



JOB No.: TCS00757/15

DSD CONTRACT NO. DC/2013/09 –  
ADVANCE WORKS FOR SHEK WU HUI SEWAGE  
TREATMENT WORKS – FURTHER EXPANSION PHASE 1A  
AND SEWERAGE WORKS AT PING CHE ROAD

FIRST MONTHLY ENVIRONMENTAL MONITORING AND  
AUDIT (EM&A) REPORT - **OCTOBER 2015**

PREPARED FOR

TSUN YIP WATERWORKS CONSTRUCTION CO LTD

Date	Reference No.	Prepared By	Certified By
23 November 2015	TCS00757/15/600/R0017	 Martin Li (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	11 November 2015	First Submission
2	23 November 2015	Amended according to the IEC's comment on 17 November 2015



Drainage Services Department  
44/F., Revenue Tower  
5 Gloucester Road  
Wan Chai  
Hong Kong

Your reference:

Our reference: HKDSD201/50/103226

Date: 24 November 2015

Attention: Mr Michael Leung

**BY EMAIL & POST**  
**(Email: [hkleung@dsd.gov.hk](mailto:hkleung@dsd.gov.hk))**

Dear Sirs

Agreement No.: SP 01/2015  
Environmental Monitoring and Audit for Advance Works for  
Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A  
Monthly EM&A Report for October 2015

We refer to emails of 11, 18, 23 and 24 November 2015 attaching a Monthly EM&A Report for October 2015 for the captioned project prepared by the Environmental Team (ET) of the captioned project.

We have no further comment and hereby verify the Monthly EM&A Report in accordance with Clause 3.3 of the Environmental Permit no. FEP-01/474/2013.

Please do not hesitate to contact the undersigned or our Mr Garret Lam at 2618 2836 should you have any queries.

Yours faithfully  
ANewR CONSULTING LIMITED

Adi Lee  
Independent Environmental Checker

LYMA/LCYG/chnb

cc. Ken Wong – Tsun Yip (Email: [kenwong@tsunyip.hk](mailto:kenwong@tsunyip.hk))  
Nicola Hon – AUES (Email: [nicolahon@fordbusiness.com](mailto:nicolahon@fordbusiness.com))

**EXECUTIVE SUMMARY**

- ES.01 The existing Shek Wu Hui Sewage Treatment Works (hereafter referred as “SWHSTW”) with secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas is operated and maintained by Drainage Services Department (hereafter referred as “DSD”). With planned stretching of its sewage catchment, there is an urgent need for further expansion of SWHSTW.
- ES.02 DSD Contract No. DC/2013/09 – Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road (hereinafter referred as “the Contract”), which Advance Works for Shek Wu Hui Sewage Treatment Works is part of SWHSTW Further Expansion (hereinafter referred as “the Project”), is a Designated Project to be implemented under Environmental Permit number FEP-01/474/2013 (hereinafter referred as “the FEP-01/474/2013” or “the EP”).
- ES.03 In July 2015, Tsun Yip Waterworks Construction Co Ltd (hereinafter referred as “Tsun Yip” or “the Contractor”) has awarded the Contract. Action-United Environmental Services and Consulting (AUES) has been appointed as the independent Environmental Team (ET) to implement the relevant EM&A program.
- ES.04 As part of the project EM&A program, baseline monitoring was carried out by the ET in accordance with the project EM&A Manual from **28 August 2015** to **12 September 2015** to determine the ambient environmental conditions i.e. air quality and background noise before commencement of construction works. The Baseline Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. It was submitted on 24 September 2015 and verified by IEC and endorsed by EPD before impact monitoring commencement on **1 October 2015**.
- ES.05 A set of A/L Levels serve as the yardsticks for assessing the acceptability of the environmental impact during the construction phase impact monitoring. They are statistical in nature and derived according to the criteria set out in the EM&A Manual and are given in the following tables.

<b>Action and Limit Levels for Air Quality Monitoring</b>				
<b>Monitoring Stations</b>	<b>Action Level (<math>\mu\text{g}/\text{m}^3</math>)</b>		<b>Limit Level (<math>\mu\text{g}/\text{m}^3</math>)</b>	
	<b>1-hour</b>	<b>24-hour</b>	<b>1-hour</b>	<b>24-hour</b>
<b>AM1</b>	286	147	500	260
<b>AM2</b>	276	NA	500	NA
<b>AM2a</b>	NA	155	NA	260

<b>Action and Limit Levels for Construction Noise Monitoring</b>		
<b>Monitoring Location</b>	<b>Action Level</b>	<b>Limit Level</b>
	<b>0700-1900 hours on normal weekdays</b>	
NM1 and NM2	When one or more documented complaints are received	75 dB(A) of Leq(30min) during normal hours from 0700 to 1900 hours on normal weekdays

- ES.06 This is the **first** Environmental Monitoring and Audit Monthly Report covering the period from **1** to **31 October 2015** (the Reporting Period).

**ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES**

- ES.07 Environmental monitoring activities under the EM&A program in this Reporting Month are summarized in the following table.

<b>Issues</b>	<b>Environmental Monitoring Parameters / Inspection</b>	<b>Occasions</b>
Air Quality	1-hour TSP	<b>30</b>
	24-hour TSP	<b>12</b>
Construction Noise	$L_{Aeq(30min)}$ Daytime	<b>10</b>

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Inspection / Audit	ET Regular Environmental Site Inspection	4
	IEC Monthly Environmental Site Audit	1

**BREACH OF ACTION AND LIMIT (A/L) LEVELS**

- ES.08 No exceedance of air quality and construction noise monitoring were recorded in this Reporting Month. No Notification of Exceedance (NOE) was, therefore, issued. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	-	-
	24-hour TSP	0	0	0	-	-
Construction Noise	L <sub>Aeq</sub> (30min)	0	0	0	-	-

Note: NOE – Notification of Exceedance

**ENVIRONMENTAL COMPLAINT**

- ES.09 No environmental complaint was recorded or received in this Reporting Month. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 Oct 2015 – 31 Oct 2015	0	0	NA

**NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

- ES.10 No environmental summons or successful prosecutions were recorded in this Reporting Month. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 Oct 2015 – 31 Oct 2015	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 Oct 2015 – 31 Oct 2015	0	0	NA

**REPORTING CHANGE**

- ES.11 As the first report of this EM&A programme, there are no reporting changes in this Reporting Month.

**SITE INSPECTION BY EXTERNAL PARTIES**

- ES.12 No site inspection was undertaken by external parties i.e. EPD or AFCD in this Reporting Month.

**FUTURE KEY ISSUES**

- ES.13 Dry season is approaching. Special attention should be paid to provide air quality mitigation measures for suppression of construction dust including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. Moreover, mitigation measures to avoid ingress of surface runoff into nearby water bodies from the construction site should be properly maintained.

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## 1 INTRODUCTION

### 1.1 PROJECT BACKGROUND

1.1.1 The existing Shek Wu Hui Sewage Treatment Works (hereafter referred as “SWHSTW”) with secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas is operated and maintained by Drainage Services Department (hereafter referred as “DSD”). Based on the preliminary design of the Project, the scope of works for the Project comprises the following major components:

- (a) Demolition of the existing Inlet Works and construction of the new Inlet Works, including inlet pumping station, screening and gritting facilities;
- (b) Demolition of 4 existing circular Primary Sedimentation Tanks (PSTs) and construction of new rectangular PSTs;
- (c) Construction of new pre-membrane screens;
- (d) Modification of existing Bioreactor (BR) 1 and 2 to suit the proposed membrane bioreactor (MBR) process;
- (e) Construction of a new standby Bioreactor;
- (f) Demolition of 4 existing circular Final Sedimentation Tanks (FSTs) and construction of new Membrane Tanks and Membrane Facility Building;
- (g) Reconstruction of sludge treatment facilities, including thickening, anaerobic digestion, biogas handling, sludge holding and dewatering facilities; and
- (h) Other ancillary works.

1.1.2 According to the Project implementation programme, the construction of most of the above proposed works (hereinafter referred to as “Main Works”) will be commencement in 2016 and completion in 2022. Furthermore, Advance Works as part of the above proposed works will carry out before Main Works commencement. The Advance Works will be commencement in third quarter of 2015 and comprise the following major components:

- (a) Modification of BR1, through upgrading of electrical and mechanical (E&M) equipment and minor civil works, to suit the proposed MBR process;
- (b) Demolition of FSTs 1 and 2 and construction of Membrane Tanks and the first phase of Membrane Facility Building; and
- (c) Tree felling and transplanting, to facilitate timely construction of the new Inlet Works during the implementation of Main Works (under review).

1.1.3 The general layout of Advance Works and Main Works of SWHSTW Further Expansion Phase 1A show in **Appendix A**. Subsequent to Further Expansion Phase 1A, the SWHSTW will be further expanded under separate projects (namely Further Expansion Phase 1B and Phase 2).

1.1.4 In July 2015, Tsun Yip Waterworks Construction Co Ltd (hereinafter referred as “Tsun Yip” or “the Contractor”) has awarded the DSD Contract No. DC/2013/09 – **Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road** (hereinafter referred as “the Contract”). The Contract is the Advance Works for Shek Wu Hui Sewage Treatment Works as part of SWHSTW Further Expansion which is a Designated Project under Environmental Permit number FEP-01/474/2013 (hereinafter referred as “the FEP-01/474/2013” or “the EP”).

1.1.5 The works under the Contract at Shek Wu Hui Sewage Treatment Works will be included the conversion of one existing bioreactor and two existing final sedimentation tanks into one membrane bioreactor. Moreover, construction of about 1.5 kilometres length of sewers at Ping Che Road and other ancillary works will be undertaken. The works of Contract are scheduled to be conduct about 25 months. Layout plan of the Contract is shown in **Appendix B**.

1.1.6 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) was appointed by the Contractor as an Environmental Team (hereinafter referred as “the ET”) to

implement the relevant EM&A program in accordance with the Updated EM&A Manual, as well as the associated duties.

1.1.7 As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Hence baseline monitoring including air quality and noise were carried out between **28 August 2015** and **12 September 2015** at the proposed locations before construction work commencement. The “Baseline Monitoring Report (TCS00757/15/600/R0014 Version 2)” had submitted to EPD by the DSD before commencement of major construction works and approved by the IEC on 24 September 2015. Further to Tsun Yip’s instructions, the EM&A program was commenced on 1 October 2015 and the monitoring schedule had been issued to relevant parties on 29 September 2015.

1.1.8 This is the **first** Monthly EM&A Report presenting the monitoring results and inspection findings for the reporting period from **1** to **31 October 2015**.

## 1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

<b>SECTION 1</b>	<b>INTRODUCTION</b>
<b>SECTION 2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>
<b>SECTION 3</b>	<b>SUMMARY OF MONITORING REQUIREMENTS</b>
<b>SECTION 4</b>	<b>IMPACT MONITORING RESULTS</b>
<b>SECTION 5</b>	<b>WASTE MANAGEMENT</b>
<b>SECTION 6</b>	<b>SITE INSPECTIONS</b>
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<b>SECTION 8</b>	<b>IMPLEMENTATION STATUES OF MITIGATION MEASURES</b>
<b>SECTION 9</b>	<b>IMPACT FORECAST</b>
<b>SECTION 10</b>	<b>CONCLUSIONS AND RECOMMENDATION</b>



**2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS****2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE**

2.1.1 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in [Appendix C](#).

**2.2 CONSTRUCTION PROGRESS**

2.1.2 Master Construction Program of the Contract is enclosed in [Appendix D](#) and the major construction activities undertaken in this Reporting Month are illustrated in [Appendix B](#) and listed below:-

- Install Sheet Piles and Strutting for Membrane Facilitates and Tanks; and
- Demolition of Methanol Storage Tanks.

**2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS**

2.1.3 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Month is presented in [Table 2-1](#).

**Table 2-1 Status of Environmental Licenses and Permits**

Item	Description	License/Permit Status
1	Chemical waste Producer Registration (WPN: 5213-624-T3148-04)	Application date: 19/08/2015 Date approved: 18/9/2015
2	Water Pollution Control Ordinance (Discharge License: WT00022503-2015)	Application date: 19/08/2015 Date approved: 18/9/2015
3	Billing Account for Disposal of Construction Waste (Account Number: 7022898)	Has obtained

2.1.4 In accordance with the Further EP No. FEP-01/474/2013 Condition 2.3, an Updated Environmental Monitoring and Audit (EM&A) Manual (TCS00757/15/600/R0012v3) which certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC), has submitted to DSD and EPD endorsement.

2.1.5 Baseline Monitoring Report (TCS00757/15/600/R0014v2) as certified by the ETL and verified by the IEC was submitted to the EPD on 24 September 2015 for endorsement.

**3 SUMMARY OF IMPACT MONITORING REQUIREMENT****3.1 GENERAL**

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Updated EM&A manual. Environmental issues such as air quality and construction noise were identified as the key issues during the construction phase of Advance Works of the Project.

3.1.2 A summary of EM&A programmes of construction phase are presented in the sub-sections below.

**3.2 MONITORING PARAMETERS**

3.2.1 The EM&A programmes of construction phase shall cover the following environmental issues:

- Air quality; and
- Construction noise

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1* below

**Table 3-1 Summary of EM&A Requirements**

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> <li>• 1-hour TSP by Real-Time Portable Dust Meter; and</li> <li>• 24-hour TSP by High Volume Air Sampler.</li> </ul>
Construction Noise	<ul style="list-style-type: none"> <li>• <math>L_{eq(30min)}</math> during normal working hours; and</li> <li>• <math>L_{eq(15min)}</math> for the construction works undertaken in Restricted Hours, if necessary.</li> </ul>

**3.3 MONITORING LOCATIONS**

3.3.1 According to the *Updated EM&A Manual* of Advance Works which submitted to EPD on **25 August 2015**, three air quality sensitive receivers and two construction noise sensitive receivers are proposed to monitor the environmental performance of the Contract. The proposed monitoring locations are summarized in *Table 3-2* and shown in *Appendix E*.

**Table 3-2 Proposed Air Quality and Construction Noise Monitoring Locations**

Aspect	Station ID	Location	Parameter
Air Quality	AM1	No. 31 Wai Loi Tsuen	1- hour and 24- hour TSP
	AM2	Fu Tei Au	1- hour
	AM2a	RE's Site Office	24- hour TSP
Noise	NM1	No. 31 Wai Loi Tsuen	$L_{eq(30min)}$
	NM2	Fu Tei Au	$L_{eq(30min)}$

**3.4 MONITORING FREQUENCY AND PERIOD**

3.4.1 The requirements of baseline monitoring are stipulated in *Sections 2.1.7 and 3.2.5* of the Updated EM&A Manual and presented as follows.

*Air Quality Monitoring*

3.4.2 Monitoring frequency for air quality baseline monitoring is as follows:

- 1-Hour TSP                      3 sets of 1-hour TSP monitoring shall be carried out once in every six days.
- 24-Hour TSP                    24-hour shall be carried out once in every six days.

*Noise Monitoring*

3.4.3 Construction noise monitoring should be carried out at the designated monitoring station when there are Project-related construction activities being undertaken within a radius of 300m from

the monitoring stations. The monitoring frequency should depend on the scale of the construction activities. An initial guide on the monitoring is to obtain one set of 30-minute measurement at each station between 0700 and 1900 hours on normal weekdays at a frequency of once a week when construction activities are underway.

- 3.4.4 If construction works are extended to include works during the hours of 1900 - 0700, additional weekly impact monitoring shall be carried out during evening and night-time works. Applicable permits under NCO shall be obtained by the Contractor.

### 3.5 MONITORING EQUIPMENT

#### Air Quality Monitoring

- 3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.
- 3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.
- 3.5.3 All equipment as used air quality monitoring is listed in **Table 3-3**.

**Table 3-3 Air Quality Monitoring Equipment**

Equipment	Model
<b>24-Hr TSP</b>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5028A
<b>1-Hour TSP</b>	
Portable Dust Meter	Sibata LD-3 Laser Dust monitor Particle Mass Profiler & Counter

#### Wind Data Monitoring Equipment

- 3.5.4 According to the Updated EM&A Manual Sections 2.1.3.8, alternative methods to obtain representative wind data was proposed by the ET. Meteorological information as extracted from “the Hong Kong Observatory Ta Kwu Ling Station” is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is situated the sea level above 15mPD. The station’s wind data monitoring equipment is set above the existing ground ten meters in compliance with the general setting up requirement. Furthermore, this station also can be to provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In Hong Kong of a lot development projects, weather information extracted from Hong Kong Observatory is common alternative method if weather station installation not allowed.

#### Noise Monitoring

- 3.5.5 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s<sup>-1</sup>.
- 3.5.6 Noise monitoring equipment to be used for baseline monitoring is listed in **Table 3-4**.

**Table 3-4 Construction Noise Monitoring Equipment**

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238 or Rion NL-14
Calibrator	Rion NC-73 / B&K Type 4231

Equipment	Model
Portable Wind Speed Indicator	Testo Anemometer

- 3.5.7 Sound level meters listed above comply with the *International Electrotechnical Commission Publications 651: 1979 (Type 1)* and *804: 1985 (Type 1)* specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the baseline monitoring will be calibrated yearly.

### 3.6 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

- 3.6.1 According to the baseline monitoring results and the Updating Environmental Monitoring and Audit Manual stipulation, the air quality and construction noise criteria were set up, namely Action and Limit levels are listed in *Tables 3-5 & 3-6* as below.

**Table 3-5 Action and Limit Levels for 24-Hr TSP and 1-Hr TSP Air Quality,  $\mu\text{g m}^{-3}$**

Monitoring Stations	Action Level ( $\mu\text{g/m}^3$ )		Limit Level ( $\mu\text{g/m}^3$ )	
	1-hour	24-hour	1-hour	24-hour
AM1	286	147	500	260
AM2	276	NA	500	NA
AM2a	NA	155	NA	260

**Table 3-6 Action and Limit Levels for Construction Noise**

Monitoring Stations	Action Level	Limit Level in dB(A)
Time Period: 0700-1900 hours on normal weekdays		
NM1 and NM2	When one documented complaint is received	> 75* dB(A)

Note: (\*) Reduces to 70 dB(A) for schools and 65 dB(A) during the school examination periods.

### 3.7 EVENT ACTION PLAN

- 3.7.1 If non-compliance or exceedance of the Action/Limit Levels is occurred, actions shall be taken in accordance with the Event Action Plan in *Appendix F*.

## **4 MONITORING METHDOLOGY**

### **4.1 AIR QUALITY MONITORING**

#### **Monitoring Location**

- 4.1.1 The detailed information of air quality monitoring stations referred to **Table 3-2** and the graphical plot of monitoring locations shown in **Appendix E** in this report.

#### **Monitoring Equipment**

- 4.1.2 All the monitoring equipment to be used in the EM&A program as listed in **Table 3-3** has been agreed with the IEC.

#### **Monitoring Procedures**

##### 1-hour TSP

- 4.1.3 The 1-hour TSP monitor, a Sibata LD-3 Laser Dust monitor Particle Mass Profiler & Counter was used for baseline monitoring, which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90<sup>0</sup> light scattering. The 1-hour TSP monitor consisted of the following:

- a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
- b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

- 4.1.4 The 1-hour TSP meter used is within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter was follow manufacturer's Operation and Service Manual. A valid calibration certificate is attached in **Appendix G**.

##### 24-hour TSP

- 4.1.5 The equipment used for 24-hour TSP measurement is a Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The High Volume Air Sampler (HVS) consists of the following:

- a. An anodized aluminum shelter;
- b. A 8"x10" stainless steel filter holder;
- c. A blower motor assembly;
- d. A continuous flow/pressure recorder;
- e. A motor speed-voltage control/elapsed time indicator;
- f. A 7-day mechanical timer, and
- g. A power supply of 220v/50 hz

- 4.1.6 Prior of 24-hour TSP monitoring, the HVS was calibrated in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5028A). The 24-hour TSP Monitoring using the HVS was also processed in accordance with the manufacturer's Operations Manual. A valid calibration certificate of the calibration kit with the certificate of HVS calibrated is attached in **Appendix G**.

- 4.1.7 24-hour TSP was collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keeps all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.

### **4.2 CONSTRUCTION NOISE MONITORING**

#### **Monitoring Location**

- 4.2.1 The detailed information of construction noise monitoring stations referred to **Table 3-2** and the graphical plot of monitoring locations shown in **Appendix E** in this report.

#### **Monitoring Equipment**

- 4.2.2 All the monitoring equipment to be used in the EM&A program as listed in **Table 3-3** has been agreed with the IEC.
- 4.2.3 Sound level meter listed in **Table 3-4** is complied with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO). A valid of calibration certificates including sound level meter and an acoustic were shown in **Appendix G**.

#### **Monitoring Procedures**

- 4.2.4 The noise measurement was performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) in six consecutive Leq(5 min) measurements were used as the monitoring parameter throughout the baseline monitoring period.
- 4.2.5 During the monitoring, the sound level meter was mounted on a tripod at a height of about 1.2 m and placed at the monitoring locations and oriented such that the microphone was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield was fitted for the measurement. For construction noise monitoring, all monitoring stations were conducted 1 m from the exterior of the building façade.
- 4.2.6 Prior noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The calibration level from before and after the noise measurement agrees to within 1.0dB.
- 4.2.7 During the noise measurement, a portable wind speed meter was used to check wind speed (m/s). For baseline noise monitoring, no wind speed was exceeding 5m/s or gusts exceeding 10m/s. Also, noise measurement in time was no fog and rain.

### **4.3 DATA MANAGEMENT AND DATA QA/QC CONTROL**

- 4.3.1 The monitoring data were handled by the ET's in-house data recording and management system.
- 4.3.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.
- 4.3.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.



## 5 IMPACT MONITORING RESULTS

### 5.1 GENERAL

5.1.1 Air quality and construction noise monitoring scheduled in the Reporting Month is attached in **Appendix H** and the monitoring results are shown in the following sub-sections.

### 5.2 RESULTS OF AIR QUALITY MONITORING

5.2.1 The results for 24-hour and 1-hour TSP are summarized in **Tables 5-1 to 5-2**. The 24-hour TSP data are shown in **Appendix I** and graph plots including 1-Hr TSP and 24-Hr TSP are shown in **Appendix J**.

**Table 5-1 Summary of 1-Hour TSP Monitoring Results,  $\mu\text{g}/\text{m}^3$**

DATE	AM1				AM2			
	Start Time	1 <sup>st</sup> Meas.	2 <sup>nd</sup> Meas.	3 <sup>rd</sup> Meas.	Start Time	1 <sup>st</sup> Meas.	2 <sup>nd</sup> Meas.	3 <sup>rd</sup> Meas.
2-Oct-15	14:54	79	79	80	14:19	78	78	78
8-Oct-15	14:21	235	132	115	14:50	216	120	104
14-Oct-15	14:32	122	116	125	13:02	103	103	117
24-Oct-15	13:33	78	86	88	13:19	76	80	83
30-Oct-15	10:30	95	94	87	13:00	90	90	83
Average (Range)		107 (78 to 235)				100 (76 to 216)		

**Table 5-2 Summary of 24-hour TSP Monitoring Results,  $\mu\text{g}/\text{m}^3$**

Date	AM1	AM2a
3-Oct-15	41	43
9-Oct-15	44	67
15-Oct-15	76	91
20-Oct-15	*91	106
26-Oct-15	48	51
31-Oct-15	54	62
Average (Range)	59 (41 to 91)	70 (43 to 106)

Remarks: (\*) Due to electricity supply failure incident, 24-Hour TSP sampling was only run 15.66 hours.

5.2.2 High Volume Sampler (HVS) for 24-hour TSP monitoring at Location AM1 was disconnected during operation on 20 October 2015 and the sample was run for approximately 16 hours according to the timer of the HVS. Liaised with the owner, the electricity supply for HVS has resumed.

5.2.3 As shown in **Tables 5-1** and **5-2**, the 24-hour and 1-hour TSP monitoring results were below the Action/ Limit Level. No Notification of Exceedances (NOE) of air quality criteria or corrective action was therefore required.

5.2.4 The meteorological data during the Reporting Month is summarized in **Appendix K**.

5.2.5 Construction dust assessment for short term impact was undertaken in the EIA study. In view of the current contract, monitoring locations AM1 and AM2a are not an ASR during the EIA study and therefore no prediction was made. For 1-hour TSP monitoring location AM2, it is very near the assessment point FLN-E13 in the EIA. According to the EIA prediction, the predicted result for Tier 2 in assessment year 2018 is  $91.0\mu\text{g}/\text{m}^3$  for 1-hour TSP and the cumulative 1-hour concentrations would comply with the respective criteria and adverse short-term construction dust impact is not anticipated. It is concluded that the overall 1-hour TSP monitoring result in the Reporting Period is comparable to the EIA prediction.

### 5.3 RESULTS OF CONSTRUCTION NOISE MONITORING

- 5.3.1 In the Reporting Period, a total of **10** event noise measurements were carried out at the designated locations. During construction noise monitoring, the sound level meter was set in 1m from the exterior of the building façade. Therefore, no façade correction (+3dB(A)) is added according to acoustical principles and EPD guidelines. The construction noise monitoring results at the designated locations are summarized in **Table 5-3**. The detailed noise monitoring data are presented in **Appendix I** and the relevant graphical plots are shown in **Appendix J**.

**Table 5-3 Summary of Construction Noise Monitoring Results, dB(A)**

Date	NM1		NM2	
	Time of Measurement	( $L_{eq30min}$ )	Time of Measurement	( $L_{eq30min}$ )
2-Oct-15	14:24	52	15:03	47
8-Oct-15	14:28	57	15:14	48
14-Oct-15	14:03	53	15:37	51
19-Oct-15	14:42	52	15:38	46
30-Oct-15	10:30	55	11:30	56
<b>Limit Level</b>	<b>75 dB(A)</b>			

- 5.3.2 As shown in **Table 5-3**, the noise level measured at the designated monitoring locations were below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, Contractors or DSD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

**6 WASTE MANAGEMENT****6.1 GENERAL WASTE MANAGEMENT**

6.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

**6.2 RECORDS OF WASTE QUANTITIES**

6.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

6.2.2 The quantities of waste for disposal in this Reporting Period are summarized in **Tables 6-1** and **6-2** and the Monthly Summary Waste Flow Table is shown in **Appendix L**. Whenever possible, materials were reused on-site as far as practicable.

**Table 6-1 Summary of Quantities of Inert C&D Materials for the Project**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
C&D Materials (Inert) (in '000m <sup>3</sup> )	0	0.002	0.002	Tuen Mun 38
Reused in this Project (Inert) (in '000 m <sup>3</sup> )	0	0	0	--
Reused in other Projects (Inert) (in '000 m <sup>3</sup> )	0	0	0	--
Disposal as Public Fill (Inert) (in '000 m <sup>3</sup> )	0	0	0	--

**Table 6-2 Summary of Quantities of C&D Wastes for the Project**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Metals ('000kg)	0	43.790	43.790	Licensed collector
Paper / Cardboard Packing ('000kg)	0	0	0	--
Plastics ('000kg)	0	0	0	--
Chemical Wastes ('000kg)	0	0	0	--
General Refuses ('000m <sup>3</sup> )	0.011	0.004	0.015	NENT

**7 SITE INSPECTION****7.1 REQUIREMENTS**

- 7.1.1 According to the Updated EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

**7.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH**

- 7.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor has been carried out on **7, 14, 22 and 27 October 2015**. Furthermore, IEC attend site inspection was on **22 October 2015**. No non-compliance was noted.
- 7.2.2 Observations for the site inspections and monthly audit within this Reporting Month are summarized in **Table 7-1**.

**Table 7-1 Site Observations**

<b>Date</b>	<b>Findings / Deficiencies</b>	<b>Follow-Up Status</b>
7 Oct 2015	<ul style="list-style-type: none"> <li>The Contractor was reminded to ensure all wastewater are properly treated before discharge from site.</li> </ul>	<ul style="list-style-type: none"> <li>Reminder only</li> </ul>
14 Oct 2015	<ul style="list-style-type: none"> <li>The Contractor was reminded to cover the stockpile well with impervious sheet to reduce dust generation.</li> </ul>	<ul style="list-style-type: none"> <li>Reminder only</li> </ul>
22 Oct 2015	<ul style="list-style-type: none"> <li>Soil stockpile observed located on the working areas. The Contractor should be covered the stockpile well with impervious sheet to reduce dust generation.</li> </ul>	<ul style="list-style-type: none"> <li>Before site inspection on 27 October 2015, the stockpile has removed.</li> </ul>
	<ul style="list-style-type: none"> <li>Chemical materials observed free standing on site. The Contractor should provide secondary containment such as drip tray for all chemical container which located on site to prevent land contamination.</li> </ul>	<ul style="list-style-type: none"> <li>The chemical materials was immediately removed.</li> </ul>
27 Oct 2015	<ul style="list-style-type: none"> <li>A drip tray without plug is observed. As reminded that a plug should be provided prevent leaking of chemicals from drip tray and cause land contamination.</li> </ul>	<ul style="list-style-type: none"> <li>To be reported in next month</li> </ul>

**8 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE****8.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

- 8.1.1 No environmental complaint, summons and prosecution was received in this reporting period. The statistical summary table of environmental complaint is presented in [Tables 8-1, 8-2](#) and [8-3](#).

**Table 8-1 Statistical Summary of Environmental Complaints**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 October 2015	0	0	NA

**Table 8-2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 October 2015	0	0	NA

**Table 8-3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 October 2015	0	0	NA

**9 IMPLEMENTATION STATUS OF MITIGATION MEASURES****9.1 GENERAL REQUIREMENTS**

9.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the Updated EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in **Appendix M**.

9.1.2 The Contract under the Project shall be implementing the required environmental mitigation measures according to the Updated EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by the Contract in this Reporting Period are summarized in **Table 9-1**.

**Table 9-1 Environmental Mitigation Measures**

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> <li>Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Maintain wet surface on access road</li> <li>All vehicles must use wheel washing facility before off site</li> <li>Sprayed water during breaking works</li> <li>A cleaning truck was regularly performed on the public road to prevent fugitive dust emission</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.</li> <li>Keep good maintenance of plants</li> <li>Shut down the plants when not in used.</li> </ul>
Waste and Chemical Management	<ul style="list-style-type: none"> <li>On-site sorting prior to disposal</li> <li>Follow requirements and procedures of the “Trip-ticket System”</li> <li>Predict required quantity of concrete accurately</li> <li>Collect the unused fresh concrete at designated locations in the sites for subsequent disposal</li> </ul>
General	<ul style="list-style-type: none"> <li>The site was generally kept tidy and clean.</li> </ul>

9.1.3 Based on monitoring results including air quality and construction noise, it is considered that the environmental mitigation measures implemented by the Contractor in this Reporting Period are effective.

**9.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH**

9.2.1 Construction activities listed below will be undertaken in in the coming month for the Contract of the Project.

- Install Sheet Piles and Strutting for Membrane Facilitates and Tanks;
- Demolition Structure of FST1 & FST2 (Up to +0.0mPD); and
- Pipe Laying for BR2 Pipe (CHG00-33).

**9.3 KEY ISSUES FOR THE COMING MONTH**

9.3.1 Key issues to be considered in the coming month for the Contract include:

- Implementation of dust suppression measures at all times;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
- Ensure dust suppression measures are implemented properly;
- Implementation of construction noise preventative control measures
- Management of chemical wastes;
- Follow-up of improvement on general waste management issues; and
- Potential wastewater quality impact due to surface runoff;



## **10 CONCLUSIONS AND RECOMMENDATIONS**

### **10.1 CONCLUSIONS**

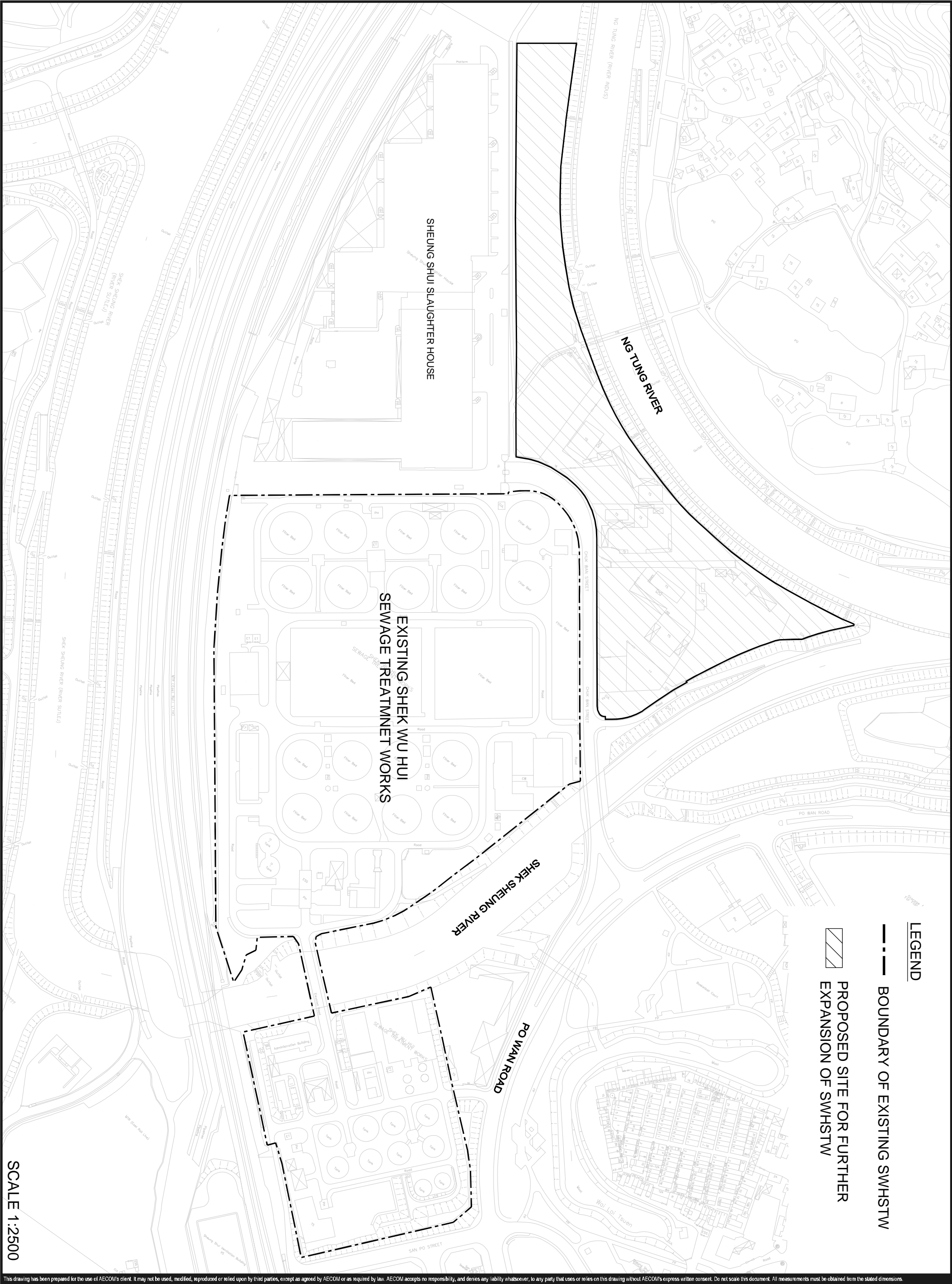
- 10.1.1 This is the 1<sup>st</sup> monthly EM&A report, covering the construction period from 1 to 31 October 2015 (the Reporting Month).
- 10.1.2 No 24-hour or 1-hour TSP monitoring results that triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.
- 10.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Month. No NOEs or the associated corrective actions were therefore issued.
- 10.1.4 No documented complaint, notification of summons or successful prosecution was received.
- 10.1.5 Joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor were carried out on **7, 14, 22 and 27 October 2015**. Furthermore, IEC attend site inspection was on **22 October 2015**. No non-compliance was observed during the inspection. In general, it was reminded that good house-keeping practice should be maintained. The environmental performance of the Project was therefore considered satisfactory.
- 10.1.6 No site inspection was undertaken by any external party in this Reporting Month.

### **10.2 RECOMMENDATIONS**

- 10.2.1 As dry season is approaching, special attention should be paid to provide air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc.
- 10.2.2 Moreover, mitigation measures to avoid ingress of surface runoff into nearby water bodies from the construction site should be properly maintained.
- 10.2.3 To control the site performance on waste management, Tsun Yip shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. Tsun Yip is also reminded to implement the recommended environmental mitigation measures according to the Updating Environmental Monitoring and Audit Manual.

## **Appendix A**

### **GENERAL LAYOUT OF ADVANCE WORKS AND MAIN WORKS OF SWHSTW FURTHER EXPANSION PHASE 1A**



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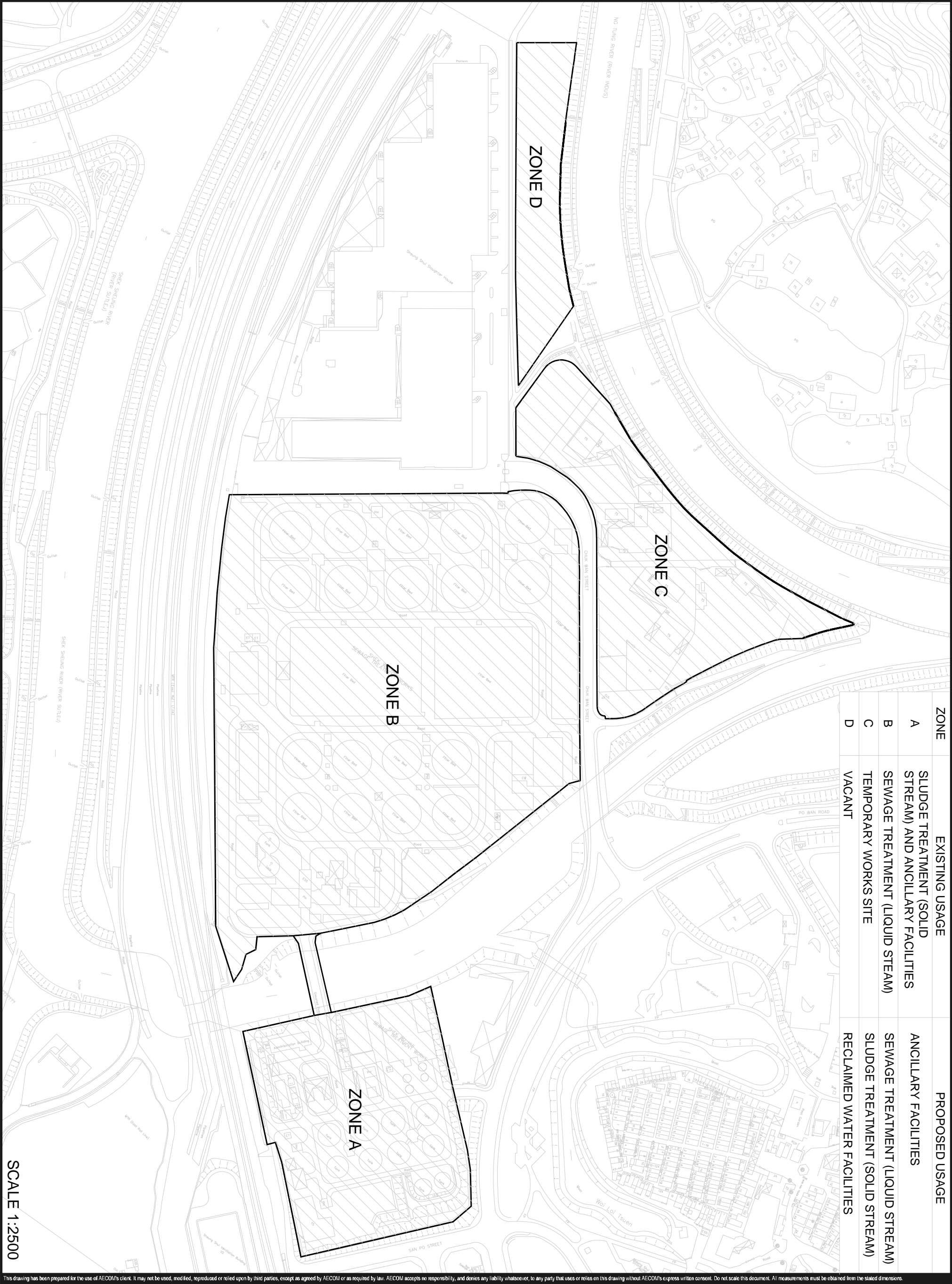
AGREEMENT NO. CE 40/2012 (DS)  
SHEK WU HUI SEWAGE TREATMENT WORKS  
- FURTHER EXPANSION PHASE 1A  
- INVESTIGATION

Project No.: 60284037      Date: FEB. 2014

LOCATION OF THE EXISTING SWHSTW AND THE  
PROPOSED SITE FOR FURTHER EXPANSION

**AECOM**

Drawing 60284037/EM&AM/400



## **Appendix B**

### **LAYOUT PLAN OF ADVANCE WORKS**



1. ALL ORDOS REFER TO WONG KONG 1980 2810.
2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 28 FOR WORKS IN THE VICINITY OF MR. CHAN'S WORKS. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28-27 FOR WORKS INSIDE WHISTLE.
3. PORTION 'A' IS ALREADY EXISTING WHISTLE. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28-27 FOR WORKS INSIDE WHISTLE.
4. THE CONTRACTOR'S ATTENTION IS DRAWN TO PS SECTION 28 FOR THE SAFETY REQUIREMENTS FOR WORKS IN GAS RISK AREA.
5. CHUK WAI STREET IS THE MAIN ACCESS FOR THE SHELTER. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28-27 FOR WORKS INSIDE WHISTLE. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28-27 FOR WORKS INSIDE WHISTLE.

☐ SITE BOUNDARY  
☒ GAS RISK AREA  
 AREA WITHIN WHICH SCC 22 AND  
 PS CLASSES 1.66101 AND 1.130 &  
 APPENDIX 1.39 SHALL APPLY

	EXISTING STRUCTURE TO BE DEMOLISHED
	EXISTING STRUCTURE TO BE MODIFIED
	PROPOSED STRUCTURE

PORTION 4 OF THE SITE

REVISION				
date	description	initial	date	name
	designed		12 DEC 2014	M. F. PANG
	drawn		12 DEC 2014	C. C. DIA
	checked		12 DEC 2014	M. C. POON
	settled		12 DEC 2014	Ir M. LAU
approved				

12 DEC 2014					
12 DEC 2014					
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ADVANCE WORKS FOR SHEK WU HUI  
SEWAGE TREATMENT WORKS -  
FURTHER EXPANSION PHASE 1A AND  
SEWAGE WORKS AT PING CHE ROAD

drawing title  
PORTION A -  
PORTIONS OF THE SITE

drawing no. DSP/DC1309/11021

scale 1 : 1000  
OR  
AS SHOWN

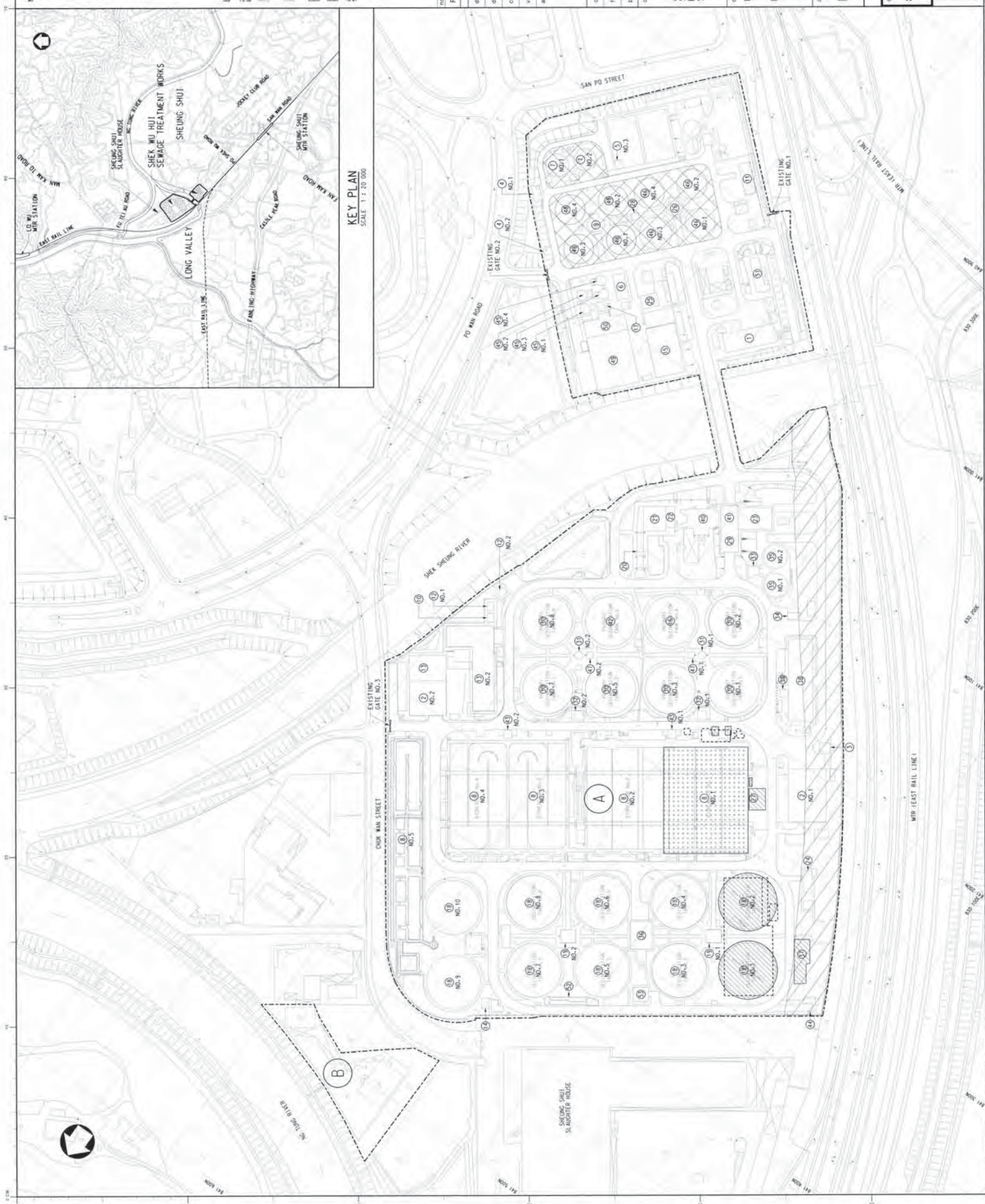
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SEWERAGE PROJECTS DIVISION

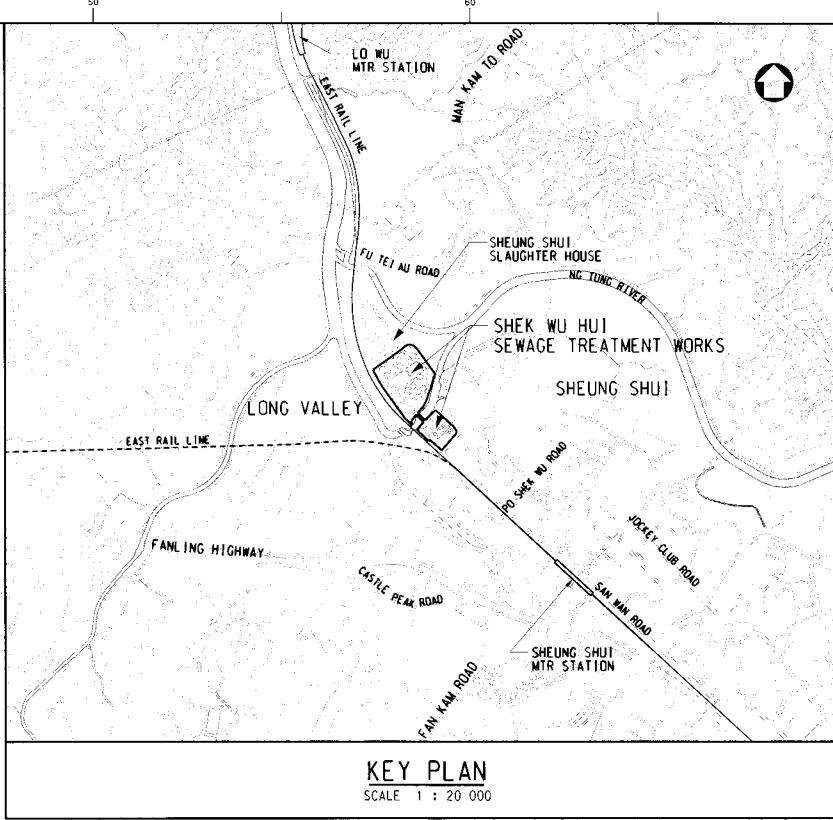
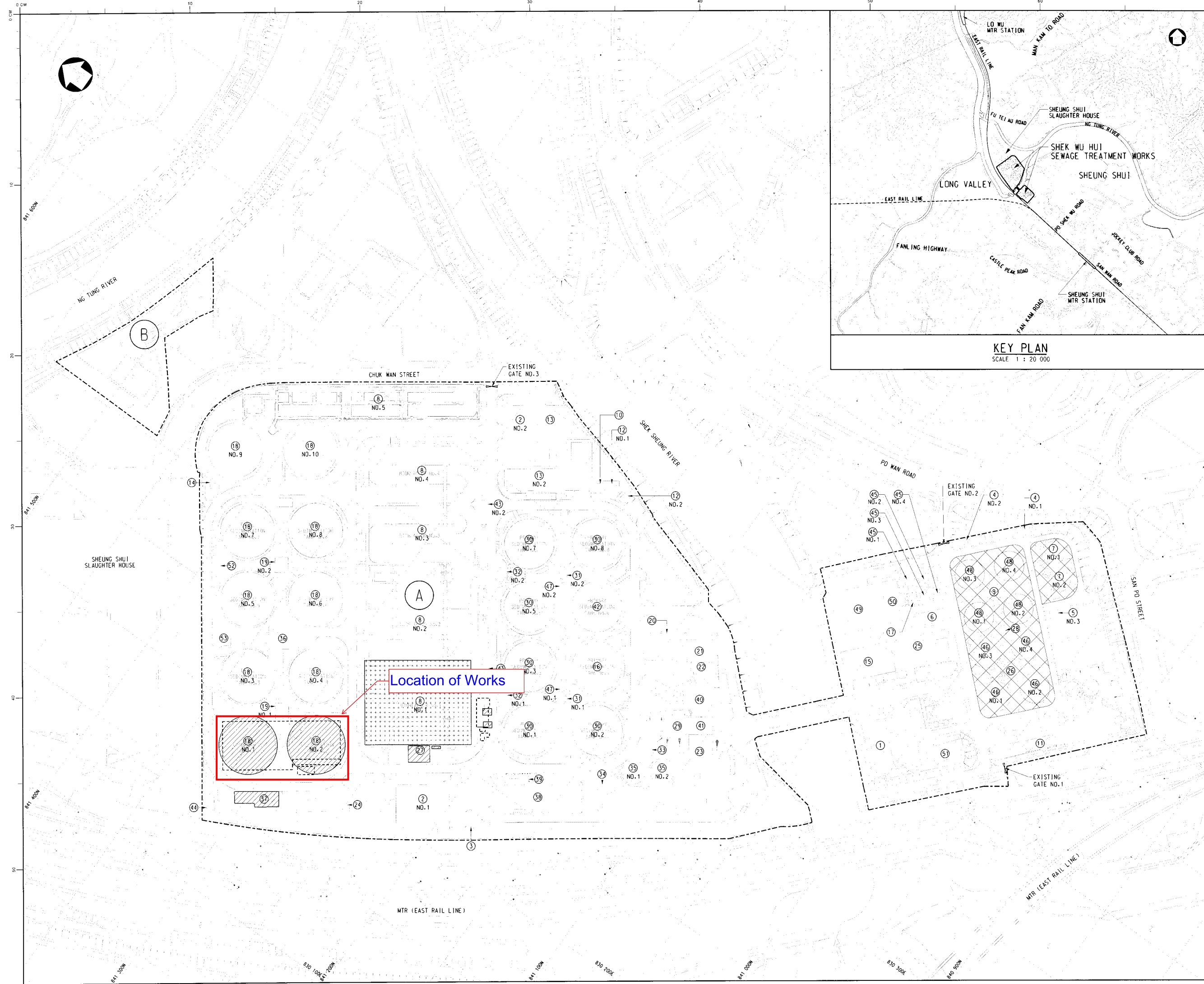


DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE  
HONG KONG  
SPECIAL ADMINISTRATIVE REGION

At 347594







- NOTES:
1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
  2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF SCC 22 AND PS CLAUSES 1.66(10) AND PS APPENDIX 1.18 FOR WORKS IN THE VICINITY OF MTR.
  3. PORTION 'A' IS INSIDE EXISTING SHWSTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28.27 FOR WORKS INSIDE SHWSTW.
  4. THE CONTRACTOR'S ATTENTION IS DRAWN TO PS SECTION 28 FOR THE SAFETY REQUIREMENTS FOR WORKS IN GAS RISK AREA.
  5. CHUK WAN STREET IS THE MAIN ACCESS FOR THE SHEUNG SHUI SLAUGHTER HOUSE. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTION TO ENSURE THE CHUK WAN STREET WILL NOT BE AFFECTED FOR ANY OF HIS WORKS NEARBY.

- LEGEND :
- [Dashed line] SITE BOUNDARY
  - [Cross-hatched box] GAS RISK AREA
  - [Diagonal lines box] EXISTING STRUCTURE TO BE DEMOLISHED
  - [Dotted box] EXISTING STRUCTURE TO BE MODIFIED
  - [Dashed box] PROPOSED STRUCTURE
  - (A) PORTION A OF THE SITE

FOR TENDER PURPOSES ONLY

A	26 JAN 2015	GENERAL REVISION	Ir. W. WONG
no	date	description	initial
REVISION			
		name	date
designed	SIGNED	H. F. PANG	12 DEC 2014
drawn	SIGNED	C. C. CHAN	12 DEC 2014
checked	SIGNED	W. C. POON	12 DEC 2014
vetted	SIGNED	Ir. W. W. LAU	12 DEC 2014
approved		SIGNED Ir. C. H. LAI Chief Engineer	12 DEC 2014 Date

contract no. DC/2013/09  
file no. SP8/4388DS  
project no. 4388DS  
contract  
ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD

drawing title  
PORTION A -  
PORTIONS OF THE SITE  
drawing no. DSP/DC1309/11021A  
scale 1 : 1000 OR AS SHOWN

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DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE HONG KONG  
SPECIAL ADMINISTRATIVE REGION

## **Appendix C**

### **ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES**

Contract No. DC/2013/09

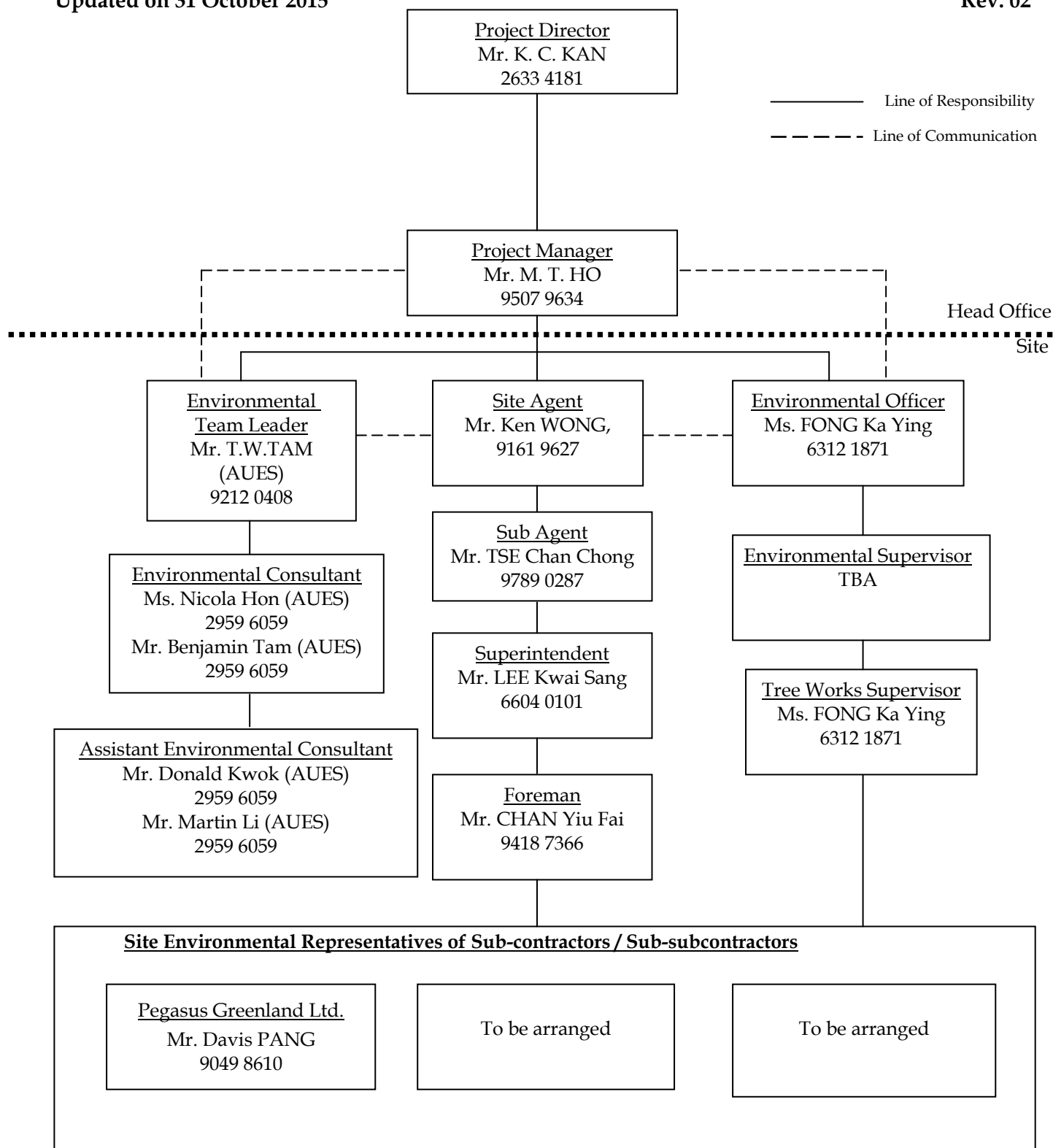
*Advance Works for Shek Wu Hui Sewage Treatment Works*

*- Further Expansion Phase 1A and Sewerage Works at Ping Che Road*

### SITE ENVIRONMENTAL TEAM ORGANIZATION CHART

Updated on 31 October 2015

Rev. 02



**Contact Details of Relevant Parties**

<b>Organization</b>	<b>Project Role</b>	<b>Name of Key Staff</b>	<b>Tel No.</b>	<b>Fax No.</b>
DSD	Resident Site Engineer	Mr. Michael Leung	2594 7463	2827 8700
ANewR	Independent Environmental Checker	Mr. Adi Lee	2618 2836	3007 8648
Tsun Yip	Project Director	Mr. K. C. KAN	2633 4181	2633 4691
Tsun Yip	Project Manager	Mr. M. T. HO	9507 9634	2633 4691
Tsun Yip	Site Agent	Mr. Ken WONG	9161 9627	2633 4691
Tsun Yip	Environmental Officer	Ms. FONG Ka Ying	6312 1871	2633 4691
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Martin Li	2959 6059	2959 6079

**Legend:**

*DSD (Employer & Resident Site Engineer) – Drainage Service Department*

*Tsun Yip (Main Contractor) – Tsun Yip Waterworks Construction Co Ltd*

*ANewR (IEC) – ANewR Consulting Limited*

*AUES (ET) – Action-United Environmental Services & Consulting*

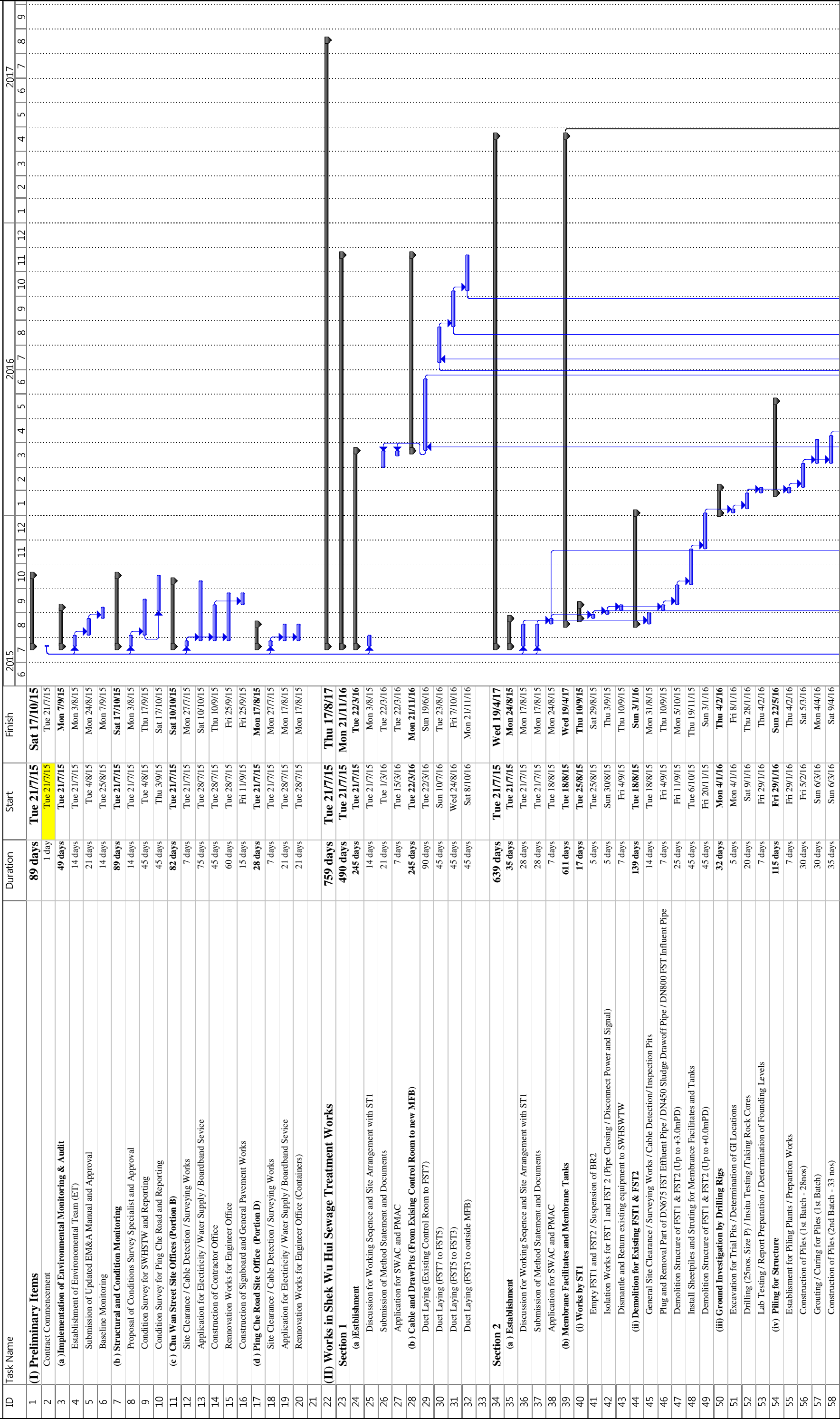
## **Appendix D**

### **MASTER CONSTRUCTION PROGRAM**

Contract DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works -  
Further Expansion Phase 1A and Sewage Works at Ping Che Road

Works Programme (Sep 2015)

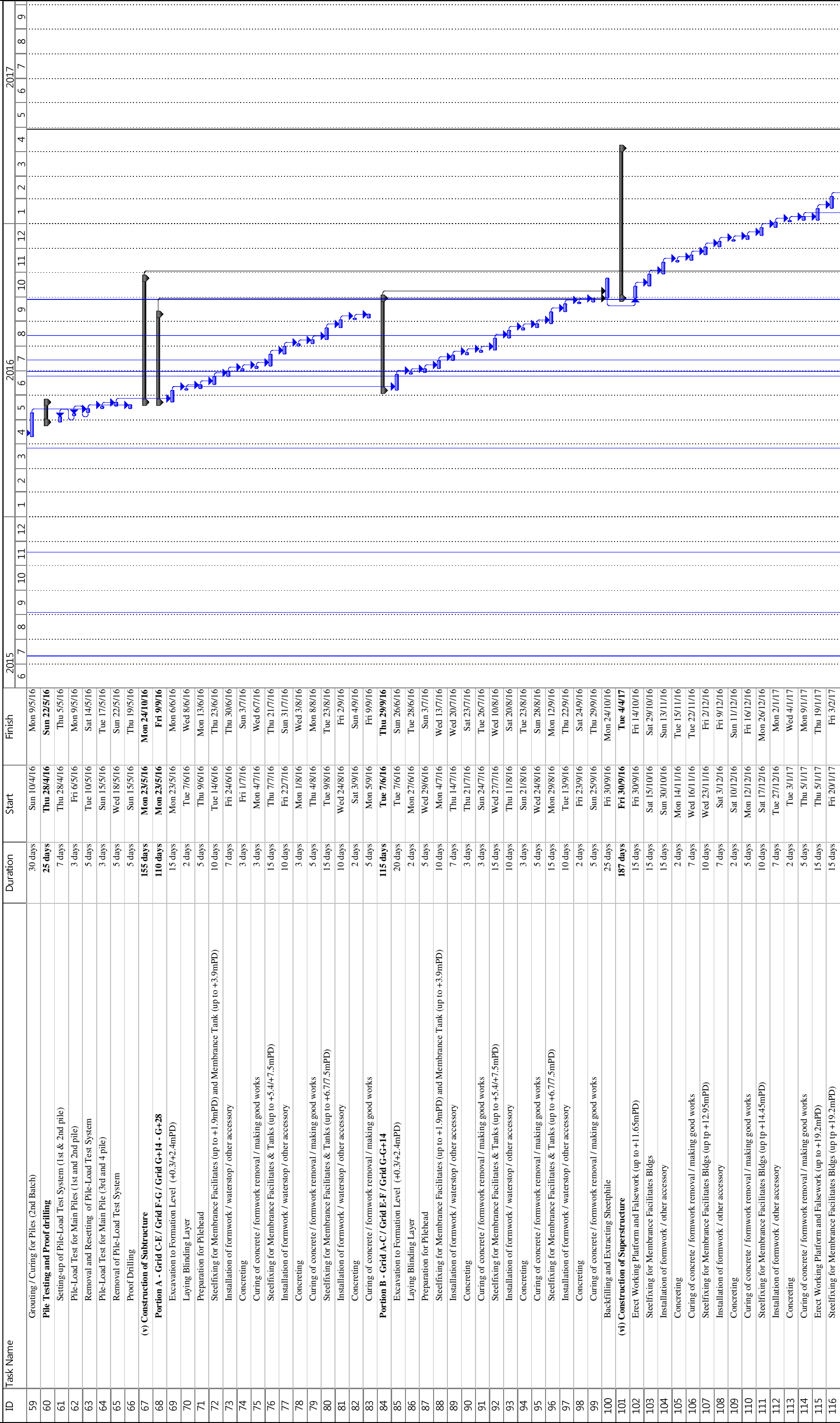




Contract DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works -  
Further Expansion Phase 1A and Sewage Works at Ping Che Road

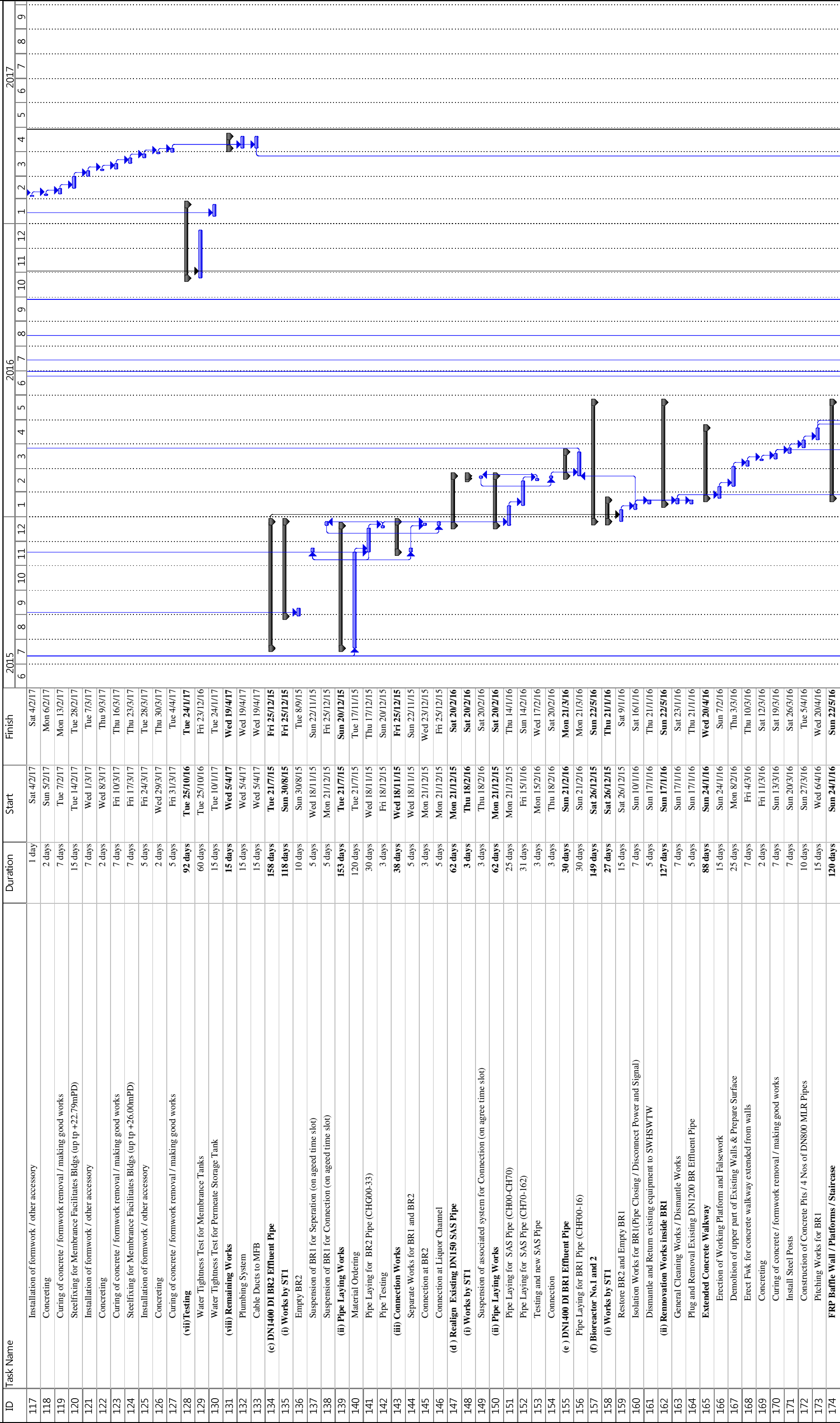
Works Programme (Sep 2015)



Contract DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works -  
Further Expansion Phase 1A and Sewage Works at Ping Che Road

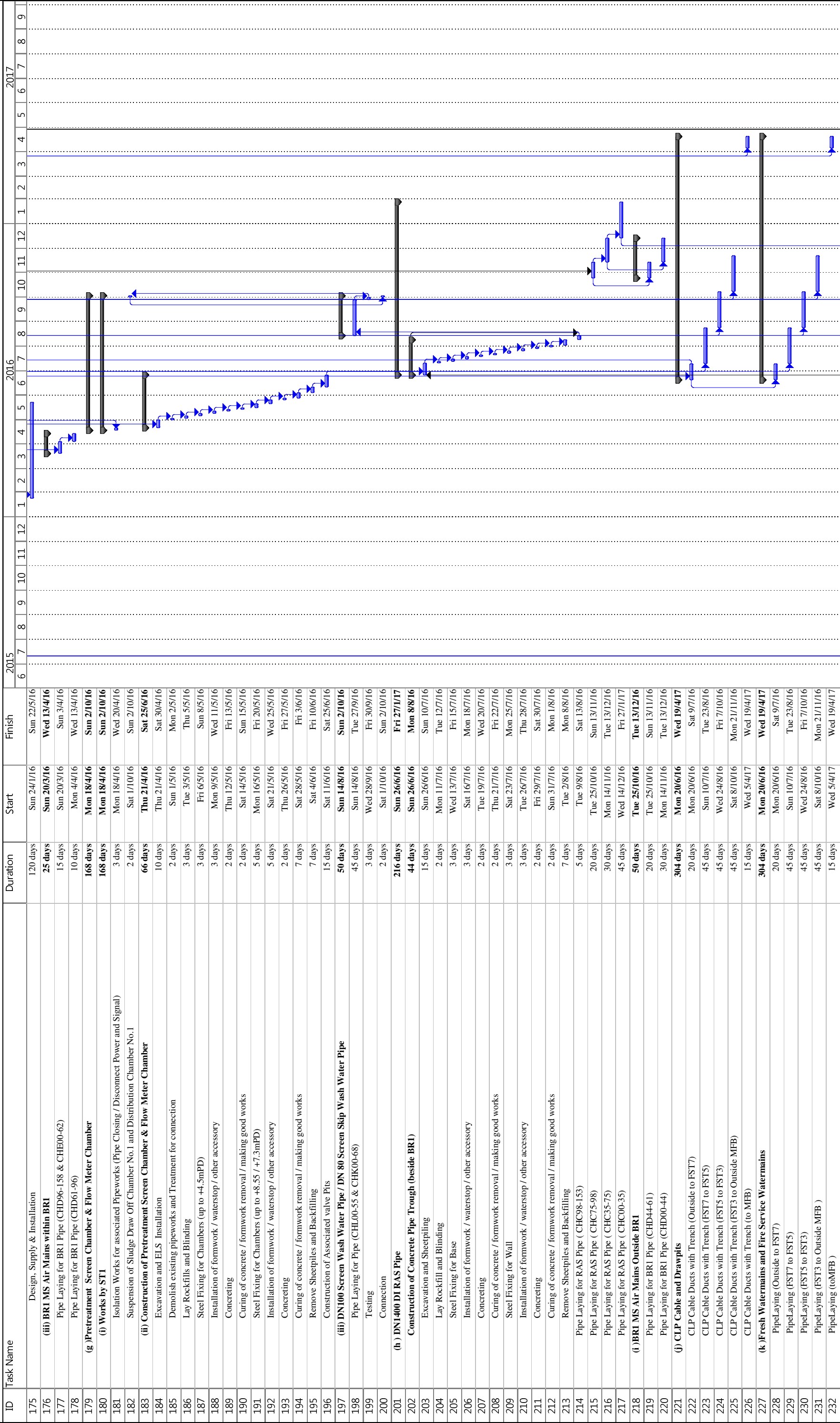
Works Programme (Sep 2015)



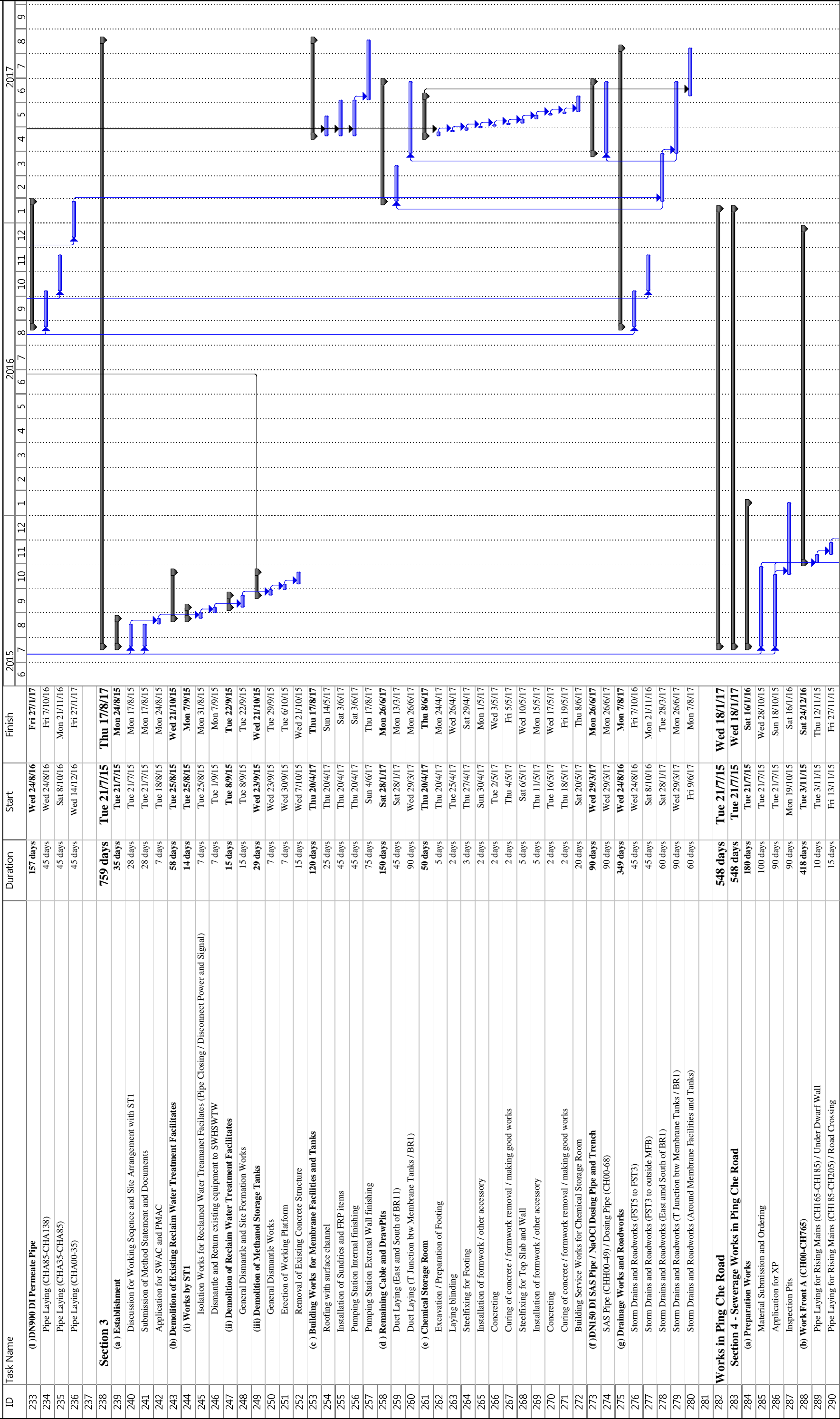
Contract DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works -  
Further Expansion Phase 1A and Sewage Works at Ping Che Road

Works Programme (Sep 2015)



Contract DC/2013/09  
Advance Works for Shek Wu Hui Sewage Treatment Works -  
Further Expansion Phase 1A and Sewage Works at Ping Che Road  
Works Programme (Sep 2015)



Contract DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works -  
Further Expansion Phase 1A and Sewage Works at Ping Che Road

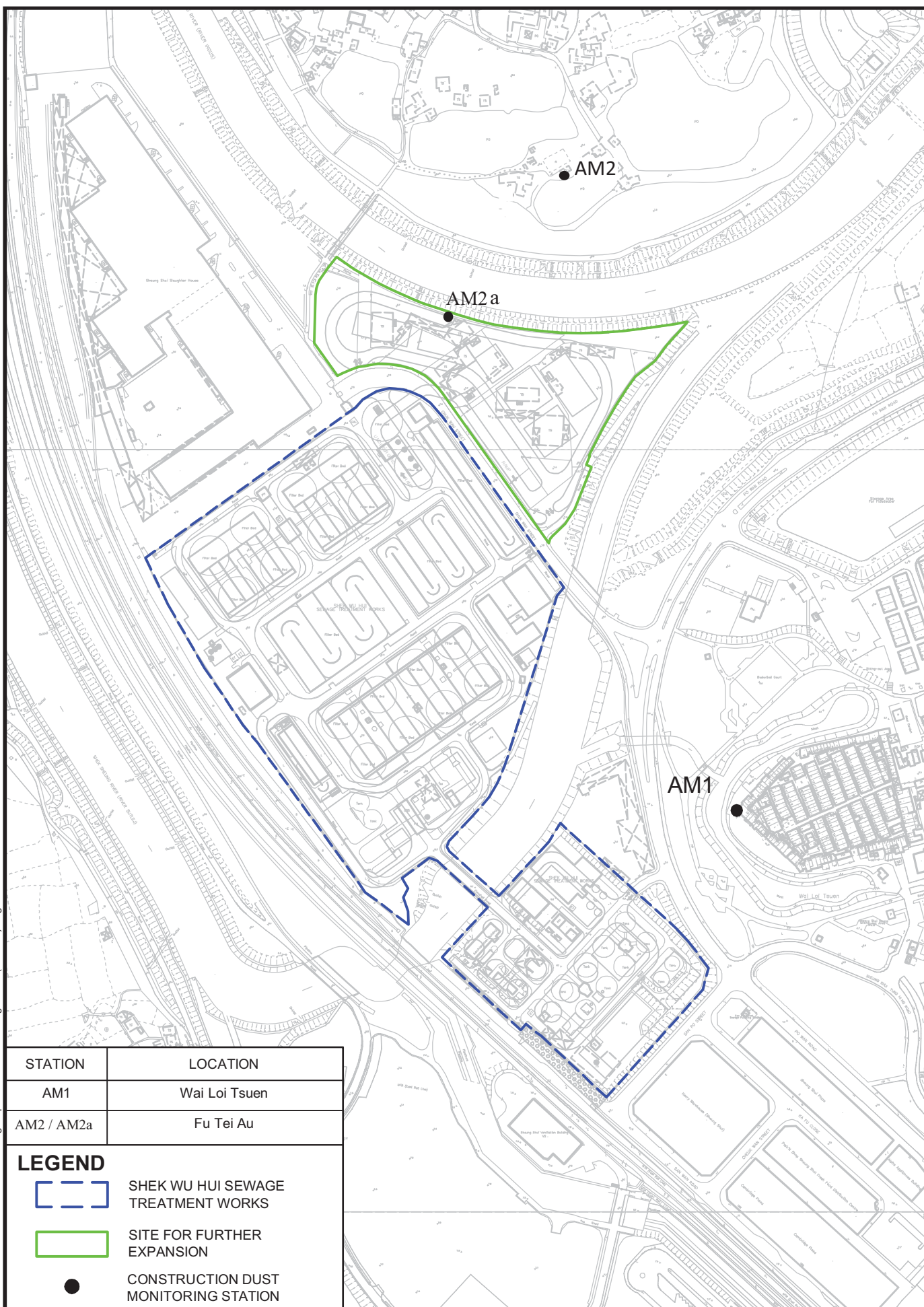
Works Programme (Sep 2015)

ID	Task Name	Duration	Start	Finish	2015				2016				2017							
291	Pipe Laying for Rising Mains (CH205-CH245) / Under Dwarf Wall	20 days	Sat 28/11/15	Thu 17/12/15																
292	Pipe Laying for Rising Mains (CH245-CH295) / Footpath	18 days	Fri 18/12/15	Mon 4/1/16																
293	Pipe Laying for Rising Mains (CH295-CH300) / Road Crossing	10 days	Tue 5/1/16	Thu 14/1/16																
294	Pipe Laying for Rising Mains (CH300-CH360) / Footpath	20 days	Fri 15/1/16	Wed 3/2/16																
295	Pipe Laying for Rising Mains (CH360-CH425) / Under Dwarf Wall	35 days	Thu 4/2/16	Wed 9/3/16																
296	Pipe Laying for Rising Mains (CH425-CH445) / Road Crossing	15 days	Thu 10/3/16	Thu 24/3/16																
297	Pipe Laying for Rising Mains (CH445-CH560)/Under Dwarf Wall	58 days	Fri 25/3/16	Sat 21/5/16																
298	Interim Pressure Test	7 days	Sun 22/5/16	Sat 28/5/16																
299	Pipe Laying for Rising Mains (CH560-CH590) / Footpath	15 days	Sun 29/5/16	Sun 12/6/16																
300	Pipe Laying for Rising Mains (CH590-CH660)/Under Dwarf Wall	35 days	Mon 13/6/16	Sun 17/7/16																
301	Pipe Laying for Rising Mains (CH660-CH670) / Road Crossing	15 days	Mon 18/7/16	Mon 1/8/16																
302	Pipe Laying for Rising Mains (CH670-CH750)/Under Dwarf Wall	40 days	Tue 2/8/16	Sat 10/9/16																
303	Pipe Laying for Rising Mains (CH750-CH765) / Road Crossing	15 days	Sun 11/9/16	Sun 25/9/16																
304	Pipe Laying for Rising Mains (CH155-CH165) / Road Crossing	15 days	Mon 26/9/16	Mon 10/10/16																
305	Pipe Laying for Rising Mains (CH60-CH155) / Carpark	48 days	Tue 11/10/16	Sun 27/11/16																
306	Pipe Laying for Rising Mains (CH00-CH60) / Footpath	20 days	Mon 28/11/16	Sat 17/12/16																
307	Interim Pipe Testing	7 days	Sun 18/12/16	Sat 24/12/16																
308	(c ) Work Front B (CH765-CH1540)	443 days	Tue 3/1/15	Wed 18/1/17																
309	Pipe Laying for Rising Mains (CH970-CH980) /Under Dwarf Wall	5 days	Tue 3/11/15	Sat 7/11/15																
310	Pipe Laying for Rising Mains (CH980-CH990) /Road Crossing	15 days	Sun 8/11/15	Sun 22/11/15																
311	Pipe Laying for Rising Mains (CH990-CH1000) /Under Dwarf Wall	5 days	Mon 23/11/15	Fri 27/11/15																
312	Pipe Laying for Rising Mains (CH1000-CH1010) / Road Crossing	15 days	Sat 28/11/15	Sat 12/12/15																
313	Pipe Laying for Rising Mains (CH1010-CH1055) /Under Dwarf Wall	23 days	Sun 13/12/15	Mon 4/1/16																
314	Pipe Laying for Rising Mains (CH1055-CH1075) /Road Crossing	15 days	Tue 5/1/16	Tue 19/1/16																
315	Pipe Laying for Rising Mains (CH1075-CH1095) /Under Dwarf Wall	10 days	Wed 20/1/16	Fri 29/1/16																
316	Pipe Laying for Rising Mains (CH1095-CH1180) / Footpath	28 days	Sat 30/1/16	Fri 26/2/16																
317	Pipe Laying for Rising Mains (CH1180-CH1205) / Road Crossing	20 days	Sat 27/2/16	Thu 17/3/16																
318	Pipe Laying for Rising Mains (CH1205-CH1270) /Under Dwarf Wall	33 days	Fri 18/3/16	Tue 19/4/16																
319	Pipe Laying for Rising Mains (CH1270-CH1290) / Road Crossing	15 days	Wed 20/4/16	Wed 4/5/16																
320	Pipe Laying for Rising Mains (CH1290-CH1335) /River Crossing	20 days	Thu 5/5/16	Tue 24/5/16																
321	Pipe Laying for Rising Mains (CH1335-CH1385) /Under Dwarf Wall	25 days	Wed 25/5/16	Sat 18/6/16																
322	Interim Pipe Testing	7 days	Sun 19/6/16	Sat 25/6/16																
323	Pipe Laying for Rising Mains (CH1385-CH1410)/ Road Crossing	15 days	Sun 26/6/16	Sun 10/7/16																
324	Pipe Laying for Rising Mains (CH1410-CH1430) / Under Dwarf Wall	10 days	Mon 11/7/16	Wed 20/7/16																
325	Pipe Laying for Rising Mains (CH1430-CH1440) / Footpath	5 days	Thu 21/7/16	Mon 25/7/16																
326	Pipe Laying for Rising Mains (CH1440-CH1495) / Under Dwarf Wall	25 days	Tue 26/7/16	Fri 19/8/16																
327	Pipe Laying for Rising Mains (CH1495-CH1520) / Footpath	10 days	Sat 20/8/16	Mon 29/8/16																
328	Pipe Laying for Rising Mains (CH1520-CH1540) / Under Draft Wall	10 days	Tue 30/8/16	Thu 8/9/16																
329	Pipe Laying for Rising Mains (CH950-CH970) / Road Crossing	15 days	Fri 9/9/16	Fri 23/9/16																
330	Pipe Laying for Rising Mains (CH855-CH950) / Under Dwarf Wall	48 days	Sat 24/9/16	Thu 10/11/16																
331	Pipe Laying for Rising Mains (CH845-CH855) / Road Crossing	15 days	Fri 11/11/16	Fri 25/11/16																
332	Pipe Laying for Rising Mains (CH765-CH845) / Under Dwarf Wall	40 days	Sat 26/11/16	Wed 4/1/17																
333	Final Pressure Testing and Swabbing	14 days	Thu 5/1/17	Wed 18/1/17																

## **Appendix E**

### **PROPOSED MONITORING LOCATIONS**





AGREEMENT NO. CE 40/2012 (DS)  
 SHEK WU HUI SEWAGE TREATMENT WORKS  
 - FURTHER EXPANSION PHASE 1A  
 - INVESTIGATION

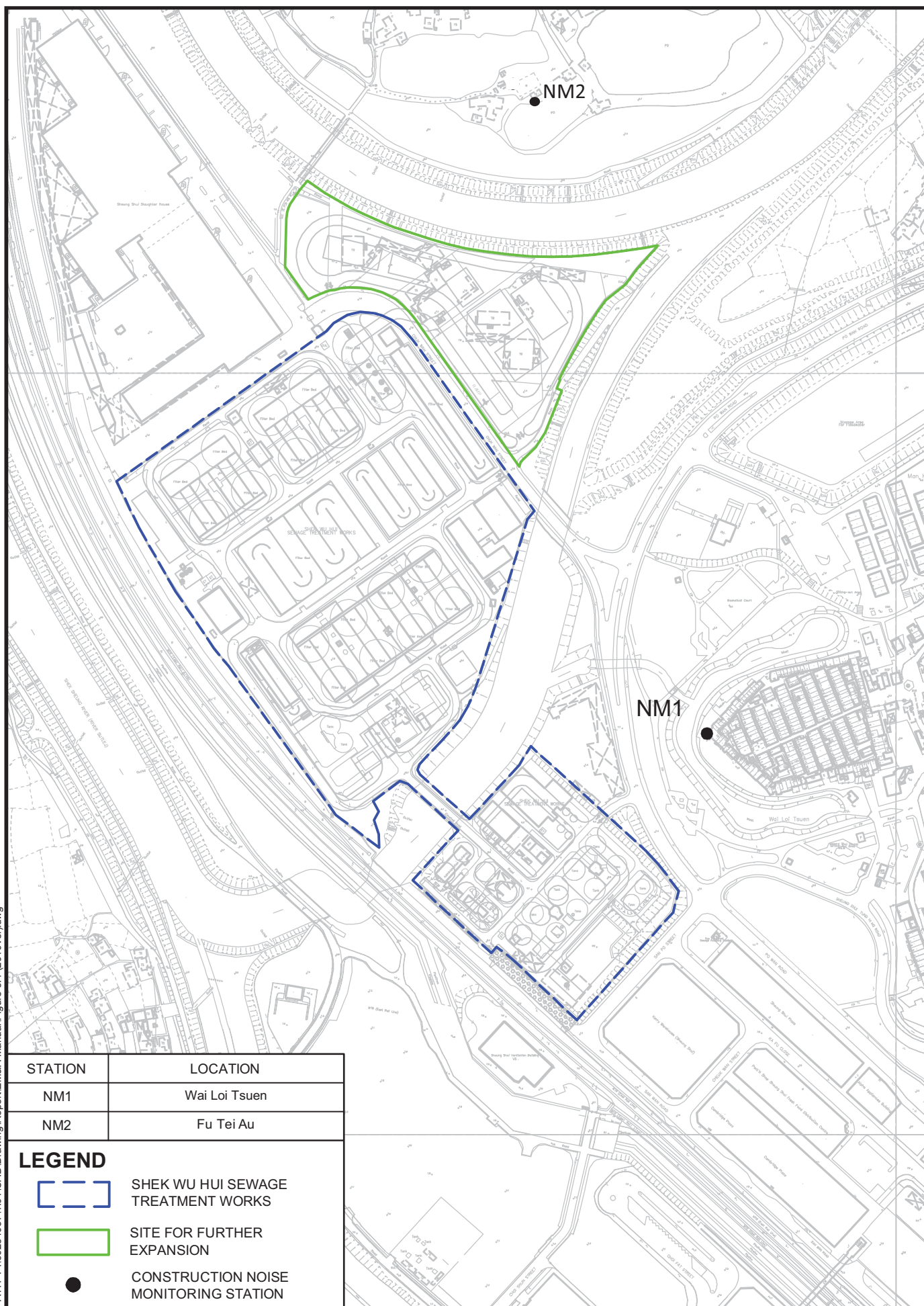
PROPOSED CONSTRUCTION DUST MONITORING  
 STATIONS FOR CONSTRUCTION PHASE AND  
 OPERATION PHASE

**AECOM**

Project No.: 60284037 Date: FEB. 2014

Drawing No.  
 60284037/EM&AM/405





AGREEMENT NO. CE 40/2012 (DS)  
 SHEK WU HUI SEWAGE TREATMENT WORKS  
 - FURTHER EXPANSION PHASE 1A  
 - INVESTIGATION

# LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS

**AECOM**

Project No.: 60284037 Date: FEB. 2014

Drawing No.  
 60284037/EM&AM/407

## **Appendix F**

### **EVENT ACTION PLAN**

**Event and Action Plan for Construction Dust**

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

**Event and Action Plan for Construction Noise**

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

## **Appendix G**

### **VALID CALIBRATION CERTIFICATES**

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : No. 31 Wai Loi Tsuen  
Location ID : AM1

Date of Calibration: 29-Aug-15  
Next Calibration Date: 29-Nov-15  
Technician: Keung Chi Young

### CONDITIONS

Sea Level Pressure (hPa)	1006.2	Corrected Pressure (mm Hg)	754.65
Temperature (°C)	27.8	Temperature (K)	301

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Serial # ->	1612		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.734	50	49.36	Slope = 25.8377 Intercept = 3.9459 Corr. coeff. = 0.9951
13	5.00	5.00	10.0	1.570	44	43.44	
10	3.85	3.85	7.7	1.379	40	39.49	
7	2.45	2.45	4.9	1.102	34	33.56	
5	1.50	1.50	3.0	0.864	26	25.67	

#### Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

#### For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

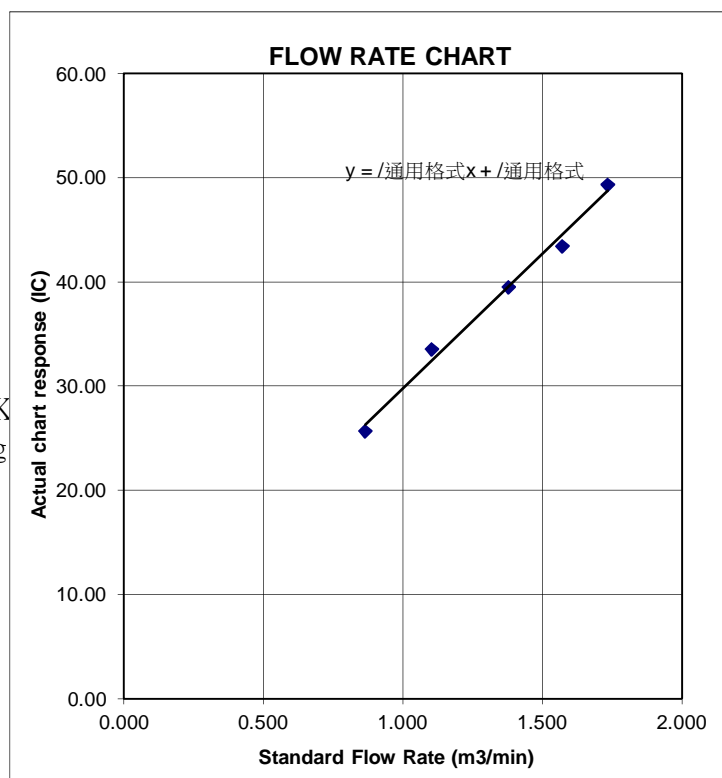
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : RE's Site Office  
Location ID : AM2a

Date of Calibration: 29-Aug-15  
Next Calibration Date: 29-Nov-15  
Technician: Keung Chi Young

### CONDITIONS

Sea Level Pressure (hPa)	1006.2	Corrected Pressure (mm Hg)	754.65
Temperature (°C)	27.8	Temperature (K)	301

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Serial # ->	1612		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.00	6.00	12.0	1.720	54	53.31	Slope = 28.0651 Intercept = 5.3205 Corr. coeff. = 0.9979
13	4.80	4.80	9.6	1.539	50	49.36	
10	3.80	3.80	7.6	1.370	44	43.44	
7	2.45	2.45	4.9	1.102	36	35.54	
5	1.45	1.45	2.9	0.849	30	29.62	

#### Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

#### For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

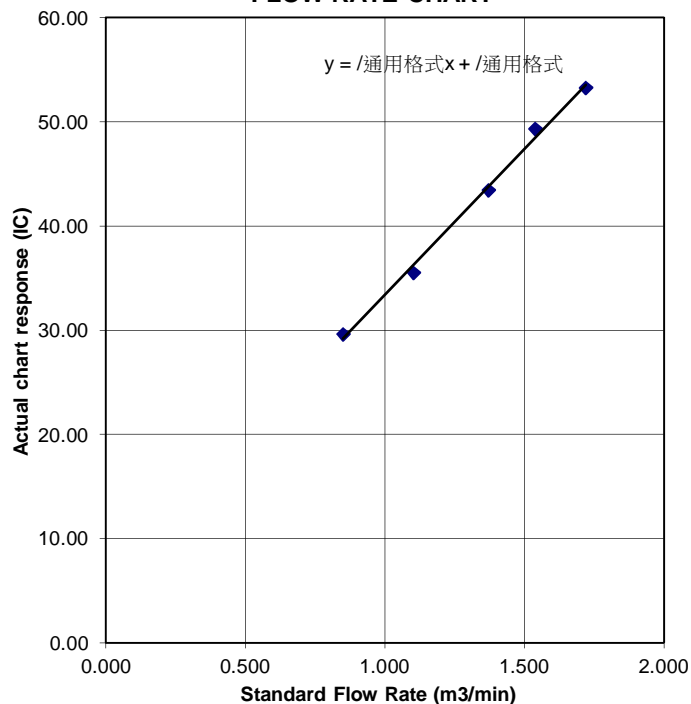
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

**FLOW RATE CHART**





ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

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

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

DATA TABULATION

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

CALCULATIONS

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

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

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

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

For subsequent flow rate calculations:

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

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

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



### SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1514380
CLIENT	: ACTION UNITED ENVIRO SERVICES	SUB-BATCH	: 1
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	DATE RECEIVED	: 27-APR-2015
PROJECT	: ----	DATE OF ISSUE	: 2-MAY-2015
		NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

### General Comments

- Sample(s) were received in an ambient condition.
- Sample(s) analysed and reported on an as received basis
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### Signatories

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories

Position

Richard Fung

General Manager

This is the Final Report and supersedes any preliminary report with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong  
Tel. +852 2610 1044 Fax: +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

A Campbell Brothers Limited Company

WORK ORDER : HK1514380  
SUB-BATCH : 1  
CLIENT : ACTION UNITED ENVIRO SERVICES  
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1514380-001	S/N: 456662	AIR	05-APR-2015	S/N: 456662



## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 456662  
Equipment Ref: EQ118  
Job Order

### Standard Equipment:

Standard Equipment: Higher Volume Sampler  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 6 February 2015

### Equipment Verification Results:

Testing Date: 5 April 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m <sup>3</sup> (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr11min	10:00 ~ 12:11	26.0	1011.3	0.041	2313	17.7
2hr21min	12:20 ~ 14:41	26.0	1011.3	0.038	2084	14.7
2hr17min	14:50 ~ 17:07	26.0	1011.3	0.057	3487	25.5

Sensitivity Adjustment Scale Setting (Before Calibration) 597 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 596 (CPM)

### Linear Regression of Y or X

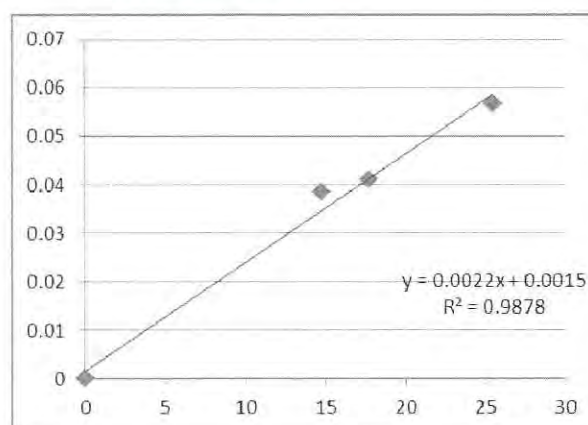
Slope (K-factor): 0.0022

Correlation Coefficient 0.9939

Date of Issue 20 April 2015

### Remarks:

1. **Strong** Correlation ( $R > 0.8$ )
  2. Factor 0.0022 should be apply for TSP monitoring
- \*If  $R < 0.5$ , repair or re-verification is required for the equipment



Operator: Donald Kwok Signature:  Date: 20 April 2015

QC Reviewer: Ben Tam Signature:  Date: 20 April 2015

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung  
Location ID : Calibration Room

Date of Calibration: 6-Feb-15  
Next Calibration Date: 6-May-15

### CONDITIONS

Sea Level Pressure (hPa) 1024.5  
Temperature (°C) 13.4

Corrected Pressure (mm Hg) 768.375  
Temperature (K) 286

### CALIBRATION ORIFICE

Make-> TISCH  
Model-> 5025A  
Calibration Date-> 7-Apr-14

Qstd Slope -> 2.00757  
Qstd Intercept -> -0.01628  
Expiry Date-> 7-Apr-15

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	3.8	3.8	7.6	1.417	56	57.44	Slope = 30.5075 Intercept = 14.6821 Corr. coeff. = 0.9974
13	3	3	6.0	1.260	52	53.33	
10	2.3	2.3	4.6	1.104	48	49.23	
8	1.7	1.7	3.4	0.950	42	43.08	
5	1.0	1.0	2.0	0.731	36	36.92	

#### Calculations :

$$Q_{std} = 1/m[\sqrt{H2O(Pa/P_{std})(T_{std}/Ta)}]-b]$$

$$IC = I[\sqrt{Pa/P_{std})(T_{std}/Ta)}]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

#### For subsequent calculation of sampler flow:

$$1/m((I)[\sqrt{298/Tav}(Pav/760)]-b)$$

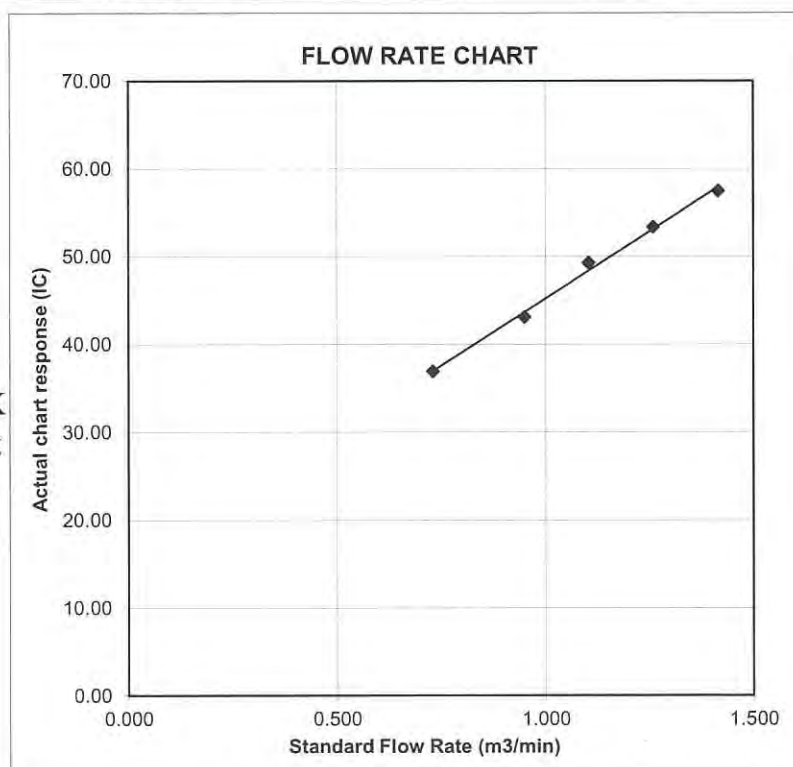
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



### SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1514379
CLIENT	: ACTION UNITED ENVIRO SERVICES		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH DATE RECEIVED DATE OF ISSUE	: 1 27-APR-2015 2-MAY-2015
PROJECT	: ----	NO. OF SAMPLES CLIENT ORDER	: 1 ----

### General Comments

- Sample(s) were received in an ambient condition.
- Sample(s) analysed and reported on an as received basis
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### Signatories

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories

Position

Richard Fung  General Manager

This is the Final Report and supersedes any preliminary report with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F, Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong

Tel. +852 2610 1044 Fax. +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

A Campbell Brothers Limited Company

WORK ORDER : HK1514379  
SUB-BATCH : 1  
CLIENT : ACTION UNITED ENVIRO SERVICES  
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1514379-001	S/N: 456660	AIR	05-APR-2015	S/N: 456660



## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 456660  
Equipment Ref: EQ117  
Job Order

### Standard Equipment:

Standard Equipment: Higher Volume Sampler  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 6 February 2015

### Equipment Verification Results:

Testing Date: 5 April 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m <sup>3</sup> (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr11min	10:00 ~ 12:11	26.0	1011.3	0.041	2344	17.9
2hr21min	12:20 ~ 14:41	26.0	1011.3	0.038	2104	14.9
2hr17min	14:50 ~ 17:07	26.0	1011.3	0.057	3514	25.7

Sensitivity Adjustment Scale Setting (Before Calibration) 607 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 602 (CPM)

### Linear Regression of Y or X

Slope (K-factor): 0.0022

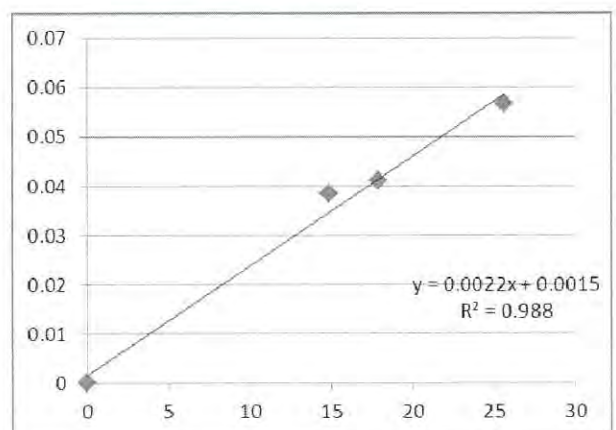
Correlation Coefficient 0.9940

Date of Issue 20 April 2015

### Remarks:

- Strong** Correlation ( $R > 0.8$ )
- Factor 0.0022 should be apply for TSP monitoring

\*If  $R < 0.5$ , repair or re-verification is required for the equipment



Operator: Donald Kwok Signature: [Signature] Date: 20 April 2015

QC Reviewer: Ben Tam Signature: [Signature] Date: 20 April 2015

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung  
 Location ID : Calibration Room

Date of Calibration: 6-Feb-15  
 Next Calibration Date: 6-May-15

### CONDITIONS

Sea Level Pressure (hPa) 1024.5  
 Temperature (°C) 13.4

Corrected Pressure (mm Hg) 768.375  
 Temperature (K) 286

### CALIBRATION ORIFICE

Make-> TISCH  
 Model-> 5025A  
 Calibration Date-> 7-Apr-14

Qstd Slope -> 2.00757  
 Qstd Intercept -> -0.01628  
 Expiry Date-> 7-Apr-15

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
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13	3	3	6.0	1.260	52	53.33	
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8	1.7	1.7	3.4	0.950	42	43.08	
5	1.0	1.0	2.0	0.731	36	36.92	

#### Calculations :

$$Q_{std} = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$

$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

#### For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/T_{av})(P_{av}/760)]-b)$$

m = sampler slope

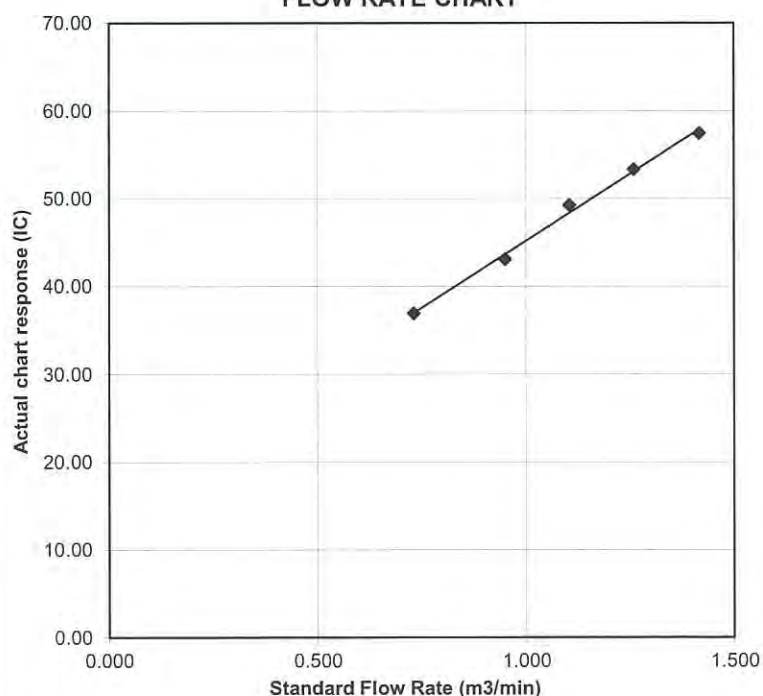
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

**FLOW RATE CHART**





# Certificate of Calibration

## 校正證書

Certificate No. : C152550  
證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC15-0720 )

Date of Receipt / 收件日期 : 16 April 2015

Description / 儀器名稱 : Acoustical Calibrator (EQ081)  
Manufacturer / 製造商 : Brüel & Kjær  
Model No. / 型號 : 4231  
Serial No. / 編號 : 2326408  
Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$   
Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 May 2015

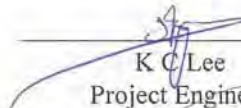
### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
All results are within manufacturer's specification.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By  
測試

  
K C Lee  
Project Engineer

Certified By  
核證

  
K M Wu  
Engineer

Date of Issue  
簽發日期

12 May 2015

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書而批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C152550  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

### Note :

The values given in this 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited 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 the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



# Certificate of Calibration

## 校正證書

Certificate No. : C153053  
證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC15-0720 )

Date of Receipt / 收件日期 : 15 May 2015

Description / 儀器名稱 : Integrating Sound Level Meter (EQ008)  
Manufacturer / 製造商 : Brüel & Kjær  
Model No. / 型號 : 2238  
Serial No. / 編號 : 2285690  
Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$   
Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 4 June 2015

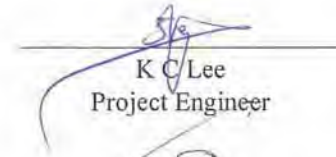
### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
All results are within manufacturer's specification.  
The results are detailed in the subsequent page(s).

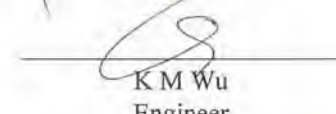
The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By :  
測試

  
K C Lee  
Project Engineer

Certified By :  
核證

  
K M Wu  
Engineer

Date of Issue : 5 June 2015  
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o: 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

# Certificate of Calibration

## 校正證書

Certificate No. : C153053  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C150014
CL281	Multifunction Acoustic Calibrator	DC130171

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	93.5

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

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# Certificate of Calibration

## 校正證書

Certificate No. : C153053

證書編號

### 6.2 Time Weighting

#### 6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.0	Ref.
	L <sub>ASP</sub>		S			94.0	± 0.1
	L <sub>AIP</sub>		I			94.0	± 0.1

#### 6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration	Reading (dB)	Type 1 Spec. (dB)
30 - 110	L <sub>AFP</sub>	A	F	106.0	Continuous	106.0	Ref.
	L <sub>AFMax</sub>				200 ms	105.0	-1.0 ± 1.0
	L <sub>ASP</sub>	S	Continuous		106.0	Ref.	
	L <sub>ASMax</sub>		500 ms		102.0	-4.1 ± 1.0	

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L <sub>AFP</sub>	A	F	94.00	31.5 Hz	54.7	-39.4 ± 1.5
					63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C153053  
證書編號

### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L <sub>CFP</sub>	C	F	94.00	31.5 Hz	91.0	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

### 6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						1/10 <sup>2</sup>		90	89.7	± 0.5
			60 sec.			1/10 <sup>3</sup>		80	79.9	± 1.0
			5 min.			1/10 <sup>4</sup>		70	69.7	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812706

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB : 31.5 Hz - 125 Hz	: ± 0.35 dB
250 Hz - 500 Hz	: ± 0.30 dB
1 kHz	: ± 0.20 dB
2 kHz - 4 kHz	: ± 0.35 dB
8 kHz	: ± 0.45 dB
12.5 kHz	: ± 0.70 dB
104 dB : 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level	: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

#### Note :

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Hong Kong Accreditation Service  
香港認可處

**Certificate of Accreditation**  
**認可證書**

*This is to certify that*  
*特此證明*

**ALS TECHNICHEM (HK) PTY LIMITED**

**11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong**  
**香港新界葵涌永業街1-3號忠信針織中心11樓**

*has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a*  
*為香港認可處執行機關根據認可諮詢委員會建議而接受的*

**HOKLAS Accredited Laboratory**  
**「香港實驗所認可計劃」認可實驗所**

*This laboratory meets the requirements of ISO / IEC 17025 : 2005 – General requirements for the competence*  
*此實驗所符合ISO / IEC 17025 : 2005 – 《測試及校正實驗所能力的通用規定》所訂的要求，*  
*of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as*  
*獲認可進行載於香港實驗所認可計劃《認可實驗所名冊》內下述測試類別中的指定*  
*listed in the HOKLAS Directory of Accredited Laboratories within the test category of*  
*測試或校正工作*

**Environmental Testing**  
**環境測試**

*This laboratory is accredited in accordance with the recognised International Standard ISO / IEC 17025 : 2005.*  
*本實驗所乃根據公認的國際標準 ISO / IEC 17025 : 2005 獲得認可。*

*This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory*  
*這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作*  
*quality management system (see joint IAF-ILAC-ISO Communiqué).*  
*(見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報)。*

*The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive*  
*香港認可處根據認可處執行機關的權限在此蓋上通用印章*

CHAN Sing Sing, Terence, Executive Administrator  
執行幹事 陳成城  
Issue Date : 5 May 2009  
簽發日期：二零零九年五月五日

Registration Number : **HOKLAS 066**  
註冊號碼：

Date of First Registration : 15 September 1995  
首次註冊日期：一九九五年九月十五日



## **Appendix H**

### **IMPACT MONITORING SCHEDULE**

**Impact Monitoring Schedule for Reporting Month – October 2015**

Date		Dust Monitoring		Noise Monitoring
		1-hour TSP	24-hour TSP	
THU	1-OCT-15			
FRI	2-OCT-15	✓		✓
SAT	3-OCT-15		✓	
SUN	4-OCT-15			
MON	5-OCT-15			
TUE	6-OCT-15			
WED	7-OCT-15			
THU	8-OCT-15	✓		✓
FRI	9-OCT-15		✓	
SAT	10-OCT-15			
SUN	11-OCT-15			
MON	12-OCT-15			
TUE	13-OCT-15			
WED	14-OCT-15	✓		✓
THU	15-OCT-15		✓	
FRI	16-OCT-15			
SAT	17-OCT-15			
SUN	18-OCT-15			
MON	19-OCT-15	✓		✓
TUE	20-OCT-15		✓	
WED	21-OCT-15			
THU	22-OCT-15			
FRI	23-OCT-15			
SAT	24-OCT-15	✓		
SUN	25-OCT-15			
MON	26-OCT-15		✓	
TUE	27-OCT-15			
WED	28-OCT-15			
THU	29-OCT-15			
FRI	30-OCT-15	✓		✓
SAT	31-OCT-15		✓	

**Tentative Impact Monitoring Schedule for next Reporting Period – November 2015**

Date		Dust Monitoring		Noise Monitoring
		1-hour TSP	24-hour TSP	
Sun	1-Nov-15			
Mon	2-Nov-15			
Tue	3-Nov-15			
Wed	4-Nov-15			
Thu	5-Nov-15	✓		✓
Fri	6-Nov-15		✓	
Sat	7-Nov-15			
Sun	8-Nov-15			
Mon	9-Nov-15			
Tue	10-Nov-15			
Wed	11-Nov-15	✓		✓
Thu	12-Nov-15		✓	
Fri	13-Nov-15			
Sat	14-Nov-15			
Sun	15-Nov-15			
Mon	16-Nov-15			
Tue	17-Nov-15	✓		✓
Wed	18-Nov-15		✓	
Thu	19-Nov-15			
Fri	20-Nov-15			
Sat	21-Nov-15			
Sun	22-Nov-15			
Mon	23-Nov-15	✓		✓
Tue	24-Nov-15		✓	
Wed	25-Nov-15			
Thu	26-Nov-15			
Fri	27-Nov-15			
Sat	28-Nov-15	✓		
Sun	29-Nov-15			
Mon	30-Nov-15		✓	



## **Appendix I**

### **24-HOUR TSP AND CONSTRUCTION NOISE MONITORING DATA**

**24-Hr TSP Monitoring Data for AM1**

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (µg/m <sup>3</sup> )
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(°C)	(hPa)	(m <sup>3</sup> /min)	(std m <sup>3</sup> )	INITIAL	FINAL	(g)	
3-Oct-15	28526	13037.77	13061.30	1411.80	29	30	29.5	26.8	1012.0	0.98	1390	2.7701	2.8277	0.0576	41
9-Oct-15	28555	13061.30	13084.82	1411.20	30	30	30.0	26.8	1011.3	1.00	1416	2.8161	2.8781	0.0620	44
15-Oct-15	28567	13084.82	13108.32	1410.00	29	30	29.5	25.9	1013.8	0.99	1392	2.7990	2.9052	0.1062	76
*20-Oct-15	28588	13108.32	13123.98	939.60	30	31	30.5	25.1	1014.6	1.03	966	2.7725	2.8604	0.0879	91
26-Oct-15	28656	13123.98	13147.42	1406.40	29	30	29.5	24.3	1015.4	0.99	1394	2.9068	2.9739	0.0671	48
31-Oct-15	28620	13147.42	13170.92	1410.00	30	31	30.5	25.6	1020.4	1.03	1453	2.8719	2.9501	0.0782	54

**24-Hr TSP Monitoring Data for AM2a**

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (µg/m <sup>3</sup> )
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(°C)	(hPa)	(m <sup>3</sup> /min)	(std m <sup>3</sup> )	INITIAL	FINAL	(g)	
3-Oct-15	28525	9627.97	9651.97	1440.00	40	41	40.5	26.8	1014.4	1.25	1800	2.7726	2.8503	0.0777	43
9-Oct-15	28556	9651.97	9675.97	1440.00	39	39	39.0	26.8	1011.3	1.19	1720	2.8156	2.9303	0.1147	67
15-Oct-15	28476	9675.97	9699.99	1441.20	42	43	42.5	25.9	1013.8	1.32	1906	2.8484	3.0225	0.1741	91
20-Oct-15	28589	9699.99	9723.99	1440.00	40	45	42.5	25.1	1014.6	1.33	1909	2.7785	2.9813	0.2028	106
26-Oct-15	28657	9723.99	9747.97	1438.80	41	42	41.5	24.3	1015.4	1.29	1859	2.8820	2.9770	0.0950	51
31-Oct-15	28680	9747.97	9771.97	1440.00	40	40	40.0	23.6	1016.7	1.24	1788	2.7802	2.8907	0.1105	62

Remarks: (\*) Due to electricity supply failure incident and run 15.66 hours, the result is not valid.

**Noise Measurement Results (dB) of NM1**

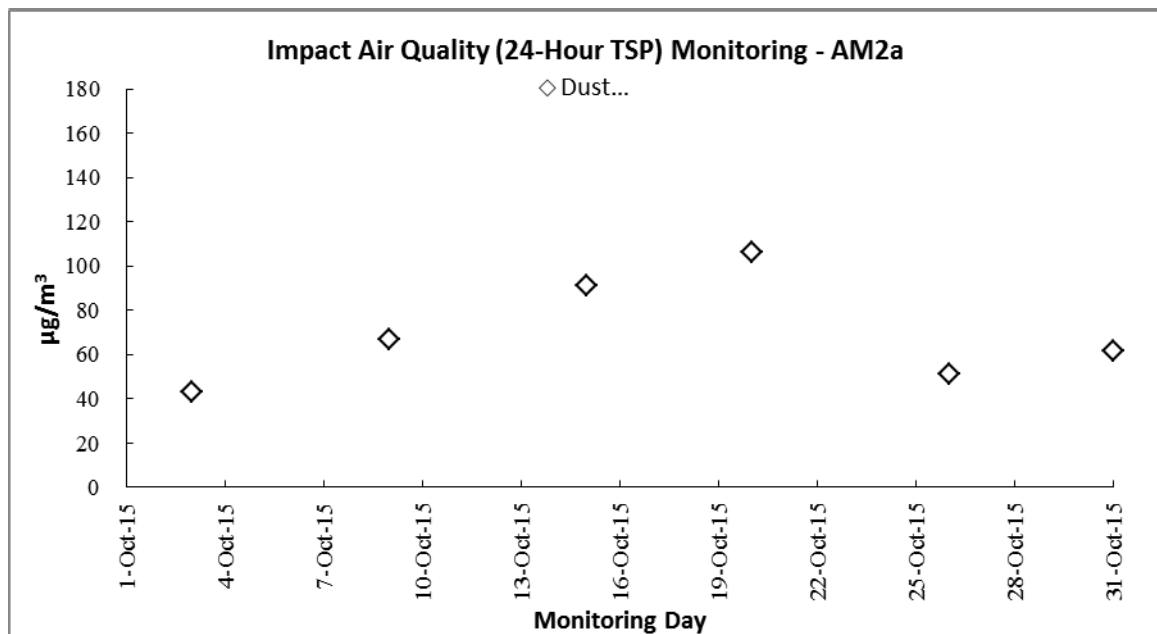
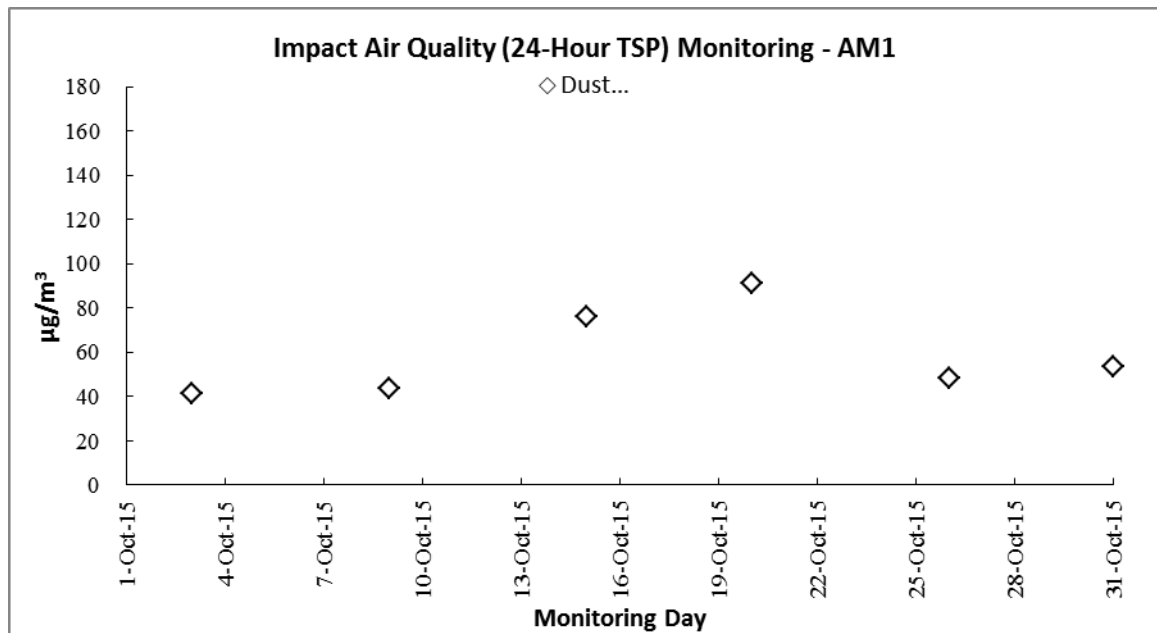
Date	Start Time	1 <sup>st</sup> Leq <sub>5min</sub>	L10	L90	2 <sup>nd</sup> Leq <sub>5min</sub>	L10	L90	3 <sup>rd</sup> Leq <sub>5min</sub>	L10	L90	4 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	5 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	6 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	Leq30min
2-Oct-15	14:24	51.2	51.7	47.2	50.1	51.7	47.8	52.0	53.4	48.6	52.2	53.5	48.3	51.5	51.9	48.1	52.4	52.9	47.9	52
8-Oct-15	14:28	54.6	55.4	49.0	54.0	56.5	49.8	61.1	61.8	50.0	56.7	60.1	49.2	56.1	60.4	49.0	55.1	59.1	49.6	57
14-Oct-15	14:03	55.2	55.0	48.0	51.4	52.5	50.0	50.4	52.0	47.5	51.8	53.5	47.0	53.2	55.0	47.0	52.5	55.0	48.0	53
19-Oct-15	14:42	50.9	53.3	47.6	55.7	53.8	48.5	50.7	52.3	47.6	51.1	53.1	47.6	51.5	53.9	47.0	50.7	53.1	47.1	52
30-Oct-15	10:30	54.0	53.0	46.5	56.3	56.0	49.0	52.9	55.0	48.5	53.0	55.0	49.5	54.5	57.0	50.0	56.0	59.0	49.5	55

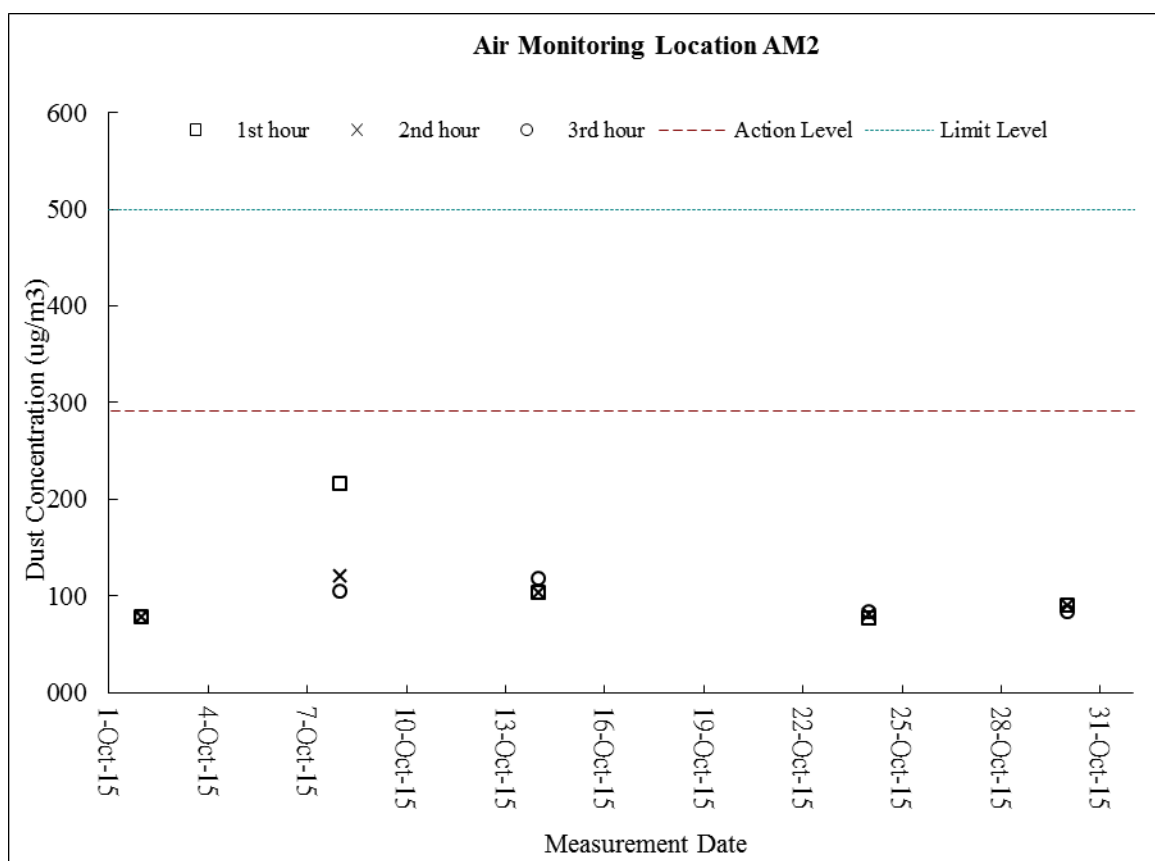
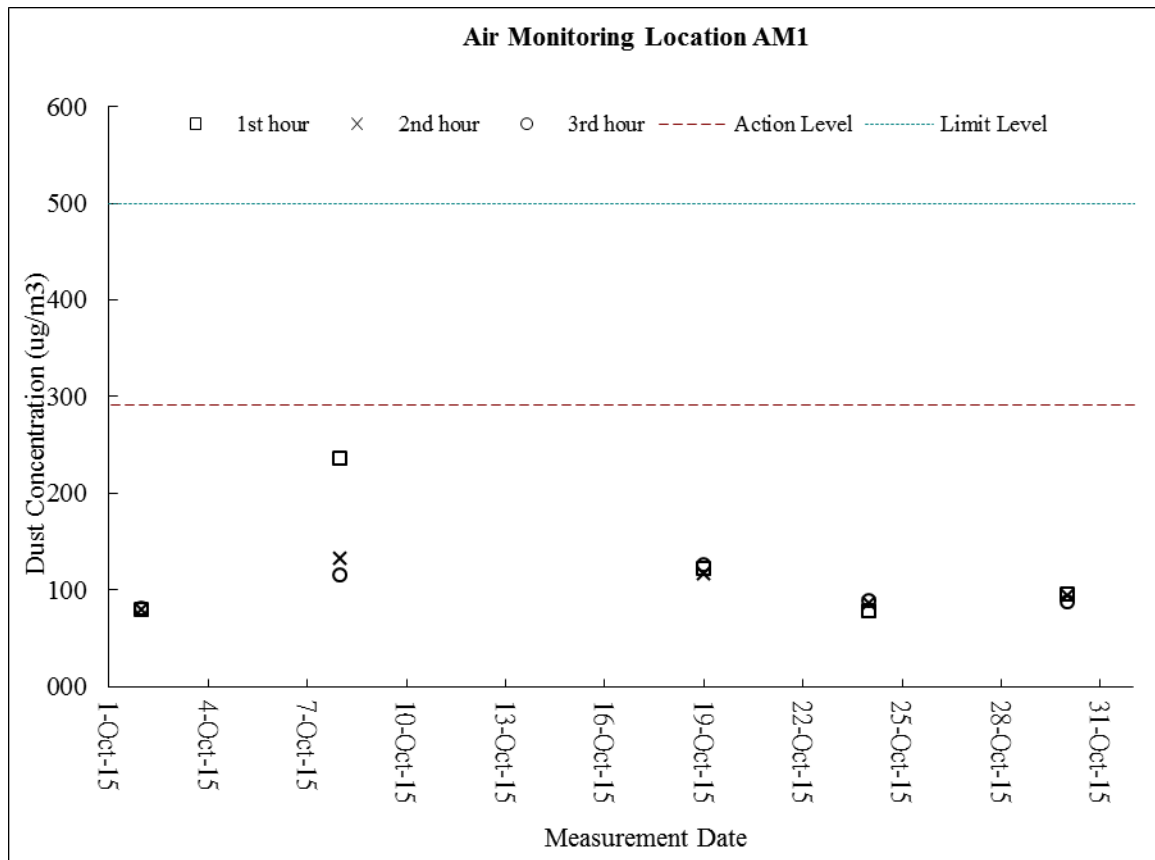
**Noise Measurement Results (dB) of NM2**

Date	Start Time	1 <sup>st</sup> Leq <sub>5min</sub>	L10	L90	2 <sup>nd</sup> Leq <sub>5min</sub>	L10	L90	3 <sup>rd</sup> Leq <sub>5min</sub>	L10	L90	4 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	5 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	6 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	Leq30min
2-Oct-15	15:03	47.5	48.2	41.1	46.7	48.7	41.7	48.2	49.5	42.8	46.3	49.4	41.4	47.5	49.5	42.5	46.9	48.2	41.2	47
8-Oct-15	15:14	46.2	49.5	39.6	45.7	46.1	40.8	48.1	49.4	41.2	50.1	54.4	40.9	48.2	49.3	40.2	45.7	47.6	40.7	48
14-Oct-15	15:37	49.8	51.5	45.0	54.5	52.5	45.5	54.4	54.0	46.0	49.9	51.5	44.5	45.1	47.5	41.0	47.2	47.0	42.0	51
19-Oct-15	15:38	48.6	51.5	42.2	47.3	49.9	41.0	45.3	47.4	41.2	44.3	46.5	41.0	44.3	46.9	41.2	45.4	47.0	41.4	46
30-Oct-15	11:30	63.4	63.5	42.5	49.5	52.5	39.5	47.8	49.5	39.5	43.8	46.0	39.5	47.6	50.5	41.0	45.6	49.0	39.0	56

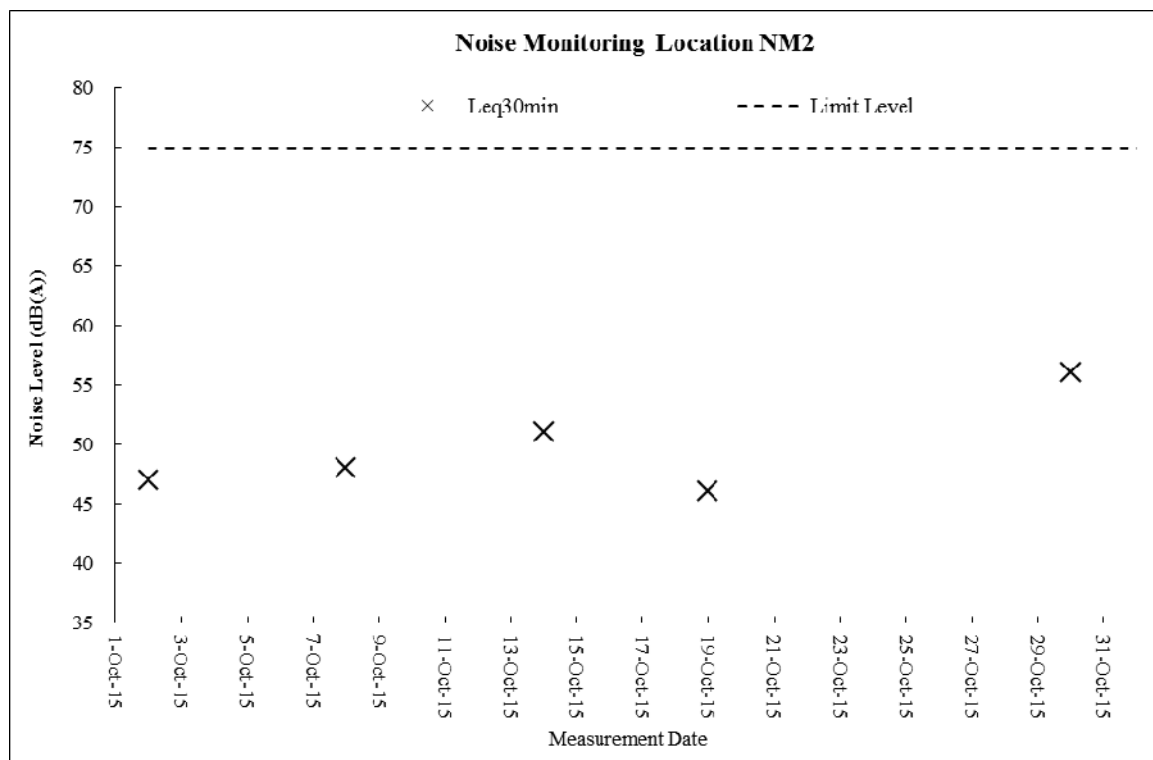
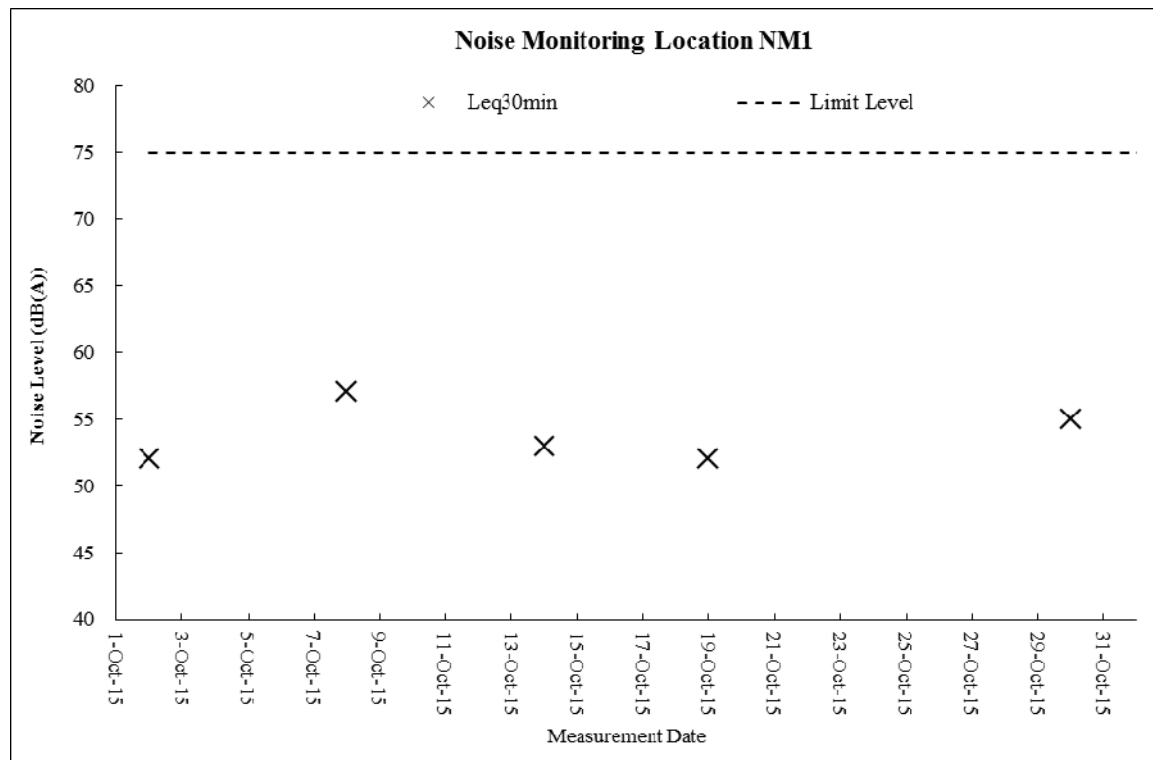
## **Appendix J**

### **GRAPHICAL PLOTS**

**Air Quality – 24-Hour TSP**

**Air Quality – 1-Hour TSP**



**Construction Noise**

## **Appendix K**

### **METEOROLOGICAL DATA DURING THE REPORTING MONTH (TA KWU LING STATION)**

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Thu	1-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	0.3	28.8	5	79.7	E/SE
Fri	2-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	7	27.3	7.7	74.5	N
Sat	3-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	46.4	26.5	14.1	81	E/NE
Sun	4-Oct-15	Cloudy with showers and a few thunderstorms. Moderate east to southeasterly winds.	38.1	26.1	18.7	87	E
Mon	5-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	15.6	26.5	14	89.5	E
Tue	6-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	50.7	26.5	8.9	89.5	E
Wed	7-Oct-15	Cloudy with showers and a few thunderstorms. Moderate east to southeasterly winds.	5.8	26.2	6	87	E/SE
Thu	8-Oct-15	Sunny periods apart from some haze. There will be one or two showers later. Light winds.	0	27.3	4.5	77.5	N/NW
Fri	9-Oct-15	Fine and dry apart from some haze. Light to moderate northeasterly winds.	Trace	27	8.9	73	N
Sat	10-Oct-15	Cloudy with showers and a few thunderstorms. Moderate east to southeasterly winds.	1	22	14.2	74.5	N
Sun	11-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	2	19.9	10.8	74	N
Mon	12-Oct-15	Mainly cloudy with showers and isolated squally thunderstorms. Moderate to fresh easterly winds.	Trace	22.2	3.3	70.5	N
Tue	13-Oct-15	Fine and dry apart from some haze. Light to moderate northeasterly winds.	Trace	25.3	6	67.5	E/SE
Wed	14-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	24.8	6.5	77.2	E
Thu	15-Oct-15	Fine and dry apart from some haze. Light to moderate northeasterly winds.	0	24.7	5.5	72.2	E
Fri	16-Oct-15	Fine and dry apart from some haze. Light to moderate northeasterly winds.	0	25	4.4	67.2	N/NW
Sat	17-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	25	7	62.5	N/NW
Sun	18-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	23.6	7.5	66.7	N/NE
Mon	19-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	22.9	8.2	70	N/NE
Tue	20-Oct-15	It will be dry. Mainly cloudy overnight. Sunny periods tomorrow. Moderate northerly winds.	0	24.2	8.2	67	N
Wed	21-Oct-15	Mainly cloudy. Sunny periods during the day tomorrow. Light to moderate northerly winds.	Trace	25	5	68.7	S/SE
Thu	22-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	26.5	5.7	68.7	E/NE
Fri	23-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	25.8	6.9	69	N
Sat	24-Oct-15	It will be dry. Mainly cloudy overnight. Sunny periods tomorrow. Moderate northerly winds.	Trace	25.8	5	69	E/NE
Sun	25-Oct-15	Mainly cloudy. Sunny periods during the day tomorrow. Light to moderate northerly winds.	0.2	26.6	5	69	N
Mon	26-Oct-15	Fine and dry apart from some haze. Light to moderate northeasterly winds.	0.7	25.3	8.5	78.5	E
Tue	27-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	26.6	5	76.2	N
Wed	28-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	Trace	5.6	8	83.7	E/NE
Thu	29-Oct-15	Fine and dry apart from some haze. Light to moderate northeasterly winds.	Trace	26.6	11.6	73.7	E
Fri	30-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0	26.4	10	51	E
Sat	31-Oct-15	Mainly fine. Dry in the afternoon. Moderate northerly winds.	0.5	24.7	11	69	E

## **Appendix L**

### **MONTHLY SUMMARY WASTE FLOW TABLE**

Monthly Summary Waste Flow Table

Department: Drainage Services DepartmentContract No.: DC/2013/09

Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road

Commencement Date: 21-Jul-2015Estimated completion Date: 19-Aug-2016Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated (in '000m <sup>3</sup> )	Hard Rock and Large Broken Concrete (in '000m <sup>3</sup> )	Reused in the Contract (in '000m <sup>3</sup> )	Reused in other Projects (in '000m <sup>3</sup> )	Disposed as Public Fill (in '000m <sup>3</sup> )	Imported Fill (in '000m <sup>3</sup> )	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m <sup>3</sup> )
Jan	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Feb	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Mar	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Apr	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
May	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
June	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
July	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
Oct	0.002	0.002	0.000	0.000	0.000	0.000	43.790	0.000	0.000	0.000	0.004
Nov	0.000										
Dec	0.000										
Total	0.002	0.002	0.000	0.000	0.000	0.000	43.790	0.000	0.000	0.000	0.015

- Notes:
- (1) The waste flow table should cover the whole construction period of the Contract.
  - (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
  - (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
  - (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
  - (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
  - (6) Broken concrete for recycling into aggregates.



## **Appendix M**

### **IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)**

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Air Quality Impact</b>						
S2.4.1.3	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> <li>Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;</li> <li>Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> <li>A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones;</li> <li>The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;</li> <li>Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;</li> <li>When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period.</li> <li>The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;</li> <li>Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously;</li> <li>Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;</li> </ul>	To minimize the dust impact	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Air Quality Impact</b>						
	<ul style="list-style-type: none"> <li>Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</li> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <li>Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;</li> <li>Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;</li> <li>Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and</li> <li>Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabilizer within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.</li> </ul>					

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Noise Impact</b>						
S3.4.1.1	Use of movable barrier, enclosure, acoustic mat and quiet plant. Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m <sup>2</sup> on a skid footing with 25mm thick internal sound absorptive lining.	To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs)	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, Noise Control Ordinance (NCO)
S3.4.1.2	<p>Good Site Practice:</p> <ul style="list-style-type: none"> <li>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.</li> <li>• Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>• Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.</li> <li>• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.</li> <li>• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction period of Advance Works and Main Works of Phase 1A	EIAO-TM, NCO

<b>EM&amp;A Ref.</b>	<b>Recommended Mitigation Measures</b>	<b>Objectives of the Recommended Measures &amp; Main Concern to Address</b>	<b>Who to implement the measures?</b>	<b>Location of the measure</b>	<b>When to implement the measures?</b>	<b>What requirements or standards for the measure to achieve</b>
<b>Ecological Impact</b>						
S4.2.1.1	Solid dull green noise/visual barriers of at least 2m high shall be erected and maintained between active works area and all areas of ecological importance.	Minimize noise and human disturbances during construction phase.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.2	Avoid unnecessary lighting.	Minimize mortality impacts on birds.	Design Contractor / Plant Operator	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.3	Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule	Minimize dust generation from construction sites.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.4	<p>The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented</p> <ul style="list-style-type: none"> <li>• Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies;</li> <li>• Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works;</li> <li>• To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites;</li> <li>• Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies;</li> <li>• Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified;</li> </ul>	Avoid, minimise and mitigate impact on water quality	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM



EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Ecological Impact</b>						
	<ul style="list-style-type: none"> <li>• Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies;</li> <li>• Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited;</li> <li>• Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered;</li> <li>• Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety;</li> <li>• Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means;</li> <li>• Stockpiling sites should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and</li> <li>• Supply of suitable clean backfill material after excavation, if required.</li> <li>• Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet season;</li> <li>• Speed control for the trucks carrying contaminated materials should be enforced;</li> <li>• Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and</li> <li>• Other measures as detailed in this schedule.</li> </ul>					

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Water Quality Impact</b>						
S5.2.2.1	Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable.	Control construction runoff	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO
S5.2.2.2 – S5.2.2.3	<p>Sewage from Workforce</p> <ul style="list-style-type: none"> <li>• Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.</li> <li>• Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures</li> </ul>	Handling of site sewage	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Waste Management</b>						
S6.2.2.1	<p>Good Site Practices and Waste Reduction Measures:</p> <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;</li> <li>Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;</li> <li>Provision of sufficient waste disposal points and regular collection for disposal;</li> <li>Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;</li> <li>An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval.</li> </ul>	Minimize waste generation during construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal Ordinance (WDO)
S6.2.3.1	<p>Waste Reduction Measures:</p> <ul style="list-style-type: none"> <li>Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;</li> <li>Proper storage and site practices to minimize the potential for damage and contamination of construction materials;</li> <li>Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;</li> <li>Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and</li> <li>Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.</li> </ul>	Reduce waste generation	Contractor	Work Sites	Prior to the commencement of construction of Advance Works and Main Works of Phase 1A	WDO
S6.2.4.1 - S6.2.4.2	<p>Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> <li>Waste, such as soil, should be handled and stored well to ensure secure</li> </ul>	Minimize waste impacts arising from waste storage	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	WDO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Waste Management</b>						
	containment, thus minimizing the potential of pollution; • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations should be designated to stockpile each material to enhance reuse. • Remove waste in timely manner; • Employ the trucks with cover or enclosed containers for waste transportation; • Obtain relevant waste disposal permits from the appropriate authorities; and • Disposal of waste should be done at licensed waste disposal facilities.					
S6.2.5.2	C&D Materials from Site Formation • Maintain temporary stockpiles and reuse excavated fill material for backfilling; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt “selective demolition” technique to demolish the existing structure and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; and • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified.	Minimize waste impacts from excavated and C&D materials	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005
S6.2.5.3	C&D Material from Buildings Demolition and New Building Construction • The Contractor should recycle as much as possible of the C&DM on-site. Public fill and C&DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage. • The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used. • Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow	Minimize waste impacts from building demolition and new building construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Waste Management</b>						
	<p>reuse of the inert material on site when implemented.</p> <ul style="list-style-type: none"> <li>In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&amp;D material arising from demolition works, selective demolition method should be adopted.</li> </ul>					
S6.2.5.4	<p>Chemical Waste</p> <ul style="list-style-type: none"> <li>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers.</li> <li>Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</li> </ul>	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.5	<p>General Refuse</p> <ul style="list-style-type: none"> <li>General refuse should be stored in enclosed bins separately from construction and chemical wastes.</li> <li>Recycling bins should also be placed to encourage recycling.</li> <li>Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean.</li> <li>A reputable waste collector should be employed to remove general refuse on a daily basis.</li> </ul>	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste



EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Landscape and Visual</b>						
S7.3.1.1	<b>Good Site Practices</b> <ul style="list-style-type: none"> <li>For areas unavoidably disturbed by the Project on a short term basis e.g. works areas, the general principle to try and restore these to their former state to suit future land use, should be adhered to.</li> <li>With regard to topsoil, where identified, it should be stripped, treated appropriately, and where suitable and practical stored for re-use in the construction of the soft landscape works such as roadside amenity strips, and open space sites.</li> </ul>	Minimize the impact to the landscape and visual	Contractor	Work Sites	Prior to construction and construction phase	
S7.3.2.1	<b>MM4 - Tree Protection &amp; Preservation</b> <ul style="list-style-type: none"> <li>Existing trees to be retained within the Project Site should be carefully protected during construction. In particular Old and Valuable Trees (OVTs) will be preserved according to ETWB TC (Works) No. 29/2004. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in Contractor's works areas. A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained.</li> </ul>	Protect and Preserve Trees	Designer / Contractor	Work Sites	Prior to construction and construction phase	ETWB TCW No. 10/2013, 29/2004 and 3/2006
S7.3.2.1	<b>MM5 - Tree Transplantation</b> <ul style="list-style-type: none"> <li>Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBTC 2/2004 and 3/2006 and final</li> </ul>	Transplant Trees where suitable for transplantation	Designer / Contractor	Work Sites where possible. Otherwise consider offsite locations	Prior to construction, construction phase and operation phase	WB TCW No. 10/2013, 3/2006 and 2/2004

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Landscape and Visual</b>						
	locations of transplanted trees should be agreed prior to commencement of the work.					
S7.3.2.1	MM17 - Light Control <ul style="list-style-type: none"> <li>Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the Construction phase. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.</li> </ul>	To minimize glare impact to adjacent VSRs.	Designer / Contractor	Work Sites and/or the Plant	Construction phase and operation phase	