from SHS Newsletter (2) Oct. 2008 – June 2009 pp.6-7

Conservation of the Square Tower

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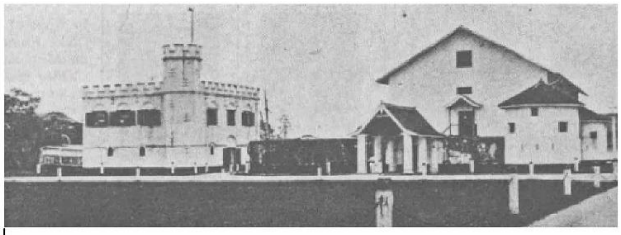
Background

Many residents of the city might have recently noticed that one of the city's iconic waterfront landmarks had been hiding behind a veil and closed off to the public recently. Many have wondered about the reason and some are even concerned about the building's future with all the talk of the waterfront extension and the government plans for the Gambier Street area.

All fears should be laid to rest as plans for the building are not of any malicious activity and the building as a designated heritage structure under Sarawak Cultural Heritage Ordinance, 1993 is to be protected and conserved.

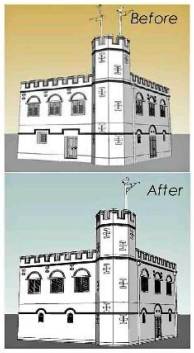
Originally built as a small fort in 1879 to replace a wooden fort located at the same site, it protected the approaches to the southern bank of Kuching from the river in conjunction with Fort Margherita on the Northern bank which was build one year later.

The building has been transformed to a myriad of other uses throughout its long lifetime. From it's original inception as a fort it has seen itself serving roles as a prison, store house and even a dance hall and later occupied by various government agencies.



Square Tower (1879) adjacent to Kuching Prison, extracted from HO AH CHON, KUCHING IN PICTURES 1841—1946

Many people do not realize that the original look of the Square Tower has been changed. Renovations and additions were done to the tower in the last few decades. For example one first floor window was bricked over, a door leading to the outside was created by knocking down a portion of the building's exterior wall and even a toilet was added inside the building. The current conservation work attempted to restore the building back to it's original state as closely as possible.



Although one might be given the impression that the building itself on the surface looks fine, certain critical elements have deteriorated over time which now needs to be addressed. A team of restorers and trained consultants who were familiar with conservation from Arkitek JFN Sdn. Bhd, with Ar. Laurence Loh as Conservation Advisor, will lead the project.

Conservation Process

Conservation is a process where one follows a set of established guidelines of international standards and a conservator is like an investigator of a building. To initiate the conservation process, a dilapidation report shall be done in order to assess the existing condition of the building. This process allows the conservator to ascertain the "sickness" of the building by thorough inspection, investigation and verification through various tests.

Existing Building Conditions

The basic components of the original fabrics were brick and timber. Samples of the timber members in the building were tested to determine the species while samples of the plaster and brick were tested to determine the salt content as well as plastering composition.

Moisture content in the brick and plaster were also tested on site to determine the level of dampness. All this was done in order to reveal problems and details that would otherwise be invisible with visual inspection.

Among the most pressing issue is the roof of the Square Tower which was found to be leaking badly. The water proofing membrane (installed in 1993) has exceeded it's life-span and has cracked thus allowing water to seep through. This caused dampness in the walls of the building which led to the rotting of the buildings timber components that were in direct contact with the wall. The wall was also affected by rising damp at the base of the brick walls on the ground floor. This destabilized the salt deposit within the wall , if left untreated will weaken the structural strength of the wall itself.

The ends of the belian joists and beams supporting the roof structure suffered wet rot where it was embedded into the damp wall. The rotted ends were cut off and a steel extension were introduced to carry the loading.

Scope of Works

The conservation works on the Square Tower's walls started with stripping the acrylic paint and damaged plaster back to a stable base to prepare for "desalination" of the wall. This was done using the "cocooning" method where pharmaceutical grade cellulose fibers in poultice form, soaked in distilled water, was applied to the walls and left there for 14 to 21 days where the salt content in the walls will be drawn out into the poultice.
The paste dries to form a "cardboard" layer which was then peeled away and a sample of the brick was again sent for testing to determine if the salt content has decreased to an acceptable level. Once done, the wall was then re-plastered with sand lime plaster and chemical sealant was applied to the base level of the ground walls to create a damp proof course to prevent any rising damp to affect the ground wall in future. The plaster surface was brushed with lime wash as finishing coat.

The original technique and materials that made up the roof were unknown. In light of this, it was decided that a metal roof was to be used as a reversible addition to stop the leaks that were the main causes of the problems. This metal roofing and the frame that held it up can easily be removed in future if details of the original roofing came to light.

The conservation team continued to look for clues on site hoping to find some evidence of the original construction of the roof.

Record of site investigations

1. Timber Bearer with rotten end.

2.. Brick arch detail above door being revealed after removal of unstable wall plastering.

3. Incompatible concrete block wall found, shall be removed.

4. Original opening that was bricked up shall be restored.

5. Removal of unstable plastering revealed outline of Brooke's Coat of Arms.

Conserving the original brick walls

6. Removed plaster to a stable base.

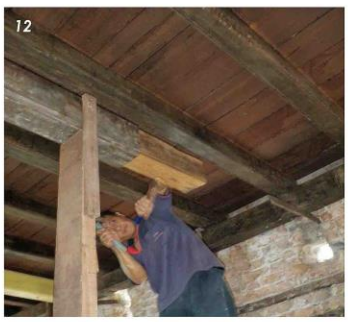
7. Injecting chemical into the base of brick walls to prevent rising damp.

8. Application of 'cocoon' to extract salt in the bricks.

9. Protecting the 'cocoon' from the elements.

10. Removal of the dried 'cocoon' after 21 days.

Restoring the timber bearers

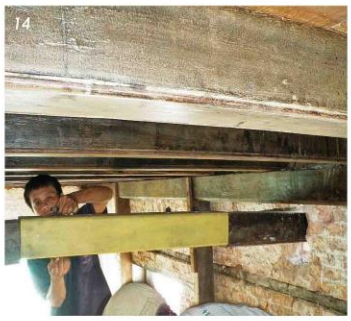


11. Timber bearers before restoration.

12. Removal of the rotten end of Bearer, notching the surfaces to receive steel section to reinforce the structure.

13. Slotting the steel reinforcement Into the end of the timber bearer.

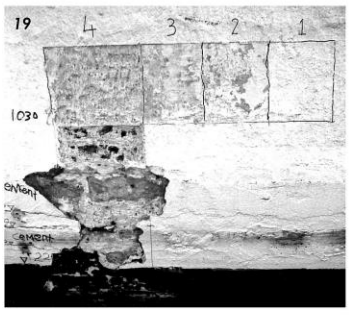
14. Bolting the steel reinforcement to the timber bearer.



15. Inserting the restored steel tie rod from external wall. The tie rod is nailed to the timber bearer inside the room.

16. Timber bearers after restoration.

Site samples



17. Trial mixes for the sand-lime plaster.

18. Test samples for plastering of various material compositions.

19. Removal of paint and plastering and paint in layers for investigation.