

## 8 CULTURAL HERITAGE IMPACT ASSESSMENT

### 8.1 Introduction

A cultural heritage impact assessment has been undertaken to define the nature and scale of the potential impacts on cultural heritage resources associated with the Project, with a specific focus on the effects in the vicinity of sensitive receivers. An archaeological survey and a historical buildings and structures survey were conducted to establish the baseline cultural heritage conditions of the Study Area. Both construction and operational phase impacts have been assessed. Measures required to mitigate identified impacts are recommended, where appropriate, to reduce residual impacts to acceptable levels.

### 8.2 Relevant Legislation & Guidelines

The following legislation and guidelines are applicable to the cultural heritage assessment in Hong Kong:

- Environmental Impact Assessment Ordinance (Cap. 499.);
- Technical Memorandum on the EIA Process, Annex 10 and 19 (EIAO TM);
- Antiquities and Monuments Ordinance (Cap. 53); and
- Hong Kong Planning Standards and Guidelines (HKPSG).

*Section 2 of Annex 10 of the Technical Memorandum on the EIA Process (EIAO TM)* defines the technical scope of cultural heritage impact assessments. It states that the criteria for evaluating impacts to sites of cultural heritage should include the following:

- 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.

The *Antiquities and Monuments Ordinance (Cap. 53) (AM Ordinance)* provides statutory protection against the threat of development on declared monuments, historical buildings and archaeological sites to enable their preservation for posterity. The *AM Ordinance* also establishes statutory procedures to be followed in making such a declaration.

In practice, the Antiquities and Monuments Office (AMO) would identify deemed monuments and agreement would be reached with the owners of the monuments to provide for specific measures to ensure preservation. Deemed monuments have the potential to be upgraded to statutory declared monuments under the *AM Ordinance*.

A wide range of potential sites of cultural heritage, among which are historical buildings and structures and archaeological sites, have been identified and recorded by AMO in addition to those for which a declaration has been made under the *AM Ordinance*. Historic buildings and structures are recorded by AMO according to the grading system shown in **Table 8-1**.

**Table 8-1 Grading of Historical Buildings**

<b>Grade</b>	<b>Description</b>
I	Buildings of outstanding merit; every effort should be made to preserve if possible
II	Buildings of special merit; effort should be made to selectively preserve
III	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

It should be noted that the grading of historical buildings is intended for AMO's internal reference only and has no statutory standing. Although there are no statutory provisions for the protection of recorded archaeological sites and historical buildings and features (including Graded, Deemed and recorded) in Hong Kong, the Government has established a set of administrative procedures<sup>(1)</sup> for giving consideration to protect these resources.

Over the years, surveys have been undertaken to identify archaeological sites in Hong Kong. AMO has established boundaries for the identified sites and a set of administrative procedures for the protection of known archaeological sites in Hong Kong. However, the current record of archaeological sites in Hong Kong is known to be incomplete as many areas have not yet been surveyed. There is a need to ensure that procedures and mechanisms, which enable 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 of project planning.

*Section 11 of the AM Ordinance* requires any person who discovers an antiquity, or supposed antiquity, to report the discovery to the Antiquities Authority. By implication, construction projects need to ensure that the Antiquities Authority is formally notified of archaeological resources, which are discovered during project assessment or construction.

*Chapter 10 HKPSG* covers planning considerations relevant to general guidelines and measures for conservation of historical buildings, archaeological sites and other antiquities.

## **8.3 Assessment Methodology**

### **8.3.1 Assessment Scope**

The assessment has followed the criteria and guidelines for evaluating and assessing impacts on sites of cultural heritage as set out in *Annexes 10 and 19 of the EIAO TM*, and *Section 3.5.6 of the EIA Study Brief (ESB-069/2001)*. To assess potential direct and indirect impacts on sites of cultural heritage, the Study Area covers an area defined by within a distance of 300 m from the boundary of the Preferred Option of the drainage tunnel system.

The assessment comprises the tasks described in the following sections.

### **8.3.2 Identification of Baseline Cultural Heritage Conditions**

A desktop search was undertaken to compile a comprehensive inventory of recorded sites of cultural heritage within the Study Area. The search included the review of:

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<sup>(1)</sup> Administrative procedures are adopted by AMO with the intention to protect sites of archaeological and historical interests that are not protected under the provisions of AM Ordinance. For example, reserve area may be imposed on a particular area or building consultation with AMO for advice when development within the reserve area is proposed. These AMO measures are referred to as administrative procedures.

- List of declared monuments protected by the *AM Ordinance (Cap. 53)*;
- Deemed monuments, graded buildings and list of cultural heritage sites identified by the AMO;
- Published and unpublished papers, records, archival and historical documents through public libraries, archives, tertiary institutions and other government departments such as old maps and aerial photos held in the Lands Department.

Following *Section 3.5.6* of the *EIA Study Brief (ESB-069/2001)*, the following cultural heritage resources within the Study Area have been included:

- all sites of archaeological interest;
- all pre-1950 buildings and structures;
- selected post-1950 buildings and structures of high architectural and historical significance and interest; and
- landscape features include 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 fishponds and cultural element such as fung shui woodlands and clan grave.

As the Study Area has not been adequately studied before, an archaeological survey and the historical buildings and structures survey were undertaken to define the baseline cultural heritage resources within the Study Area.

### **8.3.3 Archaeological Survey**

An archaeological survey was undertaken to obtain field data to evaluate the archaeological interest and the extent to which it is potentially impacted by the Project. An options selection exercise was undertaken to arrive at a Preferred Option for the drainage tunnel system comprising an approximately 5.13 km long tunnel, between Kwai Chung and Yau Kom Tau (reduced from 5.35 km during preliminary design) three intakes and an outfall structure. The scope of this survey is based on the Preferred Option. The construction activities would involve excavation works and therefore potential impact on unknown archaeological deposits may be caused. The information obtained from the survey is used to evaluate the potential cultural heritage impacts associated with the Project.

The following scope of the survey was agreed with the AMO prior to commencement of the field works:

- fieldwalking at areas that are considered to have potential;
- conducting a minimum of 30 auger holes at regular intervals to establish the horizontal and vertical spread of archaeological deposits (see **Table 8-2**); and
- excavation of a minimum of 6 test pits (see **Table 8-2**) measuring at least 1m x 1m or 1.5m x 1.5m to determine the presence or absence of any archaeological deposits.

**Table 8-2 Archaeological Fieldwork Requirements**

<b>Proposed Channels (Channel Code)</b>	<b>Min. No. of Auger Holes Required</b>	<b>Min. No. of Test Pits Required</b>
Outfall O-1	10	2
Intake I-1	0	0
Intake I-2	10	2
Intake I-3 (option 1)	10	2
Intake I-3 (option 2)	0	0
Area near Intake I-2	0	0
Area near Intake I-3	0	0
<b>Total</b>	<b>30</b>	<b>6</b>

The archaeological survey was conducted by Arhaeo-Environments Ltd. (AEL) during February and March 2004. A total of 6 test pits and 30 auger holes were completed. The Archaeological Survey Report (ASR) detailing the survey findings was received from AEL in March 2004 (see **Appendix G**).

#### **8.3.4 Historical Buildings and Structures Survey**

A historical buildings and structures survey was also conducted by AEL to identify all historical buildings and structures within the Study Area. The Study Area covers the area within a distance of 300m from the boundary of the Preferred Option of the drainage tunnel system. Villages surveyed included Wo Yi Hop, Sam Tung Uk, Lo Wai, Sam Dip Tam, San Tsuen, Fu Yung Shan, Kwong Pan Tin and Yau Kom Tau. The survey comprises a desktop research and fieldworks, which included oral interviews with local residents and village representatives, and photographic records. The detailed findings of the survey are summarised in the Built Heritage Impact Assessment Report (BHIA) (see **Appendix H**).

#### **8.3.5 Impact Assessment**

Preservation in totality is taken as the first priority and the assessment has taken into account the requirements described in *Section 2.1 of Annex 10* and *Section 2.6 to 2.14 of Annex 19* of the *EIAO TM*.

Direct and indirect impacts have been assessed and appropriate mitigation measures are recommended, where necessary.

### **8.4 Baseline Conditions and Sensitive Receivers**

A comprehensive inventory of the cultural heritage resources within the Study Area has been established through a desktop review supplemented by an archaeological survey and a historical buildings and features survey. The identified sites are described below and the detailed findings are presented in **Appendices G** and **H** of this report.

#### **8.4.1 Archaeological Resources**

No declared or recorded archaeological sites are identified within the Study Area.

Based on the findings of the archaeological field survey undertaken for this Study, most of the proposed drainage works and potentially impacted areas are located within the recent

alluvial and colluvial areas and no archaeological interest has been identified within the Study Area.

Intake I-1 is in a heavily disturbed area and no archaeological potential exist. For this reason, no field survey is necessary in accordance with the scope of fieldwork agreed with AMO.

Intake I-2 is located at the confluence of two streams near Lo Wai (see **Figure 8.1**). Two test pits measured 1m x 1m and 10 auger holes were undertaken in this area. No artefacts were found from fieldwalking survey, auger holes and TP2. Four pottery and porcelain shards dated 19<sup>th</sup> to 20<sup>th</sup> century were recovered in TP1 approximately 10 m west of Lo Wai River (see Section 8 of the ASR in **Appendix G**). Considering their close proximity to the rivers and the similarities in their characteristics compared with village ware of present day, these recovered shards should be regarded as secondary deposit with very little significance.

Intake I-3 is located on the moderate to steep cultivated slope at the confluence of two rivers (see **Figure 8.1**). Fieldwalking, two test pits TP1 and TP2 measured 1m x 1m and 10 auger holes were undertaken on the terraces and steep terrain (see Intake I-3 of the ASR in **Appendix E**). No artefacts were found during fieldwalking survey or within any of auger holes and test pits.

Outfall area O-1 is located on the moderate to steep slopes at Yau Kom Tau facing southeast (see **Figure 8.1**). Fieldwalking survey, two test pits measured 1m x 1m respectively and 10 hand auger holes were conducted in this area. No artefacts were found during fieldwalking survey or within any of auger holes and test pits.

#### **8.4.2 Historical Buildings and Structures**

The Study Area includes a number of village settlements as shown in **Figure 8.1**. No deemed monument or declared monument has been identified within the Study Area.

Two graded buildings are listed in Section 3.5.6.3 of the EIA Study Brief (ESB 069/2001) namely Chuk Lam Sim Yuen and Po Kwong Yuen Monastery. Both sites are Grade III historic building.

Chuk Lam Sim Yuen (AMO ref. code AM940608) at Fu Yung Shan falls outside the 300 m Study Area boundary (see **Figure 8.2**), and therefore no survey was carried out on this monastery.

Po Kwong Yuen Monastery (AMO ref. code AM940609) is located within the Study Area (see **Figure 8.1**) on Lo Wai Road at an approximate distance of 109 m away from the proposed drainage tunnel system. The Monastery was constructed in 1926 and is currently a Grade III building. The main building is of three-hall type with three doors. The Chinese name 'Po Kwong Yuen' is carved on a wooden plaque hanging on top of the main entrance. The main hall is the Buddha worshipping area, while the hall to the left is used for ancestor worship.

In addition to graded historic buildings, 86 potential historical buildings and structures are identified within the Study Area. They are summarised in **Table 8-3** and a detailed description of the sites and photographic records are presented in BHIA in **Appendix H**.

**Table 8-3 Potential Historical Buildings and Features Identified within the Study Area**

Location	Description	Number of Identified Potential Historical Buildings and Features	Approximate Distance From the Drainage Tunnel Scheme (m) <sup>(1)</sup>	Detailed Location of Buildings (see <i>Appendix H</i> )
Wo Yi Hop	Wo Yi Hop village is located northeast of Tsuen Wan. The village was established by the Lau's clan in the 18 <sup>th</sup> century. It is known that the present Lau residents are the 25 <sup>th</sup> generation of the Lau's clan. There are 7 historical buildings/structures including an ancestral hall and old village houses identified.	7	333 from Intake I-1	Plate 1
Sam Tung Uk	Sam Tung Uk village was established by the Chan's clan in the 18 <sup>th</sup> century. In 1980s, due to the MTR development, the entire village was relocated to its present site. The village at its old days can still be seen in the Sam Tung Uk museum. There are 2 historical buildings/structures including ancestral hall and rural committee house identified.	2	105	Plate 5
Lo Wai	Lo Wai is situated on the slope of Tai Mo Shan mountain. The village was founded in the late 17 <sup>th</sup> century and occupied by the Cheungs, Tsings, Tangs, Huis and Wongs. It is believed that the village was purposely built on the mountain slope to avoid piracy along the coastal area. An extensive list of 48 village houses and monasteries at Lo Wai was supplied by AMO as part of the BHIA brief for the project. However, most of these houses are in ruins or with little of their original appearance retained. Apart from the monasteries which are of cultural importance, the village houses offer very little of special note. In addition, there are an ancestral hall, a public school and 2 monasteries identified as potential historical building and structure.	52	25	Plate 9
Sam Dip Tam	Sam Dip Tam area is formed by three successive rocky platforms, one higher than the other. Each platform forms a lake, thus, the area is called 'Sam Dip Tam' which means 'Three Successive Lakes' in Chinese. The peaceful environment provided a good setting for aged home and Buddhist monasteries. There are 13 historical buildings and structures including a rock carving, a grave, an aged home, 3 bridges, 7 monasteries and nunneries identified.	13	0-120	Plate 30
San Tsuen	San Tsuen is situated west of Lo Wai village. The village was established by the Sun's clan and the Diu's clan in the late 19 <sup>th</sup> century. Most of the old village houses were demolished and rebuilt into new western style three-storey buildings. There are 5 historical buildings and structures from the 19 <sup>th</sup> century including 2 ancestral halls and 3 old village houses identified.	5	308	Plate 38

<b>Location</b>	<b>Description</b>	<b>Number of Identified Potential Historical Buildings and Features</b>	<b>Approximate Distance From the Drainage Tunnel Scheme (m) <sup>(1)</sup></b>	<b>Detailed Location of Buildings (see Appendix H)</b>
Fu Yung Shan	Fu Yung Shan is situated on a small hill west of Lo Wai village. In the early 20 <sup>th</sup> century, many abbots came and settled in this area. Monasteries and nunneries were established to preach Buddhism. There are 3 historical buildings and structures including a monastery and 2 abbot's memorial halls identified.	3	154	Plate 41
Kwong Pan Tin Village	Kwong Pan Tin village is formed by Kwong Pan Tin Upper village and Kwong Pan Tin Lower village. It situates west of Tsuen Wan. The entire village is occupied with temporary squatters whom built temporary structures with wood and stone. Only 1 temple of cultural significance has been identified.	1	73	Plate 47
Yau Kom Tau Village	Yau Kom Tau village originally situated in where the present Nam Fung Centre is. In 1984, the entire village was re-sited to west of Tsuen Wan due to the development of the MTR. There are 3 historical buildings and structures including an ancestral hall, a rural committee house, a temple and an earthshine identified.	4	0 horizontal distance as the drainage tunnel is located beneath one of the identified buildings.	Plate 60

Note:

(1) Distance measured from the closest historical buildings or structures to the Preferred Option of the drainage tunnel system alignment works area boundary. The distance is measured horizontally.

## **8.5 Impact Assessment**

### **8.5.1 Construction Phase**

#### **Archaeological Impact**

No declared and recorded archaeological sites or archaeological potential areas were identified from both records and field investigations within the Study Area. The construction of the Preferred Option of the drainage alignment will not impact on areas of archaeological interest. No further archaeological investigations will be required.

#### **Impact on Historical Buildings/Structures and Features**

No deemed or declared monuments identified within the Study Area. One of the two Grade III buildings, Chuk Lam Sim Yuen, is outside the 300 m Study Area and the other one, Po Kwong Yuen Monastery, is located at approximately 109 m from the Preferred Option of the drainage tunnel system. No impact is therefore expected due to the large separation distance.

All identified potential historical buildings and features in Wo Yi Hop, Sam Tung Uk, San Tsuen, Fu Yung Shan and Kwong Pan Tin village settlement areas as shown in Table 3 will not be impacted as they fall over 70 m from the Preferred Option of the drainage tunnel system. However, potential impact on some of the identified historical buildings and structures in Lo Wai, Sam Dip Tam and Yau Kom Tau settlement area may be a concern.

At Lo Wai, there are 52 potential historical buildings/structures and all of them will not be directly impacted. Except Kuen Yuen Tung Monastery, all these buildings are located at more than 50 m from the drainage tunnel alignment. Kuen Yuen Tung Monastery is located at approximately 24 m in horizontal distance from the drainage tunnel at an elevation of 107-120 mPD level (the tunnel alignment will be at approximately 68 mPD). The radial distance of the monastery from the tunnel alignment is 46-57 m. Potential vibration from tunnel boring may be a concern to the monastery buildings.

At Sam Dip Tam, 13 historical buildings and structures are identified. No sites falls within the works boundary, and therefore no direct impact is expected. However, as the sites are located in proximity to the works area of Intake I-2, potential construction noise and dust emission impact to the users of the historical buildings and structures may be a concern. The air quality and noise assessments are presented in other sections of this EIA report for details please refer to *Sections 3* and *4* respectively. Vibration from blasting and rock-breaking activities during the construction of Intake I-2 may also be a potential concern. Further details are presented in **Table 8-4**.

**Table 8-4 Separation Distances of Historical Buildings and Structures from Construction Activities at Sam Dip Tam**

Site Name	Ground Level of the Site (mPD)	Horizontal Distance from Drainage Tunnel (m)	Approximate Radial Distance from the Drainage Tunnel (m)	Approximate Distance from works area of Intake I-2 (m)
The Yuen Yuen Institute	127	100	N/A	93
Western Monastery	120	70	N/A	<b>47</b>
Yuen Yuen Home for the Aged	120	70	70	<b>28</b>
Hong Hoi Chee Hong Temple	93	30	48	<b>Immediately adjacent to Intake I-2</b>
Chiu Yum Tsing Yuen	94	70	N/A	<b>19</b>
Tse's Grave	105	58	N/A	<b>35</b>
Wan Lin Bridge	97	63	N/A	<b>Immediately adjacent to Intake I-2</b>
“No name” Bridge	90	105	N/A	58
Tin Lung Bridge	82	163	N/A	116
Wai Yuen	133	70	N/A	116
Sam Dip Tam Rock Carving	96	98	N/A	<b>35</b>
Tung Kwok Monastery	96	112	N/A	51
Fat Kwong Tsing She	84	105	N/A	111

For the purpose of this assessment, reference has been drawn from *Geoguide 4*<sup>(1)</sup>, which indicates as a general guide that blast vibrations from sub-surface works are normally not potentially damaging to structures at distances of more than 50 m and only exceptionally at distances of more than 100 m. As indicated in **Table 8-4**, potential vibration impact to the Yuen Yuen Institute, a “no name” bridge, Tin Lung Bridge, Wai Yuen and Tung Kwok Monastery and Fat Kwong Tsing She is considered minimal as they are located over 50 m from the works area of Intake I-2 or the drainage tunnel (**Figure 8.2**).

However, the Western Monastery, Yuen Yuen Home for the Aged, Hong Hoi Chee Hong Temple, Chiu Yum Tsing Yuen, Tse's Grave, Wan Lin Bridge and Sam Dip Tam Rock Carving may potentially be impacted by vibration from the construction of Intake I-2 as they are located within 50 m (see **Table 8-4**) of the proposed construction activities (**Figure 8.2**).

At Yau Kom Tau, four historical buildings are identified. The drainage tunnel will be constructed at approximately 40 mPD, potential vibration impact due to the construction activities may be a concern. Further details are shown in **Table 8-5**.

<sup>(1)</sup> *Geoguide 4: Guide to Cavern Engineering*, GEO, Civil Engineering Department, HKSAR Government (1998)

**Table 8-5 Separation Distances of Historical Buildings and Structures from Construction Activities at Yau Kom Tau**

Site Name	Ground Level of the Site (mPD)	Horizontal Distance from Drainage Tunnel (m)	Approximate Radial Distance from the Drainage Tunnel (m)
Tin Hau Temple	79	0	39
Yam Kom Tau Village Rural Committee	78	12	40
Yeung's Ancestral Hall	80	21	45
The Yau Kom Tau Village "Pai Fong"	72	65	72

As shown in **Table 8-5**, the Tin Hau Temple, Yam Kom Tau Village Rural Committee and the Yeung's Ancestral Hall fall within 50 m of the proposed construction activities, potential vibration impact may be a concern. Potential vibration impact to the Yau Kom Tau Village "Pai Fong" is considered minimal due to the large separation distance (**Figure 8.3**).

### **8.5.2 Operational Phase**

The operation of the proposed drainage scheme will only involve interception of stormwater from upland catchments via the three proposed intakes and therefore no operational impact on cultural heritage is envisaged.

## **8.6 Mitigation Measures**

As no impacts on recorded archaeological sites or area with archaeological potential were identified within the Study Area, no mitigation measure for archaeological resources is considered necessary.

The construction methods to be employed should seek to avoid potential vibration impacts to Kuen Yuen Tung Monastery at Lo Wai, the Western Monastery, Yuen Yuen Home for the Aged, Hong Hoi Chee Hong Temple, Chiu Yum Tsing Yuen, Tse's Grave, Wan Lin Bridge and Sam Dip Tam Rock Carving in Sam Dip Tam and the Tin Hau Temple, Yam Kom Tau Village Rural Committee and the Yeung's Ancestral Hall in Yau Kom Tau as these sites fall within 50 m of the Preferred Option of the drainage tunnel alignment or associated Intakes/Outfall construction activities. Construction works that generates excessive vibration in close proximity to these sites should be restricted to protect the building from adverse vibration impacts and to ensure that the building structures will not be damaged as a result of these impacts.

In order to ensure that no structural or superficial damage will be caused by the construction activities, a precautionary approach involving a pre-construction condition survey and establishment of appropriate vibration limits for the potentially impacted structures should be adopted. Protection measures for the potentially impacted structures, if considered necessary from the pre-construction condition survey, should be implemented prior to the commencement of construction works. Vibration monitoring during the construction phase should be undertaken as part of the EM& A programme.

## **8.7 Residual Impacts**

With the implementation of the mitigation measures recommended in the previous section, no residual impacts are expected.

## **8.8 Environmental Monitoring and Audit**

Baseline and vibration impact monitoring should be undertaken in the proximity of the potentially impacted sites at Lo Wai, Sam Dip Tam and Yau Kom Tau to ensure the performance meets with the vibration criteria to be discussed and agreed with AMO.

## **8.9 Conclusion**

A literature review supplemented by an archaeological investigation identified no sites of archaeological significance in the Study Area. No mitigation measures for archaeological resources are considered necessary.

One Grade III building (Po Kwong Yuen Monastery at Lo Wai) and 86 historical buildings and structures were identified within the Study Area during the built heritage survey. Most of the identified sites except a few sites at Lo Wai, Sam Dip Tam and Yau Kom Tau settlement areas are located over 70 m from the Preferred Option of the drainage tunnel alignment and the associated Intakes/Outfall construction activities.

Potential vibration impact on a number of historical buildings and structures at Lo Wai, Sam Dip Tam and Yau Kom Tau has been identified in *Section 8.5.2* and appropriate mitigation measures have been recommended including the adoption of construction methods that minimises generation of excessive vibration, a pre-construction survey to establish the existing condition of the potentially affected buildings and vibration monitoring as part of the EM&A programme.