

11b. IMPACT ON CULTURAL HERITAGE (ARTIFICIAL ISLAND NEAR SKC)

11b.1 Introduction

11b.1.1.1 This section presents a cultural heritage impact assessment of the IWMF at an artificial island near SKC, identifying cultural heritage resources, and assessing potential direct and indirect impacts caused by the proposed works on any of these resources, and recommending mitigation measures where required.

11b.2 Environmental Legislation and Standards

11b.2.1 Overview

11b.2.1.1 Legislation, Standards and Guidelines that are relevant to the consideration of Cultural Heritage impacts under this study include the following:

- *Environmental Impact Assessment Ordinance (EIAO)*;
- *Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)*;
- *Antiquities and Monuments Ordinance (A&MO)*;
- *Hong Kong Planning Standards and Guidelines (HKPSG)*;
- *Guidelines for Cultural Heritage Impact Assessment (GCHIA)*;
- *Guidelines for Marine Archaeological Investigation (GMAI)*.

11b.2.2 Environmental Impact Assessment Ordinance (Cap.499) (EIAO)

11b.2.2.1 Schedule 1 of the EIAO defines “Sites of Cultural Heritage” as “an antiquity or monument, whether being a place, building, site or structure or a relic, as defined in the Antiquities and Monuments Ordinance and any place, building, site, or structure or a relic identified by the Antiquities and Monuments Office (AMO) to be of archaeological, historical or paleontological significance”.

11b.2.3 Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)

11b.2.3.1 The criteria and guidelines for evaluating and assessing impacts are listed in Annexes 10 and 19 of the EIAO-TM respectively. The criteria for evaluating impact on 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.

11b.2.4 Antiquities and Monuments Ordinance (Cap.53) (A&MO)

11b.2.4.1 The A&MO (the Ordinance) provides the statutory framework for the preservation of objects of historical, archaeological and paleontological interest.

11b.2.4.2 The Ordinance contains the statutory procedures for the Declaration of Monuments. Under the Ordinance, a monument means a place, building, site or structure which is declared to be a monument, historical building, archaeological or paleontological site or

structure because of its historical, archaeological or paleontological significance under Section 3 of the Ordinance.

11b.2.4.3 Under Section 6 and subject to Subsection (4) of the Ordinance, the following acts are prohibited in relation to monuments, except under permit granted by the Antiquities Authority.

- To excavate, carry on building works, plant or fell trees or deposit earth or refuse on or in a proposed monument or monument; or
- To demolish, remove, obstruct, deface or interfere with a proposed monument or monument.

11b.2.4.4 The discovery of an Antiquity, as defined in the Ordinance, must be reported to the Antiquities Authority, or a designated person. The Ordinance also provides that, the ownership of every relic discovered in Hong Kong after the commencement of this Ordinance shall vest in the Government from the moment of discovery. The Authority on behalf of the Government may disclaim ownership of the relic.

11b.2.4.5 No archaeological excavation can be carried out by any person, other than the Authority and the designated person, without a licence issued by the Authority. A licence will only be issued if the Authority is satisfied that the applicant has sufficient scientific training or experience to enable him to carry out the excavation and search satisfactorily, is able to conduct, or arrange for, a proper scientific study of any antiquities discovered as a result of the excavation and search, and has sufficient staff and financial support.

11b.2.5 *Hong Kong Planning Standards and Guidelines*

11b.2.5.1 Chapter 10 of HKPSG covers planning considerations relevant to conservation. It also details the principles of conservation, the conservation of natural landscape and habitats, historic buildings and archaeological sites, and addresses the issue of enforcement. The appendices list the legislation and administrative controls for conservation, other conservation related measures in Hong Kong, and Government departments involved in conservation.

11b.2.6 *Guidelines for Cultural Heritage Impact Assessment*

11b.2.6.1 The GCHIA is attached in Appendix C of the EIA Study Brief No. ESB-184/2008 (ESB) covering baseline study, field evaluation, impact assessment and mitigation measures.

11b.2.7 *Guidelines for Marine Archaeological Impact Assessment*

11b.2.7.1 The GMAI details the standard practice, procedures and methodology, as well as a review of archaeological potential, geophysical surveys, diver inspections and assessment criteria for marine archaeological impact assessment.

11b.3 *Assessment Methodology*

11b.3.1 *Study Scope*

11b.3.1.1 The study area covers an area that stretches 300m from the Project boundary. An archaeological review and a site visit have been conducted, taking into consideration any archaeological resources that would be adversely affected by the construction works. Information of archaeological sites recorded in the official archaeological site listed by AMO has been used as a reference to determine if there are areas with archaeological potential located within the study area.

11b.3.1.2 The baseline condition of cultural heritage has been established through a literature review and field surveys.

11b.3.2 Terrestrial Archaeology

11b.3.2.1 With reference to the EIA Study Brief and the GCHIA, an archaeological desktop research and a site visit has been undertaken to examine records and interpret archaeological resources within the study area. The archaeological impact assessment was conducted in accordance with the GCHIA.

11b.3.2.2 Desktop research was conducted to collect available and relevant information of previous archaeological, historic, geographic and geological studies related to the study area where excavation works had been conducted.

11b.3.3 Marine Archaeology

11b.3.3.1 The Marine Archaeological Investigation (MAI) follows the methodology set out in the GMAI issued by AMO and the relevant requirements in the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM, Annexes 10 and 19).

11b.3.3.2 The study scope is shown on **Figure 11b.1** and consists of the following two areas:

- Reclamation area - the location for the IWMF, and
- Breakwater and cable corridor - the location of proposed breakwater for the IWMF site and the location of the submarine cables at the seabed between Shek Kwu Chau and Lower Cheung Sha Beach.

11b.3.3.3 The MAI for Shek Kwu Chau consists of the following five separate tasks:-

- Phase 1 – assess the archaeological potential of the two study areas from the results of a Baseline Review;
- Phase 2 – conduct marine Geophysical Surveys to obtain detailed data about the seabed and sub surface sediments;
- Phase 3 – through data interpretation identify and assess the location of seabed features with archaeological potential; and
- Phase 4 – carry out a diver survey to inspect unidentified objects on the seabed to establish their archaeological value.
- Phase 5 - Assess the impact of the construction of the IWMF on archaeological resources, if present, and recommend a mitigation strategy, if necessary.

11b.3.4 Built Heritage

11b.3.4.1 With reference to the GCHIA, features which fall within the scope of built heritage survey include:

- all pre-1950 buildings and structures
- selected post – 1950 buildings and structures of high architectural and historical significance and interest; and
- cultural landscapes including places associated with historic events, activities, persons or exhibiting other cultural or aesthetic values, such as sacred religious sites, battlefields, a setting for buildings or structures of architectural or archaeological importance, historic field patterns, clan graves, old tracks, feng shui woodlands and ponds, etc.

- 11b.3.4.2 In this assessment, the cultural significance of built heritage and archaeological interest have been assessed so as to establish a baseline condition for the identification of the potential impact arising from the proposed construction works as well as to recommend the corresponding mitigation measures. With reference to the Charter for the Conservation of Places of Cultural Significance of 1999 (The Burra Charter) issued by the International Council on Monuments and Sites (ICOMOS) of United Nations Educational, Scientific and Cultural Organization (UNESCO), cultural significance means aesthetic, historic, scientific, social or spiritual value.
- 11b.3.4.3 Cultural and historical landscapes assessed in this baseline study include places associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values, including:
- sacred religious sites;
 - battlefields;
 - a setting for buildings or structures of architectural or archaeological importance;
 - historic field patterns;
 - historic graves and foundation stones which are associated with historic figure or act as an important symbolic or visual landmark of a community; and
 - old tracks and ponds.
- 11b.3.4.4 Desktop literature review and site survey were conducted. The following information has been analyzed, collected and collated to determine the presence of historical occupation in the project area and to assess the potential existence of cultural heritage within the potential impacted area:
- Background information (e.g. AMO's files, Public Records Office, map libraries, university and public libraries, published and unpublished government and non-government documents, cartographic and pictorial documents) of heritage sites (including declared monuments, government historic sites, sites of archaeological interest and graded historic buildings identified by AMO) within and in close proximity to the study area;
 - Areas proposed for construction and operation activities and potential impacts induced by the project;
 - Previous recorded cultural heritage resources within the project boundary; and
 - AMO's 1,444 newly proposed historic buildings with their existing and respective proposed grading.
- 11b.3.4.5 Field surveys was conducted with the following tasks:
- Recording of identified built heritage features;
 - Interviews with local informants, residents and elders, if necessary. The interviews aim at gathering information, such as cultural and historical background of the buildings and structures, as well as historical events associated with the built heritage features; and
 - Systematic documentation of all recorded features including:
 - Photographic records of historic buildings or structures including the exterior where possible;

- A set of 1:1000 scale maps showing the location and boundary of each historic building, boundary stone, monument object, historic grave, and cultural landscape;
- Written descriptions of recorded features of historic buildings, e.g. age of the building or structure, architectural features, condition of the building or structure, past and present uses, notes on any modifications, direction faced and associations with historical or cultural events or individuals; and
- Written descriptions of recorded features of historic graves or foundation stones, boundary stones if any, a copy of the inscription of stone table, and architectural elements of the graves or stones where possible.

11b.4 Result of Terrestrial Archaeological Review

- 11b.4.1.1 A site visit was conducted for the study area by in-house archaeologist and revealed no artefacts.
- 11b.4.1.2 As described in **Section 2**, submarine cables would be laid across the water between the artificial island near SKC and Lantau Island. The cables landing point is located at Cheung Sha. Since no terrestrial archaeology has been identified within 300m of the landing point; no archaeological impacts are anticipated.

11b.5 Result of Marine Archaeological Investigation Review

11b.5.1 Baseline Review

Introduction

- 11b.5.1.1 A Baseline Review was undertaken to compile a comprehensive inventory of cultural heritage resources for both the reclamation area, breakwater and cable corridor. The Review established the historical profile and potential for cultural heritage sites and included:
- Marine charts records held in the UK Hydrographic Office, and National Maritime Museum Library in London;
 - Publications on local historical, architectural, anthropological, archaeological and other cultural studies;
 - Unpublished papers, records, archival and historical documents held in local libraries and other government departments.
- 11b.5.1.2 Practically nothing is known about the archaeological potential of the seabed deposits in Hong Kong. The only marine archaeological discovery is that of a late Sung/early Ming Dynasty boat uncovered during construction of the High Island Reservoir, near Sai Kung (Frost, 1974). Since then, no other historic shipwreck has been found. However, this is probably because there were no dedicated marine archaeological surveys until the introduction of the 1998 EIA Ordinance. Marine archaeology is therefore a new area of study in Hong Kong with very little baseline data to draw upon.
- #### Maritime Activity in the Vicinity of Shek Kwu Chau
- 11b.5.1.3 Shek Kwu Chau is a small island 3.2 km west of Cheung Chau. It was generally barren and uninhabited until 1962 when a drug rehabilitation centre was established. The Island was sometimes known as 'coffin island' perhaps because there is a European grave on the North West shoreline.

- 11b.5.1.4 The grave is for Elizabeth Ann McIntyre, who died at sea on the 21st of October 1845. Her husband was master of the ship “Castle Huntly”. The “Castle Huntly” was a three-masted wooden caravel of thirteen hundred tons, built at the Port of Calcutta and owned jointly by Thomas Garland Murray of London and John Paterson of Castle Huntley. John Paterson was her first Master. Later the vessel passed through the hands of various owners and, in 1838, was re-registered at Bombay as the property of three Parsee merchants. Later, it appears, two of the owners sold out and she became the sole property of one Cursetzee Cawasjee. The closing entry says that the “Castle Huntly” was lost on Lincoln’s Shoal some four hundred miles south of Hong Kong on 23rd October 1845, while on a voyage from China to Bombay. Lloyd’s List confirms that the Master of the ship at the time of her loss was a Captain MacIntyre and adds that the Master, Officers, passengers and part of her crew were saved and landed at Hong Kong. Documentary evidence indicates that the ship sailed regularly in this trade between Calcutta and the Canton River in 1835. It seems likely that the vessel met her end while still engaged in the opium traffic. The wife of the Master was buried at Shek Kwu Chau two days before the ship was lost, and it seems likely that the gravestone was brought to the island at a later date, as the granite used does not appear to be of Hong Kong origin (Moore, 1974).
- 11b.5.1.5 The presence of the historic grave on Shek Kwu Chau indicates the island’s important location within the main shipping route towards Canton. The Adamasta Channel between Cheung Chau and the Chi Ma Wan Peninsula has always been an important sea passage. The main route between Hong Kong and Macau passes through this channel, with the lesser used northern route passing Ma Wan and the northern Lantau coast. The Adamasta Channel remains the main marine route for the high speed ferries travelling between Hong Kong and Macau. By the mid-nineteenth century this route, which also linked Hong Kong with Canton and the West River ports, became of increasing importance (Hayes, 1963). The Hong Kong Government Gazette from 1899 records that Cheung Chau was a very busy port used by junks and steamers en route to Macau.
- 11b.5.1.6 There is no other documentary evidence to indicate specific maritime activity around Shek Kwu Chau. However, it is less than two miles from Cheung Chau which was the haunt of a large pirate band under the command of Cheung Po, also and more popularly known as Cheung Po-Tsai. In 1808 he fought against the Ch’ing Government’s Navy several times and was victorious on every occasion. His band repeatedly raided villages in the San Hui, Panyu and San On Counties. Cheung’s forces and influence rapidly grew. At one time he had over 270 vessels, 7,000 swords, 1,200 guns and 16,000 men working under him (Murray, 1987). He had hideouts at Tung Chung (Lantau) and Chek Chue (modern Stanley on Hong Kong Island). He also built and endowed the Tin Hau Temples at Ma Wan, Cheung Chau and Stanley, all of which still stand and are dedicated to fishing and sea-faring activities. He was eventually defeated and surrendered to government forces and at the time of his death in 1822 he was a Lieutenant in the Ming Navy. There is a cave on Cheung Chau Island which is associated with Cheung and a popular tourist destination.
- 11b.5.1.7 Throughout coastal southern China, smuggling and piracy have always dominated maritime activities. It was not until controlling legislation on the registration of native craft was enacted and enforced in the late 1860’s that it became more difficult for pirates to operate in Hong Kong waters. The first man to survey Hong Kong waters using modern methods, the Bombay Marine Company Daniel Ross, reported in 1808 that when he went ashore on Cheung Chau to set up a triangulation station there were only two boat repairers resident as the island had just been devastated by pirates.
- 11b.5.1.8 There is further documentary evidence from the records of the Chinese Customs Station at Cheung Chau. L.C. Arlington of the Chinese Maritime Customs, who spent six years (1893-9) in charge of the Customs Station at Cheung Chau, wrote in his autobiography: *‘During my time in Kowloon territory (1893-1901), piracies were so common that we regarded it as extraordinary if a day passed without one. Indeed, it was the daily routine*

for junk masters to report at the Customs Station that they had been pirated and all of their cargo looted' (Hayes, 1983).

11b.5.1.9 The bay at Cheung Sha Wan Lower Beach would have offered a sheltered anchorage from the prevailing N.E. Monsoon, within easy striking distance from the main shipping routes. Archaeological remains from the Neolithic, Bronze Age and Tang Dynasties have all been identified at Cheung Sha. This is evidence for the continued occupation and use of water transport in this location (Peacock and Nixon, 1995)

Shek Kwu Chau Archive Search

11b.5.1.10 The UK Hydrographic Office (UKHO) holds a database of surveyed shipwrecks in Hong Kong, including those not shown on Admiralty Charts. The database contained no records of shipwrecks close to the study area. However, it only shows ships which are a hazard to navigation so it is possible that there could be uncharted shipwreck material on the seabed. A copy of the results is presented in **Appendix 11b.1**.

11b.5.1.11 The UKHO holds a British navigation chart of the study areas from 1899 (**Figure 11b.2**) which interestingly shows a wreck south east of Cheung Chau Island.

11b.5.2 Geophysical Survey

Introduction

11b.5.2.1 In order to establish the potential of marine archaeology of the proposed reclamation area, breakwater and submarine cable corridor for the IWMF, geophysical survey was arranged in two phases. The Phase 1 survey, which covered the reclamation area, was completed in June 2009; while the Phase 2 survey, which covered the breakwater and submarine cable corridor area, was conducted in May/June 2010. Both surveys followed the same methodology and were undertaken by the GEO Term Contractor. The results are included into this report.

11b.5.2.2 During the geophysical surveys, the following techniques was adopted:-

- Marine side scan sonar survey - To find objects on or above the seabed with archaeological potential
- Marine seismic profiling survey - To establish the geological succession over the survey area and locate buried objects
- Echo sounding and swath survey - To measure sea bed levels in detail and map anomalous features

11b.5.2.3 The results of the geophysical surveys have been presented in the following summary charts enclosed in **Appendix 11b.2**:-

- Echo Sounding and Swath Bathymetry Track Plots
- Seismic and Side Scan Sonar Track Plots
- Colour Contoured Swath Bathymetry Plans
- Sea Bed Features and Cable Alignments
- Contoured Levels at the Base of Marine Deposits
- Contoured Levels on Top of Rock in Any State of Decomposition
- Contoured Levels on Top of Presumed Moderately Decomposed Rock
- Isopachs of Marine Deposits

- Isopachs of Alluvium
- Isopachs of Rock in Any State of Decomposition

Seabed Features

- 11b.5.2.4 The survey area is mainly covered with soft and fine sediments with numerous trawl scars. Rock outcrops were recorded close to the shore.
- 11b.5.2.5 Six sonar contacts were identified. The details of each one are listed in **Table 11b.1** below. The location of each contact is presented on **Figure 11b.3**, and the images of the sonar contacts are enclosed in **Appendix 11b.2**.

Table 11b.1 Sonar Contact List

Contact Number	Easting	Northing	Dimensions (m)	Description
Phase 1 Geophysical Survey – Reclamation Area				
WH2-SC001A	816663.7E	805744.9N	2.4x0.9	Unidentified Object
WH2-SC002A	816665.6E	805743.5N	1.3 x0.6	Unidentified Object
WH2-SC003A	816668.6E	805742.0N	1.6x0.7	Unidentified Object
WH2-SC004A	816672.4E	805740.3N	1.9x1.2	Unidentified Object
WH2-SC005A	816971.3E	805443.5N	3.2x1.0x0.3	Unidentified Object
Phase 2 Geophysical Survey – Breakwater & Submarine Cable Corridor				
WH2-SC001B	816236.2E	805443.5N	3.5x1.2x0.4	Unidentified Object

Marine Deposits

- 11b.5.2.6 The thickness of the Marine Deposits is generally low close to the rock outcrop area and gets thicker away from the shore.
- 11b.5.2.7 Six unidentified objects were located buried in the Marine Deposit. The details are listed in **Table 11b.2** below. The location of each contact is presented on **Figure 11b.3**, and the images of the seismic contacts are enclosed in **Appendix 11b.2**.

Table 11b.2 Seismic Contact List

Contact Number	Easting	Northing	Description
Phase 1 Geophysical Survey – Reclamation Area			
WH2-SEI001A	816842.4E	805576.3N	Unidentified Object, 2m below seabed
WH2-SEI002A	816898.2E	805456.1N	Unidentified Object, 1m below seabed
Phase 2 Geophysical Survey – Breakwater & Submarine Cable Corridor			
WH2-SEI001B	815657.6E	806596.2N	Unidentified Object, 1m below seabed
WH2-SEI002B	816309.9E	805315.1N	Unidentified Object, 4m below seabed
WH2-SEI003B	816163.9E	805467.6N	Unidentified Object, 4m below seabed
WH2-SEI004B	816324.1E	805369.4N	Unidentified Object, 0.5m below seabed

Alluvium

- 11b.5.2.8 Alluvium is missing near the shore and mainly appears in the south east half of the survey area. The surface of the Alluvium is varying and reaches to below -35m below PD at the south of the survey boundary.

Contoured Sounding Plan

- 11b.5.2.9 The most obvious features on the sounding plan are the rock outcrops located near the shore. The rock outcrops are generally more than 1m high. Apart from them the seabed is relatively featureless.
- 11b.5.2.10 The seabed in the survey area is generally flat and deepening towards the south with depths between -1.0mPD close to the shore and -16.9mPD.

Summary and Recommendations

- 11b.5.2.11 The geophysical surveys located a total of twelve unidentified objects in the survey area. The positions of the unidentified objects were plotted in the proposed layout plan of the IWMF development and the proposed alignment of the submarine cables. It was found that the proposed reclamation and submarine cables would have direct impact to the unidentified objects. As two seismic contacts (WH2-SEI002B & WH2-SEI003B), which are located in the submarine cable corridor, are located at 4m beneath the seabed, it would be impossible to locate and identify these contacts by a diver inspection. To minimize the potential impact, the proposed alignments of the submarine cables were revised. Direct impact to five unidentified objects (WH2-SC001B, WH2-SEI001B, WH2-SEI002B, WH2-SEI003B & WH2-SEI004B) would be avoided with the revised alignment. The revised alignment of the submarine cables, the proposed layout plan of the IWMF development and the locations of the unidentified objects are shown in **Figure 11b.3**. Although WH2-SC001B & WH2-SEI003B would still be quite close to the proposed breakwater (about 40m from the proposed breakwater), the construction of the breakwater would unlikely cause impact to these two unidentified objects as the dredging of seabed would be limited to approximately 5-10m from the breakwater to a depth of approximately 1m.
- 11b.5.2.12 For the remaining seven unidentified objects (WH2-SC001A, WH2-SC002A, WH2-SC003A, WH2-SC004A, WH2-SC005A, WH2-SEI001A & WH2-SEI002A), a diver inspection was conducted to locate the contacts and establish their archaeological potential.

11b.5.3 Diver Inspection

- 11b.5.3.1 A diver survey was carried out in February 2010 to locate the seven unidentified objects and establish their archaeological potential.
- 11b.5.3.2 The Differential GPS was used to position the dive boat as near as possible to each target and a detailed search was conducted at each location. However no objects were found on the seabed. In fact, the seabed was uncharacteristically clean and clear.
- 11b.5.3.3 There were very high levels of turbidity in the water, due to the study area's proximity to the Pearl River Delta. It was very difficult to obtain either video footage or still photographs.
- 11b.5.3.4 It is usually the case in Hong Kong that the seabed has a high volume of modern debris. In this case there was nothing on the seabed except a few broken shells. There was some evidence of the trawling of fishing nets in the form of narrow grooves. Some fishing boats were also seen working in the area during the survey.
- 11b.5.3.5 The metal probe was used to look for buried objects but none were located. Very detailed surveys were conducted at each location of all seven unidentified objects and at each position nothing was located. It was assumed that the objects had been removed by fishing vessels.

11b.6 Result of Built Heritage Resources Review and Cultural Landscape

11b.6.1.1 A desktop review and survey of built heritage were conducted. Details of the built heritage resources within the study area and their locations are presented in **Appendix 11b.3** and **Figure 11b.4**. The location plan in scale 1:1000 is shown in **Figure 11b.5**. A heritage structure, namely “Courtyard Complex” (SK5) on the Shek Kwu Chau Treatment and Rehabilitation Centre of the Society for the Aid and Rehabilitation of Drug Abusers (SARDA), is identified within the study area and it is a Grade 3 historic building. The Courtyard Complex was built by the inhabitants of the facility in Year 1971 as part of SARDA’s rehabilitation process. The structures were built in a Roman Architectural Style and use of stone and concrete as construction materials.

11b.6.1.2 Apart from the Courtyard Complex, four built heritages (SK1-SK4) with no grading in the SARDA complex were indentified within the study area:

- Administrative Block and Assembly Hall (SK1);
- Recovery House (SK2);
- Office Block (SK3); and
- Mei House and Ming House(SK4).

11b.6.1.3 As described in **Section 2**, submarine cables would be laid across the water between The artificial island near SKC and Cheung Sha on Lantau Island. The cables landing point is located at Cheung Sha. Since no built heritage has been identified within 300m of the landing point; no built heritage impacts are anticipated.

11b.7 Identification of Potential Impacts

11b.7.1 Construction Phase

11b.7.1.1 Any heritage resources, located within close proximity to works area of the proposed IWMF may have impact through:

- Direct impact to historical buildings, historical landscape and sites of terrestrial and marine archaeological potential (e.g. excavation, reclamation and dredging);
- Indirect vibration impact from construction and dust from construction works; and
- Indirect visual impact to historic buildings and cultural landscapes due to construction works.

11b.7.2 Operation Phase

11b.7.2.1 Impacts on cultural heritages during operation phase of the Project include:

- Indirect visual impact associated with alteration of the surrounding environment of historical structures and cultural landscapes due to the above-ground structures of the Project; and
- Indirect vibration impact to historical buildings and cultural landscapes from operation of the project plant.

11b.8 Evaluation of Potential Impacts

11b.8.1 Construction Phase

Terrestrial Archaeology

11b.8.1.1 Based on the results of the desktop review and site visit, no archaeological site or artefact was identified within 300m study area. Adverse terrestrial archaeological impact is not expected.

Marine Archaeology

11b.8.1.2 The results of the geophysical survey and diver inspection indicate there are no archaeological resources within the proposed reclamation area for the IWMF. Therefore no adverse marine archaeological impact is anticipated due to the proposed reclamation.

11b.8.1.3 According to the results of the geophysical survey, five unidentified objects were located within the submarine cables corridor. To minimize the potential impact, the alignment of the submarine cables were revised to avoid the unidentified objects. No adverse marine archaeological impact is anticipated due to the proposed submarine cables.

Built Heritage and Cultural Landscape

11b.8.1.4 Existing built heritages (SK1-SK5) are located to the north of the Project area. The structures are generally located on elevated terrain while the Project site is situated by the southern coast of the island and the construction activities mainly consists of reclamation works. Direct impact on these built heritage sites in the area is therefore not anticipated.

11b.8.1.5 Indirect impacts such as dust, vibration and visual impacts may occur during the construction of the IWMF; however, due to the large separation of the built heritages to the Project site, and due to the lack of a direct line of sight, adverse visual impacts are not anticipated.

Table 11b.3 Potential Impact on Cultural Heritage Sites

ID	Built Heritage Resources	Existing Grading	Proposed Grading	Horizontal Distance from Project Site	Potential Impact and Impact Level
SK1	Administrative Block and Assembly Hall	---	---	Approx. 200m	The structure is located about 200m away from the proposed site and therefore no impacts are anticipated.
SK2	Recovery House	---	---	Approx. 210m	The structure is located about 210m away from the proposed site and therefore no impacts are anticipated.
SK3	Office Block	---	---	Approx. 200m	The structure is located about 200m away from the proposed site and therefore no impacts are anticipated.

ID	Built Heritage Resources	Existing Grading	Proposed Grading	Horizontal Distance from Project Site	Potential Impact and Impact Level
SK4	Mei House and Ming House	---	---	Approx. 220m	The structure is located about 220m away from the proposed site and therefore no impacts are anticipated.
SK5	Courtyard Complex	3	---	Approx. 190m	The structure is located about 190m away from the proposed site and therefore no impacts are anticipated.

11b.8.2 Operation Phase

- 11b.8.2.1 The identified built heritages will not be in direct line of sight of the IWMF. Furthermore, due to the large separation of the historic buildings to the Project site, adverse visual impacts are not anticipated.
- 11b.8.2.2 Due to the sufficient buffer distance between the structures and the project area, indirect vibration impacts would also not be anticipated.
- 11b.8.2.3 Based on the preliminary design information, the proposed works under the Project would not result in any changes of access to the identified built heritages.

11b.9 Recommended Mitigation Measures

11b.9.1 Construction Phase

Terrestrial Archaeology

- 11b.9.1.1 Since no archaeological site is located within the study area, no adverse impacts are anticipated and therefore no mitigation measures are necessary.

Marine Archaeology

- 11b.9.1.2 As no adverse marine archaeological impact is anticipated, no mitigation measures are required.

Built Heritage and Cultural Landscape

- 11b.9.1.3 Given the large separation between the Project site and the built heritages, adverse vibration, dust and visual impacts on built heritages are not anticipated. No mitigation measures are therefore necessary.

11b.9.2 Operation Phase

Terrestrial Archaeology

- 11b.9.2.1 There would be no archaeological impact due to the operation of the IMWF. No mitigation measures are proposed.

Built Heritage and Cultural Landscape

11b.9.2.2 Due to the large separation between the Project site and the built heritages, no impacts are anticipated and therefore no mitigation measures are proposed.

11b.10 Environmental Monitoring and Audit

11b.10.1.1 No monitoring and audit programme on cultural heritage would be required.

11b.11 Conclusion

11b.11.1.1 Based on the results of the desktop review and survey, no archaeological site was identified within the study area. No adverse archaeological impact is expected.

11b.11.1.2 Regarding the marine archaeological potential in the proposed reclamation area, breakwater and cable corridor for the IWMF, geophysical surveys were conducted. A total of twelve unidentified objects were spotted within the MAI study area. Potential impact to five unidentified objects would be avoided by revising the alignment of the proposed submarine cables, while seven unidentified objects might be affected by the reclamation and breakwater construction. A diver inspection was carried out, trying to locate the seven unidentified objects and establish their archaeological potential. A detailed search was conducted, but nothing was located. The results of the geophysical survey and diver inspection indicate there are no archaeological resources within the proposed reclamation area, and therefore no adverse marine archaeological impact is anticipated due to the proposed reclamation.

11b.11.1.3 One grade 3 historic building (Courtyard Complex on the Shek Kwu Chau Treatment and Rehabilitation Centre of the Society for Aid and Rehabilitation of Drug Abusers) and four other built heritage structures with no grading are identified within the study area. However, due to large separation between the built heritages and the IWMF, no adverse impacts during the construction and operation phases are anticipated.

11b.12 References

廣東省文物考古研究所 1997 《香港南丫島、長洲島、大鴉洲島、小鴉洲島及石鼓洲島考古調查報告》，香港，古物古蹟辦事處。

Frost, R. ,C.H. Ho and Bobby Ng 1974 Sha Tsui, *Journal of The Hong Kong Archaeological Society*, vol. 5. 23-30.

Brage, J.M., 1965. China Landfall 1513, *Jorge Alvares Voyage to China*. Macau Imprensa Nacional.

Corteseo, 1944. *The Suma Oriental of Pome Pires and the Book of Francisco Rodrigues*. London, Hakult Society.

Hayes, J.W. 1983. *The Rural Communities of Hong Kong. Studies and Themes*. Hong Kong. Oxford University Press.

Hong Kong Maritime Museum. 2006. *Piracy and the World of Zhang Baozai*.

Hydrographic Office. 2005. Charts for Local Vessels, Marine Department, Government of the HKSAR.

Moore, Jean. 1974. The European Grave at Shek Kwu Chau. *Journal of the Hong Kong Branch of the Royal Asiatic Society*, Vol. XIV: 186-7.

Peacock & Nixon, 1995. *The Hong Kong Archaeological Survey: Subsurface Investigation Reports*. Antiquities and Monuments Office Occasional Paper No. 1.

Ride, L. & Ride, M. 1995. *An East India Company Cemetery. Protestant Burials in Macao*. Hong Kong. Hong Kong University Press.

Sayer, G. R. 1980. *Hong Kong 1841-1862. Birth, Adolescence and Coming of Age. Hong Kong*. Hong Kong University Press.

Siu, K.K., 1977. *Forts and Batteries: Coastal Defence in Guangdong during the Ming to Qing Dynasties*. Hong Kong Urban Council.

Websites:

List of the Historic Building Assessment (as of 20 Sept 2010)

<http://www.amo.gov.hk/b5/antiquities.php>

List of Archaeological Interest in Hong Kong (as at Feb 2009):

<http://www.lcsd.gov.hk/CE/Museum/Monument>

Antiquities and Monuments Office website: <http://www.amo.gov.hk/>

SARDA Website: <http://www.sarda.org.hk>