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

Monthly EM&A Report

August 2016

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

(August 2016)

Certified by: Fredrick Leong

Position: Environmental Team Leader

Date: 12 September 2016

MOTT MACDONALD

Hyder-Arup-Black & Veatch Joint Venture
c/o Arcadis
20/F, AXA Tower, Landmark East,
100 How Ming Street,
Kwun Tong, Hong Kong
Attn: Mr. James Penny

Your Reference

Our Reference
JFP/EC/ST/pl/T329380/22
.05/L-0133

20/F AIA Kowloon Tower
Landmark East
100 How Ming Street
Kwun Tong
Kowloon
Hong Kong

T +852 2828 5757
F +852 2827 1823
mottmac.hk

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 – August 2016 for the portion of Stage 2 works entrusted to Civil Engineering and Development Department (CEDD) under Contract No. CV/2012/09

12 September 2016
By Fax (2805 5028) & Hand

We refer to the revised Monthly EM&A Report – August 2016 received on 12 September 2016 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – August 2016 (Rev. 0) for the portion of works under Stage 2 of the captioned Project which is entrusted to CEDD under Contract No. CV/2012/09.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

Steven Tang
Independent Environmental Checker

c.c.

HyD	Mr. Chung Lok Chin	By Fax (2714 5198)
CEDD/BCP	Mr. Desmond Lam	By Fax (3547 1659)
AECOM	Mr. Alan Lee	By Fax (3922 9797)
Meinhardt	Mr. Fredrick Leong	By Fax (2540 1580)

Date	Revision	Prepared By	Checked By	Approved By
12 September 2016	0	Ivan TING Cindy KWOK	Fredrick LEONG	Helen COCHRANE

Contents

List of Tables

List of Figures

List of Appendices

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. Please note noise monitoring originally scheduled to be conducted 4 August 2016 has been rescheduled to 5 August 2016 due to raining.

This report documents the findings of EM&A works conducted in August 2016. As informed by the Contractor, the major activities in the reporting month were:

- Cable Detection and Trial Trenches;
- Installation of Stone Cladding;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Piling Works for Viaduct;
- Piling Works for Noise Barrier;
- Retaining Wall Construction;
- Road Works;
- Sewer Works;
- Slope Works;
- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Water Main Laying.

Breach of Action and Limit Levels for Air Quality

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

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

Breach of Action and Limit Levels for Noise

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

Breach of Action and Limit Levels for Water Quality

The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 originally scheduled from 19 February 2016. However, the mentioned works were cancelled and postponed to the next dry season in late 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.

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;
- Demolition of the Existing Vehicular Bridge between Tai Wo Service West and Tai Wo Service Road East;
- Installation of Stone Cladding;
- Cap Pier Construction of Kiu Tau Footbridge;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Piling Works for Viaduct;
- Piling Works for Noise Barrier;
- Road Works;

- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Water Main Laying.

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 August 2016.

1.3 Report Structure

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

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Status of Environmental Licenses, Notifications and Permits
- Section 4: Air Quality Monitoring
- Section 5: Noise Monitoring
- Section 6: Water Monitoring
- Section 7: Waste Management
- Section 8: Environmental Site Inspection and Audit
- Section 9: Implementation Status of Environmental Mitigation Measures
- Section 10: Summary of EP Submission in the Reporting Month
- Section 11: Environmental Non-Conformance
- Section 12: Future Key Issues
- Section 13: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 Tolo Highway and Fanling Highway are expressways in the North East New Territories connecting Sha Tin, Tai Po and Fanling. These highways form a vital part of the strategic Route 1, which links Hong Kong Island to Shenzhen. At present, this section of Route 1 is a dual 3-lane carriageway. However, at several major interchanges along this section of Route 1, the highway is only dual-2 lane. Severe congestion is a frequent occurrence during peak periods, particularly in the Kowloon bound direction.

2.1.2 The objective of the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.

2.1.3 The construction works for the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling are to be delivered in 2 stages:

- Stage 1 – Construction works between Island House Interchange and Tai Hang; and
- Stage 2 – Construction works between Tai Hang and Wo Hop Shek Interchange.

2.1.4 The construction works of Stage 1 under the EP commenced in November 2009 and was planned to be completed in December 2013 tentatively. The works of Stage 2 was planned to commence in November 2013 and complete by end of 2016. Hyder-Arup-Black and Veatch Joint Venture (HABVJV) was appointed by the Highways Department (HyD) as the consultants for the design and construction assignment for the Project. Mott MacDonald Hong Kong Ltd is the Independent Environmental Checker (IEC) of both Stage 1 and Stage 2 works.

2.1.5 A portion of Stage 2 works of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling (hereafter called “the Project”) is entrusted to the contractor of Contract No. CV/2012/09 Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 3, i.e. Chun Wo. AECOM Asia Co Ltd was appointed by the CEDD as the consultant for the design and construction assignment for the Liantang development.

2.1.6 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). An Environmental Impact Assessment (EIA) Report together with an Environmental Monitoring and Audit (EM&A) Manual were approved on 14 July 2000 (Register Number: EIA-043/2000). The Project is governed by an Environmental Permit (EP) (EP-324/2008) which was granted on 23 December 2008. A variation of EP (VEP) was applied and the VEP (EP-324/2008/A) was subsequently granted on 31 January 2012. An additional VEP has been applied on 24 February 2014 and the VEP (EP-324/2008/B) was subsequently granted on 17 March 2014. Furthermore, an additional VEP has been applied on 9 March 2015 and the VEP (EP-324/2008/C) was subsequently granted on 27 March 2015. The 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 Reprovision; 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;
- Installation of Stone Cladding;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Piling Works for Viaduct;
- Piling Works for Noise Barrier;
- Retaining Wall Construction;
- Road Works;
- Sewer Works;
- Slope Works;
- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Water Main Laying.

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Alan Lee	2171 3303	2171 3498
		Resident Engineer (Environmental)	Mr. Perry Yam	2171 3350	
Mott MacDonald	Independent Environmental Checker (IEC)	IEC	Mr. 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		
Environmental Permit				
EP-324/2008/D	27 Aug 2015	--	Granted on 27 Aug 2015	
Construction Noise Permit				
GW-RN0064-16	16 Feb 2016	13 Aug 2016	Valid	For road diversion and maintenance of Fanling Highway Northbound
GW-RN0098-16	6 Mar 2016	4 Sep 2016	Valid	For lane shifting work at Northbound of Fanling Highway
GW-RN0113-16	25 Feb 2016	24 Aug 2016	Valid	For Segment Delivery to Kiu Tau
GW-RN0140-16	2 Mar 2016	24 Aug 2016	Valid	For general works at the northward of site office
GW-RN0158-16	8 Mar 2016	31 Aug 2016	Valid	For general work of AB10
GW-RN0168-16	15 Mar 2016	14 Sep 2016	Valid	For segment erection crossing over MTRC's Rail Track of Pier AB11 and AD12(1900-2300)
GW-RN0170-16	11 Mar 2016	10 Sep 2016	Valid	For segment erection AB7 to AB10
GW-RN0233-16	11 Apr 2016	10 Oct 2016	Valid	For general works on Tai Wo Service Road West
GW-RN0307-16	10 May 2016	9 Sep 2016	Valid	For Segment erection of AC9
GW-RN0308-16	10 May 2016	9 Sep 2016	Valid	For segment erection of pier AA4, AB6, AD7 and AA18
GW-RN0309-16	30 Apr 2016	29 Oct 2016	Valid	For segment erection AB10 to AD11
GW-RN0305-16	5 May 2016	4 Aug 2016	Valid	For falsework dismantling of Pier AB11 and AD12
GW-RN0414-16	18 Jun 2016	17 Dec 2016	Valid	For road diversion and maintenance of Fanling Highway Southbound

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RN0419-16	21 Jun 2016	30 Sep 2016	Valid	For segment erection of spans AA5, AA6, AA7, AB3 and AB4 across Fanling Highway
GW-RN0421-16	21 Jun 2016	30 Sep 2016	Valid	For segment erection of spans AA11, AA12, AC3 and AC4 across Fanling Highway
GW-RN0446-16	24 Jun 2016	31 Aug 2016	Valid	For segment erection of AC6 and AC7 over Tai Wo Service Road
GW-RN0434-16	22 Jun 2016	21 Dec 2016	Valid	For general works at the southward of site office
GW-RN0509-16	16 Jul 2016	31 Aug 2016	Valid	For Mobilization of Lifting Frame between Piers AA12 and AA5
GW-RN0514-16	16 Jul 2016	15 Oct 2016	Valid	For segment erection crossing over MTRC's Rail Track of Pier AB11 and AD12(0115-0500)
GW-RN0525-16	20 Jul 2016	7 Jan 2017	Valid	For loading and unloading along Fanling Highway both bounds
GW-RN0541-16	5 Aug 2016	4 Nov 2016	Valid	For falsework dismantling of Pier AD12
GW-RN0549-16	30 Jul 2016	9 Jan 2017	Valid	For road resurfacing of Fanling Highway Southbound
GW-RN0557-16	8 Aug 2016	30 Sep 2016	Valid	For installation of temporary support system of existing vehicular flyover linking at Fanling Highway both bounds
GW-RN0561-16	16 Aug 2016	11 Feb 2017	Valid	For road diversion and maintenance of Fanling Highway Northbound
GW-RN0581-16	25 Aug 2016	24 Feb 2017	Valid	For segment Delivery to Kiu Tau
GW-RN0580-16	25 Aug 2016	24 Feb 2017	Valid	For general works at the northward of site office
GW-RN0596-16	17 Aug 2016	15 Feb 2017	Valid	For fuel delivery entering the construction site next to MTRC's East Rail Line at Tong Hang Tung

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RN0619-16	22 Aug 2016	14 Feb 2017	Valid	For tractor with trailer entering the Construction Site next to MTRC's East Rail Line at Tong Hang Tung
GW-RN0606-16	27 Aug 2016	02 Oct 2016	Valid	For demolition of vehicular bridge at Fanling Highway both bounds
Wastewater Discharge License				
WT00016832-2013	28 Aug 2013	31 Aug 2018	Valid	--
Chemical Waste Producer Registration				
5113-634-C3817-01	7 Oct 2013	--	Valid	--
Billing Account for Construction Waste Disposal				
7017914	2 Aug 2013	--	Account Active	--
Notification Under Air Pollution Control (Construction Dust) Regulation				
--	31 Jul 2013	30 Jul 2019	Notified	--

4 AIR QUALITY MONITORING

4.1 Monitoring Requirement

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

4.2 Monitoring Equipment

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

Table 4.1 Air Quality Monitoring Equipment

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

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

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

4.3 Monitoring Location

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

Table 4.2 Location of Air Quality Monitoring

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

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

4.4 Monitoring Parameters, Frequency and Duration

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

Table 4.3 Air Quality Monitoring Parameters, Frequency and Duration

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

4.5 Monitoring Methodology

1-hr and 24-hr TSP Monitoring

4.5.1 With the consideration of criteria stated in the Updated EM&A Manual, the HVS was installed in the vicinity of the air sensitive receivers.

4.5.2 The relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any special phenomena observed were recorded. The weather information was referenced from Hong Kong Observatory (http://www.weather.gov.hk/wxinfo/pastwx/extractc.htm).

4.5.3 A HOKLAS accredited laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments, to handle the 24-hr TSP samples, was employed for sample analysis.

4.5.4 Filter papers of size 8"x10" were labelled before sampling. They were inspected to be clean with no pin holes and conditioned in a humidity controlled chamber for over 24-hr and were pre-weighed before use for the sampling.

4.5.5 The 24-hr TSP levels were measured by following the standard high volume sampling method for TSP as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. TSP was sampled by drawing air through a conditioned, pre-weighted filter paper inside the HVS at a controlled air flow rate. After 24-hr sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg.

4.5.6 All the collected samples were kept in a good condition for 6 months before disposal.

4.5.7 For 1-hr TSP monitoring, monitoring methodology is the same as 24-hr TSP monitoring which has been presented in **Section 4.5.1** to **Section 4.5.6**, but with sampling period changed to 1 hour.

4.6 Monitoring Schedule for the Reporting month

4.6.1 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 ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM1(SR77) *	113.6	58.9 –161.6	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 ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM1(SR77) *	101.9	55.3 – 151.5	170.3	260

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

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

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

4.7.4 The Event and Action Plan for the occurrence of non-compliance of the air quality criteria is annexed in **Appendix G**.

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**. Please note noise monitoring originally scheduled to be conducted 4 August 2016 has been rescheduled to 5 August 2016 due to raining.

5.7 Monitoring Results

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

Table 5.4 Summary of Noise Monitoring Results

Noise Monitoring Station ID	Average, dB(A), Leq (30min) (2)	Range, dB(A), Leq (30min) (2)	Action Level	Limit Level, dB(A)
M1(SR77) (1)	64.9	63.5 – 66.0	When one documented valid complaint is received	75

Remark:
(1) Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling
(2) +3dB(A) façade correction included

5.7.2 Major noise sources during the noise monitoring included construction activities of the Project and that along Tai Wo Service Road East, and nearby traffic noise.

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

5.7.4 The Event and Action Plan for the occurrence of non-compliance of the noise criteria is annexed in **Appendix G**.

6 WATER MONITORING

6.1.1 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 originally scheduled from 19 February 2016. However, the mentioned works were cancelled and postponed to the next dry season in late 2016 after the utilities diversions complete.

6.1.2 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.

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 582m^3 of excavated material has been generated. 494m^3 of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. No inert C&D materials were reused on site. 105m^3 of general refuse was disposed of at North East New Territories (NENT) Landfill. 1m^3 of plastics was collected by recycling contractor in the reporting month. No paper/cardboard packaging was collected by recycling contractor in the reporting month. No metals were collected by recycling contractor in the reporting month. 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 1, 8, 15, 24 and 29 August 2016. The one held on 29 August 2016 was a joint inspection with the IEC, ER, ET and Contractor. No site inspection was conducted by the EPD during the reporting month. No non-compliance was recorded during the site inspection. A summary of the reminders and observations recorded during the site inspections are presented in **Table 8.1**.

Table 8.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	N/A	N/A	N/A
Air Quality	29 Aug 2016	Observation: Mud and debris was observed on the public road opposite to exit SA23. The Contractor should ensure all mud and debris being removed from vehicles before leaving the construction site opposite to exit SA23.	Mud and debris was removed from the public road opposite to exit SA23 as observed during 5 September 2016 site inspection.
Noise	N/A	N/A	N/A
Waste / Chemical Managem-ent	8 Aug 2016	Observation: Accumulation of stagnant water was observed in the drip tray at SA12. The Contractor should regularly inspect the status to prevent overflowing of stagnant water and mosquito breeding.	The drip tray has been covered to avoid water accumulation as observed during the site inspection on 15 Aug 2016.
	15 Aug 2016	Reminder: Stagnant water observed near NB68. Contractor is reminded to provide necessary mosquito preventive measures.	Proper mosquito preventive chemical has been added to the water patch as observed during the site inspection on 24 Aug 2016.
	29 Aug 2016	Observation: Oily mixture was observed accumulated in the chemical drip trays near Pier AA6. The Contractor should remove the oily mixture before rainstorm ASAP.	The follow up action will be reported in the next Monthly EM&A Report.
	29 Aug 2016	Observation: Oil stain was observed on ground near Pier AA6. The Contractor should clear up the oil stain and dispose of chemical waste.	The follow up action will be reported in the next Monthly EM&A Report.
Landscape & Visual	N/A	N/A	N/A
Permits / Licenses	N/A	N/A	N/A

9 MPLEMENTATION 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 July 2016	12 August 2016

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;
- Demolition of the Existing Vehicular Bridge between Tai Wo Service West and Tai Wo Service Road East;
- Installation of Stone Cladding;
- Cap Pier Construction of Kiu Tau Footbridge;
- Noise Barrier Construction;
- Pier / Pier Table Construction;
- Pile Cap Works;
- Portal Beam Construction;
- Piling Works for Viaduct;
- Piling Works for Noise Barrier;
- Road Works;
- Utilities Duct Laying;
- Viaduct Segment Erection; and
- Water Main Laying.

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 originally scheduled from 19 February 2016. However, the mentioned works were cancelled and postponed to the next dry season in late 2016 after the utilities diversions complete.

13.1.8 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.

13.2 Recommendations

13.2.1 According to the environmental site inspections performed in the reporting month, the following recommendation was provided:

Air Quality

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

Chemical and Waste Management

- Good housekeeping should be maintained and stagnant water should be removed from secondary containment regularly.

- Provide proper chemical and chemical waste management.

- A spill response procedure shall be in place and absorption material available for minor spillages.

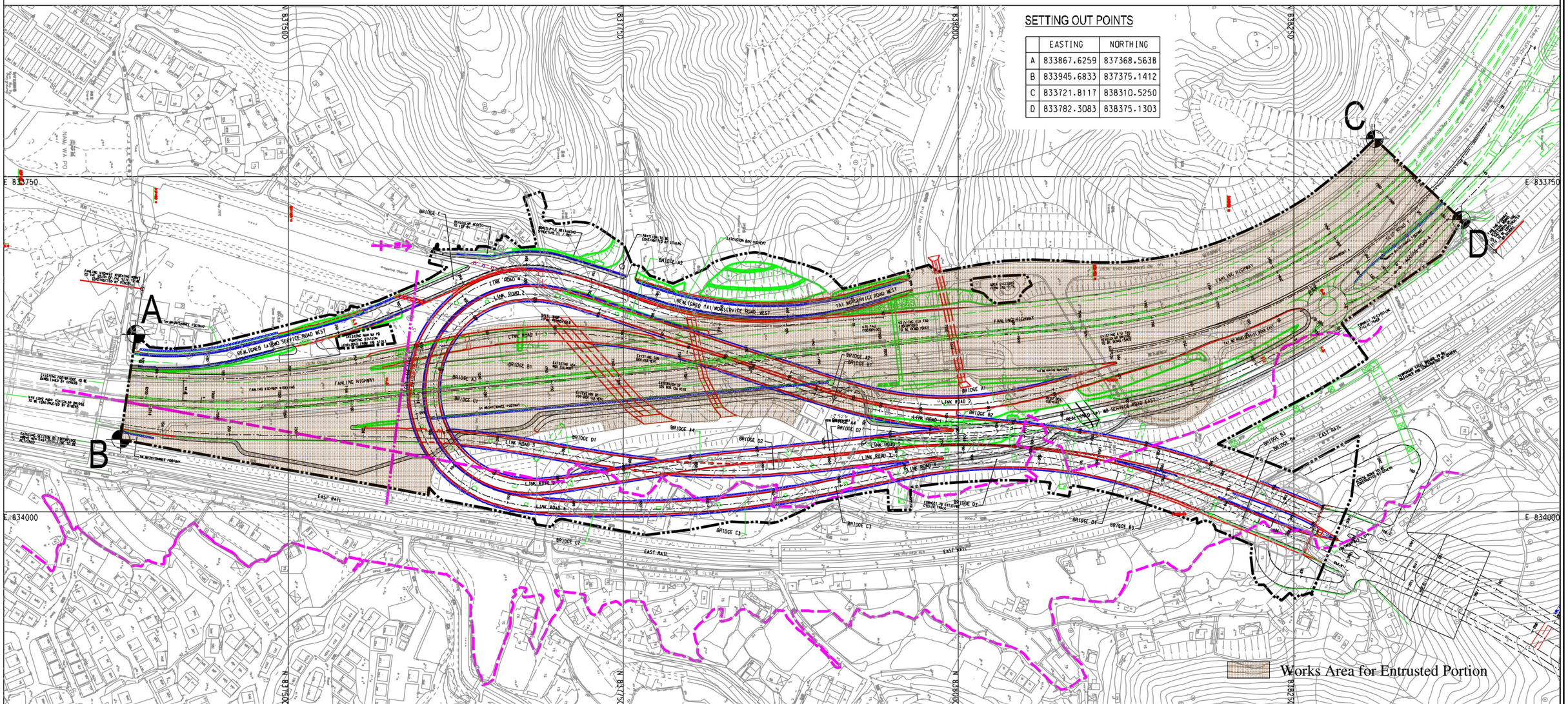
Figure

Contract No. CV/2012/09
Liantang / Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works - Contract 3

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

SETTING OUT POINTS

	EASTING	NORTHING
A	833867.6259	837368.5638
B	833945.6833	837375.1412
C	833721.8117	838310.5250
D	833782.3083	838375.1303

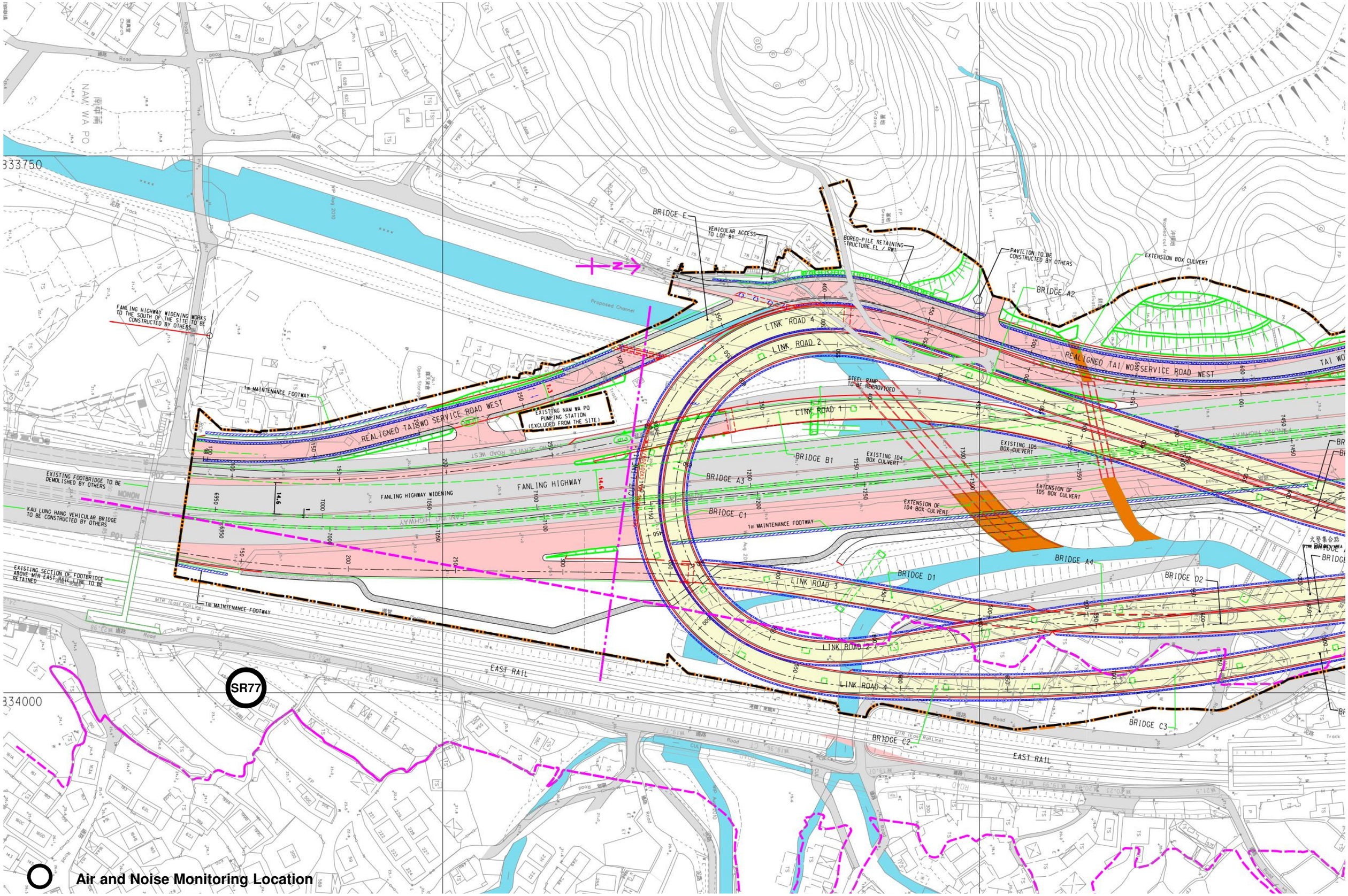


CV201209-T-CWC-SK-001g_AD_edit.dgn 22/1/2014 17:10:34

MEINHARDT

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

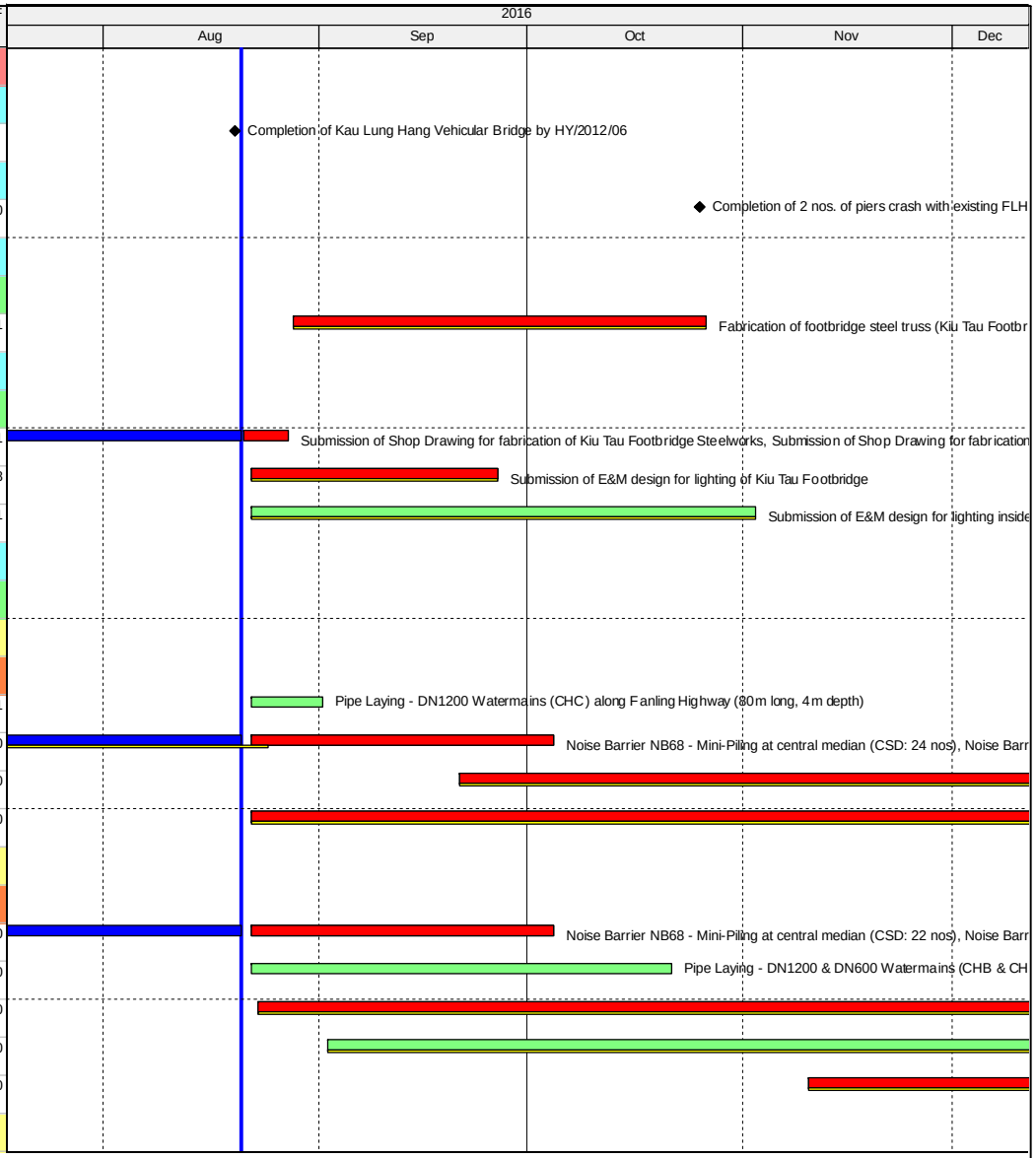
Figure 1: Demarcation of Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling – Stage 2



MEINHARDT	Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2	**Figure 2: Air and Noise Monitoring Locations**

Appendix A
Construction Programme

Activity ID	Activity Name	OD	RD	Start	Finish	TF
3-Month Rolling Programme 2016-08-21						
Dependent Milestones from Other Contracts						
MS-0110	Completion of Kau Lung Hang Vehicular Bridge by HY/2012/06	0	0		20-Aug-16 A	
Major Milestones and Events						
MS-0210	Completion of 2 nos. of piers crash with existing FLH (by 1 set)	0	0		25-Oct-16	60
Major Procurement & Delivery						
Footbridge Steel Truss						
MM-3050	Fabrication of footbridge steel truss (Kiu Tau Footbridge)	60	60	28-Aug-16	26-Oct-16	-101
Design and Submissions						
Method Statement and Design (Major) Approved by AECOM						
PRE-2050	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks	30	7	02-Nov-15 A	27-Aug-16	-101
PRE-2030	Submission of E&M design for lighting of Kiu Tau Footbridge	30	30	22-Aug-16	26-Sep-16	-18
PRE-2040	Submission of E&M design for lighting inside viaduct structures of Bridge A, B, C & D	60	60	22-Aug-16	02-Nov-16	151
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)						
Fanling Highway South Portion between CH6935 and CH7470						
Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZ2)						
At-Grade Roadworks (195m)						
FHW-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	10	20-Feb-14 A	01-Sep-16	281
FHW-1300	Noise Barrier NB68 - Mini-Piling at central median (CSD: 24 nos)	80	36	21-Mar-16 A	04-Oct-16	-80
FHW-1310	Noise Barrier NB68 - Footing at central median (72m)	73	73	21-Sep-16	16-Dec-16	-80
FHW-1140	Noise Barrier NB70 - Footing adjacent to SB lane (15m)	115	115	22-Aug-16	09-Jan-17	-80
Fanling Highway Zone 2 between CH7130 and CH7290						
At-Grade Roadworks (160m)						
FHW-2300	Noise Barrier NB68 - Mini-Piling at central median (CSD: 22 nos)	80	36	06-Apr-16 A	04-Oct-16	-100
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	144	50	12-Oct-15 A	21-Oct-16	340
FHW-2310	Noise Barrier NB68 & NB68A - Footing at central median (157m)	110	110	23-Aug-16	04-Jan-17	-100
FHW-2190	Footpath & DSD Access Track adjacent to SB lane	108	108	02-Sep-16	12-Jan-17	140
FHW-2320	Road Formation & Central Barrier (Middle Part: FLH NB & SB 4th lanes)	79	79	10-Nov-16	20-Feb-17	-100
Fanling Highway Zone 3 between CH7290 and CH7380						



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

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

CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

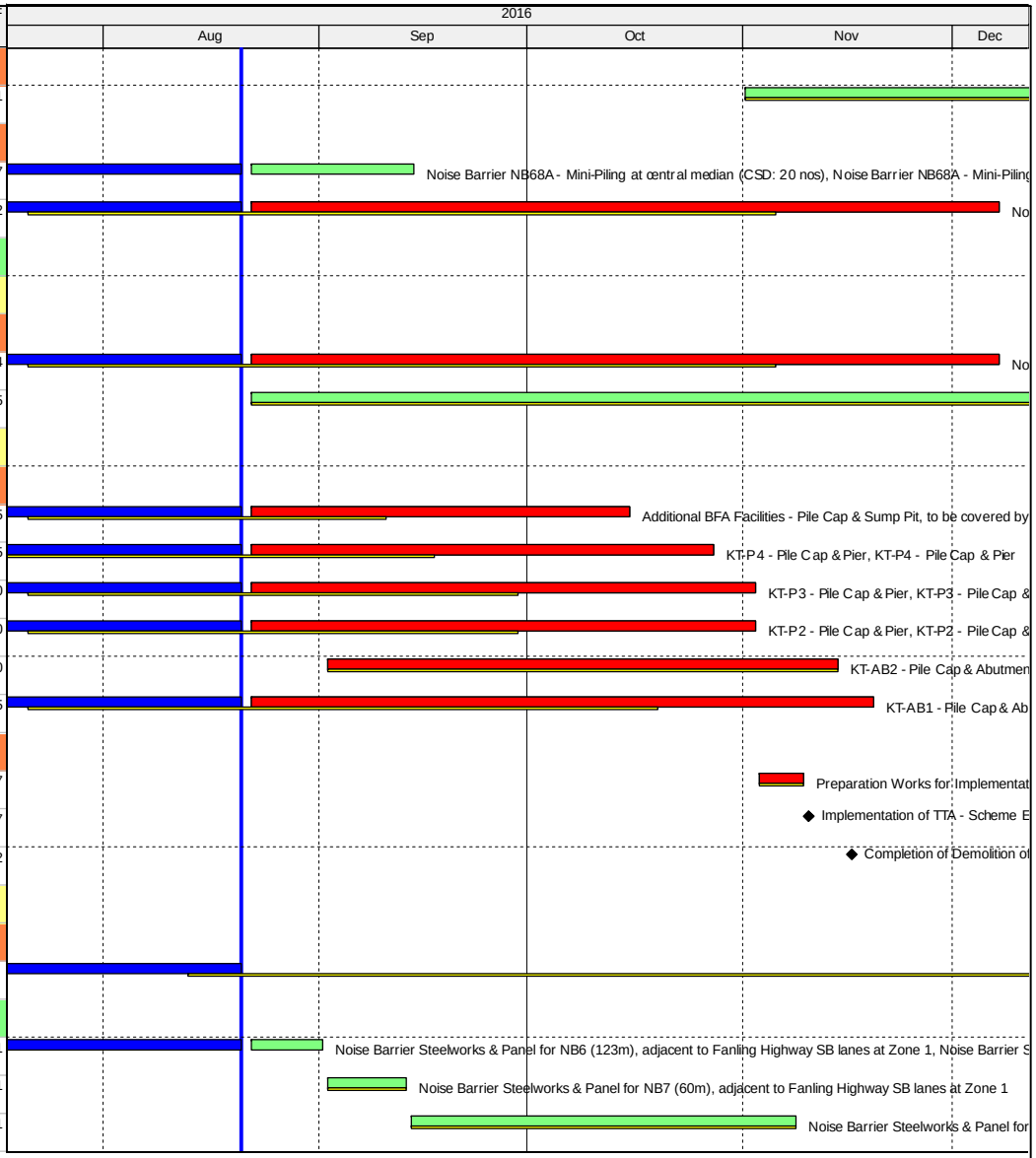
3-Month Rolling Programme

Programme ID: 3MPR037 (Data Date: 21-Aug-16)_____Page 1 of 9

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
	Box Culvert Extension - ID4					
ID4-3090	Bay 1 - Remaining Base Slab (To be carried out after diversion of DN1400 water mains)	45	45	01-Nov-16*	22-Dec-16	151
	At-Grade Roadworks (130m)					
FHW-3300	Noise Barrier NB68A - Mini-Piling at central median (CSD: 20 nos)	70	21	06-Apr-16 A	14-Sep-16	867
FHW-3310	Noise Barrier NB68A - Footing at central median (98m)	90	90	27-Jun-16 A	07-Dec-16	-112
	Fanling Highway North Portion between CH7470 and CH7925					
	Fanling Highway Zone 4 between CH7380 and CH7470					
	At-Grade Roadworks (90m)					
FHW-4210	Noise Barrier NB68A - Footing at central median (40m)	90	90	27-Jun-16 A	07-Dec-16	-124
FHW-4100	Noise Barrier NB71 & NB72 - Footing adjacent to SB lane (90m)	115	115	22-Aug-16	09-Jan-17	5
	Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)					
	Kiu Tau Footbridge Reprovision (East)					
FHW-5090	Additional BFA Facilities - Pile Cap & Sump Pit, to be covered by VO	45	45	11-Jul-16 A	15-Oct-16	-75
FHW-5010E	KT-P4 - Pile Cap & Pier	75	55	08-Apr-16 A	27-Oct-16	-85
FHW-5010D	KT-P3 - Pile Cap & Pier	60	60	11-Jul-16 A	02-Nov-16	-100
FHW-5010C	KT-P2 - Pile Cap & Pier	60	60	11-Jul-16 A	02-Nov-16	-100
FHW-5010B	KT-AB2 - Pile Cap & Abutment	60	60	02-Sep-16	14-Nov-16	-100
FHW-5010A	KT-AB1 - Pile Cap & Abutment	75	75	11-Jul-16 A	19-Nov-16	-105
	At-Grade Road Works (130m)					
FHW-5120E	Preparation Works for Implementation of TTA Scheme E4	6	6	03-Nov-16	09-Nov-16	-27
FHW-5120F	Implementation of TTA - Scheme E4 (shifting TWSR East to original alignment)	0	0	10-Nov-16		-27
FHW-5130	Completion of Demolition of existing control valve house	0	0		16-Nov-16	22
	Fanling Highway Zone 7 between CH7660 and CH7925					
	At-Grade Roadworks (265m)					
FHW-7110	Road Formation and Pavement (Eastern Side: FLH SB 1st & 2nd lane and hard shoulder)	160	0	02-Jun-16 A	21-Aug-16 A	
	Remaining Works for Noise Barrier along widened Fanling Highway					
FHW-NB-120	Noise Barrier Steelworks & Panel for NB6 (123m), adjacent to Fanling Highway SB lanes at Zone 1	20	10	03-Mar-16 A	01-Sep-16	361
FHW-NB-130	Noise Barrier Steelworks & Panel for NB7 (60m), adjacent to Fanling Highway SB lanes at Zone 1	10	10	02-Sep-16	13-Sep-16	361
FHW-NB-140	Noise Barrier Steelworks & Panel for NB71 (254m), adjacent to Fanling Highway SB lanes at Zones 2,3 & 4	45	45	14-Sep-16	08-Nov-16	361



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

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

CEDD Contract No. CV/2012/09

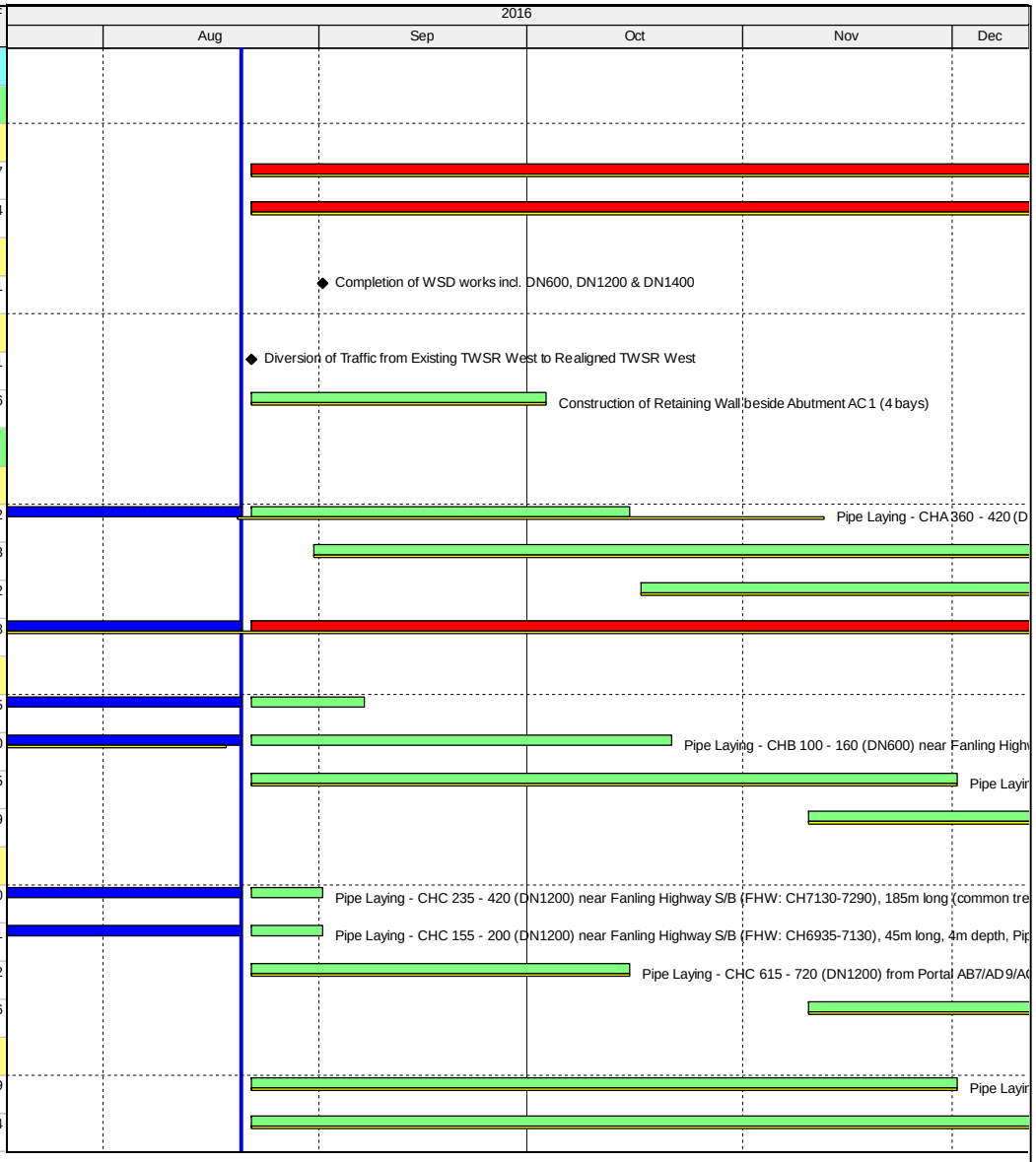
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
	Section II - Remainder of the Works (KD-3)					
	At Grade Link Road at Fanling Highway Interchange					
	Link Road 1 (near Abutment AB1)					
FHI-LR1-1005	Noise Barrier NB66 - Footing adjacent NB lane (75m)	95	95	22-Aug-16	13-Dec-16	-107
FHI-LR1-1010	Noise Barrier NB67 - Mini-Piling (42nos) (Assume 2 sets of plant)	160	160	22-Aug-16	09-Mar-17	-114
	Link Road 3 (near Abutment AD1)					
FHI-LR3-3000	Completion of WSD works incl. DN600, DN1200 & DN1400	0	0		01-Sep-16	281
	Link Road 4 (near Abutment AC1)					
FHI-LR4-4000	Diversion of Traffic from Existing TWSR West to Realigned TWSR West	0	0	22-Aug-16		291
FHI-LR4-4030	Construction of Retaining Wall beside Abutment AC1 (4 bays)	35	35	22-Aug-16	03-Oct-16	256
	WSD Works					
	DN450 Fire Mains (CHA)					
WA-1040	Pipe Laying - CHA 360 - 420 (DN450) near Ext. TWSR West, 60m long & 4m depth	70	45	22-Dec-15 A	15-Oct-16	172
WA-1060	Pipe Laying - CHA 450 - 575 (DN450) near Realigned TWSR West (Re-TWSRW: CH640 - 695), 125m long & 2m depth	95	95	31-Aug-16	22-Dec-16	263
WA-1030	Pipe Laying - CHA 260 - 360 (DN450) near Ext. TWSR West, 100m long & 2m depth	65	65	17-Oct-16	03-Jan-17	172
WA-1090	Pipe Laying - CHA 800 - 960 (DN450) near Ext. TWSR West (No Roadworks), 160m long & 3m depth	148	120	10-Jun-16 A	14-Jan-17	-78
	DN600 Water Mains (CHB)					
WB-1060	Pipe Laying - CHB 538 - 635 (DN600) near Realigned TWSR East (TWSRE: CH270-380), 97m long & GL	40	15	17-Jul-15 A	07-Sep-16	375
WB-1000	Pipe Laying - CHB 100 - 160 (DN600) near Fanling Highway S/B (FHW: CH7130-7290), 60m long (common trench with NB)	60	50	12-Mar-16 A	21-Oct-16	340
WB-1030C	Pipe Laying - CHB 350 - 450 (DN600) from Portal AB7/AD9/AC12 to Portal AB8	85	85	22-Aug-16	01-Dec-16	305
WB-1030B	Pipe Laying - CHB 350 - 450 (DN600) from TWSRE to Portal AB7/AD9/AC12	75	75	10-Nov-16	15-Feb-17	249
	DN1200 Water Mains (CHC)					
WC-1060	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)	95	10	12-Oct-15 A	01-Sep-16	140
WC-1050A	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m long, 4m depth	120	10	15-Oct-14 A	01-Sep-16	281
WC-1090C	Pipe Laying - CHC 615 - 720 (DN1200) from Portal AB7/AD9/AC12 to Portal AB8	45	45	22-Aug-16	15-Oct-16	252
WC-1090B	Pipe Laying - CHC 615 - 720 (DN1200) from TWSRE to Portal AB7/AD9/AC12	45	45	10-Nov-16	04-Jan-17	186
	Twin DN1400 Water Mains (CHE & CHG)					
WE-1050	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB7/AD9/AC12 to Portal AB8	85	85	22-Aug-16	01-Dec-16	29
WE-1060	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB8 to new connection point	110	110	22-Aug-16	03-Jan-17	4



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

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

CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
WE-1040	Pipe Laying - CHE & CHG (Twins DN1400) from TWSRE to Portal AB7/AD9/AC12	75	75	10-Nov-16	15-Feb-17	-27
DN2200 Water Mains (CHF)						
WF-1000A	Pipe Laying - CHF 80 - 112 (DN2200) near ext. TWSR West underneath Box Culvert BC01	210	210	22-Aug-16	13-May-17	7
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)						
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near Realigned TWSR East, 80m long & 4m depth	55	23	05-Oct-15 A	17-Sep-16	184
WJ-1100	DN300 Washout at around CHJ 268	65	48	29-Apr-16 A	19-Oct-16*	37
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	90	90	19-Sep-16	06-Jan-17	184
Kau Lung Hang Valve Control & Telemetry House Reprovision						
VCTH-1020c	Testing and Commissioning (Valve operation for DN1400 watermains)	30	12	10-Oct-15 A	03-Sep-16	22
VCTH-1030	Demolition of Existing KLH Valve Control & Telemetry House	60	60	05-Sep-16*	16-Nov-16	22
Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)						
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	50	50	01-Sep-16*	01-Nov-16	277
PS-1010	Construction of New Boundary Wall for Pumping Station (PST3)	90	90	02-Nov-16	24-Feb-17	277
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)						
TWSRW Zone 1 betweeen CH100 and CH155						
At-Grade Roadworks						
TWSRW-1160B	Remaining Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	46	46	01-Nov-16	23-Dec-16	322
TWSRW Zone 2 betweeen CH155 and CH280						
At-Grade Roadworks						
TWSRW-2140	Rectification Works for Southern Trunk Sewer	48	0	30-Oct-15 A	13-Aug-16 A	
TWSRW-2130B	Noise Barrier NB1a - Remaining Footing adjacent Realigned TWSR West (Covered by VO 103) (Approx. 20m)	30	30	24-Sep-16	31-Oct-16	22
TWSRW-2120B	Remaining Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	46	46	01-Nov-16	23-Dec-16	22
TWSRW Zone 5 betweeen CH376 and CH520						
At-Grade Roadworks						
TWSRW-5150	Construction of overflow sewer by DC/2013/01 (by Interface contractor)	26	0	25-May-16 A	25-Jul-16 A	
TWSRW-5140	Diversion of DN150 water mains	21	6	26-Jul-16 A	27-Aug-16	310
TWSRW-5130	Installation of Stone Facing Finish	45	34	19-Mar-16 A	30-Sep-16	392
TWSRW-5160	Construction of remaining Retaining Wall RW9	55	55	29-Aug-16	03-Nov-16	310
TWSRW-5120	Permanent Vehicular Access to Lot 81 (incl. backfilling works between RW7 and RW8)	125	100	07-Jun-16 A	19-Dec-16	326

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

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

CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

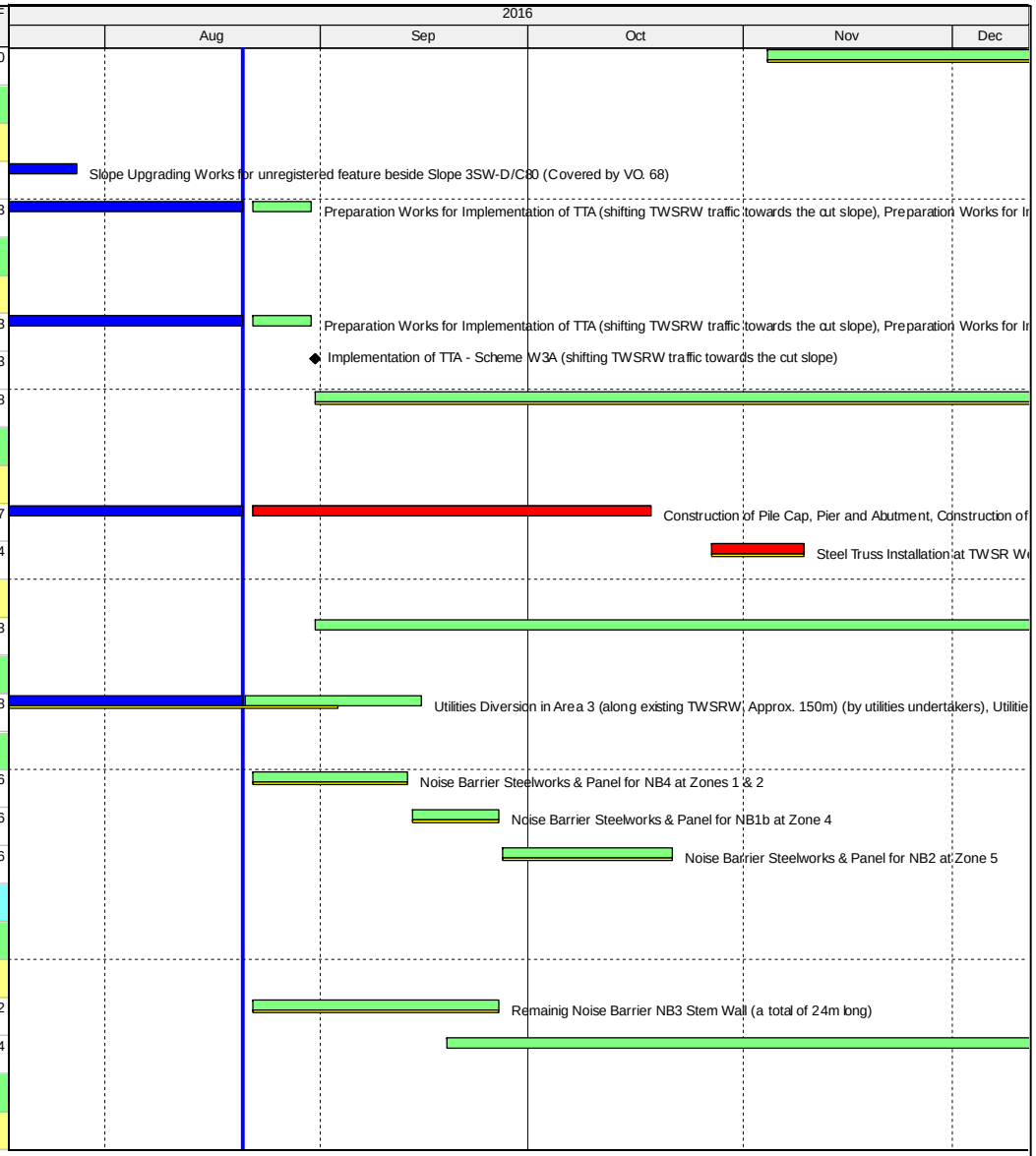
3-Month Rolling Programme

Programme ID: 3MPR037 (Data Date: 21-Aug-16)_____Page 4 of 9

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
TWSRW-5170	Remaining Road Formation, Kerb, Planter and Pavement (incl. Zone 5)	55	55	04-Nov-16	10-Jan-17	310
TWSRW Zone 6 betweeen CH520 and CH530						
At-Grade Roadworks						
TWSRW-6110	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68)	65	0	22-May-15 A	28-Jul-16 A	
TWSRW-6100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut slope)	21	8	24-Dec-15 A	30-Aug-16	263
TWSRW Zone 7 betweeen CH530 and CH640						
At-Grade Roadworks						
TWSRW-7100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut slope)	21	8	22-Dec-15 A	30-Aug-16	263
TWSRW-7110	Implementation of TTA - Scheme W3A (shifting TWSRW traffic towards the cut slope)	0	0	31-Aug-16		263
TWSRW-7150B	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)	90	90	31-Aug-16	16-Dec-16	328
TWSRW Zone 8 betweeen CH640 and CH695						
Kiu Tau Footbridge Reprovision (West)						
TWSRW-8020	Construction of Pile Cap, Pier and Abutment	50	47	17-Nov-15 A	18-Oct-16	-77
TWSRW-8030	Steel Truss Installation at TWSR West	12	12	27-Oct-16	09-Nov-16	-84
At-Grade Roadworks						
TWSRW-8110*	Pipe Laying - DN450 Watermains (CHA)	95	95	31-Aug-16	22-Dec-16	263
Remainder of the Works						
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	106	26	03-May-16 A	15-Sep-16	118
Remaining Works for Noise Barrier along realigned TWSR West						
TWSRW-NB-110	Noise Barrier Steelworks & Panel for NB4 at Zones 1 & 2	20	20	22-Aug-16*	13-Sep-16	376
TWSRW-NB-130	Noise Barrier Steelworks & Panel for NB1b at Zone 4	10	10	14-Sep-16	26-Sep-16	376
TWSRW-NB-140	Noise Barrier Steelworks & Panel for NB2 at Zone 5	20	20	27-Sep-16	21-Oct-16	376
Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)						
TWSRE Zone 1 between CH100 and CH270						
At-Grade Roadworks						
TWSRE-1170	Remainig Noise Barrier NB3 Stem Wall (a total of 24m long)	30	30	22-Aug-16	26-Sep-16	362
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	90	90	19-Sep-16	06-Jan-17	184
TWSRE Zone 2 between CH270 and CH380						
At-Grade Roadworks						



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

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

CEDD Contract No. CV/2012/09

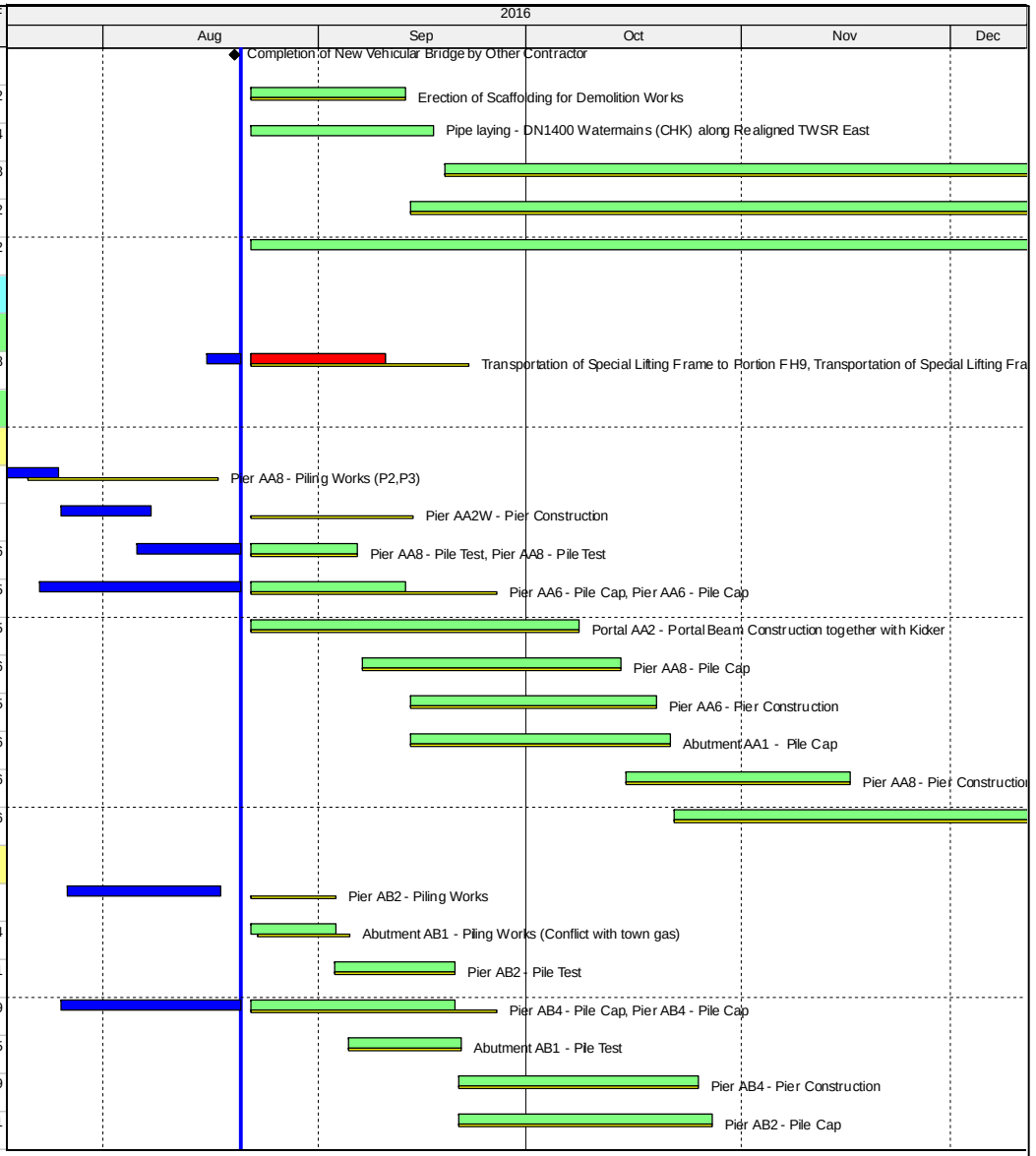
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
TWSRE-2050	Completion of New Vehicular Bridge by Other Contractor	0	0		20-Aug-16 A	
TWSRE-2060	Erection of Scaffolding for Demolition Works	20	20	22-Aug-16	13-Sep-16	2
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	23	05-Oct-15 A	17-Sep-16	184
TWSRE-2040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement	71	71	19-Sep-16	12-Dec-16	298
TWSRE-2070	Demolition of Existing Vehicular Bridge	80	80	14-Sep-16	19-Dec-16	2
TWSRE-2030A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	30	130	17-Jul-15 A	26-Jan-17	282
Stage 1C - Viaduct Structure & TCSS Civil Provisions (KD-9)						
Preliminaries						
B-6000	Transportation of Special Lifting Frame to Portion FH9	27	18	16-Aug-16 A	10-Sep-16	-108
Foundation & Pier Construction						
Bridge A						
BA-08-1040	Pier AA8 - Piling Works (P2,P3)	24	0	18-Jun-16 A	25-Jul-16 A	
BA-02-1030	Pier AA2W - Pier Construction	21	0	26-Jul-16 A	08-Aug-16 A	
BA-08-1010	Pier AA8 - Pile Test	14	14	06-Aug-16 A	06-Sep-16	16
BA-06-1020	Pier AA6 - Pile Cap	30	20	23-Jul-16 A	13-Sep-16	25
BA-02-1050	Portal AA2 - Portal Beam Construction together with Kicker	40	40	22-Aug-16	08-Oct-16	75
BA-08-1020	Pier AA8 - Pile Cap	30	30	07-Sep-16	14-Oct-16	16
BA-06-1030	Pier AA6 - Pier Construction	28	28	14-Sep-16	19-Oct-16	25
BA-01-1020	Abutment AA1 - Pile Cap	30	30	14-Sep-16	21-Oct-16	36
BA-08-1030	Pier AA8 - Pier Construction	28	28	15-Oct-16	16-Nov-16	16
BA-01-1030	Abutment AA1 - Abutment Construction	50	50	22-Oct-16	19-Dec-16	36
Bridge B						
BB-02-1000	Pier AB2 - Piling Works	12	0	27-Jul-16 A	18-Aug-16 A	
BB-01-1000B	Abutment AB1 - Piling Works (Conflict with town gas)	12	12	23-Aug-16 A	03-Sep-16	44
BB-02-1010	Pier AB2 - Pile Test	14	14	03-Sep-16	20-Sep-16	11
BB-04-1020	Pier AB4 - Pile Cap	30	25	26-Jul-16 A	20-Sep-16	9
BB-01-1010	Abutment AB1 - Pile Test	14	14	05-Sep-16	21-Sep-16	65
BB-04-1030	Pier AB4 - Pier Construction	28	28	21-Sep-16	25-Oct-16	9
BB-02-1020	Pier AB2 - Pile Cap	30	30	21-Sep-16	27-Oct-16	11



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

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

CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

Programme ID: 3MPR037 (Data Date: 21-Aug-16)_____Page 6 of 9

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
BB-06-1050	Portal AB6 - Portal Beam Construction together with Kicker	42	61	06-Jun-16 A	03-Nov-16	14
BB-12-1030	Abutment AB12/AD14 - Abutment Construction	75	69	15-Aug-16 A	12-Nov-16	15
BB-01-1020	Abutment AB1 - Pile Cap	30	30	15-Oct-16	18-Nov-16	47
BB-02-1030	Pier AB2 - Pier Construction	28	28	28-Oct-16	29-Nov-16	11
BB-01-1030	Abutment AB1 - Abutment Construction	50	50	19-Nov-16	19-Jan-17	47
Bridge D						
BD-03-2040	Portal AD3 - Portal Beam Construction together with Kicker	51	9	10-Jun-16 A	31-Aug-16	49
BD-11-1020A	Pier AD11E - Pile Cap	30	21	11-Aug-16 A	14-Sep-16	-53
BD-11-1030	Pier AD11E - Pier Construction	35	35	15-Sep-16	28-Oct-16	-53
BD-08-1040	Portal AC11/AD8 - Portal Beam Construction together with Kicker	60	81	11-Apr-16 A	26-Nov-16	-46
BD-11-1050	Portal AD11 - Portal Beam Construction together with Kicker	60	60	07-Nov-16	18-Jan-17	-53
Pier Table Construction						
Bridge A						
PA-1100	Pier Table Construction at Pier AA10 (3 nos.)	40	21	30-Jul-16 A	14-Sep-16	7
PA-1070	Pier Table Construction at Pier AA7 (3 nos.)	40	40	22-Aug-16	08-Oct-16	20
PA-1090	Pier Table Construction at Pier AA9 (4 nos.)	40	40	22-Aug-16	08-Oct-16	27
PA-1020	Pier Table Construction at Portal AA2 (2 nos.)	15	15	11-Oct-16	27-Oct-16	75
PA-1060	Pier Table Construction at Pier AA6 (3 nos.)	40	40	28-Oct-16	13-Dec-16	25
Bridge B						
PB-1110	Pier Table Construction at Pier AB11 (4 nos.) incl. in-situ cross head	42	0	24-Dec-15 A	19-Aug-16 A	
PB-1060	Pier Table Construction at Portal AB6 (2 nos.)	15	15	04-Nov-16	21-Nov-16	14
PB-1030	Pier Table Construction at Pier AB3 (3 nos.)	50	50	08-Oct-16	06-Dec-16	9
PB-1040	Pier Table Construction at Pier AB4 (3 nos.)	40	40	03-Nov-16	19-Dec-16	9
Bridge C						
PC-1030	Pier Table Construction at Pier AC3 (3 nos.)	40	0	24-Jun-16 A	27-Jul-16 A	
PC-1040	Pier Table Construction at Pier AC4 (3 nos.)	50	0	25-Jun-16 A	08-Aug-16 A	
PC-1020	Pier Table Construction at Pier AC2 (3 nos.)	40	39	20-Aug-16 A	07-Oct-16	6
Bridge D						
PD-1090	Pier Table Construction at Portal AD9/AC12 (4 nos.)	15	15	22-Aug-16	07-Sep-16	94

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

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

CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

Programme ID: 3MPR037 (Data Date: 21-Aug-16)_____Page 7 of 9

3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
PD-1030	Pier Table Construction at Portal AD3 (2 nos.)	15	15	01-Sep-16	19-Sep-16	49
PD-1120	Pier Table Construction at Pier AD12 (4 nos.) incl. in-situ cross head	40	42	08-Apr-16 A	12-Oct-16	-31
PD-1130	Pier Table Construction at Pier AD13 (4 nos.) incl. in-situ cross head	140	61	25-May-16 A	03-Nov-16	48
Viaduct Bridge Segement Erection						
Bridge A						
EA-1050	Bridge Deck Construction at Pier AA5 by Typical Lifting Frame (12 nos + 1 no. key segment)	10	0	06-Jul-16 A	30-Jul-16 A	
EA-1110	Bridge Deck Construction at Pier AA11 by Typical Lifting Frame (18 nos + 1 no. key segment)	18	0	04-Aug-16 A	18-Aug-16 A	
EA-1100	Bridge Deck Construction at Pier AA10 by Typical Lifting Frame (22 nos + 1 no. key segment)	17	17	22-Sep-16	13-Oct-16	6
EA-1070	Bridge Deck Construction at Pier AA7 by Typical Lifting Frame (14 nos + 1 no. key segment)	7	7	01-Nov-16	08-Nov-16	6
EA-1090	Bridge Deck Construction at Pier AA9 by Typical Lifting Frame (13 nos + 1 no. key segment)	7	7	09-Nov-16	16-Nov-16	6
EA-1180	Bridge Deck Construction at Pier AA18 by Typical Lifting Frame (24 nos + 2 no. key segment)	12	12	17-Nov-16	30-Nov-16	6
Bridge B						
EB-1090	Bridge Deck Construction at Pier AB9 by Crane (36 nos + 2 no. key segment)	16	0	18-Jul-16 A	11-Aug-16 A	
EB-1100	Bridge Deck Construction at Pier AB10 by Special Lifting Frame (54 nos in which 12 nos above MTRCL Railway)	72	0	30-Mar-16 A	12-Aug-16 A	
EB-1110	Bridge Deck Construction at Pier AB11 by Special Lifting Frame (48 nos in which 20 nos above MTRCL Railway)	101	101	12-Sep-16	13-Jan-17	-108
Bridge C						
EC-1030	Bridge Deck Construction at Pier AC3 by Typical Lifting Frame (15 nos + 1 no. key segment)	16	8	20-Aug-16 A	30-Aug-16	6
EC-1040	Bridge Deck Construction at Pier AC4 by Typical Lifting Frame (18 nos + 2 no. key segment)	18	18	31-Aug-16	21-Sep-16	6
EC-1020	Bridge Deck Construction at Pier AC2 by Typical Lifting Frame (22 nos)	15	15	14-Oct-16	31-Oct-16	6
EC-1010	Bridge Deck Construction at Abutment AC1 (End-span) by Falsework & Crane (16 nos)	47	47	21-Oct-16	14-Dec-16	62
Bridge D						
ED-1090	Bridge Deck Construction at Portal AD9 by Crane (14 nos + 4 no. key segment)	15	15	08-Sep-16	26-Sep-16	94
ED-1030	Bridge Deck Construction at Portal AD3 by Crane (12 nos)	24	24	20-Sep-16	19-Oct-16	49
ED-1130	Bridge Deck Construction at Pier AD13 by Crane (6 nos)	6	6	04-Nov-16	10-Nov-16	48
ED-1010	Bridge Deck Construction at Abutment AD1 (End-span) by Falsework & Crane (13 nos)	33	33	20-Oct-16	26-Nov-16	49
Major Works on Deck Surfaces						
C-1000	Cast Parapet, Permanent Prestressing & TCSS Civil Provision Works for Bridge A	180	180	24-Sep-16	11-May-17	6
Section VI - Works in Portion FH9 (KD-6A)						
Major Works						

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

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

CEDD Contract No. CV/2012/09

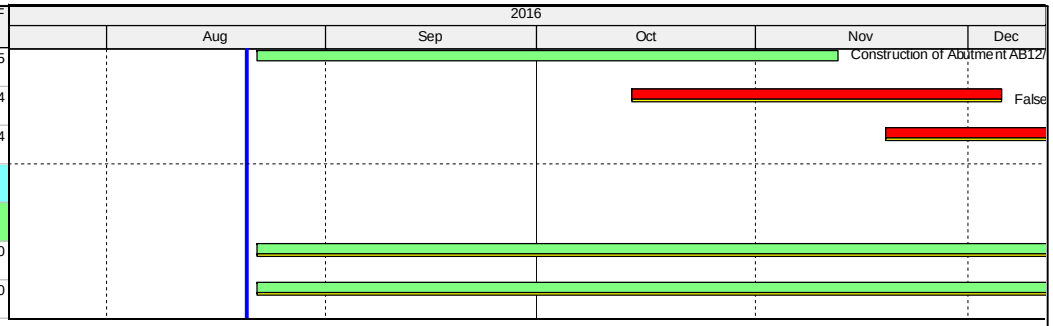
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

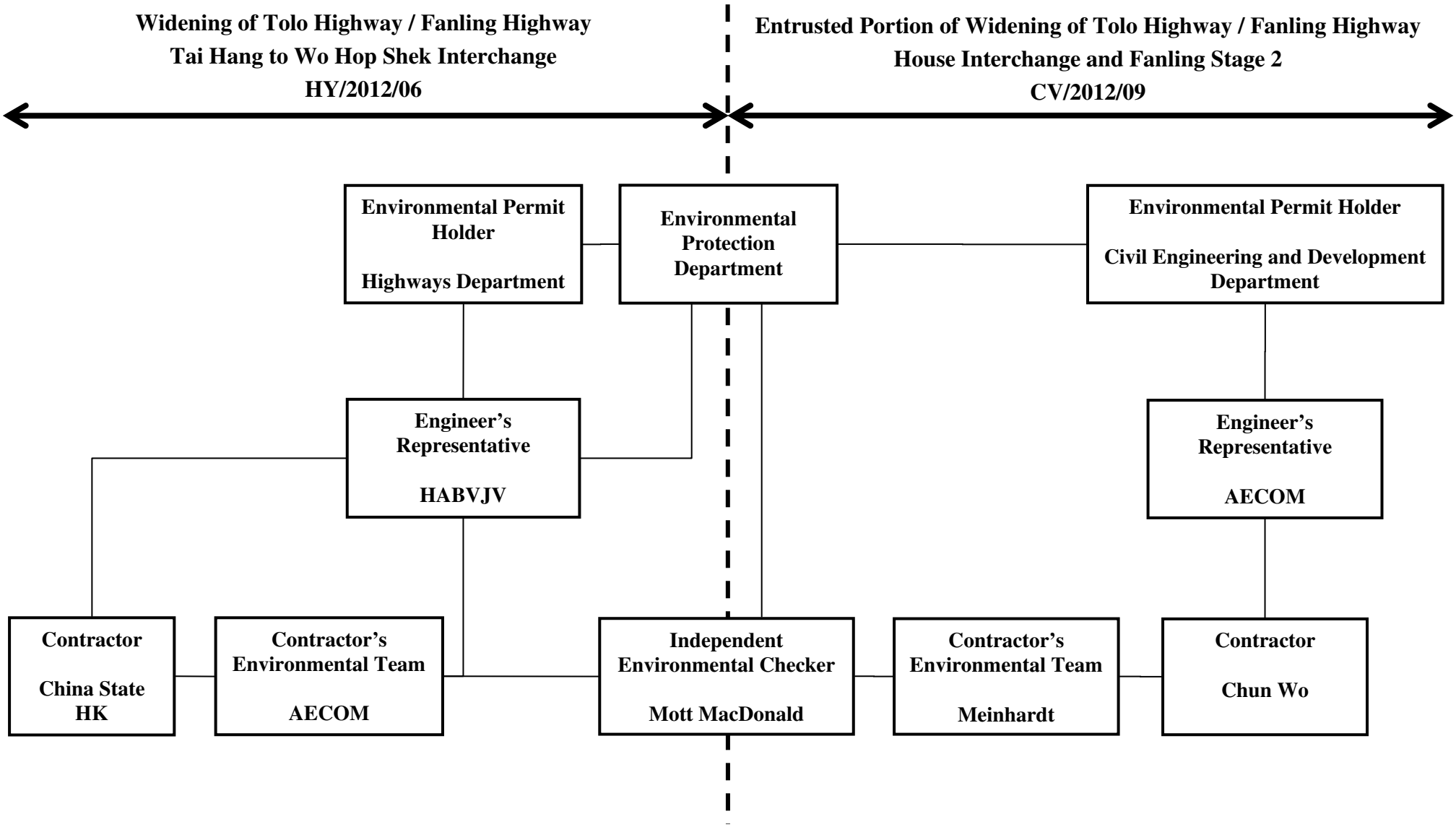
3-Month Rolling Programme updated to 2016-08-21

Date	Revision	Checked	Approved
20-Aug-16	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
S6-2000*	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	69	06-Feb-15 A	12-Nov-16	15
S6-4010	Falsework Erection for Installation of Bridge Deck at Abutment AB12	45	45	14-Oct-16	05-Dec-16	-4
S6-4000	Falsework Erection for Installation of Bridge Deck at Abutment AD14	45	45	19-Nov-16	13-Jan-17	-4
Landscaping & Establishment Works (KD-4, 4A, 5, 5A, 6)						
Secton III - Remainder of Landscaping Softworks Not Included in Secton IIIA						
S3-1000	Transplanting along Realigned TWSR West	180	180	22-Aug-16	01-Apr-17	130
S3-1020	Transplanting near MTR East Rail Line	240	240	22-Aug-16	19-Jun-17	70



Appendix B
Project Organization Structure


Widening of Tolo Highway / Fanling Highway
Tai Hang to Wo Hop Shek Interchange
HY/2012/06
Entrusted Portion of Widening of Tolo Highway / Fanling Highway
House Interchange and Fanling Stage 2
CV/2012/09
Environmental Permit Holder
Highways Department
Environmental Protection Department
Environmental Permit Holder
Civil Engineering and Development Department
Engineer's Representative
HABVJV
Engineer's Representative
AECOM
Contractor
China State HK
Contractor's Environmental Team
AECOM
Independent Environmental Checker
Mott MacDonald
Contractor's Environmental Team
Meinhardt
Contractor
Chun Wo

Appendix C
Calibration Certificates of Monitoring Equipment

TISCH Environmental

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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 14, 2016 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 1612 Pa (mm) - 745.49

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3770	3.2	2.00
2	NA	NA	1.00	0.9710	6.4	4.00
3	NA	NA	1.00	0.8710	7.8	5.00
4	NA	NA	1.00	0.8310	8.7	5.50
5	NA	NA	1.00	0.6860	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9866	0.7165	1.4078		0.9957	0.7231	0.8896
0.9824	1.0117	1.9909		0.9914	1.0210	1.2581
0.9804	1.1256	2.2259		0.9894	1.1360	1.4066
0.9793	1.1785	2.3345		0.9883	1.1893	1.4753
0.9741	1.4200	2.8155		0.9830	1.4330	1.7792
Qstd slope (m) =		2.00411		Qa slope (m) =		1.25494
intercept (b) =		-0.03059		intercept (b) =		-0.01933
coefficient (r) =		0.99995		coefficient (r) =		0.99995
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

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

TSP Sampler Calibration

SITE

Location: Lian Tang 3 — Date: July 5, 2016
Sampler: TE-5170 MFC (Serial # : 2359) — Tech: Sam Wong

CONDITIONS

Barometric Pressure (in Hg):	39.70	Corrected Pressure (mm Hg):	1008
Temperature (deg F):	87	Temperature (deg K):	304
Average Press. (in Hg):	39.70	Corrected Average (mm Hg):	1008
Average Temp. (deg F):	87	Average Temp. (deg K):	304

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	2.00411
Model:	TE-5025A	Qstd Intercept:	-0.03059
Serial#:	1612	Date Certified:	March 14, 2016

CALIBRATIONS

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)
1	12.00	1.988	58.0	66.19
2	10.00	1.816	54.0	61.63
3	8.20	1.646	48.0	54.78
4	5.20	1.314	38.0	43.37
5	3.20	1.034	30.0	34.24

LINEAR REGRESSION

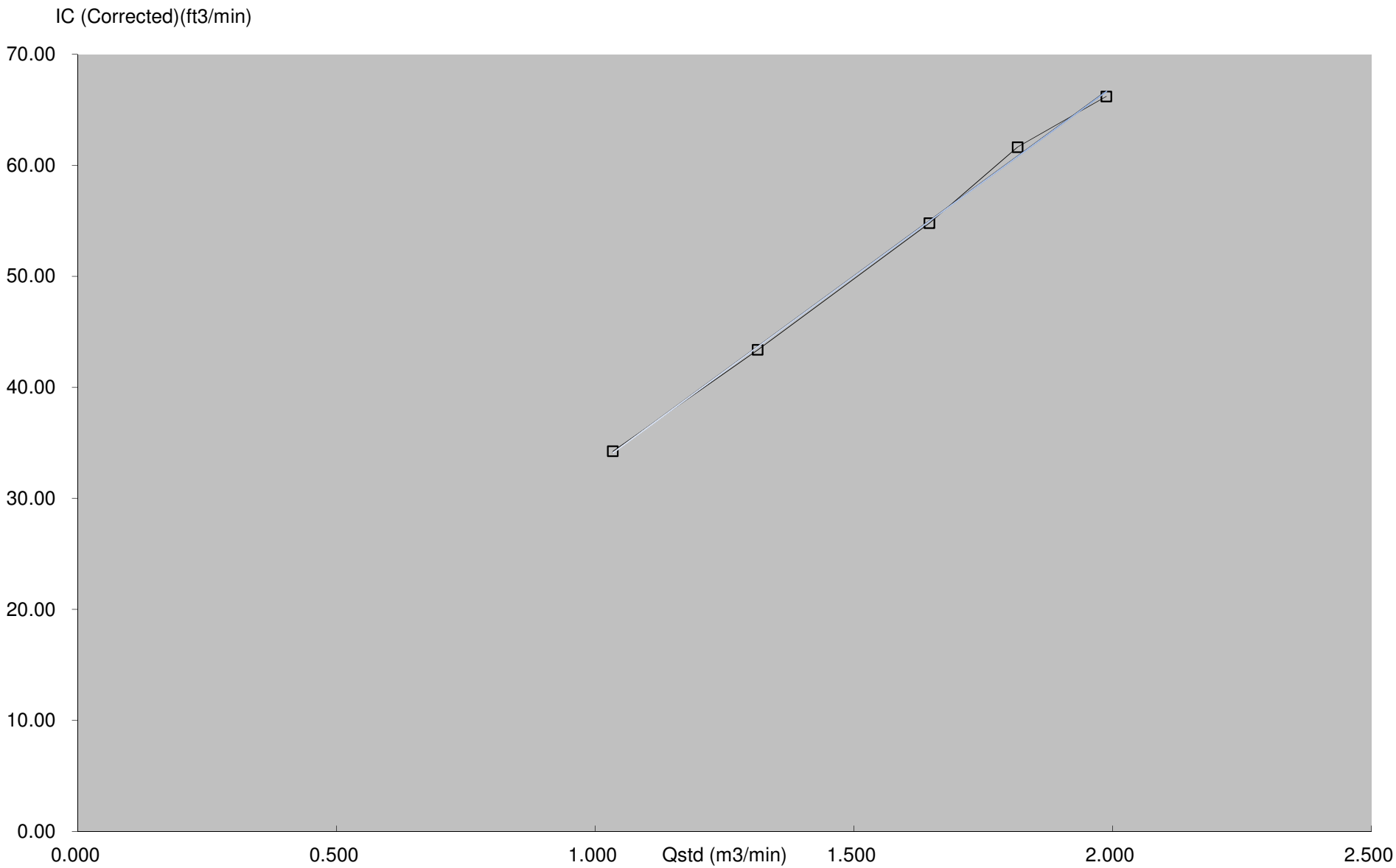
Slope =	34.1197
Intercept =	-1.1696
Corr. coeff.=	0.9992
# of Observations:	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

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


IC (Corrected)(ft3/min)
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0.000
0.500
1.000
Qstd (m3/min)
1.500
2.000
2.500

TEST REPORT

for

SOUND CALIBRATOR

Model : NC－74

Serial No. : 34857296

Condition : Temperature 25 ℃

Humidity 64 %RH

Date : September, 8, 2015

Signature : Y. kitajima

RION CO., LTD.

NC-74
34857296

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

Applicable standards

JIS C 1515:2004 class1
IEC 60942:2003 class1

RION

Hong Kong Calibration Ltd.
香港校正有限公司

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:

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

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

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : Alan Chu

Approved by : Steve Kwan

Date: 15-Oct-15

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

EO

Calibration Certificate

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. : ± 0.7 dB
Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 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	± 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 : ± 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	± 0.4 dB
	94.0	93.9 (Ref.)	- -	
	95.0	94.9	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

Calibration Certificate

4. Frequency Weighting

A weighting

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

Uncertainty : ± 0.1 dB

5. Time Averaging

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

Uncertainty : ± 0.1 dB

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

---------- END ----------

Appendix D
EM&A Monitoring Schedules

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

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

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

September 2016						
Sun	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
				1	2 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	3
4	5 ET Site Walk(09:30am – 11:00am)	6	7	8 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	9	10
11	12 ET Site Walk(09:30am – 11:00am)	13	14 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	15	16 The day following the Chinese Mid-Autumn Festival	17
18	19	20 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	21 ET Site Walk(09:30 am – 11:00 am) with Liantang Project-wide ET and IEC + SSEMC (To be confirmed)	22	23	24
25	26 ET Site Walk(09:30 – 11:00) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	27	28	29	30 24-hour TSP + 3 x 1-hour TSP	

Appendix E
Meteorological Data Extracted from Hong Kong Observatory

Daily Extract of Meteorological Observations , August 2016 - 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	998.8	32.1	29.6	26.3	25.2	78	0.5	***	***
02	994.9	28.1	26.2	24.4	24.8	92	145.0	***	***
03	1005.9	27.9	26.5	25.5	25.3	94	36.5	***	***
04	1008.3	29.1	26.3	25.2	25.8	97	44.0	***	***
05	1007.8	34.0	29.0	25.4	26.0	85	0.0	***	***
06	1004.4	35.1	30.0	25.6	25.7	79	0.0	***	***
07	1002.2	35.6	30.4	26.9	26.3	80	0.0	***	***
08	1002.4	36.1	30.4	27.4	26.2	79	0.0	***	***
09	1001.4	33.2	28.7	25.7	26.4	88	2.5	***	***
10	1002.1	27.8	26.3	24.7	25.4	95	23.5	***	***
11	1002.7	31.9	27.6	25.3	25.2	87	0.5	***	***
12	1000.8	30.6	27.6	26.0	25.7	90	2.0	***	***
13	999.3	33.3	28.6	26.4	25.6	85	1.0	***	***
14	998.0	29.1	27.2	25.3	25.0	88	16.0	***	***
15	997.2	30.5	26.5	24.9	25.6	95	17.5	***	***
16	995.8	27.2	26.0	24.9	25.4	97	15.0	***	***
17	993.6	28.4	26.6	25.0	25.6	95	14.0	***	***
18	995.8	29.2	26.8	25.6	25.7	94	57.5	***	***
19	1002.5	32.5	28.9	26.0	26.0	85	0.0	***	***
20	1004.2	34.5	28.7	26.2	27.0	91	11.5	***	***
21	1002.6	33.0	27.0	23.1	25.2	91	58.5	***	***
22	1004.2	34.8	29.1	25.5	25.0	81	0.0	***	***
23	1004.2	35.7	29.8	25.3	24.9	76	0.0	***	***
24	1003.2	34.3	30.1	26.9	24.8	74	0.0	***	***
25	1003.7	35.3	30.3	26.0	25.5	78	0.0	***	***
26	1004.2	35.6	29.6	26.0	25.1	78	2.0	***	***
27	1006.0	35.1	28.5	25.7	25.5	85	12.5	***	***
28	1006.1	30.4	26.8	24.6	24.1	86	57.5	***	***
29	1007.1	27.9	26.0	24.9	21.2	75	0.0	***	***
30	1007.2	31.8	27.5	23.9	22.7	76	0.0	***	***
31	1005.8	33.3	27.7	23.6	24.0	81	0.0	***	***

*** unavailable

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

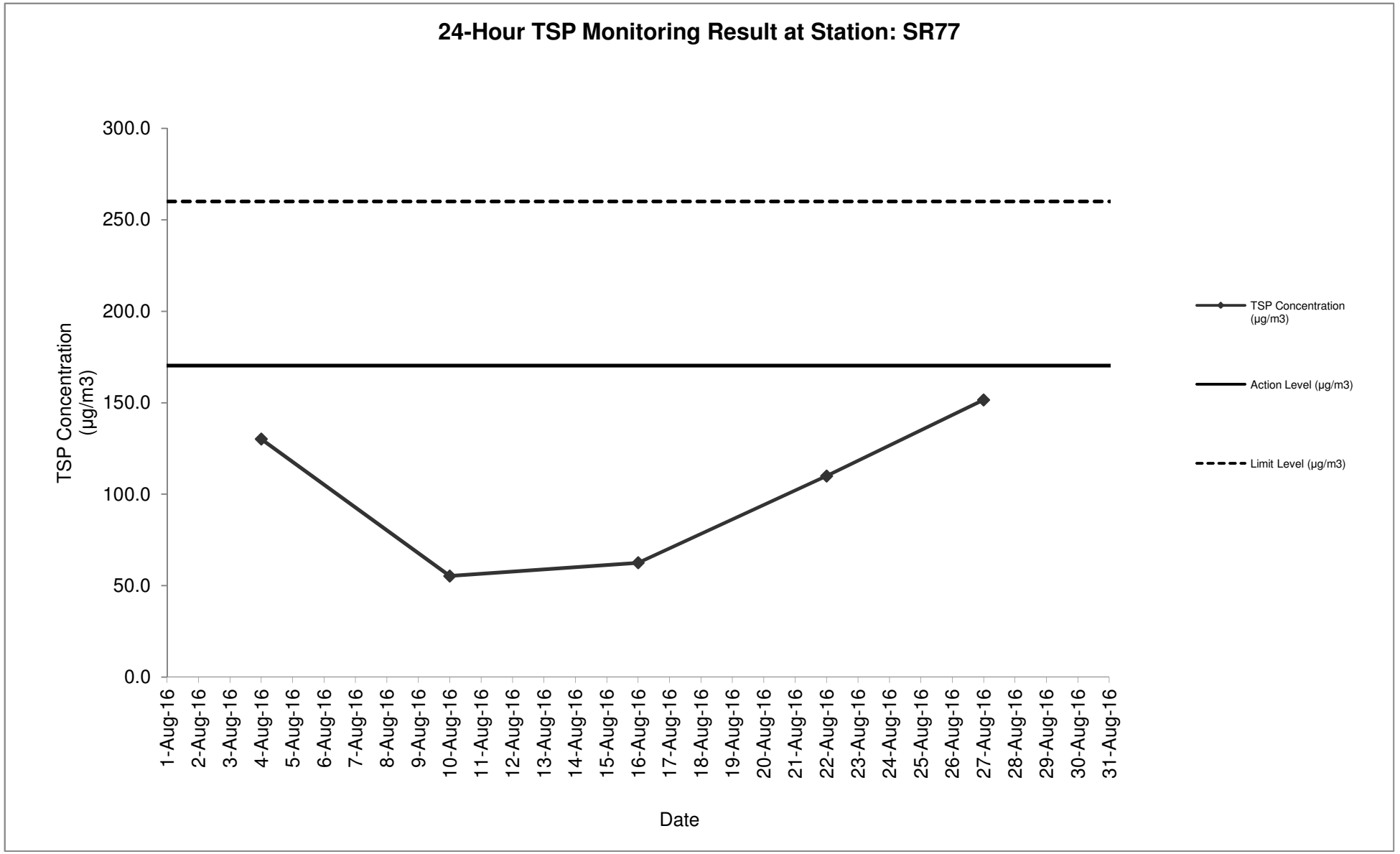
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

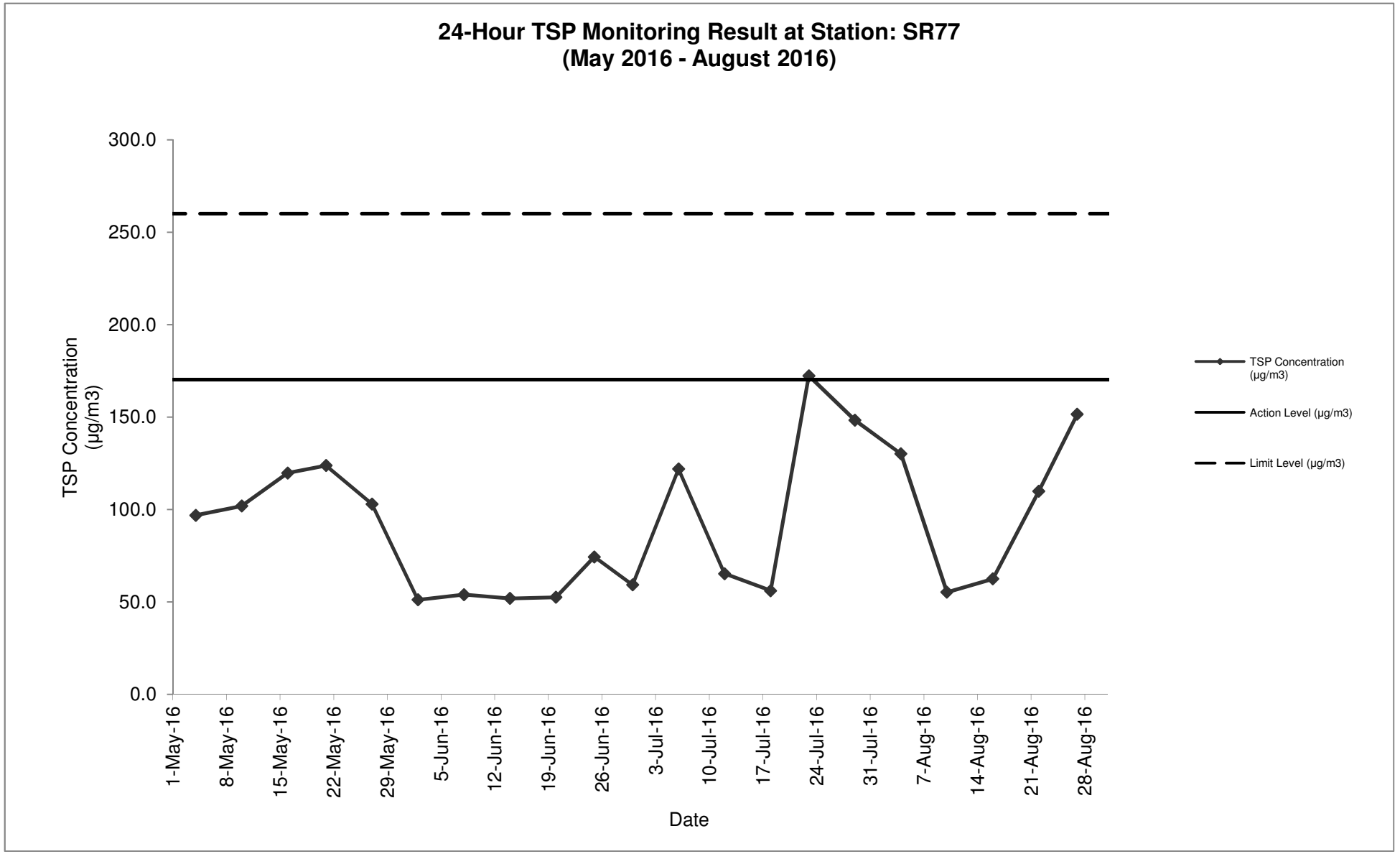
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

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^3/min)			Total Volume (m^3)	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m3$)	Limit Level ($\mu g/m3$)	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						
4-Aug-16	Rainy	12:11	218	2.7565	3.0271	0.2706	5116.67	5140.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	130.1	170.3	260.0	<5	N
10-Aug-16	Rainy	12:12	220	2.8429	2.9579	0.1150	5143.67	5167.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	55.3	170.3	260.0	<5	N
16-Aug-16	Rainy	12:10	222	2.8216	2.9516	0.1300	5170.67	5194.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	62.5	170.3	260.0	<5	N
22-Aug-16	Sunny	12:10	224	2.8165	3.0451	0.2286	5197.67	5221.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	109.9	170.3	260.0	<5	N
27-Aug-16	Sunny	12:12	226	2.8566	3.1717	0.3151	5224.67	5248.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	151.5	170.3	260.0	<5	N
																Average	101.9				
																Min	55.3				
																Max	151.5				

Note: No major dust source observed during the monitoring period


24-Hour TSP Monitoring Result at Station: SR77
TSP Concentration (µg/m3)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
1-Aug-16
2-Aug-16
3-Aug-16
4-Aug-16
5-Aug-16
6-Aug-16
7-Aug-16
8-Aug-16
9-Aug-16
10-Aug-16
11-Aug-16
12-Aug-16
13-Aug-16
14-Aug-16
15-Aug-16
16-Aug-16
17-Aug-16
18-Aug-16
19-Aug-16
20-Aug-16
21-Aug-16
22-Aug-16
23-Aug-16
24-Aug-16
25-Aug-16
26-Aug-16
27-Aug-16
28-Aug-16
29-Aug-16
30-Aug-16
31-Aug-16
Date
TSP Concentration (µg/m3)
Action Level (µg/m3)
Limit Level (µg/m3)

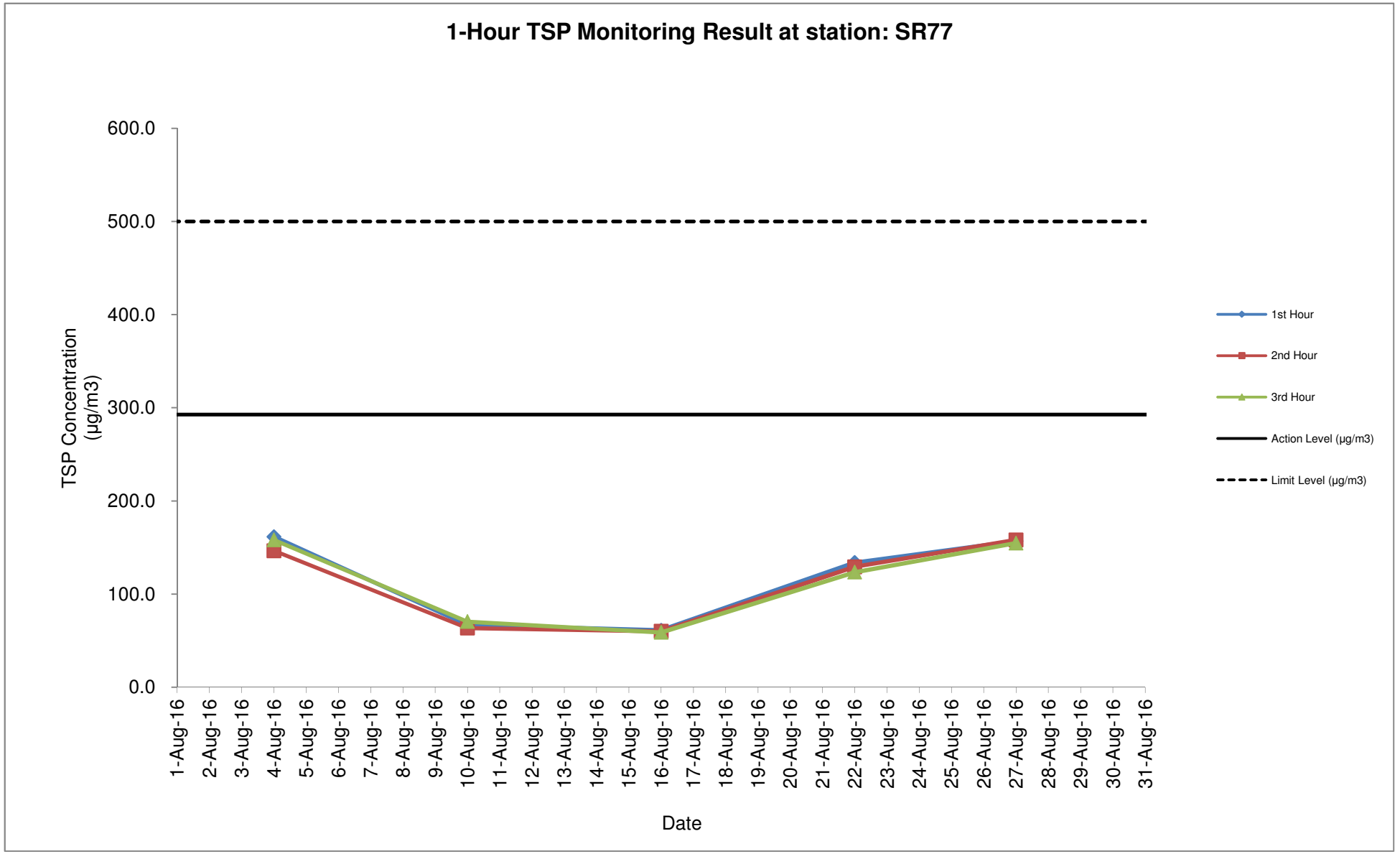

24-Hour TSP Monitoring Result at Station: SR77
(May 2016 - August 2016)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
TSP Concentration (µg/m3)
1-May-16
8-May-16
15-May-16
22-May-16
29-May-16
5-Jun-16
12-Jun-16
19-Jun-16
26-Jun-16
3-Jul-16
10-Jul-16
17-Jul-16
24-Jul-16
31-Jul-16
7-Aug-16
14-Aug-16
21-Aug-16
28-Aug-16
Date
TSP Concentration (µg/m3)
Action Level (µg/m3)
Limit Level (µg/m3)

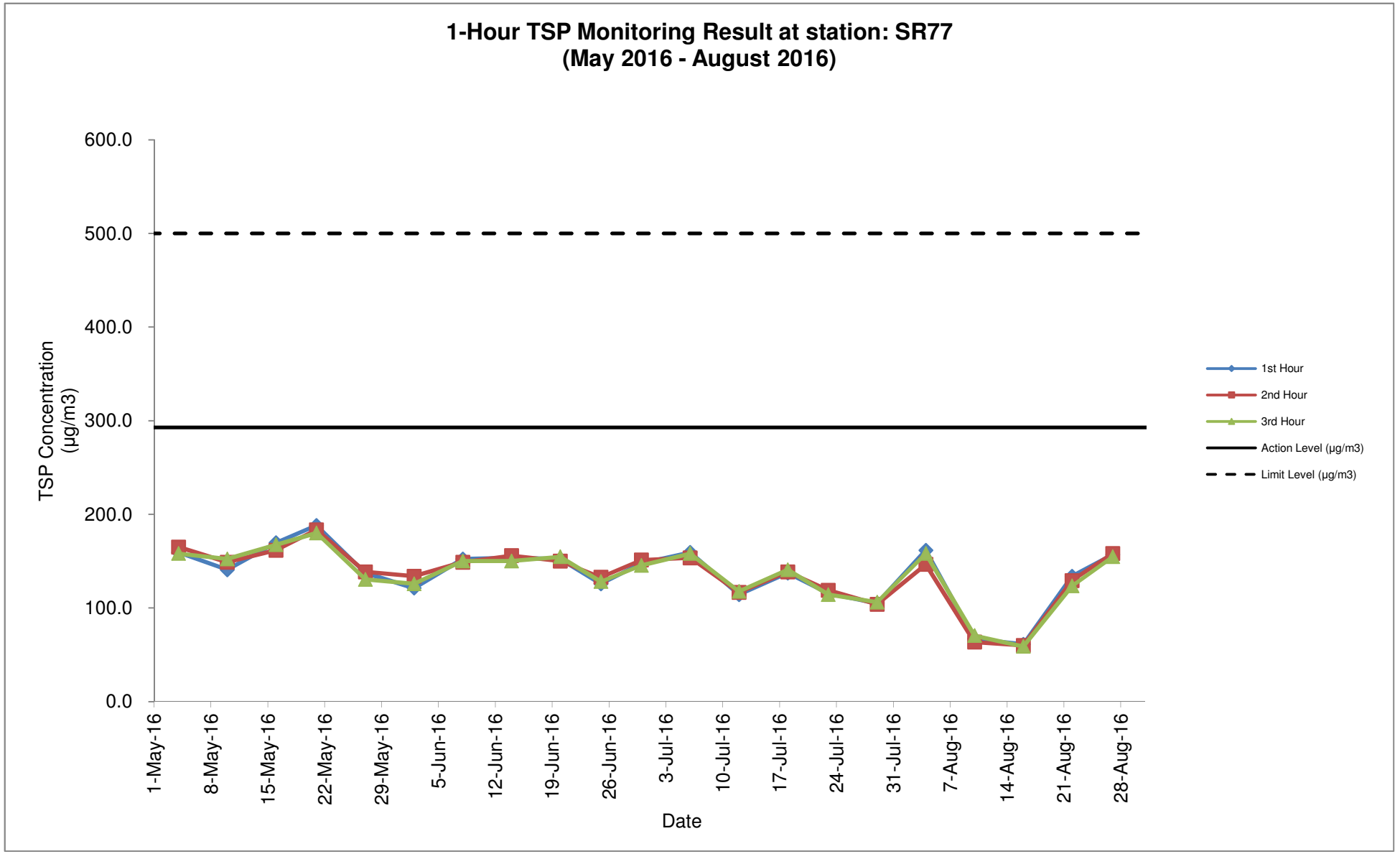
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

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

Sampling Date	Weather Condition	Starting Time	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m^3/min)			Total Volume (m^3)	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m3$)	Limit Level ($\mu g/m3$)	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						
4-Aug-16	Rainy	09:00	C219A	2.8221	2.8361	0.0140	5113.67	5114.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	161.6	292.7	500.0	<5	N
	Rainy	10:03	C219B	2.7944	2.8071	0.0127	5114.67	5115.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	146.6	292.7	500.0	<5	N
	Rainy	11:07	C219C	2.8167	2.8304	0.0137	5115.67	5116.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	158.1	292.7	500.0	<5	N
10-Aug-16	Rainy	09:00	C221A	2.8330	2.8388	0.0058	5140.67	5141.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	66.9	292.7	500.0	<5	N
	Rainy	10:04	C221B	2.8113	2.8168	0.0055	5141.67	5142.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	63.5	292.7	500.0	<5	N
	Rainy	11:08	C221C	2.8057	2.8118	0.0061	5142.67	5143.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	70.4	292.7	500.0	<5	N
16-Aug-16	Rainy	09:00	C223A	2.8221	2.8274	0.0053	5167.67	5168.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	61.2	292.7	500.0	<5	N
	Rainy	10:03	C223B	2.8169	2.8221	0.0052	5168.67	5169.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	60.0	292.7	500.0	<5	N
	Rainy	11:07	C223C	2.8148	2.8199	0.0051	5169.67	5170.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	58.9	292.7	500.0	<5	N
22-Aug-16	Sunny	09:00	C225A	2.7941	2.8057	0.0116	5194.67	5195.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	133.9	292.7	500.0	<5	N
	Sunny	10:04	C225B	2.8090	2.8202	0.0112	5195.67	5196.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	129.3	292.7	500.0	<5	N
	Sunny	11:09	C225C	2.8142	2.8249	0.0107	5196.67	5197.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	123.5	292.7	500.0	<5	N
27-Aug-16	Sunny	09:00	C227A	2.8541	2.8677	0.0136	5221.67	5222.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	157.0	292.7	500.0	<5	N
	Sunny	10:04	C227B	2.8311	2.8448	0.0137	5222.67	5223.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	158.1	292.7	500.0	<5	N
	Sunny	11:08	C227C	2.8297	2.8431	0.0134	5223.67	5224.67	1.00	51	51	51.0	1.44	1.44	1.44	86.65	154.6	292.7	500.0	<5	N
																Average	113.6				
																Min	58.9				
																Max	161.6				

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


1-Hour TSP Monitoring Result at station: SR77
TSP Concentration (µg/m3)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
1-Aug-16
2-Aug-16
3-Aug-16
4-Aug-16
5-Aug-16
6-Aug-16
7-Aug-16
8-Aug-16
9-Aug-16
10-Aug-16
11-Aug-16
12-Aug-16
13-Aug-16
14-Aug-16
15-Aug-16
16-Aug-16
17-Aug-16
18-Aug-16
19-Aug-16
20-Aug-16
21-Aug-16
22-Aug-16
23-Aug-16
24-Aug-16
25-Aug-16
26-Aug-16
27-Aug-16
28-Aug-16
29-Aug-16
30-Aug-16
31-Aug-16
Date
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)
Limit Level (µg/m3)


1-Hour TSP Monitoring Result at station: SR77
(May 2016 - August 2016)
TSP Concentration (µg/m3)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
1-May-16
8-May-16
15-May-16
22-May-16
29-May-16
5-Jun-16
12-Jun-16
19-Jun-16
26-Jun-16
3-Jul-16
10-Jul-16
17-Jul-16
24-Jul-16
31-Jul-16
7-Aug-16
14-Aug-16
21-Aug-16
28-Aug-16
Date
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)
Limit Level (µg/m3)

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	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Identify source; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling days	1. Notify IEC, ER, Contractor, and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase frequency to daily; 5. Analyse Contractor's working procedures to determine possible mitigation to be; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discus amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by ER until the exceedance is abated.

Event and Action Plan for Noise Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	1. Notify IEC, ER, EPD and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Water Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor & ER; 4. Check monitoring data, all plant, equipment & contractor's working methods;	1. Check monitoring data submitted by ET & Contractor's working methods;	1. Confirm receipt of notification of failure in writing; Notify, Contractor	1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures with IEC, ER & Contractor; 6. Ensure mitigation measures are implemented; 7. Increase monitoring to daily until no exceedance of Action level.	1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures properly implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 5. Implement the agreed mitigation measures.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & contractor's working methods; 5. Discuss mitigation measures with IEC, Contractor & ER.	1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods.	1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat measurement on the next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures within IEC, Contractor & ER; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on potential remedial actions; 3. Review Contractor's mitigation measures whenever necessary to assure their effectiveness & advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider & instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Appendix H
Noise Monitoring Results and their Graphical Presentation

Appendix H
Noise Monitoring Results and their Graphical Presentation

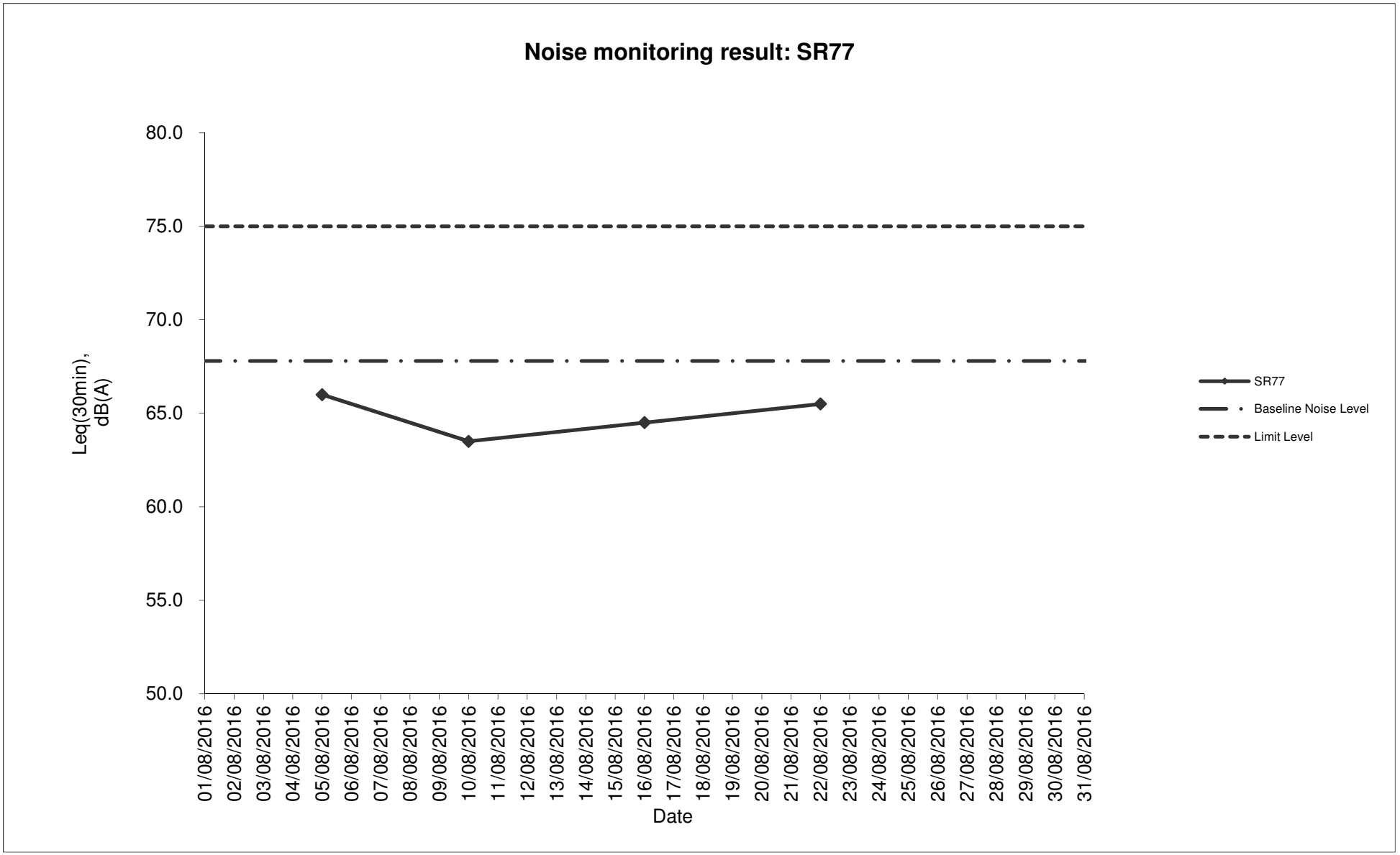
Noise Monitoring Result at SR77

Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)	Exceedance (Y / N)
				L10(30min)	L90(30min)	Leq(30min)				
2016/08/05	Fine	13:30	14:00	90.5	61.5	66.0	-	67.8	75.0	N
2016/08/10	Cloudy	14:00	14:30	91.0	61.5	63.5	-	67.8	75.0	N
2016/08/16	Rainy	14:00	14:30	90.0	56.5	64.5	-	67.8	75.0	N
2016/08/22	Sunny	13:30	14:00	88.5	57.0	65.5	-	67.8	75.0	N
					Average	64.9				
					Minimum	63.5				
					Maximum	66.0				

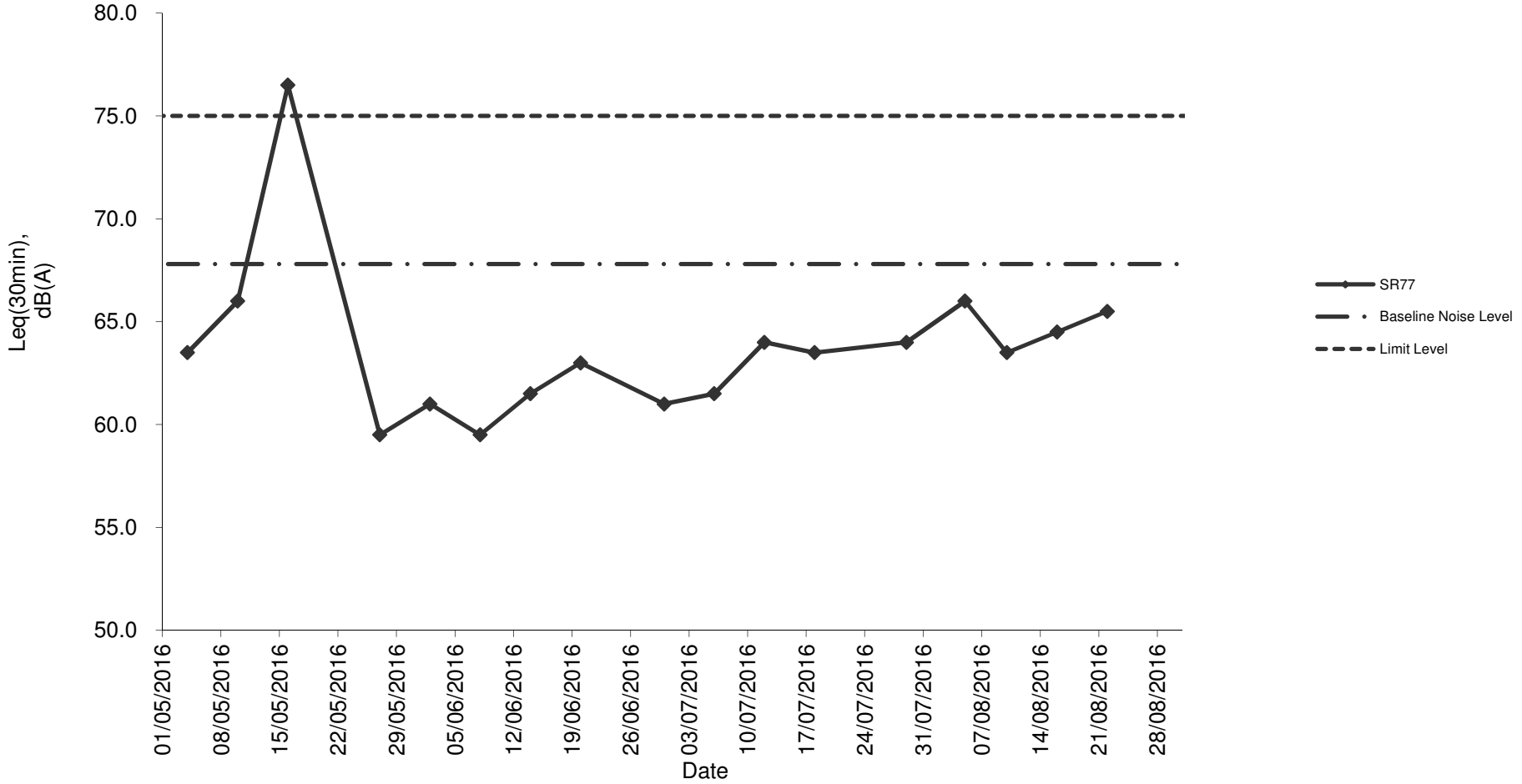
Remarks

* +3dB(A) Façade effect correction included

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


Noise monitoring result: SR77
80.0
75.0
70.0
65.0
60.0
55.0
50.0
Leq(30min), dB(A)
01/08/2016
02/08/2016
03/08/2016
04/08/2016
05/08/2016
06/08/2016
07/08/2016
08/08/2016
09/08/2016
10/08/2016
11/08/2016
12/08/2016
13/08/2016
14/08/2016
15/08/2016
16/08/2016
17/08/2016
18/08/2016
19/08/2016
20/08/2016
21/08/2016
22/08/2016
23/08/2016
24/08/2016
25/08/2016
26/08/2016
27/08/2016
28/08/2016
29/08/2016
30/08/2016
31/08/2016
Date
SR77
Baseline Noise Level
Limit Level

Noise monitoring result: SR77
(May 2016 - August 2016)



Appendix K
Waste Flow Table

Monthly Summary Waste Flow Table

	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
Month	Total Quantity Generated	Hard Rock and Large Broken Concrete	Soil	Soil Reused in the Contract	Soil Reused in other Projects	Soil Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging (Note 3)	Plastics	Chemical Waste	General Refuse (Note 2)
Unit	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in m^3)	(in '000m^3)
Jan-16	2.683	0.253	2.430	0.030	-	2.400	0.799	0.001	-	-	-	0.115
Feb-16	1.876	0.651	1.225	0.020	-	1.205	1.141	-	-	-	-	0.110
Mar-16	1.501	0.417	1.084	-	-	1.084	0.831	-	-	0.001	-	0.090
Apr-16	0.472	0.046	0.426	0.018	-	0.408	0.647	-	-	-	-	0.135
May-16	0.488	0.013	0.475	-	-	0.475	2.479	-	-	-	-	0.105
Jun-16	0.523	0.103	0.420	-	-	0.420	0.716	-	-	0.001	-	0.135
Sub-Total	7.543	1.483	6.060	0.068	-	5.992	6.613	0.001	-	0.002	-	0.690
Jul-16	0.565	0.019	0.546	-	-	0.546	1.407	-	0.001	0.004	1.000	0.085
Aug-16	0.582	0.088	0.494	-	-	0.494	0.715	-	-	0.001	-	0.105
Sep-16	-		-		-							
Oct-16	-		-		-							
Nov-16	-		-		-							
Dec-16	-		-									
Total	8.690	1.590	7.100	0.068	-	7.032	8.735	0.001	0.001	0.007	1.000	0.880

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

Appendix L
Implementation Schedule of Environmental Mitigation Measures (EMIS)

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status [#]
Air Quality				
Air Quality during Construction	• Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading. • All stockpiles of excavated materials or spoil of more than 50m^3 shall be enclosed, covered or dampened during dry or windy conditions. • Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas. • All spraying of materials and surfaces shall avoid excessive water usage. • Vehicles that have the potential to create dust while transporting materials shall be covered, with the cover properly secured and extended over the edges of the side and tail boards. • Materials shall be dampened, if necessary, before transportation. • Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks. • Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads.	During Construction	Contractor	✓ ✓ ✓ ✓ ✓ ✓ ✓ Obs
Air Quality during Operation	Not required	N/A	N/A	N/A
Noise				
Noise during Construction	• Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant. • Reduce the number of equipment and their percentage on-time.	During Construction	Contractor	✓ ✓
Noise during Operation	Not required	N/A	N/A	N/A
Water Quality				
Water Quality during Construction	<u>Road Widening Works, Earthworks and Culvert Extension Works</u> • Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required.	During Construction	Contractor	✓

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status [#]
	• Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained.			✓
	• Runoff from exposed working areas, unfinished slopes and from unlined temporary channels should be directed to stilling basins and/or silt traps before discharging to the drainage outfalls.			✓
	• Regular inspections of stilling basins and/or silt traps is required to ensure that sediment is not conveyed into the existing drainage system.			✓
	• Open stockpiles should be covered with a tarpaulin cover.			✓
	• During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded.			✓
	• Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains.			✓
	• Fuels should be stored in bunded areas such that spillage can be easily collected.			✓
Water Quality during Operation	Not required	N/A	N/A	N/A
Waste Management				
Waste Management during Construction	<u>General Waste</u>			
	• Transport of wastes off site as soon as possible.	During Construction	Contractor	✓
	• Maintenance of accurate waste records.			✓
	• Minimisation of waste generation for disposal (via reduction/recycling/re-use).			✓
	• No on-site burning will be permitted.			✓
	• Use of re-useable metal hoardings/signboards.			✓
	<u>Vegetation from site clearance</u>			
	• Segregation of materials to facilitate disposal.	During Construction	Contractor	✓
	• Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas.			✓

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status [#]
	<u>Demolition Wastes</u>			
	• Segregation of materials to facilitate disposal.	During Construction	Contractor	✓
	• Appropriate stockpile management.			✓
	<u>Excavated Materials</u>			
	• Segregation of materials to facilitate disposal / reuse.	During Construction	Contractor	✓
	• Appropriate stockpile management.			✓
	• Re-use of excavated material on or off site (where possible).			✓
	• Special handling and disposal procedures in the event that contaminated materials are excavated.			N/A
	<u>Construction Wastes</u>			
	• Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles).	During Construction	Contractor	✓
	• Appropriate stockpile management.			✓
	• Planning to reduce over ordering and waste generation.			✓
	• Recycling and re-use of materials where possible (e.g. metal, wood from formwork)			✓
	• For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal.			✓
	<u>Bentonite Slurries</u>			
	• Bentonite slurries should be reused as far as possible.	During Construction	Contractor	N/A
	• Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94.			N/A
	<u>Chemical Wastes</u>			
	• Storage within locked, covered and bunded area.	During Construction	Contractor	✓
	• The storage area shall not be located adjacent to sensitive receivers e.g. drains.			✓
	• Minimise waste production and recycle oils/solvents where possible.			✓

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status [#]
	• A spill response procedure shall be in place and absorption material available for minor spillages. • Use appropriate and labelled containers. • Educate site workers on site cleanliness/waste management procedures. • If chemical wastes are to be generated, the contractor must register with EPD as a chemical waste producer. • The chemical wastes shall be collected by a licensed chemical waste collector. <u>Municipal Wastes</u> • Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal. • Regular, daily collections are required by an approved waste collector.	During Construction	Contractor	Obs ✓ Rem / Obs ✓ ✓ ✓ ✓
Waste Management during Operation	Not required.	N/A	N/A	N/A
Ecology				
Ecology during Construction	<u>Accurate Delineation of Works Area</u> • Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats. • Individual trees which fall within the works areas but which work plans show do not require removal are to be retained and fenced off to maximise protection. <u>Dust generation</u> There are a number of measures which shall be taken as specified in the Air Pollution Control (Construction Dust) Regulation on 'Dust Control Requirements, including the following key measures to be applied during construction: • vehicle washing facilities to be provided at every discernible or designated vehicle exit point;	During Construction During Construction	Contractor Contractor	✓ ✓ ✓

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status [#]
	• all temporary site access roads shall be sprayed with water to suppress dust as necessary; • all dusty materials should be sprayed with water immediately prior to any handling; and • all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area. <u>Surface Run-off</u> In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include: • Bund and cover stockpiles to avoid run-off; • Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical; • All vehicle maintenance to be undertaken within a bunded area; and • Maximise vegetation retention on-site to maximise absorption (minimise transport).	During Construction	Contractor	✓ ✓ ✓ ✓ ✓ ✓ ✓
Ecology during Operation	• To conduct compensatory ecological planting as specified in the latest landscape plans approved by EPD (Clause 2.6 of the Environmental Permit refers).	During Construction and operation	Contractor (during construction) / LCSD* (during operation) (Note: * The division of vegetation planting and maintenance responsibilities shall follow the guidelines stipulated in ETWB TCW No. 2/2004.)	N/A
Landscape and Visual				
Landscape and Visual during Construction	<u>Preservation of Existing Vegetation</u> • Trees identified for retention within the project limit would be protected during the works • The tree transplanting and planting works shall be implemented by approved Landscape Contractors	During Construction	Contractor	✓ ✓

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

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status [#]
	<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.	During Construction	Contractor	✓
	<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.	During Construction	Contractor	✓
	<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.	During Construction	Contractor	N/A
	<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.	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	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. An EM&A Programme is being undertaken to monitoring the environmental performance of the construction works, and the Contractor has also implemented appropriate mitigation measures to avoid silt-laden runoff discharging from the works sites into the river. The complaint is considered an invalid complaint under this Project.	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)	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. 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. 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.	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					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 The complaint is considered unlikely due to the construction works of this project.	

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

10/F Genesis
33-35 Wong Chuk Hang Road
Hong Kong
香港黃竹坑道33-35號
創協坊10樓

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

mail@meinhardt.com.hk
www.meinhardt-china.com
www.meinhardtgroup.com