8. IMPACT TO CULTURAL HERITAGE

8.1. INTRODUCTION

Background

8.1.1. The Project comprises the construction of a new Annex Block at the HKO Headquarters, for meeting the existing shortfall in office space and functional areas for developing and delivering HKO's essential operation and services and organising public education and outreach activities. Other associated and supporting facilities will also be provided to suit HKO's operational needs.

8.1.2. The Project also covers the refurbishment works to convert the existing Red House as a History Room for telling the heritage story of HKO, road widening works for EVA at the existing access road, and other associated works.

Project Site

8.1.3. The Project Site is located within the boundary of HKO Headquarters. HKO Headquarters, located at 134A Nathan Road, Tsim Sha Tsui, was a Declared Monument (DM) in 1984 under the *Antiquities and Monuments Ordinance (Cap. 53).* The HKO Headquarters is also considered as a predominate ecological hub in South Kowloon area. Developments in the vicinity include Tsim Sha Tsui District Kaifong Welfare Association, Mira Place, St. Andrew's Church Compound (Grade 1 historic building), Antiquities and Monuments Office (AMO) Head Office (Former Kowloon British School (DM)), Knutsford Terrace, etc.

8.1.4. The Project Site is located in the southern side of HKO Headquarters with the existing car park situated there.

Objectives of the Cultural Heritage Impact Assessment (CHIA)

- To evaluate whether the Project is acceptable from cultural heritage conservation point of view based on existing and collected information and to propose effective mitigation measures.
- To avoid or minimise adverse impacts to the cultural heritage at the HKO Headquarters.

Structure of the CHIA Report

- To introduce the environmental legislation and standards adopted in this report.
- To introduce the assessment methodology adopted in this report.
- To carry out a baseline study on the site: 1) historical background; 2) inventory list of cultural heritage resources within or around the HKO Headquarters, including archaeological sites, historic buildings and structures, and landscape features.

- To evaluate potential impacts of the new works on the cultural heritage.
- To propose effective mitigation measures.
- To provide a conclusion for the report.

8.2. ENVIRONMENTAL LEGISLATION AND STANDARDS

Environmental Impact Assessment Ordinance (Cap 499)

8.2.1. This ordinance is formulated for "assessing impacts on the environment of certain projects and proposals, for protecting the environment and for incidental matters". It specifies the need of producing an Environmental Impact Assessment (EIA) report under certain circumstances. According to the ordinance, "environmental impact" includes "an effect of the change on physical and cultural heritage". It has defined "site 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 (Cap. 53)* and any place, building, site, or structure or a relic identified by the AMO to be of archaeological, historical or palaeontological significance".

Technical Memorandum on Environmental Impact Assessment Process (Environmental Impact Assessment Ordinance (Cap 499, S. 16)) and Guidance Notes on Assessment of Impact on Sites of Cultural Heritage in Environmental Impact Assessment Studies

8.2.2. This Memorandum includes 12 sections and 22 annexes covering key EIA process steps and issues. Annex 10 is the "Criteria for Evaluating Visual and Landscape Impact, and Impact on Sites of Cultural Heritage". Annex 19 of the Memorandum is "Guidelines for Assessment of Impact on Sites of Cultural Heritage and Other Impacts". It introduces a basic framework of the CHIA report and general content that should be included in the report. It describes "the commonly adopted approaches and methodologies for assessment of impact on sites of cultural heritage and other environmental issues".

8.2.3. The Guidance Notes is a detailed version assisting the understanding of the Memorandum.

Antiquities and Monuments Ordinance (Cap. 53)

8.2.4. This ordinance is formulated for the preservation of objects of historical, archaeological, and palaeontological interest and for matters ancillary thereto or connected therewith. According to the ordinance, subject to subsection (4) of *Section 6*, no person shall— (a) excavate, carry on building or other works, plant or fell trees or deposit earth or refuse on or in a proposed monument or monument; or (b) demolish, remove, obstruct, deface or interfere with a proposed monument or monument, except in accordance with a permit granted by the Authority. (Amended 38 of 1982 s. 7) According to the ordinance "monument" means a place, building, site or structure which is declared to be a monument, historic building or archaeological or palaeontological site or structure under section 3 (Replaced 38 of 1982 s. 2); "proposed monument" means a place, building, site or structure which is declared to be a proposed monument, proposed historic building, or proposed archaeological or palaeontological site or structure under section 2A (Added 38 of 1982 s. 2).

Hong Kong Planning Standards and Guidelines

8.2.5. Chapter 10 of *Hong Kong Planning Standards and Guidelines* is dedicated for giving guidance on conservation in the perspective of land use planning. Section 2 which introduces the principles for the practical pursuit of conservation in land use planning is an essential reference. Section 4.6 "Heritage Conservation and Development Control" is a highly important reference that gives guidance on the conservation of different cultural heritage items during the planning process.

Guidelines for Cultural Heritage Impact Assessment

8.2.6. This document sets the framework and detailed requirements of a CHIA established by AMO as attached in Annex F of the Study Brief (ESB-347/2021) of this consultancy. It provides step-by-step guidance in writing the baseline study, an impact assessment study, and the proposal of appropriate mitigation measures.

8.3. ASSESSMENT METHODOLOGY

International Charters and Guidance

8.3.1. This CHIA references several international charters and guidance, including

- **Venice Charter (1964)** (International Charter for the Conservation and Restoration of Monuments and Sites) – the most fundamental principles and international standards for conservation and restoration of heritage buildings and sites adopted by United Nations of Education, Science & Cultural Organization (UNESCO) & International Council of Monuments and Sites (ICOMOS).
- **The Burra Charter (2013)** (The Australia ICOMOS Charter for Places of Cultural Significance) – a worldwide recognised standard of establishment and implementation of conservation, and provides guidance for the concept and definition of cultural significance.
- **The China Principles (2015)** (Principles for the Conservation of Heritage Sites in China) – a document that covers general conservation principles, a management planning process and intervention guidelines. The China Principles was developed based on the Burra Charter but with modifications made specifically according to local cultural and political conditions in China.

8.3.2. The CHIA includes a built heritage impact assessment (BHIA) and an Archaeological Impact Assessment (AIA) for the construction and operation of the Project and comprising the following tasks.

8.3.3. In accordance with Appendix F of the Study Brief (No. ESB-347/2021), the AIA shall be conducted by qualified archaeologist. This AIA is prepared by Mr. Raymond Ng from ERM who is a qualified archaeologist with over 18 years of archaeological experience, while this BHIA is prepared by Ms. Wendy Ng and Ms. Erica Chim from Revival Heritage Consultants Limited. They are the Professional Members (PM) of the Hong Kong Institute of Architectural Conservationists (HKICON), who possess more than 10 years and 4 years of experience in architectural conservation respectively.

Study Area

8.3.4. In accordance with *Section 3.4.8.2* of the EIA Study Brief No. ESB-347/2021, the assessment area is defined by a distance of 150m from the boundary of the Project Area (i.e., the Project Site) as shown in ***Figure 8.1***.

Assessment Methodology

8.3.5. The scope of the AIA baseline study consisting of desk-top research has been completed according to Clause 2 of Appendix F of the Study Brief (ESB-347/2021). Details are discussed in *Section 8.4.19* and *Section 8.4.20* under archaeological potential evaluation.

8.3.6. A desktop study will be carried out to identify the following features at the Project Site:

- DMs protected by the *Antiquities and Monuments Ordinance* (*Cap. 53*) found within Study Area;
- All proposed monuments; sites and buildings graded or proposed to be graded by the Antiquities Advisory Board (AAB);
- Buildings/structures/sites of high architectural and historical significance and interest; and
- the buildings / structures within the monument boundary but also any structures therein built at grade or underground before 1970 which may have historical and heritage values, whether recorded or not yet identified;
- Cultural landscapes include places associated with historic event, activity, or person 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, fung shui woodlands and ponds, etc.

Assessment Methodology: Field Survey

8.3.7. Field surveys were conducted between August and October 2019:

- To understand and record the built heritage, cultural landscape, and surrounding environment of the HKO Headquarters with photos; and

- To write historical and architectural appraisal of the HKO Headquarters

Impact Assessment

8.3.8. Based on the findings and analysis from baseline study and survey findings, a cultural heritage impact assessment including an AIA and BHIA for the construction and operation of the Project has been conducted.

Sources of Information for Desktop Research

8.3.9. Information collected for desktop study includes the following sources:

- List of declared and proposed monuments protected by the *Antiquities and Monuments Ordinance (Chapter 53)*
- Graded and proposed to be graded historic buildings/ structures/ sites
- Government historic sites identified by AMO
- Lists and archives kept in the Reference Library of AMO including sites of archaeological interest, declared monuments, proposed monuments and recorded historic buildings/ structures/ sites identified by AMO
- Publications on local historical, architectural, anthropological, archaeological, and other cultural studies, such as, Journals of the Royal Asiatic Society (Hong Kong Branch), Journals of the Hong Kong Archaeological Society, AMO Monograph Series and so forth
- Other unpublished papers, records, archival and historical documents through public libraries, archives, and the tertiary institutions, such as the libraries of The University of Hong Kong and The Chinese University of Hong Kong, the Government Records Service, Photo Library of the Information Services Department and so forth
- Any other unpublished archaeological investigation and excavation reports kept by AMO
- Relevant information from AMO's website
- Historical documents which can be found in the Government Records Service, the Land Registry, District Lands Office, District Office, the Hong Kong Museum of History
- Cartographic and pictorial documentations
- Previous AIA, CHIA and / or approved EIA studies conducted within the study area

8.4. BASELINE CONDITION

Historical Background of Hong Kong Observatory

8.4.1. Mount Elgin is a hummock at Tsim Sha Tsui on Kowloon Peninsula that once commanded the view of Victoria Harbour. According to existing known record, Mount Elgin was first

proposed as the residence and office of Governor Hercules Robinson but the plan was not materialised eventually.

8.4.2. Regarded as the most appropriate site for an observatory, Mount Elgin has been the Headquarters of the HKO since 1883. The site was selected after the considerations of the distance from the harbour, the privacy of the site, technical operation, and financial expenditure. The growing of rice in extensive paddy fields near the Observatory was prohibited after the establishment of the Observatory.

8.4.3. The establishment of the Observatory was first proposed to the authority in 1877 by J.M. Price (John Macneile Price), the Surveyor General. Alfred P. Ryder, the Admiral, Commander-in-Chief, also raised the need to establish an observatory in the same year. Their chief intention was to fulfil the essential commercial and maritime needs of the time when sea trading was extremely prosperous.

8.4.4. Apart from the government officials, the Royal Society also played a significant role in the establishment of the Observatory. The Royal Society in London was largely motivated by doing physical research and pursuing scientific knowledge.

8.4.5. Governor John Pope Hennessey was very supportive towards the scheme.

8.4.6. The earliest programme of operations included meteorological observations, time service, and magnetic observation. The first building was constructed at the site in 1883 as the office and residence of the director. The scope of service had expanded throughout so many years. More buildings have been constructed within and outside the site to meet the needs of the expansion.

8.4.7. The Hong Kong Observatory was named Royal Observatory in 1912 and resumed the name Hong Kong Observatory in 1997.

8.4.8. During Japanese Occupation, the Observatory was used as a meteorological station by the Japanese soldiers. It is said that the buildings only suffered superficial damages but almost all the equipment were removed.

Archaeological Background

Topographical and Geological Background

8.4.9. The Cultural Heritage Assessment Area (CHAA) is located in urban area in Tsim Sha Tsui on Kowloon Peninsula. The Project Site is located on a low hill (about 40m) named Observatory Hill (formerly known as Mount Elgin), with a mixture of developed and plantation area, at the southern side of HKO Headquarters which is a declared monument under the *Antiquities and Monuments Ordinance (Cap.53)* at 134A Nathan Road, Tsim Sha Tsui. It is surrounded by HKO Quarters No. 1 to 3 to the north, Observatory Road to the southeast, commercial, and residential buildings at Knutsford Terrace to the south and Tsim Sha Tsui District Kaifong Welfare Association to the west.

8.4.10. The solid geology in the CHAA is mainly fine-grain and medium-grain granite, while the Project Site lies entirely on fine-grain granite. The granite is grey and equigranular, with a fine groundmass of less than 1 mm average grain size and distinctive feldspar megacrysts averaging 8 to 10 mm in length. (CEDD, 2020) (Please refer to ***Figure 8.2*** for geology map of the CHAA).

Historical Background

8.4.11. The written record of the name "Tsim Sha Tsui" appeared very early in the reign of Wanli 萬曆 in Ming Dynasty on the Map of Guangdong's Coastal Defence (廣東海防圖, "Guangdong Hai Fang Tu") at the Local Chronicle of Guangdong (粵大記, "Yue Daji"). The map does not specify if "Tsim Sha Tsui" is a village name but Professor Jao Tsung-I (饒宗頤) believed that "Tsim Sha Tsui" is a village name marked on the map. The name "Tsim Sha Tau" (尖沙頭), which is also regarded as a village name, was recorded on the Xin'an County Gazetteer (新安縣志, "Xin'an Xianzhi"), which was published in the reign of Jiaqing (嘉慶) in Qing Dynasty. Although it was regarded that Kowloon Peninsula was a barren land, the name "Tsim Sha Tsui Village" (尖沙嘴村) was clearly recorded in the reign of Daoguang (道光) in Qing Dynasty at a document sent by Lin Zexu (林則徐) to the Qing government. The document stated that Lin Weixi 林維喜, a villager of "Tsim Sha Tsui Village", was killed by foreigners. Charles Elliot, the British Chief Superintendent of Trade in China also mentioned Lin Weixi being a villager of "Tsim Sha Tsui Village" in a document sent to the Qing government. Due to the lack of primary sources, the information and locations of these places are not clear.

8.4.12. It is believed that survey maps of Tsim Sha Tsui drawn in the 19th century are the earliest known sources showing the locations of the scattered settlements at the area. From the maps, it can be noticed that there were cultivated lands and some settlements around Mount Elgin.

8.4.13. Studying the historical map of 1845 and 1863, cultivated lands can be found at the south, east and north of Mount Elgin. (***Figure 8.3*** to ***Figure 8.4***) Doberck, the first Director of the Observatory also said in 1885 that there were paddy fields around the Observatory.

8.4.14. The map of 1845 drawn by Lieut Collinson shows there were a settlement south to Mount Elgin marked the name "Chimsa tsue" (尖沙嘴) and a settlement north to Mount Elgin marked the name "Chowpae" (with reference to the attached map of the Beijing Convention, the Chinese name of the place may be 仇排). (***Figure 8.3***) Making reference to the map of

1863 prepared by A.P. Elves, the two settlements were still located at similar locations, although the settlement south to Mount Elgin was marked the name "Tsun Shaw Wye" (Chinese name is unknown) and the settlement north to Mount Elgin was not named on the 1863 map. (***Figure 8.4***)

8.4.15. According to historical maps, Mount Elgin has been a hummock. With reference to historical maps and photos, cultivated lands and settlements were sparsely located on flat land at Tsim Sha Tsui so it is believed that there was no settlement on Mount Elgin. No building is annotated at the location of Mount Elgin according to the old maps of Tsim Sha Tsui drawn in 1845 and 1863. (***Figure 8.3*** to ***Figure 8.5***) This is further verified by the statement of Doberck, the first Director of the Observatory, made in 1885 that Mount Elgin was an unsuitable place for living. Doberck said "My private quarters [the first floor of the main building] are very draughty in the winter during the height of the NE monsoon, which is so trying to the health. This cannot of course be helped, as the Observatory should be exposed to the full force of the wind. He also added that even though growing rice in extensive paddy fields near the Observatory was prohibited, the ground had not been drained." He stated that "…during the heavy rains of last summer converted into an extensive swamp, to the malaria emanating from which the intermittent and remittent fevers, from which we all suffered, may be ascribed."

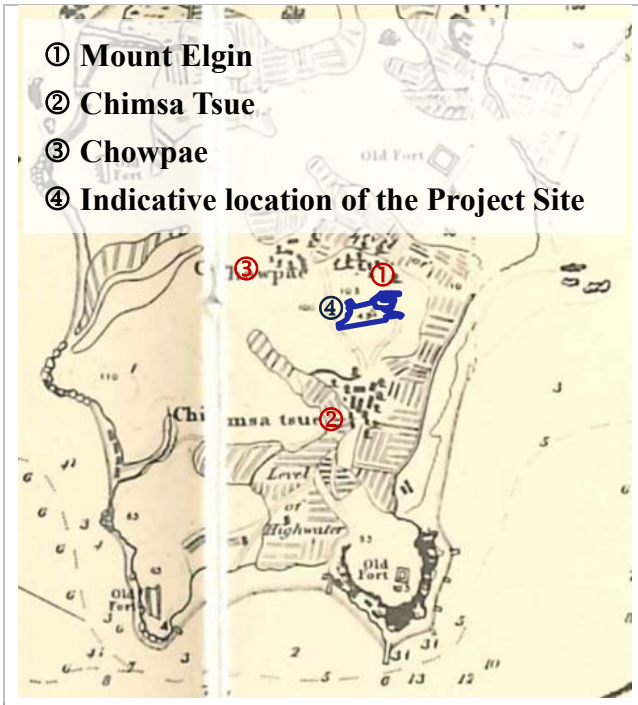


Figure 8.3 Map of 1845 by Lieut Collinson. (Source: Hal Empson, *Mapping Hong Kong: A Historical Atlas*, Hong Kong: Hong Kong Government Information Service, 1992).

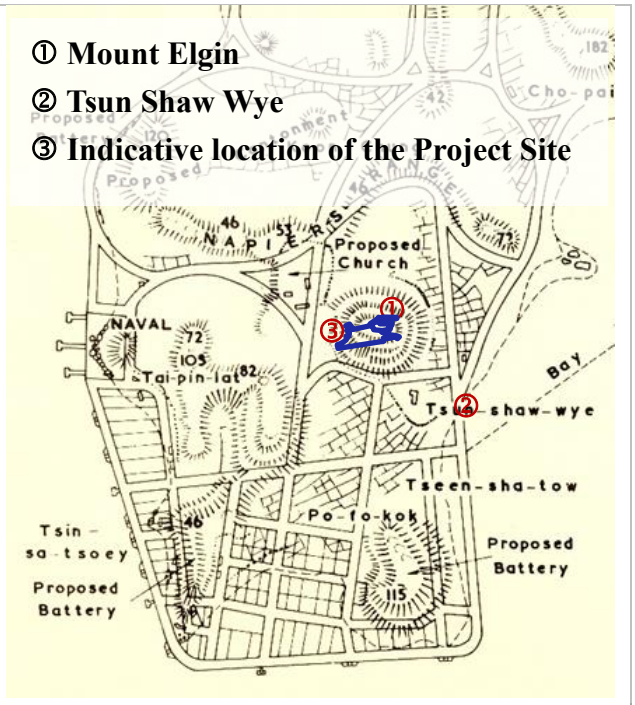


Figure 8.4 Planning Map of Kowloon Peninsula, 1863. (Source: Hal Empson, *Mapping Hong Kong: A Historical Atlas*, Hong Kong: Hong Kong Government Information Service, 1992).

Figure 8.5 Tsim Sha Tsui Showing Cultivated Lands, Houses, and Military Encampments Taken by Felice Beato in 1860. (Source: Wellcome Trust)

Archaeological Background

8.4.16. An archaeological survey was carried out at the Annex Building of 1883 Building in 2015. The Archaeological Report for the Annex Building of the Hong Kong Observatory (Horizon Asia Limited, 2016) examined the foundation of the Annex Building. Two 1m x 2m trial pits (T1 and T2) were conducted in front of the Annex Building and the location of the trial pits are shown in ***Figure 8.2***. The report revealed the foundation of the Annex Building was laid in 1883 and 1912. No cultural layer and cultural deposits earlier than 1883 was found from the layers of the trial pits. The report stated that the foundation of the building was laid directly on the decomposed rock in 1883 and 1912. There was no human activity at certain area on Mount Elgin before the establishment of HKO.

8.4.17. No other relevant EIA studies about the Project Site is found. No Site of Archaeological Interest (SAI) is found within or in the vicinity of the Project Site.

8.4.18. The Project Site, including the area of the proposed Annex Block, was converted into an open carpark and access road in the 1960s. It underwent further extensions in the 1970s, and the carpark and access roads were constructed and paved with approximately 400mm thick concrete after site formation. ***Figure 8.6*** shows the changes in the landscape of the Project Site, including the development of the carpark and its associated access road, from the 1950s to the present day. ***Figure 8.7*** shows an aerial photo taken in 1963, indicating the location of the Project Site. The extent of underground disturbance caused by the construction of roads, buildings, installation of underground utilities, and other infrastructure has diminished the potential archaeological interest of the area. It is very likely that the original topsoil layer, including any traces of a cultural layer, if present, has been largely removed. For summarising the above findings, it is believed that there is no archaeological potential in the Project Site.

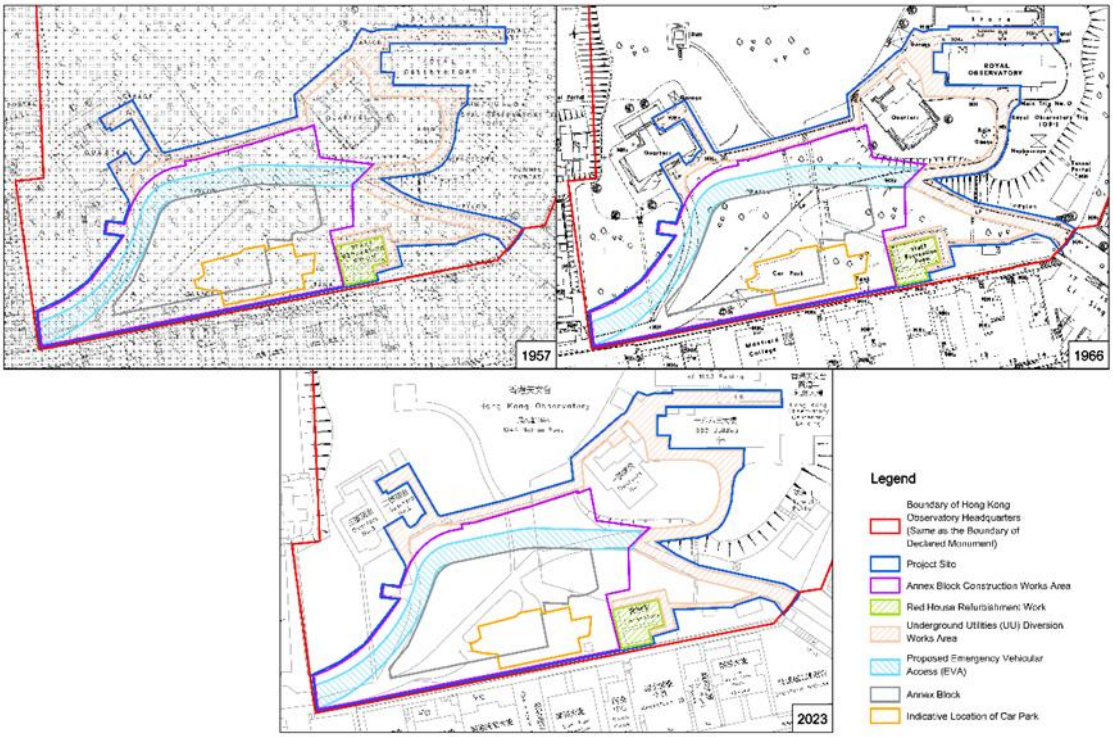


Figure 8.6 Maps showing changes in the landscape of the Project Site from the 1950s to the present day.
(Source: HKMS)

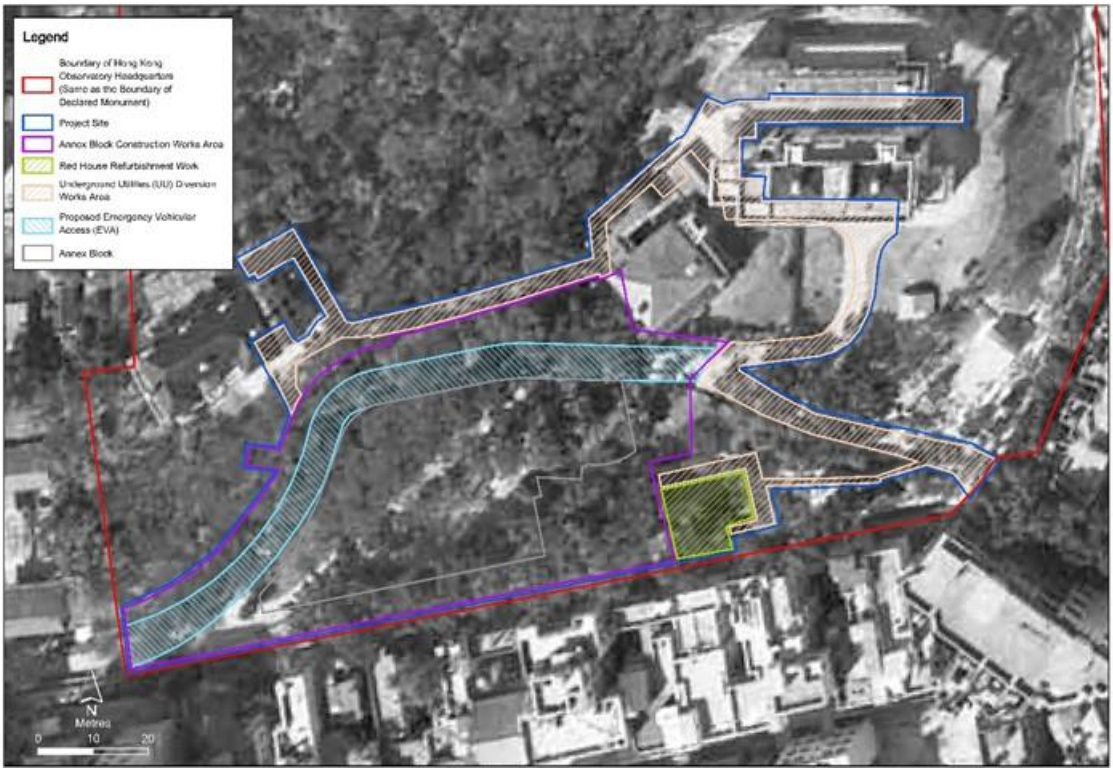


Figure 8.7 Aerial Photo of the Observatory in 1963
(Source: HKMS)

Archaeological Potential Evaluation

8.4.19. The key elements of the proposed works that may involve ground excavation work for the Project include the following:

a) Construction of a new Annex Block at HKO Headquarters with building height not exceed +45 mPD to provide a total gross floor area of approximately 3,800m^2;

b) Refurbishment works to convert the existing Red House into a History Room for showing history of HKO;

c) Road widening works for EVA at the existing access road in HKO Headquarters; and

d) Other associated works including underground utilities (UU) diversion works, utilities connection works within HKO Headquarters and slope upgrading and improvement works.

8.4.20. The proposed new Annex Block which requires ground excavation of 6m from the ground is located on an open carpark and access road, and other key Project ground excavation works like UU diversion works (excavation depth ranging from 1m to 2m from ground level), refurbishment works of the Red House, road widening works for EVA, slope upgrading and associated improvement works are mainly located on developed area and by existing access road. These developed areas and existing roads underwent construction works with high level of ground disturbance. Moreover, the Project Site is located on solid geology with fine-grain granite which is unfavourable to cultural deposit accumulation, therefore, no archaeological potential is expected.

Built Heritage

8.4.21. The heritage buildings have been standing at a landscape with rich flora and fauna. Located at a hummock, there have been many trees from early times. With the practice of horticulture as well as the construction of buildings in different styles throughout the past years, a rich cultural landscape has been formed at Mount Elgin. (***Figure 8.8*** to ***Figure 8.11***)

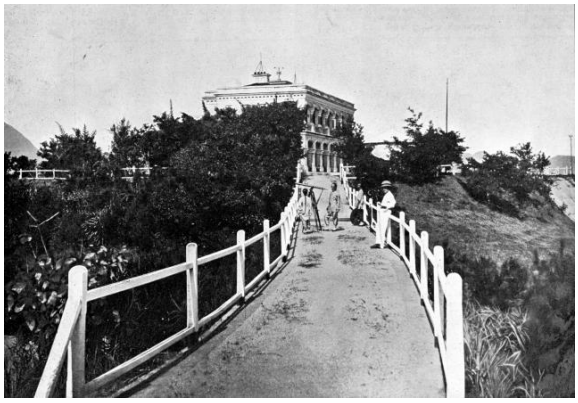


Figure 8.8 1883 Building in 1890s. (Source: Royal Photograph Gallery)

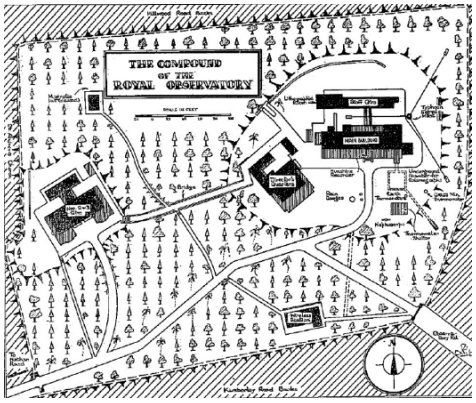


Figure 8.9 Sketch Map of Royal Observatory in 1950s. (Source: L. Starbucks, *A Brief History of the Royal Observatory*, Hong Kong: Government Printers, 1951).

Figure 8.10 Aerial Photo of the Observatory in 1979 (Source: Lands Department)

Figure 8.11 Aerial Photo of the Observatory in 2019 (Source: Lands Department)

8.4.22. Buildings built before 1970 within the HKO Headquarters are shown in the ***Table 8.1***.

Table 8.1 Buildings built before 1970 within the HKO Headquarters

	Architecture	**Built Year**
1	1883 Building	1883
2	Annex Building of 1883 Building	1883
3	Quarters No. 2 and No. 3	1921
4	Garage for Quarters No. 2	Possibly 1921, Pre-1951
5	Underground Chamber	1924
6	Red House	1926
7	Quarters No. 1 & Garage	1934
8	Garage adjacent to Quarters No. 1	c.1955-1957
9	Substation A	c.1960-66
10	White House No. 2	c.1960-66
11	White House No. 1	1966

8.4.23. DM and graded historic buildings around the HKO Headquarters are shown in the ***Table 8.2.***

Table 8.2 Declared Monument and graded historic buildings around the HKO Headquarters

	Architecture	Built Year	Designation
1	Former Kowloon British School	1902	Declared Monument
2	St. Andrew's Church Compound	1904-1910	Grade 1
3	Kowloon Bowling Green Club	1926 (western part) 1955 (eastern part)	Grade 3

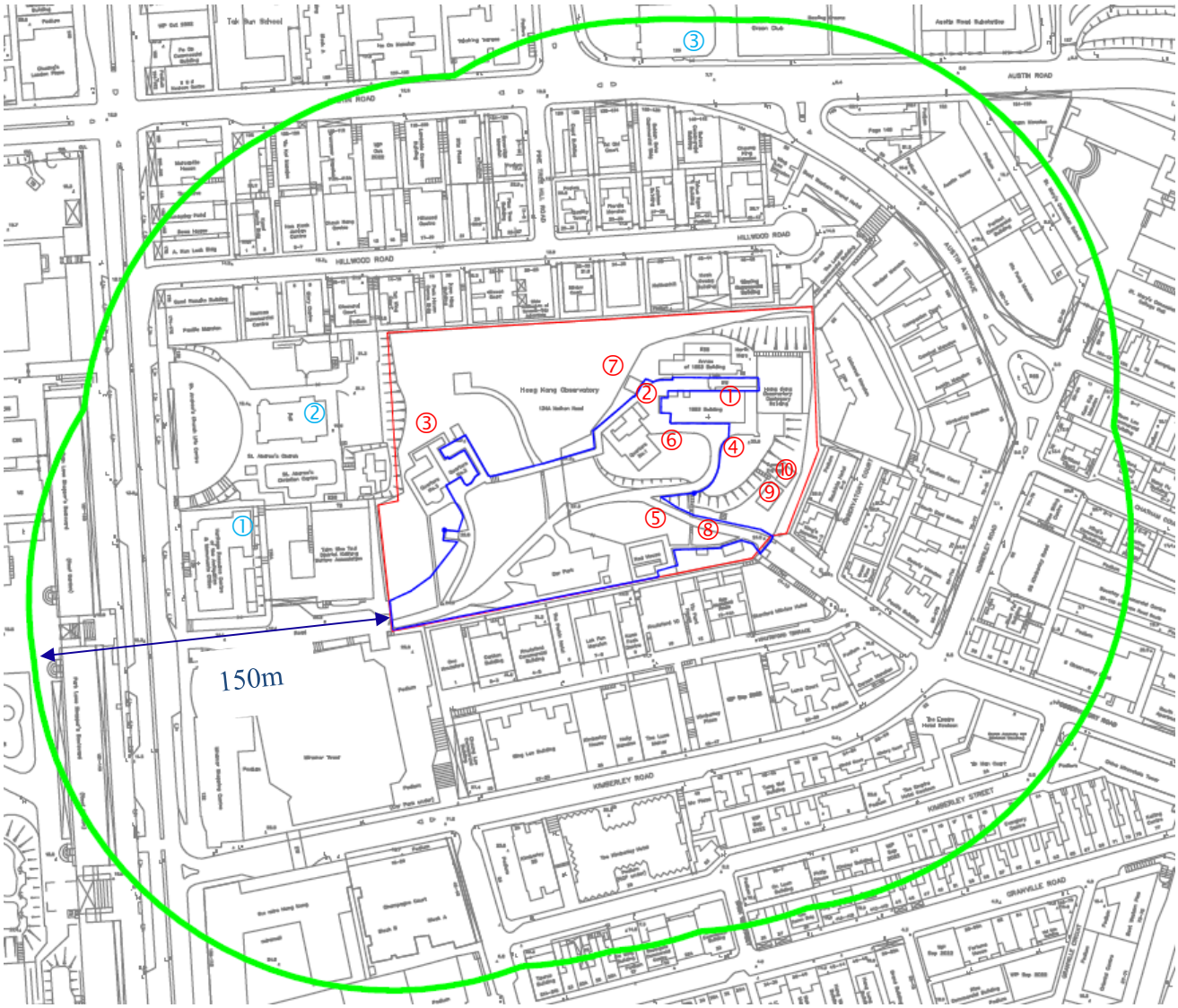


Figure 8.12 Master Layout Plan Showing the Location of Each Historic Items

Legend	
Declared monument boundary of the HKO Headquarters Project Site boundary Study area (150m from boundary of the Project Site)	
Buildings built before 1970 within HKO Headquarters	**Nearest distance between buildings built before 1970 within HKO Headquarters and the Project Site**
① 1883 building	0m*
② Annex Building of 1883 Building	1.8m
③ Quarters No. 2 and No.3, and Garages	0m*
④ Tunnel Portal to the Underground Chamber	0m
⑤ Red House	1.6m
⑥ Quarters No. 1, and Garage	0m*
⑦ Garage adjacent to Quarters No.1	1.8m
⑧ Substation A	0m*
⑨ White House No. 2	9.1m
⑩ White House No. 1	21.1m
Built heritage within 150m from the boundary of the Project Site	**Nearest distance between the built heritage and the Project Site**
① Former Kowloon British School	51.7m
② St. Andrew's Church Compound	24.93 m#
③ Kowloon Bowling Green Club	133.8m

Remarks:
* Those works are UU diversion works at localised location to the historic buildings
# Such distance has taken into account the site level difference with a slope between St. Andrew's Church Compound and the Project Site at HKO Headquarters

8.4.24. The proposed work area of UU diversion works near to the entrance of the 1883 building, which requires excavation of 1.8m from the ground level, is located near to the underground chamber and the stairs connecting the tunnel portal to underground chamber. As limited record is found for the underground chamber with tunnel portal, its exact alignment and depth are unknown. Indicative location of the underground chamber with tunnel portal is overlaid in ***Figure 8.1*** with reference to the Sketch Map of Royal Observatory in 1950s shown in ***Figure 8.9***. Details of the underground chamber with tunnel portal are shown in ***Table 8.6***. Based on field survey observations, the proposed work area of UU diversion work is located horizontally approximately 1.5m away from the underground chamber and 4m from the stairs connecting the tunnel portal to underground chamber. Moreover, the floor level of the underground chamber is estimated (based on field inspection) to be about 5.3m below ground level which is approximately +32.95 mPD and the internal ceiling of the chamber is about 3.3m high, which is approximately 2m below the ground floor. Potential indirect vibration/settlement /tilting impact to the underground chamber, stairs and tunnel portal may be a concern.

Historical and Architectural Appraisal of Each Building

8.4.25. 1883 Building

Table 8.3 Historical and Architectural Appraisal of 1883 Building

Current Appearance




Old Appearance


1883 Building in 1913
(Source: HKO Technical Note 108, 2016)


1883 Building in 1977
(Source: HKO Technical Note 108, 2016)

Location	
Built Year	1883
Previous Use	Office; Director's Quarters; Multi-purpose Rooms: Library, Publication Room, Equipment Room
Present Use	Office
Historical Appraisal	The 1883 Building was constructed in 1883 as the first building constructed on the site. The building is historically significant in being the heart of the Observatory for more than 130 years witnessing the establishment, operation, and expansion of the HKO. The building is one of the first government facilities constructed on Kowloon Peninsula and it is a rare existing western architecture built during the late 19th century at Tsim Sha Tsui. Before the completion of Director's Quarters in 1934, directors used to live in the 1883 Building.
Architectural Appraisal	The 1883 Building is an outstanding example of classical revival architecture in Hong Kong. It is a two-storey brick-constructed building with typical architectural features of the late 19th and early 20th centuries, for instance, long verandahs, fireplaces, and hipped roofs laid with Chinese pan and roll tiles. The building exemplifies elements of classical architecture with new designs, for example, the Corinthian columns and pilasters, arched windows, and ornamental balustrades. The building originally adopted a symmetrical design with two hip roofs on the top. The left wing was added in 1912-1913 to fulfil the needs of expansion. The back verandahs were also enclosed probably after 1950s for offices.

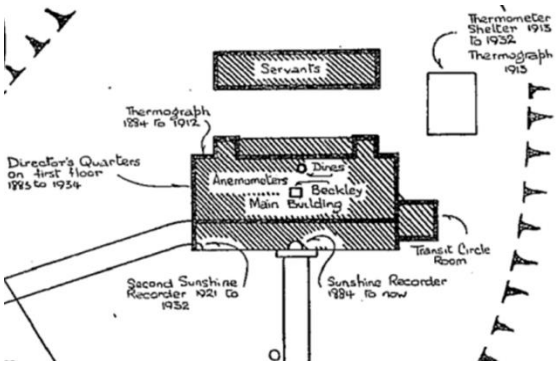
8.4.26. Annex Building of 1883 Building

Table 8.4 Historical and Architectural Appraisal of Annex Building of 1883 Building

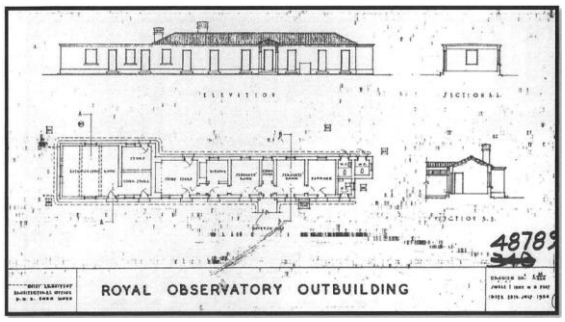
Current Appearance



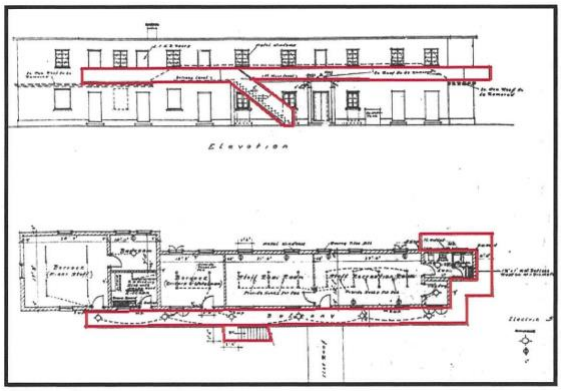
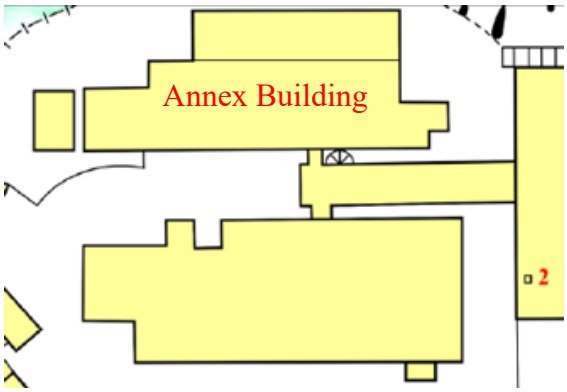
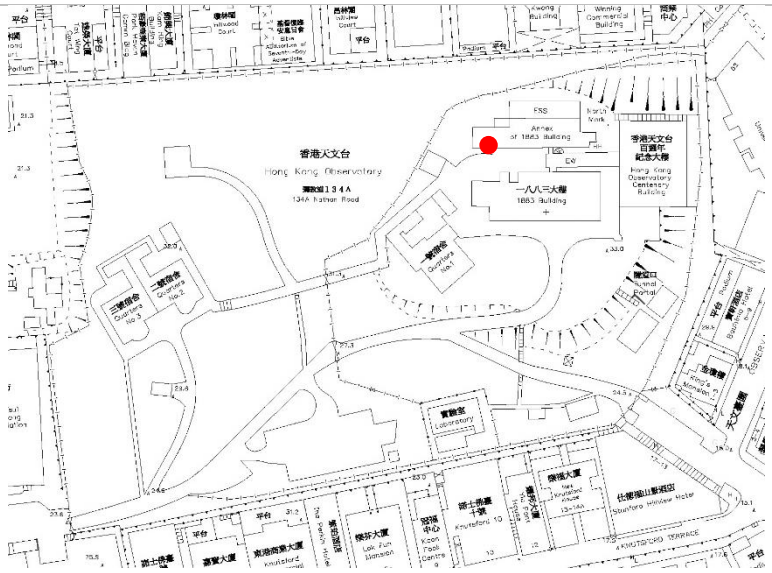

Old Appearance



Annex Building in 1883
(Source: L. Starbucks, *A Brief History of the Royal Observatory,* Hong Kong: Government Printers, 1951).



Annex Building in 1954. It was built as a one storey building. Two rooms were added to the west end of the building in 1912; one room was added to the east end before 1951
(Source: Horizon Asia Limited：《香港天文台 2015 年後勤大樓地基探考古評估報告》，2016 年。)

	
Annex Building in 1955. An additional floor was constructed with a flat roof. (Source: Horizon Asia Limited：《香港天文台 2015 年後勤大樓地基探考古評估報告》，2016 年。)	Annex Building in 2015. There are more additions to the north and west of the building. It is connected to the 1883 Building and the Centenary Building by bridges (Source: HKO Technical Note 108, 2016)
Location	
Built Year	1883
Previous Use	Servants' Quarters with Store Room; Minor Staff's Quarters with Lithographic Room, Store Room
Present Use	Office, Library, MD Standby Room, Facilities for Electrical and Mechanical Works
Historical Appraisal	The Annex Building was constructed in 1883 as the servants' quarters together with the 1883 Building being the first buildings on the site. The nature of the building reveals that there were once servants living on the site, which served as a supplementary building to the 1883 Building. The historic building underwent several expansions to supplement the operation of the Observatory. The second floor has been housing the library which stores precious resources.
Architectural Appraisal	The Annex Building was originally a single-storey building with a gable roof. Built as a servants' quarters, the building carries a humble design. The building experienced several expansions. Two rooms were added to

	the west end of the building in 1912; one room was added to the east end before 1951; the second floor was constructed with a flat roof in 1955; two one-storey blocks in smaller scale were built to the north facade housing electrical and mechanical facilities in 1960-66 and 1979-83 respectively. The Annex Building has been flexible in fulfilling the expansion needs of the Observatory throughout the past years. The building is connected to the 1883 Building and the Centenary Building by bridges.

8.4.27. Quarters No. 2 and No. 3, and Garage for Quarters No. 2

Table 8.5 Historical and Architectural Appraisal of Quarters No. 2 and No. 3, and Garage for Quarters No. 2

Current Appearance




Old Appearance


Quarters No. 2 and 3 in 1930s (Source: Mr. GSP Heywood, Director 1946-1956)

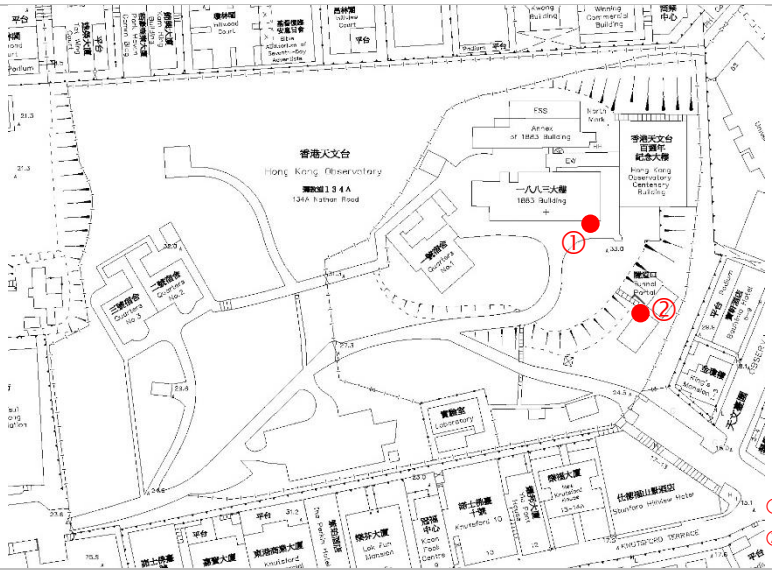
Quarters No. 2 and 3 in 1958 (Source: Mr. Gorden Bell, Director 1965-1981)

Location	
Built Year	1921 (Quarters), possibly 1921 and pre-1951 (Garage)
Previous Use	Quarters and Garage
Present Use	Quarters for Senior Staff and Garage
Historical Appraisal	Quarters No. 2 and Quarters No. 3 as the living places of staff are significant in reflecting the operation needs of the Observatory for many years. As the Observatory operates 24 hours every day so there has been a need to provide accommodation for staff. Besides, high-ranking staff have to deal with urgent operational matters so there is a particular need to provide them living quarters. It is believed that the garage was built at the same time when the quarters were built.
Architectural Appraisal	Quarters No. 2 and Quarters No. 3 are typical western-styled mansions for high-ranking staff in Hong Kong during the late 19th and early 20th centuries. It is a two-storey building with hipped roofs laid with Chinese pan and roll tiles. It adopts a symmetrical design which divides the flat into two portions; each house one family. It is a functional building with some design details, for instance, the verandahs and convex balconies with grooved balusters, the cantilevered balconies with patterned metal grilles, the cantilevered shading slabs above the two entrances, and metal window grilles. The open garage adopts a humble design with two windows at the rear facade.

8.4.28. Underground Chamber

Table 8.6 Historical and Architectural Appraisal of Underground Chamber

Current Appearance
 Entrance staircase  Underground chamber  Underground chamber ceiling design  Tunnel portal

Location	
Built Year	1924
Previous Use	Housing seismographs and clocks
Present Use	Housing seismographs
Historical Appraisal	The Underground Chamber is historically significant as the place for seismic observation in Hong Kong for more than 90 years. The Chamber reveals the early start of Hong Kong observing earthquake activities.
Architectural Appraisal	Built in early 1920s, the Underground Chamber is architecturally significant of having a specially designed ceiling that allows a column free interior. There is a tunnel next to the entrance of the Chamber leading to the tunnel portal at the eastern part of the site.

8.4.29. Red House

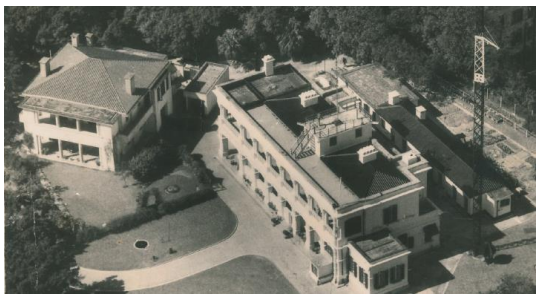
Table 8.7 Historical and Architectural Appraisal of Red House

Current Appearance	
   	
Location	
Built Year	1926
Previous Use	Wireless Station, Staff Recreational Room
Present Use	Laboratory and Office
Historical Appraisal	Red House is historically important as a supplementary building for the Headquarter for more than 90 years. It has been served for various purposes throughout the history. It was built as a wireless station, which was later used as a staff recreational room since the early post-war period. It is now used as a laboratory and office.
Architectural Appraisal	Red House is a fair-faced red-brick building built as an L-shaped building with gable roof, which adopted a utilitarian design to suit its original

	function as a wireless station. The pitched roof is laid with Chinese pan and roll tiles on timber rafters and king post trusses, which are supported on red brick piers and load bearing walls. From the old plan and site observations, it is believed that the original layout comprises a big rectangular room to the west, a smaller rectangular room to the east, and a small square room at the rear. South facing façade experienced intervention, with the concrete extension added in 1975-76 which affects its original appearance. The building façade is also being obscured by the concrete extension greatly. The extension added in 1975-76 comprises a new barrack room and two lavatories when it was built. It is currently a laboratory and office. Although it has experienced change of uses throughout the history, the original structure and layout are believed to be largely retained in a good condition.

8.4.30. Quarters No. 1, and Garage

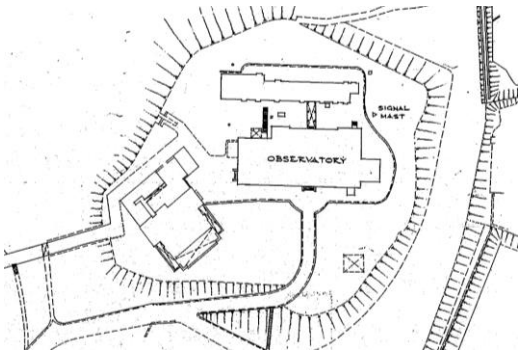
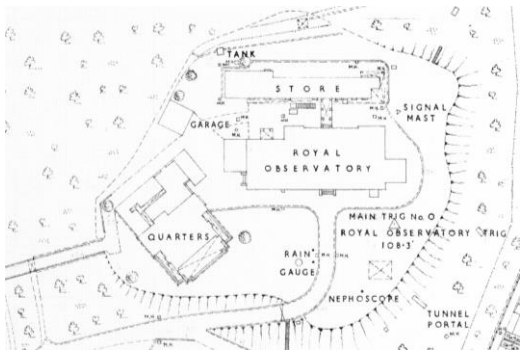
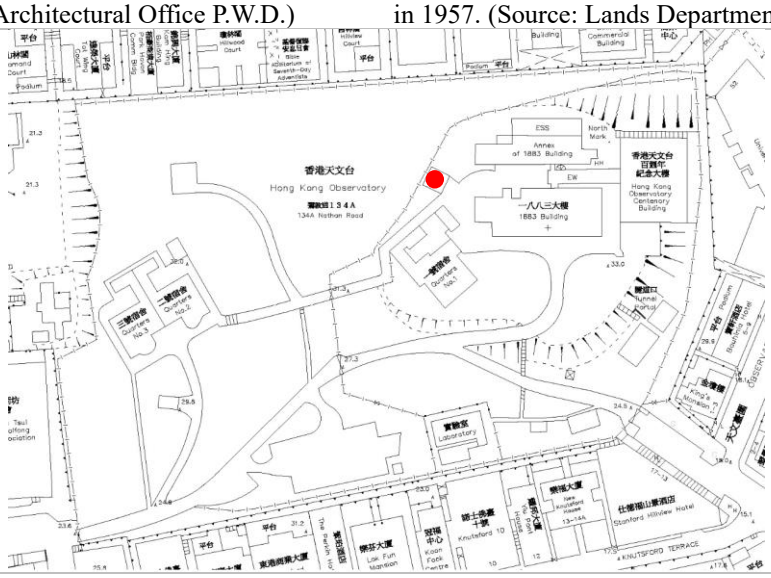
Table 8.8 Historical and Architectural Appraisal of Quarters No. 1, and Garage

Current Appearance
   
Old Appearance
 

Quarters No. 1 in 1930s (Source: Mr. GSP Heywood, Director 1946-1956)	Quarters No. 1 in 1951 (Source: HKO Technical Note 108, 2016)
	
Quarters No. 1 in 1964 (Source: Mr. Gorden Bell, Director 1965-1981)	
Location	
Built Year:	1934
Previous Use	Director's Quarters
Present Use	Senior Staff's Quarters
Historical Appraisal	The building was built as the directors' quarters in 1934. Before the completion of the building, directors lived in the 1883 Building. Currently, the quarter is provided to the senior staff who has to deal with urgent operational matters in view that the Observatory operates 24 hours every day and thus, there is a particular need to provide an accommodation to the senior staff. It is believed that the garage was built at the same time when the quarters was built.
Architectural Appraisal	Quarters No. 1 is a two-storey building with a pyramid roof. The building is a good example of western mansion for high-ranking staff in Hong Kong during the late 19th and early 20th centuries. It is a functional building with some design details, for instance, verandahs and columns with fluting capitals, cantilevered balcony with horizontal lines and grooves, and plaster moulding with fish-scale pattern. The garage which can park one car was installed a pair of doors and a window with fanlight at the side facade.

8.4.31. Garage adjacent to Quarters No. 1

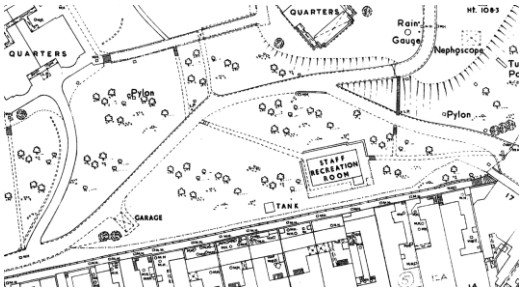
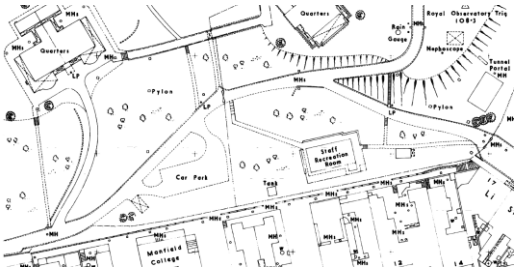
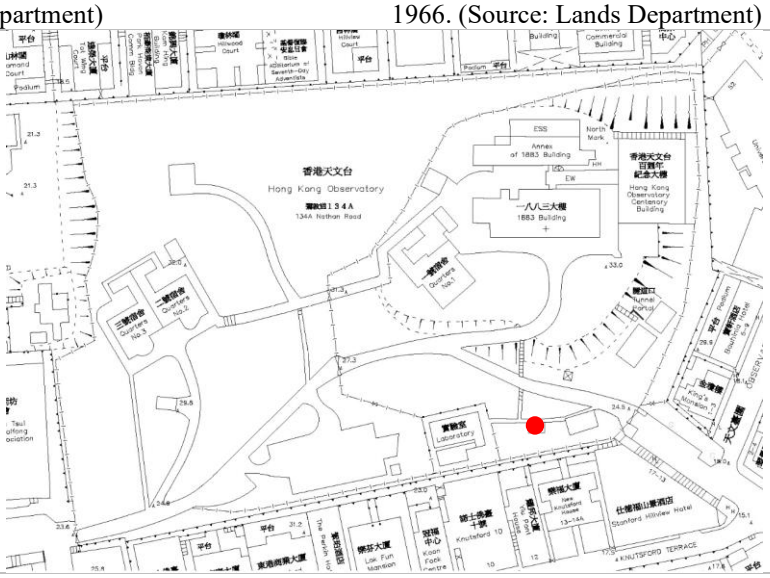
Table 8.9 Historical and Architectural Appraisal of Garage adjacent to Quarters No. 1

Current Appearance	
	
Old site plan/ map	
	
The garage was still absent on the site plan of HKO in 1955. (Source: Architectural Office P.W.D.)	The garage was already present on the survey map in 1957. (Source: Lands Department)
Location	
Built Year:	c. 1955-57
Previous Use	Garage
Present Use	Garage
Historical Appraisal	The garage was still absent on the site plan in 1955 and first appeared on the survey map dated 1957 which was marked ‘GARAGE’.
Architectural	The garage is a single-storey building which adopted a simple cubic form

Appraisal	with a flat roof. A row of timber plank door panels is found on the front.

8.4.32. Substation A

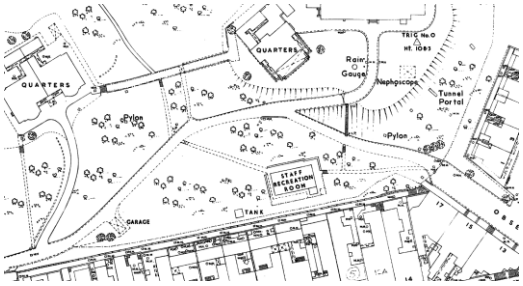
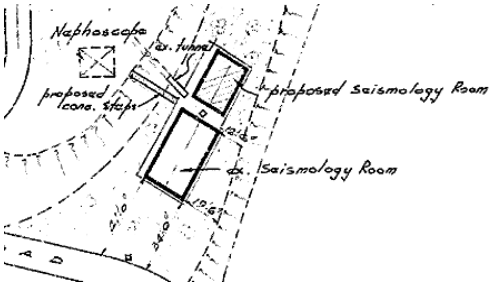
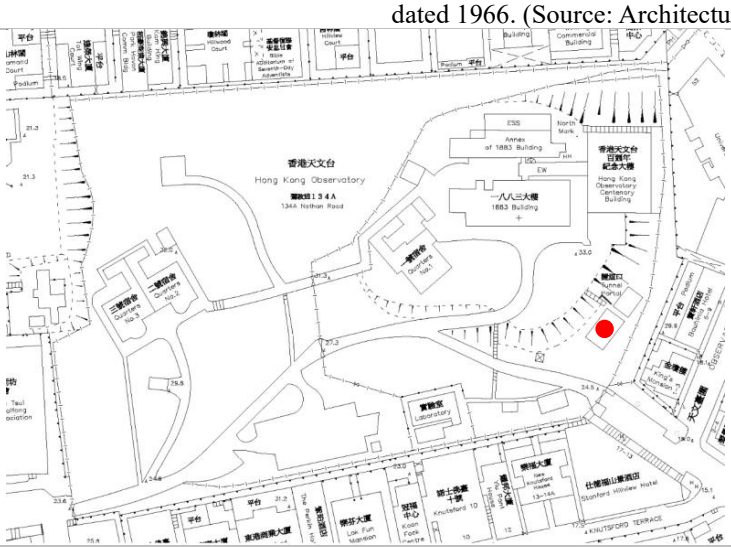
Table 8.10 Historical and Architectural Appraisal of Substation A

Current Appearance	
	
Old map	
	
Substation A was absent on the survey map in 1960. (Source: Lands Department)	Substation A was present on the survey map in 1966. (Source: Lands Department)
Location	
Built Year:	c. 1960-66
Previous Use	Substation
Present Use	Substation
Historical Appraisal	The substation was still absent on the survey map in 1960 and first appeared on the survey map dated 1966.

Architectural Appraisal	Substation A is a single-storey building which adopted a simple cubic form with a flat roof.

8.4.33. White House No. 2 (former Seismology Room)

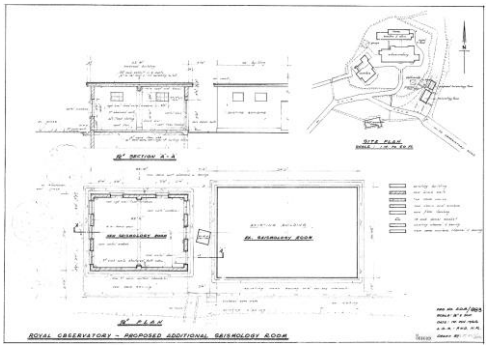
Table 8.11 Historical and Architectural Appraisal of White House No. 2 (former Seismology Room)

Current Appearance	
	
Old map/ site plan	
	
White House No. 2 was absent on the survey map in 1960. (Source: Lands Department)	White House No. 2 (which was marked as existing Seismology Room) was present on the site plan dated 1966. (Source: Architectural Office P.W.D.)
Location	
Built Year:	c. 1960-66
Previous Use	Seismology Room
Present Use	Mechanical Workshop
Historical	The building was still absent on the survey map in 1960 and first

Appraisal	appeared on a site plan dated 1966. It was originally built as a Seismology Room and is now used as a mechanical workshop.
Architectural Appraisal	The building is a single-storey building which adopted a simple cubic form with a flat roof.

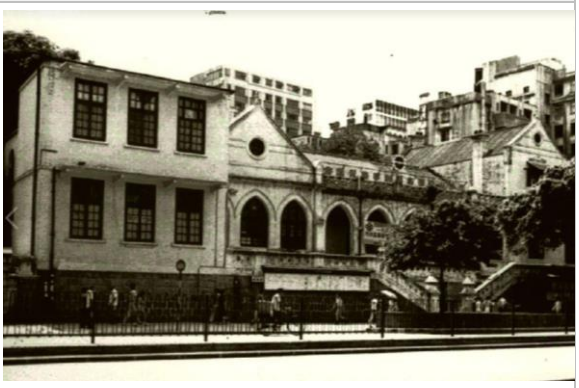
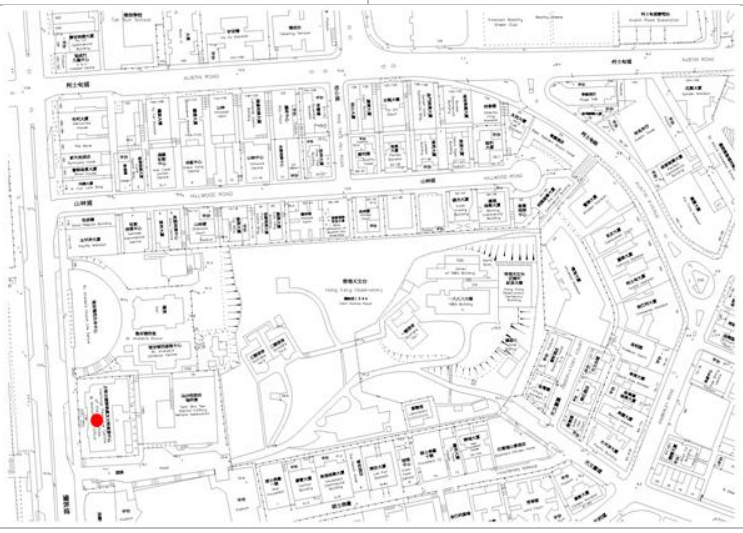
8.4.34. White House No. 1 (former Seismology Room)

Table 8.12 Historical and Architectural Appraisal of White House No. 1 (former Seismology Room)

Current Appearance	Old drawing
	 The architectural drawing showing the proposed additional Seismology Room (Source: Architectural Office P.W.D.)
Location	
Built Year:	1966
Previous Use	Seismology Room
Present Use	Mechanical Workshop
Historical Appraisal	The building was originally built as a Seismology Room in addition to the existing Seismology Room adjacent to it. It is now used as a mechanical workshop.
Architectural Appraisal	The building is a single-storey building which adopted a simple cubic form with a flat roof.

8.4.35. Former Kowloon British School

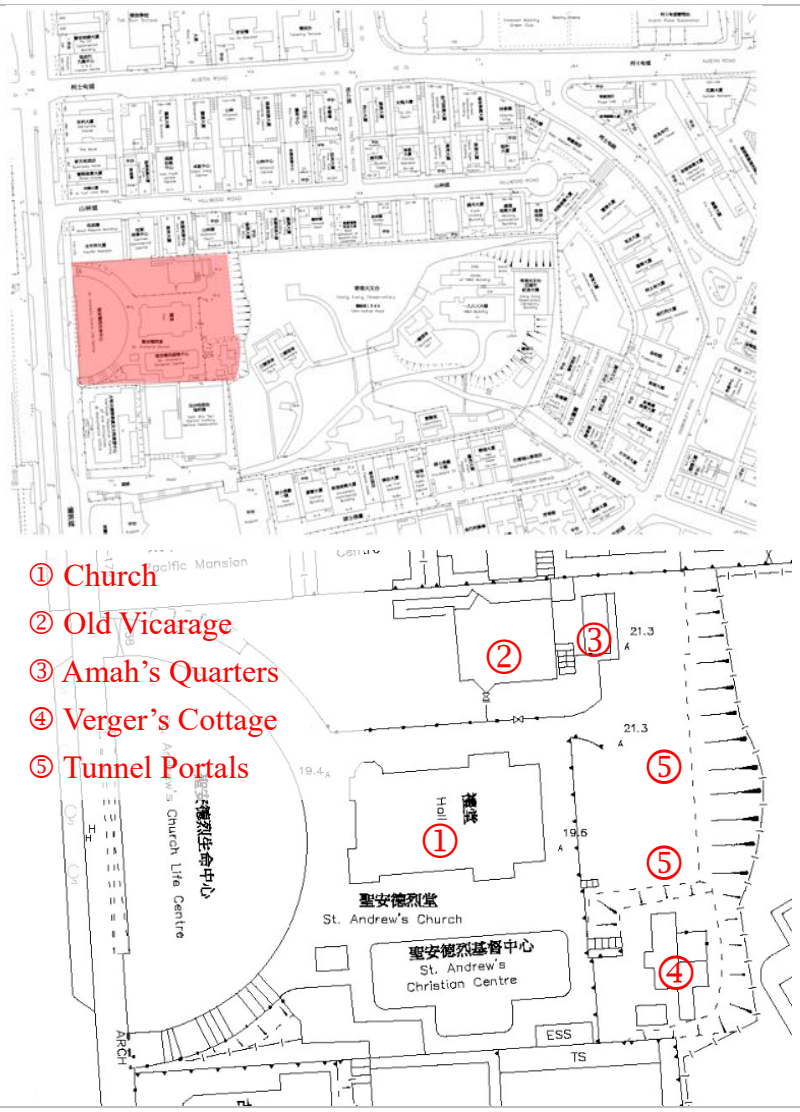
Table 8.13 Historical and Architectural Appraisal of Former Kowloon British School

Current Appearance	Old Appearance
 Kowloon British School in 2012	 Kowloon British School in 1970s (Source: Hong Kong Heritage)
Location	
Built Year	1902
Previous Use	School
Present Use	Office of Antiquities and Monuments Office
Historical Appraisal	The former Kowloon British School is historically remarkable as the oldest surviving school building constructed for the children of foreign residents in Hong Kong. It is one of the earliest institutional buildings constructed on Kowloon Peninsula.
Architectural Appraisal	The building is an outstanding Western architecture in Kowloon, with key features such as fair-faced red bricks and pointed arches. The design was modified and carries typical architectural features of the late 19th and early 20th centuries to suit the hot and wet climate, including wide verandahs, high ceilings and pitched roofs.

8.4.36. St. Andrew's Church Compound

Table 8.14 Historical and Architectural Appraisal of St. Andrew's Church Compound

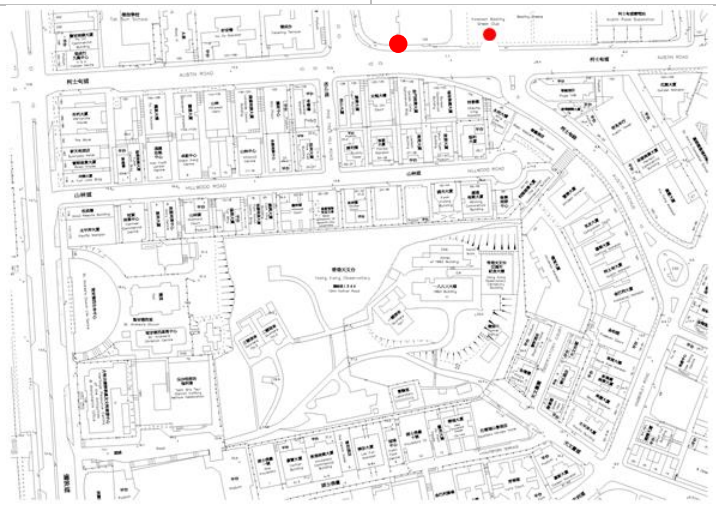
Current Appearance	
 St. Andrew's Church in 2019	 Amah's Quarters in 2019
 Old Vicarage in 2019	 Verger's Cottage in 2009
Tunnel Portal	**Old Appearance**
 Tunnel portal at the carpark of St. Andrew's Church Compound in 2019	 St Andrew's Church in 1908 (Source: Arnold Wright, *Twentieth century impressions of Hong-kong, Shanghai, and other Treaty Ports of China*, London: Lloyd's, 1908).

Location	
Built Year	Church: 1904-1906; Old Vicarage 1908-1909; Amah's Quarters and Verger's Cottage: around 1910; Tunnel Portals: Possibly pre-1945
Previous Use	Church
Present Use	Church
Historical Appraisal	St. Andrew's Church Compound is historically significant as the oldest Protestant Church in Kowloon. It was one of the earliest institutional buildings constructed on Kowloon Peninsula after the British annexation of Kowloon Peninsula. The compound was constructed with the donation of Sir Chatchick Paul Chater, a prominent historical businessman and entrepreneur at the time. It has survived from several typhoons, a landslip, and a wartime bomb blast. The church building experienced the history of being used as a magistrate and a Shinto shrine during Japanese occupation. The Old Vicarage served as the home of the vicar until 1978. The Amah's Quarters and the Verger's Cottage were servant quarters. Two tunnel portals which were believed to be built before 1945 were spotted at the carpark of the Compound.
Architectural Appraisal	St. Andrew's Church Compound is a rare and remarkable example Edwardian Gothic Revival church building in Hong Kong. Some key

	elements of this cruciform fair-faced red brick building include a bell tower, pointed arches, flying buttress, and stained-glass windows. Although the spire has gone, the authenticity of the building is still regarded high. The Old Vicarage is a two-storey brick structure with the features of Gothic style. The Amah's Quarters is composed of two independent single-storey red-brick blocks. The Verger's Cottage comprises of two single-storey red-brick blocks. The two tunnel portals have been vacant and sealed.

8.4.37. Kowloon Bowling Green Club

Table 8.15 Historical and Architectural Appraisal of Kowloon Bowling Green Club

Current Appearance	
 Kowloon Bowling Green Club in 2012 (Source: City University of Hong Kong)	 Kowloon Bowling Green Club in 2012 (Source: City University of Hong Kong)
Location	
Built Year	1926
Previous Use	Recreational Club
Present Use	Recreational Club
Historical Appraisal	Kowloon Bowling Green Club (KBGC) is historically remarkable as the oldest Lawn Bowls Club in Hong Kong. The club has survived from the devastating Japanese occupation. However, the clubhouse was used as an accommodation to house Japanese Officers and the Bowling Greens were dug up to produce agricultural crops to feed them.
Architectural Appraisal	KBGC Clubhouse is a good example of Arts and Crafts style (western part) and Streamline Moderne style (eastern part). The Arts and Crafts part feature a hipped roof supported by brackets, with rough-cast external walls, while the Streamline Moderne design is characterised with the emphasis on curved forms, horizontal lines, and nautical elements.

8.5. KEY CHARACTER DEFINING ELEMENTS (CDES)

8.5.1. The key character defining elements are listed below, which means the materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of a historic place[1].

8.5.2. The following list of key character defining elements will cover the general setting of HKO Headquarters, identify major built heritage within HKO Headquarters, and focus in detail on the proposed site area for the construction of an Annex Block.

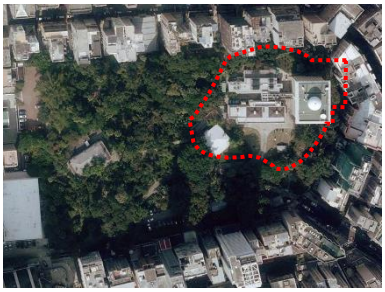
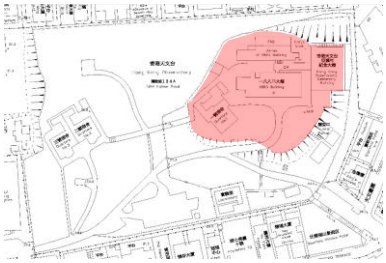
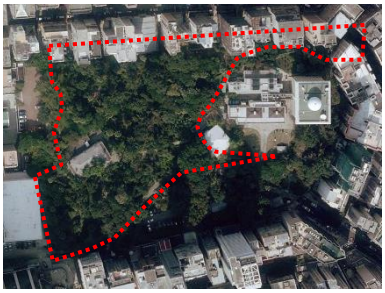
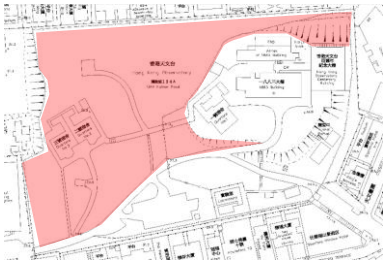
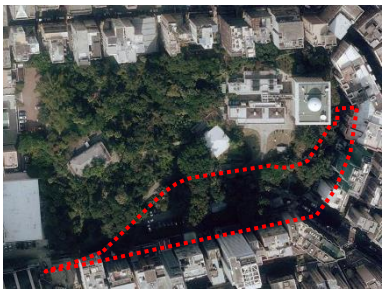
8.5.3. Definition of terms[2]

Levels of Significance	Meaning
High	Elements which make a major contribution to the overall significance of the place. Spaces, elements or fabric originally of substantial intrinsic quality, and exhibit high degree of intactness and quality, though minor alterations or degradation may be evident.
Medium	Elements which make a moderate contribution to the overall significance of the place. Spaces, elements or fabric originally of some intrinsic quality, and may have undergone minor or extensive alteration or degradation.
Low	Elements which make a minor contribution to the overall significance of the place. Spaces, elements or fabric originally of little intrinsic quality, and may have undergone alteration or degradation. Original spaces, elements or fabrics of some quality, which have undergone extensive alteration or adaptation to the extent that only isolated remnants survive.

[1] *Definition extracted from Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada*. Retrieved on December 15 2010, from Parks Canada under Her Majesty the Queen in Right of Canada, Website: http://www.pc.gc.ca/docs/pc/guide/nldclpc-sgchpc/index_e.asp.

[2] The definition of terms is developed based on Kerr, James Semple, *Conservation Plan, the 7th edition: A Guide to the Preparation of Conservation Plans for Places of European Cultural Significance*, Australia ICOMOS, 2013.

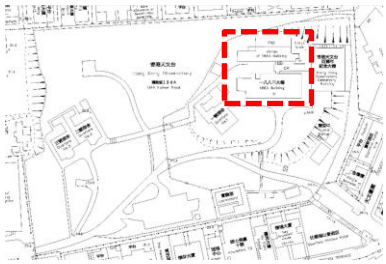
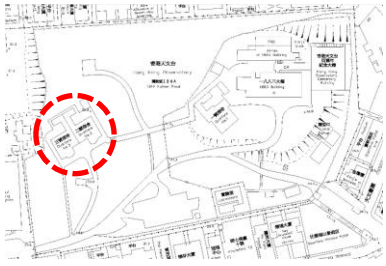
8.5.4. Setting

	Key Character Defining Elements	Level of significance	Photos	Location[3]
S-01	**Main area** With key buildings from early establishment	**High**		
S-02	**Area with supplementary facilities** Supplementary facilities include staff quarters and garages, and landscaped area	**Medium**		
S-03	**Supporting area** Supporting facilities include Red House and other additions during post war era including the car park	**Low**		
S-04	**Site entrances from Nathan Road and Observatory Road** Major entrances to give access to HKO since the establishment of HKO.	**High**	 	

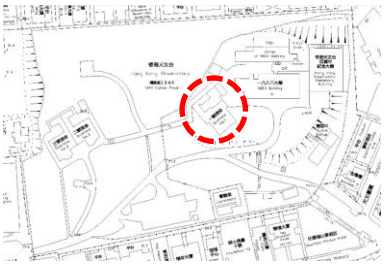
[3] All the locations presented are for indicative purpose only. Exact location to be verified in-situ.

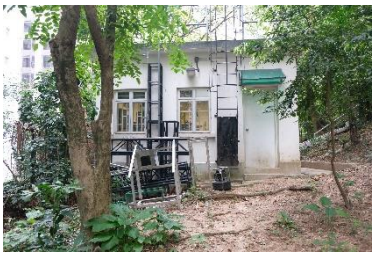
	Key Character Defining Elements	Level of significance	Photos	Location[3]
S-05	**Major pathways**	**Medium**		

8.5.5. Buildings within Hong Kong Observatory Headquarters

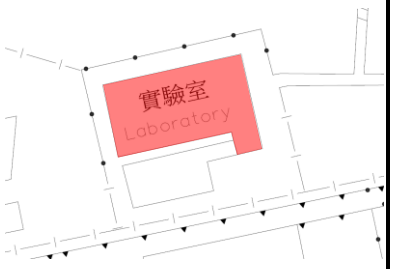
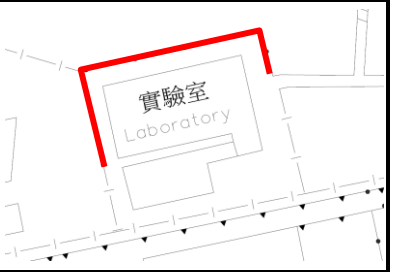
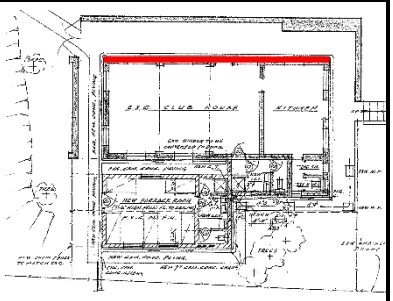
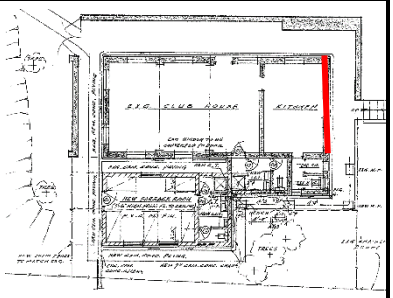
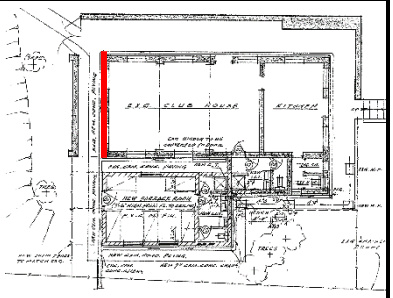
	Key Character Defining Elements	Level of significance	Photos	Location[4]
B-01	**1883 Building and its annex building**	**High**	 	
B-02	**Quarters No. 2 and No. 3**	**High**		
B-03	**Garage of Quarters No. 2**	**Medium**		

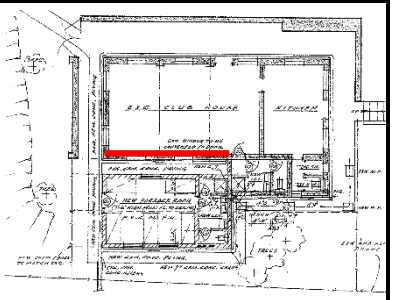
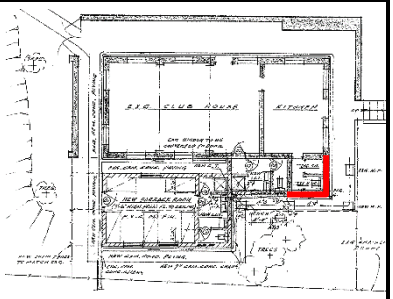
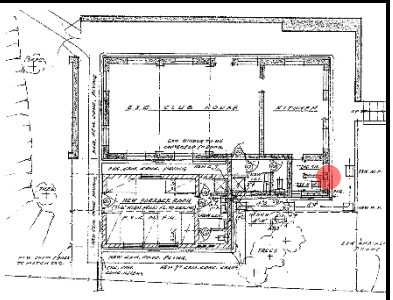
[4] All the locations presented are for indicative purpose only. Exact location to be verified in-situ.

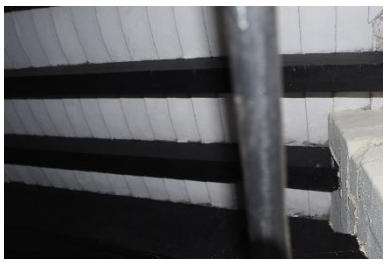
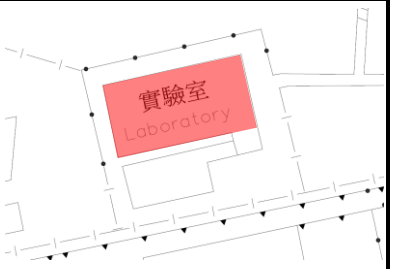
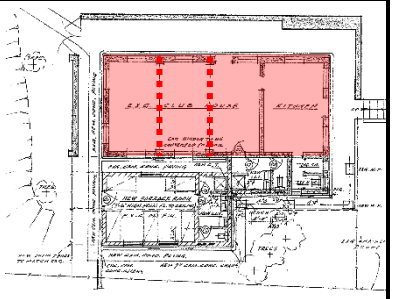
	Key Character Defining Elements	Level of significance	Photos	Location[4]
B-04	**Underground chamber with tunnel portal**	**High**	 ① Entrance staircase  ② Tunnel portal 	
B-05	**Quarters No. 1**	**High**		
B-06	**Garage of Quarters No. 1**	**Medium**		
B-07	**Garage adjacent to Quarters No. 1**	**Low**		
B-08	**Red House**	**Medium**		

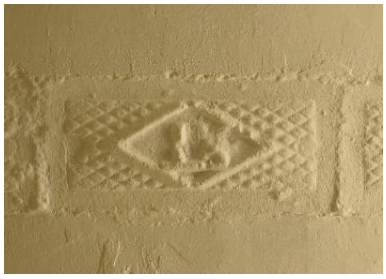
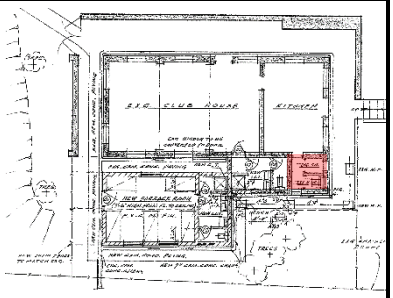
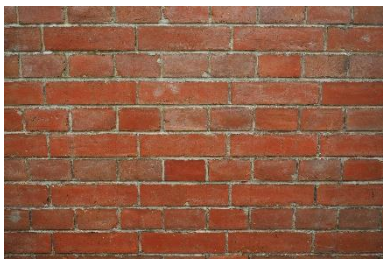
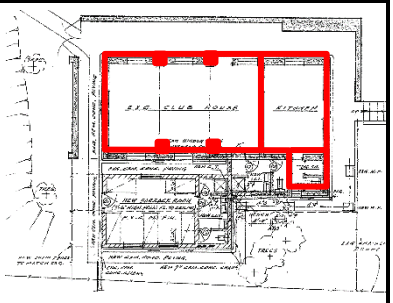
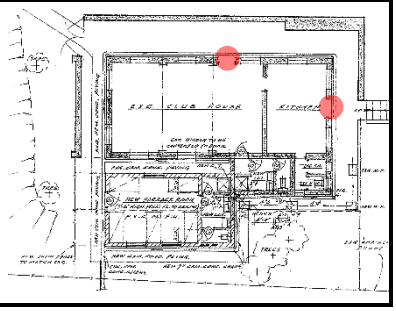
	Key Character Defining Elements	Level of significance	Photos	Location[4]
B-09	**Substation A**	**Low**		
B-10	**White House No. 2**	**Low**		
B-11	**White House No. 1**	**Low**		

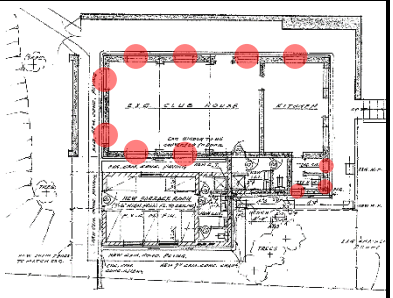
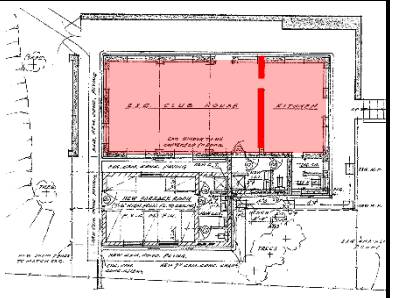
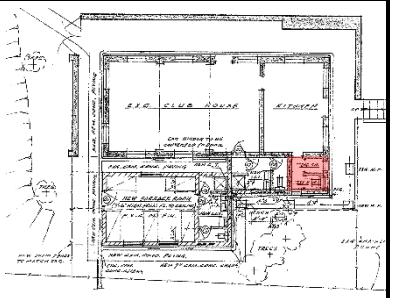
8.5.6. Red House

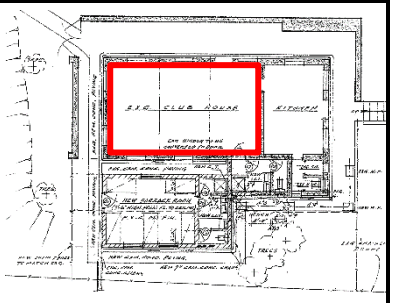
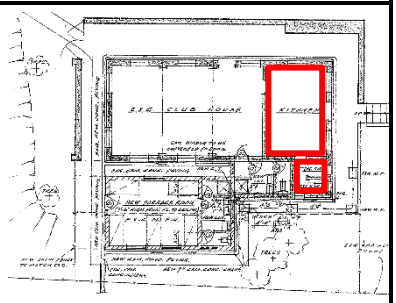
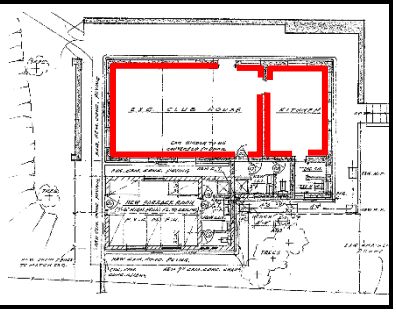
	Key Character Defining Elements	Level of significance	Photos	Location
R-01	**L-shaped form**	**High**		
R-02	**External brick walls**	**Medium**		
R-03	**North facing façade** • Fair-face brickworks • Plastered plinth	**High**		
R-04	**East facing façade** • Triangular gable wall • Fair-face brickworks • Plastered plinth	**High**		
R-05	**West facing façade** • Triangular gable wall • Fair-face brickworks • Plastered plinth • Circular vent	**High**		

	Key Character Defining Elements	Level of significance	Photos	Location
R-06	**South facing façade** • Fair-face brickworks • Plastered plinth Remarks: South facing façade experienced intervention, with the concrete extension added in 1975-76 which affects its original appearance. The building façade is also being obscured by the concrete extension greatly	**Medium**		
R-07	**Rear block façades** • Fair-face brickworks • Plastered plinth	**Medium**		
R-08	**Vent pipe**	**Medium**		
Building construction and materials				

	Key Character Defining Elements	Level of significance	Photos	Location
R-09	**Main roof with Chinese pan and roll tiles pitched roof**	**High**	  	
R-10	**Roof structure with timber rafters supporting on timber trusses**	**High**		 Truss

	Key Character Defining Elements	Level of significance	Photos	Location
R-11	**Concrete flat roof with special marks**	**High**	 	
R-12	**Brick construction with English bond**	**High**		
R-13	**Entrance door opening** • concrete lintel • granite threshold	**High**	 	

	Key Character Defining Elements	Level of significance	Photos	Location
R-14	**Window opening** • concrete lintel • brick window sill • ironmongery of period style * Excluding later additions, e.g. air-conditioning units and vents, metal security bars Existing window leaf appears to be later interventions.	**High**	   Window stay 	
Interior				
R-15	**Spatial arrangement – bigger room (former club house)**	**High**		
R-16	**Spatial arrangement - small room (former latrine)**	**Medium**		

	Key Character Defining Elements	Level of significance	Photos	Location
R-17	**Plastered internal walls with paint**	**High**		
R-18	**Exposed brickworks with paint over**	**High**		
R-19	**Plastered dado**	**High**		

8.6. THE PROJECT DESCRIPTION

8.6.1. The Project is located within the boundary of the HKO Headquarters to the southern side with the existing car park situated there. The Red House, built in 1926 is in its close vicinity.

8.6.2. The Project involves the construction of a new Annex Block to provide a net operating floor area (NOFA) of about 2,850 sqm. The overall building height will be capped at +45mPD, which has four storeys with intermediate floors between G/F & 1/F and 1F & 2/F. An underground water tank and associated plant room of some 4.5m deep will be located to the northeast of the new Annex Block.

8.6.3. It will comprise of a multi-hazard warning centre, a purpose-built news briefing room and a broadcast studio, a calibration laboratory and electronics workshop; a weather radar and satellite operation centre, a computation centre, offices, display areas, viewing galleries, resource centre, rest rooms, car parking spaces and other supporting facilities.

8.6.4. The Project also covers the refurbishment works to convert the existing Red House into a history room for telling the heritage story of HKO, and works for a widened access road to the new building for emergency vehicular access in compliance with the latest statutory requirements.

8.6.5. The Project also includes road widening works for EVA at the existing access road in HKO Headquarters.

8.6.6. Other associated works include UU diversion works, utilities connection works within HKO Headquarters and slope upgrading and improvement works.

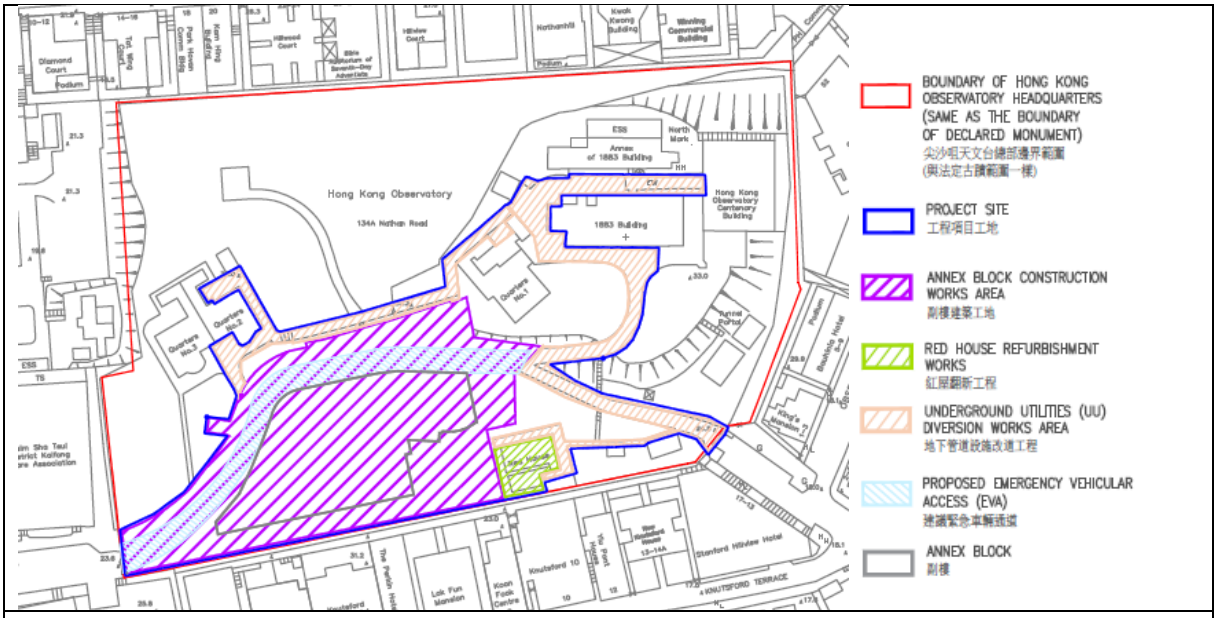


Figure 8.13 Site Location Plan for the Construction of New Annex Block at Hong Kong Observatory Headquarters, Tsim Sha Tsui

Figure 8.14 Site Section for the Construction of New Annex Block at Hong Kong Observatory Headquarters, Tsim Sha Tsui

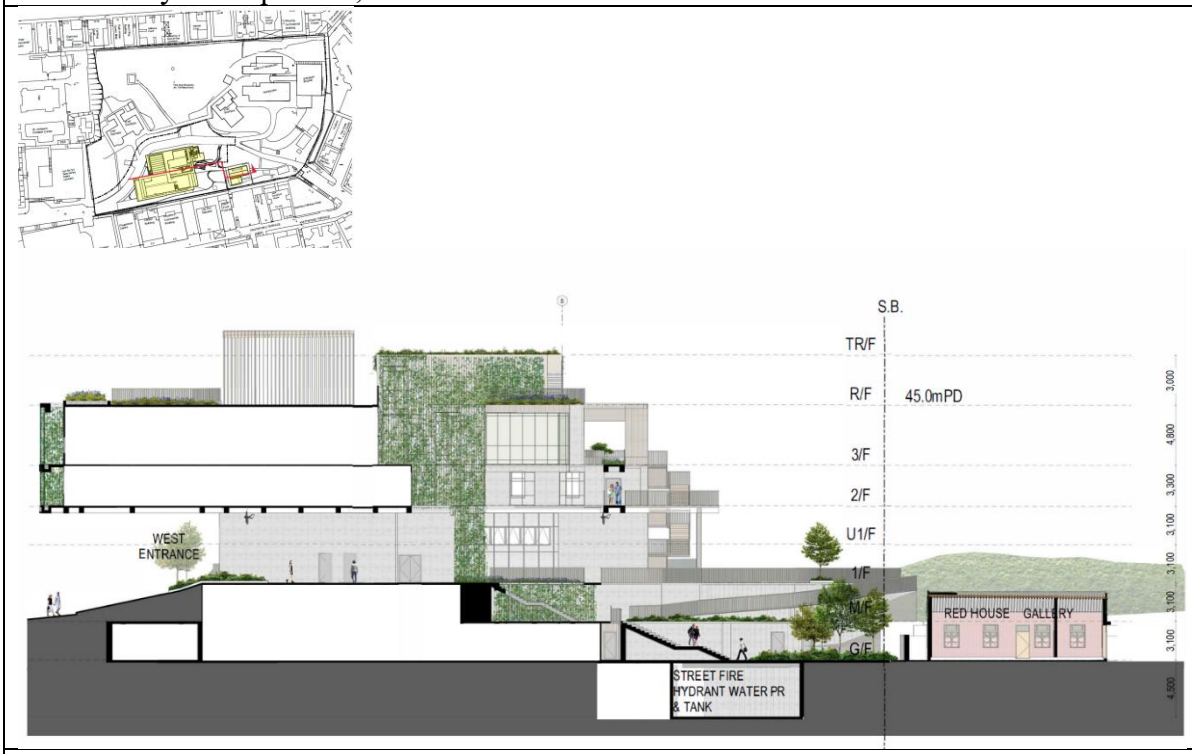


Figure 8.15 Site Section for the Construction of New Annex Block at Hong Kong Observatory Headquarters, Tsim Sha Tsui

Figure 8.16 Artist's impression with bird's eye view to the New Annex Block and Red House

Figure 8.17 Artist's impression with bird's eye view to New Annex Block and Red House

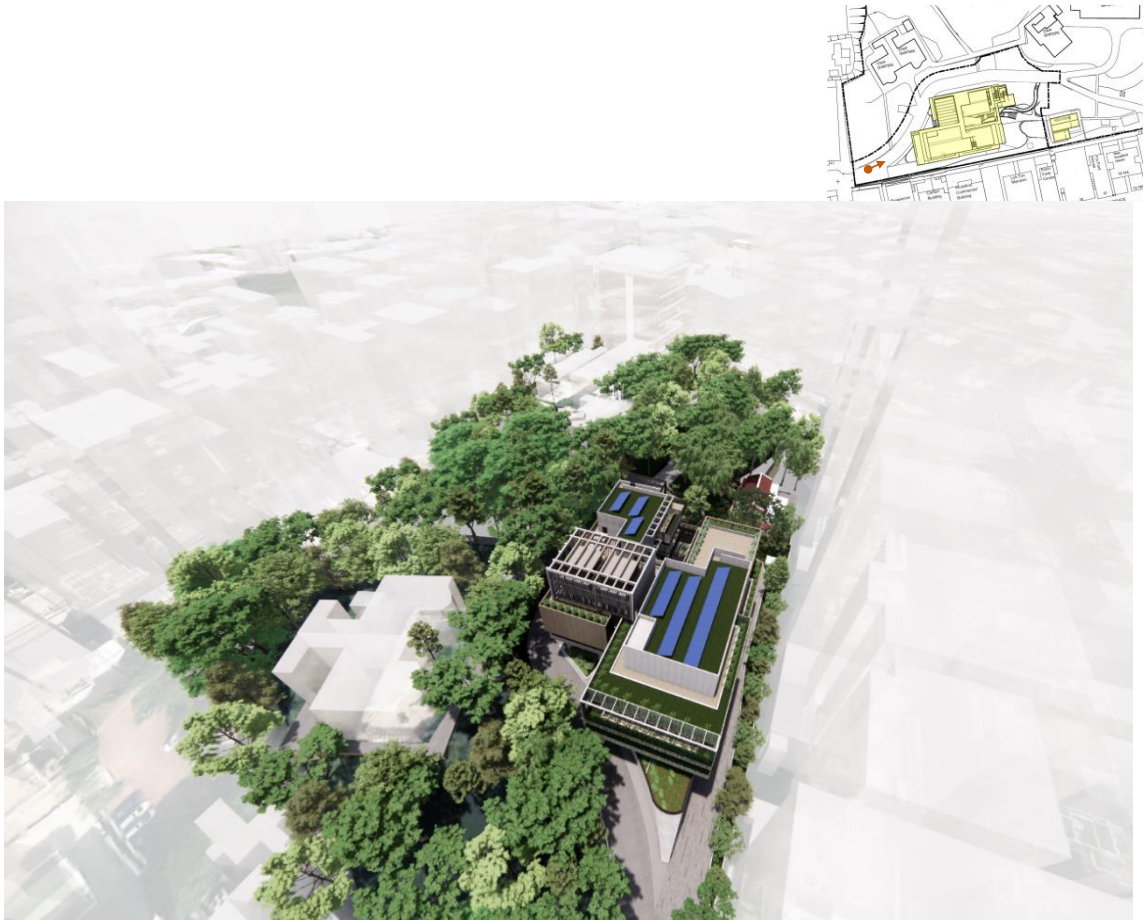


Figure 8.18 Artist's impression with bird's eye view to New Annex Block and 1883 Building

Figure 8.19 Artist's impression with pedestrian view to New Annex Block's main entrance

Figure 8.20 Artist's impression with view to outdoor space between New Annex Block and Red House

Figure 8.21 Artist's impression with pedestrian view to outdoor space between New Annex Block and Red House

Figure 8.22 Artist's impression with pedestrian view from 1883 Building to New Annex Block

8.7. CONSERVATION POLICIES AND GUIDELINES

Opportunities and constraints

8.7.1. Throughout the history, HKO Headquarters experiences progressive development starting from the 1883 Building and its Annex and gradually scattered around Mount Elgin to meet the increasing needs on the operation of the HKO. Apart from meeting the operational needs, HKO Headquarters also serves as an educational platform to promote weather observation, the history and development of the Observatory, as well as offering a chance for the appreciation of the unique built heritage within the Project Site. Today, the HKO Headquarters is still in operation.

8.7.2. The HKO Headquarters stands on Mount Elgin, which is an elevated site in the hustle and bustle of Tsim Sha Tsui surrounded by rich fauna and flora. The large area over Mount Elgin offers opportunities for further development meeting the increasing needs.

8.7.3. In the following sections, conservation policies and guidelines will be established with a focus on the Project Site and for the Project.

Conservation Principles

8.7.4. The conservation policies and guidelines prepared in this Chapter are developed from international charters and their conservation principles.

International Charters and Principles

8.7.5. The Venice Charter (1964) (International Charter for the Conservation and Restoration of Monuments and Sites) – the most fundamental principles and international standards for conservation and restoration of heritage buildings and sites adopted by UNESCO & ICOMOS.

8.7.6. The Burra Charter (2013) (The Australia ICOMOS Charter for Places of Cultural Significance) – a worldwide recognised standard of establishment and implementation of conservation, which provides guidance for the concept and definition of cultural significance.

8.7.7. The China Principles (2015) (Principles for the Conservation of Heritage Sites in China) – a document that covers general conservation principles, a management planning process and intervention guidelines. The China Principles was developed based on the Burra Charter but with modifications made specifically according to local cultural and political conditions in China.

Conservation Policies and Guidelines

8.7.8. Respect the Setting of the Hong Kong Observatory Headquarters

Policy SE01

- The new works should respect the historic setting of the HKO Headquarters.

Conservation guidelines

- The proposed development shall keep an appropriate distance from the main area, i.e., the area around 1883 Building and its Annex.
- The original entrance posts and the connections to the 1883 Building shall be kept as far as technically feasible.
- In the event that it is necessary to widen existing access to comply with statutory requirements, the affected gate post shall be salvaged and re-installed in a new location as far as technically feasible. The proposal and works on the entrance, the gate and the posts should be conducted upon AMO's approval as appropriate.

8.7.9. New use and compatibility

Policy NU01

- The new use of the adjacent Project Site should be compatible to the historic place without compromising the cultural significance of the site. The proposed use should not extensively alter the historic structure and layout in order to suit the new use.

Policy NU02

- The proposed use should be accommodated as far as possible within the existing layout of the heritage building and should avoid any unnecessary interventions. Greater flexibility should be allowed at area with lower significance.

Conservation guidelines

- The proposed new facilities shall be accommodated within the new Annex Block without affecting the buildings and structures within the main area.
- The original layout of the Red House comprises a bigger room, a smaller room and a small rear room should be kept.

8.7.10. Preservation of Built Fabrics - Exterior

Policy EBF01

- All conservation works should be carried out with the principle of repair rather than replacement. Where replacement is necessary, it should be carried out on a like-for-like basis as far as technically feasible in terms of design and material.

Conservation guidelines

- The repair works to be carried out should match the original material, colour, and texture. In case the architectural element is beyond repair where replacement is necessary, the replacement should follow the original construction method, material, colour, and texture as much as possible.

Policy EBF02

- The three major external façades of the Red House facing north, east and west should be preserved as much as possible. Greater flexibility could be allowed for the south facing façade and the rear block façades.

Conservation guidelines

- Every effort shall be made to preserve the three major façades. The original façades shall generally be left unaltered, restored to its original appearance with available documentation and must not be disturbed as far as possible.
- The brick walls shall be kept fair-faced without being painted over.
- Features identified to be later interventions shall be removed. Affected surfaces shall be made good.
- A list of features identified to be later interventions proposed to be removed, and details of renovation works to the features considered with lower significant shall be submitted for AMO's comment before proceeding the *Section 6* permit application (*Antiquities and Monuments Ordinance*) for the Project.

Policy EBF03

- Where changes are required on building façade for statutory and operational reasons, any intervention to the key CDEs should be minimised where feasible and respect the original elevation design.

Conservation guidelines

- Existing window type air-conditioners and vents are considered intrusive and shall be removed in order to restore the original window appearance. Split-type air conditioning unit shall be considered. Outdoor units shall be considered at the rear of the Red House, which is a less prominent location. The proposed design, location and routing shall be submitted for AMO's comment before proceeding the *Section 6* permit application (*Antiquities and Monuments Ordinance*) for the Project.
- Routings for building services such as pipes and electric cables shall be grouped together in order to minimise number of openings on walls. Existing openings on walls should be utilised as far as technically feasible. Existing windows on the south facing façade and the rear facades could be considered. If new opening has to be formed on existing wall, the wall in direct contact to the later extension on the south facing façade could be considered. Location of new openings should be submitted for AMO's comment before proceeding the *Section 6* permit application (*Antiquities and Monuments Ordinance*) for the Project.

Policy EBF04

- The existing physical fabrics of the heritage buildings identified to be key CDEs in *Section 8.5* shall be preserved and provided with necessary monitoring measures to prevent any adverse impact incurred during the course of the works for the construction of new Annex Block.

Conservation guidelines

- All the heritage buildings identified to be key CDEs in *Section 8.5* should be provided with periodic monitoring and inspection to ensure they are in place and in intact condition during the course of the works.
- Vibration, settlement, and tilting monitoring measures should be provided with the 3A levels (Alert, Alarm and Action) to be agreed with AMO during the course of the works from foundation to the completion of the superstructures.
- Different sets of monitoring points should be provided in the vicinity of the Project Site and the identified heritage buildings respectively, with locations and frequency to be agreed by AMO during the course of works.
- Periodic visual inspections of the identified heritage buildings should be conducted during the course of the works and the monitoring data should be submitted for AMO's noting, comment and record.
- In case monitoring reading is found to exceed the limits given in the control scheme during the course of the works, the construction activities shall be suspended immediately. Investigation report shall be prepared to investigate the reason(s) and remedial measures shall be conducted before resumption of the works. Report to Project Team of ArchSD and AMO.

8.7.11. Preservation of Built Fabrics – Interior

Policy IBF01

- The original spatial setting and historic fabric of the interior identified to be of high significance at Red House should be restored and revealed as much as possible based on available document and records.

Conservation guidelines

- Every effort shall be made to preserve, restore, and reveal the original spatial setting and historic fabric of areas identified to be of high significance.
- Refer to *Section 8.5* Key CDEs for architectural features at the interior.

Policy IBF02

- Where alteration and addition are necessary for compliance with statutory requirements, they should be reversible where it is feasible to do so.

Conservation guidelines

- Any new internal finishes or furnishing shall be added in a reversible way that can be replaced or renewed in the future without damaging the significant internal historic fabrics.

8.7.12. Addition and alteration

Policy AA01

- A full photographic survey and cartographic survey shall be carried out prior to any works to Red House.
- Condition survey should be carried out to record conditions of the heritage site before, during (at a regular interval during works period) and upon completion of the Project so as to ensure that the CDEs of historic buildings and / or surrounding within the HKO Headquarters would be properly monitored. All the survey reports should be submitted for AMO's record.

Conservation guidelines

- The photographic survey, cartographic survey and condition survey should be carried by experienced surveyors/ conservationists. A set of record shall be kept by the operator.

Policy AA2

- Any addition and alteration works shall be confined to less significant locations and less prominent façades.

Conservation guidelines

- The three major external façades of the Red House facing north, east and west should be preserved as much as possible. Greater flexibility could be allowed for the south facing façade and the rear block façades.
- The extension to the Red House is a later addition which provide opportunities to addition and alteration works. Removal of the extension could be considered if necessary.
- Details of removal of any extension, which is considered as later addition in Red House, shall be submitted for AMO's comment before proceeding the *Section 6* permit application (*Antiquities and Monuments Ordinance*) for the Project.

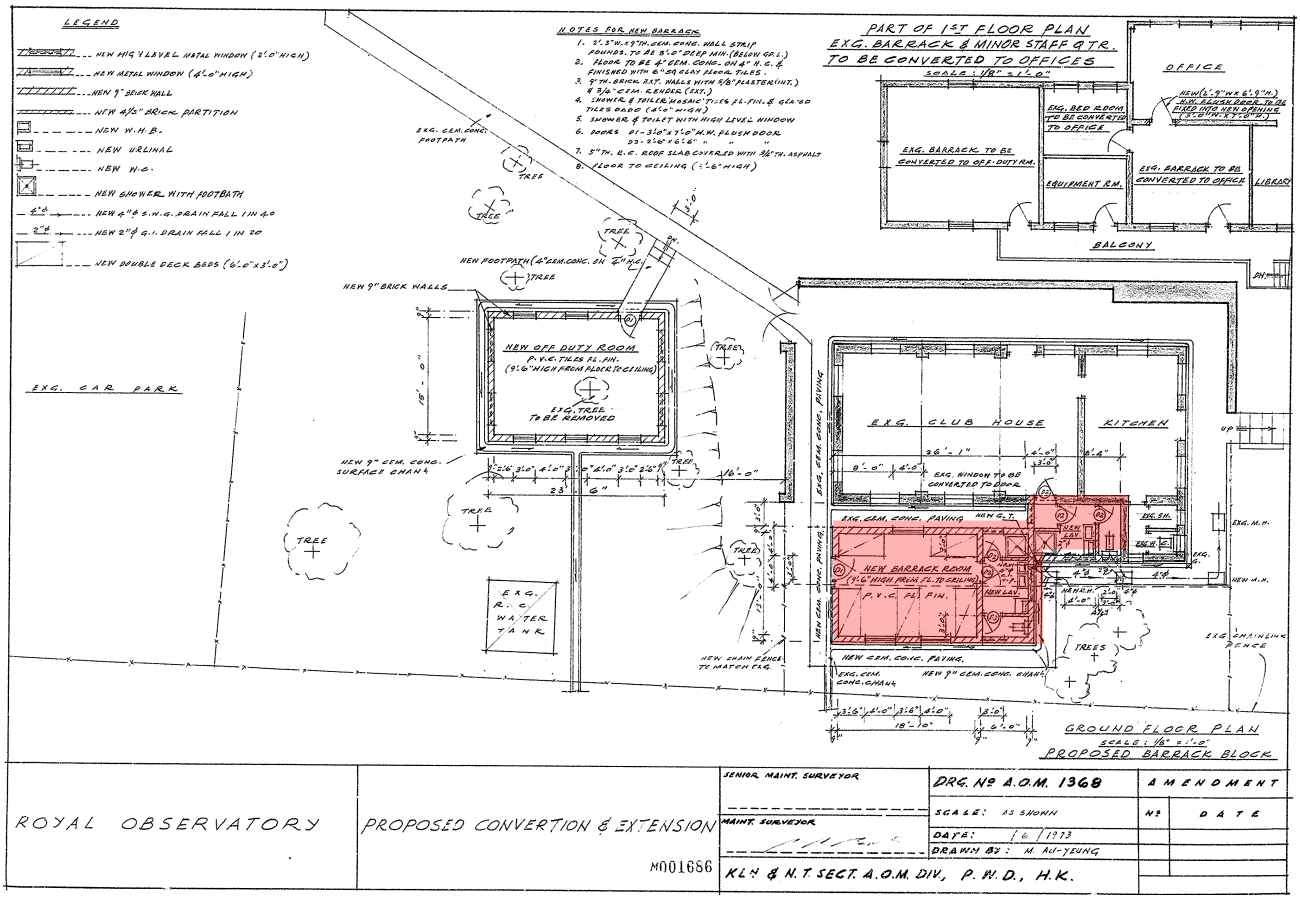


Figure 8.23. Floor plan for the proposed conversion and extension to Red House in 1973.[5]

Figure 8.24. Extension of Red House in 2019.

[5] Architectural Office P.W. D., *Royal Observatory – Proposed Conversion & Extension*, drawing no. A.O.M. 1368, 1973.

Policy AA3

- Any refurbishment works necessary to be carried out at the interior of the historic building should be kept to a minimum. Major alterations and additions should be confined to the areas of lesser significance.

Conservation guidelines

- The works to the interior of Red House shall be kept to a minimum as far as practicable.
- New works could consider to be housed at the small room at the rear, which is of lower significance where greater flexibility is allowed for addition and alteration works.

8.7.13. Interpretation

Policy IN01

- Interpretation should be provided for the education and promotion of the cultural significance of HKO to the public.

Conservation guidelines

- Interpretation should be provided for telling the heritage story of HKO.
- Interpretation could be considered through the means of display of interpretative media, original setting of the heritage building or guided tours for the general public.

8.7.14. Management & Maintenance

Policy MM01

- A management and maintenance plan should be drawn up to ensure that the heritage site is well kept in a good condition.

Conservation guidelines

- The plan should provide details on maintenance tasks to be undertaken, together with an indication of those responsible, maintenance schedule and tracking methods. The plan should also provide guidance on appropriate techniques and materials to be used in the maintenance of specific features of the heritage site.
- The plan should be made ready before the operation of the new use and should be reviewed by building management professionals, conservationists, and professionals as necessary in order to ensure the execution of a proper maintenances programme.
- The plan should be prepared to ensure that the responsibilities to look after the heritage building are well understood by the building management team.

8.7.15. Documentation

Policy DC01

- The process of conservation should be documented during different stages of works, from design and planning, works execution, works completion and future management as a record to manage the changes.

Conservation guidelines

- All survey records and drawings for existing conditions; drawings and documents for the purpose of obtaining statutory approval; scope of works, method statements and materials used for repairing the key CDEs shall be properly recorded and secured together with this Conservation Management Plan.
- A restoration report will be a good means to document the restoration process.

8.8. IMPACT ASSESSMENT

Identification of Potential Impacts

Level of Impact

8.8.1. The evaluation of the cultural heritage impact assessment may be classified into five levels of significance below.

- Beneficial impact: the impact is beneficial if the Project will enhance the preservation of the heritage site(s);
- Acceptable impact: if the assessment indicates that there will be no significant effects on the heritage site(s);
- Acceptable impact with mitigation measures: if there will be some adverse effects, but these can be eliminated, reduced, or offset to a large extent by specific measures;
- Unacceptable impact: if the adverse effects are considered to be too excessive and are unable to mitigate practically;
- Undetermined impact: if the significant adverse effects are likely, but the extent to which they may occur or may be mitigated cannot be determined from the study. Further detailed study will be required for the specific effects in question.

Archaeological Impact Assessment and Mitigation Measures

Construction Phase

8.8.2. No Site of Archaeological Interests (SAIs) is found within the CHAA.

8.8.3. The excavation of the Project is mainly located in developed area undergone construction works with high level of ground disturbance, and area unfavourable to cultural deposit accumulation which has no archaeological potential, therefore no adverse archaeological impact due to the proposed works of the Project is anticipated.

8.8.4. As a precautionary measure, the Project Proponent is required to inform AMO immediately when any antiquities or supposed antiquities under the *Antiquities and Monuments Ordinance (Cap. 53)* are discovered during the course of works.

Operation Phase

8.8.5. No excavation works will be involved in operation phase of the Project, therefore no adverse archaeological impact is anticipated. No mitigation measure is required.

Built Heritage Impact Assessment and Mitigation Measures

8.8.6. The impacts were assessed for both the construction and operation phases with the potential sources of impacts are discussed in the following sections.

Construction Phase

8.8.7. Any heritage resources, located in close proximity to the Project Site may be impacted through:

- Direct impact to historic buildings/ structures (construction works for the construction of the new Annex Block, provision of a widened access road to the new Annex Block, the excavation works for the UU diversion works and the refurbishment works to convert the existing Red House into a history room for telling the heritage story of HKO)
- Indirect vibration/settlement /tilting impact on historic buildings due to drilling, piling and excavation activities during construction phase that may lead to the structural damage or interference of normal activities; and
- Indirect visual impact to historic buildings due to construction works.

8.8.8. The proposed works area of UU diversion works near to the entrance of the 1883 building, which requires excavation of 1.8m from the ground level, is located near to the underground chamber and the stairs connecting the tunnel portal to underground chamber. Based on field inspection, the proposed works area of UU diversion works is located horizontally approximately 1.5m away from the underground chamber and 4m from the stairs connecting the tunnel portal to underground chamber. Moreover, the floor level of the underground chamber is estimated to be about 5.3m below ground level which is approximately +32.95 mPD and the internal ceiling of the chamber is about 3.3m high, which is approximately 2m below the ground floor. It is recommended that design proposal, method of works and choice of machinery should be targeted to avoid direct physical impacts to the underground chamber, stair, and tunnel portal. Any vibration/settlement /tilting induced from the proposed works should be strictly monitored to ensure no physical damages made to the underground chamber with tunnel portal during the course of works.

Operation Phase

8.8.9. Impacts on sites of cultural heritage during operation phase of the Project Site include:

- Indirect visual impact associated with alteration in surrounding environment of the historical structures due to the above-ground structures of the Project.
- The activities during the operation phase will be mainly typical of office uses by HKO at the new Annex Block, while the activities at the Red House will be mainly visits by the public to be organised and managed by HKO. No adverse impact to the cultural heritage is expected during the operation phase.

Evaluation of Potential Impacts with Mitigation Measures

Direct impact during construction phase

8.8.10. The proposed construction of the new Annex Block with various greening strategies, including the addition of underground plant room for street fire hydrant water plant room and tank at the outdoor space between the new Annex Block and Red House

Affected CDEs / fabric	**Level of significance**	**Impact Level**
Major pathways	Medium	Acceptable impact with mitigation measures
Area with supplementary facilities	Medium	
Supporting area	Low	

Treatment/ Mitigation Measures

- Photographic and cartographic survey of the heritage site including the affected CDEs shall be carried out before the commencement of works.
- Condition survey should be carried out to record conditions of the affected CDEs before, during (at a regular interval during works period) and upon completion of the Project so as to ensure that the CDEs of historic buildings and / or surrounding within the HKO Headquarters would be properly monitored. All the survey reports should be submitted for AMO's record.
- Interpretation strategy should be properly formulated and the historic development and changes of the heritage site should be presented to enhance and reinforce the understanding of its cultural significance.
- The Project Proponent should be reminded to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.
- Details of the construction of underground plant room should be submitted to AMO at the implementation stage for further review.
- Any construction works of the temporary EVA during construction stage to be outside Project Site boundary should be reversible and shall have minimum disturbance to existing historic landscape.

8.8.11. The proposed geotechnical works including retaining structure, slope improvement works and excavation, lateral support works for pile cap construction, substructure and superstructure works for the construction of new Annex Block

Affected CDEs / fabric	Level of significance	Impact Level
Area with supplementary facilities	Medium	Acceptable impact with mitigation measures
Supporting area	Low	
Major pathways	Medium	

Treatment/ Mitigation Measures

- Photographic and cartographic survey of the heritage site including the affected CDEs shall be carried out before the commencement of works.
- Condition survey should be carried out to record conditions of the affected CDEs before, during (at a regular interval during works period) and upon completion of the Project so as to ensure that the CDEs of historic buildings and / or surrounding within the HKO Headquarters would be properly monitored. All the survey reports should be submitted for AMO's record.
- Interpretation strategy should be properly formulated and the historic development and changes of the heritage site should be presented to enhance and reinforce the understanding of its cultural significance.
- The Project Proponent should be reminded to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.
- The proposed works for the construction of new Annex Block (including site formation works, excavation and foundation works, slope upgrading and improvement works, superstructure and external works etc.) shall have minimum disturbance to existing historic landscape.
- The proposed works for the construction of new Annex Block shall take into account of the existing historic buildings in the close vicinity which shall not incur ground settlement, and impose vibration and tilting to the historic buildings, and should not undermine or cause damage to the foundation of the historic structures.
- During the construction stage, works boundary should be set away from the historic buildings within the HKO Headquarters as far as practical and physical barrier should be provided to fence off heritage sites from the works area.
- Foundation information of the historic structures shall be verified on site where necessary, sufficient lateral support should be provided and de-watering (if required) should be carried out with great cautions to control ground movement and change of ground water regime at the heritage site.

8.8.12. Provision of a widened access road to the new Annex Block for the minimum 6m width EVA in compliance with the latest government regulations

Affected CDEs / fabric	**Level of significance**	**Impact Level**
Area with supplementary facilities	Medium	Acceptable impact with mitigation measures
Supporting area	Low	
Major pathways	Medium	
Garage of Quarters No. 2	Medium	
Site entrances from Nathan Road and Observatory Road	High	

Treatment/ Mitigation Measures

- Photographic and cartographic survey of the heritage site including the affected CDEs shall be carried out before the commencement of works.
- Condition survey should be carried out to record conditions of the affected CDEs before, during (at a regular interval during works period) and upon completion of the Project so as to ensure that the CDEs of historic buildings and / or surrounding within the HKO Headquarters would be properly monitored. All the survey reports should be submitted for AMO's record.
- Interpretation strategy should be properly formulated and the historic development and changes of the heritage site should be presented to enhance and reinforce the understanding of its cultural significance.
- The Project Proponent should be reminded to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.
- The widened access road will be constructed in a way such that the major access from the Nathan Road site entrance to the main area is still maintained.
- The site entrance from Nathan Road will need to be widened in order to achieve the widened EVA. The affected gate posts shall be salvaged and re-installed in a new location as far as technically feasible.
- The proposal and works on the entrance, the gate and the posts should be conducted upon AMO's approval as appropriate.

8.8.13. Proposed UU diversion works including excavation, enlargement of existing openings and creating new openings to the affected historic buildings as below:

Affected CDEs / fabric	**Level of significance**	**Impact Level**
1883 Building and its annex building	High	Acceptable impact with mitigation measures
Quarters No. 2 and No. 3	High	
Garage of Quarters No. 2	Medium	
Underground chamber with tunnel portal	High	
Quarters No. 1	High	
Garage of Quarters No. 1	Medium	
Garage adjacent to Quarters No. 1	Low	
Red House	Medium	
Substation A	Low	
White House No. 2	Low	
White House No. 1	Low	

Treatment/ Mitigation Measures

- Condition survey should be carried out to record conditions of the affected CDEs before, during (at a regular interval during works period) and upon completion of the Project so as to ensure that the CDEs of historic buildings and / or surrounding within the HKO Headquarters would be properly monitored. All the survey reports should be submitted for AMO's record.
- The proposed works area of UU diversion will both make use of existing trenches and forming new trenches along the existing paths.
- In case of forming new trenches:
  - The forming of new trenches will require excavation of 1.8m from the ground level. The proposed works for the UU diversion shall take into account of the existing historic buildings in the close vicinity which shall not incur ground settlement, and impose vibration and tilting to the historic buildings, and should not undermine or cause damage to the foundation of the historic structures.
  - The exact boundary for the excavation works shall be refined and determined in detailed design stage in order to avoid disturbance to the foundation of existing buildings. Trial pits shall be carried out subject to AMO's approval.
  - The excavation works will be limited to the use of small excavator and handheld tools for shallow excavations to minimise the indirect vibration impact.
  - New underground utilities will be grouped together when entering the affected buildings at localised locations.
  - Any new openings for passage of the underground utilities should be at less prominent locations, and should be agreed prior to the works. The forming of the new openings shall be subject to the advice from Registered Structural Engineer.

- In case of making use of the existing trenches:
  - Existing openings should be utilised as far as technically feasible so that minimum number of openings will be made on the walls.
  - In the event that it is necessary to enlarge existing openings, the extent of the enlargement shall be determined by Registered Structural Engineer. Disturbance to the existing structure shall be kept to a minimum as far as possible.
- The proposed works for the UU diversion shall have minimum disturbance to existing historic buildings and landscape.
- Monitoring measures are required during the construction stage upon commencement of any works till the works completed to ensure the structural integrity of the historic buildings.
- Three levels of control criteria, alert, alarm, and action levels (AAA system) would be adopted for monitoring during excavations for the UU diversion works. Checkpoints and markers relating to ground settlement, services settlement, building tilting, vibration and water table would be installed for the monitoring. The concerned limits are proposed below:

Monitoring	**Alert level**	**Alarm level**	**Action level**
Ground settlement (mm)	6	8	10
Tilting	1/2000	1/1500	1/1000
Vibration (mm/s)	2	2.5	3

- Different sets of monitoring points should be provided in the vicinity of the Project Site and the historic buildings of HKO Headquarters respectively, with locations and frequency to be agreed by AMO. Monitoring criteria would be subjected to review by AMO.
- Construction works shall be suspended immediately when a vibration monitoring reading is found to exceed the limits given in the vibration control / monitoring scheme. An investigation report and remedial proposal shall be submitted to Project Team, ArchSD and AMO to examine the construction method and review ground response history of the monitoring record. The construction works shall only be resumed after the acceptance of the investigation report and remedial proposal by Project Team, ArchSD and AMO.
- Periodic visual inspections of the historic buildings shall be conducted by Contractor during the course of construction works, and the monitoring data should be submitted for Project Team and AMO's noting, comment and record.
- The Project Proponent should be reminded to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.

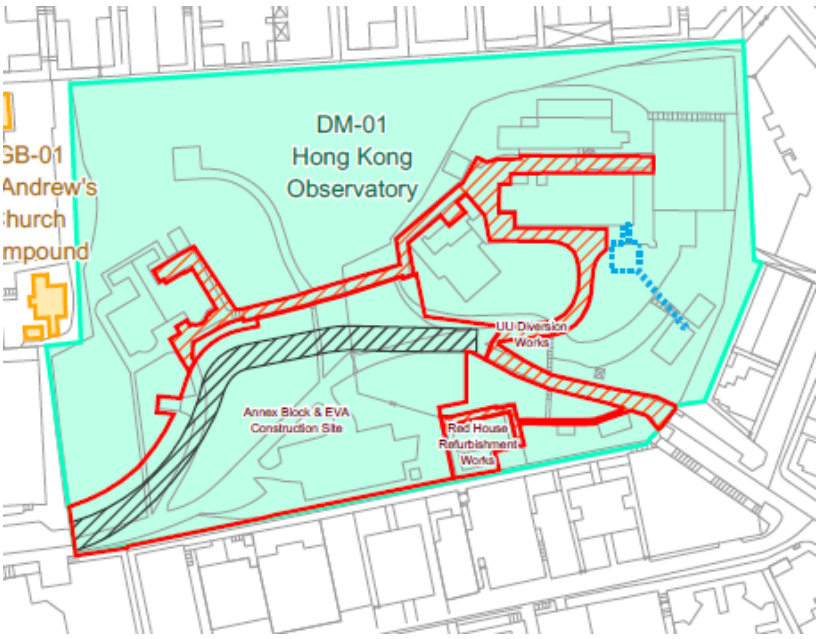


Figure 8.25. Location plan for the UU diversion works (hatched in red)

8.8.14. Refurbishment of the Red House for the purpose of providing a history room

Affected CDEs / fabric	Level of significance	Impact Level
Red House	Medium	Acceptable impact with mitigation measures
Spatial arrangement – bigger room (former club house)	High	

Treatment/ Mitigation Measures

- Photographic and cartographic survey of Red House including the affected CDEs shall be carried out before the commencement of works.
- Interpretation strategy should be properly formulated and the historic development and changes of the Red House should be presented to enhance and reinforced the understanding of its cultural significance.
- The new use as a history room will make use of the existing internal layout and will not impose any impact to the original spatial arrangement.

8.8.15. Removal of existing later-added window-type A/C units at Red House

Affected CDEs / fabric	Level of significance	Impact Level
North facing façade	High	Beneficial impact
South facing façade	Medium	
East facing façade	High	
West facing façade	High	
Timber window	High	

Treatment/ Mitigation Measures

- The later-added window-type A/C units are undesirable interventions to the Red House and shall be removed. Reinstating those affected windows could reveal the original façade and window design.
- Detailed documentation including photographic survey and cartographic survey should be carried out to the affected building elements prior to the removal.
- New timber windows to be installed should make reference to the existing timber windows of period style in terms of materials, dimensions, texture, colour, and ironmongeries.

8.8.16. Removal of existing internal fittings identified to be later additions (e.g., false ceilings) at Red House

Affected CDEs / fabric	Level of significance	Impact Level
Roof structure with timber rafters supporting on timber trusses	High	Beneficial impact
Plastered internal walls with paint	High	
Exposed brickworks with paint over	High	

Treatment/ Mitigation Measures

- The later-added internal fittings are undesirable interventions to the Red House and shall be removed. Reinstating those affected CDEs could reveal the original historic fabrics and interior.
- Detailed documentation including photographic survey and cartographic survey should be carried out to the affected building elements prior to the removal.

8.8.17. Installation of building services systems such as electrical system, fire services system, air conditioning system, etc. at Red House

Affected CDEs / fabric	Level of significance	Impact Level
South facing façade	Medium	Acceptable impact with mitigation measures
Roof structure with timber rafters supporting on timber trusses	High	
Concrete flat roof with special marks	High	
Brick construction with English bond	High	
Plastered internal walls with paint	High	
Exposed brickworks with paint over	High	
Plastered dado	High	

Treatment/ Mitigation Measures

- Existing building services installation should be followed as far as technically feasible. All the locations of new openings should be submitted to AMO for approval.
- New building services will be grouped together when entering the Red House so that minimum number of openings will be made on the walls.
- Instead of forming new holes, existing openings on walls should be utilised as far as technically feasible.
- New openings for passage of pipes should be at less prominent location, and should be agreed prior to the works.
- Cable trunking should be used instead of individual electrical conduits.
- Minimise disturbance to the historic walls as far as possible. The openings shall be formed by removal of masonry units subject to the advice from Registered Structural Engineer.

- No new conceal type conduit and pipe is allowed at existing historic fabrics. The exposed routing should be carefully designed at less prominent locations and tidily aligned to keep minimum disturbance and visual impact to historic fabrics.

Indirect vibration impact on historic buildings during construction phase

8.8.18. The proposed geotechnical works including retaining structure, slope improvement works and excavation, lateral support works for pile cap construction, substructure and superstructure works for the construction of new Annex Block

Affected CDEs / fabric	**Level of significance**	**Impact Level**
1883 Building and its annex building	High	Acceptable impact with mitigation measures
Quarters No. 2 and No. 3	High	
Garage of Quarters No. 2	Medium	
Underground chamber with tunnel portal	High	
Quarters No. 1	High	
Garage of Quarters No. 1	Medium	
Garage adjacent to Quarters No. 1	Low	
Red House	Medium	
Substation A	Low	
White House No. 2	Low	
White House No. 1	Low	

Treatment/ Mitigation Measures

- The proposed works for the construction of new Annex Block (including excavation and foundation works, geotechnical works, substructure, and superstructure works etc.) shall have minimum disturbance to existing historic buildings and landscape.
- The proposed works for the construction of new Annex Block shall take into account of the existing historic buildings in the close vicinity which shall not incur ground settlement and impose vibration to the historic buildings, and should not undermine or cause damage to the foundation of the historic structures.
- Foundation information of the historic structures shall be verified on site where necessary, and sufficient lateral support should be provided and de-watering (if required) should be carried out with great cautions to control ground movement and change of ground water regime at the heritage site.
- The excavation and foundation works for the construction of the new Annex Block shall be carried out by a non-percussive method to minimise the disturbance to existing historic building. Percussive method shall be avoided as far as practicable.
- Monitoring measures are required during the construction stage upon commencement of any works till the works completed to ensure the structural integrity of the historic buildings.

- Three levels of control criteria, AAA system would be adopted for monitoring during excavation and foundation works. Checkpoints and markers relating to ground settlement, services settlement, building tilting, vibration and water table would be installed for the monitoring. The concerned limits are proposed below:

Monitoring	**Alert level**	**Alarm level**	**Action level**
Ground settlement (mm)	6	8	10
Tilting	1/2000	1/1500	1/1000
Vibration (mm/s)	2	2.5	3

- Different sets of monitoring points should be provided in the vicinity of the Project Site and the historic buildings of HKO Headquarters respectively, with locations and frequency to be agreed by AMO. Monitoring criteria would be subjected to review by AMO.
- Construction works shall be suspended immediately when a vibration monitoring reading is found to exceed the limits given in the vibration control / monitoring scheme. An investigation report and remedial proposal shall be submitted to Project Team, ArchSD and AMO to examine the construction method and review ground response history of the monitoring record. The construction works shall only be resumed after the acceptance of the investigation report and remedial proposal by Project Team, ArchSD and AMO.
- Periodic visual inspections of the historic buildings shall be conducted by Contractor during the course of construction works, and the monitoring data should be submitted for Project Team and AMO's noting, comment and record.
- The Project Proponent should be reminded to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.

Indirect visual impact to historic buildings within the boundary of HKO Headquarters due to construction works during construction stage

8.8.19. The proposed construction of new Annex Block with various greening strategies

Affected CDEs / fabric	**Level of significance**	**Impact Level**
1883 Building and its annex building	High	Acceptable impact with mitigation measures
Quarters No. 2 and No. 3	High	
Garage of Quarters No. 2	Medium	
Underground chamber with tunnel portal	High	
Quarters No. 1	High	
Garage of Quarters No. 1	Medium	
Garage adjacent to Quarters No. 1	Low	
Red House	Medium	
Substation A	Low	
White House No. 2	Low	
White House No. 1	Low	

Treatment/ Mitigation Measures

- The new Annex Block will be located away from the main area of HKO Headquarters and the building height is capped at +45 mPD for the least visual impact in the perception of the overall setting.
- The location of the new Annex Block is carefully chosen, which is mainly in the supporting area and partly in the area with supplementary facilities, and these areas are with lower significance and experienced interventions throughout the history of the site.
- The appearance of the new Annex Block should be compatible with but distinguishable from the heritage site.
- Various greening strategies adopted in the design such as vertical green walls and roof trellis with climber plants could soften the appearance of the new Annex Block, while stepped terraces with planting serves as green buffer towards adjacent buildings.
- The new Annex Block will be located away from Red House, where a new outdoor space is introduced in-between to minimise visual impact.
- The new Annex Block should be understated in design which should not overwhelm the appearance of Red House.

Figure 8.26. Artist's impression with bird's eye view to the New Annex Block and Red House

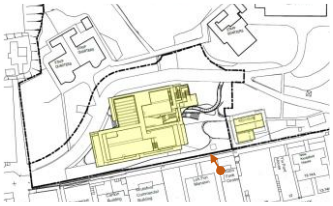


Figure 8.27. Artist's impression with bird's eye view to the New Annex Block

Figure 8.28. Artist's impression with bird's eye view to New Annex Block and 1883 Building

Figure 8.29. Artist's impression with pedestrian view to New Annex Block's main entrance

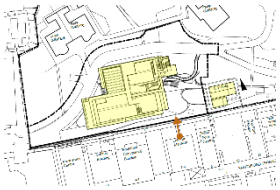


Figure 8.30. Artist's impression with view to outdoor space between New Annex Block and Red House

Figure 8.31. Artist's impression with pedestrian view to outdoor space between New Annex Block and

Figure 8.32. Artist's impression with pedestrian view from 1883 Building to New Annex Block

Possible impact to the built heritage around the Project Site during construction stage

8.8.20. The built heritage within 150m from boundary of the Project Site are Former Kowloon British School (DM), St. Andrew's Church Compound (Grade 1 historic buildings), and Kowloon Bowling Green Club (Grade 3 historic building), which have the nearest distance of 51.7m, 24.93m, and 133.8m away from the boundary of the Project Site respectively. For built heritage beyond 50m from boundary of the Project Site, no direct physical impact is expected during the construction stage.

8.8.21. For St. Andrew's Church Compound, as there are two heritage buildings with their nearest distance from the boundary of the Project Site within 50m, the impact is evaluated as follows:

Affected built heritage around the Project Site	**Nearest distance between the built heritage and the Project Site #**	**Impact Level**
Church Verger's Cottage	49.44m 24.93m	Acceptable impact with mitigation measures

(# Remarks: The nearest distance has taken the level difference into consideration)

Treatment/ Mitigation Measures

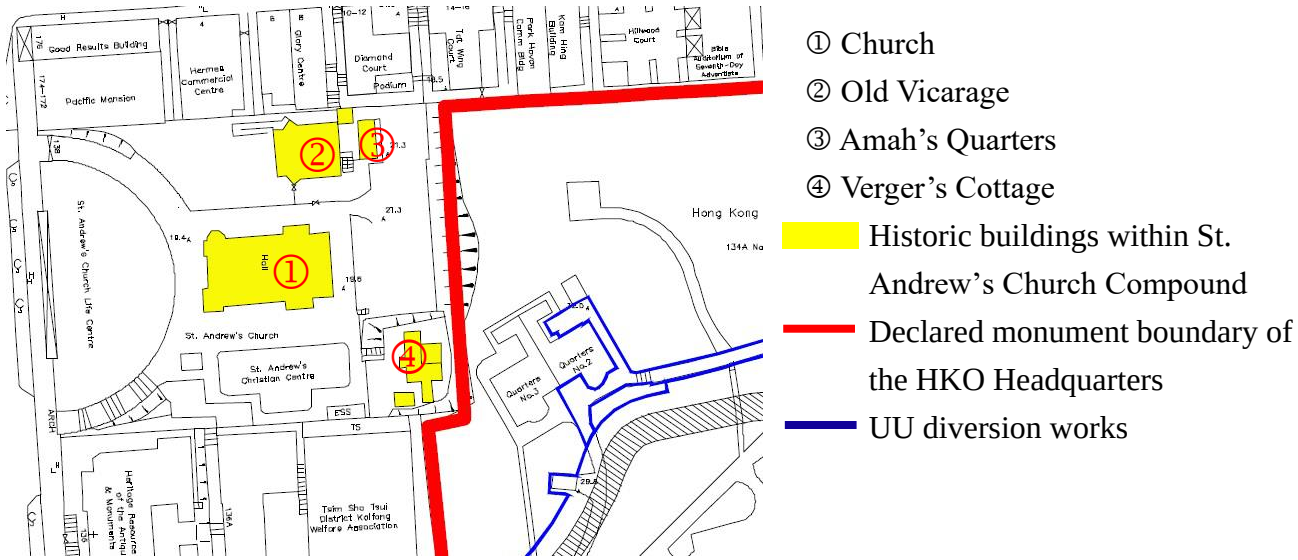


Figure **8.33.** Location plan showing the nearest distance between the affected built heritage and the boundary of the Project Site

- The proposed works in concern are UU diversion works including excavation, enlargement of existing openings and creating new opening to existing buildings within the HKO Headquarters.
- The excavation works will be limited to the use of small excavator and handheld tools for shallow excavations to minimise the indirect vibration/settlement /tilting impact.
- Condition survey should be carried out to record conditions of the affected historic buildings before, during (at a regular interval during works period) and upon completion

of the Project so as to ensure that the affected historic building would be properly monitored. All the survey reports should be submitted for AMO's record.

- Monitoring measures are required during the construction stage upon commencement of any works till the works completed to ensure the structural integrity of the historic buildings.
- Three levels of control criteria, AAA system would be adopted for monitoring during excavations for the UU diversion works. Checkpoints and markers relating to ground settlement, services settlement, building tilting, vibration and water table would be installed for the monitoring. The concerned limits are proposed below:

Monitoring	**Alert level**	**Alarm level**	**Action level**
Ground settlement (mm)	6	8	10
Tilting	1/2000	1/1500	1/1000
Vibration (mm/s)	2	2.5	3

- Different sets of monitoring points should be provided on the affected historic buildings respectively, with locations and frequency to be agreed by AMO. Monitoring criteria would be subjected to review by AMO upon updates of grading status of heritage sites.
- Construction works shall be suspended immediately when a vibration monitoring reading is found to exceed the limits given in the vibration control / monitoring scheme. An investigation report and remedial proposal shall be submitted to Project Team, ArchSD and AMO to examine the construction method and review ground response history of the monitoring record. The construction works shall only be resumed after the acceptance of the investigation report and remedial proposal by Project Team, ArchSD and AMO.
- Periodic visual inspections of the historic buildings shall be conducted by Contractor during the course of construction works, and the monitoring data should be submitted for Project Team and AMO's noting, comment and record.
- The Project Proponent should be reminded to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.

8.9. CONCLUSION

8.9.1. Cultural heritage resources within study area have been identified and reviewed through literature review and field surveys. Visual impact to the major heritage resources is not anticipated during construction and operation phases. Direct impact to key historic buildings will be in a controlled manner, which will be at localised locations for the UU diversion works, and restricted to refurbishment works to Red House, with mitigation measures. Indirect vibration/settlement /tilting impact on historic buildings during construction phase will be monitored with monitoring measures.

8.9.2. No SAI is found within the CHAA.

8.9.3. The excavation of the Project is mainly located in developed area undergone construction works with high level of ground disturbance, and area unfavourable to cultural deposit accumulation which has no archaeological potential, therefore no adverse archaeological impact due to the proposed works of the Project is anticipated.

8.9.4. The proposed work area of UU diversion work near to the entrance of the 1883 building, which requires excavation of 1.8m from the ground level, is located near to the underground chamber and the stairs connecting the tunnel portal to underground chamber. It is recommended that design proposal, method of works and choice of machinery should be targeted to avoid direct physical impacts to the underground chamber, stair, and tunnel portal. Any vibration/settlement/tilting induced from the proposed works should be strictly monitored to ensure no physical damages made to the underground chamber with tunnel portal during the course of works.

8.9.5. As a precautionary measure, the Project Proponent is required to inform AMO immediately when any antiquities or supposed antiquities under the *Antiquities and Monuments Ordinance (Cap. 53)* are discovered during the course of works.

8.9.6. To conclude, the construction and operation of the Project would not cause unacceptable impact on cultural heritage resources.

8.10. REFERENCE

- CO129/186.
- CO129/195.
- CO129/205.
- CO129/206.
- Civil Engineering and Development Department. "Kowloon Granite." https://www.cedd.gov.hk/eng/about-us/organisation/geo/pub_info/memoirs/geology/vol/klk/index.html. Accessed on November 5, 2019.
- Dyson, Anthony, *From Time Ball to Atomic Clock*. Hong Kong: Government Printer, 1983.
- Empson, Hal. *Mapping Hong Kong: A Historical Atlas*. Hong Kong: Hong Kong Government Information Service, 1992.
- Hong Kong Memory. "Developing Tsim Sha Tsui." Accessed on October 8, 2019. http://www.hkmemory.org/city_relics/text/index.php?p=home&catId=146&photoNo=0.
- Hong Kong Observatory. "130th Anniversary." Accessed on September 18 2019. https://www.hko.gov.hk/en/cis/stn.htm#.
- Hong Kong Observatory. "Information of Weather Station." Accessed on September 18 2019. https://www.hko.gov.hk/en/cis/stn.htm#.
- Hong Kong Observatory Technical Note 108, 2016. Retrieved from https://www.hko.gov.hk/publica/tn/tn108.pdf.
- Horizon Asia Limited：《香港天文台 2015 年後勤大樓地基探考古評估報告》，2016 年。
- Kowloon Bowling Green Club. "History of KBGC." Accessed on November 5, 2019. http://www.kbgc.com.hk/content.php?tp_id=3.
- MacKeown, P. Kevin. *Early China Coast Meteorology: The Role of Hong Kong*. Hong Kong: Hong Kong University Press, 2011.
- St. Andrew's Church. "Heritage." Accessed on November 5, 2019. http://www.standrews.org.hk/.
- Starbucks, L. *A Brief History of the Royal Observatory*. Hong Kong: Government Printer, 1951.
- The Hong Kong Government Gazette, 17th November, 1877. Retrieved September 3, 2019, under The University of Hong Kong, Website: http://sunzi.lib.hku.hk/hkgro/index.jsp.
- The Hong Kong Government Gazette, 3rd September, 1881. Retrieved September 3, 2019, under The University of Hong Kong, Website: http://sunzi.lib.hku.hk/hkgro/view/g1881/682276.pdf.
- Tregear, T. R. and Berry, L., *The Development of Hong Kong and Kowloon as Told in Maps*. Hong Kong: Hong Kong University Press, 1959.
- Welsh Frank. *A History of Hong Kong.* London: Harper Collins Publishers, 1997.

- Wellcome Collection gallery (2018-03-30): https://wellcomecollection.org/works/mdrv6vz8; retrieved on September 3, 2019
- Antiquities and Monuments Office. Declared Monuments in Hong Kong (as at 20 May 2022) [available from: https://www.amo.gov.hk/filemanager/amo/common/form/DM_Mon_List_e.pdf; accessed on 20 June 2023]
- Antiquities and Monuments Office. List of Sites of Archaeological Interest in Hong Kong (as at Nov 2012) [available from: https://www.amo.gov.hk/filemanager/amo/common/form/list_archaeolog_sites.pdf; accessed on 20 June 2023]
- Antiquities and Monuments Office. List of the 1,444 Historic Buildings with Assessment Results (as at 9 March 2023). [available from: https://www.aab.gov.hk/filemanager/aab/en/content_29/AAB-SM-chi.pdf; accessed on 20 June 2023]
- Antiquities and Monuments Office. Government Historic Sites Identified by AMO (as at May 2022. [available from: https://www.amo.gov.hk/filemanager/amo/common/form/build_hia_government_historic_sites.pdf; accessed on 20 June 2023]
- HKMS, Map: 1:600 196-NE-2 (version 1957-08) , 1:600 196-NE-2 (version 1966)
- 王崇熙：《新安縣志》，24 卷，嘉慶二十四年(1819 年)版。
- 油尖旺區議會：《油尖旺區風物志》（香港：油尖旺區議會，2000）。
- 劉蜀永：《割佔九龍》（香港：三聯書店，1997）。
- 饒宗頤：〈港、九前代考古雜錄〉，載《新亞學術集刊》，第四期，1983 年。

[This page is intended to be blank]