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

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

October 2017

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

港燈
HK Electric

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499

ENVIRONMENTAL PERMIT NO. EP-071/2000/C

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

Report Title	Lamma Power Station Extension – Unit L10 & L11 Monthly EM&A Report (October 2017)
Date	10 November 2017
Certified by	(Mr. IP Tat-Yan, Environmental Team Leader)
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EXECUTIVE SUMMARY

This is the 90th 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 October 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 February 2016.

In September 2016, the Government approved HK Electric to construct the third combined cycle gas-fired generating unit (L11) to implement the 2020 Fuel Mix Target. L11 is planned for commercial operation in 2022 and the associated construction work commenced in November 2016.

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

Construction Activities Undertaken

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

Item	Construction Activities
Unit L10 Civil and Building	Main Station Building (trench excavation and backfilling, sheet piling, , installation of columns and beams, installation of pipes, formwork, steel fixing and concreting), Site Office Building (formwork, steel fixing and concreting), and Join Bay
Unit L10 Mechanical Erection	Site preparation work
Unit L10 Electrical, Instrumentation & Control Erection	Site preparation work
Unit L11 Piling	Ground investigation works and sheet pile works

Environmental Monitoring Works

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

Air Quality

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

Noise

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

Site Environmental Audit

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

Environmental Licensing and Permitting

Description	Permit No.	Valid Period		Issued To	Date of Issuance
		From	To		
Varied Environmental Permit	EP-071/2000/C	18/05/05	-	HK Electric	18/05/05
Construction Noise Permit	GW-RS0537-17	26/06/17	25/12/17	Contractor	23/06/17
Construction Noise Permit	GW-RS0754-17	12/09/17	11/03/18	Contractor	04/09/17
Construction Noise Permit	GW-RS0621-17	01/08/17	31/12/17	Contractor	24/07/17
Construction Noise Permit	PP-RS0018-17	26/08/17	23/02/18	Contractor	24/08/17
WPCO Discharge Licence	WT00027040-2017	06/02/17	28/02/22	Contractor	06/02/17
WPCO Discharge Licence	WT00027316-2017	01/03/17	31/03/22	Contractor	01/03/17
Registration of Chemical Waste Producer	WPN5113-912-S3180-19	21/01/16	-	Contractor	21/01/16
Registration of Chemical Waste Producer	WPN5213-912-P2781-22	22/02/16	-	Contractor	22/02/16
Registration of Chemical Waste Producer	WPN5113-912-S3180-20	11/01/17	-	Contractor	11/01/17
Waste Disposal Billing Account	Account No.: 7026035	06/10/16	-	Contractor	06/12/16
Waste Disposal Billing Account	Account No.: 7026793	28/12/16	-	Contractor	28/12/16
Waste Disposal Billing Account	Account No.: 7027632	20/04/17	-	Contractor	20/04/17

Implementation Status of Environmental Mitigation Measures

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

Environmental Complaints

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

Future Key Issues

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

Unit L10 Civil and Building Works

- to continue monitoring the noise level during construction and to ensure compliance with the CNP's already obtained;
- to continue executing the preventive measures for avoiding noise exceedance and keep monitoring/ reviewing the performance;
- to monitor and review the sufficiency of the dust suppression measures provided and increase the resources accordingly if necessary;
- to treat wastewater in sedimentation pit and tanks before discharge and to ensure compliance with the WPCO discharge licence already obtained.

Unit L10 Mechanical Erection

- 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;

Unit L10 Electrical, Instrumentation & Control Erection

- 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;

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;
- to recycle and reuse wastewater and to ensure compliance with the WPCO discharge licence already obtained.

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 October 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 activities for Unit L10 civil and building works were carried out for Main Station Building (trench excavation and backfilling, sheet piling, installation of columns and beams, installation of pipes, formwork, steel fixing and concreting), for Site Office Building (formwork, steel fixing and concreting) and for Join Bay. Construction activity for Unit L10 mechanical erection was site preparation work. Construction activity for Unit L10 electrical, instrumentation & control erection was site preparation work. Construction activities for Unit L11 piling were ground investigation works and sheet pile works. Layout plan for construction site is shown in Figure 1.1.

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

Table 1.1 Construction Activities and Their Corresponding Environmental Mitigation Measures

Item	Construction Activities	Environmental Mitigation Measures
Unit L10 Civil and Building Works		
1.	Main Station Building (trench excavation and backfilling, sheet piling, installation of columns and beams, installation of pipes, formwork, steel fixing and concreting)	**Air** – All regulated machine attached with valid exception/approval NRMM labels. – Water truck was used for water spraying of the haul road. – Water spraying for concrete breaking of pile head. – Excavated slope covered with cement or tarpaulin. – Backfilled surface was compacted. **Noise** – Works conducted during holiday should comply with the valid CNP. **Wastewater** – Wastewater should be treated in sedimentation pit and tanks before discharge. Solution should be added to speed up the sedimentation process. Sediment in pit and tanks must be removed regularly. **Waste Management** – Excavated soil was temporary stored for

Item	Construction Activities	Environmental Mitigation Measures
		backfilling. – Scrape metal will be recycled. – Timber will be reused as much as possible.
2.	Site Office Building (formwork, steel fixing and concreting)	**Air** – All regulated machine attached with valid exception/approval NRMM labels. **Waste Management** – Scrape metal will be recycled. – Timber will be reused as much as possible.
3.	Join bay	**Air** – All regulated machine attached with valid exception/approval NRMM labels. – Water spraying for road surface breaking – Soil stock covered with tarpaulin. **Waste Management** – Excavated soil was temporary stored for backfilling. – Scrape metal will be recycled.
Unit L10 Mechanical Erection		
4.	Site Preparation Work	**Air** – Dust suppression in the main haul road. **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 L10 Electrical, Instrumentation & Control Erection		
5.	Site Preparation Work	**Air** – Dust suppression in the main haul road. **Noise** – General noise mitigation measures employed at all work sites throughout the construction phase. **Waste Management** – Waste Management Plan submitted and implemented.
Unit L11 Piling Works		
6.	Ground Investigation Works	**Water** – Wastewater will be re-used for drilling machine.
7.	Sheet Pile Works	**Waste Management** – Waste management plan submitted and implemented

1.4 Summary of EM&A Requirements

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

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

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

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

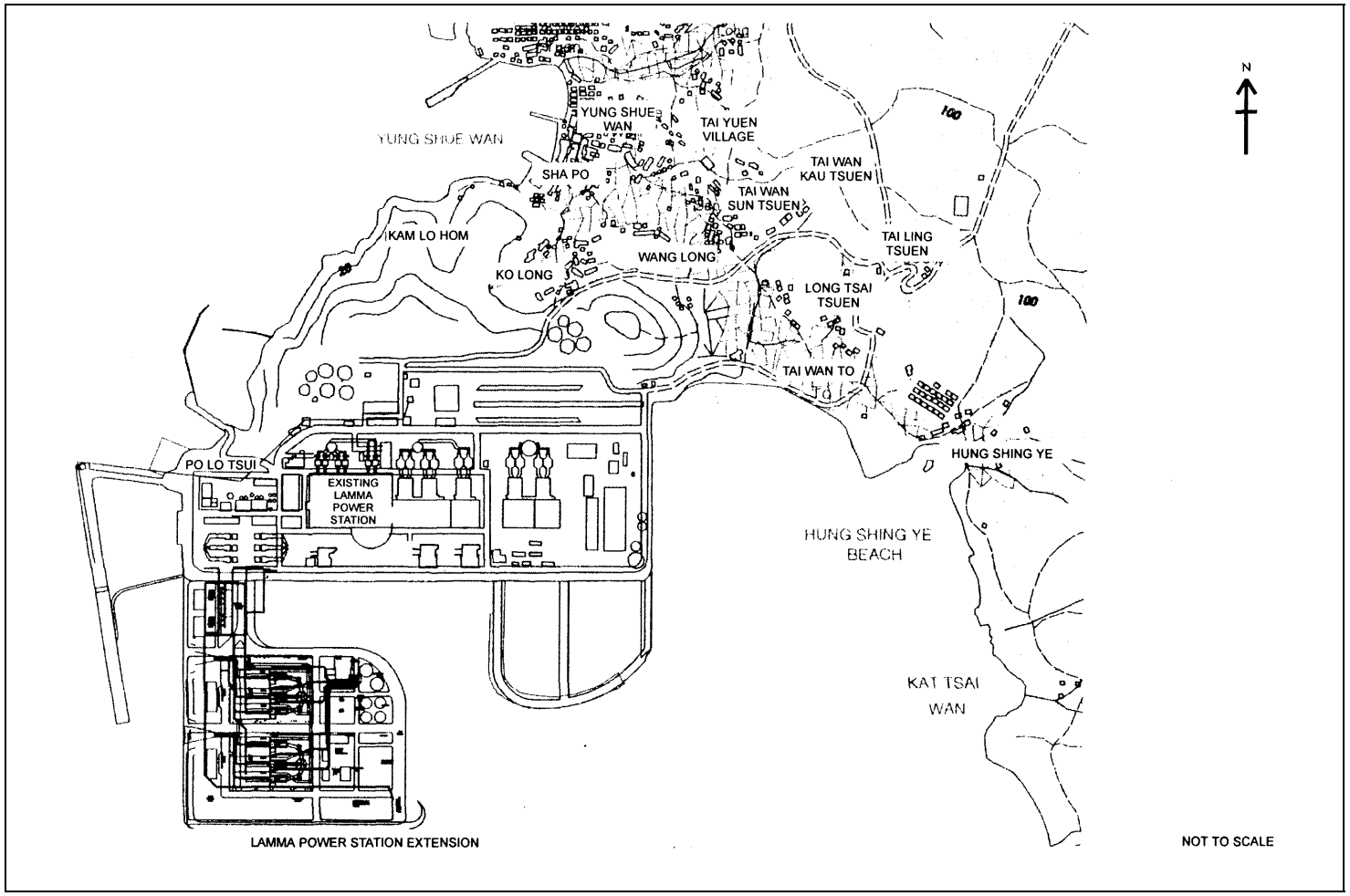


Figure 1.1 Layout of Work Site

2. AIR QUALITY

2.1 Monitoring Requirements

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

2.2 Monitoring Locations

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

Table 2.1 Air Quality Monitoring Locations

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

2.3 Monitoring Equipment

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

Table 2.2 Air Quality Monitoring Equipment

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

2.4 Monitoring Parameters, Frequency and Duration

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

Table 2.3 Air Quality Monitoring Parameter, Duration and Frequency

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

2.5 Monitoring Procedures and Calibration Details

HVAS and MINIVOL (24- hour TSP Monitoring):

Preparation of Filter Papers

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

Field Monitoring

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

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

- The following parameters of the TEOM model dust meters are regularly checked to ensure proper functionality:

    - Operation Mode;
    - Frequency of the tapered element;
    - Main flow;
    - Bypass flow.

Maintenance & Calibration

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

2.6 Results and Observations

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

1-hour TSP

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

24-hour TSP

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

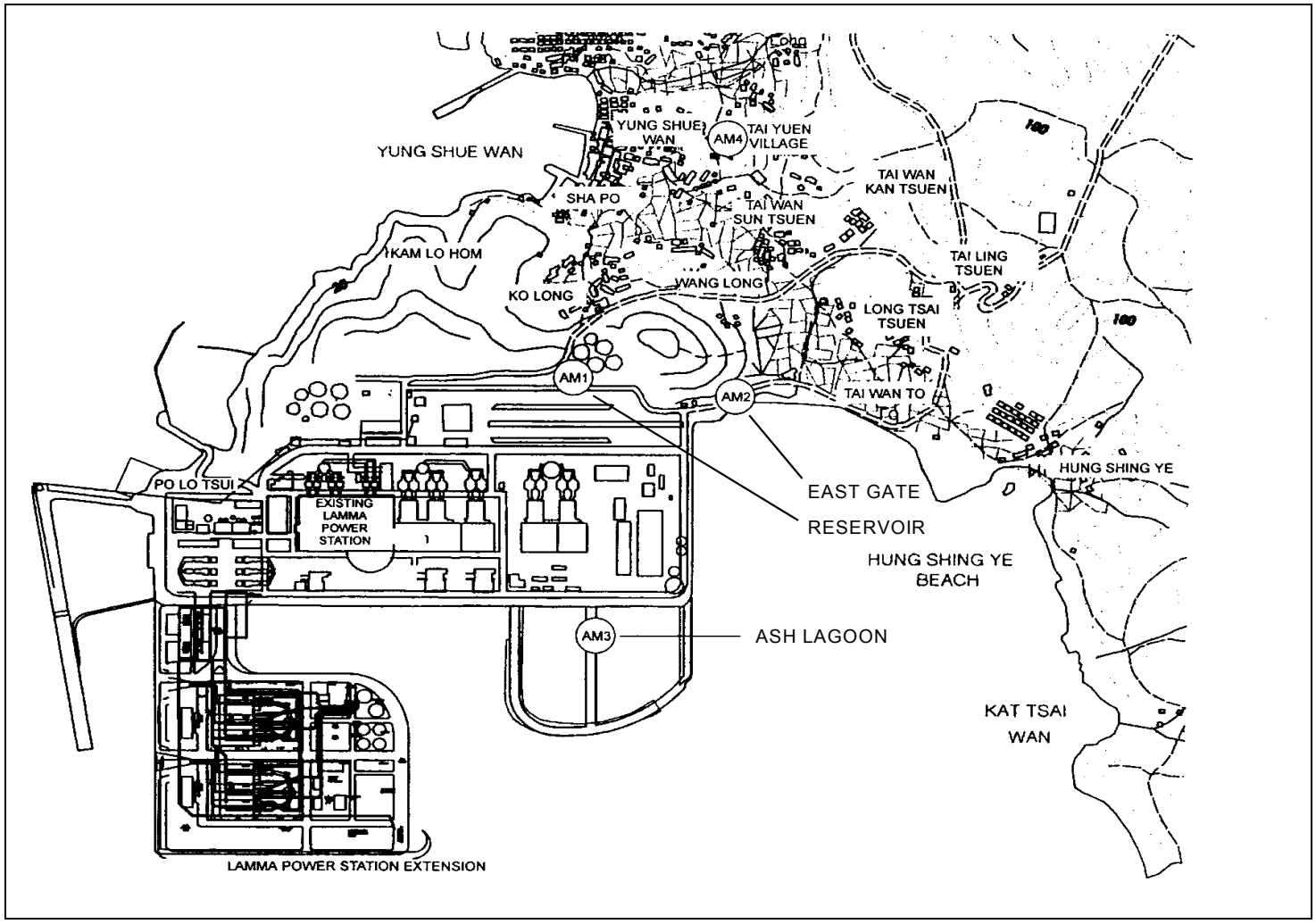


Figure 2.1 Location of Air Quality Monitoring Stations

3. NOISE

3.1 Monitoring Requirements

Continuous noise alarm monitoring at Ash Lagoon/Ching Lam were carried out to calculate the noise contributed by the construction activities at the two critical NSR's, viz. Long Tsai Tsuen/Hung Shing Ye and the school within the village of Tai Wan San Tsuen. The impact monitoring data for construction noise were checked against the limit levels specified in the EM&A Manual. With the availability of the construction noise permits, impact monitoring for the construction work during the restricted hours was also carried out. Section 3 presents the details of the construction noise permits.

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

3.2 Monitoring Locations

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

3.3 Monitoring Equipment

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

Table 3.1 Noise Monitoring Equipment

Equipment	Model
Sound level meters	B&K 2250
Sound level calibrator	B&K 4231

3.4 Monitoring Parameters, Frequency and Duration

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

Table 3.2 Noise Monitoring Duration and Parameter

Location	Time Period	Frequency	Parameter

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

3.5 Monitoring Procedures and Calibration Details

Monitoring Procedures

Continuous Noise Monitoring for Lamma Extension Construction

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

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

Equipment Calibration

The sound level meters and calibrators have been verified by the manufacturer or accredited laboratory. With the endorsement of the Independent Environmental Checker, the enhancement of calibration of sound level meter at the noise monitoring stations was implemented in October 2017. The monthly manual on-site calibration using sound level calibrator was replaced by the daily auto charge injection calibration function of the sound level meter. For additional quality assurance, manual on-site calibration would still be conducted for the noise monitoring stations once every 6 months.

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.

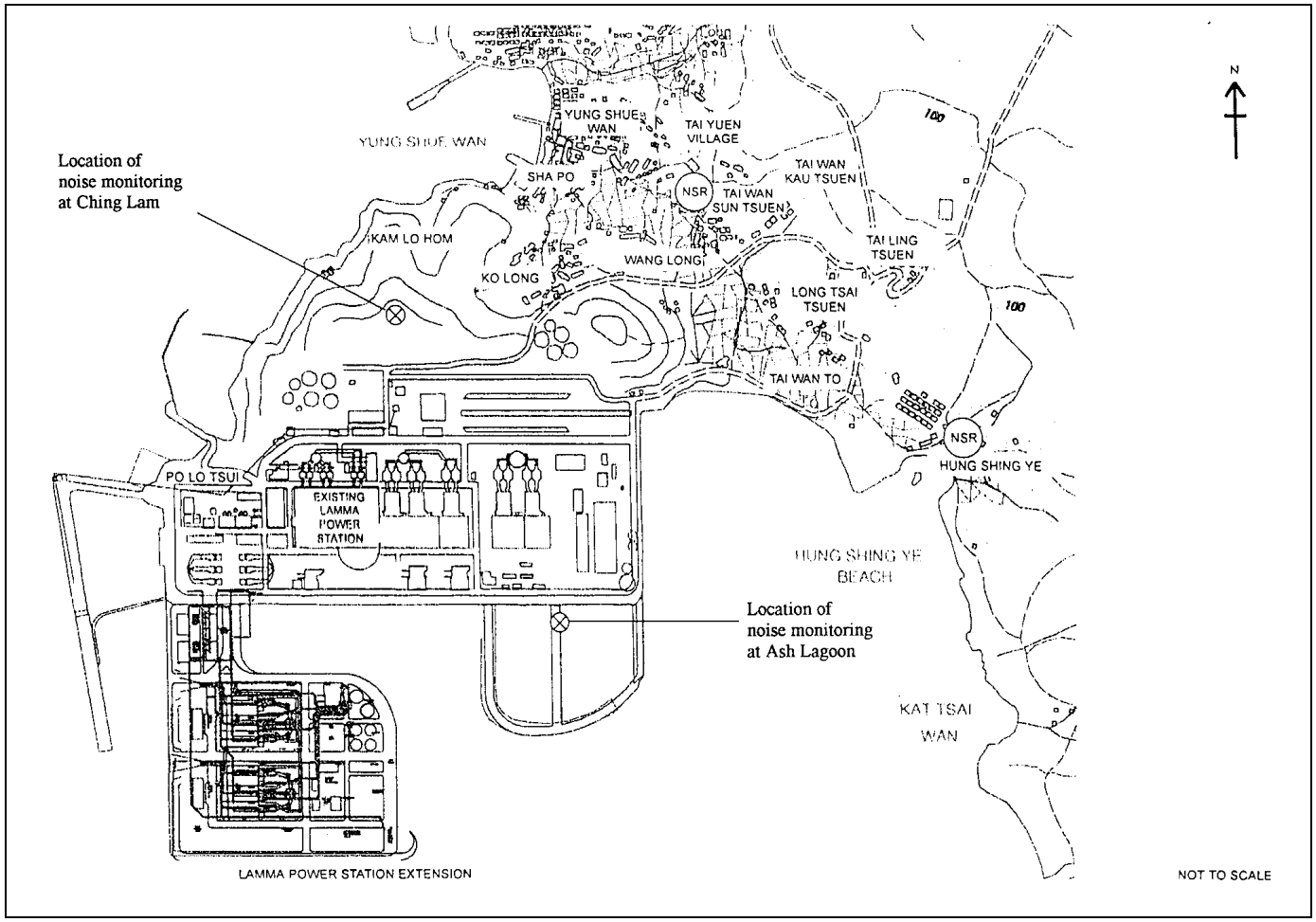


Figure 3.1 Location of Noise Monitoring Stations

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 and 3 respectively are summarized in Table 4.1.

Table 4.1 Summary of AL Level Exceedances on Monitoring Parameters

Item	Parameter Monitored	Monitoring Period	No. of Exceedances In		Event/Action Plan Implementation Status and Results
			Action Level	Limit Level	
Air					
1	Ambient TSP (24-hour)	01/10/17-31/10/17	0	0	
2	Ambient TSP (1-hour)	01/10/17-31/10/17	0	0	
Noise					
1	Noise level at the critical NSR's predicted by the noise alarm monitoring system	01/10/17-31/10/17	0	0	

4.3 Waste Management

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

Inert C&D material and non-inert C&D material disposed of in October 2017 are shown in Table 4.2.

Table 4.2 Estimated Amounts of Waste in October 2017

Total Inert C&D Waste Materials	Non-inert C&D Materials		
	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
3810.48 Tonnes	0 Tonnes	0 Tonnes	480 Litres

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.

Table 4.3 Summary of Environmental Licensing and Permit Status

Description	Permit No.	Valid Period		Highlights	Status
		From	To		
Varied Environmental Permit	EP-071/2000/C	18/05/05	-	The whole construction work site	Valid
Construction Noise Permit	GW-RS0537-17	26/06/17	25/12/17	Civil and Building Works for Unit L10. Operation of PME during restricted hours.	Valid
Construction Noise Permit	GW-RS0754-17	12/09/17	11/03/18	Foundation work for Unit L11. Operation of PME during restricted hours.	Valid
Construction Noise Permit	GW-RS0621-17	01/08/17	31/12/17	Power Block Facilities works for Unit L10. Operation of PME during restricted hours.	Valid
Construction Noise Permit	PP-RS0018-17	26/08/17	23/02/18	Percussive piling for foundation work of Unit L11.	Valid

Description	Permit No.	Valid Period		Highlights	Status
		From	To		
WPCO Discharge Licence*	WT00027040-2017	06/02/17	28/02/22	Foundation works for Unit L11	Valid
WPCO Discharge Licence#	WT00027316-2017	01/03/17	31/03/22	Civil and Building Works for Unit L10	Valid
Registration of Chemical Waste Producer	WPN5113-912-S3180-19	21/01/16	-	Foundation works for Unit L10	Valid
Registration of Chemical Waste Producer	WPN5213-912-P2781-22	22/02/16	-	Civil and Building Works for Unit L10	Valid
Registration of Chemical Waste Producer	WPN5113-912-S3180-20	11/01/17	-	Foundation works for Unit L11	Valid
Waste Disposal Billing Account	Account No.: 7026035	06/10/16	-	Civil and Building Works for Unit L10	Valid
Waste Disposal Billing Account	Account No.: 7026793	28/12/16	-	Foundation works for Unit L11	Valid
Waste Disposal Billing Account	Account No.: 7027632	20/04/17	-	E&M Erection of Power Block Facilities	Valid

Notes: * - Water quality monitoring was carried out in October 2017 and the result of which would be reported under a separate cover by the contractor.
- Water quality monitoring was carried out in August 2017 and the result of which had been 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 October 2017, no complaint against the construction activities was received.

Table 4.4 Environmental Complaints Received in October 2017

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

Table 4.5 Outstanding Environmental Complaints Carried Over

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

5. FUTURE KEY ISSUES

5.1 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

Unit L10 Civil and Building 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 treat wastewater in sedimentation pit and tanks before discharge and to ensure compliance in accordance with the WPCO discharge licence already obtained.

Unit L10 Mechanical Erection

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.

Unit L10 Electrical, Instrumentation & Control Erection

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.

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 and to ensure compliance in accordance with the WPCO discharge licence already obtained.

5.2 Monitoring Schedules for the Next 3 Months

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

5.3 Construction Program for the Next 3 Months

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

6. CONCLUSION

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

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

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

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

The environmental performance of the Project was generally satisfactory.

Appendix A Organization Chart

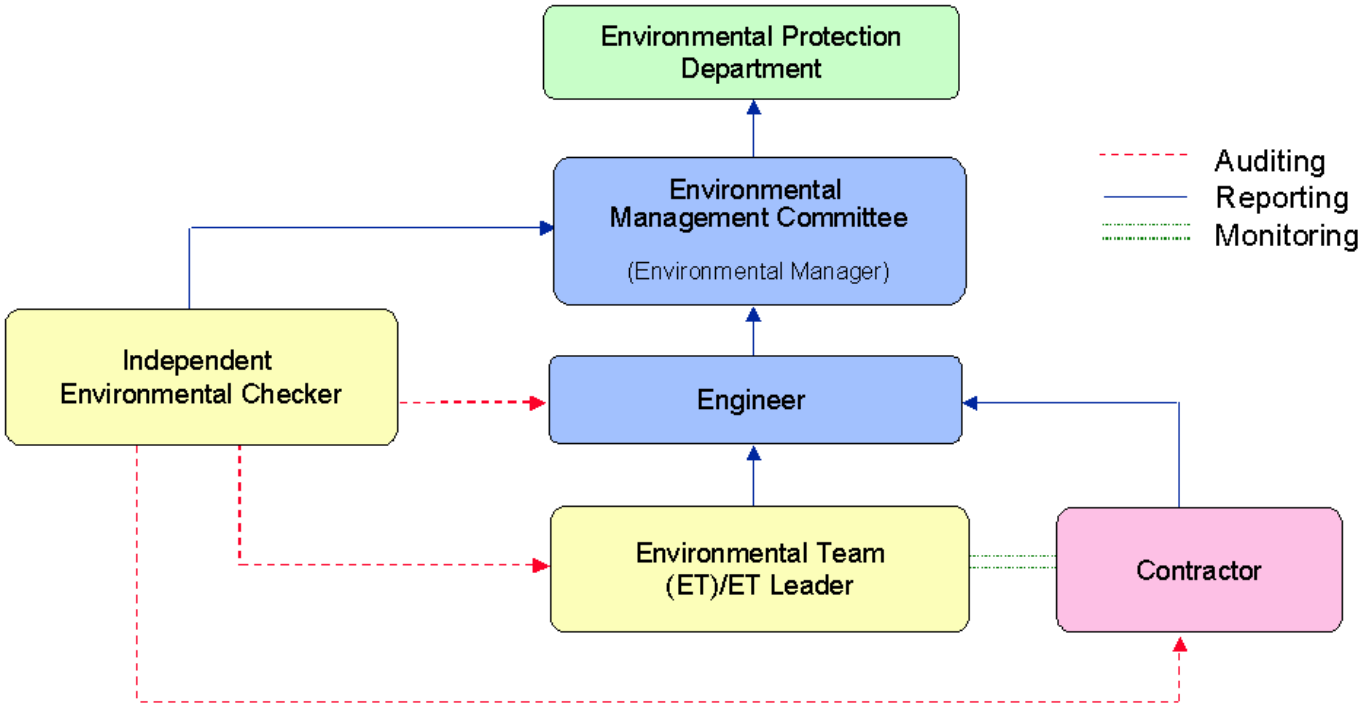


Figure A.1 Organisation of EM&A Programme at Construction Phase

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

B.1. Air

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

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

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

B.2. Noise

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

Parameters	Action	Limit
Noise Levels at the NSR's at Long Tsai Tsuen/Hung Shing Ye and school within the village of Tai Wan San Tsuen predicted by the noise alarm monitoring system	When one or more documented complaints are received	a. 75 dB(A) in $L_{Aeq,30\ min}$ (07:00-19:00 hrs on normal weekdays) (Note 1) b. subject to statutory control under the Noise Control Ordinance (07:00-23:00 hrs on holidays and 19:00-23:00 hrs on all other days). Set to 60 dB(A) in $L_{Aeq,5\ min}$ c. subject to statutory control under the Noise Control Ordinance (23:00-07:00 hrs of next day). Set to 45 dB(A) in $L_{Aeq,5\ min}$
Manual noise monitoring at the nearest Pak Kok Tsui residences to cable landing points N4 and N5		
Note: 1. For educational institution, the limit level shall be 70 dB(A), reduced to 65 dB(A) during examination periods.		

Appendix C Environmental Monitoring Schedule

Table C.1 Monitoring schedule for 24hr and 1hr TSP monitoring for Lamma Extension Construction (October 2017 to January 2018)

24hr TSP Monitoring	1hr TSP Monitoring
01/October/2017	01/October/2017 1500hr to 1800hr
07/October/2017	07/October/2017 1500hr to 1800hr
13/October/2017	13/October/2017 1500hr to 1800hr
19/October/2017	19/October/2017 1500hr to 1800hr
25/October/2017	25/October/2017 1500hr to 1800hr
31/October/2017	31/October/2017 1500hr to 1800hr
06/November/2017	06/November/2017 1500hr to 1800hr
12/November/2017	12/November/2017 1500hr to 1800hr
18/November/2017	18/November/2017 1500hr to 1800hr
24/November/2017	24/November/2017 1500hr to 1800hr
30/November/2017	30/November/2017 1500hr to 1800hr
06/December/2017	06/December/2017 1500hr to 1800hr
12/December/2017	12/December/2017 1500hr to 1800hr
18/December/2017	18/December/2017 1500hr to 1800hr
24/December/2017	24/December/2017 1500hr to 1800hr
30/December/2017	30/December/2017 1500hr to 1800hr
05/January/2018	05/January/2018 1500hr to 1800hr
11/January/2018	11/January/2018 1500hr to 1800hr
17/January/2018	17/January/2018 1500hr to 1800hr
23/January/2018	23/January/2018 1500hr to 1800hr
29/January/2018	29/January/2018 1500hr to 1800hr

APPENDIX D AIR QUALITY MONITORING RESULTS

Site: Lamma Power Station Extension

Month: October 2017

24 hour TSP Measurement:-

Date	TSP concentration (μg/m^3)				Weather Information (From Hong Kong Observatory)		
	Reservoir (AM1)	East Gate (AM2)	Ash Lagoon (AM3)	Tai Yuen Village (AM4)	Mean Wind Speed (km/hr)	Prevailing Wind Dir. (°)	Mean R.H. (%)
1/10/2017	12	29	27	35	28.5	90	86
7/10/2017	40	39	17	65	39.7	70	74
13/10/2017	37 (17/10)*	69	56	63	34.8	360	64
19/10/2017	58	75	43	22	33.5	350	71
25/10/2017	66	63	60	71	32.3	70	69
31/10/2017	103	92	94	89	31.2	70	61

Note:

* - TSP monitoring at AM1 (Reservoir) was suspended on 13/10/2017 due to the breakdown of the High Volume Air Sampler. Make-up 24-hr TSP sampling at AM1 was conducted on 17/10/2017.

1 hour TSP Measurement:-

Date	Time	TSP concentration (μg/m^3)		
		Reservoir (AM1)	East Gate (AM2)	Ash Lagoon (AM3)
1/10/2017	15:00 - 15:59	35	27	30
	16:00 - 16:59	19	23	23
	17:00 - 17:59	28	22	21
7/10/2017	15:00 - 15:59	65	54	67 (9/10)*
	16:00 - 16:59	49	38	51 (9/10)*
	17:00 - 17:59	47	37	43 (9/10)*
13/10/2017	15:00 - 15:59	39	57	45
	16:00 - 16:59	33	70	68
	17:00 - 17:59	66	82	76
19/10/2017	15:00 - 15:59	73	71	78
	16:00 - 16:59	48	72	64
	17:00 - 17:59	49	65	51
25/10/2017	15:00 - 15:59	54	54	56
	16:00 - 16:59	55	55	55
	17:00 - 17:59	55	55	54
31/10/2017	15:00 - 15:59	108	92	93
	16:00 - 16:59	108	90	87
	17:00 - 17:59	99	88	82

Note:

* - TSP monitoring at AM3 (Ash Lagoon) was suspended on 07/10/2017 due to the breakdown of the

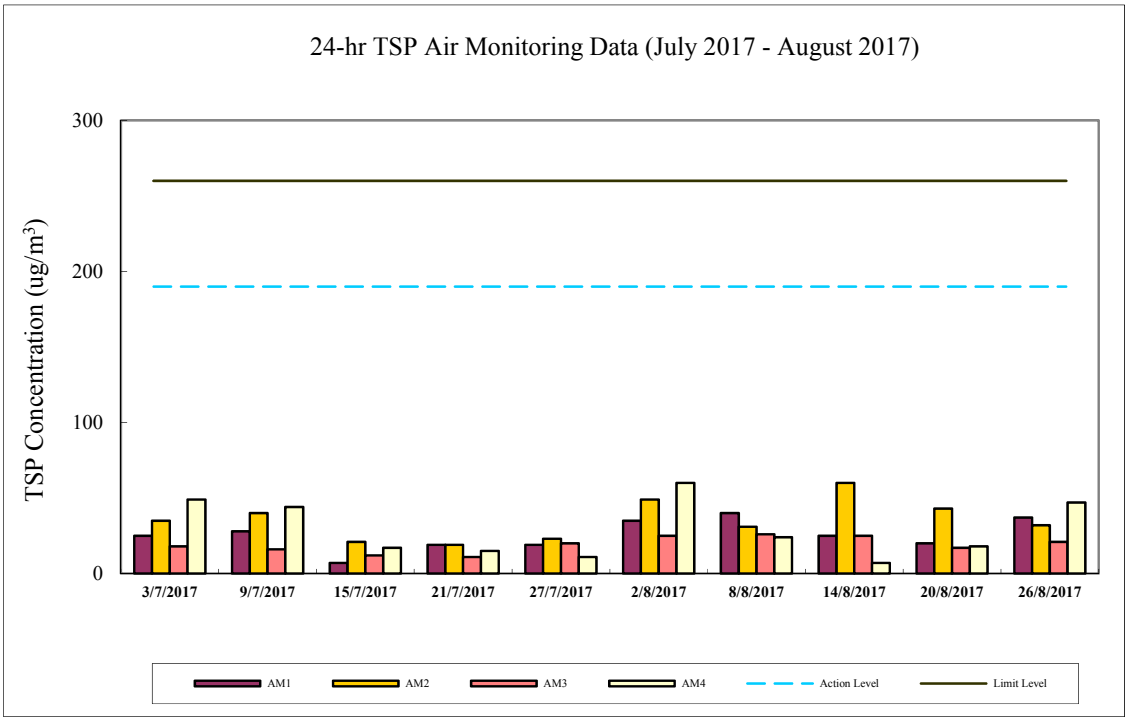
TEOM TSP sampler. Make-up 1-hr TSP sampling at AM3 was conducted on 09/10/2017.

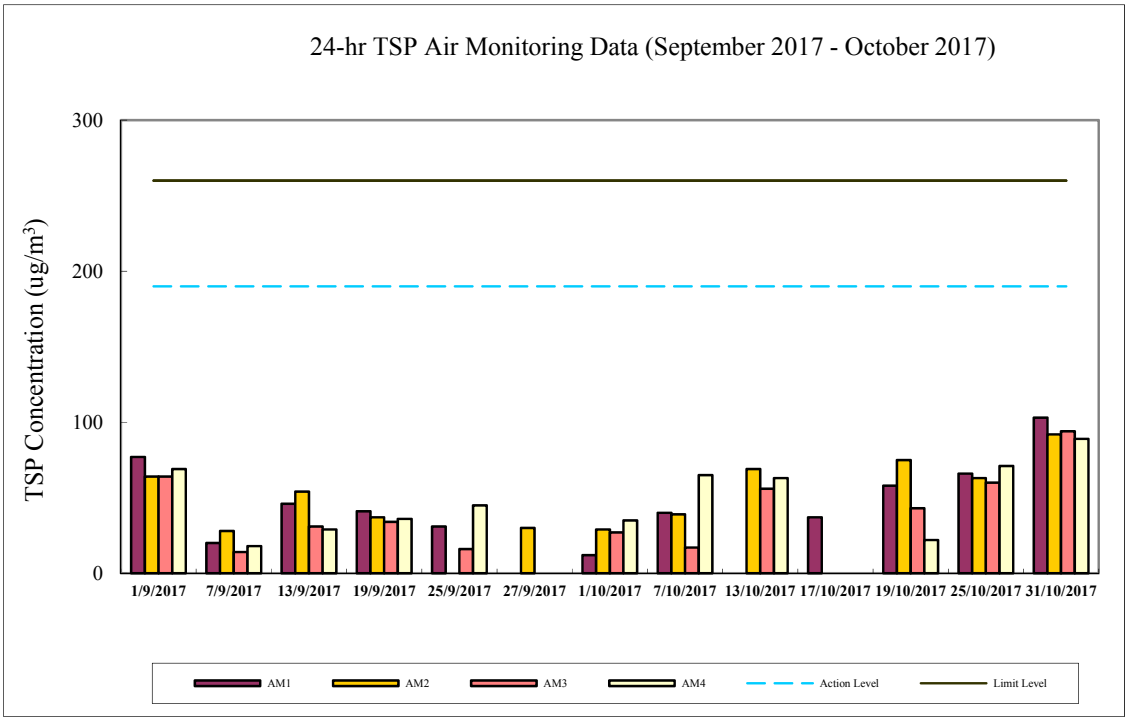
	1-hr TSP ($\mu g/m^3$)	24-hr TSP ($\mu g/m^3$)
Action Level	340	190
Limit Level	500	260

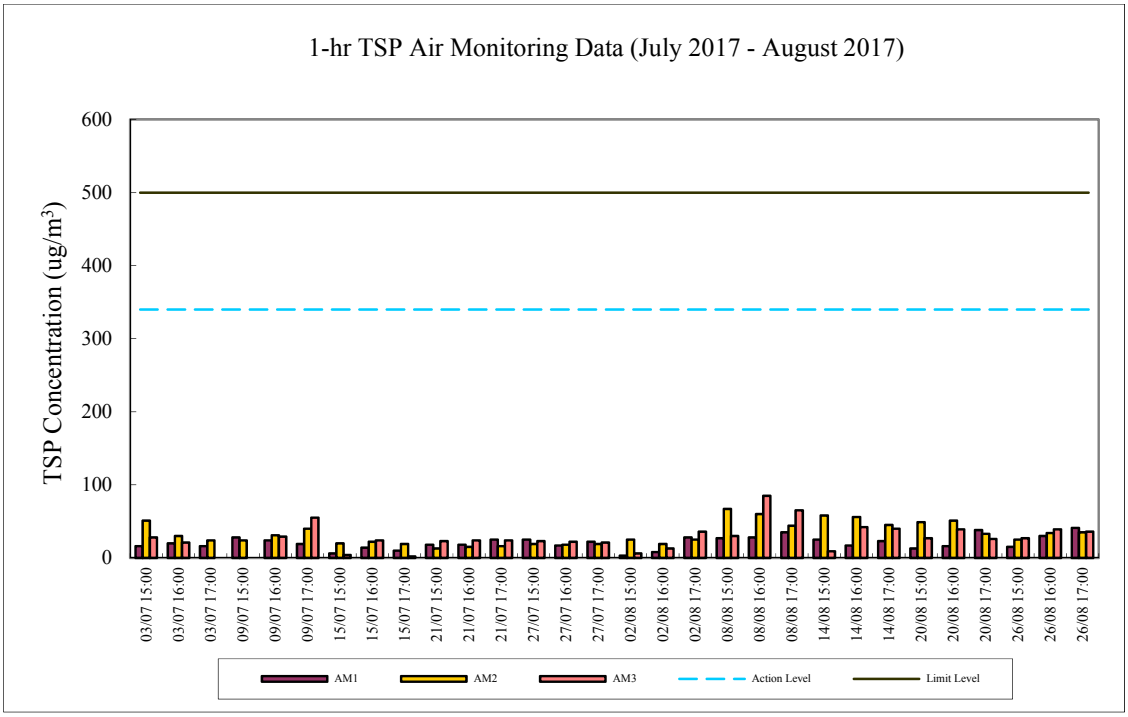
Calibration: Calibration details are shown in appendix F.

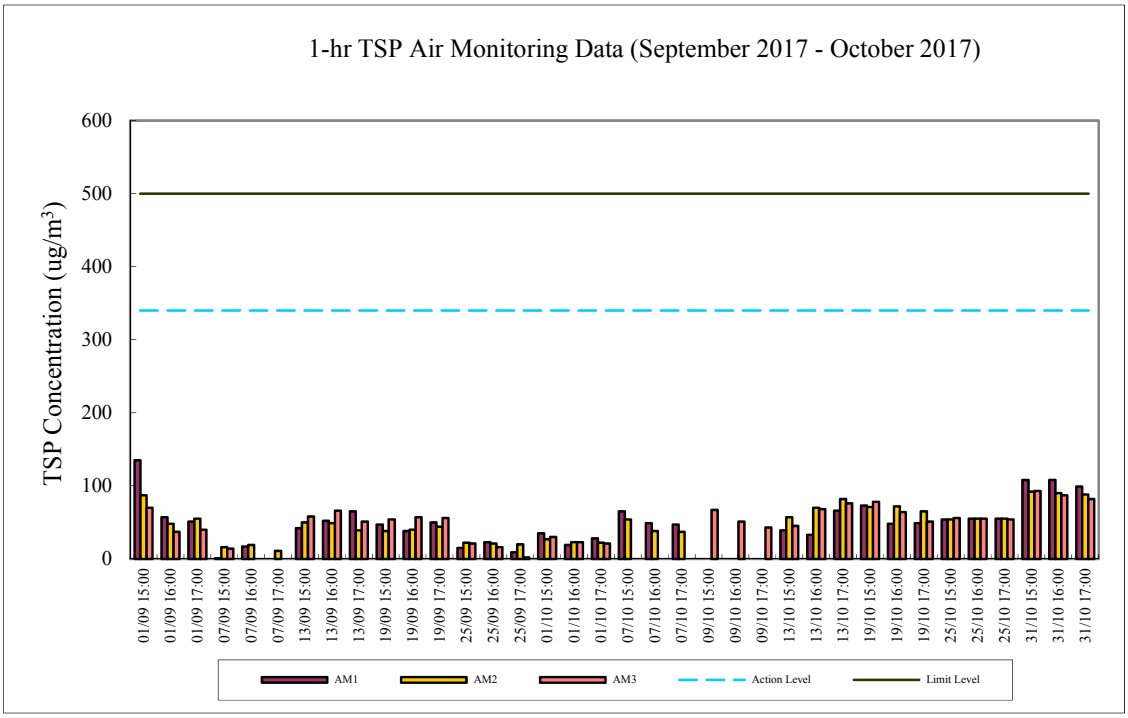
Equipment used:

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


24-hr TSP Air Monitoring Data (July 2017 - August 2017)
TSP Concentration (ug/m3)
300
200
100
0
3/7/2017
9/7/2017
15/7/2017
21/7/2017
27/7/2017
2/8/2017
8/8/2017
14/8/2017
20/8/2017
26/8/2017
AM1
AM2
AM3
AM4
Action Level
Limit Level


24-hr TSP Air Monitoring Data (September 2017 - October 2017)
TSP Concentration (ug/m3)
300
200
100
0
1/9/2017
7/9/2017
13/9/2017
19/9/2017
25/9/2017
27/9/2017
1/10/2017
7/10/2017
13/10/2017
17/10/2017
19/10/2017
25/10/2017
31/10/2017
AM1
AM2
AM3
AM4
Action Level
Limit Level


1-hr TSP Air Monitoring Data (July 2017 - August 2017)
TSP Concentration (ug/m3)
600
500
400
300
200
100
0
03/07 15:00
03/07 16:00
03/07 17:00
09/07 15:00
09/07 16:00
09/07 17:00
15/07 15:00
15/07 16:00
15/07 17:00
21/07 15:00
21/07 16:00
21/07 17:00
27/07 15:00
27/07 16:00
27/07 17:00
02/08 15:00
02/08 16:00
02/08 17:00
08/08 15:00
08/08 16:00
08/08 17:00
14/08 15:00
14/08 16:00
14/08 17:00
20/08 15:00
20/08 16:00
20/08 17:00
26/08 15:00
26/08 16:00
26/08 17:00
AM1
AM2
AM3
Action Level
Limit Level


1-hr TSP Air Monitoring Data (September 2017 - October 2017)
TSP Concentration (ug/m3)
600
500
400
300
200
100
0
01/09 15:00
01/09 16:00
01/09 17:00
07/09 15:00
07/09 16:00
07/09 17:00
13/09 15:00
13/09 16:00
13/09 17:00
19/09 15:00
19/09 16:00
19/09 17:00
25/09 15:00
25/09 16:00
25/09 17:00
01/10 15:00
01/10 16:00
01/10 17:00
07/10 15:00
07/10 16:00
07/10 17:00
09/10 15:00
09/10 16:00
09/10 17:00
13/10 15:00
13/10 16:00
13/10 17:00
19/10 15:00
19/10 16:00
19/10 17:00
25/10 15:00
25/10 16:00
25/10 17:00
31/10 15:00
31/10 16:00
31/10 17:00
AM1
AM2
AM3
Action Level
Limit Level

Appendix E Continuous Noise Monitoring Results for October 2017

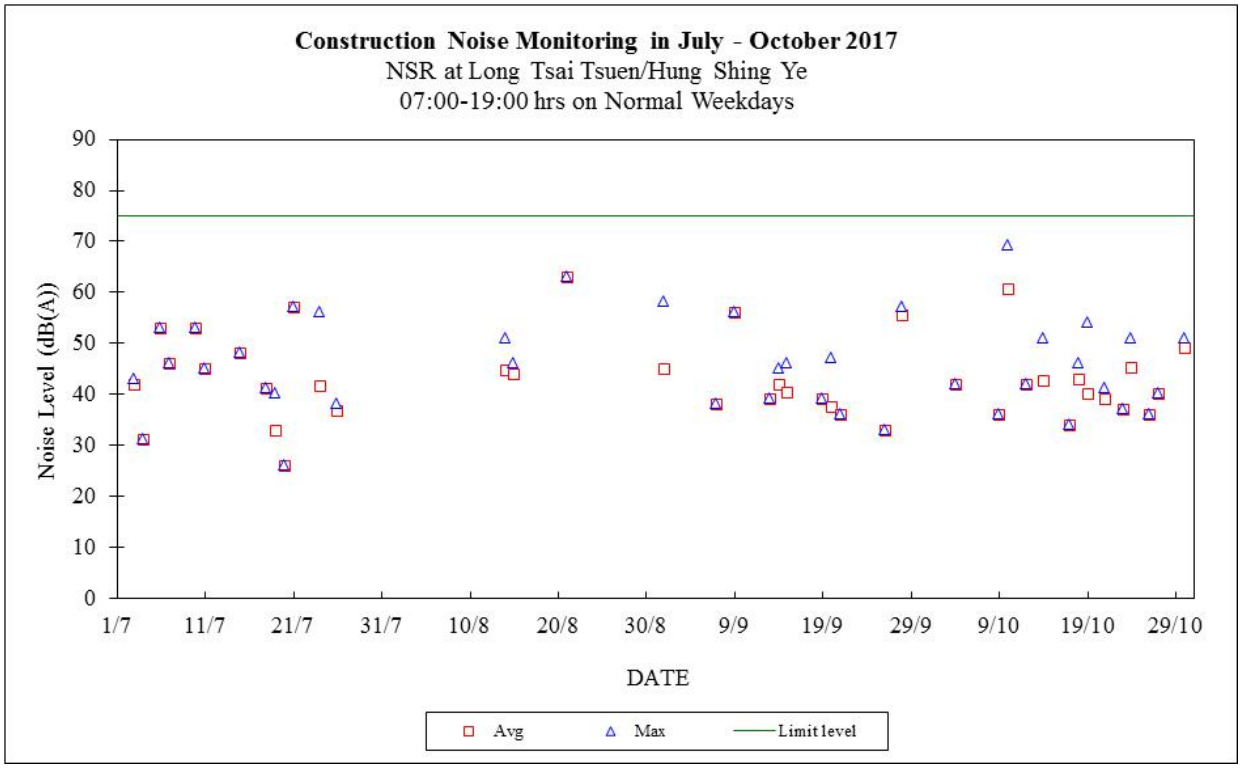
Site: Lamma Power Station Extension Construction
Measurement Location: Ash Lagoon and Ching Lam
Measurement Parameter: 30-min Leq (07:00-19:00 hrs on normal weekdays)
5-min Leq (07:00-23:00 hrs on holidays and 19:00-23:00 hrs on all other days, and 23:00-07:00 hrs of next day)
Noise Equipment: B&K 2250 sound level meters
Laboratory Calibration Date of Noise Equipment:
19/08/2016 (Ash Lagoon) and 09/11/2015 (Ching Lam)

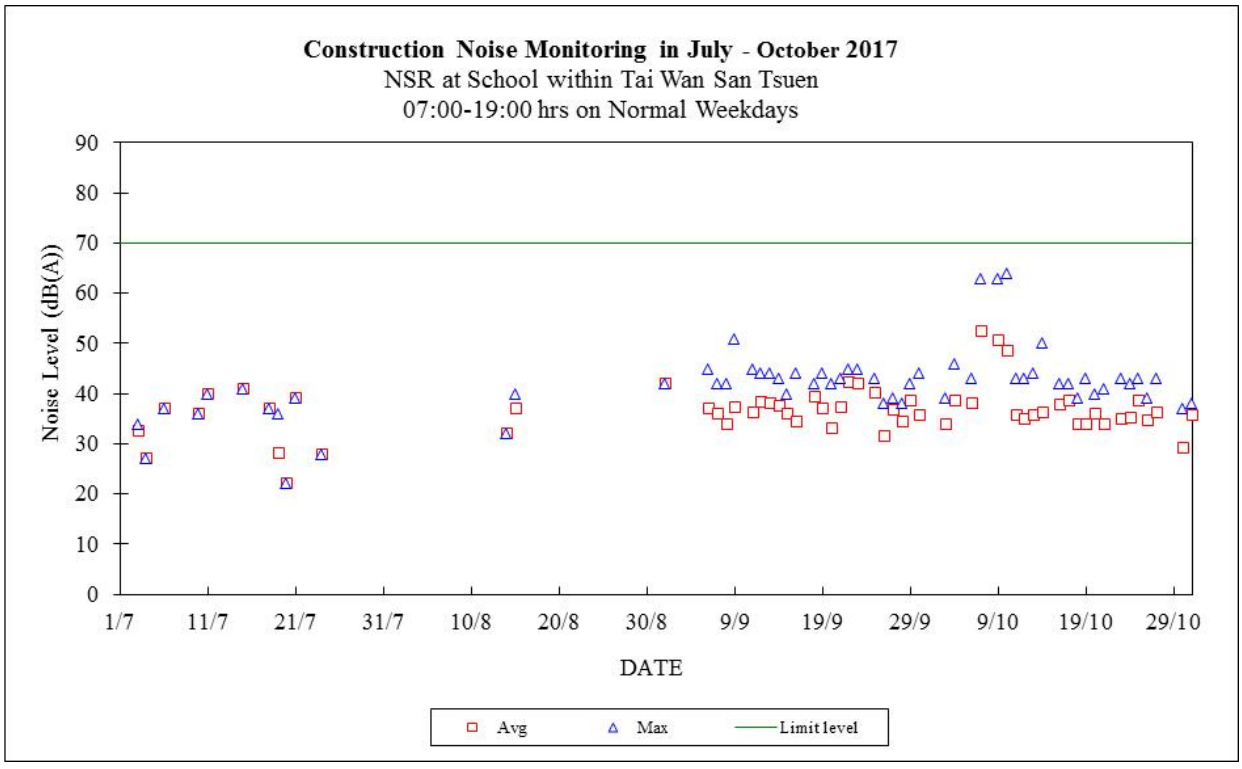
Date	Time	Calculated Noise Level at NSR at Long Tsai Tsuen/Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))	Calculated Noise Level at NSR at the school within Tai Wan San Tsuen (dB(A))		Limit Noise Level (dB(A))
		Max	Avg		Max	Avg	
01/10/2017	07:00-23:00	40	31	60	46	39	60
01/10/2017	23:00-07:00	---	---	45	44	38	45
02/10/2017	07:00-23:00	40	39	60	44	36	60
02/10/2017	23:00-07:00	37	37	45	41	36	45
03/10/2017	07:00-19:00	---	---	75	39	34	70
03/10/2017	19:00-23:00	---	---	60	42	38	60
03/10/2017	23:00-07:00	44	41	45	40	34	45
04/10/2017	07:00-19:00	42	42	75	46	39	70
04/10/2017	19:00-23:00	---	---	60	47	40	60
04/10/2017	23:00-07:00	40	31	45	45	36	45
05/10/2017	07:00-23:00	42	33	60	48	37	60
05/10/2017	23:00-07:00	---	---	45	42	38	45
06/10/2017	07:00-19:00	---	---	75	43	38	70
06/10/2017	19:00-23:00	---	---	60	60	42	60
06/10/2017	23:00-07:00	34	34	45	44	38	45
07/10/2017	07:00-19:00	---	---	75	63	53	70
07/10/2017	19:00-23:00	41	39	60	60	53	60
07/10/2017	23:00-07:00	24	24	45	45	34	45
08/10/2017	07:00-23:00	60	39	60	60	46	60
08/10/2017	23:00-07:00	43	37	45	45	36	45
09/10/2017	07:00-19:00	36	36	75	63	51	70
09/10/2017	19:00-23:00	45	39	60	60	36	60
09/10/2017	23:00-07:00	44	36	45	45	35	45
10/10/2017	07:00-19:00	69	61	75	64	49	70
10/10/2017	19:00-23:00	28	28	60	41	37	60
10/10/2017	23:00-07:00	38	32	45	42	34	45
11/10/2017	07:00-19:00	---	---	75	43	36	70
11/10/2017	19:00-23:00	---	---	60	48	39	60
11/10/2017	23:00-07:00	26	26	45	39	34	45
12/10/2017	07:00-19:00	42	42	75	43	35	70
12/10/2017	19:00-23:00	---	---	60	40	34	60

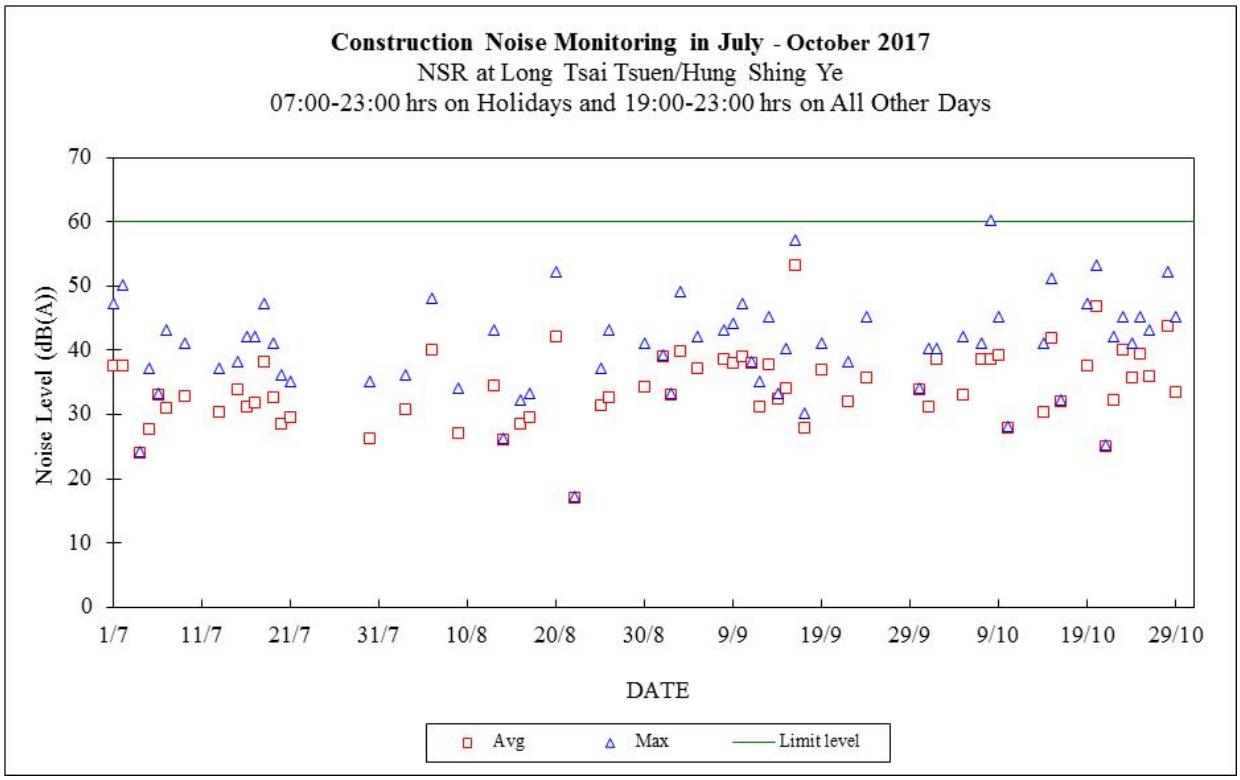
12/10/2017	23:00-07:00	43	37	45	37	33	45
13/10/2017	07:00-19:00	---	---	75	44	36	70
13/10/2017	19:00-23:00	---	---	60	39	33	60
13/10/2017	23:00-07:00	39	30	45	41	35	45
14/10/2017	07:00-19:00	51	43	75	50	36	70
14/10/2017	19:00-23:00	41	30	60	49	34	60
14/10/2017	23:00-07:00	45	36	45	44	33	45
15/10/2017	07:00-23:00	51	42	60	46	37	60
15/10/2017	23:00-07:00	41	37	45	43	34	45
16/10/2017	07:00-19:00	---	---	75	42	38	70
16/10/2017	19:00-23:00	32	32	60	46	36	60
16/10/2017	23:00-07:00	45	38	45	41	36	45
17/10/2017	07:00-19:00	34	34	75	42	39	70
17/10/2017	19:00-23:00	---	---	60	49	36	60
17/10/2017	23:00-07:00	45	42	45	44	37	45
18/10/2017	07:00-19:00	46	43	75	39	34	70
18/10/2017	19:00-23:00	---	---	60	52	35	60
18/10/2017	23:00-07:00	---	---	45	40	34	45
19/10/2017	07:00-19:00	54	40	75	43	34	70
19/10/2017	19:00-23:00	47	38	60	38	31	60
19/10/2017	23:00-07:00	45	40	45	40	36	45
20/10/2017	07:00-19:00	---	---	75	40	36	70
20/10/2017	19:00-23:00	53	47	60	33	29	60
20/10/2017	23:00-07:00	45	38	45	39	33	45
21/10/2017	07:00-19:00	41	39	75	41	34	70
21/10/2017	19:00-23:00	25	25	60	43	35	60
21/10/2017	23:00-07:00	45	37	45	39	32	45
22/10/2017	07:00-23:00	42	32	60	45	36	60
22/10/2017	23:00-07:00	44	37	45	37	31	45
23/10/2017	07:00-19:00	37	37	75	43	35	70
23/10/2017	19:00-23:00	45	40	60	43	37	60
23/10/2017	23:00-07:00	45	39	45	43	34	45
24/10/2017	07:00-19:00	51	45	75	42	35	70
24/10/2017	19:00-23:00	41	36	60	43	35	60
24/10/2017	23:00-07:00	44	38	45	45	34	45
25/10/2017	07:00-19:00	---	---	75	43	39	70
25/10/2017	19:00-23:00	45	39	60	48	35	60
25/10/2017	23:00-07:00	44	38	45	43	34	45
26/10/2017	07:00-19:00	36	36	75	39	35	70
26/10/2017	19:00-23:00	43	36	60	42	37	60
26/10/2017	23:00-07:00	45	37	45	40	32	45
27/10/2017	07:00-19:00	40	40	75	43	36	70
27/10/2017	19:00-23:00	---	---	60	44	35	60
27/10/2017	23:00-07:00	35	34	45	45	33	45
28/10/2017	07:00-23:00	52	44	60	58	35	60
28/10/2017	23:00-07:00	38	32	45	38	28	45
29/10/2017	07:00-23:00	45	34	60	41	33	60
29/10/2017	23:00-07:00	45	41	45	37	30	45
30/10/2017	07:00-19:00	51	49	75	37	29	70
30/10/2017	19:00-23:00	---	---	60	44	37	60
30/10/2017	23:00-07:00	45	40	45	34	29	45
31/10/2017	07:00-19:00	---	---	75	38	36	70
31/10/2017	19:00-23:00	41	36	60	37	36	60
31/10/2017	23:00-07:00	45	42	45	44	34	45

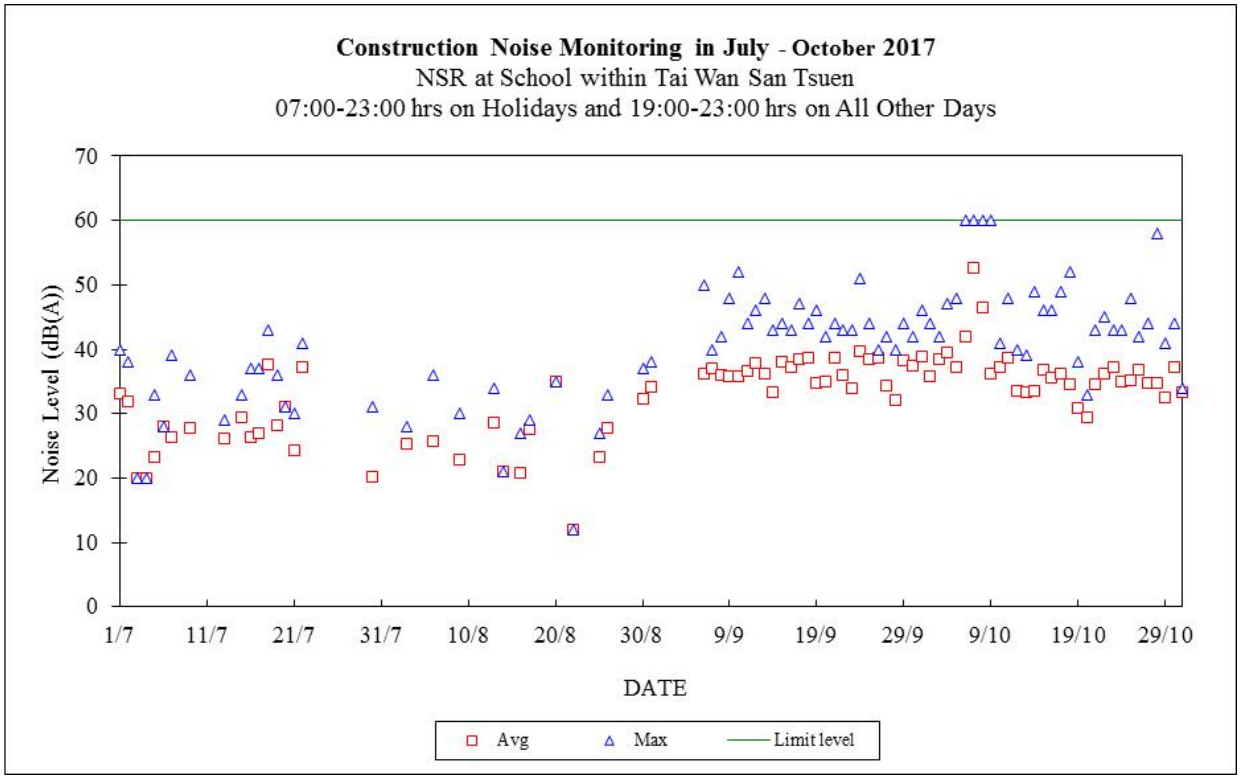
Note:

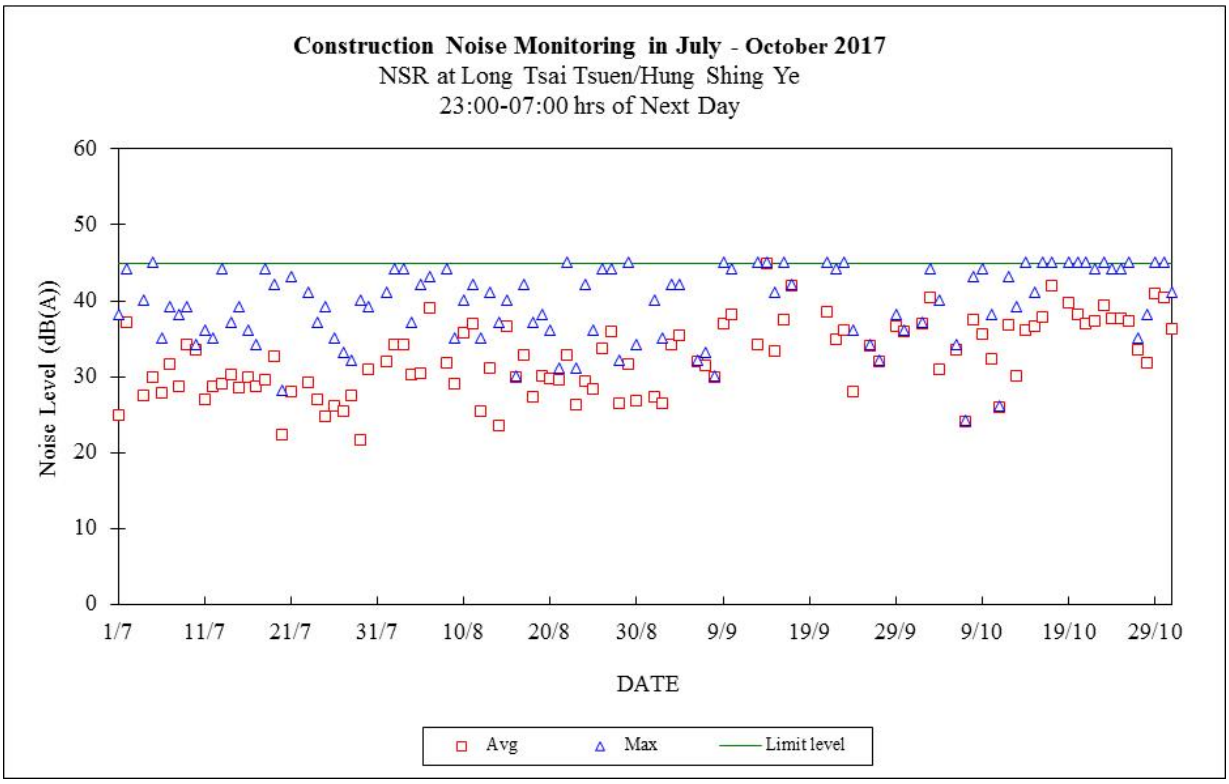
a. “---“ represents the measured noise monitoring data lower than the established notional background level/discarded under strong wind.
b. Continuous noise monitoring was carried out at holidays & evening-time (07:00-23:00 hrs on holidays and 19:00-23:00 hrs on all other days) and night-time (23:00-07:00 hrs of next day) under construction noise permit.

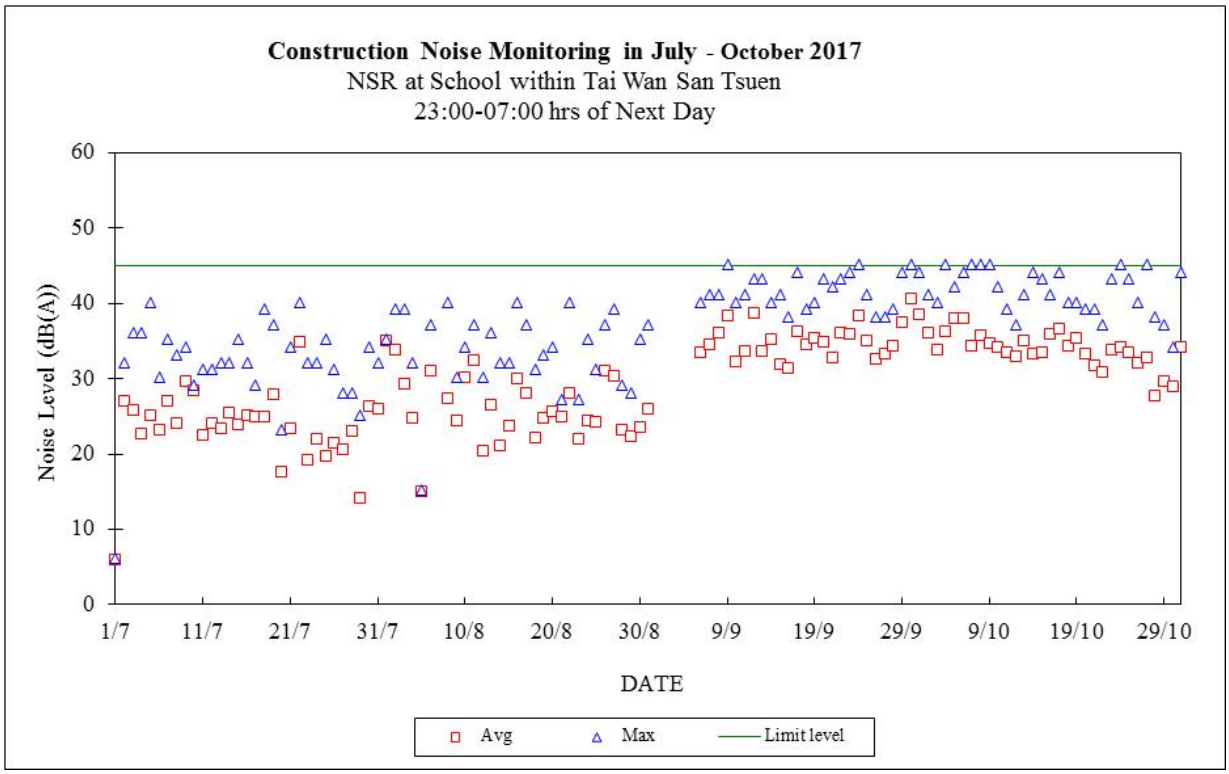

Construction Noise Monitoring in July - October 2017
NSR at Long Tsai Tsuen/Hung Shing Ye
07:00-19:00 hrs on Normal Weekdays
Noise Level (dB(A))
90
80
70
60
50
40
30
20
10
0
1/7
11/7
21/7
31/7
10/8
20/8
30/8
9/9
19/9
29/9
9/10
19/10
29/10
DATE
Avg
Max
Limit level


Construction Noise Monitoring in July - October 2017
NSR at School within Tai Wan San Tsuen
07:00-19:00 hrs on Normal Weekdays
Noise Level (dB(A))
90
80
70
60
50
40
30
20
10
0
1/7
11/7
21/7
31/7
10/8
20/8
30/8
9/9
19/9
29/9
9/10
19/10
29/10
DATE
Avg
Max
Limit level


Construction Noise Monitoring in July - October 2017
NSR at Long Tsai Tsuen/Hung Shing Ye
07:00-23:00 hrs on Holidays and 19:00-23:00 hrs on All Other Days
Noise Level (dB(A))
70
60
50
40
30
20
10
0
1/7
11/7
21/7
31/7
10/8
20/8
30/8
9/9
19/9
29/9
9/10
19/10
29/10
DATE
Avg
Max
Limit level


Construction Noise Monitoring in July - October 2017
NSR at School within Tai Wan San Tsuen
07:00-23:00 hrs on Holidays and 19:00-23:00 hrs on All Other Days
Noise Level (dB(A))
70
60
50
40
30
20
10
0
1/7
11/7
21/7
31/7
10/8
20/8
30/8
9/9
19/9
29/9
9/10
19/10
29/10
DATE
Avg
Max
Limit level


Construction Noise Monitoring in July - October 2017
NSR at Long Tsai Tsuen/Hung Shing Ye
23:00-07:00 hrs of Next Day
Noise Level (dB(A))
60
50
40
30
20
10
0
1/7
11/7
21/7
31/7
10/8
20/8
30/8
9/9
19/9
29/9
9/10
19/10
29/10
DATE
Avg
Max
Limit level


Construction Noise Monitoring in July - October 2017
NSR at School within Tai Wan San Tsuen
23:00-07:00 hrs of Next Day
Noise Level (dB(A))
60
50
40
30
20
10
0
1/7
11/7
21/7
31/7
10/8
20/8
30/8
9/9
19/9
29/9
9/10
19/10
29/10
DATE
Avg
Max
Limit level

Appendix F

The QA/QC Procedures and Results

The Hongkong Electric Co., Ltd.
Lamma Power Station Extension
TEOM Continuous Dust Monitor
Data Quality Assurance Log Sheet

Month: October Year: 2017

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)
01/10/2017	266.764	4	2.97	13.52
07/10/2017	266.425	4	2.96	13.47
13/10/2017	272.347	4	2.95	13.43
19/10/2017	271.954	4	2.99	13.61
25/10/2017	271.180	4	3.03	13.79
31/10/2017	270.195	4	3.03	13.80

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)
01/10/2017	254.475	4	2.96	13.49
07/10/2017	254.123	4	2.95	13.44
13/10/2017	260.007	4	2.94	13.38
19/10/2017	259.524	4	2.98	13.58
25/10/2017	258.677	4	3.02	13.76
31/10/2017	257.662	4	3.03	13.80

Ash Lagoon (AM3)				
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)
01/10/2017	265.132	4	2.94	13.36
07/10/2017	266.003 (09/10)*	4 (09/10)*	2.92 (09/10)*	13.30 (09/10)*
13/10/2017	265.667	4	2.93	13.33
19/10/2017	265.306	4	2.97	13.51
25/10/2017	264.560	4	3.00	13.65
31/10/2017	263.596	4	3.01	13.73

* - TSP monitoring at AM3 (Ash Lagoon) was suspended on 07/10/2017 due to the breakdown of the TEOM TSP Sampler Sampler. Make-up 1-hr TSP sampling at AM3 was conducted on 09/10/2017.

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

Remarks:

N/A

Prepared by: HY Chan Checked by: KF Chan

The Hongkong Electric Co., Ltd.
High Volume Air Sampler Site Visit Log Sheet

Attendance Log Site Name: Reservoir (AM1)

Date/Time	Staff Name
17/10/2017 / 10:30	WM Tam / WH Man

Equipment / Item

Equipment / Item	Serial No. / No.
HVAS	0131
Used filter paper no.	MI65
New filter paper no.	MI67

Type of filter: Glass-fibre

I. Ambient Conditions

Temperature, Ta: 301.3 K Pressure, Pa: 1006.6 mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions Corresponds to Q_{STD} = 40 cubic ft/min. (inch H_2O)
1534(10/2016)	H_a= 18.32(T_a/P_a)= 5.48

Manometer reading before calibration: 5.90
Adjustment of flow controller (Y/N): Yes
Manometer reading after calibration: 5.50

Note: Tolerance Limit of HVAS flow: ±1.0 cubic ft/min. Corresponding limits for manometer : ±0.2 inch H_2O

III. General Conditions of HVAS
Good.

IV. Remarks
N/A.

Conducted by: WM Tam / WH Man Checked by: SM Hon

The Hongkong Electric Co., Ltd.
High Volume Air Sampler Site Visit Log Sheet

Attendance Log Site Name: East Gate (AM2)

Date/Time	Staff Name
17/10/2017 / 11:15	WM Tam / WH Man

Equipment / Item

Equipment / Item	Serial No. / No.
HVAS	0132
Used filter paper no.	MI66
New filter paper no.	MI68

Type of filter: Glass-fibre

I. Ambient Conditions

Temperature, Ta: 302.9 K Pressure, Pa: 1010.6 mb

II. Correction of manometer reading

Calibration orifice No.	Manometer reading at site conditions Corresponds to Q_{STD} = 40 cubic ft/min. (inch H_2O)
1534(10/2016)	H_a= 18.32(T_a/P_a)= 5.49

Manometer reading before calibration: 5.50
Adjustment of flow controller (Y/N): No
Manometer reading after calibration: N/A

Note: Tolerance Limit of HVAS flow: ±1.0 cubic ft/min. Corresponding limits for manometer : ±0.2 inch H_2O

III. General Conditions of HVAS
Good.

IV. Remarks
N/A.

Conducted by: WM Tam / WH Man Checked by: SM Hon

The Hongkong Electric Co., Ltd.
Mini Volume Air Sampler Site Visit Log Sheet

Attendance Log

Site Name: Tai Yuen Village (AM4)

Date/Time	Staff Name
18/10/2017 / 15:30	HT Pang / WH Man

Equipment / Item

Equipment / Item	Serial No. / No.
MINIVOL	5580
Used filter paper no.	MP14
New filter paper no.	MP15

Type of filter: Glass-fibre

I. Calibration is performed by using Drycal DC-2 Flow Calibrator
5 std. L/min set point is recommended

Before: 5.30
After: 5.03

II. General Services

1. Clean Rotameter: Yes
2. Clean / Replace Pump Valves: No
3. Clean / Replace Pump Diaphragms: No
4. Clean Impaction Inlet: Yes
5. Replace Timer Battery Every 6 months: No
6. Replace Inlet Filter: Yes

Remarks

N/A

Conducted by: HT Pang / WH Man

Checked by: SM Hon

The Hongkong Electric Co., Ltd.
Lamma Power Station Extension
Noise Monitoring Stations
Daily Calibration Records

Date	Location: Ash Lagoon		Location: Ching Lam	
	Calibration Results	Deviation from Reference (dB)	Calibration Results	Deviation from Reference (dB)
01/10/2017	Passed	0.10	Passed	0.03
02/10/2017	Passed	0.09	Passed	0.02
03/10/2017	Passed	0.09	Passed	0.02
04/10/2017	Passed	0.12	Passed	0.02
05/10/2017	Passed	0.08	Passed	-0.01
06/10/2017	Passed	0.08	Passed	0.06
07/10/2017	Passed	0.07	---	---
08/10/2017	Passed	0.09	Passed	0.02
09/10/2017	Passed	0.08	---	---
10/10/2017	Passed	0.08	Passed	0.02
11/10/2017	Passed	0.09	Passed	0.04
12/10/2017	Passed	0.11	Passed	0.05
13/10/2017	Passed	0.08	Passed	0.02
14/10/2017	Passed	0.05	Passed	0.03
15/10/2017	Passed	0.07	---	---
16/10/2017	Passed	0.11	Passed	-0.01
17/10/2017	Passed	0.07	Passed	-0.01
18/10/2017	Passed	0.10	Passed	0.00
19/10/2017	Passed	0.06	Passed	0.00
20/10/2017	Passed	0.04	Passed	-0.01
21/10/2017	Passed	0.06	Passed	-0.02
22/10/2017	Passed	0.06	Passed	-0.02
23/10/2017	Passed	0.06	Passed	0.04
24/10/2017	Passed	0.07	Passed	0.02
25/10/2017	Passed	0.05	Passed	0.01
26/10/2017	Passed	0.06	Passed	0.02
27/10/2017	Passed	0.06	Passed	0.00
28/10/2017	Passed	0.07	Passed	0.01
29/10/2017	Passed	0.06	Passed	-0.01
30/10/2017	Passed	0.06	---	---
31/10/2017	Passed	0.06	Passed	-0.01

Remarks:

1. The B&K sound level meter at the noise monitoring station has an advanced feature of internal calibration checking (viz. Charge Injection Calibration (CIC)). CIC is a B&K patented method for in situ verification of the integrity of the entire sound measurement chain (including microphone, preamplifier and cabling).
2. The acceptance criterion of deviation from reference is ± 0.5 dB.
3. "--" denote that CIC calibration had not performed.

Appendix G Event/Action Plans

Table G.1 Event and Action Plans for Air Quality

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

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

Table G.2 Event and Action Plans for Construction Noise

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

Table G.3 Event and Action Plans for Water Quality

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

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

Appendix H Summary of Site Audit Findings

L10 Civil & Building Superstructure Work

Dates of Inspection: 03/10/2017, 10/10/2017, 17/10/2017, 24/10/2017 and 31/10/2017.

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 Mechanical, Electrical, Instrumentation & Control Erection Work

Dates of Inspection: 06/10/2017, 13/10/2017, 20/10/2017 and 27/10/2017.

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: 06/10/2017, 13/10/2017, 20/10/2017, and 27/10/2017.

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.	C
	• the load carried by vehicle shall be covered by impervious sheeting to ensure no leakage of dusty materials from the vehicle.	C
	• the heights from which fill materials are dropped shall be controlled to a practical level to minimise the fugitive dust arising from unloading.	C
A2	For the concrete batching plant, the following control measures are recommended:	
	• loading, unloading, handling, transfer or storage or any dusty materials shall be carried out in a totally enclosed system.	C
	• The materials which may generate airborne dust emissions shall be wetted by water spray system.	C
	• All receiving hoppers shall be enclosed on three sides up to 3m above unloading point.	C
	• All conveyor transfer points shall be totally enclosed.	C
	WATER QUALITY	
B1	Silt curtains shall be installed on the eastern, southern and north western sides of the reclamation site during dredging for the reclamation construction. This is a required mitigation measure for the construction works and shall be implemented prior to the commencement of bulk dredging. **	N/A
B3	As a necessary operational constraint combined bulk dredging and sand filling for site formation shall not be permitted at any time. In addition, sand filling for site platform shall take place behind constructed sea walls which pierce the water surface. **	N/A
B4	HEC shall ensure design to divert all storm drains away from Hung Shing Ye Bay. **	N/A
B5	Sand fill for the rubble mound seawalls shall be placed by controlled pumping down the trailer arm. **	N/A
B6	EM&A shall confirm the acceptability of any impacts during construction and should any unacceptable impacts be found then one or more of the following mitigation measures shall be implemented: ** • reducing the number of dredgers working at any one time; • reducing the rate of working of the dredgers; • temporary suspension of operations; • phasing of the works so that dredging / filling is only undertaken at certain stages of the tidal cycle.	N/A

EM&A Log Ref.	Mitigation Measures	Implementation Status
B7	In addition to the above specific measures the following general working procedures shall be adopted. **	
	• fully-enclosed or watertight grabs shall be used to minimise loss of sediment during the raising of loaded grabs through the water column;	N/A
	• the descent speed of grabs shall be controlled to minimise the seabed impact speed and to reduce the volume of over dredging;	N/A
	• barges shall be loaded carefully to avoid splashing of material;	N/A
	• all barges used for the transport of dredged materials shall be fitted with tight bottom seals in order to prevent leakage of material during loading and transport;	N/A
	• all barges shall be filled to a level which ensures that material does not spill over during loading and transport to the disposal site and that adequate freeboard is maintained to ensure that the decks are not washed by wave action;	N/A
	• the speed of trailer dredgers shall be controlled to prevent propeller wash from stirring up the sea bed sediments;	N/A
	• "rainbowing" sand fill from trailer dredgers shall not be permitted; and	N/A
	• the works shall cause no visible foam, oil, grease or litter or other objectionable matter to be present in the water within and adjacent to the dredging site and along the route to the disposal site.	N/A
B8	Cumulative impacts shall be assessed through EM&A. Co-ordination with the EM&A consultants for other projects to determine if any exceedances are caused by the other projects or by HEC's activities. Should monitoring results indicate exceedances at sensitive receivers due to HEC's activities, then the above described mitigation measures shall be implemented until impacts reduce to acceptable levels. **	N/A
	NOISE	
C1	General noise mitigation measures shall be employed at all work sites throughout the construction phase.	C
C2	Mitigate against general construction noise during Sunday's and public holidays, either at source with portable noise barriers, or by rescheduling of some PMEs to less sensitive time periods.	C
C3	Mitigate against night time noise from dredging equipment, with silencers or mufflers. **	N/A
	LANDSCAPE & VISUAL IMPACTS	
D1	The following mitigation measures shall be allowed for landscape and visual improvement:	
	• Use rubble mound seawall along south and west edges of the reclamation to provide a more natural look.	C
	• Break the mass of main buildings by varying the height/division into smaller units.	C
	• Plant trees and vegetation for screening.	C
	• Adopt colour scheme to blend the buildings into the scenery.	C

EM&A Log Ref.	Mitigation Measures	Implementation Status
	WASTE MANAGEMENT	
E1	HEC to submit a Waste Management Plan for the construction phase to EPD. The Plan shall be verified by the IEC and shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommendations of the EIA report.	C
	Dredging Waste	
E2	All vessels for marine transportation of dredged sediment shall be fitted with tight fitting seals to their bottom openings to prevent leakage of materials. In addition, loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water, and barges or hoppers should under no circumstances be filled to a level which shall cause the overflowing of materials or polluted water during loading or transportation**	N/A
	Storage, Collection and Transport of Waste	
E3	• Minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers.	C
	• Obtain the necessary waste disposal permits from the appropriate authorities, if they are required, in accordance with the Waste Disposal Ordinance (Cap.354), Waste Disposal (Chemical Waste) (General) Regulation (Cap.354), the Crown Land Ordinance (Cap 28), Dumping at Sea Ordinance (Cap 466) and Work Branch Technical Circular No. 22/92, Marine Disposal of Dredged Mud.	C
	• Disposal of waste at Licensed sites;	C
	• Develop procedures such as a ticketing system to facilitate tracking of marine mud and chemical waste, and to ensure that illegal disposal does not occur;	C

	• Segregate and sort the waste materials into 3 categories:
	  • public fill (e.g. concrete and rubble) for re-use on-site or disposal at a public filling area;
	  • re-use and/or recycling waste (e.g. steel and other metals);
	  • waste which cannot be re-used and/or recycled (e.g. wood, glass and plastic) for landfill disposal.
	  • The sorting process shall be carefully monitored to avoid missing of the 3 categories. Different types of wastes shall be stockpiled and stored in different containers or skips to enhance re-use or recycling of materials and their proper disposal.
		C

	• Maintain records of the quantities of wastes generated and disposed off-site for each category of waste.	C
E4	Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes	C
	LAND CONTAMINATION	
F1	No land Contamination mitigation measures are required during the construction phase.	N/A
	MARINE ECOLOGY	

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

Remarks:

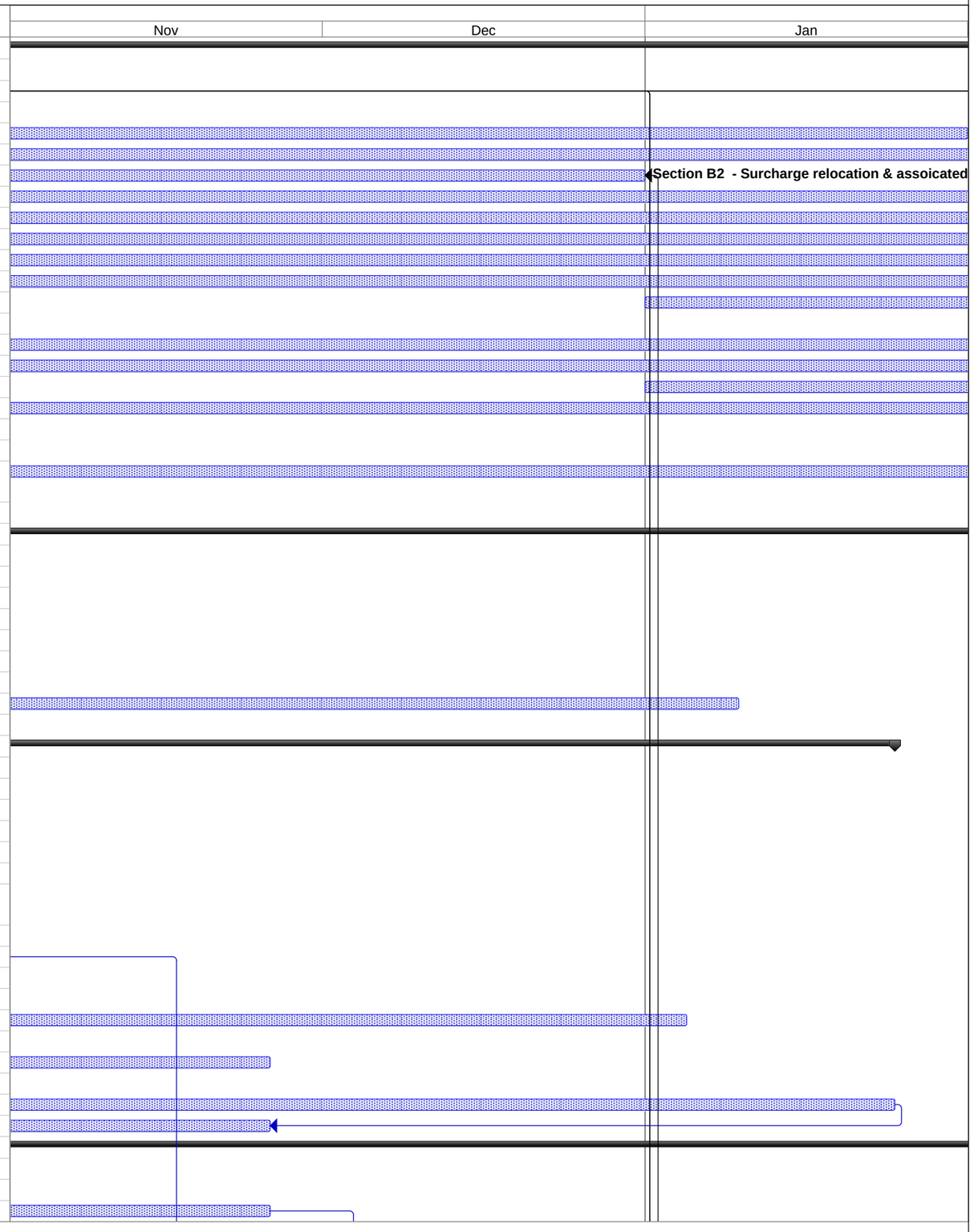
** - No dredging and reclamation work would be involved for L10 construction
C - Compliance with mitigation measure
NC - Non-compliance with mitigation measure
N/A - Not Applicable

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

16_8002 Rev4 Master Programme (01-8-2017).mpp

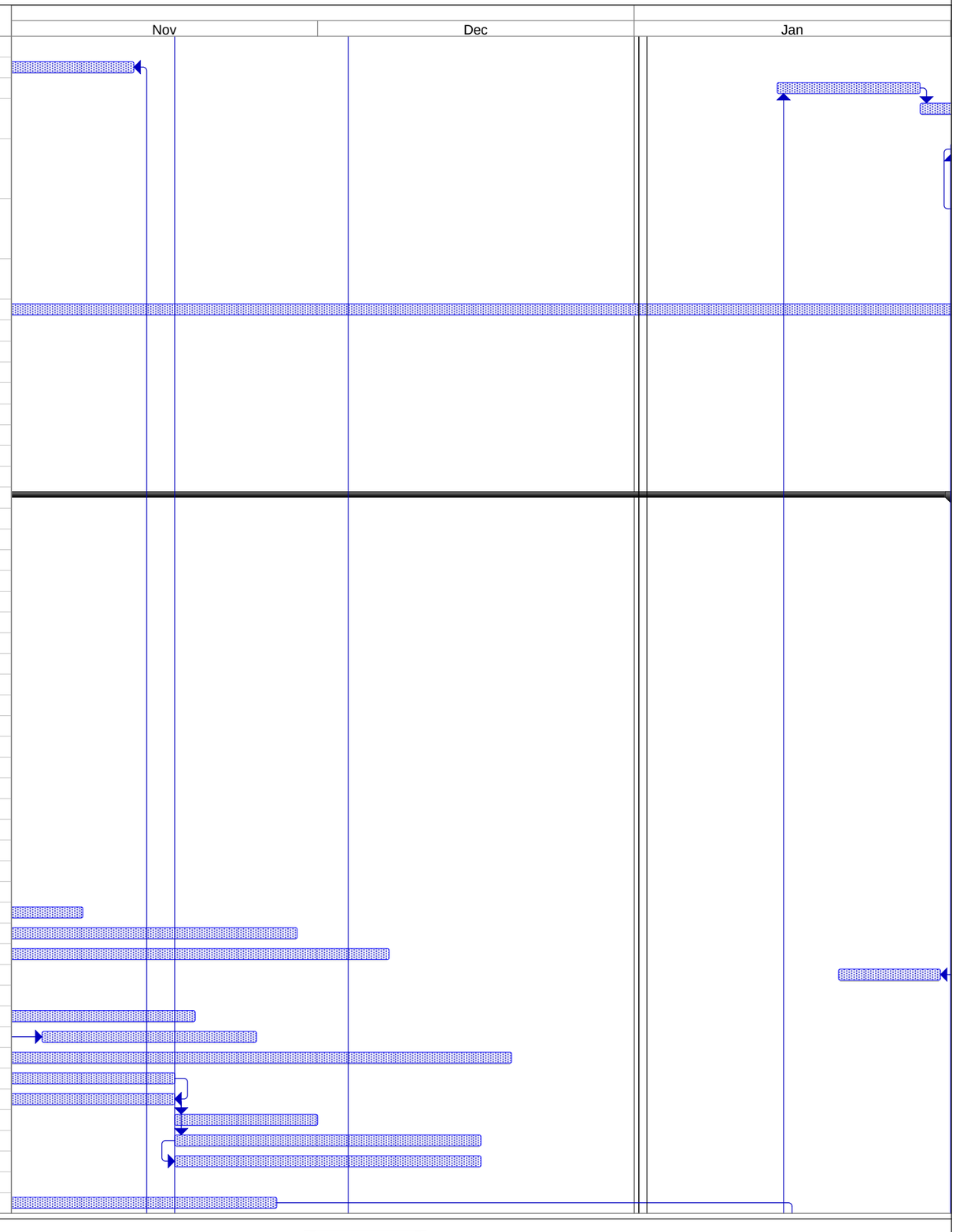
01/08/17

ID	Task Name	Duration	Start	Finish
1	**Contract Key Date**	**1308 days**	**01/11/16**	**31/05/20**
2	**Possession Date**	**1308 days**	**01/11/16**	**31/05/20**
3	Contract Commencement Date	0 days	01/11/16	01/11/16
4	Section A1 - Modify Plinth at Ext. GRS	61 days	01/11/16	31/12/16
5	Section A2 - LPS Site Office Building	410 days	18/12/16	31/01/18
6	Section B1 - Area C1&2 incl. all UG structures & Temp. Access for Empolyer's Specialis	426 days	12/12/16	10/02/18
7	Section B2 - Surcharge relocation & assoicated top-up works	122 days	01/09/17	31/12/17
8	Section C - Area C3, HRSG & MSBU10 for Empolyer's Specialist	457 days	13/12/16	14/03/18
9	Section D - Remaining of MSBU10, HRSG, A&A at L9 & L8, Ext. & Demolish Site Toilet	516 days	22/12/16	21/05/18
10	Section D - CW Pump Equip. Rm No. 4	365 days	01/04/17	31/03/18
11	Section E - Middel Rd & South of L10. Expose & Construction New 275kV Trench at LM	577 days	01/11/16	31/05/18
12	Section F -Urea Storage & Handling Factilies	488 days	01/05/17	31/08/18
13	Section G - Demin. Plant Road & No.3 Outfall	273 days	01/01/18	30/09/18
14	Section G - Modification at No. 4 CW Intake	122 days	01/06/18	30/09/18
15	Section H1 - Gas Support foundation & trench at Area C11	745 days	01/11/16	15/11/18
16	Section H2 - GRS Improvement work at Area C10	441 days	01/09/17	15/11/18
17	Section H3 - L10 Chimney Flue and A&A L9 & pipe rack formation	319 days	01/01/18	15/11/18
18	Section I1 - Link Bridge & associated A&A	455 days	06/01/17	05/04/18
19	Section I2 - Shunt Reactor SR4 Foundation	90 days	01/01/19	31/03/19
20	Section I3 - All remaining work except deferred works	417 days	08/02/18	31/03/19
21	Section J - Cable Route CPX1&2 cable diversion & whole of work except deferred works to be carried out in DLP	790 days	01/11/16	30/12/18
22	Deferred works during DLP	336 days	01/07/19	31/05/20
23	**General & Preliminary**	**552 days**	**01/11/16**	**06/05/18**
24	Set up Temporary Site Office and Utilities	30 days	01/11/16	30/11/16
25	Full Mobilization	14 days	01/11/16	14/11/16
26	Permit Applications & Statuary Submissions	45 days	08/11/16	22/12/16
27	Existing Utilities scanning & Excavation Permit	45 days	01/11/16	15/12/16
28	Foundation of Tower Crane Construction	7 days	05/04/17	11/04/17
29	Tower Crane Erection	5 days	12/04/17	16/04/17
30	Removal of Tower Crane (Including Foundation)	14 days	23/04/18	06/05/18
31	L10 MSB External Scaffolding erection	120 days	12/09/17	09/01/18
32	L10 MSB External Scaffolding Removal	14 days	09/04/18	22/04/18
33	**Submission and Approval**	**450 days**	**01/11/16**	**24/01/18**
34	Method Statement / Temp Work Submission & Approval from HEC for General Works	240 days	01/11/16	28/06/17
35	BD Approval & Consent (If required)	90 days	01/12/16	28/02/17
36	BIM Model, CSD & CBWD Submission & Approval from HEC	200 days	01/12/16	18/06/17
37	Structure Steelwork Connection Design Submission & BD Approval	30 days	31/12/16	29/01/17
38	Structure Steelwork Shop Drawing & Approval	30 days	30/01/17	28/02/17
39	Metal Cladding, louvre & windows submission & BD Approval	60 days	30/01/17	30/03/17
40	Metal Cladding, louvre & windows shop drawing submission	45 days	14/02/17	30/03/17
41	Order, Off Site Fabrication and Delivery (S. Steel & Cladding & louvres)	180 days	31/03/17	26/09/17
42	CW Culvert (Inlet) ELS BD approval & consent	90 days	31/03/17	28/06/17
43	Sumission & Approval of Steel Flue Assessment Report and Design Drawings	210 days	31/12/16	28/07/17
44	Submission and Approval of Steel Flue Design from BD	90 days	29/07/17	26/10/17
45	Material Fabrication & Delivery for L10 Flue	100 days	27/09/17	04/01/18
46	Folding Shutters Shop Drawing Submission & Approval	120 days	01/03/17	28/06/17
47	Fabrication & Delivery of Foldering Shutters	150 days	29/06/17	25/11/17
48	Sewage Pump System Design submission & Approval	45 days	13/08/17	26/09/17
49	Fabrication & Delivery of Sewage Pump	120 days	27/09/17	24/01/18
50	Other Material Submission & Approval & Deliverys	240 days	31/03/17	25/11/17
51	**Coordination with the Employer's Specialist Contractors**	**480 days**	**09/07/17**	**31/10/18**
52	Outlet Culvert Box Verical Puddle Pipes Installation	7 days	09/07/17	15/07/17
53	Inlet Culvert Box Verical Puddle Pipes Installation	7 days	05/09/17	11/09/17
54	Template setting in at L10 Turbo Block Foundation	45 days	12/10/17	25/11/17

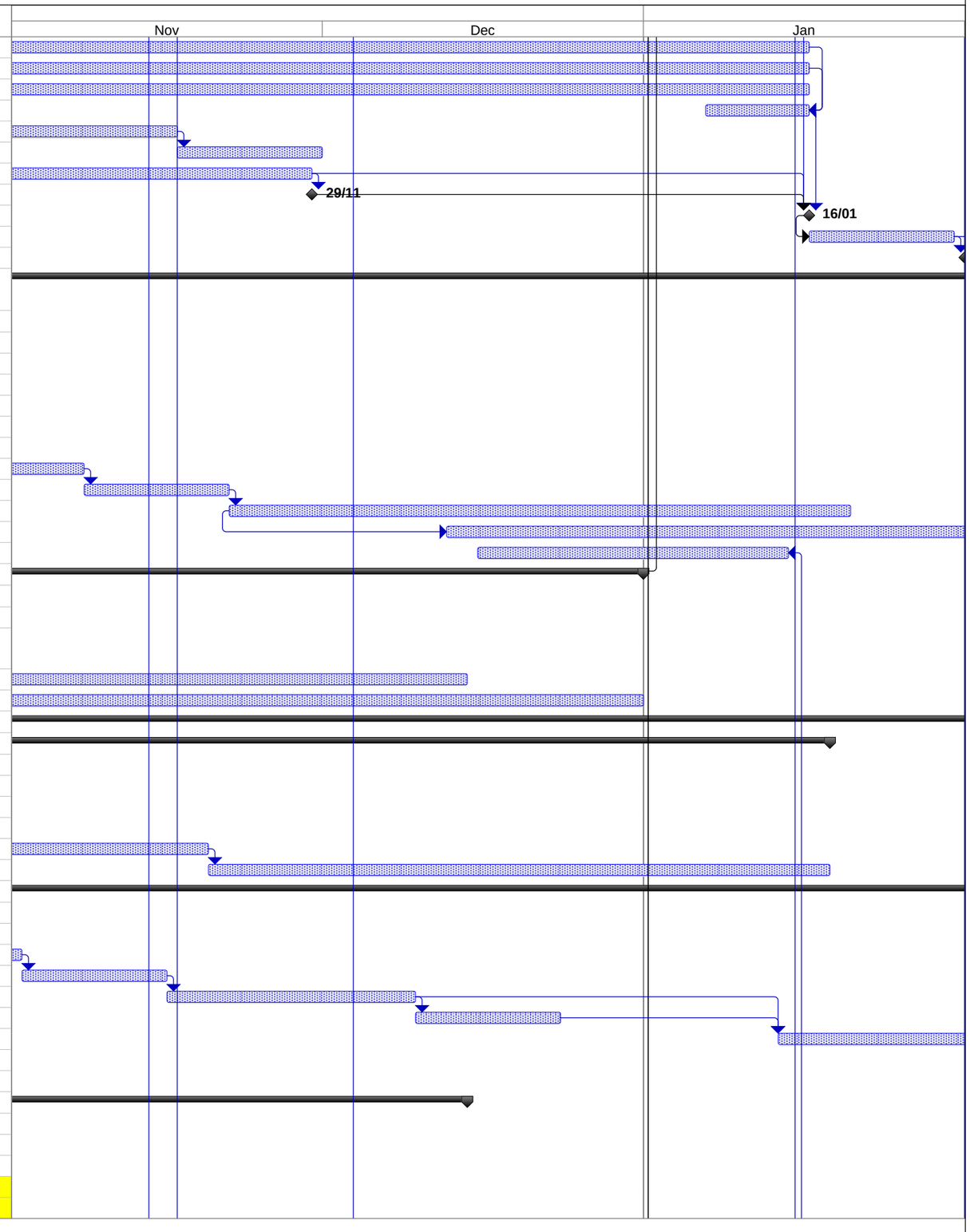


16_8002 Rev4 Master Progra | Critical Split | Task | Split | Milestone | Summary

ID	Task Name	Duration	Start	Finish
55	Template setting of holding down bolts at HRSG Column Base	45 days	16/08/17	29/09/17
56	I-beam/ Channel Base Installation on top of Transformer Foundations at Transformer Ar	32 days	12/10/17	12/11/17
57	Overhead crane rail installation	14 days	15/01/18	28/01/18
58	Overhead Crane Erection at Turbine Hall using Access through a Temporary Opening at L10 MSB Roof between GL 10-G to 10-H and 10-2 and 10-6	21 days	29/01/18	18/02/18
59	Condenser Assembly and Erection using Access through a Temporary Opening at L10 MSB below 1/F along GL 10-6 from GL 10-B to 10-C including a Clear Space below 1/F between GL 10-B to 10-C	89 days	01/02/18	30/04/18
60	Installation of Power Train Equipment including Air Inlet Duct using Access through a Temporary Façade Opening at L10 MSB below 1/F along GL 10-6 from GL 10-F to 10-H including a Clear Space below 1/F of the above Area	89 days	07/02/18	06/05/18
61	Installation of Equipment in L10 HRSG Area after the Temporary Paving was Removed to Expose the Respective Foundations by the Contractor	78 days	15/08/18	31/10/18
62	Installation of Embedded Materials such as Holding Down Bolts for Equipment Foundati	200 days	30/07/17	14/02/18
63	**Section A1 - Modify Plinth at Ext. GRS**	**61 days**	**01/11/16**	**31/12/16**
64	Existing Plinth Removal	18 days	01/11/16	18/11/16
65	Wall Base & Plinth Construction	45 days	17/11/16	31/12/16
66	**Pipe Rcak at Unit 9 North (VO under EI No. 6)**	**197 days**	**29/01/17**	**14/08/17**
67	Consent and BA10 Submissions	0 days	29/01/17	29/01/17
68	Hoarding & Plant Load Test	18 days	30/01/17	16/02/17
69	Footing Construction & Reinstatement	120 days	17/02/17	16/06/17
70	Structural Steel Fabrication, Delivery & Erection	60 days	16/06/17	14/08/17
71	**Section A2 - LPS Site Office Building**	**457 days**	**01/11/16**	**31/01/18**
72	Submissions of Shop Drawings and Approval	90 days	01/11/16	29/01/17
73	Submisson & Approval of CSD & CBWD	60 days	15/01/17	15/03/17
74	Complete site clearance by HKE	0 days	01/11/16	01/11/16
75	Demolish of existing site office	21 days	01/11/16	21/11/16
76	BA 10 Application	0 days	01/11/16	01/11/16
77	Erection of Hording	7 days	01/11/16	07/11/16
78	Plate Load Test	7 days	08/11/16	14/11/16
79	Installation of Earthing Grid	18 days	15/11/16	02/12/16
80	Construction of pad footing, bearing wall, columns up to G/F	45 days	03/12/16	16/01/17
81	Chinese New Year	10 days	27/01/17	05/02/17
82	Backfill & UG Drainage within Building	75 days	17/01/17	01/04/17
83	Backfill & Blinding	4 days	02/04/17	05/04/17
84	Construct G/F on-grade slab & External Scaffold Erection	12 days	06/04/17	17/04/17
85	RC Walls, Columns and Slab up to 1/F	100 days	18/04/17	26/07/17
86	RC Walls, Columns and Slab up to R/F	40 days	13/07/17	21/08/17
87	Parapet Wall, FS Water Tank, Top Roofs + RC curb, hatch door etc	21 days	22/08/17	11/09/17
88	Waterproofing for Liift pit + Water test	14 days	15/08/17	28/08/17
89	G/F Window, Louvre, Doors Frame & Shutter Frame	30 days	26/08/17	24/09/17
90	G/F Finishing Works	45 days	09/09/17	23/10/17
91	G/F Plumbing & Drainage Works	30 days	09/10/17	07/11/17
92	G/F Sanitary Fitting and Cubicles	30 days	30/10/17	28/11/17
93	G/F Other sundry metal, railing, etc	45 days	24/10/17	07/12/17
94	G/F Placing Furnitures	10 days	21/01/18	30/01/18
95	1/F Window, Louvre & Door Frames	30 days	21/09/17	20/10/17
96	1/F Finishing Works	45 days	05/10/17	18/11/17
97	1/F Plumbing, Sanitary Fittings & Drainage Works	21 days	04/11/17	24/11/17
98	1/F Other sundry metal, railing, etc	60 days	21/10/17	19/12/17
99	R+UR/F Waterproofing Installation + Testing	45 days	03/10/17	16/11/17
100	R/F Finishing Works (incl. Water Tank & FS Pump Room)	45 days	03/10/17	16/11/17
101	R/F Plumbing Works	14 days	17/11/17	30/11/17
102	R/F Sundry Metal, Handrail & Glazed Railing	30 days	17/11/17	16/12/17
103	Installation of Door a& Shutter leafs	30 days	17/11/17	16/12/17
104	Handover of lift shaft	0 days	28/08/17	28/08/17
105	Lift Installation + EMSD Inspection + Issue of Lift Cert	90 days	29/08/17	26/11/17



ID	Task Name	Duration	Start	Finish
106	Electrial Installation	85 days	24/10/17	16/01/18
107	Fire Service Installation	85 days	24/10/17	16/01/18
108	MVAC Installation	85 days	24/10/17	16/01/18
109	Testing & Commissioning Works	10 days	07/01/18	16/01/18
110	External Wall Finishing Works	45 days	03/10/17	16/11/17
111	Removal of Scaffolding	14 days	17/11/17	30/11/17
112	External UG P&D and Road Works	100 days	22/08/17	29/11/17
113	WWO046 Completion	0 days	29/11/17	29/11/17
114	FSD Inspection	0 days	16/01/18	16/01/18
115	Submit BA 13 Inspection	14 days	17/01/18	30/01/18
116	Expected OP Issue	0 days	31/01/18	31/01/18
117	**Section B1 - Area C1&2 incl. all UG structures & Temp. Access for Empolyer's Specialist**	**277 days**	**10/05/17**	**10/02/18**
118	**C.W. Culvert System (Area C1 & C2) (~160m)**	**277 days**	**10/05/17**	**10/02/18**
119	Excavation to Formation Level (+1.1mPD)	18 days	10/05/17	27/05/17
120	Construction of Binding & Plinth	14 days	19/05/17	01/06/17
121	Pile Laying	14 days	02/06/17	15/06/17
122	Thrust Box + Manhole Construction	14 days	16/06/17	29/06/17
123	Water Test	4 days	30/06/17	03/07/17
124	Backfill	7 days	04/07/17	10/07/17
125	Return area to Sunley for L11 piling	120 days	11/07/17	07/11/17
126	Cutting Sheet pile	14 days	08/11/17	21/11/17
127	All underground Utilities	60 days	22/11/17	20/01/18
128	Backfill & Reinstatement & Formation of Access	60 days	13/12/17	10/02/18
129	Supporting Structure for Overhead Crane	30 days	16/12/17	14/01/18
130	**Section B2 - Surcharge relocation & assoicated top-up works**	**229 days**	**17/05/17**	**31/12/17**
131	**Roadworks and External Works**	**229 days**	**17/05/17**	**31/12/17**
132	Surface Drainage Modification	60 days	17/05/17	15/07/17
133	Remove of Surcharge Fill (~21500 m3)@ Area C2, C10 & C15 to Area B1, B2, D2, D3 and D4	45 days	01/09/17	15/10/17
134	Construction of Access Road	60 days	16/10/17	14/12/17
135	Existing Band Drains Cut-down (2520 nos)	90 days	03/10/17	31/12/17
136	**Section C - Area C3, HRSG & MSBU10 for Empolyer's Specialist**	**499 days**	**01/11/16**	**14/03/18**
137	**HRSG Area Equipment Rm & Fdn - South (Area C7)**	**201 days**	**02/07/17**	**18/01/18**
138	Excavation to Formation Level	14 days	02/07/17	15/07/17
139	Pile Head Treatment	14 days	16/07/17	29/07/17
140	Pile Cap & Tie Beam - GL 10-H to 10H-H, 10-H5 to 10-9	60 days	23/07/17	20/09/17
141	Pit Constructions	30 days	22/08/17	20/09/17
142	All Underground Utilities	60 days	21/09/17	19/11/17
143	Backfill & Reinstatement & Formation of Access Road	60 days	20/11/17	18/01/18
144	**HRSG Equipment Room**	**175 days**	**21/09/17**	**14/03/18**
145	Plate Load Test	10 days	21/09/17	30/09/17
146	Underground Drainage	14 days	01/10/17	14/10/17
147	HRSG Equipment RM Foundation + Backfill	18 days	15/10/17	01/11/17
148	Construct G/F	14 days	02/11/17	15/11/17
149	Roof Construction	24 days	16/11/17	09/12/17
150	Parapet Wall	14 days	10/12/17	23/12/17
151	ABWF Works	30 days	14/01/18	12/02/18
152	Building Service Installations	30 days	13/02/18	14/03/18
153	Ready for BA 13 Application	0 days	14/03/18	14/03/18
154	**Main Station Building Fdn, G/F &1/F**	**409 days**	**01/11/16**	**14/12/17**
155	Installation of Dewatering Well & King Post for Type A	14 days	01/11/16	14/11/16
156	BD Consent for ELS Phase I MSBU10 Foundation	0 days	23/12/16	23/12/16
157	BD Consent for ELS Phase II MSBU10 Foundation	0 days	13/01/17	13/01/17
158	Turbo Block (Col portion)	21 days	22/08/17	11/09/17
159	Turbo Block (Upper Portion) for handover to erection contractor	30 days	12/09/17	11/10/17



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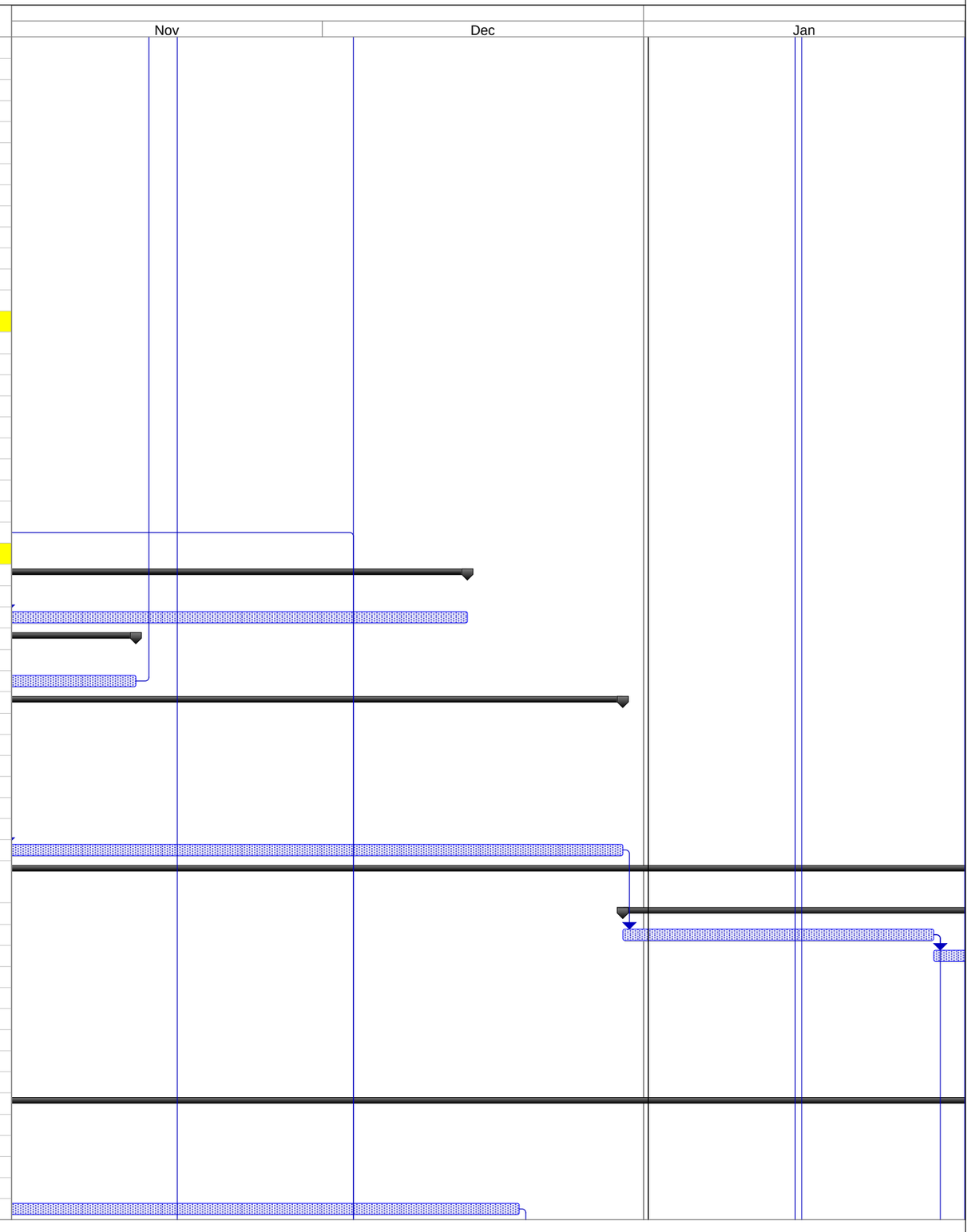
ID	Task Name	Duration	Start	Finish
160	**Substructure & G/F- GL SC1 to 10-F, 10-1 to 10-6**	**307 days**	**24/12/16**	**26/10/17**
161	Excavation to Formation Level (Tx Bay Area + upto 10-D)	14 days	24/12/16	06/01/17
162	Cut-down Pile Head & treatment	45 days	28/12/16	10/02/17
163	Construction of Transformer Bay Foundations	60 days	11/02/17	11/04/17
164	Pile Cap & Tie Beam, Pits Construction	60 days	12/04/17	10/06/17
165	Bearing Wall, Column Post and G/F Plinths	60 days	11/06/17	09/08/17
166	Excavation, Waling & Struct (Type A & Type C)	60 days	26/04/17	24/06/17
167	CEP Drain Pit /Sump Pit Construction	14 days	25/06/17	08/07/17
168	Arrival of CW Culvert piping materials incl. flexible joint & other cast in materials	0 days	30/12/16	30/12/16
169	Construction of Culvert Outlet Box (1st pour)	18 days	25/06/17	12/07/17
170	Construction of Tie Beam/ Ground Beam + Outlet Box 2nd Pour	40 days	13/07/17	21/08/17
171	Construction of Culvert Inlet Box & Ground Beams	45 days	22/08/17	05/10/17
172	Backfill + Slabs & Drainage at G/F Area	21 days	06/10/17	26/10/17
173	Turbo Block Foundation (1st portion) + Temp work	35 days	18/07/17	21/08/17
174	**Substructure & G/F- GL 10-F to 10-H, 10-1 to 10-6**	**278 days**	**07/01/17**	**11/10/17**
175	Excavation to Formation Level (+2.425mPD & 5.025mPD)	60 days	07/01/17	07/03/17
176	Existing Sheet Pile Cut-down	7 days	08/03/17	14/03/17
177	Pile Head Treatment	14 days	15/03/17	28/03/17
178	Pile Cap & Tie Beam Construction	90 days	29/03/17	26/06/17
179	Complete excavation at Type B & Plate Load Test	65 days	15/03/17	18/05/17
180	Blow Down Sump (1st pour) + Mass Concrete for tie beams	50 days	27/06/17	15/08/17
181	Remaining Tie Beams + Column Post at North of Turbo Block	30 days	16/08/17	14/09/17
182	Backfill, Bearing Wall, Drainage and G/F Slab Construction	21 days	15/09/17	05/10/17
183	Pile Caps & Tie Beam at South of Turbo Block	30 days	22/08/17	20/09/17
184	Turbo Block Foundation (GL 10-F to H)	21 days	21/09/17	11/10/17
185	**G/F & 1/F & Maintenance Floor**	**115 days**	**22/08/17**	**14/12/17**
186	Steel Column & Beam Erections (other than for roof truss)	70 days	22/08/17	30/10/17
187	R.C. Structure Construction	45 days	31/10/17	14/12/17
188	**Transformer Area**	**95 days**	**10/08/17**	**12/11/17**
189	Fire Wall Construction	50 days	10/08/17	28/09/17
190	Slab & Plinths Construction + Backfill	45 days	29/09/17	12/11/17
191	**C.W. Culvert System (Area C3)**	**202 days**	**11/06/17**	**29/12/17**
192	Excavation to Formation Level	14 days	11/06/17	24/06/17
193	Construction of Binding & Plinth	3 days	25/06/17	27/06/17
194	CW Pipe Laying	14 days	28/06/17	11/07/17
195	Thrust Box Construction	14 days	12/07/17	25/07/17
196	Water Test	10 days	26/07/17	04/08/17
197	Backfill	14 days	05/08/17	18/08/17
198	Pile Cap & Tie Beam + Underground UU + Backfill	60 days	31/10/17	29/12/17
199	**Section D - Remaining of MSBU10, HRSG, A&A at L9 & L8, CW Pump Equip. Rm No. 4 Ext. & Demolish Site Toilet**	**419 days**	**29/03/17**	**21/05/18**
200	**C.W Culvert System (Area C5)**	**142 days**	**30/12/17**	**20/05/18**
201	Excavation to Formation Level (-2.8mPD) with ELS Installation	30 days	30/12/17	28/01/18
202	Construction of Binding & Plinth	7 days	29/01/18	04/02/18
203	Penstock Trial & Preparation for connection to existing outlet pipe	0 days	04/02/18	04/02/18
204	Pipe Laying (2 Pipes)	21 days	05/02/18	25/02/18
205	Water Test	10 days	26/02/18	07/03/18
206	Backfill	14 days	08/03/18	21/03/18
207	All underground Utilities	60 days	22/03/18	20/05/18
208	Backfill & Reinstatement & Formation of Access	60 days	22/03/18	20/05/18
209	**HRSG Area Fdn - North (Area C6)**	**356 days**	**29/03/17**	**19/03/18**
210	Excavation to Formation Level	21 days	29/03/17	18/04/17
211	Pile Head Treatment	14 days	19/04/17	02/05/17
212	Fdn North of HRSG Area GL 10-H to 10H-H, 10-1to 10H-5	60 days	03/05/17	01/07/17
213	Pit Constructions	30 days	21/09/17	20/10/17
214	Backfill	60 days	21/10/17	19/12/17



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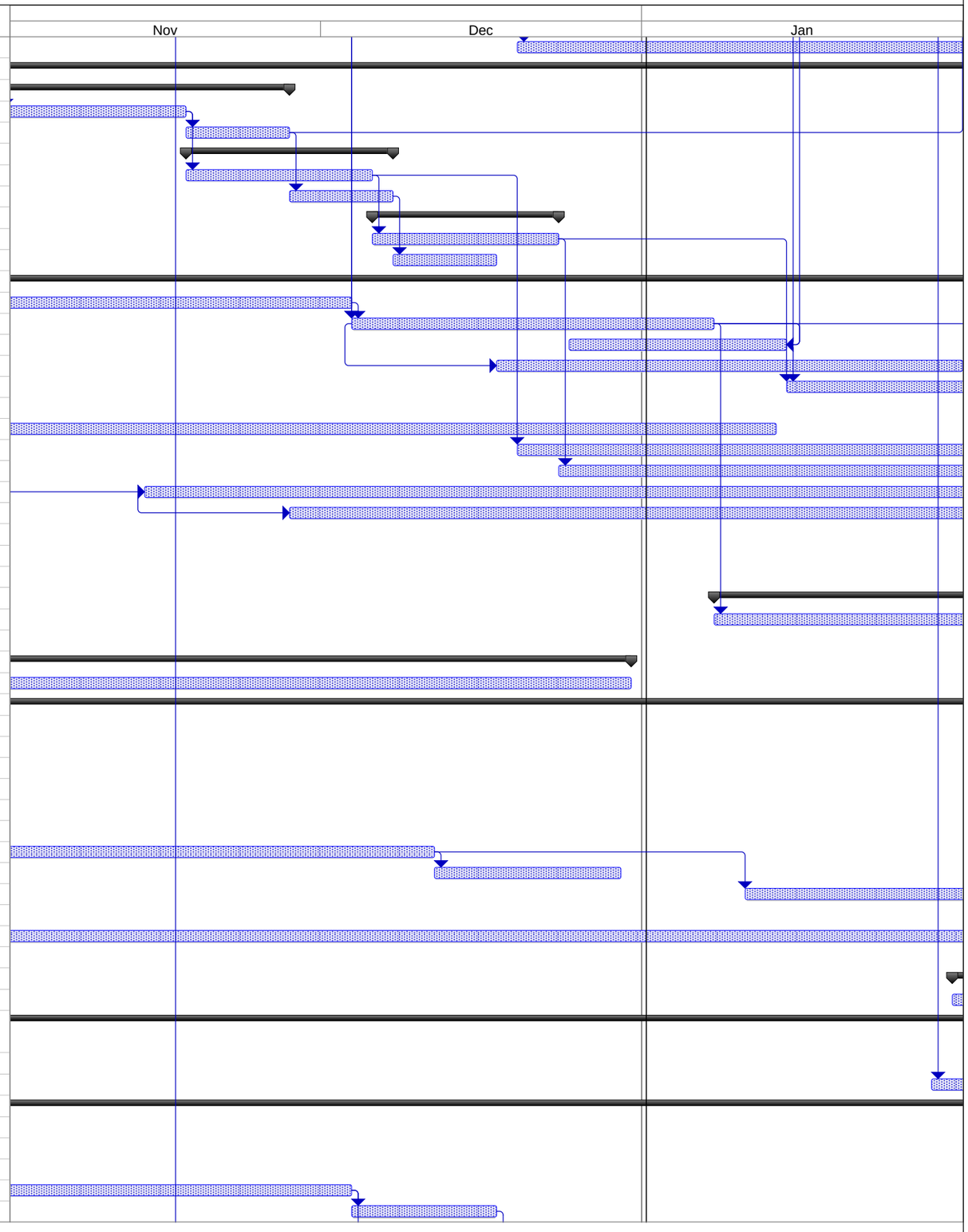
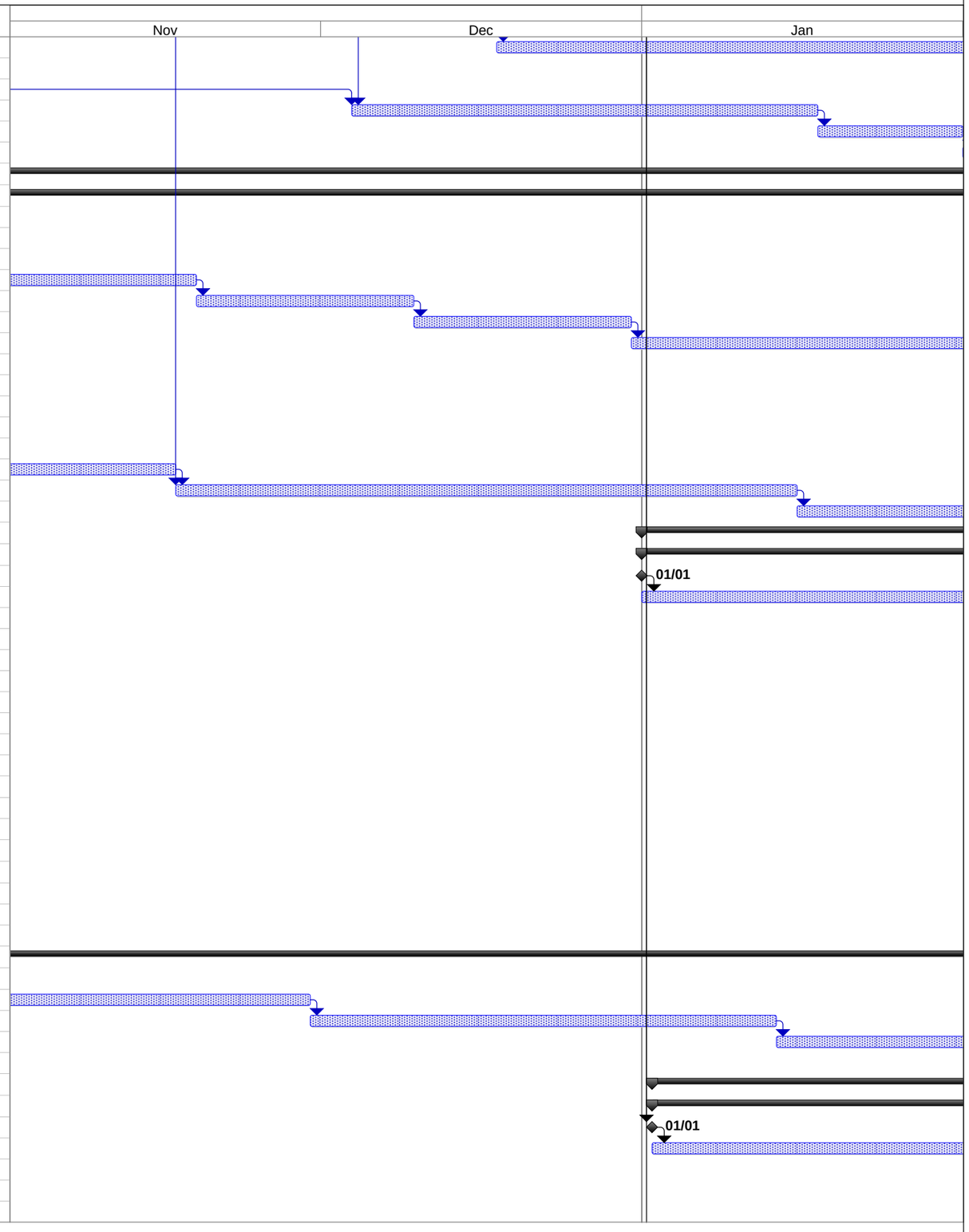
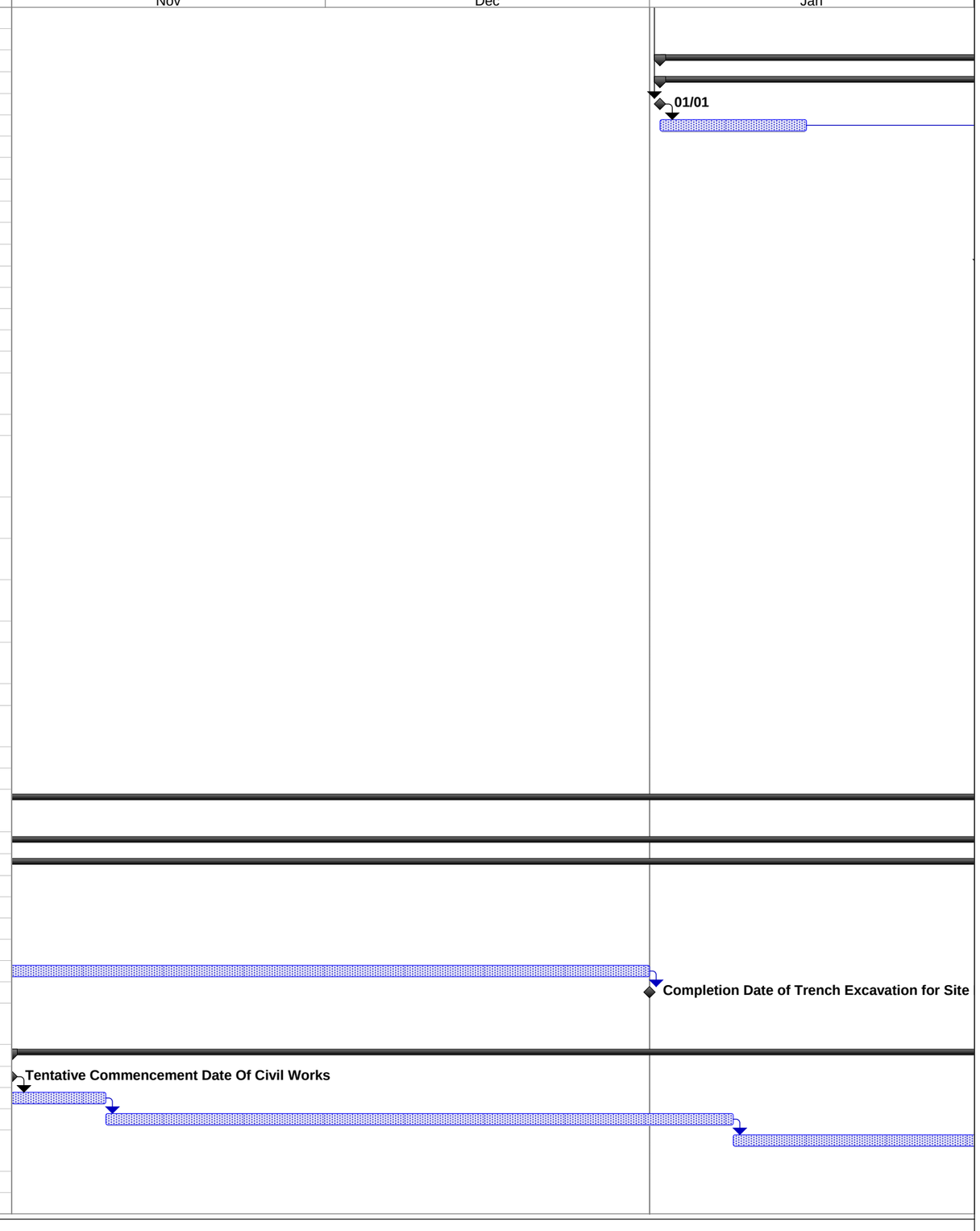
ID	Task Name	Duration	Start	Finish
215	Underground UU & Formation of Access	90 days	20/12/17	19/03/18
216	**Main Station Building - Unit L10 Superstructure**	**229 days**	**05/10/17**	**21/05/18**
217	**2/F**	**28 days**	**31/10/17**	**27/11/17**
218	Steel Beam Erection	18 days	31/10/17	17/11/17
219	R.C. Structure Construction	10 days	18/11/17	27/11/17
220	**3/F**	**20 days**	**18/11/17**	**07/12/17**
221	Steel Beam Erection	18 days	18/11/17	05/12/17
222	R.C. Structure Construction	10 days	28/11/17	07/12/17
223	**4/F**	**18 days**	**06/12/17**	**23/12/17**
224	Steel Beam Erection	18 days	06/12/17	23/12/17
225	R.C. Structure Construction	10 days	08/12/17	17/12/17
226	**5/F & Roof except GL 10-G to 10-H and 10-2 to 10-6**	**168 days**	**05/10/17**	**21/03/18**
227	Steel Roof Truss Preparation	60 days	05/10/17	03/12/17
228	Steel Roof Truss Erection + 2d Truss Bolt & Nut	35 days	04/12/17	07/01/18
229	Steel Roof & Crane Rail Erection	21 days	25/12/17	14/01/18
230	Slab Construction	45 days	18/12/17	31/01/18
231	Upper Roof - Steel Roof Erection	21 days	15/01/18	04/02/18
232	Upper roof RC construction	45 days	05/02/18	21/03/18
233	Staircase Constructions	75 days	31/10/17	13/01/18
234	Ceiling Scaffolding & Fendolite Installation to S. Steel Works	120 days	20/12/17	18/04/18
235	External Metal Cladding Installation	120 days	24/12/17	22/04/18
236	Internal ABWF Works	150 days	14/11/17	12/04/18
237	BS Installation	175 days	28/11/17	21/05/18
238	**275kV Cable Trench (Area C5 &C6)**	**61 days**	**22/03/18**	**21/05/18**
239	Cable & Pipe Trench (C5 Area)	45 days	22/03/18	05/05/18
240	Cable Trench (C6 Area)	45 days	07/04/18	21/05/18
241	**MSB UnitL9 - A&A**	**105 days**	**08/01/18**	**22/04/18**
242	Hack-off Lean Concrete	60 days	08/01/18	08/03/18
243	Pipe Rack Support Construction	45 days	09/03/18	22/04/18
244	**MSB UnitL8 - A&A**	**120 days**	**02/09/17**	**30/12/17**
245	A&A Works	120 days	02/09/17	30/12/17
246	**C.W. Pump Equipment Room**	**276 days**	**28/06/17**	**31/03/18**
247	BA 10 Application	0 days	28/06/17	28/06/17
248	Removal of RC fin from existing CW Pump Room	14 days	29/06/17	12/07/17
249	Tree Transplant & falling	30 days	13/07/17	11/08/17
250	Excavation & Raft Footing	45 days	12/08/17	25/09/17
251	Underground Drainage + Backfill	18 days	26/09/17	13/10/17
252	Construct G/F	14 days	14/10/17	27/10/17
253	Roof Construction	45 days	28/10/17	11/12/17
254	Parapet Wall	18 days	12/12/17	29/12/17
255	ABWF Works	40 days	11/01/18	19/02/18
256	Building Service Installations	40 days	20/02/18	31/03/18
257	Extenal Pipe Rack Extension & Reinstatement Works	150 days	28/10/17	26/03/18
258	Ready for BA 13 Application	0 days	31/03/18	31/03/18
259	**Demolition Work - Temporary Site Toilet**	**60 days**	**31/01/18**	**31/03/18**
260	Demolition of Temp. Site Toilet	60 days	31/01/18	31/03/18
261	**Section E - Middel Rd & South of L10. Expose & Construction New 275kV Trench at LMX**	**337 days**	**29/06/17**	**31/05/18**
262	**275kV Cable Trench**	**120 days**	**29/01/18**	**28/05/18**
263	275kV Cable Trench Re-excavation (~172m)	120 days	29/01/18	28/05/18
264	**C.W. Culvert System (Area C9a & C15)**	**337 days**	**29/06/17**	**31/05/18**
265	Removal of existing paving block	8 days	29/06/17	06/07/17
266	Install ELS Phase 1 + consent	60 days	07/07/17	04/09/17
267	Excavation & Blinding & Construct Plinth	30 days	05/09/17	04/10/17
268	Pipe Laying & Thrust Box	60 days	05/10/17	03/12/17
269	Water Test and Backfill	14 days	04/12/17	17/12/17



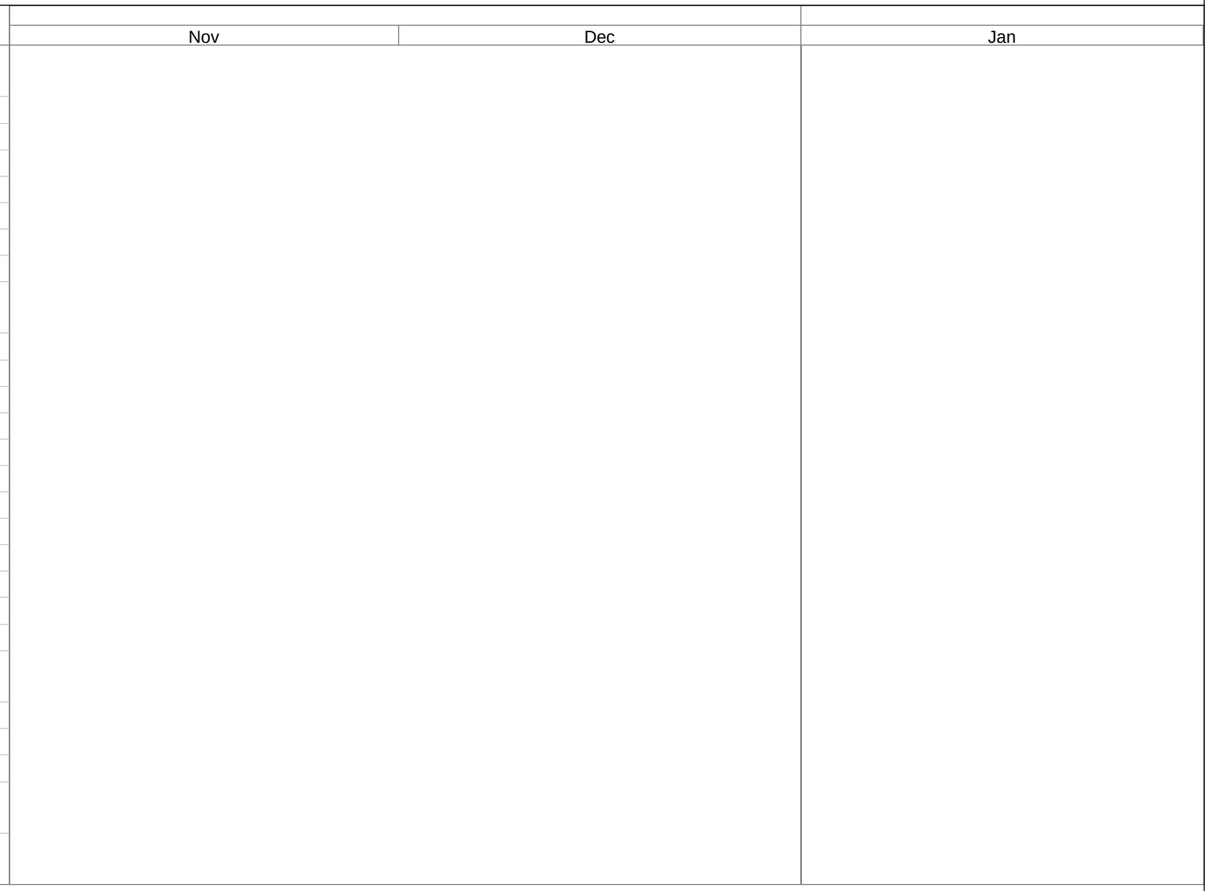
ID	Task Name	Duration	Start	Finish
270	Underground UU and Reinstatement	120 days	18/12/17	16/04/18
271	Install ELS Phase 2 + consent	21 days	15/08/17	04/09/17
272	Blinding & Concrete Plinth	30 days	05/09/17	04/10/17
273	Pipe Laying and Thrust Box	45 days	04/12/17	17/01/18
274	Water Test & Backfill	14 days	18/01/18	31/01/18
275	Underground UU and Reinstatement	120 days	01/02/18	31/05/18
276	**Section F -Urea Storage & Handling Factilies**	**488 days**	**01/05/17**	**31/08/18**
277	**Urea Handling & Storage Plant House, Electrical Room &Pipe Rack**	**488 days**	**01/05/17**	**31/08/18**
278	BA 10 Application	7 days	01/05/17	07/05/17
279	Excavation to Formation Level	10 days	26/09/17	05/10/17
280	Plate Load Test	14 days	06/10/17	19/10/17
281	Raft Foundation (Urea Handlng Rm + Ele Rm)	30 days	20/10/17	18/11/17
282	Backfill	21 days	19/11/17	09/12/17
283	Construct G/F	21 days	10/12/17	30/12/17
284	Roof Construction	90 days	31/12/17	30/03/18
285	Parapet Wall	14 days	31/03/18	13/04/18
286	ABWF Works	60 days	14/04/18	12/06/18
287	Building Service Installations	80 days	13/06/18	31/08/18
288	Ready for BA 13 Application	0 days	31/08/18	31/08/18
289	Plate Load Test	14 days	06/10/17	19/10/17
290	Pipe Rack Foundation	28 days	20/10/17	16/11/17
291	Supporting Tower (4 no.) (9.55m in Height)	60 days	17/11/17	15/01/18
292	Pipe Rack Truss (3 no.)17.3m Span	60 days	16/01/18	16/03/18
293	**Section G - Demin. Plant Road & Modification at No. 4 CW Intake**	**273 days**	**01/01/18**	**30/09/18**
294	**C.W Culvert System (Area C9b)**	**273 days**	**01/01/18**	**30/09/18**
295	Site possession	0 days	01/01/18	01/01/18
296	Removal of paving block & ELS Installation + consent	60 days	01/01/18	01/03/18
297	Excavation to Formation Level with ELS Installation	30 days	02/03/18	31/03/18
298	Construction of Blinding & Plinth	21 days	01/04/18	21/04/18
299	Pipe Laying (2 pipes x ~45m)	30 days	22/04/18	21/05/18
300	Construction of Thrust Box	14 days	22/05/18	04/06/18
301	Water Test	7 days	05/06/18	11/06/18
302	Backfill	16 days	12/06/18	27/06/18
303	All underground Utilities	50 days	28/06/18	16/08/18
304	Backfill & Reinstatement & Formation of Access	45 days	17/08/18	30/09/18
305	**Modification Works - No. 4 C.W. Intake & No.3 C.W. Outfall**	**183 days**	**01/04/18**	**30/09/18**
306	No. 3 C.W. Outfall Modification	90 days	01/04/18	29/06/18
307	No. 4 C.W. Intake Modification	90 days	03/07/18	30/09/18
308	**Section H1 - Gas Support foundation & trench at Area C11**	**179 days**	**21/05/18**	**15/11/18**
309	**GRS Support Foundation**	**179 days**	**21/05/18**	**15/11/18**
310	Temporary Protection, advance work etc	14 days	21/05/18	03/06/18
311	Gas Pipe Footing	165 days	04/06/18	15/11/18
312	Gas Pipe Trench	90 days	18/08/18	15/11/18
313	**Section H2 - GRS Improvement work at Area C10**	**441 days**	**01/09/17**	**15/11/18**
314	**GRS Area Improvement Works**	**441 days**	**01/09/17**	**15/11/18**
315	Retaining Wall Construction	90 days	01/09/17	29/11/17
316	Removal of Surcharge and Backfill	45 days	30/11/17	13/01/18
317	Footing Construction	240 days	14/01/18	10/09/18
318	Topping up, finish and Misc. Works	66 days	11/09/18	15/11/18
319	**Section H3 - L10 Chimney Flue and A&A L9**	**318 days**	**01/01/18**	**15/11/18**
320	**No.4 Chimney Steel Flue**	**318 days**	**01/01/18**	**15/11/18**
321	Consent, documentation and site preparation	0 days	01/01/18	01/01/18
322	Steel Flue Preparation & installation	150 days	02/01/18	31/05/18
323	Install Steel Cover at Windshield	45 days	01/06/18	15/07/18
324	Install Steel Cover at Roof	30 days	16/07/18	14/08/18
325	Modification & Reinstatement Works	55 days	15/08/18	08/10/18



ID	Task Name	Duration	Start	Finish
326	E & M Installation	38 days	09/10/18	15/11/18
327	L9 A&A	120 days	19/07/18	15/11/18
328	**Section I1 - Link Bridge & associated A&A**	**94 days**	**01/01/18**	**05/04/18**
329	**Link Bridge**	**94 days**	**01/01/18**	**05/04/18**
330	Design & Shop Drawings	0 days	01/01/18	01/01/18
331	Site preparation	14 days	02/01/18	15/01/18
332	Link Bridge between Unit L9 & L10	60 days	05/02/18	05/04/18
333	**Section I2 - Shunt Reactor SR4 Foundation**	**90 days**	**01/01/19**	**31/03/19**
334	**Shunt Reactor Compound SR4**	**90 days**	**01/01/19**	**31/03/19**
335	Modification Work at Shunt Reactor SR4	90 days	01/01/19	31/03/19
336	**Section I3 - All remaining work except deferred works**	**417 days**	**08/02/18**	**31/03/19**
337	**Remaining Works**	**417 days**	**08/02/18**	**31/03/19**
338	Demolition of Canopy @ Jetty Guard Hose & Toilet)	30 days	02/08/18	31/08/18
339	Demolition of Existing Contractor Shed	60 days	01/09/18	30/10/18
340	Seurity Fence Erection	20 days	31/10/18	19/11/18
341	All External Works & Road Works	417 days	08/02/18	31/03/19
342	**Deferred Works - L10 MSB and HRSG**	**395 days**	**02/03/18**	**31/03/19**
343	Construction of L10 MSB Roof BetweenGL 10-G to 10-H and 10-2 to 10-6 After the Overhead Crane Installation	30 days	02/03/18	31/03/18
344	Construction of Walls and Ceilings of Lube Oil Tank Room at L10 MSB	92 days	01/05/18	31/07/18
345	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
346	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
347	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
348	Removal of Temporary Paving Within L10 HRSG Area to Expose all respective Equipment Foundations	14 days	01/08/18	14/08/18
349	Construction of Foundation Plinths and Walls of Lube Oil Storage Tank	93 days	15/08/18	15/11/18
350	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
351	**Deferred Works - External Works**	**182 days**	**01/10/18**	**31/03/19**
352	Final Reinstatement of Access Roads and Pavement Surrounding and within L10 MSB and L10 HRSG Area	151 days	01/10/18	28/02/19
353	FSD Inspection	14 days	02/03/19	15/03/19
354	BD OP Inspection	14 days	18/03/19	31/03/19
355	**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**
356	**275kV Cable Diversion**	**1127 days**	**01/05/17**	**31/05/20**
357	**Part I (1km in Length, 1.1m to 1.5m Deep) (Works in existing Trench)**	**426 days**	**01/05/17**	**30/06/18**
358	Tentative Commencement Date Of Civil Works	0 days	01/05/17	01/05/17
359	Trail Pit & Trench at Joint Bay	120 days	01/05/17	28/08/17
360	Implementation of TTA	7 days	22/08/17	28/08/17
361	Remove the Concrete Road Cover	60 days	29/08/17	27/10/17
362	Cable Trench Re-excavation (by Mechanical Method)	120 days	03/09/17	31/12/17
363	Completion Date of Trench Excavation for Site Handover	0 days	31/12/17	31/12/17
364	Tentative Period for Backfilling and Road Reinstatement (Excluding Joint Bay and Trench at Station Road)	91 days	01/04/18	30/06/18
365	**Part II (630m in Length, 1.1m to 1.5m Deep) (Works in existing Trench)**	**485 days**	**01/11/17**	**28/02/19**
366	Tentative Commencement Date Of Civil Works	0 days	01/11/17	01/11/17
367	Implementation of TTA	9 days	01/11/17	09/11/17
368	Remove the Concrete Road Cover	60 days	10/11/17	08/01/18
369	Trench Excavation and Installation of Road Decking at Joint Bay (Including Part I & II)	145 days	09/01/18	02/06/18
370	Cable Trench Re-excavation (by Mechanical Method)	90 days	03/06/18	31/08/18
371	Completion Date of Trench Excavation for Site Handover	0 days	31/08/18	31/08/18



ID	Task Name	Duration	Start	Finish
372	Tentative Period for Backfilling and Road Reinstatement (Including Joint Bay at Part I, but excluding Joint Bay SJ3)	90 days	01/12/18	28/02/19
373	**Part III (400m in Length, 1.3m to 1.5m Deep) (Works in New Trench)**	**518 days**	**01/07/18**	**30/11/19**
374	Tentative Commencement Date Of Civil Works	0 days	01/07/18	01/07/18
375	Implementation of TTA	9 days	01/07/18	09/07/18
376	Remove the Concrete Road Cover	90 days	10/07/18	07/10/18
377	Cable Trench Excavation with shoring	260 days	31/07/18	16/04/19
378	Construction of New Joint Bay	45 days	17/04/19	31/05/19
379	Completion Date of Trench Excavation for Site Handover	0 days	31/05/19	31/05/19
380	Tentative Period for Backfilling and Road Reinstatement (excluding new slab but including SJ3)	91 days	01/09/19	30/11/19
381	**Part IV (Hand Dig Tunnel) + Defer portion**	**701 days**	**01/07/18**	**31/05/20**
382	Tentative Commencement Date Of Civil Works	0 days	01/07/18	01/07/18
383	Trial Pits / Trenches	30 days	01/07/18	30/07/18
384	Existing Drainage Diversion, if any	20 days	31/07/18	19/08/18
385	Formation of Temp. Cable Pit	90 days	20/08/18	17/11/18
386	Hand Dig Tunel (15m)	150 days	18/11/18	16/04/19
387	Excavtion for new RC Works	90 days	17/01/19	16/04/19
388	Construction of new RC Works	45 days	17/04/19	31/05/19
389	Backfill & reinstatement except new trench	30 days	01/06/19	30/06/19
390	Completion Date of Trench for Site Handover	0 days	30/06/19	30/06/19
391	**Deferred Works - Cable Diversion CPX1 and CPX2 (during DLP)**	**274 days**	**01/09/19**	**31/05/20**
392	Formation of Wall Opening between existing trench CPX1 and new Joint Bay	7 days	01/09/19	07/09/19
393	Breaking up for Road Paving and Excavation down to Cable Tiles of Existing Trench CPX2	31 days	01/12/19	31/12/19
394	Demolition of Existing Trench CPX1 and CPX2	30 days	01/04/20	30/04/20
395	Final Reinstatement of the CPX1 and CPX2 Areas	31 days	01/05/20	31/05/20
396	**Deferred Works - Shunt Reactor Compound SR4 (during DLP)**	**153 days**	**01/07/19**	**30/11/19**
397	Trench Re-excavation and Cable Supports Installation for Shunt Reactor Compound SR4	62 days	01/07/19	31/08/19
398	Backfilling and Road Re-instatement of Shunt Reactor SR4 and Associated Trench	30 days	01/11/19	30/11/19



SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing & Commissioning of Power Block Facilities

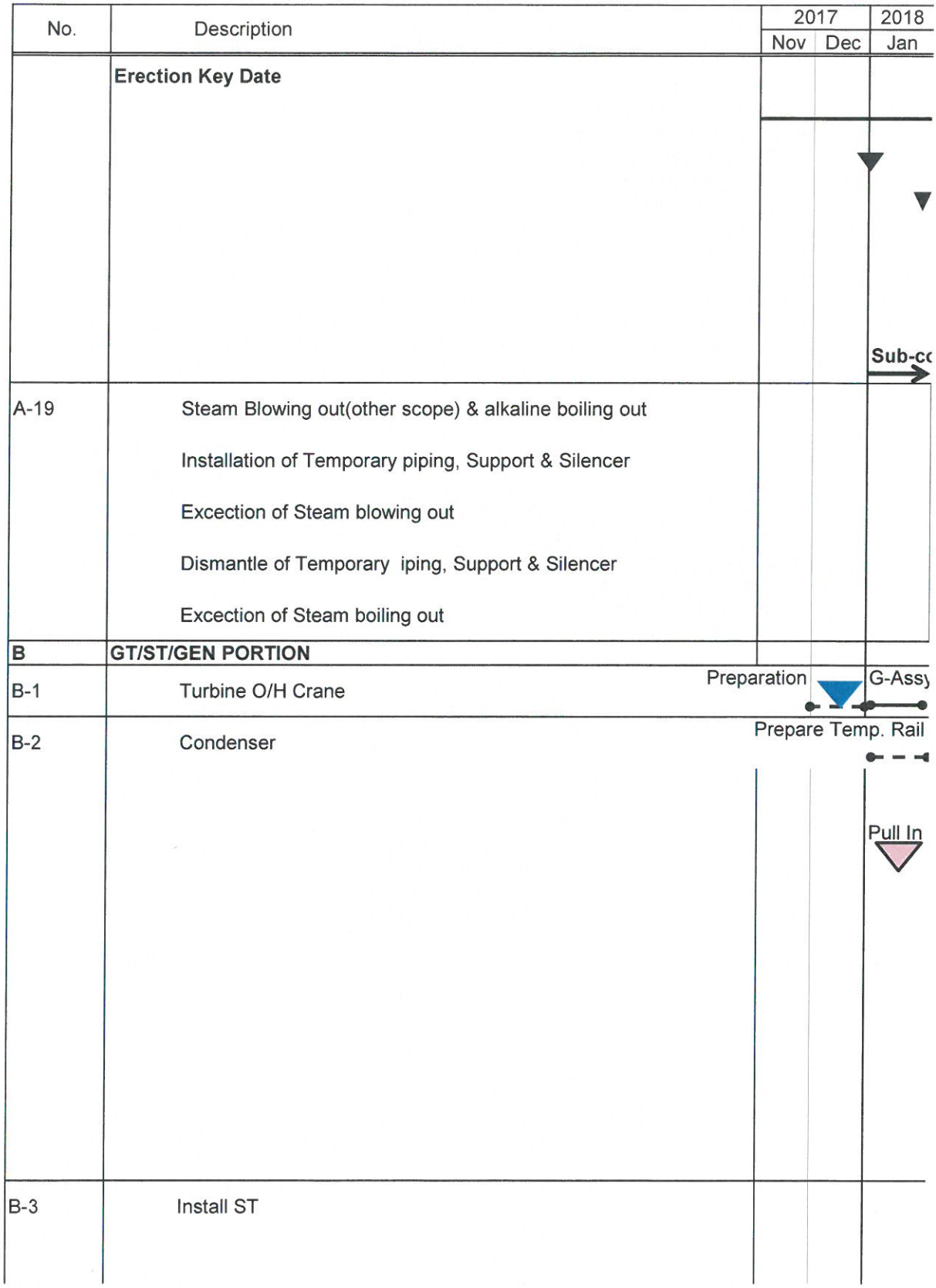
No.	Description	2017 Nov	2017 Dec	2018 Jan
	Erection Key Date			
A	**HRSG PORTION**			
A-01	Install Casing (Bottom/Side/Top) with Structure	Chipping/Packer Preparation		
A-02	Upper/Lower Connection Pipe			Lower Pipe Temp. Install
A-03	Module Install (Bundle Tube Block)			
A-04	Down Commer Pipe			
A-05	Drum Lifting / HDR Level Adjustment			
A-06	Critical Piping/connecting piping (Main Steam, Aux, R/H, HP/LP Feed Water)			
A-07	Other piping			
A-08	Access Platform / Hand Rail			
A-09	Inside Baffle Plate & Seismic Tie Adjust / Setting			

SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing & Commissioning of Power Block Facilities

No.	Description	2017 Nov	2017 Dec	2018 Jan
	Erection Key Date			Sub-cc
A-10	SCR System			
A-11	Inlet Duct Structure / Include Pipe Rack (U9-U10 Connection)			
A-12	Inlet Duct			
A-13	Exhaust Duct Structure			
A-14	Exhaust Duct			
A-15	Aux Equip(B/D Tank, HP/IP Feed Water Pump, LP Eco Recirculation Pump, etc.) HP/IP Feed Water Pump Reserve feed water Tank		Chipping/Pac Chipping/Pac	
A-16	Insulation			
A-17	Painting			
A-18	Install Catalyst			

SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing & Commissioning of Power Block Facilities

No.	Description	2017 Nov	2017 Dec	2018 Jan
	Erection Key Date			
A-19	Steam Blowing out(other scope) & alkaline boiling out Installation of Temporary piping, Support & Silencer Excection of Steam blowing out Dismantle of Temporary iping, Support & Silencer Excection of Steam boiling out			
B	**GT/ST/GEN PORTION**			
B-1	Turbine O/H Crane			
B-2	Condenser			
B-3	Install ST			



SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing &
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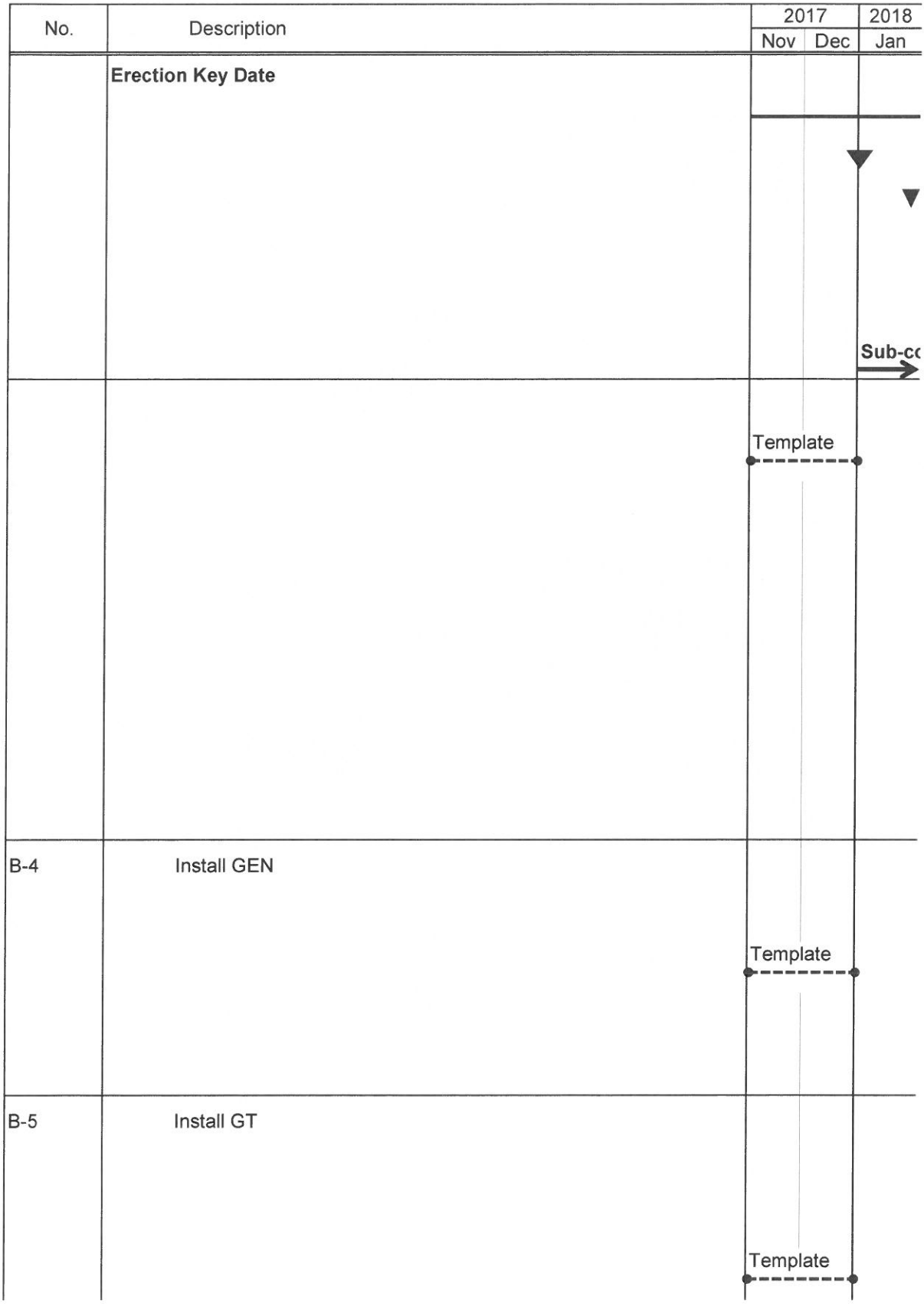
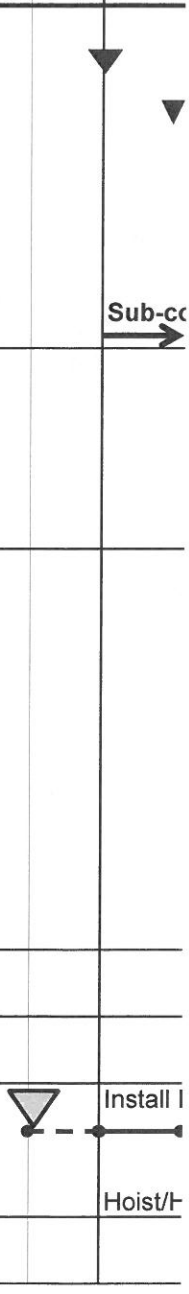


SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing &
Commissioning of Power Block Facilities

No.	Description	2017 Nov	2017 Dec	2018 Jan
	Erection Key Date			
B-6	Aux Equipment			
B-7	Insulation			
B-8	Painting			
B-9	Switchgear/Hoist/Hoist for condenser			



SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing & Commissioning of Power Block Facilities

No.	Description	2017 Nov	2017 Dec	2018 Jan
	Erection Key Date			▼ Sub-cc →
C	**ERECTRICAL & INSTRUMENTATION PORTION**			
C-1	Transformer & Ancillaries (G Tx, U Tx, Ex Tx, SFC Tx)			
C-2	EQUIPMENT INSTALLATION			
	Generator & Ancillaries			
	Isolated Phase Busducts			
	Switchgear and Accessories			
	UPS, Batterys, Battery Charger System & DBs			
	Electrical Panels & Local Control Panels			
	Control Systems, Control Panels, Local Instrument Cubicle & Rack			
	Channel Base Installation			
C-3	CABLING SYSTEM INSTALLATION			
	Cable Ladder / Tray Installation			
	Conduit Pipe Installation			
	Earthing Installation			
	Cable Laying & Termination			
	Fire Resistant Sealing			
	Cable Trench Opening & Transportation			

SCHEDULE C. Contract No. 16/2209
Lamma Power Station Extension - Unit 10
Complete Erection, Inspection, Testing & Commissioning of Power Block Facilities

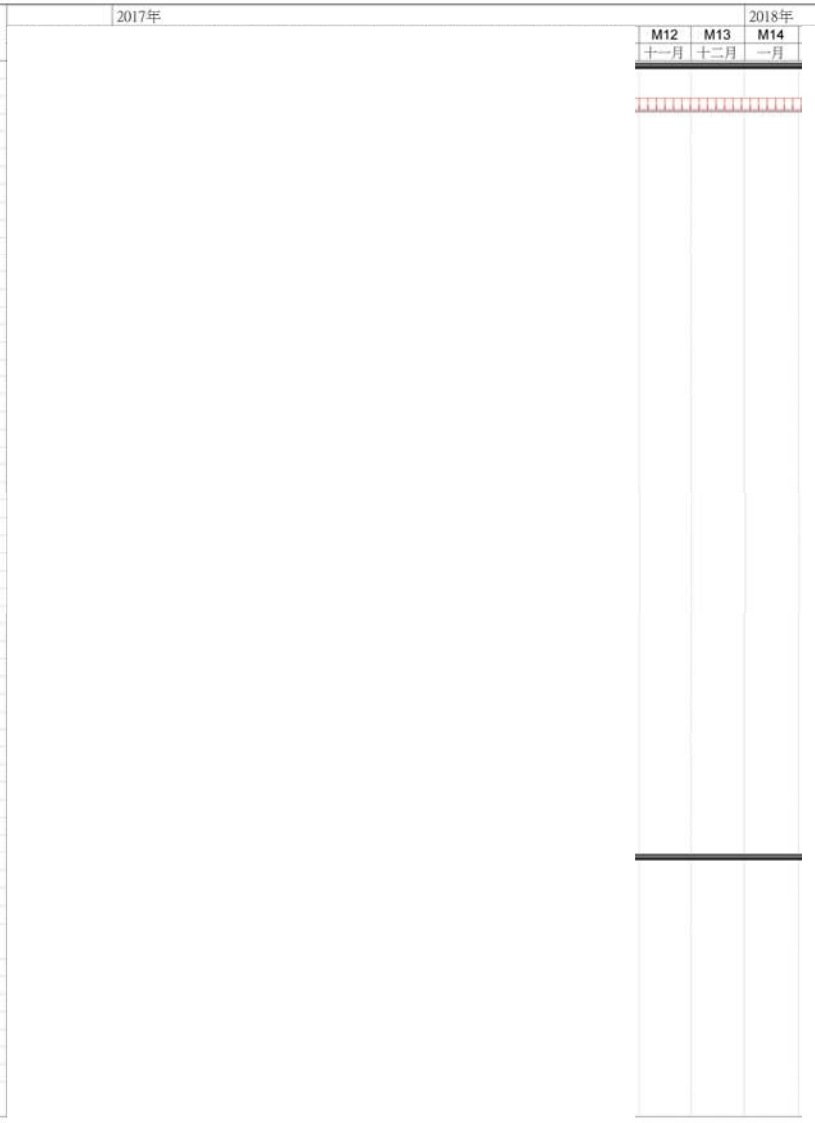
No.	Description	2017 Nov	2017 Dec	2018 Jan
	Erection Key Date		▼	▼ Sub-cc →
C-4	INSTRUMENTS, INSTR. PIPINGS & AIR TUBE			
	Local Instruments, Piping & Tubing			
	Instrument Calibration			
C-5	OTHER WORK			
	275kV Shunt Reactor Relocation			
	Turbine Overhead Crane, Hoist, Battery Power Supply		●	———
	Existing CWP etc.			
	BOP & Other Works			
	Site Cleaning			
C-6	TESTING & COMMISSIONING			
	Testing & Commissioning			
	Commissioning Assistant			

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

Master Programme (Rev 1)

ID	Task Name	Duration	Start	Finish
1	**Key Date**	**455 days**	**2016/12/21**	**2018/3/20**
2	Commencement date	0 days	2016/12/21	2016/12/21
3	Duration of works	455 days	2016/12/21	2018/3/20
4	Site possession date	0 days	2016/12/21	2016/12/21
5	Completion of the Contract	0 days	2018/3/20	2018/3/20
6				
7	**Submission & Works Commenced Before the Contract**	**229 days**	**2016/11/14**	**2017/6/30**
8	**Prelimiminaries**	**75 days**	**2016/11/14**	**2017/1/27**
9	Coordination with utility companies	14 days	2016/12/14	2016/12/27
10	Condition survey	1 day	2016/12/14	2016/12/14
11	Notification of commencement of works to Labour Department	1 day	2016/12/19	2016/12/19
12	Notification of air pollution control for commencement of works to EPD	1 day	2016/12/19	2016/12/19
13	Application of water discharge licence from EPD	14 days	2016/12/12	2016/12/25
14	Application for billing account for disposal of construction waste from EPD	7 days	2016/12/12	2016/12/18
15	CCTV for existing underground drainage pipe around site boundary	12 days	2017/1/16	2017/1/27
16	Erection of contractor's site office	21 days	2016/12/14	2017/1/3
17	Installation of monitoring checkpoints	2 days	2016/12/13	2016/12/14
18	Submission of BA10 for foundation works	0 days	2016/11/14	2016/11/14
19				
20	**Predrilling Works**	**51 days**	**2016/11/23**	**2017/1/12**
21	Drilling rigs mobilization (6 rigs)	1 day	2016/12/22	2016/12/22
22	Predrilling works	31 days	2016/11/23	2016/12/23
23	Submission of predrill logs	16 days	2016/12/28	2017/1/12
24	Completion of predrilling works	0 days	2017/1/12	2017/1/12
25				
26	**Plant Mobilization for Bored Pile Construction**	**197 days**	**2016/12/8**	**2017/6/22**
27	**Crawler Crane**	**68 days**	**2016/12/8**	**2017/2/13**
28	1st & 2nd set	1 day	2016/12/8	2016/12/8
29	3rd & 4th set	1 day	2017/1/3	2017/1/3
30	5th & 6th set	1 day	2017/2/13	2017/2/13
31	**Oscillator**	**196 days**	**2016/12/9**	**2017/6/22**
32	1st & 2nd set	4 days	2016/12/9	2016/12/12
33	3rd & 4th set	1 day	2017/1/4	2017/1/4
34	5th set	1 day	2017/2/14	2017/2/14
35	6th set	2 days	2017/6/21	2017/6/22
36	**RCD**	**84 days**	**2017/1/7**	**2017/3/31**
37	1st & 2nd set	7 days	2017/1/7	2017/1/13
38	3rd & 4th set	7 days	2017/1/21	2017/1/27
39	5th & 6th set (Optional if necessary)	7 days	2017/3/25	2017/3/31
40	Completion of plant mobilization for bored pile construction	0 days	2017/3/31	2017/3/31
41				
42	**Delivery of Temporary Steel Casing for Bored Pile Construction**	**192 days**	**2016/12/21**	**2017/6/30**
43	Duration for delivery of temporary steel casing	192 days	2016/12/21	2017/6/30
44	Completion of delivery of temporary steel casing for bored pile construction	0 days	2017/6/30	2017/6/30
45				
46	**Total Contract Period**	**455 days**	**2016/12/21**	**2018/3/20**
47				
48	**Section A**	**304 days**	**2016/12/21**	**2017/10/20**
49	**Bored Pile Construction (22 piles)**	**304 days**	**2016/12/21**	**2017/10/20**
50	**1st set - G2 > G1 > G3 > G4 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**136 days**	**2016/12/21**	**2017/5/5**
51	G2	35 days	2016/12/21	2017/1/24
52	Delivery of liner for G1	2 days	2017/3/3	2017/3/4
53	G1	58 days	2017/1/25	2017/3/23
54	Delivery of liner for G3	2 days	2017/3/10	2017/3/11
55	G3	49 days	2017/2/1	2017/3/21
56	Delivery of liner for G4	2 days	2017/4/21	2017/4/22
57	G4	45 days	2017/3/22	2017/5/5
58	**2nd set - G7 > G5 > G6 > BP26 > BP20 > BP23 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**273 days**	**2016/12/21**	**2017/9/19**



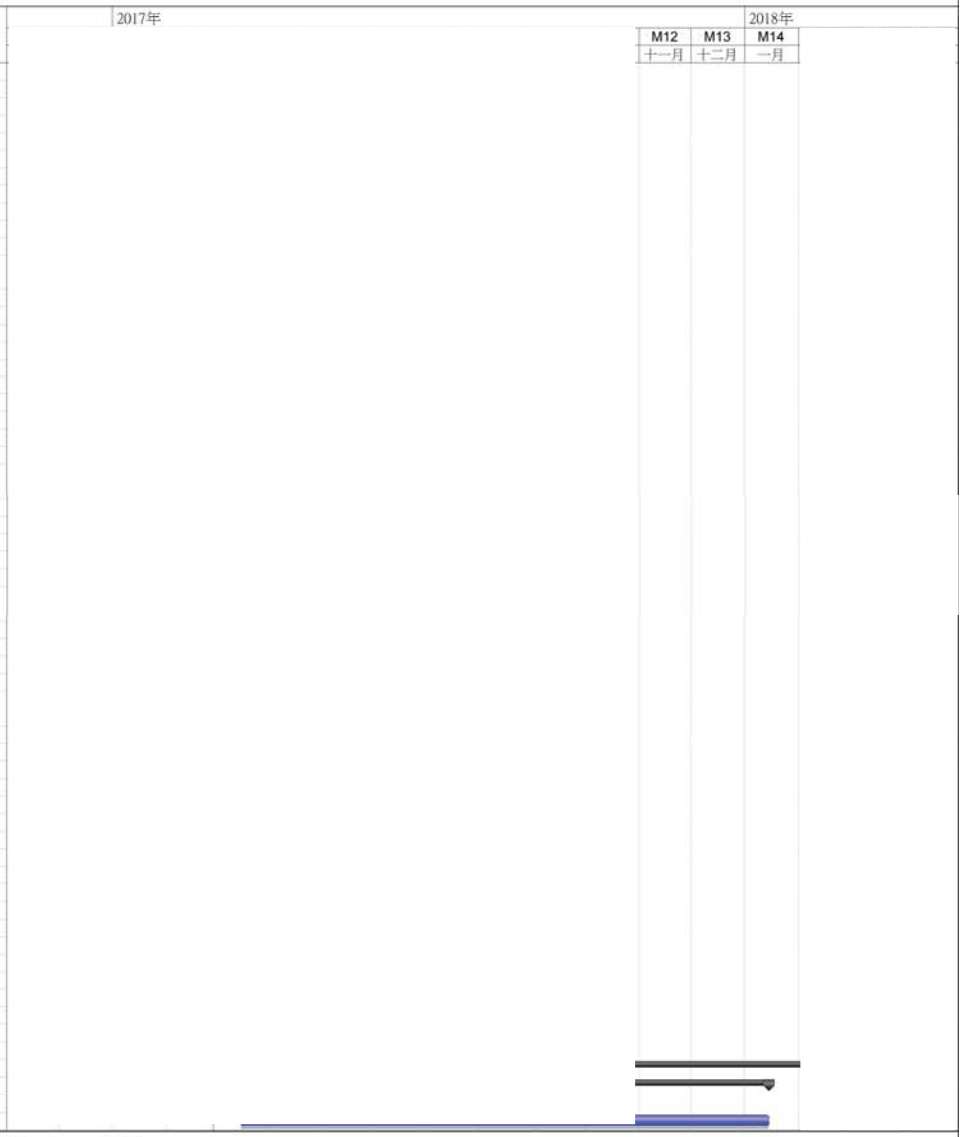
Master Programme
Rev 1 (28 Feb 2017)

Task | Critical Task | Milestone | Summary

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

Master Programme (Rev 1)

ID	Task Name	Duration	Start	Finish
59	G7	45 days	2016/12/21	2017/2/3
60	Delivery of liner for G6	2 days	2017/3/3	2017/3/4
61	G6	39 days	2017/2/4	2017/3/14
62	Delivery of liner for G5	2 days	2017/4/21	2017/4/22
63	G5	48 days	2017/3/15	2017/5/1
64	Delivery of liner for BP26	2 days	2017/6/9	2017/6/10
65	BP26	46 days	2017/5/2	2017/6/16
66	Delivery of liner for BP20	2 days	2017/7/7	2017/7/8
67	BP20 (requested the latest day for construction of this pile on 23 Jun 17)	44 days	2017/6/23	2017/8/5
68	Delivery of liner for BP23	2 days	2017/9/1	2017/9/2
69	BP23	45 days	2017/8/6	2017/9/19
70	**3rd set - BP5 > BP1 > BP13 > BP9 > BP17 (1 crane operator, 1 oscillator operator, 2 RCD operators, 4 riggers & 2 welders)**	**155 days**	**2017/1/5**	**2017/6/8**
71	Delivery of liner for BP5	2 days	2017/3/1	2017/3/2
72	BP5	65 days	2017/1/5	2017/3/10
73	Delivery of liner for BP1	2 days	2017/3/10	2017/3/11
74	BP1	48 days	2017/2/12	2017/3/31
75	Delivery of liner for BP13	2 days	2017/4/7	2017/4/8
76	BP13	45 days	2017/3/11	2017/4/24
77	Delivery of liner for BP9	2 days	2017/4/28	2017/4/29
78	BP9	50 days	2017/4/3	2017/5/22
79	Delivery of liner for BP17	2 days	2017/5/19	2017/5/20
80	BP17	45 days	2017/4/25	2017/6/8
81	**4th set - G10 > G8 > G9 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**122 days**	**2017/1/12**	**2017/5/13**
82	G10	45 days	2017/1/12	2017/2/25
83	Delivery of liner for G9	2 days	2017/3/17	2017/3/18
84	G9	31 days	2017/2/26	2017/3/28
85	Delivery of liner for G8	2 days	2017/4/28	2017/4/29
86	G8	46 days	2017/3/29	2017/5/13
87	**5th set - BP8 > BP4 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**89 days**	**2017/6/23**	**2017/9/19**
88	Delivery of liner for BP8	2 days	2017/7/21	2017/7/22
89	BP8 (requested the latest day for construction of this pile on 23 Jun 17)	44 days	2017/6/23	2017/8/5
90	Delivery of liner for BP4	2 days	2017/9/8	2017/9/9
91	BP4	45 days	2017/8/6	2017/9/19
92	**6th set - BP12 > BP16 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**89 days**	**2017/6/23**	**2017/9/19**
93	Delivery of liner for BP12	2 days	2017/7/21	2017/7/22
94	BP12 (requested the latest day for construction of this pile on 23 Jun 17)	44 days	2017/6/23	2017/8/5
95	Delivery of liner for BP16	2 days	2017/9/8	2017/9/9
96	BP16	45 days	2017/8/6	2017/9/19
97	Interface & sonic test	30 days	2017/8/28	2017/9/26
98	Prepare & submit as-built record plan	7 days	2017/9/19	2017/9/25
99	Submission of BA14	1 day	2017/9/26	2017/9/26
100	Allow 14 days for selection of pile for concrete full core test	14 days	2017/9/27	2017/10/10
101	Concrete full core test	10 days	2017/10/11	2017/10/20
102	Completion of bored pile construction	0 days	2017/10/20	2017/10/20
103	**Sheet Pile**	**162 days**	**2017/5/12**	**2017/10/20**
104	Plant mobilization (1 rig) (1 operator, 4 riggers & 4 welders)	7 days	2017/8/3	2017/8/9
105	Delivery of sheet pile material	90 days	2017/5/12	2017/8/9
106	Installation of sheet pile - Type B (approx. 80 piles)	65 days	2017/8/10	2017/10/13
107	Prepare & submit as-built record plan	6 days	2017/10/14	2017/10/19
108	Submission of BA14	1 day	2017/10/20	2017/10/20
109	Completion of sheet pile	0 days	2017/10/20	2017/10/20
110	Completion of section A	0 days	2017/10/20	2017/10/20
111				
112	**Section B**	**455 days**	**2016/12/21**	**2018/3/20**
113	**Delivery of Permanent Casing & Double Wall Liner**	**390 days**	**2016/12/21**	**2018/1/14**
114	Testing for double wall liner (subject to HEC's request)	45 days	2016/12/21	2017/2/3
115	Duration for delivery of permanent casing & double wall liner	305 days	2017/3/16	2018/1/14



Master Programme
Rev 1 (28 Feb 2017)

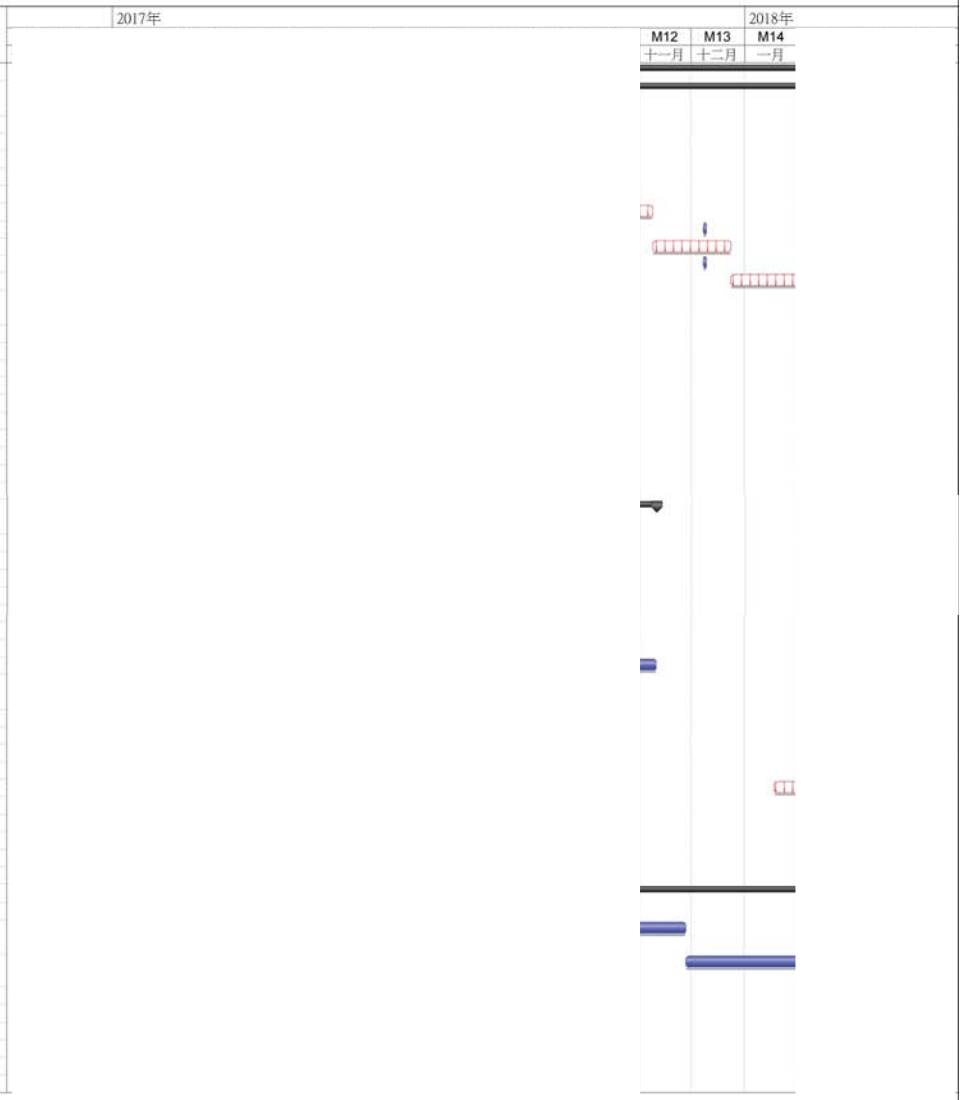
Task | Critical Task | Milestone | Summary

SUNLEY ENGINEERING & CONSTRUCTION CO., LTD.

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

Master Programme (Rev 1)

ID	Task Name	Duration	Start	Finish
116	**Bored Pile Construction (16 piles)**	**399 days**	**2017/2/15**	**2018/3/20**
117	**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**
118	Delivery of liner for BP21	2 days	2017/7/28	2017/7/29
119	BP21	46 days	2017/6/25	2017/8/9
120	Delivery of liner for BP22	2 days	2017/8/25	2017/8/26
121	BP22	45 days	2017/8/10	2017/9/23
122	Delivery of liner for BP18	2 days	2017/10/27	2017/10/28
123	BP18	45 days	2017/9/25	2017/11/8
124	Delivery of liner for BP19	2 days	2017/12/8	2017/12/9
125	BP19	45 days	2017/11/9	2017/12/23
126	Delivery of liner for BP15	2 days	2017/12/8	2017/12/9
127	BP15	45 days	2017/12/24	2018/2/6
128	**3rd set - BP14 > BP11 > BP29 > BP6 > BP7 (1 crane operator, 1 oscillator operator, 2 RCD operators, 4 riggers & 2 welders)**	**137 days**	**2017/5/23**	**2017/10/6**
129	Delivery of liner for BP14	2 days	2017/6/23	2017/6/24
130	BP14	46 days	2017/5/23	2017/7/7
131	Delivery of liner for BP11	2 days	2017/7/7	2017/7/8
132	BP11	45 days	2017/6/9	2017/7/23
133	Delivery of liner for BP29	2 days	2017/8/4	2017/8/5
134	BP29	45 days	2017/7/8	2017/8/21
135	Delivery of liner for BP6	2 days	2017/8/25	2017/8/26
136	BP6	45 days	2017/7/24	2017/9/6
137	Delivery of liner for BP7	2 days	2017/9/15	2017/9/16
138	BP7	46 days	2017/8/22	2017/10/6
139	**4th set - BP27 > BP28 > BP25 > BP24 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**181 days**	**2017/5/14**	**2017/11/10**
140	Delivery of liner for BP27	2 days	2017/6/9	2017/6/10
141	BP27	45 days	2017/5/14	2017/6/27
142	Delivery of liner for BP28	2 days	2017/7/7	2017/7/8
143	BP28	46 days	2017/6/27	2017/8/11
144	Delivery of liner for BP25	2 days	2017/8/25	2017/8/26
145	BP25	45 days	2017/8/12	2017/9/25
146	Delivery of liner for BP24	2 days	2017/10/27	2017/10/28
147	BP24	46 days	2017/9/26	2017/11/10
148	**5th set - BP3 > BP10 (1 crane operator, 1 oscillator operator, 1 RCD operator, 4 riggers & 2 welders)**	**94 days**	**2017/2/15**	**2017/5/19**
149	Delivery of liner for BP3	2 days	2017/3/17	2017/3/18
150	BP3	45 days	2017/2/15	2017/3/31
151	Delivery of liner for BP10	2 days	2017/5/5	2017/5/6
152	BP10	44 days	2017/4/6	2017/5/19
153	Interface & sonic test	30 days	2018/1/18	2018/2/16
154	Prepare & submit as-built record plan	7 days	2018/2/17	2018/2/23
155	Submission of BA14	1 day	2018/2/24	2018/2/24
156	Allow 14 days for selection of pile for concrete full core test	14 days	2018/2/25	2018/3/10
157	Concrete full core test	10 days	2018/3/11	2018/3/20
158	Completion of bored pile construction	0 days	2018/3/20	2018/3/20
159	**Sheet Pile**	**225 days**	**2017/7/10**	**2018/2/19**
160	Delivery of sheet pile material	90 days	2017/7/10	2017/10/7
161	Installation of sheet pile - Type A (approx. 192 piles) (1 rig mobilized after completion of sheet pile of Type B) (1 operator, 4 riggers & 4 welders)	45 days	2017/10/14	2017/11/27
162	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	2017/11/28	2018/2/11
163	Prepare & submit as-built record plan	7 days	2018/2/12	2018/2/18
164	Submission of BA14	1 day	2018/2/19	2018/2/19
165	Completion of sheet pile	0 days	2018/2/19	2018/2/19
166	Completion of section B	0 days	2018/3/20	2018/3/20
167				
168	Contract completion	0 days	2018/3/20	2018/3/20



Master Programme
Rev 1 (28 Feb 2017)

Task | Critical Task | Milestone | Summary

Monthly Waste Flow Table for October 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 Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Materials Generated Monthly					
	Excavated Materials			Non-excavated Materials										
	Disposed in Public Fill	Disposed in Sorting Facilities	Others (e.g Reused in the Contract / Other Projects)	Broken Concrete or Construction Waste Collected by Recycled Company	Reused in the Contract	Reused in other Projects	Disposed in Public Fill	Disposed in Sorting Facilities	Metals (steel bar / metal strip) (1)	Metals (aluminum can) (1)	Paper / cardboard packaging (1)	Plastics (1) & (4)	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00
Feb-17	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
Mar-17	3160.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.17	0.00	0.00	0.00	0.00	0.00
Apr-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.84	0.00	0.00	0.00	0.00	0.00
May-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.41	0.00	0.00	0.00	0.00	0.00
Jun-17	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
Jul-17	2988.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.26	0.00	0.00	0.00	0.00	0.00
Aug-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.61	0.00	0.00	0.00	0.00	0.00
Sep-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.04	0.00	0.00	0.00	0.00	0.00
Oct-17	1963.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00
Nov-17														
Total	9890.91	1.43	0.00	0.00	0.00	0.00	0.00	0.00	167.33	0.00	0.00	0.00	0.40	20.48

Total Inert C&D Waste Materials Generated	Non-inert C&D Materials		
	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
9892.34 tonnes	167.33 tonnes	20.48 tonnes	400 Liters

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 9892.34 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 9892.34 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 October 2017

Project: LAMMA POWER STATION EXTENSION –Unit 10 Complete Erection, Inspection, Testing & Commissioning of Power Block Facilities

Contractor: Taihei Dengyo Kaisha, Ltd.

Record by: Marco Yip / Jason Wong

Year of Record: 2017

MM.YYYY	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Materials Generated Monthly					
	Excavated Materials			Non-excavated Materials										
	Disposed in Public Fill	Disposed in Sorting Facilities	Others (e.g Reused in the Contract / Other Projects)	Broken Concrete or Construction Waste Collected by Recycled Company	Reused in the Contract	Reused in other Projects	Disposed in Public Fill	Disposed in Sorting Facilities	Metals (steel bar / metal strip) (1)	Metals (aluminum can) (1)	Paper / cardboard packaging (1)	Plastics (1) & (4)	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)
Jan 2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Feb 2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mar 2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Apr 2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
May 2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jun 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
Jul 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
Aug 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
Sep 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
Oct 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
Nov 2017														
Dec 2017														
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 0.00 tonnes of inert C&D material were generated from the Project, of which 0 tonnes were reused in this and other contracts, and the remaining 0.00 tonnes were disposed as public fill to Fill Banks.

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

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

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

Notes:

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

Monthly Waste Flow Table for October 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 Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Materials Generated Monthly					
	Excavated Materials			Non-excavated Materials										
	Disposed in Public Fill	Disposed in Sorting Facilities	Others (e.g Reused in the Contract / Other Projects)	Broken Concrete or Construction Waste Collected by Recycled Company	Reused in the Contract	Reused in other Projects	Disposed in Public Fill	Disposed in Sorting Facilities	Metals (steel bar / metal strip) (1)	Metals (aluminum can) (1)	Paper / cardboard packaging (1)	Plastics (1) & (4)	Chemical waste (wasted lubricant oil/oil container)	Other, e.g. general refuse
	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in L)	(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
Feb-17	2029.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
Mar-17	2790.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26
Apr-17	7481.83	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
May-17	7690.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16
Jun-17	8808.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01
Jul-17	11622.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83
Aug-17	9403.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.69
Sep-17	3511.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30
Oct-17	1847.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	280.00	0.00
Total	55184.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	280.00	31.24

Total Inert C&D Waste Materials Generated	**Non-inert C&D Materials**		
	C&D Materials Recycled	C&D Waste Disposed of at Landfill	Chemical Waste
55184.62 tonnes	0 tonnes	31.24 tonnes	280L

Where (A) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil. In total, 55184.62 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 55184.62 tonnes were disposed as public fill to Fill Banks.

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

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

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

Notes:

(1) metal, paper & plastic were collected by recycler
(2) The performance target of waste recycling are specified in the Contractt.
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(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.