DRAINAGE SERVICES DEPARTMENT
CONTRACT NO. DC/2011/06

REPROVISIONING OF BOUNDARY PATROL ROAD AND ASSOCIATED SECURITY FACILITIES BETWEEN PING YUEN RIVER AND PAK FU SHAN AND DRAINAGE WORKS IN NORTH DISTRICT

EM&A REPORT FOR DRAINAGE WORKS UNDER EP-277/2007/A (FEBRUARY 2013)

PREPARED FOR
SANG HING CIVIL CONSTRUCTORS CO., LTD.

Quality Index

Date	Reference No.	Prepared By	Approval By
11 March 2013	TCS00599/12/600/R0091v1	F. N. Wong Senior Environmental Consultant	T. W. Tam Environmental Team Leader

Version	Date	Description
0	7 March 2013	First submission.
1	11 March 2013	Amended against IEC e-mailed comments

ENVIRON

Ref.: DSDBPRNDEM00_0_0114L.13

11 March 2013

By Post and Fax (2959 6079)

Action-United Environmental Services & Consulting
Unit A, 20/F,
Gold King Industrial Building,
New Territories, Hong Kong

Attention: Mr. T.W. Tam

Dear Sir,

Re: Contract No. DC/2011/06
Reprovisioning of Boundary Patrol Road and Associated Security Facilities between Ping Yuen River and Pak Fu Shan and Drainage Works in North District
EM&A report for Drainage Works under EP-277/2007/A (February 2013)

Reference is made to the Environmental Team's submission of the captioned report (Version 1) dated 11 March 2013 received through E-mail on 11 March 2013 for our review and comment.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 3.4 in the captioned Environmental Permit.

Thank you for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,

Roger Leung
Independent Environmental Checker

c.c.	DSD	Mr. Eric Y.M. Cheng	by fax: 2827 8700
	SHCCCL	Mr. Raymond W.M. Yau	by fax: 2403 1162

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EXECUTIVE SUMMARY

BREACHES OF ENVIRONMENTAL QUALITY CRITERIA (A/ L LEVELS)

ES01 Monitoring results indicated no exceedances of A/L Levels for air quality and construction noise during the Reporting Period. Neither NOE nor remedial actions were required.

COMPLAINTS LOG

ES02 No environmental complaint was registered in the Reporting Period. The complaint log is presented as follows:

Reporting Month	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
May to January 2013	0	0	NA
February 2013	0	0	NA

NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES03 No notifications of summons and successful prosecutions were registered during the Reporting Period.

REPORTING CHANGES

ES04 No reporting changes were made during the Reporting Period.

FUTURE KEY ISSUES

ES05 Construction dust, noise and water quality continue to be the key environmental issues for construction of the Works during the coming Reporting Period.

ES06 As predicted in the EIA Report (Register No. in the EP: AEIAR-108/2007), with full implementation of the recommended environmental protection measures, adverse environmental impacts generated from future construction activities under the Works can be eliminated to acceptable levels.

ES07 Special attention is drawn to implementation of air quality mitigation measures, in particular construction dust suppression measures during dusty construction activities under dry and windy conditions.

ES08 In addition, water quality mitigation measures is reminded during rainy days to eliminate adverse water quality impacts generated from surfaces runoff of haul roads, stock pile of excavated materials, etc.

ES09 Construction noise mitigation measures should also be implemented during noisy construction activities.

RECOMMENDATIONS

ES10 As persistent power failure at MUP-A1 (MUP05) occurred throughout the whole Reporting Period, considerably affecting continuity of the 24-Hour TSP monitoring. The Contractor is required to reinstate the power supply.

ES11 Special attention is drawn to some extremely high turbidity and SS levels detected during the Reporting Period and full implementation of the required water quality mitigation measures is reminded during pruning, felling and transporting of existing trees to be conducted in the near future in order to avoid disturbance of the stream water and henceforth prevent potential adverse environmental impacts on the water quality.

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LIST OF ANNEXES

1 ENVIRONMENTAL IMPLEMENTATION STATUS

1.01 This is the monthly EM&A report (herein after "this Report") for Drainage Works under EP-277/2007/A for the period from 1 to 28 February 2013 (hereinafter "the Reporting Period").

1.02 Location plan for the works under the Contract is shown in ***Annex A***, whereas environmental management organization and communication lines, including contacts of key personnel under the Contract are shown in ***Annex B***.

1.03 Status of environmental licenses and permit is summarized in the following ***Table 1-1***.

Table 1-1 Status of Environmental Licenses and Permit

Permit Type	Licenses / Permit No.	Date of Issuance by EPD	Expiry Date	Concerned Location	Status
Environmental Permit	EP-277/2007	09 July 2007	N.A	Lin Ma Hang and Man Uk Pin	EP-277/2007/A to supersede EP-277/2007
	EP-277/2007/A	01 December 2009			
Notification pursuant to Section 3(1) of the Air Pollution Control Ordinance (APCO) (Construction Dust) Regulation	N.A.	N.A.	N.A.	Contract Area (Lin Ma Hang, Man Uk Pin, Ma Wat Wai and Ping Yuen River)	Valid
Account for Disposal of Construction Waste	7015003	07 May 2012	N.A.	Contract Area (Lin Ma Hang, Man Uk Pin, Ma Wat Wai and Ping Yuen River)	Valid
Application for Wastewater Discharge License under Water Pollution Control Ordinance (WPCO)	W5/11363/1	29 August 2012	31 Aug 2017	Lin Ma Hang, Man Uk Pin and Ma Wat Wai	Valid
Register as a Chemical Waste Producer under Waste Disposal Ordinance	5123-642-S3565-03	3 October 2012	N.A	Contract Area (Lin Ma Hang, Man Uk Pin, Ma Wat Wai and Ping Yuen River)	Valid

1.04 Construction program of the Works with fine tuning of construction activities showing the interrelationship with environmental protection/mitigation measures is presented in Implementation Schedule for the recommended mitigation measures attached in ***Annex C*** of this Report whereas updated 3-Month Construction Program of the Works is shown in ***Annex D***.

1.05 Implementation Status for the recommended mitigation measures are presented in the monthly site inspection checklists which are endorsed by related parties including representatives of the ER, IEC, Contractor, EO and ET.

MAJOR CONSTRUCTION ACTIVITIES

THE REPORTING PERIOD

1.06 Major construction activities of the Works undertaken during the Reporting Period are listed in ***Table 1-2*** below:

Table 1-2 Major Construction Activities for the Works during the Reporting Period

Portion of the Works	Major Construction Activities
Portion E (Man Uk Pin)	1) Installation of temporary sheet pile decking; 2) Construction of vehicle crossing at CH321 to CH328; and 3) Liaison with villagers to arrange relocation of hoarding or fencing.

FORTHCOMING TWO MONTHS

1.07 Major construction activities of the Works for the forthcoming two months are listed in ***Table 1-3*** below:

Table 1-3 Major Construction Activities for the Works for the Forthcoming Two Months

Portion of the Works	Major Construction Activities
Portion E (Man Uk Pin)	1) Pruning, felling and transporting of existing trees; 2) Construction of box culvert transition; 3) Construction of box culvert; 4) Construction of gabion channel; 5) Construction of vehicular crossing VBM05-1; and 6) Relocation of hoarding.

EM&A ACTIVITIES

BASELINE MONITORING AND ENVIRONMENTAL QUALITY CRITERIA

1.08 The baseline monitoring for air quality, construction noise and water quality has been carried out since 17 September 2008, whereas that for ecology has been performed since 16 September 2008 in close accordance with the requirements of the EM&A Manual.

1.09 It is agreed amongst the Engineer, IEC, Contractor and ET that the established environmental quality criteria i.e. Action/Limit Levels (hereinafter "the A/L Levels") for air quality, construction noise and water quality as shown in ***Tables 2-7*** and ***Tables 2-8*** respectively are to be used in the EM&A for air quality, construction noise and water quality under Drainage Works under EP-277/2007/A.

ENVIRONMENTAL MONITORING

1.10 The environmental monitoring during the Reporting Period followed monitoring schedules submitted to relevant parties upon agreement with the IEC and ER prior to implementation. They are presented in ***Annex E***.

2 SUMMARY OF REQUIREMENTS FOR CONSTRUCTION IMPACT MONITORING

2.01 The requirements for EM&A for Drainage Works under EP-277/2007/A are detailed in *Methodology for Environmental Monitoring and Audit under the Contract* (hereinafter "the Methodology", which has been verified by the IEC on 27 July 2012 and submitted to EPD for approval subsequently. They are summarized as follows.

MONITORING PARAMETERS

2.02 The monitoring parameters required for the Works are summarized in ***Table 2-1***.

Table 2-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters
Air Quality	(a) 1-Hour Total Suspended Particulate (hereinafter '1-Hr TSP'); and (b) 24-Hour Total Suspended Particulate (hereinafter '24-Hr TSP').
Construction Noise	(c) A-weighted equivalent continuous sound pressure level (30min) (hereinafter 'Leq(30min)' during the normal working hours; and (d) A-weighted equivalent continuous sound pressure level (5min) (hereinafter 'Leq(5min)' for construction work during the restricted hours.
Water Quality	(e) In Situ Measurement: temperature, Dissolved Oxygen, Dissolved Oxygen Saturation, pH value, Water Depth, Temperature & Turbidity
	(f) Laboratory Analysis: Suspended Solids (hereinafter 'SS'),
Ecology (MUP05)	(g) The stream conditions monitoring (in-situ measurements of DO, pH and turbidity; laboratory testing of SS); (h) Riparian vegetation along the banks of channel monitoring; (i) General site audit to ensure the existing natural stream channel is protected; and (j) Reported the sediment condition during the construction phase

MONITORING LOCATIONS

DESIGNATED LOCATIONS IN THE EM&A MANUAL

2.03 Monitoring locations for EM&A under EP-277/2007/A have been identified in the EM&A Manual. They are shown in ***Annex F***. According to the EM&A Manual and agreement among the Engineer, IEC, Contractor and ET, the environmental monitoring stations closest to the construction site are to be adopted for the EM&A under the Contract. As sensitive receiver MUP05-2 is the closest location to the Works site, it will most likely be impacted by the construction under the Works. The sensitive receiver MUP05-1 is therefore adopted as environmental monitoring locations for air quality namely MUP-A1 and construction noise namely MUP-N1.

2.04 On the other hand, as there was neither riparian vegetation along the banks of channel nor existing natural stream channel within the site of the Works, no ecology monitoring is required during the construction period of the Works.

2.05 ***Table 2-2*** summarizes all the monitoring locations under the Works.

Table 2-2 Monitoring Locations

Issue	Channel	Sensitive Receiver	Location ID	Detailed Address
Air	MUP05	MUP05-2	MUP-A1	Village house at Man Uk Pin
Noise	MUP05	MUP05-2	MUP-N1	Same village house at Man Uk Pin as MUP-A1 above

ADDITIONAL MONITORING LOCATIONS

2.06 In order to monitor the potential construction impacts more effectively, additional environmental monitoring for construction noise and water quality has been recommended by the Engineer and IEC. They are summarized in ***Table 2-3*** and shown in ***Annex F***.

Table 2-3 Summary of Additional Environmental Monitoring Locations

Issue	Channel	Sensitive Receiver	Location ID	Monitoring Time
Construction Noise	MUP05	MUP05-2	MUP-Nx (Village house)	The whole construction period
Water Quality	MUP05	-	MUP-Wx1 (Up-Stream Control Station)	The whole construction period
		-	MUP-Wx2 (Impact Monitoring Station)	Before connection of stream diversion
		-	MUP-Wx3 (Impact Monitoring Station)	After connection of stream diversion

2.07 The additional monitoring has been commenced since August 2012 upon the IEC's verification of the Methodology.

MONITORING FREQUENCY

2.08 The impact monitoring should be conducted during the construction period to ensure the environmental conditions comply with the environmental quality criteria i.e. A/L Levels. The impact monitoring frequency as stipulated in the EM&A Manual is summarized below.

AIR QUALITY

Parameters: 24-Hour TSP and 1-Hour TSP.
Frequency: Once every 6 days for 24-Hour TSP & three times every 6 days for 1-Hour TSP.
Duration: During the course of construction works

CONSTRUCTION NOISE

Parameters: Leq(30 min) in six consecutive Leq(5 min) measurements
Frequency: Once a week during 0700-1900 on normal weekdays
Duration: During the course of construction works

WATER QUALITY

Parameters: Duplicate in-situ measurements of water depth, temperature, DO, pH & turbidity; and laboratory testing of SS. Relevant data will also be measured time of sampling, DO Saturation, weather conditions and special phenomena.

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

Frequency: 3 times a week with an interval of at least 36 hours between two consecutive sampling days

Duration: During the construction period of the channel works

MONITORING EQUIPMENT

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

AIR QUALITY

2.10 Air quality monitoring equipment is listed in the following ***Table 2-4***.

Table 2-4 Air Quality Monitoring Equipment

Equipment	Model
24-Hour TSP	
High Volume Air Sampler (herein after 'HVS')	Grasby Anderson GMWS 2310 HVS
Calibration Kit	TISCH Model TE-5025A
1-Hour TSP	
Portable Dust Meter	AM510; Dust Trak Model 8520

CONSTRUCTION NOISE

2.11 Construction noise monitoring equipment is listed in ***Table 2-5***.

Table 2-5 Construction Noise Monitoring Equipment

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

WATER QUALITY

2.12 Monitoring equipment for water quality is listed in ***Table 2-6***.

Table 2-6 Water Quality Monitoring Equipment

Equipment	Model / Description
In-situ Measurement	
Water Depth Detector	Eagle Sonar or steel ruler
Water Sampler	Teflon bailer / bucket
Thermometer & DO meter	YSI Multimeter
pH meter	Extech pH EC 500
Turbidimeter	Hach 2100p
Sample Container and Storage	High density polythene bottles (provided by laboratory) and 'Willow' 33-liter plastic cool box
Laboratory Analysis	
Suspended Solids	HOKLAS accredited Laboratory

EQUIPMENT CALIBRATION

2.13 The calibrations certificate of all monitoring equipment are used during the impact monitoring program are attached in ***Annex G*** and the calibration requirement are described in below:

AIR QUALITY

2.14 The calibration of the HVS is performed at a bimonthly interval in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model No.TE-5025A). The calibration data are properly documented and the associated records are maintained by the ET for future reference.

2.15 The 1-Hour TSP meter is calibrated at a year intervals in accordance with the in-house method. Zero response of the equipment is checked before and after each monitoring event.

NOISE

2.16 The sound level meters are calibrated using an acoustic calibrator prior to and after spot checking measurements. The meters are calibrated annually by HOKLAS accredited laboratory. 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 are considered valid only if the calibration levels before and after the noise measurement agree to within 1.0 dB.

WATER QUALITY

2.17 Once every three months, the in-situ monitoring instruments are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme.

MONITORING PROCEDURE

2.18 The monitoring methodology and procedure during the impact monitoring are presented as below:

AIR QUALITY

1-Hour TSP

2.19 Operation of the 1-Hour TSP meter is follow manufacturer's Operation and Service Manual. The 1-Hour TSP monitor, a TSI Dust Track Aerosol Monitor Model 8520, or Sibata LD-3 Laser Dust Meter is a portable, battery-operated laser photometer. The 1-Hour TSP meter provides a real time 1-Hour TSP measurement based on 90^0 light scattering. The 1-Hour TSP monitor consists of the following:

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

2.20 The 1-Hour TSP meter using was within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event.

24 –hour TSP

2.21 The equipment used for 24-Hour TSP measurement is the HVS brand named Thermo Andersen, Model GS2310 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Annex B to Part 50. The HVS consists of the following:

1) An anodized aluminum shelter;
2) A 8"x10" stainless steel filter holder;
3) A blower motor assembly;
4) A continuous flow/pressure recorder;
5) A motor speed-voltage control/elapsed time indicator;
6) A 6-day mechanical timer, and
7) A power supply of 220v/50 Hz

2.22 The HVS is calibrated prior the impact monitoring to following the manufacturer's instruction using the NIST-certified standard calibrator brand named Tisch Calibration Kit Model TE-5028A. Regular HVS operation and maintenance as well as filter paper installation and collection was performed by the ET's competent technicians, whereas laboratory analyses were conducted in a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (hereinafter 'ALS'). The analyzed 24-Hour TSP filters were kept in ALS for six months prior to disposal.

METEOROLOGICAL INFORMATION

2.23 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 is recorded in detail.

2.24 Meteorological information is sourced from the Hong Kong Observatory (Ta Kwu Ling Station). The data included wind direction, wind speed, humidity, rainfall, air pressure and temperature etc that in general is required for evaluating the air quality for air quality monitoring.

CONSTRUCTION NOISE

2.25 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 BE issued under the Noise Control Ordinance (NCO).

2.26 All noise measurements are performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) measurements are used as the monitoring parameter for the time period throughout the construction phase.

2.27 The sound level meter is set higher than 1.2m above the existing ground. The microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield is fitted for all measurements. As the measurement point at impact locations is set close to the exterior of the building, i.e. no free field noise measurement is performed, free field correction will not be made for monitoring results.

2.28 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 (94 dBA). Measurements are accepted as valid due to the calibration levels from before and after the noise measurement agree to within 1.0 dB.

WATER QUALITY

2.29 Water quality monitoring is conducted at the middle of the water columns (Mid-Depth) due to water columns at all sampling locations are less than 3.0 meters during monitoring.

Water Depth

2.30 Water depths are determined prior to measurement and sampling. A steel ruler with a suitable weight was dropped to the bottom of the water column to measure the water depth which is actually well below 1 meter.

Dissolved Oxygen (DO)

2.31 A portable Extech Instrument, ExStikR DO600 DO Meter is 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.

2.32 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 is recorded.

pH

2.33 A portable Extech Instrument, ExStikTM Models pH EC 500 or a Hanna HI98107 pH Meter is 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.

Turbidity

2.34 A portable Hach 2100p turbidity Meter is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU.

Suspended Solids (SS)

2.35 SS is determined by ALS using HOKLAS accredited analytical methods namely ALS Method EA-025. The Limit of Reporting (hereinafter "LOR") is 2 mg/L.

Water Sampler

2.36 Water samples are collected by the ET using a plastic sampler to avoid metal contamination. Due to water depth for both sampling locations are lesser than 0.5 m, a cleaned plastic beaker is used for sample collection.

2.37 The sampler is rinsed with the sample before collection with the sample to be taken. 1,000mL water sample is collected from depth for laboratory analyses.

Sample Container

2.38 Water samples are contained in screw-cap PE (Poly-Ethylene) bottles as provided by ALS. The PE bottles are pretreated by laboratory in accordance with the corresponding analytical requirements of HOKLAS. Where appropriate, the sampling bottles are rinsed with the water to be contained. Water sample is transferred from the sampler to the sample bottles to 95% bottle capacity to allow possible volume expansion during delivery and storage.

Sample Storage and delivery

2.39 A 'Willow' 33-liter plastic cool box packed with ice is used to preserve the collected water samples prior to arrival at the laboratory. The temperature of the cool box is maintained as close to 4^0C as possible without being frozen. Samples are delivered to the laboratory end of sampling day or following day within the maximum storage time requirement.

Chemical Analysis

2.40 ALS Technichem (HK) Pty Ltd (HOKLAS No. 66) is appointed by ET to provide analytical services for this project. The analysis of suspended solids is carried out to follow the APHA Standard Methods for the Examination of Water and Wastewater 19ed 2540D. The sample preparation and analysis under the QA/QC control is follow the HOKLAS QA/QC requirements and undertaken by the laboratory.

ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

2.41 Baseline monitoring for air quality and construction noise was carried out during 17 September to 13 October 2008 in close accordance with the requirements stipulated in the EM&A Manual. The A/L Levels of MUP-A1 and MUP-N1 will be adopted for EM&A for air quality and construction noise respectively. They are summarized in ***Table 2-7, Table 2-8 and Table 2-9*** respectively.

Table 2-7 Action and Limit Levels for Air Quality

Monitoring Station	Action Level (μg /m³)		Limit Level (μg/m³)	
	1-Hour TSP	24-Hour TSP	1-Hour TSP	24-Hour TSP
MUP-A1	307	156	500	260

Table 2-8 Action and Limit Levels for Construction Noise (dB(A))

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

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

2.42 Environmental quality criteria for additional water quality monitoring are proposed in ***Table 2-9*** as follows:

Table 2-9 Action and Limit Levels for Additional Water Quality Monitoring

Action Level	Limit Level
120% of the corresponding Levels of Up-Stream Control Station	130% of the corresponding Levels of Up-Stream Control Station

EVENT AND ACTION PLAN

2.43 Event Action Plan for air quality, construction noise and water quality as stipulated in ***Annex H*** will be triggered in cases of exceedances of A/L Levels.

ENVIRONMENTAL MITIGATION MEASURES

2.44 Environmental mitigation measures to minimize potential environmental impacts arising from the construction of the Contract have been recommended and summarized in ***Annex C*** of the previous *First Monthly EM&A Report for Drainage Works under EP-277/2007/A*. Those related to the construction activities for the up-coming construction period are summarized in ***Table 7-2*** *Environmental Mitigation Measures for the Coming Month* in ***Section 7*** of this Report.

DATA MANAGEMENT AND DATA QUALITY CONTROL

2.45 The impact monitoring data is handled by the ET's systematic data recording and management, which complies with an in-house certified (ISO 9001:2000) Quality Management System. Standard Field Data Sheets (FDS) are used in the EM&A program.

2.46 The monitoring data recorded in the equipment e.g. 1-Hour TSP meters and noise meters are downloaded directly at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data.

2.47 For monitoring activities which require laboratory analysis, the responsible laboratory, ALS, follows the QA/QC requirements as set out under their HOKLAS scheme for all laboratory testing.

3 ENVIRONMENTAL MONITORING RESULTS

AIR QUALITY

3.01 As agreed among the Engineer, IEC, Contractor and ET, the construction noise monitoring is performed at MUP-A1 of Channel MUP05.

MONITORING RESULTS

3.02 The air quality monitoring results of 24-Hour and 1-Hour TSP during the Reporting Period are summarized in ***Tables 3-1*** and ***Table 3-2***. Detailed 24-Hour TSP monitoring data and the graphic plots of both 24-Hour and 1-Hour TSP are shown in ***Annex I***.

Table 3-1 Air Quality (1-Hour TSP) Monitoring Results at MUP-A1 (MUP05)

Date	Start Time	1-Hour TSP Monitoring Results at MUP-A1 (MUP05), μg/m³			
		1st	2nd	3rd	Mean
2-Feb-13	10:30	79	83	77	80
8-Feb-13	13:00	38	40	39	39
15-Feb-13	10:10	69	65	63	66
20-Feb-13	13:00	101	93	96	97
26-Feb-13	10:55	75	80	82	79
Average (Range)	72 (38-101)				
A/L Levels	307 / 500				

Table 3-2 Air Quality (24-Hour TSP) Monitoring Results at MUP-A1 (MUP05)

Date	24-Hour TSP Monitoring Results, μg/m³
1, 7, 14, 20 & 26 February 2013	Data Not Available Due to Power Failure
Average (Range)	Not Applicable
A/L Levels	156 / 260

DISCUSSION

3.03 As shown in ***Table 3-1*** and ***Table 3-2***, no exceedances of A/L Levels were recorded for 1-Hour TSP and 24-Hour TSP during the Reporting Period.

3.04 Neither Notice of Exceedance (hereinafter "NOE") nor the associated remedial actions were required for air quality during the Reporting Period.

3.05 Power failure persisted at MUP-A1 (MUP05) throughout the whole Reporting Period. The Contractor has been informed of the power failure and the reinstatement of the power supply at MUP-A1 (MUP05) was on-going.

RECOMMENDATION

3.06 The Contractor is reminded of full implementation of the required environmental protection measures, in particular construction dust suppression measures during dusty construction activities under dry and windy conditions.

CONSTRUCTION NOISE

3.07 As agreed among the Engineer, IEC, Contractor and ET, the construction noise monitoring is performed at MUP-N1 of Channel MUP05 as recommended in the EM&A Manual.

3.08 Additional construction noise monitoring has also been commenced since August 2012 at MUP-Nx upon verification of the Methodology by the IEC prior to implementation.

MONITORING RESULTS

3.09 Construction noise monitoring results are summarized in ***Table 3-3*** and ***Table 3-4*** below and graphic plots of the monitoring results are shown in ***Annex I***.

Table 3-3 Construction Noise Monitoring Results at MUP-N1 (MUP05)

Date	Start Time	1st Leq5	2nd Leq5	3rd Leq5	4th Leq5	5th Leq5	6th Leq5	Leq30 (dB(A))
2-Feb-13	10:31	59.2	66.0	61.9	62.3	63.7	61.5	63
8-Feb-13	14:50	72.3	62.2	62.1	62.3	62.8	69.6	67
15-Mar-13	10:38	60.7	53.6	5.1	55.1	57.9	62.5	58
20-Feb-13	14:15	67.4	66.6	66.8	67.2	71.3	66.8	68
26-Feb-13	11:25	55.0	55.7	57.3	54.7	55.8	58.3	56
Average (Range)		63 (56 - 68)						

Table 3-4 Construction Noise Monitoring Results at MUP-Nx (MUP05)

Date	Start Time	1st Leq5	2nd Leq5	3rd Leq5	4th Leq5	5th Leq5	6th Leq5	Leq30	Corrected Leq30 (dB(A))
2-Feb-13	11:15	65.1	58.7	55.1	56.6	53.3	52.8	59	62
8-Feb-13	14:10	63.2	56.0	55.4	58.6	55.4	56.1	59	62
15-Feb-13	10:05	59.6	53.7	53.6	55.7	53.2	56.1	56	59
20-Feb-13	14:53	58.4	56.9	57.6	57.7	58.6	58.0	58	61
26-Feb-13	10:45	61.0	56.9	59.1	57.0	54.7	56.5	58	61
Average (Range)		61 (59 - 62)							

DISCUSSION

3.10 No environmental complaints against construction noise were registered, indicating no Action Level exceedances were documented during the Reporting Period. In addition, no exceedances of construction noise Limit Level of 75 dB(A) were recorded.

3.11 Neither NOE nor the associated remedial actions were required for construction noise during the Reporting Period.

RECOMMENDATION

3.12 Attention is drawn to construction noise mitigation measures during noisy construction activities.

WATER QUALITY

3.13 No environmental monitoring is recommends in the EM&A Manual during construction of the Works.

3.14 However, additional water quality monitoring at MUP-Wx1 (Up-Stream Control Station) and MUP-Wx2 (Impact Monitoring Station) is recommended by the Engineer and IEC to commence from August 2012 upon verification of the Methodology prior to implementation.

MONITORING RESULTS

3.15 Water quality monitoring results are summarized in ***Table 3-5*** below and graphically presented in ***Annex I***.

Table 3-5 Water Quality Monitoring Results at Wx1 and Wx2 (MUP05)*

Date	Monitoring Parameter							
	DO, mg/L		Turbidity, NTU		pH, pH Value		SS, mg/L	
	Wx1	Wx2	Wx1	Wx2	Wx1	Wx2	Wx1	Wx2
2-Feb-13	6.8	7.2	3	3	8.00	7.89	2	2
4-Feb-13	5.8	6.5	4	4	8.34	7.59	3	2
6-Feb-13	4.9	5.6	10	9	7.76	7.74	40	13
8-Feb-13	4.2	5.4	6	4	8.05	8.05	3	2
15-Feb-13	5.3	5.7	5	5	8.84	8.36	4	4
18-Feb-13	4.0	4.2	12	9	8.27	8.24	128	15
20-Feb-13	3.6	7.3	11	4	9.00	8.78	26	12
23-Feb-13	7.3	8.8	1	1	9.00	8.78	26	12
26-Feb-13	4.7	4.8	15	13	8.78	8.73	34	16
28-Feb-13	6.3	6.8	253	220	8.86	8.76	52	47
**Note:*	*Wx1- up-stream control station ; Wx2 – Impact monitoring station*							

DISCUSSION

3.16 Neither exceedances of 120% (Action Level) nor 130% (Limit Level) of the corresponding Up-Stream Control levels were documented during the Reporting Period. Therefore, neither NOE nor the associated remedial actions were required for water quality during the Reporting Period.

3.17 Nevertheless, special attention is drawn to extremely high turbidity and SS levels detected on some days of Feb 2013 (e.g. 6, 18 and 28 Feb 2013, etc.). Although construction activities of 'Pruning, felling and transporting of existing trees' as shown in previous ***Table 1-3*** have not been commenced and the major sources of high turbidity and SS were not attributable to works under the Project, full implementation of the required water quality mitigation measures is reminded during pruning, felling and transporting of existing trees to avoid disturbance of the stream water and henceforth prevent potential adverse environmental impacts on the water quality.

RECOMMENDATION

3.18 Attention is drawn to water quality mitigation measures during wet season to alleviate adverse water quality impacts on the nearby receiving water body.

METEOROLOGICAL DATA

3.19 Meteorological information downloaded from the Hong Kong Observatory Ta Kwu Ling Weather Station was summarized in ***Annex J*** and used in the EM&A of the Works as appropriate.

CONCLUSION

3.20 Monitoring results indicated no exceedances of environmental quality criteria during the Reporting Period. Neither NOE nor the associated remedial actions were therefore required for air quality, construction noise and water quality

3.21 Nevertheless, the required environmental protection measures are reminded to be fully implemented and maintained as appropriate, in particular construction dust suppression measures during dusty construction activities under dry and windy conditions and water quality protection measures during wet season.

4 WASTE MANAGEMENT

4.01 Waste management is routinely carried out by the on-site Environmental Officer or Environmental Supervisor.

4.02 The quantity of waste for disposal or reuse is summarized in *Monthly Summary of Waste Flow Table* in ***Annex K***.

4.03 To ensure satisfactory performance of the waste management, the Contractor is reminded to comply with all relevant regulatory requirements, including those stipulated in the effluent discharge licenses and chemical waste producer registration, as well as the EM&A Manual, etc.

4.04 Where possible, construction materials should be reused on-site as far as practicable to reduce the construction waste, which should then be sorted or classified on site for proper recycling and disposal as recommended in the Environmental Management Plan and the associated Waste Management Plan.

5 ENVIRONMENTAL SITE INSPECTION

5.01 According to the EM&A Manual, the environmental site inspection should be formulated by the ET Leader and regularly conducted jointly by the representatives of the ET, Contractor and ER. During the Reporting Period, a total of four (4) occasions of the site inspection were conducted on 7, 14, 21 and 26 February 2013.

5.02 No non-compliance with the relevant regulatory requirements was identified. Observations of the regular site inspection and environmental audit during the Reporting Period are summarized in ***Table 5-1***.

Table 5-1 Observations of Site Inspection during the Reporting Period

Date	Findings / Deficiencies	Follow-Up Status
7 February 2013 14 February 2013 21 February 2013	No adverse environmental impacts were observed, however, full implementation of the required mitigation measures is reminded.	Not required for general reminders
26 February 2013	Stock piles of construction materials were observed near river, posing potential of adverse water quality impacts on the river water quality. Covering of the stock piles with tarpaulin sheet is required or removal of the stock piles from the river side is reminded	Stock piles of construction materials were observed.

5.03 Site inspection checklists completed and endorsed by all related parties on the date of site inspection have been kept by the ET and are available for inspection upon request.

6 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

6.01 No environmental complaint was received during the Reporting Period. Summary of environmental complaint is presented in ***Table 6-1*** below.

Table 6-1 Summary of Environmental Complaints

Reporting Month	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
May to January 2013	0	0	NA
February 2013	0	0	NA

6.02 No summons and prosecution was received during the Reporting Period. Summary of summon and prosecution is presented in ***Table 6-2*** and ***Table 6-3*** below.

Table 6-2 Summary of Environmental Summons

Reporting Month	Environmental Summons Statistics		
	Frequency	Cumulative	Nature
May to January 2013	0	0	NA
February 2013	0	0	NA

Table 6-3 Summary of Environmental Prosecution

Reporting Month	Environmental Prosecution Statistics		
	Frequency	Cumulative	Nature
May to January 2013	0	0	NA
February 2013	0	0	NA

7 IMPACT FORECAST

KEY ENVIRONMENTAL ISSUES

7.01 Key environmental issues to be considered in the up-coming month are summarized in ***Table 7-1*** below:

Table 7-1 Key Environmental Issues for the Up-Coming Month

Item	Environmental Issue	Description
(a)	Air Quality	Construction activities under the Contract may have the potential of generating adverse construction dust impacts during dusty construction activities under dry and windy conditions.
(b)	Water Quality	Ssurface runoff during heavy storm/rain may pollute the surrounding water bodies with suspended solids or turbidity, and concrete washing may change the alkalinity or acidity or pH value of the water bodies;
(c)	Chemical Waste	Potential adverse water quality impacts and soil contamination may be generated from chemicals used or chemical waste generated during construction of the Contract, e.g., organic solvents, cleaning solutions, waste batteries, oil & grease spillage or leakage from construction equipment and the associated oil containers within site areas;
(d)	Construction Noise	Construction noise impacts may be caused by noisy construction activities;

ENVIRONMENTAL MITIGATION MEASURES FOR THE COMING MONTH

7.02 Environmental mitigation measures for construction of the Contract have been compiled in ***Annex C***. Attention is drawn to implementation of the environmental mitigation measures for construction activities in the up-coming month as summarized in ***Table 7-2*** below:

Table 7-2 Environmental Mitigation Measures for the Up-Coming Month

Item	Environmental Issue	Description
(a)	Air Quality	Dust suppression measures, in particular proper watering during dusty construction activities under dry and dusty conditions, should be fully implemented;
(b)	Water Quality	Sedimentation or silt removal facilities of adequate capacity should be used, for proper treatment of any site effluent generated from stockpiles of construction materials/waste or dusty haul roads or excavated surfaces within the site during storm rain, prior to discharge to nearby water bodies in order to remove suspended solids or turbidity;
(c)	Chemical Waste	Proper handling and storage of chemical wastes should be maintained;
(d)	Construction Noise	Implementation of the construction noise mitigation measures during noisy construction works
(e)	Other	Follow-up actions for any defects identified during regular site inspection should be promptly taken to rectify the situation.

8 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

8.01 Monitoring results indicated that no exceedances of A/L Levels for air quality, construction noise and water quality during the Reporting Period. Neither NOE nor remedial actions were therefore required during the Reporting Period.

8.02 No environmental complaint, notification of summons or successful prosecution were registered during the Reporting Period.

8.03 No non-compliance with regulatory requirements was found during the site inspection and environmental audit of the Reporting Period, including the regular joint site inspection by the ER, IEC, ET and Contractor. Defects of minor environmental significance were sometimes observed during the site inspection, they were normally rectified in-situ or within the specified time prior to the next site inspection.

RECOMMENDATIONS

8.04 Power failure at MUP-A1 (MUP05) occurred throughout the whole Reporting Period. The Contractor is required to promptly reinstate the power supply.

8.05 The Contractor is reminded to fully comply with all relevant regulatory environmental requirements, including environmental mitigation measures stipulated in the EM&A Manual.

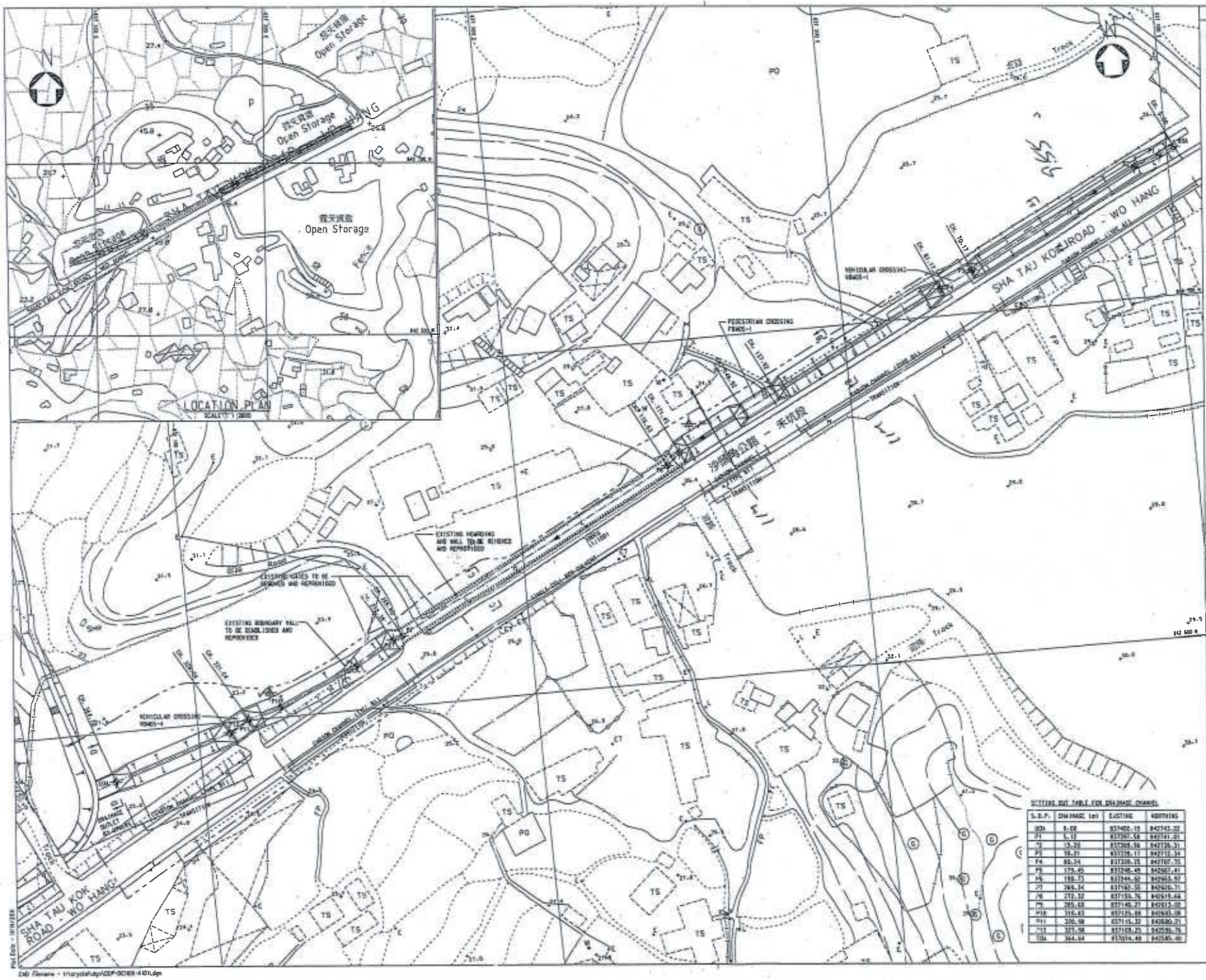
8.06 Attention is drawn to full implementation of air quality mitigation measures, in particular the construction dust suppression measures during dusty construction activities under dry and windy conditions.

8.07 On the other hand, special attention is drawn to some extremely high turbidity and SS levels detected during the Reporting Period and full implementation of the required water quality mitigation measures is reminded during pruning, felling and transporting of existing trees to be conducted in the near future in order to avoid disturbance of the stream water and henceforth prevent potential adverse environmental impacts on the water quality.

8.08 In addition, attention is drawn to implementation of the construction noise mitigation measures during noisy construction works.

ANNEX A

LOCATION PLAN FOR THE WORKS UNDER EP-277/2007/A



SETTING OUT TABLE FOR DRAINAGE CHANNEL

S.O.P.	DRAINAGE (m)	EASTING	NORTHING
BSA	0.00	837402.15	842743.22
P1	5.12	837390.58	842741.81
P2	13.20	837368.96	842736.31
P3	18.21	837358.17	842732.34
P4	80.34	837326.25	842707.75
P5	135.45	837298.45	842667.41
P6	188.77	837244.62	842663.97
P7	246.34	837182.55	842620.71
P8	272.32	837156.76	842615.66
P9	295.68	837145.71	842613.02
P10	316.83	837125.88	842603.08
P11	320.98	837115.22	842600.21
P12	327.58	837108.25	842598.76
EOA	344.64	837074.48	842585.40

NOTES:

1. ALL LEVELS ARE IN METERS ABOVE PRINCIPAL DATUM OF HONG KONG.
2. GRIDLINES ARE HONG KONG METRIC GRID(1980).
3. DIMENSIONS AND CHAINAGES ARE IN METERS, UNLESS OTHERWISE STATED.
4. THE CHAINAGE FOR THE CHANNELS ARE INDICATIVE ONLY. THE EXACT CHAINAGE MAY BE CHANGED ACCORDING TO THE SITE CONDITION.
5. THE EXACT LOCATION FOR THE REPROVISION OF WALLS, HOARDING AND GATES TO BE AGREED WITH THE ENGINEER ON SITE.
6. FLOOD WARNING SIGN REFER TO EGO STANDARD DRAWING NO. 001072.
7. EXACT LOCATIONS OF FLOOD WARNING SIGN SHALL BE AGREED WITH THE ENGINEER ON SITE.

LEGEND:

- WORKS LIMIT
- SETTING OUT POINT (S.O.P.) FOR CHANNEL
- BSA — BEGINNING OF ALIGNMENT
- EOA — END OF ALIGNMENT
- 300(D) (1:100) — U-CHANNEL WITH CONCRETE COVER IN THE DIRECTION OF FLOW AND SIZE SPECIFIED HORIZONTAL OF FALL SPECIFIED
- PROPOSED HANDRAIL
- PROPOSED FLOOD WARNING SIGN

FOR TENDER PURPOSES ONLY

Revision	Date	Description			Initial
	Designed	Checked	Drawn		Checked
Initial	WLC	CHW	CZ		CHW
Date	10/11	10/11	10/11		10/11

Approved

Contract No.
DC/2011/06

Contract Title
REPROVISIONING OF BOUNDARY PATROL ROAD AND ASSOCIATED SECURITY FACILITIES BETWEEN PING YUEN RIVER AND PAK FU SHAN AND DRAINAGE WORKS IN NORTH DISTRICT

Drawing Title
GENERAL LAYOUT PLAN FOR DRAINAGE CHANNEL MUP05

Drawing No.
DDP/DC1106/41011

Scale
1:500 A1
1:1000 A3

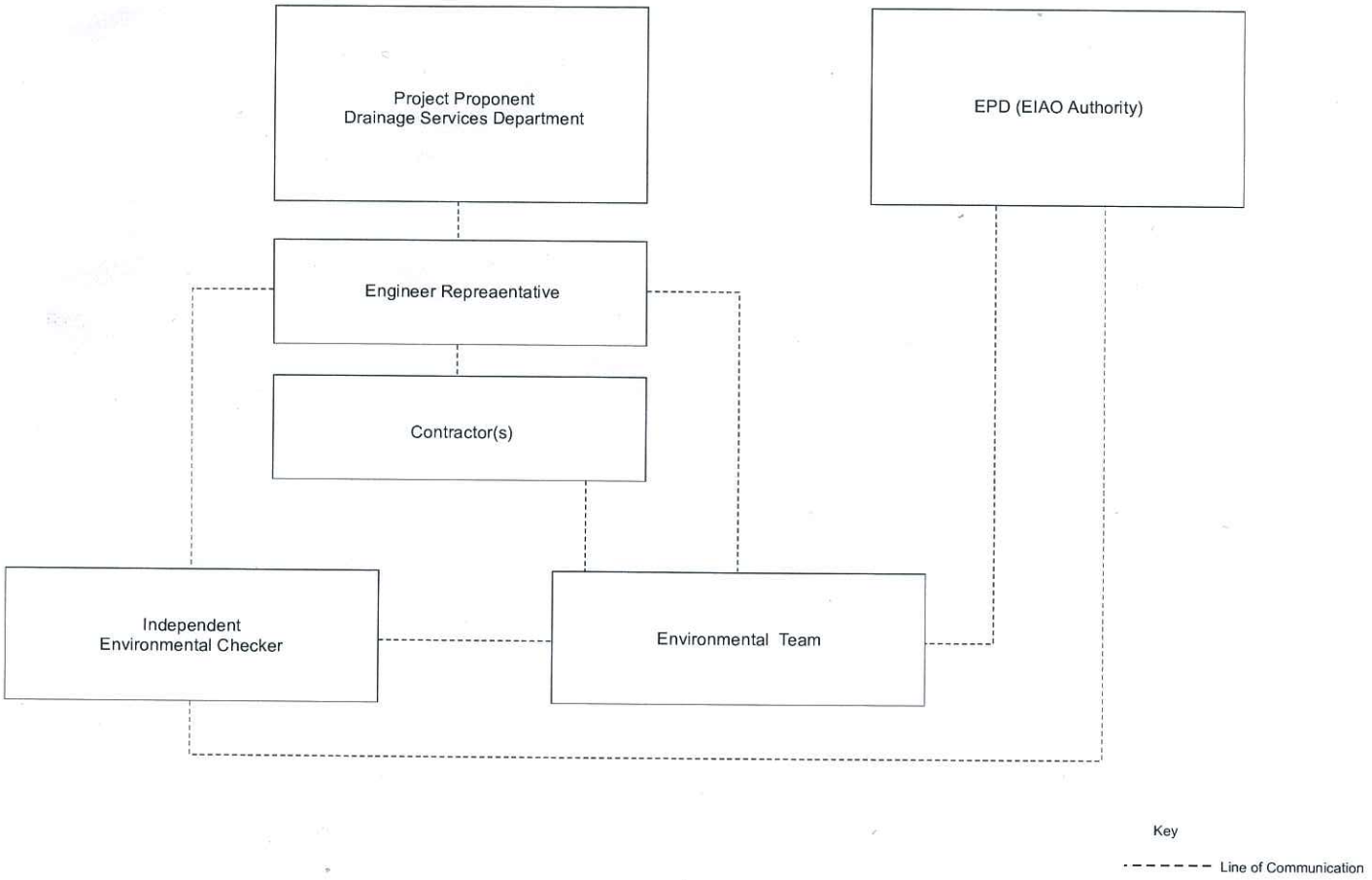
香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
布萊文顧問有限公司

CAD filename : h:\crystal\dsp\DDP-DC1106-41011.dgn

ANNEX B

ENVIRONMENTAL MANAGEMENT ORGANIZATION AND COMMUNICATION LINES



EM&A Organisation Chart

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Project Proponent / Employer	Mr. Eric Y. M. Cheng	2594-7341	2827-8700
Environ	Independent Environmental Checker	Mr. Roger W. K. Leung	3743-0754	3548-6988
CHCC	Project Manager	Mr. Raymond Yau	2403 1165	2403 1165
SHCC	Site Agent	Mr. Elvin Lam	2640 9286	2640 9286
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Senior Environmental Consultant	Mr. Wong Fu Nam	2959-6059	2959-6079
AUES	Environmental Team Supervisor	Mr. Ben Tam	2959-6059	2959-6079

24-Hour Hotline Telephone Number for the Public to Make Enquiries

24-Hour Hotline: 6770 3827
Contact Person: Mr. Mocha Mok

Legends:

DSD *(Project Proponent / Engineer) – Drainage Services Department*

SHCC *(Main Contractor) –Sang Hing Civil Constructors Co., Ltd*

Environ *(IEC) – Environ Hong Kong Limited*

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

ANNEX C

IMPLEMENTATION SCHEDULE

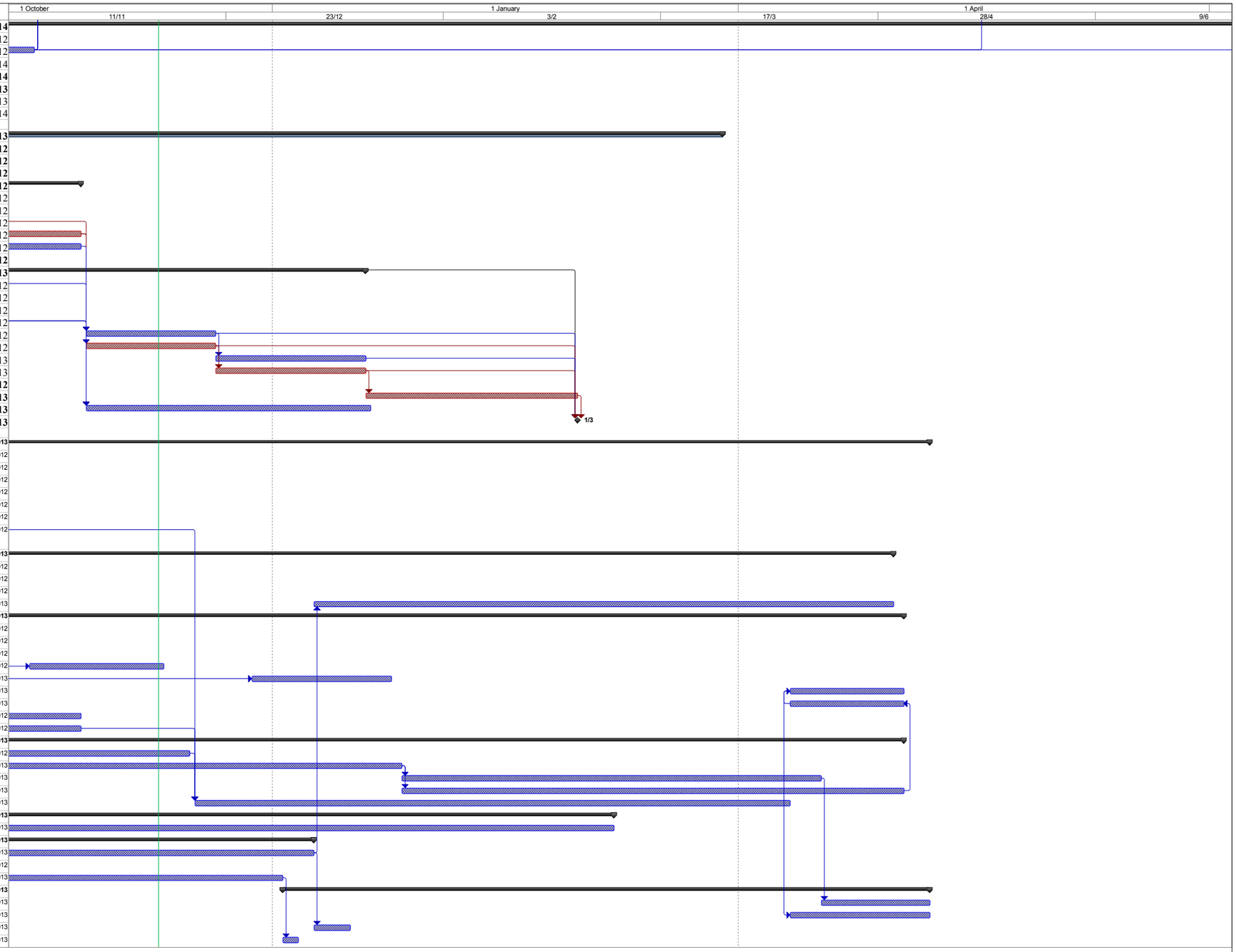
FOR ENVIRONMENTAL MITIGATION MEASURES

**(REFER TO *ANNEX C OF THE*
*First Monthly EM&A Report for Drainage Works under EP-277/2007/A)***

ANNEX D

3-MONTH ROLLING CONSTRUCTION PROGRAM

ID	Task Name	Duration	Start	Finish
1785	**3. CH_R 4+000 to 4+271**	**409 days**	**17/10/2012**	**5/3/2014**
1786	3.1 Tree survey	10 days	17/10/2012	29/10/2012
1787	3.2 Tree felling	15 days	30/10/2012	15/11/2012
1788	3.3 Tree compensation (430nos)	12 days	20/2/2014	5/3/2014
1789	**Security system by EMSD**	**104 days**	**29/10/2013**	**5/3/2014**
1790	**1. Installation**	**50 days**	**29/10/2013**	**27/12/2013**
1791	CH 2838-4271	50 days	29/10/2013	27/12/2013
1792	**2. Testing and Commissioning**	54 days	28/12/2013	5/3/2014
1793				
1794	**Construction of Portion D**	**294 days**	**31/3/2012**	**28/3/2013**
1795	**Possession of Site**	**1 day**	**31/3/2012**	**31/3/2012**
1796	**Setting out and site clearance**	**24 days**	**2/4/2012**	**5/5/2012**
1797	**Traffic diversion**	**45 days**	**2/4/2012**	**30/5/2012**
1798	**Box culvert**	**148 days**	**31/5/2012**	**24/11/2012**
1799	1. Box culvert CH 97-103.4	46 days	31/5/2012	25/7/2012
1800	2. Box culvert CH 90-97	32 days	2/8/2012	7/9/2012
1801	3. Box culvert CH 40-50	32 days	8/9/2012	17/10/2012
1802	4. Box culvert CH 34-40	32 days	18/10/2012	24/11/2012
1803	5. Box culvert CH 50-56	32 days	18/10/2012	24/11/2012
1804	**Reinstate existing road**	**6 days**	**26/7/2012**	**1/8/2012**
1805	**Rectangular channel**	**222 days**	**24/4/2012**	**18/1/2013**
1806	1. Rectangular channel CH 56- 60	22 days	24/4/2012	21/5/2012
1807	2. Rectangular channel CH 70-80	22 days	24/4/2012	21/5/2012
1808	3. Rectangular channel CH 60-70	22 days	22/5/2012	15/6/2012
1809	4. Rectangular channel CH 80-90	22 days	22/5/2012	15/6/2012
1810	5. Rectangular channel CH 30-34	22 days	26/11/2012	20/12/2012
1811	6. Rectangular channel CH 10-20	22 days	26/11/2012	20/12/2012
1812	7. Rectangular channel CH 20-30	22 days	21/12/2012	18/1/2013
1813	8. Rectangular channel CH 7-10	22 days	21/12/2012	18/1/2013
1814	**Protect existing structure near CH 54**	**120 days**	**2/4/2012**	**28/8/2012**
1815	**Inlet apron CH 0-7**	**32 days**	**19/1/2013**	**28/2/2013**
1816	**Reinstate existing structure**	**45 days**	**26/11/2012**	**19/1/2013**
1817	**Type 2 railing**	**24 days**	**1/3/2013**	**28/3/2013**
1818				
1819	**Construction of Portion E**	**323 days**	**31/3/2012**	**7/5/2013**
1820	**Possession of Site**	1 day	31/3/2012	31/3/2012
1821	**Site clearance**	30 days	31/3/2012	11/5/2012
1822	**Setting out**	15 days	12/5/2012	29/5/2012
1823	**Utilies detection**	7 days	30/5/2012	6/6/2012
1824	**Utility Diversion**	20 days	14/9/2012	9/10/2012
1825	**Liasion with villagers**	45 days	30/5/2012	23/7/2012
1826	**Reprovisioning of existing boundary fence for private lots**	30 days	24/7/2012	27/8/2012
1827	**Landscaping Works**	**273 days**	**30/5/2012**	**30/4/2013**
1828	1. Tree Survey	30 days	30/5/2012	5/7/2012
1829	2. Tree felling	60 days	6/7/2012	13/9/2012
1830	3. Transplant	90 days	6/7/2012	20/10/2012
1831	4. Compensatory planting	89 days	9/1/2013	30/4/2013
1832	**Transition Section**	**244 days**	**6/7/2012**	**2/5/2013**
1833	1. CH 359-364 (S18)	22 days	6/7/2012	31/7/2012
1834	2. CH 328-333 (S16)	22 days	10/10/2012	5/11/2012
1835	3. CH 317-321 (S14)	22 days	10/10/2012	5/11/2012
1836	4. CH 272-276 (S12)	22 days	15/11/2012	10/12/2012
1837	5. CH 168-171 (S10)	22 days	28/12/2012	23/1/2013
1838	6. CH 148-151 (S8)	18 days	11/4/2013	2/5/2013
1839	7. CH 134-137 (S6)	18 days	11/4/2013	2/5/2013
1840	8. CH 81-86 (S4)	22 days	31/10/2012	24/11/2012
1841	9. CH 67-70 (S2)	22 days	31/10/2012	24/11/2012
1842	**Gabion Wall Channel**	**184 days**	**14/9/2012**	**2/5/2013**
1843	1. CH 333-359 (27m type B1) with 1 gang (S17)	77 days	14/9/2012	15/12/2012
1844	2. CH 276-317 (41m type B1) with 2 gangs (S13)	79 days	22/10/2012	25/1/2013
1845	3. CH 151-168 (17m type B1) with 1 gang (S9)	62 days	26/1/2013	16/4/2013
1846	4. CH 86-134 (48m type B1) with 2 gangs (S5)	75 days	26/1/2013	2/5/2013
1847	5. CH 0-67 (67m type A1) with 2 gangs (S1)	89 days	17/12/2012	10/4/2013
1848	**Box Culvert**	**156 days**	**28/8/2012**	**7/3/2013**
1849	CH 171-272 (9 bays) (S11)	156 days	28/8/2012	7/3/2013
1850	**Vehicular Crossing**	**109 days**	**28/8/2012**	**8/1/2013**
1851	1. VBM05-4 (S15)	52 days	6/11/2012	8/1/2013
1852	2. VBM05-1 (S3)	52 days	28/8/2012	30/10/2012
1853	**Pedestrian Crossing FBM05-1 (S7)**	52 days	31/10/2012	2/1/2013
1854	**Railing**	**99 days**	**3/1/2013**	**7/5/2013**
1855	1. gabion wall and box culvert	17 days	17/4/2013	7/5/2013
1856	2. transition	22 days	11/4/2013	7/5/2013
1857	3. vehicular crossing	6 days	9/1/2013	15/1/2013
1858	4. pedestrian crossing	3 days	3/1/2013	5/1/2013



Project No: DC/2011/06
Master Programme: MP02
Date: 08-10-2012

progress | Milestone | Project Summary | External Milestone | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only | Critical Split | Deadline
Split | Summary | External Tasks | Inactive Task | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | Critical | Progress

ANNEX E

IMPACT MONITORING SCHEDULE

IMPACT MONITORING SCHEDULE FOR THE REPORTING PERIOD

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

	Monitoring Day
	Sunday or Public Holiday

IMPACT MONITORING SCHEDULE FOR THE NEXT MONITORING PERIOD

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

	Monitoring Day
	Sunday or Public Holiday

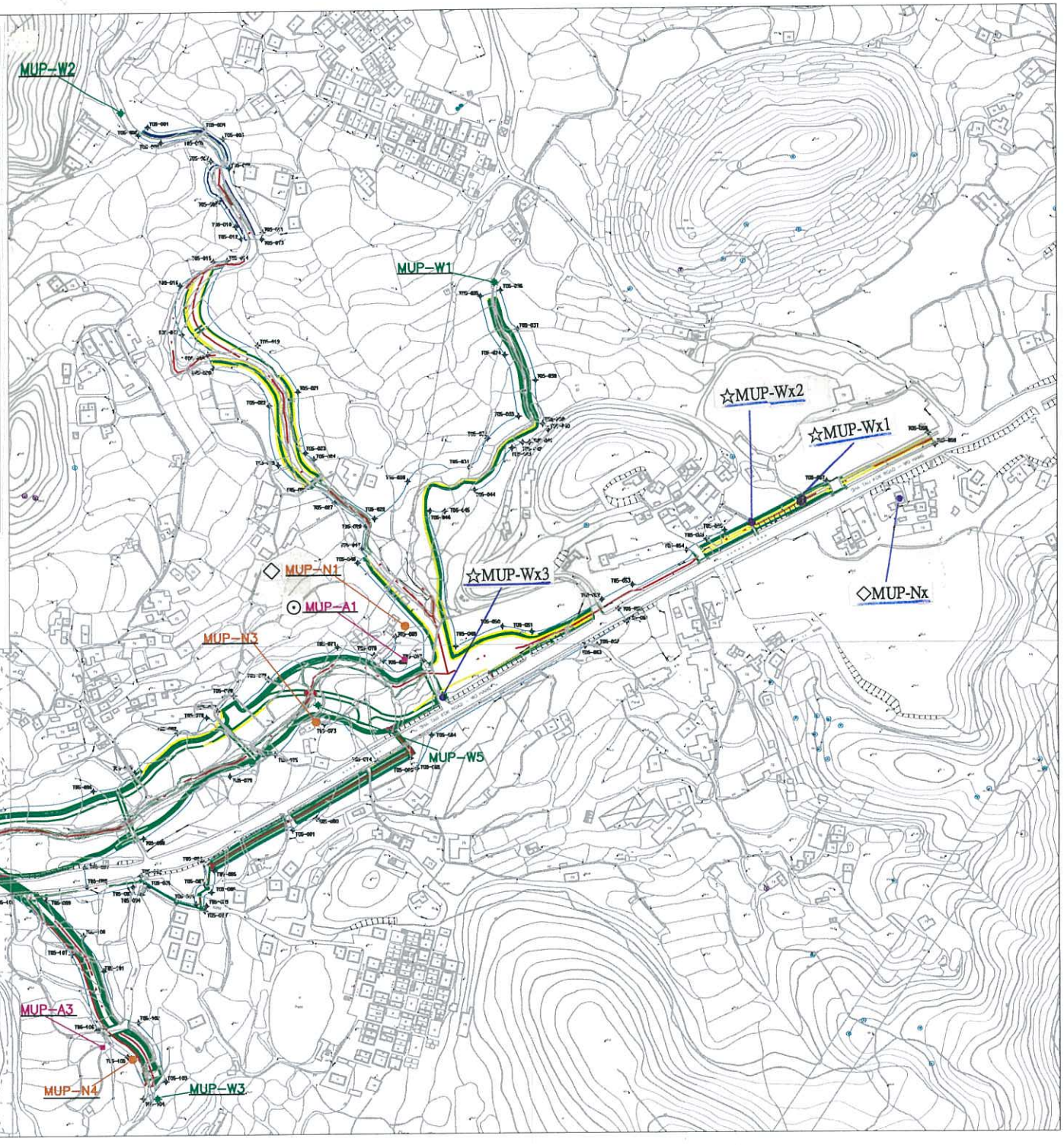
ANNEX F

MONITORING LOCATIONS

LOCATION PLAN FOR ENVIRONMENTAL MONITORING STATIONS

Legend:

⊙ MUP-A1	**Air Quality Monitoring Location**
◇ MUP-N1	**Construction Noise Monitoring Location**
☆ MUP-W	**Water Quality Monitoring Location**



ANNEX G
MONITORING EQUIPMENT CALIBRATION CERTIFICATES

*MONITORING EQUIPMENT CALIBRATION CERTIFICATES**

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	TSP Sampler Calibration Spreadsheet for MUP-A1**	13 Sep 12	13 Nov 2012
2		Dust Trak Model 8520 (Serial Number 23080)	8 Mar 12	8 Mar 2013
3		AM510 (Serial No. 11008018)	16 Aug 2012	16 Aug 2013
5	Noise	Bruel & Kjaer Integrating Sound Level Meter EQ010 (Serial No. 2285721)	20 Apr 12	20 Apr 13
6		Bruel & Kjaer Integrating Sound Level Meter EQ082 (Serial No. 2713428)	20 Apr 12	20 Apr 13
7		NL-31 Rion Sound Level Meter EQ068 (Serial No. 00410247)	20 Apr 12	20 Apr 13
8		Bruel & Kjaer 4231 Acoustical Calibrator (Serial number 2713428)	20 Apr 12	20 Apr 13

Note:

* *This Appendix G presents only calibration certificates of new monitoring equipment or those expired and re-calibrated during the Reporting Period (**Renewed Item No. and Calibration dates will be highlighted for ease of checking**). No valid calibration certificates presented in the previous report will be dittoed under environmental consideration.*

** *No calibration for TSP Sampler was performed due to power failure of the HVS. The calibration will be re-instated and included in this Annex upon re-instatement of the power supply to the HVS.*

ANNEX H

EVENT/ ACTION PLAN

Table 2.4
Event/Action Plan for Air Quality

EVENT	ACTION			
	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 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 ET Leader. 2. Check Contractor's working method 3. Discuss with 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 ET Leader 2. Check Contractor's working method 3. Discuss with 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, 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.

Table 3.3 Event/Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC, Contractor and ER 2. Carry out investigation and identify source 3. Report the results of investigation to the IEC, Contractor and ER 4. Discuss with the Contractor and formulate remedial measures 5. Increase monitoring frequency 6. Check compliance to Action/Limit Levels after application of mitigation measures	1. Review the analysed results submitted by the ET Leader 2. Review the proposed remedial measures by the Contractor and advise the ER & ET accordingly 3. Review the implementation of remedial measures	1. Confirm receipt of notification of complaint in writing 2. Notify Contractor 3. Check monitoring data submitted by the ET 4. Require Contractor to propose remedial measures for the analysed noise problem 5. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to ER and IEC within three working 2. Liaise with the ER to ensure the effectiveness of the agreed mitigation 3. Amend proposal if required 4. 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. Check monitoring data submitted by ET 2. Discuss amongst ER, ET Leader and Contractor on the potential remedial actions 3. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER & ET accordingly 4. Audit the implementation of remedial measures	1. Confirm receipt of notification of exceedance 2. Notify Contractor 3. Check monitoring data submitted by the ET 4. Require Contractor to propose remedial measures for the analysed noise problem 5. Discuss with ET, IEC and Contractor on proposed remedial actions to be implemented 6. Ensure remedial measures are properly implemented 7. Assess the effectiveness of the remedial actions and keep the Contractor informed 8. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to ER within 3 working days of notification 3. Liaise with the ER to ensure the effectiveness of the agreed mitigation 4. Amend proposal if required 5. Implement the agreed proposals 6. Resubmit proposals if problem still not under control 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table 4.6 Event and Action Plan for Water Quality

Event	ET Leader	IEC	ER	Contractor
Action Level being exceeded by one sampling day	1. Repeat in-site measurement to confirm findings. 2. Identify source(s) of impact. 3. Inform IEC an Contractor. 4. Check monitoring data, all plant, equipment and Contractor's working methods. 5. Discuss mitigation measures with IEC and Contractor. 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures. 2. Review proposals on mitigation measures. submitted by Contractor and advise the ER accordingly. 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures. 2. Make agreement on the mitigation measures to be implemented. 3. Assess effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing. 2. Rectify unacceptable practice. 3. Check all plant and equipment. 4. Consider changes of working methods. 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER. 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact. 3. Inform IEC and Contractor. 4. Check monitoring data, all plant, equipment and Contractor's working methods. 5. Discuss mitigation measures with IEC and Contractor. 6. Ensure mitigation measures are implemented. 7. Prepare to increase the monitoring frequency to daily. 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures. 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly. 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures. 2. Make agreement on the mitigation measures to be implemented. 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing. 2. Rectify unacceptable practice. 3. Check all plant and equipment. 4. Consider changes of working methods. 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days. 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings. 2. Identify source(s) of impact. 3. Inform IEC, contractor and EPD. 4. Check monitoring data, all plant, equipment and Contractor's working methods. 5. Discuss mitigation measures with IEC, ER and Contractor. 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Discuss with ET and Contractor on the mitigation measures. 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly. 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures. 2. Request Contract to critically review the working methods. 3. Make agreement on the mitigation measures to be implemented. 4. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing. 2. Rectify unacceptable practice. 3. Check all plant and equipment. 4. Consider changes of working methods. 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days. 6. Implement the agreed mitigation measures.

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

ANNEX I

24-HR TSP DATA AND

GRAPHICAL PLOTS OF ENVIRONMENTAL MONITORING RESULTS

A) AIR QUALITY

B) CONSTRUCTION NOISE

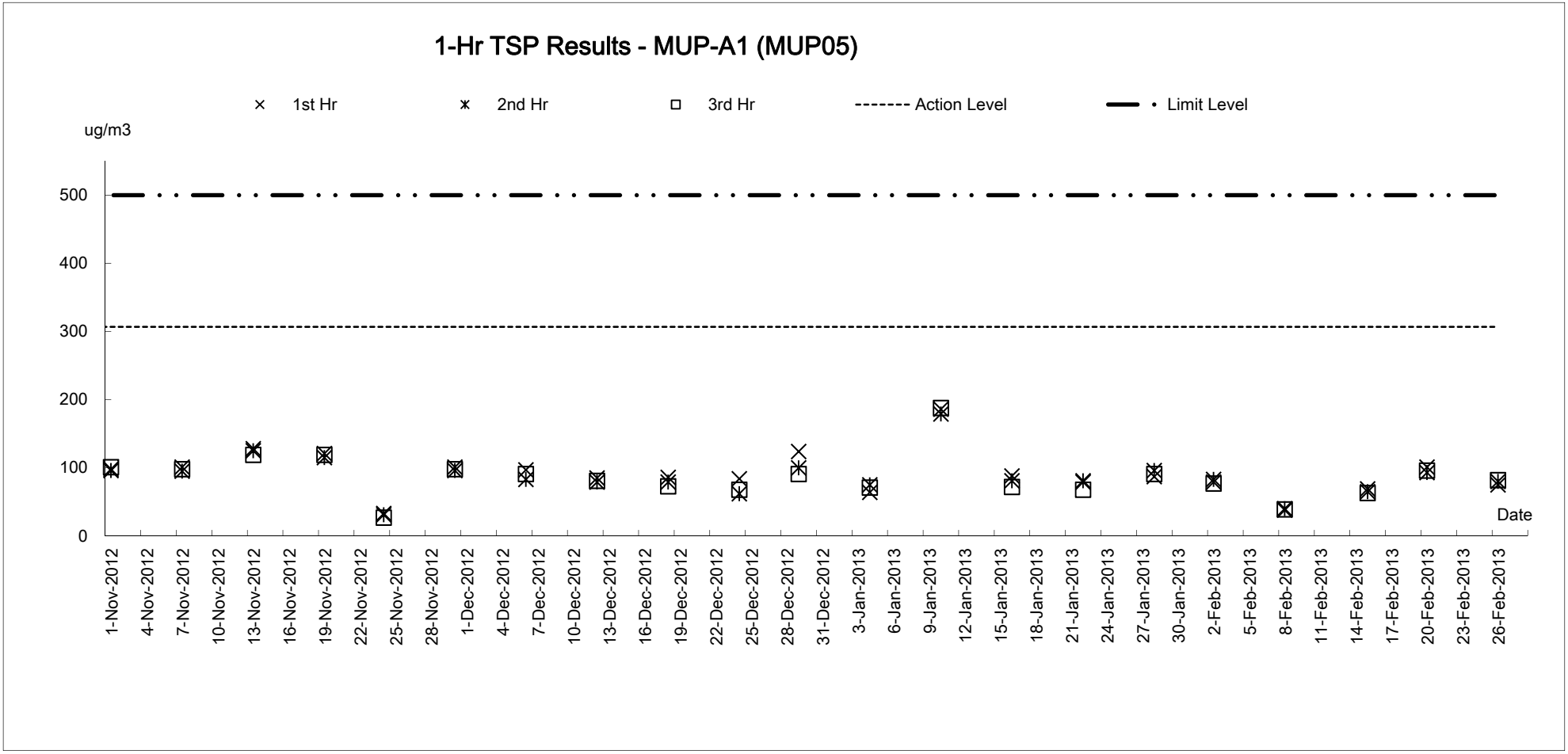
C) WATER QUALITY

24-HR TSP DATA – MUP-A1 Data Not Available due to power failure (Action Level: 156 Limit Level: 260**)**

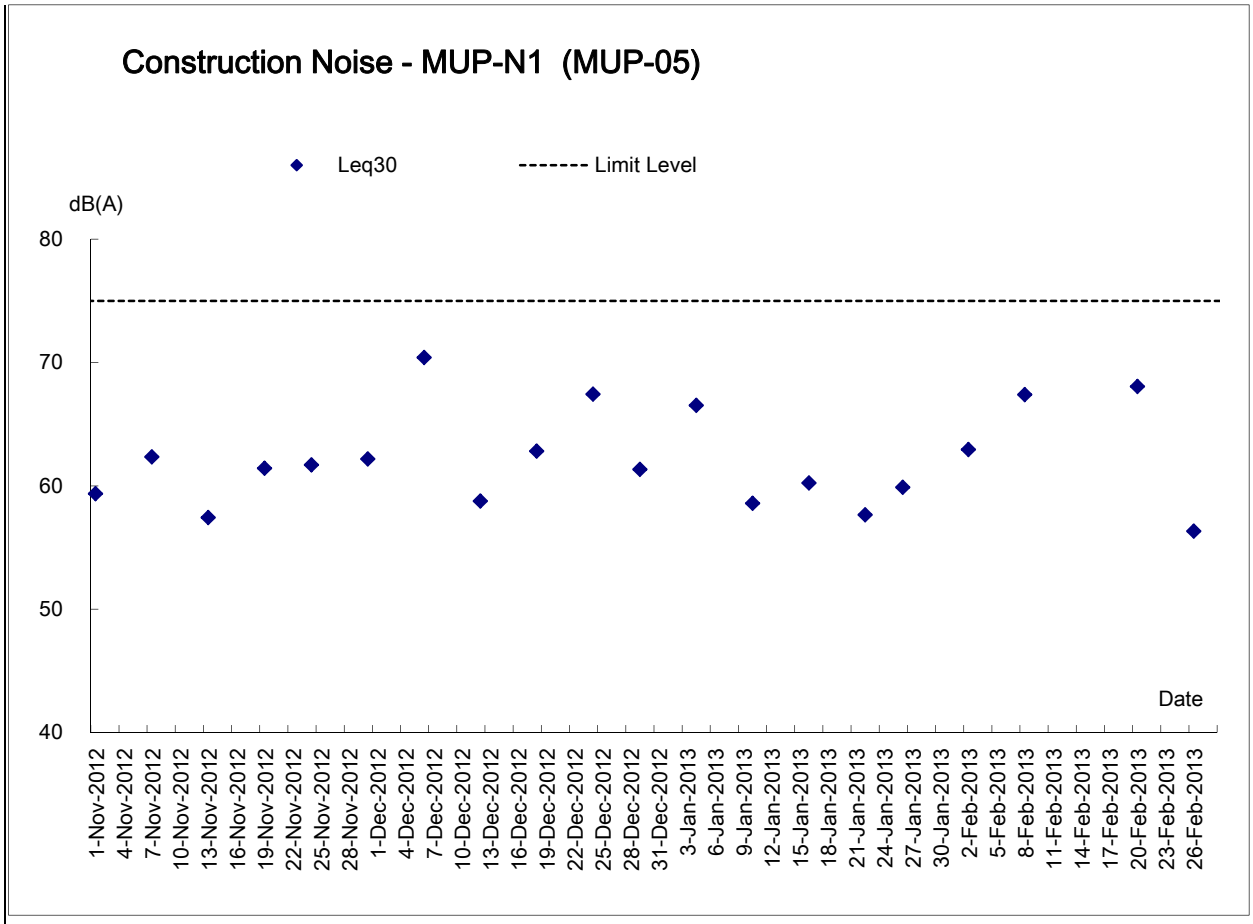
GRAPHICAL PLOTS OF ENVIRONMENTAL MONITORING RESULTS

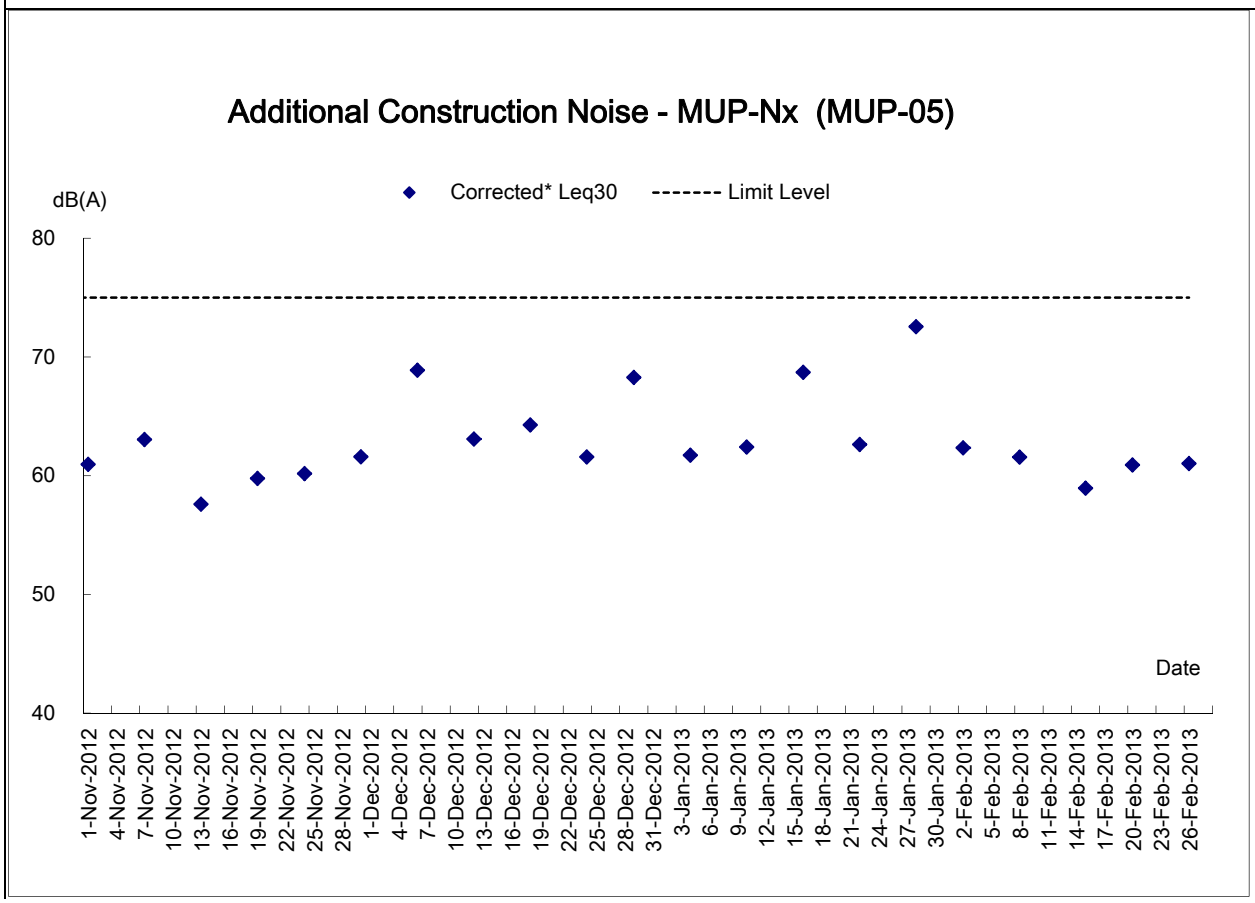
A) AIR QUALITY

24-Hr TSP- No graphical plot is presented due to lack of monitoring data

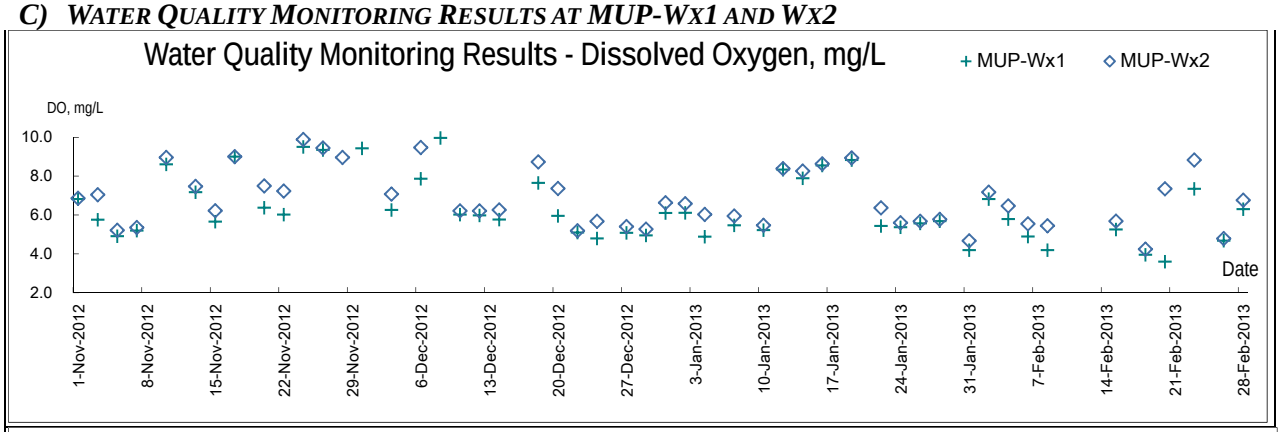


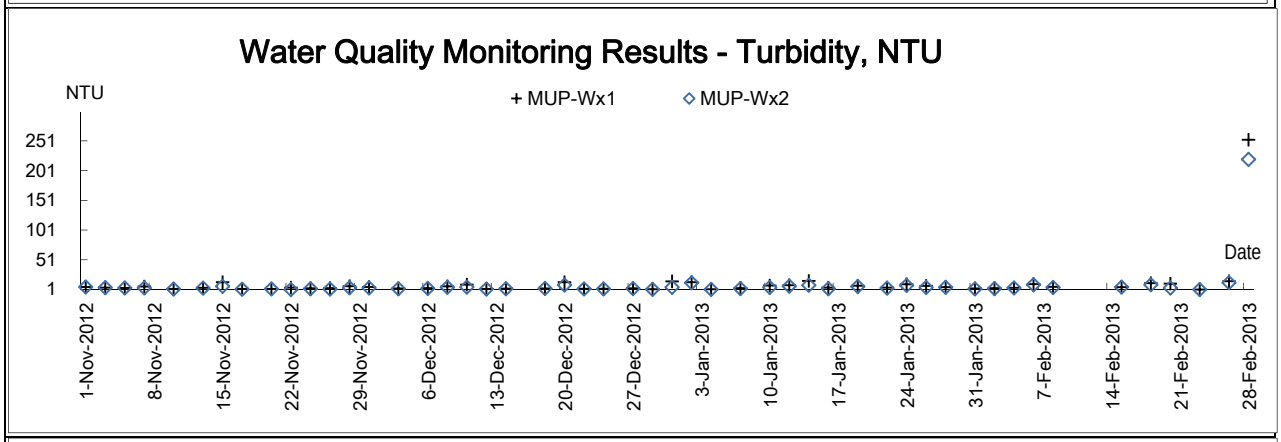
B) CONSTRUCTION NOISE

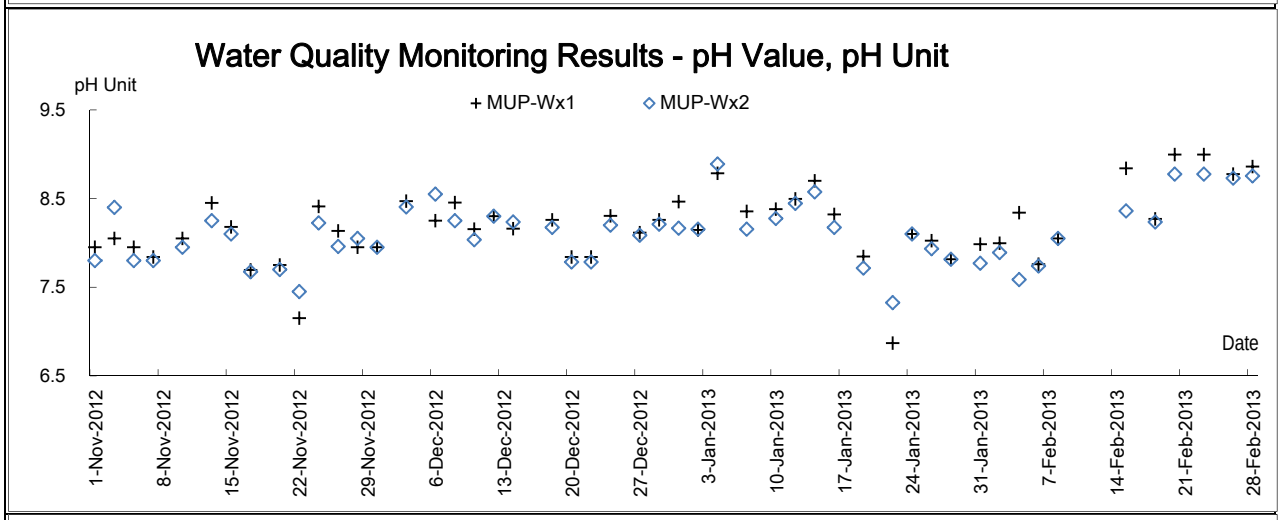


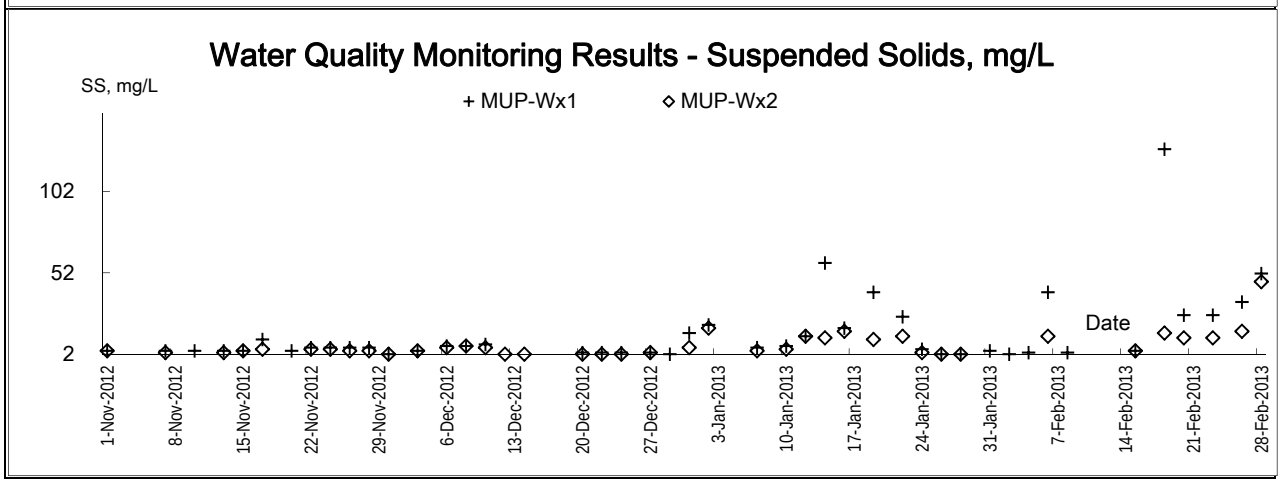


C) WATER QUALITY MONITORING RESULTS AT MUP-WX1 AND WX2









ANNEX J

METEOROLOGICAL DATA

Meteorological Data from HKO for the Reporting Period

Date		Weather	*Total Rainfall (mm)	Ta Kwu Ling			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Feb-13	Fri	Cloudy, fog, rain, light to moderate easterly winds.	-	20.4	9	69.5	E
2-Feb-13	Sat	Cloudy, fog, rain, light to moderate easterly winds.	-	21.1	10.5	66	E/SE
3-Feb-13	Sun	Warm, rain, sunny periods, moderate easterly winds	-	19.4	10.3	75.5	E/SE
4-Feb-13	Mon	Warm, sunny periods, moderate easterly winds	0.5	21.8	4.7	79	E/SE
5-Feb-13	Tue	Warm, rain, sunny periods, moderate easterly winds	-	22.5	6.5	78.5	E
6-Feb-13	Wed	Warm, sunny periods, moderate easterly winds	-	23	7.9	79.5	E
7-Feb-13	Thu	Cloudy, rain, fresh east to northeasterly winds.	-	20.2	15	79	E/SE
8-Feb-13	Fri	Warm, rain, sunny periods, moderate easterly winds	1.0	14.9	7.7	81	E/SE
9-Feb-13	Sat	Cloudy, rain, fresh east to northeasterly winds.	-	11.8	7.5	69.2	N
10-Feb-13	Sun	Warm, rain, sunny periods, moderate easterly winds	-	14	10	71	N
11-Feb-13	Mon	Warm, rain, sunny periods, moderate easterly winds	-	18.5	11.2	78.2	E/SE
12-Feb-13	Tue	Cloudy, rain, fresh east to northeasterly winds.	-	18.5	9.2	70.5	E
13-Feb-13	Wed	Cloudy, rain, fresh east to northeasterly winds.	-	17.2	8	66.2	E
14-Feb-13	Thu	Warm, rain, sunny periods, moderate easterly winds	-	18.9	7.7	74.7	E
15-Feb-13	Fri	Cloudy, sunny periods, Light winds.	0.5	22.4	9.2	77.5	E/SE
16-Feb-13	Sat	Cloudy, fog, warm, light to moderate southeasterly winds	0.5	16.6	11	80	E/SE
17-Feb-13	Sun	Cloudy, sunny periods, Light winds.	-	18.9	5.9	74.5	E
18-Feb-13	Mon	Cloudy, fog, warm, light to moderate southeasterly winds	-	21.4	6.1	79.7	E
19-Feb-13	Tue	Sunny periods, fog, rain, light winds, winds will freshen from the east to northeast	-	22.2	6.1	75.7	E/SE
20-Feb-13	Wed	Cloudy, bright, fresh east to northeasterly winds.	-	17.1	6.1	66	N
21-Feb-13	Thu	Cloudy, sunny periods, moderate east to northeasterly winds.	-	19.1	5	70.5	E/NE
22-Feb-13	Fri	Cloudy, sunny periods, moderate east to northeasterly winds.	-	18.6	8.2	70.5	N/NW
23-Feb-13	Sat	Cloudy, bright, fresh east to northeasterly winds.	-	17.1	7.4	65.5	E
24-Feb-13	Sun	Cloudy, sunny periods, moderate east to northeasterly winds.	-	18.2	11.5	65.7	E/SE
25-Feb-13	Mon	Cloudy, fog, rain, sunny intervals,fresh easterly winds.	-	20.7	11.3	68.7	E/NE
26-Feb-13	Tue	Rain, sunny intervals, fog, moderate east to southeasterly winds.	-	22.8	9.7	73.2	E
27-Feb-13	Wed	Cloudy, rain, fog, moderate east to southeasterly winds.	-	23.8	4.5	77.5	W/SW
28-Feb-13	Thu	Cloudy, rain, fog, moderate east to southeasterly winds.	-	19.7	12.9	86.5	E/SE

**Note*:

- means no rainfall

****** unavailable*

 # missing (less than 24 hourly observations a day)

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

ANNEX K

WASTE FLOW TABLE AND SUMMARY OF WORKS PROCESSES OR ACTIVITIES REQUIRING TIMBER FOR TEMPORARY WORKS

Monthly Summary Waste Flow Table

Name of Department: DSD

Contract No.: DC/2011/06

Monthly Summary Waste Flow Table for Feb 2013

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported 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 '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan-12	N/A	---	---	---	---	---	---	---	---	---	---
Feb-12	N/A	---	---	---	---	---	---	---	---	---	---
Mar-12	N/A	---	---	---	---	---	---	---	---	---	---
Apr-12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May-12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013
Jun-12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Jul-12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug-12	0.007	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep-12	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.154
Oct-12	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.058
Nov-12	0.005	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042
Dec-12	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
Jan-13	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.035
Feb-13	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
Total	0.023	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.359

Notes :

(1) Note Used.

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.

(4) The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring.

Summary Table for Work Processes or Activities Requiring Timber for Temporary Works

Contract No.: DC/2011/06

Contract Title: *Reprovisioning of Boundary Patrol Road and Associated Security Facilities between Ping Yuen River and Pak Fu Shan and Drainage Works in North District*

Report Period: Feb-13

Item No	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m^3)	Actual Quantities used (m^3)	Remarks
1	Transition formwork & falsework (Portion A,B,E)	Temperary formwork & falsework design	10	9	
2	Transition formwork & falsework (Portion A,B,C)	Temperary formwork & falsework design	25	18	
3	Transition formwork & falsework (Portion A,B,C,E)	Temperary formwork & falsework design	52	40	
4	Transition formwork & falsework (Portion A,B,C,E)	Temperary formwork & falsework design	77	72	
5	Transition formwork & falsework (Portion A,B,C,E)	Temperary formwork & falsework design	102	86	
6	Transition formwork & falsework (Portion A,B,C,E)	Temperary formwork & falsework design	115	103	
7	Transition formwork & falsework (Portion A,B,C,E)	Temperary formwork & falsework design	121	112	
		Total Estimated Quantity of Timber Used	502		

Notes

(a) The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.

(b) The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring