

## Tai Shue Wan Development at Ocean Park

Detailed Vegetation Survey Report  
Document No. 328011/03/04/D

September 2014  
Ocean Park Corporation

# Tai Shue Wan Development at Ocean Park

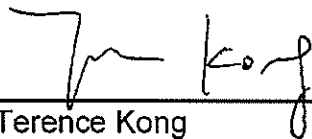
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September 2014

Ocean Park Corporation

**Pursuant to Condition 2.6 of Environmental Permit No. EP-487/2014,  
this Detailed Vegetation Survey Report has been reviewed and  
certified by the Environmental Team Leader (ETL) and verified by  
the Independent Environmental Checker (IEC).**

**Certified by:**

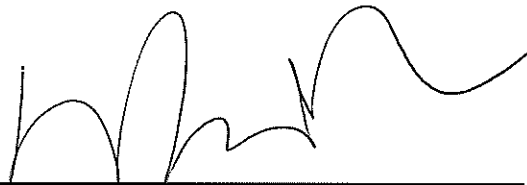


Terence Kong  
Environmental Team Leader (ETL)  
Mott MacDonald Hong Kong Limited

Date

17 September 2014

**Verified by:**



Winnie Ko  
Independent Environmental Checker (IEC)  
Environmental Resources Management

Date

17 Sept 2014

**Pursuant to Conditions 2.3 and 2.6 of Environmental Permit No. EP-487/2014,**

**this Detailed Vegetation Survey Report has been prepared by the  
Qualified Ecologist.**

**Prepared by:**



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**Pak Kin CHAN  
Qualified Ecologist  
Mott MacDonald Hong Kong Limited**

**Date**

**17 September 2014**

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# 1. Introduction

## 1.1 Background

In August 2013, Ocean Park Corporation (OPC) commissioned Mott MacDonald Hong Kong Limited (MMHK) to carry out the EIA study for the proposed Tai Shue Wan Development at Ocean Park (hereafter referred as “the Project”) for the construction and operation.

The Project Profile for the Project was submitted to EPD on 10 May 2013, and was exhibited for public consultation between 11 May 2013 and 24 May 2013. EPD issued an EIA Study Brief for the Project (ESB-261/2013) on 13 June 2013.

The EIA report was submitted to EPD on 31 March 2014. As mentioned in Section 10.6.2 of the EIA report, one flora species of conservation interest *Platycodon grandiflorus* is found distributed within the Project area. The several individuals of *Platycodon grandiflorus* recorded are located at the southern end on the hillside of the Project area, which will not be affected by the construction activities. Nonetheless, some potential indirect disturbance might affect the plants, which include construction dust deposition on plants and storage / disposal of construction waste / materials in retained vegetated areas. Dust deposition on plants could adversely interfere with the photosynthesis of plants while storage / disposal of construction waste / materials could cause physical or chemical damage to the plants. These construction disturbances are not uncommon in construction sites in Hong Kong, but could be effectively prevented through clear definition of site limit, good workmanship and regular site inspections. The significance of ecological impact on concerned plant species within the Project area is therefore considered as minor.

In Section 10.7.1.4 of the EIA report, mitigation measures are recommended for the potential impact on the *Platycodon grandiflorus* identified within the Project boundary and any other flora species of conservation interest likely to be affected. For precautionary purposes and to further ensure that no flora species of conservation interest to be affected, it is recommended to conduct a detailed vegetation survey as baseline monitoring to update the exact locations, number and condition of individuals of *Platycodon grandiflorus* prior to commencement of site clearance. A Detailed Vegetation Survey Report summarising the findings and recommendations of the detailed vegetation survey should be prepared and submitted to EPD for approval no later than one month prior to commencement of site clearance.

During construction phase, erection and maintenance of a temporary protective fence along the flora species of conservation concern identified under the detailed vegetation survey is recommended to avoid potential impact from construction activities such as materials storage. Monthly monitoring of individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified in the detailed vegetation survey should be conducted during the construction phase to make sure that the flora species of conservation interest are not affected by the construction works of the Project.

The EIA report was approved with condition on 27 August 2014 (Register No. AEIAR-184/2014). EPD issued an Environmental Permit (EP) for the Project (EP-487/2014) on 27 August 2014.

As stipulated in Condition 2.6 of the EP, the Project proponent is required to follow the recommendations of the EIA report and conduct a detailed vegetation survey and submit a Detailed Vegetation Survey Report to EPD for approval no later than one month before the commencement of site clearance works on relevant parts of the Project. This Detailed Vegetation Survey Report is prepared to meet this EP condition.

## 1.2 Objectives of Detailed Vegetation Survey

The objectives of the detailed vegetation survey are as follows:

- Checking and updating of the number, locations and condition of the *Platycodon grandiflorus* identified and any other flora species of conservation interest by actively searching within the site formation boundary;
- Preparation of an updated location plan showing the individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified within the site formation boundary during the detailed vegetation survey;
- Confirmation on whether any of the individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified within the site formation boundary during the detailed vegetation survey will likely be affected by the proposed works of the Project; and
- Recommendation on protective measures of identified individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified within the site formation boundary during the detailed vegetation survey should in situ preservation be considered feasible. Otherwise, remedial actions, such as transplantation, should be proposed.

## 2. EIA Baseline Information and EM&A Requirements

### 2.1 Findings of Habitat and Vegetation during EIA stage

#### 2.1.1 Baseline information within the Project Boundary

There are nine habitats present within the Project boundary, as discussed in Section 10.4.3 of the EIA report. Distribution of each habitat type is shown in **Figure 2.1**.

A total of 227 flora species were recorded within the Project Area. The plant list is presented in **Appendix A** for information. One flora species of conservation interest *Platycodon grandiflorus* was recorded within the shrubland habitat. Location of *Platycodon grandiflorus* is illustrated in **Figure 2.1**.

*Platycodon grandiflorus* is a native herb species with distribution restricted locally in Hong Kong. It is protected under the Forestry Regulations (Cap. 96 sub. leg.) and listed in *Rare and Precious Plants of Hong Kong* (AFCD, 2003), of Least Concern (LC) status in China. Six individuals were found in shrubland near the Middle Kingdom.

#### 2.1.2 Baseline information with the EIA Study Area

There are 11 major habitats identified within the EIA Study Area (covering 500m from the Project boundary). Distribution of each habitat type is shown in **Figure 2.2**.

A total of 330 flora species were recorded within the EIA Study Area, of which 17 species were of conservation interest. Locations of flora species of conservation interest are illustrated in **Figure 2.2**.

Outside the Project boundary, *Platycodon grandiflorus* was also recorded within the EIA Study Area. Forty individuals were found within the 500m Buffer Zone; 14 individuals in shrubland near the cable car maintenance path; 5 individuals in shrubland near Ocean Theatre and 21 individuals in the shrubland on Nam Long Shan Road.

The other 16 flora species of conservation interest are:

- *Ania hongkongensis* (29 individuals recorded in the tall shrubland habitat near the Summit of Ocean Park);
- *Aristolochia thwaitesii* (3 individuals recorded in shrubland near the cable car maintenance path);
- *Artocarpus hypargyreus* (9 individuals in shrubland near the cable car maintenance path, 1 in shrubland on Nam Long Shan and 1 in tall shrubland near the Summit of Ocean Park);
- *Arundina graminifolia* (2 individuals recorded in tall shrubland near the Summit of Ocean Park);
- *Spathoglottis pubescens* (20 individuals recorded in shrubland near the cable car maintenance path, 2 individuals recorded in shrubland at Nam Long Shan);
- *Brainea insignis* (5 individuals recorded in shrubland near the cable car maintenance path);
- *Cymbidium ensifolium* (3 individuals recorded in the tall shrubland near the Summit of Ocean Park);
- *Eulophia graminea* (1 individual recorded in shrubland near the cable car maintenance path);
- *Geodorum densiflorum* (9 individuals recorded in shrubland near the cable car maintenance path, 6 individuals recorded in shrubland on Nam Long Shan, 3 individuals recorded in tall shrubland near the Summit);
- *Habenaria linguella* (5 individuals recorded in shrubland on Nam Long Shan);
- *Goodyera viridiflora* (28 individuals recorded in the tall shrubland near the Summit);

- *Habenaria dentata* (5 individuals recorded in the shrubland near the cable car maintenance path);
- *Ixonanthes reticulata* (1 individual recorded in the shrubland near the cable car maintenance path);
- *Lilium brownii* (1 individual recorded in shrubland near the cable car maintenance path and 11 individuals recorded in the tall shrubland near the Summit of Ocean Park);
- *Peristylus calcaratus* (22 individuals recorded in the tall shrubland near the Summit); and
- *Spiranthes hongkongensis* (27 individuals recorded in the hillside grassland on the Summit).

## 2.2 Impact Assessment for Flora Species of Conservation Interest in the EIA Report

As discussed in Section 10.6.2 of the EIA report, among the 17 flora species were of conservation interest recorded in the EIA study, only *Platycodon grandiflorus* is found distributed within the Project boundary. The six individuals of *Platycodon grandiflorus* is located at the southern end on the hillside of the Project area, which will not be affected by the construction activities. Nonetheless, some potential indirect disturbance might affect the plants, which include construction dust deposition on plants and storage / disposal of construction waste / materials in retained vegetated areas. Dust composition on plants could adversely interfere with the photosynthesis of plants while storage / disposal of construction waste / materials could cause physical or chemical damage to the plants. These construction disturbances are not uncommon in construction sites in Hong Kong, but could be effectively prevented through clear definition of site limit, good workmanship and regular site inspections. The significance of ecological impact on concerned plant species within the Project area is therefore considered as minor.

Nevertheless, in Section 10.7.1.4 of the EIA report, mitigation measures are recommended for potential impact on the *Platycodon grandiflorus* and any other flora species of conservation interest. Although direct removal of *Platycodon grandiflorus* is not expected as the hillside area where the individuals located will unlikely be used for the construction activities, in-situ preservation should be considered during construction phase. For precautionary purposes and to further ensure that no flora species of conservation interest to be affected, it is recommended to conduct a detailed vegetation survey as baseline monitoring to update the exact locations, number and condition of individuals of *Platycodon grandiflorus* prior to commencement of site clearance. A qualified botanist/ecologist with 5 years of experience in flora study or survey should be appointed to carry out the vegetation survey. The scope of the vegetation survey should include the following:

- Checking and updating of the number, locations and condition of the *Platycodon grandiflorus* identified and any other flora species of conservation interest by actively searching within the site formation boundary;
- Preparation of an updated location plan showing the individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified within the site formation boundary during the detailed vegetation survey;
- Confirmation on whether any of the individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified within the site formation boundary during the detailed vegetation survey will likely be affected by the proposed works of the Project; and
- Recommendation on protective measures of identified individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified within the site formation boundary during the detailed vegetation survey should *in situ* preservation be considered feasible. Otherwise, remedial actions, such as transplantation, should be proposed.

A Detailed Vegetation Survey Report summarising the findings and recommendations of the detailed vegetation survey should be prepared and submitted to EPD for approval no later than one month prior to commencement of site clearance.

During construction phase, erection and maintenance of a temporary protective fence along the flora species of conservation concern identified under the detailed vegetation survey is recommended to avoid potential impact from construction activities such as materials storage.

### **2.3 Environmental Monitoring and Audit Requirements**

Monthly monitoring of individuals of *Platycodon grandiflorus* and any other flora species of conservation interest identified in the detailed vegetation survey should be conducted during the construction phase to make sure that the flora species of conservation interest are not affected by the construction works of the Project.

## 3. Detailed Vegetation Survey

### 3.1 Survey Period

A detailed vegetation survey was undertaken from 8 August 2014 to 5 September 2014 within the Project boundary.

### 3.2 Survey Methodology

A detailed vegetation survey was conducted by actively searching for individuals of *Platycodon grandiflorus* and any other flora species of conservation interest within the Project boundary. Since all flora species of conservation interest identified in the EIA report were found in either shrubland, tall shrubland or grassland within the Study Area, particular attention was paid to these habitat types (as shown in **Figure 2.2**) during the detailed vegetation survey to actively search for any flora species of conservation interest.

The vegetation survey was carried out by a qualified ecologist with more than 5 years of experience in flora study. Curriculum vitae of the qualified ecologist is attached in **Appendix B** for reference.

The number and condition of *Platycodon grandiflorus* identified were recorded. The locations of the identified individuals of *Platycodon grandiflorus* were recorded with a Global Positioning System (GPS) device. Should other flora species of conservation interest be encountered during the detailed vegetation survey, their number, locations and condition were also recorded.

### 3.3 Survey Findings

In the detailed vegetation survey, two groups of *Platycodon grandiflorus* were identified at the southern periphery of the Project area on the hillside, one of which was previously recorded in the EIA report. The locations of these two groups of *Platycodon grandiflorus* are shown in **Figure 3.1** and their photographs are shown in **Plates 1 to 3** in **Appendix C**.

#### Group 1

This group of *Platycodon grandiflorus* is within the Project boundary and was recorded in the EIA report. It contains 8 stems growing close together, and it is therefore difficult to differentiate if these stems are all from different individuals. Among the 8 stems, one of them has finished flowering but shows no sign of fruiting; two are in bloom; three bearing flower buds; and the remaining two stems show no sign of flowering. The condition of this group of *Platycodon grandiflorus* is generally fair, but all eight stems are elongated, probably due to competition for sunlight with neighbouring vegetation.

#### Group 2

This group of *Platycodon grandiflorus* was not previously recorded in the EIA report. It is very close to but outside the Project boundary. It contains one flowering individual with one stem located upslope to the south of the first group. The condition of this individual is similar to those in the first group with elongated stem, probably due to competition for sunlight with neighbouring vegetation.

During the detailed vegetation survey, no flora species of conservation interest other than *Platycodon grandiflorus* has been identified within the Project boundary.



## 4. Recommendations

### 4.1 Protection of *Platycodon grandiflorus*

The two groups of *Platycodon grandiflorus*, which were identified at the southern periphery of the Project area on the hillside, are not anticipated to be directly affected by the Project as they are located on the hillside not directly affected by construction activities. One of them is within and the other one is adjacent to the Woodland Compensation Area as identified in the EIA report and shown in Figure 2 of the EP for the Project (EP-487/2014).

Preventive measures as recommended in **Section 10.7.1.4** of the EIA report is considered sufficient to ensure that the identified *Platycodon grandiflorus* will not be affected by the Project during construction phase. These preventive measures include the following:

- Erection and maintenance of a temporary protective fence surrounding the two groups of *Platycodon grandiflorus* identified during the detailed vegetation survey to avoid potential impact from construction activities such as materials storage;
- Monthly monitoring of the two groups of *Platycodon grandiflorus* identified during the detailed vegetation survey to make sure that they are not affected by the construction works of the Project.

The above preventive measures are recommended to be undertaken throughout the entire construction phase of the Project.

For the design of the temporary protective fence, chain-link fence is recommended for two major reasons:

- (i) the two groups of *Platycodon grandiflorus* identified show signs of intensive competition for sunlight with neighbouring vegetation. An enclosed protective fence with non-transparent material may partially block the sunlight, particularly at dawn and dusk, which will create a stressful condition for the two groups of *Platycodon grandiflorus* and may thereby affect their health;
- (ii) *Platycodon grandiflorus* is known to thrive in open areas in sunny condition with good air circulation. An enclosed protective fence will unavoidable affect air circulation near the protected *Platycodon grandiflorus* and may have adverse effect on their health. Therefore, chain-link fence is proposed to minimize blockage of available sunlight and maintain good air circulation.

To ensure that *Platycodon grandiflorus* are properly protected from construction activities, the size of the fenced-off area for each group of identified *Platycodon grandiflorus* is recommended to be at least 2m x 2m with the height of the fence no less than 1.5m. Signs alerting the construction workers that no construction activities are allowed within the fenced-off areas should be posted on the fences of all four sides of the 2m x 2m fenced-off zones. The indicative locations of the fenced-off zones are shown in Figure 4.1.

Since one of the two groups of *Platycodon grandiflorus* is within and the other one is adjacent to the Woodland Compensation Area as identified in the EIA report and shown in Figure 2 of the EP for the Project (EP-487/2014), it is recommended that the temporary protective chain-link fences should be maintained during the entire planting period of the woodland compensatory tree planting and no works, including planting works, should be carried out within the fenced-off zones to ensure that *Platycodon grandiflorus* will not be affected.

## **4.2 Protection of Other Flora Species of Conservation Interest**

No flora species of conservation interest other than *Platycodon grandiflorus* was recorded within the Project area during the detailed vegetation survey. Therefore, no direct impact on any flora species of conservation of interest other than *Platycodon grandiflorus* is anticipated. No additional protective / preventive / mitigation measure for flora species of conservation concern is required.

## **4.3 Environmental Monitoring and Audit Requirements**

Monthly monitoring of the two groups of *Platycodon grandiflorus* identified in this vegetation survey should be conducted during the construction phase to ascertain that the *Platycodon grandiflorus* individuals protected with proper protective measures and are not affected by the construction works of the Project.

## 5. Conclusion

### 5.1 Conclusion

In the detailed vegetation survey, two groups of *Platycodon grandiflorus* were identified within the Project area. Direct impact on these two groups of *Platycodon grandiflorus* due to the Project is not anticipated. As a preventive measure, it is recommended to erect and maintain a temporary protective fence surrounding these two groups of *Platycodon grandiflorus* to avoid potential impact from construction activities such as material storage. Also, monthly monitoring of the identified *Platycodon grandiflorus* throughout the construction phase is recommended to make sure that they are not affected by the construction works of the Project.

In the detailed vegetation survey, no flora species of conservation interest other than *Platycodon grandiflorus* was recorded within the Project area. No additional protective / preventive / mitigation measure for flora species of conservation interest is required.

## **Appendix A**

### **List of flora species recorded within the Project Boundary**

Flora species recorded within the project boundary

Scientific Names	Native to HK	Habit	Tall Shrubland	Woodland	Plantation	Stream	Pond	Shrubland	Bare Ground (Plantation Reinstatement)	Protection & Conservation Status
<i>Acacia auriculiformis</i>	No	T			+					
<i>Acacia confusa</i>	No	T			+++		++			
<i>Acronychia pedunculata</i>	Yes	T	++	++	+	+				
<i>Adenosma glutinosum</i>	Yes	H	+	+						
<i>Adiantum flabellulatum</i>	Yes	H			+					
<i>Ageratum conyzoides</i>	No	H			+	++	+		++	
<i>Aglaia odorata</i>	No	S			+					
<i>Alangium chinense</i>	Yes	T	++	+++	+					
<i>Albizia corniculata</i>	Yes	C	+	+				+		
<i>Allamanda schottii</i>	No	S			+					
<i>Alocasia macrorrhizos</i>	Yes	H			+					
<i>Alpinia zerumbet</i>	No	H			+					
<i>Alternanthera philoxeroides</i>	No	H					+++			
<i>Alyxia sinensis</i>	Yes	C	+	+				+		
<i>Ampelopsis cantoniensis</i>	Yes	C	+	+						
<i>Antirhea chinensis</i>	Yes	S	++	+	+					
<i>Apluda mutica</i>	Yes	H				+		+		
<i>Aporosa dioica</i>	Yes	T	+++	+++	+++					
<i>Araucaria heterophylla</i>	No	T					+			
<i>Archidendron lucidum</i>	Yes	T	+	+	++					
<i>Archontophoenix alexandrae</i>	No	T			+					
<i>Ardisia crenata</i>	Yes	S			+					
<i>Aristida chinensis</i>	Yes	H	+							
<i>Artocarpus hypargyreus</i>	Yes	T	+							
<i>Asparagus cochinchinensis</i>	Yes	C	+	+	+	++		++		
<i>Asparagus densiflorus</i>	No	H					++			
<i>Aster baccharoides</i>	Yes	H						+		
<i>Atalantia buxifolia</i>	Yes	S	+	+	+	+		++		
<i>Bambusa ventricosa</i>	No	B			++					
<i>Bambusa vulgaris</i>	No	B			++					
<i>Bauhinia blakeana</i>	Yes	T			+				+	
<i>Bauhinia championii</i>	Yes	C	+	+				++		
<i>Bauhinia purpurea</i>	No	T			+					
<i>Bauhinia variegata</i>	No	T			+					
<i>Berchemia floribunda</i>	Yes	C	++	++	++					
<i>Bidens alba</i>	No	H	++	++	++	+	+		++	
<i>Bougainvillea spectabilis</i>	No	S			+					
<i>Breynia fruticosa</i>	Yes	S	++	++	++	+		++		
<i>Bridelia tomentosa</i>	Yes	T, S	++	++	++	++		+		
<i>Brucea javanica</i>	Yes	S	++	+	++					
<i>Caesalpinia crista</i>	Yes	C			+					
<i>Cansjera rheedii</i>	Yes	C	+	+	+			+++		
<i>Carallia brachiata</i>	Yes	T	+	+						
<i>Caryota mitis</i>	No	S	+	+	+					
<i>Cassytha filiformis</i>	Yes	C	+	+	++	+		++		
<i>Casuarina equisetifolia</i>	No	T			++					
<i>Catharanthus roseus</i>	No	S					++			
<i>Celastrus hindsii</i>	Yes	C	++	+	+			+		
<i>Celtis sinensis</i>	Yes	T	++	+++	++	+	+	+	+	
<i>Celtis timorensis</i>	Yes	T	++	+						
<i>Choerospondias axillaris</i>	Yes	T		+	+					
<i>Cinnamomum burmannii</i>	Yes	T			+					
<i>Cinnamomum camphora</i>	Yes	T			+				+	
<i>Cleistocalyx nervosum</i>	Yes	T	+	+						
<i>Clerodendrum fortunatum</i>	Yes	S				+		+		
<i>Cocculus orbiculatus</i>	Yes	C	++	++	++	+		++		
<i>Cordyline fruticosa</i>	No	S			+					
<i>Cratoxylum cochinchinense</i>	Yes	T	++	++	++	+		++		
<i>Cuphea hyssopifolia</i>	No	H			+					
<i>Cuscuta australis</i>	Yes	H						+		
<i>Cyclea hypoglauca</i>	Yes	C			+					
<i>Cyclobalanopsis myrsinifolia</i>	Yes	T	+							
<i>Cyclosorus interruptus</i>	Yes	H					+			
<i>Cynodon dactylon</i>	Yes	H							++	
<i>Cyperus involucratus</i>	No	H					++			
<i>Cyrtococcum patens</i>	Yes	H	+	+						
<i>Dalbergia benthamii</i>	Yes	C	++	++	+			+		
<i>Dalbergia hancei</i>	Yes	C	++	++	++	+		+++		
<i>Delonix regia</i>	No	T	+	+			+			
<i>Dendrotrophe varians</i>	Yes	C	+							
<i>Desmos chinensis</i>	Yes	S	++	+	++					
<i>Dianella ensifolia</i>	Yes	H	++	+	++					
<i>Dicranopteris pedata</i>	Yes	H	+							
<i>Dimocarpus longan</i>	No	T	+	+	++	++				
<i>Diospyros vaccinioides</i>	Yes	S	++	++	++	+				
<i>Diploclisia glaucescens</i>	Yes	C			+			++		
<i>Diplospora dubia</i>	Yes	S	+		+					
<i>Dracaena marginata</i>	No	S					++			
<i>Dracaena reflexa</i>	No	S			++					
<i>Duhaldea cappa</i>	Yes	H	+			+				
<i>Duranta erecta</i>	No	S			+					
<i>Dyopsis lutescens</i>	No	S			+		+			
<i>Elephantopus tomentosus</i>	Yes	H			+	++				
<i>Embelia laeta</i>	Yes	S	+		+					
<i>Embelia ribes</i>	Yes	C	+							
<i>Emilia sonchifolia</i>	Yes	H	+	+	+			+		
<i>Epipremnum aureum</i>	No	C					+			
<i>Eremochloa ciliaris</i>	Yes	H						+		
<i>Erythrina variegata</i>	No	T					+			
<i>Eurya nitida</i>	Yes	S	++		++					

Flora species recorded within the project boundary

Scientific Names	Native to HK	Habit	Tall Shrubland	Woodland	Plantation	Stream	Pond	Shrubland	Bare Ground (Plantation Reinstatement)	Protection & Conservation Status
<i>Ficus elastica</i>	No	T			+					
<i>Ficus hirta</i>	Yes	S	++	+	+					
<i>Ficus hispida</i>	Yes	T, S	+	+	+			+		
<i>Ficus microcarpa</i>	Yes	T			+					
<i>Ficus subpisocarpa</i>	Yes	T					+			
<i>Ficus variegata</i>	Yes	T	+	+						
<i>Ficus variolosa</i>	Yes	S	+		++					
<i>Ficus virens</i>	Yes	T			+					
<i>Gahnia tristis</i>	Yes	H	+	+	+					
<i>Garcinia oblongifolia</i>	Yes	T			+					
<i>Garcinia subelliptica</i>	No	T					+			
<i>Gardenia jasminoides</i>	Yes	S	+							
<i>Glochidion eriocarpum</i>	Yes	S	+	+	++					
<i>Gnetum luofuense</i>	Yes	C	+++	+	++					
<i>Gonocarpus chinensis</i>	Yes	H	+							
<i>Gymnema sylvestre</i>	Yes	C	+		+			+++		
<i>Hedyotis acutangula</i>	Yes	H	+	+	+					
<i>Hedyotis auricularia</i>	Yes	H			+			+		
<i>Hedyotis consanguinea</i>	Yes	H	+	+						
<i>Hedyotis corymbosa</i>	Yes	H			+					
<i>Helicteres angustifolia</i>	Yes	S	+					+		
<i>Heterosmilax japonica</i>	Yes	C	+		+	+				
<i>Hibiscus rosa-sinensis</i>	No	S					++			
<i>Hibiscus tiliaceus</i>	Yes	T, S	+	+						
<i>Homalium cochinchinense</i>	Yes	T	+	+	+	+				
<i>Hymenocallis littoralis</i>	No	H			+					
<i>Ilex asprella</i>	Yes	S	++	++	++					
<i>Ilex pubescens</i>	Yes	S	+	+	+					
<i>Ipomoea cairica</i>	No	C	+	+	+					
<i>Iris japonica</i>	No	H			+					
<i>Ischaemum barbatum</i>	Yes	H						+		
<i>Itea chinensis</i>	Yes	T	+	+						
<i>Ixora chinensis</i>	Yes	S					++			
<i>Ixora stricta</i>	No	S			+					
<i>Koelreuteria bipinnata</i>	No	T							+++	
<i>Kyllinga nemoralis</i>	Yes	H					++			
<i>Lagerstroemia speciosa</i>	No	T			+					
<i>Lantana camara</i>	No	S			+					
<i>Lasia spinosa</i>	No	H					+			
<i>Leucaena leucocephala</i>	No	T	++	++	++	++			+++	
<i>Liriope spicata</i>	Yes	H	++	+	++	+		++		
<i>Lithocarpus hancei</i>	Yes	T	+							
<i>Litsea glutinosa</i>	Yes	T	++	++	+	+		++		
<i>Litsea rotundifolia</i>	Yes	S	++	+	++	++		+++		
<i>Livistona chinensis</i>	No	T			+		+++			
<i>Lophatherum gracile</i>	Yes	H	+	+						
<i>Lygodium japonicum</i>	Yes	C	++	+	+					
<i>Macaranga tanarius</i>	Yes	T	++	++	++	+	+++			
<i>Mallotus paniculatus</i>	Yes	T, S	++	++	++			++		
<i>Mallotus repandus</i>	Yes	S	+	+	+					
<i>Melastoma sanguineum</i>	Yes	S	+							
<i>Melia azedarach</i>	No	T	+	+	+					
<i>Melinis repens</i>	No	H	+		+				+++	
<i>Melodinus suaveolens</i>	Yes	C	++	+						
<i>Microcos nervosa</i>	Yes	S	++	+	++	++				
<i>Mikania micrantha</i>	No	C	+	+	+					
<i>Millettia nitida</i>	Yes	C	+	+	+					
<i>Millettia reticulata</i>	Yes	C	+					+		
<i>Mimosa pudica</i>	No	H							++	
<i>Miscanthus floridulus</i>	Yes	H	+	+		+				
<i>Miscanthus sinensis</i>	Yes	H	+		+				+	
<i>Monstera deliciosa</i>	No	S					+			
<i>Morinda parvifolia</i>	Yes	C			+	+		+		
<i>Murraya paniculata</i>	No	S	+		+			+		
<i>Mussaenda pubescens</i>	Yes	C	+	+	+					
<i>Neyraudia reynaudiana</i>	Yes	H	+							
<i>Paederia scandens</i>	Yes	C	++	+	++			+		
<i>Pandanus austrosinensis</i>	Yes	H			+					
<i>Pandanus utilis</i>	No	T					+			
<i>Panicum maximum</i>	No	H	+	+	++				+++	
<i>Parthenocissus dalzielii</i>	No	C			+					
<i>Passiflora foetida</i>	No	C	+		+				+	
<i>Philodendron selloum</i>	No	H					++			
<i>Phoenix loureiroi</i>	Yes	S	+		+			+		
<i>Phyllanthus cochinchinensis</i>	Yes	S	+++	++	++					
<i>Phyllanthus emblica</i>	Yes	T, S						+		
<i>Phyllanthus myrtifolius</i>	No	S					++			
<i>Phyllanthus reticulatus</i>	Yes	S			+					
<i>Pinus massoniana</i>	Yes	T	+		+					
<i>Pittosporum glabratum</i>	Yes	S	+		+					
<i>Platycodon grandiflorus</i>	Yes	H						+		C96, RP
<i>Podocarpus macrophyllus</i>	Yes	T							+	
<i>Polyscias balfouriana</i>	No	S			+					
<i>Polyspora axillaris</i>	Yes	T, S	++	++	++	+		+		
<i>Psychotria asiatica</i>	Yes	S	+++	++	++	++				
<i>Psychotria serpens</i>	Yes	C	+	+	+	+				
<i>Pteris biaurita</i>	Yes	H	+							
<i>Pteris semipinnata</i>	Yes	H	+	+	++					
<i>Pteris vittata</i>	Yes	H	+		+					
<i>Pyrostegia venusta</i>	No	C			+		++			

Flora species recorded within the project boundary

Scientific Names	Native to HK	Habit	Tall Shrubland	Woodland	Plantation	Stream	Pond	Shrubland	Bare Ground (Plantation Reinstatement)	Protection & Conservation Status
<i>Reevesia thyrsoidea</i>	Yes	T	+	+						
<i>Rhaphiolepis indica</i>	Yes	S	++	+	+	+		++		
<i>Rhapis excelsa</i>	No	S			+					
<i>Rhodomyrtus tomentosa</i>	Yes	S	+	+						
<i>Rhus hypoleuca</i>	Yes	T, S	+	+	+	+				
<i>Rhus succedanea</i>	Yes	T, S	+	+	++	+				
<i>Ricinus communis</i>	No	S	+						++	
<i>Sageretia thea</i>	Yes	S	+++	++	++	++	+	+++		
<i>Sansevieria trifasciata</i>	No	H			+		++			
<i>Sapium discolor</i>	Yes	T	++	++	++			+		
<i>Schefflera arboricola</i>	No	S			+		+			
<i>Schefflera heptaphylla</i>	Yes	T	++	+++	++	++		+		
<i>Schima superba</i>	Yes	T	+	+	++					
<i>Scleria ciliaris</i>	Yes	H	+		+			+		
<i>Sinosideroxylon wightianum</i>	Yes	T	+	+						
<i>Solanum americanum</i>	No	H					+			
<i>Solanum torvum</i>	No	S			+		+			
<i>Spathodea campanulata</i>	No	T			+					
<i>Spermacoce stricta</i>	Yes	H	+		+					
<i>Stachytarpheta jamaicensis</i>	No	S	+		+		+			
<i>Stephania longa</i>	Yes	C			+					
<i>Sterculia lanceolata</i>	Yes	T	+++	+++	+++	+++		++		
<i>Strophanthus divaricatus</i>	Yes	C	+	+	++			++		
<i>Strychnos angustiflora</i>	Yes	C	+	+	++	+		++		
<i>Syzygium jambos</i>	No	T	+	+	+				+++	
<i>Syzygium levinei</i>	Yes	T							+	
<i>Tadehagi triquetrum</i>	Yes	S	+	+						
<i>Tetracera asiatica</i>	Yes	C	++	+						
<i>Tetradium glabrifolium</i>	Yes	T		+						
<i>Teucrium quadrifarium</i>	Yes	S	+					+		
<i>Thunbergia erecta</i>	No	S			+					
<i>Thysanolaena latifolia</i>	Yes	H	+							
<i>Toxocarpus wightianus</i>	Yes	C						+		
<i>Tradescantia zebrina</i>	No	H					++			
<i>Trema tomentosa</i>	Yes	S	+	+	++					
<i>Tylophora ovata</i>	Yes	C	+	+	+	+				
<i>Urena lobata</i>	Yes	H	+	+						
<i>Uvaria macrophylla</i>	Yes	C			+	+				
<i>Veratrum schindleri</i>	Yes	H			+					
<i>Vernicia montana</i>	No	T			+					
<i>Vernonia cinerea</i>	Yes	H	+	+						
<i>Vitex negundo</i>	Yes	S	+	+						
<i>Wedelia trilobata</i>	No	H	+	+	+	+	+++	+	++	
<i>Wikstroemia indica</i>	Yes	S			+	++		+		
<i>Youngia japonica</i>	Yes	H			+		+			
<i>Zanthoxylum avicennae</i>	Yes	T	++	++	++	+		++		
<i>Zanthoxylum nitidum</i>	Yes	C			+					
<b>Total No. of Plant Species</b>			131	99	148	43	37	52	18	

Notes:

Relative Abundance:

+++ = High Abundance, plants common in the habitat; ++ = Medium Abundance, plants occasionally occur in the habitat; + = Low Abundance, plants uncommon in the habitat

Native to Hong Kong: Yes = Native species; No = Exotic species

Habit: T = Tree; S = Shrub / Sub-shrub; C = Climber; H = Herb; B = Bamboo

Protection & Conservation Status:

C96 = Listed under Cap. 96

C586 = Scheduled under Cap. 586

RP = Listed in *Rare and Precious Plants of Hong Kong* (AFCD, 2003)

RA = species ranked as *Rare* in "*Hong Kong Vascular Plants: Distribution and Status*" (Corlett et al, 2000)

LC = status of *Least Concern* in "*The Wild Orchids of Hong Kong*" (Baretto et al, 2011)

NT = status of *Near Threatened* in "*The Wild Orchids of Hong Kong*" (Baretto et al, 2011)

VU = status of *Vulnerable* in "*The Wild Orchids of Hong Kong*" (Baretto et al, 2011)

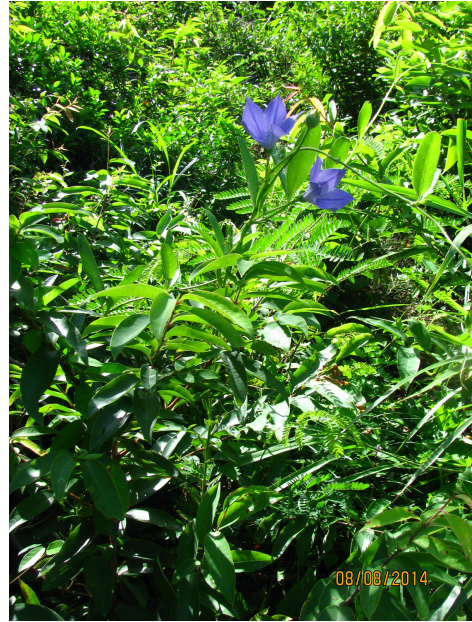
EN = status of *Endangered* in "*The Wild Orchids of Hong Kong*" (Baretto et al, 2011)

**Appendix B**  
**Curriculum Vitae of the Qualified Ecologist (Removed)**

**Appendix C**  
**Photographic Record of Detailed Vegetation Survey**



**Plate 1:** *Platycodon grandiflorus* in Group 1



**Plate 2:** *Platycodon grandiflorus* in Group 1

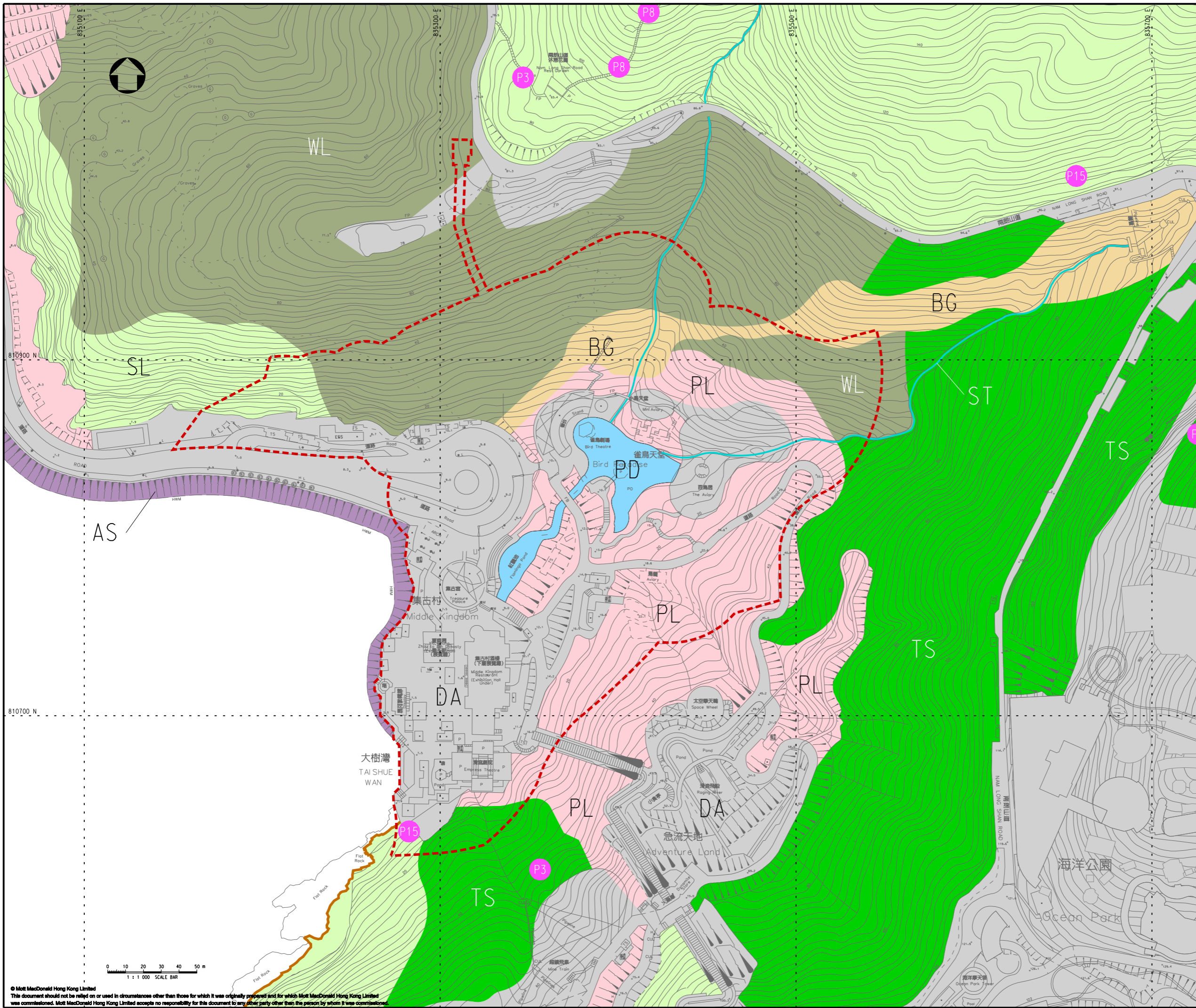


**Plate 3:** *Platycodon grandiflorus* in Group 2



**Plate 4:** Shrubland habitat of *Platycodon grandiflorus* within Project boundary





**Notes**

CODE	SCIENTIFIC NAME	CODE	SCIENTIFIC NAME
P1	<i>Ania hongkongensis</i>	P10	<i>Habenaria dentata</i>
P2	<i>Aristolochia thwaitesii</i>	P11	<i>Habenaria linguella</i>
P3	<i>Artocarpus hypargyreus</i>	P12	<i>Ixanthes reticulata</i>
P4	<i>Arundina graminifolia</i>	P13	<i>Lilium brownii</i>
P5	<i>Brainea insignis</i>	P14	<i>Peristylus calcaratus</i>
P6	<i>Cymbidium ensifolium</i>	P15	<i>Platycodon grandiflorus</i>
P7	<i>Eulophia graminea</i>	P16	<i>Spathoglottis pubescens</i>
P8	<i>Geodorum densiflorum</i>	P17	<i>Spiranthes hongkongensis</i>
P9	<i>Goodyera viridiflora</i>		

**Key to symbols**

- PROJECT BOUNDARY
- LOCATION OF PLANT SPECIES OF CONSERVATION INTEREST
- WOODLAND
- TALL SHRUBLAND
- SHRUBLAND
- PLANTATION
- STREAM
- POND
- BARE GROUND
- HILLSIDE GRASSLAND
- DEVELOPED AREA
- ARTIFICIAL SHORE
- ROCKY SHORE

P1	SEP 14	MING	FIRST ISSUE		HY	AFK
Rev	Date	Drawn	Description		Ch'kd	App'd

20/F Two Landmark East  
100 How Ming Street  
Kowloon, Kowloon  
Hong Kong  
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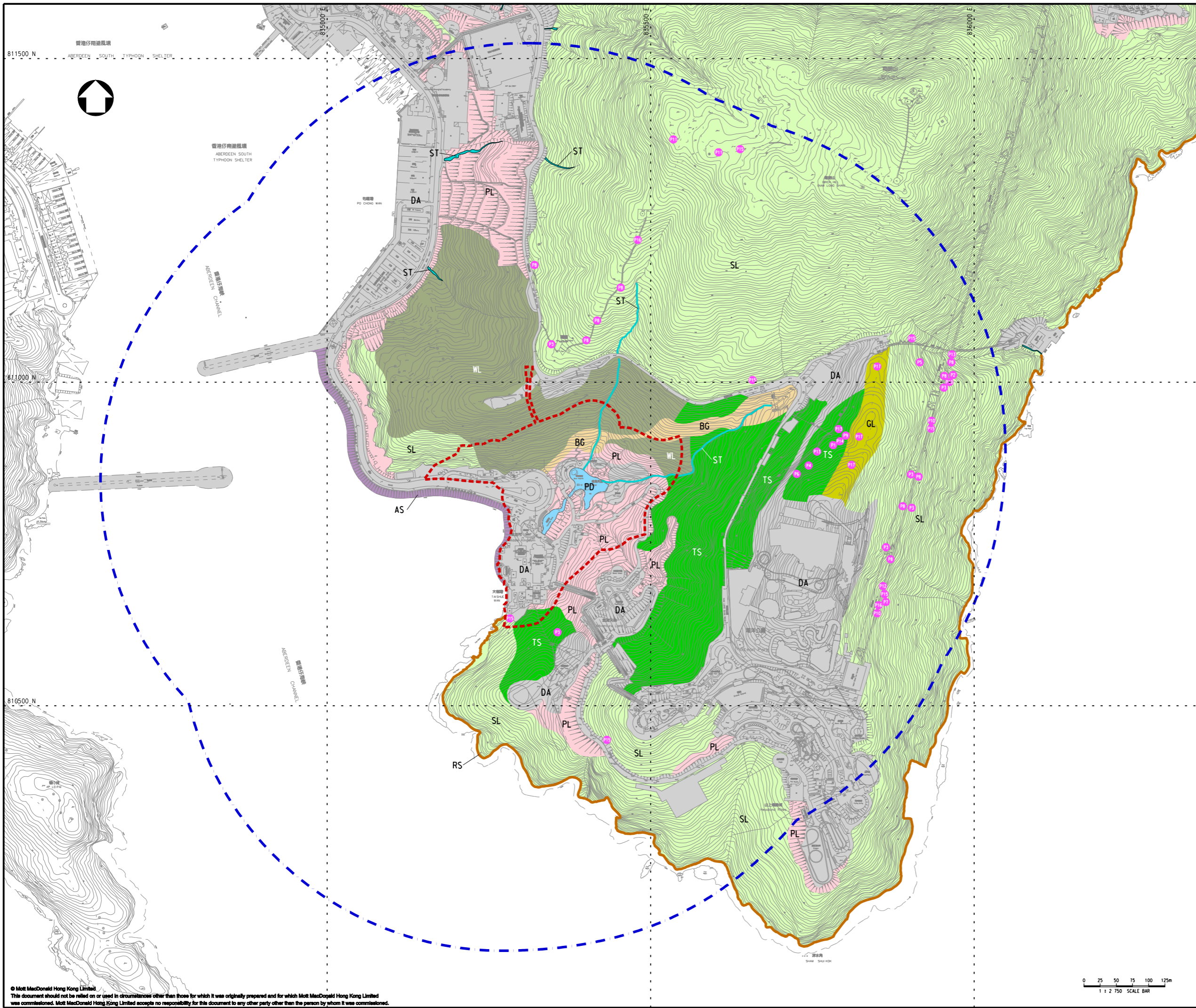
Client

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

Title  
**HABITAT MAP AND LOCATION OF SPECIES OF CONSERVATION INTEREST WITHIN THE PROJECT BOUNDARY**

Designed	HY	Eng check	FW
Drawn	MING	Coordination	FW
Dwg check	HY	Approved	AFK
Scale at A1	1:1000	Status	PRE
Rev			P1

Drawing Number **FIGURE 2.1**



**Notes**

CODE	SCIENTIFIC NAME	CODE	SCIENTIFIC NAME
P1	<i>Ania hongkongensis</i>	P10	<i>Habenaria dentata</i>
P2	<i>Aristolochia thwaitesii</i>	P11	<i>Habenaria linguella</i>
P3	<i>Artocarpus hypargyreus</i>	P12	<i>Ixonanthes reticulata</i>
P4	<i>Arundina graminifolia</i>	P13	<i>Lilium brownii</i>
P5	<i>Brainea insignis</i>	P14	<i>Peristylus calcaratus</i>
P6	<i>Cymbidium ensifolium</i>	P15	<i>Platycodon grandiflorus</i>
P7	<i>Eulophia graminea</i>	P16	<i>Spathoglottis pubescens</i>
P8	<i>Geodorum densiflorum</i>	P17	<i>Spiranthes hongkongensis</i>
P9	<i>Goodyera viridiflora</i>		

**Key to symbols**

- 500m ASSESSMENT AREA
- PROJECT BOUNDARY
- LOCATION OF PLANT SPECIES OF CONSERVATION INTEREST
- WOODLAND
- TALL SHRUBLAND
- SHRUBLAND
- PLANTATION
- STREAM
- POND
- BARE GROUND
- HILLSIDE GRASSLAND
- DEVELOPED AREA
- ARTIFICIAL SHORE
- ROCKY SHORE

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Rev	Date	Drawn	Description	Ch'k'd	App'd

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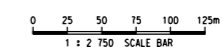
Client

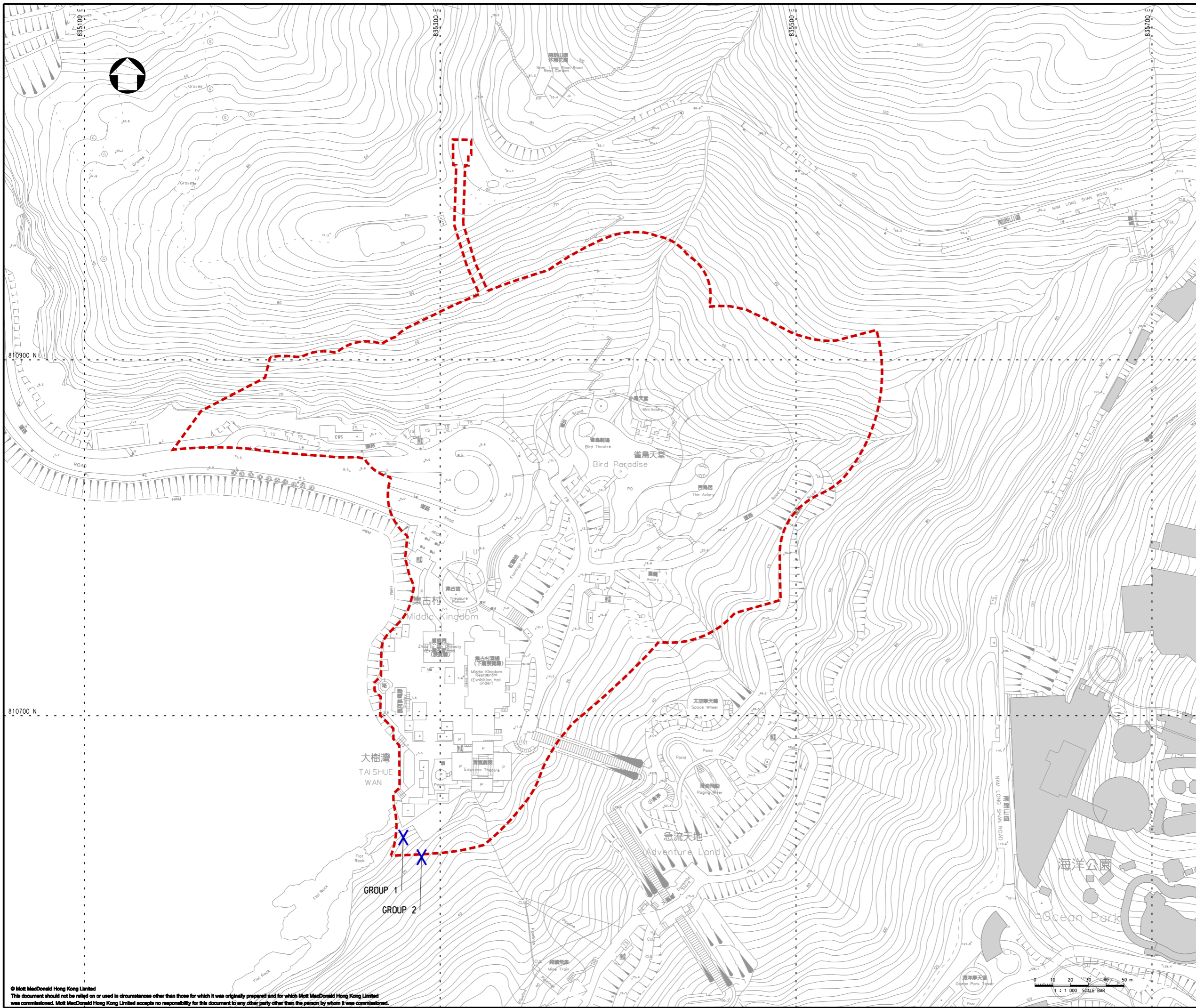
Project  
**TAI SHUE WAN DEVELOPMENT  
AT OCEAN PARK**

Title  
**HABITAT MAP AND LOCATION  
OF SPECIES OF CONSERVATION  
INTEREST WITHIN THE EIA STUDY  
AREA**

Designed	HY	Eng check	FW
Drawn	MING	Coordination	FW
Dwg check	HY	Approved	AFK
Scale at A1	1:2750	Status	PRE
Rev			P1

Drawing Number  
**FIGURE 2.2**





**Notes**

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**Key to symbols**

--- PROJECT BOUNDARY

X PLATYCODON GRANDIFLORUS

**Reference drawings**

Rev	Date	Drawn	Description	Ch'kd	App'd
P1	AUG 14	MING	FIRST ISSUE	PK	AFK

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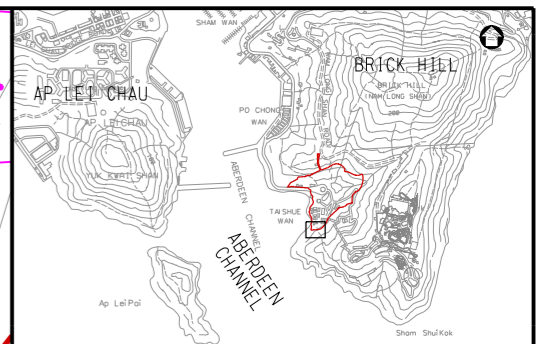
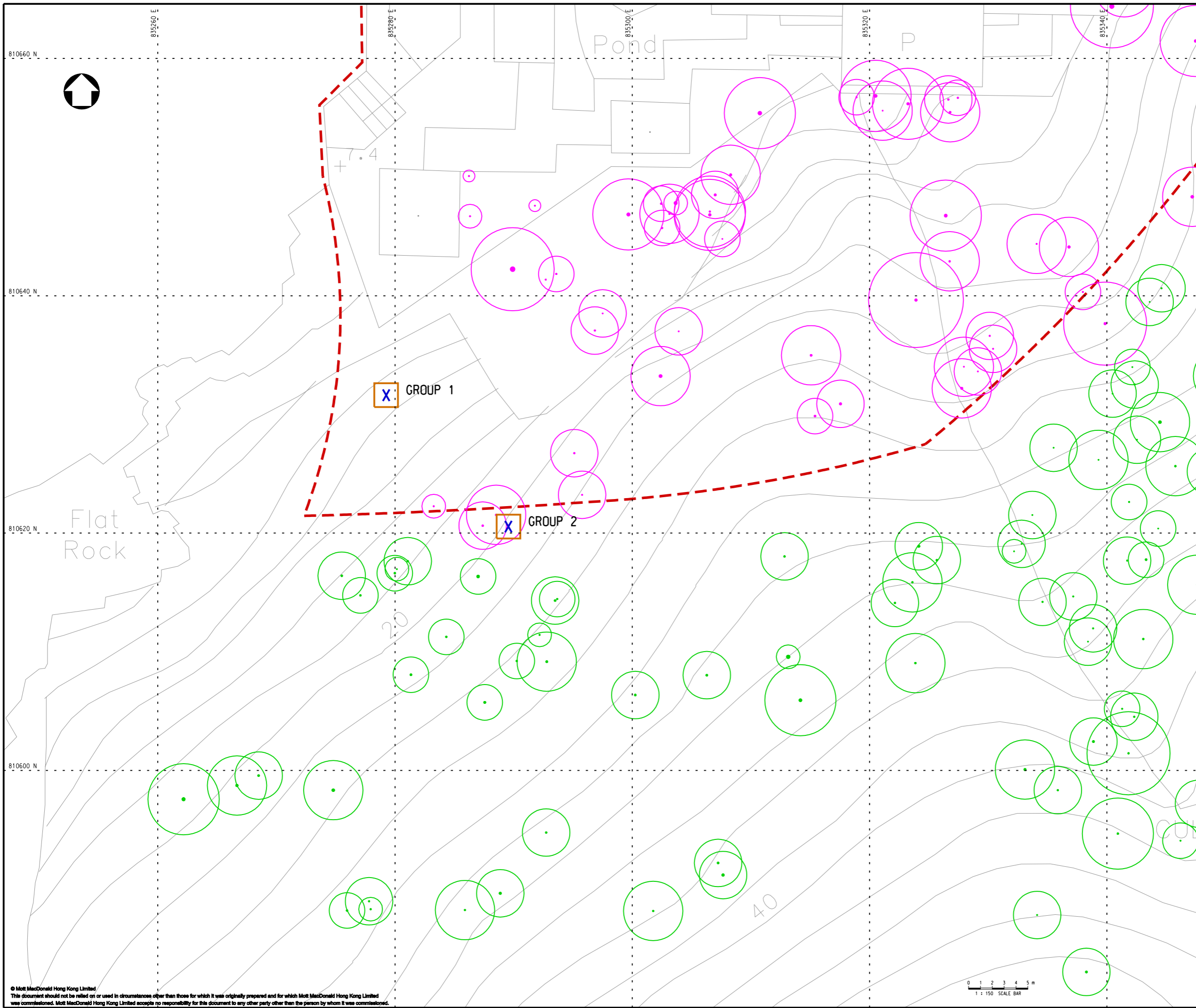
**Project**

**TAI SHUE WAN DEVELOPMENT  
AT OCEAN PARK**

**Title**

**LOCATIONS OF PLATYCODON  
GRANDIFLORUS WITHIN  
THE PROJECT BOUNDARY**

Designed	PK	Eng check	FW
Drawn	MING	Coordination	FW
Dwg check	PK	Approved	AFK
Scale at A1	1:1000	Status	PRE
Rev			P1
Drawing Number	<b>FIGURE 3.1</b>		



**KEY PLAN**  
(1:20000)

- - - PROJECT BOUNDARY
- X PLATYCODON GRANDIFLORUS
- TEMPORARY PROTECTIVE FENCE
- EXISTING TREE TO BE RETAINED
- EXISTING TREE TO BE FELLED

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	SEP 14	MING	GENERAL REVISION	PK	AFK
P1	SEP 14	MING	FIRST ISSUE	PK	AFK

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Client

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

Title  
**LOCATIONS OF FENCED-OFF ZONES  
FOR PLATYCODON GRANDIFLORUS  
WITHIN THE PROJECT BOUNDARY**

Designed	PK	Eng check	FW
Drawn	MING	Coordination	FW
Dwg check	PK	Approved	AFK
Scale at A1	1:150	Status	PRE
Rev			P2
Drawing Number	<b>FIGURE 4.1</b>		

