Annex A

Heritage Impact Assessment
For Lung Tsun Stone Bridge Preservation Corridor at Kai Tak

BACKGROUND

1. The Architectural Services Department (“ArchSD”) will carry out the works under the Public Works Programme subject to funding approval and the Leisure and Cultural Services Department (“LCSD”) will manage the venue after its completion. The project targets to provide landscape open space within a 30-meter wide preservation corridor for heritage conservation and public appreciation of the Lung Tsun Stone Bridge (“LTSB”) remnants in-situ at Kai Tak. The project covers two sites, Site A and Site B. The location of Site A, of which remnants are located, is indicated in Fig. 1. A photo of the LTSB in the early 20th century is shown in Fig. 2.

2. Site A was the original location of 1873-1875 built LTSB. Archaeological investigation and excavations were carried out in 2008, 2008-2009 and 2011-2012 to uncover remnants of the Pavilion for Greeting Officials, solid mass section, supporting pillar section, landing platform of LTSB, former Kowloon City Pier, 1924 built seawall, 1933 built causeway and foundation structures of Kai Tak Airport (Fig. 3 to Fig. 16).

3. Site A will be the location of the 30-meter wide LTSB Preservation Corridor. Site B involves modification of existing facilities at Shek Ku Lung Road Playground and the adjacent Shek Ku Lung Road Rest Garden. No heritage site is found within Site B and the area of 50 meters from Site B’s boundary.

4. In the Heritage Impact Assessment (“HIA”) report, the Study Area will only cover Site A, also known as Lung Tsun Stone Bridge Site of Archaeological Interest (“LTSB SAI”) recorded by the Antiquities and Monuments Office (“AMO”) and the area of 50 meters from Site A’s boundary. “The Site” will be used in the following sections to avoid confusion. “The Site” is equivalent to “Site A”, the location of the Lung Tsun Stone Bridge Preservation Corridor.

5. The then Chief Executive announced in his 2007-08 Policy Address a package of initiatives for heritage conservation including the requirement to
undergo HIA for all new capital works projects involving historic and built heritage. In this project, the HIA will serve as reference by ArchSD in the preparation of detailed design study, tender drawings and documents for the project, as well as to serve as reference by LCSD in preparing the management and operation plan of the Site.

STATEMENT OF CULTURAL SIGNIFICANCE

6. The Site is culturally significant for the following reasons:

a. Historic Value
LTSB is a unique historical landmark with strategic position epitomising the long history of diplomatic exchanges between the Qing government and British colonial government. It symbolises the presence of the Qing government’s jurisdiction over Kowloon Walled City (“KWC”). It also testifies the flourishing trade of opium and gambling in 19th century, the early commercial activities in Kowloon City and the economic growth of Hong Kong under British governance.

b. Architectural Value
LTSB is of architectural significance because it is one of the surviving examples of typical Qing stone bridge in Hong Kong other than four existing bridges in the rural areas. It showcases the construction method and materials used for Guangdong bridge during the Qing dynasty. It also demonstrates the influence of Chinese architecture as well as local adaptation in Hong Kong.

(i) Solid Mass Section of LTSB
The LTSB portion connecting with inland and Pavilion for Greeting Officials is identified as solid mass. The granite slabs arrangement strikes resemblance to the walls of KWC. Pre-shaped dressed transverse blocks were placed between five layers of pre-shaped dressed longitudinal blocks as identified in a few historical photographs. Such arrangement can provide stability for the wall structure. Similar arrangement was also adopted in the brick walls of Chinese vernacular houses.
(ii) Supporting Pillar Section of LTSB

The seaward portion is considered column structure. There were a total of 20 stone supporting pillars excavated in the full archaeological excavation in 2011-12. Each stone supporting pillar consisted of several parts: granite decking at the top, nine tiers of granite slabs laying in a hexagonal shape on plan and was constructed in an alternating straight-cross manner (丁順建築法). This hexagonal plan can minimise the effect of waves and tides for the stability of the bridge. This is given a technical term of “point for break water” (分水尖). Such design is similar to other Chinese column bridges. The bottom part was made of foundation boulders of over 50cm in size. Wooden poles struck into the sea floor to stabilise the structure in the bottom. Wooden planks and foundation boulders on top of the wooden poles provided platforms for granite structure. It is believed that timber posts were possibly vertically arranged under pillar footing slabs to support the pillar above.

(iii) Landing Platform of LTSB

Landing Platform at the seaward end of LTSB was constructed using pre-shaped dressed granite blocks with two passenger boarding steps on both NE and SE sides. It is a solid mass structure built by granite slabs. Similar forms of seaward ends were observed in masonry piers of Sheung Wan, Central, Admiralty and Wan Chai. LTSB is not an ordinary bridge but a landing pier adopting the style of stone cutwater (supporting pillar in hexagonal shape) commonly used in river bridges of Guangdong province during the Qing dynasty.

(iv) Pavilion for Greeting Officials

The Pavilion for Greeting Officials (the Pavilion) (接官亭) was a two-storey Chinese style architecture with double-eaved hip roof (重檐式廡殿). It was constructed with green bricks and stones. It had a recessed (凹斗式) entrance, a granite tablet with “龍津” carved / written on top of the front door and two murals on the two sides of the granite tablet (Fig. 17). However, only southern, eastern and western foundation walls and two footing granite slabs of the Pavilion were unearthed according to the findings of previous archaeological work.
c. **Social Value**
LTSB facilitated development of Kowloon Street, the most important commercial and entertainment hub in Kowloon district during the Qing dynasty. It served as a landing pier for Kowloon City area for over 60 years. The construction, interventions and demolitions of LTSB illustrate the urban transformation of Kowloon City. KWC is an urban legend in Hong Kong. It completes the story of early life of KWC. It also testifies the activities of charitable organisation, Lok Sin Tong in 19th century, which played an important role in the community development of early colonial Hong Kong.

d. **Contextual Value**
The originality of the location of LTSB is a key to illustrate the early Kowloon City development and political importance of KWC. The LTSB Preservation Corridor and the declared monuments in Kowloon Walled City Park (i.e. Former Yamen Building of KWC and Remnants of the South Gate of KWC) as well as Hau Wong Temple (also a declared monument), and Stone Houses (石屋家園)¹ can join together to embrace and enrich their distinctive roles in the Chinese civil and military establishment as well as the local community in the late 19th century Hong Kong. With the heritage displays in the future To Kwa Wan MTR Station and the Sung Wong Toi Park, a wider historical cluster will be formed to tell the story of Hong Kong from Song dynasty to the early colonial period of Hong Kong.

e. **Townscape and Landscape Value**
LTSB was an important landmark on the coastline, linking the Kowloon Street and KWC. Before the extension of colony’s territory, it was a visual reminder of the presence of Chinese officials and navy. The archaeological features unearthed within the original site of LTSB could represent the rapid change of townscape and landscape in Kowloon from 1875 to 1998.

f. **Archaeological Value**
The excavated archaeological features of LTSB are physical evidences relating to the Kowloon villages, KWC, Lok Sin Tong, Kowloon City Pier, Kai Tack Bund and Kai Tak Airport development. They are valuable in

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¹ A Grade 3 historic building and revitalised under the Revitalising Historic Buildings Through Partnership Scheme.
terms of urban or historical archaeology in Hong Kong. It is particularly significant in studying history of KWC against the Hong Kong’s colonial background. Archaeological discoveries of LTSB provided detailed information to understand the technology and skill of masonry works in the nineteenth century. These remains are important for the study of architecture of stone pier structures in Hong Kong and surrounding regions.

g. **Authenticity and Rarity**
LTSB is a rare remaining example of typical Qing stone bridge in urban Hong Kong. The location and orientation of LTSB have remained unchanged for over a hundred years. Though the LTSB has suffered from several interventions and various degrees of destructions, the overall layout as well as the construction materials and method are highly authentic.

**HERITAGE IMPACT ASSESSMENT**

7. In accordance with the Development Bureau Technical Circular (Works) No. 6/2009 and AMO’s Guidelines for Archaeological Impact Assessment (“AIA”) (as at 5 September 2012), an HIA is to identify the direct and indirect impacts on the LTSB SAI at the planning stage of the project and formulate conservation policy and mitigation measures for due protection of the remnants within the Site. It provides a set of guiding principles for the design proposal of the LTSB Preservation Corridor, as a public open space with in-situ preservation of remnants of the historic stone bridge.

**A. Plan to Conserve the Cultural Significance of the Site**

8. The plan for devising and implementing necessary mitigation measures to conserve and interpret the significances of the Site are summarised as follows:

a. **Historic Fabrics**
The following key character-defining elements (“CDEs”) identified should be exposed and preserved in-situ as far as possible such as:

   (i) the setting and context of the remnants of LTSB including the Pavilion for Greeting Officials, solid mass section, supporting pillar section and landing platform;
(ii) remnants of the Pavilion for Greeting Officials, solid mass section, supporting pillar section and landing platform; and

(iii) remnants of the 1924 seawall and 1933 causeway within the remnant display area to illustrate the setting and context of LTSB in the early Kowloon City development.

b. Optimum New Additional Works
The number of means of escape, new building services and new ancillary facilities should be kept optimum and not excessive. The ancillary facilities such as pedestrian corridors, link-walkways/bridges, baby care room, first-aid room, store rooms and toilets etc. should be in compatible design and located at areas which will not obstruct the remnant display area.

c. Conservation of the Remnants during Construction Stage

(i) During the construction stage, a qualified archaeologist should be engaged to apply for a licence under the Antiquities and Monuments Ordinance (Cap. 53) to conduct archaeological watching brief to monitor the construction works as well as to conduct archaeological excavation to re-expose the remnants down to the finished levels and to uncover the remnants which have not been excavated before to the level agreed for future display. Archaeological excavation of individual remnants should be conducted before commencement of construction works within the area for archaeological excavation. Protective measures should be taken by the contractor of the construction works in consultation with the heritage consultant and the archaeologist as well as in prior agreement with AMO to prevent the CDEs from further deformation, decay and settlement problems; and

(ii) Condition survey, structural appraisal and photographic report should be conducted / prepared under the recommendations of the heritage consultant and the qualified archaeologist commissioned to verify the actual site and CDEs condition against the proposed design. Method statement including the conservation treatment, safety measures and alternative proposals (if actual situation is found
different from original detail / design intent) should be submitted for AMO’s prior approval. Appropriate protective measures should be taken on site, in prior agreement with AMO, to prevent the remnants from being affected by the construction works. Immediate notification of on-site archaeological problem or archaeological discovery should be made to AMO. Record drawings will be provided by the contractor and vetted and agreed by the heritage consultant after completion of construction works. Photos of “before”, “during” and “after” for works to CDEs should be properly recorded.

d. Interpretation
In order to enhance the cultural heritage of the Site for public appreciation, the remnant display and interpretation areas will be designed to showcase the remnants, historical photographs, background stories and construction methods of LTSB. It can facilitate public appreciation of the LTSB remnants and the relationship between LTSB and KWC.

e. Post-construction
All conservation studies, conservation plans and guidelines, site inspection records during construction stage, record drawings and photographs after completion of works and records of any future alteration works, should be documented by the contractor, vetted and agreed by the heritage consultant and filed at ArchSD and/or LCSD. They should be made available to future users who are responsible for up-keeping the Site and reviewing the development of the Site. Routine maintenance and small scale alteration and additional works should follow the recommendations of the HIA. ArchSD will work with LCSD, its maintenance agents including but not limited to Property Services Branch of ArchSD, Electrical and Mechanical Services Department and other specialist parties to resolve the detailed management and maintenance issues of the preservation corridor in the design stage of the project.

B. Key Design Proposals

9. The project aims to transform the Site for in-situ preservation of LTSB
remnants in a 30-metre wide landscape open space with easy access from Kowloon City centre, Kai Tak Station Square, adjoining Comprehensive Development Area (“CDA”) sites and proposed Underground Shopping Street (“USS”). (Fig. 18 to Fig. 23) The scope of this project includes:

a. displaying the LTSB remnants in the original location to reinstate the historical landmark and demonstrate the cultural significance of the Site;

b. conserving the LTSB remnants *in-situ*, including providing treatment to ensure their structural integrity; and

c. providing interpretation facilities including display areas and appropriate media for virtual presentation to facilitate public appreciation of the LTSB remnants and the relationship between LTSB and KWC.

10. The conservation and interpretation of the significances of the Site are to expose all of the LTSB surface remained, as well as the other important remnants, like the solid mass section and some supporting pillars, instead of only a few sections of the bridge section through the following means:

a. **Display of the remnants of Pavilion for Greeting Officials, the solid mass section and supporting pillar section**
   - Excavate down to the level of +1.2mPD (finished level) which allows exposure of all the remnants of the bridge surface and the original form of the LTSB for *in-situ* preservation and display.
   - Excavate and expose the whole supporting pillar SP17 down to the level of the footing stone at -0.1mPD to show an almost-complete profile of the stone pillar, and to excavate and expose Grid 2 remnant, part of the solid mass section, down to the level of the footing stone +0.6mPD to show the construction method and materials of a typical stone bridge of Qing period.
   - Remove the foundation structure of Kai Tak Airport and any concrete modifications which have covered the original granite stones except the concrete decking among SP18, SP19 and SP20.

b. **Display the remnants of the landing platform of LTSB**
   Excavate down to the level of +1.2mPD (finished level) in order to expose the remnants for *in-situ* preservation and display. Retain the 1892, 1910s,
1920s concrete repairs and 1930s constructed ramp to former Kowloon City Pier for in-situ preservation and display.

c. **Display the remnants of the 1924 seawall and 1933 causeway**
   - Excavate down to the level of +1.2mPD (finished level) and preserve *in-situ* the remnants of the seawall and causeway lie within the remnants display area in order to illustrate the setting and context of LTSB in the early Kowloon City development; and
   - Remove the remnants of seawall and causeway which lie outside the remnant display area so as to give way for the new corridors and link-walkways for meeting the operational needs, current statutory regulations and standards for the new use of the Site.

d. **Footprint of remnants of former Kowloon City Pier**
   Remain backfilled for providing an open space to facilitate heritage and community related activities as well as enjoyment of public.

11. **Enhancement works for facilitating public use of the Site:**

   a. Convert the area above ground of the former Kowloon City Pier as an open space;

   b. Add new pedestrian corridors, link-walkways / bridges along the remnant display area; and

   c. Add ancillary facilities including baby care room, first-aid room, store rooms and toilets etc. to suit the new use of the Site and to meet the latest statutory requirements. Provide information plaques and direction signs to facilitate visitors to visit the heritage sites and facilities in the vicinity.

**C. Potential Impact and Mitigation Measures**

12. Potential impact and mitigation measures are assessed and summarised as follows:

   a. **Potential Impact to the Fabric, Setting and Significance and the Corresponding Mitigation Measures**
(i) The Site is a heritage site that embodies archaeological, historic, architectural, social and contextual, townscape and landscape significance. LTSB was one of the visual landmarks of Kowloon City since late nineteenth century and is highly significant in the history of Hong Kong because its strategic position epitomised the important history of diplomatic exchanges between the Qing government and British colonial government in the early colonial period. The display of the physical form of “LTSB” at its original location and layout is a strong expression of the heritage site. The LTSB will be presented and the historic water atmosphere / surface around will be imitated;

(ii) According to the archaeological reports on the excavations of LTSB, the original decking level of LTSB was likely to be +2.6mPD to +2.8mPD, while, the existing topmost levels (structure top) of the remnants range from +1.39mPD (SP11) to +2.67mPD (SP12). Due to the continuous seepage of ground water problem of the Site, excavation level of the remnants for display becomes crucial in striking a balance between public appreciation of remnants and technical, management and cost implications. If the remnants are exposed down to +1.2mPD, the topmost level of all LTSB remnants (including the Pavilion for Greeting Officials, solid mass section, supporting pillar section and landing platform) can be unearthed with at least 100mm (approx.) thickness and up to 1.47m height of remnants for display above +1.2mPD, which can facilitate better understanding of the original form and function of the stone bridge (Fig. 23);

(iii) While the remnants are mostly exposed down to +1.2mPD, the soil underneath the original broken granite decking between SP12 & SP13, SP13 & SP14, and the broken concrete decking between SP18 & SP19, SP19 & SP20, and associated soil berms are planned to remain in place to provide required support to the remaining structure between supporting pillars;

(iv) The foundation structures of Kai Tak Airport and any other concrete modifications covering the original LTSB should be removed except the 1892, 1910s, 1920s and 1930s concrete modifications on the
landing platform and the concrete decking among SP18, SP19 and SP20;

(v) LTSB is of architectural significance because it is one of the surviving examples of typical stone bridges of Qing period. The supporting pillars were constructed in hexagonal shape on plan with alternating straight-cross manner. This construction method was commonly used in most Guangdong river bridge in Qing dynasty. In order to showcase the construction method and the materials of LTSB, one of the supporting pillars is recommended to be excavated down to the footing level (-0.1mPD). Supporting pillar SP17 is selected because it is rather complete as its top eight tiers still remain according to the archaeological excavations conducted before;

(vi) The solid mass section is another major part of LTSB. From the archaeological excavations, it is noted that part of the remnants with five layers of granite blocks (about 5.5m long) and a layer of pre-shaped footing stones has remained at Grid 2 (named T3b in the further archaeological excavation conducted in 2008-2009). It is suggested to excavate to the footing level at +0.6mPD for future display;

(vii) The permanent exposure of SP17 and the remnants at Grid 2 (Grid 2 remnants) down to -0.1mPD and +0.6mPD respectively will allow better viewing and appreciation of the construction method and materials of LTSB, though more technical and management issues such as more groundwater seepage, falling of debris to the local voids below +1.2mPD, would need to be addressed;

(viii) Though the solid mass section is truncated into sections by ground beams of the airport building, the unexposed bottom part of the solid mass section is likely continuous. The design of the link-walkway near to Grid 2 remnant and the central walkway linking the proposed USS will consider this “continuous solid mass” situation and may need to be revised to suit the actual conditions revealed on site after the associated archaeological excavation;
(ix) In order to allow more space for visitors and closer views of SP17, the corridor at the northeast side near to SP17 will be widened and that a link-walkway is planned to be constructed between SP17 and SP18. In view of the limited clear spacing between the two supporting pillars and to allow good view of the bottom part of SP17, the link-walkway is planned to be of 1.5m clear width which still permits 2 wheelchairs to pass each other. Footings / columns of this link-walkway will be located away from the zone directly between the two supporting pillars to avoid damage to the latter;

(x) Due to the limited space of the Site, the foundation structures of former Kowloon City Pier will be covered up for providing an open space for facilitating heritage and community related activities as well as enjoyment of public;

(xi) Regarding the new facilities, they will be in compatible design with the remnants. An intention in the selection of colours and materials of the finishes at the general excavation level of +1.2mPD and on LG1/F is to showcase the remnants more prominently;

(xii) Excavation for display of remnants may cause adverse effects to the remnants. Monitoring measures stated in para. 8(c) will be followed to prevent / minimise such adverse effects; and

(xiii) Visitors can appreciate the LTSB remnants including Pavilion for Greeting Officials, solid mass section, supporting pillar section, landing platform and remnants of partial 1924 seawall and 1933 causeway from different distances and levels at the new viewing spaces, link-walkways, link-bridges and corridors. Interpretation area with exhibition boards will be set along the remnant display area to tell the stories of LTSB.

b. Potential Impact during Construction of the Project and the Corresponding Mitigation Measures:

(i) Due to the close proximity of the construction works, potential vibration, dust deposition, debris during demolition, excavation, foundation and substructure construction in different stages of the
construction works may pose potential impact on the LTSB remnants; and

(ii) Monitoring measures stated in para. 8(c) will be followed to prevent / minimise such adverse effects. Vibration / settlement / tilting limit as agreed by AMO will be fully adopted in the construction works. Regular monitoring of the vibration / settlement / tilting should be conducted and relevant records should be submitted to AMO for record. Percussive piling would not be used in order to minimise the vibration during the construction works. Excavation and lateral support system along the construction site will be provided to minimise the settlement and ground movement affecting the adjacent remnants.

CONCLUSION

13. The HIA concludes that the overall potential impacts on the Site are considered minimal and manageable with the proposed mitigation measures. The design proposal will minimise potential impact on the Site and maximise the benefit to the community as the remnants of LTSB are preserved in-situ and they will be suitably displayed. The proposed new use of the Site into a preservation corridor for in-situ preservation of LTSB remnants within a 30-metre wide landscape open space is considered technically feasible and acceptable from the heritage conservation perspective.

Architectural Services Department
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Fig 1. Location of the Site (Site A) is indicated by hatch. (Source: Google Map, modified by author.)

Fig 2. Lung Tsun Stone Bridge in the early 20th century.
Fig 3. Remnants of the Site.

Pavilion: Remnants of Pavilion for Greeting Officials

Fig 4. (1) Southern side wall, (2) Eastern side wall.

Fig 5. Footing granite slabs.
SM: Remnants of the Solid Mass Section of LTSB

Fig 6. Southern end of the solid mass section.

Fig 7. Bird’s eye view of the solid mass section.

SP: Remnants of the Supporting Pillar Section of LTSB

Fig 8. Decking between SP12 and SP13.

Fig 9. Remnants of SP12 to SP14.

Fig 10. Remnant of SP17.

Fig 11. Partial concrete decking between SP19 and SP20.
LP: Remnants of the Landing Platform of LTSB

Fig 12. The 1892, 1910s, 1920s and 1930s layers of concrete pavement were found on top of granite structure.

Seawall: Remnants of the 1924 seawall

Fig 13. Remnants of the 1924 seawall near SP12-13.
Causeway: Remnants of the 1933 causeway

Fig 14. The 1933 causeway is connected with the landing platform of LTSB.

KCP: Remnants of former Kowloon City Pier

Fig 15. The remnants of former Kowloon City Pier.
KTA: Foundation Structures of former Kai Tak Airport

Fig 16. The foundation structures of former Kai Tak Airport.

Fig 17. The A stone lintel inscribed with Chinese character “龍津” was placed at the main entrance of the Pavilion.
Fig 18. Design Proposal of the Site. Viewing from G/F.

Fig 19. Design Proposal of the Site. Viewing from LG1/F.
Fig 20. Design Proposal of the Site. Viewing from LG1/F.
Fig 21. G/F Plan of the Design Proposal
Fig 22. LG1 & LG2 Plan of the Design Proposal
Fig 23. Section of the Design Proposal