11. CULTURAL HERITAGE

11.1 INTRODUCTION

11.1.1 This Section of the report presents the results of the assessment of potential impacts on cultural heritage resources in the Study Area which may be impacted as a result of Project construction and operation activities.

11.1.2 Mitigation measures required to maintain identified impacts to within acceptable levels have been recommended, as appropriate.

11.1.3 A full bibliography is provided in *Annex J*.

11.2 LEGISLATION, STANDARDS, GUIDELINES & CRITERIA

11.2.1 The following legislation, standards, guidelines and criteria are relevant to the evaluation of impacts on cultural heritage resources in Hong Kong:

- Environmental Impact Assessment Ordinance (Cap. 499.S16). Technical Memorandum on the EIA Process (EIAO TM);
- Guidance Notes on Assessment of Impact on Sites of Cultural Heritage in Environment Impact Assessment Studies (GN CH);
- Antiquities and Monuments Ordinance (Cap. 53);
- Criteria for Cultural Heritage Assessment; and
- Hong Kong Planning Standards and Guidelines (HKPSG).

ANTIQUITIES AND MONUMENTS ORDINANCE (CAP. 53)

11.2.2 The heritage resources of Hong Kong are governed by a range of legislative and planning mechanisms. The *Antiquities and Monuments Ordinance (Cap. 53)*, provides statutory protection against the threat of development for declared monuments, historical buildings and archaeological sites to enable their preservation for posterity. The Ordinance establishes a statutory procedures to be followed in making such a declaration.

11.2.3 In practice, certain 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. There is not, however, any statutory procedure to cover this. Deemed monuments have the potential to be upgraded to statutory declared monuments in the usual way.

11.2.4 A wide range of sites of cultural heritage are identified and recorded by the AMO in addition to those in respect of which a declaration has been made under the Antiquities and Monuments Ordinance; historical buildings and structures are so recorded as follows:

- Grade 1 Buildings of outstanding merit, which every effort should be made to preserve if possible.
- Grade 2 Buildings of special merit; effort should be made to selectively preserve.
- Grade 3 Buildings of some merit, but not yet qualified for consideration as possible monuments.

These are to be recorded and used as a pool for future selection.

11.2.5 This classification is for AMO internal reference and has no statutory protection power. Although there are no statutory provisions for the protection of the sites of historical interest, Graded Buildings and Deemed Monuments in Hong Kong, the Government has administrative procedures which state that consideration must be given to protect listed and locally designated historic buildings and sites of cultural interest.

11.2.6 Archaeological surveys have been undertaken to identify archaeological sites in Hong Kong. The AMO has set boundaries on the identified sites and has administrative procedures, which state that consideration must be given to protect known archaeological sites in Hong Kong. However, the current record of archaeological sites in Hong Kong is known to be incomplete as many areas are not yet surveyed, there is a need to ensure that procedures and mechanisms, which ensure the preservation or formal notification of previously unknown archaeological resources that may be revealed or discovered during project assessment or construction, are identified at an early stage in project planning.

EIAO, EIAO TM & GN CH

11.2.7 Guidelines on the approach, methodologies and criteria to be used in the conduction a cultural heritage impact assessment (HIA) are included under *Annex 10* and *19* of the EIAO TM. The stated in EIAO TM *Annex 10* criteria for evaluating impacts to sites of cultural heritage include:

- 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 an absolute minimum.

11.2.8 However, the GN CH serves only as a reference to assist the understanding of the requirements set in the EIAO TM *Annexes 10 and 19*.

HONG KONG PLANNING STANDARDS & GUIDELINES

11.2.9 The HKPSG, Chapter 10 (Conservation), provides general guidelines and measures for the conservation of historical buildings, archaeological sites and other antiquities.

PROJECT SPECIFIC CRITERIA FOR CULTURAL HERITAGE IMPACT ASSESSMENT

11.2.10 Detailed criteria for the cultural heritage impact assessment for this Project are included in *Appendix 2* of the Study Brief which is provided in *Annex L* of this report.

11.3 ASSESSMENT SCOPE AND METHODOLOGY

SCOPE

11.3.1 The scope for the assessment of cultural heritage impacts includes activities associated with the construction and operation of elements of the Project as described in *Section 2* of this report. Cumulative impacts as a result of other concurrent proposed projects in the Study Area have also been considered.

METHODOLOGY

Baseline Research

11.3.2 A baseline study including both desk-top studies and field surveys has been conducted to develop a comprehensive inventory of archaeological sites (including marine archaeological sites) and built historical features in the Study Area has been compiled to include:

- all sites of archaeological interest (including marine archaeological sites);
- all pre-1950 buildings and structures;
- selected post-1950 buildings and structures of high architectural and historical significance and interest; and
- landscape features including sites of historical events or providing a significant historical record or a setting for buildings or monuments of architectural or archaeological importance, historic field patterns, tracks and fish ponds and cultural element such as, fung shui woodlands and clan graves.

11.3.3 Desk-top studies to identify the above elements has included reference and review of the following:

- records held by the AMO;
- published records;
- unpublished records;
- journals of the Hong Kong Archaeological Society;
- maps and aerial photos from the Land Department;
- information from other government departments; and
- relevant findings of EIA Reports and relevant studies etc.

11.3.4 The full bibliography of the baseline study is presented in Annex J of this report.

11.3.5 Field visits, field scans of historic buildings and structures and focused scoped archaeological field evaluations have been undertaken, which follows AMO's detailed criteria on heritage impact assessment (see Annex L), to supplement the findings of desk-top studies and included:

- a preliminary site observation within the Study Area in winter 1998;
- focused scoped archaeological field observation and field scans for historical buildings undertaken at Yam O, Wan Tuk and Ngong Shuen Au in November 1998;
- fieldwalking and field scans at Tsing Chau Tsai headland undertaken in November 1999;
- focused scoped archaeological field evaluation along the CKWLR alignment undertaken in November 1999; and
- Marine Archaeological Investigations at Penny's Bay and Yam O in 1999 and January 2000 respectively.

IMPACT ASSESSMENT

11.3.6 The assessment of direct and indirect, positive and negative impacts upon identified heritage resources has been conducted in accordance with the approach outlined in *Annex 19* of the TM and *Appendix 2* of the *Study Brief*. The assessment hierarchy is as follows:

- Preservation in totality will be a beneficial impact and will enhance the cultural and socio-economical environment if suitable measures to integrate the sites of cultural heritage into the proposed project are

carried out.

- If, due to site constraints and other factors, only preservation in part is possible, this must be fully justified with alternative proposals or layout designs, which confirm the impracticability of total preservation.

- Total destruction must be taken as the very last resort in all cases and shall only be recommended with a meticulous and careful analysis balancing the interest of preserving the archaeological, historical, architectural and other cultural values as against that of the community as a whole.

11.4 EXISTING ENVIRONMENT

ARCHAEOLOGICAL RESOURCES

11.4.1 A review of existing information has focused on the archives held by the AMO and supplemented by the Archaeological Survey Report for Lantau Port Development conducted by the Chinese University of Hong Kong (CUHK) in 1991(CUHK, 1991), the Territory Wide Archaeological Survey report at North Lantau conducted by AMO's appointed specialist team (AMO, 1998), the Wan Tuk Archaeological Site Investigation conducted by AMO's appointed specialist team (Zhuhai Relics Management Committee, 1999) and reviews of other relevant literature as shown in *Annex J,* and field surveys undertaken by the EIA Study Team.

11.4.2 No declared archaeological sites under the AMO have been identified within the Study Area. However, a number of archaeological sites listed or recorded by the AMO under its administrative procedures are identified within the Study Area; these are presented below and their location and extent are shown in *Figure 11.3a*.

- Wan Tuk archaeological site was identified by AMO during their 1997-1998 Territory Wide Archaeological Survey. According to the survey result, although the extent of the site was not certain, a charcoal kiln site dated to Tang dynasty was thought likely to be buried somewhere in this site which may cover an area of 2,250 m^2 located to the south of a stream at Wan Tuk. (*see Figure 11.3b* for the location of test pit Sq1 excavated in the survey).

- A further detailed archaeological field evaluation was undertaken by an AMO appointed specialist team in October 1999 (Zhuhai Relic Management Committee, 1999) to investigate the extent of archaeological deposits potentially impacted by the Theme Park and associated developments and reclamation in Penny's Bay at Wan Tuk. The site was divided into 3 main survey areas as shown in *Figure 11.3b*. No archaeological deposits were identified in Survey Area 3. A small amount of pottery shards dated to Yuan dynasty (1279-1368 AD) was unearthed at test pit T6 in Survey Area 2 (SA2); Neolithic period pottery shards and settlement features were identified in test pits T5 and T2 (see *Figure 11.3b* for test pit locations).

- Although this survey did not identify the Tang kiln site location, the extent of the Neolithic site may cover an area of 1,000 m^2 within Survey Area 1 (SA1) as shown in *Figure 11.3b;* SA 2 is also considered as area of archaeological interest.

- According to the archaeological deposits identified at the Penny's Bay area (Scott 1999a and 1999b; Meacham, 1986-88; Lam, 1989-92), the coastal area beneath the existing Cheoy Lee Shipyard (CLS) is considered to have a archaeological potential. However, no field survey has been undertaken prior to the construction of the CLS during the 1960s. According to the review of aerial photos in the past, the coastline of Penny's Bay before the occupation of CLS is shown in *Figure 11.3c.* Most of the existing CLS site was reclaimed from early 1960s to 1970s and the hills along the Shipyard have been cut and filled for the formation of the CLS site. Therefore, the area may have been extensively modified by construction and operation of these facilities, therefore, any significant archaeological deposits may have been disturbed or destroyed to an unknown extent. The proposed decommissioning of the CLS will require a subsequent stand alone Schedule 2 EIA and that study will provide an opportunity to

undertake an archaeological field evaluation of this site as access to this private site was not possible as part of this EIA.

- Several extensive archaeological excavations were undertaken at Chok Ko Wan (Penny's Bay) archaeological site during 1986-1992 (Meacham, 1986-88; Lam, 1989-92) and most information of the site was retrieved. Large quantities of early Ming dynasty shards of the site were recovered. The comparative rarity of Ming sites in Hong Kong makes these findings of importance; the excavation also revealed a historic lime kiln site and prehistoric coarse and incised/impressed earthware shards. The site has been modified by the construction of the CLP power station. The EIA Study Team has undertaken further surface scanning and augering at this site during the CKWLR archaeological investigation and the lime kiln area and the potential site boundary is shown in *Figure 11.3d.*

- The Ngong Shuen Au Kiln archaeological site was identified by Peacock and Nixon (Peacock and Nixon,1986) during their Territory Wide Survey in the 1980s. A historical lime kiln site probably dating to Tang dynasty and some Bronze Age ceramics were identified. The site was re-surveyed by CUHK in 1991 (CUHK, 1991) which commented that this site no longer had any archaeological remains. Although the lime kiln site was identified, there is no map reference to indicate its precise location. The site has been developed as part of the North Lantau Highway (NLH) and has no archaeological potential.

- Surface survey was undertaken at Ta Shui Wan by the CUHK in 1991 as part of the Lantau Port development studies (CUHK, 1991), and the survey results indicated that no artefacts were found in this site. This area has been developed as part of the NLH and now has no archaeological potential.

AREA FROM NGONG SHUEN AU TO WAN TUK

11.4.3 This area was surveyed prior to the NLH development and resurveyed during the Wan Tuk archaeological investigation undertaken by the AMO appointed specialist team (SA3 area), which concluded that this area has no archaeological potential.

- Although the Pa Tau Kwu and Fa Peng Teng archaeological sites are located outside the Study Area (see *Figure 11.3a* for locations and site extent), they may be impacted by the Theme Park and associated developments, and therefore, are briefly addressed:

- Pa Tau Kwu archaeological site is a Neolithic occupation site identified by the CUHK (CUHK, 1991). This site was further surveyed by specialists appointed by the AMO in 1997-1998 (AMO, 1998). The site is currently densely vegetated and is well preserved. Preservation *in situ* of this site is required by AMO.

- Fa Peng Teng archaeological site was recently surveyed by AMO appointed specialist team (AMO 1998). Artefacts collected indicated that ancient human activities may have existed but there is lack of cultural layer deposits in this site, therefore, this may not have comprised a favourable site for prehistoric settlement.

MARINE ARCHAEOLOGICAL RESOURCES

11.4.4 Marine archaeological resources in Hong Kong have not been extensively investigated and few written records are available.

Penny's Bay

11.4.5 Two Marine Archaeological Investigations (MAIs) were undertaken in 1999 (Scott Wilson (Hong Kong) Ltd., 1999a and 1999b) to identify potential archaeological resources in Penny's Bay within the proposed Theme Park and associated developments. The baseline review of information indicated that the volume and quality of archaeological material found during land excavation at Penny's Bay and Wan Tuk gives the area high archaeological potential and the soft, silty Hang Hau

Formation sediments provide an excellent preservation environment for such materials. Detailed analysis of geophysical data identified 49 seabed areas considered to have high marine archaeological potential and recommended subsea (diver) inspections to further investigate them. Diver inspections were undertaken by a local marine archaeologist in April and a specialist team appointed by AMO in November 1999 to inspect the areas identified from the two MAIs. However, no significant marine archaeological deposits were identified as buried in the seabed of the Penny's Bay reclamation area and AMO have confirmed that no further underwater archaeological investigation is required.

Yam O

11.4.6 A baseline review indicated a high archaeological potential of shipwrecks within the proposed 10 ha reclamation area at Yam O. Blue-and-white porcelain shards retrieved from Luk Keng Bay suggested that the Yam O area may have been used as an anchorage for overseas trade ships. A Geophysical Survey was undertaken by Civil Engineering Department (CED) (Unit 6, Survey Division, CED,1999) at the proposed 10 ha reclamation area at Yam O, however, the data did not reveal any seabed anomalies and did not provide 100% coverage of the area. Therefore, a detailed diver survey of the 10 ha reclamation area at Yam O was carried out by a marine archaeologist in late January 2000 for further detailed investigation**.** Only anthropogenic material including tyres, oil drums fishing nets and construction waste were identified. It was concluded that no significant marine archaeological deposits were identified as buried in the seabed of the proposed 10 ha Yam O reclamation *(*Scott Wilson, 2000) and AMO have confirmed that no further underwater archaeological investigation is required.

HISTORICAL STRUCTURES

11.4.7 No declared/deemed monuments, graded historical buildings/features, additional sites have been identified within the Study Area from the desk-top literature/ records reviews and field surveys. However, two Qing dynasty grave sites are located outside the Study Area boundary immediately to the east of the CLP site (see *Figure 11.3a* for location) which are addressed briefly below as they may be impacted by the Theme Park and associated developments:

- *Two Qing dynasty grave sites near Chok Ko Wan* have been identified by the EIA Study Team during the archaeological field evaluation undertaken in mid-November 1999. The two graves are located some 160 m and 200 m to the eastern edge of the Penny's Bay GTP . According to the headstone inscription of the two grave sites, Grave 1 and Grave 2 date to 1915 and 1838 respectively

- The detailed findings and detailed impact assessment of the above two grave sites is presented under the NLDFS EIA.

11.5 POTENTIAL SOURCES OF IMPACTS - CONSTRUCTION AND OPERATION

11.5.1 Potential impacts on identified cultural heritage resources within and in close proximity to the Study Area boundary may arise from the following:

- Landtake for both temporary and permanent facilities which may result in damage to, or loss of, archaeological remains and deposits, culturally significant features and changes to the physical coherence of historic landscapes;

- Severance and "islanding" may result from permanent landtake required for the Theme Park and associated developments construction; areas of historic and cultural interest may be severed, thereby altering or destroying their integrity;

- Construction works may result in damage to or loss of buried archaeological sites by:
- Disturbance through excavation at or near an archaeological site, topsoil stripping and the passage of heavy machinery on exposed and buried deposits;
- Change in the watertable due to construction and development activities;
- 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 material with spoil from other sites.

11.5.2 The introduction of archaeological material with spoil from other sites.

- Ground compaction due to construction activities or the weight of permanent filled materials may cause damage or distortion to buried archaeological remains, especially in soft alluvial deposits; and
- Indirect impacts such as visual and noise intrusion on the setting and amenity of historic and cultural resources (eg. grave sites and monuments and culturally or historically significant landscape features).

11.6 EVALUATION OF CULTURAL HERITAGE IMPACTS

ARCHAEOLOGICAL RESOURCES

11.6.1 As Ta Shui Wan, Ngong Shuen Au Kiln archaeological sites were destroyed by previous NLH development, no impact to these two sites arising from the Theme Park and associated development is expected.

11.6.2 As no archaeological potential is expected at the area from Ngong Shuen Au to Wan Tuk, no impact is expected.

11.6.3 The preferred CKWLR, PBRL and Road P2 alignments has avoided and minimised direct impact to most of the known archaeological sites including the Wan Tuk and Chok Ko Wan and on other considerations. However, potential impact towards Wan Tuk, Chok Ko Wan archaeological sites and the archaeological potential site at CLS still exist where preservation *in situ* may not be practical. The detail impact assessment of these sites is shown below.

11.6.4 No significant finds were identified in SA3 at Wan Tuk, therefore, although part of the Penny's Bay temporary access road, the PBRL, Road P2 and the CKWLR have been aligned in SA3, no impact to any archaeological deposit in SA3 is expected. Preservation *in situ* at SA1 and SA2 is possible as the proposed construction works at the site would not involve no soil excavation of the site. Therefore, the impact to these areas is considered acceptable. However, filling works are required for part of the SA2 and part of SA1 and SA2 for the construction of the temporary access road and ground level adjustment work respectively. (see *Figure 11.3b* for areas to be impacted by the temporary access road). This may result in ground compaction, limitation on accessibility for future archaeological investigation and obscure present visible surface evidence. Moreover, the raising of the ground level nearby Wan Tuk archaeological site for the Penny's Bay reclamation may lead to water logging of the site, which may change the water table of the site and result in damage to the archaeological deposits, during construction and operation stages.

11.6.5 The Penny's Bay Reclamation would require filling of materials to raise up the ground level to approximately +6.5 to +8 mPD which involve partially filling of materials on top of the Chok Ko

Wan archaeological site. This may result in limitation to future investigation and the ground compaction may result in damage to the archaeological deposits of the site. Moreover, the construction of the structural support of the CKWLR and its associated construction works may impact this site due to permanent landtake for the construction. The full cultural heritage impact assessment for the Chok Ko Wan Archaeological site due to the construction of the CKWLR is presented under the NLDFS EIA report and it is concluded that the Penny's Bay reclamation should avoid and minimise the filling of this site.

11.6.6 A number of the original coastal areas beneath the existing CLS may potentially be impacted by CKWLR, Road P2 and PBRL (see *Figure 11.3c*). As the portal area at Wan Tuk has been cut by previous development, any surviving archaeological deposit of the area may have be destroyed or disturbed in an unknown level. Moreover, the section from Wan Tuk towards the Theme Park of the PBRL is to be constructed at-grade, which is on top of the Penny's Bay reclamation site at a level of + 8 mPD, no excavation of the soil at the original coastal level at CLS is expected. Therefore, the impact arising from the PBRL is considered minimal. The Road P2 and the CKWRL are to be constructed on viaduct at the Penny's Bay area, where permanent landtake for the construction of the structural support for the road alignments may result in damage to or loss of archaeological deposit. However, as no archaeological field evaluation has been undertaken due to private ownership at this area, the extent and significance of any archaeological deposit of this area is unknown. Since the original topography of the CLS area has been modified by cut and fill for the CLS, any surviving archaeological deposit at the area may have been disturbed or destroyed to an unknown level. Therefore, the potential impact arising from the developments of the area may not be significant but should not be discounted. If there are any archaeological deposits surviving in the areas as shown in *Figure 11.3c* to be impacted by the structural support, preservation *in situ* wound be impractical. Moreover, the Penny's Bay Reclamation may result in ground compaction and limitation on accessibility for future archaeological investigation.

11.6.7 Archaeological field evaluation is required for further detailed assessment, and the proposed decommissioning of the CLS will require subsequent stand alone Schedule 2 EIA and that study will provide an opportunity to undertake an archaeological field evaluation of the original coastal area prior to CLS's occupation to investigate the archaeological potential of the area as access to this private site was not possible as part of this EIA Study.

11.6.8 As the eastern stormwater channel will discharge within 300 m of the existing Pa Tau Kwu archaeological site, it comprises a Schedule 2 Designated Project under the EIA Ordinance. However, the cultural heritage impact assessment has reviewed impact on this site from the channel, and has concluded that this site will not be impacted. Although the Pa Tau Kwu archaeological site is strictly outside the Study Area, construction activities of the Theme Park and associated development may have potential soil disturbance of the site with uncontrolled construction activities.

11.6.9 As the Fa Peng Teng archaeological site is strictly outside the Study Area and far away from the construction areas, no impact is expected.

MARINE ARCHAEOLOGICAL RESOURCES

11.6.10 No significant archaeological resources were identified at the seabed of Penny's Bay and the 10 ha reclamation area at Yam O (AMO, pers. comm. and Scott Wilson (Hong Kong) Ltd., 2000). AMO has confirmed that no further underwater archaeological investigation is required and,

therefore, the Penny's Bay and Yam O reclamation are not envisaged to cause any impact on marine archaeological resources.

HISTORIC BUILDINGS AND FEATURES

11.6.11 No standing heritage sites have been identified within the Study Area and therefore, no impact is expected.

11.6.12 The two Qing dynasty grave sites are located outside the Study Area boundary, and thus no direct impact to these two grave sites is expected. However, indirect impact such the limitation to access of these sites during construction and operation stage should be considered.

11.7 MITIGATION OF ADVERSE ENVIRONMENTAL IMPACTS

11.7.1 It is recommended that plastic sheets shall be used to cover the impacted area within the SA2 of Wan Tuk archaeological site before the temporary access road construction. After the completion of the Penny's Bay reclamation, all the fill materials and plastic sheets at the site shall be removed. The filling area required for Penny's Bay reclamation at SA1 and SA2 of Wan Tuk archaeological site should be avoided. If it is unavoidable, the area required to be filled should be kept in an absolute minimum. Should there be any unavoidable filling work required at the Wan Tuk site for the Penny's Bay Reclamation, plastic sheets should be used to cover the filled area prior to the filling work. Moreover, as the filling work on part of the SA1 and 2 or nearby may result in a waterlogged site condition, detailed design of filling ground level adjustment work should consider runoff diversion of the site to prevent any waterlogged condition.

11.7.2 The detailed design of structural support locations for the CKWLR and Road P2 at the original coastal area should be avoided to ensure the potential impact to any surviving archaeological remains is kept in an absolute minimum. If preservation *in situ* is not possible for the archaeological deposit identified under the CLS decommissioning EIA, the impacted archaeological deposits should be mitigated by rescue excavation. However, as the Penny's Bay reclamation would result in limitation on accessibility for future archaeological investigation at the area, a total rescue excavation instead of a partial rescue excavation could be considered, if necessary, before the construction of these transport infrastructural elements associated with the Theme Park development so that the archaeological deposits of the area could be preserved by record in totality.

11.7.3 As Chok Ko Wan archaeological site may potentially filled up due to the Penny's Bay reclamation and the site may potentially be impacted by the structural support of the CKWLR and its associated work and, having considered that this site has been investigated a number of times and partially destroyed by the construction of the GTP, only partial preservation *in situ* is possible. It is recommended that a full rescue excavation programme of 1 months long is implemented as early as possible prior to site is filled to allow preservation by record in totality.

11.7.4 Additionally, the Pa Tau Kwu archaeological site and the two grave sites which are outside the Study Area boundary should be indicated on any construction plans as "temporary protection areas" to ensure construction activities avoid any impact to these sites. An indicative plan for such purpose is presented in *Figure 11.6a*. Moreover, the site boundaries, with the provision of at least 5m buffer zone, should be marked at clearly on site so that construction workers' attention is drawn to ensure no direct impact to the grave sites and no soil disturbance to the archaeological

site are allowed. Furthermore, the grave owners should be informed so that special arrangement to visit the grave sites is possible, when necessary. Detail development plan should retain any access possibility to the grave sites for future visitors after the completion of the developments.

11.8 RESIDUAL ENVIRONMENTAL IMPACT

11.8.1 Provided that the mitigation measures recommended in *Section 11.6* are implemented. No residual impact is expected in terms of cultural heritage resources.

11.8.2 However, further detailed archaeological field evaluation is to be undertaken under the subsequent CLS decommissioning EIA and appropriate mitigation measures to any archaeological deposits identified in that EIA, if any, should be provided under the CLS decommissioning EIA.

IMPACT SUMMARY

Table 11.9 - Cultural Heritage Impact Summary Table

Location	Construction Impact	Mitigation Measures	Operational Impact	Mitigation Measure
Wan Tuk archaeological site	Ground compaction and limitation on accessibility for future archaeological investigation The ground level adjustment work at or near the site may result in a waterlogged site condition	Plastic sheets shall be used to cover the impact area before the temporary access road construction. After the completion of the Penny's Bay reclamation, all the fill materials and plastic sheets should be removed. The filled area required at SA1 and SA2 should be avoided, if it is impractical, the impacted area should be kept in an absolute minimum. Any area required to be filled shall be covered by plastic sheets before any filling work. Detailed design of filling work or ground level adjustment work should consider diversion of site runoff to prevent any waterlogged conditions.	Potential waterlogged site condition	No waterlogging condition should be allowed by drainage provision.
Chok Ko Wan archaeological site	Potential damage to or loss of archaeological deposit due to the construction of the CKWLR Limit accessibility for future archaeological investigation due to the fill up work required for Penny's Bay reclamation required fill up	Preservation by record in totality, i.e. a 1 month full rescue excavation, to be implemented as early as possible prior to the site is filled..	N/A or Nil	N/A or Nil

Location	Construction Impact	Mitigation Measures	Operational Impact	Mitigation Measure
CLS archaeological potential site	Potential damage to or loss of archaeological deposit at the original coastal area beneath the CLS Limitation on accessibility for future archaeological investigation	Detailed design of the structural support locations of CKWLR and Road P2 should avoid the potential impact to the original coastal areas at CLS site. An opportunity should be provided for an archaeological field evaluation at the coastal area of existing CLS as part of the Schedule 2 EIA for the CLS decommissioning. If the impact on archaeological deposit is unavoidable, the impacted area should be mitigated by rescue programme. A full rescue programme could be considered, if necessary, to allow preservation by record in totality of this site.	Limitation on accessibility for future archaeological investigation	A full rescue programme could be considered, if necessary, to allow preservation by record in totality of this site.
Pa Tau Kwu archaeological site	No direct impact. Potential uncontrolled construction work may result in damage to the site	Site location marked on any construction plans as "temporary protection area" The physical location of site boundaries, with the provision of at least 5 m buffer zone, should be fenced off and drawn the construction workers' attention to ensure no soil disturbance within the archaeological site boundary is allowed.	N/A or Nil	N/A or Nil
Two Qing dynasty grave sites	No direct impact. Potential damage to the grave sites Limit accessibility to these sites may be impacted during construction.	Site location marked on any construction plans as "temporary protection area" The physical location of site boundaries, with the provision of at least 5 m buffer zone, should be fenced off and drawn the construction workers' attention to ensure no soil disturbance within the archaeological site boundary is allowed. The grave owners should be informed so that special arrangement to these sites is possible when necessary. Development plan should retain access possibility to these sites for future visitors after the completion of the developments.	Limit accessibility to these sites may be impacted during construction.	Access possibility should be retained for visiting these sites by proper planning of the development. .

Note: N/A - Not applicable

11.9 CONCLUSIONS

11.9.1 Literature reviews of existing information supplemented with the results of recently undertaken field surveys on cultural heritage resources indicate that there are no standing heritage and marine archaeological deposits within the Theme Park and associated developments Study Area. However, concerns have been raised regarding the potential unmitigated impact to some archaeological sites identified.

11.9.2 Potential impact to archaeological resources may arise from temporary or permanent landtake, ground compaction, topsoil or subsoil disturbance during construction, change in watertable and a limitation on accessibility for future investigation, which may result in damage to, or loss of the archaeological remains. Mitigation measures to heritage resources including the usage of plastic sheets to cover the impacted area at Wan Tuk archaeological site (SA2) before the temporary access road construction; the avoidance and minimisation of potential impact to SA1 and SA2 required for ground level adjustment; if the impact is unavoidable, plastic sheets should be used to cover impacted area before the fill up work and avoidance of waterlogged site conditions through detail design of runoff diversion. The associated residual impact could be mitigated by the removal of the filled material and the plastic sheet covers when necessary for future investigation and design to allow the diversion of surface runoff to avoid the waterlogged site conditions.

11.9.3 Preservation by record prior to the reclamation of Chok Ko Wan archaeological site has been recommended to mitigate the impact to this site and therefore, a full rescue programme should be implemented as early as possible prior to the fill up of the Penny's Bay Reclamation at this site.

11.9.4 As the CKWLR and Road P2 comprise the preferred alignments, the impact to any archaeological deposit at the original coastal area could be mitigated by detailed design of the CKWLR and Road P2 support column locations to reduce the impact to the potential coastal archaeological deposit to an absolute minimum. The development of the area will provide an opportunity for an archaeological field evaluation to be undertaken at the original coastal area of existing CLS site, which will be considered under a separate Schedule 2 EIA of CLS site commissioning in order to provide appropriate mitigation measure on any impacted archaeological deposit. If preservation *in situ* is not possible, the residual impacted could be mitigated by rescue excavation before the construction of these transport infrastructural elements associated with the Theme Park development.

11.9.5 In order to ensure the preservation of the heritage sites outside the Study Area boundary not to be impacted by construction, the Pa Tau Kwu archaeological site and the two grave sites, which are outside the Study Area boundary, could be indicated on any construction plans as "temporary protection area"; the physical site boundaries, with the inclusion of 5 m buffer zone, could be fenced off on sites and drawn construction workers' attention to ensure no direct impact to the grave sites and no soil disturbance to the archaeological sites are allowed. Access to the grave sites could be possible during construction, if grave owners are informed so that special arrangement for the them to visit the sites is possible, when necessary. Operational access should also be retained to the grave sites for future visitors after Project completion.

11.9.6 Having implemented the recommended mitigation measures on impacted heritage resources and undertaken archaeological field evaluation at the CLS for the provision of appropriate mitigation measures, the impacts to the cultural heritage resources are acceptable.