PROJECT NO.: TCS/00394/12

CONTRACT NO. DC/2007/06 –
RIVER IMPROVEMENT WORKS IN UPPER LAM TSUEN RIVER, SHE SHAN RIVER AND UPPER TAI PO RIVER

52ND MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT FOR UPPER TAI PO RIVER – DECEMBER 2012

PREPARED FOR
CHIU HING CONSTRUCTION AND TRANSPORTATION COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified by
4 February 2013	TCS00396/12/600/R0039v2	Nicola Hon (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

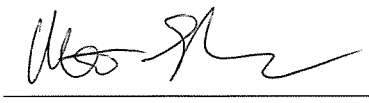
Ver.	Date	Description
1	10 January 2013	First submission
2	4 February 2013	Amended against IEC's comments on 21 January 2013

The Content of this report has been

Certified by

Mr. T.W. Tam
(Environmental Team Leader)

4/2/13
Date



Dr. Mark Shea
(Ecologist)

4/2/13
Date

And Verified by

Ms. Winnie Ko
(Independent Environmental Checker)

6/2/13
Date

EXECUTIVE SUMMARY

ES.01. This is the **fifty-second (52nd)** monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Services Department (DSD) Contract No. DC/2007/06 entitled "River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River" (hereinafter "the Project"). This report concludes the impact monitoring results and findings for the activities undertaken during the period from **1st to 31st December 2012** (hereinafter "the Reporting Period").

ES.02. The Environmental Team (ET) is responsible for the EM&A works required in the EM&A manual. Site inspections were carried out on weekly basis to investigate and audit the equipment and work methodologies with respect to pollution control and environmental mitigation. The weekly inspection records and photos taken were kept.

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.03. Environmental Team had carried out construction noise monitoring on weekly basis and no exceedance was found in the Reporting Period. The noise monitoring results collected in the Reporting Period are presented in ***Section 4***.

ES.04. In the Reporting Period, weekly ecological inspections were carried out on **3rd, 10th, 17th, and 24th and 31st December 2012**.

ES.05. In the Reporting Period, 4 events of site inspection were carried out by the ET on **5th, 12th, 19th and 27th December 2012** in which on **5th, 12th and 27th December 2012** were joint weekly environmental site inspections with the Contractor, Independent Environmental Checker (IEC) and Engineer's Representative (ER). Also, DSD's representatives attended the site inspection with the IEC and ER on **18th December 2012**. In the Reporting Period, **5** observations were recorded but no non-compliance was identified.

ES.06. As no piling work conducted, no vibration monitoring was performed in this Reporting Period.

ES.07. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occurrences
Construction Noise	$L_{eq30min}$ Daytime	44
Inspection / Audit	Weekly Environmental inspection by the ET	4
Ecological	Ecological Impact Monitoring	0
	Weekly inspection by the Ecologist	4

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.08. No noise complaint (which is an Action Level exceedance) was received in the Reporting Period. Also, no Limit Level exceedance of noise monitoring was recorded.

ENVIRONMENTAL COMPLAINT

ES.09. No written or verbal complaint in relation to environmental matters was recorded in the Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

ES.10. No environmental summons or successful prosecution was recorded in the Reporting Period.

REPORTING CHANGE

ES.11. No reporting change was made in the Reporting Period.

FUTURE KEY ISSUES

ES.12. During dry season, dust control measures to avoid fugitive dust in the construction site should be properly provided and maintained, as appropriate. In addition, water quality mitigation measures such as prevention of muddy water and other water quality pollutants via site surface water runoff into the local stream of Tai Po River should be fully implemented.

ES.13. On the other hand, construction noise will be another key environmental issue. Noise mitigation measures should be implemented in accordance with the EM&A Manual.

ES.14. The Contractor is reminded to provide environmental pollution control measures wherever necessary and keep a good environmental management for site practice.

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1.0 INTRODUCTION

PROJECT BACKGROUND

1.01 This is the **fifty-second (52nd)** monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Services Department Contract No. DC/2007/06 entitled "River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River".

1.02 Site layout plan of Upper Tai Po River is shown in ***Appendix A.*** Approximately 0.6km of Upper Tai Po River will be improved to enhance the hydraulic performance of the river. The location of the project site at Upper Tai Po River starts from Ta Tit Yan of Tai Mo Shan, flows from southeast to northeast alongside Wilson Trail, turning northward before joining the Lam Tsuen River and then runs towards Tai Po Market. To the east of the river, there are active and abandoned cultivated lands. Village settlements are mainly located on the west and northeast side of the river bank, where the San Uk Ka and Lai Chi Shan establishment also lie. The construction of the proposed improvement works for Upper Tai Po River has commenced on 15th September 2008 and substantially completed on 31 December 2012. The improvement works comprise of the following:

- Re-profiling and realignment of the channel;
- Inclusion of gabions and retaining wall for bank protection whilst providing a natural channel bed; and
- Re-provisioning of footbridges and footpaths along the channel.

1.03 Since 12th July 2012, Action United Environmental Services & Consulting (AUES) has been appointed by Chiu Hing Construction and Transportation Company Limited (hereinafter "the Contractor") as the Environmental Team replacing Environmental Pioneers & Solutions Limited to implement the EM&A programme and prepare report.

1.04 This report presents the results of the environmental monitoring conducted at Upper Tai Po River in **December 2012**. It includes weekly site inspections to verify the implementation of the mitigation measures as recommended in Environmental Permit EP-223/2005/A, EM&A Manual, the Particular Specifications of the Contract and the Contractor's Environmental Management Plan (EMP).

REPORT STRUCTURE

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

Section 1	**Introduction**
Section 2	**Construction Progress and Submission**
Section 3	**EM&A Program Requirement for Upper Tai Po River**
Section 4	**Noise Monitoring Results**
Section 5	**Vibration Monitoring Results**
Section 6	**Ecology Monitoring Results**
Section 7	**Site Inspections**
Section 8	**Waste Management**
Section 9	**Environmental Complaint and Non-Compliance**
Section 10	**Implementation Status of Mitigation Measures**
Section 11	**Impact Forecast**
Section 12	**Conclusions and Recommendations**

2.0 CONSTRUCTION PROGRESS AND SUBMISSION

CONSTRUCTION PROGRESS

2.01 The proposed construction sequences are shown in the following:

- Site clearance and preparation works
- Construction of maintenance access which involves construction of retaining walls
- River channel construction and excavation, involving excavation works, construction of retaining walls and gabion walls
- Construction of additional boulder trap and additional stilling basins with baffle blocks
- Provision of riverbed treatment
- Re-provisioning of footbridges
- Construction of footpaths
- Landscaping works

2.02 The major construction activities undertaken at Upper Tai Po River in the Reporting Period are listed below:-

- Formation of riverbed;
- Construction of dwarf walls;
- Construction of retaining walls;
- Construction of surface drains;
- Construction of footpath;
- Construction of inclined gabion walls;
- Installation of steel decking;
- Construction of gabion mattress; and
- Laying of underground utilities.

2.03 The master and three month rolling construction programs are enclosed in ***Appendix B***.

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.04 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Contract in the Reporting Period is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Description	License / Permit No.	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-223/2005	31 Aug 2005	N/A	Superseded by EP-223/2005/A
Amended Environmental Permit	EP-223/2005/A	18 Nov 2008	N/A	Issued
Construction Noise Permit	NA	N/A	N/A	N/A
Effluent Discharge License	3678	14 Mar 2008	31 Mar 2013	Issued
Registration as a Chemical Waste Producer	5213-724-C3251-03	19 Dec 2007	N/A	Issued
Billing Account for Disposal of Construction Waste	7006101	N/A	N/A	N/A

3.0 EM&A PROGRAM REQUIREMENT FOR UPPER TAI PO RIVER

3.01 The EM&A requirements set out in the Environmental Permit EP-223/2005/A (hereinafter 'the EP'), and the associated EM&A Manual, are presented in the following sub-sections.

MONITORING PARAMETERS

3.02 According to the EM&A Manual, the monitoring requirements under this Contract are listed in ***Table 3-1***.

Table 3-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter '$L_{eq(30min)}$' during the normal working hours; and • A-weighted equivalent continuous sound pressure level (15min) (hereinafter '$L_{eq(15min)}$' for construction work during the restricted hours.
*Ecology	Inspection and auditing the proper implementation of mitigation measures stipulated in EIA report and EM&A Manual

*Remarks: *Monitoring as carried out by the Ecologist appointed by the Contractor*

MONITORING LOCATIONS

3.03 Monitoring locations have been proposed in EM&A Manual. Graphic plot is shown in ***Appendix C*** and summarized in ***Table 3-2***.

Table 3-2 Designated Monitoring Locations of the EM&A Programme

Aspect	Location ID	Address
Construction Noise	UTP1	54B, Sheung Wun Yiu
	UTP2	Village House in Lai Chi Shan
	UTP3	Village House near Upper Tai Po River
	UTP4	Village House near Upper Tai Po River
	UTP5	Village House near Upper Tai Po River
	UTP6	Village House near Upper Tai Po River
	UTP7	Village House near Upper Tai Po River
	UTP8	Village House near Upper Tai Po River
	UTP9	49A, Pun Shan Chau
	UTP10	Village House near the proposed access road
	UTP11	49G, San Uk Ka
Ecology	As within and adjacent to Upper Tai Po River of construction works areas	

MONITORING FREQUENCY

3.04 The monitoring frequency and duration as specified in EM&A Manual are summarized below.

Construction Noise

Frequency: Once a week during 0700-1900 on normal weekdays for $L_{eq(30min)}$

If construction work is undertaken at restricted hour, the frequency of construction noise monitoring will comply with the requirements stipulated in the related Construction Noise Permit issued by EPD.

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

Ecology

Frequency: Weekly site inspection and bi-annual monitoring

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

MONITORING EQUIPMENT

Noise Monitoring

3.05 Sound level meter in compliance with *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used for noise monitoring. The sound level meter shall be checked with an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter, which is capable to measure wind speed in m/s.

Table 3-3 Monitoring Equipment Used in EM&A Program

Equipment	Model
Construction Noise	
Integrating Sound Level Meter	Bruel & Kjaer Type 2238 or Rion NL-31
Calibrator	Bruel & Kjaer Type 4231
Portable Wind Speed Indicator	Testo Anemometer

MONITORING METHODOLOGY

Noise Monitoring

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

3.07 Sound level meters as listed in ***Table 3-3*** comply with *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)*.

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

3.09 During the course of measurement, the sound level meter is mounted on a tripod with a height of 1.2m above ground 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. The assessment point is normally set as free-field situation for the measurement.

3.10 Prior to noise measurement, the accuracy of the sound level meter is checked by an acoustic calibrator which generates a known sound pressure level at a known frequency. The checking is performed before and after noise measurement.

DATA MANAGEMENT AND DATA QA/QC CONTROL

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

3.12 The monitoring data recorded in the noise meter are downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET.

OTHERS MONITORING IMPLEMENTATION FOR THE CONTRACT

Vibration

3.13 Vibration monitoring will be carried out when piling works take place in Upper Tai Po River. The targeted monitoring buildings are Fan Sin Temple (VM2) and Wun Yiu Kiln Site of Sheung Wun Yiu (VM1), they are located within 300m of the proposed work areas. The vibration

monitoring measures would record the vibration levels in the vicinity at entrance ground level and external wall of Temple buildings.

3.14 Vibration samples will be taken using a SVAN 949 analyzer. This analyser is equipped with a connecting cable MIL-C-17/28 RG 058 and a DYTRAN 3185D accelerometer. The frequency range will be set to 200 Hz and the number of sampling points will be set to 1024, resulting in a frequency resolution of around 0.2 Hz. Hanning window functions will be selected and maximum hold functions shall be applied over the event to pick up the peak-to-peak amplitude.

3.15 Measurements will be recorded by attaching the accelerometer to the structural foundation, such as structural steel beam(s) of the building. The accelerometer will be orientated, either x-, y- or z-directional in order to pick to the maximum amplitude. If measurements have to be taken on a floor or a hard surface next to a structure, the accelerometer shall be attached firmly on the surface (or to a triangular metal bracket glued to a spiked plate).

3.16 The monitoring would be taken at the closest accessible point to the historic building to enable assessment of the potential risk arising from the vibration associated with the prospective work activities.

3.17 Vibration monitoring works will be conducted upon commencement of piling/ drilling process. Monitoring will be carried out weekly in the first month and bi-weekly in the subsequent months of piling/ drilling process during the construction period if no exceedance of limit were recorded. No disturbance will be made to the fabrics of Fan Sin Temple during the vibration monitoring process.

DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.18 The established performance criteria for construction noise, namely Action and Limit levels are used for the Project is listed in ***Table 3-4***.

Table 3-4 Action and Limit Levels for Construction Noise

Location	Time Period	Action Level	Limit Level
UTP1, UTP2, UTP3, UTP4, UTP5, UTP6, UTP7, UTP8, UTP9, UTP10, UTP11	Daytime 0700 – 1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)
	1900 – 2300 on all days and 0700 – 2300 on general holidays (including Sundays)		60/65/70 dB(A)**
	2300 – 0700 on all days		45/50/55 dB(A)**

Note: * *Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.*
** *To be selected based on the Area Sensitivity Rating of A/B/C, and the conditions of the applicable CNP(s) must be followed*

3.19 Guidance regarding vibration limits is provided by the following British Standards "*BS 7385 - Measurement and evaluation of vibration in buildings. Part 2: Guide to damage levels from ground borne vibration*" (or their equivalent ISO standards). ***Table 3-5*** is shown the transient vibration guide values for cosmetic building damage

Table 3-5 Transient Vibration Guide Values for Cosmetic Building Damage (BS7385:Part 2 1993)

Type of Building		Peak component particle velocity (mm/s) in frequency range of predominant pulse
1	Reinforced or framed structures	50 at 4 Hz and above
2	Un-reinforced or light framed structures	15 at 4 Hz, increasing to 20 at 15 Hz, increasing to 50 at 40 Hz and above.

BS 7385 suggests vibration levels, above which damage is unlikely to occur in 95% of buildings. For cosmetic damage, the level is 15 mm/s at 4 Hz, increasing to 20 mm/s at 15 Hz, increasing to 50 mm/s at 40

Hz and above. Minor structural damage is possible at vibration levels twice those given above, major damage at four times the levels given.

EQUIPMENT CALIBRATION

3.20 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme in yearly basis. Valid calibration certificates of the noise monitoring equipment used for the impact monitoring program in the Reporting Period are attached in ***Appendix D***.

METEOROLOGICAL INFORMATION

3.21 The meteorological information during the construction phase is obtained from Tai Po and Shatin Stations of the Hong Kong Observatory (HKO). The meteorological data during the impact monitoring days are summarized in ***Appendix G***.

4.0 NOISE MONITORING RESULTS

4.01 The monitoring schedule had been issued to relevant parties before each Reporting Period and presented in ***Appendix F***. The works undertaken during the Reporting Period are illustrated in ***Appendix B.*** The monitoring results are presented in the following sub-sections.

RESULT SUMMARY

4.02 In the Reporting Period, the noise monitoring results at the designated locations are presented in ***Tables 4-1 to 4-11*** and the graphical plot is shown in ***Appendix H***. The observed noise sources during the course of noise monitoring are summarized in in ***Appendix J***

Table 4-1 Construction Noise Monitoring Results at UTP1

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	15:15	62.9	63.8	66.0	64.6	63.6	67.0	65	EQ065
11-Dec-12	14:18	64.0	63.6	67.7	61.9	65.6	71.1	67	EQ009
17-Dec-12	10:59	67.7	62.9	62.0	70.6	65.7	68.1	67	EQ009
29-Dec-12	10:30	61.4	69.2	65.6	62.3	62.3	66.5	65	EQ065
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-2 Construction Noise Monitoring Results at UTP2

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	15:47	56.4	57.7	62.0	61.1	59.7	60.2	60	EQ065
11-Dec-12	13:16	66.6	66.4	65.8	65.8	66.9	66.7	66	EQ009
17-Dec-12	11:33	57.1	60.7	56.0	54.2	63.5	66.3	62	EQ009
29-Dec-12	10:35	63.8	65.9	65.6	62.3	65.5	63.3	65	EQ006
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-3 Construction Noise Monitoring Results at UTP3

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	15:53	69.2	69.5	70.5	70.1	69.8	70.8	70	EQ006
11-Dec-12	13:47	69.0	71.7	67.5	65.1	69.1	65.9	69	EQ009
17-Dec-12	11:13	65.5	65.8	65.4	69.1	65.3	65.3	66	EQ067
29-Dec-12	9:41	61.7	60.8	62.7	63.2	64.4	63.6	63	EQ067
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-4 Construction Noise Monitoring Results at UTP4

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	14:07	56.1	60.1	61.3	61.0	61.4	58.9	60	EQ009
11-Dec-12	13:34	75.4	60.5	73.6	66.6	59.1	64.1	70	EQ010
17-Dec-12	10:36	73.8	70.2	73.0	74.1	74.3	74.3	73	EQ010
29-Dec-12	10:15	56.2	57.1	57.8	57.3	58.8	60.1	58	EQ067
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-5 Construction Noise Monitoring Results at UTP5

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	14:40	62.5	59.9	60.7	72.2	59.9	63.2	66	EQ009
11-Dec-12	13:03	64.0	59.0	70.9	70.0	66.9	62.5	67	EQ010
17-Dec-12	10:05	70.6	69.3	70.2	66.1	69.0	70.9	70	EQ010
29-Dec-12	10:53	57.7	58.0	56.2	57.0	57.6	56.3	57	EQ067
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-6 Construction Noise Monitoring Results at UTP6

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	15:16	53.9	52.5	52.4	53.9	53.9	53.7	53	EQ006
11-Dec-12	14:12	66.9	60.3	60.4	59.8	54.4	56.3	62	EQ006
17-Dec-12	11:30	58.2	56.7	53.1	51.0	50.2	53.8	55	EQ006
29-Dec-12	10:32	59.9	68.7	67.6	58.4	53.9	57.5	64	EQ010
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-7 Construction Noise Monitoring Results at UTP7

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	15:13	62.6	56.1	58.4	55.1	55.9	57.2	58	EQ009
11-Dec-12	14:07	57.3	60.8	56.2	55.1	55.0	52.3	57	EQ010
17-Dec-12	11:00	60.8	59.0	59.4	66.6	71.4	73.3	69	EQ006
29-Dec-12	10:00	59.3	60.3	59.1	63.2	56.7	54.9	60	EQ010
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-8 Construction Noise Monitoring Results at UTP8

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	14:41	56.2	65.3	66.5	54.4	54.4	60.9	62	EQ006
11-Dec-12	13:39	64.2	66.0	62.8	63.7	63.1	62.2	64	EQ006
17-Dec-12	10:25	61.3	63.4	58.2	62.0	59.9	58.1	61	EQ006
29-Dec-12	9:26	54.8	55.2	60.4	60.5	57.3	62.8	59	EQ010
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-9 Construction Noise Monitoring Results at UTP9

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	14:10	62.6	64.2	63.1	54.3	53.1	64.1	62	EQ006
11-Dec-12	13:08	68.6	58.9	61.8	62.1	59.0	57.8	63	EQ006
17-Dec-12	9:55	65.0	62.5	63.6	65.0	64.0	60.2	64	EQ006
29-Dec-12	9:25	64.9	58.8	60.4	63.7	57.3	64.4	62	EQ006
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-10 Construction Noise Monitoring Results at UTP10

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Sound Level Meter ID
5-Dec-12	14:42	46.0	46.9	53.7	43.8	49.3	51.8	50	EQ065
11-Dec-12	13:00	53.1	61.2	57.3	42.8	40.6	41.8	55	EQ065
17-Dec-12	9:50	49.8	46.0	57.3	48.6	69.5	47.1	62	EQ009
29-Dec-12	9:25	56.8	52.6	53.5	46.7	48.8	55.4	54	EQ065
Limit Level in dB(A)								**75**	

Remarks: *The monitoring is undertaken under façade situation. No façade correction is made according to acoustical principles and EPD guidelines.*

Table 4-11 Construction Noise Monitoring Results at UTP11

Date	Start Time	1st L_{eq5min}	2nd L_{eq5min}	3rd L_{eq5min}	4th L_{eq5min}	5th L_{eq5min}	6th L_{eq5min}	$L_{eq30min}$	Corrected $L_{eq30min}$	Sound Level Meter ID
5-Dec-12	14:10	58.9	47.1	46.7	48.7	47.3	49.0	52.6	56	EQ065
11-Dec-12	13:32	44.8	43.7	40.7	44.2	41.3	48.5	44.7	48	EQ065
17-Dec-12	10:25	47.2	45.7	45.1	46.6	44.7	47.4	46.2	49	EQ009
29-Dec-12	9:56	49.1	51.5	46.6	54.2	55.9	55.2	53.2	56	EQ065
Limit Level in dB(A)								**75**		

Remarks: *The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines*

4.03 A free field noise monitoring is performed only at UTP11, therefore, a façade correction +3 dB(A) is added in accordance with the acoustical principles and EPD guidelines.

4.04 No noise complaint (which is an Action Level exceedance) was received in the Reporting Period. Furthermore, no noise monitoring exceedance was recorded. No Notice of Exceedance (NOE) was issued to notify EPD, IEC, the Contractor and the ER.

4.05 Although all noise measurement results are below 75dB(A), the Contractor is reminded to strictly implement noise mitigation measures as recommended in the EM&A Manual to avoid noise Limit Level exceedance.

5.0 VIBRATION MONITORING RESULTS

5.01 There was no vibration monitoring carried out in the Reporting Period. Vibration monitoring will be carried out when piling works take place in Upper Tai Po River.

6.0 ECOLOGY MONITORING RESULTS

6.01 Weekly ecological inspections by the Ecologist Dr. Mark Shea were carried out on **3rd, 10th, 17th, and 24th December 2012**. Details of findings are summarized in ***Table 6-1***.

Table 6-1 Summary Results of Ecological Site Inspection Findings

Date	Observations	Advice from Ecologist	Action Taken	Closing Date
3rd December 2012	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
10th December 2012	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
17th December 2012	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
24th December 2012	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
31st December 2012	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A

6.02 Furthermore, the last bi-annual ecological impact monitoring was conducted in July 2012 and the ecological impact monitoring report has been presented in Monthly EM&A Report August 2012, therefore no ecological impact monitoring report would be submitted in this Reporting Period. The next bi-annual ecological impact monitoring has been arranged to be carried out in January 2013.

7.0 SITE INSPECTION

REGULAR SITE INSPECTION AND AUDITING

7.01 In the Reporting Period, 4 events of site inspection were carried out by the ET on **5th, 12th, 19th and 27th December 2012** in which on **5th, 12th and 27th December 2012** were joint weekly environmental site inspections with the Contractor, IEC and ER**.** Also, DSD's representatives attended the site inspection with the IEC and ER on **18th December 2012**. In the Reporting Period, **5** observations were recorded but no non-compliance was identified.

7.02 Observations for the site inspection and monthly audit within the Reporting Period are summarized in ***Table 7-1***.

Table 7-1 Site Inspection of Observations – Findings and Deficiencies

Date	Findings / Deficiencies	Follow-Up Status
27th November 2012 (last Reporting Period)	• Muddy river water was observed at Upper Tai Po River during rainstorm. The Contractor was reminded to provide proper mitigation measures to prevent muddy water directly discharging into the river stream.	• Tarpaulin sheets were provided at the discharge point for Upper Tai Po River to prevent discharge of muddy water on 12th December 2012.
5th December 2012	• C&D wastes were observed in the tree protection area at Upper Tai Po River. The Contractor was reminded to fence off the tree protection zone to prevent damage to the preserved tree.	• Tree protection zone was set up to prevent damage to the preserved trees on 19th December 2012.
12th December 2012	• No adverse environmental issue was observed.	N.A.
19th December 2012	• No adverse environmental issue was observed.	N.A.
27th December 2012	• No drip tray was provided for the chemical containers at Upper Tai Po River. Drip tray should be provided for all the chemical containers to prevent chemical leakage. • Label tags of the existing trees are missing. The Contractor was required to provide label tag for all existing trees in the project. • Muddy water was observed at Upper Tai Po River during rainstorm. The Contractor was required to provide de-silting facility to avoid muddy water discharge to the river stream.	• These findings would be rectified in January 2013.

7.03 One deficiency observed during previous site inspections is still outstanding. The status of rectification is presented in ***Table 7-2***.

Table 7-2 Rectification Status of Previous Site Inspection Deficiencies

Inspection Date	Findings / Deficiencies	Status
6th Oct 2011	Noise barriers have not yet been erected by the Contractor along Upper Tai Po River. The Contractor was urged to install noise barriers to minimize the noise impact arisen from construction activities.	Ongoing

7.04 Implementation status of environmental protection and mitigation measures are shown in ***Table 10-1*** of this report.

8.0 WASTE MANAGEMENT

8.01 Waste management is carried out by an on-site Environmental Officer (EO) or an Environmental Supervisor (ES) from time to time.

RECORDS OF WASTE QUANTITIES

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

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

8.03 The quantities of waste for disposal in the Reporting Period are summarized in ***Table 8-1*** and ***8-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix I***. Whenever possible, materials are reused on-site as far as practicable.

Table 8-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity
C&D Materials (Inert) (in '000m^3)	0
Reused in the Contract (Inert) (in '000m^3)	0
Reused in other Projects (Inert) (in '000m^3)	0
Disposal as Public Fill (Inert) (in '000m^3)	0

Table 8-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity	Disposal Method
Metal (in '000kg)	0	--
Paper / Cardboard Packing (in '000kg)	0	--
Plastic (in '000kg)	0	--
Chemical Wastes (in '000kg)	0	--
General Refuses (in '000m^3)	0.0050	Refuse Collector

8.04 In the Reporting Period, the C&D wastes would be stockpiled on site until certain quantities are accumulated before disposal to public fill or recycle companies. Therefore, zero cubic meter was reported in Wastes Flow Table – December 2012.

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

9.0 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

9.01 No environmental complaint, summons and prosecution was received in the Reporting Period. The statistical summary of environmental complaint, summons and prosecution, is presented in ***Tables 9-1, 9-2*** and ***9-3***.

Table 9-1 Statistical Summary of Environmental Complaint

Complaint Nature	Environmental Complaint Statistics		
	Cumulative (Sep 2008 –Nov 2012)	Frequency (Dec 2012)	Total
Air/Dust	7	0	7
Noise	5	0	5
Water	11	0	11
Housekeeping Hygiene	1	0	1
Chemical Waste	0	0	0
Overall	**24**	**0**	**24**

Table 9-2 Statistical Summary of Environmental Summons

Complaint Nature	Environmental Summons Statistics		
	Cumulative (Sep 2008 –Nov 2012)	Frequency (Dec 2012)	Total
Air/Dust	0	0	0
Noise	0	0	0
Water	0	0	0
Housekeeping Hygiene	0	0	0
Chemical Waste	0	0	0
Overall	**0**	**0**	**0**

Table 9-3 Statistical Summary of Environmental Prosecution

Complaint Nature	Environmental Prosecution Statistics		
	Cumulative (Sep 2008 –Nov 2012)	Frequency (Dec 2012)	Total
Air/Dust	0	0	0
Noise	0	0	0
Water	0	0	0
Housekeeping Hygiene	0	0	0
Chemical Waste	0	0	0
Overall	**0**	**0**	**0**

10.0 IMPLEMENTATION STATUS OF MITIGATION MEASURES

10.01 The environmental mitigation measures recommended in EM&A Manual covering the issues of dust, noise and waste and they are summarized as follows:

Noise Mitigation Measures

(a) No percussive piling shall be carried out;
(b) Only well-maintained plant should be operated on-site; and plant shall be serviced regularly during the construction program;
(c) Silencers or mufflers on construction equipment should be utilized and shall be properly maintained during the construction program;
(d) Mobile plant, if any, should be sited as far from Noise Sensitive Receivers (NSRs) as possible;
(e) Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
(f) Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;
(g) Materials stockpiled on site and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities;
(h) Use of quieter plants to carry out the construction tasks proposed for the Project;
(i) Use 2.0m high temporary noise barriers as screened the noisy Powered Mechanical Equipments (PMEs) to carry out the river implementation work;
(j) Low Impact Method, such as using PMEs smaller in size.

Dust Mitigation Measures

10.02 Implementation of mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices include but not limited to the following:

(a) Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage, particularly during dry weather;
(b) Use of frequent watering for particularly dusty static construction areas and areas close to Air Sensitive Receivers (ASRs);
(c) Tarpaulin covering of all dusty vehicle loads transported to, from and between site location;
(d) Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;
(e) Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
(f) Stockpiled excavated materials should be covered with tarpaulin.

Local Stream Water Quality Mitigation Measures

(a) Excavation works within the site area of Tai Po River shall be carried out in stages and excavation area for each stage shall be limited to section of half width of the channel and less than 100m long at any one time in order to maintain water flow within the river during construction stage;
(b) Land-based plant shall be employed and site run-off shall be directed towards regularly cleaned and maintained silt traps and oil / grease separators to minimize leakage and loss of sediments during excavation;
(c) Large boulders removed from Tai Po River within the Project during excavation shall be re-instated upon completion of works A section of 150m long natural riverbank on the western side of the river channel (Ch0 –Ch150) shall be retained;
(d) The excavation area shall be enclosed with bunds or barriers and dewatered prior to excavation to minimize the impacts upon the downstream of the Tai Po River;
(e) Provide silt trap and oil interceptor to remove oil, lubricants, grease, silt, grit and debris from the wastewater before discharging to the public storm water drainage system;
(f) Provide site toilet facilities;

(g) During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in Professional Persons Environmental Consultative Committee (ProPECC) [PN 1/94] shall be followed.

Waste Mitigation Measures

(a) The Contractor shall observe and comply with the Waste Disposal Ordinance (WDO) and its subsidiary regulations;
(b) The Contractor shall submit to the Engineer for approval a Waste Management Plan with appropriate mitigation measures including allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan;
(c) The Contractor shall minimize the generation of waste from his work. Avoidance and minimization of waste generation can be achieved through changing or improving design and practices, careful planning and good site management;
(d) The reuse and recycling of waste shall be practised as far as possible. The recycling materials shall include paper/cardboard, timber and metal etc;
(e) The Contractor shall ensure that Construction and Demolition (C&D) materials are sorted into public fill (inert portion) and C&D waste (non-inert portion). The public fill which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works. The C&D waste which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled where possible and, as the last resort, disposal of at landfills;
(f) The Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal sites). The Contractor shall use a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill;
(g) In order to avoid dust or odour impacts, any vehicles leaving a works area carrying construction waste or public fill shall have their load covered;
(h) To avoid the excessive use of wood, reusable steel shutters shall be used as a preferred alternative to formwork and falsework where possible;
(i) The Contractor shall observe and comply with the Waste Disposal (Chemical Waste) (General) Regulation. The Contractor shall apply for registration as chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation when chemical waste is produced. All chemical waste shall be properly stored, labeled, packaged and collected in accordance with the Regulation.

Vibration

(a) Percussive piling is to be replaced by bore-hole piling to minimize vibration impacts to the two identified declared monuments;
(b) Carrying out of vibration monitoring to ensure that vibration associated with the construction works do not exceed the threshold limit otherwise contractor have to review the work method and construction activities have to be slowed down or rescheduled to reduce the impacts;
(c) Close monitoring and measurement on the cracks of the external wall of Fan Sin Temple during construction works will be carried out. Any changes on the cracks will be recorded for the contractor to slow down the construction activities accordingly; and to review the work methods and equipment immediately.

Ecology

(a) Large boulders will be returned to the riverbed following the excavation works;
(b) Construction works from Ch. 0.0m – Ch. 150m would be along one side of the river only;
(c) Approximately 150m of the existing natural riverbank on the western side of the river would be retained;
(d) Excavation works within the river channel should be restricted to an enclosed dewater

section of the river, and would be limited to sections 50-100m long at any one time;

(e) Flows to the area downstream shall be maintained at all times during the construction phase;

(f) Capture survey shall be conducted within the works area at Tai Po River before commencement of works. The captured target species shall be relocated to areas of the watercourse upstream of the watercourse upstream of the Tai Po River;

(g) Temporary noise barriers should be constructed to control noise impacts to habitats and associated wildlife within and adjacent to the proposed works area;

(h) Excavation works shall be carried out by land based plant within enclosed dry section of river channel;

(i) Compensatory planting of trees and other vegetation along the banks of the newly improved drainage channel should be provided to compensate for the loss of riparian vegetation;

(j) Operation phase activities in the improved drainage channel would be limited to periodic channel maintenance such as de-silting.

10.03 Based on the site environmental situation, the Contractor has implemented the required environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual. In the Reporting Period, environmental mitigation measures implemented by the Contractor are summarized in ***Table 10-1***.

Table 10-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Drainage systems were regularly and adequately maintained.
Air Quality	• Increase watering frequency to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpiled dusty materials by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit regularly kept clean and free from dust; and • Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	• Reduce construction machines as used within the site; • Use of quite plant and working methods; • Scheduling of construction works nearly the NSR; and • Alternative use of plant items within one worksite, where practicable.
Waste and Chemical Management	• Excavated materials such as soils and cobbles were reused as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising kept to a minimum and be handled, transported and disposed of in a suitable manner; • A trip ticket system was used for the disposal of C&D materials to any designated public fill facility and/or landfill; and • Chemical waste handling was in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	• Tidy and clean general kept the site.

11.0 IMPACT FORECAST

CONSTRUCTION ACTIVITIES FOR THE FORTH-COMING MONTH

11.01 Construction activities planned to be carried out next month at Upper Tai Po River is listed as below:-

- Construction of dwarf walls;
- Construction of surface drains;
- Construction of footpaths;
- Construction of inclined gabion wall;
- Installation of Type II railings;
- Removal of stockpiled materials;
- Laying of cable ducts for public lighting; and
- Laying of watermains.

KEY ISSUES FOR THE COMING MONTH

11.02 According to construction activities to be carried out in coming month, key issues to be considered include:

- Implementation of dust suppression measures should be conducted at all times;
- Ensure dust suppression measures should be implemented properly;
- Empty engine oil containers present within the site area should be disposed of appropriately;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes should be followed;
- Discharge of site effluent to the nearby local stream or storm drainage, stockpiling or disposal of materials, and any dredging or construction area at this area should be prohibited;
- Follow-up of improvement on general waste management issues should be conducted; and
- Implementation of construction noise preventative control measures should be undertaken.

12.0 CONCLUSIONS AND RECOMMENTATIONS

CONCLUSIONS

12.01 This is the **fifty-second (52nd)** monthly EM&A report for the Project presenting the monitoring results and inspection findings for the reporting month from **1st to 31st December 2012**.

12.02 No noise complaint (which is an Action Level exceedance) was received in the Reporting Period. In the Reporting Period, a total 44 occurrences of construction noise monitoring was undertaken and all measurement results were below 75dB(A). No Notice of Exceedance (NOE) was therefore issued to notify EPD, IEC, the Contractor and ER.

12.03 As no piling work was conducted, no vibration monitoring was performed in the Reporting Period.

12.04 Weekly ecological site inspections were performed on **3rd, 10th, 17th, 24th and 31st December 2012**. According to inspection findings, no advice and action was recommended by the ecologist.

12.05 No documented environmental complaint, notification of summons or successful prosecution was received in the Reporting Period.

12.06 In the Reporting Period, 4 events of site inspection were carried out by the ET on **5th, 12th, 19th and 27th December 2012** in which on **5th, 12th and 27th December 2012** were joint weekly environmental site inspections with the Contractor, IEC and ER. Also, DSD's representatives attended the site inspection with the IEC and ER on **18th December 2012**. In the Reporting Period, **5** observations were recorded but no non-compliance was identified.

RECOMMENDATIONS

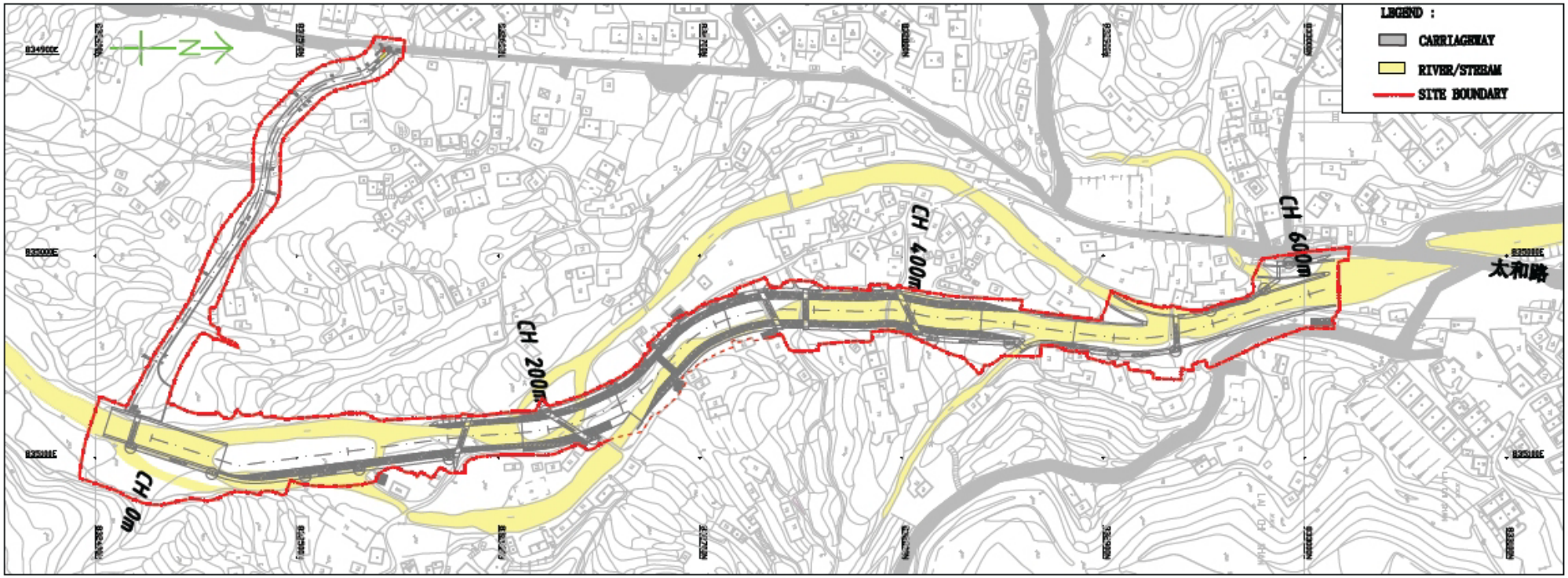
12.07 During dry season, dust control measures to avoid fugitive dust in the construction site should be properly provided and maintained, as appropriate. In addition, water quality mitigation measures such as prevention of muddy water and other water quality pollutants via site surface water runoff into the local stream of Tai Po River should be fully implemented.

12.08 On the other hand, construction noise is another key environmental issue during construction works. Noise mitigation measures are reminded to be implemented in accordance with EM&A Manual stipulation. Dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road are also reminded to be implemented.

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

Appendix A

Site Layout Plan of the Upper Tai Po River

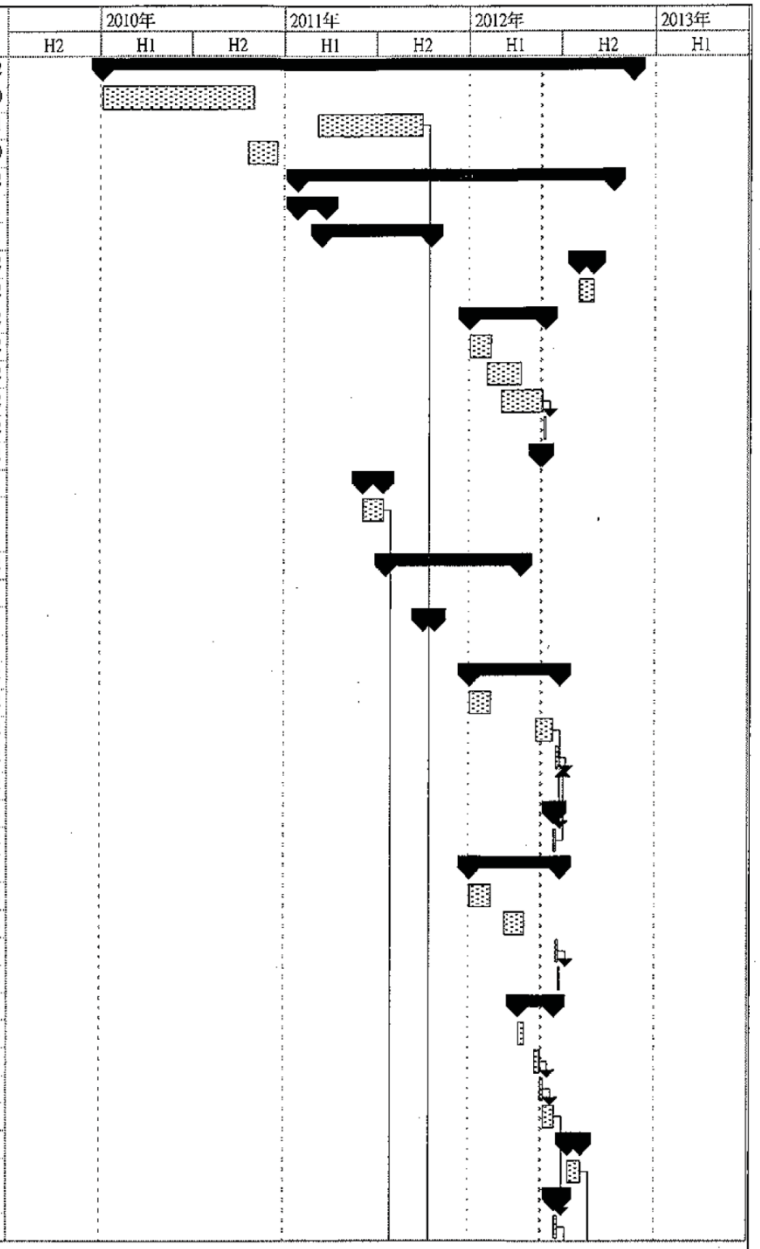


Upper Tai Po River

Appendix B

Master and Three Months Rolling Construction Programs

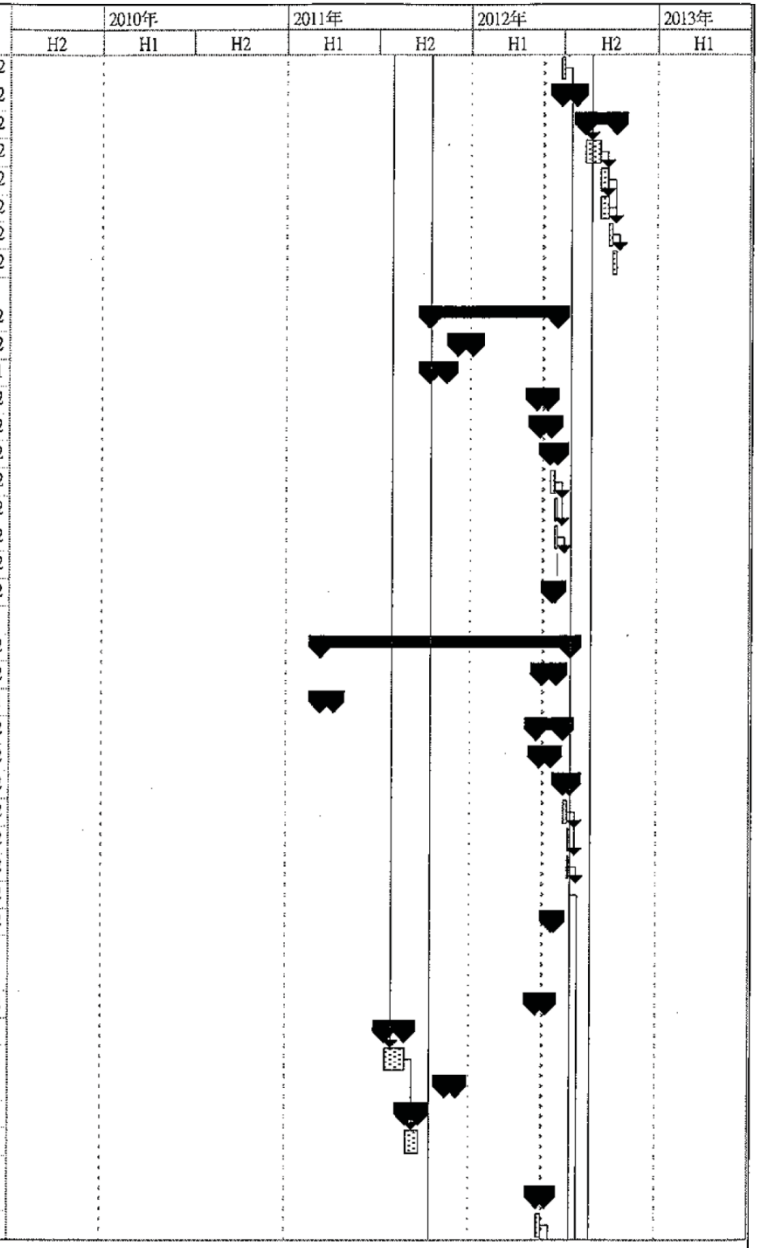
識別碼		任務名稱	工期	開始時間	完成時間
1		Programme of Upper Tai Po River	750 工作日	5/1/2010	19/11/2012
2		Wet Season of 2010	214 工作日	5/1/2010	31/10/2010
3		Wet Season of 2011	149 工作日	8/3/2011	30/9/2011
4		Works Suspended Due to Villager's Rally	42 工作日	21/10/2010	18/12/2010
5		Ch 230-350	446 工作日	28/1/2011	12/10/2012
6		Gabion Wall (Ch 230-275 RHS) TG1/TG1A (Completed)	40 工作日	28/1/2011	24/3/2011
10		Retaining Wall (Ch 275-330 RHS) TR1 (replaced by AD1) (Completed)	154 工作日	17/3/2011	18/10/2011
17		Drainage & Footpath (CH 275-330 RHS)	21 工作日	6/8/2012	3/9/2012
18		Construction of drainage & footpath	21 工作日	6/8/2012	3/9/2012
19		Inclined Gabion Wall (Ch 290-327 LHS)	109 工作日	3/1/2012	1/6/2012
20		Remove Concrete Blocks and shotcrete (Completed)	30 工作日	3/1/2012	13/2/2012
21		Concreting (Completed)	50 工作日	6/2/2012	13/4/2012
22		No-fine	60 工作日	5/3/2012	25/5/2012
23		Gabion	5 工作日	28/5/2012	1/6/2012
24		Maintainence Staircase (Ch 315 LHS) (Completed)	4 工作日	22/5/2012	25/5/2012
26		Drainage & Footpath (Ch 270-330 LHS)	30 工作日	6/6/2011	15/7/2011
27		Construction of drainage & footpath	30 工作日	6/6/2011	15/7/2011
28					
29		Temp Utiltiy and Pedestrian Diversion at Ch230 (Completed)	192 工作日	21/7/2011	13/4/2012
32					
33		Demolition of Interim Footbridge at Ch230 (Completed)	17 工作日	3/10/2011	25/10/2011
36					
37		Inclined Gabion Wall (Ch 218-240 LHS)	129 工作日	3/1/2012	29/6/2012
38		Remove Shotcrete & concrete block (Completed)	30 工作日	3/1/2012	13/2/2012
39		Concreting	25 工作日	14/5/2012	15/6/2012
40		No-fine	3 工作日	22/6/2012	26/6/2012
41		Gabion	3 工作日	27/6/2012	29/6/2012
42		Maintainence Staircase (Ch 242 LHS)	4 工作日	18/6/2012	21/6/2012
43		Formwork and concreting	4 工作日	18/6/2012	21/6/2012
44		Inclined Gabion Wall (Ch 240-272 LHS)	129 工作日	3/1/2012	29/6/2012
45		Remove Concrete Blocks and shotcrete (Completed)	30 工作日	3/1/2012	13/2/2012
46		Concreting (Completed)	30 工作日	12/3/2012	20/4/2012
47		No-fine	3 工作日	22/6/2012	26/6/2012
48		Gabion	3 工作日	27/6/2012	29/6/2012
49		Inclined RC Wall and Step 2A (Ch 272-290 LHS)	51 工作日	9/4/2012	18/6/2012
50		Concreting (Base)	10 工作日	9/4/2012	20/4/2012
51		Concreting (Ramp)	7 工作日	11/5/2012	21/5/2012
52		Concreting (Slab)	5 工作日	22/5/2012	28/5/2012
53		Concreting (Wall Stem and Step 2A with stilling basin)	15 工作日	29/5/2012	18/6/2012
54		Drainage & Footpath (Ch 230-270 LHS)	20 工作日	16/7/2012	10/8/2012
55		Construction of drainage & footpath	20 工作日	16/7/2012	10/8/2012
56		Step 2(Ch 236)	10 工作日	19/6/2012	2/7/2012
57		Stilling Basin	5 工作日	19/6/2012	25/6/2012



專案: Master Programme TPR 11 May
日期: 22/5/2012

任務 進度 摘要 外部任務 期限
分割 里程碑 專案摘要報告 外部里程碑

識別碼		任務名稱	工期	開始時間	完成時間
58		Ramp and Slab	5 工作日	26/6/2012	2/7/2012
59		Cascade (Ch 275) (Completed)	21 工作日	28/6/2012	26/7/2012
62		Lighting at CH 250-320	45 工作日	13/8/2012	12/10/2012
63		Construction of Drawpits / Ductings	21 工作日	13/8/2012	10/9/2012
64		Public lighting Installation (CE2318)	12 工作日	11/9/2012	26/9/2012
65		Public lighting Installation (CE2317)	12 工作日	11/9/2012	26/9/2012
66		T&C	6 工作日	27/9/2012	4/10/2012
67		Removal of existing lighting (VA1311-Z1)	6 工作日	5/10/2012	12/10/2012
68					
69		Footbridge TB04 (Ch 330)	181 工作日	12/10/2011	20/6/2012
70		Construction of Abutment A (LHS) (Completed)	22 工作日	7/12/2011	5/1/2012
78		Construction of Abutment B (RHS) (Completed)	24 工作日	12/10/2011	14/11/2011
87		Construction of decking (steel deck) (Completed)	16 工作日	11/5/2012	1/6/2012
91		Demolition of Bridge TB-A (Completed)	17 工作日	17/5/2012	8/6/2012
94		Lighting at Footbridge TB04	11 工作日	6/6/2012	20/6/2012
95		Construction of Drawpits / Ductings	7 工作日	6/6/2012	14/6/2012
96		Public lighting Installation (CE2315)	3 工作日	15/6/2012	19/6/2012
97		Public lighting Installation (CE2316)	3 工作日	15/6/2012	19/6/2012
98		T&C	1 工作日	20/6/2012	20/6/2012
99		Construction of Gabion Wall at TB-A (Completed)	5 工作日	11/6/2012	15/6/2012
103					
104		Footbridge TB05 (ch 350)	353 工作日	10/3/2011	16/7/2012
105		Construction of Abutment A (LHS) (Completed)	20 工作日	22/5/2012	18/6/2012
113		Construction of Abutment B (RHS) (Completed)	19 工作日	10/3/2011	5/4/2011
121		Construction of decking (Completed)	37 工作日	11/5/2012	2/7/2012
126		Demolition of Bridge TB-B (Completed)	17 工作日	17/5/2012	8/6/2012
129		Lighting at Footbridge TB05	10 工作日	3/7/2012	16/7/2012
130		Construction of Drawpits / Ductings	6 工作日	3/7/2012	10/7/2012
131		Public lighting Installation (CE2313)	3 工作日	11/7/2012	13/7/2012
132		Public lighting Installation (CE2314)	3 工作日	11/7/2012	13/7/2012
133		T&C	1 工作日	16/7/2012	16/7/2012
134		Consturction of Gabion Wall at TB-B (Completed)	5 工作日	11/6/2012	15/6/2012
138					
139					
140		Inclined Gabion Wall (Ch 327-448 LHS) (Completed)	13 工作日	11/5/2012	29/5/2012
145		Drainage & Footpath (Ch 330-400 LHS)	30 工作日	18/7/2011	26/8/2011
146		Construction of drainage & footpath	30 工作日	18/7/2011	26/8/2011
147		Gabion Wall (Ch 330-345 RHS) TG2 (Completed)	16 工作日	15/11/2011	6/12/2011
151		Drainage & Footpath (Ch 400-450 LHS)	20 工作日	29/8/2011	23/9/2011
152		Construction of drainage & footpath	20 工作日	29/8/2011	23/9/2011
153					
154		Step 3 (Ch327)	12 工作日	14/5/2012	29/5/2012
155		Stilling Basin	7 工作日	14/5/2012	22/5/2012



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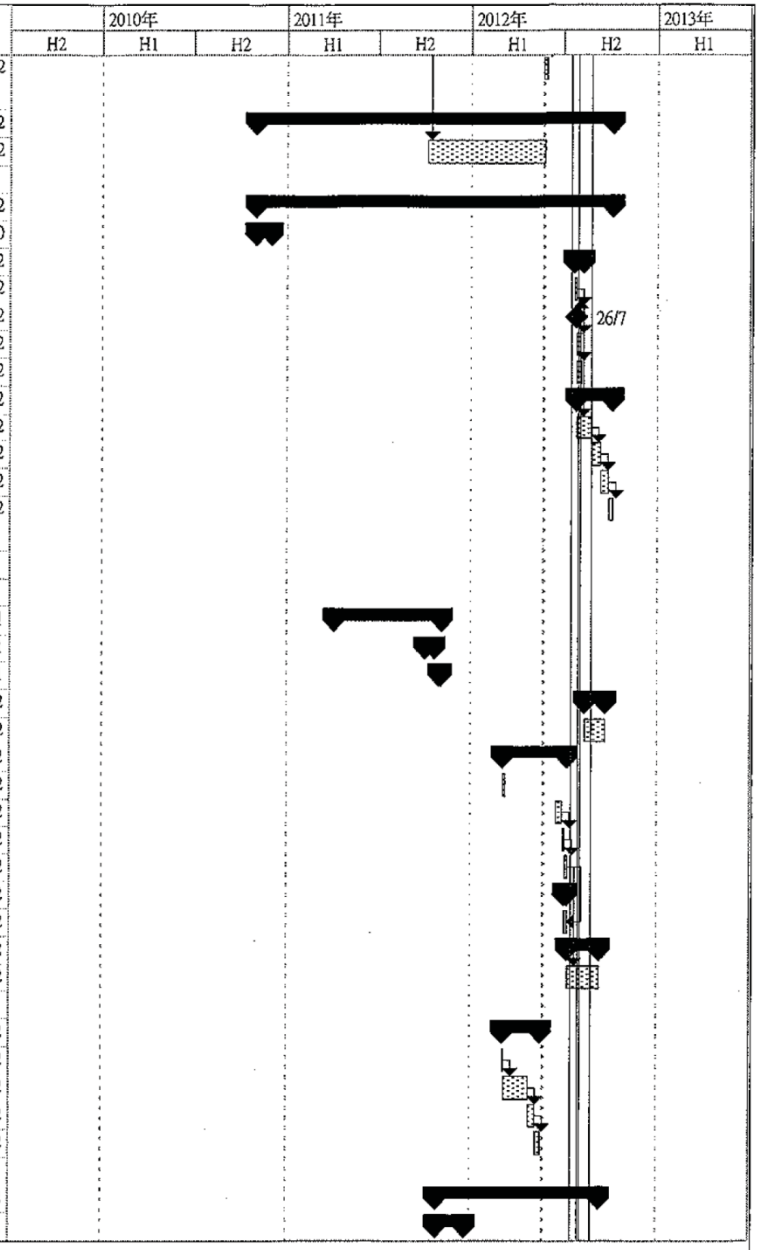
156		Ramp and Slab	5 工作日	23/5/2012	29/5/2012
157					
158		Ch 45-100	505 工作日	1/11/2010	5/10/2012
159		Additional Boulder Trap	166 工作日	7/10/2011	25/5/2012
160					
161		Footbridge TB02 (Ch 150)	505 工作日	1/11/2010	5/10/2012
162		Construction of Abutment A (LHS)	23 工作日	1/11/2010	1/12/2010
170		Construction of decking	14 工作日	23/7/2012	9/8/2012
171		Erection of steel deck+ conc deck	4 工作日	23/7/2012	26/7/2012
172		XXConcreting	0 工作日	26/7/2012	26/7/2012
173		Deck finishing	10 工作日	27/7/2012	9/8/2012
174		Railing installation	7 工作日	27/7/2012	6/8/2012
175		Lighting at Footbridge TB02	51 工作日	27/7/2012	5/10/2012
176		Construction of Drawpits / Ductings	21 工作日	27/7/2012	24/8/2012
177		Public lighting Installation (CE2308)	12 工作日	27/8/2012	11/9/2012
178		Public lighting Installation (CE2309)	12 工作日	12/9/2012	27/9/2012
179		Removal of existing lighting (VA2642-A1)	6 工作日	28/9/2012	5/10/2012
180					
181					
182					
183		Gabion Wall (Ch 150-178 LHS) TG3A	154 工作日	5/4/2011	4/11/2011
187		Gabion Wall (Ch 178-230 LHS) TG5A/TG2	15 工作日	3/10/2011	21/10/2011
190		Maintainence Staircase (Ch 178 LHS)	4 工作日	31/10/2011	3/11/2011
192		Drainage & Footpath (Ch 150-Ch230 LHS)	30 工作日	13/8/2012	21/9/2012
193		Drainage & Footpath	30 工作日	13/8/2012	21/9/2012
194		Inclined Gabion Wal (Ch 110-130 RHS)	91 工作日	5/3/2012	9/7/2012
195		Remove shotcrete (Completed)	5 工作日	5/3/2012	9/3/2012
196		Concreting	10 工作日	18/6/2012	29/6/2012
197		No-fine	3 工作日	2/7/2012	4/7/2012
198		Gabion	3 工作日	5/7/2012	9/7/2012
199		Maintainence Staircase (Ch 130 RHS)	4 工作日	4/7/2012	9/7/2012
200		Formwork and concreting	4 工作日	4/7/2012	9/7/2012
201		Drainage & Footpath (Ch 0-150 RHS)	45 工作日	10/7/2012	10/9/2012
202		Construction of drainage & footpath	45 工作日	10/7/2012	10/9/2012
203					
204		Inclined Gabion Wall (Ch 130-220 RHS)	55 工作日	5/3/2012	18/5/2012
205		Remove Shotcrete (Completed)	2 工作日	5/3/2012	6/3/2012
206		Concreting (Comleted)	35 工作日	7/3/2012	24/4/2012
207		No-fine (Completed)	10 工作日	25/4/2012	8/5/2012
208		Gabion	8 工作日	9/5/2012	18/5/2012
209					
210		Footbridge TB03 (Ch 200)	229 工作日	26/10/2011	10/9/2012
211		Construction of Abutment B (RHS)	41 工作日	26/10/2011	21/12/2011



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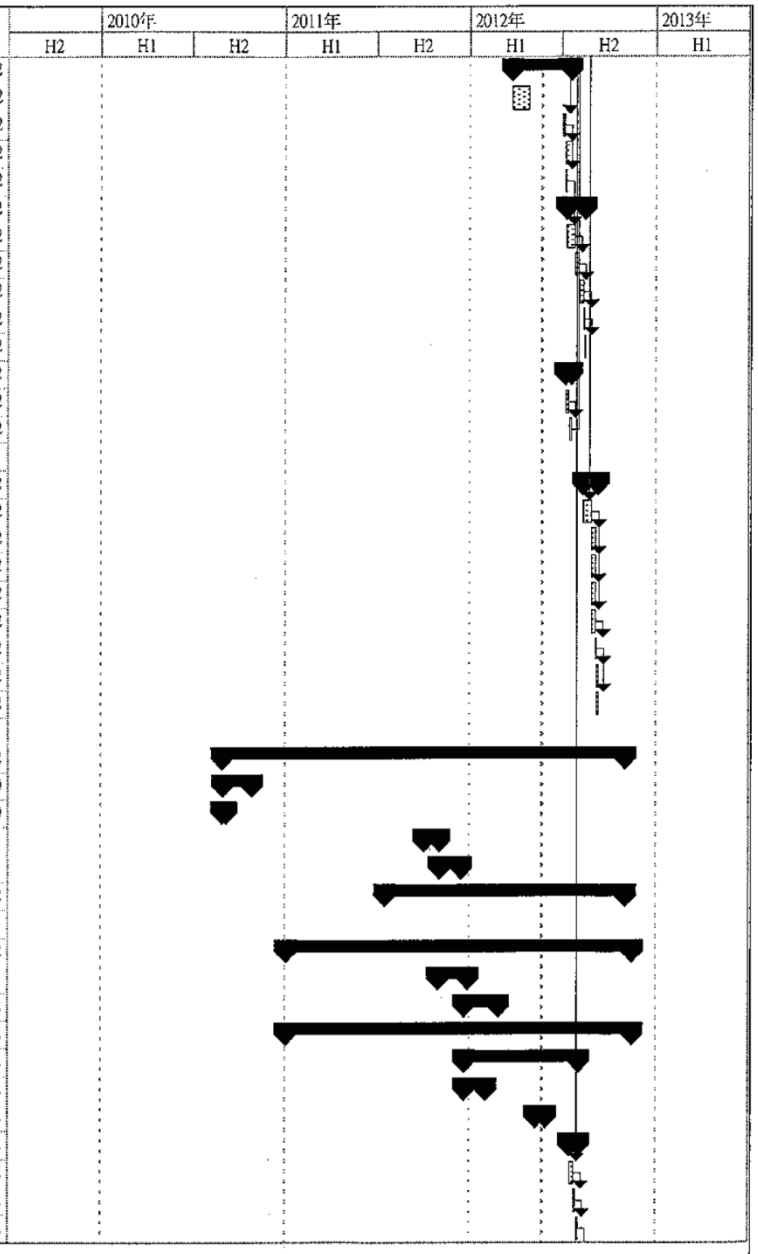
219		Construction of Decking (TB03)	85 工作日	26/3/2012	20/7/2012
220		Modification of LHS table top	25 工作日	26/3/2012	27/4/2012
221		Erection of steel deck+ conc deck	4 工作日	3/7/2012	6/7/2012
222		Deck finishing	10 工作日	9/7/2012	20/7/2012
223		Railing installation	2 工作日	9/7/2012	10/7/2012
224		Lighting at Footbridge TB03	27 工作日	11/7/2012	16/8/2012
225		Construction of Drawpits / Ductings	12 工作日	11/7/2012	26/7/2012
226		Public lighting Installation (CE2321)	6 工作日	27/7/2012	3/8/2012
227		Public lighting Installation (CE2322)	6 工作日	6/8/2012	13/8/2012
228		T&C	1 工作日	14/8/2012	14/8/2012
229		Removal of existing lighting (VA1309-Z1)	2 工作日	15/8/2012	16/8/2012
230		Step 1 (Ch 178)	10 工作日	9/7/2012	20/7/2012
231		Stilling Basin	5 工作日	9/7/2012	13/7/2012
232		Ramp and Slab	5 工作日	16/7/2012	20/7/2012
233					
234		Lighting CH 175-250	21 工作日	13/8/2012	10/9/2012
235		Construction of Drawpits / Ductings	12 工作日	13/8/2012	28/8/2012
236		Public lighting Installation (CE2319)	6 工作日	29/8/2012	5/9/2012
237		Public lighting Installation (CE2320)	6 工作日	29/8/2012	5/9/2012
238		Public lighting Installation (CE2323)	6 工作日	29/8/2012	5/9/2012
239		Public lighting Installation (CE2324)	6 工作日	29/8/2012	5/9/2012
240		T&C	1 工作日	6/9/2012	6/9/2012
241		Removal of existing lighting (VE2641-A1)	2 工作日	7/9/2012	10/9/2012
242		Removal of existing lighting (VA1310-A1)	2 工作日	7/9/2012	10/9/2012
243					
244		Ch -23-45 (Completed)	570 工作日	30/8/2010	2/11/2012
245		Retaining Wall at Access D (Boulder Trap)	41 工作日	1/9/2010	27/10/2010
265		Filling Work at Boulder Trap (RHS of downstream)	6 工作日	30/8/2010	6/9/2010
267		Dwarf Wall (Ch 60-75) RHS	23 工作日	3/10/2011	2/11/2011
276		Box Culvert 03 (Ch 45) (Completed)	31 工作日	3/11/2011	15/12/2011
287		Retaining Wall at Access D (Boulder Trap)	340 工作日	18/7/2011	2/11/2012
319					
320		Ch 350-450	489 工作日	3/1/2011	15/11/2012
321		Gabion Wall (Ch 350-400 LHS) TR1 (AD) (Completed)	43 工作日	31/10/2011	28/12/2011
326		Gabion Wall (Ch 400-450 LHS) TR1 (AD) (Completed)	48 工作日	22/12/2011	27/2/2012
331		TB06	489 工作日	3/1/2011	15/11/2012
332		Footbridge TB06 (Ch 400)	162 工作日	22/12/2011	3/8/2012
333		Construction of Abutment A (LHS)	30 工作日	22/12/2011	1/2/2012
342		Construction of decking	14 工作日	11/5/2012	30/5/2012
347		Lighting at Footbridge TB06	14 工作日	17/7/2012	3/8/2012
348		Construction of Drawpits / Ductings	6 工作日	17/7/2012	24/7/2012
349		Public lighting Installation (CE2311)	3 工作日	25/7/2012	27/7/2012
350		Public lighting Installation (CE2310)	3 工作日	30/7/2012	1/8/2012



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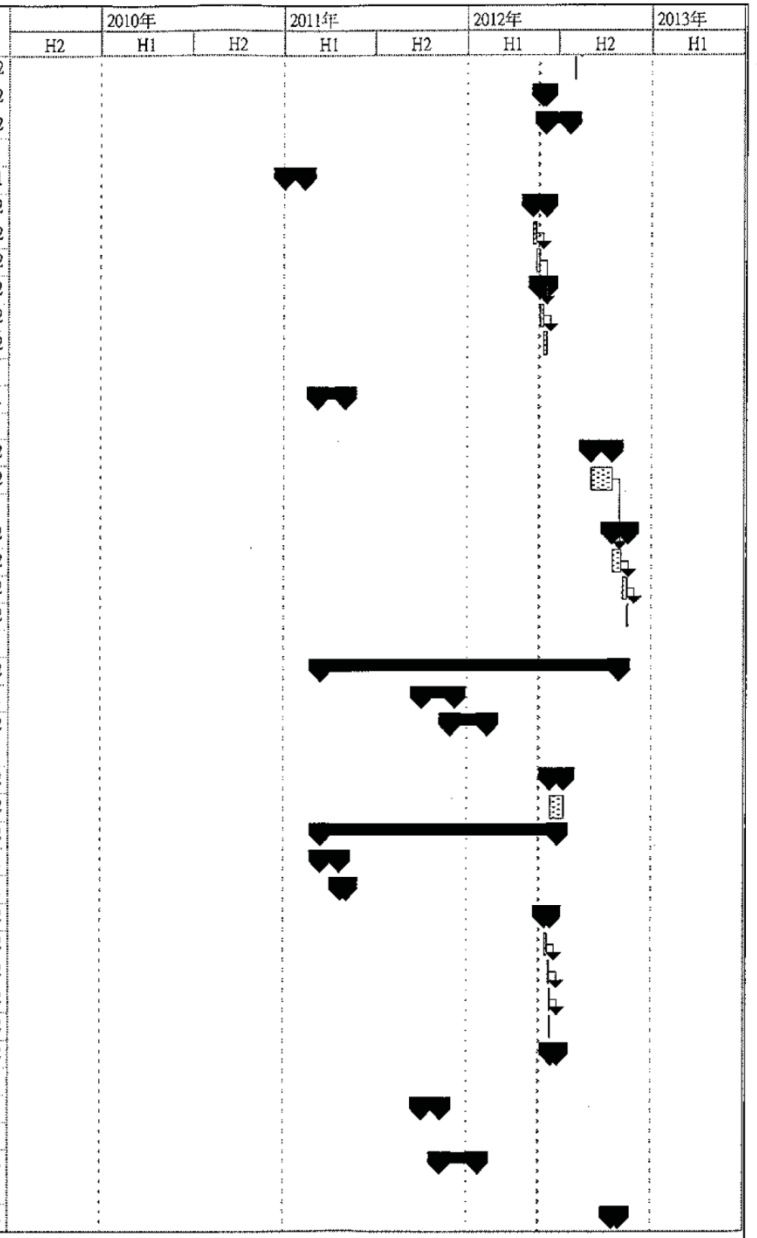
351		T&C	2 工作日	2/8/2012	3/8/2012
352		Demolition of Bridge TB-C	4 工作日	31/5/2012	5/6/2012
355		Consturction of Gabion Wall at TB-C	35 工作日	6/6/2012	24/7/2012
359					
360		Gabion Wall (Ch 400-450 RHS) TR1 (replaced by AD1)	30 工作日	3/1/2011	11/2/2011
364		Step 4	20 工作日	11/5/2012	7/6/2012
365		Basin	5 工作日	11/5/2012	17/5/2012
366		Ramp and Slab	5 工作日	18/5/2012	24/5/2012
367		Step 5	10 工作日	25/5/2012	7/6/2012
368		Basin	5 工作日	25/5/2012	31/5/2012
369		Ramp and Slab	5 工作日	1/6/2012	7/6/2012
370					
371		Box Culvert TB01 (Ch 450) (Completed)	40 工作日	10/3/2011	4/5/2011
381					
382		Drainage & Footpath (Ch330-450) RHS	30 工作日	4/9/2012	15/10/2012
383		Drainage & Footpath	30 工作日	4/9/2012	15/10/2012
384					
385		Lighting at CH 350-380	23 工作日	16/10/2012	15/11/2012
386		Construction of Drawpits / Ductings	14 工作日	16/10/2012	2/11/2012
387		Public lighting Installation (CE2312)	7 工作日	5/11/2012	13/11/2012
388		T&C	2 工作日	14/11/2012	15/11/2012
389					
390		Ch 450-525	424 工作日	16/3/2011	29/10/2012
391		Retaining Wall (ch 450-500) TR2 (RHS)	48 工作日	3/10/2011	7/12/2011
434		Retaining Wall (ch 450-500) TR2 (LHS)	54 工作日	29/11/2011	10/2/2012
483					
484		Drainage & Footpath (Ch 450-490 RHS)	20 工作日	15/6/2012	12/7/2012
485		Construction of drainage & footpath and wall stem 2nd portion	20 工作日	15/6/2012	12/7/2012
486		Retaining Wall (Ch 500-530) TR3 (RHS)	338 工作日	16/3/2011	29/6/2012
487		Base Slab Construction Bay 1 (RHS)	28 工作日	16/3/2011	22/4/2011
492		Wall Stem Construction Bay 1 (RHS)	10 工作日	25/4/2011	6/5/2011
497		Base Slab Construction Bay 1 (RHS)	10 工作日	4/6/2012	15/6/2012
498		Excavation and Formation	5 工作日	4/6/2012	8/6/2012
499		Formwork and rebar fixing	3 工作日	11/6/2012	13/6/2012
500		Concreting	1 工作日	14/6/2012	14/6/2012
501		Stripping off formwork	1 工作日	15/6/2012	15/6/2012
502		Wall Stem Construction Bay 2 (RHS)	10 工作日	18/6/2012	29/6/2012
507					
508		Cascades (Ch 500 LHS)	28 工作日	3/10/2011	9/11/2011
514					
515		Retaining Wall (Ch 500-530) TR3 (LHS)	54 工作日	9/11/2011	23/1/2012
538					
539		Drainage & Footpath (Ch 490-525 RHS)	10 工作日	16/10/2012	29/10/2012



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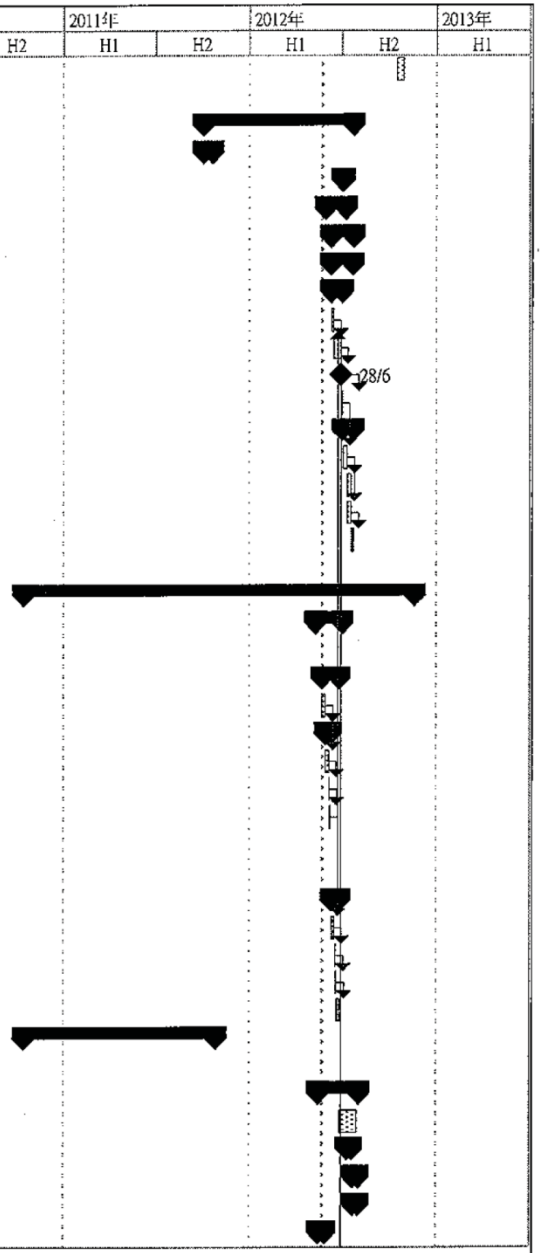
540		Construction of drainage & footpath	10 工作日	16/10/2012	29/10/2012
541					
542		Footbridge TB07 (Ch 525)	213 工作日	3/10/2011	25/7/2012
543		Temporary Pedestrian Division	14 工作日	3/10/2011	20/10/2011
545		Demolition of existing Footbridge TB-D (Ch 525)	3 工作日	3/7/2012	5/7/2012
547		Construction of Abutment A	28 工作日	31/5/2012	9/7/2012
556		Construction of Abutment B	33 工作日	11/6/2012	25/7/2012
565		Footbridge TB07 (Ch 525)	31 工作日	11/6/2012	23/7/2012
566		Construction of decking	16 工作日	11/6/2012	2/7/2012
567		Erection of steel deck+ conc deck	4 工作日	11/6/2012	14/6/2012
568		Deck finishing	10 工作日	15/6/2012	28/6/2012
569		NA	0 工作日	28/6/2012	28/6/2012
570		Railing installation	2 工作日	29/6/2012	2/7/2012
571		Footbridge TB07 Lighting	15 工作日	3/7/2012	23/7/2012
572		Construction of Drawpits / Ducting	7 工作日	3/7/2012	11/7/2012
573		Public lighting Installation (CE2328)	6 工作日	12/7/2012	19/7/2012
574		Public lighting Installation (CE2329)	6 工作日	12/7/2012	19/7/2012
575		T&C	2 工作日	20/7/2012	23/7/2012
576					
577		Ch 525-615	547 工作日	15/10/2010	19/11/2012
578		Retaining Wall (Ch 535-546) TR4 (LHS)	37 工作日	11/5/2012	2/7/2012
598					
599		Retaining Wall (Ch 535-546) TR4 (RHS)	25 工作日	23/5/2012	26/6/2012
600		Excavation and Formation	5 工作日	23/5/2012	29/5/2012
601		Base Slab Construction Bay 1+2 (RHS)	8 工作日	30/5/2012	8/6/2012
602		Formwork and rebar fixing (with DWF)	5 工作日	30/5/2012	5/6/2012
603		Concreting	1 工作日	6/6/2012	6/6/2012
604		Stripping off formwork	2 工作日	7/6/2012	8/6/2012
605		Wall Stem Construction Bay 1 (RHS) del	0 工作日	8/6/2012	8/6/2012
610		Base Slab Construction Bay 2 (RHS) del	0 工作日	8/6/2012	8/6/2012
614		Wall Stem Construction Bay 1+2 (RHS)	12 工作日	11/6/2012	26/6/2012
615		Formwork and rebar fixing	5 工作日	11/6/2012	15/6/2012
616		Concreting	1 工作日	18/6/2012	18/6/2012
617		Stripping off formwork	2 工作日	19/6/2012	20/6/2012
618		Backfill	4 工作日	21/6/2012	26/6/2012
619		Retaining Wall TR5 Ch (546-596 RHS) TR5 (AD)	269 工作日	15/10/2010	26/10/2011
627					
628		Retaining Wall TR5A CH546-585 LHS	58 工作日	16/5/2012	3/8/2012
629		River diversion, Excavation and Formation	24 工作日	27/6/2012	30/7/2012
630		Base Slab Construction TR5A Bay 1 LHS	8 工作日	11/7/2012	20/7/2012
634		Wall Stem Construction TR5A Bay 1 LHS	9 工作日	23/7/2012	2/8/2012
639		Base Slab Construction TR5A Bay 2 LHS	8 工作日	23/7/2012	1/8/2012
643		Wall Stem Construction TR5A Bay 2 LHS	9 工作日	16/5/2012	28/5/2012



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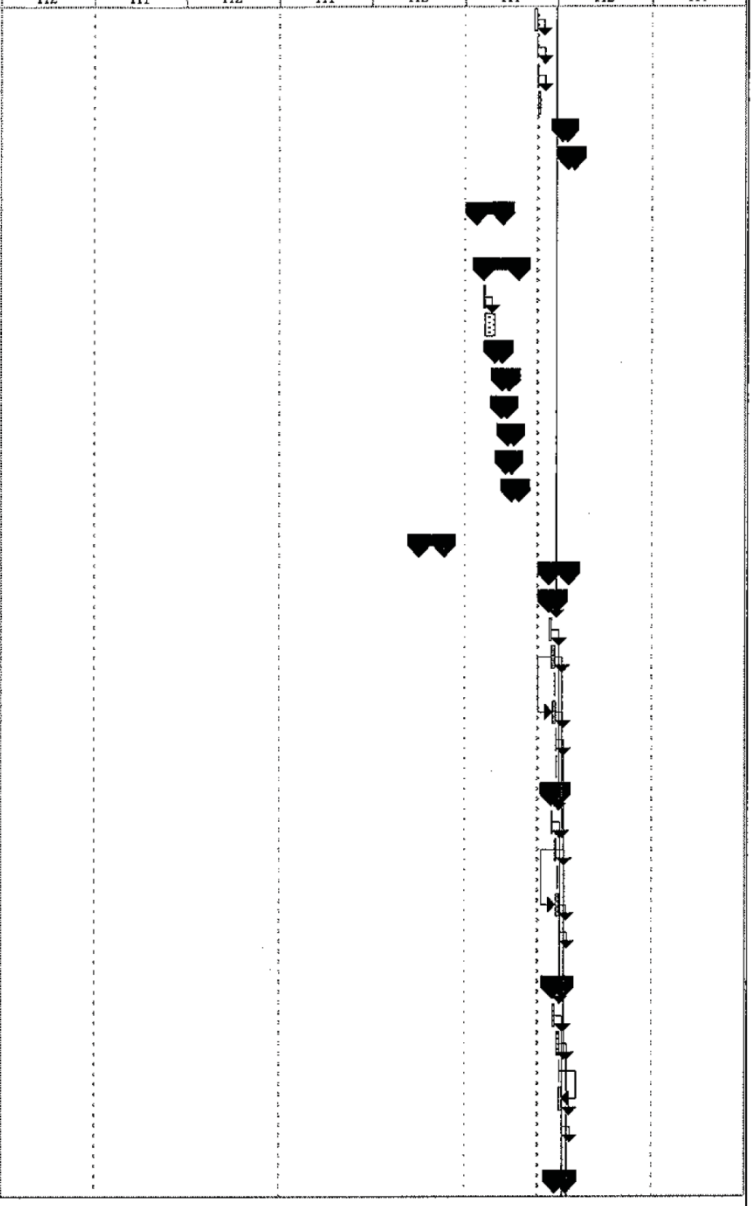
644	Formwork and rebar fixing	4 工作日	16/5/2012	21/5/2012
645	Concreting	1 工作日	22/5/2012	22/5/2012
646	Stripping off formwork	1 工作日	23/5/2012	23/5/2012
647	Backfill	3 工作日	24/5/2012	28/5/2012
648	Base Slab Construction TR5A Bay 3 LHS	8 工作日	11/7/2012	20/7/2012
652	Wall Stem Construction TR5A Bay 3 LHS	10 工作日	23/7/2012	3/8/2012
657				
658	Box Culvert TB02 (ch 580)	39 工作日	24/1/2012	16/3/2012
668				
669	Retaining Wall TR5A & TR6 CH585-595 LHS	50 工作日	7/2/2012	16/4/2012
670	River/Haul Road Diverison (to TR3 and TR5 RHS)	3 工作日	7/2/2012	9/2/2012
671	Excavation and Blinding	14 工作日	10/2/2012	29/2/2012
672	Base Slab Construction TR6 Bay 1 LHS	10 工作日	1/3/2012	14/3/2012
676	Wall Stem Construction TR6 Bay 1 LHS	10 工作日	15/3/2012	28/3/2012
681	Base Slab Construction TR5A Bay 4 LHS	8 工作日	14/3/2012	23/3/2012
685	Wall Stem Construction TR5A Bay 4 LHS	10 工作日	26/3/2012	6/4/2012
690	Base Slab Construction TR5A Bay 5 LHS	8 工作日	22/3/2012	2/4/2012
694	Wall Stem Construction TR5A Bay 5 LHS	10 工作日	3/4/2012	16/4/2012
699				
700	Retaining Wall (ch 595-615) TR3 (Bay 3)	36 工作日	3/10/2011	21/11/2011
715	Concrete Slab (Ch546 - Ch596) LHS	27 工作日	15/6/2012	23/7/2012
716	Bay 1	11 工作日	15/6/2012	29/6/2012
717	Excavation/Blinding	3 工作日	15/6/2012	19/6/2012
718	Formwork and rebar fixing for DWF	4 工作日	20/6/2012	25/6/2012
719	Concreting of DWF	1 工作日	26/6/2012	26/6/2012
720	Formwork and rebar fixing for slab	4 工作日	22/6/2012	27/6/2012
721	Concreting of slab	1 工作日	28/6/2012	28/6/2012
722	Stripping off formwork	1 工作日	29/6/2012	29/6/2012
723	Bay 2	12 工作日	20/6/2012	5/7/2012
724	Excavation/Blinding	2 工作日	20/6/2012	21/6/2012
725	Formwork and rebar fixing for DWF	4 工作日	26/6/2012	29/6/2012
726	Concreting of DWF	1 工作日	2/7/2012	2/7/2012
727	Formwork and rebar fixing for slab	4 工作日	28/6/2012	3/7/2012
728	Concreting of slab	1 工作日	4/7/2012	4/7/2012
729	Stripping off formwork	1 工作日	5/7/2012	5/7/2012
730	Bay 3	14 工作日	22/6/2012	11/7/2012
731	Excavation/Blinding	2 工作日	22/6/2012	25/6/2012
732	Formwork and rebar fixing for DWF	4 工作日	29/6/2012	4/7/2012
733	Concreting of DWF	1 工作日	5/7/2012	5/7/2012
734	Formwork and rebar fixing for slab	4 工作日	4/7/2012	9/7/2012
735	Concreting of slab	1 工作日	10/7/2012	10/7/2012
736	Stripping off formwork	1 工作日	11/7/2012	11/7/2012
737	Bay 4	16 工作日	26/6/2012	17/7/2012



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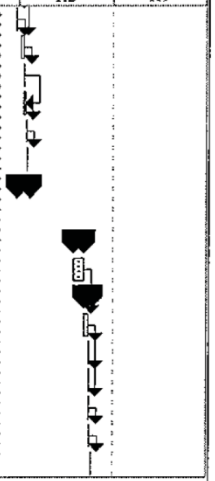
738		Excavation/Blinding	2 工作日	26/6/2012	27/6/2012
739		Formwork and rebar fixing for DWF	4 工作日	5/7/2012	10/7/2012
740		Concreting of DWF	1 工作日	11/7/2012	11/7/2012
741		Formwork and rebar fixing for slab	4 工作日	10/7/2012	13/7/2012
742		Concreting of slab	1 工作日	16/7/2012	16/7/2012
743		Stripping off formwork	1 工作日	17/7/2012	17/7/2012
744		Bay 5	18 工作日	28/6/2012	23/7/2012
751					
752		Drainage and Footpath (Ch525-615 LHS & RHS)	15 工作日	16/10/2012	5/11/2012
753		Construction of footpath & drainage works	15 工作日	16/10/2012	5/11/2012
754		Lighting at CH 550-610	10 工作日	6/11/2012	19/11/2012
755		Construction of Drawpits / Ducting	6 工作日	6/11/2012	13/11/2012
756		Public lighting Installation (CE2325)	2 工作日	14/11/2012	15/11/2012
757		Public lighting Installation (CE2326)	2 工作日	14/11/2012	15/11/2012
758		Public lighting Installation (CE2327)	2 工作日	14/11/2012	15/11/2012
759		T&C	1 工作日	16/11/2012	16/11/2012
760		Removal of existing lighting (CE1600-B2)	1 工作日	19/11/2012	19/11/2012



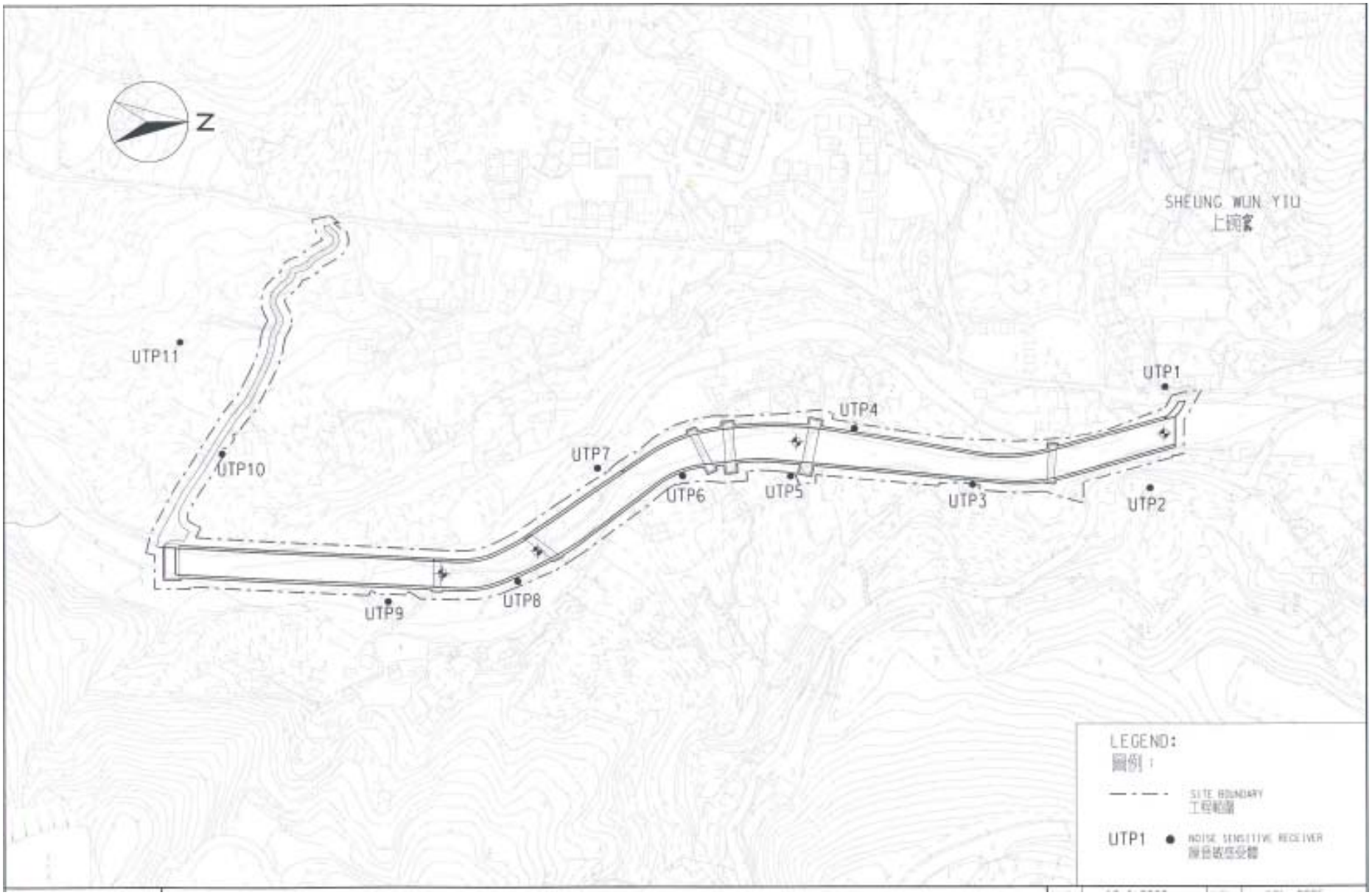
專案: Master Programme TPR 11 May
日期: 22/5/2012

任務 進度 摘要 外部任務 期限
分割 里程碑 專案摘要報告 外部里程碑

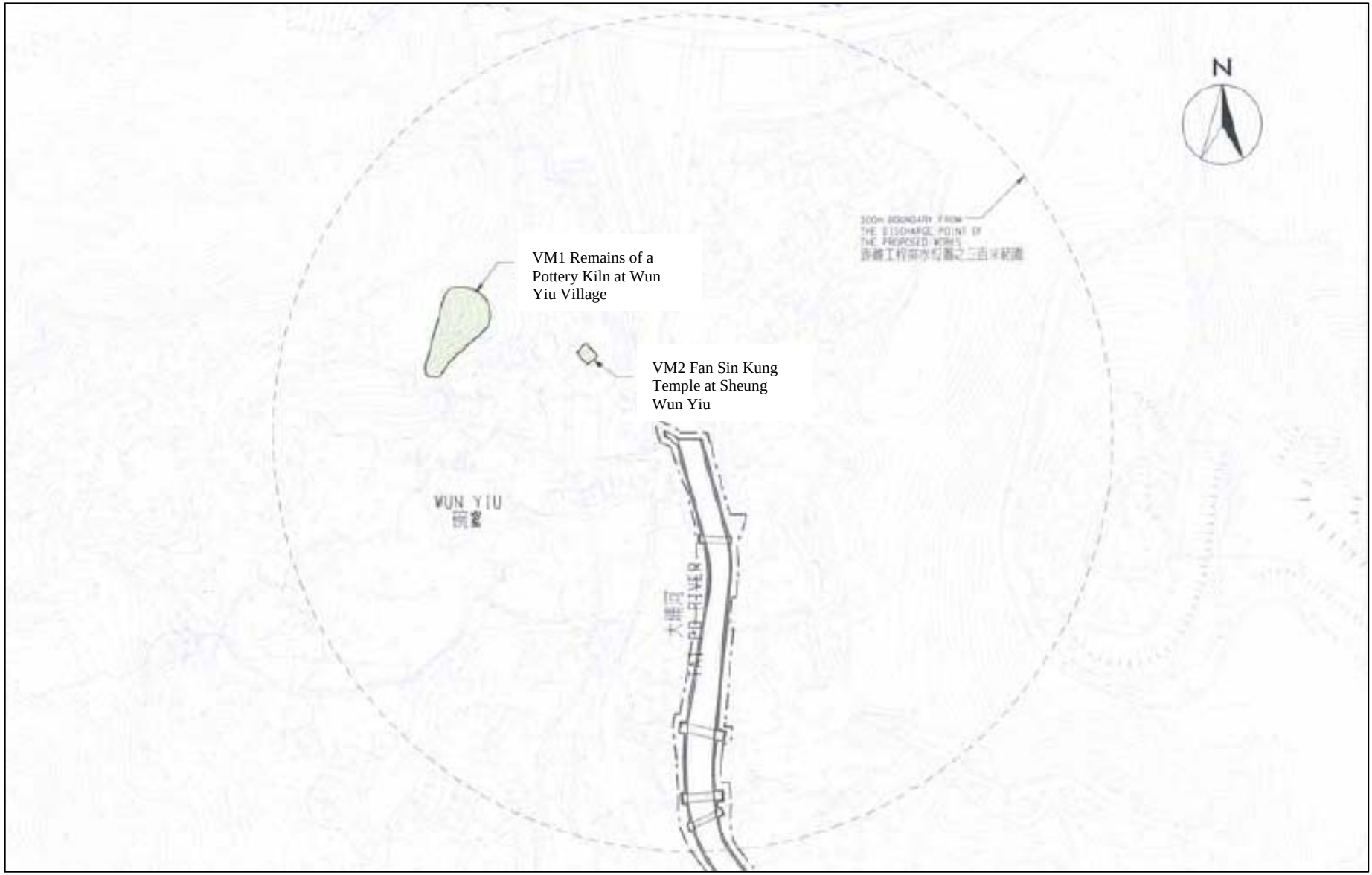
Appendix C

Environmental Monitoring Locations

Construction Noise and Vibration



Construction Noise Monitoring Location



Vibration Monitoring Location

Appendix D

Calibration certificates of the monitoring equipment

Equipment Calibration List

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Noise	Bruel & Kjaer Integrating Sound Level Meter (Serial No. 2285762) AUES Equipment ID: EQ006	7 May 2012	7 May 2013
2		Bruel & Kjaer Integrating Sound Level Meter (Serial No. 2285722) AUES Equipment ID: EQ009	20 July 2012	20 July 2013
2		Bruel & Kjaer Integrating Sound Level Meter (Serial No. 2285721) AUES Equipment ID: EQ010	20 April 2012	20 April 2013
3		Bruel & Kjaer Integrating Sound Level Meter (Serial No. 2337676) AUES Equipment ID: EQ065	18 May 2012	18 May 2013
4		Rion NL-31 Sound Level Meter (Serial No. 00410221) AUES Equipment ID: EQ067	8 May 2012	8 May 2013
5		Bruel & Kjaer Acoustical Calibrator (Serial No. 2326408) AUES Equipment ID: EQ081	7 May 2012	7 May 2013

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

Certificate of Calibration
校正證書

Certificate No. : C122713
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商 : Bruel & Kjaer
Model No. / 型號 : 2238
Serial No. / 編號 : 2285762
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 May 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 8 May 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122713
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the B & K Acoustic Calibrator 4231, S/N : 2326408 was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.1	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.1 (Ref.)
				104.00		104.1
				114.00		114.1

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.1	Ref.
	L_{ASP}		S			94.1	± 0.1
	L_{AIP}		I			94.2	± 0.1

Certificate of Calibration
校正證書

Certificate No. : C122713
證書編號

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	55.2	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	93.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.5	-3.0 ± 1.5
					63 Hz	93.4	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C122713
證書編號

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	79.4	± 1.0
			5 min.			$1/10^4$		70	69.3	± 1.0

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

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.40 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz	: ± 0.40 dB
	4 kHz	: ± 0.50 dB
	8 kHz	: ± 0.70 dB
	12.5 kHz	: ± 1.20 dB
104 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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

Certificate of Calibration
校正證書

Certificate No. : C124263
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱	:	Integrating Sound Level Meter (EQ009)
Manufacturer / 製造商	:	Bruel & Kjaer
Model No. / 型號	:	2238
Serial No. / 編號	:	2285722
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 20 July 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 20 July 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C124263
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

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

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	93.6

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C124263
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.0	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	54.5	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.2	+1.0 ± 1.0
					8 kHz	94.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C124263
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.7	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.1	± 1.0
			5 min.			$1/10^4$		70	69.1	± 1.0

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

- Uncertainties of Applied Value :

94 dB :	31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱	:	Integrating Sound Level Meter (EQ010)
Manufacturer / 製造商	:	Bruel & Kjaer
Model No. / 型號	:	2238
Serial No. / 編號	:	2285721
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 20 April 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 23 April 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

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

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.1	± 0.1

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	101.9	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	54.6	-39.4 ± 1.5
					63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.1	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.6	± 0.5
			60 sec.			$1/10^3$		80	79.8	± 1.0
			5 min.			$1/10^4$		70	69.8	± 1.0

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

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.40 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz	: ± 0.40 dB
	4 kHz	: ± 0.50 dB
	8 kHz	: ± 0.70 dB
	12.5 kHz	: ± 1.20 dB
104 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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

Certificate of Calibration
校正證書

Certificate No. : C123007
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱	:	Integrating Sound Level Meter (EQ065)
Manufacturer / 製造商	:	Bruel & Kjaer
Model No. / 型號	:	2238
Serial No. / 編號	:	2337676
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 18 May 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee

Certified By 核證 : C C Cheung

Date of Issue 簽發日期 : 22 May 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C123007
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

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

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.3

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.1	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.1 (Ref.)
				104.00		104.1
				114.00		114.1

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

Certificate of Calibration
校正證書

Certificate No. : C123007
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.1	Ref.
	L_{ASP}		S			94.1	± 0.1
	L_{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.1	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	55.0	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	93.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

Certificate of Calibration
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Certificate No. : C123007
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.3	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.1	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.0	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.7	± 1.0
			5 min.			$1/10^4$		70	69.7	± 1.0

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

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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

Certificate of Calibration
校正證書

Certificate No. : C122715
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱	:	Sound Level Meter (EQ067)
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-31
Serial No. / 編號	:	00410221
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 May 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 9 May 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122715
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.9	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.9 (Ref.)
				104.00		103.9
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.9	Ref.
			Slow			93.9	± 0.1

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122715
證書編號

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
20 -110	L_A	A	Fast	106.00	Continuous	106.0	Ref.
	L_A^{max}				200 ms	105.1	-1.0 ± 1.0
	L_A		Slow		Continuous	106.0	Ref.
	L_A^{max}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	90.8	-3.0 ± 1.5
					63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C122715
證書編號

6.4 Time Averaging

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

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz: ± 0.35 dB
250 Hz - 500 Hz : ± 0.30 dB
1 kHz : ± 0.20 dB
2 kHz - 4 kHz : ± 0.35 dB
8 kHz : ± 0.45 dB
12.5 kHz : ± 0.70 dB
104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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

Certificate of Calibration
校正證書

Certificate No. : C122712
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱 : Acoustical Calibrator (EQ081)
Manufacturer / 製造商 : Bruel & Kjaer
Model No. / 型號 : 4231
Serial No. / 編號 : 2326408
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 May 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 8 May 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C122712
證書編號

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

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

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C113350
CL281	Multifunction Acoustic Calibrator	DC110233
TST150A	Measuring Amplifier	C120886

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited - Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Appendix E

Event and Action Plan

Event Action Plan for Construction Noise

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

Event Action Plan for Ecology

Event	Action			
	ET	ER	IEC	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 ET and the Contractor on possible remedial measures, 4. Advise the Contractor on effectiveness of proposed remedial measures 5. Check implementation of remedial measures	1. Ensure Remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non conformity	1. Identify Source 2. Inform the IEC and the ER 3. Increase monitoring 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	1. Check the Contractor's working method 2. Discuss with the ET and the Contractor on possible remedial measures 3. Advise the Contractor on effectiveness of proposed remedial measures 4. Check implementation of remedial measures	1. Ensure Remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement

Contingency Plan of Vibration of exceedance

If there be any exceed of limit level;

1. ET will notify IEC, ER and contractor at once.
2. A joint investigation will be carried out in order to identify the possible source and remedial actions required and agreed between ER, IEC, ET and the Contractor.
3. During such investigation, piling and drilling works will be suspended.

Appendix F

Monitoring Schedule in Reporting Period and the Coming Month

Monitoring / Inspection Schedule during the Reporting Period –December 2012

Date		Monitoring			Site Inspection		SSEMC
		Noise	Ecology	Vibration	General*	Ecology	
Sat	1-Dec-12						
Sun	2-Dec-12						
Mon	3-Dec-12					■	
Tue	4-Dec-12						
Wed	5-Dec-12	■			■		
Thu	6-Dec-12						
Fri	7-Dec-12						
Sat	8-Dec-12						
Sun	9-Dec-12						
Mon	10-Dec-12					■	
Tue	11-Dec-12	■					
Wed	12-Dec-12				■		
Thu	13-Dec-12						
Fri	14-Dec-12						
Sat	15-Dec-12						
Sun	16-Dec-12						
Mon	17-Dec-12	■				■	
Tue	18-Dec-12						■
Wed	19-Dec-12				■		
Thu	20-Dec-12						
Fri	21-Dec-12						
Sat	22-Dec-12						
Sun	23-Dec-12						
Mon	24-Dec-12					■	
Tue	25-Dec-12						
Wed	26-Dec-12						
Thu	27-Dec-12				■		
Fri	28-Dec-12						
Sat	29-Dec-12	■					
Sun	30-Dec-12						

* IEC carried out joint site inspection with the RE and Contractor on 5th, 12th, 18th and 27th December 2012.

■	Monitoring / Inspection Day
	Sunday or Public Holiday

Predict Monitoring / Site Inspection for the coming month – January 2013

Date		Monitoring			Site Inspection		SSEMC
		Noise	Ecology*	Vibration	General	Ecology	
Tue	1-Jan-13						
Wed	2-Jan-13				■		
Thu	3-Jan-13						
Fri	4-Jan-13						
Sat	5-Jan-13	■					
Sun	6-Jan-13						
Mon	7-Jan-13					■	
Tue	8-Jan-13						
Wed	9-Jan-13				■		
Thu	10-Jan-13						
Fri	11-Jan-13	■					
Sat	12-Jan-13						
Sun	13-Jan-13						
Mon	14-Jan-13		■			■	
Tue	15-Jan-13						
Wed	16-Jan-13				■		
Thu	17-Jan-13	■					
Fri	18-Jan-13						
Sat	19-Jan-13						
Sun	20-Jan-13						
Mon	21-Jan-13					■	
Tue	22-Jan-13				■		■
Wed	23-Jan-13	■					
Thu	24-Jan-13						
Fri	25-Jan-13						
Sat	26-Jan-13						
Sun	27-Jan-13						
Mon	28-Jan-13					■	
Tue	29-Jan-13	■					
Wed	30-Jan-13				■		
Thu	31-Jan-13						

■	Monitoring / Inspection Day
	Sunday or Public Holiday

Appendix G

Meteorological Data of Reporting Period

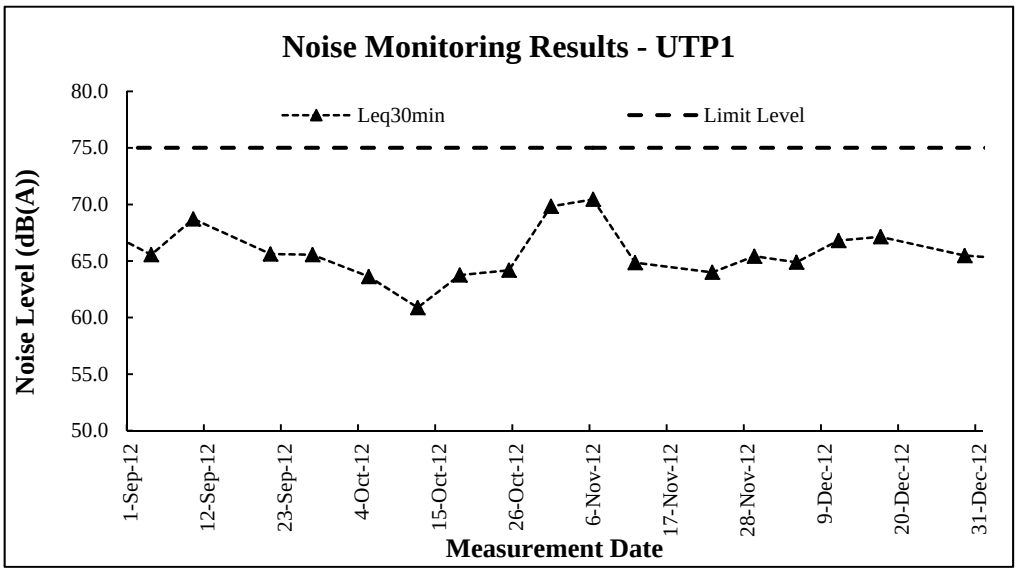
Meteorological Data in Reporting Period

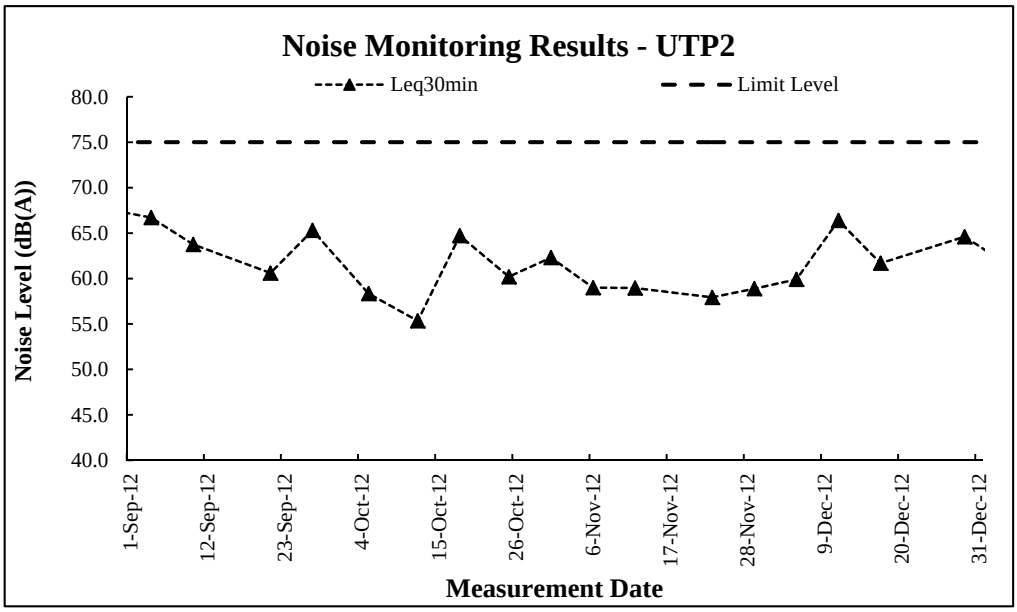
Date		Weather	Total Rainfall (mm)	Tai Po Station		Shatin Station	
				Mean Air Temp. (°C)	Mean Relative Humidity (%)	Wind Speed (km/h)	Wind Direction
1-Dec-12	Sat	Cool, fine, moderate to fresh east to northeasterly winds	0.3	20.4	86	7.1	N
2-Dec-12	Sun	Cloudy, rain, moderate to fresh east to northeasterly winds	3.2	17.5	84	10.5	N
3-Dec-12	Mon	Cloudy ,rain , moderate north to northeasterly winds	10.9	15.5	87.5	7	N
4-Dec-12	Tue	Cloudy, rain, moderate to fresh east to northeasterly winds	8.7	15.4	85.5	10.1	N
5-Dec-12	Wed	Cloudy, rain, moderate to fresh northerly winds	6.5	15.7	79	11.5	N/NE
6-Dec-12	Thu	Cool, fine, moderate to fresh east to northeasterly winds	0	15.1	71	6.1	N/NE
7-Dec-12	Fri	Sunny intervals, cloudy, moderate northeasterly winds.	Trace	17.5	75	6	N/NE
8-Dec-12	Sat	Sunny periods, cloudy, fresh easterly winds	0.9	18	75.7	8.4	N/NE
9-Dec-12	Sun	Cloudy, rain, sunny intervals, moderate northeasterly winds	0	18.4	71	10.4	E/NE
10-Dec-12	Mon	Sunny periods, cloudy, fresh easterly winds	0	18.4	70	9.6	E/NE
11-Dec-12	Tue	Cloudy, rain, sunny intervals, moderate northeasterly winds	0	17.7	74.5	8.5	N/NE
12-Dec-12	Wed	Cloudy, sunny periods, moderate to fresh easterly winds	0	16.1	74.7	11.1	N
13-Dec-12	Thu	Cloudy, sunny periods, moderate to fresh easterly winds	0	18.4	73.2	11.1	E/SE
14-Dec-12	Fri	Cloudy, rain, sunny intervals, moderate northeasterly winds	0	20.3	82.2	6.4	E/NE
15-Dec-12	Sat	Cloudy, rain, sunny intervals, moderate northeasterly winds	0	21.7	88	7.3	E/NE
16-Dec-12	Sun	Cloudy, rain, sunny intervals, moderate northeasterly winds	0	23.4	85.7	7.5	E/NE
17-Dec-12	Mon	Sunny intervals, cloudy, moderate northeasterly winds.	0	21.3	86	10.2	NE
18-Dec-12	Tue	Cloudy, rain, fresh northerly winds	2.3	16	80.7	11	N
19-Dec-12	Wed	Sunny periods, cloudy, fresh easterly winds	1.1	14.3	77	9.5	E
20-Dec-12	Thu	Cloudy, rain, moderate to fresh east to northeasterly winds	0	17.8	83	9.5	N/NE
21-Dec-12	Fri	Cloudy, sunny periods, moderate to fresh easterly winds	Trace	20.5	88	7.7	N/NE
22-Dec-12	Sat	Cloudy, rain, fresh northerly winds	0	16.9	50	15.7	N/NE
23-Dec-12	Sun	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0	12.1	52	14	N/NE
24-Dec-12	Mon	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0	11.3	64.2	13.6	NE
25-Dec-12	Tue	Cloudy, rain, fresh northerly winds	0	Holiday			
26-Dec-12	Wed	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	Trace	Holiday			
27-Dec-12	Thu	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	Trace	17.3	82.2	13.6	E/NE
28-Dec-12	Fri	Sunny periods, cloudy, fresh easterly winds	Trace	19.1	73.7	6.5	E/NE
29-Dec-12	Sat	Sunny periods, cloudy, fresh easterly winds	22.1	15.4	55.7	10.7	E/NE
30-Dec-12	Sun	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	Trace	9.4	45	16.2	N/NE
31-Dec-12	Mon	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0	8.8	39.5	10.5	N/NE

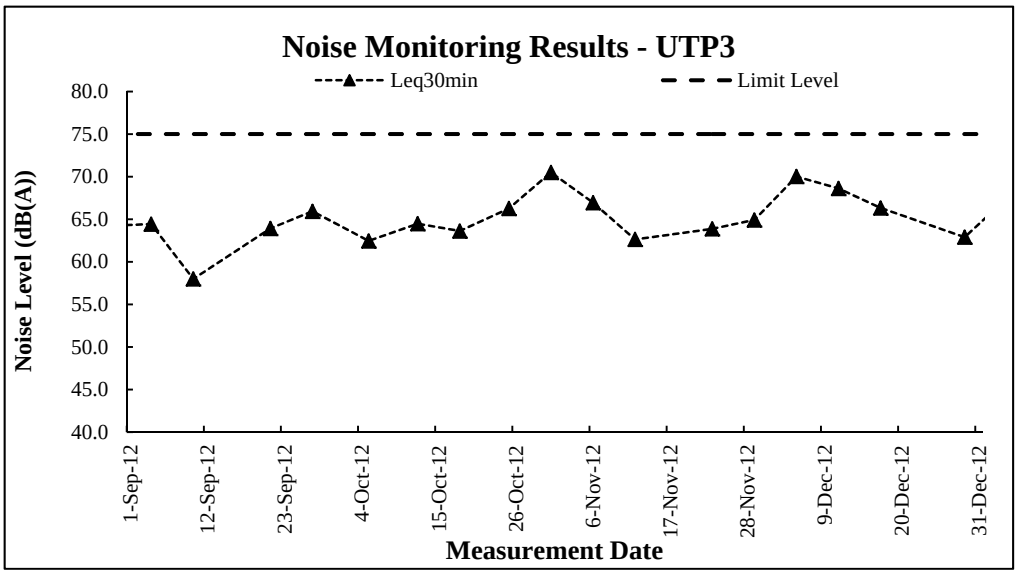
** The record was downloaded from The Hong Kong Observatory Weather Stations*

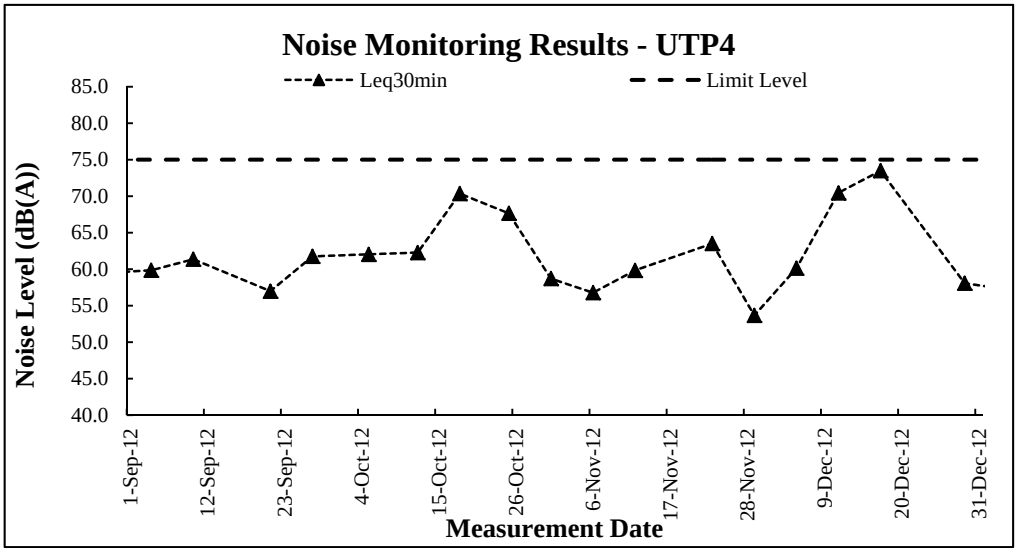
Appendix H

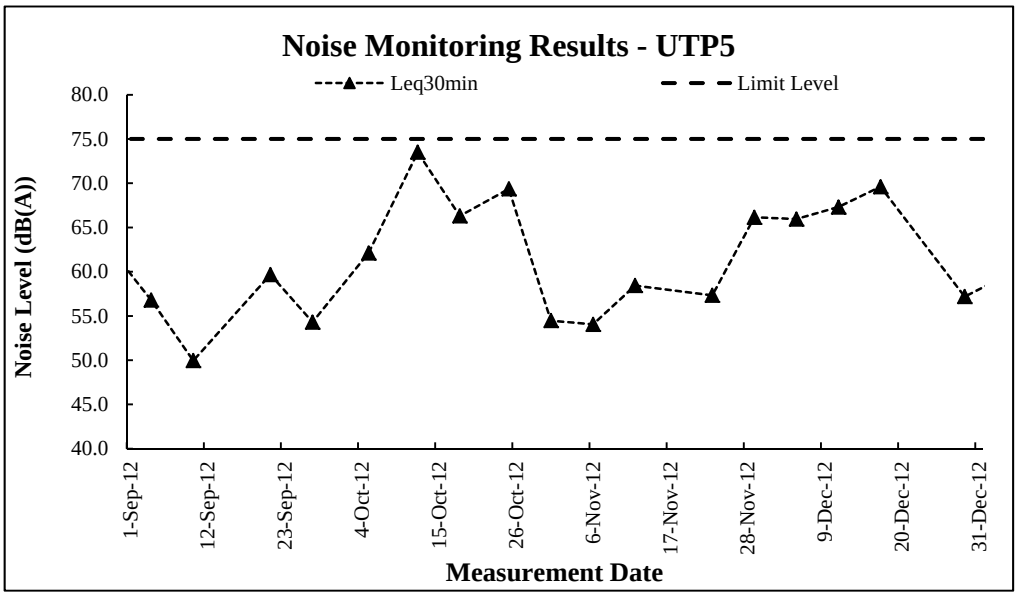
Graphical Plots of Noise Monitoring

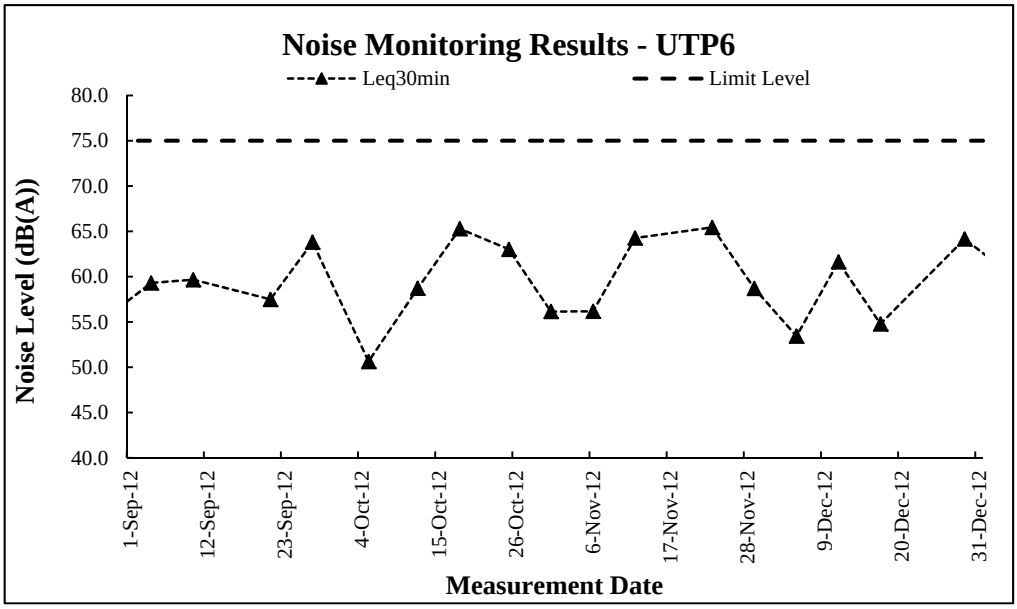

Noise Monitoring Results - UTP1
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date

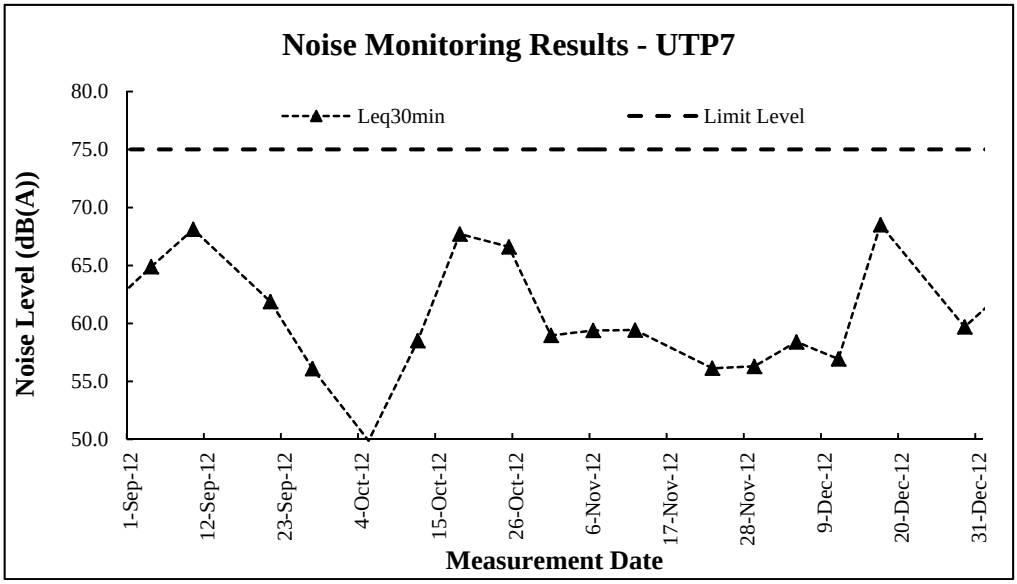

Noise Monitoring Results - UTP2
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date

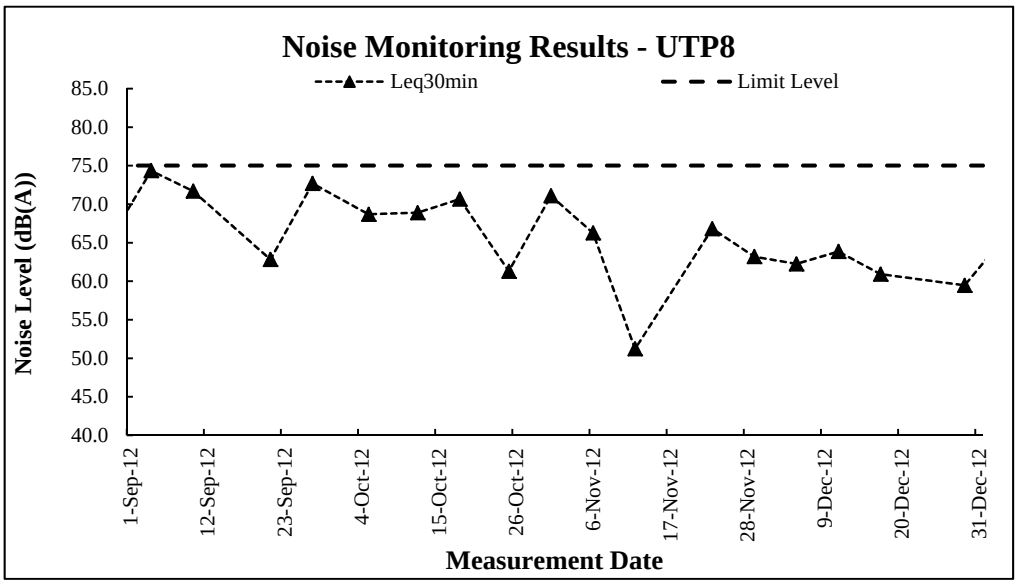

Noise Monitoring Results - UTP3
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date

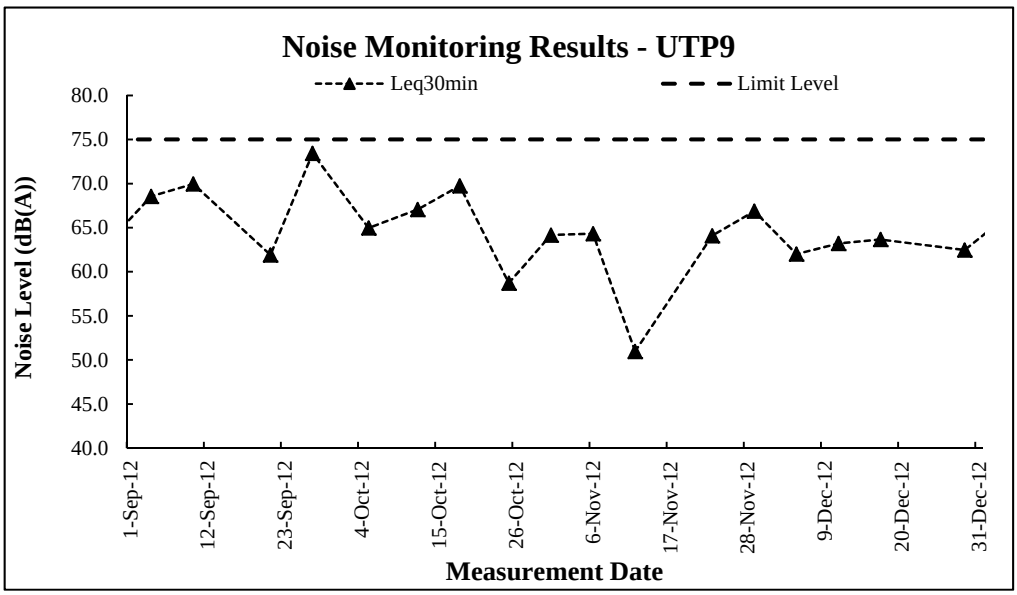

Noise Monitoring Results - UTP4
Leq30min
Limit Level
Noise Level (dB(A))
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date

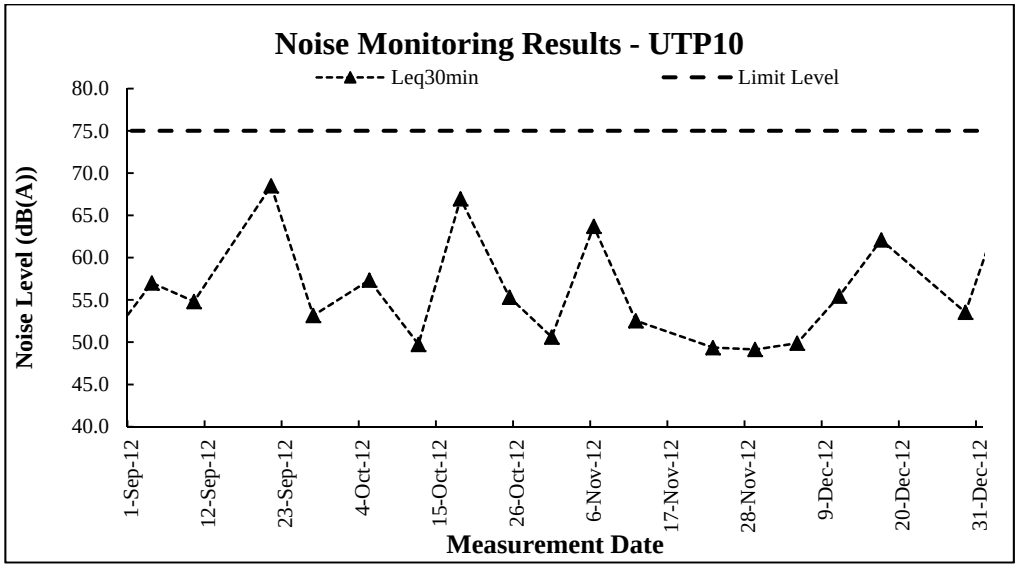

Noise Monitoring Results - UTP5
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date

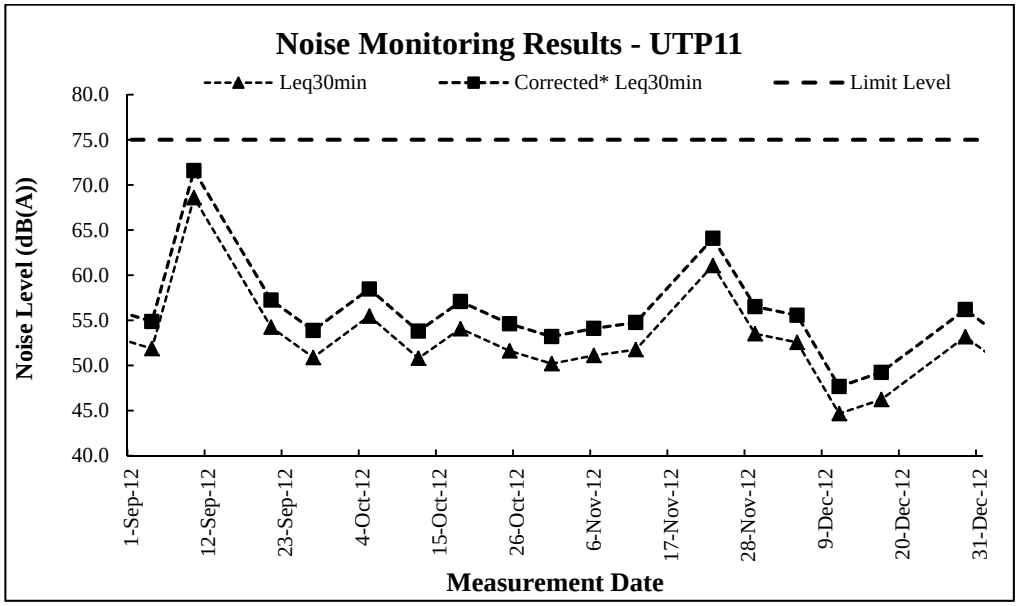

Noise Monitoring Results - UTP6
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date


Noise Monitoring Results - UTP7
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date


Noise Monitoring Results - UTP8
Leq30min
Limit Level
Noise Level (dB(A))
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date


Noise Monitoring Results - UTP9
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date


Noise Monitoring Results - UTP10
Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date


Noise Monitoring Results - UTP11
Leq30min
Corrected* Leq30min
Limit Level
Noise Level (dB(A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1-Sep-12
12-Sep-12
23-Sep-12
4-Oct-12
15-Oct-12
26-Oct-12
6-Nov-12
17-Nov-12
28-Nov-12
9-Dec-12
20-Dec-12
31-Dec-12
Measurement Date

Appendix I

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table

Name of Department: DSD

Contract No.: DC/2007/06

Monthly Summary Waste Flow Table of Upper Tai Po River for 2012

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity of Inert C&D Materials 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 '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	1.920	0.490	0.490	1.430	0.000	0.000	0.050	0.040	0.020	0.002	0.030
Feb	2.110	1.970	2.000	0.110	0.000	0.000	0.030	0.020	0.015	0.001	0.020
Mar	1.401	0.107	0.281	1.120	0.000	0.000	0.040	0.045	0.020	0.000	0.030
Apr	0.710	0.280	0.280	0.295	0.135	0.000	0.035	0.040	0.015	0.000	0.030
May	0.161	0.160	0.161	0.000	0.000	0.000	0.040	0.035	0.020	0.000	0.035
June	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.040	0.025	0.000	0.030
July	0.128	0.128	0.128	0.000	0.000	0.000	0.040	0.045	0.025	0.000	0.050
Aug	0.128	0.128	0.128	0.000	0.000	0.000	0.050	0.050	0.030	0.001	0.060
Sept	0.764	0.764	0.764	0.000	0.000	0.000	0.045	0.040	0.030	0.000	0.050
Oct	0.244	0.244	0.244	0.000	0.000	0.000	0.050	0.050	0.040	0.000	0.045
Nov	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
Total	7.566	4.271	4.476	2.955	0.135	0.000	0.415	0.405	0.240	0.004	0.385

*For all the three rivers in the Contract

Appendix J

Observed Noise Source During Noise Monitoring

J1 Observed Noise Source During Noise Monitoring for UTP1

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	-	Human voice, animals sound and low road traffic noise
11-Dec-12	Excavation	Human voice and low road traffic noise
17-Dec-12	-	Human voice and medium road traffic noise
29-Dec-12	Excavation	Human voice and low road traffic noise

J2 Observed Noise Source During Noise Monitoring for UTP2

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Excavation	Human voice and low road traffic noise
11-Dec-12	Excavation	Human voice and low road traffic noise
17-Dec-12	-	Low road traffic noise
29-Dec-12	Excavation	Human voice and low road traffic noise

J3 Observed Noise Source During Noise Monitoring for UTP3

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Dredging	Human voice, animals sound and low road traffic noise
11-Dec-12	Excavation	Human voice
17-Dec-12	-	Human voice, animals sound
29-Dec-12	Dredging	Human voice

J4 Observed Noise Source During Noise Monitoring for UTP4

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Excavation and drilling	Human voice
11-Dec-12	Excavation and cutting	Human voice
17-Dec-12	Excavation	Human voice
29-Dec-12	Excavation	Human voice

J5 Observed Noise Source During Noise Monitoring for UTP5

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Excavation and drilling	Human voice
11-Dec-12	Excavation and cutting	Human voice
17-Dec-12	Excavation and uploading	Human voice
29-Dec-12	Excavation and uploading	Human voice

J6 Observed Noise Source During Noise Monitoring for UTP6

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Dredging	Human voice, animals sound
11-Dec-12	Dredging	Human voice, animals sound
17-Dec-12	-	Human voice and animals sound
29-Dec-12	Dredging	Human voice

J7 Observed Noise Source During Noise Monitoring for UTP7

Date	Construction Activities	Other Noise Source

	under the Project	
5-Dec-12	Excavation	Human voice
11-Dec-12	Cutting	Human voice
17-Dec-12	Dredging	Human voice and animals sound
29-Dec-12	Dredging	Human voice

J8 Observed Noise Source During Noise Monitoring for UTP8

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Dredging	Human voice and animals sound
11-Dec-12	Dredging	Human voice, animals sound and low road traffic noise
17-Dec-12	Formworks	Human voice, animals sound and low road traffic noise
29-Dec-12	Dredging	Human voice and low road traffic noise

J9 Observed Noise Source During Noise Monitoring for UTP9

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	Dredging	Human voice, animals sound and low road traffic noise
11-Dec-12	Dredging	Human voice, animals sound and low road traffic noise
17-Dec-12	Excavation	Human voice, animals sound and low road traffic noise
29-Dec-12	Dredging	Human voice and low road traffic noise

J10 Observed Noise Source During Noise Monitoring for UTP10

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	-	Human voice and animals sound
11-Dec-12	-	Human voice and animals sound
17-Dec-12	-	Human voice and animals sound
29-Dec-12	-	Human voice and animals sound

J11 Observed Noise Source During Noise Monitoring for UTP11

Date	Construction Activities under the Project	Other Noise Source
5-Dec-12	-	Human voice and animals sound
11-Dec-12	-	Human voice and animals sound
17-Dec-12	-	Animals sound
29-Dec-12	-	Human voice and animals sound