

9 IMPACT ON CULTURAL HERITAGE

9.1 Introduction

The EIA Study Brief requires a Cultural Heritage Impact Assessment (CHIA), which comprises a Built Heritage Impact Assessment (BHIA) and an Archaeological Impact Assessment (AIA). The BHIA needs to search all known and unknown historic buildings, clan graves and landscape features within the study area while the AIA requires a terrestrial investigation of the archaeological potential of the study area, particularly the identified Tsang Tsui Archaeological Site (TTAS). This section presents the cultural heritage impact assessment of the project.

The field investigation of the CHIA study was carried out in March 2008. Before the commencement of the archaeological survey, a licence was obtained from the Antiquities Authority on 22 June 2007 (Licence No. 245). The location of Cultural Heritage Survey at WENT Landfill Extension is indicated in **Figure 9.1**.

This chapter is composed of two major parts: BHIA and AIA. In each part, the result of field investigation will be presented, the impact that may affect the identified cultural heritage assessed, and appropriate mitigation measures recommended. The written and graphic records related to or derived from the investigations are presented in forms of Tables, Figures and Plates as appendices of this chapter.

9.2 Environmental Legislation & Standards

The relevant legislation and associated guidance notes applicable to the study for the assessment of impact on cultural heritage include:

- Antiquities and Monuments Ordinance (A&MO), Cap 53;
- Environmental Impact Assessment Ordinance (EIAO), Cap. 499;
- Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO); and
- Administrative regulations.

9.2.1 Antiquities and Monuments Ordinance (A&MO) (Cap.53)

The Antiquities and Monuments Ordinance (Cap. 53) was enacted in 1976. It provides the statutory framework for the preservation of objects of historical, archaeological and palaeontological interest. The Ordinance contains the statutory procedures for the Declaration of Monuments. Monument proposed can be any place, building, site or structure, which is considered to be of public interest by reason of its historical, archaeological or palaeontological significance. The Ordinance also grants to Government the ownership of all artifacts made prior to 1800 found in Hong Kong after the enactment of the A&MO, and it provides control over the excavation and search for relics through a licensing system. It should be noted that the protective measures contained in the ordinance only pertain to Declared or Deemed Monuments.

9.2.2 Environmental Impact Assessment Ordinance (EIAO) (Cap.499) and Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO)

The EIAO provides additional legislative protection to sites of cultural heritage threatened by development and the EPD is the enforcing authority. The EIAO lists cultural heritage sites among the “sensitive receivers” that should be considered in carrying out an EIA for any project. It also stipulates guidelines and criteria for the assessment of sites of cultural heritage interest in Annexes 10 and 19 of the Technical Memorandum issued under Section 16 of the EIAO. The Annexes specify that sites of cultural heritage shall be given a general presumption in favour of protection and conservation, that adverse impacts on such sites

shall be kept to a minimum, and that total or partial destruction must be taken as the last resort after all alternatives have been considered and all possibilities have been exhausted. The “Guidance Notes on Assessment of Impact on Sites of Cultural Heritage in Environmental Impact Assessment Studies” is also issued under the EIAO.

9.2.3 Administrative Regulations

Apart from above mentioned Ordinances, there are administrative regulations intended to provide additional protection for buildings and sites of historical or archaeological interest.

On 31 March 2003, the AMO issued the “Criteria for Cultural Heritage Impact Assessment”, stipulating specific requirements for the baseline study and assessment of both built and archaeological heritage impacts.

In January 2006, the Planning Department issued the “Hong Kong Planning Standards and Guidelines”, which requires conservation of cultural heritage in all sorts of land planning works in Chapter 10.

More recently on the last day of 2007, the Development Bureau issued a comprehensive technical circular on “Heritage Impact Assessment for New Capital Works Projects”. This technical circular sets out detailed requirements on conducting heritage impact assessment for all public works projects from the project inception stage. This administrative requirement is imposed with the aim to avoiding new projects affecting historic sites or buildings and to minimizing unavoidable impact by suitable mitigating measures.

9.3 Built Heritage Impact Assessment

The BHIA was primarily based on the findings of a field survey of built heritage features in the study area. The identified built heritage features can be classified into two sub-categories: historic building and historic grave.

9.3.1 Building Survey

9.3.1.1 General Description

There is only one permanent building complex identified within the study area: the Hung-Shing and Dragon Mother Temple (Hung-Shing Temple) (洪聖大王龍母娘娘廟), which is located at the northwestern corner of the study area (**Figure 9.2**). This temple site is composed of four independent structures, including the main structure Hung-Shing Palace (洪聖殿), an Altar behind the Palace holding figurines of deities, a pavilion in front of the Palace as a resting place and a Furnace for burning paper offerings (**Plate 9.1:1 in Appendix 9.1**).

The Hung-Shing Palace is a two-room structure. The front room hosts an altar with an incense burner and candle stands in the front of the back-room door (**Plate 9.1:2 in Appendix 9.1**). The back room is locked with several large deity statues stored inside. The Altar behind the Palace is an open small structure hosting several small figurines of Taoist and Buddhist deities (**Plate 9.1:3 in Appendix 9.1**).

9.3.1.2 Temple History

The exact date of the original construction of the temple is unknown, but the history of the temple can be roughly traced back to the mid-20th century. According to the Memorandum of the Rebuilding of the Hung-Shing and Dragon Mother Temple written in 1991, which was found in the front room of the Hung-Shing Palace, the temple at Tsang Tsui was originally built several decades ago; the temple was first rebuilt in 1986, but it was destroyed by fire right after the rebuilding. In 1988, the temple; including all the associated structures, was rebuilt again with cement, steel and mortar (**Plate 9.2:1 in Appendix 9.1**).

In addition to the written record, information from the locals also indicates that the history of the temple can be traced at least back to the 1950s. According to a local resident of 60

years old, his father took him to visit the temple regularly when he was seven-eight years old.

It is difficult to date existing ritual utilities and deity statues inside the Palace based on observation. The only possible remaining object from the old temple is a broken piece of a stone plaque mounted on the back wall of the front room, which was incised with the names of donors (**Plate 9.2:2 in Appendix 9.1**).

As described in the Memorandum, the Hung-Shing Temple was completely rebuilt in 1988, the structures of the temple therefore were all made of modern material. The structures, however, imitated the architectural style of traditional Chinese temples and palaces to a certain degree, indicated by the style and the pavilion and the roof of the Palace which was covered with green-colored glazed tiles (**Plate 9.2:3 in Appendix 9.1**).

9.3.1.3 Impact Assessment

The Hung-Shing Temple is important culturally and religiously to the local people in the Nim Wan area, judging from its continuous rebuilding history and the large amount of statues and figurines enshrined in the temple. The historic and architectural value of the temple, however, is relatively low because this temple has been rebuilt twice in the recent past and both its material and style are modern.

Since the WENT Landfill Extension is to be carried out in this area, the original site of the temple will be no longer suitable for a cultural and religious setting. Hence, the temple shall be relocated to another location to be separately identified. The temple should be duly surveyed for record purpose prior to the relocation. Comments from the local community on the location and the building style should be collated where appropriate. If necessary, the inscription of the tablet can be recorded prior to the relocation.

9.3.2 Grave Survey

9.3.2.1 General Information

Arup conducted a grave survey in August 2007, in which six graves were found out of 12 graves or sites of former graves highlighted on Lands Department 1:1000 map. The six identified graves were then coded from G1 to G6 and described in a Grave Record as attached in **Appendix 9.2** to this report. The grave survey conducted in March 2008 confirmed the locations of graves and identified four additional graves in the eastern part of the study area. Following the Grave Report, the four newly identified graves are coded from G7 to G10 (**Figure 9.2**).

The detailed information of the identified graves is presented in a systematic and coherent format in the Grave Record (see **Appendix 9.2**). There are 9 forms in the Grave Record for Grave 1 to Grave 10, because the originally identified G3 and G4 should be counted as one grave (see explanation below). Besides, the status of G1 in the Grave Report is modified based on the observation of this grave in the field investigation.

9.3.2.2 Grave Record

The Grave Record is appended in **Appendix 9.2** to this report.

There are five major categories in the Grave Record: Location, Classification, Inscription, Addition and Description. The category "Location" includes all the information on the three-dimensional geographic measurements of a grave. The category "Classification" covers various aspects of a grave from its material and shape to its measurement and funerary type. The category "Inscription" consists of two subsets: the recording of grave epitaph and the dating of the grave. The category "Addition" records the investigator's observation of a grave with regard to its present condition and signs or remains related to the visiting of the grave by descendants and relatives of the deceased. Finally, the category "Depiction"

presents relevant photographic images; if required, the cartographic record of a grave can also be attached to this category.

Several concepts used in the above categories require a further explanation.

“Place”: This concept refers to a group of burial sites or separate graves relatively close to each other in distribution in the entire study area. The use of this term is only a subjective device for the purpose of a clear and concise presentation. The burial sites in each “place” do not necessarily have any family-clan or other kind of internal relationship. In this survey, all the identified graves are considered belonging to the place of Nim Wan.

“Burial Site”: This concept refers to a group of graves or grave grounds located relatively close to each other and isolated from others at a location. With respect to the levels of classification, the concept “burial site” is equivalent to that “cemetery”. The latter concept is not used because it is difficult to justify in the field whether a group of graves at the same location actually belong to a cemetery owned and managed by a family, a clan or a village. In this survey, the identified graves are grouped into four burial sites: Tsang Tsui, Tsang Tsui West, Tsang Tsui East and Tsang Tsui South.

“Grave”: This term refers to either a “grave” or a “grave ground”. A “grave” refers to an independent structure, although it may host either one deceased (single burial) or multiple deceased (joint burial) under the ground. A “grave ground” refers to a cement or natural earth platform holding one or multiple pottery urns storing the bones of the deceased. Although each of the urns on the same platform functions as a coffin itself, these urns are only in a transitional period during the funerary process, waiting for the secondary burying and eventually forming a “joint burial”. From this point of view, the “grave ground” rather than the pottery urn(s) is treated as the basic unit. For this reason, the originally identified G3 and G4 are two urns on the same platform and should be considered one grave instead of two.

“Shape”: According to our experience in grave surveys in Hong Kong, the majority of the historic graves in Hong Kong since the Qing dynasty is horse-hoof shaped, which is composed of four basic structural units on four tiers along the slope in cross section, including a curved wall at the top and back, a round wall above the grave chamber, an altar platform with straight and perpendicular walls for the epitaph stone, and a half-moon shaped “fung-shui pond” in the front. At some locations, a stone wall was built to protect the slope of the front platform. Of the 10 identified graves in the study area, only G5, the Tang clan grave, is in this standard style, others are simplified structures or urns on natural platform.

“Decoration”: Grave decoration includes both carved or shaped motifs and the use of colors. Again, G5 is the only grave in the study area with decoration.

“Funerary Type”: This aspect refers to the funerary arrangement of the deceased. Based on the number of the deceased buried in the same grave structure or on a platform, a grave is either “single” or “joint”. A single grave hosts only one deceased person and a “joint grave” may contain either a couple or multiple deceased of more than one generation. Single graves might be buried only once, called “primary burial” in archaeology, while bodies in joint graves are naturally buried at least twice, which is known as “secondary burial”.

“Dating”: The dating of a grave is primarily based on the original and/or rebuilt date(s) of the grave indicated by the text of its epitaph. If the inscription is unclear or not present at a grave, the dating is based on a comparison of its structural style to that of a historic grave.

9.3.2.3 Findings of the Grave Survey

The findings of the grave survey are briefly described as follows:

Grave 1 (G1): According to the Grave Report, G1 is an urn without any grave structure. However, this so-called urn is actually a basin-shaped lid of an urn and a broken grave structure was identified only around two

meters away from the lid vessel. Therefore, it is more likely that this grave has been relocated, the original structure abandoned and the lid vessel deserted at the original location.

- Grave 2 (G2): An urn on a natural earth platform with a tea pot placed aside as a symbol of offering. The dating of G2 is unknown but most likely modern.
- Grave 3-4 (G3-G4): Two urns on natural earth platform. This grave has probably been deserted or relocated, or at least unattended, for one of the urns is left open and empty. The dating of G3-G4 is unknown but most likely modern.
- Grave 5 (G5): A large grave structure with multiple burial in a typical four-tier and horse-hoof shape of historic graves. This grave hosts nine ancestors of the Tang (鄧) clan belonging to three generations (the 19th, 20th and 22nd generation ancestors of current Tang descendants). The original date of the grave is unknown but most likely in the late Qing dynasty. This grave was rebuilt twice in 1935 and 1995, but the style has probably retained the old one. It is interesting to note that, according to the text of the epitaph stones, the original Chinese writing of the location Tsang Tsui was 津嘴 instead of 曾嘴.
- Grave 6 (G6): A large single burial structure belonging to the Chan (陳) clan with a style of typical historic graves mentioned above. The original date of G6 is unknown but most likely historical if considering its four-tier and horse-hoof shape, that is probably late Qing dynasty or at least before 1950. This grave has probably been rebuilt more than once in the past and the latest one should be after August 2007 when the first grave survey was conducted. According to the Grave Record, much of the sections of this grave had lost their outer covering, and the grave stone was damaged according to the photograph taken in August 2007. The current condition of this grave, however, is fresh with a layer of cement cover and a new grave stone.
- Grave 7 (G7): A single burial grave structure belonging to the Leung (梁) clan. The original date of this grave is unknown and the structure simulates the old style in a simplified manner. But it is mostly likely that this grave was rebuilt or redecorated in 2007, judging from the style of its cement covering, which is identical to that of Grave 9 dating to 2007.
- Grave 8 (G8): Two urns on natural earth platform. This grave was visited recently, judging from the fresh fruits offered at the grave location, but one of the urns is open and empty.
- Grave 9 (G9): A single burial grave structure belonging to a woman from the Tang clan married to the Leung clan. According to the epitaph of the grave tablet, G9 was rebuilt in 2007.
- Grave 10 (G10): A single burial grave structure belonging to the Lai (黎) clan. The original date of this grave is unknown but it is mostly likely that this grave was rebuilt or redecorated in 2007, judging from the style of its cement covering, which is identical to that of Grave 9 dating to 2007.

9.3.2.4 Impact Assessment

Of all the graves identified in the study area, G5 and G6 are historic clan graves. G5 is particularly important, for it hosts ancestors of three generations of a Tang family back to the

late Qing dynasty. However, from the perspective of heritage and architectural interest, the two graves are not much significant because they have been rebuilt only recently.

Since the WENT Landfill Extension is to be carried out in the study area, all the identified graves will be destroyed, the Government therefore shall consult the descendants of the buried for a removal or relocation. For G5 and G6, it is unnecessary to conduct photographic and cartographic survey to make further records.

9.4 Archaeological Impact Assessment

9.4.1 Purpose and Scope

The purpose of the intended archaeological survey is to obtain sufficient information on the distribution and the preservation of the archaeological deposit within the boundary of the identified archaeological site, in order to develop a detailed programme to protect archaeological heritage from the impact caused by the WENT Landfill Extension.

The archaeological survey is required to cover the entire study area of the WENT Landfill Extension, but the field work will be focused on the area within the marked boundary of the TTAS. This sampling strategy is based on the geographic-geological features of the study area and the results of previous archaeological surveys in the vicinity of the study area.

9.4.2 Geography and Geology

The study area is distributed from the coast in the north to the rocky hill slopes in the south. Geologically, the surface deposits of the coast are formed during the Holocene, including beach or raised beach deposits and alluvium; the surface deposits of the inland and high-elevation areas are debris flow deposits formed during the late Pleistocene and Holocene (**Figure 9.3**).

Before the 1980s, the study area was mainly agricultural fields and only occupied with scattered structures. The most distinctive structures in this area were the Hung-Shing temple near the coast and the grave G5 mentioned above (**Figure 9.4**). After the 1980s, the major modification of the landscape was made by the construction of the former BBC Relay Station to the south of the TTAS and the development of sludge treatment facility (ash lagoon) outside of the original coastal line (**Plate 9.3 in Appendix 9.1**).

Topographically, the coastal and low-elevation areas to the northwest, north and northeast of the TTAS may have some archaeological potential, if considering the general location pattern of a series of archaeological sites distributed along the coastal line of the New Territories West. However, previous archaeological surveys in the vicinity (see below) have ruled out the possibility of any archaeological discovery in coastal and low-elevation areas. The area to the south of the TTAS has not been fully covered by previous archaeological surveys, but it is highly unlikely to identify a human settlement on rocky hill slopes (**Plate 9.4 in Appendix 9.1**).

9.4.3 Previous Archaeological Surveys

There have been two archaeological surveys conducted previously at the Tsang Tsui Archaeological Site and in surrounding areas. For a purpose to present the distribution of previous archaeological works, the locations of all the test pits and auger holes conducted previously are marked up in **Figure 9.5**, but the original codes of these test pits and auger holes are not specified.

The Tsang Tsui Archaeological Site was identified during a survey organized by the Antiquities and Monuments Office (AMO) in 2000 as part of a feasibility study for the proposed Sludge Treatment Facility at Nim Wan in Tuen Mun^[9-1].

During the 2000 survey, the archaeological site was identified on a terrace to the south of the former BBC Relay Station, with a height roughly from 8 m to 13 m and an area of

approximately 30,000 m². 13 out of the total 34 auger holes and 7 test pits were allocated within the boundary of the site, of which three auger holes and five test pits yielded over 600 pieces of pottery and stone relics dating to the Late Neolithic period (c. 2200 – 1500 B.C.).

It should be noted, however, the five test pits and three auger holes were all allocated along the northern and northeastern border of the site, and the marking of the site boundary, presumably, was not based on the distribution of discovered archaeological deposit but based on landscape and topographic features of the area at Tsang Tsui. To be specific, the marked site boundary in the west, north and east is actually the natural boundary of the raised terraces.

The second archaeological survey in the Project study area was conducted by the AMO in the following year of 2001. The purpose of the 2001 survey was not to verify the distribution of archaeological deposit within the marked site boundary; instead, this survey focused on the archaeological potential in the areas surrounding the identified site. Therefore, all of the 44 auger holes and eight test pits were purposefully allocated outside the marked boundary of the TTAS^[9-2].

The 2001 survey did not identify any trace of archaeological remains outside the boundary of the TTAS. The survey report, therefore, reached a conclusion that the existing Tsang Tsui site was the only place with archaeological value within the entire study area of the WENT Landfill Extension. The report also recommended that no further archaeological survey be required in the already studied areas outside the identified boundary of the TTAS.

9.4.4 Methodology of the Archaeological Survey

It is our understanding that archaeological field work for the EIA study or a rescue purpose is different from research-question oriented archaeological field work in sampling strategy and scale, because if archaeological heritage is disturbed or destroyed, the damage is not replaceable and the loss is permanent. Therefore, the scale of sampling and field investigation in EIA studies or rescue programmes should be much larger than that in an academic research. Even if some areas seem unlikely to have archaeological deposit, field work is still required to be conducted in order to prove that archaeological heritage will not be affected by a proposed development project.

With this understanding and based on the information from previous surveys in the study area, an initial field survey should be conducted before developing a detailed programme for the protection of the TTAS. The purpose of the initial survey is to verify the distribution of archaeological deposit within the entire site area. As mentioned previously, the 2000 survey has identified rich archaeological remains only in the northern – northeastern part of the site, the focus of this initial survey, therefore, should be placed in the central and southern sections of the site.

The study area for the archaeological field investigation, however, had been reduced before its commencement due to land property issues. Because of the constraint in access to private lots, the flat terraces in the western and eastern sections of the TTAS were excluded from the field investigation, and all the archaeological works confined on the low hill slopes in the middle section of the site. It must be pointed out that previously identified artifacts were all distributed on the flat terraces, whereas all of the terraces were within the private land lots (**Figure 9.6**).

The field survey at the TTAS was carried out using three methods: field scan, auger test and test pit excavation. During the field survey, 15 test pits, each measuring 1m by 1m, were first excavated to reveal the stratification of the deposits in the study area. Since previous two surveys had opened 15 test pits in total at the site, the 15 test pits excavated during the 2008 survey were coded from T16 to T30. 24 auger holes were then drilled to expand our understanding of the horizontal distribution of the deposit patterns of the study area; again, to avoid overlapping code numbers, the 24 auger holes were coded from A101 to A124.

Before the commencement of the field work, a professional surveyor was hired to set up six control points in the study area for the allocation of archaeological works within the study area (**Figure 9.7**).

For the purpose of covering the entire works area with a roughly even allocation of the test pits and auger holes, the study area was divided into three zones in terms of Zone North, Zone West and Zone South, with grave G5 as the centre of the division. In each of the three zones, five test pits and eight auger holes were allocated (**Figure 9.8**).

The three zones are slightly different from each other in topography. Zone North is basically the northern edge of the low hill around 11 to 12 meters above the sea level, but its eastern edge falls on a flat terrace with an elevation of 9 meters (**Plate 9.5:1,2 in Appendix 9.1**). Zone West is a tree-covered gentle slope to the west of G5, with elevations varying from 12 to 13 meters (**Plate 9.5:3,4 in Appendix 9.1**). Zone South is distributed along the relatively steep slopes of the hill, which vary in elevation from 13 to 17 meters and now are covered intensively with newly planted fruit trees (**Plate 9.5:5,6 in Appendix 9.1**).

All the test pits and auger holes were excavated to the sterile deposit, which is either reddish brown clay or reddish clay mixed with a large amount of white colored rock granules. The “context” system was used as the minimum unit of archaeological stratigraphy to record any recognizable deposit layers and archaeological features. All the excavated cultural relics were also coded with a context number.

9.4.5 Findings of the Archaeological Survey

The detailed information in relation to the subsurface deposits revealed from the test pits and auger holes is recorded in **Table 9.1** and **Table 9.2** respectively (see **Appendix 9.3**). The information in **Table 9.1** includes the location, size, coordinates and elevations (surface and bottom) of each test pits; for each of the contexts (e.g. deposit layer), the information recorded includes the thickness of the layer, the characteristics of the soil deposit, the unearthened remains and additional description or interpretation of each context. The same set of the information for the contexts out of each auger hole is shown in **Table 9.2** (see **Appendix 9.3**). **Figure 9.9** to **Figure 9.13** show the section profiles of the 15 test pits, with the north wall and east wall chosen for each test pit. The corresponding photographs of the strata exposed in each of the 15 test pits are shown in **Plate 9.6** to **Plate 9.10** in **Appendix 9.1**.

Of the 15 excavated test pits, T16, the pit allocated at the northeastern corner of the study area on the flat terrace with an elevation of 9 m above sea level, is the only one which has yielded pottery remains dating to the prehistoric period. The soil characteristics and associated remains of T16 are described as follows (**Figure 9.9**; **Plate 9.6:1-2 in Appendix 9.1**):

- T16C1: Light blackish surface soil with rock granules; one blue-and-white porcelain sherd with additional green decoration was found in this context (**Plate 9.12:1 in Appendix 9.1**).
- T16C2: Dark grayish clay; no cultural remains were found in this context.
- T16C3: Yellowish gray soft clay; 13 red coarse pottery shards were unearthened from this layer (**Plate 9.11 in Appendix 9.1**).
- T16C4: Reddish brown clay with intense rock granules; not containing any remains.
- T16C5: Revealed by the auger testing; yellowish clay with rock granules; not containing any remains.

Under the present surface soil, T16C2 was probably formed during the late Qing to modern time, according to ceramic remains unearthened from sub-surface layer in nearby test pits T19 and T20. Judging from the characteristics of the clay soil, C4 and C5 are sterile deposits of

weathered clay formed during the late Pleistocene to early Holocene period. The third layer C3 in T16 is the single layer of prehistoric cultural deposit.

Three red coarse pottery sherds from T16C3 are relatively large and can be taken as specimens:

T16C3:1, round rim and long neck (**Plate 9.11:1 in Appendix 9.1**).

T16C3:2, cord-marked shard with flared rim (**Plate 9.11:2 in Appendix 9.1**).

T16C3:3, cord-marked shard with flared thin rim (**Plate 9.11:3 in Appendix 9.1**).

The original form of the three specimens is probably cord-marked and round-bottomed jar as a type of cooking and storage vessel. Besides above three shard recognizable for their form, there are other 10 pieces of body parts (**Plate 9.11:4 in Appendix 9.1**).

The prehistoric remains of the TTAS have been dated to the period of 2200 – 1500 B.C. by the archaeologist of the 2000 survey. This period has been considered the late Neolithic period in the archaeology of Hong Kong and Pearl River Delta area^[9-3]. The nature of this period, however, should be reconsidered due to new discoveries in Hong Kong. An archaeological survey was conducted at the Luk Keng Tsuen site in Lantau in 2007, during which two phases of prehistoric remains were unearthed. The pottery remains from the second phase are identical to the findings from the 2000 survey at the Tsang Tsui site, but a stone mold for bronze casting was found in association with the pottery remains of the second phase^[9-4].

T18 in Zone North was located on the edge of a flat terrace, sharing soil characteristic with T16. However, the layer of yellowish gray soft clay (C3 in T16) is absent in this pit and no archaeological remains were discovered in this pit (**Figure 9.9:5-6; Plate 9.6:5-6 in Appendix 9.1**).

The other three test pits in Zone North, T17, T19 and T20, were located on the northern end of a low hill. T17 was on the northern tip of the hill and no cultural remains were found in this pit. It should be noted, however, that the soil characteristics of C2 in T17 is close to that of C3 in T16 (**Figure 9.9:1-4; Plate 9.6:1-4**). T19 and T20 are basically identical with each other in soil stratification (**Figure 9.10:1-4; Plate 9.7:1-4 in Appendix 9.1**) and both have yielded a glazed stoneware shard from the second layer dating to the late Qing to modern time (**Plate 9.12:2-3 in Appendix 9.1**).

The other 10 test pits in Zone West and Zone South are empty with cultural remains. In Zone West, the excavation of five test pits T21 to T25 indicates that the sterile deposits on the terrace are either reddish clay or reddish brown clay mixed with intense rock granules, cobbles or boulders; above the sterile deposits and under the surface layer, there is only one layer of soil deposit in these pits, which is not associated with any artificial remains. There is a cement foundation of ruined house found on the terrace, suggesting that the sub-surface layer above the sterile deposits in this area was probably formed during the modern time (**Figure 9.10:5-6, Figure 9.11: 1-6, Figure 9.12:1-2; Plate 9.7:5-6, Plate 9.8:1-6, Plate 9.9:1-2 in Appendix 9.1**).

In Zone South, the excavation of five test pits T26 to T30 indicates that the sterile deposits on the hill slopes are either reddish brown clay or dark reddish brown clay mixed with intense rock granules. T30 was allocated at the southern tip of the study area; in this pit, sterile deposits were directly covered by the surface layer. The soil stratification above the sterile deposits varies in other four test pits, but the formation of upper layers was most likely associated with recent tree-planting activities. In T27, for example, a layer of light blackish soil with tree roots and grass was buried under two layers of deposit, but this deposit is obviously identical to the surface layer in other parts of the study area (**Figure 9.12:3-6, Figure 9.13:1-6; Plate 9.9:3-6, Plate 9.10:1-6 in Appendix 9.1**).

In summary, test pit T16 with unearthed prehistoric pottery remains is located on the terrace at the northernmost section of the study area, T19 and T20, the other two test pits with late historical ceramic remains, are also located in Zone North. The other test pits in Zone West and Zone South as well as all the auger tests have not yielded any evidence of archaeological or historic remains.

9.4.6 Impact Assessment

The archaeological survey in 2008 at the TTAS has not identified any evidence of archaeological remains within the confined study area, with an exception of T16 in the northeastern corner of the study area. This no-discovery result is still significant, for it provides reliable information to revise the site boundary originally defined by the archaeological survey conducted in 2000 (**Figure 9.14**).

According to the report on the 2000 archaeological survey, three test pits (T1, T2 and T7) revealed undisturbed prehistoric deposit; another two test pits (T5 and T6) also yielded pottery remains but the prehistoric sherds were found either in the surface layer or from the disturbed deposit inside a snake hole. Since all the five test pits with prehistoric remains are located in the northern part of the site, this area therefore should be the core area of the site.

Prehistoric remains were not found in test pits T3 and T4, which are located along the eastern border of the site, but the number of archaeological works in this section is still limited and this section is also on the relatively flat terraces, the eastern section therefore can not be excluded from the site boundary. Based on the result of the 2008 survey, the central and southern sections of the study area with higher elevations should be excluded from the revised boundary of the TTAS. The total size of the TTAS within the revised boundary is approximately 7,000 m².

As the archaeological survey conducted in 2008 has barely touched the flat terraces with archaeological remains, the archaeological survey conducted in 2000 is still the primary source for the assessment of the value of the TTAS. In short, the TTAS is a prehistoric site with a single phase of cultural remains dating to 2200 – 1500 B.C. and with a size of approximately 7,000 m². The site is rich with prehistoric ceramic and lithic remains, but the potential is unclear with regard to archaeological features. The archaeological remains are generally deposited in one or two layers 30 cm to 50 cm under the surface, and some of the deposit layers have been disturbed by natural forces and continuous cultivation and tree planting from the past to the present day.

From a broader perspective, the TTAS is important in Hong Kong archaeology for both its geographic location and its topographic setting. With regard to its geographic location, the TTAS is one of a series of prehistoric archaeological sites that have been identified along the coast of the New Territories West, including some famous sites in Hong Kong archaeology such as So Kwun Wat^[9-5], Lung Kwu Tan^[9-6], Ha Pak Nai^[9-7] and Ngau Hom Shek^[9-8]. The TTAS, therefore, is an indispensable link for our understanding of the prehistoric cultures in this area. As for its topographic setting, the TTAS is unique among the Neolithic sites in Hong Kong, for it is distributed on high-elevation terraces whereas other Neolithic sites identified along the coast are largely located on sand bars.

However, it is still considered essential to occupy the TTAS to construct the WENT Landfill Extension. A summary of the reasons for is given below:

Landfill Capacity

- Engineering studies have been conducted to investigate whether it is feasible to avoid the TTAS in developing the WENT Landfill Extension. A number of different options have been explored and discussed in Chapter 2.
- According to the engineering findings, the capacity of layout options excluding the TTAS, Graves and Temple is

	only 39Mm ³ .
	<ul style="list-style-type: none"> As compared to the selected layout which has capacity of 81Mm³, option excluding the TTAS, Grave and the Temple can only achieve a capacity 50% less (ie 42Mm³ less). It is understood that there is a public need for landfill space. The loss of waste capacity as a result of not maximising the use of this extension site would require void space to be provided at other landfills, resulting in a shortfall of space at other landfills. In view of the issues/constraints that other land-based landfills are facing, the compensatory landfill space will probably need to come from a reclamation-based landfill site, even if the site formation costs involved are much higher (due to the costly seawalls & reclamation involved).
Engineering Constraints	<ul style="list-style-type: none"> If WENT Landfill Extension does not cover TTAS, there will be surplus materials (about 1.2 Mm³) generated, which would need to be disposed off site due to the reduced size of the WENT Landfill Extension. Designated area would need to be identified to accommodate these materials surplus materials.
Lack of alternative Site	<ul style="list-style-type: none"> As Hong Kong is running out of landfill space far earlier than expected, the remaining landfill space will only last until mid / late 2010s if waste levels continue to increase at current levels. Unless solutions are identified immediately, we could face a crisis in the next decade of having nowhere to put the thousands of tonnes of waste thrown away each day. New landfill sites must be identified to maintain the continuity of waste disposal resulting in additional environmental impacts on many more sensitive receivers near to the new landfill sites. As such, when balancing all the considerations and taking account of the environmental benefits and dis-benefits of all the options, the recommended option, which covers the area of TTAS but gives the largest waste capacity whilst avoiding prolonged adverse environmental impacts to other sensitive receivers near to the new landfill sites, was evaluated as a preferred option and is recommended for detailed environmental impact assessment.

It can be seen from the above table that it is essential to occupy the TTAS for developing the WENT Landfill Extension. The pros and cons of leaving the TTAS intact for subsequent rescue excavation, if necessary, after the completion of the landfill development has also been considered. A summary of the pros and cons is given below for reference.

Pros	<ul style="list-style-type: none"> Any artifacts within the TTAS would be preserved in-situ Where necessary, any artefacts preserved in situ could be excavated in the future
Cons	<ul style="list-style-type: none"> The TTAS would be covered with landfill material of over 10m thick. The landfill materials are confined by the bottom and top liners. Future excavation would damage the top as well as the bottom liners rendering

the leakage of leachate and landfill gas. Besides, the landfill materials, which comprise of wastes, are not geotechnically sound materials. The stability of the formed slopes during the excavation works may not be robust and the safety of the workers may be jeopardised.

- The landfill material would generate lot of leachate which would infiltrate into the TTAS. If the artifacts are not excavated before occupying the site, the leachate, which is highly acidic, would cause certain damage to the artefact. Even if the artefacts are excavated in the future, the artefacts would have been damaged already.
- The landfill material would also generate a fair amount of landfill gas which is explosive and hence hazardous unless it is proper transferred to a proper treatment system. If there is excavation of the landfill material covering the TTAS, the landfill gas will be released to the neighbouring environment. It would therefore pose very high risk for the archaeologists who need to work near to a high concentration of landfill gas source.
- The landfill material is also an odour source. The archaeologists would also need to work very closely to a strong odour source. Given the long duration for the rescue excavation, it is undesirable for the archaeologists work under such unfavourable conditions.

It can therefore be seen from the above that leaving the TTAS in-situ has overriding disadvantages. As such, it is recommended that a full scale rescue excavation shall be launched to protect the archaeological heritage of the TTAS in record prior to carrying out any construction works at TTAS. Considering the distribution of archaeological deposit within the revised site boundary is still unclear, an additional archaeological survey shall be conducted first in order to determine the specified extent of the rescue excavation.

9.5 “What If IWMF not proceed”

The feasibility of IWMF is still being conducted and there is no decision on the implementation programme and site selection. In case the IWMF is not located at the middle ash lagoon, the boundary of the WENT Landfill Extension would be further expanded to include the middle lagoon. This, however, would not have additional impacts on the TTAS and other built heritage identified in the EIA Report.

Please note that since the TTAS is located at the middle of the WENT Landfill Extension, exclusion of TTAS from the Landfill Extension would greatly reduce the capacity of the WENT Landfill Extension (see Chapter 2 on Option 5). On the other hand, since the middle ash lagoon is at the edge of the WENT Landfill Extension and could not accommodate significant amount of the wastes, inclusion of this lagoon would not contribute significant extra capacity to the WENT Landfill Extension and thus could not compensate for the capacity loss due to the exclusion of TTAS. As such, it is not recommended to exclude TTAS under this scenario (ie. IWMF not locate at middle ash lagoon and WENT Landfill Extension expand to include the middle ash lagoon.)

9.6 Mitigation Recommendations

9.6.1 Built Heritage

The historic and architectural value of the Hung-Shing Temple is relatively low because this temple has been rebuilt twice in the recent past and both its material and style are modern. Since the WENT Landfill Extension is to be carried out in this area, the temple shall be relocated to another location to be separately identified. The temple should be duly

surveyed for record purpose prior to the relocation. Comments from the local community on the location and the building style should be collated where appropriate.

Of all the graves identified in the study area, Graves G5 and G6 are historic clan graves. However, the two graves are not much significant from the perspective of heritage and architectural interest as they have been rebuilt recently. Since the WENT Landfill Extension is to be carried out in this area, all the identified graves will be destroyed. The Government therefore shall consult the descendants of the buried for a removal or relocation. For G5 and G6, it is unnecessary to conduct photographic and cartographic survey to make further records.

9.6.2 Archaeology

The original boundary of the TTAS has been revised based on the discovery of the 2008 survey. The archaeological survey in 2008 at the TTAS has not identified any evidence of archaeological remains within the confined study area, with an exception of T16 in the northeastern corner of the study area. Since the WENT Landfill Extension is to be carried out in this area, a full scale rescue excavation shall be launched to protect the archaeological heritage of the TTAS in record. Considering the distribution of archaeological deposit within the revised site boundary is still unclear, an additional archaeological survey shall be conducted first, subject to the availability of land access, in order to determine the specified extent of the rescue excavation.

This proposed Project is to create a landfill place and after tons of garbage being piled up over the site, it becomes impossible to reopen the site in the future. That means that this archaeological site will be lost forever and it has no difference from totally destroying the site. Therefore, as the TTAS is included into the landfill area after balancing all sorts of considerations, a rescue excavation is the feasible mitigation measure, so that the archaeological data can be retrieved and recorded.

The project proponent shall appoint a qualified and experienced archaeologist to carry out the additional archaeological survey and rescue excavation. The archaeologist shall apply for a licence for carrying out the survey and rescue excavation. A separate Archaeological Action Plan following relevant parts of the Guidelines for Cultural Heritage Impact Assessment shall be prepared by the archaeologist detailing the archaeological actions required to mitigate impacted archaeological deposits in Tsang Tsui Archaeological Site.

The plan shall include the following:

- a. a detailed plan for the additional archaeological survey;
- b. a detailed plan for the rescue excavation;
- c. a contingency plan to address possible arrangement when significant archaeological findings are unearthed.

The project proponent shall allow sufficient funding, time and personnel to implement the plan prior to commencement of construction works. The Archaeological Action Plan shall be submitted and agreed with AMO prior to licence application by the archaeologist. As Tsang Tsui Archaeological Site is an important archaeological site in Hong Kong, all the archaeological works for the site shall be conducted by qualified and experienced archaeologists. The contractual arrangement (including the contract brief) for the archaeological survey and rescue excavation shall be agreed with AMO prior to engagement of archaeologists.

9.7 Conclusion

Built heritage survey and archaeological survey have been conducted within the study area of the WENT Landfill Extension. During the built heritage survey, the Hung-Shing Temple was investigated for its dating and heritage value, and nine graves were investigated for their dating and current status. During the archaeological survey, 15 test pits and 24 auger holes were excavated in the confined study area on the Government land within the identified boundary of the Tsang Tsui Archaeological Site.

As for the built heritage impact assessment, the Hung-Shing Temple was completely rebuilt in 1988, and graves G5 and G6 have been rebuilt in the past two decades; therefore, the cultural heritage value of these structures is relatively low. Before the relocation of these structures, it is unnecessary to take further mitigation measures on the two graves; the Hung-Shing Temple, however, should be duly surveyed for record purpose prior to the relocation.

As for the archaeological impact assessment, the original boundary of the TTAS has been revised based on the discovery of the 2008 survey. Since the WENT Landfill Extension would cover the area of the TTAS, a rescue excavation shall be conducted before the commencement of the construction. Subject to the findings of an additional archaeological survey, the rescue excavation shall cover the revised site boundary in order to protect the potential archaeological heritage of the TTAS comprehensively in record.

9.8 References

- [9-1] AMO: *Preliminary Project Feasibility Study of a Sludge Treatment Facility – Preliminary Archaeological Survey Report at Nim Wan Site, Tuen Mun* (Hong Kong: AMO Archive No. TM13, 2000).
- [9-2] AMO: *Preliminary Archaeological Survey Report on the Proposed Extensions of WENT Landfill at Nim Wan Site, Tuen Mun* (Hong Kong: in AMO Archive, 2001).
- [9-3] Chau Hing-wah: Periodization of Prehistoric Culture of Pearl River Delta Area, in Chau H-w ed. *Collected Essays on the Culture of the Ancient Yue People in South China* (Hong Kong: published by the Urban Council, 1993), pp. 40 – 55.
- [9-4] Hong Kong Archaeological Society: *The 2007 Archaeological Survey at the Luk Keng Tsuen Village Site, Lantau* (Hong Kong: in AMO Archive, 2008).
- [9-5] Au Ka Fat: *Report of Archaeological Survey at So Kwun Watt, Tuen Mun 1997* (Hong Kong: AMO Archive, No. TM1, 1997).
- [9-6] 古物古蹟辦事處: 香港龍鼓灘新石器時代遺址 (Hong Kong: AMO Archive, No. TM20, 1996).
- [9-7] 香港考古學會: 元朗廈村鄉白泥村陳家園沙丘遺址發掘報告 (Hong Kong: AMO Archive, No. YL17, 1999).
- [9-8] 古物古蹟辦事處: 全港文物普查 1997 第一地區(元朗區)工作報告 (Hong Kong: AMO Archive, No. YL9, 1997).