

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

Monthly EM&A Report

October 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

(October 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 – October 2018 for the portion of Stage 2 works entrusted to Civil Engineering and Development Department (CEDD) under Contract No. CV/2012/09**

08 November 2018  
By Fax (2805 5028) & Hand

We refer to the Monthly EM&A Report – October 2018 received on 06 November 2018 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – October 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


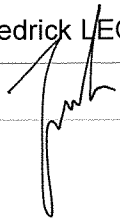



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## EXECUTIVE SUMMARY

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 October 2018. As informed by the Contractor, the major activities in the reporting month were:

- Cable detection and trial trenches;
- Remaining works on new Footbridge;
- Noise barrier construction;
- Road pavement works;
- Water main laying works (on Grade and on bridge deck);
- Installation of Noise barrier steel column & panel, and sign gantry (on Grade and on bridge deck);
- Construction of Pavilion and Pai Lau;
- Road Drainage Works;
- Construction of retaining wall; and
- Landscaping works.

### *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 major construction works in the coming reporting month are anticipated to include:

- Cable detection and trial trenches;
- Remaining works on new Footbridge;
- Noise barrier construction;
- Road pavement works;
- Water main laying works (on Grade and on bridge deck);
- Installation of Noise barrier steel column & panel, and sign gantry (on Grade and on bridge deck);
- Construction of Pavilion and Pai Lau;
- Road Drainage Works;
- Construction of retaining wall; and
- Landscaping works.

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 October 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:

- Cable detection and trial trenches;
- Remaining works on new Footbridge;
- Noise barrier construction;
- Road pavement works;
- Water main laying works (on Grade and on bridge deck);
- Installation of Noise barrier steel column & panel, and sign gantry (on Grade and on bridge deck);
- Construction of Pavilion and Pai Lau;
- Road Drainage Works;
- Construction of retaining wall; and
- Landscaping works.

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		
<b>Environmental Permit</b>				
EP-324/2008/E	26 Jan 2017	--	Granted on 26 Jan 2017	
<b>Construction Noise Permit</b>				
GW-RM0259-18	19 Jun 2018	17 Dec 2018	Valid	For lane shifting work of Fanling Highway both bound
GW-RN305-18	22 Jun 2018	17 Dec 2018	Valid	For road diversion and maintenance of Fanling Highway both bound
GW-RN366-18	9 Jul 2018	18 Dec 2018	Valid	For connection of DN600 Watermain near Kau Lung Hang
GW-RN361-18	15 Jul 2018	18 Dec 2018	Valid	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 2018	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	Vaild	For road diversion and maintenance of Fanling Highway bothbound.
GW-RN0566-18	29 Oct 2018	4 Apr 2019	Vaild	For sampling works Fanling Highway bothbound.
<b>Wastewater Discharge License</b>				
WT00032188-2018	20 Sep 2018	31 Aug 2023	Valid	--
<b>Chemical Waste Producer Registration</b>				
5113-634-C3817- 01	7 Oct 2013	--	Valid	--
<b>Billing Account for Construction Waste Disposal</b>				
7017914	2 Aug 2013	--	Account Active	--
<b>Notification Under Air Pollution Control (Construction Dust) Regulation</b>				
--	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 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**.

#### 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) *	124.5	90.0-176.6	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) *	73.4	41.5-105.5	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) <sup>(2)</sup>	Range, dB(A), Leq (30min) <sup>(2)</sup>	Action Level	Limit Level, dB(A)
M1(SR77) <sup>(1)</sup>	72.0	70.5 – 73.5	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 1198m<sup>3</sup> of excavated material has been generated. 882m<sup>3</sup> of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. No inert C&D materials were reused on site. 115m<sup>3</sup> 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 4, 11, 18 and 24 October 2018. The one held on 24 October 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	11 October 2018	Reminder: The contractor was reminded to replace the faded NRMM label for excavator at SA2.	Faded NRMM label has been replaced to colour label for Excavator. (item closed on 16 Oct 2018)
	18 October 2018	Observation: Mud and debris were observed at Tong Hang Road. The contractor was advised to remove the mud and debris to prevent potential muddy water flow to public road.	Mud and Debris has been removed to prevent potential muddy water flow to public at Tong Hang Road. (item closed on 24 Oct 2018)
		Reminder: The contractor was reminded to cover the slope with impervious sheeting at tong Hang Road.	Slope has been covered with impervious sheeting at Tong Hang road. (item closed on 24 Oct 2018)
Noise	N/A	N/A	N/A

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	27 September 2018	Observation: Muddy water was observed at the site entrance SA2 flow to public road. The contractor was advised to remove the water and enhance the mitigation measure to prevent the muddy water flow to public.	Muddy water has been removed from public road on 27 Sep 2018 and the ground of site entrance SA2 has been paved on 3 Oct 2018 to prevent the muddy water flow to public.(item closed)
	27 September 2018	Reminder: The contractor was reminded to remove the stagnant water at Tau Pass tunnel works area.	Stagnant water has been removed at Tau Pass tunnel works area on 3 Oct 2018. (item closed)
Waste/ Chemical Management	18 October 2018	Observation: Chemicals were observed without secondary containment near footbridge. The contractor was advised to provide secondary containment for all chemicals to prevent potential leakage.	Chemical has been removed to prevent potential leakage near footbridge. (item closed on 24 Oct 2018)
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 August 2018	11 Oct 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 major construction works in the coming reporting month are anticipated to include:

- Cable detection and trial trenches;
- Remaining works on new Footbridge;
- Noise barrier construction;
- Road pavement works;
- Water main laying works (on Grade and on bridge deck);
- Installation of Noise barrier steel column & panel, and sign gantry (on Grade and on bridge deck);
- Construction of Pavilion and Pai Lau;
- Road Drainage Works;
- Construction of retaining wall; and
- Landscaping works.

### **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, the following recommendation was provided:

#### Air Quality

- Slope and stockpile of dusty material shall be covered by impervious sheeting entirely.
- Faded NRMM label shall be replaced to colour label for all Non Road Mobile Machineries.
- Mud and debris shall be removed to prevent potential muddy water flow to public road.

#### Water Quality

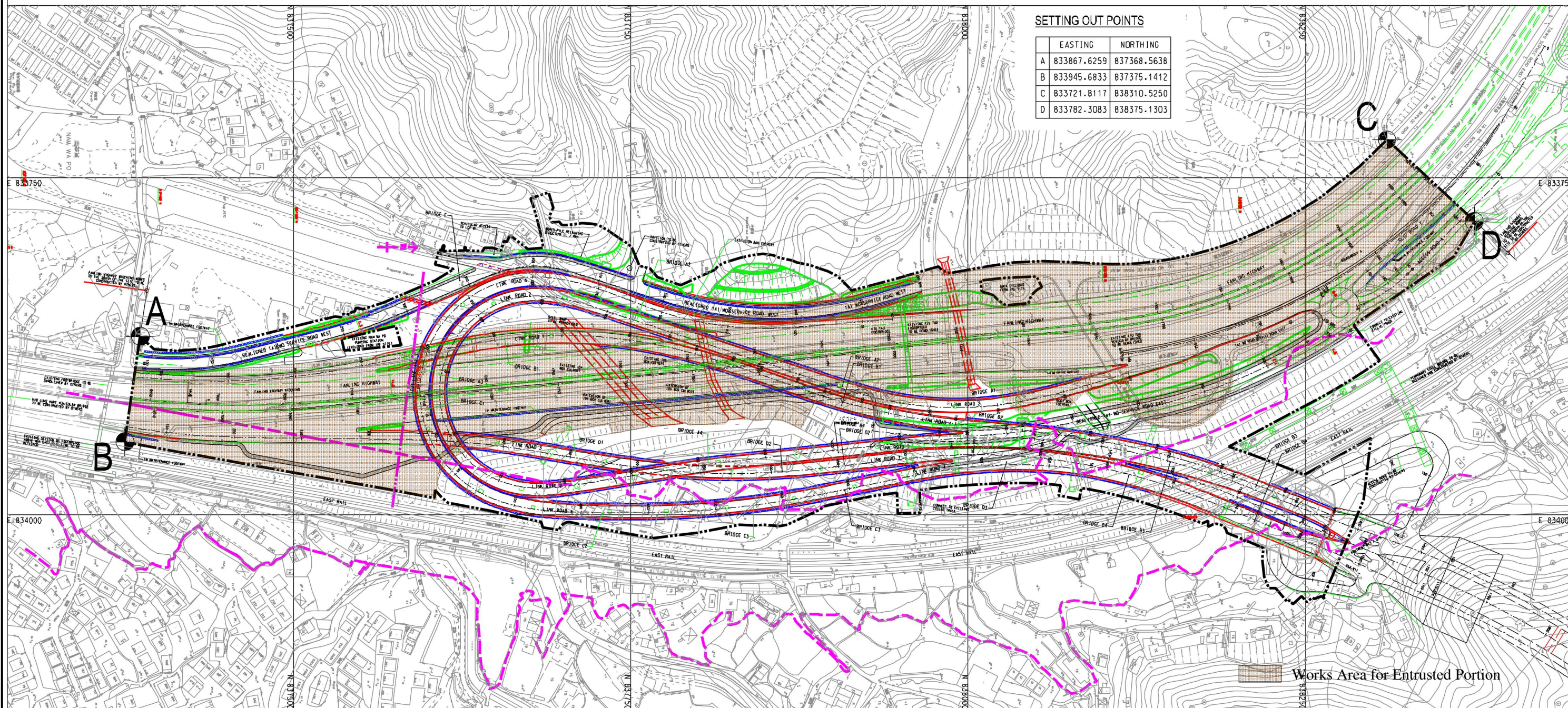
- Stagnant water and muddy water shall be removed to avoid site runoff overflow to public road.

#### Waste/ Chemical Management

- Secondary containment shall be provided for chemical to prevent potential leakage.

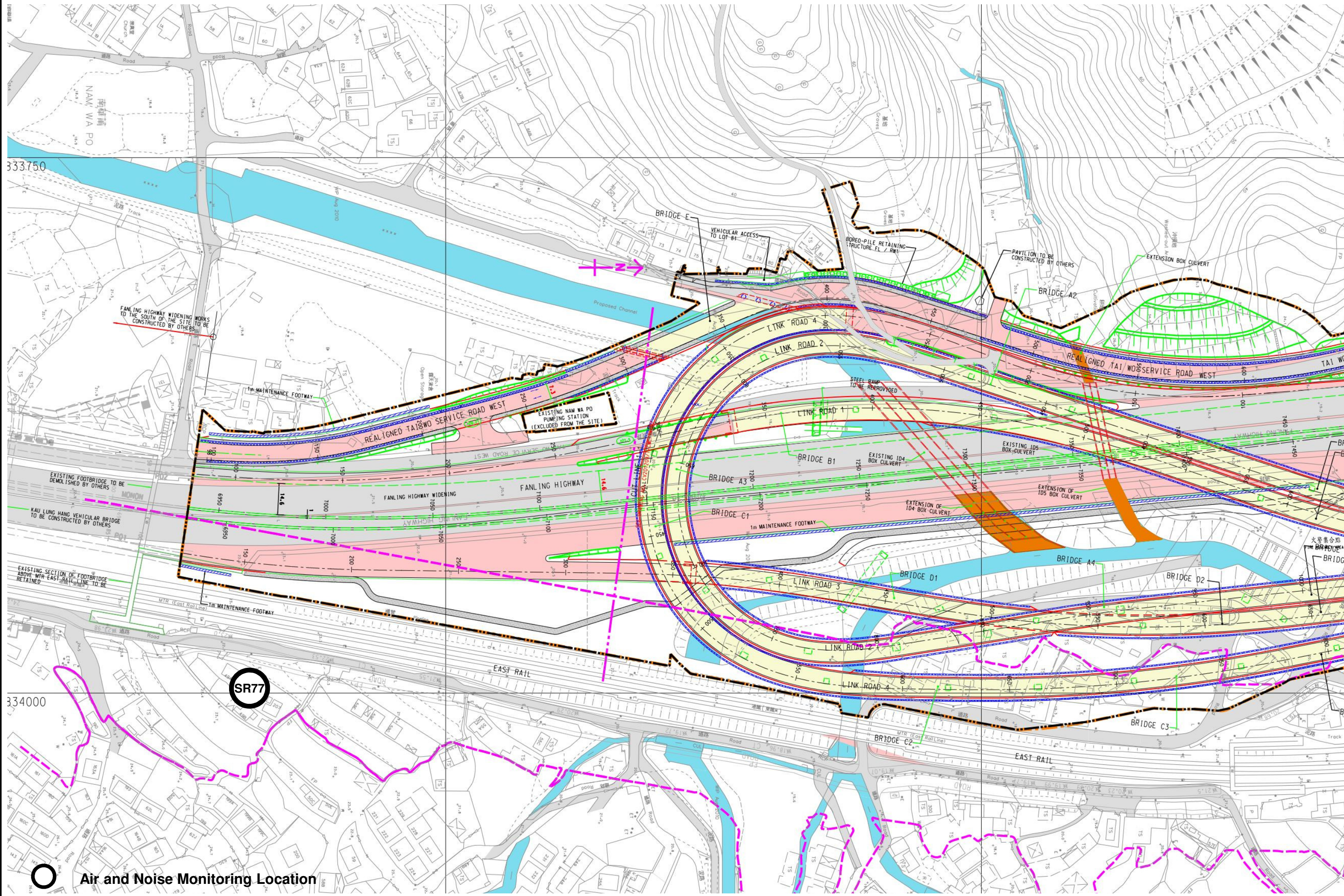
## Figure





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# Appendix A Construction Programme



Activity ID	Activity Name	OD	RD	Start	Finish	TF	2018					2019
							Aug	Sep	Oct	Nov	Dec	Jan
FHW-3340	Noise Barrier NB69 - Pile cap/ Footing and Stem Wall adjacent to NB lane (108m)	77	35	16-Oct-17 A	29-Nov-18	-55	[Gantt bar: 16-Oct-17 A to 29-Nov-18]					Noise Barrier NB69 - Pile cap/ Footing and Stem Wall
<b>At-Grade Roadworks (130m)</b>												
FHW-3240	Road Pavement on FLH SB 4th lane after Removal of Temp. Street Light (due to Claim No. 63)	10	10	31-Aug-18 A	31-Oct-18	-12	[Gantt bar: 31-Aug-18 A to 31-Oct-18]					Road Pavement on FLH SB 4th lane after Removal of Temp. Street Light (due to Claim No. 63)
FHW-3350a	Road Drainage (FLH NB hard shoulder, next to NB69)	61	50	26-Feb-18 A	17-Dec-18	-77	[Gantt bar: 26-Feb-18 A to 17-Dec-18]					Road Drainage (FLH NB hard shoulder, next to NB69)
FHW-3350b	Road Formation and Pavement (FLH NB 1st lane and HS next to NB69, due to Tau Pass under VO191)	25	25	18-Dec-18*	18-Jan-19	-77	[Gantt bar: 18-Dec-18* to 18-Jan-19]					Road Formation and Pavement (FLH NB 1st lane and HS next to NB69, due to Tau Pass under VO191)
<b>Fanling Highway North Portion between CH7470 and CH7925</b>												
<b>Fanling Highway Zone 4 between CH7380 and CH7470</b>												
<b>At-Grade Roadworks (90m)</b>												
FHW-4150	Road Pavement (FLH SB 1st lane) by re-surfacing (due to Claim No. 63)	15	33	10-Sep-18 A	27-Nov-18	-35	[Gantt bar: 10-Sep-18 A to 27-Nov-18]					Road Pavement (FLH SB 1st lane) by re-surfacing (due to Claim No. 63)
FHW-4150a	Road Drainage and Road Pavement (FLH H.S., Merging Lane)(due to Claim No. 63)	48	48	10-Sep-18 A	14-Dec-18	-50	[Gantt bar: 10-Sep-18 A to 14-Dec-18]					Road Drainage and Road Pavement (FLH H.S., Merging Lane)(due to Claim No. 63)
FHW-4330c	Construction of FL/RW2 (mass concrete wall, VO not yet received)	38	38	27-Aug-18 A	03-Dec-18	-45	[Gantt bar: 27-Aug-18 A to 03-Dec-18]					Construction of FL/RW2 (mass concrete wall, VO not yet received)
FHW-4330d	Remaining Gullies and Road Pavement after Construction of FL/RW2 (VO not yet received)	25	25	10-Nov-18*	08-Dec-18	-45	[Gantt bar: 10-Nov-18* to 08-Dec-18]					Remaining Gullies and Road Pavement after Construction of FL/RW2 (VO not yet received)
FHW-4330e	Road Drainage MN9.1 - MN9.3	24	0	23-Aug-18 A	20-Oct-18	-2	[Gantt bar: 23-Aug-18 A to 20-Oct-18]					Road Drainage MN9.1 - MN9.3, Road Drainage MN9.1 - MN9.3
<b>Noise Barrier</b>												
FHW-4220a	Noise Barrier NB68A - Footing at central median (Bay 22 - 23)	50	0	24-Jul-17 A	27-Sep-18 A		[Gantt bar: 24-Jul-17 A to 27-Sep-18 A]					Noise Barrier NB68A - Footing at central median (Bay 22 - 23)
<b>Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)</b>												
<b>Kiu Tau Footbridge Re-provision (East)</b>												
FHW-5070	Installation of Lighting Facilities (affect by design change which is under VO)	21	21	20-Jun-18 A	13-Nov-18	-23	[Gantt bar: 20-Jun-18 A to 13-Nov-18]					Installation of Lighting Facilities (affect by design change which is under VO)
FHW-5080	Fabrication of Pillar Box (affect by design change which is under VO)	32	8	15-Jun-18 A	29-Oct-18	-86	[Gantt bar: 15-Jun-18 A to 29-Oct-18]					Fabrication of Pillar Box (affect by design change which is under VO), Fabrication of Pillar Box
FHW-5090	Erection of Pillar Box (affect by design change which is under VO)	19	19	30-Oct-18*	20-Nov-18	-86	[Gantt bar: 30-Oct-18* to 20-Nov-18]					Erection of Pillar Box (affect by design change which is under VO)
FHW-5100	Power Cable Laying Works (affect by design change which is under VO)	36	36	21-Nov-18*	04-Jan-19	-86	[Gantt bar: 21-Nov-18* to 04-Jan-19]					Power Cable Laying Works (affect by design change which is under VO)
FHW-5110	Permanent Power Supply Connection (affect by design change which is under VO)	6	6	05-Jan-19	11-Jan-19	-71	[Gantt bar: 05-Jan-19 to 11-Jan-19]					Permanent Power Supply Connection (affect by design change which is under VO)
FHW-5110a	Installation of Drainage Pipe	32	32	10-Sep-18 A	26-Nov-18	-34	[Gantt bar: 10-Sep-18 A to 26-Nov-18]					Installation of Drainage Pipe, Installation of Drainage Pipe
FHW-5110b	Laying of Floor Tiles (affect by design change which is under VO)	72	62	28-Jun-18 A	03-Jan-19	-64	[Gantt bar: 28-Jun-18 A to 03-Jan-19]					Laying of Floor Tiles (affect by design change which is under VO)
FHW-5110c	Installation of Suspended Ceiling (affect by design change which is under VO)	104	55	21-May-18 A	22-Dec-18	-57	[Gantt bar: 21-May-18 A to 22-Dec-18]					Installation of Suspended Ceiling (affect by design change which is under VO)
<b>Provision of BFA Facilities (Lift)</b>												
FHW-L-103	Lift Delivery and Installation	70	78	08-Jan-18 A	22-Jan-19	-91	[Gantt bar: 08-Jan-18 A to 22-Jan-19]					Lift Delivery and Installation
FHW-L-104	Permanent Power Supply (affect by design change which is under VO)	10	10	05-Jan-19*	16-Jan-19	-86	[Gantt bar: 05-Jan-19* to 16-Jan-19]					Permanent Power Supply (affect by design change which is under VO)
<b>Works at existing TWSRE</b>												
FHW-5480a	Noise Barrier NB73 Footing Bays 1-6, 10 - 14	140	33	29-Aug-17 A	27-Nov-18	-51	[Gantt bar: 29-Aug-17 A to 27-Nov-18]					Noise Barrier NB73 Footing Bays 1-6, 10 - 14, Noise Barrier NB73 Footing Bays 1-6, 10 - 14
FHW-5480d	Noise Barrier NB73 Footing Bay 7A & 7B (Access for FR32, due to claim no. 62)	37	37	16-Jul-18 A	01-Dec-18	-55	[Gantt bar: 16-Jul-18 A to 01-Dec-18]					Noise Barrier NB73 Footing Bay 7A & 7B (Access for FR32, due to claim no. 62)
FHW-5480e	Noise Barrier NB73 Footing Bay 8 & 9 (after completion of Bay 1-3 of FR32, due to claim no. 62)	30	30	31-Oct-18*	04-Dec-18	-57	[Gantt bar: 31-Oct-18* to 04-Dec-18]					Noise Barrier NB73 Footing Bay 8 & 9 (after completion of Bay 1-3 of FR32, due to claim no. 62)
FHW-5480f	Noise Barrier NB73 Remaining Stem Wall of Bay 12 & 13 (access for FR32, due to claim no. 62)	19	27	05-Jul-18 A	20-Nov-18	-45	[Gantt bar: 05-Jul-18 A to 20-Nov-18]					Noise Barrier NB73 Remaining Stem Wall of Bay 12 & 13 (access for FR32, due to claim no. 62)
FHW-5481	Noise Barrier NB72 Bay 5 - 9 (after water shutdown for twin DN1400 WM, due to claim)	73	51	26-Feb-18 A	18-Dec-18	-69	[Gantt bar: 26-Feb-18 A to 18-Dec-18]					Noise Barrier NB72 Bay 5 - 9 (after water shutdown for twin DN1400 WM, due to claim)
FHW-5490	Road Drainage, Pavement and TCSS duct laying (Merging lane next to NB72)(due to claim)	2	2	19-Dec-18*	20-Dec-18	-55	[Gantt bar: 19-Dec-18* to 20-Dec-18]					Road Drainage, Pavement and TCSS duct laying (Merging lane next to NB72)(due to claim)
FHW-5500	Road Drainage (MS10.1-10.3A), Road Pavement and TCSS duct laying (Merging lane next to NB73)	31	44	21-Apr-18 A	10-Dec-18	-46	[Gantt bar: 21-Apr-18 A to 10-Dec-18]					Road Drainage (MS10.1-10.3A), Road Pavement and TCSS duct laying (Merging lane next to NB73)
<b>At-Grade Road Works (130m)</b>												

- 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**  
**3MPR063**      **Page 2 of 7**      **20-Oct-18**

3-Month Rolling Programme updated to 2018-10-20

Date	Revision	Checked	Approved







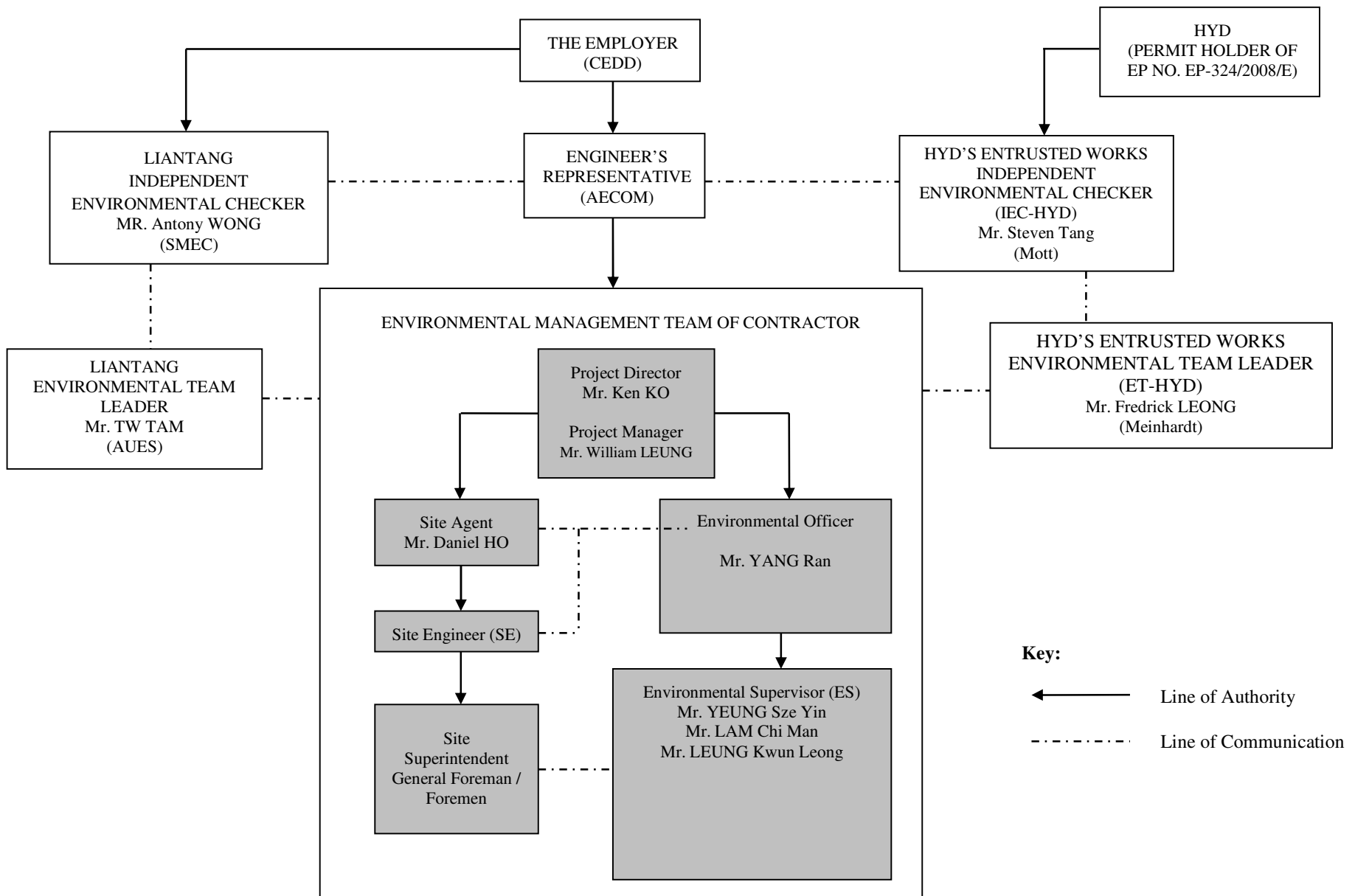






# Appendix B

## 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: <b>1612</b>		

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
<b>QSTD</b>	m=	<b>2.02017</b>	<b>QA</b>	m=	<b>1.26500</b>
	b=	<b>-0.03691</b>		b=	<b>-0.02263</b>
	r=	<b>0.99988</b>		r=	<b>0.99988</b>

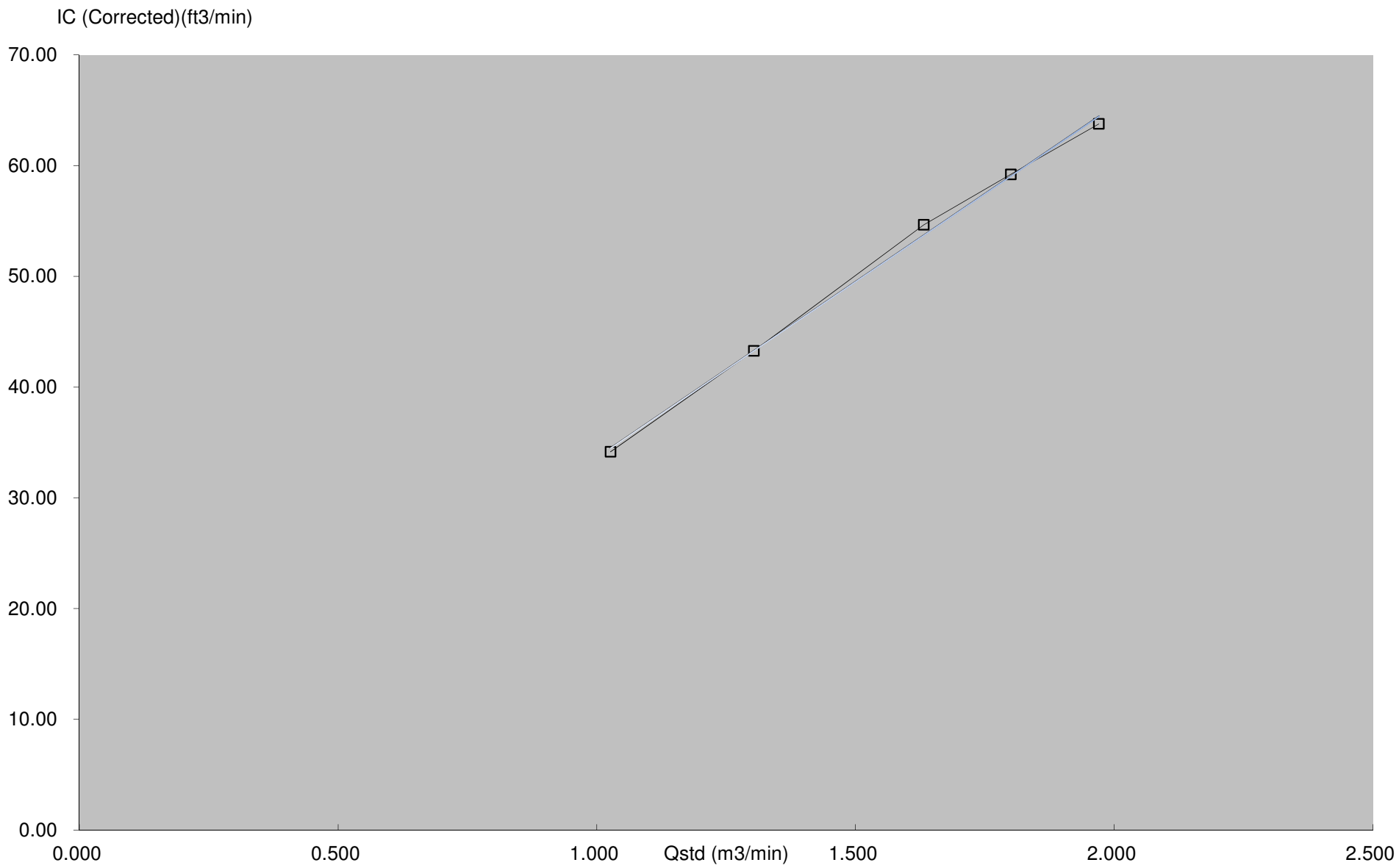
Calculations	
Vstd= $\Delta Vol \left( \frac{Pa - \Delta P}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)$	Va= $\Delta Vol \left( \frac{Pa - \Delta P}{Pa} \right)$
Qstd= Vstd/ΔTime	Qa= Va/ΔTime
<b>For subsequent flow rate calculations:</b>	
<b>Qstd=</b> $1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd}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

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
<b>Key</b>	
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









# 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	$\pm 0.4$ dB

Uncertainty :  $\pm 0.2$  dB

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

## 3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	0.999	$\pm 1$ %

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

4. **Total Distortion** :  $< 1.1$  %  
IEC 60942 Class 1 Spec. :  $< 4$  %  
Uncertainty :  $\pm 2.3$  % 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

Page 2 of 3 Pages

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

Page 3 of 3 Pages

## 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 October 2018**

October 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	<b>1</b> National Day of the People's Republic of China	<b>2</b>	<b>3</b>	<b>4</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(09:30am – 11:00am)	<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>11</b> ET Site Walk(09:30am – 11:00am)	<b>12</b>	<b>13</b>
<b>14</b>	<b>15</b>	<b>16</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>17</b> Chung Yeung Festival	<b>18</b> ET Site Walk(09:30am – 11:00am)	<b>19</b>	<b>20</b>
<b>21</b>	<b>22</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>23</b>	<b>24</b> ET Site Walk(09:30am – 11:00 am) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC +SSEMC	<b>25</b>	<b>26</b> 24-hour TSP + 3 x 1-hour TSP	<b>27</b>
<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>			

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

November 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				<b>1</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(09:30am – 11:00am)	<b>2</b>	<b>3</b>
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>8</b> ET Site Walk(09:30am – 11:00am)	<b>9</b>	<b>10</b>
<b>11</b>	<b>12</b>	<b>13</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>14</b> ET Site Walk(09:30 am – 11:00 am) with Liantang Project-wide ET and IEC + SSEMC (To be confirmed)	<b>15</b>	<b>16</b>	<b>17</b>
<b>18</b>	<b>19</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>20</b>	<b>21</b>	<b>22</b> ET Site Walk(09:30am – 11:00am)	<b>23</b> 24-hour TSP + 3 x 1-hour TSP	<b>24</b>
<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b> 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 (To be confirmed)	<b>30</b>	

# **Appendix E**

## **Meteorological Data Extracted from Hong Kong Observatory**

## Daily Extract of Meteorological Observations , October 2018

Day	Hong Kong Observatory							
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)				
01	1013.9	29.6	26.8	23.2	20.6	70	70	2.9
02	1014.9	30.4	27.2	25.3	20.2	67	33	0.0
03	1015.3	30.5	26.9	25.0	20.3	68	30	0.0
04	1013.8	30.5	26.9	24.2	16.5	54	8	0.0
05	1012.1	31.4	27.1	23.6	12.1	40	16	0.0
06	1013.4	30.9	26.8	23.5	14.5	48	18	0.0
07	1014.7	30.5	27.1	25.1	20.9	69	43	0.0
08	1014.2	29.8	26.7	24.3	21.8	75	60	2.0
09	1013.7	29.3	26.5	25.1	22.4	78	72	0.6
10	1014.7	29.2	24.8	22.5	21.8	83	82	42.8
11	1017.6	24.7	23.2	22.3	17.9	72	88	0.0
12	1018.9	27.1	23.8	22.0	18.6	73	85	0.3
13	1017.5	26.8	24.7	22.7	19.2	72	86	0.4
14	1015.5	27.3	25.3	23.6	21.3	79	82	0.6
15	1014.6	27.9	25.6	24.3	22.6	84	83	31.4
16	1013.2	25.8	24.3	23.2	22.8	92	91	8.9
17	1012.5	25.2	23.5	21.9	20.6	84	90	1.5
18	1014.7	23.9	22.5	20.9	20.3	87	91	12.6
19	1017.2	26.0	24.2	23.0	19.9	77	87	0.2
20	1018.6	24.9	24.0	23.3	19.9	78	86	Trace
21	1017.6	27.3	24.8	23.2	20.5	77	49	Trace
22	1015.9	27.4	25.0	23.7	21.5	81	62	Trace
23	1016.5	27.4	25.3	24.1	21.3	79	78	0.1
24	1016.8	27.4	25.2	24.0	21.4	80	78	Trace
25	1017.0	27.7	25.5	24.4	21.6	79	54	0.0
26	1016.5	28.6	26.3	23.9	21.5	76	41	0.0
27	1018.1	27.9	25.4	23.7	17.4	61	53	0.0
28	1017.4	27.5	24.3	21.7	14.3	54	13	0.0
29	1015.1	28.9	25.2	22.2	8.5	35	4	0.0
30	1014.8	28.5	25.7	23.4	8.2	33	24	0.0
31	1014.2	27.2	25.0	22.9	9.1	37	83	0.0
Mean/Total	1015.5	28.0	25.3	23.4	18.7	69	59	104.3
Normal§	1014.1	27.8	25.5	23.7	20.2	73	58	100.9

Trace means rainfall less than 0.05 mm

§ 1981-2010 Climatological Normal

# **Appendix F**

## **Air Quality Monitoring Results and their Graphical Presentation**

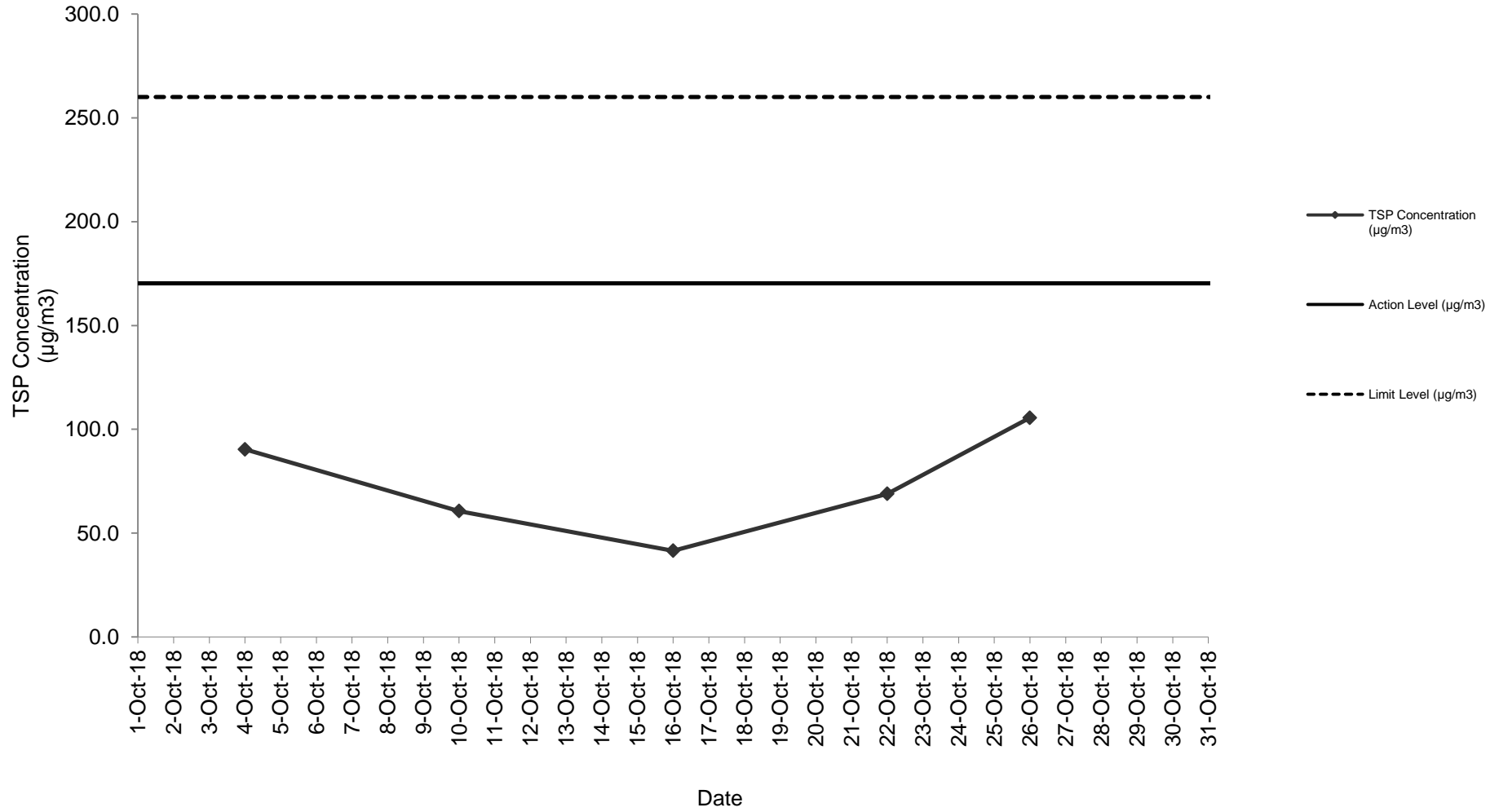
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

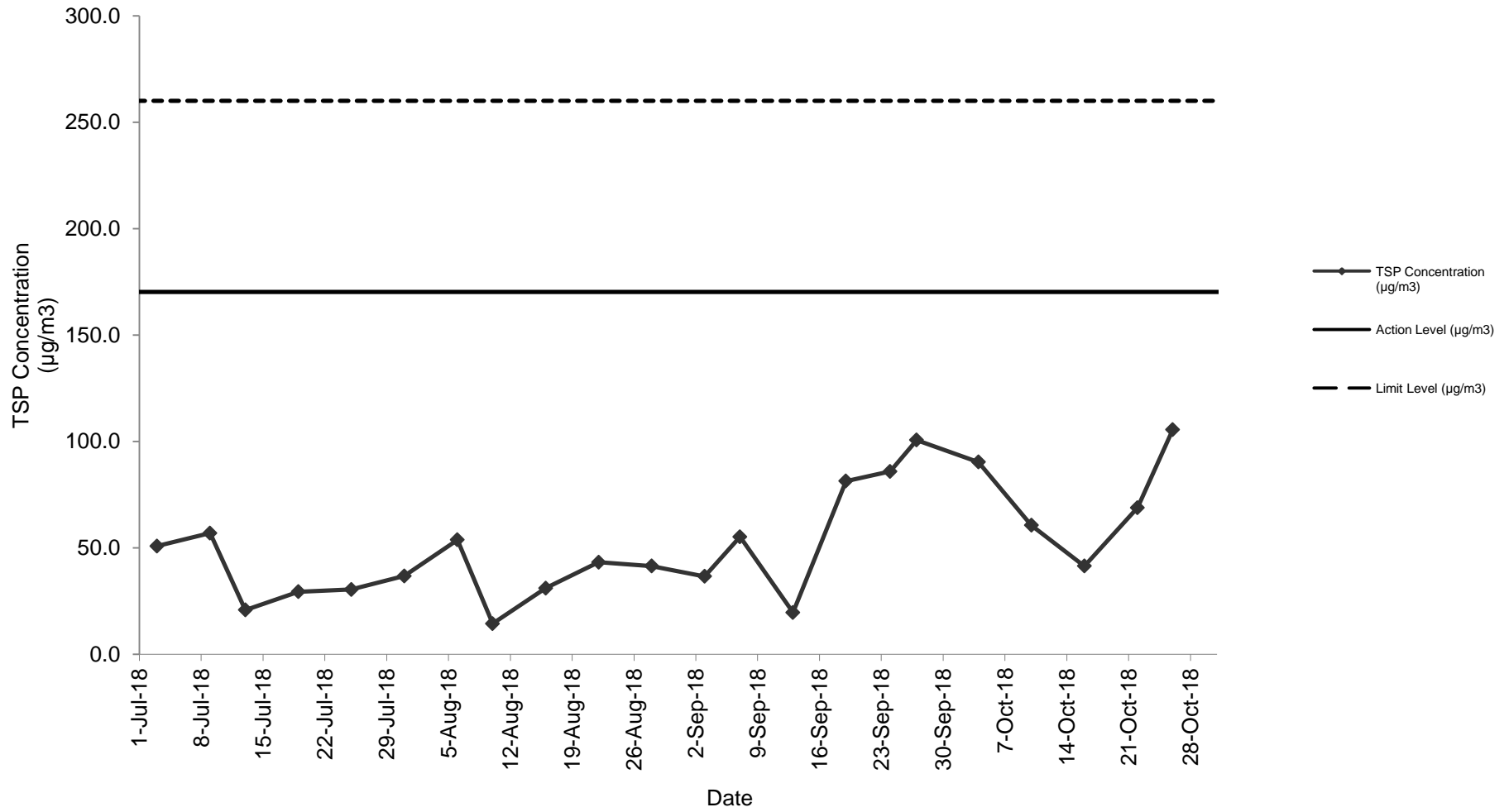
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction	NOE	IR
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate								
4-Oct-18	Sunny	12:11	C182	2.6644	2.8523	0.1879	8982.67	9006.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	90.4	170.3	260.0	<5	N		
10-Oct-18	Cloudy	12:12	C184	2.6874	2.8135	0.1261	9009.67	9033.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	60.6	170.3	260.0	<5	N		
16-Oct-18	Cloudy	12:13	C186	2.6781	2.7644	0.0863	9036.67	9060.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	41.5	170.3	260.0	<5	N		
22-Oct-18	Cloudy	12:12	C188	2.6392	2.7825	0.1433	9063.67	9087.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.9	170.3	260.0	<5	N		
26-Oct-18	Sunny	12:11	C190	2.6519	2.8714	0.2195	9090.67	9114.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	105.5	170.3	260.0	<5	N		
																<b>Average</b>	73.4						
																<b>Min</b>	41.5						
																<b>Max</b>	105.5						

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 (July 2018 - October 2018)





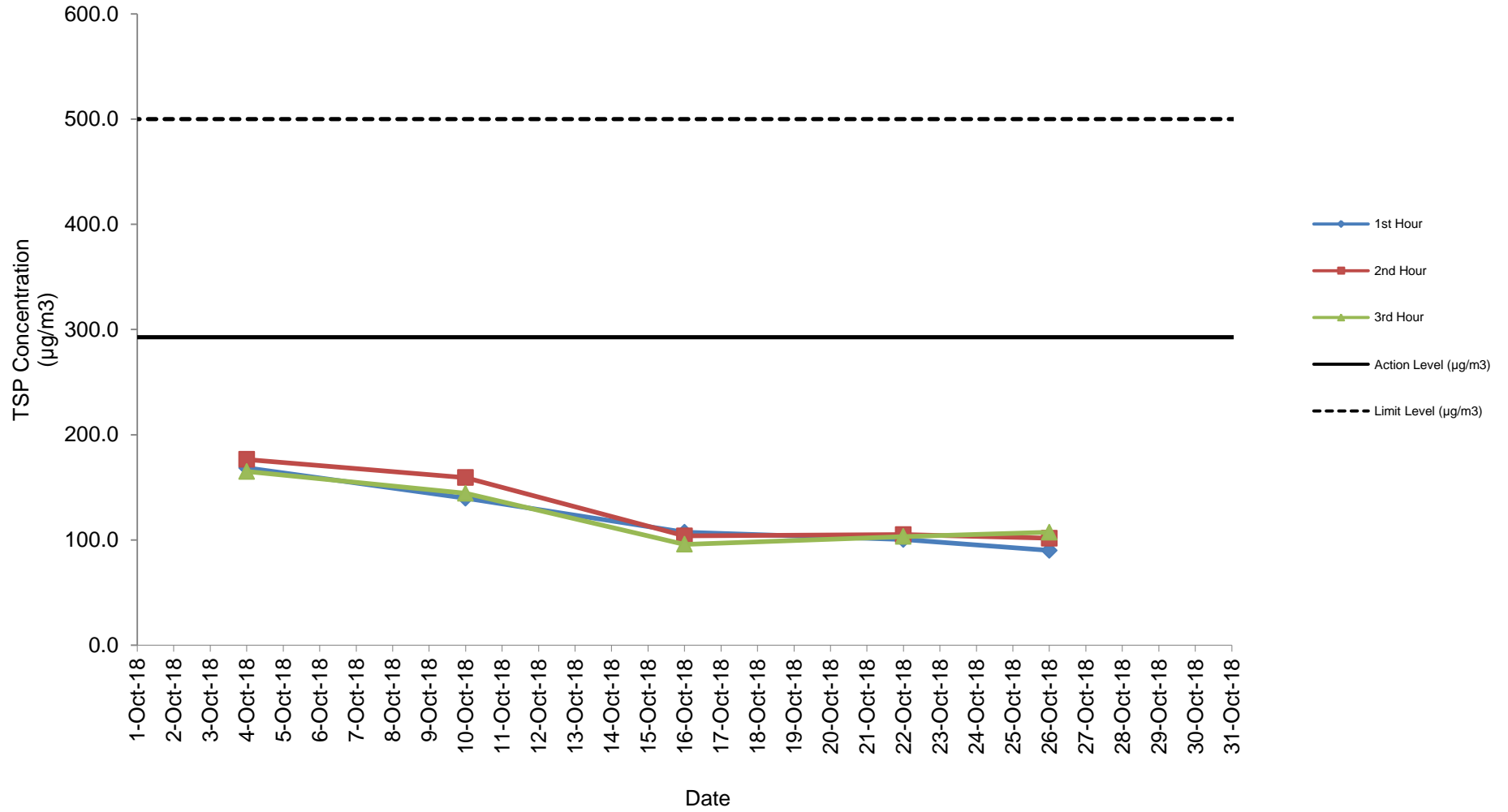
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

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

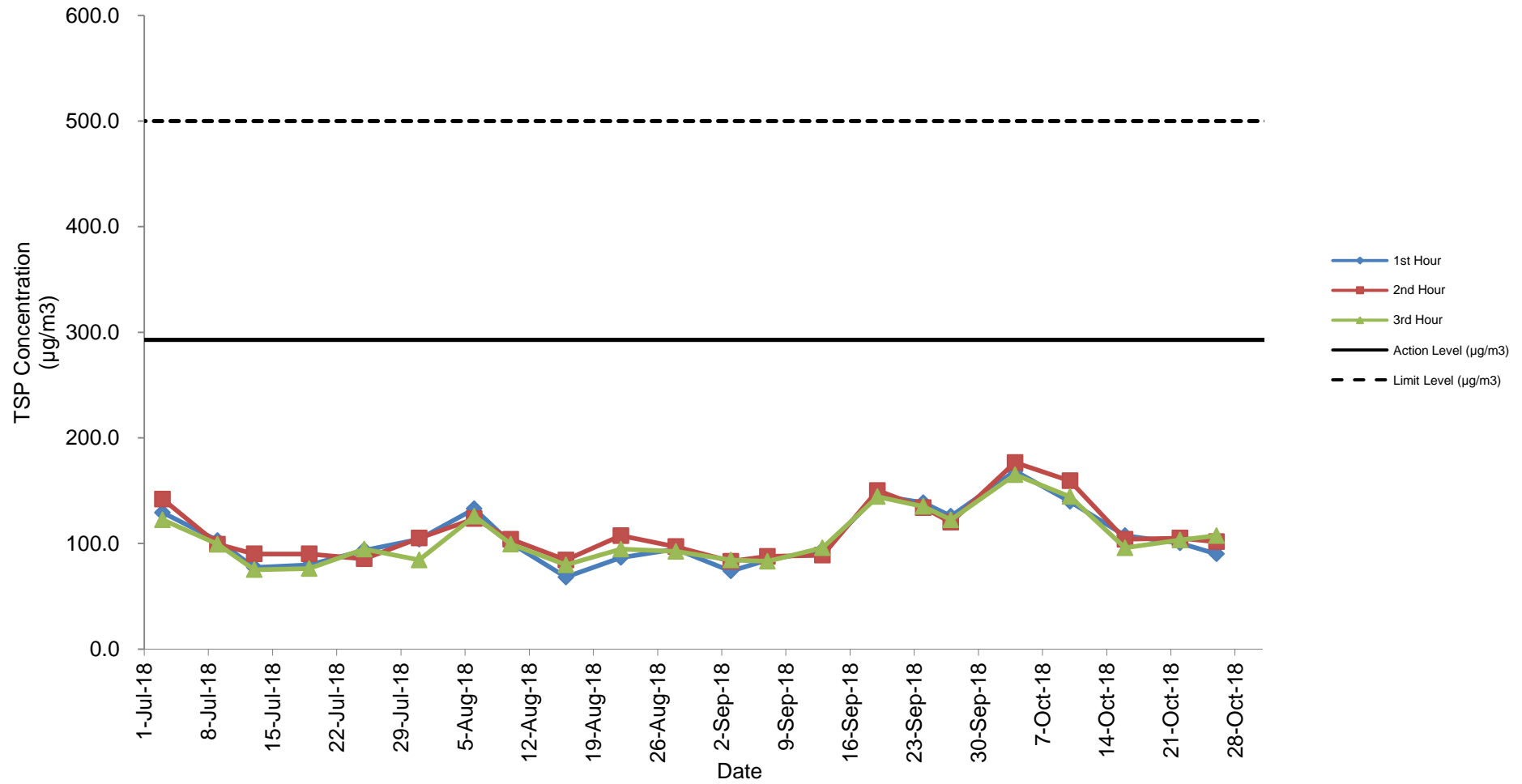
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction	NOE	IR
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate								
4-Oct-18	Sunny	09:00	C183A	2.6665	2.6811	0.0146	8979.67	8980.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	168.5	292.7	500.0	<5	N		
	Sunny	10:04	C183B	2.6519	2.6672	0.0153	8980.67	8981.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	176.6	292.7	500.0	<5	N		
	Sunny	11:08	C183C	2.6411	2.6554	0.0143	8981.67	8982.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	165.0	292.7	500.0	<5	N		
10-Oct-18	Cloudy	09:00	C185A	2.6729	2.6850	0.0121	9006.67	9007.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	139.6	292.7	500.0	<5	N		
	Cloudy	10:03	C185B	2.6708	2.6846	0.0138	9007.67	9008.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	159.3	292.7	500.0	<5	N		
	Cloudy	11:07	C185C	2.6649	2.6774	0.0125	9008.67	9009.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	144.3	292.7	500.0	<5	N		
16-Oct-18	Cloudy	09:00	C187A	2.6631	2.6724	0.0093	9033.67	9034.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	107.3	292.7	500.0	<5	N		
	Cloudy	10:04	C187B	2.6748	2.6838	0.0090	9034.67	9035.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	103.9	292.7	500.0	<5	N		
	Cloudy	11:09	C187C	2.6681	2.6764	0.0083	9035.67	9036.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	95.8	292.7	500.0	<5	N		
22-Oct-18	Cloudy	09:00	C189A	2.6694	2.6781	0.0087	9060.67	9061.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	100.4	292.7	500.0	<5	N		
	Cloudy	10:03	C189B	2.6711	2.6802	0.0091	9061.67	9062.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	105.0	292.7	500.0	<5	N		
	Cloudy	11:07	C189C	2.6675	2.6764	0.0089	9062.67	9063.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	103.2	292.7	500.0	<5	N		
26-Oct-18	Sunny	09:00	C191A	2.6844	2.6922	0.0078	9087.67	9088.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	90.0	292.7	500.0	<5	N		
	Sunny	10:04	C191B	2.6893	2.6981	0.0088	9088.67	9089.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	101.6	292.7	500.0	<5	N		
	Sunny	11:08	C191C	2.6591	2.6684	0.0093	9089.67	9090.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	107.3	292.7	500.0	<5	N		
																<b>Average</b>	124.5						
																<b>Min</b>	90.0						
																<b>Max</b>	176.6						

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 (July 2018 - October 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"> <li>1. Identify source;</li> <li>2. Inform IEC and ER;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice;</li> <li>2. Amend working methods if appropriate.</li> </ol>
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IEC and ER;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Discuss with IEC and Contractor on remedial actions required;</li> <li>6. If exceedance continues, arrange meeting with IEC and ER;</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise Implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>2. Implement the agreed proposals;</li> <li>3. Amend proposal if appropriate.</li> </ol>

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

**Event and Action Plan for Noise**

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

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



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

# **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)			
2018-10-04	Sunny	11:15	11:45	72.5	70.0	71.0	-	67.8	75.0
2018-10-10	Cloudy	11:15	11:45	79.0	70.5	73.5	-	67.8	75.0
2018-10-16	Cloudy	11:15	11:45	80.5	65.5	73.0	-	67.8	75.0
2018-10-22	Cloudy	11:30	12:00	77.0	66.0	70.5	-	67.8	75.0
						<b>Average</b>	72.0		
						<b>Minimum</b>	70.5		
						<b>Maximum</b>	73.5		

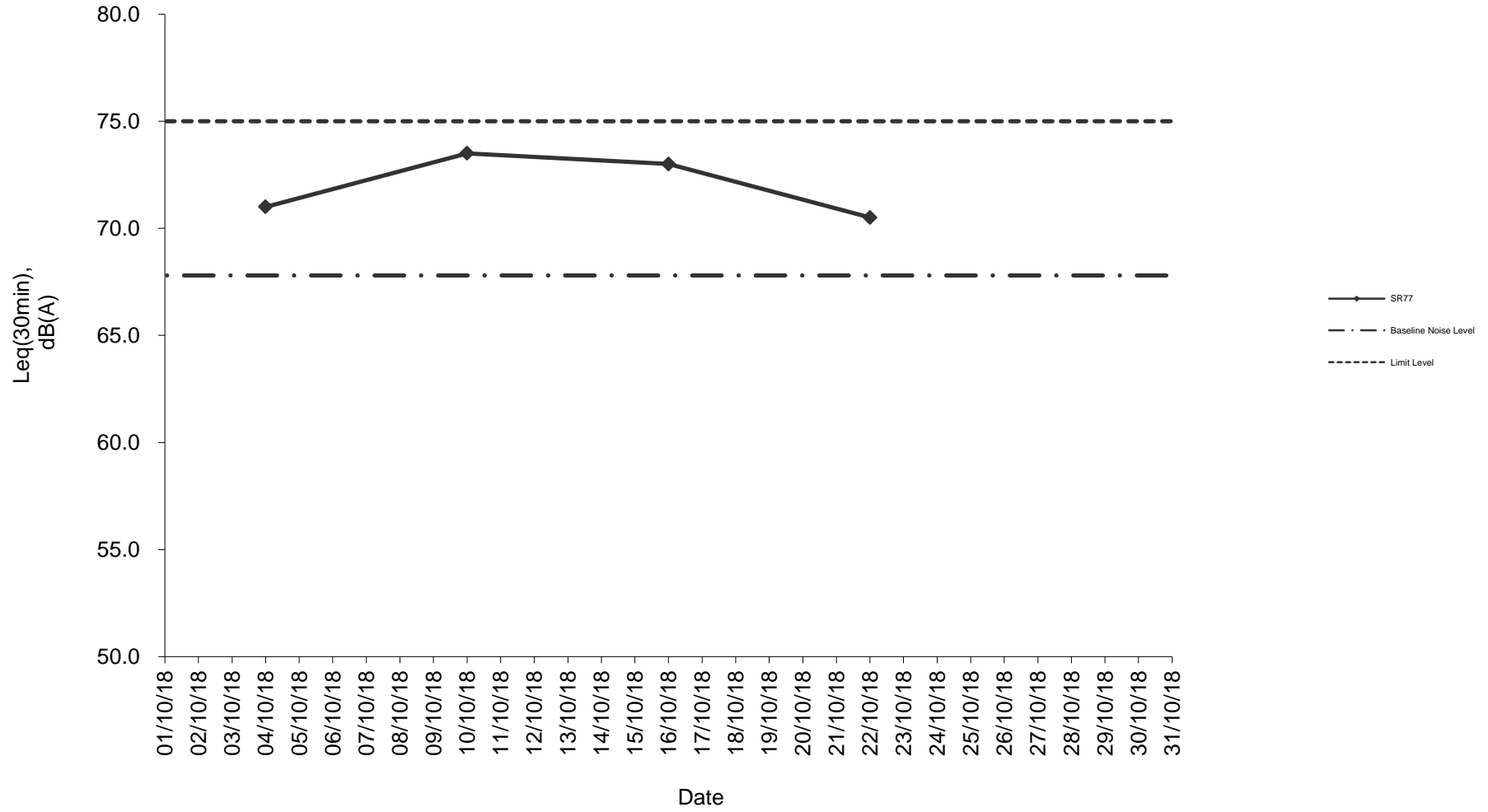
**Remarks**

\* +3dB(A) Façade effect correction included

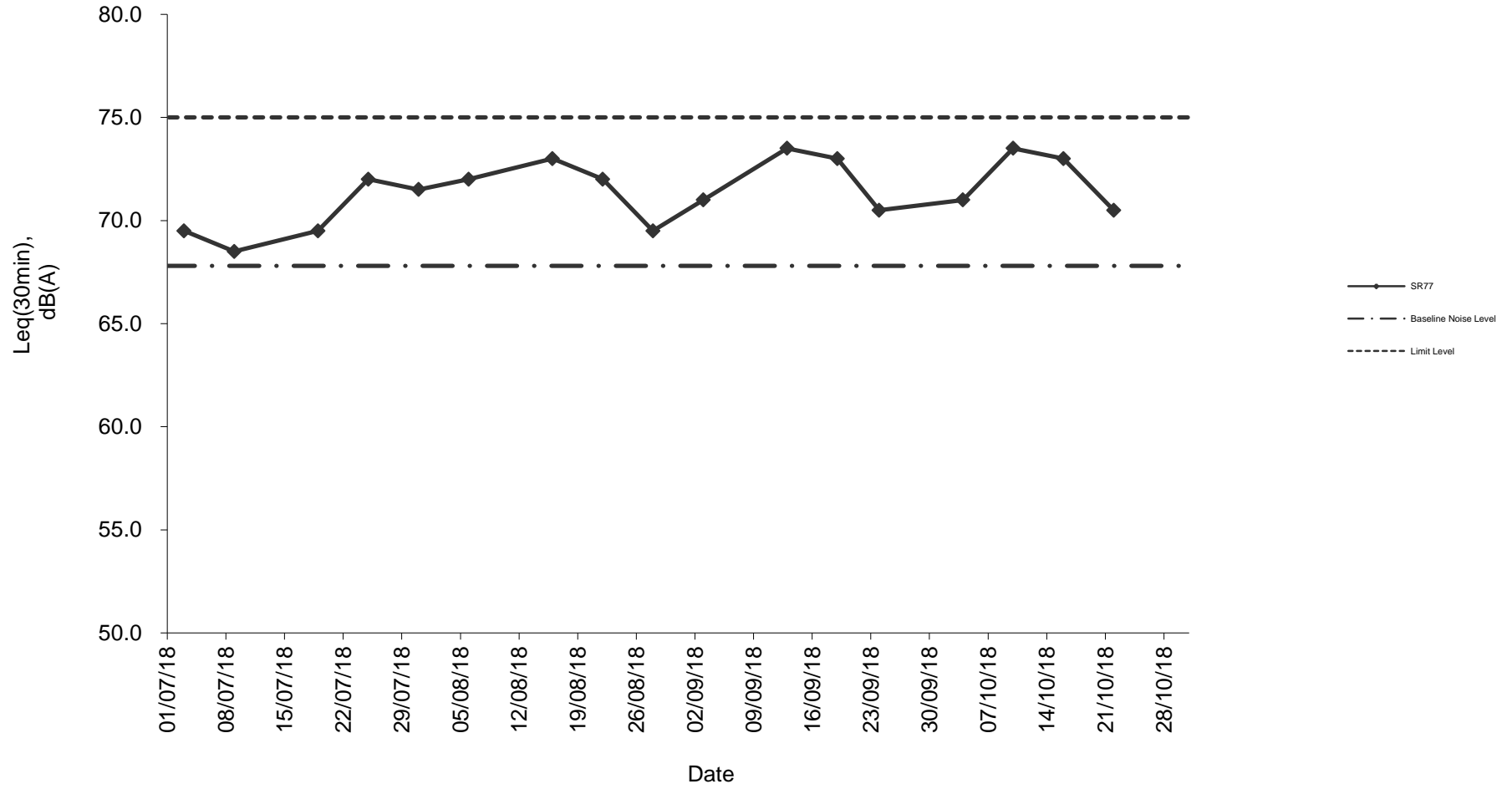
\*\* Baseline corrected level is only calculated when measured noise level (Leq) > limit level.

\*\*\* Data in  denotes exceedance of respective Limit Level

### Noise monitoring result: SR77



### Noise monitoring result: SR77 (July 2018 - October 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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in m <sup>3</sup> )	(in '000m <sup>3</sup> )
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	-	-	-	-	-	-	-	-	-	-	-	-
Dec-18	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.016	3.275	15.741	2.776	-	12.965	3.755	-	-	-	-	1.210

- Note:
1. Assume the density of soil fill is 2 ton/m<sup>3</sup>.
  2. Assume the density of rock and broken concrete is 2.5 ton/m<sup>3</sup>.
  3. Assume each truck of C&D wastes is 5m<sup>3</sup>.
  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/m<sup>3</sup>.
  8. Assume the density of plastic is 941 kg/m<sup>3</sup>.
  9. Assume the density of paper is 800 kg/m<sup>3</sup>.

# **Appendix L Implementation Schedule of Environmental Mitigation Measures (EMIS)**



Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
<b>Air Quality</b>				
Air Quality during Construction	<ul style="list-style-type: none"> <li>Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading.</li> <li>All stockpiles of excavated materials or spoil of more than 50m<sup>3</sup> shall be enclosed, covered or dampened during dry or windy conditions.</li> <li>Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas.</li> <li>All spraying of materials and surfaces shall avoid excessive water usage.</li> <li>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.</li> <li>Materials shall be dampened, if necessary, before transportation.</li> <li>Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks.</li> <li>Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads.</li> </ul>	During Construction	Contractor	✓  Rem.  ✓  ✓  ✓  ✓  ✓
Air Quality during Operation	Not required	N/A	N/A	N/A
<b>Noise</b>				
Noise during Construction	<ul style="list-style-type: none"> <li>Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant.</li> <li>Reduce the number of equipment and their percentage on-time.</li> </ul>	During Construction	Contractor	✓  ✓
Noise during Operation	Not required	N/A	N/A	N/A
<b>Water Quality</b>				
Water Quality during Construction	<u>Road Widening Works, Earthworks and Culvert Extension Works</u> <ul style="list-style-type: none"> <li>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.</li> </ul>	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"> <li>● Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained.</li> <li>● 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.</li> <li>● Regular inspections of stilling basins and/or silt traps is required to ensure that sediment is not conveyed into the existing drainage system.</li> <li>● Open stockpiles should be covered with a tarpaulin cover.</li> <li>● During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded.</li> <li>● Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains.</li> <li>● Fuels should be stored in bunded areas such that spillage can be easily collected.</li> </ul>			✓  Rem.  ✓  ✓  ✓  Obs.  ✓
Water Quality during Operation	Not required	N/A	N/A	N/A
<b>Waste Management</b>				
Waste Management during Construction	<u>General Waste</u> <ul style="list-style-type: none"> <li>● Transport of wastes off site as soon as possible.</li> <li>● Maintenance of accurate waste records.</li> <li>● Minimisation of waste generation for disposal (via reduction/recycling/re-use).</li> <li>● No on-site burning will be permitted.</li> <li>● Use of re-useable metal hoardings/signboards.</li> </ul> <u>Vegetation from site clearance</u> <ul style="list-style-type: none"> <li>● Segregation of materials to facilitate disposal.</li> <li>● Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas.</li> </ul>	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 #
	<p><u>Demolition Wastes</u></p> <ul style="list-style-type: none"> <li>• Segregation of materials to facilitate disposal.</li> <li>• Appropriate stockpile management.</li> </ul> <p><u>Excavated Materials</u></p> <ul style="list-style-type: none"> <li>• Segregation of materials to facilitate disposal / reuse.</li> <li>• Appropriate stockpile management.</li> <li>• Re-use of excavated material on or off site (where possible).</li> <li>• Special handling and disposal procedures in the event that contaminated materials are excavated.</li> </ul> <p><u>Construction Wastes</u></p> <ul style="list-style-type: none"> <li>• Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles).</li> <li>• Appropriate stockpile management.</li> <li>• Planning to reduce over ordering and waste generation.</li> <li>• Recycling and re-use of materials where possible (e.g. metal, wood from formwork)</li> <li>• For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal.</li> </ul> <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> <li>• Bentonite slurries should be reused as far as possible.</li> <li>• Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94.</li> </ul> <p><u>Chemical Wastes</u></p> <ul style="list-style-type: none"> <li>• Storage within locked, covered and bunded area.</li> <li>• The storage area shall not be located adjacent to sensitive receivers e.g. drains.</li> <li>• Minimise waste production and recycle oils/solvents where possible.</li> </ul>	<p>During Construction</p> <p>During Construction</p> <p>During Construction</p> <p>During Construction</p> <p>During Construction</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>N/A</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>N/A</p> <p>N/A</p> <p>✓</p> <p>Obs.</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 #
	<ul style="list-style-type: none"> <li>● all temporary site access roads shall be sprayed with water to suppress dust as necessary;</li> <li>● all dusty materials should be sprayed with water immediately prior to any handling; and</li> <li>● all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area.</li> </ul> <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"> <li>● Bund and cover stockpiles to avoid run-off;</li> <li>● Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical;</li> <li>● All vehicle maintenance to be undertaken within a bunded area; and</li> <li>● Maximise vegetation retention on-site to maximise absorption (minimise transport).</li> </ul>	During Construction	Contractor	✓  ✓  ✓  ✓  ✓  ✓  ✓
Ecology during Operation	<ul style="list-style-type: none"> <li>● To conduct compensatory ecological planting as specified in the latest landscape plans approved by EPD (Clause 2.6 of the Environmental Permit refers).</li> </ul>	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
<b>Landscape and Visual</b>				
Landscape and Visual during Construction	<p><u>Preservation of Existing Vegetation</u></p> <ul style="list-style-type: none"> <li>● Trees identified for retention within the project limit would be protected during the works</li> <li>● The tree transplanting and planting works shall be implemented by approved Landscape Contractors</li> </ul>	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&amp;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&amp;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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