

9. IMPACT ON CULTURAL HERITAGE

9.1 Introduction

9.1.1 This chapter will address any potential adverse impacts associated with the Project. This assessment has been carried out following the criteria and guidelines of Annexes 10 and 19 of the EIAO TM and Clause of 3.4.8 of the Study Brief. The whole alignment was studied for potential impacts on historical buildings and cultural heritage sites.

9.1.2 Thirty five intakes that will intercept existing flows and divert them via 30 dropshafts to the drainage tunnel. The intakes will include the in-stream flow diversion structure (including screen for preventing debris and large stones from entering the tunnel system), vortex inlet to facilitate stable flow within the drop shaft, the drop shafts, a low flow bypass channels and maintenance platforms. The drop shafts vary in height with the shortest being 8 metres and the longest being approximately 180 metres;

9.2 Objectives of the Cultural Heritage Impact Assessment

9.2.1 A Cultural Heritage Impact Assessment CHIA must be undertaken in order to identify the impact that any proposed construction will have on the cultural heritage of the Project. The specific objectives include the following:

- to identify and highlight all archaeological deposits, cultural heritage resources and built heritage structures in the Study Area;
- to assess direct and indirect impacts which may result from the proposed construction and operation activities of this Project on these resources; and
- to recommend mitigation of impacts where required.

9.3 Desk Based Study

Built Heritage Resources

9.3.1 A number of built heritage resources were identified in the Cultural Heritage Review as possibly being within 50 m of proposed works areas; however, changes and refinements in project plans have now excluded these from consideration. Table 9.1 illustrates that they are located more than 50m from works areas and no impacts will result. As a result of this, no further investigation of these resources will be required.

Table 9.1
Distance from Works Areas of Heritage Resources Outside the
Defined 50m Study Area

Heritage Resource	Works Area	Approx. Distance from area
St. Stephens Girls College	W8	125 m
Old Pathological Institute	W8	250 m
Old British Military Hospital	B2	125 m
Ohel Leah Synagogue	RR1	68 m
Ex-Commodore's House	MGR2	No longer designated as a works area
Pedder Building	C10-3	No longer designated as a works area
Lover's Rock	BR4	190 m
Tram Bridge	M3 M4	No longer designated as a works area
Botanical Gardens	W5(P)	75 m
Sikh Temple	C15-1	No longer designated as a works area
Muslim Cemetery	C15-1	No longer designated as a works area
First Church of Christ, Scientist	MCL3	No longer designated as a works area
Pinewood Battery	W11	200 m
Pinewood Battery	W17	400 m
Pinewood Battery	PFLR1	500 m
Mount Davis Batteries	W12	> 1000 m

9.3.2 The following known built heritage resources were identified as part of the desk-based study;

Haw Par Mansion and Gardens - Tai Hang Road

(i) The Public Gardens

9.3.3 Haw Par Public Gardens, more commonly known as Tiger Balm Gardens, were completed in 1935 next to the private residence of the Haw family, Haw Par Mansion. The public gardens served to advertise the family business, Tiger Balm medicinal ointment, and to provide a place of entertainment and to teach traditional Chinese cautionary tales. Apparently, there was no formal design of the gardens in advance of construction. Each of the exhibitions was described verbally by Haw Boon-haw to craftsmen from Shantou. The original gardens covered eight acres and were completed in 1935.

9.3.4 The gardens were altered a number of times during Aw Boon-haw's lifetime, and were reduced by half, a number of years ago, when the southern and western sides were set back

to accommodate construction of private apartments. The remaining public gardens were recently demolished to make way for another residential development project.

(ii) Haw Par Mansion and Private Gardens

- 9.3.5 As part of this latest redevelopment scheme, it was agreed that the mansion and its private gardens, including the existing boundary walls and gateway would be preserved. This site was granted Grade II status and was surrendered to the SAR government in 2001, see Figure 9.1 for the current boundary of the historical site.
- 9.3.6 The mansion and private gardens also date from the 1930's and were built by Aw Boon-haw, an entrepreneur and philanthropist, who along with his brother made his fortune from the development and marketing of Tiger Balm ointment. Aw Boon-haw also invested in the newspaper industry, founding the "Star Press", and became known as "King of the Press". After his death in 1954 his daughter, Sally Aw Sian took over the business.
- 9.3.7 The cultural significance of this site is integrally connected to the now demolished public gardens, which were highly placed in the collective memory of Hong Kong inhabitants and formed a highly visible link to a bye-gone, but fondly remembered era in Hong Kong's historical record.

Former Explosives Magazine / Old Ammunitions Depot - former Victoria Barracks, Queensway

- 9.3.8 The Explosives Magazine, a Grade I site, may have been constructed as early as 1843 by Major Edward Aldrich, the Commander of the Royal Engineers who built the Murray Building and Victoria Barracks. There is no record of exactly when the magazine was built, but documents show it had been in operation when the British Army opposed government proposals to build Kennedy Road in 1868. Army officials claimed the safety of the ammunition depot, surrounded by steep slopes, might have been placed in danger by any nearby traffic. The military finally conceded in 1876 and agreed that the road could be built on the upper slope above the magazine depot. The stores were built in such a way that an accidental explosion would only be directed upwards through the roof.

Hop Yat Church - 2 Bonham Road

- 9.3.9 Dr. James Legge, a Scottish missionary and sinologist who arrived in Hong Kong in 1843 founded the church. He established the Union Church in Hollywood Road in 1844 with services in English and Chinese. In 1926 the Chinese congregation moved to the new Hop Yat Church on Bonham Road (Figure 9.9). The cornerstone of the original church is incorporated in the present building. The church is a Grade II historical building.
- 9.3.10 The building was repaired in 1987 when air-conditioning was also installed. It is in near original condition and has undergone only superficial alterations and retains high architectural value in terms of rarity and in the integration of western inspired Gothic features. It has cultural significance, as it is the home of the oldest surviving Chinese-Christian group in Hong Kong.

Catholic Cathedral of the Immaculate Conception - 16 Caine Road

- 9.3.11 The structure was originally constructed between the years of 1883 and 1888. A recent conservation programme started in 1997 when major roof leakages were reported. The major repairs and upgrading of the Cathedral to fit the needs of its community and to enhance its historic character were completed in 2002. The conservation works received Honorable Mention from the UNESCO Heritage Awards, 2003.
- 9.3.12 The Catholic Cathedral of the Immaculate Conception retains its well-conserved architectural significance. Alterations to the site have been minimal and in keeping with the overall integrity of the building. The cultural significance of the structure lies in its value to the local and international Catholic community and its continuous use as a religious centre for more than a century.

Terrestrial Archaeology

- 9.3.13 The Western Portal is located on the rocky promontory between reclamations at Pok Fu Lam and Cyber Port and has no archaeological potential. The Eastern Portal is located in a stream course and on rock face at an elevation of approx. 100m PD. Modifications to the landscape and the elevation make the archaeological potential of the area low. There are no known archaeological sites in the vicinity of any of the proposed works areas. No further investigation is required.

Marine Archaeology

- 9.3.14 The Western Portal is located south of Sassoon Road, in a rocky headland between Pok Fu Lam to the north and Cyber Port to the south. It will serve as the outfall for stormwater discharge for the drainage tunnel. Works will be confined to boring and blasting for the portal, and construction of a hydraulic stilling basin but will not involve any offshore works or reclamation that could potentially impact on marine archaeological deposits. There are no known marine archaeological sites in the offshore areas to the west of the alignment portal at Pok Fu Lam, therefore there will be no potential impacts to marine archaeological resources and no further investigation is required.

Cultural and Historical Landscapes

- 9.3.15 No cultural or historical landscapes were identified in the desk-based study.

Historical Graves

- 9.3.16 No historical graves were identified in the desk-based study.

9.4 Results of the Field Survey

- 9.4.1 A field survey was undertaken for the entire alignment. No other resources were identified apart from those already identified in the desk-based study. Detailed inventory forms of the recorded resources can be found in Appendix E. Descriptions of the resources have also been included in the following paragraphs;

Haw Par Mansion and Private Gardens

- 9.4.2 Haw Par Mansion is a Chinese-style three-story building with a green tiled roof and red columns (Figure 9.2). It has hexagonal towers with green tiled pagoda-style projecting roofs; the lower story is cream color stucco and the upper storeys are red brick with large decorative windows. Deep balconies ring each story with plain colonnades. The interior has many significant and opulent decorative features, including excellent examples of cabinetry and stained glass windows. There is extensive use of the color red and of circular Art-Deco motifs in windows, furnishings and built in cabinets to display jade and other collections belonging to the family.
- 9.4.3 The Haw Par Mansion represents an eclectic architectural style, mixing Chinese and Western features in an idiosyncratic manner. This personal style and high rarity value give it high architectural significance. The cultural significance of the mansion is also high due to its historical associations with an important Hong Kong and Asian family and with a pivotal era of local history.
- 9.4.4 The boundary wall is constructed of cut stone masonry and is divided into four receding levels each with a sloping capping course and moldings (Figure 9.3). At intervals are stepped projecting piers with molded capitals that span the middle levels. The base of the wall has a curved projecting footing over decorative moldings. At the top of the wall curved brackets support the ornate balustrade.
- 9.4.5 The gateway was built in the form of a four-storey hexagonal pagoda, of cut stone masonry (Figure 9.4). The lowest floor has an arched entranceway with wrought iron and glass doors. Above this, there is a floor with decorative stone masonry coursing and a central window with ornate ironwork. It is topped with projecting moldings. The third level has large windows on each face set between red semi-columns. The Chinese style pagoda roof is green tiled with ornate finials. The upper story has red decorative elements and a similar style roof. At each side of the pagoda gateway are fancy cut stone pillars with moldings standing on three tiers of receding masonry, set into the angle between gateway and terrace wall. The gateway has high architectural significance because of its craftsmanship and in that it reflects closely the ornate and colorful Chinese style characteristic of the Haw Par Mansion and of the former public gardens.

Former Explosive Magazine of the Former Victoria Barracks

- 9.4.6 The complex is built into the sloping hillside on a substantial cut stone platform supporting a surrounding wall. The three remaining structures are separated by large earth blast bunks known as the North and South Traverses. The bunks are retained by random rubble walls and the surcharge is covered by grass and planted with ornamental trees and shrubs. The site plan can be seen in Figure 9.5.
- 9.4.7 The L-shaped building, a former laboratory, is a single storey structure with thick granite walls and a tiled roof (Figures 9.6 and 9.7). On the southern side there is a colonnaded verandah with stone paving. There is also a small detached toilet block at one end. The north face of the building has numerous windows with plain projecting canopies and moldings below the eaves.

- 9.4.8 The central building, known as Magazine A served as a storehouse for explosives (Figure 9.8). It is built of granite and has a barrel vaulted roof. A red brick annex building was constructed at the eastern end of Magazine A, as was a small detached toilet block.
- 9.4.9 The third building, Magazine B, is located to the south at the foot of the slope. It is a single story stone walled structure with a verandah on the north and a roof similar to that of Magazine A.
- 9.4.10 The Former Explosives Magazine complex retains architectural significance as a fine example of a utilitarian, military complex from the earliest years of colonial Hong Kong. Although the compound and individual buildings have undergone superficial alterations they retain a wide range of original features and have high architectural value in terms of rarity. The overall cultural significance of the complex is also high as it is one of the few military compounds left intact in Hong Kong.

Hop Yat Church

- 9.4.11 Hop Yat Church is built on a high terrace supported by a curving, cut stone retaining wall and is accessed by a flight of steep stairs. The Church is in a simplified Gothic style with pointed arches and flying buttresses (Figure 9.10). The building is constructed of brick and stucco painted cream with brown trim and decorative brick courses creating a striped effect inside the recessed alcoves. The windows are decorated with ornate tracery on both upper and lower storeys. It has a rectangular plan with a single bell tower at the front topped by a balustrade, main hall on the first floor and offices and secondary hall on the ground floor (Figure 9.11). It has a pitched roof with steel truss supported on buttresses.

The Catholic Church of the Immaculate Conception

- 9.4.12 The Catholic Cathedral of the Immaculate Conception (Figure 9.12) is an imposing Gothic style building in cruciform shape with a tower at the intersection of nave and transepts (Figure 9.13). The structure is built of cut stone and stucco with an ornate projecting portico with three arches at the entrance. The façade has a triple stained glass window with rosette above and is flanked by piers topped with pointed finials; the sidewalls are buttressed and have narrow windows with decorative glasswork.

9.5 Identification of Impacts

Construction Phase

- 9.5.1 Impacts will arise from site formation and engineering works associated with the construction of a TBM bored-tunnel and intake shafts (that will intercept existing flow and divert them to the drainage tunnel). These adverse impacts can include potential structural damage from groundborne vibration, superficial external damage from contact with construction equipment and machinery operations.

Operation Phase

- 9.5.2 There will be no adverse impacts arising from the operation of the tunnel itself. Potential adverse impacts may arise from alterations to the existing environment at sites in the vicinity of surface structures.

9.6 Prediction of Impacts

Construction Phase

- 9.6.1 The majority of the tunnel excavation will not result in any adverse impacts as it will be carried out at a minimum depth of 30m and a maximum depth of 350 m below the ground surface. It will mainly be dug by tunnel boring machine (TBM).
- 9.6.2 Potential impacts will be limited to the works areas around designated tunnel portals and intake shafts. Details below;

Eastern Portal Site

- 9.6.3 Site formation works at the Eastern Portal site will include modifications of the site for construction vehicle access, equipment and tunnel segment storage, water treatment facilities, an electricity sub-station, a workshop and a stockpile for excavated material and a temporary engineering and construction office. The engineering works will consist of initial excavation to establish the portal and spoil handling facilities. It will also include the establishment of site offices.

Western Portal Site

- 9.6.4 The western portal will consist of a large tunnel opening with an apron leading down to a stilling basin and silt trap. There are no cultural heritage resources in the vicinity of the western portal.

Intake Structures

- 9.6.5 The only intake shaft that is the vicinity of an historical building is W3(P), which is located adjacent to the former explosive magazine of the former Victoria Barracks. This intake shaft will be excavated by raise boring method. Spoil material from the excavation works will be dropped down to the tunnel and removed via the two tunnel portals. The temporary works sites will include water treatment facilities, electricity provision, crane, storage area and raise bore rig/ reverse circulation drilling plant. The intake structure will consist of a deep vertical concrete shaft and a surface approach channel that will intercept the upstream flow.

Operation Phase

- 9.6.6 Potential adverse impacts may arise from alterations to the existing surface environment in the vicinity of the Eastern Portal, specifically in the construction of a permanent vehicle access road in close proximity to northeastern corner of the boundary wall and gateway of Haw Par Mansion. Details of the impacts can be found in section 9.7.

9.7 Evaluation of Impacts

Construction Phase

- 9.7.1 Four built heritage resources were identified as being located within 50 m of works areas. The details of the impact evaluation are presented in the table below;

Table 9.2
Evaluation of impacts associated with the proposed works (construction phase)

Heritage Resource	Minimum distance from works area	Evaluation of Impacts
Haw Par Mansion	<p>From works area (for construction of tunnel portal and permanent vehicle access ramp): 20 m</p> <p>The building is situated on a terrace approximately 20 m higher than the surface of the works area. It is separated from the works area by a cut stone retaining wall.</p>	<p>As the mansion contains a number of fragile structural and decorative elements, damage may occur from groundborne vibration associated with the engineering works for the construction of the tunnel portal.</p> <p>Building settlement is not expected, as the area is inland rock formation. A well-developed valley is situated at the works area and groundwater table draw down will be negligible.</p>
Boundary wall of Haw Par Mansion	<p>From works area for construction of the tunnel portal: minimum 3 m buffer zone to be provided All construction works will take place within the proposed temporary works area and permanent work boundaries, which will have standard DSD site hoarding** located around the periphery, except exit/entrance.</p>	<p>Engineering works during the construction of the tunnel portal will consist of the initial excavation for establishing the tunnel portal and spoil handling. The boundary wall shows evidence of structural deterioration in the form of cracks and further damage may occur from ground borne vibration associated with the engineering works. The gateway contains fragile architectural and decorative elements, which also may be damaged by ground borne vibration associated with the engineering works described above.</p>
Gate of Haw Par Mansion	<p>From works area for the proposed permanent vehicle access ramp: minimum 3 m buffer zone to be provided. All construction works will take place within the proposed temporary works area and permanent work boundaries, which will have standard DSD site hoarding** located around the periphery, except exit/entrance.</p>	<p>After the engineering works for the tunnel portal have been completed, the construction of a permanent vehicle access ramp has been proposed. The 3 m buffer zone and hoarding will provide sufficient protection to ensure that there will be no adverse impacts to the wall or gate from machinery operation or equipment. It must also be ensured that the gate and wall will be accessible at all times for routine inspection and maintenance.</p>

Heritage Resource	Minimum distance from works area	Evaluation of Impacts
Former Explosive Magazine of the former Victoria Barracks;		
Laboratory Block	3 m	No adverse vibration impacts will result from the works associated with the excavation of the intake structure, as excavation will be by raise boring method. Adverse impacts from contact with machinery operation or equipment will not occur, as the structures are separated from the works area (which will be enclosed by standard DSD site hoarding*) by a stone retaining wall.
North Transverse Magazine A	10 m	
South Transverse Magazine B	10 m	
	15 m	
	35 m	
Retaining wall	3 m	The wall does not contain any fragile structural elements, however, damage to the wall was visible in the form of cracks and vegetation growth. Adverse vibration impacts may arise from the excavation of the intake structure. Adverse impacts from contact with machinery operation or equipment will not occur, as there is a 3 m by a buffer zone between the wall and the works area, which will be enclosed by standard DSD site hoarding*.
Catholic Cathedral of the Immaculate Conception	48 m	No adverse impacts will result from the excavation of the intake structure as the works are located at a sufficient distance from the cathedral to provide an adequate buffer zone.
Hop Yat Church	50 m	No adverse impacts will result from the excavation of the intake as the works are located at a sufficient distance from the church to provide an adequate buffer zone.

Remarks:

* See Figure 9.1 for the site plan of the temporary works area and Haw Par Mansion, boundary wall and gate at the Eastern Portal Location

* See Figure 9.18 for detailed description of the site hoarding

Operation Phase

9.7.2 Four built heritage resources were identified as being located within 50 m of sites where permanent surface alterations will occur. The details of the impact evaluation are presented in the table below:

Table 9.3
Evaluation of impacts associated with the proposed works (Operation phase)

Heritage Resource	Minimum distance from works area	Intervening landscape	Potential impacts
Haw Par Mansion	20 m	Stream bed, steep worked slope and elevation difference of > 20 m (Figure 9.14)	None. An existing footpath is situated along the northeastern section of the wall and is outside of the permanent site boundary, thus access to the mansion, wall and gate will not be impacted by the operation of the drainage tunnel. As well, existing trees will be retained and additional tree planting will enhance the environment of the site.
Former Haw Par Boundary Wall and Gate	3 m	N/A (Figure 9.15)	None. An existing footpath is situated along the northeastern section of the wall and is outside of the permanent site boundary, thus, access to the mansion, wall and gate will not be affected by the operation of the drainage tunnel. As well, existing trees will be retained and additional tree planting will enhance the environment of the site.
Former Explosive Magazine	3 m from the retaining wall	Streambed, hill slope, elevation difference of > 10m (Figure 9.16)	None, the intake structure will be located in an area where the existing water course has already been artificially channeled.
Catholic Cathedral of the Immaculate Conception	48 m	Modern buildings, access road into Cathedral compound and compound area (Figure 9.17)	None, as the intake structure will be situated in an existing urban setting and at a sufficient distance from the building to have no impact on the setting of the cathedral.
Hop Yat Church	50 m	Large residential block and associated landscaping (Figure 9.10)	None, as the intake structure will be situated in an existing urban setting and at a sufficient distance from the building to have no impact on the setting of the church.

9.8 Mitigation Measures

Construction Phase

9.8.1 The following resources will require mitigation measures to negate adverse impacts arising from the works during the construction phase;

Table 9.4

Recommended mitigation measures for impacted built heritage resources (construction phase)

Resource	Impact Assessment	Mitigation Recommendation
Haw Par Mansion	<p>The mansion contains a number of fragile structural and decorative elements that may be damaged by groundborne vibration associated with the engineering works for construction of the tunnel portal.</p> <p>No adverse impacts are predicted for the construction of the permanent vehicle access ramp.</p>	<p>A condition survey must be undertaken prior to the commencement of construction works for the tunnel portal. This survey will assess the structural integrity of the building, (with special attention paid to any fragile architectural features) and determine if vibration monitoring or other protective measures will be necessary during the construction phase. Detailed description of the survey is provided in EM &A chapter.</p> <p>No mitigation required.</p>
Boundary Wall and Gate of Haw Par Mansion Site	<p>The wall shows evidence of structural deterioration in the form of cracks and further damage may occur from groundborne vibration associated with engineering works associated with construction of the tunnel portal. The gate contains fragile architectural and decorative elements, which also may be damaged from groundborne vibration associated with the engineering works for the tunnel portal.</p>	<p>A condition survey must be undertaken prior to the commencement of construction works for the tunnel portal, to assess the structural integrity of the wall and gate and to determine if vibration monitoring or other protective measures will be necessary during the construction phase. Detailed description of the survey is provided in EM &A chapter.</p>
	<p>A buffer zone will be required to ensure that the wall and gate are not damaged by machinery operation or related construction activities on the site (during works for both the tunnel portal and the permanent vehicle access ramp).</p>	<p>A buffer zone (minimum of 3 m) with an obstruction free access point must be maintained between the boundary wall/ gate and the temporary works area (during construction works for both the tunnel portal and the permanent vehicle access ramp) at all times to enable access for routine maintenance. The temporary works area will be enclosed by standard DSD site hoarding, which will provide adequate physical protection to the adjoining built heritage resources and ensure that the wall and gate are not damaged by machinery operation or related construction activities.</p>
Former Explosive Magazine of the former Victoria Barracks;		
Laboratory Block North transverse Magazine A South Transverse	<p>No adverse impacts will result from the project</p>	<p>No mitigation required.</p>

Resource	Impact Assessment	Mitigation Recommendation
Magazine B		
Retaining wall	<p>The wall does not contain any fragile structural elements, however, damage to the wall was visible in the form of cracks and vegetation growth. Adverse vibration impacts may arise from the excavation of the intake structure.</p> <p>The wall may receive damage from contact with equipment and machinery operations within the works area if an appropriate buffer zone is not provided.</p>	<p>A condition survey must be undertaken prior to the commencement of construction works, to assess the structural integrity of the wall and the extent of damage from cracks and vegetation growth, to determine if vibration monitoring or other protective measures will be necessary during the construction phase. Detailed description of the survey is provided in EM & A chapter.</p> <p>A buffer zone (minimum of 3 m) with an obstruction free access point must be maintained between the retaining wall and the works area (which will be enclosed by standard DSD site hoarding) for the duration of the construction phase. This will ensure that the wall is not damaged by machinery operation or related construction activities.</p>
Catholic Cathedral of the Immaculate Conception	No adverse impacts will result from the project.	No mitigation required.
Hop Yat Church	No adverse impacts will result from the project.	No mitigation required.

Operation Phase

9.8.2 No resources will require mitigation measures during the operation phase.

9.9 Environmental Monitoring and Audit Requirements for Cultural Heritage Resources

9.9.1 Details of the environmental monitoring and audit programme for impacted cultural heritage resources are provided below;

Haw Par Mansion (including boundary wall and gate)

9.9.2 A condition survey must be undertaken by a qualified professional prior to the commencement of construction works for the tunnel portal, in order to assess the structural integrity of the mansion, wall and gate (with special attention paid to any fragile architectural features). A report containing description of the types of construction, identification of fragile elements, an appraisal of the condition and a photographic record must be prepared. The report must also provide an assessment indicating whether further precautionary measures will be necessary during the construction phase, and if so provide details for sufficient protective measures, including monitoring for vibration control to ensure that no damage to the structure and fabric of the house, wall and gate results from the construction works. The report must be submitted to AMO for approval before construction activities commence. Upon approval the contractor shall ensure that the

appropriate monitoring and precautionary measures are put into place. Implementation of the condition survey and any recommended protective measures will be the responsibility of the contractor.

- 9.9.3 The contractor will also be responsible for ensuring that a buffer zone with a minimum width of 3 metres and an obstruction free access point is maintained between the boundary wall/ gate and the temporary works area (during construction works associated for both the tunnel portal and the permanent vehicle access ramp). This is to enable access for routine maintenance works on the wall and to ensure that the wall is not damaged by machinery operation or related construction activities. The temporary works area will be enclosed by standard DSD site hoarding (Figure 9.18).

Former Explosive Magazine of Victoria Barracks

- 9.9.4 A condition survey must be undertaken by a qualified professional prior to the commencement of construction works in order to assess the structural integrity of the retaining wall and the extent of damage from cracks and vegetation growth. A report containing a description of the types of construction, identification of fragile and/or endangered elements, an appraisal of the condition and a photographic record of the retaining wall must be prepared. The report must also provide an assessment indicating whether further precautionary measures will be necessary during the construction phase, and if so provide details for sufficient protective measures, such as monitoring for vibration control, to ensure that no damage to the retaining wall results from the construction works. The report must be submitted to AMO for approval before construction activities commence. Upon approval the contractor shall ensure that the appropriate monitoring and precautionary measures are put into place. Implementation of the condition survey and any recommended protective measures will be the responsibility of the contractor.
- 9.9.5 The contractor will also be responsible for ensuring that a buffer zone with a minimum width of 3 metres and an obstruction free access point is maintained between the retaining wall and the temporary works area (for the duration of the construction phase). The works area will be enclosed by standard DSD site hoarding.

9.10 Conclusions

- 9.10.1 The works associated with proposed drainage tunnel will have no impact on terrestrial or marine archaeological resources, cultural or historical landscapes or historical graves. Four built heritage resources were identified as falling within the 50 m Study Area of the project. Two of these resources, i.e. the Catholic Cathedral of the Immaculate Conception on Caine Road and the Hop Yat Church on Bonham Road, were found to be located at sufficient distance from the works that no adverse impacts would result from the project during either the construction or operation phases. Two other resources (located within close proximity to works areas) will require mitigative measures during the construction phase to ensure that they will receive adequate protection against the identified adverse impacts. These resources are the Haw Par Mansion, wall and gate and the Former Explosive Magazine of the Victoria Barracks.

References

AMO file AM93 – 0526

AMO file AM99 – 0956

Bard, S.M. (1988) *In Search of the Past*. Urban Council, Hong Kong

Rodwell, S. (1992) *Historic Hong Kong*. Odyssey, Hong Kong.

Siu, A, K.K. and Sum, S (eds) (2001) *Heritage Trails in Urban Hong Kong*. Man Lee Book Shop, Hong Kong.

Tang, M.H. *et al* (1988) *Historical Hong Kong Walks*. The Guidebook Company, Hong Kong.