JOB NO.: TCS00491/09

DSD CONTRACT NO.: DC/2009/08

CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

26TH ENVIRONMENTAL MONITORING & AUDIT MONTHLY REPORT – MARCH 2012

PREPARED FOR

CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified By
16 April 2012	TCS00491/09/600/R0361v2	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	10 April 2012	First submission
2	16 April 2012	Amended against IEC's comments on 12 April 2012
3	17 April 2012	Amended against IEC's comments on 17 April 2012

Scott Wilson CDM Joint Venture

Chief Engineer/Harbour Area Treatment Scheme
Drainage Services Department
5/F Western Magistracy
2A Pok Fu Lam Road
Hong Kong

Your reference:

Our reference: 05117/6/16/387831

Date: 18 April 2012

BY FAX ONLY

Attention: Mr. Kenley C K Kwok

Dear Sirs,

Contract No. DC/2009/13
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Yung Shue Wan Portion Area
Quarterly EM&A Summary Report No. Q6 (December to February 2012)

We refer to the Environmental Permit (EP-282/2007/A) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the revised report for the captioned project, dated 17 January 2011. We have no comment and have verified the captioned report.

Yours faithfully
SCOTT WILSON CDM JOINT VENTURE

Rodney Ip
Independent Environmental Checker

ICWR/SYSL/ycky

cc Leader Civil Engineering (Attn: Mr Vincent Chan)
AUES (Attn: Mr T.W. Tam)
ER/LAMMA (Attn: Mr Neil Wong)
CDM (Attn: Mr Mark Sin)

EXECUTIVE SUMMARY

ES01. The China State Construction Engineering (Hong Kong) Limited (hereinafter "The Contractor") has been awarded by the Drainage Services Department (DSD) the Contract **DC/2009/08** *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (the Project) in October 2009.

ES02. For ease of reporting, it has been agreed among the Engineer's Representatives (ER, AECOM), Independent Environmental Checker (IEC, Hyder Consulting Limited), the Contractor (The China State Construction Engineering (Hong Kong) Limited), Environmental Team (Action-United Environmental Services and Consulting, ET) and Environmental Protection Department (EPD) that the Environmental Monitoring & Audit (EM&A) Report under the Project is split to the following two stand-alone parts:

- Expansion of the existing Ha Tsuen Sewage Pumping Station (with Environmental Permit No.EP-327/2009/A)
- Construction of a sewage pumping station near Shui Tsiu San Tsuen Road in Yuen Long South; and construction of about 9km of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas (without Environmental Permit).

ES03. This is the **26th** Monthly Environmental and Audit (EM&A) Report for the designated work of Project under Environmental Permit No.EP-327/2009A (hereinafter 'the EP'), covering a period from **1 to 31 March 2012** (hereinafter 'the Reporting Period').

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES04. Environmental monitoring activities under the EM&A programme in this Reporting Period are summarized in the following table.

Aspects	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour Total Suspended Particulates (TSP)	**30**
	24-hour Total Suspended Particulates (TSP)	**10**
Construction Noise	$L_{eq(30min)}$ Daytime	**10**
Water Quality	Dissolved Oxygen	**14**
	Turbidity	**14**
	Suspended Solids	**14**
Inspection / Audit	ET Weekly Environmental Site Inspection	**4**

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES05. Breach of the air quality, construction noise and water quality in this Reporting Period is summarized in the following table.

Environmental Aspects	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	Dissolved Oxygen	0	0	0	--	--
	Turbidity	0	0	0	--	--
	Suspended Solids	0	**1**	**1**	Not Project related	--

Note: NOE – Notification of Exceedance

ES06. In this reporting period, no exceedance was recorded in air quality and noise monitoring. No NOE was issued and thus no follow up action was therefore required.

ES07. For water quality monitoring, (1) Limit Level exceedance of SS was recorded on 12 March

2012. Notification of exceedance (NOE) was issued to relevant parties upon confirmation of the results and investigation for the exceedance has been carried out subsequently and concluded that the SS exceedance is not related to the works under the DP Project. No corrective action is therefore required.

ENVIRONMENTAL COMPLAINT

ES08. No environmental complaint was recorded / received in this Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES09. No environmental summons and successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES10. There are no reporting changes in this reporting month.

SITE INSPECTION BY EXTERNAL PARTIES

ES11. In this Reporting Period, no site inspection was carried by EPD or AFCD.

FUTURE KEY ISSUES

ES12. As wet season is approaching, muddy water or other water pollutants from site surface runoff into the local stream will be key environment issue. Therefore, water mitigation measures to prevent surface runoff into nearby water bodies should be paid on special attention. Moreover, mitigation measures should be properly maintained to avoid fugitive dust emissions from loose soil surface or haul road.

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1. INTRODUCTION

BACKGROUND

1.01 The China State Construction Engineering (Hong Kong) Limited (hereinafter "The Contractor") has been awarded by the Drainage Services Department (DSD) the Contract DC/2009/08 *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (the Project) in October 2009.

1.02 The Project involves construction of about 9km of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas, a sewage pumping station near Shui Tsiu San Tsuen Road in Yuen Long South, expansion of existing Ha Tsuen Sewage Pumping Station. The site layout plan is shown in ***Appendix A***.

1.03 The construction of expansion Ha Tsuen Sewage Pumping Station is under a statutory EIA (Register No. AEIAR-072/2003) study for "*Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station*" commissioned by the DSD. An Environmental Permit (No. EP-327/2009/A) for upgrading and expansion of Sewage Treatment Works at San Wai (excluded for the Project) and Ha Tsuen Sewage Pumping Station has been obtained by DSD in January 2009 for the relevant works.

1.04 According to the Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-327/2009/A, the scope of monitoring includes air quality, construction noise, water quality and environmental site audit. It should be undertaken in accordance with the Environmental Monitoring and Audit Manual as part of EIA report [AEIAR-072/2003] (hereafter "the EM&A Manual") by an independent Environmental Team (ET). Also, monitoring and audit works for landscaping and visual will be undertaken as part of the EM&A programme.

1.05 As the works of the Project has been commenced in different periods of time, the EM&A Report for the Project are split to two separate parts as follows:

(a) Expansion Ha Tsuen Sewage Pumping Station (under Environmental Permit No.EP-327/2009/A);

(b) Construction of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas and a sewage pumping station near Shui Tsiu San Tsuen Road in Yuen Long South (the works without Environmental Permit)

1.06 Action-United Environmental Services and Consulting (AUES) has been commissioned by the Contractor as the ET to implement the relevant EM&A program. As part of the project EM&A program, baseline monitoring was conducted between *22 December 2009* and *18 January 2010* to determine the ambient environmental conditions before the project commence any major construction works at Ha Tsuen Sewage Pumping Station and it had been verified by IEC and endorsed by EPD.

1.07 This is the **26th** Monthly EM&A Report – *Expansion of Ha Tsuen Sewage Pumping Station* (hereinafter 'this Report') for designated works of the Project under Environmental Permit No.EP-327/2009 (hereinafter 'the EP'), covering a period from **1 to 31 March 2012**.

REPORT STRUCTURE

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

SECTION 1 INTRODUCTION
SECTION 2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS
SECTION 3 SUMMARY OF IMPACT MONITORING REQUIREMENTS
SECTION 4 IMPACT MONITORING RESULTS
SECTION 5 WASTE MANAGEMENT
SECTION 6 SITE INSPECTIONS

2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of the Contractor and relevant parties with respect to the on-site environmental management are shown in ***Appendix B***.

CONSTRUCTION PROGRESS

2.02 The tentative master construction programs and a three month rolling construction programme are enclosed in ***Appendix C.*** Also, the major construction activities undertaken in this reporting month are listed below:

- Construction of pumping station

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting month is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Environmental Permit (EP-329/2009/A)	Updated on 1 June 2010
2	Chemical Waste Producer Registration Registration No. 5213-511-C3570-01	Issued on 13 Nov 2009
3	Water Pollution Control Ordinance (Discharge License) License No. WT00005671-2009	Issued on 12 Jan 2010 Expiry date: 31 Jan 2015
4	Billing Account for Disposal of Construction Waste (Account Number: 700947)	Issued on 7 October 2009

2.04 The baseline monitoring report - *Expansion of Ha Tsuen Sewage Pumping Station* (*Ref: TCS00491/09/600/R0023v6*) had been verified by IEC and endorsed by EPD.

3. SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.01 The Environmental Monitoring and Audit requirements are set out in the EM&A Manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of expansion of Ha Tsuen Pumping Station. Also, monitoring and audit works for landscaping and visual shall be undertaken as part of the EM&A programme.

MONITORING PARAMETERS

3.02 According to the *EM&A Manual*, the environmental aspect implemented by ET has to be included air quality, construction noise and water quality, also the landscape and visual impact to be monitored by a competent landscape architect. The monitoring parameters are summarized in ***Table 3-1***.

Table 3-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters
Air Quality	• 1-hour Total Suspended Particulates (hereinafter '1-hr TSP'); and • 24-hour Total Suspended Particulates (hereinafter '24-hr TSP').
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter '$L_{eq(30min)}$') during the normal working hours; and • A-weighted equivalent continuous sound pressure level (5min) (hereinafter '$L_{eq(5min)}$') for construction work during the restricted hours.
Water Quality – Local Stream Course	• In Situ Measurement - Dissolved Oxygen (DO) and Turbidity • Laboratory Analysis - Suspended Solids (SS)
Water Quality – Effluent Discharge	• In Situ Measurement - pH value • Laboratory Analysis - SS and Chemical oxygen demand (COD)
Landscape and Visual Resources	• Vegetation survey undertaken on an "area" basis to identify representative types and species composition; • Assessment of landscape character; and • Tree survey report. • The inspection findings will be submitted separately.

MONITORING LOCATIONS

Monitoring Location Stipulation in the EM&A Manual

3.03 According to *EM&A Manual* ***Sections 2.2.1.18, 3.4.1.1*** & ***4.4.1.4***, and Figures ***2.1***, ***2.2***, ***3.1***, ***3.2*** and ***4.2***, there are four air quality and noise monitoring stations and one water quality monitoring station identified as sensitive receivers during construction phase of the Project. For the four designated air quality and noise monitoring stations, two are located within the San Wai STW and other two are within the existing Ha Tsuen Pumping Station. Also, a local stream course of water quality monitoring station is identified in Tin Shui Wai Nullah. Besides, the area of landscape and visual monitoring is recommended for the entire selected route and within compounds in accordance with *the EM&A Manual* ***Section 6.3.1.1.***

Air Quality

3.04 In order to identify and seek for the access for the air quality monitoring locations designated in the EM&A Manual, site inspection and the premises request about the monitoring locations have been carried out by the Contractor and ET. The designated monitoring location Yeung Chun Pui Care & Attention Home located at Sha Chau Lei Road has been identified, but the premise was granted by CEDD existing project CV/2008/03 for air quality monitoring. Also, the HVS installation at the other one designated air quality monitoring station Tin Shing Court, the access to premises is refused by the incorporated owners.

3.05 In this case, the alternative location Ho Tak Sum Primary School as one sensitive receiver mentioned in the EIA Report (Register No. AEIAR-072/2003) is proposed to be the replacement to undertake air quality monitoring during the expansion works of Ha Tsuen Sewage Pumping Station in accordance with the EM&A Manual Clauses 2.2.1.20. Simultaneously, air quality monitoring at the designated location Yeung Chun Pui Care & Attention Home is proposed to be performed. The proposal and recommendation is agreed by IEC and as endorsed by EPD.

3.06 As requested by the occupants of Yeung Chun Pui Care & Attention Home (AM2) due to safety reasons, The HVS for AM2 was relocated to a nearby location on 27 October 2011. Details of the relocation were given in the October 2011 Monthly EM&A Report

3.07 The monitoring stations are listed in ***Table 3-2*** and illustrated in ***Appendix D.***

Table 3-2 Air Quality Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
AM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
AM2*	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual

** HVS shifted to nearby location where less than 10 meters from the original location towards the construction site on 27 October 2011.*

Construction Noise

3.08 Similar to the air quality monitoring, the construction noise monitoring stations undertaken for EM&A programme is agreed by IEC and as endorsed by EPD.

3.09 The detailed monitoring stations are listed in ***Table 3-3*** and shown in ***Appendix D***.

Table 3-3 Construction Noise Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
NM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
NM2	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual

Water Quality

3.10 One designated location of a local stream course, Tin Shui Wai Nullah, is proposed to carry out water quality monitoring in accordance with the EM&A Manual. The designated sampling location R1 is located at the midpoint between two pedestrian flyovers athwart Tin Shui Wai Nullah, which are 320 meters apart, there is technical difficulty and safety is concerned. So, a new sampling point located at approximately 160m upstream of the R1 (hereinafter as R1b) was therefore proposed for the local stream impact monitoring. A proposal (submission ref.: TCS00491/09/300/L0080) has been verified by IEC and submitted to EPD with no further comments received.

3.11 The detailed monitoring station is listed in ***Table 3-4*** and show in ***Appendix D***.

Table 3-4 Local Stream Water Quality Monitoring Station

Monitoring Location ID	Identified Address	Remarks
R1b	The athwart Tin Shui Wai Nullah pedestrian flyover	About 160 meters upstream from the designated location as stipulated in the EM&A Manual. Also, closer the existing Ha Tsuen Pumping Station

3.12 According to the EM&A Manual Section 4.3.1.5, the effluent water quality monitoring are proposed to be carried out at representative discharge point(s) where effluent from the construction sites is discharged into the local water course after being treated in a wastewater treatment system.

Landscape and Visual

3.13 The selected route and area, frequency and requirements of landscape & visual monitoring is proposed by a competent landscape architect.

MONITORING FREQUENCY

3.14 According to the *EM&A Manual* Sections 2.2.1.27, 3.6 and 4.4.1.8, impact monitoring is covered air quality, noise and water quality of local stream course.

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.
Frequency: Once every six days for 24-hour TSP and three times every six days for 1-hour TSP.
Duration: Throughout the construction period.

Noise Monitoring

Parameters: One set of $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700-1900 hours on normal weekdays.
$L_{eq(5min)}$, L_{10} and L_{90} during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday)
Frequency: Once every six days during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.
Duration: Throughout the construction period.

Water Quality Monitoring of Local Stream Course

Parameters: DO, Turbidity and SS.
Frequency: 3 days per week.
Depths: mid-depth
Duration: Throughout the construction period and the interval between 2 sets of monitoring is not less than 36 hours

Water Quality Monitoring of Effluent Discharge

Parameters: pH, COD and SS.
Frequency: Depend on conditions stipulated in discharge license under **Section 20** of the ***Water Pollution Control Ordinance***.
Duration: Throughout the construction period

Landscape and Visual Monitoring

Parameters: Site inspection with broad scope of audit as listed in the EM&A Manuals
Frequency: Once every 2 weeks
Duration: Throughout the construction period

3.15 Post Project Monitoring will be performed at water quality monitoring local stream course. The requirements are same as baseline monitoring are presented below:

Parameters: DO, Turbidity and SS.
Frequency: 3 days per week.
Depths: mid-depth
Duration: 4 weeks and the interval between 2 sets of monitoring is not less than 36 hours upon completion of the construction activities

MONITORING METHODOLOGY AND EQUIPMENT

Air Quality

3.16 The air quality monitoring equipment for 1-hour and 24-hour TSP are listed in ***Table 3-5*** and the specification of equipment was submitted before the EM&A programme commencement.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Description
1-hour TSP	
Portable dust meter	TSI DustTrak Aerosol Monitor Model 8520
24-hour TSP	
High Volume Air Sampler	Thermo Anderson GS 2310 HVS
Calibration Kit	TISCH Model TE-5025A

1-hour TSP

3.17 The 1-hour TSP monitoring is conducted with a portable dust meter, brand named, TSI DustTrak Aerosol Monitor Model 8520 which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^{o} light scattering. The 1-hour TSP monitor consists of the following:

(a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;

(b.) A sheath air system isolates 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.

3.18 The 1-hour TSP meter is used within the valid period as follow manufacturer's Operation and Service Manual.

24-hour TSP

3.19 The equipment used for 24-hour TSP measurement is Thermo Andersen Model GS2310 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.

3.20 The HVS was operated and calibrated on a regular basis in accordance to the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). One point checking would be carried out in two-month interval while full point checking every six months.

3.21 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 kept all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25^{o}C, for six months prior to disposal.

Noise

3.22 The equipment for noise monitoring is summarized in ***Table 3-6*** and the specification was submitted before the EM&A programme commencement**.**

Table 3-6 Noise Monitoring Equipment

Equipment	Description
Integrating Sound Level Meter	B&K Type 2238
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer

3.23 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 Technical Memorandum ™ issued under the Noise Control Ordinance (NCO).

3.24 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels (dB). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.

3.25 During the construction noise monitoring, all noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30min)}$ in six consecutive $L_{eq(5min)}$ measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $L_{eq(15min)}$ in three consecutive $L_{eq(5min)}$ measurements were used as monitoring parameter for other time periods (e.g. during restricted hours).

3.26 No noise extension cable was used to link the microphone with sound level meter for the measurement. The microphone was set about 1.2m height above ground and oriented such that it was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield was fitted for all measurements. The monitoring locations NM1 and NM2 were normally set in a free field situation.

3.27 In prior of impact 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 checking was performed before and after the noise measurement. Also, the wind speed was checked with a portable wind speed meter. No fog and rain were encountered during the noise measurement, and the wind speed and gusts were also below 5m/s and 10m/s respectively.

Water quality of Local Stream Course

3.28 The equipment for water monitoring is summarized in ***Table 3-7*** and the specifications were submitted before the EM&A programme commencement**.**

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model / Description
Water Sampler	Teflon bailer / bucket
Thermometer & DO meter	YSI Professional Plus
Turbidimeter	Hach 2100q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-litter plastic cool box

3.29 Water quality monitoring was conducted at mid-depth of the water column.

Dissolved Oxygen (DO)

3.30 A multiple meter, brand named YSI Professional Plus was used for in-situ DO measurement, which automates the measurements of temperature, dissolved oxygen, dissolved oxygen saturation and pH simultaneously. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation. Before each round of monitoring, the dissolved oxygen probe is calibrated by the wet bulb method with distilled water. Calibration of the equipment is performed by ALS on quarterly basis.

Turbidity

3.31 A portable turbiditmeter, brand named Hach 2100p was used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. Calibration of the equipment is performed by ALS on quarterly basis.

Suspended Solids (SS)

3.32 SS will be determined by ALS upon receipt of the water samples using HOKLAS accredited analytical methods namely ALS Method EA-025.

Water Sampler

3.33 Water samples were collected by the ET using a plastic sampler, which has a volume of not less than 2 litres and can be sealed at both ends with cups to prevent metal contamination. The sampler was rinsed before collection with the sample to be taken. The water sample was collected at mid-depth level at the selected monitoring location for SS determination.

Sample Container

3.34 Water sample was contained in screw-cap PE (Poly-Ethylene) sampling bottle (1,000ml) to be provided by HOKLAS accredited laboratory ALS. Where appropriate, the sampling bottle was rinsed with the water to be contained in prior. Water sample was then transferred from the sampler to the sample bottles to 95% bottle capacity to allow possible volume expansion during delivery and storage.

Sample Storage

3.35 A 'Willow' 33-liter plastic cool box packed with ice was used to preserve the collected water samples prior to arrival at the laboratory. The water temperature of the cool box was maintained at a temperature as close to 4℃ as possible without being frozen. Samples were delivered to laboratory within 24 hours and analyzed within 2 days of delivery or within the holding time as advised by the laboratory.

EQUIPMENT CALIBRATION

3.36 Calibration of the HVS was performed upon installation in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The calibration data are properly documented and the records are maintained by ET for future reference.

3.37 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. In-house calibration with the High Volume Sampler (HVS) in same condition was undertaken in yearly basis.

3.38 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.

3.39 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in this Reporting Month are attached in ***Appendix E***.

METEOROLOGICAL INFORMATION

3.40 The meteorological information in this reporting month was downloaded from Lau Fau Shan Station of the Hong Kong Observatory (HKO) and presented in ***Appendix F***.

DATA MANAGEMENT AND DATA QA/QC CONTROL

3.41 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.

3.42 The monitoring data recorded in the equipment e.g. 1-hour TSP meters and noise meters are downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results or water quality in-situ measurement records are input directly into the

computerized database and QA/QC checked by personnel other than those who input the data.

3.43 For monitoring activities that require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.44 According to the EM&A Manual, the air quality, construction noise and water quality criteria were set up, namely Action and Limit levels are listed in ***Tables 3-8, 3-9*** and ***3-10*** as below:-

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Location	Action Level ($\mu g/m^3$)		Limit Level ($\mu g/m^3$)	
	1-hour	24-hour	1-hour	24-hour
AM1	305	162	500	260
AM2	310	190	500	260

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	0700-1900 hrs on normal weekdays	
NM1	When one or more documented complaints are received	70 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 65 dB(A) during school examination periods
NM2		70 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays

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

Table 3-10 Action and Limit Levels for a Local Stream Water Quality Monitoring (R1b)

Parameter	Action Level	Limit Level
DO (mg/L)	4.6	4 mg/L or 40% saturation at 15°C
Turbidity (NTU)	15.6	16.2
SS (mg/L)	31.5	31.9

3.45 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in ***Appendix G***.

4. IMPACT MONITORING RESULTS

4.01 The monitoring activities undertaken in this Reporting Period is listed in ***Appendix H***. The monitoring results are presented in the following sub-sections.

RESULTS OF AIR QUALITY MONITORING

4.02 In this Reporting Period, a total of **10** events of 24-hour TSP monitoring and **30** events of 1-hour TSP monitoring were undertaken and the results are summarized in ***Tables 4-1 and 4-2***. The 24-hour TSP raw data sheets are shown in ***Appendix I***. Also, the graphical plots for the 24-hour and 1-hour TSP monitoring result are shown in ***Appendix J***

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM1

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
6-Mar-12	48	5-Mar-12	13:16	206	189	223
12-Mar-12	42	10-Mar-12	9:51	82	76	91
17-Mar-12	40	16-Mar-12	13:03	82	95	91
23-Mar-12	63	22-Mar-12	10:58	134	162	167
29-Mar-12	54	28-Mar-12	13:06	62	76	74
Average (Range)	**49 (40-63)**	Average (Range)		**121 (62-223)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM2

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
6-Mar-12	45	5-Mar-12	14:31	217	234	208
12-Mar-12	78	10-Mar-12	10:09	88	101	106
17-Mar-12	76	16-Mar-12	14:08	113	101	96
23-Mar-12	63	22-Mar-12	11:31	141	106	123
29-Mar-12	93	28-Mar-12	13:59	63	66	70
Average (Range)	**71 (45-93)**	Average (Range)		**122 (63-234)**		

Remarks: Bold and italic indicated Action Level exceedance

4.01 As shown in ***Tables 4-1*** and ***4-2***, 1-hour and 24-hour TSP monitoring results fluctuated well below the Action Level in this Reporting Period.

4.02 The meteorological data during the impact monitoring days are summarized in ***Appendix F***.

RESULTS OF CONSTRUCTION NOISE MONITORING

4.03 The noise monitoring results conducted at the designated locations are summarized in ***Tables 4-3*** and ***4-4***. The sound level were set up in a free field situation and, therefore, a façade correction of +3 dB(A) was added according to acoustical principles and EPD guidelines.

Table 4-3 Summary of Construction Noise Monitoring Results – NM1

Date	Start Time	1st $L_{eq(5min)}$	2nd $L_{eq(5min)}$	3rd $L_{eq(5min)}$	4th $L_{eq(5min)n}$	5th $L_{eq(5min)}$	6th $L_{eq(5min)}$	$L_{eq(30min)}$	Corrected* $L_{eq(30min)}$
5-Mar-12	13:40	61.9	67.0	63.1	62.7	69.3	67.7	66.2	69.2
10-Mar-12	9:46	62.1	63.3	65.5	64.8	62.6	61.2	63.5	66.5
16-Mar-12	13:04	63.0	66.5	62.6	62.0	65.9	64.6	64.4	67.4
22-Mar-12	11:01	69.3	64.4	67.7	64.3	64.9	65.5	66.4	69.4
28-Mar-12	13:02	59.5	63.2	62.2	62.1	61.1	63.9	62.2	65.2
Limit Level		-						**70 dB(A)**	

(*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

Table 4-4 Summary of Construction Noise Monitoring Results – NM2

Date	Start Time	1st $L_{eq(5min)}$	2nd $L_{eq(5min)}$	3rd $L_{eq(5min)}$	4th $L_{eq(5min)n}$	5th $L_{eq(5min)}$	6th $L_{eq(5min)}$	$L_{eq(30min)}$	Corrected* $L_{eq(30min)}$
5-Mar-12	14:36	63.6	65.9	63.9	66.0	59.1	61.8	64.0	67.0
10-Mar-12	10:48	58.6	64.0	56.8	56.6	56.4	55.7	59.2	62.2
16-Mar-12	14:01	61.3	59.9	61.1	66.9	59.9	56.1	62.2	65.2
22-Mar-12	13:18	60.3	58.3	58.9	64.3	59.5	62.4	61.2	64.2
28-Mar-12	14:04	59.2	59.0	61.4	61.4	59.5	59.9	60.2	63.2
Limit Level		-						**70 dB(A)**	

(*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

4.04 In this Reporting Period, no noise complaint (which is an Action Level exceedance) was received. As shown in ***Tables 4-3*** and ***4-4,*** no Limit level exceedance was recorded and no corrective action was therefore required. The graphical plots of the monitoring results are shown in ***Appendix J***.

RESULTS OF WATER QUALITY MONITORING – LOCAL STREAM COURSE

4.05 In this Reporting Period, a total of **14** sampling days were performed for water quality monitoring at R1b of the local stream course, Tin Shui Wai Nullah. The monitoring results including in-situ measurements and laboratory testing results are provided in ***Appendix I***. The graphical plots of the monitoring results are shown in ***Appendix J***.

4.06 Monitoring results of 3 key parameters: dissolved oxygen (DO), turbidity and suspended solids (SS) in this Reporting Period, are summarized in ***Table 4-5***.

Table 4-5 Summaries of Water Quality Results – R1b

Sampling date	DO conc. (mg/L)	Turbidity (NTU)	SS (mg/L)
1-Mar-12	6.4	12.1	13.0
3-Mar-12	5.5	13.4	16.0
5-Mar-12	6.4	13.1	15.0
7-Mar-12	6.6	12.4	14.0
10-Mar-12	5.9	10.0	11.0
12-Mar-12	6.2	14.0	**32.0**
14-Mar-12	5.9	11.1	7.0
16-Mar-12	6.2	14.2	6.0
19-Mar-12	6.6	13.5	18.0
22-Mar-12	5.7	12.2	24.0
24-Mar-12	5.9	13.7	30.0
26-Mar-12	4.8	11.0	17.0
28-Mar-12	6.7	11.2	12.0
31-Mar-12	5.5	10.6	20.0

Remark: bold and underlined indicated Limit Level exceedance

4.07 In this Reporting Period, one (1) Limit Level exceedance of SS was recorded during water quality monitoring on 12 March 2012. Notification of exceedance (NOE) was issued to relevant parties upon confirmation of the results and investigation for the exceedance has been carried out subsequently.

4.08 According to the site information provided by the Contractor, construction activities within the DP site at Ha Tsuen Pumping Station during 12 March 2012 comprised re-bar fixing work and formwork, which is not considered highly likely to generate adverse water quality impacts. Water quality mitigation measures implemented within the DP site includes water treatment facility installed at the DP site for treatment of all the collected construction wastewater including surface runoff/groundwater/wheel washing etc. prior to discharge.

4.09 Our recent records of weekly site inspection on the DP site and water discharge status on 12 March 2012 reported by the Contractor confirm zero discharge from Ha Tsuen Pumping Station during the date of exceedance, which has been sustained since months ago when pumping of groundwater generated within the DP site was ceased in order to maintain the existing

groundwater level and all wastewater generated from the DP site was used for V-Tec operation.

4.10 It is therefore concluded that the exceedance of SS Limit Level on 12 March 2012 was not due to the works under the DP Project. No corrective action is therefore required.

4.11 During the Reporting Period, field measurements showed that water temperature and pH value of the local stream are within **14.2℃** to **18.8℃** and **8.4 to 8.7** respectively..

RESULTS OF LANDSCAPE AND VISUAL IMPACT

4.12 The landscape and visual impacts monitoring results and findings will be submitted separately as a stand-alone document.

RESULTS OF EFFLUENT MONITORING

4.13 A discharge license under Water Pollution Control Ordinance has been obtained by the Contractor upon commencement of the Project. The licensee shall perform self-monitoring as and when required by the Authority.

4.14 There was no site effluent discharged in this monthly period, therefore, no result of effluent monitoring was submitted by the Contractor.

5. WASTE MANAGEMENT

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

RECORDS OF WASTE QUANTITIES

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

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

5.03 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 5-1*** and ***5-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix K***. Whenever possible, materials were reused on-site as far as practicable.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) (m^3)	0	-
Reused in this Contract (Inert) (m^3)	0	-
Reused in other Projects (Inert) (m^3)	0	-
Disposal as Public Fill (Inert) (m^3)	2256	Tuen Mun Area 38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity	Disposal Location
Recycled Metal (kg)	0	-
Recycled Paper / Cardboard Packing (kg)	0	-
Recycled Plastic (kg)	0	-
Chemical Wastes (kg)	0	-
General Refuses (m^3)	1	NENT

5.04 There was no site effluent or surface runoff discharged in this monthly period.

5.05 To control over the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are in full compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual based on actual site conditions.

6. SITE INSPECTIONS

6.01 According to the Environmental Monitoring and Audit Manual, the environmental site inspection should be formulated by ET Leader. Regular environmental site inspections had been carried out by ET joined with the Contractor and ER to confirm the environmental performance. During this Reporting Period, the joint site inspection was undertaken on **6, 16, 20 and 27 March 2012** to evaluate the site environmental performance. No non-compliance was noted.

6.02 Observations for the site inspections and monthly audit found at Ha Tsuen Pumping Station within this Reporting Period are summarized in ***Table 6-1*** and inspection checklists are attached in ***Appendix L***.

Table 6-1 Site Observations in the Reporting Month

Date	Findings / Deficiencies	Follow-Up Status
6 March 2012	• Tree trunks and branches were used for supporting of shelters of construction plant within Ha Tsuen Pumping Station. Some trees within the site were also used for supporting ropes for drying washed clothes. Removal of the materials attached to the trees is required to protect the trees.	The materials attached to the trees or support of construction shelter found to be removed during site inspection on 16 March 2012.
16 March 2012	• Excessive accumulation of construction waste was observed within the site at Ha Tsuen Pumping Station. Regular clearance is reminded. • Soil trails were observed on the road near the entrance/exit. Wheel washing of the vehicles is required prior to exit the site.	• Excessive accumulation of construction waste was found to be cleared during site inspection on 27 March 2012. • Clearance of the dusty road surface was observed during site inspection on 20 March 2012. Besides, wheel washing bay was observed constructed at the exit of the site and put into operation on 27 March 2012
20 March 2012	• Excessive construction waste were observed at Ha Tsuen Pumping Station. Regular clearance is reminded.	Excessive accumulation of construction waste was found to be cleared during site inspection on 27 March 2012.
27 March 2012	• Dusty surface was observed within the site at Ha Tsuen Pumping Stations. Construction dust suppression measures is reminded during dusty construction activities under dry and windy conditions.	To be followed.

7. ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE

ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. The statistical summary table of environmental complaint is presented in ***Tables 7-1, 7-2*** and ***7-3***.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
Feb – Dec 2010	3	3	Air(2)/Noise(1)
Jan –Dec 2011	0	3	NA
Jan – Feb 2012	0	3	NA
Mar 2012	0	3	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
Feb – Dec 2010	0	0	NA
Jan –Dec 2011	0	0	NA
Jan – Feb 2012	0	0	NA
Mar 2012	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
Feb – Dec 2010	0	0	NA
Jan –Dec 2011	0	0	NA
Jan – Feb 2012	0	0	NA
Mar 2012	0	0	NA

8. IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste and they are summarized as following:

Dust Mitigation Measure

(a) The contractor shall frequently clean and water the site to minimize fugitive dust emissions.
(b) Effective water sprays shall be used during the delivery and handling of aggregate, and other similar materials, when dust is likely to be created and to dampen all sited material during dry and windy weather.
(c) Watering of exposed surfaces shall be exercised as often as possible depending on the circumstance.
(d) Areas within the site where there is regular movement of vehicles must be regularly watered as often as necessary for effective suppression of dust or as often as directed by the Engineer.
(e) Where dusty materials are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhausted fans shall be provided for this enclosure and vented to a suitable fabric filer system.
(f) The Contractor shall restrict all motorized vehicles within the site, excluding those on public roads, to a maximum speed of 5km per hour and confine haulage and delivery vehicles to designated roadways inside the site.
(g) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads, water in wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit detailed proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity in the site.
(h) Any material dropped in the roads will need to be cleaned up immediately to prevent dust nuisance.

Noise Mitigation Measure

(a) During construction of the Project, temporary noise barriers should be used in order to reduce the noise impacts emanating from the construction sites on nearby Noise Sensitive Receivers (NSRs). The location of the temporary noise barriers should be along the site boundary of the expanded portion of Ha Tsuen Pumping Station.
(b) Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical. Prolonged operation of noisy equipment close to dwellings and schools should be avoided.
(c) The Contractor should minimize construction noise exposure to the schools. Especially during examination periods, the Contractor should not carry out any construction activities. Activities shall be restricted to transit movements by construction vehicles during this period.
(d) Noisy plant or processes should be replaced by quieter alternatives where possible. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressors should be used.
(e) Noisy activities should be scheduled to minimize exposure of nearby sensitive receivers to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours).
(f) Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.
(g) The power units of non-electric stationary plant and earth-moving plant should be quietened by vibration isolation and partial or full acoustic enclosures for individual noise-generating components.

(h) Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided, thus reducing the cumulative impacts between operations. The numbers of operating items of powered mechanical equipment should be minimized.

(i) Construction plant should be properly maintained (well-greased, damage and worn parts promptly replaced) and operated. Construction equipment often has silencing measures built in or added on, e.g. bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilized. Where possible, rubber or damping materials should be introduced between metal panels to avoid rattle and reverberation of noise.

(j) Equipment known to emit sound strongly in one direction, should where possible, be oriented so that the noise is directed away from nearby NSRs.

(k) Material stockpiles and other structures (such as site offices) should be effectively utilized, where practicable, to screen noise from on-site construction activities.

(l) The Contractor should devise, arrange methods of working and carry out the works in such manner as to minimize noise impacts on the surrounding environment, and should provide experienced personnel with suitable training to ensure that these measures are implemented properly.

Water Quality Mitigation Measures

(a) Exposed stockpiles should be covered with tarpaulin or impervious sheets before a rainstorm occurs;

(b) The exposed soil surfaces should also be properly protected to minimise dust emission;

(c) The stockpiles of materials should be placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;

(d) Wheel washing facilities should be provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles;

(e) Provision of site drainage systems and treatment facilities would be required to minimize the water pollution;

(f) A discharge licence needs to be applied from EPD for discharging effluent from the construction site;

(g) The treated effluent quality is required to meet the requirements specified in the discharge licence;

(h) Provision of chemical toilets is required to collect sewage from workforce. The chemical toilets should be cleaned on a regular basis;

(i) Wastewater generated from kitchens should be discharged to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible;

(j) A licensed waste collector should be employed to clean the chemical toilets and temporary storage tank on a regular basis;

(k) Illegal disposal of chemicals should be strictly prohibited;

(l) Registration as a chemical waste producer is required if chemical wastes are generated and need to be disposed of. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes;

(m) Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance should be used as a guideline for handling chemical wastes; and

(n) The impact from accidental spillage of chemicals can be effectively controlled through good management practices.

Waste Mitigation Measures

(a) Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;

(b) To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce;
(c) Any unused chemicals or those with remaining functional capacity should be recycled;
(d) Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste utilised as fill material to minimise the quantity of waste to be disposed of to landfill;
(e) Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and
(f) Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.

Landscape and Visual Mitigation Measures

(a) Prior to construction work the detailed tree survey should have been completed and, if appropriate, trees to be transplanted moved to their final positions.
(b) The transplants and existing trees to be retained should be properly protected from damage by stout hoarding positioned as directed by a qualified Landscape Architect.
(c) Hoarding will help screen the construction work from the view of passers by.
(d) Typically a minimum of 4 months should be allowed prior to construction to prepare trees for transplanting.
(e) During construction regular inspections of the retained and transplanted trees should be made to ensure the effectiveness of the hoarding.
(f) Any topsoil excavated in the course of the works shall be stored and protected on site for reuse for restoration and screen planting works.

8.02 The Contractor had been implementing the required environmental mitigation measures according to the Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by the Contractor in this Reporting Period are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater were appropriately treated by treatment facilities; • Drainage channels were provided to convey run-off into the treatment facilities; • Drainage systems were regularly and adequately maintained. • De-silting facility was provided to treat the discharged water; also the treated water is reused for spraying the road surface; • Exposed stockpiles and exposed soil surfaces were covered with tarpaulin or impervious sheets to minimise dust emission; • The stockpiles of materials were placed in the locations away from the drainage channel so as to avoid releasing materials into the channel; • Wheel washing facilities has been provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles; • A discharge licence was issued by EPD for discharging effluent from the construction site; • A licensed waste collector have been applied from EPD; and • Illegal disposal of chemicals should be strictly prohibited

Issues	Environmental Mitigation Measures
Air Quality	• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; • Tarpaulin covering of any dusty materials on a vehicle leaving the site; • Water sprinkler system is provided at haul road to reduce dust emissions during the vehicles passing through the haul road' • The vehicle speed within the site is limited to 5km/hr; and • Wheel washing facilities have been provided at the site exit.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quite plant and working methods according to EP-329/2009; • Use of site hoarding with noise barriers to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs according to EP-329/2009; • Use of temporary noise barrier with surface density 7kg/m^2 to be assumed that the noise reduction is 10 dB(A) for stable plants and 5dB(A) for movable plant in accordance with approved EIA Report Appendix 4A Table 4A3.2; • Idle equipment are turned off or throttled down; • No construction works shall be undertaken during school examination period in the Ha Tsuen Pumping Station according to EP-329/2009; and • Alternative use of plant items within one worksite, where practicable.
Waste and Chemical Management	• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce; • Any unused chemicals or those with remaining functional capacity should be recycled; • Prior to disposal of C&D waste, wood, steel and other metals were separated for re-use and recycling and inert waste utilised as fill material to minimise the quantity of waste to be disposed of to landfill; • Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.
Landscape and Visual	The landscape and visual impacts monitoring results and findings will be submitted in the stand-alone document.
General	• The site was generally kept tidy and clean.

9. IMPACT FORCAST

KEY ISSUES FOR THE COMING MONTH

9.01 Key issues to be considered in the coming month include:

- Implementation of dust suppression measures at all times;
- Potential wastewater quality impact due to surface runoff;
- Potential fugitive dust quality impact from the dry/loose/exposure soil surface/dusty material;
- Disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby nullah or storm drainage, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures.

10. CONCLUSIONS AND RECOMMENTATIONS

CONCLUSIONS

10.01 This is the **26th** Monthly EM&A Report for the designated work of the Project, covering the construction period from **1** to **31 March 2012**.

10.02 No 1-hour TSP and 24-hour TSP monitoring results that triggered the Action or Limit Level was recorded in this Reporting Period.

10.03 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results exceeded the Limit Level were recorded in this Reporting Period.

10.04 For water quality monitoring, (1) Limit Level exceedance of SS was recorded on 12 March 2012. Notification of exceedance (NOE) was issued to relevant parties upon confirmation of the results and investigation for the exceedance has been carried out subsequently and concluded that the SS exceedance is not related to the works under the DP Project. No corrective action is therefore required.

10.05 No documented complaint, notification of summons or successful prosecution was received.

10.06 The ET had carried out a site inspection on **6, 16, 20 and 27 March 2012**. No non-compliance was observed during the inspections. In general, it was reminded that general housekeeping should be improved and dust mitigation measures should be fully implemented. Overall, the environmental performance of the Project was therefore considered satisfactory.

10.07 The landscape and visual impacts monitoring results and findings will be submitted separately as a stand-alone document. The Contractor is reminded that the landscape and visual impacts site audit shall be carried out by a competent landscape architect, as a member of ET to implement the EM&A programme.

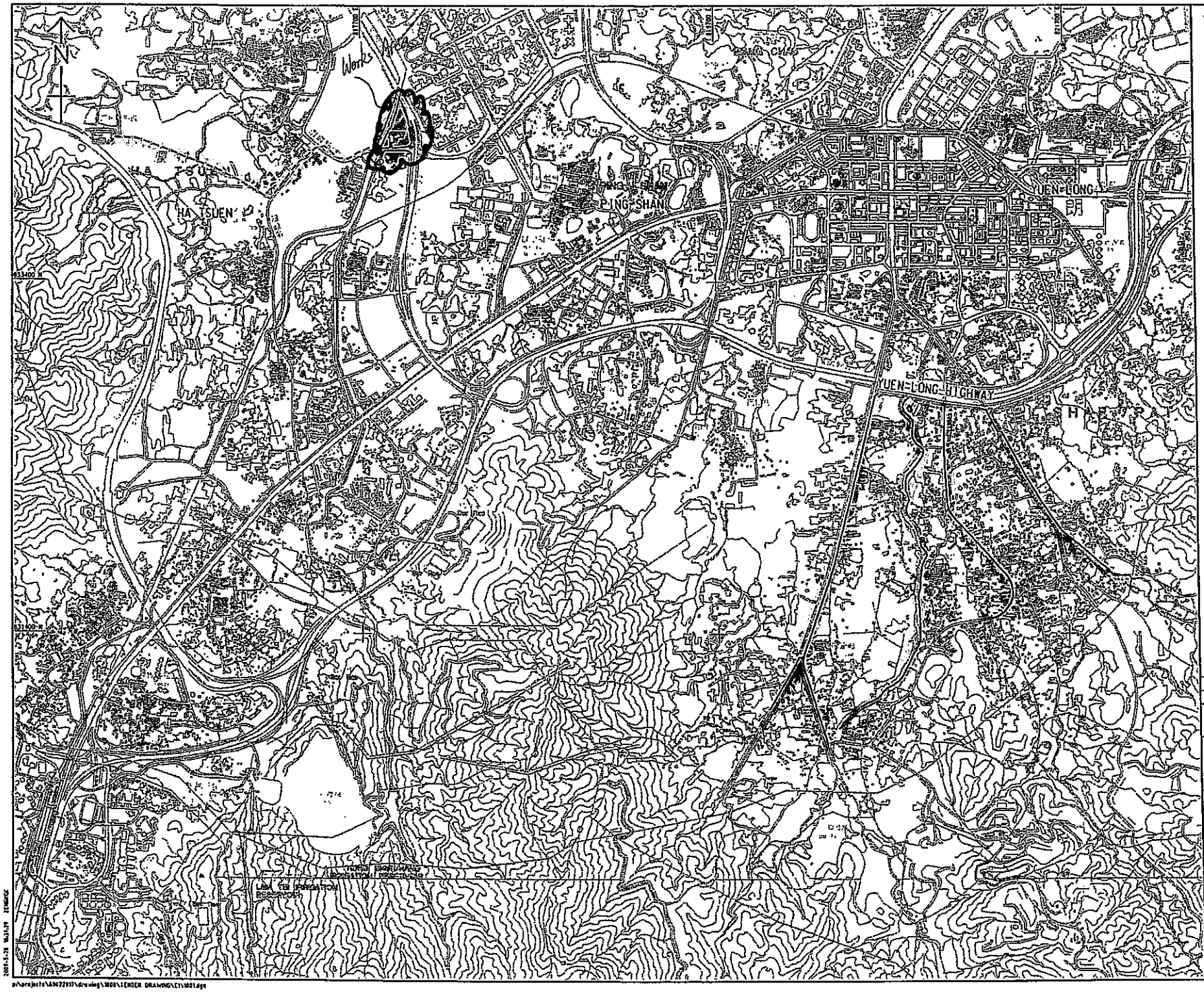
RECOMMENDATIONS

10.08 As wet season is approaching, muddy water or other water pollutants from site surface runoff into the local stream will be key environment issue. Therefore, water mitigation measures to prevent surface runoff into nearby water bodies should be paid on special attention. Moreover, mitigation measures should be properly maintained to avoid fugitive dust emissions from loose soil surface or haul road.

10.09 To control the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration.

Appendix A

Site Layout Plan



-	TENDER DRAWING	DSD/ACTS	05.09

DRAINAGE SERVICES DEPARTMENT,
THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION

YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL - CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

LOCATION PLAN

AECOM

DRG NO. 60022017/C1/1001

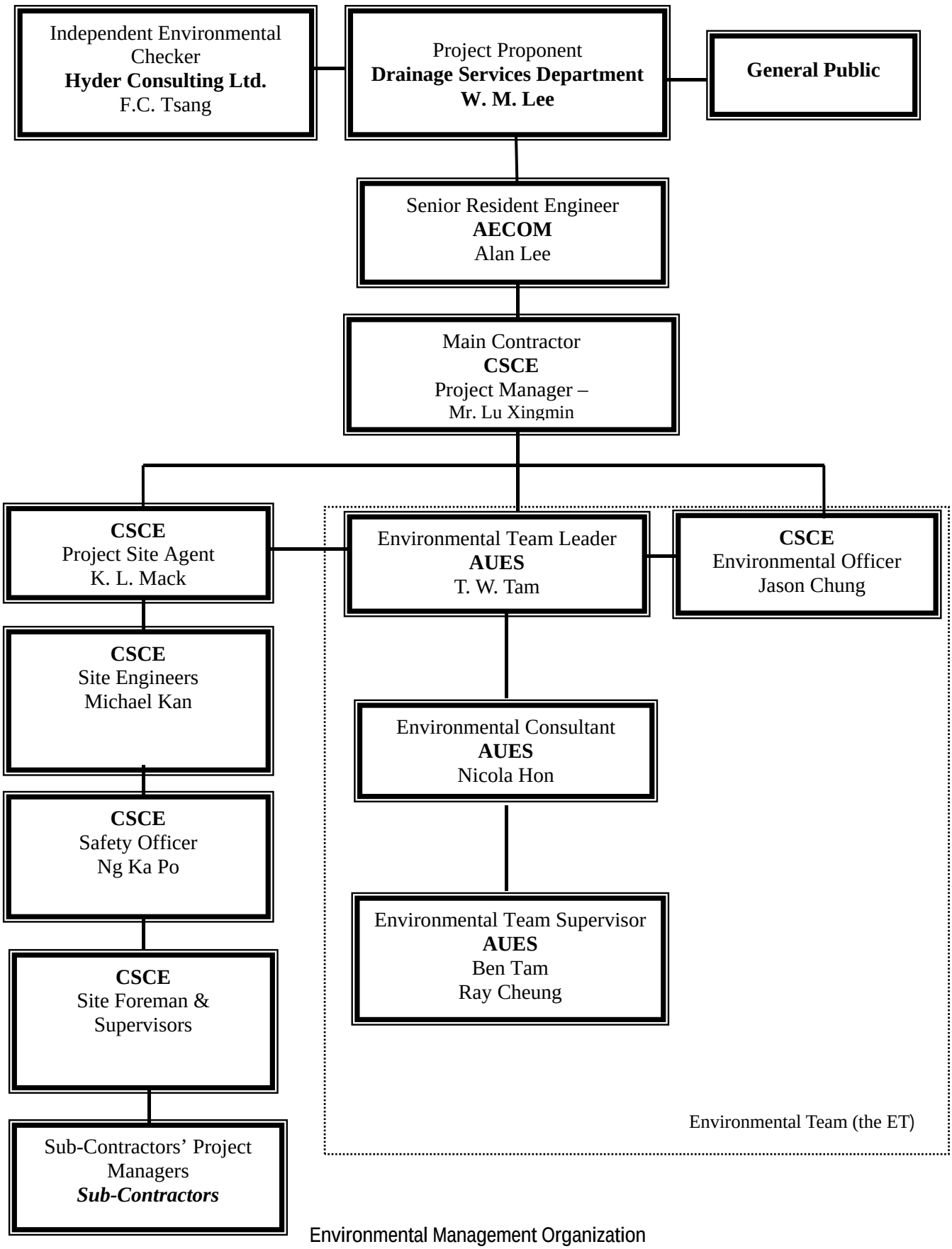
CONTRACT NO. DC/2009/08

SCALE AT A1 1 : 10000

METRES

Appendix B

On-site environmental management



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. W. M. Lee	--	2827-8700
AECOM	Senior Resident Engineer	Mr. Alan Lee	9706 9568	2472 0132
Hyder	Independent Environmental Checker	Dr. F C Tsang	2911 2744	2805 5028
CSCE	Project Manager	Mr. Lu Xingmin	2472 0113	2472-0229
CSCE	Site Agent	Mr. K L Mack	2472 0113	2472-0229
CSCE	Site Engineer	Mr. Michael Kan	2472 0113	2472-0229
CSCE	Environmental Officer	Mr. Jason Chung	2472 0113	2472-0229
CSCE	Environmental Supervisor	Mr. Chan Yau Pang	2472 0113	2472-0229
CSCE	Safety Officer	Mr. Ng Ka Po	2472 0113	2472-0229
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Assistance Environmental Consultant	Mr. Ray Cheung	2959-6059	2959-6079
AUES	Team Supervisor	Mr. Ben Tam	2959-6059	2959-6079

Legend:

DSD (Employer) – Drainage Services Department

AECOM (Engineer) – AECOM

CSCE (Main Contractor) – China State Construction Engineering (Hong Kong) Ltd

Hyder (IEC) – Hyder Consulting Limited

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

Appendix C

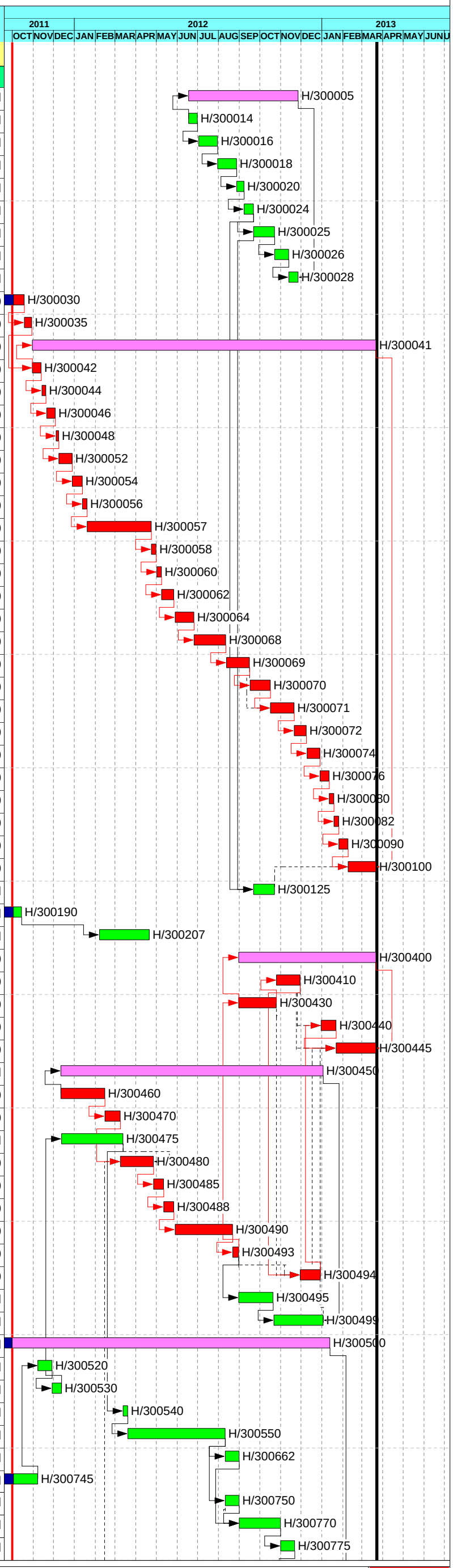
Master construction program

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Ha Tsuen Area

Rising Main

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
H/300005	Rising Main bet HTPS to ChC20	136 *	1	18JUN12	26NOV12	1d
H/300014	Sheet Piling bet HTPS to ChC20	12	1	18JUN12	30JUN12	1d
H/300016	Excavation and Shoring bet HTPS to ChC20	24	1	03JUL12	30JUL12	1d
H/300018	Pipe Laying bet HTPS to ChC20	24	1	31JUL12	27AUG12	1d
H/300020	Pipe Connection at ChC20	10	1	28AUG12	07SEP12	1d
H/300024	Cast Bend Block	12	1	08SEP12	21SEP12	1d
H/300025	Water Testing HTPS to C20	24	1	22SEP12	22OCT12	1d
H/300026	Backfill and Remove Sheet Pile HTPS to ChC20	18	1	23OCT12	12NOV12	1d
H/300028	Reinstatement HTPS to ChC20	12	1	13NOV12	26NOV12	1d
H/300030	XP Application for Flow Meter Chamber	75	1	16JUL11 A	18OCT11	0
H/300035	Obtain RA for TTA	10	1	19OCT11	29OCT11	0
H/300041	Rising Main bet ChC20 to ChC57	410 *	1	31OCT11	21MAR13	0
H/300042	Erect Temp Fence	12	1	31OCT11	12NOV11	0
H/300044	Remove Extg Fence	6	1	14NOV11	19NOV11	0
H/300046	Fell and Transplant Tree	12	1	21NOV11	03DEC11	0
H/300048	Remove Wheel Washing Bay	4	1	05DEC11	08DEC11	0
H/300052	Remove Existing Planter	15	1	09DEC11	28DEC11	0
H/300054	TTA for RM bet ChC20 to ChC57	12	1	29DEC11	12JAN12	0
H/300056	Remove U-channel and Catchpit	6	1	13JAN12	19JAN12	0
H/300057	Diversion of Existing Drainage	72	1	20JAN12	23APR12	0
H/300058	Trial Pits bet ChC20 to ChC57	6	1	24APR12	30APR12	0
H/300060	Relocation of Existing Gate Control Panel	6	1	02MAY12	08MAY12	0
H/300062	Sheet Piling bet ChC20 to ChC57	15	1	09MAY12	26MAY12	0
H/300064	Excavation and Shoring bet ChC20 to chC57	24	1	29MAY12	25JUN12	0
H/300068	Laying Pipe bet ChC20 to ChC57	40	1	26JUN12	11AUG12	0
H/300069	Construct Flow Meter Chamber	30	1	13AUG12	15SEP12	0
H/300070	Water Testing Ch20 to Ch57	24	1	17SEP12	16OCT12	0
H/300071	Backfill and Remove Sheet Pile	30	1	17OCT12	20NOV12	0
H/300072	New Catchpit and DN200 DI Pipe	16	1	21NOV12	08DEC12	0
H/300074	Power Supply Cable Duct and Draw Pit	15	1	10DEC12	28DEC12	0
H/300076	Extend U-channel	11	1	29DEC12	11JAN13	0
H/300080	Formation Work	6	1	12JAN13	18JAN13	0
H/300082	Reinstatement of Gate Control Panel	6	1	19JAN13	25JAN13	0
H/300090	Kerb and Footpath	12	1	26JAN13	08FEB13	0
H/300100	Reinstate ChC20 to ChC57	30	1	09FEB13	21MAR13	0
H/300125	Testing of RM bet station and extg valve chamber	24	1	22SEP12	22OCT12	91d
H/300190	ChA0 - ChA13: Reinstate Inside HTPS	12	1	16JUL11 A	14OCT11	129d
H/300207	Connection at Ch89	60	1	07FEB12	20APR12	129d
H/300400	Rising Main bet ch267 to ch280 & Washout Chamber	164 *	1	31AUG12	21MAR13	0
H/300410	Construct Washout Chamber	30	1	26OCT12	29NOV12	0
H/300430	Rising Main between ch280 to ch267	46	1	31AUG12	25OCT12	0
H/300440	Connection at ch267	18	1	31DEC12	21JAN13	0
H/300445	Reinstatement of Area	46	1	22JAN13	21MAR13	0
H/300450	Pipe Jacking between ch280 to ch387	312 *	1	12DEC11	02JAN13	16d
H/300460	Construct Jacking pit at ch280	48	1	12DEC11 *	14FEB12	0
H/300470	Setting up Pipe Jacking at ch280	20	1	15FEB12	08MAR12	0
H/300475	Preparation Works at Receiving Pit at Ch387	70	1	13DEC11	12MAR12	10d
H/300480	DN1500 Jacking Sleeve: Ch280 to Ch387	38	1	09MAR12	26APR12	0
H/300485	Demobilization of Jacking Plant	12	1	27APR12	11MAY12	0
H/300488	Setting up for Pipe Laying Ch280 to Ch387	12	1	12MAY12	26MAY12	0
H/300490	Install RM1200 bet ch280 to ch387	72	1	29MAY12	21AUG12	0
H/300493	Grouting bet RM and Pipe Sleeve	8	1	22AUG12	30AUG12	0
H/300494	Water Testing Ch267 to Ch387	24	1	30NOV12	29DEC12	0
H/300495	Insitu Bend at Ch387 and Backfill	42	1	31AUG12	20OCT12	16d
H/300499	Reinstatement of Area at ch387	60	1	22OCT12	02JAN13	16d
H/300500	Pipe Jacking between ch387 to ch815	790 *	1	14MAY10 A	12JAN13	53d
H/300520	Setting up Pipe Laying ch580 to 387 Stage 1	18	1	08NOV11	28NOV11	10d
H/300530	Install RM1200 bet 580 to ch387 Stage 1	12	1	29NOV11	12DEC11	10d
H/300540	Setting up Pipe Laying ch580 to 387 Stage 2	6	1	13MAR12	19MAR12	53d
H/300550	Install RM1200 bet 580 to ch387 Stage 2	116	1	20MAR12	10AUG12	53d
H/300662	Grouting bet RM and Pipe Sleeve Ch580 to 387	18	1	11AUG12	31AUG12	53d
H/300745	Install RM1200 bet ch815 to ch580	215	1	30APR11 A	07NOV11	10d
H/300750	Grouting bet RM and Pipe Sleeve ch580 to 815	18	1	11AUG12	31AUG12	53d
H/300770	Bend Block and Access Chamber at ch580	50	1	01SEP12	31OCT12	53d
H/300775	Backfill / Remove Sheet Pile at ch580	18	1	01NOV12	21NOV12	53d



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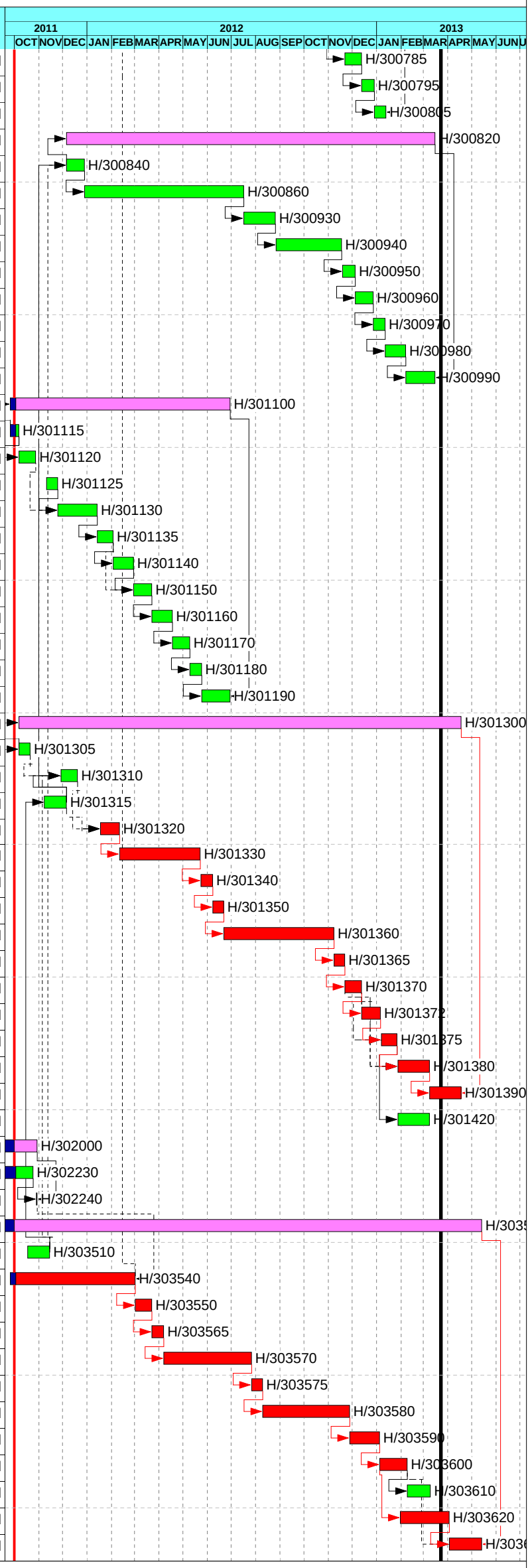
Programme of Works (Rev. 06) - Ha Tsuen Rising Main

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
H/300785	Reinstate Box Culvert at ch580	18	1	22NOV12	12DEC12	53d
H/300795	Reinstate Planter	12	1	13DEC12	28DEC12	53d
H/300805	Bamboo Planting	12	1	29DEC12	12JAN13	53d
H/300820	RM between ch900 to ch815	374 *	1	06DEC11	15MAR13	5d
H/300840	Setting up at ch900	18	1	06DEC11	28DEC11	5d
H/300860	Excavation ch900 to ch825	158	1	29DEC11	16JUL12	5d
H/300930	Excavation between Ch815 to ch825	35	1	17JUL12	25AUG12	5d
H/300940	Pipe Laying between ch830 to ch900	70	1	27AUG12	17NOV12	5d
H/300950	Pipe Laying between ch815 to ch830	14	1	19NOV12	04DEC12	5d
H/300960	Pipe Connection and Bend Block at Ch830	18	1	05DEC12	27DEC12	5d
H/300970	Grouting between Ch815 to Ch900	12	1	28DEC12	11JAN13	5d
H/300980	Pipe Connection and Bend Block at Ch815	22	1	12JAN13	06FEB13	5d
H/300990	Backfill and Reinstatement at Ch815 and Ch825	27	1	07FEB13	15MAR13	5d
H/301100	RM between Ch1192 to Ch1156	222 *	1	26SEP11 A	29JUN12	216d
H/301115	Sheet Piling bet Ch1156 to Ch1172	8	1	26SEP11 A	06OCT11	36d
H/301120	Excavation bet Ch1156 to Ch1172	18	1	07OCT11	27OCT11	216d
H/301125	Setting up for Heading Excavation at Ch1172	12	1	11NOV11	24NOV11	216d
H/301130	Excavation between Ch1172 to Ch1192	40	1	25NOV11	13JAN12	216d
H/301135	Setting up for Pipe Laying Ch1172 to Ch1192	12	1	14JAN12	02FEB12	216d
H/301140	Pipe Laying between Ch1172 to ch1192	22	1	03FEB12	28FEB12	216d
H/301150	Pipe Connection at Ch1192	20	1	29FEB12	22MAR12	216d
H/301160	Pipe Laying between Ch1156 to 1172	18	1	23MAR12	17APR12	216d
H/301170	Pipe Connection at Ch1172	18	1	18APR12	09MAY12	216d
H/301180	Grouting between Ch1172 to 1192	12	1	10MAY12	24MAY12	216d
H/301190	Backfill and Reinstatement at Ch1192	30	1	25MAY12	29JUN12	216d
H/301300	Pipe Line between ch 1140 to ch900	449 *	1	07OCT11	17APR13	-19d
H/301305	Sheet Piling Ch1130 to 1140	12	1	07OCT11	20OCT11	36d
H/301310	Construct Jacking Pit at Ch1130	18	1	29NOV11	19DEC11	3d
H/301315	Construct Receiving Pit at Ch900	24	1	08NOV11	05DEC11	3d
H/301320	Setting up at Ch1130	16	1	18JAN12	10FEB12	-19d
H/301330	DN1500 Jacking Sleeve: Ch1130 to Ch900	82	1	11FEB12	22MAY12	-19d
H/301340	Demobilize Jacking Plant at Ch1130	12	1	24MAY12	07JUN12	-19d
H/301350	Setting up for Pipe Laying Ch1130 to Ch900	12	1	08JUN12	21JUN12	-19d
H/301360	Install Pipe between Ch1130 to ch900	116	1	22JUN12	07NOV12	-19d
H/301365	Pipe Laying bet Ch1135 to ch1140	12	1	08NOV12	21NOV12	-19d
H/301370	Grouting between Ch1130 to Ch900	18	1	22NOV12	12DEC12	-19d
H/301372	Pipe Connection at ch1135	18	1	13DEC12	05JAN13	-19d
H/301375	Bend Block at Ch1130	18	1	07JAN13	26JAN13	-19d
H/301380	Access Chamber at Ch904	30	1	28JAN13	08MAR13	-19d
H/301390	Backfill and Reinstatement at ch900	30	1	09MAR13 *	17APR13	-19d
H/301420	Backfill and Reinstatement at Ch1130	30	1	28JAN13	08MAR13	11d
H/302000	Pipe jacking between ch 1615 to ch1793	497 *	1	23FEB10 A	29OCT11	58d
H/302230	Backfill / Reinstatement at ch1680	24	1	22JUL11 A	24OCT11	58d
H/302240	Road Opening at Ch1680	1	1	29OCT11	29OCT11	58d
H/303500	Pipe Jacking between Ch1610 to Ch1256	571 *	1	06JUN11 A	13MAY13	-40d
H/303510	Construct Receiving Pit at Ch1256	24	1	18OCT11	14NOV11	3d
H/303540	DN1500 Jacking Sleeve Ch1610 to Ch1256	128	1	26SEP11 A	01MAR12	-40d
H/303550	Demobilize Jacking Plant at Ch1610	18	1	02MAR12	22MAR12	-40d
H/303565	Setting up Pipe Laying at Ch1610	12	1	23MAR12	06APR12	-40d
H/303570	Pipe Laying between Ch1610 to Ch1440	88	1	07APR12	26JUL12	-40d
H/303575	Setting up bet Ch1440 to 1256	12	1	27JUL12	09AUG12	-40d
H/303580	Pipe Laying between Ch1440 to Ch1256	92	1	10AUG12	27NOV12	-40d
H/303590	Connection at Ch1615 to 1621 and Ch1256	30	1	28NOV12	04JAN13	-40d
H/303600	Construct Access Chamber at Ch1610 and 1256	30	1	05JAN13	08FEB13	-40d
H/303610	Grouting between Ch1610 to Ch1256	20	1	09FEB13	09MAR13	10d
H/303620	Water Test of Rising Main	48	1	31JAN13 *	02APR13	-40d
H/303640	Backfill & Reinstatement at Ch1615 to 1621& 1256	30	1	03APR13	13MAY13	-40d



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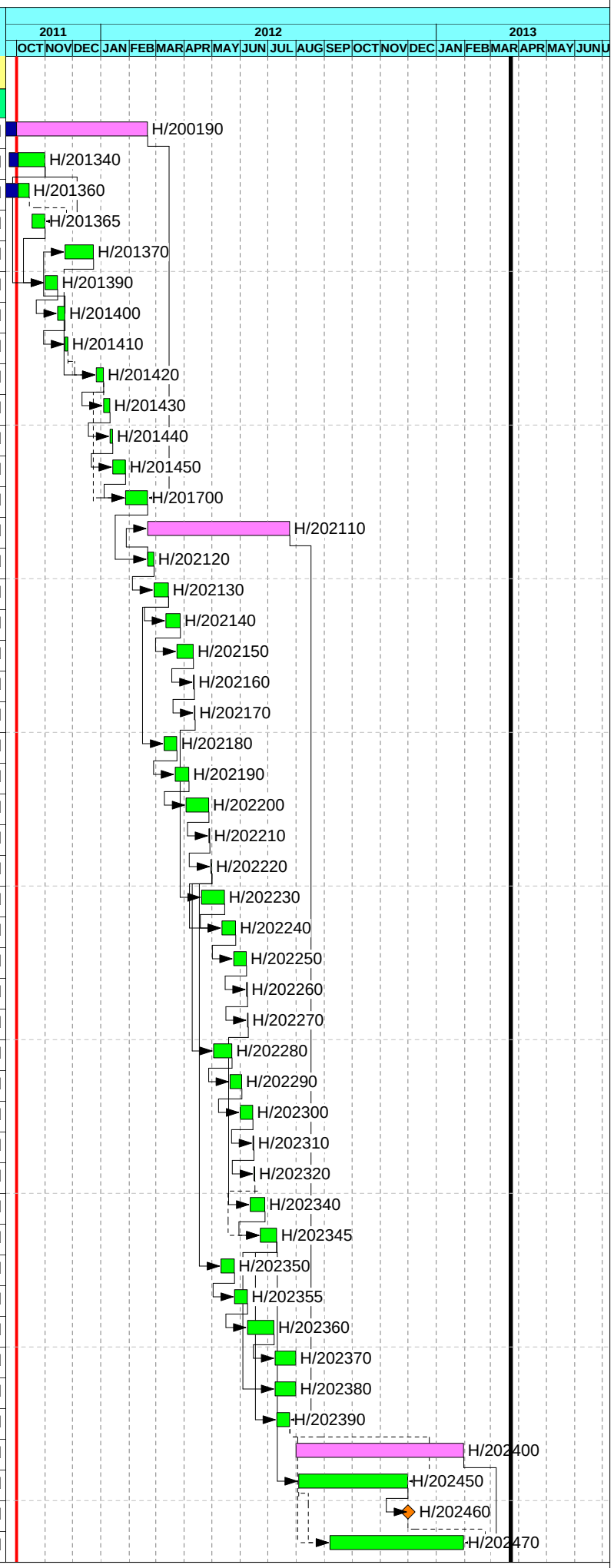
Programme of Works (Rev. 06) - Ha Tsuen Rising Main

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
Ha Tsuen Area						
Pumping Station						
H/200190	Substructure	278 *	4	01MAR11 A	20FEB12	6d
H/201340	Wall at Coarse Screen Channel Chamber (7th Pour)	26	4	23SEP11 A	31OCT11	6d
H/201360	Complete Dry Well (9th Pour) and ground floor	12	4	14SEP11 A	14OCT11	15d
H/201365	Floor Slab at +2.65 (10th Pour)	12	4	18OCT11	31OCT11	6d
H/201370	Complete Remaining Chamber Wall (11th Pour)	27	4	23NOV11	23DEC11	6d
H/201390	Backfill up to Bottom of Middle Strut	12	4	01NOV11	14NOV11	6d
H/201400	Remove Middle Strut	7	4	15NOV11	22NOV11	6d
H/201410	Touch up Left-in Mid Strutting Area	3	4	23NOV11	25NOV11	30d
H/201420	Backfill up to Bottom of Top Strut	6	4	27DEC11	03JAN12	6d
H/201430	Remove Top Strut	6	4	04JAN12	10JAN12	6d
H/201440	Touch up Left-in Top Strutting Area	3	4	11JAN12	13JAN12	6d
H/201450	Backfill up to Ground Level	7	4	14JAN12	27JAN12	6d
H/201700	Remove Sheet Pile and Backfill	20	4	28JAN12	20FEB12	6d
H/202110	Superstructure	115 *	4	21FEB12	24JUL12	6d
H/202120	Temporary Platform and Scaffolding	6	4	21FEB12	27FEB12	6d
H/202130	Internal Formwork Lower Wall 1	14	4	28FEB12	14MAR12	6d
H/202140	Steel Fixing Lower Wall 1	14	4	12MAR12	27MAR12	6d
H/202150	External Formwork Lower Wall 1	14	4	24MAR12	10APR12	6d
H/202160	Cleaning and Checking Lower Wall 1	1	4	11APR12	11APR12	6d
H/202170	Concrete to Lower Wall 1	1	4	12APR12	12APR12	6d
H/202180	Internal Formwork Lower Wall 2	12	4	10MAR12	23MAR12	6d
H/202190	Steel Fixing Lower Wall 2	12	4	22MAR12	05APR12	6d
H/202200	External Formwork Lower Wall 2	12	4	03APR12	27APR12	6d
H/202210	Cleaning and Checking Lower Wall 2	1	4	28APR12	28APR12	6d
H/202220	Concrete to Lower Wall 2	1	4	30APR12	30APR12	6d
H/202230	Internal Formwork Upper Wall 1	12	4	20APR12	14MAY12	6d
H/202240	Steel Fixing Upper Wall 1	12	4	12MAY12	26MAY12	6d
H/202250	External Formwork Upper Wall 1	12	4	25MAY12	07JUN12	6d
H/202260	Cleaning and Checking Upper Wall 1	1	4	08JUN12	08JUN12	6d
H/202270	Concrete to Upper Wall 1	1	4	09JUN12	09JUN12	6d
H/202280	Internal Formwork Upper Wall 2	12	4	03MAY12	22MAY12	7d
H/202290	Steel Fixing Upper Wall 2	12	4	21MAY12	02JUN12	7d
H/202300	External Formwork Upper Wall 2	12	4	01JUN12	14JUN12	7d
H/202310	Cleaning and Checking Upper Wall 2	1	4	15JUN12	15JUN12	7d
H/202320	Concrete to Upper Wall 2	1	4	16JUN12	16JUN12	7d
H/202340	Roof Slab 1	14	4	12JUN12	27JUN12	6d
H/202345	Roof Slab 2	14	4	23JUN12	10JUL12	6d
H/202350	Trench at Transformer and Switch Room	12	4	11MAY12	25MAY12	38d
H/202355	Ground Floor to Transformer and Switch Room	12	4	26MAY12	08JUN12	38d
H/202360	Wall and roof to Transformer and Switch Room	24	4	09JUN12	07JUL12	38d
H/202370	Remove temp support in Transformer and SR	20	4	09JUL12	31JUL12	38d
H/202380	Staircase	20	4	09JUL12	31JUL12	38d
H/202390	Parapet	12	4	11JUL12	24JUL12	6d
H/202400	Architectural Finishes	152 *	4	01AUG12	30JAN13	38d
H/202450	Internal Finishes	100	4	04AUG12	30NOV12	67d
H/202460	Handover of Pumping Station	0	4		30NOV12	87d
H/202470	External Finishes	120	4	07SEP12	30JAN13	38d



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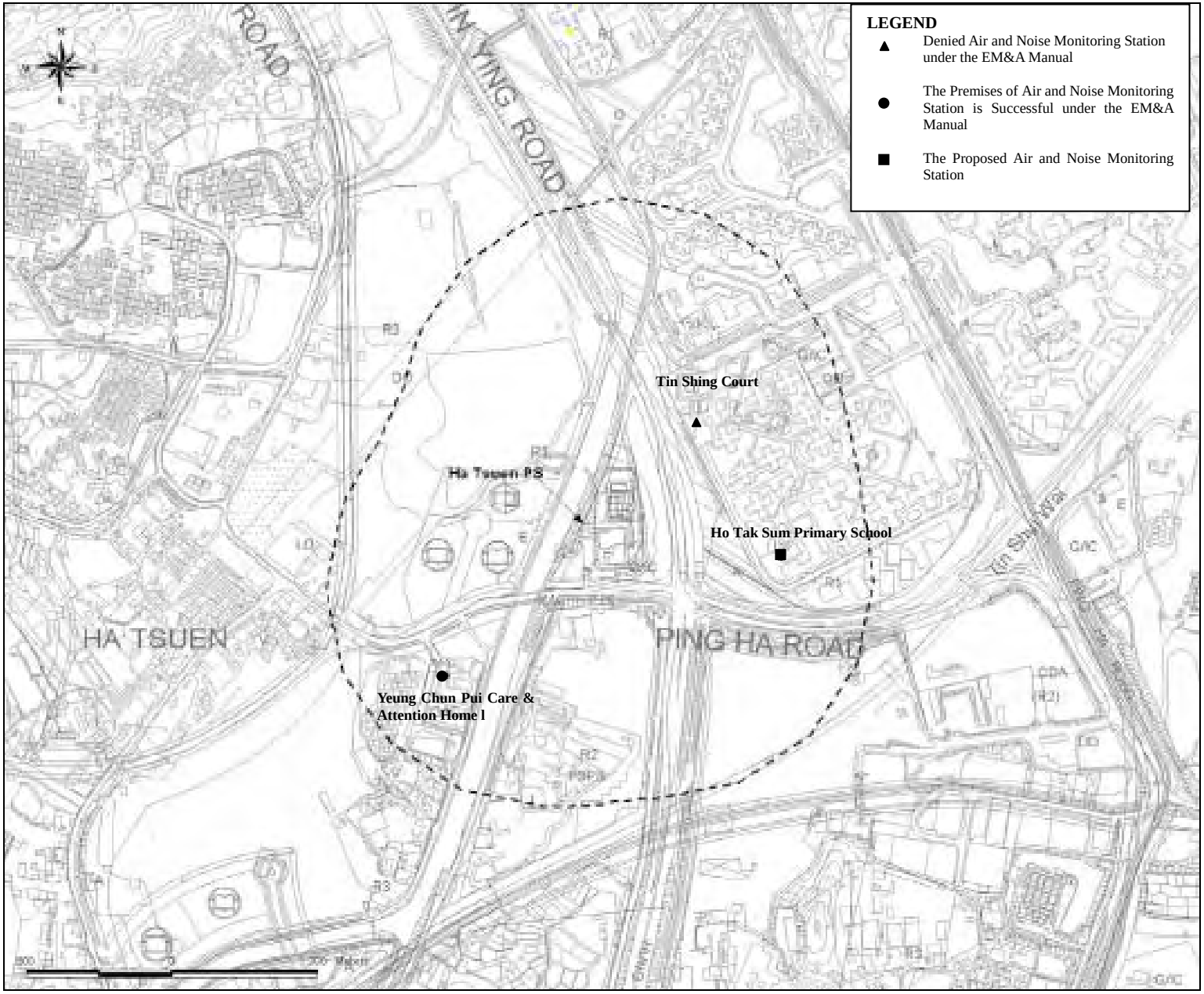
Programme of Works (Rev. 06) - Ha Tsuen Sewage Pumping Station

中國建築 CHINA STATE CONSTRUCTION

Appendix D

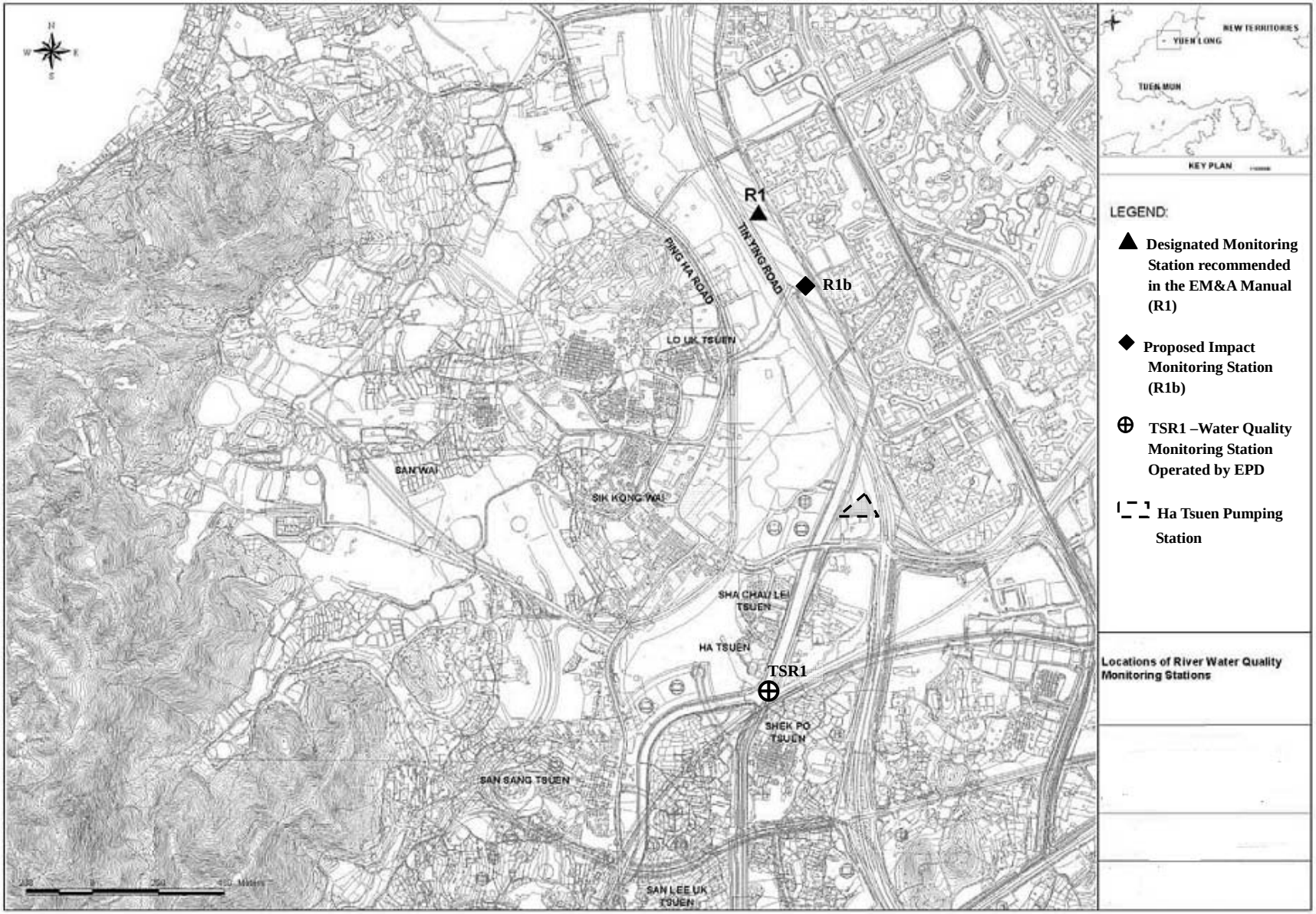
Monitoring Location of EM&A Programme


LEGEND
Denied Air and Noise Monitoring Station under the EM&A Manual
The Premises of Air and Noise Monitoring Station is Successful under the EM&A Manual
The Proposed Air and Noise Monitoring Station
Tin Shing Court
Ha Tsuen PS
Ho Tak Sum Primary School
Yeung Chun Pui Care & Attention Home l
HA TSUEN
PING HA ROAD
IN YING ROAD

DSD Contract No. DC/2009/08 – Construction of Yuen Long South Branch Sewers And Extension of Ha Tsuen Sewage Pumping Station

Proposed Water Quality Monitoring Location

AUES



Appendix E

Calibration certificates

Equipment Calibration Certificates List

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	Thermo Anderson Model GS2310 TSP high volume air sampling system (AM1 - Ho Tak Sum Primary School)	2 Feb12	2 Apr 12
2		Thermo Anderson Model GS2310 TSP high volume air sampling system (AM2 Yeung Chun Pui Care & Attention Home)	28 Feb 12	28 Apr 12
3		Calibration Kit TISCH Model TE-5025A Orifice ID 1941 and Rootsmeter S/N 0438320	2 Jun 11	2 Jun 12
4		TSI DustTrak Model 8520 (Serial number: 23079)	13 Sep 11	13 Sep 12
5	Noise	Bruel & Kjaer 4231 Acoustical Calibrator (Serial number 2713428)	19 Apr 11	19 Apr 12
6		Bruel & Kjaer 2238 Integrating Sound Level Meter (Serial number: 2285721)	19 Apr 11	19 Apr 12
7	Water	Turbidimeter Hach 2100q (Serial Number: 11030C008499)	9 Jan 12	9 Apr 12
8		YSI Professional Plus (Serial number" 10G101946)	16 Feb 12	16 May 12

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location: Lions Clubs International Ho Tak Sum Primary School
Location ID : AM1

Date of Calibration: 2-Feb-12
Next Calibration Date: 2-Apr-12
Technician: Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1021.5	Corrected Pressure (mm Hg)	766.125
Temperature (°C)	16.0	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11693
Model->	5025A	Qstd Intercept ->	-0.02568
Calibration Date->	2-Jun-11	Expiry Date->	2-Jun-12

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	4.8	4.8	9.6	1.504	50	51.76
13	3.7	3.7	7.4	1.322	44	45.55
10	2.5	2.5	5	1.089	36	37.27
7	1.8	1.8	3.6	0.926	28	28.99
5	1.2	1.2	2.4	0.758	21	21.74

LINEAR REGRESSION

Slope = 40.4082
Intercept = -8.1922
Corr. coeff. = 0.9971

Calculations :

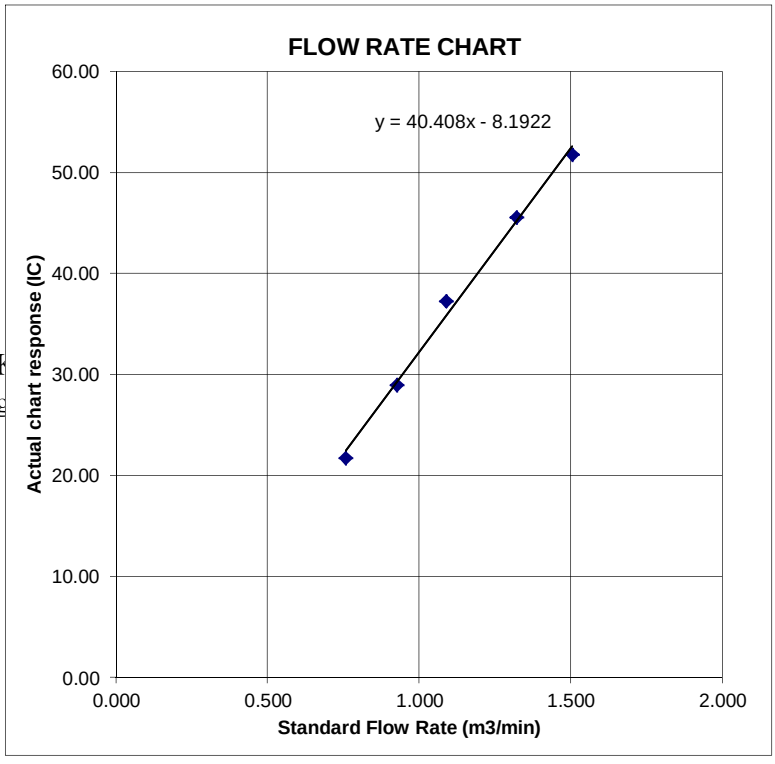
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 : Yeung Chun Pui Care & Attention Home
Location ID : AM2

Date of Calibration: 28-Feb-12
Next Calibration Date: 28-Apr-12
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1013.2	Corrected Pressure (mm Hg)	759.9
Temperature (°C)	13.0	Temperature (K)	286

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11693
Model->	5025A	Qstd Intercept ->	-0.02568
Calibration Date->	2-Jun-11	Expiry Date->	2-Jun-12

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.5	4.5	9.0	1.459	49	51.05	Slope = 38.6556
13	3.5	3.5	7.0	1.288	42	43.76	Intercept = -5.8585
10	2.6	2.6	5.2	1.112	36	37.51	Corr. coeff. = 0.9960
7	2	2	4.0	0.976	29	30.21	
5	1.0	1.0	2.0	0.694	21	21.88	

Calculations :

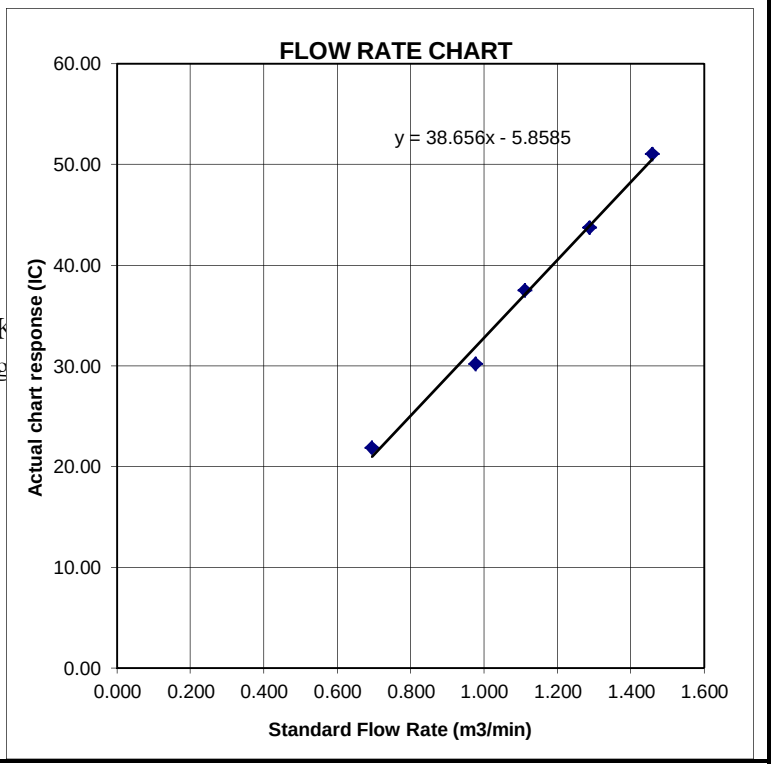
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jun 02, 2011 Rootsmeter S/N 0438320 Ta (K) - 294
Operator Tisch Orifice I.D. - 1941 Pa (mm) - 754.38

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	1.4660	3.3	2.00
2	NA	NA	1.00	1.0410	6.4	4.00
3	NA	NA	1.00	0.9310	8.1	5.00
4	NA	NA	1.00	0.8830	8.9	5.50
5	NA	NA	1.00	0.7310	13.0	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0017	0.6833	1.4185		0.9956	0.6791	0.8829
0.9975	0.9582	2.0061		0.9914	0.9524	1.2486
0.9952	1.0690	2.2429		0.9892	1.0625	1.3959
0.9942	1.1260	2.3524		0.9882	1.1191	1.4641
0.9887	1.3526	2.8371		0.9827	1.3444	1.7657
Qstd slope (m) =		2.11693		Qa slope (m) =		1.32558
intercept (b) =		-0.02568		intercept (b) =		-0.01598
coefficient (r) =		0.99993		coefficient (r) =		0.99993
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}

CERTIFICATE OF CALIBRATION AND TESTING

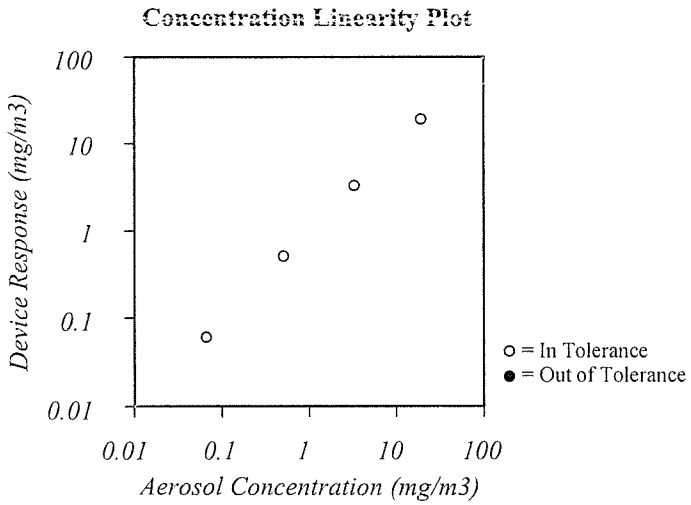
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Condition		
Temperature	68.7 (20.4)	°F (°C)
Relative Humidity	41	%RH
Barometric Pressure	28.98 (981.4)	inHg (hPa)

Model	**8520**
Serial Number	**23079**

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance



System ID: DTII01-02

Zero Stability Results

Average:	Minimum:	Maximum:	Time:
0.000 :mg/m³	0.000 :mg/m³	0.001 :mg/m³	4:00 :hrs.

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust) Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Barometric Pressure	E003733	01-15-11	02-15-12
Humidity	E002873	11-24-10	11-24-11
DC Voltage	E003315	01-05-11	01-05-12
Microbalance	E001324	01-04-11	01-04-12
Flowmeter	E003769	06-13-11	06-13-12

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E002873	11-24-10	11-24-11
DC Voltage	E003314	01-05-11	01-05-12
Photometer	E003319	07-25-11	01-25-12
Pressure	E003511	11-12-10	11-12-11

T. Thao
Calibrated

☑ Final Function Check

September 13, 2011
Date

TSI P/N 2300157

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

Certificate No. : C112202

Certificate of Calibration

This is to certify that the equipment

Description : Integrating Sound Level Meter (EQ010)

Manufacturer : Bruel & Kjaer

Model No. : 2238

Serial No. : 2285721

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C112202.

The equipment is supplied by

Co. Name : Action-United Environmental Services and Consulting

Address : Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

Date of Issue : 19 April 2011

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Report No. : C112202

Calibration Report

ITEM TESTED

DESCRIPTION : Integrating Sound Level Meter (EQ010)
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 2238
SERIAL NO. : 2285721

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 18 April 2011 ***JOB NO.*** : IC11-0947

TEST RESULTS

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by : *L L Cheung* *Date : 19 April 2011*

Report No. : C112202

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the B & K Acoustic Calibrator 4231, S/N : 2713428 was performed before the test.

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	C110018
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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.

Report No. : C112202

Calibration Report

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			94.1	± 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	101.9	-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	54.6	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-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	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

Report No. : C112202

Calibration Report

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	91.1	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	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	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-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	Time Weighting	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	89.6	± 0.5
			60 sec.			$1/10^3$		80	79.3	± 1.0
			5 min.			$1/10^4$		70	69.9	± 1.0

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

- Uncertainties of Applied Value :

94 dB :	31.5 Hz - 125 Hz	: ± 0.40 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz	: ± 0.40 dB
	4 kHz	: ± 0.50 dB
	8 kHz	: ± 0.70 dB
	12.5 kHz	: ± 1.20 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 Calibration Report 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.

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

Certificate No. : C112201

Certificate of Calibration

This is to certify that the equipment

Description : Acoustical Calibrator (EQ082)

Manufacturer : Bruel & Kjaer

Model No. : 4231

Serial No. : 2713428

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C112201.

The equipment is supplied by

Co. Name : Action-United Environmental Services and Consulting

Address : Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

Date of Issue : 19 April 2011

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Report No. : C112201

Calibration Report

ITEM TESTED

DESCRIPTION : Acoustical Calibrator (EQ082)
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 4231
SERIAL NO. : 2713428

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 18 April 2011 ***JOB NO.*** : IC11-0947

TEST RESULTS

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by : *L L Cheung* *Date : 19 April 2011*

Report No. : C112201

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 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	C103289
CL281	Multifunction Acoustic Calibrator	C1006860
TST150A	Measuring Amplifier	C101008

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 Calibration Report 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.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR RAY CHEUNG	**WORK ORDER:**	HK1200383
CLIENT:	ACTION UNITED ENVIRO SERVICES	**LABORATORY:**	HONG KONG
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**DATE RECEIVED:**	05/01/2012
		DATE OF ISSUE:	10/01/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Turbidity
Description:	Turbidimeter
Brand Name:	HACH
Model No.:	2100Q
Serial No.:	11030C008499
Equipment No.:	--
Date of Calibration:	09 January, 2012

NOTES

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.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1200383
Date of Issue: 10/01/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: --
Date of Calibration: 09 January, 2012 Date of next Calibration: 09 April, 2012

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.15	--
4	4.19	4.8
40	39.3	-1.8
80	78.9	-1.4
400	370	-7.5
800	817	2.1
	Tolerance Limit (±%)	10.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1204157
CLIENT:	ACTION UNITED ENVIRO SERVICES	**AMENDMENT:**	1
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	10/02/2012
		DATE OF ISSUE:	23/02/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity and Temperature
Description:	YSI Professional Plus
Brand Name:	YSI
Model No.:	YSI Professional Plus
Serial No.:	10G101946
Equipment No.:	--
Date of Calibration:	16 February, 2012

NOTES

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.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1204157
Amendment: 1
Date of Issue: 23/02/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: YSI Professional Plus
Brand Name: YSI
Model No.: YSI Professional Plus
Serial No.: 10G101946
Equipment No.: --
Date of Calibration: 16 February, 2012 Date of next Calibration: 16 May, 2012

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
7.00	6.90	-0.1
7.40	7.22	-0.18
8.85	8.70	-0.15
	Tolerance Limit (±mg/L)	0.20

pH Value **Method Ref: APHA (21st edition), 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.96	-0.04
7.0	7.00	0.00
10.0	10.01	0.01
	Tolerance Limit (±unit)	0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	9.83	-1.7
20	19.35	-3.2
30	29.66	-1.1
	Tolerance Limit (±%)	10.0

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
10.0	10.0	0.0
21.5	21.0	-0.5
31.0	30.9	-0.1
	Tolerance Limit (°C)	2.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Appendix F

Meteorological information

Meteorological Data Extracted from HKO during the Reporting Period

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Mar-12	Thu	Cloudy.	Trace	17.1	8.5	85.5	1-Mar-12
2-Mar-12	Fri	Coastal fog and one or two light rain patches at first.	0	20.2	11	82	2-Mar-12
3-Mar-12	Sat	Moderate easterly winds.	0.2	20.7	14	81.5	3-Mar-12
4-Mar-12	Sun	Moderate east to southeasterly winds.	0.5	22.3	12	76.7	4-Mar-12
5-Mar-12	Mon	Mainly cloudy with coastal mist.	Trace	23.9	9.2	77.5	5-Mar-12
6-Mar-12	Tue	Moderate easterly winds.	0.3	25.6	16.2	78.7	6-Mar-12
7-Mar-12	Wed	Mainly cloudy with a few light rain patches.	Trace	22.9	22	78.5	7-Mar-12
8-Mar-12	Thu	Moderate to fresh easterly winds.	3.3	28.5	10.2	91.5	8-Mar-12
9-Mar-12	Fri	Mainly cloudy with coastal mist.	0.2	14.9	12.9	89.5	9-Mar-12
10-Mar-12	Sat	Mainly cloudy with a few light rain patches.	Trace	12.5	11	91	10-Mar-12
11-Mar-12	Sun	Moderate east to northeasterly winds, freshening gradually.	8.4	12	10	90	11-Mar-12
12-Mar-12	Mon	Moderate northeasterly winds	6.6	12.1	9.5	90.5	12-Mar-12
13-Mar-12	Tue	Cloudy with mist and a few light rain patches.	1.7	14.5	7.5	85.5	13-Mar-12
14-Mar-12	Wed	Cloudy with mist and a few light rain patches.	Trace	17.8	8.3	79.2	14-Mar-12
15-Mar-12	Thu	Fresh easterly winds	0.6	19.7	12.4	76.5	15-Mar-12
16-Mar-12	Fri	Cloudy with fog.	0.2	23.8	7	77.5	16-Mar-12
17-Mar-12	Sat	Light to moderate easterly winds.	Trace	23.2	8.2	76	17-Mar-12
18-Mar-12	Sun	Cloudy and misty.	0	24.5	9.8	74	18-Mar-12
19-Mar-12	Mon	Moderate easterly winds, occasionally fresh offshore.	Trace	23.7	10.7	75	19-Mar-12
20-Mar-12	Tue	Cloudy.	Trace	22.5	9	78	20-Mar-12
21-Mar-12	Wed	Mainly cloudy with a few mist patches.	Trace	21.3	16.1	75	21-Mar-12
22-Mar-12	Thu	Moderate to fresh easterly winds	Trace	24.4	15.7	68	22-Mar-12
23-Mar-12	Fri	Fresh easterly winds	0	20.4	20	79.2	23-Mar-12
24-Mar-12	Sat	Cloudy with fog.	0.1	17.2	17.4	51	24-Mar-12
25-Mar-12	Sun	Moderate to fresh easterly winds	0	19.2	16.5	47	25-Mar-12
26-Mar-12	Mon	Cloudy and misty.	0	20.7	14.2	38.5	26-Mar-12
27-Mar-12	Tue	Mainly cloudy with a few mist patches.	0	22.5	15	45.5	27-Mar-12
28-Mar-12	Wed	Mainly cloudy with relatively low visibility.	0	23.1	18.4	49.5	28-Mar-12
29-Mar-12	Thu	Sunny intervals	0	24.5	13	58.7	29-Mar-12
30-Mar-12	Fri	Moderate easterly winds	0	24	9.1	77	30-Mar-12
31-Mar-12	Sat	Mainly cloudy with relatively low visibility.	Trace	22.5	8.1	79	31-Mar-12

Remark: The local wind speed was checked with a portable wind speed meter during the course of construction noise monitoring.

Appendix G

Event and Action Plan

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded for one sample	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures are properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level being exceeded for one sample	1. Identify source; 2. Inform IEC, ER and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions; 6. Keep EPD and ER informed of the results.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with IEC and Contractor on potential remedial actions; 5. Ensure remedial actions properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC, ER and EPD the causes & actions taken for the exceedances; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss with IEC and the Contractor on potential remedial actions; 5. Review Contractor's remedial actions whenever necessary to assure their effectiveness; 6. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not resolved; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the marine work or construction activities.

Appendix H

Monitoring Schedule in Reporting Month and Coming Month

Monitoring Schedule for Reporting Period

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Thu	1-Mar-12				■
Fri	2-Mar-12				
Sat	3-Mar-12				■
Sun	4-Mar-12				
Mon	5-Mar-12	■		■	■
Tue	6-Mar-12		■		
Wed	7-Mar-12				■
Thu	8-Mar-12				
Fri	9-Mar-12				
Sat	10-Mar-12	■		■	■
Sun	11-Mar-12				
Mon	12-Mar-12		■		■
Tue	13-Mar-12				
Wed	14-Mar-12				■
Thu	15-Mar-12				
Fri	16-Mar-12	■		■	■
Sat	17-Mar-12		■		
Sun	18-Mar-12				
Mon	19-Mar-12				■
Tue	20-Mar-12				
Wed	21-Mar-12				
Thu	22-Mar-12	■		■	■
Fri	23-Mar-12		■		
Sat	24-Mar-12				■
Sun	25-Mar-12				
Mon	26-Mar-12				■
Tue	27-Mar-12				
Wed	28-Mar-12	■		■	■
Thu	29-Mar-12		■		
Fri	30-Mar-12				
Sat	31-Mar-12				■

■	Monitoring Day
	Sunday or Public Holiday

Monitoring Schedule for Coming Month

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

	Monitoring Day
	Sunday or Public Holiday

Appendix I

Results Data

DSD Contract No DC/2009/08 – Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station

Impact 24-Hour TSP Monitoring Results - AM1 (Lions Clubs International Ho Tak Sum Primary School)

DATE	SAMPLE NUMBER	ELAPSED TIME			MIN CHART READING	MAX CHART READING	AVG CHART READING	AVG TEMP	STANDARD			INITIAL FILTER WEIGHT	FINAL FILTER WEIGHT	WEIGHT DUST COLLECTED	Dust 24-hr TSP in air
									AVG PRESS	FLOW RATE	AIR VOLUME				
		INITIAL	FINAL	(min)				(oC)	(hPa)	(m3/min)	(std m3)	(g)	(g)	(g)	(ug/m^3)
6-Mar-12	24654	10923.53	10947.65	1447.20	32	38	35.0	23.8	1008.5	1.07	1546	2.8073	2.8821	0.0748	48
12-Mar-12	24587	10947.65	10971.73	1444.80	33	37	35.0	12.6	1021.7	1.09	1576	2.7425	2.8084	0.0659	42
17-Mar-12	24627	10971.73	10995.81	1444.80	34	38	36.0	22.3	1012.5	1.10	1585	2.7951	2.8596	0.0645	40
23-Mar-12	24652	10995.81	11019.89	1444.80	33	37	35.0	20.9	1014.3	1.08	1554	2.8239	2.9225	0.0986	63
29-Mar-12	24667	11019.89	11043.95	1443.60	32	38	35.0	22.3	1017.7	1.07	1551	2.8194	2.9035	0.0841	54

Action Level : 162 Limit Level : 260

Impact 24-Hour TSP Monitoring Results - AM2 (Yeung Chun Pui Care & Attention Home)

DATE	SAMPLE NUMBER	ELAPSED TIME			MIN CHART READING	MAX CHART READING	AVG CHART READING	AVG TEMP	STANDARD			INITIAL FILTER WEIGHT	FINAL FILTER WEIGHT	WEIGHT DUST COLLECTED	Dust 24-hr TSP in air
									AVG PRESS	FLOW RATE	AIR VOLUME				
		INITIAL	FINAL	(min)				(oC)	(hPa)	(m3/min)	(std m3)	(g)	(g)	(g)	(ug/m^3)
6-Mar-12	24588	12444.46	12468.53	1444.20	32	38	35.0	23.8	1008.5	1.06	1526	2.7598	2.8295	0.0697	45
12-Mar-12	24586	12468.53	12492.62	1445.40	31	36	33.5	12.6	1021.7	1.04	1504	2.7499	2.8681	0.1182	78
17-Mar-12	24631	12492.62	12516.69	1444.20	32	36	34.0	22.3	1012.5	1.03	1494	2.8171	2.9308	0.1137	76
23-Mar-12	24655	12516.69	12540.71	1441.20	32	38	35.0	20.9	1014.3	1.06	1533	2.7939	2.8918	0.0979	63
29-Mar-12	24666	12540.71	12564.74	1441.80	31	36	33.5	22.3	1017.7	1.02	1476	2.8215	2.9591	0.1376	93

Action Level : 190 Limit Level : 260

DSD Contract No DC/2009/08

Construction of Yuen Long South Branch Sewers and Extension of Ha Tsuen Sewage Pumping Station

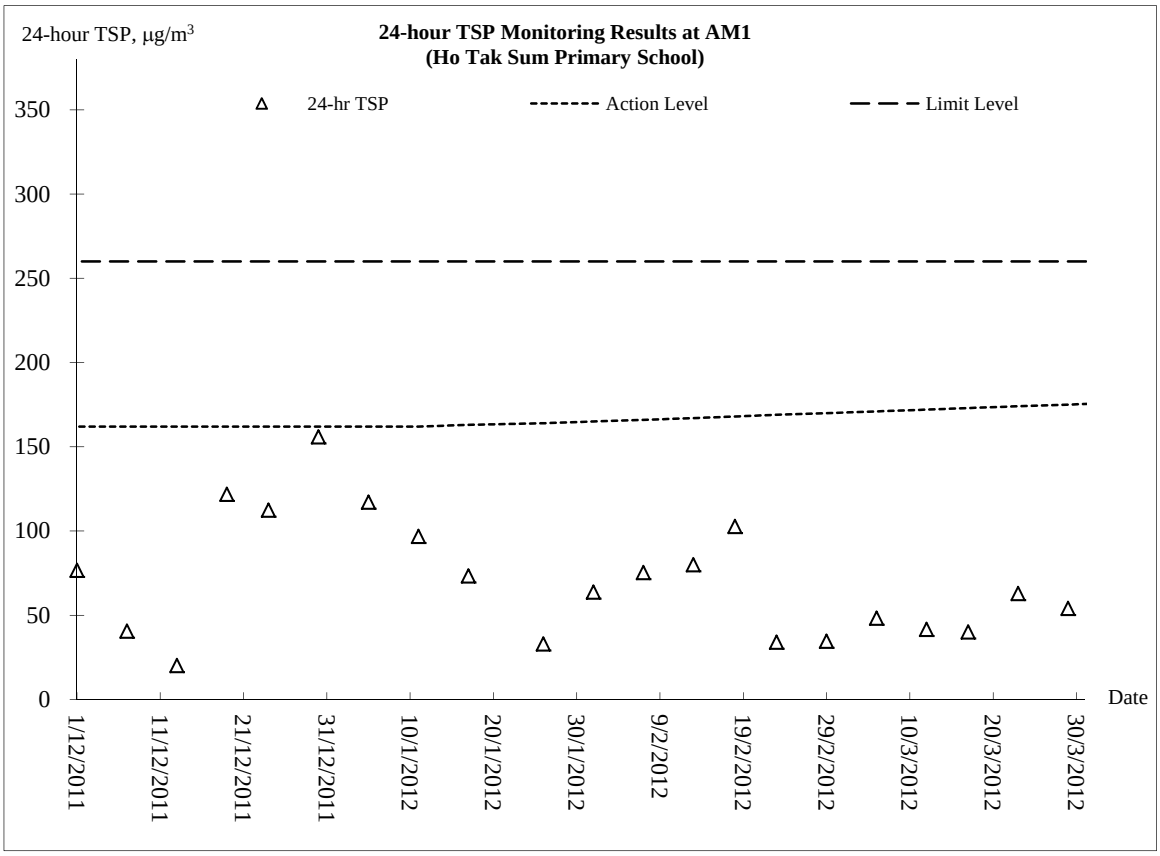
Summary of Water Quality Monitoring Results - R1b

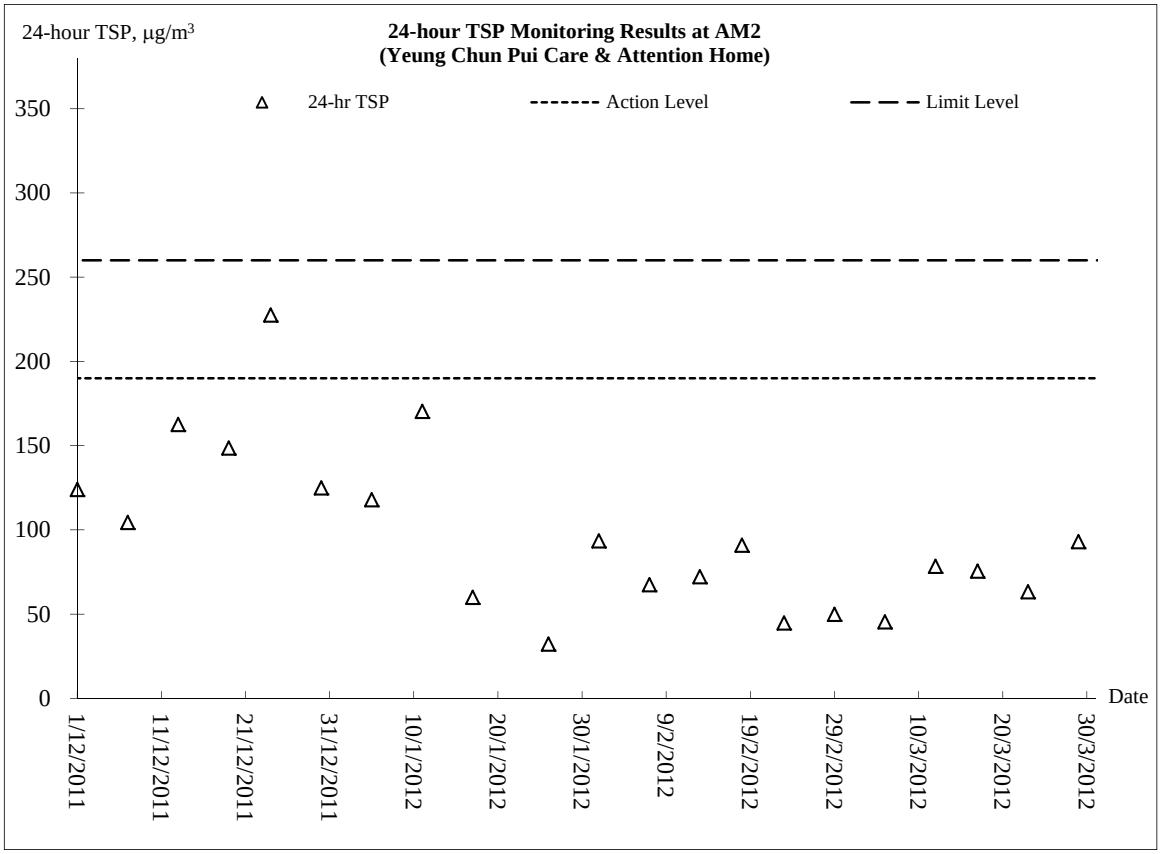
Date	ACTION/ LIMIT													
Location					DO (mg/L)		DOS (%)		Turbidity (NTU)		pH		SS (mg/L)	
R1b					ACT	4.6			ACT	15.6	ACT		ACT	31.5
					LIM	4			LIM	16.2	LIM		LIM	31.9
Date	**1-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	10:09	0.50	17.9	17.9	6.38	6.4	93.6	93.7	12.4	12.1	8.6	8.5	13	13.0
			17.9		6.43		93.8		11.7		8.4		13	
Date	**3-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	10:28	0.60	17.7	17.7	5.46	5.5	66.7	67.1	13.2	13.4	8.7	8.7	16	16.0
			17.7		5.58		67.4		13.6		8.6		16	
Date	**5-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	16:40	0.60	19.1	19.1	6.37	6.4	71.4	71.7	13.4	13.1	8.5	8.5	15	15.0
			19.1		6.45		71.9		12.8		8.4		15	
Date	**7-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	10:05	0.60	19.1	19.1	6.54	6.6	86.4	86.7	12.2	12.4	8.5	8.5	14	14.0
			19.1		6.59		86.9		12.6		8.4		14	
Date	**10-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	11:50	0.70	14.6	14.6	5.82	5.9	71.5	72.0	10.5	10.0	8.4	8.4	11	11.0
			14.6		5.93		72.4		9.4		8.4		11	
Date	**12-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	10:03	0.50	14.2	14.2	6.19	6.2	75.6	75.9	14.3	14.0	8.7	8.7	32	**32.0**
			14.2		6.23		76.1		13.6		8.6		32	
Date	**14-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	10:07	0.50	16.1	16.1	5.82	5.9	71.6	72.0	11.6	11.1	8.6	8.6	7	7.0
			16.1		5.93		72.4		10.5		8.5		7	
Date	**16-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	16:08	0.70	20.3	20.3	6.12	6.2	82.4	82.6	14.3	14.2	8.6	8.6	6	6.0
			20.3		6.18		82.8		14.1		8.5		6	
Date	**19-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	9:59	0.60	18.6	18.6	6.52	6.6	96.7	97.1	13.2	13.5	8.6	8.6	18	18.0
			18.6		6.58		97.4		13.7		8.5		18	
Date	**22-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	15:03	0.50	20.4	20.4	5.62	5.7	79.6	80.1	12.4	12.2	8.5	8.5	24	24.0
			20.4		5.7		80.5		11.9		8.4		24	
Date	**24-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	10:06	0.60	20.5	20.5	5.82	5.9	71.4	71.7	13.5	13.7	8.5	8.5	30	30.0
			20.5		5.91		71.9		13.8		8.4		30	
Date	**26-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	9:56	0.70	21.8	21.8	4.82	4.8	70.8	71.0	11.2	11.0	8.7	8.7	17	17.0
			21.8		4.86		71.2		10.8		8.6		17	
Date	**28-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	16:06	0.50	21.9	21.9	6.62	6.7	89.4	89.7	11.6	11.2	8.5	8.5	12	12.0
			21.9		6.7		89.9		10.8		8.4		12	
Date	**31-Mar-12**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS (mg/L)**	
R1b	9:56	0.50	20.9	20.9	5.48	5.5	79.4	80.5	10.8	10.6	8.4	8.4	20	20.0
			20.9		5.56		81.5		10.3		8.3		20	

Appendix J

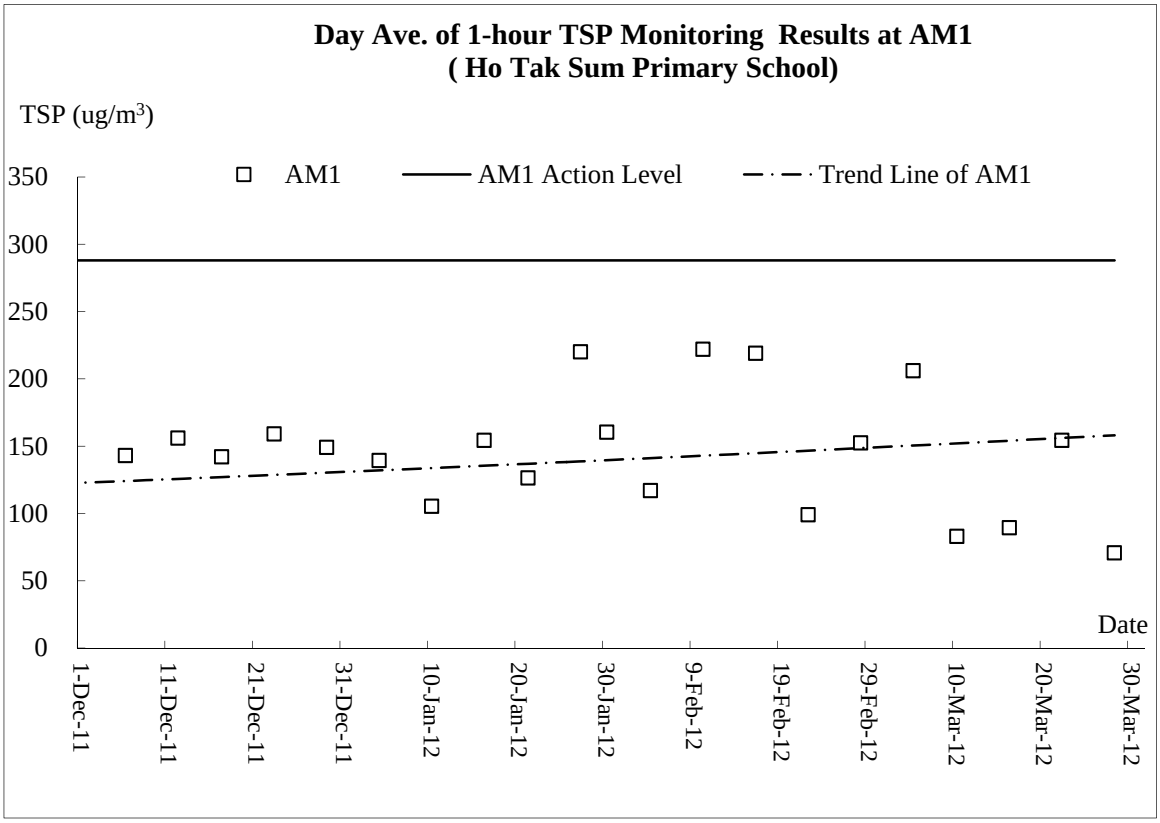
Graphical plots

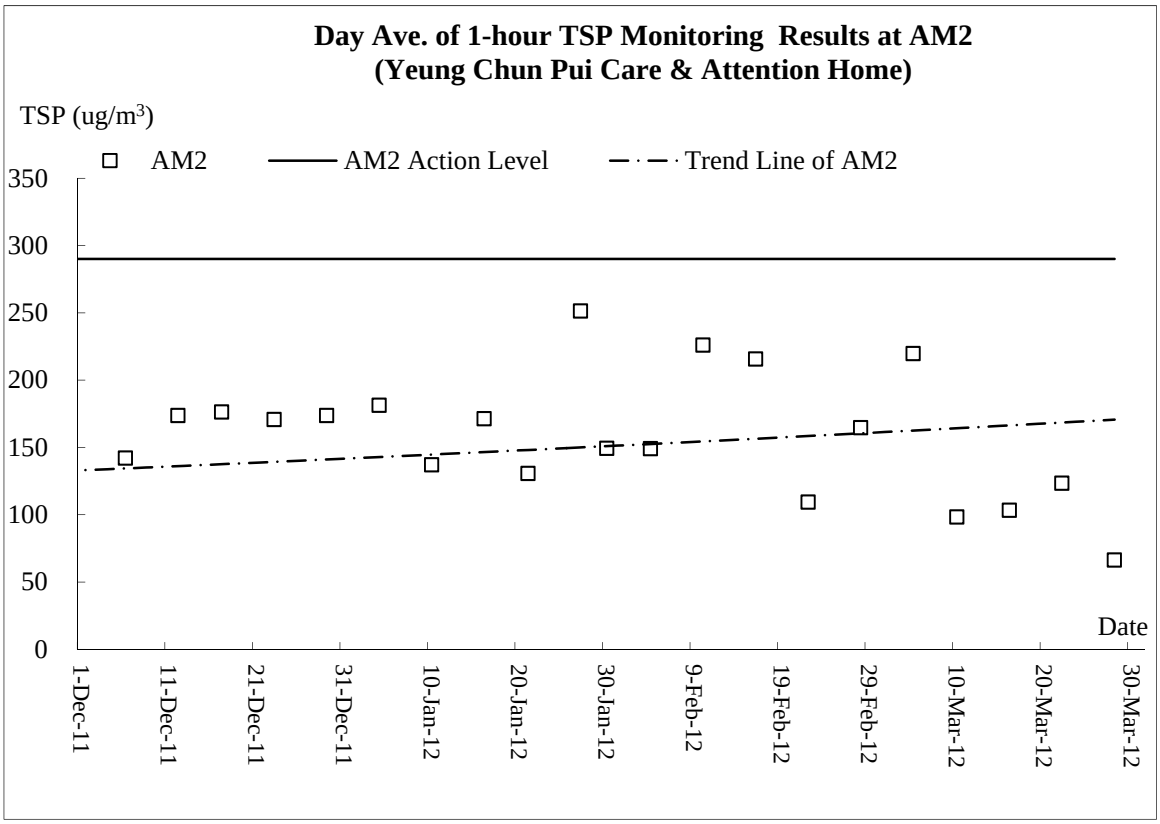
Air Quality – 24-hour TSP



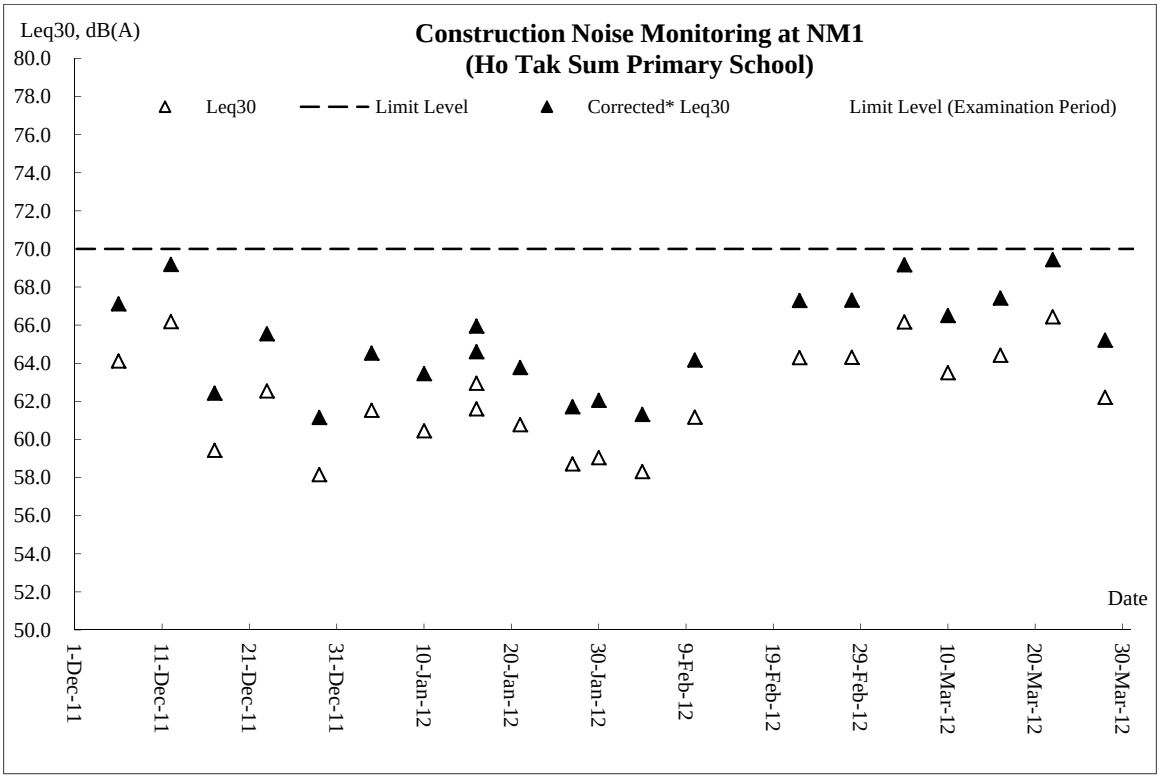


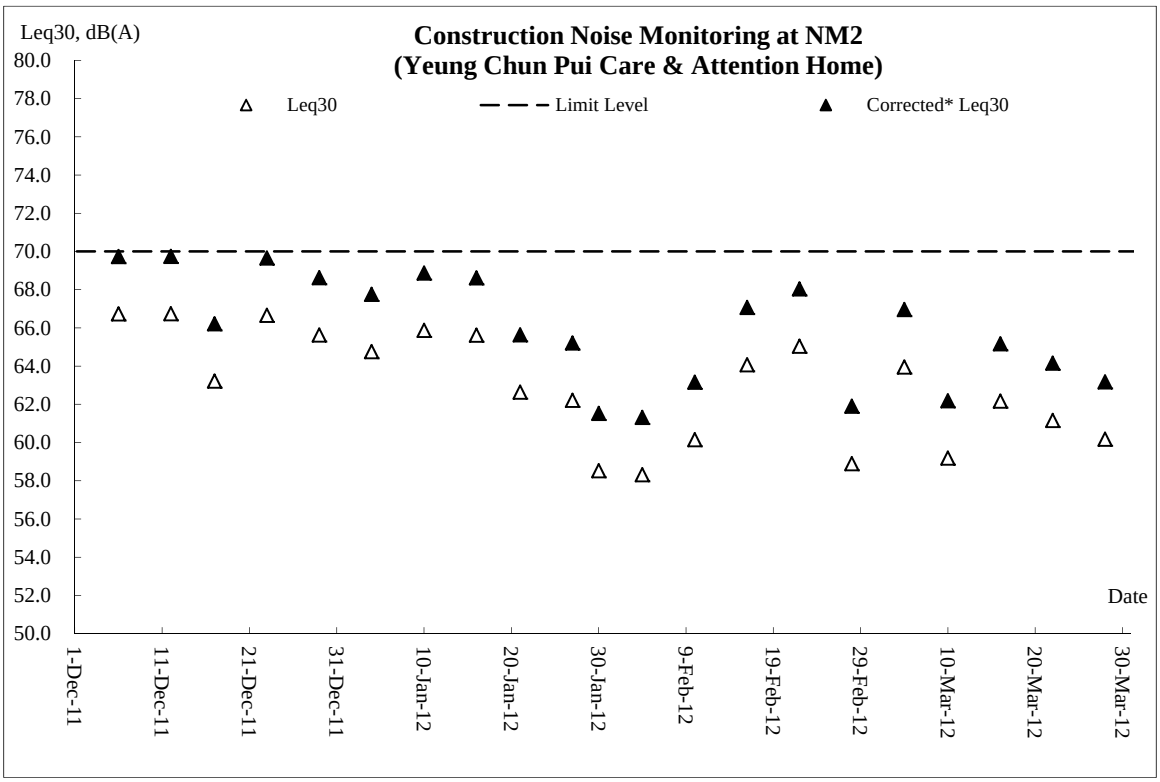
Air Quality – 1 hour TSP



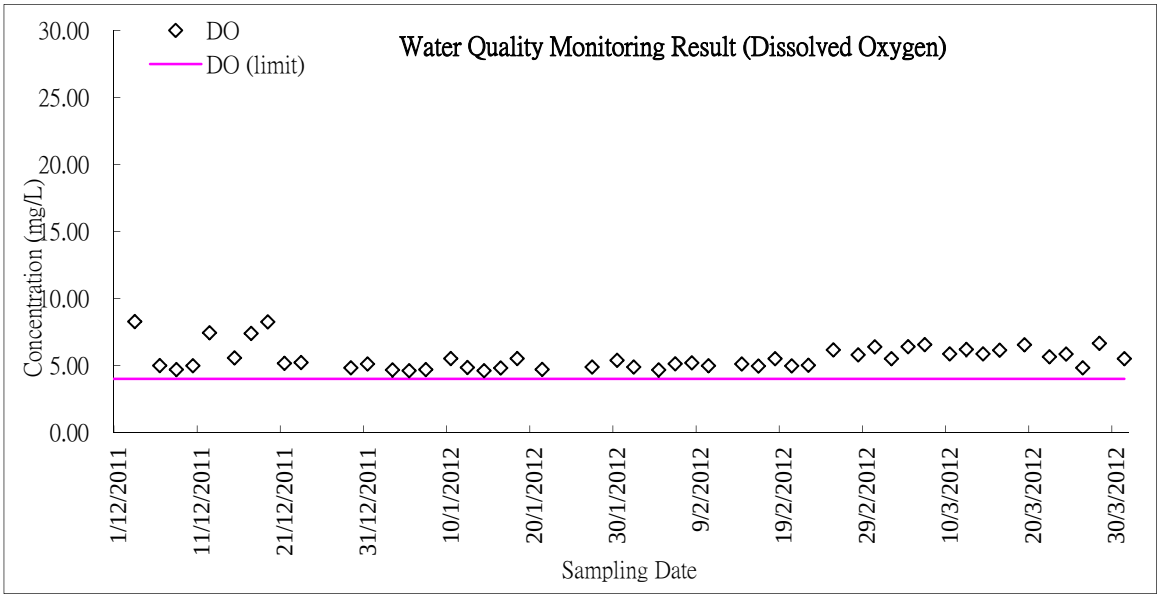


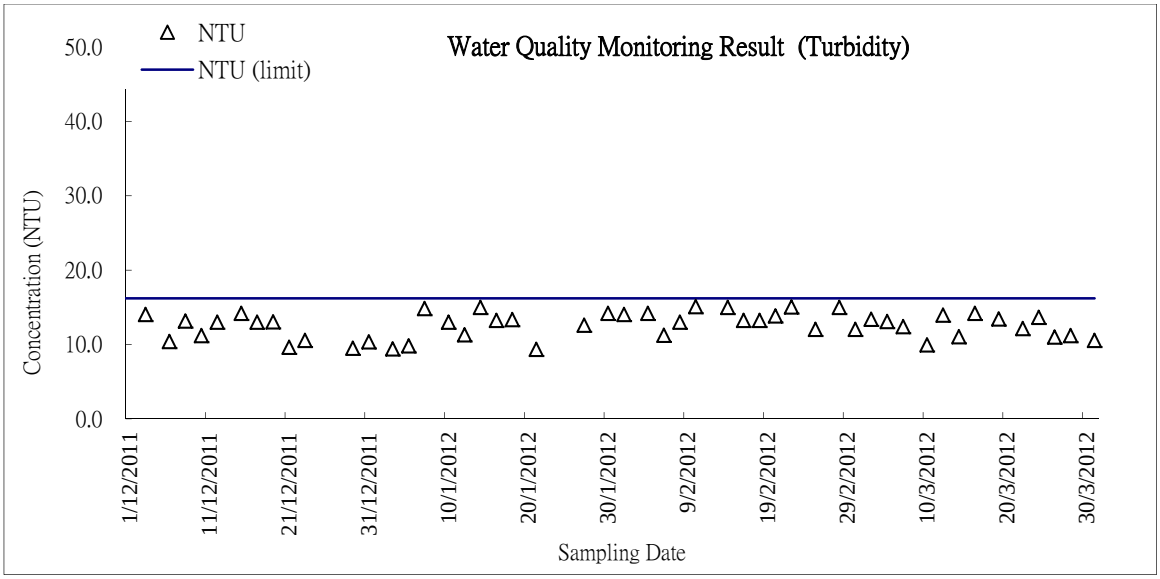
Construction Noise

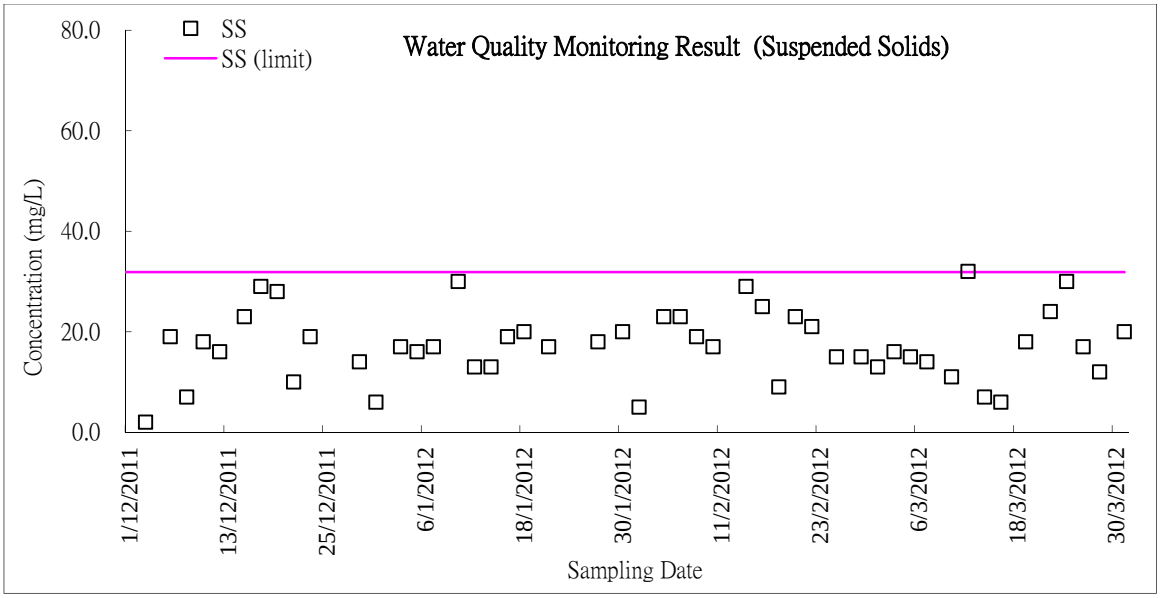




Water Quality – Local Stream Course (R1b)







Appendix K

Monthly Summary Waste Flow Table

Drainage Service Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2012

Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

2012 Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging	Plastic (bottles/containers, plastic sheets/ foams from package material)	Chemical Waste	Others (e.g. General Refuse etc.)
	[a+b+c+d]	(a)	(b)	(c)	(d)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
January	1.856	0	0	0	1.856	0	0	0	0.000	0	0.001
February	1.516	0	0	0	1.516	0	0	0	0.000	0	0.001
March	2.256	0	0	0	2.256	0	0	0	0.000	0	0.001
April	0.000										
May	0.000										
June	0.000										
Half-year total	5.628	0	0	0	5.628	0	0	0	0.000	0	0.003
July	0.000										
August	0.000										
September	0.000										
October	0.000										
November	0.000										
December	0.000										
Yearly Total	5.628	0	0	0	5.628	0	0	0	0.000	0	0.003

Appendix L

Inspection Checklist

Environmental Site Inspection Checklist

AUES

Project:	**DC/2009/08 Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen PS**	**Inspected by**	
		RE's representative:	K.P. Cheung
Inspection		**IEC's representative:**	
Date:	6 March 2012	**ET's representative:**	F. N. Wong
Time:	10:00	**Contractor's representative:**	Chan Yau Pang/ Jason Chung
		Checklist No.	DC200908-6-Mar-2012

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☐ Fine	☑ Cloudy	☐ Rainy
Temperature:	19 ^{0}C			
Humidity:	☑ High	☐ Moderate	☐ Low	
Wind:	☐ Strong	☑ Breeze	☐ Light	☐ Calm

PART B: SITE AUDIT

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☐	☑	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☑	☐	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☐	☐	☐	☑	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☐	☐	☐	☐	☑	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☐	☐	☐	☑	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☐	☑	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☐	☑	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☐	☑	☐	☐	☐	
4.15	Are construction wastes reused?	☐	☑	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☑	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☑	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
6.02	Is mosquito control measures adequately implemented?	☐	☑	☐	☐	☐	

Remarks

Follow up of Last Site Inspection:

1. Not required for reminders.
2. Provision of drip- trays is on-going.

Observations recorded in this Site Inspection: (6-March-2012)

1) Generators without drip trays were observed within construction site along Kiu Hing Road. Drip trays are required or removal of the generator from to appropriate storage area is reminded. (Photos 1-3)

2) Tree trunks and branches were used for supporting of shelters of construction plant within Ha Tsuen Pumping Station. (Photos 4 & 5). Some trees within the site were also used for supporting ropes for drying washed clothes (Photo 6). Removal of the materials attached to the trees is required to protect the trees.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

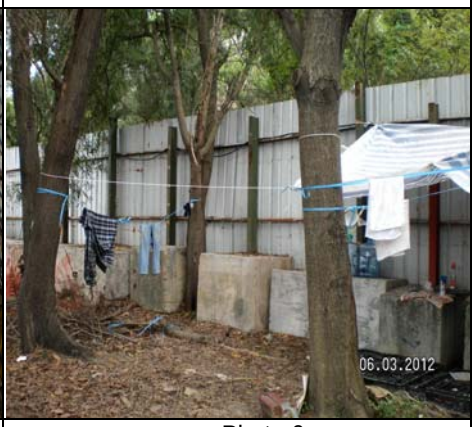


Photo 6

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
( )	( )	(F. N. Wong)	( )

Environmental Site Inspection Checklist

AUES

Project:	**DC/2009/08 Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen PS**	**Inspected by**	
		RE's representative:	K.P. Cheung
Inspection		**IEC's representative:**	
Date:	16 March 2012	**ET's representative:**	F. N. Wong
Time:	9:30	**Contractor's representative:**	Chan Yau Pang/ Jason Chung
		Checklist No.	DC200908-16-Mar-2012

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☑ Fine	☐ Cloudy	☐ Rainy
Temperature:	26 ^{0}C			
Humidity:	☑ High	☐ Moderate	☐ Low	
Wind:	☐ Strong	☐ Breeze	☑ Light	☐ Calm

PART B: SITE AUDIT

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☐	☑	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☑	☐	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☐	☐	☐	☑	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☐	☐	☐	☐	☑	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☐	☐	☐	☑	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☐	☑	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
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3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☐	☑	☐	☐	☐	
4.15	Are construction wastes reused?	☐	☑	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☑	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☑	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
6.02	Is mosquito control measures adequately implemented?	☐	☑	☐	☐	☐	

Remarks

Follow up of Last Site Inspection:

1. Provision of drip- trays is on-going.
2. The materials attached to the trees or support of construction shelter was removed (Photo 1).

Photo 1

Observations recorded in this Site Inspection: (16-March-2012)

1) Dusty surface was observed within the site at Shui Tsiu San Tsun Pumping Station. Construction dust suppression measures is reminded during dusty construction activities under dry and windy conditions.
2) Excessive accumulation of construction waste was observed within the site at Ha Tsuen Pumping Station. Regular clearance is reminded.
3) Soil trails were observed on the road near the entrance/exit. Wheel washing of the vehicles is required prior to exit the site.

Photo 2

Photo 3

Photo 4

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
( )	( )	(F. N. Wong)	( )

Environmental Site Inspection Checklist

AUES

Project:	**DC/2009/08 Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen PS**	**Inspected by**	
		RE's representative:	K.P. Cheung
Inspection		**IEC's representative:**	
Date:	20 March 2012	**ET's representative:**	F. N. Wong
Time:	10:00	**Contractor's representative:**	Chan Yau Pang/ Jason Chung
		Checklist No.	DC200908-20-Mar-2012

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☑ Fine	☐ Cloudy	☐ Rainy
Temperature:	26 ^{0}C			
Humidity:	☑ High	☐ Moderate	☐ Low	
Wind:	☐ Strong	☐ Breeze	☑ Light	☐ Calm

PART B: SITE AUDIT

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☐	☑	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☑	☐	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☐	☐	☐	☑	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☐	☐	☐	☐	☑	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☐	☐	☐	☑	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☐	☑	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☐	☑	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☐	☑	☐	☐	☐	
4.15	Are construction wastes reused?	☐	☑	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☑	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☑	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
6.02	Is mosquito control measures adequately implemented?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

AUES

Project:	**DC/2009/08 Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen PS**	**Inspected by**	
		RE's representative:	K.P. Cheung
Inspection		**IEC's representative:**	
Date:	27 March 2012	**ET's representative:**	F. N. Wong
Time:	10:00	**Contractor's representative:**	Chan Yau Pang/ Jason Chung
		Checklist No.	DC200908-27-Mar-2012

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☑ Sunny	☐ Fine	☐ Cloudy	☐ Rainy
Temperature:	26 ^{0}C			
Humidity:	☐ High	☑ Moderate	☐ Low	
Wind:	☐ Strong	☐ Breeze	☑ Light	☐ Calm

PART B: SITE AUDIT

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☐	☑	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☑	☐	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☐	☐	☐	☑	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☐	☐	☐	☐	☑	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☐	☐	☐	☑	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☐	☑	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
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3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
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		Not Observed	Yes	No	Follow up	Not Applicable	Photo/ Remarks
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4.03	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☐	☑	☐	☐	☐	
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4.16	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☑	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☑	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
6.02	Is mosquito control measures adequately implemented?	☐	☑	☐	☐	☐	

Remarks

Follow up of Last Site Inspection:

1) Not required for reminders.
2) Excessive accumulation of construction waste was observed cleared. (Photo 1)
3) Soil trails were cleared and wheel washing bay was observed constructed at the exit of the site and put into operation.(Photo 2)

Photo 1

Photo 2

Observations recorded in this Site Inspection: (27-March-2012)

1) Dusty surface was observed within the site at Shui Tsiu San Tsun and Ha tsuen Pumping Stations. Construction dust suppression measures is reminded during dusty construction activities under dry and windy conditions. (Photo 3 and 4)
2) Generator without drip tray was observed within the site. Drip tray or removal of the generator from the site is required to avoid contamination of soil and receiving water bodies.(Photo 5).

Photo 3

Photo 4

Photo 5

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
( )	( )	(F. N. Wong)	( )

Remarks

Follow up of Last Site Inspection:

1) Not required for reminder.
2) Clearance of excessive construction waste is on-going.
3) Construction of wheel washing facility is on-going. (Photo 1) Clearance of the dusty road surface was observed.(Photo 2)

Photo 1

Photo 2

Observations recorded in this Site Inspection: (16-March-2012)

1) Dusty construction activities were observed at Shui Tsiu Tsuen. Construction dust suppression measures is reminded during dusty construction activities under dry and windy conditions. (Photo 3)
2) Traces of oil were observed within the site at Kiu Hing Road. Clearance and proper disposal of the oil traces is required to avoid contamination of soil and water. (Photo4)
3) Excessive construction waste were observed at Ha Tsuen Pumping Station. Regular clearance is reminded.

Photo 3

Photo 4

Photo 4

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
( )	( )	(F. N. Wong)	( )