

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

Monthly EM&A Report

March 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

(March 2015)

Certified by: Fredrick Leong 

Position: Environmental Team Leader

Date: 13 April 2015

Our ref AFK/TK/bw/T329380/22.05/L-0067

**T** 2828 5919

**E** terence.kong@mottmac.com.hk

Your ref

Hyder-Arup-Black & Veatch Joint Venture  
c/o Hyder Consulting Limited  
47/F Hopewell Centre  
183 Queen's Road East  
Wanchai, Hong Kong

Dear Sir,

14 April 2015  
By Fax (2805 5028) & Post

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

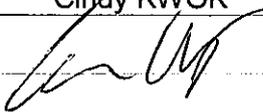
We refer to the revised Monthly EM&A Report – March 2015 received on 13 April 2015 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – March 2015 (Rev. 0) for the portion of works under Stage 2 of the captioned Project which is entrusted to CEDD under Contract No. CV/2012/09.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED



Terence Kong  
Independent Environmental Checker

c.c. HyD – Mr. Chung Lok Chin (Fax: 2714 5198) / Ms. Jackei Yin (Fax: 2761 4864)  
CEDD/BCP – Mr. Desmond Lam (Fax: 3547 1659)  
AECOM – Mr. Alan Lee (Fax: 3922 9797)  
Meinhardt Infrastructure and Environment Limited – Mr. Fredrick Leong (Fax: 2540 1580)

Date	Revision	Prepared By	Checked By	Approved By
13 April 2015	0	Ivan TING Cindy KWOK	Fredrick LEONG	Helen COCHRANE
				

## Contents

	Page
<b>EXECUTIVE SUMMARY</b>	<b>i</b>
<b>1 INTRODUCTION</b>	<b>1</b>
1.2 Purpose of the Report .....	1
1.3 Report Structure .....	1
<b>2 PROJECT INFORMATION</b>	<b>2</b>
2.1 Background .....	2
2.2 Site Description .....	3
2.3 Construction Programme and Activities .....	3
2.4 Project Organisation .....	4
<b>3 STATUS OF ENVIRONMENTAL LICENSES, NOTIFICATION AND PERMITS</b>	<b>5</b>
<b>4 AIR QUALITY MONITORING</b>	<b>6</b>
4.1 Monitoring Requirement .....	6
4.2 Monitoring Equipment .....	6
4.3 Monitoring Location .....	6
4.4 Monitoring Parameters, Frequency and Duration .....	6
4.5 Monitoring Methodology .....	7
4.6 Monitoring Schedule for the Reporting month .....	7
4.7 Monitoring Results .....	7
<b>5 NOISE MONITORING</b>	<b>9</b>
5.1 Monitoring Requirements .....	9
5.2 Monitoring Equipment .....	9
5.3 Monitoring Locations .....	9
5.4 Monitoring Parameters, Frequency and Duration .....	9
5.5 Monitoring Methodology .....	10
5.6 Monitoring Schedule for the Reporting Month .....	10
5.7 Monitoring Results .....	10
<b>6 WATER MONITORING</b>	<b>12</b>
<b>7 WASTE MANAGEMENT</b>	<b>13</b>
<b>8 ENVIRONMENTAL SITE INSPECTION AND AUDIT</b>	<b>14</b>
8.1 Site Inspection .....	14
<b>9 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES</b>	<b>16</b>
<b>10 SUMMARY OF EP SUBMISSION IN THE REPORTING MONTH</b>	<b>17</b>
<b>11 ENVIRONMENTAL NON-CONFORMANCE</b>	<b>18</b>
11.1 Summary of Monitoring Exceedances .....	18

11.2	Summary of Environmental Non-Compliance.....	18
11.3	Summary of Environmental Complaints.....	18
11.4	Summary of Environmental Summon and Successful Prosecutions.....	18
<b>12</b>	<b>FUTURE KEY ISSUES</b>	<b>19</b>
12.1	Construction Programme for the Next Month.....	19
12.2	Key Issues for the Coming Month.....	19
12.3	Monitoring Schedule for the Next Month.....	20
<b>13</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>21</b>
13.1	Conclusions.....	21
13.2	Recommendations .....	21

### List of Tables

Table 2.1	Contact Information of Key Personnel
Table 3.1	Status of Environmental Licenses, Notifications and Permits
Table 4.1	Air Quality Monitoring Equipment
Table 4.2	Location of Air Quality Monitoring
Table 4.3	Air Quality Monitoring Parameters, Frequency and Duration
Table 4.4	Summary of 1-hr TSP Monitoring Results
Table 4.5	Summary of 24-hr TSP Monitoring Results
Table 5.1	Noise Monitoring Equipment
Table 5.2	Location of Noise Monitoring
Table 5.3	Noise Monitoring Parameters, Frequency and Duration
Table 5.4	Summary of Noise Monitoring Results
Table 8.1	Observations and Recommendations of Site Audit
Table 9.1	Status of Required Submission under Environmental Permit

### List of Figures

Figure 1	Demarcation of Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling – Stage 2
Figure 2	Air and Noise Monitoring Locations

### List of Appendices

Appendix A	Construction Programme
Appendix B	Project Organization Structure
Appendix C	Calibration Certificates of Monitoring Equipment
Appendix D	EM&A Monitoring Schedules
Appendix E	Meteorological Data Extracted from Hong Kong Observatory
Appendix F	Air Quality Monitoring Results and their Graphical Presentation
Appendix G	Summary of Event and Action Plan
Appendix H	Noise Monitoring Results and their Graphical Presentation
Appendix I	Not used
Appendix J	Not used
Appendix K	Waste Flow Table
Appendix L	Implementation Schedule of Environmental Mitigation Measures (EMIS)
Appendix M	Not Used
Appendix N	Statistics on Complaints, Notifications of Summons and Successful Prosecutions

## 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 March 2015. As informed by the Contractor, the major activities in the reporting month were:

- Abutment construction for Bridge E;
- Box Culvert inlet structure;
- Cable detection and trial trenches;
- E & M work for new valve control & Telemetry House;
- Erection of Temporary support at DSD nullah for Bridge E;
- Filling Works at Tong Hang East;
- Lagging wall and capping beam for bored pile wall;
- Lay storm drains;
- Noise barrier construction;
- Pier Construction;
- Pile Cap works;
- Piling Works;
- Pre-drilling;
- Road works at Fanling Highway;
- Sewer works at TWSRW;
- Utilities duct laying;
- Viaduct segment erection; and
- Water pipes laying.

### *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 November 2015 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 November 2015 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:

- Abutment construction for Bridge E;
- Cable detection and trial trenches;
- Demolition of central divider at Fanling Highway;
- E & M work for new valve control & Telemetry House;
- Erection of Temporary support at DSD nullah;
- Filling works at Tong Hang East;
- Lagging wall for bored pile wall;
- Laying storm drains;
- Noise barrier construction;

- Pier construction;
- Pier table construction;
- Pile Cap works;
- Pre-drilling works and piling works for viaduct;
- Road works at Fanling highway;
- Sewer works at TWSRW;
- Socket H-pile installation;
- Tree Felling Works;
- Utilities duct laying;
- Viaduct Segment erection;
- Water pipes laying;
- Catch Fence Erection; and
- Diversion of DN1400 watermain deck construction of Bridge E.

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/B 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 March 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.

## **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:

- Abutment construction for Bridge E;
- Box Culvert inlet structure;
- Cable detection and trial trenches;
- E & M work for new valve control & Telemetry House;
- Erection of Temporary support at DSD nullah for Bridge E;
- Filling Works at Tong Hang East;
- Lagging wall and capping beam for bored pile wall;
- Lay storm drains;
- Noise barrier construction;
- Pier Construction;
- Pile Cap works;
- Piling Works;
- Pre-drilling;
- Road works at Fanling Highway;
- Sewer works at TWSRW;
- Utilities duct laying;

- Viaduct segment erection; and
- Water pipes laying.

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. Terence Kong	2828 5919	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/B	17 Mar 2014	27 Mar 2015	Superseded by EP-324/2008/C	--
EP-324/2008/C	27 Mar 2015	--	Granted on 27/03/2015	
<b>Construction Noise Permit</b>				
GW-RN0684-14	16 Nov 2014	26 Apr 2015	Valid	For removal of the broken central dividers in the daytime on Sundays and Public Holidays
GW-RN0095-15	24 Feb 2015	18 Jul 2015	Valid	For road diversion and maintenance of Fanling Highway
<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) *	105.5	69.2 – 145.4	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) *	90.3	54.2 – 138.9	170.3	260

Remark:

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

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

## 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	B&K (Model No. 4231)	1	2685684
Sound Level Meter	Rion (Model No. NL-52)	1	00220553

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>	69.6	68.0 – 72.8	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 November 2015 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 November 2015 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 3,742 m<sup>3</sup> of excavated material has been generated. 3,443m<sup>3</sup> of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. 270m<sup>3</sup> of inert C&D materials was reused on site. 80m<sup>3</sup> of general refuse was disposed of at North East New Territories (NENT) Landfill. 1,030m<sup>3</sup> of plastics was collected by recycling contractor in the reporting month. No paper/cardboard packaging and metals were collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. Details of the waste management data are presented in **Appendix K**.

## 8 ENVIRONMENTAL SITE INSPECTION AND AUDIT

### 8.1 Site Inspection

- 8.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the site inspection is provided in **Appendix L**.
- 8.1.2 In the reporting month, 5 site inspections were carried out on 2, 9, 18, 23, and 30 March 2015. The one held on 30 March 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	N/A	N/A	N/A
Air Quality	9 Mar 2015	Reminder: The Contractor was reminded to provide sufficient watering at SA12 for dust suppression.	The watering within the site is improved as observed during 18 Mar 2015 site inspection.
	18 Mar 2015	Reminder: The contractor is reminded to properly cover stockpiles or remove them.	The stockpiles at SA15 have been covered with tarpaulin as observed during 23 Mar 2015 site inspection.
	23 Mar 2015	Reminder: The Contractor was reminded to properly cover the stockpile with impervious sheetings at SA12.	The stockpiles at SA12 have been removed as observed during 30 Mar 2015 site inspection.
	30 Mar 2015	Reminder: The Contractor was reminded to properly cover the stockpile with impervious sheeting or implement water spraying at SA15.	The stockpile at SA15 has been removed during 8 Apr 2015 site inspection.
Noise	N/A	N/A	N/A
Waste / Chemical Management	2 Mar 2015	Observation: Oil stain was observed on the ground near NB71 at SA12. The Contractor was advised to remove the oil stain ASAP and dispose of as chemical waste.	The contaminated soil had been cleaned up and collected by the Contractor on 2 Mar 2015, and had been placed in the chemical waste storage area for disposal.
	2 Mar 2015	Reminder: The Contractor was advised to provide proper storage for chemical waste at SA13.	The chemical waste at SA13 has been removed as observed during 9 Mar 2015 site inspection.
	9 Mar 2015	Reminder: The Contractor was reminded to provide proper labels to standard for chemical waste storage area at SA13.	The labeling has been enlarged to adequate size as observed during 18 Mar 2015 site inspection

Parameters	Date	Observations and Recommendations	Follow-up
	18 Mar 2015	Reminder: Contractor is reminded to properly provide a bund area within the chemical waste storage area.	Please refer to Reminder identified during 23 March 2015 site inspection.
	23 Mar 2015	Reminder: The Contractor was reminded to provide secondary containment for holding the chemical waste within the chemical storage area at SA13.	The chemical waste has been provided with drip trays as observed during 30 Mar 2015 site inspection.
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 February 2015	10 March 2015

## **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:

- Abutment construction for Bridge E;
- Cable detection and trial trenches;
- Demolition of central divider at Fanling Highway;
- E & M work for new valve control & Telemetry House;
- Erection of Temporary support at DSD nullah;
- Filling works at Tong Hang East;
- Lagging wall for bored pile wall;
- Laying storm drains;
- Noise barrier construction;
- Pier construction;
- Pier table construction;
- Pile Cap works;
- Pre-drilling works and piling works for viaduct;
- Road works at Fanling highway;
- Sewer works at TWSRW;
- Socket H-pile installation;
- Tree Felling Works;
- Utilities duct laying;
- Viaduct Segment erection;
- Water pipes laying;
- Catch Fence Erection; and
- Diversion of DN1400 watermain deck construction of Bridge E.

### **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.
- 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 Five (5) 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 November 2015 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 November 2015 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:

#### *Air Quality*

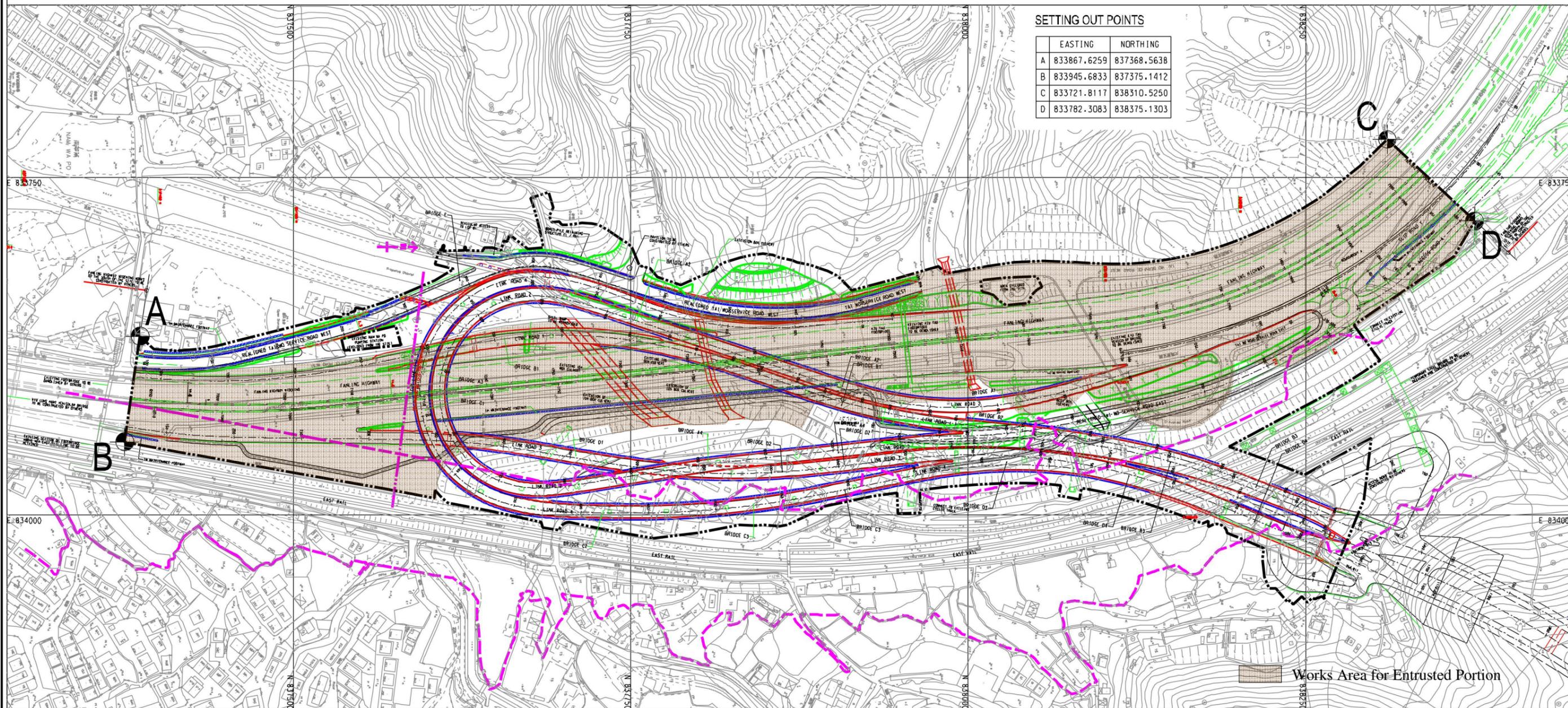
- Water spraying or covering of tarpaulin should be properly implemented whenever necessary for the unpaved roads, access roads and construction areas.
- All vehicles should be washed to remove any dusty materials before leaving the construction site.
- Wheel washing facilities should be properly maintained to ensure proper functioning.

- Plant and equipment should be properly maintained to avoid emitting black smoke.

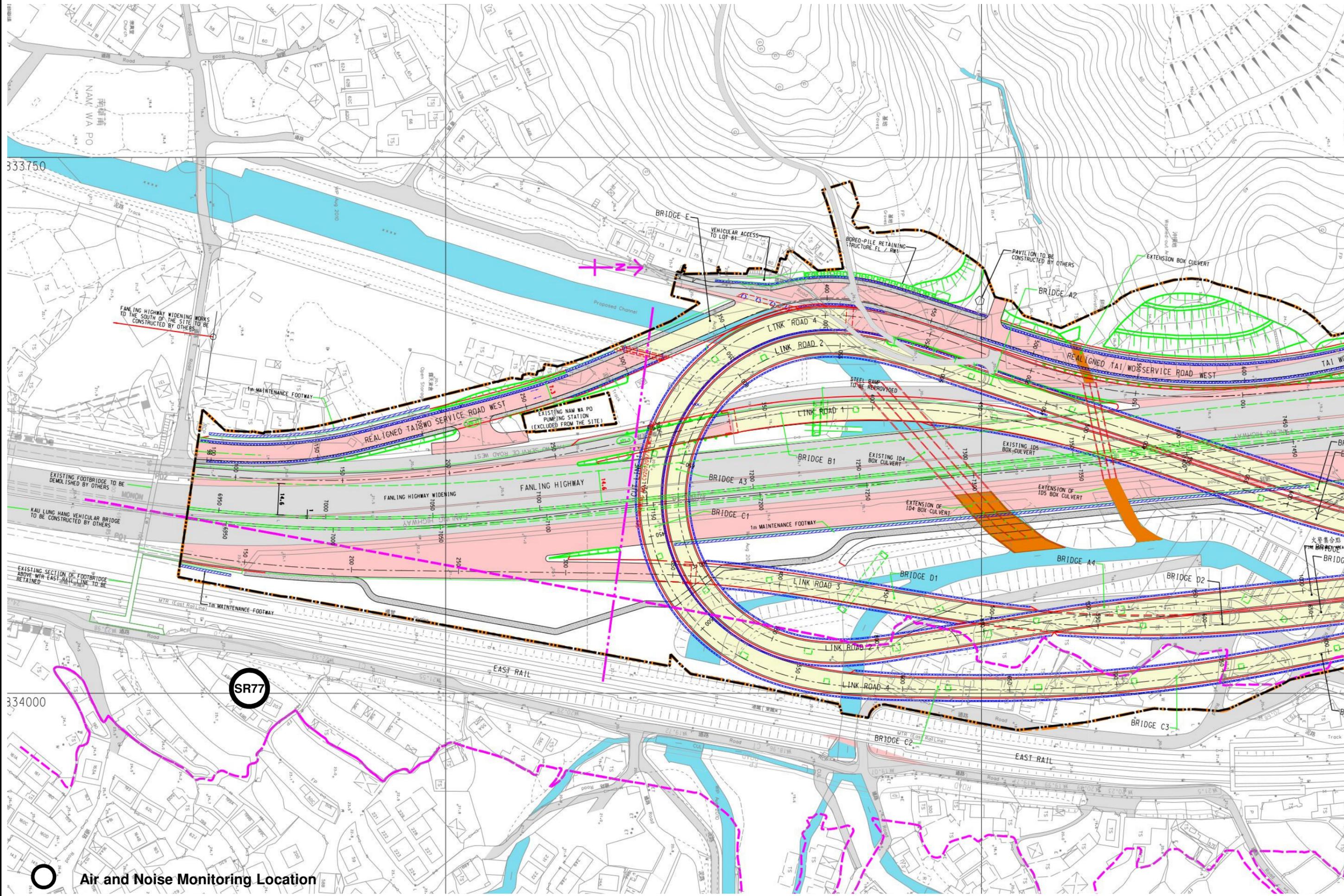
*Chemical and Waste Management*

- Provide proper chemical and chemical waste management.
- Good housekeeping should be maintained and general refuse should be removed regularly.
- A spill response procedure shall be in place and absorption material available for minor spillages.

**Figure**



CV/201209-T-CWC-SK-001g\_AD\_edit.dgn 22/1/2014 17:10:34



# Appendix A

# Construction Programme

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Mar	Apr	May	Jun	Jul
<b>3-Month Rolling Programme 2015-03-21</b>											
<b>Major Milestones and Events</b>											
MS-2000A2	T1b: TTA to shift FLHS SB eastward to the widened pavement (shift 2 lanes)	1	0	08-Mar-15 A	08-Mar-15 A		T1b: TTA to shift FLHS SB eastward to the widened pavement (shift 2 lanes)				
MS-2000A3	T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3 lanes)	1	1	22-Mar-15	22-Mar-15	0	T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3 lanes)				
MS-2000B	T2: TTA to shift FLHS NB eastward	1	1	19-Apr-15	19-Apr-15	1	T2: TTA to shift FLHS NB eastward				
MS-0220	Commissioning of the diverted twin DN1400 Dong Jiang Watermains (Stage 1)	0	0		25-Apr-15	218	Commissioning of the diverted twin DN1400 Dong Jiang Watermains (Stage 1)				
<b>Major Procurement &amp; Delivery</b>											
<b>Water Supply Pipeworks</b>											
MM-1060	E&M equipment for the re-provisioned WSD Valve Control House	60	60	20-Mar-15	04-Jun-15	29	E&M equipment for the re-provisioned WSD Valve Control House				
<b>Precast Bridge Segment Lifting Frames and Precast Yard</b>											
MM-2050	Certification of lifting frame	12	12	20-Mar-15	02-Apr-15	-6	Certification of lifting frame				
<b>Design and Submissions</b>											
<b>Statutory Approval</b>											
PRE-1220	Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD	45	21	09-Apr-14 A	17-Apr-15	125	Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD				
PRE-1500	Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290)	70	14	17-Apr-14 A	09-Apr-15	6	Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290), Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290)				
PRE-1210	Consent for Dong Jiang watermains connection for DN1400 - WSD	0	0		20-Mar-15	223	Consent for Dong Jiang watermains connection for DN1400 - WSD				
PRE-1510	Confirmation of Revised Retaining Structure along Slope no. 3SW-C/C898	0	0		20-Mar-15*	191	Confirmation of Revised Retaining Structure along Slope no. 3SW-C/C898				
<b>Method Statement and Design (Major) Approved by AECOM</b>											
PRE-2020	Submission of noise barrier design for absorptive panels, transparent panels and associated fixing details	60	30	11-Mar-14 A	28-Apr-15	61	Submission of noise barrier design for absorptive panels, transparent panels and associated fixing details				
<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 SBZZ)</b>											
<b>At-Grade Roadworks (195m)</b>											
FHW-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	40	20-Feb-14 A	11-May-15	738	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)				
<b>Fanling Highway Zone 2 between CH7130 and CH7290</b>											
<b>At-Grade Roadworks (160m)</b>											
FHW-2110B	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (affected due to design change)	150	150	26-Jul-14 A	19-Sep-15	0	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (affected due to design change)				
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	210	210	20-Mar-15	02-Dec-15	357	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)				
<b>Fanling Highway Zone 3 between CH7290 and CH7380</b>											
<b>At-Grade Roadworks (130m)</b>											
FHW-3130	Noise Barrier NB71 - Footing adjacent to SB lane (130m) Including pile cap	270	55	23-May-14 A	29-May-15	131	Noise Barrier NB71 - Footing adjacent to SB lane (130m) Including pile cap				
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	150	115	07-Jun-14 A	10-Aug-15	560	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)				
FHW-3210	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)	79	79	20-Apr-15	24-Jul-15	1	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)				
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard shoulder)	90	90	23-Apr-15	10-Aug-15	131	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard shoulder)				
<b>Fanling Highway Zone 4 between CH7380 and CH7470</b>											
<b>At-Grade Roadworks (90m)</b>											
FHW-4120*	Pipe Laying - Twin DN1400 Watermains (CHE & CHG) along Fanling Highway (90m long, 3m depth)	155	0	15-Oct-14 A	12-Mar-15 A		Pipe Laying - Twin DN1400 Watermains (CHE & CHG) along Fanling Highway (90m long, 3m depth)				



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

**CEDD Contract No. CV/2012/09**  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

**3-Month Rolling Programme**  
**3MPR020 Page 1 of 9 25-Mar-15**

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015								
							Mar	Apr	May	Jun	Jul				
FHW-4130*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	60	21	27-Nov-14 A	17-Apr-15	762									
FHW-4100	Noise Barrier NB71 & NB72 - Footing adjacent to SB lane (90m)	140	140	30-May-15	14-Nov-15	354									
<b>Miscellaneous Works for Facilitating Traffic Diversion of Fanling Highway</b>															
FHW-M-1020	Permanent Road Formation with 2 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-construction	45	0	10-Nov-14 A	07-Mar-15 A										
FHW-M-1030	Permanent Road Formation with 3 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-surfacing	12	2	09-Mar-15 A	21-Mar-15	0									
FHW-M-1040	Demolition of a certain section of Central Barrier & Make Good of Road Pavement for further Traffic Diversion	20	20	23-Mar-15	18-Apr-15	0									
<b>Fanling Highway North Portion between CH7470 and CH7925</b>															
<b>Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)</b>															
<b>Kiu Tau Footbridge Re-provision (East)</b>															
FHW-5000A2	KT-AB1 - Piling Works (5 out of 12 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	25	25	08-Apr-15	07-May-15	4									
FHW-5010B	KT-AB2 - Pile Cap & Abutment	105	105	29-Apr-15	02-Sep-15	201									
FHW-5000E	KT-P4 - Piling Works (8 out of 8 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	40	40	08-May-15	25-Jun-15	4									
<b>At-Grade Road Works (130m)</b>															
FHW-5120A	Preparation Works for Implementation of TTA Scheme E2	25	25	29-Apr-15	29-May-15	72									
FHW-5120B	Implementation of TTA - Scheme E2 (shifting TWSR East towards Pier AA4 for pipe laying works at crossing)	0	0	30-May-15		72									
<b>Fanling Highway Zone 7 between CH7660 and CH7925</b>															
<b>At-Grade Roadworks (265m)</b>															
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	158	30-Aug-13 A	30-Sep-15	8									
<b>Section II - Remainder of the Works (KD-3)</b>															
<b>WSD Works</b>															
<b>DN450 Fire Mains (CHA)</b>															
WA-1050	Pipe Laying - CHA 420 - 520 (DN450) near Realigned TWSR West (Re-TWSRW: CH530 - 640), 100m long & 2m depth	70	70	28-May-15	19-Aug-15	14									
<b>DN600 Water Mains (CHB)</b>															
WB-1020	Pipe Laying - CHB 245 - 335 (DN600) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	21	27-Nov-14 A	17-Apr-15	594									
WB-1090	Pipe Laying - CHB 756 - 849 (DN600) near Realigned TWSR East (along Access Road A), 93m long & GL	40	22	03-Mar-15 A	18-Apr-15	52									
WB-1030B	Pipe Laying - CHB 350 - 450 (DN600) from Pier AA4 to Portal AB7/AD9/AC12	30	30	20-Mar-15	28-Apr-15	72									
WB-1010	Pipe Laying - CHB 153 - 245 (DN600) near Fanling Highway S/B (FHW: CH7290-7380), 92m long (common trench with NB)	60	60	30-May-15	10-Aug-15	560									
WB-1030A	Pipe Laying - CHB 335 - 350 (DN600) near crossing TWSRE 15m long & 3m depth	30	30	30-May-15	06-Jul-15	572									
WB-1070	Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL	78	78	18-Jun-15	18-Sep-15	37									
<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	40	15-Oct-14 A	11-May-15	738									
WC-1080	Pipe Laying - CHC 510 - 600 (DN1200) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	21	27-Nov-14 A	17-Apr-15	762									
WC-1150	Pipe Laying - CHC 1030 - 1123 (DN1200) near Realigned TWSR East (along Access Road A), 93m long & GL	40	30	03-Mar-15 A	28-Apr-15	78									
WC-1060	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)	95	95	20-Mar-15	17-Jul-15	472									



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

**CEDD Contract No. CV/2012/09**  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

**3-Month Rolling Programme**  
3MPR020 Page 2 of 9 25-Mar-15

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	



Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Mar	Apr	May	Jun	Jul
<b>Stage 1A - Realignment of Tai Wo Service Road West (KD-7)</b>											
<b>Preliminary Works</b>											
TWSRW-1100	Tree Survey, Tree Felling and Transplanting	81	15	16-Oct-13 A	10-Apr-15	-29	Tree Survey, Tree Felling and Transplanting, Tree Survey, Tree Felling and Transplanting				
<b>TWSRW Zone 1 between CH100 and CH155</b>											
<b>At-Grade Roadworks</b>											
TWSRW-1150	Installation of Cable Ducts for Utilities Diversion Works at Zone 1 & Zone 2 (Approx. 100m) (by utilities undertakers)	167	46	22-Oct-14 A	04-May-15	291					
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	286	213	15-Nov-14 A	05-Dec-15	33					
<b>TWSRW Zone 2 between CH155 and CH280</b>											
<b>At-Grade Roadworks</b>											
TWSRW-2120	Road Formation, Road Drainage, Kerb, Planter and Pavement	165	213	16-Oct-14 A	05-Dec-15	33					
<b>TWSRW Zone 3 between CH280 and CH315</b>											
<b>At-Grade Roadworks</b>											
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 3 (Approx. 120m) (by utilities undertakers)	239	239	01-Apr-15*	25-Nov-15	19					
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	207	207	01-Apr-15	10-Dec-15	29					
<b>TWSRW Zone 4 between CH315 and CH376</b>											
<b>Construction of Bridge E</b>											
TWSRW-4060	Construction of Temporary Support at DSD nullah (Work in dry season)	55	10	22-Jan-15 A	31-Mar-15	0	Construction of Temporary Support at DSD nullah (Work in dry season), Construction of Temporary Support at DSD nullah (Work in dry season)				
TWSRW-4050A	Pile Cap for AE1	55	29	11-Feb-15 A	27-Apr-15	81	Pile Cap for AE1, Pile Cap for AE2				
TWSRW-4050D	Trim Down the existing retaining wall for construction of AE2	29	0	28-Feb-15 A	19-Mar-15 A		Trim Down the existing retaining wall for construction of AE2				
TWSRW-4070	In-situ Casting for Bridge Segment (North Bay & Middle Bay)	100	100	01-Apr-15	04-Aug-15	0					
<b>TWSRW Zone 5 between CH376 and CH520</b>											
<b>Construction of Retaining Structures</b>											
TWSRW-5090	Lagging Wall Construction and Capping Beam	160	54	06-Nov-14 A	28-May-15	7	Lagging Wall Construction and Capping Beam				
TWSRW-5070	Construction of Mass Concrete Wall (FL/RW4)	35	35	16-Apr-15	28-May-15	57	Construction of Mass Concrete Wall (FL/RW4)				
<b>At-Grade Roadworks</b>											
TWSRW-5100	Noise Barrier NB2 - Footing and Retaining Structure adjacent to Realigned TWSRW West (66m)	90	90	10-Apr-15	28-Jul-15	7					
<b>TWSRW Zone 6 between CH520 and CH530</b>											
<b>Box Culvert Extension - BC01</b>											
TWSRW-6070	Inlet structure of the box culvert BC01 (Covered by VO. 41)	70	0	17-Dec-14 A	19-Mar-15 A		Inlet structure of the box culvert BC01 (Covered by VO. 41)				
<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	166	28-Jan-15 A	01-Sep-15	16					
TWSRW-7120*	Pipe Laying - DN450 Watermains (CHA)	70	70	28-May-15	19-Aug-15	14					
<b>TWSRW Zone 8 between CH640 and CH695</b>											
<b>Kiu Tau Footbridge Re-provision (West)</b>											
TWSRW-8010	Installation of Socket H-Pile for Proposed Kiu Tau Footbridge (14 nos of Pile)	75	75	11-Apr-15	11-Jul-15	-29					
<b>Remainder of the Works</b>											
TWSRW-9010*	Utilities Diversion in Area 1 (along Re-aligned TWSRW CH100 - CH280)	167	46	22-Oct-14 A	04-May-15	291	Utilities Diversion in Area 1 (along Re-aligned TWSRW CH100 - CH280)				

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Mar	Apr	May	Jun	Jul
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	166	28-Jan-15 A	01-Sep-15	16					
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	239	239	01-Apr-15	25-Nov-15	19					
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	287	287	01-Apr-15*	12-Jan-16	38					
<b>Remaining Works for Noise Barrier along realigned TWSR West</b>											
TWSRW-NB-110	Noise Barrier Steelworks & Panel for NB4 (105m) at Zones 1 & 2	60	60	03-Jun-15*	13-Aug-15	33					
<b>Stage N4A &amp; N4B - Realignment of Tai Wo Service Road East (KD-13 &amp; KD-14)</b>											
<b>Preliminary Works</b>											
TWSRE-4000	Site Formation, Preparation Works & Tree Transplant	65	20	15-Apr-14 A	16-Apr-15	1					
<b>TWSRE Zone 1 between CH100 and CH270</b>											
<b>At-Grade Roadworks</b>											
TWSRE-1120	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	47	29-Dec-14 A	19-May-15	1					
TWSRE-1150	Construct no fine concrete, U-channel and filling to required level for pipe laying works	30	16	06-Jan-15 A	11-Apr-15	5					
TWSRE-1110	Noise Barrier NB3 - PC01 & PC02 Pile Cap Construction	55	26	19-Jan-15 A	23-Apr-15	22					
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	55	55	12-Apr-15	05-Jun-15	6					
<b>TWSRE Zone 2 between CH270 and CH380</b>											
<b>At-Grade Roadworks</b>											
TWSRE-2010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	100	03-Mar-15 A	23-Jul-15	136					
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	55	06-Jun-15	11-Aug-15	5					
<b>TWSRE Zone 3 between CH380 and CH456</b>											
<b>At-Grade Roadworks</b>											
TWSRE-3010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (62m)	85	85	19-Mar-15 A	06-Jul-15	37					
TWSRE-3020A*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	78	78	18-Jun-15	18-Sep-15	37					
<b>Roundabout A, Slip Road and Access Road</b>											
TWSRE-4050A*	Pipe laying - DN2300 Watermains (CHJ) along Access Road A	68	16	02-Jan-15 A	11-Apr-15	40					
TWSRE-4040A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Access Road A	58	30	03-Mar-15 A	28-Apr-15	78					
TWSRE-4060B	Access Road A - Road Formation, Kerb, Planter and Pavement	51	51	20-Apr-15	19-Jun-15	52					
TWSRE-4080	Preparation Works for Implementation of TTA Scheme E1	48	48	23-Apr-15	19-Jun-15	52					
<b>Stage 1C - Viaduct Structure &amp; TCSS Civil Provisions (KD-9)</b>											
<b>Preliminaries</b>											
B-5010	Provide a Temporary Cycle Track (Scheme 2, along DSD maintenance access)	28	0	05-Feb-15 A	02-Mar-15 A						
B-5020	Demolition of Temporary Cycle Track constructed at FH6	27	12	03-Mar-15 A	02-Apr-15	4					
B-4050	Erection of Catch Fence at Portion FH9 for AB11 and AD12	14	14	23-Mar-15*	11-Apr-15	5					
<b>Foundation &amp; Pier Construction</b>											
<b>Bridge A</b>											
BA-05-1030	Pier AA5 - Pier Construction (Twin Pier)	27	40	29-Oct-14 A	11-May-15	244					

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Mar	Apr	May	Jun	Jul
BA-13-1030	Pier AA13 - Pier Construction	38	20	06-Nov-14 A	16-Apr-15	13	Pier AA13 - Pier Construction, Pier AA13 - Pier Construction				
BA-14-1030	Pier AA14 - Pier Construction	31	15	20-Nov-14 A	10-Apr-15	8	Pier AA14 - Pier Construction, Pier AA14 - Pier Construction				
BA-18-1020	Pier AA18 - Pile Cap	30	0	15-Jan-15 A	16-Mar-15 A		Pier AA18 - Pile Cap				
BA-04-1020	Pier AA4 - Pile Cap	30	0	04-Feb-15 A	19-Mar-15 A		Pier AA4 - Pile Cap				
BA-17-1030	Pier AA17 - Pier Construction	24	24	05-Feb-15 A	21-Apr-15	140	Pier AA17 - Pier Co				
BA-15-1030	Pier AA15 - Pier Construction	31	28	14-Feb-15 A	25-Apr-15	32	Pier AA15 - Pier Construction, Pier AA15 - Pier Construction				
BA-16-1020	Pier AA16 - Pile Cap	30	20	03-Mar-15 A	16-Apr-15	58	Pier AA16 - Pile Cap, Pier AA16 - Pile Cap				
BA-01-1000	Abutment AA1 - Piling Works	24	20	14-Mar-15 A	16-Apr-15	186	Abutment AA1 - Piling Works, Abutment AA1 - Piling Works				
BA-02-1020A	Pier AA2E - Pile Cap	30	30	20-Mar-15	28-Apr-15	21	Pier AA2E - Pile Cap				
BA-10-1000	Pier AA10 - Piling Works	24	24	17-Apr-15	15-May-15	186	Pier AA10 - Piling Works				
BA-07-1000	Pier AA7 - Piling Works	24	24	20-Apr-15	18-May-15	37	Pier AA7 - Piling Works				
BA-16-1030	Pier AA16 - Pier Construction	31	31	27-Apr-15	03-Jun-15	50	Pier AA16 - Pier Construction				
BA-03-1020	Pier AA3 - Pile Cap	30	30	29-Apr-15	04-Jun-15	21	Pier AA3 - Pile Cap				
BA-01-1010	Abutment AA1 - Pile Test	7	7	05-May-15	12-May-15	484	Abutment AA1 - Pile Test				
BA-09-1000	Pier AA9 - Piling Works	24	24	16-May-15	13-Jun-15	186	Pier AA9 - Piling Works				
BA-11-1000	Pier AA11 - Piling Works	24	24	19-May-15	16-Jun-15	67	Pier AA11 - Piling Works				
BA-10-1010	Pier AA10 - Pile Test	7	7	03-Jun-15	10-Jun-15	199	Pier AA10 - Pile Test				
BA-18-1030	Pier AA18 - Pier Construction	24	24	04-Jun-15	03-Jul-15	50	Pier AA				
BA-07-1010	Pier AA7 - Pile Test	7	7	05-Jun-15	12-Jun-15	92	Pier AA7 - Pile Test				
BA-07-1020	Pier AA7 - Pile Cap	30	30	13-Jun-15	20-Jul-15	92					
BA-08-1000	Pier AA8 - Piling Works	24	24	15-Jun-15	14-Jul-15	192					
BA-02-1000	Pier AA2W - Piling Works	12	12	17-Jun-15	02-Jul-15	37	Pier AA2				
<b>Bridge B</b>											
BB-08-1040	Pier AB8E - Pier Construction	24	21	13-Dec-14 A	17-Apr-15	-133	Pier AB8E - Pier Construction, Pier AB8E - Pier Construction				
BB-08-1030	Pier AB8W - Pier Construction	24	21	15-Dec-14 A	17-Apr-15	-133	Pier AB8W - Pier Construction, Pier AB8W - Pier Construction				
BB-12-1000A	Abutment AB12/AD14 - Piling Works	70	45	06-Feb-15 A	16-May-15	56					
BB-06-1030	Pier AB6E - Pier Construction	24	24	20-Mar-15	21-Apr-15	174	Pier AB6E - Pier Construction				
BB-09-1020	Pier AB9 - Pile Cap	30	30	20-Mar-15*	28-Apr-15	-54	Pier AB9 - Pile Cap				
BB-10-1010	Pier AB10 - Pile Test	7	7	20-Mar-15	27-Mar-15	-34	Pier AB10 - Pile Test				



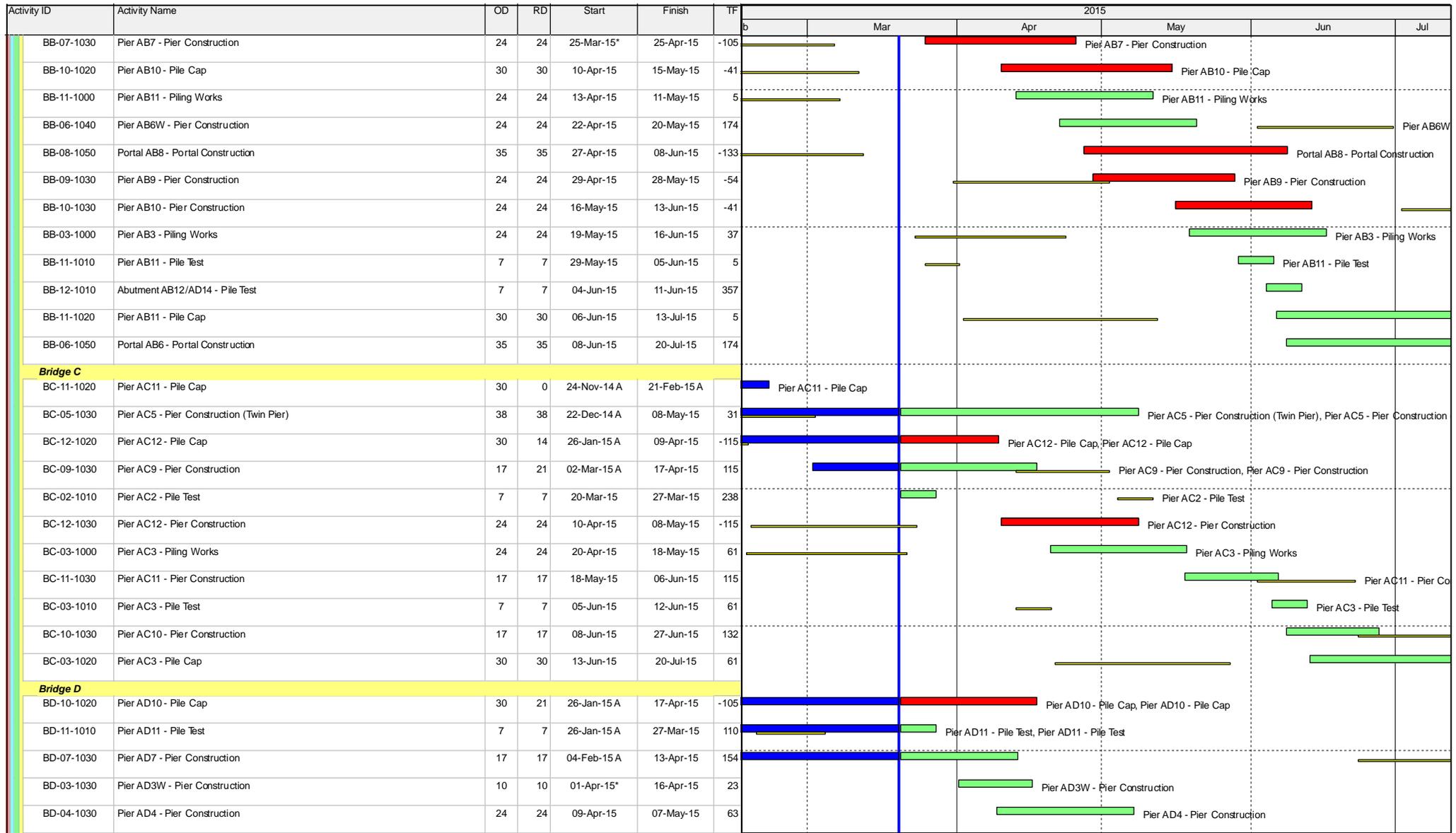
俊和建築工程有限公司  
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

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

**CEDD Contract No. CV/2012/09**  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

**3-Month Rolling Programme**  
3MPR020 Page 6 of 9 25-Mar-15

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	

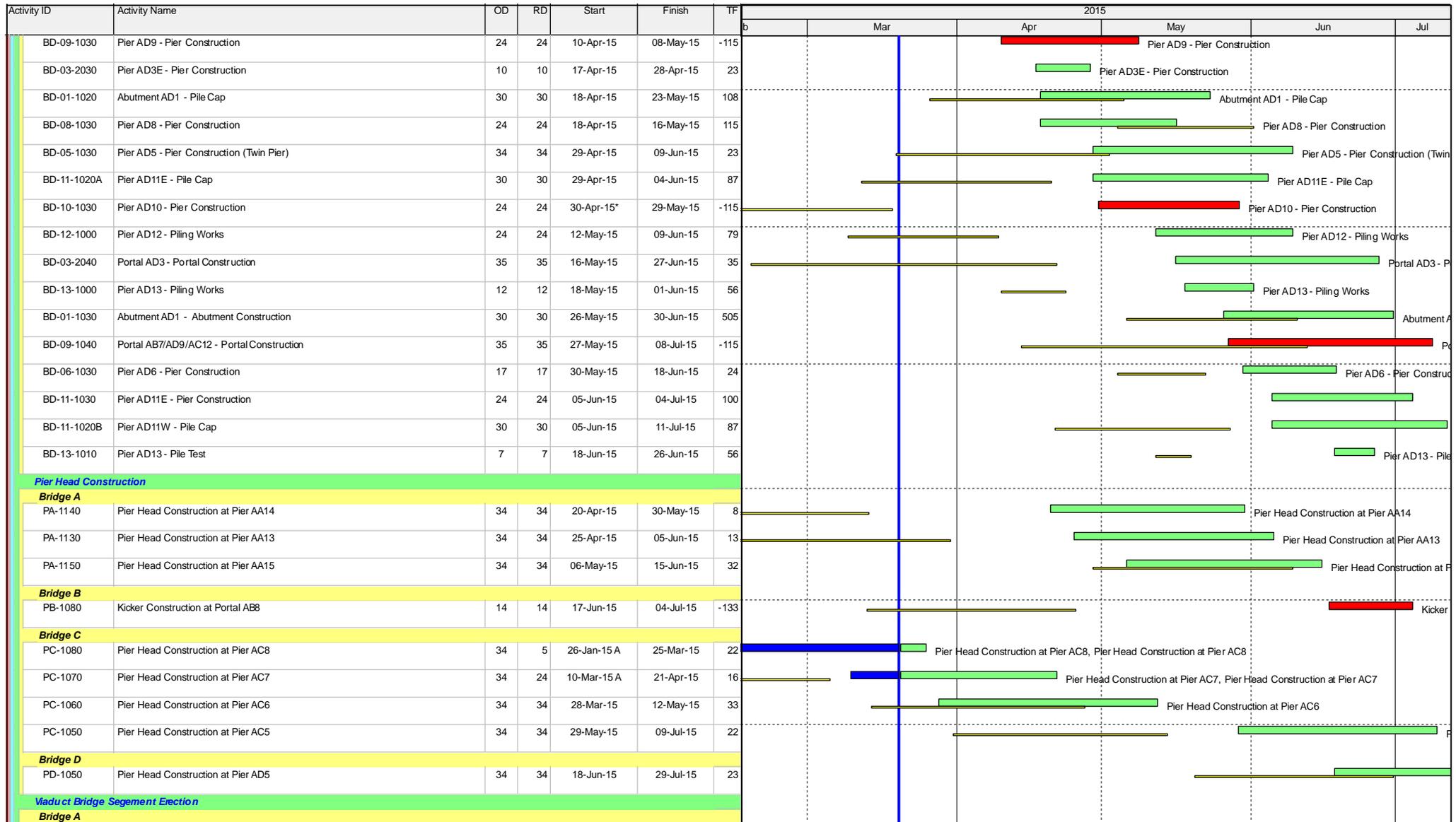


- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- ◆ Milestone
- Project Baseline Bar

**CEDD Contract No. CV/2012/09**  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

**3-Month Rolling Programme**  
 3MPR020 Page 7 of 9 25-Mar-15

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	



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

**CEDD Contract No. CV/2012/09**  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015						
							Feb	Mar	Apr	May	Jun	Jul	
EA-1140	Bridge Deck Construction at Pier AA14 by Typical Lifting Frame (21 nos)	10	10	01-Jun-15	11-Jun-15	8							
EA-1130	Bridge Deck Construction at Pier AA13 by Typical Lifting Frame (26 nos)	23	23	12-Jun-15	10-Jul-15	8							
<b>Bridge C</b>													
EC-1080	Bridge Deck Construction at Pier AC8 by Typical Lifting Frame (24 nos)	25	25	08-Apr-15	07-May-15	15							
EC-1070	Bridge Deck Construction at Pier AC7 by Typical Lifting Frame (27 nos)	12	12	08-May-15	21-May-15	15							
<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	216	06-Feb-15 A	09-Dec-15	272							



俊和建築工程有限公司  
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

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

**CEDD Contract No. CV/2012/09**  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

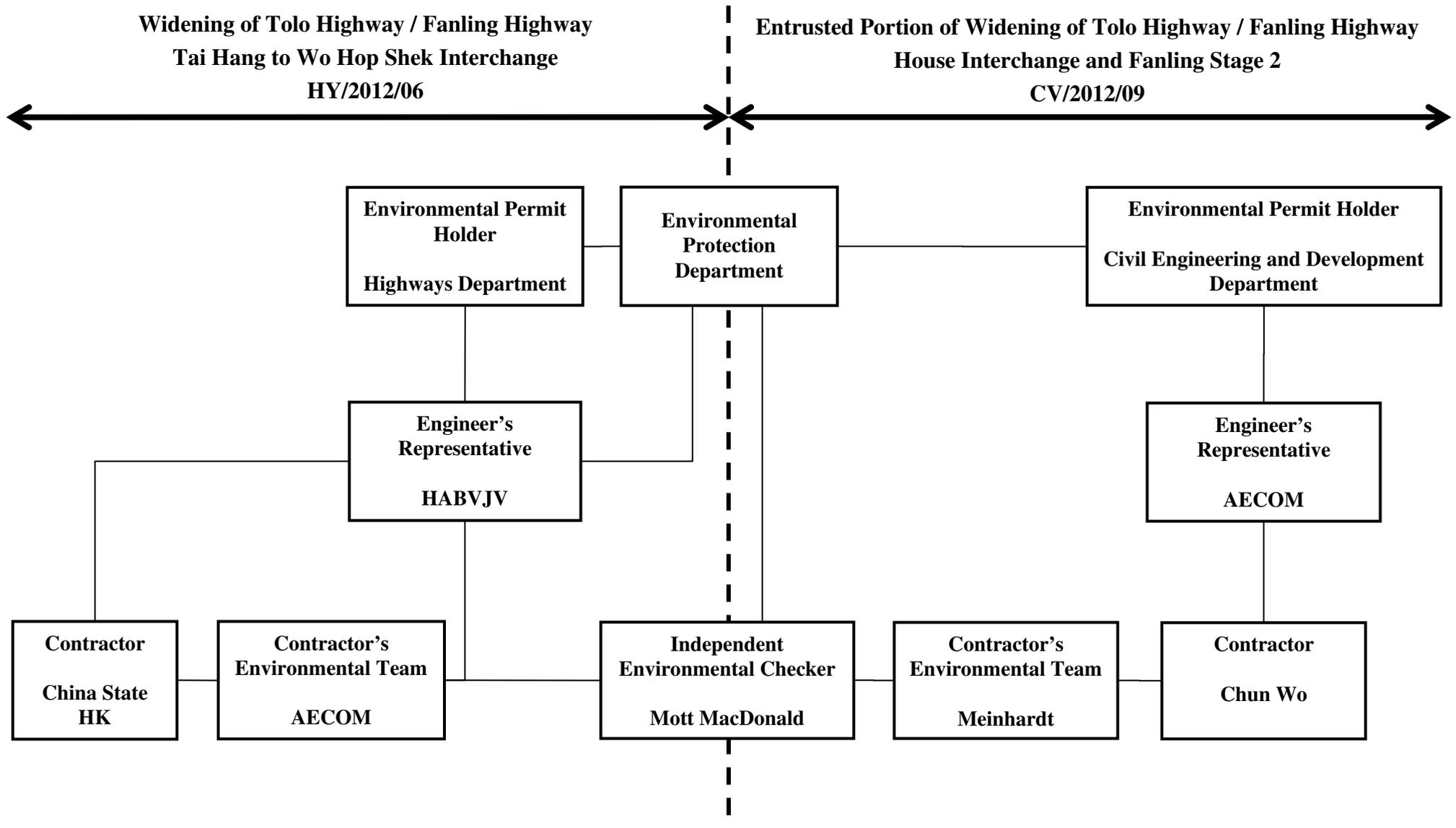
**3-Month Rolling Programme**

3MPR020 \_\_\_\_\_ Page 9 of 9 \_\_\_\_\_ 25-Mar-15

3-Month Rolling Programme updated to 2015-03-21			
Date	Revision	Checked	Approved
26-Mar-15	Rev.1	SL	

# 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 - Apr 07, 2014 Rootmeter S/N 0438320 Ta (K) - 294  
 Operator Tisch Orifice I.D. - 1612 Pa (mm) - 742.95

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3940	3.2	2.00
2	NA	NA	1.00	0.9790	6.4	4.00
3	NA	NA	1.00	0.8800	7.8	5.00
4	NA	NA	1.00	0.8350	8.8	5.50
5	NA	NA	1.00	0.6910	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9866	0.7077	1.4077	0.9957	0.7142	0.8896
0.9823	1.0034	1.9908	0.9914	1.0127	1.2581
0.9804	1.1140	2.2258	0.9894	1.1243	1.4066
0.9791	1.1726	2.3345	0.9881	1.1834	1.4753
0.9739	1.4094	2.8155	0.9829	1.4224	1.7793
Qstd slope (m) = 2.00757			Qa slope (m) = 1.25710		
intercept (b) = -0.01628			intercept (b) = -0.01029		
coefficient (r) = 0.99989			coefficient (r) = 0.99989		
y axis = $\text{SQRT}[\text{H2O}(\text{Pa}/760)(298/\text{Ta})]$			y axis = $\text{SQRT}[\text{H2O}(\text{Ta}/\text{Pa})]$		

CALCULATIONS

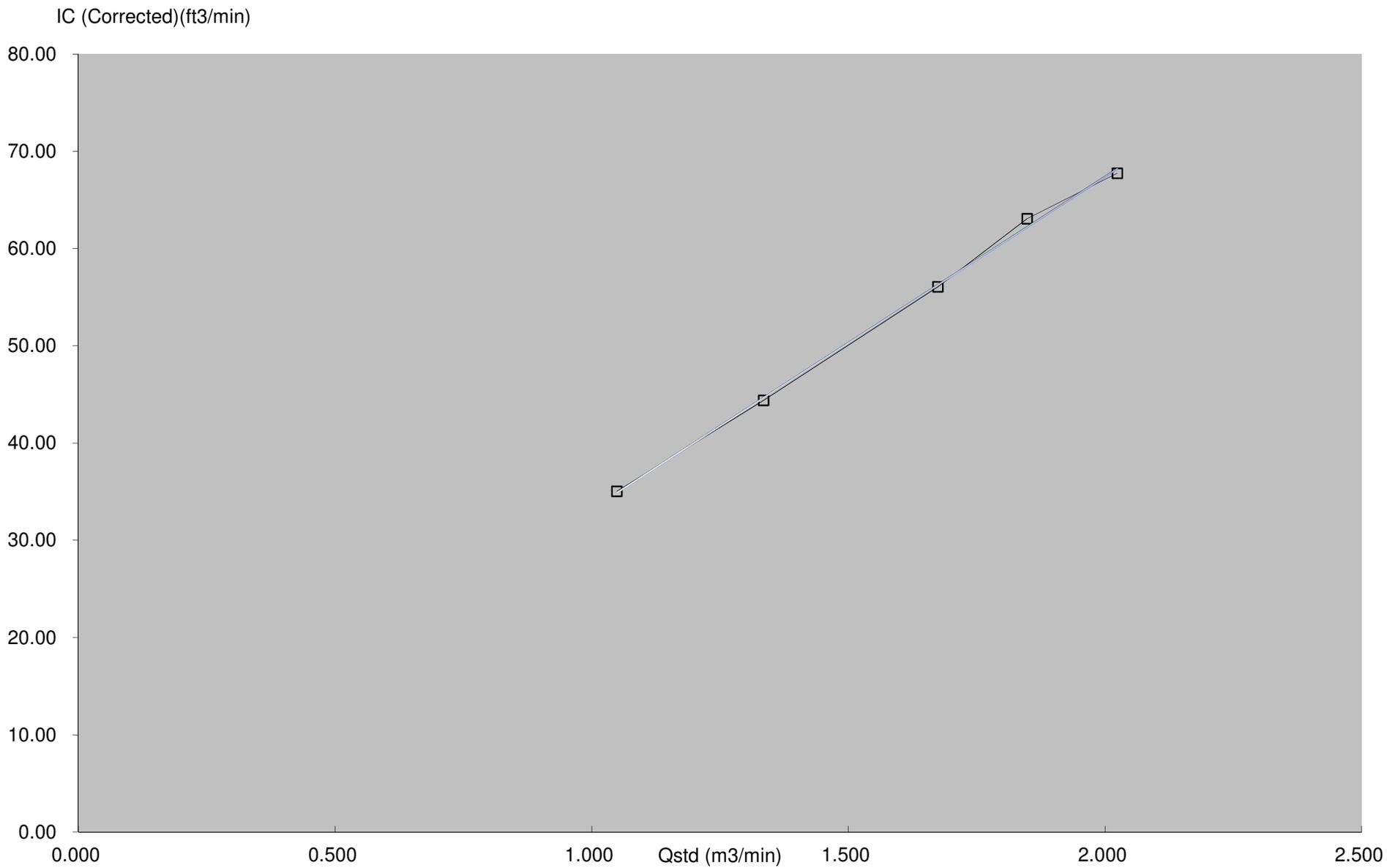
$V_{std} = \text{Diff. Vol} [(\text{Pa} - \text{Diff. Hg}) / 760] (298 / \text{Ta})$   
 $Q_{std} = V_{std} / \text{Time}$

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

For subsequent flow rate calculations:

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







# Calibration Certificate

Certificate No. **407497**

Page 1 of 2 Pages

**Customer :** Enovative Environmental Service Limited

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

**Order No. :** Q43167

**Date of receipt :** 10-Oct-14

## Item Tested

**Description :** Sound Level Calibrator

**Manufacturer :** B&K

**Model :** Type 4231

**Serial No. :** 2685684

## Test Conditions

**Date of Test :** 18-Oct-14

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02, IEC 942.

## Test Results

All results were within the IEC 942 Class1 specification.

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

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	405316	NIM-PRC & SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR
S041	Universal Counter	405317	SCL-HKSAR
S206	Sound Level Meter	405322	SCL-HKSAR
S031	6½ dgt. Multimeter	39256	NIM-PRC

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 :**   
Dorothy Cheuk

**Approved by :**   
Steve Kwan

**Date:** 18-Oct-14

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

The copyright of this certificate is owned by Hong Kong Calibration Ltd.. It may not be reproduced except in full.



# Calibration Certificate

Certificate No. 407497

Page 2 of 2 Pages

Results :

## 1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.1	± 0.3 dB
114	114.1	

Uncertainty : ± 0.1 dB

## 2. Frequency

UUT Nominal Value	Measured Value	IEC 942 Class 1 Spec.
1 kHz	1.000 kHz	± 2 %

Uncertainty : ± 3.6 x 10<sup>-6</sup>

## 3. Level Stability : 0.0 dB

IEC 942 Class 1 Spec. : ± 0.1 dB

Uncertainty : ± 0.01 dB

## 4. Total Harmonic Distortion : < 0.6 %

IEC 942 Class 1 Spec. : < 3 %

Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test

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

3. Atmospheric Pressure : 1005 hPa.

----- END -----



# Calibration Certificate

Certificate No. 406516

Page 1 of 4 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. :** Q42822

**Date of receipt :** 1-Sep-14

## Item Tested

**Description :** Sound Level Meter (N12-RION-004)

**Manufacturer :** Rion

**Model :** NL-52

**Serial No. :** 00220553

## Test Conditions

**Date of Test :** 24-Sep-14

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

## Test Results

All results were within the IEC 61672 Type1 specification.

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

Main Test equipment used:

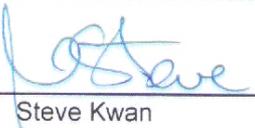
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C127181	SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR

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 :**   
Dorothy Cheuk

**Approved by :**   
Steve Kwan

**Date:** 25-Sep-14

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

The copyright of this certificate is owned by Hong Kong Calibration Ltd.. It may not be reproduced except in full.



# Calibration Certificate

Certificate No. 406516

Page 2 of 4 Pages

Results :

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

2. Acoustical signal test

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
30-130	A	F	OFF	94.2	94.2
		S	OFF		94.2
	C	F	OFF		94.2
	Z	F	OFF		94.2
	A	F	OFF	114.2	114.2
		S	OFF		114.2
	C	F	OFF		114.2
	Z	F	OFF		114.2

IEC 61672 Type 1 Spec. :  $\pm$  1.1 dB

Uncertainty :  $\pm$  0.1 dB

3 Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.7	- 39.4 dB, $\pm$ 2 dB
63 Hz	-26.3	- 26.2 dB, $\pm$ 1.5 dB
125 Hz	-16.2	- 16.1 dB, $\pm$ 1.5 dB
250 Hz	-8.7	- 8.6 dB, $\pm$ 1 dB
500 Hz	-3.2	- 3.2 dB, $\pm$ 1.4 dB
1 kHz	0.0 (Ref)	0 dB, $\pm$ 1.1 dB
2 kHz	+1.2	+ 1.2 dB, $\pm$ 1.6 dB
4 kHz	+1.0	+ 1.0 dB, $\pm$ 1.6 dB
8 kHz	-1.0	- 1.1 dB, + 2.1 dB $\sim$ -3.1 dB
16 kHz	-8.0	- 6.6 dB, + 3.5 dB $\sim$ - 17.0 dB

Uncertainty :  $\pm$  0.1 dB



# Calibration Certificate

Certificate No. 406516

Page 3 of 4 Pages

## 4. Frequency & Time weightings at 1 kHz

### 4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.2	94.2 (Ref.)	--	± 0.4 dB
C	94.2	94.2	0.0	
Z	94.2	94.2	0.0	

### 4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.2	94.2 (Ref.)	--	± 0.3 dB
Slow	94.2	94.2	0.0	
Time-averaging	94.2	94.2	0.0	

Uncertainty : ± 0.1 dB

## 5. Level linearity on the reference level range

UUT Range	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
30-130 dB (Ref Level)	129.0	129.0	0.0	± 1.1 dB
	124.0	124.0	0.0	
	119.0	119.0	0.0	
	114.0	114.0 (Ref)	--	
	109.0	109.0	0.0	
	104.0	104.0	0.0	
	99.0	99.0	0.0	
	94.0	94.0	0.0	
	89.0	89.0	0.0	
	84.0	84.0	0.0	
	79.0	79.0	0.0	
	74.0	74.0	0.0	
	69.0	69.0	0.0	
	64.0	64.0	0.0	
	59.0	59.0	0.0	
	54.0	54.0	0.0	
	49.0	49.1	+0.1	
44.0	44.1	+0.1		

Uncertainty : ± 0.1 dB



# Calibration Certificate

Certificate No. 406516

Page 4 of 4 Pages

## 6. Toneburst response (4kHz)

UUT Setting	Tone Burst Duration(ms)	UUT Reading(dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	Steady	127.0(Ref)	--	--
	200	126.0	-1.0	-1.0 ± 0.8dB
	2	109.0	-18.0	-18.0, +1.3 dB ~ -1.8 dB
	0.25	99.9	-27.1	-27.0, +1.3 dB ~ -3.3 dB
Slow	Steady	127.0(Ref)	--	--
	200	119.6	-7.4	-7.4 ± 0.8dB
	2	100.0	-27.0	-27.0, +1.3 dB ~ -3.3 dB
Time averaging	Steady	127.0(Ref)	--	--
	200	120.4	-6.6	-7.0±0.8dB
	2	100.3	-26.7	-27.0, +1.3 dB ~ -1.8 dB
	0.25	91.0	-36.0	-36.0, +1.3 dB ~ -3.3 dB

Uncertainty : ± 0.1 dB

## 7. Overload indication (30-130 dB range, A-weighted, Time-average, 4kHz)

UUT Reading at overload (dB)		Difference (dB)	IEC 61672 Type 1 Spec.
+ ve one half cycle	- ve one half cycle		
136.1	137.2	1.1	< 1.8 dB

The overload indicator latched on until reset

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 : 1001 hPa.

4. Preamplifier model : NH-25 , S/N : 10553

5. Firmware Version: 1.2

6. Power Supply Check: OK

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

----- END -----

# Appendix D

## EM&A Monitoring Schedules

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

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

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

April 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3 Good Friday	4 Ching Ming Festival
5	6 The Next day of Chin Ming Festival	7 The next day of Easter Monday	8 ET Site Walk(09:30am – 11:00am) 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 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC + SSEMC	16	17	18
19	20 ET Site Walk(09:30am – 11:00am) 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	21	22	23	24	25 24-hour TSP + 3 x 1-hour TSP
26	27 ET Site Walk(09:30 – 11:00) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC	28	29	30 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)		

# **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**

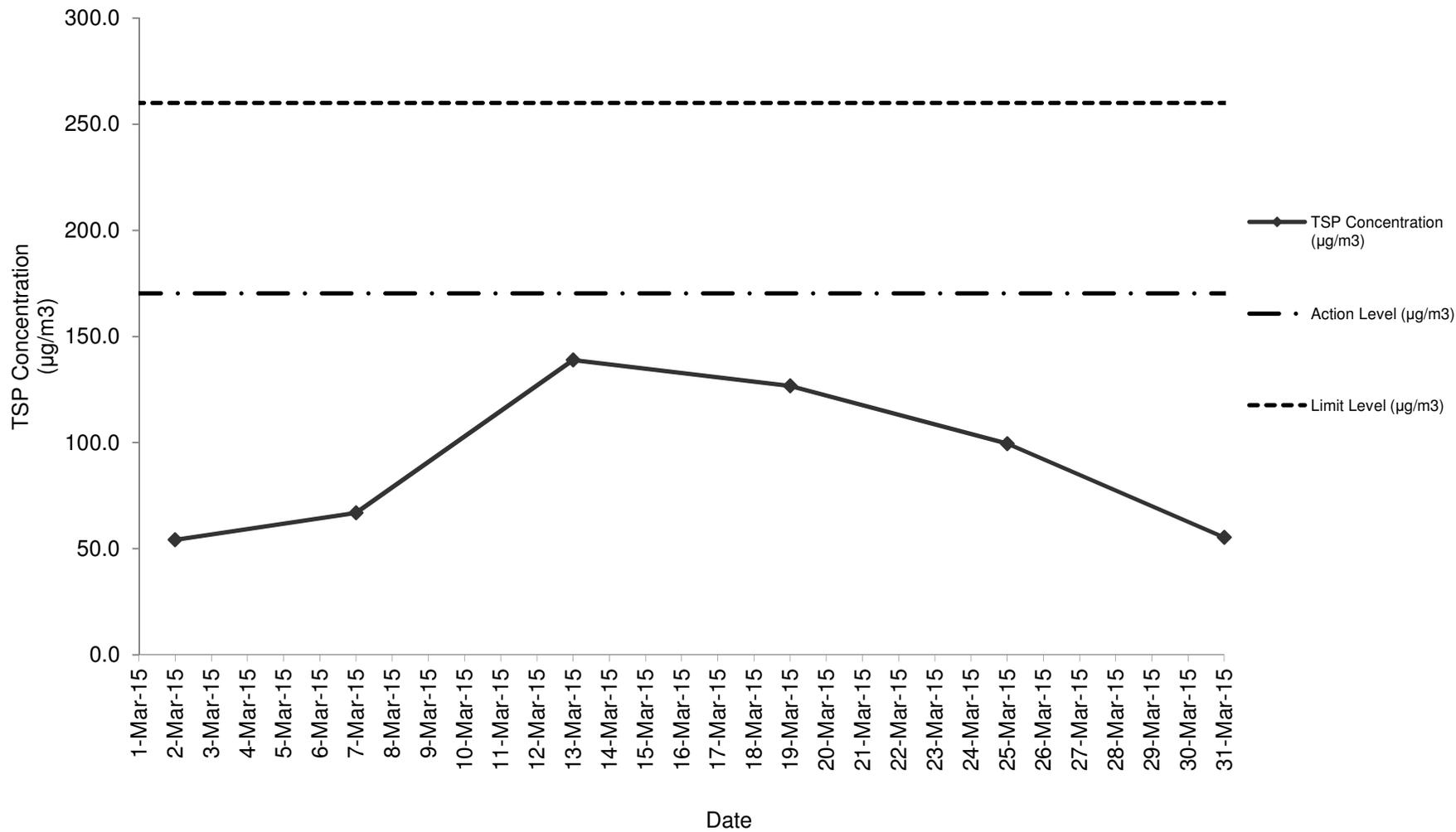
Appendix F  
 Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

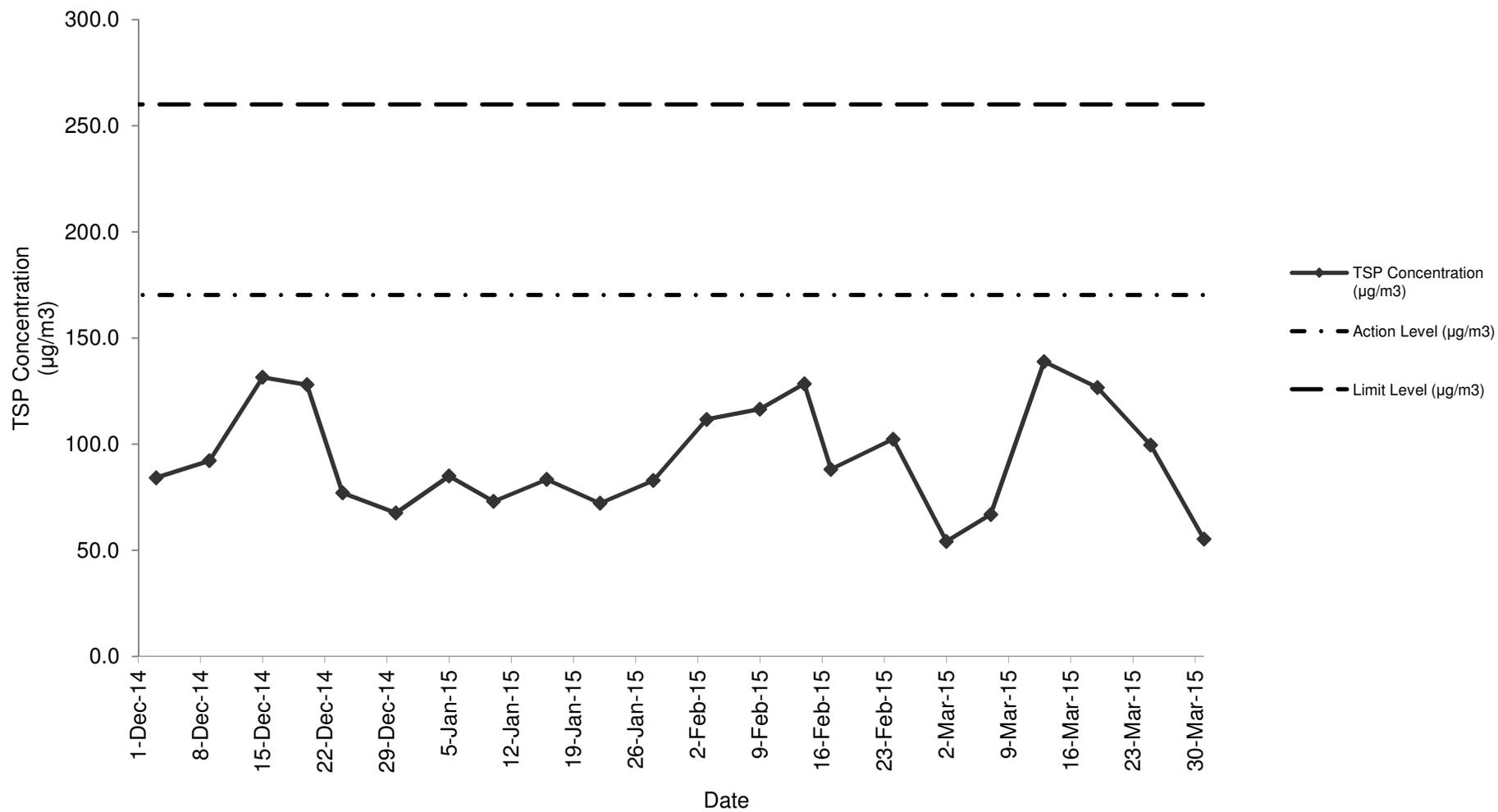
Sampling Date	Weather Condition	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction
			Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
2-Mar-15	Cloudy	B34	2.8219	2.9347	0.1128	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	54.2	170.3	260.0	<5	N
7-Mar-15	Cloudy	B37	2.8120	2.9511	0.1391	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	66.9	170.3	260.0	<5	N
13-Mar-15	Fine	B39	2.7991	3.0880	0.2889	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	138.9	170.3	260.0	<5	N
19-Mar-15	Fine	B41	2.8002	3.0637	0.2635	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	126.7	170.3	260.0	<5	N
25-Mar-15	Cloudy	B43	2.7841	2.9911	0.2070	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	99.5	170.3	260.0	<5	N
31-Mar-15	Sunny	B65	2.8170	2.9321	0.1151	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	55.3	170.3	260.0	<5	N
															<b>Average</b>	90.3				
															<b>Min</b>	54.2				
															<b>Max</b>	138.9				

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 (December 2014 - March 2015)



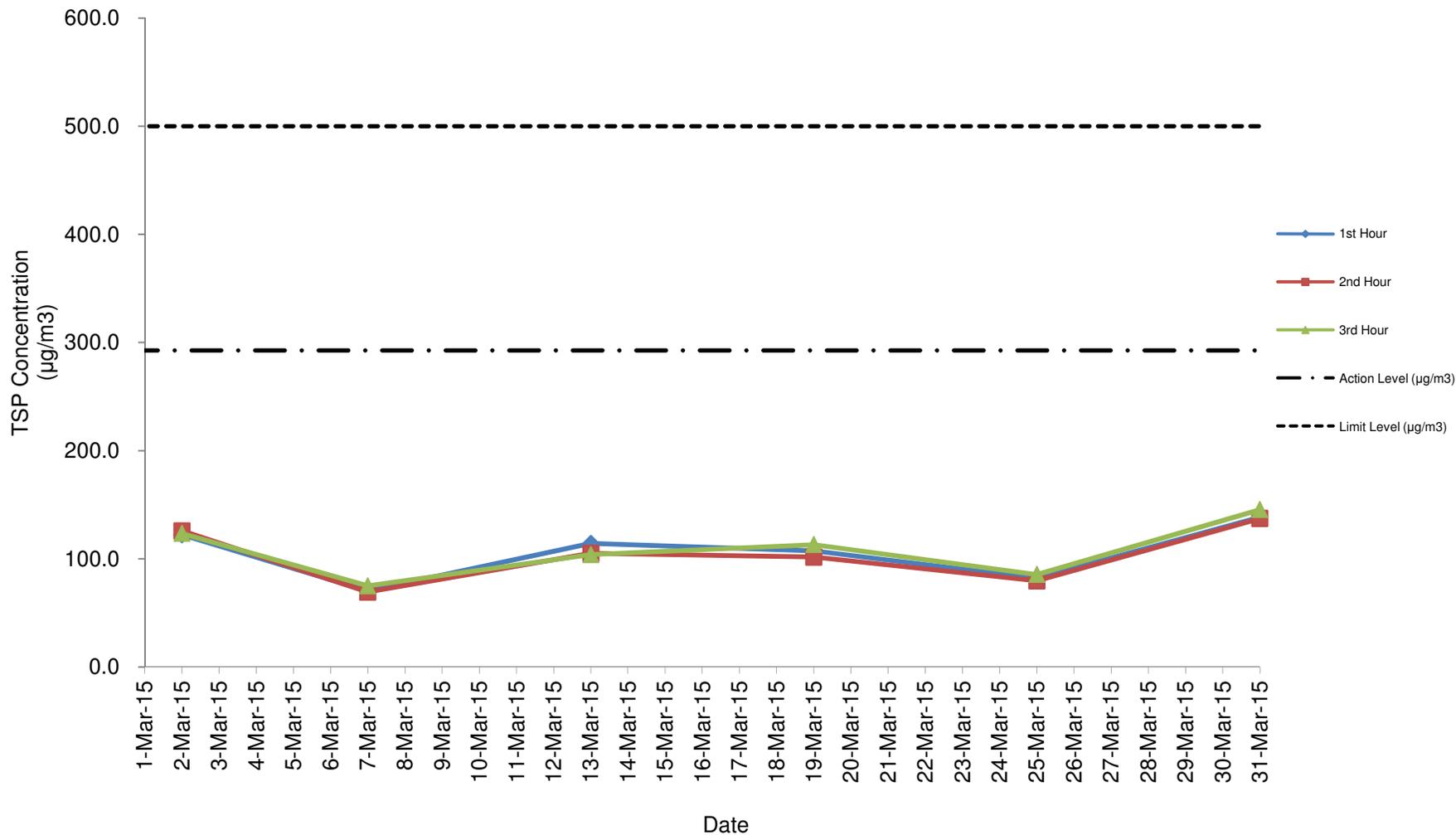
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

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

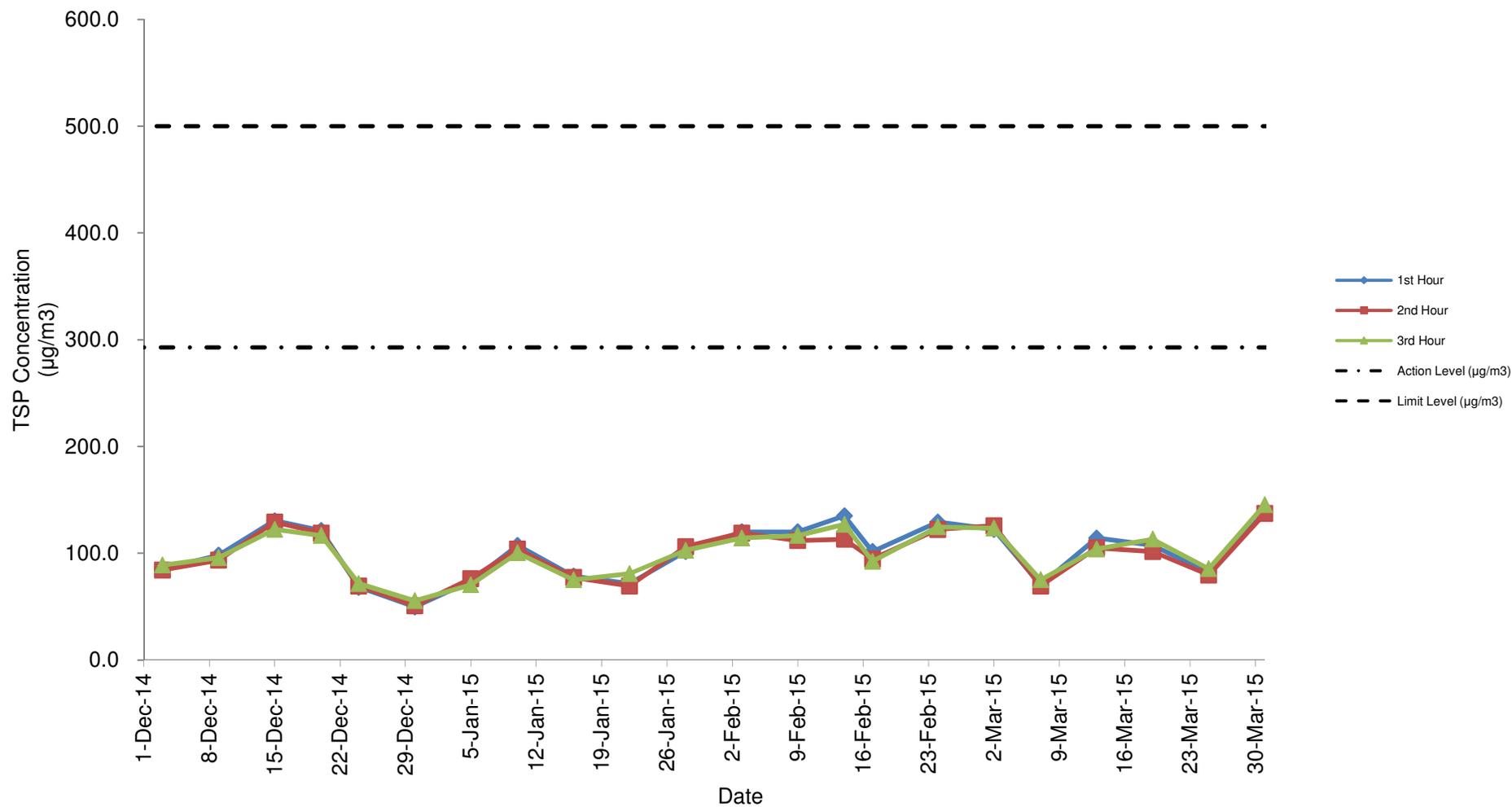
Sampling Date	Weather Condition	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction	
			Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate							
2-Mar-15	Cloudy	B35A	2.8135	2.8241	0.0106	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	122.3	292.7	500.0	<5	N	
		B35B	2.8012	2.8121	0.0109	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	125.8	292.7	500.0	<5	N	
		B35C	2.7994	2.8101	0.0107	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	123.5	292.7	500.0	<5	N	
7-Mar-15	Cloudy	B38A	2.7980	2.8041	0.0061	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	70.4	292.7	500.0	<5	N	
		B38B	2.8014	2.8074	0.0060	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	69.2	292.7	500.0	<5	N	
		B38C	2.7760	2.7825	0.0065	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	75.0	292.7	500.0	<5	N	
13-Mar-15	Fine	B40A	2.8011	2.8110	0.0099	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	114.3	292.7	500.0	<5	N	
		B40B	2.7741	2.7832	0.0091	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	105.0	292.7	500.0	<5	N	
		B40C	2.8151	2.8241	0.0090	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	103.9	292.7	500.0	<5	N	
19-Mar-15	Fine	B42A	2.8109	2.8202	0.0093	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	107.3	292.7	500.0	<5	N	
		B42B	2.8114	2.8202	0.0088	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	101.6	292.7	500.0	<5	N	
		B42C	2.8211	2.8309	0.0098	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	113.1	292.7	500.0	<5	N	
25-Mar-15	Cloudy	B44A	2.7884	2.7955	0.0071	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	81.9	292.7	500.0	<5	N	
		B44B	2.7910	2.7979	0.0069	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	79.6	292.7	500.0	<5	N	
		B44C	2.7760	2.7834	0.0074	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	85.4	292.7	500.0	<5	N	
31-Mar-15	Sunny	B64A	2.8060	2.8180	0.0120	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	138.5	292.7	500.0	<5	N	
		B64B	2.8022	2.8141	0.0119	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	137.3	292.7	500.0	<5	N	
		B64C	2.8017	2.8143	0.0126	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	145.4	292.7	500.0	<5	N	
<b>Average</b>																105.5					
<b>Min</b>																69.2					
<b>Max</b>																145.4					

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

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



### 1-Hour TSP Monitoring Result at station: SR77 (December 2014 - March 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

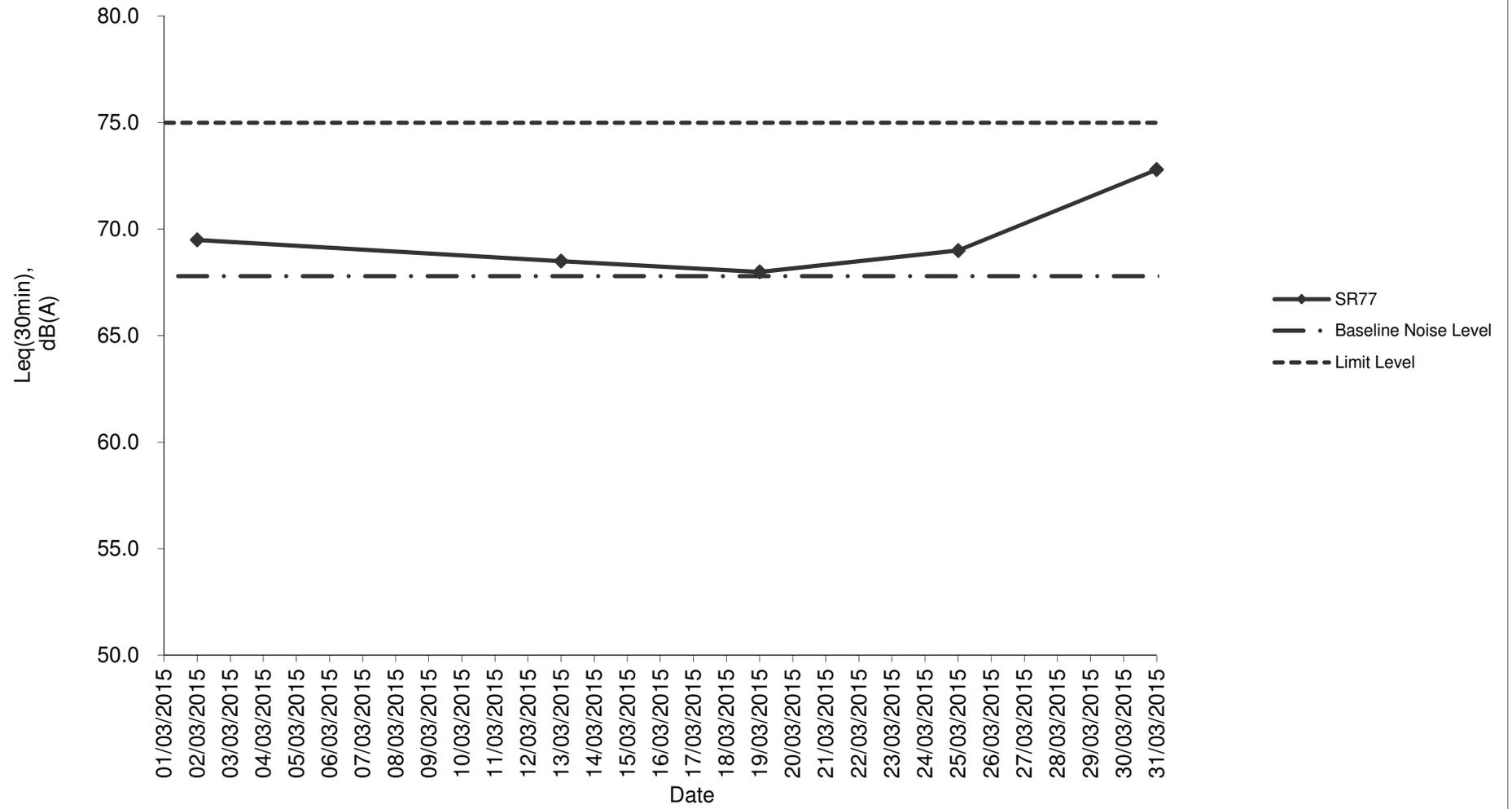
Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)	Exceedance (Y / N)
				L10(30min)	L90(30min)	Leq(30min)				
2015/03/02	Cloudy	16:00	16:30	76.5	61.0	69.5	-	67.8	75.0	N
2015/03/13	Fine	14:00	14:30	75.0	60.5	68.5	-	67.8	75.0	N
2015/03/19	Fine	14:30	15:00	75.5	58.5	68.0	-	67.8	75.0	N
2015/03/25	Cloudy	16:00	16:30	77.0	60.0	69.0	-	67.8	75.0	N
2015/03/31	Sunny	11:00	11:30	78.0	61.0	72.8	-	67.8	75.0	N
						<b>Average</b>	69.6			
						<b>Minimum</b>	68.0			
						<b>Maximum</b>	72.8			

**Remarks**

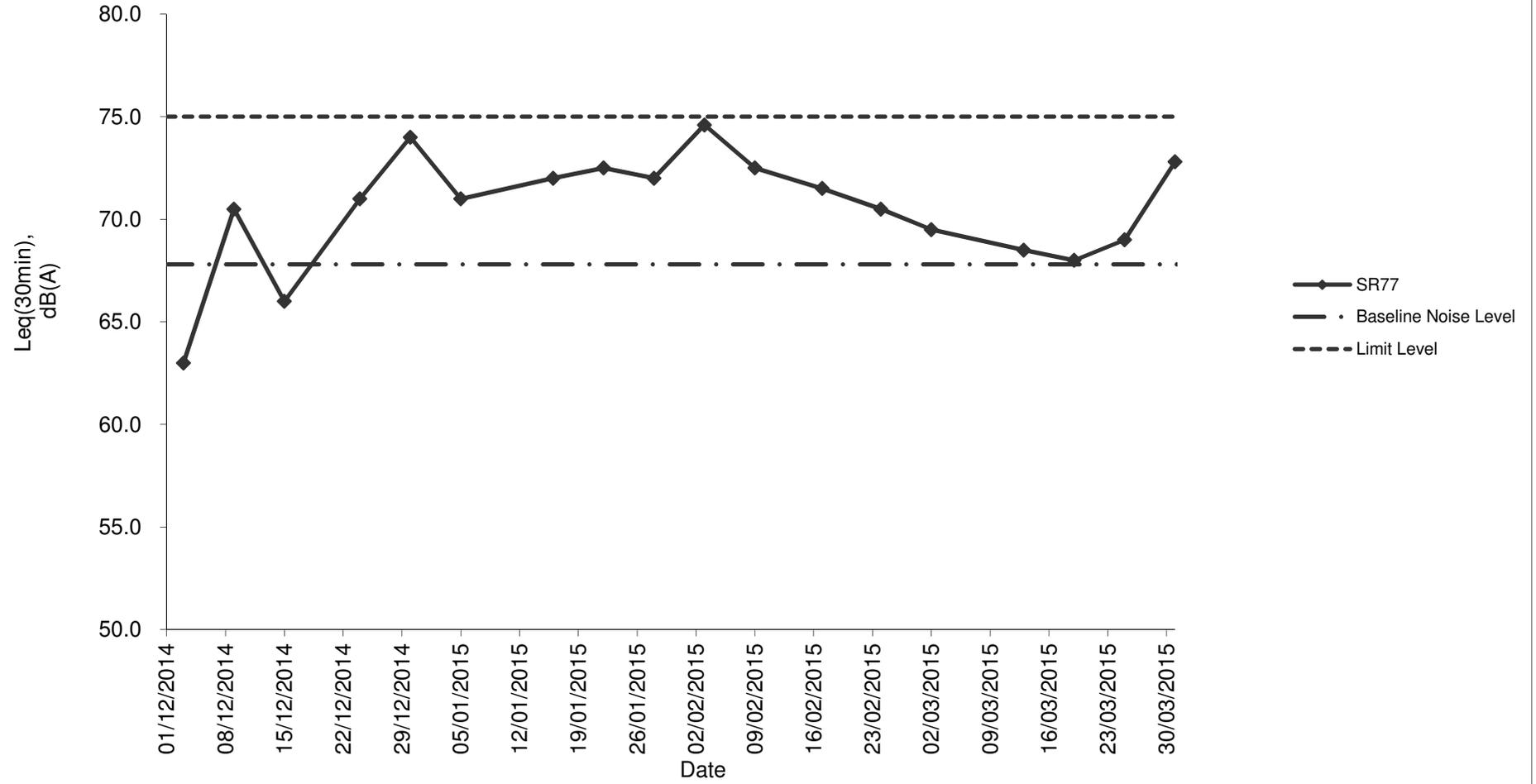
\* +3dB(A) Façade effect correction included

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

### Noise monitoring result: SR77



**Noise monitoring result: SR77  
(December 2014 - March 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 '000m3)	(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	-	-	0.009	0.009	0.070
Mar-15	3.742	0.029	3.713	0.270	-	3.443	0.100	-	-	1.030	-	0.080
Apr-15	-	-	-	-	-	-	-	-	-	-	-	-
May-15	-	-	-	-	-	-	-	-	-	-	-	-
Jun-15	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total	10.189	0.183	10.006	2.436	-	7.570	0.318	-	-	1.039	0.049	0.230
Jul-15	-	-	-	-	-	-	-	-	-	-	-	-
Aug-15	-	-	-	-	-	-	-	-	-	-	-	-
Sep-15	-	-	-	-	-	-	-	-	-	-	-	-
Oct-15	-	-	-	-	-	-	-	-	-	-	-	-
Nov-15	-	-	-	-	-	-	-	-	-	-	-	-
Dec-15	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.189	0.183	10.006	2.436	-	7.570	0.318	-	-	1.039	0.049	0.230

- 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  Rem  ✓ ✓  ✓ ✓  ✓
Air Quality during Operation	Not required	N/A	N/A	N/A
<b>Noise</b>				
Noise during Construction	<ul style="list-style-type: none"> <li>Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant.</li> <li>Reduce the number of equipment and their percentage on-time.</li> </ul>	During Construction	Contractor	✓  ✓
Noise during Operation	Not required	N/A	N/A	N/A
<b>Water Quality</b>				
Water Quality during Construction	<u>Road Widening Works, Earthworks and Culvert Extension Works</u> <ul style="list-style-type: none"> <li>Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settleable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required.</li> </ul>	During Construction	Contractor	✓

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



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

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

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

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<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	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>N/A</li> <li>✓</li> </ul>
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	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> </ul>

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

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

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

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

**Cumulative Complaint Log**

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

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

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					<p>The water from the Ma Wat Channel adjoins the Ng Tung River before passing through the complaint location, so other pollution sources may also occur at upstream of Ng Tung River</p> <p>The complaint is considered unlikely due to the construction works of this project.</p>	



**Meinhardt Infrastructure and  
Environment Ltd**  
邁進基建環保工程顧問有限公司

4/F Wah Ming Centre  
421 Queen's Road West  
Hong Kong  
香港皇后大道西421號華明中心4樓

Tel 電話: +852 2858 0738  
Fax 傳真: +852 2540 1580

[mail@meinhardt.com.hk](mailto:mail@meinhardt.com.hk)  
[www.meinhardt-china.com](http://www.meinhardt-china.com)  
[www.meinhardtgroup.com](http://www.meinhardtgroup.com)