. of Exceedances In				Event/Action Plan Implementation Status
			Action Level	Limit Level	and Results		
Air	•	•					
1	Ambient TSP (24-hour)	01/01/17- 31/01/17	0	0			
2	Ambient TSP (1-hour)	01/01/17- 31/01/17	0	0			
Noise	·	·					
1	Noise level at the critical NSR's predicted by the noise alarm monitoring system	01/01/17- 31/01/17	0	0			

 Table 4.1
 Summary of AL Level Exceedances on Monitoring Parameters

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 January 2017 as shown in Table 4.2.

	No	als	
Total Inert C&D Waste Materials	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
6758.76 Tonnes	0 Tonnes	3.16 Tonnes	440 Litres

Table 1 2	Estimated Amounts	of Wooto	in Ionuomy 2017
1 auto 4.2	Estimated Amounts	or waste	III January 2017

The monthly waste flow tables prepared by the contractors are attached in Appendix K.

4.4 Site Environmental Audit

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

4.5 Status of Environmental Licensing and Permitting

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

Description	Permit No.	Valid Period		Permit No. Valid Period		Highlights	Status
_		From	То				
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		
Construction Noise Permit	GW-RS1318-16	26/12/16	26/06/17	Foundation work for Unit L11. Operation of PME during restricted hours.	Valid		

Description	Permit No.	Valid Period		Highlights	Status
-		From	То		
WPCO	WT00023765-	07/03/16	31/03/21	Foundation works	Cancelled on
Discharge	2016			for Unit L10	16/1/17
Licence					
WPCO	WT00025747-	05/10/16	31/10/21	The construction	Valid
Discharge	2016			site of 275kV	
Licence*				Switching Station	
Registration	WPN5113-912-	21/01/16	-	Foundation works	Valid
of Chemical	S3180-19			for Unit L10	
Waste					
Producer					
Registration	WPN5213-912-	22/02/16	-	Civil and Building	Valid
of Chemical	P2781-22			Works for Unit L10	
Waste					
Producer					
Waste	Account No.:	03/02/16	-	Foundation works	Valid
Disposal	7024247			for Unit L10	
Billing					
Account					
Waste	Account No.:	06/10/16	-	Civil and Building	Valid
Disposal	7026035			Works for Unit L10	
Billing					
Account					

Note: * - Water quality monitoring was carried out in January 2017 and the result would be reported under a separate cover by the contractor.

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 January 2017, no complaint against the construction activities was received.

Table 4.4Environmental Complaints Received in January 2017

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

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

5. FUTURE KEY ISSUES

5.1 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

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

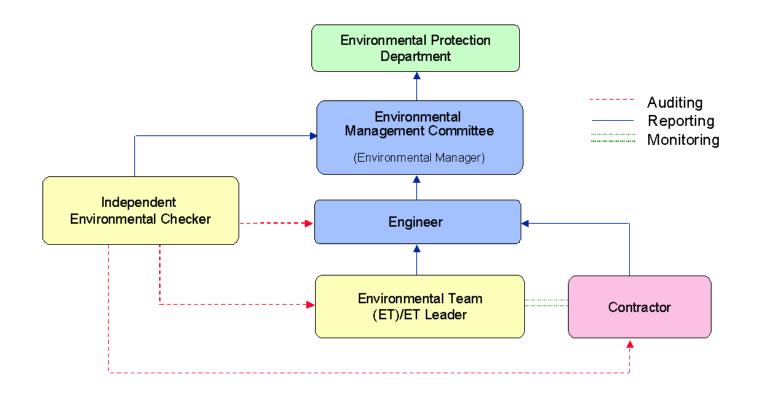


Figure A.1 Organisation of EM&A Programme at Construction Phase

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 Table
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	Action Level, µg/m ³	Limit Level, µg/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 Pe	Percussive Piling)
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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 Manual noise monitoring at the nearest Pak Kok Tsui residences to cable landing points N4 and N5	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} 					
 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.1Monitoring schedule for 24hr and 1hr TSP monitoring for Lamma
Extension Construction (January 2017 to April 2017)

24hr TSP Monitoring	1hr TSP Monitoring
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
04/Apr/2017	04/Apr/2017 1500hr to 1800hr
10/Apr/2017	10/Apr/2017 1500hr to 1800hr
16/Apr/2017	16/Apr/2017 1500hr to 1800hr
22/Apr/2017	22/Apr/2017 1500hr to 1800hr
28/Apr/2017	28/Apr/2017 1500hr to 1800hr

APPENDIX D AIR QUALITY MONITORING RESULTS

Site: Lamma Power Station Extension

Month: January 2017

24 hour TSP Measurement:-

	TSP concentration ($\mu g/m^3$)					ather Informations of Kong Observer	
Date	Reservoir	East Gate	Ash Lagoon	Tai Yuen Village	Mean Wind Speed	Prevailing Wind Dir.	Mean R.H.
	(AM1)	(AM2)	(AM3)	(AM4)	(km/hr)	(*)	(%)
04/01/2017	49	41	39	56	27.7	70	80
10/01/2017	67	56	51	51	36.6	70	80
16/01/2017	41	40	34	40	35.5	70	80
22/01/2017	75	87	67	43	18.8	20	58
28/01/2017	46	(1)	44	17	30.4	60	79
01/02/2017	-	49	-	-	(2)	(2)	(2)

Note:

(1) Breakdown of High Volume Air Sampler. A make up 24-hr TSP sampling was conducted on 1/2/2017.

(2) Weather information from Hong Kong Observatory not available.

1 hour TSP Measurement:-

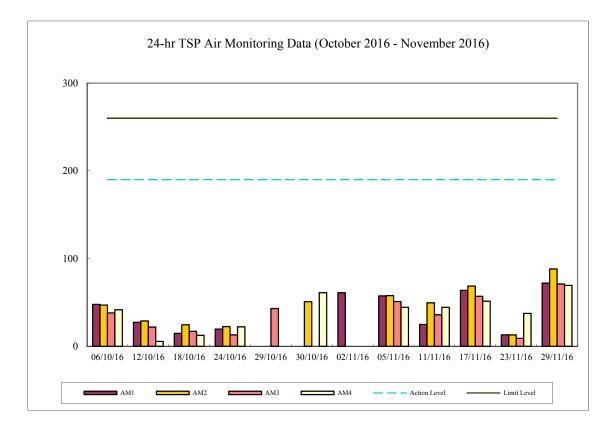
		TSP concentration ($\mu g/m^3$)					
Date	Time	Reservoir (AM1)	East Gate (AM2)	Ash Lagoon (AM3)			
	15:00 - 15:59	34	38	42			
04/01/2017	16:00 - 16:59	43	37	40			
	17:00 - 17:59	30	39	37			
	15:00 - 15:59	42	47	44			
10/01/2017	16:00 - 16:59	51	55	53			
	17:00 - 17:59	55	58	57			
	15:00 - 15:59	27	30	27			
16/01/2017	16:00 - 16:59	24	31	8			
	17:00 - 17:59	28	39	38			
	15:00 - 15:59	48	63	39			
22/01/2017	16:00 - 16:59	30	54	47			
	17:00 - 17:59	71	71	65			
	15:00 - 15:59	46	41	38			
28/01/2017	16:00 - 16:59	37	41	37			
	17:00 - 17:59	44	42	41			

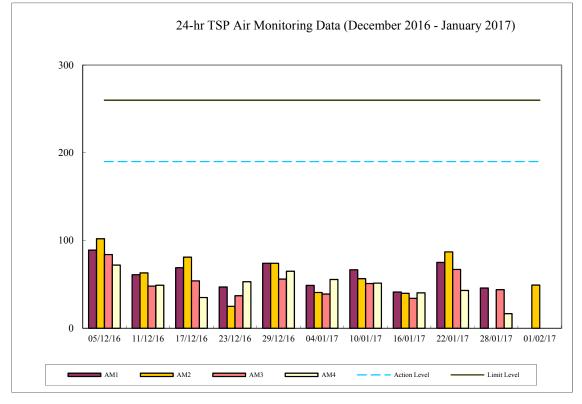
	1-hr TSP	24-hr TSP
	$(\mu g/m^3)$	$(\mu g/m^3)$
Action Level	340	190
Limit Level	500	260

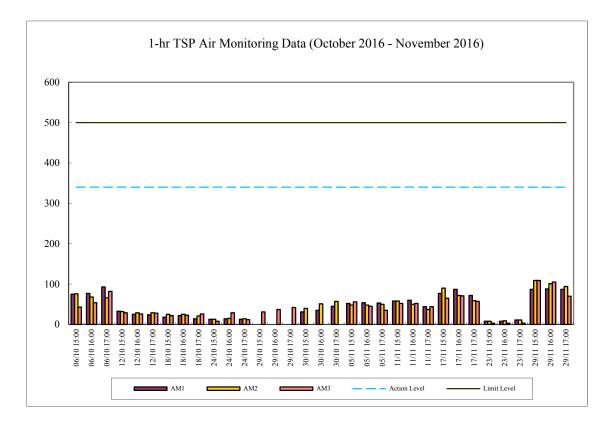
Calibration: Calibration details are shown in appendix F.

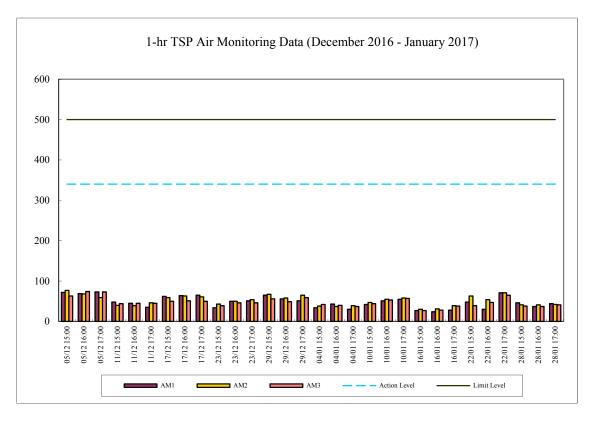
Equipment used:

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









Appendix E Continuous Noise Monitoring Results for January 2017

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 (Ching Lam)
	19/08/2016 (Ash Lagoon)
	B&K 4231 calibrator - 07/04/2016

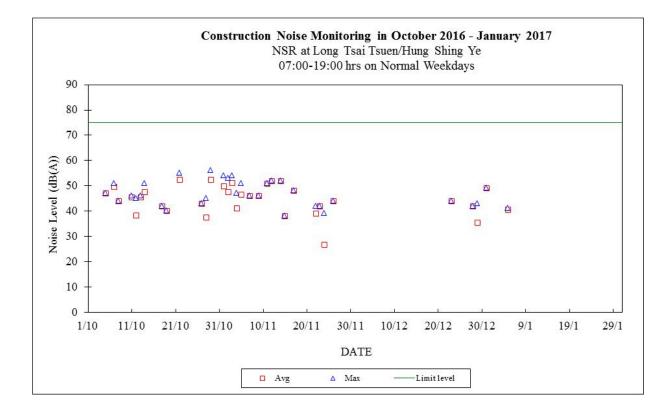
Date	Time	Calcula Noise Level a NSR at Tsai Tsuen/H Shing N (dB(A)) Max	at Long Hung Ze	Limit Noise Level (dB(A))	Calcula Noise Level a NSR at school within Wan Sar Tsuen (dB(A)) Max	at the Tai	Limit Noise Level (dB(A))
01/01/2017	07:00-23:00	34	30	60	29	28	60
01/01/2017	23:00-07:00	24	20	45	20	16	45
02/01/2017	07:00-23:00	54	50	60			60
02/01/2017	23:00-07:00	42	35	45	38	31	45
03/01/2017	07:00-19:00			75			70
03/01/2017	19:00-23:00	37	31	60	30	26	60
03/01/2017	23:00-07:00	36	30	45	32	26	45
04/01/2017	07:00-19:00			75			70
04/01/2017	19:00-23:00			60			60
04/01/2017	23:00-07:00	36	30	45	31	26	45
05/01/2017	07:00-19:00	41	41	75	37	36	65
05/01/2017	19:00-23:00	30	28	60	26	24	60
05/01/2017	23:00-07:00	38	32	45	34	27	45
06/01/2017	07:00-19:00			75			65
06/01/2017	19:00-23:00			60			60
06/01/2017	23:00-07:00			45	33	25	45
07/01/2017	07:00-19:00			75			75
07/01/2017	19:00-23:00			60			60
07/01/2017	23:00-07:00			45	27	22	45
08/01/2017	07:00-23:00			60	44	42	60
08/01/2017	23:00-07:00			45	25	20	45
09/01/2017	07:00-19:00			75			65
09/01/2017	19:00-23:00			60	37	30	60
09/01/2017	23:00-07:00			45	32	23	45
10/01/2017	07:00-19:00			75			65
10/01/2017	19:00-23:00			60			60

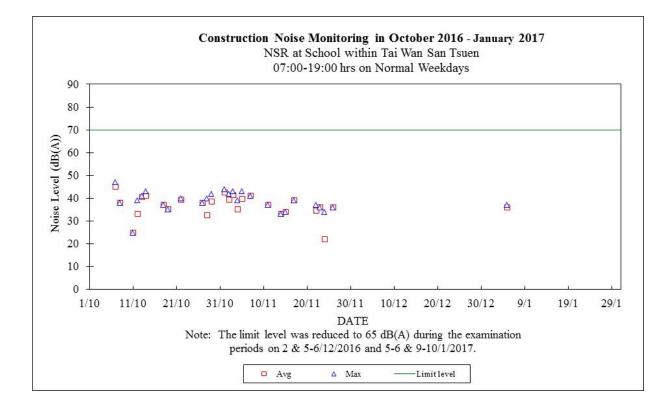
10/01/2017	23:00-07:00	 	45	31	26	45
11/01/2017	07:00-19:00	 	75			70
11/01/2017	19:00-23:00	 	60			60
11/01/2017	23:00-07:00	 	45	28	23	45
12/01/2017	07:00-19:00	 	75			70
12/01/2017	19:00-23:00	 	60	32	30	60
12/01/2017	23:00-07:00	 	45	35	29	45
13/01/2017	07:00-19:00	 	75			70
13/01/2017	19:00-23:00	 	60	32	24	60
13/01/2017	23:00-07:00	 	45	34	29	45
14/01/2017	07:00-19:00	 	75			70
14/01/2017	19:00-23:00	 	60	25	20	60
14/01/2017	23:00-07:00	 	45	42	31	45
15/01/2017	07:00-23:00	 	60	41	30	60
15/01/2017	23:00-07:00	 	45	29	25	45
16/01/2017	07:00-19:00	 	75			70
16/01/2017	19:00-23:00	 	60	33	26	60
16/01/2017	23:00-07:00		45	31	23	45
17/01/2017	07:00-19:00		75			70
17/01/2017	19:00-23:00	 	60			60
17/01/2017	23:00-07:00	 	45	25	17	45
18/01/2017	07:00-19:00	 	75			70
18/01/2017	19:00-23:00	 	60			60
18/01/2017	23:00-07:00	 	45	28	24	45
19/01/2017	07:00-19:00	 	75			70
19/01/2017	19:00-23:00	 	60			60
19/01/2017	23:00-07:00	 	45	32	20	45
20/01/2017	07:00-19:00	 	75			70
20/01/2017	19:00-23:00	 	60			60
20/01/2017	23:00-07:00	 	45	31	23	45
21/01/2017	07:00-19:00	 	75			70
21/01/2017	19:00-23:00	 	60	27	27	60
21/01/2017	23:00-07:00	 	45	32	25	45
22/01/2017	07:00-23:00	 	60	27	26	60
22/01/2017	23:00-07:00	 	45	34	24	45
23/01/2017	07:00-19:00	 	75			70
23/01/2017	19:00-23:00	 	60	27	24	60
23/01/2017	23:00-07:00	 	45	32	26	45
24/01/2017	07:00-19:00	 	75			70
24/01/2017	19:00-23:00	 	60	38	29	60
24/01/2017	23:00-07:00	 	45	33	25	45
25/01/2017	07:00-19:00	 	75			70
25/01/2017	19:00-23:00	 	60			60
25/01/2017	23:00-07:00	 	45	30	26	45
26/01/2017	07:00-19:00	 	75			70
26/01/2017	19:00-23:00	 	60			60

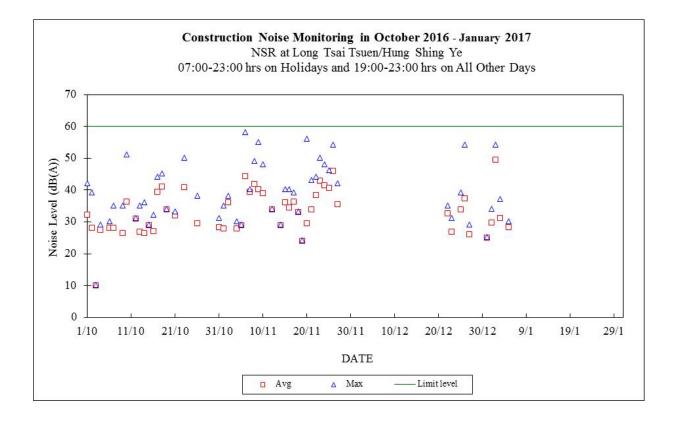
26/01/2017	23:00-07:00	 	45	27	23	45
27/01/2017	07:00-19:00	 	75			70
27/01/2017	19:00-23:00	 	60			60
27/01/2017	23:00-07:00	 	45	33	24	45
28/01/2017	07:00-23:00	 	60			60
28/01/2017	23:00-07:00	 	45	32	23	45
29/01/2017	07:00-23:00	 	60	33	27	60
29/01/2017	23:00-07:00	 	45	28	25	45
30/01/2017	07:00-23:00	 	60	33	29	60
30/01/2017	23:00-07:00	 	45	35	29	45
31/01/2017	07:00-23:00	 	60			60
31/01/2017	23:00-07:00	 	45			45

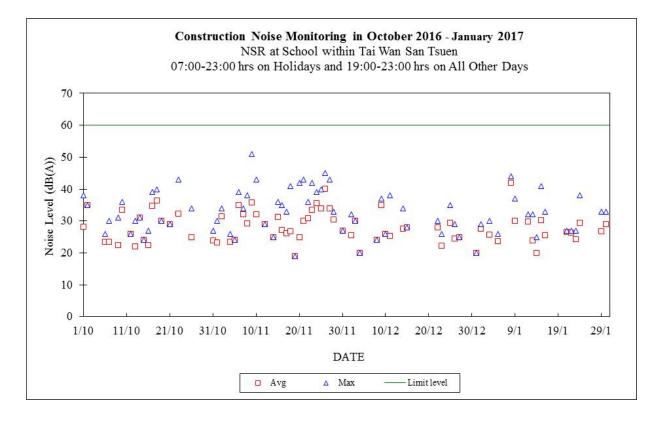
Note:

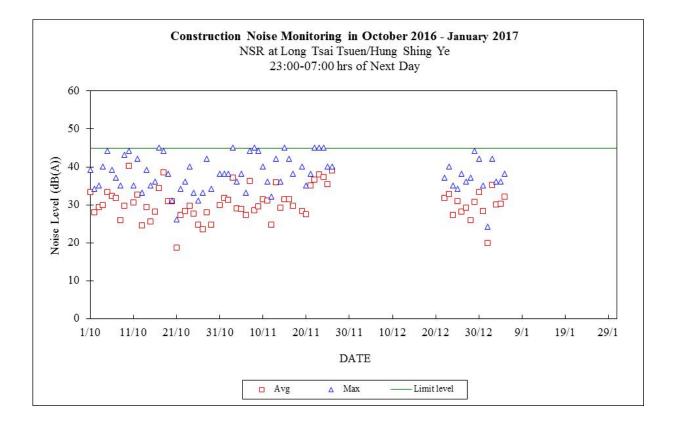
- a. "---" represents the measured noise monitoring data lower than the established notional background level, particularly for the period of 06/01/2017 07:00 -01/02/2017 07:00. The Ash Lagoon noise monitoring station was in normal operation but there were no data of calculated noise level at NSR at 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.

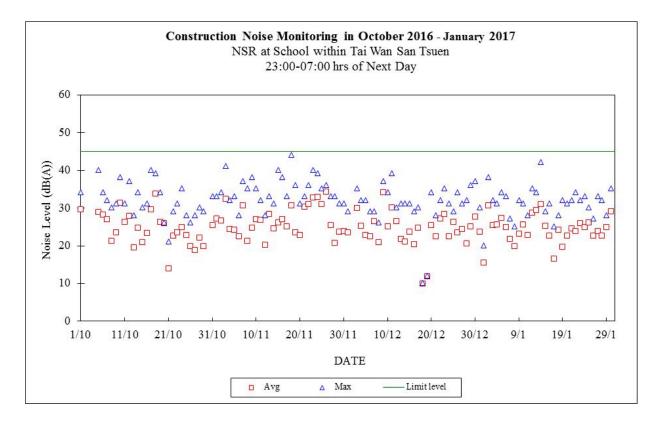












Appendix F

The QA/QC Procedures and Results

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

Aonth: Janu	iary Year:	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)
4/1/2017	269.425	4	3.08	14.05
10/1/2017	268.769	4	3-10	14-14
16/1/2017	268.148	4	3-15	14-33
22/1/2017	267.523	4	3-13	14.26
28/1/2017	259-116	4	3-14	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)
4/1/2017	258.952	4	3.04	13-8+
10/1/2017	238-353	4	3.06	13.94
16/1/2017	257-672	4	3-11	14.13
22/1/2017	256-982	4	3.09	14.08
28/1/2017	259.542	4	3-10	14-13

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)
4/1/2017	255-458	4	(-00	15-69
10/1/2017	255-266	4	1.00	15.69
16/1/2017	255.081	4	1.00	15.69
22/1/2017	254-887	4	1-00	15-69
28/1/2017	254-664	4	1.00	15-69

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

Remarks:

Prepared by : Q Checked by :

D.\alex\teomchk.doc

HIGH VOLUME AIR SAMPLER SITE VISIT LOG SHEET

Site Name:	RE	Site No.:	AMI
Date of visit:	17-1-2017	Hour of Visit:	13:15 Wa
Staff name:	W.M.TAM / H.T. PANG	HVAS S/N:	0 31
Used filter paper no.:	MH69	New filter paper no.:	MHTI
Type of filter:	Glass-fibre		
I. Ambient Condit	ions		
Temperature, T	a = 295.2 K Pi	ressure, $P_a = _$	(03.2 mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions corresponds to $Q_{STD} = 40 \text{ ft}^3/\text{min.}$ (inch H ₂ O)
1534(10/2016)	$H_a = 18.32(T_a/P_a) ={5.34}$

 Manometer reading before calibration:
 5.40

 Adjustment of flow controller (Y/N):
 N

 Manometer reading after calibration:
 N/A

Note: Tolerance Limit of HVAS flow: "1.0 ft3/min. Corresponding limits for manometer : "0.2 inch H2O

III. General Conditions of HVAS

IV.	Remarks		
Condi	ucted by: WWTTAM H.T.PALIA	_ Checked by:	TAL
File Na	me: HVASCAL_1535_2016.Doc		
	· · · ·		

HIGH VOLUME AIR SAMPLER SITE VISIT LOG SHEET

N

Site Name:	<u>Eg</u>	Site No.:	AM2
Date of visit:	17-1-2017	Hour of Visit:	15=00 hrs
Staff name:	W.M.TAM (H.T. FANG	HVAS S/N:	0132
Used filter paper no.:	MHTO	New filter paper no.:	MH72
Type of filter:	Glass-fibre		
I. Ambient Condition	15		
Temperature, $T_a =$	= <u>294.2</u> K Pr	essure, $P_a = 10$	169mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions corresponds to $Q_{STD} = 40 \text{ ft}^3/\text{min.}$ (inch H ₂ O)
1534(10/2016)	$H_a = 18.32(T_a/P_a) = _5.30$

Manometer reading before calibration:5.10Adjustment of flow controller (Y/N):YManometer reading after calibration:5.30

Note: Tolerance Limit of HVAS flow: " 1.0 ft3/min. Corresponding limits for manometer : " 0.2 inch H2O

III. General Conditions of HVAS

				2.1
	14-14-14-14-14-14-14-14-14-14-14-14-14-1		·	
IV.	Remarks			
Cond	lucted by: WINTAM HT PANG	Checked by:	HA	<u>></u>

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:	17-1-2017	Hour of Visit:	14:00 hre
Staff name:	W.M.TAM (H.T.PANG	MINIVOL S/N:	3393
Used filter paper no.:	MO 72	New filter paper no.:	M073
Type of filter: I. Calibration is perf	Cellulose / Glass (Delete as appropr formed by using BIOS	iate))
5 Sl/min set point	is recommended		
5.07	Before	<u>5.02</u> Aft	er
II. General Service of N	Aini Vol Air Sampler		
	ameter:	×	
	blace Pump Valves:	X	
-	place Pump Diaphrag		
1	action Inlet:		
1		1	
.1	imer Battery Every 6	A star	
o. Replace if	ilet Filter:		
····			
III. Remarks			•

Conducted by: <u>MMTam</u>	HITPANG	Checked by :	MEM

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

Location <u>Station Building Rooftop/Reservoir Area/Ching Lam/</u>
Ash Lagoon/No.2 Limestone Silo Roof/Hung Shing Ye*
Date 20-1-2017 Time 945 Wrs
Equipment Bak 2050 Serial No. 3009916
Staff Attended W.M.TAM W.H. MAN
1. <u>Calibration</u>
Acoustic calibrator: <u>Bak4031 (SN127304A</u>)
Noise level measured in calibration: $\underline{\mathfrak{B}}$ (94±1.0 dBA)
2. Weather Conditions
a. Sunny/fine/cloudy/showery/heavy-rain*
b. Strong-wind/breeze/calm*
3. <u>Beacon</u>
Function normally (Yes/No): TES
4. <u>Remark/Observation</u>
Note: * - Please delete where inappropriate.
Conducted By: WWW WHMAN Checked By: Terme Chin
June 2016

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

Loca	ation _
	-Ash-Lagoon/No.2-Limestone-Silo-Roof/Hung-Shing-Ye*
Date	= 17-1-2017 Time 15-45 hr
Equi	ipment <u>Bak 2250</u> Serial No. <u>300.062</u>
Staf	Ef Attended W.M.TAM W.H. MAN
1.	Calibration
	Acoustic calibrator: <u>Bak 4231 (SN: 2730419</u>)
	Noise level measured in calibration: 949 (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):
4.	Remark/Observation
Note	: * - Please delete where inappropriate.
Conc	ducted By: WMTOM WHMAIN Checked By: Terrow Ch

June 2016

Appendix G Event/Action Plans

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	

Table G.1Event and Action Plans for Air Quality

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.2Event and Action Plans for Construction Noise
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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	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.
	the Construction works, verbally advise the Contractor, Engineer and IEC, and inform the EPD of the exceedance, as soon as practicable.		Discuss with Contractor the remedial actions to be implemented.	Amend proposals if required by the Engineer.
	Discuss remedial actions required with	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.
	Engineer.		If the exceedance continues, consider what portion of the work is responsible and instruct the	If the exceedance continues, consider what portion of the work is responsible
	Increase manual monitoring frequency to assess efficacy of remedial measures.		Contractor to stop the portion of work until the exceedance is abated	and, as instructed by the Engineer, stop the portion of work until the exceedance is abated

Table G.3Event 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;		implemented mitigation measures.	within 3 working days and discuss with Engineer;
	Discuss mitigation measure with Engineer and Contractor;			Implement the agreed mitigation measures.
	Ensure mitigation measures are implemented;			
	Increase the monitoring frequency to daily until no exceedance of Limit level.			
Limit level exceeded by more than one	Repeat in-situ measurement to confirm findings; Identify source(s) of impact;	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor	Discuss with Contractor on the proposed mitigation measures; Request Contractor to critically	Inform the Engineer and confirm notification of the non-compliance in writing;
consecutive	Inform Contractor, IEC and EPD;	Advise Engineer on the effectiveness of the	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	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;
sampling day	Check monitoring data, all plant, equipment and Contractor's	proposed remedial measures Verify the implementation of the remedial measures		
	working methods;			
	Discuss mitigation measure with Engineer and Contractor;			
	Ensure mitigation measures are implemented;			Implement the agreed mitigation measures
	Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.			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 (275 kV S/S Construction Sites)

Dates of Inspection: 06/01/2017, 13/01/2017, 20/01/2017 and 27/01/2017.

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: 03/01/2017, 10/01/2017, 17/01/2017 and 24/01/2017.

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: 06/01/2017, 13/01/2017, 20/01/2017 and 27/01/2017.

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.	С
	• the load carried by vehicle shall be covered by impervious sheeting to ensure no leakage of dusty materials from the vehicle.	С
	• the heights from which fill materials are dropped shall be controlled to a practical level to minimise the fugitive dust arising from unloading.	С
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.	С
	• The materials which may generate airborne dust emissions shall be wetted by water spray system.	С
	• All receiving hoppers shall be enclosed on three sides up to 3m above unloading point.	С
	All conveyor transfer points shall be totally enclosed.	С
	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
В3	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: **	N/A
	 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. 	

EM&A Log Ref.	Mitigation Measures	Implementation Status
В7	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.	С
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.	С
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.	С
	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.	С
	• 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.	С
	Disposal of waste at Licensed sites;	С
	• 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;	С
	 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; 	С
	 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.	
	• Maintain records of the quantities of wastes generated and disposed off-site for each category of waste.	С
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	С
	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
С	-	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

Key Date 1.1 Commencement da 1.2 Duration of works 1.3 Possession date	e	486 days	0040/4/4	
1.1Commencement da1.2Duration of works1.3Possession date	e	486 days	0040/4/4	
1.2Duration of works1.3Possession date	<u>a</u>		2016/1/1	2017/4/30
1.3 Possession date		0 days	2016/1/1	2016/1/1
		486 days	2016/1/1	2017/4/30
		0 days	2016/1/1	2016/1/1
1.4 Completion of the C	ontract	0 days	2017/4/30	2017/4/30
2 Total Contract Period		486 days	2016/1/1	2017/5/1
2.1 Preliminaries		37 days	2016/1/1	2016/2/6
	th utility companies	14 days	2016/1/1	2016/1/14
2.1.2 Condition surve		20 days	2016/1/1	2016/1/20
	ommencement of works to Labour Department	7 days	2016/1/1	2016/1/20
	ir pollution control for commencement of works to EPD	7 days	2016/1/1	2016/1/7
	rater discharge licence from EPD	7 days	2016/1/1	2016/1/7
	billing account for disposal of construction waste from EPD		2016/1/1	2016/1/7
	ng underground drainage pipe around site boundary	7 days 21 days	2016/1/1 2016/1/1	2016/1/7
			2016/1/1 2016/1/1	2016/1/21
	for existing underground cables	20 days	2016/1/1 2016/1/1	
		21 days		2016/1/21
	tractor's site office	21 days	2016/1/1	2016/1/21
	ionitoring checkpoints 3A10 for ELS & foundation works	20 days	2016/1/18 2016/1/1	2016/2/6 2016/1/1
2.1.12 Submission of	SATU TOF ELS & TOUNDATION WORKS	0 days	2016/1/1	2016/1/1
2.2 Section A		305 days	2016/1/1	2016/10/31
2.2.1 Hoarding		90 days	2016/1/1	2016/3/30
.2.1.1 Erection o	Hoarding	90 days	2016/1/1	2016/3/30
	orks at Unit L10	295 days	2016/1/11	2016/10/31
	e - Temporary Steel Casing	56 days	2016/1/22	2016/3/17
	on for delivery temporary steel casing	56 days	2016/1/22	2016/3/17
		172 days	2016/2/24	2016/8/13
	e - Permanent Casing & Double Wall Liner g for double wall liner	0 days	2016/2/24	2016/8/13
	on for delivery permanent casing & double wall liner	160 days	2016/3/7	2016/8/13
	- Plant Mobilization	56 days	2016/1/15	2016/3/11
	er Crane	53 days	2016/1/15	2016/3/8
	st & 2nd set	0 days	2016/1/15	2016/1/15
	rd set	0 days	2016/2/4	2016/2/4
	th & 5th set	0 days	2016/2/19	2016/2/19
	th set	0 days	2016/3/8	2016/3/8
.2.3.2 Oscil		35 days	2016/1/29	2016/3/4
	st & 2nd set	0 days	2016/1/29	2016/1/29
	rd & 4th set	0 days	2016/2/24	2016/2/24
	th set	0 days	2016/3/4	2016/3/4
.2.3.3 RCD		7 days	2016/3/4	2016/3/11
	st & 2nd set	0 days	2016/3/4	2016/3/4
	rd, 4th & 5th set	0 days	2016/3/11	2016/3/11
.2.2.4 Predrillin		60 days	2016/1/11	2016/3/10
	lling works (38 nos.)	60 days	2016/1/11	2016/3/10
	Construction	263 days	2016/2/12	2016/10/31
	pile construction (38 piles)	215 days	2016/2/12	2016/9/13
		30 days	2016/8/25	2016/9/23
	•	7 days	2016/9/17	2016/9/23
	ission of BA14	1 day	2016/9/23	2016/9/23
.2.5.5 Allow	14 days for selection of pile for concrete full core test	14 days	2016/9/24	2016/10/7
arommo Te	sk Critical Task (istone	mmary	
gramme			Thirley V	•
.2.5. .2.5. .2.5. .2.5.	2 Interfa 3 Prepa 4 Subm 5 Allow	2 Interface & sonic test 3 Prepare & submit as-built record plan 4 Submission of BA14 5 Allow 14 days for selection of pile for concrete full core test	2 Interface & sonic test 30 days 3 Prepare & submit as-built record plan 7 days 4 Submission of BA14 1 day 5 Allow 14 days for selection of pile for concrete full core test 14 days	2 Interface & sonic test 30 days 2016/8/25 3 Prepare & submit as-built record plan 7 days 2016/9/17 4 Submission of BA14 1 day 2016/9/23 5 Allow 14 days for selection of pile for concrete full core test 14 days 2016/9/24

M14 2月	M15 3月	M16 4月
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SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

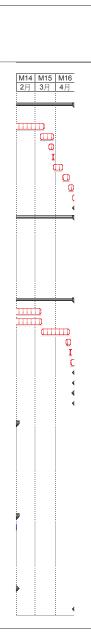
em T				
	ask Name	Duration	Start	Finish
.2.2.5.6	Concrete full core test	14 daya	2016/10/8	2016/10/21
.2.2.5.0	Compression test for concrete core	14 days 7 days	2016/10/22	2016/10/21
.2.2.5.7	Submission of log report & compression test report	4 days	2016/10/22	2016/10/28
2.2.3.6	Submission of nog report & compression test report	92 days	2016/10/28	2016/10/21
2.2.2.6.1	Plant mobilization	-	2016/7/31	2016/7/31
.2.2.6.1		0 days		2016/7/22
	Delivery sheet pile material	0 days	2016/7/22	
.2.2.6.3	Installation of sheet pile - Type A (approx. 212 piles)	50 days	2016/8/1	2016/9/19
.2.2.6.4	Installation of sheet pile - Type B (approx. 100 piles)	24 days	2016/9/20	2016/10/13
.2.2.6.5	Prepare & submit as-built record plan	7 days	2016/10/14	2016/10/20
.2.2.6.6	Submission of BA14	1 day	2016/10/21	2016/10/21
2.2.2.7	Completion of foundation works at Unit L10	0 days	2016/10/31	2016/10/31
2.2.3	New Site Facilities	198 days	2016/1/1	2016/7/16
2.2.3.1	Submission for design of site office A	90 days	2016/1/1	2016/3/30
2.2.3.2	Approval for design of site office A	28 days	2016/3/31	2016/4/27
2.2.3.3	Erection of site office A	50 days	2016/4/28	2016/6/16
2.2.3.4	Erection of wasing facilities with shelter & container shower facilities	20 days	2016/5/28	2016/6/16
2.2.3.5	Installation of earthing	30 days	2016/6/7	2016/7/6
2.2.3.6	Installation of portable water pipes	30 days	2016/6/17	2016/7/16
2.2.3.7	Installation of sewage drain pipes	30 days	2016/6/17	2016/7/16
2.2.3.8	Completion of new site facilities	0 days	2016/7/16	2016/7/16
2.2.4	Completion of section A	0 days	2016/10/31	2016/10/31
2.2.5	Demobilization of plants	0 days	2016/10/21	2016/10/21
2.3	Handover of site works area for Section A	0 days	2016/11/1	2016/11/1
2.4	Section B	121 days	2016/1/1	2016/4/30
2.4.1	Ground Treatment Works	121 days	2016/1/1	2016/4/30
2.4.1.1	Verification GI works (approx. 20 nos.)	14 days	2016/2/20	2016/3/4
2.4.1.2	Plant mobilization	55 days	2016/1/1	2016/2/24
2.4.1.3	Trial installation of band drain	5 days	2016/2/25	2016/2/29
2.4.1.4	Installation of band drain (approx. 2477 nos.)	45 days	2016/3/1	2016/4/14
2.4.1.5	Installation of steel plate & geotextile on existing U-channel	20 days	2016/3/28	2016/4/16
2.4.1.6	Filling of surcharge (approx. 21000 m3)	20 days	2016/4/7	2016/4/26
2.4.1.7	Installation of ground settlement markers	10 days	2016/4/21	2016/4/30
2.4.2	Completion of section B	0 days	2016/4/30	2016/4/30
2.5	Section C	229 days	2016/9/14	2017/4/30
2.5.1	Hoarding	45 days	2016/11/1	2016/12/15
2.5.1.1	Erection of Hoarding	45 days	2016/11/1	2016/12/15
2.5.2	Foundation Works at 275kV Substation Building	229 days	2016/9/14	2017/4/30
2.5.2.1	Early start milestone	0 days	2016/10/6	2016/10/6
2.5.2.2	Bored Pile - Temporary Steel Casing	7 days	2016/9/14	2016/9/20
.5.2.2.1	Duration for delivery temporary steel casing	7 days	2016/9/14	2016/9/20
2.5.2.3	Bored Pile - Permanent Casing & Double Wall Liner	120 days	2016/9/26	2017/1/23
.5.2.3.1	Duration for delivery permanent casing & double wall liner	120 days	2016/9/26	2017/1/23
2.5.2.4	,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,			2016/10/15
.5.2.4.1				2016/10/15
.2.4.1.1				2016/10/1
.2.4.1.1		,		2016/10/1
.2.4.2.1				
		,		2016/10/5
.5.2.4.3				2016/10/15
.2.4.3.1		,		2016/10/15
2.5.2.5	Predrilling	21 days	2016/11/1	2016/11/21
2.5. .5.2. .2.4. .5.2. .2.4. .5.2. .2.4.	2.4 4.1 1.1 4.2 2.1 4.3 3.1	Bored Pile - Plant Mobilization 4.1 Crawler Crane 1.1 1st & 2nd set 4.2 Oscillator 2.1 1st & 2nd set 4.3 RCD 3.1 1st & 2nd set 2.5 Predrilling	2.4 Bored Pile - Plant Mobilization 14 days 4.1 Crawler Crane 0 days 1.1 1st & 2nd set 0 days 4.2 Oscillator 0 days 2.1 1st & 2nd set 0 days 4.3 RCD 0 days 3.1 1st & 2nd set 0 days 2.5 Predrilling 21 days	Bored Pile - Plant Mobilization 14 days 2016/10/1 4.1 Crawler Crane 0 days 2016/10/1 1.1 1st & 2nd set 0 days 2016/10/1 4.2 Oscillator 0 days 2016/10/5 2.1 1st & 2nd set 0 days 2016/10/5 4.3 RCD 0 days 2016/10/15 3.1 1st & 2nd set 0 days 2016/10/15

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

Master Programme Revision 1

D	Item	Task Name	Duration	Start	Finish
	nem	Table Name	Duration	Start	1 111311
05	2.5.2.5.1	Predrilling works (10 nos.)	21 days	2016/11/1	2016/11/2
06	2.5.2.5.1	Bored Pile	181 days	2016/11/1	2010/11/2
07	2.5.2.6.1	Installation of monitoring checkpoints	7 days	2016/11/1	2017/4/30
08	2.5.2.6.1	Bored pile construction (10 piles)	125 days	2016/11/10	2016/11/7
09	2.5.2.6.2	Interface & sonic test	20 days	2017/3/9	2017/3/14
10	2.5.2.6.4	Prepare & submit as-built record plan	7 days	2017/3/22	2017/3/28
11	2.5.2.6.4	Submission of BA14	1 day	2017/3/22	2017/3/28
12	2.5.2.6.6	Allow 14 days for selection of pile for concrete full core test	14 days	2017/3/29	2017/3/20
13	2.5.2.6.0	Concrete full core test	14 days 10 days	2017/3/29	2017/4/11
13	2.5.2.6.7	Compression test for concrete core	7 days	2017/4/12	2017/4/21
15	2.5.2.6.8		4 days	2017/4/21	2017/4/27
15	2.5.2.6.9	Submission of log report & compression test report Completion of foundation works at 275kV substation building	0 days	2017/4/27	2017/4/30
· .		Trial Pile	,		
17	2.5.3 2.5.3.1		212 days	2016/10/1	2017/4/30
18		Early start milestone	0 days	2016/10/1	2016/10/1
19	2.5.3.2	Submission of BA10 for trial pile	7 days	2016/11/1	2016/11/7
20	2.5.3.3	Predrilling	28 days	2016/11/8	2016/12/5
21	2.5.3.3.1	Predrilling works (3 nos.)	28 days	2016/11/8	2016/12/5
22	2.5.3.4	Ground Instrumentation	24 days	2016/11/22	2016/12/1
23	2.5.3.4.1	Installation of magnetic extensometer in predrilled hole (3 nos.)	16 days	2016/11/22	2016/12/7
24	2.5.3.4.2	Installation of settlement plate	10 days	2016/12/6	2016/12/1
25	2.5.3.5	Construction of Trial Pile	136 days	2016/12/16	2017/4/30
26	2.5.3.5.1	Installation of trial pile (6 piles)	84 days	2016/12/16	2017/3/9
27	2.5.3.5.2	Dynamic pile test	72 days	2016/12/29	2017/3/10
28	2.5.3.5.3	Static load test	42 days	2017/3/11	2017/4/21
29	2.5.3.5.4	Prepare & submit as-built record plan	7 days	2017/4/17	2017/4/23
30	2.5.3.5.5	Submission of BA14	1 day	2017/4/23	2017/4/23
31	2.5.3.5.6	Cut off the piles to level +3.0mPD	7 days	2017/4/24	2017/4/30
32	2.5.3.6	Completion of trial pile	0 days	2017/4/30	2017/4/30
33	2.5.4	Completion of section C	0 days	2017/4/30	2017/4/30
34	2.5.5	Demobilization of plants	0 days	2017/4/30	2017/4/30
35	2.6	Handover of site works area for Section C	0 days	2017/5/1	2017/5/1
36 37	2.7	Section D	383 days	2016/1/15	2017/1/31
38	2.7.1	General Site Works	36 days	2016/3/1	2017/1/31
39	2.7.1	Cable duct & draw pit	21 days	2016/3/1	2016/3/21
40	2.7.1.1	Reloaction of lamp pole (5 poles)	21 days 20 days	2016/3/17	2016/3/21
41	2.7.1.2	G.I. Works	99 days	2016/3/17	2016/6/10
12					
+2 13	2.7.2.1	Submission of BA10 for G.I. works Carry out G.I. works (11 nos.)	7 days 85 days	2016/3/4 2016/3/11	2016/3/10
+3 14	2.7.2.2	Prepare & submit as-built record plan	7 days	2016/3/11 2016/6/4	2016/6/3
44	2.7.2.3	Submission of BA14	1 days	2016/6/10	2016/6/10
45	2.7.2.4	Ground Treatment Time	276 days		
40	2.7.3	9 months for monitoring settlement after completion of ground treatment	276 days 276 days	2016/5/1 2016/5/1	2017/1/31 2017/1/31
48	2.7.3.1	S months for monitoring settlement after completion of ground treatment	276 days 227 days	2016/5/1	2017/1/3
19	2.7.4.1	Repair & make good site office B & existing latrines	90 days	2016/3/1	2016/5/29
50	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
51	2.7.4.3	Installation of bund wall of sandbags	60 days	2016/5/1	2016/6/29
	2.7.4.4	Construction of new type 3 road	60 days	2016/6/30	2016/8/28
53	2.7.5	Completion of section D	0 days	2017/1/31	2017/1/31
54		October of according to a		0047/1/00	0017/1/27
55	2.8	Contract completion	0 days	2017/4/30	2017/4/30



Page 3

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Sector D- Reading of MBBU 6 MBC Akk at US 15, Dick Jack Denoting for York 95 (200) 91 (200)		Section B2 - Surcharge relocation & assoicated top-up works	122 days	01/09/17	31/12/17	
Sector D. Resume of MSB100 /HSG. AAA in U.S. Li, Die A. Demotion is in lot H. 9102000 9102000 910200	;	Section C - Area C3, HRSG & MSBU10 for Empolyer's Specialist	457 days	01/11/16	31/01/18	
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6 Parapet Wait, FS Water Tank, Top Roots + RC outs, hatch door etc. 45 days 210497 040717 7 GFW Moky, Louver, Doors Tame & Shuller Frame 45 days 040517 240617 3 GF Finshing Works 45 days 010717 310717 3 GF Finshing Works 45 days 220717 310717 1 GF Finshing Works 45 days 2209177 100717 1 GF Finshing Works 45 days 2209177 100717 1 GF Finshing Works 45 days 2209177 101717 3 UF Finshing Works 00 days 180717 106177 3 UF Window, Loure & Door Frames 00 days 180717 100817 4 UF Finshing Works (nd. Water Tank & FD Pump Room) 30 days 100717 101017 3 UF Finshing Works (nd. Water Tank & FD Pump Room) 30 days 020717 101017 3 UF Finshing Works (nd. Water Tank & FD Pump Room) 30 days 020717 101017 3 UF Finshing Works (nd. Water Tank & FD Pump Room) <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
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1 Water Test 7 days 20/05/17 26/05/17	20	Thrust Box Construction	21 days	29/04/17	19/05/17]]				
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	22	Backfill	30 dave	27/05/17	25/06/17	F M A J A J
7 Security Security Security Security Security Constrained Security Constrained Security		All underground Utilities				
Bit School Bit Sch		Backfill & Reinstatement & Formation of Access	24 days	08/12/17	31/12/17	
Bit Bedatok se fil bern Beda	27	Supporting Supporting Structure for Overhead Crane	200 days	26/05/17	11/12/17	
30 Schweiz Derseg Modified mit 2 0.005/17 3009/17 31 Schweiz Derseg Modified mit 2 0.005/17 3009/17 32 Schweiz Derseg Modified mit 2 0.005/17 3109/17 33 Schweiz Derseg Modified mit 2 0.005/17 3109/17 34 Schweiz Derseg Modified mit 2 0.005/17 3109/17 35 Bezignen Fin 2, fan 19, fan fan	28	Section B2 - Surcharge relocation & assoicated top-up works	242 days		31/12/17	
Nill Bancov of Suchasport Pice (2000 mt) By Asia ZD (2000 CB) Such Asia BH, PD, DD, DD, 46 Gays 00.0007 100077 Status Delating Read Chain CAchem (2000 mt) 00.0007 100077 Status Delating Read Chain CAchem (2000 mt) 20.0007 100077 Status Delating Read Chain CAchem (2000 mt) 20.0007 100077 Status Delating Read Chain CAchem (2000 mt) 20.0007 20.0007 Status Delating Read Chain CAchem (2000 mt) 20.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 10.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 10.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 40.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 40.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 40.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 40.0007 20.0007 Status Delating Read Chain Chain Control (1000 mt) 40.0007 20.0007 Status Delatin		Roadworks and External Works	242 days	04/05/17	31/12/17	
and 16 methods Number Numbr	30		120 days	04/05/17		
Simulate Data Code on (200 ms) Bit O 197 Bit 2011 Bit 2011 <thbit 2011<="" th=""> Bit 2011 <th< td=""><td></td><td>and D4</td><td>-</td><td></td><td>15/10/17</td><td></td></th<></thbit>		and D4	-		15/10/17	
34 Sector - Acc 2, Hield & MBBU (16 or Employer's Speciality 47						
55 HeSA Ave Equipment In F Am - South (Kers C) 29 4 4 yr 980417 310118 10 Lecardin for Tomation Level 18 4 ayr 800417 230017 10 Part (Ma) Tom (Ha) (Level In John Hage) 10 4 ayr 200017 230017 10 Part (Level In Tom (Ha) (Level In John Hage) 10 4 ayr 200017 230017 10 Part (Level In Tom (Ha) (Level In John Hage) 10 4 ayr 200017 230017 10 Part (Level In Tom (Ha) (Level In John Hage) 10 4 ayr 200017 230017 10 Part (Level In Tom (Ha) (Level In John Hage) 10 4 ayr 200017 230017 10 Part (Level In Tom (Ha) (Level In John Hage) 10 4 ayr 200017 200017 11 4 ayr 10 4 ayr 200017 700017 200017 11 4 ayr 10 4 ayr 200017 700017 200017 12 Audio Y ayr 10 4 ayr 200017 7001717 200017 12 Audio Y ayr 10 4 ayr 200017 7001177 7001177						
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80 Pice ises Tradinary (bo) 44 sigs 00017 23017 90 Pice ises themes -C. (10-10+1 (b+18) 10:0 60 sigs 00017 71077 81 Pice ises themes -C. (10-10+1 (b+18) 10:0 60 sigs 00017 71077 81 Pice ises themes -C. (10-10+1 (b+18) 10:0 60 sigs 00017 71077 82 Pice ises themes -C. (10-10+1 (b+18) 10:0 60 sigs 00017 710777 83 Backlin & Fernishem & Formation & Access Road 60 sigs 000177 230017 84 Underground Dimongo 10 sigs 000177 230017 710017 84 Descrits 60 sigs 000177 230017 710017 84 Descrits 60 sigs 100177 710017 710017 85 Descrits 60 sigs 1011171 711717 710017 84 Passport Na 10 sigs 101117 711717 710017 85 Book Sigs 10 sigs 1011117 711717 710017 710017 710017 7						
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60 Rod Construction 21 days 2009177 011/117 61 Paged Wal 152 days 21/11/17 011/117 62 ABWF Works 30 days 18/11/17 10/11/117 62 ABWF Works 45 days 18/11/17 10/11/118 01/11/16 64 Resdy for BA13 Application 0 days 31/01/18 07/01/16 65 Building Service Installations 0 days 01/11/18 07/01/16 67 BD Consert for E13 MSU10 Foundation 0 days 01/11/16 01/11/16 01/11/16 69 Build consert for E13 MSU10 Foundation 16 days 25/11/16 05/21/06 60 Excavation Myling A Struct (Free ABT) 114 days 25/11/16 06/11/16 06/11/16 61 Cut down Fiel Head & Reatment 45 days 09/11/16 00/11/16 00/11/17 00/11/17 62 Daria Miland Struct (Free A & Targe O / 10/10 30 days 00/11/17 28/01/17 10/01/17 63 Daria Miland Struct (Free A & Targe O / 10/10 30 days 27						
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64 Ready for BA 13 Application 0 days 3101/18 3101/18 56 Main Station Building Ard, Olf & Mr A13 days 011/116 1411/16 56 Installation of Dewatering Weil & King Post for Type A 14 days 011/116 1411/16 57 BD Chewatering Weil & King Post for Type A 21 days 011/116 011/116 58 Buik Excavation to approx. 43 dmPD 21 days 1011/116 061/216 59 Substructwack/FG - SL Strop 40, 101 to 10-44 154 days 2011/11 061/216 60 Curcher The East Micro Information Level (1.325mPD) 14 days 2011/16 061/216 61 Curcher The East Micro Information Level (1.325mPD) 14 days 2011/17 050/17 62 Construction of Transforme Bay Foundations 45 days 0701/17 050/17 63 Arrival OK Wildweit Plagin Materials Incl. Resulte joint & other cast In materials 0 days 07001/17 050/17 64 Construction of Gr- Arrival Daws Encl. Top of the Pipe) (0LSC1 to SC4 and SC4 20 dayi 200/17 050/17 71 Subdays						
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57 B0 Consent for ELS MSB/U10 Foundation 0 daya 0 full /16 0 full /16 59 Bulk Loravalon to Agromov. 43 0mPD 21 daya 15/11/16 65/12/16 59 Substructure&GF-GL SC1 to 100, 10-1 to 10-6 154 daya 25/11/16 67/21/16 50 Exavalon to Formation Level (1-1 25/mPD) 14 daya 25/11/16 12/01/17 61 Cut-down Pile Head & treatment 45 daya 29/11/16 12/01/17 62 Pile Cap & Tis Beam Construction 100 daya 03/12/16 20/01/17 63 Construction of Cambrid Construction 40 daya 07/01/17 07/01/17 64 Construction of Culver Outel Box 30 daya 08/01/17 08/01/17 65 Construction of Culver Inite Box 30 daya 07/02/17 12/04/17 67 Construction of Culver Inite Box 30 daya 09/03/17 27/04/17 07/01/17 68 Construction of Culver Inite Box 30 daya 09/03/17 27/04/17 12/04/17 71 Substructure & Gr-G 10/0 daya 09/12/16 20/01/17 12/04/17 72 Exiavialon to Formation Level (
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99 Substructure&G/F-GL SC1 to 10-0, 10-0-6 196 days 25/11/16 27/10-17 0 Excavation to Framinoi Luev(1-1, 25mPD) 14 days 25/11/16 0/12/17 01 Cut-down Pile Head & treatment 45 days 29/11/16 1/20/17 03 Construction of Transforme Bay Foundations 45 days 0/11/17 0/01/17 03 Construction of Transforme Bay Foundations 45 days 0/11/17 0/01/17 04 Excavation, Waling & Struct (Type A Type C) 30 days 0/01/17 0/01/17 0/01/17 05 Drain PIL Symp PIL Construction 21 days 0/01/17 0/01/17 0/01/17 04 Excavation & Valing Cutvert pilang materials incl. flexible joint & other cast in materials 0 days 0/01/17 0/01/17 05 Construction of Cutvert Outlet Box 30 days 0/01/17 0/02/17 1/06/03/17 06 Construction of Tee Beam/ Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SC4 30 days 0/01/17 2/01/17 1/01/14 17 Substructure & S(rF-GL 10-D to 10-H, 10-1 to 10-6 395 days 0/01/17						
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62 Pile Cap & Tie Beam Construction 100 days 03/12/16 1203/17 63 Construction of Transforme Bay Foundations 45 days 17/12/16 0300/17 64 Excavation, Waling & Struct (Type A & Type C) 30 days 09/12/16 07/01/17 65 Drain PI/Sump Pi Construction 21 days 08/01/17 08/01/17 67 Construction of Cuiver I tolitet Box 30 days 07/01/17 07/01/17 68 Construction of Cuiver I tolitet Box 30 days 07/01/17 12/04/17 69 Construction of Cuiver I tolitet Box 30 days 27/02/17 12/04/17 70 Bearing Wall, Column Post and Gir Siab Construction 30 days 29/02/17 27/04/17 71 Substructure & Gir Siab Construction 30 days 09/12/16 07/01/18 72 Excavation to Formation Level (+2.425mPD & 5.025mPD) 45 days 09/12/16 01/01/17 73 Excavation to Type B 14 days 09/12/16 01/01/17 74 Complete excavation at Type B 14 days 19/12/16 10/01/17	61					
64 Excavation, Waing & Struct (Type A & Type C) 30 days 09/12/16 07/01/17 65 Dran PH Comprison 21 days 08/01/17 28/01/17 28/01/17 66 Arrival of CW Culvert piping materials incl. flexible joint & other cast in materials 0 days 08/01/17 06/02/17 67 Construction of Culvert Unitet Box 30 days 08/01/17 08/03/17 68 Construction of The Beam Ground Beam (Top of the Pipe) (SLSC1 to SC4 and SC to SC5 b) 27/02/17 08/03/17 12/04/17 69 Construction of the Pipe) (SLSC1 to SC4 and SC to SC5 days 09/12/16 27/02/17 12/04/17 70 Bearing Wail, Column Post and G/F Slab Construction 30 days 29/03/17 27/04/17 12/04/17 71 Substruct Tre & GriF- GL 10-10-10-10-10-10-6 39 days 29/02/17 27/04/17 12/04/17 72 Existing Sheet Pile Cut-down 7 days 12/12/16 01/01/17 10/02/17 73 Existing Sheet Pile Cut-down 7 days 12/12/16 10/11/17 10/02/17 74 Pile Head Treatment (Bino.) 30 days	62	Pile Cap & Tie Beam Construction		03/12/16	12/03/17	
65 Drain Pit /Sump Pit Construction 21 days 08/01/17 28/01/17 68 Arrival of CW Cuvert pliping materials inci. flexible joint & other cast in materials 0 days 07/01/17 07/01/17 68 Construction of Culvert Dulet Box 30 days 07/02/17 08/03/17 08/03/17 68 Construction of Culvert Dulet Box 30 days 07/02/17 08/03/17 12/04/17 69 Construction of Te Bearn (Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SCa 25 days 27/02/17 12/04/17 70 Bearing Wall, Column Post and GF Slab Construction 30 days 09/12/16 07/04/17 71 Substructure & Suif- G-L 10-D to 10+1, 10-1 to 10-4 396 days 09/12/16 07/01/18 72 Excavation to Formation Level (+2.425mPD & 5.025mPD) 45 days 09/12/16 07/01/18 73 Excisiting Sheet Pile Cut-down 7 days 10/12/16 10/10/17 15/02/17 74 Complete excavation at Type B 14 days 19/12/16 10/10/17 15/02/17 75 Bearing Wall, Column Post and GF Slab Construction 36 days						
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68 Construction of Culvert Intel Box 30 days 07/02/17 08/03/17 69 Construction of Tie Beam/ Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SCa to SCb) 27/02/17 12/04/17 12/04/17 70 Bearing Wall, Column Post and G/F Siab Construction 30 days 29/03/17 27/04/17 71 Substructure & G/F - G1 - Do to 10-10 to 10-10 to 10-6 395 days 09/12/16 09/12/16 09/12/16 72 Exoation to Formation Level (+2.425mPD & 5.025mPD) 45 days 09/12/16 18/12/16 18/12/16 73 Existing Sheet Pile Cut-down 7 days 12/12/16 18/12/16 18/12/16 74 Complete excavation at Type B 14 days 19/12/16 110/11/7 17/01/17 75 Blow Down Sump Construction 100 days 29/12/16 17/01/17 17/01/16 76 Pile Head Treatment (18/0.0) 100 days 29/12/16 07/04/17 17/00/17 77 Pile Cap & Tie Beam Construction 35 days 25/03/17 28/04/17 17/00/17 78 Bearing Wall, Column Post and G/F Stab Construction			-			
69 Construction of Tie Beam/ Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SCa 45 days 27/02/17 12/04/17 70 Bearing Wall, Column Post and G/F Slab Construction 30 days 29/03/17 27/04/17 71 Stubstructure & G/F- GL 10- Dt 01-0H, 10-16 395 days 09/12/16 07/01/18 72 Excavation to Formation Level (+2.425mPD & 5.025mPD) 45 days 09/12/16 12/12/16 73 Existing Sheet Pile Cut-down 7 days 19/12/16 18/12/16 74 Complete excavation at Type B 14 days 19/12/16 19/12/16 75 Blow Down Sump Construction 30 days 19/12/16 17/01/17 76 Pile Head Treatment (18no.) 30 days 19/12/16 17/01/17 77 Pile Cap & Tie Beam Construction 30 days 25/03/17 28/08/17 78 Bearing Wall, Column Post and G/F Slab Construction 35 days 15/07/17 28/08/17 79 Turbo Block Foundation 45 days 15/07/17 28/08/17 27/08/17 70 Bearing Wall, Column Post and G/F Sub Construction						
70 Bearing Wall, Column Post and G/F Slab Construction 30 days 29/03/17 27/04/17 71 Substructure & G/F - GL 10- Dt 10-H, 10-1 to 10-6 395 days 09/12/16 22/01/17 72 Exacavation to Formation Level (+2.425mPD & 5.025mPD) 45 days 09/12/16 22/01/17 73 Existing Sheet Pile Cut-down 7 days 12/12/16 18/12/16 74 Complete excavation at Type B 14 days 19/12/16 15/02/17 76 Blow Down Sump Construction 45 days 09/12/16 17/01/17 77 Pile Lead Treatment (18no.) 30 days 19/12/16 17/01/17 77 Pile Cap & Tie Beam Construction 130 days 29/10/17 28/04/17 78 Bearing Wall, Column Post and G/F Slab Construction 130 days 29/12/16 07/04/17 79 Turbo Block Foundation 45 days 15/07/17 28/08/17 28/08/17 71 Turbo Block Superstructure 90 days 21/09/17 18/08/17 27/08/17 79 Turbo Block Superstructure 90 days 28/08/17 <td>169</td> <td>Construction of Tie Beam/ Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SCa</td> <td></td> <td></td> <td></td> <td></td>	169	Construction of Tie Beam/ Ground Beam (Top of the Pipe) (GLSC1 to SC4 and SCa				
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79 Turbo Block Foundation 45 days 15/07/17 28/08/17 80 Backfill of Turbo Block Superstructure 14 days 14/08/17 27/08/17 81 Turbo Block Superstructure 90 days 21/09/17 19/12/17 82 Beam & Slabs at G/F Area 90 days 28/08/17 25/11/17 83 Associated ABWF & BS Works for Specialist Access 60 days 09/11/17 11/06/17						
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9 0 1 C.W	e Erection of Steel Column along GL10-2 and 10-6 and 10-C to 10-H (G/F to R/F) for roof truss	Duration	Start	Finish	F M A M J
7 3 T 3 0 1 C.W.					
C.W.		14 days	09/05/17	22/05/17	F M A M J
)) C.W.	R.C. Structure Construction	30 days	13/05/17	11/06/17	
0 1 C.W .	Transformer Area	111 days	07/08/17	25/11/17	
1 C.W.	Wall Construction	90 days	07/08/17	04/11/17	
	Slab & Plinths Construction /. Culvert System (Area C3)	21 days 236 days	05/11/17 18/12/16	25/11/17 10/08/17	
	Excavation to Formation Level	230 days 21 days	18/12/16	07/01/17	-1
	Penstock Trial & Preparation for connection to existing outlet pipe	21 days 21 days	18/12/16	07/01/17	
	Construction of Binding & Plinth	7 days	08/01/17	14/01/17	
	CW Pipe Laying	14 days	15/01/17	28/01/17	-
96 T	Thrust Box Construction	12 days	29/01/17	09/02/17	
	Nater Test	10 days	03/02/17	12/02/17	
	Backfill	14 days	13/02/17	26/02/17	
	All underground Utilities	45 days	27/02/17	12/04/17	
	Backfill & Reinstatement & Formation of Access	120 days	13/04/17	10/08/17	
Ext. & D	n D - Remaining of MSBU10, HRSG, A&A at L9 & L8, CW Pump Equip. Rm No. 4 Demolish Site Toilet	478 days	09/12/16	31/03/18	
	/ Culvert System (Area C5)	419 days	09/12/16	31/01/18	
	Excavation to Formation Level (-2.8mPD) with ELS Installation	30 days	09/12/16	07/01/17	_1
	Construction of Binding & Plinth	7 days	08/01/17	14/01/17	-1
	Pipe Laying (2 Pipes)	14 days	15/01/17	28/01/17	
	Construction of Thrust Box	21 days	29/01/17	18/02/17	
	Nater Test Backfill	7 days	20/02/17 27/02/17	26/02/17 12/03/17	
	All underground Utilities	14 days 125 days	13/03/17	15/07/17	
	Backfill & Reinstatement & Formation of Access	200 days	16/07/17	31/01/18	
	SG Area Fdn - North (Area C6)	340 days	26/04/17	31/03/18	
	Excavation to Formation Level	21 days	26/04/17	16/05/17	
	Drain Pit Construction (5no.1.6m to 6m in Height)	45 days	17/05/17	30/06/17	
	Pile Head Treatment (8no.)	16 days	15/06/17	30/06/17	
	MSB Fdn North of HRSG Area GL 10-H to 10H-H, 10-1to 10H-3	150 days	22/06/17	18/11/17	
	All underground Utilities	60 days	19/11/17	17/01/18	-
17 P	Plate Load Test	10 days	18/01/18	27/01/18	
18 R	Raft Fdn (1no.)	18 days	28/01/18	14/02/18	
	Backfill & Reinstatement & Formation of Access	45 days	15/02/18	31/03/18	
	n Station Building - Unit L10 Superstructure	337 days	29/04/17	31/03/18	
	2/F	44 days	13/05/17	25/06/17	$\overline{\nabla}$
22	Steel Beam Erection	14 days	13/05/17	26/05/17	
23	R.C. Structure Construction	14 days	12/06/17	25/06/17	
	3/F	51 days	27/05/17	16/07/17	
25	Steel Beam Erection R.C. Structure Construction	14 days	27/05/17	09/06/17	
		21 days 58 days	26/06/17 10/06/17	16/07/17 06/08/17	-1
27 44 28	Steel Beam Erection	14 days	10/06/17	23/06/17	
9	R.C. Structure Construction	21 days	17/07/17	06/08/17	
	5/F & Roof except GL 10-G to 10-H and 10-2 to 10-6	81 days	23/05/17	11/08/17	
30 3 1	Steel Roof Truss Erection (GL 10-D & 10-E)	7 days	23/05/17	29/05/17	
32	Steel Roof Truss Erection (GL 10-F & 10-G)	7 days	30/05/17	05/06/17	
33	Steel Roof & Crane Rail Erection	21 days	25/05/17	14/06/17	
34	Slab Construction	30 days	15/06/17	14/07/17	
5	Upper Roof - Steel Roof Erection	30 days	08/07/17	06/08/17	
36	Upper roof RC construction	21 days	22/07/17	11/08/17	-1
	Staircase Constructions	100 days	29/04/17	06/08/17	
	Fendolite Installation to S. Steel Works	90 days	07/08/17	04/11/17	-1
	External Metal Cladding Installation nternal ABWF Works	120 days 180 days	21/08/17 06/09/17	18/12/17 04/03/18	-1
	3S Installation	180 days	03/10/17	31/03/18	1
	kV Cable Trench (Area C5 &C6)	180 days	16/07/17	11/01/18	1
	275kV Cable Trench Excavation(C5 Area)	90 days	16/07/17	13/10/17	1
	275kV Cable Trench Excavation(C6 Area)	90 days	14/10/17	11/01/18	1
	B UnitL9 - A&A	140 days	12/06/17	29/10/17	
	Hack-off Lean Concrete	70 days	12/06/17	21/08/17	
	Pipe Rack Support Construction	70 days	21/08/17	29/10/17	
	B UnitL8 - A&A	150 days	09/04/17	06/09/17	
	A&A Works	150 days	09/04/17	06/09/17	
50 C.W.	/. Pump Equipment Room	364 days	01/04/17	31/03/18	

נ	Task Name	Duration	Start	Finish
_	BA 10 Application	0 days	01/04/17	01/04/17
	Excavation to + 4.05mPD	21 days	02/04/17	22/04/17
2 3	Plate Load Test	14 days	23/04/17	06/05/17
54	Raft Foundation Construction	18 days	07/05/17	24/05/17
255	Underground Drainage	21 days	25/05/17	14/06/17
256	Backfill	10 days	15/06/17	24/06/17
257 258	Construct G/F	21 days	25/06/17	15/07/17
258 259	Roof Construction	45 days 18 days	16/07/17 30/08/17	29/08/17 16/09/17
259 260	Parapet Wall ABWF Works	75 days	17/09/17	30/11/17
61	Building Service Installations	75 days	01/12/17	13/02/18
262	Extenal Pipe Rack Extension & Reinstatement Works	90 days	31/12/17	30/03/18
263	Ready for BA 13 Application	0 days	31/03/18	31/03/18
264	Demolition Work - Temporary Site Toilet	60 days	08/07/17	06/09/17
265	Demolition of Temp. Site Toilet	60 days	08/07/17	06/09/17
66	Section E - Middel Rd & South of L10. Expose & Construction New 275kV Trench at LM	336 days	15/06/17	16/05/18
67	275kV Cable Trench	240 days	16/07/17	12/03/18
268	275kV Cable Trench Re-excavation (~172m)	240 days	16/07/17	12/03/18
69	C.W. Culvert System (Area C9a & C15)	336 days	15/06/17	16/05/18
270 271	Removal of existing paving block Install ELS & Excaavation, Phase 1	12 days 45 days	15/06/17 27/06/17	26/06/17 10/08/17
71	Blinding & Construct Plinth	45 days 30 days	11/08/17	09/09/17
73	Pipe Laying & Thrust Box	30 days	10/09/17	09/10/17
74	Water Test and Backfill	12 days	10/10/17	21/10/17
275	Underground UU and Reinstatement	45 days	22/10/17	05/12/17
276	Install ELS & Excavation, Phase 2	45 days	06/12/17	19/01/18
277 278	Blinding & Concrete Plinth Pipe Laying and Thrust Box	30 days 30 days	20/01/18 19/02/18	18/02/18 20/03/18
278 279	Water Test & Backfill	12 days	21/03/18	01/04/18
280	Underground UU and Reinstatement	45 days	02/04/18	16/05/18
281	Section F -Urea Storage & Handling Factilies	488 days	01/05/17	31/08/18
282	Urea Handling & Storage Plant House, Electrical Room & Pipe Rack	488 days	01/05/17	31/08/18
283	BA 10 Application	10 days	01/05/17	10/05/17
284	Excavation to Formation Level	14 days	11/05/17	24/05/17
285	Plate Load Test	14 days	25/05/17	07/06/17
286	Raft Foundation (Urea HandIng Rm)	21 days	08/06/17	28/06/17
287	Raft Foundation (Electrical Rm)	30 days	29/06/17	28/07/17
288	Backfill	21 days	29/07/17	18/08/17
289 290	Construct G/F Roof Construction	45 days 75 days	19/08/17 03/10/17	02/10/17 16/12/17
90 91	Parapet Wall	21 days	17/12/17	06/01/18
91	ABWF Works	120 days	07/01/18	06/05/18
293	Building Service Installations	120 days	04/05/18	31/08/18
94	Ready for BA 13 Application	0 days	31/08/18	31/08/18
95	Plate Load Test	14 days	25/05/17	07/06/17
96	Pipe Rack Foundation	28 days	08/06/17	05/07/17
297	Supporting Tower (4 no.) (9.55m in Height)	60 days	06/07/17	03/09/17
298	Pipe Rack Truss (3 no.)17.3m Span	60 days	04/09/17	02/11/17
299	Section G - Demin. Plant Road & Modification at No. 4 CW Intake	273 days	01/01/18	30/09/18
00	C.W Culvert System (Area C9b)	272 days	01/01/18	30/09/18
01	Design, Approval & Consent	0 days	01/01/18	01/01/18
302	Removal of paving block & ELS Installation	30 days	02/01/18	31/01/18
303	Excavation to Formation Level with ELS Installation	45 days	01/02/18	17/03/18
304 305	Construction of Blinding & Plinth Pipe Laying (2 pipes x ~45m)	14 days 30 days	18/03/18 01/04/18	31/03/18 30/04/18
305	Construction of Thrust Box	14 days	01/04/18	14/05/18
307	Water Test	8 days	15/05/18	22/05/18
808	Backfill	21 days	23/05/18	12/06/18
309	All underground Utilities	50 days	13/06/18	01/08/18
10	Backfill & Reinstatement & Formation of Access	60 days	02/08/18	30/09/18
11	Modification Works - No. 4 C.W. Intake & No.3 C.W. Outfall	181 days	01/01/18	30/06/18
312	No. 3 C.W. Outfall Modification	90 days	01/01/18	01/04/18
313	No. 4 C.W. Intake Modification	122 days	01/03/18	30/06/18
314	Section H1 - Gas Support foundation & trench at Area C11	405 days	01/11/16	10/12/17
15	GRS Support Foundation	405 days	01/11/16	10/12/17

	Task Name	Duration	04	
18 19 20 21 22 23 24 25 26 27 28		Baration	Start	Finish
322 323 324 325 326 327 328	Temporary Protection, advance work etc	45 days	01/11/16	15/12/16
319 320 321 322 323 324 325 326 327 328	Gas Pipe Footing	180 days	16/12/16	13/06/17
320 321 322 323 324 325 326 327 328	Gas Pipe Trench	180 days	14/06/17	10/12/17 15/11/18
321 322 323 324 325 326 327 328	Section H2 - GRS Improvement work at Area C10	441 days	01/09/17	
322 323 324 325 326 327 328	GRS Area Improvement Works Retaining Wall Construction	441 days 90 days	01/09/17 01/09/17	15/11/18 29/11/17
323 324 325 326 327 328 329	Removal of Surcharge and Backfill		30/11/17	13/01/18
324 325 326 327 328		45 days		
325 326 327 328	Footing Construction	240 days	14/01/18	10/09/18
326 327 328	Topping up, finish and Misc. Works	66 days	11/09/18	15/11/18
327 328	Section H3 - L10 Chimney Flue and A&A L9 & pipe rack formation	318 days	01/01/18	15/11/18
328	No.4 Chimney Steel Flue	318 days	01/01/18	15/11/18
	Consent, documentation and site preparation	0 days	01/01/18	01/01/18
329	Steel Flue Preparation & installation	150 days	02/01/18	31/05/18
000	Install Steel Cover at Windshield	45 days	01/06/18	15/07/18
330	Install Steel Cover at Roof	30 days	16/07/18	14/08/18
331	Modification & Reinstatement Works	55 days	15/08/18	08/10/18
332	E & M Installation	38 days	09/10/18	15/11/18
333	MSB Unit 9 Pipe Rack Construction	90 days	01/04/18	29/06/18
334	Section I1 - Link Bridge & associated A&A	455 days	01/01/18	31/03/19
335	Link Bridge	455 days	01/01/18	31/03/19
336	Design & Shop Drawings	90 days	01/01/18	31/03/18
337	Access	0 days	17/11/18	17/11/18
338	Site preparation	14 days	18/11/18	01/12/18
339 340	Link Bridge between Unit L9 & L10	120 days	02/12/18	31/03/19
	Section I2 - Shunt Reactor SR4 Foundation	90 days	01/01/19	31/03/19
341	Shunt Reactor Compound SR4	90 days	01/01/19	31/03/19
342	Modification Work at Shunt Reactor SR4	90 days	01/01/19	31/03/19
343	Section I3 - All remaining work except deferred works	417 days	08/02/18	31/03/19
344	Remaining Works	417 days	08/02/18	31/03/19
345	Demolition of Canopy @ Jetty Guard Hose & Toilet)	30 days	02/08/18	31/08/18
346	Demolition of Existing Contractor Shed	60 days	01/09/18	30/10/18
347	Seurity Fence Erection	20 days	31/10/18	19/11/18
348	All External Works & Road Works	417 days	08/02/18	31/03/19
349	Deferred Works - L10 MSB and HRSG	417 days	08/02/18	31/03/19
350	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
351	Construction of Walls and Ceilings of Lube Oil Tank Room at L10 MSB	92 days	01/05/18	31/07/18
352	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
353	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
354	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
355	Removal of Temporary Paving Within L10 HRSG Area to Expose all respective Equipment Foundations	14 days	01/08/18	14/08/18
356	Construction of Foundation Plinths and Walls of Lube Oil Storage Tank	93 days	15/08/18	15/11/18
357	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
358	Deferred Works - External Works	182 days	01/10/18	31/03/19
359	Final Reinstatement of Access Roads and Pavement Surrounding and within L10 MSB	151 days	01/10/18	28/02/19
	and L10 HRSG Area	-		
360	FSD Inspection	14 days	02/03/19	15/03/19
361	BD OP Inspection	14 days	18/03/19	31/03/19
362	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
363	275kV Cable Diversion	1127 days	01/05/17	31/05/20
364	Part I (1km in Length, 1.1m to 1.5m Deep) (Works in existing Trench)	426 days	01/05/17	30/06/18
365	Tentative Commencement Date Of Civil Works	0 days	01/05/17	01/05/17
366 367	Implementation of TTA Remove the Concrete Road Cover	7 days 60 days	01/05/17 08/05/17	07/05/17 06/07/17

ID Teak	b. 16/8002 Lamma Power Station Extension Civil and Building Unit L10			
ID Taski	Name	Duration	Start	Finish
368	Cable Trench Re-excavation	208 days	07/06/17	31/12/17
369	Completion Date of Trench Excavation for Site Handover	0 days	31/12/17	31/12/17
370	Tentative Period for Backfilling and Road Reinstatement (Excluding Joint Bay and Trench at Station Road)	91 days	01/04/18	30/06/18
371	Part II (630m in Length, 1.1m to 1.5m Deep) (Works in existing Trench)	485 days	01/11/17	28/02/19
372	Tentative Commencement Date Of Civil Works	0 days	01/11/17	01/11/17
373	Implementation of TTA	7 days	01/11/17	07/11/17
374	Remove the Concrete Road Cover	32 days	08/11/17	09/12/17
375	Trench Excavation and Installation of Road Decking at Joint Bay (Including Part I & II)	90 days	25/11/17	22/02/18
376	Cable Trench Re-excavation	190 days	23/02/18	31/08/18
377	Completion Date of Trench Excavation for Site Handover	0 days	31/08/18	31/08/18
378	Tentative Period for Backfilling and Road Reinstatement (Including Joint Bay at Part	90 days	01/12/18	28/02/19
379	I, but excluding Joint Bay SJ3)	-	01/07/18	30/11/19
	Part III (400m in Length, 1.3m to 1.5m Deep) (Works in New Trench)	518 days	01/07/16	30/11/19
380	Tentative Commencement Date Of Civil Works	0 days	01/07/18	01/07/18
381	Implementation of TTA	7 days	01/07/18	07/07/18
382	Remove the Concrete Road Cover	30 days	08/07/18	06/08/18
383	Cable Trench Excavation with shoring	270 days	07/08/18	03/05/19
384	Construction of New Joint Bay	28 days	04/05/19	31/05/19
385	Completion Date of Trench Excavation for Site Handover	0 days	31/05/19	31/05/19
386	Tentative Period for Backfilling and Road Reinstatement (excluding new slab but including SJ3)	91 days	01/09/19	30/11/19
387	Part IV (Hand Dig Tunnel)	701 days	01/07/18	31/05/20
388	Tentative Commencement Date Of Civil Works	0 days	01/07/18	01/07/18
389	Excavation to Approx. +5mPD	30 days	01/07/18	30/07/18
390	Existing Drainage Diversion	50 days	31/07/18	18/09/18
391	Construction of New Cable Joint Bay	30 days	19/09/18	18/10/18
392	Ramp Trench	75 days	19/10/18	01/01/19
393	Formation of Temp. Cable Pit	45 days	02/01/19	15/02/19
394	Hand Dig Tunel (17.6m) (0.2~0.3m/day)	75 days	16/02/19	01/05/19
395	Excavation for Duct Bank Construction	60 days	02/05/19	30/06/19
396	Completion Date of Trench Excavation for Site Handover	0 days	30/06/19	30/06/19
397	Deferred Works - Cable Diversion CPX1 and CPX2 (during DLP)	274 days	01/09/19	31/05/20
398	Formation of Wall Opening between existing trench CPX1 and new Joint Bay	7 days	01/09/19	07/09/19
399	Breaking up for Road Paving and Excavation down to Cable Tiles of Existing Trench CPX2	31 days	01/12/19	31/12/19
400	Demolition of Existing Trench CPX1 and CPX2	30 days	01/04/20	30/04/20
401	Final Reinstatement of the CPX1 and CPX2 Areas	31 days	01/05/20	31/05/20
402	Deferred Works - Shunt Reactor Compound SR4 (during DLP)	153 days	01/07/19	30/11/19
403	Trench Re-excavation and Cable Supports Installation for Shunt Reactor	62 days	01/07/19	31/08/19
404	Compound SR4 Backfilling and Road Re-instatement of Shunt Reactor SR4 and Associated	30 days	01/11/19	30/11/19
-0-	Trench	50 days	01/11/13	30/11/13

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

ID	Task Name	Duration	Start	Finish	2017年
					M3 M4 M5
	Key Date	455 days	2016/12/21	2018/3/20	二月 三月 四月
	Commencement date	0 days	2016/12/21	2016/12/21	
	Duration of works	455 days	2016/12/21	2018/3/20	
	Site possession date	0 days	2016/12/21	2016/12/21	
	Completion of the Contract	0 days	2018/3/20	2018/3/20	
		e daje	LUTURILU	2010/0/20	
-	Submission & Works Commenced Before the Contract	231 days	2016/11/14	2017/7/2	
в	Prelimiminaries	75 days	2016/11/14	2017/1/27	1
,	Coordination with utility companies	14 days	2016/12/14	2016/12/27	
10	Condition survey	1 day	2016/12/14	2016/12/14	
1	Notification of commencement of works to Labour Department	1 day	2016/12/19	2016/12/19	
2	Notification of air pollution control for commencement of works to EPD	1 day	2016/12/19	2016/12/19	
3	Application of water discharge licence from EPD	14 days	2016/12/12	2016/12/25	
F	Application for billing account for disposal of construction waste from EPD	7 days	2016/12/12	2016/12/18	
5	CCTV for existing underground drainage pipe around site boundary	12 days	2017/1/16	2017/1/27	
5	Erection of contractor's site office	21 days	2016/12/14	2017/1/3	
7	Installation of monitoring checkpoints	2 days	2016/12/13	2016/12/14	
3	Submission of BA10 for foundation works	0 days	2016/11/14	2016/11/14	
9			122222000000		
0	Predrilling Works	51 days	2016/11/23	2017/1/12	
1	Drilling rigs mobilization (6 rigs)	1 day	2016/12/22	2016/12/22	
2	Predrilling works	31 days	2016/11/23	2016/12/23	
3	Submission of predrill logs	16 days	2016/12/28	2017/1/12	
4	Completion of predrilling works	0 days	2017/1/12	2017/1/12	
6	Plant Mobilization for Bored Pile Construction	207 days	2016/12/8	2017/7/2	
7	Crawler Crane	86 days	2016/12/8	2017/3/3	
8	1st & 2nd set	1 day	2016/12/8	2016/12/8	
9	3rd & 4th set	1 day	2017/1/6	2017/1/6	
0	5th & 6th set	7 days	2017/2/25	2017/3/3	O C
1	Oscillator	206 days	2016/12/9	2017/7/2	3
2	1st & 2nd set	4 days	2016/12/9	2016/12/12	
3	3rd & 4th set	2 days	2017/1/7	2017/1/8	
4	5th set	7 days	2017/3/4	2017/3/10	D
5	6th set	7 days	2017/6/26	2017/7/2	
6	RCD	84 days	2017/1/7	2017/3/31	
17	1st & 2nd set	7 days	2017/1/7	2017/1/13	
88	3rd & 4th set	7 days	2017/1/21	2017/1/27	
9	5th & 6th set (Optional if necessary)	7 days	2017/3/25	2017/3/31	e •
10	Completion of plant mobilization for bored pile construction	0 days	2017/3/31	2017/3/31	*
1					
2	Delivery of Temporary Steel Casing for Bored Pile Construction	192 days	2016/12/21	2017/6/30	
13	Duration for delivery of temporary steel casing	192 days	2016/12/21	2017/6/30	
14	Completion of delivery of temporary steel casing for bored pile construction	0 days	2017/6/30	2017/6/30	
5					
6	Total Contract Period	455 days	2016/12/21	2018/3/20	
7					
8	Section A	315 days	2016/12/21	2017/10/31	
9	Delivery of Permanent Casing & Double Wall Liner	270 days	2016/12/21	2017/9/16	
0	Testing for double wall liner (subject to HEC's request)	45 days	2016/12/21	2017/2/3	
Ĵ	ter Programme Task Critical Task	Milestone	*	Summary 🛡	

Appendix J

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

ID i	Fask Name	Duration	Start	Finish	2017年
					M3 M4 M5
					二月 三月 四月
51 52	Duration for delivery of permanent casing & double wall liner	240 days	2017/1/20	2017/9/16	
52 53	Bored Pile Construction (22 piles)	315 days	2016/12/21	2017/10/31	
	1st set - G2 > G1 > G4 > G3 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	186 days	2016/12/21	2017/6/24	
4	G2	45 days	2016/12/21	2017/2/3	
5	G1	46 days	2017/2/4	2017/3/21	
56	G4	50 days	2017/3/22	2017/5/10	
57	G3	45 days	2017/5/11	2017/6/24	
8	2nd set - G7 > G5 > G6 > BP26 > BP20 > BP23 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	283 days	2016/12/21	2017/9/29	
9	G7	45 days	2016/12/21	2017/2/3	2
50	G6	43 days	2017/2/4	2017/3/18	
51	G5	48 days	2017/3/19	2017/5/5	
52	BP26	46 days	2017/5/6	2017/6/20	
3	BP20 (required after 1 July 17)	44 days	2017/7/3	2017/8/15	
64	BP23 (required after 1 July 17)	45 days	2017/8/16	2017/9/29	
55	3rd set - BP5 > BP1 > BP13 > BP9 > BP17 (1 crane operator, 1 oscillator operator, 2 RCD operators, 4 riggers & 2 welders)	135 days	2017/1/9	2017/5/23	
6	BP5	45 days	2017/1/9	2017/2/22	
37	BP1	50 days	2017/1/27	2017/3/17	
8	BP13	45 days	2017/2/23	2017/4/8	
9	BP9	50 days	2017/3/18	2017/5/6	
0	BP17	45 days	2017/4/9	2017/5/23	
1	4th set - G10 > G8 > G9 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	136 days	2017/1/16	2017/5/31	
2	G10	45 days	2017/1/16	2017/3/1	
3	G8	45 days	2017/3/2	2017/4/15	
4	G9	46 days	2017/4/16	2017/5/31	
5	5th set - BP8 > BP4 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	85 days	2017/7/3	2017/9/25	
76	BP8 (required after 1 July 17)	41 days	2017/7/3	2017/8/12	
77	BP4 (required after 1 July 17)	43 days	2017/8/14	2017/9/25	
8	6th set - BP12 > BP16 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	87 days	2017/7/3	2017/9/27	
79	BP12 (required after 1 July 17)	46 days	2017/7/3	2017/8/17	
30	BP16 (required after 1 July 17)	41 days	2017/8/18	2017/9/27	
1	Interface & sonic test	30 days	2017/9/7	2017/10/6	
2	Prepare & submit as-built record plan	7 days	2017/9/30	2017/10/6	
33	Submission of BA14	1 day	2017/10/7	2017/10/7	
4	Allow 14 days for selection of pile for concrete full core test	14 days	2017/10/8	2017/10/21	
15	Concrete full core test	10 days	2017/10/22	2017/10/31	
6	Completion of bored pile construction	0 days	2017/10/31	2017/10/31	
17	Sheet Pile	163 days	2017/5/22	2017/10/31	
18	Plant mobilization (1 rig) (1 operator, 4 riggers & 4 welders)	7 days	2017/8/13	2017/8/19	
9	Delivery of sheet pile material	90 days	2017/5/22	2017/8/19	
0	Installation of sheet pile - Type B (approx. 80 piles)	65 days	2017/8/20	2017/10/23	
1	Prepare & submit as-built record plan	7 days	2017/10/24	2017/10/30	
92	Submission of BA14		2017/10/31	2017/10/31	
		0 00,0	Lottrioidi		
93 94 Íaste	Submission of BA14 Completion of sheet pile Completion of section A r Programme 3 (14 Jan 2017)	1 day 0 days 0 days Milestone	2017/10/31 2017/10/31 2017/10/31	2017/10/31 2017/10/31 2017/10/31 Summary	

Appendix J

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

	ask Name	Duration	Start	Finish	2017年	201
	uan munic	Duration	Otan	T man	2017年 M3 M4 M5	2018
					二月 三月 四月	
				1000313-01797755827		
	Section B	455 days	2016/12/21	2018/3/20		
	Delivery of Permanent Casing & Double Wall Liner	390 days	2016/12/21	2018/1/14		
	Testing for double wall liner (subject to HEC's request)	45 days	2016/12/21	2017/2/3		
	Duration for delivery of permanent casing & double wall liner	305 days	2017/3/16	2018/1/14		
	Bored Pile Construction (16 piles)	373 days	2017/3/13	2018/3/20		
	1st set - BP21 > BP22 > BP18 > BP19 > BP15 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	227 days	2017/6/25	2018/2/6		
	BP21	46 days	2017/6/25	2017/8/9		
Ξ	BP22	45 days	2017/8/10	2017/9/23		
	BP18	45 days	2017/9/25	2017/11/8		
-	BP19	45 days	2017/11/9	2017/12/23		
	BP15	45 days	2017/12/24	2018/2/6		
	3rd set - BP14 > BP11 > BP29 > BP6 > BP7 (1 crane operator, 1 oscillator operator, 2 RCD operators. 4 riggers & 2 welders)	137 days	2017/5/7	2017/9/20		
	BP14	46 days	2017/5/7	2017/6/21		
_	BP11	45 days	2017/5/24	2017/7/7		
	BP29	45 days 45 days	2017/5/24	2017/8/5		
_	BP29 BP6	200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
_		45 days	2017/7/8	2017/8/21		
	BP7	46 days	2017/8/6	2017/9/20		
	4th set - BP27 > BP28 > BP25 > BP24 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	182 days	2017/6/1	2017/11/29		
	BP27	45 days	2017/6/1	2017/7/15		
	BP28	46 days	2017/7/16	2017/8/30		
	BP25	45 days	2017/8/31	2017/10/14		
	BP24	46 days	2017/10/15	2017/11/29		
	5th set - BP10 > BP3 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)	94 days	2017/3/13	2017/6/14		
	BP10	45 days	2017/3/13	2017/4/26	GTTTTTTD	
	BP3	44 days	2017/5/2	2017/6/14	Tuduchadaudaudaudaudau	
	Interface & sonic test	30 days	2018/1/18	2018/2/16		
į	Prepare & submit as-built record plan	7 days	2018/2/17	2018/2/18		
	Submission of BA14	1 day	2018/2/17	2018/2/23		
-	Allow 14 days for selection of pile for concrete full core test	14 days	2018/2/24	2018/2/24		
-	Concrete full core test	*	2018/2/25			
-		10 days	2018/3/11	2018/3/20		
_	Completion of bored pile construction	0 days		2018/3/20		
	Sheet Pile	235 days	2017/7/10	2018/3/1		
	Delivery of sheet pile material 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)	90 days 45 days	2017/7/10 2017/10/24	2017/10/7 2017/12/7		
)	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	2017/12/8	2018/2/21		
1	Prepare & submit as-built record plan	7 days	2018/2/22	2018/2/28		
	Submission of BA14	1 day	2018/3/1	2018/3/1		
	Completion of sheet pile	0 days	2018/3/1	2018/3/1		
_	Completion of section B	0 days	2018/3/20	2018/3/20		
	Completion of Section D	U uays	2010/3/20	2010/3/20		
	Our track a second at least	0.4	0010/0/00	0040/0/00		
-	Contract completion	0 days	2018/3/20	2018/3/20		

Monthly Waste Flow Table for January 2017

Project: Foundation Works for Lamma Power Station Extension Unit L10

Contractor: Sunley Engineering & Construction Co Ltd

Record by: Andy Fan

Year of Record: 2017

MM.YYYY		Actual Qu	antities of I	nert C&D Ma	aterials Ge	enerated I	Monthly		Actual Q	uantities of N	Non-inert C&I	O Materials	Generated	Monthly	
	Exca	vated Mater	ials	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		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	Remarks
	(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	9323.37	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	Notes 7
Jul-16	12248.01	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	Notes 7
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	
Jan-17	6758.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	3.16	
Total	67877.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	41.96	I

Total Inert C&D Waste Materials	I	Non-inert C&D Material	s
Generated	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
67877.49 tonnes	0.00 tonnes	41.96 tonnes	0.24 tonnes

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 67877.49 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

67877.49 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) ______kg of metals, _____kg of papers/ cardboard packing and _____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.

(7) The quantities of excavated materials disposed in landfill for June & July 2016 are revised.

Monthly Waste Flow Table for January 2017

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 & 2017

MM.YYYY		Actual Q	uantities of	Inert C&D N	laterials C	Generated	Monthly		Actual Quantities of Non-inert C&D Materials Generated Monthly						
	Exc	avated Mate	erials		Non-exc	cavated M	laterials								
	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 '000L)	(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	20.48	
Jan-17	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.00	
Feb-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	0.20	20.48	

CHIT ticket was returned after cut off day last

Total Inert C&D Waste Materials	Non-inert C&D Materials							
Generated	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste					
1780.91 tonnes	0.00 tonnes	20.48 tonnes	200 Liters					

- Where
 (A)
 Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, <u>1780.91</u> tonnes of inert C&D material were generated from the Project, of which <u>0</u> tonnes were reused in this and other contracts, and the remaining <u>1780.91</u> 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 Contract.

(3) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(4) Plastics refer to plastic bottles/ containers, plastic/ foam from packaging material.

(5) Broken concrete for recycling into aggregates.

(6) Disposal of inert waste to public fill or sorting facilities will NOT be considered as recycled waste.

Monthly Waste Flow Table for January 2017

Project: Foundation Works for Lamma Power Station Extension Unit L11

Contractor: Sunley Engineering & Construction Co Ltd

Record by: Andy Fan

Year of Record: 2017

MM.YYYY		Actual Q	uantities of	Inert C&D N	Aterials G	Generated	Monthly		Actual Q	uantities of N	on-inert C&I	D Materials	Generated	Monthly
	Exc	avated Mate	erials	Non-excavated Materials										
	Disposed in Public Fill	Disposed in Sorting Facilities	Others (e.g Reused in the Contract / Other Projects)	Concrete or	the	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
Jan-2017	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	Non-inert C&D Materials								
Generated	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.
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