

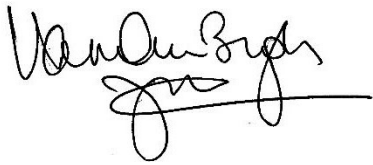
**URA Project K1 Nga Tsin Wai Village redevelopment (NTW)  
Report on Protective Works for Excavated Remains**

Archaeological Assessments Limited  
August 2021

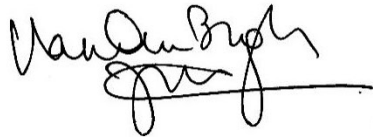
LICENCE TO EXCAVATE AND SEARCH FOR ANTIQUITIES  
Licence No. 453

TITLE OF THE REPORT  
URA Project K1 Nga Tsin Wai Village redevelopment (NTW)  
Report on Protective Works for Excavated Remains

PREPARED BY  
Archaeological Assessments Ltd.

A handwritten signature in black ink, appearing to read "Wanda Brygh". The signature is written in a cursive style with a long horizontal stroke at the end.

AUTHORIZED SIGNATURE AND SEAL  
Licensed Archaeologist SIGNATURE

A second handwritten signature in black ink, identical to the one above, appearing to read "Wanda Brygh". It is written in a cursive style with a long horizontal stroke at the end.

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## **1 Introduction**

The field works for the initial AIA and Further Investigation at Nga Tsin Wai Village were completed by 7 October 2016 (Trenches 4, 6, 8, 10 and 11), 14 November 2018 (T2) and 15 December 2018 (Trenches 1, 3, 5, 7 and 9) respectively. Trenches 2, 4, 5, 6, 8, 10 and 11 were back filled after completion and prior to the end of the field works. Protective materials, including geotextile covering and sandbags were placed against the structural remains and sections, and cover features such as stake holes and brick floor within Trenches 1, 3, 7 and 9.

The latter four trenches are currently covered by bamboo weather shelters, but excavations had not been backfilled. In 2018 Typhoon Mangkhut destroyed and displaced some of the bamboo weather shelters over the trenches and to prevent a repeat and ensure protection of the remains in long-term, it is proposed to update the current protective measures.

The licence (#453) for backfilling Trenches 1, 3, 7 and 9 was granted on first of September 2020 and the licenced archaeologist Ms Julie Van Den Bergh monitored the protective measures for the four trenches (T1, T3, T7 and T9) intermittently between 17 September and 19 November 2020.

## **2 Objective**

The objective of the implementation of the protective measures is the short and long-term protection of the excavated remains in Nga Tsin Wai.

## **3 Method for back filling of Archaeological Trenches at Nga Tsin Wai Village**

The location of the four backfilled trenches (T1, T3, T7 and T9) are shown in Annex A Location Plan.

A number of steps were implemented as part of the methodology for each of the four trenches (T1, T3, T7 and T9):

1. Firstly, the debris, damaged or worn sandbags and worn geotextile coverings from site were cleared. The stability of the remnants as well as the upper sandbags, if applicable, were taken into account when replacing them;
2. A new layer of geotextile covering, where necessary, was installed over the Nga Tsin Wai structural remains and features; followed by a minimum of three rows of sandbags or its equivalent in clean sand placed over the geotextile;
3. The bottom of the excavated trenches (without features) were covered by sandbags/clean sand, and soil sections supported by sandbags;
4. The remainder of the excavated areas was filled with clean sand or sandbags to 150mm below the current surface;
5. Topsoil (i.e. no large stones or inclusions) was used to cover the sandbags/clean sand to current surface over the entirety of the trenches;
6. Where structural remains were at same level or higher than adjacent ground level, sandbags and topsoil were laid to form a gentle berm over the structural remains to ensure sufficient protection and coverage;
7. There was no mechanical compaction of sand or soils. The backfilling compaction was carried out by water jetting. The trenches were backfilled with sand or sandy soil and compacted by pressurized water applied to the bottom of fill with a probe. The sand

was placed slowly and in lifts of 100 to 150mm thick. After water was applied, it was allowed to drain from the soil to improve compaction.

Each step of the backfill procedures was documented by photo record (see Section 4).

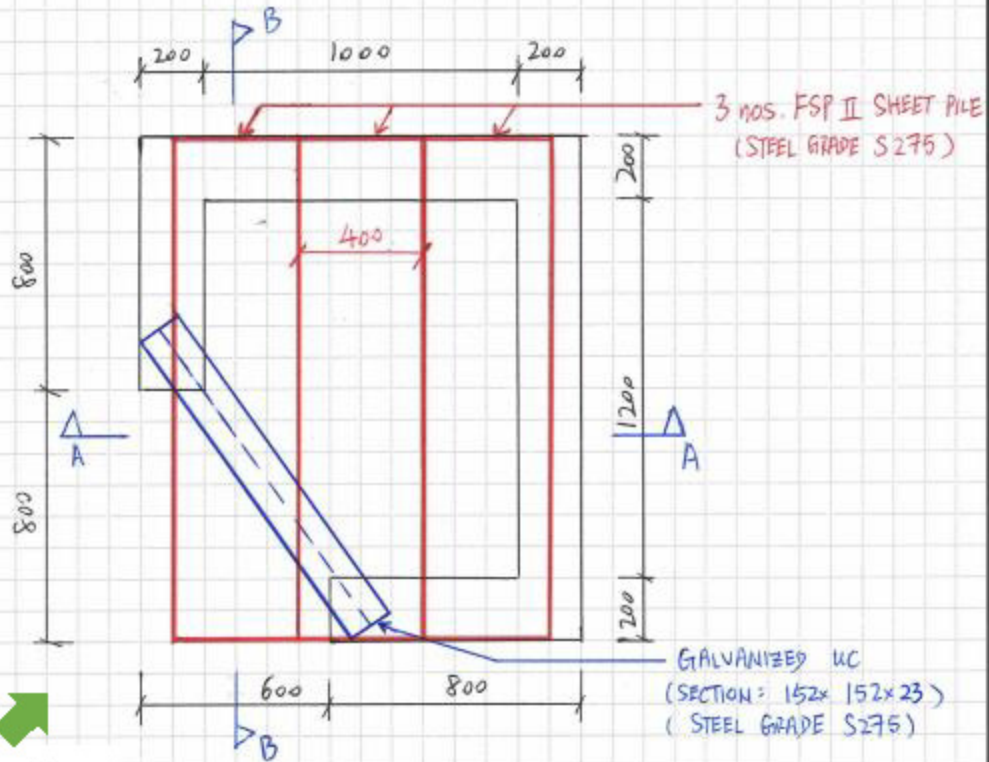
The applied backfilling methodology slightly differs from the proposed methodology in the Archaeological Action Plan (AAP) submitted with Licence application. The main difference is that the bamboo shelters will remain in place. The positive side of this decision is that the backfilled areas will not be affected by run-off rain erosion. Since the shelters will be kept on site, it is not necessary to provide chain linked fencing. The site security will monitor the trenches and will not allow vehicles, heavy equipment and machinery to enter the trench areas. The bamboo shelters will be removed at an appropriate time to be agreed with AMO.

The protective measures report is hereby submitted to AMO for review and agreement. The final protective measures report will be available for public viewing in the Reference Library of the Hong Kong Heritage Discovery Centre and uploaded onto the project proponent's website and hyper-linked to AMO's website for public viewing.

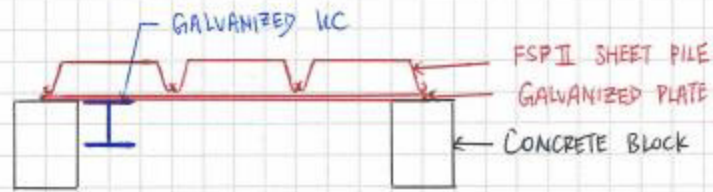
For the area over the stove in T9 (**Plates 25-33**), a tailored approach was taken with reference to the methodology in the AAP under the approved licence. Around the stove a rough square was set out with cement bricks. The cavities of the stove in and around were protected with additional geotextile (**Plate 27**). Bricks could not be placed at one corner as it was an area of mortar (**Plate 26**) associated with the stove. A tailored approach was needed and designed by the structural engineer, JMK Consulting Engineers Limited. An universal steel beam at the corner is supported by the brick wall as seen in the Engineer's sketch on next page to ensure greater stability (**Plate 29**).

The blocks were bonded with mortar and built up to of at least 15cm above the stove structure. The square measuring 140cm by 160cm was covered first by a steel plate (**Plate 30**). An additional galvanized profile sheet steel capable of sustaining 25kPa UDL over approx. 1.6m span (**Plate 31**) was finally added on top. The added galvanized profile sheet protecting the stove at T9 has a design life of 25 years and is in accordance with CEDD Specification and BSEN ISO 1461. The structure was surrounded by sandbags and covered by topsoil (**Plates 32 and 33**). Stability of the system was checked by the structural engineer and found satisfactory to sustain 25kPa UDL.

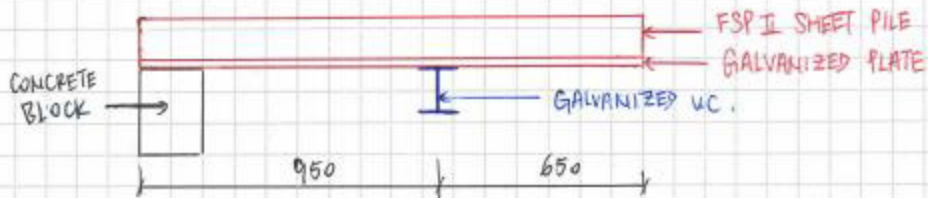
The implementation of the protective measures for the stove was supervised by the licenced archaeologist and checked by the professional structural engineer.



View direction in Plate 29



Section A-A



Section B-B

Sketch prepared by JMK Consulting Engineers Limited showing the components of the structure around the stove.

## 4 Results

The methodology is recorded in a series of photographs, presented here first in general to document problem areas recorded prior to backfill and after by trench.



Plate 1 Split sand bags, exposed stone walls and sections not completely supported by sandbags in Trench 1



Plate 2 Split sand bags and exposed stone walls in Trench 3



Plate 3 Exposed sections in Trench 7



Plate 4 Split sand bags over the brick floor, uncovered stone walls and rubbish in Trench 9

## Trench 1



Plate 5 Adding protective geotextile to ensure all visible structural remains are covered, looking northeast.



Plate 6 Stacking sandbags to the surface; looking south.



Plate 7 Adding soil to top of sandbags; looking northeast.



Plate 8 Water jetting topsoil, looking north.

## Trench 3



Plate 9 Adding protective geotextile to ensure all visible structural remains are covered, looking northeast.



Plate 10 Stacking sandbags to the surface; looking east.





Plate 11 Adding soil to top of sandbags; looking east-southeast.



Plate 12 Water jetting topsoil, looking north.

### Trench 7



Plate 13 Adding protective geotextile to ensure all visible structural remains are covered, looking southeast.



Plate 14 Stacking sandbags to the surface; looking east.



Plate 15 Adding soil to top of sandbags; looking north.



Plate 16 Water jetting topsoil, looking west.

## Trench 9



Plate 17 Adding protective geotextile to ensure all visible structural remains are covered, looking east.



Plate 18 Stacking sandbags to the surface; looking southeast.



Plate 19 Adding soil to top of sandbags; looking northeast.



Plate 20 Water jetting topsoil, looking west.

Completed backfilling at four trenches



Plate 21 Backfill completed at T1, looking northeast.



Plate 22 Backfill completed at T3, looking northeast.



Plate 23 Backfill completed at T7, looking northeast.



Plate 24 Backfill completed at T9, looking north.

### Trench 9- stove protective measures



Plate 25 On site discussions prior to implementing protective measures



Plate 26 placing bricks around the stove, avoiding the mortar spread



Plate 27 Geotextile in and around the stove



Plate 28 Building the brick wall around the stove and bonding the bricks together



Plate 29 Universal steel beam at the corner installed to ensure greater stability.



Plate 30 Adding galvanized plate to top of brick structure



Plate 31 Adding specialized galvanized sheet piles to distribute anticipated weight



Plate 32 Surround and cover structure with sandbags

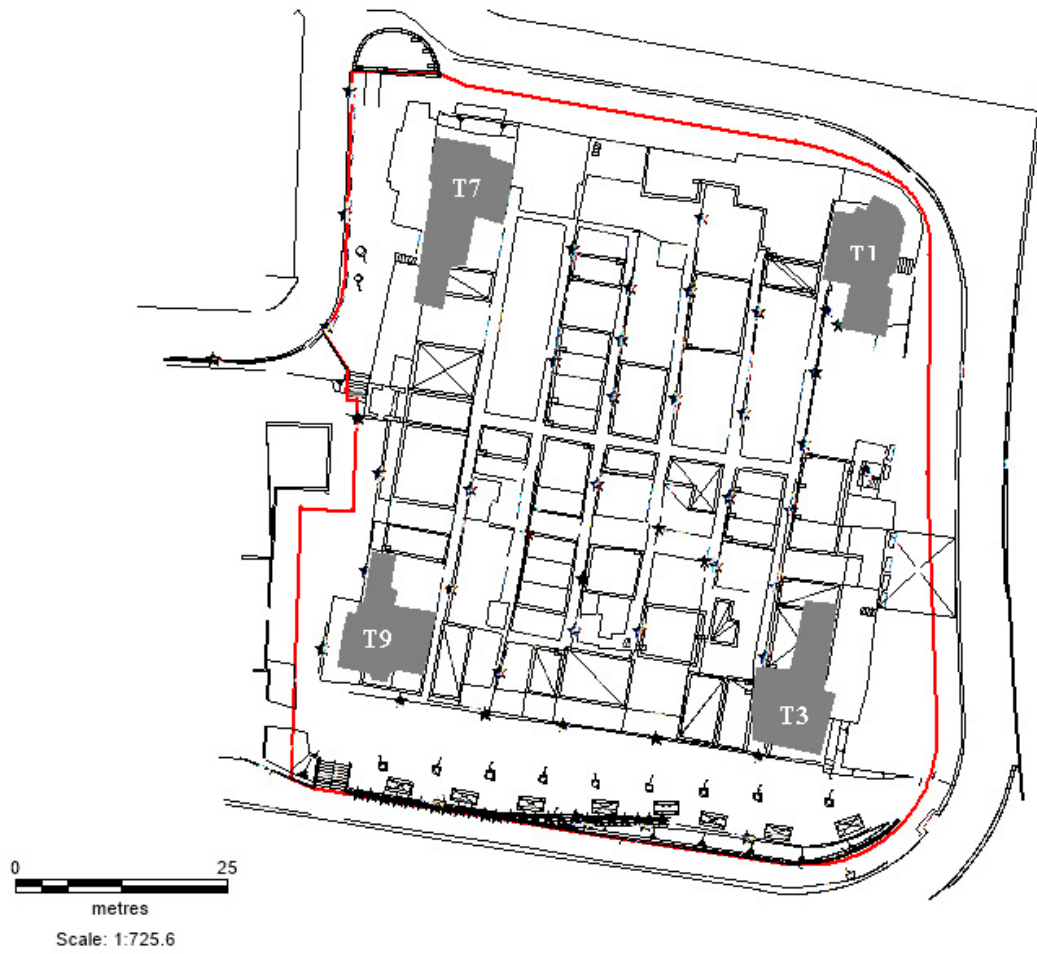


Plate 33 Last step of soil covering the sandbags

## 5 Conclusion and Recommendation

The backfill went smoothly but slower than the two weeks which was anticipated mainly due to inclement weather and protective measures adopted at T9 stove.

Annex A Location Plan



Map showing the works areas for protective measures for excavated remains in grey and Licence area marked with red line