



JOB No.: TCS00744/14

TSW-C004 – OCEAN PARK TAI SHUE WAN
DEVELOPMENT
SITE FORMATION AND FOUNDATION WORKS

5th QUARTERLY ENVIRONMENTAL MONITORING &
AUDIT SUMMARY REPORT –
(17 July 2016 to 16 October 2016)

PREPARED FOR OCEAN PARK CORPORATION

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Version	Date	Remarks
1	28 October 2016	First Submission
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Pursuant to Environmental Monitoring and Audit Manual Section 11.4, a "Quarterly Environmental Monitoring and Audit (EM&A) Report (no.5) – 17 July 2016 to 16 October 2016" was certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC).

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Date:

7 November 2016

EXECUTIVE SUMMARY

ES.01. This is the 5th Quarterly EM&A Summary Report for the “*Ocean Park Tai Shue Wan Development*” under Environmental Permit No. EP-487/2014 (hereinafter “the EP”), covering the period from **17 July to 16 October 2016** (hereinafter “Reporting Period”).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Total Occasions
Construction Noise	L _{eq(30min)} Daytime	26
Ecology	Site Inspection	3
landscape and Visual	Inspection of the mitigation measures implementation situation	6
Site Inspection / Audit	Environmental Team (ET), the Contractor and Project Management Representative (PMR) joint site Inspection and Auditing	13
	Independent Environmental Checker (IEC) joint site Inspection and Auditing	3

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In this Reporting Period, construction noise monitoring results demonstrated that no exceedance of environmental performance. The summary of breach is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	L _{eq(30min)} Daytime	0	0	0	0	0

ENVIRONMENTAL COMPLAINT

ES.04. No environmental complaints were received under the EM&A Programme in the Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05. No environmental summons or successful prosecutions were recorded in the Reporting Period.

REPORTING CHANGES

ES.06. No reporting changes were made in the Reporting Period.

FUTURE KEY ISSUES

ES.07. Although the rainy seasonal will soon be over, however the contractor shall pay attention to prevent muddy water and other water pollutants via site surface runoff direct discharge into the sea due to rainy day may be to encounter the coming month. Water quality mitigation measures should be properly to implement in accordance with EMIS stipulation.

ES.08. Furthermore, noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement since construction noise is a key environmental issue during construction work of the Project.

ES.09. Since dry and windy season come soon, soil stockpile and temporary haul road should pay attention. Dust mitigation measures should be properly performed to avoid fugitive dust generated from the Project.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. Ocean Park Corporation is the Project Proponent and the Permit Holder of the *Ocean Park Tai Shue Wan Development* (hereinafter “the Project”), which is a Designated Project to be implemented under Environmental Permit number EP-487/2014 (hereinafter referred as “the EP-487/2014” or “the EP”).
- 1.1.2. The Project will redevelop the existing theme park areas at Tai Shue Wan into a Water Park to enhance the attractiveness of Ocean Park into a world-class theme park and provide a must-see destination to visitors. The layout plan of the Project is shown in [Appendix A](#).
- 1.1.3. Site formation and foundation works as part of the Project is awarded by Paul Y. Construction Company Limited (hereinafter called “the Contractor”) on 17 July 2015. To compliance with Environmental Permit requirement, the Contractor has been appointed Action-United Environmental Services & Consulting (AUES) as the Environmental Team (hereinafter referred as “the ET”) to implement the relevant Environmental Monitoring and Audit (EM&A) programmes.
- 1.1.4. Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties.
- 1.1.5. This is the **5th** Quarterly EM&A Summary Report for the Site formation and foundation works as part of the Project under Environmental Permit No. EP-487/2014, covered the period from **17 July 2016 to 16 October 2016**.

1.2 REPORT STRUCTURE

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

Section 1 Introduction

Section 2 Project Organization and Construction Progress

Section 3 Summary of Impact Monitoring Requirements

Section 4 Construction Noise

Section 5 Ecology

Section 6 Landscape & Visual

Section 7 Waste Management

Section 8 Site Inspections

Section 9 Environmental Complaints, Non-Compliance, Notifications of Summons and Successful Prosecutions

Section 10 Implementation Status of Mitigation Measures

Section 11 Conclusions and Recommendations

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION

2.1.1 The project organization is shown in *Appendix B*. The responsibilities of respective parties are:

Ocean Park Corporation

2.1.2 Ocean Park Corporation is the Project Proponent and the Permit Holder of the EP for the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by Ocean Park Corporation to audit the results of the EM&A works carried out by the ET.

Environmental Protection Department (EPD)

2.1.3 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

Project Management Representative (PMR) of Ocean Park Corporation

2.1.4 The PMR is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with the related government departments, ET, IEC, the Contractor and the other Contractors of the Project discussing regarding the cumulative impact issues.

The Contractor

2.1.5 The duties and responsibilities of the Contractor are:

- Comply with the relevant contract conditions and specifications on environmental protection
- Employ an Environmental Team (ET) to undertake monitoring, laboratory analysis and reporting of EM &A Facilitate ET's monitoring and site inspection activities
- Participate in the site inspections by the ET and IEC, and undertake any corrective actions
- Provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event / Action Plans
- Implement measures to reduce impact where Action and Limit levels are exceeded
- Adhere to the procedures for carrying out complaint investigation

Environmental Team (ET)

2.1.6 The ET should be employed by the Contractor to conduct the EM&A programme. The ET should be managed by the ET Leader. ET Leader should have relevant professional qualifications in environmental control and possess at least 7 years' experience in EM&A. Suitably qualified professional and technical staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in the time under the Contract, to enable fulfilment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET shall include qualified botanist/ecologist for the ecological service and a Registered Landscape Architect for review of implementation of landscape and visual mitigation measures. The ET should report to the OPC and the duties should include:

- to monitor and audit various environmental parameters as required in the Approved EM&A Manual;
- to analyse the EM&A data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising;
- to monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications;
- to audit environmental conditions on site;
- to report on the EM&A results to EPD, the ER, the IEC and Contractor or their delegated representatives;
- to recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans;
- to liaise with the IEC on all environmental performance matters, and ensure timely submission of all relevant EM&A pro forma for IEC's approval;
- to provide advice to the Contractor on environmental improvement, awareness and enhancement matters, etc on site;
- to adhere to the procedures for carrying out complaint investigation;
- to prepare reports on the environmental monitoring data and the site environmental conditions;
- to submit the EM&A report to Director of Environmental Protection (DEP) timely;
- to review proposals of mitigation measures from the Contractor in case of exceedance of Action and Limit levels, in accordance with the Event and Action Plan; and
- to carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and mitigation measures.

Independent Environmental Checker (IEC)

2.1.7 The IEC is empowered to audit the environmental performance of construction, but is independent from the management of construction works. As such, the IEC should not be in any way an associated body of the Contractor or the ET for the Project. The IEC should be employed by OPC prior to the commencement of the construction of the Project. The IEC should be a person who has relevant professional qualifications in environmental control and at least 7 years' experience in EM&A and environmental management. The duties and responsibilities of the IEC are:

- to provide proactive advice to the ER and OPC on EM&A matters related to the project;
- to review and verify the monitoring data and all submissions in connection with the EP and EM&A Manual submitted by the ET;
- to arrange and conduct regular, at least monthly site inspections of the works during the construction phase, and to carry out ad hoc inspections if significant environmental problems are identified;
- to check compliance with the agreed Event and Action Plan in the event of any exceedance;
- to check compliance with the procedures for carrying out complaint investigation;
- to check the effectiveness of corrective measures;
- to feedback audit results to the ET by signing off relevant EM&A pro forma;
- to check that mitigation measures are effectively implemented;
- to report the works conducted, and the findings, recommendations and improvements of the site inspections, after reviewing ET's and Contractor's works, the ER and OPC on a monthly basis;
- to verify the investigation result of the environmental complaint cases and the effectiveness of corrective measures;
- to verify EM&A report that has been certified by ET leader; and
- to audit EIA recommendations and requirements against the status of implementation of environmental mitigation measures on site.

2.2 CONSTRUCTION PROGRESS

2.2.1 The master construction program of Site Formation and Foundation Works is enclosed in [Appendix C](#). In the Reporting Period, major construction activities conducted under the Contract is summarized below.

- Site surveying
- UU detection
- Site clearance
- Excavation of footings
- Site formation works and slope stabilization works
- Construction of Flat EVA
- Drainage works like catch pit, intake, stepped channel and pipe laying
- Fire service pipe laying
- Construction of Raft B and Package 2, 3 & 6 footings
- Pipe piling
- Gas main laying at slope EVA
- Construction of remaining HKT drawpit and pipe laying
- Excavation for de-aeration chamber
- Demolition of existing EVA bridge
- Installation of traffic signs

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summaries of the relevant permits, licenses, and/or notifications on environmental protection for the Project are presented in [Table 2-1](#).

Table 2-1 Status of Environmental Licenses and Permits of the Project

No.	Type of Permit/ License	Submission Date	Reference/ License No.	Date of Issue	Date of Expiry
1	Air pollution Control (Construction Dust) Regulation	Submitted to EPD on 27/07/2015	392566	07/09/2015	N/A
2	Chemical Waste Producer Registration - Waste Producers	4-08-2015	5213-176-P2781-21	25/08/2015	N/A
3	Water Pollution Control Ordinance - Discharge License	Application was on 25/08/2015	WT00022680-2015	14/10/2015	31/10/2020
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	22-07-2015	7022926	06-08-2015	N/A
5	Construction Noise Permit	14-06-2016	GW-RS0682-16	28/06/2016	29/12/2016

2.3.2 To according with the EP stipulation, the required documents has submitted to EPD for retention as listed below:

- Project Layout Plans
- Management Organization of Main Construction Companies
- Detailed Vegetation Survey Report
- Woodland Compensation Plan
- Ardeid Inspection Report
- Short-nosed Fruit Bat Inspection Report
- Baseline Monitoring Report Revision A of the Project

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Approved EM&A Manual. During the construction phase of the Project, construction noise is identified a key Environmental issue. Moreover, Landscape & Visual and Ecology monitoring are also required during the construction phase in accordance with the Approved EM&A Manual.

3.1.2 A summary of construction phase EM&A requirements are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:

- Construction noise;
- Landscape & Visual; and
- Ecology

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1*.

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Noise	<ul style="list-style-type: none"> • $L_{eq(30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday; • 3 sets of consecutive $L_{eq(5min)}$ on restricted hours i.e. 19:00 to 07:00 next day, and whole day of public holiday or Sunday when applicable, and • Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.
Landscape & Visual	<ul style="list-style-type: none"> • Site inspection, monitoring and Audit
Ecology	<ul style="list-style-type: none"> • Site inspection and monitoring

3.3 MONITORING LOCATIONS

3.3.1 The designated noise monitoring locations as recommended in the *EM&A Manual* is shown in [Appendix D](#). During baseline monitoring, the designated monitoring location NM1 was denied by the owner, so the previous ETL proposed alternative location NM1A. The proposal was verified by the previous IEC and agreed by EPD. *Table 3-2* and [Appendix E](#) respectively list and show the construction noise monitoring locations for the Project.

Table 3-2 Impact Monitoring Stations - Construction Noise

Station ID	Description
NM1A	Slope near Victoria Shanghai Academy (VSA) to replace NM1 of the VSA
NM2	Hong Kong Juvenile Care Centre (HKJCC)

3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 Measurement of $L_{eq(30min)}$ between 0700-1900 hours on normal weekdays and once every week during course of works. If construction work necessary to carry out at other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as “the restricted hours”), 3 consecutive $L_{eq(5min)}$ measurement will depended Control Noise Permit (CNP) requirements to undertake. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

3.5 MONITORING EQUIPMENT

3.5.1 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s⁻¹.

3.5.2 Noise monitoring equipment to be used for monitoring is listed in *Table 3-3*.

Table 3-3 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238
Calibrator	B&K Type 4231 / Rion NC-74
Portable Wind Speed Indicator	Testo Anemometer

3.5.3 Sound level meter listed above comply with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the impact monitoring will be calibrated yearly.

3.6 MONITORING METHODOLOGY

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

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

3.6.3 Prior of noise measurement, the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The checking is performed before and after the noise measurement.

3.7 EQUIPMENT CALIBRATION

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

3.7.2 The calibration certificates of sound level meter and calibrator used for impact monitoring program in the Reporting Period are attached in [Appendix F](#).

3.8 METEOROLOGICAL INFORMATION

3.8.1 Meteorological information was extracted from “the Hong Kong Observatory Wong Chuk Hang Station”. For Wong Chuk Hang Station, it is situated nearby the Project site and can provide the humidity, rainfall, and air pressure and temperature etc. meteorological information.

3.9 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

3.9.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual with baseline monitoring results, construction noise criterion, namely Action and Limit levels

proposed are listed in *Table 3-4*.

Table 3-4 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1A and NM2	When one or more documented complaints are received	70 dB(A) ^{Note 1 and Note 2}

Note 1: Acceptable Noise Levels for school should be reduced to 65 dB(A) during examination period

Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.

3.9.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in [Appendix G](#).

3.10 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.10.1 All monitoring data will be handled by the ET's in-house data recording and management system. The monitoring data recorded in the equipment will be downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data will input into a computerized database properly maintained by the ET.

4 CONSTRUCTION NOISE MONITORING

4.1 GENERAL

4.1.1 Total 26 construction noise monitoring events conducted at the two designated locations were in the Reporting Period.

4.2 NOISE MONITORING RESULTS IN REPORTING PERIOD

4.2.1 All noise monitoring results throughout the Reporting Period is tabulated in *Table 4-1* and relevant graphical plot is shown in *Appendix H*.

Table 4-1 Summary of Construction Noise Monitoring Results

Date	Time		(*NM1A		Time		NM2 (Leq30min)
	Start	Finish	(Leq30min)	Correction	Start	Finish	
22-Jul-16	13:36	14:06	66	69	15:00	15:30	60
28-Jul-16	10:57	11:27	65	68	9:38	10:08	61
3-Aug-16	9:16	9:46	65	68	10:13	10:43	60
9-Aug-16	13:16	14:46	63	66	14:18	14:48	61
15-Aug-16	13:01	13:31	54	57	13:47	14:17	59
26-Aug-16	9:47	10:17	61	64	10:38	11:08	58
1-Sep-16	10:33	11:03	64	67	9:45	10:15	63
7-Sep-16	10:50	11:20	62	65	9:56	10:26	63
13-Sep-16	11:03	11:33	63	66	10:08	10:38	61
19-Sep-16	09:42	10:12	62	65	11:09	11:39	62
29-Sep-16	10:13	10:43	61	64	09:14	09:44	59
4-Oct-16	13:14	13:44	60	63	13:59	14:29	60
14-Oct-16	09:27	09:57	61	64	10:23	10:53	61
Limit Level	70dB(A)						

Remarks:

(*) Sound level meter set at NM1A is made free-field measurement, façade correction (+3dB(A)) is therefore added according to acoustical principles and EPD guidelines.

4.2.2 As shown in Table 4-1, all the results of noise measurement are below 70dB(A) of the acceptance criteria. Furthermore, there were no noise complaints (Action Level exceedance) received by the PMR, Contractor or EPD in the Reporting Period. Therefore, no Action Level exceedance was triggered nor corrective action was therefore required.

4.2.3 The summary of weather conditions during the Reporting Period is presented in *Appendix I*.

5 ECOLOGY MONITORING

5.1 GENERAL

5.1.1 As required under the **Section 8.3.2** of the approved EM&A Manual, the implementation of ecological mitigation measures as detailed in the **Section 15** of the EIA report and **Appendix C** of the approved EM&A Manual shall be routinely audited during the routine environmental audit; and any observations and recommendations shall be reported in periodic EM&A reports.

5.1.2 Among those mitigation measures recommended to avoid or minimize the disturbance to any plants of conservation interest (EM&A reference 8.3.1.1), nested ardeids (EM&A reference 8.3.1.2) and roosted short-nosed fruit bat (EM&A reference 8.3.1.3), the required inspection has already been undertaken in August/September 2014 with the results presented in the submitted respective baseline report. Therefore, the following sections only address those applicable to this stage of the project, i.e., Section 8.3.2 of the approved EM&A Manual.

5.2 MONITORING REQUIREMENT

Monitoring of Plants of Conservation Interest (*Platycondon grandiflorus*)

5.2.1 The Detailed Vegetation Survey Report (DVSR) has located two groups of the protected *Platycondon grandiflorus* and recommended that the plants should be protected with temporary protective fencing to avoid potential impact from construction activities (such as material storage), and monitor the identified *Platycondon grandiflorus* on a monthly basis throughout the construction phase to make sure that they are not affected by the construction works of the Project. Accordingly, the following monitoring parameters will be undertaken on a monthly basis during the construction period.

- i. Effective implementation of the protection measures as recommended in the Section 4.1 of the DVSR
- ii. Monitoring of the two groups of *Platycondon grandiflorus* identified during the detailed vegetation survey to make sure that they are not affected by the construction works

Monitoring of Nesting Activities of Ardeids in Breeding Season

5.2.2 The project area should be checked monthly in breeding season (April to July) for any potential breeding and nesting activities, and if required suitably sized buffer area will be recommended to avoid human or machinery disturbance until the nest is abandoned.

Monitoring of Roosting Activities of Ardeids in Peak Wintering Season

5.2.3 The last monitoring event of roosting activities of Ardeids in Peak Wintering Season has been carried out on 15 March 2016. Hence, no monitoring of roosting activities was carried out between Reporting Period and tentatively scheduled on 12th November 2016 of the coming reporting month to carry out.

Compensation for Ardeid roosting Site

5.2.4 An enhancement area provided as an alternative roosting site for ardeids should be developed during the first phase of the construction.

Compensation of Woodland Habitat

5.2.5 Mitigation measures recommended in the approved Woodland Compensation Plan should be fully and properly implemented, including but not limited to the creation of 0.84 ha woodland compensation on-site and 0.78 ha on-site woodland reinstatement, to mitigate for permanent loss of woodland habitat.

5.3 INSPECTION FINDINGS

5.3.1 In the Reporting Period, ecological inspections were undertaken on **8th August 2016**, **13th September 2016** and **14th October 2016** by the qualified ecologist. The inspection findings are presented below.

Plants of Conservation Interest (*Platycodon grandiflorus*)

- 5.3.2 In the reporting period between 17 July 2016 and 16 October 2016, within the fenced area of the two groups *Platycodon grandiflorus* recorded in the 2015s' growing season was observed to healthy and vigorously growing. Moreover, the preventive mitigation measures, i.e., erecting of temporary protective fencing and sign post, are found to be effectively implemented, and there is no signs or evidence to suggest that the on-going construction activities within the Project Area has affected the health condition of the *Platycodon grandiflorus*.
- 5.3.3 Moreover, each EM&A Monthly Report has enclosed the relevant month photograph records.

Nesting Activities of Ardeids in Breeding Season

- 5.3.4 This monitoring parameter only required during the breeding season of ardeids, i.e., from April to July. Hence, monitoring would not be required for the reporting period.

Roosting Activities of Ardeids in Peak Wintering Season

- 5.3.5 The last monitoring event of roosting activities of Ardeids in Peak Wintering Season has been carried out on 15 March 2016. Hence, no monitoring of roosting activities was carried out between this Reporting Period and tentatively scheduled on 12th November 2016 of the coming reporting month to carry out.

Compensation for Ardeid roosting Site

- 5.3.6 To be implemented.

Compensation of Woodland Habitat

- 5.3.7 To be implemented.

5.4 CONCLUSION

- 5.4.1 The implementation of the mitigation measures for the plant species of conservation interest, i.e., the *Platycodon grandiflorus*, was found to be effective during the reporting period and no sign of activities related to construction work was noted within or in proximity of the fenced up area. The growth of the 2 groups of *Platycodon grandiflorus* within the fenced area was found to be vigorous and all of the shoots were all in healthy condition.

6 LANDSCAPE & VISUAL MONITORING

6.1 GENERAL

6.1.1 According to the EM&A Manual requirements, a Registered Landscape Architect (RLA) was responsible for monitoring the implementation of landscape and visual mitigation measures during the construction.

6.2 INSPECTION FINDINGS

6.2.1 In the Reporting Period, total six occasions of landscape and visual site inspection were undertaken on *27th July 2016, 12th & 27th August 2016, 13th & 29th September 2016 and 14th October 2016*

6.2.2 According to the inspections, no construction activities conducted or materials storage placed outside of the working site boundary. The Contractor is fully compliance with the intended of mitigation measures.

7 WASTE MANAGEMENT

7.1 GENERAL WASTE MANAGEMENT

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

7.2 RECORDS OF WASTE QUANTITIES

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

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

7.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 7-1* and *7-2*.

Table 7-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity (in tonne)				Disposal Location
	17 Jul to 16 Aug 2016	17 Aug to 16 Sep 2016	17 Sep to 16 Oct 2016	Total	
C&D Materials (Inert)	20,686.76	15,477.89	57,268.65	93,433.3	-
Mixed Waste to Sorting Facility	0	0	0	0	-
Reused in this Contract (Inert)	0	0	0	0	-
Reused in other Projects (Inert)	0	0	0	0	MTR SIL 904
Disposal as Public Fill	20,686.76	15,477.89	57,268.65	93,433.3	Chai Wan Barging Point and TKO137 and TM38

Table 7-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity (in tonne)				Disposal Location
	17 Jul to 16 Aug 2016	17 Aug to 16 Sep 2016	17 Sep to 16 Oct 2016	Total	
Recycled Metal	0.114	0	35.240	35.354	Licensed collector
Recycled Paper / Cardboard Packing	0	0	0	0.00	-
Recycled Plastic	0	0	0	0.00	-
Chemical Wastes	0	0	0	0.00	-
General Refuses	22.46	42.15	40.31	104.92	SENT Landfill

7.2.3 The Monthly Summary Waste Flow Table is shown in [Appendix J](#). Whenever possible, materials were reused on-site as far as practicable.

8 SITE INSPECTION

8.1 REQUIREMENTS

8.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulation by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

8.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

8.2.1 In the Reporting Period, total 13 occasions of joint site inspection to evaluate site environmental performance has been carried out by the PMR, ET and the Contractor. Moreover, IEC performed site inspection and audit is on **5 August 2016, 9 September 2016** and **7 October 2016**.

8.2.2 In the Reporting Period, no non-compliance was recorded; however, *twelve (12)* reminders and *eleven (11)* observations were recorded during the site inspections. The findings / deficiencies observed during the weekly site inspections are summarized in **Table 8-1**.

Table 8-1 Site Observations of the Project

Reporting Period	Findings / Deficiencies
17 July 2016 to 16 August 2016	<ul style="list-style-type: none"> • Dry and loose access road was observed, the Contractor should make sure the access road is moist so as to reduce dust emission. • In some working areas, free standing chemical buckets were observed, the Contractor should enhance the chemical storage training to the workers. • It was reminded that concrete mixing area shall be provided with 3-sides shelter with top cover to reduce dust mission when it is under operation. (Reminder) • Dry and loose surface of haul road is observed. Water spraying should be provided to reduce dust impact. • It was reminded that cement bags should be covered with tarpaulin sheeting to reduce the dust generation. (Reminder) • It was reminded that stagnant water accumulated on site should be removed to prevent mosquito breeding. (Reminder) • Dust emission from rock breaking activities was observed. Water spraying as a mitigation measures shall be implemented to reduce dust impact. • The Contractor was reminded to maintain the temporary drainage system to avoid run-off of wheel washing water flowing outside site boundary. (Reminder) • It was reminded that the stagnant water accumulated in the pit should be redirected to wastewater treatment facility before discharge. (Reminder) • Free standing chemical containers without drip tray was observed. Drip tray should be provided for all chemical storage on site. • 3 sides plus top shelter should be provided for the concrete mixing area during operation. (Reminder) • NEL should be displayed for the air compressor before it use. (Reminder)
17 August 2016 to 16 September 2016	<ul style="list-style-type: none"> • As a reminder, proper maintenance should be provided for the de-silting system and make sure all water discharged from site should comply with license requirement. (Reminder) • Oil drum without drip tray storage on site was observed. Drip tray should be provided for all chemical storage on site. • Dust emission was observed during soil nail works. Dust mitigation

	<p>measures should be properly implement to reduce air quality impact.</p> <ul style="list-style-type: none"> • Stagnant water cumulated inside the drip tray after the rainstorm was observed. The contractor was reminded to clean. (Reminder) • Oil spillage on ground after refueling was observed. The contractor should clean it up ASAP to prevent contamination. • Stagnant water cumulated on site after the rainstorm should be removed to prevent mosquito breeding. (Reminder)
<p>17 September 2016 to 16 October 2016</p>	<ul style="list-style-type: none"> • An oil drum without drip tray is observed free standing on site. The contractor reminded that drip tray should be provided for all chemicals containers located or stored on site. • A stockpile without covering located on site is observed. Dust control measures should be provided to reduce dust generation. • Since dry and windy season come soon, water spraying frequency for the haul road should be increased to minimize dust generation. (Reminder) • Dust emission during soil nail work was observed. Dust mitigation measures should be properly implemented to reduce air quality impact. • Remind that dust mitigation measures should be provided for the drilling, excavating and rock breaking activities during dry and windy season to reduce dust impact. (Reminder)

8.2.3 Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. No non-compliance was observed by ET and IEC in the Reporting Period. Remind that wastewater discharge from the working site shall be followed the discharge license stipulation. Wastewater sampling and analysis shall be conducted per quarter in accordance the discharge license requirements. Moreover, dust mitigation measures implementation should be enhanced during rock breaking or drilling activities to minimize air quality impact.

8.2.4 In the Reporting Period, no external parties visited the Project site. Overall, the environmental performance of the Project as managed by the Contractor with OPC is satisfactory.

9 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

9.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

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

Table 9-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
17 Jul 2016 – 16 Aug 2016	0	0	NA
17 Aug 2016 – 16 Sep 2016	0	0	NA
17 Sep 2016 – 16 Oct 2016	0	0	NA

Table 9-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
17 Jul 2016 – 16 Aug 2016	0	0	NA
17 Aug 2016 – 16 Sep 2016	0	0	NA
17 Sep 2016 – 16 Oct 2016	0	0	NA

Table 9-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
17 Jul 2016 – 16 Aug 2016	0	0	NA
17 Aug 2016 – 16 Sep 2016	0	0	NA
17 Sep 2016 – 16 Oct 2016	0	0	NA

10 IMPLEMENTATION STATUS OF MITIGATION MEASURES

10.1 GENERAL REQUIREMENTS

10.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in [Appendix K](#).

10.1.2 The Project shall be implementing the required environmental mitigation measures according to the approved EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by the Contractor in this Reporting Period are summarized in [Table 10-1](#).

Table 10-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Construction Noise	<ul style="list-style-type: none"> Shut down construction equipment when not in used
Ecology	<ul style="list-style-type: none"> Wire fencing provided for temporary protect the identified flora species of conservation concern Undertake site inspection of the flora species of conservation and the Ardeid of breeding and nesting activities
Landscape & Visual	<ul style="list-style-type: none"> Good site management
Air Quality	<ul style="list-style-type: none"> Good site management to reduce air quality impact Main temporary access road paved with concrete Prior to any loading or transfer operation, all dusty materials has sprayed with water to keep its wet Any debris has covered entirely by impervious sheeting Before debris dumped into a chute, water has sprayed onto the debris to make its wet Vehicles has covered with tarpaulin during transporting dusty materials When vehicles leaving the construction site, any vehicles loaded dusty materials covered with clean impervious sheeting as prevent fugitive dusty materials emission The speed of the trucks passing site areas was controlled to below 10 km/hour Water spray has been provided for soil-nailing work
Water Quality	<ul style="list-style-type: none"> Portable chemical toilets has provided on site A licensed collector has employed to collect effluent and off-site dispose.
Waste and Chemical Management	<ul style="list-style-type: none"> A temporary container which located far away from sea shore and drainage channel, has provided for chemical materials and waste storage Drip tray is provided for chemical materials which use on the working areas Has provided a waste skip for general refuse disposal
General	<ul style="list-style-type: none"> The site was generally kept tidy and clean

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

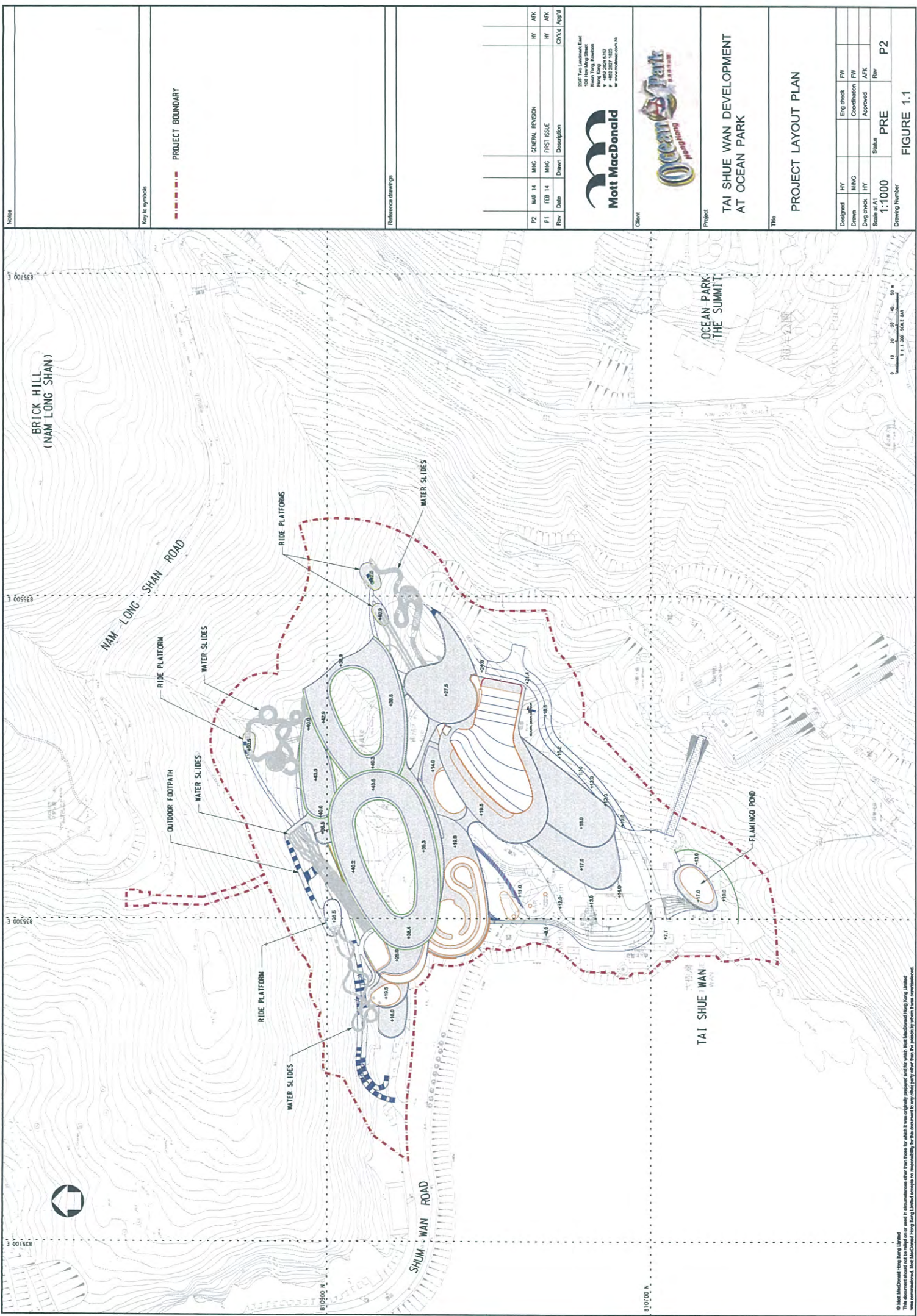
- 11.1.1 This is 5th Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **17 July 2016 to 16 October 2016**.
- 11.1.2 In Reporting Period, there were no noise complaints (Action Level exceedance) received by the PMR, Contractor or EPD in the Reporting Period. Furthermore, no noise complaint (which is an Action Level exceedance) was received by the EPD, PMR and the Contractor. No NOEs or the associated corrective actions were therefore issued. Therefore, no Action Level exceedance was triggered nor corrective action was therefore required.
- 11.1.3 In the Reporting Period, ecological inspections were undertaken on **8th August 2016, 13th September 2016** and **14th October 2016** by the qualified ecologist. The implementation of the mitigation measures for the plant species of conservation interest, i.e., the *Platycodon grandiflorus*, was found to be effective during the reporting period of monitoring. Also, the growth of the 2 groups of *Platycodon grandiflorus* within the fenced area were found to be vigorously and all of the shoots were in healthy condition in the reporting period. Nevertheless, vegetation maintenance such as trimming and weeding of other plant species is recommended to alleviate the inter-specific competition for light and growing space within the fenced up area.
- 11.1.4 In the Reporting Period, total six occasions of landscape and visual site inspection were undertaken. No construction activities conducted or materials storage placed outside of the working site boundary. The Contractor is fully compliance with the intended of mitigation measures.
- 11.1.5 During the Reporting Period, total 13 occasions of joint site inspection to evaluate site environmental performance has been carried out by the PMR, ET and the Contractor. Moreover, IEC performed three events of the site inspection and audit. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- 11.1.6 In the Reporting Period, no external parties visited the Project
- 11.1.7 No documented complaint, notifications of summons and successful prosecutions were received during the Reporting Period.

11.2 RECOMMENDATIONS

- 11.2.1 Although the rainy seasonal will soon be over, however the contractor shall pay attention to prevent muddy water and other water pollutants via site surface runoff direct discharge into the sea due to rainy day may be to encounter the coming month. Water quality mitigation measures should be properly to implement in accordance with EMIS stipulation.
- 11.2.2 Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement since construction noise is a key environmental issue during construction work of the Project.
- 11.2.3 Furthermore, dust mitigation measures should be properly performed to avoid fugitive dust generated from the Project. To control the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.

Appendix A

Layout Plan of the Project



Notes

Key to symbols

--- PROJECT BOUNDARY

Reference drawings

Rev	Date	Drawn	Description	Checked	App'd
P2	MAR 14	MNG	GENERAL REVISION	HY	ARK
P1	FEB 14	MNG	FIRST ISSUE	HY	ARK



Client
 Tai Shue Wan Development
 at Ocean Park

Title
 PROJECT LAYOUT PLAN

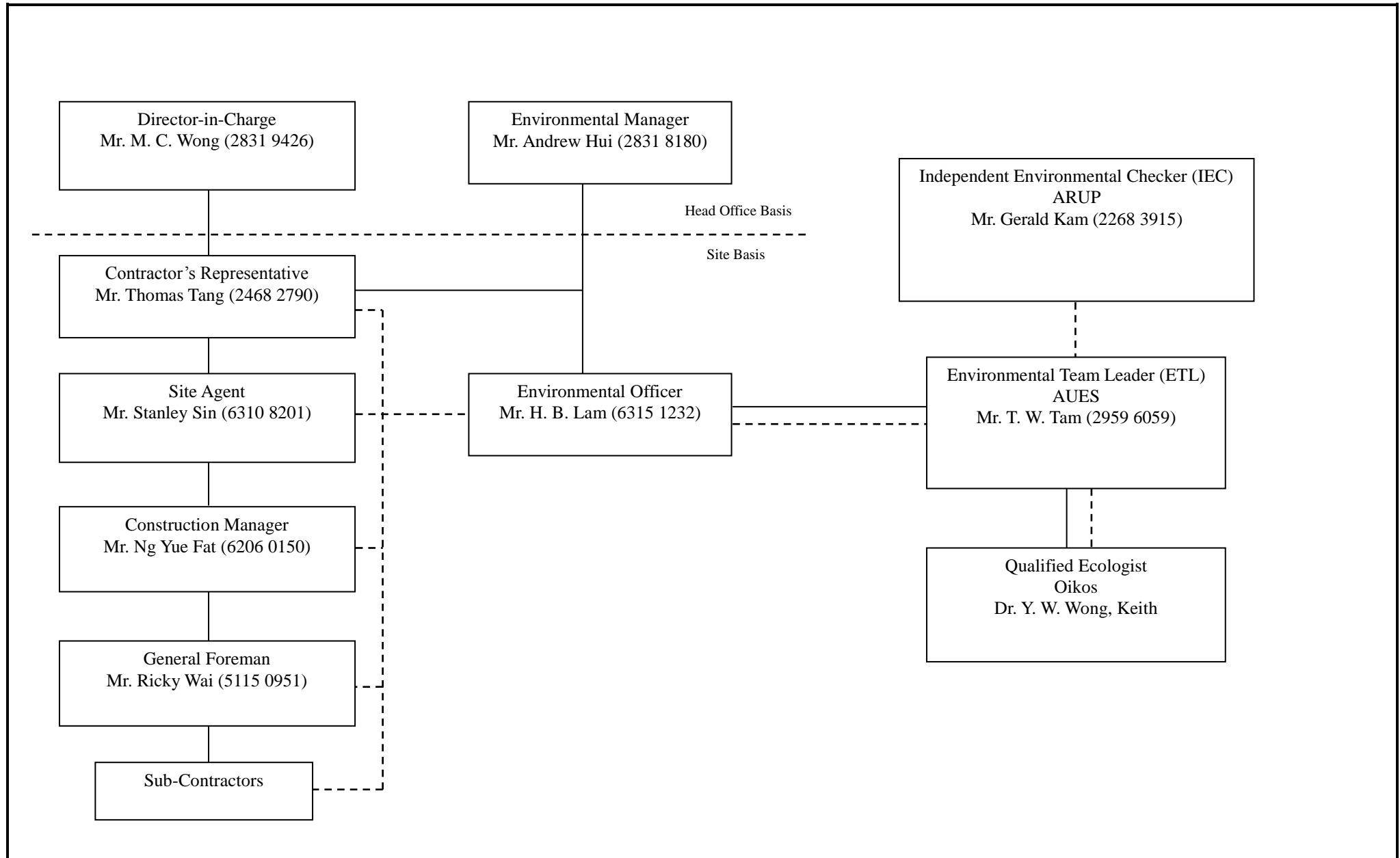
Designed	HY	Eng check	PW
Drawn	MNG	Coordination	PW
Draw check	HY	Approved	ARK
Scale at A1	1:1000	Status	PRE
Drawing Number		Rev	P2

FIGURE 1.1

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Appendix B

Organization Chart



Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
Project Proponent : Ocean Park Corporation				
OPC	(*) Project Management Representative / Resident Engineer (Planning)	Mr. Tsoi Mau Chui	2870 6121	2814 0179
Arup	Independent Environmental Checker	Mr. Gerald Kam	2268 3915	2268 3950
Paul Y	Project Director of Contractor	Mr. Thomas Tang	2468 2790	2833 5604
Paul Y	Site Agent of Contractor	Mr. Stanley S.C. Sin	2831 8282	2833 5604
Paul Y	Construction Manager of Contractor	Mr. Ng Yue Fat	6206 0150	2833 5604
Paul Y	Environmental Officer of Contractor	Mr. Lam Ho Ben	2831 8282	2833 5604
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
Oikos	Qualified Ecologist	Dr. Keith Wong	9421 2016	2542 3411

Legend:

OPC – Ocean Park Corporation

Arup – Ove Arup & Partners Hong Kong Ltd

Paul Y – Paul Y. Construction Company, Limited

AUES – Action-United Environmental Services & Consulting

Oikos – Oikos Consulting Limited

Remarks:

(*) - Acting

Appendix C

Master Construction Programme – Formation and Foundation Works

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2015																								2016			2017		
						Jul 1	Aug 2	Sep 3	Oct 4	Nov 5	Dec 6	Jan 7	Feb 8	Mar 9	Apr 10	May 11	Jun 12	Jul 13	Aug 14	Sep 15	Oct 16	Nov 17	Dec 18	Jan 19	Feb 20	Mar 21									
OPC-Works Programme (as of Aug-16)						475	02-Jan-15 A	09-Mar-17	0																										
Key Dates & Programme Dates						602	17-Jul-15 A	09-Mar-17	0																										
KD10000	Commencement Date	0	17-Jul-15 A			◆																													
KD10010	Instruct Optional Works - FS Pipes	0	14-Aug-15 A			◆																													
KD10020	Instruct Optional Works - Additional slope works	0	14-Aug-15 A			◆																													
KD10025	Instruct VO - Site Formation for Ride P2, P4	0	09-Oct-15 A			◆																													
KD10035	Instruct VO - Site Formation for Ride P3	0	01-Sep-15 A			◆																													
KD10050	Instruct VO - Raft A Foundation Amendment	0	01-Oct-15 A			◆																													
KD10060	HEC 22kV cable - EVA (Flat Section) Access Date	0	12-Dec-15 A			◆																													
KD10070	HEC 22kV cable - North of Site Access Date	0	20-May-16 A			◆																													
KD10075	HEC 22kV cable - EVA (Covered and Sloping Section) Access Date	0	27-Jun-16 A			◆																													
KD10080	Access the designated part of the Site for other Contractor	0		15-Oct-16*	-156																														
KD10085	Contract Completion	0		09-Mar-17*	-182																														
KD10090	Programme Completion	0		09-Mar-17*	-182																														
Permit Application						37	17-Jul-15 A	22-Aug-15 A																											
BD Submission						475	17-Jul-15 A	09-Mar-17	-146																										
BD Submission for Foundation Works						333	14-Aug-15 A	14-Jun-16 A																											
BD Submission for Demolition Works						53	02-Oct-15 A	21-Sep-16	-69																										
BD Submission for Site Formation Works						54	17-Jul-15 A	08-Sep-15 A																											
Miscellaneous						46	23-Jul-15 A	06-Sep-15 A																											
BD Submission for Drainage Works						427	15-Aug-15 A	15-Oct-16	-100																										
BA14						251	13-Jan-16 A	09-Mar-17	-146																										
BA14 for Demolition Works						19	13-Jan-16 A	10-Nov-16	-50																										
BA14 for Site Formation Works						94	22-Sep-16	14-Jan-17	-103																										
BA14 for Drainage Works						69	18-Dec-16	25-Feb-17	-170																										
BA14 for Foundation Works						21	16-Feb-17	09-Mar-17	-182																										
Preliminary Works						255	17-Jul-15 A	24-Feb-16 A																											
Site Accommodation						73	20-Jul-15 A	24-Dec-15 A																											
Hoarding						18	06-Aug-15 A	26-Aug-15 A																											
Hammer Head						14	17-Jul-15 A	01-Aug-15 A																											
UU detection and CCTV						240	04-Aug-15 A	23-Oct-15 A																											
Tree Protection						10	07-Aug-15 A	18-Aug-15 A																											
GI Works						121	19-Aug-15 A	24-Feb-16 A																											
Main Construction Work						431	02-Jan-15 A	16-Feb-17	18																										
Site Formation Work						353	16-Aug-15 A	11-Nov-16	96																										
Temporary Haul Road						39	16-Aug-15 A	03-Oct-15 A																											



**Ocean Park Tai Shue Wan Development
Site Formation and Foundation Works
Completion Works Programme**

Date	Revision	Checked	Approved
17-May-16	-	TF	TT
31-Aug-16	Update		

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2015												2016												2017		
						Jul 1	Aug 2	Sep 3	Oct 4	Nov 5	Dec 6	Jan 7	Feb 8	Mar 9	Apr 10	May 11	Jun 12	Jul 13	Aug 14	Sep 15	Oct 16	Nov 17	Dec 18	Jan 19	Feb 20	Mar 21						
Slope Stabilization, North of Site (Phase I)																																
S9		113	09-Sep-15 A	01-Mar-16 A		[Gantt bar from Sep 9 to Mar 1]																										
S8		41	12-Dec-15 A	16-Feb-16 A		[Gantt bar from Dec 12 to Feb 16]																										
S10		47	19-Dec-15 A	17-Feb-16 A		[Gantt bar from Dec 19 to Feb 17]																										
S17		11	24-Feb-16 A	28-May-16 A		[Gantt bar from Feb 24 to May 28]																										
Thoroughfare																																
Excavation at North (Work Front 2)						[Gantt bar from Jan 4 to Sep 3]																										
Excavation near site Entrance (Work Front 1)						[Gantt bar from Dec 5 to Jun 4]																										
HEC Cable						[Gantt bar from Feb 25 to May 25]																										
Slope Stabilization, North of Site (Phase II)																																
S12		144	26-Mar-16 A	22-Sep-16	-104	[Gantt bar from Mar 26 to Sep 22]																										
S5,7		53	25-Feb-16 A	13-Sep-16	-98	[Gantt bar from Feb 25 to Sep 13]																										
S4, S6, S13, S14, S15		60	12-Aug-16 A	26-Oct-16	-104	[Gantt bar from Aug 12 to Oct 26]																										
Slope Stabilization, South-East of Site																																
S34,36		32	25-Sep-15 A	24-Feb-16 A		[Gantt bar from Sep 25 to Feb 24]																										
S41		87	06-Oct-15 A	23-Feb-16 A		[Gantt bar from Oct 6 to Feb 23]																										
S40		14	01-Sep-16	19-Sep-16	139	[Gantt bar from Sep 1 to Sep 19]																										
S30		21	04-Nov-15 A	02-Dec-15 A		[Gantt bar from Nov 4 to Dec 2]																										
S32		20	17-Oct-16	09-Nov-16	-65	[Gantt bar from Oct 17 to Nov 9]																										
Slope Stabilization, North-East of Site																																
S19		123	26-Oct-15 A	08-Mar-16 A		[Gantt bar from Oct 26 to Mar 8]																										
S23		145	23-Feb-16 A	01-Jun-16 A		[Gantt bar from Feb 23 to Jun 1]																										
S20		39	18-Apr-16 A	08-Jun-16 A		[Gantt bar from Apr 18 to Jun 8]																										
S17		64	22-Feb-16 A	07-Sep-16	-132	[Gantt bar from Feb 22 to Sep 7]																										
S25		128	22-Apr-16 A	15-Sep-16	-137	[Gantt bar from Apr 22 to Sep 15]																										
Upgrading Slope Features																																
Site Formation, Main Site Area						[Gantt bar from Feb 18 to Nov 11]																										
Ride Platform P3(Variation)						[Gantt bar from Oct 20 to Jan 20]																										
Rides Platform P2 and P4 (Variation)						[Gantt bar from Mar 14 to Jun 11]																										
Demolition Works/Abandoning Works																																
Foundations						[Gantt bar from Oct 27 to Oct 20]																										
Basement Water Tank & Sewage Tank (Package 6)																																
Basement Water Tank						[Gantt bar from Jun 18 to Jul 29]																										
Sewage Tank						[Gantt bar from Oct 27 to Jun 28]																										
Raft A (Package 4)																																
Raft A, Phase I						[Gantt bar from Dec 4 to Sep 5]																										



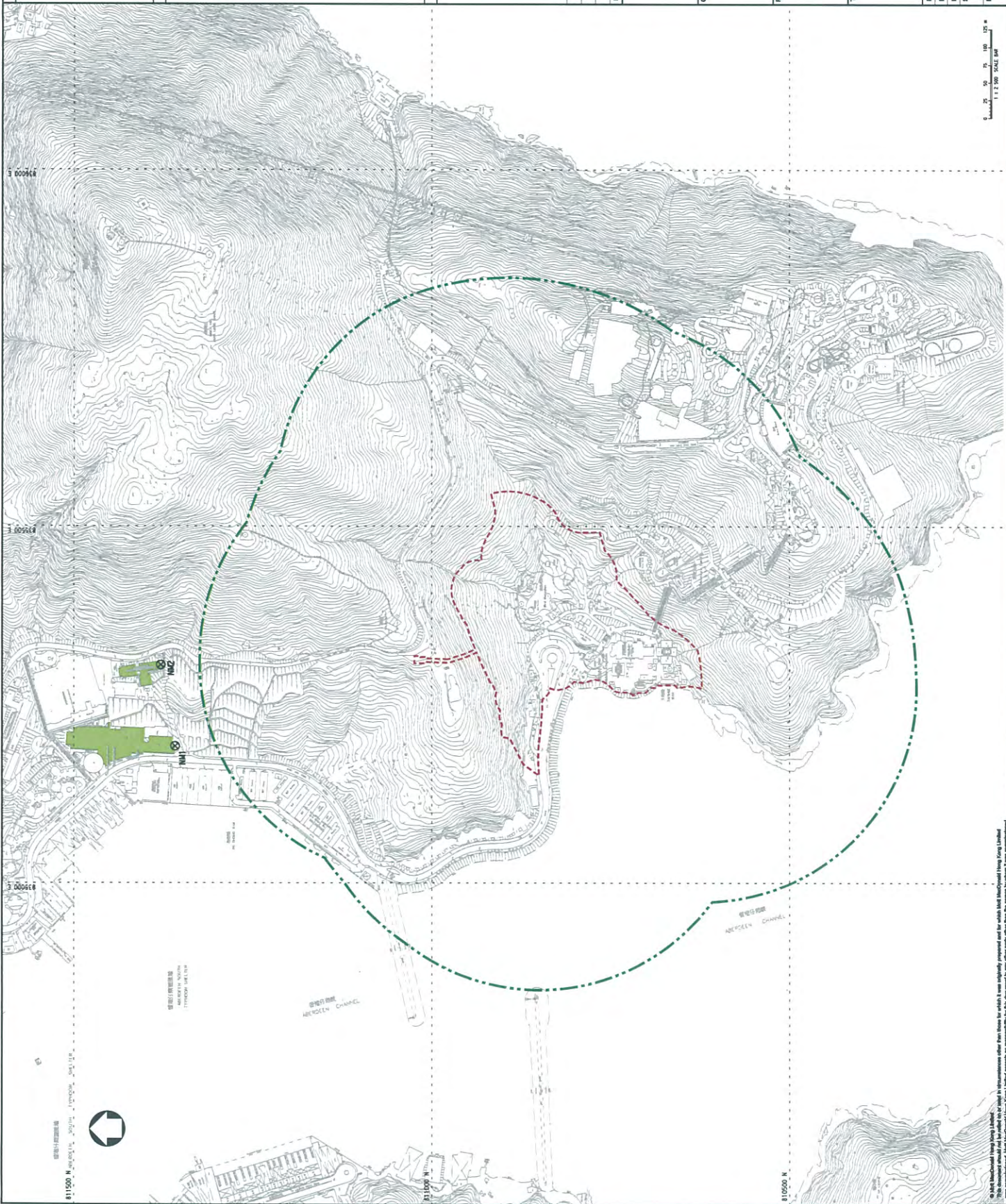
**Ocean Park Tai Shue Wan Development
Site Formation and Foundation Works
Completion Works Programme**

Date	Revision	Checked	Approved
17-May-16	-	TF	TT
31-Aug-16	Update		

Appendix D

Designated Monitoring Locations as Recommended in the Approved EM&A Manual

<p>Notes</p> <p>Key to symbols</p> <p>300M ASSESSMENT AREA</p> <p>PROJECT BOUNDARY</p> <p>CONSTRUCTION NOISE MONITORING STATION</p>		<p>Reference drawings</p>																									
<p>300M ASSESSMENT AREA</p> <p>PROJECT BOUNDARY</p> <p>CONSTRUCTION NOISE MONITORING STATION</p>		<table border="1"> <tr> <th>Rev</th> <th>Date</th> <th>Drawn</th> <th>Description</th> <th>Checked</th> <th>App'd</th> </tr> <tr> <td>P3</td> <td>MAY 14</td> <td>MING</td> <td>GENERAL REVISION</td> <td></td> <td>FKK</td> </tr> <tr> <td>P2</td> <td>MAY 14</td> <td>MING</td> <td>GENERAL REVISION</td> <td></td> <td>FKK</td> </tr> <tr> <td>P1</td> <td>FEB 14</td> <td>MING</td> <td>FIRST ISSUE</td> <td></td> <td>FKK</td> </tr> </table>		Rev	Date	Drawn	Description	Checked	App'd	P3	MAY 14	MING	GENERAL REVISION		FKK	P2	MAY 14	MING	GENERAL REVISION		FKK	P1	FEB 14	MING	FIRST ISSUE		FKK
Rev	Date	Drawn	Description	Checked	App'd																						
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P2	MAY 14	MING	GENERAL REVISION		FKK																						
P1	FEB 14	MING	FIRST ISSUE		FKK																						
<p>2007 Tai Leekwan Street 100 Hwa Ming Street New Territories Hong Kong Tel: +852 2628 0187 Fax: +852 2628 0187 www.mottmacdonald.com.hk</p> <p>Mott MacDonald</p>		<p>Client</p> <p>Ocean Park</p>																									
<p>Project</p> <p>TAI SHUE WAN DEVELOPMENT AT OCEAN PARK</p>		<p>Title</p> <p>PROPOSED LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS</p>																									
<table border="1"> <tr> <th>Designed</th> <th>AM</th> <th>Eng check</th> <th>FW</th> </tr> <tr> <th>Drawn</th> <th>MING</th> <th>Construction</th> <th>FW</th> </tr> <tr> <th>Dwg check</th> <th>AM</th> <th>Approved</th> <th>AFK</th> </tr> <tr> <th>Scale at A1</th> <td>1:2500</td> <th>Status</th> <td>PRE </td></tr> <tr> <th>Flow</th> <td></td> <th>Flow</th> <td>P3</td> </tr> <tr> <th>Drawing Number</th> <td></td> <th>Flow</th> <td></td> </tr> </table>		Designed	AM	Eng check	FW	Drawn	MING	Construction	FW	Dwg check	AM	Approved	AFK	Scale at A1	1:2500	Status	PRE	Flow		Flow	P3	Drawing Number		Flow		<p>FIGURE 3.1</p>	
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Drawn	MING	Construction	FW																								
Dwg check	AM	Approved	AFK																								
Scale at A1	1:2500	Status	PRE																								
Flow		Flow	P3																								
Drawing Number		Flow																									

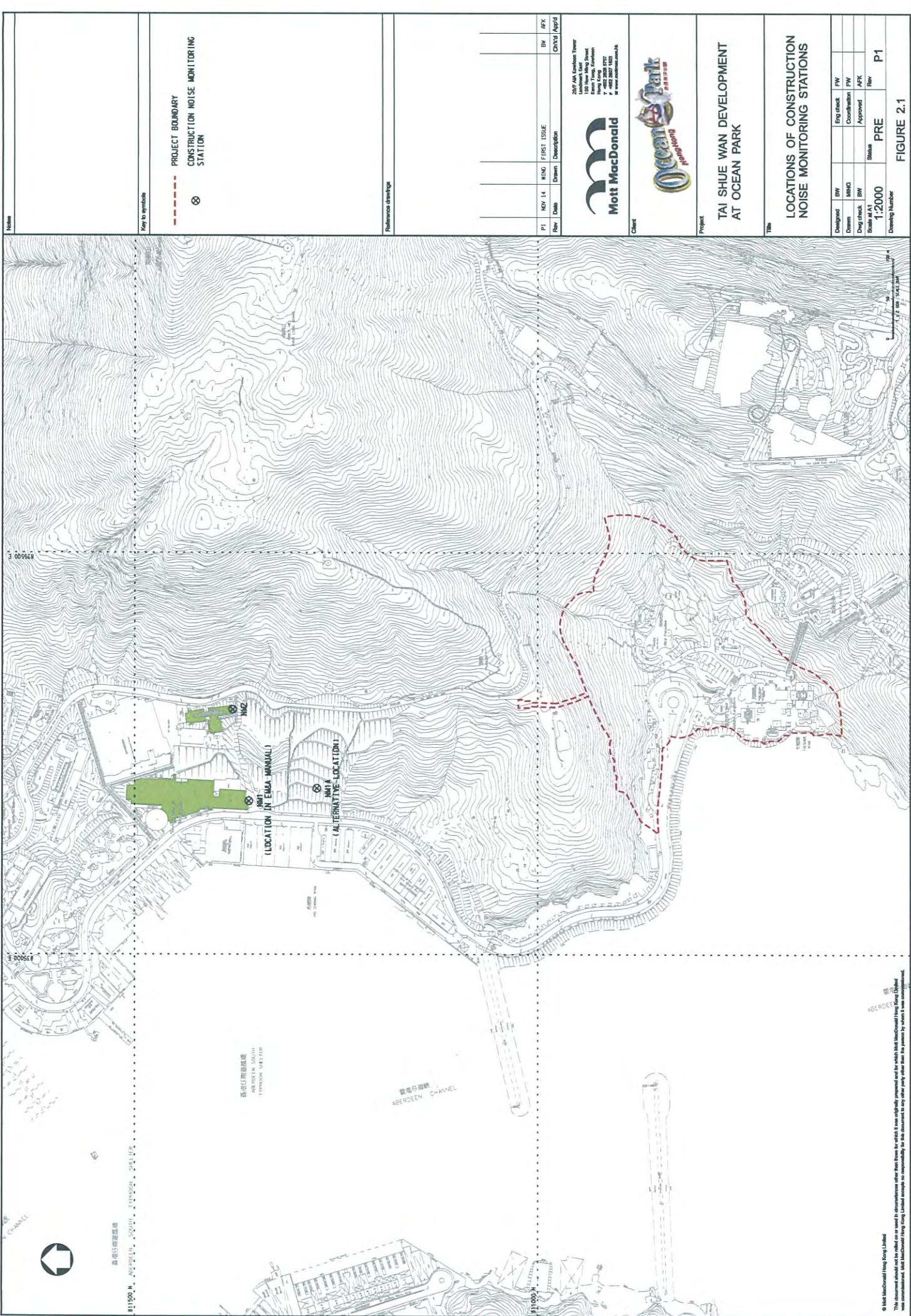


Scale 1:2500 SCALE BAR

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Appendix E

Actual Locations of Impact Monitoring



Notes

Key to symbols

--- PROJECT BOUNDARY

⊗ CONSTRUCTION NOISE MONITORING STATION

Reference drawings

Rev	Date	By	Drawn	Description	Rev	RFK
P1	NOV 14	NING	FIRST ISSUE		01	RFK

2007 AA London Tower
 100 West Street
 Kowloon, Hong Kong
 T: +852 2368 8727
 F: +852 2367 1623
 www.mottmacdonald.com.hk

Mott MacDonald



Client

Project
**TAI SHUE WAN DEVELOPMENT
 AT OCEAN PARK**

Title
**LOCATIONS OF CONSTRUCTION
 NOISE MONITORING STATIONS**

Designed	BY	Eng check	FW
Drawn	MMO	Coordination	FW
Draw check	BY	Approved	APK
Scale at A1	1:2000	Status	PRE
Flow		Flow	P1
Drawing Number			

FIGURE 2.1

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 www.mottmacdonald.com.hk
 DATE: 14/10/2014 TIME: 10:00:01 USER: jw441189

Appendix F

Calibration Certificate of Monitoring Equipment



Certificate of Calibration 校正證書

Certificate No. : C163603
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843) Date of Receipt / 收件日期 : 22 June 2016
Description / 儀器名稱 : Integrating Sound Level Meter (EQ008)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285690
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 : 4 July 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Project Engineer

Date of Issue : 5 July 2016
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C163603
證書編號

- 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.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C160077
CL281	Multifunction Acoustic Calibrator	PA160023

- Test procedure : MA101N.

- 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 _{AFF}	A	F	94.00	1	94.5

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 _{AFF}	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 _{AFF}	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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C163603
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	54.7	-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	89.8	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C163603
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	91.0	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-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	93.1	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	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
			60 sec.					90	89.8	± 0.5
			5 min.					80	79.8	± 1.0
								70	69.8	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812706

- 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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C162996
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843)

Date of Receipt / 收件日期 : 26 May 2016

Description / 儀器名稱 : Integrating Sound Level Meter (EQ065)
Manufacturer / 製造商 : Brüel & Kjær
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 : 2 June 2016

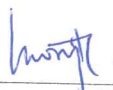
TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany

Tested By
測試



H T Wong
Technical Officer

Certified By
核證



K C Lee
Project Engineer

Date of Issue
簽發日期

6 June 2016

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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Certificate of Calibration

校正證書

Certificate No. : C162996

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			94.1	± 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	105.0	-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	54.9	-39.4 ± 1.5
					63 Hz	67.9	-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	94.0	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	89.8	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C162996
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	91.2	-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	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-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	100.2	± 0.5	
								90	90.1	± 0.5	
			60 sec.					1/10 ³	80	79.8	± 1.0
			5 min.					1/10 ⁴	70	69.8	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812708

- 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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C162991
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843)

Description / 儀器名稱 : Sound Calibrator (EQ083)
 Manufacturer / 製造商 : Rion
 Model No. / 型號 : NC-74
 Serial No. / 編號 : 34246492
 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.

Date of Receipt / 收件日期 : 24 May 2016

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
 Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 : (55 ± 20)%

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 2 June 2016


TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
 The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By
測試


H T Wong
Technical Officer

Certified By
核證


K C Lee
Project Engineer

Date of Issue
簽發日期

3 June 2016

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
 本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。



Certificate of Calibration 校正證書

Certificate No. : C162438
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843)

Date of Receipt / 收件日期 : 5 May 2016

Description / 儀器名稱 : Acoustical Calibrator (EQ081)
Manufacturer / 製造商 : Brüel & Kjær
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 : $(23 \pm 2)^{\circ}\text{C}$
Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 : $(55 \pm 20)\%$

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 10 May 2016


TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Project Engineer

Date of Issue : 11 May 2016
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Certificate of Calibration

校正證書

Certificate No. : C162438

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C153519
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

- Test procedure : MA100N.

- 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.

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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 – 校正及檢測實驗室

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. : C162991
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843)

Description / 儀器名稱 : Sound Calibrator (EQ083)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NC-74

Serial No. / 編號 : 34246492

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.

Date of Receipt / 收件日期 : 24 May 2016

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 : (55 ± 20)%

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 2 June 2016


TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By
測試


H T Wong
Technical Officer

Certified By
核證


K C Lee
Project Engineer

Date of Issue
簽發日期

3 June 2016

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C162991

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C153519
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

- Test procedure : MA100N.

- 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	± 0.3	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	1 kHz ± 1 %	± 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.

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Certificate of Calibration 校正證書

Certificate No. : C162125
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843) Date of Receipt / 收件日期 : 14 April 2016
Description / 儀器名稱 : Acoustical Calibrator (EQ082)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2713428
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 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(55 \pm 20)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check


DATE OF TEST / 測試日期 : 22 April 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Project Engineer

Date of Issue : 25 April 2016
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C162125
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C153519
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

- Test procedure : MA100N.

- 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	114.1		

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.



Certificate of Calibration

校正證書

Certificate No. : C162177
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843) Date of Receipt / 收件日期 : 14 April 2016

Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商 : Brüel & Kjær
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 : 25 April 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany

Tested By : 
測試 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Project Engineer

Date of Issue : 27 April 2016
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C162177
證書編號

- 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.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C160077
CL281	Multifunction Acoustic Calibrator	PA160023

- Test procedure : MA101N.

- 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	94.2

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.

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Certificate of Calibration

校正證書

Certificate No. : C162177
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			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L _{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L _{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L _{ASP}	S	Continuous		106.0	Ref.	
	L _{ASMax}		500 ms		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	55.1	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.9	-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	91.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C162177
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	91.5	-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	93.2	-0.8 ± 1.0
					8 kHz	92.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-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	100.0	± 0.5	
								1/10 ²	90	89.9	± 0.5
								1/10 ³	80	79.2	± 1.0
								1/10 ⁴	70	69.2	± 1.0
			60 sec.								
			5 min.								

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812705

- 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.

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Appendix G

Event and Action Plan

Event and Action Plan for Construction Noise

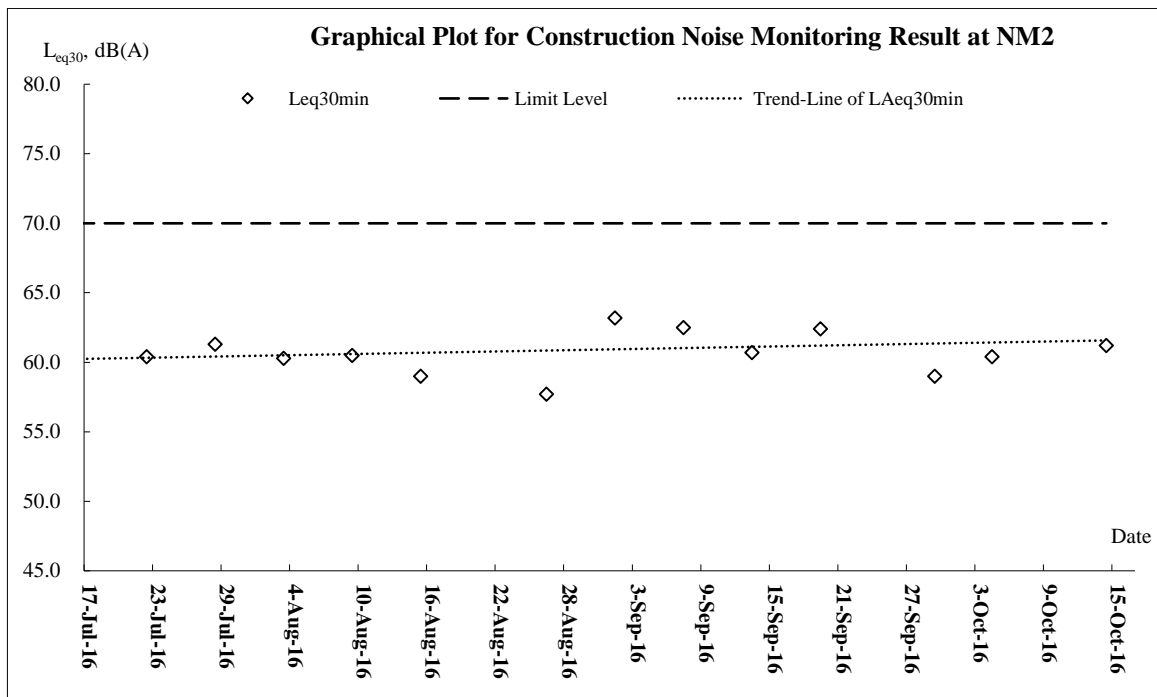
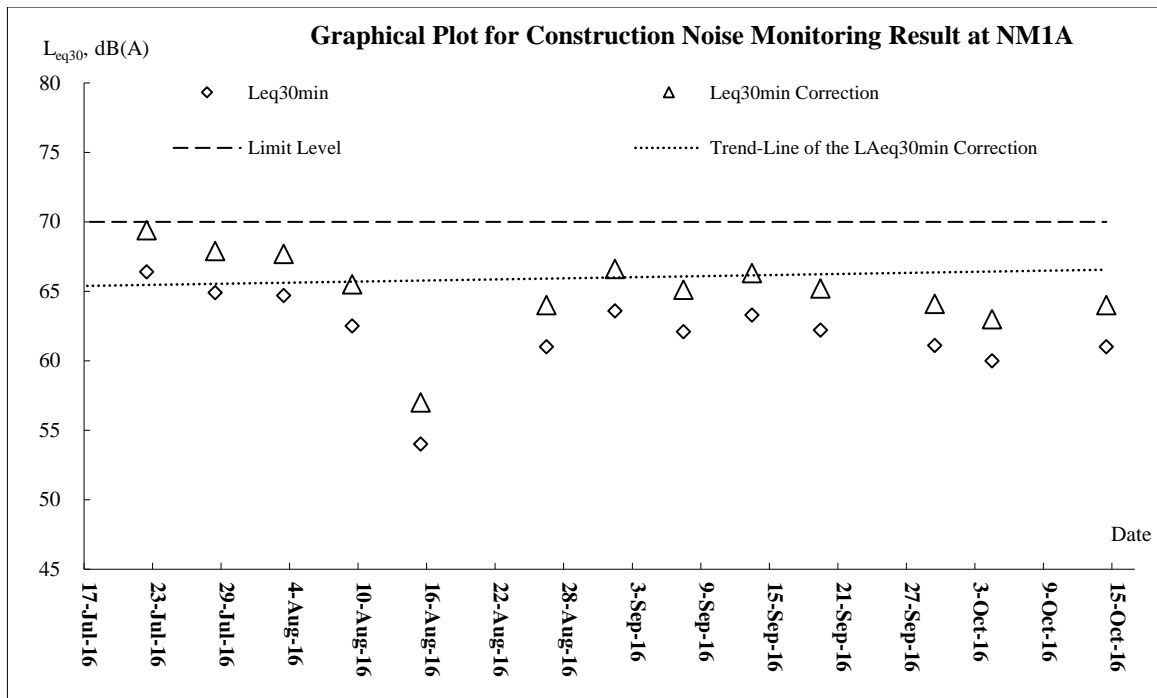
Event	Action			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

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

Action Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Non-conformity On one occasion	<ol style="list-style-type: none"> 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 action until rectification has been completed 	<ol style="list-style-type: none"> 1. Check report 2. Check the Contractor's working method 3. Discuss with the ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures 	<ol style="list-style-type: none"> 1. Notify the Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake remedial measures or any necessary replacement
Repeated Non-conformity	<ol style="list-style-type: none"> 1. Identify source 2. Inform the IEC and the ER 3. Increase monitoring (site audit) frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring (site audit) 	<ol style="list-style-type: none"> 1. Check report 2. Check the Contractor's working method 3. Discuss with the ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Notify the Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake remedial measures or any necessary replacement

Appendix H

Graphical Plots for Monitoring Result



Appendix I

Meteorological Data

Weather Conditions - 17 to 31 July 2016

Date		Total Rainfall (mm)	Wong Chuk Hang Station			
			Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Sun	17-Jul-16	0	30.2	9	78.5	W/SW
Mon	18-Jul-16	0.6	30.2	10.5	77	W/SW
Tue	19-Jul-16	4.4	29.3	8	81	N/NW
Wed	20-Jul-16	16.8	28.7	9.1	85.7	N/NW
Thu	21-Jul-16	0.3	28.3	8.5	80	E/SE
Fri	22-Jul-16	0	29.1	7.3	78.7	SW
Sat	23-Jul-16	0	29.8	11	77	SW
Sun	24-Jul-16	0	30.2	6.5	70.5	SW
Mon	25-Jul-16	0	29.6	7.5	77	S/SE
Tue	26-Jul-16	8	30.2	10.7	74.5	E
Wed	27-Jul-16	Trace	29.4	8	79.5	SE
Thu	28-Jul-16	0	29.3	7.5	77.5	SE
Fri	29-Jul-16	0	29.7	8	71.7	E/NE
Sat	30-Jul-16	Trace	31.6	10	65	E/SE
Sun	31-Jul-16	1.2	30.6	10	65	E/SE

Weather Conditions – August 2016

Date		Total Rainfall (mm)	Wong Chuk Hang Station			
			Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Mon	1-Aug-16	4.6	29.5	8.5	76	NW
Tue	2-Aug-16	121	27.1	9	88	N
Wed	3-Aug-16	17.3	26.8	12	93	SE
Thu	4-Aug-16	20.9	26.9	11.5	94	E
Fri	5-Aug-16	Trace	29.3	12	83.7	NE
Sat	6-Aug-16	0	30	9	77	SW
Sun	7-Aug-16	0	30.4	6.5	80	SW
Mon	8-Aug-16	0	30.5	6.2	76.5	SW
Tue	9-Aug-16	33.5	29.2	5.6	83	SW
Wed	10-Aug-16	39.8	26.7	5.4	91.1	S
Thu	11-Aug-16	42.1	27.2	8	87	E
Fri	12-Aug-16	0.4	28.1	11	86.5	NW
Sat	13-Aug-16	Trace	28.8	8.4	84	NW
Sun	14-Aug-16	25.7	27.3	14.2	90.5	E
Mon	15-Aug-16	19.1	26.6	12	93	E
Tue	16-Aug-16	4.6	29.5	9	86	E
Wed	17-Aug-16	40.9	27	16.1	89.7	E
Thu	18-Aug-16	50.9	27.5	15.5	88.5	E/SE
Fri	19-Aug-16	10.5	28.8	11.3	83.5	E/SE
Sat	20-Aug-16	3.8	29.1	12	82.5	E/SE
Sun	21-Aug-16	39.9	27.2	6.3	85.5	W/NW
Mon	22-Aug-16	0	29.2	9.3	77.5	E/SE
Tue	23-Aug-16	0	28.5	7.3	79	E/NE
Wed	24-Aug-16	0	30	8	75	N
Thu	25-Aug-16	0	30.4	10	77	W/NW
Fri	26-Aug-16	0	29.5	6.9	79.5	N
Sat	27-Aug-16	3.5	29.8	8	80	N
Sun	28-Aug-16	8.7	28.2	#	73.5	#
Mon	29-Aug-16	Trace	27.6	9.2	73	N/NW
Tue	30-Aug-16	0	28.7	#	#	#
Wed	31-Aug-16	0.2	#	#	#	#

Remark: # - Under Maintenance

Weather Conditions – September 2016

Date		Total Rainfall (mm)	Wong Chuk Hang Station			
			Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Thu	1-Sep-16	68.9	27	#	88.7	#
Fri	2-Sep-16	6.1	28.4	#	87	#
Sat	3-Sep-16	7	27.8	#	#	#
Sun	4-Sep-16	Trace	28.3	#	77.5	#
Mon	5-Sep-16	75.3	27.6	#	84	#
Tue	6-Sep-16	10.8	26.4	#	88.7	#
Wed	7-Sep-16	20.4	26.2	#	92	#
Thu	8-Sep-16	2.8	26.4	10.4	90.7	S/SW
Fri	9-Sep-16	16.3	#	10.7	88.2	N/NW
Sat	10-Sep-16	53.2	#	#	#	#
Sun	11-Sep-16	6.6	#	#	#	#
Mon	12-Sep-16	0	28.7	#	83	#
Tue	13-Sep-16	8.5	28.2	5	84	S
Wed	14-Sep-16	8	29.6	8	69	W
Thu	15-Sep-16	0.7	29.4	9	68	NW
Fri	16-Sep-16	0	29.0	10	70	NW
Sat	17-Sep-16	0	29.2	5.0	66.0	S/SE
Sun	18-Sep-16	Trace	28.9	5.3	66.2	S/SE
Mon	19-Sep-16	3.8	29	8.2	65.5	E/SE
Tue	20-Sep-16	39.6	26.3	8.7	77.5	E/NE
Wed	21-Sep-16	2.4	28.4	10.8	63.5	E/NE
Thu	22-Sep-16	0	27.7	11.3	67.5	E/NE
Fri	23-Sep-16	Trace	28.4	11.8	69.0	E
Sat	24-Sep-16	Trace	28.9	10.0	78.0	E
Sun	25-Sep-16	0	28.7	3.1	81.2	S/SW
Mon	26-Sep-16	Trace	28.2	5.0	79.5	S/SW
Tue	27-Sep-16	0	30.9	7.2	77.5	W/SW
Wed	28-Sep-16	0	31.0	11.4	87.0	W/NW
Thu	29-Sep-16	0.7	27.0	9.6	#	W/NW
Fri	30-Sep-16	0	26.0	7.0	70.7	W/NW

Remark: # - Under Maintenance

Weather Conditions – 1 to 16 October 2016

Date		Total Rainfall (mm)	Wong Chuk Hang Station			
			Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Sat	1-Oct-16	95.5	26.6	#	89	#
Sun	2-Oct-16	Trace	27.6	#	82	#
Mon	3-Oct-16	0.2	27.5	#	82	#
Tue	4-Oct-16	0	27.5	#	83	#
Wed	5-Oct-16	Trace	28.6	#	78	#
Thu	6-Oct-16	16.7	28.5	8.5	75	#
Fri	7-Oct-16	17.3	27.7	9.8	79	#
Sat	8-Oct-16	Trace	28.1	8.1	71	#
Sun	9-Oct-16	0	26.5	7.7	69	#
Mon	10-Oct-16	0	25.3	8.2	70	#
Tue	11-Oct-16	0.1	24.5	6.8	79	#
Wed	12-Oct-16	0.9	24.6	15.4	84	#
Thu	13-Oct-16	Trace	26.0	12.6	77	#
Fri	14-Oct-16	Trace	26.7	14.2	76	#
Sat	15-Oct-16	0	27.2	13.7	72	E/N
Sun	16-Oct-16	0	28.0	12.9	71	E/NE

Remark: # - Under Maintenance

Appendix J

Waste Flow Table

Appendix K

Implementation Schedule for
Environmental Mitigation Measures

Appendix C. Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Cat.1 Key/specific proposed mitigation measure									
Noise Impact (Construction)									
5.7	3.2	Selecting Quiet Plant The actual SWL of quiet plant is less than the value specified in GW-TM for the same piece of equipment. It should be noted that the silenced PME taken from EPD's Quality Powered Mechanical Equipment (QPME) Inventory.	Within Project area / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by OPC	✓				EIAO and Noise Control Ordinance
5.7	3.2	Use of Movable Barriers Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided that the direct line of sight between the PME and the NSRs is blocked.	Within Project area / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by OPC	✓				EIAO and Noise Control Ordinance
Ecological Impact									
10.7	8.3	Inspection of Active Ardeid Nest Prior to site clearance works at the planting area abandoned for ardeid breeding, the area around the boundary of the ardeids roosting site as indicatively shown in Figure 8.1 should be inspected to confirm no active ardeid nest is present. If any active ardeid nest is observed, suitably sized buffer area should be established to avoid human or machinery disturbance until the nest is abandoned.	Indicative boundary of the ardeids roosting site within Project construction site (location indicated in Figure 8.1) / For once / Before site clearance	Qualified ecologist appointed by OPC	✓				EIAO-TM; HK Ordinance Cap. 170
10.7	8.3	Inspection of Short-nosed Fruit Bat As precautionary measure, prior to any proposed arboricultural works of the trees (particularly the Chinese Fan-palms), daytime	Project construction site / For once / Before arboricultural works of	ET appointed by OPC	✓				EIAO-TM; HK Ordinance Cap. 170

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EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		inspection should be carried out to confirm no Short-nosed Fruit Bat is present. If any Short-nosed Fruit Bat is observed roosting, suitably sized buffer area should be established around the tree to minimise human or machinery disturbance until the bat has left.	the trees						
10.7	8.3	In-situ Preservation of Plant Species of Conservation Interest During construction phase, protective fence for the identified flora species of conservation concern shall be erected and maintained.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓				EIAO-TM
10.7	8.3	Inspection of Ardeid Nest during breeding season After commencement of construction phase, the Site should be monitored monthly in breeding season (April to July) to check for any potential breeding and nesting activities.	Project construction site / Throughout construction stage / Until completion of all construction activities	Qualified ecologist appointed by OPC	✓				EIAO-TM
10.7	8.2	Timing of site clearance and tree felling works Site clearance and tree felling works at the existing ardeid night roost location as shown in Figure 8.1 should be avoided during the peak wintering season of ardeids, i.e. between November and March.	Indicative boundary of the ardeids roosting site within Project construction site (location indicated in Figure 8.1) / Throughout construction stage / Until completion of site clearance and tree felling works within the boundary	Contractor appointed by OPC	✓				EIAO-TM
10.7	8.3	Compensation for Ardeid Roosting Site An enhancement area with following features should be provided as an alternative roosting site for ardeids. <ul style="list-style-type: none"> The location is at southern part of the Project area (location indicated in Figure 8.1) The enhancement area shall include a Flamingo Pond Native tree species <i>Macaranga tanarius</i> and <i>Celtis sinensis</i> and tree species which was used by ardeids for roosting <i>Mallotus paniculatus</i>, <i>Ficus hispida</i> and <i>Cratogeomys cochinchinense</i> shall be considered in the plan. Heavy standard sized trees shall be considered for planting to allow early establishment of the trees around the Flamingo 	Southern part of Project construction site (location indicated in Figure 8.1) / Before and throughout construction stage / Until completion of Flamingo Pond construction and tree planting activities at that area	Qualified ecologist and Contractor appointed by OPC	✓	✓			EIAO-TM

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					Des	Con	Op	Dec	
10.7	8.3	<p>Pond.</p> <p>Compensation for Woodland Habitat</p> <ul style="list-style-type: none"> ▪ Provision of a Woodland Area of about 1.62 ha, which includes 0.84 ha woodland compensation on-site and 0.78 ha on-site woodland reinstatement, to mitigate for permanent loss of woodland habitat. ▪ In the woodland compensation area, whips should be planted with predominately native tree species similar to the affected woodland, such as <i>Celtis sinensis</i>, <i>Cratogeomys cochinchinense</i>, <i>Polyspora axillaris</i> and <i>Sterculia lanceolata</i>. 	Location of Woodland Compensation Area indicated in Figure 8.2/ Before and throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓	✓	EIAO-TM	
Landscape and Visual Impact (Construction)									
Table 12.13 (CP07)	Table 9.1 (CP07)	<p>Temporary Tree Nurseries</p> <p>Temporary tree nurseries may be set up within the Project area at an early stage to allow small trees to grow during the construction period. By the time these trees are needed for landscape planting at the end of the construction phase, they will have grown larger, require minimal pruning and suffer much less damage during transplanting, as the moving distance from an on-site rather than off-site nursery will be much smaller. The temporary tree nurseries can also temporarily hold the existing trees to be transplanted if direct transplantation from their original locations to the final recipient location is impracticable. The locations of the temporary tree nurseries should be carefully selected so that the trees can also act as screen planting to block the views of the Project area from the VSRs during the construction phase, if practicable.</p>	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓	✓	EIAO-TM	
Table 12.13 (CP08)	Table 9.1 (CP08)	<p>Advance Planting</p> <p>Advance planting should be undertaken at the earliest possible stage of the construction phase of the project. Plant species, preferably native ones, should be carefully selected to blend in with the existing preserved vegetation. Landscape planting in movable planters should also be considered as a temporary greening measure for the Project area.</p>	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓	✓	EIAO-TM	
Landscape and Visual Impact (Operation)									
Table 12.14 (OP04)	Table 9.2 (OP04)	<p>Green Roofs and Vertical Greening</p> <p>Green Roofs and Vertical Greening should be provided where feasible and appropriate to screen and soften the hard edges of</p>	Project building rooftops / During design stage / Throughout operation	Design Architect / Contractor appointed by OPC	✓	✓	✓	EIAO-TM	

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EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Implementation Stage ¹					Relevant Legislation & Guidelines
			Location / Duration of measures / Timing of completion of measures	Implementation Agent	Des	Con	Op	
		building structures.	phase					
Table 12.14 (OP05)	Table 9.2 (OP05)	Reprovision of Flamingo Pond A pond is recommended to replace the demolished Flamingo Pond as compensation for the loss of semi-natural ponds, where wildlife, such as birds, can utilise.	Project area / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓		EIAO-TM
Table 12.14 (OP07)	Table 9.2 (OP07)	Woodland Compensation 1.53ha of affected woodland is recommended to be reinstated / compensated by 1.62ha of whip tree planting adjacent to the existing unaffected woodland and tall shrubland. Native species should be proposed as far as practicable to re-create a native landscape, restore the ecological habitats and blend in with the existing native vegetation.	Project area / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓		EIAO-TM
Cat. 2 Submission required post EIA stage								
Sewerage and Sewage Treatment Implications								
7.7	5.2	Detailed Sewerage Design Report In order to prevent septicity problems during operation phase, a detailed sewerage design report should be submitted to DSD for approval prior to installation of the rising mains.	Rising mains site / During design stage	Design Engineer	✓			Sewerage Manual Part 1
Ecological Impact (Construction)								
10.7	8.3	Vegetation Survey for Plant Species of Conservation Interest For precautionary purposes and to further ensure no flora species of conservation interest to be affected, a detailed vegetation survey need to conduct to the exact locations, number and condition of individuals of <i>Platycodon grandiflorus</i> .	Project construction site / For once / Before site clearance	Qualified botanist/ecologist of the ET appointed by OPC	✓			EIAO-TM; Hong Kong Ordinance Cap. 96
10.7	8.3	Woodland Compensation Plan A Woodland Compensation Plan shall be prepared and submitted to AFCD for approval no later than one month prior to commencement of site clearance. The plan shall include but not limited to the following: <ul style="list-style-type: none"> ▪ Timing of planting works ▪ Planting location ▪ Species, size and number of trees ▪ Monitoring methodology 	Location of Woodland Compensation Area indicated in Figure 8.2/ Before construction stage / No later than one month prior to commencement of site clearance	Qualified botanist/ecologist of the ET appointed by OPC	✓			EIAO-TM

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EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Implementation Stage ¹					Relevant Legislation & Guidelines
			Location / Duration of measures / Timing of completion of measures	Implementation Agent	Des	Con	Op	
<p>■ Action Plan</p>								
Landscaping and Visual Impact (Construction)								
Table 12.13 (CP05)	Table 9.1 (CP05)	<p>Transplantation of Existing Trees</p> <p>Trees which are in direct conflict with the development proposals and suitable for transplantation should be transplanted as far as practicable. A tree transplantation proposal should be submitted together with the tree removal application. Trees proposed to be transplanted should preferably be transplanted from their original locations directly to their final recipient locations in one go. If this is infeasible, the trees should be held in a temporary tree nursery, preferably within the Project area, where the trees will be properly maintained.</p>	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓	EIAO-TM; LAO PN No. 07/2007	
Landscaping and Visual Impact (Operation)								
Table 12.14 (OP02)	Table 9.2 (OP02)	<p>Compensatory Tree Planting</p> <p>Existing trees to be felled should be compensated as far as practicable. Native species should be proposed as far as practicable to re-create a native landscape, restore the ecological habitats and blend in with the existing native vegetation. A compensatory tree planting proposal should be submitted together with the tree removal application for approval by relevant authorities in accordance with LAO Practice Note No. 7/2007. It is recommended that approximately 608 heavy standard trees and approximately 18,202 whip trees could be planted on-site. The availability of off-site compensatory tree planting area is still subject to further investigation and agreement with relevant authorities.</p>	Project area / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓	EIAO-TM; LAO PN No. 07/2007	
Cat. 3 Good site practice/housekeeping measures under EM&A mechanism								
Air Quality Impact (Construction)								
3.9.1	2.2	<p>Dust Control Measures</p> <p>To achieve compliance with the FSP, RSP and TSP criteria during the construction phase, good practices for dust control should be implemented to reduce dust impacts. The dust control measures are detailed as follows:</p> <ul style="list-style-type: none"> ■ Use of regular water spraying (once every 2.5 hours or 4 times per day) to reduce dust emissions from heavy construction activities (including ground excavation, earth moving, etc.) at all active works area exposed site surfaces and unpaved 	Project construction site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by OPC	✓		EIA Recommendation and Air Pollution Control (Construction Dust) Regulation	

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					Des	Con	Op	Dec	
		<p>roads, particularly during dry weather.</p> <ul style="list-style-type: none"> Covering 80% of stockpiling area by impervious sheets and spraying all dusty material with water immediately prior to any loading transfer operations to keep the dusty materials wet during material handling at the stockpile areas <p>Relevant dust control practices as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted:</p> <p>Good Site Management</p> <ul style="list-style-type: none"> Good site management is important to help reduce potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standards of housekeeping to prevent emissions of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. <p>Disturbed Parts of the Roads</p> <ul style="list-style-type: none"> Main temporary access points should be paved with concrete, bituminous hardcore materials or metal plates and be kept clear of dusty materials; or Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. <p>Exposed Earth</p> <ul style="list-style-type: none"> Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seeding with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. <p>Loading, Unloading or Transfer of Dusty Materials</p> <ul style="list-style-type: none"> All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as 							

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					Des	Con	Op	Dec	
		<p>to keep the dusty material wet.</p> <p>Debris Handling</p> <ul style="list-style-type: none"> ▪ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ▪ Before debris is dumped into a chute, water should be sprayed onto the debris so that it remains wet when it is dumped. <p>Transport of Dusty Materials</p> <ul style="list-style-type: none"> ▪ Vehicles used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. <p>Wheel washing</p> <ul style="list-style-type: none"> ▪ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. <p>Use of vehicles</p> <ul style="list-style-type: none"> ▪ The speed of the trucks within the site should be controlled to about 10 km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. ▪ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ▪ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. <p>Site hoarding</p> <ul style="list-style-type: none"> ▪ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit 							
Noise Impact (Construction)									

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					Des	Con	Op	Dec	
5.7	3.2	<p>Good Site Practice</p> <p>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs.</p> <ul style="list-style-type: none"> ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum; ▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and ▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Project construction site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by OPC	✓			EIAO and Noise Control Ordinance	
Noise Impact (Operation)									
5.7	3.3.2	<p>Fixed Plant Noise</p> <p>With the adoption of the proposed maximum allowable SWLs, all representative NSRs is expected to comply with the relevant noise criteria for the daytime and evening time periods. No adverse fixed plant noise impact is anticipated.</p> <p>It is also recommended that the following noise reduction measures should be considered as far as practicable during design stage:</p> <ul style="list-style-type: none"> ▪ choose quiet plant such as those which have been effectively silenced; ▪ include noise levels specification when ordering new plant (including chiller and E&M equipment); ▪ locate fixed plant / louvre away from any NSRs as far as practicable; ▪ locate fixed plant in walled plant rooms or in specially designed enclosures; ▪ locate noisy machine in a basement or a completely separate building; 	Within Project area / Prior to operation phase / Duration of the operation phase / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓	✓	EIAO and Noise Control Ordinance	

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					Des	Con	Op	Dec	
5.7	3.3.2	<ul style="list-style-type: none"> install direct noise mitigation measures including silencers, acoustic louvres and acoustic enclosure where necessary; and develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise. <p>Prior to the operation of the Project, noise commissioning tests for all major fixed noise sources should be conducted.</p> <p>Open Air Entertainment Noise With the adoption of the proposed maximum allowable SWLs, all representative NSRs is expected to comply with the relevant noise criteria for the daytime and evening periods, the following measures should be considered as far as practicable during stage:</p> <ul style="list-style-type: none"> use small clusters of small power loudspeakers rather than a few large power loudspeakers; and loudspeakers should be pointed away from nearby NSRs. 	Within Project area / Duration of the operation phase / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓			EIAO and Noise Control Ordinance
Water Quality Impact (Construction)									
6.7	4.2	<p>Construction Site Runoff The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and erosion. The following measures are recommended to protect water quality of the inland areas:</p> <ul style="list-style-type: none"> At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractors prior to the commencement of construction; Sand/ silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in 	Project construction site / Duration of the construction phase	Contractor appointed by OPC	✓				EIAO-TM; ProPECC Note PN 1/94; WPCO; TM-DSS

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EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractors prior to the commencement of construction;</p> <ul style="list-style-type: none"> ▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times; ▪ Measures should be taken to minimise the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from site formation excavations should be discharged into storm drains via silt removal facilities; ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; ▪ Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers; ▪ Precautions should be taken at any time of the year when 							

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EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
6.7	4.2	<p>rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes; and,</p> <ul style="list-style-type: none"> Bentonite slurries used on site should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. <p>The Contractor would be required to obtain a license from EPD under the WPCO for discharge to the public drainage system or the marine environment. Construction site discharge should be collected by the temporary drainage system installed by the Contractor and treated or desilted on-site to fulfil the WPCO discharge license requirements before discharge.</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC	✓			EIAO-TM; ProPECC Note PN 1/94	
6.7	4.2	<p>General Construction Activities Best Management Practices (BMPs) should be implemented at the construction site, including proper handling, sorting and storage of construction solid waste, debris and refuse generated on-site prior to disposal. Stockpiles of cement and other construction materials should be kept covered when not being used. The Contractor should also follow the guidelines set in the "Pesticides Used for Outdoor Mosquito Control", published by AFCD in 2010, for mosquito control on site.</p> <p>Expansion of Existing Storm U-Channel Guidelines and measures summarised in ProPECC PN 1/94 for trenching activities should be implemented.</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC	✓			ProPECC Note PN 1/94	
6.7	4.2	<p>Interception of Natural Streams Guidelines and measures summarised in ProPECC PN 1/94 for excavation and stockpiling activities should be implemented.</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC	✓			ProPECC Note PN 1/94	
6.7	4.2	<p>Site Formation Works The construction programme should be properly planned to minimise excavation works during the wet season (April to September), temporarily exposed slope/soil surfaces should be</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC	✓			ProPECC Note PN 1/94	

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EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Implementation Stage ¹					Relevant Legislation & Guidelines
			Location / Duration of measures / Timing of completion of measures	Implementation Agent	Des	Con	Op	
		covered by a tarpaulin or other means, as far as practicable. Interception channels should be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Measures will be taken to minimise water ingress into the excavation. Diverting any water from the excavated areas to on-site wastewater treatment facilities for treatment prior to discharge should also be performed. Other measures that need to be implemented before, during and after rainstorms are summarised in ProPECC PN 1/94.						
6.7	4.2	<p>Construction of Sewage Sump Pit and Rising Mains</p> <p>Measures for excavation works summarised for site formation works should also be implemented during construction of the sewage sump pit.</p> <p>During the laying of rising mains, guidelines and measures summarised in ProPECC PN 1/94 for trenching activities should be performed. Concrete water generated from the construction of the concrete support should be collected and treated with the wastewater treatment facilities prior to discharge.</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC		✓		ProPECC Note PN 1/94
6.7	4.2	<p>Accidental Spillage</p> <p>The Contractor should register as a chemical waste producer if chemical wastes are produced from construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes. This will prevent contamination of top soil and water pollution due to construction site runoff.</p> <p>Maintenance of vehicles and equipment, involving activities with potential for leakage and spillage, should only be undertaken within areas appropriately equipped to control these discharges.</p> <p>Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC		✓		ProPECC Note PN 1/94; Waste Disposal Ordinance (Cap 354); Waste Disposal (Chemical Waste) (General) Regulation

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					Des	Con	Op	Dec	
		<p>Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows:</p> <ul style="list-style-type: none"> ▪ Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. ▪ Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. ▪ Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 							
6.7	4.2	<p>Sewage Effluent from the Construction Workforce The Contractor should provide temporary sanitary facilities, such as portable chemical toilets within the construction site to handle sewage from the workforce. The Contractor has the responsibility to ensure that chemical toilets are used and properly maintained, and that licensed Contractors are employed to collect and dispose of the waste off-site at approved locations.</p>	Project construction site / Duration of the construction phase	Contractor appointed by OPC	✓				ProPECC Note PN 1/94
Water Quality Impact (Operation)									
6.7	4.2	<p>Runoff from Road Surfaces Road drainage system design has already included silt traps in the gully inlets to remove silt and grit before the runoff enters the public storm water drainage system. Silt traps should be regularly checked and maintained to ensure efficient operation.</p>	Within Project area / During operation phase	OPC/Operator appointed by OPC		✓			EIAO-TM; WPCO
6.7	4.2	<p>Runoff from On-site Planting Area Watering of plants on site should always be performed before application of pesticides, herbicides and fertilizers. Regular training should also be provided to frontline staff on the appropriate treatment and disposal of pesticides, herbicides and fertilizers.</p>	Within Project area / During operation phase	OPC/Operator appointed by OPC		✓			EIAO-TM; WPCO; TM-DSS
Waste Management Implications (Construction)									
8.5.1.1	6.2	Good Site Practice	Project construction site / Throughout construction	Contractor	✓				Waste Disposal Ordinance; Waste

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8.5.1.2	6.2	<p>Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Appropriate measures to minimise windblown litter and dust/ odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers ▪ Stockpiles of C&D materials should be kept covered by impervious sheets to avoid wind-blown dust ▪ All dusty materials including C&D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the stockpile areas ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads ▪ Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated <p>Waste Reduction Measures</p> <p>Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> ▪ Sort inert C&D materials to recover any recyclable portions such as metals ▪ Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of 	<p>stage / Until completion of all construction activities</p>	appointed by OPC					<p>Disposal (Chemical Wastes) (General) Regulation; and ETWB Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site</p>	
			<p>Project construction site / Throughout construction stage / Until completion of all construction activities</p>	Contractor appointed by OPC			✓			Waste Disposal Ordinance

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8.5.1.3	6.2	<p>materials and their proper disposal</p> <ul style="list-style-type: none"> ▪ Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force ▪ Proper site practices to minimise the potential for damage or contamination of inert C&D materials ▪ Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste <p>Inert and Non-inert C&D materials</p> <p>In order to minimise impacts resulting from collection and transportation of inert C&D materials for off-site disposal, the inert C&D materials should be reused on-site as fill material as far as practicable. In addition, inert C&D materials generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation.</p> <p>The surplus inert C&D materials will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.</p> <p>The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site.</p> <p>In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the DEVB Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the ETWB Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site.</p>	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓				Waste Disposal Ordinance ; DEVB Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials; and ETWB Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site
8.5.1.4	6.2	<p>Chemical Waste</p> <p>If chemical wastes are produced at the construction site, the</p>	Project construction site / Throughout construction	Contractor appointed by OPC	✓				Code of Practice on the Packaging

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		Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	stage / Until completion of all construction activities							Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation
8.5.1.5	6.2	General Refuse General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC		✓				Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
8.5.1.6	6.2	Floating Refuse Provide general refuse collection points on site can minimise the refuse contaminate the marine environment. The construction contractors will be required to regularly check and clean any refuse trapped or accumulated along the artificial seawall. Such refuse will then be stored and disposed of together with the general refuse.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC		✓				Waste Disposal Ordinance
Waste Management Implications (Operation)										
8.5.2.1	6.2	General Refuse General refuse should be collected on daily basis and delivered	Project area / On a regular basis /	Contractor appointed by OPC				✓		Waste Disposal Ordinance

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8.5.2.2	6.2	<p>to the refuse collection point accordingly. A reputable waste collector should be employed to remove general refuse regularly to avoid odour nuisance or pest/vermin problem. Sufficient recycling containers are recommended to be provided at suitable locations of the Project to encourage recycling of such waste as aluminium cans, plastics and waste paper.</p> <p>Chemical Waste If chemical wastes are expected to be produced during the operation phase, the Project Proponent should register with the EPD as a chemical waste producer and follow the guidelines stated in the "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. Licensed collector should be deployed to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Throughout operation stage	Contractor appointed by OPC			✓		Code of Practice on the Packaging Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation	
8.5.2.3	6.2	<p>Floating Refuse Regular inspection should be carried out along the artificial seawall of the Project boundary for any entrapment or accumulation of floating refuse. Where an appreciable amount of floating refuse is found on the artificial seawall during the inspection, the locations of such refuse will be recorded and arrangements with the project proponent will immediately be made to collect and clear the refuse from the seawall.</p>	Project area / On a regular basis / Throughout operation stage	Contractor appointed by OPC			✓		Waste Disposal Ordinance	
Land Contamination (Construction)										
9.6	7.2	In any case where contaminated soil is identified after the commencement of works, a Contamination Assessment Plan (CAP) is required to be prepared for EPD's endorsement prior to	Project construction site / Before construction stage	Contractor appointed by OPC	✓				Guidance Note for Contaminated Land Assessment and Remediation	

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9.6	7.2	<p>the site investigation. The Contamination Assessment Report (CAR) and/ or Remediation Action Plan (RAP) should be prepared for EPD's approval after the site investigation. If land contamination is confirmed, remediation works should be carried out according to the approved RAP. A Remediation Report (RR) should also be prepared for EPD's endorsement to demonstrate that the clean-up of the contaminated land is completed. No construction work or development of site should be carried out before the approval of the RR.</p> <p>If contaminated soil is identified, the following mitigation measures are for the excavation and transportation of contaminated materials (if any):</p> <ul style="list-style-type: none"> ▪ To minimise the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; ▪ Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when working directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; ▪ Stockpiling of contaminated excavated materials on site should be avoided as far as possible; ▪ The use of any contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; ▪ Vehicles containing any excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; ▪ Truck bodies and tailgates should be sealed to prevent any discharge; ▪ Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly 	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC		✓		<p>Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management</p> <p>Practice Guide for Investigation and Remediation of Contaminated Land</p> <p>Waste Disposal Ordinance (Cap 354)</p> <p>Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)</p>

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		tipping; <ul style="list-style-type: none"> ▪ Speed control for trucks carrying contaminated materials should be exercised. ▪ Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and ▪ Maintain records of waste generation and disposal quantities and disposal arrangements. 						
Landscaping and Visual Impact (Construction)								
Table 12.13 (CP01)	Table 9.1 (CP01)	Minimisation of Construction Period The construction programme should be carefully designed to minimise the length of the construction period.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓		EIAO-TM
Table 12.13 (CP02)	Table 9.1 (CP02)	Minimisation of Works Areas The footprint of the proposed hard structures as well as the extent of temporary works areas should be minimised as far as practicable.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓		EIAO-TM
Table 12.13 (CP03)	Table 9.1 (CP03)	Construction Site Controls Construction site controls should be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction phase activities, such as the storage of materials, the location and appearance of site accommodation, etc. are minimised.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓		EIAO-TM
Table 12.13 (CP04)	Table 9.1 (CP04)	Preservation of Existing Vegetation The development proposal should avoid disturbance to existing vegetation as far as practicable. A formal tree removal application should be submitted for approval by relevant authorities in accordance with LAO PN No. 07/2007 "Tree Preservation and Tree Removal Application for Building Development in Private Projects" during the detailed design phase of the Project. Where possible, all trees which are not in direct conflict with the development proposals should be retained <i>in situ</i> .	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓	✓		EIAO-TM; LAO PN No. 07/2007
Table	Table	No Intrusion Zones	Project construction site /	Contractor	✓	✓		EIAO-TM

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12.13 (CP06)	9.1 (CP06)	Where practicable, "no intrusion zones" should be designated within the Project area for protection of existing vegetation. Durable boundary fences should be erected to clearly demarcate these "no intrusion zones". No construction activities, storage of materials and vehicular access will be allowed within the "no intrusion zones" to prevent potential damage to canopies and root zones of vegetation.	Throughout construction stage / Until completion of all construction activities	appointed by OPC					
Table 12.13 (CP09)	Table 9.1 (CP09)	Construction Site Hoardings Two types of hoardings should be considered. One is used for areas in close contact with visitors and for areas where visual intrusion is a key concern. It should be graphical and thematic, and visually 'impermeable' to block the views of construction activities from the VSRs. The other is used for areas to be viewed at a distance. It should be subtle and camouflaged so that it blends in with the surrounding landscape.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓			EIAO-TM	
Table 12.13 (CP10)	Table 9.1 (CP10)	Dust and Erosion Control for Exposed Soil Exposed soil shall be covered or "camouflaged" and watered frequently. Areas that are expected to be left with bare soil for a long period of time should be hydroseeded and / or covered with suitable protective fabrics.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓			EIAO-TM	
Table 12.13 (CP11)	Table 9.1 (CP11)	Appearance of Construction Plant / Machinery To minimise the visual intrusion of construction activities to visitors and other VSRs, a suitable colour scheme of construction machines and plants should be adopted where possible.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓			EIAO-TM	
Table 12.13 (CP12)	Table 9.1 (CP12)	Construction Lighting Control All security floodlights for construction sites should be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimise light pollution and night-time glare to the VSRs.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓			EIAO-TM	
Table 12.13 (CP13)	Table 9.1 (CP13)	Appearance of Construction Workers To protect Ocean Park's image, construction workers should be required to enter the park areas with their helmets and safety vests properly stored or carried in non-transparent bags. They should also dress properly and cleanly.	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by OPC	✓			EIAO-TM	
Landscape and Visual Impact (Operation)									

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Table 12.14 (OP01)	Table 9.2 (OP01)	<p>Sensitive Design and Disposition</p> <p>All proposed hard structures should be sensitively designed in a manner that responds to the existing and planned landscape context, and minimises potential adverse landscape and visual impacts. The structural design should seek to reduce the apparent visual mass through the use of natural materials such as wooden frame and semi-transparent panels. Subdued tones should be considered for the colour palette with non-reflective finishes to reduce glare effect. Site specific measures, such as the disposition of the key structures closer to the northern slopes, the design of building forms as extension along the existing slope topography, the use of concave roof form and the location of ride platforms on or near the slopes to minimise structural support, should also be considered for better integration with the surroundings and minimisation of potential visual impacts.</p>	Project buildings / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓	✓	✓	EIAO-TM
Table 12.14 (OP03)	Table 9.2 (OP03)	<p>Enhancement Planting</p> <p>Other than compensatory tree planting, additional trees, shrubs, groundcovers and lawn should also be considered to maximise greening within the redevelopment area.</p>	Project area / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓	✓	✓	EIAO-TM
Table 12.14 (OP06)	Table 9.2 (OP06)	<p>Responsive Lighting Design</p> <p>Overall lighting design would carefully consider a reasonable level of functional and thematic lighting with due consideration of possible light pollution and night-time glare to the surroundings. Consideration shall be made by the lighting designers to the following measures:</p> <ul style="list-style-type: none"> ▪ Lighting shall be designed with due consideration of mounting height and direction of light fixtures so as not to point directly towards any sensitive receiver. ▪ Lighting shall be arranged with due consideration of reflectance so as to avoid glare effect. ▪ Lighting shall be regularly monitored during operation. ▪ Lights located adjacent or in proximity to neighbours shall be carefully designed to prevent possible light intrusion. ▪ Lighting operation schedule shall specify only lights necessary for security to be left on after business hours. ▪ Paving materials should be selected as necessary to reduce 	Project area / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓	✓	✓	EIAO-TM

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		potential glare from surface reflectance. <ul style="list-style-type: none"> ▪ Particular attention should be paid to the use of lighting having a high intensity or harsher tone (e.g. metal halide lamps). ▪ Lights shall generally be models having precise cut-off range (such as full cut-off optics where available and practicable) and if necessary be fitted with adjustable anti-glare shields. 								

Remarks:

1. Des – Design Stage, Con – Construction Stage, Op – Operation, Dec - Decommissioning