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

BASELINE MONITORING REPORT

PREPARED FOR

TSUN YIP WATERWORKS CONSTRUCTION CO LTD

Date	Reference No.	Prepared By	Certified By
24 September 2015	TCS00757/15/600/R0014v2	Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	22 September 2015	First Submission
2	24 September 2015	Amended the IEC's comments on 24 September 2015

ANEWR

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

Your reference:

Our reference: HKDSD201/50/103145

Date: 30 September 2015

Attention: Mr Michael Leung

BY EMAIL & POST
(Email: 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
Baseline Monitoring Report

We refer to email of 24 September 2015 attaching a Baseline Monitoring Report prepared by the Environmental Team (ET) of the captioned project.

We have no further comment and hereby verify the Baseline Monitoring 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

p.p.

Adi Lee
Independent Environmental Checker

LYMA/LCYG/chnb

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

ANewR Consulting Limited
Unit 517, 5/F, Tower A, Regent Centre
63 Wo Yi Hop Road, Kwai Chung, Hong Kong
Tel: (852) 2618 2836 Fax: (852) 3007 8648
Email: info@anewr.com
Web: www.anewr.com

ISO 9001 : 2008
Certificate No.: CC 3988

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 programme, including baseline and impact environmental monitoring in accordance with the Updated EM&A Manual of the Contract.

ES.04 According to the Updated EM&A Manual, air quality and noise monitoring is required to be monitored during the construction phase of the Contract. Pursuant to the EP, baseline environmental monitoring is required to be conducted prior to commencement of the construction works under the Contract. Baseline air quality and noise monitoring was conducted from ***28 August 2015*** to ***12 September 2015***. During the baseline monitoring period, no construction activities under the Project or other external influencing factors of significant concern were observed.

ES.05 This report summarizes the key findings and presents the process and rationale behind determining a set of Action and Limit Levels (A/L Levels) of air quality and construction noise based on the baseline data. These A/L Levels will serve as the yardsticks for assessing the acceptability of the environmental impact during construction phase of the Project Works impact monitoring. They are statistical in nature and derived according to the criteria set out in the Approved EM&A Manual.

ES.06 Results of the derived Action and Limit Levels for the air quality and construction noise are given in ***Tables ES-1*** and ***ES-2*** as follows.

Table ES-1 Action and Limit Levels of Air Quality Monitoring

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1	286	147	500	260
AM2	276	***NA***	500	***NA***
AM2a	***NA***	155	***NA***	260

Table ES-2 Action and Limit Levels of Construction Noise Monitoring

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1 and NM2	When one or more documented complaints are received	75 dB(A)[Note 1]

Note 1: Acceptable Noise Levels for school should be reduced to 70 dB(A) and65 dB(A) during examination period
Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.

ES.07 In cases of exceedance against these criteria triggered, actions will be carried out in accordance with the Event Action Plan as shown the Updated EM&A Manual.

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

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 degritting 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 and the Construction Programme is shown in ***Appendix B*** and ***Appendix C*** respectively.

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. As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Therefore, baseline monitoring including air quality and noise were carried out between ***28 August 2015*** and ***12 September 2015*** before construction work commencement. During the baseline monitoring period, there were no construction activities of this project or other external influencing factors of significant concern observed by the ET.

1.1.7 The milestones of environmental protection/ mitigation activities are basically following to the Implementation Schedule and Recommended Mitigation Measures (ISMM) in the Updated EM&A Manual and it is presented in ***Appendix D***.

1.1.8 This Baseline Monitoring Report presents the details of the baseline study including project background, monitoring methodology, monitoring results, summary of findings, and Action/Limit (A/L) Levels established for subsequent use in Advance Works of the Contract construction phase EM&A program.

1.2 REPORT STRUCTURE

1.2.1 The Baseline Monitoring Report is structured into the following sections:-

Section 1 Introduction

Section 2 Summaries of Baseline Monitoring Requirement.

Section 3 Baseline Monitoring Methodology

Section 4 Baseline Monitoring Results

Section 5 Conclusion and Recommendation

2 SUMMARY OF BASELINE MONITORING REQUIREMENT

2.1 GENERAL

2.1.1 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.

2.1.2 This report presents the results obtained during the baseline monitoring program of air quality and noise between ***28 August 2015*** and ***12 September 2015***. A summary of the baseline EM&A requirements for air quality and noise are presented in the sub-sections below.

2.2 MONITORING PARAMETERS

2.2.1 The EM&A baseline monitoring program shall cover the following environmental issues:
- Air quality; and
- Construction noise

2.2.2 A summary of the monitoring parameters is presented in ***Table 2-1*** below

Table 2-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	• 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Noise	• $L_{eq\ (30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday; and • 3 sets of consecutive Leq (5min) on restricted hours i.e. 19:00 to 07:00 next day, and whole day of public holiday or Sunday

2.3 MONITORING LOCATIONS

2.3.1 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 2-2*** and shown in ***Appendix C***.

Table 2-2 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	$L_{eq(30min)}$

2.4 MONITORING FREQUENCY AND PERIOD

2.4.1 The requirements of baseline monitoring are stipulated in *Sections 2.1.6 and 3.2.4* of the Updated *EM&A Manual* and presented as follows.

Air Quality Monitoring

2.4.2 Monitoring frequency for air quality baseline monitoring is as follows:
- 1-Hour TSP — 3 sets of 1-hour TSP monitoring shall be carried out daily for a period of at least two weeks.
- 24-Hour TSP — Continuous monitoring of 24-hour shall be carried out daily for a period of at least two weeks.

Noise Monitoring

2.4.3 The baseline noise monitoring shall be carried out daily for a period of at least two weeks. The

baseline noise levels for the time period between 0700 and 1900 hours on normal weekdays will be measured in terms of Leq (30 minutes). For all other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as "the restricted hours") will not be included in the baseline monitoring as they do not carry significance with the following rationales:

- Setting A/L Levels for construction noise is not based on baseline noise levels at the monitoring stations (refer to the following *Section 3.2.6: Action/Limit Levels and Event Action Plan*); and
- No construction activities are to be undertaken during the restricted hours, no construction noise impacts related to the works under the Project are therefore envisaged during the restricted hours.

2.5 MONITORING EQUIPMENT

Air Quality Monitoring

2.5.1 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.

2.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

2.5.3 All equipment to be used for baseline air quality monitoring is listed in ***Table 2-3***.

Table 2-3 Air Quality Monitoring Equipment

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

Wind Data Monitoring Equipment

2.5.4 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

2.5.5 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^{-1}.

2.5.6 Noise monitoring equipment to be used for baseline monitoring is listed in ***Table 2-4***.

Table 2-4 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
Portable Wind Speed Indicator	Testo Anemometer

2.5.7 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..

2.6 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

2.6.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. A summary of derivation of Action/Limit (A/L) Levels for air quality and construction noise are shown in ***Table 2-5*** and ***2-6*** respectively.

Table 2-5 Derivation of Action and Limit Levels for Air Quality

Parameter	Action Level	Limit Level
24-hour TSP	For baseline level ≤ 200 μg/m^3: Action level = (Baseline × 1.3 + Limit level)/2 For baseline level > 200 μg/m^3: Action level = Limit level	> 260 μg/m^3
1-hour TSP	For baseline level ≤ 384 μg/m^3: Action level = (Baseline × 1.3 + Limit level)/2 For baseline level > 384 μg/m^3: Action level = Limit level	> 500 μg/m^3

Table 2-6 Derivation of Action and Limit Levels for Construction Noise

Time Period	Action Level in dB(A)	Limit Level in dB(A)
0700-1900 hours on normal weekdays	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 BASELINE MONITORING METHDOLOGY

3.1 GENERAL

3.1.1 The baseline monitoring program of air quality and noise were conducted between ***28 August 2015*** and ***12 September 2015***. During the baseline monitoring period, there were no construction activities of this project or other external influencing factors of significant concern observed by the ET.

3.2 LOCATION OF BASELINE MONITORING

3.2.1 The detailed information of monitoring stations referred to ***Table 2-2*** and the graphical plot of monitoring locations shown in ***Appendix C*** in this report.

3.3 MONITORING EQUIPMENT AT BASELINE MONITORING

3.3.1 All the monitoring equipment to be used in the EM&A program as listed in ***Tables 2-3*** and ***2-4*** has been agreed with the IEC prior to commencement of the baseline monitoring.

3.4 MONITORING PROCEDURES

Air Quality

1-hour TSP

3.4.1 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 90^0 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.

3.4.2 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 D***.

24-hour TSP

3.4.3 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

3.4.4 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 D***.

3.4.5 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^{o}C, for six months prior to disposal.

Construction Noise

3.4.6 Sound level meter listed above comply 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), which was used for baseline noise monitoring. A valid of calibration certificates including sound level meter and an acoustic were shown in ***Appendix D***.

3.4.7 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.

3.4.8 During the baseline 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 the baseline noise monitoring, all monitoring stations were conducted 1 m from the exterior of the building façade.

3.4.9 Prior baseline 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.

3.4.10 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.

3.5 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.5.1 The baseline monitoring data were handled by the ET's in-house data recording and management system.

3.5.2 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.

3.5.3 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

4 BASELINE MONITORING RESULTS

4.1 GENERAL

4.1.1 For the baseline air quality monitoring, 1-hour TSP was performed at the designated locations AM1 and AM2 from ***28 August 2015*** to ***10 September 2015*** and 24-hour TSP for AM2a was carried out between ***29 August 2015*** and ***11 September 2015***. Since power supply failure was occurred at AM1 on ***31 August 2015***, the 24-hour TSP monitoring at AM1 was undertaken from ***29 August 2015*** to ***12 September 2015*** in order to obtain completed baseline data. The baseline monitoring schedules are presented in ***Appendix F*** and the monitoring results are shown in the following sub-sections.

4.2 RESULTS OF AIR QUALITY MONITORING

4.2.1 The results for 24-hour and 1-hour TSP are summarized in ***Tables 4-1 to 4-2***. The 24-hour TSP data are shown in ***Appendix G***.

Table 4-1 Summary of 1-Hour TSP Monitoring Results

DATE	AM1 (μg/m^3)				AM2 (μg/m^3)			
	Start Time	1st Meas.	2nd Meas.	3rd Meas.	Start Time	1st Meas.	2nd Meas.	3rd Meas.
28-Aug-15	11:26	139	75	47	12:45	39	42	32
29-Aug-15	10:20	44	64	63	10:43	36	41	40
30-Aug-15	10:25	32	27	16	12:26	18	14	22
31-Aug-15	9:58	25	18	21	10:32	21	21	21
01-Sep-15	10:12	16	16	19	11:05	23	23	24
02-Sep-15	11:02	20	15	19	11:45	20	11	15
03-Sep-15	11:12	113	57	49	12:07	47	36	30
04-Sep-15	13:10	57	77	125	14:29	47	59	70
05-Sep-15	11:04	48	50	48	11:36	43	31	40
06-Sep-15	10:42	44	45	36	12:45	40	33	31
07-Sep-15	10:40	37	63	76	11:04	43	42	55
08-Sep-15	10:14	175	157	138	11:28	137	125	115
09-Sep-15	11:08	45	38	43	11:29	31	29	34
10-Sep-15	14:37	38	39	39	14:09	36	36	37
Average (Range)	**55 (15 to 175)**				**40 (11 to 137)**			

Table 4-2 Summary of 24-hour TSP Monitoring Results

Date	AM1 (μg/m^3)	AM2a (μg/m^3)
29-Aug-15	22	38
30-Aug-15	14	41
31-Aug-15	****21***	32
01-Sep-15	17	29
02-Sep-15	15	28
03-Sep-15	32	35
04-Sep-15	41	31
05-Sep-15	26	31
06-Sep-15	29	37
07-Sep-15	13	48
08-Sep-15	33	64
09-Sep-15	29	43
10-Sep-15	32	42
11-Sep-15	37	48

12-Sep-15	36	
Average (Range)	**27 (13-41)**	**39 (28-64)**

Remarks: (*) the result is not used for the performance criteria establishment.

4.2.2 The meteorological data during the baseline monitoring period are summarized in ***Appendix H***.

Action/Limit Levels for Air Quality

4.2.3 Following the criteria shown in ***Table 2-5*** of this report, the proposed Action and Limit Levels for 24-hour and 1-hour TSP are listed in ***Table 4-3***.

Table 4-3 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1	286	147	500	260
AM2	276	***NA***	500	***NA***
AM2a	***NA***	155	***NA***	260

Note: 1-hour & 24-hour TSP Action Level = (Baseline × 1.3 + Limit level)/2

4.3 RESULTS OF NOISE MONITORING

4.3.1 The baseline noise monitoring was undertaken form ***28 August 2015*** to ***10 September 2015***. The measurement data are shown in ***Appendix F*** and summarized in ***Table 4-4***.

Table 4-4 Summaries of Noise Monitoring Results

Monitoring Station	Normal day (Monday to Saturday): Daytime 0700-1900, Leq(30min)			Public Holiday or Sunday: Daytime 0700-1900, Leq(5min)		
	Min	Mean	Max	Min	Mean	Max
NM1	51.4	54.5	58.2	49.7	51.6	52.9
NM2	44.1	48.8	52.4	45.4	49.6	53.4

Note: Figures refer to the measurement recorded at the designated station during the entire baseline period for general reference.

4.3.2 As reviewed all baseline noise measurement results, no sound pressure level exceedance the criteria 75dB(A) normal daytime and 70dB(A) restricted hour (Sundays and Public Holiday), is recorded at NM1 and NM2 monitoring stations.

Action/Limit Levels for Noise

4.3.3 The Action and Limit Levels for construction noise are illustrated in ***Table 4-5***.

Table 4-5 Action and Limit Levels of Construction Noise Monitoring

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

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

4.4 DISCUSSION AND RECOMMENDATIONS

Air Quality

Possible Influence of Seasonal Changes

4.4.1 The baseline air quality monitoring was conducted from ***28 August 2015*** to ***12 September 2015*** during typical Hong Kong wet seasons. The baseline data so collected therefore represent the baseline air quality of the wet season immediately prior to commencement of the Project. They may not reflect the air quality conditions of dry seasons in Hong Kong, which are normally significantly different.

4.4.2 It is therefore recommended that the interpretation of the air quality monitoring data should take into account the influence of the seasonal changes, and the baseline conditions should be regularly reviewed, in particular during seasonal changes.

5 CONCLUSIONS AND RECOMMENTATIONS

5.1 CONCLUSIONS

5.1.1 The baseline monitoring program was carried out between ***28 August 2015*** and ***12 September 2015*** at the designated or alternative monitoring locations in accordance with the Updated EM&A Manual. During the baseline monitoring, there were no construction activities undertaken under this Project.

5.1.2 Based on the baseline monitoring results, the recommended environmental performance criteria for air quality and construction noise are summarized as follows:

Recommended Action & Limit Levels of Air Quality				
Monitoring Station	**Action Level (μg /m^3)**		**Limit Level (μg/m^3)**	
	1-hour TSP	**24-hour TSP**	**1-hour TSP**	**24-hour TSP**
AM1	286	147	500	260
AM2	276	***NA***	500	***NA***
AM2a	***NA***	155	***NA***	260

Recommended Action & Limit Levels of Construction Noise		
Monitoring Location	**Action Level**	**Limit Level**
	0700-1900 hours on normal weekdays	
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, reduced to 70 dB(A) of Leq(30min) for schools and 65 dB(A) during school examination periods

5.2 RECOMMENDATIONS

5.2.1 The baseline monitoring of air quality was conducted during typical wet season (April to October) in Hong Kong. It is important to note that influence of seasonal changes should be taken into account when interpreting monitoring data obtained during dry season. Review of the baseline conditions may need to be conducted regularly, in particular during seasonal changes. If the changes in baseline conditions are evident, the environmental performance criteria should be re-established by agreement of the ER and IEC and submitted for EPD endorsement.

Appendix A

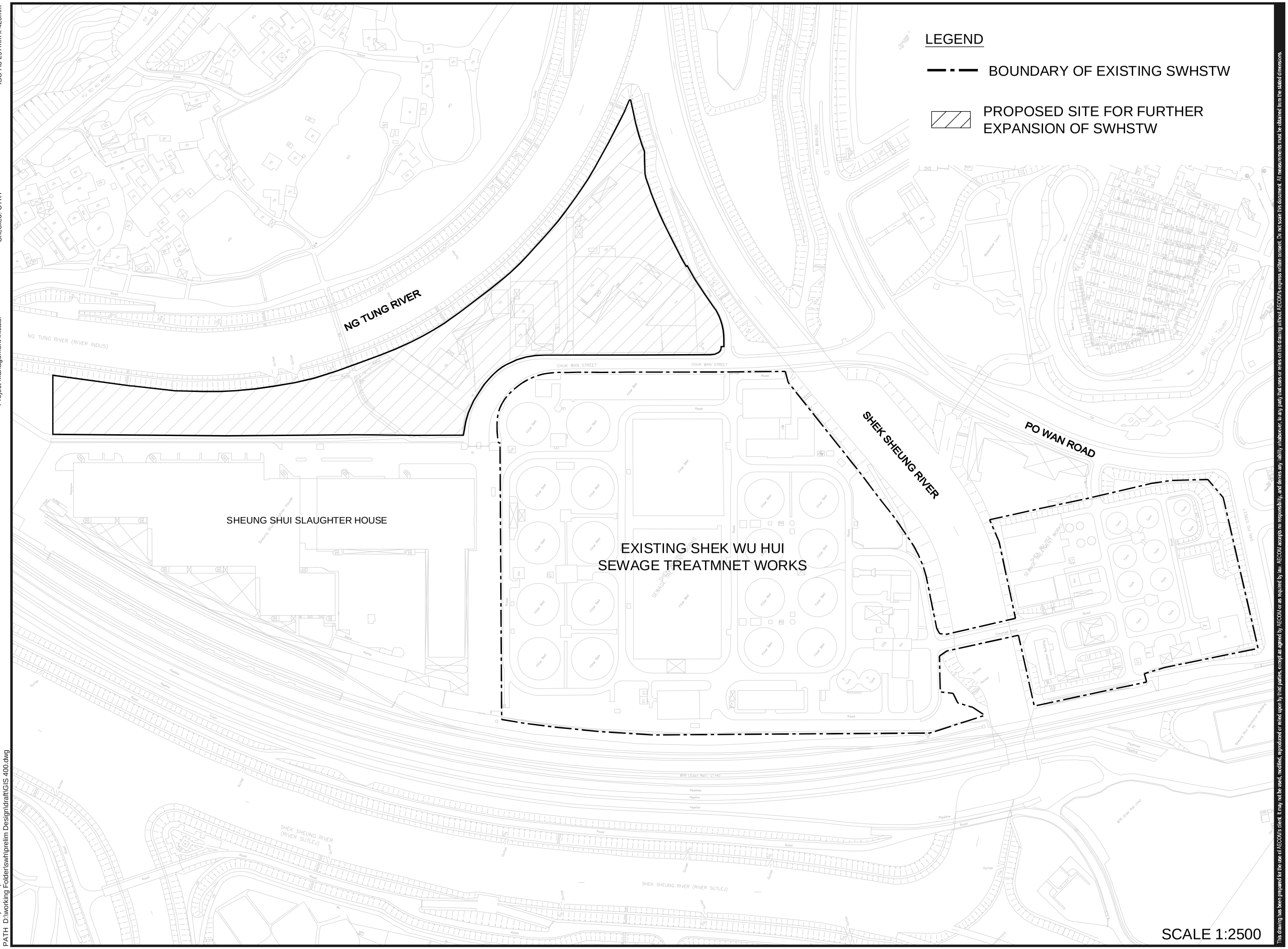
GENERAL LAYOUT OF ADVANCE WORKS AND MAIN WORKS OF SWHSTW FURTHER EXPANSION PHASE 1A

ISO A3 297mm x 420mm

Checked: CYKY

Project Management Initials:

Plot File by: Chancp1 19/02/2014
PATH D:\working Folder\swh\prelim Design\draft\GIS 400.dwg



AECOM

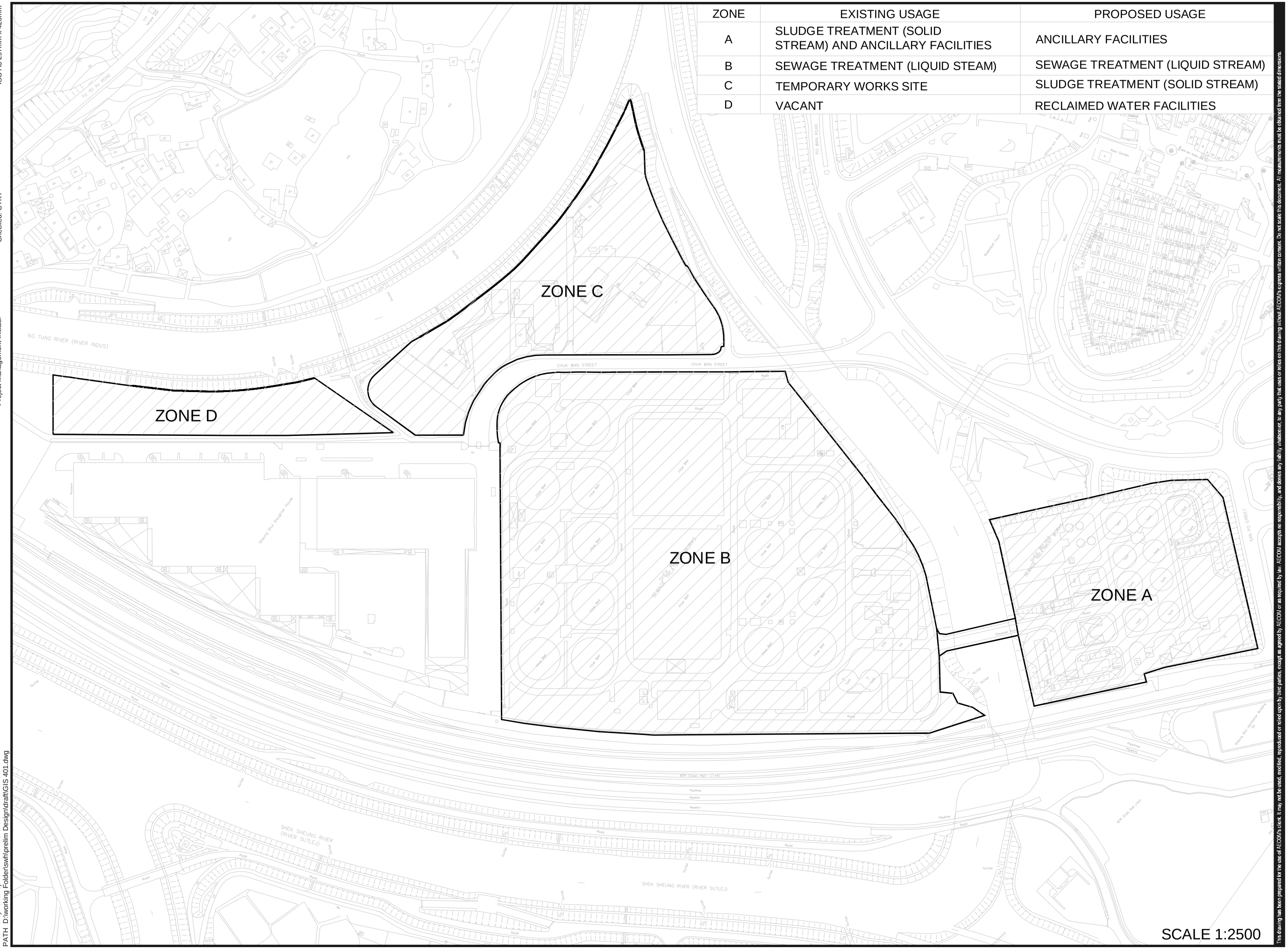
Drawing 60284037/EM&AM/400

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

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

Project No.: 60284037 Date: FEB. 2014

ZONE	EXISTING USAGE	PROPOSED USAGE
A	SLUDGE TREATMENT (SOLID STREAM) AND ANCILLARY FACILITIES	ANCILLARY FACILITIES
B	SEWAGE TREATMENT (LIQUID STEAM)	SEWAGE TREATMENT (LIQUID STREAM)
C	TEMPORARY WORKS SITE	SLUDGE TREATMENT (SOLID STREAM)
D	VACANT	RECLAIMED WATER FACILITIES



AECOM

Drawing 60284037/EM&AM/401

PREFERRED SITE UTILIZATION
ACCORDING TO BRIEF

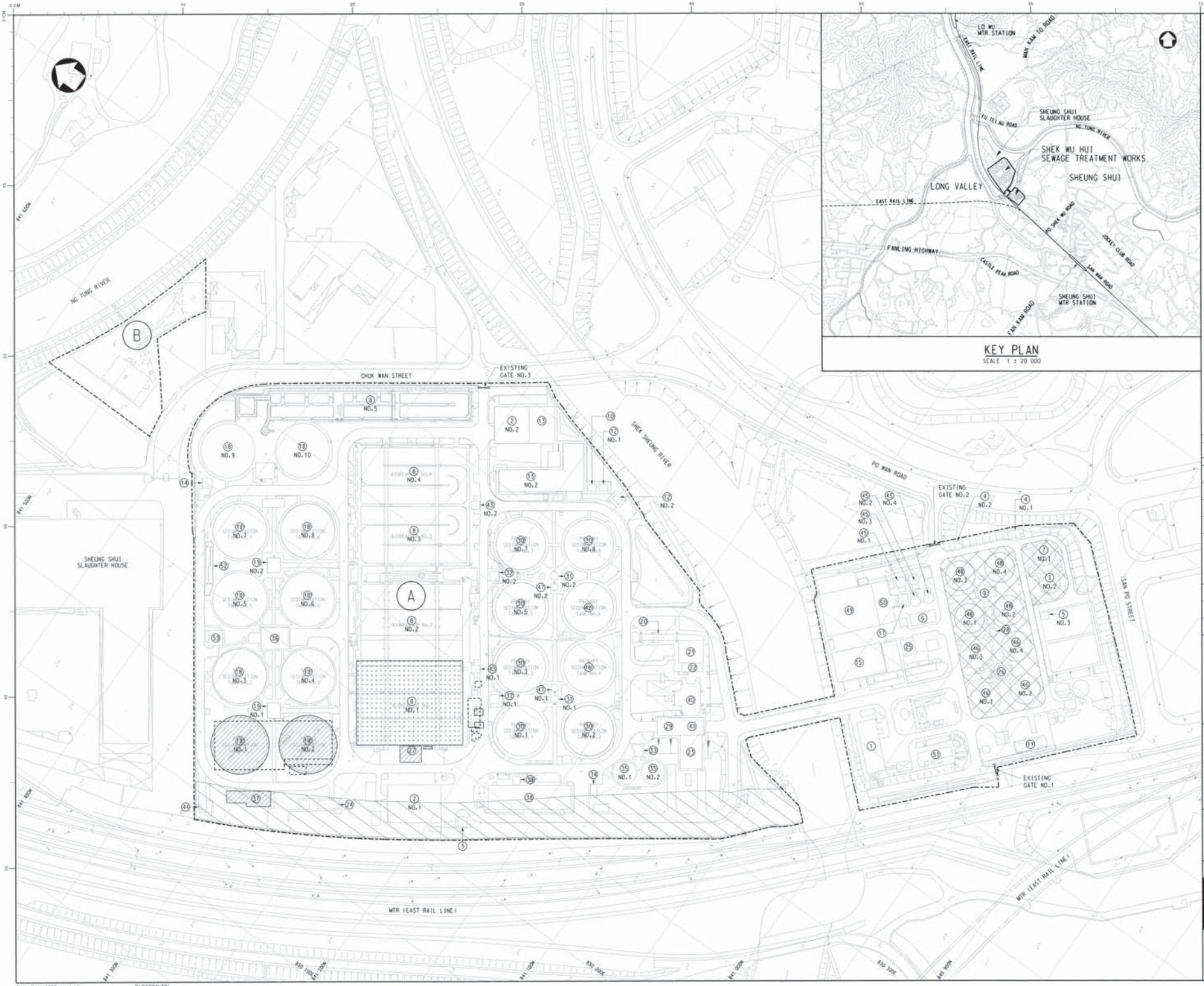
AGREEMENT NO. CE 40/2012 (DS)
SHEK WU HUI SEWAGE TREATMENT WORKS
- FURTHER EXPANSION PHASE 1A
- INVESTIGATION

Project No.: 60284037 Date: FEB. 2014

ISO A3 297mm x 420mm
Checked: CYKY
Project Management Initials:
Plot File by: Chancp1 19/02/2014
PATH D:\working Folder\swh\preliim Design\draft\GIS 401.dwg

Appendix B

LAYOUT PLAN OF ADVANCE WORKS



KEY PLAN
SCALE 1 : 20 000

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(1)(I) AND PS APPENDIX 1.18 FOR WORKS IN THE VICINITY OF MTR.
3. PORTION 'A' IS INSIDE EXISTING SWHSTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28.27 FOR WORKS INSIDE SWHSTW.
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 :

- SITE BOUNDARY
- GAS RISK AREA
- AREA WITHIN WHICH SCC 22 AND PS CLAUSES 1.66(1)(I) AND 1.130 & PS APPENDIX 1.39 SHALL APPLY
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- (A) PORTION A OF THE SITE

no.	date	description	initial
REVISION			

	name	date
designed	H. F. PANG	12 DEC 2014
drawn	C. C. CHAN	12 DEC 2014
checked	W. C. POON	12 DEC 2014
vetted	Ir W. W. LAU	12 DEC 2014

approved

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.	scale
DSP/DC1309/11021	1 : 1000 OR AS SHOWN

office

SEWERAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

Appendix C

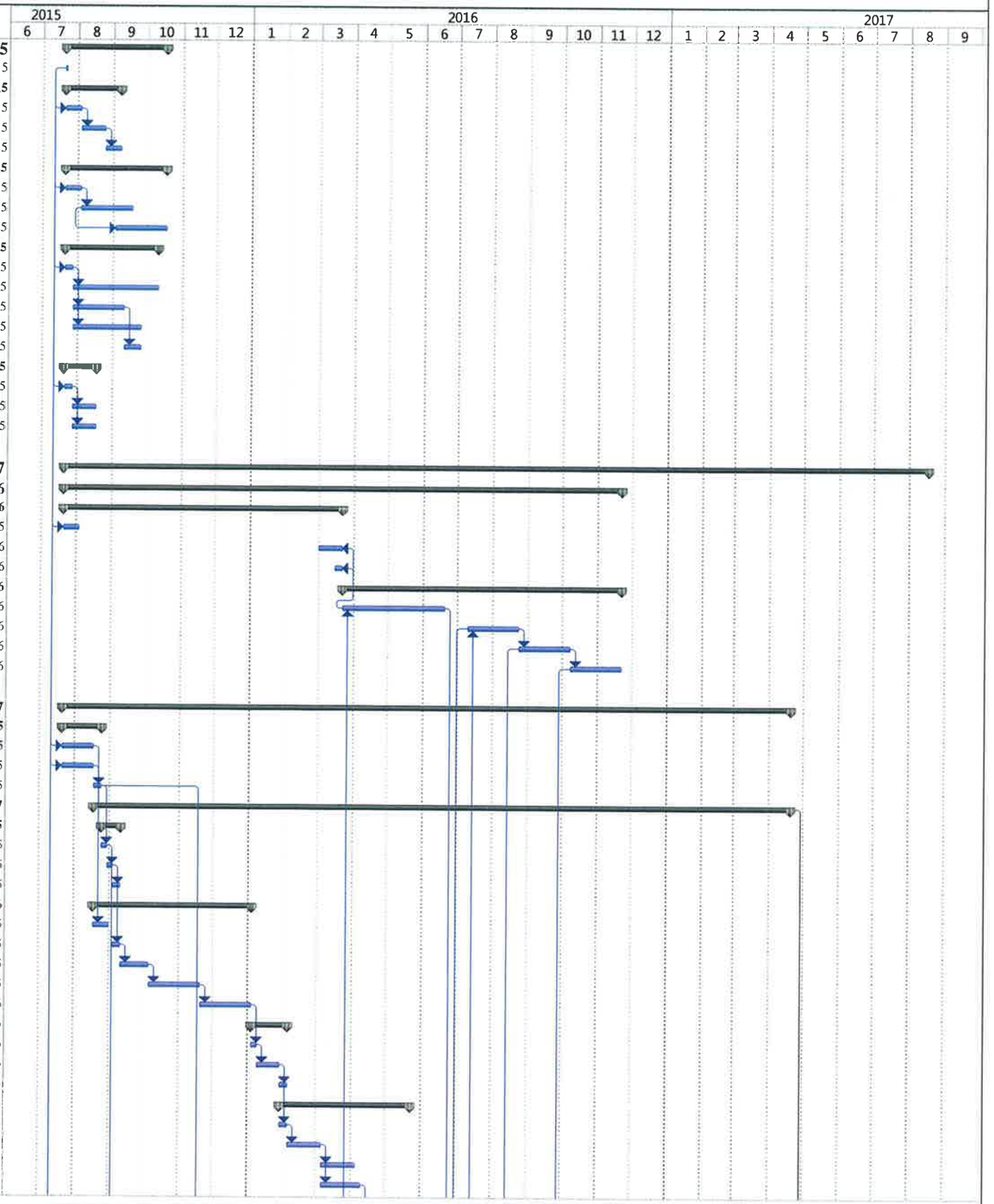
CONSTRUCTION PROGRAMME

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
1	**(I) Preliminary Items**	**89 days**	**Tue 21/7/15**	**Sat 17/10/15**
2	Contract Commencement	1 day	Tue 21/7/15	Tue 21/7/15
3	**(a)Implementation of Environmental Monitoring & Audit**	**49 days**	**Tue 21/7/15**	**Mon 7/9/15**
4	Establishment of Environomental Team (ET)	14 days	Tue 21/7/15	Mon 3/8/15
5	Submission of Updated EM&A Manual and Approval	21 days	Tue 4/8/15	Mon 24/8/15
6	Baseline Monitoring	14 days	Tue 25/8/15	Mon 7/9/15
7	**(b) Structural and Condition Monitoring**	**89 days**	**Tue 21/7/15**	**Sat 17/10/15**
8	Proposal of Conditions Survey Specialist and Approval	14 days	Tue 21/7/15	Mon 3/8/15
9	Condition Survey for SWHSTW and Reporting	45 days	Tue 4/8/15	Thu 17/9/15
10	Condition Survey for Ping Che Road and Reporting	45 days	Thu 3/9/15	Sat 17/10/15
11	**(c) Chu Wan Street Site Offices (Portion B)**	**82 days**	**Tue 21/7/15**	**Sat 10/10/15**
12	Site Clearance / Cable Detection / Surveying Works	7 days	Tue 21/7/15	Mon 27/7/15
13	Application for Electiricity / Water Supply / Boardband Sevice	75 days	Tue 28/7/15	Sat 10/10/15
14	Construction of Contractor Office	45 days	Tue 28/7/15	Thu 10/9/15
15	Rennovation Works for Engineer Office	60 days	Tue 28/7/15	Fri 25/9/15
16	Construction of Signboard and General Pavement Works	15 days	Fri 11/9/15	Fri 25/9/15
17	**(d) Ping Che Road Site Office (Portion D)**	**28 days**	**Tue 21/7/15**	**Mon 17/8/15**
18	Site Clearance / Cable Detection / Surveying Works	7 days	Tue 21/7/15	Mon 27/7/15
19	Application for Electiricity / Water Supply / Boardband Sevice	21 days	Tue 28/7/15	Mon 17/8/15
20	Rennovation Works for Engineer Office (Containers)	21 days	Tue 28/7/15	Mon 17/8/15
21				
22	**(II) Works in Shek Wu Hui Sewage Treatment Works**	**759 days**	**Tue 21/7/15**	**Thu 17/8/17**
23	**Section 1**	**490 days**	**Tue 21/7/15**	**Mon 21/11/16**
24	**(a)Estblishment**	**245 days**	**Tue 21/7/15**	**Tue 22/3/16**
25	Discussion for Working Seqence and Site Arrangement with ST1	14 days	Tue 21/7/15	Mon 3/8/15
26	Submission of Method Statement and Documents	21 days	Tue 1/3/16	Tue 22/3/16
27	Application for SWAC and PMAC	7 days	Tue 15/3/16	Tue 22/3/16
28	**(b) Cable and DrawPits (From Exising Control Room to new MFB)**	**245 days**	**Tue 22/3/16**	**Mon 21/11/16**
29	Duct Laying (Existing Control Room to FST7)	90 days	Tue 22/3/16	Sun 19/6/16
30	Duct Laying (FST7 to FST5)	45 days	Sun 10/7/16	Tue 23/8/16
31	Duct Laying (FST5 to FST3)	45 days	Wed 24/8/16	Fri 7/10/16
32	Duct Laying (FST3 to outside MFB)	45 days	Sat 8/10/16	Mon 21/11/16
33				
34	**Section 2**	**639 days**	**Tue 21/7/15**	**Wed 19/4/17**
35	**(a) Establishment**	**35 days**	**Tue 21/7/15**	**Mon 24/8/15**
36	Discussion for Working Seqence and Site Arrangement with ST1	28 days	Tue 21/7/15	Mon 17/8/15
37	Submission of Method Statement and Documents	28 days	Tue 21/7/15	Mon 17/8/15
38	Application for SWAC and PMAC	7 days	Tue 18/8/15	Mon 24/8/15
39	**(b) Membrane Facilitates and Membrane Tanks**	**611 days**	**Tue 18/8/15**	**Wed 19/4/17**
40	**(i) Works by ST1**	**17 days**	**Tue 25/8/15**	**Thu 10/9/15**
41	Empty FST1 and FST2 / Suspension of BR2	5 days	Tue 25/8/15	Sat 29/8/15
42	Isolation Works for FST 1 and FST 2 (Pipe Closing / Disconnect Power and Signal)	5 days	Sun 30/8/15	Thu 3/9/15
43	Dismantle and Return existing equipment to SWHSWTW	7 days	Fri 4/9/15	Thu 10/9/15
44	**(ii) Demolition for Existing FST1 & FST2**	**139 days**	**Tue 18/8/15**	**Sun 3/1/16**
45	General Site Clearance / Surveying Works / Cable Detection/ Inspection Pits	14 days	Tue 18/8/15	Mon 31/8/15
46	Plug and Removal Part of DN675 FST Effluent Pipe / DN450 Sludge Drawoff Pipe / DN800 FST Influent Pipe	7 days	Fri 4/9/15	Thu 10/9/15
47	Demolition Structure of FST1 & FST2 (Up to +3.0mPD)	25 days	Fri 11/9/15	Mon 5/10/15
48	Install Sheetpiles and Struting for Membrance Facilitates and Tanks	45 days	Tue 6/10/15	Thu 19/11/15
49	Demolition Structure of FST1 & FST2 (Up to +0.0mPD)	45 days	Fri 20/11/15	Sun 3/1/16
50	**(iii) Ground Investigation by Drilling Rigs**	**32 days**	**Mon 4/1/16**	**Thu 4/2/16**
51	Excavation for Trial Pits / Determination of GI Locations	5 days	Mon 4/1/16	Fri 8/1/16
52	Drilling (25nos. Size P) / Insitu Testing /Taking Rock Cores	20 days	Sat 9/1/16	Thu 28/1/16
53	Lab Testing / Report Preparation / Determination of Founding Levels	7 days	Fri 29/1/16	Thu 4/2/16
54	**(iv) Piling for Structure**	**115 days**	**Fri 29/1/16**	**Sun 22/5/16**
55	Establisment for Piling Plants / Prepartion Works	7 days	Fri 29/1/16	Thu 4/2/16
56	Construction of Piles (1st Batch - 28nos)	30 days	Fri 5/2/16	Sat 5/3/16
57	Grouting / Curing for Piles (1st Batch)	30 days	Sun 6/3/16	Mon 4/4/16
58	Construction of Piles (2nd Batch - 33 nos)	35 days	Sun 6/3/16	Sat 9/4/16



Task — Milestone — Summary

Date: 15 Sep 2015

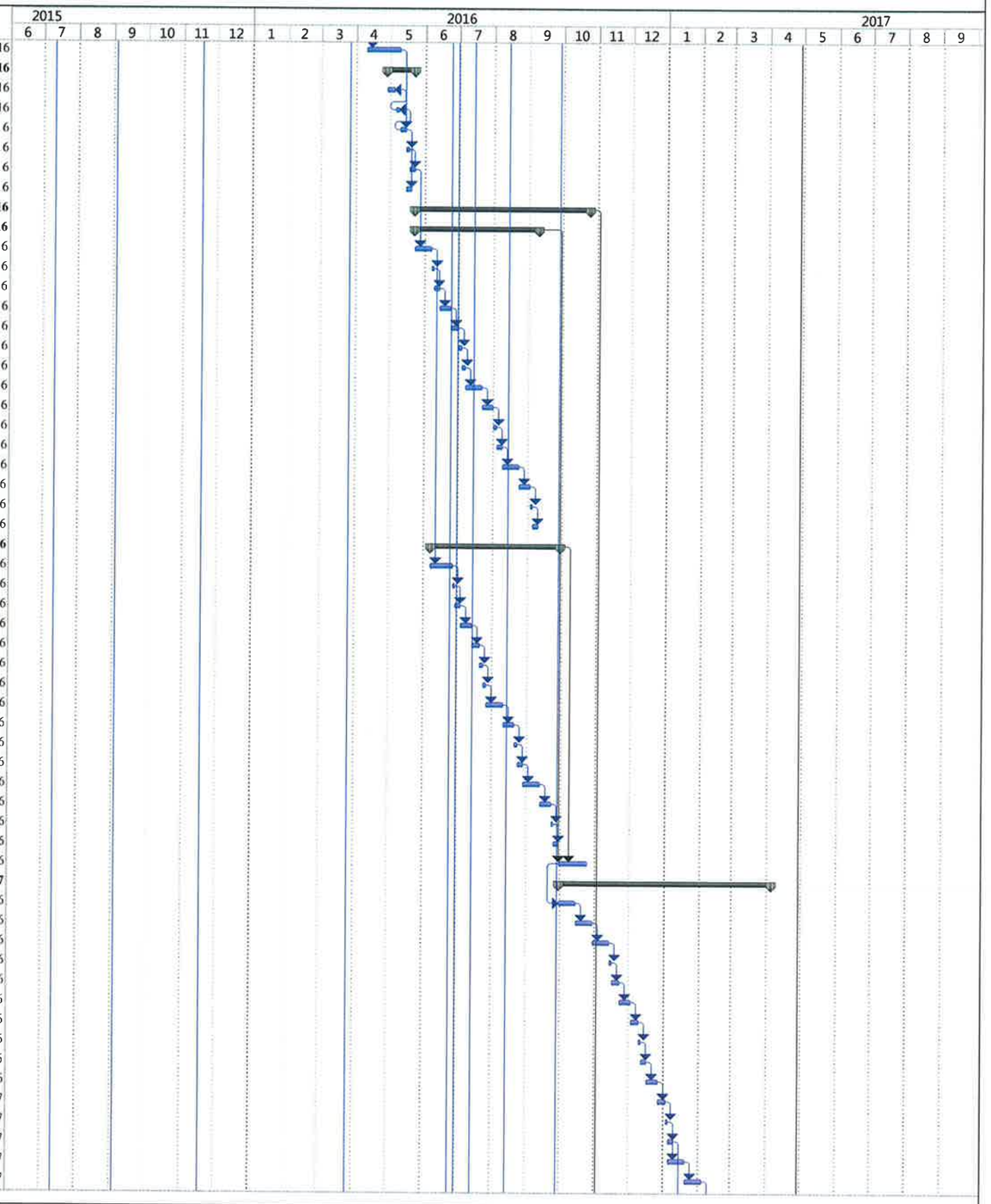
Revision 01

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 Programe (Sep 2015)

ID	Task Name	Duration	Start	Finish
59	Grouting / Curing for Piles (2nd Batch)	30 days	Sun 10/4/16	Mon 9/5/16
60	**Pile Testing and Proof drilling**	**25 days**	**Thu 28/4/16**	**Sun 22/5/16**
61	Setting-up of Pile-Load Test System (1st & 2nd pile)	7 days	Thu 28/4/16	Thu 5/5/16
62	Pile-Load Test for Main Piles (1st and 2nd pile)	3 days	Fri 6/5/16	Mon 9/5/16
63	Removal and Resetting of Pile-Load Test System	5 days	Tue 10/5/16	Sat 14/5/16
64	Pile-Load Test for Main Pile (3rd and 4 pile)	3 days	Sun 15/5/16	Tue 17/5/16
65	Removal of Pile-Load Test System	5 days	Wed 18/5/16	Sun 22/5/16
66	Proof Drilling	5 days	Sun 15/5/16	Thu 19/5/16
67	**(v) Construction of Subtructure**	**155 days**	**Mon 23/5/16**	**Mon 24/10/16**
68	**Portion A - Grid C-E / Grid F-G / Grid G+14 - G+28**	**110 days**	**Mon 23/5/16**	**Fri 9/9/16**
69	Excavation to Formation Level (+0.3/+2.4mPD)	15 days	Mon 23/5/16	Mon 6/6/16
70	Laying Blinding Layer	2 days	Tue 7/6/16	Wed 8/6/16
71	Preparation for Pilehead	5 days	Thu 9/6/16	Mon 13/6/16
72	Steelfixing for Membrance Facilitates (up to +1.9mPD) and Membrance Tank (up to +3.9mPD)	10 days	Tue 14/6/16	Thu 23/6/16
73	Installation of formwork / waterstop / other accessory	7 days	Fri 24/6/16	Thu 30/6/16
74	Concreting	3 days	Fri 1/7/16	Sun 3/7/16
75	Curing of concrete / formwork removal / making good works	3 days	Mon 4/7/16	Wed 6/7/16
76	Steelfixing for Membrance Facilitates & Tanks (up to +5.4/+7.5mPD)	15 days	Thu 7/7/16	Thu 21/7/16
77	Installation of formwork / waterstop / other accessory	10 days	Fri 22/7/16	Sun 31/7/16
78	Concreting	3 days	Mon 1/8/16	Wed 3/8/16
79	Curing of concrete / formwork removal / making good works	5 days	Thu 4/8/16	Mon 8/8/16
80	Steelfixing for Membrance Facilitates & Tanks (up to +6.7/7.5mPD)	15 days	Tue 9/8/16	Tue 23/8/16
81	Installation of formwork / waterstop / other accessory	10 days	Wed 24/8/16	Fri 2/9/16
82	Concreting	2 days	Sat 3/9/16	Sun 4/9/16
83	Curing of concrete / formwork removal / making good works	5 days	Mon 5/9/16	Fri 9/9/16
84	**Portion B - Grid A-C / Grid E-F / Grid G-G+14**	**115 days**	**Tue 7/6/16**	**Thu 29/9/16**
85	Excavation to Formation Level (+0.3/+2.4mPD)	20 days	Tue 7/6/16	Sun 26/6/16
86	Laying Blinding Layer	2 days	Mon 27/6/16	Tue 28/6/16
87	Preparation for Pilehead	5 days	Wed 29/6/16	Sun 3/7/16
88	Steelfixing for Membrance Facilitates (up to +1.9mPD) and Membrance Tank (up to +3.9mPD)	10 days	Mon 4/7/16	Wed 13/7/16
89	Installation of formwork / waterstop / other accessory	7 days	Thu 14/7/16	Wed 20/7/16
90	Concreting	3 days	Thu 21/7/16	Sat 23/7/16
91	Curing of concrete / formwork removal / making good works	3 days	Sun 24/7/16	Tue 26/7/16
92	Steelfixing for Membrance Facilitates & Tanks (up to +5.4/+7.5mPD)	15 days	Wed 27/7/16	Wed 10/8/16
93	Installation of formwork / waterstop / other accessory	10 days	Thu 11/8/16	Sat 20/8/16
94	Concreting	3 days	Sun 21/8/16	Tue 23/8/16
95	Curing of concrete / formwork removal / making good works	5 days	Wed 24/8/16	Sun 28/8/16
96	Steelfixing for Membrance Facilitates & Tanks (up to +6.7/7.5mPD)	15 days	Mon 29/8/16	Mon 12/9/16
97	Installation of formwork / waterstop / other accessory	10 days	Tue 13/9/16	Thu 22/9/16
98	Concreting	2 days	Fri 23/9/16	Sat 24/9/16
99	Curing of concrete / formwork removal / making good works	5 days	Sun 25/9/16	Thu 29/9/16
100	Backfilling and Extracting Sheetphile	25 days	Fri 30/9/16	Mon 24/10/16
101	**(vi) Construction of Superstructure**	**187 days**	**Fri 30/9/16**	**Tue 4/4/17**
102	Erect Working Platform and Falsework (up to +11.65mPD)	15 days	Fri 30/9/16	Fri 14/10/16
103	Steelfixing for Membrance Facilitates Bldgs	15 days	Sat 15/10/16	Sat 29/10/16
104	Installation of formwork / other accessory	15 days	Sun 30/10/16	Sun 13/11/16
105	Concreting	2 days	Mon 14/11/16	Tue 15/11/16
106	Curing of concrete / formwork removal / making good works	7 days	Wed 16/11/16	Tue 22/11/16
107	Steelfixing for Membrance Facilitates Bldgs (up tp +12.95mPD)	10 days	Wed 23/11/16	Fri 2/12/16
108	Installation of formwork / other accessory	7 days	Sat 3/12/16	Fri 9/12/16
109	Concreting	2 days	Sat 10/12/16	Sun 11/12/16
110	Curing of concrete / formwork removal / making good works	5 days	Mon 12/12/16	Fri 16/12/16
111	Steelfixing for Membrance Facilitates Bldgs (up tp +14.45mPD)	10 days	Sat 17/12/16	Mon 26/12/16
112	Installation of formwork / other accessory	7 days	Tue 27/12/16	Mon 2/1/17
113	Concreting	2 days	Tue 3/1/17	Wed 4/1/17
114	Curing of concrete / formwork removal / making good works	5 days	Thu 5/1/17	Mon 9/1/17
115	Erect Working Platform and Falsework (up to +19.2mPD)	15 days	Thu 5/1/17	Thu 19/1/17
116	Steelfixing for Membrance Facilitates Bldgs (up tp +19.2mPD)	15 days	Fri 20/1/17	Fri 3/2/17



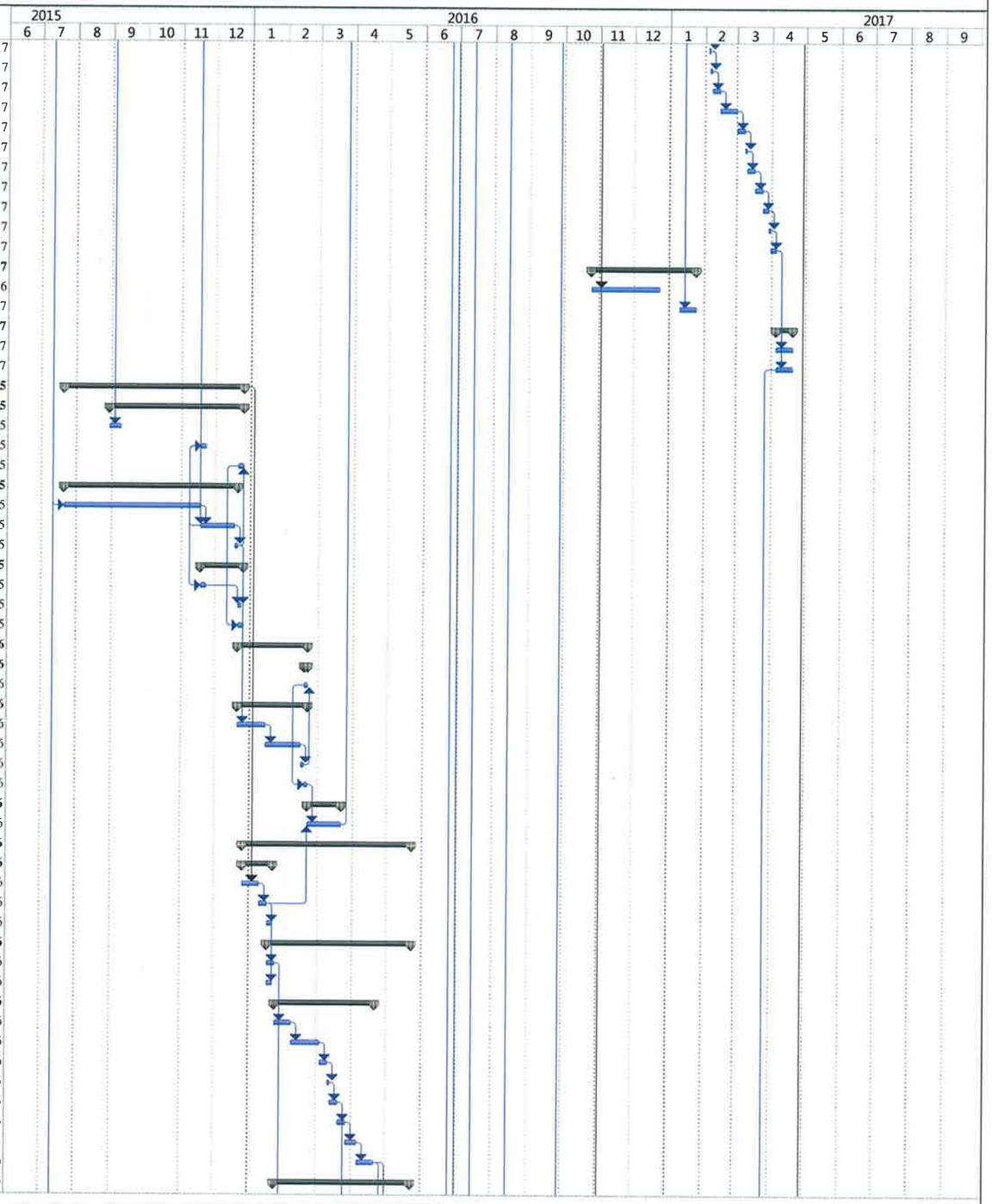
Task — Milestone ◆ — Summary

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
117	Installation of formwork / other accessory	1 day	Sat 4/2/17	Sat 4/2/17
118	Concreting	2 days	Sun 5/2/17	Mon 6/2/17
119	Curing of concrete / formwork removal / making good works	7 days	Tue 7/2/17	Mon 13/2/17
120	Steelfixing for Membrance Facilitates Bldgs (up tp +22.79mPD)	15 days	Tue 14/2/17	Tue 28/2/17
121	Installation of formwork / other accessory	7 days	Wed 1/3/17	Tue 7/3/17
122	Concreting	2 days	Wed 8/3/17	Thu 9/3/17
123	Curing of concrete / formwork removal / making good works	7 days	Fri 10/3/17	Thu 16/3/17
124	Steelfixing for Membrance Facilitates Bldgs (up tp +26.00mPD)	7 days	Fri 17/3/17	Thu 23/3/17
125	Installation of formwork / other accessory	5 days	Fri 24/3/17	Tue 28/3/17
126	Concreting	2 days	Wed 29/3/17	Thu 30/3/17
127	Curing of concrete / formwork removal / making good works	5 days	Fri 31/3/17	Tue 4/4/17
128	**(vii)Testing**	**92 days**	**Tue 25/10/16**	**Tue 24/1/17**
129	Water Tightness Test for Membrance Tanks	60 days	Tue 25/10/16	Fri 23/12/16
130	Water Tightness Test for Permeate Storage Tank	15 days	Tue 10/1/17	Tue 24/1/17
131	**(viii) Remaining Works**	**15 days**	**Wed 5/4/17**	**Wed 19/4/17**
132	Plumbing System	15 days	Wed 5/4/17	Wed 19/4/17
133	Cable Ducts to MFB	15 days	Wed 5/4/17	Wed 19/4/17
134	**(c) DN1400 DI BR2 Effluent Pipe**	**158 days**	**Tue 21/7/15**	**Fri 25/12/15**
135	**(i) Works by ST1**	**118 days**	**Sun 30/8/15**	**Fri 25/12/15**
136	Empty BR2	10 days	Sun 30/8/15	Tue 8/9/15
137	Suspension of BR1 for Seperation (on ageed time slot)	5 days	Wed 18/11/15	Sun 22/11/15
138	Suspension of BR1 for Connection (on ageed time slot)	5 days	Mon 21/12/15	Fri 25/12/15
139	**(ii) Pipe Laying Works**	**153 days**	**Tue 21/7/15**	**Sun 20/12/15**
140	Material Ordering	120 days	Tue 21/7/15	Tue 17/11/15
141	Pipe Laying for BR2 Pipe (CHG00-33)	30 days	Wed 18/11/15	Thu 17/12/15
142	Pipe Testing	3 days	Fri 18/12/15	Sun 20/12/15
143	**(iii) Connection Works**	**38 days**	**Wed 18/11/15**	**Fri 25/12/15**
144	Separate Works for BR1 and BR2	5 days	Wed 18/11/15	Sun 22/11/15
145	Connection at BR2	3 days	Mon 21/12/15	Wed 23/12/15
146	Connection at Liquor Channel	5 days	Mon 21/12/15	Fri 25/12/15
147	**(d) Realign Existing DN150 SAS Pipe**	**62 days**	**Mon 21/12/15**	**Sat 20/2/16**
148	**(i) Works by ST1**	**3 days**	**Thu 18/2/16**	**Sat 20/2/16**
149	Suspension of associated system for Connection (on agree time slot)	3 days	Thu 18/2/16	Sat 20/2/16
150	**(ii) Pipe Laying Works**	**62 days**	**Mon 21/12/15**	**Sat 20/2/16**
151	Pipe Laying for SAS Pipe (CH00-CH70)	25 days	Mon 21/12/15	Thu 14/1/16
152	Pipe Laying for SAS Pipe (CH70-162)	31 days	Fri 15/1/16	Sun 14/2/16
153	Testing and new SAS Pipe	3 days	Mon 15/2/16	Wed 17/2/16
154	Connection	3 days	Thu 18/2/16	Sat 20/2/16
155	**(e) DN1400 DI BR1 Effluent Pipe**	**30 days**	**Sun 21/2/16**	**Mon 21/3/16**
156	Pipe Laying for BR1 Pipe (CHF00-16)	30 days	Sun 21/2/16	Mon 21/3/16
157	**(f) Bioreactor No.1 and 2**	**149 days**	**Sat 26/12/15**	**Sun 22/5/16**
158	**(i) Works by ST1**	**27 days**	**Sat 26/12/15**	**Thu 21/1/16**
159	Restore BR2 and Empty BR1	15 days	Sat 26/12/15	Sat 9/1/16
160	Isolation Works for BR1(Pipe Closing / Disconnect Power and Signal)	7 days	Sun 10/1/16	Sat 16/1/16
161	Dismantle and Return existing equipment to SWHSWTW	5 days	Sun 17/1/16	Thu 21/1/16
162	**(ii) Rennovation Works inside BR1**	**127 days**	**Sun 17/1/16**	**Sun 22/5/16**
163	General Cleaning Works / Dismantle Works	7 days	Sun 17/1/16	Sat 23/1/16
164	Plug and Removal Existing DN1200 BR Effluent Pipe	5 days	Sun 17/1/16	Thu 21/1/16
165	**Extended Concrete Walkway**	**88 days**	**Sun 24/1/16**	**Wed 20/4/16**
166	Erection of Working Platform and Falsework	15 days	Sun 24/1/16	Sun 7/2/16
167	Demoltion of upper part of Existing Walls & Prepare Surface	25 days	Mon 8/2/16	Thu 3/3/16
168	Erect Fwk for concrete walkway extended from walls	7 days	Fri 4/3/16	Thu 10/3/16
169	Concreting	2 days	Fri 11/3/16	Sat 12/3/16
170	Curing of concrete / formwork removal / making good works	7 days	Sun 13/3/16	Sat 19/3/16
171	Install Steel Posts	7 days	Sun 20/3/16	Sat 26/3/16
172	Construction of Concrete Pits / 4 Nos of DN800 MLR Pipes	10 days	Sun 27/3/16	Tue 5/4/16
173	Pitching Works for BR1	15 days	Wed 6/4/16	Wed 20/4/16
174	**FRP Baffle Wall / Platforms / Staircase**	**120 days**	**Sun 24/1/16**	**Sun 22/5/16**



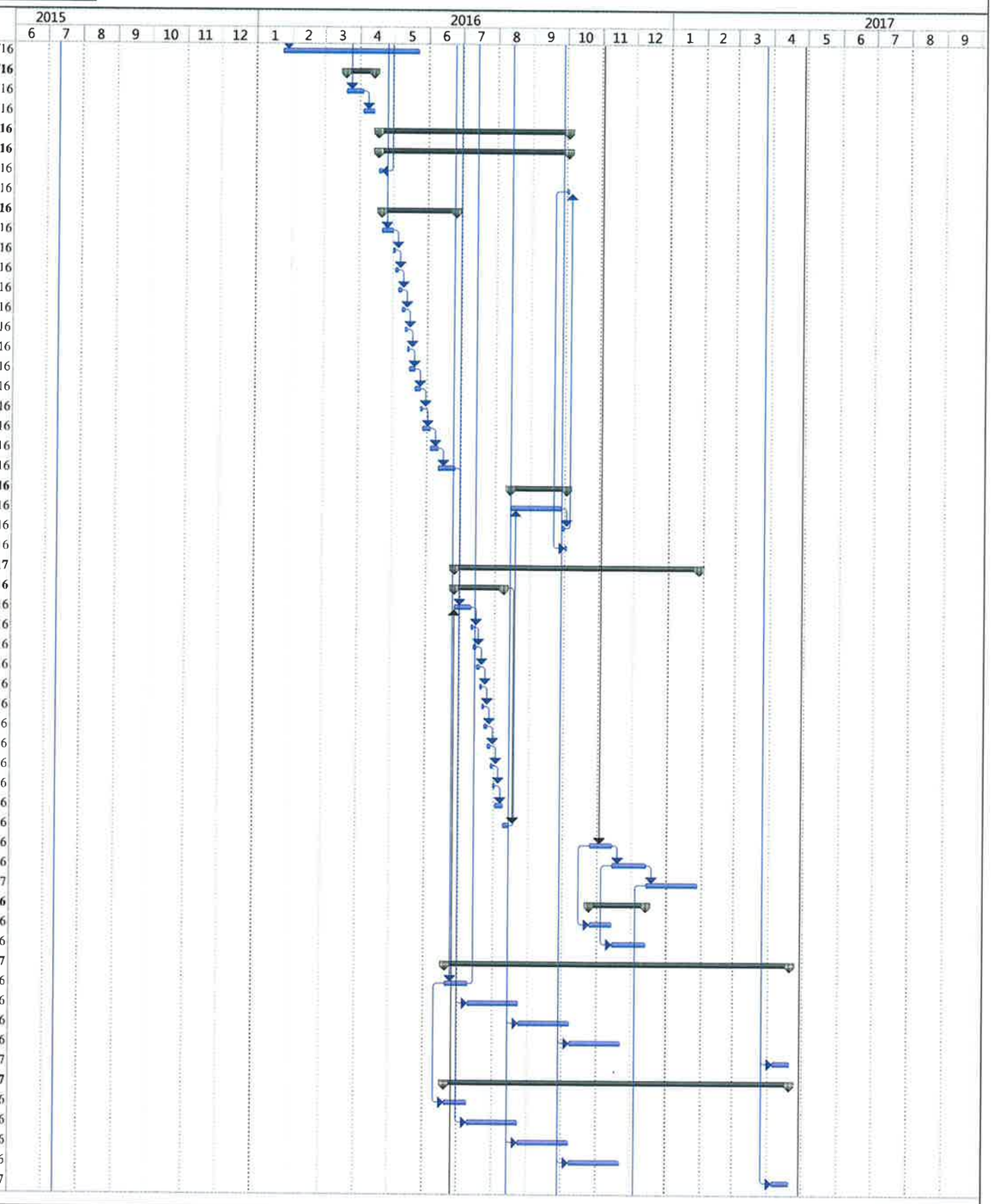
Task Milestone Summary

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 Programe (Sep 2015)

ID	Task Name	Duration	Start	Finish
175	Design, Supply & Installation	120 days	Sun 24/1/16	Sun 22/5/16
176	**(iii) BR1 MS Air Mains within BR1**	**25 days**	**Sun 20/3/16**	**Wed 13/4/16**
177	Pipe Laying for BR1 Pipe (CHD96-158 & CHE00-62)	15 days	Sun 20/3/16	Sun 3/4/16
178	Pipe Laying for BR1 Pipe (CHD61-96)	10 days	Mon 4/4/16	Wed 13/4/16
179	**(g)Pretreatment Screen Chamber & Flow Meter Chamber**	**168 days**	**Mon 18/4/16**	**Sun 2/10/16**
180	**(i) Works by ST1**	**168 days**	**Mon 18/4/16**	**Sun 2/10/16**
181	Isolation Works for associated Pipeworks (Pipe Closing / Disconnect Power and Signal)	3 days	Mon 18/4/16	Wed 20/4/16
182	Suspension of Sludge Draw Off Chamber No.1 and Distribution Chamber No.1	2 days	Sat 1/10/16	Sun 2/10/16
183	**(ii) Construction of Pretreatment Screen Chamber & Flow Meter Chamber**	**66 days**	**Thu 21/4/16**	**Sat 25/6/16**
184	Excavation and ELS Installation	10 days	Thu 21/4/16	Sat 30/4/16
185	Demolish existing pipeworks and Treatment for connection	2 days	Sun 1/5/16	Mon 2/5/16
186	Lay Rockfills and Blinding	3 days	Tue 3/5/16	Thu 5/5/16
187	Steel Fixing for Chambers (up to +4.5mPD)	3 days	Fri 6/5/16	Sun 8/5/16
188	Installation of formwork / waterstop / other accessory	3 days	Mon 9/5/16	Wed 11/5/16
189	Concreting	2 days	Thu 12/5/16	Fri 13/5/16
190	Curing of concrete / formwork removal / making good works	2 days	Sat 14/5/16	Sun 15/5/16
191	Steel Fixing for Chambers (up to +8.55 / +7.3mPD)	5 days	Mon 16/5/16	Fri 20/5/16
192	Installation of formwork / waterstop / other accessory	5 days	Sat 21/5/16	Wed 25/5/16
193	Concreting	2 days	Thu 26/5/16	Fri 27/5/16
194	Curing of concrete / formwork removal / making good works	7 days	Sat 28/5/16	Fri 3/6/16
195	Remove Sheetpiles and Backfilling	7 days	Sat 4/6/16	Fri 10/6/16
196	Construction of Associated valve Pits	15 days	Sat 11/6/16	Sat 25/6/16
197	**(iii) DN100 Screen Wash Water Pipe / DN 80 Screen Skip Wash Water Pipe**	**50 days**	**Sun 14/8/16**	**Sun 2/10/16**
198	Pipe Laying for Pipe (CHL00-55 & CHK00-68)	45 days	Sun 14/8/16	Tue 27/9/16
199	Testing	3 days	Wed 28/9/16	Fri 30/9/16
200	Connection	2 days	Sat 1/10/16	Sun 2/10/16
201	**(h) DN1400 DI RAS Pipe**	**216 days**	**Sun 26/6/16**	**Fri 27/1/17**
202	**Construction of Concrete Pipe Trough (beside BR1)**	**44 days**	**Sun 26/6/16**	**Mon 8/8/16**
203	Excavation and Sheetpiling	15 days	Sun 26/6/16	Sun 10/7/16
204	Lay Rockfill and Blinding	2 days	Mon 11/7/16	Tue 12/7/16
205	Steel Fixing for Base	3 days	Wed 13/7/16	Fri 15/7/16
206	Installation of formwork / waterstop / other accessory	3 days	Sat 16/7/16	Mon 18/7/16
207	Concreting	2 days	Tue 19/7/16	Wed 20/7/16
208	Curing of concrete / formwork removal / making good works	2 days	Thu 21/7/16	Fri 22/7/16
209	Steel Fixing for Wall	3 days	Sat 23/7/16	Mon 25/7/16
210	Installation of formwork / waterstop / other accessory	3 days	Tue 26/7/16	Thu 28/7/16
211	Concreting	2 days	Fri 29/7/16	Sat 30/7/16
212	Curing of concrete / formwork removal / making good works	2 days	Sun 31/7/16	Mon 1/8/16
213	Remove Sheetpiles and Backfilling	7 days	Tue 2/8/16	Mon 8/8/16
214	Pipe Laying for RAS Pipe (CHC98-153)	5 days	Tue 9/8/16	Sat 13/8/16
215	Pipe Laying for RAS Pipe (CHC75-98)	20 days	Tue 25/10/16	Sun 13/11/16
216	Pipe Laying for RAS Pipe (CHC35-75)	30 days	Mon 14/11/16	Tue 13/12/16
217	Pipe Laying for RAS Pipe (CHC00-35)	45 days	Wed 14/12/16	Fri 27/1/17
218	**(i)BR1 MS Air Mains Outside BR1**	**50 days**	**Tue 25/10/16**	**Tue 13/12/16**
219	Pipe Laying for BR1 Pipe (CHD44-61)	20 days	Tue 25/10/16	Sun 13/11/16
220	Pipe Laying for BR1 Pipe (CHD00-44)	30 days	Mon 14/11/16	Tue 13/12/16
221	**(j) CLP Cable and Drawpits**	**304 days**	**Mon 20/6/16**	**Wed 19/4/17**
222	CLP Cable Ducts with Trench (Outside to FST7)	20 days	Mon 20/6/16	Sat 9/7/16
223	CLP Cable Ducts with Trench (FST7 to FST5)	45 days	Sun 10/7/16	Tue 23/8/16
224	CLP Cable Ducts with Trench (FST5 to FST3)	45 days	Wed 24/8/16	Fri 7/10/16
225	CLP Cable Ducts with Trench (FST3 to Outside MFB)	45 days	Sat 8/10/16	Mon 21/11/16
226	CLP Cable Ducts with Trench (to MFB)	15 days	Wed 5/4/17	Wed 19/4/17
227	**(k)Fresh Watermains and Fire Service Watermains**	**304 days**	**Mon 20/6/16**	**Wed 19/4/17**
228	PipeLaying (Outside to FST7)	20 days	Mon 20/6/16	Sat 9/7/16
229	PipeLaying (FST7 to FST5)	45 days	Sun 10/7/16	Tue 23/8/16
230	PipeLaying (FST5 to FST3)	45 days	Wed 24/8/16	Fri 7/10/16
231	PipeLaying (FST3 to Outside MFB)	45 days	Sat 8/10/16	Mon 21/11/16
232	PipeLaying (toMFB)	15 days	Wed 5/4/17	Wed 19/4/17



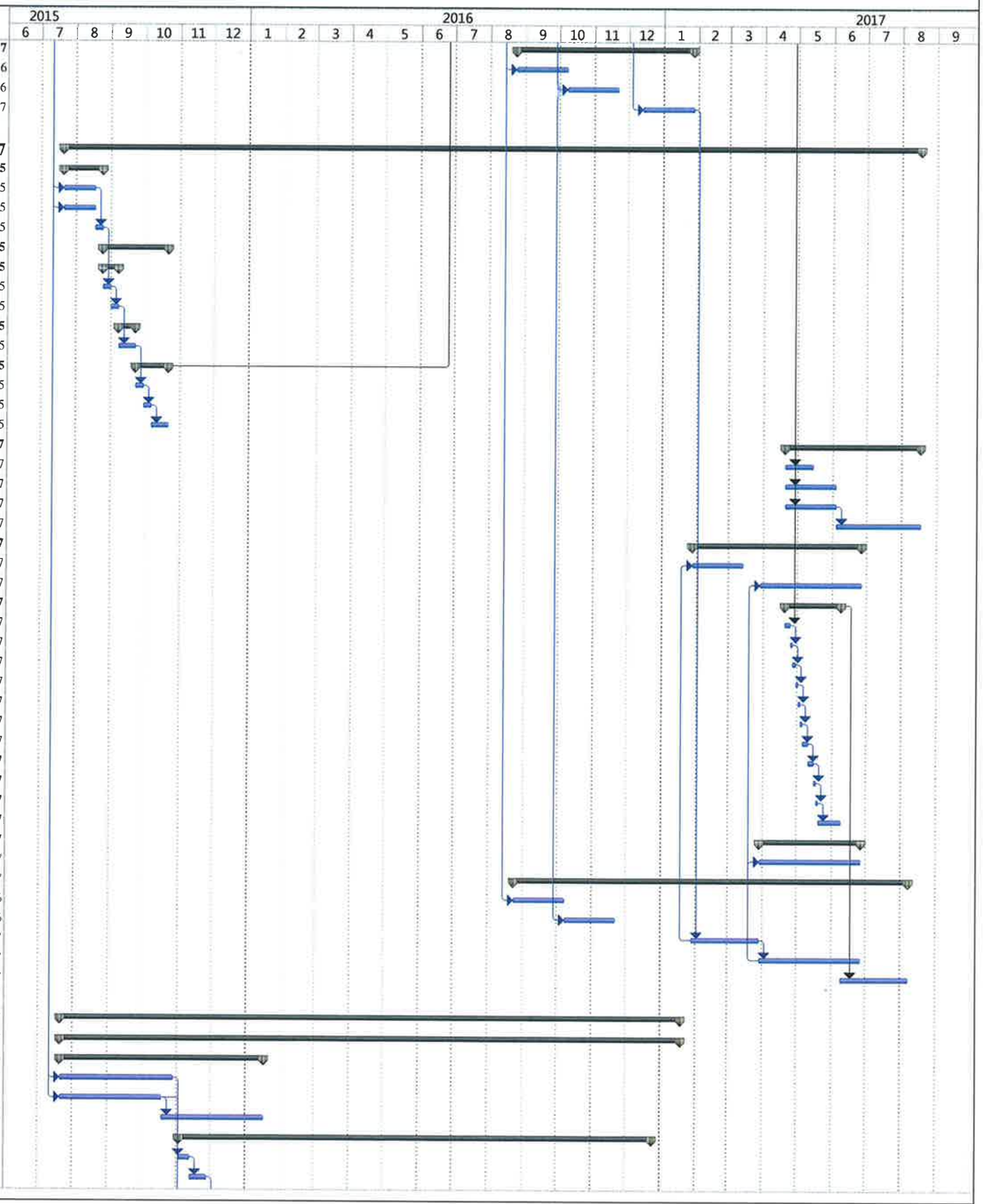
Task Milestone Summary

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 Programe (Sep 2015)

ID	Task Name	Duration	Start	Finish
233	**(l)DN900 DI Permeate Pipe**	**157 days**	**Wed 24/8/16**	**Fri 27/1/17**
234	Pipe Laying (CHA85-CHA138)	45 days	Wed 24/8/16	Fri 7/10/16
235	Pipe Laying (CHA35-CHA85)	45 days	Sat 8/10/16	Mon 21/11/16
236	Pipe Laying (CHA00-35)	45 days	Wed 14/12/16	Fri 27/1/17
237				
238	**Section 3**	**759 days**	**Tue 21/7/15**	**Thu 17/8/17**
239	**(a) Establishment**	**35 days**	**Tue 21/7/15**	**Mon 24/8/15**
240	Discussion for Working Seqence and Site Arrangement with ST1	28 days	Tue 21/7/15	Mon 17/8/15
241	Submission of Method Statement and Documents	28 days	Tue 21/7/15	Mon 17/8/15
242	Application for SWAC and PMAC	7 days	Tue 18/8/15	Mon 24/8/15
243	**(b) Demolition of Existing Reclaim Water Treatment Facilitates**	**58 days**	**Tue 25/8/15**	**Wed 21/10/15**
244	**(i) Works by ST1**	**14 days**	**Tue 25/8/15**	**Mon 7/9/15**
245	Isolation Works for Reclamed Water Treamanet Facilates (Pipe Closing / Disconnect Power and Signal)	7 days	Tue 25/8/15	Mon 31/8/15
246	Dismantle and Return existing equipment to SWHSWTW	7 days	Tue 1/9/15	Mon 7/9/15
247	**(ii) Demolition of Reclaim Water Treatment Facilitates**	**15 days**	**Tue 8/9/15**	**Tue 22/9/15**
248	General Dismantle and Site Formation Works	15 days	Tue 8/9/15	Tue 22/9/15
249	**(iii) Demolition of Methanol Storage Tanks**	**29 days**	**Wed 23/9/15**	**Wed 21/10/15**
250	General Dismantle Works	7 days	Wed 23/9/15	Tue 29/9/15
251	Erection of Working Platform	7 days	Wed 30/9/15	Tue 6/10/15
252	Removal of Existing Concrete Structure	15 days	Wed 7/10/15	Wed 21/10/15
253	**(c) Building Works for Membrane Facilities and Tanks**	**120 days**	**Thu 20/4/17**	**Thu 17/8/17**
254	Roofing with surface channel	25 days	Thu 20/4/17	Sun 14/5/17
255	Installation of Sundries and FRP items	45 days	Thu 20/4/17	Sat 3/6/17
256	Pumping Station Internal finishing	45 days	Thu 20/4/17	Sat 3/6/17
257	Pumping Station External Wall finishing	75 days	Sun 4/6/17	Thu 17/8/17
258	**(d) Remaining Cable and DrawPits**	**150 days**	**Sat 28/1/17**	**Mon 26/6/17**
259	Duct Laying (East amd South of BR11)	45 days	Sat 28/1/17	Mon 13/3/17
260	Duct Laying (T Junction btw Membrane Tanks / BR1)	90 days	Wed 29/3/17	Mon 26/6/17
261	**(e) Chemical Storage Room**	**50 days**	**Thu 20/4/17**	**Thu 8/6/17**
262	Excavation / Preparation of Footing	5 days	Thu 20/4/17	Mon 24/4/17
263	Laying blinding	2 days	Tue 25/4/17	Wed 26/4/17
264	Steelfixing for Footing	3 days	Thu 27/4/17	Sat 29/4/17
265	Installation of formwork / other accessory	2 days	Sun 30/4/17	Mon 1/5/17
266	Concreting	2 days	Tue 2/5/17	Wed 3/5/17
267	Curing of concrete / formwork removal / making good works	2 days	Thu 4/5/17	Fri 5/5/17
268	Steelfixing for Top Slab and Wall	5 days	Sat 6/5/17	Wed 10/5/17
269	Installation of formwork / other accessory	5 days	Thu 11/5/17	Mon 15/5/17
270	Concreting	2 days	Tue 16/5/17	Wed 17/5/17
271	Curing of concrete / formwork removal / making good works	2 days	Thu 18/5/17	Fri 19/5/17
272	Building Service Works for Chemical Storage Room	20 days	Sat 20/5/17	Thu 8/6/17
273	**(f)DN150 DI SAS Pipe / NaOCl Dosing Pipe and Trench**	**90 days**	**Wed 29/3/17**	**Mon 26/6/17**
274	SAS Pipe (CHH00-49) / Dosing Pipe (CH00-68)	90 days	Wed 29/3/17	Mon 26/6/17
275	**(g) Drainage Works and Roadworks**	**349 days**	**Wed 24/8/16**	**Mon 7/8/17**
276	Storm Drains and Roadworks (FST5 to FST3)	45 days	Wed 24/8/16	Fri 7/10/16
277	Storm Drains and Roadworks (FST3 to outside MFB)	45 days	Sat 8/10/16	Mon 21/11/16
278	Storm Drains and Roadworks (East amd South of BR1)	60 days	Sat 28/1/17	Tue 28/3/17
279	Storm Drains and Roadworks (T Junction btw Membrane Tanks / BR1)	90 days	Wed 29/3/17	Mon 26/6/17
280	Storm Drains and Roadworks (Around Membrane Facilities and Tanks)	60 days	Fri 9/6/17	Mon 7/8/17
281				
282	**Works in Ping Che Road**	**548 days**	**Tue 21/7/15**	**Wed 18/1/17**
283	**Section 4 - Sewerage Works in Ping Che Road**	**548 days**	**Tue 21/7/15**	**Wed 18/1/17**
284	**(a) Preparation Works**	**180 days**	**Tue 21/7/15**	**Sat 16/1/16**
285	Material Submission and Ordering	100 days	Tue 21/7/15	Wed 28/10/15
286	Application for XP	90 days	Tue 21/7/15	Sun 18/10/15
287	Inspection Pits	90 days	Mon 19/10/15	Sat 16/1/16
288	**(b) Work Front A (CH00-CH765)**	**418 days**	**Tue 3/11/15**	**Sat 24/12/16**
289	Pipe Laying for Rising Mains (CH165-CH185) / Under Dwarf Wall	10 days	Tue 3/11/15	Thu 12/11/15
290	Pipe Laying for Rising Mains (CH185-CH205) / Road Crossing	15 days	Fri 13/11/15	Fri 27/11/15



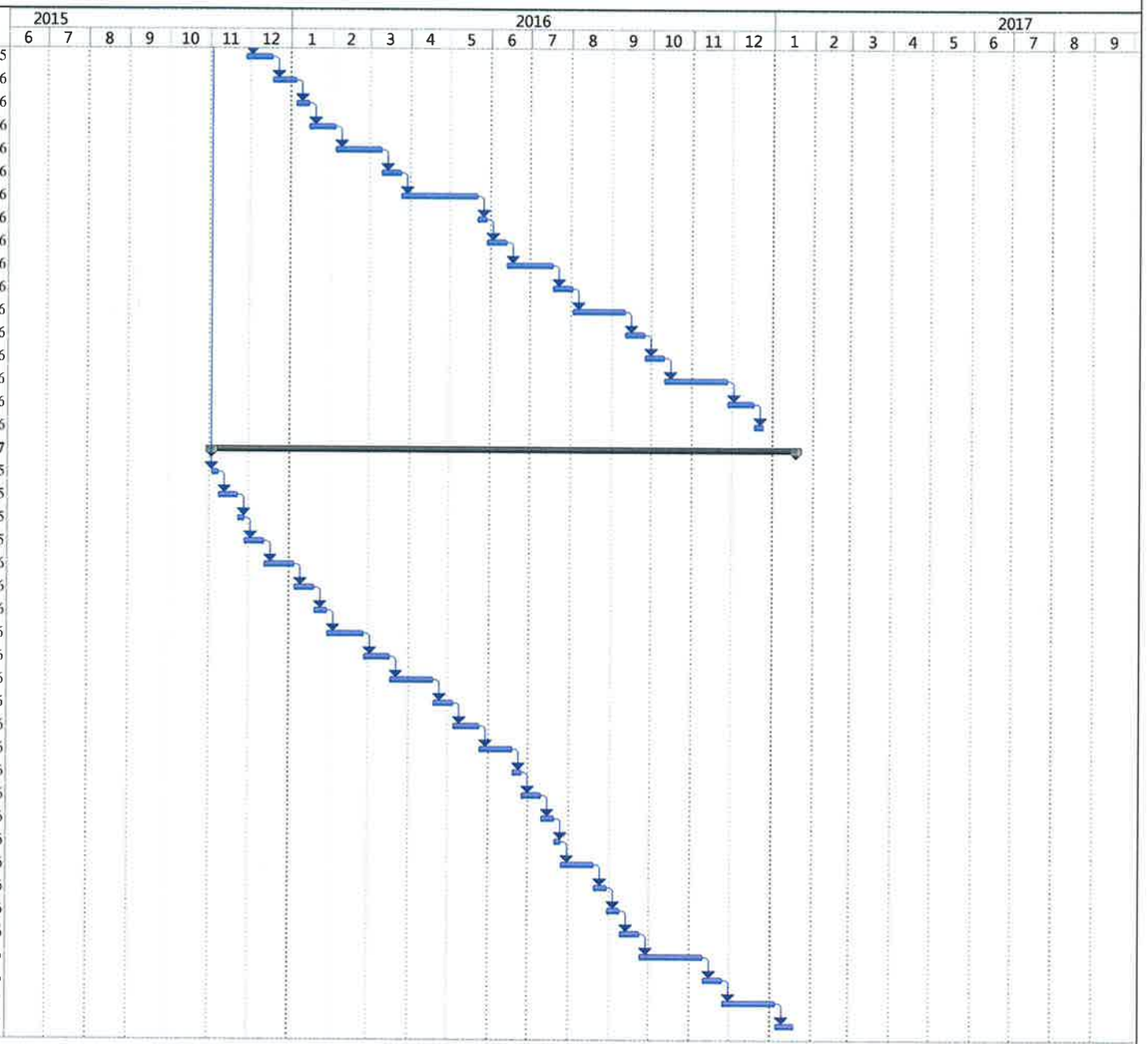
Task — Milestone — Summary

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 Programe (Sep 2015)

ID	Task Name	Duration	Start	Finish
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 3/11/15**	**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 Prssure Testing and Swabbing	14 days	Thu 5/1/17	Wed 18/1/17



Task — Milestone ◆ — Summary

Appendix D

IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

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
Air Quality Impact						
S2.4.1.3	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • 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; • Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • 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; • 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; • 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. • 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; • 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; • 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	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
Air Quality Impact						
	surface wet; • 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; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • 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; • 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; • 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 • 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.					

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
Noise Impact						
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/m² 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	Good Site Practice: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • 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. • 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. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	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

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
Ecological Impact						
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	The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented • Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies; • 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; • 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; • 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; • Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be	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
Ecological Impact						
	identified; • Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies; • Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited; • 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; • Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety; • 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; • 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 • Supply of suitable clean backfill material after excavation, if required. • 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; • Speed control for the trucks carrying contaminated materials should be enforced; • Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and					

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
Ecological Impact						
	• Other measures as detailed in this schedule.					

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
Water Quality Impact						
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	Sewage from Workforce • 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. • 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	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
Waste Management						
S6.2.2.1	Good Site Practices and Waste Reduction Measures: • 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; • Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • Provision of sufficient waste disposal points and regular collection for disposal; • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; • An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval.	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	Waste Reduction Measures: • Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Proper storage and site practices to minimize the potential for damage and contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and • Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.	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	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, should be handled and stored well to ensure secure	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
Waste Management						
	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	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
Waste Management						
	volume of generated waste and ensure proper segregation to allow reuse of the inert material on site when implemented. • 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&D material arising from demolition works, selective demolition method should be adopted.					
S6.2.5.4	Chemical Waste • If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers. • 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	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	General Refuse • General refuse should be stored in enclosed bins separately from construction and chemical wastes. • Recycling bins should also be placed to encourage recycling. • 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. • A reputable waste collector should be employed to remove general refuse on a daily basis.	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
Landscape and Visual						
S7.3.1.1	Good Site Practices • 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. • 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.	Minimize the impact to the landscape and visual	Contractor	Work Sites	Prior to construction and construction phase	
S7.3.2.1	MM4 - Tree Protection & Preservation • 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.	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	MM5 - Tree Transplantation • 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	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
Landscape and Visual						
	locations of transplanted trees should be agreed prior to commencement of the work.					
S7.3.2.1	MM17 - Light Control • 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.	To minimize glare impact to adjacent VSRs.	Designer / Contractor	Work Sites and/or the Plant	Construction phase and operation phase	

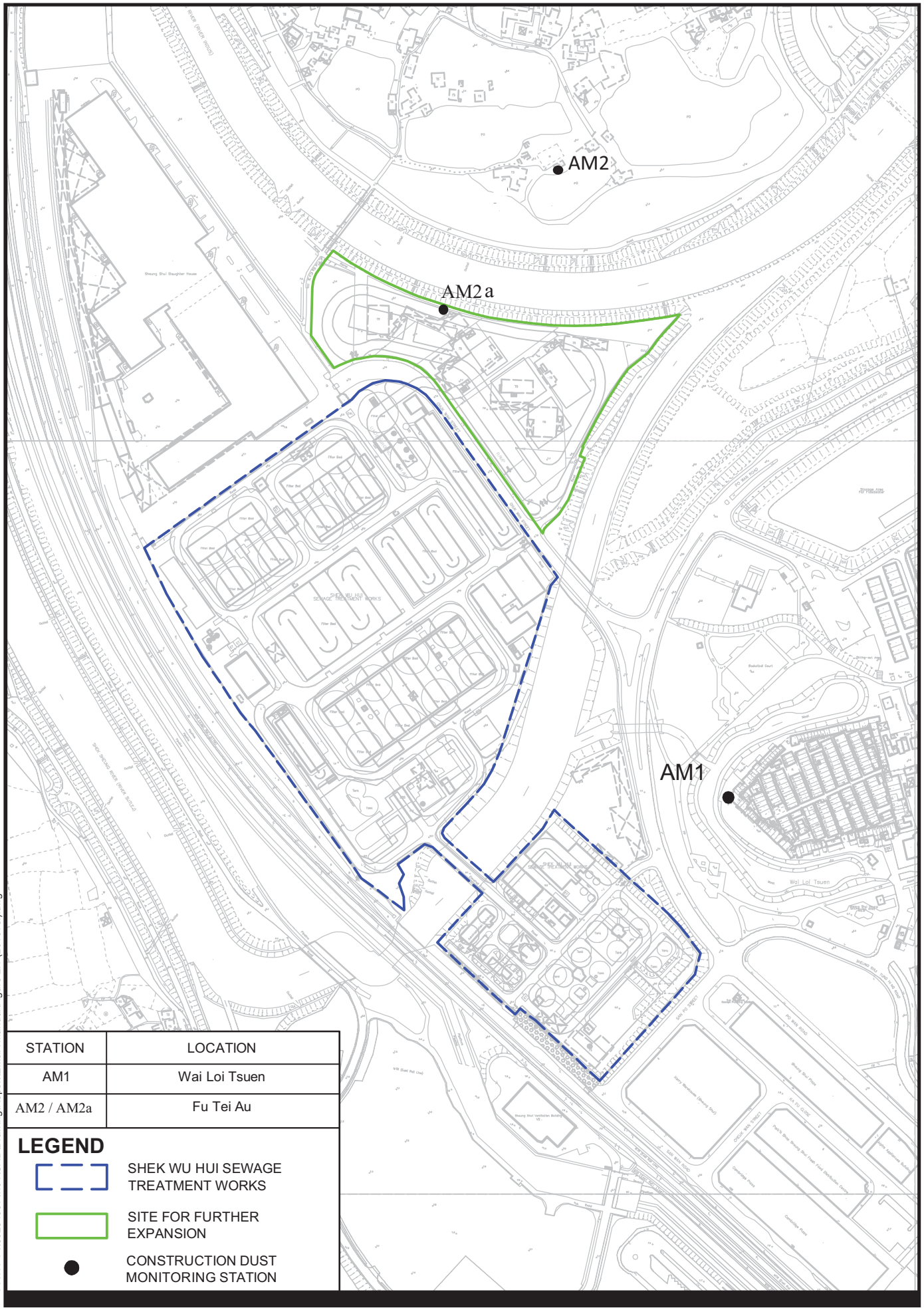
Appendix E

PROPOSED MONITORING LOCATIONS OF AIR QUALITY AND CONSTRUCTION NOISE

ISO A4 210mm x 297mm

Checked:

Project Management Initials:



STATION	LOCATION
AM1	Wai Loi Tsuen
AM2 / AM2a	Fu Tei Au

LEGEND

- SHEK WU HUI SEWAGE TREATMENT WORKS
- SITE FOR FURTHER EXPANSION
- CONSTRUCTION DUST MONITORING STATION

26/02/2014
Plot File by: Shumyjj
PATH P:\60284037\1.01\CAD\Drawing\Report\EM&A Manual\Figure 2.1 (2010ver).dwg

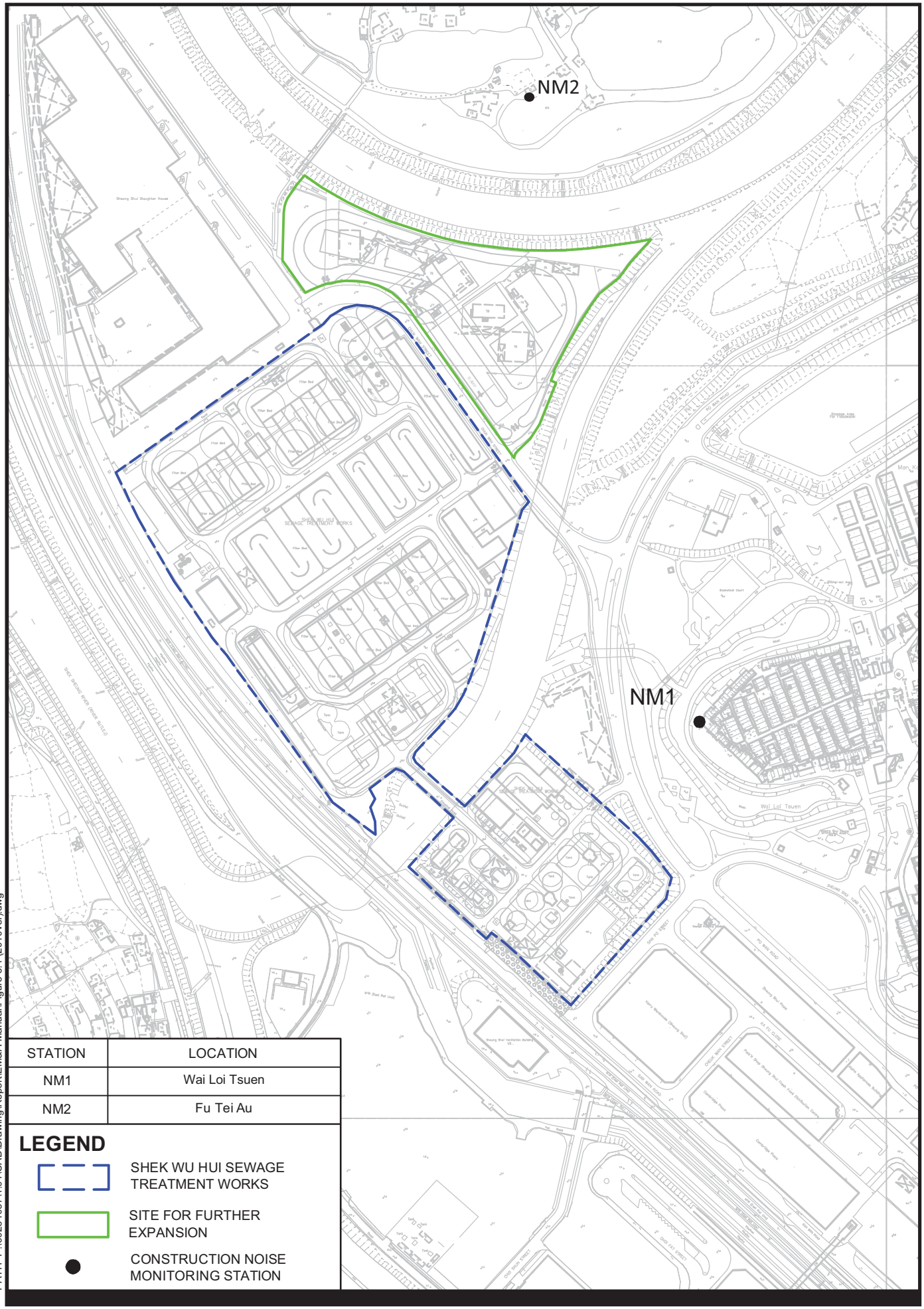
AGREEMENT NO. CE 40/2012 (DS)
SHEK WU HUI SEWAGE TREATMENT WORKS
- FURTHER EXPANSION PHASE 1A
- INVESTIGATION

PROPOSED CONSTRUCTION DUST MONITORING STATIONS FOR CONSTRUCTION PHASE AND OPERATION PHASE

AECOM

Project No.: 60284037 Date: FEB. 2014

Drawing No.
60284037/EM&AM/405



STATION	LOCATION
NM1	Wai Loi Tsuen
NM2	Fu Tei Au

LEGEND

- SHEK WU HUI SEWAGE TREATMENT WORKS
- SITE FOR FURTHER EXPANSION
- CONSTRUCTION NOISE MONITORING STATION

ISO A4 210mm x 297mm

Checked:

Project Management Initials:

Plot File by: Shumyjl
PATH P:\60284037\1.01\CAD\Drawing\Report\EM&A Manual\Figure 3.1 (2010ver).dwg
26/02/2014

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

VALID CALIBRATION CERTIFICATE OF MONITORING EQUIPMENT

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 (ºC)	27.8	Temperature (K)	301

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (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
13	5.00	5.00	10.0	1.570	44	43.44	Intercept = 3.9459
10	3.85	3.85	7.7	1.379	40	39.49	Corr. coeff. = 0.9951
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 :

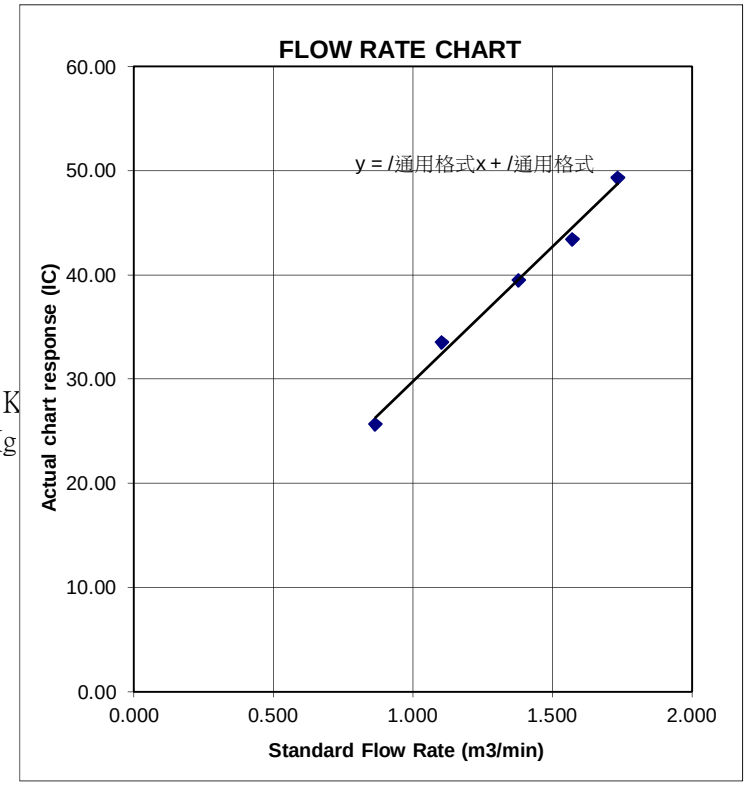
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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



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 (ºC)	27.8	Temperature (K)	301

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (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
13	4.80	4.80	9.6	1.539	50	49.36	Intercept = 5.3205
10	3.80	3.80	7.6	1.370	44	43.44	Corr. coeff. = 0.9979
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 :

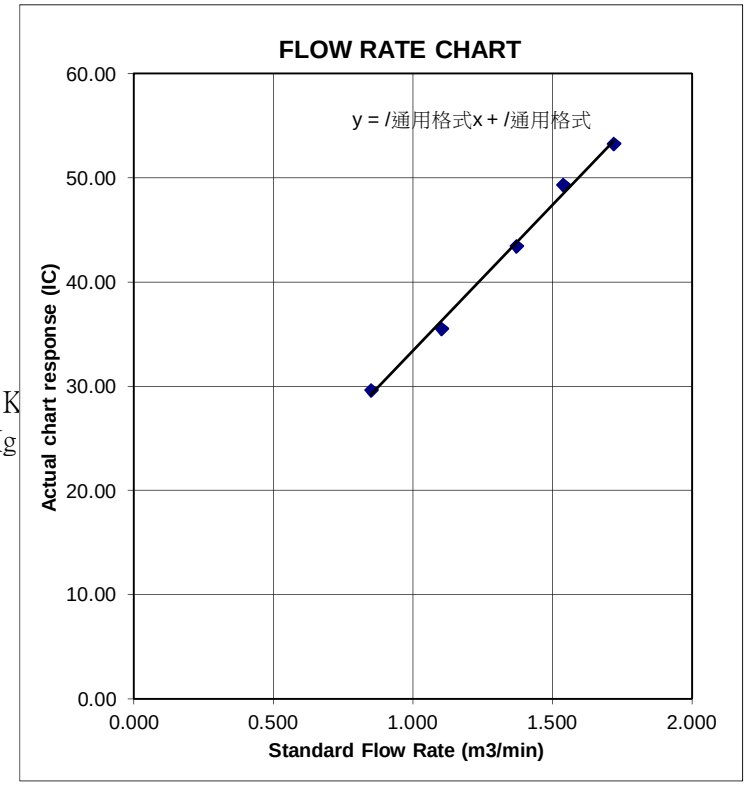
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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



TISCH Environmental

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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2015 Rootsmeter 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 = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

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

For subsequent flow rate calculations:

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

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**		
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.

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^3 (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)

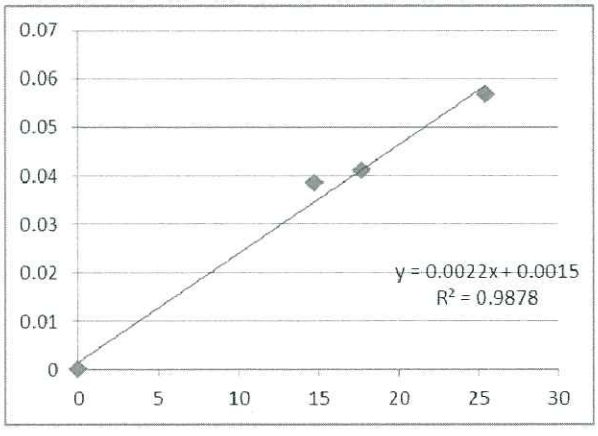
Sensitivity Adjustment Scale Setting (After Calibration) 596 (CPM)

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	Date of Calibration:	6-Feb-15
Location ID :	Calibration Room	Next Calibration Date:	6-May-15

CONDITIONS

Sea Level Pressure (hPa)	1024.5	Corrected Pressure (mm Hg)	768.375
Temperature (°C)	13.4	Temperature (K)	286

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Calibration Date->	7-Apr-14	Expiry Date->	7-Apr-15

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (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
13	3	3	6.0	1.260	52	53.33	Intercept = 14.6821
10	2.3	2.3	4.6	1.104	48	49.23	Corr. coeff. = 0.9974
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 :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

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)

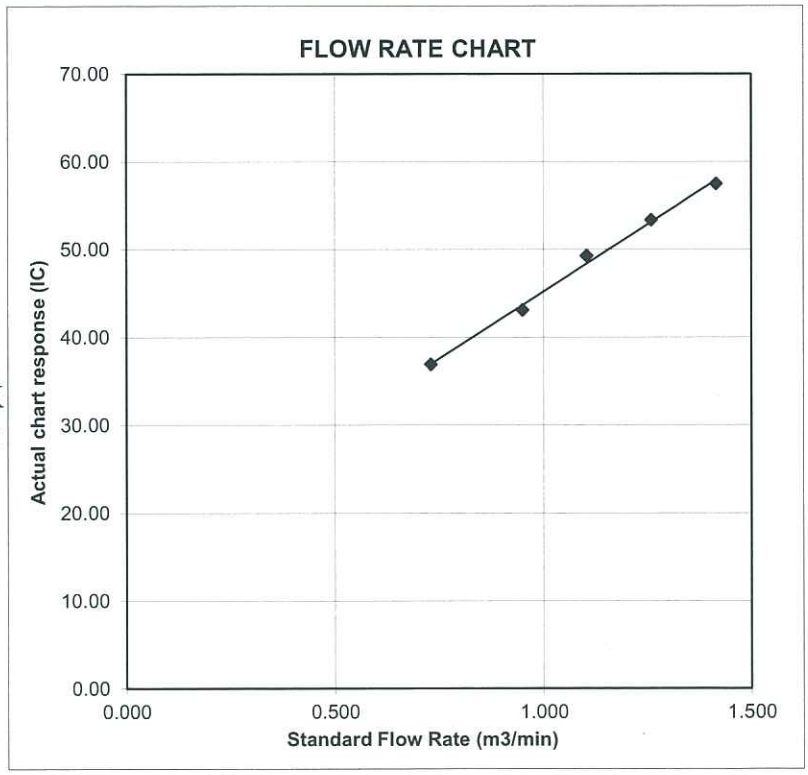
m = sampler slope

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.

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^3 (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)

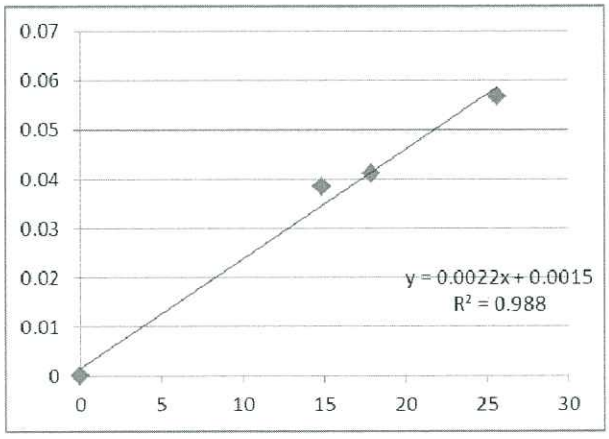
Sensitivity Adjustment Scale Setting (After Calibration) 602 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9940

Date of Issue 20 April 2015



Remarks:

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	Date of Calibration:	6-Feb-15
Location ID :	Calibration Room	Next Calibration Date:	6-May-15

CONDITIONS

Sea Level Pressure (hPa)	1024.5	Corrected Pressure (mm Hg)	768.375
Temperature (°C)	13.4	Temperature (K)	286

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Calibration Date->	7-Apr-14	Expiry Date->	7-Apr-15

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (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
13	3	3	6.0	1.260	52	53.33	Intercept = 14.6821
10	2.3	2.3	4.6	1.104	48	49.23	Corr. coeff. = 0.9974
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 :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

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)

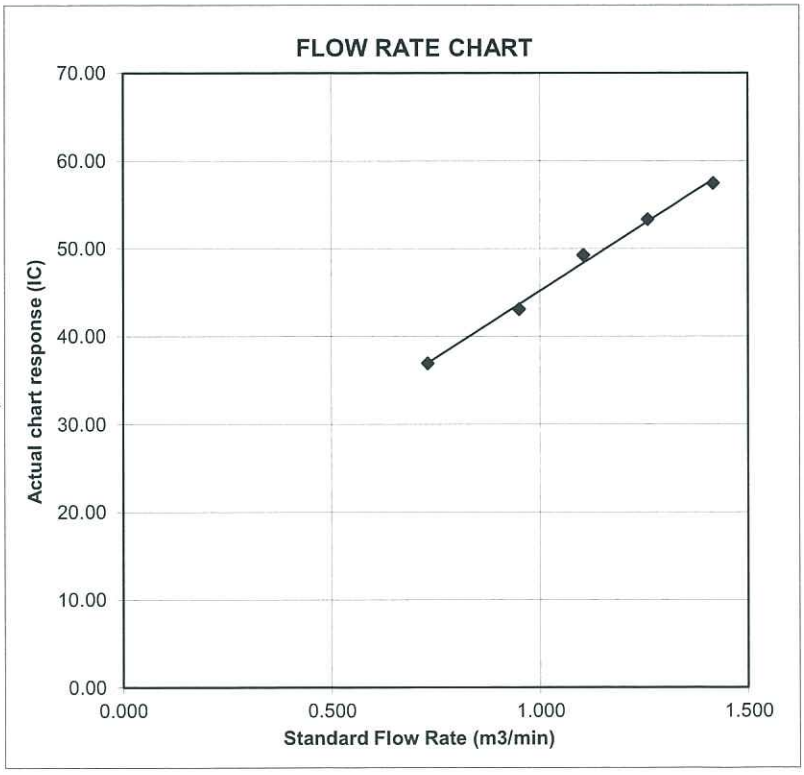
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

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 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

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

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 - 校正及檢測實驗所
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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C152550
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

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

4. Test procedure : MA100N.

5. 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.

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 – 校正及檢測實驗所
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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

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 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

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 簽發日期 : 5 June 2015

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 – 校正及檢測實驗所
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

1. 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.

2. Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.

3. 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_{AFP}	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_{AFP}	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_{AFP}	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.

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 - 校正及檢測實驗所
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

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_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.0	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				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_{AFP}	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)

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 – 校正及檢測實驗所
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

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_{CFP}	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_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.9	± 1.0
			5 min.			$1/10^4$		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 :
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.

Appendix G

HOKLAS-ACCREDITATION CERTIFICATE OF THE TESTING LABORATORY

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 of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as listed in the HOKLAS Directory of Accredited Laboratories within the test category of
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，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 quality management system (see joint IAF-ILAC-ISO Communiqué).
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（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

This certificate is issued subject to the terms and conditions laid down by HKAS
本證書按照香港認可處訂立的條款及條件發出

L 000552

Appendix H

BASELINE MONITORING SCHEDULES

Baseline Air and Noise Monitoring Schedule

Date		Noise Monitoring	Air Quality	
			1-hour TSP Monitoring	24-hour TSP Monitoring
Fri	28-Aug-15	NM1 and NM2	AM1 and AM2	
Sat	29-Aug-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Sun	30-Aug-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Mon	31-Aug-15	NM1 and NM2	AM1 and AM2	AM2a
Tue	1-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Wed	2-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Thu	3-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Fri	4-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Sat	5-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Sun	6-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Mon	7-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Tue	8-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Wed	9-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Thu	10-Sep-15	NM1 and NM2	AM1 and AM2	AM1 and AM2a
Fri	11-Sep-15			AM1 and AM2a
Sat	12-Sep-15			AM1

Note: Power supply failure incident was happened at AM1 on 31 August 2015. Therefore, 24-Hr TSP monitoring at AM1 is until 12 September 2015 as meet baseline monitoring stipulation

	Sunday or Public Holiday

Appendix I

Meteorological Data during Baseline Monitoring (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
Fri	28-Aug-15	Fine and dry apart from some haze. It will be very hot. Light winds.	Trace	28.1	5.5	79.5	E/SE
Sat	29-Aug-15	Mainly cloudy with a few showers and isolated thunderstorms. Light winds.	0.9	28.1	7.5	82.2	E/SE
Sun	30-Aug-15	Cloudy with a few showers and squally thunderstorms. Light to moderate southeasterly winds	9.7	27.2	5.4	86.2	E/SE
Mon	31-Aug-15	Cloudy with a few showers and squally thunderstorms. Light to moderate southeasterly winds	Trace	27.9	5.5	85.5	E/NE
Tue	1-Sep-15	Mainly fine. Moderate easterly winds.	5.3	27.8	7.5	86	E
Wed	2-Sep-15	Mainly fine. Moderate easterly winds, fresh offshore at times.	39	25.5	7	93.2	E
Thu	3-Sep-15	Mainly fine. Moderate easterly winds, fresh offshore at times.	0.2	27.4	4.5	86.2	E
Fri	4-Sep-15	Mainly fine. Moderate easterly winds.	0	29.3	7.5	79.7	E
Sat	5-Sep-15	Sunny periods in the afternoon. Mainly cloudy tonight. Moderate easterly winds, fresh at times.	0	29.3	5	73	W/SW
Sun	6-Sep-15	Sunny periods in the afternoon. Mainly cloudy to night. Moderate easterly winds, fresh at times.	0	29.4	6.6	76.5	SW
Mon	7-Sep-15	Cloudy with a few rain patches and squally thunderstorms. Moderate northeasterly winds.	7.3	27.8	9	85.7	N/NW
Tue	8-Sep-15	Sunny periods in the afternoon. Mainly cloudy tonight. Moderate easterly winds, fresh at times.	0	27.9	6.5	73.2	E/NE
Wed	9-Sep-15	Mainly fine. Moderate easterly winds, fresh offshore at times.	Trace	28.7	9	69	E
Thu	10-Sep-15	Mainly fine. Moderate easterly winds.	0	28.1	7	71.2	E/SE
Fri	11-Sep-15	One or two rain patches. Sunny periods during the day. Moderate easterly winds.	Trace	28.4	7.5	75	E/SE
Sat	12-Sep-15	Mainly fine. Moderate easterly winds.	Trace	28.4	7.5	75.5	E

Appendix J

Monitoring Results Data

- **Air Quality (24-hour TSP);**
- **Noise**

Air Quality (24-hour TSP)

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/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
29-Aug-15	28291	12688.88	12712.76	1432.80	26	28	27.0	27.8	1006.2	0.88	1266	2.7869	2.8142	0.0273	22
30-Aug-15	27757	12712.76	12736.93	1450.20	26	34	30.0	28.7	1005.8	1.00	1446	2.7723	2.7920	0.0197	14
**31-Aug-15*	*28298*	*12736.93*	*12750.95*	*841.20*	*34*	*35*	*34.5*	*27.4*	*1007.4*	*1.17*	*987*	*2.8284*	*2.8489*	*0.0205*	*21*
1-Sep-15	28301	12750.95	12774.84	1433.40	30	37	33.5	27.4	1007.8	1.14	1627	2.8477	2.8761	0.0284	17
2-Sep-15	28286	12774.84	12798.59	1425.00	28	28	28.0	25.8	1010.9	0.93	1323	2.7959	2.8155	0.0196	15
3-Sep-15	28321	12798.59	12822.25	1419.60	27	28	27.5	27.6	1013.0	0.91	1287	2.8199	2.8607	0.0408	32
4-Sep-15	28324	12822.25	12845.93	1420.80	28	29	28.5	29.1	1013.1	0.94	1339	2.8171	2.8714	0.0543	41
5-Sep-15	28287	12845.93	12869.93	1440.00	27	28	27.5	29.3	1011.1	0.90	1300	2.7890	2.8229	0.0339	26
6-Sep-15	28947	12869.93	12893.93	1440.00	28	29	28.5	29.6	1008.1	0.94	1352	2.7613	2.7999	0.0386	29
7-Sep-15	28314	12893.93	12917.92	1439.40	28	28	28.0	28.3	1007.2	0.92	1327	2.8250	2.8425	0.0175	13
8-Sep-15	28311	12917.92	12941.70	1426.80	28	30	29.0	28.1	1007.8	0.96	1371	2.8228	2.8674	0.0446	33
9-Sep-15	28341	12941.70	12965.65	1437.00	22	28	25.0	28	1008.0	0.81	1160	2.8358	2.8695	0.0337	29
10-Sep-15	28344	12965.65	12989.65	1440.00	27	28	27.5	28	1008.1	0.90	1301	2.8225	2.8644	0.0419	32
11-Sep-15	28277	12989.65	13013.65	1440.00	30	30	30.0	28.1	1011.1	1.00	1442	2.8407	2.8939	0.0532	37
12-Sep-15	28351	13013.65	13037.65	1440.00	23	30	26.5	28.1	1011.1	0.87	1248	2.8145	2.8596	0.0451	36

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/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
29-Aug-15	28292	9295.09	9319.33	1454.40	39	40	39.5	27.8	1006.2	1.21	1755	2.8012	2.8676	0.0664	38
30-Aug-15	27752	9319.33	9343.10	1426.20	38	44	41.0	28.7	1005.8	1.26	1793	2.7816	2.8555	0.0739	41
31-Aug-15	28297	9343.10	9366.84	1424.40	42	42	42.0	27.4	1007.4	1.30	1847	2.8151	2.8738	0.0587	32
1-Sep-15	28302	9366.84	9390.42	1414.80	41	42	41.5	27.4	1007.8	1.28	1810	2.8356	2.8882	0.0526	29
2-Sep-15	28303	9390.42	9413.94	1411.20	42	42	42.0	25.8	1010.9	1.30	1839	2.8421	2.8927	0.0506	28
3-Sep-15	28322	9413.94	9437.94	1440.00	39	40	39.5	27.6	1013	1.21	1745	2.8277	2.8889	0.0612	35
4-Sep-15	28325	9437.94	9461.94	1440.00	41	42	41.5	29.1	1013.1	1.28	1842	2.8080	2.8651	0.0571	31
5-Sep-15	28326	9461.94	9485.97	1441.80	40	41	40.5	29.3	1011.1	1.24	1790	2.8130	2.8693	0.0563	31
6-Sep-15	28323	9485.97	9507.73	1305.60	42	43	42.5	29.6	1008.1	1.31	1709	2.8040	2.8667	0.0627	37
7-Sep-15	28336	9507.73	9531.90	1450.20	40	41	40.5	28.3	1007.2	1.24	1800	2.7864	2.8720	0.0856	48
8-Sep-15	28312	9531.90	9555.70	1428.00	38	40	39.0	28.1	1007.8	1.19	1698	2.8331	2.9423	0.1092	64
9-Sep-15	28342	9555.70	9579.70	1440.00	40	42	41.0	28	1008	1.26	1815	2.8358	2.9138	0.0780	43
10-Sep-15	28343	9579.70	9603.96	1455.60	40	42	41.0	28	1008.1	1.26	1834	2.8124	2.8903	0.0779	42
11-Sep-15	28278	9603.96	9627.96	1440.00	42	42	42.0	28.1	1011.1	1.30	1869	2.8393	2.9298	0.0905	48

Noise

Noise Measurement Results (dB) of NM1

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30min
28-Aug-15	12:05	52.0	53.6	48.9	51.7	53.3	48.3	52.5	54.6	49.1	51.4	53.2	49.2	53.2	52.7	48.3	50.5	52.1	47.7	52.0
29-Aug-15	13:57	56.5	59.8	49.3	57.1	59.8	51.1	59.1	61.8	54.6	58.0	60.7	53.2	59.1	61.9	52.9	58.0	61.0	50.7	58.1
***30-Aug-15**	**10:28**	**52.0**	**53.9**	**50.0**	**52.5**	**53.6**	**49.4**	**50.7**	**52.1**	**49.1**	**52.7**	**54.3**	**50.7**	**51.7**	**52.7**	**49.9**	**51.6**	**52.5**	**49.7**	**51.9**
31-Aug-15	9:50	54.9	54.5	50.0	53.8	56.0	50.5	53.1	55.0	50.5	52.0	53.0	50.5	52.6	54.0	50.5	52.2	53.5	49.0	53.2
1-Sep-15	10:10	54.1	54.2	50.8	52.3	54.4	49.5	53.8	55.8	50.9	54.1	56.7	50.3	51.8	53.5	49.9	52.0	54.0	49.8	53.1
2-Sep-15	11:00	57.8	59.5	55.0	56.7	58.1	54.7	58.4	59.7	57.0	58.8	59.9	57.5	58.8	59.8	57.6	58.6	59.7	56.8	58.2
***3-Sep-15**	**11:07**	**51.8**	**53.4**	**49.9**	**52.5**	**54.6**	**50.5**	**52.5**	**54.8**	**50.2**	**51.9**	**53.6**	**49.6**	**51.6**	**53.0**	**50.0**	**52.7**	**55.7**	**49.2**	**52.2**
4-Sep-15	11:34	50.2	52.0	48.1	51.0	52.3	49.6	51.8	53.4	49.0	58.1	53.8	48.8	53.1	54.8	50.0	52.5	54.6	49.2	53.7
5-Sep-15	11:16	53.0	54.9	50.3	51.7	53.3	49.8	54.5	58.6	48.9	52.2	54.5	49.0	51.3	53.0	48.7	52.1	54.4	49.8	52.6
***6-Sep-15**	**10:49**	**51.3**	**52.4**	**48.2**	**49.7**	**51.5**	**47.6**	**50.1**	**51.3**	**48.5**	**50.6**	**52.7**	**48.5**	**52.9**	**53.7**	**48.1**	**50.6**	**52.4**	**48.5**	**51.0**
7-Sep-15	13:13	50.5	52.4	48.3	57.8	54.6	48.6	52.5	54.2	50.3	50.9	52.4	47.7	50.7	52.6	48.2	49.7	51.2	48.0	53.1
8-Sep-15	10:12	51.8	53.7	49.7	51.5	53.0	47.9	51.9	55.0	48.0	51.8	52.9	48.0	50.5	52.4	48.2	50.4	52.8	47.6	51.4
9-Sep-15	13:09	52.7	53.5	50.5	52.5	53.5	50.5	51.8	52.5	50.5	58.4	54.0	50.5	56.5	56.5	49.5	59.9	62.0	51.0	56.4
10-Sep-15	14:45	62.0	63.0	49.5	57.1	56.5	50.0	53.2	53.5	50.0	53.9	54.0	49.5	55.9	59.0	48.5	52.6	54.0	50.0	57.2

Remarks: (*) Public Holiday or Sunday

Noise Measurement Results (dB) of NM2

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30min
28-Aug-15	12:58	50.6	52.7	47.9	50.7	53.3	48.3	49.5	51.0	48.3	48.9	49.9	48.2	51.7	55.0	48.5	50.1	51.1	49.1	50.3
29-Aug-15	15:27	52.4	54.0	49.4	51.6	53.5	49.2	50.7	52.3	48.8	50.6	52.2	48.9	50.3	51.9	48.7	51.2	52.8	48.9	51.2
***30-Aug-15**	**12:29**	**52.1**	**54.0**	**46.7**	**53.2**	**58.1**	**46.6**	**51.4**	**51.7**	**46.5**	**49.5**	**51.5**	**47.0**	**48.7**	**49.5**	**46.6**	**50.2**	**55.3**	**46.5**	**51.1**
31-Aug-15	10:53	50.8	51.0	40.0	42.3	44.5	40.0	41.0	42.5	39.0	42.6	44.0	41.0	41.7	43.0	40.0	42.5	42.5	39.0	45.2
1-Sep-15	11:00	44.0	44.7	43.2	45.5	47.7	43.0	43.0	44.4	42.1	43.6	45.7	41.6	43.6	46.1	41.2	44.2	48.1	41.2	44.1
2-Sep-15	15:27	50.3	51.9	46.1	47.8	49.8	45.8	47.1	48.9	45.2	46.3	48.2	44.1	45.1	46.4	44.0	44.3	45.1	43.4	47.3
***3-Sep-15**	**13:06**	**45.8**	**46.6**	**44.8**	**48.6**	**52.7**	**44.8**	**50.3**	**49.0**	**44.7**	**45.4**	**46.1**	**44.7**	**45.7**	**46.9**	**44.5**	**45.5**	**46.8**	**44.5**	**47.3**
4-Sep-15	14:26	49.6	50.0	48.6	49.5	50.3	48.9	48.9	49.2	48.6	49.1	49.8	48.7	49.1	49.6	48.7	48.8	49.2	48.5	49.2
5-Sep-15	14:37	56.9	63.2	41.6	42.5	43.8	41.2	46.3	43.5	41.4	43.6	45.9	41.2	43.1	45.3	41.3	45.6	48.7	42.2	50.2
***6-Sep-15**	**12:48**	**50.0**	**50.6**	**49.5**	**50.1**	**50.8**	**49.4**	**50.3**	**51.1**	**49.0**	**52.2**	**55.2**	**49.5**	**50.2**	**51.5**	**49.4**	**53.4**	**56.5**	**49.6**	**51.2**
7-Sep-15	10:57	54.6	56.5	51.3	51.4	53.1	49.4	50.5	51.9	47.4	55.4	56.5	46.0	49.3	51.5	43.7	48.9	51.0	43.8	52.4
8-Sep-15	11:26	48.9	49.9	43.0	44.8	45.8	43.5	45.5	49.3	43.1	49.5	50.9	48.3	48.7	49.5	48.1	48.8	49.5	48.2	48.0
9-Sep-15	14:14	52.9	56.5	46.5	49.0	48.5	46.0	48.5	49.5	46.0	51.9	51.5	45.5	48.2	49.0	45.5	49.0	50.5	46.0	50.3
10-Sep-15	15:28	46.2	47.0	43.0	47.7	47.5	44.5	46.4	48.0	44.5	48.8	53.0	44.5	50.7	55.0	45.0	49.9	55.0	44.5	48.6

Remarks: (*) Public Holiday or Sunday

Appendix K

Laboratory Data Report

CERTIFICATE OF ANALYSIS

Client	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**	*Laboratory*	:	**ALS Technichem (HK) Pty Ltd**	*Page*	: **1 of 3**
Contact	:	**MR BEN TAM**	*Contact*	:	**Fung Lim Chee, Richard**	*Work Order*	: **HK1532724**
Address	:	**RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG**	*Address*	:	**11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong**		
E-mail	:	**Bentam@fordbusiness.com**	*E-mail*	:	**Richard.Fung@alsglobal.com**		
Telephone	:	**+852 2959 6059**	*Telephone*	:	**+852 2610 1044**		
Facsimile	:	**+852 2959 6079**	*Facsimile*	:	**+852 2610 2021**		
Project	:	**----**	*Quote number*	:	**HK/1518b/2014**	*Date received*	: **01-SEP-2015**
Order number	:	**----**				*Date of issue*	: **04-SEP-2015**
C-O-C number	:	**H030407**				*No. of samples*	- *Received* : **8**
Site	:	**----**					- *Analysed* : **8**

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1532724 supersedes any previous reports with this reference. The completion date of analysis is 02-SEP-2015. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific comments for Work Order HK1532724 : Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.
Sample(s) analysed and reported on an as received basis.

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.

Signatory	*Position*	*Authorised results for:*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER (TSP/RSP)**

Client sample ID	Client sampling date / time	Laboratory sample ID	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
Compound							
LOR Unit			0.0010 g	0.0010 g	0.0010 g		
			EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
28291 757-AM1	[29-AUG-2015]	HK1532724-007	**0.0273**	**2.7869**	**2.8142**		
28292 757-AM2	[29-AUG-2015]	HK1532724-008	**0.0664**	**2.8012**	**2.8676**		

Laboratory Duplicate (DUP) Report

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **AIR**

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
Particulate Matters (QCLot: 4014889)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8616	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8616	----	----	----	----	----	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

CERTIFICATE OF ANALYSIS

Client	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**	*Laboratory*	:	**ALS Technichem (HK) Pty Ltd**	*Page*	: **1 of 3**
Contact	:	**MR BEN TAM**	*Contact*	:	**Fung Lim Chee, Richard**	*Work Order*	: **HK1533105**
Address	:	**RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG**	*Address*	:	**11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong**		
E-mail	:	**Bentam@fordbusiness.com**	*E-mail*	:	**Richard.Fung@alsglobal.com**		
Telephone	:	**+852 2959 6059**	*Telephone*	:	**+852 2610 1044**		
Facsimile	:	**+852 2959 6079**	*Facsimile*	:	**+852 2610 2021**		
Project	:	**----**	*Quote number*	:	**HK/1518b/2014**	*Date received*	: **04-SEP-2015**
Order number	:	**----**				*Date of issue*	: **08-SEP-2015**
C-O-C number	:	**H030413**				*No. of samples*	- *Received* : **11**
Site	:	**----**					- *Analysed* : **11**

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1533105 supersedes any previous reports with this reference. The completion date of analysis is 07-SEP-2015. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific comments for Work Order HK1533105 : Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.
Sample(s) analysed and reported on an as received basis.

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.

Signatory	*Position*	*Authorised results for:*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER (TSP/RSP)**

Client sample ID	Client sampling date / time	Laboratory sample ID	Compound	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
			LOR Unit	0.0010 g	0.0010 g	0.0010 g		
				EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
28285 599-MUP-A1	[28-AUG-2015]	HK1533105-001		0.0334	2.7817	2.8151		
28281 670-AM1A	[28-AUG-2015]	HK1533105-002		0.0459	2.8131	2.8590		
28282 670-AM2	[28-AUG-2015]	HK1533105-003		0.1048	2.8033	2.9081		
28283 670-AM3	[28-AUG-2015]	HK1533105-004		0.0804	2.7941	2.8745		
28284 670-AM7B	[28-AUG-2015]	HK1533105-005		0.0658	2.7888	2.8546		
28269 670-AM8	[28-AUG-2015]	HK1533105-006		0.0454	2.8293	2.8747		
28256 670-AM9B	[28-AUG-2015]	HK1533105-007		0.0596	2.8157	2.8753		
28280 704-A1	[25-AUG-2015]	HK1533105-008		0.1182	2.8105	2.9287		
28276 733-AM02	[31-AUG-2015]	HK1533105-009		0.2922	2.8325	3.1247		
27757 757-AM1	[30-AUG-2015]	HK1533105-010		**0.0197**	**2.7723**	**2.7920**		
27752 757-AM2	[30-AUG-2015]	HK1533105-011		**0.0739**	**2.7816**	**2.8555**		

Laboratory Duplicate (DUP) Report

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **AIR**

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
Particulate Matters (QCLot: 4017928)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8616	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8617	----	----	----	----	----	----	----
Particulate Matters (QCLot: 4017929)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8616	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8617	----	----	----	----	----	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

CERTIFICATE OF ANALYSIS

Client	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**	*Laboratory*	:	**ALS Technichem (HK) Pty Ltd**	*Page*	: **1 of 3**
Contact	:	**MR BEN TAM**	*Contact*	:	**Fung Lim Chee, Richard**	*Work Order*	: **HK1534784**
Address	:	**RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG**	*Address*	:	**11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong**		
E-mail	:	**Bentam@fordbusiness.com**	*E-mail*	:	**Richard.Fung@alsglobal.com**		
Telephone	:	**+852 2959 6059**	*Telephone*	:	**+852 2610 1044**		
Facsimile	:	**+852 2959 6079**	*Facsimile*	:	**+852 2610 2021**		
Project	:	**TCS00757_15**	*Quote number*	:	**HK/1518b/2014**	*Date received*	: **11-SEP-2015**
Order number	:	**----**				*Date of issue*	: **15-SEP-2015**
C-O-C number	:	**H031450-H031451**				*No. of samples*	- *Received* : **18**
Site	:	**----**					- *Analysed* : **18**

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1534784 supersedes any previous reports with this reference. The completion date of analysis is 14-SEP-2015. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific Comments for Work Order HK1534784 :

Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.

Sample(s) analysed and reported on an as received basis.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatory	*Position*	*Authorised results for:*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER (TSP/RSP)**

Client sample ID	Client sampling date / time	Laboratory sample ID	Compound: HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
		LOR Unit	0.0010 g	0.0010 g	0.0010 g		
			EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
28298 757-AM1	[31-AUG-2015]	HK1534784-001	**0.0205**	**2.8284**	**2.8489**		
28301 757-AM1	[01-SEP-2015]	HK1534784-002	**0.0284**	**2.8477**	**2.8761**		
28286 757-AM1	[02-SEP-2015]	HK1534784-003	**0.0196**	**2.7959**	**2.8155**		
28321 757-AM1	[03-SEP-2015]	HK1534784-004	**0.0408**	**2.8199**	**2.8607**		
28324 757-AM1	[04-SEP-2015]	HK1534784-005	**0.0543**	**2.8171**	**2.8714**		
28287 757-AM1	[05-SEP-2015]	HK1534784-006	**0.0339**	**2.7890**	**2.8229**		
208947 757-AM1	[06-SEP-2015]	HK1534784-007	**0.0386**	**2.7613**	**2.7999**		
28314 757-AM1	[07-SEP-2015]	HK1534784-008	**0.0175**	**2.8250**	**2.8425**		
28311 757-AM1	[08-SEP-2015]	HK1534784-009	**0.0446**	**2.8228**	**2.8674**		
28297 757-AM2	[31-AUG-2015]	HK1534784-010	**0.0587**	**2.8151**	**2.8738**		
28302 757-AM2A	[01-SEP-2015]	HK1534784-011	**0.0526**	**2.8356**	**2.8882**		
28303 757-AM2A	[02-SEP-2015]	HK1534784-012	**0.0506**	**2.8421**	**2.8927**		
28322 757-AM2A	[03-SEP-2015]	HK1534784-013	**0.0612**	**2.8277**	**2.8889**		
28325 757-AM2A	[04-SEP-2015]	HK1534784-014	**0.0571**	**2.8080**	**2.8651**		
28326 757-AM2A	[05-SEP-2015]	HK1534784-015	**0.0563**	**2.8130**	**2.8693**		
28323 757-AM2A	[06-SEP-2015]	HK1534784-016	**0.0627**	**2.8040**	**2.8667**		
28336 757-AM2A	[07-SEP-2015]	HK1534784-017	**0.0856**	**2.7864**	**2.8720**		
28312 757-AM2A	[08-SEP-2015]	HK1534784-018	**0.1092**	**2.8331**	**2.9423**		

Laboratory Duplicate (DUP) Report

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **AIR**

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
Particulate Matters (QCLot: 4023003)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8601	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8603	----	----	----	----	----	----	----
Particulate Matters (QCLot: 4023004)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8601	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8603	----	----	----	----	----	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 3
Contact	: MR BEN TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1534819
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Bentam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS00757_15	Quote number	: HK/1518b/2014	Date Samples Received	: 14-SEP-2015
Order number	: ----			Issue Date	: 16-SEP-2015
C-O-C number	: H031454			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 15-SEP-2015

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1534819

Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.

Sample(s) analysed and reported on an as received basis.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER (TSP/RSP)**

Compound	CAS Number	LOR	Unit	Client sample ID: 28341 757-AM1	28344 757-AM1	28342 757-AM2	28343 757-AM2	
				Client sampling date / time: [09-SEP-2015]	[10-SEP-2015]	[09-SEP-2015]	[10-SEP-2015]	
				HK1534819-001	HK1534819-002	HK1534819-003	HK1534819-004	
EA/ED: Physical and Aggregate Properties								
HK-TSP: Total Suspended Particulates	----	0.0010	g	**0.0337**	**0.0419**	**0.0780**	**0.0779**	
HK-TSP: Initial Weight	----	0.0010	g	**2.8358**	**2.8225**	**2.8358**	**2.8124**	
HK-TSP: Final Weight	----	0.0010	g	**2.8695**	**2.8644**	**2.9138**	**2.8903**	

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: AIR

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
Particulate Matters (QC Lot: 4023854)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8603	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8597	----	----	----	----	----	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

CERTIFICATE OF ANALYSIS

Client	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**	*Laboratory*	:	**ALS Technichem (HK) Pty Ltd**	*Page*	: **1 of 3**
Contact	:	**MR BEN TAM**	*Contact*	:	**Fung Lim Chee, Richard**	*Work Order*	: **HK1535663**
Address	:	**RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG**	*Address*	:	**11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong**		
E-mail	:	**Bentam@fordbusiness.com**	*E-mail*	:	**Richard.Fung@alsglobal.com**		
Telephone	:	**+852 2959 6059**	*Telephone*	:	**+852 2610 1044**		
Facsimile	:	**+852 2959 6079**	*Facsimile*	:	**+852 2610 2021**		
Project	:	**----**	*Quote number*	:	**HK/1518b/2014**	*Date received*	: **18-SEP-2015**
Order number	:	**----**				*Date of issue*	: **21-SEP-2015**
C-O-C number	:	**H031458**				*No. of samples*	- *Received* : **9**
Site	:	**----**					- *Analysed* : **9**

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1535663 supersedes any previous reports with this reference. The completion date of analysis is 21-SEP-2015. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific Comments for Work Order HK1535663 :

Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.

Sample(s) analysed and reported on an as received basis.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatory	*Position*	*Authorised results for:*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER (TSP/RSP)**

Client sample ID	Client sampling date / time	Laboratory sample ID	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
Compound							
LOR Unit			0.0010 g	0.0010 g	0.0010 g		
			EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
28277 757-AM1	[11-SEP-2015]	HK1535663-007	**0.0532**	**2.8407**	**2.8939**		
28351 757-AM1	[12-SEP-2015]	HK1535663-008	**0.0451**	**2.8145**	**2.8596**		
28278 757-AM2	[11-SEP-2015]	HK1535663-009	**0.0905**	**2.8393**	**2.9298**		

Laboratory Duplicate (DUP) Report

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **AIR**

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
Particulate Matters (QCLot: 4028372)											
HK-TSP: Total Suspended Particulates	----	0.0010	g	<0.0010	----	----	----	----	----	----	----
HK-TSP: Initial Weight	----	0.0010	g	2.8595	----	----	----	----	----	----	----
HK-TSP: Final Weight	----	0.0010	g	2.8597	----	----	----	----	----	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**