

Temples of Bengal: Material Style and Technological Evolution

Priyanka Mangaonkar
Architect and Researcher

Art of Bengal, which was mainly religious in nature, was expressed through the medium of temples. Brick temples of Bengal (built between 16th and 19th century) forms one of the most distinctive groups of sacred monuments in India. Due to multiple artistic influences acting upon the region during this period the Brick temples of Bengal show wide range of forms and techniques of construction. Hence the temples constitute a coherent series in their architecture and sculpture, characteristically expressed in brick and terracotta. The chronological span also significant coinciding with the emergence of the new Bengali culture. "In fact, the Bengali temples may be viewed as one of the most important manifestations of this regions culture, closely associated with contemporary movements in religion, literature and the arts as well as with broader political, social and economic developments."ⁱ Due to the political unification and consequent independence of Bengal; a unique Bengali style of monumental architecture was created which was also an expression of the local idioms. "Another important result of this change was the combination of Hindu and Muslim elements as intrinsic part of Bengali culture: thus, Muslim rulers and monumental Islamic architecture, but Hindu revivalism and religious poetry."ⁱⁱⁱ

The history of religious architecture in Bengal can be divided into three periods:

1. Early Hindu (up to the end of the twelfth century, later in western areas)
2. Sultanate (fourteenth to early sixteenth centuries)
3. Hindu revival (sixteen to nineteenth centuries) ⁱⁱⁱ

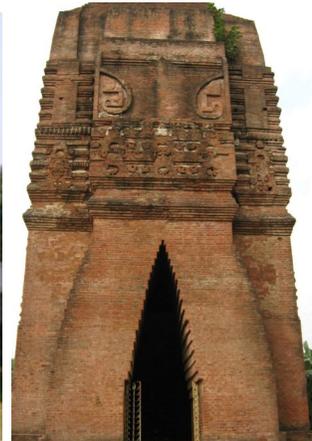
During early Hindu period, Bengali temples were based on Mayuryan and Pre-Mayuryan art of India. In this early stage, the terracottas consist of stray cult pieces of small sizes. In later stages terracotta plaques appeared with new designs which were different from the primitive illustration of the same theme. In the next stage terracottas appeared in larger sizes and related to architectural structures, as decorations of the facades of the temples. The temples were having elaborate representation of themes borrowed from the *Puranas*. Most of the decorations are typically Gupta in style.

When Muslims came to India in the beginning of 13th century, under Sikander Shah, Bengal became an independent entity for the first time and for the next two centuries distinctive Bengali culture developed which was evident in literature and architecture of Bengal. In combination with large domes and corner minarets, local characteristics of curved cornices taken from bent bamboo eaves of village huts and

indigenous terracotta decoration was added. Structurally also there was a significant shift from the old Hindu corbelling system to Islamic vaults, dome and keystone arches.



Siddheshvari temple at Barakar



Rekha Deul brick Temple at Sonatopal

Figure 1. Showing Siddheshvari temple at Barakar and Brick temple at Sonatopal

By the end of the 16th century, a uniquely Bengali style of temples architecture and sculpture had established itself as the Hindu artistic expression of the new social, religious and Cultural Revolution. "The wide range of temple styles embraced elements of both change and continuity, typical in the dynamic but traditionally based Bengali society."^{iv} Furthermore, the temple decoration depicted the aspects of everyday life of the contemporary society, particularly the ambitions of the temple builders. Clearly temple building was the result of an intense concentration of economic and artistic resources, as well as public means of expressing power. Temples built in the later part of eighteenth century were smaller in size and also had less terracotta decoration mostly having it only on the front façade. This was due to the economic and social change that Bengal experienced, because of the increase in overseas trade.



Figure 2. Siddhesvara temple of Bahulara at Bankura

Style of construction^v

There were four different styles of construction followed in Bengal.

- Traditional style
- Hut style
- Pinnacled style
- Flat roof style

Traditional style

The temples of pre-Muslim period have few remaining evidences from which it can be said that tall curvilinear *rekha deul* temples were predominantly built. The earliest temple still standing of this group is Siddheshvari temple at Barakar. (Figure 1) This type of temples went on developing up to the end of twelfth century, increasing in height and complexity. Examples of later complexity in Bengal are the dilapidated *deul* still standing at Satdeulia (Burdwan), Bahulara and Sonatapol (Bankura), or Deulghat (Purulia).^{vi} (Figure 1 and 2)

Another Equally common group of temples found in Pre-Mughal Bengal are temples with tiered pyramidal tower known as *pirha* or *bhadra deul*. A combination of *pirha deul* surmounted by a *rekha shikhara* (*Rekha deul*) temple evolved later.

During the earlier and later Hindu period religious changes took place in Bengal which also brought some changes in temple architecture. Hence from the above designs *rekha deul* continues to be built in large numbers. In their places of the other temple styles appeared two entirely new styles – hut style and pinnaced style. Hut style which was based on imitation of common village house with thatched roof and pinnaced style was closest to the Islamic style. Both these styles incorporated Islamic construction features like domes, vaults, arches etc and also took over the local features that were current on the mosques: curved cornices and terracotta decoration in low relief with prominent moldings.



Figure 3. Simple domestic hut form transformed into temple form

Hut style

A simple form of domestic hut is been reproduced in case of hut style temples in Bengal. The struts supporting the gable ends and bamboo framing done for the walls are often reproduced as a decorative feature in brick temples. (Figure 3) Even the bamboo rafters on which the thatch rests in case of hut may be reproduced on the inner vault and supporting poles on the inner vault. This design is referred to as *ek-bangla* or *do-chala*. Two such huts, one as a porch in front of the other as shrine constitute as *jor-*

bangla or *char-chala* design—Bengal's most distinctive contribution to temple architecture.^{vii} (Figure 4)

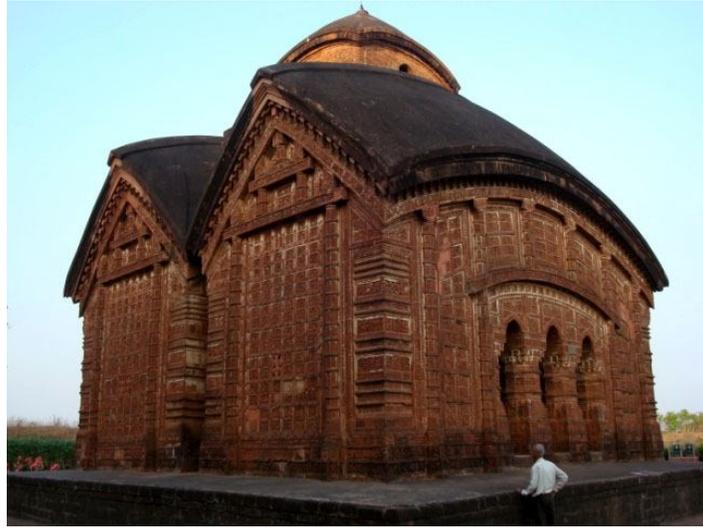


Figure4. Jor Bangla or Keshta-Raya temple at Bishnupur

Another reason behind the imitation of vernacular hut form for temple construction was the evolution of local cults that occurred during the same period. Most of the local deities in Bengal which were worshiped in huts, when transformed incorporating the services of Brahmins, were housed in brick temples copying its original form. "This progression from mud and thatch to brick was later continued in stucco and concrete construction.



Figure 5. Showing Siva temple at Amadpur^{viii} and Raghavesvara temple at Diknagar^{ix}

If on the roof of a *char-chala* temple, a miniature temple is built then the temple is called as *at-chala*. This typical hut form when imitated in bricks or stone the result is more decorative than utilitarian. For construction of a *char-chala* roof, a square plan is covered internally by a dome on pendentives to give it a hut shaped roof. In case of *at-chala* temples on elongated base, the chamber roof extends lengthwise from a central dome on arches and narrow corbelled vaults. *Do-chala* design is also supported on

similar type of large vault with curved ridges and lower edges construction. This type of construction was also used for porches of *at-chala* temples.



Figure 6. Rasamancha at Bishnupur showing repetitive use of eka-bangla roof

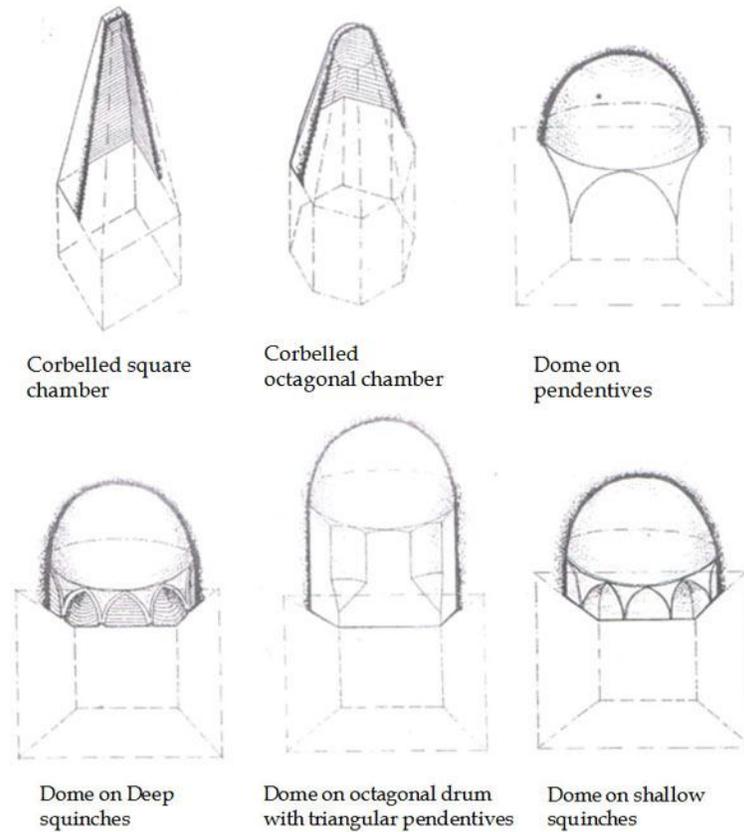


Figure 7. Different type of roof construction^x

Even though jor-bangla design was developed from *ek-bangla*, examples of latter very rarely exist. 'During the Mughal period do-chala roof should have been taken up by

Muslims, and even exported to other parts of India, where it became a prominent feature of seventeenth century architecture of Delhi, Lahore, Gulburg, from where it passed in the eighteenth century on to the palace balconies and garden pavilions of Rajasthan.^{xii} In Bengal this form was majorly used for entrance gateways to temple enclosures, or for subsidiary buildings as in case of Madan-Mohana *bhoga-mandapa* or as it is used in repetitive way around huge Rasamancha built in sixteenth century at Bishnupur.



Eka-ratna temple: Madan Mohan temple, Bishnupur

Pancha-ratna temple: Shyamrai Temple, Bishnupur

Figure 8. Madan-Mohan temple and Shyamrai temple at Bishnupur

Pinnacled style

Pinnacled or *ratna* style design has the same lower structure as in case of chala – but the roof is more or less flat and is surrounded by one or more towers or pinnacles called *ratna*. The simplest form has a single central tower called *eka-ratna*, to which four more towers can be added at the corner which is called as *panchratna*. 'By thus increasing the number of stories and corner turrets the number of *ratnas* can be multiplied through nine, thirteen, seventeen, and twenty-one up to maximum of twenty-five (*panchavimshati-ratna*)'.^{xii} Ratna style seems to emerge in sixteenth century and was a favorite style of a Malla king of Bishnupur.

Flat-roofed style

Apart from the above three types there existed one more minor category with lotus shaped domes or spires called flat roofed temples. In nineteenth century Bengal architecture came under European influence in which structures were domed internally but internally spanned by shallow vault and latterly flat ceilinged. Porch resting on two or more pilasters was replaced by clustered pilaster. The arches were cusped and facades were designed as those of chala and ratna designs with plastered terracotta decoration. Common example of flat roofed temple is the sixteenth century Durga *dalan* built for annual *pujas*.

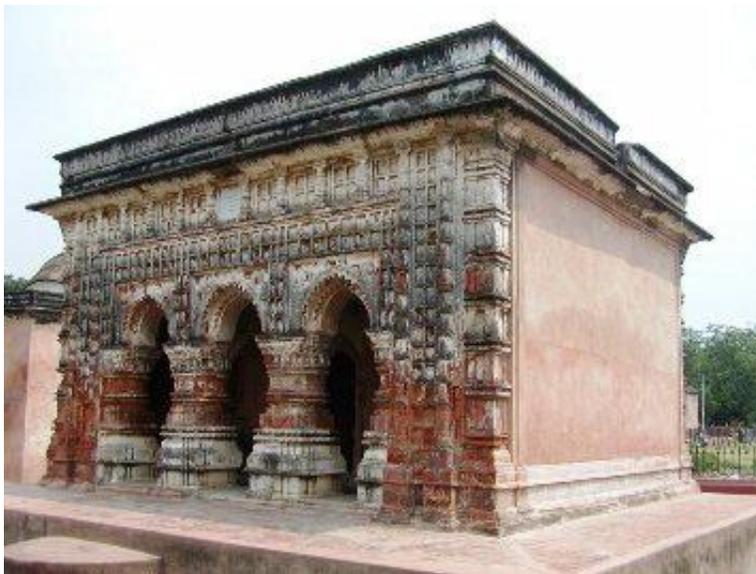


Figure 9. Rupesvara Temple, Kalna.^{xiii}

Over a period of time these temples lost their traditional characteristics, becoming a brick built room similar to those of modern domestic architecture. Innumerable such temples have been built in late nineteenth and twentieth century.

The Temple builders

The plaques of terracotta give us a glimpse of the early culture of the people of Bengal which is not available in Bengal literature. This proves that this plastic art supports the literary art of Bengal. In Bengal only two caste forms can be traced – the *Acharyas* and *Sutradharas*. The role of the *Acharyas* and *Sutradharas* indicates an age old relationship of working together that existed in India.

These terracotta reliefs are noteworthy contribution of these artists. These artists derived their inspiration not only from the standard rules and regulations of the *Shilpa Sashtras*, but also from the keen observations of the daily lives of the people around. In course of time *Sutradharas* became capable of using materials like stone, ivory, metal etc. and became skilful artists. They accordingly developed into four different directions namely – *Kastha* (wood), *Mrttika* (clay), *Chitra* (painting), *Pasan* (stone) and divided themselves into several regional groups. The *Sutradharas* worked as a group and each consisting of several families and having their hereditary knowledge used to live and work under *Acharyas* who were responsible for planning and supervision. These teams used to travel from one place to another. The heads of these groups had readymade master plans of temples of varied size and shapes and they use to carry these plans with them. Then according to donor's choice and even details regarding arrangements of terracotta bricks, according to the theme and pattern used to be completed and

necessary instructions were issued by the leader before the commencement of the construction.^{xiv}

'As the majority of Bengalis during this period were illiterate, terracotta artists had little opportunity to acquaint themselves with the Sanskrit *Puranas*, epics, and other source books of mythologies. For these artists' knowledge of the epics and myths was mainly derived from the works of local Bengali poets particularly in the form of popular dramas and songs. These poets translated and retold the stories for the benefit of villagers and also introduced new episodes and their own interpretation in it without any hesitation. This brought atmosphere of contemporary society in their stories and poetry; bringing their works nearer to the hearts of Bengalis and profoundly influenced the artists who decorated the temples of the period.'^{xv} For example the influence of contemporary society is seen in *Mangal Kavyas* as well as in the portrayals of the marriage of Shiva and *Parvati* in temple art. In the depiction of this popular scene, temple artist didn't follow the standard iconographic texts but preferred to represent *Parvati* as a small girl, and *Shiva* as a half naked old man. While describing the marriages between the poor and homeless *Shiva* and the beautiful *Parvati*, poet drew upon scenes of ordinary Bengali life in which girls of tender age were sometimes given in marriage to old men. In their descriptions of such scenes poets did not hesitate to emphasize the pain and regret of the young girl. And this was true in 18th and 19th century when marriage between old men and young girls was a common practice. Hence this way the different epics of *Puranas* were recited by storytellers at village gatherings and undoubtedly influenced terracotta artists of that time.

Materials and technique

The temples of Bengal form one of the most distinctive groups of sacred monuments in India, incorporating a wide range of forms and techniques that testify to the multiple artistic influences acting upon the region. Following four different building traditions influenced the temple architecture in Bengal:

1. Temple architecture of north India specifically of Orissa: Massive walled towers with hollow interiors constructed in corbelled layer of stonework. This kind of temples stone temples can be found in Burudwan.
2. Temple architecture associated with Buddhism: pointed arches, vaults were created using by laying voussoired bricks end to end.
3. Monumental architecture if Sultanate period: By using bricks which was a local building material in Bengal typical Islamic features such as domes, arches, vaults were created. Not only domes and vaults were created but local building forms were replicated to make these structures more permanent. Like hut shapes are

recreated in brick vaulting along with curved cornices and terracotta façade decoration.

4. Mughal architecture: Mostly finished in plaster-decorated surfaces, interior spaces are roofed with variety of vaulted forms, particularly shallow pointed cross-vaults and flat ceiling with curved coves on square and octagonal plan.

Material

Even though stone was mainly used for construction till this period, there are rarely any stone temples in this province due to scarcity of stone. In Bengal Stone temples are mostly found on southwestern periphery of Bengal as a coarse-grained laterite was plentiful in those regions. Region wise availability of Material in Bengal is described below:

- Coarse grained Laterite: Midnapore, Bankura and Purulia district
- Yellow Baraka sandstone: Northern Burdwan and adjacent Purulia.
- Local sandstone: Birbhum
- Fine grained crimson laterite: Bolpur-Suri-Rampurhat^{xvi}

Due to abundant availability of good alluvial soil temples were rarely built with or faced with stone. The majority of the Bengal temples were built with well-fired bricks. These brick sizes vary not only from region to region and from century to century but also within the same building (Figure 7). For example at Kodla brick sizes range from 24 x 20 x 4 cm to 17 x 13 x 4 cm.^{xvii} Following drawing will help to understand how different sizes of bricks were used to get desired effect or to create pseudo effect of stone construction. Mortar used for laying brick was made from mixture of powdered brick and lime (lime was obtained by processing snails shells.) fine but very hard *pankha* plaster done on roofs, vaults and walls of plaster was made from snail lime mixed with river sand.

Bricks were generally laid as stretchers, with half bricks to fill the gaps and to avoid successive vertical joints. Surface brickwork when covered with terracotta sculptures organized into overall façade schemes, displays considerable skill of the craftsman. Different shapes of bricks are used such as long thin bricks laid edgewise as framing bands, triangular bricks as filling pieces and flat plaques coordinated in large scale sculptural compositions, these all carefully interlock.

The surface skin i.e terracotta tiles were carefully knitted into the core structure of the building i.e of brick. Various broken temples shows that, the core of structure generally consist of properly laid horizontal brick courses. Domes and vaults were also created using bricks laid as stretchers. In arches bricks are cut often crudely to form tapering voussoirs. Curved layers of brickwork were used to create vaults as well as swelling contours of temple cornices and roofs. Bricks laid diagonally sometimes decorate supporting arches and pendentives. Regular shapes were used for temple

plans like square, rectangular, octagonal etc. these spaces were vaulted or domed or sometimes arranged in complex composition. Sizes of these domed or vaulted spaces were also limited. Krishna- Chandra temple at Kalna consisting of dome of almost 4.5 m diameter is one of the largest extant examples. Wall thickness were also ranging from 75cm to 125cm. Very rarely massive brick work was done like one at Kodla which is almost 3m thick to imitate stone construction.

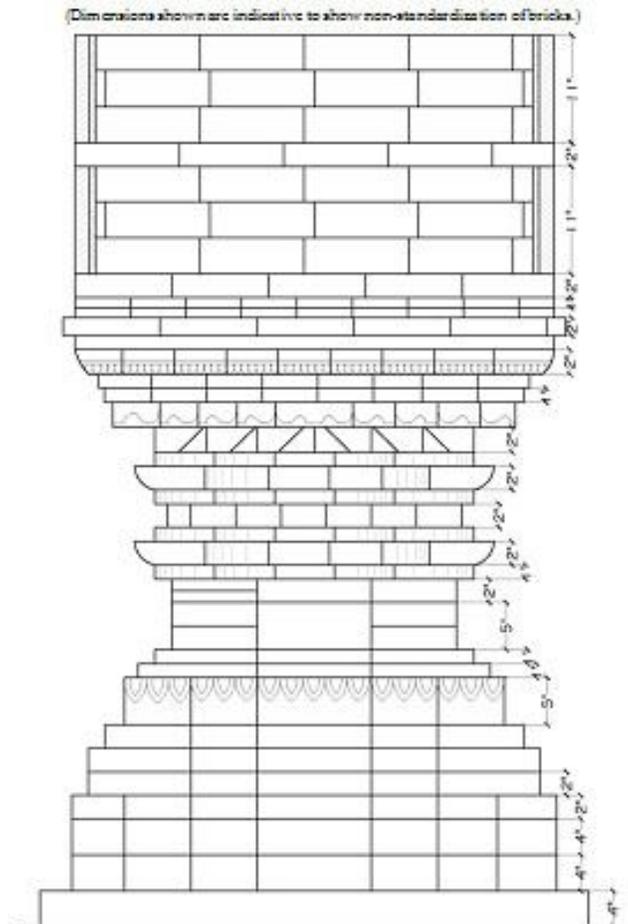


Figure 4. Varying brick sizes used to create a make believe effect at Rasmancha, Bishnupur

Non standardization in construction^{xviii}

Well fired brick is the basic building material for temple making in Bengal. Brick sizes vary, not only from region to region and from century to century but also within the same building. Following drawing will help to understand how different sizes of bricks were used to get required effect or to create pseudo effect of stone construction. (Figure 9, 10)

Bricks are generally laid as stretchers, with half bricks to fill the gaps and avoid successive vertical joints. (Figure 9) Surface brickwork when covered with terracotta

sculptures organized into overall façade schemes, displays considerable skill of the craftsman. Different shapes of bricks are used such as long thin bricks laid edgewise as framing bands, triangular bricks as filling pieces and flat plaques coordinated in large scale sculptural compositions, these all carefully interlock.



Figure11. Different sizes of brick were used according to the requirement.



Figure12. In case of arch bricks are cut to form tapering voussoirs



Figure13. Different sizes and shapes of bricks used to get the desired effect

Vaults and domes are also created with bricks laid as stretchers. In arches, bricks are cut to form tapering voussoirs. Curved layers of brickwork are employed to create vaults as well as swelling contours of temple cornices and roofs. Sometimes bricks are laid diagonally to decorate supporting arches and pendentives.

Articulation on the temples

Articulation on the facades of Bengali temples appears to be figurative as well as ornamental. Carvings appear in panels above arched entrances, as well as on surrounding walls, raised bands and pilasters, bases and cornices, columns and arches. There is more uniformity in the decoration of the facades, particularly in their sculptured details, than in the diverse temple types, which were evidently invented by architects with particular flair for improvisation and experimentation.



Figure 14. Scenes of hunting with variety of animals seen o temple façade



Figure15. Mythological scenes and foreign women showed on temple facades

After the middle of the eighteenth century there was an emergence of neoclassical forms in temple articulation. The popularity for European styles in dress and education among the wealthy Bengalis also found an expression in architecture. Many neoclassical Italianate urban and country houses came up all over Bengal, and many

neoclassical details of these houses were imitated in nearby temples, reinforcing the link between religious and domestic architectural traditions. A continuous friezes form one of the most common subject in temple art of Bengal. Subjects like royal processions, boating, receptions; hunting with variety of animals can be found on temple facades.

There was more emphasis on war scenes, warriors with contemporary weapons, music, dancers and instrumentalists. Foreigners too were common subject, easily recognizable by their dress and headgear, weapons they hold or ships they navigate. By depicting scenes form upper strata of the society on his temple, the patron connected himself with this powerful, leisured class of the society. General scenes of village and urban life were showed in a mythological context.

Deterioration of temple art

In the second half of the nineteenth century, due to the increasing westernization of wealthy Bengali people, and emergence of Calcutta as the capital of the new British India there was decline in temple patronage. Hence architects and artisans who were always dependant on these local patronage found themselves without work and were forced to turn to other craft such as wood or scroll painting or to give up work altogether. By the middle of nineteenth century terracotta work on the temples were already replaced by stucco work. In twentieth century the traditional art of temples building with terracotta and brick has vanished with the adoption of modern materials like steel and concrete. Today the temples are mostly disfigured and also covered with ugly concrete additions.



Figure 16. While conserving the Shyamrai temple one of the roof of the tower was made straight instead curvilinear form

Acknowledgement: For the above paper the author has heavily relied on the book 'Brick Temples of Bengal: from the Archives of David McCutcheon Edited by George Michell.'

Glossary

Acharya: Preceptor

Bhogmandapa: Hall of offerings

Chutar: Carpenter

Durga: The mother goddess, consort to *shiva* in the form of a fierce woman riding a tiger, the destroyer of evil

Jor Bangla: Twin *chala* hut

Pancharatna: *Ratna* temple with five *ratna* aedicules, four on four corners of roof level

Pankha plaster: Plaster made from snail lime mixed with river sand

Ratna: A type of late mediaeval temple in Bengal characterized by a *latina* aedicule kept on sloping roofs with curved cornices

Rekha: *latina* temples as called in Bengal

Shilpa Sashttra: The science of architecture and other cognate arts

Shiva: One of the primary gods known as the 'destroyer'

Sutradhar: Member of the carver/carpenter caste

Notes

ⁱ Michell, George. "Historical background", in Michell, George (Ed.). "Brick Temples of Bengal - From the Archives of David McCutcheon" Princeton University press, New Jersey, 1983, Page no. 3

ⁱⁱ *Ibid*, page no.4

ⁱⁱⁱ McCutcheon, David, "Origins and Developments", *Ibid*, page no. 15

^{iv} Michell, George. "Historical background", *Opsit*, page no. 6

^v Understanding for Style of construction is based on David McCutcheon's "Origins and Development" in Michell, George (Ed.) "Brick Temples of Bengal - from the Archives of David McCutcheon", Princeton University Press, New Jersey, 1983.

^{vi} *McCutcheon, David*, Origin and Development, *Opsit*, Page no.18

^{vii} McCutcheon, David. "Origins and Developments", *Opsit*, Page no. 20

^{viii} http://www.aishee.org/essays/essay_at_chala.html, 10 June 2012, 1pm

^{ix} http://www.aishee.org/essays/essay_char_chala.html, 10 June 2012, 1.15pm

^x Michell, George (Ed.). *"Brick Temples of Bengal - from the Archives of David McCutcheon"* Princeton University press, New Jersey, 1983, Page no. 83

^{xi} McCutcheon, David. *"Origins and Developments"*, *Oposit*, Page no. 23,24

^{xii} *Ibid*, page no 20

^{xiii} http://www.aishee.org/essays/essay_dalan.html, 10 June 2012, 3pm

^{xiv} Understanding for Temple builders is based on Michell, George (Ed.) *"Brick Temples of Bengal - from the Archives of David McCutcheon"*, Princeton University Press, New Jersey, 1983.

^{xv} Haque, Zulekha. "Literary Sources" in Michell, George (Ed.). *"Brick Temple of Bengal – From the Archives of David McCutcheon"*, Princeton University Press, New Jersey, 1983

^{xvi} Michell, George, "Materials and Techniques", *Opsit*, Page no.64

^{xvii} *Ibid*, page no. 64

^{xviii} Understanding for Non standardization in construction is based on (Ed.) Michell, George. *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983,

Priyanka Mangaonkar is an architect with a Masters in Interior Architecture and Design, with specialization in Craft and Technology from Centre for Environmental planning and Technology, Ahmedabad. She has Worked as a project coordinator with Centre for Sustainable Environment and Energy (CSEE), Ahmedabad for a project titled 'Energy efficiency improvements in Indian brick Industry' for promoting energy efficiency in the Indian brick sector with The Energy and Resources Institute (TERI) and United Nations Development Programme (UNDP). Email: mangaonkar.priyanka@gmail.com
