



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

Assam is located in the North-eastern part of India; it is blessed with its rich and diverse culture and heritage. One of the most influential aspects of heritage is the reign of Ahoms in Assam for nearly 600 years (A.D. 1228–1826). Historically, Ahoms are from a group of Tai people and most historians mention that the descendants of Tai people are from Yunnan province. The Ahoms came to Assam by crossing the Patkai Hills on the northern- eastern border of Myanmar. They settled over the Brahmaputra valley and extended their kingdom over the upper and lower part of Assam. With the leadership of the first Ahom King *Sukapha* (A.D. 1228–1268), they set up their first capital in the Charaideu district of Assam. The initial phase of the Ahom dynasty was unstable as they were expanding the kingdom subjugating the Brahmaputra valley of Assam. By the 17th century, art and architecture flourished prosperously. Literature states that during the reign of Ahom King Rudra Singha (A.D. 1698-1714), the masonry architecture flourished.

The pilot study discloses that there are more than 30 Ahom masonry architectures all over Assam. These architectures are mostly temples and only a few non-religious architectures are able to subsist. Out of these 30 monuments, most of them are preserved under the Archaeological Survey of India (ASI), Guwahati Circle, Assam and Directorate of Archaeology, Guwahati, Assam. The Ahoms in the late mediaeval period used stone cuts, stucco reliefs and terracotta moulds in their ornamentations. The stone cuts have managed to survive the geographic conditions, but the terracotta and the stucco ornamentations are fragmented. The study moreover reveals that out of all these monuments, the Namath kali temple of Nilachal Hills, Ghanasyam House, Rang Ghar, Talatal Ghar of Sivasagar district and Kareng Ghar of

Charaideu district of Assam have managed to retain their original structure and ornamentations. Few sections include renovated ornamentation, but it lacks early aesthetics, as the renovated forms are unable to unify with the ancient forms. This not only dilutes the early essence but also ignores the early artisans' values and the underlying design principles of the ornamentation. Literature shows that there is significantly less study on the architectural ornamentation of the Ahom monuments, resulting in the absence of systematic documentation of these architectural ornaments. It also discloses that the Namath kali and Ghanasyam House display similar architectural styles, yet the Namath kali construction period is indefinite. This gives a solid consideration to study the visual and material aspects of the Ahom Brick ornamentation.

Based on the pilot and literature studies, the following objectives are considered:

- To study the art and architecture of the Ahom dynasty.
- To identify the visual characteristics of the ornamentations of the Ahom brick monuments.
- To study the construction materials of Ahom brick masonry architectures.

There are two phases- **A** & **B** in data collection. Phase **A** includes collecting photo and video data of the ornamentation in monuments and semi-structured interviews with locals and experts; **B** includes the collection of material data of Bricks sample and mortar samples. The material study has provided information related to early construction raw materials and the connections with similar types of architecture with respect to its construction dates. The secondary data are collected from journals, magazines, libraries and the internet.

As the data was in large numbers, the categorization theory of Athavankar (1989) was adopted. This includes segmentation of the motifs and patterns into the following types: Floral motifs, Compound motifs, Animal motifs, Symbolic motifs, Organic patterns and Geometric patterns. The motifs and patterns are coded to reduce data redundancy based on the categorization. Variation analysis, visual analysis and symmetry analysis are conducted with the coded data. The symmetry analysis considers the one-dimensional and two-dimensional pattern classes. The method to classify the pattern classes is adopted from Washburn & Crowe (1988). In Phase B, multiple site visits were done to study the brick dimensions and sample collection of brick and mortars. For the analysis of materials, samples of bricks and mortar were collected from the monuments. Three testing phases are conducted with the collected

brick and mortar samples- Energy Dispersive X-Ray Analysis (EDX) to study morphology and elemental compositions of the brick and mortar samples, Power X-Ray diffraction (PXRD) helps to identify mineral presents in bricks and mortar samples and Fourier Transform Infrared Spectroscopy (FT-IR) identifies the chemical bonds in a molecule.

The results of variation and visual analysis display the visual characteristics of the motifs and patterns and the underlying design principles followed in the visual compositions and spatial arrangements. The results display quantitative data of predominant symmetry operations of the motifs and pattern classes. It also discloses that vegetal forms are predominant in the overall Ahom brick-masonry ornamentations. The use of singular floral motifs like Lotus flower is prominent in all the monuments. Although the ornamentations radiate influences from the Gupta style, Indo-Islamic arts and exotic Southeast Asian styles, the artisans have managed to develop and inculcate traditional and local styles in masonry constructions. The overall study discloses the underlying structure and visual characteristics of Ahom architectural ornamentations with insights into early bricks and mortars used in the constructions of these majestic architectures.

The thesis provides significant contributions to understanding the Ahom architectural ornamentations of Assam by systematically documenting them. The study provides in-depth insights into the early Ahom ornamentation styles, elements and forms used to embellish the brick architectures. It provides a reference source for the art and archaeology of Assam and India for the conservation and preservation of the traditional architectural art of Assam. The studied data unlocks the integration of multidisciplinary domains like Artificial Intelligence (Deep learning), Augmented Reality (AR), etc. for digital preservation and digital exploration with concern for the tangible heritage of Assam.