

ICOMOS

Report on the ICOMOS Advisory Mission to Historic City of Ayutthaya (C 576)

28th April to 2nd May 2014



**REPORT ON THE ICOMOS ADVISORY MISSION TO HISTORIC CITY OF
AYUTTHAYA, THAILAND**

FROM 28TH APRIL TO 2ND MAY 2014

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A. CONSERVATION OF AYUTTHAYA HISTORICAL SITE AS A RESULT OF MAJOR FLOODS

1. Direct Impact of the Major Flooding in 2011 and Emergency Measures for Conservation

Two and half years since the 'Big Flooding' of 2011, conservation measures for architectural ruins directly affected by the floods are proceeding smoothly. The direct impact of the floods, in terms of damage to the buildings, is not large. Rather, it may be said that the flooding temporarily accelerated, in parts, the deterioration that already existed as a result of the passage of time. For this reason, the necessary conservation work does not consist of emergency treatment of deteriorated parts but of an overall approach geared toward treatment of the deterioration due to time. In other words, regardless of the flooding, all of the buildings are in some state of deterioration and require well-planned conservation work.

The impact of the major floods of 2011 is most apparent in the wall paintings. Deterioration of these paintings is evident due to their detachment from the walls caused by the precipitation of salt crystals as a result of the gradual evaporation of the tremendous amount of water that had permeated into the walls.

2. Mid- and Long-term Impact of the Flood Water

Wall paintings are still affected by the flooding. Precipitation of salt crystals on wall surfaces, as mentioned above, still continues and is expected to do so into the future. Application of resins to the painting surface to stop the detachment caused by the precipitation of salt crystals is an urgent treatment that needs to be undertaken, but it is also a fact that as a result greater detachment of the painting surface has occurred in some cases. This is an extremely difficult and serious issue.

It should be noted that while undertaking such measures we must also consider fundamental methods for preventing such damage. Salts crystallize and are deposited on the surfaces of wall paintings because water that has penetrated into the walls evaporates from the surface of the paintings. By making water evaporate from places other than from the wall painting surfaces, it is possible to greatly mitigate the impact. In fact, it has been found that at temples where restoration has been undertaken and walls other than those with wall paintings are covered with tiles, it is quite difficult for water to evaporate. Thus, as a long-term measure, it is necessary to construct a drainage system inside the walls so that any water which has penetrated evaporates towards the outside rather than into the rooms.

It seems that FAD does not have adequate technical expertise to apply resins and install drainage. Therefore, specialist advice is needed and capacity building should be undertaken. Also the details of the project should be provided to the World Heritage Centre for review by the Advisory Bodies before the work is undertaken.

3. Future Measures against Major Floods

3.1 Protection from flooding (construction of an artificial barrier)

Perhaps the simplest and most certain way to protect the ruins from flooding is the construction of a protective wall to prevent penetration of water. A method in accordance with this way of thinking has actually been carried out at Wat Chaiwattanaram. It is a modern civil engineering project using metal and concrete, and can be evaluated as a well-planned, challenging method. However, this is a special example customized for Wat Chaiwattanaram, and applying this method to protect the entire Ayutthaya Historical Site is not realistic. For this reason, several other methods are considered.

3.2 Measures to mitigate the impact of flood water (water pressure)

If it is impossible to completely prevent the penetration of flood water, the important issue then becomes how to minimize the impact of flood water. What is important in this case is the pressure with which water will penetrate, in other words, the speed of penetration. If that speed can be lessened it is probably possible to minimize the impact. A realistic, natural and inexpensive way to do this is to plant trees at places where water will flow (the path of the water). One possible type of tree to be planted is bamboo. This is a suitable choice since it will grow quickly and densely, it is strong against water pressure and it will fit well in the landscape. However, other types should also be considered since there may be other good options.

3.3 Learning from history

3.3.1 Reproduction of a city wall

The Ayutthaya dynasty, which existed for 400 years, constructed and maintained the city of Ayutthaya. During that time there must have been numerous floods, so the fact that the dynasty protected and developed the city means that there must have been appropriate measures against flooding. Among such measures, it is thought that the city wall was the most important. If a high, sturdy city wall protected the city in the past, it may be said that a reproduction today would be the most commonsense measure. It is said that the city wall of Ayutthaya was taken apart and the bricks carried to Bangkok at the time the capital was relocated. If this was so, a reproduction of the city wall would be natural from the point of view of history as well. So, consideration of the possibility of actually reproducing the city wall is recommended.

3.3.2 Traditional measures (rediscovering traditional wisdom)

Various measures against flooding undertaken during the Ayutthaya period need to be considered in addition to the reproduction of the city wall as mentioned above. There must have been many ingenious attempts besides the physical prevention of floods. It is recommended that consideration be given to “rediscovering wisdom” that can be put to use by investigating and studying the valuable knowledge and techniques of the Ayutthaya period.

4. Comprehensive Plan for Conservation and Utilization

A master plan concerning the conservation and utilization of the Ayutthaya Historical Site has already been produced and implemented by the Fine Arts Department (FAD). Experts from various other fields – history, archaeology, structural dynamics, geotechnical engineering, hydraulic engineering, meteorology, civil engineering, ethnology, geography, urban planning, sociology, conservation science, etc. - should participate in updating and extending this master plan in order to address flood related issues.

4.1 International symposium (Ayutthaya Symposium)

It is suggest that an international symposium (Ayutthaya Symposium) might be considered, under the authorization of UNESCO in which experts from a wide range of disciplines could participate in discussions on flood prevention and flood management measures. Financial assistance from ASEAN and Japan may also be possible.

B. CONSERVATION APPROACHES AND PRACTICES

1. Overview

In the limited time span available for inspecting the monuments and the background reading material provided, the mission found that most sites where the interventions had taken place, looked as though they were predominantly being repaired and tidied to make them presentable. For some sites extensive repairs and reconstruction had carried out, such as at Wat Dusit Darang, and these were more than is desirable. From close study of some of the archival images, it can be concluded that these monuments, which are basically ruins, did have age-related defects prior to the flooding in 2011.

However, after the flooding numerous interventions have taken place which, though not visible to the average visitor, is clearly visible to the professional heritage conservationist's eye.

What was gathered from the FAD team which presented the sites to the mission was that there was good professional input at the drawing board stages, and full awareness of cultural significance and conservation issues including philosophy. However, it is at the lower level where there is a genuine disconnection between monitoring and execution - the so-called works to be implemented. This is of concern as the monuments where the interventions are taking place are part of the Outstanding Universal Value of the World Heritage property.

Specific observations and recommendations are as set out as follows, based on the monuments visited.

2. Understanding of cultural significance:

The in-house professional team of FAD and the academicians from Universities who have been involved in various stages of the master plan preparation have good knowledge of their

subject from a historical, archaeological, ecological and landscape point of view. However, only a few of the structures that we saw have been well documented. The issues related to conservation were understood theoretically, but there seems to be a hiatus between this and the reality of implementation. Now that a SoOUV has been adopted, it is essential that the attributes of OUV are clearly defined in terms of individual monuments, the relationship between them, and their associated materials and craftsmanship.

3. Workmanship

The craftsmanship or workmanship can only be rated “moderate to poor”. Considering the monuments are part of a World Heritage property of Outstanding Universal Value, the workmanship does not reflect experienced craftsmen who know their job. This was evident from the way the bricks were laid with over-lapping joints, and it was also noted that the corners of the polygon bases of the structures never had straight joints, etc. (see photos in Annex 3)

The craftsmen seem to be lacking in expertise for the use of traditional materials such as lime. During the inspection, the mission noticed that none of the sites had active lime-slaking pits, demonstrating the absence of the use of a material like lime. Traditional lime mortars and renders in SE Asian sites normally use a lot of brick dust but that does not seem to be the case here.

Instead, newer materials like white cement (perhaps mixed with some amount of lime) seem to be the acceptable norm; as a result, the executed hard render showed shrinkage cracks, etc. and will have a highly detrimental impact on the bricks over time.

The standards of workmanship need considerable improvement, with trained managers on site who could teach and share knowledge with traditional craftsmen. If there is an absence of traditional craftsmen, then a dedicated team of masons should be trained for the task and experimentation work should be carried out with close monitoring. Expertise from other parts of the world and from surrounding nations could be sought for capacity building. This is an absolute necessity.

Laboratory testing of original mortar and new mortar can help to achieve desired mix and required proportions. The Scientific Laboratory should be a mandatory establishment in the area to assist the restoration and conservation process.

4. Materials

The sites are dotted with numerous reconstruction patch works, which are easily identifiable due to presence of new bricks recognizable due to their colour and fresh mortar.

The reconstruction of the said works seems to have been carried out at a relatively fast pace as there appears to have been little effort in sourcing bricks of similar size and properties than the original bricks.

A study of different types of bricks (i.e. sizes and shapes) should have been carried out for corners, cornices and curved profiles. Furthermore, the strength of bricks should ideally be tested and matched to the originals in a scientific laboratory.

The use of tiles at Wat Dusi Daram for the floor finish was undesirable and disturbs the ethos of the ruin/monument impacting adversely on its contribution to OUV. These should be removed and traditional brick paving should be revived.

Some of the monuments have undergone a lot of strengthening by having circular RCC tie beams at several levels, which were shown in a structural report. These were all camouflaged by covering them with a brick layer.

The important issue in such cases is the following: Was it following minimum intervention principles or philosophy? Did it really help to arrest structural defects? Is there a scientific study to prove/justify the intervention carried out? Another important question is the life span of such interventions, because if proper concreting does not happen then the corrosion of reinforcements at a later stage will result in the cracking of the covering brick layer.

It was not clear whether this intervention of RCC tie members was related to the floods as the structure had a high base and the tie beams were added above flood levels too.

A proper scholarly discussion or a workshop is essential on this subject to gain from other knowledge of works at other World Heritage properties such as Angkor Wat etc.

It was also noted that many plinth bases at Wat Phra Si Sanphet had been redone as they were at perfect right angles. They also seemed to house a new tie RCC plinth beam camouflaged by exposed bricks (this needs to be verified with the FAD authorities).

In summary, the interventions were more than the minimum that was desirable and appear to have been carried out relatively quickly without a full analysis or impact assessment.

5. Preventive Maintenance

Erecting scaffolds for such tall structures/temples is not easy and hence a mechanism should be worked out, where the vegetation growth when noticed can be easily removed at the earliest opportunity with the help of biocides before they become full grown trees damaging the existing fabric.

The joints of the exposed brick masonry are predominantly open; ideally these should be repointed in a recessed manner using lime mortar.

6. New Development

New temples have been built within historical sites, not only at Ayutthaya. Although these are said to be outside the jurisdiction of FAD, the relationship between these new temples and the protection of historical sites is important and relates to the OUV of the property. Appropriate control in line with national policy concerning the protection of cultural heritage must be undertaken.

It is also considered that a good, cooperative relationship should be constructed so that activities to enlighten local residents about the protection of historical sites may be executed. In other words, by undertaking activities to protect sites, these temples will not only contribute directly to the protection of the sites but will also make it possible to educate the local residents about the importance of the sites and of their protection. Taking into consideration the nationwide spillover effects, we wish FAD to undertake effective measures so that Ayutthaya may become a model case.

7. Conservation Approach

The conservation approach for repair has not been clearly understood as some monuments during the past (50 years ago) have been completely rendered in cement. Some others are rendered partially or in patches, perhaps to show a ruinous effect, however this may be detrimental to the fabric as it is more vulnerable to decay until and unless regular consolidation does not happen. Similarly the Fort has only its gates rendered but not the entire structure which seems more of an aesthetic decision rather than one undertaken to conservation reasons.

For living sites which are in constant use and not under FAD jurisdiction, these often undergo refurbishment using modern materials (like Wat Sena Saram and Wat Dusidaram). The use of hard cementitious render and synthetic paint results in flaking of the paint as seen externally at Wat Sena Saram. These can also damage the interiors as being unbreathable/non-porous they would inadvertently retain moisture resulting in an increased dampness which could affect the frescoes on the interior walls.

The mission recommends that such works should be carried out based on scientific conservation principles while at the same time respecting the use of local materials and skills as these have been time tested. Many of these buildings support the OUV of the property.

The relationship between these 'living sites' and the attributes of OUV need to be set out clearly. The attributes of OUV are not confined to those monuments under the management of FAD. If possible the FAD should have overall responsibility for all structures within the property (and in its setting) to ensure that repair and maintenance does not reduce the cultural value of living sites in relation to OUV.

8. Methodology

The mission considers that the FAD should adopt accepted international methodology where a fabric status report is prepared, its cultural significance identified and defect mapping done. Recommendations are then prepared which become the basis for tender documents or implemented in-house as the case may be.

Close supervision is essential to adhere to the international charters such as the use of like materials, minimum desirable interventions, and documentation of work (i.e. before, during and after). In living monuments this approach is at the moment relaxed and the structures can be restored/refurbished following traditional skills, materials and scriptures/philosophy.

However, the SoOUV states that:

An extension of the World Heritage property is under preparation which will cover the complete footprint of the city of Ayutthaya as it existed in the 18th century, when it was one of the world's largest urban areas. This will bring other important ancient monuments, some of which are outside of the presently-inscribed area under the same protection and conservation management afforded to the current World Heritage property.

The living sites could thus be part of the of OUV in which case an overall approach to conservation is needed for both living and archaeological sites based on their significance and contribution to OUV, and both should come under the supervision of the FAD.

The mission did not have a chance to interact with any craftsmen or contractors which the implementation stage requires to discuss improvement by incorporating the points referred to earlier and reviving the use of traditional materials.

These monuments also require regular periodic monitoring and consolidation.

The works being undertaken with the World Monuments Funding and through the German funding seems to be carrying out this methodology as this work is well supervised.

Ideally a national debate/workshop with academicians, FAD and conservation practitioners with the local UNESCO office should be conducted on the conservation philosophy for such protected sites, as well as living protected sites and lived-in domestic sites. Successful case studies of adjoining countries in the region can also be integrated.

This should be followed by a demonstration or pilot projects whose focus should be on reviving arts, skills and materials, being closely monitored by professionals and integrating scientific study i.e. examination of samples in the lab to arrive at best possible solutions.

C. OVERALL RECOMMENDATIONS

Wall Paintings:

1. Undertake the application of resins to the surface of wall paintings to stop the detachment caused by the precipitation of salt crystals as a matter of urgency.
2. Construct a drainage system inside the walls so that any water which has penetrated evaporates towards the outside rather than into the rooms.
3. Provide details of both of these projects to the World Heritage Centre for review by ICOMOS before the project is undertaken.

Flood Prevention:

1. Explore options for improving flood prevention such as: tree planting, construction of wall along the line of former town wall and the revival of other traditional practices.
2. Revise Master Plan to address flood prevention measures.

Conservation methods and approaches:

1. Define the attributes of OUV in terms of individual monuments, the relationship between them, and their associated materials and craftsmanship.
2. Put in place a detailed documentation system for the structures within the property.
3. Stop the use of cement in mortars. Undertake an analysis of traditional mortars through laboratory analysis. Introduce regular use of lime in mortars through the construction of lime pits. Analyse structure of traditional bricks and explore new sources.
4. Put in place as a matter of urgency training programme to improve the skills and expertise of craftsmen undertaking conservation activities.
5. Remove the new tiles at Wat Dusi Daram and re=instat e traditional brick paving.
6. Undertake a full assessment and documentation of modern structural interventions.
7. Consider a national debate/workshop with academicians, FAD and conservation practitioners with the local UNESCO office on the conservation philosophy for protected sites, as well as living protected sites and lived-in domestic sites, and on structural engineering approaches.
8. Introduce demonstration or pilot projects to focus on reviving arts, skills and materials.
9. Put in place appropriate controls to regulate new buildings in the property and its setting.

ANNEXE 1 – TERMS OF REFERENCE

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ICOMOS Advisory Mission
Historic City of Ayutthaya

28 April – 2 May 2014

Following the report dated 7 August 2013 (No.1007.5/171) submitted by the State Party regarding the restoration activities at the Historic City of Ayutthaya following the heavy floods in 2011, it was agreed that an advisory mission should be invited by the State Party of Thailand. **The objective of the mission is to assess the current state of conservation of the property, in particular in relation to impacts from the flood, and to provide the State Party with technical advice to ensure the conservation and strict protection of the property's Outstanding Universal Value (OUV).** The mission will be undertaken by Mr Vikas Dilawari (India) and Professor Tadateru Nishiura (Japan), representing ICOMOS.

In particular, the mission should address the following key issues:

1. Examine the appropriateness of the interventions made after the flood and their impact on the property's OUV including the quality of materials and workmanship;
2. Identify appropriate solutions to conservation problems that may have arisen, and incase the restoration work that have already been carried out are found inappropriate, corrective measures to retain the OUV of the property;
3. Provide practical recommendations to the State Party on the anti-flooding system to be put in place within and outside the City isle according to the management plan of the property and the recent heavy flooding of 2011. It is desirable that the State Party may consider a disaster risk reduction plan within the management plan for the property.

Based on the above, produce a technical report and recommendations.

ANNEXE 2 – MISSION TEAM

Professor Tadateru Nishiura (Japan) and Vikas Dilawari (India)

ANNEXE 3 – PROGRAMME

Tentative Program

For Advisory Mission to Thailand on the restoration activities at the
Historic City of Ayutthaya following the heavy floods in 2011.

Between April 28th – May 2nd 2014.

Monday, April 28th, 2014

- Arrive Bangkok
- Leave for Ayutthaya
- Overnight in Ayutthaya (Iudia on the river Hotel)

Tuesday, April 29th, 2014

- 09.30-012.00 hrs - Welcome Speech by Director of the 3rd Regional Office of Fine Arts, Ayutthaya
- Discussion about the specific concerns of the World Heritage Center on the Restorations of the Historic City of Ayutthaya
- 12.30 – 13.00 hrs - Lunch
- 13.00 – 17.00 hrs. - Site investigation (**Wat Phra Si Sanphet, Wat Ratchaburana, Wat Phra Ram, Wat Chaiwattanaram**)
- 17.00 – 19.00 hrs. - Cruising around Ayutthaya Island and observing Flood Protection System
- Dinner on a cruise ship.

Wednesday, April 30, 2014

- 09.00 – 12.00 hrs - Site investigation (Wat Kudidao, Wat Chakkawat, Wat Ayothaya, Wat Dusidaram)
- 12.30 – 13.00 hrs - Lunch
- 13.00 – 17.00 hrs. - Site investigation (Wat Choeng Tha, Wat Senasanaram, Wat Chaiyaphum, Pom Phet Fortress)
- 18.00 – 20.00 hrs. - Dinner

Thursday, May 1st, 2014

- 08.00 – 09.30 hrs. - Leave for Bangkok
- 10.00 – 12.00 hrs. - Conclusions and Recommendations of the Mission (at the Fine Arts Department)
- 12.30 – 13.00 hrs. - Lunch Reception
- 14.30 hrs. - Check in at Riva Surya Hotel

Friday, 2nd May, 2014

- Departure of the experts
-

ANNEXE 4 - ILLUSTRATIONS

1.0 Wat Phra Si Sanphet



New square bases and some reconstruction possibly camouflaging the concrete tie beams?



New reconstructed plinths – were these essential for structural strengthening?



Conservation philosophy and execution should ideally converge.



Reconstruction or original??



Reconstructed base - undulating brick layers not the best of workmanship



In the new brick laying work there is a lot of room for improvement



Traces of original render and decorations speaks of high quality and standard

2.0 Wat ratchaburana



Old and new lime mortar decorations



Recent lime render work

3.0 Wat dusi daram



A lot of reconstruction is noticed with re-plastering in patches



New tiles laid challenges the authenticity of monument. Need to be removed and replaced with brick paving



Reconstructed masonry, perhaps camouflaging the concrete tie beams?



Conservation philosophy is not clear where to stop ?



Straight Joints in recent works reflect poor workmanship



Flaking of newly done plaster perhaps due to synthetic paint??

4.0 Wat Ayodhya



Past



Present

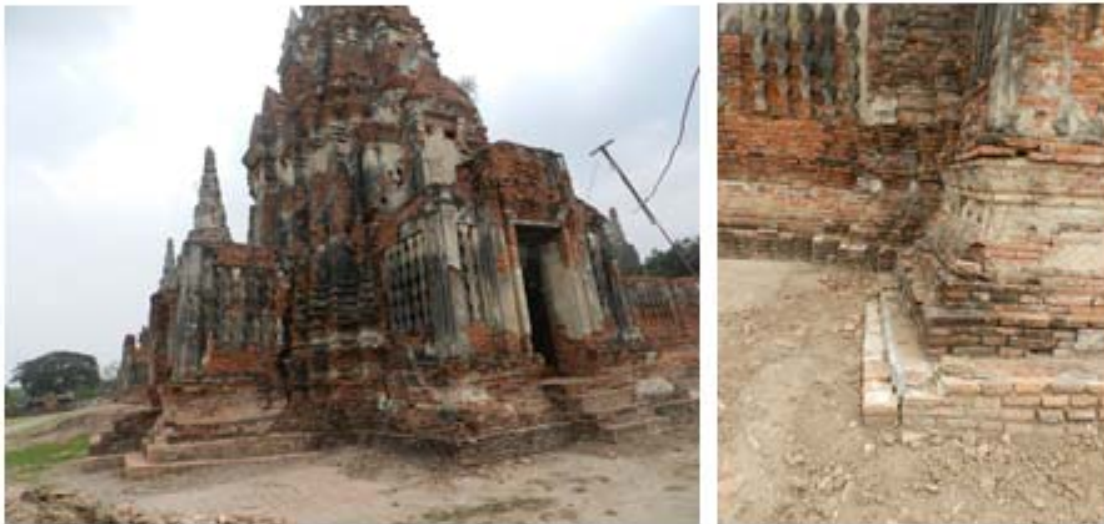


A lot reconstruction is seen, new brick in-fills, the parapet- not sure as to how the decision not to plaster is taken . Is aesthetical or need based?



Pointing missing on the brick monument , a lot of vegetation growth then happens from here as seen in the picture

5.0 Wat Chaiwattanaram



Detail view of the Porches and the repairs done

6.0 Wat choeng tha



Restored Exteriors – Few of the houses adjoining the river banks have raised their stilt heights

7.0 Wat Senasaram



Living heritage sites : Complete redoing seems to be the approach, traditional craftsmanship is used however, the finishes and material are not original and are contemporary like the render and paint which can be detrimental to the wall paintings as these are non breathable



Rising dampness damaging the murals



Flaking of new paint

8.0 Pom Phet Fortress



Repaired/ restored and reconstructed . The conservation philosophy is not clear as to only the gate to be rendered ?