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The Twenty-sixth Regular Report

公益財団法人　ユネスコ・アジア文化センター文化遺産保護協力事務所
Cultural Heritage Protection Cooperation Office, Asia-Pacific Cultural Centre for UNESCO (ACCU)

ACCU Nara International Correspondent

The ACCU correspondents periodically send reports on cultural heritage protection activities in which they have been recently involved. This is a collection of eight reports submitted by international correspondents in the Asia-Pacific region.

The Twenty-sixth Regular Report

Contents

Cambodia

National Museum and Current Situation

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Introduction

The collection of Khmer cultural heritage comprising archaeological and ethnographic objects (stone, wood, metal, ceramic and textile) totals 17,763 objects from many different time periods, including the prehistoric, pre-Angkor (6th to 8th centuries), Angkor (9th to 15th centuries) and post-Angkor (16th to 20th centuries) periods. This treasure of the Khmer was collected and kept safe in one place, well known as the National Museum. Over more than a hundred years, this exemplary building has carried out many functions, such as conservation, exhibition, inventory and documentation education and publication (Fig. 1). Recently, the whole building has been facing serious dilapidation even though the building has been repaired many times. The fulfilment of this building restoration project requires a significant budget. Because of the limited capacity of the national budget and the Covid-19 situation to support museum building restoration work, the project has been separated into parts. For example: roof repair: we have divided this into four steps of restoration (1. northern roof, 2. southern roof, 3. eastern roof, 4. western roof) and selected the most damaged one to restore as the first step. Other restoration steps include wall repair (interior and exterior), floor, foundation and storage. Last year we accomplished part of the southern roof repair (southern roof block 1), and long-term prevention (pigeons: by using mechanical and physical control; termites: by using chemical control).

Projects Achieved 2020

Last year we accomplished two main projects of prevention and museum building restoration such as integrated pest management and southern roof restoration. For pest management, we completed pigeon prevention on the roof, the top of pillars and motif pediment (we used metal netting to cover the joints of the roof structure where the pigeons used to stand and nest. On the top of the pillars, we placed pieces of zinc. For the motif pediment we used plastic netting to shield it; we also painted the motif pediment with *mrak* (Khmer traditional paint) and imported color paint (Fig. 2). As a result, we noticed that the number of pigeons decreased significantly, especially those that inhabited the space. In addition, we are currently undertaking termite treatment such as putting a chemical substance into the ground around the building, under the floor and on the roof structure; we need to check the effect of the chemical substance on termites monthly for five years (Fig. 3). One more point is that the successful southern roof restoration required us to change and replace the roof structure, such as the timber, roof beams, and roof tiles. For the timber roof structure, we were unable to recover most of the wood. So, we needed to replace it with a new timber structure. On the roof beam, we tried to keep the old model by fixing the most damaged parts and removing the decayed parts. We also tried to keep most of the old roof tiles if there was less damage.

Project in progress

The museum building still needs more treatment activities to conserve it over the long time because the risk of damage continues to exist. After finishing last year's project, at the beginning of 2021 we have three more conservation and prevention activities in progress:

1. Long-term roof restoration project
2. Interior wall repair and repaint
3. Surrounding fence repair

1. Long-term roof restoration project

It is planned that this project will run from 2021 to 2024, comprising four steps of roof restoration projects (Fig. 4):

- First step restoration start (beginning 2021); roof part 1 (northern roof)
- Second step restoration start (2022); roof part 2 (southern roof)
- Third step restoration start (2023); roof part 3 (western roof and fire protection equipment)
- Fourth step restoration start (2024); roof part 4 (eastern part)

As the result of humidity, rain, and termites, most of the roof structure of the museum building has decayed, especially the northern roof part. This most seriously damaged roof part was selected to be restored in the first step of restoration work planned to protect the roof from collapsing.

Damage and Roof Repair Part 1 (Northern Roof)

Much damage to part of the roof structure was evident upon dismantling work: Timber: most of the timber in this part had decayed, moved and displayed cracks. Roof Beam: damaged beam, cracks, and serious decay. Roof tiles: missing and moved tiles due to birds and exposure to the air. To start this project, the site was covered to facilitate restoration work. The roof tiles were removed to check and treat the damaged structure. Some of timber was removed and replaced. We will try to retain as much as the old structure as we can (Fig. 5).

2. Interior Wall Repair and Repaint

Currently, there is interior wall damage to some parts such as the mortar, and the paint is peeling and dirty due to pigeon droppings and dust (Fig. 6). The bricks of the wall will suffer more decay from humidity if the mortar receives no treatment. The wall damage must be repaired to help preserve the building and to improve its education and publication functions. The plan was to remove all the damaged mortar and replace it with new mortar and then repaint it. This work has resulted in some changes to the gallery giving the exhibition a new look of. For example: Special Buddha Exhibition gallery (Fig. 7).

Fig. 1: The library and the archive room

Fig. 2: Installation of pigeon bars under the pediment

Fig. 3: Termite treatment

3. Surrounding Museum Site

The plan is to repair the fence surrounding the museum to improve security, because the fence is currently old and damaged. We will fix the old and damaged columns and strengthen them, and install steel timber between the two columns of the fence. We will then replant the damaged plants.

Conclusion

In conclusion, the National Museum of Cambodia is a place that stores our great artefacts since prehistoric periods until the present and also a place to conserve, educate, exhibit, and publish Cambodian culture and tradition, not only to the local community but also to foreigners from around the world, to help them more clearly understand Cambodia. So, it is our obligation as Cambodian citizens to restore and improve our work to protect this important building for the next generation.

For the next project, the plan should be to repair and repaint the exterior wall. In addition, we are preparing a proposal for the repair of the foundation.

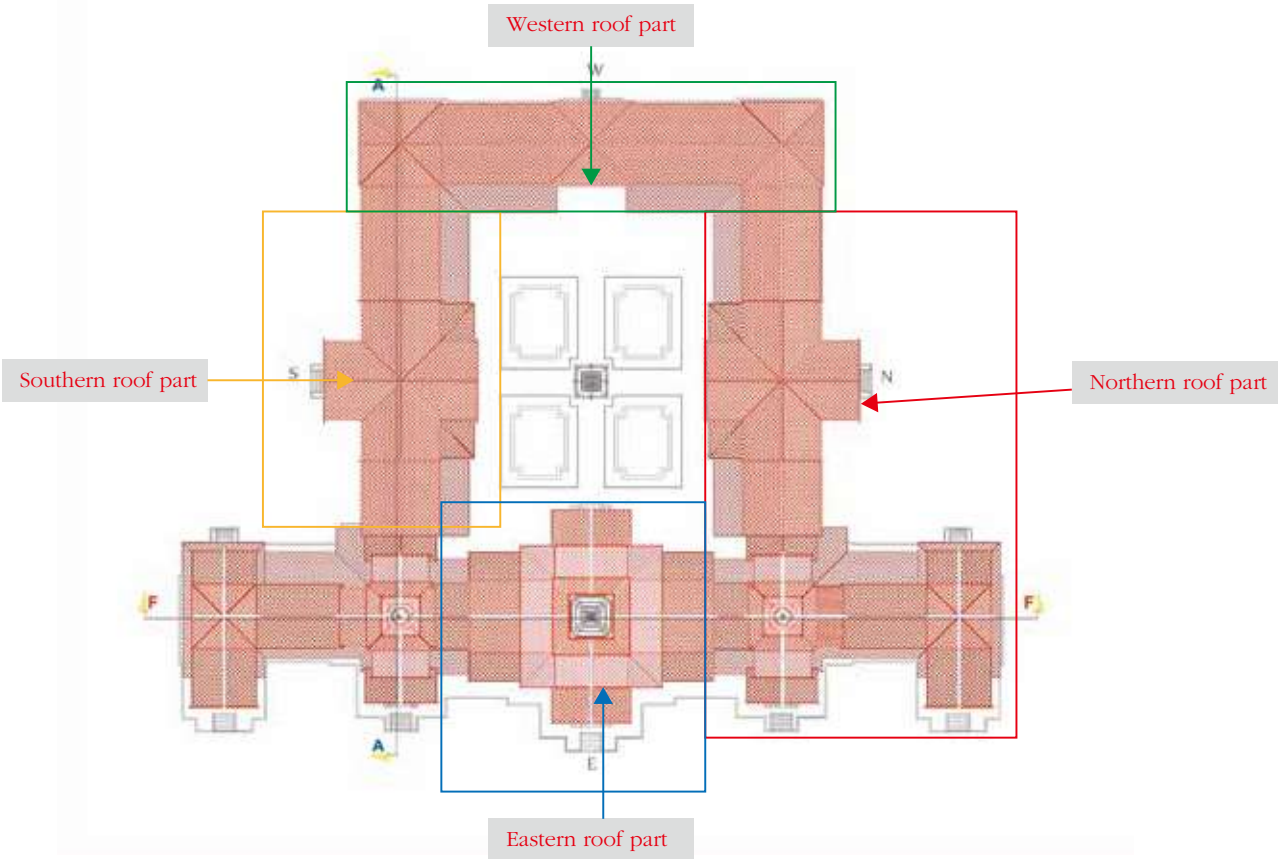

Fig. 4: Separating roof parts for restoration

Fig. 5: Damaged timber

Fig. 6: Dirty wall due to pigeon droppings and peeling mortar

Fig. 7: Buddha exhibition gallery before and after repair of interior walls

Designation of Lasem City as a National Cultural Heritage Landscape

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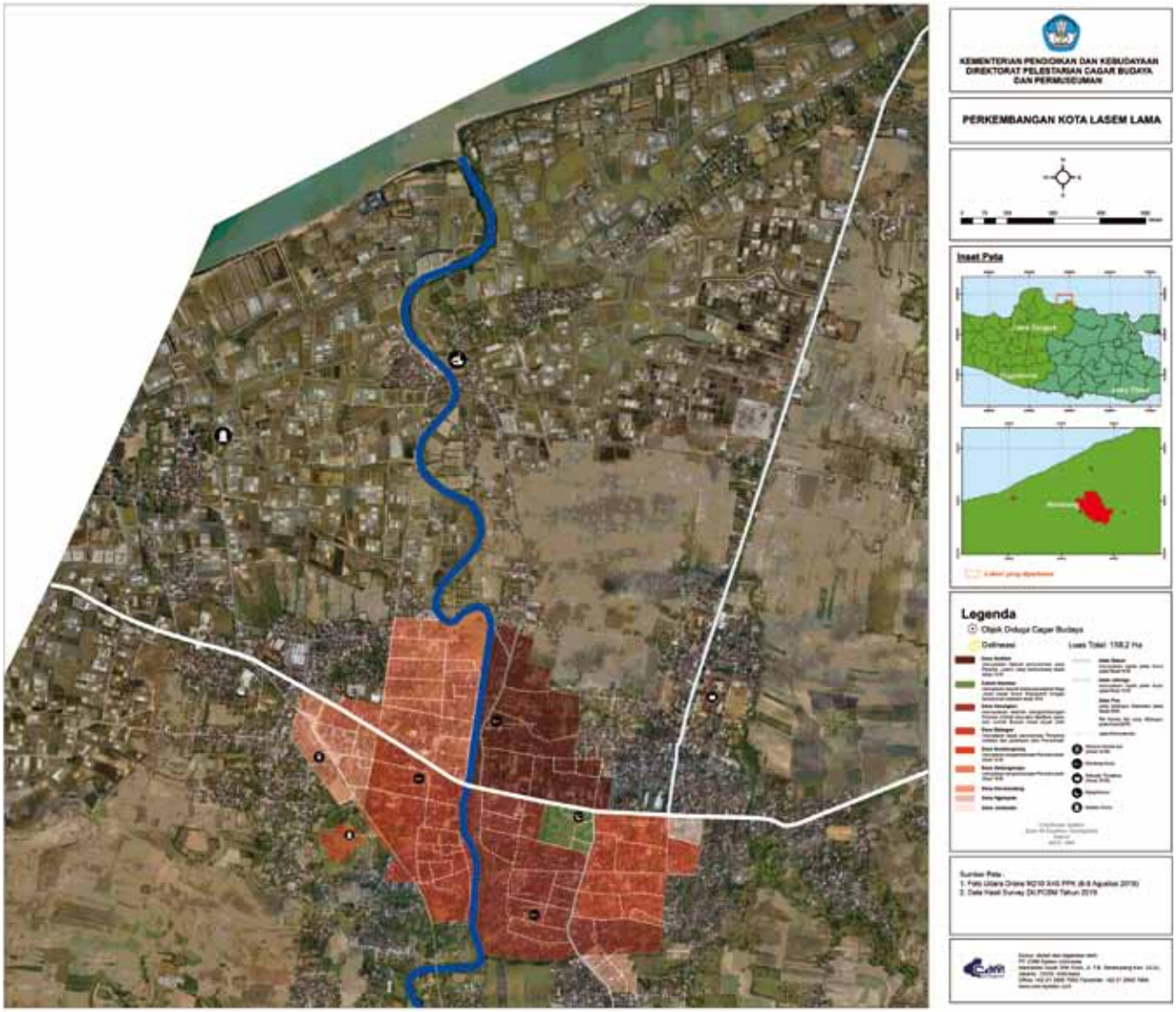
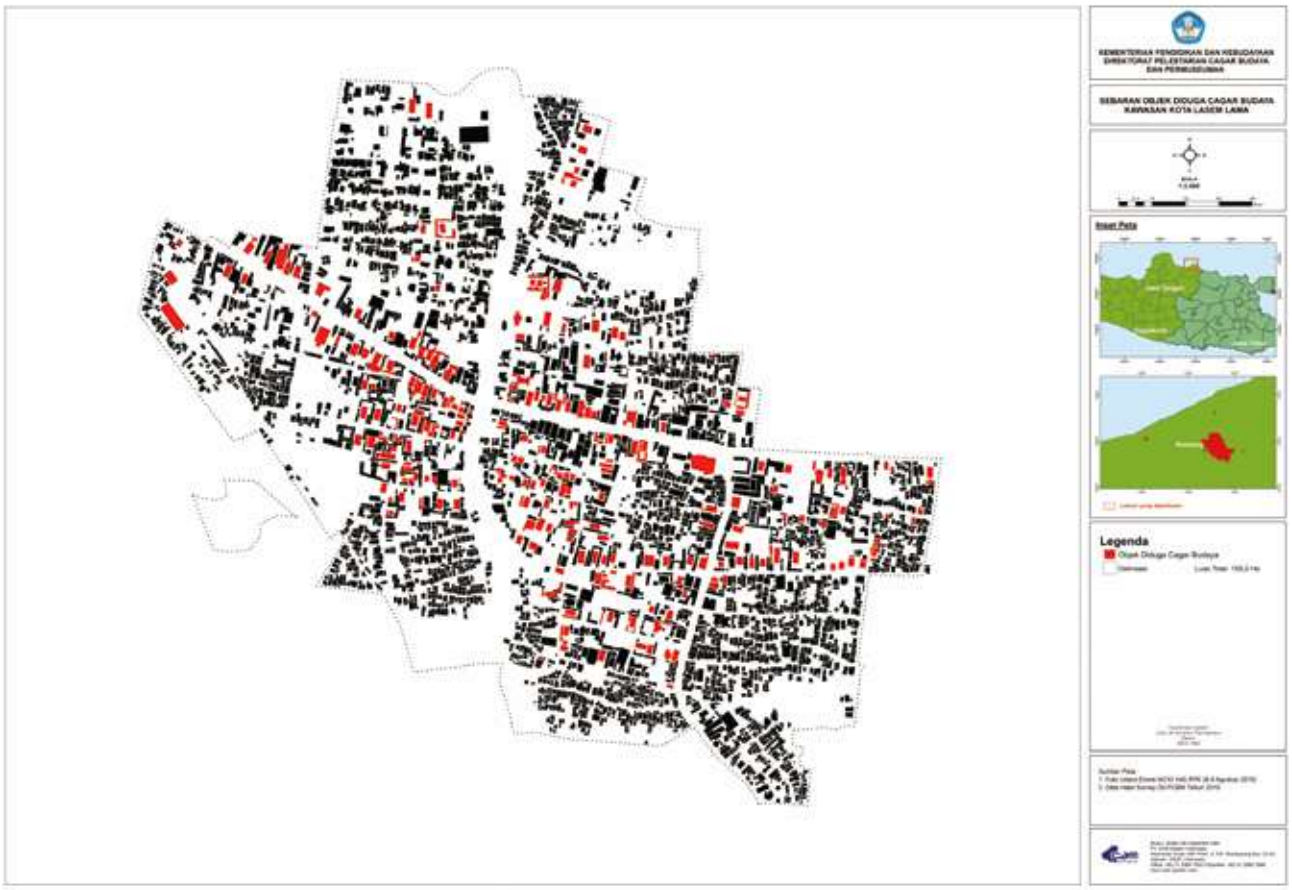
Lasem is an old port city in Rembang, Central Java, which has been written about in history from at least the 14th century starting from the Majapahit manuscript called *Nāgarakrĕtāgama* or Description of the Country (1365 CE). The city and its port have always been a place of imperial interests since the days of the Majapahit Empire, Demak and Islamic States in Java (16th century), the Dutch East India Company (17th century), and the Japanese Occupation during World War II. The city has been a melting pot of Javanese and Chinese culture due to the ancient spice trade since at least the Majapahit period (14th century). This melting pot city gave birth to unique architecture, a city plan, and intangible heritages, most notably *Batik* Lasem (hand-dyed cotton and silk garments).



Map of Lasem City

The city plan and architecture of ancient mosques, Chinese temples, houses, roads, a railway station, and tombs in Lasem still show some unique features from the 17th to 20th centuries. Urban development in Lasem since at least 50 years ago has changed some of its unique features as a heritage city. Since the late 1980s, this heritage city has attracted Indonesian architects because of its significant heritage value.

The heritage city of Lasem, especially its Chinatown, has been in the Indonesian media spotlight since ten years ago. Indonesian heritage workers including architects, archaeologists, historians, conservators, and others have worked intensively in Lasem for at least the last ten years. In 2019, I joined a team from the Directorate General of Culture to document and map this heritage city to begin its designation as a National Cultural Heritage Landscape. The mapping of the heritage city of Lasem was carried out using aerial photography using fixed-wing drones. Aerial photos are used to make plans to designate a heritage landscape, which includes an urban heritage area in Lasem covering an area of 158.2 ha.



Ground plan of Lasem City

Aerial photography as part of a geographic information system (GIS) is a very useful method for making documentation, especially for mapping the heritage city. This method, combined with ground survey and photography, has been carried out to create a database of cultural heritage in Lasem. The map and database were used to delineate the cultural heritage landscape boundary and its management plan. The conservation management of this old city will be based on its spatial heritage including its old city plan, roads, religious buildings, houses, tombs, etc.

Tomb of a late 16th century Muslim preacher in Lasem Mosque

The designation of a Cultural Heritage Landscape is the first step for Lasem City to be managed as a heritage city according to the Law of Cultural Conservation. Urban development in Lasem has threatened the heritage city plan and buildings, and most of the old houses have been abandoned since the 1950s. Since the media and heritage workers have paid great attention to this city, many descendants of the people of Old Lasem have returned and continued their ancestors creative industries such as Batik making, culinary arts, hospitality, etc.

The 18th century Chinese temple in Lasem

The designation of this city as a cultural heritage landscape is also expected to restore the spirit of cultural heritage to Lasem, especially for its people. Last year, this cultural heritage city was designated as a Cultural Heritage Landscape by the Regent of Rembang in accordance with the Law of Cultural Conservation. Designation of the Old City of Lasem as a National Cultural Heritage Landscape is still ongoing and planned to be signed this year.

Batik maestro in Lasem

Lao PDR

The Conservation of Tomo Ancient Site, Tomotha Village, Pathoumphone District, Champasak Province

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1. Introduction

Laos is a country located in Mainland Southeast Asia that is enriched by cultural resources created by humans since a thousand years ago, and as a result, there have been a variety of archaeological evidences and monuments distributed around the country over a long period of time. The archaeological remains are invaluable cultural resources. However, the economic development of the country has effected rapid change to the nation's way of life, and this may affect the cultural value of the past, while if the standard of management is insufficient and enforcement action also not strongly taken, this will endanger archaeological and historical sites or put them at great risk in the future. Regarding these significant cultural heritage issues, a decree of the Lao president on the preservation of cultural, historical and natural heritages was issued and enforced in 1997; then, the Law on National Heritage was developed and enacted in 2005, after which it was continuously improved and amended in 2014 to include all types of properties. Currently, the Lao government has also taken cultural heritage protection and promotion into account in terms of the country's development as mentioned in the 8th Five-Year National Socio-Economic Development Plan (Ministry of Planning and Investment, 2016).

In this report, I would like to highlight some brief information on a case study of cultural heritage management at an ancient site of a monument which is part of Wat Phu Champasack World Heritage Site in the southern part of Laos, called "Tomo Ancient Site."

The Tomo ancient monument site is one of the most significant sites in Laos. The research on the conservation of Tomo Ancient Site in Tomotha Village, Pathoumphone District, Champasak Province had two objectives: preservation of the condition of the ancient site and conservational orientation of the Tomo ancient sanctuary. The qualitative research method and archaeological method were also applied. The population sample targeted local authorities, related stakeholders and local people, with observations, field in-depth interviews and general interviews, and an archaeological survey being conducted in order to obtain crucial information.

2. Site location

Tomo Ancient Site is located in Tomotha Village, Pathoumphone District, Champasak Province. This ancient site is close to the Mekong River to the south, Tomo Ancient Site comes under the 3rd and 4th zones of the World Heritage Site of Wat Phu Champasack, which covers 23.85 square kilometers.

The ancient site area is divided into three areas:

- Landscape reserves and green areas
- Bumper area
- Construction area

3. History of Tomo Ancient Site

The history of Tomo Ancient Site is not clear, due to insufficient research investigations. However, some evidence has revealed that the ancient site of Tomo can be dated to between the 9th and 11th centuries.

4. Tomo Ancient Site management

The research results revealed that the task of conservation involves various stakeholders including government offices (central and local levels) and the UNESCO World Heritage Office. The ancient site management includes various processes such as maintenance, registration, monitoring activities, cleaning, location management and dissemination of information, as well as security, event management, infrastructure, information promotion and management evaluation. There still remain various issues regarding the preservation of the ancient site involving numerous factors such as the gap in cooperation among stakeholders and the local community, environmental change, socioeconomic development issues, the problem of understanding and public awareness, and ultimately, the challenge seems to be preserving the natural landscape and environment surrounding the ancient site. Local community awareness is one of the issues which is urgently required to be solved, as well as the gap between laws/regulations and practical application based on the capacity of the staff who work directly in the field and related stakeholders. Nevertheless, more experimental research is also required to be carried out in order to contribute more data and information on the ancient site.

The solution to the management of the ancient site can be applying practical standard, increasing the number of scholars and experts and capacity building for the local community living nearby the ancient site, particularly on the significance and values of the ancient site in the near future. In addition, the developmental direction is aimed to be the tourist destination, so infrastructure, facilities and services are also required to be developed alongside cultural heritage protection efforts.

5. Conclusion

Cultural heritage management in Laos is largely concerned with the management of monumental archaeological sites, historical architecture, and more recent sites and objects related to the communist regime. Lao heritage management has its roots in the time when Laos was part of French Indochina with additions from Buddhism, communism, and a currently growing business of alternative tourism. The Tomo ancient monument site is quite well managed compared to many other ancient sites due to this ancient site being managed under the regulations of UNESCO. However, numerous issues are still required to be solved and developed in the future, especially the process of management, human resources, local community awareness, etc.


Tomo monument


Platform hole of stela and water channel


Ancient road

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The Practice of Heritage Building Conservation in Malaysia

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Introduction

Conservation refers to the process of maintaining and protecting heritage assets from threats and risks of being damaged, destroyed, changed, or even restored without proper design, planning, and management in accordance with approved standards and guidelines. Such practice entails guardianship for maintenance, preservation, or protection of what presently exists in both the natural resources and built environment from being destroyed or changed in an inappropriate manner. Although some aspects of conservation may differ in terms of the design, approach, and methodology, they nonetheless share the same objective, which is to ensure that the maximum life cycles of both the natural resources and built environment are maintained. Heritage building conservation refers to the practice of keeping intact all buildings and properties of immense historical, architectural, and cultural values. It is implemented through various phases including listing and grading of historic buildings, evaluating buildings to be gazetted under the current laws, preparing proposals for building conservation and renovation, and carrying out conservation projects under the auspices of a project steering committee. Based on vast experience and the success stories of heritage building conservation works in the country, an effective operational framework has been established for the practice of heritage building conservation in Malaysia. This article outlines key definitions and concepts of heritage building conservation and presents an overview of the heritage building conservation scenario in Malaysia. It highlights the framework of heritage building conservation as practiced in the country including the five most important stages. It also discusses the challenges faced by building conservators in safeguarding heritage buildings in Malaysia for future generations.

Definitions and Concepts of Heritage Building Conservation

In Malaysia, heritage buildings are regarded as those properties that relate directly or indirectly to important events in the country's cultural, political, economic, military, and social history. Such buildings range from traditional Malay houses and Southern Chinese shophouses to colonial government offices and railway stations. In section 2, Part 1 of the National Heritage Act 2005 (Act 645), heritage is defined broadly as follows:

i. Heritage imports the generic meaning of a National Heritage, sites, objects and underwater cultural heritage whether listed or not in the Register.
ii. National Heritage means any heritage site, heritage objects, underwater cultural heritage or any living person declared as a National Heritage under section 67.
iii. Cultural heritage includes tangible or intangible form of cultural property, structure or artefact and may include a heritage matter, object, item, artefact, formation structure, performance, dance, song, music that is pertinent to the historical or contemporary way of life of Malaysians, on or in land or underwater cultural heritage of tangible form but excluding natural heritage.
iv. Underwater cultural heritage means all traces of human existence having a cultural, historical, or archaeological character which have been partially or totally under water, periodically or continuously, for at least one hundred years such as:
    (a) sites, structures, buildings, artefacts, and human remains, together with their archaeological and natural context;
    (b) vessels, aircraft, other vehicles, or any part thereof, their cargo or other contents, together with their archaeological and natural context; and
    (c) objects of prehistoric character.
v. Tangible cultural heritage includes area, monument, and building.
vi. Intangible cultural heritage includes any form of expressions, languages, lingual utterances, sayings, musically produced tunes, notes, audible lyrics, songs, folksongs, oral traditions, poetry, music, dances as produced by the performing arts, theatrical plays, audible compositions of sounds and music, martial arts, that may have existed or exist in relation to the heritage of Malaysia or any part of Malaysia or in relation to the heritage of a Malaysian community.
vii. Cultural heritage significance means cultural heritage having aesthetic, archaeological, architectural, cultural, historical, scientific, social, spiritual, linguistic or technological value.
viii. Natural heritage includes natural features of any area in Malaysia which may consist of earthly physical or biological formations or group of such formations, geological or physiographical features, mountains, rivers, streams, rock formation, seashore or any natural sites of outstanding value from the point of view of nature, science, history conservation or natural beauty including flora and fauna of Malaysia.

Conservation aims to recapture a sense of the past and to preserve, conserve and restore as much as possible of the existing fabric in its original condition or situation. Heritage building conservation thus relates to the entire process of maintenance, repair, and restoration of heritage buildings that aims to prolong a building's lifecycle and practical function. It involves technical actions to prevent building decay and to manage building change in a systematic manner. The practice of heritage building conservation has a long history, but its popular application is relatively recent in Malaysia. A heritage building with significant historical, architectural and cultural values is often given due recognition and conserved for posterity. Other similar terminologies associated with the practice of building conservation are

described as follows:

i. **Preservation:** keeping cultural property from being harmed or decayed.
ii. **Restoration:** returning a place to a known earlier state.
iii. **Rehabilitation:** returning a property to a state of utility through repair or alteration which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic architecture.
iv. **Replication:** imitating what previously existed.
v. **Relocation:** moving the entire building or parts of a building to be reassembled at other sites for economic or geographical reasons.
vi. **Adaptive re-use:** changing the main function of a building while maintaining its original form and character.
vii. **Maintenance:** continuous care and protection of a cultural heritage.

Despite natural ageing, the original function, and aesthetic values, there is a case to be made for any building to be conserved by adapting appropriate technologies available to suit contemporary needs. Providing that the buildings are structurally in a reasonable physical state and do not require excessive structural alterations, some buildings can be conserved for the purpose of investment and financial gain. Rehabilitation or adaptive re-use of heritage buildings into appropriate new uses such as shops, museums, galleries, cafes, restaurants, and entertainment centres can help promote tourism and boost local income generation.

Conservation stakeholders involved in heritage building conservation in Malaysia should make a point to adhere to the following guiding principles to ensure a standard conduct of practice and professional ethics:

i. All conservation works should be based upon and preceded by sufficient historical research, site analysis, and documentation to identify and safeguard fully the heritage values to be conserved.
ii. The evolution of the structures and sites over a time span should be well respected. The contributions of all time periods are important to the historical development and merit retention. Decisions about appropriate levels of intervention shall be based upon the heritage values of each contribution.
iii. Long-term protection of a historic resource should be balanced with the user requirements within a shorter time frame. All future resource management goals should be identified clearly prior to undertaking any work.
iv. The approach to all heritage conservation projects should be one of minimal intervention to ensure maximum preservation of the existing and authentic physical fabric as well as maximum retention of the signs of age.
v. Ensure the building's stability and public safety. Professional inputs such as from structural engineers and geologists may be sought to this end.
vi. Conjecture and falsification of building elements should be avoided at all costs in all heritage conservation projects.
vii. A well-defined maintenance plan should be clearly established in order to prepare for an appropriate level of building maintenance and care upon project completion.

Cultural Heritage of Malaysia

The history of Malaysia's heritage buildings and monuments can be traced back hundreds of years, through the discovery of *candi* at Lembah Bujang, Kedah built by Indian traders plying the Straits of Malacca. Early historical records by Chinese traders had revealed the existence of forts in Melaka in 1414. Nonetheless, the Portuguese invasion of the port city of Melaka during the Melaka Sultanate in 1511 had marked a turn of events affecting the history of heritage buildings and monuments in Malaysia with the building of the A Famosa fort (now in ruins) by the Portuguese. When the Dutch seized Melaka from the Portuguese in 1641, they erected new buildings, such as the Stadhuys, to mark their existence on the Malay Peninsula. During the British colonisation of the Malay Peninsula from the early 19th century, they also built numerous buildings including government offices, mosques, and schools throughout the country.

Malaysia is endowed with priceless heritage buildings, both vernacular and those built during the colonial era. However, heritage building conservation has received lukewarm support from the local architectural community. The underlying reasons for this situation are manifold and remain to be unraveled. Cost factors, misconceptions of heritage values, and ineffective enforcement of heritage acts, enactments, and ordinances are partly to blame for this debacle. It is imperative that all conservation stakeholders recognise the need to strengthen the practice of heritage building conservation in Malaysia. At any rate, heritage building conservation requires not only vast knowledge and expertise in the preservation and maintenance of buildings; it also commands insights into the buildings' historical, architectural, and cultural significance. This important task should be performed in a professional manner in accord with universal conservation standards and building requirements.

Several heritage buildings in Malaysia have since been gazetted under the (now defunct) Antiquities Act 1976, which provides due protection to those buildings and encourages their conservation. The Malaysian government has been actively involved in providing financial support for heritage building conservation in the country. Examples of heritage buildings which have been conserved under the supervision of the (then) Department of Museum and Antiquities Malaysia include the Acheen Street Mosque and Kapitan Keling Mosque in George Town, Penang; the Ubudiah Mosque in Kuala Kangsar, Perak; the Sultan Abu Bakar Mosque in Johor Bahru, Johor; the Tengkera Mosque in Melaka; and the Jamek Mosque in Kuala Lumpur.

In 2005, the National Heritage Act 2005 (Act 645)

superseded the Antiquities Act 1976 to enforce provisions for the conservation and preservation of the National Heritage, natural heritage, tangible and intangible cultural heritage, underwater cultural heritage, treasure troves, and other related heritage matters. Presently, matters pertaining to both intangible and tangible heritage properties in Malaysia are under the jurisdiction of the Department of National Heritage (Jabatan Warisan Negara) in the Ministry of Tourism, Arts and Culture. The Department of National Heritage is led by the Commissioner of Heritage, who has the legislative power to designate, establish, and supervise the conservation, preservation, restoration, maintenance, promotion, exhibition, and accessibility of national heritage assets for the National Registrar.

Heritage building conservation initiatives at the local level have so far made considerable progress. The City Council of Penang Island, Taiping Municipal Council, Melaka Historical City Council, and Kuala Lumpur City Hall have established not only a heritage unit or department within the council but have adopted conservation guidelines on buildings and heritage sites in their respective areas. Consequently, many heritage buildings in the urban areas including shophouses, terrace houses, mosques, mansions, and government buildings have been conserved and maintained according to appropriate conservation guidelines. Streets flanked by rows of shophouses are a common sight in Malaysian cities including the cities of Melaka and George Town World Heritage Sites (WHS). A shophouse is an urban building form with a mixed-use function, that of residential and commercial. A shop or business premise is usually found on the lower floor; while the living quarters are located on the upper floor, thus providing convenience, shelter, security, and livability for the inhabitants. Such a unique architectural ensemble depicts one of the Outstanding Universal Values (OUV) of Melaka and George Town WHS, which should be well preserved in parallel with the UNESCO convention.

Under the National Heritage Act 2005 (Act 645), more than 700 heritage items are enlisted as the National Heritage of Malaysia, including buildings, natural sites, objects, cultural practices, traditional foods, performing arts, poems, legend manuscripts, and traditional games. Act 645 further underlines the process of identifying tangible and intangible cultural heritage, as well as outstanding cultural and natural objects and sites for their definitive recognition as the National Heritage of Malaysia. Article 67 of Act 645 provides nine criteria for an item to be considered for the declaration of National Heritage as follows:

i. historical importance, association with or relationship to Malaysian history.
ii. good design or aesthetic characteristics.
iii. scientific or technical innovations or achievements.
iv. social or cultural associations.
v. potential to educate, illustrate or provide further scientific investigation in relation to Malaysian cultural heritage.
vi. importance in exhibiting a richness, diversity or unusual integration of features.
vii. rarity or uniqueness of the natural heritage, tangible or intangible cultural heritage or underwater cultural heritage.
viii. representative nature of a site or object as part of a class or type of a site or object.
ix. any other matter which is relevant to the determination of cultural heritage significance.

Similarly, other laws that encourage the conservation and preservation of cultural heritage in Malaysia include the Sarawak Heritage Ordinance 2019 (Chapter 77), Penang Heritage Enactment 2011 (Enactment 14), Malacca Preservation and Conservation of Cultural Heritage Enactment 1988, Town and Country Planning Act 1976 (Act 172), Johor Enactment 1988, Local Government Act 1976 (Act 171), and Street Drainage and Building Act 1974 (Act 133). It is imperative that all conservation stakeholders, including policy makers, professional bodies, and building conservators comprehend the legal provisions and requirements clearly to enable them to conduct the conservation works accordingly.

Framework of Heritage Building Conservation in Malaysia

In Malaysia, heritage building conservation works are usually awarded and carried out by experienced and knowledgeable building contractors. In accordance with the guidelines on heritage building conservation in the country, the conservation works should be carried out based on the following principles:

i. Building conservation tasks should be carried out in a manner of "from top-to-bottom". Thus, installing a temporary roof to protect a heritage building is very important as buildings are often at their most vulnerable during the construction period of conservation works.
ii. Conduct scientific studies and laboratory tests on selected building conditions and materials.
iii. Apply only proven conservation methods and techniques to tackle building problems or defects.
iv. Document the building condition before, during and after conservation through a Historical, Architectural and Building Survey (HABS), digital photographs and videos.

An operational framework has been developed and documented to guide the practice of heritage building conservation in Malaysia. This framework is devised based on many successful experiences of heritage building conservation projects conducted by the Department of National Heritage Malaysia in recent years. The framework incorporates five critical stages of conservation projects, namely i) preliminary investigations; ii) dilapidation survey; iii) preparation of a tender document; iv) conservation works; and v) heritage management. Details of each stage are elaborated as follows:

i) Stage 1: Preliminary Investigations

Preliminary investigations are often carried out at the outset once a building is designated for conservation works. The preliminary investigations stage provides key information pertaining to the building per se and the immediate surroundings. Vital data are gathered during preliminary investigations including site analysis, year

built, historical background, architectural style, building status (national, state, district, or village), building ownership, and details of previous maintenance works undertaken. Information related to preliminary investigations may be solicited from various sources, such as:

i. face-to-face interviews with building stakeholders including those individuals who can offer additional knowledge and details about the building.
ii. existing documentation and records concerning the building held by local agencies, institutions and conservation bodies, museums, archives, libraries, universities, or heritage organisations.

All related information gathered including old photographs, paintings, or a building plan, if any, should be documented in a technical report for future reference, especially for use in Stages 2 and 3. Reports of the preliminary investigations should be presented to the building owner and respective clients who would then set up a project steering committee to oversee the conservation project. The project steering committee should be broadly representative in its membership circle, including representatives of the Department of National Heritage, Department of Public Works, and the local authority, a consultant architect, engineers (mechanical, electrical, civil and structural), a quantity surveyor, a building conservator, an archaeologist, and a historian. This is to ensure that all conservation works run efficiently as per schedule.

ii) Stage 2: Dilapidation Survey

Conducting a dilapidation survey during conservation works is crucial in determining the nature and extent of building defects. Dilapidation surveys require detailed analyses of building defects, probable causes, and proposed remedial measures, methods, and techniques of building conservation. Such surveys involve comprehensive and meticulous identification, description, and systematic recording of building defects through manual photographic and digital documentation prior to conservation works. This important practice in building conservation often requires multiple professional inputs including from a historian, an architect, a building conservator, engineers, and a quantity surveyor to advise the building contractor on-site. At times, inputs from other experts including from a microbiologist, chemist, archaeologist, and geologist are also solicited to expedite the conservation works.

Data and information obtained from dilapidation surveys are often analysed and documented in a technical report. This key report provides a sound basis for preparing related project briefs, building specifications, and the Bill of Quantities (BQ), as required in Stage 3. Measured drawings including building plans, elevations, and sections are all included in the report with clear indications of the defective areas for immediate repair. A dilapidation survey report, prepared by the consultant architect or building conservator, also makes clear recommendations on the proposed scientific studies and laboratory tests to be carried out during the conservation works. Dilapidation surveys are instrumental in the practice of heritage building conservation with regards to the following aspects:

i. Understanding the state of the building defects.
ii. Determining the causes of the building defects.
iii. Identifying appropriate methods and techniques of building conservation.
iv. Assisting quantity surveyors and other conservation -related professionals in making estimates for building repair and maintenance costs.
v. Providing additional building information in the tender document.
vi. Providing reference materials to clients, consultants, and building contractors.
vii. Providing a vital resource for conducting the HABS procedures during the conservation works.

iii) Stage 3: Preparation of Tender Document

The final dilapidation survey report is forwarded to the respective project steering committee for their purview. The consultant quantity surveyor would then check the report to review the building diagnoses, propose appropriate methods and techniques of conservation, make cost estimations, evaluate total project costs, and prepare the BQ for the tender document. The BQ shall include all the critical requirements of building conservation works including recording the physical condition of the building before, during, and after conservation through the HABS process, as well as conducting scientific studies and laboratory tests as explained in Stage 4. During the preparation of the tender document, it is advisable that the quantity surveyor works closely with the consultant architect and building conservator to determine the proper methods and techniques to be applied during the conservation works, and to ascertain the possible cost estimates. Poor understanding and appreciation of the nature of conservation works entail significant cost ramifications in the conservation project, which may affect work progress in the long run.

iv) Stage 4: Conservation Works

Heritage building conservation requires in-depth knowledge in building preservation and maintenance; hence the building contractor appointed for such works should be well trained and experienced in the conservation field. A building conservator is often engaged to monitor the works of the building contractor on a regular basis and to offer technical advice on undertaking conservation works. Conducting weekly technical meetings and monthly site meetings during the project's duration is vital to keep track of the progress of the work, and to resolve any technical issues on-site. Close monitoring and effective networking among the building contractor, building conservator, and consultants during the course of the project can ensure a successful completion of the conservation project. Good practice in heritage building conservation also involves conducting relevant scientific studies and laboratory tests to gauge the nature and extent of building defects and their probable causes. Based on the building defect diagnoses discussed in the dilapidation report in Stage 2, it is recommended that the building contractor conduct several scientific studies and laboratory tests during the construction stage. Table 1 shows some common scientific studies and laboratory tests that are often required during heritage

building conservation.

Table 1: Common scientific studies and laboratory tests required in heritage building conservation in Malaysia

Scientific Studies	Laboratory Tests
- Archaeology - Lime plaster - Microbiology - Paint colour scheme - Relative humidity & local temperature - Roof tiles - Tessellated floor tiles	- Brick compressive strength - Component elements of building materials (XRF) - Level of salt content - Petrography - Infrared thermography - Ground penetrating radar - Schmidt hammer rebound - Timber verification

Heritage building conservation involves a systematic method of recording and documentation based on HABS, a practice introduced by the (then) Department of Museums and Antiquities, Malaysia. HABS, which involves three main stages, is carried out throughout the project to record and document the detailed conditions of the building before, during, and after conservation works. The three stages of HABS are discussed as follows:

i. **Stage I of HABS:** requires the condition of the entire building to be recorded before any conservation work begins. All external and internal wall surfaces are fixed with yellow strings to form grids of 1 m². Each grid is carefully labeled and photographed for digital recording and documentation for future reference and the final report. Standard information is recorded for each grid including type of building defect, proposed conservation technique, grid location, and scaled photograph.

ii. **Stage II of HABS:** involves the documentation of the building condition during the ongoing conservation works. This stage requires inputs from various professionals including a building conservator, structural engineer, quantity surveyor, archaeologist, microbiologist, chemist, and geologist. The building contractor is required to produce detailed work method statements (Tatacara Kerja) for all major conservation works undertaken, as well as to prepare reports for all scientific studies and laboratory tests carried out during the project. The documentation required include analyses of building materials; reports on the results of scientific studies and laboratory tests; and the application of appropriate conservation methods and techniques as recommended by relevant consultants and professionals.

iii. **Stage III of HABS:** involves documentation of the building condition after all conservation works are completed. The building contractor is required to produce a final documentation to be submitted to the consultants and the client including the three volumes of HABS: Stage I, II, and III.

Apart from fulfilling the HABS requirements, the building contractor should observe the following standards of ethics throughout the duration of the project:

i. Continuous inspection of building problems or defects in the building.
ii. Establish systematic pictorial and video documentation for future reference.
iii. Minimise disturbance to existing building structures and fabric.
iv. Secure building stability throughout the conservation project.
v. Ensure public safety in the vicinity especially in living cultural properties.
vi. Provide sufficient security to safeguard the building and its properties.

A work method statement is required from the building contractor before each work is commenced on-site. A work method statement is step-by-step detailed set of procedures for conservation works assigned, which is presented to project consultants for comments and approval. A technical report is also prepared by the building contractor to document all scientific analyses and laboratory tests conducted throughout the duration of the project. In addition to the HABS documentation, work method statement and technical report, the building contractor also produces a final project report detailing all the conservation works conducted. This final report is presented in A3-size format, complete with all information related to the building conservation project including pictorial documentation before, during, and after conservation; methods and techniques applied; results of the scientific studies and laboratory tests conducted; as well as building plans, elevations, and sections. The building contractor is also required to record the conservation works with both digital photography and videography. Upon completion of the conservation project, the building contractor shall submit all reports, photographs, and video documentation to the client as well as to related government agencies for future reference, maintenance, and archival purposes.

v) Stage 5: Heritage Management

Heritage building management is all about managing the distinctive architectural and cultural properties in an effective manner at all times before, during, and after conservation works. A cyclical maintenance programme is often undertaken to ensure that heritage buildings are kept structurally sound, habitable, and aesthetically pleasing over the years. Heritage buildings should be managed accordingly to enhance both resource conservation and visitor support services, including user satisfaction and the quality of the visitor experience. For instance, visits to Fort Cornwallis and the Jamek Mosque in George Town, and Kuala Lumpur Heritage Trails, respectively, are very popular among local and international tourists. The unique features of these heritage buildings inspire a sense of pride and dignity among the local community, and the emotions and sentiments resonate well with the visitors.

In 2013, the United Nations Educational, Scientific and Cultural Organisation underlined the need for a holistic framework to protect and manage property

and heritage sites especially at World Heritage Sites to ensure that the Outstanding Universal Values of heritage properties, including those within core and buffer zones, can be enhanced over time. This situation calls for the preparation of a Conservation Management Plan (CMP), a legally binding document which deals with the management of heritage property. Thus, the CMP is prepared with the aim of protecting the significant values of gazetted heritage buildings and sites and encouraging their preservation and conservation. In this regard, heritage organisations and consultants are encouraged to employ the CMP as a tool for effective heritage management.

Since the inscription of Melaka and George Town as UNESCO World Heritage Sites in 2008, conservation stakeholders in Malaysia have been made aware of the requirements of the CMP. In Malaysia, the CMP is an important legal document pertaining to the control, appraisal, and maintenance of heritage sites as listed or gazetted under Malaysian laws, namely the National Heritage Act 2005 (Act 645), State of Penang Heritage Enactment 2011 (Enactment 14) and Sarawak Heritage Ordinance 2019 (Chapter 77). Specifically, under section 46 of the National Heritage Act 2005 (Act 645), the CMP is clarified as follows:

(1) The Commissioner shall, in consultation with the Council, prepare a conservation management plan for the purposes of:
   (a) promoting the conservation, preservation, rehabilitation, restoration or reconstruction of a heritage site,
   (b) ensuring the proper management of a heritage site including the use and development of all buildings and lands in the heritage site and the preservation of the environment including measures for the improvement of the physical living environment, communications, socio-economic well-being, the management of traffic and the promotion of economic growth; and
   (c) promoting schemes for the education of, or for practical and financial assistance to, owners and occupiers, and for community involvement in decision making.

(2) The Commissioner shall from time to time submit such conservation management plan to the State Authority or the relevant local planning authority, as the case may be, and advise and co-ordinate with the State Authority or the local planning authority for the implementation of the conservation management plan and its guidelines.

(3) The Commissioner shall from time to time revise any conservation management plan.

The CMP is instrumental in protecting the significance of heritage sites as it allows minimal interventions in the building structure and fabric, and due respect for building authenticity and integrity. The CMP also serves as a vital guidance for future care and use of heritage sites, especially in the review of planning permissions for any proposed development of heritage property within the core, buffer, and peripheral zones. Such provisions could safeguard heritage sites against intense development pressure and urban encroachment.

Since many stakeholders are involved in building conservation, a working network is an appropriate platform to bring together all these actors to resolve contemporary conservation issues. Conservation stakeholders include the Department of National Heritage, Department of Public Works, local authorities, tourism professionals, NGOs, and the local community. Public awareness campaigns, webinars, skills workshops, and seminars are important avenues to help educate the local community on heritage building appreciation and protection. It also equips them with the knowledge and skills to participate effectively in cultural heritage development. Good practice of heritage building management satisfies not only the clients' needs, but also influences the local community's perspectives and values on heritage buildings as sustainable cultural properties to be upheld for posterity.

Challenges Faced by Building Conservators

Building conservators play a major role in the practice of heritage building conservation in Malaysia alongside other professionals and experts such as architects, structural engineers, quantity surveyors, and mechanical and electrical engineers. A building conservator must acquire sufficient knowledge and expertise not only in the technical aspects of built environment per se, but specifically in heritage building conservation. Having adequate knowledge in various aspects of tangible cultural heritage is an added advantage for building conservators. This is because the building conservator can relate particular aspects of historical background, building function, and existing building materials to the processes of maintenance, repair, and restoration of heritage buildings. Today, there are 44 registered building conservators in Malaysia appointed by the Commissioner of Heritage under the Department of National Heritage Malaysia. These registered building conservators act as the 'eyes and ears' of the Department of National Heritage in aspects related to the conservation of cultural heritage as listed under Act 645. They are given specific roles and responsibilities in monitoring and giving advice on heritage building conservation projects, and in ensuring the rules and regulations as outlined by the Department of National Heritage are followed accordingly by all stakeholders in the projects. The major challenges faced by building conservators in carrying out heritage building conservation projects in Malaysia are discussed as follows:

i) Conduct Research on Historical Background

Before a heritage building is set for conservation, preliminary investigations should first be conducted. This task provides essential information on the building and its vicinity, such as site analysis, construction year, historical background, architectural style, building status (national, state, district or village), building ownership, and prior maintenance works undertaken. At times, a building conservator is sought to conduct the investigations. Oftentimes, heritage buildings are severely lacking in key documentation, written documents, or drawing plans. Thus, a building conservator-cum-resourceful researcher would seek other possible alternatives to obtain building information including conducting oral interviews with

relevant parties, and re-measuring the buildings for floor plan and elevation drawings.

ii) Diagnose Building Defects and their Causes

Some of the most common building defects affecting heritage buildings in Malaysia are termite attack, harmful or organic growth, crumbling or broken plaster, erosion of mortar joints, poor rainwater goods, rising and falling damp, and salt contamination. An effective building conservator is perceptive and capable of diagnosing such building defects comprehensively. Any building defect diagnosed must be analysed carefully to determine its causes and possible remedial treatments. Sometimes, building defects may be caused by peculiar human factors such as incorporating inappropriate or incompatible building materials in the existing building structure and fabric; heavy traffic vibrations, lack of building maintenance; or poor application of building conservation methods and techniques. A good building conservator can detect all the building defects and their possible causes at a site in order to finalise the scope of work required.

iii) Prepare Work Method Statements

A work method statement, prepared by the building conservator, is an important technical document required by the building contractor before any work is carried out on-site. A work method statement describes the step-by-step procedure for any conservation work assigned. It is presented to project consultants for comments and final approval. A building conservator is expected to understand not only the building defects and their probable causes but also to propose the proper treatments to be implemented on-site as well as the estimated costs for the proposed treatments. Related technical drawings and building sketches may be necessary to support the proposed treatments.

iv) Document the Process of Conservation Works

Building conservation involves three important processes: before, during, and after construction. Each process needs careful documentation. The building conservator should prepare the relevant documentation for each process in a proper format including a work description, drawings, photographs, and a video presentation. This task is considered the most challenging since the building conservator needs to closely monitor all changes affecting the building structure, elements, materials, and conditions. Upon completion of the conservation work, a final report should be prepared by the building conservator for future reference and archival purposes.

v) Analyse the Results of Scientific Studies and Laboratory Tests

The building conservator is required to conduct specific scientific studies and laboratory tests during conservation works. Conducting scientific studies and laboratory tests is an essential aspect of building conservation since it provides vital information in identifying building defects and problems as highlighted in the dilapidation survey. Results from the scientific studies and laboratory tests, presented in technical reports and information sheets, serve as key inputs in project decision-making, particularly in selecting building materials, identifying appropriate methods and techniques of repair, and in structural modifications. The building conservator must possess sufficient knowledge and experience to be able to analyse and interpret the results of both scientific studies and laboratory tests accurately.

vi) Outsource Local Experts and Available Building Materials

Some elements of heritage buildings are adorned with intricate architectural features including timber carvings, bamboo weavings, stained glass, floor and wall patterns, and plastered renderings. Such architectural features were designed by specialist and skilled local experts, and craftsmen such as carpenters, timber carvers, glass makers, plasterers, and artisans. Some of these craftsmen are no longer available locally, partly due to age and health factors or low demand for their skills. A building conservator must therefore outsource and engage experts and craftsmen from other localities. This task entails considerable cost, time, and effort. Moreover, some old building materials are no longer available on the market. Hence, a building conservator should seek out the closest possible building materials as a replacement.

vii) Determine Proven Methods and Techniques of Conservation

In building conservation projects, it is vital that replaced building materials and repair methods are matched as closely as possible to the existing materials and methods of construction. This is essential to preserve the authenticity of the building façade, appearance, and historic integrity, as well as to ensure that the materials used are long lasting. The introduction of new methods or techniques of building repair should be carried out with much caution. Such methods and techniques can only be carried out when they are proven effective over time and that no similar traditional alternatives are available or identified. The extent of damage caused to the building appearance, historic integrity, and fabric should be considered carefully and rationally when adopting new methods and techniques. The building conservator should advise the building contractor and the clients in determining appropriate methods and techniques of conservation to be employed. Technological advancements in the field of heritage building conservation necessitate the building conservator to be well versed and well equipped to handle related equipment and requirements.

Concluding Remarks

Heritage building conservation in Malaysia has gained considerable heights and momentum over the last few years. The establishment of the Department of National Heritage in 2006 and the introduction of the National Heritage Act 2005 (Act 645) have made a significant mark towards advocating the practice of heritage building conservation in the country. Heritage building conservation is increasingly perceived as an important practice to safeguard and retain the authenticity of Malaysia's historical and architectural assets. Those involved in heritage building conservation projects in Malaysia should make a conscious attempt to abide by the principles, procedures, standards, guidelines, and regulations set by the local authorities and government

agencies including the Department of National Heritage, Department of Public Works, and the Department of Fire and Rescue. Amidst a growing appreciation of heritage building conservation in Malaysia and elsewhere, the building conservator alongside other building professionals has a major role to play in building conservation practices. He or she is required to have in-depth knowledge and expertise in building pathology, building defect diagnoses, and treatment of building defects. He or she is also expected to conduct common scientific studies and laboratory tests to better understand building problems and to advise on remedial procedures. Thus, the building conservator should enhance his or her role and position in ensuring the authenticity and originality of heritage buildings, especially in Malaysia.

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A traditional Malay house in Kampung Lonek, Batu Kikir, Negeri Sembilan

A row of shophouses in George Town, Penang

British colonial building in Kuala Lumpur (Selangor Club Building)

An example of an adaptive re-use building (from high court to art gallery) that maintains its original form and character (Kedah State Art Gallery, Alor Setar, Kedah)

Heritage building conservation relates to the process of maintenance, repair, and restoration of a heritage building to prolong the building's lifecycle and function (National Mosque, Kuala Lumpur).

Heritage buildings which have been restored and converted into new uses such as a shop, museum, gallery, café, or restaurant can promote tourism and boost local income generation (Kuala Lumpur City Gallery).

Dataran Merdeka or Independence Square in Kuala Lumpur is surrounded by heritage buildings and monuments including Sultan Abdul Samad Building (foreground), flag post (left), St. Mary's Cathedral (right) and Selangor Club building (top). Photo courtesy of Ar. Junn Ng Hooi.

Heritage building conservation requires in-depth knowledge in building preservation and maintenance; hence the building contractor appointed for such works should be well trained and experienced in the conservation field (Fort Emma, Kanowit, Sarawak).

A Historical, Architectural and Building Survey (HABS), which involves three main stages, is carried out throughout the project to record and document the conditions of the building before, during, and after conservation works (The mural of Dewan Bahasa dan Pustaka Building, Kuala Lumpur).

In carrying out a heritage building conservation project, the building conservator often faces challenges in outsourcing local experts, and in the availability of similar building materials for replacement (City Hall Building, George Town, Penang).

Diagnosing building defects and their causes in a heritage building poses a great challenge to the building conservator (Old Market, Taiping, Perak).

During the dilapidation survey, the building conservator advises the consultants and client in determining appropriate methods and techniques of conservation to be employed on-site (Rumah Sri Aman, Sri Aman, Sarawak).

During heritage building conservation, the building conservator needs to monitor closely all changes affecting the building structure, elements, materials, and conditions (Istana Kenangan, Kuala Kangsar, Perak). Photo courtesy of Dr. Mohd Jaki Mamat.

Mongolia

Tsantyn Denj Memorial Complex

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Between the end of June and the beginning of July, 2020, an expedition of the Institute of Archaeology, Mongolian Academy of Sciences, documented and rescued several immovable ancient cultural heritages which had been located along the main road construction area between the centers of Ugiinuur and Battsengel *soums* in Arkhangai *aimag* (Enkhtur et al. 2020). Within the scope of this rescue archaeological project, which was led by Dr. A. Enkhtur, an Ancient Turkic memorial complex was excavated. Here, the preliminary results of the excavation that was carried out only at this memorial complex are presented.

The Tsantyn Denj memorial complex is located about 20 m to the north of the main road, in Ugiinuur *soum,* Arkhangai (Fig. 1 and 2). To the northeast of the memorial complex, behind a hill, there are ruins of a Xiongnu period walled settlement called Talyn Gurvan Kherem ('Three Walls of the Steppe'). There is Tsantyn Denj—a hill with an *ovoo,* a sacral mound made of stones—to the southeast of the memorial complex.

The local people call the human figure stone statue of the complex "Khöshöö Chuluu" ("Stone Statue") or "Orosyn Khöshöö" ("Statue of a Russian"). The latter one is most likely due to the characteristic depiction of the face of the stone statue, especially of its eyes and long nose, which may look Caucasoid in appearance.

It is known that this monument was built purposely along the main road, like most of the Ancient Turkic memorial complexes in Mongolia (Ser-Odjav 1970: 12). The enclosure of the complex, which consists of four stone slabs, is located at the southern half of an artificial earthen flat mound that is named by specialists as the platform (Fig. 2).

Human figure stone statue

The human figure stone statue had been placed on the inner side of the quadrangular enclosure and slanted to the southwest corner of the enclosure (Figs. 6 and 7). This statue is made of quite a large grey-blue stone and can be described as a partially depicted one. In such partially depicted statues in Mongolia and adjacent countries, the eyes and nose of human figure stone statues have often been engraved with single continuous strokes, but there are no images of dress, decorations, weapons, or tools (Bayar 1997: 28).

The maximum width of the statue is 46 cm at the head and 58 cm at the chest. The length of the statue from the top of the head to the ground surface was 171 cm before the excavation. The perpendicular height from the head of the statue to the ground was 124 cm. The thickness of the statue is 28 cm.

The state of preservation is not so poor. After the excavation inside the enclosure, it became clear that the total length of the statue was 254 cm and the width of the bottom side was 55 cm (Fig. 5). When the inner side of the enclosure was reburied, the stone statue was erected in its original position. It can be said that this prevented the enclosure from being pressed and damaged by the heavy stone statue.

Enclosure

The outer surfaces of the slabs of the enclosure are decorated with engraved rhombic patterns. The color of the slabs is blue-grey, like the human figure stone statue. The inner surfaces of the slabs are rough. In contrast, the outer surfaces of the slabs may have been intentionally smoothed and polished. The state of preservation of the slabs is relatively good. There is a small fragment of a slab outside the southwest corner of the enclosure (Figs: 5-7).

Sizes of the slabs:

	Eastern	Southern	Western	Northern
Length (cm)	118	123	113	121
Thickness (cm)	18	10	11	12
Height above the ground surface (cm)	27	26	34	21

The edges of the northern and eastern slabs meet. If the outsides of the slabs were excavated and dirt and stones removed, there would be a risk of the slabs falling. Therefore, only the outside part of the northern slab was excavated. It gave us the opportunity to document the entire northern slab. Because the stone statue leaned on the southern and western slabs, any attempt to remove dirt and stones from their exterior would be extremely risky.

Excavations inside and outside the enclosure revealed that the slabs were much higher than we expected. When the soil outside the northern slab was completely removed and the bottom of the slab was exposed, its height was 105 cm. It means that this is twice as high as we presumed before the excavation. Moreover, through the excavation on the inner side of the enclosure, the bottom of the southern slab was also revealed. Its height was 98 cm. Thus, the difference in height between the northern and southern slabs is 7 cm and the height of the eastern and southern slabs should not differ much from these two. Accordingly, it can be concluded that the

approximate height of the enclosure is 100 cm.

During the excavation, many stones were found inside and outside the enclosure, which had been used to strengthen the bottom of the slabs. The longest of these stones is 41×21×4 cm, and the thickest one is 28×13×12.5 cm. No artifacts were found during the excavations, but animal bones such as a small cattle leg bone and a horse tooth were found on the eastern side of the enclosure, 56 cm below the ground surface. A cattle astragalus was also revealed from this side.

Excavation trenches

According to the excavation plan, we followed the tactic of digging the enclosure last, by approaching it from a distance without disturbing the level gravel mound, i.e. the platform. A 1 m wide trench was dug in each cardinal direction, and all of these four trenches joined at the enclosure. The trench excavations began from a considerable distance from the center where the enclosure is located and it gradually rose along the slope.

During the excavation in the direction of the enclosure, the edges of all four sides of the platform were uncovered in those trenches. Consequently, the excavation continued without disturbing the surface of the platform as we had planned before. Another reason for planning such long trenches was aerial photography. In the photographs taken with the drone, some signs of possible traces of a canal and a ditch were seen around the platform (Fig. 2). However, excavations did not reveal any evidence that there is a canal and ditch at the site.

The features of the site that were only visible to the naked eye were recorded in the drawing of the plan before excavation. It should be noted that this is also consistent with the excavation results. It shows that in some cases, drone imagery may provide false information due to the vegetation of the area. On the other hand, the use of multiple methods and different techniques in field documentation proves that it is better not to rely on a single method or technique. The trenches on all four sides of the enclosure are marked as eastern, southern, western, and northern, depending on which side of the enclosure they were located (Fig. 3).

Eastern trench

The total length of the eastern trench is 17 m. This is the longest of all the trenches dug at the site. At Layer 2, traces of fire were found 12-13 m to the east from point 0, which was at the center of the enclosure. Traces of fire were found in five places on the floor of Layer 2, 13-14 m east of point 0. Other traces of fire were found in Layer 4, 4-5 m east of point 0. A few centimeters southeast of these traces, gray clay, which is probably the remains of a rammed earthen floor, was uncovered. Brown soil with dense gravel in this part is an intentionally constructed platform to place the enclosure on its top. As mentioned above, the hard, thin gray clay on such brown earth with dense gravel could have been a deliberately paved clay floor over the platform. This was confirmed by the excavations in the western trench (Fig. 3).

The stone statue at the center of the enclosure was initially thought to have been on the eastern side of the enclosure, so excavations in the eastern trench sought to find traces of a man-made hole for erecting the statue. However, the excavations in the eastern trench did not reveal any traces of such a hole (Figs. 4 and 5).

Southern trench

The total length of this trench is 9 m. Neither hard gray clay on the floor nor traces of fire were found. However, like the other trenches, stones used to strengthen the outside bottom of the slab, and brown soil with gravel, i.e., a part of the platform, were also found in this trench (Figs. 3 and 4).

Western trench

The total length of this trench is 9 m (Figs. 3 and 4). Excavations in the western trench revealed a layer of brown earth with gravel, stones on the outside bottom of the slab, hard grey clay on the platform floor, and traces of fire. The hard gray clay was found in three places on the floor of Layer 3, 5-6 m to the east of point 0. These small parts of the floor are very hard and may have been preserved for this reason. The traces of fire were revealed at Layer 4, 4-5 m to the west of point 0, and in two places at the same level, 1-2 m to the west of point 0.

Northern trench

The total length of the trench is 13 m. Gravelly brown soil from the platform and stones from the slab bottom were found from this trench (Figs. 3 and 4).

Conclusion

The excavations at the Tsantyn Denj complex provided us with some data to determine the structure of this complex and the condition of the soil layer of the site. The human figure stone statue and enclosure, which represent the main features of the complex, were documented during this field research. The excavation made clear that first, a multi-layered platform was built specially by earth-ramming. After that, the enclosure was placed nearly at the center of the platform. However, there were no signs of a ditch and canal outside the platform.

It is clear that when the four slabs of the enclosure were erected, the inner and outer bottoms of the slabs were strengthened with stones. An important result of the excavation was the discovery that the platform was not only covered with gravel but also that the gravel floor was paved with hard gray clay.

Moreover, early traces of fire and burnt animal bones were revealed on the eastern and western sides of the enclosure. Unburnt animal bones were also found around the enclosure. These can be considered as traces of sacrifice. The human figure stone statue might have originally been inside the enclosure, as excavation in the eastern trench did not reveal any traces of a man-made hole for erecting the stone statue. In addition, the stone statue was so large that it must have been difficult to move, especially out of the enclosure.

The monument can be classified as an Ancient Turkic aristocratic memorial complex due to the erection of a human figure stone statue and quadrangular enclosure on the earthen platform. In terms of chronology, it is dated to the late 7th and early 8th centuries, to the Second Turkic Khaganate period.

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Fig. 1: Tsantyn Denj memorial complex, before the excavation, from the east

Fig. 2: Tsantyn Denj memorial complex, before the excavation

Fig. 3: Tsantyn Denj memorial complex, during the excavation

Fig. 4: The memorial complex, after the excavation

Fig. 5: Excavation of the enclosure

Fig. 6: Enclosure and human figure stone statue, from the east

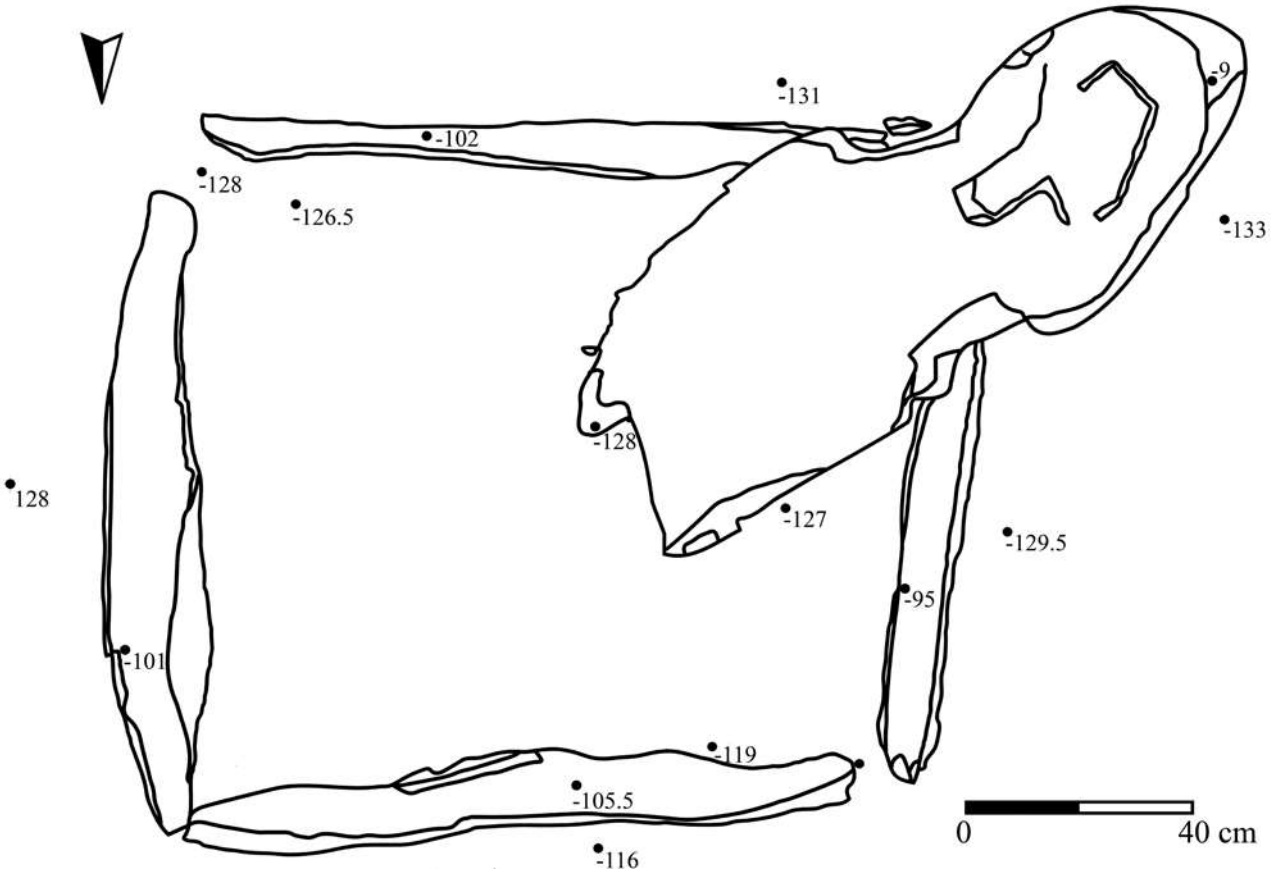

Fig. 7: Plan of the enclosure and stone statue

Sri Lanka

Restoration of Mirisaweti Stupa

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Department of Archaeology

Introduction

Sri Lanka has a recorded history of more than 2500 years. Our cultural heritage grew and developed with the introduction of Buddhism in the 3rd century BC.

Sri Lanka is endowed with gigantic monastic complexes, administrative capitals created as a result of the arrival of Buddhism to the country. These consist of architecture, sculptures, and paintings. The most striking feature of these heritage items is their continued usage since their creation, starting from the 3rd century BC to the present. At present, there are six World Heritage Sites in the country.

This stupa (stupas are hemispherical brick edifices for enshrinement of the corporal relics of the Buddha or of saints and sometimes to mark sacred spots), is situated in the ancient city of Anuradhapura alongside the old Puttalam – Anuradhapura Road. The GPS coordinates are 8° 20' 39.3" N, 80° 23' 20.67" E. After restoration of the ancient stupa, a large number of devotees and visitors arrived daily, not only to visit the stupa premises, but also the entire monastic complex, which includes image houses, chapter houses, bodhigara, preaching halls and refectories, etc.

As the Salapathamaluwa (stone terrace around the stupa) has been restored, devotees can use it for their ceremonial functions. Later-built image houses and flower altars were restored to match their ancient values. Pilgrim and visitor facilities were upgraded, including the addition of parking and other subsidiary facilities. A new residential building for monks was built opposite the main road, although this does not affect the architectural views of the ancient stupa.

History

Mirisaweti Stupa was the first colossal stupa built by King Dutugemunu in the 2nd century BC. Chronicles stated that "Seven days after the royalty, the great king Dutugemunu, had gone to the bath, while his sceptre, which had a sacred relic of Buddha inside, and other belongings had been placed in an intermediate location. When he returned to the palace, it is said that the sceptre could not be moved. The stupa was built in the place where the sceptre stood, with the stupa covering the holy sceptre. It is also known that this dagaba was called 'Mirisavatiya' as a punishment for himself because the king forgot to offer a food made out of chili (miris) to the Buddhist priests before he consumed it."

This stupa was enlarged by King Gajabahu in the 2nd century AD. The final phase of the enlargement took place during the 12th century AD by the King Parakramabahu I. A stone slab found in a recent excavation done in the terrace of the stupa, depicts a sketch of the stupa including three basal rings, dome, square chamber and spire. According to the letters appearing on the stone slab, it is revealed that this inscription dates back to the 8th to 10th centuries, so there was remarkable restoration done in this period.

Recent Restoration

In 1888, a prince from Thailand donated a sum of money for the restoration of this stupa and then the colonial government took over the restoration work with the help of the provincial engineer. While the work could not be completed at this time, an architect named Ditel from the Royal Asiatic Society in Great Britain was assigned to prepare a proper restoration plan in 1900. He indicated the importance and spiritual value of restoration of this kind of stupa. The then King of Thailand, Rama V, agreed to complete the restoration, but this was not fulfilled.

Yet another restoration effort that was made by a restoration society in 1979 was not successful either. Unfortunately, during the later restoration, the partially completed stupa collapsed only several hours before the enshrinement of relics in June 1987. Although ten vertical cracks had earlier appeared on the restored dome, actual separation and movement of large segments of the new brickwork now occurred. This destroyed one of the best Vahalkada (ayaka) structures of the Anuradhapura Era.

Amid this tragic situation, several parties, i.e., archaeologists, engineers, clergy, politicians and the general public had discussions regarding the procedure of restoration of the stupa. Therefore, the then president of Sri Lanka took over this effort in March 1991 and it was completed in June 1993.

Restoration Procedure

There was a need for collaboration between engineers and architects/archaeologists in the conservation/ restoration of ancient stupas, especially after the catastrophic failure of the partly restored Mirisawetiya Stupa on 10th June, 1987. As a result, several engineering studies were conducted to ascertain the reasons for the failure.

The restoration procedure and plans were designed and prepared by the Department of Archaeology, which is the apex institution and responsible for every archaeological activity in Sri Lanka, with the guidance of engineering experts. It was based on the historical evidence. The support of engineering experts familiar with the restoration of this kind of brick structure was used in this attempt.

According to the proposal,

Diameter of the stupa – 145 ft
Diameter with basal rings – 174 ft

Height of 3 basal rings – 12 ft
Height of the dome – 81 ft
Square chamber – 48 × 48 × 18 ft
Spire height – 67 ft
Pinnacle height – 13 ft
Total height – 192 ft

The bore hole measurements were taken as geotechnical investigations at five points; i.e., two in the terrace of the stupa, two on the basal rings and other inside the stupa. The Rotary Core Drilling Method was applied and an Acker Hillbilly-type drilling machine was used for obtaining this reading. This investigation revealed that the bedrock was a few feet below the center of the stupa and the brickwork of the basal rings was constructed on a silty sand layer of 1 to 2 meters.

It was indicated that the force on new brickwork and the foundation due to the square chamber and spire was 40,000 KN. In addition, new brickwork containing 287,000 KN force and total force transmitted to the foundation was 327,000 KN, assuming that much of the load transmitted from the square chamber and the spire would take place through the arching action of the structure. A minimum base width of 18 ft was required circumferentially to cater to this load with differential movement—elastic, thermal, and shrinkage—and this space could be easily reserved by removing loose ancient brickwork from the base.

It was decided to use standard engineering bricks of a particular strength (determined through finite element analysis of the proposed model) and a very lean sand/lime/cement mortar (instead of butter clay), used successfully by the Department of Archaeology in the past for conservation work on stupas. The engineers had specified a minimum crushing strength of 400 psi for the bricks.

In order to avoid horizontal thrust in the new brickwork for the dome, 2 RCC ring beams spaced at 5 m were introduced horizontally and this set of ring beams was repeated vertically every 2 m levels. Both the square chamber and the spire were constructed in brickwork with an RCC frame. This RCC beams placed during the brickwork commenced, while maximum compressive strength acted on the outer surface of the lower level of the dome and maximum tensile strength acted in the radial and circumference directions. This compressive strength could be carried by the bricks and the RCC framework was introduced for tensile strength.

A steel truss template had been used to obtain the curvature of the dome, which was driven on a rail track fixed at the top of the basal ring, with the top end hinged to the vertical steel rod. Three lifts carrying a load of up to 1000 kg were used for taking material up to the elevated positions. Finally, a brass pinnacle weighing 2000 kg and with a height of 13 ft was fitted on top of the spire.

Materials and Workforce

The Department of Archaeology itself undertook the responsibility to handle the restoration project while expert conservation staff, strong leadership with past experience in doing such stupa projects, were employed in that period. Not only that, the then president of Sri Lanka had keen interest in finishing this stupa, and he appointed a committee to monitor the project and to also raise the funds. This project was funded with contributions from the general public. A labor force of 100 skilled and 500 unskilled craftsman was utilized daily, including 30 conservation staff, and devotees involved in the restoration as a meritorious act.

According to the records, it was calculated that the major materials utilized and total expenditure amounted to SLR 60 million in 1993. The total brickwork was calculated at 700 m³.

i. Cement (50 kg) – 20,000 units
ii. River sand – 7,400 m³
iii. Lime – 120,000 kg
iv. Bricks – 11.5 million
v. ¾" metal – 600 m³
vi. Steel – 53 MT

Summary

i. A proposal arose from engineering experts that a RC concrete shell should cover the ancient dome to carry the load of the square chamber and spire. This was not accepted by the archaeologists and conservators since it contravened the ethics of architectural conservation.
ii. After considering the major demand, national importance, and value of this cultural property, the Department of Archaeology finally accepted the above proposal, which includes the stipulation that the stupa has to be restored as a solid brick structure including RCC framework, with the restored dome on the ancient brickwork, and introduce a new square chamber and spire.
iii. Mirisawetiya, along with other ancient stupas in Sri Lanka, had used burnt bricks as the main building material, which resulted different sizes of bricks used in different places in the same stupa. These bricks had been bound in a thin layer of clay mortar (called butter clay) which enabled the internal movement of brickwork. As in modern construction, movement joints cannot be formed in the construction of a stupa. Therefore, as a remedy, a thin layer of sand/lime/cement mortar was used as a binding.
iv. The main demand of this project was the supply of the required quality of bricks. As an engineering design, normal engineering bricks with characteristic compressive strength of 400 psi. and Type 2, grade II in the Sri Lanka Standards were used.

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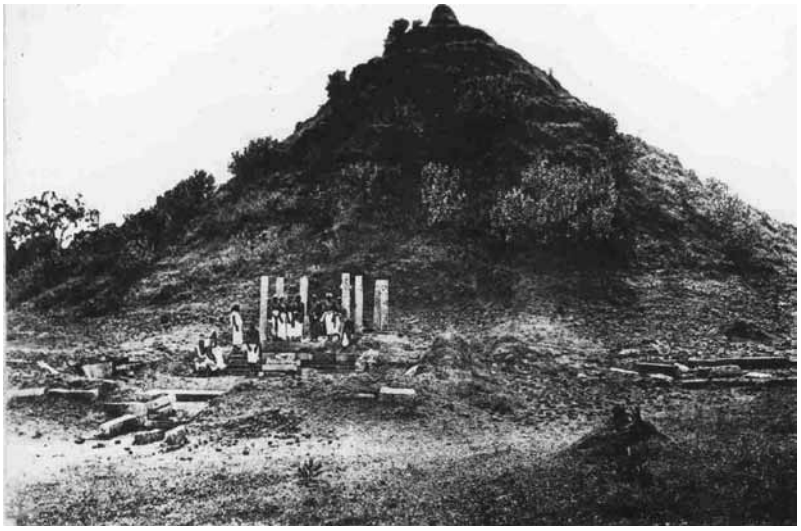
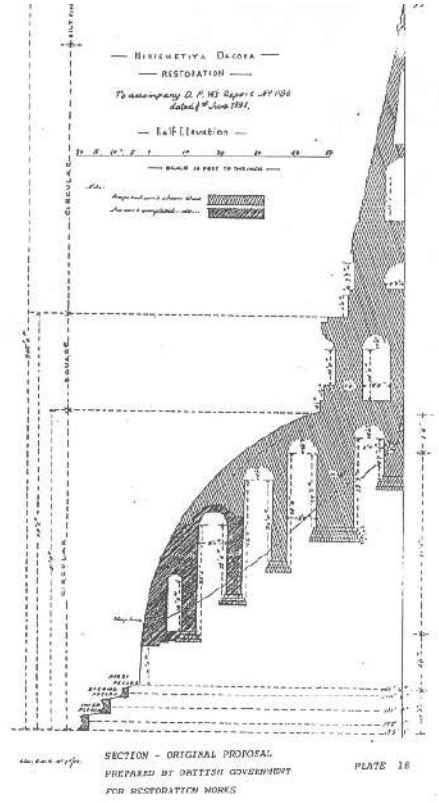
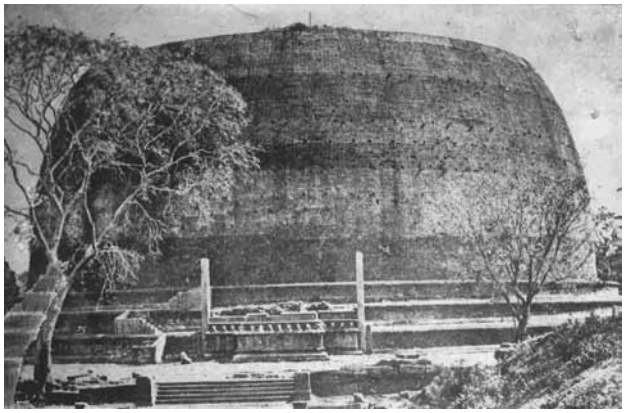


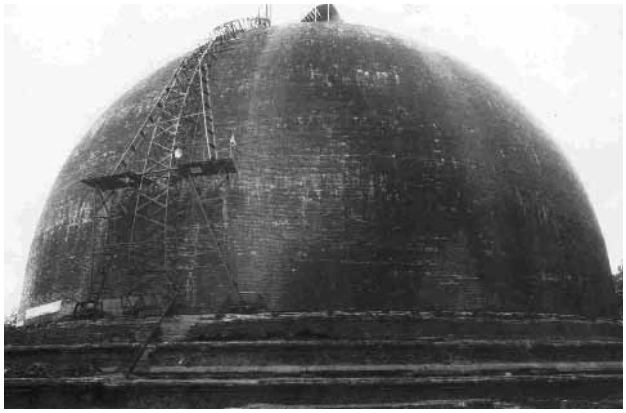
Mirisawetiya Stupa, before conservation in the colonial era



The proposed designs for reconstruction by the colonial administration

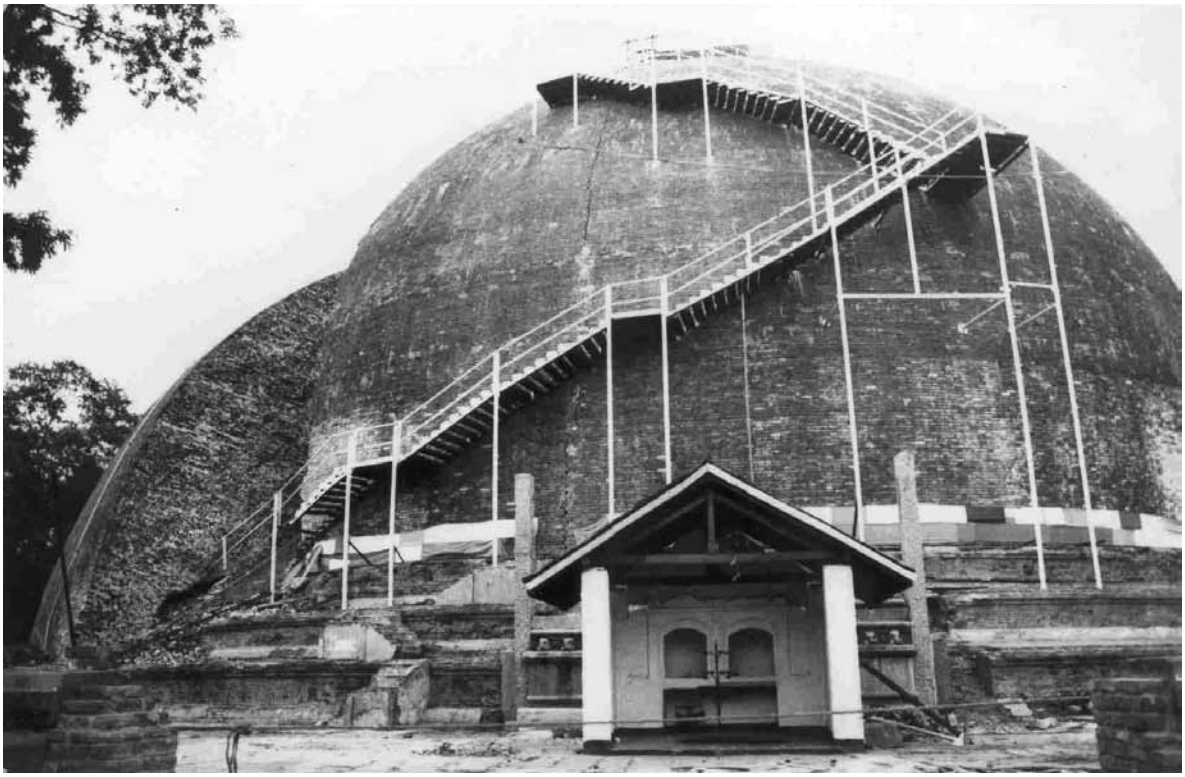


Mirisawetiya during restoration work by the British in 1906



Mirisawetiya restoration work in the 1980s

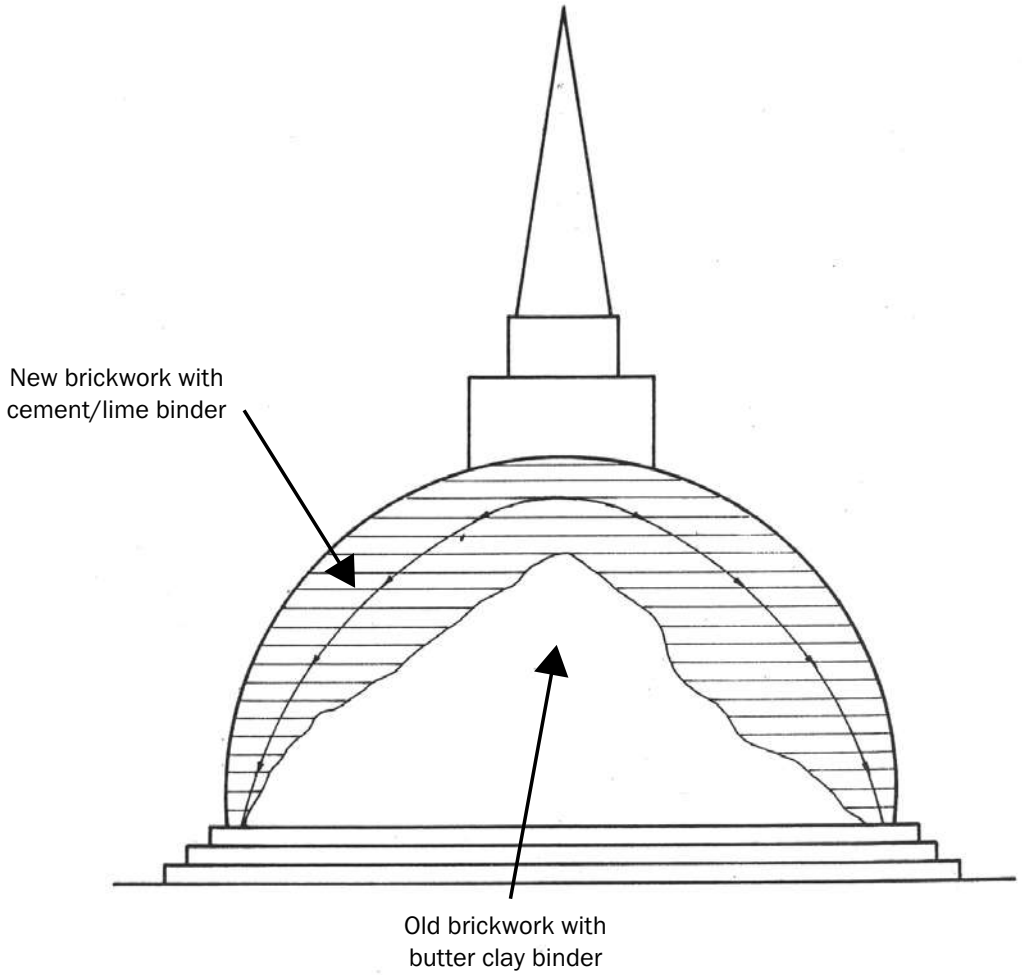
Cracks that appeared on the dome of Mirisawetiya before the failure



Failure of the restored dome of Mirisawetiya Stupa – Second attempt in the eighties

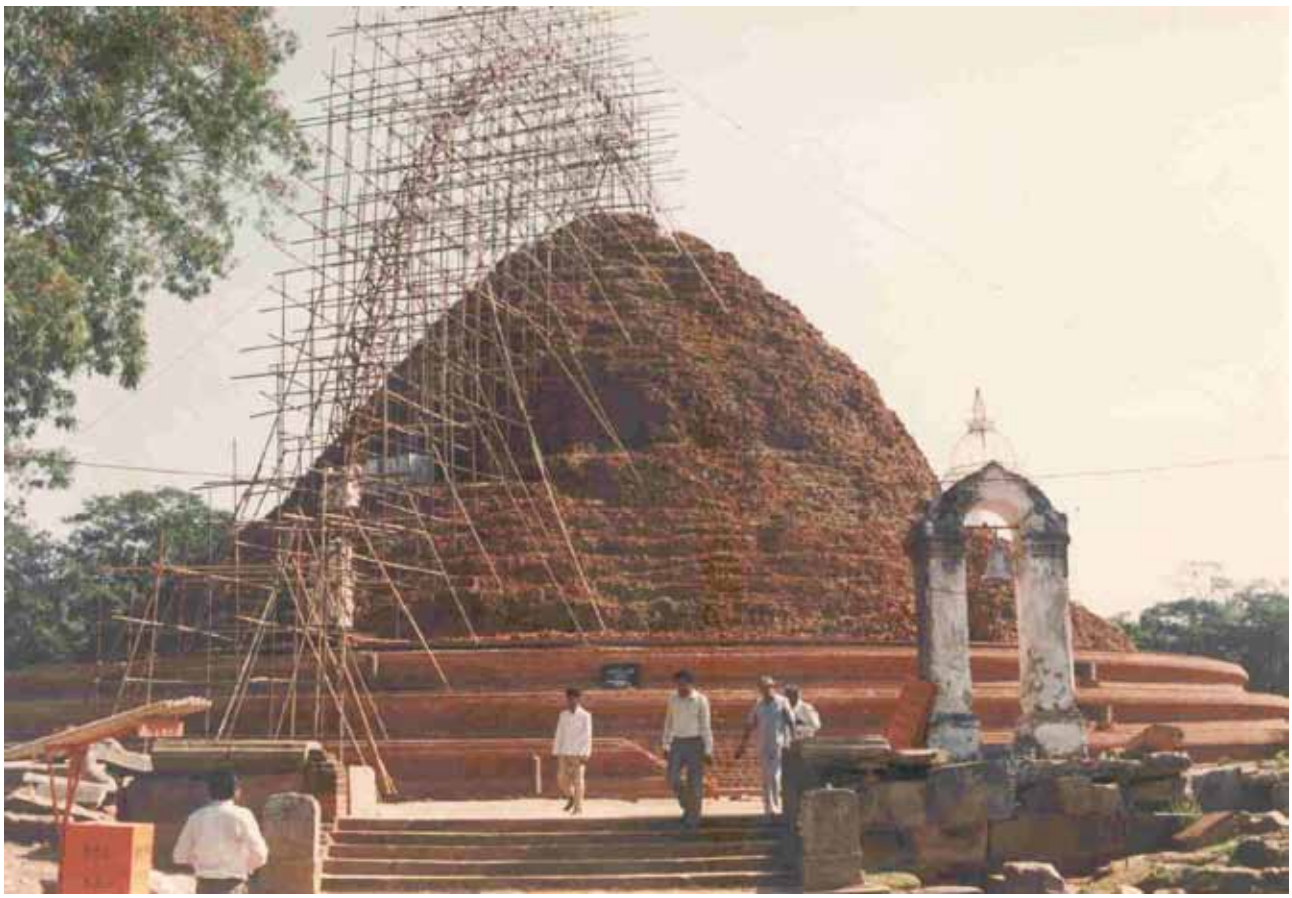
Failure of the restored dome of Mirisawetiya Stupa – Second attempt in the eighties

The damaged western Ayakaya



Proposal

All loose ancient brickwork was carefully removed.



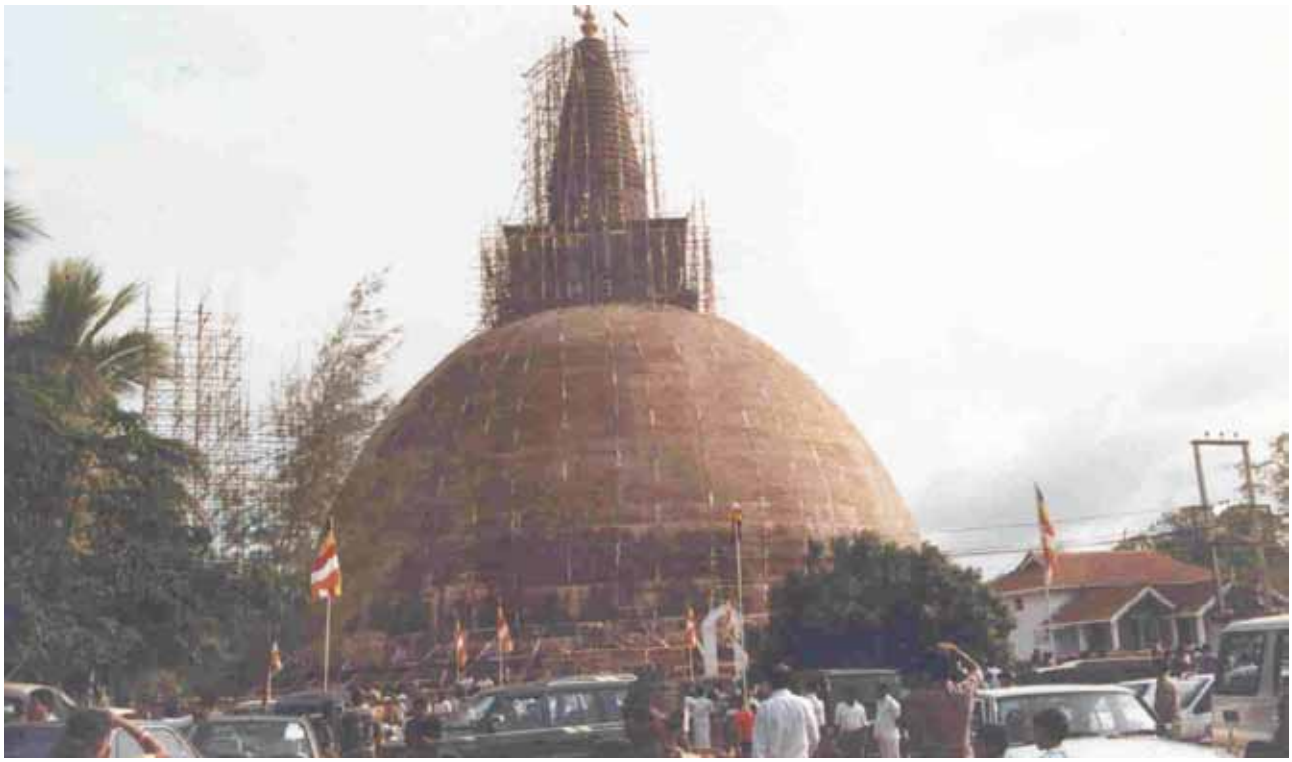
Pesawa basal rings were restored first and the revolving template for the reconstruction of the dome was installed.

Prior to the casting of reinforced concrete rings

Prior to the casting of reinforced concrete rings

Dome construction

Dome completed—hatareskotuwa partially completed



Work commenced in 1990 and was completed with the pinnacle unveiling ceremony on the Poson Full Moon Day in 1992, about a month after the death of the President, who had spearheaded this restoration work.

After the restoration of Wahalkada

The restored Mirisawetiya stupa being given new plaster

Attempted 3D Reconstruction of the Ayrtam Buddhist Stupa in Termez

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Introduction

There are about a dozen Buddhist sites in the southern part of Uzbekistan. These include the Buddhist complexes of Karatepa and Fayaztepa, the Zurmala stupa near the *shakhristan* (ancient town) in Old Termez, Ayrtam, Zartepa, Dalvarzintepa and others. The revealed Buddhist monuments belong to the Kushan period (the 1st to 3rd centuries AD) and consist of structures such as monasteries, temples, and stupas. The stupa is characterized by its volumetric-spatial composition, architectural and artistic ornaments, and philosophical interpretation. Unfortunately, most stupas have not been fully preserved to the present time due to natural disasters and other reasons. However, thanks to the study of the structures of stupas, their individual decorative parts, and the analogies of neighboring historical and cultural regions, their appearance can be restored graphically using modern technologies.

Location

Ayrtam was located 18 km east of the modern city of Termez, on the right bank of the Amu Darya River. Unfortunately, in the 1980s, construction work was carried out for a road and railway bridge across the Amu Darya (700 m), which passed through all the historical sites of the monument, and the foundation of the bridge was laid on the site of a Buddhist monastery (Fig. 1).

Historical background

The monument became known to science in 1932, when border guards discovered a magnificent sculptural blog depicting three musicians under water (*Masson*, 1933). A year later, the remains of the Buddhist stupa were investigated by the Termez archaeological expedition led by academician M.E. Masson, but no archaeological excavations were carried out on the stupa at that time. After some time, archaeological excavations at the monument continued (*Vyazmitina*, 1945).

In 1964-1967, the monument was investigated by the Uzbekistan Art Expedition (abbr. in Russian: "UzIskE") headed by G.A. Pugachenkova. Then it turned out that the stupa was preserved on the eastern side of the *shakhristan* in the form of a remnant of a round tower. Archaeological excavations have shown that the stupa was built on a rectangular stylobate measuring 9.20×8.85 m on the sides and 0.96 m high. The structure is oriented to the cardinal points, which is typical of Buddhist stupas. The stylobate was built of rectangular raw bricks. Above the stylobate rises the cylindrical body of the stupa, 5.12-5.40 m in diameter and preserved 1.20 m high. The cylindrical body of the stupa consisted of two rows of *pakhsa* (raw adobe blocks) 0.50 m thick, and on top of these was a layer of raw bricks. Only one layer of bricks has survived from the brickwork. Apparently, the final part – a hemispherical dome – was erected on several layers of bricks (Fig. 2a). The groin blocks were laid transversely (radially), and the space formed in the middle was filled with lumpy clay. According to G.A. Pugachenkova, there was a secret place to store the "sacred box," that is, the relict. On visual inspection, no traces of plaster were preserved on the stylobate. However, judging by the large number of limestone fragments scattered over the stupa, it can be assumed that it was covered with stone slabs. On the basis of the Kanishka coin found here, the researchers determined that the stupa in Ayrtam dates back to the 2nd century AD (*Pugachenkova*, 1973).

In 1979, the construction of the bridge along the shortest crossing over the Amu Darya coincided with the study of the monument, and in a short time, archaeological excavations were carried out by the staff of the UzIskE expedition under the leadership of B.A. Turgunov. In particular, when cleaning a stupa discovered during previous excavations, it was found that inside the cylindrical body there was another smaller stupa, with a body diameter of 1.8 m and a height of 2.3 m. The small stupa was walled up in rows of *pakhsa* and raw bricks (Fig. 2b). This stupa also consisted of a platform made of mud and a cylindrical body, ending in a hemispherical dome. On the outer side of the stupa, judging by the remains of the predominantly pink paint on the surface of the cylinder, in the middle there was a belt of two rows of raw material protruding by 17 cm. It must be assumed that it had been completely colored (*Turgunov*, 1987). Due to the fact that the construction of the bridge had begun at this site in those years, as mentioned above, further research was possible only on the basis of an analysis of archival data and drawings related to the monument, and scientific literature.

Reconstruction attempt

The reconstruction of the Ayrtam stupa allows us to present its hypothetical appearance during construction, as well as to identify common similarities and distinctive features shared with other similar structures in this region. Now let's look at the sources available to create a complete hypothetical reconstruction of the stupa. There are practically no written sources about Buddhist structures of the Kushan period: they all belong to a much later period and are limited to general information. For example, the Chinese pilgrim Xuanzang (602-664, a Chinese Buddhist monk, scholar, traveler, and translator), who is mentioned in several scientific publications, notes that in Termez he saw dozens of Buddhist temples and stupas dedicated to thousands of monks (*Pugachenkova* et.al.).

The following sources represent factual materials obtained directly from the archaeological excavations of the monument, by analyzing which we have an idea of the main components of the stupa – the stylobate, the

dimensions of the cylindrical body, and building materials. In addition, for the reconstruction of the stupa, the architectural and artistic parts of it, carved from limestone, are important. For example, stone decorative elements such as corner pilasters, polished cornices, and rods. Such art elements are used to restore the appearance of the stupa (Fig. 4 a-b).

Studying and making comparisons with other monuments of the same period around Termez, as well as similar buildings in neighboring historical and cultural regions, provide a good opportunity for restoring the appearance of the stupa close to its original form. For example, stupas similar to Ayrtam can be compared with stupas found at such archaeological sites as Zurmala, Karatepa, Fayaztepa, and Zartepa. The large Zurmala stupa and the main stupa on Karatepe differ sharply in size from the Ayrtom sample (*Ulmasov*, 2018). However, there are similarities in individual architectural elements and cladding. In addition to the large stupa, several other small stupas were discovered on Karatepe. While most of their platforms are square, there are also circular platform models. In general, the study of stupas and their architectural and artistic parts, which were identified as a result of archaeological excavations at Karatepe, is of great importance in the restoration of the stupa in Ayrtam (*Pidaev & Kato*, 2007).

The stupa on Fayaztepa, which is located separately from the complex, is more suitable for the Ayrtam model, not only in its appearance, but also in terms of size. Here the entire stupa has been preserved, with the exception of the *harmika*[1] and *chattra* (honorary umbrella), which were to be installed on the top of the dome. On the Fayaztepa stupa, despite the fact that it was made of clay, the plinth of the cylindrical body and the thrust on the surface of the drum at the transition to the dome are well traced. However, the diameter of the cylindrical body of the Fayaztepa stupa is half that of the Ayrtam analogue. Also, there are no stone decorations on the Fayaztepa stupa (*Asanov*, 1976).

The Zartepa stupa, located far from Termez, is close in size and volume to the Ayrtam stupa. According to archaeologist Sh. Pidaev, who investigated the monument, the total height of the structure was 6-7 meters. On the northern side of the stupa, a shelter was found, similar to that near the Ayrtam stupa. And in this secret place were found fragments of pottery, jewelry, a piece of cotton cloth, and more than 500 copper coins of Vasudeva, one of the last rulers of the Kushan Empire. On the basis of the artifacts found here, researchers date the Zartepa stupa to the late Kushan period, that is, the 3rd to 4th centuries (Pidaev, 1986).

Buddhist stupas of the Kushan period are found not only in the south of Uzbekistan, but also in Afghanistan, Pakistan, and northern India (*Franz*, 1980). In particular, in recent years, dozens of stupas have been discovered in the city of Mes Ainak, 60 km from the Afghan capital of Kabul. Like the stupas of Termez, they also have common features, but differ significantly in structure, size, building materials, and techniques, as well as in the external design of the devices. It can be seen here that the platforms are multi-story and decorated with pilasters, arched shelves around the perimeter, and between them, Buddhist statues and paintings (*Paluch*, 2014).

Conclusion

In a word, the use of modern technology in the study and reconstruction of buildings that have not been handed to us, such as the Ayrtam stupa, has a positive effect. Most importantly, there is an opportunity to imagine how this or that structure was built and how it looked in volume and space. Considering that the monument has already disappeared from the face of the earth, the creation and installation of information boards and models of the structure, reflecting the results of archaeological research on site, will serve to increase its tourist potential.

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[1] The term harmika is used to describe a fence-like or cube-shaped structure on Buddhist stupas, which later could also take on a closed box shape. The origin of the term harmika is ultimately unclear. Most researchers bring the Sanskrit word hammiya ("house" or "pavilion") into play, because small blind windows (chandrasalas) can still be recognized on some early harmikas, which can be interpreted as being an abbreviation for 'house' (Source: https://second.wiki/wiki/harmika).

Fig. 1. Buddhist stupas in the territory of southern Uzbekistan

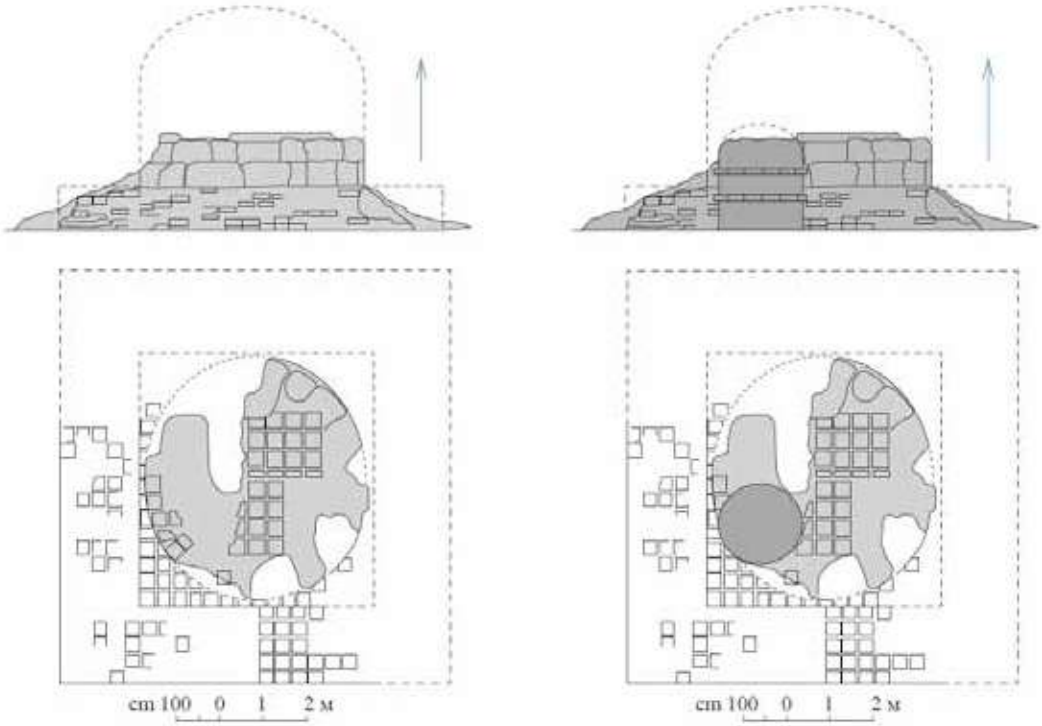

Fig. 2 a-b. Plan and section of Ayrtam Buddhist stupa:
a) According to G.A. Pugachenkova, 1967; b) According to B.A. Turgunov, 1987

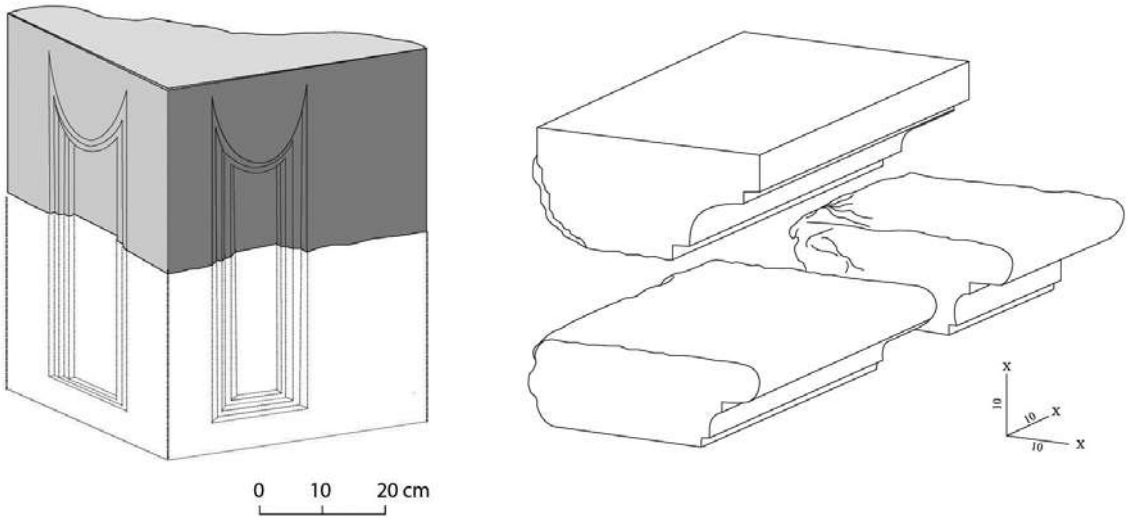

Fig. 3. Architectural and decorative elements of the Ayrtam stupa

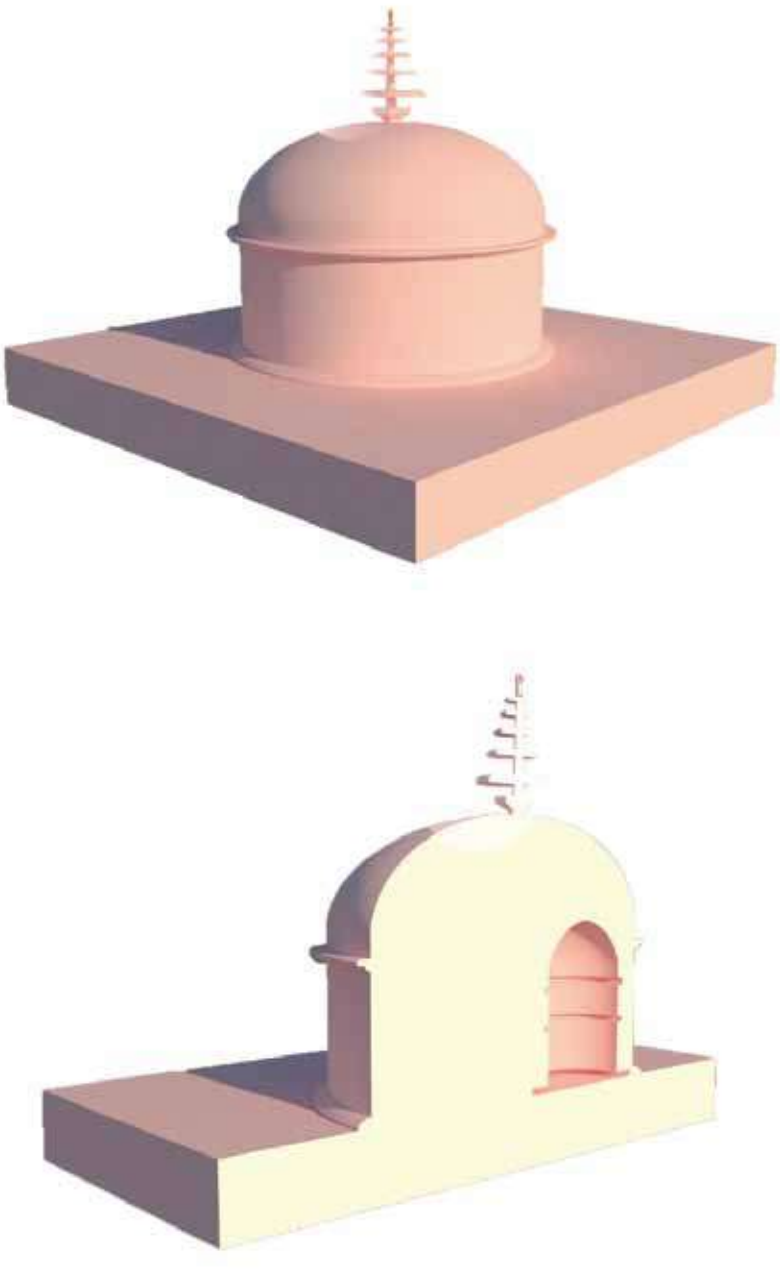

Fig. 4 a-b. Options for 3D reconstruction of the Ayrtam stupa

The Important Role of the Local Community in Restoring Hoi An Communal House

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I. Background of the relic

This relic is a complex of two main buildings: Hoi An communal house and a temple. The communal house was built by ancestors of Hoi An village's clans to worship the tutelary god and protector of this village. Based on its stone steles and other old documentation, the communal house could have been built as late as the Lê dynasty *(King Cảnh Hưng - 景興 (1740 – 1786))*, but the exact date of construction has not yet been determined. The communal house has been restored and renovated several times. The first restoration was in 1818. In 1907, due to the opening of the new Rue Hoi An Street *(today known as Le Loi Street)*, the communal house had to be relocated and renovated on its left side. Thus, the current architecture of the communal house is its architecture after being relocated in 1907, not the original one. There is no documentation to prove whether the architecture and scale of the communal house before and after relocation resembled each other or not. In 1942, the communal house was restored, and an additional vestibule was built. After this renovation, the layout and architectural scale of the communal house was completed, including the following construction items: gate and fences; front yard with two stone flagpoles and two elephant statues; vestibule, east wing, west wing, courtyard, main hall, and 2-storey altar, creating a square-shaped plan; a well, and a kitchen in the backyard. This is the one and only religious building in Hoi An, and rare in Quang Nam province which has a 2-storey altar, giving the communal house its own unique architecture. The wooden elements of the communal house are beautifully carved with many traditional decorative patterns.

The temple was located in the left corner of the front yard on high ground. It had two roofs and four altars inside. There was a screenwall in front of the temple. The construction date of the temple has not been determined. However, based on descriptions in documents and existing architecture, it is possible that the temple could have existed before the relocation of the communal house.

This relic had been affected by many impacts due to the improper use of the monument not in keeping with its inherent function. In the 1960s, because of the fierce war, many displaced people came and built temporary homes inside the relic precinct. Besides the religious function, the communal house was used as a headquarters where administrative, military, and social activities of the local government were carried out. In 1981, it was used as a kindergarten. In order to build facilities to serve the school's activities, some of the construction items were dismantled, such as the temple and flagpoles; the gate was blocked by a brick wall; a new gate and 2-storey concrete classrooms were built in the front yard; and the communal house's interior was divided into small rooms by wooden partition walls, etc. Therefore, the architectural landscape of the relic has changed greatly. The gods worshiped in the temple were brought to be worshiped together with the gods in the communal house. Many valuable decorative items have also been lost or misplaced. Religious activities which were held in the communal house were also interrupted. In 1996, the east wing, west wing, main hall, and altar were restored. In 2007, the vestibule was repaired. In 2019, the kindergarten was relocated to another site. This is a great effort by the local government to return it to its original landscape and functions. Until the time of restoration, the roof of the communal house had degraded and was leaking, and some wooden components had been damaged.

II. Preparation of restoration project

The main content of the project is identified as follows: restoration of the communal house and the gate; reconstruction of dismantled items *(the temple, flagpoles, kitchen, the patios in front of the east wing and west wing)*; renovation of the site's landscape; rearrangement of the items of worship in the communal house and the temple as before. The main purpose is to restore the traditional architectural space and religious activities of the relic in order for it to become a community meeting place according to its inherent function.

The survey and drawing of the current status of the relic started in 2014. The restoration plan for dismantled or lost items faced many difficulties. Hoi An Center for Cultural Heritage Management & Preservation has searched for sources of historical documents related to the relic. Fortunately, documents on Quang Nam province *(Hoi An town included)*, which were created by The École Française d'Extrême-Orient *(French School of the Far East)* between 1941 and 1943, recorded quite specifically details of the history, worship, religious activities, and especially the architecture of this relic. In addition, the contents of ornamental horizontal lacquered boards and parallel sentences inside the relic were also recorded *(which unfortunately are now all lost)*.

Besides this, we organized three community consultations on the history, culture and architecture of the relic, related artifacts, worship and religious activities at the relic, and some in-depth interviews. These consultations involved the displaced people who used to live temporarily inside the relic, as well as knowledgeable elderly people living in the vicinity of the relic. We have thereby obtained quite detailed and important information, especially for construction items that have been dismantled or have had major architectural changes. Combining information through documents and through community consultations provides an important background to help us obtain a fairly detailed visualization of each item of the relic. Due

to that, we can propose a restoration plan with high accuracy.

III. Restoration works

In October 2020, the handover of the site for the restoration and renovation was carried out. Firstly, the 2-storey concrete classrooms, the additional items for kindergarten teaching not related to the relic, and the extension items attached to the communal house were dismantled. Although those masonry works had no value, the dismantling was done with great care to minimize the impact on the original elements of the relic. The foundations were also dismantled little by little, especially at the locations where there are believed to be original architectural items that have been dismantled before.

1. The communal house

Degradation had occurred mainly in the roof and plastering on the walls. The yin-yang tiles were also damp, mossy and had lost their adhesive. When restoring the main items of the communal house, the authenticity of each construction detail and the building as a whole is strictly ensured, with only the parts that have been damaged or changed compared to the original elements being dismantled and replaced. Load-bearing wooden frames and old ying yang tiles which are still in good condition have been reused. Only some rotted purlins, rafters and tiles have been replaced. Dissection of degenerated and flaked walls which were no longer able to be attached to the masonry blocks, have been rendered back with traditional lime mortar. In the process, we discovered traces of arched walkways that were blocked by brick walls in the east wing and west wing. Through inspection, the structure above the walkway still retained its bearing capacity, so the blocked walls were dismantled. The vestibule's floor had been paved with granite tiles to make a classroom for children. We removed them and paved back with hand-made hexagonal terracotta bricks *(like the prototype at the relic)*. The patios in front of the east wing and west wing *(which were dismantled and renovated into working rooms for kindergarten teachers)* have been reconstructed.

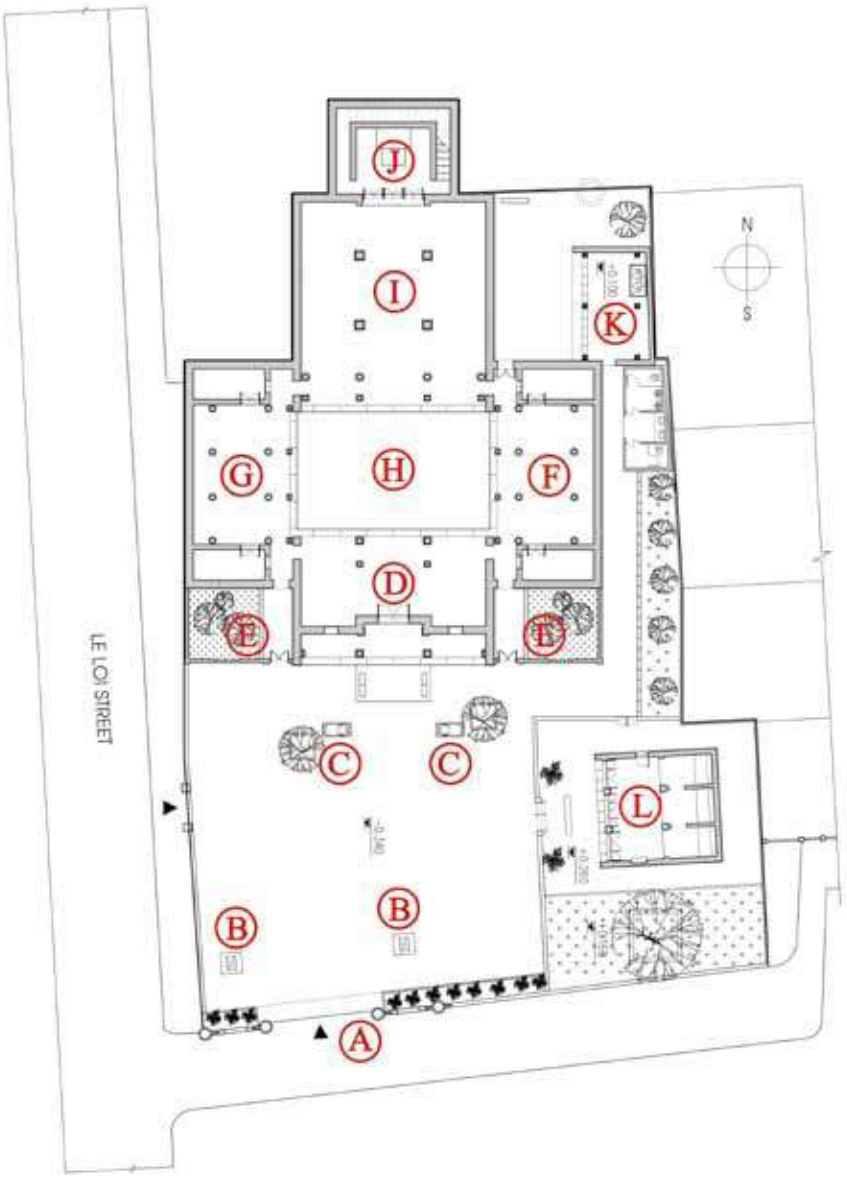
The current front yard level has been lowered about 0.3 m compared to its old level. While removing the earth, lower parts of the elephant statues which were buried in the ground and some architectural traces of the vestibule were revealed. Lowering the foundation makes the yard level lower than the existing pavement, so additional drainage has been provided.

2. Dismantled construction items *(Lost construction items)*

For this project, reconstructing the dismantled construction items to ensure the scientific accuracy is the most difficult thing. We conducted an archaeological excavation in the area that was identified as the location of the former temple. This location has been affected by the building's 2-storey classrooms, so we found only traces of part of the temple's foundation *(the back half)*. Its location and size almost completely matched the information we had gathered through community consultations, thereby showing the reliability of the information from the local community. While dismantling the roof and removing the plaster of the kindergarten's kitchen, based on some revealed architectural traces, we determined that these walls had been renovated from the communal house's kitchen walls. We also found traces and the position of the base stones where wooden pillars had been placed. The foundation of the two stone flagpoles in the front yard had left no trace. However, through community consultations, we now know the relative position, size and architectural form of these flagpoles.

Based on the results of the archaeological excavation and revealed architectural traces, combined with information from community consultations, we sketched architectural drawings of dismantled construction items. Then, we consulted with the community again before proposing the final restoration plans which include colors, decorative patterns, and worship ornaments of the temple. During the ongoing reconstruction process of these items, we also need the supervision and support people who are knowledgeable about the relic. This will enable us to make timely adjustments if any architectural details are built incorrectly compared to the original ones. It can be said that the local community plays an important role in this project.

The project is expected to be completed in December 2021. In parallel with the restoration works, Hoi An Center for Cultural Heritage Management & Preservation is proposing a plan to manage and promote the value of this relic. Because of its location in the core zone of Hoi An Ancient town, hopefully it will become an interesting place to visit and attract many tourists in the coming years.



Site master plan:
A. Main gate; B: Flag poles; C: Elephant statues; D: Vestibule; E: Patios;
F: East wing; G: West wing; H: Courtyard; I: Main hall; J: 2-storey altar;
K: Kitchen; L: Temple

Blocked main gate and 2-storey classrooms

The communal house was used as a kindergarten.

Dismantled 2-storey classrooms

Community consultation at the site

Traces of the temple's foundation

Traces of the arched walkway in the east wing

Flaked mortar walls were removed.

Rendering the walls with lime mortar

Restoring the communal house's roofs

The temple being reconstructed

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