9 CULTURAL HERITAGE IMPACT ASSESSMENT

9.1 Introduction

9.1.1 This section presents the approach to and the findings of the cultural heritage impact assessment; the aim of which is to identify and examine the nature and extent of potential impacts of the helipad development at Peng Chau on cultural heritage and marine archaeology.

9.1.2 For the purpose of the marine archaeology assessment the 'assessment area' occupies an area offshore of about 300m^2 that includes the proposed helipad site and EVA link. The assessment area for the marine archaeology investigation is provided on *Figure 9.1*.

9.1.3 There is no specific requirement for terrestrial cultural heritage assessment in the EIA Study Brief. However, *Clause 3.4.7.2* of the EIA Study Brief states that the cultural heritage assessment shall try to identify "other unknown items of archaeological and historical interests at or close to the proposed Project". As such, the coastline and adjoining slopes above the helipad and EVA link were included in the terrestrial cultural heritage assessment area – a radius of approximately 100 metres from the Project location.

9.2 Assessment Approach

9.2.1 The cultural heritage impact assessment has been carried out in accordance with Annex 10 and 19 of the EIA-TM which pertain to criteria for evaluating the impacts on sites of cultural heritage and guidelines for impact assessment, respectively; and the requirements referred under Clause 3.4.7 and Appendix A of the EIA Study Brief as follows:

- The cultural heritage study shall assess both direct and indirect impacts on the marine archaeology, as well as identifying other unknown items of archaeological and historical interests at or close to the proposed Project, and propose appropriate mitigation measures.
- Assessment requirements for the Marine Archaeological Investigation (MAI) are detailed in *Sub-section 9.4* below.

9.3 Regulations, Standards and Guideline

9.3.1 The legislation directly relevant to the protection and preservation of the local cultural heritage is the Antiquities and Monuments Ordinance (Cap. 53). This Ordinance, enacted in January 1976, provides for the preservation of any "site of cultural heritage". This refers to the following:

- *Historical buildings and structures*, i.e. currently pre-1950 buildings and structures that possess definite heritage value.
- Archaeological sites and structures.
- *Palaeontological sites*, i.e. pre-Holocene geological beds of sedimentary rocks containing fossil remains and their impressions.
- *Other cultural features*, e.g. in the assessment area these may include amongst others, stone engravings, foundation and boundary stones, graves and track ways.

9.3.2 The Ordinance provides for two main areas of heritage protection:

- The statutory declaration of sites of cultural heritage of exceptional qualities and significance in the Government Gazette as Monuments, Historical Buildings, Archaeological Sites, etc., under the Antiquities and Monuments (Declaration of Historical Building) Notice.
- Relics, (defined under the Ordinance as fossils and objects/artefacts created, modified, etc. by human agency before 1800 AD) discovered after 1976 are, by law, properties of the Hong Kong SAR Government. Search and excavation for relics should comply with the Ordinance. All discoveries of antiquities or supposed antiquities must also be reported.

9.3.3 Annexes 10(2) and 19(2) of EIA-TM present guidelines for the evaluation and assessment of impacts on cultural heritage, respectively. In addition, Guidance Notes on *Assessment of Impact on Sites of Cultural Heritage in Environmental Impact Assessment Studies* under the Environmental Impact Assessment Ordinance (Cap. 499) are applicable.

9.3.4 Other legislation that supplements the work of heritage preservation includes the Lord Wilson Heritage Trust Ordinance (Cap. 425) that came into operation in 1992.

9.4 Assessment Methodology

Marine Archaeology

9.4.1 As detailed in Appendix A of the EIA Study Brief, marine archaeology assessment involves four stages, as follows:

Baseline Study

9.4.2 A review was undertaken to identify the potential for archaeological resources and, if identified, their likely character, extent, quality and value. This includes:

- Historical land use and settlement data as well as archive records such as seabed survey data collected from previous geological research (GEO).
- Marine Department, Hydrographic Office - the Department holds a substantial archive of hydrographic data and charts; and
- Royal Naval Hydrographic Department in the UK.

9.4.3 The above data sources – including dredging history - will provide historical records and more detailed geological analysis of submarine features which may have been subsequently masked by more recent sediment deposits and accumulated debris.

9.4.4 Throughout the course of the assessment meetings and discussions were held with representatives of the Antiquities and Monuments Office (AMO).

Geophysical Survey

9.4.5 In accordance with marine archaeological investigation (MAI) guidelines a marine geophysical survey was carried out in the assessment area in October and November 2002 with the following aims:

(a) Providing exact definition of greatest archaeological potential;

(b) Assessment of the depth and nature of the seabed sediments to define which areas consist of suitable material to bury and preserve archaeological material; and

(c) Detailed examination of the geophysical records to map anomalies on the seabed that may be archaeological material.

9.4.6 The geophysical survey involved the use of side scan sonar and a seismic boomer. Echo sounding was conducted in conjunction with the seismic survey to be able to get reasonably detailed coverage (side scan sonar survey lines are more widely separated). Further details of the geophysical survey and equipment involved are presented in *Sub-section 9.6*.

9.4.7 Prior to the geophysical survey a tide gauge was installed and checked for correct operation at the southeast corner of Cheung Chau typhoon shelter. The tide gauge data was required to calibrate the distance range between the survey vessel / equipment and the seabed, and to refer all data acquired to the Hong Kong Principal Datum (HKPD). Position fixing was carried out by differential GPS (DGPS) system. The system was checked for correct calibration at a known coordinated point onshore prior to installation on the survey vessel. A professional geophysicist has interpreted the data to identify potential areas of archaeological interest.

Establishing Archaeological Potential

9.4.8 The data examined during the desktop review and geophysical survey will be analyzed to provide an indication of the likely character and extent of archaeological resources with the assessment area. This would facilitate formulation of a strategy for investigation.

Remote Operated Vehicle (ROV) / Visual Diver Survey / Watching Brief

9.4.9 Subject to the outcome of the above tasks, a field evaluation programme may be planned to acquire more detailed data on areas identified as having archaeological potential. Either ROV or divers could be employed to conduct inspection given that the marine traffic in the vicinity of the proposed helipad at Peng Chau is not heavy. Alternatively, an archaeological watching brief can be used to monitor dredging operations should any area of high potential be identified through previous survey.

Cultural Heritage

Desktop Study

9.4.10 The aim of the desktop study is to identify archaeological and cultural heritage resources in the assessment Area from previous studies / investigations relevant to terrestrial archaeology. The study initially involves compiling details of geology and geomorphology in the assessment area through reference to geological maps; available bore hole data, early maps of the area and aerial photographs.

9.4.11 Any unpublished papers, records, archives and historical documents or archaeological investigation and excavation reports kept by the AMO were also reviewed where appropriate and possible. For information on historic buildings and other structures, reference was made to the list of declared monuments (via the AMO's Internet pages). The list of deemed (but not declared) monuments and the list of sites of cultural heritage identified by the AMO were also reviewed.

Field Evaluation

9.4.12 Verification of historical buildings and structures as well as existing and potential archaeological sites has been carried out in and around the assessment area.

9.5 Baseline Conditions

Geological and Topographical Setting

9.5.1 The geology of the area is of the medium grained tertiary intrusive igneous rhyolitic bedrock. Shallow colluvial deposits are also common along gentle swales along the northern coastline at Peng Chau. There is also large fine-grained acidic dyke which runs parallel to the coastline adjacent the development area. The coastline is moderately sloping with a small beach adjacent the area of the helipad footprint

Land use history: Historic background

9.5.2 Peng Chau has a recorded onshore archaeological site of the Neolithic period as well as an archaeological site where kiln remains of the historic period were discovered.

9.5.3 It is unlikely that there was any shore-based settlement at Peng Chau before 1725-1750, and doubtful that even the anchorage was much used before about 1700. The first shore-based settlement consisted of sheds and workshops on the landward side of a footpath that ran around the head of the bay that formed the anchorage (Sayer, 1975).

9.5.4 The northern edge of the original town is marked by the existing Tin Hau Temple that has been dated back to the 57th year of Emperor Qianlong of the Qing Dynasty (i.e., the year of 1792). The town was a success, and even as early as 1834 there were enough fishing junks using the bay as their home anchorage to petition the Viceroy against abuses by the naval authorities. By 1857 there were 200 junks in the anchorage and an association was founded to protect their interests. Most of these 200 vessels were deep-sea trawlers engaged in the Yellow Croaker fisheries, but there were also a large number of inshore sampan fishermen, mostly Hoklos, who fished particularly for shrimps (*ibid*.).

9.5.5 The original settlement was extended in the middle nineteenth century by reclamation over the beach to provide a second row of shops on the seaward side of Wing On Street. Further large areas of reclamation north and south of the town were completed at the very end of the nineteenth century to support the lime-burning trade that, along with fishing, was the main industry of the town. Sayer (1975) reports that there were corals across the seabed between Peng Chau and East Lantau that could be dredged for stone to be burnt into lime – a resource much in demand by the building trade throughout the Pearl River Delta. There were regular ferries before 1900 running between Peng Chau and the cities of the Delta: it is likely that lime was a major part of the cargo they carried.

9.5.6 Before the late nineteenth century reclamations, the limekilns had been located mostly on the shore of East Lantau, although they continued to be operated by Peng Chau people. Early in the twentieth century reports state that nearby some 80 Peng Chau-based boats were actively dredging corals, and by which time 12 limekilns were in operation on the island. Some of the boats engaged in dredging were Hoklo sampans that collected coral part of the year, and fished for shrimps in the summer.

9.5.7 In the last few decades there has been considerable additional reclamation at Peng Chau, and the original shoreline is now well inland. It is likely that reclamation and new buildings disturbed much of the marine archaeological deposits.

Land use history: Prehistoric background

9.5.8 While the area surrounding the entire Hong Kong archipelago was dry land some 8, 000 – 10,000 years ago with sea-level stability being reached at 6,000 B.P – preservation of habitation sites of this period (now submerged) is likely to be rare.

Historical Building and Structures

9.5.9 Verification of historic buildings and structures was conducted in June 2003. The area covered the shoreline, slopes above (including graves sites) and various built structures adjacent to Sea Crest Villa.

9.6 Impact Assessment and Evaluation

Marine Archaeology

9.6.1 The geophysical survey recorded seabed levels in the assessment area range from -0.0 to -4.1 mPD (Cosine Ltd., 2003). The shallowest part of the study area is closest to shore, and the seafloor gently dips away to the north and northwest with few irregularities.

9.6.2 From an archaeological perspective, finer sediments including muds and silts are deposited in relatively calm or sheltered waters and therefore tend to offer better conditions for burial and preservation of artefacts. In contrast, turbulent water conditions would be physically detrimental to archaeological preservation, keeping silts and muds in suspension and selectively depositing coarse sands and cobbles.

9.6.3 The seabed for the most part is composed of rock rubble and cobbles. There appears to be a distinct edge of rubble and cobbles in the northern part of the site, which runs parallel to the shoreline. This may possibly be a rock terrace.

9.6.4 The northwest of the study area is composed of sand with boulders protruding from, or resting on, the seabed. There is a small depression in the seabed approximately 60 m to the north west of the high water mark. With reference to *Figure 9.1*, this depression is labelled item 'A'. The feature is 0.5 m deep with a weakly elevated rim and irregular outline. It has been interpreted as possibly being coral rather than a rock outcrop. However, given its irregularity it is also possible that it could be a cultural feature.

9.6.5 Taking the difficulties of obtaining good quality data into consideration, some sense of the stratigraphy of the study area can be ascertained. Generally, the thickness of the coarse sand stratum increases with distance from shore. At approximately 10 to 15 m from shore there is little or no sand coverage. At approximately 70 m from shore the sediment thickness reaches 15 m. Areas of larger pebbles and small rock boulders were more obvious closer to the shoreline.

9.6.6 The sediments rest on bedrock, the gradient of the bedrock suggesting that prior to sea level rise in the early Holocene, the study area was once an exposed hillside. It was not possible to distinguish weathered rock, Grade IV to VI.

9.6.7 As regards step 2 of the MAI guidelines, establishing archaeological potential involved consideration of the potential for the following: shipwrecks; anchors; artefacts associated with submerged terrestrial sites; and / or artefacts from adjacent terrestrial sites.

9.6.8 Of these categories, the potential for encountering shipwreck remains was a possibility given the absence of any land reclamation in the study area, although the distance of the Pak Wan area from the main town would diminish the likelihood. The casting off of anchors from a vessel may be a response to trying to avoid getting shipwrecked, although the likelihood of finding such remains in the study area is considered very low. There is also some potential that the objects identified from the geophysical survey could be associated with past activity on the shoreline.

9.6.9 Task 3 of the MAI guidelines, dive survey, was enacted as a precautionary measure given: (i) the anomalies recorded during the geophysical survey; and (ii) the presence of 'dead zones' close to the shore that the geophysical survey was unable to survey due to shallow water depth constraints.

9.6.10 A dive survey of the helipad site was conducted on the 24th June. A total of six separate dives were undertaken: three to examine the anomalies recorded during the geophysical survey and three long transects parallel to the coastline, in the rocky areas close to shore.

9.6.11 The visual diver survey at the Peng Chau study area found two possible distinct forms of cultural activity: (i) Artefacts (mostly ceramics) deposited on the seabed from shore; and (ii) Deposits of coral rubble offshore forming mounds. The coral mound is item 'A' as indicated on Figure 9.1. Item 'B' was confirmed to be a boulder.

9.6.12 As regards artefacts being deposited from shore, it would appear that these were mostly thrown from the cliff overlooking the study area. That this activity was partly linked with visitation to the graves located on the upper slope above the cliff as evidenced by the recovery of a fragment of a grave bowl. On initial examination the ceramics appear to be mostly that of 'village ware' of indistinct date and provenance, although likely to be less than 200 years old and of low archaeological significance.

9.6.13 The coral rubble mounds appear to have been deposited as a temporary dump for the lime burning activities on shore. Their possible association with early 20th century industry on Peng Chau is notable although this material is also of low cultural significance.

Historical Buildings and Structures

9.6.14 Field investigation at the western edge of the proposed helipad site, at the backshore area, revealed a large deposit of kiln residue – presumably the refuse from an early 20th century limekiln. It is likely that a large kiln was located immediately upslope from this deposit and has since been removed.

9.6.15 Several graves within 40-50m of the proposed development - above the beach - were noted although these will not be impacted by Helipad development. A small temple and sister shrines located about 50m south of Sea Crest Villa will also not be impacted by the Project.

9.7 Impact Mitigation & Residual Impact Assessment

No potential impacts on resources of cultural heritage or archaeological value will arise from the proposed Project. As such, there is no mitigation requirement.

9.8 Environmental Monitoring & Audit

9.8.1 There are no archaeological / cultural heritage monitoring and audit requirements for the Project.

9.9 Conclusions & Recommendations

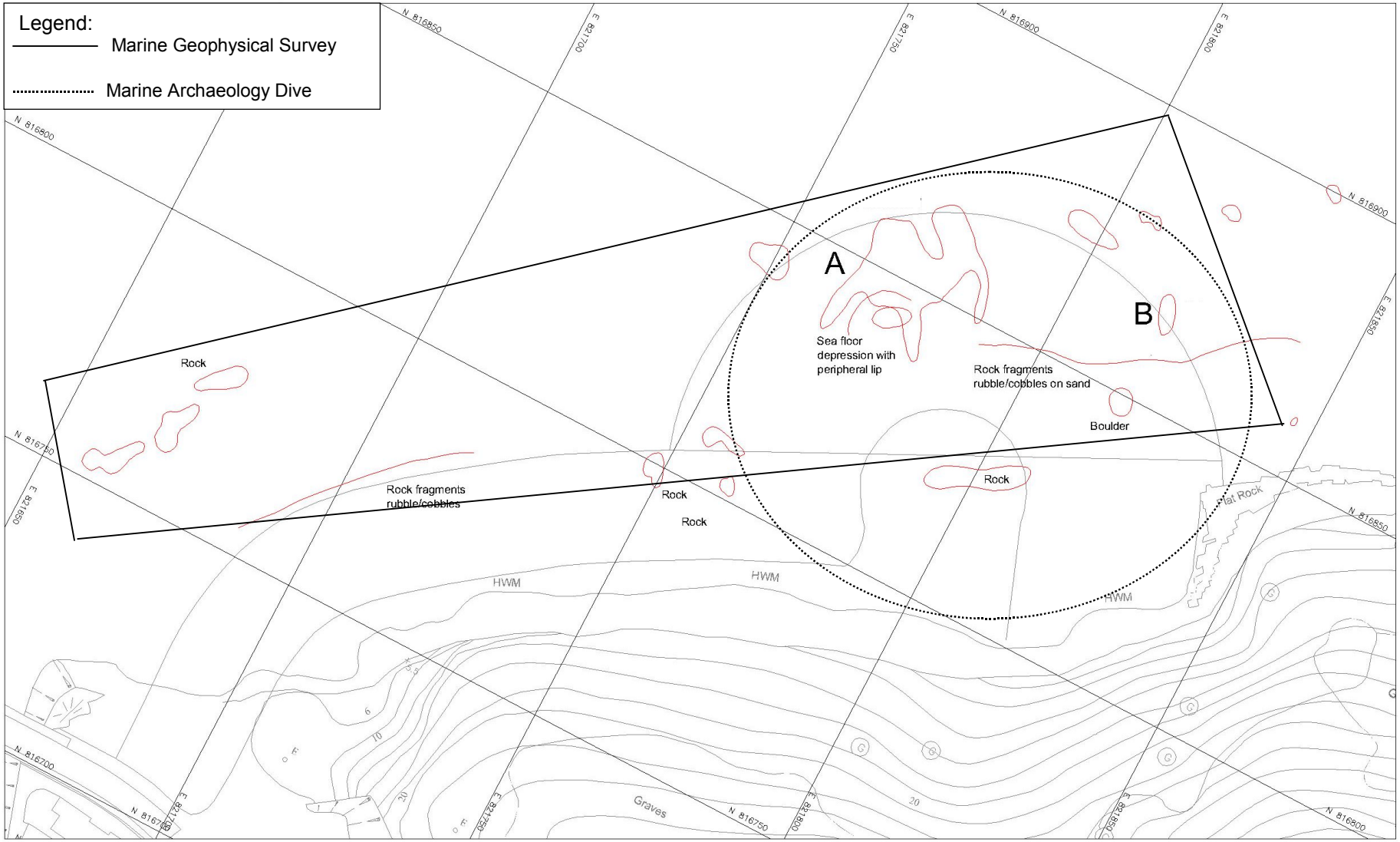
9.9.1 Given that two items / objects were recorded during the geophysical survey at Pak Wan, and the limitations of the geophysical survey in accessing shallow coastal waters due to insufficient water depth, it was decided to conduct a precautionary dive survey to cover these areas.

9.9.2 The two items / objects were recorded by the marine geophysical survey were an area of coral rubble that was deposited from the shoreline, and a boulder. Various small items were recorded form the dive survey in waters too shallow for the geophysical survey boat, and these have been assessed to be of minimal to low cultural heritage significance. No further field investigation is recommended for the Peng Chau study area.

9.9.3 Desktop and field evaluation of terrestrial cultural heritage in and around the study area at Peng Chau revealed no archaeological sites, historic buildings or structures which are likely to be impacted by the helipad development.

9.10 References

- Cosine Ltd. (2003). Island Helipads EIA Study: Yung Shue Wan, Lamma Island and Peng Chau – Geophysical Investigation
- EPD (2002). Environmental Impact Assessment Ordinance (Cap. 499). Guidance Notes: *Assessment of Impact on Sites of Cultural Heritage in Environmental Impact Assessment Studies*. Environmental Protection Department / Antiquities and Monuments Office.
- Hase, P. H. (2002). Notes on the history of Peng Chau (unpublished).
- Sayer, G.R. (1975). *Hong Kong 1862-1919*. Hong Kong University Press.



EIA Study for Peng Chau Helipad

MARINE GEOPHYSICAL / MARINE ARCHAEOLOGY SURVEY AREA AND SEA FLOOR FEATURES OF NOTE

Figure 9.1

Drawn	WWY	Checked	FC
Scale	NTS	Date	June 2005