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CONSERVATION AND RELOCATION PROJECT OF THE TELUK MEMALI MOSQUE

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Abstract

The Teluk Memali Mosque was located in Teluk Memali, Gajah, Perak, 35 kilometres from Teluk Intan town. This mosque had been abandoned and neglected since 1995 as the residents moved out to a higher new settlement due to the threat of flood every year. As a historical religious building, efforts should be made to salvage and restore the mosque as it has intriguing Malay architecture characteristics that are worth saving and preserve for future generations. A restoration projects led by ATSA Architects with other consultants, conservator, Ungku Omar Polytechnic and local community voluntarily form workgroups that cater specific workforce, such as fundraising, documentation, dilapidation studies and restoration works. The project was fully funded by individual and organisational donations. With tight budgets, the Teluk Memali Mosque was successfully restored and relocated to a new site in Bandar Seri Botani, Ipoh, Perak, 60 kilometres from its former site. The task commenced in May 2016, later on, completed and occupied by the new community in 2018. In line with the academic requirements, throughout the project execution, a single case study method with data collection was done to produce a complete work chronology through voluntary efforts, which was uniquely different from the other conventional conservation projects.

1. Introduction

Conservation involves various processes, including maintenance, preservation, restoration, reconstruction, adaptation and interpretation (Norlizaiha Harun *et al.*, 2010; A Ghafar Ahmad, 2010; The Burra Charter, 1999; The New Zealand Charter, 2010; Reyer, 2003). Esmaeili (2016) and Gustavo (2011) completes an understanding of building conservation, a process of refurbishment with the aim of safeguarding a building from the dilapidated by preserving its original form and structure. Conservation is also a process characterised or linked to the functions of preserving and saving cultural heritage (Luciani, 2018; Mansfield, 2008).

The traditional timber buildings are among the earliest human-built forms as timber is an ancient material used in construction (Zhou, 2015; McDougall, 2006). However, traditional timber buildings are considered the most vulnerable and begin to diminish over a variety of factors such as weather and lack of conservation. This has indirectly affected the loss of culture and its existence with it (Sheng, 2019; Fuat, 2013). Nevertheless, efforts to conserve timber buildings often faced numerous

obstacles, especially lack of timber resources as well as skilled individuals or craftsmen (Umi Kalsum, 2015). This is due to the fact that the restoration of timber buildings requires unique techniques based on the structure and joints applied in the buildings, it refers to certain timber construction using different techniques derived from the craftsmen's background, technologies and different materials (Damla, 2016). Hence, the study focuses on the techniques of dismantling, relocation and reinstallation of building elements of the Teluk Memali Mosque.

Besides that, this study has also indirectly touched on the community's involvement in conservation efforts as the Teluk Memali Mosque conservation and relocation project involves the whole community as a technical group, funding aspect and also communal work activities. Community involvement in conservation is an important measure as it assures the continuity of building's lifespan by continuous use (Stukas, 2016; Bullen, 2010). It is also driven by a consciousness movement that will be manifested during the post-conservation stage (Den, 2014; Foxell, 2010). This is because heritage buildings need to have a strong bond with the surrounding community (Dragouni, 2018; Robins, 2008). So it coincided with this project that was not only involved the community before and during the conservation process but also has had a new community as the mosque end-users after it was completed.

2. Methodology

This study adopts a single case study method, which refers to the research aim, which is to study the process of dismantling and re-assembling components of the Teluk Memali Mosque. A single case study is conducted to provide an in-depth view. A case study requires involvement in a real-life project, i.e. direct observation through site visits. This case study is supported by the method of data collection through observation. Through this method, the data were collected via notes, images and video recordings. Throughout the research process, cross-referencing was also done to validate the further observation findings.

3. Historical background

The Teluk Memali Mosque is believed built before 1900 on the banks of the Perak River; it was then known as Surau Teluk Memali. In 1910, the building was shifted to 20 metres (65 feet) away from the riverbanks (the original site before 2016's relocation) to thwart the water flooding as well as to prevent the soil erosion. This initial mosque relocation was also in line with the mosque upgrading effort that saw the addition of new spaces such as ablution water trough and an annexe hall (*balai lintang*) for learning and religious activities. It is said that an unknown donor had funded this upgrade. The mosque is equipped with a carved wooden pulpit (*mimbar*) crafted by a famous *mimbar* maker in Perak at that time, namely Megat Jaafar. On this *mimbar*, the inscribed year 1921 is believed to be the inaugural year of Teluk Memali Mosque. The mosque was no longer in use since 1995 as all the villagers of Teluk Memali had moved out to a new settlement called Kampung Tersusun Teluk Memali, located two kilometres (1.2 miles) inland from the original site.

4. Architecture of the Teluk Memali Mosque

The architecture of Teluk Memali Mosque portrays the mosque-oriented Malay architecture of Perak state, especially in terms of space layout and design. Like any other Malay architectural styles, this building emphasises the optimum natural ventilation and lighting through openings such as the full-height windows, carvings and doors. The use of two-layer ventilation panels with the height of one metre (three feet) along the upper wall perimeter also maximises the cross ventilation of its interior area. The use of a two-tier pyramidal roof is a significant feature for the mosque, taking into account the cooling of the roof with the ventilation louvres between the two-tier roof. Meanwhile, the rooftop is furnished with an ornamented pinnacle. The

exquisite Malay carvings are also highlighted on the fascia boards around the roof edge, matched with the *cecicak* carvings in every roof edge corner.

Similar to the construction of other mosques, the layout design of Teluk Memali Mosque is aligned to *qiblat* direction, but its space layout is quite simple with the front porch as a welcoming entry to the mosque, followed by the prayer hall and later on, the protruded *mihrab* area built beyond the front wall line. An intricate timber *mimbar* is placed on the right side of the *mihrab*. The prayer hall can accommodate about 100 worshippers at one time. The square layout of the prayer hall is also attributed to the design of the pyramidal roof structure where the four main columns that bear the roof loads are placed in the centre.

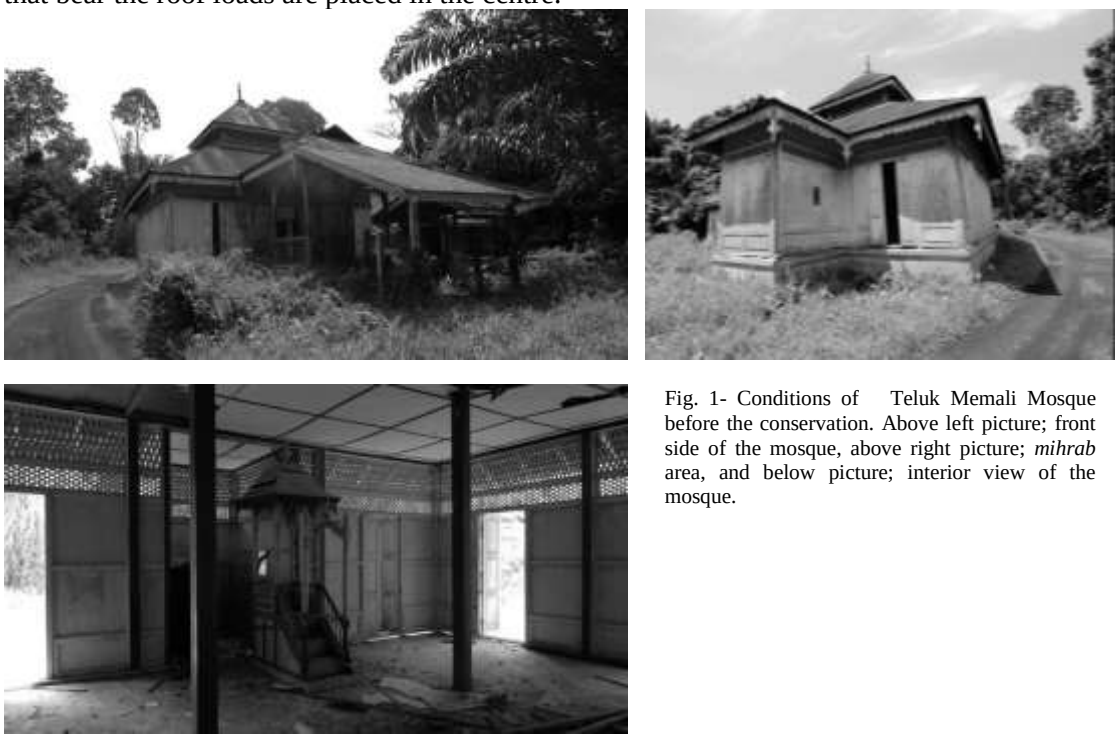

Fig. 1- Conditions of Teluk Memali Mosque before the conservation. Above left picture; front side of the mosque, above right picture; *mihrab* area, and below picture; interior view of the mosque.

5. Conservation and Relocation

The conservation and relocation works of the Teluk Memali Mosque can be divided into four main phases;

5.1 Dilapidation studies and documentation

Just like any other conservation practices, the conservation and relocation project of the Teluk Memali Mosque began with the historical investigation and re-measurement to produce a complete set of measured drawings. Even though Ungku Omar Polytechnic had conducted an earlier study in the year 2005, however, for conservation and the approval of local authorities, this set of drawings was revised by ATSA Architects, conservator and Ungku Omar Polytechnic once again. This set of measured drawings had been used as the main reference for the conservation works especially during the inventory process, dismantling and reinstallation. In the drawings, specified codes and numbers were marked on each component as they were re-pinned exactly in the same position on the new site. Based on this measured drawings, a study was also done to identify the type and varying degree of defects. A general timber inspection test was also undertaken in this phase by officials from the MTIB (Malaysian Timber Industry Board). A dilapidation survey report was prepared earlier as a guide to measure the project costs and treatment works. The study found out that 75% of the elements and components were still in good conditions and can be re-used. Most of the dilapidated elements were the original roofing materials, the wood shingles. The building is also believed had been renovated from elevated on

timber stilts to the current form that rests on a concrete platform. This renovation was done due to timber decay as it was located in a flood-prone area.

5.2 Dismantling works of building elements

The Teluk Memali Mosque conservation works involved site relocation, whereas the restoration and treatment works were carried out on the new site and workshops. On the old site, the works of dismantling each building element and component started with the cleaning of the site surroundings for the wood arrangement, machinery access and transportation process. Simultaneously, the cleaning of interior space was also concluded like transporting furniture and *mimbar*. During the dismantling process, the code marking was completed as not all components were successfully marked prior to the dismantling process. The dismantling of components began with the roof finishes of the zinc roof and wood shingles of the entire roof. Subsequent work removed the finial and the entire upper tier of the pyramidal roof structure then followed by fascia boards and *cecicak* end-carvings. The following works involved the dismantling of ceiling boards before commenced with the whole battens, rafters and main roof structure. The next steps involved the four main columns in the prayer hall. After that, the dismantling works were followed by the dominant elements of the building, the walls and lattice panels that needed to be done carefully to avoid significant damages. For the final element which was the building structure, the works commenced with the roof beams, columns and wall frames and finally the floor beams (acted as timber sills for platform flooring). The summary of the process of dismantling the elements and components of the Teluk Memali Mosque is shown in Figure 2.

Fig. 2 - The process of dismantling the elements and components of the Teluk Memali Mosque.

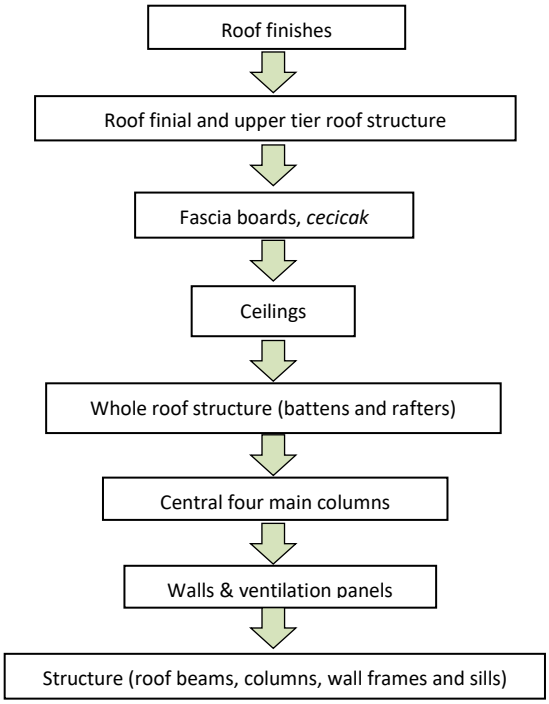

Figure 3- Dismantling process took about two weeks.

5.3Inventory and treatment

The process of transporting components was carried out using a lorry through the state road of Gajah - Ipoh about 60 kilometres (37 miles) in total distance. Three tents were installed on the new site for unloading purposes. During the dismantling process, timber segregation was done according to the type of building elements such as windows, wall panels, ceiling boards, ventilation panels and so on. These elements were then arranged according to the sequential codes. Later on, they were separated by the defect levels. In this phase, the identification of wood species and assessment on the timber strength was done carefully by the Malaysian Timber Industry Board (MTIB) consultant and the conservator. All of these evaluations were documented to plan for treatment methods, decision-making of wood replacements and cost calculations. As a result of the assessment, all components were either reused, refurbished or combined with the new timber components of the same wood species during the treatment process. There were two elements of the building that were required to be replaced, i.e. the supporting columns (14 units) due to the severe internal conditions of the original columns. All of these columns were of *chengal* wood species. While the old roof finishes of *belian* wood shingles were completely replaced by custom-made clay tiles called *Singgora* tiles from Bachok, Kelantan.

The treatment process was done in a timber workshop in Chemor, Perak, 20 kilometres (12 miles) from the new site. The timber treatment process began with the cutting of decayed timber parts to be replaced with the new parts of the same species. This process also involved the making of joints for some structures and frameworks. Carving works were also carried out for several elements, including the ornaments, balustrades, window grilles and decorative ventilation panels. The next step of the treatment involved sanding process to remove the outer paint layers for a new finish. Multi-grade sandpapers were used accordingly to the difficulty levels and type of work either manually or by machine. After the completion of treatment works and sanding process, all of the timber components were sealed with anti-termite layers and

water repellents before the installation works begin. Upon the completion of treatment works, all of the components were then brought back to the new site.

For the final finish, the whole timber components were painted based on the original colour scheme. Even though most traditional Malay buildings were usually finished with shellac or oil paint, there was no such proof of these finishes ever applied on this mosque either through written or verbal sources. Moreover, based on the timber assessment by conservator found out that the original paint layers had penetrated the timber body at a considerable depth that deemed too difficult to polish and can affect the durability, thickness and size of every timber component.

5.4 The reinstallation of Teluk Memali Mosque

All treated building components were transported to the new site periodically and stored in a temporary tent. A concrete platform was built as the mosque base with the same specifications of height and width on the old site. 14 wall plugs were planted on the concrete platform at each column point to a depth of 200 mm (7.8 inches) and 100 mm (3.9 inches) above the surface. The reconstruction of Teluk Memali Mosque began with the installation of columns through a slot-in method which included a wall plug into a hole that was readily punched in the column base. This method was vastly different from the original construction which saw the whole structure sits on the platform. This is because the original columns are believed had been cut to replace the elevated floor with a podium floor. The wall plug method was also applied to increase the resistance of the structure due to the strong wind conditions of the new site.

Installation works were continued with other building structures such as roof beams, trusses, battens and door sills. The roof elements were further added with heat-resistant insulation layers and also marine plywood to address leakage issues in the future, as well as to allow maintenance works to be executed easily even without roofing. The reinstallation works, then continued with wall panels and windows. The clay roof tile fitting was done simultaneously with the installation of finial and fascia boards of the jack roof. Then, it was followed by the installation of ceiling boards finished with paint layers. The painted ventilation panels were put on the upper part of the walls followed by the painting works of the whole wall panels. The final stage of the reinstallation involved building accessories such as fascia boards, *cecicak* carving, carving panels, handrails and balustrades with window grilles.

Generally, all of the building components were painted prior to reinstallation works, except the wall panels. This was done to assist the reinstallation process and painting work, especially for complicated elements such as the ventilation panels and the height issue as well as to prevent the paint spills and smudges on the wall panels. During the reinstallation period, there were some other works tasked simultaneously, such as the repair of the ablution water trough, construction of *balai lintang* (annexe hall), earthworks, drainage and site pavement. Soon after the completion of reinstallation and construction works, the subsequent landscaping work, electrical connection and the water supply system were done. The summary of reinstallation works of the Teluk Memali Mosque is shown in Figure 5 below.

Fig. 4 - Preparation of concrete base based on the original size and height.

Figure 5 - The reinstallation process of the building elements and components of the Teluk Memali Mosque

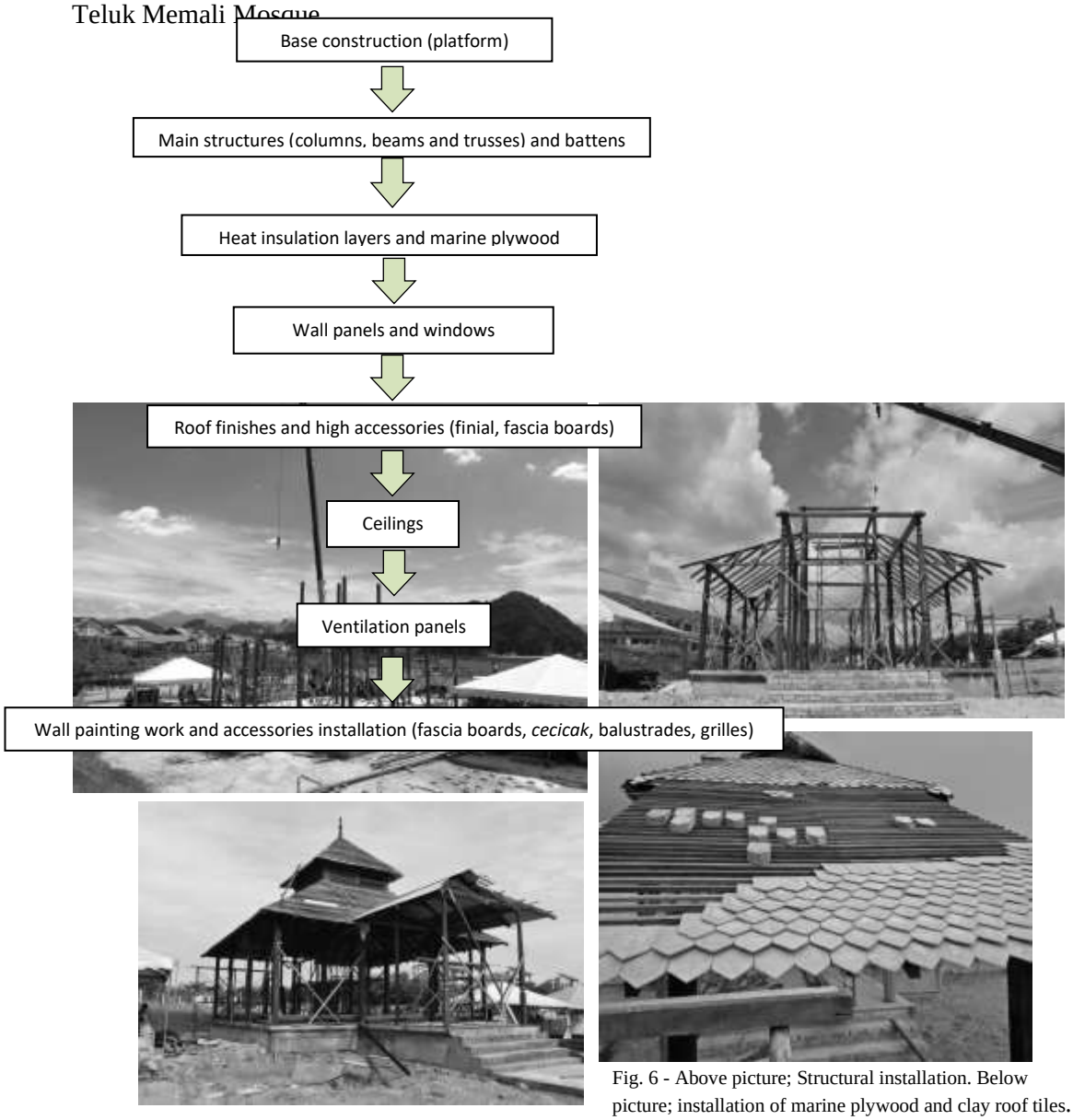

Fig. 6 - Above picture; Structural installation. Below picture; installation of marine plywood and clay roof tiles.







Fig. 7 - Pictures show the installation works of building elements and components of Teluk Memali Mosque including the fascia boards, *mimbar* treatment, *balai lintang* construction and landscaping work.

6. Significance of the Teluk Memali mosque conservation and relocation project

This project has valuable features that can be used as a lesson and guide to other projects in the future. This project showed that an earlier academic study could be turned into an actual conservation project, even though the preliminary study was done and documented by the Architectural Unit, Ungku Omar Polytechnic, but then it had attracted certain parties into conservation practice.

The project was a voluntary effort either on the side of consultants such as architects, conservators, engineers and landscape architects, as well as the academia to form various technical teams to execute tasks such as dilapidation survey, applying to local councils, cost calculations, site supervision, fundraising and project management. Even the overall cost of this project was fully funded through donations by individuals, organisations and private agencies.

The conservation and relocation of Teluk Memali Mosque project had received strong cooperation from the local community, including the residents of Kampung Tersusun Teluk Memali who gave their permission for the mosque to be conserved and relocated to a new site further away from their village. Villagers also had provided enough information about the historical background of the Teluk Memali Mosque. On the other hand, the new community in Taman Seri Bougainvillea (Ipoh) had also helped very least regarding the financial aspect, organising communal works and their anticipation of preserving the building in the future.

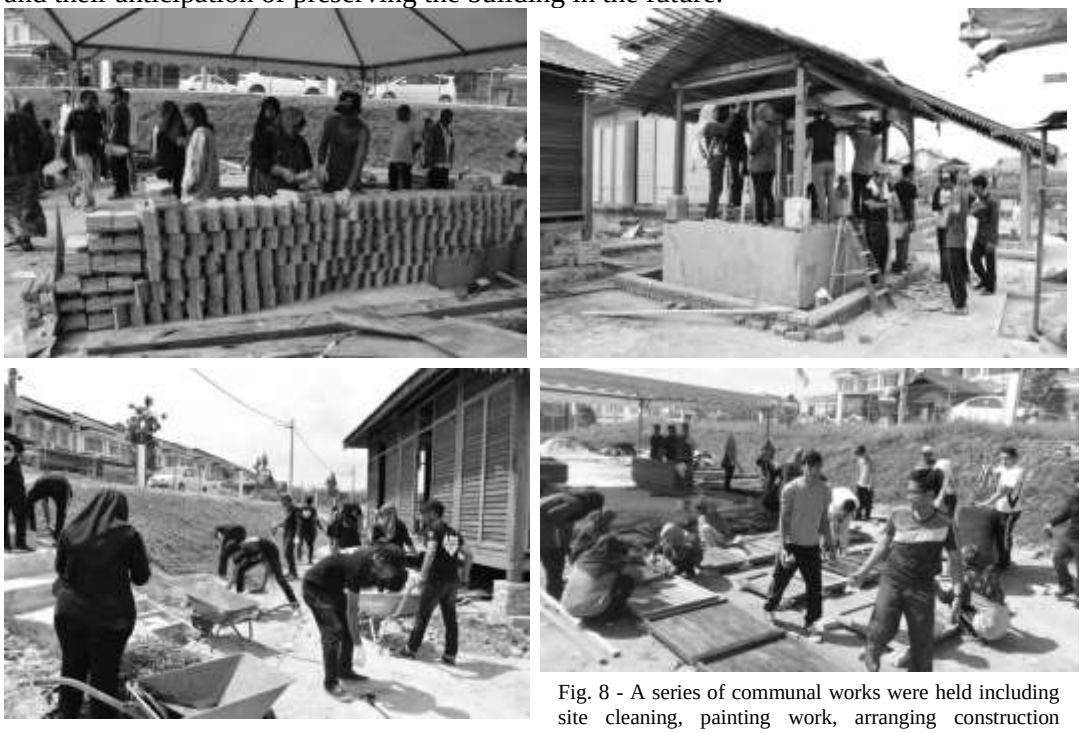

Fig. 8 - A series of communal works were held including site cleaning, painting work, arranging construction materials, painting of anti-termite layers and water repellent. These activities were participated by the local communities, students and individuals.

This project had also received attention from the youngsters, especially students from the institutions, namely Ungku Omar Polytechnic, Universiti Teknologi MARA (Perak Campus), International Islamic University Malaysia (IIUM) and Lebuh Cator Vocational College of Ipoh, Perak as well as the local communities. They were mostly involved in a series of communal works such as mosque and site cleaning, painting, painting of anti-termite layers and water repellent, landscaping work and so on. Such activities have generated interest and awareness on the heritage buildings among the younger generations.

7. Conclusion

Generally, common methods were applied in the dismantling of traditional building elements/components which was from top to bottom and followed by the structural components. However, several important points should be looked into during the reinstallation process, especially an in-depth understanding of the structure and the jointing system, the financial position, the workers' knowledge and expertise, the duration of component treatment and replacement process and weather conditions. All of these were the key factors of the reinstallation of the Teluk Memali Mosque.

Nevertheless, this project has achieved considerable success in terms of public awareness and participation through voluntary works either from technical groups or individual donors. Moreover, the active involvement of the younger generations can be seen in this conservation project. These elements proffered strong justifications for more conservation projects of built heritage that should have met multitude areas such as the community involvement, adaptive reuse, self-awareness, preservation of folklore and so on.

Fig. 9 - Teluk Memali, Gajah, Perak (before)

Fig. 10 - Taman Seri Bougainvillea, Bandar Seri Botani, Ipoh, Perak (after)

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