

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

Quarterly EM&A Summary Report for September  
- November 2019

December 2019



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Gammon Engineering & Construction Company Limited



**This Quarterly EM&A Summary Report for September – November 2019  
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 11.4.**

**Certified by:**



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Gary Chow  
Environmental Team Leader (ETL)  
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**Date:**

07 - January 2020

**Verified by:**



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**Date:**

08 - Jan - 2020



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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 Development Water World.

This is the 10<sup>th</sup> Quarterly EM&A Summary report for the Tai Shue Wan Development Water World under Section 11.4 of the EM&A Manual (Register No.: AEIAR-184/2014). This report summarises the findings on EM&A during the period from 1 September 2019 to 30 November 2019.

## Environmental Monitoring and Audit Activities

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 <sub>eq(30min)</sub> Daytime	26
	L <sub>eq(15min)</sub> Additional monitoring	2
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

No exceedance of construction noise measurement and no Notifications of Exceedances (NOEs) were issued to the PMR, IEC and the Contractor. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table:

Environmental Aspect	Monitoring Parameter	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	L <sub>eq(30min)</sub> Daytime	0	0	0	0	0

## Environmental Complaints

There was no record of complaints received in the Reporting Period.

## Notification of Summons and Successful Prosecutions

There was no record of notification of summons and successful prosecution in the Reporting Period.

## Reporting Changes

There are no reporting changes.

## Future Key Issues

The contractor should pay attention to the following environmental issues and maintain relevant mitigation measures:

- Site formation for ride footing & column construction P1 – P5
- Cut soil slope and soil nail installation for Ride P1 and P3
- Rock breaking and slope stabilization works for Ride P1 to P5
- Drainage works, and water meter room construction at A4
- Rising Main construction (PJD & slope portions)
- Footing and column construction at P3
- Backfilling for ride footing
- Gas main construction at A2
- Ride installation at P3
- UU and carriageway construction at A2
- Footing Column Construction at P1 and P2
- Buttress Wall at P1
- Down pipe construction at P2
- Main Building: B1 drainage work. ABWF in B1, L1-L3 secondary structure construction; L2M E&M works; L2 Block work and ABWF works, area Pool B, C, D, E, F, H, R filtration pipe works installation and pool structure construction; Indoor Wave Pool construction, Outdoor Wave Pool A ABWF works, Roof ABWF & Landscape works (Green Roof, Curtain Wall, ETFE), Lift T&C works & ABWF, L2 North Cladding Wall construction, ABWF works Pool B & C concrete defects, waterproofing works, screening and tiling works, reuse water flood test for Pool B,C, D
- South Transformer Room: ABWF
- South Plant Room: E&M
- Level 2 binnacle installation, basement installation and painting
- External Area: Laying of underground utilities, removal of concrete paving, manholes and watermain construction, trench excavation for cables & pipes, backfilling, retaining wall construction

# 1 Introduction

## 1.1 Project Background

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 comprise variation of project boundary, location of sump pit and size of rising main. The layout plan of the Project is indicated in **Appendix A**.

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.

As part of the EM&A program, 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 which was verified by the previous IEC was submitted to 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 and the next construction phase (Contract No.: TSW-C006) for the Ocean Park Tai Shue Wan Development was handed over to Gammon Engineering & Construction Company Limited on 31 May 2017.

This report summarizes the findings during the Reporting Period from 1 September to 30 November 2019.

## 2 Project Organization

### 2.1 Project Organization

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

#### 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 Contractor'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

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, 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 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 analyze 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 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

During the Reporting Period, works of the Project undertaken include:

- Site formation for ride footing & column construction P1 – P5
- Cut soil slope and soil nail installation for Ride P1 and P3
- Rock breaking and slope stabilization works for Ride P1 to P5
- Drainage works, and water meter room construction at A4
- Rising Main construction (PJD & slope portions)
- Footing and column construction at P3
- Backfilling for ride footing
- Gas main construction at A2
- Ride installation at P3
- UU and carriageway construction at A2
- Footing Column Construction at P1 and P2
- Buttress Wall at P1
- Down pipe construction at P2
- Main Building: B1 drainage work. ABWF in B1, L1-L3 secondary structure construction; L2M E&M works; L2 Block work and ABWF works, area Pool B, C, D, E, F, H, R filtration pipe works installation and pool structure construction; Indoor Wave Pool construction, Outdoor Wave Pool A ABWF works, Roof ABWF & Landscape works (Green Roof, Curtain Wall,

ETFE), Lift T&C works & ABWF, L2 North Cladding Wall construction, Pool B & C concrete defects and waterproofing works; North Plant Room wall construction.

- South Transformer Room: ABWF
- South Plant Room: E&M
- External Area: Laying of underground utilities, removal of concrete paving, manholes and watermain construction, trench exaction for cables & pipes, backfilling

### 2.3 Summary of Environmental Submissions

Summaries of validity permits, licenses, and/or notifications on environmental protection for the Project are presented in **Table 1**.

**Table 1: Status of Environmental Licenses and Permits of the Project**

Type of Permit/ License	Submission Date	Reference/ License No.	Date of Issue	Date of Expiry	Status
Environmental Permit	/	EP-487/2014/A	10-Jan-18	N/A	Valid
Variation of Environmental Permit	18-Dec-17	Application No. VEP-539/2017	10-Jan-18	N/A	Valid
Environmental Permit	/	EP-487/2014	27-Aug-14	N/A	Superseded
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	15-Mar-17	414651	N/A	N/A	Valid
Application for a Billing Account for Disposal of Construction Waste	14-Dec-16	Account No. 7026786	28-Dec-16	N/A	Valid
Discharge Licence under WPCO WT00028196-2017	15-Mar-17	414650	29-May-17	31-May-22	Valid
Registration as a Chemical Waste Producer (WPN: 5213-176-G2785-01)	21-Apr-17	415966	31-May-17	N/A	Completed
Construction Noise Permit under NCO GW-RS0439-17	26-Apr-17	416080	15-May-17	29-Dec-17	Superseded
Construction Noise Permit under NCO GW-RS0825-17	8-Sep-17	420985	22-Sep-17	21-Mar-18	Superseded
Construction Noise Permit under NCO	3-Nov-17	422922	21-Nov-17	16-May-18	Superseded



Type of Permit/ License	Submission Date	Reference/ License No.	Date of Issue	Date of Expiry	Status
GW-RS1024-17					
Construction Noise Permit under NCO	16-Apr-18	432628	30-Apr-18	16-Nov-18	Superseded
GW-RS0356-18					
Construction Noise Permit under NCO	18-May-18	433713	04-Jun-18	30-Nov-18	Superseded
GW-RS0469-18					
Construction Noise Permit under NCO	23-Nov-18	439700	07-Dec-18	06-Jun-19	Superseded
GW-RS1151-18					
Construction Noise Permit under NCO	03-Apr-19	434093	18-Apr-19	17-Oct-19	Superseded
GW-RS0345-19					
Construction Noise Permit under NCO	22-Jul-19	447459	25-Jul-19	01-Feb-20	Valid
GW-RS0726-19					

According to the EP stipulation, the required documents have been 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 Environmental Monitoring and Audit Requirements

### 3.1 General

As specified in the approved EM&A Manual, environmental monitoring of construction noise, ecology, landscape and visual impacts as well as waste management are required. A summary of the monitoring parameters is presented in **Table 2**.

**Table 2: Summary of Impact EM&A Requirements**

Parameters	Description	Locations	Frequency
Construction Noise	<ul style="list-style-type: none"> <li>• <math>L_{eq}</math> (30min) on normal working days</li> <li>• 3 sets of consecutive <math>L_{eq}</math> (5min) during restricted hours if construction is necessary</li> <li>• Supplementary information for data auditing, statistical results such as <math>L_{10}</math> and <math>L_{90}</math> shall also be obtained for reference</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 construction is necessary
Ecology	<ul style="list-style-type: none"> <li>• Monitoring of in-situ preservation of <i>Platycodon grandifloras</i></li> <li>• Inspection of ardeids nest during breeding season (April to July)</li> <li>• Monitoring for ardeid night roost (November to March)</li> </ul>	Project area and preservation area for <i>Platycodon grandifloras</i>	Once per month
	<ul style="list-style-type: none"> <li>• Inspection of enhancement area for ardeid roosting</li> </ul>		An enhancement area provided as an alternative roosting site for ardeids should be developed during the first phase of the construction.
	<ul style="list-style-type: none"> <li>• Monitoring on woodland compensation</li> </ul>		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

Parameters	Description	Locations	Frequency
			reinstatement, to mitigate for permanent loss of woodland habitat.
Landscape & Visual Impact	<ul style="list-style-type: none"> <li>Ensure no construction activities / storage are undertaken outside the project boundary</li> <li>Ensure landscaping works are carried out in accordance with the specifications</li> <li>Ensure new planting is carried out properly and during the right season</li> <li>Review progress of engineering works on site to identify the earliest practical opportunities for landscape works</li> </ul>	Project site	Bi-weekly
Regular Site Inspection Air, water, waste management	To review the environmental situation, and monitor the implementation of proper environmental protection and pollution control measures for the Project	Project site	Weekly

### 3.2 Monitoring Locations

Two designated noise monitoring locations as established in the EM&A Manual are shown in **Appendix C**. After the baseline monitoring, alternative location NM1A was proposed by MMHK due to the rejection of the monitoring location set up at NM1. The proposal was verified and agreed by EPD in the Baseline Monitoring Report. The construction noise monitoring locations for the Project are shown in **Table 3** and **Appendix D**.

**Table 3: Impact Monitoring Stations for Construction Noise**

Monitoring location	Descriptions	Type of measurement
NM1A	Slope near Victoria Shanghai Academy (VSA) to replace NM1 of the VSA	Free field
NM2	Hong Kong Juvenile Care Centre (HKJCC)	Facade

### 3.3 Derivation of Action/Limit Levels

The baseline results formed the basis for determining the environmental acceptance criteria for impact monitoring. According to the approved EM&A Manual and baseline monitoring results, the following construction noise criterion, namely Action and Limit levels listed in **Table 4** were proposed:

**Table 4: Action and Limit Levels for Construction Noise**

Monitoring Location	Action Level	Limit Level in dB(A)
<b>Time Period: 0700-1900 hours on normal weekdays</b>		
NM1A and NM2	When one or more documented complaints are received	70 dB(A)*

Note: Acceptable Noise Levels for school should be reduced to 65 dB(A) during examination period. If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA must be followed.

### 3.4 Meteorological Information

Meteorological information including humidity, wind speed, wind direction, temperature and total rainfall was extracted from “the Hong Kong Observatory Wong Chuk Hang Station” to provide background weather information. The meteorological data for the Reporting Period is summarized in **Appendix E**.

## 4 Construction Noise Monitoring

### 4.1 Monitoring Results

Construction noise monitoring was conducted 26 times at the two designated locations in the Reporting Period. As shown in the summary of noise monitoring results in **Table 5**, no noise complaints were received in this Reporting Period and no exceedance of Action or Limit level in relation to construction noise was recorded.

**Table 5: Summary of Construction Noise Monitoring Results (Noise level for 30 minutes)**

Monitoring Date	Time		Mean and range of noise levels, dB(A)		Limit Level for $L_{eq}$ (dB(A)) <sup>2</sup>
	Start	Finish	$L_{eq}$ (30min)	Corrected $L_{eq}(30min)$ <sup>1</sup>	
<b>NM1A</b>					
05-Sep-19	10:30	11:00	57.0	60.0	70
11-Sep-19	10:30	11:00	56.8	59.8	70
17-Sep-19	08:53	09:23	56.7	59.7	70
23-Sep-19	10:15	10:45	58.4	61.4	70
03-Oct-19	10:10	10:40	58.5	61.5	70
09-Oct-19	10:20	10:50	58.0	61.0	70
15-Oct-19	10:05	10:35	57.1	60.1	70
21-Oct-19	09:50	10:20	57.3	60.3	70
31-Oct-19	10:14	10:44	57.9	60.9	70
06-Nov-19	10:00	10:30	58.0	61.0	70
12-Nov-19	08:42	09:12	58.6	61.6	70
18-Nov-19	10:10	10:40	56.3	59.3	70
28-Nov-19	08:33	09:03	57.2	60.2	70
<b>NM2</b>					
05-Sep-19	09:50	10:20	53.5	-	70
11-Sep-19	09:50	10:20	53.0	-	70
17-Sep-19	10:50	11:20	52.3	-	70
23-Sep-19	09:30	10:00	52.5	-	70
03-Oct-19	09:30	10:00	53.5	-	70
09-Oct-19	09:40	10:10	52.6	-	70
15-Oct-19	09:25	09:55	52.7	-	70
21-Oct-19	09:10	09:40	53.8	-	70

Monitoring Date	Time		Mean and range of noise levels, dB(A)		Limit Level for $L_{eq}$ (dB(A)) <sup>2</sup>
	Start	Finish	$L_{eq}$ (30min)	Corrected $L_{eq}(30min)$ <sup>1</sup>	
31-Oct-19	09:30	10:00	52.4	-	70
06-Nov-19	09:20	09:50	53.7	-	70
12-Nov-19	10:30	11:00	51.1	-	70
18-Nov-19	09:25	09:55	53.3	-	65
28-Nov-19	10:20	10:50	51.4	-	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.

As shown in **Table 6**, results of the additional noise monitoring measurement were below 70 dB(A). No exceedance (Action/Limit Level) of construction noise was thus recorded in this period.

**Table 6: Summary of Construction Noise Monitoring Results (Noise level for 15 minutes)**

Monitoring date	Time		Mean and range of noise levels, dB(A)		Limit Level for $L_{eq}$ (dB(A)) <sup>2</sup>
	Start	Finish	$L_{eq}$ (15min)	Corrected $L_{eq}(15min)$ <sup>1</sup>	
<b>NM1A</b>					
01-Sep-19	10:30	10:45	54.1	57.1	70
<b>NM2</b>					
01-Sep-19	10:03	10:18	46.8	-	65

Note: 1. A correction of +3dB(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.

A summary of data and the supplementary data auditing information are shown in **Appendix F**. Graphical plots of the monitoring data are shown in **Appendix G**.

## 5 Ecology Monitoring

### 5.1 Inspection Findings

The ecological inspections were undertaken on 13 September, 11 October and 28 November 2019 by the qualified ecologist. The inspection findings are presented below.

#### Plants of Conservation Interest (*Platycodon grandiflorus*)

*Platycodon grandiflorus* is a perennial herb up to 120 cm high. Stems erect and 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 ecological inspections in September and October, it was observed that Group 2 of *Platycodon grandiflorus* was found to be vigorous and was in 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.

In November, it was observed that chlorosis and leaf drop occurred on Group 2 of *Platycodon grandiflorus*. On the other hand, 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.

On the other hand, the preventive mitigation measures, i.e., erecting of temporary protective fencing and sign post, were found to be effectively implemented to protect 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*.

#### Nesting Activities of Ardeids in Breeding Season

This monitoring parameter is only required during the breeding season of ardeids, i.e., from April to July, and the last monitoring event for nesting activities of Ardeids in the 2019's breeding season was undertaken on 12 July 2019, and such monitoring would not be required for the reporting period.

#### Roosting Activities of Ardeids in Peak Wintering Season

According to the Approved EM&A Manual, monitoring of roosting activities of Ardeids within the project area should be performed once a month during peak wintering season (November to March) during the construction phase.

Monitoring of roosting activities of Ardeids has been carried out by direct observation at vantage point on 28 November 2019 including the evening time from an hour before sunset until nightfall. Monitoring of roosting activities of ardeids is not required in September and October 2019.

No ardeids were noted within or in the vicinity of the project area during the monitoring period.

#### Compensation for Ardeid roosting Site

To be implemented.

Compensation of Woodland Habitat

To be implemented.

## 5.2 Conclusion

The implementation of the mitigation measures for the plant species of conservation interest, i.e., erecting of temporary protective fencing and sign post during the Reporting Period was noted. It was observed that chlorosis and leaf drop occurred on Group 2 of *Platycodon grandiflorus* and Group 1 of *Platycodon grandifloras* 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.

Roosting activities of ardeids have not been observed within the project area during the monitoring.



## 6 Landscape and Visual Monitoring

### 6.1 Inspection Findings

In the Reporting Period, bi-weekly landscape and visual site inspection were conducted on 13 September, 27 September, 11 October, 25 October, 8 November and 22 November 2019.

According to the bi-weekly site inspections, it was observed that the Contractor complied with the intended aims of the mitigation measures, for example, neither construction activities nor materials storage were conducted and placed outside of the working site boundary.

## 7 Waste Management

### 7.1 Record of Waste Quantities

The quantity of waste for disposal in this Reporting Period is summarized in **Table 7** and **Table 8**.

**Table 7: Summary of Quantities of Inert C&D Materials**

Type of Waste	Quantity (tonne)		
	Total Generated C&D Materials	Total Disposal as Public Fill	Total Reused
September 2019	1619.16	1619.16	0.00
October 2019	1475.42	1375.42	100.00
November 2019	1934.96	1834.96	100.00
Total	5029.54	4829.54	200.00

**Table 8: Summary of Quantities of Non-inert C&D Materials**

Type of Waste	Quantity (tonne)				
	Recycled Metal	Recycled Paper / Cardboard Packing	Recycled Plastic	Disposed Chemical Wastes	Disposed General Refuses
September 2019	7240.00	200.00	0.00	0.00	530.03
October 2019	6340.00	200.00	0.00	0.00	548.02
November 2019	0.00	132.00	0.00	0.00	605.63
Total	13580.00	532.00	0.00	0.00	1683.68

## 8 Site Inspection

### 8.1 Inspection Findings

In the Reporting Period, joint site inspections were undertaken by the PMR, ET and the Contractor on 6, 13, 20 and 27 September, 4, 11, 18 and 25 October as well as 1, 8, 15, 22 and 29 November 2019. Furthermore, site inspection and audit were performed by the IEC on 13 September, 11 October and 15 November 2019. During the site inspections, non-compliance was not observed by ET and IEC. The site observations for the Reporting Period is summarized in **Table 9**.

**Table 9: Site Observations of the Project**

Reporting Period	Findings / Deficiencies
September 2019	<ul style="list-style-type: none"> <li>The Contractor should closely monitor the condition of wastewater treatment facilities, such as refill chemical mixtures when necessary, to maintain the quality of treated water.</li> <li>Stagnant water near nursery should be removed.</li> </ul>
October 2019	<ul style="list-style-type: none"> <li>Chemical containers in Zone A, Level 2 near Pool B should be placed on drip tray.</li> <li>Chemical and oil containers should be placed on drip tray.</li> <li>Cement over 20 bags should be covered or placed in indoor area.</li> <li>Stagnant water in basement (near slope) should be removed).</li> </ul>
November 2019	<ul style="list-style-type: none"> <li>Watering measures should be implemented to prevent fugitive dust. (location: EVA and next to wet-sep 2)</li> <li>Chemical containers should be placed on drip tray. (Next to wet-sep 2)</li> <li>Stagnant water and debris should be removed. (location: Back of North Plant Room)</li> <li>Appropriate labels should be provided for chemical waste containers.</li> <li>Drip trays or appropriate chemical storage area should be provided for chemicals stored on Floor 2/2M.</li> <li>Dust suppression measures should be applied for dusty works on Floor 2, Zone A.</li> <li>Idle cement bags on Floor 2, Zone A should be properly covered.</li> <li>Drip trays should be provided for chemical containers on site.</li> <li>Deformed drip tray in Zone B should be repaired/replaced.</li> </ul>

## 9 Summary of Environmental Quality Performance Limits

### 9.1 Record on Non-compliance of Action and Limit Levels

No exceedances of Action level or Limit levels were observed for construction noise during the Reporting Period.

### 9.2 Record on Environmental Complaints Received

No environmental complaints were received during the reporting period.

# 10 Implementation Status of Mitigation Measures

## 10.1 General Requirements

The environmental mitigation measures that were recommended in the Implementation Schedule for Environmental Mitigation Measures in the approved EM&A Manual covered the issues of dust, noise, water and waste and are presented in **Appendix H**.

Environmental mitigation measures generally implemented by the contractor are listed in **Table 10**.

**Table 10: Environmental Mitigation Measures**

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

Issues	Environmental Mitigation Measures
	<ul style="list-style-type: none"><li>• Drip tray was provided for chemical materials at the working areas</li><li>• Waste skip was provided for general refuse disposal</li></ul>
General	<ul style="list-style-type: none"><li>• The site was generally kept tidy and clean</li></ul>

# 11 Conclusions and Recommendations

## 11.1 Conclusions

The EM&A programme as recommended in the EM&A manual has been undertaken in the Reporting Period.

Monitoring of construction noise, ecology, landscape and visual, as well as waste management for the Project were conducted as scheduled in the Reporting Period. Data collected during construction noise monitoring were checked against the established Action and Limit levels and no exceedances was recorded.

For ecological monitoring, the implementation of the mitigation measures for the plant species of conservation interest, i.e., erecting temporary protective fencing and sign post during the Reporting Period was noted. It was observed that chlorosis and leaf drop occurred on Group 2 of *Platycodon grandiflorus* and Group 1 of *Platycodon grandifloras* 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.

Roosting activities of ardeids have not been observed within the project area during the monitoring.

For landscape and visual monitoring, the Contractor was reminded to remove weeds and the invasive species (i.e. *Mikania micrantha*) regularly.

## 11.2 Recommendations

With considerations on the construction activities and environment, the following reminders and recommendations were provided:

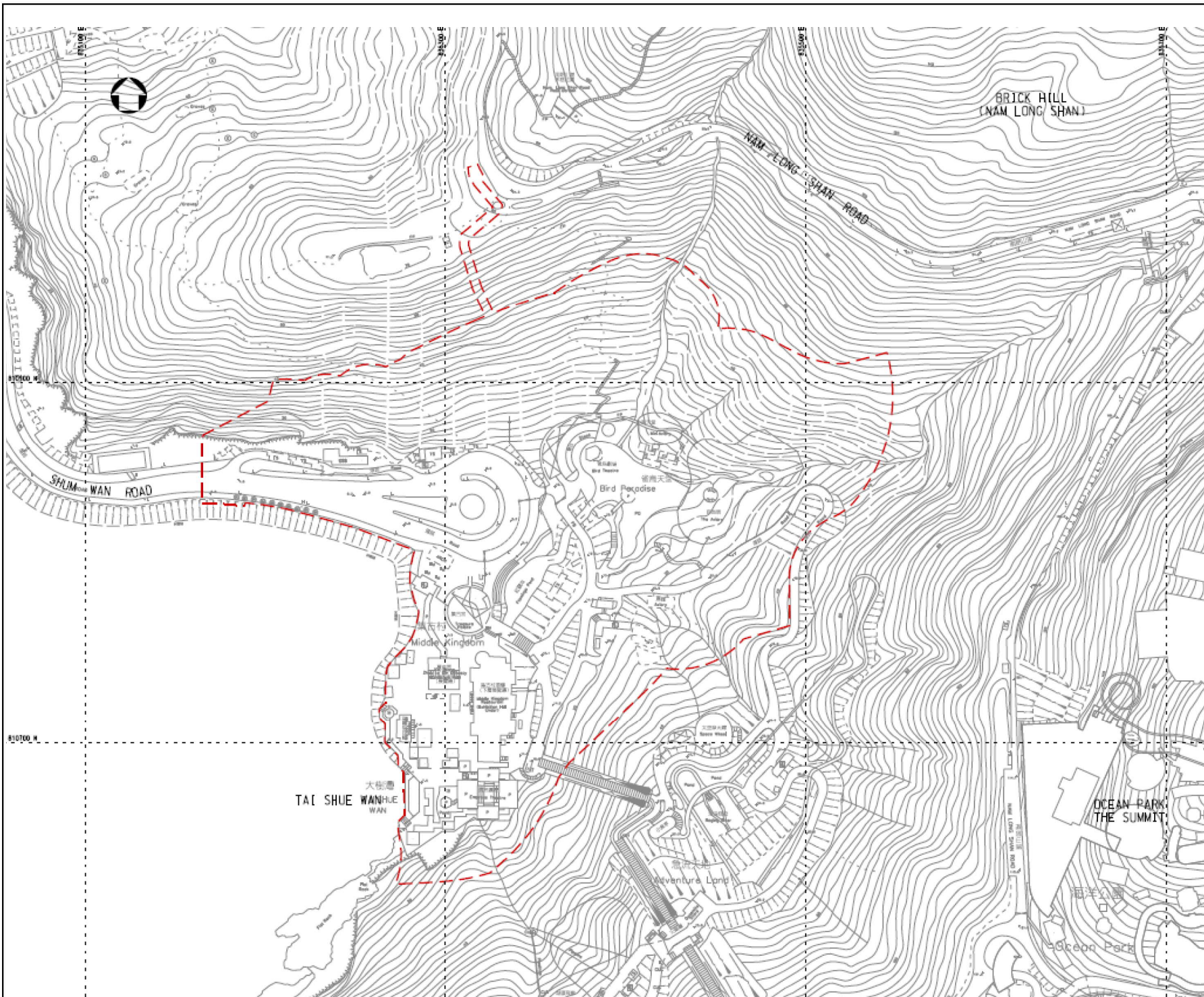
- All drainage facilities, erosion and sedimentation control structures (including the sedimentation tanks installed on site) should be regularly inspected and maintained in good condition, especially during the wet season.
- Appropriate label should be provided in specific machine.
- Noise mitigation measures, including the use of quiet plants, should be implemented in accordance with the EM&A requirement.
- Cleanliness and tidiness in construction site should be enhanced.

# Appendices

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## A. Layout Plan of the Project



Notes

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Key to symbols

--- Project Boundary  
項目範圍

---

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**

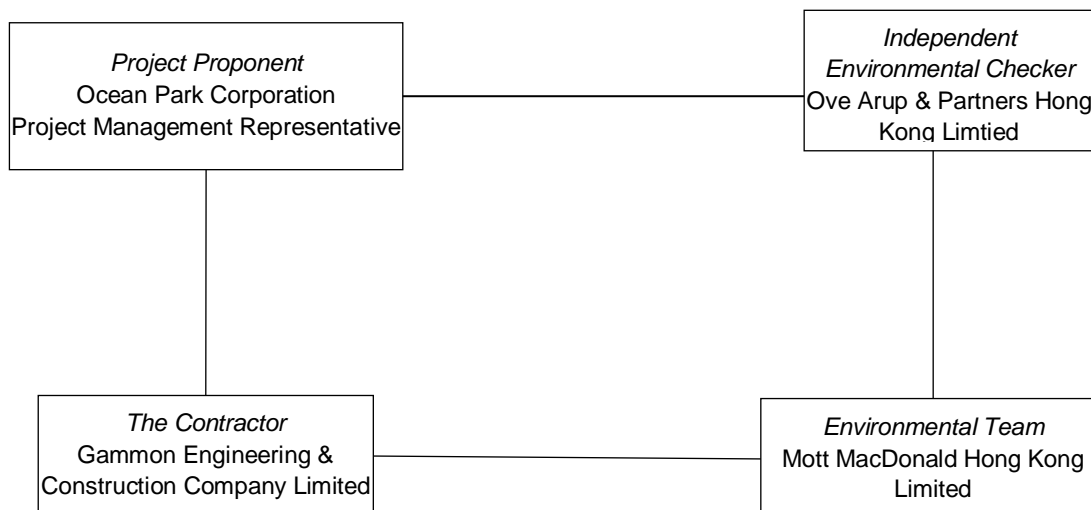
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Drawn		Coordination	
Dwg check		Approved	
Scale at A1	Status		Rev

Drawing Number

**APPENDIX A**

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## B. Project Organization

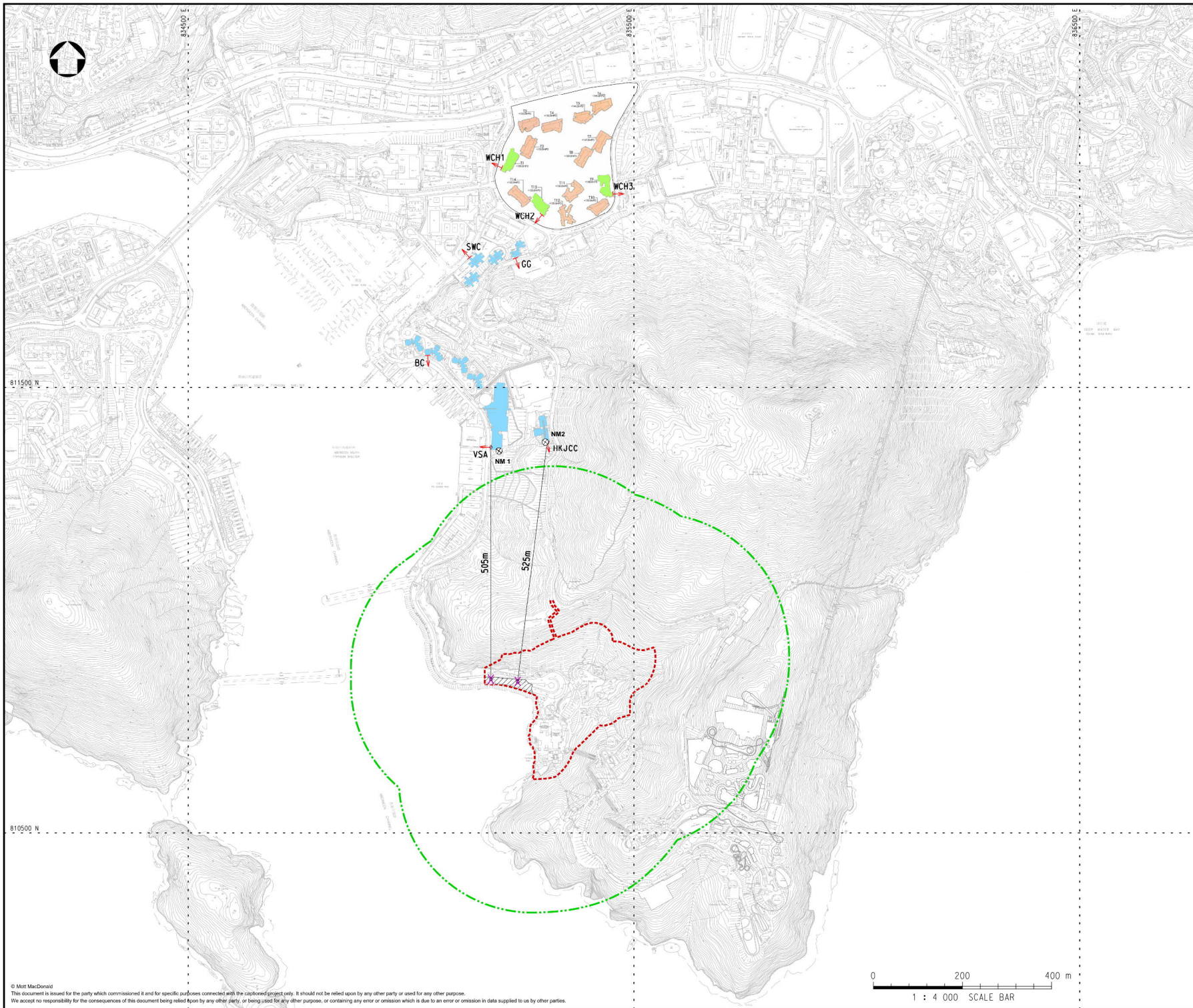


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Mott MacDonald Hong Kong Ltd.	Qualified Ecologist	Mr Roy Hung	2828 5965	2827 1823
Gammon Engineering & Construction Company Limited	Construction Manager	Mr Paul Leaver	3690 9229	2148 2890
Gammon Engineering & Construction Company Limited	Environmental Officer	Ms Sammie Chan	3690 9233	2148 2890

## **C. Designated Monitoring Locations as Recommended in the Approved EM&A Manual**





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

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Client



Project

**TAI SHUE WAN DEVELOPMENT  
 AT OCEAN PARK**

Title

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

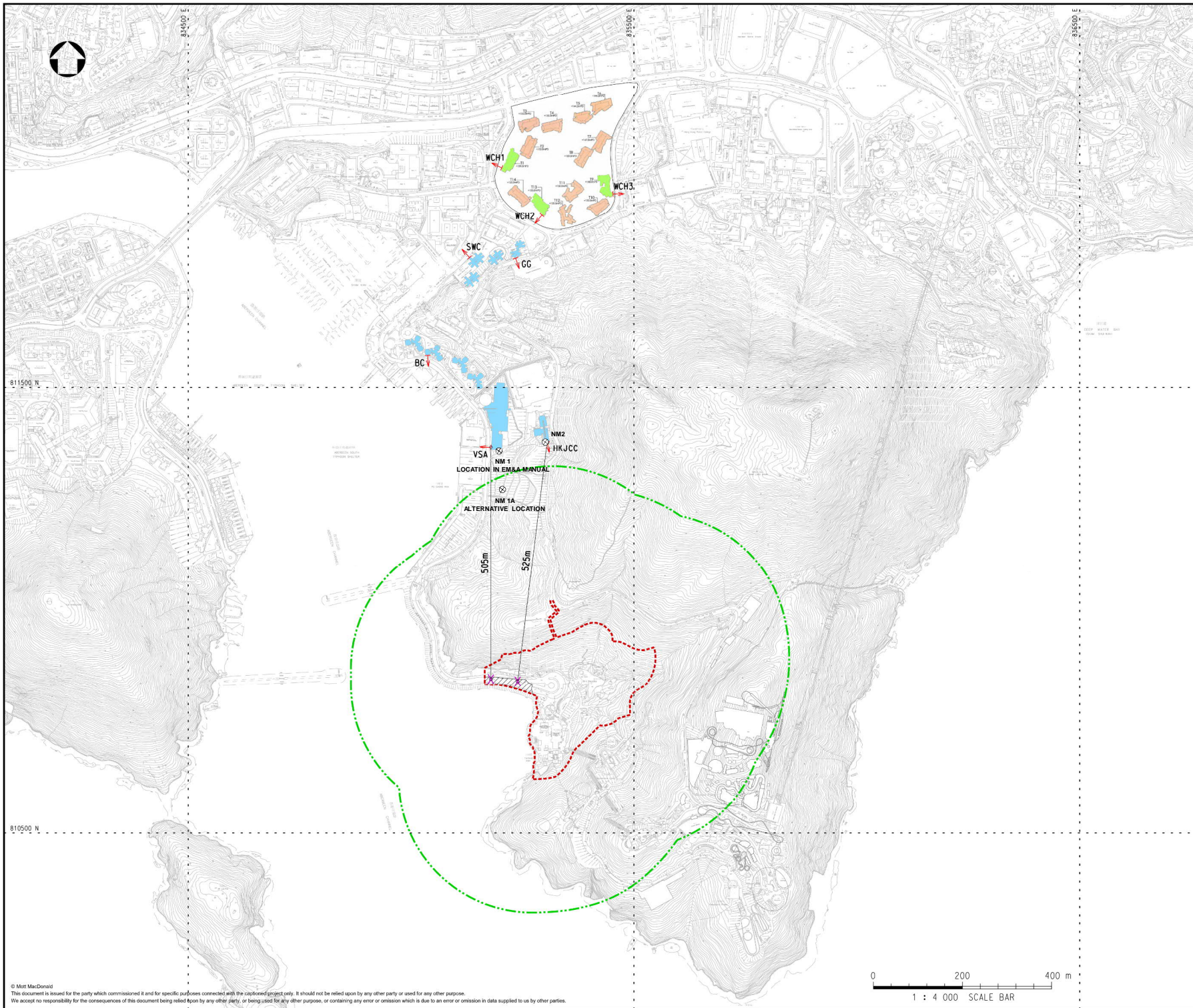
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Drawn	MING	Coordination	HC
Dwg check	HL	Approved	EC

Scale at A1: **1:4000** Status: **PRE** Rev: **P4**

Drawing Number: **APPENDIX C**

## **D. Actual Locations of Impact Monitoring**





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
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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

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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 D**

## E. Meteorological Data



### Weather Conditions - September 2019

Date		Mean Air Temperature (°C)	Mean Relative Humidity (%)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Sun	01-Sep-19	28.2	82	60	44.1
Mon	02-Sep-19	26.9	90	70	47.4
Tue	03-Sep-19	28.4	80	50	39.3
Wed	04-Sep-19	26.8	91	80	34.7
Thu	05-Sep-19	27.2	88	090#	25.4#
Fri	06-Sep-19	28.9	79	50	20.3
Sat	07-Sep-19	29.8	79	10	7.2
Sun	08-Sep-19	30	80	210	9
Mon	09-Sep-19	30	78	140	7.8
Tue	10-Sep-19	30.1	76	90	13.1
Wed	11-Sep-19	30.2	73	90	8.2
Thu	12-Sep-19	30.3	73	50	11.8
Fri	13-Sep-19	30.1	77	80	13.2
Sat	14-Sep-19	29.8	78	100	7.5
Sun	15-Sep-19	29.2	76	80	9.8
Mon	16-Sep-19	29.3	76	90	14.5
Tue	17-Sep-19	29.2	76	90	27.4
Wed	18-Sep-19	28.8	79	80	22.8
Thu	19-Sep-19	28	74	130	16.9
Fri	20-Sep-19	29	52	350	16.9
Sat	21-Sep-19	29.2	42	360	31.1
Sun	22-Sep-19	28.3	40	360	40.1
Mon	23-Sep-19	27.7	57	360	28.4
Tue	24-Sep-19	27.5	70	60	21
Wed	25-Sep-19	27.3	71	90	16.9
Thu	26-Sep-19	27.5	71	80	17.7
Fri	27-Sep-19	27.6	72	80	16.3
Sat	28-Sep-19	28.2	71	80	12
Sun	29-Sep-19	28.7	75	150	9.3
Mon	30-Sep-19	30.1	64	250	13.1

# incomplete data

### Weather Conditions - October 2019

Date		Mean Air Temperature (°C)	Mean Relative Humidity (%)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Tue	01-Oct-19	30.3	59	250	18.6
Wed	02-Oct-19	29.5	71	240	22.3
Thu	03-Oct-19	29	67	220	16.2
Fri	04-Oct-19	28.6	70	150	9
Sat	05-Oct-19	29.1	69	80	6.3
Sun	06-Oct-19	26.3	81	60	36.6
Mon	07-Oct-19	26.3	86	80	42.6
Tue	08-Oct-19	27.7	79	80	29
Wed	09-Oct-19	27.8	75	80	32.8
Thu	10-Oct-19	27.9	76	80	17.5
Fri	11-Oct-19	28.5	75	240	10.4
Sat	12-Oct-19	28.6	78	140	10
Sun	13-Oct-19	27.2	84	30	18.7
Mon	14-Oct-19	25.8	86	70	26.5
Tue	15-Oct-19	26	74	70	47
Wed	16-Oct-19	25.5	67	80	37.4
Thu	17-Oct-19	26.2	70	080#	20.3#
Fri	18-Oct-19	26.5	70	70	19.3
Sat	19-Oct-19	26.2	72	80	19.3
Sun	20-Oct-19	25.4	76	80	25.6
Mon	21-Oct-19	25.3	72	80	18.2
Tue	22-Oct-19	25	68	80	21.7
Wed	23-Oct-19	25.5	71	70	25.1
Thu	24-Oct-19	26.2	71	70	32
Fri	25-Oct-19	25.8	75	70	33.3
Sat	26-Oct-19	25.9	75	70	30.3
Sun	27-Oct-19	25.7	76	80	21.6
Mon	28-Oct-19	25.2	77	80	19.9
Tue	29-Oct-19	22.7	65	360	27.9
Wed	30-Oct-19	24	60	60	28.2
Thu	31-Oct-19	24.8	68	60	37.1

# incomplete data

### Weather Conditions - November 2019

Date		Mean Air Temperature (°C)	Mean Relative Humidity (%)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Fri	01-Nov-19	25.7	73	70	37.5
Sat	02-Nov-19	25.3	74	70	28.2
Sun	03-Nov-19	25.7	74	70	20.7
Mon	04-Nov-19	25	56	360	26.6
Tue	05-Nov-19	23.9	56	70	25.4
Wed	06-Nov-19	23.8	69	70	28.9
Thu	07-Nov-19	23.8	56	360	23.5
Fri	08-Nov-19	23.3	51	360	29.5
Sat	09-Nov-19	22.7	62	70	29.3
Sun	10-Nov-19	22.7	70	60	21.4
Mon	11-Nov-19	23.1	72	80	20.8
Tue	12-Nov-19	23.3	78	70	30.9
Wed	13-Nov-19	24.1	75	70	20
Thu	14-Nov-19	23	64	360	29.8
Fri	15-Nov-19	22.8	70	80	25.9
Sat	16-Nov-19	22.5	76	70	22.4
Sun	17-Nov-19	23.4	79	60	17.1
Mon	18-Nov-19	24.3	69	360	14.7
Tue	19-Nov-19	20.5	63	360	25.8
Wed	20-Nov-19	21.1	66	70	26.2
Thu	21-Nov-19	21.7	66	70	19.7
Fri	22-Nov-19	22.3	66	90	11.5
Sat	23-Nov-19	23.3	78	60	17.8
Sun	24-Nov-19	23.4	77	60	17.8
Mon	25-Nov-19	23.8	73	80	40.4
Tue	26-Nov-19	22	76	80	41.3
Wed	27-Nov-19	22.3	78	70	33.1
Thu	28-Nov-19	20.3	61	360	32.5
Fri	29-Nov-19	19.7	65	10	32.9
Sat	30-Nov-19	20.4	71	70	25.6

## F. Noise Monitoring Data

**Noise Monitoring Data - Summary of Construction Noise Monitoring Results, dB(A)**

<b>NM1A - Slope near the Victoria Shanghai Academy</b>						
<b>Date</b>	<b>Time</b>		<b>Noise Levels, dB(A)</b>			<b>Limit Level for Leq (dB(A))<sup>(2)</sup></b>
	<b>Start</b>	<b>Finish</b>	<b>Corrected L<sub>eq</sub>(30min)<sup>(1)</sup></b>	<b>Corrected L<sub>90</sub><sup>(1)</sup></b>	<b>Corrected L<sub>10</sub><sup>(1)</sup></b>	
05-Sep-19	10:30	11:00	60.0	57.7	62.1	70
11-Sep-19	10:30	11:00	59.8	57.2	61.9	70
17-Sep-19	08:53	09:23	59.7	56.2	62.2	70
23-Sep-19	10:15	10:45	61.4	57.5	63.1	70
03-Oct-19	10:10	10:40	61.5	59.5	63.0	70
09-Oct-19	10:20	10:50	61.0	58.9	64.2	70
15-Oct-19	10:05	10:35	60.1	56.0	62.2	70
21-Oct-19	09:50	10:20	60.3	58.0	62.4	70
31-Oct-19	10:14	10:44	60.9	56.3	62.7	70
06-Nov-19	10:00	10:30	61.0	58.6	62.6	70
12-Nov-19	08:42	09:12	61.6	59.5	63.7	70
18-Nov-19	10:10	10:40	59.3	57.6	61.6	70
28-Nov-19	08:33	09:03	60.2	56.1	62.4	70

<b>NM2 - Hong Kong Juvenile Care Centre</b>						
<b>Date</b>	<b>Time</b>		<b>Noise Levels, dB(A)</b>			<b>Limit Level for Leq (dB(A))<sup>(2)</sup></b>
	<b>Start</b>	<b>Finish</b>	<b>L<sub>eq</sub>(30min)</b>	<b>L<sub>90</sub></b>	<b>L<sub>10</sub></b>	
05-Sep-19	09:50	10:20	53.5	52.2	54.7	70
11-Sep-19	09:50	10:20	53.0	51.2	55.6	70
17-Sep-19	10:50	11:20	52.3	51.1	54.0	70
23-Sep-19	09:30	10:00	52.5	51.3	53.7	70
03-Oct-19	09:30	10:00	53.5	50.5	55.5	70
09-Oct-19	09:40	10:10	52.6	49.6	54.8	70
15-Oct-19	09:25	09:55	52.7	51.2	56.1	70
21-Oct-19	09:10	09:40	53.8	50.7	55.8	70
31-Oct-19	09:30	10:00	52.4	47.9	53.8	70
06-Nov-19	09:20	09:50	53.7	52.3	54.9	70
12-Nov-19	10:30	11:00	51.1	49.2	52.9	70
18-Nov-19	09:25	09:55	53.3	50.4	55.4	65
28-Nov-19	10:20	10:50	51.4	46.6	53.4	70

NM1A - Slope near the Victoria Shanghai Academy						
Date	Time		Noise Levels, dB(A)			Limit Level for L <sub>eq</sub> (dB(A)) <sup>(3)</sup>
	Start	Finish	Corrected L <sub>eq</sub> (15min) <sup>(1)</sup>	Corrected L <sub>90</sub> <sup>(1)</sup>	Corrected L <sub>10</sub> <sup>(1)</sup>	
01-Sep-19	10:30	10:45	57.1	56.3	58.7	70

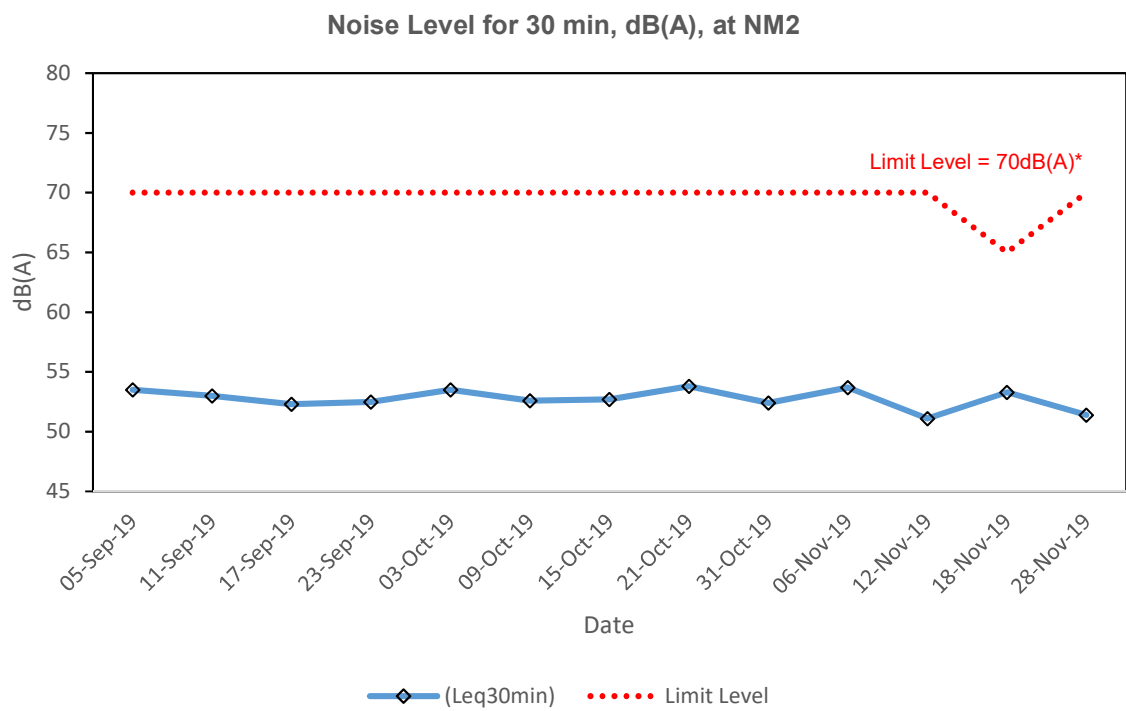
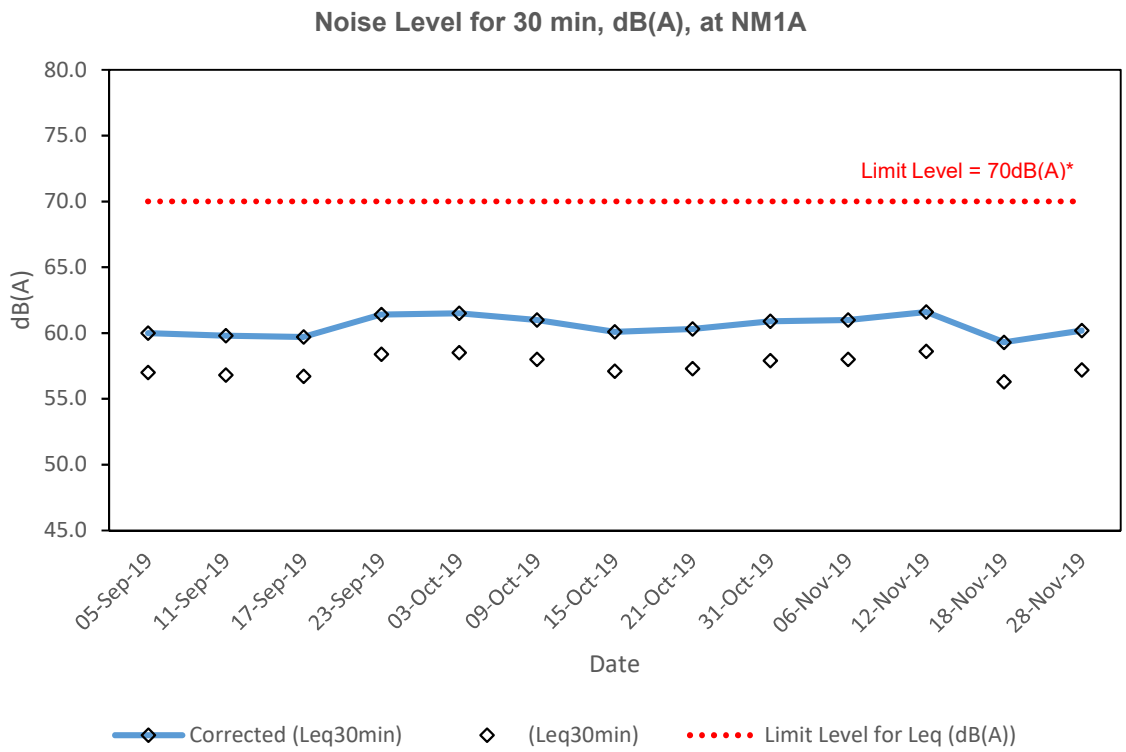
NM2 - Hong Kong Juvenile Care Centre						
Date	Time	Noise Levels, dB(A)			Limit Level for L <sub>eq</sub> (dB(A)) <sup>(3)</sup>	
	Start	Finish	L <sub>eq</sub> (15min)	L <sub>90</sub>		L <sub>10</sub>
01-Sep-19	10:03	10:18	46.8	45.2	48.5	65

**Notes:**

- (1) A free field correction of +3dB(A) has been made to these measurements as specified in the EM&A Manual and EPD guidelines.
- (2) Acceptable noise level should be reduced to 65dB(A) upon school examination period.
- (3) Acceptable noise level should be 65dB(A) according to Technical Memorandum on noise from construction works other than percussive piling.

## G. Graphical Plots of Noise Monitoring Data

## Graphical Plot for Noise Monitoring Data (November 2019)





## **H. 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 <sup>1</sup>				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
<b>Cat.1 Key/specific proposed mitigation measure</b>									
<b>Noise Impact (Construction)</b>									
5.7	3.2	<b>Selecting Quiet Plant</b> 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	<b>Use of Movable Barriers</b> 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
<b>Ecological Impact</b>									
10.7	8.3	<b>Inspection of Active Ardeid Nest</b> 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	<b>Inspection of Short-nosed Fruit Bat</b> 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 <sup>1</sup>				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	<b>In-situ Preservation of Plant Species of Conservation Interest</b> 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	<b>Inspection of Ardeid Nest during breeding season</b> 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	<b>Timing of site clearance and tree felling works</b> 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	<b>Compensation for Ardeid Roosting Site</b> An enhancement area with following features should be 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 (location indicated in Figure 8.1)</li> <li>▪ The enhancement area shall include a Flamingo Pond</li> <li>▪ 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.</li> <li>▪ Heavy standard sized trees shall be considered for planting to allow early establishment of the trees around the Flamingo</li> </ul>	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><b>Compensation for Woodland Habitat</b></p> <ul style="list-style-type: none"> <li>▪ 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.</li> <li>▪ 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>.</li> </ul>	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
<b>Landscape and Visual Impact (Construction)</b>									
Table 12.13 (CP07)	Table 9.1 (CP07)	<p><b>Temporary Tree Nurseries</b></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><b>Advance Planting</b></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
<b>Landscape and Visual Impact (Operation)</b>									
Table 12.14 (OP04)	Table 9.2 (OP04)	<p><b>Green Roofs and Vertical Greening</b></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 <sup>1</sup>					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)	<b>Reprovision of Flamingo Pond</b> 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)	<b>Woodland Compensation</b> 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
<b>Cat. 2 Submission required post EIA stage</b>								
<b>Sewerage and Sewage Treatment Implications</b>								
7.7	5.2	<b>Detailed Sewerage Design Report</b> 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
<b>Ecological Impact (Construction)</b>								
10.7	8.3	<b>Vegetation Survey for Plant Species of Conservation Interest</b> 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	<b>Woodland Compensation Plan</b> 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"> <li>▪ Timing of planting works</li> <li>▪ Planting location</li> <li>▪ Species, size and number of trees</li> <li>▪ Monitoring methodology</li> </ul>	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 <sup>1</sup>					Relevant Legislation & Guidelines
			Location / Duration of measures / Timing of completion of measures	Implementation Agent	Des	Con	Op	
<p>■ Action Plan</p>								
<b>Landscape and Visual Impact (Construction)</b>								
Table 12.13 (CP05)	Table 9.1 (CP05)	<p><b>Transplantation of Existing Trees</b></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	
<b>Landscape and Visual Impact (Operation)</b>								
Table 12.14 (OP02)	Table 9.2 (OP02)	<p><b>Compensatory Tree Planting</b></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	
<b>Cat. 3 Good site practice/housekeeping measures under EM&amp;A mechanism</b>								
<b>Air Quality Impact (Construction)</b>								
3.9.1	2.2	<p><b>Dust Control Measures</b></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"> <li>■ 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</li> </ul>	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"> <li>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</li> </ul> <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"> <li>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.</li> </ul> <p>Disturbed Parts of the Roads</p> <ul style="list-style-type: none"> <li>Main temporary access points should be paved with concrete, bituminous hardcore materials or metal plates and be kept clear of dusty materials; or</li> <li>Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li> </ul> <p>Exposed Earth</p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p>Loading, Unloading or Transfer of Dusty Materials</p> <ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as</li> </ul>							

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					Des	Con	Op	Dec	
		<p>to keep the dusty material wet.</p> <p><b>Debris Handling</b></p> <ul style="list-style-type: none"> <li>▪ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.</li> <li>▪ Before debris is dumped into a chute, water should be sprayed onto the debris so that it remains wet when it is dumped.</li> </ul> <p><b>Transport of Dusty Materials</b></p> <ul style="list-style-type: none"> <li>▪ 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.</li> </ul> <p><b>Wheel washing</b></p> <ul style="list-style-type: none"> <li>▪ 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.</li> </ul> <p><b>Use of vehicles</b></p> <ul style="list-style-type: none"> <li>▪ 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.</li> <li>▪ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> <li>▪ 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.</li> </ul> <p><b>Site hoarding</b></p> <ul style="list-style-type: none"> <li>▪ 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</li> </ul>							
<b>Noise Impact (Construction)</b>									



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					Des	Con	Op	Dec	
5.7	3.2	<p><b>Good Site Practice</b></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"> <li>▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works;</li> <li>▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum;</li> <li>▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;</li> <li>▪ mobile plant should be sited as far away from NSRs as possible; and</li> <li>▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul>	Project construction site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by OPC	✓			EIAO and Noise Control Ordinance	
<b>Noise Impact (Operation)</b>									
5.7	3.3.2	<p><b>Fixed Plant Noise</b></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"> <li>▪ choose quiet plant such as those which have been effectively silenced;</li> <li>▪ include noise levels specification when ordering new plant (including chiller and E&amp;M equipment);</li> <li>▪ locate fixed plant / louvre away from any NSRs as far as practicable;</li> <li>▪ locate fixed plant in walled plant rooms or in specially designed enclosures;</li> <li>▪ locate noisy machine in a basement or a completely separate building;</li> </ul>	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"> <li>install direct noise mitigation measures including silencers, acoustic louvres and acoustic enclosure where necessary; and</li> <li>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.</li> </ul> <p>Prior to the operation of the Project, noise commissioning tests for all major fixed noise sources should be conducted.</p> <p><b>Open Air Entertainment Noise</b> 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"> <li>use small clusters of small power loudspeakers rather than a few large power loudspeakers; and</li> <li>loudspeakers should be pointed away from nearby NSRs.</li> </ul>	Within Project area / Duration of the operation phase / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓			EIAO and Noise Control Ordinance
<b>Water Quality Impact (Construction)</b>									
6.7	4.2	<p><b>Construction Site Runoff</b> 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"> <li>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;</li> <li>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</li> </ul>	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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					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"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ Precautions should be taken at any time of the year when</li> </ul>								

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					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"> <li>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.</li> </ul> <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><b>General Construction Activities</b> 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><b>Expansion of Existing Storm U-Channel</b> 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><b>Interception of Natural Streams</b> 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><b>Site Formation Works</b> 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 <sup>1</sup>					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><b>Construction of Sewage Sump Pit and Rising Mains</b></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><b>Accidental Spillage</b></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"> <li>▪ Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>▪ Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>▪ Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul>							
6.7	4.2	<p><b>Sewage Effluent from the Construction Workforce</b> 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
<b>Water Quality Impact (Operation)</b>									
6.7	4.2	<p><b>Runoff from Road Surfaces</b> 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><b>Runoff from On-site Planting Area</b> 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
<b>Waste Management Implications (Construction)</b>									
8.5.1.1	6.2	<b>Good Site Practice</b>	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"> <li>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</li> <li>Training of site personnel in proper waste management and chemical handling procedures</li> <li>Provision of sufficient waste disposal points and regular collection of waste</li> <li>Appropriate measures to minimise windblown litter and dust/ odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers</li> <li>Stockpiles of C&amp;D materials should be kept covered by impervious sheets to avoid wind-blown dust</li> <li>All dusty materials including C&amp;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</li> <li>Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads</li> <li>Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&amp;D materials is not anticipated</li> </ul> <p><b>Waste Reduction Measures</b></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"> <li>Sort inert C&amp;D materials to recover any recyclable portions such as metals</li> <li>Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of</li> </ul>	<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			✓		<p>Waste Disposal Ordinance</p>	

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8.5.1.3	6.2	<p>materials and their proper disposal</p> <ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ Proper site practices to minimise the potential for damage or contamination of inert C&amp;D materials</li> <li>▪ Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste</li> </ul> <p><b>Inert and Non-inert C&amp;D materials</b></p> <p>In order to minimise impacts resulting from collection and transportation of inert C&amp;D materials for off-site disposal, the inert C&amp;D materials should be reused on-site as fill material as far as practicable. In addition, inert C&amp;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&amp;D materials will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.</p> <p>The C&amp;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&amp;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 &amp; 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><b>Chemical Waste</b></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.	Project construction 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	<b>General Refuse</b> 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	<b>Floating Refuse</b> 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
<b>Waste Management Implications (Operation)</b>										
8.5.2.1	6.2	<b>General Refuse</b> 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><b>Chemical Waste</b> 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><b>Floating Refuse</b> 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	
<b>Land Contamination (Construction)</b>										
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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					Des	Con	Op	Dec		
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"> <li>▪ To minimise the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment should be employed;</li> <li>▪ 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;</li> <li>▪ Stockpiling of contaminated excavated materials on site should be avoided as far as possible;</li> <li>▪ The use of any contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out;</li> <li>▪ Vehicles containing any excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater;</li> <li>▪ Truck bodies and tailgates should be sealed to prevent any discharge;</li> <li>▪ 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</li> </ul>	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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			Location / Duration of measures / Timing of completion of measures	Implementation Agent	Des	Con	Op	
		tipping; <ul style="list-style-type: none"> <li>▪ Speed control for trucks carrying contaminated materials should be exercised.</li> <li>▪ 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</li> <li>▪ Maintain records of waste generation and disposal quantities and disposal arrangements.</li> </ul>						
<b>Landscaping and Visual Impact (Construction)</b>								
Table 12.13 (CP01)	Table 9.1 (CP01)	<b>Minimisation of Construction Period</b> 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)	<b>Minimisation of Works Areas</b> 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)	<b>Construction Site Controls</b> 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)	<b>Preservation of Existing Vegetation</b> 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	<b>No Intrusion Zones</b>	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)	<b>Construction Site Hoardings</b> 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)	<b>Dust and Erosion Control for Exposed Soil</b> 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)	<b>Appearance of Construction Plant / Machinery</b> 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)	<b>Construction Lighting Control</b> 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)	<b>Appearance of Construction Workers</b> 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	
<b>Landscape and Visual Impact (Operation)</b>									

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Table 12.14 (OP01)	Table 9.2 (OP01)	<p><b>Sensitive Design and Disposition</b></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><b>Enhancement Planting</b></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><b>Responsive Lighting Design</b></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"> <li>▪ 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.</li> <li>▪ Lighting shall be arranged with due consideration of reflectance so as to avoid glare effect.</li> <li>▪ Lighting shall be regularly monitored during operation.</li> <li>▪ Lights located adjacent or in proximity to neighbours shall be carefully designed to prevent possible light intrusion.</li> <li>▪ Lighting operation schedule shall specify only lights necessary for security to be left on after business hours.</li> <li>▪ Paving materials should be selected as necessary to reduce</li> </ul>	Project area / During design stage / Throughout operation phase	Design Architect / Contractor appointed by OPC	✓	✓	✓	✓	EIAO-TM



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		<p>potential glare from surface reflectance.</p> <ul style="list-style-type: none"> <li>▪ Particular attention should be paid to the use of lighting having a high intensity or harsher tone (e.g. metal halide lamps).</li> <li>▪ 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.</li> </ul>								

**Remarks:**

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

