

**Field Survey Report
for Proposed Building Expansion
of DTTB Project at Lamma Island**

**(For Specific Condition 2.4,
Environmental Permit No. EP-261/2006)**

8th September 2009

Prepared By:
ADI Limited



**DAVID S.K. AU &
ASSOCIATES LTD.**

Project Title **Proposed Building Expansion of DTTB Project at Lamma Island**

Report Title **Field Survey Report for the Proposed Building Expansion of DTTB Project
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Date of Issue **8th September 2009**


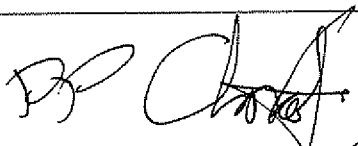
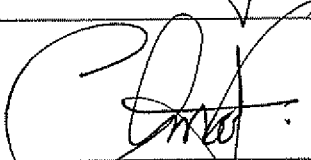
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1.0 INTRODUCTION

1.1 Background

- 1.1.1 David S. K. Au and Associates Limited have been appointed by the Asia Television Limited (ATV) as their consultant to undertake the proposed design and oversee the construction of the Television Station in Ling Kok Shan Television Transmitting Station, Lamma Island. This report has been prepared in accordance with Environmental Permit No. EP-261/2006, Part C and the specific condition stated in paragraph 2.4 '*Before commencement of construction of the Project, a field survey shall be conducted to ascertain any presence of rare or protected plant species within and close to the Project Site.*' This specifically relates to the identification of specimens of *Artocarpus hypargyreus* which shall be protected from disturbance during the construction phase of the project. ADI Limited has been appointed to prepare the Field Survey Report.
- 1.1.2 The subject site is located on Ling Kok Shan (Lamma Island) slightly to the south of the summit as shown in Site Location Plan in Figure 1. A further survey was undertaken by an Ecologist on 2nd July 2009 to identify any potential rare or protected species beyond the specimens of *Artocarpus hypargyreus* already identified in previous surveys. The survey was undertaken by China – HK Ecology Consultants with the Landscape Consultant (ADI Limited) in attendance.

1.2 Purpose of the Report

- 1.2.1 The purpose of this submission in accordance with Environmental Permit No. EP-261/2006, Part C and the specific condition stated in paragraph 2.4 is as follows:
- To present the field survey findings about the presence or not of rare or protected plant species within or close to the Project site (re. EP Condition 2.4); and
 - To show the locations of plant species *Artocarpus hypargyreus* and to provide detailed designs for the protection measures for the plant species *Artocarpus hypargyreus* (re. EP Condition 2.3).
- 1.2.3 The previously completed assessment of the existing trees and shrubs of the species *Artocarpus hypargyreus* within the Project Area was verified again on site during May 2009. Currently the works on site have been on hold since October 2008 following the completion of the Site Formation Contract. The findings of the field survey will inform the recommendations regarding the treatment of the existing specimens of *Artocarpus hypargyreus* designated as a protected plant species within and in close proximity to the Project site. The purpose of this report is to identify each specimen and suggest a means for its protection throughout the construction phase of the project.
- 1.2.2 In addition to the previous survey works undertaken a further vegetation survey was conducted on the 2nd July 2009 to determine if there were any other rare or protected species of plants present within the site or in the area immediately adjacent to it.

2.0 SITE DESCRIPTION

- 2.1 The site is situated on the summit of Ling Kok Shan in Lamma Island within a "Conservation Area" (CA) according to the Lamma Island Outline Zoning Plan No. S/I-LI/8. The South Lamma Island SSSI is located approximately 1.4 km to the west of the proposed extension site.
- 2.2 The existing landscape of the area is characterised by a combination of low scrub

and thin coarse grassland. Whilst a thin, intermittent woodland plantation consisting of largely exotic species is located along the southern boundary fence of the existing transmitting station probably planted as part of the mitigation for the existing facilities.

- 2.3 The existing facility comprises two existing transmission buildings and two antenna towers situated at the peak. The building in grey blue at the eastern side of the peak is TVB transmitting station (the height of the main building is 248.7mPD and the associated antenna 249.4mPD with an adjacent transposer tower of 258.3mPD). The light green building at the western side of the peak is RTHK/FM transmission building used for ATV, Metro Radio, Commercial Radio and RTHK transmission. The main building is 248.9mPD and the antenna 269mPD). The facility is accessed via a steep trail extending from Ta Shui Wan or via a footpath from Mo Tat Old Village. The proposed site is located at the southern side of the existing RTHK/FM transmission building, at the southern slope of the peak. The approximate application site area is 163m². A narrow concrete pathway located to the south of the existing TV transmitting stations provides access up the hillside.
- 2.4 The southern slope where the proposed extension site is located is clothed by thin scrubland slope intermixed with exposed rocky boulders along the southern edge of a moderately steep slope colonized mostly coarse grasses, scrubs and trees.

3.0 PROPOSED DEVELOPMENT

- 3.1 The proposed scheme will be constructed adjacent to a group of existing TV transmitting stations which are currently in operation. The transposer station would comprise of a 2-storey-building and an antenna tower, approximately 15m, on the roof of the building. The building area would be approximately 130.5m² with top of the antenna reaching 269mPD. There may be some minor adjustments to footpaths for foot access to the station due to the project, but these works would be minor in nature and would only be undertaken in the immediate vicinity of the structure. No other works such as slope stabilization will be involved with the proposed transposer station construction.

4.0 EXISTING VEGETATION

- 4.1 The field survey was undertaken in two phases the first phase identified the presence of *Artocarpus hypargyreus* in or immediately adjacent to the Project Area and the second phase was undertaken by an Ecologist to identify any other rare or protected plant species within or close to the Project Area. The boundary for the survey extended some 5m from the Project Area.
- 4.2 As previously reported the first phase of the filed survey identified five specimens of *Artocarpus hypargyreus* within the site being located between the existing facility and the proposed extension area, and to the south of the proposed extension area. *Artocarpus hypargyreus* (Silver-back Artocarpus) is a native species listed amongst the Rare and Precious Plants of Hong Kong in AFCD Hong Kong Herbarium; it is worthy of note and protection. The location of the five specimens of this plant species of conservation importance are shown on Figure 2 – Plant Location Plan and photographs of the plants presented as Figures 3 – 6 – Current Status of Protected Plants.
- 4.3 Table 4.1 below provides details of the five specimens of *Artocarpus hypargyreus* identified on site. The schedule contained in Appendix I also provides more details concerning the condition of the existing plants.

Table 4.1 Survey of Existing Specimens of *Artocarpus hypargyreus*

Ident. Code	Diameter of Main Stem	Height of Plant	Canopy / Foliage Spread	Plant Condition
T1	0.23m	3.0m	4.0m	Fair as originally recorded in the tree survey report for the conducted in November 2006
T2A	0.02m	1.4m	0.4m	Fair condition
T3A	0.01m	1.08m	0.10m	Fair condition
T4A	0.05m	1.7m	1.10m	Good Condition
T5A	0.02m	0.77m	0.58m	Good condition

- 4.4 It should be noted that each of the specimens has lost some foliage however this is due to wind exposure (the site is an exposed location) during the winter season. This is evident in the loss of foliage on one side of specimen T1 which coincides with the direction of the prevailing wind, and the loss of foliage is evident in all of the specimens. During the site verification survey in May 2009 new growth was observed at the leaf buds revealed suggesting that the plants are now recovering as part of the normal phenological cycle.
- 4.5 Phase two of the filed survey examined the Project Area and an area some 5m from the boundary of the works to determine the existence of any additional rare and protected plant species. This survey found an additional 50 number species of plants within the area surveyed. Of these species *Diospyros vacciniodes* identified as T6A was to be mentioned on the IUCN Red List of Threatened Species and is recorded as critically endangered. Details of this species contained on the website for the Red List are provided as Appendix IV - IUCN Red List Citation for *Diospyros vacciniodes*. The location of this specimen is indicated on Figure 2 Plant Location Plans showing the location of the plants identified in the survey and photographs of the plants in question are shown on Figure 11 and 12 Supplementary Field Survey Photographs. It is understood that none of the other plant species identified in the survey are rare or protected.
- 4.6 Table 4.2 below provides details of the plant species identified and their relative abundance.

Table 4.2 Survey of Existing Plant Species

Family	Botanical Name	Chinese Name	Form	Relative Abundance	Notes
Anacardiaceae	<i>Rhus succedanea</i>	野漆樹	S	++	
Anacardiaceae	<i>Rhus hypoleuca</i>	白背漆	S	+	
Apocynaceae	<i>Strophanthus divaricatus</i>	羊角拗	C/S	++	
Apocynaceae	<i>Alyxia sinensis</i>	念珠藤	C	+	
Aquifoliaceae	<i>Ilex asprella</i>	梅葉冬青	S	+	
Aquifoliaceae	<i>Ilex pubescens</i>	毛冬青	S	+	
Araliaceae	<i>Schefflera heptaphylla</i>	鴨腳木	T	+	

Family	Botanical Name	Chinese Name	Form	Relative Abundance	Notes
Asteraceae	<i>Aster baccharoides</i>	白舌紫菀	S	+	
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊	S/C	++	
Asteraceae	<i>Senecio stauntonii</i>	閩粵千里光	S	+	
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊	S	+	
Daphniphyllaceae	<i>Daphniphyllum oldhami</i>	交讓木	S	+	
Dilleniaceae	<i>Tetracera asiatica</i>	錫葉藤	C	+	
Ebenaceae	<i>Diospyros vaccinioides</i>	小果柿	S	+	Listed as "Vulnerable" under IUCN Red List of Threatened Species
Euphorbiaceae	<i>Phyllanthus cochinchinensis</i>	越南叶下珠	S	+	
Euphorbiaceae	<i>Breynia fruticosa</i>	黑面神	S	+	
Euphorbiaceae	<i>Glochidion eriocarpum</i>	毛果算盤子	S	+	
Euphorbiaceae	<i>Sapium discolor</i>	山烏柏	S	+	
Fabaceae	<i>Millettia reticulata</i>	雞血藤	C/S	+	
Fabaceae	<i>Millettia speciosa</i>	牛大力	S	+	
Gleicheniaceae	<i>Dicranopteris pedata</i>	芒萁	S	+	
Gramineae	<i>Cymbopogon goeringii</i>	香港吉草	S	+	
Gramineae	<i>Rhynchelytrum repens</i>	紅毛草	S	+	
Gramineae	<i>Miscanthus floridulus</i>	五節芒	S	+	
Lauraceae	<i>Litsea rotundifolia</i>	豺皮樟	S	+	
Lauraceae	<i>Litsea glutinosa</i>	潺槁樹	T/S	+	
Lauraceae	<i>Cassytha filiformis</i>	無根藤	C	+	
Liliaceae	<i>Dianella ensifolia</i>	山菅蘭	S	+	
Liliaceae	<i>Asparagus cochinchinensis</i>	天門冬	S	+	
Lygodiaceae	<i>Lygodium japonicum</i>	海金沙	C	+	
Melastomataceae	<i>Melastoma sanguineum</i>	毛椴	S	+	
Mimosaceae	<i>Acacia confusa</i>	台灣相思	T	+	
Moraceae	<i>Ficus variolosa</i>	變葉榕	S	+	
Moraceae	<i>Artocarpus hypargyreus</i>	白桂木	T/S	+	Class III protected at mainland China Listed as

Family	Botanical Name	Chinese Name	Form	Relative Abundance	Notes
					"Vulnerable" under IUCN red list of Threatened Species
Myrsinaceae	<i>Embelia laeta</i>	酸藤果	S	+	
Myrtaceae	<i>Rhodomyrtus tomentosa</i>	桃金娘	S	+	
Rosaceae	<i>Rhaphiolepis indica</i>	車輪梅	S	+	
Rubiaceae	<i>Psychotria serpens</i>	葡萄九節	C	+	
Rubiaceae	<i>Hedyotis acutangula</i>	方骨草	S	+	
Rubiaceae	<i>Psychotria asiatica</i>	九節	S	+	
Rubiaceae	<i>Gardenia jasminoides</i>	梔子	S	+	
Rutaceae	<i>Zanthoxylum avicennae</i>	筍欖花椒	S	+	
Rutaceae	<i>Severinia buxifolia</i>	酒餅筍	S	+	
Smilacaceae	<i>Smilax glabra</i>	光葉菝葜	C	+	
Sterculiaceae	<i>Helicteres angustifolia</i>	山芝麻	S	+	
Sterculiaceae	<i>Sterculia lanceolata</i>	假蘋婆	S	+	
Theaceae	<i>Gordonia axillaris</i>	大頭茶	T/S	+	
Theaceae	<i>Eurya chinensis</i>	崗茶	S	+	
Thymelaeaceae	<i>Wikstroemia indica</i>	了哥王	S	+	
Verbenaceae	<i>Lantana camara</i>	馬纓丹	S	+	
Verbenaceae	<i>Vitex rotundifolia</i>	白背蔓荊	S	+	

Notes: + Occurred T Tree
 ++ Common S Shrub
 +++ Abundant C Climber

5.0 PLANT PROTECTION MEASURES

5.1 The five specimens of *Artocarpus hypargyreus* (T1 and T2A to T5A) will be protected within a cordon area surrounded by a wire mesh fence in accordance with the details indicated in Figures 7-10 Tree Protection Measures. However as the works are currently suspended on site pending the commencement of the Superstructure Contract a temporary protective fence has been erected for specimens T2A to T5A. These fences are shown on Figures 3 to 6 Current Status of Protected Plants. These temporary fences will be replaced by chain link fencing similar to that used for T1 prior to the commencement of the Super Structure contract when a helicopter is available to transport the materials to site. It is

considered that the temporary fencing is adequate at this time as no construction works are currently underway. The protection works will remain in place until the end of the Superstructure Works.

- 5.2 The preserved specimen plants shall be protected during the construction works in accordance with the Particular Specification for Tree Protection Works (Appendix II refers). The tree protection measures for specimen T1 use the extent of the existing crown as a guide to the tree protection area. The recommendations for the smaller specimen plants T2A to T5A is that the protection fence be erected at a distance of 2m from the central stem of the plant. T2A and T3A are closely located and so the protective fence for these plants will encircle both specimens.
- 5.3 The specimen of *Diospyros vacciniodes* identified as T6A in the Phase 2 survey will also be protected using the same detail as the one used for specimens T2A to T5A. Photographs of the temporary protection works are presented as Figure 12. Transplantation of this specimen may be considered if there is conflict with the proposed works subject to the prior approval of the relevant government departments. If this is required a separate submission will be for the transplantation of the identified plant prior to the commencement of the transplanting works.

6.0 CONCLUSION

- 6.1 The first phase of the field survey of the proposed site and the immediate vicinity revealed the presence of five specimens of *Artocarpus hypargyreus* within the site and immediately adjacent to it. *Artocarpus hypargyreus* is listed under the Rare and Precious Plants of Hong Kong in AFCD Hong Kong Herbarium and is specifically protected as part of the Environmental Permit for the project. The verification survey undertaken in May 2009 found that all of the plants are intact and healthy although there has been some foliage loss due to wind exposure of the winter which is part of the normal growth cycle. New growth was observed at the leaf buds during the verification survey.
- 6.2 The second phase of the field survey which looked for the existence of other rare or protected plant species in or immediately adjacent to the Project Area identified one specimen of *Diospyros vacciniodes* identified as T6A. This species is mentioned in the IUCN Red List of Threatened Species and is recorded as critically endangered. The remainder of the survey area contained no rare or protected plant species.
- 6.3 Protection measures have been constructed for all of the specimens of *Artocarpus hypargyreus* and these will be upgraded prior to the commencement of the Super Structure Contact with new chain link fencing. The specimen of *Diospyros vacciniodes* identified as T6A will be protected using the same method as the other protected plants. These protective measures will be maintained in place until the completion of the construction works and the health and condition of the plants carefully monitored.

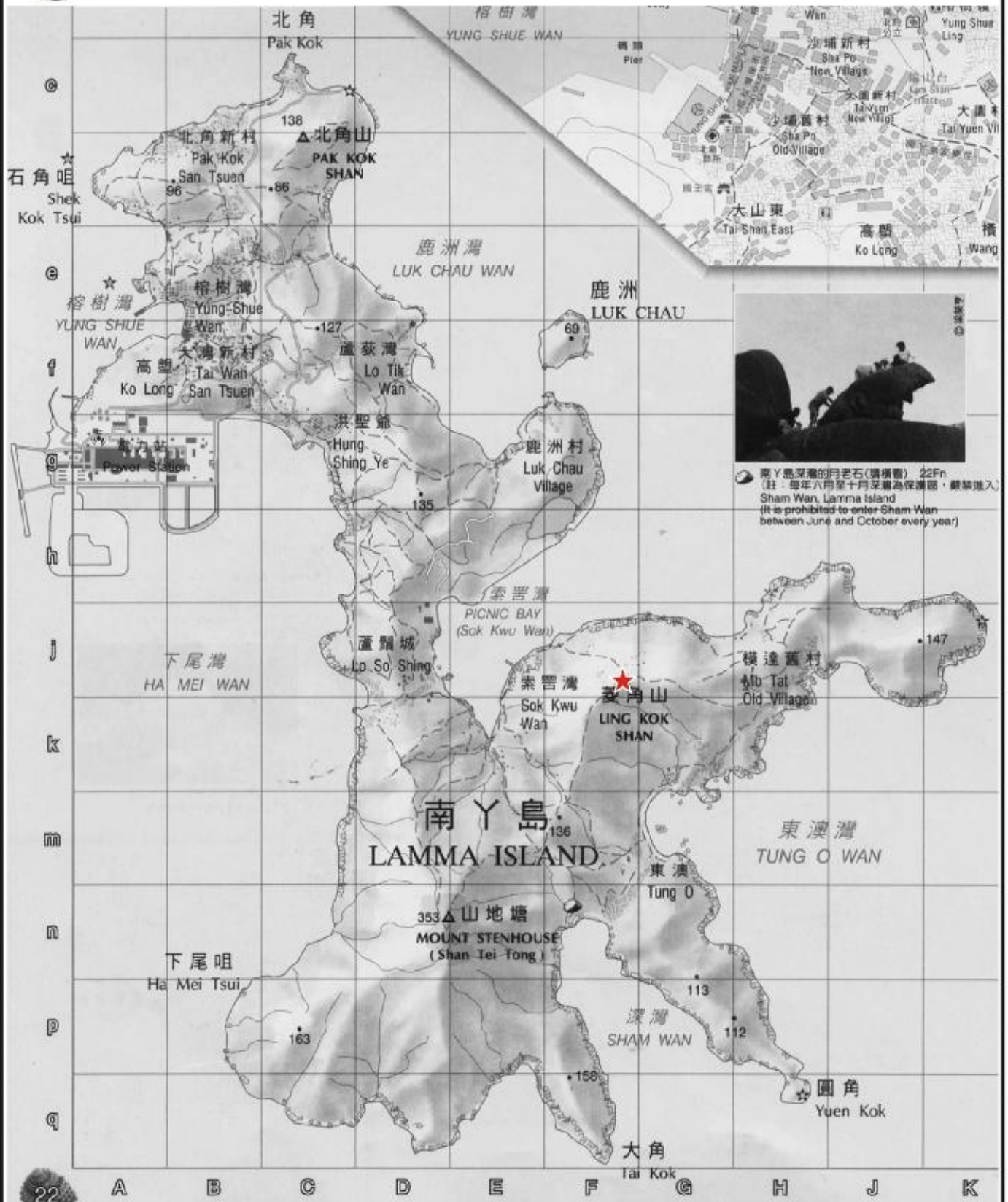
REFERENCES

- AFCD Register of Special Areas and Site of Special Scientific Interest
Rare and Precious Plants of Hong Kong, Hong Kong Herbarium,
www.hkherbarium.net
- IUCN IUCN Red List of Threatened Species
<http://www.iucnredlist.org>

Figures

Figure I

Site Location Plan



南丫島深灣的月老石(騎橫石) 22Fm
 (註：每年八月至十月深灣為保護區，嚴禁進入)
 Sham Wan, Lamma Island
 (it is prohibited to enter Sham Wan
 between June and October every year)

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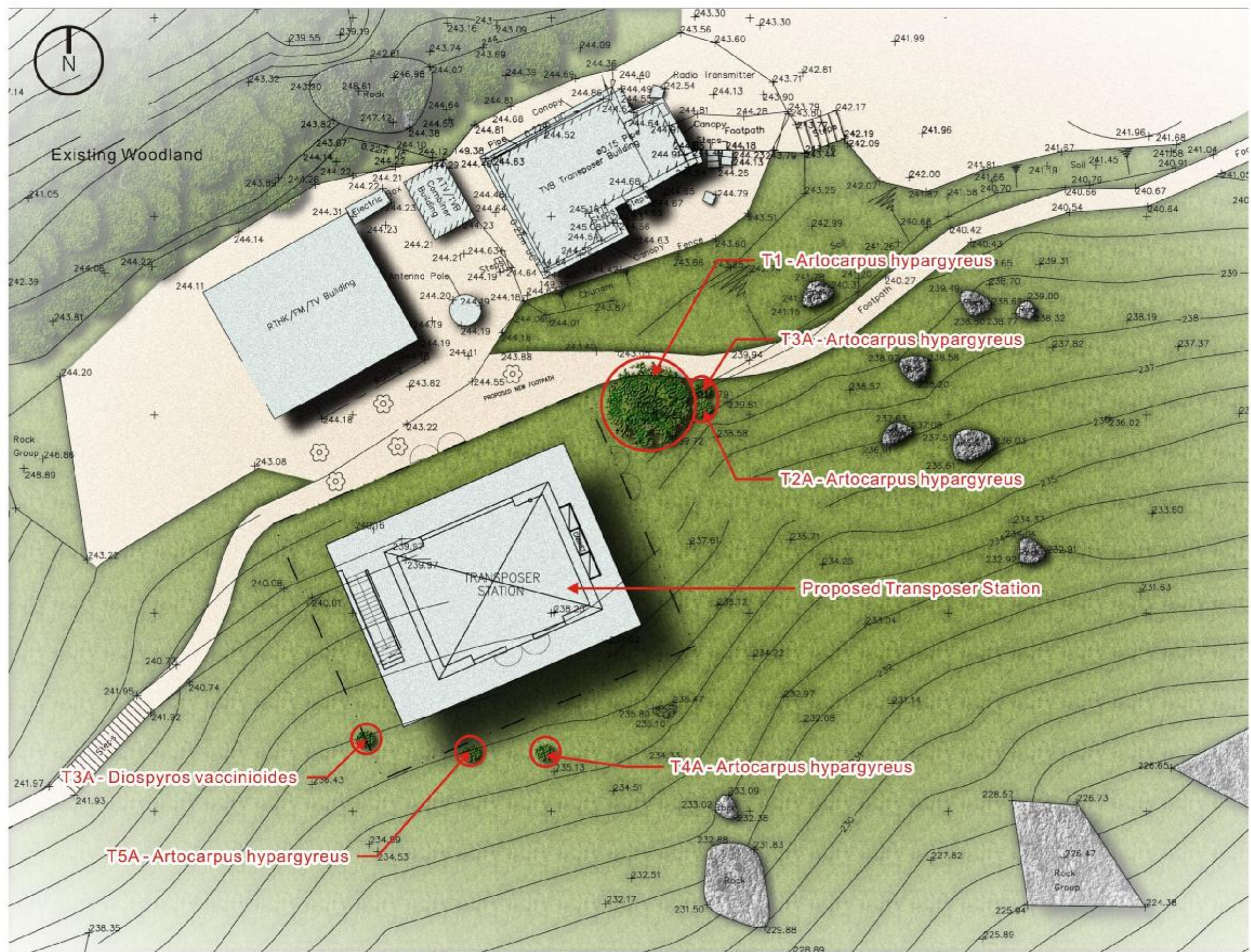


PROPOSED BUILDING EXPANSION OF DTTB PROJECT AT LAMMA ISLAND	SCALE	N.T.S.	DATE	20 NOV 2006
	CHECKED	CJF	DRAWN	NOC
	FIGURE NO.	Figure 1		
			REV	



Figure 2

Plant Location Plan



- Legend**
-  Preserved Plants
 -  Plant Protection Zone

Note: Detailed plant protection measures to be refer to Figure TVBL03A-TP2 to TP5

Proposed Building Expansion of DTTB Project at Lamma Island
Plants Location Plan

SCALE	N.T.S.	DATE	08 JUL 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TVBL03A/TL01		REV D



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Figures 3 to 6

Current Status of Protected Plants



T1 with Tree Protection Fence



T1 with Tree Protection Fence

R-Retain T-Transplant F-Fell D-Dead Tree

Proposed Building Expansion of DTTB
Project at Lamma Island

Current Status of Protected Plants

SCALE	N.T.S.	DATE	14 MAY 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TV/BL03A/PR1		REV
			-





T2A(A)



T3A



T2A and T3A Plant Protection Fence

R-Retain T-Transplant F-Fell D-Dead Tree

Proposed Building Expansion of DTTB
Project at Lamma Island

Current Status of Protected Plants

SCALE	N.T.S.	DATE	14 MAY 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TV3L03A/PR2		REV
			-





T4A



T4A with Plant Protection Fence

R-Retain T-Transplant F-Fell D-Dead Tree

Proposed Building Expansion of DTTB
Project at Lamma Island

Current Status of Protected Plants

SCALE	N.T.S.	DATE	14 MAY 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TV/BL03A/PR3		REV
			-





T5A



T5A with Plant Protection Fence

R-Retain T-Transplant F-Fell D-Dead Tree

Proposed Building Expansion of DTTB
Project at Lamma Island

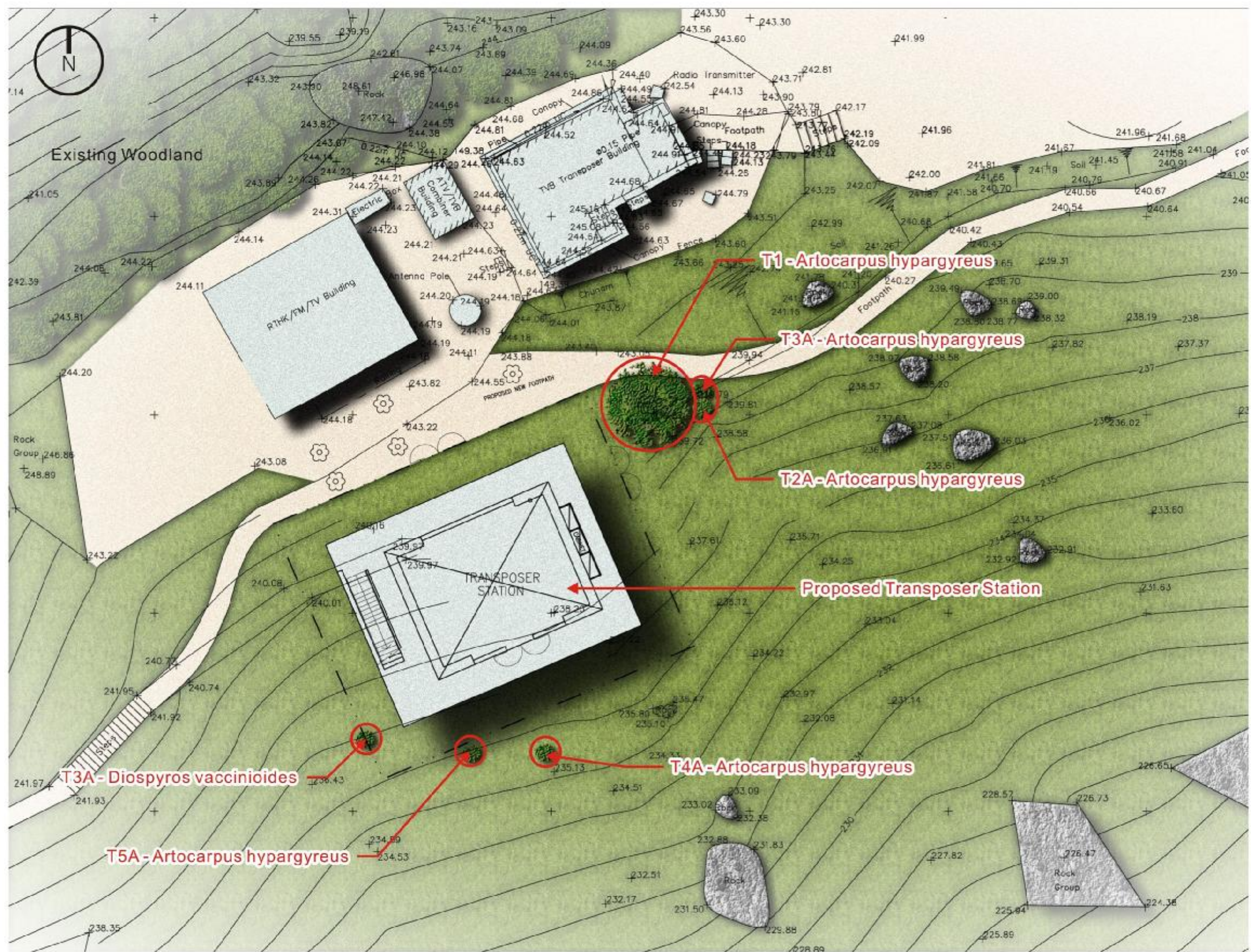
Current Status of Protected Plants

SCALE	N.T.S.	DATE	14 MAY 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TV/BL03A/PR4		REV
			-



Figures 7 to 10

Tree Protection Measures



- Legend**
-  Preserved Plants
 -  Plant Protection Zone

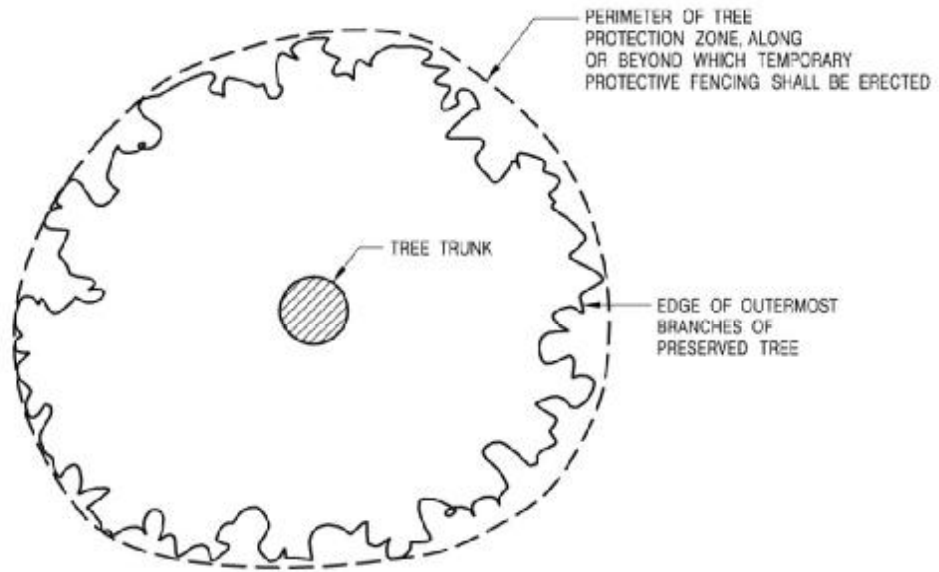
Note: Detailed plant protection measures to be refer to Figure TVBL03A-TP2 to TP5

Proposed Building Expansion of DTTB Project at Lamma Island
Plants Protection Measures

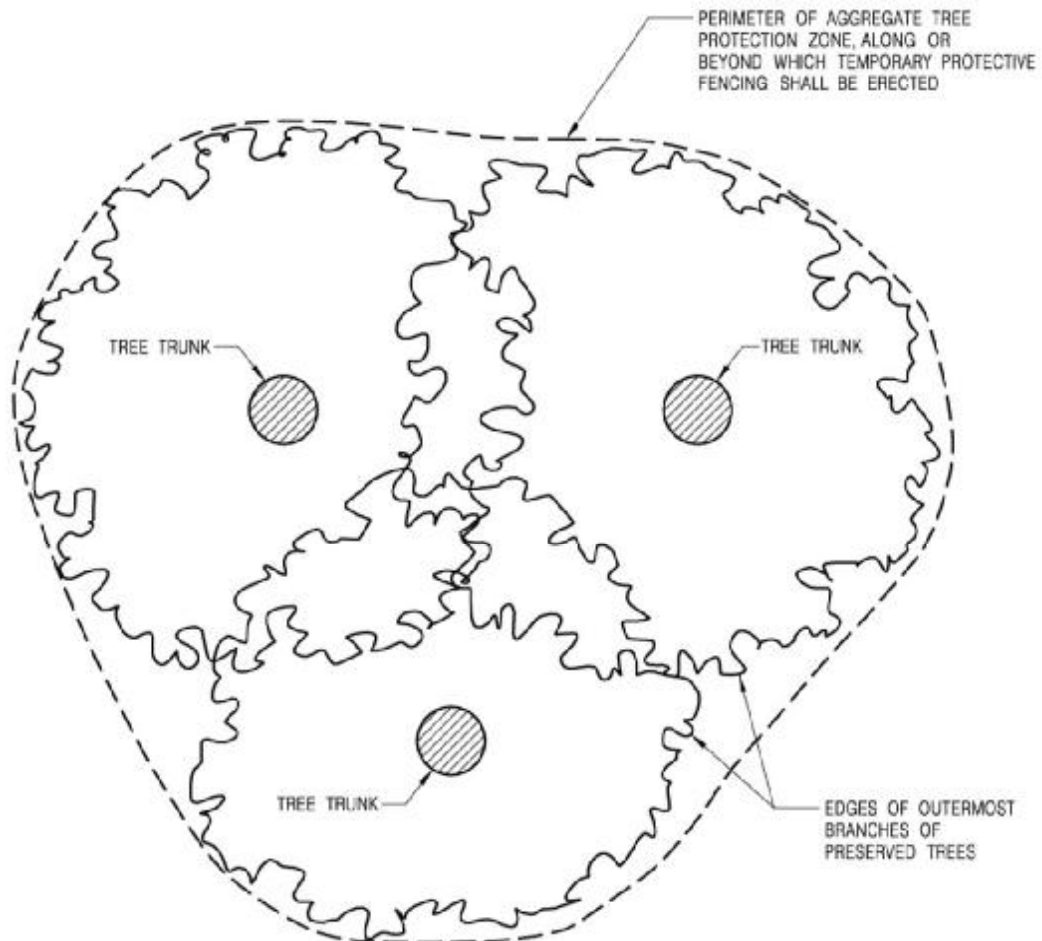
SCALE	N.T.S.	DATE	08 JUL 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TVBL03A/TP01		REV D



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PLAN - INDIVIDUAL TREE
(DIAGRAMMATIC)



PLAN - GROUP OF TREES
(DIAGRAMMATIC)

Proposed Building Expansion of DTTB Project at Lamma Island

SCALE

N.T.S.

DATE

09 OCT 2008

CHECKED

CJF

DRAWN

EIK

Tree Protection Measures

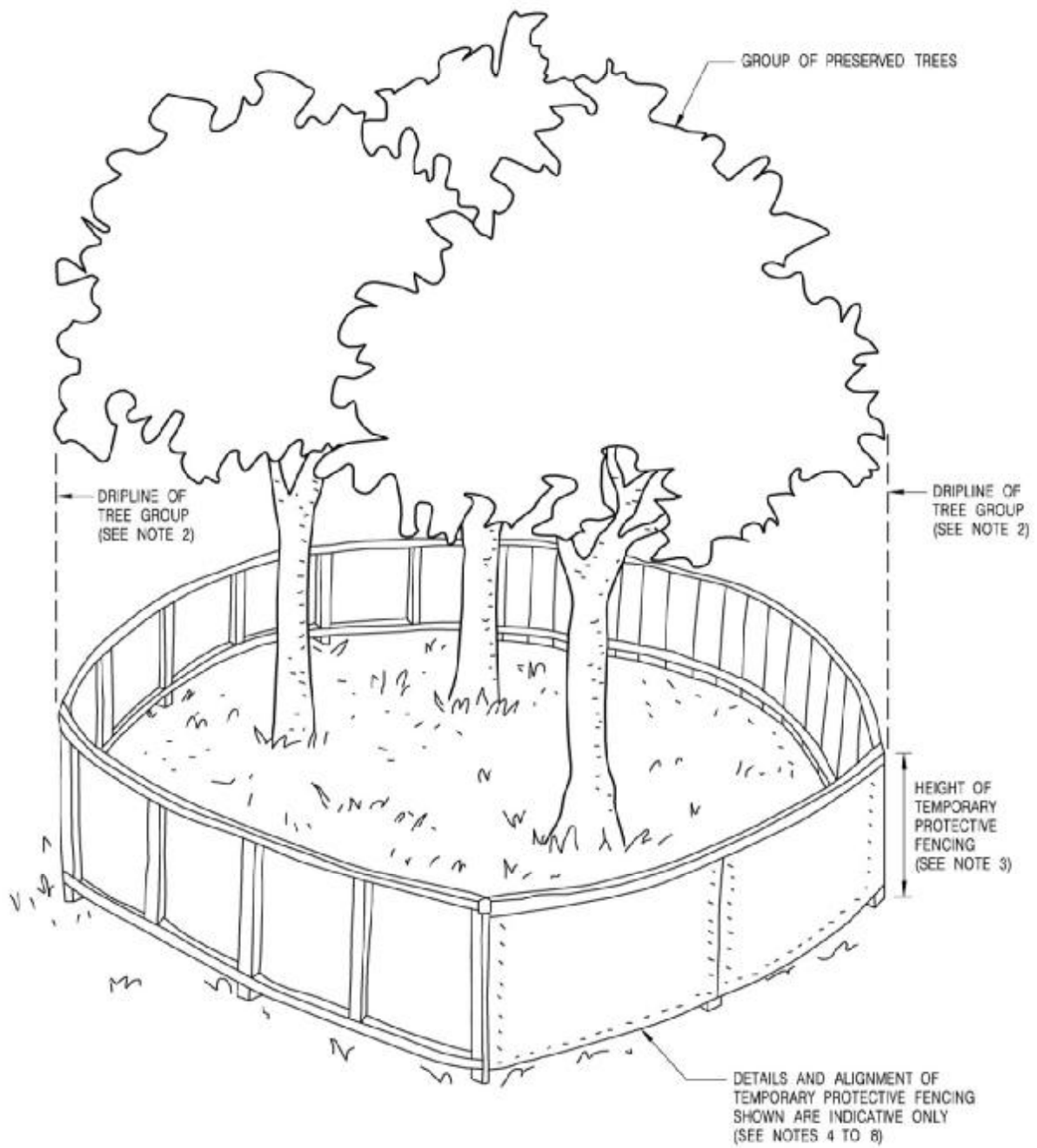
FIGURE NO.

TVBL03A/TP2


REV

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ADI




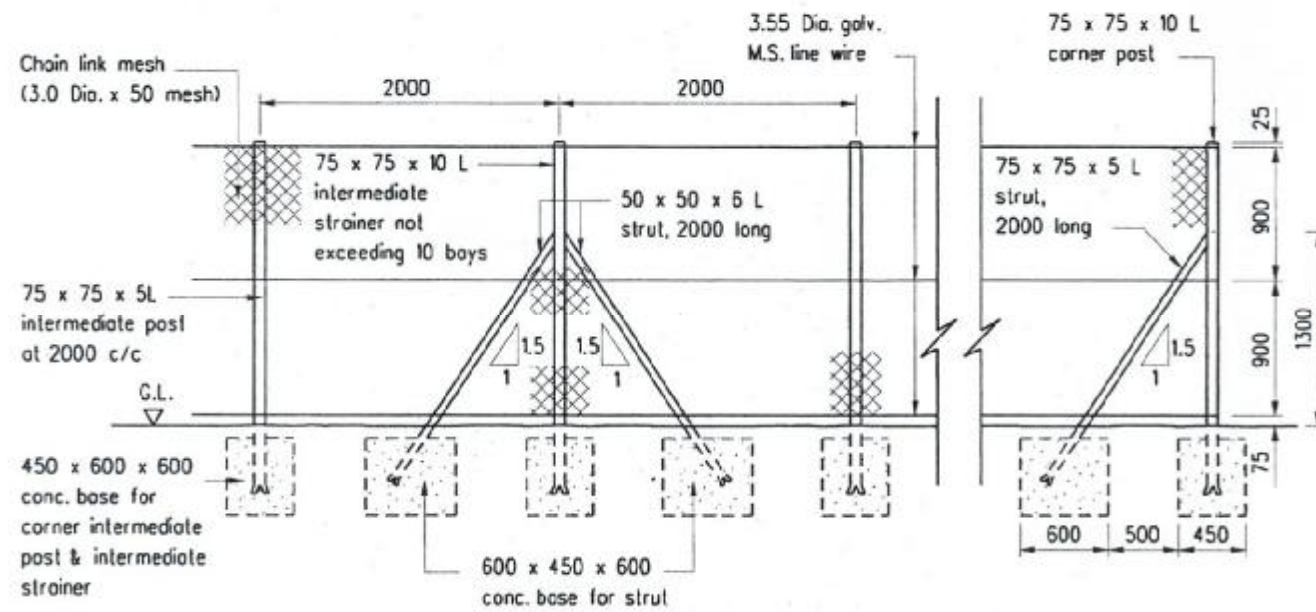
PERSPECTIVE - GROUP OF TREES
(DIAGRAMMATIC)

Proposed Building Expansion of DTTB Project at Lamma Island	SCALE	N.T.S.	DATE	09 OCT 2008	
	CHECKED	CJF	DRAWN	EIK	
	FIGURE NO.	TVBL03A/TP3		REV	
Tree Protection Measures					

Notes:

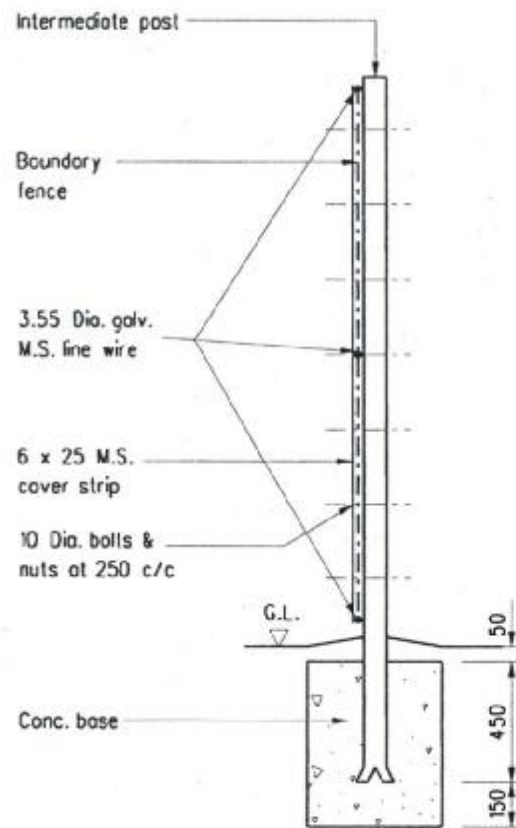
1. All dimensions in millimetres unless otherwise specified.
2. Extent of Tree Protection Zone for the retained and tree determined by extent of existing crown.
3. Height of temporary chain link fencing shall be a minimum of 2000mm in height.
4. Temporary protective fencing shall be strong and appropriate for resisting the impacts of construction activities on site. It shall be made of robust materials and shall comprise of well braced and supporting chain link fencing. Fencing will be erected prior to the commencement of construction activity and removed the cessation of construction activity.
5. The alignment of the temporary protective fencing can be circular, square rectangular or any shape so long as the fencing does not encroach on the Tree Protection Zone.
6. A lockable gate shall be provided to the temporary protective fencing to allow entry for carrying out the necessary arboricultural works or maintenance works to the tree or any other approved works within the Tree Protection Zone.
7. A warning notice guarding against unauthorized operations within the fenced area shall be erected on the temporary protective fencing.
8. The contractor shall submit the construction details of the temporary protective fencing to the Architect for approval prior to erection of fencing.

Proposed Building Expansion of DTTB Project at Lamma Island Tree Protection Measures	SCALE	N.T.S.	DATE	09 OCT 2008	
	CHECKED	CJF	DRAWN	EIK	
	FIGURE NO.			REV	
	TVBL03A/TP4			-	



ELEVATION OF INTERMEDIATE POST
INTERMEDIATE STRAINER & CORNER POST

(NTS)

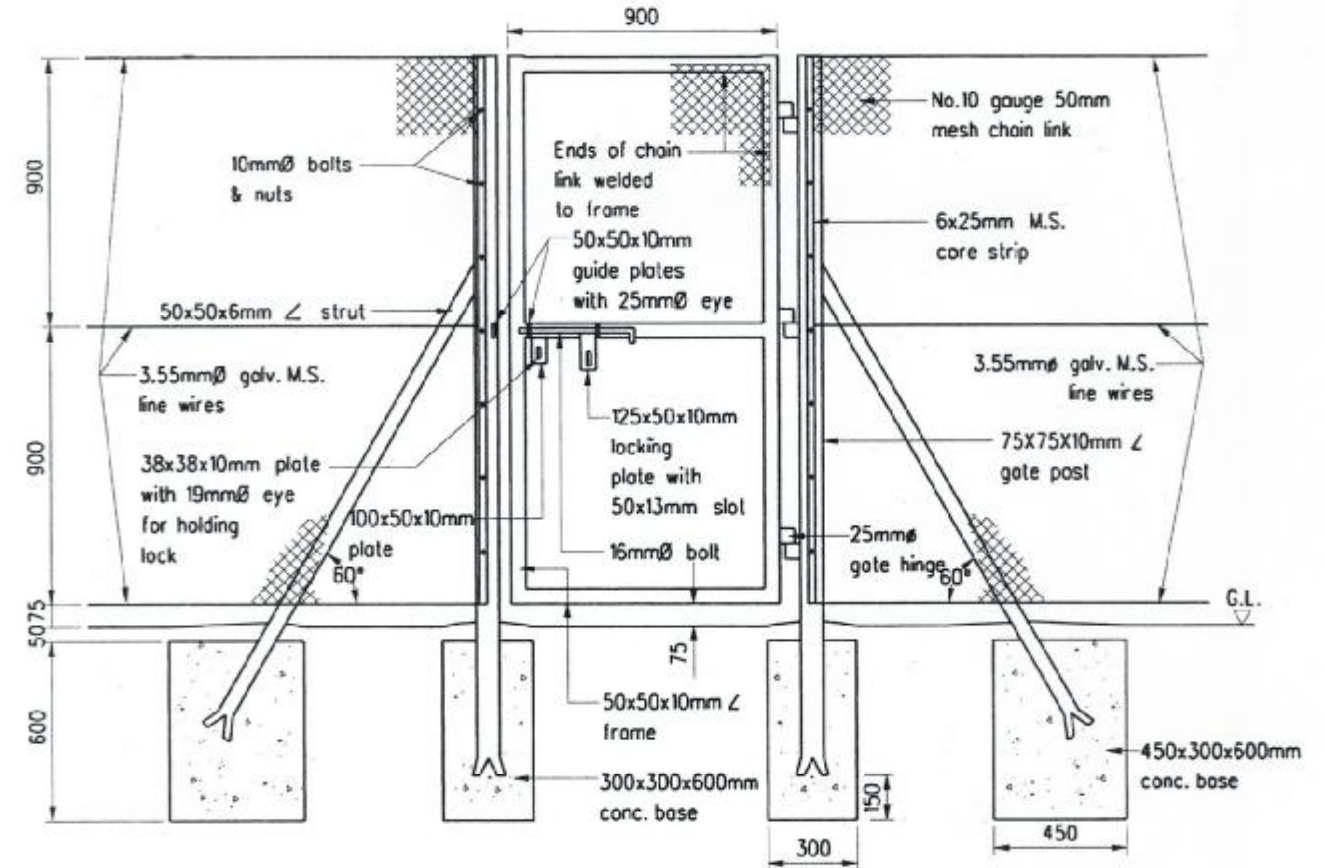


INTERMEDIATE POST

(NTS)

Notes :

1. Dimensions are in millimetres.
2. All welds to be ground smooth.
3. Steel to be grade 43 BS 4360.
4. All site welds to be treated with two coats of zinc rich paint before application of paint system.
5. Steelwork for fencing including wires to be hot dip galvanized to BS 729 to a coating thickness at least 500 g/m².
6. Chain link mesh to be zinc coated type GLS180 of BS1722 Part 1.
7. Concrete to be grade 30/20.
8. Where the concrete footing is located in block paved footpath, the footing should be lowered to allow for the paving blocks and the sand course.



PEDESTRIAN GATE

(NTS)

Note: One pedestrian gate in each enclosure.

Proposed Building Expansion of DTTB project at Lamma Island

Tree Protection Measures: Chain Link Fence to Protect Existing Trees

SCALE	N.T.S.	DATE	09 OCT 2008
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TVBL03A/TP5		REV



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Figures 11 to 12

Supplementary Field Survey Photos



T6A(A)

Proposed Building Expansion of DTTB
Project at Lamma Island

Supplement Field Survey Photo

SCALE	N.T.S.	DATE	28 AUG 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TVBL03A/SFS-01		REV
			-





T6A(B)

Proposed Building Expansion of DTTB
Project at Lamma Island

Supplement Field Survey Photo

SCALE	N.T.S.	DATE	28 AUG 2009
CHECKED	CJF	DRAWN	EIK
FIGURE NO.	TVBL03A/SFS-02		REV
			-



Appendices

Appendix I

Plant Survey Schedule

Plant Assessment Schedule

Address: Peak of Ling Kok Shan, Lamma Island
 Lot: Short Term Tenancy No. CX1834

Field Survey verified on site in May 2009 & July 2009

To be read in conjunction with the Figure 2 Plant Location Plan, the photographs presented as Figures 3 to 6 Current Status of Protected Plants and supplementary field survey photographs presented as Figures 11 to 12.

Tree No.	Botanical Name	Chinese Name	Survey Size (M)			Form			Existing Tree Condition				Amenity Value					Transplant		Location		Proposed Treatment			Remarks	
			Stem Dia	Height	Spread	Good	Aver	Poor	Good	Fair	Poor	Dead	A	B	C	D	E	Yes	No	Slope	Flat	Retain	Trans	Fell		
T1	<i>Artocarpus hypargyreus</i>	白桂木	0.23	3.00	4.00			1		1							1						1			Contorted base, heavy leaning form due to wind exposure on ground, broken branches, multibranching at 0.6m up from base. Note: Species listed in Rare and Precious Plants of Hong Kong (Hong Kong Herbarium, AFCD)
T2A	<i>Artocarpus hypargyreus</i>	白桂木	0.02	1.40	0.40			1		1							1						1			Small plant, relatively sparse foliage. Note: Species listed in Rare and Precious Plants of Hong Kong (Hong Kong Herbarium, AFCD)
T3A	<i>Artocarpus hypargyreus</i>	白桂木	0.01	1.08	0.10			1		1							1						1			Small plant, relatively sparse foliage. Note: Species listed in Rare and Precious Plants of Hong Kong (Hong Kong Herbarium, AFCD)
T4A	<i>Artocarpus hypargyreus</i>	白桂木	0.05	1.70	1.10			1	1							1							1			Medium sized bushy shrub form, good foliage cover. Note: Species listed in Rare and Precious Plants of Hong Kong (Hong Kong Herbarium, AFCD)
T5A	<i>Artocarpus hypargyreus</i>	白桂木	0.02	0.77	0.58			1	1								1						1			Small shrub form, relatively good foliage coverage. Note: Species listed in Rare and Precious Plants of Hong Kong (Hong Kong Herbarium, AFCD)
T6A	<i>Diospyros vaccinioides</i>	小果柿	0.01	0.50	0.10			1		1							1						1			Small shrub form. Note: Species listed in IUCN Red List of Threatened Species
Summary Statistics						0	1	5	2	4	0	0	0	1	3	2	2	1	5	6	0	6	0	0	5	
						0%	20%	100%	40%	80%	0%	-	0%	20%	60%	40%	40%	9%	100%	120%	0%	120%	0%	0%		
						Good	Aver	Poor	Good	Fair	Poor	Dead	A	B	C	D	E	Yes	No	Slope	Flat	Retain	Trans	Fell	Total	

Rare or Protected Species

Legend

Tree Condition / Health

G Good
 F Fair
 P Poor
 D Dead

Tree Form

G Good
 F Fair
 P Poor

Survival After Transplanting

Y Yes
 N No

Amenity Value

A with cultural significance or high functional significance or high visual impact, or mature and good health, good condition and good form.
 B with cultural significance or high functional significance or high visual impact, or mature and poor health, poor condition and poor form.
 C Common species and good health, good condition and good form.
 D Common species and average health, average condition and average form.
 E Common species and little or no functional or visual value and poor health, poor condition and poor form.

Remarks

Trees with high conservation values such as rare or protected species or of Old and Valuable tree values or will be recorded in the remarks of the Tree Survey Schedule

Appendix II

Particular Specification for Tree Protection Works

**Particular Specification:
Treatment of Existing Trees and Establishment Works**

70.12.00 EXISTING TREES

(1) Treatment of Existing Trees

(2) For the treatment of existing trees which are to be retained, the Contractor shall work to B.S. 3998 (Recommendations for Tree Work, 1989) and shall be directed and supervised by the Architect or Architect's Representative . BS 3998 Tree Work

(3) "Tree" means a plant with diameter at breast height measuring 95 mm or more. Plants growing on retaining structures shall also be measured and considered. Definitions

"Diameter at breast height" means the diameter of the trunk of the plant measured at a height of 1.3 m above ground level. For trunk with an obviously elliptical cross-section, the diameter at breast height shall be the average of any two diameter measurements taken at right-angle.

"Tree crown spread" means the diameter of the tree crown defined by the outermost branches of the tree.

"Tree height" means the height from ground level to the top of the tree.

"Dripline" of a tree means the imaginary vertical plumb line that extends downward from the tips of the outermost tree branches and intersects the ground.

"Tree protection zone" means an area the perimeter of which is defined by the dripline of the tree.

"Preserved tree" means an existing tree not earmarked to be felled (identified as trees to be retained in the accompanying schedule and tree recommendation plan), which may be a tree to be retained at its existing location, a tree at its existing location prior to transplanting, or a tree transplanted within the Site.

"Arboricultural work" means any work related to the cultivation and care of trees for any purpose other than timber production, including but not limited to planting, replanting, transplanting, tree surgery work and control of pest and disease.

(4) A list of specialist landscape contractors suitable for undertaking the trees works for this project is provided within this tender package. The Contractor shall enter into a written sub-contract with a specialist contractor pursuant to carry out the arboricultural work to trees, including but not limited to planting, replanting, transplanting, tree surgery work, and control of pest and disease. Specialist contractor

(5) The Contractor shall fully allow the effects of preservation and protection of existing trees in his programme, the method of operation and construction, and the vehicular access for the Works. Programming

(6) The Contractor shall assign a competent member of the site supervisory staff to oversee and supervise tree works related to Site Inspection and Supervision

horticultural operations and preservation of trees within the Site, including, but without limitation to, planting, transplanting, tree surgery work and control of pests and diseases affecting trees on Site. The person assigned shall be working full-time on the Site but not necessarily working solely on trees. The assigned person shall have attended relevant training on the subject organised by training institutes (such as the Construction Industry Training Authority) or similar courses as considered appropriate by the Architect's Representative. The Contractor shall submit to the Architect's Representative for approval within 45 days of the date of the Employer's letter of acceptance of the Tender particulars of the assigned person (including their name, experience and position) together with a copy of the certificate issued by the training institute confirming the their satisfactory completion of the relevant course. Safety precautions shall be taken to protect those engaged in operations as well as people and property in the vicinity.

- (7) Before starting work, the Contractor shall carry out an inspection of all existing trees which are to be retained and produce a Schedule of Work indicating the tree no., species, problem and suitable treatment. The Schedule of Work must be approved by the Architect or Architect's Representative prior to commencement of any tree work or felling. Schedule of Works

- (8) The Contractor shall also clearly mark on each tree its status of retain, transplant or fell, which shall be recorded in a Tree Identification Schedule. The Contractor shall provide the schedule to the Architect or Architect's Representative for approval prior to commencing work. Tree Identification
Schedule

The Contractor shall mark on the Site with labelling or marking systems to identify trees of different status in accordance with the approved recommendations for tree retention, transplantation or felling contained in accordance Tree Recommendation Plan and the Tree Survey Schedule. It should be noted that these recommendations have yet to be approved by Government and so may be subject to change. The Contractor shall comply with the following in providing the identification labelling or marking systems:

- (i) the identification labelling or marking systems for different tree status shall be in different colours and be clearly distinguishable (a coloured sash with blue for retain, yellow for transplant and red for fell),
- (ii) the identification labelling or marking system for the preserved trees shall be made of durable materials that are non-injurious to the trees, be placed at a position not easily accessible to the public, and be attached in such a manner that allows for the growth of the trees and does not injure the trees,
- (iii) the identification labelling or marking systems and the on-site status identification of trees shall be agreed by the Architects Representative and installed prior to the commencement of site clearance, demolition, construction of permanent or temporary works, and any other site operations which may affect

the trees, and

- (iv) the Contractor shall reinstate or replace where necessary the identification labelling or marking systems for the preserved trees and shall remove these identification labelling or marking systems from the Site upon completion of the works other than Establishment Works, or earlier if so directed by the Architect's Representative.
- (9) Only suitable qualified personnel shall be employed to inspect and complete the Schedule of Works. Qualified Personnel
- (10) The Contractor shall take care to avoid damaging any structures or neighbouring trees, shrubs, grass or surfaces and if any are damaged the Contractor shall undertake to reinstate or compensate to the satisfaction of the Architect or Architect's Representative. Damage to Site
- (11) The Contractor shall provide adequate warning signs and staff to ensure the safety of public and traffic during operations. Traffic and Pedestrian Control and Warning Signs
- (12) Any plant material produced as a result of pruning, felling and cavity work performed on trees shall be collected and removed from Site to a tip provided by the Contractor at his own expense. No such material shall be burned on Site. Disposal of Wood and Fires
- (13) All work shall be done in the appropriate season or as by the Architect or Architect's Representative. Seasons
- (14) The Contractor shall notify the Architect or Architect's Representative before work is to commence and when work is completed. Notification
- (15) The specialist landscape contractor shall report to the site management office before and after carrying out any tree work and a countersigned log book of the work carried out shall be kept at the site office and made available for inspection. This log book shall record all activities undertaken which could potentially affect the health of the retained and transplanted trees, together with the operations undertaken to prepare the trees and maintain their health. All entries shall be dated and signed by the specialist landscape contractor and countersigned by the Clerk of Works. Log Book

17.12.03 Felling

- (1) The limits of site clearance shall be agreed by the Architect's Representative on the Site before site clearance commences. The trees to be felled are identified on the Tree Recommendation Plan (drawing number TVBL03A-LI-TR01). The Contractor shall comply with the following requirements in respect of tree felling the Contractor shall:
 - (i) fell only those trees earmarked for such under the Works and labelled for such on the Site pursuant to Clause 70.12.00 or those as directed or approved by the Architect's Representative,
 - (ii) take all necessary precautions to protect the people engaged in the tree felling work as well as the peopleLimits of Site Clearance

- and property in the vicinity,
- (iii) fell the trees by cutting them near the ground and ensure felled trees fall away from preserved trees, where trees are in close proximity to preserved trees those recommended for felling shall be cut in sections starting with the branches followed by sections of the trunk. The direction of the fall shall be controlled through the cutting method, the use of wedges and the use of ropes / winches to control the angle of the fall,
- (iv) protect both the crown and trunk areas of preserved trees during felling operation,
- (v) stumps of felled trees shall be ground removing the base of the trunk leaving major roots intact rather than pulled so that the roots of the nearby plants to be retained are not injured,
- (vi) remove the stumps and rootballs of the felled trees carefully to avoid causing damage to the roots of the nearby plants to be retained, where it is necessary to have such removal as directed by the Architect's Representative; and
- (vii) remove all debris, wood, and roots where necessary from the trees felled from the Site as soon as possible. There shall be no burning of felled material on site.

- | | | |
|-----|---|--------------------|
| (2) | Felling shall involve the removal of trees, including stumps, by Felling one of the following methods to be approved by the Architect or Architect's Representative before work commences: | Felling |
| a) | Bulldozer: A bulldozer shall be used to push over the whole tree Bulldozer which shall then be cut by chain saw and removed from Site. This method shall only be used where no trees are to be retained. | Bulldozer |
| b) | Winches: Power mounted or hand winches shall be used for pulling winch over the whole tree, the main support roots shall first be severed either by mechanical means or by hand grubbing. Preserved trees shall not be used as anchor points for winching | Winches |
| c) | Felling: Felling the whole tree at once or in sections. The stump shall be removed by hand grubbing and winching; stump cutting machine; hydraulic lifting or another method approved by the Architect or Architect's Representative before work commences. Care shall be taken not damage trees identified for retention or transplantation. | Chain Saws |
| (3) | Where it is found necessary for the completion of the Works to remove by felling any trees other than those earmarked for such under the Works or those directed or approved for such during the progress of the Works by the Architects Representative, the Contractor shall: | Additional Felling |
| | (i) report to the Architect's Representative the necessity of such tree removal, | |
| | (ii) provide all reasonable assistance as required by the Architect's Representative in the tree survey and the justification for the proposed tree removal with substantiation and the necessary details such as site formation plan and architectural or engineering | |

- drawings, for the Architect's Representative preparation of the tree felling or transplanting application for the tree removal,
- (iii) fell the trees only after the Architect's Representative's approval to the tree removal which shall normally be given only after the tree felling or transplanting application has been approved by the government approving authority, and
- (iv) install protection measures for subject trees pending necessary approval.

17.12.04 Works Near Existing Trees

- | | | |
|-----|--|---|
| (1) | All individual trees to be retained on site are to be protected for the duration of construction works by Temporary Protective Fencing as described in 17.12.04 to be erected at the edge of the Cordon Area or Tree Protection Zone (equivalent to the extent of the drip line) or as otherwise directed by the Architect or Architect's Representative. The proposed Temporary Protective Fencing shall be inspected on a weekly basis to ensure there is no damage. Should the fence be damaged or there be any infringement of the Cordon Area remedial action must be taken immediately. | General Excavation
Near Existing Trees |
| (2) | Where excavation is required near existing trees the following precautions shall be taken to protect the roots: <ul style="list-style-type: none"> i) The area to be excavated as part of the root pruning activities for the transplanting works must be approved by the Architect or Architect's Representative prior to the commencement of the works: ii) Roots exposed and damaged during excavation shall be cut cleanly back to living tissue and sealed with an approved wound sealant. The Architect or Architect's Representative shall be contacted immediately when root of diameter larger than 50mm are exposed, damaged or severed. Cutting of the roots shall be kept to a minimum; iii) All excavations shall be completed within one working day and exposed roots shall be protected by damp Hessian; iv) Excavations undertaken as part of the preparation of the rootball prior to transplantation shall be backfilled with topsoil including sufficient slow release complete fertiliser to ensure a rate of application of 500g/m³. Backfilling following the permanent relocation of the transplanted trees is described under Clause 70.13.01. | Root Protection |
| (3) | The detailed alignment and location of trench excavations for services, including drainage and sewerage, which within the Cordon Area described in Clause 17.12.04 (1) shall be agreed with the Architect or Architect's Representative prior to the commencement of the works. Large roots exposed in trench excavation and above the final line of the installation shall be preserved, and excavation close to trees shall be carried out with particular care to ensure this. Following installation of the services, severed roots shall be cut back cleanly to living tissue. All pruning sites will be treated with an approved wound fungicide. Trenches shall be backfilled as specified, except that | Excavation for
Services Near
Existing Trees |

where topsoil is required, sufficient slow release fertiliser to assure a rate of application of 500g/m³ shall be applied.

- (4) As soon as the Site or any part thereof becomes available the Contractor shall erect Temporary Protective Fencing around any tree identified for transplantation. The fence shall be as described below to be erected at the edge of the tree canopy or as otherwise directed by the Architect or Architect's Representative.
- Temporary Protective Fencing

Temporary Protective Fencing shall be 2000mm high chain link fence comprising end straining corner posts and intermediate straining posts.

- i) End straining posts shall be constructed of 35mm angle iron set within 300 x 300 x 400mm concrete footings with angled brace. Posts shall be installed at corners, ends of runs and at 10m centres;
- ii) Intermediate posts shall be constructed of 35mm angle iron set within 300 x 300 x 400mm concrete footings at 1500 centres;
- iii) Lockable gates to be located within each of the fence structures to control access to the areas containing preserved trees.
- iv) Locations of post footings to avoid damage to the roots of preserved trees and to be agreed on site with Architect's Representative, area above the preserved rootballs to be protected against runoff from concrete used to establish footings;
- v) Protective rim to be constructed at the base of the chain link fence on the side affected by the proposed works to prevent construction runoff entering the soil of the preserved rootballs of the retained trees. This rim is to be constructed of waterproof sheeting weighted down by double row of sand bags.
- vi) The Contractor shall maintain the Temporary Protective Fencing in good repair and subsequently remove it. Removal will be subject to the permission of the Architect or Architect's Representative for this aspect of the work will be undertaken during the removal of the trees from site and at substantial completion of an adjacent and substantial part of the works other than Landscape Softworks.

Maintenance and
Removal of
Temporary Protective
Fencing

70.12.05 Protection of Existing Trees

- (1) In respect of all existing trees, the Contractor shall ensure, for the whole duration of the Contract, the following:
- Protection of Existing
Trees
- i) No unnecessary intrusion into areas of woodland or scrubland is made;
 - ii) All access routes to construction areas which need to pass through woodland or scrub shall be approved by the Architect or Architect's Representative;

- iii) The limits of site clearance are to be agreed by the Architect or Architect's Representative on site before site clearance commences. All trees to be cleared shall be marked by the Contractor and approved by the Architect or Architect's Representative before felling;
- iv) Trees which are not required to be trimmed, pruned or felled shall not be marked.

(2) For the preserved trees, the Contractor shall exercise the greatest care to avoid any damage to them and shall comply with the following:

- i. no nails or other fixings shall be driven into the trees, including the exposed tree roots,
- ii. no fencing, services, or signs other than the identification labels or markings required under sub-clause (3) of this Clause shall be attached to any part of the trees,
- iii. no trees shall be used as anchorages for ropes or chains used in guying or pulling or for equipment used for removing stumps, roots or other trees, or for any other purposes,
- iv. no soil, materials, equipment or machinery shall be stockpiled or stored within the tree protection zones,
- v. no site offices, workshops, canteens, containers or similar structures shall be installed within the tree protection zones,
- vi. petrol, oil, bitumen, creosote, cement and other materials likely to be injurious to the trees shall be kept away from the tree protection zones, and any accidental spills of these materials shall be cleaned up immediately,
- vii. exhaust from vehicles and machinery involved in the works shall be directed away from the canopies of preserved and transplanted trees;
- viii. excessive water shall be drained away from the tree cordon areas to prevent damage to tree roots by asphyxiation,
- ix. the surface on slopes shall be shaped so that water including construction runoff will not drain to the tree trunks but bypass them,
- x. no passage or parking of vehicles and no operation of equipment or machinery shall take place within the tree protection zones unless otherwise agreed by the Architect's Representative,
- xi. no stripping of surface vegetation or top layer of soil shall be carried out within the tree protection zones unless otherwise agreed by the Architect's Representative,
- xii. no fires shall be lit within the area which could potentially affect the health of the retained and transplanted trees, bearing in mind the size of the fire and the wind direction,

- xiii. no concrete mixing, gas tank filling, paintbrush and tool cleaning, or equipment maintenance shall be carried out within the tree protection zones; runoff from these activities shall be directed away from tree protection zones,
- xiv. any necessary scarification or cultivation within the tree protection zones shall be carried out carefully by hand so as not to cause damage to the trees, in particular the bark and the roots and the extent of these works will be agreed with Architect's Representative prior to commencement,
- xv. any equipment, in particular delivery vehicles, overhead cranes, mechanical excavations, drilling rigs and piling rigs, shall be carefully operated so as not to cause striking of the trunks, branches, foliage or root collars of the trees,
- xvi. the trees to be felled that are adjacent to, or that lie within a continuous canopy of, the preserved trees, shall be carefully removed, and if necessary in sections but not using bulldozers in any circumstances, so as not to cause damage to the preserved trees such as scraping bark off trunks or breaking branches of trees,
- xvii. where it is necessary to use herbicides to kill any vegetation, herbicides that can leach through the soil, such as the products containing sodium chlorate, and any other herbicides that are injurious to the trees shall not be used,
- xviii. allowance shall be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards the trees,
- xix. alkaline clays or limestones shall not be used for filling or paving, concrete shall be mixed on a thick plastic tarpaulin or outside the Site, and mixing trucks shall not be rinsed out on the Site, so as not to cause changes, in particular increases, in soil pH,
- xx. grouting for soil nails shall be controlled to prevent splash and leaching into soil around retained rootballs so as not to cause changes, in particular increases, in soil pH, and
- xxi. all building debris and chemical wastes shall be hauled away for proper disposal, and in any circumstances shall not be burned or buried on the Site or be disposed of by pouring them on the soil within the Site,

(3) report any damage to trees within four hours of the event to Architect's Representative and repair any damage to the trees in accordance with the requirements stipulated in Particular Specification Clause 70.12.05 and as agreed by the Architect's Representative,

Reporting Tree
Damage

(4) where the passage or parking of vehicles or the operation of equipment or machinery within the tree protection zones is considered necessary and is agreed by the Architect's Representative, carry out the following measures to reduce soil compaction:

Entering Tree
Cordon Area

- i) minimise the traffic of the vehicles, equipment or machinery,
 - ii) confine the passage or parking of vehicles or operation of equipment or machinery to the areas laid with temporary protective mulching as stipulated in and with double, overlapping, thick metal sheet coverings, or other materials of equivalent strength as agreed by the Architect's Representative, placed on top, and
 - iii) where roots are located on the slope surface protection measures shall incorporate spacers to lift metal sheet coverings or other materials of equivalent strength above the roots,
- (5)
- i) where it is necessary to clear the existing undergrowth within the tree protection zones to allow access and visibility for, and operation of any construction work,
 - (a) shrubs shall be pruned and grass or other herbaceous plants shall be cut to a height of not less than 50 mm above the ground level but not pulled out by equipment in any circumstances, and
 - (b) the agreement of the Architect's Representative shall be obtained prior to commencing the vegetation clearance,
 - ii) protect the preserved trees, where necessary, from increased exposure to sun and wind due to removal of adjacent trees,
 - iii) align all routes of the overhead services within the Site and all access routes to the Site or within the Site away from the preserved trees as far as possible and seek the Architect's Representative approval to the alignment,
 - iv) report to the Architect's Representative of any preserved tree having structural defects or unhealthy or decaying symptoms which may pose danger to the public if the tree falls,
- Cleaning Existing Vegetation in Tree Cordons Area
- (6)
- i) The Contractor shall exercise the greatest care during the progress of the work to avoid damage to any tree which the Contract does not require to clear.
 - ii) As soon as the Site or any part thereof becomes available the Contractor shall erect Temporary Protective Fencing around any tree or group of trees which are required to be protected. The fence shall be located at the edge of the Cordon Area described under Clause 17.12.04. The Contractor shall inform the Architect or Architect's Representative if Works are to be carried out within such fenced areas and, save with the express permission of the Architect or Architect's Representative or on his order, all such work shall be executed using only hand-held tools. The rates in the Contract shall include for this restriction.
 - iii) Slow release fertilizer shall be applied to existing mature trees in a feeding band 1.5m either side of the branch spread as and when directed by the Architect or Architect's Representative. Holes shall be drilled, at an angle, at
- Care of Existing Trees
- Feeding

450-600mm centres in the feeding bands, they shall be 300-600mm deep and approximately 37-50mm in diameter.

- iv) Slow release fertilizer shall be inserted in the holes, bulked up if necessary with sand or fine peat, at the rate of 1kg/25mm of trunk diameter at a height of 1.2 metres from ground level.
 - v) The fertilizer shall be applied between March and June or as directed by the Architect or Architect's Representative. Time of Application
- (7)
- i) the Contractor shall provide temporary protective Hessian and plank armouring as an alternative to the same trees for enhanced protection. The temporary protective Hessian armouring shall be implemented in a manner which prevents damage to the bark on the tree trunk or branches. Protection from physical damage and soil compaction by construction activities
 - ii) When instructed by the Architect's Representative, the ground of the Cordon Areas of the trees referred to in the sub-clause (a) of this Clause shall be protected from damage by construction activities through the use of temporary protective mulching. The Contractor may also be instructed to lay thick metal sheet coverings or other materials of equivalent strength as agreed by the Architect's Representative, on top of the temporary protective mulching to provide additional protection from soil compaction due to passage or operation of equipment or machinery. Where roots are visible at the surface of the slope the thick metal sheet coverings or other materials of equivalent strength shall incorporate spacers on the base to prevent damage to the roots from abrasion.
 - iii) The Contractor shall complete erection of the temporary protective armouring and application of the temporary protective mulching prior to the commencement of site clearance, demolition, construction of permanent or other temporary works, and any other site operations which may affect the trees.
 - iv) The Contractor shall remove the temporary protective armouring and the temporary protective mulching from the Site upon completion of the Works, or earlier if so directed by the Architect's Representative. The Contractor shall not remove or relocate the temporary protective armouring or the temporary protective mulching without the prior agreement of the Architect's Representative.
- (8)
- Without the prior approval of the Architect's Representative, the Contractor shall not change the existing ground levels within the tree protection zones of the preserved trees unless the site formation proposals explicitly require such changes. Protection from changes in ground levels resulting from slope re-grading

Where it is necessary for the completion of the Works to reduce/raise the existing ground level around a preserved tree which will result in a lowering/rise of the existing ground level within the tree cordon area, the Contractor shall carry out permanent protective work for the preserved trees in accordance details provided by the Architect's Representative.

Before commencing the construction of the permanent

protective work to accommodate reduction/raise in the ground level pursuant to sub-clause (2) of this Clause, the Contractor shall submit method statements, for construction details, for the work for the Architect's Representative. The Contractor shall commence the construction of the permanent protective work only after the Architect's Representative; approval to the method statements has been given.

The Contractor shall follow the requirements stipulated in Particular Specification Clause 17.12.05 regarding excavation and cutting of tree roots and shall maintain balanced moisture content in the tree and in the soil after construction of the permanent protective work, by carrying out necessary precautionary measures such as crown thinning, watering and mulching.

- (9) Without the prior approval of the Architect's Representative, the Contractor shall not carry out excavation within the tree protection zones of the preserved trees unless the site formation proposals require such excavation work. For the approved excavation work within the tree protection zones, the Contractor shall comply with the following requirements:

Protection from excavation including slope re-grading works or trenching

- (i) obtain agreement from the Architect's Representative to the detailed locations and extent of the excavations before commencing any excavation work,
- (ii) carry out the site investigation before commencing any cutting work to the aerial roots or underground roots of the preserved trees to determine the locations of the major roots and the bulk of the absorbing roots so as to keep the cutting of tree roots to a minimum and to preserve the tap roots, sinker roots and support roots of the trees in any circumstances,
- (iii) where appropriate based on the findings of the site investigation and the Site Formation proposals with consideration for the extent of the proposed pruning prepare method statement including programme for root pruning for approval by Architect's Representative, prior to commencement of works including the following:
 - (a) extent of existing and retained roots clearly indicated on a dimensioned drawing verifying the existing and proposed levels, and location of any proposed drainage or slope maintenance / inspection access measures,
 - (b) location where appropriate of measures such as rock dowels or soil nails required to stabilize slope within tree preservation area allowing safe distance from preserved roots;
 - (c) extent of phased root pruning indicating the location of the proposed root pruning trenches and time interval

- (d) between root pruning episodes,
 - (d) indication of the commencement date and programme for the pruning works allowing an appropriate time for the recovery of tree between root pruning episodes,
 - (e) method for cutting roots, treatment of cut root surfaces and specification of backfilling material where a phased root pruning approach is to be followed,
 - (f) programme for site inspections of the pruning works by Architect's Representative,
 - (g) obtain agreement from the Architect's Representative to the extent of root cutting on the Site, and
 - (h) where the stability of the trees is likely to be jeopardised, comply with the requirements stipulated in Particular Specification Clauses 70.12.05 sub clause 12,
- (iv) submit to the Architect's Representative photographic records showing the condition of the affected trees and the agreed extent of excavations and root cuttings as marked on the Site prior to commencement of the excavation work and root cutting work and thereafter submit photographic records showing the condition of the affected trees and the progress of the excavation work and root cutting work at weekly intervals until backfilling of the excavations is complete,
 - (v) excavate the trench on the paved side of the tree if one exists,
 - (vi) pile the excavated materials outside the tree protection zones to reduce soil compaction,
 - (vii) excavated soil shall be replaced with soil mix specified under Clause 70.13.01,
 - (viii) carry out the excavations carefully so as not to damage the bark and root collars of the preserved trees, and
 - (ix) maintain balanced moisture content in the trees and in the soil after backfilling of the excavations, by carrying out necessary precautionary measures such as crown thinning, watering and mulching.
- (10) The Contractor shall take the following precautions when carrying out the works that involves cutting of the roots of the preserved trees:
- (i) excavation shall be carried out using only hand-held tools such as hoe and spade, but not mechanical diggers or bulldozers in any circumstances,
- Precautions for works involving root pruning

- (ii) whenever roots are encountered and before root cutting is carried out, soil shall be carefully forked away from the roots using hand-held tools up to the edge along which root cutting is required,
- (iii) root cutting shall be carried out carefully using sterilised hand-held pruning tools, and roots greater than 25 mm in diameter shall be pruned carefully so as not to result in shattered and frayed roots,
- (iv) any roots damaged during excavation shall be cut back cleanly with sharp tools to undamaged tissue and treated with an approved root growth promoting hormone dressing prior to backfilling,
- (v) all cut and exposed roots shall be prevented from drying out during excavation by adopting the following measures until backfilling, unless otherwise agreed by the Architect's Representative:
 - a. wrap the tap roots, sinker roots, support roots, and roots with diameter exceeding 50 mm, which shall not be cut, with hessian, straw or other porous, absorbent fabric once they are exposed,
 - b. hang thick hessian or other porous, absorbent fabric from top of the cut surface over the exposed roots and soil immediately after root cutting, and
 - c. mist the hessian or fabric in a frequency that keeps the roots and the soil at the cut surface moist all the time,
- (vi) the hessian, straw or other porous, absorbent fabric of this Clause and the hessian or fabric of this Clause shall be removed immediately before backfilling,
- (vii) excavations shall be backfilled with soil mix incorporated with slow release fertiliser at a rate of 500 g/m³ or at a rate as directed by the Architect's Representative to a level not higher than the original soil level at the root collar, and
- (viii) where possible pruning of roots shall be programmed to ensure completion within one working day.

(11) Without the prior approval of the Architect's Representative, the Contractor shall not carry out drilling, such as soil nailing and drilling for bore holes, rock bolts or dowels, within the tree protection zones of the preserved trees unless the Contract explicitly requires such drilling work within the tree protection zones. For the approved drilling work within the tree protection zones, the Contractor shall comply with the following requirements:

Protection from
drilling

- (i) obtain agreement from the Architect's Representative to the detailed locations and extent of the drill holes before commencing any drilling work, bearing in mind that the drill holes shall be located in such a way that the structures to be placed into the drill holes, including the surface elements of the structures such as soil nail heads, are at a minimum distance of 500 mm from the trunks of the preserved trees and 300mm from preserved major roots and the bulk of the absorbing roots unless otherwise agreed by the Architect's Representative in exceptional circumstances, and
- (ii) carry out the following before commencing any cutting work to the aerial roots or underground roots of the preserved trees:
 - (a) determine the locations of their major roots and the bulk of the absorbing roots so as to keep the cutting of tree roots to a minimum and to preserve the tap roots, sinker roots and support roots of the trees in any circumstances,
 - (b) obtain agreement from the Architect's Representative to the extent of root cutting on the Site, and
 - (c) where the stability of the trees is likely to be jeopardised, comply with the requirements stipulated in Particular Specification Clauses 70.12.05,
- (iii) carry out the drilling work carefully so as not to damage the branches, foliage, trunk, bark and root collars of the preserved trees when gaining access for, supporting, mobilising, positioning and operating the drilling rig, and
- (iv) maintain balanced moisture content in the trees and in the soil after the drilling work, by carrying out necessary precautionary measures such as crown thinning, watering and mulching.

The Contractor shall take the following precautions when carrying out drilling work that involves cutting of the roots of the preserved trees:

- (i) drilling work and root cutting work shall be carried out carefully,
- (ii) roots greater than 25 mm in diameter shall be pruned carefully in order to prevent shattered and frayed roots, and
- (iii) any roots damaged during drilling shall be cut back cleanly with sharp tools to undamaged tissue and treated with an approved fungicidal dressing.

- (12) (i) The mechanical stability of preserved trees requiring the works which involve cutting of any major roots or other

Protection from instability

major parts of the preserved trees shall be investigated prior to the commencement of the works. This assessment shall inform the extent of the removal of root and crown material in terms of the structural stability of the tree, and where appropriate inform the design of the physical support measures described in this Clause. Contractor shall submit tree stability assessment including Engineer structural design calculations to the Architect's Representative for approval.

- (ii) Where the Works involve cutting of any major roots or other major parts of the preserved trees or any other works that may jeopardise the stability of the preserved trees, the Contractor shall install all necessary physical support for the preserved trees to ensure their stability. The Contractor shall pay particular attention to the preserved trees growing on retaining structures in order to prevent the trees from being dislodged from its position as a result of inadequate support.
- (iii) The physical support for the preserved trees shall be installed securely prior to commencement of the root cutting, tree pruning or any other works that may affect the stability of the trees. Before commencing the installation of the physical support measures, the Contractor shall submit method statements for the support measures to the Architect's Representative for approval. The Contractor shall commence the installation of the support measures only after the Architect's Representative's approval to the method statements.
- (iv) The physical support for the preserved trees shall be securely founded in footings independent of existing walls or building structures or in other supporting systems as appropriate, without interfering with other works, other existing features. These physical support measures shall not encroach on the tree protection zone or interfere with the retained crown. Where the affected tree is growing on a retaining structure, the Contractor shall make a detailed assessment to estimate the weight of the tree and identify the best position of supporting the tree in relation to its overall spread and centre of gravity. The method statements for the support measures in respect of the trees growing on retaining structures shall include the following information:
 - a. details of the form of construction and where requested by the Engineer structural design calculation for the support measures, demonstrating the bearing capacity of each element,
 - b. details of the foundation of the support measures, demonstrating that the support measures shall not interfere with other works, other existing features, and the preserved trees and shall not affect the stability of the retaining structure,
 - c. means of securing the tree to the supporting measures, including how cups and ties are adjusted to the form of the tree, and
 - d. method of fabrication and erection on the Site.

- (v) The Contractor shall remove the physical support for the preserved trees from the Site upon completion of the works other than Establishment Works, or earlier if so directed by the Architect's Representative. The Contractor shall not remove or relocate the physical support for the trees without the prior agreement of the Architect's Representative.
- (9) (i) The Contractor shall take all necessary precautionary measures to protect the preserved trees from pest and disease attack and all necessary control measures to eradicate pest and disease from the infected trees. Control of pest and disease for preserved trees
- (ii) Before commencing the application of the pest and disease control measures, the Contractor shall submit method statements for the control measures to the Architect's Representative for approval. The Contractor shall commence the application of the control measures only after obtaining the Architect's Representative's approval to the method statements.
- (iii) The method statements for the pest and disease control measures shall cover, amongst other aspects as required by the Architect's Representative, the pesticide or fungicide to be used and any other necessary associated arboricultural work to the infected areas.
- (iv) The Contractor shall comply with the following requirements in applying the pest and disease control measures:
- (a) environmentally friendly measures shall be adopted, and
- (b) safety precautions as the manufacturer's instruction shall be strictly followed in using pesticide or fungicide so as to avoid causing danger or harm to the public and the environment
- (10) (i) The Contractor shall carry out all necessary work of repair of any damage to the preserved trees and any other plants affected. All necessary work of repair of damage shall be carried out at the Contractor's own expense if the necessity for such work is, in the opinion of the Architect's Representative, due to neglect or failure on the part of the Contractor to comply with any obligation expressed or implied on the Contractor's part under the Contract. Repair of damage to preserved trees and other affected plants
- (ii) The work of repair of damage as referred to in sub-clause (1) of this Clause shall include the following:
- (a) all necessary arboricultural work to the preserved trees and any other plants damaged, which may include:
- (i) tree surgery work to remove dead, damaged, diseased or hazardous parts, to repair wounds, or to provide cables or braces for additional support,
- (ii) watering and/or mulching in case of

- (iii) water deficiency, and
 - (iii) applying appropriate fertilizers in case of nutrient deficiency,
 - (b) the replacement planting pursuant to sub-clause (vii) of this Clause for the trees and any other plants damaged to an extent as described in sub-clause (vi) of this Clause and the subsequent Establishment Works for the new plants for 1 year, when instructed by the Architect's Representative, and
 - (c) any other reinstatement work necessary to bring the damaged plants to their original condition prior to the occurrence of the damage, as directed by the Architect's Representative.
- (iii) The Contractor shall notify the Architect's Representative of any damage to the preserved trees and other affected plants within the same day of the occurrence of damage and shall submit to the Architect's Representative within 7 days of the occurrence of damage, a report comprising the following information in a format agreed by Architect's Representative:
- (a) the timing of the damage,
 - (b) the nature and extent of the damage,
 - (c) photographic records of the damage,
 - (d) the proposed work of repair of the damage, and
 - (e) the proposed protection measures to avoid recurrence of similar incident.
- (iv) When directed by the Architect's Representative, the Contractor shall firm up and secure all dislodged trees and any other dislodged plants and shall treat all wounds of the damaged trees/plants within 3 days of the occurrence of the damage.
- (v) Save as stated in sub-clause (iv) of this Clause, the Contractor shall not carry out any work of repair of the damage prior to the Architect's Representative, acceptance of the report as required in sub-clause (iii) of this Clause.
- (vi) The Contractor shall provide replacement planting of the damaged trees and any other affected plants under the following circumstances:
- (a) in the opinion of the Architect's Representative the damaged trees/plants are dead,
 - (b) in the opinion of the Architect's Representative, the trees/plants have been substantially damaged, resulting in one or more of the following conditions:
 - (i) that imminent death of the trees/plants within the coming growing season is predicted,

- (ii) that the structural integrity of the damaged trees/plants is permanently compromised and consequently the trees/plants become an irreparable public hazard,
- (iii) that any major parts of the damaged trees/plants have been lost and consequently their form, habit and balance have been grossly altered so that their function cannot be reasonably recovered or the trees/plants are causing harm to other preserved trees.
- (iv) When instructed by the Architect's Representative, the Contractor shall carry out the following:
 - (a) removal of the damaged trees/plants for which replacement planting as sub-clause (vi) of this Clause is required, in accordance with the following requirements:
 - (i) for the removal of the damaged trees, the Contractor shall prepare a tree felling application document to the Architect's Representative's satisfaction and provide any other assistance or information as required by the Architect's Representative, for the Architect's Representative's application for approval to the felling of the damaged trees from the government approving authority,
 - (ii) the Contractor shall fell the damaged trees only after the Architect's Representative's approval to the tree felling, which shall normally be given only after the tree felling application has been approved by the government approving authority, and
 - (iii) the Contractor shall remove the damaged plants from the Site, and
 - (b) replacement planting of new plants in accordance with the following requirements:
 - (i) the Contractor shall complete the replacement planting within 28 days from the Architect's Representative's instruction or other time duration as agreed by the Architect's Representative, and
 - (ii) for replacement planting, the Contractor shall plant new plants of the same species and of similar size and form as the damaged plants prior to the damage or provide other alternative replacement planting as agreed by the Architect's Representative.

**Other
References**

70.15.00 (1) The Contractor's attention is also drawn to the latest editions of the following British Standards and British Standard Code of Practice for general reference:

BS 3998 Recommendations for tree work

- BS 4043 Recommendations for transplanting root-balled trees
- BS 4428 Code of practice for general landscape operations
(excluding hard surfaces)
- BS 5837 Guide for tree in relation to construction

Appendix III

Vegetation Survey (undertaken by Ecologist)

The Digital Terrestrial Television Broadcasting Transposer Station construction site at peak of Ling Kok Shan, Lamma Island

Vegetation Survey Report July 2009



CHEC

生態及環境顧問
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The Digital Terrestrial Television Broadcasting Transposer Station construction site at peak of Ling Kok Shan, Lamma Island

Vegetation Survey Report

July 2009

Rev	Date	Originator	Checker /Approver	Description
1 st draft	July 09	Vincent Liu	Dr. Mark Shea	

The Digital Terrestrial Television Broadcasting Transposer Station construction site at peak of Ling Kok Shan, Lamma Island

Vegetation Survey

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1 INTRODUCTION

The Digital Terrestrial Television Broadcasting Transposer Station will be constructed at the peak of Ling Kok Shan, Lamma Island. The whole construction site including 5 meter buffering zone (thereafter called “project area”) is covered with shrubland habitat and bare ground. The current vegetation survey was performed within the proposed project area during July 2009. Flora species including some species of conservation interest were recorded.

2 SURVEY METHODOLOGY

The shrubland habitat and bare ground within the project area was surveyed on foot. All plant species including locally protected, uncommon or restricted plant species of conservation concerned was recorded. The locations for the species with conservation interest were also marked on map. Nomenclature and conservation status of plant species was made a reference to Xing *et al.* (2000) and the Check List of Hong Kong Plants published by AFCD (2004).

3 RESULTS OF VEGETATION SURVEY

In total, 51 flora species, including globally conservation concerned flora species, was recorded. Of these, *Tetracera asiatica*, *Wedelia chinensis* and *Rhodymyrtus tomentosa* were common species within shrubland habitat. Five individuals of Silver-back Artocarpus (*Artocarpus hypargyreus*) and a Small Persimmon (*Diospyros vaccinioides*) were recorded within the project boundary. Both Silver-back Artocarpus and a Small Persimmon were listed as "Vulnerable" under IUCN red list of Threatened Species. In addition, Silver-back Artocarpus was also Class III protected at mainland China. Recorded Silver-back Artocarpus were fenced on-site by contractor while no protection measure was performed for the recorded Small Persimmon. Table 1 shows records of flora species within study area. Table 2 shows the details information for the plants with conservation value. Figure 1 shows the locations for plant species with conservation interest within study area.

Table 1: Plant species found within shrubland habitat at project area.

Family	Latin Name	中文名	Form	Relative abundance
Anacardiaceae	<i>Rhus succedanea</i>	野漆樹	S	+
Anacardiaceae	<i>Rhus hypoleuca</i>	白背漆	S	+
Apocynaceae	<i>Strophanthus divaricatus</i>	羊角拗	C/S	+
Apocynaceae	<i>Alyxia sinensis</i>	念珠藤	C	+
Aquifoliaceae	<i>Ilex asprella</i>	梅葉冬青	S	+
Aquifoliaceae	<i>Ilex pubescens</i>	毛冬青	S	+
Araliaceae	<i>Schefflera heptaphylla</i>	鴨腳木	T	+
Asteraceae	<i>Aster baccharoides</i>	白舌紫菀	S	+
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊	S/C	++
Asteraceae	<i>Senecio stauntonii</i>	閩粵千里光	S	+
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊	S	+
Daphniphyllaceae	<i>Daphniphyllum oldhami</i>	交讓木	S	+
Dilleniaceae	<i>Tetracera asiatica</i>	錫葉藤	C	++
Ebenaceae	<i>Diospyros vaccinioides</i>	小果柿	S	+
Euphorbiaceae	<i>Phyllanthus cochinchinensis</i>	越南叶下珠	S	+
Euphorbiaceae	<i>Breynia fruticosa</i>	黑面神	S	+
Euphorbiaceae	<i>Glochidion eriocarpum</i>	毛果算盤子	S	+
Euphorbiaceae	<i>Sapium discolor</i>	山烏柏	S	+
Fabaceae	<i>Millettia reticulata</i>	雞血藤	C/S	+
Fabaceae	<i>Millettia speciosa</i>	牛大力	S	+
Gleicheniaceae	<i>Dicranopteris pedata</i>	芒萁	S	+
Gramineae	<i>Cymbopogon goeringii</i>	香港吉草	S	+
Gramineae	<i>Rhynchelytrum repens</i>	紅毛草	S	+
Gramineae	<i>Miscanthus floridulus</i>	五節芒	S	+
Lauraceae	<i>Litsea rotundifolia</i>	豺皮樟	S	+
Lauraceae	<i>Litsea glutinosa</i>	潺槁樹	T/S	+
Lauraceae	<i>Cassytha filiformis</i>	無根藤	C	+
Liliaceae	<i>Dianella ensifolia</i>	山菅蘭	S	+
Liliaceae	<i>Asparagus cochinchinensis</i>	天門冬	S	+
Lygodiaceae	<i>Lygodium japonicum</i>	海金沙	C	+
Melastomataceae	<i>Melastoma sanguineum</i>	毛梔	S	+
Mimosaceae	<i>Acacia confusa</i>	台灣相思	T	+
Moraceae	<i>Ficus variolosa</i>	變葉榕	S	+
Moraceae	<i>Artocarpus hypargyreus</i>	白桂木	T/S	+
Myrsinaceae	<i>Embelia laeta</i>	酸藤果	S	+
Myrtaceae	<i>Rhodomyrtus tomentosa</i>	桃金娘	S	++
Rosaceae	<i>Rhaphiolepis indica</i>	車輪梅	S	+
Rubiaceae	<i>Psychotria serpens</i>	葡萄九節	C	+

Family	Latin Name	中文名	Form	Relative abundance
Rubiaceae	<i>Hedyotis acutangula</i>	方骨草	S	+
Rubiaceae	<i>Psychotria asiatica</i>	九節	S	+
Rubiaceae	<i>Gardenia jasminoides</i>	梔子	S	+
Rutaceae	<i>Zanthoxylum avicennae</i>	筍欖花椒	S	+
Rutaceae	<i>Severinia buxifolia</i>	酒餅筍	S	+
Smilacaceae	<i>Smilax glabra</i>	光葉菝葜	C	+
Sterculiaceae	<i>Helicteres angustifolia</i>	山芝麻	S	+
Sterculiaceae	<i>Sterculia lanceolata</i>	假蘋婆	S	+
Theaceae	<i>Gordonia axillaris</i>	大頭茶	T/S	+
Theaceae	<i>Eurya chinensis</i>	崗茶	S	+
Thymelaeaceae	<i>Wikstroemia indica</i>	了哥王	S	+
Verbenaceae	<i>Lantana camara</i>	馬纓丹	S	+
Verbenaceae	<i>Vitex rotundifolia</i>	白背蔓荊	S	+

Note:

+, occurred; ++, common; +++, abundant

T – Tree; S – Shrub; C – Climber

Table 2: Details information for the plants with conservation interest within the project area.

Family	Latin Name	中文名	Habitat	Status
Ebenaceae	<i>Diospyros vaccinioides</i>	小果柿	Shrubland	- listed as "Vulnerable" under IUCN red list of Threatened Species
Moraceae	<i>Artocarpus hypargyreus</i>	白桂木	Shrubland	- Class III protected at mainland China - listed as "Vulnerable" under IUCN red list of Threatened Species

7 CONCLUSIONS

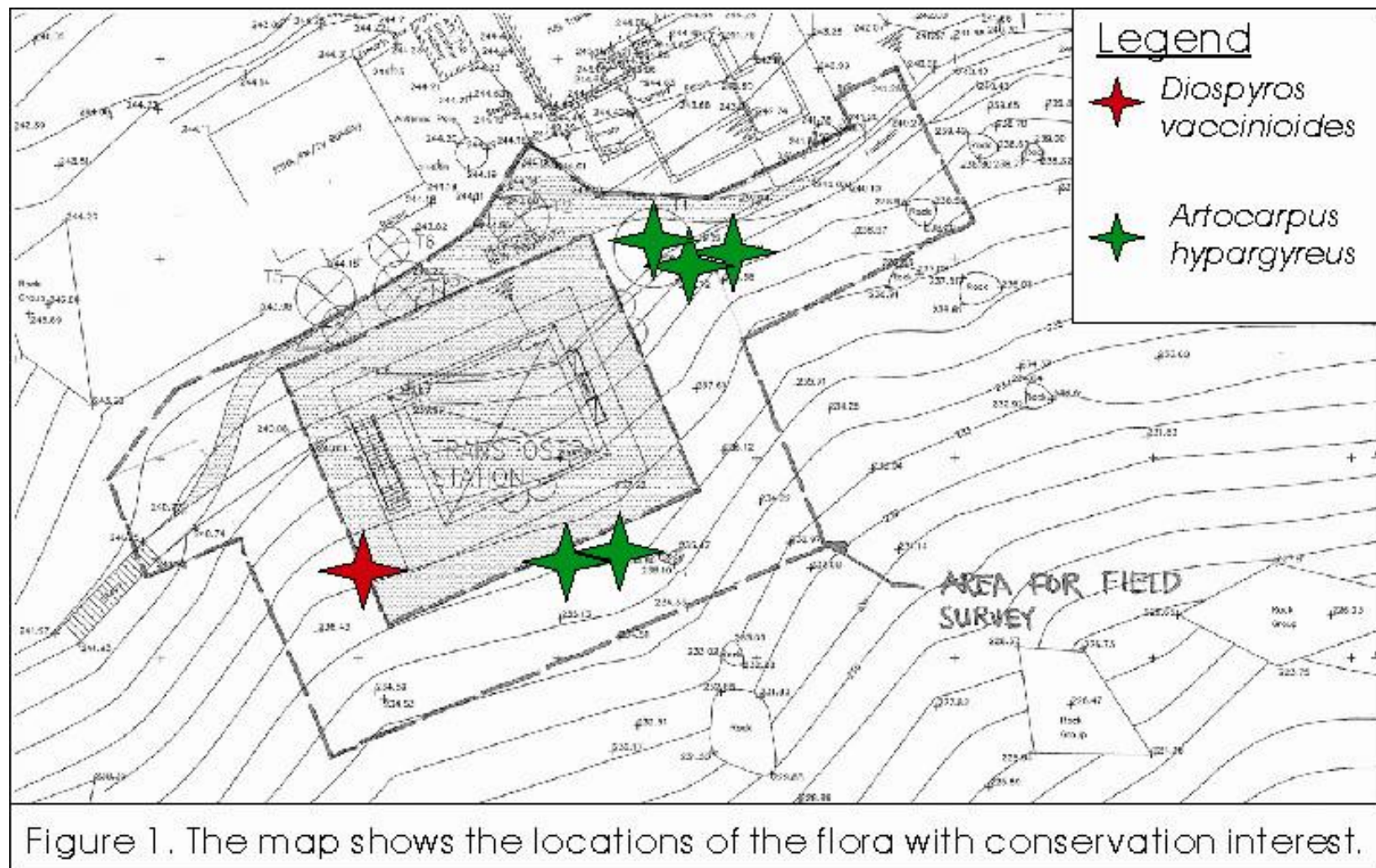
In total, 51 species of flora species including two globally conservation concerned species (i.e. *Artocarpus hypargyreus* and *Diospyros vaccinioides*) were found within the proposed project area. Recorded Silver-back Artocarpus were fenced on-site by contactor while no protection measure was conducted for the recorded Small Persimmon. It is recommended to setup a fence to protect recorded Small Persimmon from damage during construction. Transplantation should be considered if the Small Persimmon is conflicted with the construction activities.

8 REFERENCES

Hong Kong Herbarium (2004), *Check List of Hong Kong Plants*, HKSAR

Xing Fu Wu., Ng Sai Chit and Lawrence K.C. Chau (2000). *Gymnosperms and Angiosperms of Hong Kong*. Memoirs of The Hong Kong Natural History Society. No. 23: 21-136

FIGURE



PHOTOS



Photo 1. Shrubland habitat and project site



Photo 2. Shrubland habitat



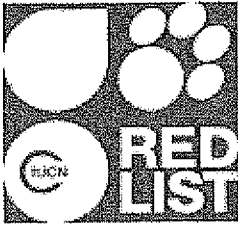
Photo 3. Shrub/Tree *Artocarpus hypargyreus*



Photo 4. Shrub *Diospyros vaccinioides*

Appendix IV

IUCN Red List Citation for *Diospyros vacciniodes*



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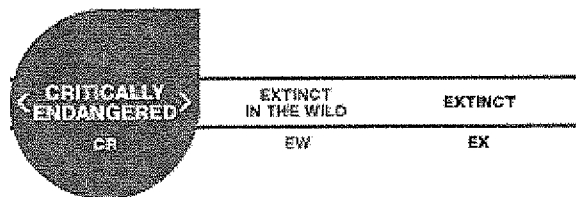


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Diospyros vaccinioides

NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED
NE	DD	LC	NT	VU	EN



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Taxonomy [\[top\]](#)

Kingdom	Phylum	Class	Order	Family
PLANTAETRACHEOPHYTAMAGNOLIOPSIDAEBENALESEBENACEAE				

Scientific Name: *Diospyros vaccinioides*

Species Authority: Lindly

Common Name/s:

English - Small Persimmon

Assessment Information [\[top\]](#)

Red List Category & Criteria: Critically Endangered A1ad+2bd, B1+2abc, C1+2ab, D [ver 2.3](#)

Year Assessed: 1998

Assessor/s: Lu, S.Y. & Pan, F.J.

Geographic Range [\[top\]](#)

Range Description: A population of unproductive individuals is believed to exist on a wooded hillside in Fengkang. Populations are also recorded from Chuhai and Huiyang in China, and Hong Kong.

Countries: Native:
China (Guangdong); Hong Kong; Taiwan, Province of China

Habitat and Ecology [\[top\]](#)

Systems: Terrestrial

Threats [\[top\]](#)

Major Threat(s): A heavily-exploited ornamental species. Overcollecting in Taiwan, has led to the complete absence of mature trees in the wild.

Citation: Lu, S.Y. & Pan, F.J. 1998. *Diospyros vaccinioides*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. <www.iucnredlist.org>. Downloaded on **02 July 2009**.

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