

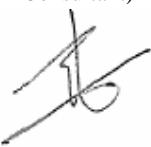


PROJECT No.: TCS/00408/08

DSD CONTRACT NO. DC/2007/17
DRAINAGE IMPROVEMENT WORKS IN CHEUNG PO,
MA ON KONG, YUEN KONG SAN TSUEN AND TIN SAM
TSUEN OF YUEN LONG DISTRICT AND SEWERAGE AT
TSENG TAU CHUNG TSUEN, TUEN MUN

FIRST MONTHLY EM&A REPORT – OCTOBER 2008
- KT14A

PREPARED FOR
CHINA ROAD & BRIDGE CORPORATION

Quality Index

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1	3 Nov 2008	Ben Tam	FN Wong	T.W. Tam	First submission
2	13 Nov 2008	Ben Tam	FN Wong	T.W. Tam	Revised against IEC's comments on 13 Nov 08

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Executive Summary

- ES01 For ease of reporting, it has been agreed among the ER, IEC, CRBC, ET and EPD that the EM&A report under the Project is split to the following three stand-alone parts:
 (a) EM&A Report - KT13 (under EP No.EP263/2007);
 (b) EM&A Report - KT14A (under No. EP231/2005A); and
 (c) EM&A Report - KT12, KT14B and KT14C (Non-Designated works under no Environmental Permit).
- ES02 It is also agreed among the ER, IEC, CRBC, ET and EPD that 25th of each month is set as the cut-off day of the reporting month. That is to say, the reporting month is counted from 26th of the previous month to 25th of the reporting month.
- ES03 Based on the notification of Drainage work commencement date, KT12, KT14B and KT14C (non-designated works) of construction works were commenced on 7 August 2008, 29 September 2008 and 9 October 2008 respectively, although the construction works for KT13 and KT14A (designated works) were started on 20 October 2008 and 2 October 2008 respectively. The impact EM&A program for air quality, construction noise, water quality and ecology has been started different period.
- ES04 This is the first monthly EM&A Report - KT14A (hereinafter 'this Report') for designated works under Environmental Permit No.EP231/2005A (hereinafter 'the EP'), covering a period from 2 to 25 October 2008 (hereinafter 'the Reporting Period') during the designated works commencement.
- ES05 For this reporting month, no exceedance of Action and Limit levels of air quality and construction noise are recorded during the Reporting Period. However, eight action level and 23 limit exceedances were found in water quality monitoring. The NOE with investigation report s were issued and submitted. Based on the construction activities as provided by the Contractor and during sampling observation, ET considers that the exceedances including DO, turbidity, suspended solids and zinc were found at impact station W8B are unlikely due to the project. The high concentration of those parameters is come from Kam Po Road Nullah, due to the sampling point W8B is located at the junction between downstream of the construction site and the nullah. The exceedances are summarized as follows:

Parameter	Quality Criteria Exceeded	No of Exceedance	Sampling Date
DO	Action Level	6	2, 11, 15, 17, 22 and 24 October 2008
	Limit Level	5	4, 6, 9, 13 and 20 October 2008
Turbidity	Limit Level	7	2, 4, 6, 9, 11, 17 and 20 October 2008
Suspended Solids	Limit Level	8	2, 4, 6, 9, 11, 17, 20 and 22 October 2008
Zinc	Action Level	2	4 and 6 October 2008
	Limit Level	3	17, 20 and 22 October 2008

- ES06 No written or verbal complaints, notifications of summons and successful prosecutions were received (written or verbal) for each media during the Reporting Period. No adverse environmental impacts were observed during the weekly site inspection and environmental audit, indicating the implemented mitigation measures for air quality, construction noise, water quality and ecology were effective. Minor deficiencies found in the weekly site inspection and audit was in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- ES07 No adverse environmental impacts were observed during the weekly site inspection and environmental audit, indicating the implemented mitigation measures for air quality, construction noise, water quality and ecology were effective. Minor deficiencies found in the weekly site inspection and audit was in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- ES08 During the rain season is between April and November, turbidity and other water quality pollutants via site surface water runoff into the river within KT14 continues to be the key issue in the forth-coming month. Mitigation measures for water quality should therefore be fully implemented.

- ES09 On the other hand, construction dust will continue to become a key environmental issue during dry and windy days. The implemented construction dust mitigation measures should therefore also be maintained and improved as necessary during dry and windy days.
- ES10 In addition, special attention should also be paid to construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule should be fully implemented.
- ES11 Due to the baseline of water quality monitoring was undertaken at dry season (18 March 2008 to 12 April 2008), so extra water sampling was conducted between 26 August 2008 and 30 September 2008 before the construction works commencement for the contractor's interesting. Totally fourteen water sampling days were performed in accordance with EM&A requirements.
- ES12 Review the water condition was sampled between 26 August 2008 and 30 September before the works commencement, the condition of water quality is significant change due to weather and natural back ground are different from the baseline monitoring period between 18 March 2008 and 12 April 2008. Therefore, the Action and Limit levels will be adjusted to recommend for approve.

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1 INTRODUCTION

1.1 BASIC PROJECT BACKGROUND

China Road & Bridge Corporation (hereinafter 'CRBC') has been awarded since 25 January 2008 by Drainage Services Department (hereinafter 'DSD') the DSD Contract No. DC/2007/17 Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun (hereinafter "the Project"). The works to be executed under the Project are located in Kam Tin, Pat Heung and Tuen Mun, New Territories as shown in the location plan in **Appendix A** and the contract period is about 36 months from 31 December 2008 to 5 October 2010.

The Project forms part of the Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Improvement Project to relieve the flooding problems in New Territories North and the Sewerage Improvement Works in Tuen Mun for improving the sewerage problems in Tseng Tau Chung Tsuen. The Project involves construction of five drainage channels namely KT12, KT13 (under Environmental Permit No. EP263/2007), KT14A (under Environmental Permit No. EP231/2005A), KT14B and KT14C in Kam Tin and Pat Heung and the sewerage works at Tseng Tau Chung Tsuen in Tuen Mun.

Major construction activities of the Project include:

- (a) construction of the five drainage channels in Kam Tin and Pat Heung and the sewerage works in Tuen Mun;
- (b) construction of about 1.8 km of secondary drainage channels and about 0.5 km of storm-water box culverts;
- (c) construction of DSD maintenance access;
- (d) construction of public access road with footpath;
- (e) provisioning and re-provisioning of vehicular/ pedestrian crossings;
- (f) bank raising of existing channel near Pat Heung Road;
- (g) water main laying works;
- (h) associated ancillary works;
- (i) re-provision of Ma On Kong Playground;
- (j) construction of approximately 3.8 km gravity sewers of diameter ranging from 150mm to 225mm and associated manholes at Tseng Tau Chung Tsuen in Tuen Mun;
- (k) landscaping works; and
- (l) all other works as required under the Contract.

In order to effectively implement the environmental protection measures stipulated in the Project Profile (hereinafter 'the PP'), Environmental Study Report (hereinafter "the ESR"), Environmental Impact Assessment (herein after 'the EIA'), Environmental Permits (hereinafter "the EP") No. EP263/2007 and EP231/2005A, three corresponding Environmental Monitoring and Audit Manuals (hereinafter 'the EM&A Manuals') have been prepared to guide the setup of the EM&A program of the Project.

1.2 ENVIRONMENTAL MANAGEMENT ORGANIZATION

DSD is the Project Proponent; CRBC is the main Contractor of the Project; Environmental Protection Department (hereinafter 'EPD') and Agriculture, Fisheries and Conservation Department (hereinafter 'AFCD') are the supervisory department for environmental protection of the Project; Black & Veatch Hong Kong Ltd is the Engineer's Representative of DSD (hereinafter 'the ER'); ARUP is the Independent Environmental Checker (hereinafter 'the IEC'); Action-United Environmental Services and Consulting (hereinafter 'AUES') is the environmental team (hereinafter 'the ET') while.

Detailed environmental management organization including management structure and key personnel contact names and telephone numbers is presented in **Appendix B**.

1.3 CONSTRUCTION PROGRAM

Construction program is enclosed in **Appendix C**.

1.4 ENVIRONMENTAL LICENSING STATUS

1.4.1 Air Pollution Control (Construction Dust) Regulation

Pursuant to the **Air Pollution Control (Construction Dust) Regulation**, CRBC has notified EPD, via submission of Form NA dated 14 February 2008, of the scope and nature of the works to be carried out under the Project, including construction activities such as stockpiling, loading and unloading, transfer of dusty material, use of vehicles and debris handling, etc. CRBC will continuously review the status of the environmental licenses and apply the required licenses/permits prior to the commencement of construction work.

1.4.2 Noise Control Ordinance

No **Construction Noise Permit** (hereinafter 'CNP') is required for the Project pursuant to the **Noise Control Ordinance** (hereinafter 'NCO') and the associated applicable subsidiary regulations of **Noise Control (General) Regulation**, **Noise Control (Hand-held Percussive Breaker) Regulation** and **Noise Control (Air Compressor) Regulation**, as the use of powered mechanical equipment, or conducting construction work in during restricted hours, i.e. 1900 to 0700 hours on normal weekdays and any time on general holidays including Sundays is not anticipated during the whole construction period. CRBC will continuously review the status of the environmental licenses under the NCO and apply the required licenses/permits prior to the commencement of construction work.

1.4.3 Waste Disposal (Charges for Disposal of Construction Waste) Regulation

CRBC has applied for a Billing Account (Construction Work Contract with Value of \$1million or Above), under the **Waste Disposal (Charges for Disposal of Construction Waste) Regulation**. The account number 7006524 has been assigned on 9 Jan 2008.

1.4.4 Water Pollution Control Ordinance

CRBC has applied for a discharge license under Section 20 of the **Water Pollution Control Ordinance**, and the license No. 1U461/1 has been issued.

1.4.5 Waste Disposal (Chemical Waste) (General) Regulation

CRBC has registered as a Chemical Waste Producer with EPD under the Waste Disposal (Chemical Waste) (General) Regulation and the Waste Producer Number assigned is WPN: 5611-531-C3124-28 dated 2 May 08.

1.5 IMPLEMENTATION STATUS

1.5.1 Baseline Monitoring

In order to establish environmental quality criteria, i.e. Action and Limit levels, for implementation of the Event and Action Plan of the EM&A program, baseline monitoring for KT14A was carried out during 18 March 2008 to 17 May 2008 in accordance with the requirements set out in the PP, EP and the EM&A Manual. Details of the baseline monitoring have been presented respectively in the Baseline Monitoring Report for KT14A, which have been submitted to the ER and IEC.

The proposed environmental quality criteria, i.e. Action and Limit levels, have in general been accepted by the ER and IEC to be used in the Event and Action Plan of the EM&A program. They are awaiting EPD's formal approval for implementation.

1.5.2 Works Undertaken during the Reporting Period

Works undertaken during the Reporting Period are shown in the construction program in **Appendix C**. Major construction activities implemented during the Reporting Period were:

- (a) Underground utility investigation;
- (b) Hoarding erection
- (c) Site clearance
- (d) Structural condition survey
- (e) Sheet Piling work at CH 0 – CH 56

1.5.3 Environmental Protection and Pollution Control Mitigation Measures

In addition to the environmental licensing stated in the previous **Section 1.4**, CRBC has been delivering committed responsibilities to implement environmental protection and pollution control / mitigation measures including measures for ecological and visual impacts, as recommended in the EIA, EP and the EM&A Manuals, summarized in the mitigation measures implementation schedules in the EM&A Manual. The implemented mitigation measures include

- (a) Watering of stockpiles of rip-rap;
- (b) Covering of the loose soil to minimize water quality impacts;
- (c) Hard pavement of haul road leading to public roads;
- (d) Classification and disposal of illegally dumped construction and demolition materials; and
- (e) Construction of temporary removable noise barriers to follow the updated Noise Mitigation Measures Plan.

2 SUMMARY OF ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

2.1 MONITORING PARAMETERS

The ET has compiled the EM&A requirements set out in the EIA, Environmental Permits No.EP263/2007 (hereinafter 'the EP'), and the associated EM&A Manual in the **Environmental Monitoring Methodology**, which has been agreed by the ER and IEC. Monitoring parameters are summarized below.

Table 2-1 Summary of Monitoring Parameters

Environmental Aspect	Monitoring Parameters	
Air Quality	(a)	1-Hour Total Suspended Particulate (hereinafter '1-Hr TSP'); and
	(b)	24-Hour Total Suspended Particulate (hereinafter '24-Hr TSP').
Construction Noise	(a)	A-weighted equivalent continuous sound pressure level (30min) (hereinafter 'Leq(30min)' during the normal working hours; and
	(b)	A-weighted equivalent continuous sound pressure level (5min) (hereinafter 'Leq(5min)' for construction work during the restricted hours.
Water Quality	(a) In Situ Measurement	temperature, Dissolved Oxygen (hereinafter 'DO'), pH & Turbidity
	(b) Laboratory Analysis	Suspended Solids (hereinafter 'SS'), Ammonia Nitrogen (hereinafter 'NH ₃ -N') and Zinc (hereinafter 'Zn')

2.2 MONITORING LOCATIONS

In order to identify and seek access for the monitoring locations designated in the EM&A Manual, site inspection has been conducted by the ET, IEC, ER and CRBC. The monitoring locations have been identified and the associated accesses have also been granted except the air monitoring location A8. The monitoring location A8 is relocated the entrance of Strong Sing Garden due to request of the property management. For the significant change is agreed by ER, IEC and EPD. Details of the monitoring locations are summarized in **Table 2-2** and shown in **Appendix A**. For ease of reference, '(a)' is denoted for the replacement location IDs to differentiate from the EM&A Manuals' locations..

Table 2-2 Summary of Monitoring Locations

Env. Aspect	Monitoring Location ID	Identified Address / Co-ordinates
Air	A8(a)	Entrance of Strong Sing Garden
Noise	N8	Ground floor of Strong Sing Garden H502
Water	W8A	E825274 / N831712
	W8B	E825143 / N831786

2.3 MONITORING FREQUENCY

The monitoring frequency and duration as specified in the EM&A Manuals are summarized below.

2.3.1 Impact Monitoring

Impact environmental monitoring is conducted upon commencement of the construction activities and throughout the whole construction period to detect and minimize any adverse environmental impacts generated from the construction activities of the Project.

The impact monitoring frequency and duration for air quality, construction noise, water quality and ecology are summarized below.

Air Quality

Frequency: Once every 6 days for 24-Hr TSP and three times every 6 days for 1-Hr TSP, when the highest construction dust impacts are anticipated.

Duration: Throughout the construction period when the major construction activities were undertaken

Construction Noise

Frequency: Once a week during 0700-1900 on normal weekdays for Leq30min

If the construction work is undertake at restrict hour at KT14A, the frequency of noise monitoring will be conducted in accordance with the related Construction Noise Permit requirement issued by EPD as follow

- 3 consecutive Leq5min at restrict hour from 1700 – 2300;
- 3 consecutive Leq5min for restrict hour from 2300 – 0700 next day;
- 3 consecutive Leq5min for Sunday or public holiday from 0700 – 1900;

Duration: Throughout the construction period when the major construction activities were undertaken

Water Quality

Frequency: Three times a week with no consecutive two intervals is less than 36 hours

Depths: All measurements shall be carried out at three water depths, namely, 1 m below water surface, mid-water depth, and 1 m above river bed. If the water depth is less than 6 m, the mid-depth measurement is omitted. If the depth is less than 3 m, only the mid-depth measurement needs to the taken.

Duration: Throughout the construction period when the major channel construction activities were undertaken.

2.4 MONITORING EQUIPMENT AND PROCEDURE

The monitoring equipment and procedures for air quality, construction noise and stream water quality are summarized below.

2.4.1 Air Quality

Monitoring Equipment

A list of air quality monitoring equipment is shown below.

Table 2-4-1 Air Quality Monitoring Equipment

Equipment	Model
24-Hr TSP	
High Volume Air Sampler (herein after 'HVS')	Grasby Anderson GMWS 2310 HVS
Calibration Kit	TISCH Model TE-5028A
1-Hr TSP	
Portable Dust Meter	Sibata LD-3 Laser Dust Meter

Monitoring Procedure

1-Hr TSP

Operation of the 1-Hr TSP meter will follow manufacturer's Operation and Service Manual. The 1-Hr TSP monitor, a TSI Dust Track Aerosol Monitor Model 8520, or Sibata LD-3 Laser Dust Meter is a portable, battery-operated laser photometer. The 1-hr TSP meter provides a real time 1-hr TSP measurement based on 90° light scattering. The 1-hr TSP monitor consists of the following:

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

The 1-Hr TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument will be checked before and after each monitoring event.

24-hr TSP

The equipment used for 24-Hr TSP measurement is the HVS brand named Thermo Andersen, Model GS2310 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The 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 6-day mechanical timer, and
- (g) A power supply of 220v/50 Hz

The HVS will be operated and calibrated on a regular basis following the manufacturer's instruction using the NIST-certified standard calibrator brand named TISCH Calibration Kit Model TE-5025A. Regular HVS operation and maintenance as well as filter paper installation and collection will be performed by the ET's competent technicians, whereas laboratory analyses are conducted in a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (herein after 'ALS'). The analyzed 24-hr TSP filters will be kept in ALS for six months prior to disposal.

Meteorological Information

All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper will be recorded in details. The meteorological information will down loaded from the Hong Kong Observatory (Lau Fau Shan Station). The data will include wind direction, wind speed, humidity, rainfall, air pressure and temperature etc that in general is required for evaluating the air quality impact arising from the construction activities.

2.4.2 Construction Noise

Monitoring Equipment

A list of construction noise monitoring equipment is shown below.

Table 2-4-2 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2236 & 2238
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer

Monitoring Procedure

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 (TM) issued under the Noise Control Ordinance (NCO).

All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30 min) in six consecutive Leq(5 min) measurements will be used as the monitoring parameter for the time period between 0700-1900 hours on weekdays throughout the construction period. Leq(15min) in three consecutive Leq(5 min) measurements for other time periods (e.g. during restricted hours) will only be conducted for monitoring the construction noise during restricted hours as necessary.

The sound level meter will be mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield will be fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point would normally be at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point would be at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.

Immediately prior to and following each noise measurement the accuracy of the sound level meter will be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements will be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0dB. Noise measurements will not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed will be checked with a portable wind speed meter capable of measuring the wind speed in m/s. Calibration certificates are shown in **Appendix D**.

2.4.3 Water Quality

Monitoring Equipment

Monitoring Equipments for water quality are shown below.

Table 2-4-3 Water Quality Monitoring Equipment

Equipment	Model / Description
Water Depth Detector	Eagle Sonar
Water Sampler	Teflon bailer / bucket
Thermometer & DO meter	YSI 550A DO Meter
pH meter	Hanna HI 98128
Turbidimeter	Hach 2100p
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-litter plastic cool box

Monitoring Procedure

Water Depth

Water quality monitoring will be conducted at the middle of the water columns (Mid-Depth) if the depths of the water columns at the sampling locations are less than 1.5 meters during monitoring. Or else, monitoring will be performed at two depths, at 0.5 meter from surface and bottom respectively. Water depths will be determined prior to measurement and sampling, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. For the depths well below 1 meter, an appropriate steel ruler or rope with appropriate weight will be used for the depth estimation.

Dissolved Oxygen (DO)

A portable YSI 550A DO Meter will be used for in-situ DO measurement. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation and checked against water saturated ambient air on each monitoring day prior to monitoring. Although the DO Meter automatically compensates ambient water temperature to a standard temperature of 20°C for ease of comparison of the data under the changing reality, the temperature readings of the DO Meter will be recorded in the field data sheets. Calibration of the equipment will be performed by ALS on quarterly basis.

pH

A portable Hanna pH Meter will be used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement. Quarterly calibration of the equipment will be performed by ALS.

Turbidity

A portable Hach 2100p turbidity Meter will be 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 will be performed by ALS on quarterly basis.

Suspended Solids (SS)

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

Ammonia Nitrogen(NH₃-N)

NH₃-N will be examined by ALS upon receipt of the water samples using HOKLAS accredited analytical methods namely ALS Method EK-055A.

Zinc(Zn)

Zn will be analyzed by ALS upon receipt of the water samples using HOKLAS accredited analytical methods namely ALS Method EG-020.

Water Sampler

Water samples will be collected by the ET using a plastic sampler to prevent metal contamination. For water depths deeper than 1.5 meter, a cleaned plastic bailer bucket will be used for sample collection. Or else a plastic bucket with a rope of appropriate length will be used for water sampling. The sampler will be rinsed before collection with the sample to be taken.

One litre or 1000 mL water sample will be collected from each depth for SS determination. The samples collected are stored in a cool box maintained at 4°C and delivered to ALS upon completion of the sampling by end of each sampling day. Sampling in the stream with shallow water condition, plastic bucket will be used for sample collection.

Sample Container

Water samples will be contained in screw-cap PE (Poly-Ethylene) bottles, which will be provided and pretreated and 'PE' (Poly-Ethylene) sampling bottles provided and pre-treated according to corresponding analytical requirements of HOKLAS and ALS. Where appropriate, the sampling bottles will be rinsed with the water to be contained. Water sample is then transferred from the sampler to the sample bottles to 95% bottle capacity to allow possible volume expansion during delivery and storage.

Sample Storage

A 'Willow' 33-litre plastic cool box packed with ice will be used to preserve the collected water samples prior to arrival at the laboratory. The water temperature of the cool box will be maintained at a temperature as close to 4°C as possible without being frozen. Samples collected will be delivered to the laboratory upon collection within the maximum storage time requirement.

3 QUALITY ASSURANCE PROCEDURES AND DATA MANAGEMENT

3.1 DOCUMENTATION OF THE ENVIRONMENTAL MONITORING

Field data including in-situ monitoring results, weather conditions and water sampling information and observation will be recorded in corresponding Field Data Sheets, which will be signed and dated by the respective environmental technician prior to submission to the ETL for validation and endorsement at the end of the monitoring day.

3.2 DATA MANAGEMENT AND ANALYSIS

All impact monitoring data will be processed by the AUES data recording and management system, which complies with in-house Quality (**ISO 9001:2000**) Management System. Monitoring results recorded in the monitoring equipment e.g. 1-Hr TSP Meters and Noise Meters will be downloaded directly from the equipment at the end of the monitoring period.

The downloaded monitoring data will be input into a computerized database maintained by the ET. Laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

3.3 QUALITY ASSURANCE PROCEDURES

Appropriate and standard QA/QC measures will be adopted for the environmental monitoring to ensure the scientific integrity of the data produced. Sources of error in the impact monitoring will be properly controlled with the following QA/QC procedures:

- (a) Appropriate field monitoring and sampling techniques, including monitoring equipment, storage and delivery of samples;
- (b) Well organized systematic field-data system e.g. all baseline monitoring information, field observation, results, weather conditions and water sampling information, etc. will be recorded in the field monitoring record sheets. The laboratory analysis records will be maintained by the HOKLAS following HOKLAS requirements;
- (c) HOKLAS requirements for QA/QC of all laboratory testing to ensure acceptable accuracy and reproducibility of the laboratory analysis indicated by consistent agreement between duplicate samples, validity of the analytical results by compliance with the required blanks and recovery of standard addition.

3.4 RECORDS

All impact monitoring data will be clearly and systematically documented in both hardware and software format and the software copy will be available for inspection upon request. All the document and data will be kept for at least one year after completion of the Project.

Field Data Sheets are used to record the impact monitoring information, field observation, results, weather conditions and water sampling information, etc., will be properly maintained and kept by the ET.

The copies of laboratory analysis records from ALS will be kept by the ET throughout the at least one year after completion of the EM&A program of the Project.

4 REPORTING

4.1 GENERAL REQUIREMENTS FOR REPORT SUBMISSION

General requirements for Monthly EM&A report submission as stipulated in the PP, EP and EM&A Manual are summarized below.

Table 4-1 Requirements for Report Submission

Report	Submission
Monthly EM&A Report	<ul style="list-style-type: none"> Within 10 working days of the end of each reporting month.
Quarterly EM&A Summary Report	<ul style="list-style-type: none"> No specific requirement, proposed three weeks after endorsement of the 3rd monthly EM&A report within a particular quarter.
Final EM&A Summary Report	<ul style="list-style-type: none"> No specific requirement, proposed one month upon completion of entire EM&A program

4.2 CUT-OFF DAY OF THE REPORTING MONTH

It is also agreed among the ER, IEC, CRBC, ET and EPD that, in order to avoid unnecessary delay of the EM&A report submission due to the time required for laboratory analyses for those environmental monitoring samples collected at the ends or near the ends of the reporting months, in particular on eve of public holidays, the cutoff day is 25th of each month. That is to say, the reporting month is counted from 26th of the previous month to 25th of the reporting month.

5 MONITORING RESULTS

This is the first monthly EM&A Report - KT14A for designated works under Environmental Permit (hereinafter 'this Report'), covering a period from 2 to 25 October 2008 (hereinafter 'the Reporting Period').

5.1 AIR QUALITY

5.1.1 Action and Limit Levels

According to Baseline Monitoring Report of KT13, the Action and Limit Levels for 24-Hr and 1-Hr TSP are illustrated as follow

Table 5-1-1 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-Hr TSP	24-Hr TSP	1-Hr TSP	24-Hr TSP
A8(a)	>310	>144	> 500	> 260

5.1.2 Event Action Plan

Should non-compliance of the air quality criteria occurs, the Contractor's ET, the ER and the Contractor shall undertake the relevant action in accordance with the Action Plan are attached in **Appendix H**.

5.1.3 Results

Results of air quality monitoring at the identified locations during the Reporting Period are summarized in **Table 5-1-3** as below. Monitoring Schedules for the Reporting Period and Forth-Coming Month are presented in **Appendix E**. The data of 24-hr TSP is listed in **Appendix F**.

Table 5-1-3 Summary of Air Quality Monitoring Results

1-Hour TSP ($\mu\text{g}/\text{m}^3$)						24-Hour TSP ($\mu\text{g}/\text{m}^3$)	
Date	Start Time	1st Hr	2nd Hr	3rd Hr	Average	Date	Results
06-Oct-08	13:18	94	96	92	94	8-Oct-08	27
13-Oct-08	13:05	191	193	197	194	14-Oct-08	23
18-Oct-08	13:08	137	136	139	137	20-Oct-08	Power Shortage
24-Oct-08	13:00	178	179	180	179	25-Oct-08	30
Max / Min / Mean		197 / 92 / 151				30 / 23 / 27	
Action Level		310				144	
Limit Level		500				260	

Power shortage was happened for the 24-hr TSP monitoring on 20 October 2008, the replacement was undertaken on 25 October 2008 accordingly.

5.1.3 Discussion and Conclusion

Meteorological data in the **Appendix E** indicates that the air quality monitoring of the Reporting Period was in general conducted under normal weather conditions.

As shown in **Tables 5-1-3** the 1-HR TSP and 24-Hr TSP results fluctuated well below the Action level. As no exceedance of Action and Limit levels was recorded during the Reporting Period, no Notification of Exceedance (NOE) of air quality criteria was therefore issued and no associated corrective action was required.

Extra air quality monitoring was undertaken before the construction commencement day. There have totally 18 events of 1-hr TSP and 6 events of 24-hr TSP were carried out between 29 August 2008 and 1 October 2008. The extra measurement results are shown in **Appendix J** for reference due to the baseline was conducted in April 2008 dry season.

5.2 CONSTRUCTION NOISE

5.2.1 Action and Limit Levels

The Action and Limit levels for construction noise are illustrated in **Table 5-2-1**.

Table 5-2-1 Action and Limit Levels of Construction Noise Monitoring

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

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

5.2.2 Event Action Plan

In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Action Plan is attached in **Appendix H**, shall be carried out. The additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities. The ET, the ER and the Contractor shall undertake the relevant action in accordance with the Action Plan accordingly.

5.2.3 Results

Results of construction noise monitoring at the identified location N8 during the Reporting Period are summarized in **Tables 5-2-3** as below.

Table 5-2-3 Summary of Construction Noise Monitoring Results – N8

Date	Start Time	1st Leq5	2nd Leq5	3rd Leq5	4th Leq5	5th Leq5	6th Leq5	Leq30
6-Oct-08	16:27	56.6	56.9	57.4	58.5	58.1	56.8	57.4
13-Oct-08	16:42	56.7	59.4	58.6	57.2	58.0	58.4	58.1
18-Oct-08	16:38	55.3	53.2	53.0	54.4	53.8	56.2	54.5
24-Oct-08	13:15	54.7	51.3	50.5	51.0	49.5	49.2	51.5
Limit Level		-						> 75 dB(A)

5.2.3 Discussion and Conclusion

The construction noise monitoring was undertaken under no raining condition and also with the wind speed less than 5m/s. The meteorological data is shown in **Appendix E**.

As shown in **Tables 5-2-3**, all the construction noise results fluctuated well below the Limit level. As no exceedance of Limit levels was recorded during the Reporting Period, no Notification of Exceedance (NOE) of construction noise quality criteria was therefore issued and no associated corrective action was required.

Totally 6 extra noise measurement were conducted at the identified monitoring station N8 between 29 August 2008 and 1 October 2008 before the commencement day on 2 October 2008. The extra noise measurement results are shown in **Appendix J** for reference only.

5.3 WATER QUALITY

5.3.1 Action and Limit Levels

The Action and Limit levels for water quality are illustrated in **Table 5-3-1**.

Table 5-3-1 Action and Limit Levels for Water Quality Monitoring

Parameter	Monitoring Location	Type of Station	Action Level	Limit Level
DO (mg/L)	W8A	Control	NA	NA
	W8B	Impact	6.378	4.00
Turbidity (NTU)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
pH	W8A	Control	NA	NA
	W8B	Impact	9.2 (95%-ile of baseline results)	9.3 (99%-ile of baseline results)
SS (mg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
Ammonia (µg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day

Parameter	Monitoring Location	Type of Station	Action Level	Limit Level
Zinc (µg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day

5.3.2 Event Action Plan

Should the monitoring results at W8B indicate that the Action and Limit levels are exceeded; the actions specified in **Appendix H** shall be carried out.

5.3.3 Results

In this reporting month, total 11 sampling days were performed on 2, 4, 6, 9, 11, 13, 15, 17, 20, 22 and 24 October. Results data of water quality monitoring at location W8A and W8B during the Reporting Period are shown in **Appendix F**.

For this reporting month, eight action level and 23 limit exceedances were found in water quality monitoring, the exceedance parameters include DO, turbidity, SS, zinc. The NOE with investigation reports were issued and submitted. Based on the construction activities as provided by the Contractor and during sampling observation, ET considers that the exceedances including DO, turbidity, suspended solids and zinc were found at impact station W8B are unlikely due to the project. The high concentration of those parameters is come from Kam Po Road Nullah, due to the sampling point W8B is located at the junction between downstream of the construction site and the nullah. During the report submission date still not yet closed.

A summary of water exceedances during this reporting month is presented in **Table 5-3-3**.

Table 5-3-3 Summary of Marine Water Quality Exceedances

Station	Exceedance	DO	Turbidity	pH	SS	NH ₃ -N	Zinc	Total
W8B	Action Level	6	0	0	0	0	2	8
	Limit Level	5	7	0	8	0	3	23

5.3.3 Discussion, Conclusion and Recommendation

Non-Works Related Water Quality Deterioration

Compared with the baseline water conditions measured in April 2008, Turbidity, SS, NH₃-N and Zinc were elevated. Updated construction Program and observation during the sampling demonstrated that the exceedances are come from Kam Po Road Nullah due to the sampling point W8B is located at the junction between downstream of the construction site and the nullah and also no effluent was generated and discharged to the stream within KT14A. The elevation of the exceedances at W8B is therefore concluded not works related. Therefore the associated corrective action was not required.

Review the results of extra water samples were conducted between 29 August 2008 and 30 September 2008 before the works commencement on 2 October, the stream water quality condition at the sample point is significant change due to weather and natural back ground are different from the baseline monitoring period between 18 March 2008 and 12 April 2008. Therefore, the Action and Limit levels will be recommended to adjust for approve.

6 REPORT ON NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS, SUCCESSFUL PROSECUTIONS AND OTHERS

6.1 NON-COMPLIANCE

As concluded in **Section 5.1 to 5.4**, no non-compliance (exceedances) of the air and noise environmental quality performance limits (Action and Limit Levels) was recorded during the Reporting Period.

For water quality monitoring, totally 31 Action and Limit levels exceedances were although found in water quality, but it is concluded the exceedances is unlikely due to the project. The exceedances are considered to be came from Kam Po Road Nullah due to (i) the sampling point W8B is located at the junction between downstream of the construction site and the nullah; (ii) also no effluent was generated and discharged to the stream within KT14A, (iii) the nullah water condition is significant change to compare with the baseline monitoring period which is proved by extra water samples were conducted between 29 August 2008 and 30 September 2008 before the works commencement on 2 October, the results of water quality is same as impact monitoring, so the water deterioration is significant change due to weather and natural back ground.

6.2 ENVIRONMENTAL COMPLAINTS

No written or verbal complaints were received (written or verbal) for each medial were registered during the Reporting Period.

6.3 NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No notifications of summons and successful prosecutions were recorded during the Reporting Period.

6.4 OTHERS

6.4.1 Waste Management Status

Waste generated, re-used, recycled and disposed of during the Reporting Period is shown in **Appendix G: Monthly Summary Waste Flow Table for 2008**.

6.4.2 Site Inspection and Environmental Audit

In this reporting period, four occasions of weekly environmental site inspection and audit were conducted on 4, 9, 16 and 24 October 2008 jointly by the ER, EO and ET during the Reporting Period. Although the major construction activities include excavation, formwork were undertaken, however no non-compliance were observed during the inspection, so no adverse environmental impacts were registered, indicating the mitigation measures implemented were effective and sufficient for the construction activities or preparation work and site clearance undertaken. Minor deficiencies found in the site inspection and audit was in general rectified within the specified deadlines. Findings of the site inspection and environmental audit are summarized below.

Table 6-4-2 Summary of findings of Site Inspection and Environmental Audit

Date	Findings / Deficiencies	Follow-Up Status
4 Oct 2008	Debris of general refuse are observed surrounding at working area, the contractor was reminded that the housekeeping should be undertaken.	Rubbish bin is observed to provide in the working site on 9 October 2008.
9 Oct 2008	No adverse environmental impacts were observed however the contractor was reminded the provided noise mitigation measures should be met the EP, PP and EM&A manual requirement,	Only reminder
16 Oct 2008	No adverse environmental impacts were observed during the site inspection. Dust suppression measures were reminded for KT14A during vehicle release to site.	Wheel wash was observed in site exist during inspection on 24 October 2008.
24 Oct 2008	No adverse environmental impacts were observed. Excavation and formwork were observed at working site. Noise and water quality impact is reminded to implement by the contractor. Housekeeping should be undertaken to ensure the environmental performance.	Only reminder

6.4.3 Works to be Undertaken in the Forth-Coming Month

Works to be undertaken in the forth-coming month are shown in the construction program enclosed in **Appendix C**. In addition, the activities undertaken in the Reporting Period including construction, preparation and site clearance activities will also be continued in the forth-coming month.

6.4.4 Future Key Issues and Mitigation Measures for the Forth-Coming Month

The rain season in Hong Kong normal has been approach in April to November; therefore turbidity and other water quality pollutants via site surface water runoff into the river within KT14A continues to be the key issue in the forth-coming month. Mitigation measures for water quality should therefore be fully implemented.

On the other hand, construction dust will continue to become a key environmental issue during dry and windy days. The implemented construction dust mitigation measures should therefore also be maintained and improved as necessary during dry and windy days.

In addition, special attention should also be paid to construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the PP and summarized in Mitigation Measure Implementation Schedule should be fully implemented. The updating EMIS is list in **Appendix K**

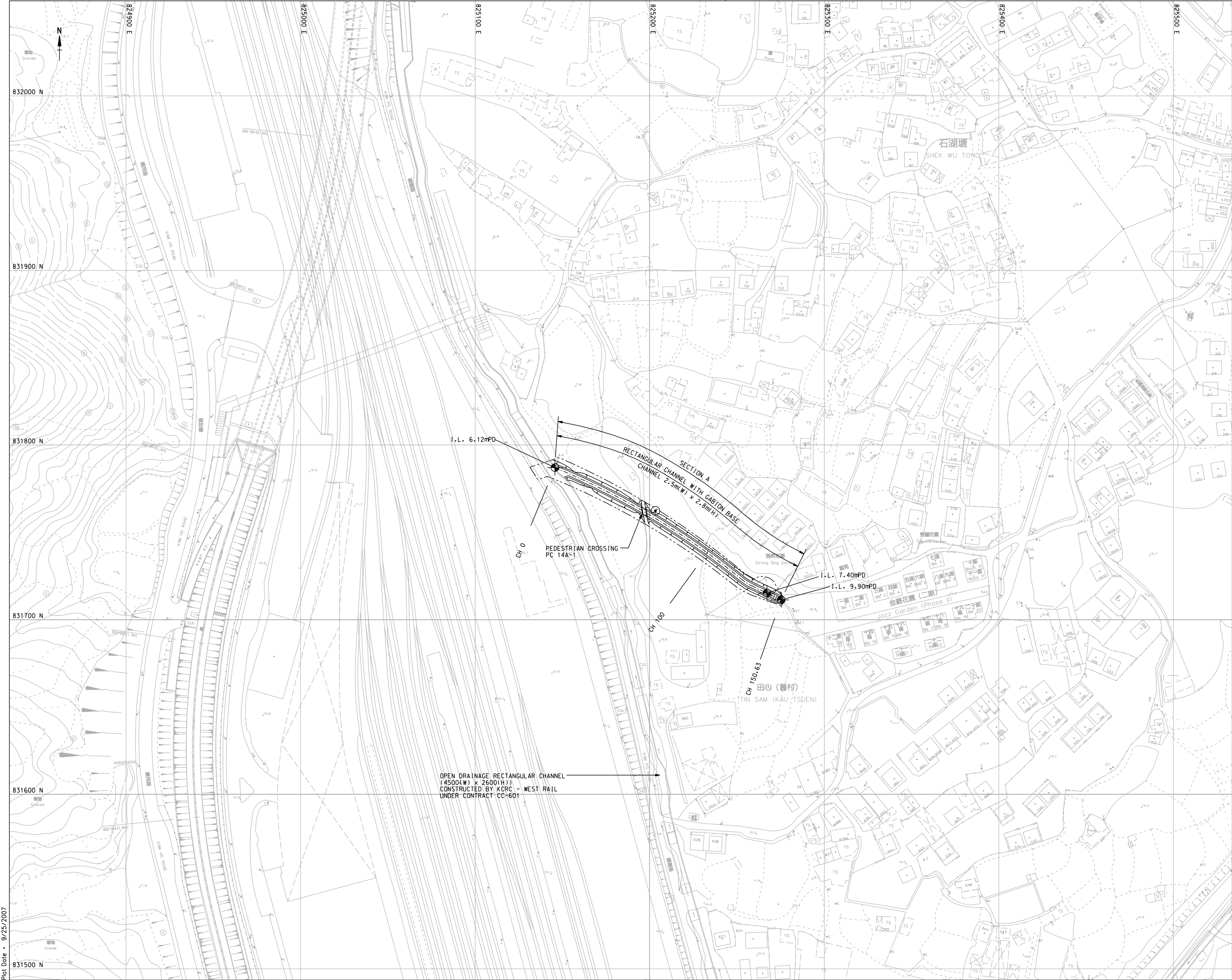
7 CONCLUSIONS AND RECOMMENDATIONS

- i) For ease of reporting, it has been agreed among the ER, IEC, CRBC, ET and EPD that the EM&A report for the Project is split to the following three stand-alone parts:
 - (d) EM&A Report - KT13 (under EP No. EP263/2007);
 - (e) EM&A Report - KT14A (under No. EP231/2005A); and
 - (f) EM&A Report - KT12, KT14B and KT14C (for Non-Designated works under no Environmental Permit).
- ii) It is also agreed among the ER, IEC, CRBC, ET and EPD that the cut-off day is 25th of each month. That is to say, the reporting month is counted from 26th of the previous month to 25th of the reporting month.
- iii) Synchronizing commencement of preparation, site clearance and construction works at KT14A, the EM&A program for air quality, construction noise and water quality have been actual performed on 2 October 2008. This is the first monthly EM&A Report - KT14A for designated works under Environmental Permit EP-231/2005A, covering a period from 2 to 25 October 2008.
- iv) Monitoring results demonstrated that air quality and construction noise are full compliance with the environmental quality criteria, no exceedance of Action and Limit levels recorded during the Reporting Period.
- v) For water quality monitoring, 8 Action levels and 23 Limit levels exceedances were found in water quality in DO, turbidity, SS and zinc. As concluded that the exceedances is not related the project as follows: (i) no effluent was generated and discharged to the stream within KT14A; (ii) bad effluent condition was observed in the Kam Po Road Nullah, selection the sampling point W8, it is located at the junction between downstream of the construction site and the nullah; (iii) the water condition is significant change, which is proved by extra water samples were conducted between 29 August 2008 and 30 September 2008 before the works commencement on 2 October, the results of water quality is same as impact monitoring, so the water deterioration is significant due to weather and natural background.
- vi) No written or verbal complaints, notifications of summons and successful prosecutions were received (written or verbal) for each media during the Reporting Period. No adverse environmental impacts were observed during the four occasion's weekly site inspection. Minor deficiencies found in the weekly site inspection were in general rectified within the time.
- vii) Although the conclusion of the environmental performance for the Project is accepted however the mitigation measures including noise, dust and water impact are recommended to be implement in accordance with PP, EP and EM&A manual requirement e.g.
 - As rain season has approached, ingress of water quality pollutants via site surface water runoff into the river within KT14A continues to be the key issue in the forth-coming month. Mitigation measures for water quality should therefore be fully implemented.
 - Construction dust will continue to become a key environmental issue during dry and windy days. The implemented construction dust mitigation measures should therefore also be maintained and improved as necessary during dry and windy days; and
 - In addition, special attention should also be paid to construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the PP and summarized in Mitigation Measure Implementation Schedule should be fully implemented.
- viii) Extra monitoring included water quality, air quality and noise were conducted between 29 August 2008 and 30 September 2008 before the construction commencement on 2 October 2008. The results of extra measurement are also attached in this monthly report for reference only.

END OF TEXT

Appendix A

Location Plan of the Project and Environmental Monitoring Locations



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- NOTES :
1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 021.

Revision	Date	Description			Initial
	Designed	Checked	Drawn	Verified	
Initial	BW	WLC	LWL	KIL	
Date	09/07	09/07	09/07	09/07	
Approved					

CONTRACT NO. DC /2007 /17

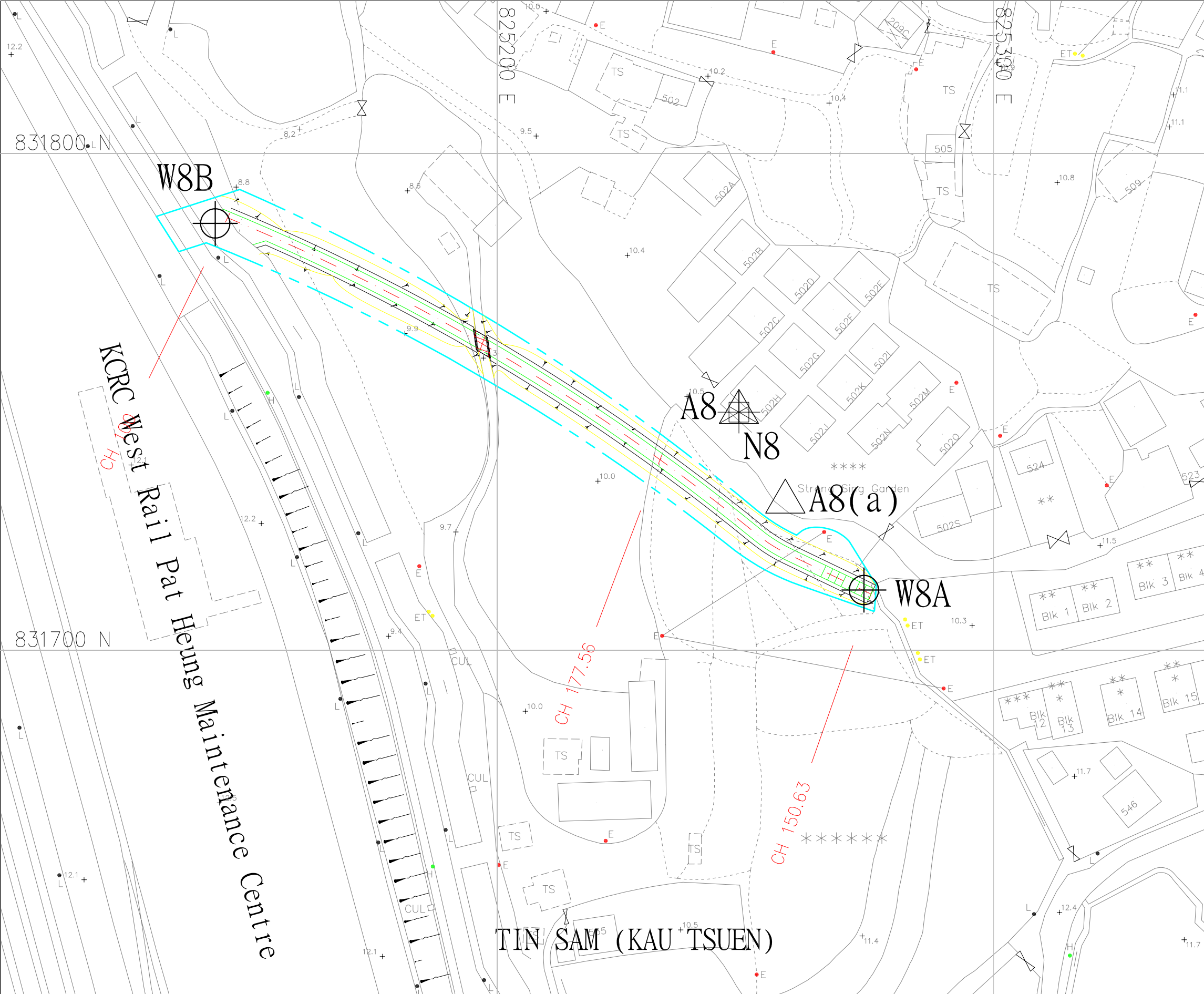
Contract title
DRAINAGE IMPROVEMENT WORKS
IN CHEUNG PO, MA ON KONG,
YUEN KONG SAN TSUEN AND TIN SAM
TSUEN OF YUEN LONG DISTRICT AND
SEWERAGE AT TSENG TAU CHUNG TSUEN,
TUEN MUN

Drawing title
CHANNEL KT14
GENERAL LAYOUT PLAN
(SHEET 1 OF 2)

Drawing no.	Scale
024	1:1000 A1 1:2000 A3

 香港特別行政區政府渠務署
THE GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT


BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司



Legends

Construction Noise Monitoring Location

Air Quality Monitoring Location

Water Quality Monitoring Location

Monitoring Location access is not allow
(Air or Noise or Water) for measurment

Table

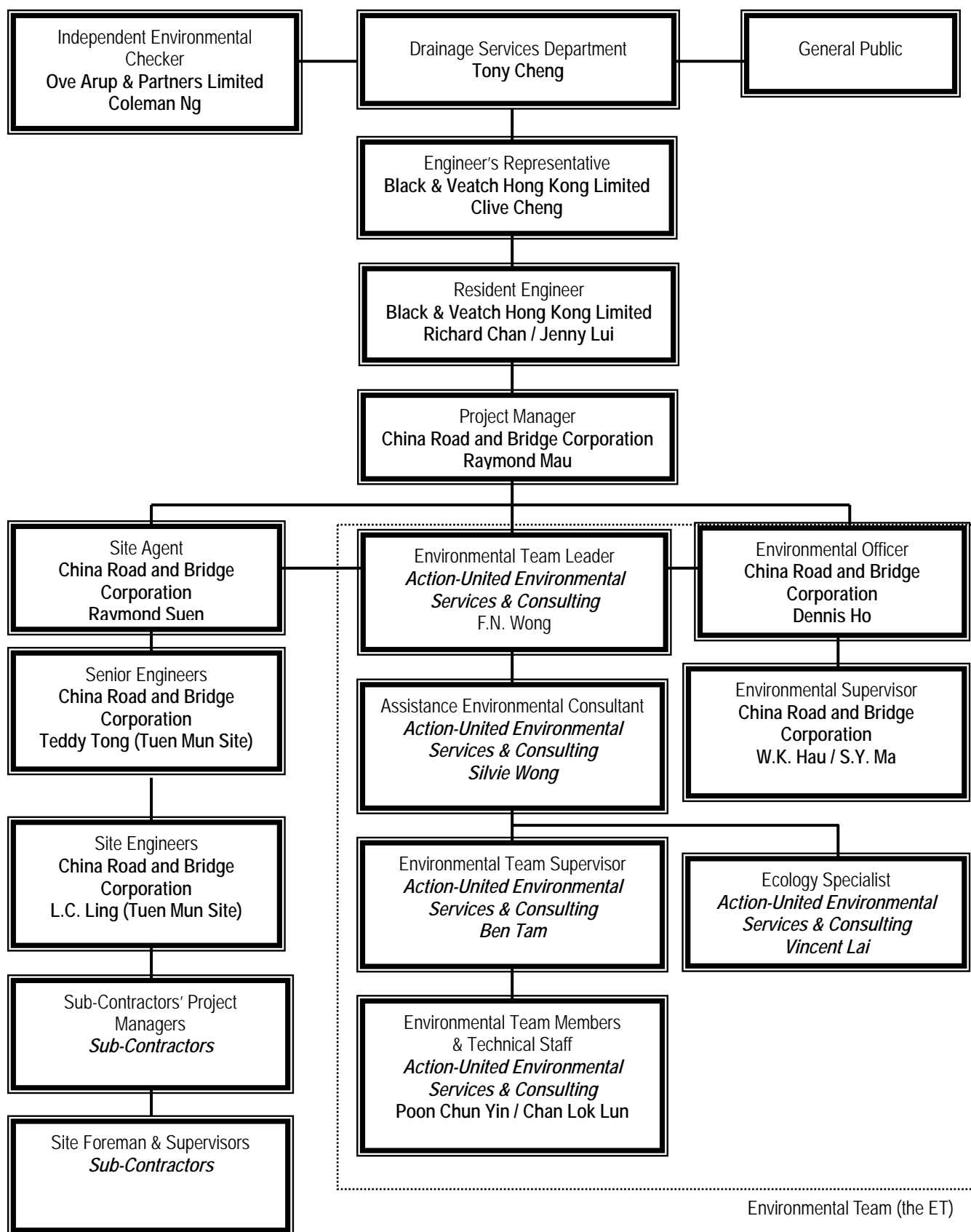
Monitoring Parameter	Location ID	Address	Remarks
Water	W8A	E825274 / N831712	
Water	W8B	E825143 / N831786	
Air	A8		Replaced by A8(a)
Air	A8(a)	Extrance of Strong Sing Garden	Recommended Location
Noise	N8	No. 205H of Strong Sing Garden	

Note:

Air Monitoring Location A8 are proposed to relocate at the extrance of Strong Sing Garden A8(a) due to request of the property management. The relocated monitoring point is considered suitable as representative sensitive receiver for Strong Sing Garden.

Appendix B

Environmental Management Organization and Contacts of Key Personnel



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. Tony Cheng	2594 7264	2827-8526
B&V	Engineer's Representative	Mr. Clive Cheng	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Richard Chan	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Jenny Lui	2478-9161	2478-9369
OAP	Independent Environmental Checker	Mr. Coleman Ng	2268 3097	2268 3950
CRBC	Project Director	Mr. Wang Yanhua	22831688	2283-1689
CRBC	Project Manager	Mr. Raymond Mau	9048-3669	2283-1689
CRBC	Site Agent	Mr. Raymond Suen	9779-8871	2283-1689
CRBC	Senior Engineer (Tuen Mun Site)	Mr. Teddy Tong	6283 9684	2283-1689
CRBC	Site Engineer (Tuen Mun Site)	Mr. L.C. Ling	6770 4010	2283-1689
CRBC	Environmental Officer	Mr. Dennis Ho	6474-6975	2283-1689
CRBC	Environmental / Construction Supervisor (Tuen Mun and Yuen Long site)	Mr. W.K. Hau	6283 9696	2283-1689
CRBC	Environmental / Construction Supervisor (Yuen Long site)	Mr. S.Y. Ma	9401 6296-	2283-1689
CRBC	Safety Officer	Kenny Sze	9374-8954	2283-1689
AUES	Environmental Team Leader	Mr. FN Wong	2959-6059	2959-6079
AUES	Assistance Environmental Consultant	Miss Sylvie Wong	2959-6059	2959-6079
AUES	Environmental Site Inspector	Mr. Ben Tam	2959-6059	2959-6079
AUES	Ecologist	Mr. Vincent Lai	2959-6059	2959-6079

Legend:

DSD (Employer) – Drainage Services Department

B&V (Engineer) – Black & Veatch Hong Kong Limited

CRBC (Main Contractor) – China Road and Bridge Corporation

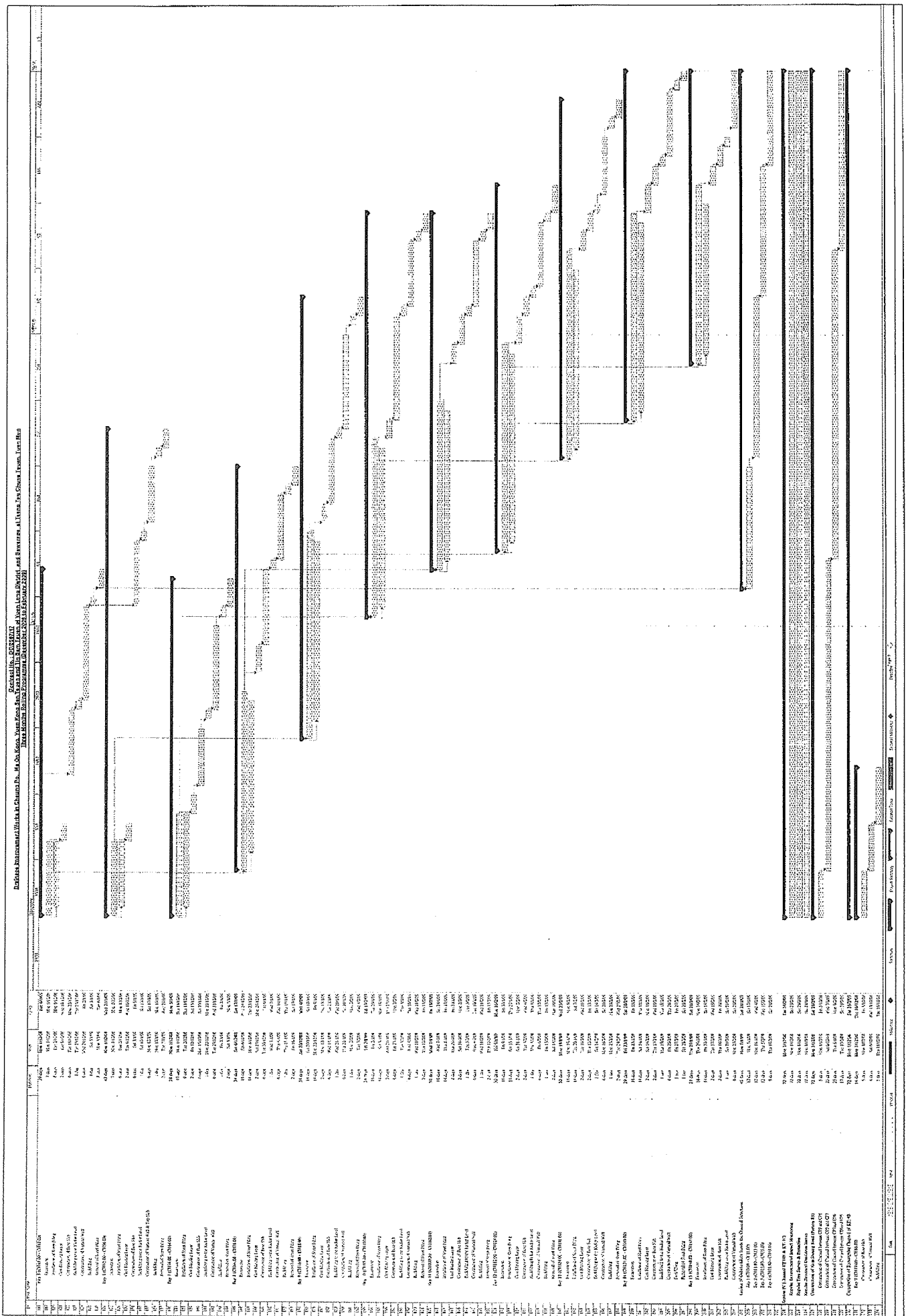
OAP (IEC) – Ove Arup & Partners Ltd

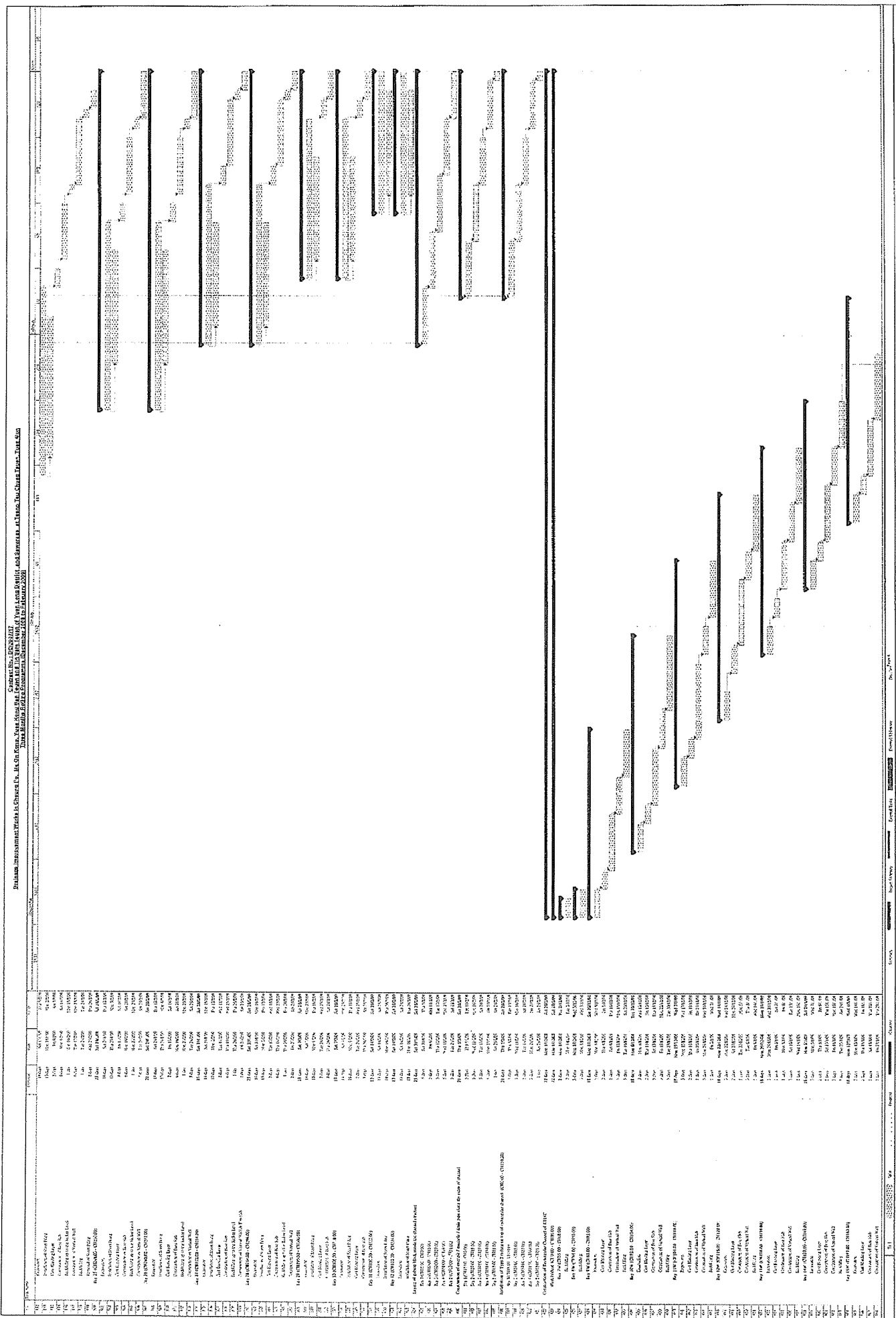
AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

Construction Program

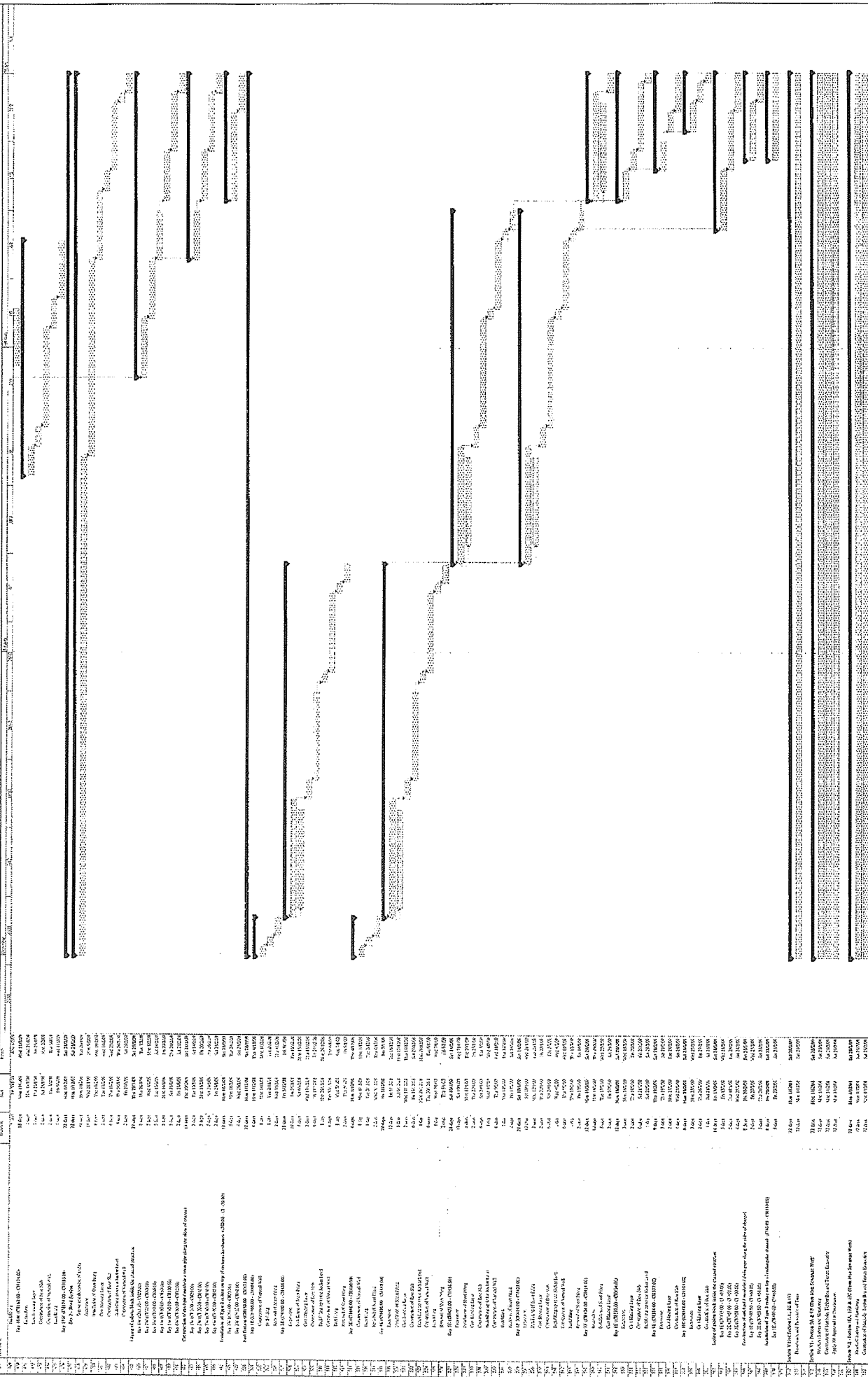
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General Note: 1. The design is based on the assumption that the structure is subjected to the design loads specified in the design code. 2. The design is based on the assumption that the structure is subjected to the design loads specified in the design code. 3. The design is based on the assumption that the structure is subjected to the design loads specified in the design code.

General Note: 1. The design is based on the assumption that the structure is subjected to the design loads specified in the design code. 2. The design is based on the assumption that the structure is subjected to the design loads specified in the design code. 3. The design is based on the assumption that the structure is subjected to the design loads specified in the design code.



NO.	REVISION	DATE	BY	CHKD.	APPD.	DESCRIPTION
1						Initial Design
2						Revised Design
3						Final Design
4						As-Built

Appendix D

Calibration Certificates and HOKLAS-Accreditation Certificate

CERTIFICATE OF ANALYSIS




Batch: HK0817539
Date of Issue: 17/10/2008
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration of Thermometer

Item : YSI Multimeter
Model No. : YSI 550A
Serial No. : 05F2063AZ
Equipment No.: - -
Calibration Method : In-house Method
Date of Calibration : 17 October, 2008

Testing Results :

Reference Temperature (°C)	Recorded Temperature (°C)
23.2 °C	23.3°C
31.5 °C	31.4 °C
Allowing Deviation	±0.2 mg/L


Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS



Batch: HK0817539
Date of Issue: 17/10/2008
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration of DO System

Item : YSI Multimeter

Model No. : YSI 550A

Serial No. : 05F2063AZ

Equipment No. : --

Calibration Method : This meter was calibrated in accordance with standard method APHA (18th Ed.) 4500-OC & G

Date of Calibration : 17 October, 2008

Testing Results :

Expected Reading	Recording Reading
4.88 mg/L	4.76 mg/L
6.52 mg/L	6.38 mg/L
7.89 mg/L	7.86 mg/L
Allowing Deviation	±0.2 mg/L

Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS

Batch: HK0815012
Date of Issue: 19/09/2008
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:



Calibration of Turbidity System

Item : HACH Turbidimeter
Model No. : HACH 2100P
Serial No. : 950900008735
Equipment No. : EQ091
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2130B
Date of Calibration : 01 September, 2008

Testing Results :

Expected Reading	Recording Reading
0.00	0.23
1.00	1.08
2.00	2.17
4.00	3.78
16.0	15.1
40.0	37.5
80.0	74.9
160	149
Allowing Deviation	± 0.2

Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS



Batch: HK0817540
Date of Issue: 17/10/2008
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration of Salinity System

Item : HAND REFRACTOMETER
Model No. : ATAGO
Serial No. : 289468
Equipment No. : EQ114
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2520 A and B
Date of Calibration : 17 October, 2008

Testing Results :

Expected Reading	Recording Reading
10 g/L	10 g/L
20 g/L	19 g/L
30 g/L	28 g/L
40 g/L	38 g/L
Allowing Deviation	±10%

Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS



Batch: HK0810119
Date of Issue: 09/07/2008
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration of pH System

Item : HANNA pH Meter

Model No. : HI98107

Serial No. : S388220


Equipment No. : 0800542

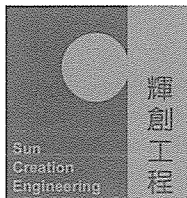
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 4500-H⁺B

Date of Calibration : 27 June, 2008

Testing Results :

Expected Reading	Recording Reading
4.00	3.8
7.00	6.9
10.0	10.0
Allowing Deviation	± 0.2


Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C082016

Certificate of Calibration

This is to certify that the equipment

Description : Integrating Sound Level Meter (EQ006)

Manufacturer : Bruel & Kjaer

Model No. : 2238

Serial No. : 2285762

*has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C082016.*

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 : 22 April 2008

Certified by :

K C Lee

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

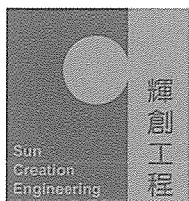
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

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. : C082016

Calibration Report

ITEM TESTED

DESCRIPTION : Integrating Sound Level Meter (EQ006)
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 2238
SERIAL NO. : 2285762

TEST CONDITIONS

AMBIENT TEMPERATURE : $(23 \pm 2)^{\circ}\text{C}$ RELATIVE HUMIDITY : $(55 \pm 20)\%$
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 21 April 2008

JOB NO. : IC08-0992

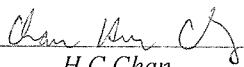
TEST RESULTS

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

Tested by :


H C Chan

Date : 22 April 2008

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Page 1 of 4

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 2326408 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	C080037
CL281	Multifunction Acoustic Calibrator	DC080007

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 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)		
20 - 100	L _{AFP}	A	F	94.00	1	93.9	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)	
40 - 120	L _{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)		
20 - 100	L _{AFP}	A	F	94.00	1	94.0	Ref.
	L _{ASP}		S			94.0	± 0.1
	L _{AIP}		I			94.0	± 0.1

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Burst Duration		
30 - 110	L _{AFP}	A	F	106.00	Continuous	106.0	Ref.
	L _{AFMax}				200 ms	104.9	-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 651 Type I Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq.		
20 - 100	L _{AFP}	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.6	-16.1 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.0	+1.2 ± 1.0
					4 kHz	94.8	+1.0 ± 1.0
					8 kHz	92.6	-1.1 (+1.5 ; -3.0)
					12.5 kHz	88.8	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type I Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq.		
20 - 100	L _{CFP}	C	F	94.00	31.5 Hz	91.0	-3.0 ± 1.5
					63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.5	-0.2 ± 1.0
					500 Hz	93.8	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.7	-0.2 ± 1.0
					4 kHz	93.1	-0.8 ± 1.0
					8 kHz	90.7	-3.0 (+1.5 ; -3.0)
					12.5 kHz	86.9	-6.2 (+3.0 ; -6.0)

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Freq. Weight	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type I Spec. (dB)
30 - 110	Leq	A	10 sec.	4	1	1/10	110.0	100	100.2	± 0.5
						1/10 ²		90	90.2	± 0.5
			60 sec.			1/10 ³		80	79.8	± 1.0
			5 min.			1/10 ⁴		70	69.5	± 1.0

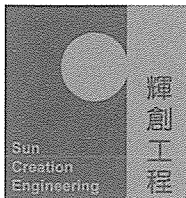
Remarks : - Mfr's Spec. : IEC 651 & IEC 60804 Type 1

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.40 dB
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. : C081990

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter (EQ067)

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410221

*has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C081990.*

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 : 22 April 2008

Certified by :

K C Lee

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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. : C081990

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter (EQ067)
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00410221

TEST CONDITIONS

AMBIENT TEMPERATURE : $(23 \pm 2)^{\circ}\text{C}$ RELATIVE HUMIDITY : $(55 \pm 20)\%$
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

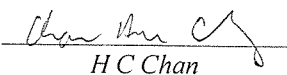
DATE OF TEST : 18 April 2008

JOB NO. : IC08-0992

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

Tested by : 
H C Chan

Date : 22 April 2008

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Page 1 of 4

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 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	C080037
CL281	Multifunction Acoustic Calibrator	DC080007

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 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)		
20 - 100	L _A	A	Fast	94.00	1	93.7	± 0.7

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	
30 - 120	L _A	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.6
				114.00		113.6

IEC 651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

- 6.2 Time Weighting

- 6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)		
20 - 100	L _A	A	Fast	94.00	1	93.7	Ref.
			Slow			93.7	± 0.1

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Burst Duration		
20 - 110	L _A	A	Fast	106.00	Continuous	106.0	Ref.
	L _{Amax}				200 ms	105.1	-1.0 ± 1.0
	L _A		Slow		Continuous	106.0	Ref.
	L _{Amax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
20 - 100	L _A	A	Fast	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
					500 Hz	90.5	-3.2 ± 1.0
					1 kHz	93.7	Ref.
					2 kHz	94.9	+1.2 ± 1.0
					4 kHz	94.4	+1.0 ± 1.0
					8 kHz	89.9	-1.1 (+1.5 ; -3.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
20 - 100	L _C	C	Fast	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.6	-0.2 ± 1.0
					500 Hz	93.8	0.0 ± 1.0
					1 kHz	93.7	Ref.
					2 kHz	93.5	-0.2 ± 1.0
					4 kHz	92.6	-0.8 ± 1.0
					8 kHz	88.0	-3.0 (+1.5 ; -3.0)

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Weight	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type I Spec. (dB)
20 - 110	L _{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						1/10 ²		90	90.0	± 0.5
			60 sec.			1/10 ³		80	80.0	± 1.0
			5 min.			1/10 ⁴		70	70.0	± 1.0

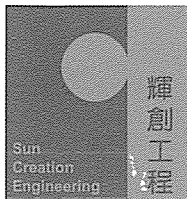
Remarks : - Mfr's Spec. : IEC 651 & IEC 60804 Type I

- Uncertainties of Applied Value : 94 dB : 31.5Hz - 125 Hz : ± 0.35 dB
500 Hz : ± 0.30 dB
1 kHz : ± 0.20 dB
2 kHz - 4 kHz : ± 0.35 dB
8 kHz : ± 0.45 dB
104 dB : 1 kHz : ± 0.30 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. : C082026

Certificate of Calibration

This is to certify that the equipment

Description : Acoustical Calibrator (EQ016)

Manufacturer : Bruel & Kjaer

Model No. : 4231

Serial No. : 2292167

*has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C082026.*

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 : 22 April 2008

Certified by :

K/C Lee

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

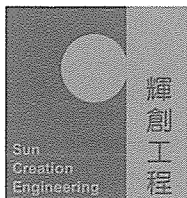
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

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. : C082026

Calibration Report

ITEM TESTED

DESCRIPTION : Acoustical Calibrator (EQ016)
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 4231
SERIAL NO. : 2292167

TEST CONDITIONS

AMBIENT TEMPERATURE : $(23 \pm 2)^{\circ}\text{C}$ RELATIVE HUMIDITY : $(55 \pm 20)\%$
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 21 April 2008

JOB NO. : IC08-0992

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification & user's specified acceptance criteria.
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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by : Chan Hing On
H C Chan

Date : 22 April 2008

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Page 1 of 2

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 :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
TST150A	Measuring Amplifier	C080751
CL129	Universal Counter	C072995
CL281	Multifunction Acoustic Calibrator	DC080007

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	User's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.3	± 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

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- 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.

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Strong Sing Garden	Date of Calibration: 29-Aug-08
Location ID :	KT14-1 (A8(a))	Next Calibration Date: 29-Nov-08
		Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1008.6	Corrected Pressure (mm Hg)	756.45
Temperature (°C)	29.1	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.54431
Model->	515N	Qstd Intercept ->	-0.01988

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.8	4.8	9.6	2.001	51	50.19	Slope = 40.1942
13	4.0	4.0	8.0	1.828	43	42.32	Intercept = -30.6782
10	3.1	3.1	6.2	1.611	35	34.44	Corr. coeff. = 0.9993
7	2.4	2.4	4.8	1.419	26	25.59	
5	1.3	1.3	2.6	1.047	12	11.81	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

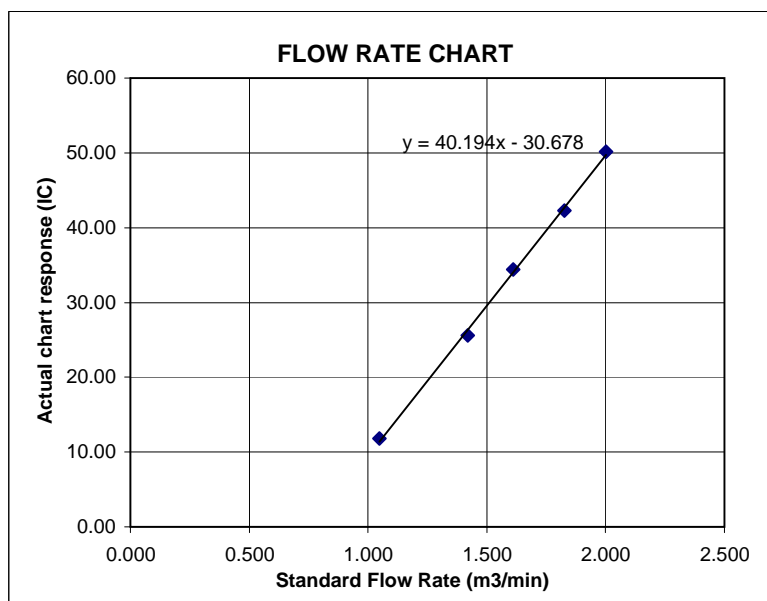
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Calibration Record

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata
 Serial No. 362359
 Equipment Ref: EQ096
 Sensitivity 769 CPM

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: Village House in Cheung Chun San Tsuen
 Equipment Ref: A1
 Last Calibration Date: 07 May 2008

Equipment Calibration Results:

Calibration Date: 20 June 2008

Hour	Time	Temp °C	RH %	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
1	11:30 ~ 12:30	31.2	82	0.133	4240	70.7
1	14:30 ~ 15:30	32.1	77	0.056	1602	26.7
1	16:30 ~ 17:30	29.2	81	0.058	1764	29.4

Sensitivity Adjustment Scale Setting (Before Calibration) 769 (CPM)

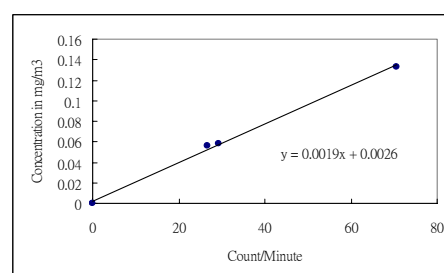
Sensitivity Adjustment Scale Setting (After Calibration) 769 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0019

Correlation Coefficient 0.9988

Validity of Calibration Record 24 June 2008



Operator : Ben Tam Signature : [Signature] Date : 24 June 2008

QC Reviewer : Ken Wong Signature : [Signature] Date : 24 June 2008



Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

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

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

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

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

Environmental Testing
環境測試

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

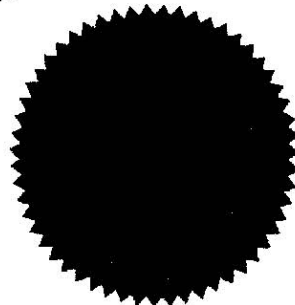
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory
這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作
quality management system (refer joint ISO-ILAC-IAF Communiqué dated 18 June 2005).
(見國際標準化組織、國際實驗所認可合作組織及國際認可論壇於二零零五年六月十八日的聯合公報)。

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

CHAN Sing Sing, Terence, Executive Administrator
執行幹事 陳成城
Issue Date : 3 May 2006
簽發日期：二零零六年五月三日

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

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



Appendix E

- (a) Monitoring Schedules**
- (b) Meteorological Data**

(A1) First Month of Environmental Monitoring Schedule - October 2008

Date		Air Quality		Noise Leq 30min	Water Quality
		Hour TSP	24-Hour TSP		
1-Oct-08	Wed				
2-Oct-08	Thu				
3-Oct-08	Fri				
4-Oct-08	Sat				
5-Oct-08	Sun				
6-Oct-08	Mon				
7-Oct-08	Tue				
8-Oct-08	Wed				
9-Oct-08	Thu				
10-Oct-08	Fri				
11-Oct-08	Sat				
12-Oct-08	Sun				
13-Oct-08	Mon				
14-Oct-08	Tue				
15-Oct-08	Wed				
16-Oct-08	Thu				
17-Oct-08	Fri				
18-Oct-08	Sat				
19-Oct-08	Sun				
20-Oct-08	Mon		Power Shortage		
21-Oct-08	Tue				
22-Oct-08	Wed				
23-Oct-08	Thu				
24-Oct-08	Fri				
25-Oct-08	Sat		Replacement		
26-Oct-08	Sun				
27-Oct-08	Mon				
28-Oct-08	Tue				
29-Oct-08	Wed				
30-Oct-08	Thu				
31-Oct-08	Fri				

	Monitoring Day
	Sunday or Public Holiday

Remarks: Impact Monitoring Frequency

Air Quality :Once every 6 days for 24-Hr TSP and three times every 6 days for 1-Hr TSP, when the highest construction dust impacts are anticipated.

Noise :Once a week during 0700-1900 on normal weekdays for Leq30min

Water Quality :Three times a week with intervals of at least 36 hours between two consecutive monitoring events

A(2) Come Month of Environmental Monitoring Schedule – November 2008

Date		Air Quality		Noise Leq 30min	Water Quality
		1-Hour TSP	24-Hour TSP		
1-Nov-08	Sat				
2-Nov-08	Sun				
3-Nov-08	Mon				
4-Nov-08	Tue				
5-Nov-08	Wed				
6-Nov-08	Thu				
7-Nov-08	Fri				
8-Nov-08	Sat				
9-Nov-08	Sun				
10-Nov-08	Mon				
11-Nov-08	Tue				
12-Nov-08	Wed				
13-Nov-08	Thu				
14-Nov-08	Fri				
15-Nov-08	Sat				
16-Nov-08	Sun				
17-Nov-08	Mon				
18-Nov-08	Tue				
19-Nov-08	Wed				
20-Nov-08	Thu				
21-Nov-08	Fri				
22-Nov-08	Sat				
23-Nov-08	Sun				
24-Nov-08	Mon				
25-Nov-08	Tue				
26-Nov-08	Wed				
27-Nov-08	Thu				
28-Nov-08	Fri				
29-Nov-08	Sat				
30-Nov-08	Sun				

	Monitoring Day
	Sunday or Public Holiday

Remarks: Impact Monitoring Frequency

Air Quality :Once every 6 days for 24-Hr TSP and three times every 6 days for 1-Hr TSP, when the highest construction dust impacts are anticipated.

Noise :Once a week during 0700-1900 on normal weekdays for Leq30min

Water Quality :Three times a week with intervals of at least 36 hours between two consecutive monitoring events

(B) Meteorological Data Extracted from HKO in 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-Oct-08	Wed	Holiday					
2-Oct-08	Thu	sunny periods/moderate	3.0	27.9	9.0	68.0	E/NE
3-Oct-08	Fri	cloudy/overcast/rain/moderate/fresh/strong	2.4	27.6	17.0	70.0	E
4-Oct-08	Sat	cloudy/scattered showers/squally thunderstorm/moderate/fresh	14.0	28.1	17.0	78.0	E
5-Oct-08	Sun	cloudy/moderate/fresh	122.6	25.0	29.5	88.5	S/SE
6-Oct-08	Mon	cloudy/moderate/fresh	Trace	24.0	27.5	80.5	N/NW
7-Oct-08	Tue	Holiday					
8-Oct-08	Wed	cloudy/sunny periods/moderate/fresh	0.5	25.0	12.0	77.0	E/NE
9-Oct-08	Thu	sunny periods/cloudy/moderate/fresh	Trace	27.7	14.0	72.0	E
10-Oct-08	Fri	fine/dry/moderate	0.0	28.3	10.0	70.0	E/SE
11-Oct-08	Sat	fine/dry/moderate/fresh	0.0	28.2	13.5	68.5	E/NE
12-Oct-08	Sun	cloudy/rain/fresh/strong	Trace	26.6	12.0	73.0	E/NE
13-Oct-08	Mon	cloudy/rain/fresh/strong	0.3	24.5	11.0	83.0	E/NE
14-Oct-08	Tue	cloudy/haze/sunny periods/moderate/fresh	Trace	25.6	13.5	75.5	E/NE
15-Oct-08	Wed	fine/dry/moderate/fresh	Trace	26.9	9.0	71.0	E
16-Oct-08	Thu	fine/hazy/cloudy/moderate	0.0	27.4	12.0	71.0	E/SE
17-Oct-08	Fri	cloudy/rain/moderate/fresh	0.1	26.8	11.7	69.5	E/SE
18-Oct-08	Sat	sunny periods/cloudy/moderate/fresh	0.0	28.5	10.7	71.5	E/SE
19-Oct-08	Sun	fine/dry/moderate/fresh	1.6	28.6	9.5	66.2	E/SE
20-Oct-08	Mon	fine/dry/moderate/fresh	Trace	28.3	14.5	66.5	E/SE
21-Oct-08	Tue	fine/moderate	0.0	27.4	13.5	66.5	E
22-Oct-08	Wed	fine/moderate	0.0	27.0	9.0	74.0	E/SE
23-Oct-08	Thu	fine/hot/haze/light winds	0.0	26.7	10.5	76.2	S/SE
24-Oct-08	Fri	cloudy/sunny intervals/moderate/fresh	0.0	28.0	11.5	68.0	E/NE
25-Oct-08	Sat	cloudy/sunny intervals/moderate/fresh	Trace	27.6	15.5	68.0	E
26-Oct-08	Sun	cloudy/sunny intervals/moderate/fresh	0.0	27.4	11.7	70.5	E/SE
27-Oct-08	Mon	fine/haze/moderate	Trace	27.3	10.5	74.3	E/NE
28-Oct-08	Tue	fine/cloudy/rain/moderate/fresh	0.1	26.0	9.7	73.5	E
29-Oct-08	Wed	sunny intervals/cloudy/moderate	0.0	27.5	10.2	6.9	E/SE
30-Oct-08	Thu	fine/moderate/fresh/rain	0.0	28.0	9.0	71.5	E/SE
31-Oct-08	Fri	sunny intervals/cloudy/moderate/fresh	0.0	28.5	12.5	71.7	E

Appendix F

Environmental Monitoring Data

24-Hour TSP Monitoring

IMPACT 24-Hour TSP Monitoring Results - KT14A(A8(a))

DSD CONTRACT NO. DC/2007/17
Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun

Cal Graph Slope 40.1942
Cal Graph Intercept -30.6782

DATE	SAMPLE NUMBER	STANDARD										BLANK				SAMPLE OF FILTER PAPER			Dust 24-Hr TSP in Air (µg/m³)	Action Level (µg/m³)	Limit Level (µg/m³)
		ELAPSED TIME			CHART READING		AVERAGE			FLOW	AIR	SAMPLE NUMBER	WEIGHT (g)			WEIGHT (g)					
		INITIAL	FINAL	(min)	MIN	MAX	CHART READING	TEMP (°C)	PRESS (hPa)	RATE (m³/min)	VOLUME (std m³)		INITIAL	FINAL	DIFF	INITIAL	FINAL	DUST COLLECTION			
8-Oct-08	SX71	611.96	636.21	1455.00	34	35	34.5	25.5	1013.8	1.62	2359	NA	3.6459	3.6419	-0.0040	3.5520	3.6128	0.0608	27	150	260
14-Oct-08	SY24	636.21	660.51	1458.00	33	34	33.5	26.1	1015.9	1.60	2327	NA	3.6459	3.6419	-0.0040	3.5733	3.6227	0.0494	23	150	260
20-Oct-08	Power Stortage																				
25-Oct-08	SZ01	660.51	685.11	1476.00	33	34	33.5	26.3	1014.1	1.60	2355	NA	3.6459	3.6419	-0.0040	3.6049	3.6721	0.0672	30	150	260

Water Quality Monitoring

Summary of Water Quality Monitoring Results - KT14A

Date 2-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	12:20	0.17	27.1	27.1	3.41	3.44	43.9	44.3	2.1	2.2	0	0.0	6.9	6.9	3	3.0	16.3	16.30	24	24.0
			27.1		3.47		44.7		2.2		0		6.9		3		16.3		24	
W8B	12:10	0.06	27.0	27.0	4.01	4.04	50.7	51.0	7.4	7.9	0	0.0	6.8	6.8	18	18.0	0.07	0.07	25	25.0
			27.0		4.06		51.3		8.3		0		6.8		18		0.07		25	

Date 4-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:20	0.21	26.9	26.9	3.62	3.65	46.8	47.2	3.0	3.0	0	0.0	6.9	6.9	6	6.0	11.1	11.10	28	28.0
			26.9		3.67		47.6		3.0		0		6.9		6		11.1		28	
W8B	11:10	0.09	26.7	26.7	3.98	3.95	50.3	49.9	10.2	10.0	0	0.0	6.7	6.7	18	18.0	0.05	0.05	34	34.0
			26.7		3.91		49.5		9.8		0		6.7		18		0.05		34	

Date 6-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:30	0.24	27.0	27.0	3.14	3.16	39.6	40.0	2.6	2.7	0	0.0	6.8	6.8	5	5.0	5.11	5.11	23	23.0
			27.0		3.17		40.3		2.8		0		6.8		5		5.11		23	
W8B	10:15	0.11	27.1	27.1	3.46	3.45	44.2	44.0	12.4	12.8	0	0.0	6.9	6.9	22	22.0	0.02	0.02	29	29.0
			27.1		3.44		43.8		13.1		0		6.9		22		0.02		29	

Date 9-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:05	0.25	27.2	27.2	3.41	3.42	44.1	44.2	4.2	4.1	0	0.0	7.1	7.1	7	7.0	15.6	15.60	37	37.0
			27.2		3.42		44.3		4.0		0		7.1		7		15.6		37	
W8B	09:55	0.10	27.0	27.0	3.59	3.58	46.2	46.0	21.6	22.5	0	0.0	6.9	6.9	37	37.0	0.3	0.30	31	31.0
			27.0		3.56		45.8		23.3		0		6.9		37		0.3		31	

Date 11-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:30	0.21	26.9	26.9	3.88	3.85	48.7	48.4	6.1	5.8	0	0.0	6.9	6.9	10	10.0	14.8	14.80	35	35.0
			26.9		3.82		48.1		5.4		0		6.9		10		14.8		35	
W8B	10:20	0.08	26.7	26.7	4.1	4.08	52.8	52.5	18.3	18.6	0	0.0	7	7.0	32	32.0	0.02	0.02	39	39.0
			26.7		4.05		52.2		18.9		0		7		32		0.02		39	

Date 13-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	12:10	0.20	27.8	27.8	3.6	3.61	47.1	47.3	7.7	7.4	0	0.0	7.1	7.1	12	12.0	9.53	9.53	24	24.0
			27.8		3.62		47.5		7.0		0		7.1		12		9.53		24	
W8B	12:00	0.10	27.9	27.9	3.71	3.72	48.6	48.8	2.8	3.1	0	0.0	7.1	7.1	5	5.0	0.32	0.32	10	10.0
			27.9		3.73		48.9		3.3		0		7.1		5		0.32		10	

Date 15-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	13:05	0.18	26.9	26.9	3.26	3.27	40.8	40.9	2.9	2.9	0	0.0	6.8	6.8	5	5.0	8.16	8.16	22	22.0
			26.9		3.27		40.9		2.8		0		6.8		5		8.16		22	
W8B	12:55	0.07	26.8	26.8	4.12	4.13	53.3	53.5	2.4	2.4	0	0.0	6.9	6.9	4	4.0	0.51	0.51	24	24.0
			26.8		4.14		53.7		2.4		0		6.9		4		0.51		24	

Date 17-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	13:20	0.23	27.4	27.4	3.51	3.55	46.7	47.2	3.7	3.8	0	0.0	6.9	6.9	7	7.0	11.6	11.60	26	26.0
			27.4		3.58		47.6		3.9		0		6.9		7		11.6		26	
W8B	13:05	0.14	27.3	27.3	3.99	4.03	50.0	50.7	11.1	10.9	0	0.0	6.8	6.8	22	22.0	0.19	0.19	38	38.0
			27.3		4.07		51.3		10.7		0		6.8		22		0.19		38	

Summary of Water Quality Monitoring Results - KT14A

Date 20-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:20	0.17	27.4	27.4	3.48	3.50	42.7	43.0	13.2	13.5	0	0.0	6.9	6.9	12	12.0	13.8	13.80	34	34.0
			27.4		3.52		43.2		13.8		0		6.9		12		13.8		34	
W8B	10:10	0.07	27.1	27.1	3.91	3.92	48.7	48.9	101.0	100.2	0	0.0	6.8	6.8	68	68.0	0.16	0.16	84	84.0
			27.1		3.92		49.0		99.4		0		6.8		68		0.16		84	

Date 22-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:00	0.16	27.8	27.8	3.66	3.65	45.1	45.0	19.6	19.4	0	0.0	6.8	6.8	16	16.0	11.7	11.70	31	31.0
			27.8		3.64		44.8		19.1		0		6.8		16		11.7		31	
W8B	10:50	0.06	27.6	27.6	4.06	4.04	51.5	51.1	22.5	22.4	0	0.0	6.8	6.8	23	23.0	0.21	0.21	41	41.0
			27.6		4.01		50.6		22.2		0		6.8		23		0.21		41	

Date 24-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	12:05	0.07	27.1	27.1	3.75	3.77	47.3	47.6	7.1	7.5	0	0.0	6.7	6.7	14	14.0	16.6	16.60	34	34.0
			27.1		3.78		47.8		7.9		0		6.7		14		16.6		34	
W8B	12:15	0.17	27.0	27.0	4.12	4.15	52.4	52.7	6.4	6.3	0	0.0	6.8	6.8	12	12.0	0.23	0.23	24	24.0
			27.0		4.17		52.9		6.1		0		6.8		12		0.23		24	

Appendix G

Event Action Plan

Air

Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	Engineer	Contractor
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source 2. Inform IEC and Engineer 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	Notify Contractor	1. Rectify any unacceptable practice 2. Amend working methods if appropriate
2. Exceedance for two or more consecutive samples	1. Identify source 2. Inform IEC and Engineer 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 Engineer 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. Advice Engineer on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IEC within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source 2. Inform Engineer and EPD 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results	1. Check monitoring data submitted by ET 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advice Engineer on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notification 3. Implement the agreed proposals 4. Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	1. Notify IEC, Engineer and EPD 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with IEC and Engineer to discuss the remedial actions to be taken 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst Engineer, ET and Contractor on potential remedial actions 2. Review Contractor's remedial actions whether necessary to assure their effectiveness and advice the Engineer accordingly 3. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented 4. Discuss amongst Environmental Team Leader and the Contractor potential remedial actions 5. Ensure remedial measures properly implemented 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 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 the Engineer until the exceedance is abated

Construction Noise

Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET Leader	IEC	Engineer	Contractor
ACTION LEVEL	<ol style="list-style-type: none"> 1. Notify Contractor and Engineer 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 mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by ET 2. Review the proposed remedial measures by the Contractor and advice the Engineer accordingly 3. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals for remedial actions to IEC 2. Implement the agreed proposals
LIMIT LEVEL	<ol style="list-style-type: none"> 1. Notify IEC, Engineer, EPD and 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, Engineer and EPD the causes & actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst Engineer, ET and Contractor on potential remedial actions 2. Review Contractor's remedial actions whether necessary to assure their effectiveness and advice the Engineer accordingly 3. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the Engineer until the exceedance is abated

Water Quality

Event and Action Plan for Stream Water Quality

Event	ET Leader	IEC	Engineer	Contractor
ACTION LEVEL (being exceeded by one sampling day)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings 2. Identify source(s) of impact 3. Inform IEC and Contractor 4. Check monitoring data, all plant, equipment and Contractor's working methods 5. Discuss mitigation measures IEC and Contractor 6. Repeat measurement on next day of exceedance 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures 2. Make agreement on the mitigation measures to be implemented 	<ol style="list-style-type: none"> 1. Inform Engineer 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 Contractor and propose mitigation measures to IEC and Engineer 6. Implement the agreed mitigation measures
ACTION LEVEL (being exceeded by more than one sampling day)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings 2. Identify source(s) of impact 3. Inform IEC, Contractor and EPD 4. Check monitoring data, all plant, equipment and Contractor's working methods 5. Discuss mitigation measures IEC, Engineer and Contractor 6. Repeat measurement on next day of exceedance 7. Ensure mitigation measures are implemented 8. Prepare to increase the monitoring frequency to daily 9. Repeat measurement on next day of exceedance 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Inform Engineer 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 Engineer within 3 working days 6. Implement the agreed mitigation measures
LIMIT LEVEL (being exceeded by one sampling days)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings 2. Identify source(s) of impact 3. Inform IEC, Contractor and EPD 4. Check monitoring data, all plant, equipment and Contractor's working methods 5. Discuss mitigation measures IEC, Engineer and Contractor 6. Ensure mitigation measures are implemented 7. Increase the monitoring frequency to daily until no exceedance of Limit level 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Inform Engineer 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 Engineer and propose mitigation measures to IEC and Engineer within 3 working days 6. Implement the agreed mitigation measures
LIMIT LEVEL (being exceeded by more than one sampling days)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform Contractor, Engineer, IEC and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 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 construction activities until daily until no exceedance of Limit level 	<ol style="list-style-type: none"> 1. Inform Engineer 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 Engineer and propose mitigation measures to IEC and Engineer within 3 working days 6. Implement the agreed mitigation measures; 7. As directed by Engineer, to slow down or to stop all or part of the construction activities

Appendix H

Updated Environmental Mitigation Implementation Schedule - October 2008

Mitigation Measure Implementation Schedule – Construction Noise

Construction Noise Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Noise 1	<p>The Contractor is required to adopt Level 1 and 2 site-specific direct technical measures as specified below during the construction phase</p> <p><i>Level 1 Mitigation Measures</i></p> <ul style="list-style-type: none"> The use of equipment with sound power level lower than that stipulated in the Technical Memorandum on Noise from Construction Works Other Than Percussive Piling is recommended as the first level mitigation (Level 1 mitigation) for all construction works under this Project. Quiet plant is defined as PME whose actual sound power level is less than the value specified in the Technical Memorandum on Noise from Construction Works Other Than Percussive Piling for the same piece of equipment. BS5228 also provides examples of quiet construction plant and their sound power level. The quiet plant used in the noise calculation including the BS5228 reference number is shown in Attachment 1 for reference <p><i>Level 2 Mitigation Measures</i></p> <ul style="list-style-type: none"> In addition to the use of quiet plant purpose-built site noise barriers shall be used as hoarding where construction works would be undertaken close (about 30m or less) to the NSRs (Figure 5.4). Temporary noise barrier with a minimum height of 3m shall be erected along the part of site boundary closest to the NSRs. Notwithstanding the required minimum height these barriers shall be constructed in a way such that no construction works and PME can be visible from the NSRs nearby. The minimum height is estimated assuming the construction equipment activities will be located on the channel bed 2m below the surrounding ground level. 	Prevent noise impact at sensitive receivers	To be implemented at the works site of KT14 during the Construction Phase (Figure 5.4 show locations of proposed temporary noise barriers.)	Construction Contractor		√		EIAO

Construction Noise Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Noise 1 (Cont'd)	<ul style="list-style-type: none"> Stationary equipment shall be placed on the channel bed during construction works. For the construction works which are predicted to exceed 75dB(A) (Leq30min) at nearby NSR and whose line of sight cannot be blocked by the temporary noise barrier (i.e. further away from the hoardings), movable (mobile) noise barrier of more than 3m high shall be provided. A typical example is shown in Figure 5.7. The noise barriers or screens shall be constructed of appropriate material with a minimum surface density of 10kg/m². Generators and compressors, shall be completely screened by construction barriers giving a total noise reduction of 10dB(A) or more. The location of the proposed temporary noise barriers for KT14 is shown on Figures 5.4. 	Prevent noise impact at sensitive receivers	To be implemented at the works site of KT14 during the Construction Phase (Figure 5.4 show locations of proposed temporary noise barriers.)	Construction Contractor		√		EIAO

Mitigation Measure Implementation Schedule – Air Quality

Air Quality Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Air 1	The Contractor shall prevent dust nuisance arising from the construction activities. The Contractor is required to follow all the requirements for dust control stipulated in the Air Pollution Control (Construction Dust) Regulation	Prevent dust nuisance	To be implemented at all works are of KT14 site during the Construction Phase.	Construction Contractor		√		Air Pollution Control Ordinance Air Pollution Control (Construction Dust Regulation)
Air 2	<p>The following dust suppression measures shall be installed as part of construction practice, and these shall be incorporated in the Contract Specification and implemented to minimize dust nuisance to within acceptable levels.</p> <ul style="list-style-type: none"> i) The Contractor shall frequently clean and water the site to minimise fugitive dust emissions. ii) 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 stored materials during dry and windy weather. iii) Watering of exposed surfaces shall be exercised at least three times a day. iv) Areas within the site where there is a regular movement of vehicles must be regularly watered at minimum three times a day. v) The Contractor shall restrict all motorised vehicles within the site, excluding those on public roads, to a maximum speed of 15 km per hour and confine haulage and delivery vehicles to designated road ways inside the site. vi) Any stockpiles of construction materials that are likely to generate fugitive dust shall be covered with tarpaulins including the materials on lorries or trucks. 	Prevent dust nuisance	To be implemented at all works are of KT14 site during the Construction Phase.	Construction Contractor		√		Air Pollution Control Ordinance Air Pollution Control (Construction Dust Regulation)

Air Quality Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Air 2 (Cont'd)	vii) 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 the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity on the site. The Contractor shall also provide a hard-surfaced road between any washing facility and the public road.	Prevent dust nuisance	To be implemented at all works are of KT14 site during the Construction Phase.	Construction Contractor		√		Air Pollution Control Ordinance Air Pollution Control (Construction Dust Regulation)
	viii) Any materials dropped on paved roads will need to be cleaned up immediately to prevent dust nuisance.							

Mitigation Measure Implementation Schedule – Water Quality

Water Quality Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Water 1	Wash facilities for workers and wheel wash waste result in muddy construction site runoff. Temporary earth hunds and sand barriers shall be used to direct such runoff to a designated settlement area within the site.	Prevent additional pollution load being added to stream due to KT14 works	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		✓		WPCO & ProPECC PN1/94
Water 1 (Cont'd)	The settlement area shall be located within the temporary site area. Construction site runoff shall be settled in this settlement area, while runoff from the surface should be channelled through a local site drainage system into the settlement area. When solids build up in the settlement area, and certainly before the onset of the wet season (Apr-Oct) solids shall be excavated from the base of the settlement area. No excavation shall be allowed in rainy weather.	Prevent additional pollution load being added to stream due to KT14 works	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		✓		WPCO & ProPECC PN1/94
Water 2	All discharged waters, including sewage and site runoff, should comply with the appropriate standards in the Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters, prior to discharge. Licensed contractors shall dispose the collected sewage to the government sewers. No sewage shall be allowed to enter wash facilities or sediment setting area.	Prevent additional pollution load being added to stream due to KT14 works	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		✓		WPCO & ProPECC PN1/94

Mitigation Measure Implementation Schedule – Waste Management

Waste Management								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
	<p><i>Waste Management Plan</i></p> <p>Upon appointment, the main contractor of each construction contract should submit a Waste Management Plan (WMP) to the Engineer for approval. The WMP shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommended mitigation measures in the Project Profile report. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. All mitigation measures numbered Waste 1 to 6 shall be included in the WMP</p>	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.	To be implemented at the works sites of KT14 during the Construction Phase.	Construction Contractor		√		<p>WBTC No. 2/93, 2/93B, 16/96, 4/98, 4/98A, 25/99 25/99A, 25/99C, 12/2000, 19/2001</p> <p>ETWB TC No. 33/2002, 34/2002, 15/2003, 31/2004</p>
Waste 1	<p>i) Trip-ticket system – In order to monitor the disposal of C&D and solid wastes at public filling facilities and landfills, and control fly-tipping, a trip-ticket system shall be included.</p> <p>ii) Records of wastes – A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed.</p> <p>iii) Training – Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.</p>	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.	To be implemented at the works sites of KT14 during the Construction Phase.	Construction Contractor		√		<p>WBTC No. 2/93, 2/93B, 16/96, 4/98, 4/98A, 25/99 25/99A, 25/99C, 12/2000, 19/2001</p> <p>ETWB TC No. 33/2002, 34/2002, 15/2003, 31/2004</p>

Waste Management								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Waste 2	<p><i>Site Clearance Waste / Demolition Waste</i></p> <p>All construction waste shall be sorted on site into inert and non-inert components. Non-inert materials (wood, glass, metals and plastics) shall be recycled or reused and disposed to landfill only as a last resort. Inert materials (soil, rubble, sand, rock, brick and concrete) shall be separated and reused on site prior to final disposal at public filling facilities. The final disposal site for public fill shall be the Public Filling Facility at Tuen Mun Area 38. The final disposal site for construction and demolition waste shall be the North East New Territories (NENT) Landfill.</p>	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.	To be implemented at the works sites of KT14 during the Construction Phase.	Construction Contractor		✓		<p>WBTC No. 2/93, 2/93B, 16/96, 4/98, 4/98A, 25/99 25/99A, 25/99C, 12/2000, 19/2001</p> <p>ETWB(TC) W No. 33/2002, 34/2002, 15/2003, 31/2004</p>
Waste 3	<p>Excavated Material</p> <p>Any excavated material from the stream shall not be stockpiled, and shall be removed from site on the same day. The material shall be stored in covered impermeable skips while awaiting removal from site.</p> <p>Any leachate from skips shall be treated to meet discharge standard from Government sewers before being collected along with toilet waste by licensed contractor.</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p> <p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p>	<p>To be implemented at the works sites of KT14 during the Construction Stage.</p> <p>To be implemented at the works sites of KT14 during the Construction Stage</p>	<p>Construction Contractor during Construction Stage</p> <p>Construction Contractor during Construction Stage</p>		<p>✓</p> <p>✓</p>		<p>ETWB(TC) W No. 34/2002,</p> <p>WBTC 12/2000</p> <p>ETWB(TC) W No. 34/2002,</p> <p>WBTC 12/2000</p>

Waste Management								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Waste 4	<p><i>Recycling the Use of Non-Reusable Materials on Site</i></p> <p>Hoarding, shutters, form works and false works made of reusable materials such as steel or plastic concrete panels shall be used as a preferred alternative to non-reusable materials such as wood and timber, with reference to WBTC No. 19/2001 – Metallic Site Hoarding and Signboards.</p>	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		✓		WBTC 19/2001
Waste 5	<p><i>Chemical Waste</i></p> <p>Any Contractor generating waste oil, lubricants, paints or other chemicals as a result of his activities should register in a chemical waste producer. Storage, handling, transport and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD. Chemical waste should be collected by licensed collector.</p> <p>The Contractor shall provide a storage area with hard standing, impermeable surface for storing chemicals on site to prevent inadvertent release of waste oil or other chemicals into nearby water bodies. Oil and fuel bunkers should be bunded and/or enclosed on three sides to prevent discharge due to accidental spillages or breaches of tanks. Bunded area should be of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste, whichever is largest. For construction plant that is likely to leak oil, absorbent inert materials e.g. sand, shall be placed beneath it. This material should be replaced on a regular basis and the contaminated material disposed as chemical wastes. Storage areas should have adequate ventilation and be covered to prevent rain entering.</p>	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		✓		WDO Waste Disposal (Chemical Waste) General Regulation)

Waste Management								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Waste 5 (Cont'd)	Grease traps shall be installed for site drains. These traps shall be cleared at least once a week. A licensed contractor shall regularly clear the traps and dispose waste oils. No chemicals should be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from the construction site. Training on safety codes and relevant manuals related to the chemicals stored on site should be obligatory for the personnel who handle the chemicals on site.	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		√		WDO Waste Disposal (Chemical Waste) General Regulation)
Waste 6	Domestic garbage generated by site staff shall be stored at dry locations in covered impermeable skips. It should be collected daily and disposed to the nearest Refuse Collection Point or arranged for collection by licensed contractors. The Engineer is responsible for checking that no chemical waste, sewage, excavated material or sorted reusable material is disposed as domestic garbage.	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline	To be implemented at all of KT14 construction site	Construction Contractor		√		Public Health and Municipal Services Ordinance

Mitigation Measure Implementation Schedule – Landscape / Visual

Landscape / Visual Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Land 1	A survey of existing trees shall be completed in accordance with Works Branch Technical Circular No. 14/2002. Management and Maintenance of Natural Vegetation and Landscape Works, and Tree Preservation during detailed design stage. The results of the survey shall form consideration in the detail design for the proposed Secondary Channels KT14, in order that any significant trees shall be protected during both the design and construction periods. Parameters assessed in the survey shall include species, health, form, transplant-ability and amenity value (assessed according to form, size, age, condition and situation of the tree). All surveyed trees should be checked with species listed under the “Animals and Plants (Protection of Endangered Species) Ordinance (CAP 187)” and Forestry and Countryside Ordinance (CAP. 96)” to ensure that no endangered species are affected. Where tree felling is unavoidable, compensatory planting proposal shall be prepared and submitted to EPD and LandsD for approval.	Protect visual quality of project area and proposed works	To be implemented along KT14 during the Detail Design Phase and Construction Phase.	Design Engineer to conduct tree survey during detailed design stage.	✓			Works Bureau Technical Circular No. 14/2002
		Ensure protection of trees.		Construction Contractor to follow the results during construction		✓		
		Protect visual quality of project area and proposed works	To be implemented along KT14 during the Detail Design Phase and Construction Phase.	Design Engineer to conduct tree survey during detailed design stage.	✓			Works Bureau Technical Circular No. 14/2002
		Ensure protection of trees		Construction Contractor to follow the results during construction		✓		

Note:

EIAO Environmental Impact Assessment Ordinance
WDO Waste Disposal Ordinance
WPCO Water Pollution Control Ordinance
TMEIA Technical Memorandum on Environmental Impact Assessment Process

Appendix I

Monthly Summary Waste Flow Table for 2008

Monthly Summary Waste Flow Table

Date: 31-Oct-08
Year/Month: Oct-08

Monthly Summary Waste Flow Table for <u>October 2008</u>										
Year	Actual Quantities of Inert C & D Materials Generated Monthly					Estimated Annual Quantities of C & D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals	Paper/ Cardboard packaging	Plastics (see note 3)	Chemical Waste	Others, e.g. General refuse
	(in '000M ³)	(in '000M ³)	(in '000M ³)	(in '000M ³)	(in '000M ³)	(in '000KG)	(in '000KG)	(in '000KG)	(in '000KG)	(in '000M ³)
Jan	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0
May	0.08	0.04	0.04	0	0	0	0	0	0	0
Jun	0.00	0.001	0.001	0	0	0	0	0	0	0
Sub-Total	0.08	0.041	0.041	0	0	0	0	0	0	0
Jul	0.021	0.003	0.018	0	0	0	0	0	0	0
Aug	0.899	0.005	0.894	0	0	0	0	0	0	0.01
Sep	5.055	0.003	3.480	0	1.572	0	0	0	0	0.06
Oct	4.044	0.002	2.526	0	1.516	0	0	0	0	0
Nov										
Dec										
Total	10.102	0.054	6.959	0.000	3.088	0.000	0.000	0.000	0.000	0.070

- Notes: (1) The performance targets are given in PS Clause 28.10(14)
 (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 (3) Plastics refer to plastic bottles/ containers, plastic sheets/ foam form packaging material
 (4) Broken concrete for recycling into aggregates

Appendix K

Extra Environmental Measurement and Survey Results (Before Commencement date on 2 October 2008)

Noise

Impact Noise Monitoring at KT14A (N8)

Date	Start Time	1st Leq5	2nd Leq5	3rd Leq5	4th Leq5	5th Leq5	6th Leq5	Leq30	Limit Level
29-Aug-08	09:35	49.2	49.9	49.2	49.9	53.7	53.5	51.4	75.0
4-Sep-08	10:39	57.4	60.0	61.9	60.3	58.9	56.0	59.5	75.0
10-Sep-08	15:37	59.6	60.2	62.0	62.4	60.5	63.8	61.7	75.0
17-Sep-08	15:16	60.8	61.0	59.2	61.2	60.5	61.1	60.7	75.0
23-Sep-08	16:49	59.6	59.6	59.5	60.4	59.8	58.1	59.6	75.0
27-Sep-08	15:15	59.7	58.6	59.1	59.4	57.1	56.8	58.6	75.0

Air Quality

IMPACT 1-Hr TSP Data Input - KT14(A8)

Date	Start Time	1st Reading	2nd Reading	3rd Reading	Average	NO	
						Action Level	Limit Level
25-Aug-08						310	500
29-Aug-08	09:34	41	42	45	43	310	500
4-Sep-08	09:06	47	52	55	51	310	500
10-Sep-08	13:00	73	78	74	75	310	500
17-Sep-08	13:27	229	236	231	232	310	500
23-Sep-08	13:00	179	188	187	185	310	500
29-Sep-08	13:02	186	188	187	187	310	500

IMPACT 24-Hour TSP Monitoring Results - KT14A(A8(a))

DSD CONTRACT NO. DC/2007/17
 Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long
 District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun

Cal Graph Slope 40.1942
 Cal Graph Intercept -30.6782

DATE	SAMPLE NUMBER	STANDARD										BLANK				SAMPLE OF FILTER PAPER			Dust 24-Hr TSP in Air (µg/m³)	Action Level (µg/m³)	Limit Level (µg/m³)
		ELAPSED TIME			CHART READING		AVERAGE			FLOW	AIR	SAMPLE NUMBER	WEIGHT (g)			WEIGHT (g)					
		INITIAL	FINAL	(min)	MIN	MAX	CHART READING	TEMP (°C)	PRESS (hPa)	RATE (m³/min)	VOLUME (std m³)		INITIAL	FINAL	DIFF	INITIAL	FINAL	DUST COLLECTION			
30-Aug-08	SU32	466.15	490.40	1455.00	33	34	33.5	29.5	1008.8	1.59	2311	NA	3.6459	3.6419	-0.0040	3.6006	3.6855	0.0849	38	150	260
5-Sep-08	SU14	490.40	514.70	1458.00	34	35	34.5	27.6	1010.1	1.62	2357	NA	3.6459	3.6419	-0.0040	3.5656	3.5850	0.0194	10	150	260
11-Sep-08	SV07	514.70	539.05	1461.00	35	36	35.5	29.4	1007.2	1.64	2392	NA	3.6459	3.6419	-0.0040	3.6150	3.7329	0.1179	51	150	260
18-Sep-08	SV35	539.05	563.32	1456.20	34	35	34.5	29.2	1008.9	1.61	2350	NA	3.6459	3.6419	-0.0040	3.6248	3.7036	0.0788	35	150	260
24-Sep-08	SV99	563.32	587.68	1461.60	31	32	31.5	27.1	1003.8	1.54	2252	NA	3.6459	3.6419	-0.0040	3.5996	3.6322	0.0326	16	150	260
30-Sep-08	SW36	587.68	611.96	1456.80	33	34	33.5	27.7	1011.0	1.59	2319	NA	3.6459	3.6419	-0.0040	3.5900	3.6619	0.0719	33	150	260

Water Quality

Summary of Water Quality Monitoring Results - KT14A

Date 26-Aug-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	14:00	0.13	29.8	29.8	4.04	4.06	58.2	58.5	7.7	7.8	0	0.0	6.8	6.8	7	7.0	10.9	10.90	22	22.0
			29.8		4.07		58.7		7.9		0		6.8		7		10.9		22	
W8B	14:20	0.08	30.4	30.4	4.14	4.13	57.2	56.9	6.9	7.1	0	0.0	7	7.0	19	19.0	0.26	0.26	26	26.0
			30.4		4.11		56.5		7.3		0		7		19		0.26		26	

Date 28-Aug-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:05	0.16	27.1	27.1	4.98	4.96	63.2	62.9	4.3	4.5	0	0.0	6.8	6.8	<2	2.0	0.04	0.04	<10	<10
			27.1		4.94		62.6		4.7		0		6.8		<2		0.04		<10	
W8B	10:20	0.09	27.6	27.6	4.44	4.46	56.3	56.6	4.1	4.2	0	0.0	6.8	6.8	<2	2.0	0.04	0.04	<10	<10
			27.6		4.47		56.9		4.3		0		6.8		<2		0.04		<10	

Date 2-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:10	0.13	26.4	26.4	5.13	5.10	64.7	63.9	11.3	11.5	0	0.0	6.7	6.7	23	23.0	2.18	2.18	228	228.0
			26.4		5.06		63.1		11.7		0		6.7		23		2.18		228	
W8B	10:00	0.11	26.1	26.1	4.84	4.87	57.9	58.1	163.0	161.5	0	0.0	7	7.0	473	473.0	0.82	0.82	492	492.0
			26.1		4.89		58.3		160.0		0		7		473		0.82		492	

Date 4-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:25	0.16	26.9	26.9	4.66	4.67	58.8	59.0	7.3	7.6	0	0.0	6.7	6.7	14	14.0	14.1	14.10	39	39.0
			26.9		4.68		59.2		7.8		0		6.7		14		14.1		39	
W8B	11:10	0.08	26.5	26.5	4.71	4.70	59.9	59.7	3.4	3.3	0	0.0	6.9	6.9	<2	2.0	0.48	0.48	11	11.0
			26.5		4.68		59.4		3.1		0		6.9		<2		0.48		11	

Date 6-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:35	0.17	27.1	27.1	4.8	4.82	62.3	62.6	6.9	7.1	0	0.0	6.7	6.7	7	7.0	8.4	8.40	16	16.0
			27.1		4.84		62.8		7.3		0		6.7		7		8.4		16	
W8B	10:30	0.08	26.9	26.9	4.36	4.35	55.5	55.3	5.2	5.5	0	0.0	6.8	6.8	6	6.0	<0.01	0.01	22	22.0
			26.9		4.33		55.0		5.8		0		6.8		6		<0.01		22	

Date 9-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:10	0.15	26.8	26.8	4.11	4.10	52.6	52.4	7.8	7.9	0	0.0	6.7	6.7	9	9.0	9.01	9.01	32	32.0
			26.8		4.08		52.1		7.9		0		6.7		9		9.01		32	
W8B	09:00	0.09	27.1	27.1	4.36	4.35	56.4	56.2	3.3	3.4	0	0.0	6.7	6.7	3	3.0	0.57	0.57	15	15.0
			27.1		4.33		56.0		3.5		0		6.7		3		0.57		15	

Date 11-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:15	0.17	27.3	27.3	3.92	3.91	48.7	48.6	16.9	17.2	0	0.0	6.9	6.9	26	26.0	14.8	14.80	37	37.0
			27.3		3.9		48.4		17.4		0		6.9		26		14.8		37	
W8B	09:00	0.10	27.6	27.6	4.26	4.27	53.6	53.8	6.5	6.4	0	0.0	6.9	6.9	12	12.0	0.23	0.23	51	51.0
			27.6		4.28		53.9		6.2		0		6.9		12		0.23		51	

Date 13-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:25	0.16	26.0	26.0	3.77	3.80	45.3	45.7	17.4	17.5	0	0.0	6.8	6.8	19	19.0	14.8	14.80	39	39.0
			26.0		3.82		46.0		17.6		0		6.8		19		14.8		39	
W8B	09:20	0.06	26.6	26.6	4.48	4.46	58.9	58.6	4.1	4.0	0	0.0	7	7.0	5	5.0	0.11	0.11	25	25.0
			26.6		4.44		58.2		3.8		0		7		5		0.11		25	

Summary of Water Quality Monitoring Results - KT14A

Date 16-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:10	0.14	27.3	27.3	4.03	4.02	50.1	50.0	8.3	8.2	0	0.0	7	7.0	15	15.0	18.6	18.60	56	56.0
			27.3		4.01		49.8		8.1		0		7		15		18.6		56	
W8B	09:00	0.05	27.7	27.7	4.28	4.27	52.7	52.5	3.7	3.5	0	0.0	7	7.0	<2	2.0	0.12	0.12	11	11.0
			27.7		4.25		52.2		3.3		0		7		<2		0.12		11	

Date 18-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:30	0.16	26.0	26.0	3.87	3.85	48.4	48.6	3.1	3.3	0	0.0	6.9	6.9	5	5.0	8.4	8.40	78	78.0
			26.0		3.82		48.7		3.4		0		6.9		5		8.4		78	
W8B	09:20	0.10	26.3	26.3	4.83	4.84	62.1	62.4	12.3	12.2	0	0.0	7	7.0	20	20.0	0.27	0.27	31	31.0
			26.3		4.85		62.7		12.0		0		7		20		0.27		31	

Date 20-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	12:05	0.17	28.2	28.2	3.62	3.65	45.3	46.0	3.9	3.7	0	0.0	6.7	6.7	4	4.0	8.63	8.63	80	80.0
			28.2		3.68		46.6		3.5		0		6.7		4		8.63		80	
W8B	11:50	0.08	28.0	28.0	4.12	4.15	52.3	52.6	21.0	21.3	0	0.0	6.6	6.6	41	41.0	0.01	0.01	65	65.0
			28.0		4.17		52.9		21.6		0		6.6		41		0.01		65	

Date 24-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:40	0.21	26.4	26.4	3.94	3.98	49.8	50.1	9.7	9.8	0	0.0	6.8	6.8	28	28.0	1.14	1.14	70	70.0
			26.4		4.01		50.3		9.9		0		6.8		28		1.14		70	
W8B	09:30	0.13	26.2	26.2	4.48	4.50	58.0	58.3	62.5	62.8	0	0.0	7	7.0	121	121.0	0.27	0.27	107	107.0
			26.2		4.51		58.6		63.1		0		7		121		0.27		107	

Date 26-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:20	0.18	27.3	27.3	3.61	3.64	60.3	60.8	7.0	7.2	0	0.0	6.9	6.9	<2	2.0	7.1	7.10	24	24.0
			27.3		3.67		61.3		7.4		0		6.9		<2		7.1		24	
W8B	11:10	0.09	27.1	27.1	4	4.04	49.7	50.3	6.9	6.0	0	0.0	7.1	7.1	<2	2.0	0.07	0.07	56	56.0
			27.1		4.07		50.9		5.1		0		7.1		<2		0.07		56	

Date 30-Sep-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	09:20	0.21	27.0	27.0	3.71	3.72	48.1	48.4	9.2	9.4	0	0.0	7	7.0	4	4.0	8.29	8.29	22	22.0
			27.0		3.73		48.6		9.6		0		7		4		8.29		22	
W8B	09:05	0.09	26.7	26.7	4.09	4.11	50.3	50.8	4.7	4.8	0	0.0	6.8	6.8	16	16.0	0.15	0.15	22	22.0
			26.7		4.13		51.2		4.8		0		6.8		16		0.15		22	