

British Mission to Tell el-Amarna

**Great Aten Temple
Report on Recent Work
(Autumn 2017, Spring and Autumn 2018)**



Visualisation by Paul Docherty, www.amarna3d.com

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Great Aten Temple, Report on Recent Work

The results described here are the most important from the periods of work from September 20th to November 9th, 2017; and from February 18th to March 21st, and September 30th and November 8th, 2018. The archaeologists in 2017 were Barry Kemp, Miriam Bertram, Juan Friedrichs, Anna Hodgkinson, Sławomir Jedraszek and Julia Vilaró; in 2018 they were Barry Kemp, Fabien Balestra, Miriam Bertram, Delphine Driaux, Juan Friedrichs, Anna Hodgkinson and Julia Vilaró. Members of the team based at the expedition house in 2018 were Marsha Hill (sculpture fragments), Andreas Mesli (photography), Margaret Serpico (resins studies) and Alexandra Winkels (gypsum studies). The Ministry of Antiquities was represented successively on site (2017) by inspectors Moustafa Khallaf Mansour and Mahmoud Ibrahim Abd el-Samia and, with responsibility for the magazines, inspectors Hanan Mohktar Hakim and Abeer William Matta; in spring 2018 on site by Mohamed Abd el-Mohsen and (for the magazines) Mazen Osman; in autumn 2018 on site by Ahmed Mostafa Abd el-Aziz and Martha Atta Esa; for work in the magazines by inspector Tharwat Shawki Damian; and for the conservation of finds by conservator Qa'ud Abdullah Abd el-Menem. Two inspectors, Fatma Sa'ad Sultan and Taysir Abu Sa'ud Ahmed, joined the mission for training in excavation methods for the first month in 2017. The mission is grateful to the regional antiquities inspectorate, Gamal Abu Bakr, Mahmoud Salah, Aly Bakri, Ahmed Fathi, Hamada Kallawy, Salama Nagi Mohammed and their colleagues for their assistance, and to the Permanent Committee in Cairo for permission to work at Amarna. For the section on the reconstruction of the front of the temple I am grateful to Dr Kate Spence for discussions. The fine 3D-visualisations are the work of Paul Docherty (of www.amarna3d.com) for which we are very grateful.

The following studies are based largely on recent results but also draw, where appropriate, on evidence from earlier seasons.

1. Structures on the early mud floors at the front of the temple

Previous seasons (starting in 2012) had seen the removal of old excavation spoil heaps at the front of the temple. This exposed the top of a large spread of rubble which Akhenaten's builders had laid down to raise the ground level to match the stone floor inside the temple which was being rebuilt at this time (starting in or after the king's 12th year of reign). The densely packed rubble had buried and so preserved a series of mud floors from the early years of the occupation of Amarna. At the southern edge of the excavations the rubble reached a thickness of around 1 m. Previous excavators (Petrie in 1891/2 and Pendlebury in 1932) had cut irregular trenches into it, but substantial areas have remained untouched.

The early mud floors can be divided into two sectors, a northern (in front of the temple) and a southern, the division lying along the floor of a wide east–west trench cut through the levelling-rubble in 1932 (Figures 1 and 2). The difference between the two sectors is that the northern saw a second phase of development in which standing structures (mostly offering-tables) were removed and a fresh mud floor laid down on which a building of wooden posts was erected; whilst the southern sector supported a broad field of offering-tables which largely remained intact until it was buried by the levelling-rubble.

In the first stage of building, the thick enclosure wall and pylons of mud brick which now define the site on the west had probably not yet been erected. Perhaps a thinner wall ran along the same line, but it is possible that the site was largely open, defined by a series of stone markers set up on rectangular foundations of limestone blocks sunk into the desert (Figures 3 and 4). Four of them have been located so far, of different sizes and irregularly spaced. Three of them occur together, on a north–south line below the inside ramp leading down from the en-

trance between the later pylons. The best preserved retained traces of an upper layer of blocks which had formed a rectangle (2.10 x 1.10 m), smaller by 10 cm on all sides than the foundation, and was perhaps the visible pedestal for what had stood above. At present nothing certain can be said as to the appearance of the markers themselves for they were, early on, removed and their foundations covered with mud plaster. Were they stelae? The fourth lay 17 m to the south (in grid square I25; Figure 23). In the case of the group of three, a further stone rectangle of roughly the same size had been set up 2.5 m further north but, instead of there being a layer of limestone blocks sunk into the desert to act as a foundation, the foundation was a layer of gypsum concrete bearing the impressions of limestone blocks in a separate layer of gypsum mortar. As with the stone foundations, whatever had stood above the ground had been removed and the foundation had been covered with mud plaster. This structure had been uncovered and recorded in 2012.

At the same level as the top of the stone foundations a mud floor had been laid down which continued southwards to become the mud floor of the southern sector. It had probably covered the rectangular stone foundations just described. The later mud floor which had been spread over it has still been removed in only limited places but the removals have revealed the clear outlines of mud-brick offering-tables which had been cut down to their floor level. Traces remained of an overall thin coating of white plaster over the floor, and this had probably extended to the sides of the offering-tables as well. Once it had been established that the offering-tables had initially spread across this area, close inspection of the surface of the later floor allowed the identification of likely locations for further examples, on the basis of slight irregularities in the surface corresponding to positions where they might be expected, their spacings matching the spacing of the southern field of offering-tables. The suspected locations along the two east–west rows which are immediately to the south of the temple axis also add two additional offering-tables each in the westerly direction (they are marked on the plan, Figure 1)..

Southwards from the temple axis there had thus been (according to these preliminary observations) a total of three east–west rows. Beyond them twin parallel rows of offering-tables had been built from limestone blocks set on individual rectangular foundations of gypsum concrete. The greater part of these two rows had been exposed by the 1932 excavation (Figure 5). They had been closer to one another than was the case with the mud-brick offering-tables and had been built with minimum care. The stone blocks belonging to all except some closer to the temple had later been removed to allow the second mud floor to be laid over the places where they had been. Three of the ones left standing still had two courses of stone blocks in place in 1932 (though no longer), showing that they had been built as simple rectangular structures, without corner mouldings.

A small wooden palace

The second mud floor, when uncovered in 2017, was in good condition, firm and generally flat. In places it even retained the impressions of donkey hooves. Traces nevertheless remained of an original thin white plaster surface which must have been exposed to considerable wear. Its main feature was a series of roughly circular patches (the larger ones reaching c. 25 cm in diameter) where the mud surface was distorted and damaged. They could be immediately identified as filled-in post holes, and most aligned themselves to a rectangular plan with subdivisions (Figures 6 and 7). Especially in the morning sunshine, areas stood out as having a slight shine where the mud had been repeatedly trampled, in places suggesting pathways within and outside the rectangle. The mud plaster had also been shallowly worn away along narrow strips between pairs of posts (Figure 8), presumably where screens had joined them (made either from matting or from cloth, perhaps decorated).

At the northern end, the mud surface was interrupted, partly by itself being somewhat broken and partly by the presence of a patch of thin mud mortar bearing flattened circular ‘pads’ of mortar, the common way of laying mortar beneath a row of mud bricks (Figure 9). Evidently there had been a relatively small area covered with a layer of mud bricks which had been removed before the levelling-rubble was thrown down. Two large post holes seem to mark the south-western and south-eastern corners of this inner area.

The plan resolves itself into a building measuring 10.5 m north–south, and 7.5 m east–west (Figures 10 and 12). It is divided approximately mid-way by an internal wall running east–west (Figure 8). This is interrupted by what might have been a doorway behind which is a small rectangular area defined by posts and an uneven surface, behind which again is a group of four shallow circular depressions where jars had probably stood (Figure 11). To one side, a patch of brownish-black on the mud floor probably shows where one of the standard large pottery bowls or hearths had stood, of the kind commonly used to warm the interiors of houses.

Fragments from a painted gypsum plaster floor

The post holes were filled with dusty sand (sometimes with a crust of mud on top) and descended for up to 50 cm. In two of them, wedged well down in the fill, were fragments of hard but brittle gypsum plaster. The fragments from one of the holes bore painted decoration, a significant find in itself. Painted gypsum plaster is not common at Amarna but, when it is found, it forms pavements in royal buildings (the Great Palace in the Central City and a part of Maru-Aten being the best known). The way that the fragments were firmly embedded in the post holes and the absence of similar fragments in the levelling-rubble above show that they come from the wooden building and, as it was being removed, had become incorporated in the fill of the holes. Yet there is no sign of gypsum plaster attached to the mud floor itself. The answer is supplied by the remains of mud mortar from a layer of bricks, just mentioned (and see Figure 9). A low dais of bricks had stood here, bearing a thick coat of gypsum, part of which had been painted.

The archaeologist responsible for this area of the excavation, Miriam Bertram, subsequently reassembled the main fragments (which were also cleaned, conserved and photographed by conservator Alexandra Winkels) to form two groups which might not originally have been far apart (Figures 13 and 14). In each the dominant colours are white and pale blue, the areas partly defined by red lines, which also subdivide the pale blue area on the larger group of fragments. Other areas of patterning are formed from irregular black patches. One edge of each group is yellow, a common background colour for paintings at this period. Marsha Hill suggested a plausible explanation for the source of the fragments: they belong to the figure of a foreign captive. The reconstruction offered here is based upon part of a sheet of painted rushwork which had formed the seat of a chair found in Tutankhamun's tomb (Figure 15). Figure 16 is a rendering of the Nubian prisoner, its direction reversed to match the direction of our own painted fragments. The archer's bow which stands close to the front of the figure and at the same height has been omitted.

Foreign prisoners in these contexts are not only representatives of the peoples whom the Egyptians saw as their enemies; they are also representatives of their rulers and so are shown in elaborate attire. In the case of Nubians they regularly wear two pieces of fine linen, one wrapped around the waist and the other over the shoulders (although this can be omitted). The fineness of the linen sometimes allows a subdued skin colour to show through, which can extend to the whole body except for the lower torso, as if the figure wears a thicker linen loincloth. Lengths of wide coloured sash, predominantly red but with patches of coloured decoration (made from small beads?), are worn over the top. One length diagonally crosses the chest, another is wrapped around the waist and a third hangs down the front. It is possible that all three belong to a single very long sash carefully arranged. One or two long narrow cord-like items also hang stiffly from the waist, painted with a row of small separated black areas (or occasionally red) on a white background and ending in a longer tapering segment which forms the tip. Some representations show clearly that it is an animal's tail (one identification being a giraffe's, giraffe tails being a documented Egyptian import from Nubia). Some figures can wear them attached to the upper arm.

Within the scheme of Tutankhamun's Nubian figure, our fragment group 1 comes from near the top of the man's right thigh, where the lower wrap-around linen piece which reveals the skin colour of the leg adjoins the area

where the underlying loincloth conceals it. A red line separates the figure from the yellow background. Whereas on the Tutankhamun figure the creases in the linen are rendered with white lines, on our fragments they are red. The right-hand part of the group 1 fragments is taken up with an area of the vertical sash which hangs down the front. The main panel is red and preserves part of a wide border which was normally edged with black lines framing a pattern of alternating blocks of colour: black, white and sometimes blue (one certain blue patch has been identified on the Tutankhamun figure by X-ray fluorescence analysis). The painter of our fragments has converted this to a more impressionistic design, dispensing with the black outlines and reducing the pattern to a series of larger black blobs and small blue ones (although much of the blue pigment has not survived).

Our fragment group 2 has been placed not far away and to the right. The outer edge includes the red outer line of the figure, with the yellow background on one side and the greyish-white of the linen on the other. A small area of greyish-blue skin colour occupies the lower left portion of the fragment group. As in fragment group 1, the edge of the skin colour against the linen is not marked with a separate line (this characteristic is also common on other coloured representations of Nubian prisoners). The remaining motif belongs to the pendant animal tail. The artist has given it a less-than-naturalistic interpretation. The patches of black seem to be strung together on a red line. Instead of a tapering black end, the red line becomes two winding red lines, closely set together.

Foreign captives are often shown roped together by their necks, the 'rope' being one or more stems of the plants which bind them to the 'unification' hieroglyph. The Tutankhamun-chair figures are treated in this way. It is not, however, always included. In the case of the painted pavements at the Great Palace at Amarna, the foreign prisoners who are to be trodden on by the king as he processes from one doorway to another are not roped together in this way. (A frontal rope has been added to the reconstructed figures in the display in the Egyptian Museum but this is absent from Petrie's line drawing and seems to be absent from the small surviving original areas of this motif). It is also absent from the figures who were painted on the mud-brick steps — one per step — at the platform building of Amenhetep III at Kom el-Samak, south of Malkata.

Our fragments have been painted swiftly and confidently but with an impressionistic disregard for the details of the Nubian's clothing, especially the sash and animal tail. The artist has instead reduced them to rows of blobs and a mesh of red lines. It is impossible to reconstruct in detail how the artist would have completed the design. In Figure 14C the reconstruction is loosely based on the figure in the Tutankhamun chair covering. If our fragments come from a figure with the same proportions, its height (or length on the floor) would have been 1.20 m. A panel of this size has been introduced into the reconstructed plan of the building (Figure 17), along with a second panel showing an 'Asiatic' prisoner (also derived from the Tutankhamun chair cover).

The interpretation that arises is, therefore, that we are looking at the remains of a small palace of wooden posts and screens that also incorporated, at the front, a mud-brick dais the floor of which was decorated with large painted figures of foreign captives.

Was a small palace an integral part of the temple enclosure?

From evidence long available it appears that the temple, in its final phase (post-year 12), was provided with a small stone palace standing on the north side of the temple axis in a mirror-image location to our wood-framed building. The Pendlebury expedition of 1932 uncovered its foundation platform of gypsum concrete (referred to as 'pavilion' or 'altar') and it was re-examined in 2012 (where it was called the 'platform building'). A picture in the tomb of Panehsy, of what is surely the same building, puts a throne at the centre; another, in the tomb of Meryra, gives it a Window of Appearance.

Although there are obviously two periods of structural activity at the temple, separated by the levelling-rubble which was put down in or after Akhenaten's year 12, there is also an interim period, represented by the creation of

the brick enclosure wall, with its pylon entrance, and ramp which led from the threshold of the entrance down to the first mud floor (Figure 19). This ramp was also buried by the levelling-rubble. The pylon entrance was built to conform to the new and higher ground level, which was to be the floor level of the new stone temple. The ramp was built in expectation that it would not be used for long. It made the ground at the front of the temple (soon to be a building site) accessible for a while.

Imagine standing on the threshold at this time, facing east along the temple axis (Figure 18). The mud surface of the earlier period would be almost a metre below, although the ground in front of you was now covered by the ramp. On the left the builders would have started to create the concrete foundations for the small stone palace, building them up to the same height as the entrance threshold on which you are standing. To your right, at the lower level, the wood-framed building has been set up, facing the site of the stone palace-to-be. Suppose — and here we come to a probably unprovable assumption — that the stone palace was replacing one that had been there from the beginning, built either from brick or stone and now demolished. The temple site continues to be used despite the building work. Some provision is needed for the king's presence. The wood-framed palace, hastily erected, is the answer.

The irregularities in placing the post holes and the flimsiness of the building seem to go against the formality surrounding kings and the Egyptian taste for strictly geometrical shapes in architecture. Yet during an earlier visit to Amarna, as recorded on the second Boundary Stelae, Akhenaten is said to have been accommodated in something of this kind: 'One (i.e. the king) was in Akhetaten in the tent/pavilion of matting which had been made for His Majesty (l.p.h.) in Akhetaten, the name of which is "The Aten is Content".' We tend to perceive tents, with their flexible surfaces, differently from buildings of rigid materials; they evoke a different aesthetic. We are more inclined to accept a wider level of tolerance in appearance or deviation from straight lines. Even so, it is clear that those who set up the building did not do so by measurement and survey but by eye and hastily.

Mud bricks are easy to make and can be rapidly laid to make a building. They were available to make the platform at the front. Why complete the building with wooden posts and flexible screens? We have previously encountered post holes from another building belonging to the same phase, on the north side of the temple, and they were part of constructions at the site of the large stele excavated by us in 2012 just beyond the back of the main temple building. Another group of large post holes emerged this year (spring 2018) running beside the southern edge of the later stone temple. Were posts and matting or large free-standing posts (decorated with strips of coloured cloth?) preferred materials for a time in the temple enclosure? We should recall the special place that they had in the history of stone architecture in ancient Egypt, underlying its shapes and design details and bringing to mind the mythical landscape of *primaeval* time. Was this in Akhenaten's mind? That such architecture might have possessed special significance is suggested by the fact that its counterpart mentioned on the second Boundary Stelae was given its own name, Hetep-Aten, "The Aten is content". An example of how temporary and inevitably somewhat irregularly constructed tents can maintain an air of dignity at solemn moments is provided by the ubiquitous timber-framed tents of highly-coloured cotton spreads which are erected nowadays in Egypt on occasions of funerals and *mulid*-celebrations of sheikhs.

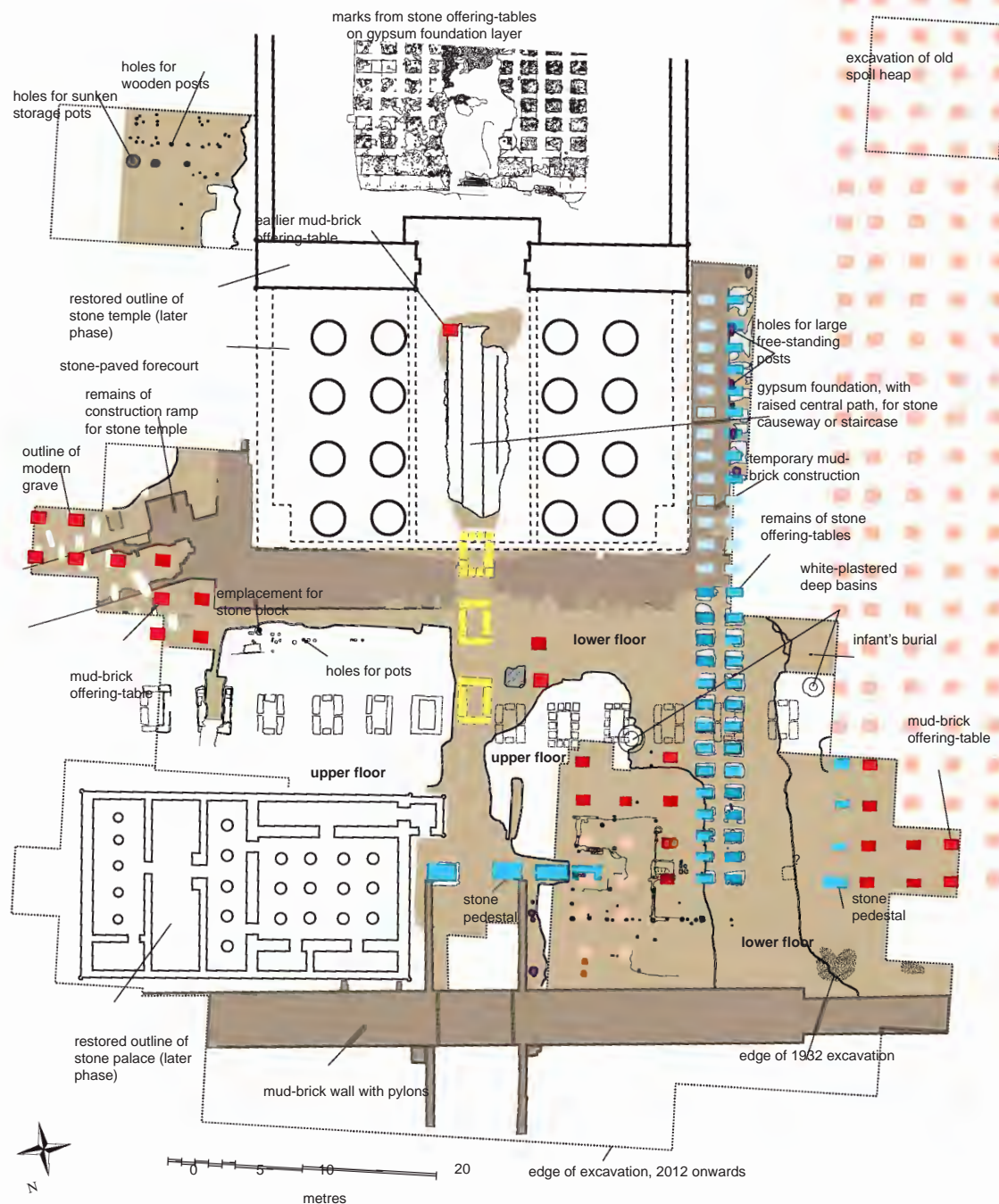


Figure 1. Plan of the main features of the excavation areas at the front of the Great Aten Temple. Those that are coloured lay beneath the levelling-rubble.

Red rectangles: mud-brick offering-tables; others which are still not fully identified by current excavation are in pink; the large field on the south is as planned by the 1932 Pendlebury expedition.

Blue rectangles: limestone offering-tables or foundations for other limestone constructions.

Yellow rectangles: gypsum covered platforms and surrounding basins.

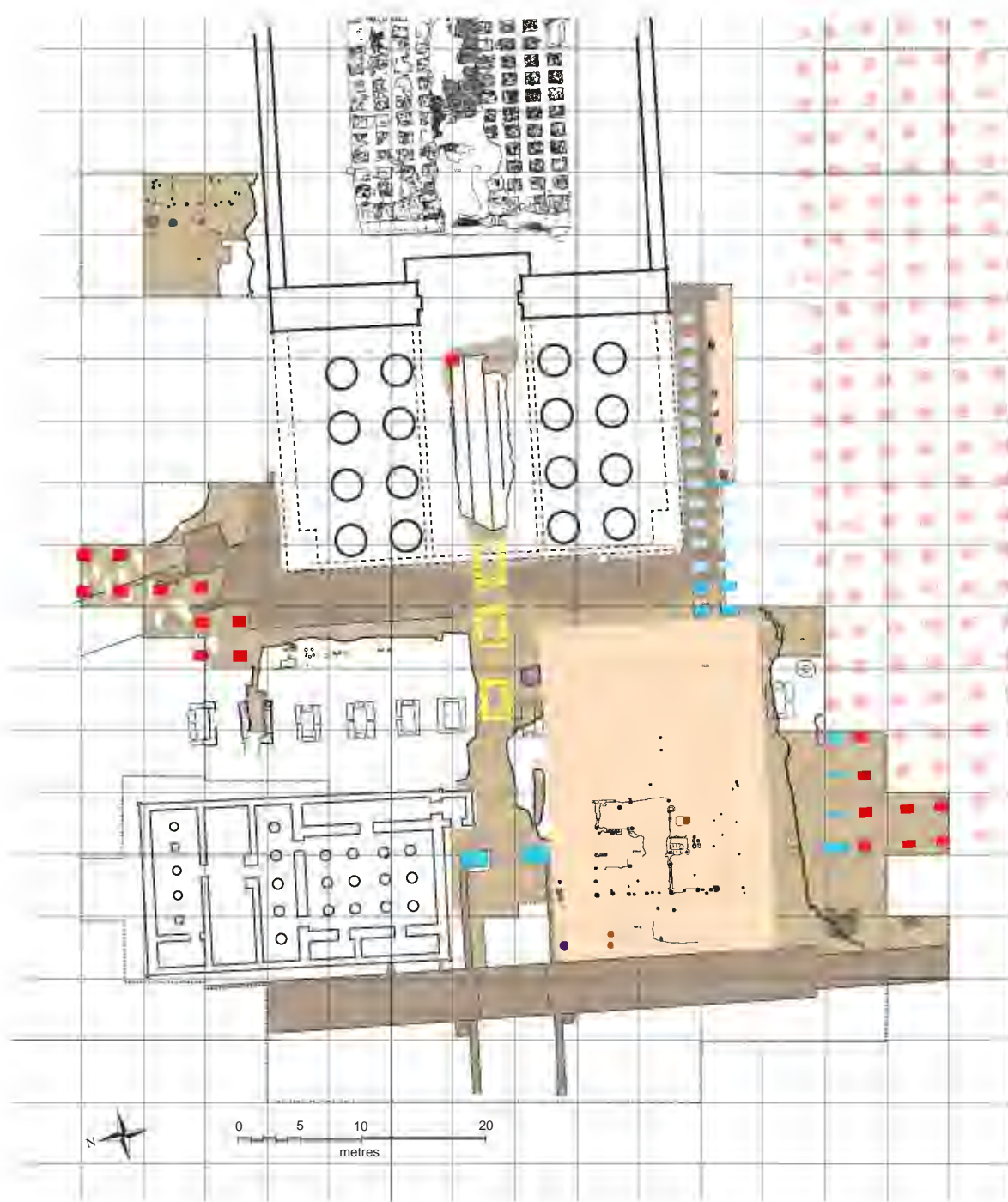


Figure 2. Plan of the main features of the excavation areas at the front of the Great Aten Temple. The large rectangle coloured pale brown is the approximate area where existing structures (mainly offering-tables) have been removed to create space for a fresh mud floor on which the wooden palace (defined by post holes) was laid out, with surrounding open space.



Figure 3. Mud floor showing the lines of post holes from a wood-framed building, with parts of earlier stone bases exposed (the nearer one in 1932). View to the south.

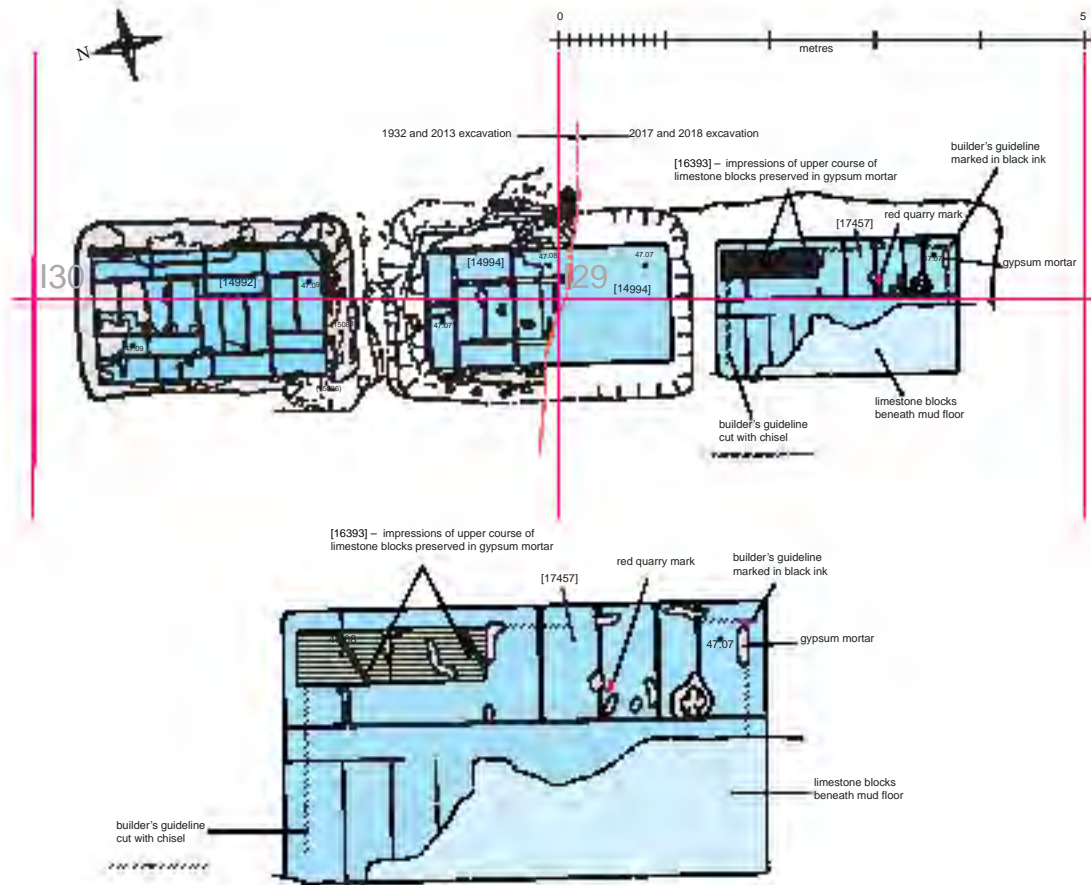


Figure 4. Plan of three earlier stone bases beneath the later mud floor. The left half of the plan is an area exposed in 1932. The right-hand base is shown below at twice the scale.



Figure 5. Part of the double row of foundations for offering-tables made from limestone blocks built on a foundation of gypsum concrete. North is towards the left. 1: levelling-rubble cut by the edge of a 1932 excavation trench. 2: patch of the mud floor on which the wooden palace was erected. It had originally covered the entire area of the photograph until cut away in 1932. 3: floor of the 1932 trench newly cleaned, bearing the remains of the gypsum-concrete foundation for offering-tables, each one made from a group of four talatat-blocks. 4: thin coating of dust and organic debris accumulated since 1932. Photograph by Anna Hodgkinson.

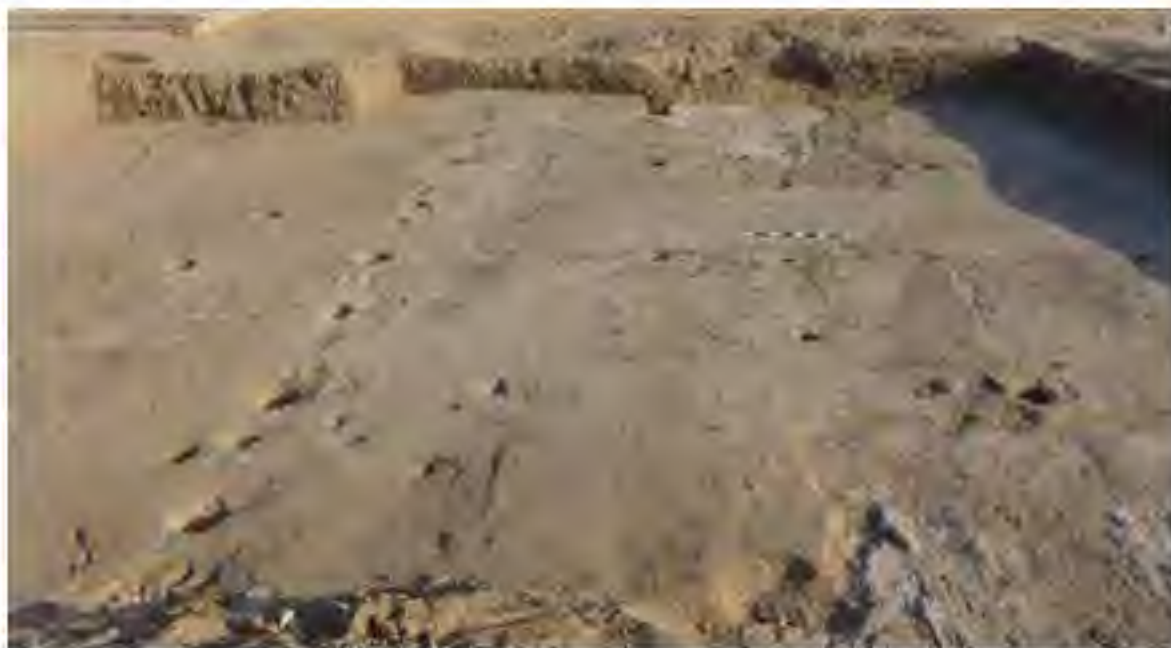


Figure 6. The mud floor into which lines of holes for wooden posts have been cut. The rectangular foundations of limestone blocks which had been covered by the floor are at the further end. In the foreground are two of the foundations for limestone offering-tables which had also been covered by the floor. View to the north.



Figure 7. Cleaning the mud floor which had been buried beneath the levelling rubble (visible in the background). The post holes are becoming visible. View to the north-east.



Figure 8. Part of the mud floor shortly after first exposure, before the post holes had been cleaned. Note the patches of linear wear between some of the holes, presumed to mark the presence of connecting screens. North is towards the bottom. The prominent line of post holes and shallow wear lines are those of the east-west 'wall' that runs across the middle of the building. Photo by Anna Hodgkinson.



Figure 9. Mud mortar from beneath a layer of mud bricks, and the line which marks the edge of the mud floor, where it lapped up against the mud-brick platform. North is towards the left. Photograph by Miriam Bertram.



Figure 10. Plan of the mud surface and post holes. Red lines are the edges of linear grooves in the floor and of separate mud layers. Beyond the edge of the 1932 excavation trench the mud floor is not preserved. Original by Miriam Bertram.



Figure 11. Square G29. Five depressions in the mud floor (<17453>). The group of four was probably to support pottery jars; the fifth (on the left) is more likely a post hole. View to the south. Photograph by Miriam Bertram.



Figure 12. Aerial view of the mud floor, showing the post holes of the wooden building. North is towards the left. Photographic mosaic by Anna Hodgkinson.



Figure 13. Fragments of painted gypsum plaster, recovered from post hole <17454> in grid square I29. Object no 41900. Fragments prepared and photographed by Alexandra Winkels and Miriam Bertram.

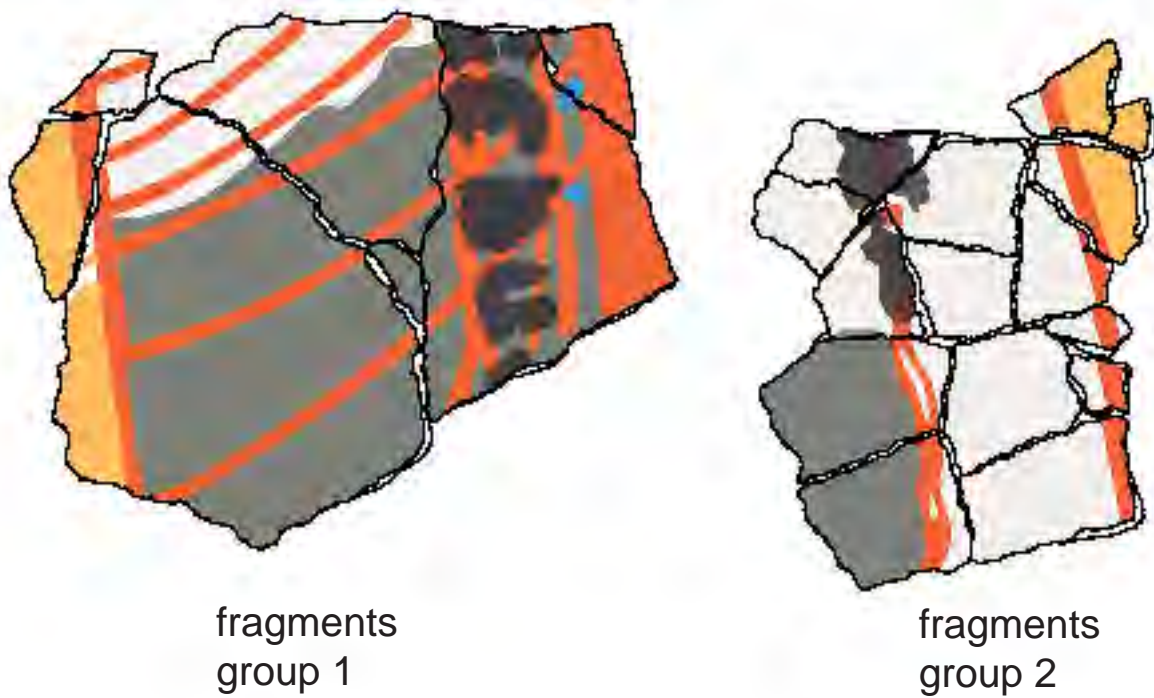


Figure 14. Digital rendering (by Miriam Bertram) of the two main groups of painted plaster fragments 41900.



Figure 15. The painted rushwork seat of a chair found in Tutankhamun's tomb, now in the Egyptian Museum, Cairo (JE 62042; Carter no. 457). The height of the Nubian figure can be calculated from the given dimensions of the painted sheet to be c. 34.7 cm. Burton photograph, copyright Griffith Institute.

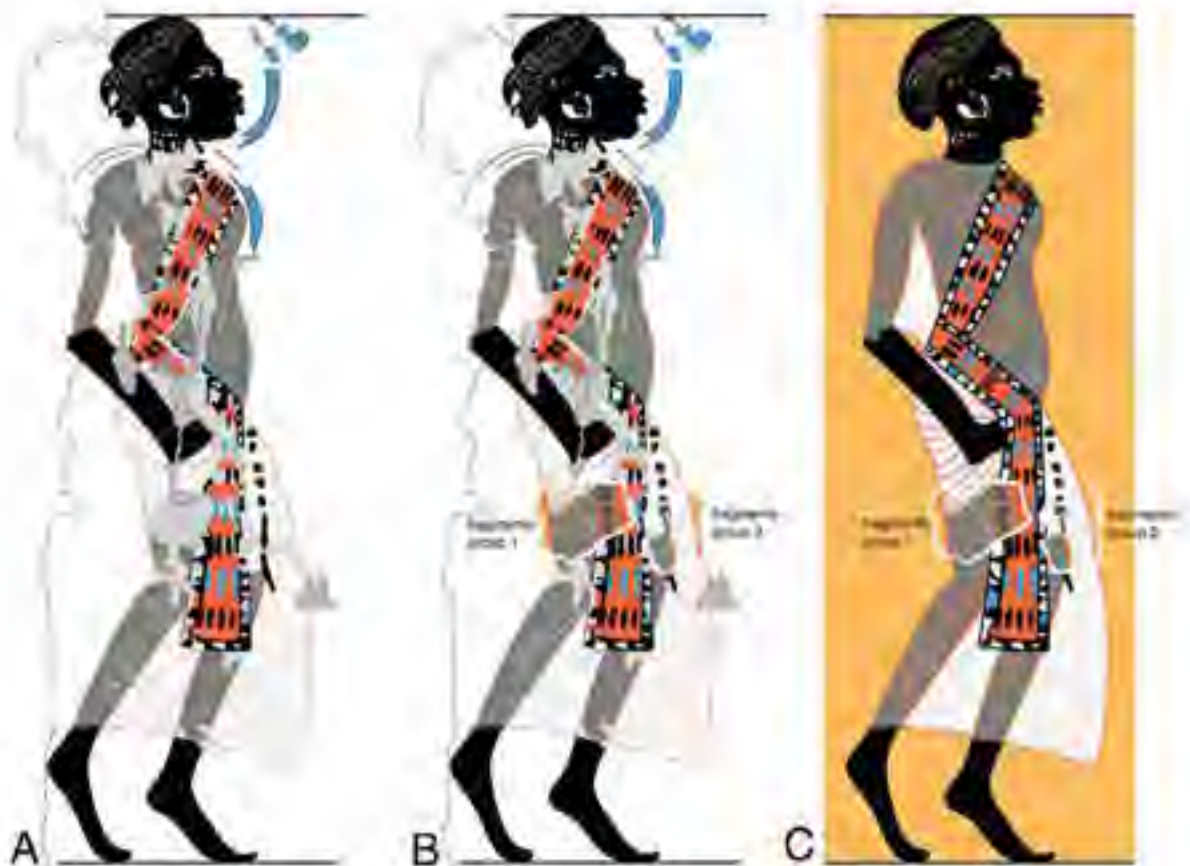


Figure 16. A: somewhat schematic rendering of the Nubian prisoner based on the Tutankhamun seat design; B: the same, with our fragments groups 1 and 2 added; C: a full colour reconstruction.

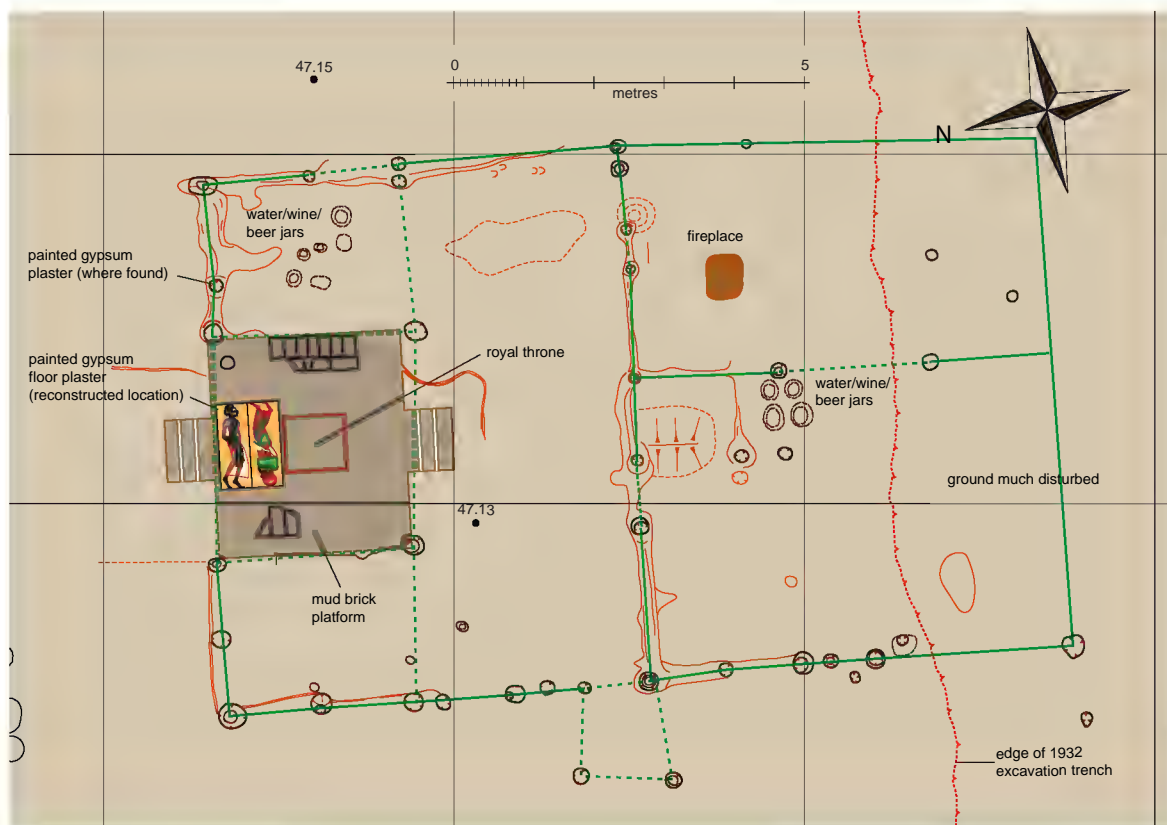


Figure 17. Reconstructed plan of the building above the post holes. The green lines show where wooden beams might have joined the vertical wooden posts. Those with broken lines are those only at roof level. Based on an original by Miriam Bertram.

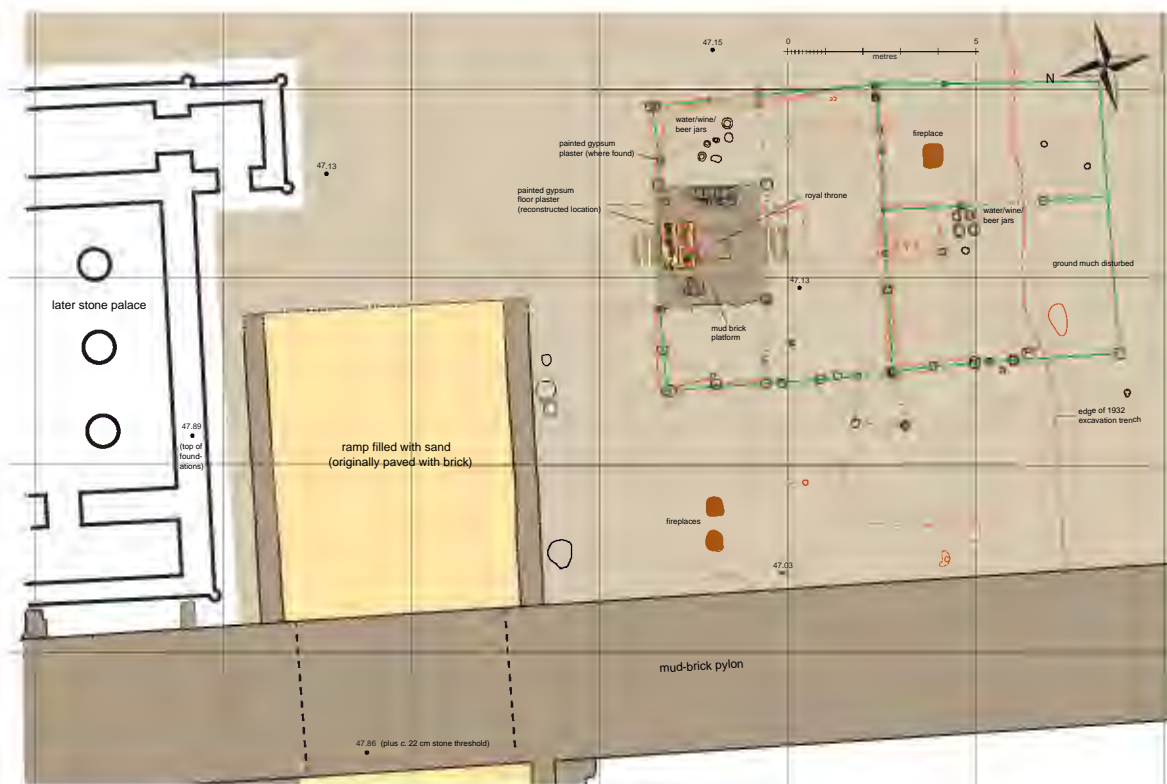


Figure 18. Plan of the area beside the main gateway into the temple enclosure. The wooden palace lies to the right of the entrance ramp. The plan of the later stone palace (left edge) is a reconstruction based on the evidence of the foundation platform.

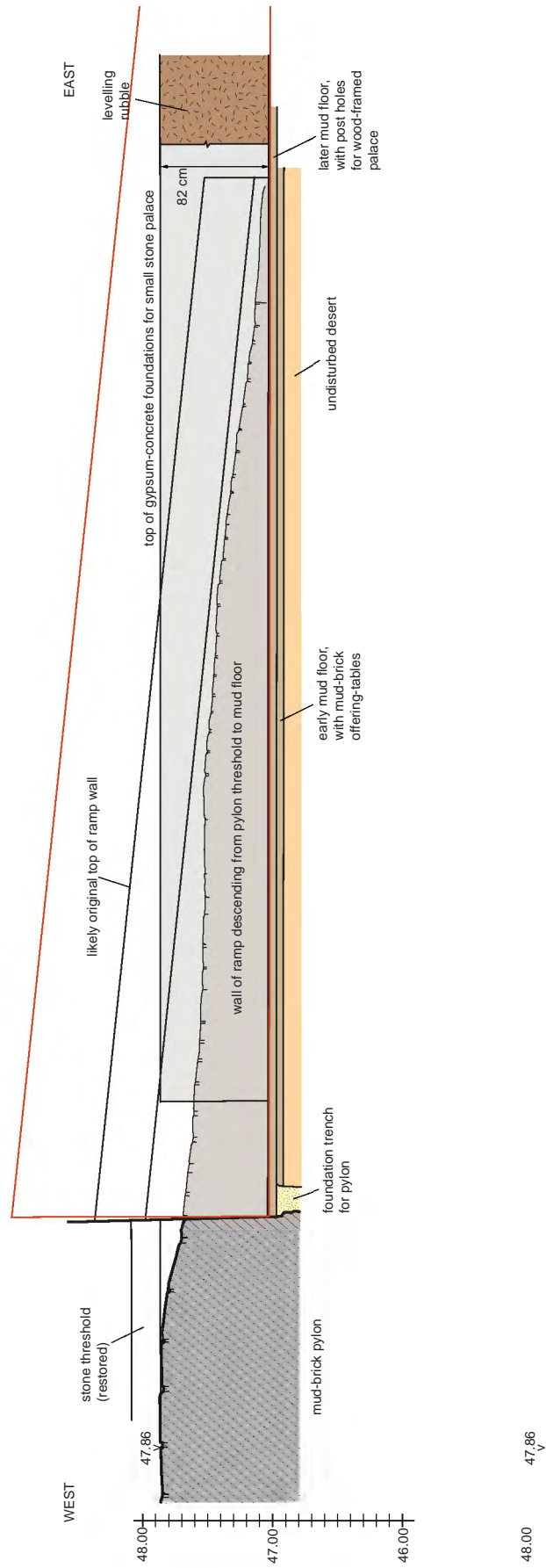


Figure 19. Schematic section to illustrate the relationships between the lower and upper surfaces at the front of the Great Aten Temple, along the central line of the inner (eastern) ramp which descends from the pylon entrance. Based on a section drawing by Anna Hodgkinson.

2. The southern field of offering-tables

As already noted, the broad east–west excavation trench of 1932 must have run along the southern edge of the second mud floor on which the wooden building was constructed. The digging of that trench had removed the second floor and so its southern edge was lost. The recent work of the expedition has extended the excavation into an area beyond the 1932 trench and so beyond the southern limit of the second floor. So far this area comprises excavation squares G25–J25, G24 and I24. It represents the beginning of a huge area of offering-tables which had been superficially examined by Petrie in 1891–2 and by Pendlebury in 1932. On the basis of spot samples across this southern zone Petrie estimated a total of 1215 offering-tables (judging by his plan) and Pendlebury 900 (although 920 according to the final published plan). On older plans they are shown side by side with the large stone temple, as if they were contemporary. Our own work has confirmed that they belong to the early phase and, having been buried by the levelling rubble, would not have been visible at the time the large stone temple was in use. (This does not exclude the possibility that they were replaced at the new, higher ground level, but of this we have no direct evidence.)

The archaeological context across the area so far investigated (2017, 2018) is fairly straightforward. Mud-brick offering-tables (where not damaged or largely destroyed as a result of having been left exposed by the older excavations) lie buried in the levelling-rubble to a maximum height of 74 cm, probably not far short of their original height (Figures 20, 21). They rise from a floor of mud plaster, generally in good condition, which rests on the natural desert surface. So far, we have exposed parts of two east–west rows (Figures 1, 20). According to the excavation plan of 1932 there should have been a further row to the north, the final one of the large area of offering-tables. Instead we find that the final row had been built from limestone blocks set on individual foundations of gypsum concrete. They have the same distances between them as the adjacent mud-brick offering-tables (and so further apart than the limestone offering-tables which appear, after a gap, to the north). Whereas the limestone offering-tables to the north had been removed before the later mud floor was laid down, the row to the south had been left to stand until the levelling rubble was laid down. Then, presumably so as to save good building-blocks for re-use, the stones were prised up, leaving the raw foundations (Figure 22).

This did not apply to the westernmost location, the last one in the row, however. In the place of an offering-table another of the rectangular foundations of limestone blocks had been laid in a shallow pit so that its top was flush with the desert surface, as was the case with the three further north (Figures 3 and 4). Whatever had then been erected on top was later removed, and the main mud floor laid over the top so that it became invisible (Figure 23). The clear covering of the stones by the main mud floor which showed no interruptions from the underlying stones helps to confirm that these stone bases were amongst the earliest constructions on the site.



Figure 20. Four mud-brick offering-tables in square I24. View to the south.



Figure 21. Four mud-brick offering-tables in square I24, seen from above. North is towards the top.



(Above) Figure 22. Parallel rows of offering-tables at the southern limit of the excavations. The further row of three (a fourth is off the picture to the left) is made from mud bricks. The nearer row had been made from stone blocks on gypsum concrete foundations. The stones had been removed before the levelling rubble had been laid down. The furthest stonework that is visible is a base made of limestone blocks which had later been covered by a mud floor and is not yet fully exposed. View to the south-west.



(Right) Figure 23. View to the south along the westernmost row of offering-tables in squares I24 and I25. The third offering-table from the viewer has been partly uncovered from the sand and dust which was put down to protect it in 2017. The fourth is still covered. In the foreground is the still only partially exposed stone foundation later covered with mud plaster.

3. The entrance to the stone temple in its final phase

The large stone temple (the Long Temple, often assumed to have had Gem-Pa-Aten as its ancient name) which became the dominant feature of the site was only begun in or after Akhenaten's 12th regnal year, although an earlier stone Aten temple is known to have stood on the same ground. One of the aims of the present expedition is to clean the surviving foundations which have the form of a thick layer of gypsum concrete which, in many places, preserves the impressions of the original limestone building blocks in gypsum mortar (Figures 24, 25); and then to plan them at a scale of 1:25 (Figure 26). These had been exposed in 1932 and planned at a smaller scale (probably 1:100) by the architect Ralph Lavers for the publication *City of Akhenaten III*.

The foundations comprise a spread of gypsum concrete on a surface of original desert (*gebel*) which is here compacted sand of an orange hue. The surface that was used was, on the line of temple front, c. 70 cm below the surface on which the mud floor further to the west was laid (46.60 m compared to 47.30 m). The reason for lowering the floor level of the temple in this way is probably to be explained as a consequence of the digging up of the foundations of the earlier temple which had occupied at least part of the same area and which would have disturbed the natural compacted sand. Fragments from the foundations and stonework of this earlier temple became incorporated into the foundations of the later temple. The desert has a slight natural upwards slope towards the east, reflected in the way that the gypsum concrete foundation layer which was now laid down rises in a series of low steps as one moves eastwards. The builders also followed an economy measure regularly seen in the foundations of stone buildings at Amarna. Where there were to be significant gaps in the stonework, gaps were left in the concrete foundation. In the case of the outer courts of the temple these gaps ran around the edges of the courts (to a width of c. 5 m) and in places also along the central avenue between the offering-tables (a short stretch visible at the top of Figure 26). The builders marked the positions of walls and offering-tables on the foundation layer and then laid stones to reach the intended floor level. At the western end of the first court this was 1.80 m higher. The result would have looked like the lower part of a hall of pillars, but with stonework that was not intended to be seen. The spaces between them and around the edges of the courts were then filled with sand. The building of the parts intended to be seen — offering-tables and walls — then continued, and the top of the sand was covered with a second thick layer of gypsum concrete and over this a layer of paving-stones was laid.

When the stonework of the temple was methodically removed after the end of the Amarna Period, the blocks of the foundations were dug out, and for this the upper concrete layer must have been broken up where stonework occurred. Around the edges of the courts, however, it was not necessary to do this and, although the paving-stones were removed, the concrete foundation was left. Extensive areas of it still survive along the north and south sides of the first court (Figure 26).

Pendlebury and Lavers, in 1932, misinterpreted the remains. Lavers marks on his plan (Figure 28) the surviving areas of the sand, with concrete covering, as areas of 'gebel platform'. In his reconstruction drawing (Figure 29) the offering-tables sit on the floor of large pits surrounded by raised walkways (the 'gebel platforms') including a central raised avenue. In fact, although the rear courts of the temple might, as a whole, have risen a little, everything within the temple boundary wall was at the same paved level from side to side. Lavers' sunk areas are foundation pits which had actually been filled in with sand and paved over. The reason for being confident in this conclusion is that where we have removed the sand fill beneath the upper concrete layer, or where it has slumped since 1932 as a result of weathering, pieces of worked stone and fragments of broken gypsum concrete and mortar from an earlier building regularly appear. They have included the legs from a small granite statue of a princess. Lavers' 'gebel' is actually redeposited sand used to build up the floor level and is the equivalent to the levelling-rubble outside the temple. Inside and outside the temple the ground and floor level was the same.

A significant observation is that the upper concrete layer (support for paving-stones), even when laid over 1.80 m of redeposited sand, was strong enough to remain stable without subsidence across widths of up to 5 m without

underlying stonework to stabilise it. Whenever the multitude of offering-tables was serviced, given their close spacing, crowds of temple servants must have walked across these areas.

At the west end of the temple the lower concrete foundation layer extended beneath a pair of relatively narrow pylons each with a width of 3.30 m (Figure 25). The ground to the west was then developed in a different way. Was a different group of builders responsible? The plan was to erect two sets of eight gigantic columns on either side of a wide paved area, 8.48 m across. The existing ground here must have lain outside the front of the earlier temple. The mud floor of the earlier period runs beneath the central paved area and, more or less at its eastern end, the remains of at least one mud-brick offering-table are recognisable standing on it (Figures 34, 35). The builders dug trenches down roughly to the same level reached in creating the foundations for the temple itself (Figure 24), cutting into the earlier mud floor (Figure 41). The trenches defined two large rectangles, each in front of one of the pylons to be built and where the columns were to be erected. They were joined by the wall which defined the western edge of the central paved area to come. Walls of stone blocks were built in the trenches, creating three adjacent box-like spaces. In the two larger ones where the columns were to rise, measuring 18.95 x 10.10 m (Figures 26, 27), the mud floor and underlying *gebel* were removed. The space so created was filled with foundations for the huge columns. Where each column was to stand, stiff concrete was heaped up (not poured) in the form of a square support (Figure 30). Their size suggests a diameter of column base of c. 2.5 m. The sides of the square supports, where not against the surrounding wall, were linked with short walls made in the same way. The tops of these constructions were, here and there, still traceable when we cleaned the tops of the platforms. Small stones were then used to fill the intervening spaces for around half the depth. The remaining depth was filled with more concrete. Over the whole surface a layer of paving-stones was laid, the pattern of the stones reflecting the locations of the buried supports for the columns which were laid over the paving-stones. (The impressions from those on the southern platform have remained fairly clear whereas those on the northern platform have been extensively weathered.) The height of this floor was the same as the top of the levelling-rubble outside the temple and as the paving-stones inside the temple.

The central compartment, where the paved approach to the pylons was to go, was prepared differently (Figures 31, 33–42). The mud floor (supporting the stump of at least one mud-brick offering-table) was left in place. This earlier mud floor was, of course, lower than the top of the levelling-rubble which was to be laid down outside the stone temple. A layer of sand, c. 30 cm deep, was used to cover it. Over this came foundations made from gypsum concrete for the pavement which, at a higher level, continued the pavement beneath the nearby columns. Instead of it being a single layer as found elsewhere in the temple, however, it has an internal structure of its own. The results of the 1932 excavation were recorded by the architect Lavers (Figure 32). His plan of the general outline and the layout of the block-marks is reasonably accurate and also shows that wide strips along both the north and south edges have been lost since then. What the *City of Akhenaten III* publication does not communicate is that the concrete incorporates a separately made structure at the lower level, resting on the 30 cm bed of sand.

A concrete foundation bed [17498], 3.7 m wide, was laid along the axis on this sand bed (Figures 31, 41, 42). Two parallel rows of limestone blocks, each with a width of two blocks end-to-end as headers, were laid on this, leaving a gap of 1.5 m between them. The builders then added a further 10 cm or more of concrete in the intervening space to create a thicker foundation bed [17878] for a central strip of blocks. This pattern of construction extended for the full length of the paved area (a distance of 19 m, although both ends had been lost by the time that Lavers planned it). Another 30 cm of sand was now added, and a further bed of gypsum concrete [17876] laid over it, covering the side strips and joining the foundations for the large columns. Paving-stones were laid on this. Of this bed nothing now survives on the north side, but a narrow strip is preserved on the south. A small patch of the mortar for one of the slabs is preserved at the eastern end, at a level of 48.11.

Towards the western end the foundations are interrupted by an area where some of the original blocks survive as well as more of the upper layers of pavement foundation. The reason for the survival of this patch of extra

masonry is a rare (and very minor) case of structural failure. The stone blocks over this patch had been laid either before the lowest layer of concrete [17498] had properly dried or because the deep sand on which it rested had settled slightly. As a result, the weight of the blocks had caused them to sink a little into the concrete foundation layer, which had also sagged slightly. This had increased the difficulty of lifting them when the time came for the building to be demolished after the end of the Amarna Period. As a result, the blocks had been left behind. In consequence this area fortuitously preserves a thicker section of the construction system (Figure 42), which had been followed for the entire length of this area of pavement.

The pictures of the temple in the tombs of Meryra (where it is shown twice) and Panehsy give prominence to a platform on which Akhenaten and Nefertiti stand to make offerings to the Aten (Figure 43). In one of the two versions in the tomb of Meryra the means of access is shown as being a flight of steps rather than a ramp. In all three cases the platform is shown on the far side of the pylon entrance, within the first court of small offering-tables. The foundations we are considering are consistent with an ascending approach to a platform located between the pylons. The central reinforced strip would represent the line of the staircase, and the wide, flanking stonework the foundations for a narrow balustrade on either side, giving a total width of 3.7 m. Such side walls, of double header-blocks, have the thickness of the side walls to several ramps or staircases at the Great Palace (although the ramps were up to 6 m wide). With a low angle of ascent, similar to the angle of the brick and sand ramp east of the brick enclosure wall, the slope would have reached a height of around 2 m, which would have been the floor of the platform. This would have had the character of an observation platform from which the sun could have been observed appearing above the line of the horizon to the east. To judge from the tomb pictures it was also provided with a table on which offerings of food, bouquets of flowers and bowls of incense could be placed. (It should be noted that the large and equally detailed picture of the temple which occurs twice, on opposite walls, in the Royal Tomb (chamber alpha) does not show an offering-platform, although the picture was probably completed before work had progressed far on the rebuilding of the temple.)

The ancient decision to add 10 cm to the central staircase strip had left the blocks 10 cm higher than the blocks for the balustrade supports. So that the original builders could resume their work with a single flat surface to work from, they carried the foundation layer for the flanking paved areas ([17876] also of 10 thickness) over the balustrade blocks as well. On this they started again to lay the extra blocks for the staircase. One explanation for the extra thickness of gypsum concrete below the staircase is that the steps themselves were made from a denser (and thus heavier) stone, which could have been alabaster (with a density twice that of ordinary limestone) which is known to have been used at least for floor slabs (in the Great Palace).

The presence of this construction and its width has a profound effect on how we reconstruct the front of the temple. It makes the platform the centre of attention and activity, framed by the widely set pylons and giant colonnades on either side. In the reconstruction offered here the pylons are set 8.4 m apart (not including the two nibs, which are an optional feature). The pylons of the Small Aten Temple (and one in the southern wall of Kom el-Nana) also have an unusually wide space between them (between 9 and 12 m in the former case, ignoring the brick nibs; at least 7 m in the latter case, where there were no nibs). These spaces were too wide to be closed by doors. In the case of the Small Aten temple the seclusion of the rear of the Sanctuary was achieved by the building of parallel offset walls behind the final stone pylon of the sanctuary which allowed access but blocked the view from the outside. (It is possible that the rear part of the Long Temple had the same arrangement, to judge from Lavers' plan.) At the first pylon of the Small Aten Temple the wide space between the pylons has been reconstructed (by the present expedition) as having a low square platform of stonework. This is a modern interpretation of the foundations which relies not only on the surviving foundations themselves but also on marks on the northern face of the brick pylon which shows that it incorporates a sloping ramp towards the base. The platform had, however, been added only in the reign of Smenkhkara. It is not clear what had preceded it.

The expedition has been fortunate this year to have the assistance of Paul Docherty (of www.amarna3d.com) who provided a series of visualisations of both the current new stonework being laid and of the likely original appearance of the staircase and platform (Figures 49–52). A key source for the original appearance is the small shrine found (in 1926) in the northern house of Panehsy, itself close to the southern boundary wall of the Great Aten Temple (Figures 53, 54). The decorated stonework from the shrine is in the Egyptian Museum, Cairo. When discovered, the stones which formed the beginning of the access staircase were still in place, but seem not to have been kept and do not appear in the museum display (they are no longer in the ruins of the house). Their importance is that they preserved the beginnings of the balustrades which had run along the centre of the wide stonework which ran on either side of the staircase. This is the basis for Paul's reconstructions of the balustrades at the Great Aten Temple. Balustrades made from granite, quartzite, indurated limestone and basalt were used at Amarna, many fragments having been found at several of the most important buildings at Amarna (including in all these materials at the Great Aten Temple). The Panehsy shrine provides the basis for the design of the specially cut blocks which will mark the beginning of the staircase in our reconstruction.

Re-creation of the temple outline in new stonework

After the Amarna Period had ended, later kings (beginning with Horemheb) stripped Amarna (including the Great Aten Temple) of its stonework. All that was left were areas of foundation beds made from gypsum concrete on which the outlines of the walls were often preserved. The current programme (which began in 2015) is to mark, in new stones, the outlines of the main stone temple. In part this is to help visitors to visualise the size and general appearance of the temple; in part it is a measure to protect the site by advertising its presence and, in particular, to create a firm boundary line with the local modern cemetery, the boundary line being the original north wall of the temple. In view of the depth of the original foundations, much of the new stonework (which will eventually be buried and invisible), is of small local blocks set in common cement. One course of *talatat*-sized blocks in fine Tura limestone is then laid on top, and this will be the part permanently visible. This is the work of a team of builders from the village of El-Till, led by Shehata Fahmy Abd el-Sittar.

By the end of 2018 they had completed the reconstruction of the north and south pylons, most of the surrounding walls for the north and south platforms on each of which eight large columns had been originally set up, the eight circular pads of white concrete (2.5 m in diameter) to mark the positions of the northern set of columns and the square foundations for the southern set. The pylons are separated by a wide gap, of 8.4 m. This would have supported a threshold of stone paving slabs at the same slightly raised level (30 cm) as the pavement on which the staircase stood. This elevation is preserved by a small patch of concrete ([17876] at height 48.11) beside the foundations for the staircase. As a preparation for the threshold, the builders created a network of narrow rectangular compartments built from small limestone blocks from local quarries and laid in normal cement. They were built so that the walls between them could support paving slabs of the same length (52 cm) as the main building stones and also cut from Tura limestone. The compartments themselves have been filled with sand to provide a solid support.

Another active part of the programme is to mark the line, to a similar height, of the entire north wall of the temple, a length of c. 200 m. The north-west end, where it leaves the north pylon, has been started. In order to ensure that it follows a straight course, the north-east corner was also located in 2017. Much of the original foundation layer of gypsum concrete was cleaned and a new plan made (Figure 55). Following this, the lines of the east and north walls and of the intersecting corner were established. Because the ground rises around the corner, the Tura blocks were laid at a level equivalent to a second course as they approached the corner (Figure 56). Newly-dug sand was heaped against the inside face of the walls, to a level approximating to that of the original floor level.



Figure 24. In the background the team of builders works on the south pylon. The wall trench that runs towards the viewer is being brushed as a detailed plan is made, prior to covering the floor with sand, and filling the trench with stone foundations. View to the east.



Figure 25. The foundation bed for the southern pylon, showing the impressions of talatat-blocks. View to the south.



Figure 26. A portion of the excavation plan of the Great Aten Temple. It shows (at the top) the west half of the first court of offering-tables; below is the site of the pylon-flanked entrance and foundation platforms for the two sets of eight large columns.

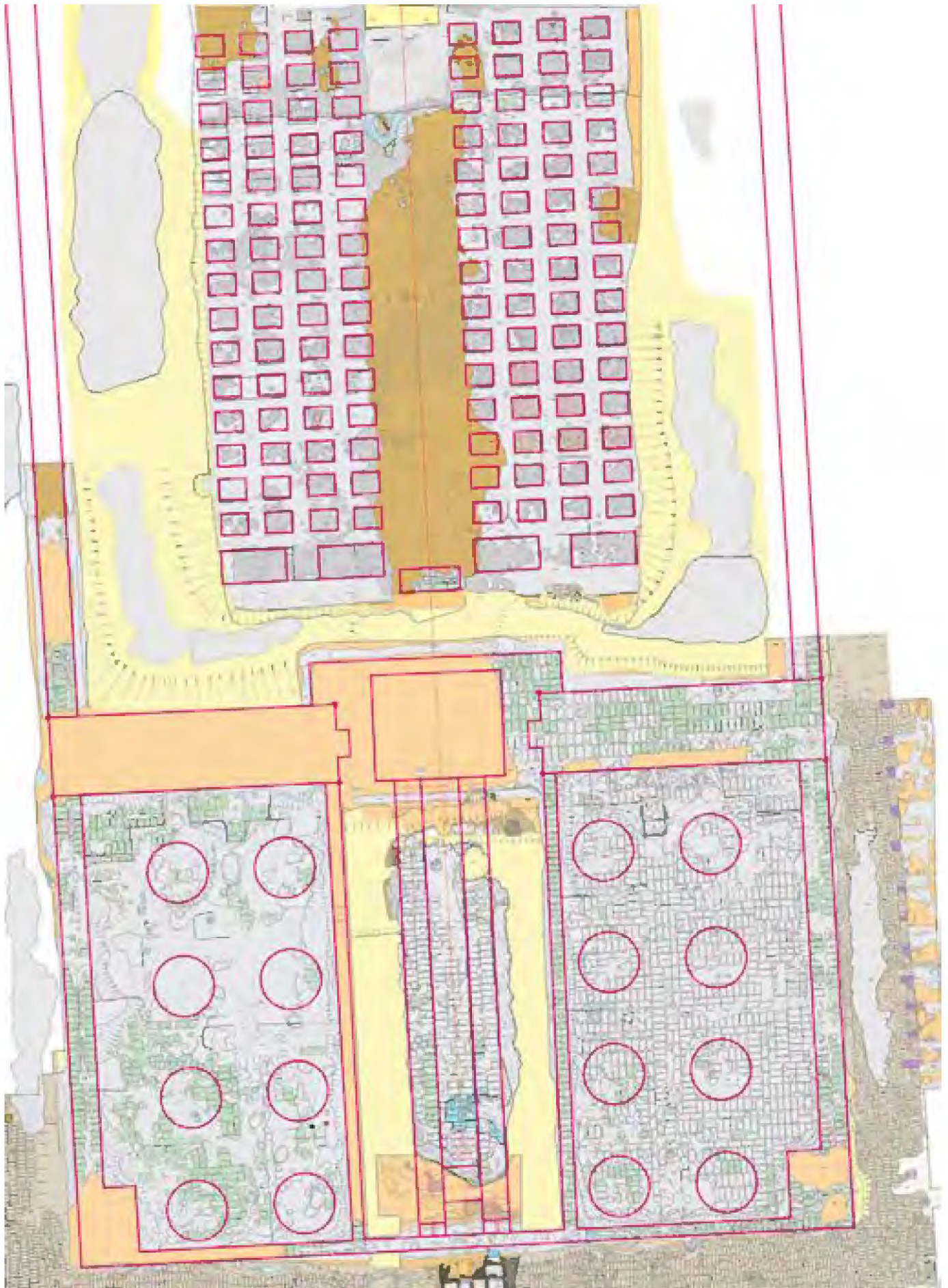


Figure 27. A portion of the excavation plan of the Great Aten Temple. The red overlay lines are those to be followed by new stonework and by cement markers for columns.

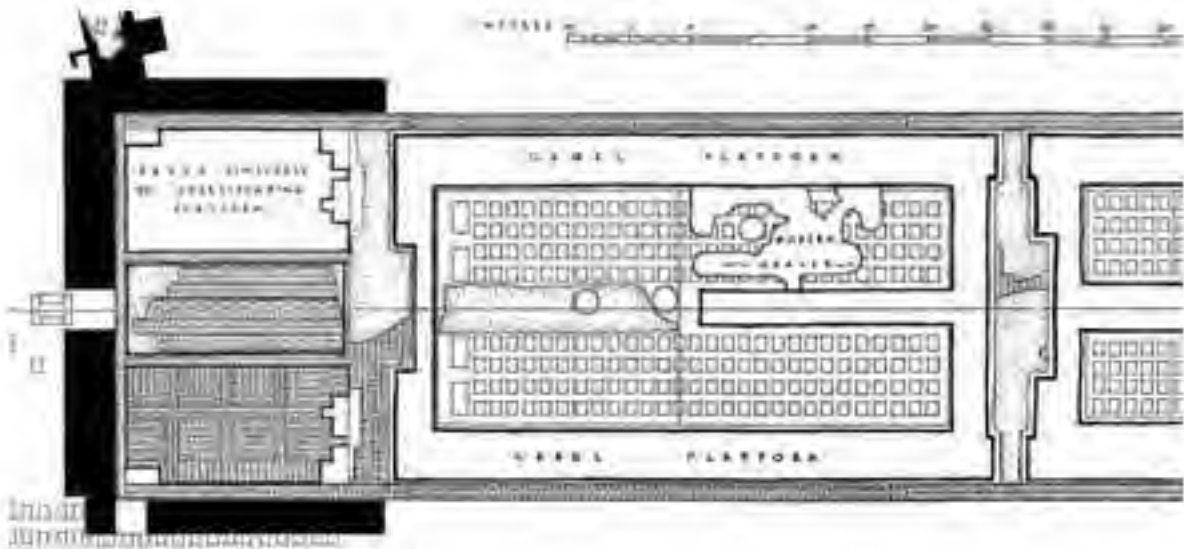


Figure 28. Lavers' plan of the front part of the Great Aten Temple. The offering-tables inside the temple lay not on a sunken floor surrounded by platforms (each marked 'gebel platform' on the plan) but on a floor at the same level as the rest of the temple. Lavers' plan is in *City of Akhenaten III*, Pl. III.

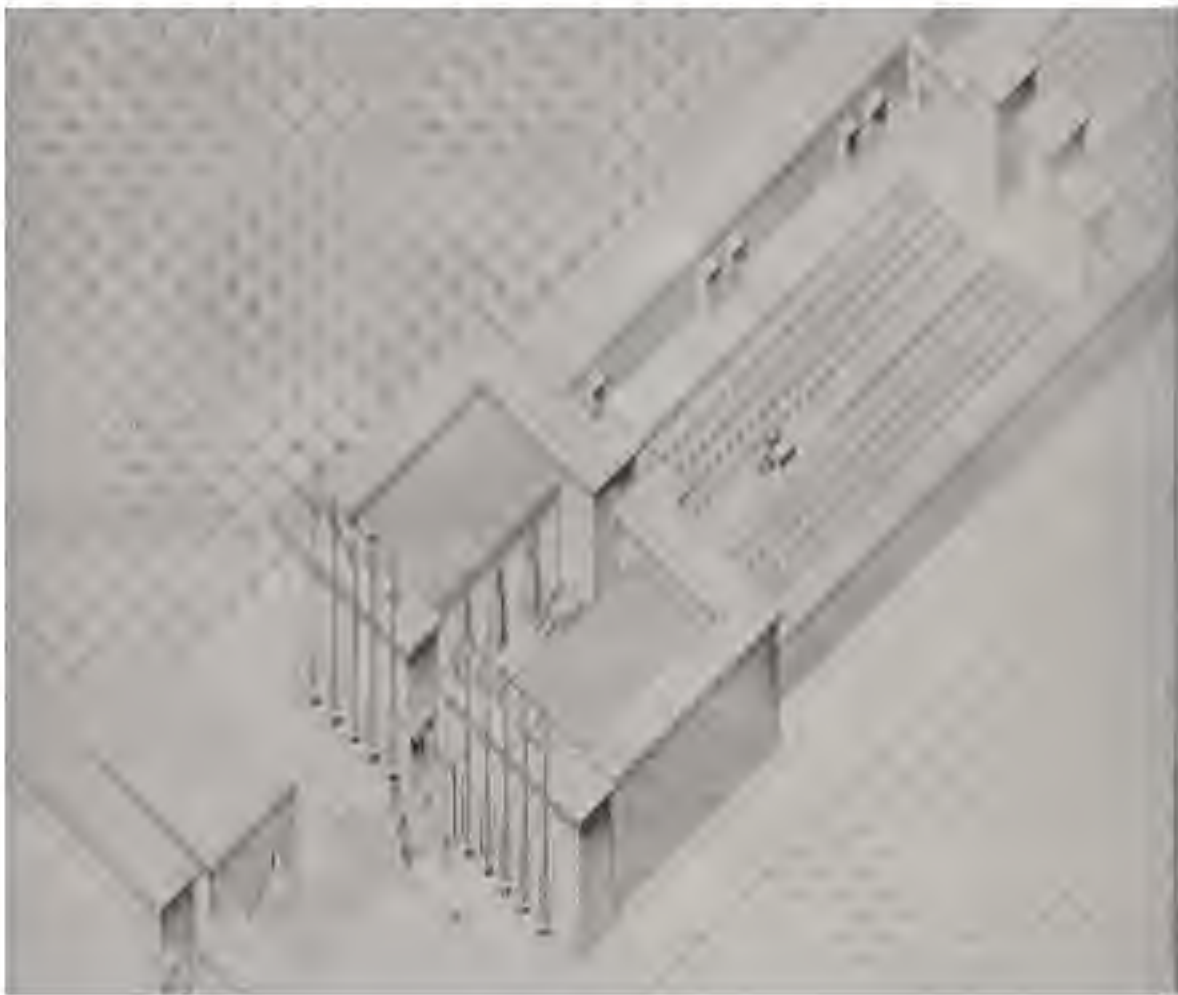


Figure 29. Lavers' reconstruction of the front part of the Great Aten Temple. For the presentation of the twin colonnades as the sides of a single hall with pylons Lavers assumed that the thick brick walls around the three sides of this front portion rose as full-height walls, whereas they were a temporary construction not visible when the temple was finished. The offering-tables inside the temple lay not on a sunken floor surrounded by platforms but on a floor at the same level as the 'platforms'. Lavers' reconstruction is in *City of Akhenaten III*, Pl. VIA.

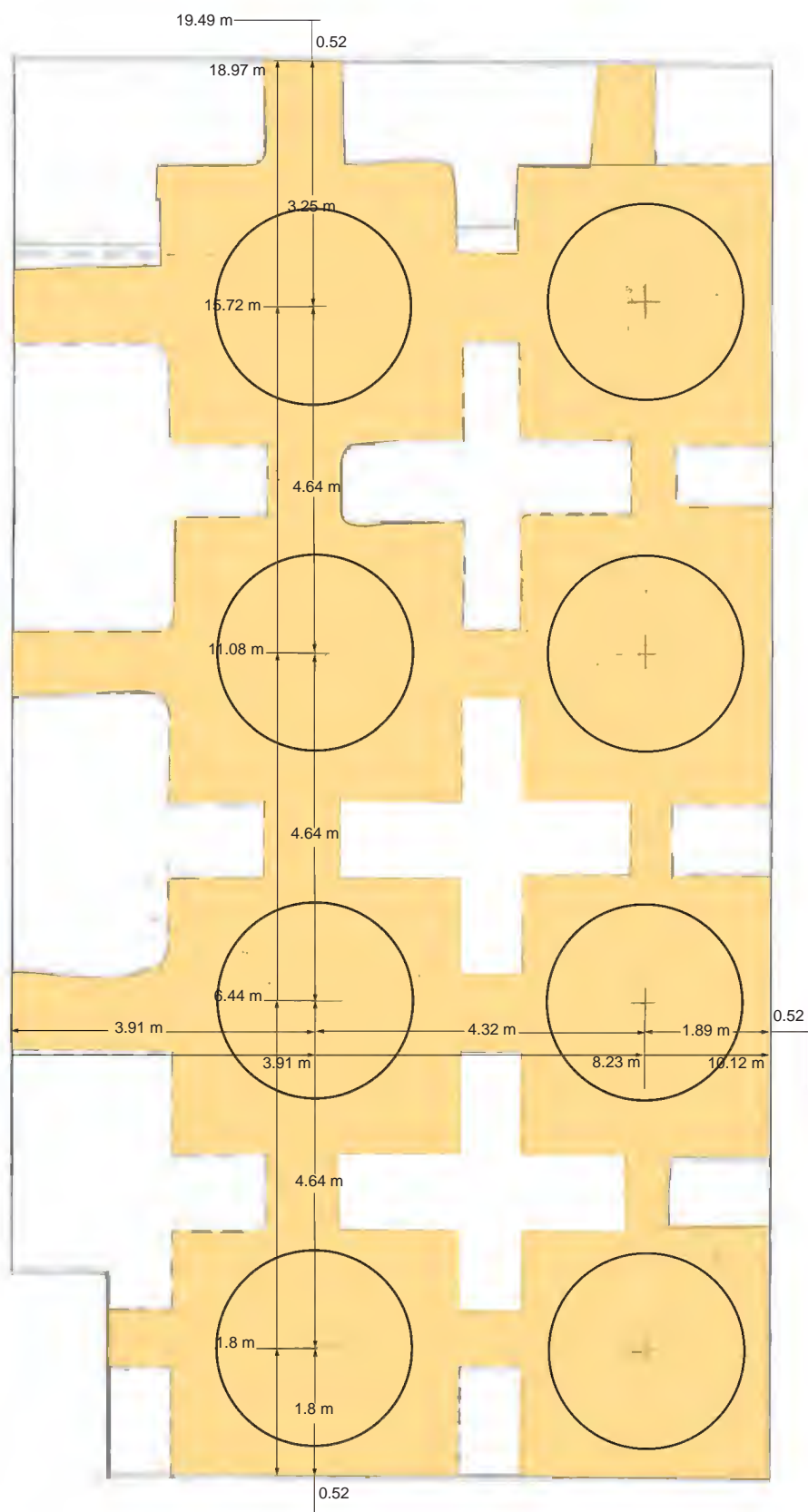


Figure 30. Plan of the foundations for the columns in front of the North Pylon. The portions coloured yellow represent gypsum concrete. The spaces in between were filled with fine gravel topped with more gypsum concrete.

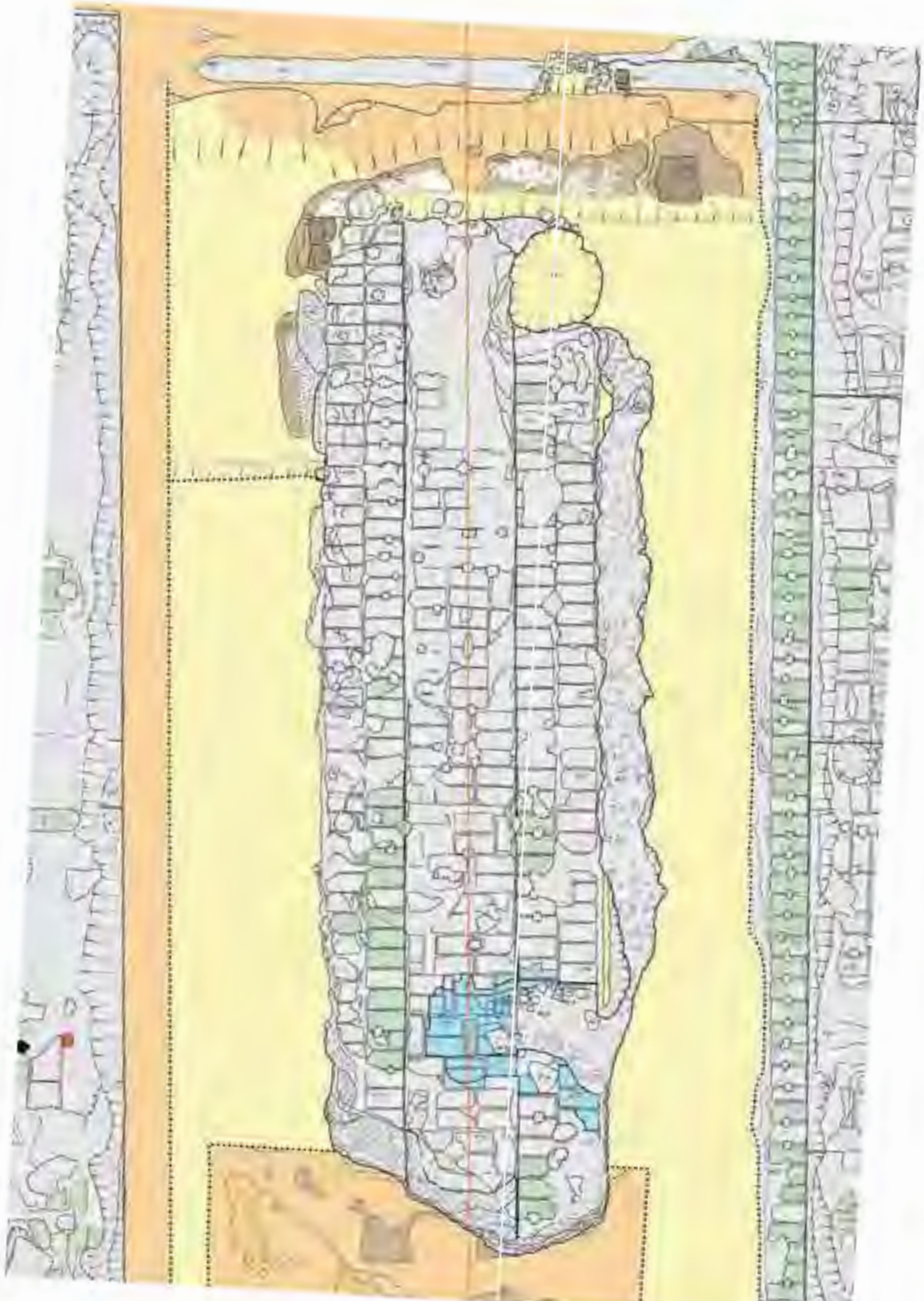


Figure 31. Plan of the foundations for the pavement to cover the space between the two platforms which supported the large columns in front of the pylons. The plan is also part of Figure 26. Original by Juan Friedrichs.

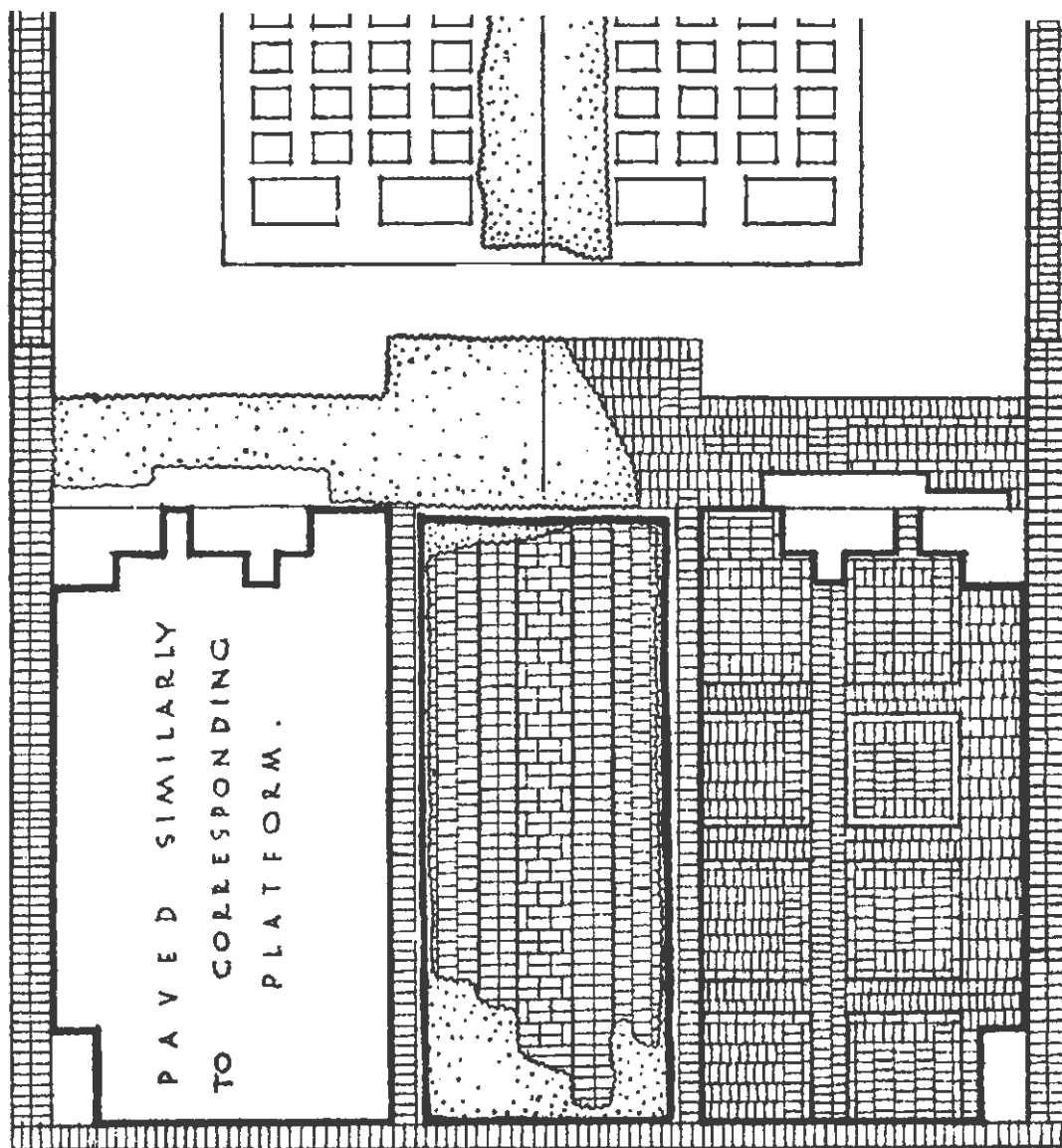


Figure 32. The 1932 plan of the area in front of the temple by Ralph Lavers. After *The City of Akhenaten*, III, pl. III.



Figure 33. View westwards along the axis of the staircase foundation in front of the temple entrance. In the low foreground the earlier mud floor is visible, separate from the gypsum concrete by c. 30 cm of sand.



Figure 34. North-east corner of the staircase foundation in front of the temple entrance. Loss of sand beneath the gypsum concrete foundation has led to a large fragment of the latter breaking off. It lies on the earlier mud floor. To the right are the remains of a mud-brick offering-table which belongs with the earlier mud floor.



Figure 35. North-east corner of the staircase foundation in front of the temple entrance, viewed to the south. The earlier mud-brick offering-table and adjacent mud floor and remains of white covering are emerging from beneath the covering of sand and gypsum concrete foundations.



Figure 36. The western end of the staircase foundation in front of the temple entrance. The low mound in the middle consists of the remains of limestone blocks still in their original place. View to the south-west.



Figure 37. The western end of the staircase foundation in front of the temple entrance. The low mound in the middle consists of the remains of limestone blocks still in their original place. View to the south-east.



Figure 38. Vertical view of the mixture of limestone blocks still in their original position and surrounding gypsum concrete from beneath the upper pavement. South is towards the top.



Figure 39. Vertical view of the limestone blocks of the staircase foundation still in their original position (A) and the adjacent surviving extra layer of concrete foundation (B) over the blocks of the balustrade foundations. East is towards the top.



Figure 40. View to the east of original limestone blocks still in place towards the west end of the staircase foundation in front of the temple entrance.

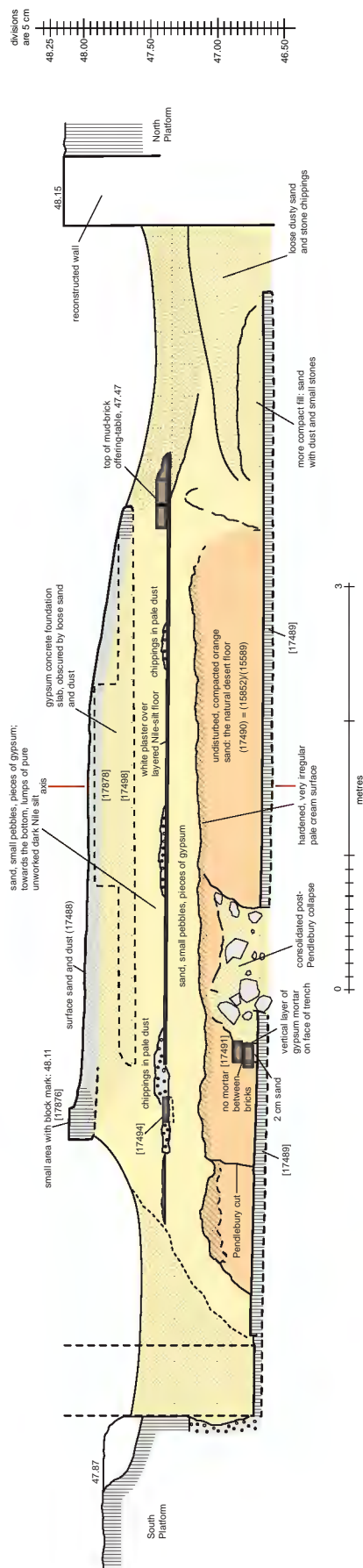


Figure 41. Section across the staircase foundation at the east end, where it rises above the foundation trench cut into the natural desert floor to receive the foundations for the stone pylons.

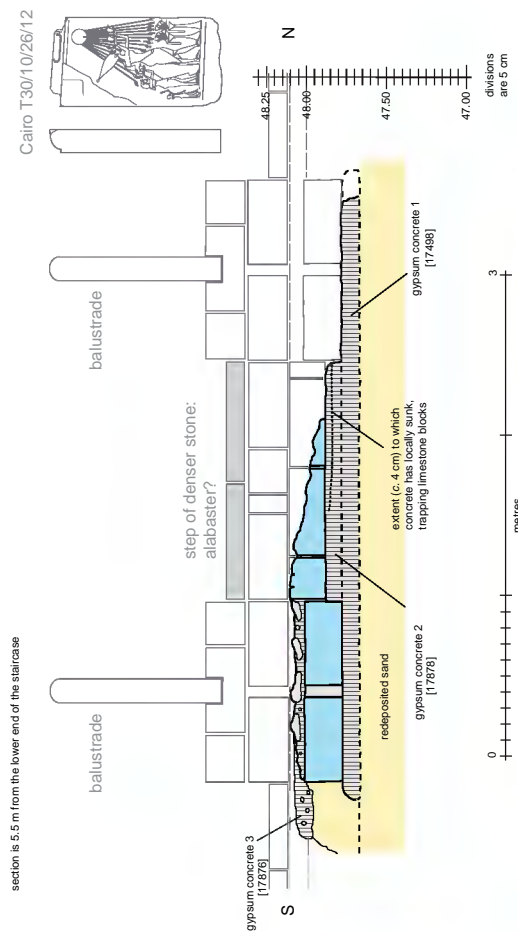


Figure 42. Section across the staircase foundation, showing how the masonry might have risen above the existing foundations.



Figure 43. Two pictures in Amarna tombs of the main offering-place in the House of the Aten. Above: in the tomb of Panehsy (after Davies, *The Rock Tombs of El Amarna II*, Pl. XVIII). Below: in the tomb of Meryra (after Davies, *The Rock Tombs of El Amarna I*, Pl. XII).

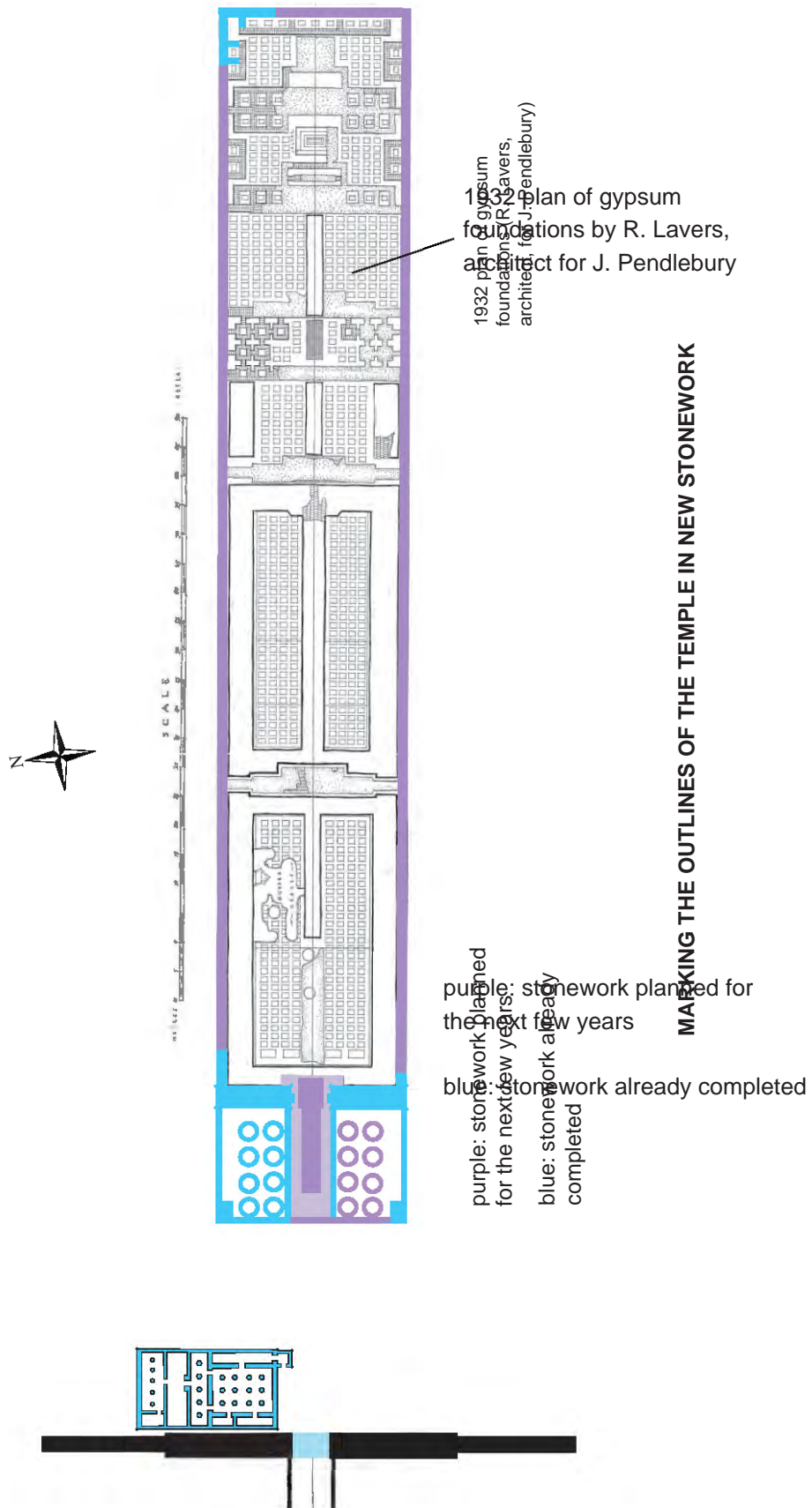


Figure 44. Plan of the Great Aten Temple, showing where the new lines of stone blocks and column bases are to be laid.



Figure 45. In the foreground is the North Pylon, reconstructed in 2015. Beyond are the foundations for the South Pylon, completed this year (2018). View to the south.



Figure 46. Foundations for the pavement between the pylons. The compartments were later filled with sand.



Figure 47. Foundations for the pavement between the pylons. The compartments have been filled with sand ready for the paving stones (of Tura limestone) to be laid over the top.



Figure 48. Work carried out on the southern half of the temple entrance system. The squares made from small limestone blocks are foundations (which will be covered with sand) for circular pads of white cement, each one 2.5 m in diameter, which will represent the eight large columns which originally stood here.

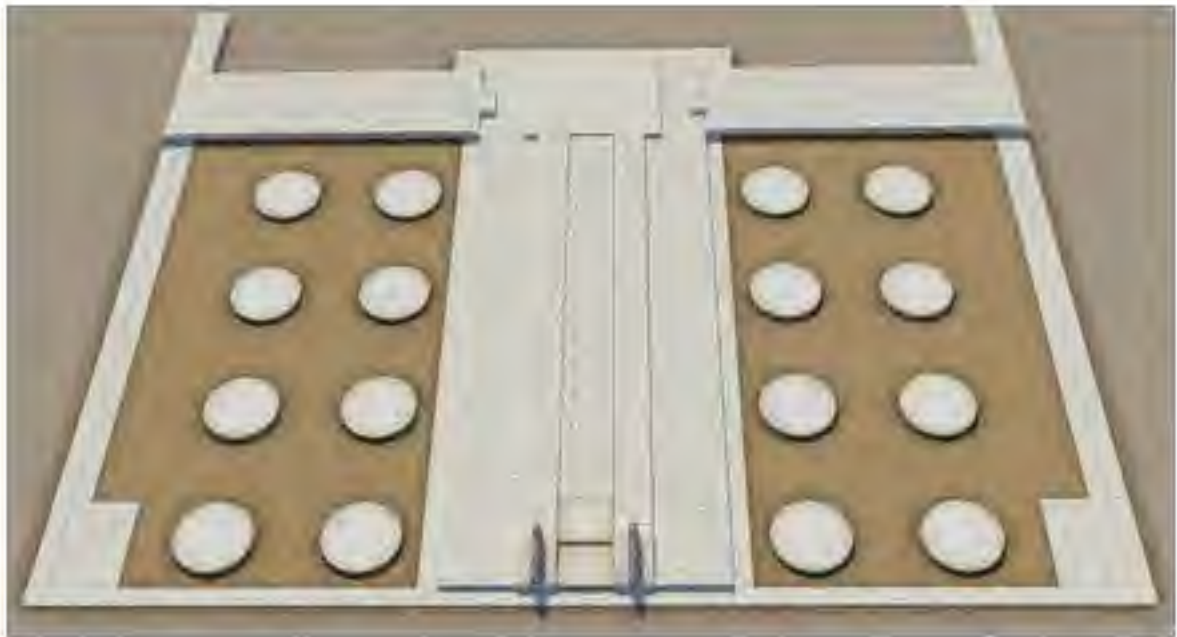


Figure 49. Visualisation of how the stonework at the front of the Great Aten Temple will look when completed. Artwork by Paul S. Docherty, www.amarna3d.com.



Figure 50. Visualisation of how the reconstruction scheme at the Great Aten Temple will look when completed. Artwork by Paul S. Docherty, www.amarna3d.com.

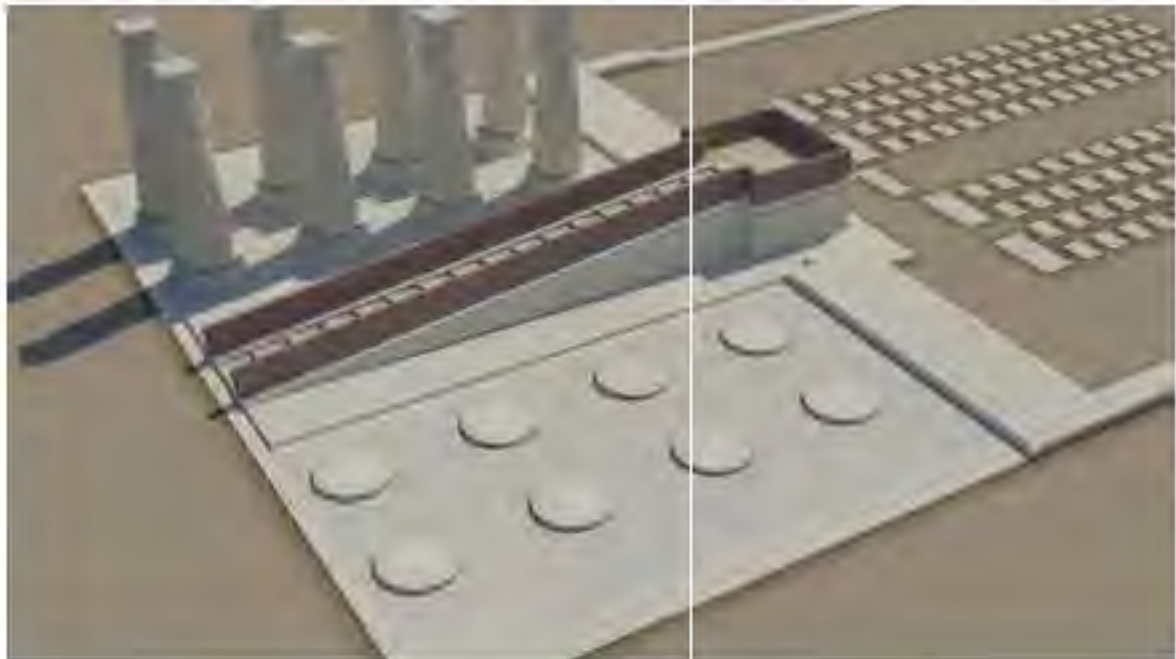


Figure 51. Visualisation of how the platform might have originally looked. Artwork by Paul S. Docherty, www.amarna3d.com.

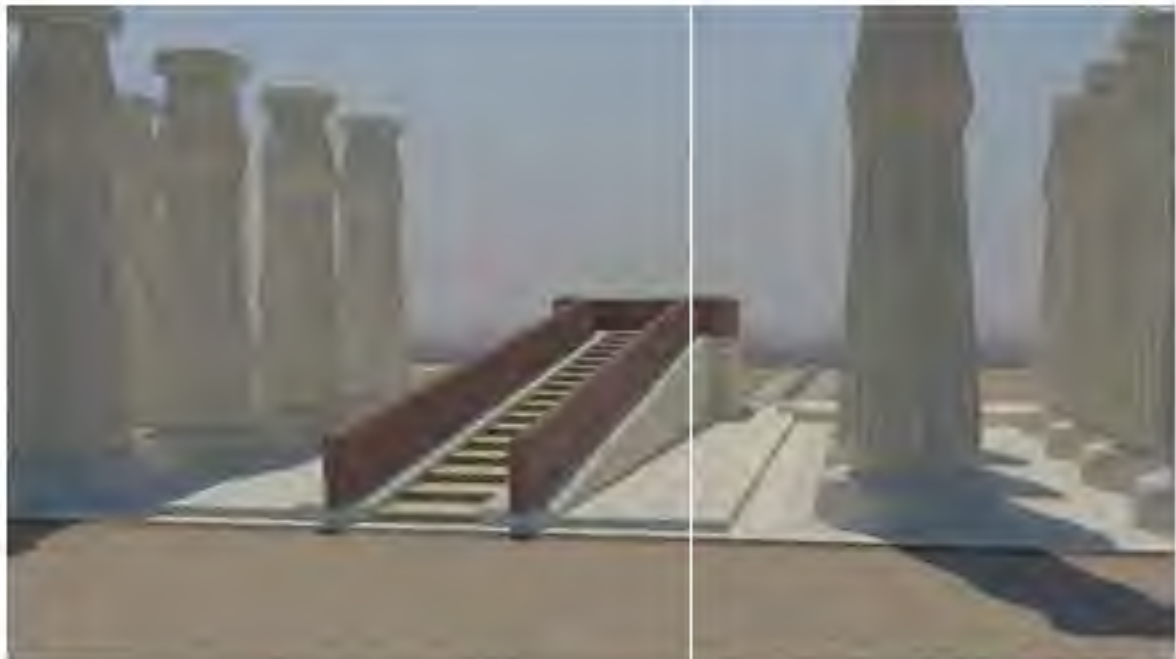


Figure 52. Visualisation of how the platform might have originally looked at the moment of sunrise. Artwork by Paul S. Docherty, www.amarna3d.com.

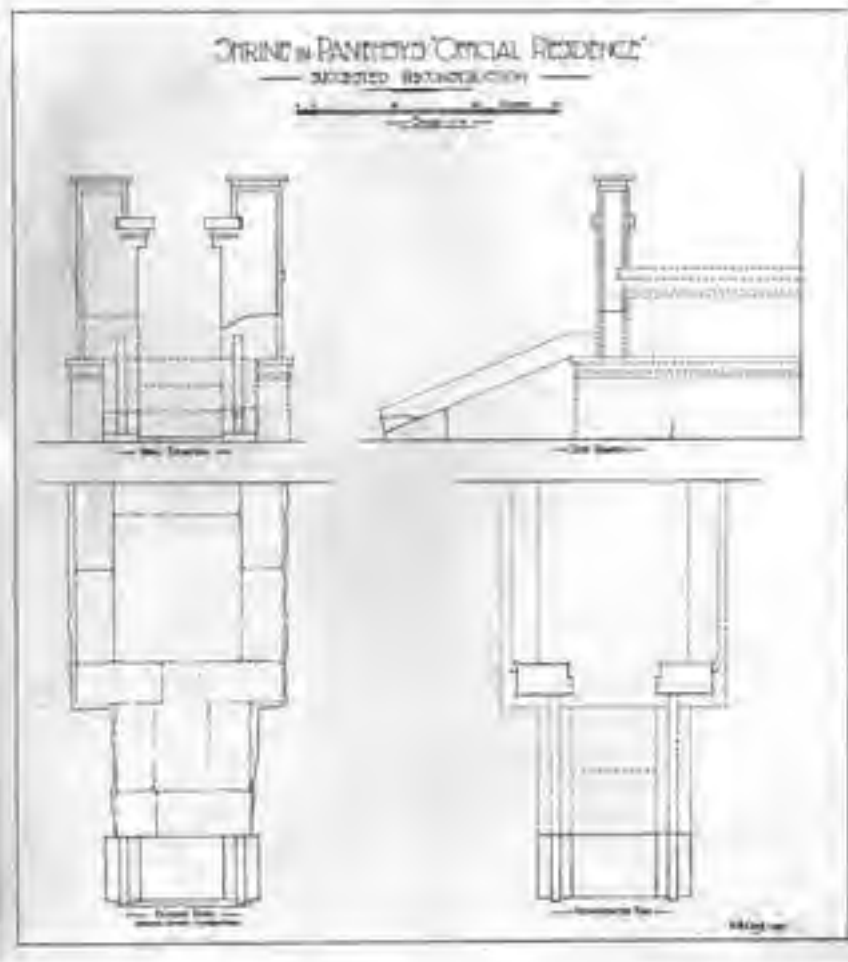


Figure 53, Plan and elevation drawings of the shrine in the northern house of Panehsy, made by H.B Clark, 1927. EES archive negative 26/108.



Figure 54. Photograph of the remains of the shrine in the northern house of Panehsy. Note the blocks at the beginning of the staircase which still preserved the beginnings of the balustrade. EES archive negative 26/06.



Figure 55. North-east corner of the temple: cleaning sand from the original gypsum foundation layer.



Figure 56. North-east corner of the temple: the corner recreated in new stone blocks. The sand is being added to build up the ground level to the bottom of the top layer of Tura-limestone blocks.

Notes

Section 1

The Petrie and Pendlebury excavations are reported in W.M.F. Petrie, *Tell El Amarna*, London, Methuen, 1894; J.D.S. Pendlebury, *The City of Akhenaten* III. London, EES, 1951.

The year 12 date is given by the hieratic label, *Horizon 13* (Summer 2013), 8.

A valuable supplement to the Burton photograph of the decorated chair seat from the tomb of Tutankhamun (Figure 15) is Moamen M. Othman, Mohamed Abd El-Rahman, Eid Mertah, Eslam Shaheen, Mohamed Ibrahim and Ahmed Tarek, 'Il papiro nascosto di Tutankhamon. Indagine Diagnostica Multispettrale sul papiro dipinto della sedia di Tutankhamon.' *Analecta Papyrologica* 29 (2017), 183–98. Thanks to Marsha Hill for bringing this to my attention.

The brick staircase painted with captives at Kom el-Samak (Malkata South) is published in Yasutada Watanabe and Kazuaki Seki, *The Architecture of 'Kom El Samak' at Malkata-South. A Study of Architectural Restoration*. Tokyo, Waseda University 1986, Pls. 3–5.

For the shape of open pavilions or kiosks at this time an example is provided in the tomb of Meryra II at Amarna where Akhenaten receives foreign tribute in year 12: N. de G. Davies, *The Rock Tombs of El Amarna*, Part II. London, EES, 1905, 38–43, Pl. XXXVII.

On the lexicography of the 'tent/pavilion of matting' see W.J. Murnane and C.C. Van Siclen III, *The Boundary Stelae of Akhenaten*. London and New York, Kegan Paul International 1993, 100, 105, note f. Also B. Kemp, *JEA* 63 (1977), 77–8.

The tomb pictures of the apparent palace in front of the Great Aten Temple are in N. de G. Davies, *The Rock Tombs of El Amarna*, Part I. London, EES, 1903, Pl. XXVI (with Window of Appearance); Part II, London, EES, 1905, Pl. XVIII (throne room).

For the importance of wood-and-matting prototypes in Egyptian architecture and early examples from Hierakonpolis: B. Kemp, *Ancient Egypt; Anatomy of a Civilization*, 3rd ed., London and New York, Routledge/Taylor and Francis 2018, 153, Figure 3.21, with cross references.

Section 2

For the number of offering-tables in the southern 'field': Petrie, *Tell El Amarna* 19, Pl. XXXVII (27 x 45 rows); Pendlebury, *City of Akhenaten* III, 15–16 (20 x 45 rows); Pl. III (46 E–W rows marked, perhaps in error for 45); *JEA* 19 (1933), Pl. XIII (45 E–W rows).

Section 3

The results of the 1932 excavation and study of the Great Aten Temple, largely based on a plan and reconstruction drawings by architect Ralph Lavers, are published in *City of Akhenaten* III, 13–17, Pls. III–VIB. The Small Aten Temple and its pylons are in *City of Akhenaten* III, 92–7, Pl. Pl. XVI; *Amarna Reports* V, 115–42. For the Kom el-Nana pylon, see <http://www.amarnaproject.com/documents/pdf/Kom-el-Nana-Reports/Chapter4-The-South-Pylon.pdf> and <http://www.amarnaproject.com/documents/pdf/Kom-el-Nana-Reports/lrg/Preliminaries-and-Chapter1-Introduction.pdf>

The ramps in the Great Palace are included in *City of Akhenaten* III, 54–8, Pls. XIII B, XIV.

Panehsy's shrine, as found, with evidence for its balustrades, is published in *City of Akhenaten* III, 26–7, Fig. 6, Pl. XXX.1. Unpublished EES archive photographs (1926/04, /05, /06) clarify the construction of the balustrade block. For balustrades see I. Shaw, 'Balustrades, stairs and altars in the cult of the Aten at el-Amarna.' *JEA* 80 (1994), 109–27; J. Wegner, *The Sunshade Chapel of Meritaten from the House-of-Waenre of Akhenaten*. Philadelphia, Pennsylvania 2017, 67–76.