



# **Ocean Park Tai Shue Wan Water World Project**

Final EM&A Review Report

September 2021



Mott MacDonald  
3/F International Trade  
Tower  
348 Kwun Tong Road  
Kwun Tong  
Kowloon  
Hong Kong

T +852 2828 5757  
mottmac.hk

Gammon Engineering &  
Construction Company  
Limited  
22/F, Tower 1, The  
Quayside  
77 Hoi Bun Road  
Kwun Tong  
Kowloon  
Hong Kong

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**This Final EM&A Review Report has been reviewed and certified by the  
Environmental Team Leader (ETL) and verified by the Independent  
Environmental Checker (IEC) as having complied with the requirements  
as set out in the EM&A Manual Section 11.5.**

**Certified by:**



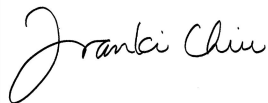
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Gary Chow  
Environmental Team Leader (ETL)  
Mott MacDonald Hong Kong Limited

**Date:**

25 OCTOBER 2021

**Verified by:**



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Franki Chiu  
Independent Environmental Checker (IEC)  
Ove Arup & Partners Hong Kong Limited

**Date:**

27 October 2021

### Information class: Standard

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# Executive Summary

Mott MacDonald Hong Kong Ltd. (“MMHK”) has been commissioned by the Gammon Engineering & Construction Company Limited to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for Ocean Park Tai Shue Wan Water World Development (the Project).

The major construction works have been completed by May 2021. There were not any construction works by end of June 2021.

This is the Final EM&A Review Report for the construction phase of the Project summarising the findings on EM&A activities during the construction period.

## Result of Noise Monitoring

The summary of measured noise level (as  $L_{eq}$ ) is presented in **Section 4.1**. No exceedance of Action or Limit Levels for construction noise was recorded during the construction period.

## Result of Ecological Monitoring

The plant species of conservation interest – One number of *Platycodon grandiflorus* was found in fence up area in the Reporting Period. Group 1 of *Platycodon grandiflorus* could not be found within the fenced area due to natural life cycle of this perennial herbaceous species, and new shoots would be expected to emerge from the underground part in the next growing season. No sign of construction activities was noted in the fence up area.

No ardeids were noted within or in the vicinity of the project area during the construction period. Details of the results are presented in **Section 4.2**.

## Result of Landscape and Visual Monitoring

No non-compliance of Landscape and Visual monitoring was recorded in the construction period. Details of the results are presented in **Section 4.3**.

## Record of Complaints

There were four complaints received in the construction period. Details of the records are presented in **Section 5**.

## Record of Notification of Summons and Successful Prosecutions

There were no record of notification of summons and successful prosecution in the construction period.

# 1 Introduction

## 1.1 Introduction

On 27 August 2014, the Environment Impact Assessment (EIA) Report and Environmental Monitoring and Audit (EM&A) Manual (Register No.: AEIAR-184/2014) for the “Tai Shue Wan Development at Ocean Park” (the Project) was approved and an Environmental Permit (EP) (Permit No.: EP-487/2014) was issued to the Ocean Park Corporation (Project Proponent).

The current valid EP (Permit No.: EP-487/2014/A) was issued on 10 January 2018 based on the Variation of Environmental Permit No. VEP-539/2017 which comprised variation of project boundary, location of sump pit and size of rising main. The Project location is indicated in **Appendix A**.

Baseline monitoring for the required parameters including background noise, landscape & visual baseline review and baseline ardeid inspection were carried out between 24 October 2014 and 10 December 2014 by the environmental consultants of Ocean Park Corporation. Furthermore, the baseline monitoring report verified by the previous Independent Environmental Checker (IEC) was submitted to the EPD and endorsed in December 2014.

The previous contract (Contract No. TSW-C004) of Site Formation and Foundation Works has been completed since 31 May 2017, while the Project site was handed over to Gammon Engineering & Construction Company Limited on 31 May 2017 for the Main Building Works (Contract No. TSW-C006, the Contract). Mott MacDonald Hong Kong Ltd. (MMHK) has been commissioned by Gammon Engineering & Construction Company Limited to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit for the Ocean Park Tai Shue Wan Water World Project.

The major construction works have been completed by May 2021 with the Occupation Permit obtained on 7 May 2021. The proposal for suspension of the construction phase environmental monitoring (including weekly noise monitoring and environmental site audits) by end of June 2021 was justified by the ET Leader and verified by the IEC on 23 June 2021, approved by EPD on 6 July 2021 and implemented on 6 July 2021.

The termination of construction EM&A Programme by 31 August 2021 was proposed by the Contractor on 30 August 2021 and is supported by ET and endorsed by IEC and ER as conforming the requirements set out in the EM&A Manual. It was accepted by EPD on 29 September 2021.

This Final EM&A Review Report summarises the monitoring results and EM&A findings for the Project during the construction period of the Contract from 1 June 2017 to 31 August 2021, and is submitted to fulfil Section 11.5 of the EM&A Manual.

## 2 Project Organization and Programme

### 2.1 Project Organization

The project organization and contacts of key management are shown in **Appendix B**. The responsibilities of respective parties are:

#### Ocean Park Corporation

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)

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

#### Project Management Representative (PMR) of Ocean Park Corporation

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', 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

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)

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 seven 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)

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 seven 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 the ET leader; and
- to audit EIA recommendations and requirements against the status of implementation of environmental mitigation measures on site.

## 2.2 Works Undertaken in the Construction Period

The construction programme of the Contract commenced on 1 June 2017. The major construction works have been completed by May 2021 with the Occupation Permit obtained on 7 May 2021, while all greening works have been completed by August 2021. During the construction period, the major construction activities conducted under the Contract are summarised below:

- Set up of site office
- Site formation for haul road construction
- Foundation construction for tower crane erection
- Rock breaking and slope stabilization works
- Construction of drainage channels to slopes
- Underground manhole and drainage work
- Column and slab construction
- Cut soil slope and soil nail installation
- Construction of plant rooms, transformer room
- Bearing wall and Core wall construction
- Footing and underground utility construction
- Rising main construction
- Tree planting and landscape works

## 2.3 Summary of Environmental Submissions

In accordance with the EP stipulation, the required documents submitted to EPD for retention are 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
- Ecological Enhancement Plan
- Visual and Landscape Plan
- Detailed Design Report for the Sewerage Facilities
- Noise Audit Report

## 3 Summary of EM&A Requirements

### 3.1 Monitoring Parameters

The EM&A programme of construction phase requires environmental monitoring of construction noise, ecology, landscape and visual as specified in the approved EM&A Manual. A summary of impact EM&A requirements is shown in Table 3.1.

**Table 3.1: Summary of Impact EM&A Requirements**

Monitoring Parameters	Descriptions	Locations	Frequencies
Construction Noise	<ul style="list-style-type: none"> <li>• <math>L_{eq(30min)}</math> on normal working days</li> <li>• 3 sets of consecutive <math>L_{eq(5min)}</math> during restricted hours if necessary</li> </ul>	NM1A and NM2	Weekly Normal working days: (07:00-19:00 except public holiday) Restricted hours: 19:00 to 07:00 next day, and whole day of public holiday or Sunday only when necessary
Ecology	<ul style="list-style-type: none"> <li>• Monitoring of in-situ preservation of the plants of conservation interest (<i>Platycodon grandiflorus</i>)</li> </ul>	Preservation area of <i>Platycodon grandiflorus</i>	Monthly
	<ul style="list-style-type: none"> <li>• Inspection of ardeids nest during breeding season (April to July)</li> </ul>	Project Site	
	<ul style="list-style-type: none"> <li>• Monitoring of ardeid night roost of in peak wintering season (November to March)</li> </ul>	Vantage Point	
	<ul style="list-style-type: none"> <li>• Inspection of enhancement area for ardeid roosting</li> </ul>	Ecological Enhancement Area	N/A (No monitoring required during the construction phase)
	<ul style="list-style-type: none"> <li>• Monitoring on woodland compensation</li> </ul>	Project Site	To be implemented in operational phase
Landscape and Visual	<ul style="list-style-type: none"> <li>• Design, implementation and maintenance of landscape and visual mitigation measures</li> </ul>	Project Site	Bi-weekly
Regular Site Inspection	<ul style="list-style-type: none"> <li>• To monitor the implementation of proper environmental protection and pollution control measures for the Project</li> </ul>	Project Site	Weekly

The construction noise monitoring locations as established in the EM&A Manual and the actual construction noise monitoring locations as agreed in the Baseline Monitoring Report are shown in **Appendix C**. The monitoring location for roosting activities of ardeid in peak wintering season is also shown in **Appendix C**.

### 3.2 Environmental Quality Performance Limits

The environmental quality performance limit for construction noise as stipulated in the EM&A Manual is presented in Table 3.2.

**Table 3.2: Action and Limit Levels for Construction Noise**

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 07:00-19:00 hours on normal weekdays	
NM1A and NM2	When one or more documented complaints are received	70 dB(A) <sup>1, 2</sup>

Note: 1. A correction of +3dB(A) was made to the free field measurement at monitoring station NM1A.  
2. Acceptable noise levels for school should be reduced to 65 dB(A) during examination period

The Event and Action Plans for construction noise and landscape and visual impact during construction phase are shown in **Appendix D**.

### 3.2 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix E**.



## 4 Summary of Environmental Monitoring Results

### 4.1 Construction Noise Monitoring

Monitoring for noise levels due to construction work was undertaken in compliance with the EM&A manual during the construction period. The results of the noise monitoring measurement were below the Limit Level of 70 dB(A). Table 4.1 summarises the construction noise monitoring results in comparison of the Limit Level and baseline condition as reported in the Baseline Monitoring Report. Graphical plots of the construction noise monitoring data are presented in **Appendix F**. No exceedance of Action or Limit Levels for construction noise was recorded during the construction period.

**Table 4.1: Summary of Construction Noise Monitoring Results**

Monitoring Location	Baseline Monitoring Results <sup>1</sup> , Leq (30min), dB(A)		Construction Noise Monitoring Results <sup>1</sup> , Leq (30min), dB(A)		Limit Level <sup>2</sup> , dB(A)
	Range	Average	Range	Average	
NM1A	52 – 63	59	56.3 – 66.0	60.3	70
NM2	50 – 67	59	47.1 – 63.0	52.2	70

Note: 1. A correction of +3 dB(A) was made to the free field measurement at monitoring station NM1A.  
 2. Acceptable Noise Levels for school should be reduced to 65 dB(A) during examination period.

Additional noise monitoring was undertaken during the restricted hour period where needed. No exceedance of Limit Level for construction noise was recorded during restricted hours in the construction period. Table 4.2 summarises the results of additional noise monitoring.

**Table 4.2: Summary of Additional Construction Noise Monitoring Results**

Monitoring Location	Baseline Monitoring Results <sup>1</sup> , Leq (5min), dB(A)		Construction Noise Monitoring Results <sup>1</sup> , Leq (5min), dB(A)		Limit Level <sup>2</sup> , dB(A)
	Range	Average	Range	Average	
NM1A	47 – 61	55	52.4 – 57.8	55.5	70
NM2	40 – 60	54 / 51 <sup>3</sup>	44.9 – 52.5	48.4	65

Note: 1. A correction of +3 dB(A) was made to the free field measurement at monitoring station NM1A.  
 2. Technical memorandum on noise from construction work other than percussive piling – Section 4 Table 2.  
 3. As reported in the Baseline Monitoring Report, the measured average baseline noise level is 54 dB(A) for normal weekdays 1900-2300 hrs and holidays 0700 – 2300 hrs, while the noise level is 51 during night-time (2300 – 0700 hrs).

Meteorological information including temperature, humidity, wind direction and wind speed was extracted from “the Hong Kong Observatory Wong Chuk Hang Station” to provide background weather information. The meteorological data during the monitoring period is summarised in **Appendix G**.

### 4.2 Ecology Monitoring

Monthly ecological monitoring has been conducted from June 2017 to June 2021 during the construction period. Monitoring has been carried out by inspections of preservation of the plant

of conservation interest, ardeid nest, ardeid night roost and ecological enhancement area within the Project Area.

### Monitoring of Plant Species of Conservation Interest (*Platycodon grandiflorus*)

*Platycodon grandiflorus* is a perennial herb up to 120 cm tall. Stems erect with scarcely any branches. It is often found on sunny grassy hillslopes in bushes. Two groups of *Platycodon grandiflorus* were recorded in 2015's growing season within the fenced area.

During the construction period, the preventive mitigation measures, i.e., erecting of temporary protective fencing and sign post, were found to be effectively implemented to protect the *Platycodon grandiflorus* from human disturbance, and there was no signs or evidence (e.g. dust coating of plant) suggesting the on-going construction activities within the Project Area has affected the health condition of the *Platycodon grandiflorus*. In general, the *Platycodon grandiflorus* was in good health condition and has been growing according to the natural life cycle. Table 4.3 summarised the special observations on the growth of *Platycodon grandiflorus* related to typhoon events during the construction period.

**Table 4.3: Summary of special observations of *Platycodon grandiflorus***

Month	Special Observation
August 2017	It was observed that the whole plant prostrated on the ground due to severe typhoon HATO battered Hong Kong on 23 August 2017. The Hong Kong Observatory issued the highest Tropical Cyclone Warning Signal – Hurricane Signal No.10 and the sea level rose above normal chart datum. It was expected that severe typhoon and high sea water level caused adverse impact to the <i>Platycodon grandiflorus</i> because of the strong wind and its low salt tolerant. Close monitoring on the <i>Platycodon grandiflorus</i> was recommended.
September 2017	It was observed that new branches were grown from the stem in both two groups after the severe typhoon HATO battered Hong Kong on 23 August 2017.
October 2018	No <i>Platycodon grandiflorus</i> was observed due to super typhoon Mangkhut battered Hong Kong on 16 September 2018. The Hong Kong Observatory issued the Hurricane Signal No.10 and sea level rose above normal chart datum. It was expected that super typhoon and high sea water level caused adverse impact to the <i>Platycodon grandiflorus</i> because of the strong wind and its low salt tolerant. Close monitoring on the <i>Platycodon grandiflorus</i> was recommended.
November 2018	It was observed that new stems were grown in both two groups after the super typhoon Mangkhut battered Hong Kong on 16 September 2018.

As recorded during the last ecological inspection event in June 2021, it was observed that Group 2 of *Platycodon grandiflorus* was found to be vigorous and was in good health condition. However, Group 1 of *Platycodon grandiflorus* could not be found within the fenced area due to natural life cycle of this perennial herbaceous species, and new shoots would be expected to emerge from the underground part in the next growing season. The latest photo of the *Platycodon grandiflorus* is shown in **Appendix H**.

### Nesting Activities of Ardeids in Breeding Season

No signs or breeding (such as courtship, nest building, brooding, juveniles etc.) of ardeids were noted within the Project Area during the monitoring period throughout the construction phase.

### Roosting Activities of Ardeids in Peak Wintering Season

No ardeids were noted roosting within or in the vicinity of the project area in the evening from an hour before sunset to nightfall during the monitoring period throughout the construction phase.

### Compensation for Ardeid roosting Site

The site of proposed Ecological Enhancement Area was prepared in the first phase of construction in early 2020. In accordance with the approved Ecological Enhancement Plan, the tree planting within the Ecological Enhancement Area was being implemented and completed in July 2021. Monitoring of the compensation at the Ecological Enhancement Area will be implemented during the operation phase.

### Compensation of Woodland Habitat

The establishment of woodland compensation will be implemented after the commencement of operation.

## 4.3 Landscape and Visual Monitoring

Bi-weekly landscape and visual site inspection has been conducted from June 2017 to June 2021 during the construction period. Throughout the construction period, the Contractor complied with the intended aims of mitigation measures. Non-compliance was not recorded, and the Event and Action Plan for landscape and visual impact was not triggered. Only a few observations related to typhoon events were being recorded as summarised in Table 4.4, where recommended actions have been undertaken by the Contractor immediately after the events.

**Table 4.4: Summary of Observations on Landscape and Visual Impact**

Month	Observation
August 2017	On 23 August 2017, severe typhoon HATO battered Hong Kong. The Hong Kong Observatory issued the Hurricane Signal No.10 and sea level rose above normal chart datum, some of the trees including A0090 and A0091 were observed with yellowing of normally green leaves and large portion of drooping leaves on 25 August 2017. Close monitoring of these trees was recommended. Also, loose wire was observed, tighten up of the wire is recommended.
September 2017	On 22 September 2017, A0090 and A0091 were observed with new leaves. Although new leaves observed on these trees, close monitoring was still recommended.
October 2018	Crown damage was observed on Royal Palm due to super typhoon Mangkhut battered Hong Kong on 16 September 2018. Close monitoring of these Royal Palm was recommended.
November 2018	A few Royal Palm were found dead during reporting period due to super typhoon Mangkhut battered Hong Kong on 16 September 2018. Removal of the dead trees and tree replacement were recommended.
December 2018	Dead Royal Palms due to super typhoon Mangkhut battered Hong Kong on 16 September 2018 were removed. Tree replacement for dead Royal Palms and regular weeding in the tree protection zone were recommended.

In accordance with the approved Visual and Landscape Plan, the landscape planting and related greening works of the Project has been implemented and completed in August 2021. The monitoring of landscape planting will be conducted in operation phase.

## 4.4 Waste Management

The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting was carried out on site. Reuse of inert C&D material was adopted as far as practicable. Recyclable non-inert C&D materials were sorted and sent to recycling facilities. Sufficient number of receptacles were available for general refuse collection. The summary of waste generated during the construction period is presented in **Appendix I**.

## 4.5 Site Inspection

Site inspection has been undertaken by the PMR, ET and the Contractor weekly and site inspection and audit were performed by the IEC monthly from June 2017 to June 2021 during the construction period. In view of the completion of construction activities which may potentially cause significant environmental impact, the weekly site inspection has been suspended from July 2021 as approved by the EPD. During the site inspections, non-compliance was not observed by ET and IEC.

## 5 Summary of Environmental Quality Performance Limits

### 5.1 Summary of Non-compliance of Action and Limit Levels

No exceedance of Action or Limit Levels of construction noise or triggering of Event and Action Plan for visual and landscape impact were recorded in this period.

### 5.2 Summary of Environmental Complaints Received

During the construction period, a total of four cases of environmental complaints were received regarding construction noise issue. Three of the complaints were considered unlikely to be related to the construction works of the Project, while one of the complaints was considered as project related. The complaint investigations are summarised in Table 5.1.

**Table 5.1: Summary of Complaint Investigations**

Date of Complaint	Descriptions	Result of investigation	Actions / Recommendations
3 March 2018	The complaint was about noise generated by construction equipment and construction vehicles movement at midnight from the construction site of Ocean Park Tai Shue Wan Water World Project.	<ul style="list-style-type: none"> <li>● As Shum Wan Road experienced congested traffic during daytime, the planned concreting works had been extended beyond 19:00.</li> <li>● Referring to the information provided by the site team, no works was carried out during the incident period.</li> <li>● It is noted that the Contractor obtained a valid Construction Noise Permit (CNP) permitting the use certain powered mechanical equipment (PME) including PME for concreting works during restricted hours between 23 November 2017 and 16 May 2018. The listed PME and no. of units have been strictly followed to CNP.</li> <li>● The complaint was unlikely to be related to the construction works on the Project site due to no construction works was carried out during the incident period.</li> </ul>	Although the complaint was considered invalid with respect to the Designated Project, the Contractor was reminded to observe all conditions stated in the relevant valid CNPs and implement all necessary noise mitigation measures identified in the EM&A Manual.
16 March 2018	The complaint was about traffic noise at Nam Long Shan Road related to Ocean Park night time operation. According to the complainant, construction vehicles travelled along Nam Long Shan Road in the direction of Ocean Park for the past few years between the hours of 01:00 and 04:00. Furthermore, it was suspected that	<ul style="list-style-type: none"> <li>● No construction vehicles accessed from Nam Long Shan Road to Project Site since the commencement of this contract (TSW-C006).</li> <li>● The site entrance at Nam Long Shan Road led to the upper part of the sewage rising main under this project. However, there were no night works for this area since the commencement of this contract (TSW-C006).</li> <li>● Based on the above information, the complaint was considered unlikely to be related to the construction works at the project site.</li> </ul>	Although the complaint was considered invalid with respect to the Designated Project, the Contractor was reminded to observe all conditions stated in the relevant valid CNPs and implement all necessary noise mitigation measures identified in the EM&A Manual.

Date of Complaint	Descriptions	Result of investigation	Actions / Recommendations
21 August 2019	<p>some of the vehicles were garbage trucks, but according to FEHD's reply, no garbage pick-up was conducted during this period.</p> <p>The complaint was about construction noise related to the construction site of Ocean Park at Tai Shue Wan.</p> <p>According to the complainant, works of the construction site at Ocean Park Tai Shue Wan on Shum Wan Road continued between the hours of 19:00 and 01:00.</p>	<ul style="list-style-type: none"> <li>It is noted that the Contractor obtained a valid Construction Noise Permit (CNP No. GW-RS0726-19) permitting the use of certain powered mechanical equipment (PME) during restricted hours (1900-2300 hours and 2300-0700 hours) between 7 August 2019 and 1 February 2020.</li> <li>During the period mentioned in the complaint, the Contractor carried out various activities in accordance with the abovementioned CNP including concreting work and glass installation. In addition and also in accordance with the CNP, the Contractor carried out the cross road excavation. The PME that was deployed during 19:00-23:00 included one no. of excavator, tower crane concrete lorry mixer, vibratory poker (hand-held, electric) and stationary concrete pump separately Also, one no. of forklift was deployed after 23:00.</li> <li>Based on the above information, the complaint was considered to be related to the construction works at the project site.</li> <li>The use of PME by the Contractor during the restricted hours of 19:00 to 01:00 has complied with the listed PME and no. of units stipulated in the abovementioned CNP. Thus, there were no evidence on any non-compliance with the relevant EP conditions or the CNP conditions.</li> </ul>	<p>Mitigation measures were implemented as below:</p> <ul style="list-style-type: none"> <li>The contractor has re-visited the installation sequence to minimizing the need of night-time operation as well as minimizing noise nuisance to the public in vicinity.</li> <li>Not to use the generator whenever cabled electricity connection is possible.</li> <li>Strictly implement to switch off the PME when not being operated.</li> <li>Prohibit to use whistles horns and loudspeakers for site communication, only allow to use mobile phone or walkie-talkies.</li> <li>Whenever possible, not to schedule the noisy construction activity / step in night-time.</li> <li>Conduct additional noise monitoring during restricted hours i.e. 19:00 to 07:00 next day.</li> <li>The noise limit level for additional noise monitoring were identified as 70 dB(A) and 65 dB(A) in NM1A and NM2.</li> </ul>
27 October 2020	<p>The complaint was about construction noise related to the construction site of Ocean Park at Tai Shue Wan.</p> <p>This complaint was referred by Mr TSUI from the Southern District Council.</p> <p>According to the complainant, works of the construction site at Ocean Park Tai Shue Wan were conducted after 00:00. The</p>	<ul style="list-style-type: none"> <li>It is noted that as of 22 October 2020, there was no works conducted after 23:00 in October 2020 at the Ocean Park Tai Shue Wan Water World Project construction site.</li> <li>It is noted that the Contractor obtained a valid Construction Noise Permit (CNP No. GW-RS0347-20) permitting the use of certain powered mechanical equipment (PME) during restricted hours between 29 May 2020 and 27 November 2020.</li> <li>Based on the above information, the complaint was unlikely to be related to the construction works on the Project site due to no construction works carried out during the incident period.</li> </ul>	<p>Although the complaint was investigated following the procedures stated in the EM&amp;A manual and no irregularity was found, the Contractor was reminded to observe all conditions stated in the relevant CNPs and implement all necessary noise mitigation measures identified in the EM&amp;A Manual.</p>

Date of Complaint	Descriptions	Result of investigation	Actions / Recommendations
	complainant expected all works that generate construction noise could be conducted during daytime.		

### 5.3 Summary of Notifications of Summons and Successful Prosecutions

No notifications of summons or successful prosecution were received during the construction period of the Project.

## 6 Review of the Validity of EIA Predictions

### 6.1 Construction Noise

It was predicted in the EIA report that with the implementation of good site practices and mitigation measures including the use of quiet PME and movable noise barriers in place, there would be no residual construction noise impact exceeding the relevant noise criteria at all noise sensitive receivers (NSRs).

Throughout the construction phase, construction site mitigation measures were properly implemented without any non-compliance observation during site inspections. The construction noise monitoring results remained below 70 dB(A) demonstrating that no Limit Level exceedance was recorded throughout the construction EM&A programme. This is in-line with the EIA predictions.

### 6.2 Ecological Monitoring

The potential ecological impacts of the Project as predicted in EIA include habitat loss, impact on plant species of conservation interest, impact on ardeid's breeding and roosting, and disturbance impact on fauna. It was predicted that with implementation of the recommended mitigation measures for the project, all residual ecological impacts were anticipated as minor to negligible.

During the construction phase, mitigation measures proposed in the EIA report were implemented as inspected during site audits for ecological monitoring, such as erection of the protective fencing for the plant species of conservation interest. It was observed that the ecological impacts have been minimised as per the EIA predictions. Monitoring on the effectiveness of the compensatory measures would be conducted during the operation phase in accordance with the relevant approved submissions/plans under the EP.

### 6.3 Landscape and Visual Monitoring

The EIA report has predicted that with the implementation of proposed landscape and visual mitigation measures, the anticipated impacts would be generally moderate adverse to insubstantial during construction phase. Overall, the EIA report concluded that the landscape and visual impacts are acceptable with mitigation measures.

During the construction phase, the landscape and visual mitigation measures were compiled by the Contractor as observed from site inspection for landscape and visual monitoring. No major environmental deficiency in landscape and visual mitigation measures or triggering of Event and Action Plan for landscape and visual impact were recorded throughout the construction period. The landscape and visual impacts were mitigated by provisional of planting and greening upon completion of construction as predicted in the EIA.



## 7 Review of EM&A Programme

The EM&A programme requires construction phase monitoring for noise, ecology, landscape and visual aspects. All monitoring works were conducted as scheduled. The EM&A programme is effective in monitoring impacts arising from the Project. The overall performance and cost effectiveness of the monitoring methodology adopted were deemed effective.

Throughout the construction phase, observations and deficiencies recorded during site inspections were reflected to the Contractor immediately and relevant follow-up actions were being implemented timely. This effectively prevented potential significant environmental impacts from the construction activities. The weekly environmental site inspections also ensured that all the environmental mitigation measures recommended were effectively implemented. With implementation of the recommended environmental mitigation measures, the environmental impacts of the Project were considered environmentally acceptable.

The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimised the potential environmental impacts from the Project as no environmental non-compliances were recorded. Also, the EM&A programme monitored the environmental impacts from the construction activities effectively and ensured proper implementation of the mitigation measures. There is no recommendation for the improvement of the EM&A programme.

## 8 Conclusion

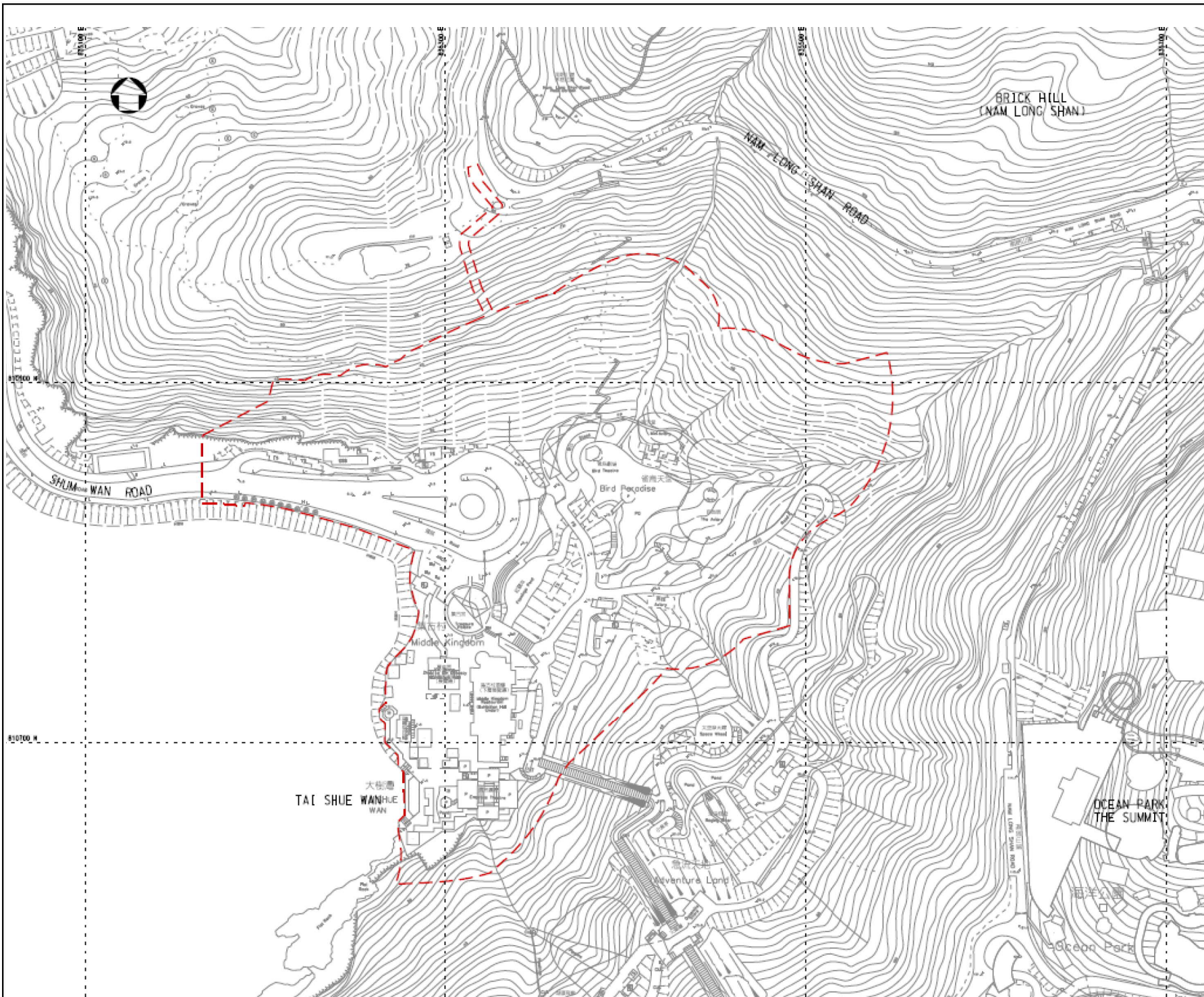
The EM&A programme for construction of the subject works was performed from 1 June 2017 to 31 August 2021. Monitoring of construction noise, ecology, landscape and visual impacts for the Project were conducted as scheduled in the construction period. All monitoring and audit results and findings in the construction period were checked and reviewed.

Construction noise monitoring results revealed that the noise levels at NSRs during construction were similar with that recorded during baseline monitoring. No exceedance of Action or Limit Levels of construction noise was recorded. On the other hand, ecological monitoring inspections revealed that mitigation measures proposed in the EIA were implemented and ecological impacts were minimised as per EIA predictions. For visual and landscape impact monitoring, there was no triggering of Event and Action Plan during the reporting period. No notification of summons of successful prosecutions were received or made against the subject works of the Project during the construction period.

Environmental complaints received during the construction period are related to construction noise. The complaint investigation results have shown that most complaints were considered unlikely to be related to the construction works of the Project. For the single complaint that was considered as project related, the investigation result demonstrated that the Contractor complied with the relevant EP conditions or the CNP conditions.

The overall EM&A programme to examine the potential environmental impacts of the Project and evaluate the predictions of the EIA report has provided solid proof that it has been working well according to the intention of the EIA framework in Hong Kong.

# A. Project Location



Notes

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Key to symbols

--- Project Boundary  
項目範圍


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Reference drawings

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Rev	Date	Drawn	Description	Ch'kd	App'd
M		M	20/F AIA Kowloon Tower Landmark East 100 How Ming Street Kwun Tong, Kowloon Hong Kong T +852 2828 5757 F +852 2827 1620 W mottmac.com		

Client



Project

**TAI SHUE WAN DEVELOPMENT  
AT OCEAN PARK**

Title

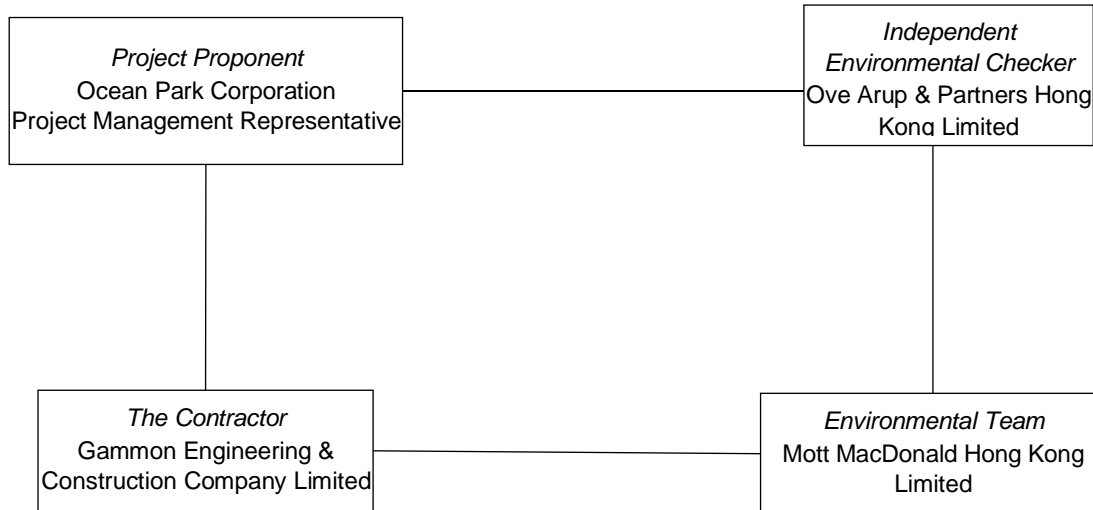
**PROJECT LOCATION**

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Drawn		Coordination	
Dwg check		Approved	
Scale at A1	Status		Rev

Drawing Number

**APPENDIX A**

## B. Project Organisation

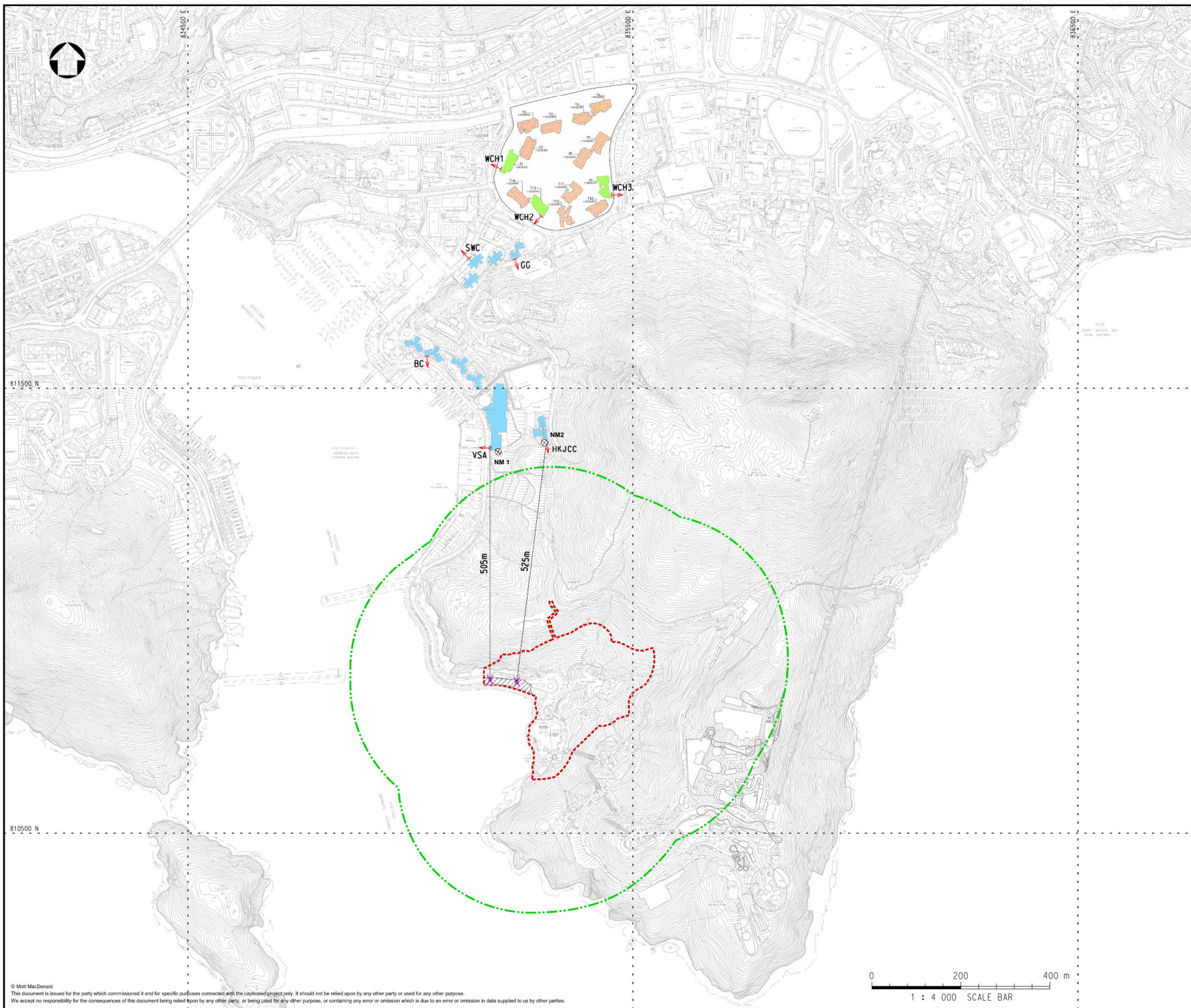


**Table A: Contact information**

Company / Department	Position	Name	Telephone / Mobile	Fax No.
Ocean Park Corporation	Project Management Representative	Mr Augustine Li	2870 6130	2814 0179
Ove Arup & Partners Hong Kong Ltd.	Independent Environmental Checker	Mr Sam Tsoi Mr Franki Chiu	2528 3031	2268 3950
Mott MacDonald Hong Kong Ltd.	Environmental Team Leader/ Qualified Ecologist	Mr Gary Chow	2828 5874	2827 1823
Gammon Engineering & Construction Company Limited	Construction Manager	Mr Paul Leaver	3690 9229	2148 2890
Gammon Engineering & Construction Company Limited	Environmental Officer	Ms Sammie Chan	3690 9233	2148 2890

## C. Monitoring Locations





Notes

Key to symbols

- ⊗ NOISE MONITORING STATION
- 300m ASSESSMENT AREA
- - - REVISED PROJECT BOUNDARY
- ▨ ADDITIONAL WORKS AREA AT SHUM WAN ROAD
- ← EXISTING NOISE SENSITIVE RECEIVER
- ← PLANNED NOISE SENSITIVE RECEIVER
- X NOTIONAL SOURCE POSITION

NSRID	DESCRIPTION
VSA	VICTORIA SHANGHAI ACADEMY
HKJCC	HONG KONG JUVENILE CARE CENTRE
BC	BROADVIEW COURT
SWC	SOUTH WAVE COURT
WCH	PLANNED DEVELOPMENT ON WONG CHUK HANG STATION DEPOT
GG	GRANDVIEW GARDEN

Reference drawings

Rev	Date	Drawn	Description	Ch'kd	App'd
P4	NOV 17	MING	FOURTH ISSUE	HL	EC
P3	NOV 17	MING	THIRD ISSUE	HL	EC
P2	AUG 17	TSE	SECOND ISSUE	HL	EC
P1	JUL 17	TSE	FIRST ISSUE	HL	EC

**MOTT  
MACDONALD**

20/F AIA Kowloon Tower  
Landmark East  
100 How Ming Street  
Kwun Tong, Kowloon  
Hong Kong  
T +852 2828 5757  
F +852 2827 1823  
W mottmac.com

Client

Project

**TAI SHUE WAN DEVELOPMENT  
AT OCEAN PARK**

Title

**DESIGNATED MONITORING  
LOCATIONS AS RECOMMENDED  
IN THE APPROVED EM&A MANUAL**

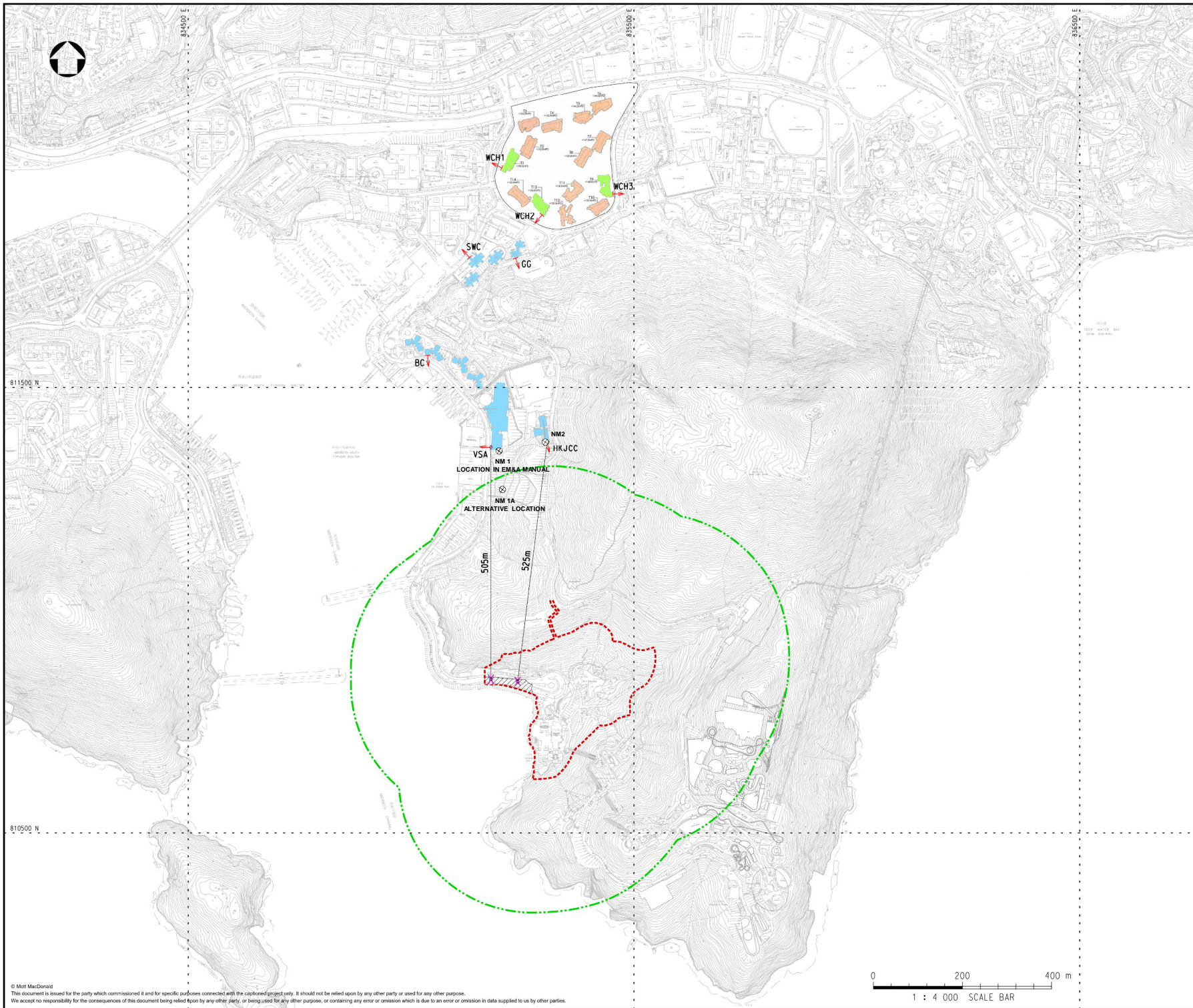
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Drawn	MING	Coordination	HC
Dwg check	HL	Approved	EC
Scale at A1	1:4000	Status	PRE
Drawing Number		Rev	P4

**Appendix C-1**

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Notes

Key to symbols

- ⊗ NOISE MONITORING STATION
- 300m ASSESSMENT AREA
- - - REVISED PROJECT BOUNDARY
- ▨ ADDITIONAL WORKS AREA AT SHUM WAN ROAD
- ← EXISTING NOISE SENSITIVE RECEIVER
- ← PLANNED NOISE SENSITIVE RECEIVER
- X NOTIONAL SOURCE POSITION

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HKJCC	HONG KONG JUVENILE CARE CENTRE
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WCH	PLANNED DEVELOPMENT ON WONG CHUK HANG STATION DEPOT
GG	GRANDVIEW GARDEN

Reference drawings

Rev	Date	Drawn	Description	Ch'kd	App'd
P4	NOV 17	MING	FOURTH ISSUE	HL	EC
P3	NOV 17	MING	THIRD ISSUE	HL	EC
P2	AUG 17	TSE	SECOND ISSUE	HL	EC
P1	JUL 17	TSE	FIRST ISSUE	HL	EC

**M**  
**MOTT**  
**MACDONALD**

20/F AIA Kowloon Tower  
Landmark East  
100 How Ming Street  
Kwun Tong, Kowloon  
Hong Kong  
T +852 2828 5757  
F +852 2827 1823  
W mottmac.com

Client



Project

TAI SHUE WAN DEVELOPMENT  
AT OCEAN PARK

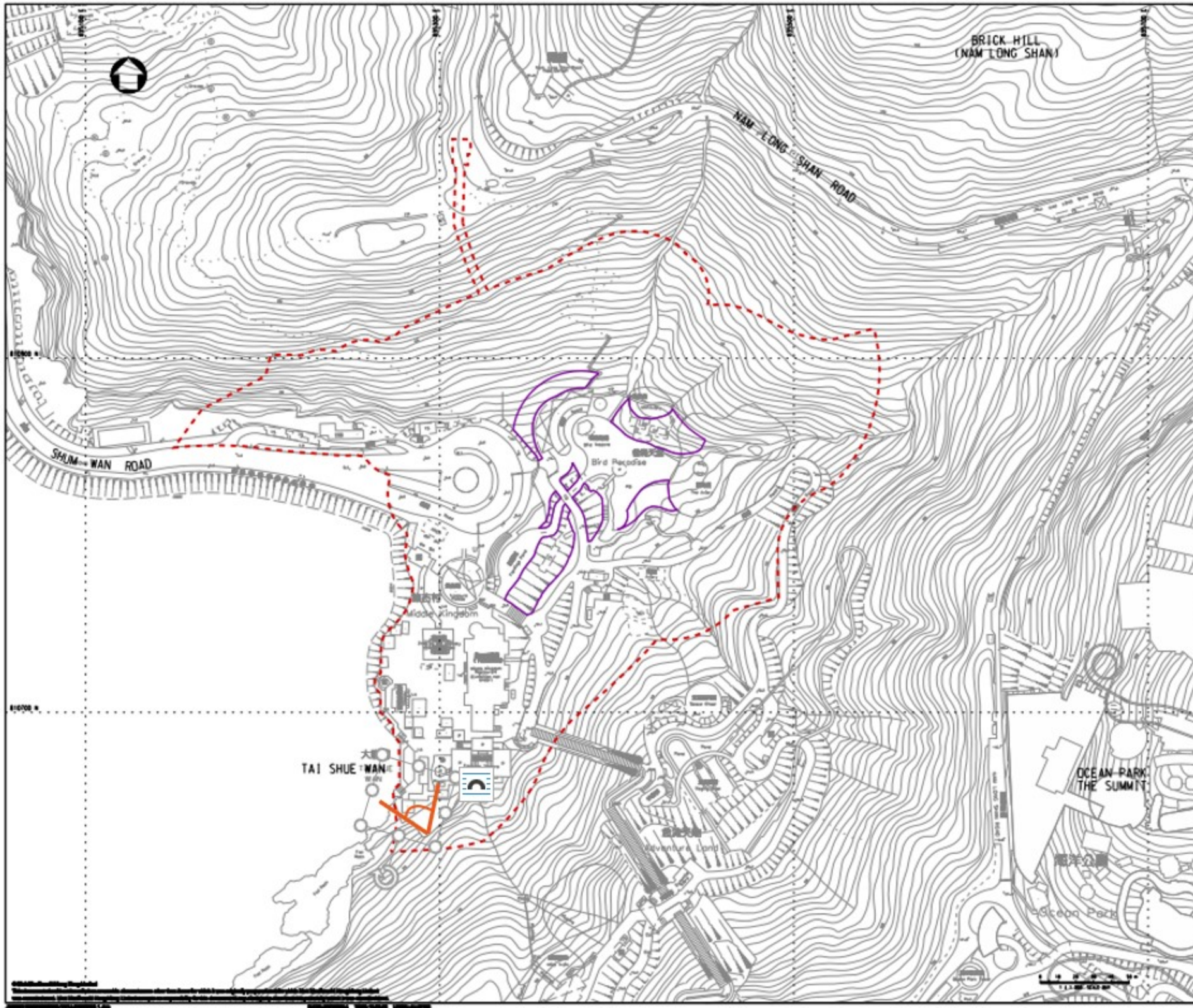
Title

**ACTUAL LOCATION OF  
IMPACT MONITORING**

Designed	HL	Eng check	JC
Drawn	MING	Coordination	HC
Dwg check	HL	Approved	EC
Scale at A1	1:4000	Status	PRE
Drawing Number		Rev	P4

**APPENDIX C-2**





**Title**

**Key/legend**

- PROJECT BOUNDARY
- INDICATIVE BOUNDARY OF ROOSTING SITES OF ARDEIDS

**Reference drawings**

PI	SEP 14	NING	FIRST ISSUE	1/1	1/1
Rev	Date	Drawn	Description		Drawn/Approved

**Client**



**Project**

**TAI SHUE WAN DEVELOPMENT AT OCEAN PARK**

**Title**

**LOCATION OF ROOSTING SITE OF ARDEIDS BEFORE COMMENCEMENT OF SITE CLEARANCE OF THE PROJECT**

Designed	BY	Checked	PW
Drawn	MMWB	Coordination	PW
Sup checked	BY	Approval	AWC

Scale: 1:1000

Sheet: PRE P1

Drawing Number: APPENDIX C-3

## D. 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"> <li>1. Notify ER, IEC and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, ER and Contractor;</li> <li>4. Discuss with the IEC and Contractor on remedial measures required;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the investigation results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;</li> <li>3. Advise the ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC and ER;</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Inform IEC, ER, Contractor and EPD;</li> <li>2. Repeat measurements to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Identify source and investigate the cause of exceedance;</li> <li>5. Carry out analysis of Contractor's working procedures;</li> <li>6. Discuss with the IEC, Contractor and ER on remedial measures required;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures;</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Submit further proposal if problem still not under control;</li> <li>5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.</li> </ol>

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

## E. Implementation Status of Mitigation Measures

Recommended Mitigation Measures	Implementation Status
<b>Noise</b>	
Actual SWL of the quiet plant should be less than the value specified in GW-TM for the same piece of equipment.	✓
Movable noise barriers should be used for screening noise from particular items of plant during construction within project area.	N/A
Only well-maintained plants are operated on-site and plants are serviced regularly during the construction period.	✓
Machines and plant in intermittent use shut down between work periods or throttled down to a minimum.	✓
Plant known to emit noise strongly in one direction, where possible, orientated to direct noise away from the NSRs.	N/A
Mobile plant, if any, should be sited as far from NSRs as possible.	N/A
Material stockpiles and other structures effectively utilised, where practicable, to screen noise from on-site construction activities.	N/A
<b>Ecology</b>	
Prior to any proposed arboricultural works of the trees (particularly the Chinese Fan-palms), daytime inspection should be carried out to confirm no Short-nosed Fruit Bat is present.	✓
If any Short-nosed Fruit Bat is observed roosting, buffer area with suitable size is established around the tree to minimize human or machinery disturbance until the bat has left.	N/A
Protective fence(s) for the identified flora species of conservation concern is erected and maintained.	✓
After commencement of the construction phase, the site is monitored monthly in peak wintering season (November to March) and breeding season (April to July) to check for any potential breeding and nesting activities.	✓
An enhancement area with the following features is provided as an alternative roosting site for ardeids: <ul style="list-style-type: none"> <li>- The location is at southern part of the project area.</li> <li>- The enhancement area has included a Flamingo Pond.</li> <li>- Native tree species include but not limited to <i>Macaranga tanarius</i> and <i>Celtis sinensis</i> and tree species which was used by ardeids for roosting including <i>Mallotus paniculatus</i>, <i>Ficus hispida</i> and <i>Cratoxylum cochinchinense</i> are selected for planting.</li> </ul> Heavy standard sized trees are planted to allow early establishment of the trees around the Flamingo Pond.	✓
A woodland area of about 1.62 ha is provided, which included 0.84 ha woodland compensation on-site and 0.78 ha on-site woodland reinstatement.	N/A
Whips are planted with predominately native tree species similar to the affected woodland, such as <i>Celtis sinensis</i> , <i>Cratoxylum cochinchinense</i> , <i>Polyspora axillaris</i> and <i>Sterculia lanceolata</i> .	N/A
<b>Landscape and Visual</b>	
Temporary tree nurseries are set up within the Project Area at an early stage to allow small tree to grow; temporarily hold existing trees to be transplanted if direct transplantation is impracticable; and acts as screen planting to block the views of the Project Area from the VSRs if practicable.	✓



Recommended Mitigation Measures	Implementation Status
Plant species, preferably native ones, are carefully selected to blend in with the existing preserved vegetation.	✓
Transplantation of existing trees	✓
Trees which are in direct conflict with the development proposals and suitable for transplantation are transplanted as far as practicable.	✓
Minimisation of construction period.	✓
Construction site controls, such as the storage of materials, the location and appearance of site accommodation, etc. are minimised.	✓
Preservation of existing vegetation. All trees which are not in direct conflict with the development proposals are retained in situ.	✓
No intrusion zones were designated within the Project area to prevent potential damage to canopies and root zones of vegetation.	✓
Two types of construction hoardings are used. One is used for areas in close contact with visitors and for areas where visual intrusion is a key concern. The other is used for areas to be viewed at a distance.	N/A
To minimise the visual intrusion of construction activities to visitors and other VSRs, a suitable colour scheme of construction machines and plants is adopted where possible.	✓
All security floodlights for construction sites are equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimise light pollution and night-time glare to the VSRs.	✓
Construction workers must enter the park areas with their helmets and safety vests properly stored or carried in non-transparent bags. They are dressed properly and cleanly.	✓
<b>Air Quality</b>	
Water spraying for active construction areas (4 times a day or once every 2.5 hour), particularly during dry season.	✓
Covering 80% stockpiling area by impervious sheets and spraying all dusty material with water to keep the dusty materials wet.	✓
Maintain in high standard of housekeeping to prevent emission of fugitive dust.	✓
Loading, unloading, handling and storage of raw materials, waste or by-products are carried out in a manner to minimise the release of visible dust emission.	✓
Any piles of materials accumulated on or around the work areas are cleaned up regularly.	✓
Cleaning, repair and maintenance of all plant facilities within the work areas are carried out in a manner minimising generation of fugitive dust emissions.	✓
Exposed earth is properly treated by compaction, hydroseeding, vegetation planting or sealing with latex, vinyl within six months after the last construction activity on the site or part of the site where the exposed earth lies.	✓
All dusty materials are sprayed with water immediately prior to any loading or transfer operation to keep the dusty material wet.	✓
Any debris are covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.	✓
Debris is sprayed with water before it is dumped into a chute so that it remains wet when it is dumped.	✓
Vehicle used for transporting dusty materials/ spoils are covered with tarpaulin or similar material and extended over the edges of the sides and tailboards.	✓
The speed of the trucks within the site are controlled to about 10km/hr.	✓
Vehicle leaving the construction site with a load of dusty materials should be covered entirely by clean impervious sheeting.	✓
Any hoarding (not less than 2.4, high from ground level) provided.	N/A

Recommended Mitigation Measures	Implementation Status
Non-Road Mobile Machinery (NRMM) are approved/exempted and affixed with the requisite approval/exemption labels.	✓
<b>Water Quality</b>	
At the start of the site establishment, perimeter cut-off drains implemented.	✓
Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities.	✓
Sand/silt removal facilities are provided to remove sand/silt from runoff to meet the requirements of the TM standard under the WPCO.	✓
All drainage facilities and erosion and sediment control structures are regularly inspected and maintained.	✓
Measures are taken to minimize the ingress of site drainage into excavations.	N/A
Prevent vehicle tracking of soil and silty water to public roads and drains.	✓
Manholes are adequately covered and temporarily sealed.	N/A
Precautions are taken at any time of the year when rainstorms are likely. Especially control of silty surface runoff during storm events, especially for areas located near steep slopes.	✓
Bentonite slurries used on site should be reconditioned and reused wherever practicable.	N/A
License from the EPD under the WPCO has been obtained for discharge to the public drainage system or the marine environment.	✓
Construction solid waste should be collected, handled and disposed properly	✓
Guidelines and measures summarised in ProPECC PN 1/94 for trenching activities are implemented within the project construction site	N/A
The construction programme is planned to minimize the excavation works during the wet season (April to September), temporary exposed slope/soil surfaces are covered by a tarpaulin or other means.	✓
Interception channels are provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces.	✓
Diverting any water from the excavated areas to on-site wastewater treatment facilities for treatment prior to discharge is also performed.	✓
Measures for excavation works summarised for site formation works are implemented during the construction of the sewage sump pit.	✓
During the laying of rising mains, concrete water generated from the construction of concrete support is collected and treated with the wastewater treatment facilities prior to discharge.	✓
Contractor must register as a chemical waste producer of chemical wastes that would be produced from construction activities.	✓
Maintenance of vehicles and equipment involving activities with potential for leakage and spillage.	N/A
Oils and fuels should only be used and stored in designated areas with sealed.	✓
Suitable containers are used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.	✓
Storage area is selected at a safe location on site and adequate space should be allocated to the storage area.	✓
Temporary sanitary facilities, such as portable chemical toilets, are employed on-site.	✓
<b>Waste Management</b>	
Nomination of an approved person to be responsible for all wastes generated at the site.	✓
Training of site personnel in proper waste management and chemical waste handling procedures.	✓
Provision of sufficient waste disposal points and regular collection for disposal.	✓

Recommended Mitigation Measures	Implementation Status
Adoption of appropriate measures to minimize windblown litter and dust during transportation of waste.	✓
All dusty materials should be sprayed with water immediately.	✓
Provision of wheel washing facilities before the trucks leaving the works area.	✓
Well planned delivery programme for offsite disposal.	✓
Sort inert C&D materials to recover any recyclable portions such as metals	✓
Segregation and storage of different types of waste in appropriate containers.	✓
Encourage collection of aluminium cans, plastics bottles and packaging material (e.g. carton boxes) and office paper by individual collectors.	✓
Proper site practices to minimize the potential for damage or contamination of inert C&D materials.	✓
C&D material and fill materials are reused on-site as fill material as far as possible.	✓
Inert C&D materials generated from excavation works are reused as fill materials in local projects that require public fill for reclamation.	✓
The surplus inert C&D materials are disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.	✓
Proper storage on the C&D materials for reuse or disposal, the non-inert materials will be disposed at the designated landfill site.	✓
Trip Ticket System has been setup.	✓
Waste Management Plan shown by Contractor.	✓
Register with the EPD as a chemical waste producer.	✓
Good quality containers compatible with the chemical wastes are used, and incompatible chemicals are stored separately.	✓
Appropriate labels for chemical waste container indicating the corresponding chemical characteristics such as explosive, etc..	✓
A licensed collector is used to transport and dispose at the designated location.	✓
Potential environmental impacts arising are expected to be minimal with the implementation of appropriate mitigation measures as recommended.	✓
Stored in enclosed bins or compaction units separated from inert C&D materials.	✓
A reputable waste collector is employed by the Contractor to remove general refuse from the site, separately from inert C&D materials.	✓
Preferably an enclosed and covered area is provided to reduce the occurrence of 'wind blown' light material.	✓
Regular check is conducted along the artificial seawall to clean any floating refuse trapped or accumulated. It should be stored and disposed of together with the general refuse.	✓
<b>Land contamination</b> (if any contaminated soil is identified)	
To minimise the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment is employed.	N/A
Contact with contaminated materials is minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks.	N/A
Stockpiling of contaminated excavated materials on site has been avoided as far as possible.	N/A
The use of any contaminated soil for landscaping purpose has been avoided unless pre-treatment carried out.	N/A
Vehicles containing any excavated materials is suitably covered.	N/A
Truck bodies and tailgates are sealed to prevent any discharge.	N/A
Only licensed waste haulers are used and are equipped with tracking system to avoid fly tipping.	N/A



Recommended Mitigation Measures	Implementation Status
Speed control for trucks carrying contaminated materials is exercised.	N/A
All necessary permits e.g. Waste Disposal Ordinance (Cap 354) for relevant regulations has been obtained,	✓
Records of waste generation and disposal quantities and disposal arrangements has been maintained.	✓
<b>Others</b>	
A copy of the Environmental Permit displayed conspicuously at all vehicular site entrances/exits for public information at all times.	✓

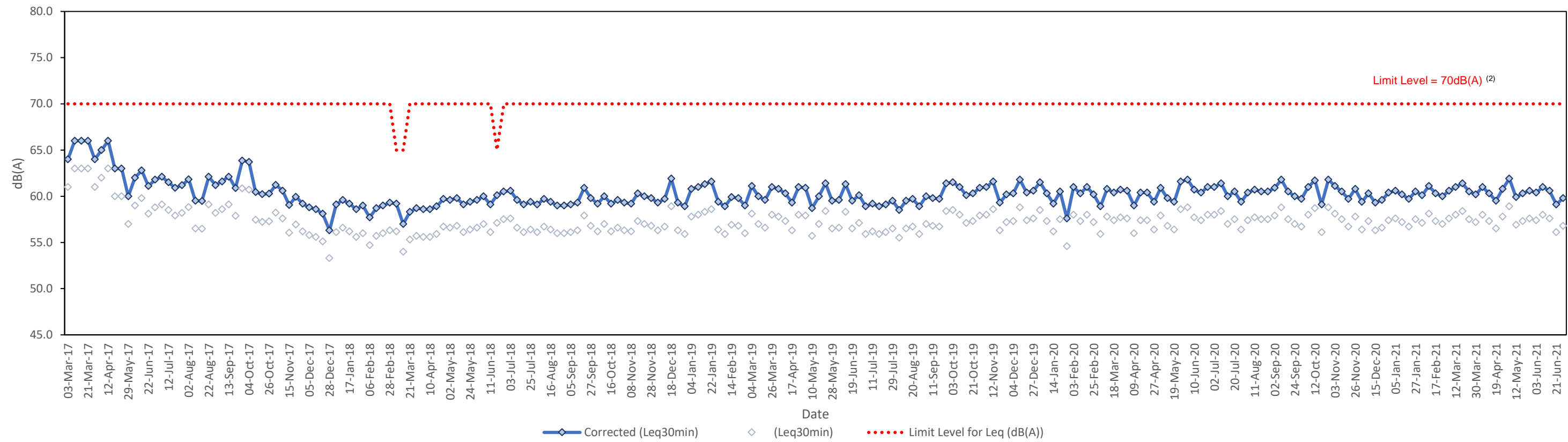
Legend:

- ✓ : Implemented
- ✘ : Not implemented
- N/A : Not applicable

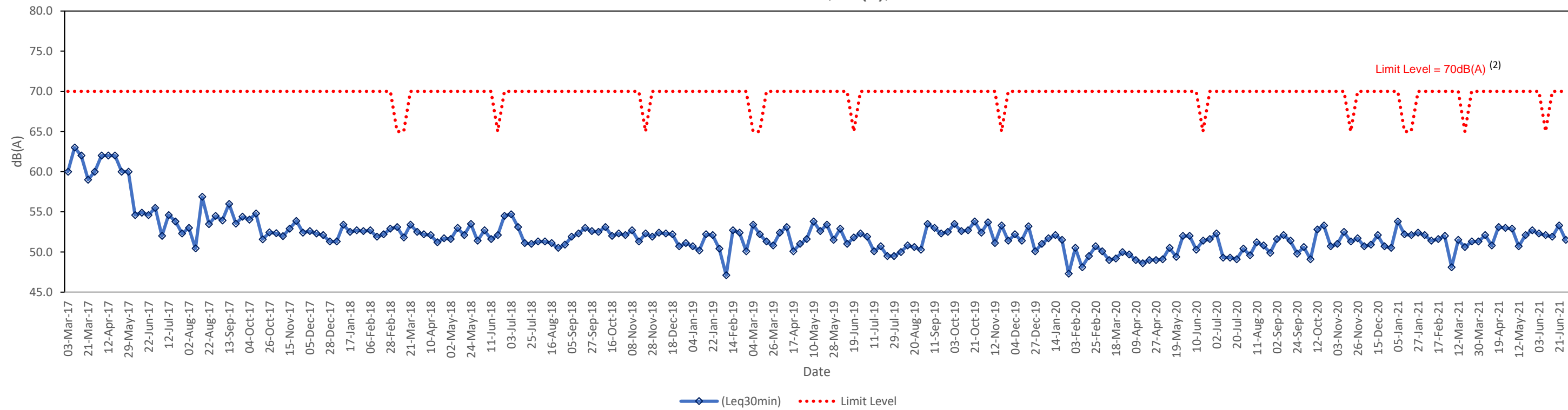
## **F. Graphical Plots for Noise Monitoring Data**

## Graphical Plots for Construction Noise Monitoring Data

### Noise Level for 30 min, dB(A), at NM1A <sup>(1)</sup>



### Noise Level for 30 min, dB(A), at NM2



#### Notes:

1. A correction of +3 dB(A) was made to the free field measurement at monitoring station NM1A.
2. Acceptable Noise Levels for school should be reduced to 65 dB(A) during examination period.
3. The construction activities being carried out during the monitoring period refers to Section 2.2.

## G. Summary of Weather Condition

Month	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
June 2017	28.4#	92#	120#	7.1#
July 2017	28.8	90	070#	6.7#
August 2017	29	80	220	5.7
September 2017	28.8	79	80	6.2
October 2017	26.7	64	80	9.7
November 2017	22.7	69#	70	7.2
December 2017	18.2	57	60	7.9
January 2018	16.3	70	70	7.9
February 2018	15.9	67	110	5.7
March 2018	20.6	73	70	6.6
April 2018	23.1	76	120	5.9
May 2018	27.6	79	220	6.6
June 2018	28.2	81	080#	7.0#
July 2018	28.5	85	200#	4.4#
August 2018	28	88	50	5.5
September 2018	27.5	81	50	6.8
October 2018	24.9	71	40	7.0
November 2018	22.9	77	50	7.8
December 2018	19.3	76	40	6.5
January 2019	18	76	100	5.6
February 2019	20.2	85	50	6.9
March 2019	20.9	86	50	7.0
April 2019	24.2	87	50	6.5
May 2019	25.2	86	50	7.6
June 2019	28.3	87	210	5.2
July 2019	28.8	86	210	6.5
August 2019	28.5	85	210	6.6
September 2019	28	75	50	6.6
October 2019	26	73	50	6.6
November 2019	22.6	67	40	7.0
December 2019	18.8	66	50	6.6
January 2020	18.6	72	50	6.8
February 2020	18.5	74	50	6.9

Month	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
March 2020	21.5	82	50	6.2
April 2020	21.6	76	100	5.6
May 2020	27.2	86	100	5.0
June 2020	28.8#	84#	210	4.9
July 2020	29.7	79	200	5.5
August 2020	28.6	82	100	5.4
September 2020	28	84	60	5.2
October 2020	25.6	68	50	10.6
November 2020	23.6	68	20	7.2
December 2020	18.3	64	10	6.3
January 2021	16	58	10	6.6
February 2021	19.1	75	360	6.6
March 2021	22	80	40	6.2
April 2021	23.9	81	40	7.1
May 2021	28.5	84	210	5.7
June 2021	28.4	88	210	5.6

Note: # Incomplete data

## H. Record of Plant of Conservation Interest



Photo 1 – Group 2 of *Platycodon Grandiflorus*  
(As of June 2021)



Photo 2 – Fencing and warning sign  
(As of June 2021)

# I. Waste Flow Table



**Ocean Park Tai Shue Wan Water World Project Contact No. TSW-C006**  
**Waterpark - Main Building Works**  
**Monthly Summary Waste Flow Table**

Month	Quantity of Inert C&D Materials								Quantity of Non-inert C&D Materials (i.e. C&D Wastes)				
	Generated	Disposed				Reused			Recycled			Disposed	
	Total Quantity Generated (Tonne)	Disposed as Public Fill at CW-PFBP (Tonne)	Disposed as Public Fill at TKO137 (Tonne)	Disposed as Public Fill at TM38 (Tonne)	Total Quantity Disposal (Tonne)	Reused in the Contract (Tonne)	Reused in other Projects (Tonne)	Total Quantity Reused (Tonne)	Metals (kg)	Paper/cardboard packaging (kg)	Plastics (kg)	Chemical Waste (kg/ L)	General Refuse (Tonne)
Jun-17	4917.45	3061.36	156.09	0.00	3217.45	1700.00	0.00	1700.00	0.00	258.00	0.00	0.00	60.93
Jul-17	7447.78	6416.15	191.63	0.00	6607.78	840.00	0.00	840.00	0.00	0.00	0.00	0.00	45.82
Aug-17	4168.41	2211.67	356.74	0.00	2568.41	1600.00	0.00	1600.00	0.00	311.00	0.00	0.00	52.86
Sep-17	6370.40	4641.55	868.85	0.00	5510.40	860.00	0.00	860.00	0.00	0.00	0.00	0.00	71.06
Oct-17	5607.83	3646.03	161.80	0.00	3807.83	1800.00	0.00	1800.00	0.00	210.00	0.00	0.00	61.09
Nov-17	5587.77	4175.11	421.46	0.00	4596.57	732.00	259.20	991.20	0.00	210.00	0.00	0.00	86.47
Dec-17	5881.38	3614.28	356.22	0.00	3970.50	180.00	1730.88	1910.88	0.00	189.00	0.00	0.00	65.60
Jan-18	7573.16	6488.47	430.69	0.00	6919.16	600.00	54.00	654.00	74670.00	0.00	0.00	0.00	134.96
Feb-18	6413.22	5417.91	495.31	0.00	5913.22	500.00	0.00	500.00	6520.00	91.00	0.00	0.00	95.61
Mar-18	5196.18	4092.33	358.36	75.49	4526.18	602.00	68.00	670.00	7180.00	271.00	0.00	0.00	234.16
Apr-18	5322.94	4399.56	411.38	0.00	4810.94	512.00	0.00	512.00	5200.00	231.00	0.00	0.00	163.40
May-18	3197.41	1701.51	195.90	0.00	1897.41	1300.00	0.00	1300.00	6690.00	101.00	0.00	0.00	287.39
Jun-18	4511.40	3746.81	404.59	0.00	4151.40	360.00	0.00	360.00	15620.00	315.00	0.00	0.00	223.85
Jul-18	2779.37	2335.98	263.39	0.00	2599.37	180.00	0.00	180.00	100.00	262.00	0.00	200.00	256.12
Aug-18	2589.30	2131.24	358.06	0.00	2489.30	100.00	0.00	100.00	0.00	546.00	0.00	0.00	262.69
Sep-18	1754.92	1526.65	123.44	14.83	1664.92	90.00	0.00	90.00	0.00	168.00	0.00	0.00	207.83
Oct-18	3427.41	3043.85	273.56	0.00	3317.41	110.00	0.00	110.00	0.00	231.00	0.00	0.00	330.71
Nov-18	1948.93	950.28	183.05	15.60	1148.93	800.00	0.00	800.00	0.00	0.00	0.00	0.00	290.94
Dec-18	3110.19	1960.82	139.37	0.00	2100.19	1010.00	0.00	1010.00	0.00	210.00	0.00	0.00	287.69
Jan-19	3178.28	2548.89	214.95	14.44	2778.28	400.00	0.00	400.00	5000.00	0.00	0.00	0.00	311.84
Feb-19	2095.76	1038.04	57.72	0.00	1095.76	1000.00	0.00	1000.00	6180.00	0.00	0.00	0.00	196.96
Mar-19	4128.68	3746.69	81.99	0.00	3828.68	300.00	0.00	300.00	9930.00	0.00	0.00	0.00	289.31
Apr-19	3079.71	2392.94	86.77	0.00	2479.71	600.00	0.00	600.00	5380.00	0.00	0.00	0.00	257.30
May-19	2936.62	2604.86	140.56	91.20	2836.62	100.00	0.00	100.00	5050.00	222.20	0.00	0.00	360.84
Jun-19	1228.83	939.49	153.29	16.05	1108.83	120.00	0.00	120.00	0.00	200.00	0.00	0.00	403.55
Jul-19	890.90	704.45	156.74	29.71	890.90	0.00	0.00	0.00	0.00	200.00	0.00	0.00	290.55
Aug-19	4536.77	4245.23	291.54	0.00	4536.77	0.00	0.00	0.00	6250.00	222.20	0.00	0.00	673.04
Sep-19	1619.16	1446.28	172.88	0.00	1619.16	0.00	0.00	0.00	7240.00	200.00	0.00	0.00	530.03
Oct-19	1475.42	1186.38	141.91	47.13	1375.42	100.00	0.00	100.00	6340.00	200.00	0.00	0.00	548.02
Nov-19	2034.96	1692.44	142.52	0.00	1834.96	200.00	0.00	200.00	0.00	132.00	0.00	0.00	605.63
Dec-19	2763.97	2529.47	120.43	14.07	2663.97	100.00	0.00	100.00	0.00	200.00	0.00	0.00	519.22
Jan-20	712.40	641.87	55.88	14.65	712.40	0.00	0.00	0.00	10520.00	210.00	0.00	0.00	311.86
Feb-20	3424.94	732.64	86.16	406.14	1224.94	2200.00	0.00	2200.00	0.00	210.00	0.00	0.00	293.17
Mar-20	4246.64	1675.42	126.34	244.88	2046.64	2200.00	0.00	2200.00	0.00	210.00	0.00	0.00	303.45
Apr-20	1733.91	1230.37	14.50	489.04	1733.91	0.00	0.00	0.00	0.00	180.00	0.00	0.00	320.04
May-20	346.84	206.61	0.00	140.23	346.84	0.00	0.00	0.00	0.00	210.00	0.00	0.00	340.28
Jun-20	555.33	461.03	17.63	76.67	555.33	0.00	0.00	0.00	0.00	180.00	0.00	0.00	505.90
Jul-20	456.65	344.10	19.89	92.66	456.65	0.00	0.00	0.00	0.00	180.00	0.00	0.00	492.59
Aug-20	197.63	152.41	29.91	15.31	197.63	0.00	0.00	0.00	0.00	210.00	0.00	0.00	485.40
Sep-20	208.58	158.52	3.18	46.88	208.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	493.97
Oct-20	146.20	136.67	9.53	0.00	146.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	554.42
Nov-20	241.36	241.36	0.00	0.00	241.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	446.80
Dec-20	1733.91	1230.37	14.50	489.04	1733.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	320.04
Jan-21	55.16	25.29	29.87	0.00	55.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	236.95
Feb-21	25.32	7.10	18.22	0.00	25.32	0.00	0.00	0.00	0.00	210.00	0.00	0.00	178.45
Mar-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	76.13
Apr-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.25
May-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.72
Jun-21	472.74	385.87	86.87	0.00	472.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.96
<b>TOTAL</b>	<b>132332.12</b>	<b>98266.35</b>	<b>8423.67</b>	<b>2334.02</b>	<b>109024.04</b>	<b>21196.00</b>	<b>2112.08</b>	<b>23308.08</b>	<b>177870.00</b>	<b>7080.40</b>	<b>0.00</b>	<b>200.00</b>	<b>13705.85</b>



