



Survey and Restoration of Western Prasat Top

Interim Report 10

Reassembly of the Platform of the Central Sanctuary



The Authority for the Protection and Management of Angkor and the Region of Siem Reap

Nara National Research Institute for Cultural Properties

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Preface

We are pleased to report a successful collaboration with Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA) that 2021 marks the tenth years anniversary of the research and restoration project of Western Prasat Top.

We would like to express our heartfelt gratitude for your cooperation with our works to H.E. Dr. PHOEURNG Sackona, Minister of Ministry of Culture and Fine Arts, H.E. Dr. HANG Peou, Director General of APSARA, H.E. Mr. KIM Sothin, Deputy Director General of APSARA, H.E. Mr. IM Sok Rithy, Director of Department of Conservation of the Monuments in the Angkor Park and Preventive Archaeology and all of related experts of APSARA.

Nara National Research Institute for Cultural Properties launched the project in Cambodia just after the end of the Cambodian Civil War as a part of international cooperation for cultural reconstruction in Angkor. NABUNKEN decided to promote the projects mainly on the human resource interactions and the archaeological excavation. From 1999 to 2001, NABUNKEN promoted excavation of the A6 kiln at the Tani kiln site with APSARA.

In 2001, we launched the joint research project focused on the Western Prasat Top together with APSARA and we have continuously conducting the research and restoration project of Western Prasat Top in accordance with the tripartite Memorandum of Understanding (MOU) between APSARA, Tokyo National Research Institute for Cultural Properties (TOBUNKEN) and NABUNKEN. We believe that we can accomplish the fruitful results with further cooperation with APSARA.

Nara National Research Institute for Cultural Properties

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Explanatory Notes

1. This paper is the tenth report on the reassembly of the Platform of the Central Sanctuary of Western Prasat Top that was conducted by Nara National Research Institute for Cultural Properties and Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA) over the period from January to December 2020.
2. The dismantling and restoration work was implemented with the full cooperation of APSARA and technical support from the Japanese Government Team for Safeguarding Angkor (Japan-APSARA Safeguarding Angkor: JASA).
3. This report was written and edited by Yuni SATO, SOK Keo Sovannara and Hiroshi SUGIYAMA with counsel from the researchers who are involved with this project. The photos in the figures contained herein were taken by the above members and local Cambodian staffs.
4. Further reports shall be published hereafter as appropriate in accordance with the progress of the restoration work.

Chapter 1: The 10th Year of the Research and Restoration Project of the Western Prasat Top Site

The year 2021 marks the tenth anniversary of the Western Prasat Top Site Research and Restoration Project. Thanks to the support and cooperation of many people, we have been able to conduct the project smoothly, especially we would like to express sincere thanks to Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA). In this chapter, we will describe the progress of the restoration and summarize the new findings on the Western Prasat Top site discovered by the project so far.

Section 1: Survey of the Western Prasat Top site

In 2001, following the completion of the Tani kiln site project, the Nara National Research Institute for Cultural Properties (NABUNKEN) held discussions with the APSARA regarding the selection of a site for a new project. In order to select a site, we had a series of discussions with Prof. Ang Choulean, then Director of APSARA's Heritage Department, and decided on Western Prasat Top (Fig. 1). It was chosen as the target site because it had been in existence for a relatively long time and has a strong Buddhist element among the sites of Angkor Thom.

The Western Prasat Top site is located about 500m west of the Bayon (at the centre of Angkor Thom), and about 50m south of the east-west road that continues to the West Gate of Angkor Thom. Its existence was known but detailed investigation and research had not been done. We started the survey based on a wide range of time covering the Bayon period to the post-Angkor period. In August 2003, the first phase of excavation began and, in 2010, we compiled the results of our research and published reports in Japanese and English (NABUNKEN 2011,2012).

- (1) NABUNKEN, 2011, *Western Prasat Top Site Survey Report, Scientific Report of the Nara National Research Institute for Cultural Properties 88: Report on the Joint Research for the Protection of the Angkor Historic Site*, in Japanese.
- (2) NABUNKEN, 2012, *Western Prasat Top Site Survey Report: Report on the Joint Research for the Protection of the Angkor Historic Site*.



Fig. 1 Western Prasat Top before the restoration (view from the east)

Section 2: Background to the reconstruction

On 26 May 2008, about 40 pieces of stone fell from the east gable of the central sanctuary. It is thought that these stones were destabilised by the felling of trees, which had been growing on the top of the central sanctuary, the year before. The collapse of the stones caused further instability to the entire upper part of the central sanctuary. After urgent consultation with APSARA, and with the cooperation of the Japanese Government's International Angkor Survey (JASA), it was decided to erect a scaffold to support the main body of the sanctuary (Fig. 2).

Additional consultations between APSARA, the Nara National Research Institute for Cultural Properties and other related parties in Japan and abroad, decided to start restoration work in the next third medium-term plan of the Independent Administrative Institution (FY2011-2015). The decision to restore the temple was driven by the cooperation of many people, including TADANO Ltd. and Asuka Kensetsu Co. Ltd.. TADANO Ltd. provided us with a 16-ton rough terrain crane, a super-deck work truck, and a truck with a cargo crane (Fig. 3). Asuka Kensetsu Co., Ltd., led by Mr.SANO Katsuji, provided not only equipment, such as compressors and generators, but also technical guidance on the preparation and adjustment of the equipment provided by Tadano Ltd..

The preparatory work for the restoration began in 2011. We decided to start with the north and south sanctuaries, which are smaller than the central sanctuary. Therefore, it was decided to dismantle and restore the southern sanctuary in order to gain familiarity with the various methods and procedures, and then proceed to dismantle and restore the north and central sanctuaries in that order. In line with this decision, from the second half of 2011, the necessary on-site equipment for dismantling and restoration was prepared and maintained. A new memorandum of understanding was signed between APSARA, the Tokyo National Research Institute for Cultural Properties and the Nara National Research Institute for Cultural Properties on 14 December 2011. On 8 March 2012 a ceremony was held at the Western Prasat Top site to mark the start of restoration, with dismantling work commencing on 9 March 2012.

Section 3: Reconstruction of the southern sanctuary

Dismantling of the building frame and platform of the southern sanctuary

The southern sanctuary consists of the building frame, the upper platform and the lower platform (Fig.4). Most of the roof was lost and the body was tilted 19 degrees to the south. The dismantling of the structure was carried out by a process of drawing plans, numbering the stones, and dismantling one layer at a time, starting from the top. The dismantled parts were then reassembled on a concrete base on the ground and temporarily assembled to check the leveling, positioning and to identify areas of missing stone.

During the subsequent dismantling of the upper platform, several stones were found to have been re-used. Of par-



Fig. 2 View of scaffoldings (view from the east)



Fig. 3 Donated vehicles

ticular note was the use of a stone known as a *sīma* stone (boundary stone). These stones are usually buried in the ground to demarcate the temple area of Theravāda Buddhist temples, and they are placed at the four cardinal corners of the temple and at the centre of each side. In the southern sanctuary, 12 *sīma* stones were found in the upper part of the platform, followed by two *sīma* stones in the lower platform (Fig. 5). It is thought that the stones were originally used in another temples and were collected as the building materials for the southern sanctuary .

Dismantling of the platform of the southern sanctuary

The top surface of the platform was made of sandstone paving stones, but it had sunk more than 20cm, from the centre to the south, due to unequal settlement of the associated fill. When the paving stone layer was dismantled, it was found that the foundation soil was coarse sand. When this soil was excavated, the southern staircase of an earlier platform of the central sanctuary was found in the lower platform of the southern sanctuary (Fig.6). The southern staircase of the lower platform of the central sanctuary was in good condition and did not cause uneven settlement . The southwest corner of the exterior of the platform on the lower part of the southern sanctuary had



Fig. 4 Southern sanctuary before the restoration (view from the east)



Fig. 5 two *sīma* stones in the lowest level of the lower platform of southern sanctuary (view from the south)

collapsed due to age, and the foundation soil eroded out from the gap causing the centre of the platform to sink . On the other hand, the north side of the southern sanctuary which was overlying the southern staircase of the central sanctuary, did not sink . Therefore, it is assumed that the whole structure tilted to the south causing the roof to collapse.

The southern staircase of the lower platform of the central sanctuary

The inside of the platform was filled with reddish-brown-coloured coarse sand, with no traces of a rammed earth structure. Only a few artifacts, such as bronze bells and ceramic pieces, were found in the foundation soil of the platform. As the southern staircase of the platform for the central sanctuary will be backfilled when the sanctuary is reassembled, we made every effort to collect as many records as possible and took measurements, 3D surveys and photographs.

Foundation for the platform of the southern sanctuary

In parallel with the dismantling, archaeological excavations were carried out at the periphery of the platform. A trench 1m wide and 3m long was set up on the western side of the platform to check for construction foundations,



Fig. 6 Unearthed staircase of the lower platform of the central sanctuary (view from the south)



Fig. 7 Unearthed traces of the foundation of the southern sanctuary (view from the southwest)

but no such traces were found in this area. The trench was then excavated to about 2m below the present ground surface, but while the digging continued to reveal artefacts it failed to confirm the natural ground level. From this, it became clear that the present temple complex was built on top of more than 2m of artificial earth.

After the dismantling of the lowest level of the platform, the trace of the underground foundation was confirmed from the south side of the lower platform and also the rows of stone blocks were found in the center of the foundation (Fig. 7). These stone rows were made of sandstone or laterite blocks arranged vertically and combined in an east-west-south-west direction. A blackish-brown glazed long-necked jar, unglazed round-bottomed pottery jar, and unglazed long-necked jar were also found just south of the southern line of the underground foundation. This was the end of the dismantle survey, but a sub-trench was cut in a north-south direction to check the depth of some of the underground foundation work, and then the whole area was backfilled and reassembled.

Reconstruction of the platform of the southern sanctuary

From October 2014, we started to reconstruct the foundation under the platform. In order to reconstruct the foundation we used consolidated soil determined by the geological survey of the foundation, and the reddish-brown coarse sand layer that had previously filled the foundation (Fig. 8). On 23 September 2015, we held a ceremony for the completion of the reconstruction of the southern sanctuary and successfully completed the research and restoration of the southern sanctuary. The roof of the southern sanctuary was reconstructed up to the girders at the bottom of the gable on the east and north faces (Fig. 9).



Fig. 8 Compacting the consolidated soil



Fig. 9 Reassembled southern sanctuary (view from the east)

Section 4: Reconstruction of the northern sanctuary

In February 2016 we started the dismantling of the northern sanctuary (Fig. 10). By March we finished the dismantling of the structure and the survey of the scattered stones north of the northern sanctuary. The whole structure of the northern sanctuary had inclined to the north and the collapse of the building frame was more severe than that of the southern sanctuary. Some stones-blocks of the building frame had collapsed and were left as they are, but most of the stone blocks of the building frame had been removed by the EFEO and placed on the ground randomly, especially on the north side of the northern sanctuary. Prior to our reconstruction work, each stone was numbered and drawn, and its original position was estimated in preparation for the reconstruction.



Fig. 10 Northern sanctuary before the reconstruction (view from the east)

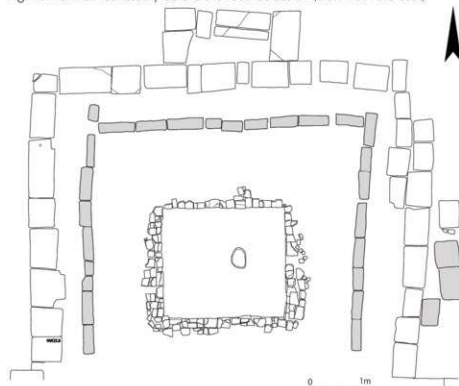


Fig. 11 Plan of the lowest platform and the topmost level of the underground brick chamber of the northern sanctuary

Dismantling of the platform of the northern sanctuary

After the dismantling of the building frame was completed, we started to investigate the platform of the sanctuary. At this stage, in order to know the condition of the foundation soil, we removed some of the paving stones in the lower platform and opened a trench aligned north-to-south. It was found that the foundation soil was mainly a reddish-brown coarse sand, the same as that of the southern sanctuary, with some grey clay, and that the soil was repeatedly levelled like rammed earth to a thickness of about 10cm. A row of bricks was found at the bottom of the trench, suggesting the presence of some brickwork below the lower platform.

Discovery of underground brick chamber

In July 2016, with the dismantling of the platform underway, an east-west trench was also set up to investigate the condition of the brickwork in the cross trenches in order to clarify the composition of the brickwork. In August, we excavated the soil fill inside the brickwork (Fig. 12) and carried out photography, measurements and 3D surveying. It revealed that the brickwork was an underground brick chamber. In this underground brick chamber, metal objects such as gold, crystal, glass beads, and burnt bone fragments were excavated. Traces of heat exposure were also found on the surface of the brick chamber and artifacts, and a number of carbon samples were also recovered. For details of the results of the analysis of these remains and excavated artifacts, please refer to Interim Report of Western Prasat Top 5 (Nabunken 2018)

(3) NABUNKEN 2018, *Survey and Restoration of Western Prasat Top Interim Report 5, Brick Structure of Northern Sanctuary*.



Fig. 12 Excavation of the underground brick chamber



Fig. 13 Unearthed underground brick chamber (view from the south)

Reconstruction of the false door of the northern sanctuary

After conducting a detailed survey of the underground brick chamber, it was backfilled with the original reddish-brown soil (Fig. 14) to preserve the remain. We then started to reconstruct the north sanctuary. The aim of the reassembly was to find the original elements among the surrounding, scattered stones and return them to their original place. In the process, it was possible to reconstruct the standing images of Buddha. The west and south faces were originally known from the archives of the EFEO in the early 20th century (CAM_01481,01482), but by the time we arrived in the 2000s, they were no longer in their original state.

The lower half of the standing Buddha statue in the west face was on site, while the upper half was stored in the Conservation d'Angkor. With the kind support of the Ministry of Culture and Fine Arts, Cambodia, the upper half of the image was brought from the conservation office to the site of Western Prasat Top in April 2016. It was reunited with the lower half of the image that had remained at Western Prasat Top (Fig. 16). On the south face, only the feet of the standing Buddha image remained in situ, and we were able to find the upper part of the Buddha image among the rubble and reconstruct it (Fig. 17). On the other hand, the entire body of the standing Buddha on the north face, which had not been recorded in the old archives was heavily damaged and collapsed—its existence could not even be presumed. However, the image was reconstructed by examining the scattered stones in detail (Fig. 18). It is interesting to note that the Buddha image on the northern false door differs from those on the south and west faces in that it is not an ordinary standing image but is more like a so-called walking Buddha.

Reassembly of the northern sanctuary

In 2017, after the reassemblage of the platform of the northern sanctuary had been completed the reconstruction of the building frame was started. The building frame of northern sanctuary had collapsed to a greater extent than the



Fig. 14 Reassembly of the northern sanctuary



Fig. 15 Curving the new stone for the Pediment of the northern sanctuary



Fig. 16 Reassembled west false door of the northern sanctuary (view from the west)



Fig. 17 Reassembled south false door of the northern sanctuary (view from the south)



Fig. 18 Reassembled north false door of the northern sanctuary (view from the north)



Fig. 19 Reassembled northern sanctuary (view from the east)

southern sanctuary. We searched for scattered stones from the surrounding area. The work was completed in December 2017 (Fig. 19).

Section 5: Reconstruction of the central sanctuary

The dismantling survey of the central sanctuary began in January 2018. As with the previous southern and northern sanctuaries, the dismantling was carried out in order from the top. As the central sanctuary was larger than the other two sanctuaries, and part of the roof was still intact, it was carefully removed from the roof cover in turn (Fig. 20). In August and September 2018, the paving stones and door frames on the top of the platform were carefully ex-



Fig. 20 Central Sanctuary before the restoration (bird-eye view from the northeast)



Fig. 21 The topmost layer of the upper platform of the central sanctuary (view from the north)



Fig. 22 Survey of the laterite platform (view from the northeast)

aminated. In October, the door frame was dismantled, and all the dismantled parts of the structure were put together to complete the trial assembly of the structure.

Survey of the surface of the upper platform of the central sanctuary

In August 2018, a survey was carried out on the upper surface of the upper platform. The sandstone paving stones on the surface of the upper platform were found to be uneven due to unequal settlement of the square-shaped stones in the centre, which are thought to have been reused (Fig. 21). When this paving stone was removed, a layer of laterite paving was found, which also showed the presence of a disordered stone in the centre. As a result of excavation, it was found that there were a further three layers of laterite stones under the laterite paving stones, and a vertical hole was dug in the middle of the laterite paving stones. It is thought that this was a looting hole in the centre of the tower—which is often seen in the Angkor monuments—and, modern wire fragments were excavated from this hole. The excavation was continued to a depth of more than 2m, but the hole was still open and it was decided to end the excavation at this point, considering the safety of the investigation and the load-bearing capacity of the platform. The pits were backfilled with sandstone, laterite, and consolidated soil to withstand the upper load.

Dismantling of the platform of the central sanctuary

The dismantling of the platform of the central sanctuary had a number of challenges. The most important of these was the theory put forward by Henri Marchal in the first half of the 20th century that there was another laterite platform inside the outer sandstone exterior platform (Marchal 1918, 1925). In fact, an architectural survey by the Nara National Research Institute for Cultural Properties confirmed the existence of a laterite platform inside the sand-



Fig. 23 Laterite platform of the central sanctuary (bird-eye view from the northeast)

stone exterior of the central sanctuary platform (Fig. 22). For this reason, we decided to dismantle the sandstone exterior one quarter at a time and investigate the exposed laterite platform. Firstly, the south-east quarter was partially dismantled to see how much of the laterite platform remained, and then the south-west and north-west quarters were dismantled.

The laterite platform of the central sanctuary

As mentioned above, the laterite platform was dismantled in each quarter, and at every stage was photographed and surveyed in 3D (Fig. 23). As a result, it was found that the laterite platform, like the sandstone platform of the exterior, was composed of three tiers: upper platform, middle platform and lower platform. The upper and lower platforms were composed of simple laterite blocks while the middle platform had a carved moulding.

Reassembly of the central sanctuary

The dismantling of the sandstone exterior of the central sanctuary platform proceeded smoothly and the entire surface of the laterite platform, including the north and east faces, was revealed in autumn 2019. In order to preserve the originality of the laterite platform without dismantling it, a 3D measuring survey and photography of the laterite platform were carried out. Some repairs were performed before the reassembly of the sandstone exterior. After the excavation of the Buddhist terrace, we reconstructed the Buddhist pedestal. Then, the reassembly of the lower platform of the central sanctuary was also carried out. As of January 2021, the reassembly of the structure is still in progress.

(4) Marchal, Henri. 1918. "Monuments secondaires et Terrasses Bouddhiques d'Angkor Thom". *Bulletin de l'Ecole Française d'Extrême-Orient*. Tome 18 (8), 1-40.

(5) Marchal, Henri. 1925. "Notes sur le monument 486 d'Angkor Thom". *Bulletin de l'Ecole Française d'Extrême-Orient*. Tome 25 (3-4), 411-416.

Western Prasat Top Research Team

Experts

LAM Sopheap
LOEUNG Ravathey
SOK Keo Sovannara
HAN Ritha
ROS Visoth (APSARA)

Vehicles driver

MOU'T Sopheap

Workers

YEOURN Sokhen
KKRUY Odom
VEOURN Vet
KAS Kak
LOUEN Loeut
PROM Chak
BRON Hey
SOK Hang
SOM Sang
SO Ler
SEM Sarath
SEM Chantee
SENG Seang
TOUNG Chomreoun
TORK Tort
CHOUN Chum
VOEUN Sros
RY Sothy
RY Sotheuon
MON Vei

Japanese Researchers

MATSUMURA Keiji
SUGIYAMA Hiroshi
SHODA Shinrya
SHIMADA Toshio
OBAYASHI Jun
TAMURA Tomomi
SATO Yuni

Special Thanks

H.E. Dr. PHOEURNG Sackona
H.E. Dr. HANG Peou
H.E. Mr. KIM Sothin
H.E. Mr. IM Sok Rithy
H.E. Dr. TIN Tina
Prof. ANG Choulean
Prof. Ashley THOMPSON
Prof. NAKAGAWA Takeshi
Mr. SANO Katsuji
Ms. EGUCHI Hiroko

TADANO Ltd.
INADA Inc.
Embassy of Japan in Cambodia
JASA
Tokyo National Research Institute for Cultural Properties



Chapter 2: Outline of the Survey and Restoration Project of the Central Sanctuary

Section 1: Progress of the reassembly of the central sanctuary

As of December 2019, the reassembly of the lower part of the central sanctuary was completed, and the reassembly work of the middle platform was almost complete, except for the northeast part. We completed the reassembly of the middle platform in January to February 2020 and continued to reassemble the middle and upper platform from March to July. In August, we reconstructed the platform of the central sanctuary and the Buddhist pedestal located in the east.

Regarding the reassembly of the building frame, the work was carried out after a trial reassembly. From September to December 2020, the doors of the four cardinal openings were temporarily assembled and reassembled. In November, the walls between the east and south openings were reconstructed.



Fig. 24 Curving the new stone blocks for the central sanctuary



Fig. 25 View of the reassembly work of the central sanctuary



Fig. 26 View of the reassembled platform of the central sanctuary (view from the east)



Fig. 27 View of the reassembled platform of the central sanctuary (view from the northeast)



Fig. 28 View of the reassembled platform and façade of the central sanctuary (view from the east)



Fig. 29 View of the reassembled middle and upper platform and façade of the central sanctuary (view from the east)



Fig. 30 View of the reassembled platform and façade of the central sanctuary (view from the southeast)



Fig. 31 View of the reassembled south façade of the central sanctuary (view from the south)

Section 2: Return of decorative stone materials from Conservation d'Angkor

During and after the Cambodian Civil War in the 1970s, the decorative stones, statues of gods and Buddha images from the Angkor monuments were stolen. Therefore, the Cambodian government took the decorative stones and statues from the temples to the Conservation d'Angkor, which was established in Siem Reap City, and stored them. To date, more than 10,000 sculptures have been stored at the Conservation d'Angkor. Sculptures were also taken from the Western Prasat Top site and are safely stored there to this day.

In preparation for the restoration and reconstruction of the central sanctuary, a survey of the sculptures associated with the central sanctuary was carried out by the Conservation d'Angkor in 2018-2019. The survey revealed that the stone collection includes lintels, colonnettes, pediments and other sculptures related to the central sanctuary. We considered the possibility of replacing them with new sandstone, but we believe that the priority should be to restore the site to its original state, so we approached the Cambodian government to return some of the original sculptures stored at the Conservation d'Angkor to the site. The reconstruction policy of this project was accepted and approved by the Minister of Ministry of Culture and Fine Arts, Cambodia in October 2020, as the decorative stones, such as lintels, are essential components for the reassembly of the temple structure and it is important to reconstruct the original decorative stones to their original position.



Fig. 32 Transporting the colonnette from the storage room of Conservation d'Angkor



Fig. 33 Check the items to transport by the conservator of Conservation d'Angkor

Accordingly, the decorative stones belonging to the central sanctuary were transferred from the Conservation d'Angkor to the Western Prasat Top Site in October 2020. Officers from the Conservation d'Angkor and heritage police accompanied the transfer work, and the stones were safely transported to the Western Prasat Top site. After that, we started to repair those parts of the lintel and colonnette which needed to be joined and repaired. On the other hand, the pediment blocks were reconstructed with other parts placed at the Western Prasat Top site, and the reassembly of the iconography is in progress. The restored pieces will be reassembled in their proper position in the central sanctuary.

	Inv. No.	Width(cm)	Height(cm)	Depth(cm)	Type	Note
	N332	16.5	116	14	Colonnette	Central sanctuary
	N333	19	100	16	Colonnette	Central sanctuary
	N423	140	48	40	Lintel	Eastern façade of central sanctuary Yama + Nandin
	N424	42	48	35	Lintel	Western façade of central sanctuary

Table1-1 Inventory of the returned decorative stones from Conservation d'Angkor






	Inv. No.	Width(cm)	Height(cm)	Depth(cm)	Type	Note
	N425	75	47	36	Lintel	Western façade of central sanctuary
	N435	18	46.5	36	Pediment	Kendi Lotus bud Bird-shaped spout
	N437	34	25	16	Pediment	Seated Buddha with bhūmisparśa mudrā
	N445	64	50	23	Pediment	
	N446	90	40	19	Pediment	Yama with stick

Table1-2 Inventory of the returned decorative stones from Conservation d'Angkor

	Inv. No.	Width(cm)	Height(cm)	Depth(cm)	Type	Note
	N451	52.5	20	36	Pediment	Head of Buddha
	N452	70	43	21.5	Pediment	Kendi Lotus bud Bird-shaped spout
	N453	55	33	14	Pediment	
	N454	20.5	38.5	19	Colonnette	Central sanctuary

Table1-3 Inventory of the returned decorative stones from Conservation d'Angkor

Chapter 3: Door Elements on the Central Sanctuary of Western Prasat Top Temple (Monument 486)

Sok Keo Sovannara

1. Introduction

Based on our recent research and restoration of the three-tower temple complex of Western Prasat Top, new information has been revealed and identified. The discoveries relate to an evaluation of the stages of construction for all three towers. Former estimates considered construction to have occurred in only two phases: the earlier laterite base thought to be from the late-9th or early 10th centuries; and, a later three sandstone-tower structure. Having now dismantled and reconstructed these three towers, we have found that they were likely built in five separate stages.

Stage 1:

This stage is represented by the laterite base that was probably constructed in the late 9th to early 10th centuries, according to inscription K.576 (1). The inscription names Çri Samaravikrama, the maternal uncle of king Yasovarman I (889 A.D.- 910 A.D.), who dedicated the temple to Vishnu. The original tower was thought to be built of brick (2) on a three-level laterite platform-base. A single-door on the eastern side of the sanctuary was decorated with grey sandstone colonnettes and a lintel. At a later point in time, this tower collapsed, but some parts remained on the base. The whole laterite base remained in its original position (Fig.1).

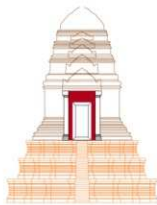


Fig. 1 Reconstruction image of Stage 1

Stage 2:

When the former sanctuary presumably collapsed a new grey sandstone structure (Fig.2)—the currently visible sanctuary—was built over the original laterite base. The structure was again a single tower, but with four sets of stairs placed at each cardinal direction. The elements of the door frames and decorative blocks, such as colonnettes and lintels, were made of red sandstone. The sanctuary was constructed with four doors open to each cardinal direction. Two of the door frames were made of red and pale-yellow sandstone blocks. The other two were made of grey sandstone. These door frame blocks seem to be reused stones. All four doors were also accompanied and decorated with red sandstone colonnettes and lintels.

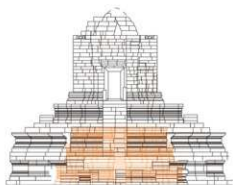


Fig. 2 Reconstruction image of Stage 2

The upper pediments, or frontons, were decorated with a sitting Buddha (in the Bhumisparasa mudra position) and figures typical of the style of the Post-Bayon or Post-Angkor periods.

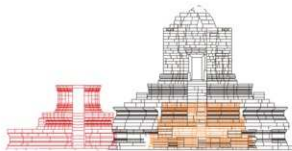


Fig. 3 Reconstruction image of Stage 3

Stage 3:

The southern sandstone sanctuary (Fig.3) was constructed over the southern staircase of the central sanctuary built in Stage 2. After we dismantled the upper sanctuary and conducted an excavation of the fills inside this structure, we revealed that this tower was built on top of the southern stairs of the main, central tower (3). However, this southern tower has only one open door, with the other three being false doors. This southern tower has no colonette or lintel, but does have four pediments with a seated Buddha image set up in the four cardinal directions.



Fig. 4 Reconstruction image of Stage 4

Stage 4:

A northern sanctuary (Fig.4) was built on the northern side of the central sanctuary. The dismantlement of this tower's platform revealed that the lower part of the earlier northern staircase of Stage 2 was cut and removed. Then, the third (i.e., lowest) platform of the northern sanctuary was added and connected to the third platform of the central sanctuary. Archaeological excavation beneath this Stage 4 tower revealed an underground brick chamber (4) which was cube-shaped and filled with sand. There were different types of metal fragments, glass beads and human (?) bones mixed in this sandy soil. Results from C14 analysis provides an estimated date for this northern sanctuary as around the end of the 14th to the beginning of the 15th centuries (5).



Fig.5 Proposed visualisation of the Buddhist Terrace

Stage 5:

A Theravada Buddhist terrace was added to the east of the central sanctuary. This Buddhist terrace probably contained a sheltered wooden structure covered by brown glazed roof tiles 6.

The phasing of the temple complex at Western Prasat Top is very complicated. Another problem concerns the red sandstone elements of the door-frames. There are some questions related to this point:

- Did they belong to the former 9th to 10th century temple?
- Were they part of another temple around the site when the grey sandstone elements were recycled to build the Stage 2 sanctuary? Or,



Fig.6 Eastern door frame (during reconstruction)

•Were they made at the same time as the grey sandstone sanctuary's construction?

These questions are still not yet explainable. However, we can research and make observations on the red sandstone elements.

2. The Stone Elements of the Central Sanctuary

We can classify the elements of the doors of the central sanctuary into three types: door frames; colonnettes; and, lintels.

2.1. Door Frames

There is a total of 16 door frames—four for each direction of the central sanctuary. These door frames are mostly made from red or pink sandstone blocks, except for the lower frame of the southern door and the upper frame of the northern door, which are made of grey sandstone blocks. The sizes and heights of these door frames are different.

2.1.a. Eastern Door Frame (Fig.6)

The eastern door frame blocks are completely made of red or pink sandstone. There are in total four blocks, such as the: lower frame; vertical right frame; vertical left frame; and, upper frame. Both vertical frames were almost the same height and thickness. The lower frame was short in length and thickness, but its width was bigger than the vertical and the upper frame. The inner side had two holes cut into it for the wooden door jambs and door. The upper frame is longer than the lower frame. Originally, the north-west edge of this frame was already broken before it was installed on the vertical frames. These four frames seem to have been produced and installed together in the original period of construction since, when we reinstalled them, the connection points were also almost fixed in shape.

2.1.b. Western Door Frame (Fig.7)

There are also four door frames made of red sandstone blocks. The vertical right and left frames have the same heights, widths and thickness. The lower frame is a little thinner than the other, but is wider. The thickness of the upper frame is not equal to the southern and northern parts. There is a problem with this western door frame. When we reinstalled the four parts together, we found that the upper-south edge of the frame did not fit, while the other three edges fit well into position. There is a small gap between the southern edge of the upper frame and the upper edge of the southern vertical frame. This could be an original mistake or evidence for reused frames from different collections.

2.1.c. Southern Door Frame

There are four blocks of the southern frames. The vertical right, vertical left and upper frames are made of red or pink sandstone, but the lower frame is made of grey sandstone. This might indicate that the three red



Fig.7 Western door frame (during reconstruction)



Fig.8 Northern door frame (during reconstruction)

sandstone frames were made at the same time and the grey one added when the old one (i.e., red sandstone) was either broken or disappeared. Additionally, the grey sandstone is very big and thick but its quality is poor and fragile. It had already broken into many small pieces before we dismantled it. One problem has been observed with this door. When we reinstalled these four frames, we found that the left vertical frame and the upper frame were not fixed in position. The upper frame is about 2cm out of alignment, forming a crooked line.

2.1.d. Northern Door Frame (Fig.8)

There are five blocks in this frame. The vertical frames are made from red sandstone of the same sizes. The lower frame is made of two blocks of pale-yellow sandstone. These two lower blocks seem to be remade or reused to connect with the vertical frames, because their tenons are not fixed to the mortises of the vertical frames. The problem is related to the size of the mortises, which are bigger than the tenons. So, the constructors had to add a block or keystone for fixing the space or gap of the tenons and mortises. Actually, we found a small block of laterite inside this space. Also, the western block of these lower frames had broken at the edge and was originally fixed by adding another piece. The upper frame was made of grey sandstone, similar to the lower frame of the southern door. This grey sandstone block is very poor and fragile. It broke into parts, but these parts can be repaired and used again.

2.2. Colonnets

There are a total of eight colonnettes: two for each direction of the central sanctuary. According to the old photos of the EFEO archives, in 1924 (EFEO_CAM01477, 01484, 01489, 01496), all these colonnettes were in their original places and positions. After that, the tower was damaged by trees and people. The eastern, western and northern parts of the tower collapsed and the colonnettes broke. In 1994, four broken blocks of the colonnettes, two from the north and two from the east, were collected and preserved in the Conservation d'Angkor (Inv.312, Inv.332, Inv.333a and Inv.333b). In October 2020, we applied to recover these blocks for installing back to their original positions. These eight colonnettes are not the same size. The colonnettes of the east and west doors are the same cross-section dimension (0.185m x 0.185m), while the colonnettes of the north and south doors are bigger and longer (0.22m x 0.22m).



Fig.9 A part of the Colonnette from the eastern face



Fig.10 Colonnette from the western face



Fig.11 Colonnette from Southern face



Fig.12 A part of the Colonnette from the northern face

2.2.a. Eastern Colonnets

The two colonnettes of the eastern door are made from red sandstone, measuring about 1.7m high and 0.185m wide. The colonnettes are roughly rectangular in shape with the lower part carved with four corners while the body is carved into a heptagonal (7-sided) shape. The two long sides connect to the door frame and wall, while the other five are decorated with motifs. The southern colonnette is decorated on three sides only. The northern colonnette is decorated on five corners.

2.2.b. Western Colonnets

The two colonnettes of the western door are made from pale-yellow sandstone, measuring about 1.74m high and 0.185m wide. The colonnettes have broadly rectangular shapes, with the bottom part having square-shaped profile while the body is heptagonal. Two long sides are connected to the door frame and wall while the other five are decorated with motifs. These

two colonnettes are decorated on five sides. We have found that these two colonnettes were made or brought from the same place, but the southern colonnette was broken and cut at the lower part and finally added a new connection before installation.



Fig.13 Eastern lintel

2.2.c. Southern Colonnets

The two colonnettes of the southern door are made from light-red sandstone, measuring about 1.86m high and 0.22m wide. The east-side colonnette is rectangular, with the lower part being four cornered while the body is heptagonal. The west-side colonnette is eight sided. Normally, two long sides are connected to the door frame and wall while the other five are decorated. These two colonnettes are decorated on five sides.



Fig.14 Western lintel

2.2.d. Northern Colonnets

The two colonnettes of the northern door are made from light-red sandstone, measuring about 1.81m high and 0.21m wide. The colonnettes are rectangular, the lower part being four cornered but with a heptagonal body. Two long sides are connected to the door frame and wall while the other five are decorated with motifs.



Fig.15 Southern lintel

2.3. Lintels

There are four lintels in the central sanctuary. Three of them—the south, east and west—are made of red sandstone, while the north lintel is made from pale-yellow sandstone. However, the outside surface of the northern lintel was applied with a red-coloured coating. These four lintels were recycled for this central sanctuary since the installations of these lintels did not conform with the usual directions of the gods.



Fig.16 Northern lintel (under reconstruction)

2.3.a. Eastern Lintel (Fig.13)

The eastern lintel is made of red sandstone measuring 1.47m long, 0.4m wide and 0.49m high. The northern side is straight while the southern side retains in its original edge measuring 0.07m long, 0.29m wide and 0.20m high. The north-west edge of the lintel originally broke and disappeared before dismantlement. The front face of the lintel is well designed with stylistic decorations between the Pre Rup to Banteay Srei styles. The middle part of the lintel shows an image of the god sitting on a horse. He is the god Kubera who controls the north direction.

2.3.b. Western Lintel (Fig.14)

The western lintel is made of red sandstone. The original length of this lintel is not clear because it was cut into three. The middle part was stolen in 1994, and the other two parts (right and left) were collected and preserved in the Conservation d'Angkor. The sizes of these two blocks are about 0.50m long 0.41m wide and 0.42m high.

2.3.c. Southern Lintel (Fig.15)

This lintel remained in place before dismantling. It is made from red sandstone measuring 1.32m long, 0.465m wide and 0.425m high. The middle part is designed with an image of the god sitting on the lion, carrying a stick or sword in his right hand that could be Ketu.

2.4.d. Northern Lintel (Fig.16)

According to an old photo by the EFEO, this lintel remained complete, but was probably destroyed and cut into pieces before 1994. The middle part was stolen. We have found and collected the broken pieces for repair. This lintel is made of pale-yellow or yellowish-grey sandstone measuring about 1.57m long, 0.39m wide and 0.52m high. It is bigger than the other three lintels of the central sanctuary. The remaining parts show an ear of the elephant. If we compare it to the old photo, we know that the middle design was an image of the god

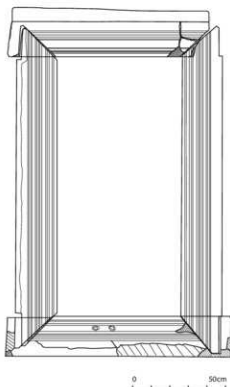


Fig.17 Drawing of the eastern door

sitting on an elephant. This god is Indra who controls the eastern direction.

3. Problems

We know that the central sanctuary was built in the second stage after the collapse of the former tower (Stage 1) probably collapsed. The complete structures, and the decorated pediments, relate to the Buddhist temple, especially to the Post-Bayon or Post-Angkor periods. But the door frames and their elements seem to belong to another temple and were re-used for this later, visible sanctuary. This causes problems in understanding this event. Were these elements made at the same time to the central sanctuary? If not, when and where did they belong? We can check with these block elements.

3.a. Door Frames

Every set of door frames for each direction had problems of gaps when assembled. This suggests that they were not made together at the same time, or from the same group or set. Normally, a set of door frames (four blocks) would be cut to a certain size and angle, when compared with other temples. The tenons and the mortises also match together.

3.a.a. Eastern Door Frame (Fig.17)

The reinstallation of the eastern door's frames revealed a problem in the height of the north-vertical frame. There is gap between the vertical and the lower frame, hidden behind the colonnette. The space was originally filled with small blocks or chips of sandstone and they were stabilized well.

3.a.b. Western Door Frame (Fig.18)

The western door frame installation has three edges that are fixed perfectly but in the upper-south edge, there was a gap. It could be said that the three frames (two vertical and one lower) were from same, or original, set while the upper frame was from another set. However, these four frames could be used to set up together. There could be another reason for a mistake in cutting the upper block during construction of this western door frame.

3.a.c Northern Door Frame (Fig.19)

The upper frame of the northern door and lower frame of

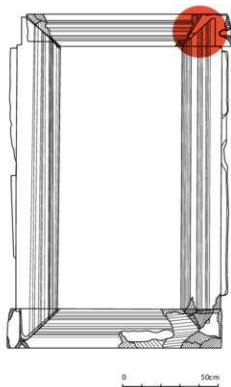


Fig.18 Drawing of the western door (red indicates unstable position)

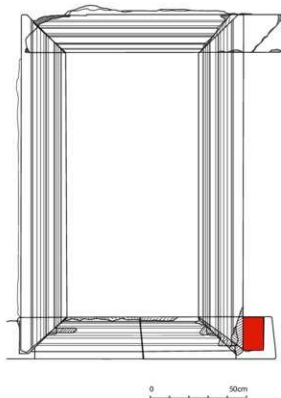


Fig.19 Drawing of the northern door (red indicates the position where it was broken before the restoration)

the southern door were made of grey sandstone blocks while the other is made from red sandstone. These two grey frames are bigger and thicker than the other frames. This indicates that these two grey sandstone frames were newly made to add to the broken red sandstone frames. The upper frame of the northern door, the block cut and set up on both vertical frames, had a decorated side that was chiseled and sloped to the eastern side to match the heights of the colonnettes and lintel. Another point relates to the lower frame of the northern door. There is normally a single block on the lower frame for each door, but the lower frame of the northern door has two blocks. Also, the southeast corner of the western block was broken before it was installed. This is known from the additional piece of stone added to the broken edge. One more problem concerns the mortise of the western block: the hole is bigger than the tenon of the vertical frame. Another block of laterite was inserted into the space of the mortise to stabilize the vertical frame.

3.a.d Southern Door Frame

The lower frame of the door was made of grey sandstone while the other elements were red sandstone. This would indicate that the lower frame was new. It is thicker but very fragile and poorer in quality than the others. It broke into many pieces. After dismantlement, this lower frame block could not be reused. We decided to replace it with a new block. The western vertical frame is a little taller than the eastern vertical frame. However, we can fix this problem by cutting the hole of the lower frame a bit deeper than the eastern side.

3.b. Colonnettes

There are eight colonnettes in this sanctuary. But they are not the same sizes or heights. The colonnettes of the eastern door and western doors are the same size but different heights. The colonnettes of the southern and northern doors are also the same size but bigger than the eastern and western doors. However, the corners of all these colonnettes are not the same sizes or numbers. Normally, the colonnettes are divided into three main parts: head, body and bottom (Fig.24). The colonnettes of the eastern, western and southern doors retain their original sizes and parts. The colonnettes of the northern door cut the head-part to conform to the height of the door frames. Interestingly, we have found that the southern colonnette of the western door was repaired before installation. This was confirmed when we dismantled it. The lower part was probably, and accidentally, broken but another piece measuring about 38cm high (Fig.20) was added. The original



Fig.20 Colonnettes from the western door- southern side

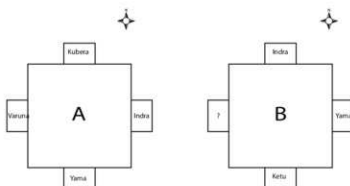


Fig.21 Arrangement of lintels decorated with Hindu Gods: A. regular direction, B. Western Prasat Top

part had a hole cut into the bottom, while a new block was chiseled with a tenon for inserting into the hole of the old colonnette.

3.c. Lintels

There are four lintels that were used for each door. These lintels are not the same size. Generally, a single tower was designed with regular and equal sizes of doors and elements. But in this central sanctuary, we have observed that every element seems to be reused with irregular sizes or placement (i.e., directions). The confusion with these lintels is related to the functions and directions of the god-images designed on the lintels. Normally, the lintel decorated with the image of a god sitting on an elephant must be Indra and positioned in the east. But in the central sanctuary of Western Prasat Top, the Indra lintel was placed on the northern door. This is wrong. It was probably the mistake of the constructors who did not take an interest in the former function, and meaning, of the lintel. Also, the eastern lintel shows the god Kubera, who controls the northern direction, but it was placed over the eastern door. The southern lintel presents an image of the god sitting on a lion that could be Ketu, who is rarely sculpted on lintels in Khmer art. Normally, the god who controls the southern direction is Yama, sitting on a buffalo.

Lintel of Western Prasat Top



Lintel of Banteay Srei



Fig.22 Comparison of lintels at Western Prasat Top and Banteay Srei

4. Art and Style Study

To find the answers to these problems, we must firstly focus on the study of art and stylistic relations. This can be done for the art of lintels and colonnettes. Former study of these lintels was done by French scholars and their primary conclusion was referred to as the Banteay Srei style. Potentially, there are similar items or designs on lintels, colonnettes and door frames that can confirm this art style.

4.1. Lintel (Fig.22)

- Absent of the original upper edge (1)
- Absent of the original lower edge (2)
- Bow arcs appear from the central medallion outward, created as Haṃsa (swan) tails (3)
- Presence of lion heads spitting out a



Fig.23 Comparison of colonnettes at Western Prasat Top and Banteay Srei

cluster of flowers (4)

-Garlands of flowers spiralling like snail shell (5)

-Tied ring as Makuta (crown) at the ends of bow arcs in the central point (6)

4.2. Colonnets (Fig.23)

There are some similarities of the colonnettes at Western Prasat Top temple and Banteay Srei temple.

-Most colonnettes have seven sides or corners

-The Colonnets are divided into three parts: heads, bodies and bottoms.

-The Heads are designed with multiple rings decorated by lotus-petal and fish-egg motifs.

-The bodies are divided into three parts such as: $\frac{1}{2}$ ring, and two $\frac{1}{4}$ rings decorated with multiple motifs.

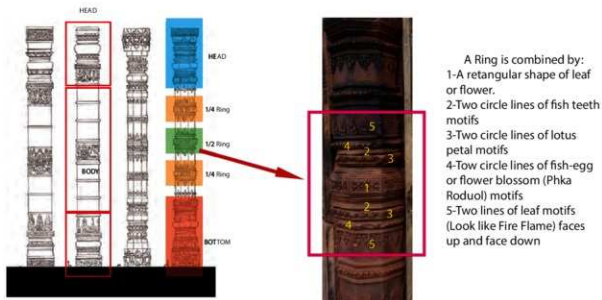
-The $\frac{1}{2}$ rings are normally created by a rectangular motif of a flower associated with two lines of flower blooms, and two lines of fire-leaf (face down and face up) motifs.

-The heads and bottoms are decorated with the same motifs.

-The lower parts of the bottoms are square shaped and decorated with images of figures praying in Kudu designs.

5. Conclusion

This article is a preliminary study of various elements. Further research will help to confirm the origin of these stone blocks. We need more evidence to ensure the absolute determination for the construction of the red sandstone elements as well as the whole structure of the central sanctuary. However, there is currently little information that we can use to identify these red sandstone elements.



[Black Drawing: J. Sotarker (1966), Le Cambodge, Tome I, Paris, p.161.]

Fig.24 Model of motif classification of colonnettes

1. Did they belong to the former 9th to 10th century temple?

It is certain that these elements did not belong to the former 9th or 10th century temple. Why? If the temple had collapsed, it would be expected that damage would also have occurred to these elements. Also, they could not be removed or changed from one to another direction, especially the lintels. The northern colonnettes too were not cut to the same heights as the door frame.

2. Were they part of another temple around the site when the grey sandstone elements were recycled to build the Stage 2 sanctuary?

This is possible. There are temple ruins around Angkor Thom that had already collapsed. Some of the elements, such as doors, were made from red sandstone. One example is Prasat Sralao or Sraloa temple, located about 3km away in the north-west wall of Angkor Thom. For a single tower temple with four doors, the constructors should make the doors the same sizes, including widths and heights. But these door frame blocks are always different (See details of frame drawing Fig.24 to 35).

3. Were they made at the same time as the grey sandstone sanctuary's construction?

Only two blocks of grey sandstone, the upper frame of the northern door and lower frame of the southern door, were probably made to replace the missing or broken red sandstone frames.

4. Do these red sandstone elements belong to Banteay Srei temple?

Some structures at the Banteay Srei temple complex had already collapsed and some elements, such as door and window frames, lintels, colonnettes and pediments were removed or have disappeared from the temple. However, this is just a preliminary idea about the red sandstone elements. Future research will provide more information to help confirm these problems.

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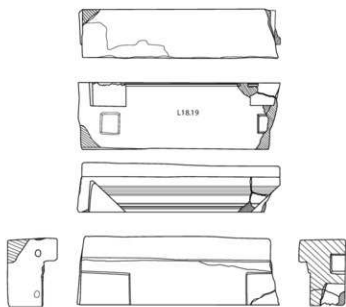


Fig.25 Eastern door - upper frame

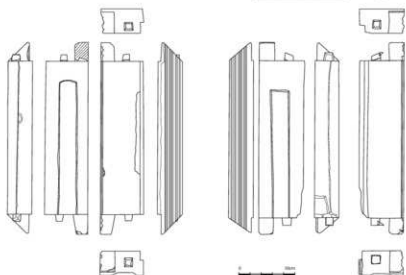


Fig.26 Eastern door - vertical frame

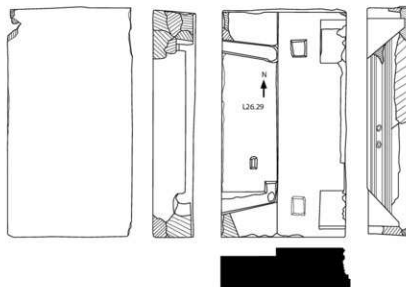


Fig.27 Eastern door - lower frame

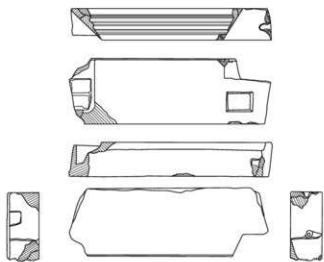


Fig.28 Western door - upper frame

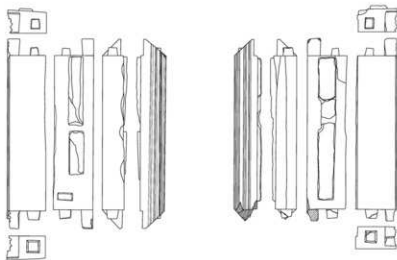


Fig.29 Western door - vertical frame

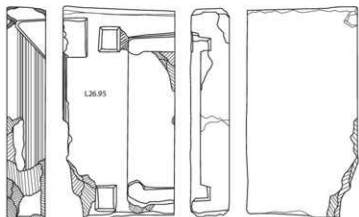


Fig.30 Western door - lower frame

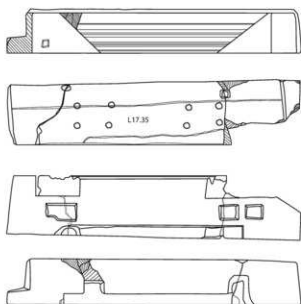


Fig.31 Northern door - upper frame

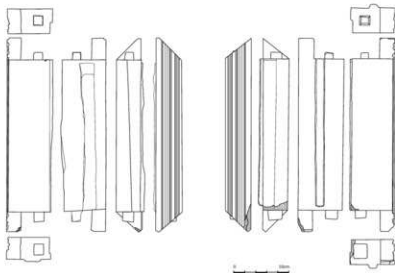


Fig.32 Northern door - vertical frame

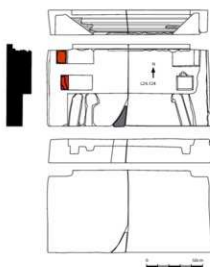


Fig.33 Northern door - lower frame

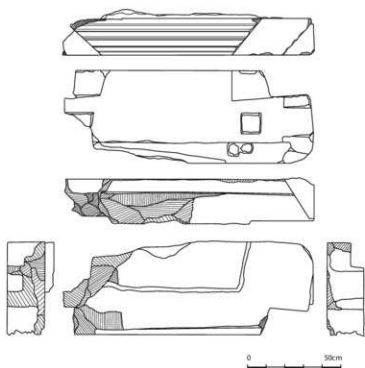


Fig.34 Southern door - upper frame

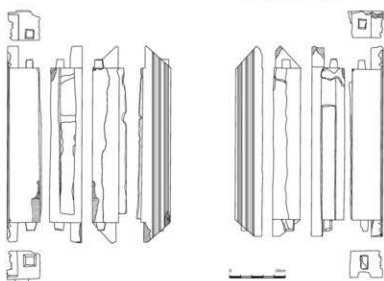


Fig.35 Southern door - vertical frame

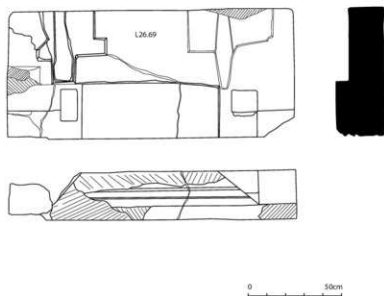


Fig.36 Southern door - lower frame

