

**Halcrow China Limited**

AGREEMENT NO. CE 18/2004 (GE)

10 YEAR EXTENDED LPM PROJECT

PHASE 5, PACKAGE H

Report of Baseline Survey for *Philautus romeri*

Feature no. 15NW-C/C3

Location: Sok Kwu Wan, Lamma Island

November 2007

**The Government of the Hong Kong  
Special Administrative Region  
Civil Engineering and  
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**Halcrow China Ltd**

Level 10 Millennium City 6

392 Kwun Tong Road Kwun Tong Kowloon Hong Kong

Tel +852 2802 9228 Fax +852 2827 8352

[www.halcrow.com](http://www.halcrow.com)

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**Contents Amendment Record**

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0	Final	October 2007	F Lee
1	1	Revised Final	November 2007	

# Contents

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2</b>	<b>BASELINE SURVEYS OF ROMER'S TREE FROGS AND ITS HABITATS BEFORE CONSTRUCTION</b>	<b>1</b>
2.1	Work schedule	1
2.2	Methodology	2
2.3	Results	2
<b>3</b>	<b>COLLECTING ROMER'S TREE FROGS</b>	<b>4</b>
3.1	Work schedule	4
3.2	Methodology	4
3.3	Results	5
<b>4</b>	<b>ACCEPTABLE RANGE OF WATER QUALITY PARAMETERS</b>	<b>6</b>
4.1	Range of water quality of Romer's Tree Frog breeding sites across Hong Kong	6
4.2	Range of water quality of Romer's Tree Frog breeding habitats within the project site	6
4.3	Acceptable range of water quality within the project site	7
<b>5</b>	<b>REFERENCES</b>	<b>8</b>

## LIST OF FIGURE

## LIST OF PLATES

# 1 INTRODUCTION

This report covers the findings of the baseline surveys and the collecting of Romer's Tree Frogs following the Translocation Manual which has been issued in compliance with the specific condition (Clause 2.8) of Environmental Permit no. EP-149/2002 pertaining to feature no. 15NW-C/C3, located at Sok Kwu Wan, Lamma Island. Romer's Tree Frog is protected in Hong Kong under the Wild Animals Protection Ordinance (Cap. 170). The collecting of Romer's Tree Frogs and their subsequent maintenance in captivity has been undertaken with the permission from the Agriculture, Fisheries and Conservation Department (reference no. AF GR CON 09/51).

## 2 BASELINE SURVEYS OF ROMER'S TREE FROGS AND ITS HABITATS BEFORE CONSTRUCTION

### 2.1 *Work schedule*

Baseline surveys were carried out on the following dates:

Description	Timing
Baseline surveys	18 <sup>th</sup> August 2007
	28 <sup>th</sup> August 2007
	1st September 2007
	29th September 2007
	13 <sup>th</sup> October 2007

## 2.2

### **Methodology**

The project site were visited both during the day and at night during the survey dates Previous successful techniques to locate Romer's Tree Frogs, its tadpoles and eggs (Lau, 1998) were used. These include:

- searching in all appropriate microhabitats both during the day and at night (with the help of headlamps and dip nets for tadpoles); and
- intensive search at breeding sites at night by sight and by detection of mating calls from males.

For all the breeding habitats identified, the following habitat parameters were measured and ranked which were the same as those in a previous ecological study of Romer's Tree Frog (Lau, 1998) so that the results from the baseline surveys can be put into the context of habitat use of this species:

- seasonality of water bodies,
- surface flow,
- maximum water depth,
- sloping bank,
- water area,
- canopy cover,
- substrates,
- submerged leaf litter,
- hydrophytes cover
- presence of algal bloom,
- presence of iron bacteria, and
- presence of predatory fish.

## 2.3

### **Results**

The vast majority of Romer's Tree Frogs were found in the southern end of the project site where there is a healthy stand of small trees forming a young forest. This is as expected as this species is a forest floor species (Lau, 1998) (Plates 1 to 3). The exceptional case was on 28<sup>th</sup> August when one male was heard calling in the marsh in the northern side of the project site (Plate 4).



Romer's Tree Frogs used a variety of breeding habitats within the project site. These include the section of concrete ditch in the southern side (Plate 5), grassy marshes (Plate 6), seepage pools (Plate 7) and rainwater pools (Plate 8). This species is found to be adaptable and uses a wide range of breeding habitats including those listed (Lau, 1998).

The breeding habitat characteristics of Romer's Tree Frog within the project site are outlined below:

Habitat Features	Range
Seasonality	Permanent to seasonal
Surface Flow	Zero to less than 10cm per sec.
Maximum Water Depth	2-12 cm
Sloping Bank	Present to absent
Water Area	0.15 to over 20 sq. m.
Canopy Cover	Less than one quarter to over three quarters
Substrates	Concrete to mud
Submerged Leaf Litter	Less than one quarter to over three quarters
Hydrophytes Cover	0% to over three quarters
Algal bloom	Absence
Iron bacteria	Absence to presence in trace
Predatory Fish	Absence

### 3

## COLLECTING ROMER'S TREE FROGS

### 3.1

#### *Work schedule*

More collecting trips were made than was originally planned in the Translocation Manual due to two factors. Firstly, we had an unusually dry July this year which resulted in limited breeding habitats observed in the first collecting trip on 18<sup>th</sup> August because most of the seasonal wetlands were still dry. This trip was also cut short because of a thunder storm hitting Lamma early that night. To compensate for this, in the second trip pools were dug out to provide more breeding habitats. Secondly, it was near impossible to locate and collect Romer's Tree Frogs among thick vegetation which covers most of the project site, and successful collecting could only be made inside the young forest, along the trails created by the researchers or near the breeding pools. Hence only a small number of frogs can be collected each time and the numbers of frogs detected but not caught remained quite high in August and September.

Description	Timing
Collecting of Romer's Tree Frogs	18 <sup>th</sup> August 2007
	28 <sup>th</sup> August 2007
	1 <sup>st</sup> September 2007
	9 <sup>th</sup> September 2007
	15 <sup>th</sup> September 2007
	22 <sup>nd</sup> September 2007
	29 <sup>th</sup> September 2007
	7 <sup>th</sup> October 2007
13 <sup>th</sup> October 2007	

### 3.2

#### *Methodology*

Frogs, tadpoles and eggs were located using the methods outlined in Section 2.2. Once seen, adults and juveniles were collected by 'imprisoning' in a curled-up hand and then put into clear plastic bags with some damp leaves to provide cover and moisture. Advanced tadpoles, i.e. those reached the free-swimming stage, (stage 25 or above, Gosner, 1960) were collected by a dip-net. Eggs are delicate and often



do not survive long, rough journeys on boats and vehicles (Lau, 1998). Hence attempts were made at the beginning to place egg clutches in small, plastic compartments lined with fine mesh to hold them temporarily until future visits when they had hatched and grew into big enough tadpoles that can be transported safely. However, the compartment was disturbed by someone and it was decided not to use these compartments as they seemed to attract undue attention. Rather the eggs and young tadpoles were left *in-situ* and were collected in subsequent visits. The number of frogs, tadpoles collected and the number of egg clutches found was recorded. The sex of the adults was also estimated base on their size and the presence of vocal sacs.

### 3.3

#### **Results**

A total of 112 adults (57 males and 55 females), 4 juveniles, about 212 tadpoles were collected. Fifteen egg clutches were also found from late August to late September 2007. The collected frogs and tadpoles are now being kept in a laboratory in the University of Hong Kong, School of Biological Sciences (Plates 9 to 11) under the supervision of Dr Billy Hau.

Date	No. of Frogs Collected			No. of Tadpoles Collected	No. of Clutch of eggs found
	Male	Female	Juvenile		
18-Aug-07	1	0	0	0	0
28-Aug-07	1	6	0	24	5
1-Sep-07	13	7	0	31	4
9-Sep-07	7	8	0	~100	3
15-Sep-07	4	4	1	35	2
22-Sep-07	11	13	0	0	0
29-Sep-07	6	4	1	19	1
7-Oct-07	4	4	1	3	0
13-Oct-07	10	9	1	0	0
<b>Total</b>	<b>57</b>	<b>55</b>	<b>4</b>	<b>~212</b>	<b>15</b>

## 4 ACCEPTABLE RANGE OF WATER QUALITY PARAMETERS

### 4.1 *Range of water quality of Romer's Tree Frog breeding sites across Hong Kong*

The range of water quality of active breeding sites occupied by Romer's Tree Frog (Lau, 1998) are:

- pH (6.21-7.51),
- conductivity (38.6-138  $\mu\text{S}/\text{cm}$ ),
- total nitrogen (0.03-6.00 mg/l),
- phosphate (0.15-19mg/l),
- BOD<sub>5</sub> (1.2-3.5 mg/l), and
- suspended solids (1.2-18.2 mg/l).

### 4.2 *Range of water quality of Romer's Tree Frog breeding habitats within the project site*

The range of water quality of breeding habitats within the project site has been measured in August 1993 and July 1995 (M. Lau, unpublished data):

- pH (5.96-6.92),
- conductivity (108.3-139.1  $\mu\text{S}/\text{cm}$ ),
- total nitrogen (0.04-3.20 mg/l),
- phosphate (0.35-19mg/l),
- BOD<sub>5</sub> (1.5-1.8 mg/l), and
- suspended solids (5.26 mg/l).

Prior to the commencement of the construction works on 1 November 2007, water samples were collected on 15 October and 29 October 2007 from the seep in the rock face and the concrete drain. Results of these pre-construction values are summarised as follows:

Parameters	15 October 2007		29 October 2007	
	From rock face	From concrete drain	From rock face	From concrete drain
pH	7.8	7.6	6.7	6.5
conductivity ( $\mu\text{S}/\text{cm}$ )	90	127	103	132
total nitrogen (mg/l)	0.7	0.3	2.1	0.5
phosphate (mg/l)	<0.16	<0.16	<0.16	0.19
BOD <sub>5</sub> (mg/l)	3.5	<3	8.5	<3
suspended solids (mg/l)	21	8	10	19

#### 4.3

#### *Acceptable range of water quality within the project site*

Based on the water quality data given in Sections 4.1 and 4.2, acceptable range of the water quality of the project site is determined as follows:

- pH (5.96-7.8),
- conductivity (36.8-139.1  $\mu\text{S}/\text{cm}$ ),
- total nitrogen (0.03-6 mg/l),
- phosphate (0.15-19mg/l),
- BOD<sub>5</sub> (1.2-8.5 mg/l), and
- suspended solids (1.2-21 mg/l).

## 5

## REFERENCES

Gosner, K.L. 1960. A simplified table for staging anuran embryos and larvae with notes on identification. *Herpetologica* 16: 183-190.

Lau, W.N.M. 1998. *Habitat Use by Hong Kong Amphibians, with special reference to the Ecology and Conservation of Philautus romeri*. Ph.D. thesis, The University of Hong Kong, Hong Kong.

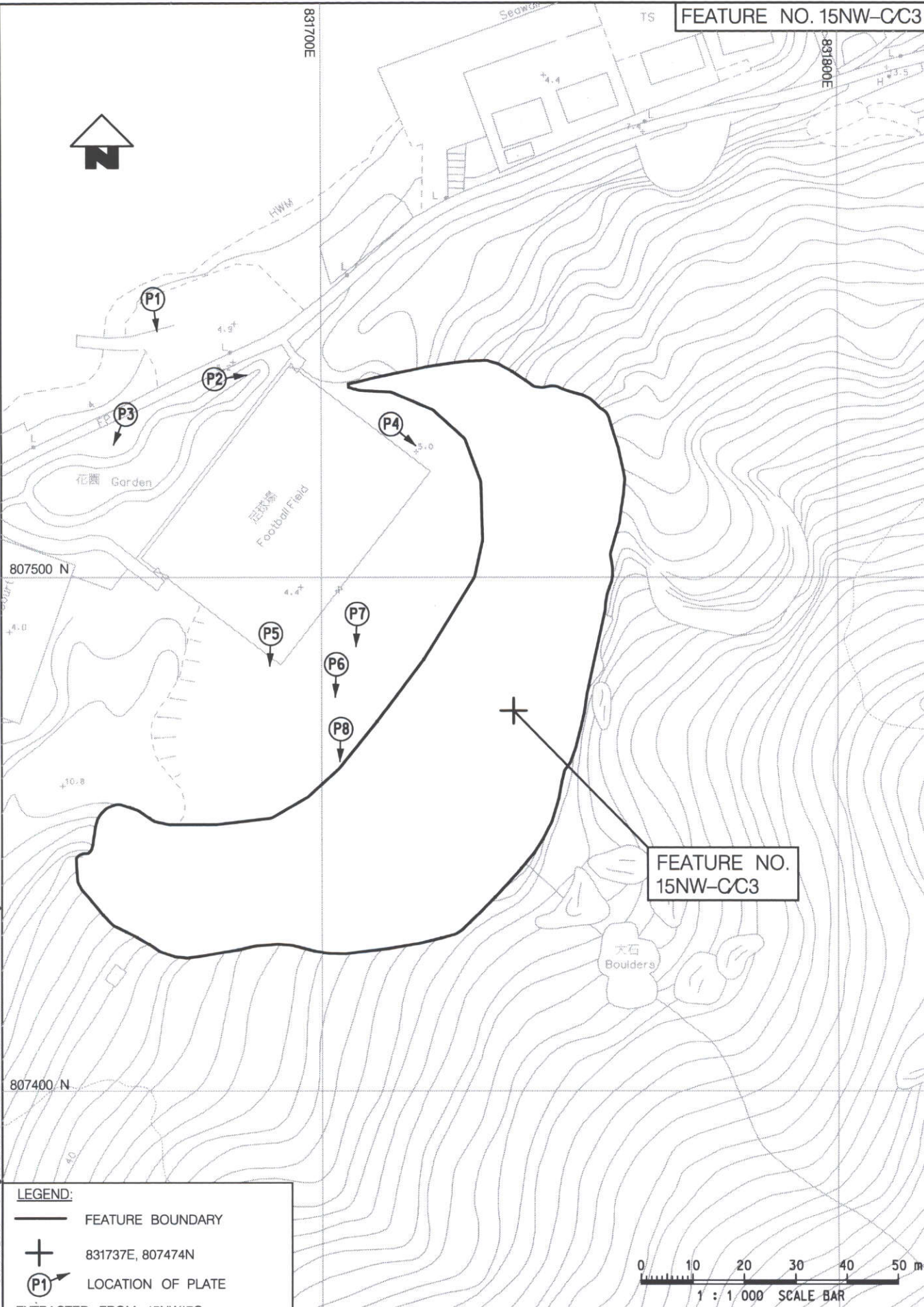
## LIST OF FIGURE

Figure No.	Title
1	General location plan



831700E

831800E



FEATURE NO.  
15NW-CC3

大石  
Boulders

花園 Garden

足球場  
Football Field

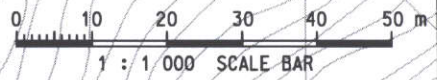
807500 N

807400 N

**LEGEND:**

-  FEATURE BOUNDARY
-  831737E, 807474N
-  LOCATION OF PLATE

EXTRACTED FROM 15NW17C



09/11/2007 e:\gso\PM\DRAWING\Figure-1\15NW-CC3\IC1\_EP.dgn  
ph111.pf

## LIST OF PLATES

Plate No.	Title
1	General view of the project site
2	Northern portion of the project site
3	Southern portion of the project site
4	Grassy marsh at the northern part of the project site
5	Ditch at the southern part of the project site
6	Grassy marsh at the southern part of the project site
7	Seepage pool at the southern part of the project site
8	Rainwater pool at the southern part of the project site
9	Holding facility of the collected Romer's Tree Frogs at the University of Hong Kong
10	View of collected Romer's Tree Frog from the project site
11	View of collected tadpoles from the project site





Plate 1: General view of the project site



Plate 2: Northern portion of the project site





Plate 3: Southern portion of the project site



Plate 4: Grassy marsh at the northern part of the project site





Plate 5: Ditch at the southern part of the project site



Plate 6: Grassy marsh at the southern part of the project site





Plate 7: Seepage pool at the southern part of the project site



Plate 8: Rainwater pool at the southern part of the project site





Plate 9: Holding of the collected Romer's Tree Frogs at the University of Hong Kong



Plate 10: View of collected Romer's Tree Frog from the project site



P11: View of collected tadpoles from the project site