

Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2

Monthly EM&A Report
December 2018

Submitted to

Environmental Protection Department

Prepared By

Meinhardt Infrastructure and Environment Ltd

Meinhardt Infrastructure and Environment Limited

**Entrusted Portion of Widening of Tolo
Highway / Fanling Highway between Island
House Interchange and Fanling Stage 2**

Monthly EM&A Report

(December 2018)

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Date: 9 January 2018

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Environmental Monitoring and Audit (EM&A) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2 (between Tai Hang to Wo Hop Shek Interchange) – Entrusted Works Environmental Permit No. EP-324/2008/E Condition 3.3 – Submission of Monthly EM&A Report – December 2018 for the portion of Stage 2 works entrusted to Civil Engineering and Development Department (CEDD) under Contract No. CV/2012/09

08 January 2019
By Fax (2805 5028) & Hand

We refer to the revised Monthly EM&A Report – December 2018 received on 07 January 2019 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – December 2018 (Rev. 0) for the portion of works under Stage 2 of the captioned Project which is entrusted to CEDD under Contract No. CV/2012/09.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED



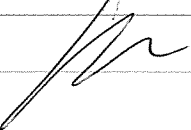


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EXECUTIVE SUMMARY

The Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2 (hereafter called “the Project”) covers part of the construction of the widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling which aimed to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic. The Project covers construction activities at Yuen Leng along the existing Fanling Highway.

The impact EM&A for the Project includes air quality, noise and water quality monitoring. The EM&A programme commenced on 5 November 2013.

This report documents the findings of EM&A works conducted in December 2018. As informed by the Contractor, the major activities in the reporting month were:

- Road pavement works;
- Water main laying works;
- Road Drainage Works;
- Construction of Police Observation Platform on the Northbound Fanling Highway; and
- Remaining works of Kiu Tau footbridge.

Breach of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.

No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.

Breach of Action and Limit Levels for Noise

No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.

Breach of Action and Limit Levels for Water Quality

The box culvert works have been completed in the end of March 2017. The 4-week post construction water quality monitoring has been completed in the end of April 2017 in the same manner as the impact monitoring.

Complaint, Notification of Summons and Successful Prosecution

No complaint, notification of summons and successful prosecution was received in the reporting month.

Future Key Issues

The remaining construction works in the coming reporting month are anticipated to include:

- Road pavement works;
- Water main laying works;
- Road Drainage Works;
- Construction of Police Observation Platform on the Northbound Fanling Highway; and
- Remaining works of Kiu Tau footbridge.

Potential environmental impacts arising from the above construction activities are anticipated to be mainly associated with construction dust, noise, water quality and waste management.

1 INTRODUCTION

1.1.1 Chun Wo Construction & Engineering Co Ltd (Chun Wo) was commissioned by the Civil Engineering and Development Department (CEDD) as the Civil Contractor for the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2. Meinhardt Infrastructure & Environment Ltd (MIEL) has been appointed by Chun Wo as the Environmental Team (ET) to fulfill the corresponding EM&A requirements pursuant to Environmental Permit No. EP-324/2008/E in accordance with the Updated EM&A Manual (dated October 2013) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2. The EM&A programme commenced on 5 November 2013.

1.2 Purpose of the Report

1.2.1 This is the monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting month of November 2018.

1.3 Report Structure

1.3.1 This monthly EM&A Report comprises the following sections:

Section 1: Introduction

Section 2: Project Information

Section 3: Status of Environmental Licenses, Notifications and Permits

Section 4: Air Quality Monitoring

Section 5: Noise Monitoring

Section 6: Water Monitoring

Section 7: Waste Management

Section 8: Environmental Site Inspection and Audit

Section 9: Implementation Status of Environmental Mitigation Measures

Section 10: Summary of EP Submission in the Reporting Month

Section 11: Environmental Non-Conformance

Section 12: Future Key Issues

Section 13: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

- 2.1.1 Tolo Highway and Fanling Highway are expressways in the North East New Territories connecting Sha Tin, Tai Po and Fanling. These highways form a vital part of the strategic Route 1, which links Hong Kong Island to Shenzhen. At present, this section of Route 1 is a dual 3-lane carriageway. However, at several major interchanges along this section of Route 1, the highway is only dual-2 lane. Severe congestion is a frequent occurrence during peak periods, particularly in the Kowloon bound direction.
- 2.1.2 The objective of the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.
- 2.1.3 The construction works for the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling are to be delivered in 2 stages:
- Stage 1 – Construction works between Island House Interchange and Tai Hang; and
- Stage 2 – Construction works between Tai Hang and Wo Hop Shek Interchange.
- 2.1.4 The construction works of Stage 1 under the EP commenced in November 2009 and was planned to be completed in December 2013 tentatively. The works of Stage 2 was planned to commence in November 2013 and complete by end of 2016. Hyder-Arup-Black and Veatch Joint Venture (HABVJV) was appointed by the Highways Department (HyD) as the consultants for the design and construction assignment for the Project. Mott MacDonald Hong Kong Ltd is the Independent Environmental Checker (IEC) of both Stage 1 and Stage 2 works.
- 2.1.5 A portion of Stage 2 works of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling (hereafter called “the Project”) is entrusted to the contractor of Contract No. CV/2012/09 Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 3, i.e. Chun Wo. AECOM Asia Co Ltd was appointed by the CEDD as the consultant for the design and construction assignment for the Liantang development.
- 2.1.6 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). An Environmental Impact Assessment (EIA) Report together with an Environmental Monitoring and Audit (EM&A) Manual were approved on 14 July 2000 (Register Number: EIA-043/2000). The Project is governed by an Environmental Permit (EP) (EP-324/2008) which was granted on 23 December 2008. A variation of EP (VEP) was applied and the VEP (EP-324/2008/A) was subsequently granted on 31 January 2012. An additional VEP has been applied on 24 February 2014 and the VEP (EP-324/2008/B) was subsequently granted on 17 March 2014. Furthermore, an additional VEP has been applied on 9 March 2015 and the VEP (EP-324/2008/C) was subsequently granted on 27 March 2015. The previous VEP (EP-324/2008/D) was granted on 27 August 2015. The current VEP (EP-324/2008/E) was granted on 26 January 2017.

2.2 Site Description

2.2.1 The major construction activities under the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2 include:

At-Grade Road Works – Temporary and permanent road formation, pipe laying, road drainage, footpath and noise barrier construction;

Demolition of existing Kiu Tau Footbridge and Footbridge Re provision; and

Box Culvert Extension – Flow diversion of existing stream, excavation, sub-base and blinding, base, wall and top slab construction.

2.2.2 **Figure 1** shows the works areas for the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2.

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting month are summarized below:

- Road pavement works;
- Water main laying works ;
- Road Drainage Works;
- Construction of the Police Observation Platform on the Northbound Fanling Highway; and
- Remaining works of Kiu Tau Footbridge.

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organisation

2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1**.

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Alan Lee	2171 3303	2171 3498
		Resident Engineer (Environmental)	Mr. Perry Yam	2171 3350	
Mott MacDonald	Independent Environmental Checker (IEC)	IEC	Mr. Steven Tang	2828 5920	2827 1823
Chun Wo	Contractor	Site Agent	Mr. Daniel Ho	2638 6144	2638 7077
		Environmental Officer	Mr. Yang Ran	2638 6147	
		Environmental Supervisor	Mr. Franki Leung	2638 7005	
Meinhardt	Environmental Team (ET)	ET Leader	Mr. Fredrick Leong	2859 1739	2540 1580

3 STATUS OF ENVIRONMENTAL LICENSES, NOTIFICATION AND PERMITS

3.1.1 The relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 3.1**.

Table 3.1 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-324/2008/E	26 Jan 2017	--	Granted on 26 Jan 2017	
Construction Noise Permit				
GW-RM0259-18	19 Jun 2018	17 Dec 2018	Valid until on 17 Dec 2018	For lane shifting work of Fanling Highway both bound
GW-RN305-18	22 Jun 2018	17 Dec 2018	Valid until on 17 Dec 2018	For road diversion and maintenance of Fanling Highway both bound
GW-RN366-18	9 Jul 2018	18 Dec 2018	Valid until on 18 Dec 2018	For connection of DN600 Watermain near Kau Lung Hang
GW-RN361-18	15 Jul 2018	18 Dec 2018	Valid until on 18 Dec 2018	For loading and unloading along Fanling Highway both bounds
GW-RN0388-18	25 Aug 2018	24 Feb 2019	Valid	For general works at the northward of site office
GW-RN0424-18	01 Sep 2018	21 Feb 2019	Valid	Parapet installation works and remedial works on Tai Wo Service Road East, Fanling Highway.
GW-RN0425-18	22 Aug 2018	21 Feb 2019	Valid	For traverse stitch joints and installation of longitudinal stitch panel over Fanling Highway and MTRC's East Rail line.
GW-RN0454-18	06 Sep 2018	05 Mar 2019	Valid	For general works at the southward of site office.

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RN0509-18	10 Oct 2018	17 Dec 2018	Valid until on 17 Dec 2018	For road diversion and maintenance of Fanling Highway bothbound.
GW-RN0566-18	29 Oct 2018	4 Apr 2019	Valid	For sampling works Fanling Highway bothbound.
GW-RN0693-18	18 Dec 2018	25 May 2019	Valid	For lane shifting work of Fanling Highway bothbound.
GW-RN0694-18	19 Dec 2018	25 May 2019	Valid	For loading and unloading along Fanling Highway both bounds.
GW-RN0696-18	19 Dec 2018	25 May 2019	Valid	For connection of DN600 Watermain near Kau Lung Hang.
GW-RN0699-18	18 Dec 2018	25 May 2019	Valid	For road diversion and maintenance of Fanling Highway bothbound.
Wastewater Discharge License				
WT00032188-2018	20 Sep 2018	31 Aug 2023	Valid	--
Chemical Waste Producer Registration				
5113-634-C3817- 01	7 Oct 2013	--	Valid	--
Billing Account for Construction Waste Disposal				
7017914	2 Aug 2013	--	Account Active	--
Notification Under Air Pollution Control (Construction Dust) Regulation				
--	31 Jul 2013	30 Jul 2019	Notified	--

4 AIR QUALITY MONITORING

4.1 Monitoring Requirement

4.1.1 In accordance with the Updated EM&A Manual, 1-hr and 24-hr total suspended particulate (TSP) levels at the designated air quality monitoring station are required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. For the 1-hr TSP impact monitoring, the sampling frequency of at least three times in every 6 days should be undertaken when the highest dust impact occurs.

4.2 Monitoring Equipment

4.2.1 The 1hr- TSP and 24-hr TSP air quality monitoring were performed using a High Volume Sampler (HVS), of which its location and operation satisfy, as far as practicable, all the requirements as specified in the Updated EM&A Manual. The brand and model of the equipment are given in **Table 4.1**.

Table 4.1 Air Quality Monitoring Equipment

Equipment	Brand and Model	Quantity	Serial Number
High Volume Sampler (1-hr TSP and 24-hr TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170 MFC)	1	2359

4.2.2 The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.

4.2.3 Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix C**.

4.3 Monitoring Location

4.3.1 Air quality monitoring was conducted at the location specified in the Updated EM&A Manual. **Table 4.2** describes the details of the air quality monitoring station with its location as shown in **Figure 2**.

Table 4.2 Location of Air Quality Monitoring

Air Monitoring Station ID	Monitoring Location	Description
AM1(SR77) *	Yuen Leng 2 *	Residential, Ground floor

Remark:

* Location and Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

4.4 Monitoring Parameters, Frequency and Duration

4.4.1 **Table 4.3** summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 4.3 Air Quality Monitoring Parameters, Frequency and Duration

Parameter	Frequency and Duration
1-hour TSP	At least three times in every 6 days should be undertaken when the highest dust impact occur
24-hour TSP	Once every 6 days

4.5 Monitoring Methodology

1-hr and 24-hr TSP Monitoring

- 4.5.1 With the consideration of criteria stated in the Updated EM&A Manual, the HVS was installed in the vicinity of the air sensitive receivers.
- 4.5.2 The relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any special phenomena observed were recorded. The weather information was referenced from Hong Kong Observatory (<http://www.weather.gov.hk/wxinfo/pastwx/extractc.htm>).
- 4.5.3 A HOKLAS accredited laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments, to handle the 24-hr TSP samples, was employed for sample analysis.
- 4.5.4 Filter papers of size 8"x10" were labelled before sampling. They were inspected to be clean with no pin holes and conditioned in a humidity controlled chamber for over 24-hr and were pre-weighed before use for the sampling.
- 4.5.5 The 24-hr TSP levels were measured by following the standard high volume sampling method for TSP as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. TSP was sampled by drawing air through a conditioned, pre-weighted filter paper inside the HVS at a controlled air flow rate. After 24-hr sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg.
- 4.5.6 All the collected samples were kept in a good condition for 6 months before disposal.
- 4.5.7 For 1-hr TSP monitoring, monitoring methodology is the same as 24-hr TSP monitoring which has been presented in **Section 4.5.1** to **Section 4.5.6**, but with sampling period changed to 1 hour.

4.6 Monitoring Schedule for the Reporting month

- 4.6.1 As informed by the contractor, all major construction activities of the Entrusted Portion Project of Section 1A and 1B were substantially completed on 28 September 2018 and 3 October 2018 respectively. In such regard, the EM&A Programme of the captioned project, including monthly EM&A reporting and the corresponding environmental monitoring and audit works, is no longer required and we proposed to cease it by the end of December 2018 and we have submitted the termination proposal to EPD on 24 December 2018. The EM&A monitoring and audit works will be carried until the termination proposal is approved. The tentative schedule for environmental monitoring

for the reporting month is provided in **Appendix D**. Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

4.7 Monitoring Results

4.7.1 The monitoring results for 1-hr and 24-hr TSP are summarised in **Table 4.4** and **Table 4.5** respectively. Detailed air quality monitoring results and the graphical presentation of air quality monitoring data for the current and past three reporting months are presented in **Appendix F**.

Table 4.4 Summary of 1-hr TSP Monitoring Results

ASR ID	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM1(SR77) *	135.4	103.9-192.7	292.7	500

Remark:

* Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

Table 4.5 Summary of 24-hr TSP Monitoring Results

ASR ID	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM1(SR77) *	79.4	46.8-101.4	170.3	260

Remark:

* Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

- 4.7.2 No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 4.7.3 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 4.7.4 The Event and Action Plan for the occurrence of non-compliance of the air quality criteria is annexed in **Appendix G**.
- 4.7.5 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring the monitoring location AM1(SR77) in the reporting month.

5 NOISE MONITORING

5.1 Monitoring Requirements

5.1.1 In accordance with the Updated EM&A Manual, the impact noise monitoring frequency shall depend on the scale of the construction activities. An initial guide on the regular monitoring frequency should be at least once per week when noise generating activities are underway.

5.2 Monitoring Equipment

5.2.1 Noise monitoring was performed using a sound level meter at the monitoring station. The sound level meter deployed complies with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. An acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. The brand and model of the equipment is given in **Table 5.1**.

Table 5.1 Noise Monitoring Equipment

Equipment	Brand and Model	Quantity	Serial Number
Sound Level Calibrator	Rion (Model No. NC-74)	1	34678506
Sound Level Meter	Rion (Model No. NL-52)	1	01143484

5.2.2 The sound level calibrator and sound level meter were verified by a certified laboratory every year. Calibration certificates of the sound level meter and acoustic calibrator are provided in **Appendix C**.

5.3 Monitoring Locations

5.3.1 Impact noise monitoring was conducted at the location specified in the Updated EM&A Manual. **Table 5.2** describes the details of the noise monitoring station with its location as shown in **Figure 2**.

Table 5.2 Location of Noise Monitoring

NSR ID	Monitoring Location	Description
M1(SR77) *	Yuen Leng 2 *	Residential, Ground floor

Remark:

* Location and Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

5.4 Monitoring Parameters, Frequency and Duration

5.4.1 **Table 5.3** summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 5.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at between 0700 and 1900 on normal weekdays. Leq, L10 and L90 would be recorded.	At least once per week

5.5 Monitoring Methodology

5.5.1 The monitoring procedures are summarised as follows:

- The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at monitoring station SR77;
- The battery condition was checked to ensure good functioning of the meter;
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - Frequency weighting: A
 - Time weighting: Fast
 - Parameters: Leq, L10 and L90
 - Time measurement: Leq(30-minutes) during non-restricted hours i.e. 07:00 – 19:00 hrs on normal weekdays
- Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- At the end of the monitoring period, the Leq, L10 and L90 were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- A façade correction of +3dB (A) shall be made to the noise parameter obtained by free field measurement.

5.6 Monitoring Schedule for the Reporting Month

5.6.1 The schedule for environmental monitoring for the reporting month is provided in **Appendix D**. Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

5.7 Monitoring Results

5.7.1 The monitoring results for noise are summarized in **Table 5.4** and the monitoring results and the graphical presentation of noise level for the current and past three reporting months are presented in **Appendix H**.

Table 5.4 Summary of Noise Monitoring Results

Noise Monitoring Station ID	Average, dB(A), Leq (30min) ⁽²⁾	Range, dB(A), Leq (30min) ⁽²⁾	Action Level	Limit Level, dB(A)
M1(SR77) ⁽¹⁾	67.9	66.5 – 69.0	When one documented valid complaint is received	75

Remark:

(1) Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

(2) +3dB(A) façade correction included

- 5.7.2 Major noise sources during the noise monitoring included construction activities of the Project and that along Tai Wo Service Road East, and nearby traffic noise.
- 5.7.3 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 5.7.4 The Event and Action Plan for the occurrence of non-compliance of the noise criteria is annexed in **Appendix G**.

6 WATER MONITORING

- 6.1.1 The box culvert works had been completed in March 2017. The 4-week post-construction water quality monitoring at I5 was completed in 28 April 2017.

7 WASTE MANAGEMENT

- 7.1.1 The Contractor has registered as a chemical waste producer of the Project. The C&D materials and waste sorting were carried out on-site. Receptacles were provided for general refuse collection.
- 7.1.2 As advised by the Contractor, a total of 1406m³ of excavated material has been generated. 1044m³ of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. 60m³ of inert C&D materials were reused on site. 85m³ of general refuse was disposed of at North East New Territories (NENT) Landfill. No plastic was collected by recycling contractor in the reporting month. No paper/cardboard packaging was collected by recycling contractor in the reporting month. No metal was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. Details of the waste management data are presented in **Appendix K**.

8 ENVIRONMENTAL SITE INSPECTION AND AUDIT

8.1 Site Inspection

8.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the site inspection is provided in **Appendix L**.

8.1.2 In the reporting month, 4 site inspections were carried out on 5, 13, 19 and 27 December 2018. The one held on 27 December 2018 was a joint inspection with the IEC, ER, ET and Contractor. No site inspection was conducted by the EPD during the reporting month. No non-compliance was recorded during the site inspection. A summary of the reminders and observations recorded during the site inspections are presented in **Table 8.1**.

Table 8.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	N/A	N/A	N/A
Noise	N/A	N/A	N/A
Water Quality	N/A	N/A	N/A
Waste/ Chemical Management	N/A	N/A	N/A
Landscape & Visual	N/A	N/A	N/A
Permits / Licenses	N/A	N/A	N/A

9 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

- 9.1.1 The Contractor has implemented the relevant environmental mitigation measures as specified in the EIA Reports, EPs and updated EM&A Manual. The implementation status of environmental mitigation measures during the reporting period is summarized in **Appendix L**.

10 SUMMARY OF EP SUBMISSION IN THE REPORTING MONTH

10.1.1 The status of the required submission under the EP during the reporting period is summarized in **Table 10.1**.

Table 10.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.3	Monthly EM&A Report for Nov 2018	11 Dec 2018

11 ENVIRONMENTAL NON-CONFORMANCE

11.1 Summary of Monitoring Exceedances

- 11.1.1 No exceedance of Action and Limit Level were recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 11.1.2 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 11.1.3 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 11.1.4 The 4-week post-construction water quality monitoring at I5 was completed in April 2017.

11.2 Summary of Environmental Non-Compliance

- 11.2.1 No environmental non-compliance was recorded in the reporting month. The cumulative statistics are provided in **Appendix N**.

11.3 Summary of Environmental Complaints

- 11.3.1 No environmental complaints were received in the reporting month. The cumulative statistics are provided in **Appendix N**.

11.4 Summary of Environmental Summon and Successful Prosecutions

- 11.4.1 No environmental related prosecution or notification of summons was received in the reporting month. The cumulative statistics are provided in **Appendix N**.

12 FUTURE KEY ISSUES

12.1 Construction Programme for the Next Month

12.1.1 The remaining construction works in the coming reporting month are anticipated to include:

- Road pavement works;
- Water main laying works;
- Road Drainage Works;
- Construction of the Police Observation Platform on the Northbound Fanling Highway; and
- Remaining works of Kiu Tau Footbridge.

12.2 Key Issues for the Coming Month

12.2.1 Key issues to be considered in the coming month are anticipated to include:

- Properly maintain all drainage facilities and wheel washing facilities on site;
- Expose slopes and dusty stockpile should be covered up properly if no work will be conducted;
- Good housekeeping should be maintained and general refuse should be removed regularly; and
- Watering shall be enhanced over the construction site.

12.3 Monitoring Schedule for the Next Month

12.3.1 The tentative schedule for environmental monitoring for the coming month is provided in **Appendix D**.

13 CONCLUSIONS AND RECOMMENDATIONS

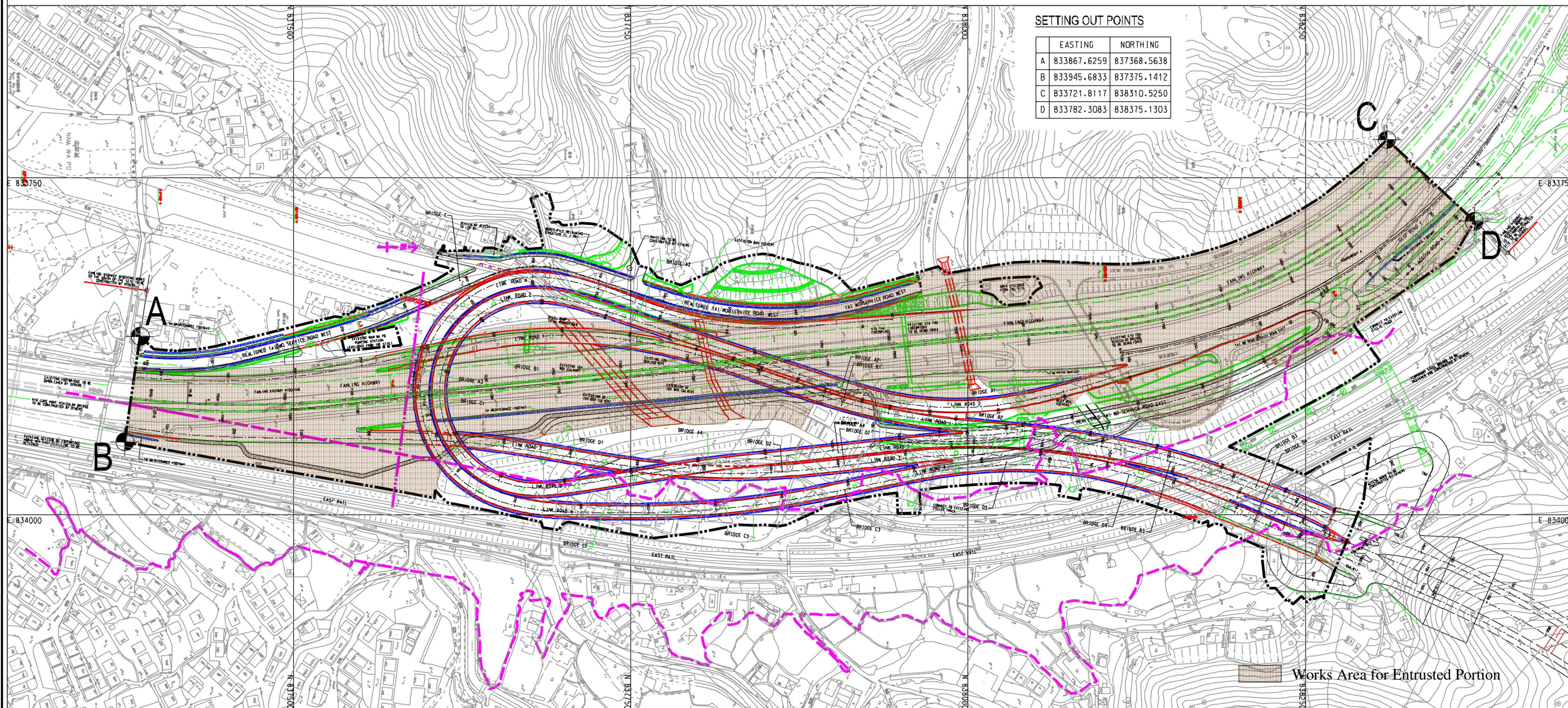
13.1 Conclusions

- 13.1.1 The construction phase EM&A programme of the Project commenced on 5 November 2013.
- 13.1.2 The 1-hr TSP, 24-hr TSP, noise and water quality monitoring were carried out in the reporting period.
- 13.1.3 No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 13.1.4 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 13.1.5 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 13.1.6 The 4-week post-construction water quality monitoring at I5 was completed in April 2017.
- 13.1.7 Four (4) environmental site inspections were carried out in the reporting month. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audit.

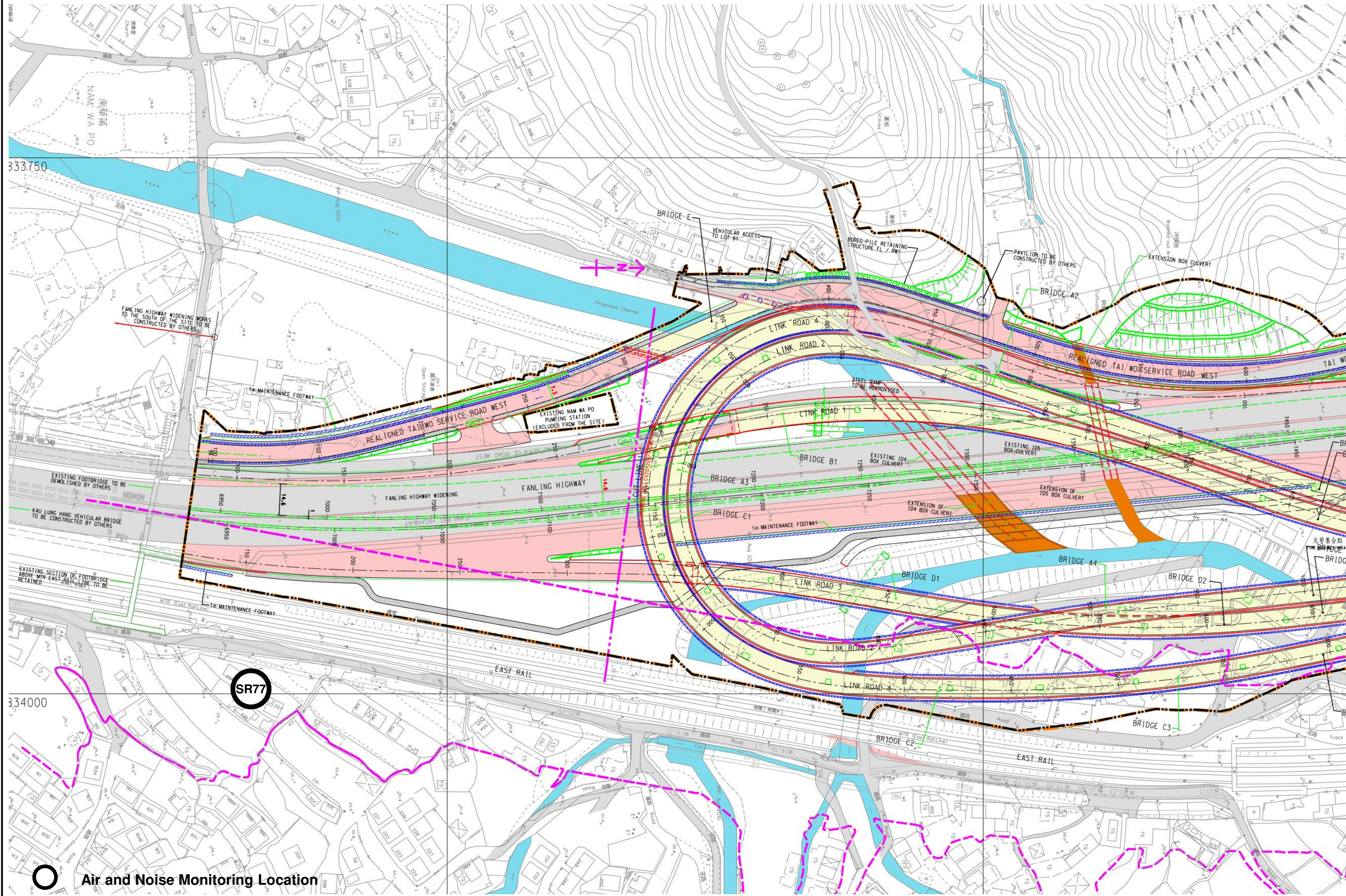
13.2 Recommendations

- 13.2.1 According to the environmental site inspections performed in the reporting month, no recommendation was provided.

Figure



CV/201209-T-CWC-SK-001g_AD_edit.dgn 22/1/2014 17:10:34



Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2

Figure 2: Air and Noise Monitoring Locations

Appendix A Construction Programme

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2018		2019					
							Nov	Dec	Jan	Feb	Mar	Apr		
Remaining Works for Noise Barrier along widened Fanling Highway														
FHW-NB-110a	Installation of Steelworks & Panel for NB70 (25m, and extended 10m under VO199), adjacent to FLH SB lanes at Zone 1	6	6	11-Mar-19*	16-Mar-19	-120							Installation of Steelworks & Panel	
FHW-NB-150	Installation of Steelworks & Panel for NB72 & NB73 (248m), adjacent to FLH SB lanes at Zones 4, 5 & 6	16	16	28-Feb-19	18-Mar-19	-121							Installation of Steelworks & Pa	
FHW-NB-220	Installation of Steelworks & Panel for NB68 (63m), FLH central median at Zones 1	36	0	10-Sep-18 A	24-Oct-18 A								Installation of Steelworks & Panel for NB68 (63m), FLH central median at Zones 1	
FHW-NB-320	Installation of Steelworks & Panel for NB67-2 (85m), adjacent to FLH NB lanes at Zones 2 & 3	14	14	20-Dec-18*	08-Jan-19	-86							Installation of Steelworks & Panel for NB67-2 (85m), adjacent to FLH NB lanes at Zones 2 & 3	
FHW-NB-330	Installation of Steelworks & Panel for NB69 (109m), adjacent to FLH NB lanes near LR1 at Zone 3	18	18	02-Feb-19*	01-Mar-19	-107							Installation of Steelworks & Panel for NB69 (109m), ad	
Section II - Remainder of the Works (KD-3)														
At Grade Link Road at Fanling Highway Interchange														
Link Road 1 (near Abutment AB1)														
FHI-LR1-1010	Allow Contractor of Contract 4 for Installation of TCSS Cable at Abutment AB1	0	0		26-Oct-18 A								Contractor of Contract 4 for Installation of TCSS Cable at Abutment AB1	
FHI-LR1-1020	Backfilling works of abutment, Gully and Profile Barrier at Abutment AB1	20	34	28-May-18 A	31-Jan-19	341							Backfilling works of abutment, Gully and Profile Barrier at Abutment AB1, Backfilling works of abut	
FHI-LR1-1110	Road Formation and Pavement (CH 240 - CH 340, nr AB1)	15	15	19-Sep-18 A	09-Jan-19	360							Road Formation and Pavement (CH 240 - CH 340, nr AB1), Road Formation and Pavement (CH 240 - CH 340, nr AB1)	
FHI-LR1-1120	Road Formation, Road Drainage, TCSS ducting, Profile Barrier and Pavement (CH 80 - CH 240, nr NB66 & 67-1)	70	49	07-Feb-18 A	25-Feb-19	326							Road Formation, Road Drainage, TCSS ducting, Profile Barie	
Noise Barrier														
FHI-LR1-1091	Noise Barrier NB67-1 - Remaining ground beam of Bay 3 (allow access from TWSRW)	7	7	20-Dec-18*	29-Dec-18	368							Noise Barrier NB67-1 - Remaining ground beam of Bay 3 (allow access from TWSRW)	
Link Road 2 (near Abutment AA1)														
FHI-LR2-2020	Construction of Fill slope FL/F10 and Road Formation of Link Road nr Abutment AA1	78	55	25-Apr-18 A	04-Mar-19	320							Construction of Fill slope FL/F10 and Road Formati	
FHI-LR2-2020	TCSS Duct Laying along Link Road next to FL/F10	52	52	28-Jul-18 A	28-Feb-19	323							TCSS Duct Laying along Link Road next to FL/F10, TCSS	
FHI-LR2-2030	3SW-D/FR32 Bay 3207 (including temporary works)	43	37	19-Jul-18 A	04-Feb-19	338							3SW-D/FR32 Bay 3207 (including temporary works), 3SW-D/FR32 Bay 3207 (including temp	
FHI-LR2-2030	3SW-D/FR32 Bay 3208 (including temporary works)	46	46	27-Aug-18 A	21-Feb-19	329							3SW-D/FR32 Bay 3208 (including temporary works), 3SW-D/FR32 I	
FHI-LR2-2030	3SW-D/FR32 Bay 3209 (including temporary works)	46	20	15-Aug-18 A	15-Jan-19	355							3SW-D/FR32 Bay 3209 (including temporary works), 3SW-D/FR32 Bay 3209 (including temporary works)	
FHI-LR2-2030	3SW-D/FR32 Bay 3210 (including temporary works)	45	45	30-Jun-18 A	20-Feb-19	294							3SW-D/FR32 Bay 3210 (including temporary works), 3SW-D/FR32 Ba	
FHI-LR2-2040	3SW-D/FR32 Bay 3212 (including temporary works)	37	37	20-Dec-18*	04-Feb-19	338							3SW-D/FR32 Bay 3212 (including temporary works)	
FHI-LR2-2040	3SW-D/FR32 Bay 3213 (including temporary works)	35	35	14-Feb-19	26-Mar-19	294							3SW-D/FR32 Bay 3	
FHI-LR2-2040	3SW-D/FR32 Bay 3214 (including temporary works)	36	36	21-Feb-19	03-Apr-19	294							3SW-D	
FHI-LR2-2050	Road Pavement and Drainage next to Abutment (after completion of NB73 Bay 12&13 Stem Wall)	20	20	20-Dec-18	15-Jan-19	355							Road Pavement and Drainage next to Abutment (after completion of NB73 Bay 12&13 Stem Wall)	
FHI-LR2-2050	Road Formation, Road Drainage and Pavement (SMH1302 - 1303 & MY2.4 - 2.5) at grade	72	72	01-Mar-18 A	23-Mar-19	303							Road Formation, Road	
FHW-SG-103	Fabrication and Delivery of Sign Gantry DS11	99	26	28-Dec-17 A	22-Jan-19	334							Fabrication and Delivery of Sign Gantry DS11, Fabrication and Delivery of Sign Gantry DS11	
FHW-SG-103	Erection of Sign Gantry DS11 (include On-site Fabrication)	15	15	23-Jan-19	15-Feb-19	334							Erection of Sign Gantry DS11 (include On-site Fabrication)	
FHW-SG-104	Fabrication and Delivery of Sign Gantry FADS11 and DS64	99	34	02-Feb-18 A	31-Jan-19	326							Fabrication and Delivery of Sign Gantry FADS11 and DS64, Fabrication and Delivery of Sign Gantr	
FHW-SG-104	Erection of Sign Gantry FADS11 and DS64 (include On-site Fabrication)	15	15	01-Feb-19	25-Feb-19	326							Erection of Sign Gantry FADS11 and DS64 (include On-site Fa	
Link Road 3 (near Abutment AD1)														
FHI-LR3-3020	Permanent Fill Slope, Construction of Gullies and Profile Barriers	48	35	25-Apr-18 A	01-Feb-19	315							Permanent Fill Slope, Construction of Gullies and Profile Barriers, Permanent Fill Slope, Construct	
FHI-LR3-3030	Road Pavement	1	1	02-Feb-19*	02-Feb-19	315							Road Pavement	

- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- ◆ Milestone
- Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3
3-Month Rolling Programme
 3MPR065 Page 3 of 6 20-Dec-18

3-Month Rolling Programme updated to 2018-12-20			
Date	Revision	Checked	Approved

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2018		2019												
							Nov	Dec	Jan	Feb	Mar	Apr									
FHI-LR3-3040	Other Civil Works for TCSS duct laying - along Link Road 3	25	25	02-Feb-19	09-Mar-19	315															
Link Road 4 (near Abutment AC1)																					
FHI-LR4-4030	Road Formation, Road Drainage, TCSS ducting and Pavement	55	35	27-Nov-18 A	01-Feb-19	296															
FHI-LR4-4040	Remaining Section of Carriageway connect to FLH	44	44	02-Feb-19*	01-Apr-19	296															
Viaduct - Pavement, Street Furnitures, Lighting inside Internal Voids and Others																					
RS-1000a	MJ Installation for Pier AD5, AB6, AB12, AD1 and AC5	72	0	15-Mar-18 A	25-Oct-18 A																
RS-1000b	MJ Installation for AC1, AC11, AA18, AA13 and AA9	33	0	28-May-18 A	31-Oct-18 A																
RS-1010d	Installation of Lighting	96	49	09-Mar-18 A	25-Feb-19	326															
RS-1010e	Cable Connection	31	23	22-Oct-18 A	18-Jan-19	352															
RS-1020a	Allow Access for Street Lighting Installation	132	23	11-Jan-18 A	18-Jan-19	352															
RS-1020b	Other Street Furniture including Sign Gantry, NB, Handrail, traffic signs, etc, for Bridge A, B, C and D	112	49	26-Feb-18 A	25-Feb-19	326															
RS-1040b	Watermains Laying at Pier AC4 on Viaduct (under VO171)	45	42	21-May-18 A	16-Feb-19	290															
RS-1040c	Watermains Laying at Pier AD9 on Viaduct (under VO171)	36	36	18-Feb-19*	30-Mar-19	297															
RS-1040d	Watermains Laying at Pier AB7 on Viaduct (under VO171)	43	43	18-Feb-19*	09-Apr-19	290															
RS-1040e	Watermains Laying at Pier AA12 on Viaduct (under VO171)	52	42	21-May-18 A	16-Feb-19	297															
RS-1040f	Watermains Laying at Pier AA7 on Viaduct (under VO171)	36	36	18-Feb-19*	30-Mar-19	297															
RS-1070c	Road Pavement AA1 - AA18 (base coarse only)	6	10	28-May-18 A	03-Jan-19	365															
RS-1080e	Waterproofing on Walkway AB6 - AB12	18	18	20-Dec-18*	12-Jan-19	357															
RS-1090a2	Road Pavement AD8 - AD14 West (base coarse only)	3	0	27-Sep-18 A	20-Oct-18 A																
RS-1090b2	Road Pavement AD8 - AD14 East (base coarse only)	3	0	27-Sep-18 A	20-Oct-18 A																
RS-1090c	Waterproofing on Walkway (AD8-AD14 West and East Sides)	20	20	20-Dec-18*	15-Jan-19	355															
RS-1110	Final Pavement and Road Marking	12	12	20-Dec-18*	05-Jan-19	363															
WSD Works																					
DN450 Fire Mains (CHA)																					
WA-1010c	Pipe Laying - CHA 38 - 113 (DN450) near Ext. TWSRW, 20m	11	102	16-Apr-18 A	03-May-19	-254															
WA-1020	Pipe Laying - CHA 113 - 135 (DN450) near Ext. TWSRW, 20m	102	102	20-Dec-18*	03-May-19	-169															
WA-1030	Pipe Laying - CHA 135 - 160 (DN450) near Ext. TWSRW, 25m	19	102	18-Apr-18 A	03-May-19*	-156															
WA-1110a	Pipe Laying - CHA 185 - 228 (DN450) near Ext. TWSRW, 43m	24	24	20-Dec-18*	19-Jan-19	-78															
WA-1130b	Pipe Laying - CHA 373 - 380 (DN450) near Ext. TWSRW, 7m	18	18	20-Dec-18*	12-Jan-19	-85															
WA-1130c	Pipe Laying - CHA 380 - 388 (DN450) near Ext. TWSRW, 8m	12	12	20-Dec-18*	05-Jan-19	-79															
WA-2080	Pipe Laying - CHA 624 - 663 (DN450) along Ext. TWSRW SB, 39m	75	75	16-Jan-19*	24-Apr-19	-162															
DN1200 Water Mains (CHC)																					
WC-1030	Construction of IT inspection tee chamber(s) near the Jacking Pits	47	47	10-May-18 A	22-Feb-19	328															
DN2200 Water Mains (CHF)																					

- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- ◆ Milestone
- Project Baseline Bar

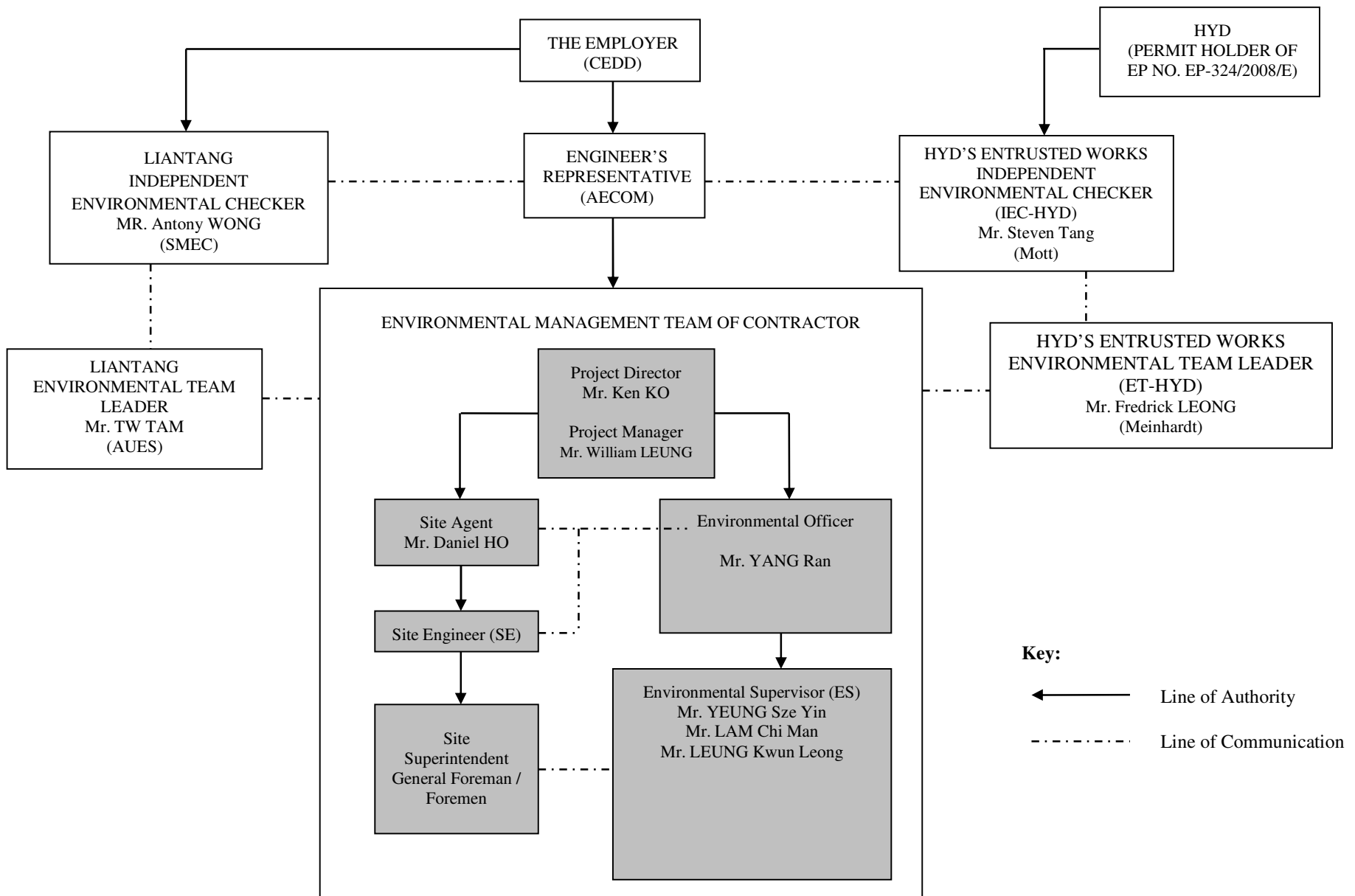
CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3
3-Month Rolling Programme
 3MPR065 Page 4 of 6 20-Dec-18

3-Month Rolling Programme updated to 2018-12-20

Date	Revision	Checked	Approved

Appendix B

Project Organization Structure



Appendix C Calibration Certificates of Monitoring Equipment

Certificate of Calibration

Calibration Certification Information			
Cal. Date: February 13, 2018	Rootsmeter S/N: 438320	Ta: 293	°K
Operator: Jim Tisch		Pa: 763.3	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 1612		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
QSTD	m=	2.02017	QA	m=	1.26500
	b=	-0.03691		b=	-0.02263
	r=	0.99988		r=	0.99988

Calculations	
Vstd = ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va = ΔVol((Pa-ΔP)/Pa)
Qstd = Vstd/ΔTime	Qa = Va/ΔTime
For subsequent flow rate calculations:	
Qstd = $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa = $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

TSP Sampler Calibration

SITE

Location: **Lian Tang 3** Date: **November 6, 2018**
 Sampler: **TE-5170 MFC (Serial # : 2359)** Tech: **Sam Wong**

CONDITIONS

Barometric Pressure (in Hg):	40.02	Corrected Pressure (mm Hg):	1017
Temperature (deg F):	81	Temperature (deg K):	300
Average Press. (in Hg):	40.02	Corrected Average (mm Hg):	1017
Average Temp. (deg F):	81	Average Temp. (deg K):	300

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	2.02017
Model:	TE-5025A	Qstd Intercept:	-0.03691
Serial#:	1612	Date Certified:	February 13, 2018

CALIBRATIONS

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
1	12.00	1.994	56.0	64.52	Slope = 31.7376 Intercept = 1.9507 Corr. coeff.= 0.9987
2	10.00	1.822	52.0	59.92	
3	8.20	1.652	48.0	55.31	
4	5.20	1.319	38.0	43.78	
5	3.20	1.039	30.0	34.57	
					# of Observations: 5

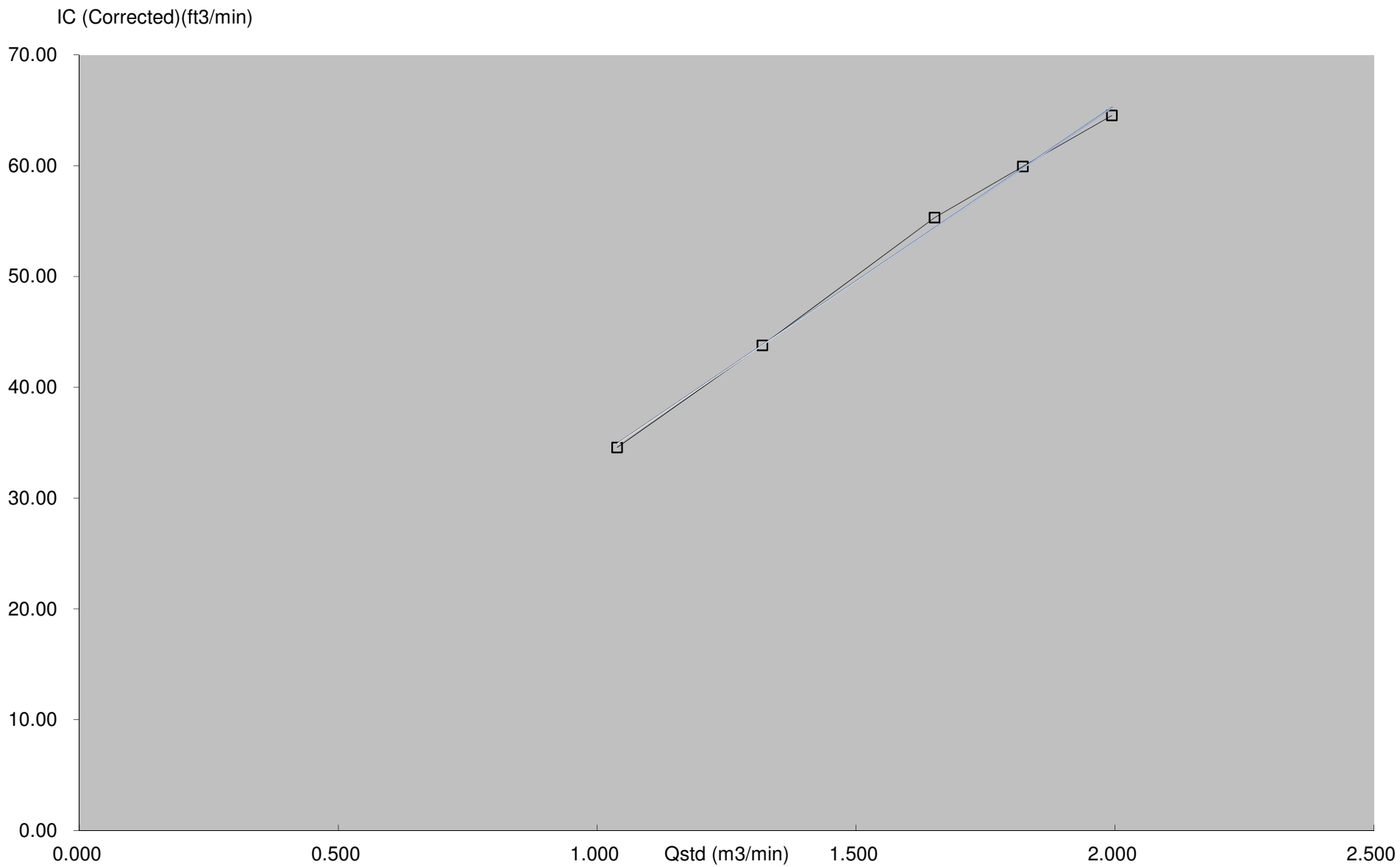
Calculations

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)] - b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure





Calibration Certificate

Certificate No. **803615**

Page 1 of 2 Pages

Customer : Enovative Environmental Service Limited

Address : Flat 6, 3/F, Block E, Wah Lok Industrial Centre, 31-35 Shan Mei Street, Shatin, N.T., Hong Kong.

Order No. : Q81437

Date of receipt : 13-Apr-18

Item Tested

Description : Sound Level Calibrator

Manufacturer : Rion

I.D. : 217656

Model : NC-74

Serial No. : 34678506

Test Conditions

Date of Test : 20-Apr-18

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

Test Results

All results were within the IEC 60942 Class 1 specifications.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	707126	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	703741	NIM-PRC & SCL-HKSAR
S041	Universal Counter	802061	SCL-HKSAR
S206	Sound Level Meter	707129	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : 
Elva Chong

Approved by : 
Kin Wong

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong

Tel: 2425 8801 Fax: 2425 8646

Date: 20-Apr-18



Calibration Certificate

Certificate No. 803615

Page 2 of 2 Pages

Results :

1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94.0	94.2	± 0.4 dB

Uncertainty : ± 0.2 dB

2. **Short-term Level Fluctuation** : 0.0 dB
IEC 60942 Class 1 Spec. : ± 0.1 dB
Uncertainty : ± 0.01 dB

3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	0.999	± 1 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

4. **Total Distortion** : < 1.1 %
IEC 60942 Class 1 Spec. : < 4 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 016 hPa.

----- END -----



Calibration Certificate

Certificate No. **804605**

Page 1 of 3 Pages

Customer : Enovative Environmental Service Limited

Address : Flat 6, 3/F, Block E, Wah Lok Industrial Centre, 31-35 Shan Mei Street, Shatin, N.T., Hong Kong.

Order No. : Q81807

Date of receipt : 9-May-18

Item Tested

Description : Sound Level Meter

Manufacturer : Rion

I.D. : --

Model : NL-52

Serial No. : 01143484

Test Conditions

Date of Test : 15-May-18

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

Test Results

All results were within the IEC 61672 Type1 or manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C170120	SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant. The test results apply to the above Unit-Under-Test only

Calibrated by : 
Elva Chong

Approved by : 
Kin Wong



Calibration Certificate

Certificate No. 804605

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Results :

1. Self-generated noise: 16.0 dBA (Mfr's Spec ≤ 17 dBA)

2. Acoustical signal test

UUT Setting				Applied Value (dB)	UUT Reading (dB)	
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter			
20-130	A	F	OFF	94.0	94.0	
		S	OFF		94.0	
	C	F	OFF		94.0	
	Z	F	OFF		94.0	
	A	F	OFF	114.0	114.1	
			S		OFF	114.1
		C	F		OFF	114.1
			Z		F	OFF

IEC 61672 Type 1 Spec. : ± 1.1 dB

Uncertainty : ± 0.1 dB

3 Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, ± 2 dB
63 Hz	-26.2	- 26.2 dB, ± 1.5 dB
125 Hz	-16.2	- 16.1 dB, ± 1.5 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.2	- 3.2 dB, ± 1.4 dB
1 kHz	0.0 (Ref)	0 dB, ± 1.1 dB
2 kHz	+1.0	+ 1.2 dB, ± 1.6 dB
4 kHz	+0.7	+ 1.0 dB, ± 1.6 dB
8 kHz	-1.2	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-8.6	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. 804605

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4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	--	± 0.4 dB
C	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	--	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 009 hPa.

4. Preamplifier model : NH-25 , S/N : 21113

5. Firmware Version: 1.8

6. Power Supply Check: OK

7. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END -----

Appendix D

EM&A Monitoring Schedules

**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2
Impact Monitoring & Site Auditing Schedule for December 2018**

December 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(14:00pm – 16:00 pm)	6	7	8
9	10	11 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	12	13 ET Site Walk(09:30am – 11:00am)	14	15
16	17 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	18	19 ET Site Walk(09:30 am – 11:00 am) with Liantang Project-wide ET and IEC + SSEMCC	20	21 24-hour TSP + 3 x 1-hour TSP	22
23	24	25 Christmas Day	26 The first weekday after Christmas Day	27 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(09:30am – 11:00 am) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC	28	29
30	31					

**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2
Impact Monitoring & Site Auditing Schedule for January 2019**

January 2019						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 The First Day of January	2 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(14:00pm – 18:00pm)	3	4	5
6	7	8 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(14:00am – 18:00pm)	9	10	11	12
13	14 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	15	16	17 ET Site Walk(09:30am – 11:00am)	18 24-hour TSP + 3 x 1-hour TSP (SR77)	19
20	21	22	23 ET Site Walk(09:30 am – 11:00 am) with Liantang Project-wide ET and IEC + SSEM (To be confirmed)	24 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	25	26
27	28	29	30 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	31 ET Site Walk(09:30am – 11:00 am) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC (To be confirmed)		

Appendix E

Meteorological Data Extracted from Hong Kong Observatory

Daily Extract of Meteorological Observations , December 2018

Day	Hong Kong Observatory							King's Park	Waglan Island [^]		
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)	Total Bright Sunshine (hours)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)							
01	1018.3	24.2	22.1	21.1	18.1	78	56	0.0	***	***	***
02	1016.4	24.3	22.4	21.2	19.3	83	51	0.0	***	***	***
03	1016.5	26.0	23.7	22.0	19.8	79	58	0.0	***	***	***
04	1016.0	27.1	24.8	22.7	20.6	78	58	0.0	***	***	***
05	1015.5	24.8	23.6	22.5	20.3	82	82	Trace	***	***	***
06	1015.5	25.1	23.3	21.6	20.4	84	83	0.1	***	***	***
07	1018.5	23.3	21.1	18.5	19.1	88	90	1.0	***	***	***
08	1021.6	19.7	18.0	16.7	13.7	76	88	0.0	***	***	***
09	1021.5	18.3	17.0	16.4	12.6	75	90	Trace	***	***	***
10	1019.7	18.3	17.0	15.1	12.6	75	88	0.2	***	***	***
11	1020.3	20.4	18.0	16.5	12.0	68	84	Trace	***	***	***
12	1024.2	16.5	14.9	13.7	8.9	67	84	0.0	***	***	***
13	1025.1	18.1	15.6	13.5	9.6	68	86	0.0	***	***	***
14	1025.3	18.2	16.8	15.5	11.7	72	88	0.0	***	***	***
15	1023.5	21.2	18.9	17.2	14.3	75	64	0.0	***	***	***
16	1022.0	20.9	19.3	18.0	14.6	74	88	Trace	***	***	***
17	1022.2	21.0	18.0	15.6	9.1	56	38	0.0	***	***	***
18	1022.2	20.2	18.1	16.2	10.1	60	38	0.0	***	***	***
19	1019.5	21.5	19.9	18.5	16.0	78	78	0.0	***	***	***
20	1016.5	23.2	21.6	20.1	18.8	84	80	0.0	***	***	***
21	1016.1	25.0	22.4	21.4	19.9	86	68	0.0	***	***	***
22	1017.0	25.2	22.2	20.0	18.0	77	66	0.0	***	***	***
23	1017.6	22.5	20.1	17.5	18.2	89	96	10.5	***	***	***
24	1017.5	19.0	18.0	16.8	15.6	86	99	0.1	***	***	***
25	1015.5	21.1	19.7	18.5	16.3	81	90	0.0	***	***	***
26	1014.3	23.6	20.9	18.7	18.0	84	27	0.0	***	***	***
27	1016.6	22.8	20.6	18.9	16.7	79	77	Trace	***	***	***
28	1021.6	20.2	18.1	16.3	12.6	70	79	Trace	***	***	***
29	1026.1	16.3	14.0	12.5	8.2	68	87	Trace	***	***	***
30	1026.5	15.4	12.6	10.3	6.7	67	83	Trace	***	***	***
31	1027.0	15.6	13.2	11.8	7.4	68	77	0.0	***	***	***
Mean/Total	1019.9	21.3	19.2	17.6	14.8	76	75	11.9	***	***	***
Normal [§]	1020.5	20.2	17.9	15.9	11.9	69	52	26.8	172.2	070	26.0

*** unavailable

[^] Information of wind direction and wind speed for Waglan Island are based on automatic weather station data since January 1989

Trace means rainfall less than 0.05 mm

[§] 1981-2010 Climatological Normal, unless otherwise specified

Appendix F

Air Quality Monitoring Results and their Graphical Presentation

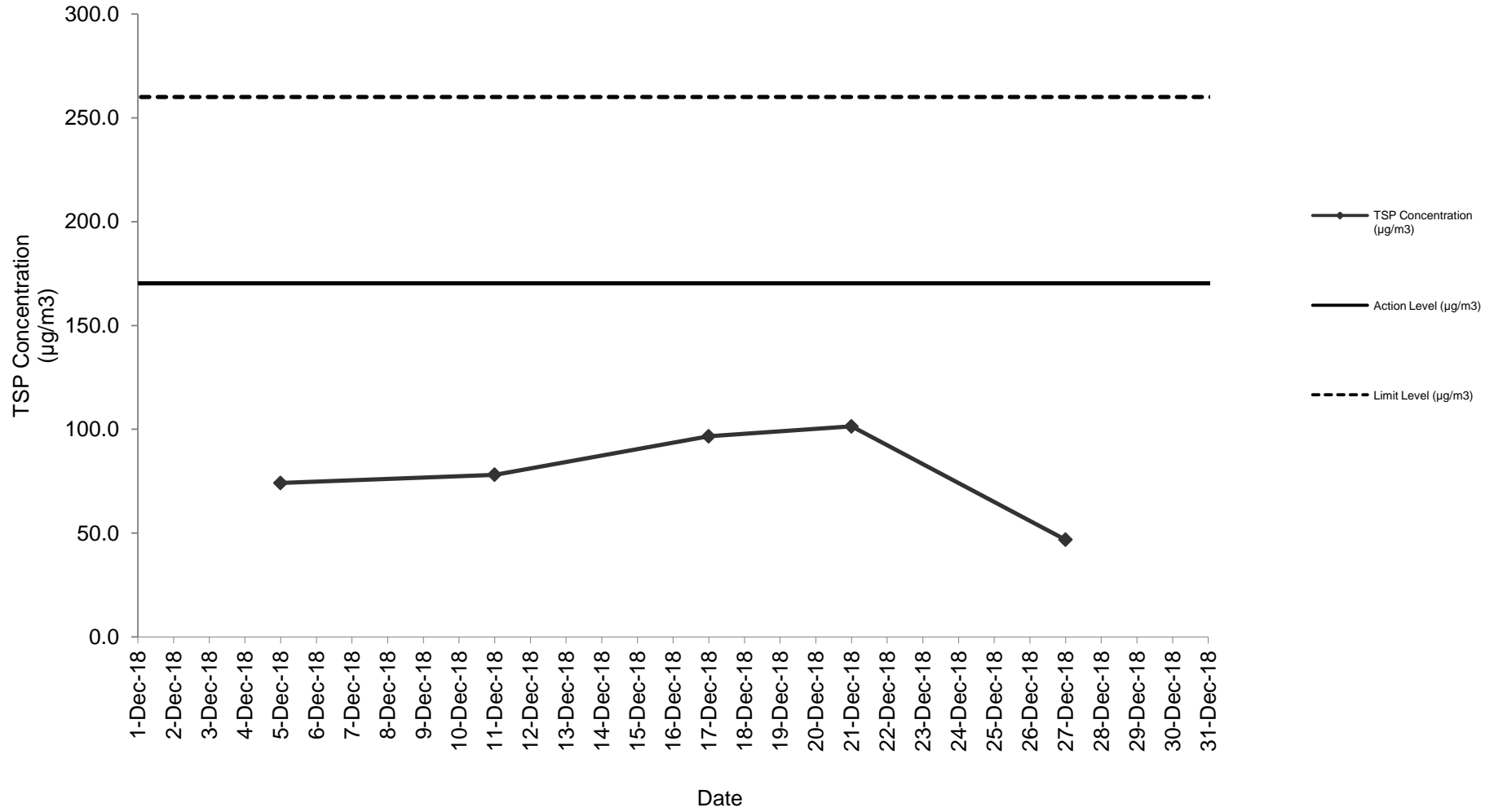
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

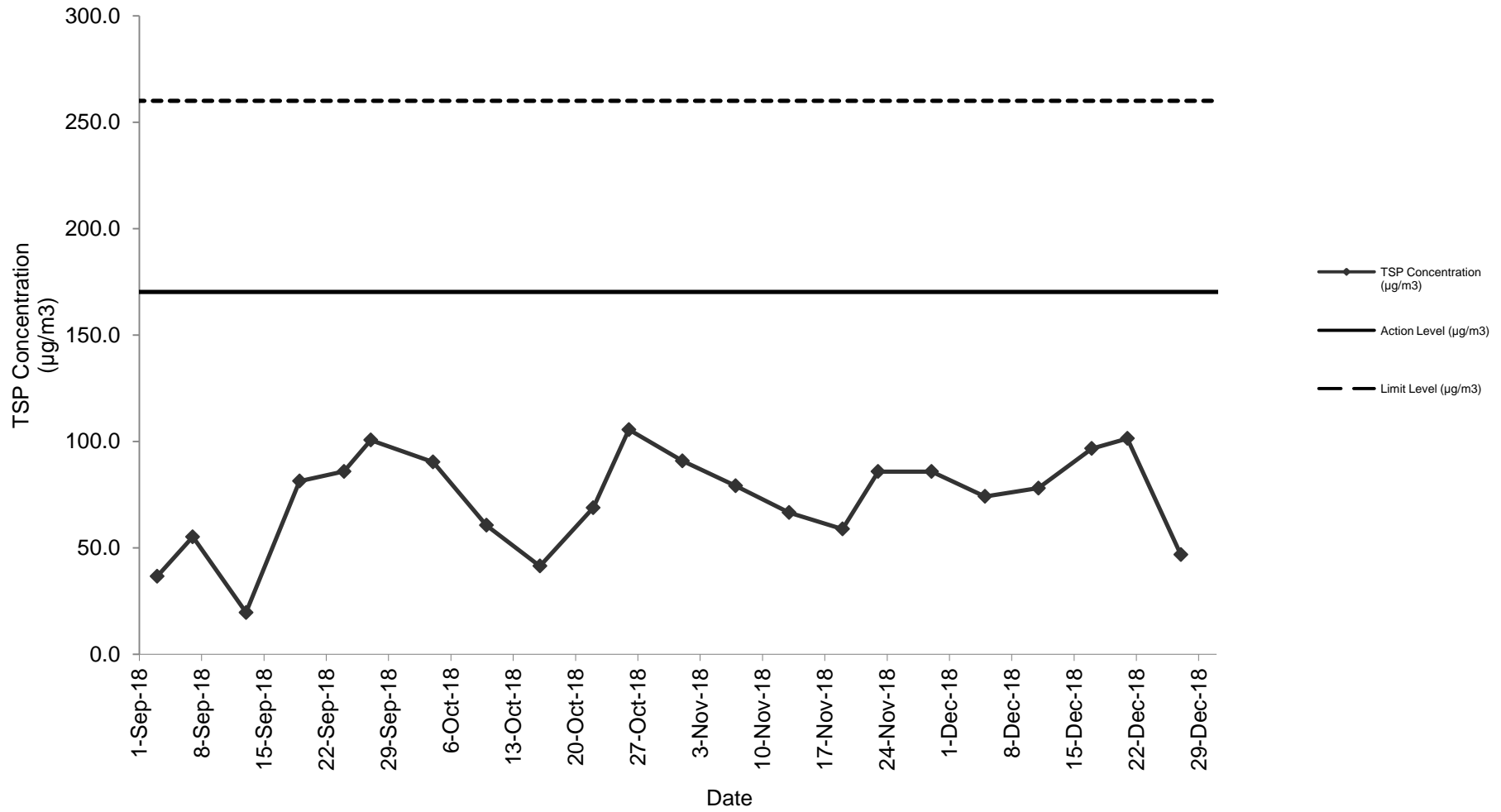
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m ³ /min)			Total Volume (m ³)	TSP Concentration (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Wind speed m/s	Wind direction	NOE	IR
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate								
5-Dec-18	Cloudy	12:11	C204	2.6714	2.8256	0.1542	9279.67	9303.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	74.1	170.3	260.0	<5	N		
11-Dec-18	Fine	12:13	C206	2.6795	2.8419	0.1624	9306.67	9330.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	78.1	170.3	260.0	<5	N		
17-Dec-18	Sunny	12:13	C208	2.6394	2.8404	0.2010	9333.67	9357.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	96.7	170.3	260.0	<5	N		
21-Dec-18	Fine	12:13	C210	2.6220	2.8329	0.2109	9360.67	9384.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	101.4	170.3	260.0	<5	N		
27-Dec-18	Fine	12:13	C212	2.6751	2.7724	0.0973	9387.67	9411.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	46.8	170.3	260.0	<5	N		
																Average	79.4						
																Min	46.8						
																Max	101.4						

Note: No major dust source observed during the monitoring period
 Data in **Bold** denotes exceedance of respective Action Level
 Data in **Bold Underline** denotes exceedance of respective Limit Level

24-Hour TSP Monitoring Result at Station: SR77



**24-Hour TSP Monitoring Result at Station: SR77
(September 2018 - December 2018)**



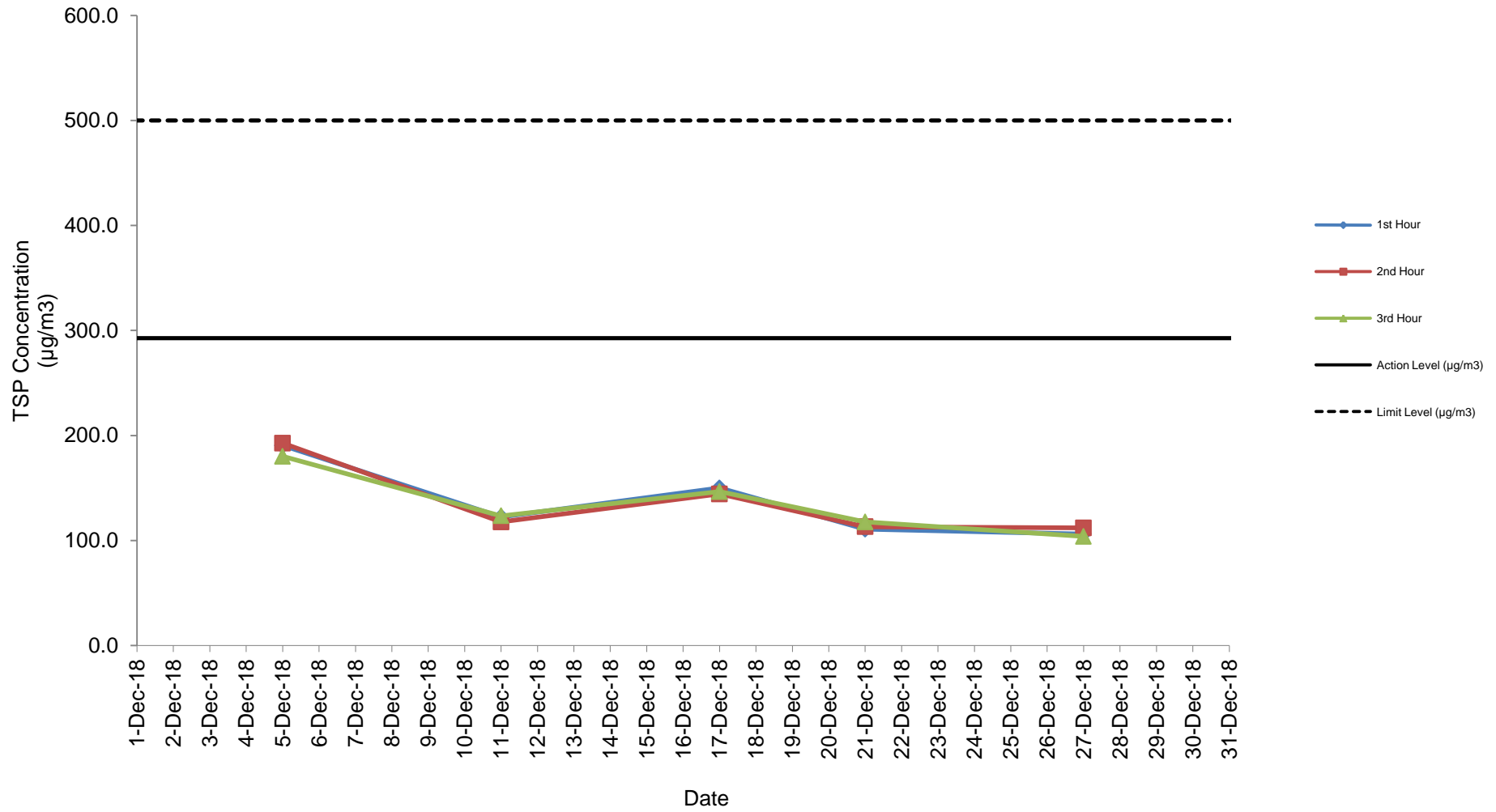
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

Detailed Calculation of 1-Hour TSP Monitoring Result at Station: SR77

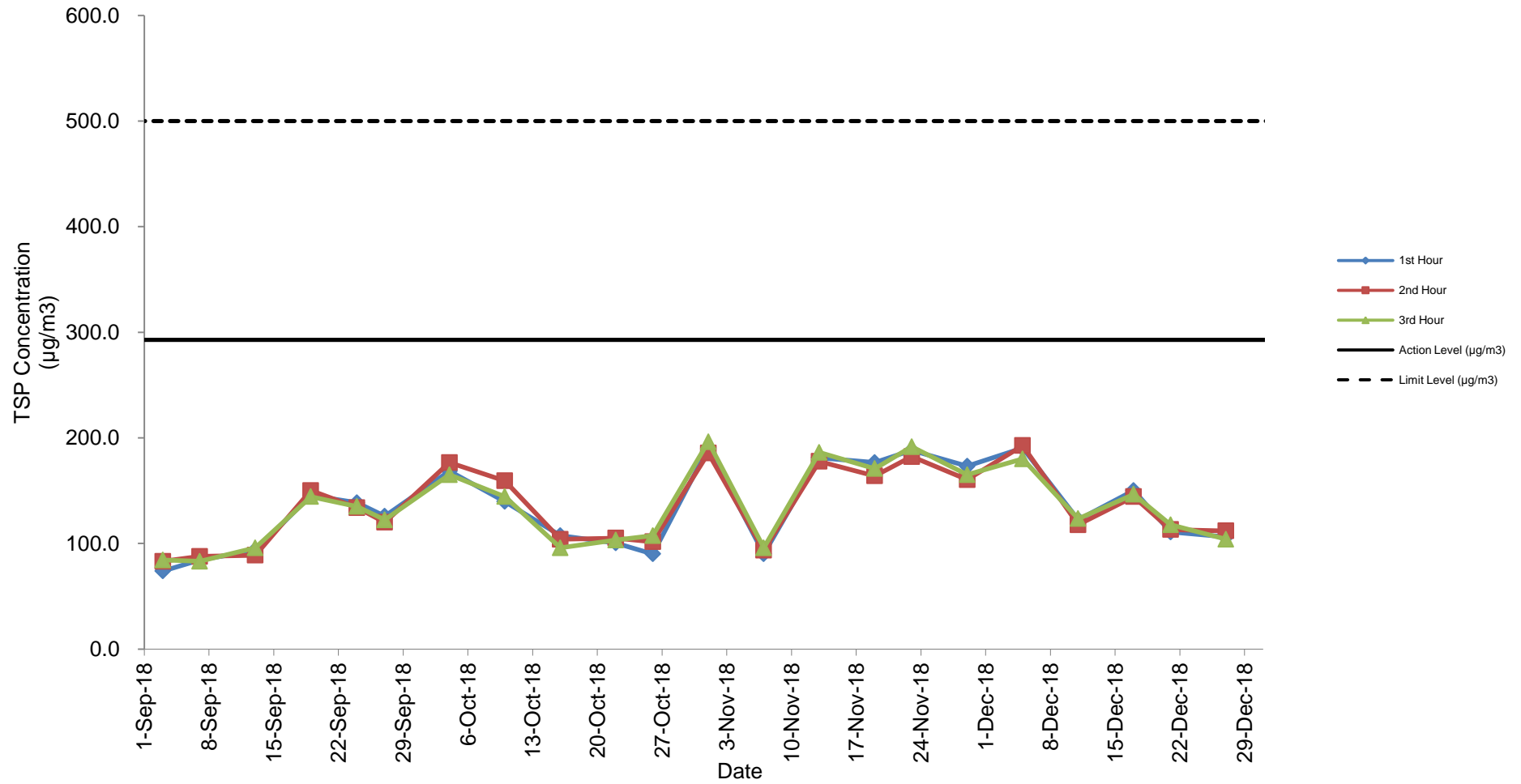
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m ³ /min)			Total Volume (m ³)	TSP Concentration (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Wind speed m/s	Wind direction	NOE	IR
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate								
5-Dec-18	Cloudy	09:00	C205A	2.6616	2.6781	0.0165	9276.67	9277.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	190.4	292.7	500.0	<5	N		
	Cloudy	10:04	C205B	2.6704	2.6871	0.0167	9277.67	9278.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	192.7	292.7	500.0	<5	N		
11-Dec-18	Cloudy	11:08	C205C	2.6379	2.6535	0.0156	9278.67	9279.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	180.0	292.7	500.0	<5	N		
	Fine	09:00	C207A	2.6695	2.6801	0.0106	9303.67	9304.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	122.3	292.7	500.0	<5	N		
17-Dec-18	Fine	10:03	C207B	2.6801	2.6903	0.0102	9304.67	9305.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	117.7	292.7	500.0	<5	N		
	Fine	11:07	C207C	2.6494	2.6601	0.0107	9305.67	9306.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	123.5	292.7	500.0	<5	N		
21-Dec-18	Sunny	09:00	C209A	2.6441	2.6571	0.0130	9330.67	9331.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	150.0	292.7	500.0	<5	N		
	Sunny	10:04	C209B	2.6594	2.6719	0.0125	9331.67	9332.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	144.3	292.7	500.0	<5	N		
27-Dec-18	Sunny	11:08	C209C	2.6717	2.6844	0.0127	9332.67	9333.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	146.6	292.7	500.0	<5	N		
	Fine	09:00	C211A	2.6841	2.6937	0.0096	9357.67	9358.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	110.8	292.7	500.0	<5	N		
21-Dec-18	Fine	10:03	C211B	2.6887	2.6985	0.0098	9358.67	9359.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	113.1	292.7	500.0	<5	N		
	Fine	11:07	C211C	2.6679	2.6781	0.0102	9359.67	9360.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	117.7	292.7	500.0	<5	N		
27-Dec-18	Fine	09:00	C213A	2.6739	2.6831	0.0092	9384.67	9385.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	106.2	292.7	500.0	<5	N		
	Fine	10:04	C213B	2.6712	2.6809	0.0097	9385.67	9386.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	111.9	292.7	500.0	<5	N		
	Fine	11:08	C213C	2.6497	2.6587	0.0090	9386.67	9387.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	103.9	292.7	500.0	<5	N		
																Average	135.4						
																Min	103.9						
																Max	192.7						

Note: No major dust source observed during the monitoring period
Data in **Bold** denotes exceedance of respective Action Level
Data in **Bold Underline** denotes exceedance of respective Limit Level

1-Hour TSP Monitoring Result at station: SR77



1-Hour TSP Monitoring Result at station: SR77 (September 2018 - December 2018)



Appendix G

Summary of Event and Action Plan

Event and Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	IEC	ER	Contractor
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor, and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase frequency to daily; 5. Analyse Contractor's working procedures to determine possible mitigation to be; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by ER until the exceedance is abated.

Event and Action Plan for Noise

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. 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. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Water Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor & ER; 4. Check monitoring data, all plant, equipment & contractor's working methods; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET & Contractor's working methods; 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; Notify, Contractor 	<ol style="list-style-type: none"> 1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures with IEC, ER & Contractor; 6. Ensure mitigation measures are implemented; 7. Increase monitoring to daily until no exceedance of Action level. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly; 4. Supervise the implementation of mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures properly implemented; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the Engineer & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 5. Implement the agreed mitigation measures.

Event	Action			
	ET Leader	IEC	ER	Contractor
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & contractor's working methods; 5. Discuss mitigation measures with IEC, Contractor & ER. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods. 	<ol style="list-style-type: none"> 1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER.
Limit level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat measurement on the next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures within IEC, Contractor & ER; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on potential remedial actions; 3. Review Contractor's mitigation measures whenever necessary to assure their effectiveness & advise the ER accordingly; 4. Supervise the implementation of mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider & instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Appendix H Noise Monitoring Results and their Graphical Presentation

Appendix H
Noise Monitoring Results and their Graphical Presentation

Noise Monitoring Result at SR77

Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)
				L10(30min)	L90(30min)	Leq(30min)			
2018-12-05	Cloudy	11:30	12:00	79.0	66.0	69.0	-	67.8	75.0
2018-12-11	Fine	11:30	12:00	78.5	63.5	68.5	-	67.8	75.0
2018-12-17	Sunny	11:00	11:30	77.5	62.0	66.5	-	67.8	75.0
2018-12-27	Fine	11:30	12:00	76.5	63.0	67.5	-	67.8	75.0
						Average	67.9		
						Minimum	66.5		
						Maximum	69.0		

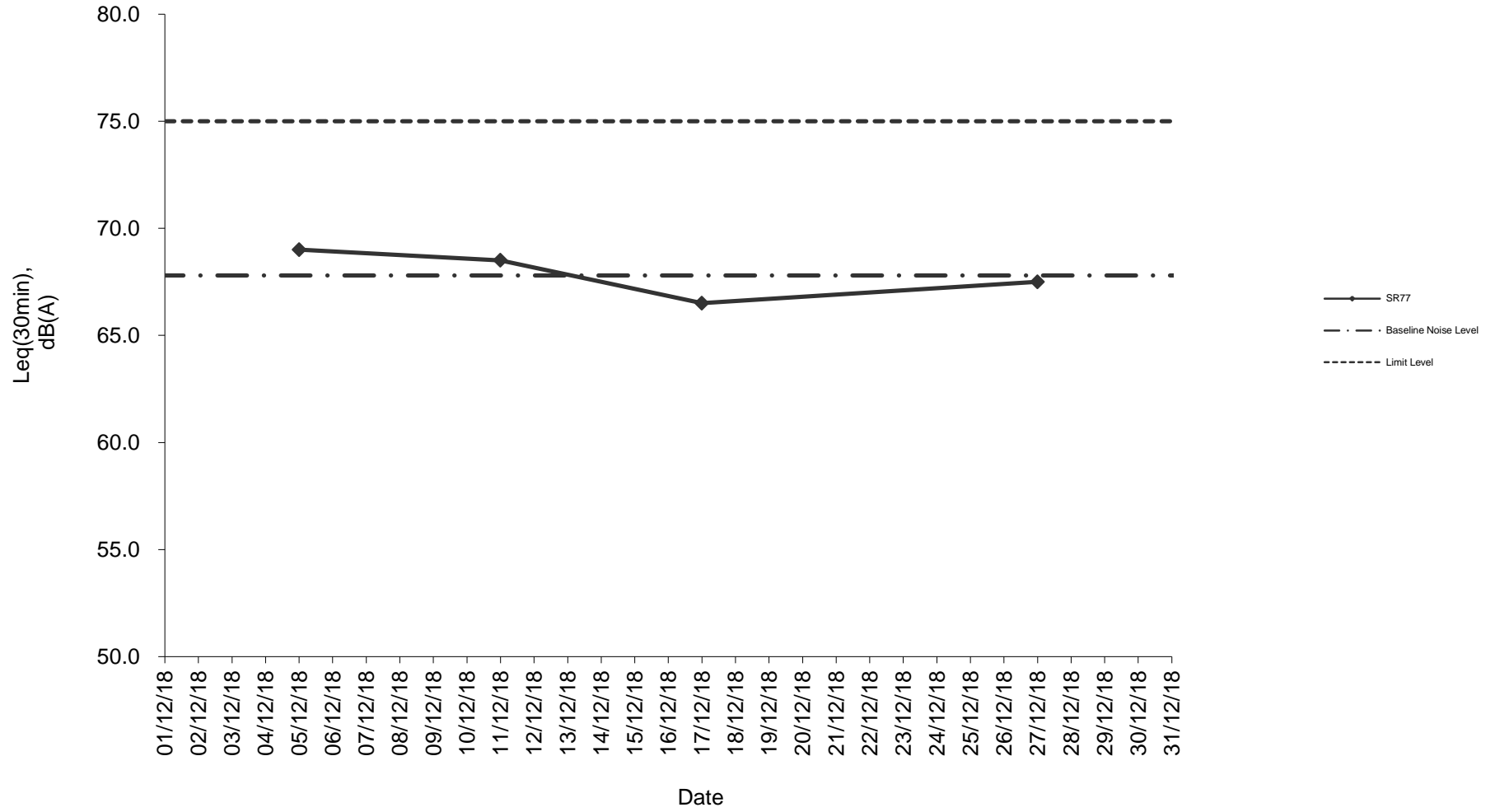
Remarks

* +3dB(A) Façade effect correction included

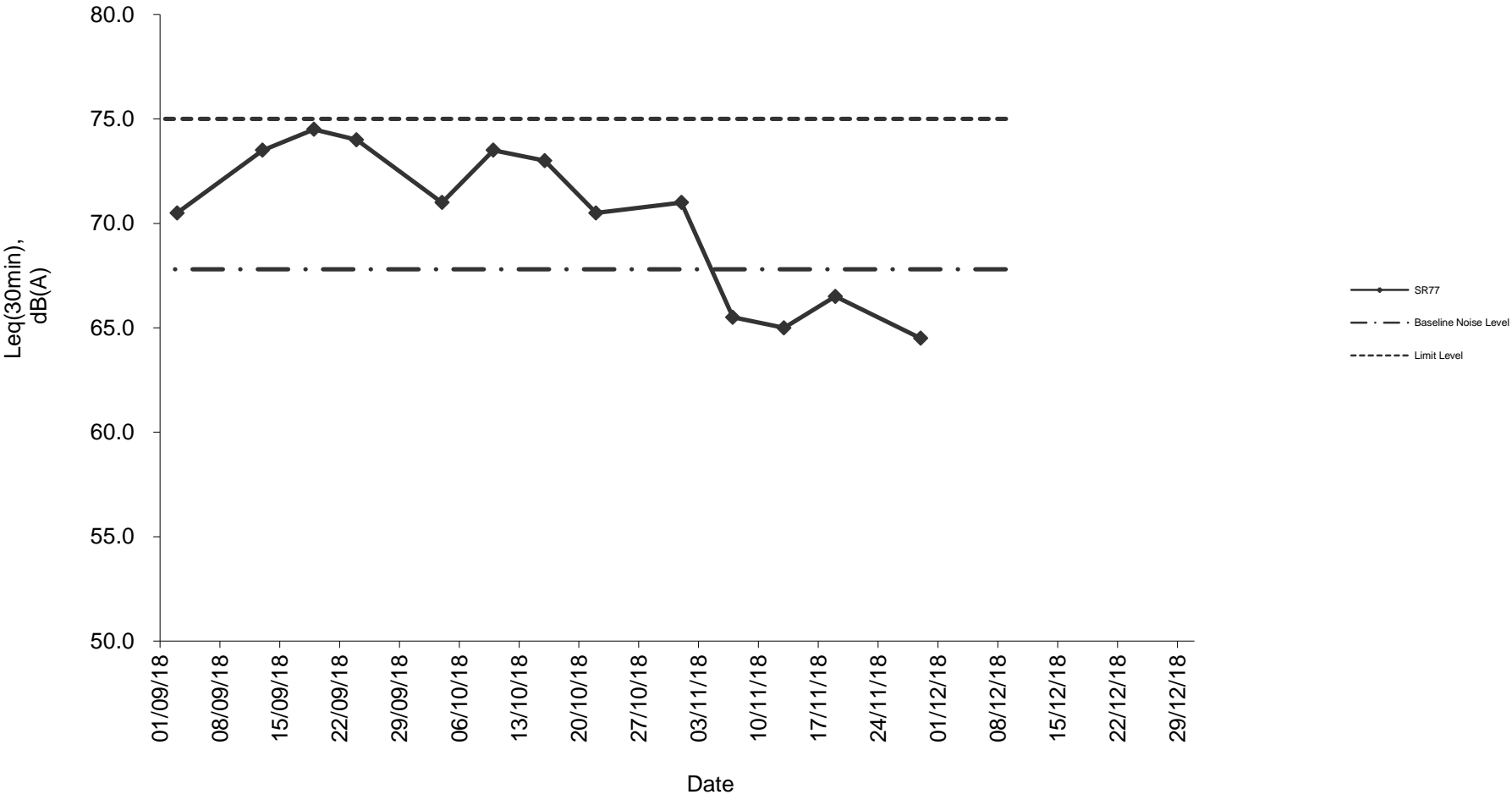
** Baseline corrected level is only calculated when measured noise level (Leq) > limit level.

*** Data in denotes exceedance of respective Limit Level

Noise monitoring result: SR77



**Noise monitoring result: SR77
(September 2018 - December 2018)**



Appendix K Waste Flow Table

Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Soil	Soil Reused in the Contract	Soil Reused in other Projects	Soil Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging (Note 3)	Plastics	Chemical Waste	General Refuse (Note 2)
Unit	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in m ³)	(in '000m ³)
Jan-18	3.089	0.304	2.785	0.060	-	2.725	0.923	-	-	-	-	0.150
Feb-18	2.698	0.256	2.442	0.150	-	2.292	1.144	-	-	-	-	0.095
Mar-18	1.524	0.141	1.383	0.120	-	1.263	0.211	-	-	-	-	0.085
Apr-18	2.880	0.786	2.094	0.360	-	1.734	0.788	-	-	-	-	0.125
May-18	1.164	0.290	0.874	0.101	-	0.773	0.185	-	-	-	-	0.150
Jun-18	0.862	0.082	0.780	0.515	-	0.265	0.000	-	-	-	-	0.110
Sub-Total	12.217	1.859	10.358	1.306	-	9.052	3.251	-	-	-	-	0.715
Jul-18	1.520	0.261	1.259	0.476	-	0.783	0.039	-	-	-	-	0.135
Aug-18	2.372	0.478	1.894	0.613	-	1.281	0.193	-	-	-	-	0.095
Sep-18	1.709	0.361	1.348	0.381	-	0.967	0.272	-	-	-	-	0.150
Oct-18	1.198	0.316	0.882	0.000	-	0.882	0.000	-	-	-	-	0.115
Nov-18	1.938	0.361	1.577	0.296	-	1.281	0.000	-	-	-	-	0.160
Dec-18	1.406	0.302	1.104	0.060	-	1.044	0.000	-	-	-	-	0.085
Total	22.360	3.938	18.422	3.132	-	15.290	3.755	-	-	-	-	1.455

- Note:
1. Assume the density of soil fill is 2 ton/m³.
 2. Assume the density of rock and broken concrete is 2.5 ton/m³.
 3. Assume each truck of C&D wastes is 5m³.
 4. The inert C&D materials except slurry and bentonite are disposed at Tuen Mun 38.
 5. The slurry and bentonite are disposed at Tseung Kwun O 137.
 6. The non-inert C&D wastes are disposed at NENT.
 7. Assume the density of metal is 7,850 kg/m³.
 8. Assume the density of plastic is 941 kg/m³.
 9. Assume the density of paper is 800 kg/m³.

Appendix L Implementation Schedule of Environmental Mitigation Measures (EMIS)

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
Air Quality				
Air Quality during Construction	<ul style="list-style-type: none"> ● Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading. ● All stockpiles of excavated materials or spoil of more than 50m³ shall be enclosed, covered or dampened during dry or windy conditions. ● Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas. ● All spraying of materials and surfaces shall avoid excessive water usage. ● Vehicles that have the potential to create dust while transporting materials shall be covered, with the cover properly secured and extended over the edges of the side and tail boards. ● Materials shall be dampened, if necessary, before transportation. ● Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks. ● Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads. 	During Construction	Contractor	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
Air Quality during Operation	Not required	N/A	N/A	N/A
Noise				
Noise during Construction	<ul style="list-style-type: none"> ● Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant. ● Reduce the number of equipment and their percentage on-time. 	During Construction	Contractor	✓ ✓
Noise during Operation	Not required	N/A	N/A	N/A
Water Quality				
Water Quality during Construction	<u>Road Widening Works, Earthworks and Culvert Extension Works</u> <ul style="list-style-type: none"> ● Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settleable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required. 	During Construction	Contractor	✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<ul style="list-style-type: none"> ● Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained. ● Runoff from exposed working areas, unfinished slopes and from unlined temporary channels should be directed to stilling basins and/or silt traps before discharging to the drainage outfalls. ● Regular inspections of stilling basins and/or silt traps is required to ensure that sediment is not conveyed into the existing drainage system. ● Open stockpiles should be covered with a tarpaulin cover. ● During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded. ● Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains. ● Fuels should be stored in bunded areas such that spillage can be easily collected. 			<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
Water Quality during Operation	Not required	N/A	N/A	N/A
Waste Management				
Waste Management during Construction	<p><u>General Waste</u></p> <ul style="list-style-type: none"> ● Transport of wastes off site as soon as possible. ● Maintenance of accurate waste records. ● Minimisation of waste generation for disposal (via reduction/recycling/re-use). ● No on-site burning will be permitted. ● Use of re-useable metal hoardings/signboards. <p><u>Vegetation from site clearance</u></p> <ul style="list-style-type: none"> ● Segregation of materials to facilitate disposal. ● Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas. 	<p>During Construction</p> <p>During Construction</p>	<p>Contractor</p> <p>Contractor</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<u>Demolition Wastes</u>	During Construction	Contractor	✓
	<ul style="list-style-type: none"> • Segregation of materials to facilitate disposal. • Appropriate stockpile management. 			✓
	<u>Excavated Materials</u>	During Construction	Contractor	✓
	<ul style="list-style-type: none"> • Segregation of materials to facilitate disposal / reuse. • Appropriate stockpile management. 			✓
	<ul style="list-style-type: none"> • Re-use of excavated material on or off site (where possible). 			✓
	<ul style="list-style-type: none"> • Special handling and disposal procedures in the event that contaminated materials are excavated. 			N/A
	<u>Construction Wastes</u>	During Construction	Contractor	✓
	<ul style="list-style-type: none"> • Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles). 			✓
	<ul style="list-style-type: none"> • Appropriate stockpile management. 			✓
	<ul style="list-style-type: none"> • Planning to reduce over ordering and waste generation. 			✓
	<ul style="list-style-type: none"> • Recycling and re-use of materials where possible (e.g. metal, wood from formwork) 			✓
	<ul style="list-style-type: none"> • For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal. 	✓		
<u>Bentonite Slurries</u>	During Construction	Contractor	N/A	
<ul style="list-style-type: none"> • Bentonite slurries should be reused as far as possible. 			N/A	
<ul style="list-style-type: none"> • Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94. 				
<u>Chemical Wastes</u>	During Construction	Contractor	✓	
<ul style="list-style-type: none"> • Storage within locked, covered and bunded area. 			✓	
<ul style="list-style-type: none"> • The storage area shall not be located adjacent to sensitive receivers e.g. drains. 			✓	
<ul style="list-style-type: none"> • Minimise waste production and recycle oils/solvents where possible. 			✓	

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<ul style="list-style-type: none"> • A spill response procedure shall be in place and absorption material available for minor spillages. • Use appropriate and labelled containers. • Educate site workers on site cleanliness/waste management procedures. • If chemical wastes are to be generated, the contractor must register with EPD as a chemical waste producer. • The chemical wastes shall be collected by a licensed chemical waste collector. <p><u>Municipal Wastes</u></p> <ul style="list-style-type: none"> • Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal. • Regular, daily collections are required by an approved waste collector. 	During Construction	Contractor	✓ ✓ ✓ ✓ ✓ ✓
Waste Management during Operation	Not required.	N/A	N/A	N/A
Ecology				
Ecology during Construction	<p><u>Accurate Delineation of Works Area</u></p> <ul style="list-style-type: none"> • Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats. • Individual trees which fall within the works areas but which work plans show do not require removal are to be retained and fenced off to maximise protection. <p><u>Dust generation</u></p> <p>There are a number of measures which shall be taken as specified in the Air Pollution Control (Construction Dust) Regulation on 'Dust Control Requirements, including the following key measures to be applied during construction:</p> <ul style="list-style-type: none"> • vehicle washing facilities to be provided at every discernible or designated vehicle exit point; 	During Construction During Construction	Contractor Contractor	✓ ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<ul style="list-style-type: none"> ● all temporary site access roads shall be sprayed with water to suppress dust as necessary; ● all dusty materials should be sprayed with water immediately prior to any handling; and ● all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area. <p><u>Surface Run-off</u></p> <p>In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include:</p> <ul style="list-style-type: none"> ● Bund and cover stockpiles to avoid run-off; ● Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical; ● All vehicle maintenance to be undertaken within a bunded area; and ● Maximise vegetation retention on-site to maximise absorption (minimise transport). 	During Construction	Contractor	✓ ✓ ✓ ✓ ✓ ✓
Ecology during Operation	<ul style="list-style-type: none"> ● To conduct compensatory ecological planting as specified in the latest landscape plans approved by EPD (Clause 2.6 of the Environmental Permit refers). 	During Construction and operation	Contractor (during construction) / LCSD* (during operation) (Note: * The division of vegetation planting and maintenance responsibilities shall follow the guidelines stipulated in ETWB TCW No. 2/2004.)	N/A
Landscape and Visual				
Landscape and Visual during Construction	<p><u>Preservation of Existing Vegetation</u></p> <ul style="list-style-type: none"> ● Trees identified for retention within the project limit would be protected during the works ● The tree transplanting and planting works shall be implemented by approved Landscape Contractors 	During Construction	Contractor	✓ ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<p><u>Temporary Works Areas</u> Where feasible the works areas would be screened using hoarding and existing vegetation would be retained where possible to reduce the landscape and visual impacts arising from the construction activity. The landscape of these works areas would be restored following the completion of the construction phase.</p> <p><u>Hoarding</u> A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSRs.</p> <p><u>Top Soils</u> The works will result in disturbance to extensive areas of topsoil. Topsoil worthy of retention should be stockpiled for use following completion of the civil engineering works. It should either be temporarily vegetated with hydroseeded grass or turned over on a regular basis.</p> <p><u>Protection of Important Landscape Features</u> Important features such as temples, Island House and kilns within the study area, although remote from the proposed works retained and adequately protected.</p>	During Construction	Contractor	✓
		During Construction	Contractor	✓
		During Construction	Contractor	N/A
		During Construction	Contractor	N/A
Landscape and Visual during Operation	Not required.	N/A	N/A	N/A

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable

Appendix N Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative Complaint Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
C131126	26, November, 2013	Mr. Tony Hung from WWF	Mat Wat River (works sites for box culvert extension)	Suspected unauthorised discharge of water from a construction site to Ma Wat River, Tai Wo Service Road East, Tai Po	<p>It was found that the water leaving the end of the steel pipes was the diverted water from the upstream of the existing box culverts, instead of being discharged from the construction works sites.</p> <p>An EM&A Programme is being undertaken to monitoring the environmental performance of the construction works, and the Contractor has also implemented appropriate mitigation measures to avoid silt-laden runoff discharging from the works sites into the river.</p> <p>The complaint is considered an invalid complaint under this Project.</p>	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
C141120	20 November, 2014	EPD	Ng Tung River and Ma Wat River nearby the site of the Liantang/ Heung Yuen Wai BCP Project (Contract Number CV/2012/09)	At Bridge NF426 in Fanling, the whole Ng Tung River showed milky and suspected illegal discharge by nearby factory has undertaken. (粉嶺近天橋編號 NF426 梧桐河整條河河水呈奶白色懷疑附近有工廠非法排放污水)	<p>Water Supplies Department (WSD) conducted a washout procedure on 20 November 2014 at about 9:30am to flush the newly installed water pipe of diameter of 1400mm which has recently finished disinfection. It is understood that the procedure has lasted for about 1 hour and large amount of freshwater has been discharged into the Ma Wat River through a washout port.</p> <p>Although water was observed seeping from the gantry switch and flew into the works sites, the area is a sump pit and the water was unlikely to run off and entered the river directly. As such, it is anticipated that only freshwater has been discharged into Ma Wat River through the washout port.</p> <p>Both site inspections conducted by the ET before the complaint (19 November 2014), and after the complaint (24 November 2014) did not identify any deficiencies on environmental mitigation measures. Also, there were no rains during the period and the risk of construction site run-off is considered minimal.</p>	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					<p>The water from the Ma Wat Channel adjoins the Ng Tung River before passing through the complaint location, so other pollution sources may also occur at upstream of Ng Tung River</p> <p>The complaint is considered unlikely due to the construction works of this project.</p>	
C171228	28 December, 2017	1823	Kau Lung Hang and Hong Lok Yuen	<p>Air quality issue nearby Kau Lung Hang and Hong Lok Yuen area. Stockpiling within the Project area was observed to be uncovered, causing dust dispersion within the area. (大埔九龍坑附近的空氣污染問題嚴重。吐露港公路蓮塘口岸隧道工程經常見到沙泥沒有覆蓋，導致沙土飛揚散佈九龍坑，康樂園一帶，造成極大困擾與明顯健康風險。要求立即改善，懲罰相</p>	<p>The Environmental Team (ET) was informed of the complaint through Chun Wo and CEDD via 1823 online-enquiry/ complaint form received on 28 December 2017 at 9:04am. Investigation was triggered in accordance with the procedures as specified in Section 7.3 of the EM&A Manual. A joint investigation by the ET and the IEC was conducted on 28 December 2017.</p> <p>As advised by the Contractor, no construction works were carried out during the public holiday.</p> <p>No exceedance of TSP level at the air monitoring station under this Contract was recorded in the past six months except 8 December 2017.</p>	

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
				<p>關建築商。附圖是該區狀況。昨日洗車，一日已經沙塵滿佈。)</p>	<p>Exceedance on 8 December 2017 was considered not project related as no major excavation works located close to the monitoring location at SR77.</p> <p>Based on the routine environmental site inspection and information provided by the Contractor, it is considered that dust suppression measures have been implemented to minimize dust nuisance arising from the works areas. Nonetheless, the ET and IEC will continue the auditing and reviewing of the Contractor's implementation of mitigation measures during the construction period.</p>	



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