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 sincre 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 platformof 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 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)

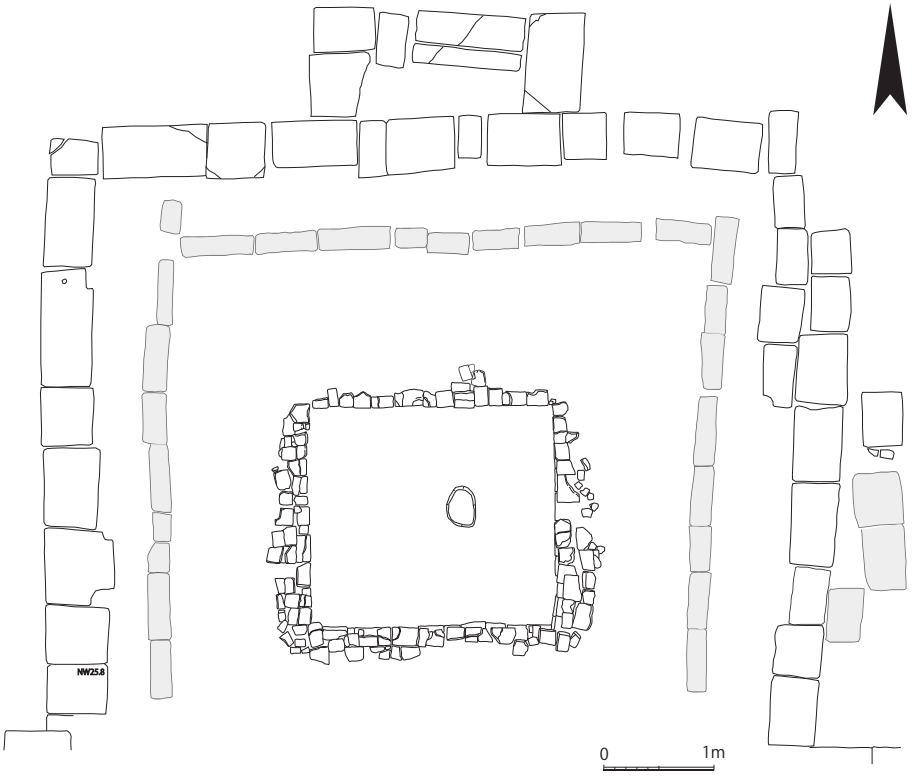

Fig. 11 Plan of the lowest platfrom and the topmost level of the underground brick chamber of the northern sanctuary

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)

Fig. 12 Excavation of the underground brick chamber

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

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

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 platfrom of the central sanctuary (view from the north)

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

amined. 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 midddle 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 Sopheak

LOEUNG Ravattey

SOK Keo Sovannara

HAN Ritha

ROS Visoth (APSARA)

Vehicles driver

MOUT 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 Shinnya

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