

**Antiquities and Monuments Office**


**Quotation Ref.: AMO1008008**

**Consultancy for Environmental Monitoring on the  
Major Restoration of the Residence of Ip Ting-Sz,  
Lin Ma Hang Tsuen, Sha Tau Kok**

Monthly Environmental Monitoring and Audit Report

November 2011

(Version 1.0)

Approved By	 Dr. Priscilla Choy (Independent Checker)
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**REMARKS:**

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

Cinotech accepts no responsibility for changes made to this report by third parties

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## 1. INTRODUCTION

### Background

- 1.1 Cinotech Consultant Limited (CINOTECH) was commissioned by Antiquities and Monuments Office (AMO) to undertake environmental monitoring and audit for the project “Provision of Consultancy for Environmental Monitoring on the Major Restoration to the Residence of Ip Ting-Sz, Lin Ma Hang Tsuen, Sha Tau Kok” (hereinafter called the “the Project”).
- 1.2 The residence of Ip Ting-sz (hereinafter called “the Residence”) is located at Lin Ma Hang Tsuen, Sha Tau Kok, New Territories, within the Closed Area. It was declared as a Monument in November 2009.
- 1.3 Major restoration works were carried out to the Residence from December 2010 to March 2011, which included the complete reconstruction of roof, internal and external redecorations (Location plan showing the project area and work boundary is at **Appendix A**).
- 1.4 There is a small brick-built Annex attached to the Residence, which was used as a kitchen, it is not within the declared monument boundary. Emergency repair was carried out in 2005 to reconstruct the roof at the Annex and covered it with corrugated sheets, minimum repair works were carried out to the Annex, as part of this major renovation project.
- 1.5 A Project Profile was prepared on August 2010 for direct application of Environmental Permit (EP).
- 1.6 An Environmental Permit (EP) (No. EP-400/2010) was issued on 29 September 2010 for Antiquities and Monuments Office, Leisure and Cultural Services Department as the Permit Holder.
- 1.7 Onsite environmental monitoring and audit will be carried out to ensure the proposed mitigation measures in the Project Profile are properly implemented throughout all phases of the project as required in the EP Section 2.8.
- 1.8 Environmental monitoring and audit works for the Project was commenced on 1 December 2010 and monitoring during the construction phase was completed on March 2011.
- 1.9 This monthly EM&A Report summarises the bat survey result for the Project in November 2011.

### Project Organizations

- 1.10 Different parties with different levels of involvement in the project organization include:
- Project Proponent–Antiquities and Monuments Office (AMO)
  - Independent Checker (IC) – Cinotech Consultants Limited (Cinotech).
- 1.11 The key contacts of the Project are shown in **Table 1.1** and the organization chart of ET is shown in **Figure 1**.

**Table 1.1 Key Project Contacts**

Party	Name	Role	Phone No.	Fax No.
AMO	Ms. Candy Chan	Senior Heritage Officer	3910 6608	3691 8185
	Mr. Lau Wing Kit	Heritage Officer	3910 6632	
	Ms. Sophia Mak	Heritage Officer	3910 6636	
Cinotech	Dr. Priscilla Choy	Project Director	2151 2089	3107 1388
	Ms. Betty Choi	Project Coordinator	2151 2072	

## **2. POST-CONSTRUCTION MONITORING**

### **Monitoring Requirements**

- 2.1 A bat-friendly gate was installed in the Kitchen Annex in March 2011.
- 2.2 During the post-construction phase from April 2011 to November 2011, bat survey shall be carried out twice a month in the first three months of the post-construction period when the bats start to return. In later months, monthly monitoring shall be followed.
- 2.3 The aim is to determine the successfulness of the maintained Kitchen Annex as a bat roosting site and the effectiveness of the bat-friendly gate in allowing bat's flight in and out of the Annex.
- 2.4 Necessity for further survey will be reviewed after the proposed monitoring period. If both are found satisfactory, no further monitoring will be required. Subject to the post-construction monitoring and further operation, if further improvement or maintenance to the gate is required, it will be carried out accordingly.

### **Monitoring Methodology**

- 2.5 Daytime counting of bats with night emergence count will be conducted to evaluate the effectiveness of the maintained bat roost and the design of the bat-friendly gate. The survey will be arranged in the evening such that daytime counting and night emergence count can be done on the same day.
- 2.6 The number of bats that has returned to the Kitchen Annex after hibernation and their preference of using the gate will be recorded. Daytime counting will start at least two hours before night fall so that the bats are allowed to recover from disturbance before emergence. Counting of bats will be conducted inside the Annex with the aid of binoculars and torch light.
- 2.7 The abundance will be recorded by direct counting of individuals observed. If the bat number is high and the bats show distress towards visitation, photographs will be taken and counting will be done from the pictures. Estimation can also be made by calculating bat density within a small part of a cluster and then extrapolating the total bat number in the whole cluster. Method to be adopted will be decided based on actual situation during the survey.
- 2.8 Any breeding activity observed will be recorded. Identification will be based on published reference (Shek, 2006).
- 2.9 Disturbance will be minimized by limiting the number of surveyors, visitation time and noise disturbance. If counting has not completed but the bats feel highly uncomfortable, the survey will be stopped. Time will be allowed for the bats to rest. It will only continue after the bats have recovered.

- 2.10 Daytime counting and night emergence count will be done on the same day. The peak activities of bats start within 30 minutes after sunset. So surveyors will be positioned at a spot where the gate can be clearly seen and where the bats will not be disturbed at least one hour before nightfall.
- 2.11 To observe bats under darkness, a camera set at exposure mode will be used to increase light collection and aid observation through the camera. The number of bats leaving the Kitchen Annex at night will be counted and the gate spacing chosen will be recorded. The survey will end when no further emergence can be seen after 30 minutes.

### **Reporting**

- 2.12 Findings on the number of bats that has returned to the Kitchen Annex after hibernation, their preference of using the gate, further recommendations and conclusions of the monitoring will be included in the monthly monitoring and audit report which will be submitted to Environmental Protection Department.

### 3. RESULTS

- 3.1 No site inspection was conducted by AMO in November.
- 3.2 Bat monitoring was conducted in late afternoon on 1 November 2011.
- 3.3 The Residence is now opened to public. As the Residence is closed on Tuesdays, there was no visitor or the security guard on the monitoring date. The bat friendly gate remained locked up. Some old furniture which was not used for display was placed inside the Kitchen Annex. They were covered by tarpaulin.
- 3.4 One bat was found hanging under the roof of the Kitchen Annex. Its small eyes, large ears, pointed lancet and horseshoe-shaped leaf nose were characteristics of a *Rhinolophus* species. Its body was around 5cm long and its dark brown fur suggested that it might be Intermediate Horseshoe Bat *Rhinolophus affinis*.
- 3.5 After inspecting in the Kitchen Annex at around 5:00pm, bat emergence survey was followed. No bat left the annex through the bat gate or the front window. At 5:50pm, the annex was re-inspected and the Intermediate Horseshoe Bat was no longer present. It might have emerged from the annex through the back window (the only alternative opening) during the monitoring period.
- 3.6 Other than direct observation of roosting bat, the presence of bat faeces and remains of eaten moths proved bat utilization of the annex. These were located in the inner part of the Kitchen Annex away from the door.
- 3.7 Around 200m away from the Ip Ting Sz Residence, there is an Ip's Ancestral Hall in the Lin Ma Hang Tsuen. The presence of Himalayan Leaf-nosed Bat (*Hipposideros armiger*) adults and juveniles in the past visits showed that the ancestral hall served as an alternative habitat and maternity roost. No bat was observed on the monitoring day. The location of the ancestral hall can be found in **Appendix A**.
- 3.8 Photographic records showing the survey findings in the Kitchen Annex of the Ip Ting-Sz Residence can be found in **Appendix B**.

#### 4. EVALUATION OF MITIGATION MEASURES

- 4.1 Eight-month bat monitoring was carried out between April to November 2011 and has fulfilled the monitoring requirement in the Project Profile and submission of bat gate design.
- 4.2 The number of bats recorded in the Kitchen Annex in each visit ranged from 0 to 1. The species observed was Intermediate Horseshoe Bat *Rhinolophus affinis*, a species alternative to the original inhabitant Himalayan Leaf-nosed Bat *Hipposideros armiger*. One bat was observed by AMO in June. While the photograph could not show the characteristics in detail, its size was quite big compared to the purlin and could be a Himalayan Leaf-nosed Bat.
- 4.3 The structure of the Kitchen Annex was not modified. Despite the bat observed in the Kitchen Annex was not always the species occurred (Himalayan Leaf-nosed Bat) before the renovation work, presence of bat, bat faeces and remains of eaten moth showed that the environment is suitable for bats to roost. Also, bats can still utilize the windows as flight route.
- 4.4 It may take time for the bats to return. From an experience in Taiwan, most bats were evacuated from an abandoned air-raid shelter during CCTV installation. It took two years for the bats to gradually return.
- 4.5 Effectiveness of the bat gate to Himalayan Leaf-nosed Bat's flight cannot be confirmed as this species was not observed during monitoring. Also, there is no project of similar nature carried out in Hong Kong as reference. The monitoring result in October showed that the Intermediate Horseshoe Bat utilized the third spacing from the top of the bat gate. The size of Intermediate Horseshoe Bat is around half of Himalayan Leaf-nosed Bat while the uppermost spacing is larger than the third spacing by 25%. The bat gate spacing may not be large enough to allow Himalayan Leaf-nosed Bat to smoothly enter the Kitchen Annex.
- 4.6 The Residence is now open from 9am-1pm and 2pm-5pm for visitors every day except Tuesdays and certain public holidays. However, as it is within the closed area, not many people can visit the site. Human disturbance due to visitation should be minor.
- 4.7 Since September, a security guard was employed to station at the Residence. He was reminded to use the light switch inside the Residence and avoid access to the Kitchen Annex to turn on/off the main electricity control in day to day operation. During the monitoring, the main electricity control in the Kitchen Annex remained switched on after operation time. Without entering or leaving the Kitchen Annex regularly, this can minimise disturbance to the roosting site.
- 4.8 Based on the above speculations, if the environment and condition of the Kitchen Annex are kept as it is and Himalayan Leaf-nosed Bat does not return in the next



breeding season when there is little human disturbance, it is recommended that the uppermost spacing should be enlarged to about 40cm (double of the third spacing).

4.9 The need for further monitoring is subject to EPD's view.

## **5. CONCLUSION**

- 5.1 One Intermediate Horseshoe Bat was observed on 1 November 2011 during bat monitoring in the Kitchen Annex.
- 5.2 Traits such as bat faeces and moth were observed in the Kitchen Annex.
- 5.3 The Ip's Ancestral Hall is an alternative habitat for Himalayan Leaf-nosed Bat.
- 5.4 Kitchen Annex can serve as a bat roost while effectiveness of the bat gate to Himalayan Leaf-nosed Bat cannot be concluded from the post-construction monitoring. The bat gate spacing is recommended to be enlarged if no Himalayan Leaf-nosed Bat returns to the Kitchen Annex in the next breeding season in 2012. The need for further monitoring is subject to EPD's view.

## **6. REFERENCE**

Kunz T.H. (2003) Censusing Bats: Challenges, Solutions, and Sampling Biases. Center for Ecology and Conservation Biology. Department of Biology. Boston University. Information and Technology Report-2003.

Shek C.T. & Chan C.S.M.. (2005) Roost Censuses of Cave Dwelling Bats of Hong Kong. AFCD. Hong Kong Biodiversity 10: 1-8.

Shek C. T. (2006) A field guide to the terrestrial mammals of Hong. Kong. Friends of Country Park and Cosmos book Limited.

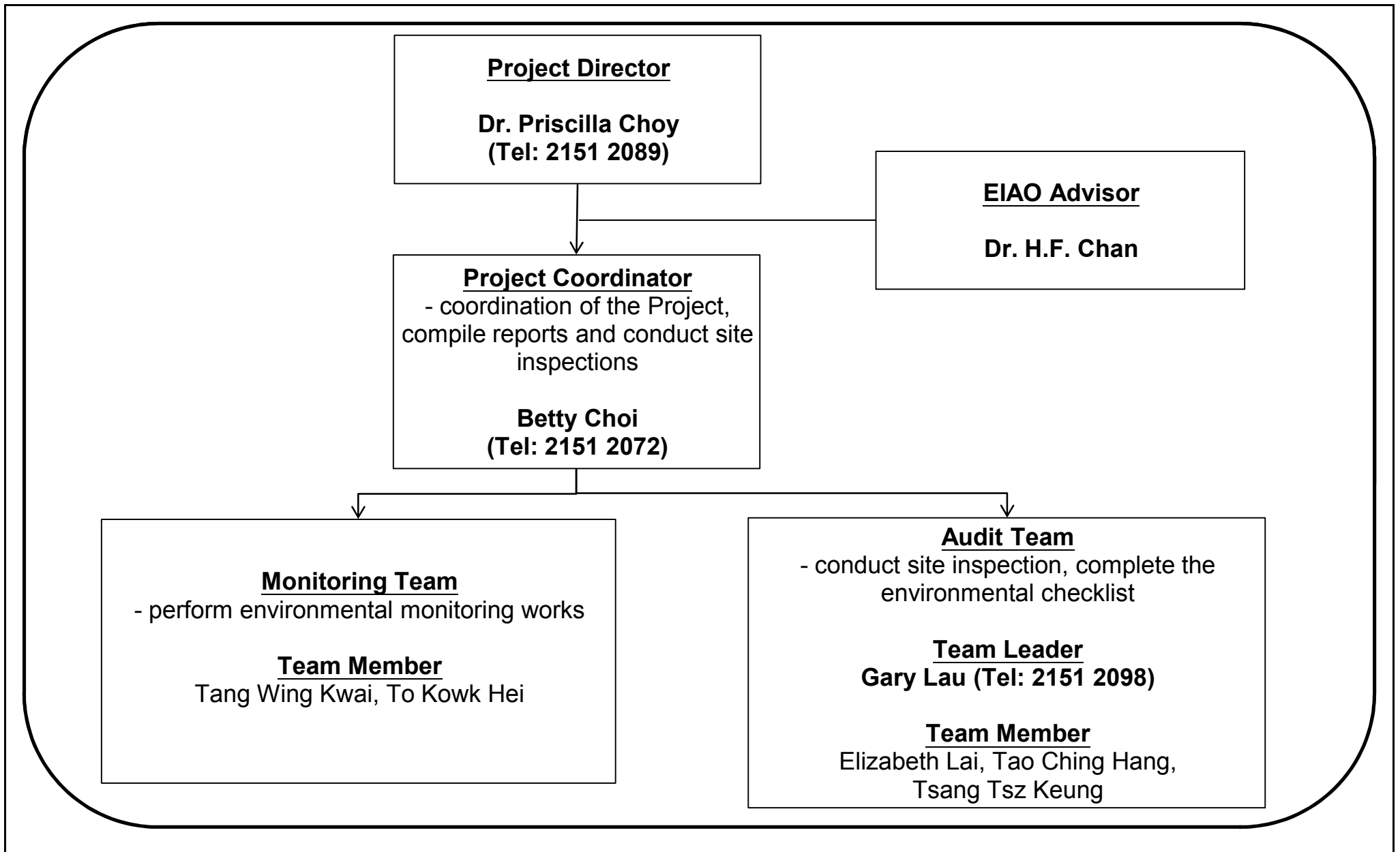
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**FIGURE 1  
ORGANIZATION CHART OF  
ENVIRONMENTAL TEAM**

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Title	<b>Provision of Consultancy for Environmental Monitoring on the Major Restoration to the Residence of Ip Ting-sz, Lin Ma Hang Tsuen, Sha Tau Kok</b>		Scale	N.T.S	Project No.	MA0060	<b>CINOTECH</b>
	<b>Organization Chart</b>		Date	Nov-10	Figure	1	

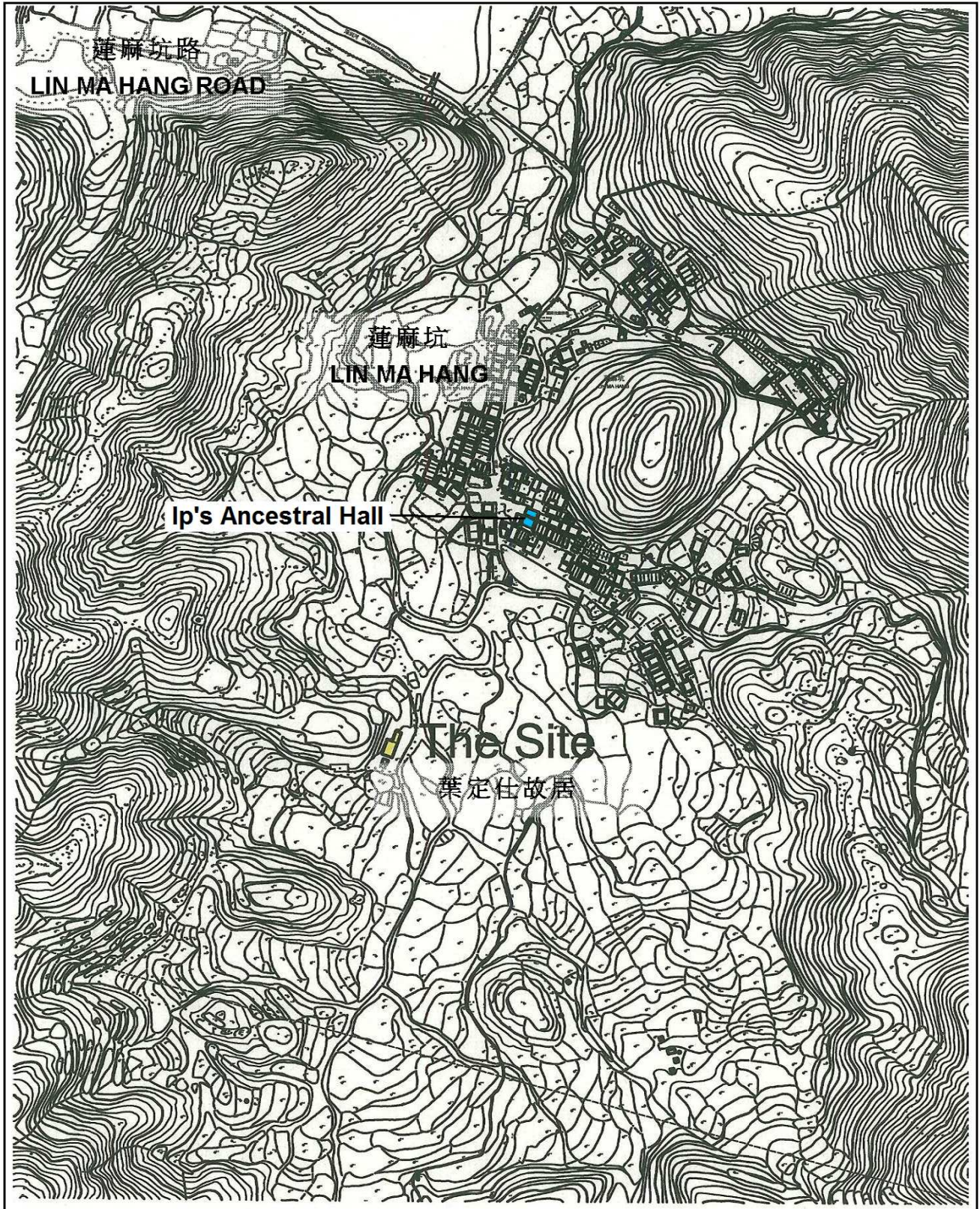
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**APPENDIX A  
LOCATION PLANS & WORK  
BOUNDARY OF THE PROJECT**

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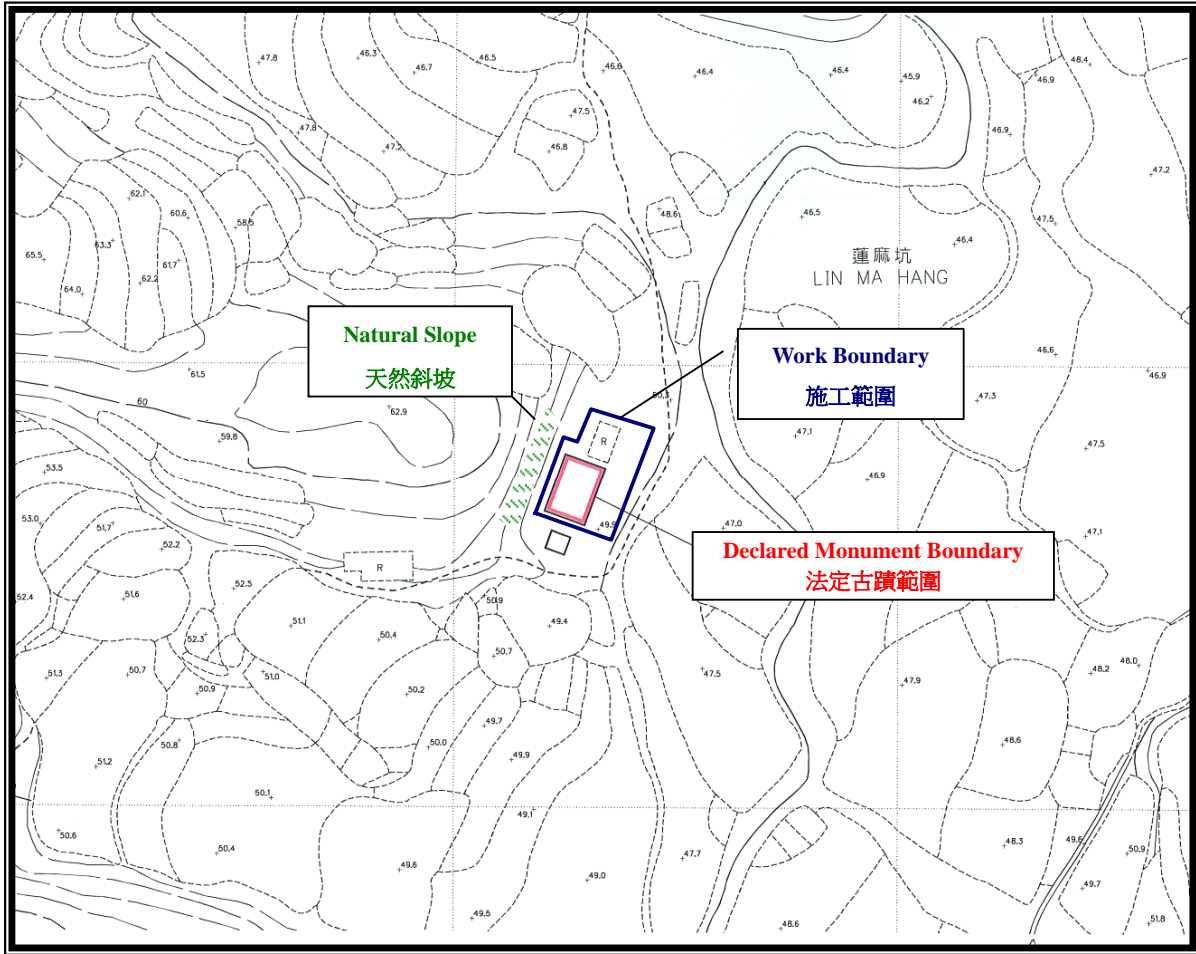
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Scale 1:5000

Location Plan  
位置圖



只作識別用 FOR IDENTIFICATION PURPOSE ONLY

## Work Boundary of the Project 施工範圍



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**APPENDIX B  
PHOTOGRAPHIC RECORDS**

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Main Building & Kitchen Annex (01/11)



Bat Gate (01/11)



Kitchen Annex - Roof (01/11)



Kitchen Annex – Intermediate Horseshoe Bat (01/11)



Kitchen Annex - Floor (01/11)



Kitchen Annex – Bat Faeces (01/11)