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# Finishing the Unfinished: Conjectural Restoration of the Open Mantapas at Badami

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**Abstract:** *Badami, along with Aihole, Pattadakal and some other sites in and around the Malaprabha Valley in northern Karnataka, contain some of the earliest stone monuments of southern India, beginning with the constructions of the Early Chalukyan dynasty, which ruled from their capital at Badami (ancient Vatapi) during the 6th to 8th centuries CE. The purpose of two open mantapas which stand prominently on a large sandstone boulder in the North Fort at Badami and accessed via a stepped path through a very narrow gap, is hitherto unknown. We hypothesize that the mantapas, which stand on partly rock-cut bases, had their structural components fashioned entirely from rock quarried from the very boulder they stand on. We further hypothesize that they are unfinished, and not partly demolished during the Pallava occupation of Vatapi, as assumed earlier. Finally, based on the documentation of the rock cut plinth and analysis of similar monuments built under the patronage of the Early Chalukyas, we attempt a conjectural restoration of the structure as possibly imagined by its builders and put forward possible reasons why the structure remained unfinished.*

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**Keywords:** Badami, Early Chalukyas, Open Mantapas, Quarry, Structural Temples, Malaprabha Idiom, Temple Architecture

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## Introduction

The sites at Badami, Mahakuta, Pattadakal and Aihole, along with a host of other minor sites in the Malaprabha Valley are very important to the study of the beginnings of temple architecture in stone, in southern India (Tartakov 1980). Badami, known as Vatapi, was the capital of the Early Chalukyan dynasty during the period of their rule from the middle of the sixth century CE to 753CE, when they were overthrown by the Rashtrakutas. As the capital city of the Early Chalukyas, Badami has several religious monuments of note, apart from fortifications and other secular structures from the period of Early Chalukyan rule and also later periods (Michell 2011). The physical landscape at Badami is dominated by a large horseshoe-shaped sandstone massif enclosing a tank created by constructing a bund across the open side of the horseshoe,

which is in the west (Figure 1). The sprawl of the modern town of Badami is mainly spread over to the west of this bund. Fortifications built during Early Chalukyan and later times can be encountered strung across both sides of this massif, which is differentiated into the North Fort and South Fort, on these respective sides of the Agastya Teertha tank. Among the important religious monuments at Badami are several major and minor rock-cut monuments, as well as structural monuments. Some of the earliest monuments here are believed to be the rock-cut sanctuaries of the South Fort, of which Cave III, dedicated to Vishnu, is embellished with an inscription of the Early Chalukyan King Mangalesa dating the consecration of the temple to 578CE (Michell 2011).



**Figure 1: A view of Badami from the east. Agastya Teertha is in the centre of frame, with the cliffs of the South Fort to the left, and the North Fort to the right**

The major structural monuments of the Early Chalukyas are concentrated in the North Fort, with the notable exception of the Bhutnath Temple, which is situated on a platform built on the north-eastern part of the Agastya Teertha tank and the Jambulinga Temple in the town to the west of the tank. The main structural temples attributed to the Early Chalukyas in the North Fort are the Lower and Upper Sivalayas, and the Malegitti Sivalaya. Though these three monuments are called Sivalayas currently, the iconographic programme and other clues point to their being sanctuaries dedicated to other deities originally. The Lower Sivalaya could have been dedicated to Ganapati, and the Upper Sivalaya definitely suggests a Vaishnavite affiliation. The Malegitti Sivalaya was probably dedicated to Surya, the Sun God.



**Figure 2: The monuments of the North Fort. The Upper Sivalaya is on the right, with the Open Mantapas at the centre. To the left is the Lower Sivalaya, with Malegitti Sivalaya just visible behind it.**



**Figure 3: The Open Mantapas on a large detached boulder in the North Fort**





**Figure 4: A view of the mantapas from the north-west**

These three monuments are located in the southern part of the North Fort, boldly sited on top of large boulders which have sloughed off the edge of the sandstone massif that girdles the Agastya Teertha on three sides, in the geological past (Figure 2). However, equally prominent among the monuments of the North Fort are two open pillared pavilions erected on top of a large detached sandstone boulder (Figure 3), the exact nature of which remains a mystery.

### **The Open Mantapas at Badami**

The two mantapas (Figure 4) are situated on the levelled top of a large boulder to the left of the path leading up from the present Archaeological Museum at Badami, immediately after entering through a gateway near the museum. A flight of steps leads up to and through a narrow cleft between two boulders to emerge at the top of the boulder where the mantapas are situated. Access through this cleft is a tricky affair, with the cleft narrowing to a width of merely 40cm at the narrowest, and the cliff surfaces bounding it angled at  $69^{\circ}$  –  $75^{\circ}$  from the horizontal (Figure 5). Upon arriving at the levelled terrace at the top, the two mantapas can be seen (Figure 6). The easterly of the two is a single-storeyed pavilion built on a high oblong plinth, with four columns ending in brackets which support a flat roof placed above beams with eaves. The westerly pavilion is two-storeyed, with both storeys having four columns each, with brackets and the beams with eaves of the lower storey supporting the floor of the upper one which has a flat roof above.



**Figure 5: The narrow inclined cleft between two boulder faces, between which the stepped path to the mantapas passes**

The plinth of both pavilions is partly rock-cut and partly assembled using dressed sandstone blocks (Figure 7). The westerly mantapa has the footprint of a rock-cut plinth extending beyond to the west (Figure 8). This, and the projections of the beams of both storeys at the western ends (Figure 9) gives the impression of an incomplete monument – either unfinished, or vandalized.





**Figure 6: The mantapas in elevation, from the south**



**Figure 7: The plinths of both the mantapas are partly rock-cut, with dressed sandstone blocks forming the remainder**



**Figure 8: The rock-cut plinth to the west of the double-storeyed mantapa**



**Figure 9: A view of the mantapas from the north-west, showing the footprint of rock-cut plinth and projecting beams at both levels of the double-storeyed mantapa, hinting at the incomplete nature of the monument.**

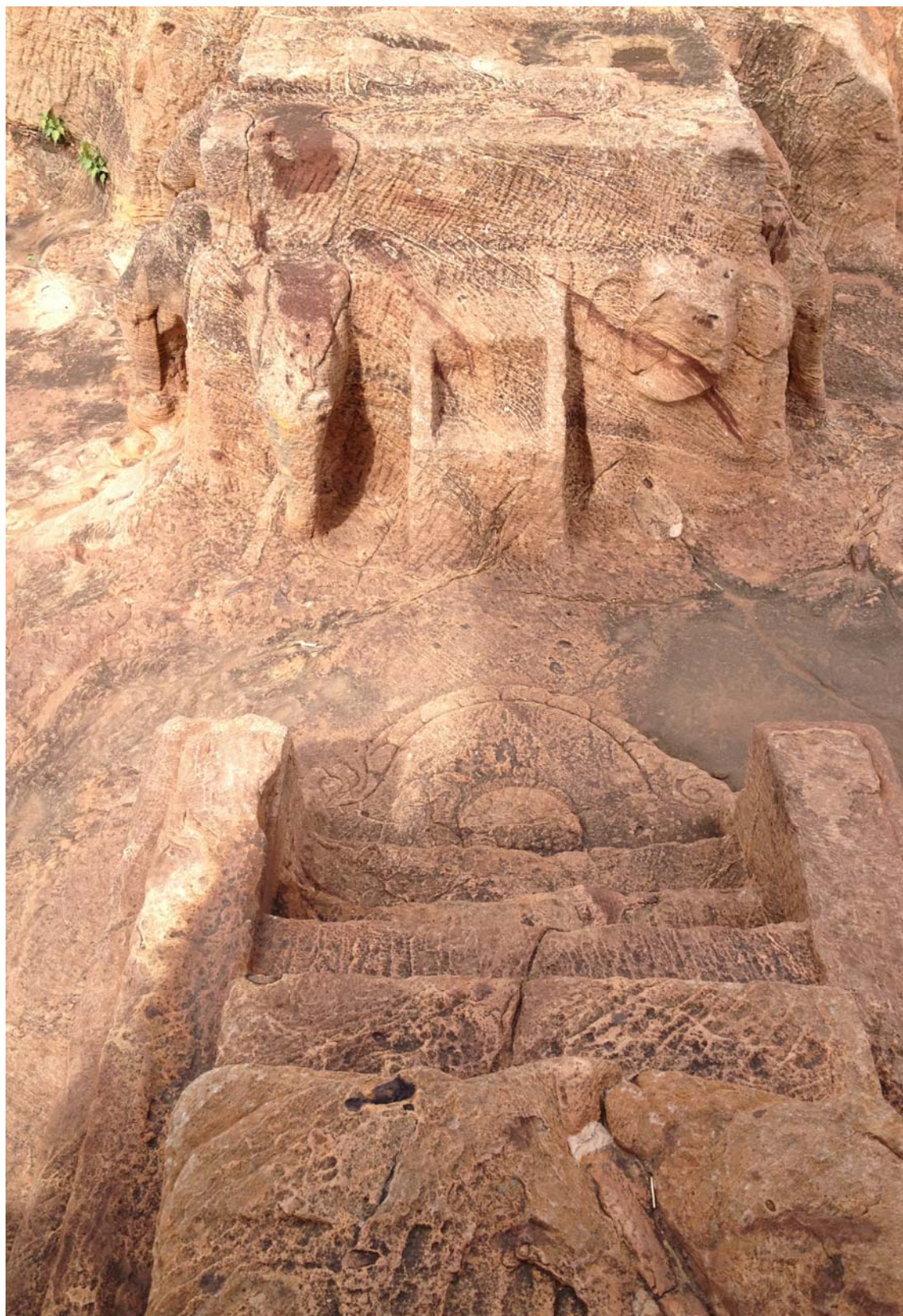




**Figure 10: Emerging elephants carved on the sides of the landing platform of the single-storeyed mantapa**

The structural part of the plinth of the single-storeyed pavilion has a maximum height of 2.5m above the rock cut part. The rock-cut part of the plinth has a set of steps leading up to a squarish landing on the western side. The platform of the landing has the head and forelegs of standing elephants emerging from the rock-cut sides, two each on all three sides (Figure 10). There are no further steps from the landing level to the top of the high plinth, which must be scaled by a short vertical climb today. The plinth measures 4.6m (E-W) x 5.7m (N-S) in plan, at its largest extent, and consists of stacked moldings of various heights, the central band of which sports *kudus* at regular intervals. The four pillars, of the *rucaka* type, each roughly 50cm x 50cm square in cross section and 2.3m in height, are set on a low band of stone running offset inwards from the edges of the plinth. Within this offset band is the top of the earth filling within the plinth. The pillars sport narrow bands in shallow relief towards the top. The capitals on top of the pillars are carved with brackets on all four sides with slanting faces embellished with curlicues, and are called *taranga* capitals in the literature (Sundara 2008). These support beams which have eaves carved out of the same piece of stone and five flat slabs laid E-W on top of these constitute the flat roof of the structure. The joints between the roofing slabs were covered with narrow strips of stone, like “logs” in the manner often seen in the structures of this region, though most of them are in broken condition now.





**Figure 11: The steps to the landing of the single-storeyed pavilion (top), facing the steps to the lower floor of the double-storeyed pavilion**





**Figure 12: A view of the double-storeyed mantapa from the south-west, showing part of the plinth made of dressed stone blocks**



**Figure 13: A view of the footprint of the structure beyond double-storeyed part of the pavilion, showing slots carved into the bedrock for placing dressed stone blocks**

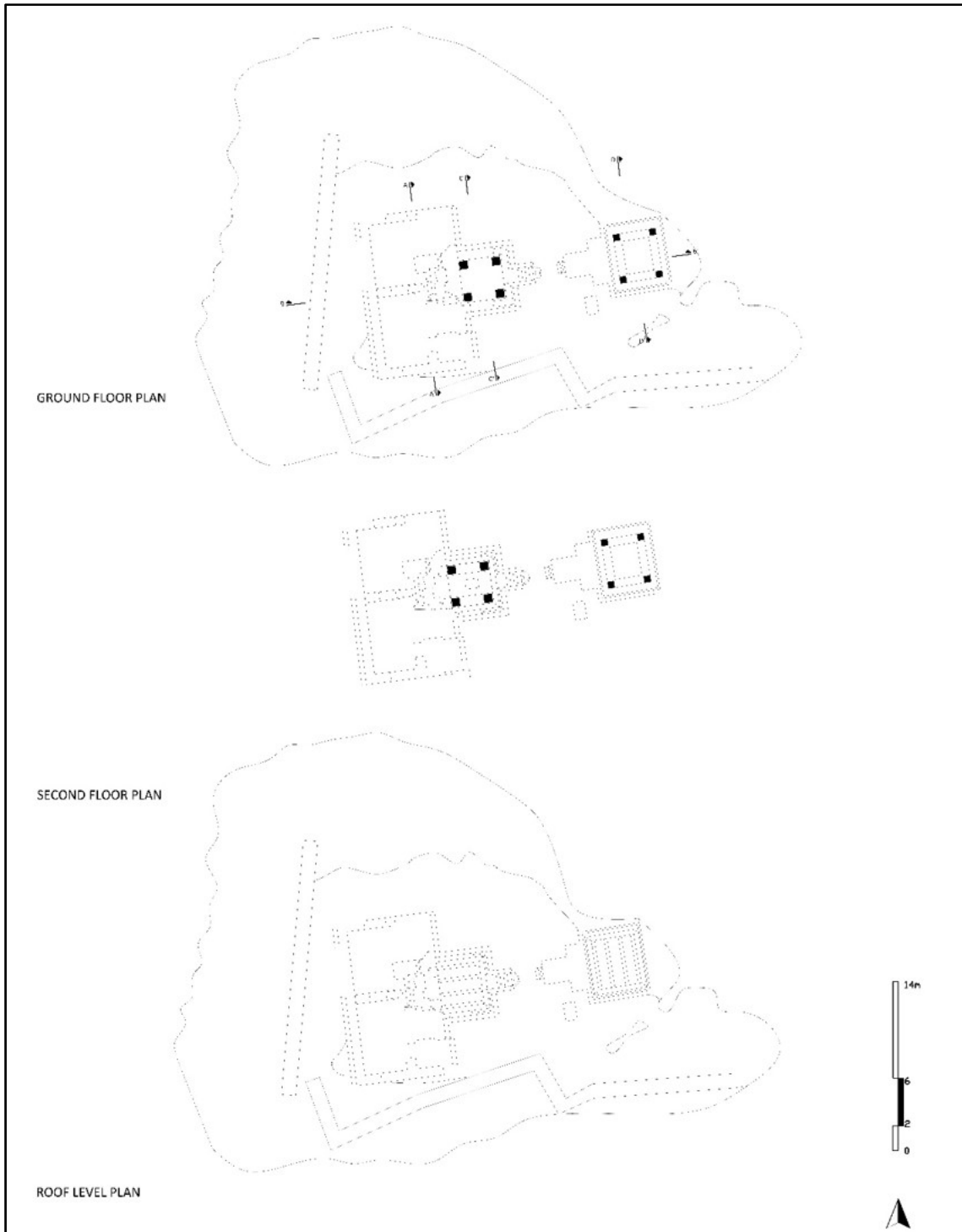




**Figure 14: A closer view of the upper storey of the double-storeyed pavilion, showing the poor quality of sandstone used for the columns**

The plinth of the double-storeyed pavilion is considerably lower than that of its single-storeyed counterpart, and is accessed by rock-cut steps on its eastern side, facing the steps of the other pavilion (Figure 11). Part of the plinth of this structure too is rock-cut, but towards the south and the west part, it is mostly built of dressed stone blocks, suggesting that the parent rock from which the plinth was hewn, was not sufficiently high in these parts to permit cutting out a plinth there (Figure 12). This plinth too consists of stacked moldings, of which one band has *kudus* as well as floriated motifs distributed along it. As mentioned earlier, the footprint of the plinth extends beyond the double-storeyed portion, which measures 3.9m (E-W) x 3.5m (N-S). The extension of the plinth beyond the double-storeyed portion measures 8.5m (E-W) x 13.6m (N-S). The height of this rock-cut portion varies from 80cm – 40cm in the northern part but diminishes towards the southern part, where slots have been cut into the bedrock, presumably to place dressed stone blocks to build that part of the plinth (Figure 13).

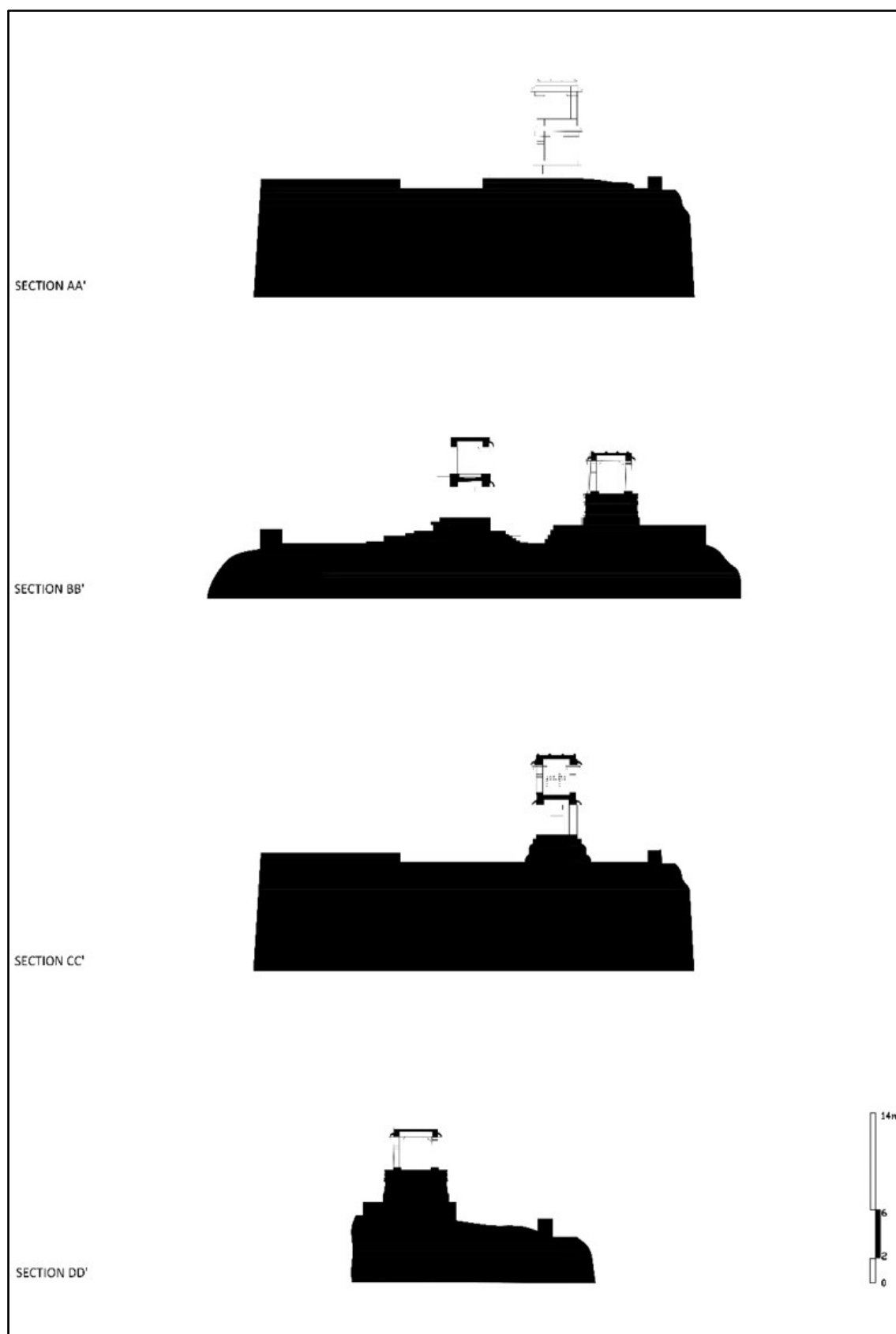
The lower floor of this pavilion has four pillars of the *rucaka* type, 60cm x 60cm square in cross section and 2.3m in height, with capitals sporting brackets which are cuboidal blocks on all sides. The brackets are truncated in the directions where they do not have to support beams. The upper floor has *rucaka* pillars which are slightly smaller in cross section, and their brackets have rounded ends. These too, are truncated in the directions they do not have to bear beams. Pillars on both floors have narrow bands raised in shallow relief near the top, as in the single-storeyed pavilion. These details might be discerned in Figure 4. The columns of the upper storey are made of sandstone of discernibly poorer quality, with many visible defects (Figure 14).



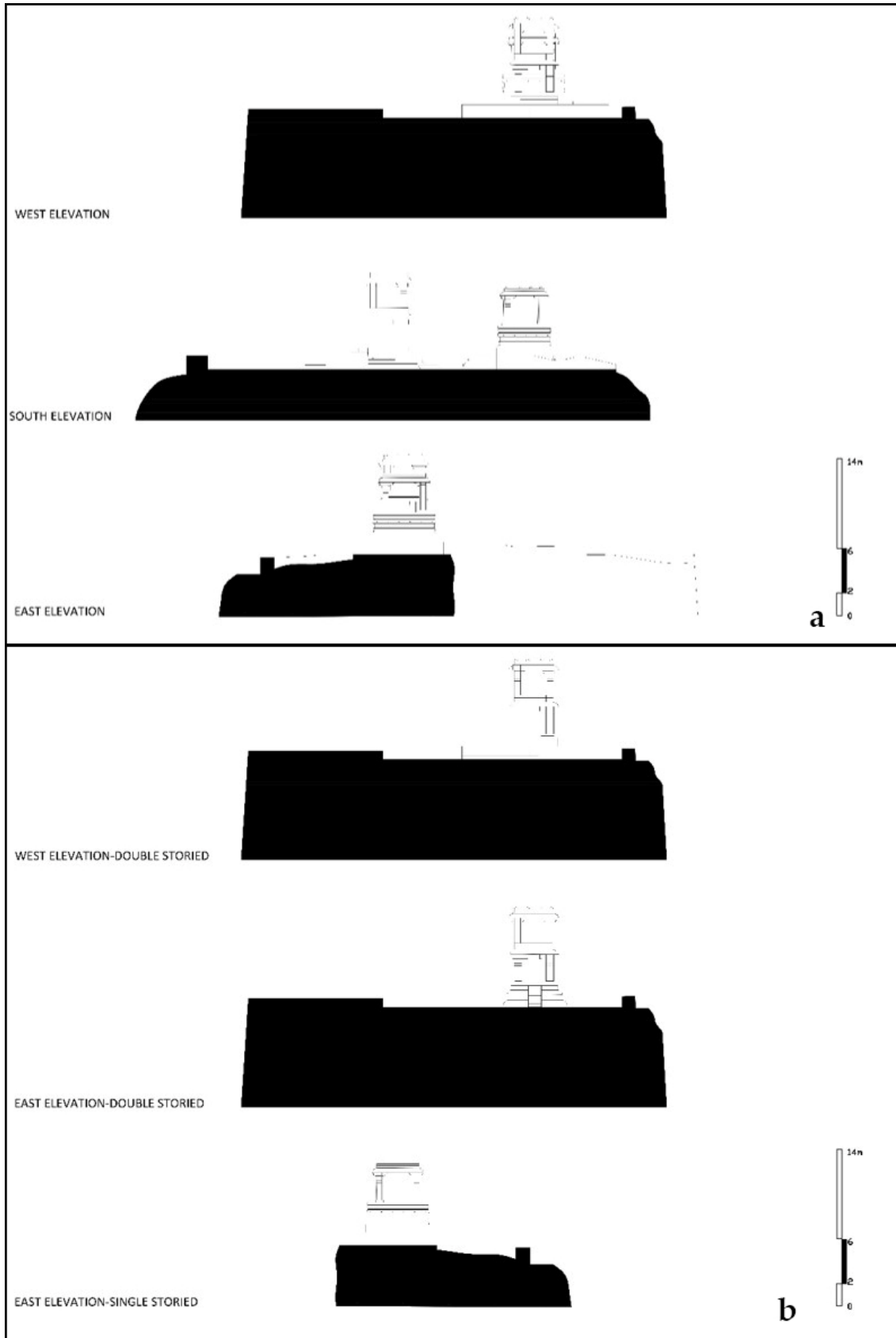
**Figure 15: Plans at various levels, of the Open Mantapas of the North Fort, Badami**

The plan and sections of the mantapas as existing today is shown in Figures 15-17. The terrace on which the two pavilions stand is protected by a fortification wall on the, southern and western sides, while the vertical sides of the rock left after the excavation for levelling acts as a parapet for the northern side (Figure 18), and the massive plinth of the single-storeyed pavilion acts as the eastern limit of the terrace.





**Figure 16: Longitudinal and cross sections of the mantapas**



**Figures 17a and 17b: Elevations of the mantapas**





**Figure 18:** A panoramic view of the mantapas and the terrace they are located in, from the north-west. One can easily see the parapet created by uncut rock in the northern portion, and the fortification walls in the southern and western parts.



**Figure 19:** A view of the bottom part of the double-storeyed mantapa showing the arrangement of stone blocks to form the plinth and floor of the structure, with the four columns placed upon them.



**Figure 20: A view of one of the capitals of the single-storeyed mantapa, with its brackets carved from a single block of stone**



**Figure 21: Showing the assembly of brackets on top of the columns, spanned by the beam-eave assembly, which in turn supports the floor and superstructure of the storey above, in the double-storeyed pavilion.**





**Figure 22: An example of the beam-eave component, lying close to the inscription of Kappe Arabhata near Tattukote at Badami**





**Figure 23: The beam-eave component which would have alternated with the piece shown in Figure 22**

## The Nature of the Open Mantapas

Despite the prominent location of the pavilions and the eye-catching quality of their architecture, not much academic attention has been focused in understanding their nature or the purpose they served. Most of the references to their nature have been anecdotal and superficial. “The open pavilions of the north fort hill may have been associated with courtly rituals of these early rulers but their precise function is not known” was one of the early conjectures (Michell 1979). In another publication, Michell (2011) elaborates, “A short distance from the gateway is a flight of narrow steps to the left. This leads to a pair of Open Mandapas built upon a rock-cut terrace with worn elephant torsos, looking down upon the houses of the town below. The *mandapa* with two superimposed storeys adjoined some other structure, of which nothing now remains except slots cut into the bedrock. The *mandapas* seem never to have formed part of any religious monument. Possibly they are remnants of a royal ceremonial complex used by the Early Chalukya rulers, partly razed by the Pallavas.” Padigar (2012) offers another perspective, though along similar lines, on the nature of these pavilions, “From the Archaeological Museum, after entering through the main gateway of the North Fort, on the left side a small passage allows for reaching a gap in the boulders through which one can with difficulty climb up to the top of the large boulder. There are remains of partly rock-cut *mantapa* and of a storeyed *mantapa*. This appears to have been a secret place where Chalukyas used to have ministerial discussions.” Michell (2014), in yet another context, reiterates that “The North Fort, on the opposite side of the town, is penetrated by deep canyon-like crevices, through one of which climbs a stepped path. The first features to be seen along this path are two free-standing, multi-storeyed *mandapas*, seemingly unconnected with any temple. Possibly they are vestiges of an Early Chalukyan ceremonial complex.” Interestingly, these prominent and arresting structures seemed to have been overlooked in other classic accounts of Early Chalukyan architecture, for instance, in the account by Cousens (1926), Tartakov (1980) etc. The local residents of present-day Badami call the structures *Gaali Mantapa*, roughly translating as “Breeze Pavilion”, on account of the stiff breeze present at nearly all times at this spot, and use the pavilions as a place to take a comfortable nap (Figure 4).

## The Construction of the Mantapas

The pavilions are constructed in simple assembly of carved structural members of stone and, in their present condition, unfinished or partly dismantled, permit a full understanding of the techniques used. Typically, the plinth of both structures is formed by arranging dressed stone blocks over the rock-cut portion to obtain a level platform. The outer part of the platform is made of elongated slabs to create an outer band, within which smaller blocks are arranged to form the floor. In the case of the single-storeyed *mantapa*, the inner blocks have not been placed over the filling inside the plinth. The four columns of a floor are placed upon the outer band of stone (Figure 19), sometimes within small square depressions carved out of the horizontal surface, presumably to accommodate small variations in height of the columns.





**Figure 24: A view of the mantapas from the Upper Sivalaya, showing the roofing of the structures with flat stone slabs**



**Figure 25: A view of the entry steps and landing of the Upper Sivalaya showing carvings of emerging elephants at the sides**





**Figure 26: Inscription of Sri Nalpayan and Sri Tanucalvan on a pillar face of the double-storeyed mantapa**



**Figure 27: Inscription of Sri Goindan on a pillar face of the double-storeyed mantapa**



**Figure 28: Inscription of Sri Kamah on a pillar face of the single-storeyed mantapa**

The columns are topped by capitals with brackets projecting in all four directions, all carved out of a single block of stone (Figure 20). On top of these capitals are arranged an ingenious component – a monolithic carved piece incorporating both a beam as well as an eave (Figure 21). This component can be understood well by seeing one such piece which is lying unassembled near the Kappe Arabhata inscription (Figure 22). This method of constructing pavilions seems to have been commonplace during the Early Chalukyan period, with pieces like the one shown in Figure 22, which “turns the corner” alternating with pieces which are truncated before the corner (Figure 23).

In the case of the single-storeyed mantapa, this assembly of four beam-eave components, was topped by five roofing slabs, with the joints protected against seepage of rainwater by narrow stone strips (Figure 24). The double-storeyed structure had the columns of the upper floor topped by a similar arrangement of components, with a finishing layer of flat roofing slabs similarly protected. The roofing slabs of the upper floor are thicker than those of the single-storeyed mantapa, probably to provide additional weight to stabilize the taller structure.

Most accounts date these pavilions among the earliest structures to come up at Badami. Prof. Shrinivas Padigar holds that they could be contemporaneous with the Upper and Lower Sivalayas, possibly before 578 CE (Padigar, Private Communication, 2015). The emerging elephants near the entry steps of the Upper Sivalaya (Figure 25) do show strong similarities with the treatment of the entry steps of the single-storeyed mantapa.





**Figure 29: The Sangameshwara Temple at Mahakuta**





**Figure 30: A panoramic view of the lower floor of the two-storeyed pavilion, and the rock-cut terrace, from the single-storeyed pavilion. The area from which the rock has been quarried is clearly discernible.**



**Figure 31: Stone blocks, which clearly were part of the plinth of the mantapas, incorporated in the fortification wall**

There are four inscriptions found in the two mantapas. Two of them are on a face of one of the pillars of the lower floor of the double-storeyed mantapa (Figure 26), and read "Sri Nalpayan" and "Sri Tanucalvan", while the third inscription, on another pillar of the same structure (Figure 27), reads "Sri Goindan vipra-manoharan" (Padigar



2010). These inscriptions are in 6<sup>th</sup> century Kannada characters. Another short inscription, hitherto unreported, and discovered during the course of our study, adorns the face of one of the pillars of the single-storeyed mantapa (Figure 28). Prof. Padigar has interpreted the inscription as reading “Sri Kamah”, written backwards, to be read from right to left (Padigar, Private Communication, 2016).



**Figure 32: An idol niche on the bedrock which was part of a temple, now collapsed, in the cliffs to the east of Bhutnath Temple at Badami**

These inscriptions are presumed to be the names of artisans, possibly those who worked on these structures. Interestingly, two of these names occur in other places of Early Chalukyan patronage – Sri Nalpayan, on a pillar in the Sangameshwara Temple at Mahakuta, in 7<sup>th</sup> century Kannada characters (Padigar 2010), and Goinda-vipran, on a cliff face near a street called Areroni in Badami, in 7<sup>th</sup> – 8<sup>th</sup> century Kannada characters. The Sangameshwara Temple at Mahakuta (Figure 29) is built in the *Nagara*, or northern idiom of temple architecture, and has been dated by various experts from 660CE to 730CE (Mohite 2012).

Thus the inscription of Nalpayan most probably belongs to the 7<sup>th</sup> century CE. However, Padigar (Private Communication, 2016) avers that the original monument is pre-650CE, perhaps even 6<sup>th</sup> century, and feels that this inscription could have been added at a later phase of restoration, possibly during the rule of the Chalukyan King Vikramaditya II.





**Figure 33: The Nandi Mantapa facing the Mahakuteshwara Temple at Mahakuta, which is similar to the single-storeyed mantapa at Badami**



**Figure 34: The two-storeyed mantapa as viewed from the west, showing uneven breakage on only one of the beam ends**





**Figure 35: Unfinished part of the basement mouldings of double-storeyed mantapa**

## Observations and Hypotheses

A careful consideration of the two pavilions and their context brings a few pertinent issues to the fore. Firstly, there is the matter of reaching building materials to the site. As explained earlier, access is through a stepped entryway between two rock faces which is around 40cm wide at its narrowest, and inclined, too, from the vertical. It is clear that transporting stone blocks through this access way is impossible. The alternative, hoisting such large blocks from beyond the boulder, is a tricky and difficult task. An examination of the rock-cut terrace upon which the pavilions stand presents a third possibility – that the structural components of the pavilions were fashioned out of stone quarried from the top of the boulder. It can be seen (Figure 30) that the original rock surface must have been at least as high as the existing rock-cut parapet on the northern side, and sloping downwards to the south till a couple of meters beyond the pavilions. It is possible to discern the original rock surface from the quarried area based on the surface texture, and hence estimate the volume of quarried rock. We have hypothesized that this quantity will equal or exceed the volume of rock locked up in the structural parts of the monuments.

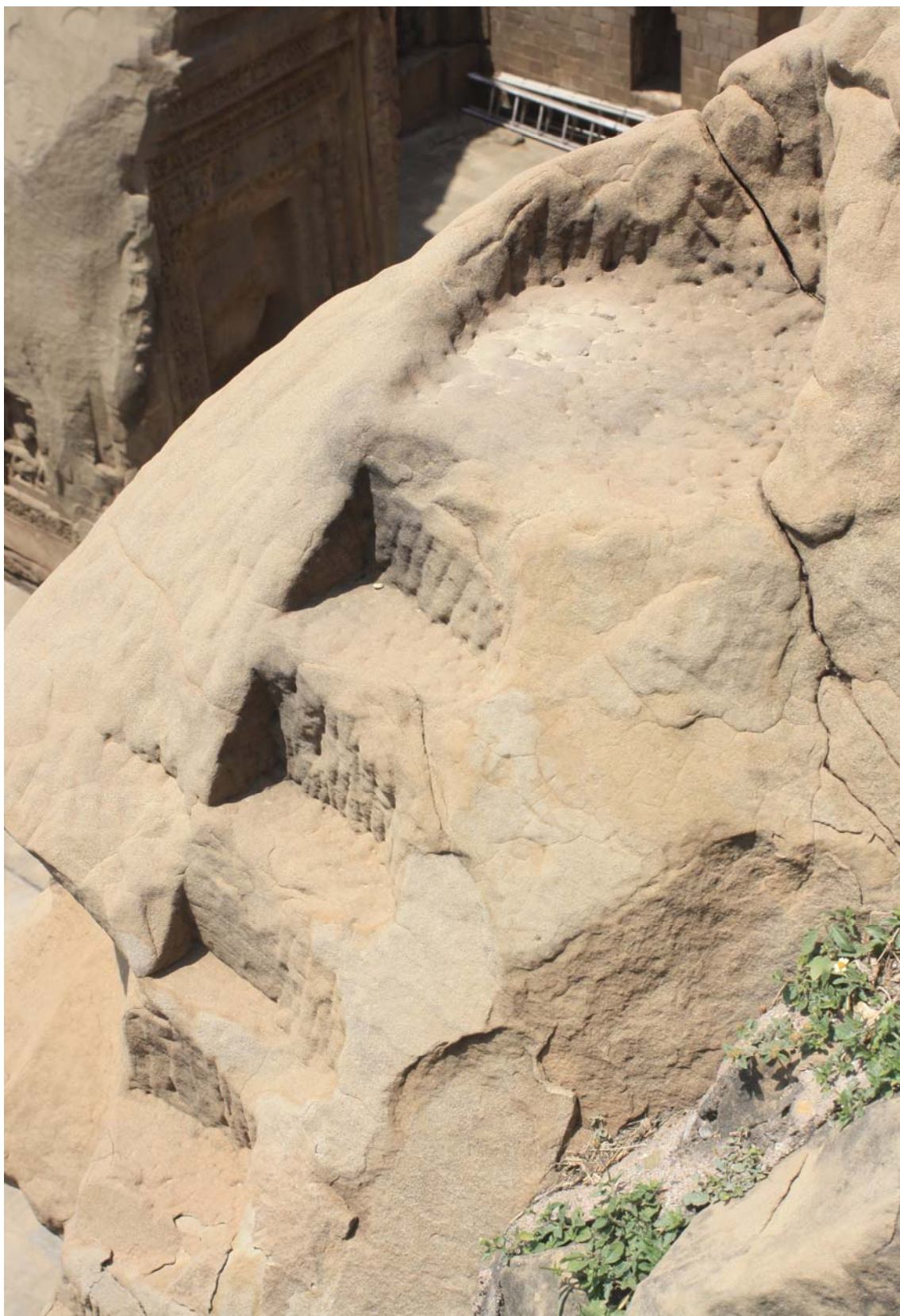
Of course the quarried rock has to account for even a large part of the fortification wall, though this wall appears to have seen much reconstruction and restoration in historical as well as recent times. It is interesting to note that some blocks which had been part of the mantapas, have also been incorporated into the fortification wall in these restorations (Figure 31).





**Figure 36: Rough workmen's steps cut into the cliff face towards the top**





**Figure 37: Workmen's steps cut into the cliff face at Masroor, Himachal Pradesh, for comparison**

Another observation that emerged during our study concerns the nature of the monument. We have observed two square nested niches in the centre of the inaccessible upper floor of the two-storeyed mantapa, from near the Upper Sivalaya. This feature, which may be seen in Figure 24, is similar to the floor niche for installing icons, as observed in other contexts (Figure 32). Thus, despite the several conjectures about these structures not being part of any religious monument (Michell 1979; Michell 2011; Padigar 2012; Michell 2014), it does look like they were meant to constitute a temple, originally. This is our second hypothesis. It is conceivable that the two structures together were meant to be a temple dedicated to, say, Siva, with the single-storeyed structure being a separate Nandi Mantapa, in a similar arrangement as the Virupaksha and Mallikarjuna Temples at Pattadakal, or the Mahakuteshwara (Figure 33) and Mallikarjuna Temples at Mahakuta. However, it does seem strange that the idol niche is in the floor of the upper storey, while the lower storey is a passage way, as evidenced by the steps leading up to it and the flooring of a patchwork of slabs without any niche for installation of idols.

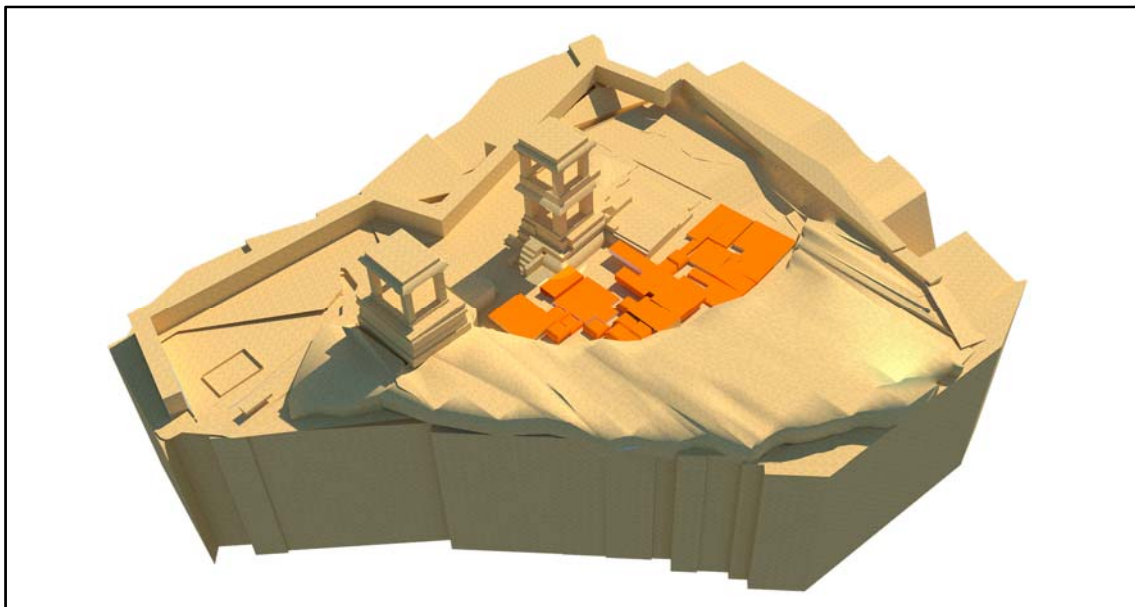
Our third hypothesis is that the structure was left unfinished, and was not destroyed by the Pallavas or anybody else, as was conjectured earlier. The Upper and Lower Sivalayas show definite signs of wilful destruction, which might have led to a similar conjecture being advanced for these pavilions, too. The only signs which can be interpreted as breakage in these structures are the western ends of the two northern beams of the two-storeyed pavilion (Figure 34). However, these could have been left unfinished too, to be finished when the rest of the superstructure above the rock-cut plinth in the west would be erected. It can be seen from the Figure 33 that the corresponding beam ends on the opposite side are neatly finished, and no sign of uneven breaking can be seen in any of the components near these beam ends. It can also be clearly seen that several parts of the rock-cut plinth of the two-storeyed mantapa have been left unfinished (Figure 35). Given that the brackets of the capitals of the pillars of the single-storeyed mantapa have the curlicues typical of the *taranga* type capital carved on them, it is also likely that the square (Figure 20) and rounded blocks (Figures 21, 33) that are the corresponding members in the double-storeyed mantapa are also in an unfinished state.

Yet another clue which suggests the unfinished nature of this monument is again concerned with the narrow and difficult nature of the access. It is extremely unlikely that an entry be left in a state so difficult and undignified to negotiate – squeezing through a narrow and tilted gap, especially when royalty could have used it, too. Some of the steps which have been cut into the cliff face (Figure 36) resemble the rough working steps used by workmen (Dehejia and Rockwell 2016) to access upper levels. Such steps are seen in the context of many rock-cut monuments in areas which only artisans are expected to access, one such example being the workmen's steps at the rock-cut temple at Masroor in Himachal Pradesh (Figure 37). Undoubtedly, had the monument been completed and consecrated, the entryway would have been enlarged and finished to the extent regular access by people demands.

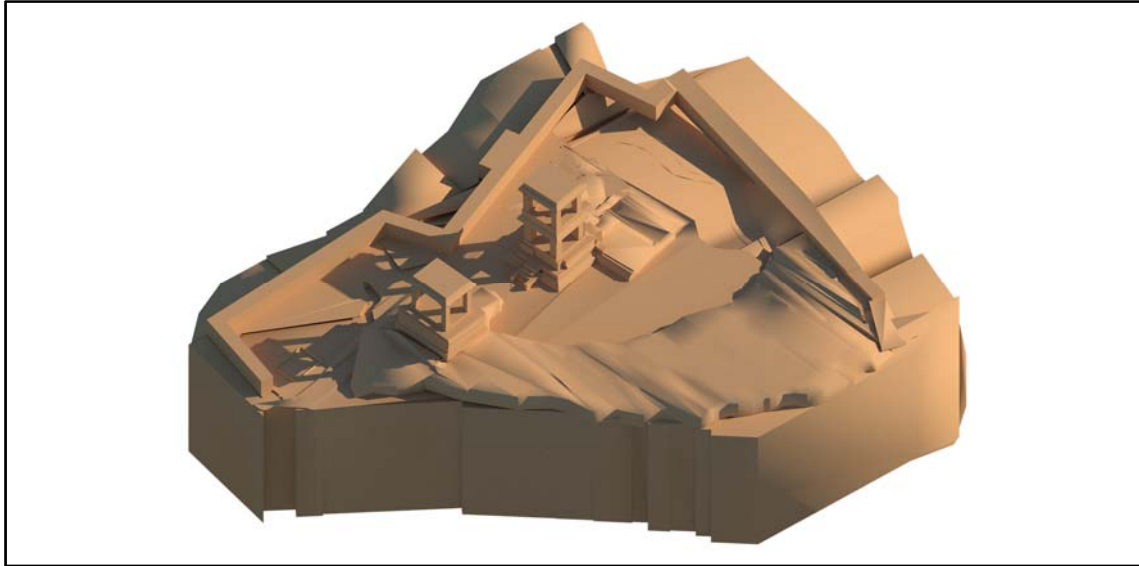




**Figure 38:** One of the partially carved beam-eave units near the Kappe Arabhata inscription, indicating the approximate size of stone needed to fashion such a member.



**Figure 39:** Showing how the stone blocks needed to prepare the structural components of the two mantapas (indicated in orange) could have been extracted from the quarried portion of the terrace.



**Figure 40: The three dimensional model of the mantapas in the present unfinished state, and their immediate surroundings**

If the superstructure above the bare rock-cut plinth (which measures 8.5m x 13.6m) to the west of the double-storeyed pavilion had been completed, and subsequently destroyed, there would be many more signatures of carved components either lying about or incorporated into the fortification wall than currently observed. Hence it is more probable that the structure was left unfinished for reasons that are unclear at present.

What could have been the reason for this monument being left unfinished for more than one and a half centuries? Though there are no clear answers to that question, one of the possibilities is that the stone needed for the venture, which was extracted from the cliff-top was exhausted. Maybe the initial intent was to erect a small structure and the larger structure was laid out during the excavation. That good quality stone was in short supply is evidenced by the poor quality of stone used for the pillars of the upper floor of the two-storeyed monument, noted earlier (Figure 14), lending credence to this hypothesis.

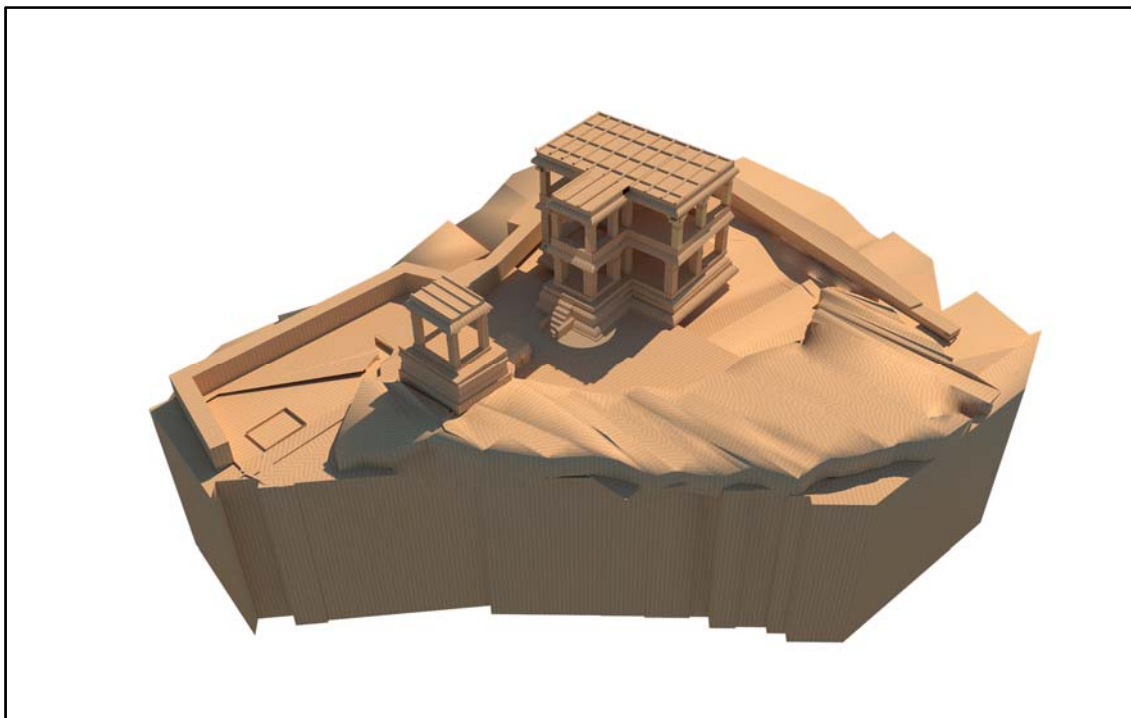
Given that these structures were meant to be a temple, what could have been the final form envisaged by the Early Chalukyan artisans? In Badami, all the structural temples are built in the southern or *Dravida* idiom; however other centres of temple architecture under Early Chalukyan patronage, such as Mahakuta, Pattadakal and Aihole, saw construction of temples in the *Dravida* idiom, and the northern *Nagara* idiom, as well as a third, which Michell (2014) terms *Malaprabha* idiom - "The other idiom appears to be confined to the Badami region, and for this reason is here termed as the Malaprabha idiom. Temples of this type are fully or partly open as porches, and are roofed with sloping stone slabs, with external joints protected by thin, log-like stone strips, in imitation of thatch and timber construction. The most evolved illustration of this idiom is the Lad Khan temple at Aihole."



If the mantapas were meant to be a temple, it is possible that the idiom adopted was most likely the *Malaprabha* idiom. Taking into account the signature of the intended extent of the planned structure indicated by the rock-cut plinth, and aided by other structures built in this local idiom, we decided to attempt a conjectural restoration of the structure envisaged by the Early Chalukyan architects. It might also be possible to infer from this exercise why the builders abandoned the idea of completing this structure.



**Figure 41: The stone ladder giving access to the upper storey of the Lad Khan Temple at Aihole**



**Figure 42: The initial flat-roofed alternative assigning two storeys to the whole of the plinth indicated by the existing footprint of the structure**

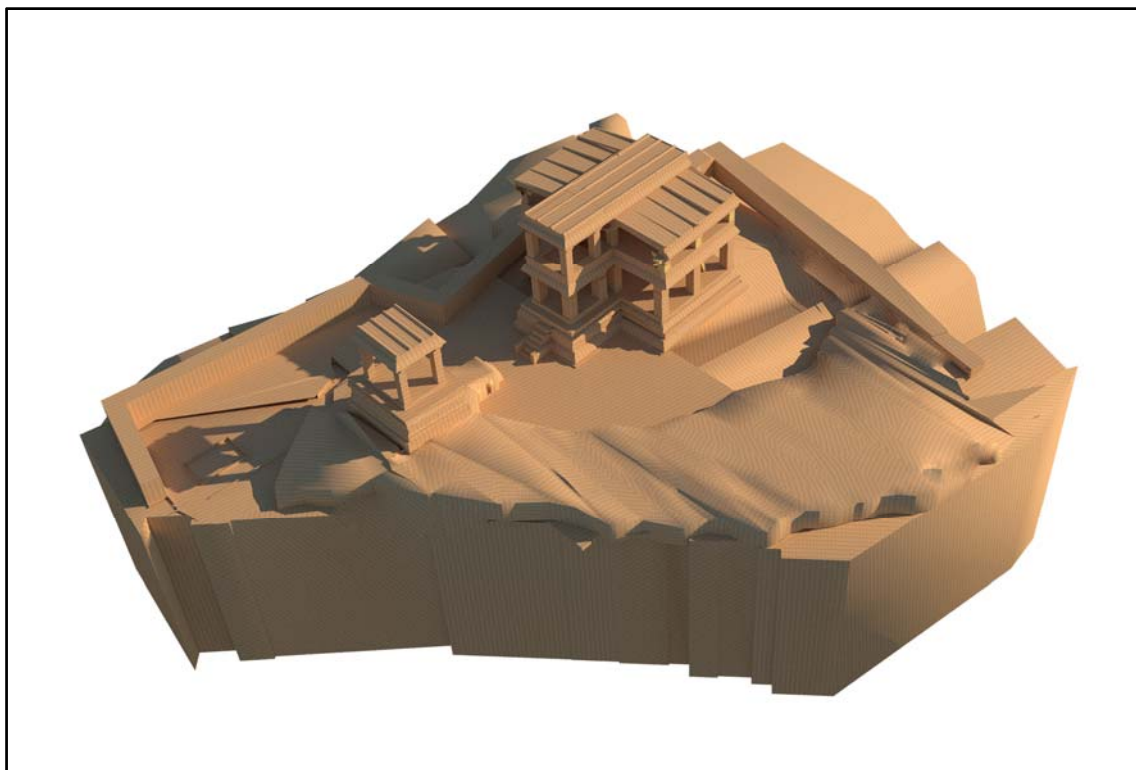


**Figure 43: The Lad Khan Temple at Aihole**

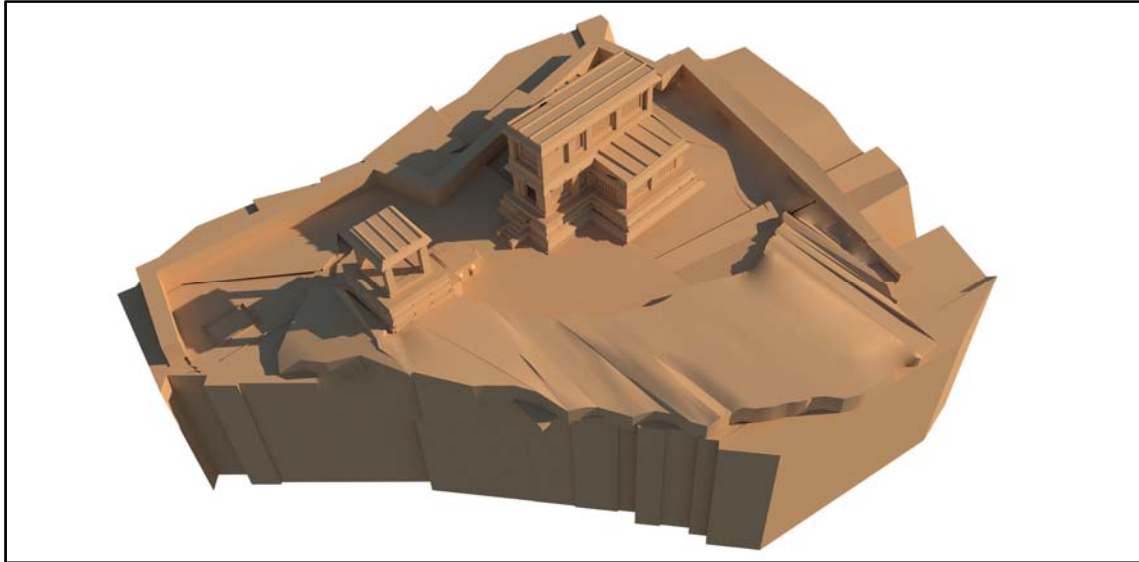




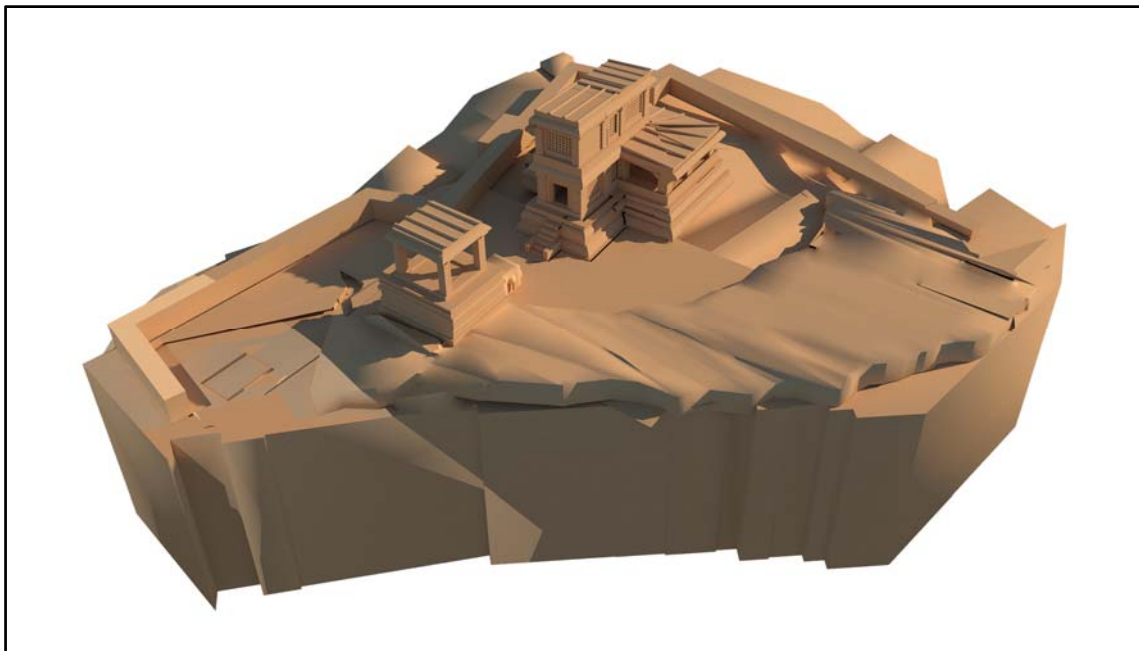
**Figure 44: The entry gateway to the Durga Temple at Aihole**



**Figure 45: The attempted model with outer parts of the upper enclosure covered with sloping roofs. As can be seen, this renders the outer parts of the upper floor unusable due to low height.**



**Figure 46: The gable-end alternative, with lean-to roofs on either side of the central bay, over the lower levels**

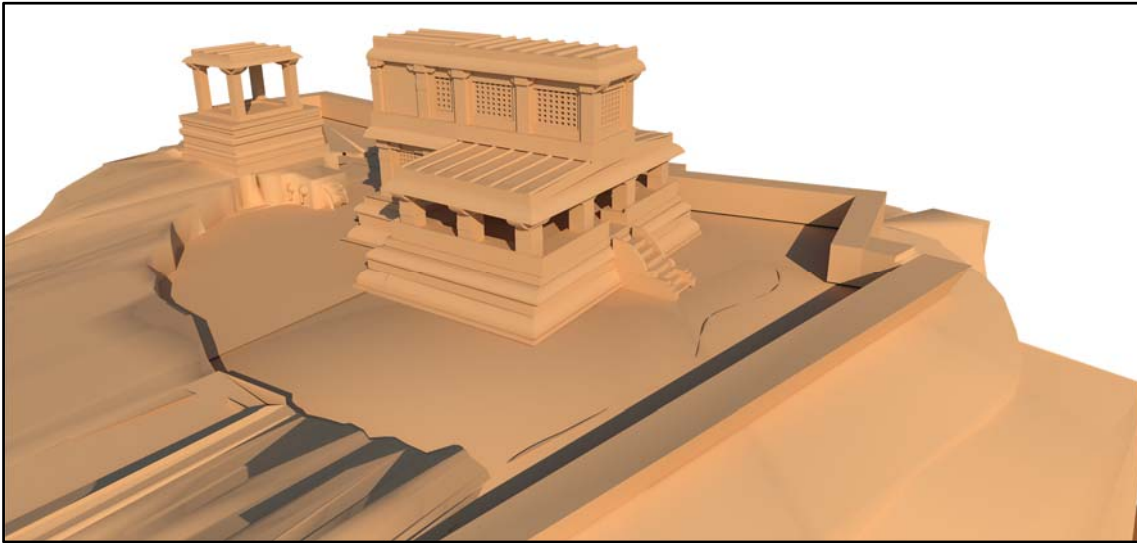


**Figure 47: The hipped-end alternative, with a hipped sloping roof wrapping around the central bay, covering the lower level mantapa of the temple and wrapping around the central bay.**

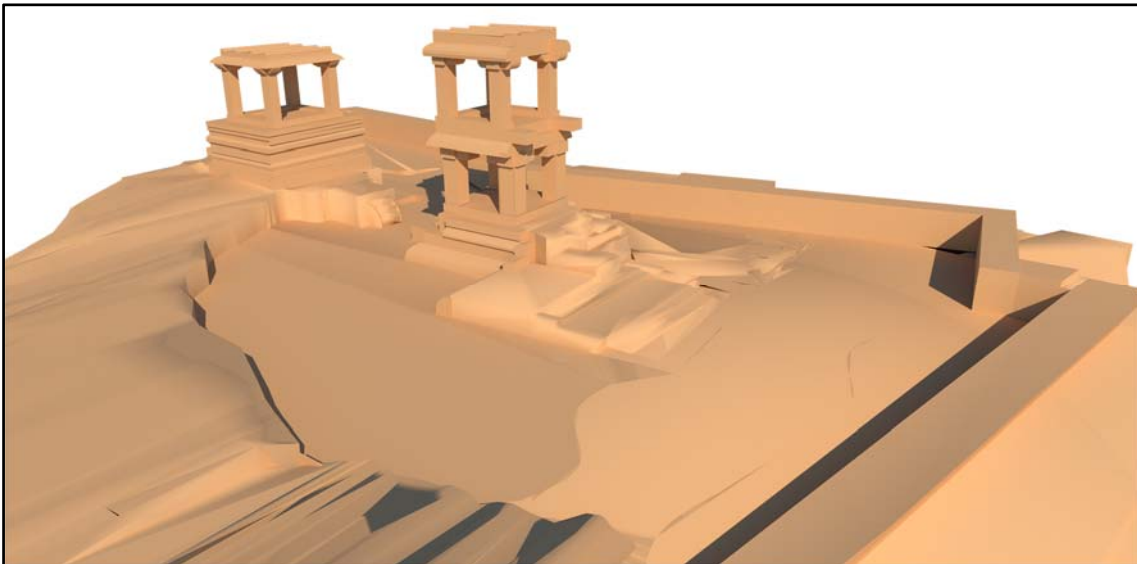
### **Rearranging Sandstone – How the Mantapas were Built?**

In order to verify or refute our hypothesis that the mantapas were built out of structural members shaped from rock hewn from the very boulder they stand on, we attempted to estimate the quantity of rock present in the rock-cut as well as structural parts of the two mantapas, as well as the total amount of rock quarried from the boulder.





**Figure 48: A view of the gable-end model from the north-west. Compare this with the model of the unfinished mantapas in Figure 49, including the unfinished plinth in the west.**



**Figure 49: A view of the unfinished mantapas as they currently exist, from the north-west**

The former part was relatively easy – it was only necessary to measure the sizes of each monolithic component and estimate the optimum size of a stone block needed to fashion the same. For instance, the dimensions of the block of stone required to carve the capital with brackets shown in Figure 20 was estimated at slightly larger than a cuboidal block encompassing the whole, including projections of the brackets on each side. The estimate for the size of the block needed to shape the beam-eave assembly was also estimated using an unfinished such member located near the Kappe Arabhata inscription as guide (Figure 38). The same was done for each structural component.

The volume of rock in the rock-cut plinth of each structure was calculated separately. We have assumed that the structural part of the plinth of the single-storeyed pavilion has a central filling of earth and rubble, as seen from the floor of this pavilion, which is not covered with stone slabs.

For estimation of the quantity of rock quarried from the top of the boulder, the top surface of the unquarried boulder was deemed to follow the contour of the rock-cut parapet currently extant on the north side (seen to the right of frame in Figure 30). The extent of the quarried portion of the rock is clearly discernible to the west and south (see Figures 13, 18 and 30). It was assumed that the undisturbed rock surface had sloped continuously from the high points defined by the parapet in the north to the low points identified in the west and south. The eastern part is dominated by the rock-cut platform of the single-storeyed mantapa, with evidence of quarrying to the south of this structure, too. Using these evidences, the total amount of rock quarried was estimated. We obtained the following rough figures for the rock volumes of various parts of the monument.

- Volume of rock-cut part of single-storeyed pavilion =  $54\text{m}^3$
- Volume of rock-cut part of double-storeyed pavilion =  $20\text{m}^3$
- Volume of rock-cut plinth to the west of the double-storeyed pavilion =  $30\text{m}^3$
- Volume of rock in structural part of single-storeyed pavilion =  $58\text{m}^3$
- Volume of rock in structural part of single-storeyed pavilion =  $59\text{m}^3$
- Volume of rock estimated to have been quarried out of boulder =  $203\text{m}^3$

The volume of rock that we estimate was quarried from the top of the boulder ( $203\text{m}^3$ ) exceeds the rock which was utilized to carve the structural components of the two pavilions ( $117\text{m}^3$ ) by  $86\text{m}^3$ . The usable blocks from this material could have gone into the construction of the fortification wall on this boulder. The volume of rock in the fortification wall as it stands today is estimated at  $116\text{m}^3$ . As can be seen this contains more quantity of rock than material leftover from the construction of the two pavilions. However, the fortification wall as it exists today is the product of several renovations in the historical past (for instance during the period of Vijayanagara occupation of Badami) as well as recent restorations and it is plausible that some material has been added in more recent times. It was not enough to merely compare the volumes of rock in the monument with the total volume of excavated rock. The various structural members such as pillars, capitals, beams and roofing slabs come in various sizes and we tried to verify if blocks necessary to carve the various structural members of the two mantapas could be hewn from the spatial configuration of the volume of rock quarried. It can be seen from Figure 39 that the blocks needed for the various structural members can indeed be obtained from the shape of the volume of the quarried rock.

Thus it is possible for the mantapas, as they stand today, to be built entirely of structural components carved from blocks extracted from the top of the same boulder they stand on, by merely cutting out and rearranging the sandstone at the top.



## Conjectural Restoration of the Mantapas

The open mantapas of Badami present a unique opportunity to explore the minds of the Early Chalukyan artisans and complete a puzzle they left unfinished. Our initial attempt, after intensive documentation, was to prepare a model of the mantapas and their immediate surroundings as existing now, including the extension of the rock-cut basement to the west (Figure 40), subsequent to which it was tried to reason out the form the rest of the structure could have taken. One of the most important assumptions that guided all the models we explored was that the upper storey of the existing two-storeyed mantapa was the *garbha griha* of the temple, based upon the observation of the idol niche on the floor there. The inconsistency of this with the lower storey of this part being an access way as indicated by the steps leading to it was ignored, possibly this departure from convention was one of the reasons for the incomplete state of this monument. This point is discussed in detail later. Another assumption made was that the entry from the east was reserved for the priestly class and royalty, hence the structure built over the bare plinth to the west was given another entry from the west for other people. The non-existence of rock-cut steps in that direction could be accounted for by the lack of enough height to fashion such steps, as evidenced by the slots cut into the rock there to facilitate masonry blocks to build up the plinth there.

We also assumed that the access to the upper storey would be via a stone ladder as is the practice in many temples of that period, such as the Lad Khan Temple (Figure 41) and the Meguti Jain Temple at Aihole. Our first attempt to try and complete the unfinished part of the monument involved assigning two storeys to the entire extent of the footprint suggested by the rock-cut plinth to the west of the double-storeyed mantapa. The only modification we made was to curtail a part of this extension to the south. It was observed that this plinth extended 4.6m in the N-S direction to the north of the existing mantapa, while it extended 5.5m beyond the southern edge of the existing mantapa. Since it is inconceivable that the structure would be so asymmetric it was decided to trim the additional 90cm on the southern side. This modified plinth was divided into three bays by means of four rows of three pillars each, the central bay being contiguous with the pillars of the existing mantapa, flanked on either side by two larger bays of equal dimensions. The resultant model (Figure 42) looks very unlike any Early Chalukyan structure. Upon the suggestion of Prof. Padigar (Padigar, Private Communication, 2017), it was decided that the *Malaprabha* idiom of sloping slabs in the outer bays was to be followed. Examples of this might be seen in the Lad Khan Temple (Figure 43) and the *pratoli* of the Durga Temple (Figure 44) at Aihole. These, and other suitable examples, were examined to understand the structural systems employed in housing the sloping slabs into the walls of the higher central bay, as well as the other ends on top of the lower outer walls.

Since the beam ends on both floors of the two-storeyed mantapa have been left projecting forward (Figure 12) it was deemed that the floor and the roof of the structure were intended to continue at the same level in the rest of the structure. The presence of an offset stone strip on all sides except the western side of the floor of the

upper level (Figure 4) demonstrates that the floor was expected to continue into that of the rest of the unfinished structure. With these constraints on the levels, the tops of the sloping slabs were positioned to be housed into the walls of the central bay with minimum necessary clearance, and a slope derived from studying other examples was given. In the resulting model (Figure 45), the heights obtained for the outer pillars was so small as to render most of the space under the sloping roof unusable for persons of average height. Hence this model, too, was rejected as implausible. Keeping this in mind it was understood that the only feasible models would involve the central bay rising to two storeys, topped by a flat roof, while the bays on either side would be only one storey, and capped by sloping roofs. This scheme, too, could have two alternatives – one (Figure 46) with the central bay extending for two storeys for the entire length of the footprint of the structure, with lean-to roofs on either side covering the single storeys of the flanking bays (henceforth called the “gable-end alternative”) and the other (Figure 47) with the central bay curtailed by one span in the west, and the remainder of the structure single-storeyed and wrapped around by a sloping roof in the north, west and south (henceforth called the “hipped-end alternative”). These two alternatives are detailed below.

### **The Gable-end Alternative**

In this alternative, the central bay of the structure is double-storeyed throughout the length, with lean-to roofs over the bays on either side of this supported by the outer columns of the mantapa extension (Figure 48). Figure 48 may be compared with a view of the model of the unfinished mantapas in their existing state, from the same angle, shown in Figure 49. In plan (Figure 50), it can be seen that the unfinished plinth to the west of the existing structures has been made into a mantapa with three bays. Access has been given into this mantapa from the west, too. The eastern entry could have been for priests and royalty, with the western entry serving other people. Access to the upper floor is by means of a stone ladder, as in other two-storeyed temples of the Early Chalukyas. In the lower floor, the eastern part of the structure has infill walls in the form of pierced screens, and the mantapa part in the west has a *kakshasana* seating all around (again based on the design of similar spaces in Lad Khan Etc.) In the upper floor, all spaces except the *garbha griha* were given latticed screen windows. The *garbha griha* on the upper storey is a feature hitherto not encountered in any temple. Hence the north and south walls of these were made of solid infill, while the eastern wall, which faces the Nandi Mantapa, has been given a lattice screen wall to permit visual contact with the same. The details of the construction can be seen in the sections (Figure 51) and elevations (Figures 52a and 52b).

### **The Hipped-end Alternative**

The alternative elaborated above, though conforming to the tenets of the *Malaprabha* idiom of temple building, is only one of the two possibilities (assuming that the upper floor of the existing structure is the *garbha griha* of the temple). The other possibility is that the upper floor of the completed structure could be curtailed by one bay less, on



the western side, permitting the sloping roof of the lower storey to wrap around the central bay on three sides (Figure 53).

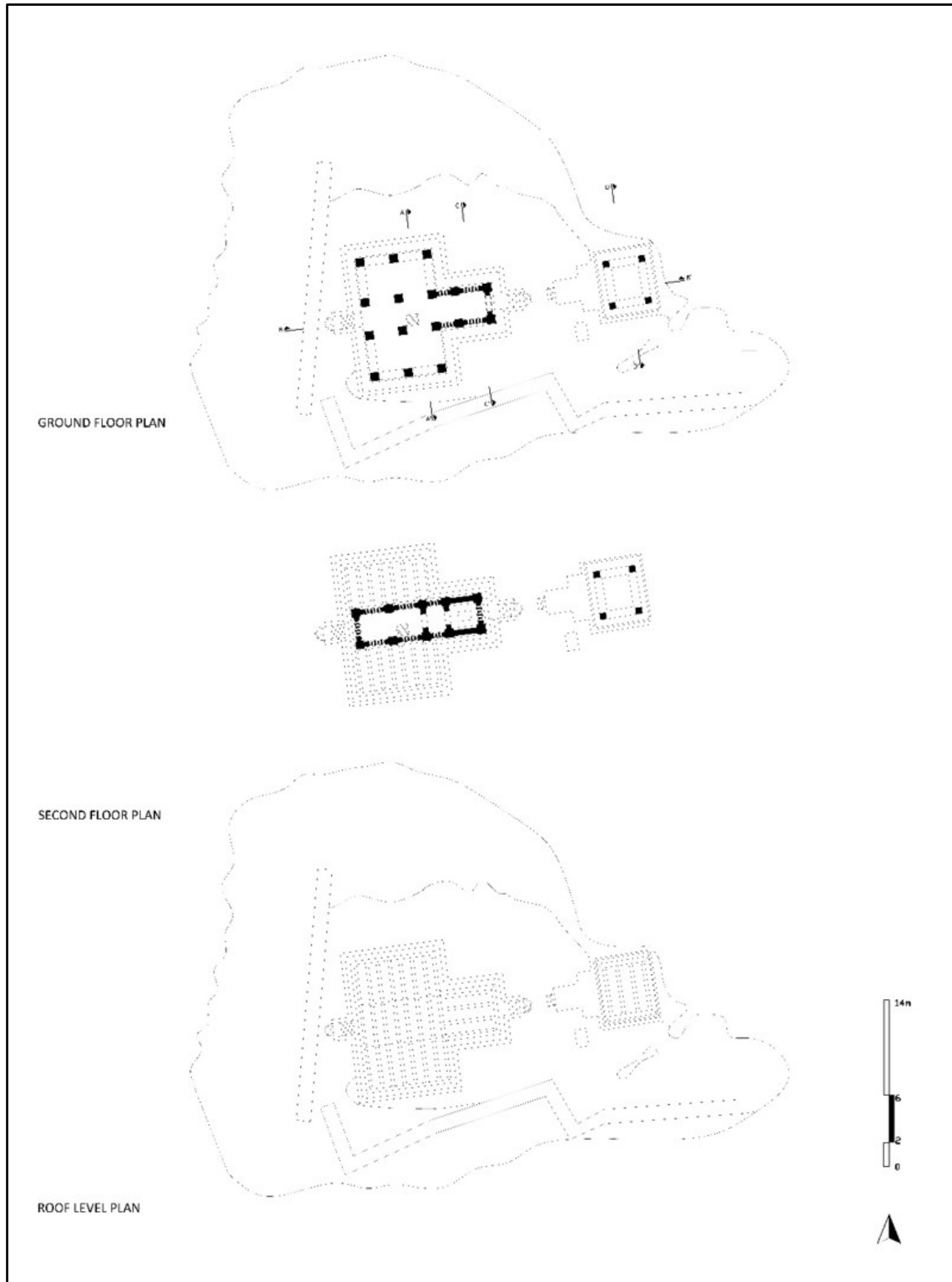


Figure 50: Floor plans at different levels, and the roof plan, for the gable-end alternative

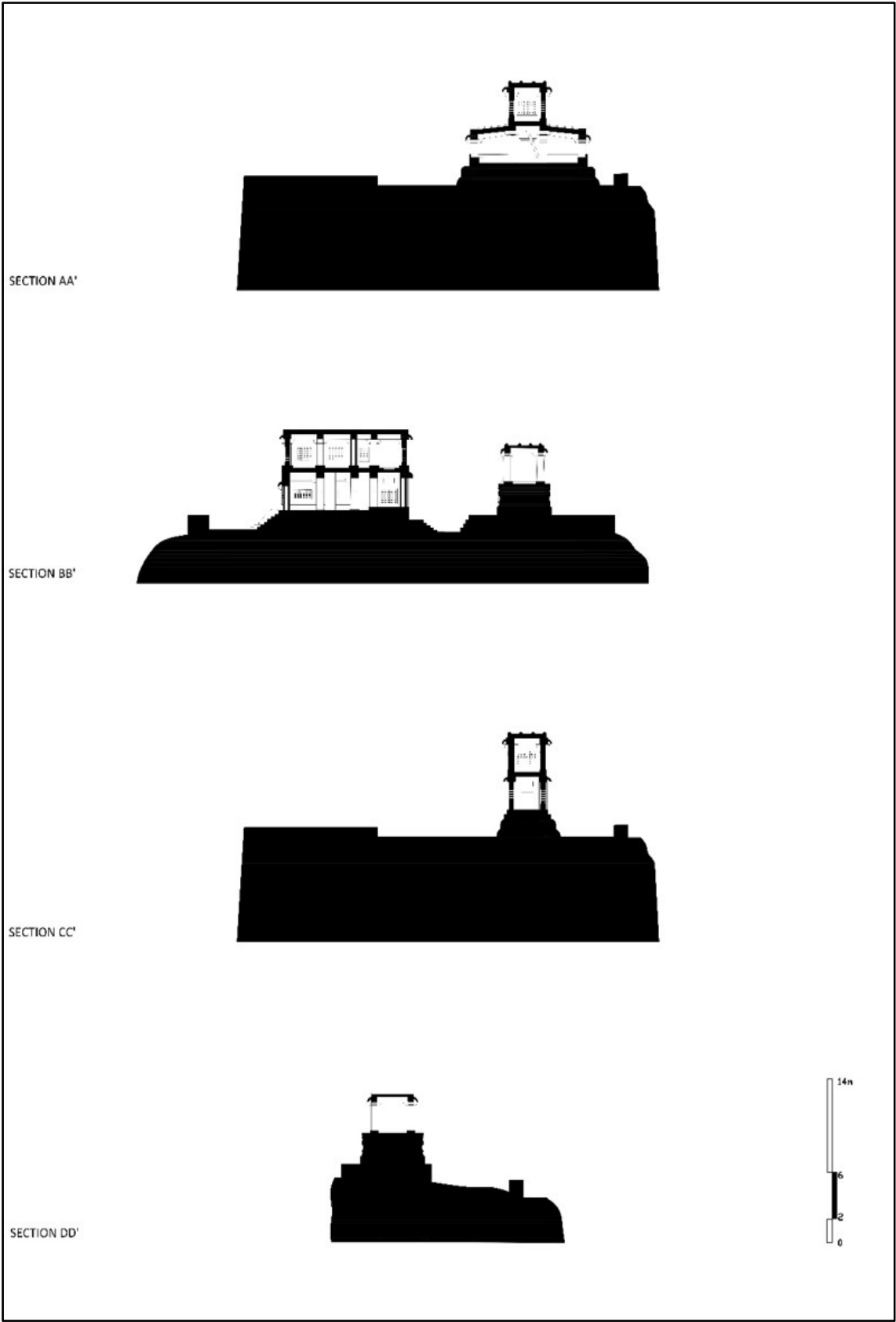
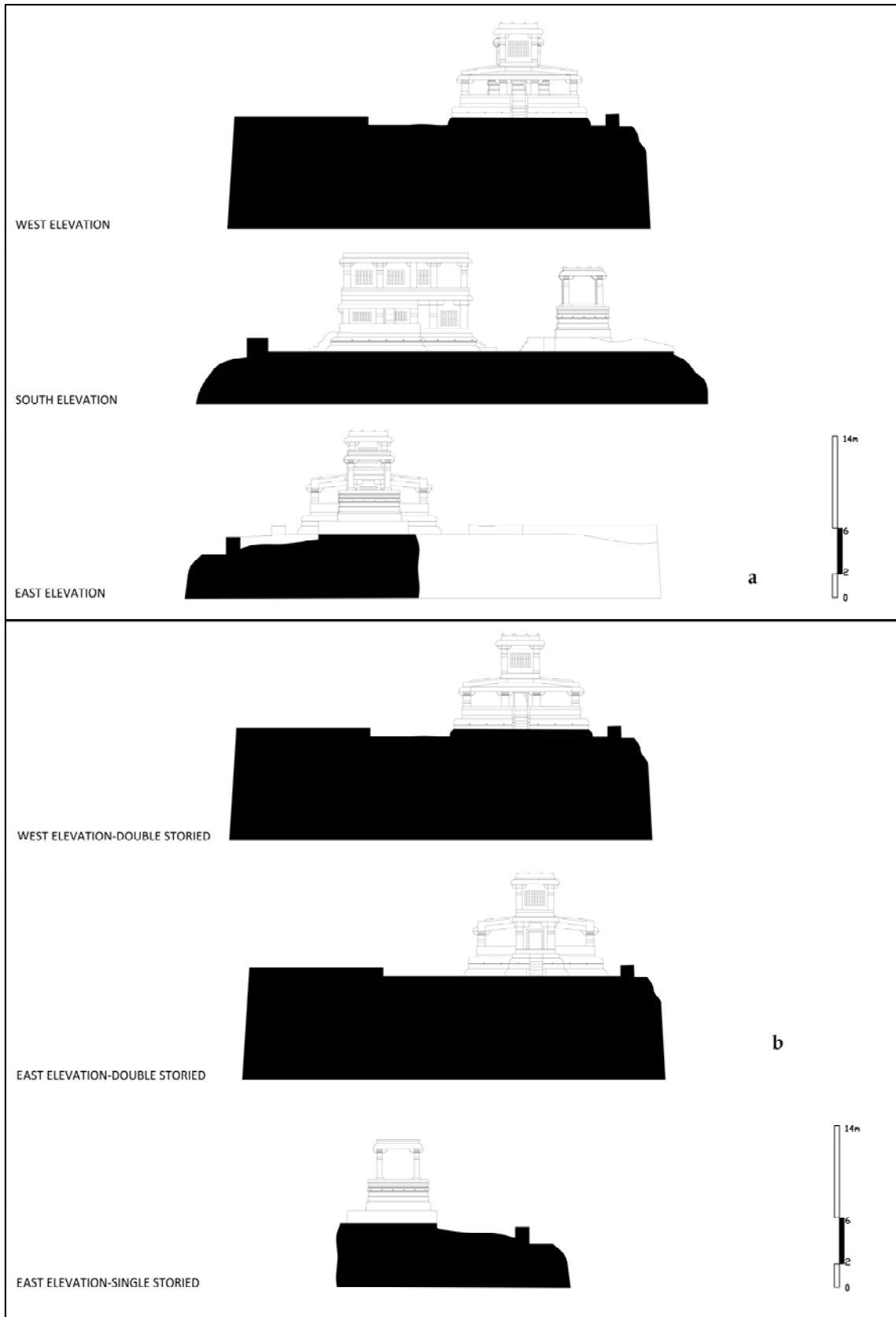
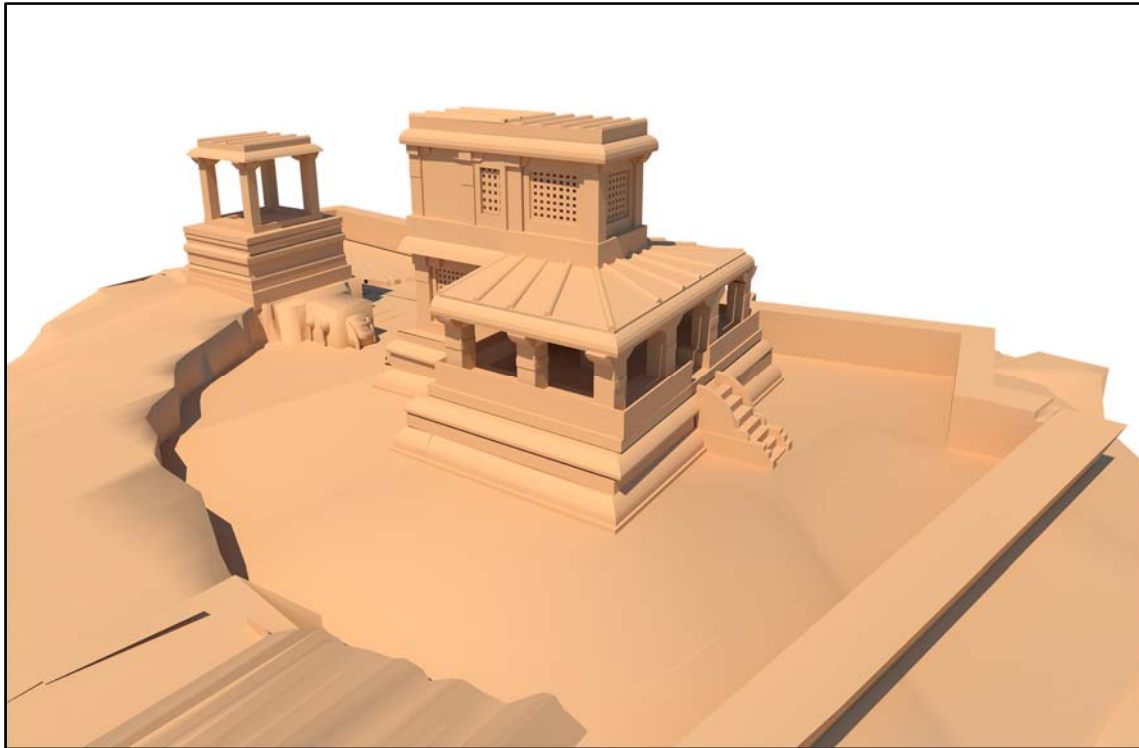


Figure 51: Longitudinal and cross sections of the gable-end alternative





Figures 52: a, b - Elevations of the hipped-end design alternative



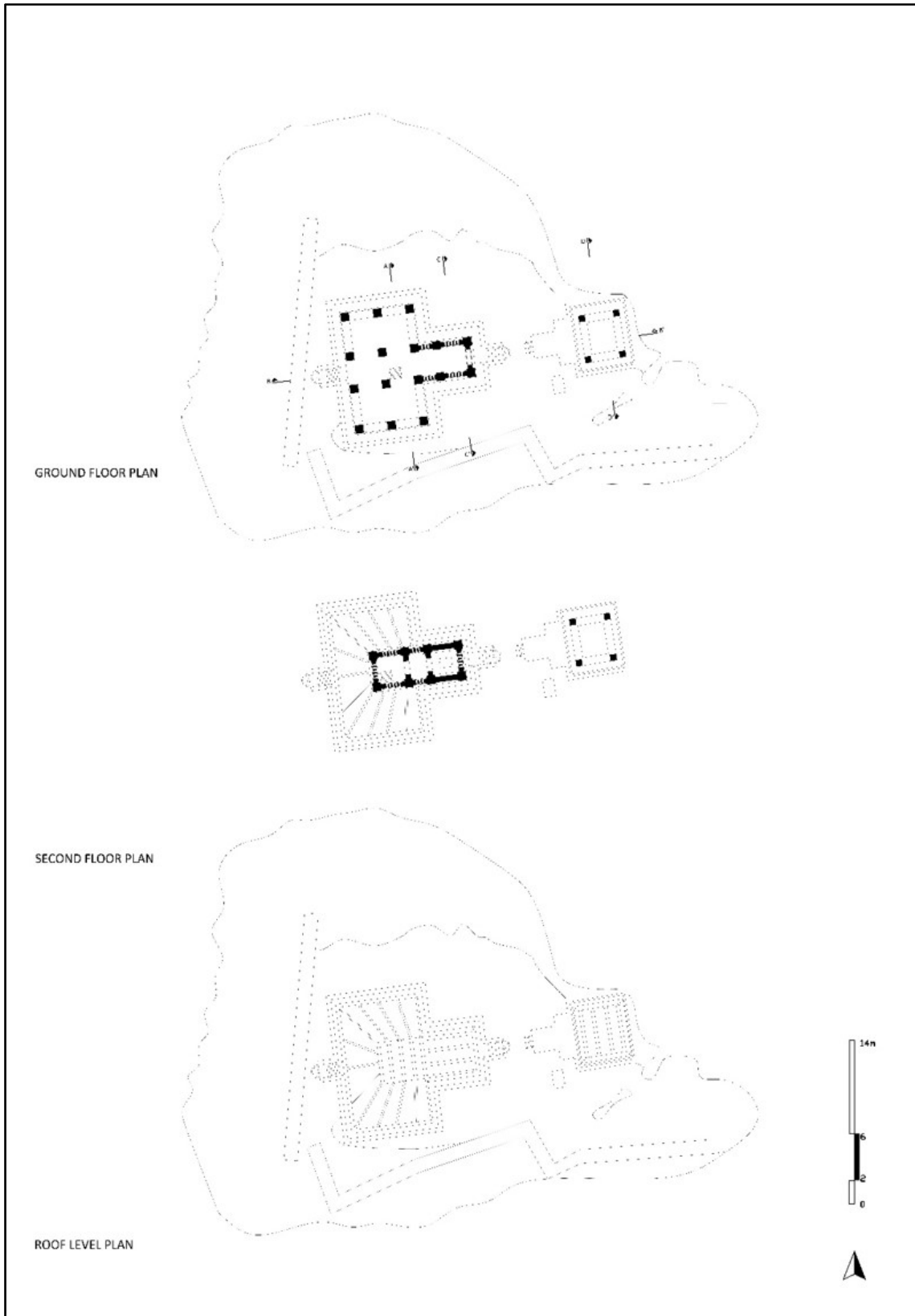
**Figure 53: A view of the hipped-end model from the north-west. Compare with Figures 48 and 49. This is the most likely form the completed structure would have assumed.**

In this alternative too, as can be seen in the floor plans (Figure 54), the western part is dominated by the mantapa, which now has a sloping roof on three sides surrounding the central part, and which has a *kakshasana* seating along the sides. The upper storey is similar to the previous alternative except for the curtailment of one bay to the west. The rest of the treatment, such as infill walls and pierced screen windows remain the same. The details of the construction can be seen in the sections (Figure 55) and elevations (Figures 56a and 56b).

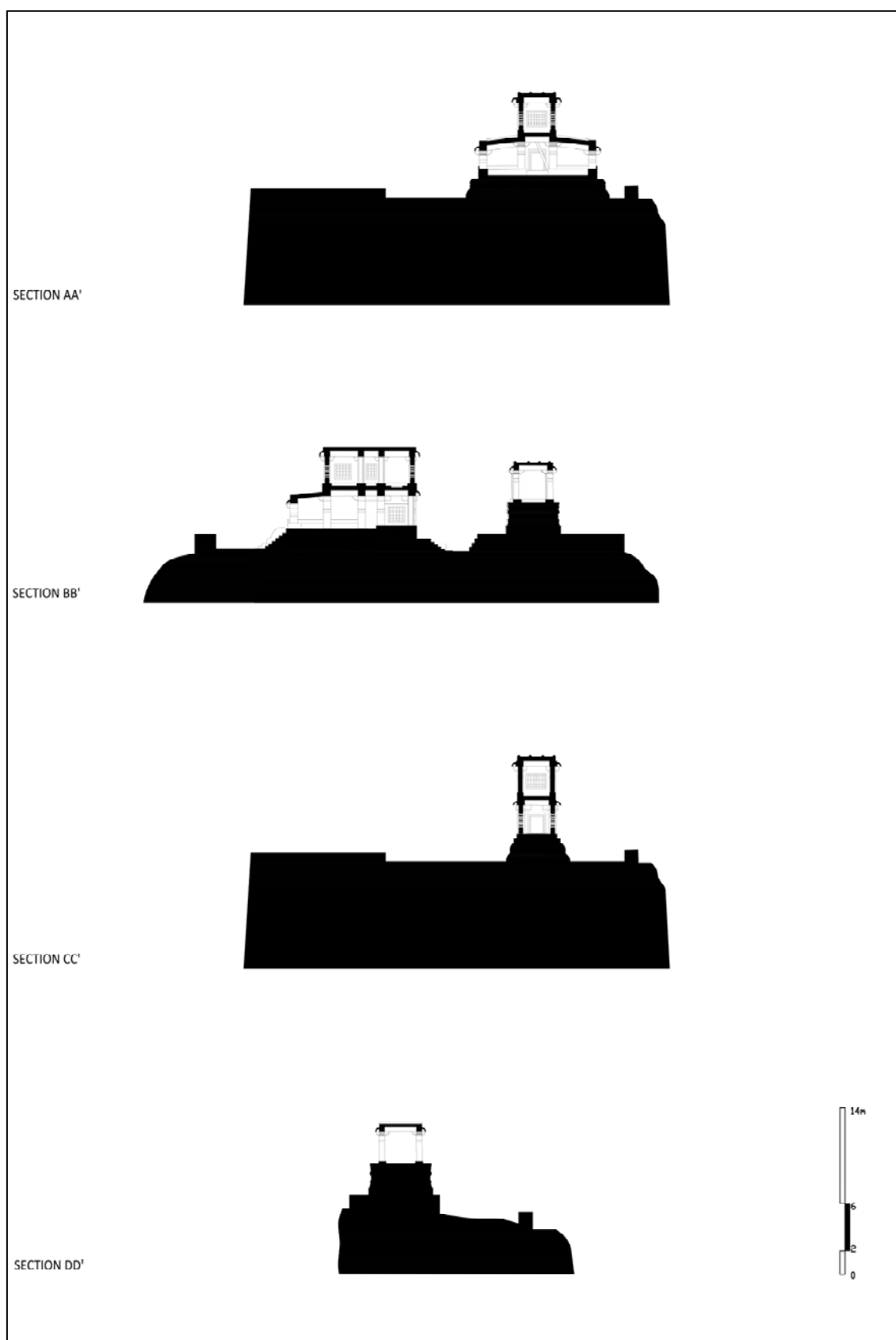
## Discussion

Our analysis has shown that the entire rock necessary for the construction of the two mantapas can be obtained from the volume of rock excavated from the top of the boulder they stand on. The remainder of stone blocks from the extracted rock material could have gone into the construction of the protective wall around the terrace, though it is not sufficient to account for the entire volume of the wall as it exists today. However, this wall, as it stands today, is the result of several additions and restorations that it is impossible to estimate the configuration of the original wall. We can easily see the discrepancy in the size of the blocks used in the construction of the wall (see Figure 57) and see that at least three episodes of construction/restoration have taken place. In fact it can be seen that at least four pillars which must have been intended to be part of the incomplete portion of the structure are embedded in sections of the fort wall to the south visible in this photograph!



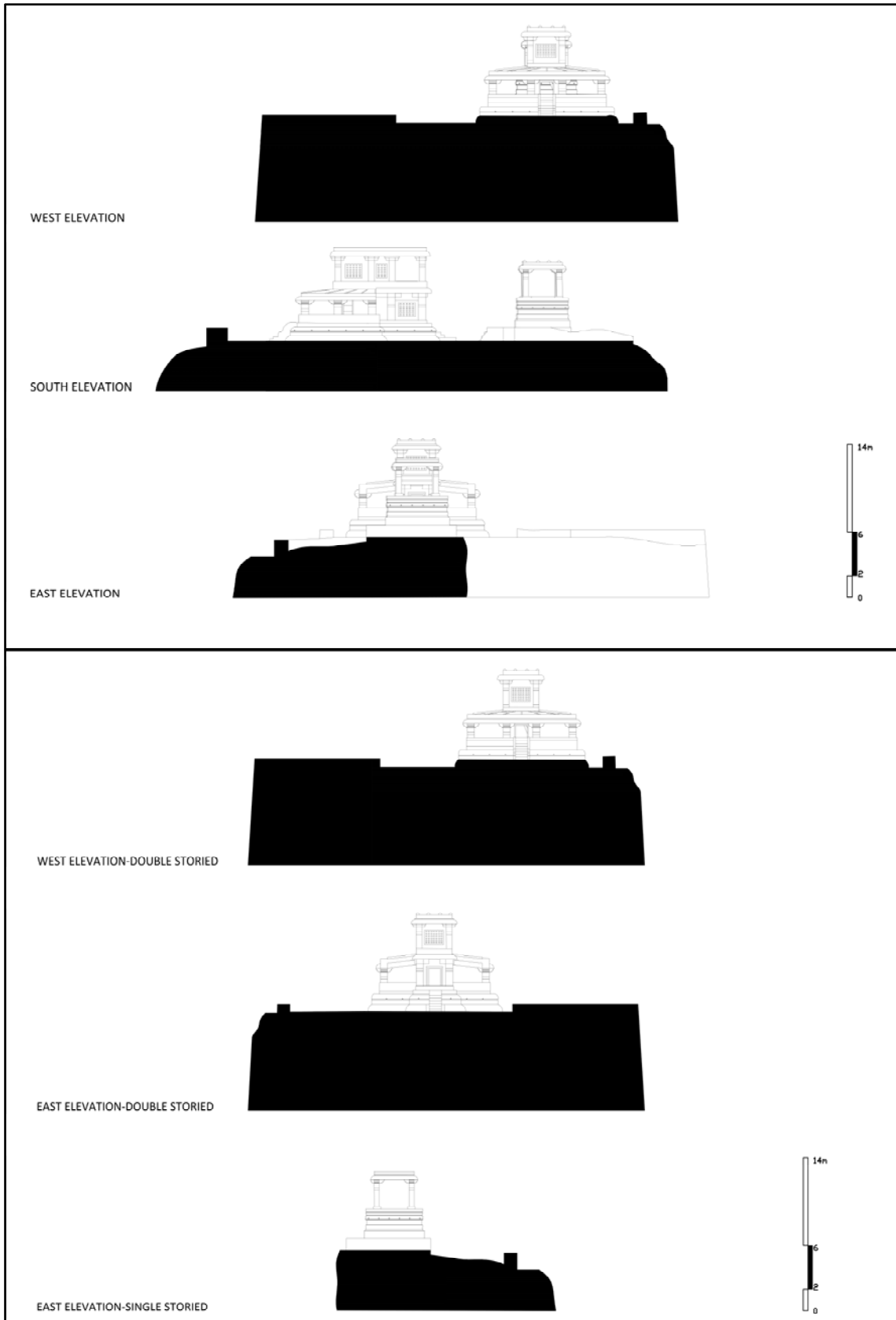


**Figure 54: Floor plans at different levels, and the roof plan, for the hipped-end alternative**



**Figure 55: Longitudinal and cross sections of the hipped-end alternative**





Figures 30.47, 30.48 Elevations of the upper end design alternative



**Figure 57:** A view of the open mantapas of the North Fort, and its encircling fortification wall, from the south-east. Careful observation will reveal areas with varying block sizes, indicating at least three episodes of reconstruction, including recent repairs with very small blocks. One can also see at least four of the pillars intended for extension of the structure embedded in the wall.



**Figure 58:** The Nandi Mantapa of a shrine at Mahakuta. Observe similarities with the single-storeyed pavilion of the North Fort, Badami.



Though various hypotheses have been advanced that the two pavilions constituted a structure which was not religious in nature, and probably had more to do with courtly rituals, the observation of an idol niche in the upper storey of the two-storeyed mantapa strongly suggests that the structures were meant to be parts of a temple. The design of Nandi Mantapas in other Early Chalukyan contexts are quite similar to that of the single-storeyed mantapa, further bolstering this hypothesis (Figure 58).

All the models discussed in this paper have been based on this assumption that the upper storey of the existing two-storeyed mantapa was intended to be the *garbha griha* of the structure which was intended to be a temple. There could be another entirely different set of alternative models if one assumes that the *garbha griha* would have been located, on both floors, at the rear (west) central bay, as in conventional temples. Such models could consider a circumambulatory path around the *garbha griha*, too. However, we have not considered this possibility because it was the idol niche observed on the floor of the upper storey of the structure that suggested that the structure was intended to be a temple, in the first place.

The two models which we have proposed for the complete structure, are based on the evidence provided by the existing part of the structure and the clues for continuity like the footprint of the plinth and the beam-ends. Based on the available evidence of the existing structure, both the gable-end as well as the hipped-end models are possible, in principle. However, among these, it is the hipped-end model that resembles the existing temples built in the *Malaprabha* idiom the best, and might be recognized as the closest to what was intended by the Early Chalukyan temple-builders.

There are slight unresolved problems with both models, such as the junction of the rounded eave meeting the slope of the lean-to or hipped roof (see floor plans, Figures 50 and 54), which is awkward. The ideal design solution to this would have been to have the rounded eaves, which are part of the beam system to wrap around the entire structure at a level higher than the tops of the sloping slabs, but the existing configuration of columns, brackets and beams does not permit that. This is a problem that could have confounded the 7<sup>th</sup> century artisans who might have tried to complete the structure a century after work on it had been begun.

However, the most disconcerting aspect of this model is the situation of the *garbha griha* of a temple on the upper floor above what is a space for passage. However, that seems to be the intention from the characteristics of the two existing floors of the two-storeyed mantapa. Did this incongruity have anything to do with the fact that the structure was never completed? Was the experiment of inserting a sanctum immediately above an access passage deemed too radical to be accommodated into the principles of temple architecture, even by this “laboratory” not at all averse to experimentation? This is distinctly possible. The Malaprabha Valley was long known as the “Cradle of Indian Temple Architecture” among architectural historians, due to the proliferation of temple forms of various idioms existing side-by-side at many sites,

like Pattadakal and Mahakuta. This is probably untrue, for both the *Nagara*, and *Dravida* idioms seem to have been fully formed by the time structures were built in these idioms in the Valley (Padigar, Personal Communication, 2015). A better sobriquet would be “Laboratory of Indian Temple Architecture”, for it cannot be disputed that there was a lot of experimentation and fusion of the *Dravida*, *Nagara* as well as *Malaprabha* idioms in several notable monuments of this period.

This monument could thus have been one early experiment which did not quite take off, compounded by the paucity of available rock for a structure which was intended to be much larger than the partial structure which currently exists. Even the Lad Khan Temple, which is said to be the “most evolved illustration” of the *Malaprabha* idiom (Michell 2014), is deemed as “famous but controversial” by art historians, and the sanctum at the rear “almost seems to have been added as an afterthought.” (Huntington 1985). Huntington (1985) also states that “It has been suggested that it derives from a type of village meeting hall rather than from earlier religious structures.” Padigar (Personal Communication, 2017), on the basis of an inscription in the structure which seems to refer to fees for performing various ceremonies, opines that the Lad Khan was a hall for community functions and not a shrine, primarily. There is no doubt that the *Malaprabha* idiom was the focus of many experiments by artisans in the period of Early Chalukyan rule, and the open pavilions of Badami were part of that experiment.

It is also possible, in fact, quite likely, that the structure as it stands today, is the product of two phases of construction activity – one in the 6<sup>th</sup> century, followed by another phase in the 7<sup>th</sup> century as suggested by the inscription of Nalpayan. With the amount of time elapsed in between, it is possible that the intentions of the original artisans was not clear to the later ones and the design inconsistencies led to the abandonment of the venture.

## Conclusions

We have demonstrated that the open mantapas standing prominently on a large boulder in the North Fort at Badami were constructed using structural members carved out of rock quarried from the top of the same boulder, set upon rock-cut plinths. We have further shown that the mantapas were most probably unfinished, and not vandalized, as has been conjectured earlier.

Based on the observation of an empty idol niche in the floor of the upper storey of one of the unfinished pavilions, we have suggested that the structures were together intended to serve as a temple, with the single-storeyed one intended as a Nandi Mantapa. After carefully documenting the existing structure, including the unfinished plinth to the west of the existing structures, we have advanced two possible alternatives for how the structure might have looked like, if completed. Both these alternatives assume the upper storey of the existing two-storeyed structure as the *garbha griha* of the temple, which contravenes conventional practice. We have assumed

that the structure would have been built in the *Malaprabha* idiom of temple architecture prevalent in the region. Future attempts at reconstruction can assume the single-storeyed pavilion as an independent shrine, and the idol niche observed in the existing two-storeyed structure for the icon of the vehicle of the deity to be installed in the *garbha griha*, which in these attempts, can be assumed to be in the west. Such attempts can complete the list of possible forms the temple can assume, based on the evidence available in those parts of the monument which exist currently.

It is difficult to understand why the venture was abandoned. It does seem, from available evidence, that the structures existing at present were products of at least two episodes of construction. While we can only conjecture why this temple was left incomplete, it looks possible that design inconsistencies, and shortage of rock could have played a part in the abandonment.

## Acknowledgements

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