

9.1 INTRODUCTION

This section of the report presents the final assessment of the potential impacts on cultural heritage resources within the Study Area. An archaeological survey was conducted by an archaeology team from the Anthropology Department of Zhongshan University in Guangzhou in Spring 1998. Mitigation measures are recommended where necessary to minimise any adverse impacts on heritage resources.

9.2 ENVIRONMENTAL LEGISLATION AND CRITERIA

The criteria for evaluating impacts to sites of cultural heritage are published in *Annex 10* of the EIAO-TM:

- the general presumption in favour of the protection and conservation of all sites of cultural heritage because they provide an essential, finite and irreplaceable link between the past and the future and are points of reference and identity for culture and tradition; and
- adverse impacts on sites of cultural heritage shall be kept to a minimum.

In addition to the EIAO, the protection and management of heritage resources in Hong Kong are governed by a range of legislative and planning mechanisms. The *Antiquities and Monuments Ordinance (Cap 53)*, provides powers for the designation of Antiquities and Monuments Sites or Declared Monuments in Hong Kong. The Ordinance provides statutory protection against the threat of development for gazetted monuments, historic buildings and archaeological sites which have been approved by the Antiquities Advisory Board (AAB) to enable rehabilitation and maintenance works and facilitate public visits.

Deemed Monuments have been identified by the Antiquities and Monuments Office (AMO) and agreement reached with the owners of the Monument to provide for specific measures to ensure preservation. Deemed Monuments have the potential to be upgraded to statutory Declared Monuments.

A wide range of sites of cultural heritage are identified and recorded by the AMO. Recorded historic buildings and structures are classified into grades I, II and III to indicate their relative importance. Although the grading is for AMO's internal reference and carries no statutory status, the recorded and graded historic buildings and structures might be required to be protected under the EIAO or by administrative measures. Consideration must be given to protect the sites of cultural heritage including the known and unknown sites, at planning stage.

As the current record of sites of cultural heritage, including both archaeological sites and historic structures, is by no means exhaustive, it is, therefore, required that a thorough survey on items of historic importance and sites of archaeological interests should be made at an early planning stage of the project.

Spatial Scope

The potential impacts to the Archaeological, Historical and Cultural Resources within the Study Area have been assessed regarding the context of features directly affected, to allow indirect impacts to be assessed and to help develop predictions on the scale of currently unknown archaeological resources.

The EIA Team have undertaken a desk top study of the Study Area as the basis for a general appraisal of the architectural history and historic landscapes of the Study Area.

The scope of the assessment comprises the following heritage resources:

- *Historic Buildings and Structures*, which include a variety of forms with a wide range of different functions including domestic, working and cultural uses. These include places of worship, houses, agricultural buildings, boundary and milestones and industrial buildings and workshops;
- *Landscape Features*, including sites of historical events, historic field patterns, tracks and fish ponds, and cultural elements such as *fung shui* woodlands and clan grave sites; and
- *Archaeological Remains*, including a variety of buried and upstanding forms dating from the prehistoric to historical times and comprising upstanding ruins, earthworks, finds scatters and evidence of landuse management, settlements and cultural attributes.

Prediction Methodology

Known Heritage Features

Data gathering on known heritage resources has focused on the records held by the AMO, supplemented by discussions with representatives of AMO and appropriate academic sources. At the outset of the EIA, a review of existing AMO records established that no known archaeological sites or historic buildings are identified within the Study Area.

It is widely acknowledged that the existing heritage record for Hong Kong does not provide comprehensive coverage, and that certain areas (primarily inland areas) remain largely uninvestigated. As a consequence, the lack of archaeological, historical and cultural records relating to the Study Area is likely to reflect a lack of investigation and perhaps a consequence of surface deposits having masked recognition, rather than the absence of sites and features.

Therefore, an archaeology team from the Anthropology Department of the Zhongshan University in Guangzhou, with the guidance of and support from AMO, was commissioned to undertake an archaeological survey in Tuen Mun Area 54 during Spring 1998 and presented to AMO in February 1998. The findings of this survey also provide data for the 2-year Territory Wide Archaeological Survey managed by AMO. The scope of the archaeological survey comprises the following:

Establishing Archaeological Potential

- identify archaeological potential of the Study Area by a predictive methodology

based on desk top study and field observation including a review of social environment, landforms, soil types and historical landuses all of which have high potential for revealing preserved archaeological deposits;

- validate the predicted area of archaeological potential by a series of trial pits and auger transects; and
- based on the findings of the desktop and field investigation assess the approximate boundary of archaeological features within the Study Area.

Identifying Historic and Cultural Resources

- identify Historical Buildings and Structures in Tuen Mun Area 54; and
- map culturally significant features.

The assessment of impact to the identified archaeological boundary is based on the result of the survey report. Mitigation measures which may be recommended include the minimisation of ground disturbance in archaeologically sensitive areas, excavation in advance of construction, and the provision of a watching brief during construction.

The assessment of impacts (both direct and indirect) to the identified historic and cultural resources is based on the findings of the survey report. Mitigation measures which may be recommended include relocation or reprovisioning and the shielding of features from visual and noise impacts.

9.2.2

Identification of Impacts

Existing Conditions

Archaeological Resources

The findings from the archaeological survey report indicated that Tuen Mun Area 54 was a favourable site of ancient settlement. A range of artefacts, including pottery dating from Sung dynasty, were excavated in Siu Hang Tsuen. The approximate boundary of archaeological deposits was marked within the Study Area and is presented in *Figure 9.4a*. The ancient settlement boundary was centred on Siu Hang Tsuen and extended over an area 200 metres in length from east to west and 60 metres from north to south. Another area of archaeological deposits was identified at Kei Lun Wai, to the west of Siu Hong Court.

It should be noted that as modern landuses currently occupy some areas of archaeological potential, excavation of trial pits and auger transects was not possible in all areas; as a consequence, the marked archaeological deposit boundary should be considered as a conservative estimation.

Historical and Cultural Resources

The findings from the archaeological survey report identified a number of historical buildings, ancestral halls, old wells, graves and temples, which are shown in *Figure 9.4b*. The historical and cultural resources are located mainly within the village areas of Siu Hang Tsuen, Tsz Tin Tsuen and Kei Lun Wai.

Potential Sources of Impacts

The heritage resources of Tuen Mun Area 54 would potentially be impacted by activities associated with the implementation of the Preferred Development Option.

Both temporary and permanent landtake may result in damage to, or loss of, archaeological remains and deposits, the removal of historic buildings, standing archaeological monuments or culturally significant features and changes to the setting of buildings and monuments and to the physical coherence of historic landscapes. Subsoil archaeological sites may be affected by:

- disturbance through excavations at or near the site, topsoil stripping and the passage of heavy machinery on exposed deposits;
- disturbance by machinery working on the present surface where there are extensive earthworks;
- the burial of sites resulting in a limitation on accessibility for future archaeological investigations (including surface survey and remote sensing techniques) and obscuring visible surface evidence; and
- the introduction of archaeological materials with spoil from other sites.

In addition, severance and 'islanding' may result from permanent landtake required for housing development and associated permanent features and from temporary landtake required during construction sites. Areas of historic and cultural interest may be severed, thereby altering or destroying their integrity.

Ground compaction due to construction activities or the weight of permanent embankments may cause damage or distortion to buried archaeological remains, especially in soft alluvial deposits.

Visual and noise intrusion on the setting and amenity of historic and cultural resources may occur where the route passes close to historic buildings, gravesites, archaeological sites and monuments and culturally or historically significant landscape features.

Prediction and Evaluation of Impacts

Historic Buildings

The findings from the archaeological survey report identified a number of historical buildings, ancestral halls, old wells, graves and temples and is presented in *Figure 9.4b*. The identified historical and cultural resources are located mainly in the village areas of Siu Hang Tsuen, Tsz Tin Tsuen and Kei Lun Wai where direct impact are not expected. However, three grave sites to the west of Kei Lun Wai are likely to be affected by the proposed development at Site 4.

Development at Site 4, to the west of Kei Lun Wai, is considered to result in significant impact to the identified graves. As these grave sites would be encroached by the development at Site 4, relocation of the graves would be necessary. Such relocation of graves should be undertaken in consultation with the affected families. However, the detailed relocation arrangements are beyond the scope of this cultural heritage assessment.

From a review of findings from other technical assessments conducted for the project,

it is also expected that the proposed developments and associated works would not cause any adverse indirect impacts on the identified historical and cultural resources.

According to the results of the air quality assessment presented in *Section 4*, there is no exceedance of the air quality criteria at the identified historical and cultural resources in both the construction and operational phases. No air quality impact associated with the proposed developments is therefore expected. It should however be noted that the air quality at higher levels (above 90 m from the ground) at the southern part of Kei Lun Wai is already affected by the chimney emissions from the Tuen Mun Hospital and the control of which is beyond the scope of this EIA.

It is understood that the scope of the proposed housing development may cause concerns on changes in the level of water table and the threat of flooding during heavy rainfall. However, the drainage improvements, as recommended by the Drainage Impact Assessment, to be implemented as part of the proposed developments will substantially improve flooding blackspots being temporarily relieved by the Rural Planning and Improvement Strategy - Minor Rural Improvement Works, Package 4 (RPIS Works). With these drainage improvements during the operational phase and good site management during the construction phase, it is anticipated that the indirect impact of water table fluctuation can be effectively controlled and therefore should not affect the preservation of historical buildings and other cultural resources.

The preferred development layout has maintained access to the existing villages and therefore access to the identified sites of cultural heritage would not be affected.

Archaeological Resources

The findings from the archaeological survey report indicated that Tuen Mun Area 54 was a favourable site of settlement during the Sung, Ming and Ching dynasties; a long history of human occupation appears to have been centred around the areas of Siu Hang Tsuen and Kei Lun Wai.

A conservative estimation of the boundary of archaeological deposits likely to be impacted by the development at Siu Hang Tsuen and Kei Lun Wai is presented in *Figure 9.4a*.

Development at Site 1, to the West of Siu Hang Tsuen and Site 2, to the North of Kei Lun Wai, is considered to result in significant impacts to archaeological deposits during the construction phase on the basis of the nature and extent of construction activities (the level of impact) and the predicted potential (the predicted value of the resource) of the area within which the activities are to take place.

Appropriate mitigation of the impacts to buried archaeology should be provided. Although there are no standard criteria against which to assess the severity of impacts to cultural heritage, the appropriate actions will be defined and recommended based upon the following factors:

- the proportion of the feature affected and whether its key characteristics would be affected by the preferred landuse layout;
- a consideration of the type, survival or condition, fragility or vulnerability, potential and amenity value of the feature affected; and
- guidelines or criteria on noise, visual intrusion, etc either in general or site-specific terms.

The adopted mitigation measures on the archaeological resources might include the minimisation of ground disturbance in archaeologically sensitive areas, excavation in advance of construction and the provision of a watching brief during construction.

9.2.3

Recommended Mitigation

The findings from the archaeological survey identified areas of archaeological deposit and sites of historic and cultural significance in Tuen Mun Area 54. Areas to be impacted by the development include Site 1, west of Siu Hang Tsuen and Site 2, north of Kei Lun Wai.

Archaeological Resources

With the maximisation of housing flat production from the Study Area as the prime objective of the Planning Study, there would be little scope in adjusting the layout of the Preferred Development Option to maximise the preservation of archaeological deposits. As the adjustment of development layout is considered not practicable, it is recommended that archaeological excavation of identified deposits be undertaken in advance of construction activities and that a watching brief is provided during construction. Within the Implementation Programme, time has been allowed for archaeological investigation/survey/rescue work by AMO before site clearance and formation of the relevant areas. Details are presented in *Table 9.5a*. Sufficient funds should also be provided for such work.

Table 9.5a *Programme for Archaeological Work*

Development Phase	Date	Duration	Work
Phase 1	Jul 2001 - Jan 2002	26 weeks	Preparations for Archaeological Survey and Rescue
	Jun 2002 - Sep 2002	13 weeks	Archaeological Rescue Work
Phase 2	Jul 2002 - Jan 2003	26 weeks	Preparations for Archaeological Survey and Rescue
	Oct 2003 - Apr 2004	26 weeks	Archaeological Rescue Work

9.2.4

Historic Building & Structures and Landscape Features

No known historic buildings and structures are to be directly impacted by the proposed development.

It is understood that the scope of the proposed housing development may cause concerns on changes in the level of water table and the threat of flooding during heavy rainfall. However, the drainage improvements, as recommended in the drainage impact assessment of this Study, to be implemented as part of the proposed developments will substantially improve flooding blackspots being temporarily relieved by the Rural Planning and Improvement Strategy - Minor Rural Improvement Works, Package 4 (RPIS Works). With these drainage improvements during the operational phase and good site management during the construction phase, it is anticipated that the indirect impact of water table fluctuation can be effectively controlled and therefore should not affect the preservation of historical buildings and other cultural resources.

The preferred development layout has maintained access to the existing villages and

therefore access to the identified sites of cultural heritage would not be affected.

Four grave sites (one along the alignment of Road D7 and three at Site 4) will be encroached by the proposed development and relocation of these graves is required. The relocation of graves should be undertaken in consultation with the relevant families. However, the detailed arrangements for grave relocation are beyond the scope of this cultural heritage assessment.

Moreover, a field survey is required before the relocation work is to be started, which should include a full photographic recording of each face of the grave sites and a detailed recording of the stone tablet inscriptions for AMO's record.

9.3 CONCLUSION

9.3.1 *Historical and Cultural Resources*

No known historic buildings and structures are to be directly impacted by the proposed development.

The proposed housing development may cause concerns on changes in the level of water table and the threat of flooding during heavy rainfall. However, the drainage improvements to be implemented as part of the proposed developments will substantially improve flooding blackspots being temporarily relieved by the Rural Planning and Improvement Strategy - Minor Rural Improvement Works, Package 4 (RPIS Works). With these drainage improvements during the operational phase and good site management during the construction phase, it is anticipated that the indirect impact of water table fluctuation can be effectively controlled and therefore should not affect the preservation of historical buildings and other cultural resources.

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Moreover, a field survey is required before the relocation work is to be started, which should include a full photographic recording of each face of the grave sites and a detailed recording of the stone tablet inscriptions for AMO's record.

9.3.2 *Archaeological Resources*

The findings from the archaeological survey conducted by the archaeological team of Zhongshan University identified areas of archaeological deposit in Tuen Mun Area 54. Areas to be impacted by the development include Site 1, west of Siu Hang Tsuen and Site 2, north of Kei Lun Wai.

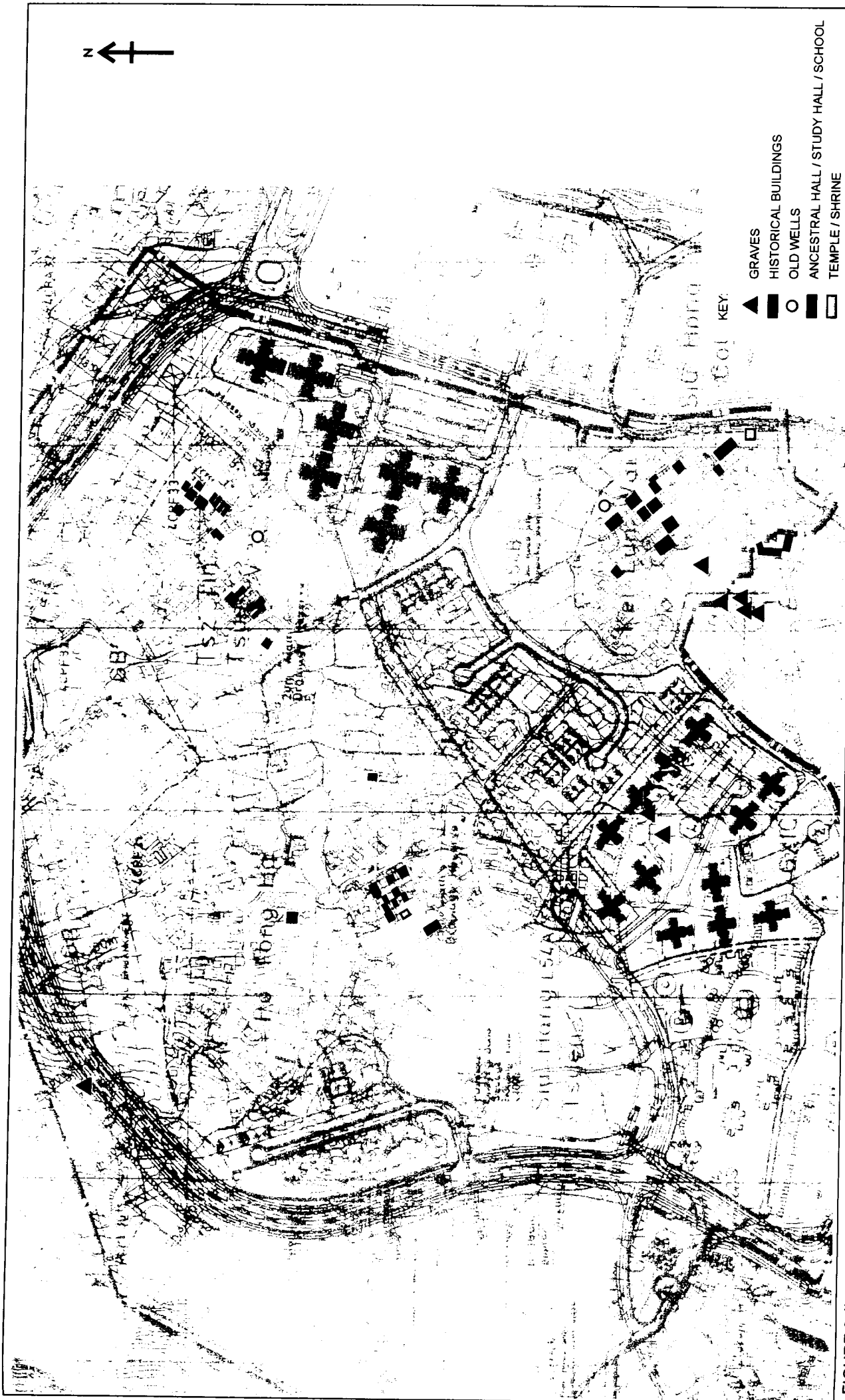
With the maximisation of housing flat production from the Study Area as the prime objective of the Planning Study, there would be little scope in adjusting the layout of the Preferred Development Option to maximise the preservation of archaeological deposits. As the adjustment of development layout is considered not practicable, it is recommended that archaeological excavation of identified deposits be undertaken in advance of construction activities and that a watching brief is provided during

construction. Sufficient time has been allowed for archaeological investigation/survey/rescue work by AMO within Phase 1 and Phase 2 of the Implementation Programme. Sufficient funds should also be provided for such work.



FIGURE 9.4a

APPROXIMATE BOUNDARY OF ARCHAEOLOGICAL DEPOSIT



KEY:
 ▲ GRAVES
 ■ HISTORICAL BUILDINGS
 ○ OLD WELLS
 ■ ANCESTRAL HALL / STUDY HALL / SCHOOL
 □ TEMPLE / SHRINE

FIGURE 9.4b

IDENTIFIED HISTORICAL AND CULTURAL RESOURCES