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

MONTHLY EM&A REPORT FOR KT13 (FEBRUARY 2010)

PREPARED FOR
CHINA ROAD & BRIDGE CORPORATION

Quality Index

Date	Reference No.	Prepared By	Certified by
11 March 2010	TCS00408/08/600/R1394v2		
		Nicola Hon Environmental Consultant	T.W. Tam Environmental Team Leader

Version	Date	Prepared by:	Certified by:	Description
1	8 March 2010	Nicola Hon	T.W. Tam	First submission
2	11 March 2010	Nicola Hon	T.W. Tam	Amended against IEC's comments on 10 Mar 2010

Ove Arup & Partners
奧雅納工程顧問

Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
Hong Kong
Tel +852 2528 3031
Fax +852 2268 3950
Direct Tel +852 2268 3097
coleman.ng@arup.com

www.arup.com

Our ref 25211/L178/CN/cl

Date 12 March 2010

By Fax and Post

Black & Veatch Hong Kong Limited
25/F, Millennium City 6
392 Kwun Tong Road
Kowloon
Hong Kong

Attention: Ms. Jenny LUI

ARUP

Dear Ms. Lui,

Contract No. DC/2007/17 Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen King San and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun
Monthly EM&A Report for KT13 (February 2010) – Version 2

We refer to the captioned report (ref.: TCS00408/08/600/R1394v2) and advise that we have no further comment on the captioned submission.

We hereby endorse the captioned report for your onward submission.

If you require any further information, please do not hesitate to contact the undersigned.

Yours sincerely,

Coleman Ng
Independent Environmental Checker

cc: China Road and Bridge Corporation (Mr. Raymond Mau) (Fax: 2478 9612)
AUES (Mr. TW Tam / Ms. Nicola Hon) (Fax: 2959 6079)

Executive Summary

ES01 This is the **17th** monthly EM&A report for the Channel KT13, covering the construction period from **26 January to 25 February 2010** (the Reporting Period).

Breaches of Action and Limit Levels

ES02 Monitoring results of the Reporting Period demonstrated no exceedances of environmental quality criteria for air quality, construction noise, water quality and ecology.

ES03 Four (4) events of weekly settlement monitoring and a condition survey were undertaken in this reporting month. There were two (2) action level exceedances recorded on the settlement monitoring whereas action level was triggered on the condition survey since 2 new cracks on the grave were found. Investigation for the cause of exceedances was conducted and it was noted that the measured levels are regularly fluctuated within ±2mm which indicated that the circumstances were normal for possibly the root encroachment of overgrown vegetation. Also, construction works undertaken by others were observed within 100m of the grave (our monitoring area) and a platform for car parking was built and in used by the villager. It is concluded that the exceedances were not related to the works under the project.

ES04 Landscape inspections were conducted on **9** and **23 February 2010**. No significant changes were observed for the identified landscape resources and visual sensitive receivers, except for minor changes due to channel excavation, site clearance and preparation work at the identified landscape resources including LR1, LR2.1, LR2.2, LCA1, LCA3 and LCA4.

Environmental Complaint, Notification of Summons and Prosecution

ES05 No documented complaint, notification of summons or successful prosecution was received during the Reporting Period. No major environmental impacts were observed during the weekly site inspection. Environmental audit of the Reporting Period indicated that the implemented mitigation measures for air quality, construction noise and ecology were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

Reporting Changes

ES06 No reporting changes were made during the Reporting Period.

Future Key Issues

ES07 During dry season, dust control measures to avoid dust emissions should be properly provided and maintained, as appropriate. In addition, the implemented mitigation measures such as sand bags downstream of the excavation site may also be improved to cater for additional water flows during wet season.

ES08 CRBC was reminded to fully implement the required water quality mitigation measures during construction under the Project, in particular when excavation and the associated channel works are undertaken and construction wastewater is generated and discharged into Channel KT13.

ES09 Special attention should be paid to construction noise and other environmental issues identified in the EM&A Manual as recommended in the EIA and summarized in Mitigation Measure Implementation Schedule.

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

1 ENVIRONMENTAL STATUS

This is the **17th** monthly EM&A report for KT13, covering the construction period from **26 January to 25 February 2010** (the Reporting Period).

1.1 PROJECT AREA AND CONSTRUCTION PROGRAMME

Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations are presented in ***Appendix A***, and the construction program in ***Appendix B.***

1.2 WORKS UNDERTAKEN DURING THE REPORTING PERIOD

Apart from general works of tree survey, structural survey and environmental monitoring & audit, works undertaken during the Reporting Period with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month are summarized as follows:

- Excavation of channel formation
- Construction of channel structure
- Backfilling
- Installation of type 2 railing
- Construction of Box Culvert
- Laying underground drain pipe
- Laying of Gabion Block/Granite Block
- Condition survey for historic grave (KT13-02-02)

1.3 ENVIRONMENTAL MANAGEMENT ORGANIZATION

Management structure and key personnel contact names and telephone numbers of the environmental management organization are presented in ***Appendix C***, where DSD is the Project Proponent; CRBC is the main Contractor; EPD and AFCD are the supervisory departments for environmental protection of the Project; BVHKL is the Engineer's Representative of DSD (the ER); ARUP is the Independent Environmental Checker (the IEC) and Action-United Environmental Services and Consulting (AUES) is the environmental team (the ET).

1.4 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*** (CNP) is required for the Project pursuant to the Noise Control Ordinance (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.

1.4.6 Dumping at Sea Permit

CRBC has been granted by the Environmental Protection Department a Permit Issued under the ***Dumping at Sea Ordinance*** (Permit no. EP/I4D/08-095, dated 18 September 2008, permit validity period of six months from 18 September 2008 to 17 March 2009) for disposal of 18,469 m^3 sediment, requiring Type 1 – open sea disposal at East Sha Chau Contaminated Mud Disposal Site – Pit IV b, to be capped as directed by the Management Team of the Civil Engineering and Development Department. Note that this permit has expired. As there is no need for further sea disposal, no further permits will be required in the future.

1.5 ENVIRONMENTAL PROTECTION AND POLLUTION CONTROL MITIGATION MEASURES

CRBC has committed to implement environmental protection and pollution control and mitigation measures, as recommended in the EIA, EP, EM&A Manuals, and summarized in the Mitigation Measures Implementation Schedules. The implemented mitigation measures include

(a) Watering of stockpiles of rip-rap at KT13;
(b) Covering of the loose soil at KT13 to minimize water quality impacts;
(c) Hard pavement of haul road leading to public roads at KT13;
(d) Classification and disposal of illegally dumped construction and demolishment materials at KT13;
(e) Construction of noise barriers; and
(f) Erection of dams with sand bags downstream the excavation site within the water course of KT13 to enhance sedimentation of turbidity and suspended solids (SS).

2 MONITORING METHODOLOGY

2.1 MONITORING PARAMETERS

According to the EM&A requirements set out in the EIA, Environmental Permit No. EP263/2007 (the EP) and the associated EM&A Manual, the required monitoring parameters are summarized as follows.

Table 2-1 Summary of Monitoring Parameters

Environmental Issue	Monitoring Parameters	
Air Quality	(a) 1-hour Total Suspended Particulate (1-hour TSP); and (b) 24-hour Total Suspended Particulate (24-hour TSP).	
Construction Noise	(a) A-weighted equivalent continuous sound pressure level (30min) (Leq(30min) during the normal working hours; and (b) A-weighted equivalent continuous sound pressure level (5min) (Leq(5min) for construction work during the Restricted Hours.	
Water Quality	(a) In Situ Measurement	temperature, dissolved oxygen (DO), pH & turbidity
	(b) Laboratory Analysis	suspended solids (SS), Ammonia Nitrogen (NH_3-N) and Zinc (Zn)
Ecology	Vegetation, all bird species of wetland, Ho Pui Egret, Ma On Hong Egret and Flight Line Survey	
Waste Management	Inspection and the document audit	
Cultural Heritage	Condition survey for a historical grave	
Landscape & Visual	To audit the implementation of the proposed construction phase mitigation measure stipulated in EIA.	

2.2 MONITORING LOCATIONS

Details of the monitoring locations are summarized in ***Table 2-2*** and shown in ***Appendix A.*** For ease of reference, monitoring locations denoted with "(a)" are relocated locations to differentiate them from the original 'EM&A Manual' locations.

Table 2-2Summary of Monitoring Locations

Environmental Issues	Monitoring Location	Identified Address / Co-ordinates	Status of Monitoring Locations / Rationale for Recommended Replacement
Air	A1(a)	No.68 Ho Pui Village	The original location of EM&A Manuals A1 has permanently been abandoned. No access can be acquired in the vicinity of A1. Taken into consideration that Ho Pui Village is one of the most important sensitive receivers near KT-13 without monitoring, the most fronting house, No. 68 Ho Pui Village, is therefore recommended as the replacement location A1(a).
	A2	No.1 Ma On Kong Village	Original location of the EM&A Manual; access granted.
Noise	N1(a)	168-169 Kam Ho Road, Ma On Kong Village,	Original location of N1 identified in the EM&A Manual was relocated to proposed area as recommended by IEC.
	N2(a)	No. 68 Ho Pui Village,	The original location of EM&A Manuals N2 has permanently been abandoned. No access can be acquired in the vicinity of N2. Taken into consideration that Ho Pui Village is one of the most important sensitive receivers near KT-13 without monitoring, the most fronting house, No. 68 Ho Pui Village, is therefore recommended as the replacement location N2(a).
	N3	No.1 Ma On Kong Village	Original locations of the EM&A Manual; access granted.
Water	W1	E824539 / N830283	Original locations of the EM&A Manual; access resolved.

Environmental Issues	Monitoring Location	Identified Address / Co-ordinates	Status of Monitoring Locations / Rationale for Recommended Replacement
	W2	E824693 / N830258	Original locations of the EM&A Manual; access resolved.
	W3(a)	E824833 / N830374	The W3 is proposed to be relocated about 55 m down stream to W3(a) for safety reason as there is no any discharge point observed between W3 and the proposed W3(a).
	W4	E824936 / N830618	Original locations of the EM&A Manual; access resolved.
	W5	E825008 / N830812	Original locations of the EM&A Manual; access resolved.
	W6	E825100 / N830987	Original locations of the EM&A Manual; access resolved.
Ecology	Monthly monitoring along the boundary of the works area to confirm that there are no adverse impacts on habitats outside the site in particular the Conservation Area (CA) zone and Ho Pui Egretry. Photographic records at six-month intervals; Monthly monitoring of all bird numbers including wetland species and species identified as being of conservation importance; Monitoring of Ho Pui egretry during March to August. The Ma On Kong egretry is also surveyed to provide reference information on the breeding egrets nearby; and Flight line surveys twice per month during April to June.		
Waste Management	Whole constriction site and document		
Cultural Heritage	Ma On Kong	Refer to EM&A Manual (KT13) Figure 7.1.	
Landscape & Visual	Refer to EIA Section 10		

2.3 MONITORING FREQUENCY, DURATION AND SCHEDULE

2.3.1 Monitoring Frequency and Duration

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

Air Quality

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

Duration: Throughout the construction period

Construction Noise

Frequency: Measurement of Leq(30min): Once a week during 0700-1900 hours on normal weekdays. If the construction work is undertake at restricted hours, the frequency of noise monitoring will be conducted in accordance with the requirements under the related Construction Noise Permit issued by EPD as follows:

- 3 consecutive Leq(5min) at restrict hour from 1700 – 2300 hours;
- 3 consecutive Leq(5min) for restrict hour from 2300 – 0700 hours next day;
- 3 consecutive Leq(5min) for Sunday or public holiday from 0700 – 1900 hours;

Duration: Throughout the construction period

Water Quality

Frequency: Three times a week with at least 36 hour intervals between any two consecutive monitoring events

As the water columns in the stream water within KT13 is generally less than 3m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6m, measurement shall be carried out at three water depths, namely, 1m below water surface, mid-depth, and 1m above river bed. If the water depths are between 3 to 6m, the mid-depth measurement is omitted.

Depths: As the water columns in the stream water within KT13 is generally less than 3m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6m, measurement shall be carried out at three water depths, namely, 1m below water surface, mid-depth, and 1m above river bed. If the water depths are between 3 to 6m, the mid-depth measurement is omitted.

Duration: Throughout the construction period.

Ecology

The Ecology Monitoring is required in accordance with the EM&A Manual.

Parameters: Vegetation, All bird species including wetland birds, Ho Pui and Ma On Hong Egretries and Flight line survey

Frequency: Vegetation – Impact monitoring – monthly;

Photographic records/checks against baseline records– six monthly

Wetland Bird survey – Monthly of half-day survey;

Ma On Kong egretry – Monthly between March to August; and

Ho Pui egretry – Bi-weekly between March and August;

Flight line Survey – Month during the period from April to June

Duration: Throughout the whole construction period

Waste Management Audit

Frequency: Once per month

Duration: Throughout the construction period.

Cultural Heritage

Scope: Condition survey and settlement monitoring of a Qing Dynasty Grave.

Frequency: Condition survey - Bi-monthly

Settlement monitoring - Bi-weekly

Duration: Throughout the construction phase period. (When construction work entered the 100m of the cultural heritage site)

Landscape & Visual

Frequency: Bi-weekly

Duration: Throughout the construction phase period.

2.3.2 Environmental Monitoring Schedule

The monitoring schedules for the Reporting Period and next month are presented in ***Appendix D.***

2.4 MONITORING EQUIPMENT AND PROCEDURE

The monitoring equipment and procedures are summarized below. Calibration certificates of the equipment and the related laboratories are presented in ***Appendix E.***

2.4.1 Weather Conditions during the Reporting Period

All meteorological information is extracted from the Hong Kong Observatory (Lau Fau Shan Station). The meteorological data include wind direction, wind speed, humidity, rainfall, air pressure and temperature etc., that are generally required for evaluating the environmental impact arising from the construction activities. The meteorological data are presented in ***Appendix D.***

2.4.2 Air Quality

Monitoring Equipment

A list of air quality monitoring equipment is shown below.

Table 2-4-2 Air Quality Monitoring Equipment

Equipment	Model	Serial Number
24-hour TSP		
High Volume Air Sampler	Grasby Anderson GMWS 2310 HVS	-
Calibration Kit	TISCH Model TE-5025A	1612
1-hour TSP		
Portable Dust Meter	TSI DustTrak Model 8520	21060 / 23080 / 23079

Monitoring Procedure

1-hour TSP

The 1-hour TSP measurement follows manufacturer's Operation and Service Manual, using a 1-hour TSP monitor brand named TSI Dust Track Aerosol Monitor Model 8520 or Sibata LD-3 Laser Dust Meter, which is a portable, battery-operated laser photometer to record the real time 1-hour TSP based on 90^0 light scattering. The 1-hour TSP monitor consists of the following:

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

The 1-hour 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-hour TSP

The equipment used for 24-hour TSP measurement is the high volume air sampling system (hereinafter 'HVS') brand named Thermo Andersen, Model GS2310 TSP. The HVS complies with US 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 is 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 is 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 24-hour TSP filters of the 24-hour TSP will be kept in ALS for six months prior to disposal.

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 are recorded in details.

2.4.3 Construction Noise

Monitoring Equipment

A list of construction noise monitoring equipment is shown below.

Table 2-4-3 Construction Noise Monitoring Equipment

Equipment	Model	Serial Number
Integrating Sound Level Meter	Cesva SC-20c/ Bruel & Kjaer 2238	T212509 2285762 / 2285690
Calibrator	Cesva CB-5 / Bruel & Kjaer 4231	030934 2292168 / 2326408
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 is 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 is fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point is normally 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 is 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 is 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. No noise measurement will be made in the present of significant fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed is checked with a portable wind speed meter capable of measuring the wind speed in m/s.

2.4.4 Water Quality

Monitoring Equipment

Monitoring Equipment for water quality is listed below.

Table 2-4-4 Water Quality Monitoring Equipment

Equipment	Model	Serial Number
Water Depth Detector	Eagle Sonar	-
Water Sampler	Teflon bailer / bucket	-
Thermometer & DO meter	YSI 550A	97F0837AM
pH meter	Extech EC500 (lab ID: HK1001303)	-
Turbidimeter	Hach 2100p	9509010008735
Hand Refractometer	ATAGO	289468
Sample Container	High density polythene bottles (provided by laboratory)	-
Storage Container	'Willow' 33-litter plastic cool box	-

Monitoring Procedure

Water Depth

As the water columns in the stream water within KT13 is generally less than 3 m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6 m, measurement shall be carried out at three water depths, namely, 1 m below water surface, mid-depth, and 1 m above river bed. If the water depths are between 3 to 6 m, the mid-depth measurement is omitted.

Water depths are 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, the depths of water columns are measured with a steel ruler with appropriate weight.

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 20^0C 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 Extech 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.

Salinity

A portable hand Refractometer AGATO will be used for in-situ salinity measurement. The refractometer is capable of measuring salinity in the range of 0-70ppt with accuracy ±1% reading. 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 the HOKLAS accredited analytical method - ALS Method EA-025.

Ammonia Nitrogen(NH_3-N)

NH_3-N will be examined by ALS upon receipt of the water samples using the HOKLAS accredited analytical methods - ALS Method EK-055A.

Zinc(Zn)

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

Water Sampler

Water samples will be collected using a plastic sampler to prevent metal contamination. As the water depths in the stream water within KT13 are generally less than 0.5 m, a plastic bucket with a rope of appropriate length is used for water sampling. The sampler is rinsed before collection with the sample to be taken. For water depths deeper than 0.5 meter, a cleaned plastic bailer bucket will be used for sample collection.

1000 mL water sample is collected from each depth for SS determination. The samples collected are stored in a cool box maintained at 4^0C and delivered to ALS upon completion of the sampling by end of each sampling day.

Sample Container

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

Sample Storage

A 'Willow' 33-litter plastic cool box packed with ice will be used to preserve the collected water samples prior to arrival at ALS. The water temperature of the cool box will be maintained at a temperature as close to 4^0C as possible without being frozen. Samples collected will be delivered to the laboratory upon collection within the maximum storage time required under the HOKLAS and ALS analytical requirements

2.4.5 Ecology

Monthly walk through survey will be conducted along the boundary of work area for KT13. Bird monitoring will be conducted in the study areas monthly for KT13. Monitoring on the Ho Pui egretry and Ma On Kong egretry will be conducted between March to August. Flight line surveys to record the feeding areas and the habitat use of breeding egrets will be conducted between April to June. Photographic record should be made at six month intervals.

Monitoring Equipment

The following equipment will be used for monitoring:-

Standard portable field survey equipment was used for ecological monitoring, including

(a) Binoculars of 10 x 40 magnifications;
(b) Digital camera; and
(c) Notebook.

Study Area

The areas for the ecological monitoring programme would cover 60 m on either side of the existing channel as well as the proposed bypass culvert, as shown in Figure 6.1 of the EM&A Manual. Within these, emphasis will be given to the area around the Ho Pui and Ma On Kong egretries and habitats of at least moderate ecological value. In addition, monitoring would also be undertaken at the Ho Pui egretry and Ma On Kong egretry (The Ma On Kong egretry is outside the demarcated monitoring area but is also monitored to identify any adverse effects on the breeding egrets).

Survey Method

Monthly monitoring will be conducted by means of walk through survey, along the boundary of work area for KT13. Any adverse impacts to the habitats outside the site, in

particular the Conservation Area (CA) zone and Ho Pui Egretry, will be checked and reported.

Photographic records will be made every six months on the fixed photo record points selected during the baseline survey. The photos from the construction phase ecological monitoring will be compared with those taken during the baseline, which are used as the baseline conditions.

Bird monitoring will be conducted in the study areas monthly for KT13. Attention should be paid on wetland species and species identified as being of conservation importance, and the habitats utilized should also be recorded. Bird surveys should commence no later than 2 hours after dawn.

Monitoring on the Ho Pui egretry and Ma On Kong egretry will be conducted between March to August. The frequency would be twice per month during March to May. Depending upon the nesting conditions at Ho Pui egretry, the frequency could be reduced to monthly between June and August if no egret nest found by the end of May, or maintained at twice per month till the end of August if there are egret nests. Number of active nests, species and number of birds present and breeding stage should be recorded.

Flight line surveys to record the feeding areas and the habitat use of breeding egrets will be conducted twice per month between April to June. The number and species of flying egrets, and their landing habitats and locations should be recorded.

2.4.6 Waste Management, Cultural Heritage and Landscape & Visual

Waste Management, Cultural Heritage and Landscape & Visual monitoring is required for KT13 as stipulated in the EM&A manual [382047/E/EMA/Issue 5] ***Section 5***, ***Section 7*** and ***Section 8*** accordingly.

Waste Management

During the monthly audit, ETL will pay attention to the issues relating to waste management, and check whether the Contractor has followed the relevant contract Specifications and the procedures specified under the law of HKSAR.

Cultural Heritage

Condition survey by a qualified archaeologist is required for the historical grave near Ma On Kong before and during the construction phase. The method statement of condition survey of Ma On Kong Historic Grave (KT13-02-02) was issued to EPD and endorsed on 27 July 2008, the frequency of the condition survey during the construction phase and given the open cut method would be adopted for the construction of the proposed bypass box culvert under KT13 project, subject to the result of the condition survey carried out before the construction stage, it is recommended that bi-monthly condition survey be undertaken during the construction work within 100m area from the grave.

Landscape and Visual

In accordance with the EM&A manual [382047/E/EMA/Issue5] ***Section 8*** landscape and visual mitigation measures are required during construction and operation phase. Site inspection will be undertaken at least once every two weeks throughout the construction period to ensure compliance with the intended aims of the proposed mitigation measures.

2.5 Quality Assurance Procedures and Data Management

2.5.1 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.

2.5.2 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-hour TSP Meters

and Noise Meters will be downloaded directly from the equipment at the end of the monitoring period and 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.

2.5.3 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.

2.5.4 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 lest one year after completion of the Project. Field Data Sheets 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 keep by the ET throughout the at least one year after completion of the EM&A program of the Project.

2.6 REPORTING

2.6.1 General Requirements for Report Submission

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

Table 2-6 Requirements for Report Submission

Report	Submission
Monthly EM&A Report	• Within 10 working days of the end of each reporting month.
Quarterly EM&A Summary Report	• No specific requirement, proposed three weeks after endorsement of the 3rd monthly EM&A report within a particular quarter.
Final EM&A Summary Report	• No specific requirement, proposed one month upon completion of entire EM&A program

2.6.2 Cut-Off Day of the Reporting Month

It was agreed among the ER, IEC, CRBC, ET and EPD that, in order to streamline the EM&A report submission and to cater for the occasional delay in obtaining laboratory analysis results, the cutoff day for each month is the 25th i.e. the first day of each report is the 26th of the last month and the end day, the 25th of that month.

3 MONITORING RESULTS

The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results and statutory criteria. In case the measured data exceed the environmental quality criteria, remedial actions will be triggered according to the Event and Action Plan enclosed in ***Appendix F***. The environmental monitoring results are tabulated below and the details of 24-hour TSP data and graphical plots of trends of monitored parameters at key stations over the past four Reporting Periods are presented in ***Appendices G*** and ***H.***

3.1 AIR QUALITY

3.1.1 Action and Limit Levels

According to the Baseline Monitoring Report for KT13, the Action and Limit Levels for 24-hour and 1-hour TSP are established as follows:

Table 3-1-1 Air Quality Action and Limit Levels

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
KT13(A1(a))	309	144	500	260
KT13(A2)	307	141	500	260

3.1.2 Results

Results of air quality monitoring at the identified locations during the Reporting Period are summarized in ***Tables 3-1-3-1*** and ***3-1-3-2*** below.

Table 3-1-2-1 Summary of Air Quality Monitoring Results at KT13-A1(a)

1-hour TSP (μg/m^3)						24-hour TSP (μg/m^3)	
Date	**Start Time**	**1st hour**	**2nd hour**	**3rd hour**	**Average**	**Date**	**Results**
27-Jan-10	09:51	89	92	87	89	26-Jan-10	14
2-Feb-10	09:41	89	92	87	89	1-Feb-10	18
8-Feb-10	09:42	90	92	87	90	6-Feb-10	17
17-Feb-10	13:04	79	81	76	79	12-Feb-10	25
23-Feb-10	09:59	84	87	82	84	18-Feb-10	32
						22-Feb-10	53
Average (range)		**86 (76-92)**				Average (range)	**27 (14-53)**

Table 3-1-2-2 Summary of Air Quality Monitoring Results at KT13-A2

1-hour TSP (μg/m^3)						24-hour TSP (μg/m^3)	
Date	**Start Time**	**1st hour**	**2nd hour**	**3rd hour**	**Average**	**Date**	**Results**
27-Jan-10	09:39	87	89	84	87	26-Jan-10	14
2-Feb-10	09:19	90	92	87	90	1-Feb-10	29
8-Feb-10	09:27	87	89	93	90	6-Feb-10	20
17-Feb-10	09:42	87	89	86	87	12-Feb-10	23
23-Feb-10	09:37	83	85	80	83	18-Feb-10	27
						22-Feb-10	45
Average (range)		**87 (80-93)**				Average (range)	**26 (14-45)**

3.1.3 Discussion

As shown in ***Tables 3-1-2-1*** and ***3-1-2-2,*** 1-hour TSP and 24-hour TSP results fluctuated well below the Action Level. No exceedance of Action or Limit Levels was recorded during the Reporting Period. Neither Notification of Exceedance (hereinafter 'NOE') of air quality criteria or corrective action was required.

3.2 CONSTRUCTION NOISE

3.2.1 Action and Limit Levels

The Action and Limit Levels for construction noise are illustrated in ***Table 3-2-1***.

Table 3-2-1 Construction Noise Action and Limit Levels

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

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

3.2.2 Results

Results of construction noise monitoring at the identified locations N1(a), N2(a) and N3 during the Reporting Period are summarized in ***Tables 3-2-2-1*** to ***3-2-2-3***.

The baseline monitoring for N1(a) and N2(a) was performed on the 1st floor of the bedroom of 168-169 Kam Ho Road, Ma On Kong Village and No. 68 Ho Pui Village respectively. The impact noise monitoring, however, was performed on the ground floor of the same house due to denial of access to the 1st floor. The change of noise monitoring from 1st floor to ground floor will negate the need for a 3dB(A) façade correction but will not introduce any significant difference in detection and minimization of the of construction noise impacts, or alteration of the established A/L Levels. The ET has obtained the approval from EPD with consultation with the ER and IEC.

Table 3-2-2-1 Summary of Construction Noise Monitoring Results – N1(a)

Date	Start Time	1st set Leq5	2nd set Leq5	3rd set Leq5	4th set Leq5	5th set Leq5	6th set Leq5	Leq30
27-Jan-10	14:04	64.1	64.7	64.4	63.9	63.7	64.2	64.2
2-Feb-10	13:14	65.8	66.0	66.1	65.7	65.9	66.4	66.0
8-Feb-10	13:31	6.1	66.4	66.3	66.2	66.1	65.8	65.4
17-Feb-10	13:41	62.7	63.1	62.9	62.6	63.4	62.9	62.9
23-Feb-10	11:07	65.2	64.9	65.7	65.3	64.9	65.4	65.2
Limit Level								**75 dB(A)**

Table 3-2-2-2 Summary of Construction Noise Monitoring Results – N2(a)

Date	Start Time	1st set Leq5	2nd set Leq5	3rd set Leq5	4th set Leq5	5th set Leq5	6th set Leq5	Leq30
27-Jan-10	13:01	62.7	63.4	62.9	63.1	63.3	63.7	63.2
2-Feb-10	10:42	58.9	57.9	58.4	58.3	57.8	58.1	58.2
8-Feb-10	10:59	64.7	64.8	64.1	64.2	64.3	64.4	64.4
17-Feb-10	11:00	59.4	59.9	59.7	59.2	59.3	59.6	59.5
23-Feb-10	10:24	62.1	61.9	62.2	62.4	61.9	61.7	62.0
Limit Level				-				**75 dB(A)**

Table 3-2-2-3 Summary of Construction Noise Monitoring Results – N3

Date	Start Time	1st set Leq5	2nd set Leq5	3rd set Leq5	4th set Leq5	5th set Leq5	6th set Leq5	Leq30
27-Jan-10	13:34	63.9	63.7	63.5	63.8	62.9	64.0	63.6
2-Feb-10	11:27	62.1	63.1	62.4	63.9	63.7	64.1	63.3
8-Feb-10	11:29	64.9	64.7	65.1	65.2	65.3	65.1	65.1
17-Feb-10	13:01	60.7	62.1	61.9	61.4	61.7	61.6	61.6
23-Feb-10	13:02	66.1	64.9	67.2	65.9	66.4	66.9	66.3
Limit Level				-				**75 dB(A)**

3.2.3 Discussion

As shown in ***Tables 3-2-2-1***, ***Table 3-2-2-2*** and ***Table 3-2-2-3***, all the construction noise results

fluctuated well below the Limit Level. No exceedance of Limit Level or documented construction complaint was recorded during the Reporting Period. No NOE or corrective action was therefore required.

3.3 WATER QUALITY

3.3.1 Action and Limit Levels

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

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

Monitoring Location	DO (mg/L)		Turbidity (NTU)		pH		SS (mg/L)		Ammonia (μg/L)		Zinc (μg/L)	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
W1 (Upstream) Control Station	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W2 (Downstream) Impact Station	1.04	1.00	36.81	37.16	8.65	8.69	79.0	86.2	16.85	16.89	234.95	266.19
W3(a) (Upstream) Control Station	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W4 (Upstream) Control Station	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W5 (Upstream) Control Station	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W6 (Downstream) Impact Station	0.93	0.91	27.88	30.02	8.7	8.7	73.40	78.68	51.62	54.56	191.90	201.58

3.3.2 Results

Water quality monitoring results measured at W1, W2, W3(a), W4, W5 and W6 during the Reporting Period are presented in tabulation and graphical plots in ***Appendix G.***

3.3.2 Discussion

In this Reporting Period, no exceedance was recorded at both impact station.

DO, Turbidity, SS, Zinc and NH_4^+-N

No exceedances of Action and Limit Levels of DO, turbidity, suspended solid, Zinc and NH_4^+-N were recorded during the Reporting Period. No Notifications of Environmental Quality Limit Exceedances (NOE) or corrective actions were therefore required for these parameters.

pH

pH fluctuated within a range from 6.3 to 8.4, which were all below the Action and Limit Levels of 8.65 and 8.69 for W2 and 8.7 for W6. Proposal for adopting the pH range of 6 to 9 in place of the existing Action and Limit Level has been approved by the ER and IEC. It is at the stage of submitting to EPD for formal approval.

3.4 ECOLOGY

3.4.1 Action and Limit Levels

The Action and Limit Levels for Construction Ecology Monitoring are shown in ***Table 3-4-1*** to according with the EM&A manual.

Table 3-4-1 Ecological Action and Limit Levels

Parameters	Action Level	Limit Level

Decrease in number of breeding egrets since previous year	>20%	> 40%

3.4.2 Results

Fifty-five (55) individuals of birds from twenty-two (22) species were recorded during the survey on 19 February 2010. Among the birds recorded, nine (9) individuals of wetland dependent birds (from 3 species) were recorded.

It is stated in the EP for KT13 that the monitoring of the Ho Pui egretry shall be carried out during the period from 1st March to 31st August as specified in the EM&A Manual. If no egret nest is found at the egretry during the period from 1st March to 31st May, the Permit Holder can start the construction works within 100m of the ecological buffer area upon obtaining the Director's approval until February in the next year. If egret nests are found during the period from 1st March to 31st August, no construction shall take place within 100m of the ecological buffer area before 1st October. The monitoring during March 2009 to May 2009 did not record any nest in Ho Pui Egretry.

In addition, it is required in the EM&A manual that biweekly monitoring of the Ho Pui egretry for the period from 1st March to end of May is required. Should no egret nest be found at the Ho Pui egretry by the end of May, monitoring frequency from June to August can be downgraded to Monthly. As no egret nest was found at the Ho Pui egretry by the end of May 09, egretry survey on Ho Pui Egretry was monthly between June to August 2009. There had been no nest found at the Ho Pui egretry during these surveys. Even though no nest was recorded at Ho Pui egretry in 2008, the Action/Limit level for ecology is complied with.

Ma On Kong egretry was also surveyed between March to August 2009 to provide reference information on the breeding. No nest was found at Ma On Kong egretry neither. Flight line surveys are required between April to June and thus not needed in the present monitoring.

During the walk through survey on 19 February 2010, other than the bamboo trees which are within Ho Pui Egretry boundary as shown in the EM&A manual and had been found to be cleared by villagers during site inspection on 11 July 2009, no further adverse impacts on habitats outside the boundary of the works area including the Conservation Area and the remaining Ho Pui Egretry was found. There was also no sign of further clearance of the bamboo trees or other trees within the Ho Pui Egretry boundary. There has been no egret breeding activity in this egretry for a few years (before the present monitoring programme commenced in 2008). As the clearance affected only a small portion of vegetations within the boundary of the Ho Pui Egretry, which had been previously used by egrets as nesting site, this incident did not affect any egret nests or egret individuals. Therefore no exceedance on ecological monitoring criteria was caused by this incident.

Photo records of trees are scheduled in every six months and are not required in the present monitoring. Ecological impact monitoring results are presented in the ***Table 3-4-2***.

Table 3-4-2 Summary of KT13 Ecology Impact Monitoring Bird Survey

Scientific Name	Common Name	Reported in the project profile	Abundance recorded in the present survey (19 February 2010)	Habitat utilized
Birds				
Little Egret	***Egretta garzetta***	✓	**3**	**Stream**
Cattle Egret	***Bubulcus ibis***	✓		
Chinese Pond Heron	***Ardeola bacchus***	✓	**3**	**Stream**
Crested Serpent Eagle	*Spilornis cheela*	✓		
Bonelli's Eagle	*Hieraaetus fasciatus*	✓		
Eurasian Hobby	*Falco subbuteo*	✓		
White-breasted Waterhen	***Amaunornis phoenicurus***	✓	**3**	**Stream**
Spotted Dove	*Streptopelia chinensis*	✓	3	Woodland, bare ground
Common Koel	*Eudynamys scolopacea*	✓	2	Woodland
Greater Coucal	*Centropus sinensis*	✓		
Little Swift	*Apus affinis*	✓		
White-Throated Kingfisher	***Halcyon smyrnensis***	✓		
Barn Swallow	*Hirundo rustica*	✓		
Red-Whiskered Bulbul	*Pycnonotus jocosus*	✓	5	Woodland,, bare ground
Chinese Bulbul	*Pycnonotus sinensis*	✓	3	Woodland
Long-Tailed Shrike	*Lanius schach*	✓	1	Bare ground
Oriental Magpie Robin	*Copsychus saularis*	✓	2	Bare ground
Masked Laughingthrush	*Garrulax perspicillatus*	✓	2	Bare ground,
Yellow-Bellied Prinia	*Prinia flaviventris*	✓	1	Low lyung grassland
Common Tailorbird	*Orthotomus sutorius*	✓	1	Low lyging grassland
Great Tit	*Parus major*	✓	2	Woodland
Japanese White-Eye	*Zosterops japonicus*	✓	6	Woodland, low lying grassland
White-Rumped Munia	*Lonchura striata*	✓	1	Low lying grassland
Eurasian Tree Sparrow	*Passer montanus*	✓	4	Bbare ground
Black-Collared Starling	*Sturnus nigricollis*	✓	2	Bare ground,
Common Myna	*Acridotheres tristis*	✓		
Crested Myna	*Acridotheres cristatellus*	✓	4	Bare ground
Black Kite	*Milvus migrans*	\	1	
White Wagtail	*Motacilla alba*	\	3	Stream
Plain Prinia	*Prinia inornata*	\	1	Low lying grassland
Common Sandpipper	*Actitis hypoleucos*	\	2	**Stream**
Species Number		27	**22**	
Individual Number		**NA**	**55**	

Wetland dependent species recorded with abundance during the baseline study with the names bolded

3.5 WASTE MANAGEMENT, CULTURAL HERITAGE AND LANDSCAPE & VISUAL

3.5.1 Waste Management

In order to comply with the waste management requirements, CRBC has been:

(a) Assigned, since 9 Jan 2008, a Billing Account (account number 7006524) under the ***Waste Disposal (Charges for Disposal of Construction Waste) Regulation;***
(b) Issued a Discharge License No. 1U461/1 under Section 20 of the ***Water Pollution Control Ordinance***;
(c) Registered as a Chemical Waste Producer under the ***Waste Disposal (Chemical Waste) (General) Regulation*** (the Waste Producer Number assigned is WPN: 5611-531-C3124-28 dated 2 May 08); and
(d) Granted by the Environmental Protection Department a Permit Issued under the

Dumping at Sea Ordinance (Permit no. EP/I4D/08-095, dated 18 September 2008, permit validity period of six months from 18 September 2008 to 17 march 2009) for 18, 469 m^3 sediment requiring Type 1 – open sea disposal at East Sha Chau Contaminated Mud Disposal Site – Pit IV b to be capped as directed by the management Team of the CEDD.

3.5.2 Cultural Heritage

The Action and Limit Levels for Cultural Heritage are shown in ***Table 3-5-2*** according to the EM&A Manual.

Table 3-5-2 Cultural Heritage Resources Action and Limit Levels

Action Level	Limit Level
When damage or structural instability is first detected	Signs of deterioration and structural instability continues on subsequent visits after Action Level is triggered

The historical grave KT13-02-02 was identified during the EIA stage of the project. A pre-construction condition survey report was issued in **July 2008** and already agreed by AMO. The details of the grave could be referred to in a report entitled "*Pre-construction condition survey on July 2008".*

During the Reporting Period, construction work at Channel KT13 had entered the area within 100m of the cultural heritage site (the grave) since 21 October 2009. To update the condition of the grave, supplementary information of condition survey was undertaken on **31 August 2009** (when no construction activities were carried out within 100m areas from the grave). The monitoring result of the supplementary survey would be adopted as the updated initial reading of the settlement level as agreed by ET and IEC

Under the current EM&A programme and approved monitoring methodology, the condition survey would be conducted by ERM Limited on a bi-monthly basis and the settlement monitoring will be conducted by CRBC, again bi-weekly. Should any exceedance was recorded, the frequency of the settlement monitoring shall be increased to weekly and the condition survey shall be increased to bi-weekly. In the settlement monitoring, five settlement marker points (13GS01 to 13GS05) were established to record the coordinates and elevation of the grave in order to monitor any ground movement or settlement during the construction works.

In this reporting period, weekly settlement monitoring was taken on **28 January, 4, 10 and 27 February 2010** to compare with the initial readings to determine if there is any significant tilting or settlement of the grave. The Condition Survey of the Grave during construction phase has undertaken in this reporting month which enclosed in **Appendix I**. There were two (2) action level exceedances recorded on the settlement monitoring whereas action level was triggered on the condition survey since 2 new cracks on the grave were found. Investigation for the cause of exceedances was conducted and it was noted that the measured levels are regularly fluctuated within ±2mm which indicated that the circumstances were normal for possibly the root encroachment of overgrown vegetation. Also, construction works undertaken by others were observed within 100m of the grave (our monitoring area) and a platform for car parking was built and in used by the villager. It is concluded that the exceedance was not related to the works under the project. Due to the exceedances were recorded in both monitoring, the frequency of monitoring shall be increase accordingly and it wouldl be reported in next reporting month. The settlement monitoring results are shown in ***Table 3-5-3.***

Table 3-5-3 Record of Five Settlement Marker Points of the Qing Dynasty Grave

Monitoring Point / Date	*Level (mpd)*	*Diff. (mm)*	*Level (mpd)*	*Diff. (mm)*	*Level (mpd)*	*Diff. (mm)*	*Level (mpd)*	*Diff. (mm)*	*Level (mpd)*	*Diff. (mm)*
	13GS01		**13GS02**		**13GS03**		**13GS04**		**13GS05**	
31/08/09 (Initial reading)	**19.222**	**0**	**19.985**	**0**	**20.644**	**0**	**19.943**	**0**	**19.211**	**0**
28/01/10	19.222	0	19.985	0	20.643	-1	19.944	1	19.210	-1
04/02/09	19.222	0	19.986	+1	20.644	0	**19.945**	**+2 (action)**	19.212	+1
10/02/09	19.223	+1	19.986	+1	20.644	0	**19.945**	**+2 (action)**	19.211	0
27/02/09	19.222	0	19.985	0	20.643	-1	19.944	+1	19.210	-1
Breach of Action/Limit Level	-		-		-		2 action		-	

Note: Action level exceedance would be triggered when the settlement difference is ±2mm.
Limit level exceedance would be triggered when the settlement difference is ±5mm.

3.5.3 Landscape and Visual

Landscape and visual inspections were conducted on **9 and 23 February 2010**. Current situation of the identified landscape resources remained the same as those of the baseline, except minor changes of river/stream/fish pond landscape character area at LR1, LR2.1, LR2.2, LCA1, LCA3 and LCA4 due to site clearance, soil stockpiling and preparation work within KT13. Updated landscape and visual status is presented in ***Appendix J.***

4 NON-COMPLIANCE, COMPLAINT, NOTIFICATION OF SUMMONS, SUCCESSFUL PROSECUTION AND OTHERS

4.1 NON-COMPLIANCE

No exceedance of environmental quality criteria was recorded in this reporting month as discussed in ***Section 3.1*** to ***3.5.*** No other non-compliance or deficiency was identified during regular site inspection and environmental audit. No associated remedial action was necessary.

4.2 ENVIRONMENTAL COMPLAINT

No written or verbal complaint was received for each environmental issue during the Reporting Period. No associated remedial action was necessary.

4.3 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

No notifications of summons and successful prosecutions were recorded during the Reporting Period. No associated remedial action was necessary.

4.4 OTHERS

4.4.1 Waste Management Status

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

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

Waste generated, re-used, recycled and disposed of during the Reporting Period is shown in ***Appendix K: Monthly Summary Waste Flow Table.*** No Type I or Type II excavated soil were recorded in this Reporting Period.

4.4.2 Site Inspection and Environmental Audit

In this Reporting Period, **four** occasions of weekly environmental site inspection and audit were conducted during the Reporting Period jointly by the ER, EO and ET. No adverse environmental impacts were registered, indicating that the mitigation measures implemented were effective and sufficient for the construction activities undertaken. Minor deficiencies found in the site inspection and audit were in general rectified within the specified deadlines. Findings of the site inspection and environmental audit are summarized below.

Table 4-4-1 Summary of Findings of Site Inspection and Environmental Audit

Date	Findings / Deficiencies	Follow-Up Status
2 February 2010	The Contractor is reminded to proper maintain the cover provided for the temporary stockpile in order to prevent fugitive dust generation.	Recommendations based on the observation on 9 February 2009 were followed.
9 February 2010	The Contractor is reminded to maintain good site tidiness at works area	Recommendations based on the observation on 17 February 2009 were followed.
17 February 2010	No adverse environmental impact was observed during site inspection.	NA
23 February 2010	The Contractor is reminded to improve the water mitigation measures for groundwater seepage found at excavated trench.	Will be reported in next reporting month.

4.4.3 Works to be Undertaken Next Month

Works to be undertaken next month are shown in the construction program enclosed in

Appendix B. The construction activities undertaken in the Reporting Period including:

- Excavation of channel formation
- Construction of channel structure
- Backfilling
- Installation of type 2 railing
- Laying underground drain pipe
- Laying of Gabion Block/Granite Block
- Condition survey for historic grave (KT13-02-02)

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

During dry season, dust control measures to avoid dust emissions should be properly provided and maintained, as appropriate.

In addition, special attention should also be paid to construction noise, water quality, ecology and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule (EMIS) should be fully implemented.

5 CONCLUSIONS AND RECOMMENDATIONS

i) This is the **17th** monthly EM&A report for Channel KT13, covering the construction period from **26 January to 25 February 2010** (the Reporting Period).

ii) Monitoring results of the Reporting Period demonstrated no exceedance of environmental quality criteria for air quality, construction noise, water quality and ecology.

iii) Landscape inspections were conducted on **9 and 23 February 2010**. No significant changes were observed for identified landscape resources and visual sensitive receivers, except for minor changes due to channel excavation, site clearance and preparation work at the identified landscape resources including LR1, LR2.1, LR2.2, LCA1, LCA3 and LCA4.

iv) No documented complaints, notifications of summons or successful prosecutions were received during the Reporting Period. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, which suggested that the implemented mitigation measures for air quality, construction noise and ecology were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

v) Four (4) events of weekly settlement monitoring and a condition survey were undertaken in this reporting month. Four (4) events of weekly settlement monitoring and a condition survey were undertaken in this reporting month. There were two (2) action level exceedances recorded on the settlement monitoring whereas action level was triggered on the condition survey since 2 new cracks on the grave were found. Investigation for the cause of exceedances was conducted and it was noted that the measured levels are regularly fluctuated within ±2mm which indicated that the circumstances were normal for possibly the root encroachment of overgrown vegetation. Also, construction works undertaken by others were observed within 100m of the grave (our monitoring area) and a platform for car parking was built and in used by the villager. It is concluded that the exceedances were not related to the works under the project.

vi) It was recommended that water quality mitigation measures stipulated in the EIA and summarized in mitigation measures implementation schedule in the EM&A Manual, including containment structure such as temporary earth bunds, sand bags, sheet pile barriers or other similar techniques, be fully implemented.

vii) During dry season, dust control measures to avoid dust emissions should be properly provided and maintained, as appropriate. 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.

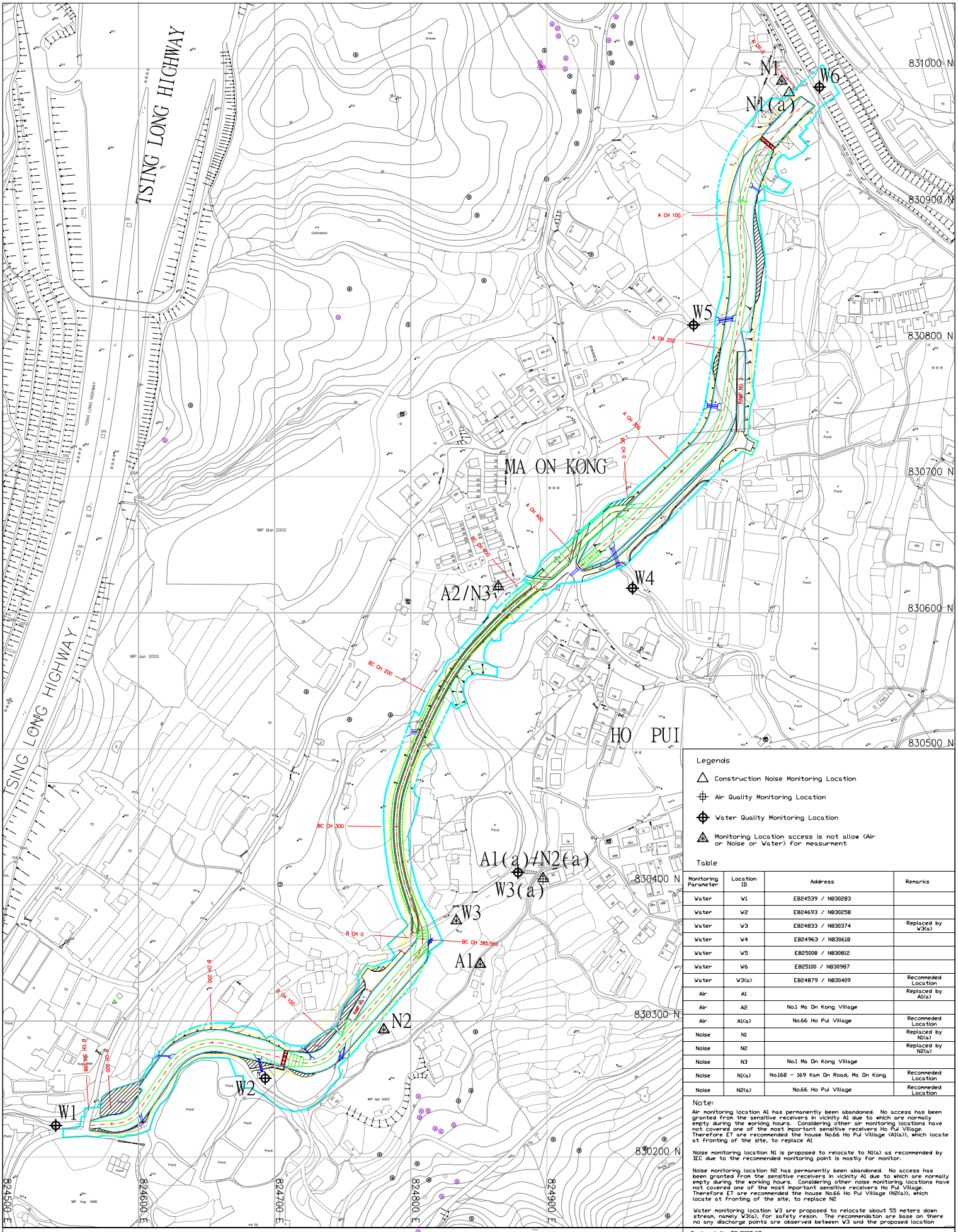
END OF TEXT

Appendix A

Location Plan and

Environmental Monitoring Locations

Under the Project



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	W1	E824539 / N830283	
Water	W2	E824693 / N830258	
Water	W3	E824833 / N830374	Replaced by W3(a)
Water	W4	E824963 / N830618	
Water	W5	E825008 / N830812	
Water	W6	E825100 / N830987	
Water	W3(a)	E824879 / N830409	Recommeded Location
Air	A1		Replaced by A1(a)
Air	A2	No.1 Ma On Kong Village	
Air	A1(a)	No.66 Ho Pui Village	Recommeded Location
Noise	N1		Replaced by N1(a)
Noise	N2		Replaced by N2(a)
Noise	N3	No.1 Ma On Kong Village	
Noise	N1(a)	No.168 - 169 Kam On Road, Ma On Kong	Recommeded Location
Noise	N2(a)	No.66 Ho Pui Village	Recommeded Location

Note:

Air monitoring location A1 has permanently been abandoned. No access has been granted from the sensitive receivers in vicinity A1 due to which are normally empty during the working hours. Considering other air monitoring locations have not covered one of the most important sensitive receivers Ho Pui Village. Therefore ET are recommended the house No.66 Ho Pui Village (A1(a)), which locate at fronting of the site, to replace A1

Noise monitoring location N1 is proposed to relocate to N1(a) as recommended by IEC due to the recommended monitoring point is mostly for monitor.

Noise monitoring location N2 has permanently been abandoned. No access has been granted from the sensitive receivers in vicinity A1 due to which are normally empty during the working hours. Considering other noise monitoring locations have not covered one of the most important sensitive receivers Ho Pui Village. Therefore ET are recommended the house No.66 Ho Pui Village (N2(a)), which locate at fronting of the site, to replace N2

Water monitoring location W3 are proposed to relocate about 55 meters down stream, namely W3(a), for safety reson. The recommendaton are base on there no any discharge points are observed between W3 and the proposed location

Drawing:

Air, Noise and Stream Water Monitoring Location at KT-13

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

AUES

NOTES :

1. GRID LINES ARE HONG KONG METRIC GRID 1980.

LEGEND:

- MA ON KONG AND HO PUI ECREFRIES
- PROPOSED COMPENSATORY TREE PLANTING
- CONSERVATION AREA DENOTED ON OUTLINE ZONING PLAN
- WORKS BOUNDARY OF CHANNEL KY13
- ECOLOGY MONITORING AREAS

824500 E

TSING LONG HIGHWAY

HO PUI ECRETRY

HO PUI

MA ON KONG

MA ON KONG ECRETRY

TAI KEK

Revision	Date	Description			Initial
	Designed	Checked	Drawn	Checked
Initial	MC	KIL	YLL	KIL
Date	09/05	09/05	09/05	09/05

Approved

AGREEMENT NO. CE 67/98

Contract title

YUEN LONG, KAM TIN,
NGAU TAM MEI AND TIN SHUI WAI
DRAINAGE IMPROVEMENT, STAGE 1,
PHASE 2B – KAM TIN

Drawing title

ECOLOGY MONITORING AREAS
RECOMMENDED FOR
CONSTRUCTION PHASE AND
OPERATION PHASE

Drawing no.

Figure 6.1

Scale

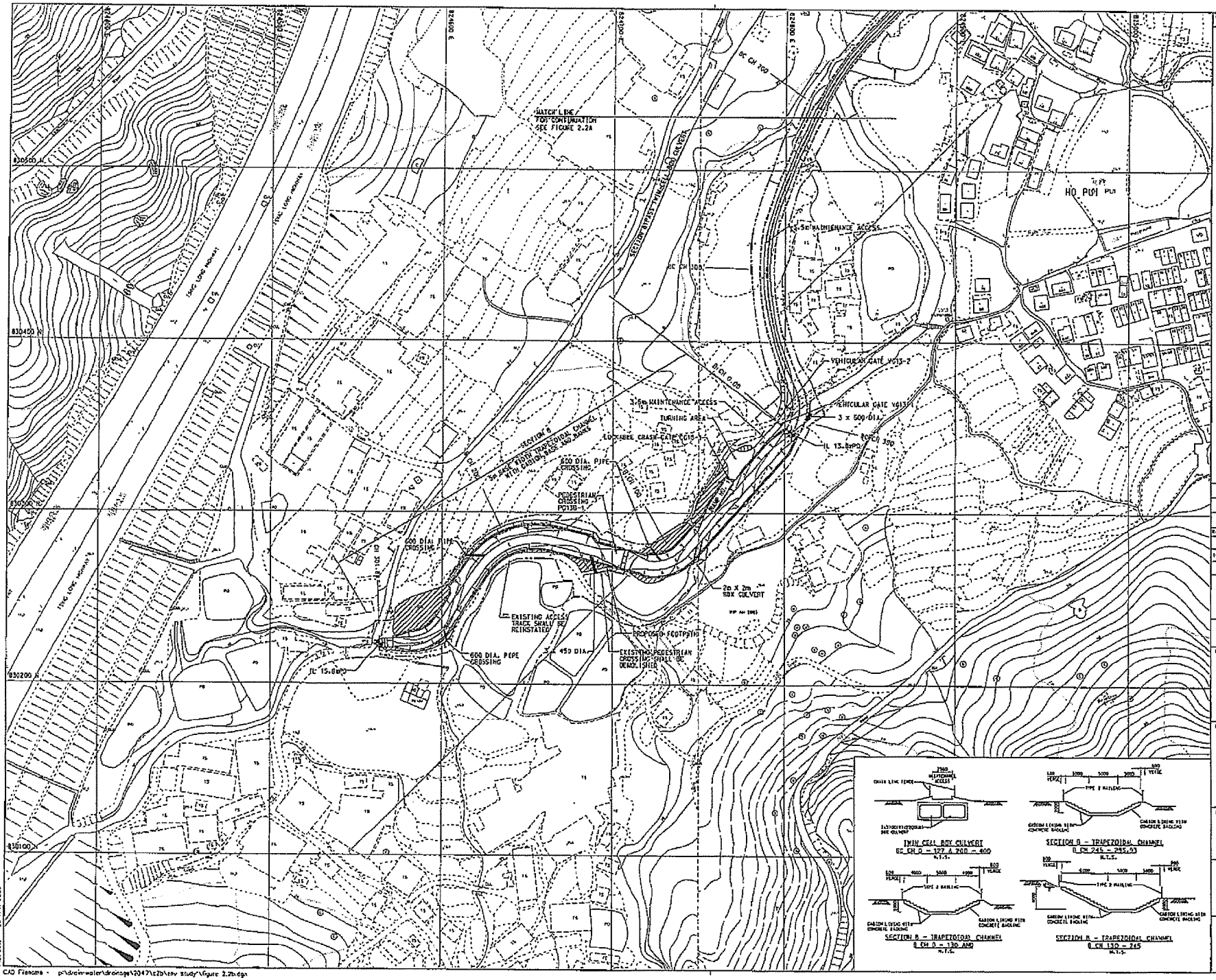
1:2000 A1
1:4000 A3

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
柏威工程顧問有限公司

Plot Date : 25 APR 2006

CAD Filename : p:\drainage\2047\c2b\env study\fig6-1.dgn



NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. GRID LINES ARE HONG KONG METRIC GRID 1980.
3. TYPE 2 RAILING WITH DEBRIS TRAP BAR AND GENERAL MESH FILL SHALL BE PROVIDED AT BOTH SIDES OF THE CHANNEL BANKS

LEGEND :

- SITE BOUNDARY
- PROPOSED CHANNEL
- PROPOSED SLOPE
- AREA TO BE FILLED TO ADJACENT GROUND LEVEL
- I.L. INVERT LEVEL
- PROPOSED RETAINING WALL

Revision	Date	Description	Initial
C	03/06	AMENDMENT TO BY-PASS CULVERT	KIL
B	10/05	MINOR AMENDMENT TO CHANNEL LAYOUT	KIL
A	05/05	MINOR AMENDMENTS TO SITE BOUNDARY	KIL

	Designed	Checked	Drawn	Verified
Initial	TW	KIL	MK	KIL
Date	04/04	04/04	04/04	04/04

Approved

AGREEMENT NO. CE 67/98

Contract title

YUEN LONG, KAM TIN, NGAU TAM MEI AND TIN SHUI WAI DRAINAGE IMPROVEMENT, STAGE 1, PHASE 2B - KAM TIN

Drawing title

MA ON KONG CHANNEL KT13 PROPOSED LAYOUT PLAN (SHEET 2 OF 2)

Drawing no. FIGURE 1.3b

Scale 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
柏威工程顧問有限公司

Plot Date - 26 APR 2006

CAD Filename - p:\drainwater\drainage\2047\e2b\env study\figure 2.2b.dgn

Appendix B

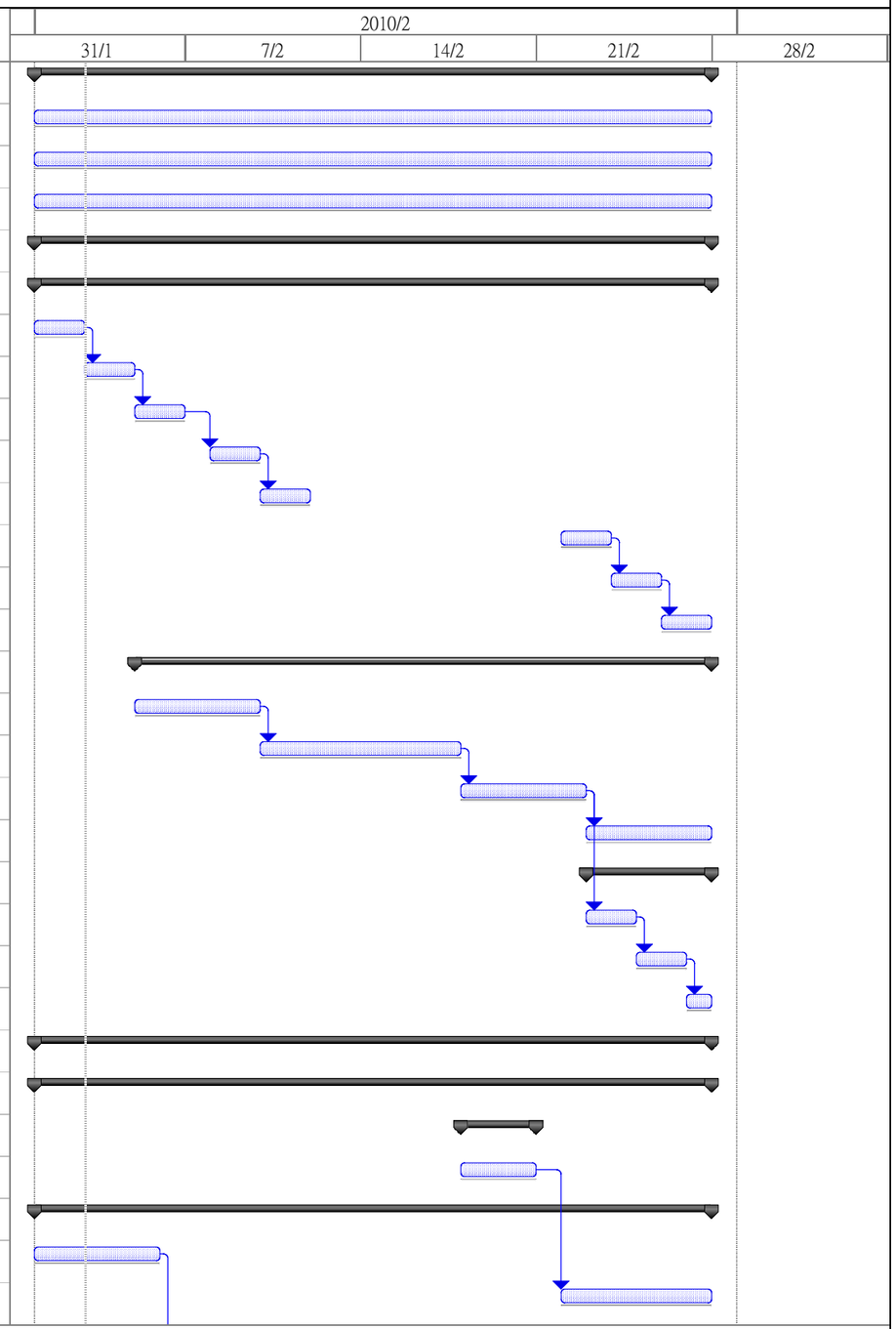
Construction Program

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

Monthly Rolling Programme - February 2010

ID	Task Name	Duration	Start	Finish
1	**Section II (Channel KT13)**	**21 days**	**2010/2/1**	**2010/2/27**
2	**Regular Environmental Impact Monitoring**	21 days	2010/2/1	2010/2/27
3	**Regular Tree Survey & Protection**	21 days	2010/2/1	2010/2/27
4	**Regular Structural Condition Survey**	21 days	2010/2/1	2010/2/27
5	**Section A**	**21 days**	**2010/2/1**	**2010/2/27**
6	**Excavation to channel formation & laying of rock fill material (A CH0.00 - A CH400.18)**	**21 days**	**2010/2/1**	**2010/2/27**
7	Bay A9 (A CH58.74 - A CH70.69) - TG2 (E.B.)	2 days	2010/2/1	2010/2/2
8	Bay A10 (A CH70.69 - A CH84.25) - TG2 (E.B.)	2 days	2010/2/3	2010/2/4
9	Bay A11 (A CH84.25 - A CH96.57) - TG2 (E.B.)	2 days	2010/2/5	2010/2/6
10	Bay A32 (A CH331.09 - A CH343.21) - Transition	2 days	2010/2/8	2010/2/9
11	Bay A33 (A CH343.21 - A CH359.26) - Transition	2 days	2010/2/10	2010/2/11
12	Bay A34 (A CH359.26 - A CH374.28)	2 days	2010/2/22	2010/2/23
13	Bay A35 (A CH374.28 - A CH389.29)	2 days	2010/2/24	2010/2/25
14	Bay A36 (A CH389.29 - A CH400.18)	2 days	2010/2/26	2010/2/27
15	**Construction of channel structure (RC2, Transition, and TG2)**	**17 days**	**2010/2/5**	**2010/2/27**
16	Bay A9 (A CH58.74 - A CH70.69) - TG2 (E.B.)	4 days	2010/2/5	2010/2/9
17	Bay A10 (A CH70.69 - A CH84.25) - TG2 (E.B.)	4 days	2010/2/10	2010/2/17
18	Bay A11 (A CH84.25 - A CH96.57) - TG2 (E.B.)	4 days	2010/2/18	2010/2/22
19	Bay A32 (A CH331.09 - A CH343.21) - Transition	5 days	2010/2/23	2010/2/27
20	**Backfilling along the channel sides / laying underground drain pipe**	**5 days**	**2010/2/23**	**2010/2/27**
21	Bay A9 (A CH58.74 - A CH70.69) - TG2 (E.B.)	2 days	2010/2/23	2010/2/24
22	Bay A10 (A CH70.69 - A CH84.25) - TG2 (E.B.)	2 days	2010/2/25	2010/2/26
23	Bay A11 (A CH84.25 - A CH96.57) - TG2 (E.B.)	1 day	2010/2/27	2010/2/27
24	**Section of Box Culvert BC13-1**	**21 days**	**2010/2/1**	**2010/2/27**
25	**Construct box culvert BC13-1 (BC CH0.00 - BC CH383.63)**	**21 days**	**2010/2/1**	**2010/2/27**
26	**Excavation for box culvert formation & laying of rock fill material (BC CH0.00 - BC CH383.63)**	**3 days**	**2010/2/18**	**2010/2/20**
27	Bay BC3 (BC CH17.23 - BC CH32.25)	3 days	2010/2/18	2010/2/20
28	**Construction of box culvert Type BC1**	**21 days**	**2010/2/1**	**2010/2/27**
29	Bay BC2 (BC CH00.00 - BC CH17.23)	5 days	2010/2/1	2010/2/5
30	Bay BC3 (BC CH17.23 - BC CH32.25)	6 days	2010/2/22	2010/2/27

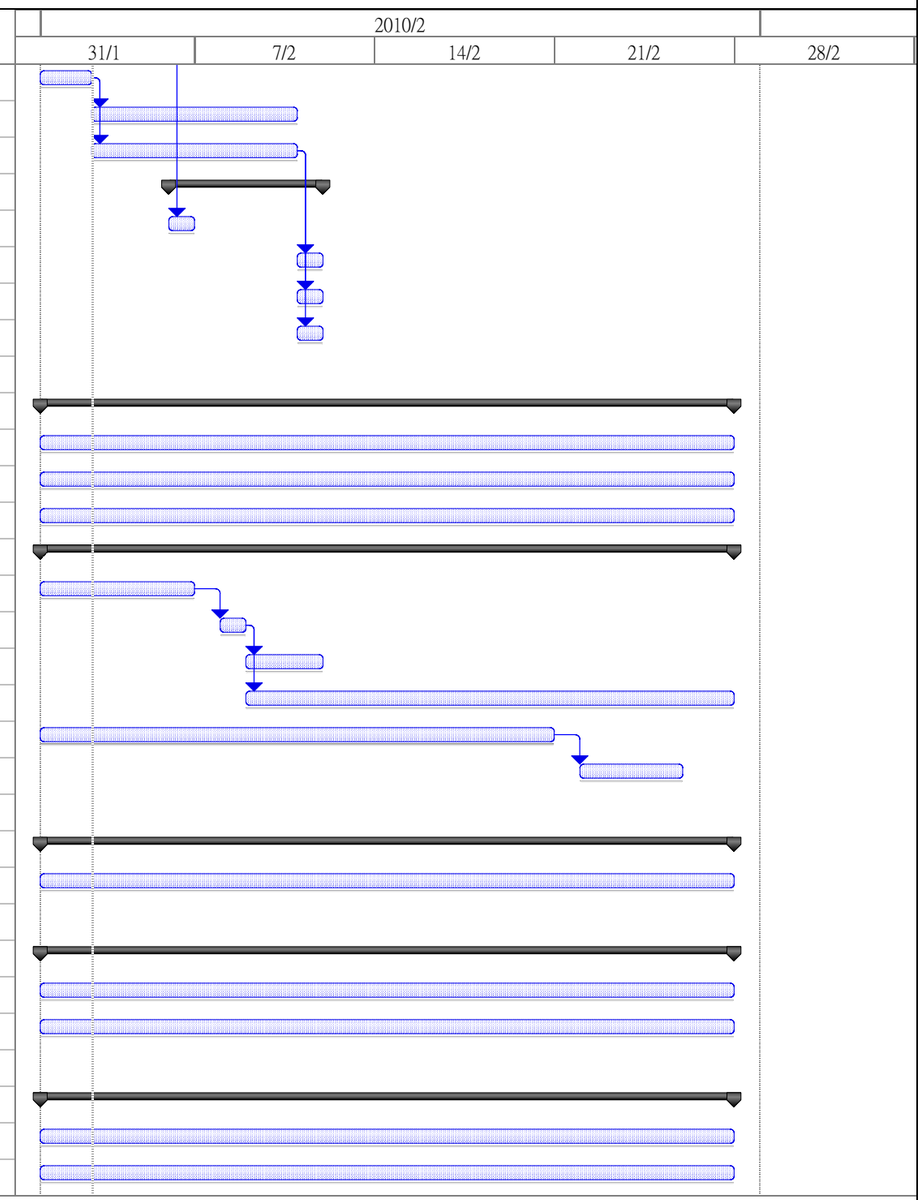


Task Split Progress Milestone Summary

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

Monthly Rolling Programme - February 2010

ID	Task Name	Duration	Start	Finish
31	Bay BC15 (BC CH184.94 - BC CH196.48)	2 days	2010/2/1	2010/2/2
32	Bay BC16 (BC CH196.48 - BC CH201.97)	7 days	2010/2/3	2010/2/10
33	Bay BC14 (BC CH170.20 - BC CH184.94)	7 days	2010/2/3	2010/2/10
34	**Backfilling the sides of channel structure & Laying of underground drain pipe**	**5 days**	**2010/2/6**	**2010/2/11**
35	Bay BC2 (BC CH00.00 - BC CH17.23)	1 day	2010/2/6	2010/2/6
36	Bay BC14 (BC CH170.20 - BC CH184.94)	1 day	2010/2/11	2010/2/11
37	Bay BC15 (BC CH184.94 - BC CH196.48)	1 day	2010/2/11	2010/2/11
38	Bay BC16 (BC CH196.48 - BC CH201.97)	1 day	2010/2/11	2010/2/11
39				
40	**Section IV (Channel KT14B & 14C and Portion 8A & 8B)**	**21 days**	**2010/2/1**	**2010/2/27**
41	**Regular Environmental Impact Monitoring**	21 days	2010/2/1	2010/2/27
42	**Regular Tree Survey & Protection**	21 days	2010/2/1	2010/2/27
43	**Regular Structural Condition Survey**	21 days	2010/2/1	2010/2/27
44	**Channel KT14C**	**21 days**	**2010/2/1**	**2010/2/27**
45	Construction of Bay 25E-R1	6 days	2010/2/1	2010/2/6
46	Backfilling of Bay 25E-R1	1 day	2010/2/8	2010/2/8
47	Type II Railing for Bay 25E-R1	3 days	2010/2/9	2010/2/11
48	Construction of U-channel along channel sides	14 days	2010/2/9	2010/2/27
49	Construction of 3.5m access road at CH180.00 - CH270.00 (west bank)	15 days	2010/2/1	2010/2/20
50	Installation of traffic sign plate / Road marking / street furniture	4 days	2010/2/22	2010/2/25
51				
52	**Section V**	**21 days**	**2010/2/1**	**2010/2/27**
53	Preservation and protection of tree for Section I, II, III and IV	21 days	2010/2/1	2010/2/27
54				
55	**Section VI - Portion 9A & 9B (Tuen Mun Sewerage Work)**	**21 days**	**2010/2/1**	**2010/2/27**
56	Structural Survey and Monitoring	21 days	2010/2/1	2010/2/27
57	Construction of Manhole, Timber Box and Trench Excavation	21 days	2010/2/1	2010/2/27
58				
59	**Section VII - Portion 10A, 10B & 10C (Tuen Mun Sewerage Work)**	**21 days**	**2010/2/1**	**2010/2/27**
60	Structural Survey and Monitoring	21 days	2010/2/1	2010/2/27
61	Construction of Manhole, Timber Box and Trench Excavation	21 days	2010/2/1	2010/2/27



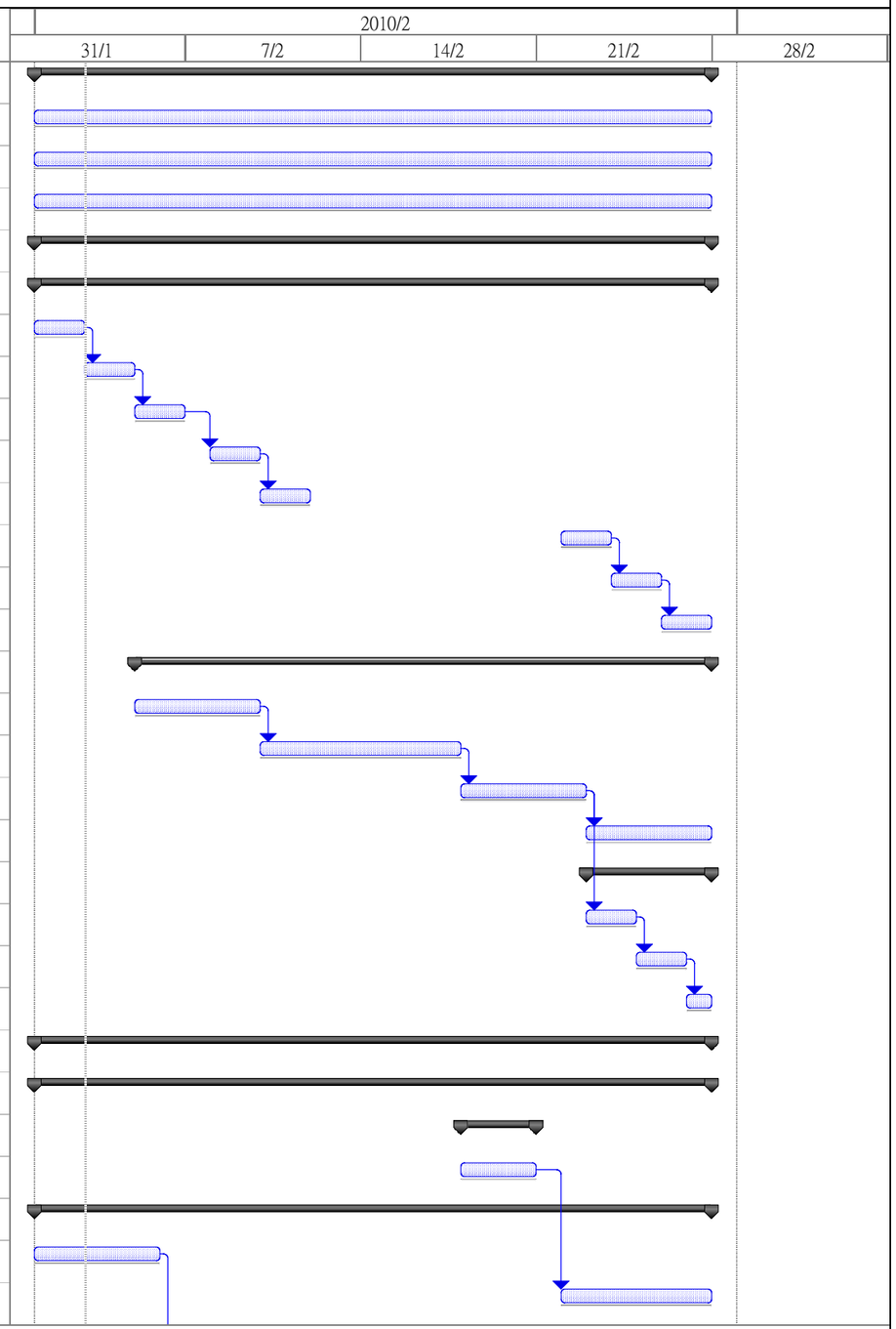
Task Split Progress Milestone Summary

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

Monthly Rolling Programme - February 2010

ID	Task Name	Duration	Start	Finish
1	**Section II (Channel KT13)**	**21 days**	**2010/2/1**	**2010/2/27**
2	**Regular Environmental Impact Monitoring**	21 days	2010/2/1	2010/2/27
3	**Regular Tree Survey & Protection**	21 days	2010/2/1	2010/2/27
4	**Regular Structural Condition Survey**	21 days	2010/2/1	2010/2/27
5	**Section A**	**21 days**	**2010/2/1**	**2010/2/27**
6	**Excavation to channel formation & laying of rock fill material (A CH0.00 - A CH400.18)**	**21 days**	**2010/2/1**	**2010/2/27**
7	Bay A9 (A CH58.74 - A CH70.69) - TG2 (E.B.)	2 days	2010/2/1	2010/2/2
8	Bay A10 (A CH70.69 - A CH84.25) - TG2 (E.B.)	2 days	2010/2/3	2010/2/4
9	Bay A11 (A CH84.25 - A CH96.57) - TG2 (E.B.)	2 days	2010/2/5	2010/2/6
10	Bay A32 (A CH331.09 - A CH343.21) - Transition	2 days	2010/2/8	2010/2/9
11	Bay A33 (A CH343.21 - A CH359.26) - Transition	2 days	2010/2/10	2010/2/11
12	Bay A34 (A CH359.26 - A CH374.28)	2 days	2010/2/22	2010/2/23
13	Bay A35 (A CH374.28 - A CH389.29)	2 days	2010/2/24	2010/2/25
14	Bay A36 (A CH389.29 - A CH400.18)	2 days	2010/2/26	2010/2/27
15	**Construction of channel structure (RC2, Transition, and TG2)**	**17 days**	**2010/2/5**	**2010/2/27**
16	Bay A9 (A CH58.74 - A CH70.69) - TG2 (E.B.)	4 days	2010/2/5	2010/2/9
17	Bay A10 (A CH70.69 - A CH84.25) - TG2 (E.B.)	4 days	2010/2/10	2010/2/17
18	Bay A11 (A CH84.25 - A CH96.57) - TG2 (E.B.)	4 days	2010/2/18	2010/2/22
19	Bay A32 (A CH331.09 - A CH343.21) - Transition	5 days	2010/2/23	2010/2/27
20	**Backfilling along the channel sides / laying underground drain pipe**	**5 days**	**2010/2/23**	**2010/2/27**
21	Bay A9 (A CH58.74 - A CH70.69) - TG2 (E.B.)	2 days	2010/2/23	2010/2/24
22	Bay A10 (A CH70.69 - A CH84.25) - TG2 (E.B.)	2 days	2010/2/25	2010/2/26
23	Bay A11 (A CH84.25 - A CH96.57) - TG2 (E.B.)	1 day	2010/2/27	2010/2/27
24	**Section of Box Culvert BC13-1**	**21 days**	**2010/2/1**	**2010/2/27**
25	**Construct box culvert BC13-1 (BC CH0.00 - BC CH383.63)**	**21 days**	**2010/2/1**	**2010/2/27**
26	**Excavation for box culvert formation & laying of rock fill material (BC CH0.00 - BC CH383.63)**	**3 days**	**2010/2/18**	**2010/2/20**
27	Bay BC3 (BC CH17.23 - BC CH32.25)	3 days	2010/2/18	2010/2/20
28	**Construction of box culvert Type BC1**	**21 days**	**2010/2/1**	**2010/2/27**
29	Bay BC2 (BC CH00.00 - BC CH17.23)	5 days	2010/2/1	2010/2/5
30	Bay BC3 (BC CH17.23 - BC CH32.25)	6 days	2010/2/22	2010/2/27

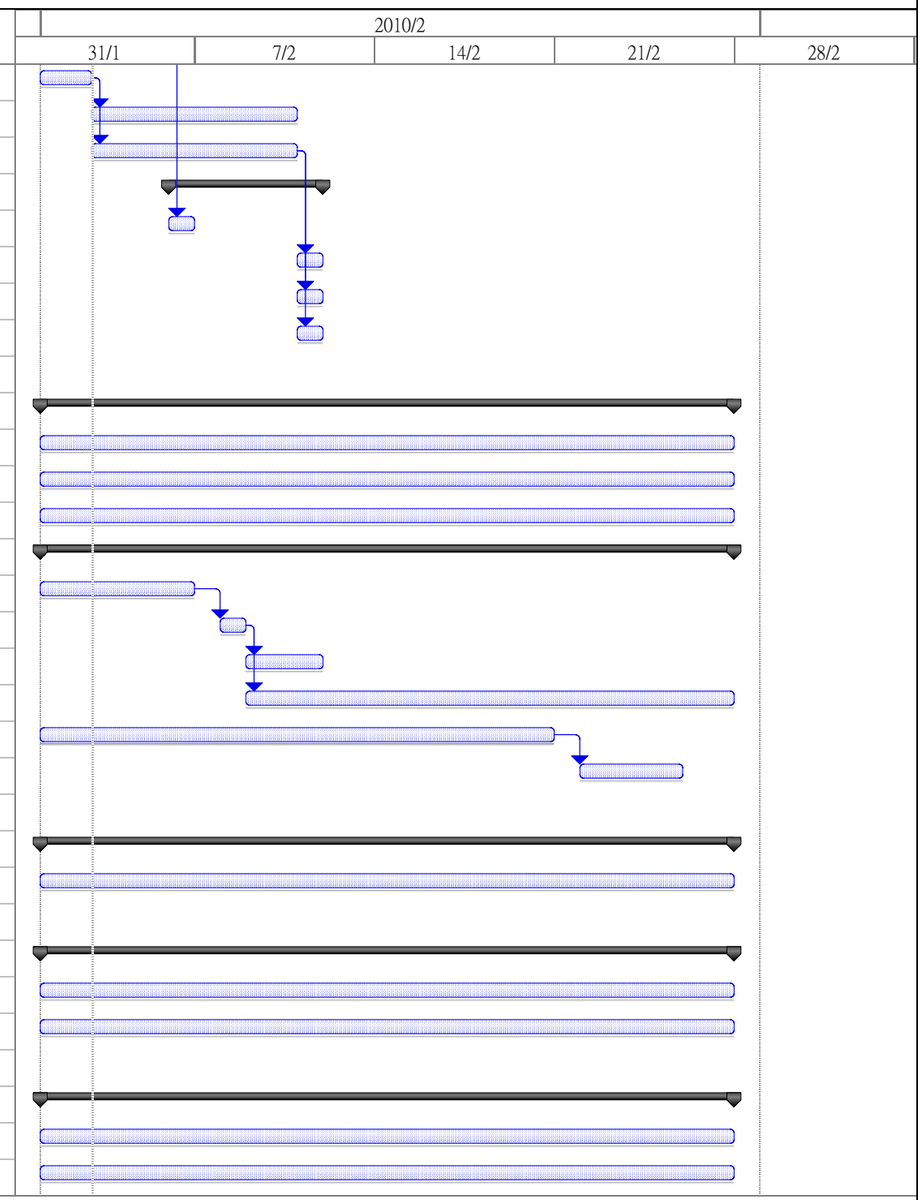


Task Split Progress Milestone Summary

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

Monthly Rolling Programme - February 2010

ID	Task Name	Duration	Start	Finish
31	Bay BC15 (BC CH184.94 - BC CH196.48)	2 days	2010/2/1	2010/2/2
32	Bay BC16 (BC CH196.48 - BC CH201.97)	7 days	2010/2/3	2010/2/10
33	Bay BC14 (BC CH170.20 - BC CH184.94)	7 days	2010/2/3	2010/2/10
34	**Backfilling the sides of channel structure & Laying of underground drain pipe**	**5 days**	**2010/2/6**	**2010/2/11**
35	Bay BC2 (BC CH00.00 - BC CH17.23)	1 day	2010/2/6	2010/2/6
36	Bay BC14 (BC CH170.20 - BC CH184.94)	1 day	2010/2/11	2010/2/11
37	Bay BC15 (BC CH184.94 - BC CH196.48)	1 day	2010/2/11	2010/2/11
38	Bay BC16 (BC CH196.48 - BC CH201.97)	1 day	2010/2/11	2010/2/11
39				
40	**Section IV (Channel KT14B & 14C and Portion 8A & 8B)**	**21 days**	**2010/2/1**	**2010/2/27**
41	**Regular Environmental Impact Monitoring**	21 days	2010/2/1	2010/2/27
42	**Regular Tree Survey & Protection**	21 days	2010/2/1	2010/2/27
43	**Regular Structural Condition Survey**	21 days	2010/2/1	2010/2/27
44	**Channel KT14C**	**21 days**	**2010/2/1**	**2010/2/27**
45	Construction of Bay 25E-R1	6 days	2010/2/1	2010/2/6
46	Backfilling of Bay 25E-R1	1 day	2010/2/8	2010/2/8
47	Type II Railing for Bay 25E-R1	3 days	2010/2/9	2010/2/11
48	Construction of U-channel along channel sides	14 days	2010/2/9	2010/2/27
49	Construction of 3.5m access road at CH180.00 - CH270.00 (west bank)	15 days	2010/2/1	2010/2/20
50	Installation of traffic sign plate / Road marking / street furniture	4 days	2010/2/22	2010/2/25
51				
52	**Section V**	**21 days**	**2010/2/1**	**2010/2/27**
53	Preservation and protection of tree for Section I, II, III and IV	21 days	2010/2/1	2010/2/27
54				
55	**Section VI - Portion 9A & 9B (Tuen Mun Sewerage Work)**	**21 days**	**2010/2/1**	**2010/2/27**
56	Structural Survey and Monitoring	21 days	2010/2/1	2010/2/27
57	Construction of Manhole, Timber Box and Trench Excavation	21 days	2010/2/1	2010/2/27
58				
59	**Section VII - Portion 10A, 10B & 10C (Tuen Mun Sewerage Work)**	**21 days**	**2010/2/1**	**2010/2/27**
60	Structural Survey and Monitoring	21 days	2010/2/1	2010/2/27
61	Construction of Manhole, Timber Box and Trench Excavation	21 days	2010/2/1	2010/2/27

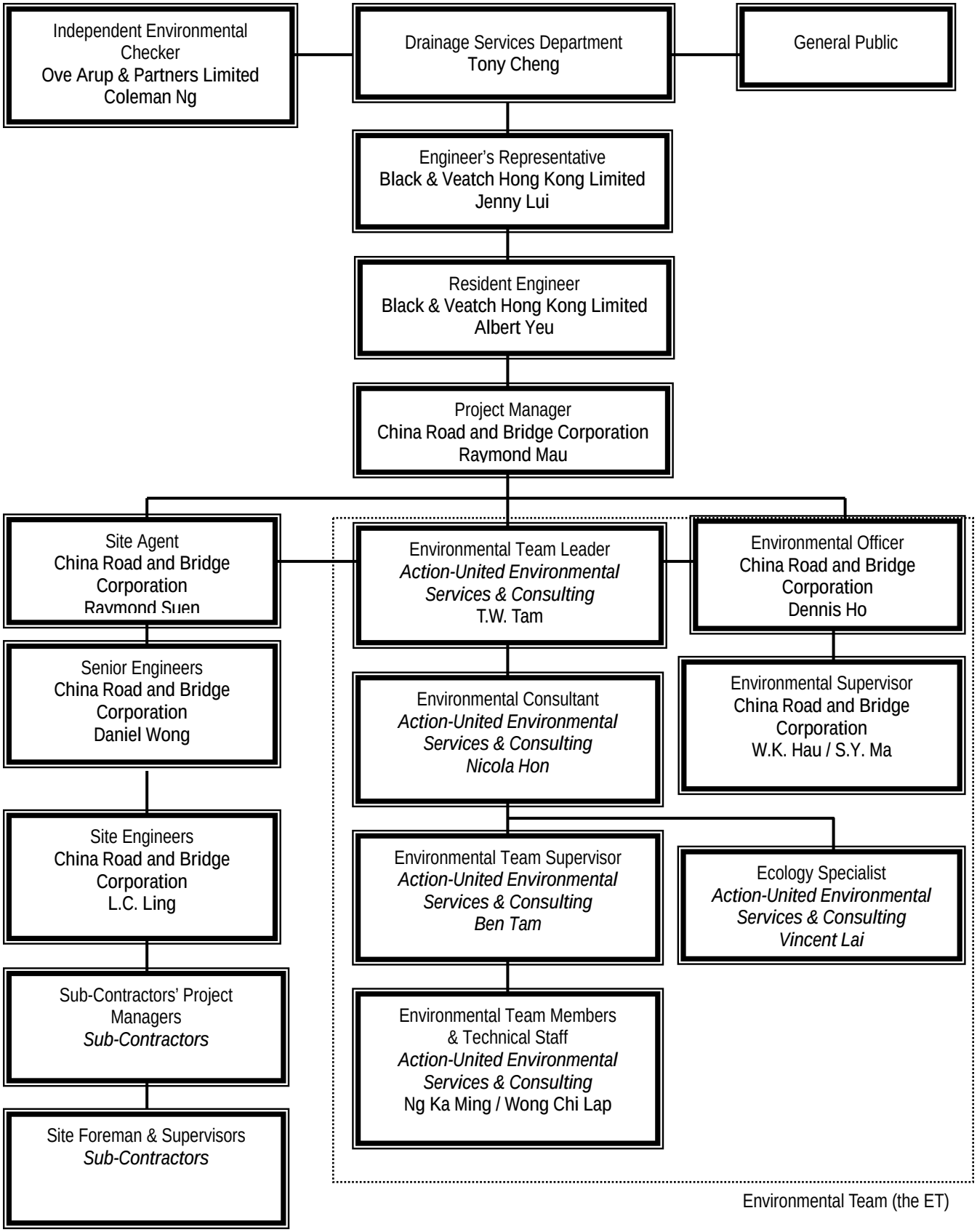


Task Split Progress Milestone Summary

Appendix C

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	Ms. Jenny Lui	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Albert Yeu	2478-9161	2478-9369
OAP	Independent Environmental Checker	Mr. Coleman Ng	2268-3097	2268-3950
CRBC	Project Director	Mr. Wang Yanhua	2283-1688	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. Daniel Wong	9858-3176	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	Mr. Kenny Sze	9374-8954	2283-1689
AUES	Environmental Team Leader	Mr. T.W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Miss Nicola Hon	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 D

(a) Monitoring Schedules

(b) Meteorological Data

Monitoring Schedule for KT 13 for Reporting Period

Date		Air Quality		Noise Leq 30min	Water Quality	Ecology Surveys
		1-hour TSP	24-hour TSP			
Tue	26-Jan-10		A1(a), A2			
Wed	27-Jan-10	A1(a), A2		N1(a), N2(a) & N3	W1,W2, W3(a), W4, W5 & W6	
Thu	28-Jan-10					
Fri	29-Jan-10				W1,W2, W3(a), W4, W5 & W6	
Sat	30-Jan-10					
Sun	31-Jan-10					
Mon	1-Feb-10		A1(a), A2		W1,W2, W3(a), W4, W5 & W6	
Tue	2-Feb-10	A1(a), A2		N1(a), N2(a) & N3		
Wed	3-Feb-10				W1,W2, W3(a), W4, W5 & W6	
Thu	4-Feb-10					
Fri	5-Feb-10				W1,W2, W3(a), W4, W5 & W6	
Sat	6-Feb-10		A1(a), A2			
Sun	7-Feb-10					
Mon	8-Feb-10	A1(a), A2		N1(a), N2(a) & N3	W1,W2, W3(a), W4, W5 & W6	
Tue	9-Feb-10					
Wed	10-Feb-10				W1,W2, W3(a), W4, W5 & W6	
Thu	11-Feb-10					
Fri	12-Feb-10		A1(a), A2		W1,W2, W3(a), W4, W5 & W6	
Sat	13-Feb-10					
Sun	14-Feb-10					
Mon	15-Feb-10					
Tue	16-Feb-10					
Wed	17-Feb-10	A1(a), A2		N1(a), N2(a) & N3	W1,W2, W3(a), W4, W5 & W6	
Thu	18-Feb-10		A1(a), A2			
Fri	19-Feb-10				W1,W2, W3(a), W4, W5 & W6	
Sat	20-Feb-10					
Sun	21-Feb-10					
Mon	22-Feb-10		A1(a), A2		W1,W2, W3(a), W4, W5 & W6	
Tue	23-Feb-10	A1(a), A2		N1(a), N2(a) & N3		
Wed	24-Feb-10				W1,W2, W3(a), W4, W5 & W6	
Thu	25-Feb-10					

Cultural Heritage

Frequency: Condition survey - Bi-monthly
Settlement monitoring - Bi-weekly

Landscape & Visual

Frequency: Bi-weekly

	Monitoring Day
	Sunday or Public Holiday

Monitoring Schedule of KT 13 for next reporting month

Date		Air Quality		Noise Leq 30min	Water Quality	Ecology Surveys
		1-hour TSP	24-hour TSP			
Fri	26-Feb-10				W1,W2, W3(a), W4, W5 & W6	
Sat	27-Feb-10		A1(a), A2			
Sun	28-Feb-10					
Mon	1-Mar-10	A1(a), A2		N1(a), N2(a) & N3	W1,W2, W3(a), W4, W5 & W6	
Tue	2-Mar-10					
Wed	3-Mar-10				W1,W2, W3(a), W4, W5 & W6	
Thu	4-Mar-10					
Fri	5-Mar-10		A1(a), A2		W1,W2, W3(a), W4, W5 & W6	
Sat	6-Mar-10	A1(a), A2		N1(a), N2(a) & N3		
Sun	7-Mar-10					
Mon	8-Mar-10				W1,W2, W3(a), W4, W5 & W6	
Tue	9-Mar-10					
Wed	10-Mar-10				W1,W2, W3(a), W4, W5 & W6	
Thu	11-Mar-10		A1(a), A2			
Fri	12-Mar-10	A1(a), A2		N1(a), N2(a) & N3	W1,W2, W3(a), W4, W5 & W6	
Sat	13-Mar-10					
Sun	14-Mar-10					
Mon	15-Mar-10				W1,W2, W3(a), W4, W5 & W6	
Tue	16-Mar-10					
Wed	17-Mar-10		A1(a), A2		W1,W2, W3(a), W4, W5 & W6	
Thu	18-Mar-10	A1(a), A2		N1(a), N2(a) & N3		
Fri	19-Mar-10				W1,W2, W3(a), W4, W5 & W6	
Sat	20-Mar-10					
Sun	21-Mar-10					
Mon	22-Mar-10				W1,W2, W3(a), W4, W5 & W6	
Tue	23-Mar-10		A1(a), A2			
Wed	24-Mar-10	A1(a), A2		N1(a), N2(a) & N3	W1,W2, W3(a), W4, W5 & W6	
Thu	25-Mar-10					

Cultural Heritage

Frequency: Condition survey - Bi-monthly
Settlement monitoring - Bi-weekly

Landscape & Visual

Frequency: Bi-weekly

	Monitoring Day
	Sunday or Public Holiday

Meteorological Data Extracted from HKO during the Reporting Period

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Tue	26-Jan-10	Cloudy with a few light rain patches. Moderate to fresh easterly winds.	Trace	15.8	12.5	75.7	E/NE
Wed	27-Jan-10	Cloudy and misty with one or two light rain patches.	Trace	18	9	77	E/NE
Thu	28-Jan-10	Cloudy with fog patches. Light to moderate easterly winds.	Trace	19.6	11	82.5	W/SW
Fri	29-Jan-10	Cloudy with a few rain patches. Misty at first.	Trace	19.9	10	78	E
Sat	30-Jan-10	Mist patches/ Light winds.	0	21.5	11.2	68.2	E/NE
Sun	31-Jan-10	Mainly fine. There will be coastal fog. Light winds.	0	21.5	11.5	79	S/SE
Mon	1-Feb-10	Mainly cloudy and misty with one or two light rain patches.	0	21.4	10.5	80	W/SW
Tue	2-Feb-10	Cloudy and misty with a few rain patches.	Trace	0	12.2	82.5	E/NE
Wed	3-Feb-10	Mainly cloudy and misty with a few light rain patches.	Trace	25.2	15.5	75	E/NE
Thu	4-Feb-10	Cloudy with light rain. Fresh easterly winds	0.4	19.4	12	80.5	E/NE
Fri	5-Feb-10	Moderate to fresh easterly winds.	Trace	20.9	14	75.5	E
Sat	6-Feb-10	Cloudy with mist and one or two light rain patches.	Trace	19.4	15.2	82.5	E/NE
Sun	7-Feb-10	Cloudy with a few rain patches.	94.1	17.6	12.2	95.5	E/SE
Mon	8-Feb-10	Moderate to fresh easterly winds	7.1	19.1	11.5	91	E/NE
Tue	9-Feb-10	Foggy with a few light rain patches at first.	0	23.8	18.5	80.5	S/SE
Wed	10-Feb-10	Moderate to fresh easterly winds.	Trace	25.2	16.7	7	S/SE
Thu	11-Feb-10	Mainly cloudy with light rain.	Trace	25.6	19	76	S/SW
Fri	12-Feb-10	Cloudy to overcast with a few rain patches.	Trace	17	24	74	NE
Sat	13-Feb-10	Holiday					
Sun	14-Feb-10	Holiday					
Mon	15-Feb-10	Holiday					
Tue	16-Feb-10	Holiday					
Wed	17-Feb-10	Moderate to fresh northerly winds.	1	7.9	18.2	83.5	N/NE
Thu	18-Feb-10	It will be cold and cloudy with a few light rain	0.8	8.1	17.7	69.5	NE
Fri	19-Feb-10	Mainly cloudy with a few rain patches at first.	3.7	7.7	13.5	88	N/NE
Sat	20-Feb-10	Cloudy with mist. A few showers at first.	Trace	11.9	8.8	72.5	N/NE
Sun	21-Feb-10	Moderate east to northeasterly winds.	Trace	16.2	9	73.5	E/NE
Mon	22-Feb-10	Cloudy/ sunny periods during the day.	0.1	18.6	8.2	82.2	N/NW
Tue	23-Feb-10	Cloudy with mist patches. Sunny intervals during the day.	0	20.3	11.5	79.5	E/SE
Wed	24-Feb-10	Mainly cloudy with a few showers.	Trace	23.2	22.2	78.5	S/SE
Thu	25-Feb-10	Misty tomorrow morning. Sunny periods during the day.	0.4	24.8	13.5	82	S/SE

Appendix E

Calibration Certificates and

HOKLAS-Accreditation Certificate

Equipment Calibration List for 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

Item	Issue	Description of Equipment	Date of Calibration	Date of Next Calibration
1#	Air	Tisch Calibration Kit Model TE-5025A (Serial No. 1612)	2 Jun 09	2 Jun 10
2*		TSP Sampler Calibration Spreadsheet for KT13-A1a	17 Dec 09 17 Feb 10	17 Feb 10 17 Apr 10
3*		TSP Sampler Calibration Spreadsheet for KT13-A2	17 Dec 09 17 Feb 10	17 Feb 10 17 Apr 10
4#		TSI DustTrak Model 8520 (Serial No. 21060)	18 Jun 09	18 Jun 10
5#		TSI DustTrak Model 8520 (Serial No. 23080)	18 Jun 09	18 Jun 10
6#		TSI DustTrak Model 8520 (Serial No. 23079)	18 Jun 09	18 Jun 10
7#	Noise	Cesva SC-20c Sound Level Meter (Serial No. T212509)	28 Apr 09	28 Apr 10
8#		Cesva CB-5 Acoustical Calibrator (Serial No. 030934)	28 Apr 09	28 Apr 10
9#		Bruel & Kjaer Integrating Sound Level Meter 2238 (Serial No. 2285762)	30 Apr 09	30 Apr 10
10#		Bruel & Kjaer Integrating Sound Level Meter 2238 (Serial No. 2285690)	30 Apr 09	30 Apr 10
11#		Bruel & Kjaer Acoustical Calibrator 4231 (Serial No. 2292168)	28 Apr 09	28 Apr 10
12#		Bruel & Kjaer Acoustical Calibrator 4231 (Serial No. 2326408)	28 Apr 09	28 Apr 10
13*	Water	YSI 550A (Serial No. 97F0837AM)	27 Jan 10	27 Apr 10
14^		Extech EC500 (ALS Lab ID: HK1001303)	20 Jan 10	20 Apr 10
15*		Turbidimeter HACH 2100p (Serial No. 950900008735)	27 Jan 10	27 Apr 10
16^		Hand Refractometer ATAGO (Serial No. 289468)	20 Jan 10	20 Apr 10

Note: * Calibration certificates will only provide when monitoring equipment is re-calibrate or new.
^The calibration certificates could be referred to the previous EM&A monthly report - January 2010.
#The calibration certificates could be referred to the previous EM&A monthly report - July 2010

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	No.1 Ma On Kong Village	Date of Calibration:	17-Feb-10
Location ID :	ASR15 (A2)	Next Calibration Date:	17-Apr-10
		Technician:	Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1022.8	Corrected Pressure (mm Hg)	767.1
Temperature (^{o}C)	9.8	Temperature (K)	283

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.01546
Model->	TE-5025A	Qstd Intercept ->	-0.02851

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.4	5.4	10.8	1.696	50	52.93	Slope = 41.2414
13	4.1	4.1	8.2	1.479	42	44.46	Intercept = -17.0253
10	3.2	3.2	6.4	1.309	35	37.05	Corr. coeff. = 0.9985
7	2.3	2.3	4.6	1.112	26	27.53	
5	1.2	1.2	2.4	0.807	16	16.94	

Calculations :

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

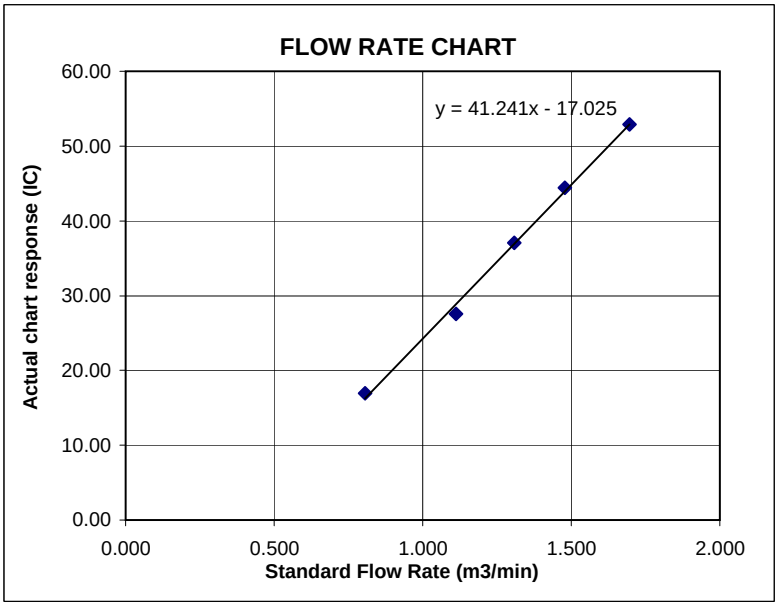
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	No.68 Ho Pui Village	Date of Calibration:	17-Feb-10
Location ID :	ASR14 (A1(a))	Next Calibration Date:	17-Apr-10
		Technician:	Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1022.8	Corrected Pressure (mm Hg)	767.1
Temperature (^{o}C)	9.8	Temperature (K)	283

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.01546
Model->	TE-5025A	Qstd Intercept ->	-0.02851

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.4	5.4	10.8	1.696	50	52.93	Slope = 41.1319
13	4.2	4.2	8.4	1.497	41	43.41	Intercept = -17.1386
10	3	3	6	1.268	34	35.99	Corr. coeff. = 0.9987
7	2.1	2.1	4.2	1.063	25	26.47	
5	1.2	1.2	2.4	0.807	15	15.88	

Calculations :

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

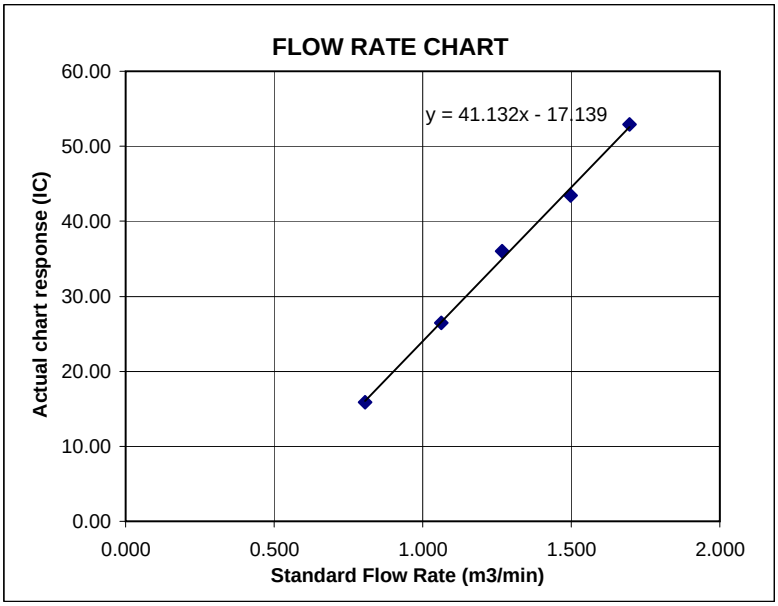
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

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



CERTIFICATE OF ANALYSIS

Batch: HK1001911
Date of Issue: 01/02/2010
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration

Item : HACH Turbidimeter
ALS Lab ID: HK1001911 -001
Date of Calibration: 27/01/2010

Model No.: HACH 2100P
Equipment No.: EQ091
Serial No.: 950900008735

Testing Results :

Turbidity

Expected Reading	Recording Reading
0.0 NTU	0.2 NTU
4.0 NTU	3.9 NTU
16.0 NTU	15.7 NTU
40.0 NTU	36.9 NTU
80.0 NTU	76.5 NTU
160 NTU	144 NTU
Allowing Deviation	±10%

Testing Method:

APHA (20th edition), 2130B

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

CERTIFICATE OF ANALYSIS

Batch: HK1001507
Date of Issue: 03/02/2010
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration

Item : YSI DO Meter 55 Model No.: YSI 52/12FT
ALS Lab ID: HK1001507 -001 Equipment No.: N/A
Date of Calibration: 27/01/2010 Serial No.: 97F0837AM

Testing Results :

Dissolved Oxygen

Expected Reading	Recording Reading
4.74 mg/L	4.84 mg/L
6.71 mg/L	6.83 mg/L
8.58 mg/L	8.72 mg/L
Allowing Deviation	±0.2 mg/L

Testing Method:

APHA (20th edition), 4500-O C & G

Temperature

Reference Temperature (^{0}C)	Recorded Temperature (^{0}C)
20.5 ^{0}C	20.6 ^{0}C
45.0 ^{0}C	44.8 ^{0}C
Allowing Deviation	±2.0^{0}C

Testing Method:

In House

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

Appendix F

Event and Action Plan

Event/Action Plan for Air Quality

EVENT	ACTION			
	Contractor's ET leader	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source 2. Inform IEC, ER and Contractor 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by Contractor's ET leader 2. Check Contractor's working method	1. 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, ER and Contractor 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Discuss with IEC, Contractor and ER on remedial actions required 6. If exceedance continue, arrange meeting with IEC, ER and Contractor 7. If exceedance stops, cease additional monitoring	1. Checking monitoring data submitted by Contractor's ET leader. 2. Check Contractor's working method 3. Discuss with Contractor's ET leader and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IEC and ER 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 IEC, ER, EPD and Contractor 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and kept IEC, EPD and ER informed of the results	1. Check monitoring data submitted by Contractor's ET leader 2. Check Contractor's working method 3. Discuss with Contractor's ET leader and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Audit 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 for the exceedance 2. Submit proposals for remedial actions to IEC and ER 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, ER, Contractor 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, Contractor and ER to discuss the remedial actions to be taken 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, Contractor's ET leader and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Audit the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consultation with IEC, agree with the Contractor on the remedial measures to be implemented 4. Ensure remedial measures properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid for the exceedance 2. Submit proposals for remedial actions to IEC and ER 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 ER until the exceedance is abate.

Event/Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	CONTRACTOR'S ET LEADER	IEC	ER	Contractor
Action Level	1. Notify IEC, Contractor and ER 2. Carry out investigation 3. Report the results of investigation to the IEC, Contractor and ER 4. Discuss with the Contractor and formulate remedial measures 5. Double monitoring frequency 6. Check compliance to Action/Limit Levels after application of mitigation measures	1. Review the analysed results submitted by the Contract's ET leader 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Review the implementation of remedial measures	1. Confirm receipt of notification of complaint in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to ER and IEC 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, ER, 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, ER and EPD the causes & actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, Contractor's ET leader and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Audit the implementation of remedial measures	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 are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to 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 ER until the exceedance is abated

Event and Action Plan for Water Quality

Event	ET Leader	IEC	ER	Contractor
Action level being exceeded by one sampling day	Repeat in-site measurement to confirm findings; Identify Source(s) of impact; Inform IEC an Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Repeat measurement on next day of exceedance	Discuss with ET and Contractor on the mitigation measures Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly Assess the effectiveness of the implemented mitigation measures.	Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented;	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check al plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER; Implement the agreed mitigation measures.
Action level being exceeded by more than one consecutive sampling days	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; Repeat measurement on next day of exceedance.	Discuss with ET and Contractor on the mitigation measures Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly Assess the effectiveness of the implemented mitigation measures.	Discuss with IEC on the proposed mitigation measures; Made agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC, contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level.	Discuss with ET and Contractor on the mitigation measures Review proposals on mitigation measures submitted by Contractor and advise the R accordingly Assess the effectiveness of the implemented mitigation measures.	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contract to critically review the working methods; Made agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures/
Limit level being exceeded by more than one consecutive sampling days	Repeat in-situ measurement to confirm fundings; Identify source(s) of impact; Inform IEC, contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the Monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	Discuss with ET and Contractor on the mitigation measures Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly Assess the effectiveness of the implemented mitigation measures.	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures; As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities.

Event/Action Plan for Ecology

EVENT	ACTION			
	ET Leader	**IEC**	**Engineer**	**Contractor**
ACTION LEVEL REACHED	1. Carry out investigation 2. Review results and assess whether amendment to action level is appropriate 3. Report the results of investigation to the IEC 4. Notify Contractor and Engineer 5. Discuss with the Contractor and formulate remedial measures 6. Repeat survey to confirm results	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	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed problem 4. Ensure remedial measures properly implemented	1. Take immediate action to avoid further problem 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
LIMIT LEVEL REACHED	1. Carry out investigation 2. Review results and assess whether amendment to limit level is appropriate 3. Report the results of investigation to the IEC 4. Notify Contractor and Engineer 5. Discuss with the Contractor and formulate remedial measures 6. Repeat survey to confirm results	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	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed problem 4. Ensure remedial measures properly implemented 5. Issue instruction to stop the relevant portion of the works until the problem is abated (construction period only).	1. Take immediate action to avoid further problem 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 problem is abated (construction period only)

Event and Action Plan for Cultural Heritage

EVENT	ACTION			
	ET Leader	IEC	ER	Contractor
Action Level	Notify IEC and Contractor to carry out investigation Report reasons of structural damage or instability to the IEC and Contractor Discuss with the Contractor and formulate remedial measures Increase monitoring frequency to once per week to check mitigation effectiveness	Review report of structural damage or instability by the ET. Review proposed remedial measures by the Contractor and advise the ER and Antiquities and Monuments Office (AMO) accordingly Supervise the implementation of remedial measures, with approval from AMO.	Confirm receipt of notification of failure in writing Notify Contractor Require Contractor to propose remedial measures and to notify and seek approval from AMO. Ensure remedial measures are properly implemented.	Notify AMO concerning the damage or structural instability of the cultural heritage resources Submit proposals for repair of damage to cultural heritage resources to AMO for approval and to implement approved measures.
Limit Level	Notify IEC and Contractor to carry out investigation and to stop construction work within 100m of cultural heritage resource to avoid further impact until AMO are satisfied that the relevant structure has been repaired or stabilized to an acceptable level. Report reasons of continued structural damage or instability to the IEC and Contractor Discuss with the Contractor and formulate remedial measures Increase monitoring frequency to daily to check mitigation effectiveness	Review report of structural damage or instability by the ET. Review proposed remedial measures by the Contractor and advise the ER and Antiquities and Monuments Office (AMO) accordingly. Supervise the implementation of remedial measures, with approval from AMO.	Confirm receipt of notification of failure in writing Notify Contractor Require Contractor to propose remedial measures and to notify and seek approval from AMO. Ensure remedial measures are properly implemented.	To carry out investigation and to stop construction work within 100m of cultural heritage resource to avoid further impact until AMO are satisfied that the relevant structure has been repaired or stabilized to an acceptable level. Propose remedial measures for the repair and stabilization of cultural heritage resources, up to liaison of moving and rebuilding the relevant structure with the approval of owner (usually the clan members) and AMO.

Event and Action Plan for Landscape and Visual Impact - Construction Phase

Action Level	Environmental Team Leader (ETL)	Independent Evnironmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Non-conformity on one occasion	1. Identify source 2. Inform the IEC and the ER 3. Discuss remedial actions with the IEC, the ER and the Contractor 4. Monitor remedial actions until rectification has been completed	1. Check report 2. Check the Contractor's working method 3. Discuss with the ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures	1. Notify the Contractor 2. Ensure remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake remedial measures or any necessary replacement
Repeated Non-conformity	1. Identify source 2. Inform the IEC and the ER 3. Increase monitoring (site audit) frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring (site audit)	1. Check report 2. Check the Contractor's working method 3. Discuss with the ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures	1. Notify the Contractor 2. Ensure remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake remedial measures or any necessary replacement

Appendix G

(a) Impact Environmental Monitoring Data

(b) Graphic Plot of Monitoring

1. Construction Noise
2. Air Quality
3. Water Quality

Summary of Water Quality Monitoring Results - KT13

Date	27-Jan-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	14:40	0.10	18.4	18.4	2.53	2.51	31.6	31.3	3.4	3.4	0	0.0	6.8	6.8	<2	2.0	0.22	0.22	10	10.0
			18.4		2.49		30.9		3.3		0		6.8		<2		0.22		10	
W2	14:30	0.10	18.8	18.8	2.48	2.44	30.8	30.5	2.9	2.9	0	0.0	6.7	6.7	<2	2.0	0.23	0.23	<10	10.0
			18.8		2.4		30.1		2.8		0		6.7		<2		0.23		<10	
W3	14:15	0.10	18.7	18.7	1.95	1.92	24.6	24.4	7.6	7.5	0	0.0	7.2	7.2	2	2.0	0.23	0.23	11	11.0
			18.7		1.89		24.1		7.4		0		7.2		2		0.23		11	
W4	14:10	0.10	18.5	18.5	2.21	2.19	27.4	27.1	7.9	7.8	0	0.0	7.8	7.8	<2	2.0	0.23	0.23	10	10.0
			18.5		2.16		26.8		7.7		0		7.8		<2		0.23		10	
W5	14:00	0.10	18.1	18.1	3.79	3.76	50.9	50.6	15.3	15.2	0	0.0	6.6	6.6	<2	2.0	0.23	0.23	12	12.0
			18.1		3.73		50.2		15.0		0		6.6		<2		0.23		12	
W6	13:45	0.20	18.3	18.3	4.23	4.20	56.4	55.8	21.0	20.7	0	0.0	7.9	7.9	2	2.0	0.23	0.23	11	11.0
			18.2		4.16		55.2		20.4		0		7.9		2		0.23		11	

Date	29-Jan-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	14:25	0.10	20.4	20.4	3.43	3.40	43.6	43.4	6.0	6.0	0	0.0	6.9	6.9	6	6.0	0.35	0.35	13	13.0
			20.4		3.37		43.1		5.9		0		6.9		6		0.35		13	
W2	14:20	0.10	19.7	19.7	3.65	3.63	46.6	46.4	5.1	5.2	0	0.0	6.8	6.8	5	5.0	0.32	0.32	12	12.0
			19.7		3.61		46.2		5.3		0		6.8		5		0.32		12	
W3	14:00	0.10	19.9	19.9	2.77	2.75	36.9	36.8	12.3	12.2	0	0.0	7	7.0	6	6.0	0.32	0.32	13	13.0
			19.9		2.72		36.6		12.1		0		7		6		0.32		13	
W4	13:50	0.10	20.1	20.1	2.56	2.54	33.4	33.2	7.4	7.3	0	0.0	7.1	7.1	6	6.0	0.32	0.32	15	15.0
			20.1		2.52		33.0		7.2		0		7.1		6		0.32		15	
W5	13:40	0.10	20.3	20.3	4.23	4.21	56.0	55.9	10.2	10.1	0	0.0	7.1	7.1	7	7.0	0.32	0.32	12	12.0
			20.3		4.19		55.7		9.9		0		7.1		7		0.32		12	
W6	13:25	0.10	19.9	19.9	4.21	4.20	56.3	56.0	24.6	24.4	0	0.0	7.9	7.9	7	7.0	0.32	0.32	12	12.0
			19.9		4.19		55.7		24.2		0		7.9		7		0.32		12	

Date	1-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	17:00	0.10	18.4	18.4	2.53	2.50	31.9	31.6	6.7	6.7	0	0.0	6.9	6.9	5	5.0	0.05	0.05	<10	10.0
			18.4		2.47		31.3		6.6		0		6.9		5		0.05		<10	
W2	16:50	0.10	18.1	18.1	3.22	3.19	35.3	35.0	5.9	5.8	0	0.0	6.9	6.9	4	4.0	0.05	0.05	<10	10.0
			18.1		3.15		34.6		5.7		0		6.9		4		0.05		<10	
W3	16:35	0.10	18.9	18.9	3.76	3.72	38.9	38.3	5.1	5.1	0	0.0	7.4	7.4	5	5.0	0.05	0.05	<10	10.0
			18.9		3.68		37.7		5.0		0		7.4		5		0.05		<10	
W4	16:25	0.10	18.2	18.2	3.49	3.45	37.3	37.1	7.2	7.2	0	0.0	7.6	7.6	4	4.0	0.04	0.04	<10	10.0
			18.2		3.4		36.8		7.1		0		7.6		4		0.04		<10	
W5	16:15	0.10	18.8	18.8	3.79	3.73	43.5	43.1	9.2	9.3	0	0.0	7.4	7.4	5	5.0	0.04	0.04	<10	10.0
			18.8		3.67		42.7		9.3		0		7.4		5		0.04		<10	
W6	16:00	0.10	17.9	17.9	4.23	4.19	52.1	51.5	19.7	19.7	0	0.0	8.1	8.1	2	2.0	0.05	0.05	<10	10.0
			17.9		4.14		50.9		19.7		0		8.1		2		0.05		<10	

Date	3-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	14:50	0.10	17.4	17.4	3.22	3.19	37.2	36.7	5.9	5.8	0	0.0	6.7	6.7	10	10.0	0.46	0.46	12	12.0
			17.4		3.15		36.1		5.7		0		6.7		10		0.46		12	
W2	14:40	0.10	17.3	17.3	3.61	3.57	42.1	41.5	5.5	5.5	0	0.0	7.5	7.5	10	10.0	0.46	0.46	14	14.0
			17.3		3.52		40.8		5.4		0		7.5		10		0.46		14	
W3	14:35	0.10	17.1	17.1	4.13	4.09	49.2	48.5	4.9	4.9	0	0.0	7.2	7.2	10	10.0	0.49	0.49	13	13.0
			17.1		4.05		47.8		4.9		0		7.2		10		0.49		13	
W4	14:15	0.10	16.9	16.9	3.59	3.57	43.1	42.5	7.0	7.0	0	0.0	7.6	7.6	9	9.0	0.48	0.48	13	13.0
			16.9		3.55		41.9		6.9		0		7.6		9		0.48		13	
W5	14:00	0.10	16.7	16.7	3.09	3.06	37.1	36.5	6.7	6.6	0	0.0	7.8	7.8	10	10.0	0.46	0.46	12	12.0
			16.7		3.02		35.9		6.4		0		7.8		10		0.46		12	
W6	13:40	0.10	17.9	17.9	4.52	4.47	53.9	53.4	17.5	17.5	0	0.0	7.6	7.6	10	10.0	0.47	0.47	13	13.0
			17.9		4.41		52.8		17.5		0		7.6		10		0.47		13	

Date	5-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	15:20	0.10	19.1	19.1	4.2	4.14	43.9	43.6	11.2	11.0	0	0.0	7.1	7.1	7	7.0	<0.01	0.01	<10	10.0
			19.1		4.07		43.2		10.7		0		7.1		7		<0.01		<10	
W2	15:10	0.10	18.5	18.5	4.02	4.00	42.4	42.2	15.3	15.0	0	0.0	7.1	7.1	6	6.0	<0.01	0.01	<10	10.0
			18.5		3.98		41.9		14.7		0		7.1		6		<0.01		<10	
W3	14:55	0.10	18.6	18.6	3.72	3.69	39.4	39.2	23.8	23.2	0	0.0	7.3	7.3	7	7.0	<0.01	0.01	<10	10.0
			18.6		3.66		39.0		22.5		0		7.3		7		<0.01		<10	
W4	14:45	0.10	18.4	18.4	2.96	2.94	31.9	31.7	12.6	12.5	0	0.0	6.9	6.9	7	7.0	<0.01	0.01	11	11.0
			18.4		2.92		31.4		12.3		0		6.9		7		<0.01		11	
W5	14:30	0.10	18.9	18.9	4.03	4.02	42.7	42.5	8.4	8.8	0	0.0	7.2	7.2	7	7.0	<0.01	0.01	10	10.0
			18.9		4.01		42.2		9.2		0		7.2		7		<0.01		10	
W6	14:15	0.20	19.0	19.0	3.56	3.53	38.3	37.9	19.7	19.6	0	0.0	7.2	7.2	7	7.0	0.01	0.01	<10	10.0
			19.0		3.5		37.4		19.4		0		7.2		7		0.01		<10	

Date	8-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	09:30	0.10	15.7	15.7	4.42	4.39	47.2	46.8	16.9	16.6	0	0.0	7.7	7.7	34	34.0	0.42	0.42	62	62.0
			15.7		4.36		46.4		16.2		0		7.7		34		0.42		62	
W2	09:15	0.10	15.9	15.9	4.07	4.06	43.2	43.1	18.4	18.2	0	0.0	7.2	7.2	26	26.0	0.42	0.42	58	58.0
			15.9		4.05		42.9		18.0		0		7.2		26		0.42		58	
W3	09:05	0.20	15.4	15.4	3.28	3.26	34.1	33.8	29.7	29.6	0	0.0	7.4	7.4	28	28.0	0.43	0.43	59	59.0
			15.4		3.24		33.5		29.5		0		7.4		28		0.43		59	
W4	09:00	0.20	15.6	15.6	2.53	2.54	28.1	28.3	13.4	13.1	0	0.0	6.8	6.8	26	26.0	0.44	0.44	62	62.0
			15.6		2.55		28.5		12.7		0		6.8		26		0.44		62	
W5	08:50	0.10	15.6	15.6	4.41	4.43	45.9	46.1	18.4	18.3	0	0.0	7.3	7.3	28	28.0	0.44	0.44	60	60.0
			15.6		4.44		46.2		18.2		0		7.3		28		0.44		60	
W6	08:35	0.20	15.9	15.9	3.65	3.63	39.8	39.4	26.8	26.0	0	0.0	7.1	7.1	32	32.0	0.44	0.44	62	62.0
			15.9		3.6		39.0		25.1		0		7.1		32		0.44		62	

Date	10-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	14:45	0.10	24.7	24.7	4.66	4.61	60.1	59.7	13.6	13.3	0	0.0	7.8	7.8	7	7.0	0.4	0.40	20	20.0
			24.7		4.56		59.2		12.9		0		7.8		7		0.4		20	
W2	14:30	0.10	23.9	23.9	4.78	4.74	61.6	61.0	16.4	16.2	0	0.0	6.6	6.6	6	6.0	0.4	0.40	18	18.0
			23.9		4.7		60.3		16.0		0		6.6		6		0.4		18	
W3	14:15	0.10	23.5	23.5	3.43	3.38	44.2	43.9	32.6	32.2	0	0.0	7.8	7.8	5	5.0	0.4	0.40	18	18.0
			23.5		3.33		43.5		31.7		0		7.8		5		0.4		18	
W4	14:10	0.10	23.6	23.6	4.16	4.10	52.8	51.9	18.4	18.1	0	0.0	7.2	7.2	6	6.0	0.4	0.40	17	17.0
			23.6		4.03		51.0		17.7		0		7.2		6		0.4		17	
W5	13:50	0.10	24.1	24.1	5.85	5.73	76.4	76.4	20.7	20.1	0	0.0	7.9	7.9	8	8.0	0.41	0.41	17	17.0
			24.1		5.6		76.3		19.4		0		7.9		8		0.41		17	
W6	13:40	0.20	24.4	24.4	5.19	5.13	65.9	65.5	24.1	23.9	0	0.0	6.8	6.8	8	8.0	0.4	0.40	17	17.0
			24.4		5.07		65.0		23.6		0		6.8		8		0.4		17	

Date	12-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	14:00	0.10	18.2	18.2	4.07	4.04	54.8	54.4	9.6	9.8	0	0.0	7.4	7.4	5	5.0	0.02	0.02	10	10.0
			18.2		4		53.9		10.0		0		7.4		5		0.02		10	
W2	13:50	0.10	18.6	18.6	4.66	4.63	60.7	60.3	13.3	13.2	0	0.0	6.8	7.1	5	5.0	0.02	0.02	<10	10.0
			18.6		4.59		60.0		13.0		0		7.3		5		0.02		<10	
W3	13:30	0.10	18.4	18.4	2.77	2.73	36.4	36.2	87.4	47.8	0	0.0	7.3	7.2	5	5.0	0.02	0.02	10	10.0
			18.4		2.69		35.9		8.2		0		7.1		5		0.02		10	
W4	13:25	0.10	19.0	19.0	1.97	1.93	26.3	26.1	11.1	10.9	0	0.0	7.6	7.4	4	4.0	0.02	0.02	<10	10.0
			19.0		1.88		25.8		10.7		0		7.2		4		0.02		<10	
W5	13:15	0.10	19.1	19.1	4.7	4.68	60.5	60.1	15.9	15.8	0	0.0	7.2	7.5	6	6.0	0.03	0.03	57	57.0
			19.1		4.65		59.7		15.7		0		7.7		6		0.03		57	
W6	13:00	0.20	19.4	19.4	4.89	4.84	66.5	65.7	16.7	16.7	0	0.0	7.6	7.6	5	5.0	0.02	0.02	26	26.0
			19.4		4.79		64.9		16.7		0		7.6		5		0.02		26	

Date	17-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	11:45	0.10	13.8	13.8	4.23	4.20	53.2	52.8	4.3	4.2	0	0.0	7.5	7.5	2	2.0	0.11	0.11	<10	10.0
			13.8		4.17		52.4		4.0		0		7.5		2		0.11		<10	
W2	11:35	0.10	14.0	14.0	5.03	4.99	58.6	58.0	3.7	3.6	0	0.0	6.9	6.9	<2	2.0	0.11	0.11	<10	10.0
			14.0		4.95		57.4		3.5		0		6.9		<2		0.11		<10	
W3	11:15	0.10	13.5	13.5	4.53	4.50	55.8	55.4	3.9	4.0	0	0.0	7.8	7.8	<2	2.0	0.11	0.11	<10	10.0
			13.5		4.46		55.0		4.0		0		7.8		<2		0.11		<10	
W4	11:00	0.10	14.1	14.1	3.42	3.38	53.8	53.4	4.5	4.4	0	0.0	7.8	7.8	2	2.0	0.11	0.11	<10	10.0
			14.1		3.34		52.9		4.3		0		7.8		2		0.11		<10	
W5	10:45	0.10	14.0	14.0	4.12	4.08	50.2	49.9	4.0	3.9	0	0.0	7.3	7.3	<2	2.0	0.11	0.11	<10	10.0
			14.0		4.04		49.5		3.8		0		7.3		<2		0.11		<10	
W6	10:35	0.10	13.9	13.9	3.67	3.66	55.2	54.8	16.9	16.6	0	0.0	7.6	7.6	<2	2.0	0.11	0.11	<10	10.0
			13.9		3.64		54.3		16.2		0		7.6		<2		0.11		<10	

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

Summary of Water Quality Monitoring Results - KT13

Date		19-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	15:20	0.10	13.1	13.1	3.32	3.26	35.9	35.1	7.5	7.4	0	0.0	7.4	7.4	<2	2.0	0.15	0.15	<10	10.0
			13.1		3.19		34.3		7.3		0		7.4		<2		0.15		<10	
W2	15:15	0.10	12.7	12.7	4.13	4.08	53.6	53.1	6.4	6.3	0	0.0	7.8	7.8	<2	2.0	0.16	0.16	<10	10.0
			12.7		4.02		52.5		6.1		0		7.8		<2		0.16		<10	
W3	14:55	0.10	12.4	12.4	4.49	4.46	58.2	57.5	5.5	5.3	0	0.0	7.7	7.7	2	2.0	0.15	0.15	14	14.0
			12.4		4.42		56.7		5.1		0		7.7		2		0.15		14	
W4	14:50	0.10	12.2	12.2	3.53	3.50	37.6	37.3	6.9	6.8	0	0.0	8.1	8.1	<2	2.0	0.16	0.16	<10	10.0
			12.2		3.46		37.0		6.7		0		8.1		<2		0.16		<10	
W5	14:40	0.10	12.6	12.6	4.76	4.72	60.3	59.7	9.7	9.6	0	0.0	7.8	7.8	<2	2.0	0.15	0.15	<10	10.0
			12.6		4.68		59.1		9.4		0		7.8		<2		0.15		<10	
W6	14:30	0.10	12.5	12.5	3.73	3.69	40.5	40.1	14.9	14.7	0	0.0	8.4	8.4	<2	2.0	0.15	0.15	<10	10.0
			12.5		3.64		39.7		14.4		0		8.4		<2		0.15		<10	

Date		22-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	15:00	0.10	18.1	18.1	4.87	4.84	58.4	58.0	5.6	5.5	0	0.0	7.3	7.3	<2	2.0	0.08	0.08	<10	10.0
			18.1		4.81		57.6		5.4		0		7.3		<2		0.08		<10	
W2	14:50	0.10	18.8	18.8	5.34	5.30	61.2	60.9	3.9	3.7	0	0.0	6.8	6.8	<2	2.0	0.06	0.06	<10	10.0
			18.8		5.26		60.5		3.5		0		6.8		<2		0.06		<10	
W3	14:35	0.10	18.2	18.2	3.98	3.93	50.2	49.9	5.9	5.7	0	0.0	7.2	7.2	3	3.0	0.12	0.12	<10	10.0
			18.2		3.87		49.5		5.5		0		7.2		3		0.12		<10	
W4	14:30	0.10	18.4	18.4	3.23	3.20	41.8	41.4	6.5	6.5	0	0.0	7.9	7.9	3	3.0	0.1	0.10	<10	10.0
			18.4		3.16		40.9		6.4		0		7.9		3		0.1		<10	
W5	14:15	0.10	19.0	19.0	4.58	4.56	56.2	55.8	13.2	13.1	0	0.0	6.9	6.9	2	2.0	0.16	0.16	<10	10.0
			19.0		4.54		55.4		12.9		0		6.9		2		0.16		<10	
W6	14:10	0.10	18.9	18.9	3.8	3.76	48.3	47.8	15.9	15.7	0	0.0	7.8	7.8	5	5.0	0.08	0.08	<10	10.0
			18.9		3.72		47.2		15.4		0		7.8		5		0.08		<10	

Date		24-Feb-10																			
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W1	15:35	0.10	21.0	21.0	5.01	4.99	63.2	62.9	3.7	3.6	0	0.0	6.9	6.9	6	6.0	<0.01	0.01	82	82.0
			21.0		4.96		62.5		3.5		0		6.9		6		<0.01		82	
W2	15:30	0.10	20.5	20.5	5.65	5.62	74.2	73.7	3.4	3.4	0	0.0	6.9	6.9	2	2.0	<0.01	0.01	<10	10.0
			20.5		5.59		73.1		3.3		0		6.9		2		<0.01		<10	
W3	15:15	0.10	20.9	20.9	4.11	4.07	52.4	51.8	6.9	6.8	0	0.0	7.2	7.2	5	5.0	<0.01	0.01	40	40.0
			20.9		4.02		51.2		6.6		0		7.2		5		<0.01		40	
W4	15:00	0.10	20.5	20.5	3.33	3.28	44.0	43.6	7.2	7.1	0	0.0	7.6	7.6	<2	2.0	<0.01	0.01	<10	10.0
			20.5		3.23		43.1		6.9		0		7.6		<2		<0.01		<10	
W5	14:40	0.10	21.0	21.0	4.78	4.73	61.7	61.1	16.7	16.5	0	0.0	6.6	6.6	2	2.0	<0.01	0.01	21	21.0
			21.0		4.68		60.5		16.3		0		6.6		2		<0.01		21	
W6	14:30	0.10	21.1	21.1	4.21	4.19	57.2	57.0	19.4	19.3	0	0.0	7.8	7.8	3	3.0	<0.01	0.01	<10	10.0
			21.0		4.16		56.7		19.2		0		7.8		3		<0.01		<10	

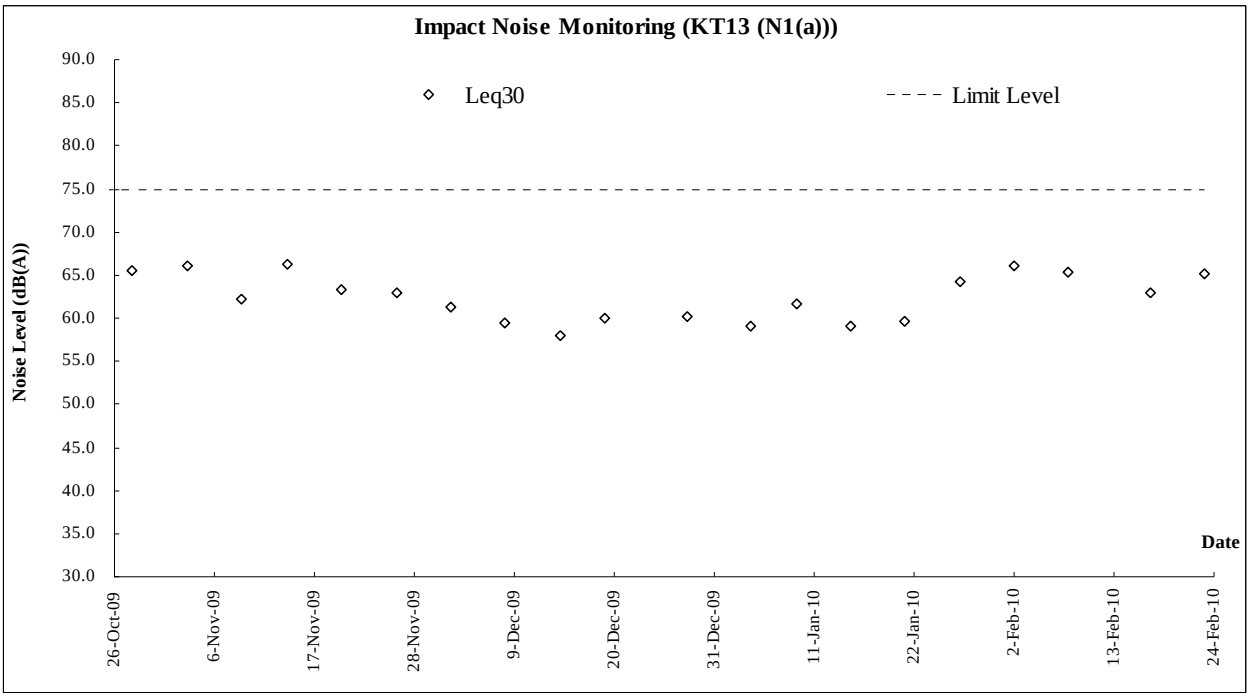
DSD CONTRACT NO. DC/2007/17

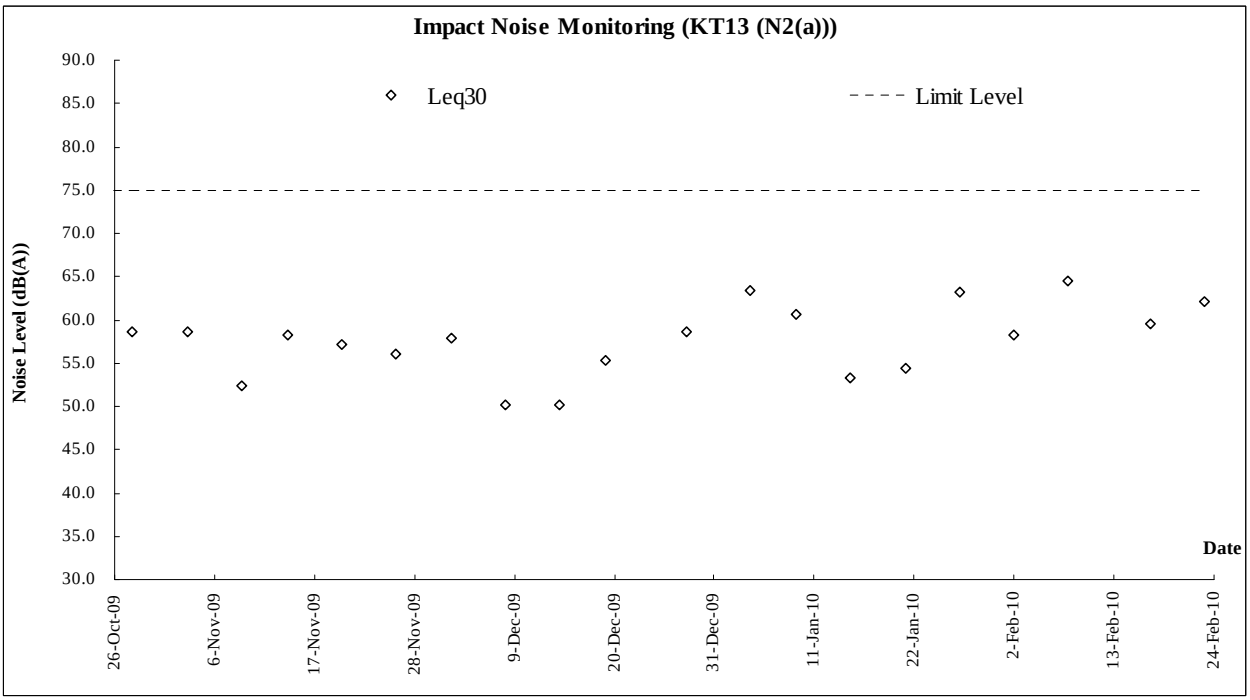
Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun

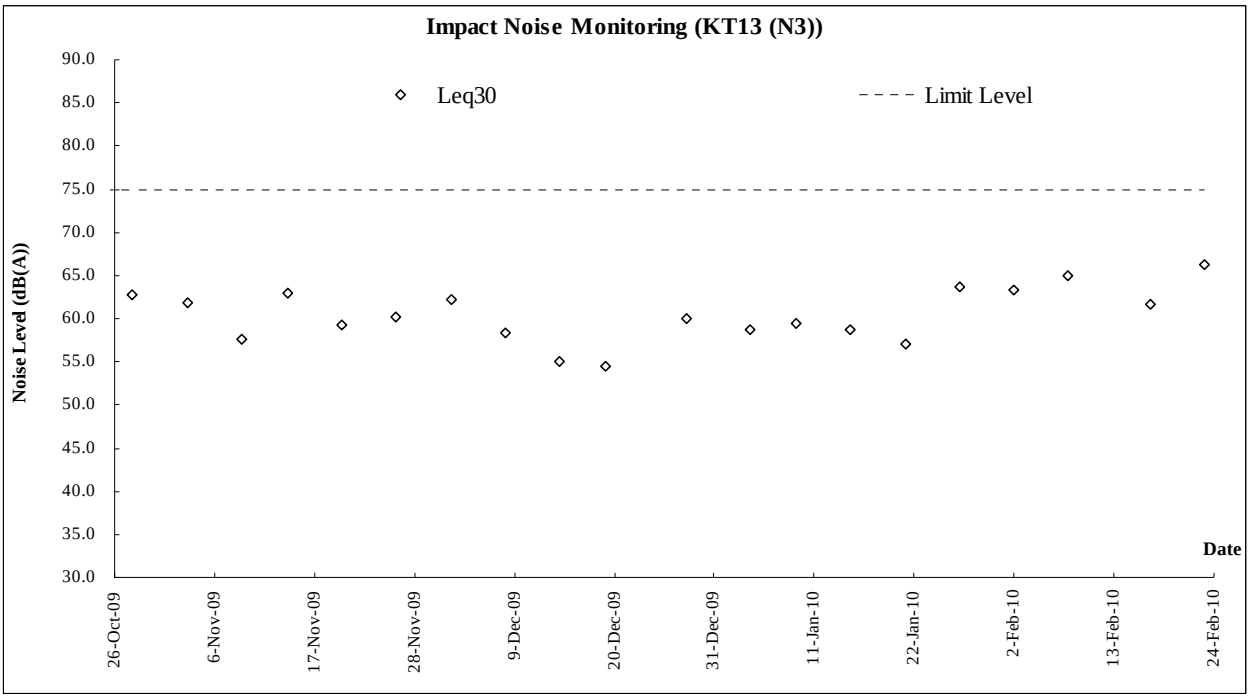
24-Hour TSP Monitoring Results

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)		INTIAL	FINAL	DIFF	INITIAL	FINAL	DUST COLLECTION			
KT13(A1(a))																					
Date of Calibration: 17-Dec-2009 Next Calibration Date: 17-Feb-2010 Cal Graph Slope = 41.7236 Intercept = -17.2460																					
Date of Calibration: 17-Feb-2010 Next Calibration Date: 17-Apr-2010 Cal Graph Slope = 41.1379 Intercept = -17.1386																					
26-Jan-10	21400	2077.29	2101.30	1440.60	36	38	37.0	15.9	1020.5	1.32	1898	NA	2.8738	2.8736	-0.0002	2.8112	2.8372	0.0260	14	144	260
1-Feb-10	21428	2101.30	2125.12	1429.20	36	38	37.0	21.6	1015.1	1.31	1867	NA	2.8735	2.8736	0.0001	2.8112	2.8450	0.0338	18	144	260
6-Feb-10	21441	2125.12	2148.87	1425.00	36	38	37.0	17.1	1017.7	1.31	1873	NA	2.8736	2.8730	-0.0006	2.8622	2.8943	0.0321	17	144	260
12-Feb-10	21491	2148.87	2172.67	1428.00	36	38	37.0	16.7	1020.0	1.32	1879	NA	2.8719	2.8723	0.0004	2.8620	2.9092	0.0472	25	144	260
18-Feb-10	21513	2172.67	2196.42	1425.00	36	38	37.0	9.1	1024.1	1.35	1918	NA	2.8726	2.8726	0.0000	2.8619	2.9234	0.0615	32	144	260
22-Feb-10	21551	2196.42	2220.24	1429.20	36	38	37.0	17.7	1015.6	1.33	1899	NA	2.8726	2.8722	-0.0004	2.8851	2.9855	0.1004	53	144	260
KT13(A2)																					
Date of Calibration: 17-Dec-009 Next Calibration Date: 17-Feb-2010 Cal Graph Slope = 43.4768 Intercept = -20.6094																					
Date of Calibration: 17-Feb-2010 Next Calibration Date: 17-Apr-2010 Cal Graph Slope = 41.2414 Intercept = -17.0253																					
26-Jan-10	21399	2101.22	2124.48	1395.60	36	38	37.0	15.9	1020.5	1.33	1862	NA	2.8738	2.8736	-0.0002	2.8391	2.8647	0.0256	14	141	260
1-Feb-10	21403	2124.48	2147.58	1386.00	36	38	37.0	21.6	1015.1	1.32	1835	NA	2.8735	2.8736	0.0001	2.8090	2.8617	0.0527	29	141	260
6-Feb-10	21443	2147.58	2170.83	1395.00	36	38	37.0	17.1	1017.7	1.33	1857	NA	2.8736	2.8730	-0.0006	2.8522	2.8883	0.0361	20	141	260
12-Feb-10	21490	2170.83	2194.10	1396.20	36	38	37.0	16.7	1020.0	1.33	1861	NA	2.8719	2.8723	0.0004	2.8445	2.8876	0.0431	23	141	260
18-Feb-10	21512	2194.10	2217.32	1393.20	36	38	37.0	9.1	1024.1	1.34	1867	NA	2.8726	2.8726	0.0000	2.8397	2.8893	0.0496	27	141	260
22-Feb-10	21521	2217.32	2240.45	1387.80	36	38	37.0	17.7	1015.6	1.32	1835	NA	2.8726	2.8722	-0.0004	2.8649	2.9467	0.0818	45	141	260

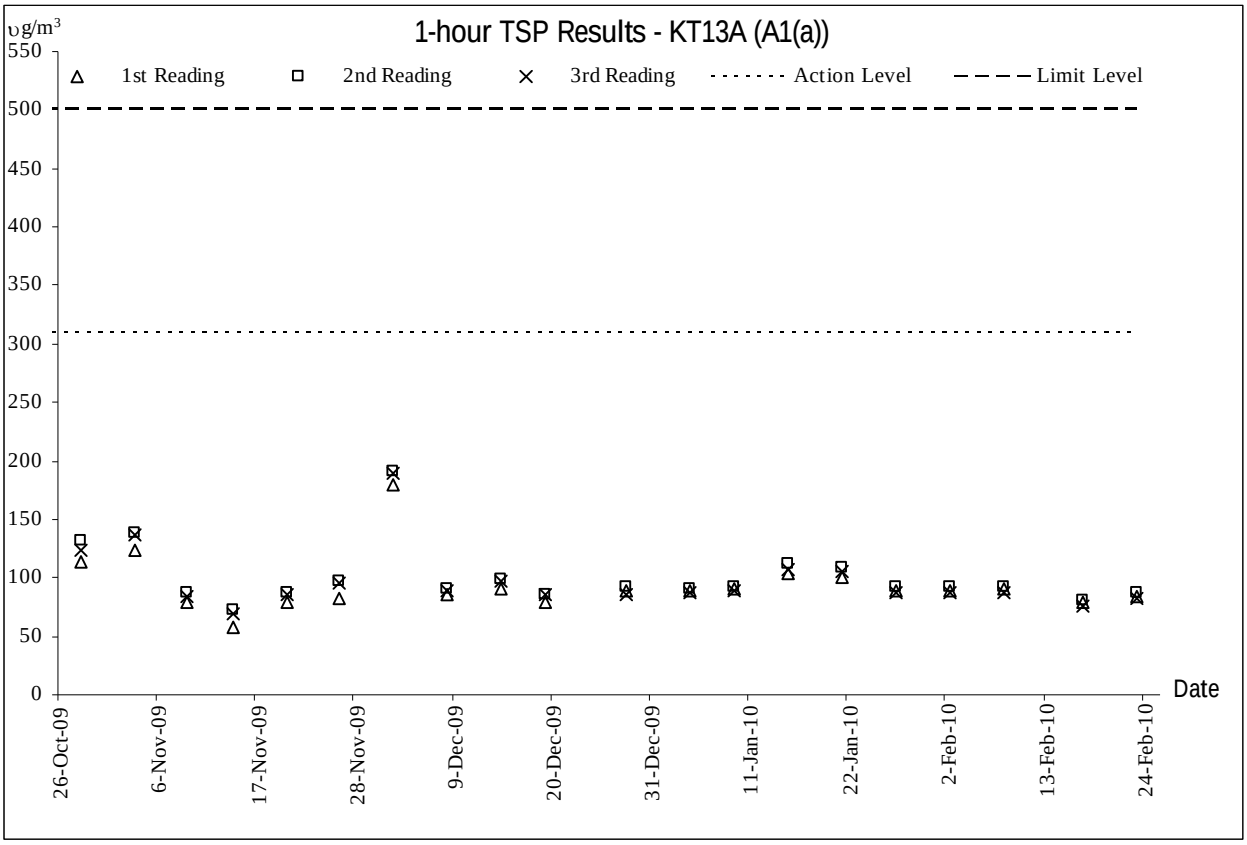
Graphic Plot of Monitoring - Construction Noise

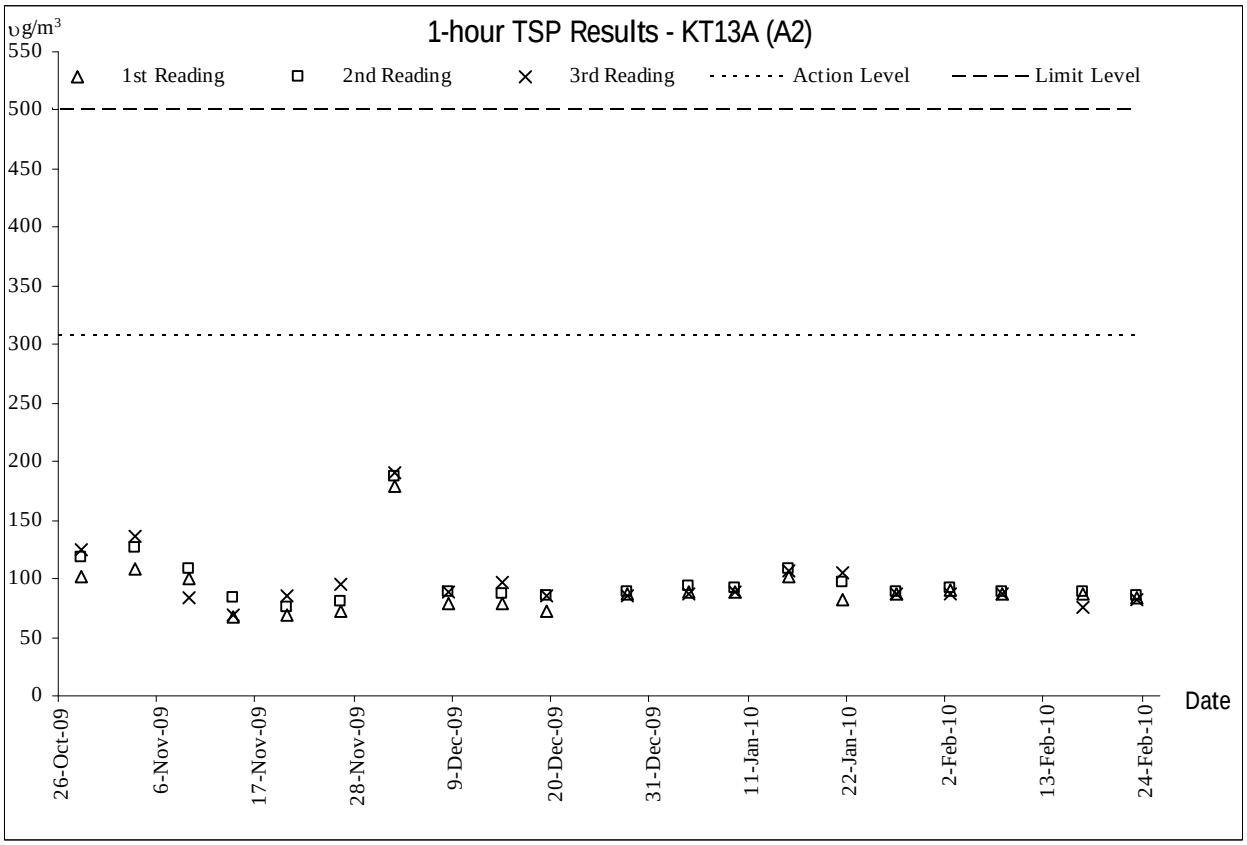


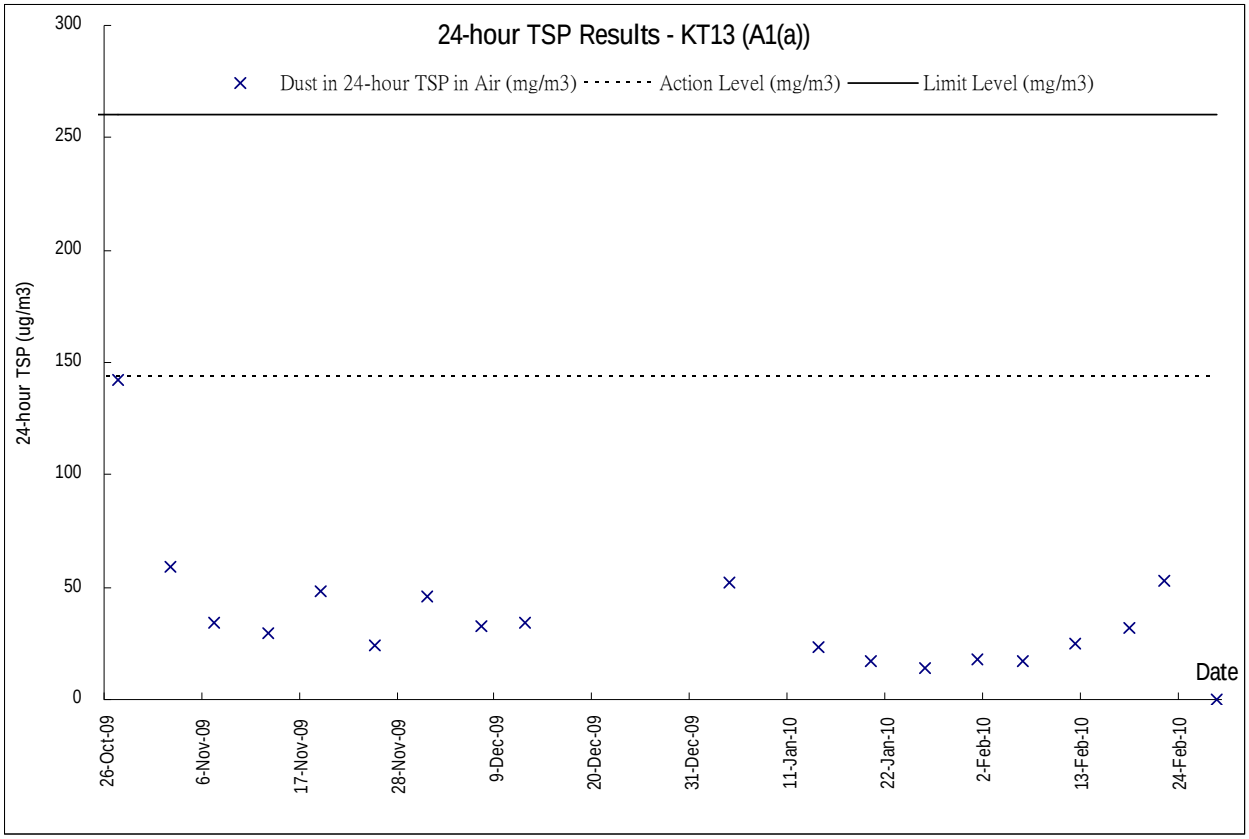



Impact Noise Monitoring (KT13 (N3))
Leq30
Limit Level
Noise Level (dB(A))
Date
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
26-Oct-09
6-Nov-09
17-Nov-09
28-Nov-09
9-Dec-09
20-Dec-09
31-Dec-09
11-Jan-10
22-Jan-10
2-Feb-10
13-Feb-10
24-Feb-10

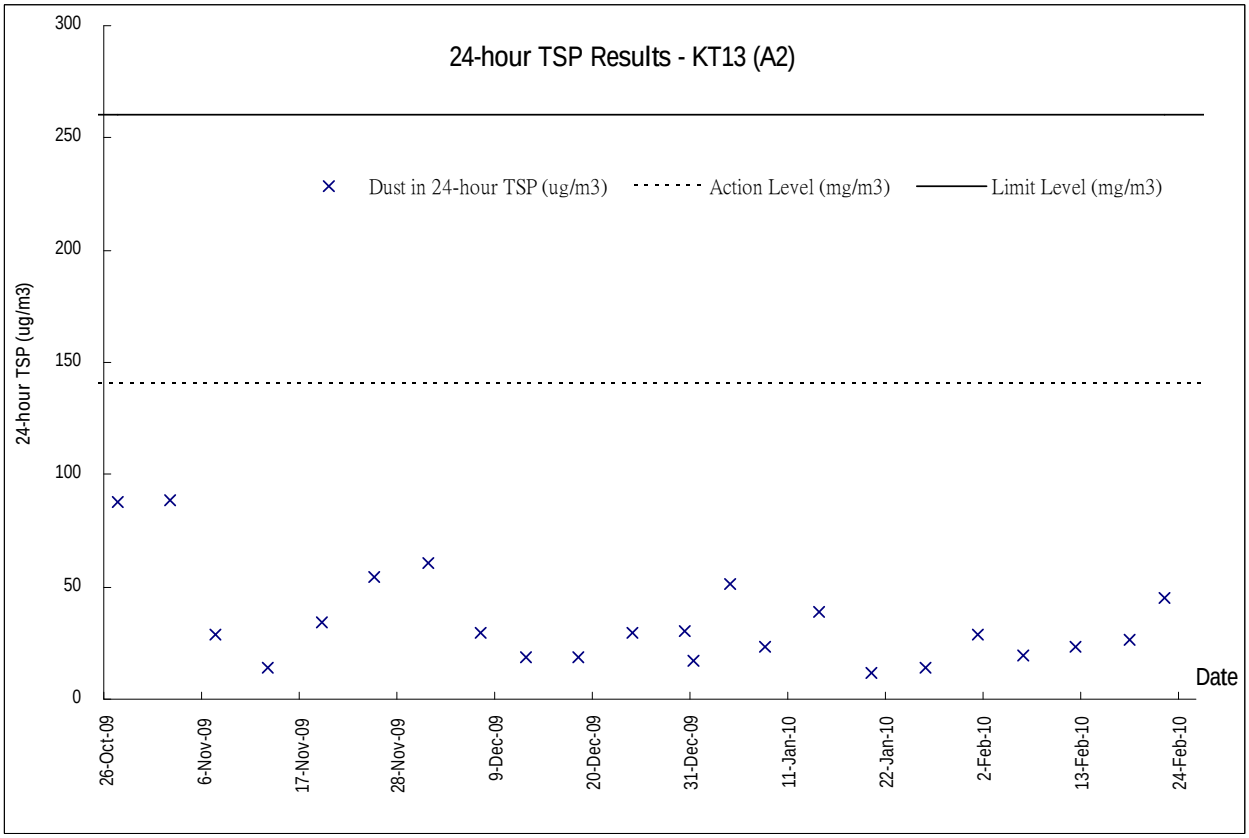
Graphic Plot of Monitoring – Air Quality



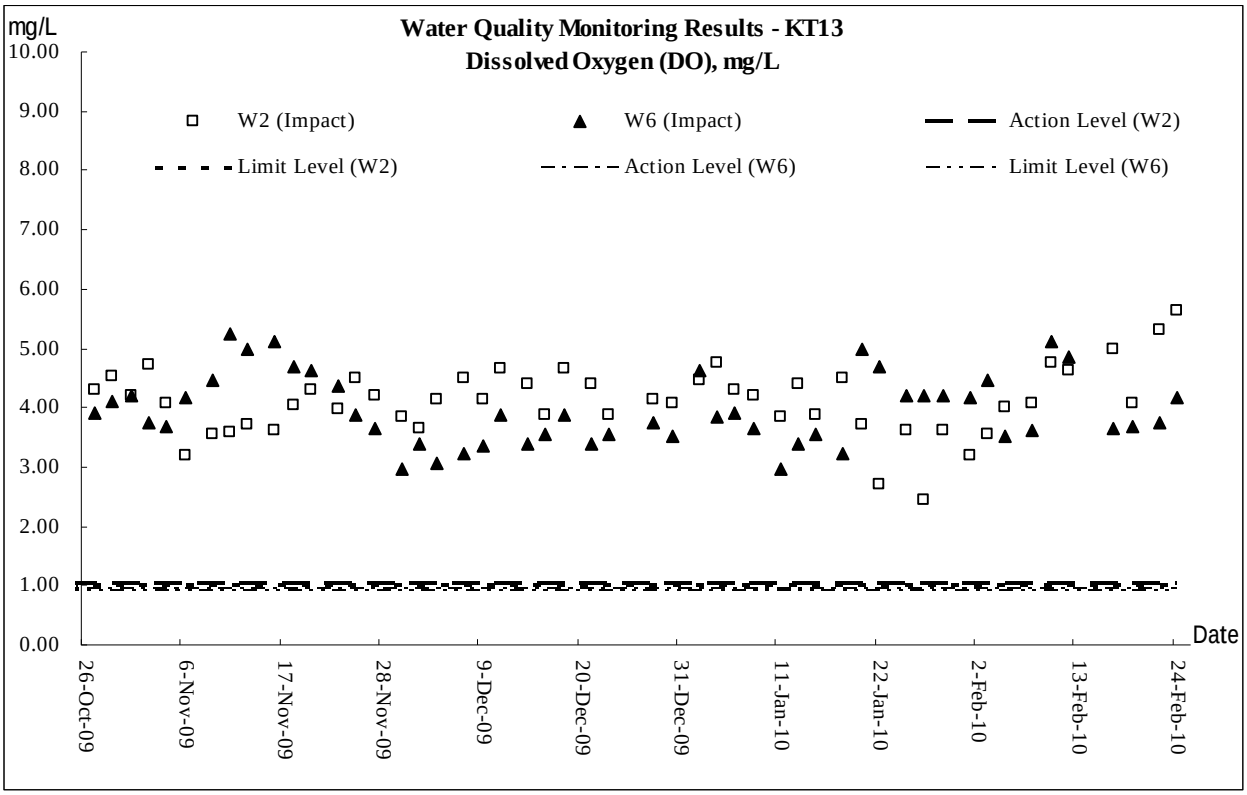


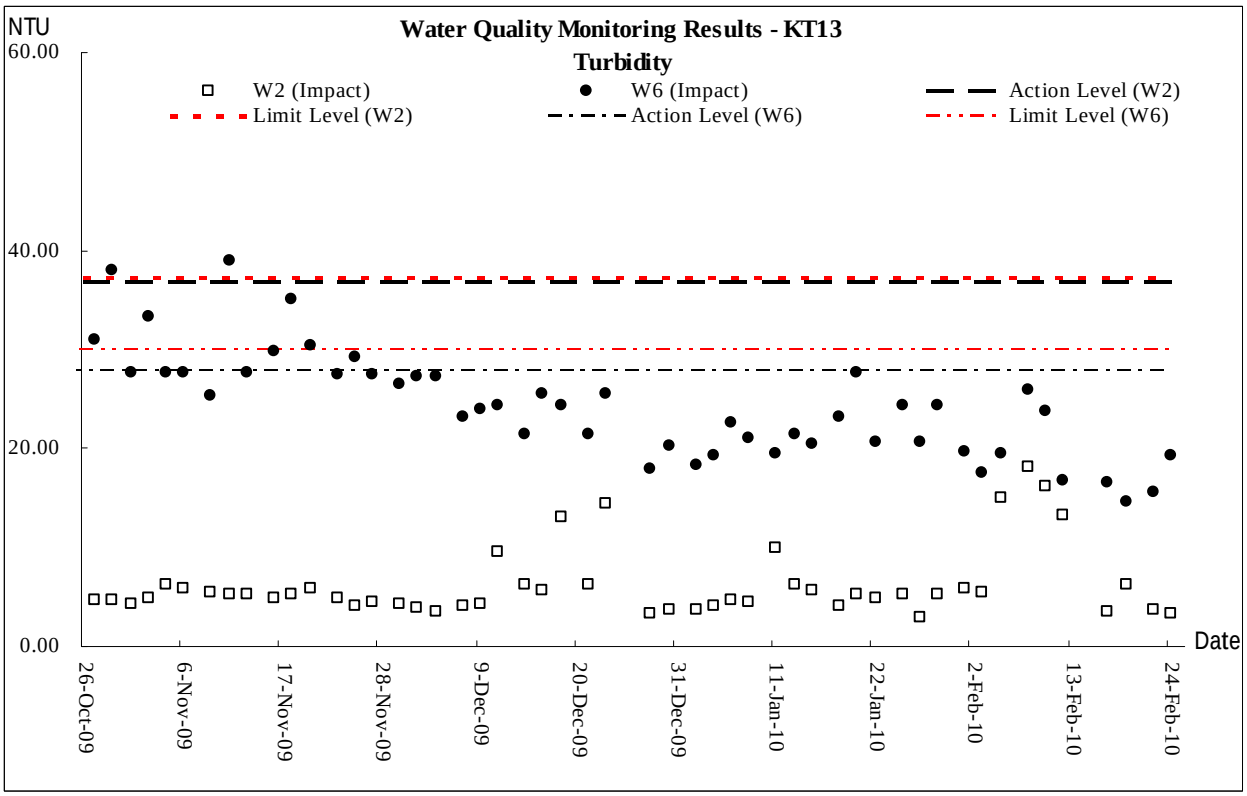


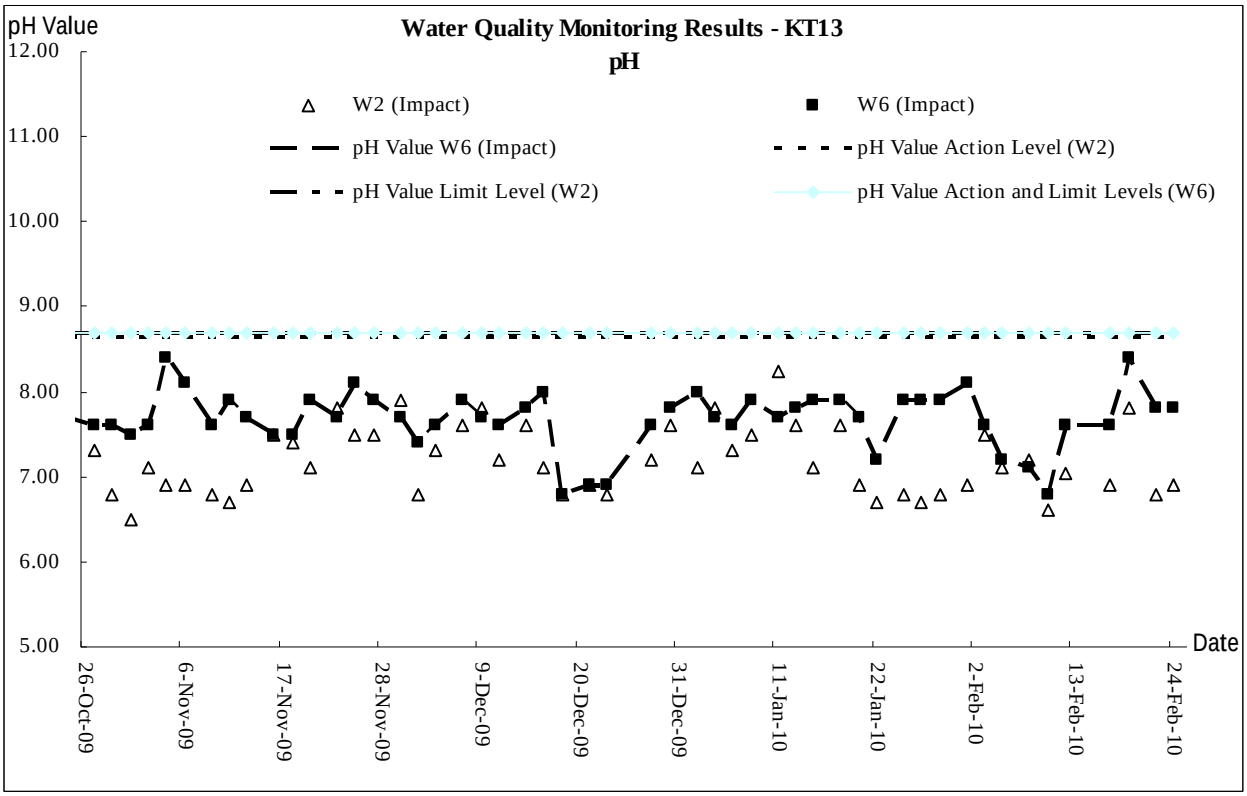
*Power failure occurred at KT13-A1(a) on 18, 24, 30 December 2009 and 8 January 2010.

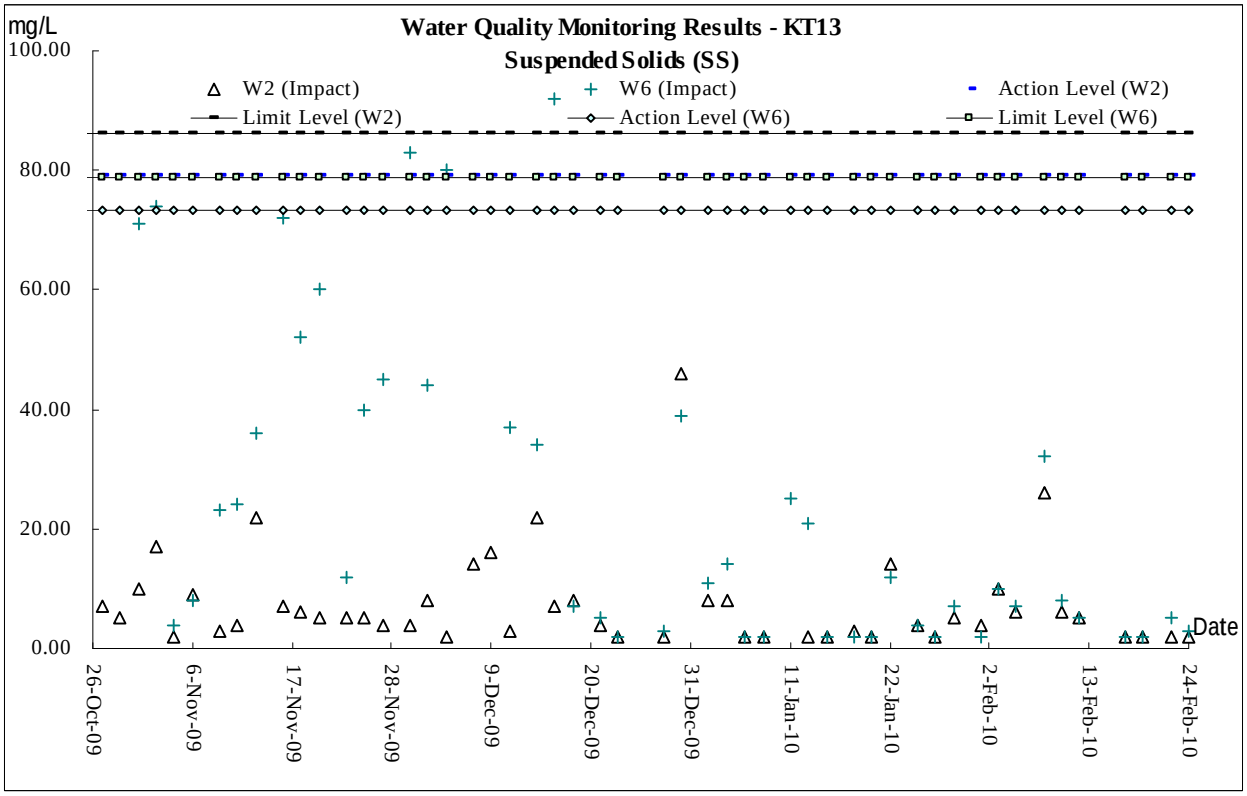


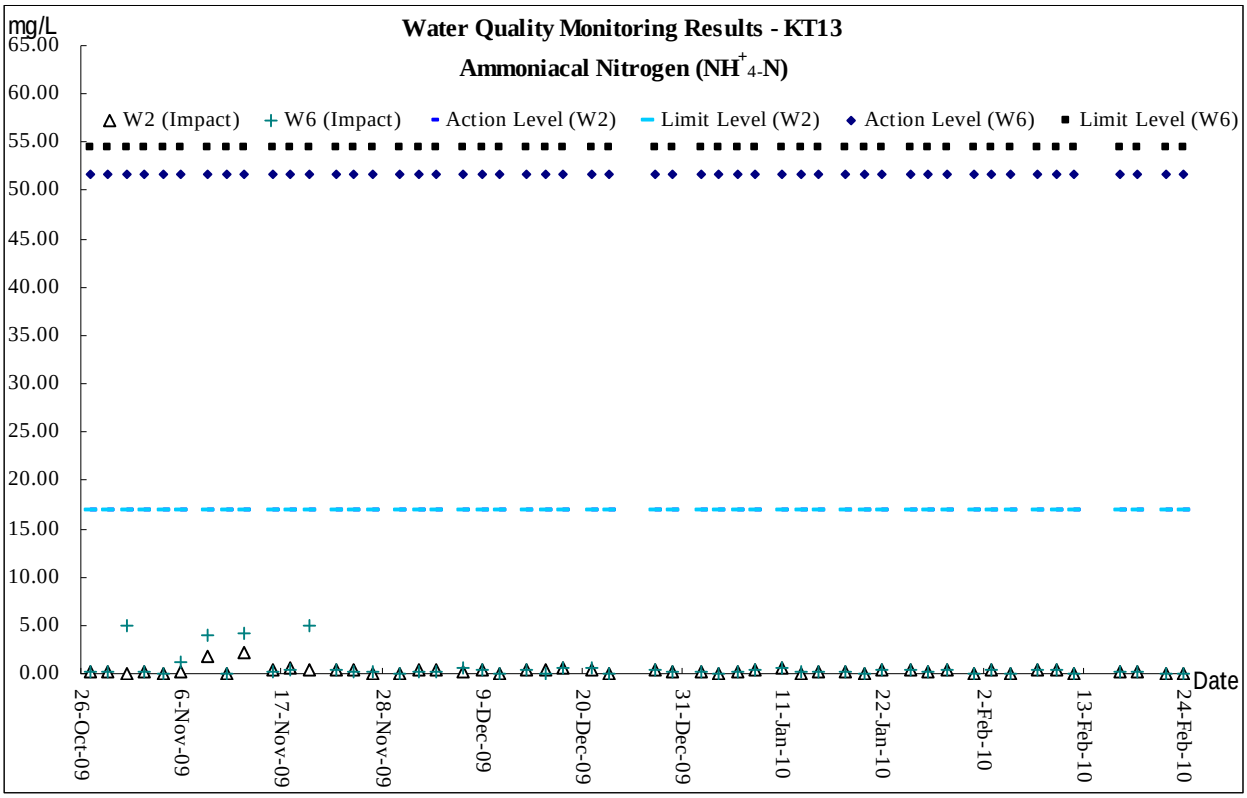
Graphic Plot of Monitoring –Water Quality

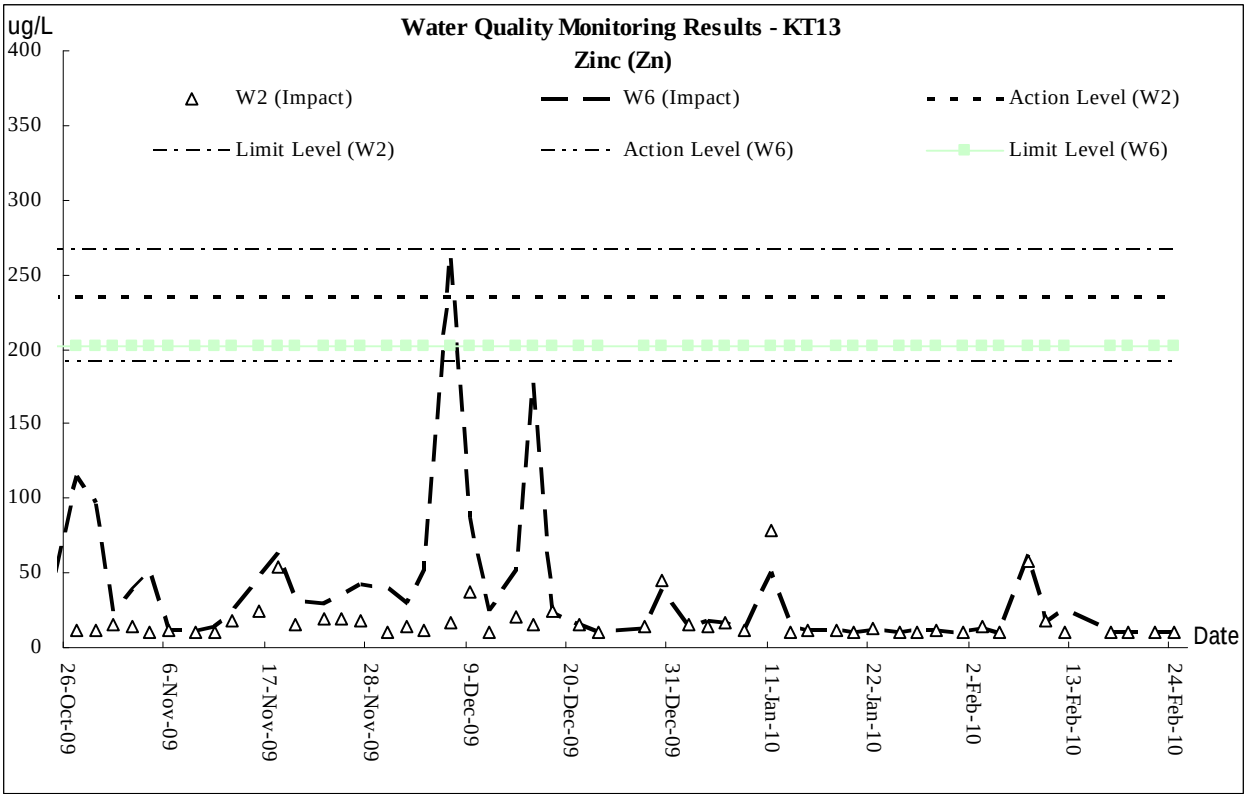





Water Quality Monitoring Results - KT13
pH
pH Value
W2 (Impact)
W6 (Impact)
pH Value W6 (Impact)
pH Value Action Level (W2)
pH Value Limit Level (W2)
pH Value Action and Limit Levels (W6)
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
Date
26-Oct-09
6-Nov-09
17-Nov-09
28-Nov-09
9-Dec-09
20-Dec-09
31-Dec-09
11-Jan-10
22-Jan-10
2-Feb-10
13-Feb-10
24-Feb-10


Water Quality Monitoring Results - KT13
Suspended Solids (SS)
mg/L
W2 (Impact)
W6 (Impact)
Action Level (W2)
Limit Level (W2)
Action Level (W6)
Limit Level (W6)
100.00
80.00
60.00
40.00
20.00
0.00
Date
26-Oct-09
6-Nov-09
17-Nov-09
28-Nov-09
9-Dec-09
20-Dec-09
31-Dec-09
11-Jan-10
22-Jan-10
2-Feb-10
13-Feb-10
24-Feb-10


Water Quality Monitoring Results - KT13
Ammoniacal Nitrogen (NH^+_4-N)
mg/L
W2 (Impact)
W6 (Impact)
Action Level (W2)
Limit Level (W2)
Action Level (W6)
Limit Level (W6)
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Date
26-Oct-09
6-Nov-09
17-Nov-09
28-Nov-09
9-Dec-09
20-Dec-09
31-Dec-09
11-Jan-10
22-Jan-10
2-Feb-10
13-Feb-10
24-Feb-10


Water Quality Monitoring Results - KT13
Zinc (Zn)
ug/L
W2 (Impact)
W6 (Impact)
Action Level (W2)
Limit Level (W2)
Action Level (W6)
Limit Level (W6)
400
350
300
250
200
150
100
50
0
Date
26-Oct-09
6-Nov-09
17-Nov-09
28-Nov-09
9-Dec-09
20-Dec-09
31-Dec-09
11-Jan-10
22-Jan-10
2-Feb-10
13-Feb-10
24-Feb-10

Appendix H

Photographic Records of

Ecological Monitoring of Vegetation

(Not Used)

Appendix I

Condition Survey of the Grave during Construction Phase

REPORT

China Road and Bridge Corporation

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: *Condition Survey During Construction Phase*

January 2010

Environmental Resources Management
21/F Lincoln House
979 King's Road
Taikoo Place
Island East, Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
http://www.erm.com

REPORT

China Road and Bridge Corporation

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: *Condition Survey During Construction Phase*

January 2010

For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Frank Wan
Signed:	
Position:	Partner
Date:	28 January 2010

Reference 0082040

CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

The China Road and Bridge Corporation (the Contractor) has been commissioned by the Drainage Services Department (DSD) of the Hong Kong Special Administrative Region (HKSAR) Government to carry out *Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseung Tau Chung Tsuen in Tuen Mun* under *Contract No. DC/2007/17* (the Contract).

According to the findings of the *Environmental Impact Assessment (EIA)* and *Section 7* of the *Environmental Monitoring and Audit (EM&A) Manual* of the captioned Project, a condition survey is required for a historical grave (KT13-02-02) near Ma On Kong before and during construction phase of the proposed bypass culvert under KT13 project, as the project is located close (approximately 39m) to the grave (see *Figure 1.1*).

ERM-Hong Kong Limited has been commissioned by the Contractor to undertake the condition survey before and during construction phase of the Project.

Prior to the condition survey, a method statement for the work has been established and approved by the Antiquities and Monuments Office (AMO) of the Leisure and Cultural Services Department (LCSD) in accordance with *Section 7.3.1* of the *EM&A Manual* for the project.

This report presents the results of the condition survey during construction phase of the project conducted on 9 January 2010.

1.2 STRUCTURE OF THE REPORT

Following this introductory section, the remainder of this report comprises the following sections:

Section 2	describes the methodology for the condition survey;
Section 3	presents the condition survey findings; and
Section 4	presents conclusions and further actions.

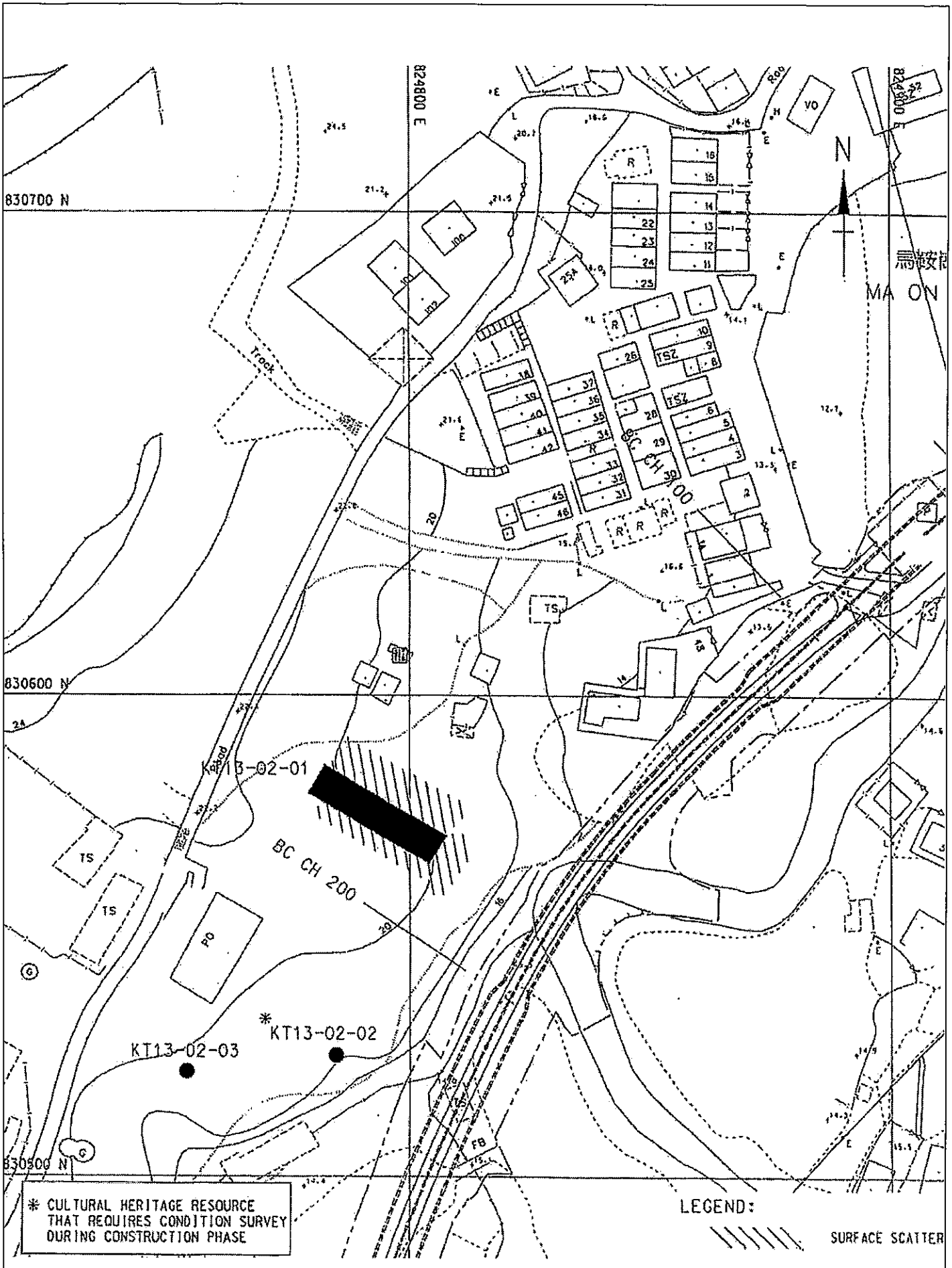


Figure 1.1

Location of the Historic Grave (KT13-02-02) at Ma On Kong

FILE: 0082040b
DATE: 27/06/2008

Environmental Resources Management

ERM

This page is deliberately left blank

As the proposed bypass culvert under KT13 project is located close to a historical grave (KT13-02-02), in order to preserve the integrity of the grave's structure, a condition survey before and during the construction phase of the KT13 project is required. The condition survey is divided into two stages, comprising Stage 1: pre-construction condition survey and Stage 2: condition surveys during construction phase. A pre-construction condition survey was undertaken in June 2008 and the survey report has been submitted to the Antiquities and Monuments Office (AMO) for review in July 2008. As the survey has been undertaken for more than a year, the Contractor has instructed ERM to carry out a condition survey on 31 August 2009 to update the condition of the grave. The findings obtained from that survey are regarded as the baseline information for reference for Stage 2: condition surveys during construction phase.

Construction work within 100m from the grave was commenced on 21 October 2009. This report, which presents the key findings of the condition survey conducted on 9 January 2010, is the second condition survey undertaken during the construction phase.

2.1.1 Stage 2: Condition Survey During Construction Phase

The purpose of the Stage 2 condition survey during construction phase was to record the existing condition of the historical grave (KT13-02-02) after construction work of the proposed bypass culvert under KT13 project had started within 100m from the grave and comprised the following tasks:

1. Identification of the historical grave (KT13-02-02) near Ma On Kong;
2. Visual inspection was adopted for the condition survey;
3. Recording of the existing condition and evaluation of structural integrity of the historical grave;
4. Measurement of ground level and exact location of the historical grave by a qualified land surveyor;
5. The condition survey was undertaken by a qualified archaeologist, a cultural heritage specialist, assisted by a surveyor and a structural engineer provided by the Contractor; and
6. Submission of all records (including photographs, ground level measurements, grave locations, all detected cracks, defects and damage, if any) to the AMO of the LCSD in this report. It will form part of the EM&A Manual findings. The next condition survey to be conducted during construction stage was recommended in *Section 4.2* of this report.

This page is deliberately left blank

3 CONDITION SURVEY FINDINGS

The condition survey was conducted on 9 January 2010 and the findings are presented below.

3.1 HISTORICAL GRAVE (KT13-02-02)

The historical grave KT13-02-02 was identified during the EIA stage of the project. It is dated to Qing Dynasty and located south of Ma On Kong village (see *Figure 1.1*) in Kam Tin facing south/southeast. The grave is constructed with Chinese bluish bricks and masonry and rendered with cement.

3.2 EXISTING CONDITION

At the time of the monitoring on 9 January 2010, the grave was generally in good condition with little weeding problem. *Figure 3.2a* shows the general view of the grave at the time of the site visit.

Figure 3.2a Front View

A total of 26 cracks (two of which were believed to happen just recently) were identified on the cement rendering, mortar of bricks and headstone of the grave. Their locations are shown in *Figure 3.3.* Crack width ranged from hairline to 5.5mm. *Table 3.1* details the cracks identified on the grave photographically and compares the cracks identified during last condition survey and those in this survey.

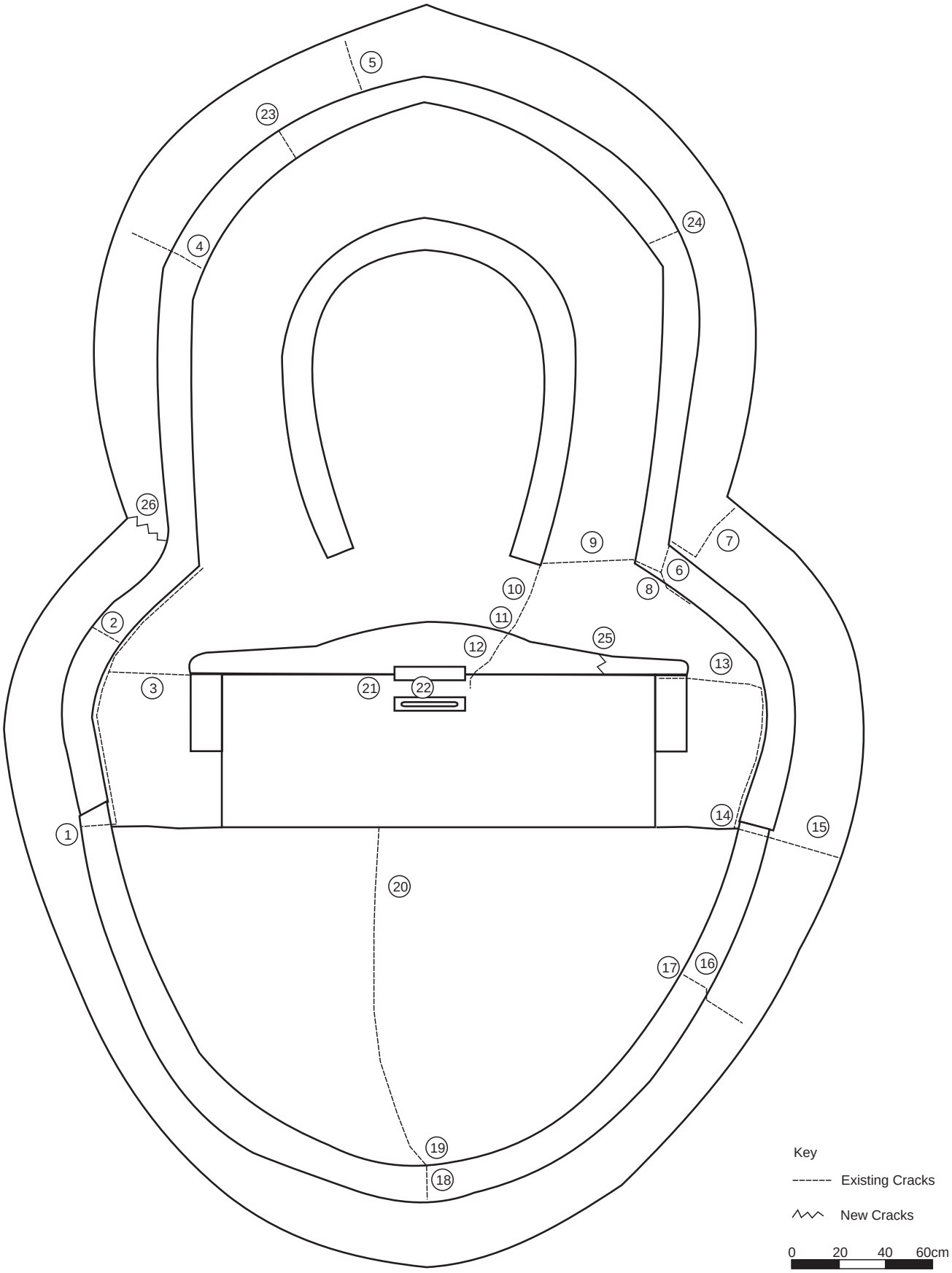


Figure 3.3

Plan of the Historic Grave Showing Existing Cracks
(as at 9 January 2010)

FILE: 0082040c
DATE: 25/01/2010

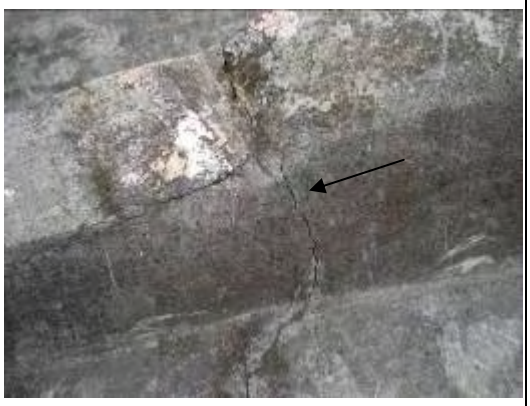
Environmental
Resources
Management

ERM

Table 3.1 Comparison of Cracks on the Historic Grave Identified on the Two Condition Surveys

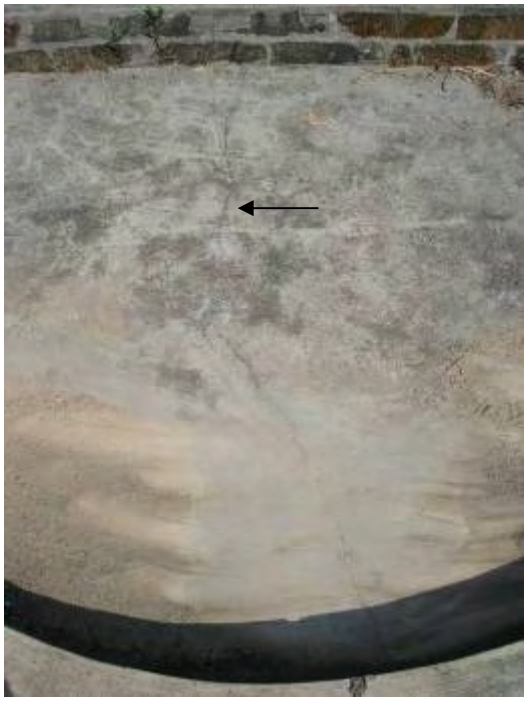
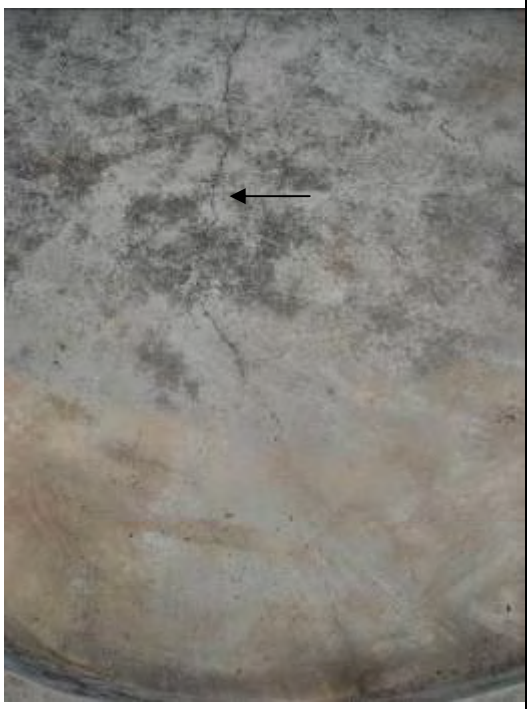
Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
1	1		
2	2		
3	1.5		
4	Previous Width: 0.5 New Width: 1		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
5	5.5		
6	1.6		
7	1.6		
8	Previous Width: 1.2 New Width: 1.5		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
9	Hair-line		
10	0.2		
11	1.5		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
12	1.6		
13	2.9		
14	1.3		
15	2		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
16	1.7		
17	1.6		
18	2		
19	0.1		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
20	0.1		
21	0.5		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
22	Hair-line		
23	Hair-line		
24	Hair-line		

Crack No.	Crack Width (mm)	Photographic Record	
		Condition Survey Undertaken in October 2009	Condition Survey Undertaken in January 2010
New Cracks Identified During the Condition Survey Conducted on 9 January 2010			
25	Hair-line		
26	1		

During this survey, two new cracks (i.e. Crack Nos. 25 and 26) were identified and two existing cracks were observed to have been widened (e.g. Crack Nos. 4 and 8). However, the remaining cracks are micro-hairline cracks which were tiny surface rendering cracks that they could only be seen in close distance and would not induce structural damage to the grave. In view of the surrounding dense vegetation and the grave being exposed, existing cracks are likely to be intensified by weathering (such as raining, intermittent heating and cooling) or root encroachment of overgrown vegetation. Furthermore, it was reported that a platform was being built by an unknown third party at north of the grave without prior notice on 4 and 5 November

2009. Such site clearance and construction activities were in close proximity to the grave (approximately 3m) and excavator was used (*Figure 3.2b)*. Moreover, it was observed that vehicles were parked on the newly built platform at the time of monitoring on 9 January 2010 (*Figure 3.2c*). As such, the additional cracks being found in this survey (i.e. Crack Nos. 25 and 26) are believed to be triggered by these recent human activities. *Figures 3.2d* and *3.2e* show the views of the platform used as car park.

Figure 3.2b A platform was being constructed adjacent to the grave with an excavator moving around it (photo taken on 4 Nov 2009).

Figure 3.2c The grave is situated very near the newly built platform (photo taken on 9 January 2010)

Figure 3.2d Front view of the platform used as a temporary car park adjacent to the road near the grave (photo taken on 9 Jan 2010).

Figure 3.2e Rear view of the platform used as a temporary car park above the grave (photo taken on 9 Jan 2010).

Apart from the cracks on cement rendering mentioned above, the cracks on the cement mortar of bricks of the grave have also been observed. It is also noted that some cement mortar of the grave bricks had recently been moulded probably by the descendants. *Figure 3.2f* shows the general conditions of the cement mortar of bricks and *Figure 3.2g* shows the comparison of original and new cement mortar.

Figure 3.2f Condition of cement mortar of grave bricks at the right hand side of the headstone. Cement mortar and bricks are covered with overgrown vegetation (photo taken on 9 January 2010).

Figure 3.2g Comparison of original and new cement mortar of grave bricks (photo taken on 9 January 2010)

No major signs of settlement of the foundations or structural cracks were identified. In order to establish the baseline condition of the grave for monitoring of potential ground settlement, five settlement markers (13GS01 to 13GS05) were established (without damaging the physical grave) to record the

coordinates and elevations of the grave (see *Figure 3.4*). The recorded points are presented in the *Table 3.2*.

Table 3.2 Record of Five Settlement Marker Points of the Historic Grave on 9 January 2010

Point	Northing	Easting	Elevation (mPD) Initial Reading (Taken on 31 August 2009)	Elevation (mPD) Updated Reading (Taken on 9 January 2010)	Difference (mm)
13GS01	830520.25	824754.57	19.222	19.222	0
13GS02	830521.54	824754.32	19.985	19.985	0
13GS03	830523.21	824754.54	20.644	20.643	-1
13GS04	830521.79	824755.67	19.943	19.944	1
13GS05	830520.61	824756.12	19.211	19.210	-1

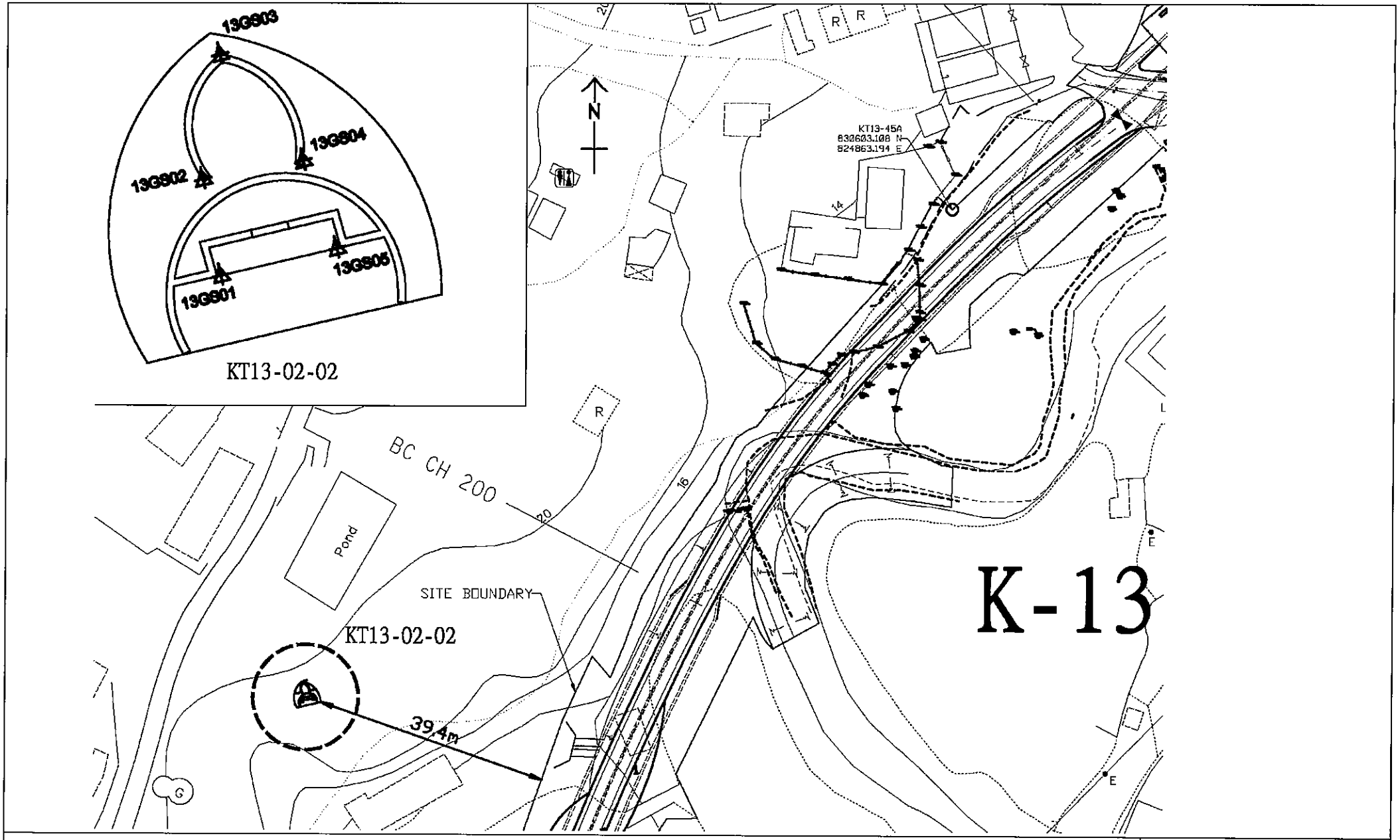


Figure 3.4

Location of Settlement Marker Points

FILE: 0082040d
DATE: 27/06/2008

Environmental Resources Management

ERM

4 CONCLUSION & FURTHER ACTIONS

4.1 CONCLUSIONS

Since construction work of the proposed bypass culvert under KT13 project within 100m from the grave commenced on 21 October 2009, the second condition survey during construction phase was conducted for a historical grave (KT13-02-02) near Ma On Kong on 9 January 2010 by a qualified archaeologist, a cultural heritage specialist, a surveyor and a structural engineer.

Comparing with the baseline information obtained on 31 August 2009, the grave was generally considered in good condition in spite of the unexpected site clearance and construction activities undertaken adjacent to the grave in early November 2009. A total of 26 slight cracks ranging from hairline to 5.5 mm in width (including two new cracks with the width ranged from hairline to 1mm) were identified in the current condition survey. There were no major signs of structural cracks. The cracks on the surface rendering are likely to be caused/intensified by the following reasons:

(a) site clearance and construction activities conducted in early November 2009 by a third party;

(b) pressure induced by the vehicles parked on the platform;

(c) natural weathering (such as raining, intermittent heating and cooling); and

(d) root encroachment of overgrown vegetation.

Five settlement marker points have been established on the grave and the coordinates and elevations of the points were recorded. The settlement monitoring results taken on 9 January 2010 were compared with the baseline readings taken on 31 August 2009 to determine if there is any significant tilting or settlement of the grave. No settlement or tilting larger than ±2mm has been detected since last condition survey on 31 October 2009.

4.2 FURTHER ACTION - NEXT CONDITION SURVEY DURING CONSTRUCTION PHASE

According to *Clause 1* of *Section 1.2.2* of *Method Statement of Condition Survey for the Historical Grave (KT13-02-02) at Ma On Kong*, when damage or structural instability on the grave is first detected the monitoring frequency is required to be increased to bi-weekly. As presented above, the two additional slight cracks identified during this reporting period were potentially triggered by the construction of the nearby asphalt platform and its operation as a car park, instead of the construction work of the proposed bypass box culvert under

KT13 project[1]. Furthermore, settlement markers measurements also indicated that there is no settlement or tilting larger than ±2mm occurred since last condition survey conducted on 31 October 2009. Given the above, it was envisaged that the damage identified was not likely to be related to construction activities under the Project. No remedial measures are required to be implemented.

Monitoring frequency is increased due to damage of the grave and additional monitoring will be conducted in accordance with the approved Method Statement as well as EM&A Manual to confirm the abovementioned justifications. Measurement of the two additional new cracks identified as well as existing cracks, i.e. a total of 26 cracks, shall be included in the subsequent condition surveys. When damage to or structural instability of the grave is again detected, the requirement under the approved Method Statement and action required in Event and Action Plan under the EM&A Manual will be followed.

The monitoring frequency of the five settlement markers (13GS01 to 13GS05) has been increased from bi-weekly to weekly since tilting/settlement of ±2mm of ground surface level of the grave was detected in the last survey conducted on 31 October 2009 (comparing with the baseline monitoring findings on 31 August 2009). As the settlement measured in this reporting period is less than ±2mm, the settlement monitoring frequency could be reverted back to bi-weekly. If a tilting or settlement of ± 5 mm of ground surface level of the grave is identified, the action and limit levels and action plan as stated in *Sections 7.5* and *7.6* of the *EM&A* will be adopted (see *Tables 4.1* and *4.2*). The construction works should cease immediately and the AMO should be informed. Remedial action should be designed and implemented by the Contractor in consultation with the AMO of LCSD following the action plan as stated in *Section 7.6* of the *EM&A Manual* of the project (see *Table 4.2*).

Table 4.1 Action and Limit Levels for the Historical Grave

Action	Limit
When damage or structure instability is first detected.	Signs of deterioration and structural instability continue on subsequent visits after action level is triggered.

[1] Construction work within 100m buffer zone of the grave during this reporting period were conducted by open cut method which work procedures included channel excavation, formwork erection, rebar fixing, concreting and backfilling works without any piling works.

Table 4.2 Event and Action Plan for the Historical Grave

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	Notify IEC and Contractor to carry out investigation. Report reasons of structural damage or instability to the IEC and Contractor. Discuss with the Contractor and formulate remedial measures. Increase monitoring frequency to once per week to check mitigation effectiveness.	Review report of structural damage or instability by the ET. Review proposed remedial measures by the Contractor and advise the ER and Antiquities and Monuments Office (AMO) accordingly. Supervise the implementation remedial measures, with approval from AMO.	Confirm receipt of notification failure in writing. Notify Contractor. Require Contactor to propose remedial measures and to notify and seek approval from AMO. Ensure remedial measures are properly implemented.	Notify AMO concerning the damage or structural instability of the historical grave. Submit proposal for repair of damage to the historical grave to AMO for approval and to implement approved measures.

Event	Action			
	ET Leader	IEC	ER	Contractor
Limit Level	Notify IEC and Contractor to carry out investigation and to stop construction work within 100m of cultural heritage resource to avoid further impact until AMO are satisfied that the relevant structure has been repaired or stabilized to an acceptable level. Report reasons of continued structural damage or instability to the IEC and Contractor Discuss with the Contractor and formulate remedial measures Increase monitoring frequency to daily to check mitigation effectiveness	Review report of structural damage or instability by the ET. Review proposed remedial measures by the Contractor and advise the ER and Antiquities and Monuments Office (AMO) accordingly. Supervise the implementation of remedial measures, with approval from AMO.	Confirm receipt of notification of failure in writing Notify Contractor Require Contractor to propose remedial measures and to notify and seek approval from AMO. Ensure remedial measures are properly implemented.	To carry out investigation and to stop construction work within 100m of cultural heritage resource to avoid further impact until AMO are satisfied that the relevant structure has been repaired or stabilized to an acceptable level. Propose remedial measures for the repair and stabilization of cultural heritage resources, up to liaison of moving and rebuilding the relevant structure with the approval of owner (usually the clan members) and AMO.

Once the construction within 100m area from the grave is completed, a final condition survey should be reported.

Appendix J

Physical, Human and Cultural Landscape Resources at KT13

Current Situation of Physical, Human and Cultural Landscape Resources at KT13, inspected on 9 and 23 February 2010

The physical resources that will be affected during the Construction Phase and Operational Phase, together with their sensitivity to change, are described below. The locations of the baseline landscape resources are mapped in Drawing no. LR-001. The Landscape Resources in direct conflict with the Project are mapped together with their extent outside study boundary for integrity of information. Photo views illustrating the landscape resources of the study area are illustrated in Drawing Nos. PR-001 to 002 inclusive. For ease of reference and co-ordination between text, tables and figures each landscape resources is given an identity number.

Table compares the baseline study and the current situation for KT13: (Landscape Resources)

Section in EIA Report	Identify number – Landscape Resources	Photo No	Baseline Study, Environmental Impact Assessment Final Report [382047/E/EIA/Issue 9]	Current Situation
Drainage				
10.7.3	LR1 – River/ Stream	A1 - A5	There is a semi-natural drainage features (the Ma On Kong Channel) in the study area with untrained natural upstream and partial trained downstream with a total length of 800m. The Channel originates from the South-West of the valley and discharge to the existing Primary Channel by Kam Ho Road running through and along the site area spanning across majority of the river valley, together with the existing vegetations forming the central part of riparian landscape network. They have medium landscape value and sensitive to change.	Minor change due to construction work within the site boundary.
Fish Pond				
10.7.4	LR2.1 (Fish Pond) within site boundary LR2.2 (Fish Pond) outside site boundary	A6 A7	There are 4 numbers of fallowed fish ponds at the upstream of the Ma On Kong Channel. A chain of fish ponds near downstream but distant from the Channel is noted. The fish ponds cover area of in total 23,000 m2. Most of them are heavily colonized by aquatic plants, which attribute to their low visual quality as a water landscape element. They have low landscape value and sensitive to change.	Minor change due to construction of structures within site boundary. A soil platform was

				created outside site boundary due to other project was noted.
Marsh				
10.7.5	LR3 (Marsh)	A8	It comprises 2 marshes at the upstream channel of the Channel. They are inundated lowland heavily colonized with wetland aquatic plants. They have low landscape value and sensitive to change.	Remain the same as the baseline
Vegetation				
10.7.7	LR4 (Woodland/ Wooded Area)	A9 A10	It comprises two major communities of woodland/ wooded area. One is dense natural woodland stretching across the Conservation Area and area behind Ma On Kong and consists approximate 450 numbers of trees based on visual estimation. The trees are mainly native species and mature in size. It is dominated by *Schefflera octophylla, Pinus massoniana, Aporusa chinensis, Celtis sinensis, Bridelia tomentosa, Cinnamomum cmaphora, Rhus chinensis* and *Phus succedanes*. Another one is a natural more sparse riparian wooded area at upstream of the Channel and consists approximate 60 numbers of trees based on visual estimation. The trees are mainly pioneer species and poorer in form and maturity. It is dominated by Ficus hispide and Macaranga tanarius. They have high landscape value and sensitivity to change.	Remain the same as the baseline
10.7.8	LR5 (Orchard/ Horticultural Trees)	A11	It comprises two groups of trees at downstream below Ma On Kong and north of Ho Pui Amongst there are approximate 400 numbers of trees based on visual estimation. They are fruit trees and landscape plants of horticultural practices. It is dominated by *Dimocarpus longan, Delonix regian, Roystonea regia and Pachira macrocarpa*. For their anthropogenic and not permanent in nature, they have medium landscape value and sensitivity to change.	Remain the same as the baseline
10.7.9	LR6 (Low-Lying Agricultural Land/ Fallowed Land)	A12	It comprises fallowed land and agricultural land in low rate of uses. The vegetation is mainly grass and sedge with mosaics of shrubs approaching the Channel. It fills up the about half of the existing	Remain the same as the baseline.

			landscape within the study area. They have low landscape value and sensitivity to change.	
Sitting-Out Area				
10.7.10	LR7 (Sitting-Out Area at Ma On Kong)	A13	It is located at the Ma On Kong next to the access road. It is a small sitting-out area primarily hard-paved with only 3 amenity trees and on pavilion. It has low landscape value and sensitivity to change.	Remain the same as the baseline
Landscape Character Areas				
10.7.12	LCA1 (Agricultural Landscape Character Area)	B1 & B2	This comprises fallowed land & agricultural land not in active uses. This character area is flat and gentle sloping in landform and vegetated with grass of various heights. It forms the majority of the landscape character of the entire river valley and the connecting landscape element between other landscape character areas. The sensitivity to change of this area is low.	Minor change due to invasion of cows. Some of the grass on the land were consumed.
10.7.13	LCA2 (Woodland Landscape Character Area)	B3	This is natural woodland between southern Ma On Kong and the Channel extending up to the access road behind Ma On Kong. The trees are mature in size forming a close woodland landscape. It is the location of egretry of conservation importance. The sensitivity to change of this area is high.	Remain the same as the baseline
10.7.14	LCA3 (River/ Stream Landscape Character Area)	B4 – B7	This is the main stream of the Channel in associate with its riparian vegetation. It meanders through the river valley landscape. It is used as a receptor of agricultural effluent from poultry farm around upstream, which contribute to the polluted appearance of the character area around upstream. The sensitivity to change of this area is medium.	Minor change due to construction work within site boundary
10.7.15	LCA4 (Fish Pond Landscape Area)	B8	This comprises a number of fish ponds of various sizes distributed about the Channel. Most of them are abandoned or with limited uses and colonized with aquatic plants. The sensitivity to change of this area is medium.	Minor change due to construction of structures within site boundary.

10.7.16	LCA5 (Village Landscape Character Area)	B9 & B10	This comprises the four major village types rural settlement encompassing tai Kek, Ma On Kong, Ho Pui and north of Ho Pui. Except Tai Kek which is less revitalized and actively resided, all other three are actively resided. This area is lightly urbanized with low rise village house. The sensitivity to change of this area is low.	Remain the same as the baseline
10.7.17	LCA6 (Industrial Landscape Character Area)	B11 & B12	This comprise collection of slummy-built temporary structure and open storage uses land, which are characterized with metallic hoarding and used for poultry, recycling, vehicle repairing etc. The sensitivity to change of this area is low.	Reconstruction of hoarding was conducted by the land owner
10.7.18	LCA7 (Nullah Landscape Character Area)	B13	This is the trained nullah next to Kam Ho Road. It is the primary tributary connecting and receiving outflow from the Ma On Kong Channel. The area is man-made and with poor and monotonous riverside vegetation. The sensitivity to change of this area is low.	Remain the same as the baseline

10.7.19 Visual Character

The visual quality of the river valley of Ma On Kong Channel is semi-natural based on combination of rural landscape elements including agricultural land, village houses, woodland and pond and stream and industrial landscape elements including open storage and temporary structures. Interspersed landscape elements on general flat landform with minor undulation render numerous small enclosed views. No major vista and high quality open view identified.

10.7.20 Visual Sensitive Receiver (VSR)

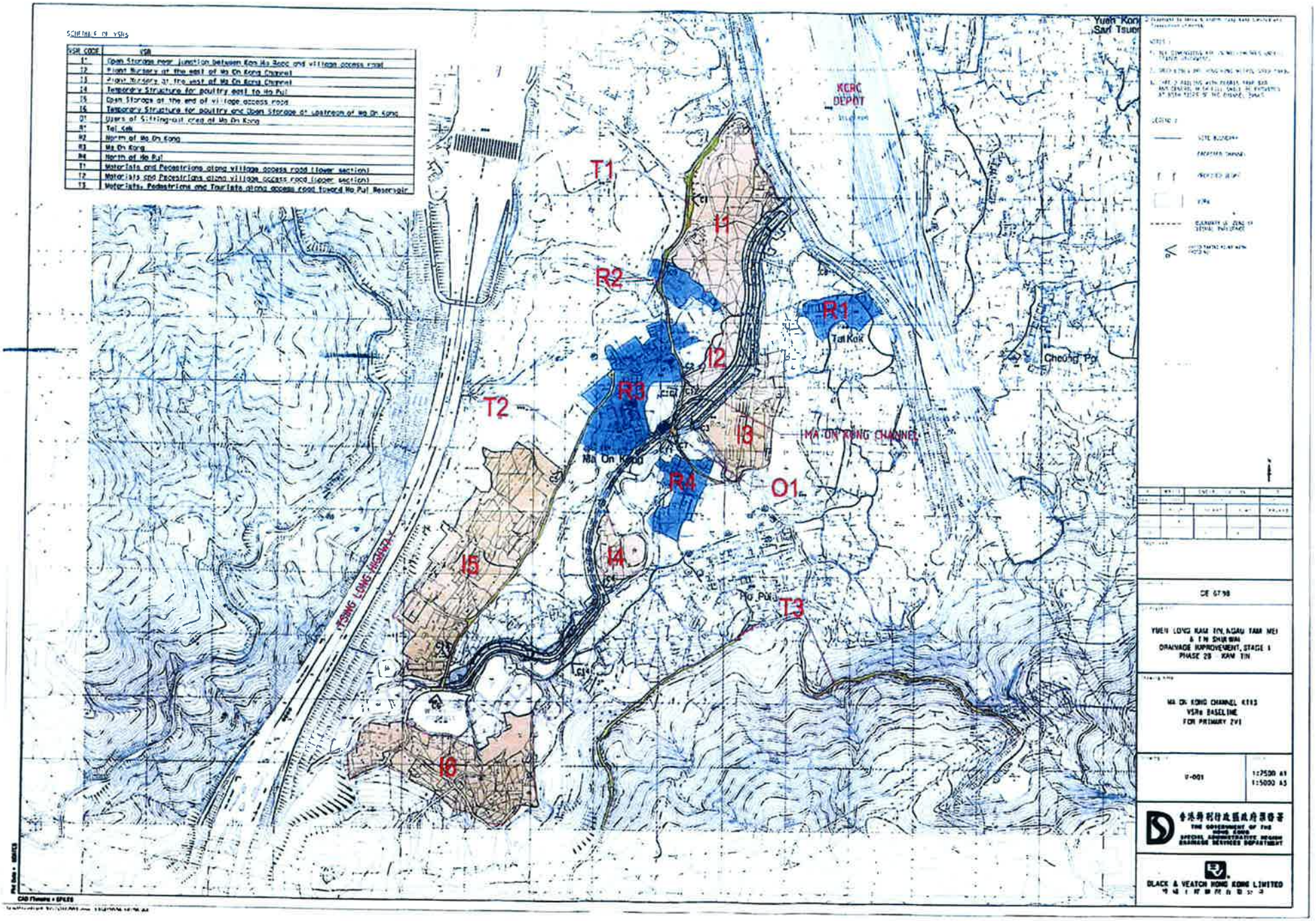
Within the ZVI, a number of key Visual Sensitive Receivers (VSRs) have been identified. These VSRs are mapped in Drawing V-001. They are listed, together with their sensitivity, in Table 10/5. Photo views illustrating the VSRs are illustrated in Drawing nos. PV-001 to 002 inclusive. For the ease of reference, each VSR is given an identity number, which is used in the text, tables and figures.

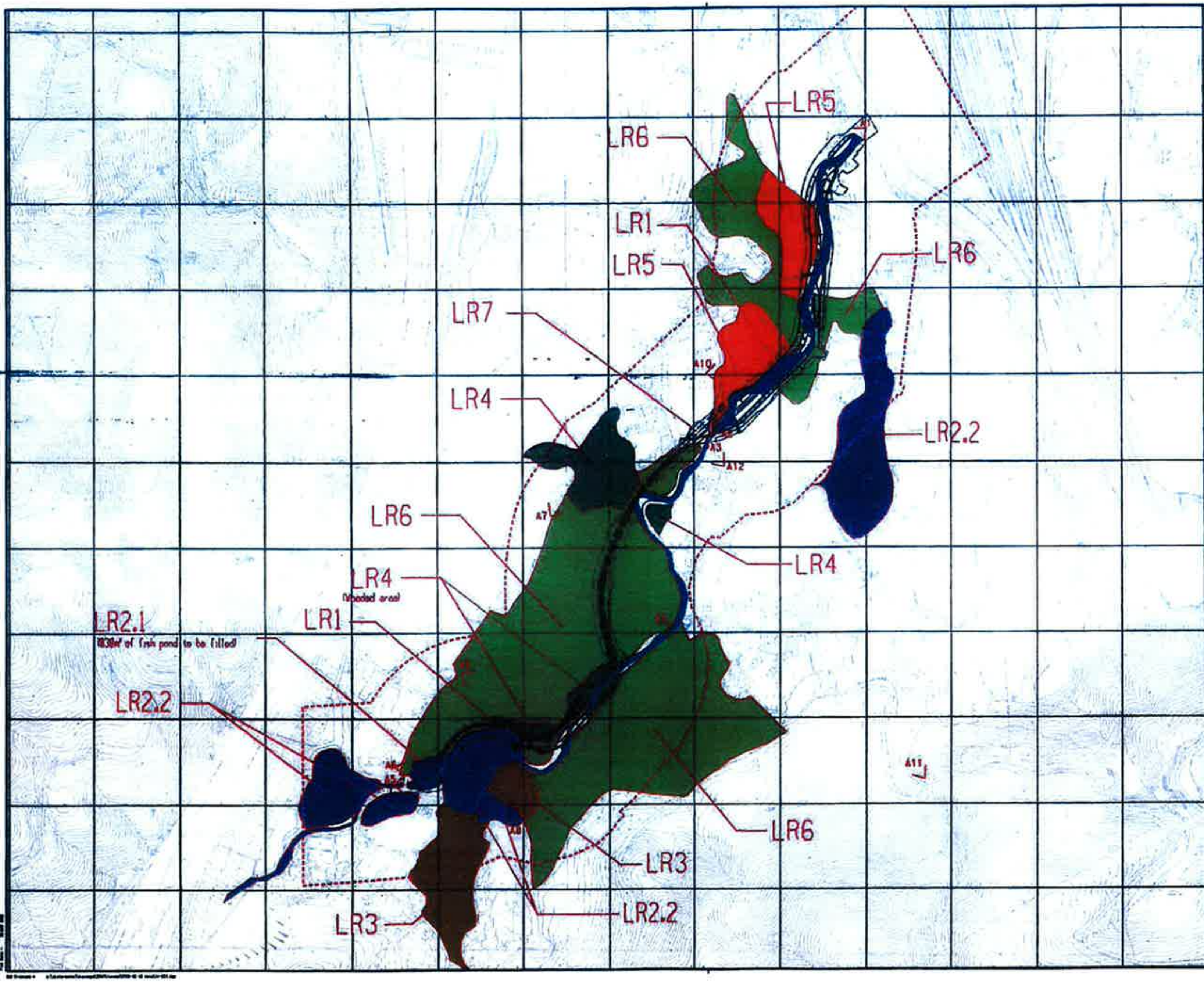
Table compares the baseline study and the current situation for KT13: (Visual Sensitive Receiver)

Section in EIA Report	**Identify number – VSR**	**Photo No.**	**Baseline Study, Environmental Impact Assessment Final Report [382047/E/EIA/Issue 9]**	**Current Situation**
Industrial VSRs				
10.7.21	I1	C1	Open storage near junction between Kam Ho Road and Village access The VSRs is workers of the open storage. The number of individual is very few and their sensitivity to visual impacts is low.	Remain the same as the baseline
10.7.22	I2	C2	Plant Nursery at the east of Ma On Kong Channel The VSRs is workers of the plant nursery. The number of individual is very few and their sensitivity to visual impacts is low.	Remain the same as the baseline
10.7.23	I3	C3	Plant Nursery at the west of Ma On Kong Channel The VSRs is workers of the plant nursery. The number of individual is very few and their sensitivity to visual impacts is low.	Temporary stockpiling was observed
10.7.24	I4	C4	Temporary Structure for poultry east to Ho Pui The VSRs is workers of the temporary structure. The number of individual is very few and their sensitivity to visual impacts is low.	Reconstruction of hoarding was conducted by the land owner
10.7.25	I5	C5	Open Storage at the end of village access road The VSRs is workers of the open storage. The number of individual is very few and their sensitivity to visual impacts is low.	
10.7.26	I6	C6	Temporary Structure for poultry and Open Storage at upstream of Ma On Kong Channel The VSRs is workers of the temporary structure and open storage. The number of individual is very few and their sensitivity to visual impacts is low.	Remain the same as the baseline

Open Space / Sitting – Out Area VSRs				
10.7.27	O1	C7	Users of Sitting-out Area at Ma On Kong The VSRs is future users of the re-provided sitting-out area during operation phase. The number of individual is few and their sensitivity to visual impacts is medium.	Remain the same as the baseline
Residential VSRs				
10.7.28	R1	C8	Tai Kek The VSRs is residents of the village. The number of individual is very few and their sensitivity to visual impacts in high.	Remain the same as the baseline
10.7.29	R2	C9	North of Ma On Kong The VSRs is residents of the village. The number of individual is very few and their sensitivity to visual impacts is high.	Remain the same as the baseline
10.7.30	R3	C10	Ma On Kong The VSRs is residents of the village. The number of individual is very few and their sensitivity to visual impacts is high.	Remain the same as the baseline
10.7.31	R4	C11	North of Ho Pui The VSRs is residents of the village. The number of individual is few and their sensitivity to visual impacts is high.	Remain the same as the baseline

Transport-related VSRs				
10.7.32	T1	C12	Motorists and Pedestrians along village access road (lower section) The VSRs is the road users of the road section. The number of individual is few and their sensitivity to visual impacts is low.	Remain the same as the baseline
10.7.33	T2	C13	Motorists and Pedestrians along village access road (high section) The VSRs is the road users of the road section. The number of individual is very few and their sensitivity to visual impacts is low.	Remain the same as the baseline
10.7.34	T3	C14	Motorists, Pedestrians and Tourists along access road toward Ho Pui Reservoir The VSRs is the road users of the road section, part of which are tourist to Ho Pui Reservoir. The number of individual is very few and their sensitivity to change is low.	Remain the same as the baseline


SCHEDULE OF VSRs
VSR CODE
VSR
T1
T2
T3
I1
I2
I3
I4
I5
I6
R1
R2
R3
R4
O1
KCRC DEPOT
Yuen Kong San Tsuen
Tai Kok
Cheung Po
Ma On Kong
Ma On Kong
Ho Pui
MA ON KONG CHANNEL
TSING LONG HIGHWAY
DE 07/98
YUEN LONG KAU TIN, KAU YAM MEI & TIN SHUI WAI
DRAINAGE IMPROVEMENT, STAGE 1
PHASE 2B KAU TIN
MA ON KONG CHANNEL KT13
VSRs BASELINE
FOR PRIMARY ZV1
V-001
1:7500 A1
1:15000 A3
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT
BLACK & VEATCH HONG KONG LIMITED



LEGEND :

SITE BOUNDARY

STUDY BOUNDARY

PROPOSED CHANNEL

PROPOSED SLOPE

MARSH

PHOTO TAKING POINT WITH PHOTO NO.

Contract no. CE 67/98

Contract title: YUEN LONG, KAM TIN, NGAU TAM MEI & TIN SHUI WAI DRAINAGE IMPROVEMENT, STAGE 1 PHASE 2B - KAM TIN

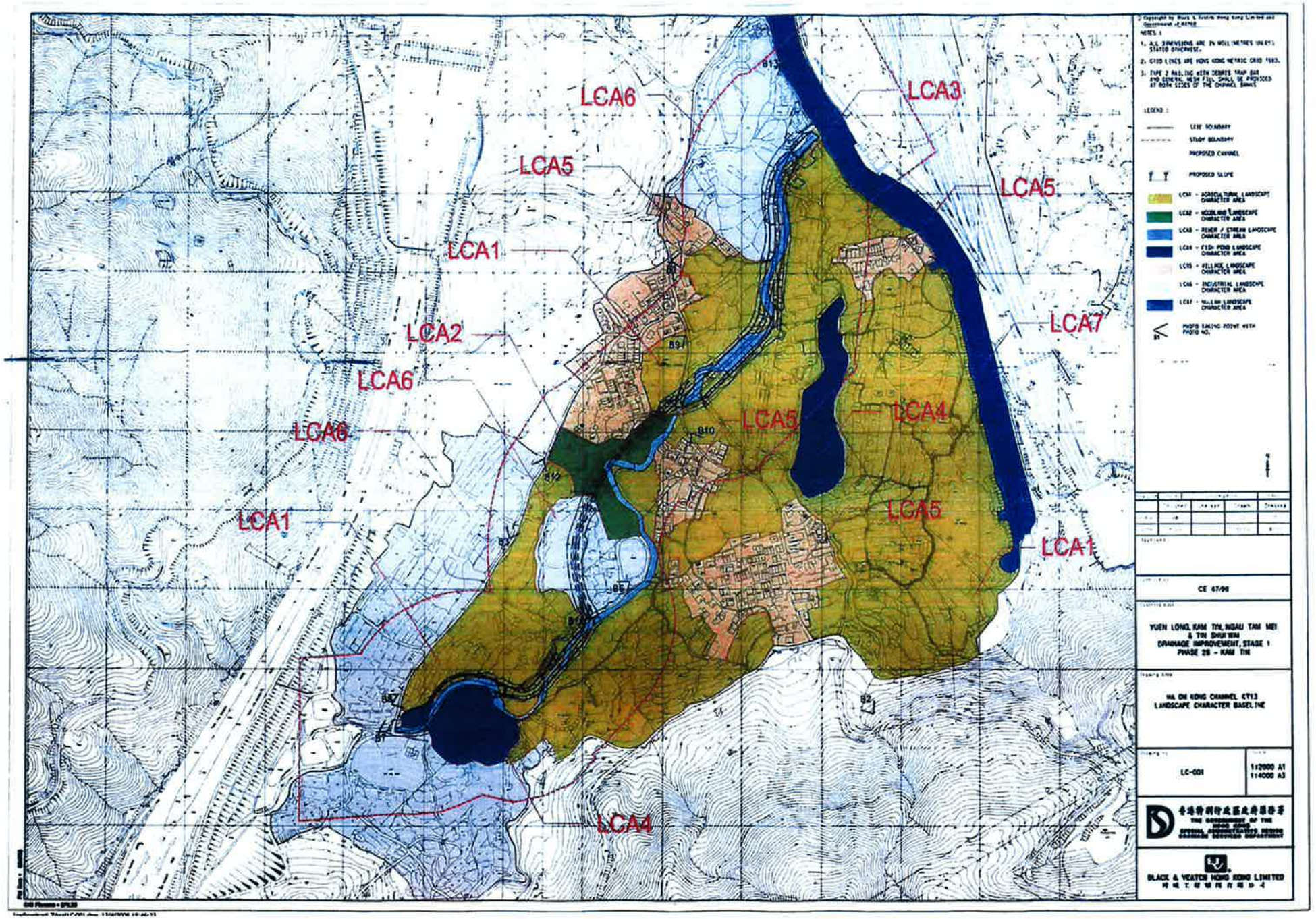
Drawing title: MA ON KONG CHANNEL (T13) LANDSCAPE RESOURCE BASELINE

Drawing no. LR-001

Scale 1:2000 A1 1:4000 A3

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

BLACK & VEATCH HONG KONG LIMITED


LCA6
LCA5
LCA1
LCA2
LCA6
LCA6
LCA1
LCA4
LCA3
LCA5
LCA7
LCA5
LCA4
LCA5
LCA1
NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. GRID LINES ARE HONG KONG METRIC GRID 1963.
3. TYPE 2 RAILING WITH DEBRIS TRAP BAR AND GENERAL MESH FILL SHALL BE PROVIDED AT BOTH SIDES OF THE CHANNEL BANKS
LEGEND :
LEASE BOUNDARY
STUDY BOUNDARY
PROPOSED CHANNEL
PROPOSED SLOPE
LCA1 - AGRICULTURAL LANDSCAPE CHARACTER AREA
LCA2 - WOODLAND LANDSCAPE CHARACTER AREA
LCA3 - RIVER / STREAM LANDSCAPE CHARACTER AREA
LCA4 - FISH POND LANDSCAPE CHARACTER AREA
LCA5 - VILLAGE LANDSCAPE CHARACTER AREA
LCA6 - INDUSTRIAL LANDSCAPE CHARACTER AREA
LCA7 - WILLOW LANDSCAPE CHARACTER AREA
PHOTO TAKING POINT WITH PHOTO NO.
CE 47/98
YUEN LONG, KAM TIN, NGAU TAM MEI & TIN SHUI WAI DRAINAGE IMPROVEMENT, STAGE 1 PHASE 2B - KAM TIN
NA ON KONG CHANNEL KT13 LANDSCAPE CHARACTER BASELINE
LC-001
1:2000 A1
1:4000 A3
BLACK & VEATCH HONG KONG LIMITED

Physical, Human and Cultural Landscape Resources Photo record

9 February 2010

Photo No. A1 – LR1 River/Stream

Photo No. A2 – LR1 River/Stream

Photo No. A3 – LR1 River/Stream

Photo No. A4 – LR1 River/Stream

Photo No. A5 – LR1 River/Stream

Photo No. A6 – LR2.1 Fish Pond within site boundary

Photo No. A7 – LR2.2 River/Stream

Photo No. A8 – LR3 River/Stream

Photo No. A9 – LR4 Woodland/Wooded Area

Photo No. A10 – LR4 Woodland

Photo No. A11 – LR5 Orchard/ Horticultural Trees

Photo No. A12 – LR6 Low-Lying Agricultural Land/ Fallowed Land

Photo No. A13 –LR7 Sitting-Out Area at Ma On Kong

Photo No. B1 – LCA1 Agricultural Landscape Character Area

Photo No. B2 – LCA1 Agricultural Landscape Character Area

Photo No. B3– LCA2 Woodland Landscape Character Area

Photo No. B4 – LCA3 River/ Stream Landscape Character Area

Photo No. B5 – LCA3 River/ Stream Landscape Character Area

Photo No. B6 – LCA3.1 River/ Stream Landscape Character Area

Photo No. B7 – LCA3 River/ Stream Landscape Character Area

Photo No. B8 – LCA4 Fish Pond Landscape Area

Photo No. B9– LCA5 Village Landscape Character Area

Photo No. B10—LCA 5 Village Landscape Character Area

Photo No. B11—LCA 6 Industrial Landscape Character Area

Photo No. B12—LCA 6 Industrial Landscape Character Area

Photo No. B13—LCA 7 Nullah Landscape Character Area

Photo No. C1 – I1 Open storage near junction between Kam Ho Road and Village access road

Photo No. C2—I2 Plant Nursery at the east of Ma On Kong Channel

Photo No. C3—I3 Plant Nursery at the east of Ma On Kong Channel

Photo No. C4—I4 Temporary Structure for poultry east to Ho Pui

Photo No. C5—I5 Open Storage at the end of village access road

Photo No. C6—I6 Temporary Structure for poultry and Open Storage at upstream of Ma On Kong Channel

Photo No. C7—O1 Sitting-out Area at Ma On Kong

Photo No. C8—R1 Tei Kek

Photo No. C9—R2 North of Ma On Kong

Photo No. C10—R3 Ma On Kong

Photo No. C11—R4 North of Ho Pui

Photo No. C12—T1 Motorists and Pedestrians along village access road (lower section)

Photo No. C13—T2 Motorists and Pedestrians along village access road (high section)

Photo No. C14—T3 Motorists, Pedestrians and Tourists along access road toward Ho Pui Reservoir

Physical, Human and Cultural Landscape Resources Photo record

23 February 2010

Photo No. A1 – LR1 River/Stream

Photo No. A2 – LR1 River/Stream

Photo No. A3 – LR1 River/Stream

Photo No. A4 – LR1 River/Stream

Photo No. A5 – LR1 River/Stream

Photo No. A6 – LR2.1 Fish Pond within site boundary

Photo No. A7 – LR2.2 River/Stream

Photo No. A8 – LR3 River/Stream

Photo No. A9 – LR4 Woodland/Wooded Area

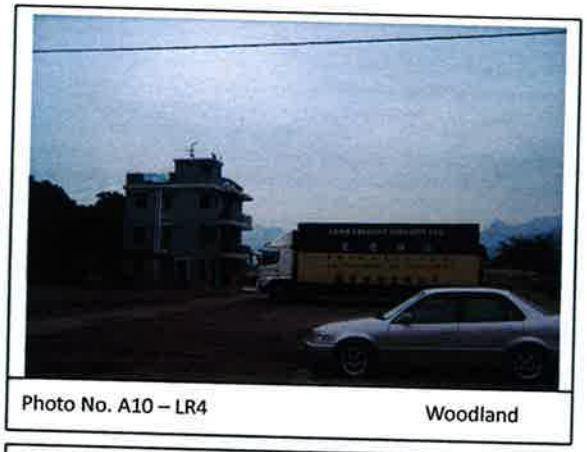


Photo No. A10 – LR4 Woodland

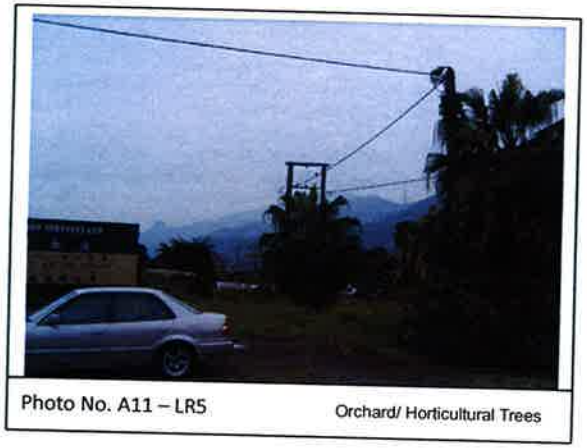


Photo No. A11 – LR5 Orchard/ Horticultural Trees

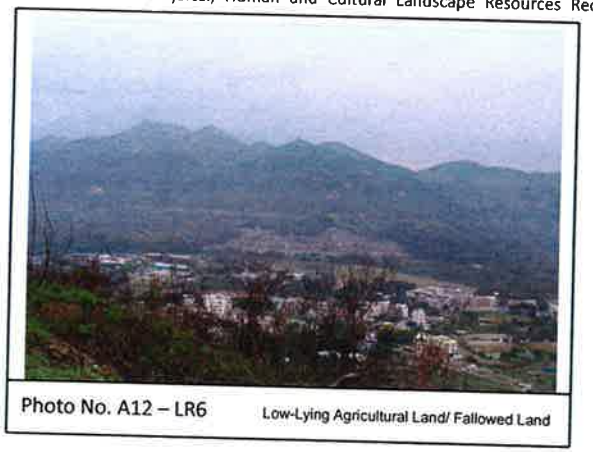


Photo No. A12 – LR6 Low-Lying Agricultural Land/ Fallowed Land

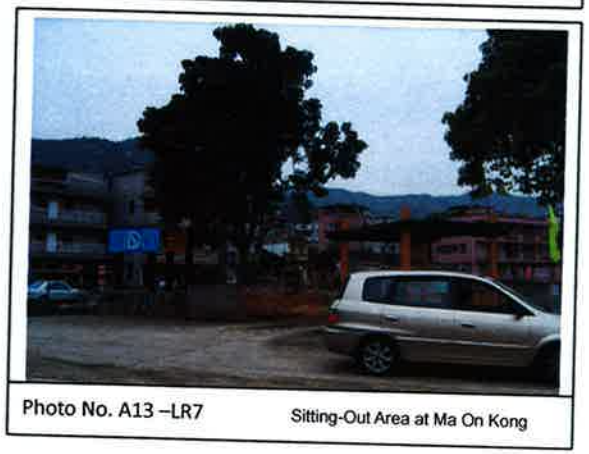


Photo No. A13 –LR7 Sitting-Out Area at Ma On Kong

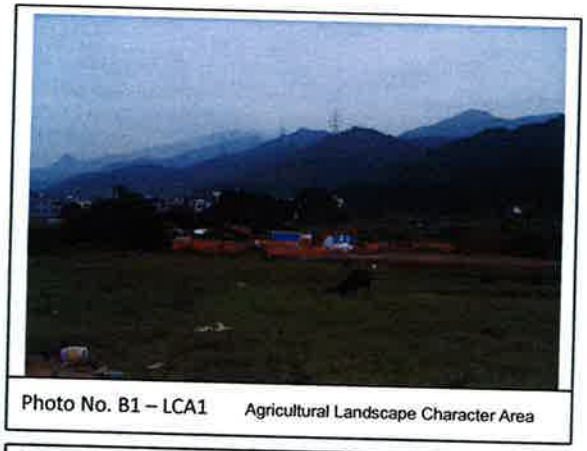


Photo No. B1 – LCA1 Agricultural Landscape Character Area

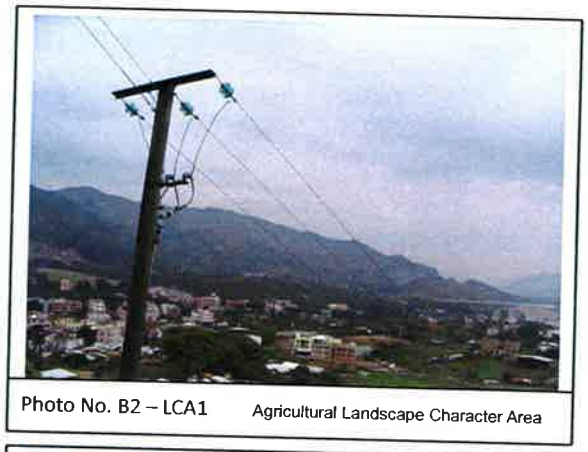


Photo No. B2 – LCA1 Agricultural Landscape Character Area

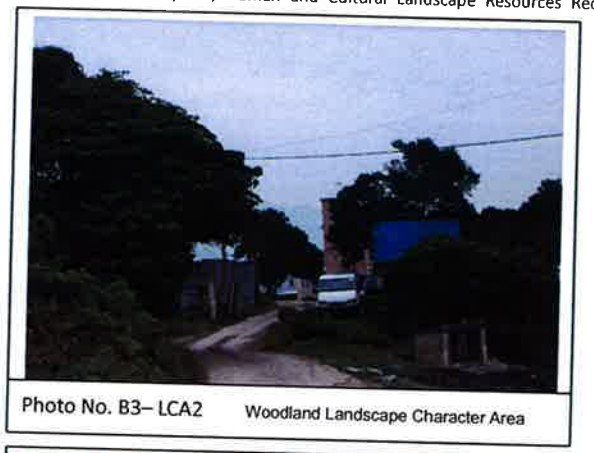


Photo No. B3– LCA2 Woodland Landscape Character Area

Photo No. B4 – LCA3 River/ Stream Landscape Character Area

Photo No. B5 – LCA3 River/ Stream Landscape Character Area

Photo No. B6 – LCA3.1 River/ Stream Landscape Character Area

Photo No. B7 – LCA3 River/ Stream Landscape Character Area

Photo No. B8 – LCA4 Fish Pond Landscape Area

Photo No. B9– LCA5 Village Landscape Character Area

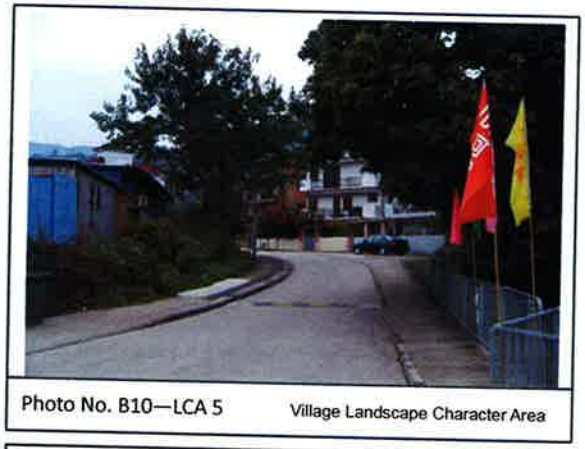


Photo No. B10—LCA 5 Village Landscape Character Area

Photo No. B11—LCA 6 Industrial Landscape Character Area

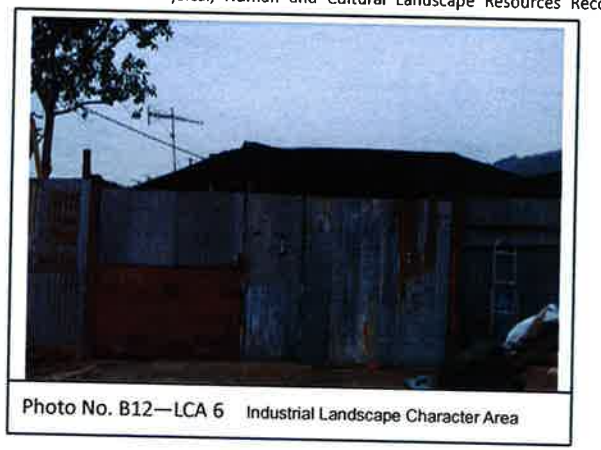


Photo No. B12—LCA 6 Industrial Landscape Character Area

Photo No. B13—LCA 7 Nullah Landscape Character Area

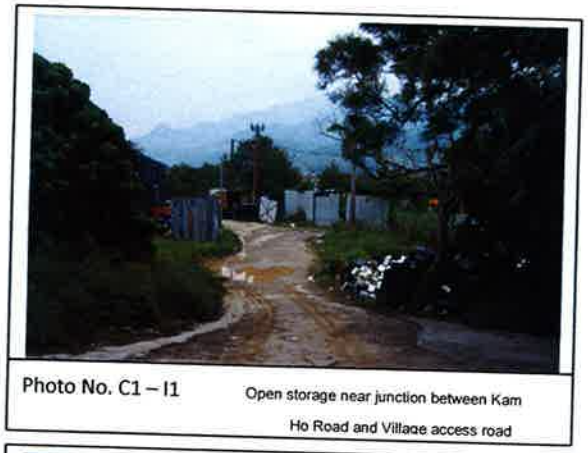


Photo No. C1 – I1 Open storage near junction between Kam Ho Road and Village access road

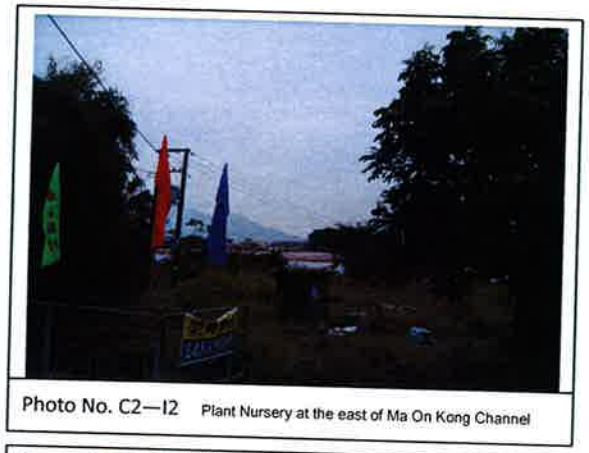


Photo No. C2—I2 Plant Nursery at the east of Ma On Kong Channel

Photo No. C3—I3 Plant Nursery at the east of Ma On Kong Channel

Photo No. C4—I4 Temporary Structure for poultry east to Ho Pui

Photo No. C5—I5 Open Storage at the end of village access road

Photo No. C6—I6 Temporary Structure for poultry and Open Storage at upstream of Ma On Kong Channel

Photo No. C7—O1 Sitting-out Area at Ma On Kong

Photo No. C8—R1 Tei Kek

Photo No. C9—R2 North of Ma On Kong

Photo No. C10—R3 Ma On Kong

Photo No. C11—R4 North of Ho Pui

Photo No. C12—T1 Motorists and Pedestrians along village access road (lower section)

Photo No. C13—T2 Motorists and Pedestrians along village access road (high section)

Photo No. C14—T3 Motorists, Pedestrians and Tourists along access road toward Ho Pui Reservoir

Appendix K

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table

Date: 28-Feb-10
Year/Month: Feb-10

Monthly Summary Waste Flow Table for Feb 2010										
Year	Actual Quantities of Inert C & D Materials Generated Monthly					Estimated Annual Quantities of C & D Wastes Generated Monthly				
	Total Quantitiy 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	10.556	0.004	10.002	0.55	0	0	0	0	0	0
Feb	4.2195	0.001	4.323	-0.105	0	0	0	0	0	0
Mar										
Apr										
May										
Jun										
Sub-Total	14.78	0.005	14.325	0.4455	0	0	0	0	0	0
Jul										
Aug										
Sep										
Oct										
Nov										
Dec										
Total	14.776	0.005	14.325	0.446	0.000	0.000	0.000	0.000	0.000	0.000

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