

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

Monthly EM&A Report

November 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

(November 2015)

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Date: 14 December 2015

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12 October 2015  
By Fax (2805 5028) & Post

Dear Sir,

**Attn: Mr. James Penny**

**Environmental Monitoring and Audit (EM&A) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling  
Stage 2 (between Tai Hang to Wo Hop Shek Interchange) – Entrusted Works  
Environmental Permit No. EP-324/2008/D  
Condition 3.3 – Submission of Monthly EM&A Report – September 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 – September 2015 received on 12 October 2015 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report –September 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.

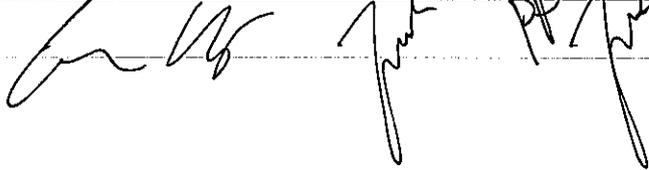
Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED



Terence Kong  
Independent Environmental Checker

c.c. HyD – Mr. Chung Lok Chin (Fax: 2714 5198) / Ms. Jackei Yin (Fax: 2761 4864)  
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Date	Revision	Prepared By	Checked By	Approved By
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## EXECUTIVE SUMMARY

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

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

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

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

- Sewer Works.

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

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

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

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

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

#### *Breach of Action and Limit Levels for Water Quality*

The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in 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 January 2016 during the course of remaining box culvert works.

#### *Complaint, Notification of Summons and Successful Prosecution*

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

#### *Future Key Issues*

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

- Cable Detection and Trial Trenches
- Decking Construction for Bridge E;
- E & M Work for New Valve Control & Telemetry House;
- Filling Works at Tong Hang East;
- Storm Drains Laying;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;

- Portal Beam Construction;
- Pre-drilling Works and Piling Works for Viaduct;
- Retaining Wall Construction;
- Road Works at Fanling Highway;
- Slope Works;
- Socket H-pile Installation;
- Tree Felling Works;
- Utilities Duct Laying;
- Viaduct Segment Erection;
- Demolition of Existing Ramp of Kiu Tau Footbridge; and
- Sewer Works.

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

## **1 INTRODUCTION**

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

### **1.2 Purpose of the Report**

1.2.1 This is the monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting month of November 2015.

### **1.3 Report Structure**

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

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Status of Environmental Licenses, Notifications and Permits
- Section 4: Air Quality Monitoring
- Section 5: Noise Monitoring
- Section 6: Water Monitoring
- Section 7: Waste Management
- Section 8: Environmental Site Inspection and Audit
- Section 9: Implementation Status of Environmental Mitigation Measures
- Section 10: Environmental Non-conformance
- Section 11: Future Key Issues
- Section 12: Conclusions and Recommendations

## 2 PROJECT INFORMATION

### 2.1 Background

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

## **2.2 Site Description**

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

- At-Grade Road Works – Temporary and permanent road formation, pipe laying, road drainage, footpath and noise barrier construction;
- Demolition of existing Kiu Tau Footbridge and Footbridge Re-provision; and
- Box Culvert Extension – Flow diversion of existing stream, excavation, sub-base and blinding, base, wall and top slab construction.

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

## **2.3 Construction Programme and Activities**

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

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

- Viaduct Segment Erection;
- Slope Works;
- Water Main Connection Works; and
- Sewer Works.

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

## 2.4 Project Organisation

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

**Table 2.1 Contact Information of Key Personnel**

Party	Role	Position	Name	Telephone	Fax
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Alan Lee	2171 3303	2171 3498
		Resident Engineer (Environmental)	Mr. Perry Yam	2171 3350	
Mott MacDonald	Independent Environmental Checker (IEC)	IEC	Mr. Steven Tang	2828 5920	2827 1823
Chun Wo	Contractor	Site Agent	Mr. Daniel Ho	2638 6144	2638 7077
		Environmental Officer	Mr. Victor Huang	2638 6181	
Meinhardt	Environmental Team (ET)	ET Leader	Mr. Fredrick Leong	2859 1739	2540 1580

### 3 STATUS OF ENVIRONMENTAL LICENSES, NOTIFICATION AND PERMITS

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

**Table 3.1 Status of Environmental Licenses, Notifications and Permits**

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
<b>Environmental Permit</b>				
EP-324/2008/D	27 Aug 2015	--	Granted on 27/08/2015	
<b>Construction Noise Permit</b>				
GW-RN0334-15	8 June 2015	7 Dec 2015	Valid	For operating generator in FH9 within restricted hours
GW-RN0428-15	9 July 2015	31 Dec 2015	Valid	For Segment Delivery to Kiu Tau
GW-RN0473-15	29 July 2015	17 Dec 2015	Valid	For road diversion and maintenance of Fanling Highway Southbound
GW-RN0461-15	5 Aug 2015	8 Jan 2016	Valid	For loading and unloading along Fanling Highway both bounds
GW-RN0495-15	12 Aug 2015	11 Feb 2016	Valid	For stressing of tendons at the southward of site office in the night time
GW-RN0497-15	14 Aug 2015	13 Feb 2016	Valid	For stressing of tendons at the northward of site office in the night time
GW-RN0488-15	6 Sep 2015	22 Nov 2016	Valid	For coring works along Fanling Highway during public holidays
GW-RN0525-15	29 Aug 2015	13 Feb 2016	Valid	For road diversion and maintenance of Fanling Highway Northbound
GW-RN0542-15	1 Sep 2015	25 Feb 2016	Valid	For installation of temporary pedestrian ramp & demolition of existing pedestrian ramp at Kiu Tau footbridge
GW-RN0608-15	28 Sep 2015	29 Feb 2016	Valid	For formwork erection of portal PT5
GW-RN0633-15	15 Oct 2015	29 Feb 2016	Valid	For operating water pumping in Kiu Tau within restricted hours

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RN0655-15	1 Dec 2015	29 Feb 2016	Valid	For connection of the DN2300 Dongjiang watermain
GW-RN0699-15	10 Nov 2015	27 Feb 2016	Valid	For Segment erection of AC9
GW-RN0695-15	29 Nov 2015	28 Feb 2016	Valid	For coring works along Fanling Highway during public holidays Environmental Permit Construction Noise Permit
<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-weighted filter paper inside the HVS at a controlled air flow rate. After 24-hr sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg.
- 4.5.6 All the collected samples were kept in a good condition for 6 months before disposal.
- 4.5.7 For 1-hr TSP monitoring, monitoring methodology is the same as 24-hr TSP monitoring which has been presented in **Section 4.5.1** to **Section 4.5.6**, but with sampling period changed to 1 hour.

#### 4.6 Monitoring Schedule for the Reporting month

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

#### 4.7 Monitoring Results

- 4.7.1 The monitoring results for 1-hr and 24-hr TSP are summarised in **Table 4.4** and **Table 4.5** respectively. Detailed air quality monitoring results and the graphical presentation

of air quality monitoring data for the current and past three reporting months are presented in **Appendix F**.

**Table 4.4 Summary of 1-hr TSP Monitoring Results**

ASR ID	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
AM1(SR77) *	122.9	92.3 – 139.6	292.7	500

Remark:

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

**Table 4.5 Summary of 24-hr TSP Monitoring Results**

ASR ID	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
AM1(SR77) *	75.0	60.2 – 91.4	170.3	260

Remark:

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

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

## 5 NOISE MONITORING

### 5.1 Monitoring Requirements

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

### 5.2 Monitoring Equipment

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

**Table 5.1 Noise Monitoring Equipment**

Equipment	Brand and Model	Quantity	Serial Number
Sound Level Calibrator	Rion (Model No. NC-74)	1	34857296
Sound Level Meter	B&K (Model No. 2238)	1	2694908

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

### 5.3 Monitoring Locations

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

**Table 5.2 Location of Noise Monitoring**

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

Remark:

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

### 5.4 Monitoring Parameters, Frequency and Duration

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

**Table 5.3 Noise Monitoring Parameters, Frequency and Duration**

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

## 5.5 Monitoring Methodology

5.5.1 The monitoring procedures are summarised as follows:

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

## 5.6 Monitoring Schedule for the Reporting Month

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

## 5.7 Monitoring Results

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

**Table 5.4 Summary of Noise Monitoring Results**

Noise Monitoring Station ID	Average, dB(A), Leq (30min) <sup>(2)</sup>	Range, dB(A), Leq (30min) <sup>(2)</sup>	Action Level	Limit Level, dB(A)
M1(SR77) <sup>(1)</sup>	66.9	66.5 – 68.5	When one documented valid complaint is received	75

Remark:

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

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

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

## **6 WATER MONITORING**

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

## 7 WASTE MANAGEMENT

- 7.1.1 The Contractor has registered as a chemical waste producer of the Project. The C&D materials and waste sorting were carried out on-site. Receptacles were provided for general refuse collection.
- 7.1.2 As advised by the Contractor, a total of 3,669m<sup>3</sup> of excavated material has been generated. 1,790m<sup>3</sup> of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. 1,200m<sup>3</sup> of inert C&D materials was reused on site. 130m<sup>3</sup> of general refuse was disposed of at North East New Territories (NENT) Landfill. No plastics were collected by recycling contractor in the reporting month. No paper/cardboard packaging was collected by recycling contractor in the reporting month. 1m<sup>3</sup> of 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 November 2015. The one held on 23 November 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	2 Nov 2015	<u>Reminder:</u> Sandbags were found insufficient at the works area near the river stream at SA12. The Contractor was advised to provide more sandbags to prevent site run-off from leaving the site.	Additional sandbags have been provided at the works area near the river stream at SA12 by the Contractor on 9 Nov 2015.
Air Quality	9 Nov 2015	<u>Reminder:</u> The Contractor was reminded to implement sufficient watering at SA16.	The Contractor was noted to provide water spraying regularly as far as practicable at SA16 and the site condition was improved during the ET weekly site inspection on 23 Nov 2015.
Noise	N/A	N/A	N/A
Waste / Chemical Management	30 Nov 2015	<u>Reminder:</u> The Contractor was reminded to ensure good housekeeping at the works area near the AquaSed No.1 at SA22.	The waste at SA22 has been removed by the Contractor as observed during the ET weekly site inspection on 7 Dec 2015.
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 October 2015	13 November 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:

- Cable Detection and Trial Trenches
- Decking Construction for Bridge E;
- E & M Work for New Valve Control & Telemetry House;
- Filling Works at Tong Hang East;
- Storm Drains Laying;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Pre-drilling Works and Piling Works for Viaduct;
- Retaining Wall Construction;
- Road Works at Fanling Highway;
- Slope Works;
- Socket H-pile Installation;
- Tree Felling Works;
- Utilities Duct Laying;
- Viaduct Segment Erection;
- Demolition of Existing Ramp of Kiu Tau Footbridge; and
- Sewer Works.

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

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

- Site discharges should be properly collected and treated prior to discharge;
- Properly maintain all drainage facilities and wheel washing facilities on site;
- Expose slopes and dusty stockpile should be covered up properly if no work will be conducted;

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

### **12.3 Monitoring Schedule for the Next Month**

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

## 13 CONCLUSIONS AND RECOMMENDATIONS

### 13.1 Conclusions

- 13.1.1 The construction phase EM&A programme of the Project commenced on 5 November 2013.
- 13.1.2 The 1-hr TSP, 24-hr TSP and noise monitoring were carried out in the reporting period.
- 13.1.3 No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 13.1.4 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 13.1.5 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 13.1.6 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 January 2016 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 13.1.8 Impact monitoring for water quality was not necessary in the reporting month due to temporarily suspension of the construction works and is anticipated to be resumed in January 2016 during the course of remaining box culvert works.

### 13.2 Recommendations

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

#### *Water Quality*

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

#### *Air Quality*

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

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

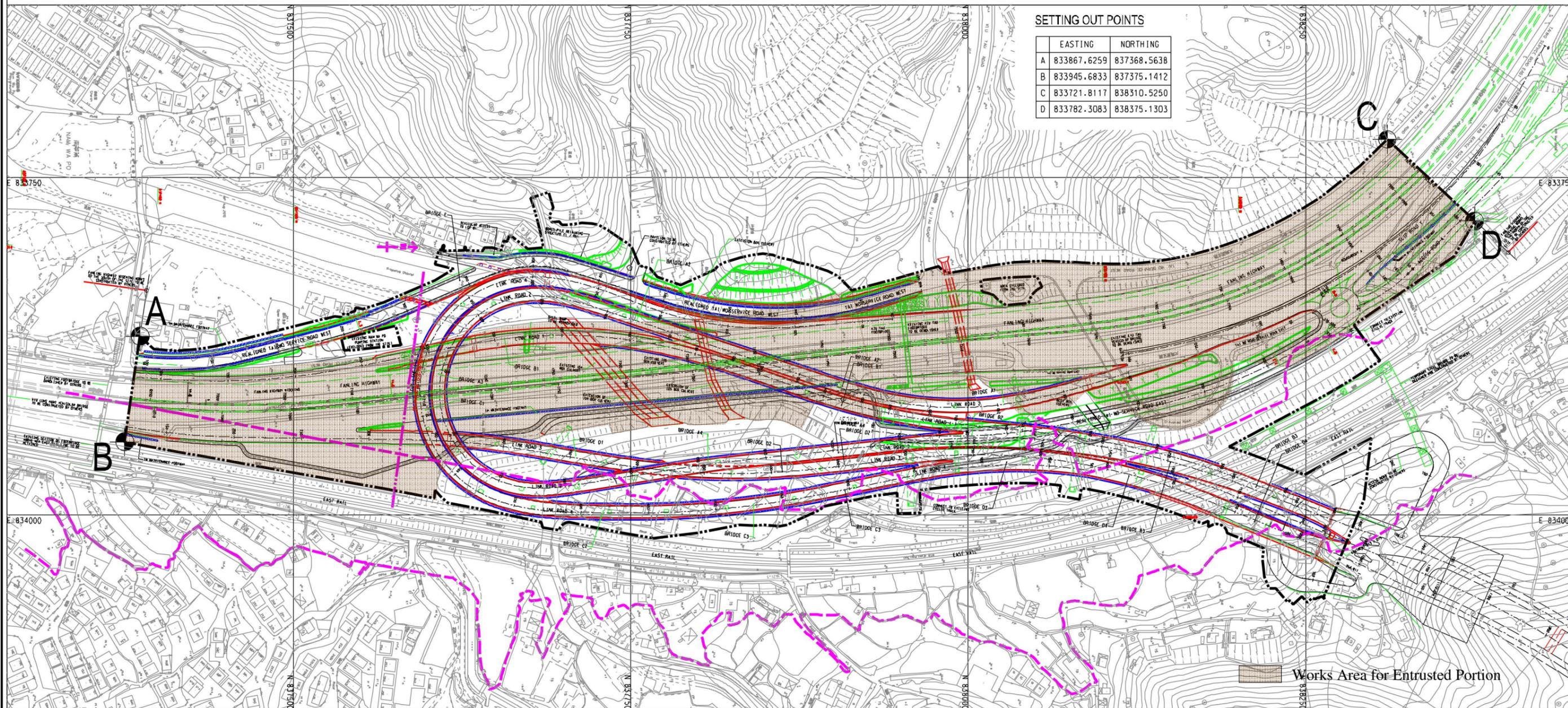
#### *Noise*

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

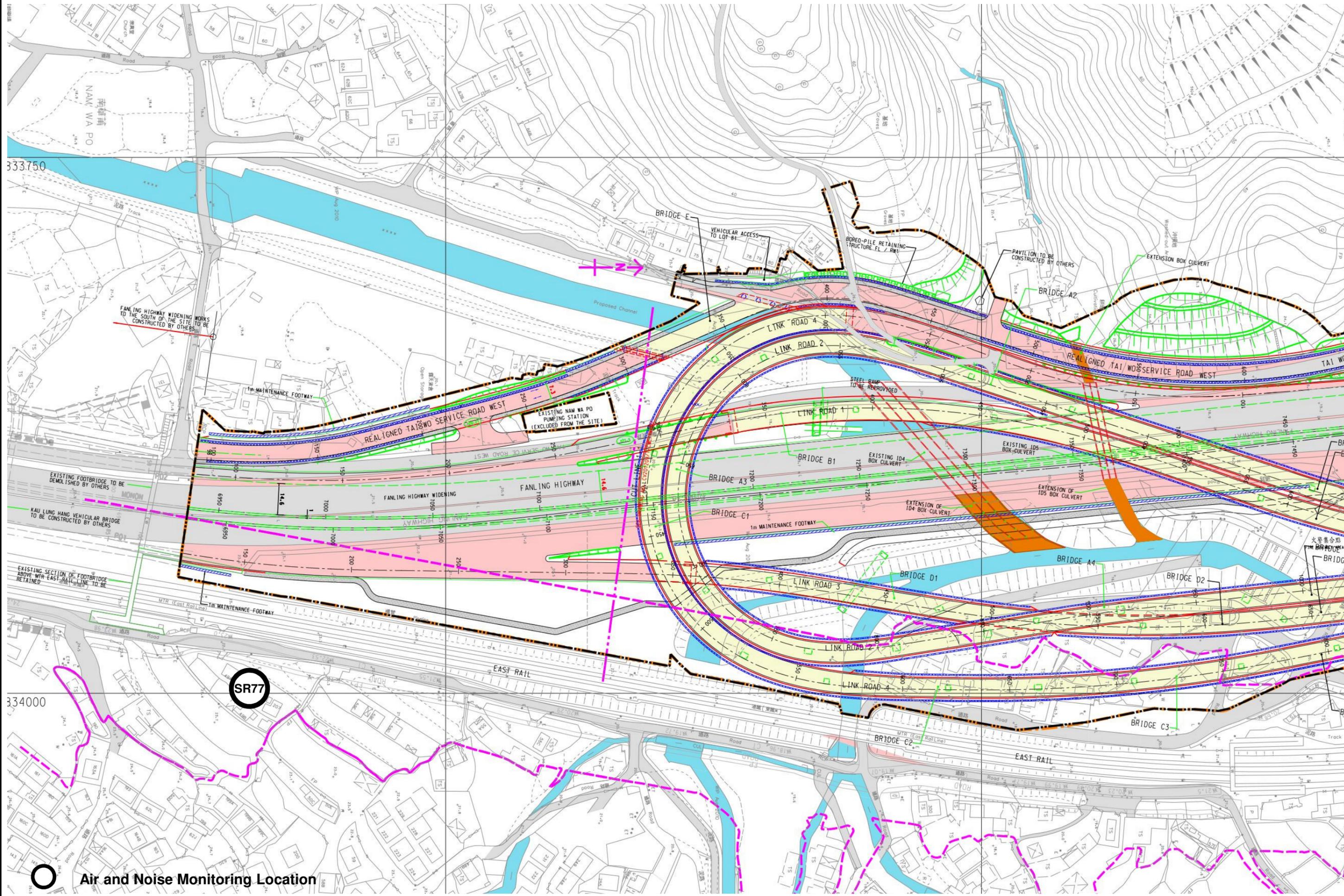
#### *Chemical and Waste Management*

- Secondary containment, like drip trays and/or bundings, should be provided for all chemical containers to retain any oil/chemical waste leakage within the construction site.
- Chemical waste should be stored, handled and disposed of properly.
- On site segregation should be implemented as far as practicable for reuse and recycle.

**Figure**



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# Appendix A

# Construction Programme

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015					2016					
							Nov	Dec	Jan	Feb	Mar						
<b>3-Month Rolling Programme 2015-11-21</b>																	
<b>Key Dates (Contractual)</b>																	
KD-1500	KD13: Stage N4A - Connection of Access Road A and Slip Road Y at Entrustment Boundary CD	0	0		21-Nov-15*	-20											
KD-1100	KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic	0	0		18-Jan-16*	0											
<b>Key Dates (Forecast)</b>																	
KD-1505	KD13: Stage N4A - Connection of Access Road A and Slip Road Y at Entrustment Boundary CD	0	0		23-Oct-15 A												
KD-1105	KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic	0	0		19-Jan-16	0											
<b>Major Milestones and Events</b>																	
MS-0240	Commissioning of the diverted DN2300 Dong Jiang Watermains	0	0		21-Dec-15	294											
MS-2000C	T3: TTA to split FLHS NB & SB with 3 lanes in the middle unoccupied (between CH7130 and CH7470)	1	1	09-Jan-16*	09-Jan-16	1											
<b>Major Procurement &amp; Delivery</b>																	
<b>Footbridge Steel Truss</b>																	
MM-3050	Fabrication of footbridge steel truss (Kiu Tau Footbridge)	100	100	06-Jan-16	13-May-16	10											
<b>Design and Submissions</b>																	
<b>Statutory Approval</b>																	
PRE-1050	Submission & approval of CDIA report for construction of temporary platform for segment erection works	185	10	27-Nov-14 A	02-Dec-15	19											
<b>Design Confirmation</b>																	
PRE-1530	Confirmation of Noise Barrier Footing Design (NB3) (under VO. 95, 98 & 109)	0	0		22-Oct-15 A												
<b>Method Statement and Design (Major) Approved by AECOM</b>																	
PRE-2050	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks	30	13	02-Nov-15 A	05-Dec-15	33											
PRE-2030	Submission of E&M design for lighting of Kiu Tau Footbridge	60	60	18-Dec-15	07-Mar-16	130											
<b>Section IA &amp; IB - Fanling Highway Widening (KD-1 &amp; KD-2)</b>																	
<b>Fanling Highway South Portion between CH6935 and CH7470</b>																	
<b>Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZ2)</b>																	
<b>At-Grade Roadworks (195m)</b>																	
FHW-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	56	20-Feb-14 A	28-Jan-16	82											
FHW-1140	Noise Barrier NB70 - Footing adjacent to SB lane (15m)	115	115	15-Feb-16	06-Jul-16	74											
<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) (Covered by VO.79)	341	0	26-Jul-14 A	09-Nov-15 A												
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	144	356	12-Oct-15 A	11-Feb-17	252											
FHW-2140	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	61	29	14-Oct-15 A	24-Dec-15	11											
FHW-2190	Footpath & DSD Access Track adjacent to SB lane	108	108	15-Feb-16	27-Jun-16	169											
<b>Fanling Highway Zone 3 between CH7290 and CH7380</b>																	
<b>At-Grade Roadworks (130m)</b>																	
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	150	356	07-Jun-14 A	11-Feb-17	93											
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	63	29	05-Oct-15 A	24-Dec-15	11											



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CEDD Contract No. CV/2012/09  
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,  
Contract 3  
3-Month Rolling Programme  
Programme ID: 3MPR028 (Data Date: 21-Nov-15)

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3-Month Rolling Programme updated to 2015-11-20			
Date	Revision	Checked	Approved
20-Nov-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015			2016		
							Nov	Dec	Jan	Feb	Mar	
FHW-3300	Noise Barrier NB68A - Mini-Piling at central median (CSD : 20 nos)	70	70	11-Jan-16	12-Apr-16	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-5000E	KT-P4 - Piling Works (8 out of 8 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	40	0	30-Sep-15 A	03-Nov-15 A							
FHW-5110	Inspection & Remedial Works for the 3nos. suspected defected piles (AB1-7, AB2-4, P3-9)	35	66	20-Nov-15 A	16-Feb-16	0						
FHW-5010E	KT-P4 - Ple Cap & Pter	75	75	21-Nov-15	26-Feb-16	71						
FHW-5000C2	KT-P2 - Piling Works (3 out of 6 nos of Pile) - Phase 2, conflict with existing TWSRE	15	15	27-Nov-15	14-Dec-15	46						
FHW-5010C	KT-P2 - Ple Cap & Pter	60	60	16-Dec-15	04-Mar-16	45						
FHW-5090	Additional BFA Facilities - Pile Cap & Sump Pit, to be covered by VO	45	45	16-Dec-15	16-Feb-16	80						
FHW-5010D	KT-P3 - Ple Cap & Pter	60	60	17-Feb-16	30-Apr-16	0						
FHW-5010A	KT-AB1 - Ple Cap & Abutment	75	75	17-Feb-16	20-May-16	5						
<b>At-Grade Road Works (130m)</b>												
FHW-5120C	Preparation Works for Implementation of TTA Scheme E3A	30	21	07-Nov-15 A	15-Dec-15	45						
FHW-5120D	Implementation of TTA - Scheme E3A (shifting TWSR East westward, at the existing ramp of Kiu Tau Footbridge)	0	0	16-Dec-15		45						
<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	3	30-Aug-13 A	24-Nov-15	1103						
<b>Remaining Works for Noise Barrier along widened Fanling Highway</b>												
FHW-NB-120	Noise Barrier Steelworks & Panel for NB6 (123m), adjacent to Fanling Highway SB lanes at Zone 1	20	20	18-Jan-16*	16-Feb-16	523						
FHW-NB-130	Noise Barrier Steelworks & Panel for NB7 (60m), adjacent to Fanling Highway SB lanes at Zone 1	10	10	17-Feb-16	27-Feb-16	523						
<b>Section II - Remainder of the Works (KD-3)</b>												
<b>At Grade Link Road at Fanling Highway Interchange</b>												
<b>Link Road 3 (near Abutment AD1)</b>												
FHI-LR3-3000	Completion of WSD works incl. DN600, DN1200 & DN1400	0	0		28-Jan-16	453						
<b>Link Road 4 (near Abutment AC1)</b>												
FHI-LR4-4030	Construction of Retaining Wall beside Abutment AC1 (4 bays)	35	35	22-Jan-16	09-Mar-16	0						
<b>WSD Works</b>												
<b>DN450 Fire Mains (CHA)</b>												
WA-1050	Pipe Laying - CHA 420 - 450 (DN450) near Realigned TWSR West (Re-TWSRW: CH530 - 640), 30m long & 2m depth	70	15	29-May-15 A	08-Dec-15	10						
WA-1090	Pipe Laying - CHA 800 - 960 (DN450) near Ext. TWSR West (No Roadworks), 160m long & 3m depth	148	148	04-Jan-16*	09-Jul-16	78						
WA-1060	Pipe Laying - CHA 450 - 575 (DN450) near Realigned TWSR West (Re-TWSRW: CH640 - 695), 125m long & 2m depth	95	95	18-Jan-16	20-May-16	224						
<b>DN600 Water Mains (CHB)</b>												
WB-1030A	Pipe Laying - CHB 335 - 350 (DN600) near crossing TWSRE 15m long & 3m depth	30	0	09-Jun-15 A	13-Nov-15 A							
WB-1010	Pipe Laying - CHB 160 - 215 (DN600) near Fanling Highway S/B (FHW: CH7290-7380), 55m long (common trench with NB)	60	60	13-Jul-15 A	02-Feb-16	281						



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3-Month Rolling Programme updated to 2015-11-20

Date	Revision	Checked	Approved
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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015			2016		
							Nov	Dec	Jan	Feb	Mar	
WB-1060	Pipe Laying - CHB 538 - 635 (DN600) near Realigned TWSR East (TWSRE: CH270-380), 97m long & GL	30	30	17-Jul-15 A	28-Dec-15	578						
WB-1070	Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL	78	22	18-Jul-15 A	16-Dec-15	201						
<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	56	15-Oct-14 A	28-Jan-16	82						
WC-1090A	Pipe Laying - CHC 600 - 615 (DN1200) near crossing TWSRE 15m long & 3m depth	30	0	09-Jun-15 A	13-Nov-15 A							
WC-1130	Pipe Laying - CHC 910 - 980 (DN1200) near Realigned TWSR East (TWSRE: CH380-456), 70m long & GL	78	32	07-Jul-15 A	30-Dec-15	191						
WC-1060	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)	95	64	12-Oct-15 A	06-Feb-16	74						
<b>Twin DN1400 Water Mains (CHE &amp; CHG)</b>												
WE-1030	Pipe Laying - CHE & CHG 225 - 240 (Twins DN1400) near crossing TWSRE 15m long & 3m depth	30	0	09-Jun-15 A	13-Nov-15 A							
<b>DN2200 Water Mains (CHF)</b>												
WF-3000	Semi-Structural Lining on existing DN2200 underneath Link Road 4, 52m long (Covered by VO no.077)	25	25	01-Dec-15*	31-Dec-15	157						
<b>DN2300 Water Mains and Leakage Collection System (CHJ &amp; CHKA/CHK)</b>												
WJ-1010B	Pipe Laying - CHJ 10 - 50 (DN2200) crossing existing TWSR East, 40m long & 6m depth	78	0	28-Jul-15 A	03-Nov-15 A							
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near Realigned TWSR East, 80m long & 4m depth	55	29	05-Oct-15 A	24-Dec-15	174						
WJ-1050B	Pipe Laying - CHJ 200 - 235 (DN2300) near Realigned TWSR East (along Access Road A), 35m long & GL	14	0	26-Oct-15 A	12-Nov-15 A							
WJ-2000B	Pressure Test for CHJ	7	7	21-Nov-15	28-Nov-15	0						
WJ-2010A	Cleaning & CCTV Inspection for CHJ	7	7	30-Nov-15	07-Dec-15	0						
WJ-2020	Installation of Connecting Pipe for Connection to Existing Mains	13	13	30-Nov-15	14-Dec-15	0						
WJ-2040	Connection to Existing Mains	7	7	15-Dec-15*	21-Dec-15*	0						
WJ-1100	DN300 Washout at around CHJ 268	65	65	22-Dec-15	16-Mar-16*	212						
WJ-1110	DN300 Washout at CHJ 155	65	65	22-Dec-15	16-Mar-16*	212						
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	90	90	28-Dec-15	22-Apr-16	174						
<b>Kau Lung Hang Valve Control &amp; Telemetry House Reprovision</b>												
VCTH-1020a	Testing and Commissioning (New Telemetry House)	60	30	10-Oct-15 A	28-Dec-15	192						
VCTH-1020b	Testing and Commissioning (Valve operation for DN2300 watermains)	30	0	10-Oct-15 A	16-Nov-15 A							
VCTH-1020c	Testing and Commissioning (Valve operation for DN1400 watermains)	30	30	10-Oct-15 A	28-Dec-15	192						
<b>Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)</b>												
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	50	50	02-Jan-16*	07-Mar-16	471						
<b>Stage 1A - Realignment of Tai Wo Service Road West (KD-7)</b>												
<b>TWSRW Zone 1 between CH100 and CH155</b>												
<b>At-Grade Roadworks</b>												
TWSRW-1160	Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	286	46	15-Nov-14 A	18-Jan-16	0						
<b>TWSRW Zone 2 between CH155 and CH280</b>												
<b>At-Grade Roadworks</b>												



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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015					2016					
							Nov	Dec	Jan	Feb	Mar						
TWSRW-2120	Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	165	46	16-Oct-14 A	18-Jan-16	0											
TWSRW-2130	Noise Barrier NB1a - Footing adjacent Realigned TWSR West (Covered by VO 103) (Approx. 60.2m)	85	29	14-Sep-15 A	24-Dec-15	0											
TWSRW-2140	Rectification Works for Southern Trunk Sewer	48	29	30-Oct-15 A	24-Dec-15	0											
<b>TWSRW Zone 3 between CH280 and CH315</b>																	
<b>At-Grade Roadworks</b>																	
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	181	46	22-Jun-15 A	18-Jan-16	0											
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 2 (Approx. 120m) (by utilities undertakers)	111	16	21-Jul-15 A	06-Dec-15	0											
TWSRW-3140	Retaining Structure RW10 (to be covered by VO)	24	0	26-Oct-15 A	14-Nov-15 A												
TWSRW-3100	Noise Barrier NB1a - Footing adjacent Realigned TWSR West (Covered by VO 103) (Approx. 35.1m)	26	26	30-Nov-15	31-Dec-15	0											
<b>TWSRW Zone 4 between CH315 and CH376</b>																	
<b>Construction of Bridge E</b>																	
TWSRW-4080	Bridge Segment (South Bay)	80	0	01-Apr-15 A	22-Oct-15 A												
TWSRW-4090	Permanent Prestressing & Abutment Wall	28	19	23-Oct-15 A	12-Dec-15	0											
TWSRW-4100	Remove Scaffold System and Temporary Work together with Slope Reinstatement	75	75	14-Dec-15*	19-Mar-16*	7											
<b>At-Grade Roadworks</b>																	
TWSRW-4200	Cast Parapet, Lay Surfacing and Road Furniture for Footpath and Carriageway	35	35	05-Dec-15	18-Jan-16	0											
<b>TWSRW Zone 5 between CH376 and CH520</b>																	
<b>Construction of Retaining Structures</b>																	
TWSRW-5080	Retaining Structure along Slope no. 3SW-C/C898 (to be covered by VO. 78)	50	7	29-Jun-15 A	28-Nov-15	12											
<b>At-Grade Roadworks</b>																	
TWSRW-5110C	Road Drainage SMH801-804	80	19	27-Apr-15 A	12-Dec-15	0											
TWSRW-5110B	Road Drainage SMH800-801 (Covered by VO No.81)	36	0	03-Sep-15 A	23-Oct-15 A												
TWSRW-5100	Retaining Wall RW7 & RW8 - adjacent to Realigned TWSR West (66m)	70	50	29-Oct-15 A	21-Jan-16	0											
TWSRW-5110A	Road Formation, DN150 watermain, Kerb, Planter and Pavement	28	28	14-Dec-15	18-Jan-16	0											
TWSRW-5110	Retaining Wall RW9 (to be covered by VO)	45	45	19-Jan-16	17-Mar-16	6											
TWSRW-5120	Permanent Vehicular Access to Lot 81	125	125	22-Jan-16	30-Jun-16	469											
TWSRW-5130	Installation of Stone Facing Finish	45	45	22-Jan-16	21-Mar-16	3											
<b>TWSRW Zone 6 between CH520 and CH530</b>																	
<b>At-Grade Roadworks</b>																	
TWSRW-6110	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68)	65	14	22-May-15 A	07-Dec-15	40											
TWSRW-6100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert)	21	21	21-Dec-15	16-Jan-16	0											
<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	45	28-Jan-15 A	04-Jan-16	373											



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CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

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CEDD Contract No. CV/2012/09  
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Date	Revision	Checked	Approved
20-Nov-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015					2016		
							Nov	Dec	Jan	Feb	Mar			
TWSRW-7120*	Pipe Laying - DN450 Watermains (CHA)	70	15	29-May-15 A	08-Dec-15	10	Pipe Laying - DN450 Watermains (CHA)							
TWSRW-7160	Pipe Laying - DN150	70	25	13-Jul-15 A	19-Dec-15	0	Pipe Laying - DN150, Pipe Laying - DN150							
TWSRW-7100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut-slope)	21	21	21-Dec-15	16-Jan-16	0	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut-slope)							
TWSRW-7110	Implementation of TTA - Scheme W3	0	0	18-Jan-16		0	Implementation of TTA - Scheme W3							
TWSRW-7150	Remaining Road Drainage, Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)	56	56	18-Jan-16	01-Apr-16	0	Remaining Road Drainage, Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)							
<b>TWSRW Zone 8 between CH640 and CH695</b>														
<b>Kiu Tau Footbridge Re-provision (West)</b>														
TWSRW-8020	Construction of Pile Cap and Abutment	50	46	17-Nov-15 A	16-Jan-16	10	Construction of Pile Cap and Abutment, Construction of							
<b>At-Grade Roadworks</b>														
TWSRW-8120	Road Formation, Road Drainage, Kerb and Pavement	22	22	21-Dec-15	18-Jan-16	0	Road Formation, Road Drainage, Kerb and Pavement							
TWSRW-8110*	Pipe Laying - DN450 Watermains (CHA)	95	95	18-Jan-16	20-May-16	224	Pipe Laying - DN450 Watermains (CHA)							
<b>Remainder of the Works</b>														
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	45	28-Jan-15 A	04-Jan-16	373	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)							
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	111	16	21-Jul-15 A	06-Dec-15	0	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)							
<b>Remaining Works for Noise Barrier along realigned TWSR West</b>														
TWSRW-NB-110	Noise Barrier Steelworks & Panel for NB4 at Zones 1 & 2	20	20	21-Dec-15*	15-Jan-16	27	Noise Barrier Steelworks & Panel for NB4 at Zones 1 & 2							
TWSRW-NB-130	Noise Barrier Steelworks & Panel for NB1b at Zone 4	10	10	16-Jan-16	27-Jan-16	27	Noise Barrier Steelworks & Panel for NB1b at Zone 4							
TWSRW-NB-140	Noise Barrier Steelworks & Panel for NB2 at Zone 5	20	20	28-Jan-16	26-Feb-16	27	Noise Barrier Steelworks & Panel for NB2 at Zone 5							
<b>Stage N4A &amp; N4B - Realignment of Tai Wo Service Road East (KD-13 &amp; KD-14)</b>														
<b>TWSRE Zone 1 between CH100 and CH270</b>														
<b>At-Grade Roadworks</b>														
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	90	90	28-Dec-15	22-Apr-16	174	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East							
<b>TWSRE Zone 2 between CH270 and CH380</b>														
<b>At-Grade Roadworks</b>														
TWSRE-2030A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	30	350	17-Jul-15 A	04-Feb-17	280	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East							
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	29	05-Oct-15 A	24-Dec-15	174	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East							
TWSRE-2040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement	90	90	28-Dec-15	22-Apr-16	269	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement							
<b>TWSRE Zone 3 between CH380 and CH456</b>														
<b>At-Grade Roadworks</b>														
TWSRE-3020A*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	78	32	07-Jul-15 A	30-Dec-15	191	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East							
TWSRE-3040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement (Incl. FL/F10)	165	165	31-Dec-15	27-Jul-16	191	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement (Incl. FL/F10)							
<b>Roundabout A, Slip Road and Access Road</b>														
TWSRE-4060B	Access Road A - Road Formation, Kerb, Planter and Pavement	44	0	22-Jun-15 A	23-Oct-15 A		Access Road A - Road Formation, Kerb, Planter and Pavement							
TWSRE-4080	Preparation Works for Implementation of TTA Scheme E1	42	0	24-Jun-15 A	23-Oct-15 A		Preparation Works for Implementation of TTA Scheme E1							
TWSRE-4090	Implementation of TTA - Scheme E1 (Drawing No. CW/009/015)	0	0	24-Oct-15 A			Implementation of TTA - Scheme E1 (Drawing No. CW/009/015)							

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							Nov	Dec	Jan	Feb	Mar						
TWSRE-4070	Roundabout A - Road Formation, Kerb, Planter and Pavement	90	67	26-Oct-15 A	17-Feb-16	6											
TWSRE-4110	Preparation Works for Implementation of TTA Scheme E1A	30	30	26-Oct-15 A	28-Dec-15	118											
TWSRE-4030B	Slip Road Y (CH100-CH230) - Road Formation, Remaining Road Drainage, Kerb, Planter and Pavement	120	120	29-Dec-15	31-May-16	118											
TWSRE-4120	Implementation of TTA - Scheme E1A	0	0	29-Dec-15*		153											
TWSRE-4020	Slip Road Y (CH260-CH404) - Road Formation, Road Drainage, Kerb, Planter and Pavement	108	108	07-Jan-16	25-May-16	6											
<b>Stage 1C - Viaduct Structure &amp; TCSS Civil Provisions (KD-9)</b>																	
<b>Preliminaries</b>																	
B-3050	Relocation of Plant including Pre-drilling Works	21	21	11-Jan-16	03-Feb-16	79											
<b>Foundation &amp; Pier Construction</b>																	
<b>Bridge A</b>																	
BA-05-1030	Pier AA5 - Pier Construction (Twin Pier)	27	39	29-Oct-14 A	08-Jan-16	21											
BA-01-1010	Abutment AA1 - Pile Test	14	14	06-May-15 A	07-Dec-15	260											
BA-18-1030	Pier AA18 - Pier Construction	56	13	08-May-15 A	05-Dec-15	39											
BA-11-1010	Pier AA11 - Pile Test	14	19	18-Aug-15 A	12-Dec-15	26											
BA-12-1030	Pier AA12 - Pier Construction	35	25	10-Oct-15 A	19-Dec-15	63											
BA-07-1020	Pier AA7 - Pile Cap	30	13	30-Oct-15 A	05-Dec-15	32											
BA-09-1030	Pier AA9 - Pier Construction (Twin Pier)	49	46	07-Nov-15 A	16-Jan-16	40											
BA-11-1000B	Pier AA11 - Piling Works (P2)	12	0	10-Nov-15 A	20-Nov-15 A												
BA-10-1000	Pier AA10 - Piling Works	24	24	21-Nov-15	18-Dec-15	5											
BA-11-1020	Pier AA11 - Pile Cap	30	30	14-Dec-15	20-Jan-16	26											
BA-01-1000b	Abutment AA1 - Piling Works (P1)	12	12	19-Dec-15	05-Jan-16	5											
BA-02-1000	Pier AA2W - Piling Works	12	12	06-Jan-16	19-Jan-16	5											
BA-10-1010	Pier AA10 - Pile Test	14	14	08-Jan-16	23-Jan-16	23											
BA-07-1030	Pier AA7 - Pier Construction	28	28	18-Jan-16	25-Feb-16	40											
BA-08-1000	Pier AA8 - Piling Works	24	24	20-Jan-16	23-Feb-16	5											
BA-11-1030	Pier AA11 - Pier Construction	35	35	21-Jan-16	08-Mar-16	39											
BA-10-1020	Pier AA10 - Pile Cap	30	30	25-Jan-16	05-Mar-16	23											
BA-02-1010	Pier AA2W - Pile Test	14	14	05-Feb-16	27-Feb-16	125											
<b>Bridge B</b>																	
BB-01-1010	Abutment AB1 - Pile Test	14	14	18-Aug-15 A	07-Dec-15	295											
BB-07-1040	Portal AB7/AD9 - Portal Beam Construction together with Kicker	60	9	19-Sep-15 A	01-Dec-15	6											



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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015					2016			
							Nov	Dec	Jan	Feb	Mar				
BB-06-1040	Pier AB6W - Pier Construction	48	0	05-Oct-15 A	18-Nov-15 A		Pier AB6W - Pier Construction								
BB-03-1010	Pier AB3 - Pile Test	14	0	13-Oct-15 A	29-Oct-15 A		Pier AB3 - Pile Test								
BB-03-1020	Pier AB3 - Pile Cap	30	13	26-Oct-15 A	05-Dec-15	101	Pier AB3 - Pile Cap, Pier AB3 - Pile Cap								
BB-12-1020	Abutment AB12/AD14 - Pile Cap	65	52	28-Oct-15 A	23-Jan-16	43	Abutment AB12/AD14 - Pile Cap								
BB-11-1030	Pier AB11 - Pier Construction	45	29	06-Nov-15 A	24-Dec-15	7	Pier AB11 - Pier Construction, Pier AB11 - Pier Construction								
BB-06-1030	Pier AB6E - Pier Construction	48	48	21-Nov-15	19-Jan-16	22	Pier AB6E - Pier Construction								
BB-12-1030	Abutment AB12/AD14 - Abutment Construction	75	75	25-Jan-16	03-May-16	175	Abutment AB12/AD14 - Abutment Construction								
BB-06-1050	Portal AB6 - Portal Beam Construction together with Kicker	40	40	28-Jan-16	21-Mar-16	22	Portal AB6 - Portal Beam Construction together with Kicker								
BB-04-1000	Pier AB4 - Piling Works	24	24	04-Feb-16	09-Mar-16	79	Pier AB4 - Piling Works								
<b>Bridge C</b>															
BC-12-1030	Pier AC12 - Pier Construction	28	16	10-Jun-15 A	09-Dec-15	26	Pier AC12 - Pier Construction, Pier AC12 - Pier Construction								
BC-04-1030	Pier AC4 - Pier Construction	35	0	03-Sep-15 A	12-Nov-15 A		Pier AC4 - Pier Construction								
BC-03-1000	Pier AC3 - Piling Works	24	0	09-Oct-15 A	07-Nov-15 A		Pier AC3 - Piling Works								
BC-01-1030	Abutment AC1 - Abutment Construction	50	50	21-Nov-15	21-Jan-16	0	Abutment AC1 - Abutment Construction								
BC-03-1010	Pier AC3 - Pile Test	14	14	24-Nov-15	09-Dec-15	136	Pier AC3 - Pile Test								
BC-03-1020	Pier AC3 - Pile Cap	30	30	10-Dec-15	16-Jan-16	136	Pier AC3 - Pile Cap								
BC-02-1020	Pier AC2 - Pile Cap	30	30	14-Dec-15	20-Jan-16	96	Pier AC2 - Pile Cap								
BC-02-1030	Pier AC2 - Pier Construction	45	45	21-Jan-16	19-Mar-16	96	Pier AC2 - Pier Construction								
<b>Bridge D</b>															
BD-11-1040	Pier AD11W - Pier Construction	84	0	26-Aug-15 A	29-Oct-15 A		Pier AD11W - Pier Construction								
BD-13-1020	Pier AD13 - Pile Cap	30	0	02-Sep-15 A	24-Oct-15 A		Pier AD13 - Pile Cap								
BD-12-1020	Pier AD12 - Pile Cap	30	0	24-Sep-15 A	13-Nov-15 A		Pier AD12 - Pile Cap								
BD-01-1020	Abutment AD1 - Pile Cap	30	19	04-Nov-15 A	12-Dec-15	96	Abutment AD1 - Pile Cap, Abutment AD1 - Pile Cap								
BD-08-1040	Portal AC11/AD8 - Portal Beam Construction together with Kicker	40	40	03-Dec-15	21-Jan-16	19	Portal AC11/AD8 - Portal Beam Construction together with Kicker								
BD-01-1030	Abutment AD1 - Abutment Construction	50	50	14-Dec-15	19-Feb-16	246	Abutment AD1 - Abutment Construction								
BD-09-1040	Portal AD9/AC12 - Portal Beam Construction together with Kicker	40	40	18-Dec-15	05-Feb-16	26	Portal AD9/AC12 - Portal Beam Construction together with Kicker								
BD-13-1030	Pier AD13 - Pier Construction	45	45	28-Dec-15	25-Feb-16	22	Pier AD13 - Pier Construction								
BD-11-1020A	Pier AD11E - Pile Cap	30	30	25-Jan-16	05-Mar-16	43	Pier AD11E - Pile Cap								
<b>Pier Table Construction</b>															
<b>Bridge A</b>															
PA-1130	Pier Table Construction at Pier AA13 (4 nos.)	50	0	25-Jul-15 A	02-Nov-15 A		Pier Table Construction at Pier AA13 (4 nos.)								

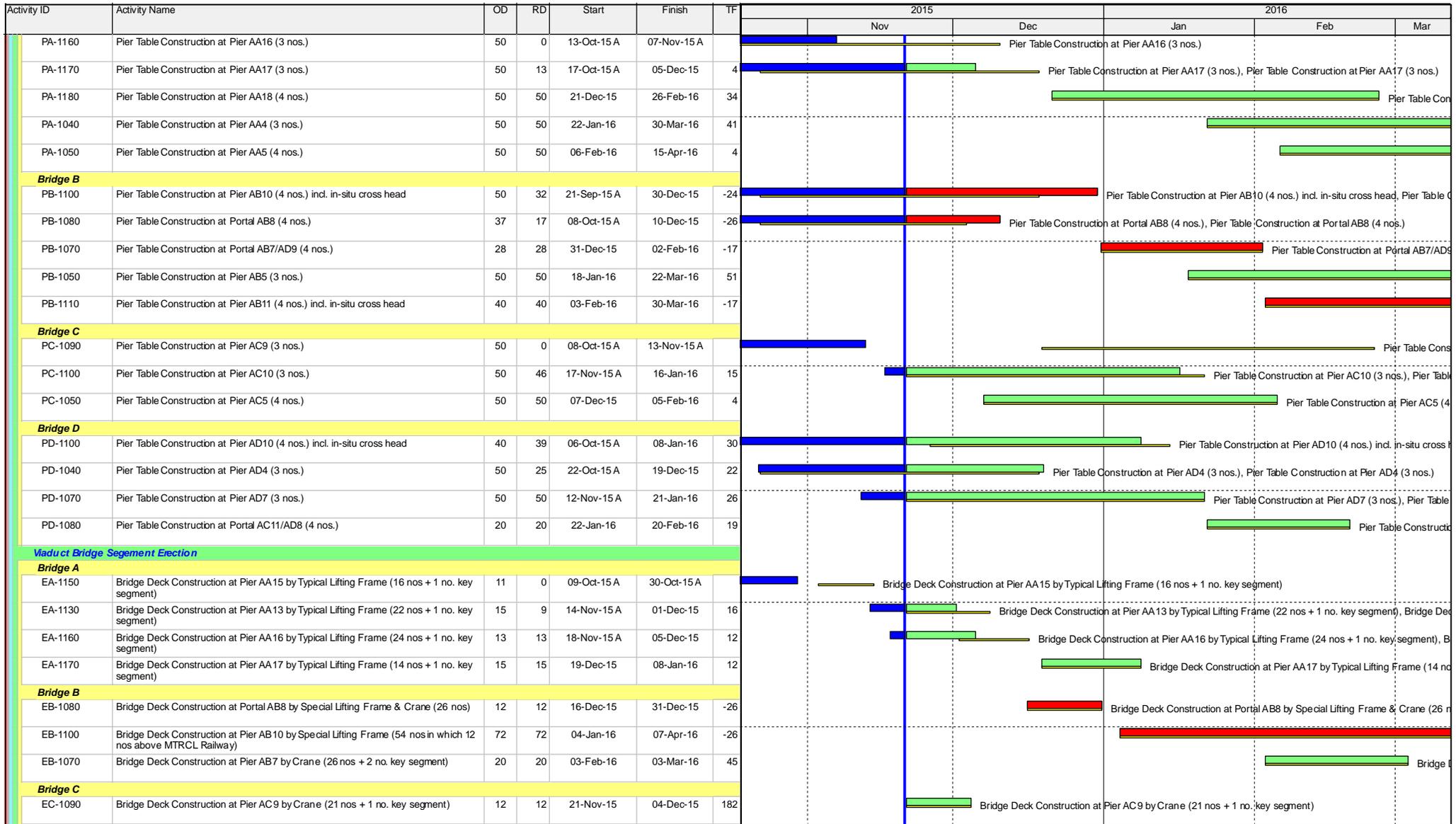


俊和建築工程有限公司  
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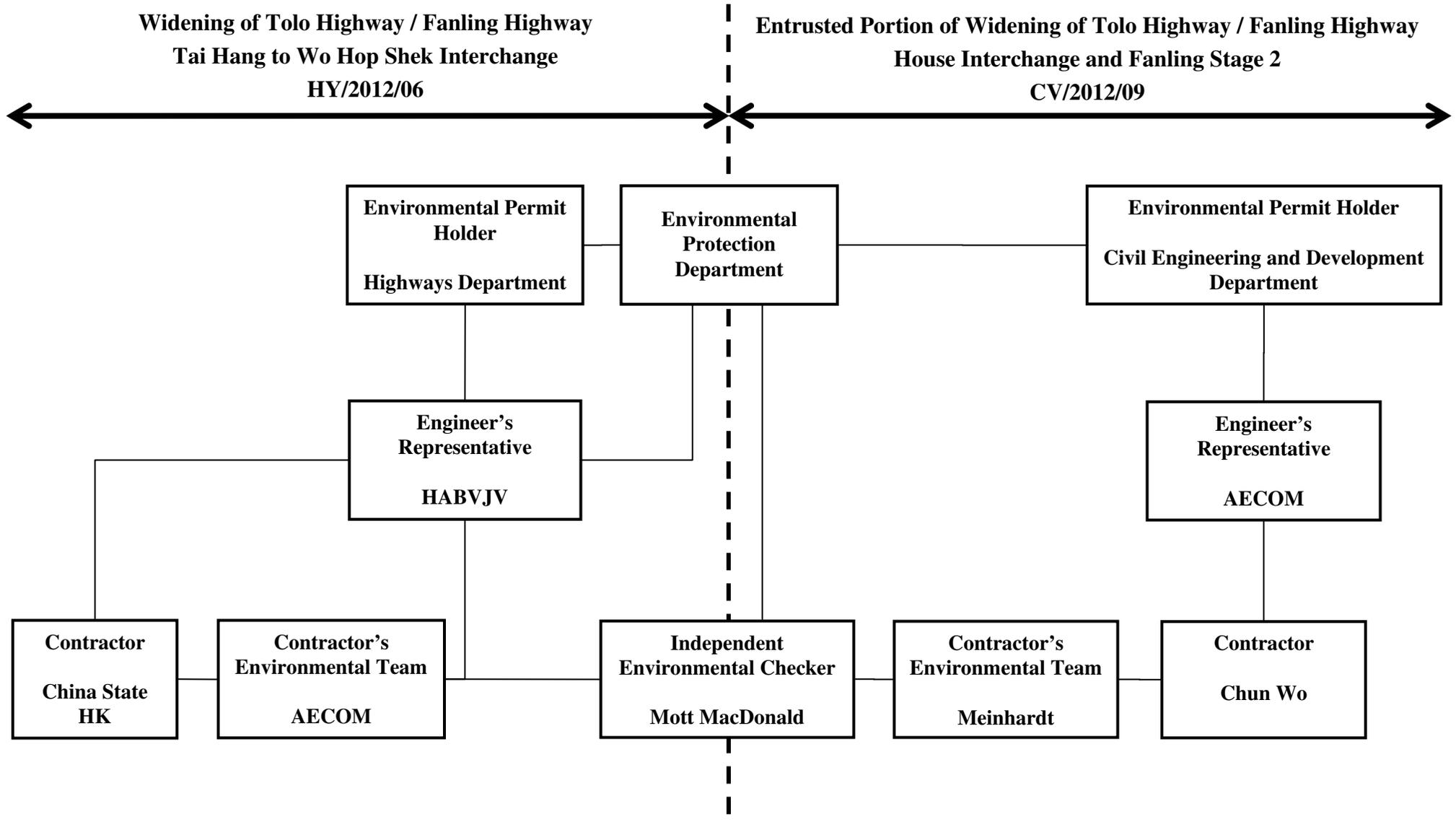
Date	Revision	Checked	Approved
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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015			2016			
							Nov	Dec	Jan	Feb	Mar		
EC-1100	Bridge Deck Construction at Pier AC10 by Typical Lifting Frame (10 nos + 1 no. key segment)	15	15	26-Jan-16	18-Feb-16	12							
<b>Bridge D</b>													
ED-1050	Bridge Deck Construction at Pier AD5 by Typical Lifting Frame (12 nos)	13	0	20-Oct-15 A	05-Nov-15 A								
ED-1060	Bridge Deck Construction at Pier AD6 by Typical Lifting Frame (18 nos + 1 no. key segment)	11	11	07-Dec-15	18-Dec-15	12							
ED-1040	Bridge Deck Construction at Pier AD4 by Typical Lifting Frame (14 nos + 2 no. key segment)	14	14	09-Jan-16	25-Jan-16	12							
ED-1100	Bridge Deck Construction at Portal AD10 by Crane (52 nos)	32	32	09-Jan-16	22-Feb-16	54							
ED-1070	Bridge Deck Construction at Pier AD7 by Typical Lifting Frame (26 nos + 1 no. key segment)	15	15	19-Feb-16	07-Mar-16	12							
<b>Section VI - Works in Portion FH9 (KD-6A)</b>													
<b>Major Works</b>													
S6-2000*	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	127	06-Feb-15 A	03-May-16	175							

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# Appendix B

## Project Organization Structure



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



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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

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

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

DATA TABULATION

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

CALCULATIONS

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

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

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

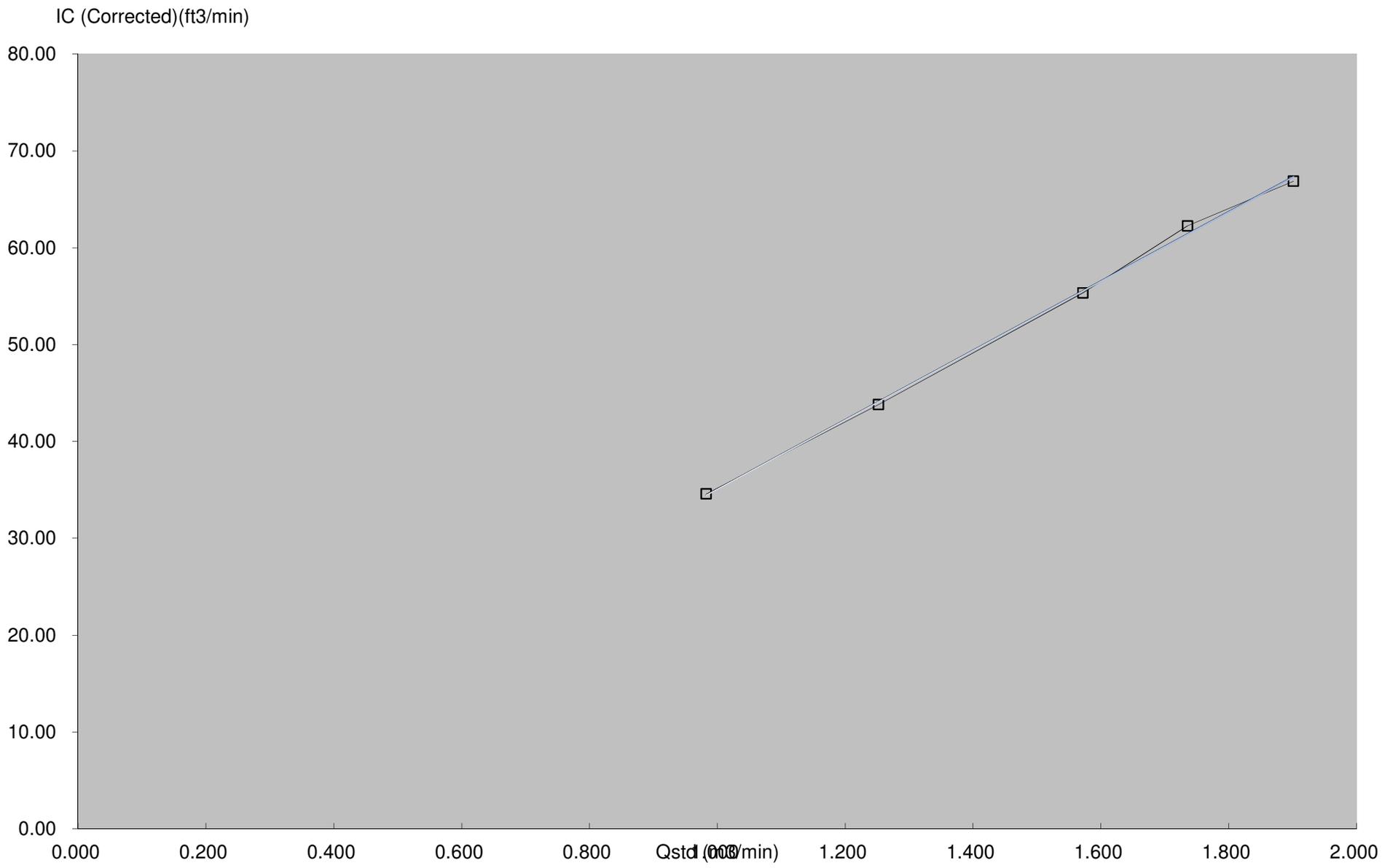
$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

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





TEST REPORT  
for  
SOUND CALIBRATOR

Model : NC - 74

Serial No. : 34857296

Condition : Temperature 25 °C

Humidity 64 %RH

Date : September, 8, 2015

Signature : *Y. Kitajima*

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

Applicable standards

JIS C 1515:2004 class1

IEC 60942:2003 class1



# Calibration Certificate

Certificate No. **508784**

Page 1 of 3 Pages

**Customer :** Enovative Environmental Service Limited

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

**Order No. :** Q53442

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

## Item Tested

**Description :** Sound Level Meter

**Manufacturer :** B&K

**Model :** 2238

**Serial No. :** 2694908

## Test Conditions

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

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

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

## Test Results

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

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

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C147450	SCL-HKSAR
S240	Sound Level Calibrator	500563	NIM-PRC & SCL-HKSAR

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

The test equipment used for calibration are traceable to International System of Units (SI).

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

**Calibrated by :**   
Alan Chu

**Approved by :**   
Steve Kwan

**Date:** 15-Oct-15

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
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EO



# Calibration Certificate

Certificate No. **508784**

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Results :

## 1. SPL Accuracy

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

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

## 2. Level Stability : 0.0 dB

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

## 3. Linearity

### 3.1 Level Linearity

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

Uncertainty :  $\pm 0.1$  dB

### 3.2 Differential level linearity

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

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

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## 4. Frequency Weighting

A weighting

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

Uncertainty :  $\pm 0.1$  dB

## 5. Time Averaging

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

Uncertainty :  $\pm 0.1$  dB

- Remarks:
1. UUT : Unit-Under-Test
  2. The uncertainty claimed is for a confidence probability of not less than 95%.
  3. Atmospheric Pressure : 1008 hPa
  4. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.
  5. \* Out of specification.

----- END -----

# Appendix D

## EM&A Monitoring Schedules

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

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

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

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

# **Appendix E**

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

# Daily Extract of Meteorological Observations , November 2015

## - Sheung Shui

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	1021.3	24.8	21.3	18.7	16.1	73	0.0	***	***
02	1020.3	25.8	20.7	18.0	14.1	66	0.0	***	***
03	1019.4	26.6	23.0	19.8	17.0	69	0.0	***	***
04	1017.9	29.4	24.7	21.9	20.1	76	0.0	***	***
05	1015.9	28.7	25.7	23.2	21.7	79	0.0	***	***
06	1015.3	28.6	26.1	25.1	21.8	78	0.0	***	***
07	1015.9	29.9	26.6	24.9	23.0	81	0.0	***	***
08	1016.0	31.9	27.1	25.1	23.2	80	0.0	***	***
09	1015.6	31.9	26.4	23.4	22.3	79	0.0	***	***
10	1016.8	27.1	24.3	22.3	19.7	76	0.0	***	***
11	1017.3	28.1	24.3	22.3	19.7	76	0.0	***	***
12	1017.0	24.9	24.1	23.4	20.4	80	0.0	***	***
13	1015.2	25.9	22.8	19.9	21.0	89	15.0	***	***
14	1014.6	27.8	23.3	19.9	20.8	87	0.0	***	***
15	1014.9	26.0	24.5	22.5	21.3	82	0.0	***	***
16	1013.2	28.6	25.6	23.6	22.6	84	0.0	***	***
17	1013.5	29.6	25.8	23.5	22.9	85	0.0	***	***
18	1015.7	32.8	25.8	21.9	22.2	82	0.0	***	***
19	1016.7	30.2	25.5	22.2	22.1	83	0.0	***	***
20	1016.7	28.3	25.1	22.8	21.3	80	0.0	***	***
21	1016.8	26.8	24.9	23.1	20.6	78	0.0	***	***
22	1016.9	30.5	25.3	22.9	21.1	79	1.0	***	***
23	1016.6	30.3	24.9	21.5	19.9	75	0.0	***	***
24	1016.7	28.3	23.7	21.1	18.6	74	0.0	***	***
25	1018.0	26.4	21.3	15.9	15.6	71	0.0	***	***
26	1021.3	22.2	16.7	13.3	4.7	46	0.0	***	***
27	1022.9	21.4	16.8	12.5	7.1	53	0.0	***	***
28	1022.5	24.5	19.8	16.4	13.5	68	0.0	***	***
29	1021.3	27.5	20.6	16.6	16.3	78	0.0	***	***
30	1019.0	27.1	21.2	17.3	16.9	78	0.0	***	***

\*\*\* unavailable

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

# **Appendix F**

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

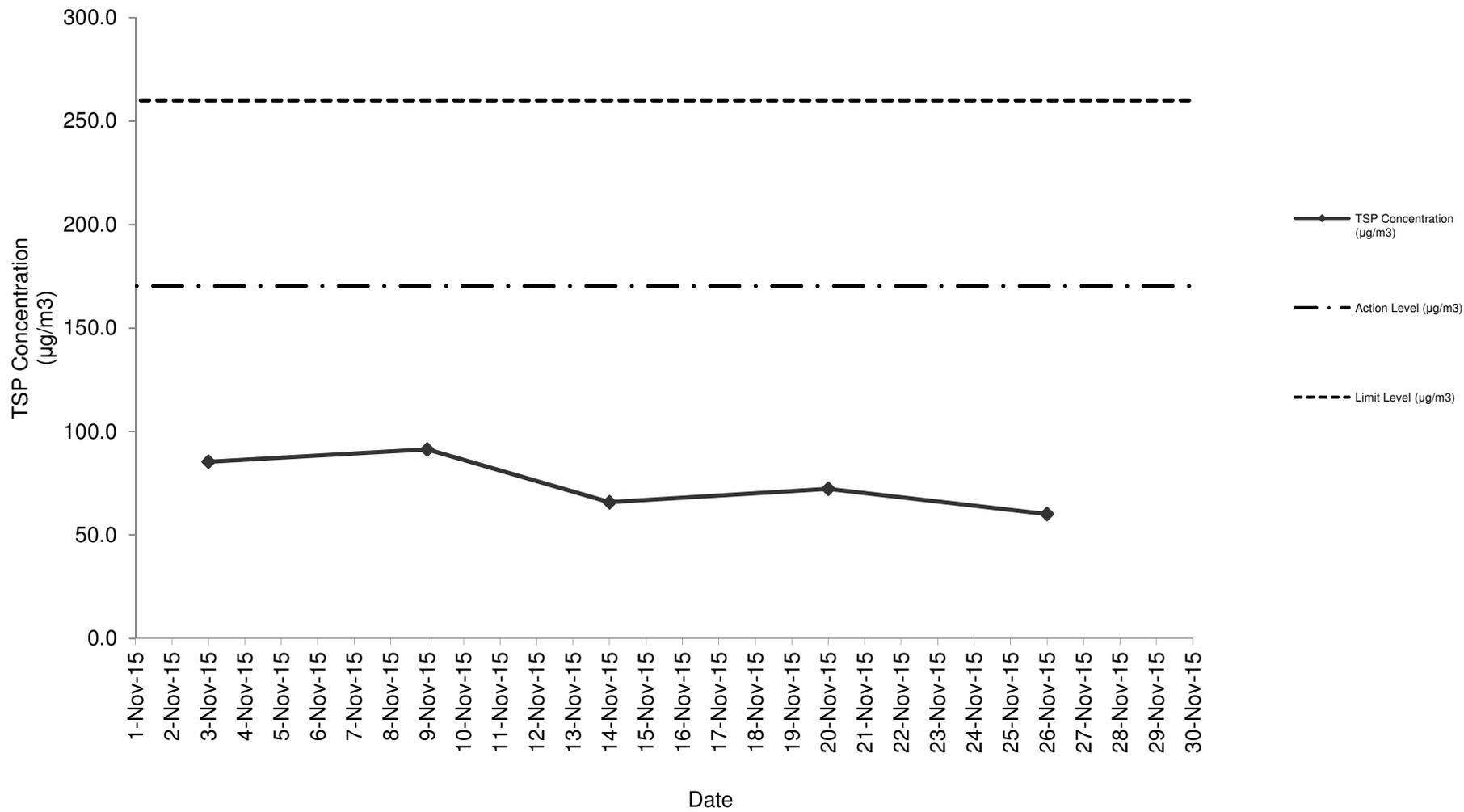
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

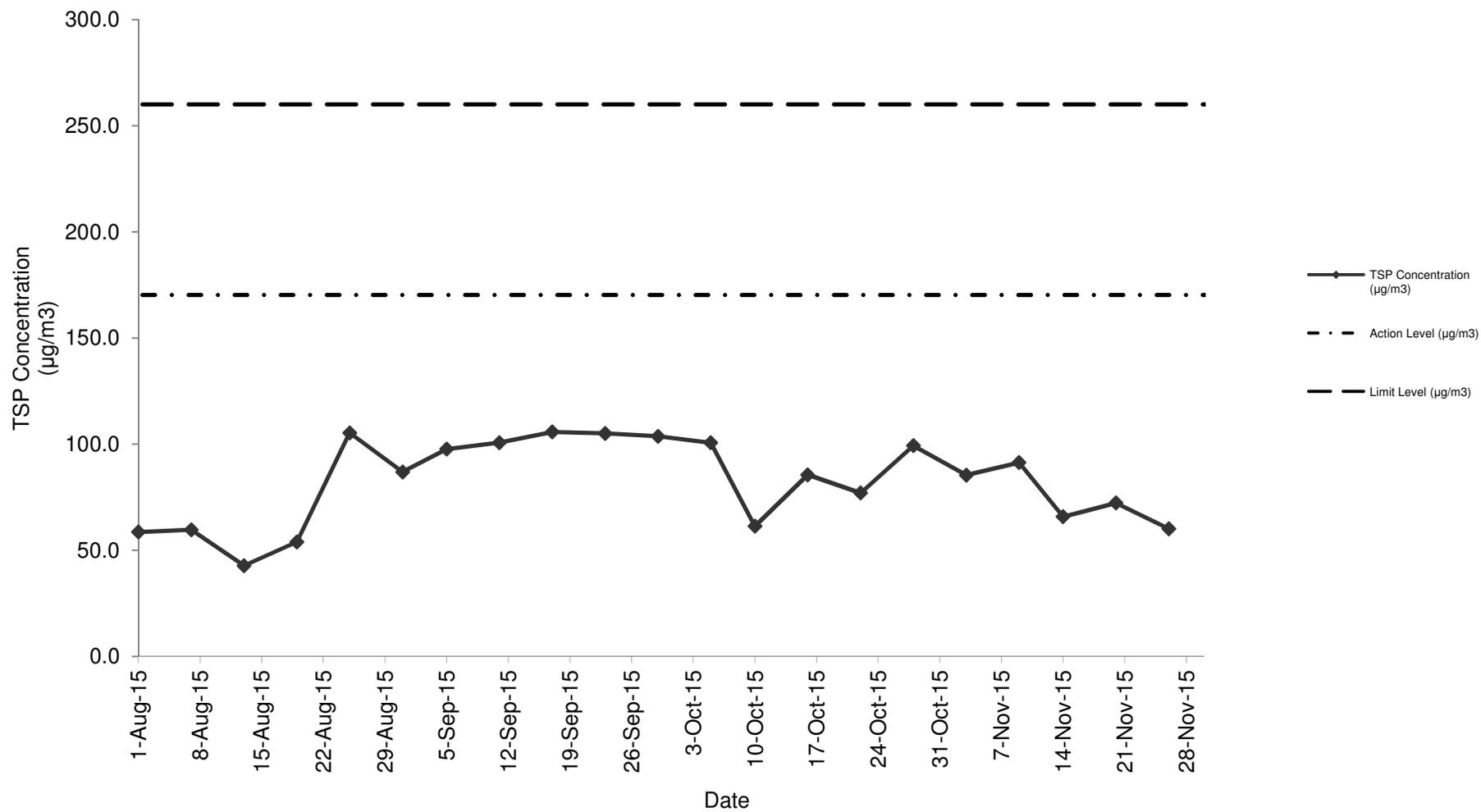
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
3-Nov-15	Sunny	12:11	C45	2.8536	3.0312	0.1776	3955.67	3979.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	85.4	170.3	260.0	<5	N
9-Nov-15	Sunny	12:10	C47	2.8249	3.0149	0.1900	3982.67	4006.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	91.4	170.3	260.0	<5	N
14-Nov-15	Sunny	12:12	C49	2.8308	2.9677	0.1369	4009.67	4033.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	65.8	170.3	260.0	<5	N
20-Nov-15	Sunny	12:10	C51	2.8297	2.9801	0.1504	4036.67	4060.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	72.3	170.3	260.0	<5	N
26-Nov-15	Sunny	12:12	C53	2.8091	2.9342	0.1251	4063.67	4087.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	60.2	170.3	260.0	<5	N
																<b>Average</b>	75.0				
																<b>Min</b>	60.2				
																<b>Max</b>	91.4				

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 (August 2015 - November 2015)



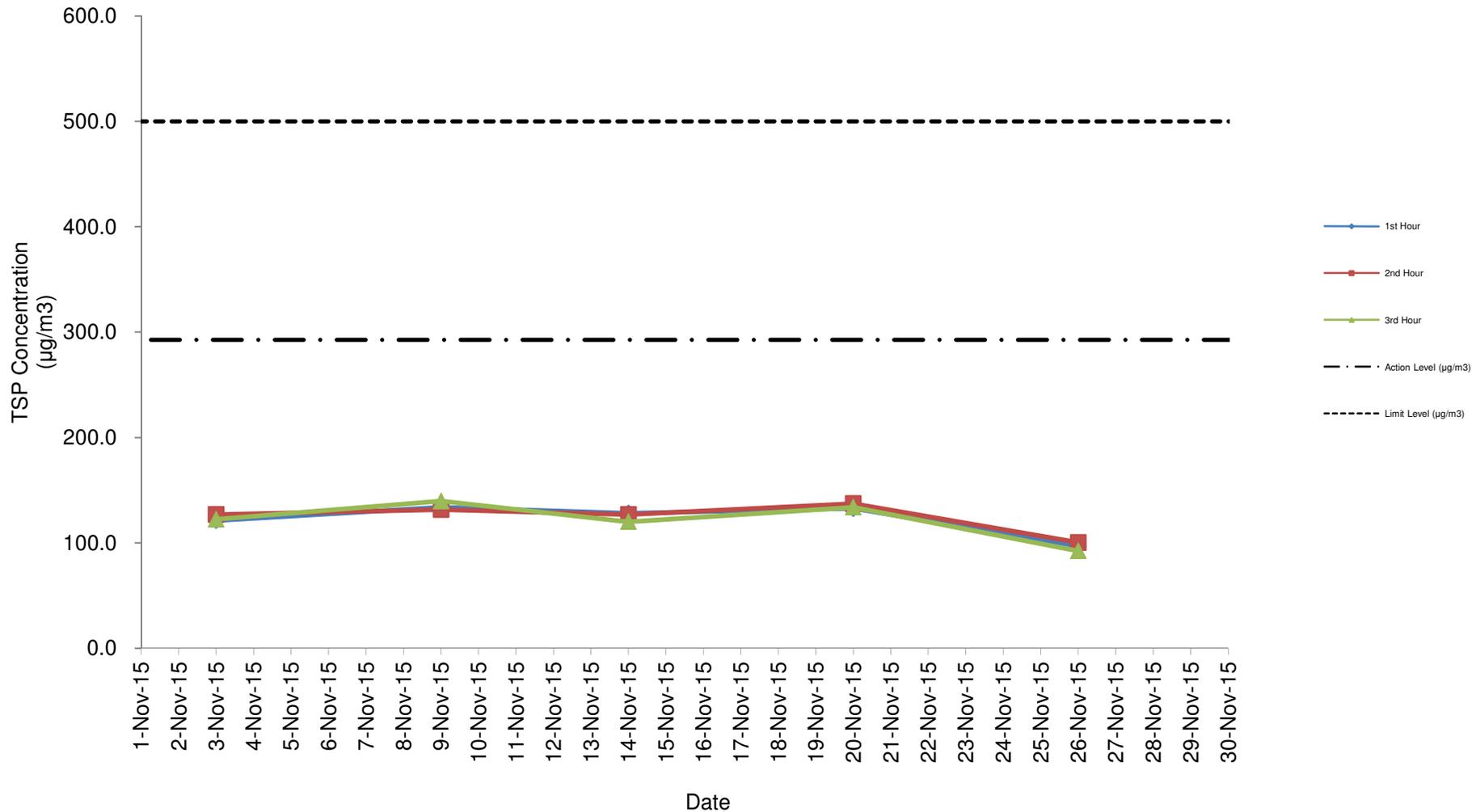
Appendix F  
Air Quality Monitoring Results and their Graphical Presentation

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

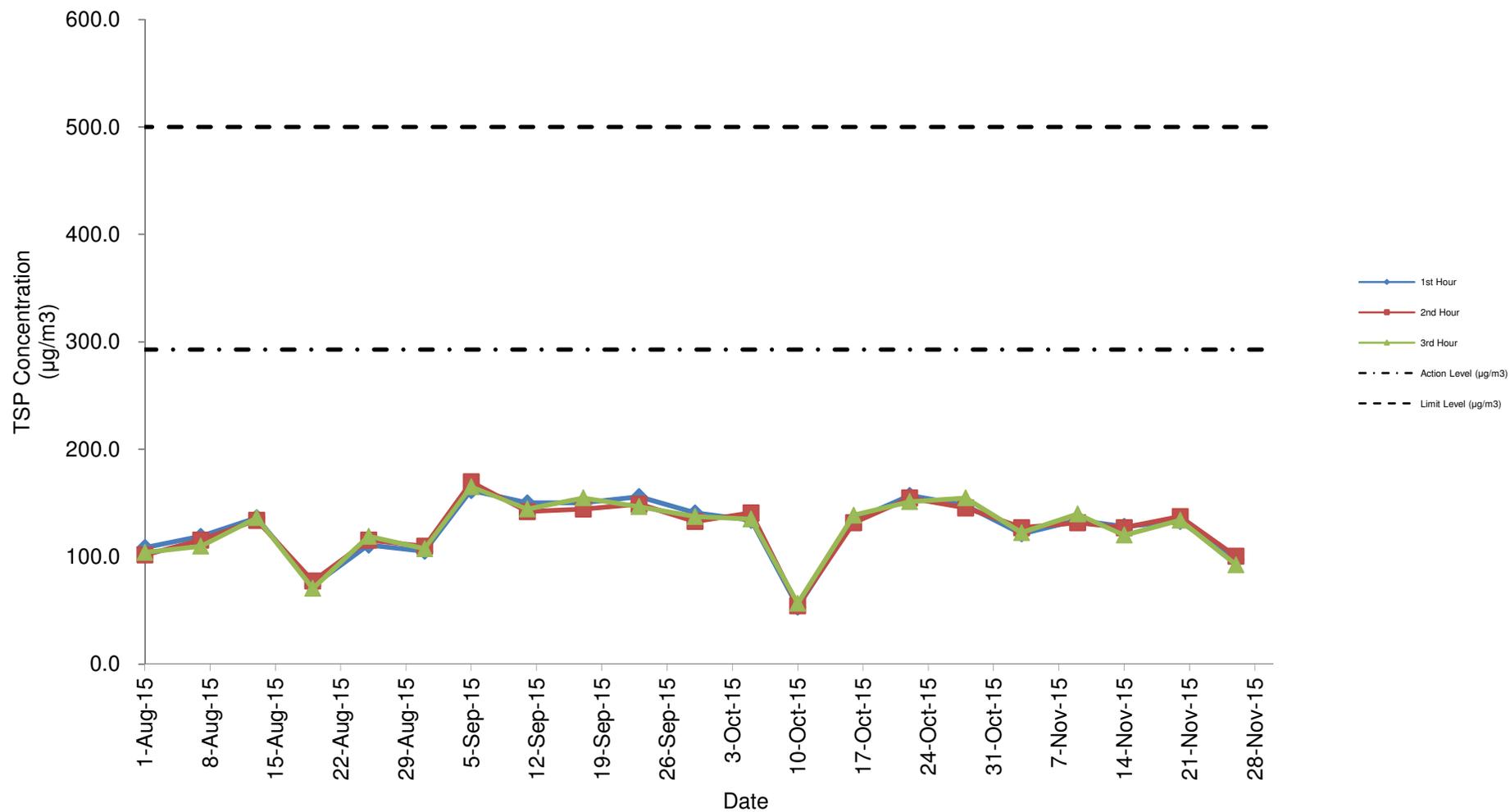
Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m <sup>3</sup> /min)			Total Volume (m <sup>3</sup> )	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Wind speed m/s	Wind direction
				Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
3-Nov-15	Sunny	09:00	C46A	2.8544	2.8649	0.0105	3952.67	3953.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	121.2	292.7	500.0	<5	N
	Sunny	10:03	C46B	2.8341	2.8451	0.0110	3953.67	3954.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	126.9	292.7	500.0	<5	N
	Sunny	11:07	C46C	2.8409	2.8515	0.0106	3954.67	3955.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	122.3	292.7	500.0	<5	N
9-Nov-15	Sunny	09:00	C48A	2.8139	2.8255	0.0116	3979.67	3980.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	133.9	292.7	500.0	<5	N
	Sunny	10:03	C48B	2.8246	2.8360	0.0114	3980.67	3981.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	131.6	292.7	500.0	<5	N
	Sunny	11:07	C48C	2.8370	2.8491	0.0121	3981.67	3982.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	139.6	292.7	500.0	<5	N
14-Nov-15	Sunny	09:00	C50A	2.8305	2.8416	0.0111	4006.67	4007.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	128.1	292.7	500.0	<5	N
	Sunny	10:03	C50B	2.8314	2.8424	0.0110	4007.67	4008.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	126.9	292.7	500.0	<5	N
	Sunny	11:06	C50C	2.8317	2.8421	0.0104	4008.67	4009.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	120.0	292.7	500.0	<5	N
20-Nov-15	Sunny	09:00	C52A	2.8334	2.8449	0.0115	4033.67	4034.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	132.7	292.7	500.0	<5	N
	Sunny	10:03	C52B	2.8216	2.8335	0.0119	4034.67	4035.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	137.3	292.7	500.0	<5	N
	Sunny	11:07	C52C	2.8345	2.8461	0.0116	4035.67	4036.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	133.9	292.7	500.0	<5	N
26-Nov-15	Sunny	09:00	C53A	2.8199	2.8283	0.0084	4060.67	4061.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	96.9	292.7	500.0	<5	N
	Sunny	10:03	C53B	2.8114	2.8201	0.0087	4061.67	4062.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	100.4	292.7	500.0	<5	N
	Sunny	11:06	C53C	2.8165	2.8245	0.0080	4062.67	4063.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	92.3	292.7	500.0	<5	N
<b>Average</b>																122.9					
<b>Min</b>																92.3					
<b>Max</b>																139.6					

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

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



### 1-Hour TSP Monitoring Result at station: SR77 (August 2015 - November 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

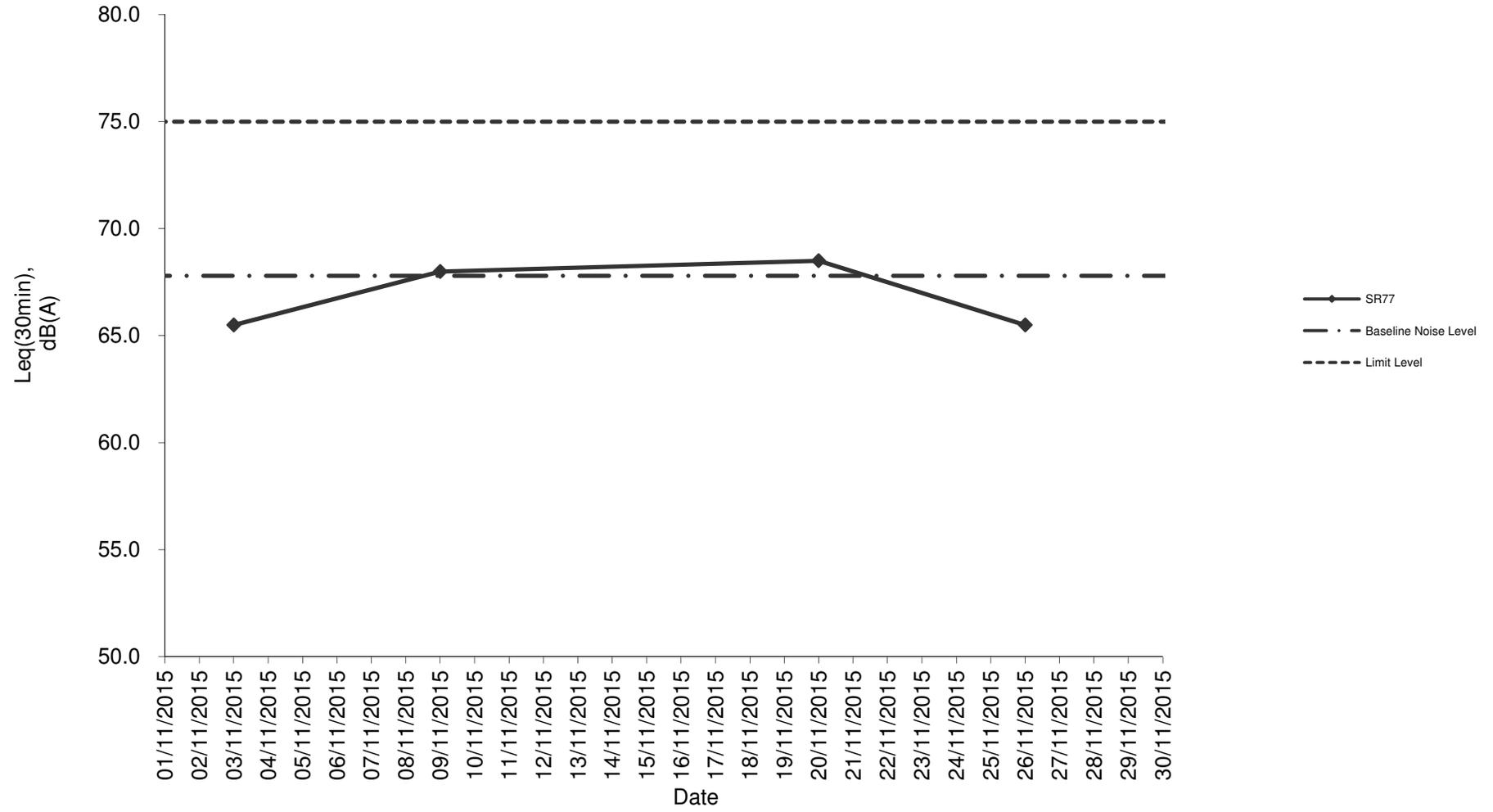
Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)	Exceedance (Y / N)
				L10(30min)	L90(30min)	Leq(30min)				
2015/11/03	Fine	14:00	14:30	81.5	56.0	65.5	-	67.8	75.0	N
2015/11/09	Fine	16:30	17:00	86.0	53.5	68.0	-	67.8	75.0	N
2015/11/20	Fine	16:00	16:30	90.0	54.0	68.5	-	67.8	75.0	N
2015/11/26	Fine	15:30	16:00	87.0	63.0	65.5	-	67.8	75.0	N
						<b>Average</b>	66.9			
						<b>Minimum</b>	65.5			
						<b>Maximum</b>	68.5			

**Remarks**

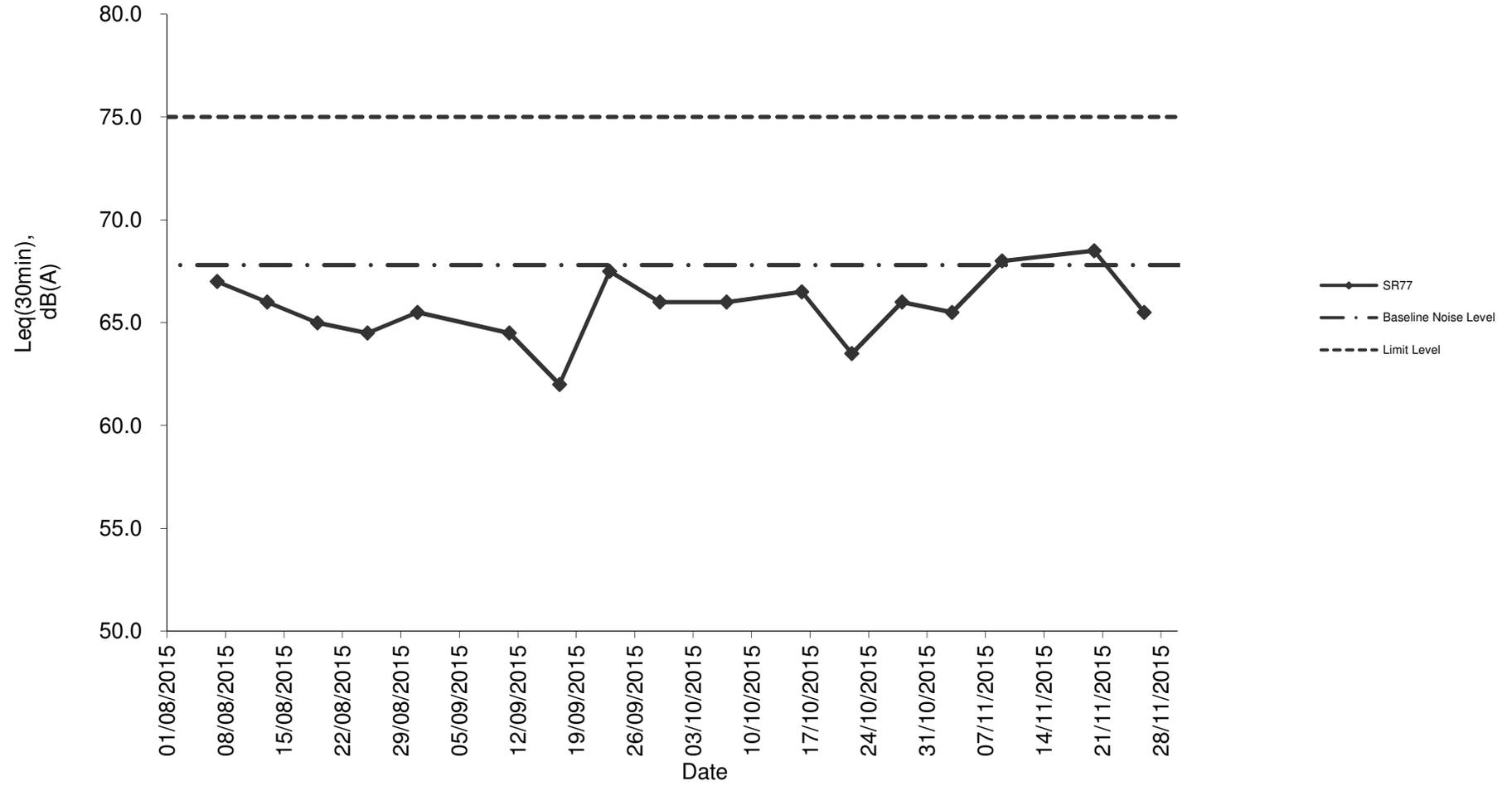
\* +3dB(A) Façade effect correction included

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

### Noise monitoring result: SR77



### Noise monitoring result: SR77 (August 2015 - November 2015)



# Appendix K Waste Flow Table

### Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Soil	Soil Reused in the Contract	Soil Reused in other Projects	Soil Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging (Note 3)	Plastics	Chemical Waste	General Refuse (Note 2)
Unit	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in m3)	(in '000m3)
Jan-15	3.969	0.105	3.864	0.648	-	3.216	0.118	-	-	-	0.040	0.080
Feb-15	2.478	0.049	2.429	1.518	-	0.911	0.100	-	-	0.003	0.900	0.070
Mar-15	3.742	0.029	3.713	0.270	-	3.443	0.100	-	-	0.006	-	0.080
Apr-15	3.711	0.115	3.597	2.308	-	1.289	0.090	0.003	-	-	-	0.065
May-15	1.554	0.197	1.357	0.108	-	1.249	0.100	-	-	0.012	-	0.065
Jun-15	2.568	0.053	2.515	0.840	-	1.675	0.125	-	-	0.030	0.800	0.060
Sub-Total	18.022	0.548	17.475	5.692	-	11.783	0.633	0.003	-	0.051	1.740	0.420
Jul-15	1.207	0.030	1.177	0.351	-	0.826	1.564	-	-	-	-	0.065
Aug-15	2.130	0.164	1.966	0.294	-	1.672	0.956	0.002	-	0.001	-	0.130
Sep-15	2.119	0.027	2.092	0.264	-	1.828	0.771	-	-	0.001	-	0.115
Oct-15	2.843	0.381	2.462	1.500	-	0.962	0.226	-	-	0.001	-	0.125
Nov-15	3.699	0.709	2.990	1.200	-	1.790	0.066	0.001	-	-	-	0.130
Dec-15	-	-	-	-	-	-	-	-	-	-	-	-
Total	30.020	1.859	28.162	9.301	-	18.861	4.216	0.006	-	0.054	1.740	0.985

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

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

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

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





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

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

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

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

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

**Cumulative Complaint Log**

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>	



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