

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

Monthly EM&A Report

December 2015

**Submitted to**

Environmental Protection Department

**Prepared By**

Meinhardt Infrastructure and Environment Ltd

Meinhardt Infrastructure and Environment Limited

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

Monthly EM&A Report

(December 2015)

Certified by: Fredrick Leong 

Position: Environmental Team Leader

Date: 14 January 2016

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Dear Sir,

12 January 2016  
By Fax (2805 5028) & Hand

**Attn: Mr. James Penny**

**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/D  
Condition 3.3 – Submission of Monthly EM&A Report – December 2015 for the portion of Stage 2 works entrusted to Civil Engineering and Development Department (CEDD) under Contract No. CV/2012/09**

We refer to the revised Monthly EM&A Report – December 2015 received on 12 January 2016 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – December 2015 (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



Steven Tang  
Independent Environmental Checker

c.c. HyD – Mr. Chung Lok Chin (Fax: 2714 5198)  
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AECOM – Mr. Alan Lee (Fax: 3922 9797)  
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Date	Revision	Prepared By	Checked By	Approved By
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## EXECUTIVE SUMMARY

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

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

This report documents the findings of EM&A works conducted in December 2015. As informed by the Contractor, the major activities in the reporting month were:

- Decking Construction for Bridge E;
- Cable Detection and Trial Trenches;
- E & M Work for New Valve Control & Telemetry House;
- Filling Works at Tong Hang East;
- FRP Lining on Existing Water Main;
- Storm Drains Laying;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Pre-drilling;
- Retaining Wall Construction;
- Road Works at Fanling Highway;
- Sewer Works;
- Tree Felling Works;
- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Slope 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 partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in January 2016 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.

Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in January 2016 during the course of remaining box culvert works.

### *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;
- Decking Construction for Bridge E;
- E & M Work for New Valve Control & Telemetry House;
- Filling Works at Tong Hang East;
- Storm Drains Laying;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;

- Pre-drilling Works and Piling Works for Viaduct;
- Retaining Wall Construction;
- Road Works at Fanling Highway;
- Sewer Works;
- Slope Works;
- Socket H-pile Installation;
- Tree Felling Works;
- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Water Main Connection 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/D 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 in 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 December 2015.

### **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: Environmental Non-conformance
- Section 11: Future Key Issues
- Section 12: 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 current VEP (EP-324/2008/D) was granted on 27 August 2015.

## **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:

- Decking Construction for Bridge E;
- Cable Detection and Trial Trenches;
- E & M Work for New Valve Control & Telemetry House;
- Filling Works at Tong Hang East;
- FRP Lining on Existing Water Main;
- Storm Drains Laying;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Pre-drilling;
- Retaining Wall Construction;
- Road Works at Fanling Highway;
- Sewer Works;
- Tree Felling Works;
- Utilities Duct Laying;

- Viaduct Segment Erection; and
- Slope 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. Victor Huang	2638 6181	
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/D	27 Aug 2015	--	Granted on 27/08/2015	
<b>Construction Noise Permit</b>				
GW-RN0334-15	8 June 2015	7 Dec 2015	Valid	For operating generator in FH9 within restricted hours
GW-RN0428-15	9 July 2015	31 Dec 2015	Valid	For Segment Delivery to Kiu Tau
GW-RN0473-15	29 July 2015	17 Dec 2015	Valid	For road diversion and maintenance of Fanling Highway Southbound
GW-RN0461-15	5 Aug 2015	8 Jan 2016	Valid	For loading and unloading along Fanling Highway both bounds
GW-RN0495-15	12 Aug 2015	11 Feb 2016	Valid	For stressing of tendons at the southward of site office in the night time
GW-RN0497-15	14 Aug 2015	13 Feb 2016	Valid	For stressing of tendons at the northward of site office in the night time
GW-RN0525-15	29 Aug 2015	13 Feb 2016	Valid	For road diversion and maintenance of Fanling Highway Northbound
GW-RN0542-15	1 Sep 2015	25 Feb 2016	Valid	For installation of temporary pedestrian ramp & demolition of existing pedestrian ramp at Kiu Tau footbridge
GW-RN0608-15	28 Sep 2015	29 Feb 2016	Valid	For formwork erection of portal PT5
GW-RN0633-15	15 Oct 2015	29 Feb 2016	Valid	For operating water pumping in Kiu Tau within restricted hours
GW-RN0655-15	1 Dec 2015	29 Feb 2016	Valid	For connection of the DN2300 Dongjiang watermain

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RN0677-15	26 Oct 2015	29 Feb 2016	Valid	For formwork erection of AB10
GW-RN0699-15	10 Nov 2015	27 Feb 2016	Valid	For Segment erection of AC9
GW-RN0695-15	29 Nov 2015	28 Feb 2016	Valid	For coring works along Fanling Highway during public holidays
GW-RN0712-15	16 Nov 2015	29 Feb 2016	Valid	For formwork erection of pier AA12 to AD7
GW-RN0736-15	24 Nov 2015	29 Feb 2016	Valid	For saw-cut method of the DN2300 Dongjiang watermain
GW-RN0765-15	1 Dec 2015	27 Feb 2016	Valid	For segment erection crossing over MTRC's Rail Track of Pier AB11 and AD12
GW-RN0812-15	20 Dec 2015	29 Feb 2016	Valid	For lane shifting work at southbound of Fanling Highway
GW-RN0837-15	23 Dec 2015	29 Feb 2016	Valid	For road diversion and maintenance of Fanling Highway Southbound
<b>Wastewater Discharge License</b>				
WT00016832-2013	28 Aug 2013	31 Aug 2018	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-weighed 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) *	140.2	121.2 – 155.8	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) *	93.4	61.1 – 138.6	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**.

## 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	34857296
Sound Level Meter	B&K (Model No. 2238)	1	2694908

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>	65.5	62.0 – 68.0	When one documented valid complaint is received	75

Remark:

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

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

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

## **6 WATER MONITORING**

- 6.1.1 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in January 2016 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 6.1.2 Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in January 2016 during the course of remaining box culvert works.

## 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 3,332m<sup>3</sup> of excavated material has been generated. 1,558m<sup>3</sup> of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. 1,600m<sup>3</sup> of inert C&D materials was reused on site. 145m<sup>3</sup> of general refuse was disposed of at North East New Territories (NENT) Landfill. 1m<sup>3</sup> of plastics was collected by recycling contractor in the reporting month. No paper/cardboard packaging was collected by recycling contractor in the reporting month. No metals were collected by recycling contractor in the reporting month. 0.6m<sup>3</sup> of 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 7, 16, 21 and 28 December 2015. The one held on 28 December 2015 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
Water Quality	7 Dec 2015	<u>Reminder:</u> The Contractor was reminded to review the wheel washing facility at SA12 and ensure the capacity of wastewater treatment facilities is sufficient for wastewater treatment.	The Contractor has checked and ensured the capacity of wastewater treatment facilities being sufficient for treating wastewater arisen from the wheel washing facility, as advised by the Contractor during 16 Dec 2015 site inspection.
	21 Dec 2015	<u>Observation:</u> Muddy water was observed discharged to the river near site office. The Contractor was advised to provide sufficient treatment to the site water before discharge.	Please refer to Observation identified during 28 Dec 2015 site inspection.
	28 Dec 2015	<u>Observation:</u> Muddy water was observed discharged to the river near site office. The Contractor was advised to provide sufficient treatment to the site water before discharge. Sufficient mitigation measures should be provided to direct the wastewater at SA12 to wastewater treatment facility.	Please refer to Observation identified in next reporting month..
Air Quality	7 Dec 2015	<u>Observation:</u> Mud and debris was observed outside the site exit SA12. The Contractor was advised to clear the mud and debris and ensure the vehicles being washed before leaving the construction site.	Mud and debris outside the site exit SA12 has been removed by the Contractor as observed during the ET weekly site inspection on 16 Dec 2015.
	21 Dec 2015	<u>Reminder:</u> Small amount of soil was observed on public road near SA25. The Contractor was reminded to remove the soil as soon as possible.	The public road near SA25 has been cleaned up by the Contractor as observed during the ET weekly site inspection on 28 Dec 2015.

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	28 Dec 2015	<u>Observation:</u> Muddy trail was observed on the public road outside the site exit SA12. The Contractor was advised to clean up the mud and debris as soon as possible.	Given temporary works were carried out at the two sides of the road near site exit SA12, the Contractor had arranged worker to clean up the mud and debris on the public road as far as practicable as observed during 4 Jan 2016 site inspection.  Please refer to Reminder identified in next reporting month.
Noise	N/A	N/A	N/A
Waste / Chemical Management	N/A	N/A	N/A
Landscape & Visual	N/A	N/A	N/A
Permits / Licenses	N/A	N/A	N/A

## 9 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

## 10 SUMMARY OF EP SUBMISSION IN THE REPORTING MONTH

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

**Table 10.1 Status of Required Submission under Environmental Permit**

EP Condition	Submission	Submission Date
Condition 3.3	Monthly EM&A Report for November 2015	14 December 2015

10.1.2 The Quarterly EM&A Report (August 2015 to October 2015) was prepared and submitted on 8 December 2015 in accordance to Section 8.3.4 of the EM&A Manual.

10.1.3 The Annual EM&A Review Report (November 2014 to October 2015) was prepared and submitted on 29 December 2015 in accordance to Section 8.3.4 of the EM&A Manual.

## **11 ENVIRONMENTAL NON-CONFORMANCE**

### **11.1 Summary of Monitoring Exceedances**

- 11.1.1 No exceedance of Action and Limit Level was 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.

### **11.2 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;
- Decking Construction for Bridge E;
- E & M Work for New Valve Control & Telemetry House;
- Filling Works at Tong Hang East;
- Storm Drains Laying;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Pre-drilling Works and Piling Works for Viaduct;
- Retaining Wall Construction;
- Road Works at Fanling Highway;
- Sewer Works;
- Slope Works;
- Socket H-pile Installation;
- Tree Felling Works;
- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Water Main Connection 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:

- Site discharges should be properly collected and treated prior to discharge;
- 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;

- Operation of construction plant should be sequenced where practicable;
- Good housekeeping should be maintained and general refuse should be removed regularly;
- Chemical waste should be stored, handled and disposed of properly;
- Properly store and label oils and chemicals on site; and
- A spill response procedure shall be in place and absorption material available for minor spillages.

### **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 and noise 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 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.

#### *Temporary Suspension of Box Culvert Works and Water Quality Monitoring*

- 13.1.7 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in January 2016 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 13.1.8 Impact monitoring for water quality was not necessary in the reporting month due to temporarily suspension of the construction works and is anticipated to be resumed in January 2016 during the course of remaining box culvert works.

### 13.2 Recommendations

- 13.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

#### *Water Quality*

- Water treatment facilities should be properly maintained and avoid untreated water entering storm drain.
- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas.

#### *Air Quality*

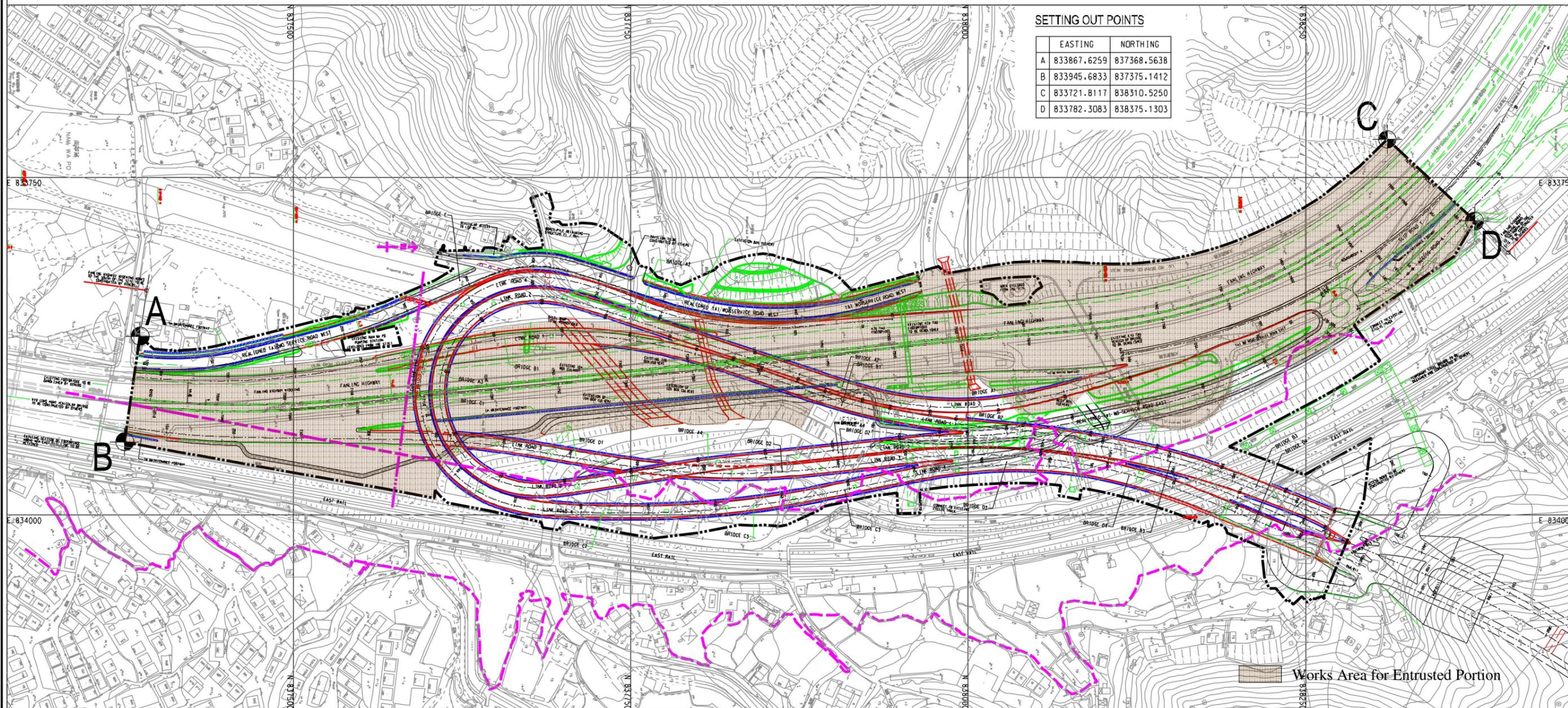
- Water spraying or covering of tarpaulin should be properly implemented whenever necessary for the unpaved roads, access roads and construction areas.

- All vehicles should be washed to remove any dusty materials before leaving the construction site.

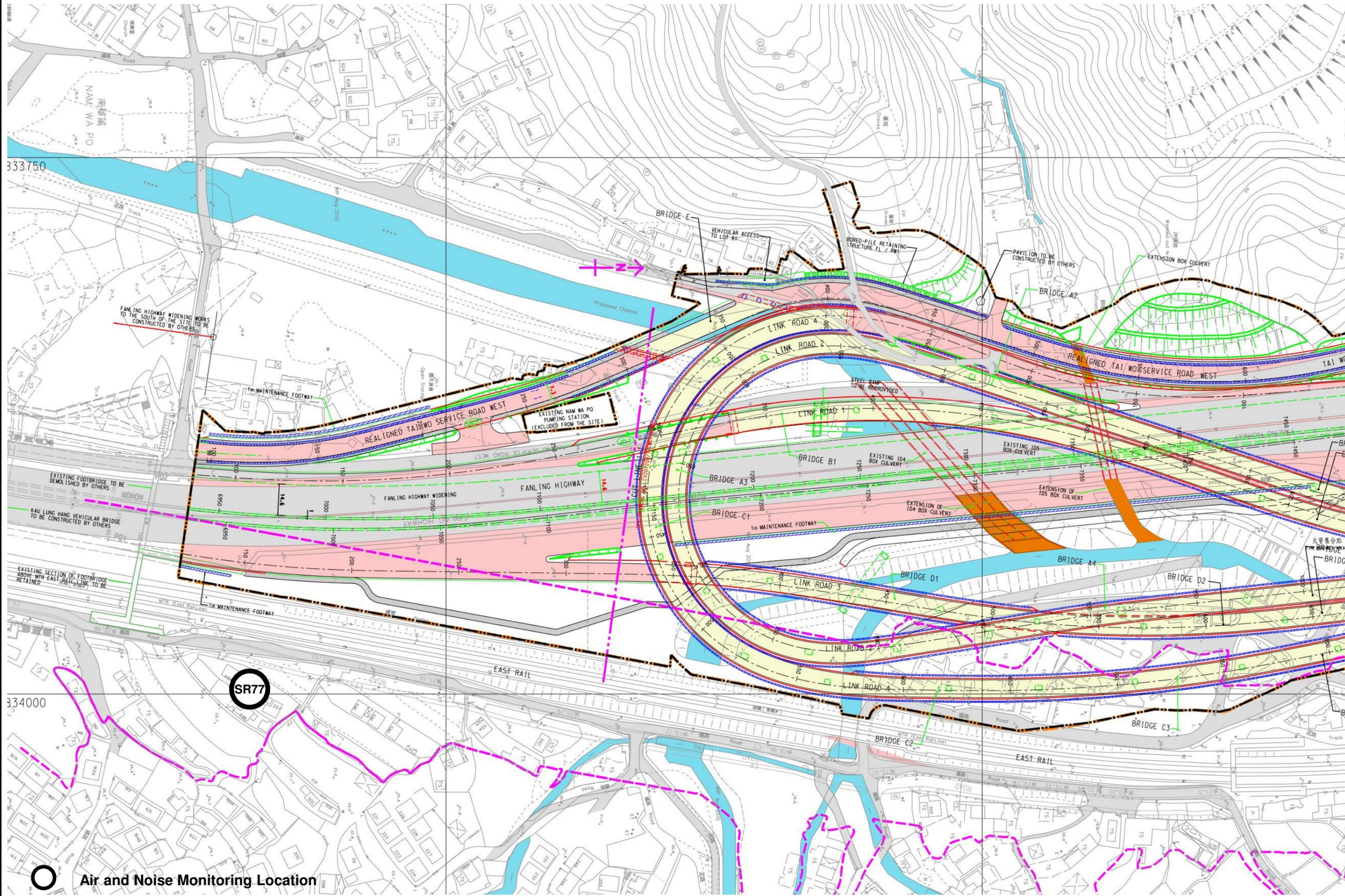
*Noise*

- Vessels and equipment operating should be checked regularly and properly maintained.

**Figure**



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# **Appendix A**

# **Construction Programme**

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015		2016					
							Dec	Jan	Feb	Mar	Apr			
<b>3-Month Rolling Programme 2015-12-21</b>														
<b>Key Dates (Contractual)</b>														
KD-1500	KD13: Stage N4A - Connection of Access Road A and Slip Road Y at Entrustment Boundary CD	0	0		21-Dec-15*	-50								
KD-1100	KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic	0	0		19-Jan-16*	0								
<b>Key Dates (Forecast)</b>														
KD-1105	KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic	0	0		20-Jan-16	0								
<b>Major Milestones and Events</b>														
MS-0240	Commissioning of the diverted DN2300 Dong Jiang Watermains	0	0		24-Dec-15	291								
MS-2000C	T3: TTA to split FLHS NB & SB with 3 lanes in the middle unoccupied (between CH7130 and CH7470)	1	1		23-Jan-16*	3								
<b>Major Procurement &amp; Delivery</b>														
<b>Footbridge Steel Truss</b>														
MM-3050	Fabrication of footbridge steel truss (Kiu Tau Footbridge)	100	100		18-Jan-16	26-May-16	0							
<b>Design and Submissions</b>														
<b>Statutory Approval</b>														
PRE-1050	Submission & approval of CDIA report for construction of temporary platform for segment erection works	185	4		27-Nov-14 A	24-Dec-15	0							
<b>Method Statement and Design (Major) Approved by AECOM</b>														
PRE-2050	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks	30	10		02-Nov-15 A	04-Jan-16	11							
PRE-2030	Submission of E&M design for lighting of Kiu Tau Footbridge	60	60		21-Dec-15	09-Mar-16	128							
<b>Section IA &amp; IB - Fanling Highway Widening (KD-1 &amp; KD-2)</b>														
<b>Fanling Highway South Portion between CH6935 and CH7470</b>														
<b>Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZ2)</b>														
<b>At-Grade Roadworks (195m)</b>														
FHW-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	37		20-Feb-14 A	04-Feb-16	76							
FHW-1300	Noise Barrier NB68 - Mini-Piling at central median (CSD: 24 nos)	80	80		25-Jan-16	09-May-16	42							
FHW-1140	Noise Barrier NB70 - Footing adjacent to SB lane (15m)	115	115		22-Feb-16	13-Jul-16	68							
<b>Fanling Highway Zone 2 between CH7130 and CH7290</b>														
<b>At-Grade Roadworks (160m)</b>														
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	144	350		12-Oct-15 A	06-Mar-17	233							
FHW-2140	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	61	14		14-Oct-15 A	08-Jan-16	14							



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- Project Baseline Bar

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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015		2016				
							Dec	Jan	Feb	Mar	Apr		
FHW-2300	Noise Barrier NB68 - Mini-Piling at central median (CSD: 22 nos)	80	80	25-Jan-16	09-May-16	2							
FHW-2190	Footpath & DSD Access Track adjacent to SB lane	108	108	22-Feb-16	05-Jul-16	163							
<b>Fanling Highway Zone 3 between CH7290 and CH7380</b>													
<b>At-Grade Roadworks (130m)</b>													
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	150	350	07-Jun-14 A	06-Mar-17	74							
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	63	14	05-Oct-15 A	08-Jan-16	14							
FHW-3300	Noise Barrier NB68A - Mini-Piling at central median (CSD: 20 nos)	70	70	25-Jan-16	26-Apr-16	2							
FHW-3310	Noise Barrier NB68A - Footing at central median (98m)	90	90	12-Mar-16	04-Jul-16	7							
<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-4210	Noise Barrier NB68A - Footing at central median (40m)	90	90	12-Mar-16	04-Jul-16	7							
<b>Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)</b>													
<b>Kiu Tau Footbridge Reprvision (East)</b>													
FHW-5110	Inspection & Remedial Works for the 3nos. suspected defected piles (AB1-7, AB2-4, P3-9)	35	41	20-Nov-15 A	16-Feb-16	0							
FHW-5010E	KT-P4 - Ple Cap & Pler	75	75	21-Dec-15	30-Mar-16	46							
FHW-5000C2	KT-P2 - Piling Works (3 out of 6 nos of Pile) - Phase 2, conflict with existing TWSRE	15	15	18-Jan-16	03-Feb-16	5							
FHW-5010C	KT-P2 - Ple Cap & Pler	60	60	04-Feb-16	25-Apr-16	5							
FHW-5090	Additional BFA Facilities - Pile Cap & Sump Pit, to be covered by VO	45	45	04-Feb-16	07-Apr-16	40							
FHW-5010D	KT-P3 - Ple Cap & Pler	60	60	17-Feb-16	30-Apr-16	0							
FHW-5010A	KT-AB1 - Ple Cap & Abutment	75	75	17-Feb-16	20-May-16	5							
FHW-5010B	KT-AB2 - Ple Cap & Abutment	60	60	11-Mar-16	26-May-16	0							
<b>At-Grade Road Works (130m)</b>													
FHW-5120C	Preparation Works for Implementation of TTA Scheme E3A	30	21	07-Nov-15 A	16-Jan-16	5							
FHW-5120D	Implementation of TTA - Scheme E3A (shifting TWSR East westward, at the existing ramp of Kiu Tau Footbridge)	0	0	18-Jan-16		5							
<b>Remaining Works for Noise Barrier along widened Fanling Highway</b>													
FHW-NB-120	Noise Barrier Steelworks & Panel for NB6 (123m), adjacent to Fanling Highway SB lanes at Zone 1	20	20	18-Jan-16*	16-Feb-16	523							
FHW-NB-130	Noise Barrier Steelworks & Panel for NB7 (60m), adjacent to Fanling Highway SB lanes at Zone 1	10	10	17-Feb-16	27-Feb-16	523							
FHW-NB-140	Noise Barrier Steelworks & Panel for NB71 (254m), adjacent to Fanling Highway SB lanes at Zones 2,3 & 4	45	45	29-Feb-16	25-Apr-16	523							



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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015		2016			
							Dec	Jan	Feb	Mar	Apr	
<b>Section II - Remainder of the Works (KD-3)</b>												
<b>At Grade Link Road at Fanling Highway Interchange</b>												
<b>Link Road 3 (near Abutment AD1)</b>												
FHI-LR3-3000	Completion of WSD works incl. DN600, DN1200 & DN1400	0	0		04-Feb-16	447						◆ Completion of WSD works incl. DN600, DN1200 & DN1400
<b>Link Road 4 (near Abutment AC1)</b>												
FHI-LR4-4030	Construction of Retaining Wall beside Abutment AC1 (4 bays)	35	35	23-Jan-16	10-Mar-16	0						Construction of Retaining Wall bes
<b>WSD Works</b>												
<b>DN450 Fire Mains (CHA)</b>												
WA-1050	Pipe Laying - CHA 420 - 450 (DN450) near Realigned TWSR West (Re-TWSRW: CH530 - 640), 30m long & 2m depth	70	1	29-May-15 A	21-Dec-15	0						Pipe Laying - CHA 420 - 450 (DN450) near Realigned TWSR West (Re-TWSRW: CH530 - 640), 30m long & 2m depth, Pp
WA-1090	Pipe Laying - CHA 800 - 960 (DN450) near Ext. TWSR West (No Roadworks), 160m long & 3m depth	148	148	04-Jan-16*	09-Jul-16	78						
WA-1060	Pipe Laying - CHA 450 - 575 (DN450) near Realigned TWSR West (Re-TWSRW: CH640 - 695), 125m long & 2m depth	95	95	19-Jan-16	21-May-16	223						
<b>DN600 Water Mains (CHB)</b>												
WB-1010	Pipe Laying - CHB 160 - 215 (DN600) near Fanling Highway S/B (FHW: CH7290-7380), 55m long (common trench with NB)	60	0	13-Jul-15 A	12-Dec-15 A							Pipe Laying - CHB 160 - 215 (DN600) near Fanling Highway S/B (FHW: CH7290-7380), 55m long (common trench with NB)
WB-1060	Pipe Laying - CHB 538 - 635 (DN600) near Realigned TWSR East (TWSRE: CH270-380), 97m long & GL	30	20	17-Jul-15 A	15-Jan-16	563						
WB-1070	Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL	78	10	18-Jul-15 A	04-Jan-16	188						Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL, f
WB-1030C	Pipe Laying - CHB 350 - 450 (DN600) from Portal AB7/AD9/AC12 to Portal AB8	85	85	25-Feb-16	10-Jun-16	450						
<b>DN1200 Water Mains (CHC)</b>												
WC-1050A	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m long, 4m depth	120	37	15-Oct-14 A	04-Feb-16	76						Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW
WC-1130	Pipe Laying - CHC 910 - 980 (DN1200) near Realigned TWSR East (TWSRE: CH380-456), 70m long & GL	78	0	07-Jul-15 A	12-Dec-15 A							Pipe Laying - CHC 910 - 980 (DN1200) near Realigned TWSR East (TWSRE: CH380-456), 70m long & GL
WC-1060	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)	95	45	12-Oct-15 A	20-Feb-16	68						Pipe Laying - CHC 235 - 420 (DN1200) near Fanling H
WC-1090C	Pipe Laying - CHC 615 - 720 (DN1200) from Portal AB7/AD9/AC12 to Portal AB8	85	85	25-Feb-16	10-Jun-16	135						
<b>DN2200 Water Mains (CHF)</b>												
WF-3000	Semi-Structural Lining on existing DN2200 underneath Link Road 4, 52m long (Covered by VO no.077)	25	0	10-Dec-15 A	19-Dec-15 A							Semi-Structural Lining on existing DN2200 underneath Link Road 4, 52m long (Covered by VO no.077)
<b>DN2300 Water Mains and Leakage Collection System (CHJ &amp; CHKA/CHK)</b>												
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near Realigned TWSR East, 80m long & 4m depth	55	23	05-Oct-15 A	19-Jan-16	155						Pipe Laying - CHK 0 - 80 (DN1400) near Realigned TWSR East, 80m long & 4m depth, Pipe
WJ-2000B	Pressure Test for CHJ	7	0	24-Nov-15 A	26-Nov-15 A							Pressure Test for CHJ
WJ-2010A	Cleaning & CCTV Inspection for CHJ	7	0	08-Dec-15 A	14-Dec-15 A							Cleaning & CCTV Inspection for CHJ
WJ-2020	Installation of Connecting Pipe for Connection to Existing Mains	13	0	15-Dec-15 A	19-Dec-15 A							Installation of Connecting Pipe for Connection to Existing Mains
WJ-2040	Connection to Existing Mains	7	4	19-Dec-15 A	24-Dec-15*	-3						Connection to Existing Mains, Connection to Existing Mains



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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				2016									
							Dec	Jan	Feb	Mar	Apr									
WJ-1100	DN300 Washout at around CHU268	65	65	28-Dec-15	19-Mar-16*	209														
WJ-1110	DN300 Washout at CHU 155	65	65	28-Dec-15	19-Mar-16*	209														
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	90	90	20-Jan-16	17-May-16	155														
<b>Kau Lung Hang Valve Control &amp; Telemetry House Re-provision</b>																				
VCTH-1020a	Testing and Commissioning (New Telemetry House)	60	10	10-Oct-15 A	04-Jan-16	187														
VCTH-1020c	Testing and Commissioning (Valve operation for DN1400 water mains)	30	33	10-Oct-15 A	30-Jan-16	164														
<b>Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)</b>																				
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	50	50	02-Jan-16*	07-Mar-16	471														
PS-1010	Construction of New Boundary Wall for Pumping Station (PST3)	90	90	08-Mar-16	28-Jun-16	471														
<b>Stage 1A - Realignment of Tai Wo Service Road West (KD-7)</b>																				
<b>TWSRW Zone 1 between CH100 and CH155</b>																				
<b>At-Grade Roadworks</b>																				
TWSRW-1160	Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	286	10	15-Nov-14 A	19-Jan-16	0														
<b>TWSRW Zone 2 between CH155 and CH280</b>																				
<b>At-Grade Roadworks</b>																				
TWSRW-2120	Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	165	21	16-Oct-14 A	19-Jan-16	0														
TWSRW-2130	Noise Barrier NB1a - Footing adjacent Realigned TWSR West (Covered by VO 103) (Approx. 60.2m)	85	9	14-Sep-15 A	02-Jan-16	6														
TWSRW-2140	Rectification Works for Southern Trunk Sewer	48	15	30-Oct-15 A	09-Jan-16	0														
<b>TWSRW Zone 3 between CH280 and CH315</b>																				
<b>At-Grade Roadworks</b>																				
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	181	23	22-Jun-15 A	19-Jan-16	0														
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 2 (Approx. 120m) (by utilities undertakers)	111	0	21-Jul-15 A	07-Dec-15 A															
TWSRW-3100	Noise Barrier NB1a - Footing adjacent Realigned TWSR West (Covered by VO 103) (Approx. 35.1m)	26	8	19-Nov-15 A	31-Dec-15	1														
<b>TWSRW Zone 4 between CH315 and CH376</b>																				
<b>Construction of Bridge E</b>																				
TWSRW-4090	Permanent Prestressing & Abutment Wall	28	0	23-Oct-15 A	11-Dec-15 A															
TWSRW-4100	Remove Scaffold System and Temporary Work together with Slope Reinstatement	75	75	21-Dec-15*	30-Mar-16*	1														
<b>At-Grade Roadworks</b>																				
TWSRW-4200	Cast Parapet, Lay Surfacing and Road Furniture for Footpath and Carriageway	35	23	12-Dec-15 A	19-Jan-16	0														



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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015		2016			
							Dec	Jan	Feb	Mar	Apr	
<b>TWSRW Zone 5 between CH376 and CH520</b>												
<b>Construction of Retaining Structures</b>												
TWSRW-5080	Retaining Structure along Slope no. 3SW-C/C898 (to be covered by VO. 78)	50	0	29-Jun-15 A	03-Dec-15 A		Retaining Structure along Slope no. 3SW-C/C898 (to be covered by VO. 78)					
<b>At-Grade Roadworks</b>												
TWSRW-5110C	Road Drainage SMH801-804	80	5	27-Apr-15 A	28-Dec-15	0	Road Drainage SMH801-804, Road Drainage SMH801-804					
TWSRW-5100	Retaining Wall RW7 & RW8 - adjacent to Realigned TWSR West (66m)	70	25	29-Oct-15 A	21-Jan-16	3	Retaining Wall RW7 & RW8 - adjacent to Realigned TWSR West (66m), Retaining Wall RW7 & RW8 - adjacent to Realigned TWSR West (66m)					
TWSRW-5110A	Road Formation, DN150 watermain, Kerb, Planter and Pavement	21	21	23-Dec-15	19-Jan-16	0	Road Formation, DN150 watermain, Kerb, Planter and Pavement					
TWSRW-5110	Retaining Wall RW9 (to be covered by VO)	45	45	20-Jan-16	18-Mar-16	5	Retaining Wall RW9 (to be covered by VO)					
TWSRW-5120	Permanent Vehicular Access to Lot 81	125	125	22-Jan-16	30-Jun-16	469	Permanent Vehicular Access to Lot 81					
TWSRW-5130	Installation of Stone Facing Finish	45	45	22-Jan-16	21-Mar-16	3	Installation of Stone Facing Finish					
TWSRW-5140	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 5)	24	24	03-Mar-16	02-Apr-16	0	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 5)					
<b>TWSRW Zone 6 between CH520 and CH530</b>												
<b>At-Grade Roadworks</b>												
TWSRW-6110	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68)	65	14	22-May-15 A	08-Jan-16	16	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68), Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68)					
TWSRW-6100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert)	21	21	22-Dec-15	18-Jan-16	0	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert)					
<b>TWSRW Zone 7 between CH530 and CH640</b>												
<b>At-Grade Roadworks</b>												
TWSRW-7140	Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers)	233	15	28-Jan-15 A	04-Jan-16	373	Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers), Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers)					
TWSRW-7120*	Pipe Laying - DN450 Watermains (CHA)	70	1	29-May-15 A	21-Dec-15	0	Pipe Laying - DN450 Watermains (CHA)					
TWSRW-7160	Pipe Laying - DN150	70	1	13-Jul-15 A	21-Dec-15	0	Pipe Laying - DN150, Pipe Laying - DN150					
TWSRW-7100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut-slope)	21	21	22-Dec-15	18-Jan-16	0	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut-slope)					
TWSRW-7110	Implementation of TTA - Scheme W3	0	0	19-Jan-16		0	Implementation of TTA - Scheme W3					
TWSRW-7150	Remaining Road Drainage, Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)	56	56	19-Jan-16	02-Apr-16	0	Remaining Road Drainage, Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)					
<b>TWSRW Zone 8 between CH640 and CH695</b>												
<b>Kiu Tau Footbridge Reprvision (West)</b>												
TWSRW-8020	Construction of Pile Cap and Abutment	50	31	17-Nov-15 A	28-Jan-16	0	Construction of Pile Cap and Abutment, Construction of Pile Cap and Abutment					
<b>At-Grade Roadworks</b>												
TWSRW-8120	Road Formation, Road Drainage, Kerb and Pavement	22	22	22-Dec-15	19-Jan-16	0	Road Formation, Road Drainage, Kerb and Pavement					
TWSRW-8110*	Pipe Laying - DN450 Watermains (CHA)	95	95	19-Jan-16	21-May-16	223	Pipe Laying - DN450 Watermains (CHA)					

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							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug				
<b>Remainder of the Works</b>																			
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	15	28-Jan-15 A	04-Jan-16	373	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)												
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	111	0	21-Jul-15 A	07-Dec-15 A														
<b>Remaining Works for Noise Barrier along realigned TWSR West</b>																			
TWSRW-NB-110	Noise Barrier Steelworks & Panel for NB4 at Zones 1 & 2	20	20	21-Dec-15*	15-Jan-16	28	Noise Barrier Steelworks & Panel for NB4 at Zones 1 & 2												
TWSRW-NB-130	Noise Barrier Steelworks & Panel for NB1b at Zone 4	10	10	16-Jan-16	27-Jan-16	28	Noise Barrier Steelworks & Panel for NB1b at Zone 4												
TWSRW-NB-140	Noise Barrier Steelworks & Panel for NB2 at Zone 5	20	20	28-Jan-16	26-Feb-16	28	Noise Barrier Steelworks & Panel for NB2 at Zone 5												
<b>Stage N4A &amp; N4B - Realignment of Tai Wo Service Road East (KD-13 &amp; KD-14)</b>																			
<b>TWSRE Zone 1 between CH100 and CH270</b>																			
<b>At-Grade Roadworks</b>																			
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	90	90	20-Jan-16	17-May-16	155	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East												
TWSRE-1170	Remaining Noise Barrier NB3 Stem Wall (a total of 24m long)	30	30	11-Mar-16	19-Apr-16	272	Remaining Noise Barrier NB3 Stem Wall (a total of 24m long)												
<b>TWSRE Zone 2 between CH270 and CH380</b>																			
<b>At-Grade Roadworks</b>																			
TWSRE-2030A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	30	325	17-Jul-15 A	04-Feb-17	280	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East												
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	23	05-Oct-15 A	19-Jan-16	155	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East												
TWSRE-2040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement	71	71	20-Jan-16	22-Apr-16	269	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement												
<b>TWSRE Zone 3 between CH380 and CH456</b>																			
<b>At-Grade Roadworks</b>																			
TWSRE-3020A*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	78	10	07-Jul-15 A	04-Jan-16	188	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East												
TWSRE-3040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement (Incl. FL/F10)	165	165	05-Jan-16	30-Jul-16	188	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement (Incl. FL/F10)												
<b>Roundabout A, Slip Road and Access Road</b>																			
TWSRE-4070	Roundabout A - Road Formation, Kerb, Planter and Pavement	90	42	26-Oct-15 A	17-Feb-16	6	Roundabout A - Road Formation, Kerb, Planter and Pavement												
TWSRE-4110	Preparation Works for Implementation of TTA Scheme E1A	30	21	26-Oct-15 A	16-Jan-16	102	Preparation Works for Implementation of TTA Scheme E1A, Preparation Works for Implementation of TTA Scheme E1A												
TWSRE-4020	Slip Road Y (CH260-CH404) - Road Formation, Road Drainage, Kerb, Planter and Pavement	108	108	07-Jan-16	25-May-16	6	Slip Road Y (CH260-CH404) - Road Formation, Road Drainage, Kerb, Planter and Pavement												
TWSRE-4120	Implementation of TTA - Scheme E1A	0	0	17-Jan-16*		134	Implementation of TTA - Scheme E1A												
TWSRE-4030B	Slip Road Y (CH100-CH230) - Road Formation, Remaining Road Drainage, Kerb, Planter and Pavement	120	120	18-Jan-16	20-Jun-16	102	Slip Road Y (CH100-CH230) - Road Formation, Remaining Road Drainage, Kerb, Planter and Pavement												
<b>Stage 1C - Viaduct Structure &amp; TCSS Civil Provisions (KD-9)</b>																			
<b>Preliminaries</b>																			



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							Dec	Jan	Feb	Mar	Apr									
B-3050	Relocation of Plant including Pre-drilling Works	21	21	25-Jan-16	24-Feb-16	67														
<b>Foundation &amp; Pier Construction</b>																				
<b>Bridge A</b>																				
BA-05-1030	Pier AA5 - Pier Construction (Twin Pier)	27	0	29-Oct-14 A	18-Dec-15 A															
BA-01-1010	Abutment AA1 - Pile Test	14	14	06-May-15 A	08-Jan-16	235														
BA-18-1030	Pier AA18 - Pier Construction	56	0	08-May-15 A	28-Nov-15 A															
BA-11-1010	Pier AA11 - Pile Test	14	0	18-Aug-15 A	10-Dec-15 A															
BA-12-1030	Pier AA12 - Pier Construction	35	0	10-Oct-15 A	11-Dec-15 A															
BA-07-1020	Pier AA7 - Pile Cap	30	0	30-Oct-15 A	17-Dec-15 A															
BA-09-1030	Pier AA9 - Pier Construction (Twin Pier)	49	26	07-Nov-15 A	22-Jan-16	35														
BA-10-1000	Pier AA10 - Piling Works	24	4	07-Nov-15 A	24-Dec-15	0														
BA-11-1020	Pier AA11 - Pile Cap	30	25	15-Dec-15 A	21-Jan-16	25														
BA-01-1000b	Abutment AA1 - Piling Works (P1)	12	12	28-Dec-15	11-Jan-16	0														
BA-02-1000	Pier AA2W - Piling Works	12	12	12-Jan-16	25-Jan-16	0														
BA-10-1010	Pier AA10 - Pile Test	14	14	14-Jan-16	29-Jan-16	18														
BA-11-1030	Pier AA11 - Pier Construction	35	35	22-Jan-16	09-Mar-16	38														
BA-07-1030	Pier AA7 - Pier Construction	28	28	23-Jan-16	02-Mar-16	35														
BA-08-1000	Pier AA8 - Piling Works	24	24	26-Jan-16	29-Feb-16	0														
BA-10-1020	Pier AA10 - Pile Cap	30	30	30-Jan-16	11-Mar-16	18														
BA-02-1010	Pier AA2W - Pile Test	14	14	18-Feb-16	04-Mar-16	120														
BA-02-1020B	Pier AA2W - Pile Cap	30	30	05-Mar-16	13-Apr-16	120														
BA-10-1030	Pier AA10 - Pier Construction	30	30	12-Mar-16	20-Apr-16	36														
BA-08-1010	Pier AA8 - Pile Test	14	14	17-Mar-16	06-Apr-16	0														
<b>Bridge B</b>																				
BB-01-1010	Abutment AB1 - Pile Test	14	14	18-Aug-15 A	08-Jan-16	270														
BB-07-1040	Portal AB7/AD9 - Portal Beam Construction together with Kicker	60	0	19-Sep-15 A	04-Dec-15 A															
BB-03-1020	Pier AB3 - Pile Cap	30	0	26-Oct-15 A	19-Dec-15 A															
BB-12-1020	Abutment AB12/AD14 - Pile Cap	65	52	28-Oct-15 A	29-Feb-16	18														
BB-11-1030	Pier AB11 - Pier Construction	45	0	06-Nov-15 A	19-Dec-15 A															



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							Dec	Jan	Feb	Mar	Apr		
BB-06-1030	Pier AB6E - Pier Construction	48	23	21-Nov-15 A	19-Jan-16	22							
BB-06-1050	Portal AB6 - Portal Beam Construction together with Kicker	40	40	28-Jan-16	21-Mar-16	22							
BB-04-1000	Pier AB4 - Piling Works	24	24	25-Feb-16	23-Mar-16	67							
BB-12-1030	Abutment AB12/AD14 - Abutment Construction	75	75	01-Mar-16	02-Jun-16	150							
BB-03-1030	Pier AB3 - Pier Construction	21	21	03-Mar-16	30-Mar-16	35							
<b>Bridge C</b>													
BC-12-1030	Pier AC12 - Pier Construction	28	0	10-Jun-15 A	18-Dec-15 A								
BC-03-1010	Pier AC3 - Pile Test	14	0	28-Nov-15 A	09-Dec-15 A								
BC-03-1020	Pier AC3 - Pile Cap	30	22	11-Dec-15 A	18-Jan-16	135							
BC-01-1030	Abutment AC1 - Abutment Construction	50	45	16-Dec-15 A	20-Feb-16	0							
BC-02-1020	Pier AC2 - Pile Cap	30	30	21-Dec-15	27-Jan-16	90							
BC-02-1030	Pier AC2 - Pier Construction	45	45	28-Jan-16	30-Mar-16	90							
<b>Bridge D</b>													
BD-01-1020	Abutment AD1 - Pile Cap	30	0	04-Nov-15 A	03-Dec-15 A								
BD-13-1030	Pier AD13 - Pier Construction	45	30	03-Dec-15 A	27-Jan-16	92							
BD-12-1030	Pier AD12 - Pier Construction	45	35	09-Dec-15 A	02-Feb-16	81							
BD-01-1030	Abutment AD1 - Abutment Construction	50	50	21-Dec-15	26-Feb-16	240							
BD-08-1040	Portal AC11/AD8 - Portal Beam Construction together with Kicker	40	40	28-Dec-15	19-Feb-16	0							
BD-09-1040	Portal AD9/AC12 - Portal Beam Construction together with Kicker	40	40	29-Dec-15	20-Feb-16	19							
BD-11-1020A	Pier AD11E - Pile Cap	30	30	01-Mar-16	08-Apr-16	18							
<b>Pier Table Construction</b>													
<b>Bridge A</b>													
PA-1170	Pier Table Construction at Pier AA17 (3 nos.)	50	0	17-Oct-15 A	30-Nov-15 A								
PA-1180	Pier Table Construction at Pier AA18 (4 nos.)	50	50	21-Dec-15	26-Feb-16	34							
PA-1040	Pier Table Construction at Pier AA4 (3 nos.)	50	50	23-Dec-15	29-Feb-16	64							
PA-1050	Pier Table Construction at Pier AA5 (4 nos.)	50	50	16-Feb-16	18-Apr-16	2							
PA-1090	Pier Table Construction at Pier AA9 (4 nos.)	50	50	27-Feb-16	29-Apr-16	72							
PA-1120	Pier Table Construction at Pier AA12 (3 nos.)	50	50	27-Feb-16	29-Apr-16	34							
PA-1110	Pier Table Construction at Pier AA11 (3 nos.)	50	50	18-Mar-16	21-May-16	49							



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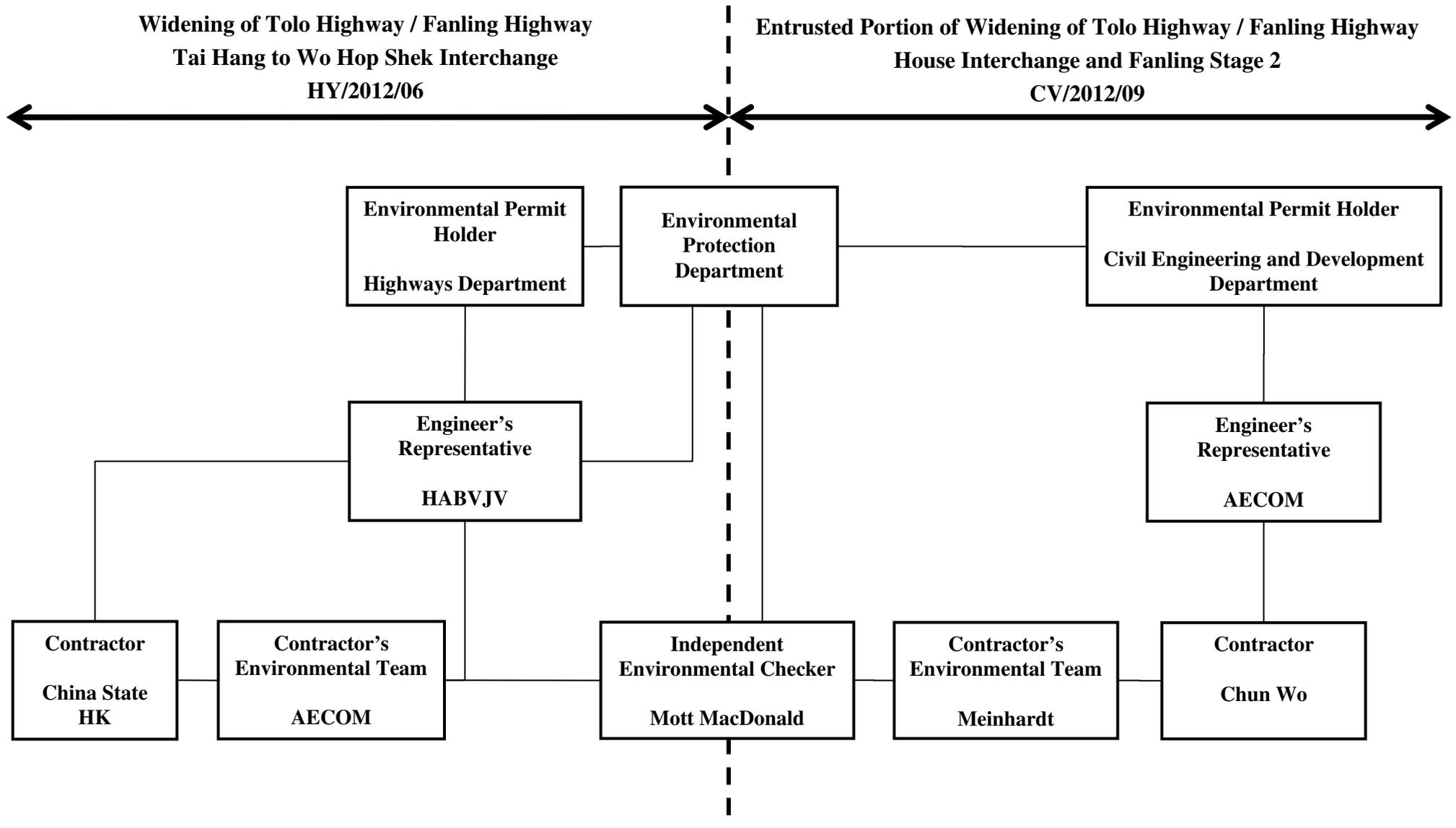
Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015		2016					
							Dec	Jan	Feb	Mar	Apr			
EC-1090	Bridge Deck Construction at Pier AC9 by Crane (21 nos + 1 no. key segment)	12	7	15-Dec-15 A	30-Dec-15	162								
EC-1100	Bridge Deck Construction at Pier AC10 by Typical Lifting Frame (10 nos + 1 no. key segment)	15	15	30-Jan-16	23-Feb-16	8								
EC-1050	Bridge Deck Construction at Pier AC5 by Typical Lifting Frame (20 nos + 2 no. key segment + 3 no. of AC6)	12	12	12-Mar-16	29-Mar-16	8								
<b>Bridge D</b>														
ED-1060	Bridge Deck Construction at Pier AD6 by Typical Lifting Frame (18 nos + 1 no. key segment)	11	3	10-Dec-15 A	23-Dec-15	8								
ED-1040	Bridge Deck Construction at Pier AD4 by Typical Lifting Frame (14 nos + 2 no. key segment)	14	14	14-Jan-16	29-Jan-16	8								
ED-1100	Bridge Deck Construction at Portal AD10 by Crane (52 nos)	32	32	16-Jan-16	29-Feb-16	48								
ED-1070	Bridge Deck Construction at Pier AD7 by Typical Lifting Frame (26 nos + 1 no. key segment)	15	15	24-Feb-16	11-Mar-16	8								
<b>Section VI - Works in Portion FH9 (KD-6A)</b>														
<b>Major Works</b>														
S6-2000*	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	127	06-Feb-15 A	02-Jun-16	150								

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# Appendix B

## Project Organization Structure



# **Appendix C Calibration Certificates of Monitoring Equipment**



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE  
 VILLAGE OF CLEVELAND, OH  
 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2015 Rootmeter S/N 0438320 Ta (K) - 292  
 Operator Tisch Orifice I.D. - 1941 Pa (mm) - 756.92

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.4880	3.2	2.00
2	NA	NA	1.00	1.0510	6.4	4.00
3	NA	NA	1.00	0.9360	7.9	5.00
4	NA	NA	1.00	0.8920	8.8	5.50
5	NA	NA	1.00	0.7360	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0121	0.6802	1.4258	0.9958	0.6692	0.8784
1.0078	0.9589	2.0163	0.9916	0.9434	1.2422
1.0057	1.0745	2.2543	0.9895	1.0571	1.3888
1.0046	1.1262	2.3644	0.9884	1.1080	1.4566
0.9993	1.3578	2.8515	0.9832	1.3358	1.7568
Qstd slope (m) = 2.10265			Qa slope (m) = 1.31664		
intercept (b) = -0.00335			intercept (b) = -0.00206		
coefficient (r) = 0.99999			coefficient (r) = 0.99999		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

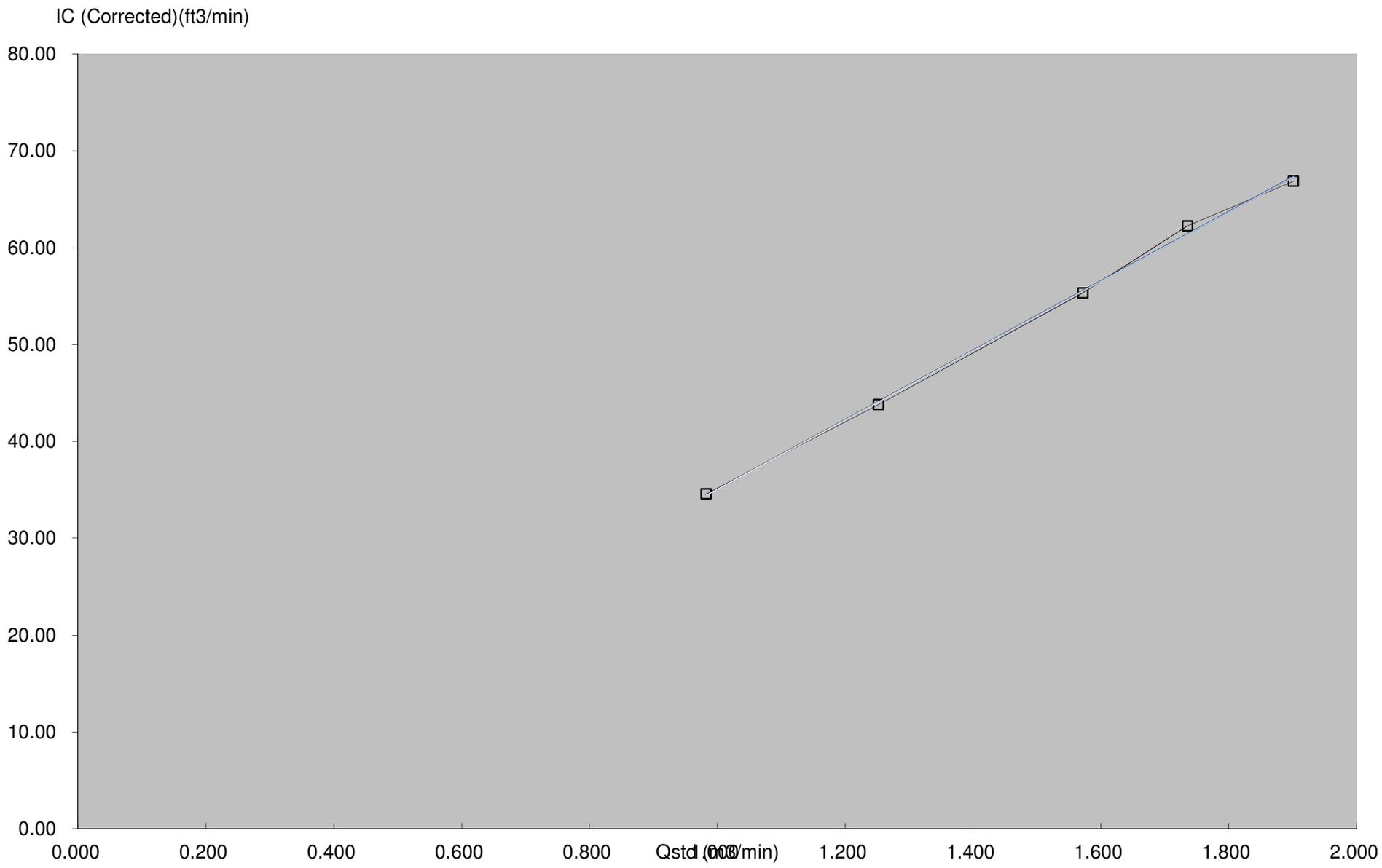
$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

$$Qstd = 1/m \{ [\text{SQRT}(H2O(Pa/760)(298/Ta))] - b \}$$

$$Qa = 1/m \{ [\text{SQRT} H2O(Ta/Pa)] - b \}$$





TEST REPORT  
for  
SOUND CALIBRATOR

Model : NC - 74

Serial No. : 34857296

Condition : Temperature 25 °C

Humidity 64 %RH

Date : September, 8, 2015

Signature : *Y. Kitajima*

1. Sound Pressure Level	94.0 ± 0.25 dB	<u>94.00 dB</u>
2. Frequency	1000 ± 7 Hz	<u>1002.0 Hz</u>
3. Distortion	3 % or less	<u>Pass</u>
4. Alarm Function		<u>Pass</u>
5. Appearance		<u>Pass</u>

Applicable standards

JIS C 1515:2004 class1

IEC 60942:2003 class1



# Calibration Certificate

Certificate No. **508784**

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. :** Q53442

**Date of receipt :** 8-Oct-15

## Item Tested

**Description :** Sound Level Meter

**Manufacturer :** B&K

**Model :** 2238

**Serial No. :** 2694908

## Test Conditions

**Date of Test :** 15-Oct-15

**Supply Voltage :** --

**Ambient Temperature :**  $(23 \pm 3)^{\circ}\text{C}$

**Relative Humidity :**  $(50 \pm 25) \%$

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 651 and IEC 804.

## Test Results

All results were within the IEC 651 Type1 and IEC 804 Type1 specification after adjustment.

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	C147450	SCL-HKSAR
S240	Sound Level Calibrator	500563	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).

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Alan Chu

**Approved by :**   
Steve Kwan

**Date:** 15-Oct-15

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

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EO



# Calibration Certificate

Certificate No. **508784**

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)	
Range	Freq. Wgt.	Bandwidth	Center Freq.		Before adjust	After adjust
20 ~ 100	A	BB/F	--	94.0	*91.6	93.8
	A	BB/S	--		--	93.8
	C	BB/F	--		--	93.8
40 ~ 120	A	BB/F	--	94.0	--	93.9
	A	BB/F	--	114.0	--	113.8

IEC 651 Type 1 Spec. :  $\pm 0.7$  dB  
Uncertainty :  $\pm 0.1$  dB

## 2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. :  $\pm 0.3$  dB  
Uncertainty :  $\pm 0.1$  dB

## 3. Linearity

### 3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
140	114.0	113.9	0.0	$\pm 0.7$ dB
130	104.0	103.9	0.0	
120	94.0	93.9 (Ref.)	--	
110	84.0	83.9	0.0	
100	74.0	73.9	0.0	
90	64.0	63.9	0.0	
80	54.0	53.8	-0.1	

Uncertainty :  $\pm 0.1$  dB

### 3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.0	+ 0.1	$\pm 0.4$ dB
	94.0	93.9 (Ref.)	--	
	95.0	94.9	0.0	$\pm 0.2$ dB

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. **508784**

Page 3 of 3 Pages

## 4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.3	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.2	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.2	- 16.1 dB, ± 1 dB
250 Hz	- 8.7	- 8.6 dB, ± 1 dB
500 Hz	- 3.2	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+ 1.2	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.0	+ 1.0 dB, ± 1 dB
8 kHz	- 1.2	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	- 6.7	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	39.9	± 0.5 dB
1/10 <sup>2</sup>	40.0	39.9	
1/10 <sup>3</sup>	40.0	39.9	± 1.0 dB
1/10 <sup>4</sup>	40.0	39.8	

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 : 1008 hPa
  4. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.
  5. \* Out of specification.

----- END -----

# Appendix D

## EM&A Monitoring Schedules

**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2  
Impact Monitoring & Site Auditing Schedule for December 2015**

December 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	3	4	5
6	7 ET Site Walk(09:30am – 11:00am)	8 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	9	10	11	12
13	14 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	15	16 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC + SSEMC	17	18	19 24-hour TSP + 3 x 1-hour TSP
20	21 ET Site Walk(09:30am – 11:00am)	22	23	24 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	25 Christmas Day	26 The first weekday after Christmas Day
27	28 ET Site Walk(09:30 – 11:00) with Fanling Stage 2 IEC & Liantang Project- wide ET and IEC	29	30 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	31		

**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2  
Impact Monitoring & Site Auditing Schedule for January 2016**

January 2016						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					<b>1</b> The first day of January	<b>2</b>
<b>3</b>	<b>4</b> ET Site Walk(09:30am – 11:00am)	<b>5</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b> ET Site Walk(09:30am – 11:00am) 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b> 24-hour TSP + 3 x 1-hour TSP
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b> ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC + SSEMC	<b>21</b>	<b>22</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>23</b>
<b>24</b>	<b>25</b> ET Site Walk(09:30 – 11:00) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC	<b>26</b>	<b>27</b>	<b>28</b> 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	<b>29</b>	<b>30</b>
<b>31</b>						

# **Appendix E**

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

# **Appendix E**

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

**[N/A]**

\*Note: In the event that the meteorological data for this reporting month was not available from the Hong Kong Observatory by the time of submission, please note that the data would be included in Appendix E in the next Monthly EM&A report.

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

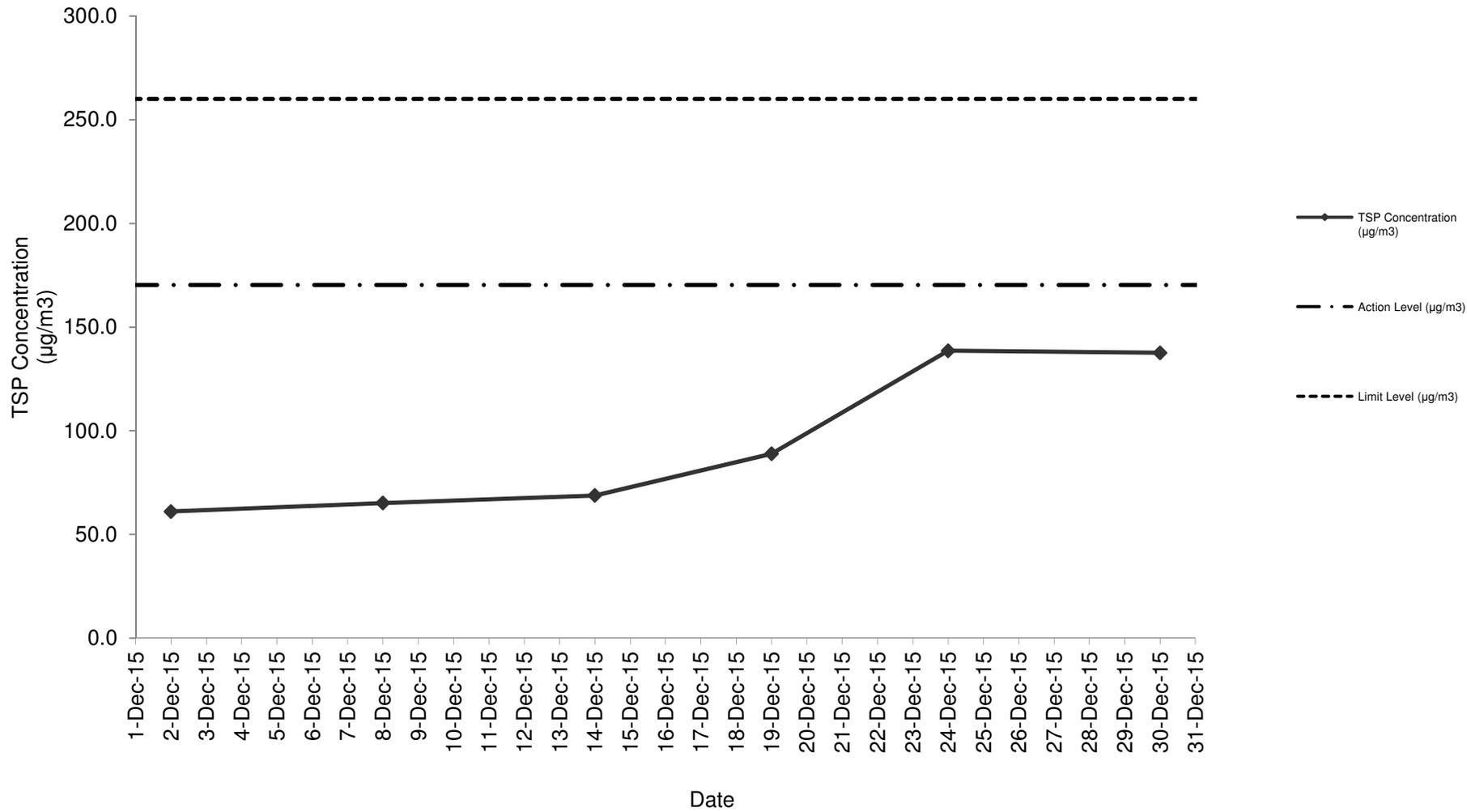
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

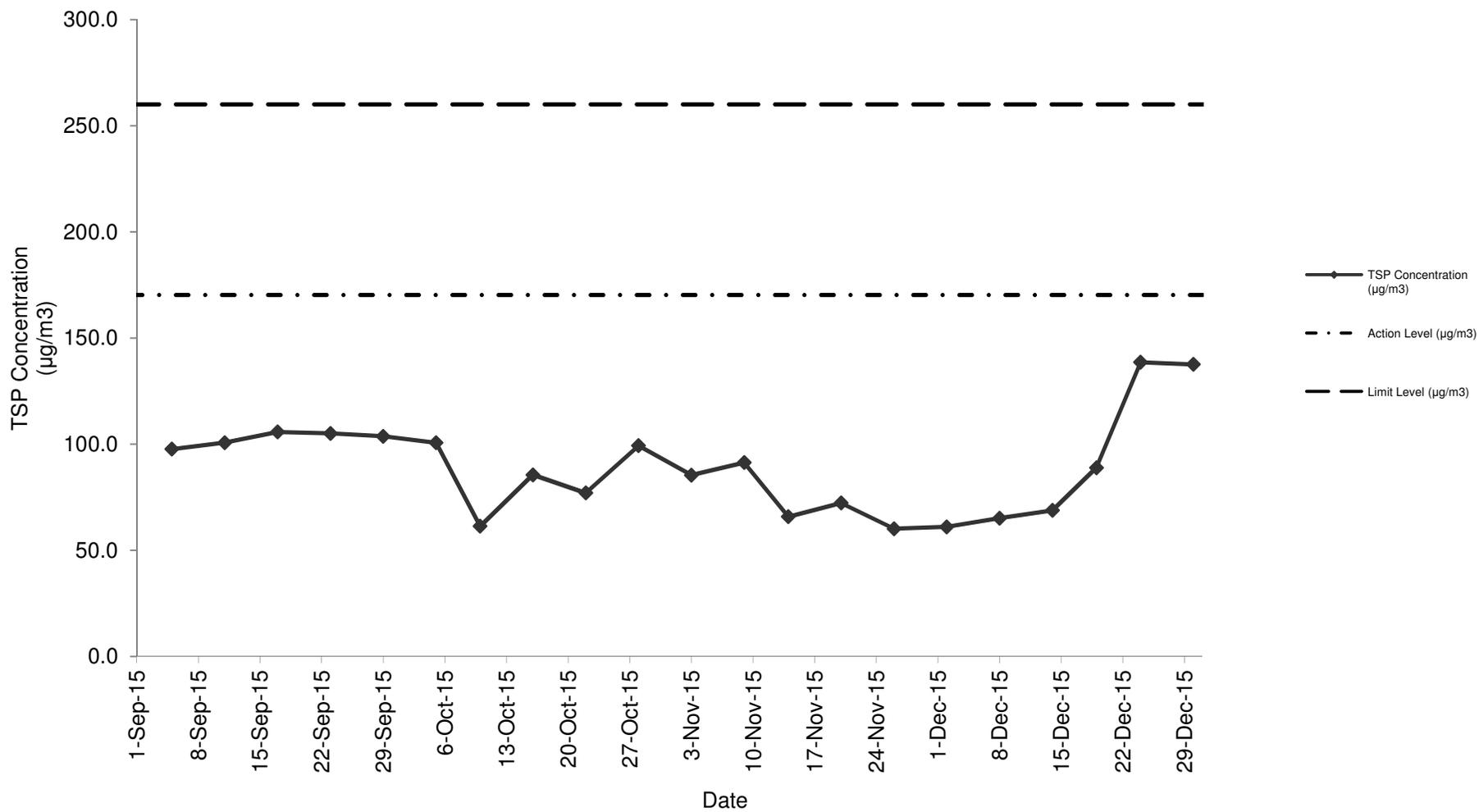
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
2-Dec-15	Fine	12:11	C134	2.8113	2.9383	0.1270	4090.67	4114.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	61.1	170.3	260.0	<5	N
8-Dec-15	Fine	12:12	C136	2.8206	2.9561	0.1355	4117.67	4141.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	65.2	170.3	260.0	<5	N
14-Dec-15	Cloudy	12:10	C138	2.8111	2.9542	0.1431	4144.67	4168.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.8	170.3	260.0	<5	N
19-Dec-15	Sunny	12:11	C140	2.8013	2.9862	0.1849	4171.67	4195.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	88.9	170.3	260.0	<5	N
24-Dec-15	Sunny	12:11	C142	2.8005	3.0887	0.2882	4198.67	4222.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	138.6	170.3	260.0	<5	N
30-Dec-15	Fine	12:09	C144	2.8057	3.0918	0.2861	4225.67	4249.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	137.6	170.3	260.0	<5	N
																<b>Average</b>	93.4				
																<b>Min</b>	61.1				
																<b>Max</b>	138.6				

Note: No major dust source observed during the monitoring period

### 24-Hour TSP Monitoring Result at Station: SR77



### 24-Hour TSP Monitoring Result at Station: SR77 (September 2015 - December 2015)



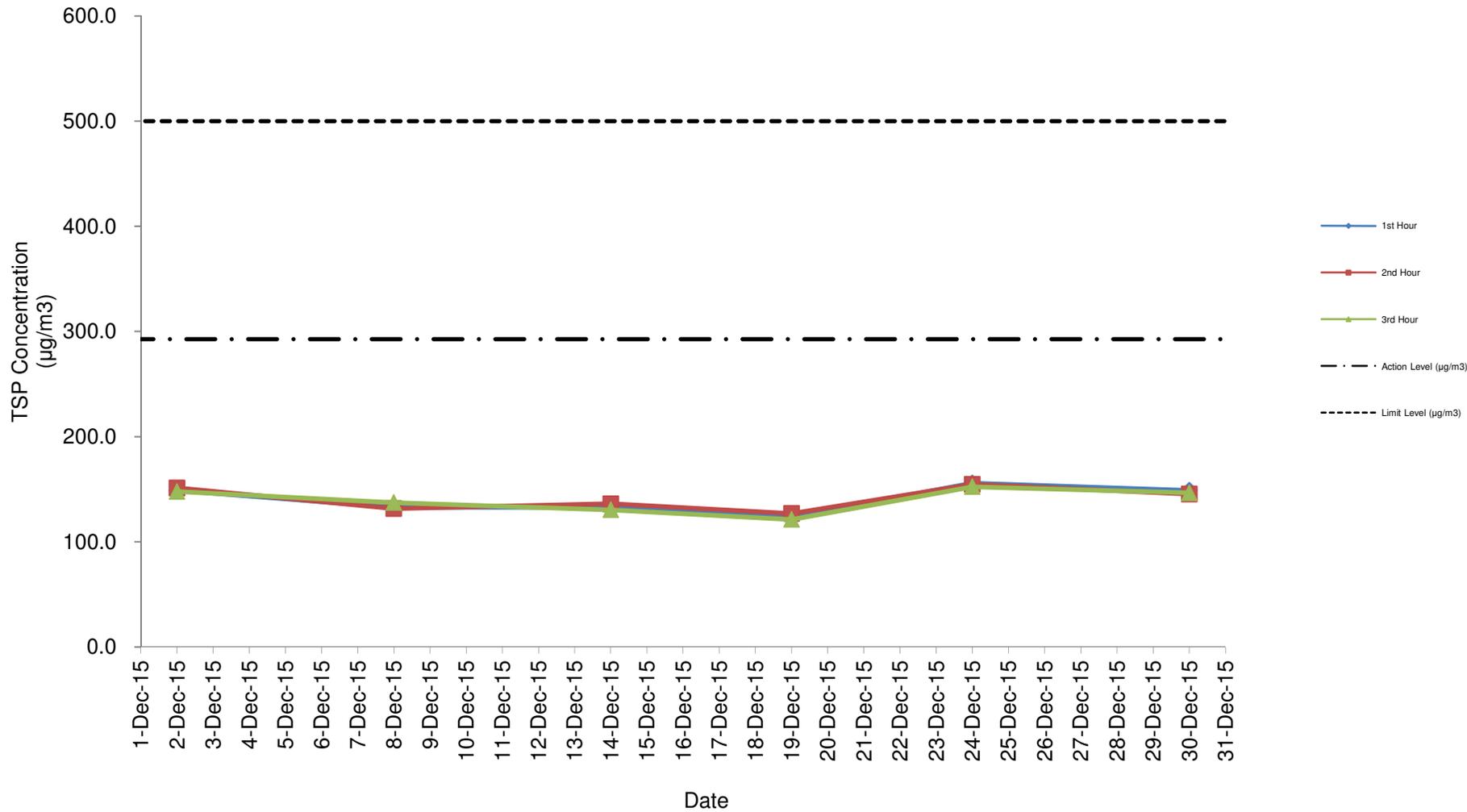
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

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

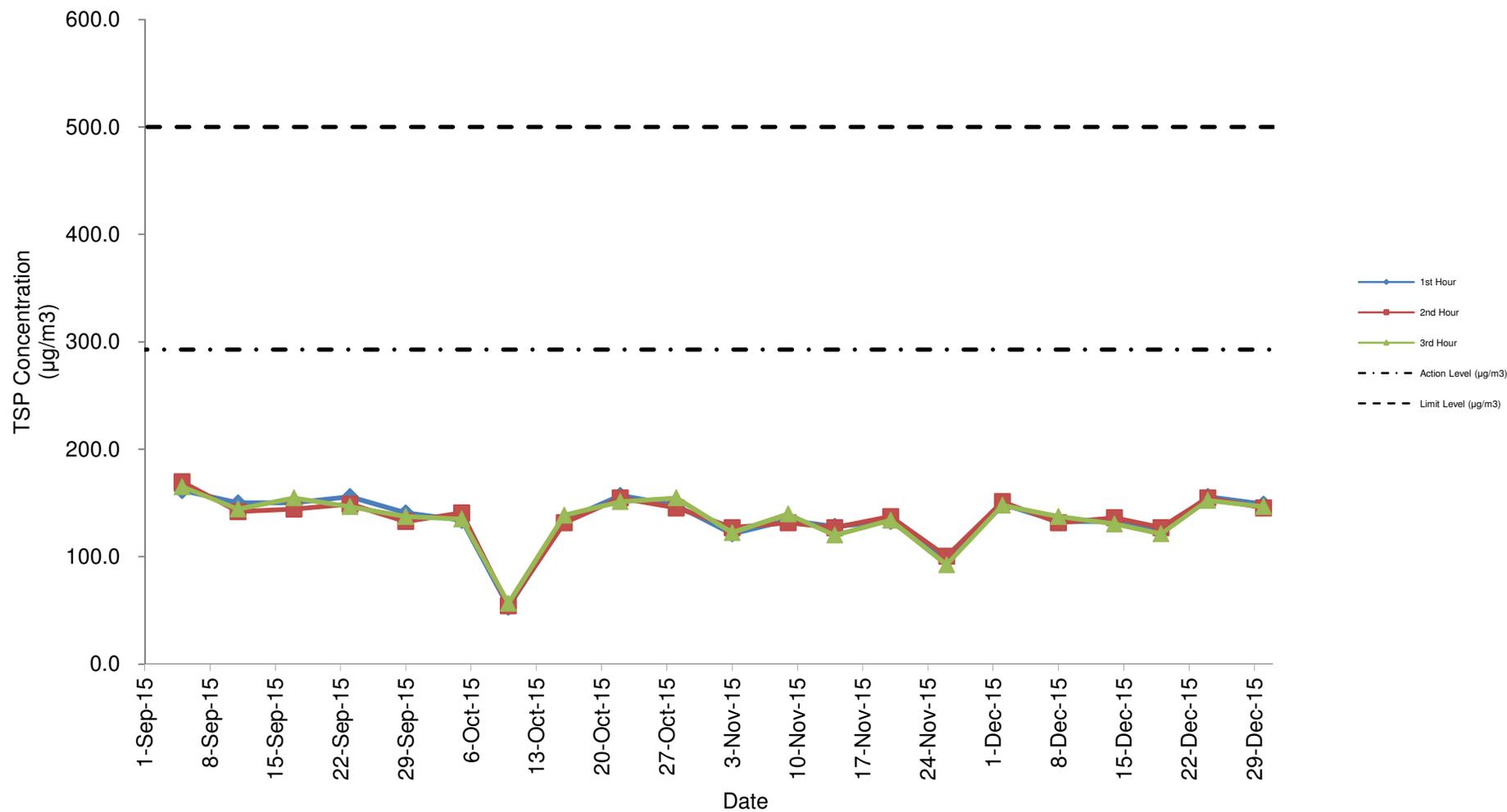
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
2-Dec-15	Sunny	09:00	C133A	2.8234	2.8363	0.0129	4087.67	4088.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	148.9	292.7	500.0	<5	N
	Sunny	10:03	C133B	2.8191	2.8322	0.0131	4088.67	4089.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	151.2	292.7	500.0	<5	N
	Sunny	11:07	C133C	2.8213	2.8341	0.0128	4089.67	4090.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	147.7	292.7	500.0	<5	N
8-Dec-15	Fine	09:00	C135A	2.8121	2.8236	0.0115	4114.67	4115.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	132.7	292.7	500.0	<5	N
	Fine	10:04	C135B	2.8137	2.8251	0.0114	4115.67	4116.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	131.6	292.7	500.0	<5	N
	Fine	11:07	C135C	2.8122	2.8241	0.0119	4116.67	4117.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	137.3	292.7	500.0	<5	N
14-Dec-15	Cloudy	09:00	C137A	2.8226	2.8341	0.0115	4141.67	4142.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	132.7	292.7	500.0	<5	N
	Cloudy	10:03	C137B	2.8165	2.8283	0.0118	4142.67	4143.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	136.2	292.7	500.0	<5	N
	Cloudy	11:06	C137C	2.8193	2.8306	0.0113	4143.67	4144.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	130.4	292.7	500.0	<5	N
19-Dec-15	Sunny	09:00	C139A	2.8114	2.8221	0.0107	4168.67	4169.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	123.5	292.7	500.0	<5	N
	Sunny	10:04	C139B	2.8231	2.8341	0.0110	4169.67	4170.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	126.9	292.7	500.0	<5	N
	Sunny	11:07	C139C	2.8056	2.8161	0.0105	4170.67	4171.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	121.2	292.7	500.0	<5	N
24-Dec-15	Sunny	09:00	C141A	2.8111	2.8246	0.0135	4195.67	4196.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	155.8	292.7	500.0	<5	N
	Sunny	10:04	C141B	2.8107	2.8241	0.0134	4196.67	4197.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	154.6	292.7	500.0	<5	N
	Sunny	11:08	C141C	2.8109	2.8241	0.0132	4197.67	4198.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	152.3	292.7	500.0	<5	N
30-Dec-15	Fine	09:00	C143A	2.8055	2.8184	0.0129	4222.67	4223.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	148.9	292.7	500.0	<5	N
	Fine	10:03	C143B	2.8106	2.8232	0.0126	4223.67	4224.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	145.4	292.7	500.0	<5	N
	Fine	11:06	C143C	2.8114	2.8241	0.0127	4224.67	4225.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	146.6	292.7	500.0	<5	N
<b>Average</b>																140.2					
<b>Min</b>																121.2					
<b>Max</b>																155.8					

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

### 1-Hour TSP Monitoring Result at station: SR77



### 1-Hour TSP Monitoring Result at station: SR77 (September 2015 - December 2015)



# **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 Quality**

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

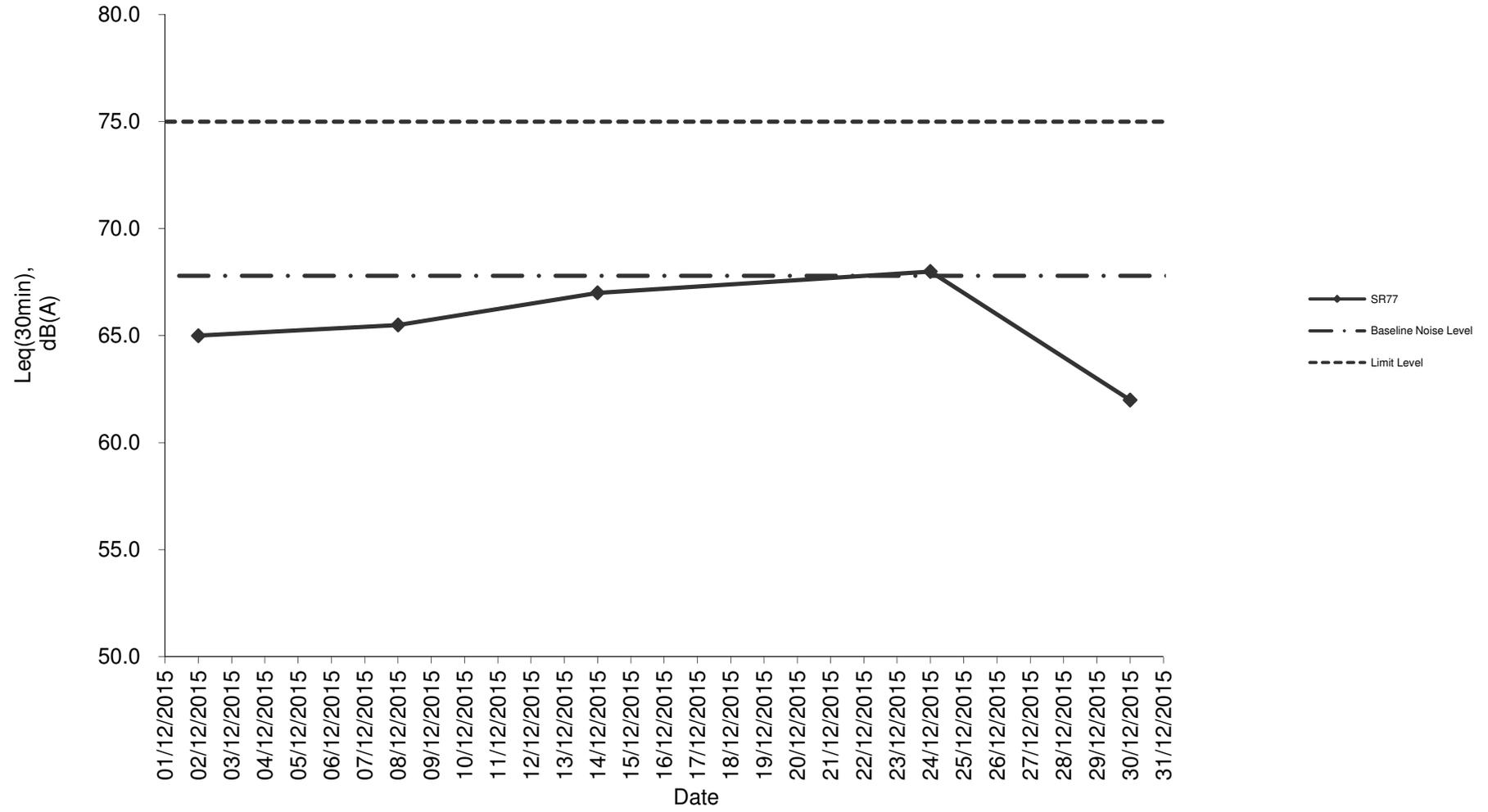
Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)	Exceedance (Y / N)
				L10(30min)	L90(30min)	Leq(30min)				
2015/12/02	Fine	14:00	14:30	87.0	51.0	65.0	-	67.8	75.0	N
2015/12/08	Fine	15:00	15:30	90.0	58.5	65.5	-	67.8	75.0	N
2015/12/14	Cloudy	15:00	15:30	89.0	57.5	67.0	-	67.8	75.0	N
2015/12/24	Fine	14:30	15:00	86.5	60.0	68.0	-	67.8	75.0	N
2015/12/30	Fine	14:00	14:30	73.0	58.0	62.0	-	67.8	75.0	N
						<b>Average</b>	65.5			
						<b>Minimum</b>	62.0			
						<b>Maximum</b>	68.0			

**Remarks**

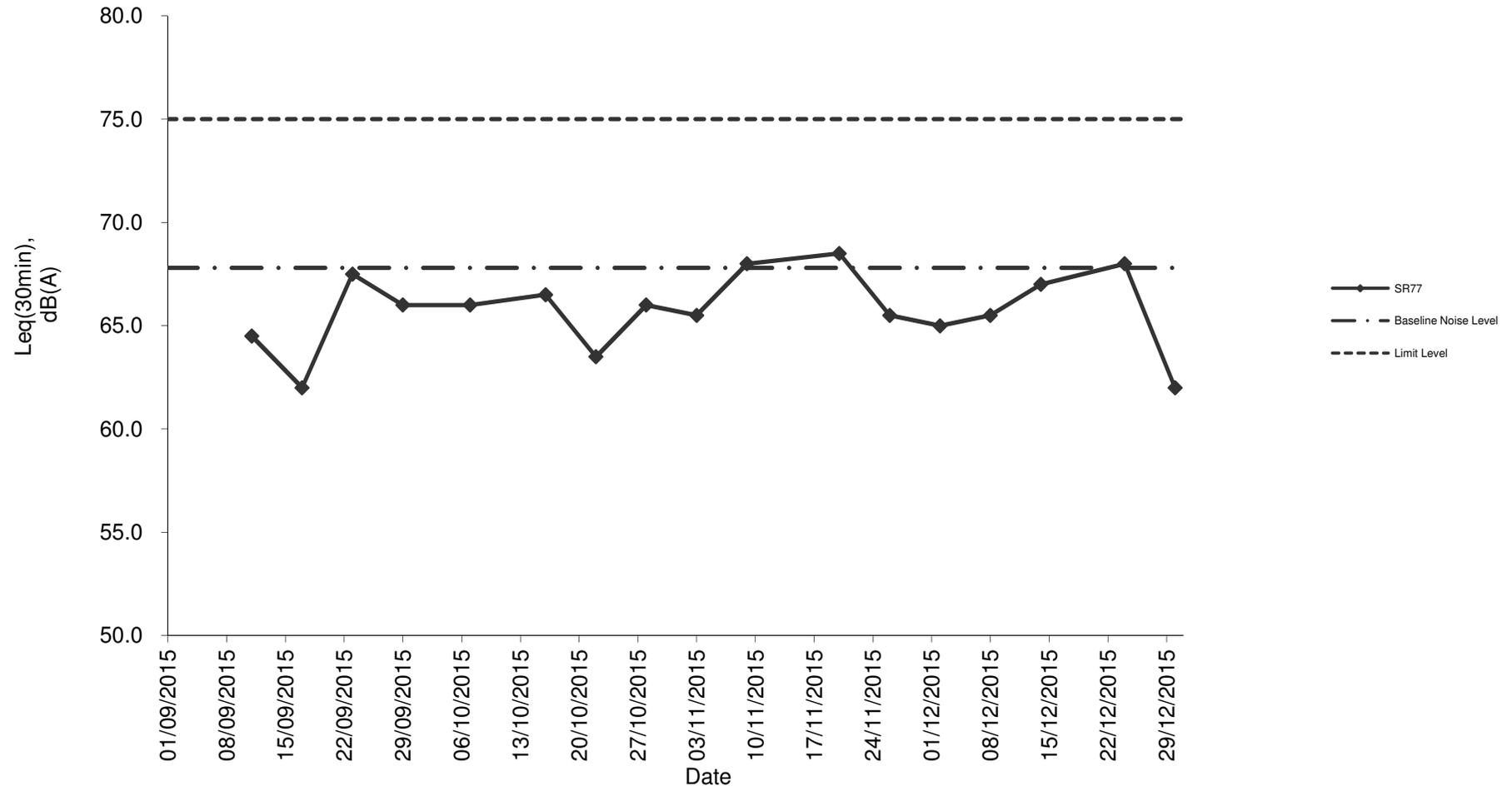
\* +3dB(A) Façade effect correction included

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

### Noise monitoring result: SR77



**Noise monitoring result: SR77  
(September 2015 - December 2015)**



# **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 '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in m3)	(in '000m3)
Jan-15	3.969	0.105	3.864	0.648	-	3.216	0.118	-	-	-	0.040	0.080
Feb-15	2.478	0.049	2.429	1.518	-	0.911	0.100	-	-	0.003	0.900	0.070
Mar-15	3.742	0.029	3.713	0.270	-	3.443	0.100	-	-	0.006	-	0.080
Apr-15	3.711	0.115	3.597	2.308	-	1.289	0.090	0.003	-	-	-	0.065
May-15	1.554	0.197	1.357	0.108	-	1.249	0.100	-	-	0.012	-	0.065
Jun-15	2.568	0.053	2.515	0.840	-	1.675	0.125	-	-	0.030	0.800	0.060
Sub-Total	18.022	0.548	17.475	5.692	-	11.783	0.633	0.003	-	0.051	1.740	0.420
Jul-15	1.207	0.030	1.177	0.351	-	0.826	1.564	-	-	-	-	0.065
Aug-15	2.130	0.164	1.966	0.294	-	1.672	0.956	0.002	-	0.001	-	0.130
Sep-15	2.119	0.027	2.092	0.264	-	1.828	0.771	-	-	0.001	-	0.115
Oct-15	2.843	0.381	2.462	1.500	-	0.962	0.226	-	-	0.001	-	0.125
Nov-15	3.699	0.709	2.990	1.200	-	1.790	0.066	0.001	-	-	-	0.130
Dec-15	3.332	0.174	3.158	1.600	-	1.558	0.259	-	-	0.001	0.600	0.145
Total	33.352	2.033	31.320	10.901	-	20.419	4.475	0.006	-	0.055	2.340	1.130

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

# **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 and Obs
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	Rem and Obs

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	<p>✓</p> <p>✓</p> <p>✓</p> <p>N/A</p> <p>✓</p> <p>N/A</p> <p>✓</p>
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	<p>✓</p> <p>✓</p>

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<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**

<b>Complaint Log No.</b>	<b>Date of Complaint</b>	<b>Received From and Received By</b>	<b>Location of Complainant</b>	<b>Nature of Complaint</b>	<b>Outcome</b>	<b>Status</b>
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>	



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