Appendix L

Ecology Chapter Appendices

Appendix L-1 – Photos on Parks

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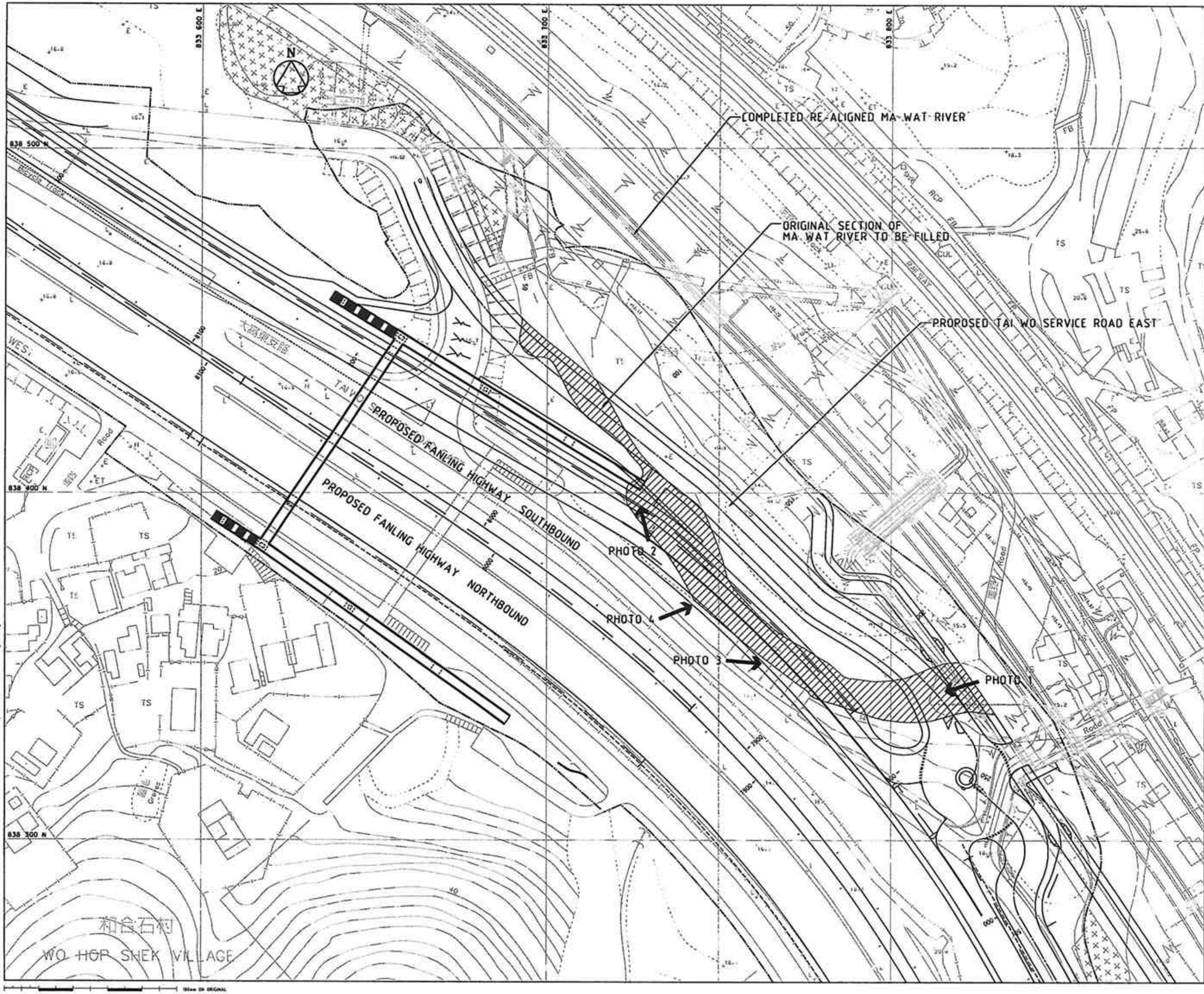
Appendix L-1

Photo L1- 1 Tai Po Waterfront Park

Photo L1- 2 Yuen Shin Park

Photo L1- 3 Yuen Chau Tsai Park



LEGEND:

PROPOSED FILLING OF EXISTING MA WAT RIVER

EXISTING MA WAT RIVER TO BE RETAINED

REVISION

DESIGNED 設計	HTL	CHECKED 審核	PKL
DRAWN 繪圖	SZ	CHECKED 審核	PKL
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路政署
HIGHWAYS DEPARTMENT
MAJOR WORKS PROJECT MANAGEMENT OFFICE

Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 1

CONTRACT NO. HY/XXXX/XX

Hyder Consulting ARUP BLACK & VEATCH

LOCATION OF MEANDERS

SHEET 1 OF 2

TENDER DRAWING

FIGURE 10.16

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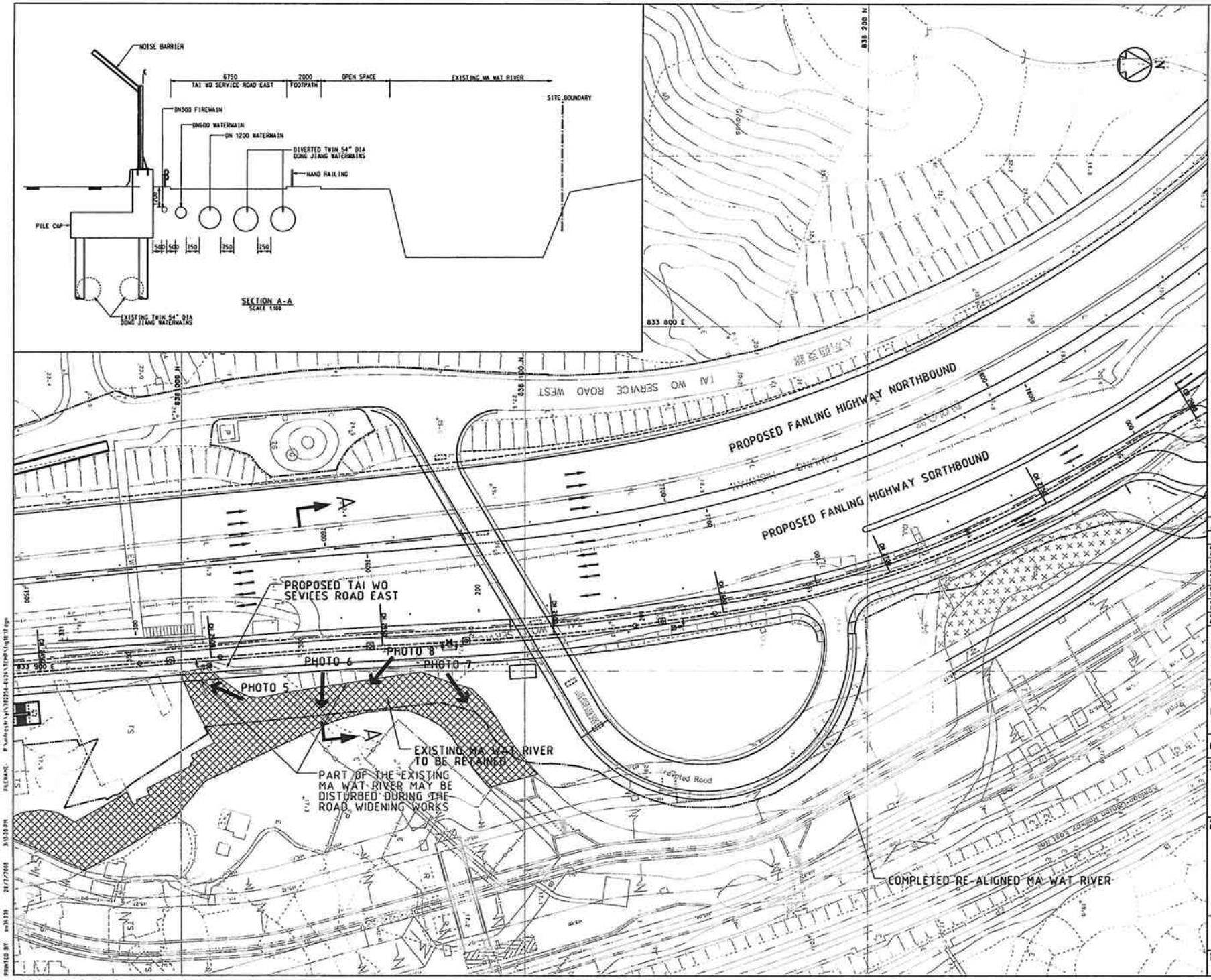
NOISE BARRIER
6750
TAI WO SERVICE ROAD EAST
2000
FOOTPATH
OPEN SPACE
EXISTING MA WAT RIVER
SITE BOUNDARY
DN300 FIREMAIN
ONGOO WATERMAIN
DN 1200 WATERMAIN
DIVERTED TWIN 54" DIA DONG JIANG WATERMAINS
HAND RAILING
PILE CAP
EXISTING TWIN 54" DIA DONG JIANG WATERMAINS
SECTION A-A
SCALE 1:100
838 200 N
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TAI WO SERVICE ROAD WEST
PROPOSED FANLING HIGHWAY NORTHBOUND
PROPOSED FANLING HIGHWAY SORTHBOUND
PROPOSED TAI WO SEVICES ROAD EAST
PHOTO 5
PHOTO 6
PHOTO 8
PHOTO 7
EXISTING MA WAT RIVER TO BE RETAINED
PART OF THE EXISTING MA WAT RIVER MAY BE DISTURBED DURING THE ROAD WIDENING WORKS
COMPLETED RE-ALIGNED MA WAT RIVER
LEGEND:
PROPOSED FILLING OF EXISTING MA WAT RIVER
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MAJOR WORKS PROJECT MANAGEMENT OFFICE
Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 1
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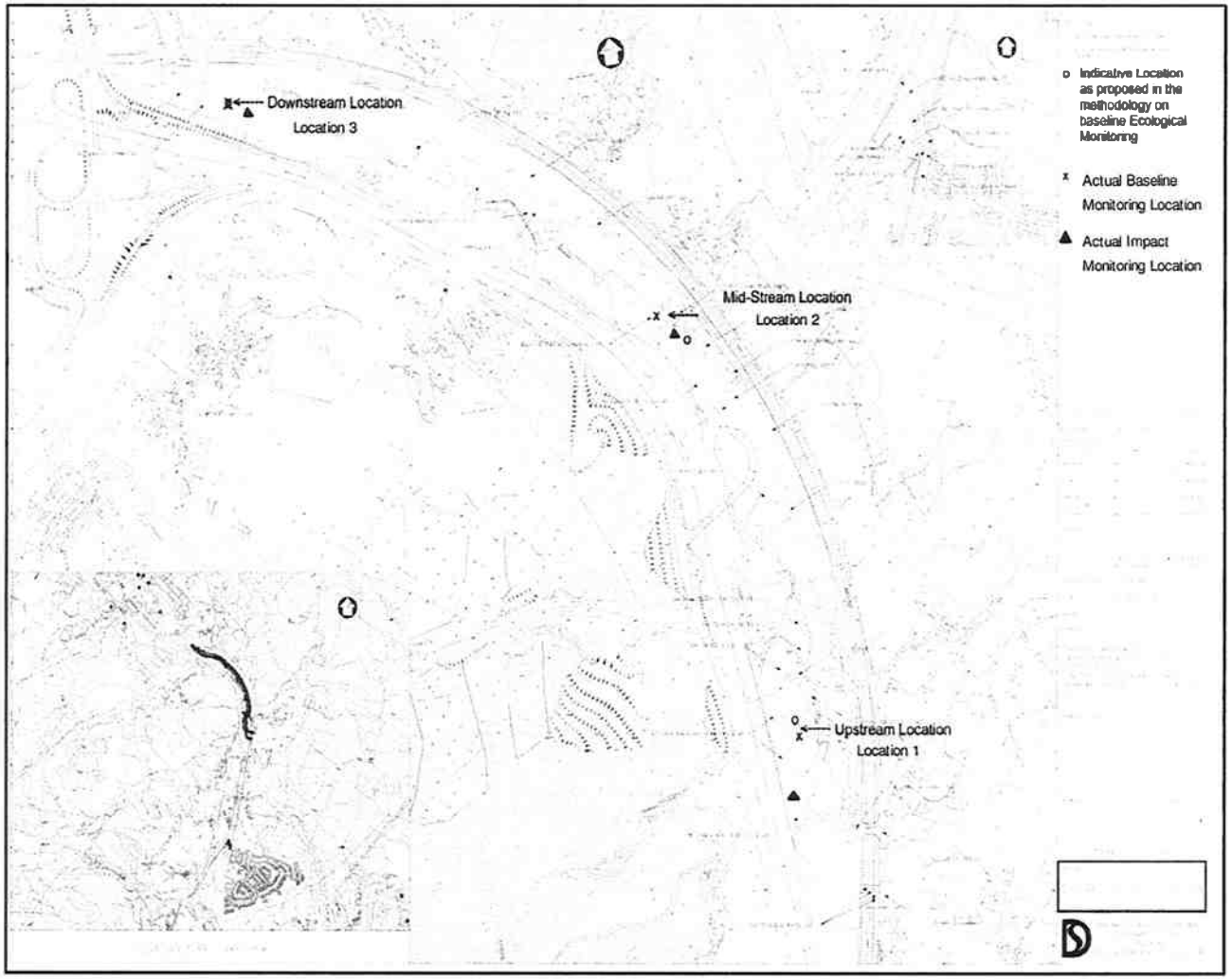
Hyder ARUP BLACK & VEATCH
LOCATION OF MEANDERS
SHEET 2 OF 2
TENDER DRAWING
FIGURE 10.17



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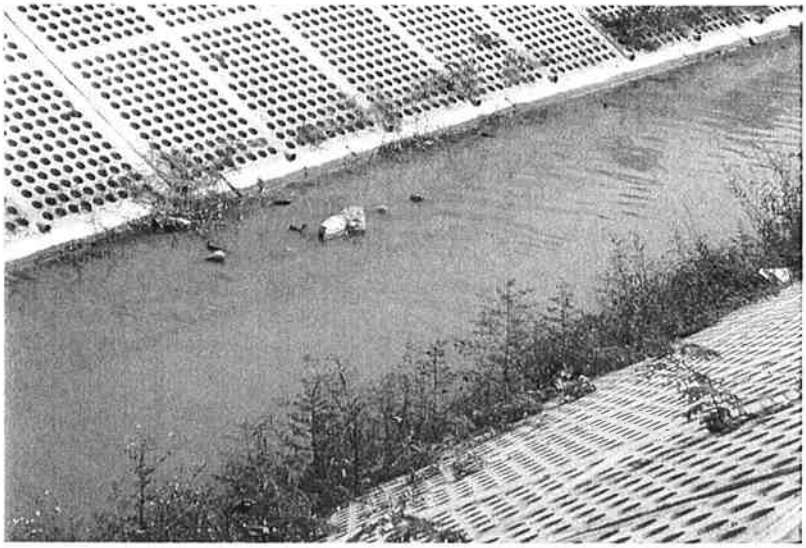
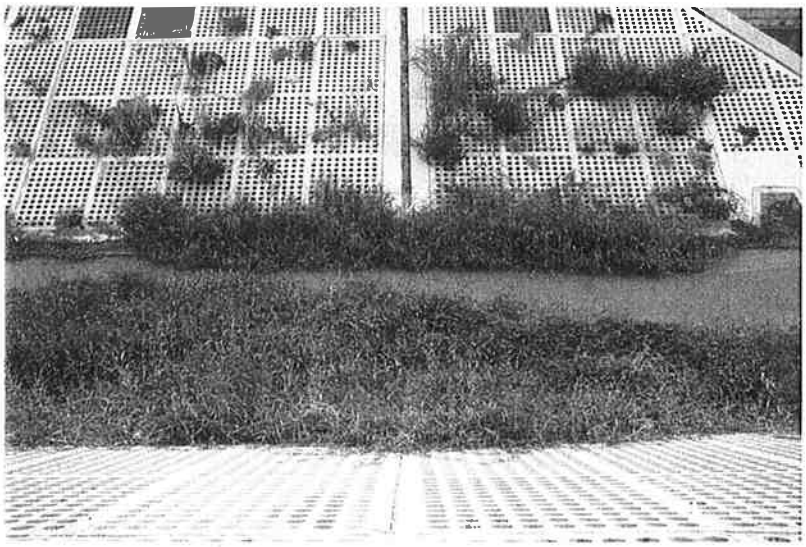
Upstream Monitoring Location (Location 1)



Mid-Stream Monitoring Location (Location 2)



Downstream Monitoring Location (Location 3)

ENSR | AECOM	Contract No. DC/2004/06 Drainage Improvements in Northern N.T., Package A, Phase 1 - Construction of Drainage Channels in Ma Wat and North of Hong Lok Yuen, Tai Po	SCALE	N.T.S.	DATE	Dec-07
		CHECK		DRAWN	JJH
	Photographic Record of Monitoring Locations	JOB NO.	60016792	DRAWING No.	Figure 2
				Rev	-

Appendix L-4. General view of North Meander

Photo L4- 1

Photo L4- 2

Appendix L-5. North meander

Photo L5- 1 Outflow at the Northern extent of North meander

Photo L5- 2 Outflow at the Northern extent of North meander

Appendix L-6 Existing condition of the Drainage Channel

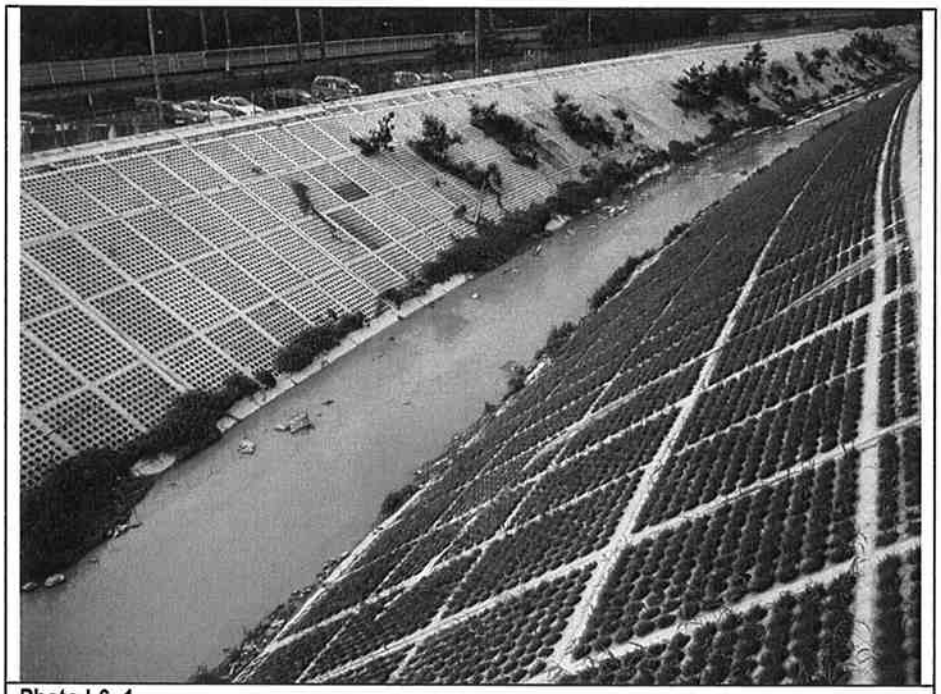


Photo L6- 1

Agreement No. CE58/2000
Design and Construction Assignment for Widening of Tolo Highway/Fanling Highway Between Island House Interchange and Fanling Supplementary Agreement No.3

Ecological Survey

Final Report

May 2008

Agreement No. CE58/2000
Design and Construction Assignment for
Widening of Tolo Highway/Fanling Highway
Between Island House Interchange and Fanling
Supplementary Agreement No.3

Final Ecological Survey Report

Table of Contents

1 INTRODUCTION

The Tolo highway/Fanling highway was planned to be widen in order to encounter the increasing traffic volume in future. A meander of Ma Wat River adjacent to existing Fanling highway needs to be filled to widen the road. Flora and fauna inside the meander would be affected due to habitat loss. The objective for the ecological survey was to update ecological information and as well as to propose of suitable mitigation measures in case ecological impact was predicted.

2 SURVEY METHODOLOGY

2.1 Scope of Field Survey

The field survey was defined as the areas of the affected meander which is approx. 90 meter in length. The meander belongs to old Ma Wat River (Photo 1). The surveys were designed to collect data to supplement ecological information to previously approved EIA of Widening of Tolo/Fanling Highway. Special attention was paid to rare/protected species of flora and fauna which would be directly impacted by the proposed road works.

The following surveys were undertaken:

Biotic Data Collection

- Vegetation surveys;
- Bird survey;
- Fish survey; and
- Other wildlife including bat, Odonate (dragonfly and damselfly), butterfly, Macro-invertebrates and Herpetofauna (amphibian and reptile) survey;

Abiotic Data Collection

- Sediment characteristics
- Water flow

The information presented in the following sections was based on the findings of the field surveys performed on the 21st and 22nd April 2008. As the site is small, approx. 90m in length and 10m in width including riparian belt, located at a highly disturbed and fragmented area, two days field survey in wet season including a night survey is considered appropriate. The ecological conditions were evaluated based on the criteria laid out in Annex 8 & 16 of the EIAO TM.

2.2 Biotic Data Collection

Avifauna

Avifauna survey was conducted during the proposed ecological survey on the 21st and 22nd April 2008. Special attention paid to those stream channel area where birds used as feeding and foraging habitat. Transect count was be used for the avi-fauna survey aimed to collect qualitative data. In general, avifauna survey was performed in the morning or late afternoon when birds are more active (feeding and foraging). Numerical abundance was recorded along survey transect. Binoculars and digital camera was the main instrument to be used. Nomenclature and protection

status of the species was follow those documented in the AFCD website (www.hkbiodiversity.net) and Carey *et al.* (2001).

Fish and Herpetofauna

Fish community, amphibian and reptile at the specified river meander was surveyed by live trapping (Photo 5), hand nets (Photo 6) and direct observation methods.

Sampling was conducted at three proposed sampling locations, and covered major part of the meander habitats. The number of the captured or observed fish was estimated and recorded.

Fish and Herpetofauna surveys were conducted once on the 21st April 2008, and one night survey on the 21st April 2008 was also conducted searching for amphibians and reptiles (Photo 7).

Bat survey

Bat and its potential habitat (such as palm tree for fruit bat) was searched during field surveys.

Aquatic Macro invertebrates

Macroinvertebrates in the likely affected meander was surveyed. Three sampling points within the affected meander sites were be designed to collect necessary macroinvertebrate fauna. Three replicates were taken at each sampling point and pool together for further sample process. Direct count and hand netting was the main survey methodologies for stream organisms survey. Numerical abundance, species identity and other notable behaviour was recorded. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiodiversity.net) and other literatures such as Dudgeon (1999).

Aquatic macroinvertebrate surveys were conducted once on the 21st April 2008.

Adult Odonate and Butterfly Survey

Adult Odonate and butterfly survey was conducted within the survey area. Transect count was used for the survey. Binoculars, digital camera and hand net was utilized to aid identification when necessary. In general, all captured fauna were released immediately after on-site identification or taking photo. Numerical abundance, species identity and other notable behaviour was recorded. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiodiversity.net).

Adult Odonate and butterfly survey was conducted along survey transect once on the 21st April 2008.

Riparian Vegetation

Riparian vegetation including aquatic and emergent plants was surveyed by line and belt transects along the affected river meander and its riparian habitat (Photo 2-4). Species, relative abundance, average heights was recorded. Major trees outside sampling transect, but within survey area were also recorded as part of the flora baseline information.

Vegetation survey was conducted at three selected belt transects. The belt transects was run across the river meander and is aimed to collect quantitative data of vegetation. Similarly,

qualitative data of plants was collected by recording plant species along line transect. Nomenclature and protection status of the species was follow those documented in the AFCD website (www.hkbiodiversity.net) and Hong Kong Herbarium (2004).

Vegetation survey was conducted once on the 21st April 2008.

2.3 Abiotic Data Collection

Sediment characteristics

Sediment/substrate characteristics were recorded by estimation of sediment cover in percentage, e.g. mud, sand, pebble, rock and boulder in the meander bed.

Water flow

Water flow rates in the meander were measured by record of travel time of the floating materials (e.g. floating ball) in a measured distance.

3 RESULTS OF FIELD SURVEYS

The affected meander was isolated and disconnected from the original old Ma Wat River due to river improvement works which re-channellized the river. High water turbidity and bad smell was observed at the meander during field survey.

3.1 Vegetation

Trees at the western side of the meander embankment were planted with majority of them belongs to fruit tree and ornamental flora such as *Litchi chinensis*, *Dimocarpus longan* and *Osmanthus fragrans*. In addition, about 10 individuals of *Podocarpus macrophyllus* (Photo 8) were recorded at the embankment. All recorded *Podocarpus macrophyllus* were newly planted for landscape purpose. Grasses of riparian species were dominated by *Microstegium ciliatum* and *Panicum trypheron*. The coverage of riparian species reaches 40-50% at locations of belt transects. In total, 39 species were recorded along the affected meander. No rare or protected plants were recorded. Flora species recorded in the meander was given in Table 3.1.1. Belt transect results were shown in Table 3.1.2,

Table 3.1.2 Flora species recorded from belt transect survey at the meander

			T1		T2		T3	
Family	Species name	Species name in Chinese	Height (M)	Coverage (%)	Height (M)	Coverage (%)	Height (M)	Coverage (%)
Gramineae	*Panicum trypheron*	毛葉黍	0.3	40	0.4	25	1.0	30
Asteraceae	*Mikania micrantha*	薇甘菊			0.6	33		
Mimosaceae	*Leucaena leucocephala*	銀合歡	3.0	1	3.0	5		
Gramineae	*Miscanthus floridulus*	五節芒	1.0	1				
Gramineae	*Microstegium ciliatum*	剛秀竹	0.3	25	0.6	30		
Fabaceae	*Pueraria lobata*	野葛	1.0	20				
Euphorbiaceae	*Macaranga tanarius*	血桐	0.2	1			1.5	1
Urticaceae	*Boehmeria nivea*	苧麻			0.6	1		
Cyperaceae	*Cyperus flabelliformis*	風車草			0.8	5		
Solanaceae	*Solanum torvum*	水茄					1.5	1
Asteraceae	*Wedelia chinensis*	蟛蜞菊	0.2	11				
Malvaceae	*Hibiscus tiliaceus*	黃槿					5.0	6
Cuscutaceae	*Cuscuta chinensis*	菟絲子					0	1
Convolvulaceae	*Ipomoea cairica*	五爪金龍					5.0	60
Araceae	*Colocasia esculenta*	芋	0.3	1				
Araceae	*Alocasia odora*	海芋					1.5	1
Sapindaceae	*Dimocarpus longan*	龍眼			3	1		

3.2 Fauna

Birds

Birds at the survey area were surveyed on the 21st and 22nd April 2008. In total, 8 species were recorded within and adjacent to the meander. Most birds recorded were resident species in Hong Kong (Carey, 2001). Both wetland and woodland species were recorded. All recorded species are common species in Hong Kong (Carey, 2001). Species list with their status, commonness and relative abundance was given in Table 3.2.1.

Adult Odonate Butterfly Survey

Dragonfly/damselfly and butterfly species recorded at the site was listed in Table 3.2.2. In total, five species of dragonfly/damselfly species were recorded within and at the vicinity of affected meander during the survey. *Copera marginipes* (Photo 9) was a dominated species at the meander. All recorded species were abundant throughout Hong Kong (Keith, 2003). However, no dragonfly/damselfly larva was recorded at the meander. Three species of butterfly with *Pieris canidia* commonly seen at the site were recorded at the meander site and they are all common species in Hong Kong (Vor Yiu et al, 2002). Butterfly species list with local status was given in Table 3.2.3.

Herpetofauna

Herpetofauna (including amphibian and reptile) survey (day and night survey) was conducted on 21st April 2008. The mating call of *Rana guentheri* was commonly heard. *Rana guentheri* is a

native and very widespread throughout in Hong Kong (Stephen et al, 1998). No other herpetofauna was recorded at the meander and its riparian habitat.

Fish

Fish surveys were performed at the affected meander. No fish was caught by live traps or hand nets in the meander. However, a number of fish were observed breathing at the water surface which indicated low dissolved oxygen level occurred in the water (Photo 10). The observed fishes belonged *Cyprinus carpio* and *Oreochromis niloticus*. *Oreochromis niloticus* is the dominated species in the meander. There were estimated over 40 individuals of O. niloticus in the meander. The recorded fish fauna are common species in Hong Kong.

Bat

No bat and bat drops and potential fruit bat roosting plant (such as palm tree) was recorded at the site.

Aquatic Macro invertebrates

Aquatic Macro invertebrates were very scarce at the meander. Only some Chironomid larvae were collected by hand net sampling at three sampling points. No tadpoles and other large invertebrates were presented in the samples.

3.3 Result of Abiotic Data

Sediment characteristics and water flow

The affected meander was isolated and disconnected from the original old Ma Wat River. No water flow was observed at the meander. Sediment composition was the same at three sampling points. Generally, sediment was comprised of mud (78%), sand (20%) and rock (2%).

4. ECOLOGICAL EVALUATION

The ecological importance of the habitats and wildlife identified within the surveyed meander are evaluated in accordance with the EIAO TM Annex 8 criteria.

Ecological importance of habitat is evaluated and presented in Tables 4.1.

Criteria	*Evaluation*
Naturalness	*Natural but disturbed by drainage improvement works*
Diversity	*Low*
Rarity	*Common*
Re-creatability	*Re-creatable.*
Fragmentation	*Fragmented*
Ecological linkage	*Linkage was interrupted by road and new drainage channel*
Potential value	*Feeding and foraging ground for aquatic life such as bird and amphibian.*
Nursery/breeding ground	*Nursery/breeding ground for aquatic life, such as fish, amphibian and dragonfly.*

Criteria	***Evaluation***
Age	*N/A*
Abundance/Richness of wildlife	*Low*
Overall Ecological value	*Low*

Table 4.1 Ecological evaluation of the surveyed meander, Ma Wat River

Relevant ecological information reported in the Final Environmental Study (ES) Report on "Drainage Improvement in Northern N.T. Package A" was reviewed for purpose of ecological evaluation of the current surveyed meander site. The ecological value of Ma Wat River was ranked 'moderate' given by the above mentioned ES report mainly based on the factor that the river supported several fish species including three fish species with declining local populations (i.e., *Ophicephalus maculatus, Carassius auratus, Clarias fuscus*) (Maunsell, 2003). Those fish species were not recorded from the surveyed meander and it is likely due to habitat quality degradation (caused by cut off from the main river channel, no water source inlet, sedimentation, receiving polluted water and etc.). As a result, the habitat could be dried up in extreme dry weather condition and it could not sustain fish population and other aquatic life in such a case. The more upper Ma Wat River system was comprised of several stream tributaries called Kau Lung Hang stream where several fish species were reported including locally endangered fish namely barb *Acrossocheilus hemispinus* and Oriental *Garra Garra orientalis* which had been recorded before and not recorded in recent years, but it could potentially existed according to ES report. Kau Lung Hang also supported other relatively diverse fauna including birds, amphibians, dragonflies, butterflies and aquatic macro-invertebrates. Ecological value of Kau Lung Hang stream was ranked high in the ES report for the mentioned drainage project. A supplementary field survey to those stream tributaries was undertaken on 14th May 2008 and found that A. hemispinus was mainly distributed in a few undisturbed Kau Lung Hang stream tributaries on the eastern side of Canton-Kowloon Railway. The A. hemispinus was not recorded from the current surveyed meander and could not inhabit the habitat due to poor water quality as the fish was found only in habitats with clean and running stream water.

5 MITIGATION

It is proposed to capture and relocate the native frog species of *Rana guentheri* to the nearby undisturbed meander or river channel. Tadpoles, if present, should also be captured and relocated. Fish should also be live-captured and relocated to the same relocation habitat as for frog before filling of the meander.

6 SUMMARY

Ecological field surveys were conducted in April 2008. The meander was isolated from the original Ma Wat River as a result of river improvement works. Only some common flora and fauna species was recorded at the site. No rare or protected flora and fauna species was found. Ecological value of the meander was considered low. It is propose to capture and relocate the frogs, potential tadpoles and fishes in the habitat to a nearby meander or river channel before filling up the meander.

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FIGURE

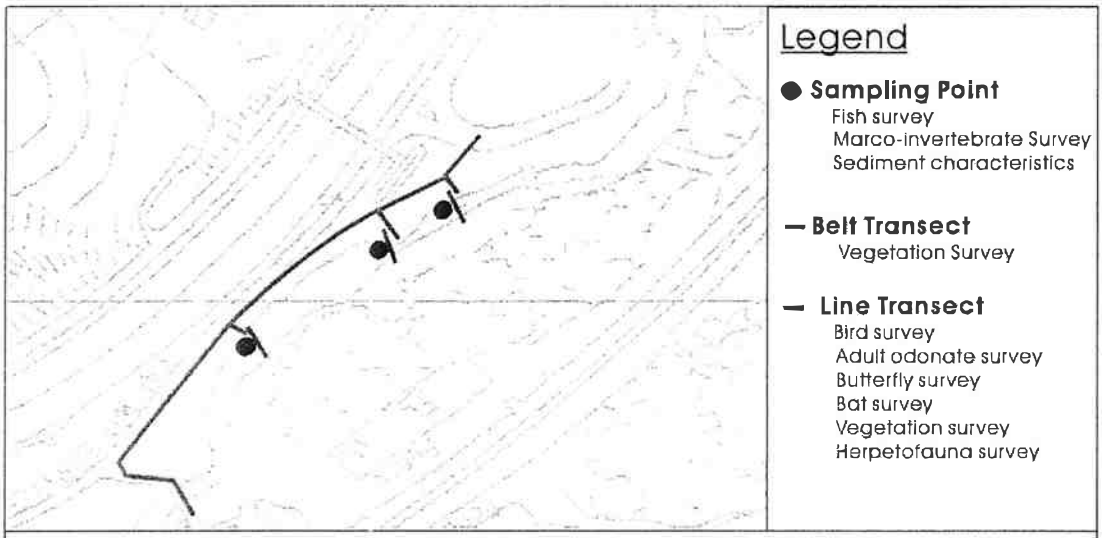


Figure 1. Location Map showing the sampling locations at the meander of Ma Wat River

TABLES

Table 3.1.1 Flora species recorded along survey line-transect at meander.

Family	Species	Chinese name	Native/Eoxtic	Ma Wat River
				Meander habitat
Anacardiaceae	*Mangifera indica*	杧果	Exotic	+
Araceae	*Colocasia esculenta*	芋	Native	+
Araceae	*Alocasia odora*	海芋	Native	+
Arecaceae	*Roystonea regia*	王棕	Exotic	+
Arecaceae	*Livistona chinensis*	蒲葵	Exotic	+
Arecaceae	*Rhapis excelsa*	棕竹	Native	+
Asteraceae	*Bidens alba*	白花鬼針草	Exotic	+
Asteraceae	*Wedelia chinensis*	蟛蜞菊	Exotic	+
Asteraceae	*Mikania micrantha*	薇甘菊	Exotic	++
Caesalpiniaceae	*Bauhinia variegata*	宮粉羊蹄甲	Exotic	+
Commelinaceae	*Commelina communis*	鴨跖草	Native	+
Convolvulaceae	*Ipomoea cairica*	五爪金龍	Exotic	++
Fabaceae	*Pueraria lobata*	野葛	Native	+
Gramineae	*Bambusa sp.*	竹	--	+
Gramineae	*Panicum maximum*	大黍	Exotic	+
Gramineae	*Miscanthus floridulus*	五節芒	Native	+
Gramineae	*Microstegium ciliatum*	剛秀竹	Native	+
Gramineae	*Panicum trypheron*	毛葉黍	Native	+++
Meliaceae	*Melia azedarach*	苦楝	Exotic	+
Mimosaceae	*Leucaena leucocephala*	銀合歡	Exotic	+
Moraceae	*Ficus microcarpa*	細葉榕	Native	+
Moraceae	*Ficus hispida*	對葉榕	Native	+
Myrtaceae	*Cleistocalyx operculatus*	水翁	Native	+
Oleaceae	*Osmanthus fragrans*	桂花	Exotic	+
Oxalidaceae	*Oxalis corniculata*	酢醬草	Native	+
Podocarpaceae	*Podocarpus macrophyllus*	羅漢松	Native	+
Polygonaceae	*Polygonum barbatum*	毛蓼	Native	+
Polygonaceae	*Polygonum perfoliatum*	杠板歸	Native	+
Rutaceae	*Clausena lansium*	黃皮	Exotic	+
Sapindaceae	*Dimocarpus longan*	龍眼	Exotic	+
Sapindaceae	*Litchi chinensis*	荔枝	Exotic	+
Ulmaceae	*Celtis sinensis*	朴樹	Native	+
Urticaceae	*Boehmeria nivea*	苧麻	Exotic	+
Vitaceae	*Cayratia corniculata*	角花烏蘞莓	Native	+
Euphorbiaceae	*Macaranga tanarius*	血桐	Native	+
Cyperaceae	*Cyperus flabelliformis*	風車草	Exotic	+
Malvaceae	*Hibiscus tiliaceus*	黃槿	Native	+
Solanaceae	*Solanum torvum*	水茄	Exotic	+
Cuscutaceae	*Cuscuta chinensis*	菟絲子	Native	+

Note:

"+" represent species exist in the study site

"++" represent species is common in the study site

"+++" represent species dominates in the study site

Table 3.2.1 Avi-fauna species recorded at the surveyed meander.

Common name	Species				Ma Wat River
			Status	Commonness	Meander habitat
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	Abundant	+
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	Abundant	+
Little Egret	*Egretta garzetta*	小白鷺	P	Abundant	+
Magpie Robin	*Copsychus saularis*	鵲鴝	R	Abundant	+
Yellow Bellid Prinia	*Prinia flaviventris*	灰頭鷦鶯	R	Abundant	+
Common Koel	*Eudynamys scolopacea*	噪鵑	R	Common	+
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R	Common	+
Grey Heron	*Ardea cinerea*	蒼鷺	W	Common	+

Note:

R: resident Sp: spring vistor

W: winter vistor P: present all year

S: summer vistor "+" represent species exist in the study site

M: migrant "++" represent species is common in the study site

A: autumn vistor "+++" represent species dominates in the study site

Table 3.2.2 Dragonfly/damselfly species recorded at the surveyed meander.

Dragonfly				Ma Wat River
Species	Common name	Chinese name	Commonness	Meander habitat
Pantala flavescens	Wandering Glider	黃蜻	Abundant	+
Pseudothemis zonata	Pied Skimmer	玉帶蜻	Common	+
Prodasineura autumnalis	Black Threadtail	烏齒原蟌	Abundant	+
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	Abundant	++
Ceriagrion auranticum ryu	Orange-tailed Sprite	疏球橘黃蟌	Abundant	+

Table 3.2.3 Butterfly species recorded at the surveyed meander.

Butterfly				Ma Wat River
Species	Common name	Chinese name	Commonness	Meander habitat
Pieris canidia	Indian Cabbage White	東方菜粉蝶	Very Common	++
Papilio polytes	Common mormon	玉帶鳳蝶	Very Common	+
Pseudozizeeria maha	Pale Grass Blue	砵漿灰蝶	Very Common	+

Note:

"+" represent species exist in the study site

"++" represent species is common in the study site

"+++" represent species dominates in the study site

PHOTOS

Photo 1: General view of the meander

Photo 2: The view of Transect 1.

Photo 3: The view of Transect 2.

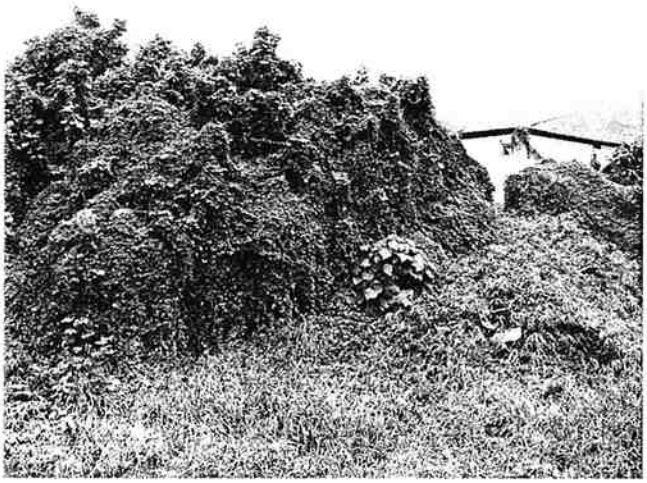


Photo 4: The view of Transect 3.

Photo 5: Live trapping

Photo 6: Hand netting

Photo 7: Active search for Herpetofauna survey

Photo 8: Planted *Podocarpus macrophyllus*

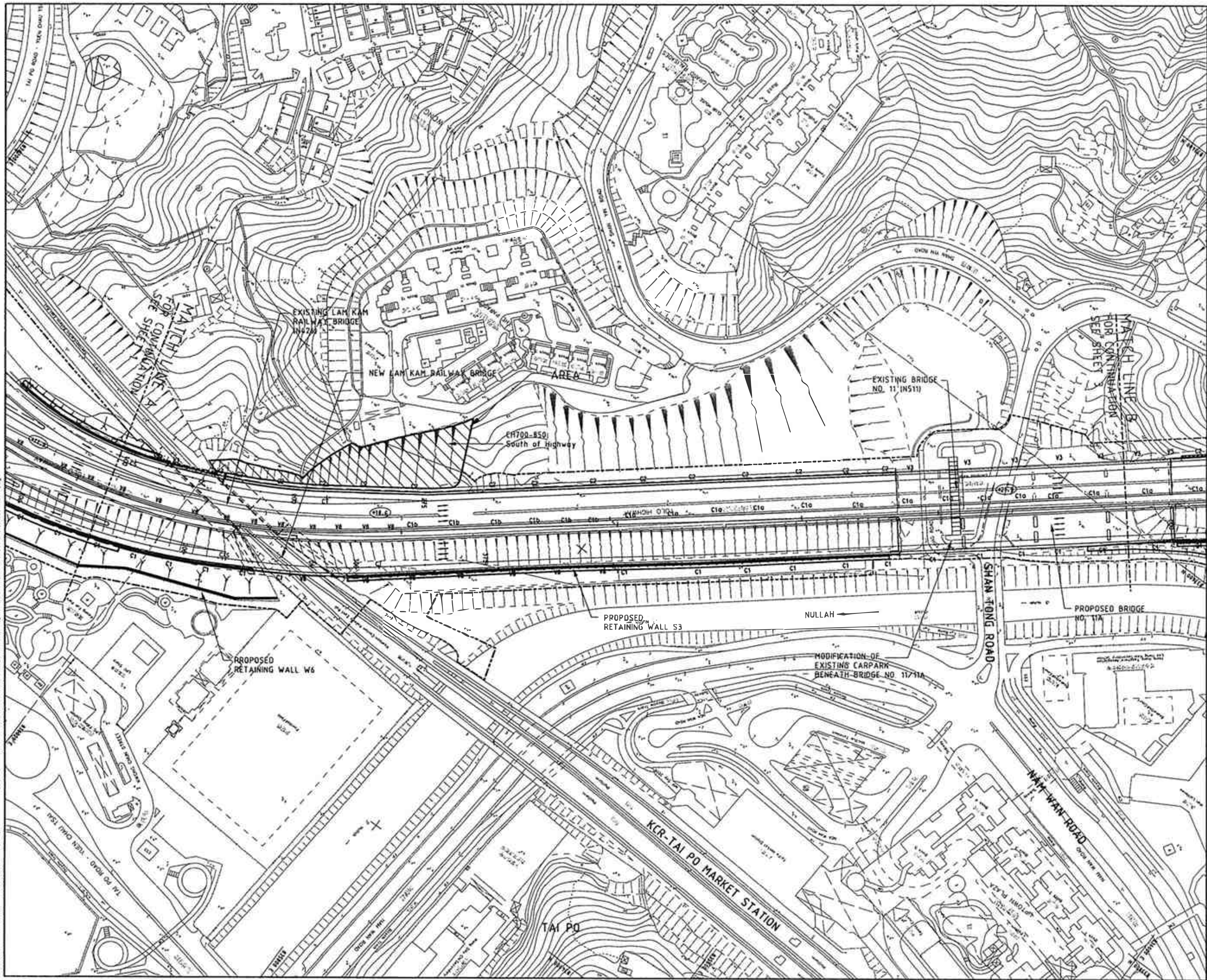
Photo 9: *Copera marginipes*

Photo 10: Fish breathing at the water surface

Appendix L-8 General view of South Meander

Photo L8- 1

Photo L8- 2



NOTE :-

REFER TO SHEET 1 FOR LEGEND

LEGEND: -

ECOLOGICAL COMPENSATORY PLANTING

DESIGNED 設計	H. SUN
CHECKED 審核	T. CHAN
DRAWN 繪圖	S. LEUNG
CHECKED 審核	S. TSE
APPROVED FOR ISSUE 簽發人	T. CHAN
DATE 日期	JAN 2008
SCALE 比例	1 : 2000 (A3)
CAD REF	APPENDIX-A-2

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Agreement No. CE 58/2000
Design and Construction Assignment for Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling

路政署
HIGHWAYS DEPARTMENT
主要工程管理處
MAJOR WORKS PROJECT MANAGEMENT OFFICE

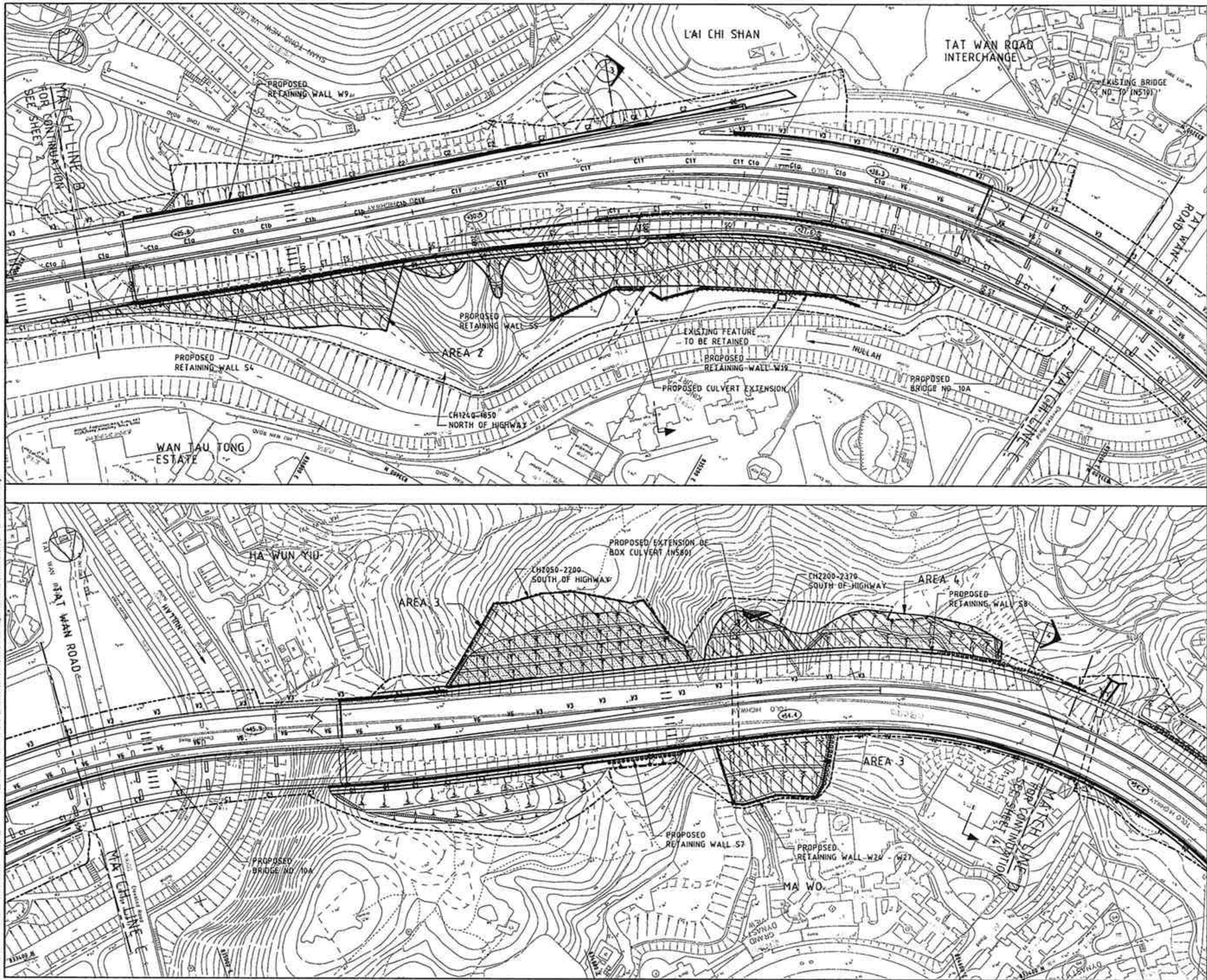
Hyder Consulting ARUP BLACK & VEATCH

LOCATION OF ECOLOGICAL COMPENSATORY PLANTING

SHEET 1 OF 4

ENVIRONMENTAL REPORT

APPENDIX-L-9



NOTE :-

1. REFER TO SHEET 1 FOR LEGEND.
2. FOR SECTIONS 3 AND 4 REFER TO FIG. NOS. 2.22 & 2.23 RESPECTIVELY.

DESIGNED: H. SUN	CHECKED: T. CHAN
DRAWN: S. LEUNG	CHECKED: S. TSE
APPROVED FOR ISSUE: T. CHAN	© Copyright Reserved
DATE: JAN 2008	All dimensions are in mm unless shown otherwise
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CAD REF: APPENDIX-A-2	

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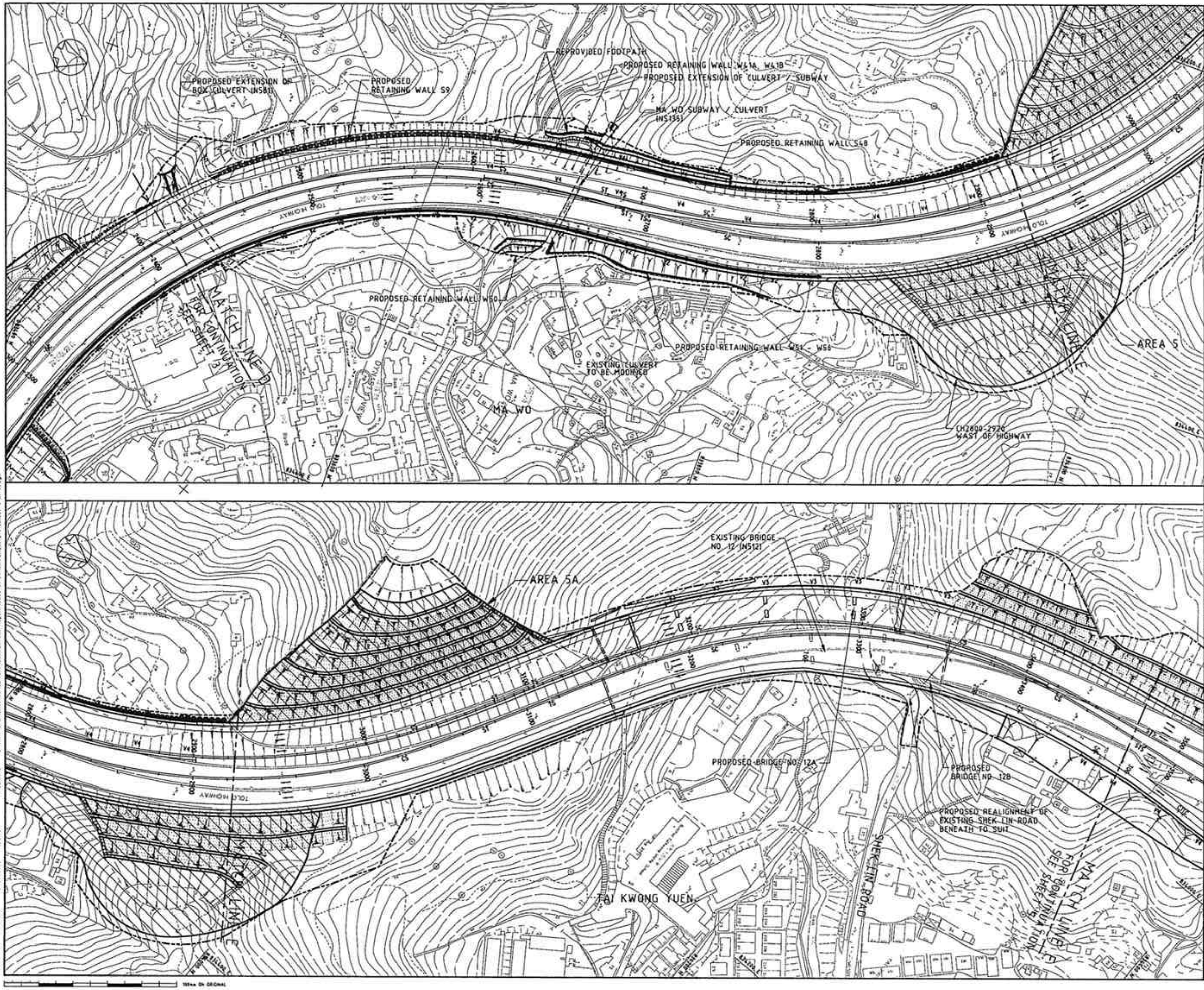
LOCATION OF ECOLOGICAL COMPENSATORY PLANTING

SHEET 2 OF 4

ENVIRONMENTAL REPORT

APPENDIX-L-9



NOTE :-

REFER TO SHEET 1 FOR LEGEND

REVISION			
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DRAWN	S. LEUNG	CHECKED	S. TSE
APPROVED FOR ISSUE	T. CHAN	© Copyright Reserved	
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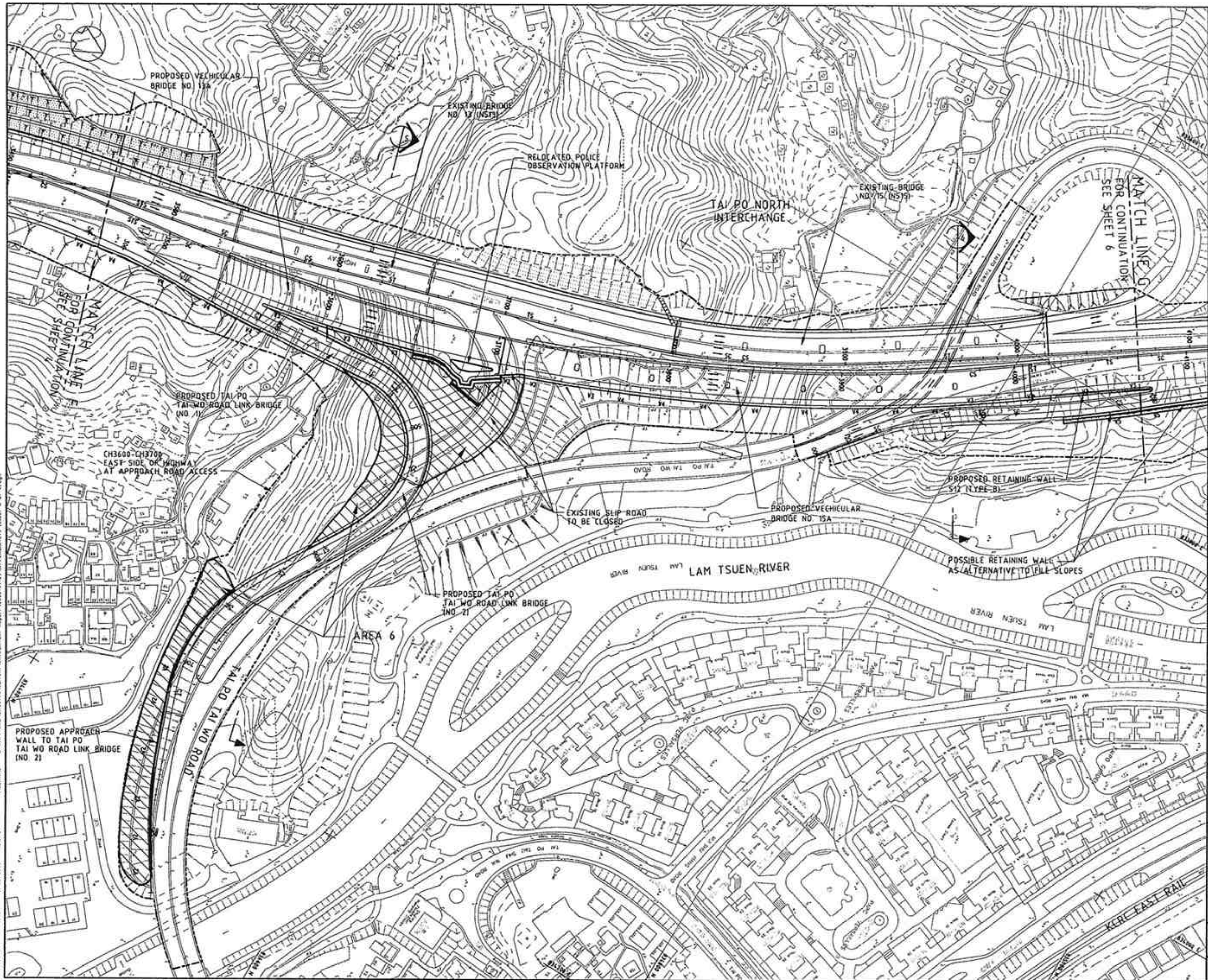
LOCATION OF ECOLOGICAL COMPENSATORY PLANTING

SHEET 3 OF 4

ENVIRONMENTAL REPORT

APPENDIX-L-9



NOTE :-

1. REFER TO SHEET 1 FOR LEGEND.

2. FOR SECTION 5, REFER TO FIG. NO. 2.23.

REV	DATE	DESCRIPTION	CHECKED	APPD

REVISION

DESIGNED	H. SUN	CHECKED	T. CHAN
DRAWN	S.K. CHAU	CHECKED	S. TSE
APPROVED FOR ISSUE	T. CHAN	© Copyright Reserved	
DATE	JAN 2000	All dimensions are in mm unless shown otherwise	
SCALE	1 : 2000 (A3)	No measurement should be taken from drawing directly	
CAD REF	APPENDIX-A-2		

PROJECT TITLE

Agreement No. CE 58/2000
Design and Construction Assignment for Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling

CLIENT

路政署
HIGHWAYS DEPARTMENT
主要工程管理處
MAJOR WORKS PROJECT MANAGEMENT OFFICE

CONSULTANT

Hyder Consulting ARUP BLACK & VEATCH

DRAWING TITLE

LOCATION OF ECOLOGICAL COMPENSATORY PLANTING

SHEET 4 OF 4

STATUS

ENVIRONMENTAL REPORT

DRAWING NO. APPENDIX-L-9 REV. -

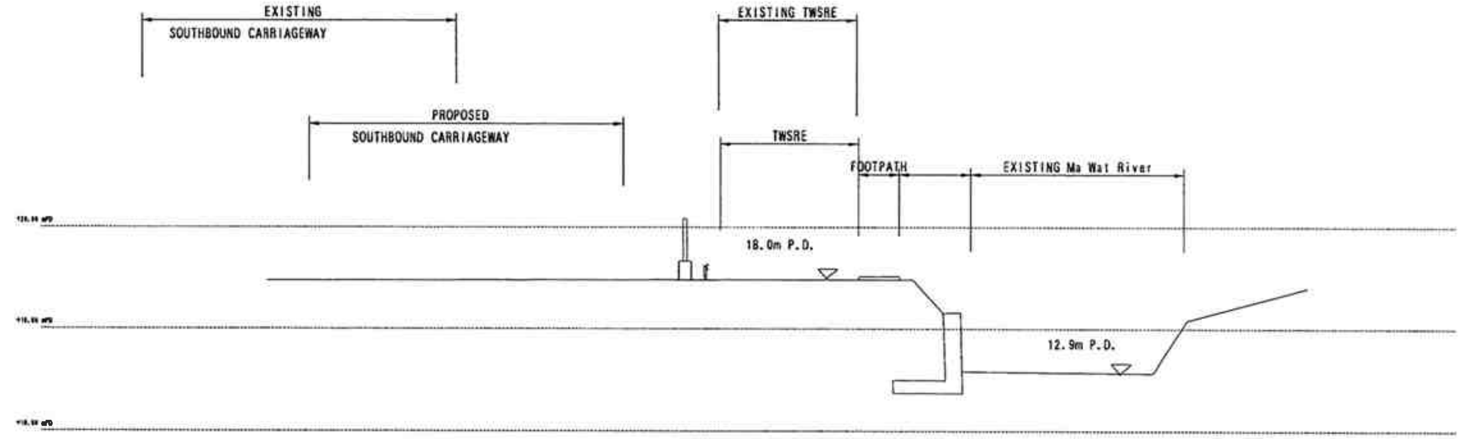


Photo 6

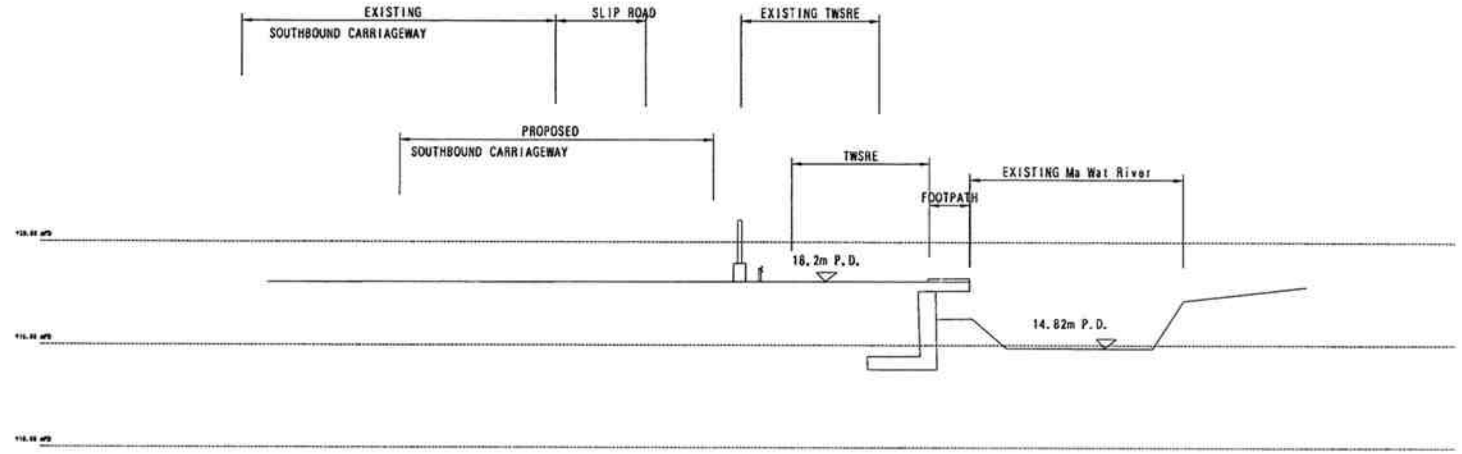


Photo 5

GENERAL REVISION

Agreement No. CE 58/2000
Design and Construction Assignment for
Widening of Tolo Highway / Fanling Highway
between Island House Interchange and Fanling

路政署
HIGHWAYS DEPARTMENT

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CROSS SECTION

APPENDIX L-1D

RETROFITTING OF NOISE BARRIERS ON FANLING HIGHWAY (EAST RAIL FANLING STATION TO WO HING ROAD) (HyD/MWPMO)

WO HOP SHEK

WO HOP SHEK INTERCHANGE

NORTH DISTRICT SEWERAGE STAGE 2 PHASE 1 (DSD/PM)

DRAINAGE IMPROVEMENT WORKS IN KAU LUNG HANG, YUEN LONG, NAM WA PO AND TAI HANG AREAS (DSD/DP)

LAM TSUEN VALLEY SEWERAGE (DSD/PM)

NAM WA PO

LAM KAM ROAD INTERCHANGE WORKS AREA

TAI HANG

LAM KAM ROAD INTERCHANGE

WAI TAU TSUEN

FANLING HIGHWAY

MUI SHUE HANG

KAU LUNG HANG

CONSTRUCTION OF DRAINAGE CHANNEL IN MA WAT AND NORTH OF HONG LOK YUEN, TAI PO (DSD/DP)

KOWLOON CANTON RAILWAY

TAI WO

CYCLE TRACK CONNECTING NORTH WEST NEW TERRITORIES AND NORTH EAST NEW TERRITORIES

LAM TSUEN RIVER

TAI PO ROAD

HONG LOK YUEN

100mm ON ORIGINAL

PRINTED BY mlhkl562 13/08/2008 15:54:07 FILENAME U:\HHY-CAD\EA0079B\current\Environment Report\2008-01-29\APPENDIX-L-11.dgn

REV 修訂	DATE 日期	DESCRIPTION 內容摘要	CHECKED 審核	APPD 批準人
REVISION				

DESIGNED 設計	M. LEE	CHECKED 審核	T. CHAN
DRAWN 繪圖	B. FOOK	CHECKED 審核	M. LEE
APPROVED FOR ISSUE 批準人	T. CHAN	©	Copyright Reserved 版權所有
DATE 日期	OCT. 2007	All dimensions are in mm unless shown otherwise	
SCALE 比例	1 : 1000 (A3)	No measurement should be taken from drawing directly	
CAD KEY 圖形名稱	APPENDIX L-11		

PROJECT TITLE 工程項目

Agreement No. CE 58/2000
Design and Construction Assignment for Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling

CLIENT 工程倡議人

路政署
HIGHWAYS DEPARTMENT
主要工程管理處
MAJOR WORKS PROJECT MANAGEMENT OFFICE

CONSULTANT 工程顧問

Hyder Consulting ARUP BLACK & VEATCH

DRAWING TITLE 圖名

LOCATIONS OF INTERFACE PROJECTS

STATUS 階段

DRAWING NO. 圖則編號 APPENDIX L-11

REV. 修訂 -

Construction Programme of Interfacing Projects (Stage 1 Contract 1)

No.	Dept.	Project	2007	2008	2009	2010	2011	2012
*	HyD	Stage 1 Contract 1 of Tolo Highway Widening Project						
1	DSD	CE 50/2001 (DS) - Drainage Improvement in Tai Po and Sha Tin, Package C – CARE village Drainage Works (Stage 1 (Contract 1))						
6a	DSD	CE 1/2006(DS) – Upgrading of North District and Tolo Harbour Regional Sewerage (Stage 1 (Contract 1))						
6b	DSD	CE 1/2006(DS) – Upgrading of North District and Tolo Harbour Regional Sewerage (Stage 1 (Contract 1 & 2))						
7	DSD	CE 9/2006(DS) – Tolo Harbour Sewerage of Unsewered Areas, Stage II (Stage 1 (Contract 1))						
8	EMSD	TCSS Works at north of Island House Interchange (720^{TH} Section) (Stage 1 and Stage 2)	(To be advised)					
9	EMSD	TCSS Works at south of Island House Interchange (561^{TH} Section) (Tolo (N))	(To be advised)					
10	HyD	Retrofitting of Noise Barriers on Yuen Shin Road (Stage 1 (Contract 1))						
13a	CEDD	Agreement No. CE6/2004 (GE) – 10-Year Extended LPM Project, Phase 5, Package B, Northern District – Landslip Preventive Works on Government Slopes and Related Studies (Stage 1 (Contract 1))						

Construction Programme of Interfacing Projects (Stage 1 Contract 2)

No.	Dept.	Project	2007	2008	2009	2010	2011	2012
*	HyD	Stage 1 Contract 2 of Tolo Highway Widening Porject						
2	DSD	Contract No. DC/2004/06 - Construction of Drainage Channels in Ma Wat and North of Hong Lok Yuen, Tai Po **(Stage 1 Contract 2)**						
3	DSD	Contract No. DC/2006/09 - Drainage Improvement Works in Kau Lung Hang, Yuen Leng, Nam Wa Po and Tai Hang Areas and Construction of Ping Kong Drainage Channels **(Stage 1 Contract 2)**						
4	DSD	PWP No. 4203DS - North District Sewerage Stage 2 Phase 1 **(Stage 1 Contract2)**						
5	DSD	CE 33/2002 DS - Lam Tsuen Valley Sewerage **(Stage 1 (Contract 2))**						
6b	DSD	CE 1/2006(DS) – Upgrading of North District and Tolo Harbour Regional Sewerage **(Stage 1 (Contract 2)**						
8	EMSD	TCSS Works at north of Island House Interchange (720TH Section) **(Stage 1 and Stage 2)**	**(To be advised)**					
9	EMSD	TCSS Works at south of Island House Interchange (561TH Section) **(Tolo (N))**	**(To be advised)**					
12a	CEDD	Cycle Track Connecting North West New Territories with North East New Territories **(Stage 1 (Contract 2))**						
13b	CEDD	Agreement No. CE6/2004 (GE) – 10-Year Extended LPM Project, Phase 5, Package B, Northern District – Landslip Preventive Works on Government Slopes and Related Studies **(Stage 1 (Contract 2))**						
14	HyD	Retrofitting of Noise Barriers on Tai Po Tai Wo Road near Po Nga Court (PWP 818 TH/B) **(Stage 1 (Contract 2))**	**(To be advised)**					

Construction Programme of Interfacing Projects (Stage 2)

No.	Dept.	Project	2007	2008	2009	2010	2011	2012
*	HyD	Stage 2 of Tolo Highway Widening Project						
2	DSD	Contract No. DC/2004/06 - Construction of Drainage Channels in Ma Wat and North of Hong Lok Yuen, Tai Po (Stage 2)						
3	DSD	Contract No. DC/2006/09 - Drainage Improvement Works in Kau Lung Hang, Yuen Leng, Nam Wa Po and Tai Hang Areas and Construction of Ping Kong Drainage Channels (Stage 2)						
4	DSD	PWP No. 4203DS - North District Sewerage Stage 2 Phase 1 (Stage 2)						
6c	DSD	CE 1/2006(DS) – Upgrading of North District and Tolo Harbour Regional Sewerage (Stage 2)						
8	EMSD	TCSS Works at north of Island House Interchange (720^{TH} Section) (Stage 1 and Stage 2)	(To be advised)					
11	HyD	Retrofitting of Noise Barriers on Fanling Highway (East Rail Fanling Station to Wo Hing Road) (Stage 2)						
12b	CEDD	Cycle Track Connecting North West New Territories with North East New Territories (Stage 2)						
13c	CEDD	Agreement No. CE6/2004 (GE) – 10-Year Extended LPM Project, Phase 5, Package B, Northern District – Landslip Preventive Works on Government Slopes and Related Studies (Stage 2)						

Photo taken on 17th August 2007, viewed towards Tolo Highway near Tat Wan Road from Wan Tau Tong Estate illustrating **Natural Woodland** (behind the villa houses)

Photo taken on 17th August 2007, viewed towards Fanling Highway near Ho Ka Yuen from Wo Hop Shek Crematorium illustrating **Urbanised Areas.**

Photo taken on 17th August 2007, viewed towards Tolo/Fanling highway near Hong Lok Yuen from Wo Hop Shek Cemetery illustrating **Urbanised Areas and Woodlands.**

Photo taken on 17th August 2007, viewed towards Tai Po North Interchange from Po Nga Court illustrating **Plantation Woodland** at roadside

Photo taken on 13th November 2007, viewed towards Fanling Highway near Kiu Tau from illustrating construction works in Ma Wat River Natural Woodland

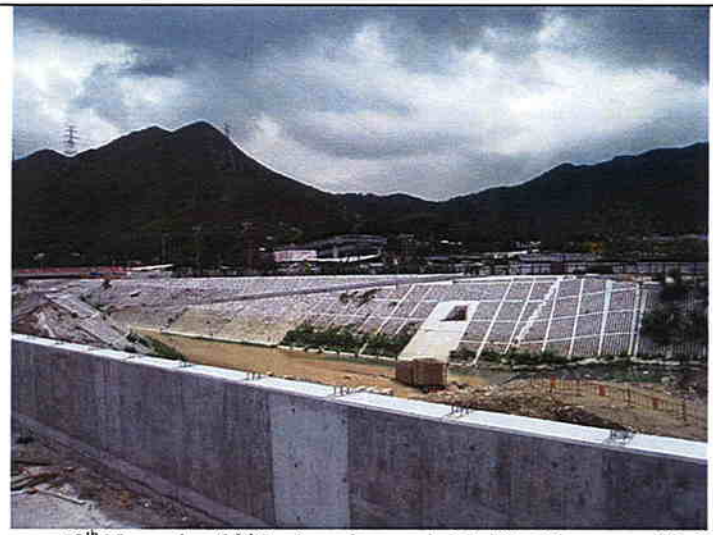

Photo taken on 13th November 2007, viewed towards Ma Wat River near Kiu Tau illustrating **Artificial Drainage Channel** (downstream of Kau Lung Hang EIS).

Photo taken on 13th November 2007, viewed towards Island House from seaside promenade illustrating mangroves

Photo taken on 22nd April 2008, viewed towards **Tai Po Egretry SSSI**

Photo taken on 30th April 2008 towards Wan Tau Tong Road illustrating **Tai Po Egretry**

Photo taken on 30th April 2008 towards **Tai Po Egretry**

Photo taken on 4th July 2008, illustrating the **Ecological Important Stream (EIS)** at Kau Lung Hang (Northern Tributary)

Photo taken on 4th July 2008, illustrating the **Ecological Important Stream (EIS)** at Kau Lung Hang (Southern Tributary)

Appendix L-14

Location	Predominant tree species	Fruit trees	Pak Kung Shrines/ worshipping location	Description of location, incl, proximity to village	General Comments
Ha Wong Yi Au	A diverse range of native species identified, including *Macaranga tanarius*. Planted species found which are not typical species[1] of FSW'.	*Dimocarpus longan, Sterculia lanceolata*	A worshiping location which is under construction.	The dense forest is "built" on a man-made slope and the tree species found are small in size	Villager interviewed had not heard of any local FSWs.
Ha Wun Yiu	A diverse range of native species *(mostly in mature phase)*, such as *Bischofia javanica, Macaranga tanarius, Dimocarpus longan, Ficus macrocarpa, Cinnamomum camphora, Celtis sinensis, Alangium chinense*, some of them are not typical species of FSW.	*Dimocarpus longan*	A temporary shrine can be found.	The forest is dense and mature and in close proximity to the village. The surroundings are modified / disturbed.	Classified as natural woodland, though also has many characteristics of a FSW.
Nam Wa Po	Species are not diverse and are smaller in size, *Dimocarpus longan, Litchi chinensis, Macaranga tanarius*, and some exotic species *Lantana camara*, and invasive species *Mikania micrantha*	*Dimocarpus longan, Litchi chinensis,*	No shrine but a church is found	The village and the slope of the forest were modified. A small river was found in front of the village. A typical crescent-shaped forest cannot be found.	Characteristics are not typical of a FSW, i.e. woodland is spreadout and trees are small.
Wong Kong Shan	*Dimocarpus longan, Macaranga tanarius.* These trees are young and small.	*Dimocarpus longan*	No	No river was found. A crescent-shaped forest cannot be found.	Characteristics are not typical of a FSW, i.e. woodland is spreadout and trees are small.
Tong Hang	*Dimocarpus longa* was found covering the whole headland, *Macaranga tanarius* was found along the roadside. Those species are smaller in size.	*Dimocarpus longan*	No	A rainwater channel was found in front of the village. A crescent-shaped forest cannot be found.	Villager interviewed (who had lived there for 30 yrs) had not heard of any local FSWs..
Yuen Leng	A diverse range of native species identified including *Macaranga tanarius*. Not typical species of FSW'.	*Dimocarpus longan*	No	No river was found. A crescent-shaped forest cannot be found.	Villager interviewed (who had lived there for many years) had not heard of any local FSWs..

[1] *Typical species found in FSW include: Antidesma bunius 五月茶, Aphananthe cuspidata 滇糙葉樹, Aporusa dioica 銀柴, Aquilaria sinensis 土沉香, Ardisia quinquegona 羅傘樹, Canthium dicoccum 魚骨木, Cinnamomum camphora 樟, Dimocarpus longan 龍眼, Endospermum chinense 黃桐, Ficus microcarpa 細葉榕, Garcinia oblongifolia 嶺南山竹子, Machilus pauhoi 刨花潤楠, Pothos chinensis 石柑, Pteris semipinnata 半邊旗, Psychotria asiatica 九節, Pygeum topengii 倒果木, Sarcandra glabra 草珊瑚, Sarcosperma laurinum 肉實樹, Schefflera heptaphylla 鵝掌柴, Schima superba 木荷, Sterculia lanceolata 假蘋婆, Syzygium hancei 韓氏蒲桃, Tetracera asiatica 錫葉藤, Uvaria macrophylla 紫玉盤, Xylosma longifolium 長葉柞木* (Source: Venturing Fung Shui Woods by AFCD)