

# FUGRO TECHNICAL SERVICES LIMITED

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## ENVIRONMENTAL MONITORING & AUDIT MONTHLY REPORT

March 2019

**Client** : SANG HING – KULY JOINT VENTURE

**Contract Name** : Castle Peak Road Trunk Sewer and Tuen Mun Village Sewerage (Sewage Pumping Station at Lok Chui Street near Castle Peak Villas)

**Contract No.** : DC/2014/01


**EP No.** : EP-068/2000/A

**Title of Project** : Sewage Pumping Stations at Tai Lam Chung Tsuen Luen On San Tsuen, Tai Lam Valley and Lok Chui Street near Castle Peak Villas under the scope of “Tuen Mun Sewerage – Eastern Coastal Sewerage Extension”

**Report No.** : 0367/15/ED/1177

**Prepared by** : Wingo H. W. So

**Reviewed by** : Cyrus C. Y. Lai

**Certified by** :   
Colin K. L. Yung  
Environmental Team Leader  
Fugro Technical Services Limited

9 April 2019



Drainage Services Department  
42/F., Revenue Tower  
5 Gloucester Road  
Wan Chai  
Hong Kong

Your reference:

Our reference: HKDSD202/50/105677

Date: 12 April 2019

Attention: Mr Lee Wai Chung

**BY EMAIL & POST**  
**(email: [wlee@dsd.gov.hk](mailto:wlee@dsd.gov.hk))**

Dear Sirs

Agreement No.: PM 08/2014  
Services for Independent Environmental Checker for  
Construction of Lok Chui Street Sewage Pumping Station  
Verification of Monthly EM&A Report (March 2019)

We refer to the email of 9 April 2019 attaching a monthly EM&A Report (March 2019) for the captioned project prepared by the ET.

We have no comment and hereby verify the monthly EM&A Report in accordance with Clause 3.5 of the Environmental Permit no. EP-068/2000/A.

Please do not hesitate to contact the undersigned or our Mr Ricky Lau at 2618 2831 should you have any queries.

Yours faithfully  
ANEWR CONSULTING LIMITED

Independent Environmental Checker

LYMA/LCCR/lhmh

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## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1. INTRODUCTION</b>	<b>2</b>
<b>2. AIR QUALITY</b>	<b>5</b>
<b>3. NOISE</b>	<b>7</b>
<b>4. LANDSCAPE AND VISUAL</b>	<b>10</b>
<b>5. ENVIRONMENTAL SITE INSPECTION AND AUDIT</b>	<b>10</b>
<b>6. ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS</b>	<b>10</b>
<b>7. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE</b>	<b>11</b>
<b>8. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES</b>	<b>11</b>
<b>9. FUTURE KEY ISSUES</b>	<b>11</b>
<b>10. CONCLUSIONS</b>	<b>12</b>

## FIGURES

Figure 1	Site Layout Plan
Figure 2	Air Quality and Noise Monitoring Stations

## LIST OF APPENDICES

Appendix A	Construction Programme
Appendix B	Project Organization Chart
Appendix C	Action and Limit Levels for Air Quality and Noise
Appendix D	Calibration Certificates of Monitoring Equipment
Appendix E	Environmental Monitoring and Data Recovery Schedules
Appendix F	Air Quality Monitoring Data and Graphical Presentations
Appendix G	Noise Monitoring Data and Graphical Presentations
Appendix H	Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions
Appendix I	Site Audit Summary
Appendix J	Event and Action Plans
Appendix K	Implementation Status of Environmental Mitigation Measures
Appendix L	Weather and Meteorological Conditions during Monitoring Period
Appendix M	Monthly Summary of Waste Flow Table
Appendix N	Proactive Environmental Protection Proforma



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## **EXECUTIVE SUMMARY**

- i. This is the 37<sup>th</sup> monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project within the period from 1 March to 31 March 2019.

### **Construction Activities for the Reporting Period**

- ii. During this reporting period, the principal work activities within the site included:
- Reinstate and construct of access

### **Breaches of Action and Limit Levels for Air Quality**

- iii. No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.

### **Breaches of Action and Limit Levels for Noise**

- iv. No exceedance was recorded at all monitoring stations in the reporting period.

### **Complaint, Notifications of Summons and Successful Prosecutions**

- v. No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.

### **Reporting Change**

- vi. There was no reporting change required in the reporting period.

### **Future Key Issues**

### **Construction Activities for the Coming Reporting Period**

- vii. During the coming reporting period, the principal work activities within the site included:
- Reinstate and construct of access
- viii. Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirements. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.



## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 Contract No. DC/2014/01 – Castle Peak Road Trunk Sewer and Tuen Mun Village Sewerage (“the Project”) includes the construction of a sewage pumping station at Lok Chui Street near Castle Peak Villas as shown in **Figure 1**.
- 1.1.2 The environmental impact assessment (EIA) report (Tuen Mun Sewerage - Eastern Coastal Sewerage Extension) – EIA Report (Register No. AEIAR-034/2000) for the Project was approved by Environmental Protection Department (EPD) dated 7 June 2000. The EIA Report involves the construction of four sewage pumping stations at Tai Lam Chung Tsuen, Luen On San Tsuen, Tai Lam Valley and Lok Chui Street near Castle Peak Villas. The scope of this EM&A Manual focuses on the Sewage Pumping Station at Lok Chui Street near Castle Peak Villas in the EIA Report. The Project is designated under Schedule 2, section F3(b) and Q1 of the Environmental Impact Assessment Ordinance (EIAO). EPD subsequently issued the Environmental Permit (EP) EP- 068/2000 on 25 July 2000.
- 1.1.3 A Register of Change to Environmental Permit was submitted to EPD to register any change to the conditions in the EP for adoption of the latest design of the Pumping Station at Lok Chui Street and justify that the latest changes would not violate the conditions as stated in the approved EIA Report and EP based on the latest engineering design information. A Variation of Environmental Permit (VEP) EP-068/2000/A was issued on 10 April 2015 and it is the current permit for the Project.
- 1.1.4 The amended EP (EP-068/2000/A) is the current permit for the Project.
- 1.1.5 In accordance to EP-068/2000/A Condition 2.3 and 2.4, an updated EM&A Manual was duly certified by ETL and verified by IEC and submitted to EPD for approval on 18 January 2016.
- 1.1.6 The construction phase and EM&A programme of the Project commenced on 29 February 2016.
- 1.1.7 This is the 37<sup>th</sup> monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project within the period from 1 March to 31 March 2019.

**1.2 Project Organization**

1.2.1 The Project Organization structure is shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1**.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Drainage Services Department, HKSAR (DSD)	Project Management	Mr. Lee Wai Chung	2594 7265	2827 8526
Engineer/Engineer's Representative (AECOM)	Resident Engineer	Ms. Jacqueline Chan	3127 5103	2441 1755
Independent Environmental Checker (ANEWR)	Independent Environmental Checker	Mr. Adi Lee	2618 2836	3007 8648
Contractor (SKLV)	Site Agent	Mr. Alan Lo	2674 3888	2674 6688
	Environmental Officer	Mr. Billy Wong		
Environmental Team (FTS)	Environmental Team Leader	Mr. Colin Yung	3565 4114	3565 4160

**1.3 Construction Programme and Activities**

1.3.1 The construction phase of the Project under the EP commenced on 29 February 2016.

1.3.2 The construction programme of the Project is shown in **Appendix A**.

**1.4 Works undertaken during the month**

1.4.1 During this reporting period, the principal work activities within the site included:

- Reinststate and construct of access

1.4.2 Illustrations of works undertaken during the reporting period are shown in **Table 1.2**:

Table 1.2 Works undertaken Illustrations



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### 1.5 Status of Environmental Licences, Notification and Permits

1.5.1 A summary of the relevant permits, licences and/or notifications on environmental protection for this Contract is presented in **Table 1.3**.

Table 1.3 Status of Environmental Licences, Notification and Permits

Permit / Direction / License	Ref No	Valid From	Valid Till
Environmental Permit	EP-068/2000/A	10/04/2015	N/A
Notification of Works Under APCO	391923	06/08/2015	N/A
Wastewater Discharge Licence	WT00022654-2015	23/10/2015	31/10/2020
Registration as a Chemical Waste Producer	5111-421-S3879-01	02/09/2015	N/A
Billing Account for Disposal of Construction Waste	7022922	06/08/2015	N/A



**2. AIR QUALITY**

**2.1 Monitoring Requirement**

2.1.1 In accordance with the updated EM&A Manual, for regular impact monitoring, the sampling frequency of at least once per week shall be strictly observed at designated monitoring stations for 1-hr TSP monitoring using the direct reading method.

**2.2 Monitoring Equipment and Detection Limits**

2.2.1 The impact air quality (1-hr TSP) monitoring was performed using the portable TSP Monitors (Sibata Model LD-3B).

2.2.2 **Table 2.1** summarizes the detail of monitoring equipment and detection limits:

Table 2.1 Air Quality Monitoring Equipment

Item	Equipment	Model Number	Serial Number	Measuring accuracy	Measuring range
1	Portable TSP Monitor	Sibata Model LD-3B	561775	±10% of calibrated particles	0.001 – 10.00mg/m <sup>3</sup>
2			561790		

**2.3 Monitoring Parameters, Frequency and Duration**

2.3.1 **Table 2.2** summarizes the monitoring parameters, monitoring duration and frequencies of air quality monitoring.

Table 2.2 Monitoring Parameters, Frequency and Duration of Air Quality Monitoring

Parameter	Duration	Frequency
1-hr TSP	1 hour	At least 3 times in every 6 days

**2.4 Monitoring Locations**

2.4.1 In accordance with the updated EM&A Manual, two designated air quality monitoring stations, LC6a and LC9 are selected for the Project Area of constructing a sewage pumping station at Lok Chui Street near Castle Peak Villas as they are the representative air sensitive receivers located near to the Project site. All designated air quality monitoring stations listed in the updated EM&A Manual and the air quality monitoring stations are shown in **Table 2.3** and the monitoring locations are shown in **Figure 2**.

Table 2.3 Air Quality Monitoring Locations

Monitoring Station	Location
LC6a	The Castle Bay
LC9	Castle Peak Villas Block C





## 2.5 Monitoring Methodology and QA/QC Procedures

2.5.1 The measuring procedures of the 1-hr dust meter are in accordance with the Manufacturer's instruction Manual as follows:

- Pull up the air sampling inlet cover
- Change the Mode 0 to BG with once
- Push Start/Stop switch once
- Turn the knob to SENSI.ADJ and press it
- Push Start/Stop switch once
- Return the knob to the position MEASURE slowly
- Push the timer set switch to set measuring time
- Remove the cap and make a measurement

### Maintenance / Calibration

2.5.2 The portable TSP Monitors should be calibrated at 1 year intervals, Current calibration certificates are given in **Appendix D**.

## 2.6 Results and Observations

2.6.1 The schedule of air quality monitoring and data recovery schedule in reporting period is provided in **Appendix E**.

2.6.2 The weather conditions during the monitoring are provided in **Appendix L**.

2.6.3 The monitoring data of 1-hr TSP are summarized in **Table 2.4**. Detailed monitoring data are presented in **Appendix F**.

Table 2.4 Summary of 1-hr TSP Monitoring Results

Monitoring Station	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
LC6a	76	36-143	344	500
LC9	68	32-107	335	500

2.6.4 The adopted Action and Limit Levels for air quality impact monitoring are presented in **Appendix C**.

2.6.5 The Event and Action Plan for air quality is given in **Appendix J**.

2.6.6 No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.

### **Other factor influencing the monitoring results**

2.6.7 There were no other noticeable external factors generally affecting the monitoring results in this reporting period.



**3. NOISE**

**3.1 Monitoring Requirement**

3.1.1 In accordance with the updated EM&A Manual, Leq (30min) monitoring is conducted for at least once a week during the construction phase between 0700 and 1900 on normal weekdays at the designated monitoring locations.

**3.2 Monitoring Equipment and Detection Limits**

3.2.1 The sound level meter used in noise monitoring will comply with the International Electrotechnical Commission Publication (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications as referred to in the Technical Memorandum issued under the Noise Control Ordinance (NCO).

3.2.2 Sound level calibrator will be used for the on-site calibration of the meter. This calibrator complies with the IEC Publication 942 (1988) Class 1 and ANSI S1.40 - 1984. Noise measurements were only accepted to be valid if the calibration levels from before and after the measurement agree to within 1.0dB.

3.2.3 Measurements shall be recorded to the nearest 1dB(A). This noise monitors are programmed to measure A-weighted equivalent continuous sound pressure level at 30-minute intervals between 0700 and 1900 during the daytime. The noise measurement shall be carried out at each of the designated monitoring stations closest to the areas of active construction works once every week.

3.2.4 **Table 3.1** summarizes the detail of monitoring equipment and detection limits:

Table 3.1 Noise Monitoring Equipment

Item	Equipment	Model Number	Serial Number	Measuring accuracy	Measuring range
1	Integrating Sound Level Meter	Casella CEL-63X Series	4637931	N.A	20-140 dB
2	Calibrator	Casella CEL-120/1	4358250	±0.1dB	94/114 dB
3	Wind Speed Anemometer	Smart Sensor AR816+	N.A	±5%	0-30m/s

**3.3 Monitoring Parameters and Frequency**

3.3.1 **Table 3.2** presents the noise monitoring parameters and frequencies.

Table3.2 Monitoring Parameters and Frequencies of Noise Monitoring

Monitoring Stations	Parameter	Frequency and Period
LC6a & LC9	LAeq (30min) L10 and L90 will be recorded for reference	At each station at 0700-1900 hours on normal weekdays at a frequency of once a week



### 3.4 Monitoring Locations

3.4.1 Noise monitoring were conducted at two designated monitoring stations as described in **Table 3.3** and the monitoring locations are shown in **Figure 2**.

Table 3.3 Location of noise monitoring station

Monitoring Station	Location
LC6a <sup>1</sup>	The Castle Bay
LC9	Castle Peak Villas Block C

Note:

1. The measurement of sound level is carried out at the fence wall outside the building of the sensitive receiver, a correction should be made to the measured level during impact monitoring in order to represent the actual sound level at the sensitive receiver building façade (Block E6, The Castle Bay).

### 3.5 Monitoring Methodology and QA/QC Procedures

3.5.1 The monitoring procedures are as follows:

- Monitoring Stations:
  - LC6a: The monitoring station was set at a point 1m from the exterior of the sensitive receiver fence wall and set at a position 1.2m above the ground. Façade measurement is carried out for noise monitoring.
  - LC9: The monitoring station was set at the top of parapet wall of sensitive receivers building and the noise monitoring station is set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 5m above the ground.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time was set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - measurement time : Leq<sub>(30min)</sub> was used as the monitoring parameter for the time period between 0700 - 1900 hours on normal weekdays. For all other time periods, Leq<sub>(5min)</sub> was recorded.
- Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement will be considered invalid and repeat of noise measurement is required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station was checked with the portable wind meter. Noise monitoring should be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

#### Maintenance / Calibration

3.5.2 Maintenance and Calibration procedures are as follows:

- The microphone head of the sound level meter and calibrator should be cleaned with a soft cloth at quarterly intervals.
- The sound level meter and calibrator should be calibrated annually by a HOKLAS laboratory.
- Relevant calibration certificates are provided in **Appendix D**.



**3.6 Results and Observations**

- 3.6.1 The schedule of noise monitoring and data recovery schedule in reporting period is provided in **Appendix E**.
- 3.6.2 The weather conditions during the monitoring period are provided in **Appendix L**.
- 3.6.3 The noise monitoring data are summarized in **Table 3.4**. Detailed monitoring data are presented in **Appendix G**.

Table 3.4 Summary of Noise Impact Monitoring Results

Monitoring Station	Leq <sub>(30min)</sub> Range, dB(A)		Leq <sub>(30min)</sub> Limit Level, dB(A)
	Measured	Corrected	
LC6a <sup>1</sup>	66-72	61-67	75
LC9	61-73	N.A	75

Note:

- Leq<sub>(30min)</sub> was measured at day-time (0700-1900) on normal weekdays.
- 1) A distance correction of -5dB(A) has been applied in monitoring data of LC6a according to baseline monitoring report (Appendix G).

- 3.6.4 The adopted Action and Limit Levels for noise impact monitoring are presented in **Appendix C**.
- 3.6.5 The Event and Action Plan for noise is given in **Appendix J**.
- 3.6.6 No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.

**Other factor influencing the monitoring results**

- 3.6.7 There were no other noticeable external factors generally affecting the monitoring results in this reporting period.



## **4. LANDSCAPE AND VISUAL**

### **4.1 Audit Requirements**

4.1.1 In accordance with the updated EM&A Manual, the landscape and visual mitigation measures during the construction phase are audited by a Landscape Architect, as a member of the ET, on a regular basis to ensure compliance with the intended aims of the measures. Site inspections are undertaken at least once every two weeks throughout the construction period and once every two months during the operational phase to ensure compliance with the intended aims of the measures.

### **4.2 Results and Observations**

- 4.2.1 Site audits were carried out to monitor and audit the implementation of landscape and visual mitigation measures. The summary of the site audits are given in **Appendix I**.
- 4.2.2 Should non-compliance of the landscape and visual impact occur, action in accordance to the event action plan presented in **Appendix J** shall be carried out.
- 4.2.3 No non-compliance of the landscape and visual impact was recorded in the reporting month.

## **5. ENVIRONMENTAL SITE INSPECTION AND AUDIT**

### **5.1 Site Inspection**

- 5.1.1 Weekly site inspections and bi-weekly landscape and visual impact inspections were carried out to monitor the implementation of proper environmental pollution control and mitigation measures for the Project.
- 5.1.2 In the reporting period, site inspections were carried out on 7, 14, 22 and March 2019 and the landscape and visual impact inspection were carried out on 7 and 22 March 2019.
- 5.1.3 The summary of the site audits are given in **Appendix I**.

## **6. Advice on the Solid and Liquid Waste Management status**

- 6.1.1 The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting was carried out on site. Receptacles were available for general refuse collection.
- 6.1.2 As advised by the Contractor, 0m<sup>3</sup> of inert C&D materials were generated and 0m<sup>3</sup> general refuse was generated in the reporting period. Monthly summary of waste flow table is detailed in **Appendix M**.



## **7. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

### **7.1 Environmental Exceedance**

- 7.1.1 No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.
- 7.1.2 No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.

### **7.2 Complaints, Notification of Summons and Successful Prosecution**

- 7.2.1 No complaints, notification of summons or successful prosecutions were received in the reporting period.
- 7.2.2 Cumulative complaint log, summaries of complaints, notification of summons and successful prosecutions are presented in **Appendix H**.

## **8. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES**

### **8.1 Implementation Status**

- 8.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and the EM&A Manuals. The implementation status of the mitigation measures during the reporting period is summarized in **Appendix K**.

## **9. FUTURE KEY ISSUES**

### **9.1 Construction Works for the Coming Month**

- 9.1.1 During the coming reporting period, the principal work activities within the site included:
- Reinstatement and construction of access

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

- 9.2.1 Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

- 9.2.2 The anticipated impact of principal work activities within the site and the recommended mitigation measures are shown in **Appendix N**.

### **9.3 Monitoring Schedules for the Coming Months**

- 9.3.1 The tentative schedules for environmental monitoring in the coming months are provided in **Appendix E**.

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### 10. CONCLUSIONS

- 10.1.1 The construction phase and EM&A programme of the Project commenced on 29 February 2016.
- 10.1.2 No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.
- 10.1.3 No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.
- 10.1.4 In the reporting period, site inspections were carried out on 7, 14, 22 and March 2019 and the landscape and visual impact inspection were carried out on 7 and 22 March 2019.
- 10.1.5 No complaints, notification of summons or successful prosecutions were received in the reporting period.

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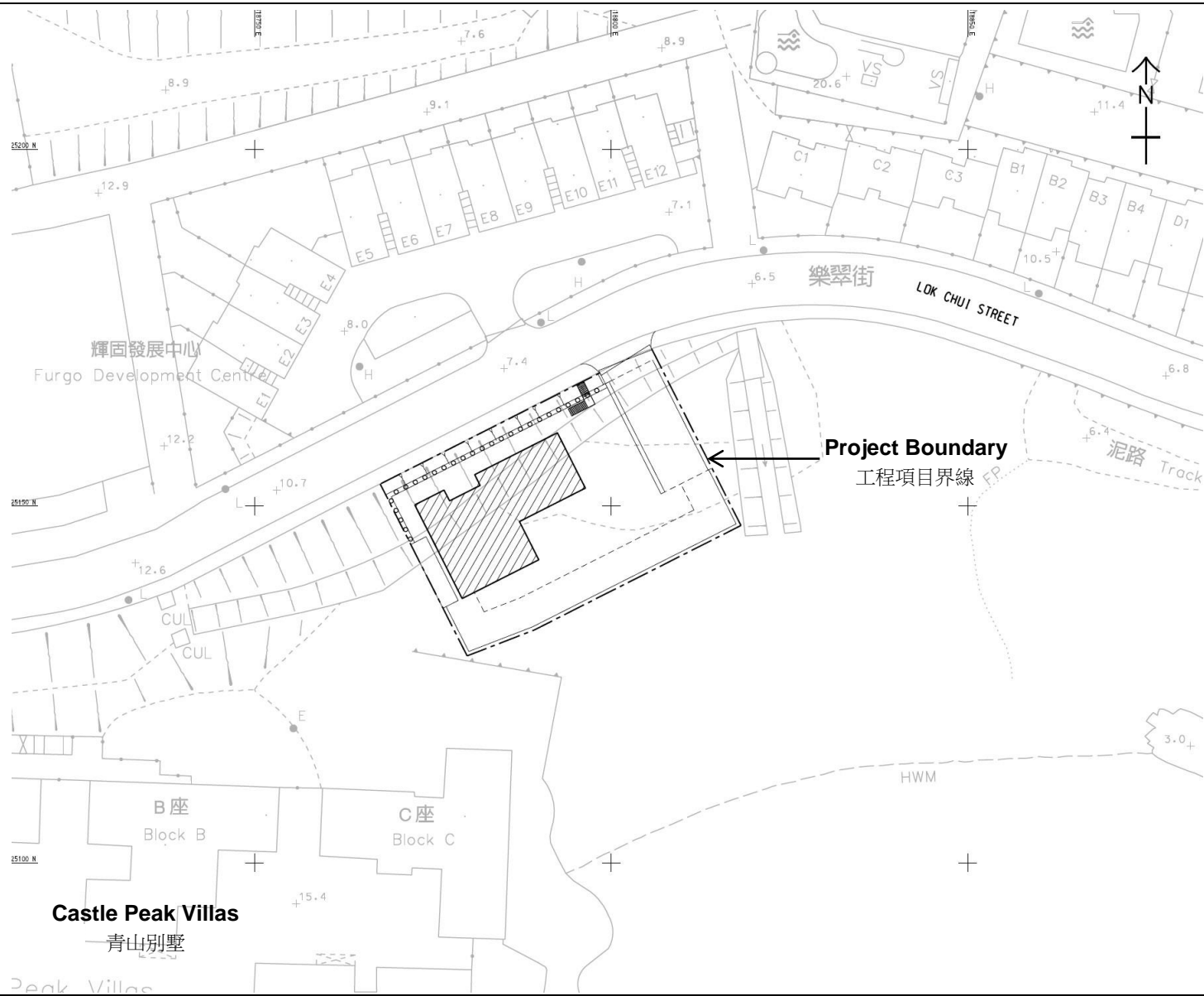
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### **Figure 1**

### **Project General Layout**





**Location of the Proposed Sewage Pumping Station at Lok Chui Street near Castle Peak Villas**  
 位於樂翠街近青山別墅的擬建污水泵水站

Figure 1

## **FUGRO TECHNICAL SERVICES LIMITED**

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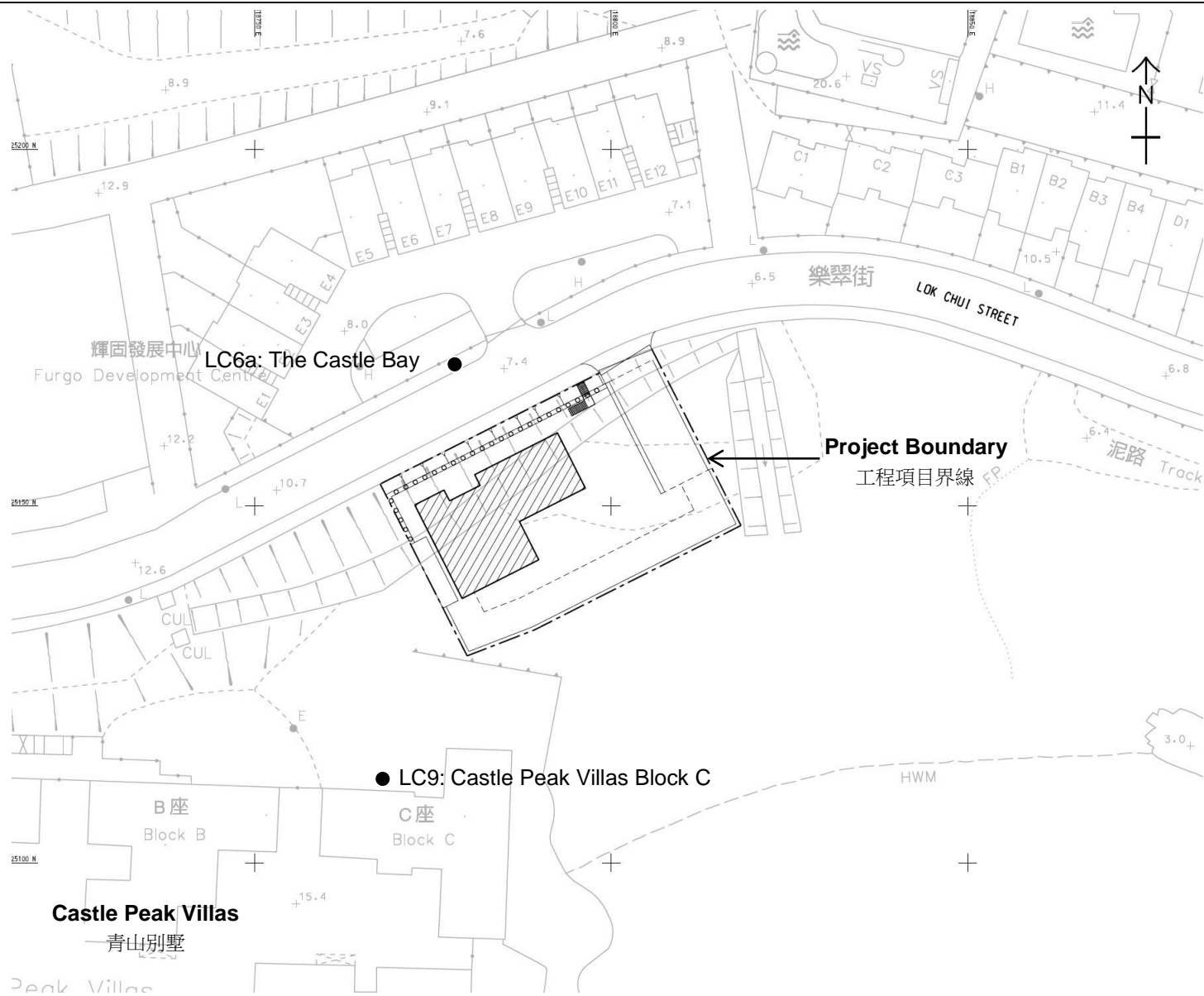
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### **Figure 2**

#### **Air and Noise Monitoring Locations**



**Air and Noise Monitoring Locations**

**Figure 2**

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LC6a: The Castle Bay






LC9: Castle Peak Villas Block C



**Note:**

1) LC6a: The air and noise monitoring station is set at a point 1m from the exterior of the sensitive receiver fence wall, and set at a position 1.2m above ground. Façade measurement will be carried out for noise monitoring.

2) LC9: The air monitoring station is set at the top of parapet wall of sensitive receivers building and the noise monitoring station is set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 5m above the ground.

- Legend:
-  Proposed Air Monitoring Location
  -  Proposed Noise Monitoring Location
  -  1m from the exterior building façade

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### **Appendix A**

### **Construction Programme**

ID	Task Name	Baseline Duration	Duration	Baseline Start	Baseline Finish	Actual Start	Actual Finish	% complete	Start	Finish	Predecessors	Gantt Chart (2015-2020)															
1301	Trial pits proposal	180 days	180 days	Sun 18/10/15	Thu 14/4/16	Sun 18/10/15	Thu 14/4/16	100%	Sun 18/10/15	Thu 14/4/16	129755,129855	[Gantt Chart Data]															
1302	Design of Temporary Work	30 days	30 days	Sat 16/1/16	Mon 15/2/16	Fri 16/9/16	Sun 16/10/16	100%	Fri 16/9/16	Sun 16/10/16	13035F	[Gantt Chart Data]															
1303	Submission of Design Temporary Work	0 days	351 days	Mon 15/2/16	Mon 15/2/16	Sun 16/10/16	Mon 2/10/17	100%	Sun 16/10/16	Mon 2/10/17	13145F-60 days	[Gantt Chart Data]															
1304	Hong Fai Road	240 days	240 days	Fri 18/8/17	Sat 14/4/18	Wed 8/2/17	Thu 5/10/17	100%	Wed 8/2/17	Thu 5/10/17		[Gantt Chart Data]															
1305	From Manhole 1903 to 0716	240 days	240 days	Fri 18/8/17	Sat 14/4/18	Wed 8/2/17	Thu 5/10/17	100%	Wed 8/2/17	Thu 5/10/17	1282FS-210 days	[Gantt Chart Data]															
1306	From Manhole 0703 to 0701	25 days	25 days	Wed 21/3/18	Sat 14/4/18	Mon 11/9/17	Thu 5/10/17	100%	Mon 11/9/17	Thu 5/10/17	1305FF	[Gantt Chart Data]															
1307	Connection to Siu Lam Tsuen Road From Manhole 0716 to 0718	35 days	35 days	Sun 11/3/18	Sat 14/4/18	Fri 1/9/17	Thu 5/10/17	100%	Fri 1/9/17	Thu 5/10/17	1305FF	[Gantt Chart Data]															
1308												[Gantt Chart Data]															
1309	EOT Claim 020 - Delay for construction of CSD Married Staff Quarter (On going event)	0 days?	1112 days?	NA	NA	NA	NA	0%	Thu 15/12/16	Tue 31/12/19		[Gantt Chart Data]															
1310	Pending ER confirm works details	0 days?	382 days?	NA	NA	NA	NA	0%	Thu 15/12/16	Sun 31/12/17		[Gantt Chart Data]															
1311	Design and Endorsement of TTA drawings and TTA Implementation	0 days?	150 days	NA	NA	NA	NA	0%	Mon 1/1/18	Wed 30/5/18	1310	[Gantt Chart Data]															
1312	Additional construction time due to revised TTA implementation period	0 days?	300 days	NA	NA	NA	NA	0%	Thu 7/3/19	Tue 31/12/19	1319	[Gantt Chart Data]															
1313	Access Road Leading to CSD Married Staff Quarter	280 days	280 days	Fri 15/4/16	Thu 19/1/17	NA	NA	0%	Thu 31/5/18	Wed 6/3/19		[Gantt Chart Data]															
1314	From Manhole 1104 to Manhole 1110	45 days	45 days	Fri 15/4/16	Sun 29/5/16	NA	NA	0%	Thu 31/5/18	Sat 14/7/18	1301SS+180 days,1311	[Gantt Chart Data]															
1315	From Manhole 1201 to Manhole 1203	25 days	25 days	Mon 30/5/16	Thu 23/6/16	NA	NA	0%	Sun 15/7/18	Wed 8/8/18	1314	[Gantt Chart Data]															
1316	From Manhole 2001 to Manhole 1203	20 days	20 days	Fri 24/6/16	Wed 13/7/16	NA	NA	0%	Thu 9/8/18	Tue 28/8/18	1315	[Gantt Chart Data]															
1317	From Manhole 1203 to Manhole 1110	20 days	20 days	Thu 14/7/16	Tue 2/8/16	NA	NA	0%	Wed 29/8/18	Mon 17/9/18	1316	[Gantt Chart Data]															
1318	From Manhole 1110 to Manhole 1118	100 days	100 days	Wed 3/8/16	Thu 10/11/16	NA	NA	0%	Tue 18/9/18	Wed 26/12/18	1317	[Gantt Chart Data]															
1319	From Manhole 1118 to Manhole 1122	70 days	70 days	Fri 11/11/16	Thu 19/1/17	NA	NA	0%	Thu 27/12/18	Wed 6/3/19	1318	[Gantt Chart Data]															
1320	Siu Lam Road	20 days	20 days	Mon 26/3/18	Sat 14/4/18	NA	NA	0%	Tue 31/7/18	Sun 19/8/18		[Gantt Chart Data]															
1321	Connection From Manhole 0901 to 0721 after trenchless	20 days	20 days	Mon 26/3/18	Sat 14/4/18	NA	NA	0%	Tue 31/7/18	Sun 19/8/18	1023SS,1049,1245	[Gantt Chart Data]															
1322	CCTV inspection	0 days?	60 days	NA	NA	NA	NA	0%	Sat 2/11/19	Tue 31/12/19	1323FF	[Gantt Chart Data]															
1323	Completion of Section 9C	0 days	0 days	Sat 14/4/18	Sat 14/4/18	NA	NA	0%	Tue 31/12/19	Tue 31/12/19	1321,1305,1306,1307,12	[Gantt Chart Data]															
1324	Section 9C - Inclement Weather Granted (EOT Claim No. 3.18, up to 31 July 2017)	0 days?	53 days	NA	NA	NA	NA	0%	Wed 1/1/20	Sat 22/2/20	1323	[Gantt Chart Data]															
1325												[Gantt Chart Data]															
1326	Duration of Section 11A - Lok Chui Street Sewage Pumping Station	929 days	929 days	Mon 20/7/15	Fri 2/2/18	Mon 20/7/15	NA	93%	Mon 20/7/15	Fri 2/2/18		[Gantt Chart Data]															
1327	Inclement Weather Granted (EOT Claim No. 3.18, up to 31 July 2017)	0 days?	58 days	NA	NA	NA	NA	0%	Sat 3/2/18	Sun 1/4/18	1326	[Gantt Chart Data]															
1328	Granted under EOT Ordrer 11 (Delayed Possession of Site)	0 days?	40 days	NA	NA	NA	NA	0%	Mon 2/4/18	Fri 11/5/18	1327	[Gantt Chart Data]															
1329	Additional Time for Completion	0 days?	347 days	NA	NA	NA	NA	0%	Mon 11/6/18	Thu 23/5/19	1328,1456FF	[Gantt Chart Data]															
1330												[Gantt Chart Data]															
1331	EOT claim - Change of Design at LCS SPS (Double roof slab)	0 days?	326 days	NA	NA	Mon 7/8/17	NA	0%	Mon 7/8/17	Thu 28/6/18		[Gantt Chart Data]															
1332	Revised construction details from ER	0 days?	0 days	NA	NA	Mon 7/8/17	Mon 7/8/17	100%	Mon 7/8/17	Mon 7/8/17		[Gantt Chart Data]															
1333	Additional roof slab of transformer room	0 days?	45 days	NA	NA	NA	NA	0%	Tue 15/5/18	Thu 28/6/18	1332,1432	[Gantt Chart Data]															
1334												[Gantt Chart Data]															
1335	EOT Claim - Additional Works in Transformer Room at Lok Chui Street SPS	0 days?	399 days	NA	NA	Thu 26/10/17	NA	22%	Thu 26/10/17	Wed 28/11/18		[Gantt Chart Data]															
1336	Revised construction details from ER	0 days?	0 days	NA	NA	Thu 26/10/17	Thu 26/10/17	100%	Thu 26/10/17	Thu 26/10/17		[Gantt Chart Data]															
1337	Additional construction time due to revised details (ie. Box out, pump sump, additional wall opening)	0 days?	90 days	NA	NA	NA	NA	0%	Sat 20/1/18	Thu 19/4/18	1336,1431	[Gantt Chart Data]															
1338	Laying additional DN100 DI drain pipe	0 days?	5 days	NA	NA	NA	NA	0%	Fri 20/4/18	Tue 24/4/18	1337	[Gantt Chart Data]															
1339	Additional plastic chain storage box	0 days?	366 days	NA	NA	NA	NA	0%	Thu 26/10/17	Fri 26/10/18		[Gantt Chart Data]															
1340	Procurement	0 days?	90 days	NA	NA	NA	NA	0%	Thu 26/10/17	Tue 23/1/18	1336	[Gantt Chart Data]															
1341	Fabrication and delivery	0 days?	90 days	NA	NA	NA	NA	0%	Wed 24/1/18	Mon 23/4/18	1340	[Gantt Chart Data]															
1342	Installation on site	0 days?	5 days	NA	NA	NA	NA	0%	Mon 22/10/18	Fri 26/10/18	1341,1445	[Gantt Chart Data]															
1343	Additional CLP single door	0 days?	380 days	NA	NA	Thu 26/10/17	NA	22%	Thu 26/10/17	Fri 9/11/18		[Gantt Chart Data]															
1344	Procurement	0 days?	90 days	NA	NA	Thu 26/10/17	NA	67%	Thu 26/10/17	Tue 23/1/18	1336	[Gantt Chart Data]															
1345	Prepare and submission of shop drawing	0 days?	60 days	NA	NA	NA	NA	0%	Wed 24/1/18	Sat 24/3/18	1344	[Gantt Chart Data]															

Project: Rolling Programme (Nov 2017)  
Date: 28 Nov 2017  
EOT Entitlement Programme based on Master Programme (Rev 0-A)

Task		Critical Split		Rolled Up Task		Rolled Up Baseline Milestone		Project Summary
Task Progress		Baseline		Rolled Up Critical Task		Rolled Up Progress		Group By Summary
Critical Task		Milestone		Rolled Up Milestone		Split		Inactive Task
Critical Task Progress		Baseline Milestone		Baseline Summary		Baseline Split		Inactive Milestone
Critical		Summary		Rolled Up Baseline		External Tasks		Deadline



ID	Task Name	Baseline Duration	Duration	Baseline Start	Baseline Finish	Actual Start	Actual Finish	% omplet	Start	Finish	Predecessors	Gantt Chart (2015-2020)															
1396												[Gantt Chart Area]															
1397	Mini-pile Foundation and Soldier Pile	297 days	369 days	Tue 1/12/15	Thu 22/9/16	Sun 31/1/16	Thu 2/2/17	100%	Sun 31/1/16	Thu 2/2/17		[Gantt Chart Area]															
1398	Mobilization of plant for predrilling works	7 days	7 days	Tue 1/12/15	Mon 7/12/15	Sun 31/1/16	Sat 6/2/16	100%	Sun 31/1/16	Sat 6/2/16	1394	[Gantt Chart Area]															
1399	Construct settlement and piezometer for monitoring	10 days	10 days	Tue 8/12/15	Thu 17/12/15	Sun 7/2/16	Tue 16/2/16	100%	Sun 7/2/16	Tue 16/2/16	1398	[Gantt Chart Area]															
1400	Predrilling works of mini-pile and soldier pile	23 days	23 days	Fri 18/12/15	Sat 9/1/16	Fri 29/4/16	Sat 21/5/16	100%	Fri 29/4/16	Sat 21/5/16	1389,1399	[Gantt Chart Area]															
1401	Submission of predrilling report	15 days	15 days	Sun 10/1/16	Sun 24/1/16	Sun 22/5/16	Sun 5/6/16	100%	Sun 22/5/16	Sun 5/6/16	1400	[Gantt Chart Area]															
1402	Mobilization of plant for 610mm soldier pile	14 days	14 days	Sun 10/1/16	Sat 23/1/16	Sun 22/5/16	Sat 4/6/16	100%	Sun 22/5/16	Sat 4/6/16	1395,1400	[Gantt Chart Area]															
1403	Construction of soldier pile (43 nos)	130 days	130 days	Sun 24/1/16	Wed 1/6/16	Sun 5/6/16	Wed 12/10/16	100%	Sun 5/6/16	Wed 12/10/16	1402	[Gantt Chart Area]															
1404	Mobilization of plant for mini-pile (64 nos)	14 days	14 days	Thu 19/5/16	Wed 1/6/16	Thu 29/9/16	Wed 12/10/16	100%	Thu 29/9/16	Wed 12/10/16	1403FS-14 days	[Gantt Chart Area]															
1405	Drilling of mini-piles	50 days	50 days	Thu 2/6/16	Thu 21/7/16	Thu 13/10/16	Thu 1/12/16	100%	Thu 13/10/16	Thu 1/12/16	1404	[Gantt Chart Area]															
1406	Installation of Rein-bar and Grouting	14 days	14 days	Fri 2/12/16	Thu 4/8/16	Thu 15/12/16	Fri 2/12/16	100%	Fri 2/12/16	Thu 15/12/16	1405	[Gantt Chart Area]															
1407	Mobilization for proof drilling	7 days	7 days	Fri 29/7/16	Thu 4/8/16	Fri 9/12/16	Thu 15/12/16	100%	Fri 9/12/16	Thu 15/12/16	1406FS-7 days	[Gantt Chart Area]															
1408	Proof Drilling	14 days	14 days	Fri 5/8/16	Thu 18/8/16	Fri 16/12/16	Thu 29/12/16	100%	Fri 16/12/16	Thu 29/12/16	1407	[Gantt Chart Area]															
1409	Submission of proof drilling report	14 days	14 days	Fri 19/8/16	Thu 1/9/16	Thu 12/1/17	Fri 30/12/16	100%	Thu 12/1/17	Fri 30/12/16	1408	[Gantt Chart Area]															
1410	Preparation of loading Test	21 days	21 days	Fri 5/8/16	Thu 25/8/16	Fri 16/12/16	Thu 5/1/17	100%	Fri 16/12/16	Thu 5/1/17	1407	[Gantt Chart Area]															
1411	Carry out loading test	14 days	14 days	Fri 26/8/16	Thu 8/9/16	Fri 6/1/17	Thu 19/1/17	100%	Fri 6/1/17	Thu 19/1/17	1410	[Gantt Chart Area]															
1412	Submission of loadign test report	14 days	14 days	Fri 9/9/16	Thu 22/9/16	Fri 20/1/17	Thu 2/2/17	100%	Fri 20/1/17	Thu 2/2/17	1411	[Gantt Chart Area]															
1413												[Gantt Chart Area]															
1414	Structural Work of Pumping Station	377 days	535 days	Fri 9/9/16	Wed 20/9/17	Fri 20/1/17	NA	80%	Fri 20/1/17	Sun 8/7/18		[Gantt Chart Area]															
1415	Temporary cofferdam for ELS for construction of pumping station	90 days	90 days	Fri 9/9/16	Wed 7/12/16	Fri 20/1/17	Wed 19/4/17	100%	Fri 20/1/17	Wed 19/4/17	1409,1411,1412FS-14 days	[Gantt Chart Area]															
1416	Excavation and shoring to formation level for wet well construction (refer drg. No. 5321A, formation level = -2.375mPD - 0.15m)	30 days	30 days	Thu 8/12/16	Fri 6/1/17	Thu 20/4/17	Fri 19/5/17	100%	Thu 20/4/17	Fri 19/5/17	1415	[Gantt Chart Area]															
1417	Welding of pile head (i.e.PC01 to PC 14)	9 days	9 days	Sat 7/1/17	Sun 15/1/17	Sat 20/5/17	Sun 28/5/17	100%	Sat 20/5/17	Sun 28/5/17	1416	[Gantt Chart Area]															
1418	Blinding layer	2 days	2 days	Mon 16/1/17	Tue 17/1/17	Mon 29/5/17	Tue 30/5/17	100%	Mon 29/5/17	Tue 30/5/17	1417	[Gantt Chart Area]															
1419	Construction of base slab of wet well	14 days	14 days	Wed 18/1/17	Tue 31/1/17	Wed 31/5/17	Tue 13/6/17	100%	Wed 31/5/17	Tue 13/6/17	1418	[Gantt Chart Area]															
1420	Construction of pump plinth	0 days?	2 days	NA	NA	Mon 12/6/17	Tue 13/6/17	100%	Mon 12/6/17	Tue 13/6/17	1419FF	[Gantt Chart Area]															
1421	Construction of Wall of wet well upto approx. -0.675mPD to 0.725mPD	14 days	14 days	Wed 1/2/17	Tue 14/2/17	Wed 14/6/17	Tue 27/6/17	100%	Wed 14/6/17	Tue 27/6/17	1419	[Gantt Chart Area]															
1422	Excavation and shoring to formation levels for Valve chamber, Coarse screen chamber and emergency storage tank	25 days	25 days	Wed 15/2/17	Sat 11/3/17	Wed 28/6/17	Sat 22/7/17	100%	Wed 28/6/17	Sat 22/7/17	1421	[Gantt Chart Area]															
1423	Welding of pile head (i.e.PB01 to PB15, PD01 to PD08 and PE01 to PE10 etc)	20 days	20 days	Sun 12/3/17	Fri 31/3/17	Sun 23/7/17	Fri 11/8/17	100%	Sun 23/7/17	Fri 11/8/17	1422	[Gantt Chart Area]															
1424	Blinding layer	2 days	2 days	Sat 1/4/17	Sun 2/4/17	Sat 12/8/17	Sun 13/8/17	100%	Sat 12/8/17	Sun 13/8/17	1423	[Gantt Chart Area]															
1425	Construction of base slabs of Valve chamber, Coarse screen chamber and emergency storage tank	25 days	25 days	Mon 3/4/17	Thu 27/4/17	Mon 14/8/17	Thu 7/9/17	100%	Mon 14/8/17	Thu 7/9/17	1424	[Gantt Chart Area]															
1426	Excavation to formation level of switch room and transformer rooms	20 days	20 days	Fri 28/4/17	Wed 17/5/17	Fri 8/9/17	Wed 27/9/17	100%	Fri 8/9/17	Wed 27/9/17	1425	[Gantt Chart Area]															
1427	Welding pile head (ie. PA01 to PA12)	10 days	10 days	Thu 18/5/17	Sat 27/5/17	Thu 28/9/17	Sat 7/10/17	100%	Thu 28/9/17	Sat 7/10/17	1426	[Gantt Chart Area]															
1428	Construction of walls below ground level	25 days	25 days	Sun 28/5/17	Wed 21/6/17	Thu 26/10/17	Sun 19/11/17	100%	Thu 26/10/17	Sun 19/11/17	1427,1336	[Gantt Chart Area]															
1429	Construction of ground floor slab	20 days	20 days	Thu 22/6/17	Tue 11/7/17	Mon 20/11/17	Sat 9/12/17	100%	Mon 20/11/17	Sat 9/12/17	1428	[Gantt Chart Area]															
1430	Backfilling to ground floor slab	25 days	25 days	Wed 12/7/17	Sat 5/8/17	Sun 10/12/17	NA	50%	Sun 10/12/17	Wed 3/1/18	1429	[Gantt Chart Area]															
1431	Construction of walls up to roof slab	25 days	25 days	Fri 28/7/17	Mon 21/8/17	NA	NA	0%	Tue 26/12/17	Fri 19/1/18	1430FS-9 days	[Gantt Chart Area]															
1432	Construction of roof slab	20 days	20 days	Tue 22/8/17	Sun 10/9/17	NA	NA	0%	Wed 25/4/18	Mon 14/5/18	1431,1338	[Gantt Chart Area]															
1433	Water Tightness test of inlet chamber, coarse screen chamber and valve chamber	15 days	15 days	Tue 22/8/17	Tue 5/9/17	NA	NA	0%	Wed 25/4/18	Wed 9/5/18	1431,1338	[Gantt Chart Area]															
1434	Roof kerb and staircase	10 days	10 days	Mon 11/9/17	Wed 20/9/17	NA	NA	0%	Fri 29/6/18	Sun 8/7/18	1432,1433,1333	[Gantt Chart Area]															
1435												[Gantt Chart Area]															
1436	Internal Finishes	135 days	261 days	Thu 21/9/17	Fri 2/2/18	NA	NA	0%	Mon 9/7/18	Tue 26/3/19		[Gantt Chart Area]															
1437	Installation of GRP cover	0 days?	14 days	NA	NA	NA	NA	0%	Fri 20/7/18	Thu 2/8/18	1438FF	[Gantt Chart Area]															
1438	Plastering & Painting	25 days	25 days	Thu 21/9/17	Sun 15/10/17	NA	NA	0%	Mon 9/7/18	Thu 2/8/18	1434	[Gantt Chart Area]															
1439	Glaze Tile (Toilet)	14 days	14 days	Mon 16/10/17	Sun 29/10/17	NA	NA	0%	Fri 3/8/18	Thu 16/8/18	1438	[Gantt Chart Area]															
1440	Installation of water closet and washing basin in toilet	0 days?	14 days	NA	NA	NA	NA	0%	Fri 3/8/18	Thu 16/8/18	1439FF	[Gantt Chart Area]															

Task		Critical Split		Rolled Up Task		Rolled Up Baseline Milestone		Project Summary
Task Progress		Baseline		Rolled Up Critical Task		Rolled Up Progress		Group By Summary
Critical Task		Milestone		Rolled Up Milestone		Split		Inactive Task
Critical Task Progress		Baseline Milestone		Baseline Summary		Baseline Split		Inactive Milestone
Critical		Summary		Rolled Up Baseline		External Tasks		Deadline

Project: Rolling Programme (Nov 2017)  
 Date: 28 Nov 2017  
 EOT Entitlement Programme based on Master Programme (Rev 0-A)







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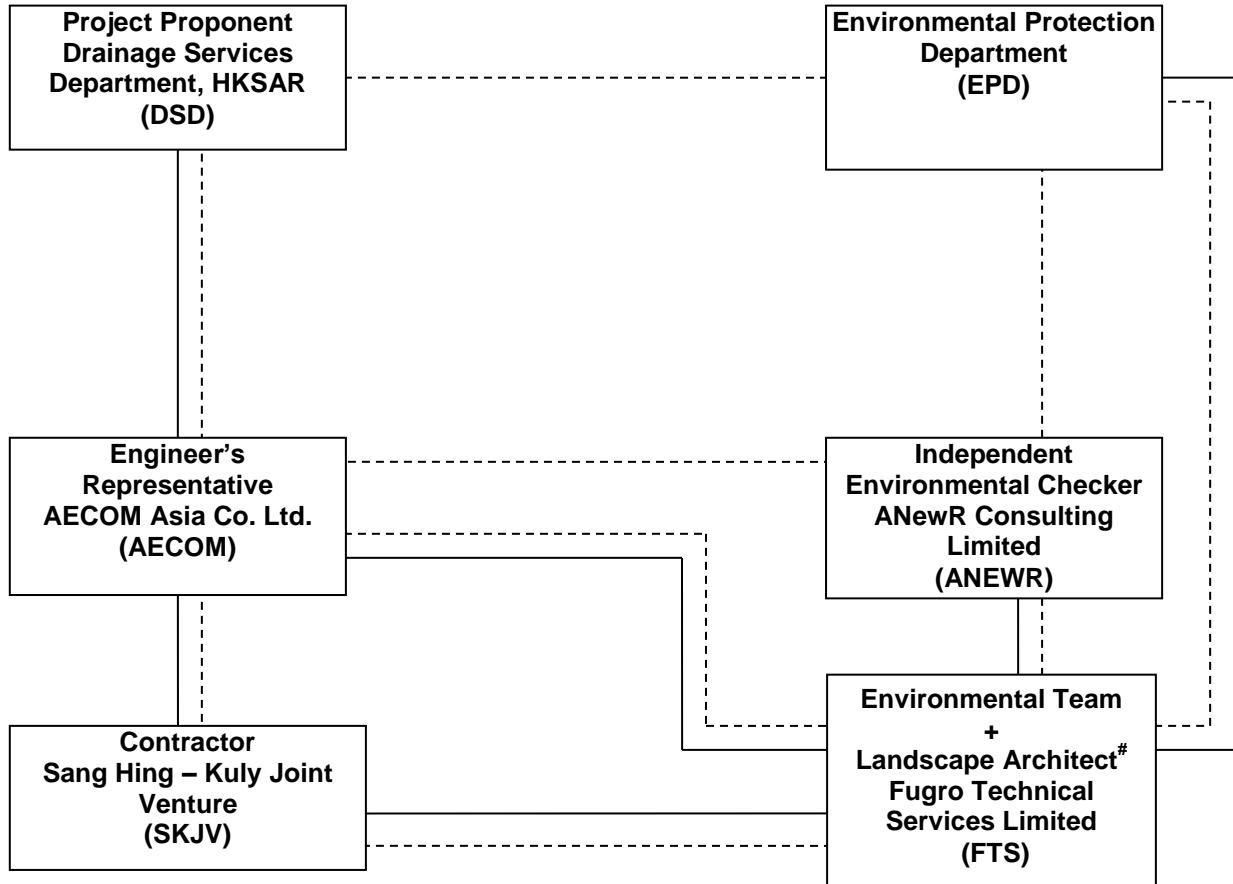
## Appendix B

### Project Organization Chart

# FUGRO TECHNICAL SERVICES LIMITED

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Remark:

# The Landscape Architect with a minimum of 1-2years on site experience as a member of the ET to monitor and audit the landscaping installation works and landscape protection measures.

**Legend:**

— Line of Reporting

- - - Line of Communication

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### **Appendix C**

#### **Action and Limit Levels for Air Quality and Noise**

## FUGRO TECHNICAL SERVICES LIMITED

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### Action and Limit Levels for Air Quality

Parameter	Monitoring Station	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	LC6a	344	500
	LC9	335	

### Action and Limit Levels for Construction Noise

Time Period	Location	Action	Limit
0700-1900 hrs on normal weekdays	LC6a LC9	When one documented complaint is received	75* dB(A)

\* reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

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### **Appendix D**

#### **Calibration Certificates of Monitoring Equipment**

# FUGRO TECHNICAL SERVICES LIMITED

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# MaterialLab

Report no. : 940891CA181789(8)

Page 1 of 1

## CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

### Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor  
Manufacturer : SIBATA  
Model No. : LD-5  
Serial No. : 561775  
Specification Limit : NA  
Next Calibration Date : 10-Oct-2019

### Laboratory Information

Description : Reference balance  
Equipment ID. : R-039-12  
Date of Calibration : 11-Oct-2018      Ambient Temperature : 21 °C  
Calibration Location : Calibration Laboratory of FTS  
Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

### Calibration Results :

Reference concentration (mg/m <sup>3</sup> )	Total count for 1 hour	CPM (Count per minute)
0.0586	2253	37.55
0.0453	2044	34.07
0.1275	3030	50.50

### Remarks:

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m<sup>3</sup>) = K x [ UUT reading (CPM) ], where K = 0.001895
3. Correlation coefficient (r) : 0.9987

Checked by : comf  
CA-R-297 (22/07/2009)

Date : 15-11-2018

Certified by : Leung Kwok Tai  
Leung Kwok Tai (Assistant Manager)

Date : 15-11-2018

\*\* End of Report \*\*

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GEN01/0917





**FUGRO TECHNICAL SERVICES LIMITED**

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**MaterialLab**

Report no. : 940891CA181789(10)

Page 1 of 1

**CALIBRATION CERTIFICATE OF DUST METER**

Client : Fugro Technical Services Limited

Project : Calibration Services

**Client Supplied Information**

Details of Unit Under Test, UUT

Description : Laser dust monitor  
Manufacturer : SIBATA  
Model No. : LD-5  
Serial No. : 561790  
Specification Limit : NA  
Next Calibration Date : 10-Oct-2019

**Laboratory Information**

Description : Reference balance  
Equipment ID. : R-039-12  
Date of Calibration : 11-Oct-2018 Ambient Temperature : 21 °C  
Calibration Location : Calibration Laboratory of FTS  
Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

**Calibration Results :**

Reference concentration (mg/m <sup>3</sup> )	Total count for 1 hour	CPM (Count per minute)
0.0586	2135	35.58
0.0453	1847	30.78
0.1275	3087	51.45

**Remarks:**

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m<sup>3</sup>) = K x [ UUT reading (CPM) ], where K = 0.001964
3. Correlation coefficient (r) : 0.9974

Checked by :          Date : 15-11-2018 Certified by : K. Kwok Tai Date : 15-11-2018  
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**\*\* End of Report \*\***

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# MaterialLab

Report no.: 183057CA185567

Page 1 of 1

## CALIBRATION CERTIFICATE OF SOUND LEVEL METER

### Client Supplied Information

Client : MaterialLab Consultants Ltd.

Address : Room 723 & 725, 7/F., Block B Profit Industrial Building, 1-15 Kwai Fung Crescent, Kwai Chung, N.T.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Level Meter  
Manufacturer : Casella

	Meter	Microphone	Preamplifier
Model No.	CEL-63X	CE-251	CEL-495
Serial No.	4637931	01836	002752

Equipment ID : N-13  
Next Calibration Date : 14-Oct-2019  
Specification Limit : EN 61672: 2003 Type 1

### Laboratory Information

Description : B & K Acoustic Multifunction Calibrator 4226 (Traditional free field setting)  
Equipment ID. : R-108-1  
Date of Calibration : 15-Oct-2018 Ambient Temperature : 22 °C  
Calibration Location : Calibration Laboratory of FTS  
Method Used : By direct comparison

### Calibration Results :

Parameters	Mean Value (dB)	Specification Limit(dB)
A-weighting frequency response	4000Hz	2.2
	2000Hz	1.5
	1000Hz	0.0
	500Hz	-3.4
	250Hz	-8.8
	125Hz	-16.3
	63Hz	-26.3
Differential level linearity	31.5Hz	-39.2
	94dB-104dB	0.0
	104dB-114dB	0.0

### Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. For calibration: Reference range is 20-140dB, reference SPL is 94,104 & 114dB, frequency weighting is A,
4. The equipment does comply with EN 61672: 2003 Type 1 sound level meter for the above measurement.

Checked by : William  
CA-R-297 (22/07/2009)

Date : 22-10-2018

Certified by : Kit Tung  
Leung Kwok Tai (Assistant Manager)

Date : 24-10-2018

\*\* End of Report \*\*

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# MaterialLab

Report no.: 183057CA185248

Page 1 of 1

## CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

### Client Supplied Information

Client : MaterialLab Consultants Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Calibrator  
Manufacturer : Casella (Model CEL-120/1)  
Serial No. : 4358250  
Equipment ID : N/A  
Next Calibration Date : 02-Jul-2019  
Specification Limit : EN 60942: 2003 Type 1

### Laboratory Information

Description : Reference Sound level meter  
Equipment ID. : R-119-1  
Date of Calibration : 03-Jul-2018 Ambient Temperature : 22 °C  
Calibration Location : Calibration Laboratory of FTS  
Method Used : By direct comparison

### Calibration Results :

Parameters (Setting of UUT)	Mean Value (error of measurement)	Specification Limit(dB)
94dB	0.0 dB	±0.4dB
114dB	0.1 dB	

### Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. The equipment does comply with the specification limit.

Checked by : William  
CA-R-297 (22/07/2009)

Date : 10-7-2018

Certified by : Chan Chun Wai  
Chan Chun Wai (Manager)

Date : 16.7.2018

**\*\* End of Report \*\***

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### **Appendix E**

#### **Environmental Monitoring and Data Recovery Schedule**

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### **Project: Sewage Pumping Stations at Tai Lam Chung Tsuen Luen On San Tsuen, Tai Lam Valley and Lok Chui Street near Castle Peak Villas under the scope of “Tuen Mun Sewerage – Eastern Coastal Sewerage Extension” – DC/2014/01**

#### Impact Monitoring Schedule (March 2019)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2 A & N Impact Monitoring
3	4	5	6	7	8 A & N Impact Monitoring	9
10	11	12	13	14 A & N Impact Monitoring	15	16
17	18	19	20 A & N Impact Monitoring	21	22	23
24	25	26 A & N Impact Monitoring	27	28	29	30
31						

#### Remarks

1. A: 1-hr TSP monitoring at LC6a and LC9.
2. N: Noise monitoring at LC6a and LC9.

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## DATA RECOVERY SCHEDULE

Date	Air Quality Monitoring		Noise Monitoring	
	Monitoring Station* 1-hr TSP		Monitoring Station* LAeq (30min)	
	LC6a	LC9	LC6a	LC9
1				
2	√	√	√	√
3				
4				
5				
6				
7				
8	√	√	√	√
9				
10				
11				
12				
13				
14	√	√	√	√
15				
16				
17				
18				
19				
20	√	√	√	√
21				
22				
23				
24				
25				
26	√	√	√	√
27				
28				
29				
30				
31				
% of R	100	100	100	100

\* Remark type of parameters

% of R The percentage of Data Recovery is the actual monitoring over the scheduled monitoring

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### **Project: Sewage Pumping Stations at Tai Lam Chung Tsuen Luen On San Tsuen, Tai Lam Valley and Lok Chui Street near Castle Peak Villas under the scope of “Tuen Mun Sewerage – Eastern Coastal Sewerage Extension” – DC/2014/01**

#### Tentative Impact Monitoring Schedule (April 2019)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 A & N Impact Monitoring	2	3	4	5	6 A & N Impact Monitoring
7	8	9	10	11 A & N Impact Monitoring	12	13
14	15	16	17 A & N Impact Monitoring	18	19	20
21	22	23 A & N Impact Monitoring	24	25	26	27
28	29 A & N Impact Monitoring	30				

#### Remarks

1. A: 1-hr TSP monitoring at LC6a and LC9.
2. N: Noise monitoring at LC6a and LC9.
3. Actual monitoring schedule may be subjected to change due to any safety concern or adverse weather condition.

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### **Appendix F**

#### **Air Quality Monitoring Data and Graphical Presentations**



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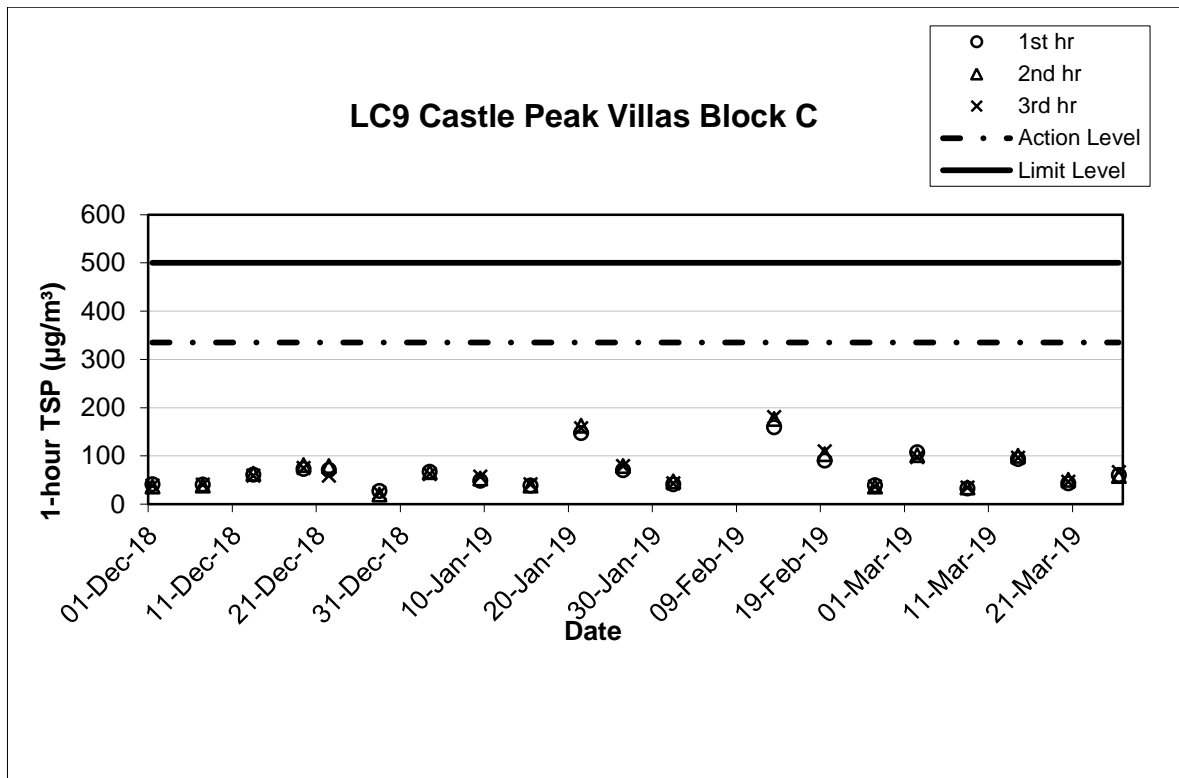
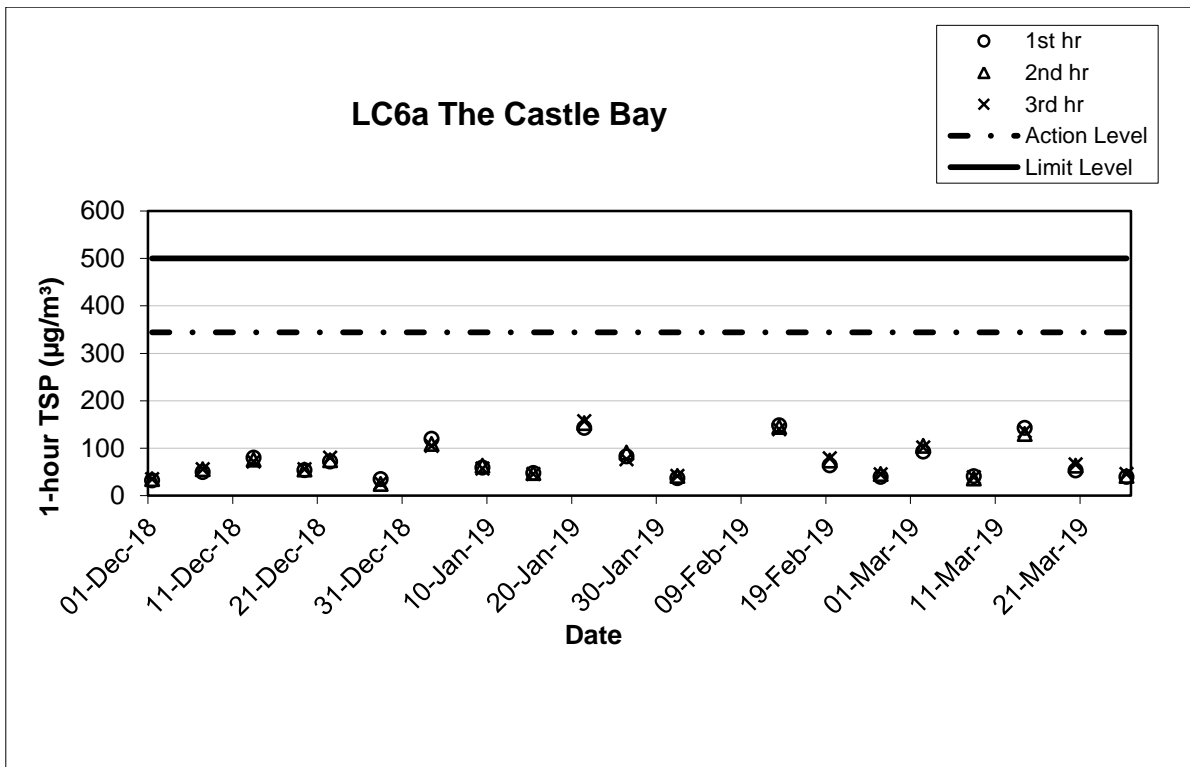


### LC6a The Castle Bay

1-hour TSP ( $\mu\text{g}/\text{m}^3$ )					
Date	Start Time	1st hr	2nd hr	3rd hr	Weather
02-Mar-19	08:58	93	105	102	Fine
08-Mar-19	13:00	41	36	39	Cloudy
14-Mar-19	13:09	143	130	136	Fine
20-Mar-19	13:30	53	63	66	Cloudy
26-Mar-19	14:32	40	42	46	Fine
	<b>Average</b>	76			
	<b>Max</b>	143			
	<b>Min</b>	36			

### LC9 Castle Peak Villas Block C

1-hour TSP ( $\mu\text{g}/\text{m}^3$ )					
Date	Start Time	1st hr	2nd hr	3rd hr	Weather
02-Mar-19	08:39	107	101	97	Fine
08-Mar-19	13:15	32	34	34	Cloudy
14-Mar-19	13:26	93	100	96	Fine
20-Mar-19	13:50	43	50	46	Cloudy
26-Mar-19	14:25	60	58	66	Fine
	<b>Average</b>	68			
	<b>Max</b>	107			
	<b>Min</b>	32			



**Note:**

- 1) The QA/QC procedures and detection Limits refer to section 2.2 and 2.5.
- 2) The other factors influencing the monitoring results refer to section 2.7.

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### **Appendix G**

#### **Noise Monitoring Data and Graphical Presentations**

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### LC6a The Castle Bay

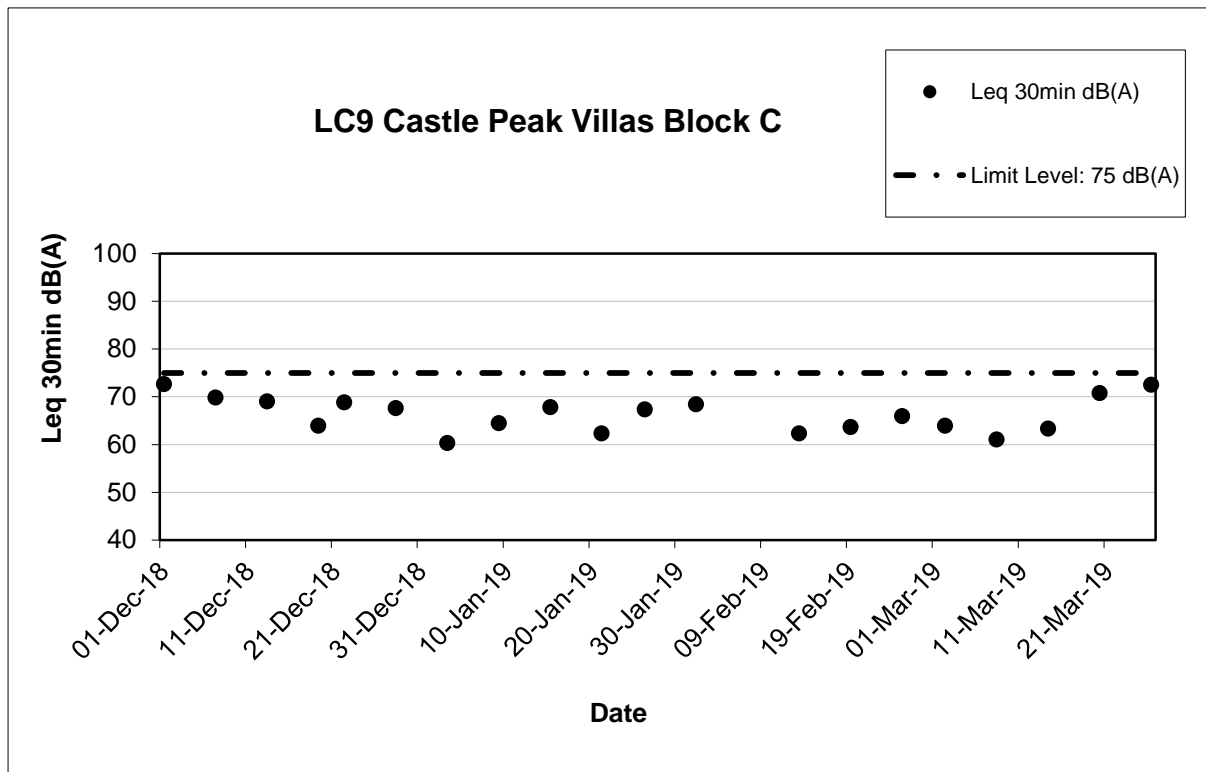
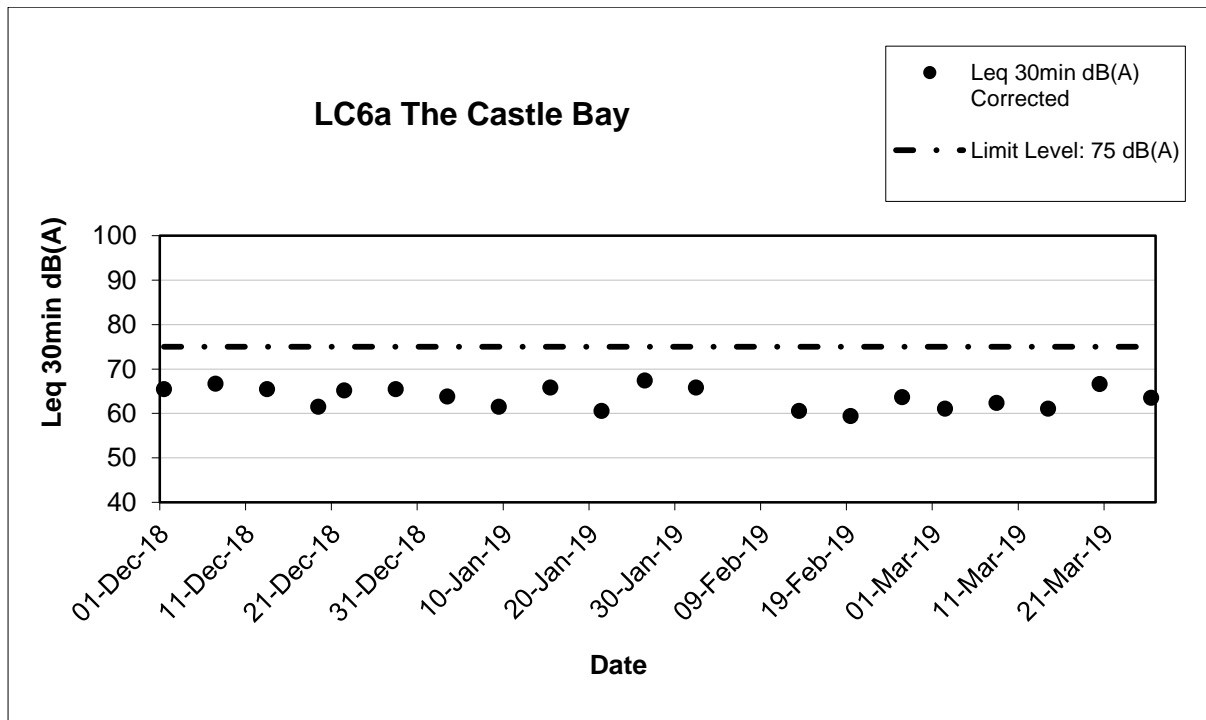
Date	Start Time	L <sub>eq</sub> 30min dB(A)	Corrected L <sub>eq</sub> 30min dB(A) <sup>1</sup>	L <sub>90</sub> dB(A)	L <sub>10</sub> dB(A)	Weather
02-Mar-19	09:05	66	61	58	68	Fine
08-Mar-19	13:00	67	62	58	70	Cloudy
14-Mar-19	14:25	66	61	58	68	Fine
20-Mar-19	14:38	72	67	63	74	Cloudy
26-Mar-19	15:12	69	64	64	73	Fine

Note:

1) A distance correction of -5dB(A) has been applied in monitoring data of LC6a according to baseline monitoring report (Appendix G).

### LC9 Castle Peak Villas Block C

Date	Start Time	L <sub>eq</sub> 30min dB(A)	Corrected L <sub>eq</sub> 30min dB(A)	L <sub>90</sub> dB(A)	L <sub>10</sub> dB(A)	Weather
02-Mar-19	09:54	64	N.A	57	66	Fine
08-Mar-19	13:45	61	N.A	55	63	Cloudy
14-Mar-19	13:36	63	N.A	57	65	Fine
20-Mar-19	13:59	71	N.A	60	73	Cloudy
26-Mar-19	14:25	73	N.A	67	75	Fine



**Note:**

- 1) The QA/QC procedures and detection Limits refer to section 3.2 and 3.5.
- 2) The other factors influencing the monitoring results refer to section 3.7.

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### **Appendix H**

#### **Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions**

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### Environmental Complaints Log

Complaint Log No.	Date of Receipt	Received From and Received By	Nature of Complaint	Date Investigated	Outcome	Date of Reply
Nil	-	-	-	-	-	-

### Cumulative Statistics on Complaints

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

### Cumulative Statistics on Notifications of Summons and Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Prosecutions This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

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### **Appendix I**

### **Site Audit Summary**



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### Summary of Site Audit

Inspection Date	Observation/ Comment	Follow Up Action	Completion Date
Follow-up action(s) of last reporting month:			
N.A	--	--	--
22/03/2019	The Contractor was reminded to regularly water spraying on site to prevent the dust nuisance to the surrounding.	N.A	
<b>Landscape and Visual Impact Inspection</b>			
07/03/2019 & 22/03/2019	Condition of LC-TC07 (R) and T0490 (R) was found recovering with newly grown leaves. Leaning trunk and broken branches remained.	Tree specialist should conduct a tree risk assessment for suitable treatment and continue to monitor the risk of falling.	ASAP

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### **Appendix J**

#### **Events and Action Plans**

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## Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	Contractor
<b>Action Level</b>				
Exceedance for one sample.	<ul style="list-style-type: none"> <li>Identify the source.</li> <li>Inform the IEC and the ER.</li> <li>Repeat measurement to confirm finding.</li> <li>Increase monitoring frequency to daily.</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by the ET.</li> <li>Check Contractor's working method.</li> </ul>	<ul style="list-style-type: none"> <li>Notify Contractor.</li> </ul>	<ul style="list-style-type: none"> <li>Rectify any unacceptable practice.</li> <li>Amend working methods if appropriate.</li> </ul>
Exceedance for two or more consecutive samples.	<ul style="list-style-type: none"> <li>Identify the source.</li> <li>Inform the IEC and the ER.</li> <li>Repeat measurements to confirm findings.</li> <li>Increase monitoring frequency to daily.</li> <li>Discuss with the IEC and the Contractor on remedial actions required.</li> <li>If exceedance continues, arrange meeting with the IEC and the ER.</li> <li>If exceedance stops, cease additional monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by the ET.</li> <li>Check the Contractor's working method.</li> <li>Discuss with the ET and the Contractor on possible remedial measures.</li> <li>Advise the ER on the effectiveness of the proposed remedial measures.</li> <li>Supervisor implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify the Contractor.</li> <li>Ensure remedial measures properly implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Amend proposal if appropriate.</li> </ul>
<b>Limit Level</b>				
Exceedance for one sample.	<ul style="list-style-type: none"> <li>Identify the source.</li> <li>Inform the ER and the DEP.</li> <li>Repeat measurement to confirm finding.</li> <li>Increase monitoring frequency to daily.</li> <li>Assess effectiveness of Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results.</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by the ET.</li> <li>Check Contractor's working method.</li> <li>Discuss with the ET and the Contractor on possible remedial measures.</li> <li>Advise the ER on the effectiveness of the proposed remedial measures.</li> <li>Supervisor implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify the Contractor.</li> <li>Ensure remedial measures are properly implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance.</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Amend proposal if appropriate.</li> </ul>
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> <li>Notify the IEC, the ER, the DEP and the Contractor.</li> <li>Identify the source.</li> <li>Repeat measurements to confirm findings.</li> <li>Increase monitoring frequency to daily.</li> <li>Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>Arrange meeting with the IEC and the ER to discuss the remedial actions to be taken.</li> <li>Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results.</li> <li>If exceedance stops, cease additional monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Discuss amongst the ER, ET and the Contractor on the potential remedial actions.</li> <li>Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> <li>Supervise the implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify the Contractor.</li> <li>In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented.</li> <li>Ensure remedial measures are properly implemented.</li> <li>If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance.</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Resubmit proposals if problem still not under control.</li> <li>Stop the relevant activity of works as determined by the ER until the exceedance is abated.</li> </ul>

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## Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	Contractor
Action Level	<ul style="list-style-type: none"> <li>Notify the IEC and the Contractor.</li> <li>Carry out investigation.</li> <li>Report the results of investigation to the IEC and the Contractor.</li> <li>Discuss with the Contractor and formulate remedial measures.</li> <li>Increase monitoring frequency to check mitigation effectiveness.</li> </ul>	<ul style="list-style-type: none"> <li>Review the analysed results submitted by the ET.</li> <li>Review the proposed remedial measures by the Contractor and advise the ER accordingly.</li> <li>Supervise the implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify the Contractor.</li> <li>Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>Ensure remedial measures are properly implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Submit noise mitigation proposals to IEC</li> <li>Implement noise mitigation proposals</li> </ul>
Limit Level	<ul style="list-style-type: none"> <li>Notify the IEC, the ER, the DEP and the Contractor.</li> <li>Identify the source.</li> <li>Repeat measurement to confirm findings.</li> <li>Increase monitoring frequency.</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>Inform the IEC, the ER and the DEP the causes &amp; actions taken for the exceedances.</li> <li>Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results.</li> <li>If exceedance stops, cease additional monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Discuss amongst the ER, the ET and the Contractor on the potential remedial actions.</li> <li>Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> <li>Supervise the implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify the Contractor.</li> <li>Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>Ensure remedial measures are properly implemented.</li> <li>If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance.</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Resubmit proposals if problem still not under control.</li> <li>Stop the relevant activity of works as determined by the ER until the exceedance is abated.</li> </ul>

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## Event / Action Plan for Landscape and Visual Impact

EVENT ACTION LEVEL	ACTION			
	ET	IEC	ER	Contractor
Design Check	<ul style="list-style-type: none"> <li>Check final design conforms to the requirements of EP and prepare report.</li> </ul>	<ul style="list-style-type: none"> <li>Check report.</li> <li>Recommend remedial design if necessary</li> </ul>	<ul style="list-style-type: none"> <li>Undertake remedial design if necessary</li> </ul>	
Nonconformity on one occasion	<ul style="list-style-type: none"> <li>Identify Source</li> <li>Inform IEC and ER</li> <li>Discuss remedial actions with IEC, ER and Contractor</li> <li>Monitor remedial actions until rectification has been completed</li> </ul>	<ul style="list-style-type: none"> <li>Check report</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise ER on effectiveness of proposed remedial measures.</li> <li>Check implementation of remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Notify Contractor</li> <li>Ensure remedial measures are properly implemented</li> </ul>	<ul style="list-style-type: none"> <li>Amend working methods</li> <li>Rectify damage and undertake any necessary replacement</li> </ul>
Repeated Nonconformity	<ul style="list-style-type: none"> <li>Identify Source</li> <li>Inform IEC and ER</li> <li>Increase monitoring frequency</li> <li>Discuss remedial actions with IEC, ER and Contractor</li> <li>Monitor remedial actions until rectification has been completed</li> <li>If nonconformity stops, cease additional monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring report</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise ER on effectiveness of proposed remedial measures</li> <li>Supervise implementation of remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Notify Contractor</li> <li>Ensure remedial measures are properly implemented</li> </ul>	<ul style="list-style-type: none"> <li>Amend working methods</li> <li>Rectify damage and undertake any necessary replacement</li> </ul>

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### **Appendix K**

#### **Implementation Status of Environmental Mitigation Measures**

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## Air Quality

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
4.5	Undertake all air pollution measures to prevent dust nuisance as a result of and during construction activities.	All unpaved haul roads, bulldozed material, exposed site areas / Throughout construction period	Contractor	TMEIA	^
4.5	No debris or other materials shall be burnt on the works areas.	All areas / Throughout construction period	Contractor	TMEIA. Avoid smoke impacts and disturbance	^
4.5	Dust suppression measures shall be provided and to be submitted to and approved by the Engineer.	All areas / Throughout construction period	Contractor	TMEIA	^
4.5	Stockpiles of imported material kept on site shall be contained within hoardings, dampened and/or covered during dry and windy weather.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust generation	^
4.5	Material stockpiled along side trenches should be covered with tarpaulins whenever works are within village boundaries.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust generation / visual impacts	^
4.5	Water sprays shall be used during the delivery and handling of cement, sands aggregates and the like.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust generation	^
4.5	No batching of concrete should be carried out on site. Concrete should be used in ready mixed form and off loaded adjacent to designated works areas.	All areas / Throughout construction period	Contractor	TMEIA	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
4.5	Any vehicle used for moving cement, sands, aggregates and construction waste and the like shall have properly fitting side and tail boards. Materials shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust and spillage of material	^
4.5	No earth, mud, debris, dust and the like shall be deposited on public roads. Details of proposals for the wheel cleaning facilities shall be agreed with the Engineer. Such wheel washing facility shall be usable prior to any earthworks excavation activity on the Site.	All areas, particularly pumping station sites / Throughout construction period	Contractor	TMEIA Avoid spread/ deposition of mud	^
4.6.9	Pumping station vent shafts should be located away from sensitive receivers.	All pumping stations	DSD	TMEIA Avoid odour impacts	N/A
4.6.18	Use a covered container to store and transport the screenings from the pump house.	All pumping stations /operational phase	DSD	TMEIA Avoid odour impacts	N/A
4.6.18	Undertake the collection of the screenings and transfer to the covered container within the confines of the pump house.	All pumping stations / operational phase	DSD	TMEIA Avoid odour impacts	N/A
11.2.8	EM&A in the form of 1 hour total suspended particulates monitoring once per week	All sensitive representative receivers / Throughout construction period	Contractor	EM&A Manual	^



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### Noise

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
5.7.1 & 5.8.1	Ensure silencers are installed on the exhaust pipes of the trucks, excavators, compactors, concrete lorry mixer, and cranes for all activities.	All areas / Throughout construction period	Contractor	TMEIA	^
5.7.1 & 5.8.1	Use of mufflers on the breakers for all activities.	All areas / Throughout construction period	Contractor	TMEIA	^
5.7.1 & 5.8.1	Use of temporary noise barriers for all activities at the pumping station sites and during main sewer construction. During main sewer construction, barriers should be used to screen the activities of mobile equipment including the crane and excavator.	All pumping stations and main sewer construction locations / Throughout construction period	Contractor	TMEIA	^
5.5.10	Use of temporary noise barriers for all activities in the villages, where there is at least a 5m clearance	Village sewer alignment / Throughout construction period	Contractor	TMEIA	^
5.8.6 & 5.9.6	Manual breaking of concrete, where the concrete is less than 50mm thick.	Sewer alignment construction / concrete breaking activities	Contractor	TMEIA	N/A
5.8.6 & 5.9.6	Use of alternative pavement removal methods/equipment (kick ripper), where the concrete is less than 100mm thick	Sewer alignment construction / concrete breaking activities	Contractor	TMEIA	N/A

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
5.8.6 & 5.9.6	Use of acoustic enclosure in place of a barrier where there is a 6m clearance.	Sewer alignment construction / Throughout construction period	Contractor	TMEIA	N/A
5.8.6 & 5.9.6	Scheduling the numbers and operating times of equipment, when noise levels cannot be reduced to within the standards by other means	Sewer alignment construction / Throughout construction period	Contractor	TMEIA	^
5.8.11	The construction activities should be carried out in the daytime period (08.00- 18.00) only and shall exclude Sundays and public holidays.	All areas	Contractor	TMEIA	^
5.8.11	Powered mechanical equipment shall not be used within 5m of an NSR without the permission of the Engineer	All areas / Throughout construction period	Contractor	TMEIA	^
5.8.11	Carry out good site practice to limit noise emission at source.	All areas / Throughout construction period	Contractor	TMEIA	^
5.8.11	Avoid simultaneous noisy activities.	All areas / Throughout construction period	Contractor	TMEIA	^
11.2.8	EM&A in the form of noise monitoring.	All representative receivers / Throughout construction period	Contractor	EM&A Manual	^

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### Water Quality

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.4.3	Stockpiles of excavated material should be kept to a minimum and covered during times of heavy rainfall.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.4.10	Pass any trench dewatering through a portable sand/silt removal traps prior to discharge.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	When works are carried out during the rainy season exposed slopes, stockpiles should be covered with tarpaulin and temporary access roads protected with a layer of gravel or crushed stone.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Surface run off should be discharged to storm drains via sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Channels, bunds or sand bags should be used to direct any storm water to the traps and perimeter channels should be constructed before the main works begin to prevent external run off from crossing the site.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Silt removal structures, channels and manholes should be maintained to remove accumulated material, specifically at the onset and end of rainy periods.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.5.2	Trenches for the sewer main should be dug and backfilled in short sections to minimise the quantities of rain water which will need to be pumped from them and upslope bunding provided to prevent surface water from flowing into the trenches.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Rainwater pumped from the trenches should be discharged to storm drains via sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Discharges to natural water courses should only take place when the effluent can be shown to comply with the relevant specified standards.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94 & Technical Memorandum on Standards for Effluent Discharged in Drainage and Sewerage Systems, Inland and Coastal Waters	^
6.5.3	All plant should be in proper working order and maintained such that there is no leakage of fuel or oil. Any waste oils should be collected in designated tanks prior to disposal off site.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.3	All mechanical plant maintenance and refuelling areas shall be sited on paved areas. All storm water run-off from these areas should be discharged via oil separators/petrol separators and sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.5.4	Groundwater pumped out of excavations for the construction of pump sumps should only be discharged following removal of silt by sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.5	Water from drilling of rock should be discharged following removal of silt by sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.6	The wheels of all vehicles leaving the construction site should be washed before leaving the site to minimise the carry over of mud onto public roads. Wheel wash water should be recycled and only discharged following removal of silt by sand/silt removal traps.	All areas particularly pumping station sites / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.7	Run off from the roofs of site buildings should be conveyed in closed drains to the nearest surface water course to prevent the generation of excessive quantities of surface water run off carrying suspended solids.	Site Office areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.7	All spillages should be cleaned up immediately to prevent their downward migration into the groundwater.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.7	Sewage from toilets and any kitchens in the site facilities should be treated via a septic tank system or if this is not practicable chemical toilets should be provided and the waste from these together with 'grey water' removed from the site on a daily basis for disposal at an appropriate receiving point.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.6.2	Overflow bypasses to be used in emergency situations only and no effluent should be discharged during regular maintenance.	All pumping stations / Operation	DSD	WPCO, TMEIA	N/A
6.6.3 & 6.6.4	Supply pumping stations with stand-by pumps, emergency power supplies and telemetry system.	All Pumping Stations	DSD	WPCO, TMEIA & ProPECC PN 1/94	N/A
11.2.8	EM&A in the form of site supervision to ensure water quality protection measures are implemented.	All areas/ Throughout construction period	Contractor	EM&A	^

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### Waste Management

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
7.12.1	The Contractor shall identify a coordinator for the management of waste. The coordinator shall prepare a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. The Waste Management Plan shall be prepared with reference to Works Branch Technical Circular (WBTC) No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material and issued to the DEP and CED to confirm the availability for C&D and public fill waste.	Plan to be prepared prior to the start of construction, Implementation throughout construction period / All areas	Contractor	TMEIA.Works Branch Technical Circular (WBTC) No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material	^
7.12.1	Stockpiled material should avoid vegetated areas where possible and covered by tarpaulins. Storage of material on site should be kept to a minimum.	All areas/ Throughout construction period	Contractor	TMEIA. Prevent windblown dust and/or surface run-off / avoid nuisance to local residents	^
7.12.1	Surplus material should be sorted on site into C&D waste and that suitable for public fill	All areas /throughout construction period	Contractor	TMEIA. Maximise reusable material	^
7.12.1	The contractor should provide a temporary storage area for general refuse during the construction phase which should be enclosed to avoid refuse being windblown and affected by rain. General refuse should be stored on site for a minimum period and disposed of at a licenced facility.	All areas / throughout construction period	Contractor	TMEIA	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
7.12.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage.	All areas / throughout construction period	Contractor	TMEIA	^
7.12.1	Suitable chemical waste storage areas shall be formed on the site for temporary storage pending collection. All chemical wastes shall be handled, stored, transported and disposed of in accordance with the relevant practices.	All areas / throughout construction period	Contractor	TMEIA/ Code of Practice on the Package, Labelling and Storage of Chemical Wastes and A Guide to the Chemical Waste Control Scheme	^
7.12.1	Nightsoil arising from chemical toilets and on site chemical treatment facilities shall be transported by a licensed contractor to government Sewage Treatment Works for disposal.	All areas / throughout construction period	Contractor	TMEIA/ Sanitation and Conservancy (Regional Council) By-laws	^
7.12.1	Any screenings and grit that are removed during maintenance shall be disposed of at a landfill site. The material shall be suitably contained and covered.	All areas / operational phase	DSD	TMEIA	N/A
11.2.8	EM&A in the form of supervision of waste management practices	All areas / throughout construction period	Contractor	EM&A	^



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## Landscape and Visual

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
10.8.5, 10.9.15, 10.10.6, 10.10.11, 10.10.20, 10.11.6	Use of a suitable colour scheme to the pump station building to match the design of the adjacent properties.	All pumping stations	DSD & Contractor	Reduce visual intrusion of pumping stations	N/A
10.8.5, 10.9.15, 10.10.11, 10.10.20, 10.11.6	Construction of boundary wall similar to the adjacent housing instead of standard chain link and barbed wire fence.	All pumping stations except Tai Lam Correctional Institution	DSD & Contractor	Screen pumping stations	N/A
10.8.5, 10.9.15, 10.10.11, 10.10.20, 10.11.6	Planting of trees and shrubs to the boundary of the pumping station compound.	All pumping stations except Tai Lam Correctional Institution	DSD & Contractor	Screen pumping stations	N/A
10.8.6	Minimise damage to the rootball of the tree east of the pumping station site.	East of Castle Peak Villas pumping station/ During excavation	DSD and Contractor		^
11.2.8	EM&A in the form of site supervision of protection measures for trees and landscaping and compensatory planting establishment during the construction and operational phases respectively	All areas	Contractor	EM&A	^

Remarks: ^ Compliance of mitigation measure  
 \* Recommendation was made during site audit but improved/ rectified by the Contractor  
 / Recommendation was made during site audit but not improved/ rectified by the Contractor  
 x Non-compliance of mitigation measure  
 N/A Not Applicable at this stage as no such site activities were conducted in the reporting month

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### **Appendix L**

#### **Weather and Meteorological Conditions during Monitoring Period**

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Date	Mean Pressure (hPa)	Air Temperature			Mean Relative Humidity (%)	Total Rainfall (mm)
		Maximum (deg. C)	Mean (deg. C)	Minimum (deg. C)		
March 2019						
1	1016.1	22.4	20.8	19.6	89	0.4
2	1012.7	23.9	21.5	19.9	87	Trace
3	1011.3	23.5	21.5	20.0	87	6.3
4	1013.7	22.6	20.9	19.3	82	10.2
5	1012.1	26.7	22.2	17.7	88	30.3
6	1013.2	22.0	20.5	19.6	92	45.5
7	1015.8	20.5	17.9	15.5	93	29.6
8	1016.0	17.4	16.5	15.1	92	11.5
9	1012.2	18.7	17.8	17.0	95	14.5
10	1013.6	18.5	17.7	17.0	87	4.6
11	1014.9	22.6	18.4	15.5	81	7.6
12	1016.4	24.2	20.1	17.4	77	0.0
13	1017.8	22.9	20.8	19.1	71	0.0
14	1018.3	21.5	20.4	19.8	83	6.4
15	1020.6	20.0	18.7	17.3	81	0.4
16	1020.0	22.8	20.2	18.8	65	0.0
17	1018.9	22.7	20.9	19.7	77	0.0
18	1016.8	24.7	21.7	19.7	82	0.0
19	1014.8	27.4	23.4	20.7	84	0.0
20	1013.0	25.0	23.5	22.1	88	0.0
21	1011.4	27.2	25.3	23.4	81	0.0
22	1012.0	27.5	25.8	24.8	84	Trace
23	1017.1	25.0	20.0	17.4	89	3.3
24	1018.0	18.2	17.5	16.6	88	0.3
25	1016.8	23.3	20.5	17.9	85	1.0
26	1018.5	24.6	21.9	20.8	85	0.0
27	1017.1	25.3	22.3	20.3	82	Trace
28	1012.6	27.8	24.4	22.2	84	0.0
29	1010.5	26.5	24.4	23.1	86	6.9
30	1013.3	24.0	23.1	22.5	86	Trace
31	1016.8	22.9	21.4	20.2	85	7.7

Source:

Hong Kong Observatory – Daily Extract of Meteorological Observations

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### Weather Conditions during noise monitoring

#### LC6a The Castle Bay

Date	Start Time	Weather	Wind Speed m/s	Wind Direction
02-Mar-19	09:05	Fine	0.8	NE
08-Mar-19	13:00	Cloudy	0.0	N.A
14-Mar-19	14:25	Fine	0.8	N
20-Mar-19	14:38	Cloudy	0.1	NE
26-Mar-19	15:12	Fine	0.5	E

#### LC9 Castle Peak Villas Block C

Date	Start Time	Weather	Wind Speed m/s	Wind Direction
02-Mar-19	09:54	Fine	0.7	NE
08-Mar-19	13:45	Cloudy	0.0	N.A
14-Mar-19	13:36	Fine	0.6	N
20-Mar-19	13:59	Cloudy	0.3	E
26-Mar-19	14:25	Fine	0.2	NE

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### **Appendix M**

#### **Monthly Summary of Waste Flow Table**



**Sang Hing – Kuly Joint Venture**  
**Environmental Monthly Report for Contract No. DC/2014/01**  
**Castle Peak Road Trunk Sewer and Tuen Mun Village Sewage**

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
27	10	8	1	1	0	2	1	1	1	2

Notes:

- (1) The performance targets are given in ETWB Technical Circular PS Clause 6(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
- (4) \*The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m<sup>3</sup>. (ETWB Technical Circular PS Clause 5(4)(b) refers). [Delete Note (4) and the table above on the forecast, where inapplicable].

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### **Appendix N**

#### **Proactive Environmental Protection Proforma**



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Reporting Period	Construction Works	Anticipated Impacts	Recommended Mitigation Measures
29/02/2016 - 31/03/2016	Hoarding Erection	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Properly cover the stockpiles.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
	Pre-Drilling		
	Earth Excavation		
	Plant Mobilization		
01/04/2016 - 30/04/2016	Soldier pile work	Noise and water quality impact	<ul style="list-style-type: none"> <li>• Shield the piling rig to avoid spreading of slurry during boring.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/05/2016 - 31/05/2016			
01/06/2016 - 30/06/2016	Construction of lagging wall	Dust, Noise impact and waste management.	<ul style="list-style-type: none"> <li>• Water sprays shall be used during the delivery and handling of dusty materials.</li> <li>• Carry out good site practice to limit noise emission at source.</li> <li>• Avoid simultaneous noisy activities.</li> <li>• Surplus material should be sorted on site into C&amp;D waste and that suitable for public fill.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>

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01/07/2016 - 31/07/2016	Construction of Mini-pile	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/08/2016 - 31/08/2016			
01/09/2016 - 30/09/2016			
01/10/2016 - 31/10/2016	Proof drill and Loading Test	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/11/2016 - 30/11/2016	Construction of ELS		
01/12/2016 - 31/12/2016			

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Reporting Period	Construction Works	Anticipated Impacts	Recommended Mitigation Measures
01/01/2017 - 31/01/2017	Excavation of ELS		<ul style="list-style-type: none"> <li>•Sufficient watering of the works site with active dust emitting activities.</li> <li>•Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/02/2017 - 28/02/2017			
01/03/2017 - 31/03/2017			
01/04/2017 - 31/05/2017	Construction of Wet Well Chamber	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>•Sufficient watering of the works site with active dust emitting activities.</li> <li>•Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>

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Reporting Period	Construction Works	Anticipated Impacts	Recommended Mitigation Measures
01/06/2017 - 30/11/2017	Construction of Pumping Station	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/12/2017 - 28/02/2018	Construction of Pumping Station	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>

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Reporting Period	Construction Works	Anticipated Impacts	Recommended Mitigation Measures
01/03/2018 - 30/04/2018	Construction of retaining wall	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/05/2018 - 31/05/2018	Retaining wall and internal finishing	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>

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Reporting Period	Construction Works	Anticipated Impacts	Recommended Mitigation Measures
01/06/2018 - 30/06/2018	Excavation of U-sharped retaining wall and internal finishing	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/07/2018 - 31/07/2018	Backfilling	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>

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01/08/2018 - 30/11/2018	Construction of U shape wall at permanent access	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>
01/12/2018 - 30/04/2019	Reinstate and construct of access	Dust, Noise and water quality impact.	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities.</li> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation.</li> <li>• Regular maintenance of machines.</li> <li>• Use of acoustic barriers if necessary.</li> <li>• Provision of appropriate desilting/sedimentation devices provided on site for treatment before discharge.</li> <li>• Regular check and maintenance of desilting/sedimentation devices.</li> <li>• Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</li> </ul>