

Location	Fort Alice, Sri Aman	Ref No.	SA/WS/AR010
Subject	Site Visit to Fort Alice	Date	26.05.2014
		Time	2.30pm – 4.00 pm
Attended by	Refer to attached attendance list	Conducted by	Mike Boon
Recorded by	Mike Boon	Coordinated by	Nelly Soh

This site visit marked the anniversary of the programme which was launched a year ago. It is meaningful to some of the participants who have persevered to witness the process in resurrecting the dilapidated fort to what it is today.

After the routine safety briefing, the group was brought into the conservation site to view and briefed on the latest progress.



Fort Alice under reconstruction during last visit on 26.03.2014.



Roof and wall cladding works in progress on 26.05.2014. (Photo by Tan Ting Huat).

**Reconstruction of belian floor boards and wall panels**

Dismantled old floor boards and wall panels were checked for wet rot, insect infestation and split surfaces. Belian boards and panels were selected for reuse with nails carefully removed. Other timber species that are still in good condition were recycled for other usage later.

Selected belian boards and panels were laid out to check for best fit before trimming to size. Then the long sides were rebated before installation. Rebated joint enables the lap to fit without gap running through even when the timber shrinks.

Belian floor boards were pre-drilled at an angle to receive belian dowels at every floor joists. A few pieces of floor boards were clamped to position for belian dowel to be driven into the pre-drilled hole; the portion of dowel above floor board was trimmed with a 'V-cut'; trimmed portion was inserted back into the open 'V' end above the floor board, then hammer them in until refusal; then trim the dowel with a chisel to flush with the floor surface. The floor boards will be sanded down by hand to receive oil finish.

Similar method was used to install the wall panels. Wall panels were pre-drilled to receive square galvanised steel nails, in order to secure them temporarily to top and bottom rails in-between columns. Thicker panels were notched to achieve even surfaces of the wall. These panels were pegged in with belian dowels. The wall panels will be finished with lime-wash.



Technique of fixing floor board with a dowel (L-R) : peg the dowel into a pre-drilled hole at an angle; trim the dowel into a 'V-cut'; drive the cut-off portion into open 'V-end' until refusal; trim the expose end with chisel to flush with floor board.



Learning the pegging skill guided by Master Johari.



Old floor boards and wall panels were selected and processed for reuse.



Wall panels with rebated laps are temporarily held in position with steel nails, which will be replaced with 'belian' dowels to secure the panels.

### How to construct belian shingle roof that will not leak?

The instability of new machine-cut shingles under wet and dry environment was discussed in the last site visit on 26.03.2014. The participants were brought to see how layers of different materials were installed on the roof to solve leaking problem of belian shingle roof.

Layers of aluminium foil and 'Rockwool' insulation blanket were rolled over the old shingles to provide sound and heat insulation. A metal tray was then laid over to receive new belian shingles as top covering.

If the new belian shingles leaks, the metal tray will collect the water and drain off at roof eaves. This 'sandwich' detailing system constructs a roof that looks and feels like shingles from inside and outside!



Belian shingles dismantled from the old roof were used as underlay for visual interpretation of the original roof.



Belian shingles moved under different weather conditions. They warped when dry and levelled up when wet.



'Rockwool' and metal tray sandwiched in between belian shingles layers for insulation and water tightness.



New machine-cut shingles are used for top finishing.

**Nails or no nails?**

John Ting explained that joints of structural components were usually connected without nails. They were scuffed and slotted into tendon, for example at beams and column connection. Nails were used as secondary fixing or to fix components at position where they would not fail or fall when the nails rotted, for example nailing the rafters that sit on roof beams.

Old nails dcollected during dismantling of Fort Alice were identified as 19th Century hand forged iron nails by Professor Miles Lewis in Melbourne. John further explained that local made these nails that were as strong as their 'parang' in various sizes. They were only produced in small quantity because of scarcity of raw material and extensive labour to make them.

Nowadays, square galvanised steel nails are commonly used to fix belian boards. Belian boards are normally pre-drilled to prevent splitting when receiving the nail by hammering. Moreover, well seasoned or 'dry' belian is prone to split as compared to other timber species.



19<sup>th</sup> Century hand forged iron nails used in the old fort.



Samples of compacted clay floor prepared on site.



John Ting talked about how the interiors will be reconstructed.

**Compacted clay floor**

The project team intended to construct a earthen floor similar to the Hakka Gold Minner's Old 'Kongsi' House in Marup. The Contractor had prepared samples by mixing clay, sand and water of various ratios, with shredded fibreglass added to reduce shrinkage when dry. The mixtures were churned in a concrete mixer before spreading to the prepared ground. The 50mm thick spread was compacted and left to air dry.

The local Malay advised a more 'modern' technique by sprinkling cement just before the surface dry up. However the project team prefers to keep their fingers crossed and wait for the result. They are prepared to conduct more experiments to find the correct 'recipe', just like the experiments on the 'recipes' of lime-wash for application on belian wall panels.

**Preview of the reconstruction of the fort's interior**

John Ting gave a preview of how the interior of the fort will be re-constructed based on information he gathered from his research.

The Court Room surrounded by officers working desks; the Rajah Residence's living spaces and bedroom; and the additional rooms for their guests, will be re-constructed with dated furniture and artefacts. The interiors will be revealed gradually in future site visits.



Group photo at the end of the site visit.