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**AGAMAS AND INDIAN TEMPLES:
GRAPHICAL TRANSLATION AND ANALYSIS**

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DECLARATION

I hereby declare that all the information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Thyagarajan C

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To my parents

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ABSTRACT

Every distinctive style of Architecture stands as a reflection of a particular culture and era. Indian temple architecture not only represents the religious and philosophical aspects as an abode to the Gods; but also the social, economic and aesthetic aspects at the period of its construction. The Hindu temple architecture is developed over two thousand years and its architectural evolution took place within the boundaries of strict proportions and rigid forms and in adherence to religious and social considerations. Hence, they remained unaltered over many centuries until today.

The temples are built for the purpose of focusing the power of the lord in a consecrated idol and invoking the Almighty's blessings for the spiritual nourishment of the entire humanity. Apart from this the temples stand as a store house of ancient knowledge of traditions and practices influencing the socio-cultural life of the people giving an undisrupted continuity of religious and social values.

This dissertation through archival research and other documentary, literary works and theoretical study on Indian Hindu temple architecture and a an in-depth investigation of temple construction directions as given in the ancient treatise 'The Agamas' which has greatly influenced the design and construction of Hindu temples since ancient times to date.

Parts of the directions of temple construction in the Agamas have been graphically translated for better understanding and to provide better scope for further investigation in the field. A comparative analysis of existing temples is done in search of the agamic principles in their architectural design principles and details.

The research work also brings out the concepts and philosophy of temple worship and architecture since ancient times, the science, technology and skills involved in the construction of temples. This work is intended to throw light on the tradition and science of Indian Hindu religion and its rich temple architecture which roots back to the dawn of human consciousness.

ASTRATTO

Ogni stile distintivo di architettura si pone come un riflesso di una particolare cultura ed epoca. Architettura tempio indiano rappresenta non solo gli aspetti religiosi e filosofici, come una dimora per gli dei; ma anche gli aspetti sociali, economici ed estetici al periodo della sua costruzione. L'architettura tempio indù è sviluppato più di duemila anni e la sua evoluzione architettonica ha avuto luogo entro i confini di proporzioni rigorose e forme rigide e in aderenza alle considerazioni religiose e sociali. Quindi, sono rimasti inalterati nel corso dei secoli fino ad oggi.

I templi sono costruiti allo scopo di focalizzare il potere del signore in un idolo consacrato e invocando le benedizioni dell'Onnipotente per il nutrimento spirituale di tutta l'umanità. Oltre a questo i templi presentarsi come una casa negozio di antica conoscenza di tradizioni e pratiche che influenzano la vita socio-culturale delle persone che danno una continuità undisrupted dei valori religiosi e sociali.

Questa tesi attraverso la ricerca d'archivio e altri documentari, opere letterarie e studio teorico su Indian architettura tempio indù e una approfondita ricerca di direzioni di costruzione del tempio, come indicato nella antico trattato 'L'Agama', che tanto ha influenzato la progettazione e costruzione di indù templi fin dai tempi antichi fino ad oggi.

Parti delle direzioni di costruzione del tempio nei Agama sono stati graficamente tradotto per una migliore comprensione e per fornire una migliore possibilità di ulteriori indagini sul campo. Un'analisi comparativa dei templi esistenti è fatto in ricerca dei principi agamiche nei loro principi di progettazione architettonica e dettagli.

Il lavoro di ricerca porta anche i concetti e la filosofia di culto del tempio ed architettura sin dai tempi antichi, la scienza, la tecnologia e le competenze coinvolti nella costruzione di templi. Questo lavoro ha lo scopo di mettere in luce la tradizione e la scienza della religione indù indiano e la sua ricca architettura del tempio quali radici agli albori della coscienza umana.

CHAPTER 1

INTRODUCTION & RESEARCH BACKGROUND

1.1. INTRODUCTION

“One might regard Architecture as history arrested in stone.” – A L Rowse

Studying the history of architecture provides the understanding of the social and cultural life of the people of a particular time period. It reveals the intellectual and creative developments and achievements of mankind in different ages and across civilizations. Every building style represent not only the technological achievements but the society as a whole; the life of people, the social stratification, the gods and the ways of worship, the economic conditions and its distribution, the artistic and cultural aspects. Every style of building construction clearly reflects the basic principles of human behaviour in a particular culture and era.

It is important to understand the purpose of the construction of a building in a certain way in any given point in history; for example, the feudal castles were built with not only for the purpose of defense, but also to allow civilians and livestock to enter the castle at the time of war; whereas gothic architecture was created to inspire awe in the minds of the congregation every time someone had a visual encounter with it.

In India temples are found everywhere and they are of varied scales from a small village temple to huge temple complexes with complex architecture and artistic feat. The word ‘temple’ is derived from the Latin word ‘templum’ means a sacred precinct. According to the definition temple is a structure reserved for religious or spiritual activities, such as prayer and sacrifice, or analogous rites. Traditionally, the temple is a sacred structure and also an indicative of abode of god or gods. However the Indian temples are not only the abode of God and place of worship, but they are also the cradle of knowledge, art, architecture and culture. The practices and traditions of temples exist to present time almost unchanged with great influence the socio-cultural life of the people.

Unlike western architecture the Indian temple architecture is marked by the strict adherence to the original ancient models with the basic proportions

and forms that were derived from the various religious treatises and considerations and it has remained unaltered over centuries.

The distinct feature of the temple architecture of India has been the evolution of different religious structure like the Hindu, Jain and Buddhist temples in the same period of time with minimal influence on each other. Where the Hindu temples were rigidly conformed to the prescribed planning, design and detailing guidelines.

The building science of Indian origin is collectively called the ‘Vastu sashtra’ which supposedly originated over two thousand years back. It is elaborately described in different treaties in different forms yet converging to a common focal point of the basic philosophical principles.

1.2.1. AIMS

This dissertation focuses on the study of the Hindu temples on which a large body of data is already available from the works of various historians, here it is seen from a perspective with respect to the ‘Agamas’ on which the temple worship is based as this aspect still remains unexplored. This study attempts to collate the existing research work and further explore the directions of temple construction revealed in the agamic treatise, and potentially contribute to the existing body of knowledge through a comparative analysis of some examples and the provided guide lines.

The study presents philosophical and practical aspect of the construction of a Hindu temple with the aim to understand the power of the basic religious prescriptions of proportions and forms and that out lived the social and technological advancements and remained unaltered throughout its evolutionary process.

The detailed study of the directions of temple construction prescribed in the Agamas and its graphical translation is attempted to ease the scope for further studies of the same. The study is not only done through archival research but also a comparative study of the prescriptions and examples from

the temple style which mostly conforms to these directions.

Finally, this dissertations aims to present the agamic directions in the form of graphics and also search for its conformity in the selected examples of temples.

1.2.1 OBJECTIVES

- Understand the basic principles of Hinduism, its history, origin and relevance to temple architecture.
- Study the concept of Hindu temple, its evolution and the different styles.
- Materials and construction techniques of the temple architecture.
- Analysis of the sacred geometry and proportions in the temples.
- Detailed study of the agamas for the directions of temple construction and its graphical representation with diagrams and tables.
- A comparative analysis of selected examples in conformity to the prescriptions.

1.3. METHODOLOGY

This work is based on archival research and other documentary, literary works and theoretical investigation on ancient treatise - precisely the ‘Agamas’ and the modern research works on the related subjects. The research helped to understand the basic concept of Hinduism and Hindu temple architecture. Apart from the Agamas the Vastu shastra (Building construction manuals) and Shilpa Shastra (sculpture) from other manuals on Hindu architecture have been referred to understand the concepts that have been adopted for the construction of Hindu temples. The significance and influence of the manuals are investigated.

This dissertation represents the prescriptions in the scripture in graphical form and compares it with examples of existing temples for conformity with

the prescriptions. The representation shows the prescribed details of different parts of the temple from the pedestal to the finial.

Almost all Indian art has been religious, and almost all forms of artistic tradition have been deeply conservative. Hence, it is justified to choose the temple architecture as the best example for the study of the architecture of a specific period in India. The design philosophy of not only the temples but any construction in ancient India was based on the Hindu cosmology. Hence, the building plan layout which is influenced by the divine ‘Vastupurusha mandala’ is explained in the examples.

The indian temple design remained almost unchanged with time not because of the lack of technology or skills, it is solely because it is strongly ruled by the religious principles and traditions.

A rediscovery of the traditional construction techniques and various parts of the temple and its details that are described in the manuals are represented in this work.

The dimensional analysis from drawings and information available in books, journals and websites have been conducted in order to reveal the relation with functional aspects of the temples. Together all these aspect bring out the science and philosophy behind the hindu temple architecture.

1.4. LIMITATIONS

The scope of this dissertation is mainly focused on the ‘Dravida’ (south Indian) style of temple architecture which differs in many aspects from the other major Hindu temple architecture style – The ‘Nagara’(north Indian). It investigates the origin, history and evolution in a brief way. However the traceable roots temple architecture in India are the rock-cut temples of the Buddhist architecture, they is not covered as they differ in the basic principles compared to the Hindu architecture.

A number of independent architectural manuals were compiled and documented based of the vast body of Sanskrit references and scattered all across

the country. The most well known compilations are 'Manasara' and 'Mayamata' which are considered as referenced of vastu shastra even today. In this dissertation the 'Agama shastra' is studied in detail as it is claimed to be the most basic and original body of manual and a origin of all other independent manuals.

The vast Agama Shastra contains prescriptions on village and town planning; Temple construction and other types of buildings. However, only the parts related to temple construction have been detailed in this work considering the limited scope of the dissertation. This study also does not take into account the details of different types, forms

and architectural features developed amongst the 'Nagara' and the 'Dravidian' style. The study is primarily limited to temple construction in stone and not those built with other materials like wood and brick in some parts of India.

The analytical study is restricted only to a few examples because of the limitations in the availability of detailed drawings, documents and other information.

One limitation faced is the availability of detailed English translation of the 'Agama shastra' which is easily available only in the Sanskrit language. As the study could not be supplemented by field work most of the information is gathered from the secondary sources.

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CHAPTER 2

RELIGION AND TEMPLE WORSHIP

2.2. GOD AND MAN

The ideology behind the designing of Hindu temples is to provide the easiest link between men and the gods. It is the place where one can feel being close to god and experience a spiritual cleansing. The Hindu temple is a depiction of the macrocosm (the universe) as well as the microcosm (the inner space) and has developed over two thousand years.

Hinduism views mankind as divine. Because Brahma is everything, Hinduism asserts that everyone is divine. Atman, or self, is one with Brahman. All of reality outside of Brahman is considered mere illusion. The spiritual goal of a Hindu is to become one with Brahma, thus ceasing to exist in its illusory form of “individual self.” The life of a Hindu is considered as an endless cycle (Samsara) of birth and death and the common goal is to escape this cycle (Moksha). The soul which liberates itself from this cycle are considered to merge with the universal supreme energy (Brahma). Irrespective of whether the person is an atheist, monotheist or polytheist Hinduism provides one with a number of ways to achieve moksha; they are:

Jnana Yoga – The path of knowledge
Dhyana Yoga – The path of meditation
Bhakti Yoga – The path of devotion
Karma Yoga – The path of good deeds

Out of these ways the path of devotion (Bhakti Yoga) is considered to be the easiest way and it is the most commonly chosen path by most Hindus. It is devoting oneself to chosen gods throughout one’s life in actions, words and deeds.

The sacred and secular lives of a Hindu are unified and for the most part, the daily routines require numerous contacts with the divine, whether it takes place in miniature temple at home or a local public temple. The Hindu temple acts as a platform for ‘Bhakti yoga’ where god’s presence can be felt and through rituals and ceremonies men can discover the divine knowledge. There is rarely any evidence of religious persecution among the cults of Hin-

duism, as Hindu believes that cults are all aspects of the divine in different forms i.e. Shiva, Vishnu and Goddess. This apparently results in a remarkable degree of tolerance and attempts of harmonization among the cults. Hence, the temple is also the product of a desire to transcend the world of man-the principles of its construction, the forms of its architecture and decoration, as well as the rituals that take place within its walls, are all aimed at ultimate liberation.³

This concept, to some extent, resembles the Hindu concept of man: 'Eating, sleeping, fear and sex are common to man as well as animals. In human beings dharma (i.e. restraint by moral rules) is extra and special. Without dharma men are no better than beasts.' According to Shankaracharya, this dharma is of two types: pravritti-lakshana and nivritti-lakshana. When one, observing the moral codes of conduct applicable to one's station in life and society performs actions for enjoyment (kama) and acquisition of wealth (artha), one is said to be following pravritti dharma. A time comes, however, when one gets disgusted with sense-enjoyments and acquisition of wealth and aspires for final emancipation (moksha).

The one embraces what is called nivritti dharma, characterized by renunciation of all worldly desires and selfish actions, and resorting to spiritual practice to attain liberation. Man rises from animal to human level by accepting pravritti dharma i.e. by observing social injunctions. He ascends to godhood and becomes divine by embracing the nivritti dharma. This Hindu concept of liberation, in turn, is based upon another concept of an ever pure, ever free, ever perfect, ever conscious spiritual entity in man called Atman (soul). According to Swami Vivekananda this Atman is the Real Man as against the body-mind complex which is only the apparent man. (Swami Brahmeshananda, Sri Ramakrishna Mission, Belur Math)

2.3. TEMPLE WORSHIP

A temple (from the Latin ‘templum’) is a structure usually built for the purpose of, and always dedicated to, religious or spiritual activities including prayer, meditation, sacrifice and worship. The templum was a sacred precinct

defined by a priest (or augur) as the dwelling place of a god or gods and the structure built there was created to honor the Deus Loci (spirit) of a certain place. (Ancient history encyclopaedia)

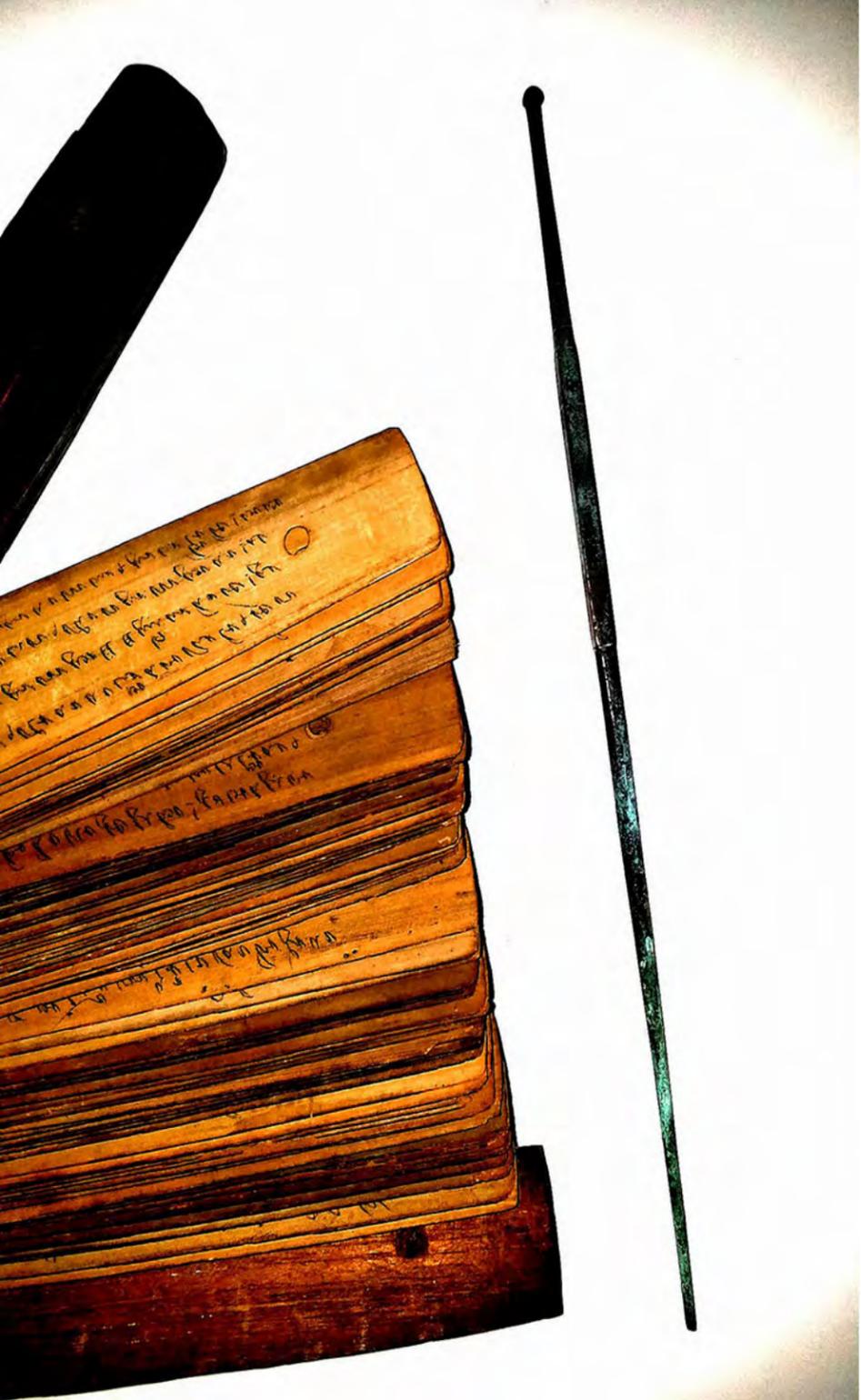
A Hindu temple is believed to be the earthly seat of a deity and the place where the deity waits for its devotees. As such, temple structures are sacred spaces where gods partake of human offerings and in which the people can be with the gods. Many temples resemble palace architecture, often elaborately decorated on the outside with stone or plaster carvings depicting religious stories, and sometimes their decoration is specific to the deity being worshiped; this is not surprising, as deities are often considered kings. Hindu temples revere gods, though the gods worshipped and honoured are in some way associated with the area of the temple. The interior of temples throughout India, with few exceptions, follows the same basic form and structure.³

The ideology behind the designing of Hindu temples is to provide the easiest link between men and the gods. It is the place where one can feel being close to god and experience a spiritual enlightening. The Hindu temple is a depiction of the macrocosm (the universe) as well as the microcosm (the inner space) and has developed over two thousand years.

Temples are normally dedicated to one primary god and often accompanied many other retinue deities. The innermost sanctuary of the temple contains the principal image of the deity. The character of each shrine is determined by the deity being worshiped. The regular worship ritual called ‘puja’ is performed mainly in this innermost sanctuary called ‘Garbha griha’.

Puja is the act of showing reverence to a god or to aspect of the divine through invocations, prayers, songs and rituals which in most cases are performed by priest who acts as a facilitator for the devotee in the process of making a spiritual connectivity with a deity. Most often that contact with the almighty is facilitated through an object: an element of nature, a sculpture(murtis), a vessel, a painting, a print or diagrams of the universe (yantras) accompanied by prayers(mantras).





2.4. THE HOLY SCRIPTURES

"Wherever we direct our attention to Hindu literature, the notion of infinity presents itself." - Sir William Jones

Hinduism is the only living tradition that can claim scriptures as numerous or as ancient as no other; which also can boast of an unbroken tradition as faithfully preserved tradition and culture. Hindu literature is the most ancient and extensive religious writings in the world which is mostly written in Sanskrit and also other ancient Indian languages like Tamil. Hindu religion has no single reference scripture like the bible for Christians. It has several sacred writings which serve as a source of doctrine. The most important texts include the Vedas, Upanishads, the Puranas, Agamas, the Epics - Ramayana, Mahabharata and the Bhagavad Gita.

The vast epics, and the books of the Vedas and Agamas were originally transmitted by a phenomenal human chain of memory, and only written down centuries after their actual compilation. This oral tradition still exists in India today. The early phase of this tradition in India is dated between 10,000 - 7,000 BCE. The greatness of the India civilization and its vast literature works pulled the curiosity of the western world only in the 18th century. As we see today Hindu scriptures are classified into two main divisions: Sruti and Smriti scriptures.

Sruti in Sanskrit means "that which is heard." Thus the Vedas are the eternal truths that the Vedic seers, called rishis, are said to have heard during their deep meditations. The Vedas are not considered the works of the human mind, but an expression of what has been realized through intuitive perception by Vedic rishis, who had powers to see beyond the physical phenomena. As such, Vedas are considered of divine origin. The Vedic truths were originally transmitted by the rishis to their disciples over thousands of years. At a later date, these were compiled by Sage Vyasa for the benefit of future generations. India's teachings are not speculative. They are based on divine revelations. Indeed, the revelations are so cosmic that they approach more closely the findings of physics and astronomy than the pious pronouncements

of preachers. The rishis made claims so cosmic that even modern physics seems only to be catching up with them and realizing, after every scientific breakthrough, that the ancients were there long before them. Sruti include the Vedas (Rig, Yajur, Sama and Atharva) and the Bhagavad Gita. The Vedas are the primary scriptures of Hinduism. Each of the four Vedas consists of four parts: Samhitas, Brahmanas, Aranyakas, and Upanishads.

Smriti means "that which is remembered." Smriti scriptures are derived from the Vedas and are considered to be of human origin and not of divine origin. They were written to explain and elaborate the Vedas, making them understandable and more meaningful to the general population. All authoritative writings outside the Vedas are collectively referred to as Smriti. Smriti include the Dharma Shastras, Nibandhas, Puranas, The Epics, Agamas or Tantras, Darshanas and Vedangas (Upa Vedas). According to Alain Danielou distinguished Orientalist, "The Puranas provide genealogies, which go back to the sixth millennium B.C. E. and are probably largely authentic. The stories and descriptions of the various regions of the earth and the various civilizations living on the "seven continents" provide priceless documentation on the world's oldest civilization."

In this book we study the directions for architecture and construction as explained in the Agama called the ka'mika Agama. The Saiva Agamas are some of the earliest books in the Sanskrit language on the Saiva religion and philosophy written over a period of several centuries before the Christian era. The Agamas represent an independent class of writing by very early seers, who had an inward experience and enlightenment from the Supreme Being, and who were also perhaps influenced by the Vedas in their original form. The agamas mainly represented the theism of the southern India.

The Theism of the south or rather, the Saivism of the Tamilians, was the growth of an unbroken tradition probably from the pre-historic past and this had three elements fused into it. These are worship of idols and images, both in the shrines throughout the land and in the devotee's own houses, symbolism and the inward meditation and realisation.

Kamika Agama are the texts dealing mainly with rituals, but also deals with the architecture construction called shilpa shastra and vastu shastra which would be graphically translated and dealt in detail in this dissertation.

2.4. THE AGAMAS AND ITS SIGNIFICANCE

"Even today, Saiva siddhanta is an important school of Hindu philosophy in Tamilnad, and temples in the region most often claim allegiance to Saiva siddhanta liturgical texts" -(Davis 2000: 14)

The Agamic scriptures guide Hindus in their daily life, help preserving the religious dimensions of family and society, gives knowledge of medicine, astrology, sociology, philosophy of religion, techniques and structural rules on architecture. Traditionally, the main Agama is used with reference to Saiva works, while those belonging to the Vaisnava or Sakta tradition are generally known as Saahita and Tantra respectively. In the current work we study parts of the Kamika Agama which is a part of the Saiva Agamas. The Saivasiddhanta consists of twenty-eight 'root' treatises (mulaagama) and numerous 'subsidiary' treatises (upaagama) linked with one or the other mulaagama.

It is generally extremely difficult to establish an exact date for Agama texts. As it has always been exposed to additions and alterations which had to bring them up to date, due to its practical importance. Kamika agama is a technical treatise in Sanskrit on rituals and the basic rules in the field of architecture and sculpture are called as the Shilpa Shastras and Vastu Shastras. Ideally, each Saivagama is divided into four parts or 'feet' called 'pada' corresponding to four aspects of religious conduct:

- caryapada (proper conduct)
- kriyapada (ritual action)
- yogapada (discipline) and
- jnanapada (knowledge)

However, only a few Agamas actually possess all the four parts, and in the majority of the works only the kriyapada is preserved.

The Agamas claim Vedic authority for their doctrines. The agama doctrines are indeed theistic and such theism is not foreign to the Upanishads as well.

The following agamic passages may be seen to affirm the derivation of the Agamas from the Vedas “The siddhanta consists of the essence of the Veda” (Suprabhedagama)

The agamic cult which was that of the general people, and the Vedic cult which was that of the priestly classes, officiating for themselves or for others, were both indigenous; they existed and grew up side by side from the earliest times without any extraneous influence. The distinction between the two was in no sense racial. The Agamas are deemed to have scriptural authority and are often called a Veda and the Fifth Veda.

There are several explanations available for the term ‘Agama’. One is that because it came from God its is called Agama. As a Sanskrit verse gives an interesting meaning for the three syllables a, ga and ma:

“Agatam siva vaktrebhyah, gatam ca girija mukhe;
Matam ca siva bhaktanam, agamam cheti katyate.”

Which means that the Agamas originated from the face of Siva, fell on the ears of parasakti and spread in the world as the mata of the Siva bhaktas. Ence they take the name from the first letters of the words agatam(originated), gatam(fell) and matam(religion).⁴

Another meaning is that the three letters denote pati(the self), pasu(the soul) and pasa(the bonds). However, the Saiva school has another root meaning for the term, where ‘a’ denoted knowledge, ‘ga’ – liberation and ma – removal of the bonds. And is it called so as the study and adherence to it liberates the soul from bondages and cause the supreme realisation.⁴

The Kamika is the Agama that is widely in use today. Purva pada of kamika Agama which is considered for this work has four sections dealing with the revelation of the agamas, the rules for the daily observances and worship, rules for the construction of temples and houses and the performance of rituals and rules for the installation of the deities. These texts deals with a whole range of architectural science topics such as soil testing techniques, orientation, measures and proportions, divination, astrology and ceremonies associated with the construction of the temples and other buildings.

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CHAPTER 3

HINDUISM AND TEMPLE ARCHITECTURE

Although it has come to be a truism that the temple is of fundamental importance in south Indian history and society, much of the existing literature, either tacitly or explicitly, encourages the interpretation that the south Indian temple simply reflects its broader social context. Temple ritual appears to be a mixture of Vedic sacrificial procedures and the logic of domestic worship (Kane 1974: Ch. 19).

The Hindu temple is an institution of immemorial antiquity which are called by different names in different regions of the country as 'Mandir' in Hindi derived from the Sanskrit work Mandira, 'Kovil' in tamil, 'Devasthanā' in Kannada, 'Devalaya' in Telugu etc., In general the hindu temple can be an isolated structure or part of a complex. They not only play an important part in the religious life of the people but also in the socio-cultural life and the economy. The temple is not unique to India. It was a worldwide institution until the rise of universal religions like the Christianity and Islam, where the church and mosque took over many of its functions. But in case of India many ancient temples Conceptually, the temple was integrally related to and dependent upon the divine presence and the interaction between that presence and humanity.

The temple had an important role to play, yet one that should not be over-estimated. The temple was secondary to both divine presence and ritual action, serving as the setting for both. Without them, it was merely an empty building, a stage bereft of actors and action. However, when all three elements converged, the temple became a place of power, accomplishing specific functions and communicating specific messages.

The evidence of the earliest known structural temples has been recovered are of 3rd century B.C., through excavations at Bairat District of Jaipur, Rajasthan, It is a circular brick and timber shrine of the Mauryan period. Also the apsidal stone temple at sanchi with wooden superstructure whose remains date back to the 2nd century B.C. The ancient Indian temples still remain preserved as they are mostly built of highly enduring materials like granite and other stones. The earliest examples of the Indian temple architecture that still remain intact are the famous 'rathas' of Mahaballipuram. It was in

the latter half of the 7th century that the Hindu temple structures of India began to acquire a definite form.²

The characters of a Hindu temple predominantly reflect the local architectural styles in terms of materials and skills, also taking into consideration the main basic forms and styles which are mentioned in the various treatises established around 600 A.D.

The temple basically includes the main cell or shrine (garbagriha) which usually have a square plan, and it house the main deity of the temple. The main shrine is approached through a columnated hall called the 'Mandapa'. The central shrine is roofed with a pyramidal spire called the sikhara or gopura. The temple is usually raised on a massive plinth. It is also associated with other subsidiary shrines dedicated to the retinue deities. South indian Dravidian temples are distinctly identified by the huge gateways called gopuras.

3.1. ELEMENTS OF HINDU TEMPLE

Similar to the terminologies used for the basic components of a Gothic church, like – the Nave, aisle, chancel, spire etc., the terminologies used for the common elements of the Hindu temple are usually in Sanskrit (fig.3.1.1) as follows:

1. Shikhara: The steeple of the dome called 'shikhara' represents the mythological 'Meru' or the highest mountain peak. The shape of the dome varies from region to region and the steeple is often in the form of the trident of Shiva.
2. Garbagriha: The inner chamber of the temple called 'garbhagriha' or 'womb-chamber' is where the image or idol of the main deity ('murti') is placed. In most temples, the visitors cannot enter the garbhagriha, and only the temple priests are allowed inside.
3. Mandapa: Most large temples have a hall meant for the devotees to sit and also for various cultural activities. This is also called the 'nata-mandira' (hall for temple-dancing) where, in days of yore, women dancers or 'devadasis' used to perform dance rituals. Devotees use the hall to sit, meditate, pray, chant or watch the priests perform the rituals. The hall is usually decorated

with paintings of gods and goddesses.

4. Ardha-mandapa: This front porch of the temples usually has a big metallic bell that hangs from the ceiling. Devotees entering and leaving the porch ring this bell to declare their arrival and departure.
5. Tirtha: If the temple is not in the vicinity of a natural water body, a reservoir of fresh water is built on the temple premises. The water is used for rituals as well as to keep the temple floor clean or even for a ritual bath before entering the holy abode.
6. Pradakshina patha: Most temples have a walkway around the walls of the inner chamber for circum-ambulation by devotees around the deity as a mark of respect to the temples god or goddess.
7. Antarala: the vestibule or the intermediate chamber. It unites the main sanctuary and the pillared hall of the temple.
8. Gopurams: meaning the monumental and ornate tower at the entrance of the temple complex, specially found in south India.

3.2. MATERIALS OF CONSTRUCTION

The Indian temples are built of different types of materials depending on the regional availability and abundance of materials. The range of materials vary from timber, mud plaster, brick, stone etc., The materials of construction affect the overall appearance, construction techniques and details, monumental character and longevity of the life of the temple.

As the earlier structures were fashioned from less durable materials such as timber, brick and plaster the early examples of Hindu architecture and art have mostly disappeared or are detectable only by the most fragmentary remains. However some of the relief carvings and paintings show that the earlier Hindu temples were constructed in timber and bamboo. Many of the later stone temples were modelled on wood and bamboo architecture is apparent from the carvings, roof forms and window shapes. This usage of timber and bamboo governs the form of temples mostly in the Himalayan valleys and regions of Kerala and Bengal. The remains of temples constructed in brick dates back to the centuries before the Christian era. The brick and mortar temples were constructed in the region where there was easy availability of

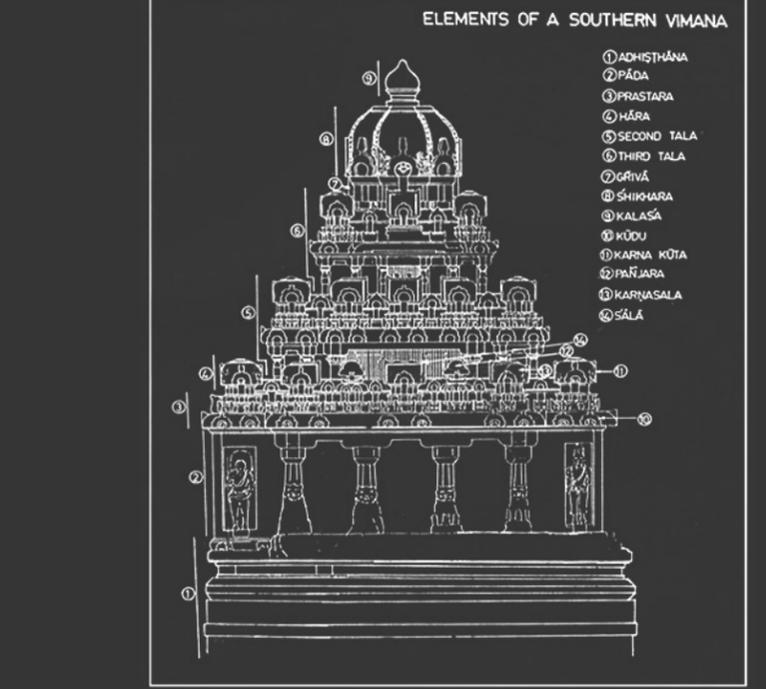
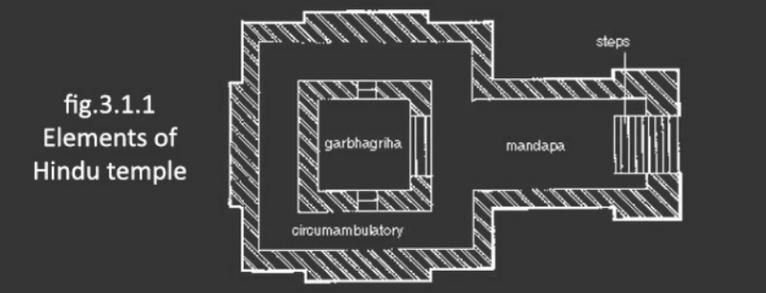
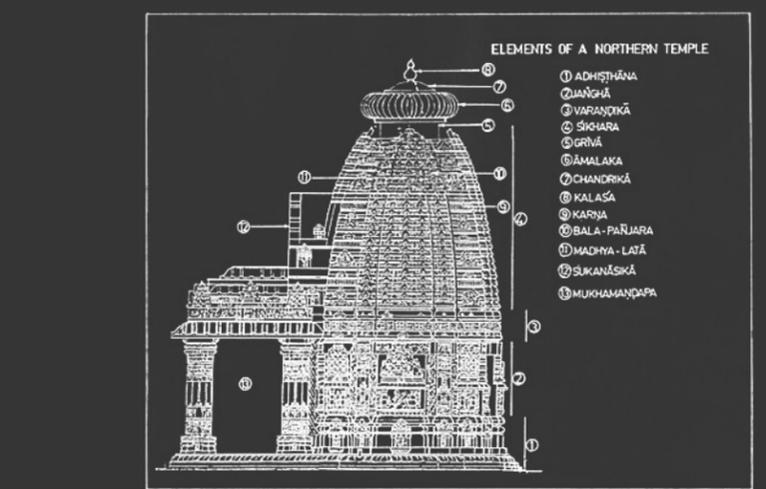




Fig.3.3.1 a - Nagara style



Fig.3.3.1 b - Dravida style



Fig.3.3.1 a - Vesara style

brick and the availability of suitable stone were limited.

The construction of temple in stone is the most distinctive expression of Hindu architecture. The highly evolved techniques of excavating and cutting blocks of stone constitute one of the major technical achievements associated with the history of the Hindu temple.⁵ The construction in stone dates back to 2nd and 3rd centuries in the form of rock cut sanctuaries and later in the form of temples with use of stones like granite, marble, soap stone, sandstone and locally available stones. The stones were used with most intricate and ornate carvings and sculptors throughout India.

3.3 EVOLUTION OF INDIAN TEMPLE STYLES

Indian temples have been a source of attraction, not only as a place of worship for the devout, but also as an architectural marvel for the curious tourist. Indian temples with its imposing towers, intricate carvings and awe inspiring size were in fact the result of a gradual evolution over time. In the Vedic period (1500 to 500 BC) there were actually no temples as such. They propitiated the Gods by performing yagas (Sacrificial procedures) using sacrificial altars. Details of how such altars may be constructed were meticulously mentioned in The SULVASUTRA (literally meaning 'the rules of the cord'). These YAGASALAS (The structures containing the sacrificial altars) later got transformed to temples.

The emergence of Hinduism under the Gupta dynasty (320-550 AD) responded in sacred forms of art and architecture built with permanent materials to protect the divine essence in monumental temples. The history of northern style of temple begins from the Guptas and their successors (5th to 7th century) and Advanced to Early chalukyas (7th to 8th century), the Kalingas and Eastern Gangas(8th to 13th century), the Pratiharas and Chandellas(8th to 11th century), the Maitrakas and the Solankis(8th to 13th century) and the Rajputanas(8th to 12th century).

The Hindu temple construction during the medieval period (6th-13th centuries) took place on a magnificent scale comparable to the building of churches

and cathedrals in the medieval Europe. Hindu temple architecture reached to its final form by combining influences from both the northern and southern India and probably also from the cultures of invaders who continued to enter India from the north- west during this period.⁵

The history of southern style of temples begins with the Early Chalukyas, and Kalchuris (6th to 8th century) and advanced to the Pallavas(7th to 8th centuries), the Rashtrakutas(8th to 10th century), the Cholas(10th to 11th century), the Hoyshalas and Later Chalukyas(11th to 14th century) and the Vijayanagas and the Nayakas(15th to 17th century).¹

In northern India the evolution of Hindu temple architecture was largely interrupted by the Muslim invaders whose presence was increasingly felt from the 11th century AD onwards. Many of the finest temples were destroyed during this time.¹ In contrast, the southern India did not experience Muslim rule until a late period and thus had a less disrupting effect upon Hindu tradition and architecture of south India. The temples architecture of south India is therefore relatively better preserved till present time.

Earliest temples were made of timber and clay, and though they were later replaced by the more enduring granite, there are still temples in Kerala and Dakshina Karnataka made with timber and which has withstood the ravages of time. Cave temples which are found in profusion particularly in Central India, were a later innovation. Hindu temples have so developed due to broad geographical, Climatic, cultural, racial, historical and linguistic differences between the northern plains and the southern peninsula of India, though the basic temple patterns are the same, temple styles fall into two categories. North Indian style called NAGARA and southern style called DRAVIDIAN. There is a derivative of the above two styles which is called VESARA.

3.3.1 NAGARA STYLE

NAGARA style temples have curvilinear towers as against DRAVIDIAN temples which have truncated pyramids. The derivative style VESARA is a combination of both NAGARA and DRAVIDIAN type of architecture. NAGARA style temple architecture originated during the Gupta period (320

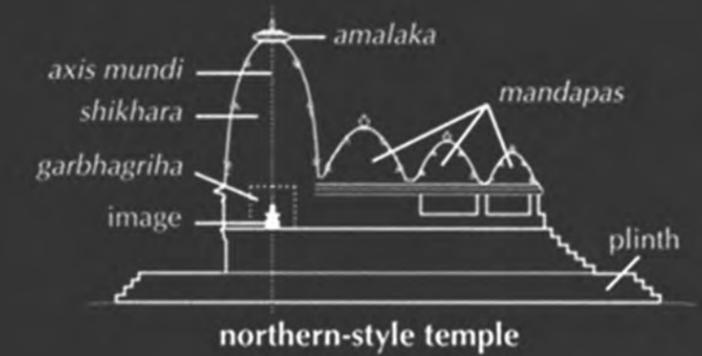
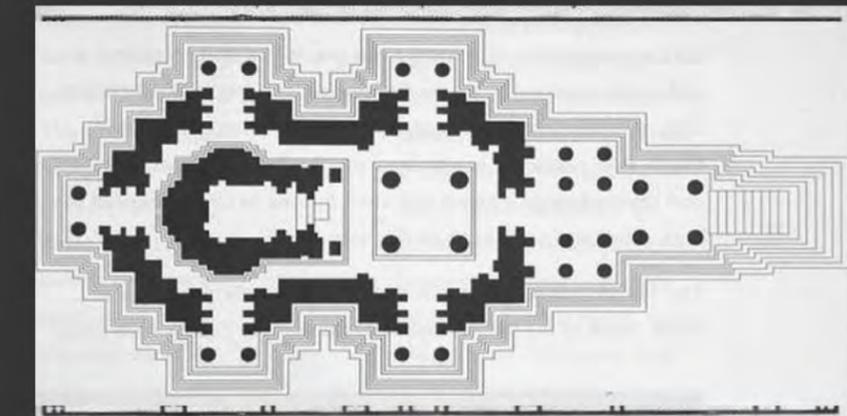


Fig.3.3.2

Fig.3.3.3 - kandariya mahadeva temple



-650 AD) and is found mostly in North and Central India. The temple complexes at TIGAWA (In modern MADHYA PRADESH), NACHNA in RAJASTHAN and DEOGARH in UTTAR PRADESH are examples of this. The major developments in temple architecture were during the following periods.

- 750 – 1250 AD in Orissa
- 950 – 1050 AD in Central India
- 10th to 11th Century in Rajasthan and
- 11th to 13th Century in Gujarat.

The characteristic temple plan of the northern India was developed in the 5th century under the rule of Hindu dynasty. These temple consisted of all the basic elements; the garbhagriha surrounded by an ambulatory path, an outer portico with columns in front and a flat roof of stone. The temples constructed during this period were simple and less impressive compared to the temple constructed during the 10th -13th century temples. Some of the examples from this period are temples at sanchi, Tigawa and Deogarh.

The development of sikhara started at the temple of Deogarh in Madhya Pradesh (Brown, 1942). The temples constructed in the 8th century had smaller shrines and the sikhara became the crowning feature of the temples. The addition of mandapa (the pillared hall) to the temple started during this period itself. The other distinct character of this period was the rectangular wall around the temple and addition of subsidiary shrines at each corner. The most common examples of this period are the temples at Osian Rajasthan and the cluster of Jain temples built between 8th -12th century in Gujarat and Rajasthan.

The temple of Teli-ka mandir, Gwalior and Vaital Deul, Bhubaneshwar were unique and inspired from the early Buddhist architecture with rectangular plan and the barrel vault roof of chaitya hall. These temples don't make the full composition of Hindu temple as they only consist of main sanctuary with neither the mandapa nor the portico. This form of architecture was abandoned by the architects in the north but was accepted in the architecture of south India. A distinct architectural style developed in the temples of Orissa (7th to 11th century). The elliptic curve of sikhara from the earlier periods

were modified as a perpendicular prismatic tower and converged near the peak. For the first time in history special attention was given to the construction of mandapa; the roof of the mandapa was now pyramidal with tapering at the top and lower than the sikhara. The finest examples of this period are the Lingaraja temple, Bhubaneshwar, the Jagannath temple Puri and the Sun temple Konark with their sikhara height ranging from 43 m to 57 m high.

A parallel development to the Orissa temple, took place in the central India during the 9th to 11th century. The temples of Khajuraho are famous for their conical tower made of piles of stone with an arrangement of miniature towers called sikhara.³ Each of these temples has portico, entrance hall and the sanctum. The roofs of various sections of the temple have distinct form. Each and every facade, wall, ceiling of these temples have carved figures from the mythology and history. The finest examples are the Khandriya Mahadev temple, and Lakshmana temple, Khajuraho.

3.3.2 DRAVIDIAN STYLE

The southern style DRAVIDIAN temples had its genesis during the age of the PALLAVAS of Kanchipuram (600 -850 AD) and later developed by the CHALUKYAS of Badami and PANDYAS of Madurai. The temple complexes at MAMMALAPURAM (earlier known as MAHABALIPURAM) IN Tamil nadu, LAKHDHAN temple in Aihole and Kasinatha temple in Pattadakal are examples of this style of architecture. The evolution of Southern temples were as follow: 600 -850 AD in Tamil nadu during the period of the Pallavas (rock cut and RATHA style temples of Mahabalipuram, Kailasanatha and Vaikunta Perumal temples of Kanchipuram) 900 – 850 in Tamil Nadu during the Chola dynasty (Brihadeeshwara and Srirangam temples) 1336 – 1565 during the period of the Vijayagara empire in Karnataka (Pampavati and Sri Vithala temples at Hampi) 1600 to 1700 during the Nayaks of Madurai. (Enlarged the existing Meenakshi temple complex by making it ornate and adding pillared corridors)

The rock cut structures developed during the 7th -9th century under the rule of Pallavas. The Pallava rulers lead the way of dravidian style of temple archi-

ecture and they built the temples at Mahabalipuram. During the Pandyas rule the south Indian temples were added with the lofty gateways gopurams at the entrance with the basic temple composition. The gopurams made the temple visually attractive and also provided the temples with an enclosure. The gopurams evolved from a rectangular base with a pyramid crowned with a barrel vaulted form. In the 11th century the Chola rulers built one of the tallest temples of that time the Brihadeshwara temple, Thanjavur with a height of 60 m.⁴ In the later period the temples extended and became more intricate.

More mandaps were included for various activities like dancing, assembly, eating, marriages, etc. The Dravidian style concluded in a series of extended temple cities or townships. The finest example of the temple township is the temple at Srirangam and Madurai with several concentric enclosures.

3.3.3 VESARA STYLE

The VESARA style temples were influenced by the Buddhist apsidal chapels and evolved during the period the Later CHALUKYAS. If the ancient YAGASALAS or RIG VEDIC times were based on the SULVA-SUTRAS the later temple complexes were based on VASTU SASTRA which had its sources from such diverse scriptures as the SUTRAS, PURANAS, AGAMAS and TANTRIC literature.

3.3.4 DISTINCTION OF 'NORTH INDIAN' AND 'SOUTH INDIAN' TEMPLE STYLES

| | North Indian style | South Indian style |
|-----------------|---|--|
| Super-structure | It has a bee-hive shaped tower called 'Sikhara'. This tower is made up of many miniature sikhara. | The Vimana, which is a tall pyramidal tower consisting of several progressively smaller storeys. |
| Gateways | The gateways are plain, simple and small. | The outer walls has intricate and marvelous gateways called 'gopuram' |

3.4. SOCIAL SIGNIFICANCE OF TEMPLES

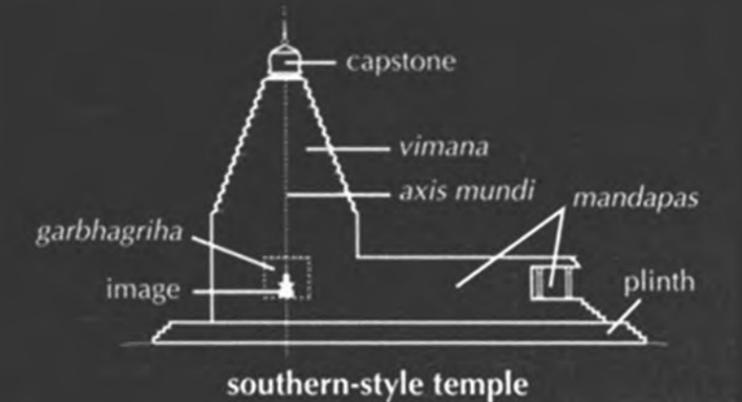


Fig.3.3.4

Fig.3.3.5 - Brihadishwara temple

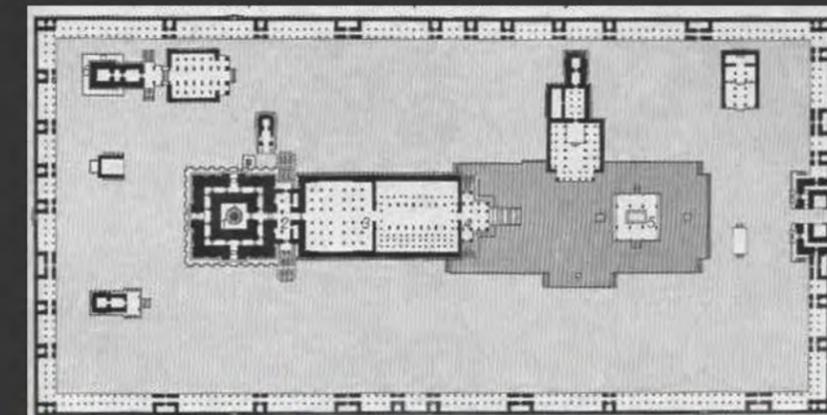




Fig.3.4.1 - Dance performance in temple
(indian-heritage-and-culture.blogspot.com)

The Indian subcontinent has a large variety of Hindu temples with distinction in scale, techniques of construction and even the deities worshipped, which reflect the differences in the political, cultural, economic prosperity and climate of the region. The character of the Hindu temples represent the local architectural styles, materials and skills attached to the region. It is not easy to distinguish these temples otherwise due to limited information has survived about the Hindu temple and their builders which are mostly inscribed on the stone slabs and metal plates and on manuscripts written on the plant leaves. The information which survived explains that the temple building, especially in stone and brick was carried out as a result of royal patronage. Building of temple in stone was an expensive affair and expresses the physical power and economic resources of the ruler. Other than royal patrons, association of wealthy merchants and group of individuals played an important role in the construction of temples. However, apart from the royal patrons and the merchants, every individual donated something to the temple. Historically, the temple has served redistributive and developmental functions that seem co-extensive with those of the political system.⁶

It is often conceived that the south Indian temple is a mere reflection, however distorted, of its broader social context. Many features of the Indian temple mimic other institutional aspects of the society, the way in which these features are synthesized in the temple is unique, both in cultural and structural terms. In Hindu culture temple is not only a place of worship but they act as a centre for intellectual and artistic life.⁵ The temple complex housed schools, hospitals and courts for the community. The spacious halls of the temple were the place for the recitation and listening of folk tales, Vedas, Ramayana, Mahabharata and debates. Music and dance were the part of daily rituals in the temple. The presence of these activities eventually gave the people more knowledge about the traditions and made them appreciate the older practices.

The temple also owned cultivable land which was leased out and revenues were earned. By this method the temple was sustaining the maintenance of the temple and able to also support the needful during poverty and emergen-

cy. Temple provided means of livelihood for a large number of persons and greatly influenced the economic life of the community. The written evidences of Brihadeshvara temple, Thanjavur(1011 AD) shows that the temple had 600 employers.¹ The temple is the centre of all aspects of the life of the community and every member of the community contributed in the up keeping and building of temple. Although the temple is the hub of different religious and cultural activities, the nucleus is the main shrine.

3.5. THE SACRED GEOMETRY

“According to the ancient Hindu scriptures, the temple is the microcosm of the cosmos and the cosmic order is perceived as integral to the human body, mind and spirit; with the human being a microcosm”. (Adam Hardy, 2007).

Even though the temple design differed from region to region the temple plan remained almost the same placed along a single linear axis or in concentric rings. The geometry of the Hindu temple with respect to Hindu cosmology and philosophy is mainly based on the ‘Vastupurushamandala’. The various components of the temple structure are studied in this chapter.

Although the elements of the temple varied as mentioned above, the temple design is derived from a single philosophy of design. All the Hindu temples built since the beginning its history follow the same philosophy. The directions of Vastu shastras (architecture) and Shilpa shastras (sculpture) as mentioned in different Hindu scriptures as still referred to for the construction of the temples.

3.5.1. HINDU COSMOLOGY AND SYMBOLISM OF THE TEMPLE

According to the ancient Hindu scriptures, the temple is the microcosm of the cosmos and the cosmic order is perceived as integral to the human body, mind and spirit; with the human being a microcosm.⁴ The Hindu temple structure presents the significant information about the science and cosmology of the period in which they were constructed. It is a symbolism of the outer and the inner cosmos where outer cosmos is expressed in terms of various astronomical connections between the temple structure and the motions of the sun, the moon, and the planets, whereas the inner cosmos is represented

in terms of the consciousness at the womb of the temple and various levels of the superstructure correspond to the levels of consciousness (Kak, 2002).

The temple is a link between the physical world of man and divine world of God. And to connect them, the plan of cosmos were graphically copied in the foundation of the temples called as the Vastupurushamandala. The Hindu architecture, religious or vernacular, in the ancient times were based on the geometry of the Vastupurushamandala.

The temple is seen as a link between man and god; and between the actual and the ideal. As such it has got to be symbolic. A temple usually seen as an abode of God, is also referred to as Prasada meaning a palace with very pleasing aspects. The symbolisms of the temple are conceived in several layers. One; the temple complex, at large, is compared to the human body in which the god resides. And, the other is the symbolism associated with Vimana of the temple per se, which also is looked upon as the body of the deity. And the other is its comparison to Sri Chakra.

At the centre of the temple is the image of divinity and its purity that generations after generations have revered and venerated. That image residing at the heart of the temple is its life; and is its reason. One can think of an icon without a temple; but it is impossible to think of a temple without an icon of the divinity. The very purpose of a temple is its icon. And, therefore is the most important structure of the temple is the Garbagriha where the icon resides. In fact, the entire temple is conceived as the manifestation or the outgrowth of the icon. And, very often, the ground-plan of a temple is a mandala(As regarded in the Agama shastras). And, the temple is the outpouring or the expansion of the deity residing in Brahmasthana at the centre. The temple and in Sri Chakra, both moves from the gross to the subtle. In the temple, the devotee proceeds from the outer structures towards the deity in the inner sanctum, which compares to the ‘Bindu’ in the Chakra. The Sri Chakra upasaka too proceeds from the outer Avarana (enclosure) pass through circuitous routes and successive stages to reach the Bindu at the centre of the Chakra, representing the sole creative principle. Similarly the devotee who enters the temple through the gateways passes through several

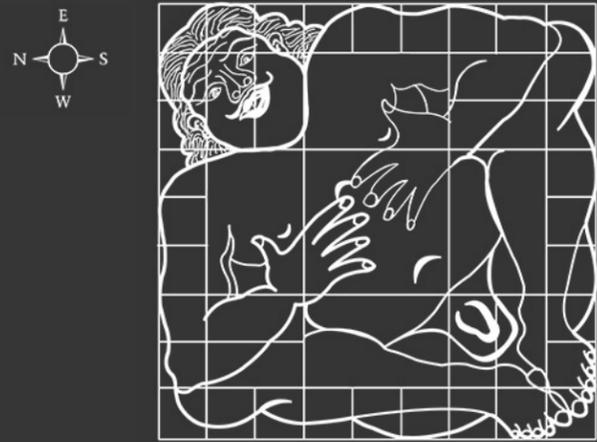


Fig.3.5.1

Fig.3.5.2 - Vastu Purusha Mandala

| | | | | | | | | |
|----------------|------------|-----------------------|---------------|-----------|---------------|---------------------------------|------------|-----------------|
| 25 VAYU | 26 NAGA | 27 MUKHYA | 28 BHAL-LATA | 29 SAUMYA | 30 MRGA | 31 ADITI | 32 UDITI | 1 ISA |
| 24 PAPA-YAKSMA | RUDRA-JAYA | | | | | | MITRA-JAYA | 2 VATAPAR-JANYA |
| 23 SOSA | | RUDRA | PRTHIVDHARA | | | APA-VATSA | | 3 JAYANTA |
| 22 ASURA | | M I T R A | BRAHMA | | | A R Y A M A N | | 4 MARUTA |
| 21 VARUNA | | | | | | | | 5 MAHENDRA |
| 20 PUSPA-DANTA | | | | | | | | 6 SATYAKA |
| 19 SUGRIVA | | INDRA | VIVASVAT | | | SAVITRI | | 7 BHRISA |
| 18 DAU-VARIKA | INDRA-JAYA | | | | | | SAVITRA | 8 ANTA-RIKSA |
| 17 NIRRTA | 16 MRSA | 15 BHRINGA-RAJA | 14 GAND-HARVA | 13 YAMA | 12 GRHAK-SATA | 11 VITATHA | 10 PUSAN | 9 AGNI |

gates, courtyards and prakaras, and submits himself to the Lord residing in the serenity of garbhagrha, the very hearts of the temple.

3.5.2. THE VASTU PURUSHA MANDALA

The Vastu Purusha Mandala is the square grid plan and an indispensable part of vastu shastra and constitutes the mathematical and diagrammatic basis for generating design. It is the metaphysical plan of a building, and it incorporates the course of the heavenly bodies and supernatural forces. The meaning of vastupurushamandala can be derived by breaking it into three different words having specific meanings - The vastu refers to physical environment, Purusha refers to energy, power, soul or cosmic man. Mandala is the generic name for any plan or chart which symbolically represents the cosmos.

In Hindu cosmology the surface of the earth is represented as a square, the most fundamental of all Hindu forms. The earth is represented as four-cornered in reference to the horizon's relationship with sunrise and sunset, the North and South direction. It is called Chaturbhuji (four cornered) and represented in the form of the Prithvi Mandala. The astrological charts or horoscopes also represent in a square plan the positions of the sun, moon, planets and zodiac constellations with reference to a specific person's place and time of birth.

The legend of the Vastu Purusha is related thus. Once a formless being blocked the heaven from the earth and Brahma with many other gods trapped him to the ground. This incident is depicted graphically in the Vastu Purusha Mandala with portions allocated hierarchically to each deity based on their contributions and positions. Brahma occupied the central portion - the Brahmasthana- and other gods were distributed around in a concentric pattern. There are 45 gods in all including 32 outer deities.

The mandala is actually a square subdivided into smaller squares in the form of a grid with each square unit clearly marking the areas of respective gods. The most commonly used mandala is the square divided into 64 and 81 squares. Mostly the square of the mandala on its outer periphery are divided into 32 smaller squares, in accordance to the astrological calculation

called nakshatra, representing the constellations or the position of planets through which moon passes in its monthly path. The closed polygon of thirty-two squares is symbolical to the recurrent cycles of time as calculated by the movements of the moon (Gosai 2002-2008).

The four directions lie outside the mandala which represents the meeting of the earth and the universe as well as the movement of the sun from east to west and its rotation to the northern and southern hemispheres. The central portion of the mandala is the place for the Brahma, the creator, and the rest squares are the position of other Gods as per their relevance.

The vastupurushamandala are the square grids and are of various types formed from the fundamental shape, the square. The smaller squares in the grid are called as the one pada and they may vary from 1, 4, 9, 16, 25, and so on 1024 and follows a geometric progression series of 1, 2, 3, 4, 5, 10, 32 with the common factor 2. There can be even numbers of pada and odd numbers of pada in a mandala and are called as yugma mandala and ayugma mandala respectively.

The Vastupurushamandala, having all the geometrical, astronomical and human properties was the basis of the ground floor plan for all Hindu temples. The basic shape acquired by the temple plan is the outer most ring of square of the mandala forms the thickness of walls of main shrine. The central 4 squares acquire the place of the main deity and the inner ring of 12 squares form the walls of the garbhagriha and the next 16 to 28 forms the pradkshina patha. These simple divisions of square with many permutations and combinations became the base for the complex structures of the temple; in the form of orthogonal and stellate plans of the temple Therefore the large squares of mandala were divided into thousand squares thus virtually forming a graph paper for the architect to facilitate him to add a unit at one side and setting back on the other.

3.5.3 THE TEMPLE PLAN LAYOUT

The intended vastupurushamandala is laid down on the earth at the place

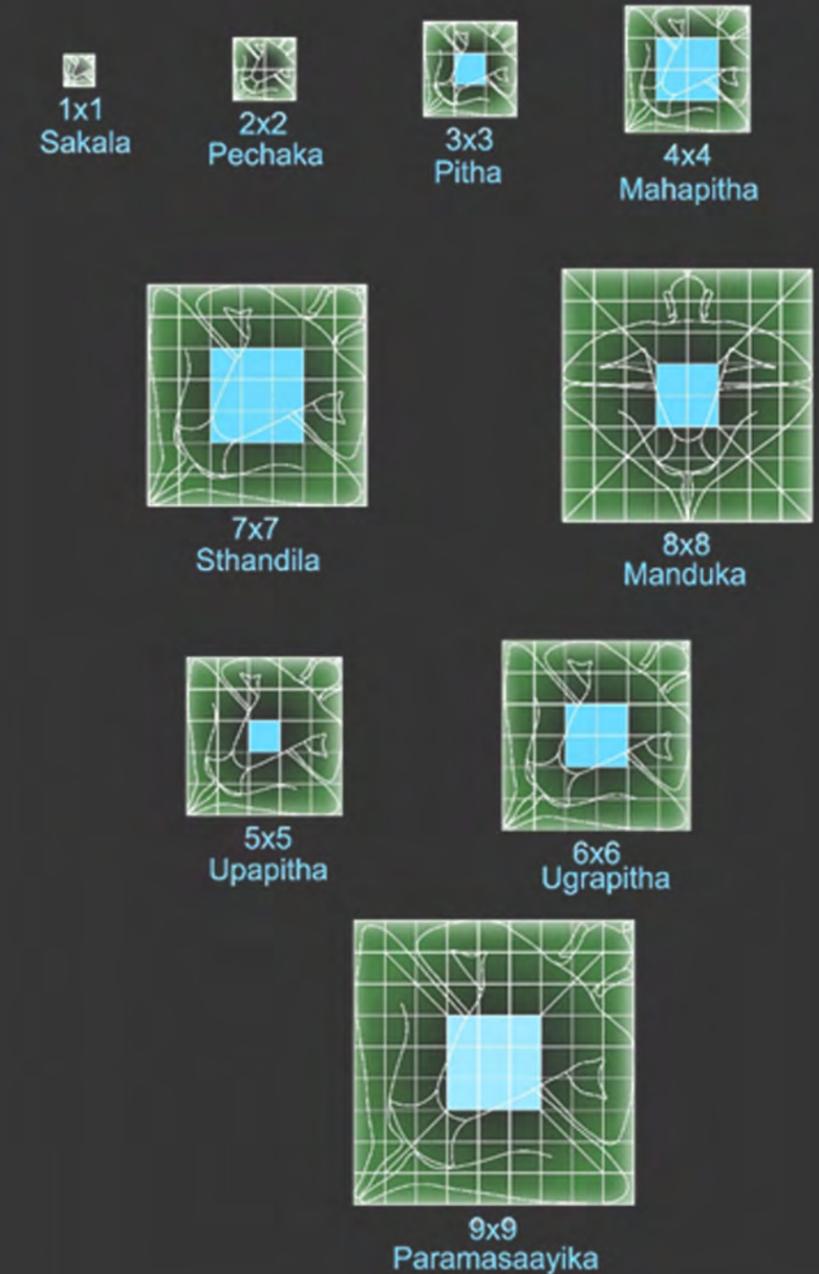


Fig.3.5.3 - Types of Vastupurusha mandala

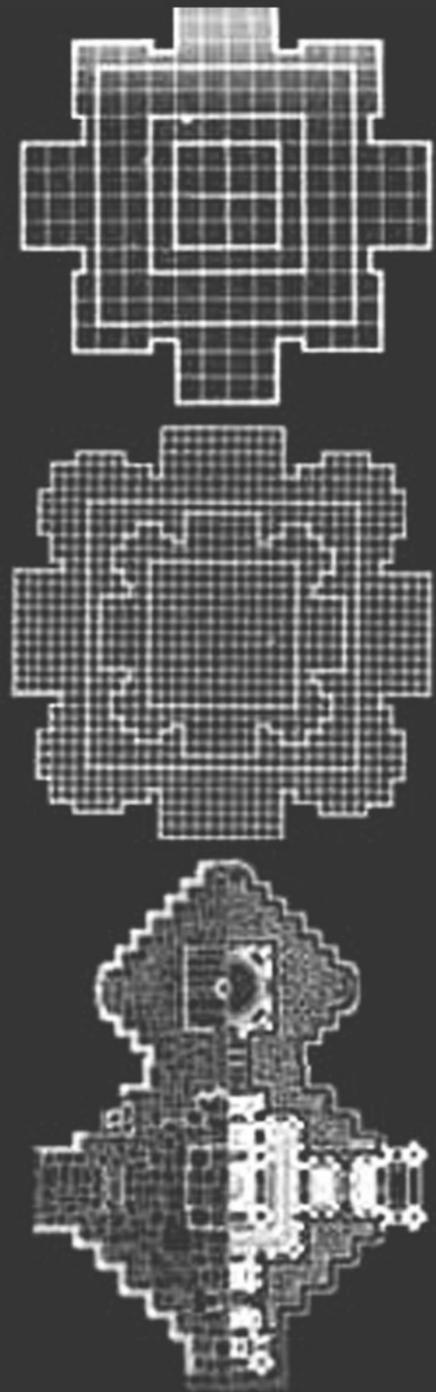


Fig.3.5.4 - Temple plans based on Vastupurusha mandala (Grover, 1980)

selected for the construction of the temple. This divine diagram is the symbolic of the universe with its fractal behaviour. As mentioned in the previous section each unit of square represents the birth of new universe and the central square is the creation of the each unit. The mandala is a square grid and the repetition of even number of square grid develops into 4 square grids and further to 16 square grids and so on. Similarly the repetition of odd number of square grid develops into 9 square grids and further to 81 and so on. The mandala is now placed on the foundation plan of the temple to seize all the cosmic energies underneath the temple. The centre of the mandala generates the energies and emits to the physical world. The square shape of mandala significantly implies to maintain the energy equilibrium. Each side of the squares applies the force towards the centre and in return the centre applies the force towards the sides, thus maintaining the equilibrium (Rian, et al. 2007). Thus increasing the number of squares in the divine diagram helps to hold more energies and emit it out to the physical world through the centre. Therefore, the centre of the mandala is the place for the main deity in the temple.

3.5.4. THE PLAN

The plan of the temples are the replica of the Vastupurushamandala, the grids of the square of 8X8 where the cella is twice the width of the walls of the cella. The Nagara style of temples in the west and the central India followed the orthogonal grids of the mandala. In examples from 7th century at the Vishnu Temple Deogarh in Madhya Pradesh, the square grid was modified by extending one time on each side outwards. Further, during the 10th century at the Surya temple, Modhera the square grid was modified by extending twice on each side outwards. Later on in the 11th century the Hindu temple plan became complex and reached their final form. This time the square grid was modified by extending thrice on each side outwards, The Khandriya Mahadev Temple at Khajuraho in Madhya Pradesh is the best example for this. The temples in the South India in the early 7th to 8th century and later in the 13th century developed the stellate plans meaning the plan of the garbhagriha was in the elaborate star shaped. These complex plans were derived from the basic square. This was achieved by rotating the square around its fixed centre, and turning it diagonal through a series of equal angles. Thus the

corners formed by overlapping so many squares resulted in a star. The number of points and their proportions could be varied merely by changing the angle through which the diagonal was turned up at every step.³ Normally the plan of the temple consisted of 8, 16, 24 and 32 points. The 16 and 32 pointed star plan was achieved by bisecting the angles of an 8 point star. And also 24 pointed star plan is achieved by the 6 point star plan. The Chenna Kesava temple, Belur is one of the finest example of the stellate plan.

3.4.5. THE STRUCTURAL SYSTEMS

The basic and most commonly seen construction technique used in the Hindu temple was the trabeated system or the post and the beam method and which was extended by the use of corbelling techniques. This method was originally used for wooden construction in India and was later adopted for the stone structures as well.

In the trabeated system of construction only the horizontal and the vertical members are used and the stability is achieved by the massive arrangements of vertical elements such as pillars and pilasters together and heavy cross beams and lintels. The use of the spanning system to enclose the interior spaces was the most typical feature of this system. The openings in the Hindu temple have lintel made of stone or timber. The roofing system consists of horizontally laid slabs of stone spanning from one supporting beam or wall to the other.

The arrangement of the internal ceilings in the Hindu temple were deliberately confined to the overlapping of the one stone course with the another or, alternatively, to the laying of the diagonal and square stone course to produce designs with rotating and diminishing squares.⁵ Later in the 10th and 11th centuries the internal ceilings were spanned circular stone courses, seated one above the other in receding diameters, to produce complex designs.

In the corbelling system the stones or the bricks in each horizontal courses are projected out to bridge the gap between the two walls to diminish until it can be closed with a single piece of stone or brick. The corbelling system was used to create the interiors of the temple and the stone shells of the



Fig.3.5.5

Fig.3.5.6

Fig.3.5.7



Fig.3.5.8

Fig.3.5.9

Fig.3.5.10

Fig.3.5.11

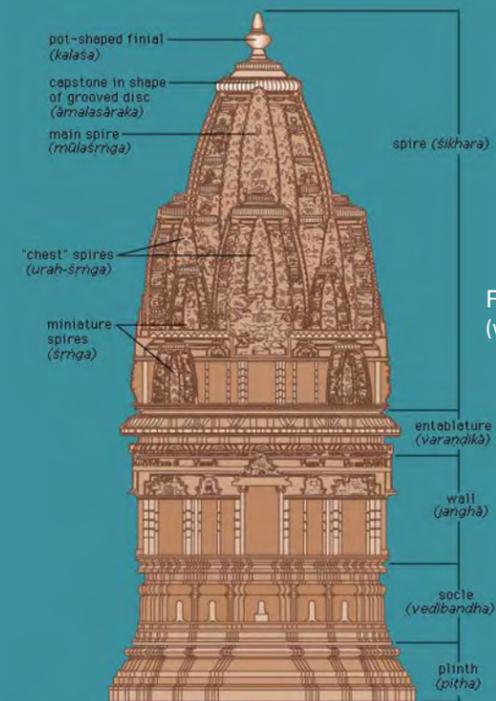


Fig.3.5.12 - North Indian Temple (www.britannica.com)

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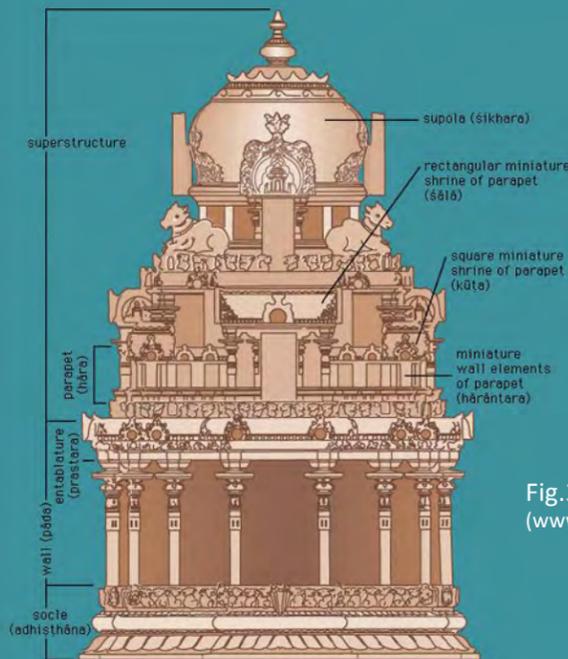


Fig.3.5.13 - South Indian Temple (www.britannica.com)

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super structure that rise above the sanctuary. Later in the 13th century the use of iron clamps and wedges to hold the stone slabs together, allowed the special feature of corbelling in which horizontal stone layers were projected out over large spans and cut into unusual shapes to produce highly decorative ceiling schemes.⁵

The column-beam-corbel method of construction was the main structural principle governing the construction of every Hindu temples. The principles of equilibrium of forces in action by means of arch, vaults and other forms of functional engineering rules never really played a part in the evolution of Hindu temple. It doesn't mean that architects of Hindu temples were ignorant about these techniques, rather it is their conformance to tradition and strict adherence to precedents, reflecting a certain firmness in their cultural attitude.¹ There was no instance of use of vaults or domes in the Hindu temple architecture, but arched niches were created on the surface of the walls and they rarely carry loads from above.

3.4.6. THE STRUCTURAL COMPONENTS

In the north Indian temples the sanctum or the garbhgriha is situated on a raised base, or a plinth (pitha). over which is the socle (vedibandha), these have different decorative mouldings, above the vedibandha is the walls of the sanctum (jaghā), having prominent offsets and niches, which are further crowned by the cornice or a series of cornices(varandika) and above this is the superstructure (sikhara). On the top of the sikhara is a single piece of stone having grooves called as the amalaka which in turn is crowned with a pot and finial. The whole temple complex including the mandapas and other shrines are usually raised on a terrace (jagati) which is at times having significant heights and size. The sanctum has a flat ceiling inside and the superstructure is usually hollow from inside to lessen the weight.

In the South Indian Temples the sanctum or the garbhagriha rises above the socle (adhithana), consisting of series of mouldings which differ from the North Indian temples, below the adhithana is the upapitha or sometimes without it, above the socle rises the walls (pada) of the sanctum, the walls are divided in to series of pilasters, above the walls is the entablature (pra-

stara) which is usually as wide as the width of the column. And then we have the neck (kantha), above which rises the pyramidal shaped superstructure consisting of stepped stories and each of them are enclosed by their own parapet. The top of the stepped structure supports the solid cupola called as sikhara in the south which in turn is crowned by a pot and finial.

The Base:

The base of the Hindu temple consists of series of mouldings. These mouldings are horizontal bands corresponding to the courses of masonry supporting the walls and super structure of the Hindu temple. In Hindu temple architecture mouldings exist not as edgings or modulations to other elements, but as elements with larger elements. These are more similar to the architrave, frieze and cornice in a classical pediment than to mouldings within these.⁴ The moulded base is called as vedibandha in the North and adisthana in the South. The floor level is at the foot of this element in the North and above the element in the South. These have elaborate carvings and have sub-bases and pedestals.

The walls:

The zone between the superstructure and the base of the Hindu temple architecture consists of walls, pillars and pilasters. The walls in the Hindu temple architecture are constructed as composite stone masonry with an infill of stone and brick with lime and mud. The thickness of the stones varies from 300 to 4500 mm. The average thickness of the masonry wall varies from 800mm–1200mm. Through stones are provided at regular intervals to strengthen the walls.

The Supporting elements:

The Hindu temple consists of tall, slender, free-standing, beam supporting columns, pillars and pilasters. The columns are not the defining elements of the Hindu temple architecture as that of the Western Classical architecture. It is not easy to categorise the Indian columns as there are no particular design type of the column.

The design of columns in each period and style have numerous interrelated

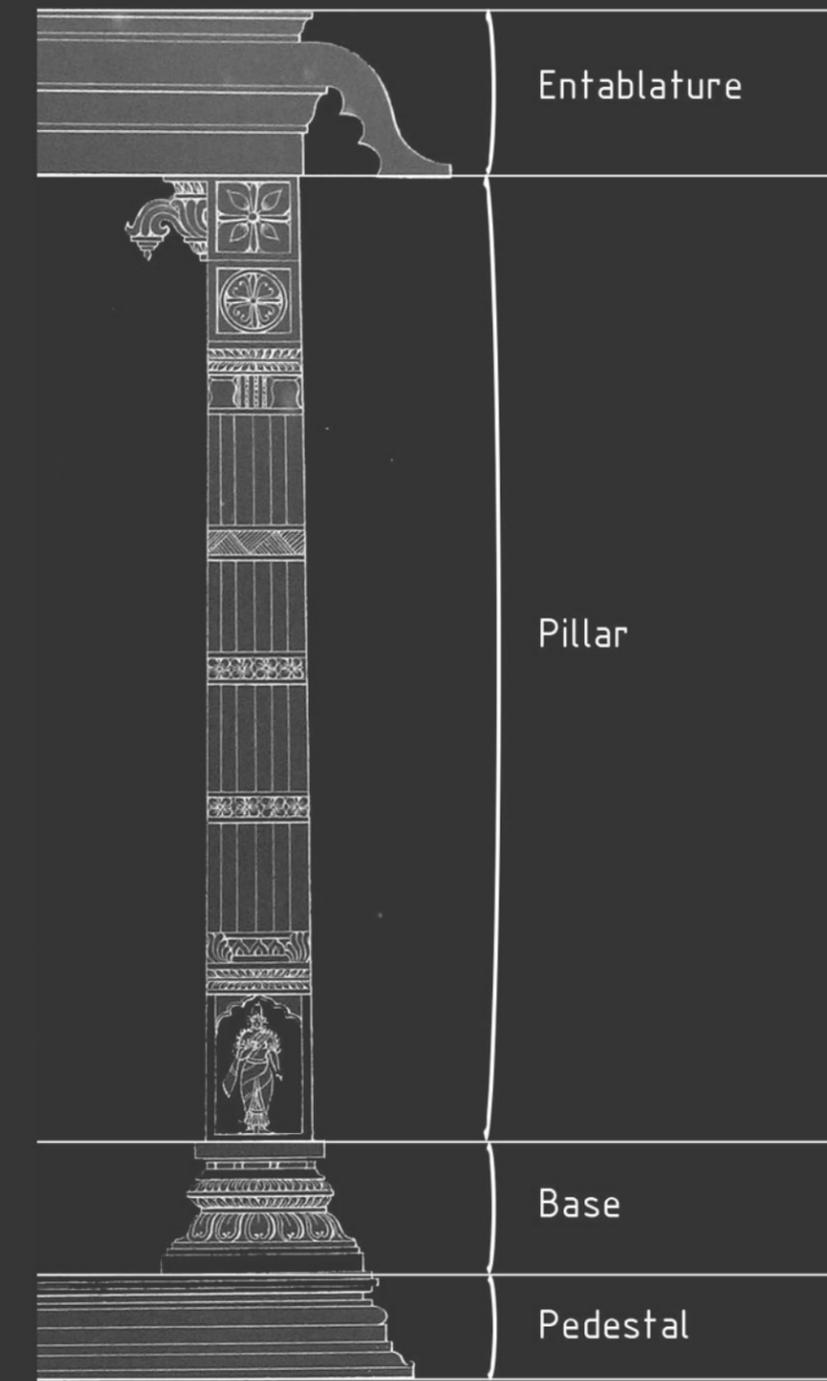


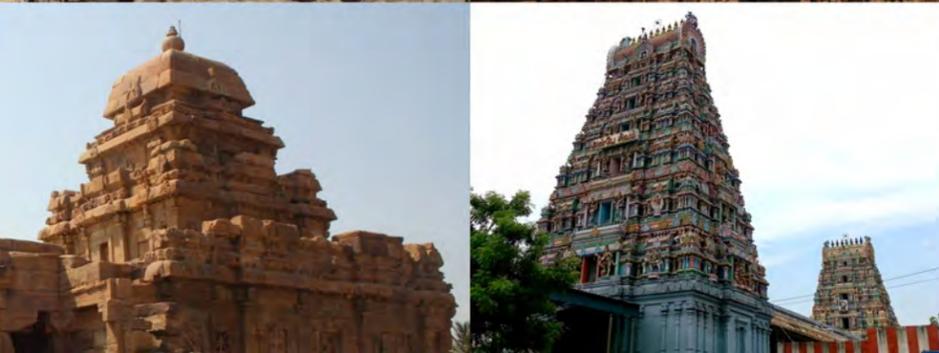
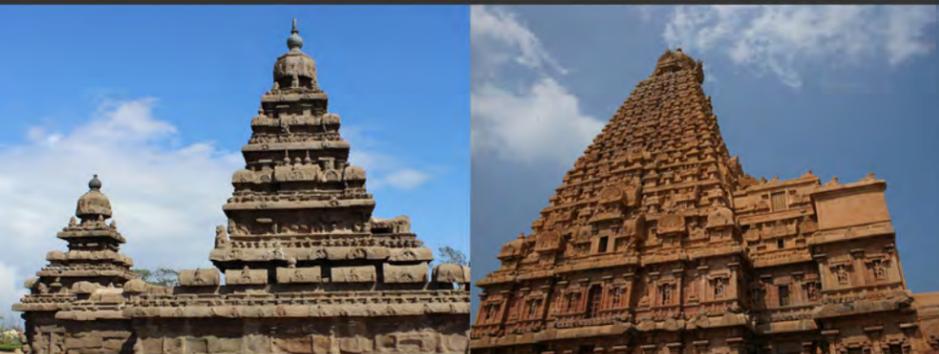
Fig.3.5.14 - Temple, structural components (Ram raz)



Examples of the north Indian 'Sikhara'

THE SUPERSTRUCTURE

examples of the south Indian 'Vimana'



yet different types, which were carried from one period to another or were transformed into new types. The Indian texts classify columns in terms of their cross section at different levels. The cross section ranges from square circular and polygonal (faceted), through scalloped (fluted), lobed, staggered and stellate.⁴

The basic parts of the columns are - The beam (uttara) the topmost section of the column is the beam and these are the structural beams of the temple. The section below is the bracket (potikas) supporting the beams. The brackets provides the bearing for the beam and shortens the span between the columns. Thereafter is the flat plate (phalaka) and underneath is the mandi, something like a dish, fluted or petalled. These bears the bracket rather than the beam directly and act as a cushion to receive the imposed loads. The head or the the capital of the column is called as the ghata, a rounded or swollen member which is held by the neck (tali) and the shoulder (lasuna) of the column. This ghata acts as cushion to the load of the structure. Below the tali and the lasuna is the horizontal band, a griddle, the malasthana and further down is the mala another horizontal band. These two element are inseperable are carved out of a single stone block. Below the mala comes the shaft which stands on the base block often cuboid in shape.

The superstructure:

The superstructure of the Hindu temple relates to the spire or the sikhara of the temple. The sikhara is the most distinctive part of the Hindu temple and provides the basis for the most useful and instructive classification.

In the North Indian temple there are three basic types of sikhara called as the phamsana, latina and the sekhari. The latina sikhara is curvilinear in outline and is composed of series of one above the other horizontal roof slabs. The surface of the entire śikhara is covered with a creeper-like interlaced work, composed of tiny ornamental candraśālā. The sikhara diminishes at the top and is capped by a horizontal course (skandha), above which is a circular necking (grīvā), carrying a large grooved disc called the āmalasāraka. The sikhara is finally crowned with the kalasa (pot) and the finial (South Asian Arts, 2008). The phāmsanā śikhara have rectilinear outline and is lower in height com-

pared to the Latina. It also consists of horizontal slabs and is capped by a bell-shaped member called the ghaṇṭā. The surfaces of this type of śikhara also have projections, and are decorated with a variety of architectural ornament. During the 10th century another type of sikhara or spire developed called as sekhari. In its developed form it consisted of a central latina spire with one or more rows of half spires added on the sides and the base strung with miniature spires. The corners, too, are sometimes filled with quarter spires, the whole mass of carved masonry recalling a mountain with a cluster of subsidiary peaks (South Asian Arts, 2008).

In the South Indian temple the super structure is that of the kutina and shala type. The super structure is pyramidal in form and consists of stepped stories. Each story replicates the main story and is conceived having its own "wall" enclosed by a parapet. In the ancient temples, these stepped stories of the superstructure with their parapets became more and more ornamental, so that in the course of time they evolved into more or less decorative bands around the pyramidal superstructure (South Asian Arts, 2008). The stepped structure is capped with a solid dome or cupola or with a barrel-vault roof. The former is the kutina type and the later is the shala type. The structure is crowned with a pot and finial.

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CHAPTER 4

GRAPHICAL TRANSLATION

'With the historian it is an article of faith that knowledge of the past is a key to understanding the present'. - Kenneth Stamp

All Indian temples irrespective of the main deities follow an agamic code of construction. In this section I have tried to graphically translate the chapters of Kamika Agama which are related to temple architecture, from the examination of the site to the design of the finial. The rituals are not studied in detail as the main focus of this study has been on the architectural details and procedures.

All the Sanskrit verses and their English translations are taken from the book 'S'R'I'MAT KA'MIKA'GAMAH Purva pada (part one)' translated by Dr.S.P.Sabharathnam Sivacharyar and published by 'The Himalayan Academy'. This treatise is originally in 'Sanskrit' language and written in the 'Grantha' script.

Pronunciation guide:

a as in 'Suitable'
a' as in 'Far'
i as in 'Pit'
i' as in 'Machine'
u as in 'Fruit'
u' as in 'Rule'

4.1. EXAMINATION OF THE SITE (C-11: BHU'PARI'KS'A' VIDIH)

The directions for the selection of auspicious time for any occasion and examination of omens in the site selected for construction are detailed in the chapters 9 and 10 of the purva pada of this agama. Now, we see the directions for examination of the site for its fitness in this chapter 11 of this agama in detail.

*śubhe nimitte labdhe ca bhūparīkṣāṁ samācāret
śaivaṁ brāhmaṇaṁ tathā vāstu vaiṣṇavañcaīndrameva call
aukṣāṅca bhautikañcaīva āsurañca piśācakaṁ
rākṣasaṁ caiva vāyavyaṁ vāruṅāgneyakau tathāll*

Once the auspicious signs indicating the growth and prosperity are obtained,

the foremost Acharya should begin to examine the nature of the ground to be selected for construction. There are 12 varieties of ground (as detailed in this Agama). They are – saiva, brahma, vaishnava, aindra, auksha, bhautika, asura, paisacaka, rakshasa, vayavya, varuna and agneyaka.

The first type of classification as mentioned in the above verse are described in the table (Tab.1.1).

In the second type of classification for the ground suitable for construction it is divided into three types as shown in the table (Tab.1.2).

In another kind of classification the land is considered to be of four kinds – padmaka, bhadraka, dhurmaka and purnaka. Their characteristics are described in the table (Tab.1.3).

The next classification is based on the slope of the land as described in the following verses –

*uttamaṁ madhyamaṁ nīcaṁ nityaṁ ceti caturvidhaml
daśadaṇḍa pramāṇaṁ tu ṣaṁmātrāvanataṁ tu yatll
uttamaṁ syādvitastyā tu madhyaṁ hastena cādhamaml
tanmandamadhyatvarita jalāvaha samanvitaml
hastādadhika nīmaṁ tu nīditaṁ vāstu kīrtitaml*

In another kind of classification, the land is held to be of four kinds – the superior(uttama), medium(madhyama, inferior(adhama) and the lowest(nica). Within a stretch of 10 rods(dandas, 40 hastas), the land which slopes gradually up to 6 digits is of superior kind; which slopes up to one span is of medium kind; which slopes up to one hasta is of inferior kind. The land which yields water in a quick phase is of superior type; which gives water in a moderate phase is of medium type; which produces water in a slow phase is of inferior type. The land which has a slope of more than one hasta within a stretch of ten dandas is said to be of lowest kind' it is avoidable.

Different shapes and colors of land suitable for different classes are mentioned in this chapter. And the characteristics of the highest quality of ground like vegetation, odor, color etc. are also described for conducive prosperity

| Type | Vegetation | Animals & Birds | Characteristics | Pay-off / Reccomendation |
|-------------------------|--|--|---|---|
| Saiva-bhumi | Trees: Karnikara, Arjuna, Asvattha, Kapittha & Asoka. Plants: Dhataki, Sthala aravinda, Tulasi, Durva, Vishnukranta, Akhu karma, salmali & Giri sariba. | Birds: Doves, Parrots & Ham-sas. | - | Yields auspicious wealth & prosperity. |
| Brahma- bhumi | Trees: Bilva & palasa Grass: Dharba, Visvamisra & Kusa. | Antelopes | Fragrant substances | Yields auspicious benefits. |
| Vaishnava- bhumi | Plants: Tinduka, Karpasa, Arka & Japa. Trees: Tintrini, Karaja, Venu | Hamsa, other birds and various animals. | Thornless trees flourish. | Gives valor and vigor to the human beings. |
| Aindra-bhumi | Trees: Kadali, Panasa, Punnaga, Vakula, Patali, Sindhuvara & Amalaka, with Indivara flowers. | - | Dwelling of vaisyas and Sudras | - |
| Auksha-bhumi (Cow land) | Patali-flowers & sandal. Food grain & Ankola trees | Cats, Mongoose, Rabbits, Iguanas, Jackals(hyenas), Cakora-birds(Partidge birds, supposed to feed in the moonbeams) & wolves. | - | Gives valor & prowess and yields abundance of wealth. |
| Bhautika-bhumi | Trees: Nirgundi, Ankola, Kimsuka & others. Plants: Madhavi, Durva, Mallika, Karavira etc., | - | - | - |
| Asura-bhumi | Large trees, Bhallata, Kakubha & Onion. | Cruel beings & Vultures | Fragrance of ashes & sandal. Inhabited by mountain tribes who live by hunting.Putrid odor. | Gives food and strength. |
| Pisacaka-bhumi | Trees: Salmali, Vakula, Vibhitaka, Sleshmataka & such others. | Asses, Camels, Foxes & Pigs | Outcaste & hunters live here. associated with stinking smell with barren spots & saline soil. | Yields destruction. |
| Rakshasa-bhumi | Poisonous plants & trees. | | Abundant in pepper, molasses and fragrant substances inflict headache& other ailments. | gradual decay. |

| | | | | |
|----------------|---|--------------------|---|-------------------------------|
| Vayavya-bhumi | - | Jackals & Crickets | gravels & splinters. | inflicts misery & misfortune. |
| Varuna-bhumi | Areca trees | - | - | All auspicious fortunes |
| Agneyaka-bhumi | Milk-hedge plants, Sleshmataka & such other trees | - | Small gravels, saline soil, bereft of watery sources. | Destruction. |

Tab.1.1 Varieties of ground (classification 1)

| Type | Characteristics | Vegetation |
|-----------------------------|--|---|
| Anupa bhumi | Has stability, with heavy mass and strewn with large heaps of gravels, very little saline water even if dug very deep. | Grains, flowering trees and fruit yielding trees. |
| Jangala bhumi | Covered with kaseru grass, in which aromatic utpala flowers have blossomed, white sand, water comes out profusely at the very instance of ploughing. | Plaintain trees, jack trees and other such trees. |
| Sa'dharana bhumi (ordinary) | whcih is with mixed qualities of both. | - |

Tab.1.2 Varieties of ground (classification 2)

| Type | Appearance | Odor | Touch | Sound | Other characteristics |
|---------|---|-------------------------|---------------------------------|----------------------------------|--|
| Padmaka | Evenly levelled | pleasantly odorous | uniformly smooth to touch, soft | resounding with melodious sounds | stable' without becoming loose during rains; water rushes up from a pit dug to a depth of a man standing with raised hands to form 'Anjali mudra'(Fig.4.1.1) |
| Bhadra | Forest on its southern side, water flowing in the east and north. | abundant fragrant grass | - | - | Salubrious & fertile; abundant in good grains & commodities; charming to mind; habitations of good people. |
| Dhumra | - | - | - | - | Ever-swelling river on the north side. |
| Purna | - | - | - | - | Ever-swelling river in its south-east |

Tab.1.3 Varieties of ground (classification 3)

of its users.

*pūryamāṇe mahīm khātvā garte svaireva pāmsubhiḥl
adhikanyūnatulyeṣu pāmsuṣvetāḍṛśaṁ phalamll
tatpāmsu dhāraṇe ṣaṣṭisatam phalavivekataḥl*

Having dug the ground up to a depth of one hasta, the Acharya should fill up the pit with the same earth removed from the pitt. If some quantity of earth is left out after the pit is filled up the ground is considered to be of supreme kind. If more quantity of earth is needed to fill up the pit, then it means that the ground is of lower type. If the earth is sufficient enough to fill up the pit, then the ground is considered to be of medium type.

*sapuṣpakumbhatoyena pūryamāṇe'vaṭe yadill
śastampradakṣiṇāvartam udakam śāntabudbudaml
uttāna puṣpakam śreṣṭham na tvadhomukha puṣpakaml*

When water is poured into the pit from the kalasa along with flower placed into it, if the water whirls round in the clockwise direction with settled bubbles and if the flower if turned upwards, then the ground is considered to be with superior standard. But the flower is turned downwards, then the ground should be considered to be unfit for the construction.

Further, the auspiciousness of the ground is examined by the sprouting of mustard seeds. The quality of the land also depends on its association with water bodies. After completion of the examination of the ground the process of taking possession of the ground with performance of the 'pravesa bali' (offering of bali for taking possession). After taking possession of the ground it is ploughed as directed in the chapters 12, 13 and 14.



Fig.4.1.1 - Anjali Mudra

4.2. ERECTION OF GNOMON (C-15: S'AN'KU STHA'PANA VIDIH)

In this 15th chapter of 'Kamika Agama' the procedure and directions for the erection of gnomons and pegs to favour the happiness and prosperity for all types of constructions is discussed. This process is basically meant for ascertaining the true east-west and the true north south lines, for fixing the orientation and other intermediate directions.

It is suggested that the gnomon be erected in the approximate south-west of the central grid called 'brahmastha'na' which is believed to bring good fortune to the occupants and users. It is suggested that in order to appear pleasing to the gods a mandala is to be designed at the set location with the prescribed dimensions and proportions; and the purification and other procedures are to be performed. Materials, design and dimensions of the gnomons and pegs for different purposes are also prescribed.

Having completed the purification and other rituals for the gnomons and pegs as mentioned in this treatise the priest should commence the erection of the gnomon as described below:

*s'an'kuprama'n.aya' rajva' s'an'kuvya'sa'rdha yuktaya' l
vr'ttam sambhra'mya tanmadhye stha'payettam inodaye ll*

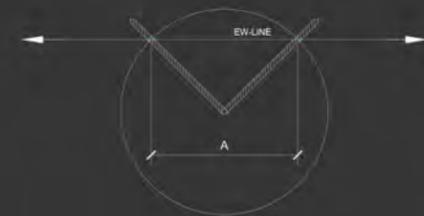
With the cord having its length equal to the length of the gnomon and its thickness equal to the half of the thickness of the bottom of the gnomon, the priest should describe a circle on the place selected for the erection (the length of the cord being the radius of the circle). Exactly at the centre of the circle he should install the duly worshipped gnomon.(fig.4.2.1)

*pu'rva'para'hn.ayos's'an'kos'cha'ya rekha gata'yatha' l
tadbindu dvayagam su'tram pu'rva'para digis"yate ll*

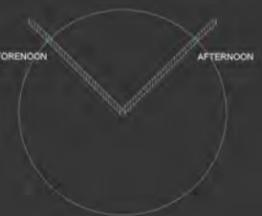
In the forenoon, the priest should mark a point (bindu) where the shadow of the gnomon meets the circumference. In the same way, he should mark a point



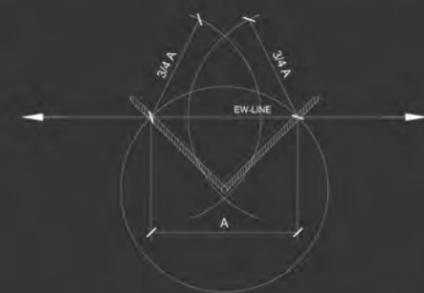
STEP 1
Fig.4.2.1



STEP 3
Fig.4.2.3



STEP 2
Fig.4.2.2



STEP 4
Fig.4.2.4



STEP 5
Fig.4.2.5

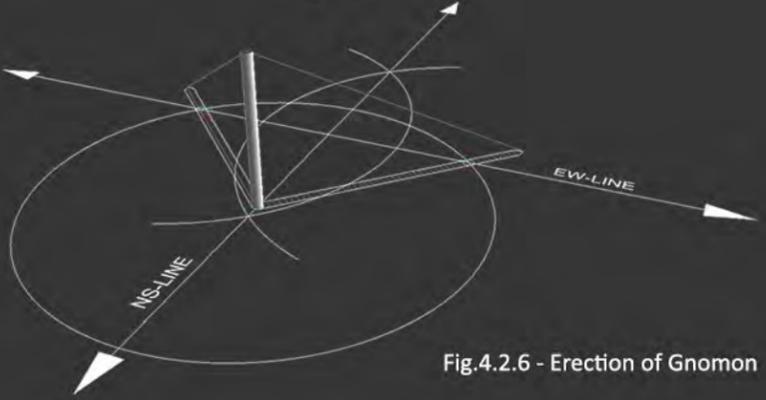


Fig.4.2.6 - Erection of Gnomon

where the shadow of the gnomon meets the circumference in the afternoon. (fig.4.2.2) The line which connects these two bindus is known as the east-west line. (fig.4.2.3)

yavasya tu turi'ya'ms'am purva'para'hn.ayor gata' t bindu dvaya'ntaram bhra'ntas's'ambaranana pucchakam || daks'in.ottaram ityuktam anyatha' va' pi kathyate |

Having a radius equal to the three fourth of the east-west line, he should draw a segment of circle, keeping the east bindu as the centre and another segment keeping the west bindu as the centre. The point where the two segments cut each other on the south of the east-west line and the point where the two segments cut each other on the north of the same line are to be joined. (fig.4.2.4) The inner space in which the two segments cut each other will look like the face and tail of a fish. The line which joins the south point and the north point is known as the south-west line. (fig.4.2.2)

It is also mentioned in this chapter that the true north and other directions can be ascertained through the position of the north star dhruva.

4.3. SYSTEM OF MEASUREMENTS AND MEASURING TOOLS (C-16: MA'NOPA-KARAN.A VIDIH)

In this chapter the different types of measurements and measuring tools applicable to all types of constructions are explained. The first type of measure is called ma'na'n'gula which is a gradual increase from the sub atomic particle called the parma'n.u.

*parama'n.uritikhya'to yogina'm dr's't'i gocaram |
ratha ren.us'ca va'la'gram liks'a' yu'ko yavastatha' || 2
kramas'o s't'agun.a'h prokta' yavais's'ad'bhis'ca saptabhih |
as't'a'bhis'ca krmen.aiva kanyasa'di vibhedatah || 3
an'gulyastrividha' prokta' ya'vatyas's'iva s'a'sane |*

That which is exclusively told as parama'n.u is perceptible to the eyes of the yogis only. From the parama'n.u all other measures such as car-dust (molecule), hair-tip, nit, louse and barley corn are obtained. Of these measures, the succeeding measure is eight times the preceding one. As detailed in this S'iva S'a'stra the an'gula measure is of three kinds – the smallest, the intermediate and the largest. 6 yavas(barley corn) make one smallest an'gula. 7 yavas make one intermediate an'gula. 8 yavas make one largest an'gula.

There are also other types of angulas based on different multiples of paddy grain and barley corn. Another important type of measure is ma'tra'ngula. which taken from the fingers and digits of human hand as explained below.

*madhyama'n'guli madhyastha parva di'rgham tu yadbhavet || 6
s'res't'am ma'tra'n'gulam proktam pa'dahi'nam tu madhyamam |
ardhonam adhamam proktam ma'ta'n'gula vibhedatah || 7*

The length of the middle digit of the middle finger is claimed to be the foremost type of ma'tra'ngula. One fourth less of this length is known as the intermediate ma'tra'ngula. half less of this length is known as the smallest ma'tra'ngula. the ma'tra'ngula type of measure is of these three different kinds. (Fig.4.3.2)

DERIVATION OF MEASURING UNITS

Tab.4.3.1

| UNIT | EQUIVALENT (IN MM) | DESCRIPTION | IMAGE |
|----------------------------------|--------------------|--|-------|
| PARAMANU. | 1.3323 e-4 | SUB-ATOMIC particle perceptible to the eyes of yogis only. (The last miniscule particle of matter which could not be subdivided further) | |
| RATHA REN.U (8 x Paramanu) | 0.0011 | CAR DUST Or particle to the size of the particle of mist (molecular) | |
| S'CAVA'LA'GRAM (8 x Ratha ren.u) | 0.0085 | Thickness of the TIP OF HAIR | |
| LI'KS'A (8 x S'cava'la'gram) | 0.0682 | NIT The egg or young form of a louse or other parasitic insect (human head louse attached to a hair) | |
| YU'KA (8 x Paramanu) | 0.5457 | LOUSE Small wingless parasitic insects that live on the skin of mammals and birds | |
| YAVA (8 x Paramanu) | 4.3656 | BARLEY CORN A member of the grass family, (A major cereal grain, one of the first cultivated grains) | |
| AN'GULA (8 x Paramanu) | 34.9250 | DIGIT The most basic unit in construction of buildings | |

MA'NA'N'GULA MEASURES

- 24 An'gulas = Ki'sku Hasta = 2 Vitastis (1 Vitasti = 12 An'gulas)
- 25 An'gulas = Pra'ja'patya Hasta
- 26 An'gulas = Dhanur mus't'i Hasta
- 27 An'gulas = Dhanurgraha Hasta
- 28 An'gulas = Pra'chya Hasta
- 29 An'gulas = Vaideha Hasta
- 30 An'gulas = Vaipulya Hasta
- 31 An'gulas = Praki'rn.a Hasta



Fig.4.3.1

Fig.4.3.2

Measures taken from other fingers and their purposes are explained there-of. The units succeeding the an'gula is vitasti and hasta as described in the further verses.

*an'gulaissu'rya san'khyatair vitastiriha kathyate |
 tad dvayam hastamuddis't'am sa kis'kuriha sammatah || 9
 pan'ca vims'ati ma'tram tu pra'ja'patya iti smr'tah |
 ma'traistu s'ad'vims'atibhir dhanurmus't'i praki'rtitah || 10
 saptavims'atibhir ma'trair dhanurgraha uda'hr'tah |
 ma'na'n'gulottha hasta'stu s'a'stre smin sampraki'rtitah || 11*

It is set forth in this Agama that 12 an'gulas make one vitasti. Two vitastis make one hasta. This kind of hasta is accepted as kis'ku hasta. 25 an'gulas constitute one pra'ja'patya hasta. 26 an'gulas make one dhanur mus't'i hasta. 27 an'gulas make one dhanurgraha hasta. These are diferent kinds of hastas obtained from ma'na'n'gula type of measure.

The most commonly used hasta measure is kis'ku hasta which is 33 inches in the imperial system of measures. Other types of hasta are;

- 28 an'gulas = 1 pra'chya hasta
- 29 an'gula = 1 vaideha hasta
- 30 an'gulas = 1 vaipulya hasta
- 31 an'gulas = 1 praki'rna hasta

*paurus'ah purus'a'j ja'tas tvan'gus't'ha'ddaks'in.a'diha |
 talam prasa'rya ca'n'gus't'ha sahitais'caturan'gulaih || 12
 kanis't'ha'dyaih kramen.aiva yavagokarn.a sajn'akaih |
 vitastih kathitas'caivam pra'des'as tadanantaram || 13
 evam vividha uddis't'o hastas sarves'u va'stus'u |*

The measure obtained from the right thumb of a man is known as paurus'a. when the right palm is kept freely extended, with al the fingers stretched up-right, various measures are obtained from the thumb in association with all other four fingers. The distance between the tip of the right thumb and that of

the little finger is known well as yava. The distance between the tip of the right thumb and that of the ring finger is known as gokarn.a. the distance between the tip of the thumb and that of the middle finger is known as vitasti. The distance between the tip of the thumb and that of the index finger is known as pr'ades'a. (Fig.4.3.1) thus various kinds of measures related to hasta have been explained as applicable to all kinds of objects and constructions.

Different types of hastas are prescribed for different purposes to be handled by a well skilled priest or architect. Hasta angula or yava measues are used based on the scale of the object or construction. Further, large scale meaures are measured in dan.da and rajju; four hastas = one pole(dan.da) eight poles = one rope(rajju)

This agama also explains the details and the materials for the making the measuring devices like the rope and the pole or measuring rod for different types of constructions, idols, statues and others. Small objects are measured using the central rib of coconut leaf. Carvings and metal decorations are recommended for the measuring rods.

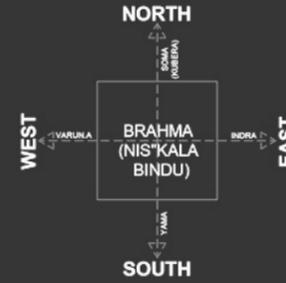
4.4. RETICULATION OF GROUND AND ALLOCATION OF GRIDS (C-17: PADA-VINYA'SA VIDIH)

The square ground plan called va'stu man.d'ala is divided into a number of square grids assigned to different deities, these Gods rule various aspects of life and have certain inherent qualities based on which the required functions and utilities are provided. There are thirty-two types of va'stuma.nd'ala as listed below which are explained in this chapter of Ka'mika Agama.

| | | |
|-------------------|---|---------------|
| Sakalam | - | 1 square grid |
| Pecakam | - | 2 x 2 |
| Pi't'ham | - | 3 x 3 |
| Maha'pi't'ham | - | 4 x 4 |
| Upapi't'ham | - | 5 x 5 |
| Ugrapi't'ham | - | 6 x 6 |
| Sthandilam | - | 7 x 7 |
| Man.d'u'kam | - | 8 x 8 |
| Parami's'a'padam | - | 9 x 9 |
| A'sanam | - | 10 x 10 |
| Sta'ni'yam | - | 11 x 11 |
| Des'l'yam | - | 12 x 12 |
| Can.d'ikam | - | 13 x 13 |
| Bhadra maha'sanam | - | 14 x 14 |
| Padmagarbham | - | 15 x 15 |
| Triyutam | - | 16 x 16 |
| Vr'ttabhogam | - | 17 x 17 |
| Karn.a's't'akam | - | 18 x 18 |
| Gan.itapa'ddakam | - | 19 x 19 |
| Su'ryavis'a'lam | - | 20 x 20 |
| Susamhitam | - | 21 x 21 |
| Supratika'ntam | - | 22 x 22 |
| Visa'lam | - | 23 x 23 |
| Vipragarbham | - | 24 x 24 |
| Vis'ves'am | - | 25 x 25 |
| Vipula bhogam | - | 26 x 26 |

| | | |
|------------------|-----------|---|
| DAN.DA (Pole) | 4 HASTAS | Villages, towns, cities and so forth |
| RAJJU (Rope) | 8 DAN.DAS | Highways and roads, boundary of ground for buildings and villages |

Fig.4.4.1 - SAKALAM



| | | |
|-----------------|---|---------|
| Vipratka'tam | - | 27 x 27 |
| Vis'a'la'ks'am | - | 28 x 28 |
| Viprabhuktikam | - | 29 x 29 |
| Vis'vasa'ram | - | 30 x 30 |
| I's'varaka'ntam | - | 31 x 31 |
| Indraka'ntam | - | 32 x 32 |

Detailed description of some of the va'stumandalas their translation and graphical representation are given in this chapter.

*sakale madhyame brhma' pu'jyah pra'ga'di su'trake |
indram yamam ca varun.am somam gandha'dina'rcayet ||
asmin deva'dayah pu'jya'cca'gnika'rayam ca bhojanam |*

In the va'stuman.d'ala known as sakala (1 square), Brahma is to be worshipped at the centre. Indra, Yama, Varun.a and Soma (kubera) located in the running along the east, south, west and north respectively are to be worshipped with sandal, flowers and other substances (Fig.4.4.1). This sakalapada is recommended for worshipping the chosen deities, for fire ritual and feeding.

*kurya'ttu pecakapade karn.asu'tra dvaya'nvite ||
as't'a su'tragata' lokapa'la' madhye praja'patih |
tanmadhye nis'kalam beram stha'payed des'ikottamah ||
sarvaman'gala ka'ryam ca ks'udragra'ma gr'ha'dikam |*

The pecakapada (2x2) should be provided with two diagonal lines in addition to the east-west and north-south lines. The eight directional deities are to be located in the eight lines. At the center of the man.d'ala is Brahma and the most enlightened priest should install and worship the formless one at the center (Fig.4.4.2). This pecaka pada is fit for all kinds of auspicious activities, small village settlement, house and so on.

Fig.4.4.2 - PECAKAM

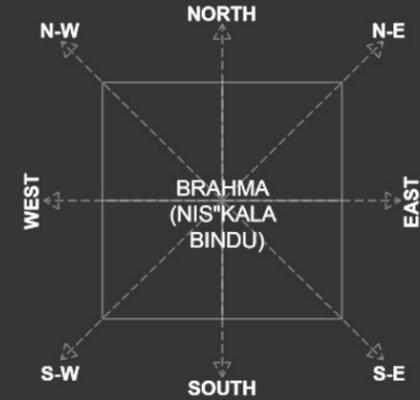


Fig.4.4.3 - PIT'HAM

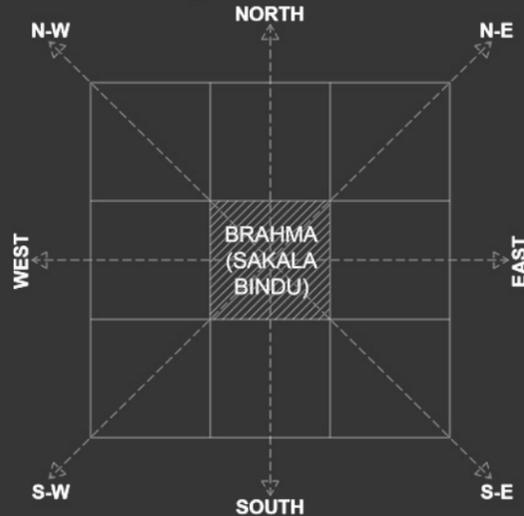
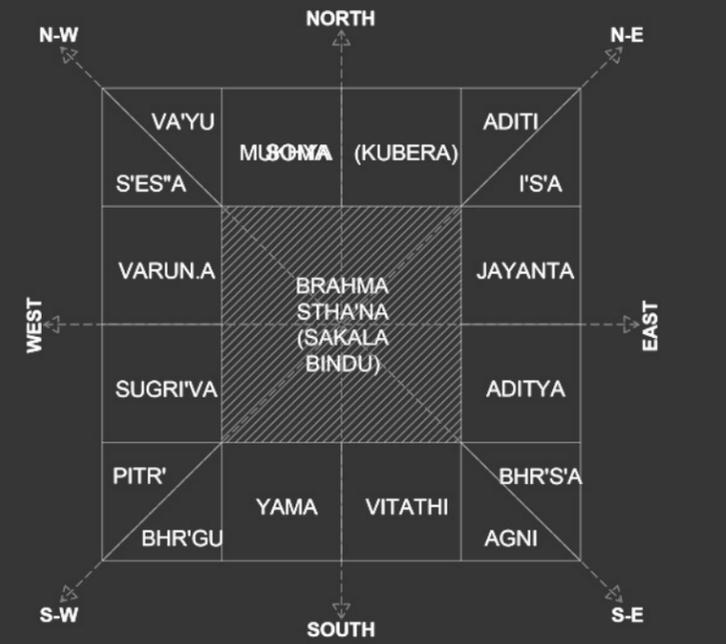


Fig.4.4.4 - MAHA'PI'THAM



*karn.a su'tradvayenaiva samyuktam pi't'ham is'yate ||
pu'rvoktastu sura' ye tu padastha'ste praki'rtita'h |
etatpadam mat'ha'di'na'm tacca gra'ma'di yogyakam ||
ks'udra gra'ma'dike ces't'am pecakam tu tathaiva hi |*

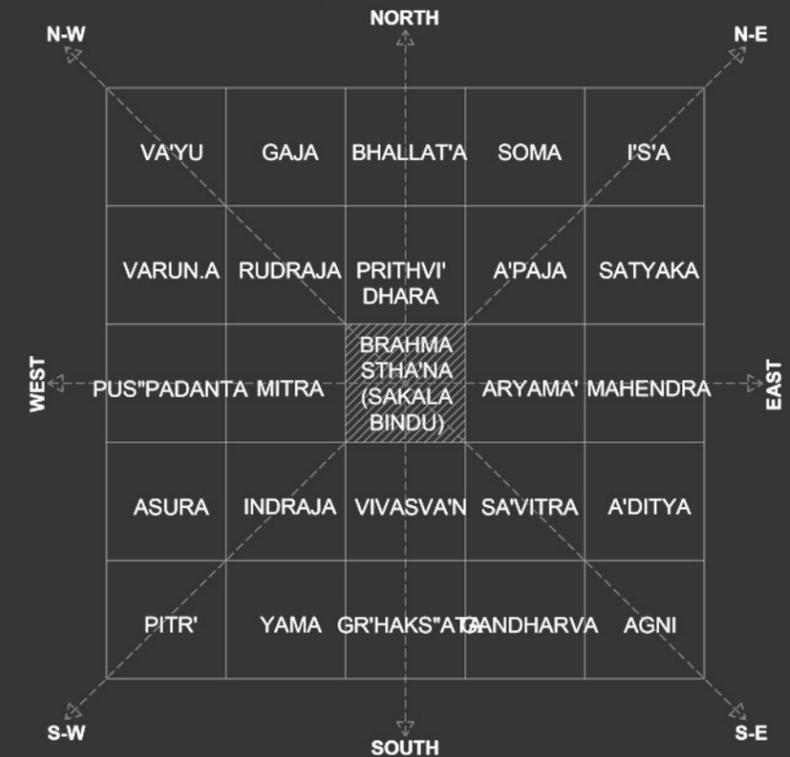
It is desirable to have the pi't'ha man.d'ala (3x3) as associated with two diagonals. Those directional deities mentioned earlier are assigned the same locations as stated before. This pi't'ha pada is fit for a small hut of ascetic, settlement of village and so on (Fig.4.4.3). As said before, pecaka pada could be considered for small village or colony.

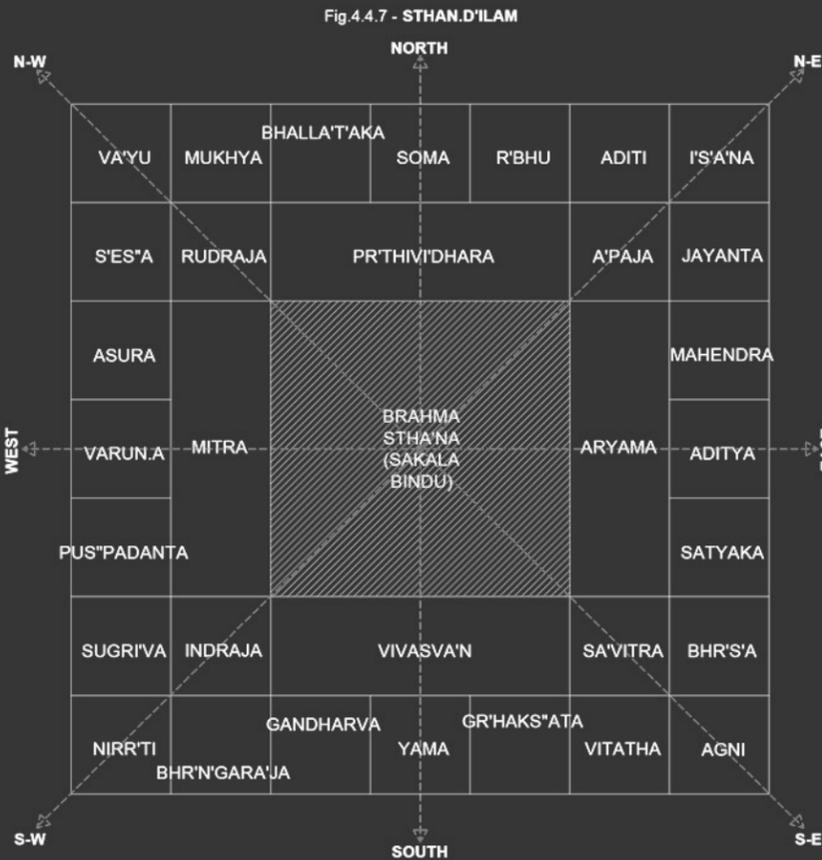
*karn.a su'tra dvayopetam maha'pi't'ham tu ka'rayet || 19
madhye catus'padam brahma' bhun'kte tra munisattama'h |
i's'o jayanta a'dityo bhr's'ognir vitatho yamah || 20
bhr'gus'ca pitr' sugri'vo varun.ah s'es'a ma'rutau |
mukhyas somo ditis'ceti su'trastha' ba'hya devata'h || 21
maha'pi't'ha padam proktam ks'udra gra'ma'di yogyakam |*

O, the virtuous sages! the maha'pi't'hapada (4x4) is to be designed so as to be associated with two diagonals (Fig.4.4.4). Out of the 16 grids, the four central grids which are in the interior of the man.d'ala are occupied by Brahma. I's'a, jayanta, Aditya, bhr's'a, Agni, Vitathi, Yama, Bhr'gu, Pitr' (Nir'uti), Sugri'va, Varun'a, S'es'a, Va'yu, mukhya, Soma (kubera), Aditi – these deities occupy the exterior grids. This maha'pi't'ha pada is fit for the settlement of small village, colony and so forth.

Va'stu Brahma occupies one grid which is at the center of the upapi't'ha pada (5x5) (Fig.4.4.5). In the eight grids lying around the central grid, four grids which are in the main directions are occupied by Aryama', Vivasva'n, Mitra and Pr'thvi'dhara, each deity possessing each grid in the east, south, west, north-west and north-east are occupied by Sa'vitra, indraja, Rudraja and A'paja respectively. Sixteen grids lying around the daivika belt are occupied by the sixteen va'stu devatas. Starting from the north-east, they are I's'a, Satyaka, Ma-

Fig.4.4.5 - UPAPI'THAM





assigned to va'stu Brahma. Facing this brahma, there are four deities (Aryama, Vivasvan, Mitra and Pr'thivi'dhara), each one of them occupying three grids of the inner belt adjacent to the brahmastha'na. Exterior to this belt, there are sixteen deities, each one of them occupying half grid in all the four corners. There are sixteen deities, each one of them occupying two grids on all the four sides. Adjacent to these holders of two grids, there are eight deities, each one of them possessing one grid in all the four corners. In this Agama, it is held that the man.d'u'ka pada is fit for the settlements like agraha'ra and others.

*parames'apadam tvetad eka's'i'ti pada'nvitam /
karn.asu'tradvyopetam kalpani'yam vicaks"an.aih //
madhye navapadam brahma' bhun'kte tasya caturmukhah /
catas'ro devata's"s"at' s"at' padabha'ga para'h smr'ta'h //
dvipadah kon.aga's'cas"t'au ba'hye tvekapara'yan.a'h /
man.d'u'ke tra sama' deva'h kathyante ca yatha'kramam //*

The paramas'a'yi pada (9x9) is to be designed by experts in such a way that it appears with eighty one grids and two diagonal lines (Fig.4.4.9). Va'stu Brahma who is four-faced occupies nine grids located at the centre. The four deities, Aryama, Vivasva'n, Mitra and Pr'thividhara, occupy six grids each in the east, south, west and north respectively. The deities of the four corners are intent in occupying two grids each. The deities of the outer belt occupy one grid each. They are considered to take possession of each grid in the same order as applicable to the man.d'u'ka pada.

*i's'a'nas'caiva parjanya jayantas'ca mahendrakah /
a'dityas satyaka bhrms'a vantariks"as'ca pu'rvaga'h //
vahnih pu's"a' ca vitatho gr'haks"ata yamau tatha' /
gandharvo bhr'n'gara'jas'ca mr'gas'caiva tu daks"in.e //
nirr'tir dauva'rikas'caiva sugri'vah pus"padantakah /
varunas'ca suras'caiva s'es"o rogastu pas'cime //
va'yur nagastatha' mukhyo bhalla't'as soma eva ca /
gajas'ca pyaditis'caiva ditis'caiva tathottare //*

The va'stu devas who reach their respective grids in the east are I's'a'na, Parjanya, jayanta, mahendra, Aditya, Satyaka, Bhr's'a and Antariks'a. Those who occupy their respective grids in the south are Agni, Pu's'a, Vitatha, Gr'haks"ata, Yama, Gandharva, Bhr'n'gara'ja and Mr'ga. Those who are in the western grids are Nirr'ti, Dauva'rika, Sugri'va, Pus"padanta, Varun.a, Asura, S'es"a and Roda. In the grids of the north belt are Va'yu, Na'ga, Mukhya, Bhalla't'a, Soma, Gaja, Aditi and Diti.

*ba'hyadeva' ime prokta's tvantara'varan.epunah /
aryama's'ca vivasva'ms'ca mitras'ca pr'thivi'dharah //
caturdiks"u gata' deva' i's'a'na'dau ca kon.ake /
a'pas'caiva pavatsas'ca savita'pi sa'vitrah //
indras'cendrajayas'caiva rudro rudrajayas tatha' /
madhye brahma' sthitah prokto man.d'u'ke ca'pi tatpare //*

The deities who have been told here belong to the outer belt. Then listen to the deities of the inner enclosure. Aryama, Vivasva'n, Mitra and Pr'thivi'dhara are in the south-east corner are Savita and Sa'vitrika; in the south-west corner are indra and Indrajaya; and in the north-west corner are Rudra and Rudrajaya. At the center, Vastu Brahma is seated as in the man.d'u'ka pada.

caraki' ca vida'ri' ca pu'tana' pa'para'ks"asi' /
 i's'a'na'dis"u kon.es"u s'u'lastha'h padavarjita'h //
 skandho ryama' ca jambhas'ca pilipin"cho dvijottama'h //
 pu'rva'ditas sama'rabhya caturdik's"u vyavasthita'h //
 gra'ma'graha'ra ves'ma'di yogyam paramas'a'yikam /

In all the corners starting from the north-east, four deities – Caraki, Vida'ri, Pu'tana' and papara'ks"asi' – exist in the trident-motif designed in each corner. They are bereft of grids. O, the foremost among the twice-borns!, starting from the east four other deities – Skandha, Aryama', Jambha and Pilipin"cha – exist in all the four directions. This paramas'a'yika pada is fit for the settlements like village, agraha'ra and so on and for houses and mansions.

a'sanam karn.a su'tra'bhya'm yuktam tu parikalpayet // 61
 brahma' s"od'as'a bha'gastho tanmukastha's"t'a bha'ginah /
 a'dityas'ca yamas'caiva varun.as soma eva ca // 62
 dvipada's'ca'pavatsa'dya' dvipada' eva kirtita'h /
 ks"etram s'atapadam durga pura't't'a'laka bhu'mis"u // 63
 nagari' khet'aka gra'ma ves'ma'dis"u ca kathyate /

The architect should design the a'sana pada (Fig.4.4.10) in such a way that it consist of two diagonal lines (10x10). Va'stu Brahma occupies sixteen grids located at the center. The four deities who are seated facing brahma, Aryam and others, occupy eight grids each. Aditya, yama, Varun.a and Soma are assigned two grids each. The corner deities A'pa, A'pavatsa and others occupy two grids each. This man.d'ala which consists of 100 grids is recommended for forts, towns, multi-story buildings, larger settlements like city, khet'aka, village, edifices, mansions and so forth.

stha'ni'yam karn.a su'tra'bhya'm yuktam tu parikalpayet //
 madhye brahma' pada'na'm tu bhajate pan"ca vims'atim /
 kon.es'a'di pade ba'hye tvi's'a'gni pitr'va'yavah //
 anye tvekapade jn"eya'h parjanya'dya' yatha'kramam /
 catva'ras tvaryama'dya'stu pu'rva'di das'a bha'ginah //
 a'pavatsa'dayah kon.s"vas"t'au dvipada bha'ginah /
 yatha'sthana's' carkya'dya's' ca's"t'au ba'hya praki'rtita'h //
 gra'ma'di yogyam vijn"eyam stha'ni'ya'khyam idam padam /

The knower of va'stu man.dalas should design the stha'ni'ya pada (11x11) so as to appear with two diagonal lines (121 grids) (Fig.4.4.11). At the center, Va'stu brahma' occupies twenty-five grids. In all the corners from the north-east and so on, I's'ana, Agni, Pitr' and Va'yu are assigned one grid each. Other deities such as parjanya and others are assigned one grid each in due order(as mentioned earlier). The four deities Aryama and others take possession of ten grids each in the four main directions from east and so on. The corner deities, who are eight in number, A'pa, A'pavasta and others occupy two grids each. Eight deities – Caraki and others – who are outside the man.d'ala, being bereft of any grid, occupy the same location as told before. It is to be known that this man.d'ala significantly called stha'ni'ya is fit for the settlement of villages and others.

In this way the design and assignment of deities for the other types of va'stu-man.d'ala upto (32x32) are detailed in this chapter. It is also mentioned that many more man.d'alas could be designed reaching the maximum of one para'rdha grids (ten thousand millions of billions). Amongst these the most prominently used are man.d'u'ka padda (8x8) which consists of 64 grids and it is known as daivika (meant for divinities). The paramas'a'yika pada (9x9) ehich consists of 81 grids is known as ma'nus"a (meant for human beings). And a'sana pada of 100 grids.

Fig.4.4.9 - PARAMI'S'A'

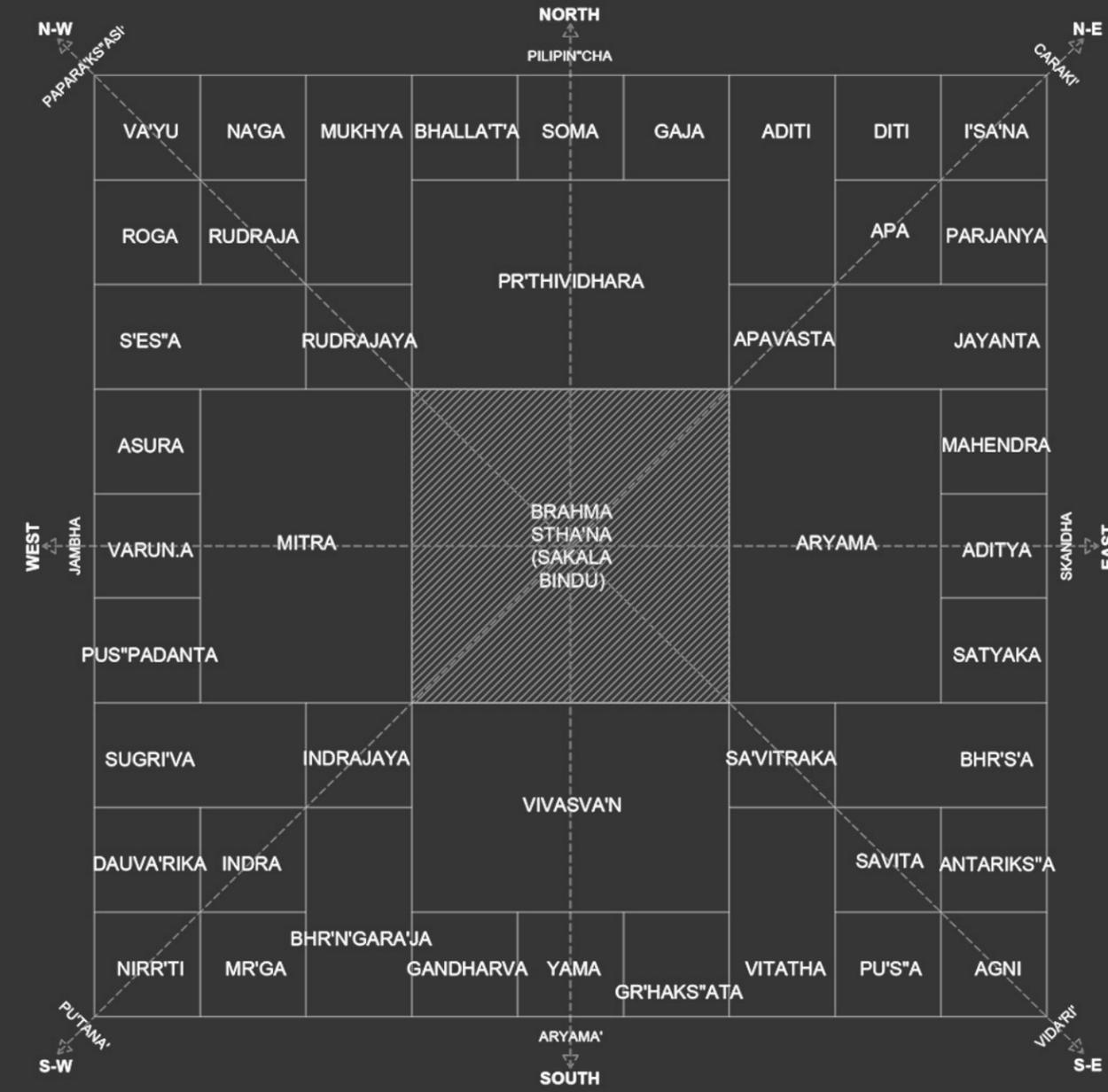


Fig.4.4.10 - A'SANAM

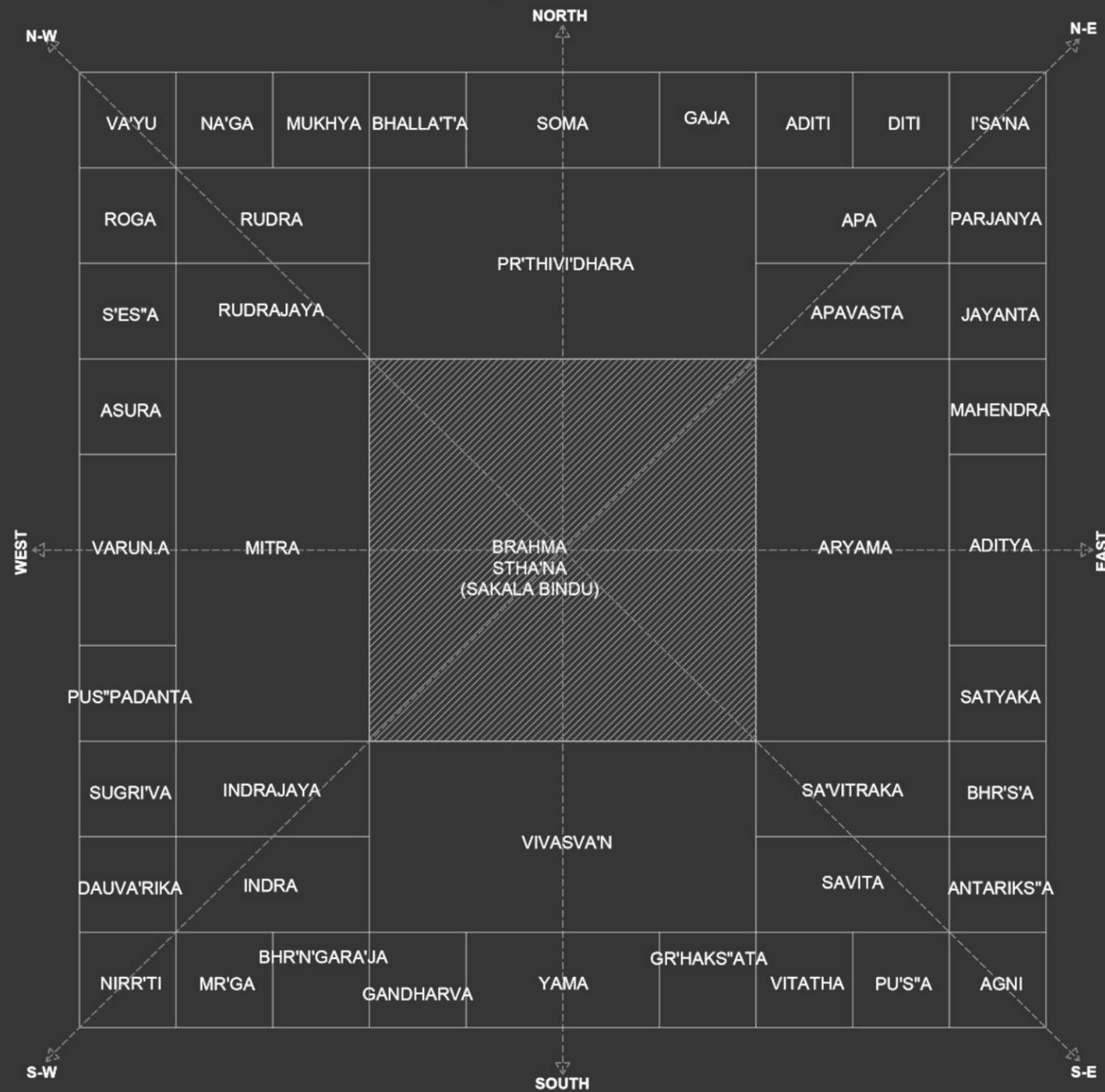
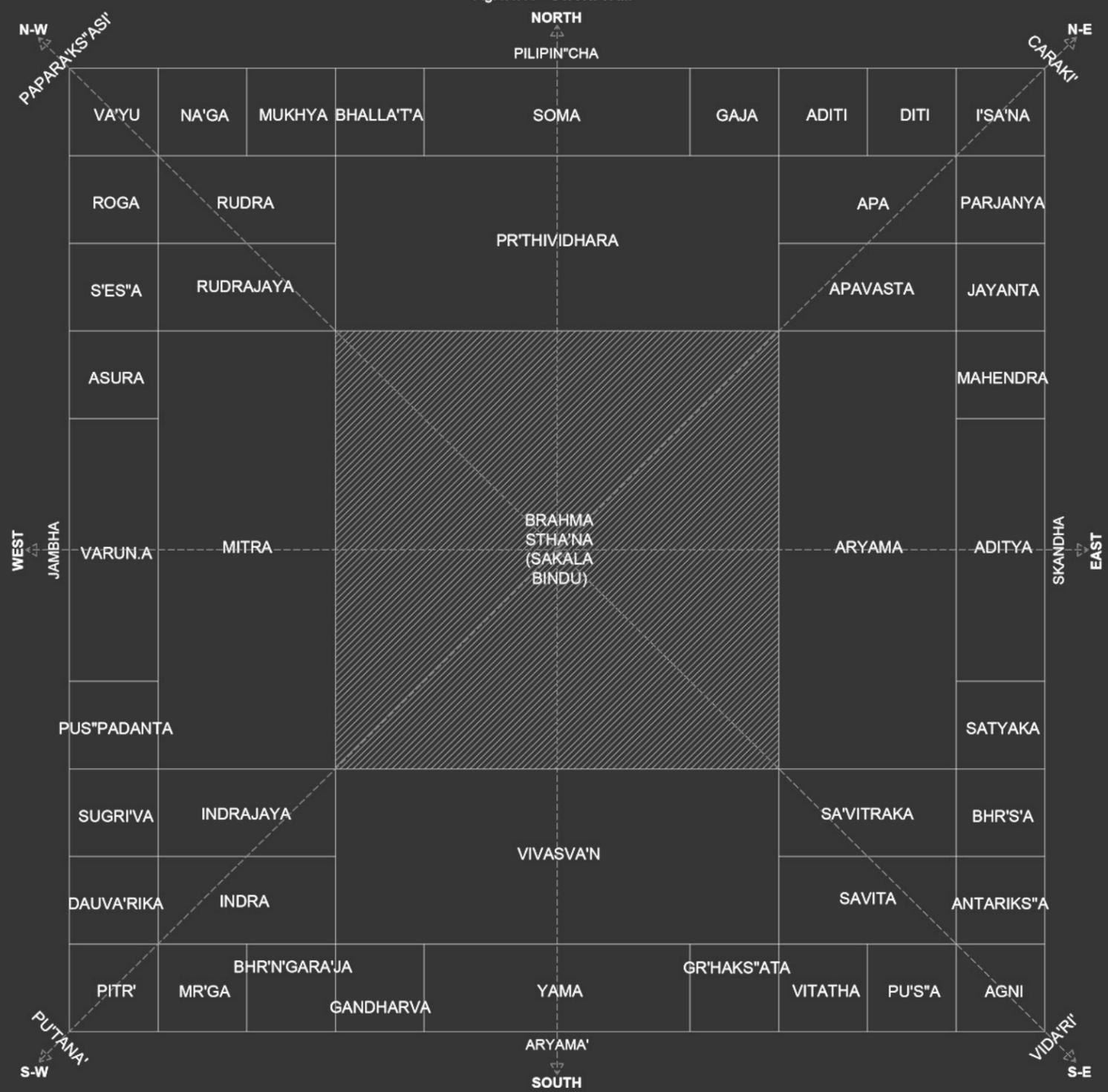


Fig.4.4.11 - STA'NIYAM



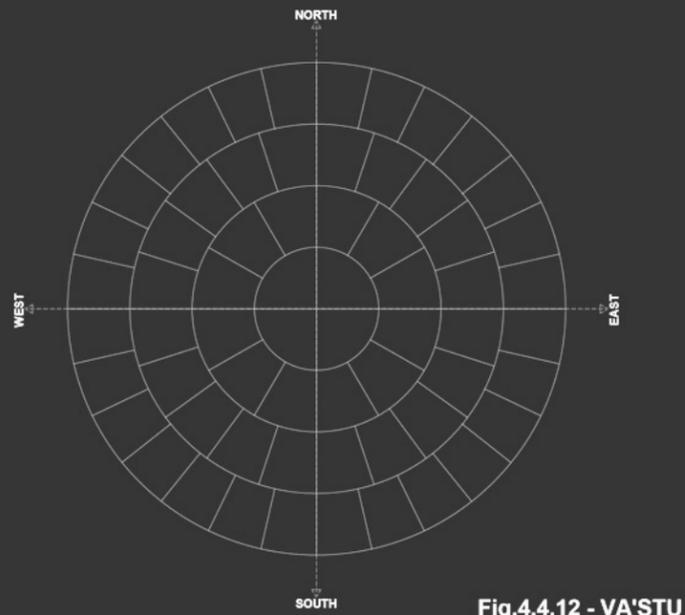


Fig.4.4.12 - VA'STU

atha vr'tta pada nya'sam pravaks"ya'mi yatha' vidhi / cakravrt pan"ca su'tra'n.i sa'ntara'n.i sama'ni ca // dva'trims'accu caturvims'ad dviras"t'a's"t'aika bhaginah / eka's'i'ti padam hyetatj jn"eyam vis"ama samsthitih //

Now I will speak on the designing of a circular man.d'ala and assigning of the grids according to the well-settled rules. Five circular lines are to be drawn in such a way that they appear equally spaced. There will be five concentric circles in the design. The outer circular belt will be with 32 grids. The adjacent inner belt will be with 24 grids. The next inner one will be with 16 grids. The belt which is adjacent to this will be with 8 grids. The innermost circle is one grid. In this way this man.d'ala consists of 81 grids and this is to be known as the man.d'ala of odd-count.

as"t'a'vims'at tatha' vims'atd dva'das'a's"t'a'rdha bha'ginah / catus"s"as"t'i padam caitac caturvr'tte prakalpayet // 117 kumbhakasya tu vinya'sam sammis'ram ubhayor nyaset / catus"s"as"t'ipadam va'stu paramais'antu va'stukam // 118

In the man.d'u'ka pada of circular type, the outer strip consists of 28 grids. The strip adjacent to it consists of 20 grids. The next inner strip consists of 12 grids. And the innermost circle consists of 4 grids. Its center is the nis"kala bindu. In this way all the 64 grids are to be formed within the four concentric circles. In both the paramas'a'yika and the man.d'u'ka, allocation of the grids to the concerned deities is to be done by joining the partitioning of certain grids. Here in this Agama, the man.d'u'ka of 64 grids is considered as va'stu (fig.4.4.12) and the paramas'a'yika of 81 grids is considered as va'stuka (fig.4.4.13).

Further, in this chapter the allocation of grids for circular man.d'ala are explained. All constructions, villages, towns and cities are believed to be kept under rhythmic order and harmony by the systematic application of va'stu principles and it believed to yield the desired benefits and fulfillment.

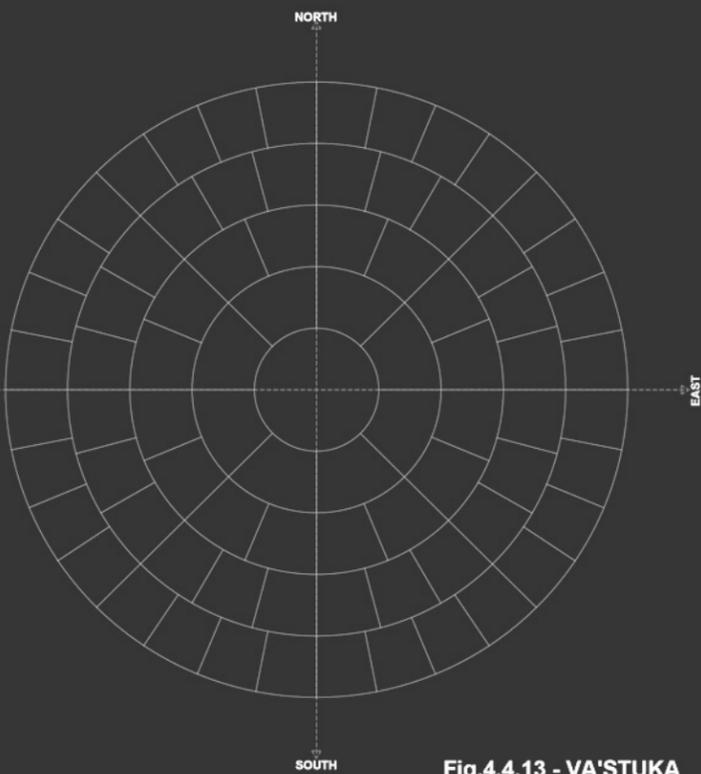


Fig.4.4.13 - VA'STUKA

4.5. CHARACTERISTICS OF AYA AND OTHER FACTORS (C-22: A'YA'DI LAKS"AN.A VIDIH)

To calculate a'ya and other factors the architect should find out the perimeter (total of the proposed length and breadth based on the perimeter the factors like a'ya and others are calculated for the auspiciousness of the construction and if is not satisfactory the perimeter is modified until auspicious factors are arrived at.

atahparam pravaks"ya'mi a'ya'di'na'm tu laks"an.am vista'ren.a'bhyased dairghyam trigun.am ca's"t'abhir hatam

Then I will explain the characteristics of A'ya and other factors. The architect should find out the total of the proposed length and breadth (perimeter) and multiply it by 3 and divide by 8.

The remainder denotes yoni which is declared to be of 8 kinds as described in the table (tab.4.5.1) below-

| Remainder | Yoni - name | Meaning | Direction | Effect |
|-----------|-------------|-----------|-----------|--------------|
| 1 | Dhvaja | Flag post | E | Auspicious |
| 2 | Dhu'ma | Smoke | SE | Inauspicious |
| 3 | Simha | Lion | S | Auspicious |
| 4 | As'va | Horse | SW | Inauspicious |
| 5 | Vr's'a | Bull | W | Auspicious |
| 6 | Khara | Ass | NW | Inauspicious |
| 7 | Gaja | Elephant | N | Auspicious |
| 8 | Dhvan'ks'a | Crow | NE | Inauspicious |

Tab.4.5.1 -8 kinds of Yoni

tameva's"t'agun.am kr'tva' saptavims'atibhir bhajet s'is"t'am as'vayuja'dyam tu naks"atram iha ki'ritam

The architect should multiply the perimeter by 3 and divide by 27. It is well declared in this Agama that the remainder obtained by this calculation denotes naks"atra occurring in the list of 27 naks"atras (lunar mansions)

kartuh janmarks"am a'rabhya tridinam pan"ca saptakam trayodas'a dinam tya'jyam tatha'pan"cadass'od'ukam dinam saptadas'am ca's"t'a'das'a dva'vims'akam dinam saptavims"ati naks"atram tya'jyam anyacchubham smr'tam

Starting from the naks"atra of the owner (for whom the building is conducted), the third, fifth, seventh and thirteenth naks"atra are to be abandoned. In the same way, the fifteenth, seventeenth, eighteenth, twenty second and twenty seventh naks"atras are to be neglected. Other naks"atras are considered to be auspicious.

The other factors and their calculations as explained in this treatise are given below along with the recommendations for each one of them.

NAKS"ATRA (Lunar mansion)
Remainder from (P*3)/27

A'YA
Remainder from P/8
(OR)
Remainder from (P*8)/12

VYAYA
Remainder from (Naks"atra for P)/8
(OR)
Remainder from (P*9)/(No. of Ma'nasu'tras)

A'ya(income) > Vyaya(expenditure) then, P is yielder of prosperity
A'ya(income) =< Vyaya(expenditure) then, P is abandoned & modified

TITHI (Lunar day)
Remainder from (P*8)/30

(OR)
Remainder from (P*8)/15

VA'RA (Week-day)
Remainder from (P*9)/7
(OR)
Remainder from P/7

RA'SI & AMS'A (dependant on naks"atras)
8th & 12th , abandoned
Others are excellent

For other geometrical shapes
Determined by Height or length or breadth
(OR)
1/2 Height + 1/2 Breadth

The perimeter of the proposed construction is called the sakala which is also known by the name kumbhaka.

4.6. CONSTRUCTION OF PEDESTAL AND BASE (C-52: UPPI'THA VIDIH)

In this chapter we will see the directions for construction of the base for the temple and other buildings. The base has two parts the supplementary base called the upapi't'ha and the base proper called the adhis"t'hana. It is prescribed to dig the ground all around the proposed construction of the temple and other buildings exceeding the original dimensions by one to three hastas.

The dug pit is to be filled up with pebbles, gravel, fine sand, moistened clods of earth and others it is suggested to stamp down the materials in the trench with huge logs of wood like the leg of an elephant. If the water remains without being absorbed and remains evenly spread, it indicates that the ground is hard and horizontal. Then, the water is drained and filled up with pieces of stones and bricks without any gap to strengthen the trench.

The first finished level of the original ground is called the prakruti which is of three kinds. Above the prakruti is the janma bhu, the plinth which is also called upana and bhuma. That which is built above the upana is called the adhis"t'ha'na (the base). The projection of the pedestal (upapi't'ha) is based on the width of the pillar. Proportionate measures are prescribed for the pedestal and base for infusing the elegance, beauty and strength to the building.

Below, we would see the proportionate measured prescribed for the upapi't'ha (pedestal).

*sabhadram va' vibhadram va' janmapabhruṭi madhyame |
upapi't'ham vidha'tavyam adis"t'ha'nodaya'rdhatah ||
pa'dena ca tripa'dena samena trigun.ena va' |
pan"ca'ms'e tu trayams'ena vahnyams'e tvekabha'gatah ||
taducca'rdham tripa'dam va' pa'dam va's"t'a'ms'ahi'nakam |
dvidan.d'am va' tridan.d'am va' nirgamam pa'daba'hyatah ||
pa'duka'cca bahirva'dho upa'nastambha ba'hyakam |*

There may or may not be a projecting moulding in between the plinth and the

upapi't'ha, supplementary base. This base should be designed with a height equal to half the height of the base. Or its height may be one fourth, three fourth, three fifth or one third of the height of the base; or less than half the height by 8 parts. Projection of the plinth of the base in relation to the pillars to the ground may be 2 or 3 dandas. The projection may be aligned to the exterior of the plinth or to the lower part of the base. Or, it may be aligned to the projection of the base and pillars.

*navapan'ktya'ms'akam kr'tva' tryams'occopa'nam is"yate ||
dvyams'am padmam tadu'rdhvam tu kampam eka'ms'am is"yate |
s"ad'ams'ah karn.am is"t'am sya'c ches"am pra'gvad i'ritam ||
kampastvams'ena kartavyam as"t'a'ms'am uppi't'hakam |
tadevordhvam adhasta'ccet ambujena vihi'nakam ||
s"ad'ams'am upapi't'ham sya'c caturvims'ati bha'jite |*

If the height of the upapi't'ha is divided into 19 parts, plinth takes 3 parts; lotus(cyma) takes 2 parts; kampa(fillet) takes 1 part; karna(middle part) takes 6 parts; kampa(fillet) takes 1 part; lotus(cyma) takes 2 parts; pattika(fillet) takes 3 parts and kampa takes 1 part. Thus, this type of upapi't'ha is associated with 8 members from the plinth to kampa. If the lotus in the upper part and that in the lower part are left out, then this type of upapi't'ha is considered to be associated with 6 members.

*tadardham karan.am pra'gvad ams'enottaram is"yate ||
rudra'ms'ena tribha'gena kapotam ihasammatam |
alinda'ntaritam dvyams'am pratyutsedham te tatsamam ||
va'janam tvekabha'gam sya't karn.astvas"t'a'ms'a is"yate |
uttare caikabha'gam sya'd rudrabha'gena ki'rtita' ||*

*kapotakam tribha'gena bha'gena'lindam is"yate |
antari'tam tu bha'gena bha'ga'bhya'm prati is"yate ||
prativa'janam eka'ms'am sarva'lan'ka'ra samyutam |*

If the total height of the upapi't'ha is divided into 24 parts, karna(fillet) takes

Fig.4.6.1 - UPAPI'THA AND ADHIS"THA'NA PROPORTIONS
(Supplementary base) (Base)



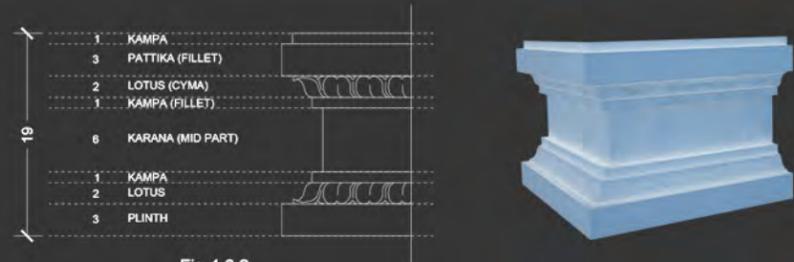


Fig.4.6.2



Fig.4.6.3

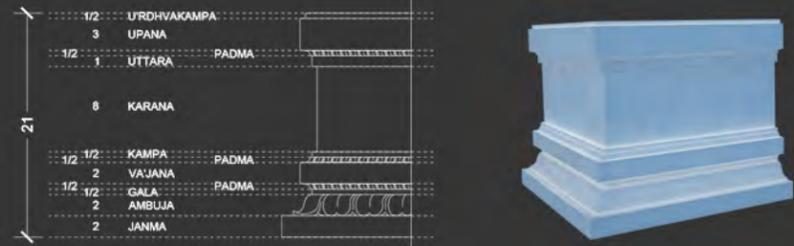


Fig.4.6.4



Fig.4.6.5

seven parts out of eleven parts; uttara(fillet) takes 1 part; kapota(carona) takes 3 parts out of 11 parts; alinda'ntarita(fillet) takes 2 parts; prati(stereobate) takes 2 parts; va'jana(fillet with greater projection) takes 3 parts; alinda(fillet) takes 1 part; antarita(recessed fillet) takes 1 part; prati takes 2 parts and prati vajana(cavetto) takes 1 part. The upapi't'ha proportioned in this way should be provided with all sorts of decorative members.

*trisapta'ms'ata utsedho dva'bhya'm janma tatha'mbujam ||
galamardhena ca'rdhena padmam dvyams'ena va'janam ||
ardhena'bjam tatha' kampam as't'a'ms'am karn.am i'ritam ||
ams'enottaram ardhena padmam copa'nakam tribhii ||
bha'ga'rdham u'rdhvakampasya't trissaptams'e tadunnate ||
janma dvyams'ena tryams'ena padmam ams'ena kandharam ||
ba'hyava'janam ekena kampam as't'a'ms'akair galam ||
ams'enottaram ams'a'bhya'm va'janam kampam ams'akam ||*

If the total height of upapi't'ha is divided into 21 parts, janma(plinth) takes 2 parts; ambuja(cyma) takes 2 parts; gala(lower neck) takes a half part and Padma(cyma) takes a half part; va'jana takes 2 parts; Padma takes a half part and kampa takes a half part; karna(middle portion) takes 8 parts; uttara takes 1 part; Padma takes a half part and upana takes 3 parts. U'rdhvakampa(upper fillet) takes a half part. For the same 21 parts, the members may be held in a different way. In this mode, janmatakes 3 parts; Padma takes 3 parts; gala takes 1 part; ba'hyava'jana(outer fillet with greater projection) takes 1 part; kampa takes 1 part; gala(middle portion) takes 8 parts; uttara takes 1 part; va'jana takes 2 parts and kampa takes 1 part.

It is suggested that the upapi't'ha being beautified with the depictions of animal figures, fish, groups of dwarfs and petals. Taking into consideration the good and inauspicious allocation of parts the first member of the building, the upapi't'ha(pedestal) should be designed. And now we would see the graphically translation of the proportionate measures suggested for the base (adhis't'ha'na)

*anenaiva praka'ren.a hyadhis't'ha'nam ca ka'rayet ||
dvididham tadiha proktam pratyangam pattikangakam ||
caturvims'ati bha'gam tu kr'tva'dhis't'ha'na tun'gakam ||
jagatyas't'a'ms'akenokta' kumudak tatsama'nakam ||
as't'pa'dam taduddis't'am kampam ams'atribha'gabha'k ||
karn.atvams'ena kampam sya't tryams'am va'janam is'yate ||*

In the same way, the architect should construct the base proper (adhis't'ha'na). in this Agama the base is considered to be of two kinds- pratyanga and pat'ika'n'ga. If the total height of the base is divided into 24 parts, jagati takes 8 parts; astragal(kumuda) takes 8 parts; kampa(fillet) takes 3 parts; karna(ear-element) takes 1 part; kampa takes 1 part; vajana(fillet) takes 3 parts. Kumuda part is also known as as't'apa'da.

*jagati' pra'gvaduddis't'a' sapta'ms'am kumudam bhavet ||
padmam ams'ena kartavyam s'es'am pu'rvavada'caret ||
sapta'ms'a' jagati'prokta' s'ad'ams'am kumudam bhavet ||
padmam ams'ena kartavyam kampam eka'ms'ato bhavet ||
tryams'am galam ityuktam eka'ms'am cordhvakampakam ||
padmam eka'ms'ato jn'eyam va'janam dvyams'am is'yate ||
u'rdhvapadmam tadaika'ms'am upkampam tathaiva ca ||*

In an alternate arrangement, jagati takes 8 parts; kumuda takes 7 parts and Padma takes 1 part. All other members are to be designed as explained before with the same parts. If the total height is divided into 28 parts, jagati takes 7 parts; kumuda takes 6 parts; Padma takes 5 parts; kampa takes 1 part; gala takes 3 parts; urdhva kampa takes 1 part; padma takes 1 part; vajana takes 2 parts; urdhva Padma takes 1 part and upakampa takes 1 part.

*pan'ca'ms'a' jagati' prokta' padmam eka'ms'ato bhavet ||
dr'gams'ena'ms'atah padmam kumudam caturams'akam ||
s'es'am pra'gvatsamuddis't'am kampastambhodaya's'reitam ||*

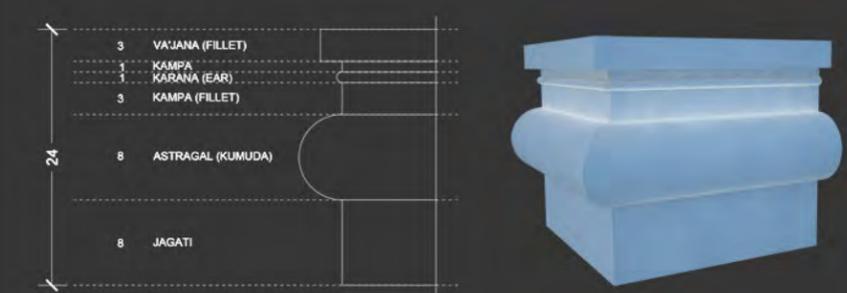


Fig.4.6.6



Fig.4.6.7

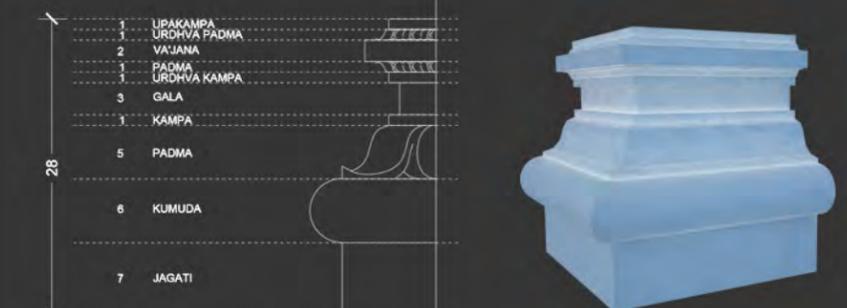


Fig.4.6.8

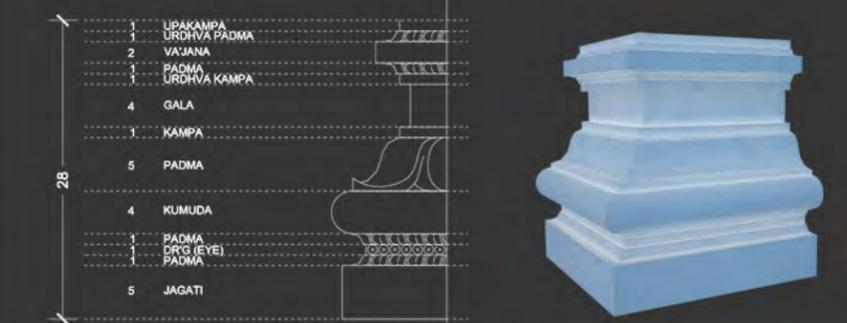


Fig.4.6.9

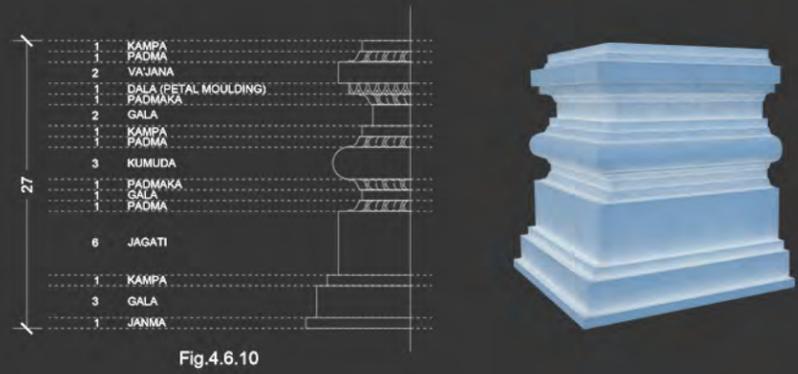


Fig.4.6.10

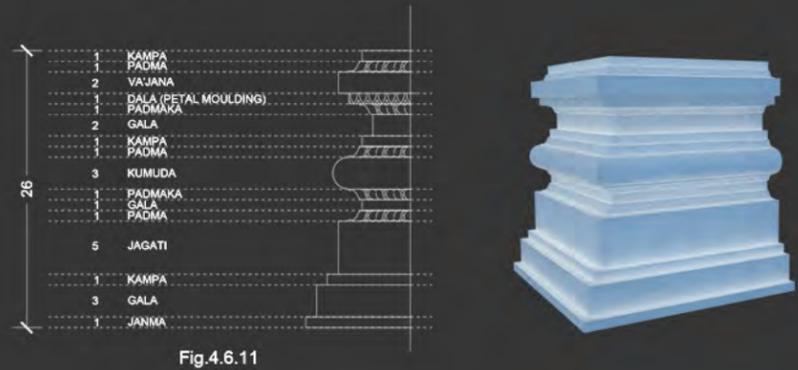


Fig.4.6.11



Fig.4.6.12

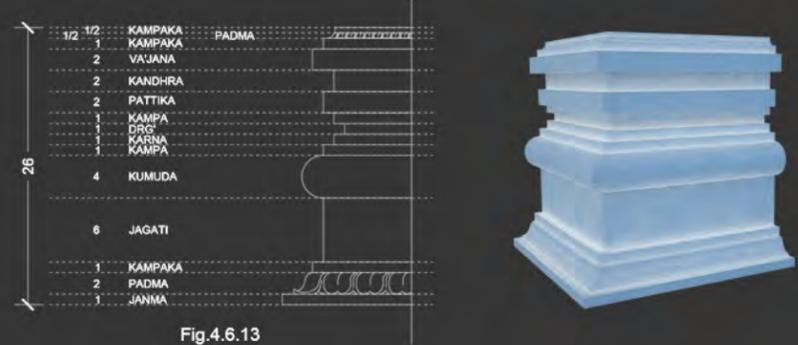


Fig.4.6.13

In an alternate way, in the same height of adhis"t'ha'na, jagati takes 5 parts; Padma takes 1 part; dr'g(eye element) takes 1 part; Padma takes 1 part and kumuda takes 4 parts. All other members are to be designed as explained before with the same measures. These arrangements are based on the height of the pillar.

*bha'genaikena janma sya't tribha'gam galam ucyate /
kampakam eka'ms'ato jn"eyam s"ad'ams'am jagatir bhavet //
ekena padmam ams'ena galam ekena padmakam /
tribha'gam kumudam padmam eka'ms'am pariki'titam //
ekena kampakam dvyams'ena galam ams'ena kampakam /*

*dalam ams'ena kartavyam va'janam dvyams'am i'ritam //
eka'ms'am jalajam proktam kampakam ams'ena ki'rtitam /*

In another mode of arrangement, janma takes 1 part; gala takes 3 parts; kampa takes 1 part; pahgati takes 6 parts; Padma takes 1 part; gala takes 1 part; padmaka takes 1 part; kumuda takes 3 parts; Padma takes 1 part; kampa takes 1 part; gala takes 2 parts; kampakam takes 1 part; dala(petal-like moulding) takes 1 part; vajana takes 2 parts; Padma takes 1 part and kampa takes 1 part.

*eka bha'gena janmasya't pan"ca'ms'a' jagatir bhavet //
prakartavye tatha'nyes"a'm sarvam etat prakalpayet /*

In another mode of arrangement, janma takes 1 part and jagati takes 5 parts. All pther members of the base should be designed as explained earlier, retaining the same measure.

*eka bha'gena janmasya't pan"ca'ms'a' jagatir bhavet //
prakartavye tatha'nyes"a'm sarvam etat prakalpayet /*

With an altered proportions of the original height or with the height two times the original height or with the half of the original height, different measures for various members of the base are to be arrived at.

*ekams'am jalajam proktam galam ardha's'ato bhavet //
u'rdhvapadmam tatha'rdha'ms'am caturbhih kumudam bhavet /
ardhena padmam ardhena kampakam dvyardha'ms'akair galam //
ams'ena kampakam ardhena padmam dvyams'ena va'janam /
ardhena padmam ekena kampakam ardhena padmakam //*

Padma in 1 part; gala in half part; urdhva Padma in half part; kumuda in 4 parts; Padma in half part; kampa in half part; gala in two and a half parts; kampa in one part; Padma in half part; vajana in 2 parts; Padma in half part; kampa in one part and Padma in half part.

*ekena janma dva'bhya'm tu padmam ekena kampakam /
s"ad'ams'a' jagati' vedabha'gam ca kumudam bhavet //
eka'ms'am kampakam au dr'gbha'gam bha'gena nirmitam /
kampakam ekena kartavyam va'janam dvyams'am is"yate //
eka'ms'am kampakam padmam sa'rdhena'rdhena kampakam /
s"ad'vims'atyams'akam proktam sarvasmin dha'mni yojayet //*

Janma in 1 part; Padma in 2 parts; kampa in 1 part; jagati in 6 parts; kumuda in 4 parts; kampa in 1 part and karna in 1 part; dr'g moulding in 1 part; kampa in 1 part; pattika in 2 parts; kandhara in 2 parts; vajana in 2 parts; kampakam in 1 part; Padma in half part and kampakam in half part. These are for the adhis"t'ha'na whose height is divided into 26 equal parts. Such base is fit for all types of buildings.

*dvibhagam janma samproktam eka'ms'am padmam is"yate /
ekena kampakam pan"cabha'gena jagati' bhavet //
kumudam caturams'am sya'd ekam padmam tu bha'gatah /
kampakam au dvibha'gena ekam kampakam tatha'bjakam //
va'janam tu dvibha'gam sya't kampakam ams'ena ki'rtitam /
evam sya't pa'dabandham tu chedan'i'yam yathocitam //
deva'na'm ca dvija'ti'na'm catur'n.a'mapi yogyakam /*

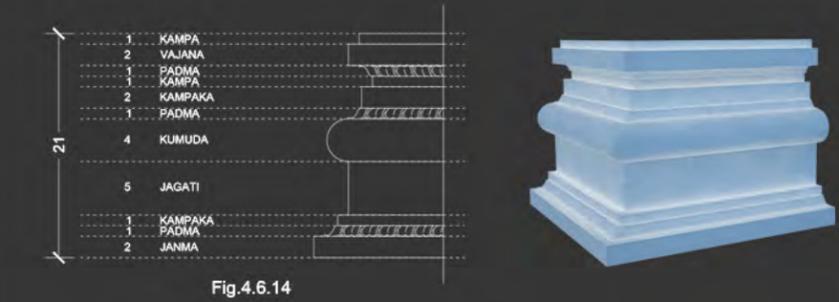


Fig.4.6.14

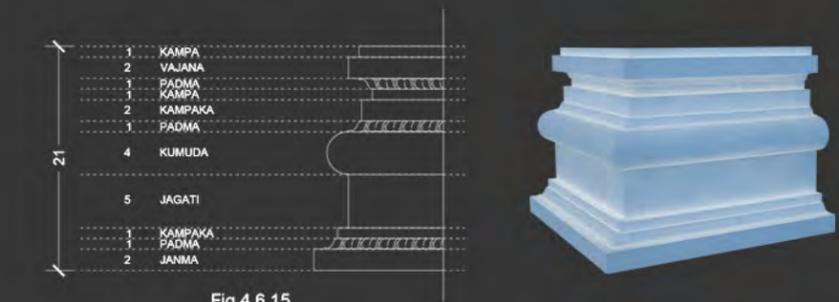


Fig.4.6.15

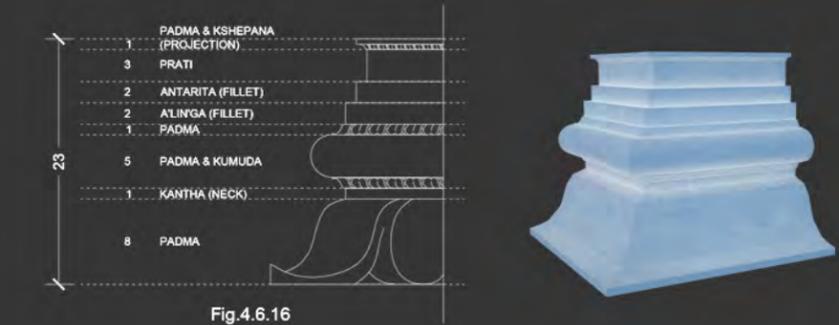


Fig.4.6.16

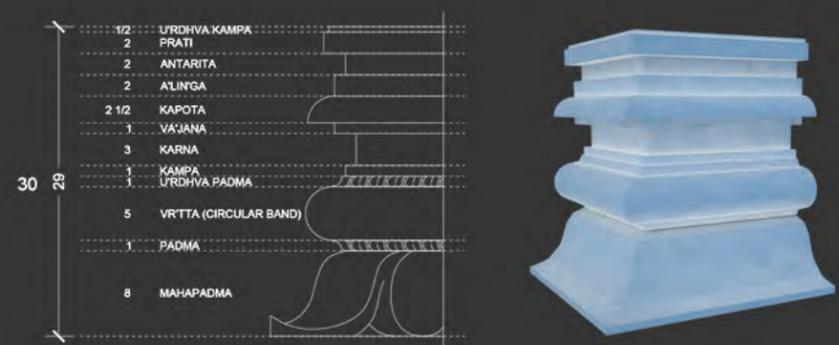


Fig.4.6.17

Janmain 2 parts; Padma in 1 part; kampaka in 1 part; jagati in 5 parts; kumuda in 4 parts; Padma in 1 part; kampaka in 2 parts; kampa in 1 part and Padma in 1 part; vajana in 2 parts; kampa in 1 part. This is the mode of arrangements of various members prescribed for the pa'dabandha type of adhis't'ha'na. these proportions could be modified as needed to harmony and elegance. This is fit for the shrines of the gods houses of the Brahmins and even for all the four castes.

*pratibandham pravaks"ya'mi trayovims'ati bha'jite ||
as"t'a'ms'a' jagat' prokta' kumudam tatsamanakam |
a'lin'gam ardhabha'gam sya'd dva'vims'atyams'ake kr'te ||
tadevam kumudam proktam va'janam sya'tkapotakam ||*

*pratyutsedham tribha'gena sa'bjakam pan"cabha'gatah |
devadvija narendra'n.a'm pras'astam na'nya ja'tis"u ||*

Now I will explain the details related to the pratibandha type of adhis't'ha'na. if the total height of the base is divided into 23 parts, jagti takes 8 parts and kumuda takes 8 parts. A'lin'ga(fillet) takes a half part and the other members of the base are to be held as explained before. If the total height is divided into 22 equal parts, kumuda takes 8 parts as before and vajana and kapota take half part each. Prati takes 3 parts and Padma takes 5 parts. This kind of adhis't'ha'na is highly recommended for devas, Brahmins and kings. This is not fit for other castes.

*as"t'a'ms'am ambujam proktam kan.t'habha'ge ca bha'gatah |
ambujam kumudam bhu'taireka'ms'am padmam is"yate ||
a'lin'gasya dvibha'gam sya't tathaiva'ntaritam matam |
pratyutsedham tribha'gena sa'bjaks"epan.am ams'ukam ||
tr'ti'yam vims'atibha'gaih kalpayet kalpavittamah |*

Eight parts are for the Padma; one part is for the kan.t'ha(neck); 5 parts are for the Padma and kumuda; one part is for the Padma; 2 parts are for the a'lin'ga(fillet); 2 parts are for the antarita(fillet); 3 parts are for the height of

the prati. One part is for the Padma and projection (kshepana). In this way, the architect who is the foremost among the knowers of this technique should design the base whose height is divided into 23 equal parts.

*as"t'abha'gam maha'padmam randhrakena'ms'ato ambujam ||
vr'ttam tu pan"cabha'gena bha'genordhva'mbujam bhavet |
kampam ekena karn.astu tribhirsams'ena va'janam ||
indra'ms'ea kapotastu sa'rdhadvyams'ena kalpitam |
a'lin'ga'ntarite dva'bhya'm pratibha'ga dvayena tu ||
ardha'ms'enordhva kampam tu bha'gena trims'adams'ake |*

Mahapadma takes 8 parts; Padma takes one part out of 9 parts; circular band (vr'tta) takes 5 parts; u'rdhva Padma takes 1 part; kampa takes 1 part; karna takes 3 parts; va'jana takes 1 part; kapota takes two and a half parts; a'lin'ga and antarita takes 2 parts each; prati takes 2 parts and u'dhva kampa takes half part. In the base whose height is divided into 30 equal parts. These are the proportionated members.

*ekavims'ati bha'ge tu janmabha'gena ki'rtitam ||
sa'rdhena padmam ardhena kampam sya'tsapta bha'gatah |
jagati' kumudam s"ad'bhira ekena'lin'gagam ams'ake ||
proktam antaritam dva'bhya'm pratisa'bjam tu va'janam |
ekabha'gena kartavyam lata'patra'di s'obhitam ||*

If the total height is divided into 21 equal parts, janma takes 1 part; Padma takes one and a half parts; kampa takes a half part; jagati takes 7 parts; kumuda takes 6 parts; a'lin'ga takes 1 part; antarita takes 2 parts; prati and Padma take 1 part and vajana takes 1 part. The base is designed in this way should be decorated with creepers and other depictions for the sake of elegant appearance.

*dva'trims'ad bhajite tun'ge janma dva'bhya'm athaikatah |
va'janam sya'n maha'padmam saptabha'gena ki'rtitam ||
karn.astvams'ena padmam sya'dekam vedena vr'ttakam |
abjam ekena kampam sya'dams'am agnyams'akair galam ||
kampam ekena tadvatsya't padmam vedaih kapotakam |
a'lin'ga'ntarite dva'bhya'm pratibhaga dvayena tu ||
sapadmakampam ekena sarva'lan'ka'ra s'obhitam |*

If the total height of the base is divided into 32 equal parts, janma takes 2 parts; va'jana takes 1 part; mahapadma takes 7 parts; karna takes 1 part; Padma takes 1 part; vr'tta takes 4 parts; Padma takes 1 part; kampa takes 1 part; gala takes 3 parts; kampa takes 1 part; Padma takes 1 part; kapota takes 4 parts; a'lin'ga takes 2 parts; antarita takes 2 parts; prati takes 2 parts; kampa and panda take 1 part. The base designed in this way should be furnished wiith all sorts of decorative elements.

*ekena janma s"ad'bha'gair jagati' s'arabha'gakam ||
kumudam bha'gavetram sya't tribhira kan.t'hah praki'rtitah |
ekena kampam ams'ena galam tryams'aih kapotakam ||
ekam kampam bhaveduccaih kr'te dva'vims'aka'ms'ake |*

If the total height of the base is held to be of 22 equal parts, janma takes 1 part, jagaati takes 6 parts; kumuda takes 5 parts; netra takes 1 part; kaan.t'ha takes 3 parts; kampa takes 1 part; gala takes 1 part; kapota takes 3 parts; and kampa takes 1 part.

*tatadeva bhavedu'rdhvam bha'gena'ntaritam bhavet ||
dva'bhya'm pratratha'ms'ena gala tryams'aih kapotakam |
sa'rdhajam va'rdhajam kampam maha'padmam s'ara'ms'akam ||
galam ams'ena bha'gena galavr'ttam tribha'gikam |
padmam ams'am bhavetkampam ams'ena pariki'rtitam ||
ams'ena'ntaritam dva'bhya'm pratrims'ena va'janam |*

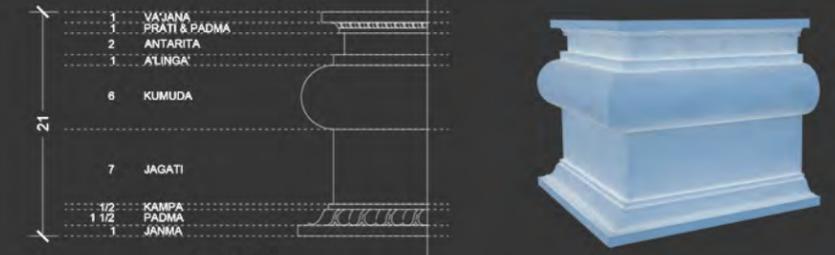


Fig.4.6.18

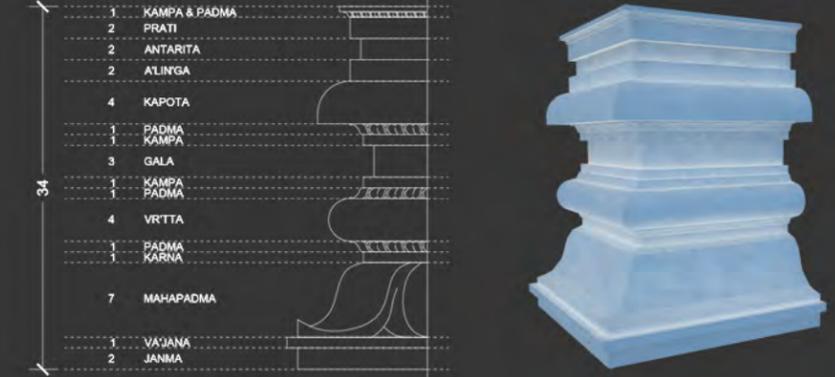


Fig.4.6.19



Fig.4.6.20

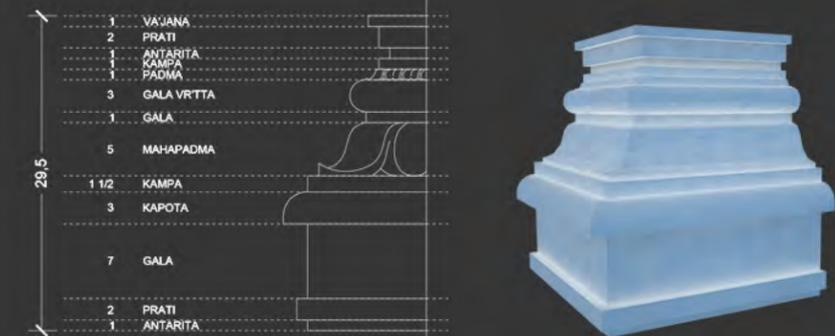


Fig.4.6.21

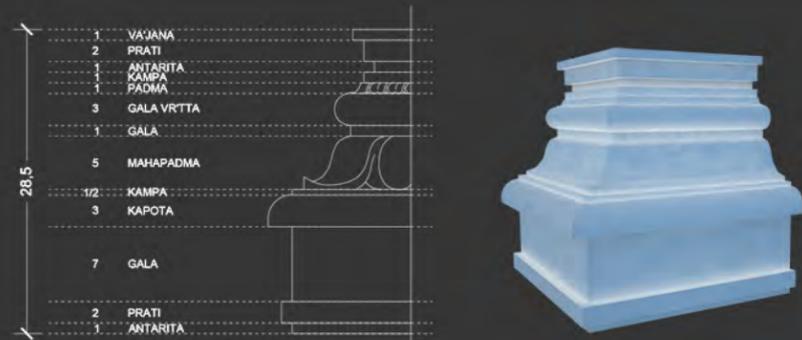


Fig.4.6.22



The upper portion of the base gets formed in this way: Antarita takes 1 part; prati takes 2 parts; gala takes 7 parts; kapota takes 3 parts; kampa takes one and a half part. Mahapadma takes 5 parts; gala takes 1 part; gala vr'tta takes 3 parts; Padma takes 1 part; kampa takes 1 part; antarita takes 1 part; prati takes 2 parts and va'jana takes 1 part.

*dva'bhya'm janma'ms'atah padmam kampam ekena ki'rriitam ||
jagati' pan"cabhagena veda'ms'aih kumudam bhavet ||
eka'ms'am padmam ekena padmam kan.t'ho dvibha'gatah ||
kampam ams'ena bha'gena padmam dva'bhya'm kapotakam ||
ekena kampam ams'ena tryams'am dva'bhya'm pratirbahvet ||
ams'ena va'janam tunge kr'te s"ad'vims'aka'ms'ake ||
trayams'am pratis'ca kampam ca tyaktva'nyairanyadis"yate ||*

If the total height of the base is held to be of 26 equal parts, janma takes 2 parts; Padma takes 1 part; kampa takes 1 part; jagati' takes 5 parts; kumuda takes 4 parts; Padma takes 1 part; kan.t'ha takes 2 parts; kampa takes 1 part; Padma takes 2 parts; kapota takes 1 part; kampa takes 3 parts; prati takes 2 parts and va'jana takes 1 part. It is desired by others to leave out the kampa part and to hold the prati to be of 3 parts.

*ekena janma ba'ga'bhya'm padmam ams'ena kampakam ||
jagati' caturams'ena kampam padmam dvibha'gakam ||
kampam ams'ena bha'gena padmam vr'ttam tribhir bhavet ||
eka'ms'am padmam a'lin'gam ams'am antaritam tatha' ||
dva'bhya'm pratis'ca bha'gena va'janam pan"ca vims'ake ||*

If the total height of the base is held to be of 25 equal parts, janma takes 1 part; Padma takes 2 parts; kampa takes 1 part; jagati' takes 4 parts; kampa takes 2 parts; Padma takes 2 parts; kampa takes 1 part; Padma takes 3 parts; vr'tta takes 3 parts; Padma takes 1 part; a'lin'ga takes 1 part; antarita takes 1 part; prati takes 2 parts and va'jana takes 1 part.

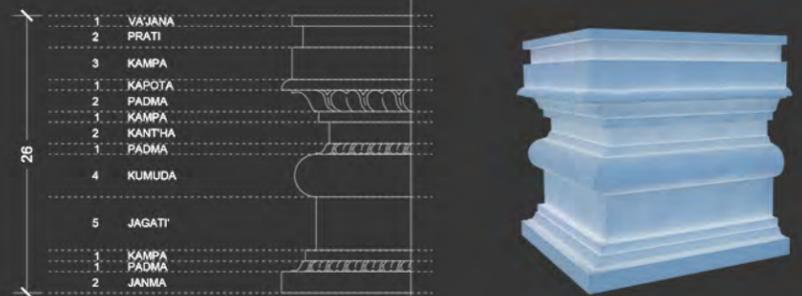


Fig.4.6.23

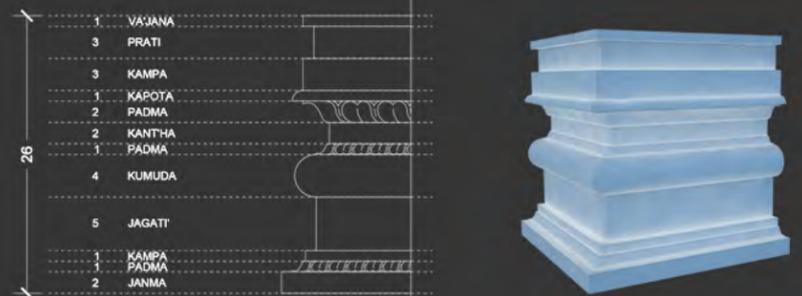


Fig.4.6.24

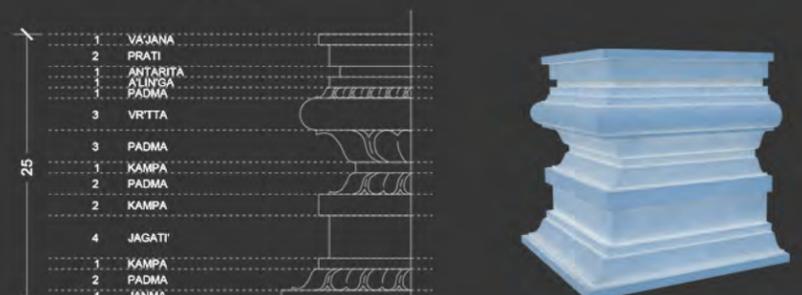


Fig.4.6.25



It is allowed to increase the obtained measure in yavas from one yava to five yavas. Masu'raka, adhis"t'ha'na, vastva'dha'ra, dhara'tala, tala, kut't'ima, a'dyan'ga are synonyms.

Projection of kumuda (torus) = projection of jagati(plinth)
Projection of lotuses (doucines) = height of lotus
Projection of vetras (top row leaves) = 1/4 the height
Projection of maha vajana (greater string course) = 3/4 the height OR height

The designing of the individual members is suggested to be done in such a way to increase the elegance and strength to the base. The projections and recess are supposed to be calculated according to the directions given above. Use of fractional measure is considered to be inauspicious. If necessary it is allowed to alter the measure of the pa'dabandha by fractional measures. Similarly for prati and other mouldings of the base, alterations could be considered according to rules.

Heights for the base according to different castes and according to the number of stories are explained in this chapter. The height of the base may also be obtained from the obtained height of the plinth or the height of the corresponding pillar.

4.7. PROPORTIONATED PARTS OF THE COLUMNS (C-53: PA'DAMA'NA VIDIH PAT'ALAH)

Next in the order we will see the technique and prescriptions for the proportionated parts of pillars. There are two types of pillars according to this treatise, they are – homastambha and pratistambha. The pillars whose base remains concealed under the ground are called nirghatastambhas.

*ayam dva'das'abhumessya't talam prati talam prati ||
vitastya'h ks"apayedeka bhu'mau trikara is"yate ||
anenaiva krama'nneyam s"od"as"aks"ma'ntam eva hi ||*

This height of pratistambha is said for the buildings with 12 storeys. Subtracting one vitasti (half a hasta, that is 12 angulas) for each storey above, the height of the pillars of the twelfth storey comes to 3 hastas. In the same way, the height of the pillars of sixteen storey building should be calculated.

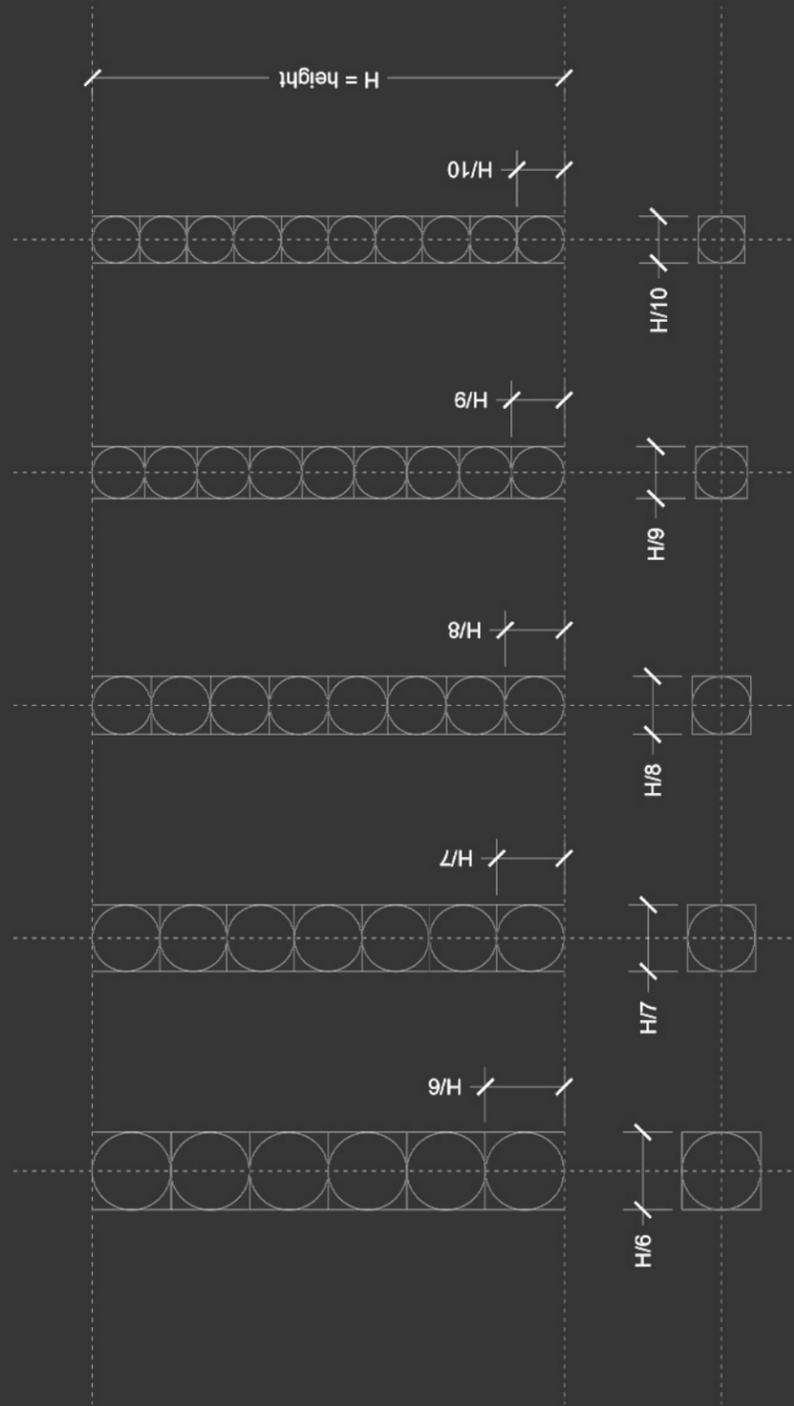
For 2 storeyed building, the reduction in height should be by 6 abgulas and 4 angulas. And for other types it is 2 angulas and 3 angulas.

*ravibhaumasya visr'tiras"t'a'vims'ati ma'trakam ||
dvyan'gulena ks"ayau bhu'mau bhu'ma'veva s"ad'an'gula' ||
ekabhu'stambha vista'ras talopari tale matam ||
dvyantara'n.a'm ca sarves"a'm dva'bhya'm va tribhira'n'gulaih ||*

The width or diameter of the ground floor pillars of 12 storeyed building should be 28 angulas. Subtracting 2 angulas for each storey above, the width or diameter of the pillar of twelfth storey comes to 6 angulas. For the two storeyed building, the height of the pillars should be reduced by 2 angulas or 3 angulas.

In case of any increase or reduction is applied to the pillars it should be maintained in all the storeys. Pillar height could be determined even from the height of the base, it has to be twice the height of the base.

Fig.4.7.1 - COLUMN WIDTH / DIAMETER Proportions



*athava'tta'ms'a ma'nena stambha dairghyam prakalpyata'm /
a'ttosedha ma'nam tu s"ad'sapta's"t'a nava'ms'kam //
hi'nam va'pyadhikam va'pi stambhotsedham prakalpayet /
athava' stambhatun'ge tu vasunanda das'a'ms'ake //
vissta'rastveka bha'gassya't sarve ydda'ru pa'dake /
tadvysa'rdham ca pa'dena tridvyams'am va prakalpayet //*

In an alternate way, the height of the pillars could be determined from the height obtained for a single part or member of the base. Or, the width of the pillar may be determined from the height of the pillar. The width of the pillar may be one sixth, one seventh, one eighth or one ninth of its height. Or, the width or the diameter may be one eighth, one ninth or one tenth of the height. This method is especially applicable to the wooden pillars. Half, one fourth or two third of this measure may be taken to be the width or diameter.

The width of the stone pillar should be twice or thrice the width of the pilaster (wall pillar) or it may be taken as desired by the chief architect. It is recommended that the shape for the top and the bottom of the pilaster should be applied even to the top and bottom of the wall.

The different types of pillars based on its composition as detailed in this treatise are tabulated in table (Tab.4.7.1).

*kumbhah caturvidhah proktah sapa'dassa'rdha eva ca /
pa'donadvigun.as'caiva d'vigun.astu'nnati krama't //
s'ri'ka'nta brahmaka'nta'di candraka'nta'h praki'rtita'h /
bha'nuka'nta iti proktas taducce tu nava'ms'ake //
ams'ena dr'gcaturbha'gah kalas'ah kan.t'ha ekatah /
a'syam ams'am atha'ms'ena padmam ardhena vr'ttakam //
ardhena hi'nako ka'ryau stambha d'vigun.a ma'natah /
kumbhavista'ra uddis"t'as' ca'dhyardham ca'syam i'ritam //*

The pot-like member(kumbha) of the pillar is of 4 kinds. The kumbha with a height of one and one fourth hasta, with a height of one and half hasta, with a height of one and three fourth hasta and with a height of 2 hastas. These are called srikanta, brahmakanta, candrakanta and bhanukanta respectively. If the total height of the kumbha is divided into 9 equal parts, the druk(eye member) takes 1 part; kalasa (pot) takes 4 parts; neck (kant'ha) part takes 1 part; face (asya) takes 1 part; Padma takes 1 part; vrutta takes a half part and hira member takes a half part. The diameter of the kumbha is twice the height of the pillar. Asya (face) takes a half part.

The proportionate width applicable to different parts of the kumbha are also described in this chapter. And then the measures for the abacus are describes.

*man.d'ita'pan"cadha'kr'tva'sa'rdhena phalaka'sanam //
tatsamam vetram ityuktam mun.d'i' s'es"en.a kalpyata'm /
dan.d'a'ka'rastu vetra'ntam pada'ka'ra samo bhavet //*

The abacus should be held in 5 equal parts. One and a half part is for the base of phalaka. One and a half part is for the verta. The remaining portion should be designed with the features of the abacus. If the pillar is equally shaped up to the verta part, then it is said to be in the form of shaft.

The Abacus is of 3 types:

- palikabha
- padmagra
- nagatala

The potika (Bracket capital) is also of 3 types

- Nagavrutta
- Patracitra
- Samudrormi

The above types of capital are now described in detail in this 53rd chapter of kamika Agama.

| PILLAR TYPE | LOWER SECTION | MID SECTION | UPPER SECTION | BASE | CAPITAL |
|---|--------------------------|---------------------------|--------------------|------|----------------------------|
| BRAHMA KANTA | | SQUARE | | | KUMBHA (POT-LIKE) & ABACUS |
| POTI KANTA (HEIGHT=3xWIDTH) | | OCTAGON | | | |
| VISNU KANTA | OCTAGON (OR OTHER) | OCTAGON | OCTAGON (OR OTHER) | | KUMBHA (POT-LIKE) & ABACUS |
| KAUMARA KANTA | | HEXAGON | | | |
| BHANU KANTA | | 12-SIDED | | | |
| CANDRA KANTA | | 16-SIDED | | | |
| PURVASRA | SQUARE | 8,12,16-SIDED OR CIRCULAR | | | |
| ISVARA KANTA | | CIRCULAR | | | |
| RUDRA KANTA | SQUARE | OCTAGON | CIRCULAR | | KUMBHA (POT-LIKE) & ABACUS |
| ISA KANTA | | DEPICTIONS OF BIRDS | | | |
| PINDAPADA | SQUARE (GREATER MEASURE) | 16-SIDED | | | |
| PADMASANA | SQUARE (LOTUS MOULDING) | | (LOTUS MOULDING) | | |
| LUKALA PADAPA MORTAR BOTTOM (WIDTH=2, HEIGHT=3HASTAS) | | OCTAGON | | | |

Tab.4.7.1 - Types of Pillars

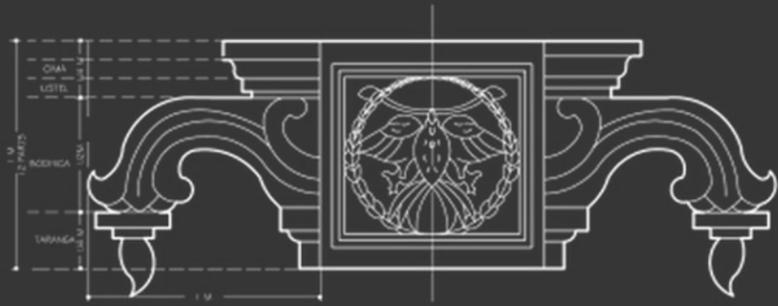


Fig.4.7.2. Detail of a typical 'Potika' (Bracket capital)
(Vinayak Bharne & Krupali Krusche. Rediscovering the Hindu temple)

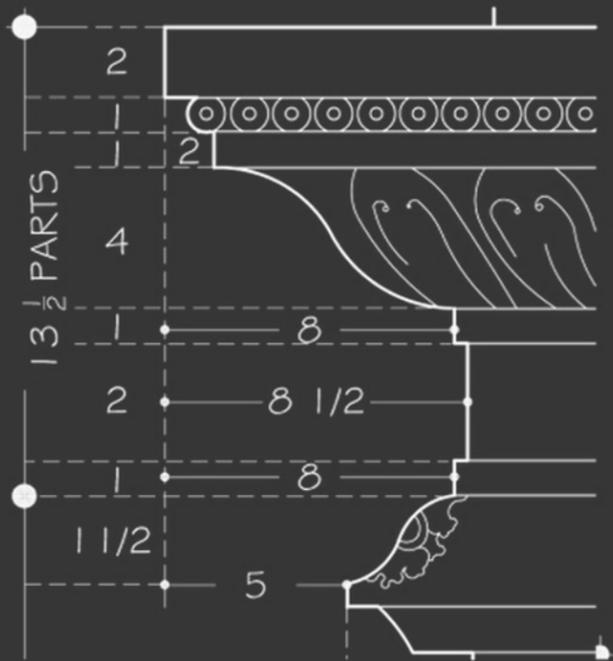


Fig.4.7.3. Detail of a typical 'Kumbha'
(Vinayak Bharne & Krupali Krusche. Rediscovering the Hindu temple)

*stambhatrigun.a ma'na' sa' dan.d'odaya sama'yuta' ||
cha'ya' ks''epan.a samyukta' na'gavr'tteti ki'rtita' |
caturdan.d'a sama'ya'ma' tripa'dodaya samyuta' ||
cha'ya'ks''epan.a patrais'ca yukta' patra vicitrita' |
pan''cadan.d'a sama'ya'ma' dan.d'ama'na samodaya' ||
caturbha'gaikata'nena yukta' yugmaistaran'gakaih |
yathes''t'aih pa'rs'vayos'caiva samudrormiriti smr'ta' ||*

That part which is with thrice the measure of the pillar and with a height of one hasta and which is applied with over-hang recess is said to be nagavrutta. That which is with the height of 4 hastas and thickness of three fourth hasta and which is applied with over-hang recess and mouldings of leaves is called patracitrita. That which is with the height of 5 hastas and a thickness of one hasta and which is provided with the mouldings of the waves of ocean up to one fourth of the said height on the desired sides of the pillar, is known as samaudrormi.

*potika'na'm ca sarva'na'm vista'rah pa'datassamah |
taduccastritribha'gena tasya'stvagre tu pat't'ika' ||
tadardha'rdhena kartavyam tadadhah ks''epan.am dvija'h |
cha'ya'ya'mam taducca'rdham tridvyams'am va'tha kalpayet ||*

For all the pillars the potika (bracket capital) should be with a width equal to the width of the pillar. On the top of potika, there should be pattika (string course) with a height equal to one third, one half or one fourth of the height of potika. Below that there should be a over-hang(chaya) with a recess equal to half or two third of the width of the potika.

The embellishment at the top should be furnished with gargoyle, a drum, depiction of lion, snake and such others. Above this there is mushtibandh- a beautified projection with depiction of snake and other forms. Many other directions of construction of pillars including the finial part of the pillars, interspace between them, materials, numbers etc., are also explained in this chapter.

4.8. DESIGNING OF ENTABLATURE (C-54: PRASTARA VIDIH PAT'ALAH)

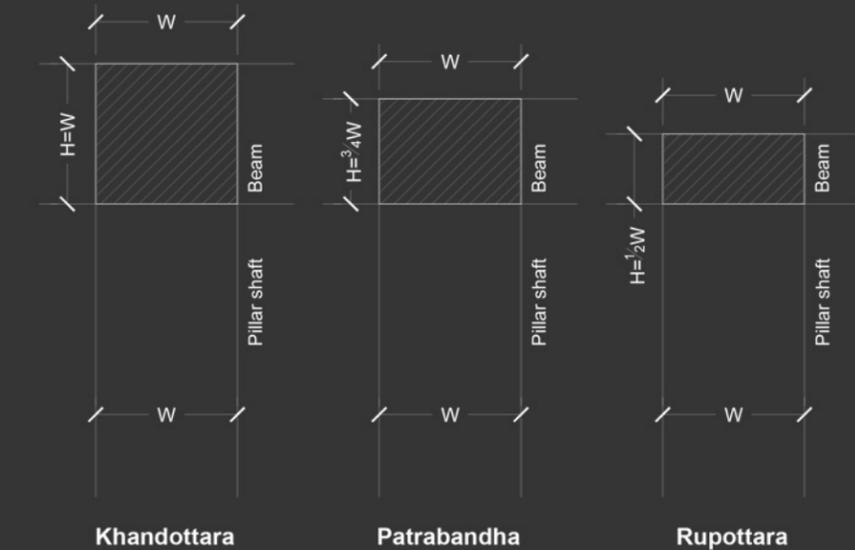
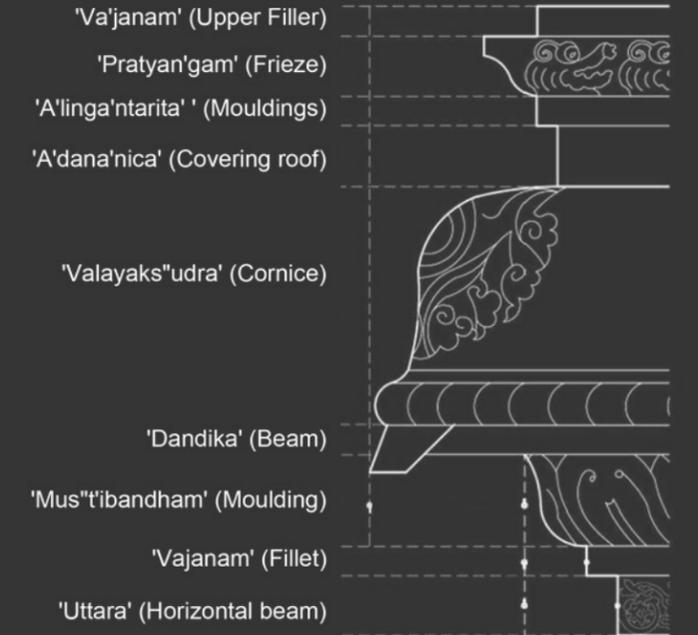
In this 54th chapter of ka'mika Agama we see the specific directions for the systematic construction of entablature. The component parts as mentioned in the first 2 verses of this chapter are:

| | |
|------------------|-------------------------------|
| Uttaram | - Horizontal beam |
| Vajanam | - Fillet |
| Mus''t'ibandham | - Fish-like moulding |
| Mr'n.a'likam | - Braces above the architrave |
| Dan.d'ika' | - Beam |
| Valayaks''udra | - Cornice |
| Gopa'na'ccha | - Small beam |
| A'dana'nica | - Covering roof |
| A'linga'ntarita' | - Mouldings of interspace |
| Pratyan'gam | - Frieze |
| Va'janam | - Upper fillet |

*trayams'aika'ms'a'ms'a pan''caika dvitribha'gaika bha'gakaih |
tribha'genaika bha'gena uparyupari yojayet ||
eta'ni prastara'n'ga'ni trividham cottaram bhavet |
khan.dottaram patrabandham ru'pottaram iha dvija'h ||*

These components should be one above the other, in the said order. These components should be in 3 parts, 1 part, 1 part, one fifth, two fifth, three fifth and one third (of the total height of the prastara). These are the components of the entablature. O, the twice-born sages!, of these components, utara is of three kinds – khandottara, patrabandha and rupottara.

| | |
|---------------|--|
| Khandottara - | Height = Width = Width of the pillar |
| Patrabandha - | Height = 3/4(Width of pillar) Width = Width of pillar |
| Rupottara - | Height = 1/2(Width of pillar) Width = Width of pillar |



The detailed proportions of the different parts of the entablature and other decorative elements are described in this chapter. The capital should be associated with gargoyle and braces. The major joists and the beams may be with or without the small secondary joists. Above the joists and beams is the roofing done in such a way to have enough strength and pleasing appearance. The embellishments of the entablature includes swans, groups of retinue deities or of demi-gods. The thickness of roofing is recommended to be one-fourth, one-eighth or one out of 6 parts of a module. All other projections, cornice and mouldings (fist mouldings, fish-like mouldings etc.,) are detailed in this chapter. It is prescribed that in the component parts of the entablature, there may be decrease or increase in the measure by 1, 2, 3 or 4 grains (yava).

4.9. EMBELLISHMENTS OF THE BUILDINGS (C-55: PRA'SA'DA BHU'S'AN.A VIDIH)

This is the 55th chapter which gives the directions for the embellishments of the buildings from the entablature, component parts of the middle section, basement and stereobate.

*adhyardha'dyam tridan.d'ena bhittima'tra visa'rin.i' /
s''at'sapta's''t'adas'otsedha' tatsamam di'rg'hika' bhavet //*

The width of the wall (with which pillars are associated) should be formed one and a half to three dandas (modules). The height should be with a measure of 6, 7, 8 or 10 parts of the width taken. Length should be equal to the height.

The the proportionate measures of the stereobate above the entablature, the fillet, top band of the entablature and the pillared segment are all described in detail. With acceptable measures in danda units. Let's see below the examples for the translation of some of the proportionate as mentioned here.

*pa'dam va' pan''cabha'ge tu tridvyams'am va'janan bhavet //
kampamardhena nidra'sya'dadhyardhenana'rdhatah kajam /
ardhena kampam ams'ena va'janam parikalpayet //*

If the base portion is divided into 5 equal parts (Fig.4.9.1), 2 parts out of 3 parts should be taken for the vajana-fillet; half part for the kampa-fillet; one and a half part for the nidra-fillet; half part for the lotus moulding; half part for the upper kampa and one part for the upper vajana.

*dva'vims'atyams'ake tun'ge karn.o dva'das'a bha'gikah /
netra'ms'ena tatha' nidra' kapotam caturams'akam //
tadu'rdhve va'janam caikam tadvatkarn.o dvibha'gatah /
nidra ka'rya' tadu'rdhvastha' pat't'as''at'ka samanvita' //*

If the height of the entablature is divided into 22 equal parts (Fig.4.9.2), cornice(karna) takes 12 parts; fillet(nidra) takes 3 parts; carona takes 4 parts;

vajana-fillet takes 1 part; cornice takes 2 parts. The nidra element should be designed above the upper cornice so as to be associated with 6 string courses or bands.

*dva'vims'atyams'ake tun'ge karn.o dva'das'abhir bhavet //
va'janam caika bha'gena nidraika' va'janam tribhah //
padmakampa gala'bja'ni tadvatkarn.o dvibha'gatah /
s''od'as'a'ms'e tadutsedhe nava'ms'am galam is''yate //
va'janam caika bha'gena tatha'nidra tribha'gatah /
pat't'apadmam athaika'ms'am padmam ekena ki'rtitam //*

Alternately, if the height is divided into 22 equal parts (Fig.4.9.3), the cornice takes 12 parts; vajana-fillet takes 1 part; nidra fillet takes 1 part, vajana-fillet takes 3 parts; cyma, kampa-fillet, dado and upper lotus takes 3 parts; and the upper cornice takes 2 parts. If the height is divided into 16 equal parts (Fig.4.9.4), the dado(gala) takes 9 parts; vajana-fillet takes 1 part; nidra element takes 3 parts; band and cyma take 1 part; and the upper cornice takes 2 parts.

The above mentioned divisions are not allowed for stereobate and spout elements. But for entrance and temples they are applicable. Next in this chapter we see the directions for designing the door.

*stambhades'e nava's''t'a'ms'e sapta'ms'e tvaikabha'ga bha'k /
dva'ratun'gam tadardham sya'd vista'ro devasadmani //*

In the edifice dedicated to a God, the height of the door may be one out of nine parts, one out of eight parts or one out of seven parts of the total height of the pillar. The width of the door should be half of its height. (Fig.4.9.5; Fig.4.9.6; Fig.4.9.7)

*na'li'geham tribha'gaikam ardhm va' navapan''cabha'k /
pan''catrim's'adbhavet tun'gam idam va's'es''ikam bahvet //*



Fig.4.9.1

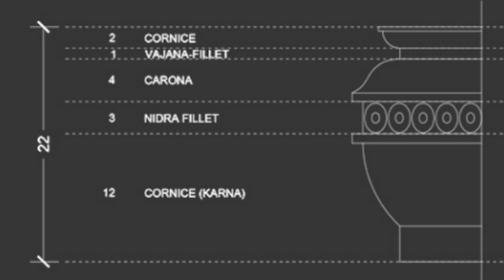


Fig.4.9.2

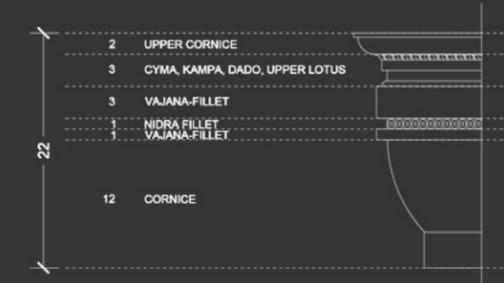


Fig.4.9.3



Fig.4.9.4

Proportions of entablature

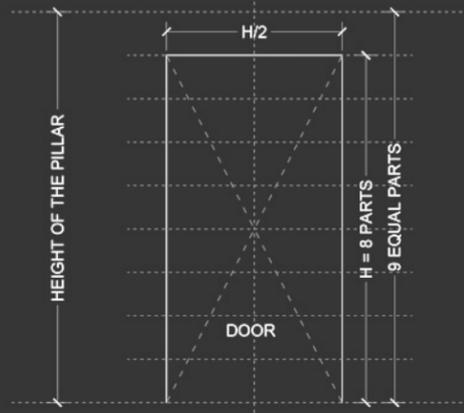


Fig.4.9.5

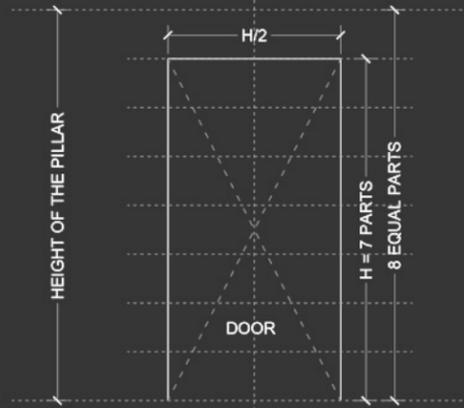


Fig.4.9.6

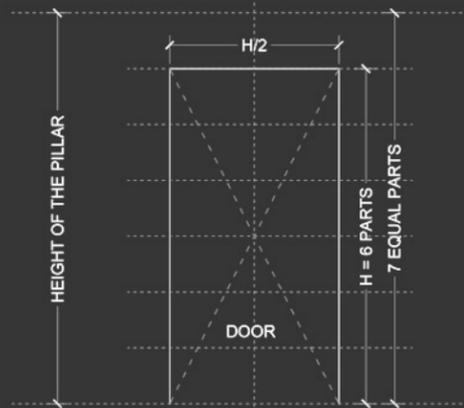


Fig.4.9.7

Proportionate measure of doors

In case of the inner chamber, if the height of the pillar is divided into 25 equal parts, the height of the door may be one-third, half or 5 parts out of 9 parts. Such dimensions are considered to be of special category.

*vista'rah pra'gavaduttis't'as tvathava' tatpraki'rtyate |
trivitasti vis'a'lam sya'd dairghyam sapta vitastikam ||
vista'ra'yamatastasma't s''ad dva'das'a kara'grakaih |
vr'ddhya' tripan''cama'na'di s''advitastyantaka'ni hi ||
pan''cavims'ati ma'na'ni dva'rata'rodaya'ni hi |
tada'tyam s'ayani'yasya gr'hasya dva'das'aiva hi ||*

The width may be taken as explained before. Or, another method of arriving at the width is also now told. Width is to be held as 3 Vitasti (1vitasti = 12angulas) and the length to be held as 7 vitasti. In an increased way, width may be 6 vitasti and the length 12 vitasti. Again this may be increased by 3, 5 and 6 vitastis. There are 25 kinds of measures for the length and the height of the door. Measures mentioned first are applicable to the recumbent type of forms. For the houses of 12 kinds of measures are available.

And then the prescriptions for houses and annexes surrounding the housing are mentioned in detail for buildings raised in different locations.

*dva'rasyobhaya pa'rs've tu man.d'itastambha yugmakam |
bhu's''an.am tu bahih ka'ryam sarves''a'm api sadmana'm ||*

On both sides of the door, two pillars associated with the elements of ornamentation should be provided. For all the types of buildings, recommended ornamentations should be designed in the exteriors.

For calculations of a'ya, vya'ya and other factors the architect should divide the obtained height by the obtained basic unit and leave out the fractions of angulas. The direction for provisions for doors are mentioned in this chapter. And next we will see some of the further details of the door.

*sapa'dapa'da vista'ras sa'rdho va' yogavistarah |
stambha vya'sa samo va'pi tadardham bahulam matam ||*

The width of the door jamb may be one, one and one fourth or one and a half module. Or it may be equal to the width of the pillar. The width of the bahua should be half of this measure.

*tripa'dam vottara'dhastat'prati'kam tatsvava'janam |
dva'rodaya'ya s'es''am tu tridha va' pan''cadha' kr'te ||
eka'ms'am va' dvyams'akam sya'dadhobhu's''an.am u'rdhvatah |
s'es''en.a bhu's''an.am kurya'c chuddhadva'ram tu madhyamam ||*

Below the upper beam, crescent moulding and fillet should be in three fourth of a module. The remaining portion should be taken for the height of the door. If this is divided into 3 or 5 parts, embellishments of the lower portion should be in 1 or 2 parts. The remaining upper portion should be taken for the needed decorative elements. A single door should be in the middle.

Other detailed dimensions of the door, its fixing details and embellishments are covered in this chapter which gives strength and pleasant appearance to the construction.

4.10. THE FEATURES OF NECK PART OF THE PILLARS (C-56: KAN.T'HA LAKS'AN.A VIDIH)

The 56th chapter tells us briefly about the neck part. Also known as the kant'ha part which is above the prasta'ra (entablature) and below the sikhara (the finial tower).

*kan.t'hasya laks''an.am vaks''ye sama'sa'cchr'n.uta dvija'h |
tanmu'le vedika' ka'rya' kan.t'hotsedha't tribhagatah ||*

Then I will tell you briefly the features of the neck part. O, the twice born sages!, listen to these. On the basement of the neck part, the pedestal should be provided. Its height should be one part out of three parts of the height of the neck.

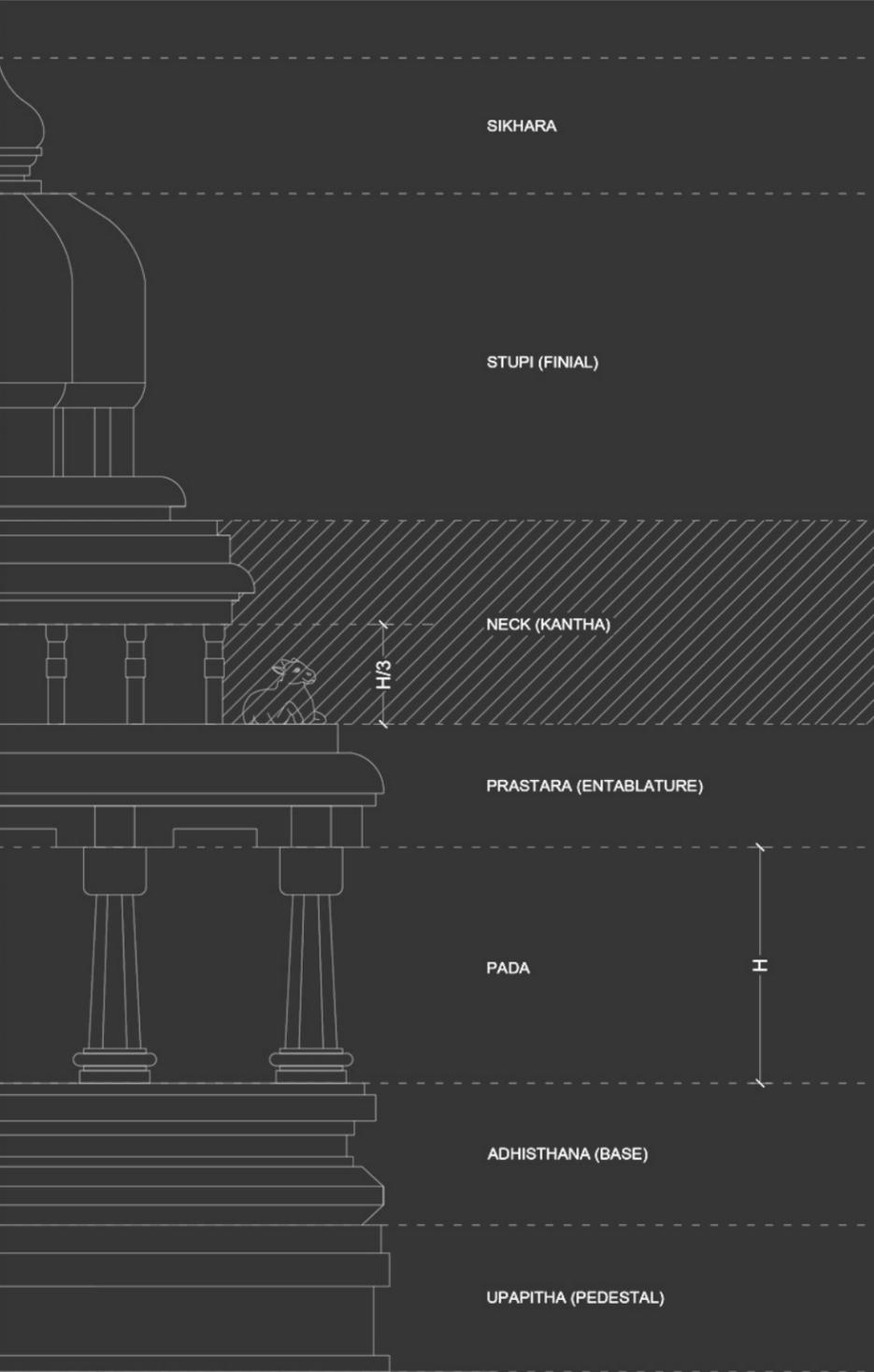
*garbhabhitti tribha'gaikam an'ghrervedyan'ghri ves'anam |
catus''pan:ca s''ad'ams'e tu sama'ves'a'dhivedika' ||*

The height of the short pillars below the pedestal should be one third of the height of the wall of the main shrine. The bottom part of the pedestal should be well settled between the short pillars. On the upper surface of the pedestal, there should be a recess in the measure of 4, 5 or 6 parts of the total height of the pedestal.

*gri'va'ves'astatas ta'vat sapta's''t'a'mse tathiva ca |
samam va'dhyardhakam va'pi dvigun.am trigun.am tu va' ||
vedikotsedha ma'nena gri'voccam parikalpayet |*

The recess of the neck part should extend up to the same measure. The height of the neck should be ascertained based on the height of the pedestal. The height of the neck should be 7 or 8 parts of the height of the pedestal, or equal to, or one and a half, twice or thrice of this height.

The different ornamental parts of the neck part called utara, vajana, mus''t'bandha, mr'n.a'lika', dan.d'ika valaya are mentioned.



*prastarordhve vr's'am stha'pya s'ivadha'mni vis'es"atah /
u'rdvena stha'pita'ste ca dha'mnodhasta't samantatah //
antarman.d'ala des'e tu stha'pani'ya's sapi't'haka'h /
anyes"a'm api deva'na'm dha'mni tadva'hana'n nyaset //*

It is recommended specifically that in the Siva temples, the bull-vehicle should be installed above the entablature. Those vehicles which are installed above the entablature should be installed around the temple at the ground level also. Specifically, they should be installed in the innermost enclosure (antar man.d'ala) as associated with the corresponding pedestals. Even in the temples of ther deities, the vehicles of the concerned deities should be installed above the entablature and on the ground level.

Similarly, even in the temples of goddess the vehicle should be installed in the neck part along with other deities. In this chapter it is also recommended to provide vestibules, dwarf pillars with circular and square mouldings. Thus explaining in detail the features of the neck part.

4.11. CHARACTERISTIC FEATURES OF THE ROOF (C-57: S'IKHARA LAKS"AN.A VIDIH)

*atha vakshye vis'es"en.a s'ikarasya tu laks"an.am /
s'ikharotsedha ma'na'ms'a bha'gama'na vas'ena va' /
dan.d'ika'vadhi ta'ren.a pan"ca'ms'akam dvyams'akam tu va' /
saptananda s'iva'ms'es"u trayodas'a tithau tatha' //
sapta das'a'ms'ake bandha vedapan"ca s"ad'ams'akam /
sapta's"t'a'ms'am tu ta'ra'rdham ityas"t'au s'ikharodaya'h //*

Now I will explain the characteristic features of the roof of the building. The height of the roof may be ascertained in the manner explained earlier. This may be ascertained so as to be proportional to the distance between the consoles. It may be 2 parts out of 5 parts, 3 parts out of 7 parts, 4 parts our of 9 parts, 5 parts out of 11 parts, 6 parts out of 13 parts, 7 parts out of 15 parts, 8 parts out of 17 parts or a half of the distance. These are the eight possible heights of the roofs which have specific names corresponding to these heights.

*pa'n"ca'lam ca'pi vaideham ma'gadham ca'pi kauravam /
kos'alam saurasenam ca ga'ndha'ram patrikam tatha' //
yatha' kramen.a na'ma'ni jn"a'tavya'ni vicaks"an.aih /*

Panchala, vaidehi, Magadha, kaurava, kosala, sauresana, gandhara and patrika – these are the eight specific names corresponding to the eight heights. These names should be known well by the skilled architects.

Amongst the ones mentioned above the smallest height is not applicable to the deities and the height half the distance between the consoles is not applicable to the houses of humans. There are different heights of rafters for different roofs. And the roofs can be of different shapes like- square, circular, hexagonal, octagonal, and dodecagonal, sixteen sided, eight sided, shape of a lotus or myrobolan fruit or it may be elliptical or spherical for different buildings. Also, the arrangement of rafters are explained.

*dan.d'ika'vadhi ta'ra'rdham caturas'ri'kr'tam samam /
kos"n.i's"a'sita si'ma'khyam su'tram yuktam ghanam nayet //*

A square area should be marked out, the width of which should be half of the distance between the consoles and which should be delimited by thick lines called ka, ushnisha, asana and sima.

*dan.d'kottara ba'hulyam su'trayeda'sana'nadhah /
a'sane caturams'a'di nyased bindu das'a'ms'akam //*

Below the asana line, a parallel line should be drawn at a distance equal to the projection of the consoles in relation to the to the architrave of the attic. Points should be marked on the asana line so as to divide it into 4, 5, 6, 7, 8, 9 or 10 parts.

*kos"n.i's"a sandhes tadbindu si'ma'ntoccam sama'haret /
ava'kva'thocca ma'na'ni kam mula'da'sanam nyaset //*

*ta'nyeva dan.d'ika'di'na'm paryanta'ni bhavanti hi /
kos"n.i's"a san'ga'tparyanta bindvantam tallupa'yanam //*

Starting from the intersection of the ka line and the ushnisha line and passing through these points, lines should be drawn up to the limit of the overhanding eave (which should be marked by the parallel traced below the asana line). Next, the distances up to the eave should be drawn on the asana line starting from the end of this line which goes up to the base of the ka line. This provides the positions of the extremities of the consoles. The length of th rafter should be taken as the distance between the intersection of the ka line and the ushnisha line and the etreme point corresponding to this rafter.

*tattat paryanta vista'ram kasu'tram vinyaset puynah /
vinyased a'sane va'pi tanma'nam sya'l lupa'vadhi //*

Each of the extreme distances should then be drawn again on the ka line. Or it may be drawn on the asana line. This denotes the extremity of the rafter.

*evam madhya lupa'si'mna' vardhate varn.a samkhyaya' I
evam a'vartya tatpas'ca'd a'rohe va'varuhya ca II
tattat kos''t'es''u samja'tam tattan mallayutam bhavet I*

Thus, the dimensions of the median rafter should be increased according to the number of the other rafters. After this has been done, the lengths of the corresponding malla should be ascertained by the process of increasing and decreasing. These component parts known as mallas are to be obtained from the corresponding pushkaras(koshtas).

*samadhyam va' vimadhyam va' lupa'nya'so dvidha' matah II
madhyam ca madhyakarn.am ca vya'karn.am anukot'ikam I
kot'irityevam ucyeta pan''cavarn.a lupa'h krama't II*

Rafters should be arranged at the center or off the center. There are five types of rafters which are specifically called madhya, madhyakarna, vyakaarna, anukoti and kotilupa.

*tattatsu'tra'dadhah pr's''t'havams'a nidra'n.i su'trayet I
s'ayitasthiti su'tra'ntam ki'lam tatku't'amu'rdhani II*

Below the lines corresponding to these rafters, line should be drawn between the ridge beam and the nidra(element of the entablature). On the top of the newel(kuta), peg should be set up so as to be within the horizontal lines.

*nidha'ya'rdhenduvat sarva's' cu'lika' vilikhet sama'h I
lupa'vilupa madhya'ntargata; sa; cu'lika'kr'tih II*

All the tuft-like mouldings should be designed so as to be of uniform shape and they should be arranged so as to look like the half-moon. These tuft-like designs should be placed in the area between the main rafters and the sub-rafters.

*evam sya'd r'juka'yam tu ca'nyadapyevam u'hyata'm I
ba'laku't'asya vista'rasthitisu'tra stana'ntarah II*

The setting of the pegs in this way is known as 'rujukaya'. Other types of ar-

ranging the pegs should be constructed in this way. The width of the small newel(kuta) should be within the two edges of the horizontal line.

*lupa'ta'rastu dan.d'o va' sapa'das sa'rdha eva va' I
yatha'bhimata ma'no va' vista'ra'd bahula'dapi II*

The width of the rafters should be one, one and a quarter or one and a half modules. Or it may be according to the selected measure derived from the width and the length of the roof.

*vista'rastricaturpan''ca bha'gaika'ms'am tu tadghanam I
ja'nuvya'sastu'ttara'rdha cu'lika' va'rdha eva va' II
dan.d'ika' vipulam ta'vat tripa'da'rdham tu tadghanam I
valayam ja'nu ni'vram ca dan.d'ika' vipula'rdhatah II*

The width of the 'janu' element should be half the width of the architrave or a quarter of the width of the tuft-like element. Its thickness should be equal to three-fourth or half of the width of the consoles. Valaya, janu and nivra- all these three should be more than the half of the width of the consoles.

*mallamadha'datha'li'na ta'lama'nam ca yadghanam I
paryanta'j ja'nuka'ntam ca cu'lika' bha'ga eva va' II
sayana'tta'vadeasya'n ni'vra'lambana su'trakam I
kut'ha'rika' lala't'am ca jaghanam caiva sammatam II*

The line called 'nivalambana' should commence from the center of the mal-la-element and proceed towards the boundary line and the janu-line or towards the area of the tuft-like moulding. This corresponds to the thickness(of the tuft) measuring one span. This line should proceed up to the horizontal line. The portions defined by this line are known as 'kutarika', 'lalata' and 'jaghana'.

*pa'davis''kambha kan.t'he va' vis''kambha dvigun.e tatha' I
ku't'avya'so lupa'madhyam dvikarn.o dvigun.o yatha' II*

The width of the newel(kuta) should be one quarter of the width of the attic or

twice this width. If it is increased further so as to be equal to twice this width, it should correspond to the center of the rafter and the two-structures.

*tadardham na'lika'lambam u'rdhvr malla'gra san'gatih I
chidram tanni'vrama'tram va' malla'na'm tu praves'anam II*

Half of this width should correspond to the line known as 'nalika lambana'. Above this, there should be the intersection of the top-line of the malla-element. The size of the hole should be equal to the nivra or to the projection of the mallat-element.

*lupa' va' sughanam va'pi valayo vams'a vistarah I
tadardha ves'ana'nni'vram valayasya vidhi'yate II*

The width of the ridge-beam should be in relation to the length of the rafter or to the thickness of the rafter or too the lierne. There should be a nivra for the lierne with a projection equal to the half of the width.

The wooden planks are placed above the rafters firmly with a special wax known as 'dhanurvamsa'. Then the tiles made of metal or bricks is placed by applying 'ashta bandhana'. And then the direction for drawing the pari rekha are explained. The line in between the 'rujukaya' and the elements such as malla are known as 'parirekha'.

*lupa'ghana prama'n.ena ghat'ika'm caturas'rika'm I
vitastyaya'mini'm r'jvi'm kr'tamadhyama su'traka'm II*

A square piece known as 'ghatika' should be designed with a measure equal to the thickness of the rafter. A line called 'yamini' should be drawn with precision, with a measure of one span corresponding to the central line of the rafter.

*cu'lika'ntar varn.alupa' tiryaksu'trasya madhyama'm I
vinyasya ghat'ika'm pas'ca'c chinna'm s'ayana su'travat II
pratvarn.e tu ghat'ika'm tadvarn.e ta'm nidha'payet I*

In between the corners rafters and the tuft-like element and in between the

cross-lines, this ghatika should be designed and it should be divided evenly, like the horizontal line. Ghatika should be provided for each corner rafter and those lines are to be joined with each corner rafter.

*ks''ipta su'trasya s'es''a'ms'a'c chinne varn.a lupodare II
dan.d'ikottara valaya sthirasu'tra samam likhet I
udara'ya'ma madhye tu likhite karakam bhavet II*

The remaining part of the adjustable line(kshipta sutra) should be cut off so as to be in alignment with middle part of the corner rafter. A constant line(non-adjustable line) should be drawn so as to connect the consoles, beam and the lierne. Another line should be drawn above the center of the middle portion of the rafter. The intersections of these lines would define a form known as 'karaka'.

*ghat'ika' lala't'a madhyastham karakam ca samam yatha' I
tatha nidha'na ghat'ika'm lupodara vas'a'yata'm II*

If this karaka which is in between the ghatika and the lalata and which I with a measure equal to these ghatika and lalata, then it becomes known as 'nidhana ghatika'. Its length is in alignment with the middle part of the rafter.

*tallala't'a'kr'tis'chedya' valaya'dya' lupodaya'h I
is''t'apa'rs've ks''ipecca'ya'm chidre ca valayasya tu II*

The lalata(forehead-like part) should be divided so as to be in alignment with the lierne and other parts whose heights are equal to the length of the rafter. The overhang should be placed in the desired sided and it should correspond to the holes of the lierne.

*tattad ghat'ikaya tattan madhyasamhita madhyaya' I
tallalla't'a gatacca'ya' ta'sa'm ta'sa'm tu va' bhavet II*

The corresponding ghatikas should be provided at the center of the group of median lines. The overhang of the corresponding lalata parts should be placed in the same way.

*dan.d'ika valaya chidra stana ja'nu'ttara'dis"uI
ghat'ika' madhyama'ya'ma chidra'n.i valayasya tuII*

Consoles, holes of the liernes, stana-part, janu-part, beam and such other parts should be aligned well. The holes of the lierne should be aligned to the central line of the ghatika.

*s'iromadhye ardhmadhye ca nyasenmun.d'am tulopari I
suvarn.a' madhyabandha's'ca kharju'radala sannibha' II*

Above the beam, munda(element of the timber-roof) should be provided at the center of the roof and at the center of the half part of the rafter. The central bands(string course) should be with pleasant colors and they should be in the shape of the leaf of date-tree.

*savalarks"a' vidha'tavya' lupa' s'ikharaka'ntare I
s'ikharocca catus"pan"ca bha'gas sya't padma tun'gakam II*

In between the roofs, the rafters should be provided associated with 'valarksha' element. The height of the lotus-moulding should be one part out of 4 or 5 parts of the height of the roof.

*vedi' vista'ra tulyam sya'c chikarasya tu ni'vrakam I
s'ikharasya tribha'ge tu na'sika' vistaro bhavet II*

The 'nivraka' element of the roof should be with a width equal to the width of the base (of the roof). The width of the vestibule should be one third of the width of the roof.

*samatripa'do hyardho va'maha'na'si' vinirgamah I
tadvatsatricaturbha'ga hi'naskandha'n'ga tun'gakam II*

The projection of the large vestibule should be three fourths or half of the width of the roof. The height of the shoulder parts should be three fourths less than the height of the roof.

*s'aktidhvajas tadardho va' tripa'do va'tha tun'gakam I
sa'rdhadan.d'o dvidan.d'o va' ks"udrana'sa' vis'a'lata' II*

The member of the roof known as 'saktidhvaja' should be with a height equal to half or three fourths of the height of the roof. The width of small vestibule should be one and a half module or two modules.

The different measures prescribed for the pediment, the base of saktidhvaja, agra patra and the 'kapola' with leaf-like mouldings. Other ornamentations used are tuft-like mouldings, horizontal planks, ring-like mouldings and such others.

4.12. CHARACTERISTIC FEATURES THE FINIAL (C-58: STHU'PIKA' LAKS"AN.A VIDIH)

The height of the finial is taken with respect to the height of the lotus below (equal or 1/2) or the height of the roof (1/2 or 1/3). The axis if the finial is recommended to be made of wood or metal and the height taken w.r.t. the height of the pillars of the upper story.

*athava' tacchika'ya'ma dvigun.am ki'la dairghyakam I
stambha vya'sa'rdha vista'ram tricaturbha'ga eva va' II
agram ardha'n'gulam vya'so s'ikhipa'dam yatha' sukham I
s'ikhara'kr'tivat ki'lam lin'gacchandam atha'pi va' II*

Or, the length of the axis may be twice that of the finial and its width may be half of the diameter of the pillar or one third or one quarter of the diameter. In that case, the diameter at the top should be half a digit and the dimensions of the peacock foot(base of axis) should be calculated so as to give the required stability. The axis of the finial may be in the shape of a pin, nail or linga(which is square at the bottom, octagonal at the middle and circular at the top).

*dva'trims'atyams'ake dairghye padmam sa'rdha'ms'am i'ritam I
sapta'mas'a vistarastasya's tadu'rdhve ca tu va'janam II 8
vista'ram dvitribha'gena vetram ardhoccam i'ritam I
tribha'go vistaram cordhve va'janam cordhvam ucyate II 9
tribha'gam vistaram cordhve padmam ams'a vinirmitam I
pan"ca'ms'o vistara stambhah kumbham pan"ca'ms'am i'ritam II*

In the finial whose height is divided into 32 equal parts, cyma takes a half part and the width takes 7 parts(horizontally); vajana(fillet) above this takes one part and the corresponding wodth takes 6 part. Vetra, above this, takes a half part and the width takes 3 parts. Vajana above this takes one part and the width takes 3 parts. Lotus above this takes one part and the width of the shaft takes 5 parts. Vase(kumbha), above takes 5 parts.

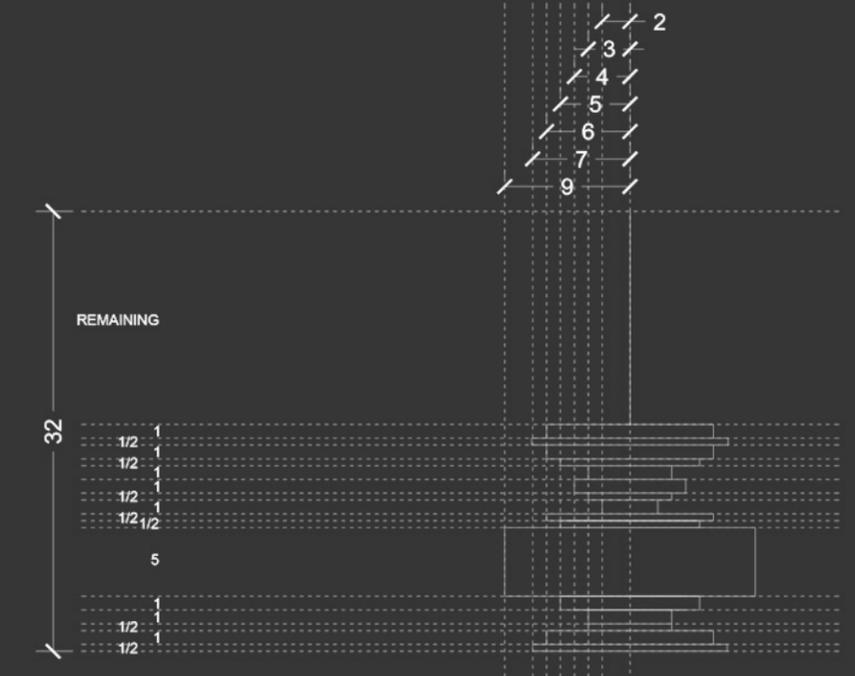


Fig.4.12.1. Proportionate measures of the 'Stupi' (Finial)

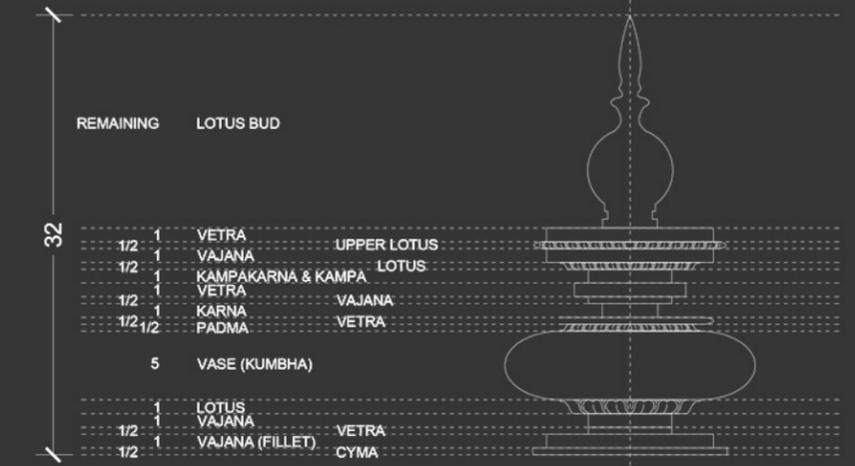


Fig.4.12.2. Parts of the 'Stupi' (Finial)



Fig.4.12.3. 3D Model of Finial

*vista'ro navabha'gassya'd u'rdhve padmam atha'ms'atah /
pan''ca'ms'o vistararasya vetram ardha vinirmitam //
tribha'go vistararasya karn.astvams'a vinirmitah /
vista'ren.a dvibha'gassya'd u'rdhvam va'janam ardhatatah //*

*vista'ren.a tribha'gassya'd vetram ams'a vinirmitam /
vista'ram caturams'assya't kampakarn.antu kampakam //*

The width of the shaft takes 9 parts. Padma, above this takes a half part and the corresponding width takes 5 parts. Vetra, above this takes a half part and the width takes 3 parts. Karna takes one part and the width takes 2 parts. Vajana, above this takes a half part and the width takes 3 parts. Vetra, above this takes one part and the width takes 4 parts. Kampakarna and kampa above this take one part.

*pu'rvavat padmam ardham sya'd vista'ram pan''cabha'gikam /
va'janam caikabha'gena s''ad'ams'o vistararasya bhavet //
u'rdhvapadmam adho yadvat tadu'rdhve vetram ams'atah /
vista'rassya'ttribha'gena tadu'rdhve padma kud'malam //*

As said earlier, lotus takes a half part and the width takes 5 parts. Vajana above this takes one part and the width takes 6 parts. The upper lotus takes a half part like the lower padma. Vetra, above this, takes one part and the width takes 3 parts. Above this should be the lotus bud.

*veda'ms'e tryams'a vista'ro mu'latah parikalpayet /
caturas'ra dviras''t'a's'ram sa'dha'ram vartulam tu va' //*

The architect should hold the width to be 3 parts out of 4 parts at the base of the finial. The base may be in the shape of square, sixteen-sided or circular associated with a pedestal.

*athva'nya praka'ren.a sthu'pika' bhu's''an.am nayet /
padmakam pan''cakarn.am tu pan''cakam padmatun'gakam //
padmakumbham ca pu'rvokta ma'nenauva sama'caret /
veda'ms'aih karn.am ityuktas tadu'rdhve pu'rvavan nayet //*

Or, the architect may provide the decorative elements of the finial in a different way. He may design the lotus and panca karna. The height of the lotus may be of 5 parts. Lotus-shaped vase should be designed according to the dimensions explained before. Karna should be with a height of 4 parts. All other elements above this should be provided as explained earlier.

*dva'vims'atyams'aka's tatra pu'rvavat parikalpitam /
i'dr'glaks''an.a samyuktam vima'nam sampada'm padam //*

In the finial whose height is divided into 22 equal parts, all the decorative elements should be provided proportionately as detailed before. The super structure associated with such significant features turns out to be the storehouse of undecaying wealth.

If the directions are violated, it is believed to result in dangerous effects and become a source of worries and difficulties.

In general it is recommended that construction of all the parts of the building should be done as prescribed in one of the Agamas. In case some detail is unavailable in one agama. It can be looked for in other related agamas. And in case of unavailability even in other agamas, Garuda Tantra and other vastu shastras can be referred.

4.13. SINGLE AND MULTI-STOREYED SUPERSTRUCTURE (C-60: EKA BHU'MYA'DI VIDIH)

In the 59th chapter the directions for construction of spouts and other elements of the building are detailed. And in this 60th chapter of the 'Ka'mika Agama' we see the features of single storeyed and multi-storeyed super structures.

*laks''n.am ekabhu'ya'der vis'es''en.a nigadyate /
harmyata'ra tribha'gaika bhu'ta'ms'es''u gun.a'ms'akam //
dha'tubha'ge yuga'ms'am tu ba'n.a'ms'am nava bha'gake /
rudra'ms'e rasa bha'gam tu vis'va'ms'e saptabha'gakam //
tithyams'e vasubha'gam tu sapta'das'a nava'ms'akam /
vista'ra'rdham tatsarvam na'li'gr'ham iti smr'tam //*

Now, the features of the single storeyed and multi storeyed super structures are detailed here. The length of the temple should be taken as reference unit. One part out of three parts, three parts out of five parts, four parts out of seven parts, five out of nine parts, six out of eleven parts, seven out of thirteen parts, eight parts out of fifteen parts, nine out of seventeen parts of the length may be taken to be the height of the super structure. For all these, the width should be maintained as half the width of the temple. This kind of super structure is known as 'Nali Grugam'

*eka dvitricatus''pan''ca s''ad'ams'astveka bhu'mikam /
tricatus''pan''cama'tram tu pa'davis''kambha is''yate //*

The single storeyed structure may be in the proportionate measure of 1, 2, 3, 4, 5 or 6 parts of the reference unit. The thickness of the pillars for this may be with 3, 4, or 5 sub-units.

*ekabha'gam adhis''t'ha'nam pa'da dairghyam dvibha'gatah |
prastaras'caiha bha'gassya't kan.t'hastvekena ki'rtitam ||
s'ikharasya dvibha'gena sthu'pirekena ki'rtitah |
vr'ttakan.t'ha s'iroyukatam vijayam na'mato bhavet ||*

The base should be with a measurement of 1 part; 2 parts for the height of the pillar; 1 part for the lower entablature; 1 part for the attic(kantha); 2 parts for the spire and 1 part for the dome(stupi). The structure should be associated with circular attic and finial. This kind of superstructure is known as Vijaya.

The same structure with some alterations becomes as below-

Sribhogam - provided with corner towers
Srivisalam - provided with projection in its middle
Svastibandhanam - associated with 8-sided finial and neck(dado)
Srikaram - associated with 4-sided finial and neck.
Hastiprushta - provided with finial and neck in the form of two sided circle(apsidal)
Skandakantam - provided with hexagonal neck and finial
Kesaram - associated with projection in the middle, with corner towers at the top, with elongated mini-structures, projection, niche and finial and neck designed in circular form.

(For kesaram the neck and finial can also be 4-sided, the projection to be provided in the middle may be in 3 parts out of 7 parts, 2 parts out of 5 parts or 1 part out of 6 parts).

Now the the two storeyed super structure the width of the ornamental moulding known as 'saushtika' should be 3 parts out of 7 parts of the height. The length of the elongated structure is 2 parts. The remaining portion should be for the recesses associated with cage-like structure (panjara).

*vima'noccam tu vibhajet as''t'a'vims'ati samkhyaya' || 13
adhis''t'ha'nam tribha'gassya't pa'da's''ad'bha'ga i'rita'h |
tribha'gah prastarah pan''ca bha'gassya'd u'rdhva bha'gatah ||
dvibha'gah prastarah karn.astribha'gah pariki'rtitah |
sa'rdhavedais's'irasthu'piradhyardhena vinirmitah || 15
caturas'ramadhis''t'ha'nam tadvatkandhara mastakam |
catus''ku't' sama'yuktam catus''kos''t'ha samanvitam || 16
ks''udrani'd'am uparyas''t'au na'mnaitat svastikam bhavet |*

If the ascertained height of the super structure is divided into 28 equal parts, the basement takes 3 parts. Pillars take 6 parts. The lower entablature takes 3 parts. The structure above this takes 5 parts. The upper entablature takes 2 parts. The cornice takes 3 parts. The finial takes 4 and a half parts. The dome take 1 and a half parts. The basement should be square. Likewise, the neck and the finial also should be square. It should be provided with 4 square aedicule and 4 elongated aedicule. Above these, there should be 8 small nestlike structures. The super structure designed in this way is called 'Svastikam'

The same structure can be modified as below-

Vipulasundaram - Height of saushatika is decreased, height of elongated structure is increased, with a stereobate(between the entablature and aedicule.)

*amams'a trayam satripa'da'ms'am sa'n'ghrobha'gikam ||
bha'gatraya vitastyantan'ghri prastaram gri'va mastakam |
pa'dodaye das'a'ms'e tu dvitala'di vima'nake ||
antara prastaropetam ku't'as'a'la'ntaram i'ritam |
tadeva kos''t'hakam nimnamunnatam saus''tikam bhavet ||
antaprastaropetam etatkaila'sam ucyate |*

The pillars, entablature, neck, finial and all such members should be built so as to be in the proportionate measures of 1 part, 3 parts, 1 and one-third parts, one and one-fourth parts, 3 parts, one vitasti(half-hasta) in due order. Holding

the height of the pillar to be of 10 parts, the two-storeyed super structure and others should be designed so as to be associated with stereobate, the pinnacle-tower and others.

Kailasa - Height of saushatika is increased, height of elongated structure is decreased, with a stereobate.

Parvata - stereobate, neck and finial are in circular form, so that it is associated with 8 squares, 4 wagon-like roof, ornamented with cage-like niches, with elongated structure, projection in the middle, saushatika with a measure of 2 or 3 modules and variously designed basements, it is called 'parvata'.

Svastikam - same structure as above provided with spire, half-projected elongated structure in all four directions, four-sided finial, four square structures and variously designed basements.

Kalyanam - same structure provided with square aedicule(saushtika), stereobate, recesses and intermediate aedicule(on entablature).

Panjalam - with finial bereft of half projected elongated aedicule and associated with four niches.

Vishnukantam - same structure, provided with eight-sided lower base, neck and finial, pitcher-like design and the finial associated with eight great niches.

Sumangalam - with elongated structure and wagonlike roof without recessed stereobate in the form of square(1/4th of its height), lower base, neck and finial designed in rectangular form and provided with 3 domes.

Gandharam - provided with lower base, neck and finial in apsidal form, associated with all kinds of ornamental members.

Hastiprushtam - designed in the square form(width greater than height by half the reference unit), with an apsidal finial, associated with gable and elongated forepart.

Manoharam - same structure, provided with a square base, circular main shrine, designed with all kinds of ornamental mouldings.

Isvarakantakam - circular right from the base up to the top pitcher, all other arrangements are same.

*dvibhu'mirevam a'khyata' tribhu'miradhunocyate |
pra'sa'dasya tu vista're sapta's''t'a'ms'air vibha'jite ||
bha'gena ku't'avista'ram kos''t'ha'd dvigun.a'yatam |
lamba pan''jaram ardha'ms'am ha'rabha'gam tu tatsamam ||*

This the features of two-storeyed super structure have been told. Now the features of the three-storeyed super structure are detailed. If the width of the temple is divided into 7 or 8 equal parts, the width of the square aedicule should be of one part. The elongated aedicule may be with a length of 2 or 3 parts. The overhanging niche should be with a width of half a part. The proportionate measure of the dwarf-gallery(on entablature, between aediculae) is the same.

*u'rdhvaks''ma ta're s''ad'bha'ge bha'gah ku't'asya vistarah |
kos''t'hakam dvigun.a'ya'mam ha'ram bha'gena kalpayet ||*

*u'rdhvabhumer dvibha'gena madhyabhadram vidhi'yate |
dan.d'assa'rdha dvidan.d'o va' harmya nirgama is''yate ||*

The width of the square aedicula in the upper storey should be in one part out of 6 parts of the height of this upper storey. The length of the elongated aedicula should be twice this width. The dwarf-gallery should occupy one part. The projection at the center should be of 2 parts in length, in this upper storey. The projection of this storey is desired to be with a measure of 1, one and a half or 2 modules.

*vima'noccam tu vibhajet caturvims'ati samkhyaya' |
dhra'talam dvibha'gena caturbhih pa'da i'ritah ||
dvibha'gah prastarah pa'das satripa'da gun.a'ms'akaih |
prastaras sa'rdha bha'gassya'd bha'gassa'rdha tribha'gakah ||
sapa'da bha'go man''cassya't sa'rdhakam kan.t'ham i'ritam |
s'ikharam sa'rdhabandham sya'd ekena sthu'pika'bhavet ||*

If the height of the vimana is divided into 24 equal parts, the height of the

basement takes 2 parts; height of the pillars 4 parts; entablature 2 parts; pillars above this 3 and three-fourth parts; upper entablature one and one half parts; pillats above this 3 and half parts; again, the entablature above this takes one and one-fourth parts; the neck part takes one and a half parts; the finial takes 3 and a half parts and the dome takes 1 part.

*ku't'am kos''t'ham ca ni'd'am ca vasu samkhya' sami'ritam |
janma'di sthu'pika'ntam tu veda's'rakam iti smr'tam ||
dviti'ya ca tr'ti'ye ca cakra ni'd'a'stu s''od'as'a |
yatha's'obham tatha' na'syas sarvatra pariki'rtitah ||
s'ikhare ti maha'na'syas' catas'rah pariki'rtitah |
kos''t'hakam connatam ku't'am nimnam antara pan''cakam ||
vima'na'kr'tikam na'mna' sarva'lan'ka'ra samyutam |*

There should be 8 square aediculae, 8 elongated aediculae and 8 niches. From the basement to the dome, it should be four-sided. In the second and the third storeys, there should be 16 niches rendered in small size. In all directions, vestibules should be provided in a pattern which could enhance the beauty of the structure. Around the finial, there should be four larger vestibules. The elongated aediculae should be with increased height and the square aediculae should be in decreased height with reference to the stereobate between the entablature and aeiculae. The whole structure should be provided with all sorts of ornamental mouldings. Such super structure is called 'Vimanakruti'.

*caturbha'gadhika'ya'mam vista'ram parikalpayet ||
vista're caturbha'ga'ssyura'ya'me dva'das'a'ms'akam |
tadvista'rordhva ma'nena vartulam vartani'yakam ||*

The length should be taken to be greater than the width by 4 parts. The width of the super structure if four parts of the total width and the length is twelve parts of the total length. The circular design should be based on the measure greater than the measure of the width.

*masu'rika'cchikharontam tu dvyams'a vr'ttam tu ka'rayet |
athva' s'ikharam kan.t'ham dvyas'ravr'ttam nayed dvija'h ||*

The portion from the base upto the cupola, the apsidal structure should be constructed. Or, o, the twice-born sages!, the lower part of the finial may be designed so as to be apsodal.

Below the above mentioned structure there should be a square. Base should be apsidalapsidal design should be provided in front of the two sides and the back. The width of the square, elongated aedicule should be twice the width. The dwarf gallery should occupy one part. Four large vestibules in the apex portion, the square aedicule should be higher than the elongated aedicule and the stereobate should be with reduced height. This three storeyed construction is called 'Svastikam'.

*ta're saptanava'ms'e tu bha'gassaus''t'ika vistarah ||
s'a'la'ya'mas tatha' dvyams'o ha'ram bha'gena kalpayet |
as''t'aku't'am tu tatkos''t'ham dva'das'aiva vidhi'yate ||
as''t'ni'd'a'ni na'd'yassur ni'd'am s'obha'vas'ena tu |
as''t'a's'ra mastakam vedi kandharam ca's''t'na'sikam ||
vimala'kr'tikam na'mna' sarva'lan'ka'ra samyutam |*

If the height of the building is divided into 27 equal parts, the width of saushtika should be one part. There should be 8 square and 12 elongated aediculae. Also there should be 8 niches and 8 facades. Or, the number of the niches may be as desided in view of the consummate beauty of the structure. The apex part, stereobate and the attic should be octagonal. It should be provided with 8 vestibules. Such construction associated with all kinds of ornamental mouldings is known as 'Vimalakrutikam'.

*caturbha'ga'dhikam ya'mam vista'ra't parikalpayet ||
vista're vasubha'ga'ssyura'ya'me dva'das'a'ms'akah |
tadvista'ra'rdhama'nena vartulam vartani'yakam ||*

The length should be taken to be greater than the width by four parts. The width of the super structure is eight parts of the total width and the length is twelve parts of the total length. The circular design should be based on the measure greater than the measure of the width.

From base to cupola the apsidal structure should be constructed or the lower part of the finial may also be designed so as to be apsidal andbase the structure below that is square. Base should be apsidal. Width of the square aedicule, elongated aedicule, the niches and the dwarf gallery should occupy 1 part each. The length of the elongated aedicule should be twice the width.

*s''ad'bha'ga'ssyustadu'rdhve tu pr's''t'hatastasya pa'rs'vayoh |
kr'tvarkadvigun.a'ms'am tu ku't'a kos''t'ha'di pu'rvavat ||
u'rdhva bhaumam caturbha'gam yatha'yukti vas'a'nnayet |
mastake purato netram s'a'la'vaktra samanvitam ||*

Above this, six parts should be taken for the construction of the upper designs in the back side and the two sides. The height should be divided into 24 equal parts and the square aedicula, elongated aedicula and other such designs should be constructed as explained before. The upper storey should occupy 4 parts and the apportioning of the height should be done according to the pattern of the whole building. In the apex part, there should be façade in the front and it should be provided with wagon-like roof and porch.

*garbha ku't'opa samyuktam ks''udrana'si vibhu's''itam |
ku't'a kos''t'hayutam va'tha tadvihini'nam tu va' nayet ||
s'ikhare dabhrana'syassus tisrah pa'dasamanvita'h |
as''t'aku't'am tu tatkos''t'ham ni'd'am dva'das'a eva ca ||*

It should be provided with a central lantern(of the sanctum) and ornamented with small niches. It may be with or without square and elongated aediculae. In the apex part, there should be three small niches associated with dwarf pil-

lars. This apex part should be provided with eight square aediculae and eight elongated aediculae and twelve false dormer windows.

There should be 24 small niches around the dwarf gallery. All the storeys may be provided with such dwarf galleries. Such construction is called 'Hastiprushtam'.

*vista'ra'stvas''t'a bha'ga'ssyur a'ya'mo das'abha'gikah ||
ku't'am kos''t'ham ca ni'd'am ca bha'gena parikalpayet |
ha'rabha'gam tu bha'gena s''ad'ams'an''cordhva bhu'mike ||
tadurdhve tu caturbha'ga a'ya'mo as''t'a'ms'a adhikah |
sa'yatam dvyas'ra vr'ttam sya'd vedika' galamastakam ||
ku't'a kos''t'ha'di sarva'n'gam pu'rvavat parikalpayet |
etaddhastadhikam saudham gajapr's''t'ham pura'tanam ||*

In the super structure whose width is 8 parts and length 10 parts, the square and elongated aediculae and the niches should occupy 1 part each. The place for the dwarf gallery should occupy one part. The upper storey should take 6 parts. Above this, the width should be of 4 parts and the length should be greater than 6 parts. The srerebate should be rectangular and the neck and the apex should be apsidal. In this part, the square and elongated aediculae and all other members should be provided in a manner explained before. This kind of structure designed after the hind side of the elephant is known as 'Gajaprushtam' which is preferred better, right from the very old period.

*navadha' bha'jite ta're garbhageham tribha'gatah |
bha'gato gr'hapin.d't' syat kandharam va'ms'ato bhavet ||
ams'ena'ndha'rika' kn''eya' saus''t'ikam va'ms'ato bhavet |
tribha'gah kos:t'haka'ya'mas sa'rdhato ni'd'a vistarah ||*

If the width of the temple is divided into 9 equal parts, the width of the main shrine takes 3 parts. One part goes to the thickness of the wall surrounding the main shrine. The neck portion takes one part. One part goes to the thickness of the square aedicula known as saushtika. The length of the elongated

aedacula should be of 3 parts and the width of the niche should be of one and a half parts.

*kos”t’hamadhye tridan.d’ena na’d’i’nirgamana’nvitah |
u’rdhvaks”mepi s”ad’ams’a’ms’am ku’t’am taddvigun.a’yatam ||
kos”t’habha’ga gato ha’rah pan”jarairan”jito bhavet |
u’rdhvbhu’mau tribha’gena madhye dan.d’ena nirgatah || 71*

The projection of the niche takes a measure of 3 modules in the middle of the elongated aedacula. Even in the upper storey, the square aedacula should be of 6 parts. Twice this measure should be the length of the elongated aedacula. The surrounding dwarf gallery should be embellished with cage-like mouldings. In the middle of the third part of the upper storey, the projection should be with a measure of one module.

*a’dautalam catus”karn.e ku’t’am veda’s’ramastake |
as”t’a’s’ram u’rdhvbhu’mau tu saus”t’ika’na’m tu mastakam |.
caturas’ram adhis”t’ha’nam vasvas’ragala mastakam |
as”t’aku’t’am tatha’ kos”t’ham ni’d’akam ca tatha’ bhavet ||
ks”udrani’d’am tatha’pyas”t’au ca’s”tausyur galana’sikah |
bhadrakos”t’ham idam na’mna’ sarva’lan’ka’ra samyutam ||*

In the first storey, the four corner structures should be provided with four-sided spire. In the upper storey, the spire of the saushtika should be eight-sided. The base should be square. The neck and the apex should be eight-sided. The square and the elongated aediculae and the niches should be in the count of eight. The small niches and the vestibules to be provided in the neck part also should be in the count of eight. Such structure associated with all sorts of ornamental mouldings is called ‘bhadrakoshtam’.

Vrutakutam – same structure with circular corner towers in each successive upper storey, associated with circular spire having 4 niche around and associated with ornamental mouldings.

Sumangalam – same structure, in the form of square with side width measuring 8 parts, square corner towers are provided with apsidal apex, associated with 3 pinnacles. (may be without elongated aedacula and projection).

*pan”ca’das’akaram vya’sam das’abha’gena yojayet ||
garbhageham caturbha’gam ga’ndha’ryams’ena ki’rtita’h |
alindramams’amams’ena khan.d’aharmyam bahis”krama’t ||
karn.amadhye antaram kurya’t ku’t’akos”t’haka pan”jaram |
bha’gena kos”t’haka’ ya’mam dvigun.am sammatam budha’h ||*

Taking the width to be of 15 hastas, it should be divided into 10 equal parts. Out of these eight parts, the sanctum sanctorum occupies four parts. Its roof(apex) should be designed to be with a measure of one part. Its aisle should occupy one part. The engaged structure should be designed in the outer side in the recommended order, between the corner structures, there should be a recessed groove, square aedacula, elongated aedacula and cage-like niche. The elongated aedacula should be with a width of 1 part and a length of 2 parts. O, the learned sages!, this measure has been agreed by the experts.

*u’rdhvbhu’mau rasa’ms’e tu bha’gassaus”t’ika vistarah |
kos”t’hakam dvigun.a’ya’mam ha’ram bha’gena yojayet ||
tadu’rdhve ca caturbha’ge bha’ge madhyena nirgamah |
dan.d’ena’dhyardha dan.d’ena dvidan.d’ena’thava’ bhavet ||*

*caturas’ram adhis”t’ha’nam tadvat kandhara mastakam |
vasu ku’t’am tatha’ ni’d’am kos”t’hakam ca tathaiva ca ||*

In the upper storeys, the width of the square aedacula(saushtika) should be maintained at one part out of six parts of the width of the floor. The length of the elongated aedacula should be twice this measure. The dwarf gallery should be of one part. Above this, the projection at the middle should be of one part out of four parts of the width. Or, its width may be one, one and a half or two modules. The base should be square. Likewise, the neck and the apex also should be square. The square aedacula, elongated aedacula and niches – all these should be in the count of eight.

*u’rdhve as”t’au lambani’d’a’ssyur jalasthala samanvitam |
na’sika’dyan’ga samyuktam sarva’vayava samyutam ||
unnatau ku’t’akos”t’au ced antaraprastara’nvitau |
evam ga’ndha’ram atroktam as”t’a’s’ram va’galam s’irah ||*

Above this, there should be eight overhanging niches associated with gutter. It should be provided with architectural members such as niches and others and with all essential parts. If the square and elongated aediculae are with increased height, then there should be a stereobate between entablature and the aedicule above. The neck and the apex may be octagonal. Such construction is called ‘Gandharam’.

Sribhogam – Same structure as above, provided with low base, neck and apex – all in circular form.

The learned architect should decide upon the proportionate measures in such a way that they render elegance strength to the whole structure.

*vaks”ye atha munays’s’res”t’a’s’ caturbhauma nikananam |
tricatus”pan”ca hasta’dir dvidvyan’gula vivardhana’t ||
ekavims’ati hasa’nto vya’satun’gastu pu’rvavat |
trayodas’akara vya’sam as”t’adha’ vibhajet tatah ||
eka’ms’ah ku’t’a vista’rah s’a’la’ya’mo dvibha’gatah |
bha’gah pan”jara vista’ro bhavedyrdhvam atho as”t’adha’ ||
pra’gvadeva sabha’s’a’la’ pan”jara’n.a’m tu kalpanam |
u’rdhvr s”ad’ams’a bha’gena ku’t’avista’ra i’ritah ||
dvibha’gak kos”t’ka’ya’mo ni’d’am bha’gordhvamis”yate |
u’rdhve gun.a’ms’a bha’gena bhadro dan.d’ena madhyame ||*

O, the excellent among the sages!, now I will detail the features of the four-storeyed super structure. Beginning from three, four or five hastas and increasing by two angulas each time, the width of the basement level could reach the maximum of 21 hastas. The height should be determined based on the width

as explained before. If the width is 13 hastas, it should be divided into 8 equal parts. Out of these, one part goes to the width of the square aedacula. The length of wagon line structure takes 2 parts. The cage-like niche should be with a width of one part. The portion above this should be taken to be of 8 parts. Based on this, the square and elongated aediculae and the niches should be designed to be proportionate to each other as done before. Above this, the width of the square aedacula should be determined so as to be in proportion to the units of 6 parts. The length of the elongated aedacula should be twice this width. The width of the niche should be slightly greater than one part. In the upper storey, the projection should be designed at the middle with a measure of one module corresponding to three parts.

*uccam yadvibhajeddha’mno navatrimis’ati samkhyaya’ |
sa’rdhadvyams’am adhis”t’ha’nam pan”ca’ms’ah pa’dadairghyatah ||
tasya’rdha prastarotsedhas satripa’da yuga’ms’akaih |
u’rdhvbhu’myan’ghrikotsedhas sapa’da dvyams’mams’akam || 96
jan’gha ca dvigun.am cordhve dvyams’ena prastarodayah |
bha’ga’dhika caturbha’ga uparis”t’atsvatun’gata’ || 97
sya’tsatribha’ga bha’gena prastaro vedika’ms’atah |
galoccam as’vini’ bha’gam sa’rdhavedais’s’iro bhavet || 98*

If the total height of the temple is divided into 39 equal parts, two and a half parts are for the base; the height of the pillars takes 5 parts; the height of the entablature takes two and a half parts; the height of the pillars of the upper storey takes four and three-fourth parts; the mouldings of the pillars(cyma and recess) takes two and one fourth parts and one part; the height of the pilasters takes twice this measure; above this, the height of the entablature takes 2 parts; above this, other architectural members take the height greater than one part and four parts with reference to the total height of the edifice; the height of the entablature, stereobate and spire takes one part out of three parts; the height of the neck takes two parts and the height of the apex structure takes four and a half parts.

*s'es"abha'gais's'ikha'ma'nam harmya'ntam caturas'rakam /
ravisamkhya' bhavetsaus"t' kos"t'ham tadvat sapan"jaram //*

*s'ikhare vedana'sa'ssyuralpana'syas tathaiva ca /
sarva'lan'ka'ra samyuktam etaddharmyam subhadrakam //*

The remaining parts are for the height of the pinnacle. The design should be in the form of square up to the flat roof. The square and elongated aediculae, inches, projected square aedicula and the cage-like niches – all these should be in the count of 12. Around the top portion of the apex, there should be four larger vestibules and four smaller vestibules. It should be provided with all sorts of ornamental designs. Such construction is known as 'Subhadrakam'.

Srivilakam - same structure, square and elongated aediculae in the middle of each storey, lower part of the apex should be square and upper part should be circular. Central passage of width half of the total width of the vimana. Remaining part surrounded by wall of thickness of 2 parts. Aisle and exterior wall of the aisle also should be of the same thickness.

pan"ca'das'akara vya'se navdha' bha'jite sati //
*garbhageham tribhirbha'gair gr'hapin.d'astadams'atah /
alindam parito ams'ena khan.d'aharmyam atha'ms'atah //*

If the width settled at 15 hastas is divided into nine equal parts, the width of the main shrine occupies 3 parts. The thickness of the surrounding wall takes one part. Around this there should be aisle occupying one part and the width of engaged structure takes one part.

*ku't'kos"t'haka ni'd'a'na'm bha'genaikena vistarah /
vista'ra dvigun.aya'mah svavya'sa samanirgamah //*
*s'a'la'mdhye haha'na'si' bha'gamadhya vinirgamah /
bhadra kos"t'haka ni'd'a'na'm antara'rdhena bha'rakam //*
*tadu'rdhvr vasubha'ge tu bha'gamat't'asya vistaram /
kos"t'hakasya tu vista'ras tathaiva pariki'rtitah //*
*a'ya'mastu dvibha'gena tanmadhye ni'd'am ams'atah /
tadu'rdhvr rasabha'ge tu ku't'am ams'ena kos"t'hakam //*

The width of the square and elongated aediculae and the niches should be taken as one part. The length of the elongated aedicula should be twice its width. The projection should be with a measure equal to its width. In the middle of the wagon-like roof, there should be a larger vestibule and a proportionate projection in its central part. There should be a supportive beam whose measure should be half of the stereobate above the entablature and the projection, aedicula and niches are to be provided. Above these, if the height of the upper level is divided into 6 equal parts, the width of the minor cross-beam takes one part. It is directed that the width of the elongated aediculae at this level should be equal to this measure. The length should be twice the width and a niche should be at its middle. Above this arrangement, if the height is considered to be of 6 parts, the square and elongated aediculae should be designed so as to occupy one part each.

*vista'ra dvigun.a'ya'mas tanmadhye ardhena pan"jaram /
u'rdhvabhu'mis'caturbha'go madhye dan.d'ena nirgamah //*
*as"t'a's'ram karn.aku't'amsya't kos"t'hakam kartari'kr'tam /
mahas'ikharam as"t'a's'ram as"t'ana'sya' vibhu's"itam //*
*ku't'a kos"t'haka ni'd'na'm samkhya' pu'rvad i'rita' /
asya'pyutsedha bha'gam tu pu'rvavat parikalpayet //*
bhadra kos"t'ham idam na'mna' vedabhaumam divaukasa'm /

The length should be twice the width and in its middle, a cage-like niche should be provided so as to occupy half a part. Keeping the upper storey to be

of 4 parts, a projection should be designed with a measure of one module. The corner towers should be octagonal and the elongated structures should be rendered crosswise. The greater the pinnacle should be octagonal and it should be ornamented with eight niches the number of the square and elongated aediculae and that of the niches is as said before. Even the higher part of this storey should be designed as explained before, such four-storeyed super construction which is pleasing to the groups of celestial beings is called 'Bhadrakoshtam'.

sapta'das'akara vya'sam das'abha'gair vibha'jayet //
*na'ligeham caturbha'gam bha'gena'ndha'rika'm nayet /
parito alindam ams'ena paritah khan.d'aharmyakam //*

Holding the width to be 17 hastas, it should be divided into 10 equal parts. Out of these 10 parts, 4 parts are for the main shrine. The aisle should occupy one part. The outside wall of the aisle should be with a thickness of one part. Around this should be the sectional structure.

*ku't'a kos"t'haka ni'd'a's'ca bha'gena parikalpayet /
s'a'la'ya'mo dvibha'gassya'd ha'rah s'es"en.a ki'rita' //*
*jalam viha'ya cordhve ca vasubha'gair vibha'jite /
bha'gena saus"t'i bha'ga'bhya'm s'ala'bha'gena pan"jaram //*
*tadu'rdhve rasabha'ge tu bha'gas saus"t'ika vistarah /
dvigun.ah kos"t'haka'ya'mo ha'ra'ya' ms"udrapan"jaram //*

The square and the elongated aediculae and the niches should occupy one part each. The length of the wagon-like structure takes 2 parts. The remaining part is for the exterior wall of the aisle. Leaving out the gutter, if the upper portion is divided into 10 equal parts, then the square and projected aediculae should occupy one part, the length of wagon-like structure takes 2 parts and the cage-like niche takes one part. Above this, if the upper storey is held to be of 6 parts, the width of the square and projected aedicula should occupy one part. The length of the elongated aedicula occupies 2 parts and the dwarf gallery and the smaller cage-like niche should be with a width occupying one part each.

*tadu'rdhvr tu tribha'ge tu madhya'd dan.d'ena nirgamah /
caturas'ram adhis"t'ha'nam as"t'a's'ram mastakam galam //*
*ravi kos"t'ham tatha' s'a'la' pan"jara'n.a'm atha's"t'akam /
lambapan"jaram as"t'au hi ks"udrani'd'am dviras"t'akam //*
*galana'sa's"t'a samyuktam kos"t'hakam kin"cid unnatam /
na'na'masu'rakastambha vedija'la'di man.d'itam //*
*sopapi't'ham adhis"t'ha'nam kevalam va' masu'rakam /
svastika'ka'ra samyuktam na'sika'bhis'ca samyutam //*
pu'rvavat tun'gabha'gam sya'd etanna'mna'jala'vaham /

Above this, in the upper storey, a projection should be designed in the middle so as to occupy one module. The base should be square and the neck and the apex should be octagonal. There should be 12 elongated aediculae and 12 wagon-like structures and 8 cage-like niches. Also, there should be 8 overhanging niches and 16 smaller niches. The vestibules around the neck should be in the count of 8. The elongated aedicula should be with a height slightly increased. The whole structure should be embellished with differently formed base, pillars, stereobate, gutter and other ornamental members. The base should be provided with pedestal or the base may without the pedestal. The structure should be arranged in the form of svastika associated with sufficient niches. The height of the structure should be ascertained as explained before. Such construction is called 'Jalavaham'.

navapan'ktikara vya'se das'abha'ga vibha'jite //
*garbhava'sas' caturbha'go bha'gena gr'hapin.d'ika' /
kandharam parito ams'ena paritah khan.d'aharmyakam //*
*ku't'akos"t'haka ni'd'a'na'm vista'ro bha'ga eva hi /
dvyams'ena kos"t'haka'ya'mo ha'ra' bha'gena sammatam //*

If the width of the temple is settled at 19 hastas and if it is divided into 10 equal parts, then the width of the main shrine takes 4 parts. The surrounding wall of this main shrine occupies one part. Around this, the width of the aisle takes one part. The sectional structure occupies one part. The width of the square

and elongated aediculae and that of the niche takes one part each. The length of the elongated aedicula takes 2 parts. The thickness of the exterior wall of the aisle occupies one part.

*ku't'akos"t'hakam ca ni'd'am ca'va'ntaraprastara'nvitam |
jalasthalam viha'yordhve ca's"t'a'ms'am saus"t'ikam bhavet |
tatha'dvigun.a s'a'la' sya't tayormadhye tu pan"jaram |
tadu'rdhve rasabha'ge tu ku't'a kos"t'ha'di pu'rvavat ||
vijayasya tatha' proktam s'es"am u'rdhve tu yojayet |
ku't'a kos"t'ha'di sarva'n'gam pu'rvavat samkhyaya' viduh ||
maha'ni'd'am dviras"t'a'ssyur na'mnaitad bhadra ku't'kam |*

This should be provided with square and elongated aediculae, niches and ste-reobate between the entablature and upper aediculae. Leaving out the gutter, the portion above this should be provided with saushtika so as to occupy 8 units. The length of the wagon-like structure(sala) occupies 16 units. Between the sala and the saushtika, a cage-like niche should be provided. Above this, the square and elongated aediculae and other structures should be provided to cover a range of 6 parts. All other architectural members should be constructed in the upper portions. The number of all the structural parts such as square and elongated aediculae and others should be in the same count as mentioned before. The number of the large vestibules which are to be provided here is 16 such construction is called 'bhadrakuntam'.

Manoharam - the same structure modified with different embellishments, A projection in the middle of elongated aedicula, a string course added to neck part .

Avantikam - The same structure, further modified with different ornamental structures, neck part and pinnacle designed to be square. (foremost for Siva temple)

*trisaptahasta vista're das'abha'ga vibha'jite ||
veda'ms'e garbhageham sya'dams'ena gr'hapin.d'ika' |
andha'ra'ms'ena bha'gena man'gala'n'gam prakalpayet ||*

If the width of the temple is taken to be 21 hastas and if it is divided into 10 equal parts, the main shrine occupies 4 parts. The surrounding wall occupies one part. The auspicious part known as the aisle should be designed so as to occupy one part.

The square aediculae, elongated aediculae, niches and other embellishments and structures are provided as explained before.

*u'rdhvbhu'mis"s"ad'ams'a' sya'd bha'gas saus"t'ika vistarah |
s'a'la'ya'mo dvibha'gena ni'd'a ta'rordhva bha'gatah || 133
u'rdhvbhu'mi dvibha'gen madhyabhadro vidhi'yate |
dan.d'ena nirgamas tasya sa'rdha dan.d'a dvayena tu || 134*

If the width of the upper floor is divided into 6 equal parts, the width of saushtika occupies one part. The length of the wagon-like structure takes 2 parts. The height of the niches should be in proportion to the units of the upper portion. The central projection should cover the measure of 2 parts of the upper storey. The side projections should be with a measure of one, one and a half or two modules.

*gri'vana'd'i' vis'a'la' sya'd vr'ttavedi samanvitam |
vr'tta'bha s'ikharagri'va maha'na'si' catus"t'ayam ||
alpa's"t'a na'sikopetam asyamu'la tale dvija'h |
samam cottun'ga s'ikharam ku't'a kos"t'haka ni'd'akam ||*

The attic and the spout should be with sufficient and proportionate measurements. The structure should be provided with circular basement. Around the circular neck and the circular pinnacle, there should be 4 large vestibules. O, the twice-born sages!, the floor at the ground level should be associated with 8 small niches. The apex, square aedicula, elongated aedicula and the nich should be with equal height.

4.14. CHARACTERISTICS OF TEMPLE ENCLOSURES (C-71: PRAKA'RA LAKS'AN.A VIDIH)

This is the 71st chapter in this Agama which explains the details of the temple enclosures.

*atha vakṣye viśeṣeṇa prākārāṇāṃ tu lakṣaṇam |
prāsādasya viśālārdhaṃ daṇḍamityabhidhīyate ||
ekadvitricatuṣpañca daṇḍairmadhyāt samantataḥ |
ekaprākāraḥ kṛtistu pañcadhā parikīrtitā ||*

Now, with all the specific details I will tell you the characteristics of the enclosures. Half the width of the temple is considered to be one pole (danda) for the purpose of calculation the proportionate measurements. With an interspace of one, two, three, four and five poles from the central shrine, a single enclosure may be constructed. Thus, a single enclosure gets formed in five different ways (interspace means the distance between the wall of the main shrine and the wall of the first enclosure).

*mūlālaya viśāle tu tridhā bhakte padaṃ bhavet |
tena bhāgena tadbāhye dviguṇaṃ triguṇaṃ tu vāl |
triciturguṇikaṃ cāpi catuṣpañcaguṇaṃ tu vāl |
pañcaṣaḍguṇamiṣṭāṇi ca prākāradvaya kalpanam ||
evaṃ caturvidhaṃ proktaṃ triprākāraṣtu kathiyate |*

If the width of the main temple is divided into three equal parts, one part is considered to be one grid (pada). Keeping the pada as the basic unit, the interspace of the first enclosure should be held to be 2 padas and that of the second enclosure to be 3 padas from the first enclosure. In an increasing pattern, interspace of the first enclosure 3 padas and that of the second enclosure 4 padas. Interspace of the first enclosure 4 padas and that of the second enclosure 5 padas. The interspace of the first enclosure 5 padas and that of the second enclosure 6 padas. In this way two enclosures may be formed with four different sets of interspace. Next, the designing of the three enclosures is explained.

*prāsādasya caturbhāge yastu daṇḍamihocyate ||
tasya dvitricaturbhāgaiḥ tricatuṣpañcabhistathā |
catuṣpañca ṣaḍamīśaistu pañcaṣaṭsaptabhistathā ||
ṣaṭsaptāṣṭabhiruddiṣṭāṇi triprākāra pramāṇakam |
pañcadhā kathitaṃ veda prākāraṃ śṛṅguta dvijāḥ ||*

If the width of the temple is divided into 4 equal parts, one part is considered to be one pole (danda). The interspace of the first, the second and the third enclosure may be 2, 3 and 4 poles respectively; or 3, 4 and 5 poles; or 4, 5 and 6 poles; or 5, 6 and 7 poles; or 6, 7 and 8 poles. In this way, three enclosures are formed with 5 different sets of interspace. O, the twice-born sages!, now listen to the designing of the four enclosures.

*triprākārasya bāhye tu ekaikāṅgula vardhanāt |
navabhāgāvasānaṃ tu samantāparivardhayet ||
evaṃ pañcavidhaṃ proktaṃ catuṣprākāra mānakam |
evaṃ catuṣprākāro'pi prāsādasya viśālakam ||
samastāni cārdhamānaṃ ca triciturabhāga mānakam |
daṇḍārdhaṃ yojayeddhīmān hastamānena cocyatet ||*

On adding one pole to each set of the three enclosure interspaces mentioned for the three enclosures to reach the maximum of 9 poles, five different sets of interspace for the four enclosures are obtained. 2, 3, 4 and 5 poles; 3, 4, 5 and 6 poles; 4, 5, 6 and 7 poles; 5, 6, 7 and 8 poles; 6, 7, 8 and 9 poles. In this way, the proportionate measures of the four enclosures are obtained in 5 different ways. All of these four enclosures are based on the width of the main temple. All such enclosures may be with an interspace arrived in terms of half part, three parts, four parts or half a pole. The interspace is to be determined in this way by the experts. Now, the interspace of the enclosures based on the hasta-unit is explained.

*dvihastādekavṛddhyā tu navahastāvasānakam |
eka prākāramānaṃ tu kṣudrāṅgāni aṣṭadhā matam ||*

Starting from 2 hastas and increasing by 1 hasta each time so as to reach up to 9 hastas, eight different interspaces are obtained for a single enclosure applicable to a small temple.

*dvihastaṃ ca trihastāni ca triciturhastameva vāl |
catuṣpañcakaraṃ caiva pañcaṣaṭkarameva ca ||
ṣaṭsaptāṣṭakaraṃ caiva aṣṭanandaṃ tathaiva ca |
nanda dīrghāṣṭakaraṃ caiva dviprākāra pramāṇakam ||
asmādeka kararddhyā tu rudra hastāntameva ca |
triprākāra pramāṇaṃ tu veda prākāraṃ tathā | |
ekaika hasta vṛddhya tu ravihastāvasānakam |
catuṣprākāra mānaṃ tu kṣudrāṅgāni prakīrtitam ||*

2 hastas, 3 hastas; 3 hastas, 4 hastas; 4 hastas, 5 hastas; 5 hastas, 6 hastas; 6 hastas, 7 hastas; 7 hastas, 8 hastas; 8 hastas, 9 hastas; 9 hastas, 10 hastas – these are the interspaces for the second enclosure, obtained in 8 sets. 2, 3 and 4 hastas; 3, 4 and 5 hastas; 4, 5 and 6 hastas; 5, 6 and 7 hastas; 6, 7 and 8 hastas; 7, 8 and 9 hastas; 8, 9 and 10 hastas; 8, 9 and 10 hastas; 9, 10 and 11 hastas – in this way the eight different set of interspaces are obtained for the three enclosures. Similarly, eight different sets of interspaces are obtained for the four enclosures. 2, 3, 4 and 5 hastas; 3, 4, 5 and 6 hastas; 4, 5, 6 and 7 hastas; 5, 6, 7 and 8 hastas; 6, 7, 8 and 9 hastas; 7, 8, 9 and 10 hastas; 8, 9, 10 and 11 hastas; 9, 10, 11 and 12 hastas – these are the eight sets of interspaces obtained for the four enclosures.

This above scheme is applicable to jāti, chanda, vikalpa and abhasa categories of temples. This need not be observed for sarvadesika category of the temple. For sama marga and anu marga temples the interspace of the four enclosures – half part, one out of three parts, one out of four parts, 2 parts.

Even for the five, six, seven, eight and nine enclosures, the interspaces of each enclosure may be obtained by hasta and pada units and by adding one unit to the previous set of unit. Firstly, the enclosure should be designed to be with equal sided to form a square. Then, the rectangular enclosure should

be designed so as to be in the front of the main shrine. In case of old temples it can be on the back, left or right sides.

*pādādhikāni athādhyardhani pādonadviguṇāni tu vāl |
dviguṇāni dviguṇārdhani vā triguṇāni ca caturguṇam ||
dvihastaṃ tu samārabhya dvidvihasta vivardhanāt |
yāvappañcaguṇāni tāraṇi mukhāyāmaṇi prakalpayet ||*

Above one fourth, one and a half, one and three fourth, two times two and half times, three times and four times the chosen basic unit may be taken for deciding the length of the enclosure. The length of the rectangular enclosure may be extended from 2 hastas to 10 hastas, increasing the unit by 2 hastas each time.

The interspace of the enclosures may be measured between the interior face of the inner wall and exterior face of the outer wall, or the central lines of the walls. For calculation of aya and other features the measurements are to be done in hasta-units.

*āyāni vasuguṇāni kṛtvā saptaviṃśatibhirharet |
śeṣaṃ ṛkṣaṃ tu vistārāt sakalādvātha kalpayet ||
uktādekamathavāṣṭa guṇitāni bhānubhirbhajet |
āyāni triguṇitāni digbhirmanubhirvibhajet tataḥ ||
vyayastu kathitaśśāstraiḥ dviguṇāni vasubhirharet |
dhvajādi yonayaḥ proktāḥ paryanta trivṃsato bhajet ||
tithiśca kathitā vāro munibhirbhājito bhavet |
mūlaprāsāda hastairvā cānyairvātha nirīkṣayet ||*

L= length, B= breadth and P=Perimeter

NAKSHATRA (STAR-FACTOR)
Remainder from L*8/27

A'YA

Remainder from L*8/12
(OR)
Remainder from B*8/12

VYAYA
Remainder from L*3/8 or B*3/8
(OR)
Remainder from L*3/14 or B*3/14

In some scriptures

Remainder from L*2/8
(OR)
Remainder from B*2/8

TITHI (Lunar day)
Remainder from (P/30)

VA'RA (Week-day)
Remainder from P/7

Such factors should be specifically analysed based on the hasta-unit.

*ekahastāṅ samārabhya caikāṅgula vivardhanāt|
dviḥastāntassamuddiṣṭas sālānāṅ caiva vistaraḥ||
tadvistāra pramāṇena yāvattriṅśadguṇāṅ bhavet|
triguṇāṅ tu samārabhya kṣudre mahatī mandire||
prākārotsedha uddiṣṭo mūlādūnāṅ tadagrataḥ|
ṣaḍaṅśaṅ tu samārabhya yāvat ṣoḍaśa bhāgikam||
tāvatkṛtvā samūlāṅ tu caikāṅśena tadagrakam|*

The width of the enclosure-wall should be from one hasta to 2 hastas, increasing the measure by one digit(angula) each time. The height of the enclosure-wall should be from 3 hastas to 30 hastas for the small temple to the

temple of larger type. The width at the top of the wall should be less than the width at its base. The width of the base should be divided into 6 equal parts to 16 equal parts. Then the width of the wall should be reduced by one part gradually up to te top.

*antassālāṅkaṅgaṅ nīmnaṅ bāhya sālāṅkaṅgaṅ bhavet||
sālānāṅ antare vyāsaṅ bāhye sālāṅkaṅgaṅ bhavet|
aṅguladvayamārabhya caikāṅgula vardhanāt||
navamātrāntakaṅ yāvat pratisālāṅ tu nīmnaṅkam|
ṣaṭpañcavedarudrākṣadvyaṅgulaiḥ parikalpayet||*

The outer courtyard should be lower than the inner courtyard. Each enclosure should be lower than the previous one by 2 digits to 9 digits; increasing the unit by one digit each time. Starting from the inner courtyard, each courtyard should be lower than the previous one by 6, 5, 4, 3 and 2 digits.

This is applicable for all types of temples except for the sarvadesika category and the temples built for the self-manifested linga.

*sālānāmantare'pi syān mālīkā maṅḍapākṛtiḥ|
sabhākṛtirvā kartavyā caikadvitrika bhittibhiḥ||
caturbhittiyutā vāpi ekāneka talānvitā|*

There should be gallery(malika) within the courtyards. The structures which constitute such gallery may be in the shape of pavilion or square hall. They may be with one, two, three or four walls and they may be designed so as to be with single storey or multiple storeys.

*upānāttu samārabhya mūlaprāsāda tuṅgakam||
uttarāntaṅ vibhājyātha saptadhā tu masūrakam|
dvipādaṅ pādadairghyaṅ tu śeṣeṇa parikalpayet||*

The height of the main shrine between its plinth and the upper fillet should be divided into 7 equal parts. Out of these, 2 parts are for the base and 5 parts are for the pilasters. The sthapati should design the walls of the inner struc-

tures(sabha and others).

*mūladhāmnastu pādāṅ tu bhajedvā navasaṅkhyayā|
adhiṣṭhāna dvibhāgena pādāṅ śeṣeṇa kalpayet||
dviḥastam tu samārabhya caikāṅgula vivardhanāt|
saptahastānta utsedhasstambhānāṅ parikṛtitaḥ||
bhittimānaṅ tathaiva syāt kṣudre kṣudra vimānake|*

The height of the pillar of the main shrine should be divided into 9 equal parts. Out of these, the base should be with a height of 2 parts and the pilasters should be with a height of 7 parts. The height of the pilasters should be from 2 hastas to 7 hastas, increasing the height by one digit each time. For temples of the lower type, the inner structures also should be comparatively small. The proportionate measures if the walls if such smaller structures should be decided in the same way.

*paṅśāṅgulaṅ samārabhya cārdhāṅgula vivardhanāt||
caturvīṅśati mātrāntaṅ stambhavistāra iṣyate|
pādoccārdhaṅ adhiṣṭhāna saptamāṣṭa navāṅśakam||
hīnaṅ vāpyadhikaṅ vāpi pādocce'pyevameva hi|
pādocce tricaturbhāgenāthavāpi masūrakam||
pādabandhaṅ sajātīyaṅ adhiṣṭhānaṅ niyojayet|
prastarādi pramāṅgaṅ ca prāsādoktavādācareḥ||*

The width of the pilars should be from 15 digits to 24 digits, increasing the measure by half a digit each time. The height of the base should be half the height of the pilaster; or it may be less than or higher than 7, 8 or 9 divisions of the height. Or, the height of the base may be equal to the height of the pilaster. The base may be with a height of 3 or 4 parts of the height of the pilaster. The upper moulding of the base (pada bandha) should be in the same style as that of the base. The proportionate measures of the entablature and other elements should be decided as prescribed for the temple.

For the inner structures, the rituals such as ‘foundation deposit’ and ‘laying

of the first brick’ should be performed. Similarly rituals like ‘laying of the crowning brick’ and ‘installation of the top nail’ should be done as set forth in this agama.

*antarmaṅḍalamādyāṅ syādantarhārā dviṅyakā|
tṛtīyā madyahārā syān maryādākhyā caturthakā||
mahāmaryādikākhyā ca pañcamī parikṛtitaḥ|
parivārāmarāṅ sarvāṅśatra saṅsthāpayedguruḥ||*

Starting from the center, the first enclosure is called antar mandala. The second enclosure is known as antarahara. The third one is madhyahara. The fourth one is maryadha. The fifth enclosure is knowm=n as maha maryadha. All five enclosures are called in this way. The acharya should install all the retinue deities in these enclosures.

Some details of installation of retinue deities are briefly explained in this chapter. The retinue shrines may be designed so as to be attached to the enclosure-wall. In front of the main shrine in which the Siva Linga is installed, the bull should be installed facing the Lord, a small pavilion should be provided for the Bull. The retinue deities should be instilled in the different padas of the vastu mandala as recommended in this a'gama.

*pañcāṅgulaṅ samārabhya caikāṅgula vivardhanāt
pañcaviṅśati mātrānto vistārādagrapīṭhakell
pādamardhaṅ tripādaṅ vā samaṅ voccaviśālataḥ
dvitivedeṣu ṣaṭsaptabhāgān kṛtvaika bhāgataḥ
ekadvitricatasrasyuḥ mekhalāyāstathoparī
sakarīkaiṅ tu padmaṅ syātkevalā karīkāpi vā
mekhalādviguṅaiṅ padmaṅ triguṅaiṅ vā caturguṅam
padmocaṅ kīrtito veśo mekhalā sadṛśo bhavet
tripādaṅ vā dvipādaṅ vā pādaṅ vā parikalpayet
karīkā mekhalocā vā padmārdhenātha pādataḥ
tripādena vidheyā vā yathā śobhabalena vā
vṛtṭaiṅ vā caturaśraṅ vā kṣudrapīṭhaiṅ tadīritam*

The width of the front altar should be from 5 digit to 25 digits, the increase being one digit each time. Its height should be one quarter, half, three quarters of the width or equal to the width. Having divided the width into 2, 3, 4, 5, 6 or 7 equal parts, the height of the first girdle (step), second, third and fourth girdles should be taken to be of one part out of these divisions. On the top of the altar should be a lotus design associated with pericarp. Or, the pericarp alone may be provided on the top. The height of the lotus should be two, three or four times the height of the girdle. The projected moulding should be with a height equal to the girdle. Or, it may be three quarters, half or one quarter of the height of the girdle. The height of the pericarp should be equal to that of the girdle or equal to half or three quarters of the height of the lotus. Or, the height may be decided so as to render beauty and strength to the pericarp. This altar may be circular or square in shape.

*mahatāṅ pīṭhakānāṅ ca lakṣaṅaiṅ śṛṅgotottamāḥ
padmagarbhā samo vāpi tadadhaḥ pāda eva vā
tadantare'ṣṭabhāge tu navadhā vistaro bhavet
rudramātraṅ samārabhya dvitryaṅgula vivardhanāt
navahasta pramāṅānto mahāpīṭhasya vistaraḥ
vistāra sama utsedhassapādassārdha eva vā
tripādo hyardhamāno vā tattadantarajo'pi vā*

O, the foremost sages!, now listen to the characteristics of the larger altar. The difference between the exact width of the main shrine and one quarter of this width should be divided into 8 equal parts to obtain 9 different widths. The width of the large altar (maha pitha) should be from 11 digits to 9 hastas, the increase being 2 digits or 3 digits. The height of the large altar should be equal to its width or one and one quarter, one and a half, three quarters or half of this width. Or, any measure available in between these divisions is acceptable.

*pīṭhocaṣṣoḍaśāṅśo vā ekabhāgena kīrtitaḥ
pīṭhatāra samo vā syādekadvitryaṅgulonnataḥ
jagatī caturaṅśassyāt tripādaṅ kumudo bhavet
pādena kampaḥ karīastu tripādena prakīrtitaḥ
bhāgenopari kampaśyādvājanaiṅ tu dvibhāgataḥ
bhāgena vājanaiṅ cordhve tadūrdhve padmamiṣyate*

If the height of the large altar is divided into 16 equal parts, the base takes one part. The plinth takes 4 parts. The torous (kumuda) takes three parts. The fillet takes one quarter. The cornice takes three quarters. The fillet above this takes one part. The upper fillet (vajana) takes 2 parts. Another vajana above this one takes one part. Above this, a lotus design should be provided.

*pīṭhākāra samo vā syādekadvitryaṅgulonnataḥ
ṣoḍaśāṣṭāṅśa hīno vā patravistāra iṣyate
tadardho vā tripādo vā svavyāsāduccamiṣyate
taylorantaramānaiṅ tu navadhoccaiṅ bhaveddvijāḥ
padmatāra tribhāgaikā karīkārdhena vā matā
pādamānāntarāṣṭāṅśe navamānaiṅ prakīrtitam
karīkā vistaraḥ proktastattripādassamo'pi vā
ardhamānāntaropetaḥ karīkocchrāya iṣyate*

For the next type of the large altar, the height may be equal to the previous width or it may exceed by 1, 2 or 3 digits. The width may be less than the previous width by 16 or 8 units. In this case, its height may be half or three quarters of this width. If the difference between the maximum height and the minimum height is divided into 8 equal parts, 9 different measures would be obtained for the choice. O, the twice-born sages!, the height of the lotus should be one part out of three parts. The height of the pericarp should be half of this. If the 8 parts of the pilasters are added, 9 kinds of height would be available for the choice. The diameter of the pericarp should be equal to the height or three quarters of the height. The height of the pericarp may be increased by another half unit.

The altar should be well ornamented and with or without the upper pedestal. It may be circular, square, triangle or octagonal in shape.

*prāsādotamadhyāttu pādamadhyā vivarjitam
mūladhāmnāḥ samārabhya vahnidaiṅḍaiṅ vyapohya ca
tatra saṅsthāpayetpīṭhaiṅ tata ārabhya vardhayet
ardhadaiṅḍena pañcāsaddaiṅḍantaiṅ deśikottamaḥ
pīṭhāyāmāntarā hyetad vṛṣapṛṣṭhe'thavā bhavet*

From the center of the foundation wall of the main shrine and avoiding the center of the vastu-grid, the distance should be measured. Leaving out a distance of 3 modules from the main shrine, the altar should be installed. Starting from that point, the foremost Guru should measure the distance by half a module

up to 50 modules. This should be held as the interspace between the inner altar and the outer altar. Or the outer altar may be installed behind the Bull.

The large altar may be installed at different locations like center of enclosures, in between the roads of villages etc., a flight of steps (sopana) which is not joined to the altar may be provided. The Bull, trident and flag-post (dvajas-tambha) are provided with respect to the gateways (gopura) as prescribed in the Agamas.

*āgneyyāṅ tu dhanasthānaiṅ nairṛtyāṅ āyudhālayaḥ
vāyavyā śayanasthānaiṅ aiśānyāṅ kūpamiṣyate
sadāśivādyāssarvatra sthāpanīyāssamantataḥ
indra pāvakayormadhye dhanasthānaiṅ tu vā bhavet*

The treasury-chamber should be in the south-east. The chamber for the weapons of the deities should be in the south-west. The bed-chamber should be in the north-west. The sacred well should be in the north-east. Various images of linga should be installed in all locations around the enclosures. The treasury-chamber may be in between the east and the south-east.

*āgneyyāṅ pacanasthānaiṅ yāgaśālā ca tatra ca
agnikuṅḍaiṅ ca tatra syādyamapāvaka madhyame
puṣpamajjana śālā syāt pānīyasthānameva ca
kāmikādi śivajñānasthānaiṅ yāmyadiśi sthitam
yama rākṣasa madhye tu gandhādi sthānaiṅ iṣyate
nirṛtau puṣpasaiṅsthānaiṅ tadvāme vātha kalpayet*

The kitchen and the pavilion for sacrificial rituals may be in the south-east. Permanent fire-pit may be in between the south-east and the south. Pavilion for flowers, pavilion for the performance of the ceremonial bath, pavilion for the storage of drinkable items, pavilion for the kamika and other Sivajana Sastras – all these should be in the south zone. Pavilion for the grating of the sandal wood and for the preparation of other perfumes should be in between the south and the south east. The storage for the collected flowers may be in the south-west and to the left side of perfume-pavilion.

*dharmasainikīrtanaṁ vātra vāruṇe vā prakalpayet
vāyavye dakṣiṇe vātha jñānakoṣaṁ prakalpayet||
tatra vā śayanasthānaṁ soma vāyvantare'pi vāl
kūpasthānaṁ kubere vā tatpūrve vaiśadeśakell
yāgamaṇḍapaṁ iṣṭaṁ syāttaddakṣe vādyamiṣyatel
aiśānyāṁ śayanasthānaṁ athavā parikalpayet||
taddakṣiṇe vā tatsthānaṁ some vā parikalpayet|
kūpaṁ ca śayanasthānaṁ puṣpamajjana maṇḍapell
madbhaktasthānakaṁ vidyāsthānaṁ vastra suvarṇayoḥ|
devopakaraṇasthānaṁ noktaṁ vistāra bhūruṇā||*

The hall for the disclosures on the dharmas should be in the west. The chamber for treasuring the holy scriptures should be in the north-west or to the right of the north-west. The bed-chamber may be in between the north-west and north. The well may be in the north. To the east of this and in the north-east, there may be the sacrificial pavilion(yaga sala). To the right side of the sacrificial pavilion, there should be the pavilion for the musical instruments. The bed-chamber may also be in the north-east. The bed-chamber may be to the right side of this location or it may be exacty in the north. The alternate locations for the well, bed-chambers, flowers, ceremonial bath, pavilion for the congregation of my devotees, chamber for the study of scriptures, chamber for storing the clothes and gold ornaments, the chamber for keeping the utensils and tools which are used for the deities – all these are not told by me due to the fear of elaborated exposition.

All the locations are decided by the master-patron. The residence for those who maintain the temple are decided in the same way. The house of the acharya nad priests are to be near the temple. The flower gardens and fruit yielding trees may be in all directions around the temple.

4.15. EMPOWERING THE GOPURA (C-75: GOPURASTHA'PANA VIDIH)

In this last and 75th chapter we are told the directions for empowering the gopura(the multi storeyed pyramidal tower structure).

*sthāpanaṁ gopurāṇāṁ ca vakṣye lakṣaṇa pūrvakam|
mūlaprāsāda vistāre saptāṣṭa navabhāgikell
daśaikādaśa bhāge tu tattadekona bhāgataḥ|
dvāraśobhādi mānaṁ syād gopurāntaṁ viśālataḥ||*

I tell you now the direction for empowering the gopura. Before that, I tell you the specific features of the gopuras. There are five types of gopuras raised above the five enclosures –

| | |
|---------------|-----------------------------------|
| Dvara sobha | - Antar mandala (first enclosure) |
| Dvara sala | - Antar hara (second enclosure) |
| Dvara harmya | - Madhya hara (third enclosure) |
| Dvara prasada | - Maryada (fourth enclosure) |
| Dvara gopura | - Maha maryada (fifth enclosure) |

The width of the gopuras should be decided based on the width of the temple. The width of the temple should be divided into 7, 8, 9, 10 and 11 equal parts. One part should be left out in each and the remaining parts should be taken as the width of the gopuras from dvara sobha to dvara gopura in the due order.

*kṣudre'lpe ca taduddiṣṭaṁ madhyamānaṁ vidhīyatel
dhāmni tāre catuṣpaṅca ṣaḍbhāgena vibhājitel|
saptāṣṭadhā kṛte tebhyo vibhāgo gopurāntakaḥ|
dvāraśobhādi vistāraḥ pañcadhā parikīrtitaḥ||
tribhāgaikamathārdhaṁ ca tribhāge tu dvibhāgakam|
caturbhāge tribhāgaṁ ca pañcāṁṣe caturaṁśakam||
jyeṣṭhadhāmnāṁ viśālaṁ syād gopurāntaṁ krameṇa tu|*

This process of deciding the width is applicable to the small and smaller categories of temple. Then the process for the intermediary type of measures is

told. If the width of the temple is divided into 4, 5, 6, 7 and 8 equal parts, then each part corresponds to the width of dvara gopura, dvara prasada, dvara harmya, dvara sala and dvara sobha respectively. One part out of three parts, one and a half part out of three parts, two parts out of three parts, three parts out of four parts, four parts out of five parts – these are the five kinds of width applicable to dvara sobha to dvara gopura belonging to the foremost category of the temple.

*dviastādi dviraṣṭāntaṁ vyomāratni vivṛddhitaḥ||
pratyekaṁ tritrimānaṁ syād gopurāntaṁ viśālataḥ|
ekaviṁśatkarāntaṁ tu triastād dvikavardhanaḥ||
pūrvavattithisaṁkhyātā mānaśobhādi vistare|*

Starting from 2 hastas and reaching up to 16 hastas, increasing by one hasta each time, 15 measures are available. From these 15 measures, width belonging to the foremost, medium and lower category and applicable to the five gopuras from the dvara sobha to dvara gopuracould be decided. Starting from 3 hastas, the architect should increase the measure by 2 hastas each time to reach up to 31 hastas. As before, 15 measures are available and these should be taken for the five types of gopuras considered in three categories – uttama, madhyama and adhama.

*ārabhya nandahastaṁ tu dvidvihasta vivardhanaḥ||
saptaviṁśatkarāntaṁ tu gopurānta viśālataḥ|
tripañcadaśasaptāttu ekahasta vivardhanaḥ||
pañcamānaṁ dviraṣṭābhyāṁ pañcasvekasya sammatam|*

Starting from 9 hastas and increasing by 2 hastas each time so as to go up to 37 hastas, 15 measures are available for the five types of gopuras to be considered in three modes, uttama and others. Starting from 15, 16 and 17 hastas, the measure should be increased by one hasta each time to have five measures in each (15 to 19, 16 to 20 an dso on). Out of three sets of five measures, one set may be taken for the five gopuras.

*anyathā hastamānena vistāraḥ pravindhīyatell
pañcādi viśvastāntaṁ caikaikakara vṛddhitaḥ|
prathamāvaraṇe dvāraśobhā vistāra iṣyatell
tithihastātrayoviṁśatyantāssyurdvāra śālakel
pañcaviṁśati hastāttu trayastriṁśatkarāntakaḥ||
dvāraprāsāda vistāraḥ pañcamahā parikīrtitaḥ|
pañcaviṁśatsamārabhya tricavāriṁśadantataḥ||
dvāraharmya viśālasyān navapaṅca karāditaḥ|
tripañcāśatkarāntaṁ tu viśālo gopurasya tull*

An alternate process for ascertaining the width based on hasta-unit is now told. Starting from 5 hastas and increasing by one hasta each time so as to reach 13 hasstas, 9 kinds of width could be derived for the dvara sobha belonging to the first enclosure(first three for the lower, second three for the medium and the last three for the superior). Increasing by one hasta from 15 hastas to 23 hastas, 9 kinds of width are available for dvara sala. Increasing by one hasta from 25 hastas to 33 hastas, 9 kinds of width are available for dvara harmya. Increasing by one hasta from 35 hastas to 43 hastas, 9 kinds of width are available for dvara prasada. Increasing by one hasta from 45 hastas to 53 hastas, 9 kinds of width are available for dvara gopura.

*sārdhadvipādatriguṇa tryaṁśaikadvyaṁśamāyatel
kalpayed dvāraśobhādau saptāṁśa daśabhāgikam||
caturaṁśa ṣaḍaṁśaṁ tu saptāṁṣe caturaṁśakam|
nandāṁṣe bhūtabhāgaṁ ca dviguṇaṁ ca prakalpayet||*

For the dvara sobha and others, the length should be taken as one and a half of the width, two and one quarter of the width, three times the width, one part out of three of the width added to thrice the width, two parts out of three parts of the width added to thrice the width respectively. Or, 7 parts out of 10 parts of the width, 4 parts out of 6 parts of the width, 4 parts out of 7 parts of the width and 5 parts out of 9 parts of the width and twice the width may be taken as the length of dvara sobha and others.

*gopurasya viśālanī tu kṛtvā viṃśati bhāgikam
ekādyaṣṭa daśānīśāntānī gopurāṇānī gurūttamāḷī
nīrgamaṇī sālābhāyādvā tadantarvā samācaret*

O, the foremost preceptors!, having divided the width of the gopura into 20 equal parts, the architect should take from one part to 18 parts as the width of the projection. This projection may be constructed either outside the enclosing wall or inside the enclosing wall.

*sārdha hastāttu pādona dvihastād dvikarātkramāt
ṣaṇṇanda ravimātraistu vardhayeddeśikottamaḷī
pañcasaptanavāntastu dvāratāraḷī pṛthagbhavet
tīthīśānkhyā ca hīne syān madhye śreṣṭhānī tu sammatam
pañcānīśe dvāravistāre saptānīśe ravibhājite
daśānīśo dviguṇaḷī pādād adhikaḷī pañcadhocchrayaḷī*

Increasing the measure of one and a half hasta by 6 digits each time to reach 5 hastas, increasing the measure of one and three fourth hasta by 9 digits each time to reach 7 hastas, increasing the measure of 2 hastas by 12 digits each time to reach 9 hastas – by these calculations, another be decided according to the three categories – adhama, madhyama and uttama. The height of the gopura could be obtained by dividing the width of the dvāra gopura by 12 and taking 5 parts, 7 parts and 10 parts. By this 3 kinds of height are available. Twice the width twice the width exceeding by one quarter – these are the two measures for the height. Thus, the height obtained is of 5 kinds.

The number of storeys may be increased from 1 to 3, exceeding this there may be 5, 6 and 7 storeys. For elegant and auspicious appearance. Further the proportionate measures for the entablature and finial(sthupi) are explained.

*ṣoḍhā vibhajya tattvīganī prastaraissāṅghri bhāgakaiḷī
tadvatkaṇṭhaśirodhyardha bhāgena sthūpikānīśakaḷī
evānī ekatalānī proktaṇī dvitalānī ca vidhīyatē*

Having divided the height above the pillars into 6 equal parts, the height of the

entablature should be taken as one and one quarter; same for the height of the dado(kantha); height of the spherical roof one and a half; the remaining part is the height of the finial(sthupi). In this way, proportionate measures for the single storey have been mentioned. Then, those for the two storeyed gopura are told.

*taduccaṇī navadhā kṛtvā sāṅghryeka prastarodayaḷī
ekānīśānī galamityuktaṇī sārhadvyaṇīśānī śīro bhavet
śeṣaśīroddhṛtaḷī proktaḷī dvitalānī tvetadīritam
dvādaśānīśānī tribhūmyuccaḷī kapotaṇī sāṅghribhāga bhāg
sārhadvyaṇīśānī ca pādoccaṇī prastaro bhāga eva hīl
dvipāgaḷī pādadairghyaṇī syādaṣṭānīśenānīśamānataḷī
taduccaṇī cānīśo grīvoccaṇī sārhadvyaṇīśāśīro bhavet
śeṣeṇa sthūpikotsedhastritalānī caivamīritam*

The height above the pillars should be divided into 9 equal parts. The height of the entablature takes one and a quarter parts; the height of the dado one part; the height of the roof, two and a half; the remaining part is for the height of the finial(sthupi). This is the arrangement of the height for the two storey. For the three storeyed gopura, the height above the pillars should be divided into 12 equal parts the height of the carona(kapota) takes one and a quarter parts; the height of the pilasters, two and a half; the height of the entablature, one part. The length of the level of pilasters at the next level, two parts. After this arrangement, the remaining height should be divided into 8 equal parts. One part for the height of the pilasters; the height of the dado, one part; two and a half parts are for the height of the roof. The remaining parts are for the height of the small dome at the top. This is the arrangement of the height for the three storeyed gopura.

*uttarādi śikhāntānī yanmānānī aṣṭādaśānīśakam
tribhāgasahitaṇī bhāgamantoccaṇī pravindhīyatē
sārhadvyaṇīśānī tu pādoccaṇī sāṅghryeka prastarodayaḷī
bhāgena galamānānī syāt tribhāgaiśśikharodayaḷī
śeṣeṇa sthūpikā proktā pañcabhaumaṇī ataḷī param*

For the five storeyed gopura, the height from the upper beam to the roof should be divided into 18 equal parts. The height of the lowermost base takes one and three quarter parts. The height of the pilasters takes two and a half parts. The height of the entablature, one and a quarter parts. The height of the dado, one part. The height of the roof, 3 parts. The remaining parts are for the height of the finial (sthupi).

*uttarādi śikhāntānī cāpyekonatrīnīśadaṇīśakam
bhagārdhaṇī prastaraṇī kuryāt pādoccaṇī caturānīśakam
pādonadvyaṇīśakaṇī mañca sārhadvyaṇīśānī tu pādapaḷī
tripādānīśaikakaṇī mañcaṇī tribhāgātpādapāyatiḷī
sapādānīśa kapotoccaṇī ūrdhvbhāgād dvibhāgataḷī
prastaroccaṇī dvibhāgena kandharocca samobhavet
sārhadvyaṇīśāśīrastuṅgaḷī śeṣeṇa syācchirodayaḷī
evānī tu ṣaṭ talānī proktaṇī saptabhaumaṇī athocyatē*

For the six storeyed gopura, the height between the upper beam and the roof should be divided into 29 equal parts. Of these, the height of the entablature takes a half part. The height of the pilasters, 4 parts. The height of the upper entablature, one and three quarters. The height of the pilasters, to and a half parts. The height of the entablature baove this, one and three quarters. The height of pilasters, 3 parts. The height of the carona(kapota), one and a quarter. The height of the roof, two and a half parts. The remaining parts are for the height of the finial at the top. This is the arrangement of the height for the six storeyed gopura. Then the arrangement of the height for the seven storeyed gopura is told.

*uttarādi śikhāntānī yanmānānī ṣaṭ trīnīśadaṇīśakam
sāṅghri dvyaṇīśānī kapotaṇī syāt sārhadvedānīśato'dhikam
dvibhāgaḷī prastarosedhaḷī pādoccaṇī vedabhāgataḷī
satripādānīśakaṇī mañcaṇī sārhadvyaṇīśastu pādapaḷī
mañcaṇī pādonabhāgābhyaṇī tripādaḷī pādavaidhṛtiḷī
sārhdānīśānī prastaroccaṇī syāt dvyaṇīśastvanta talāyatiḷī
sapādabhāgaṇī mañcoccaṇī sārhabhāgadvibhāgakam
kapotoccaṇī tu bhāgena kandharaṇī tatsmaṇī bhavet
sadvipādadvibhāgena śiraśśiṣṭāḷī śikhā matāḷī
saptabhaumaṇī idānī śreṣṭhānī tadūrdhve pūrvamānabhāk
stambhaprastara bhāgābhyaṇī kalpitābhyaṇī adhastale
ravibhaumāntamiṣṭānī syād gopurāṇāmihāgame*

The height between the upper beam and the sthupi should be divided into 36 equal parts. Of these, the carona takes two and a quarter parts for its height. Above tis, there should be an extended structure to the height of four and a half parts. The height of the entablature, 2 parts. The height of the pilasters, 4 parts. The height of the upper entablature, one and a three quarters. Above this, the height of the pilasters, two and a half parts. Above this, the height of the entablature, one and three quarters. The height of the pilasters, three quarters. Above this the height if the entablature, one and a half parts. The height of the floor above this, two parts. The height of the entablature above this, one and a quarter parts. The height of carona, two and a half parts. The height of dado, one part. The height of roof, two and a half parts. The remaining parts are for the height of the finial. This is the arrangement of the height for the superior type of seven storeyed gopura. The storeys above the seventh one should be given the proportionate measures prescribed earlier. The proportionate measures given for the pillars and the entablatures of the storeys which are below the seventh one could be given up to the twelfth storey. These are the specific directions set forth in this agama.

*uktāni gopurāṅgāni vibhajecaturāṅśakam||
ārabhyāṣṭadaśāṅśāni teṣvekāṅśāni tu navāṅśakam||
dvyaṅgulāni tryaṅgulāni vāpi catuḥpañca ṣaḍaṅgulam||
vardhayeddhṛāsayedvāpi yuktyā prāgukta mānataḥ||*

The component parts of the gopura mentioned earlier should be divided into 4 equal parts. Then each part should be first divided into 8 parts. Then taking one part, the architect should divide it into 9 parts. From the unit measure derived in this way, the architect may increase or decrease the obtained measure of the height by 2, 3, 4, 5 or 6 digits to ascertain the auspiciousness of aya and other factors. The architect may do this through his own reasoning.

*pañcabhāge viśāle tu tribhāge garbha vistaraḥ||
śeṣeṇa bhittiratroktā vyomabhūmau munīśvarāḥ||
vyāsasaptāṅśa vedāṅśo garbhakūṭastu bhāgabhāḥ||
koṣṭhasyātmaga vistāra dairghyaṅ pañcāṅśamiṣyate||
kūṭa koṣṭhāntarāle tu pañjarādi vibhūṣitam||
evaṅ viśālāni ākhyātāni tritalāni cādhunocyate||*

O, the lords of the sages!, if the width of the gopura is of 5 parts, then the width of the central chamber(the inner storey) should be of 3 parts. In the remaining part should be the surrounding wall. This is the structural order for the first storey. The length of the central chamber of the second storey should be of 7 parts and its width 5 parts. The width of the elongated hall should be according to its own proportion. Its length should be of 5 parts. This storey should be beautified with pinnacle turrets, corridor, cage-like windows and such other ornamental members. Thus, the features of the second storey have been told. Then those of the third are told.

*tāre navāṅśe garbhassyāt tribhāgastadbahiḥ kramāt||
gṛhapiṇḍasyalinda hārāṅśca krameṇa parikalpayet||
kūṭa koṣṭhādi sarvāṅgaṅ pūrvavat parikalpayet||
viśāle pañktibhāge tu garbhagehe tribhāgataḥ||
sārdhāṅśo bhittiviṣkambha ekabhāgaṅ alindakam||
khaṇḍaharmyaṅ tu bhāgena kūṭa koṣṭhādi pūrvavat||
mukhe pṛṣṭhe mahāśālā pañcāṅśo vā ṣaḍaṅśakaḥ||
caturbhaumaṅ idaṅ khyātāni sarvāvayava sundaram||*

If the width of the storey is of 9 parts, then the central chamber should be with a width of 3 parts. In the remaining part, the surrounding wall, corridor and the chain of architectural mouldings should be provided in the due order. All other component members such as the pinnacle turret should be designed as detailed before. For the fourth storey, if its width is of 5 part, the width of the central chamber should be of 3 parts. The thickness of the surrounding wall should be of half part. The corridor should be with a width of one part. The width of the sectional tower in the middle should be one part. All other members such as the pinnacle turret should be designed as explained before. With a width of 5 or 6 parts, the great outer hall should be provided in the front and the back. The features of the fourth storey, which should be very nice and beautiful furnished with all the component members, have been told.

*viśāre rudrabhāge tu nālīgehaṅ tribhāgataḥ||
dvibhāgo bhittiviṣkambho vyomāṅśassyādalindakaḥ||
ekāṅśāni khāṇḍaharmyaṅ syādanyatsarvaṅ samānakam||
pañcabhaumaṅ samākhyātāni ṣaḍbhaumaṅ adhunocyate||*

If the width of the storey is of 11 parts, the central hall (the inner space of the storey) should be with a width of 3 parts. The thickness of the wall, 2 parts. The width of the corridor, one part. All other components should be provided as detailed earlier. In this way, the features of the fifth storey have been told. Now, those of the sixth storey are told.

*viśāre ravibhāge tu nālīgehaṅ yugāṅśakam||
dvibhāgo bhitti viśāro dvārāṅśena prakīrtitaḥ||
bhāgena khāṇḍaharmyaṅ syādanyatsarvaṅ samānakam||
ṣaṣṭabhaumaṅ idaṅ proktaṅ saptamaṅ tvadhunocyate||*

If the width of the storey is of 12 parts, the central hall should be with a width of 4 parts. The width of the surrounding wall should be 2 parts. The width of the entrance, one part. The width of the sectional tower, one part. All other structures should be provided as told before. The features of the sixth storey have been told and those of the seventh storey are told now.

*trayodaśāṅśe viśāre garbhassyādāṅśabhāgabhāḥ||
sārdha dvyaṅśāni tu bhittissyād ekenālindamiṣyate||
khāṇḍaharmyamihāikāṅśāni kūṭaśālādi pūrvavat||
pṛṣṭhe mukhe mahāśālā ṣaḍbhāgena prakīrtitaḥ||
pañcāṅśe hastipṛṣṭhe ca pakṣaśālādibhiryutaḥ||
nānāmasūrakastambha vedikājāla toraṇam||
saptabhaumaṅ idaṅ proktaṅ gopuraṅ sārvaśeṣikam||*

If the width of the storey is of 13 parts, the central hall should be with a width of one part. With the width of two and a half parts should be the surrounding wall. The width of the balcony (alinda) should be of one part. The width of the sectional tower, one part. Other members such as the pinnacle turret should be provided as told before. In the front and the back, there should be the great hall with a width of 6 parts. The structure in the likeness of the back of the elephant should be with a width of 5 parts. This should be associated with the component members such as the side pillars, varieties of stereobates, arches and others. These are the features of the seventh storey. Apart from these, there are some specific details for the gopura belonging to the category of sarvadesika.

*mūlabhūdvara viśāra pañcāṅśena viśālabhāḥ||
caturāṅśonakaṅ vā syādūrdhavadvaraṅ tu vistarāt||
uparyupari dvāraṅ syān madhyādhamottamānvitam||
sopānagarbhagehe tu talāṅ prati samācaret||
uparīṭhe catuṣkhaṇṭhe sopānaṅ pravindhīyate||
maṇḍapābhāṅ bhaved dvāraṅ śobhāyai paṇḍiteśvarāḥ||*

The entrance to be provided in the upper storey should be with a width whose measure is to be 5 or 4 parts of the width of the entrance of the first storey. The entrance to be provided for each upper storey should be designed to suit one of the three categories – uttama, madhyama and adhama. In each storey, the central hall may be designed so as to be associated with stairway. The stairway should raise from the pedestal or from the level where there are four dados. O, the lords of the learned sages!, the entrance should be structured so as to look like a pavilion in order to effect the pleasant and auspicious appearance.

*daṇḍaśālā samākārā dvāraśālā prakīrtitaḥ||
prāsādākṛtivad dvāraprāsādaṅ paripaṭhyate||
mālikākṛtivad dvāraharmyaṅ syānmunisattamāḥ||
śālākāra samaṅ kuryād dvāragopuraṅ antimam||*

The dvāra sala should be designed to be in the shape of danda sala(elongated building). The dvāra prasada should be designed so as to be in the shape of temple (with multi-elevations). Dvāra harmya should be designed so as to be in the shape of the gallery-like building (malika). O, the foremost sages!, the dvāra gopura should be designed in the shape of a structure with a wagon-like roof.

*sarvatra gopurāṅ kuryādyathāśakti viśeṣataḥ |
pañcabhāgādi bhāgaṅ vā caikatrinīśatsamāvadhī |
bhāgāṅkṛtvā viśālāṅstu gopurasya dvibhāgataḥ |
vṛddhyā bhāgo'rdhamānena tithyāṅśāntaṅ prakalpayet |
garbhageha viśālaṅ syācchobhādīnāṅ munīśvarāḥ |
tenavistāra bhāgena vyomāṅśa dviguṇāvadhī |
sāyataṅ vā samaṅ vāpi garbhagehaṅ prakalpayet |
tasmādūrdhvaṅ tu dairghyaṅ syādadhikaṅ dvāratārakam |
yathā bhavettathā kuryād gopurāṅ munipuṅgavāḥ |*

O, the lords of the sages! The gopura should be constructed so as to be associated with specific features in all the directions and in all the enclosures according to the resources available to the patrons. The width of the main edifice should be divided into 5 to 31 parts according to the decided pattern. Starting from 2 parts and increasing by half part each time, the architect should be obtained 15 kinds of measures to be applied for the width of the central chamber of dvāra sobha and others. Based on the width-measure, the central chamber may be designed in the shape of square or it may be designed so that its length exceeds the width by 1 part or it may be twice the width. The length of the entrance of the central chamber of each upper storey should be increased proportionately. O, the foremost sages!, the architect should design the gopura so as to be suitable to the design of the whole structure of the temple.

*garbhagehātsamantāttu garbhārdhātpādavṛddhitaḥ |
tribhāgāvadhī kuḍyaṅ ca vyomādi bahusaṅkhyakaḥ |
tathālīndaṅ ca hāraṅ ca kalpayetkalpavittamaḥ |
aṅśamānena vā dvāratāraṅ vā gopurāṅ bhavet |
tribhāgaṅ tu samārabhya ardhāṅśāttithisaṅkhyayā |
yāvaddvāra viśālārthaṅ aṅśānātra prayojayet |*

The wall around the central chamber may be one or it may be in multiple number, its thickness being equal to half part to 3 parts of the width of the inner hall, increasing the thickness by one quarter each time. The guru who is the foremost among those who have mastered the architectural treatises should

construct all the component parts such as the balcony, corridor and the chain of mouldings. The height of the entrance of the gopura should be based on the proportionated parts if the width. Starting from 3 parts and increasing by half part each time, the architect should obtain 15 kinds of measure for the height. He should apply these measures so as to be tuned to the full width of the storey.

The ornamental structures of the gopura includes pillars, various types of entablature, square neckpart, pentroof(valabhi), multiple finials, pinnacle turrets, rostrums, cage-like windows, side halls and such others. Also with entrances, gutters and all such ornamental structures.

The rituals of ‘laying of first brick’ and ‘laying of the final brick’ should be carried out even for the gopuras. A raised moulding in the shape of a small hill should be designed at the level of the finial(sthupi). This may be in the middle of 2 sides or in all 4 directions.

The presiding deities of different storeyed gopuras are mentioned in this chapter. In the structure of such gopuras, each corresponding deity should be invoked and identified in each storey. The acharya should empower the gopura(gopura shthapana) in the prescribed way, once a pavilion is erected in front of the gopura. All the prescribed rituals are of utmost importance. If they are not available in the mula aagamas, they have to be collected from the other upaagamas.

CHAPTER 5

CASE STUDIES AND ANALYSIS

The Brihadishwara temple at Tanjavur is unanimously regarded, and with good reason, as the greatest masterpiece of Chola Architecture. It and the gangaikondacholapuram temple, built only 20 years later and closely related to the former by its architectural composition, represent a unique pair in Chola Architecture. This is firstly the case as regards their dimensions, for which there are neither antecedents nor successors, and then concerning their distinctive architectural features(inner tiers of the sanctuary-towers, circumbulatory corridors, side stairways juxtaposing the tower etc.), as well as their destiny. Long after their construction, works were undertaken towards their completion(pillared halls), as well as renovation(stucco work on the tower by the Nayaks) which to a considerable extent respected the initial plan- an exceptional attitude in south India .1 (Pierre Pichard)

Both the temples have Shiva as the main deity, follow an agamic code of construction. Hence these temples have been chosen for this particular study or decoding of the 'Agama' scriptures for directions of temple design and construction.

5.1. BRIHADISVARA TEMPLE, TANJAVUR

The Brihadeesvara temple which is also known as Periya kovil (Big temple), Peruvudaiyar kovil or Rajarajeshwara temple is located in Tanjavur, in the state of Tamil Nadu of India. The Temple is dedicated to Lord Shiva. It known to be the most magnificent works of architecture of the Cholas Era, Built During the rule of The Great King Raja Raja Cholan I. This temple which is a part of the UNESCO world heritage sites as "Great Living chola Temples" is also India's largest temple. It stand in the middle of the fortified walls added probably in the sixteenth century.

The 'Vimana' of the temple is 216 feet or 66 meters high. The 'Khumba' or the bulbous apex structure on the top of the 'Vimana' is believed to be carved out of a single granite stone. As prescribed in the Agamic codes A 'Nandi'(Bull) is to be placed in front of the main temple. The Nandi of Brihadeesvara temple is 13 feet high. All the vast quantity of granite used to build the temple is believed to be transported from Tiruchchirapalli, which is nearly 60kms

towards the west of Tanjavur.

5.1.1. History and background

The Brihadeesvara temple was constructed in Tanjavur between 995 and 1010 AD by its founder Raja Raja I effectively availed of the achievements of the two preceding reigns, during which the power of chola kingdom had been re-established and spread to many parts of south east asia apart from a major part of the southern India.

Raja Raja decided shortly before the year 1000 AD to construct his royal temple, the Rajarajeshwara in his inscriptions, which later came to be known as Brihadeesvara. At the close of 10th century only small granite temple were being built in the Chola country, which had a central square sanctum opening to a larger hall with single niches or three on each side of the main shrine. A modest tower was added on top of the main shrine and the total height would hardly exceed ten meters.

But, The emperor Rajaraja had high ambitions- The height of the temple, rising fifteen stories is about 60 meters. The increase in scale to nearly five to six times to any temple built before by cholas or the neighbouring rules was a big challenge to the Architects and builders of the country.

It can be seen that the Builders in the Brihadeesvara were able to strike a balance between the increase of scale of the temple components and retaining the ergonomics. To which utilization of the already traditional elements, the recourse to ancient paradigms and finally innovation, contributed. Emergence of the features such as multifaceted columns along with projecting signals of square capitals signifies the arrival of Chola style.

Construction of the The royal Brihadeesvara temple in a massive scale with magnificent features was for the displaying the emperor's vision for relationship and power to the universal order. The temple became the site for all the royal ceremonies, such as the anointing of the emperor and also acted as a link between the emperor and Lord Shiva, the main deity of the temple.



The Brihadeesvar temple



Location map of teh temple complex

The Big temple also showcases the true form of Dravida kind of architecture temples and is a representative of the ideology of the Chola Empire and the south India's Tamil civilization.

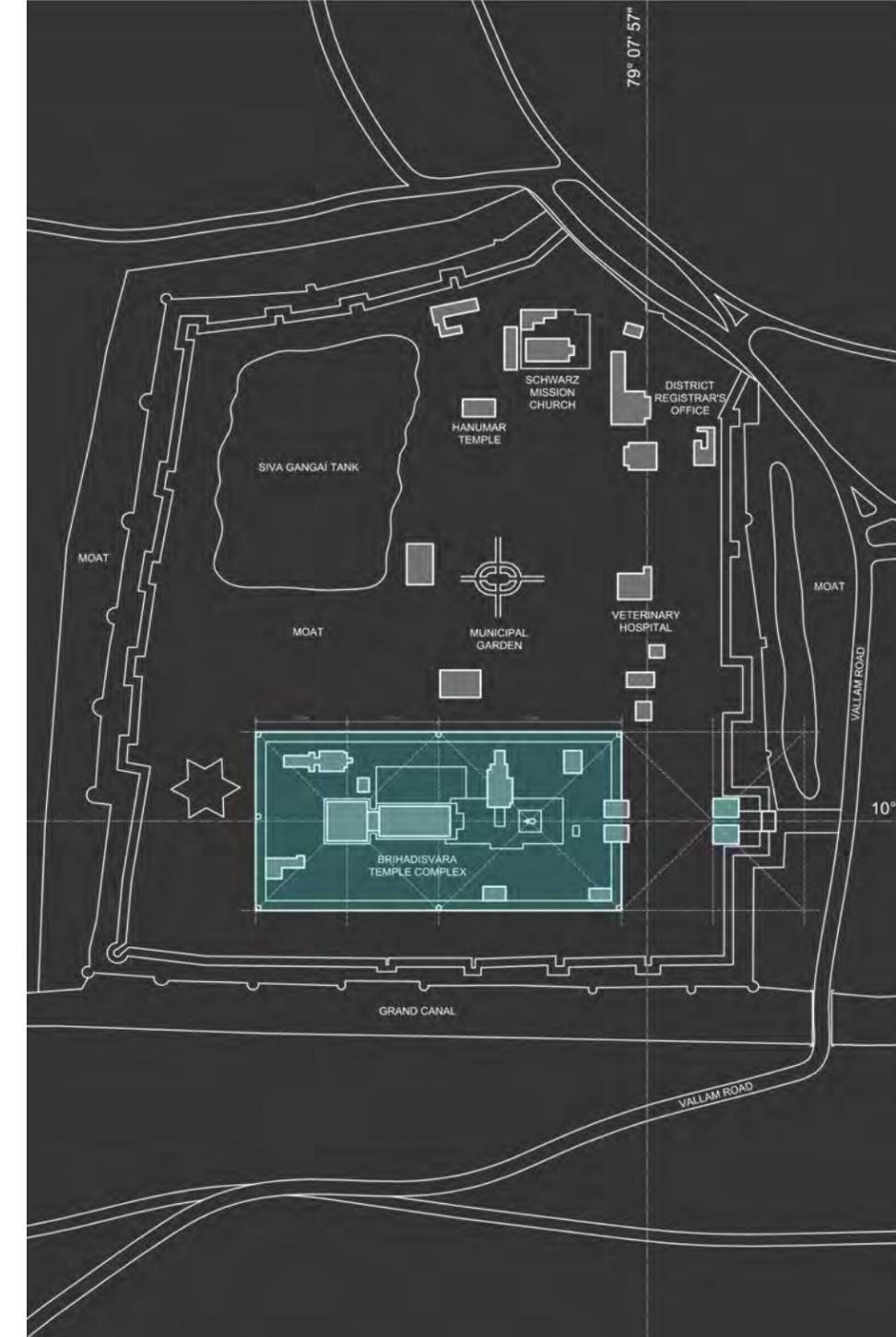
5.1.2. Location

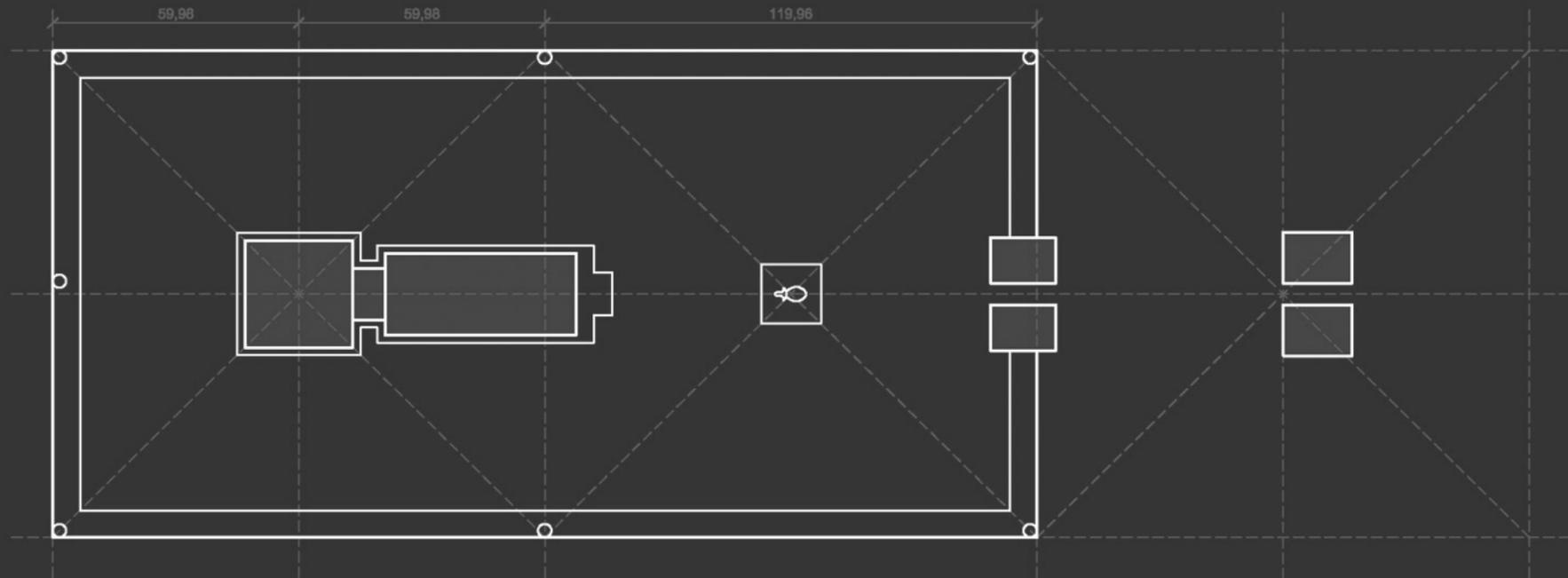
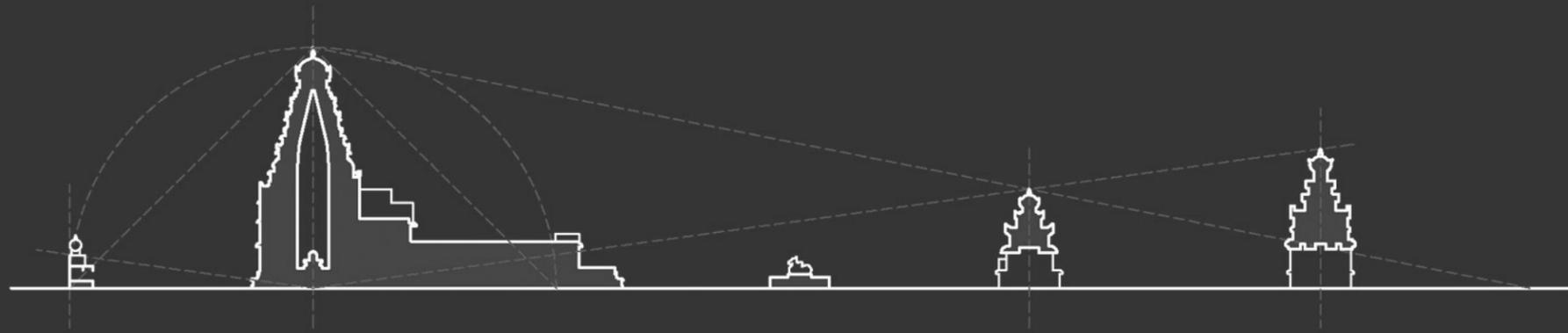
The temple complex lies on the banks of the river from which water is drawn through a manmade canal to the moat around the fortified temple complex in Tanjavur. Tanjavur has served as the capital city of the Chola rulers. There is a main entry into the complex through a five storeyed 'gopuram' and the seconds lead one directly in to the main quadrangle through a comparatively smaller 'gopuram'.

5.1.3. The temple complex

The first rectangular wall surrounding the main temple is 270 meters by 140 meters, which marks the outer boundary. The main temple consists of a central sanctuary, A pillared hall, one Nandi mandapa(pavilion) and several sub-shrines for the retinue deities. The main deity Lord Shiva resides in the Inner sanctum 'Garbagriha' in Sanskrit or 'Karuvarai' in Tamil. Each side of the sanctuary has one bay emphasizing main cult icons.

There is a circumambulatory passage around the main sanctum which is a common feature to most of the Hindu temples. The 'Garbagriha' is in the shape of a squaresitting on top of the 'Adisthana'(base). Its location is the Brahmasthana in the Vastu purusha mandala which is one location with complete harmony and equilibrium, and the whole complex represents a microcosm of the universe. There is a royal bathing hall to the east of the 'Irumudi-soran' hall, it is where the emperor Rajaraja used to give gifts. Three stair cases leads up to the base level, and then a well decorate 20 pillared porch lead to the rectangular mandapa which further leads to the central sanctum or the 'garbagriha'. Straight in front of the porch on the plinth stands a small open mandapa, which is dedicated to the thirteen feel high 'nandi' the sacred bull of lord Shiva.





5.1.4. Deities

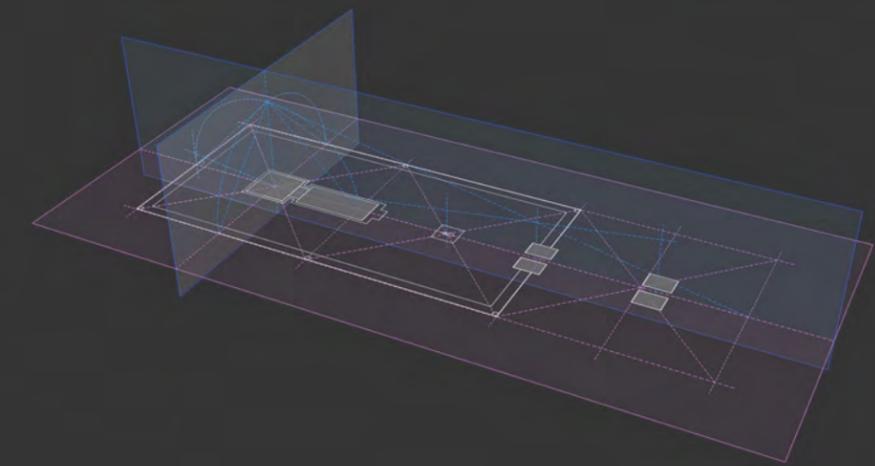
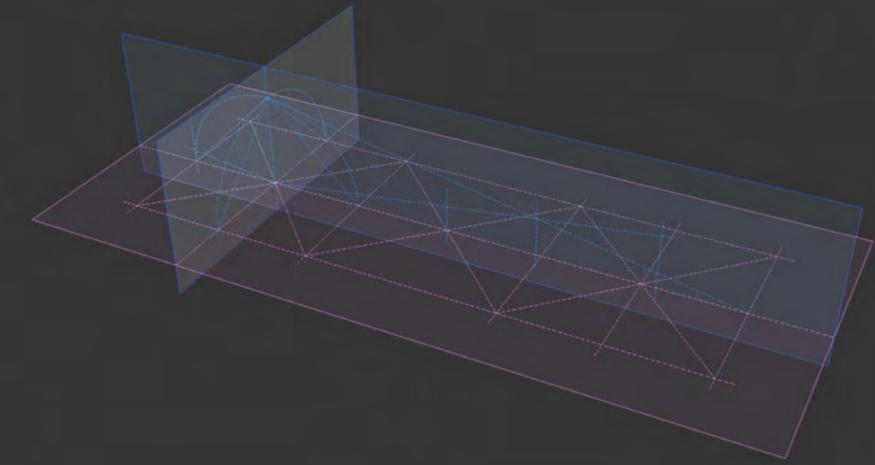
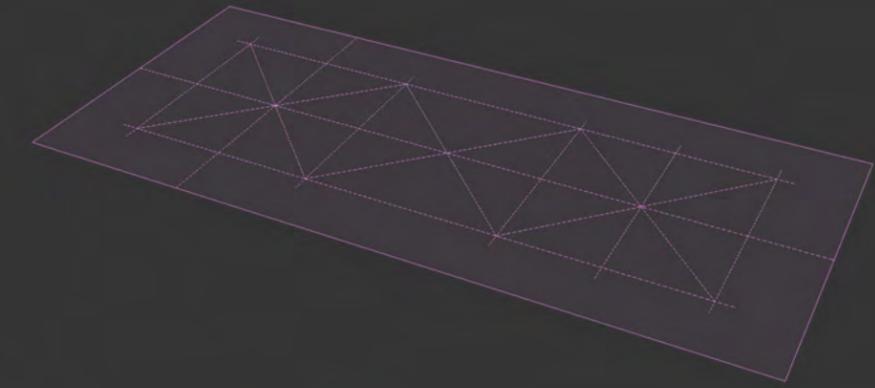
'Moolavar' the main deity as called in Tamil of the Brihadeesvara temple is Shiva. Other deities in the niches of the outer wall are Dakshinamurthy, Chandra, Surya etc. This is one among the rare temples which have statues of 'Ashtadikpaalakas' or the guardians of the eight directions- Indra, Agni, Nirrti, Varuna, Kubera, Isana, Yama, Vayu of approximately six feet each. There are also separate retinue shrines for other deities of which some were built by the Cholas and some were later on added by the later rulers like the Nayakas.

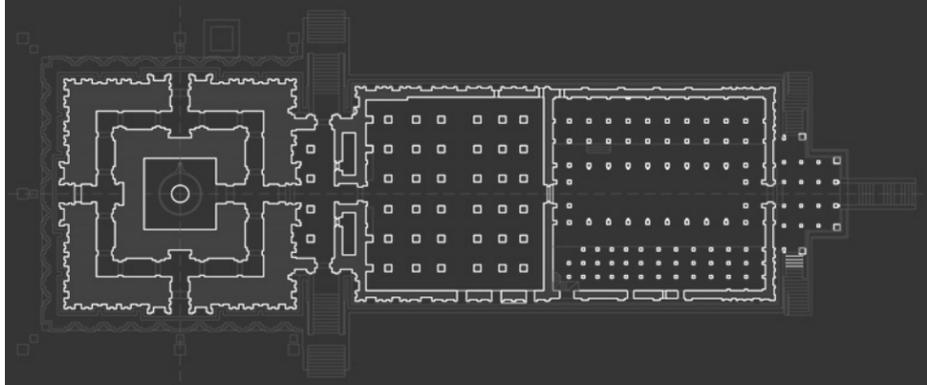
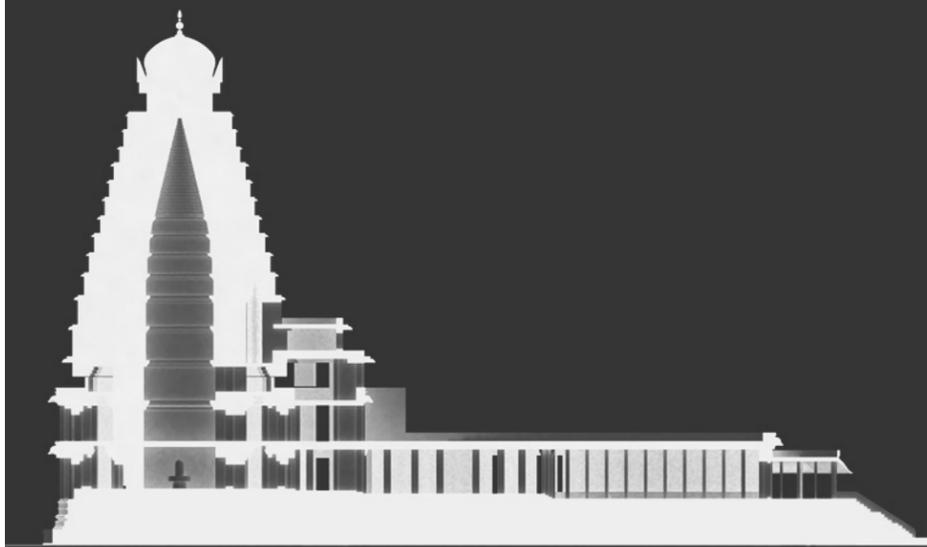
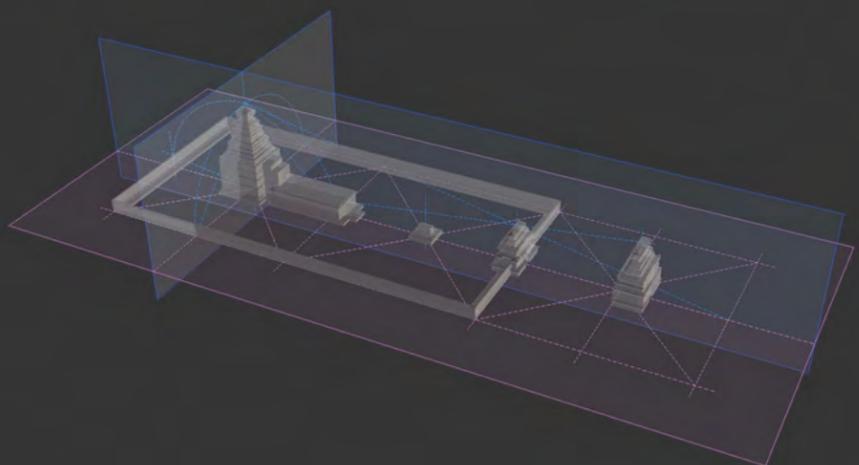
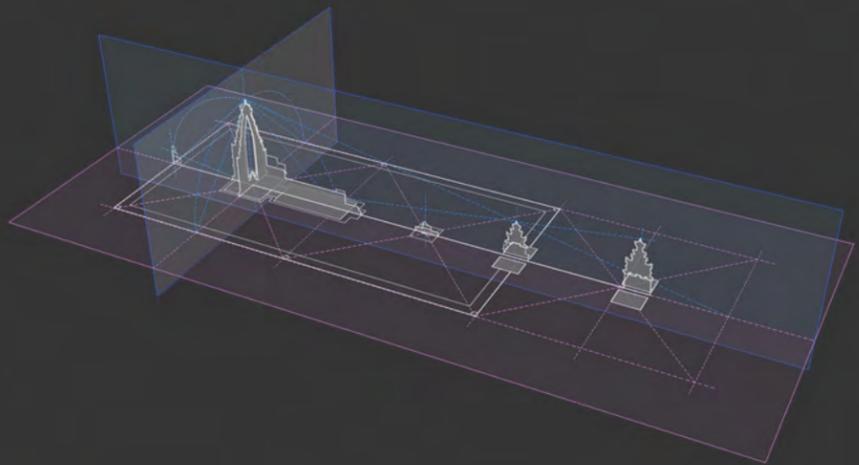
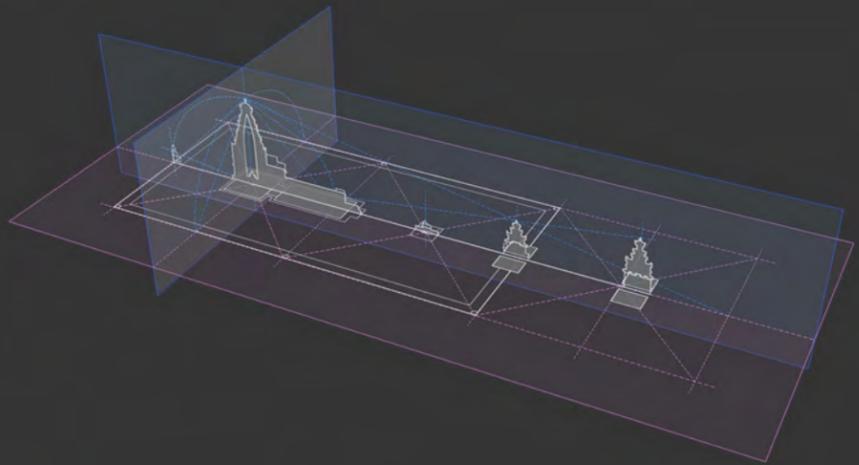
5.1.5. Adjoining structure

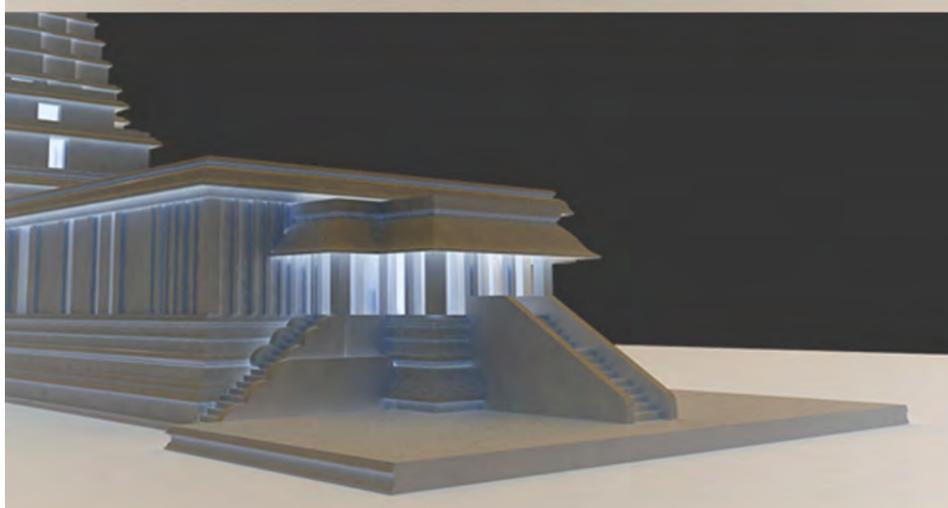
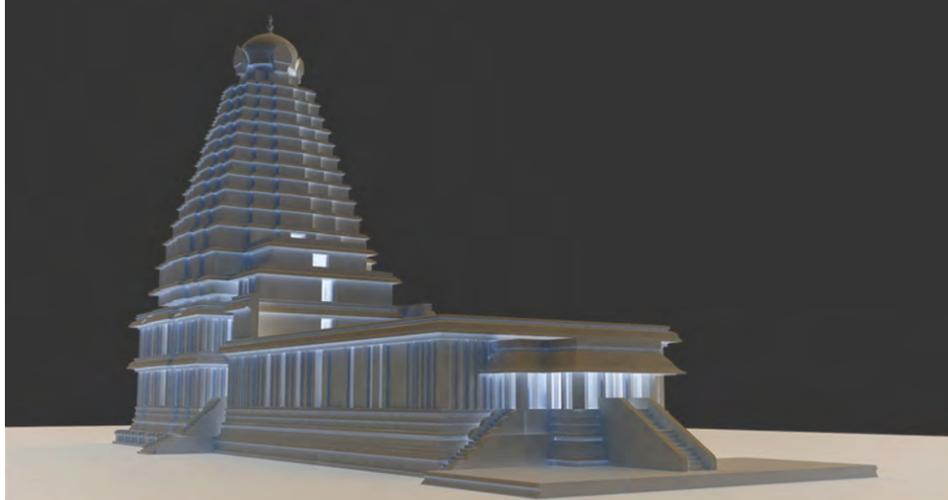
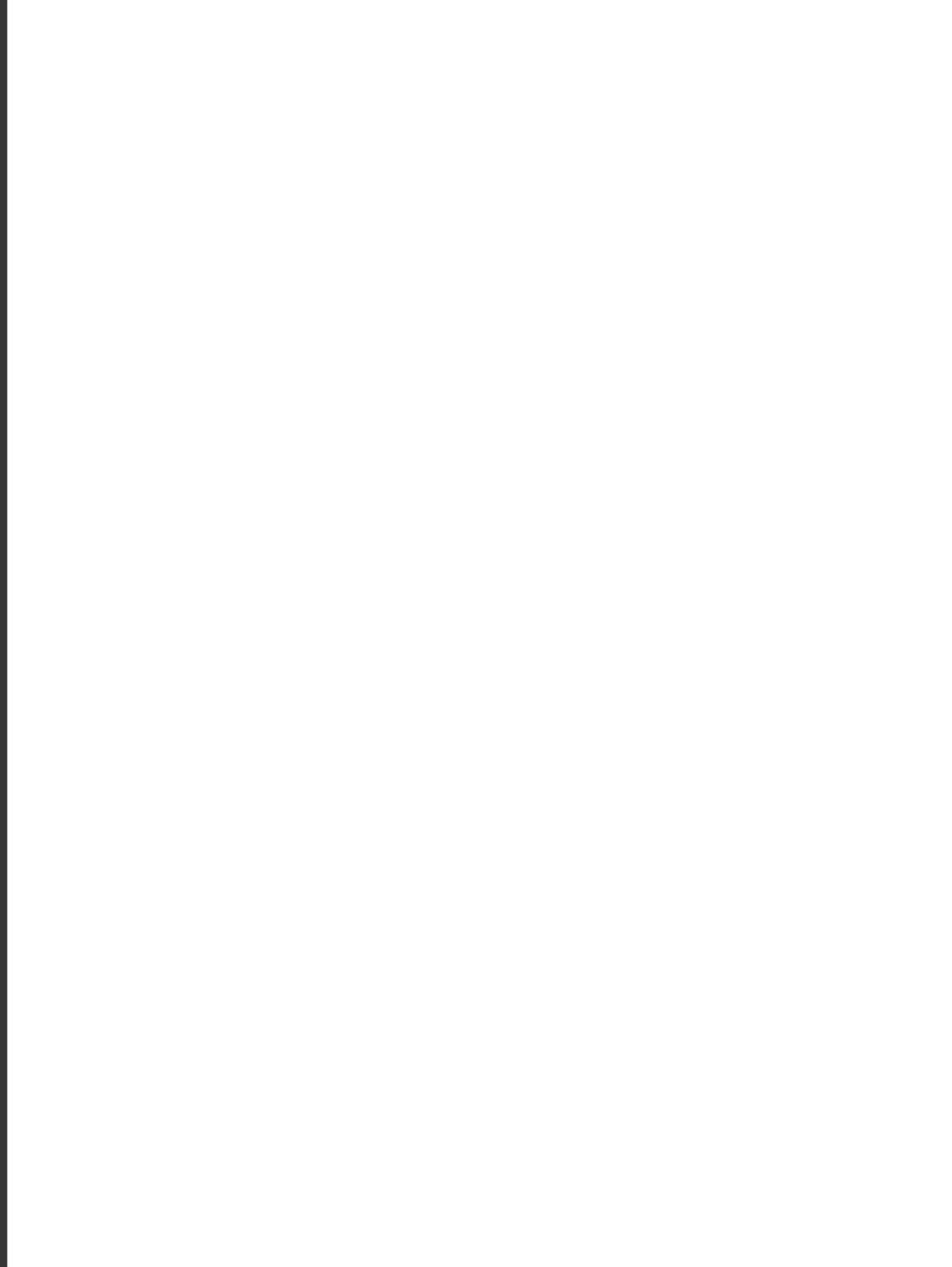
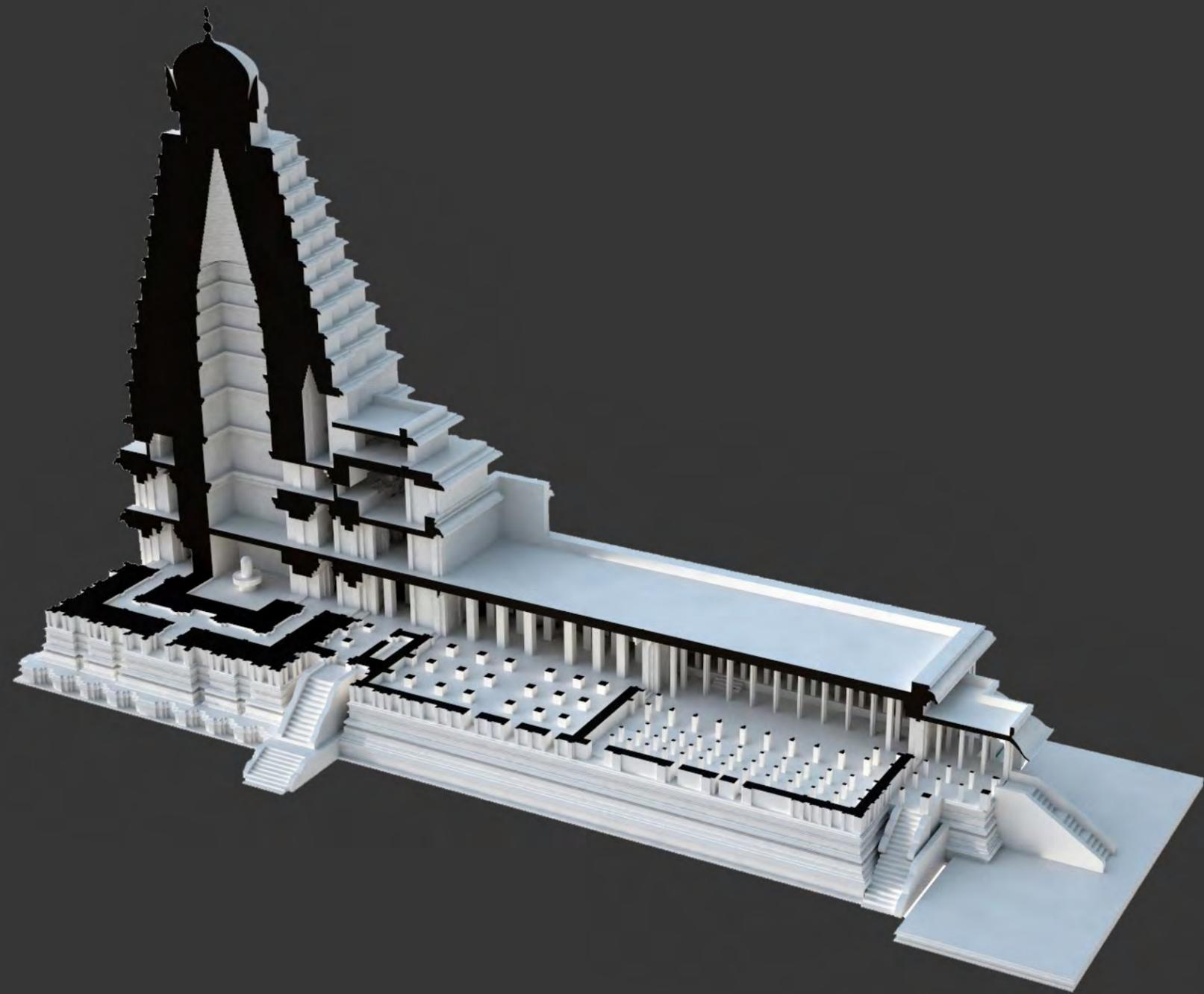
Surrounding the main temple are two high walled enclosures which define the area of the temple complex. Massive gateway or 'gopuram' rises at the main entrance of the temples. All around adjoining the high wall is the barrel vaulted pavilion having more than 400 pillars with enormous small gopuram lined axially.

5.1.6. Murals

The temple has frescos of Cholas on its walls around the sanctum, which portrays God Shiva in many actions, such as destroying fiend forts, sending one white elephant for transporting a devotee towards heaven etc. Chola artists have here proven their mettle by portraying even the Asura (evil) women with a sense of beauty. The paintings in the walls of the sanctum suffer damage due to soot deposit generated from the camphor, lamps and other smoke used in the Puja procedure. When the kings of Nayakas ruled Tanjavur they replaced some of the Chola frescos with theirs.







5.2. GANGAIKONDAR TEMPLE, GANGAIKONDACHOLAPURAM

The temple is located at the center of the Gangaikondacholapuram city and occupies around 6 acres of land. There seems to be 2 Praharams (enclosures) surrounding the Srivimana, most of the wall is destructed and the Granite rocks were used to construct a dam during the British rule. The remains of these outer wall is very less and one can judge the actual size of the temple if it had remained, whereas the second wall has the gopuram completely destructed and from the height of the entrance one could estimate the height of the second gopuram.

A western historian who studied Gangaikondacholesvaram compared the structural difference of this Srivimana with that of Rajaraja-I's Brihadisvara temple at Thanjavur and mentioned that this Srivimana is of feminine structure and the Tanjore Srivimana as masculine in nature. This temple was built by Rajendra Chola the successor of Rajaraja Chola I. The basement of Srivimana is 100 feet by 100 feet and the foundation is square in structure and raises 20 feet above the ground level. There are many shrines inside this temple found on the 2nd enclosure (circumventing path).

5.2.1. History and background

Rajendra Chola-I (1012-1044 A.D) son of the Great Rajaraja-I, established this temple after his great victorious march to river Ganges on Northern India. He was originally called Madurantakan. He assumed the title of Rajendra during his coronation and continued to rule along with his father Rajaraja-I for a while. He achieved the supreme title of Cholas called Parakesari.

Rajendra-I, a great warrior and assisted his father, in numerous expeditions to elevate the Cholas to supreme power. His empire extended the whole of southern India to river Thungabadhra in the north India. After a huge expansion and strengthening of his kingdom King Rajendra I determined to construct a temple of his own not in the shadow of his father but on a virgin and somewhat dissolute site. He thus abandoned thanjavur and the rich paddy fields of the kaveri delta and found a new capital for administrative and strate-

gic purposes and named Gangaikondacholapuram. The name literally means 'The town of the Cholas who defeated the Gangas'. This site was chosen simply because it was here that Rajendra I had decided to raid on the Gangas. The Gangaikondacholapuram temple, he constructed consists of 3 stories and surrounded by a huge fort like wall, the outer wall was greatly destructed during the English rule (1896 A.D) to reuse the building material (Granite rocks) for constructing the Lower Anicut (Dam across river Kollidam). Begun some two decades after the Brihadeeshwara temple, which had not been completed. This temple in Gangaikondacholapuram is not a mere replica, its builders refused from the outset the temptation to achieve records; the total height of the sanctuary tower is 51 meters as opposed to around 60 meters in the Thanjavur temple. It was clearly a matter of elaborating and developing the architectural experiment represented by Brihadeesvara temple, as well as improving rather than surpassing its achievements.

5.2.2. Location

The temple complex lies in Gangaikondacholapuram is situated near the Thanjavur city of Tamil Nadu. The temple was founded in the year 1020 and it took approximately nine years to fully complete the construction work. Gangaikondacholapuram was a newly found capital by the successor of Rajaraja I, Rajendra I, who named the city after his successful raid to the Ganges.

5.2.3. The temple complex

The temple of Gangaikondacholisvara is approached through the eastern entrance from the road. The entrance is called the "Mahaduvar" leads to the inner court. The High wall which acts as the second enclosure is which also marks the outer boundary of the temple complex which was destroyed during the British rule and the granite from the wall was used to build the 'Lower Anicut' a dam across the river Kollidam. Two staircases on either side lead to the enclosed porch seated on the basement of Srivimana is 100 feet by 100 feet and the foundation is square in structure and raises 20 feet above the ground level, which in turn leads to the Pillared hall or 'Mahamandapam'. The Mahamandapam opens to the central sanctum of the Shiva linga, which



has a circum ambulatory passage around.

In the second praharam or enclosure there are many shrines like the Amman shrine, Ganapathy shrine etc., . There was Nataraja Mandapam now totally destroyed and only the remains were found. The main deity Lord Shiva resides in the Inner sanctum 'Garbagriha' in Sanskrit or 'Karuvarai' in Tamil. Each side of the sanctuary has one bay emphasizing main cult icons.

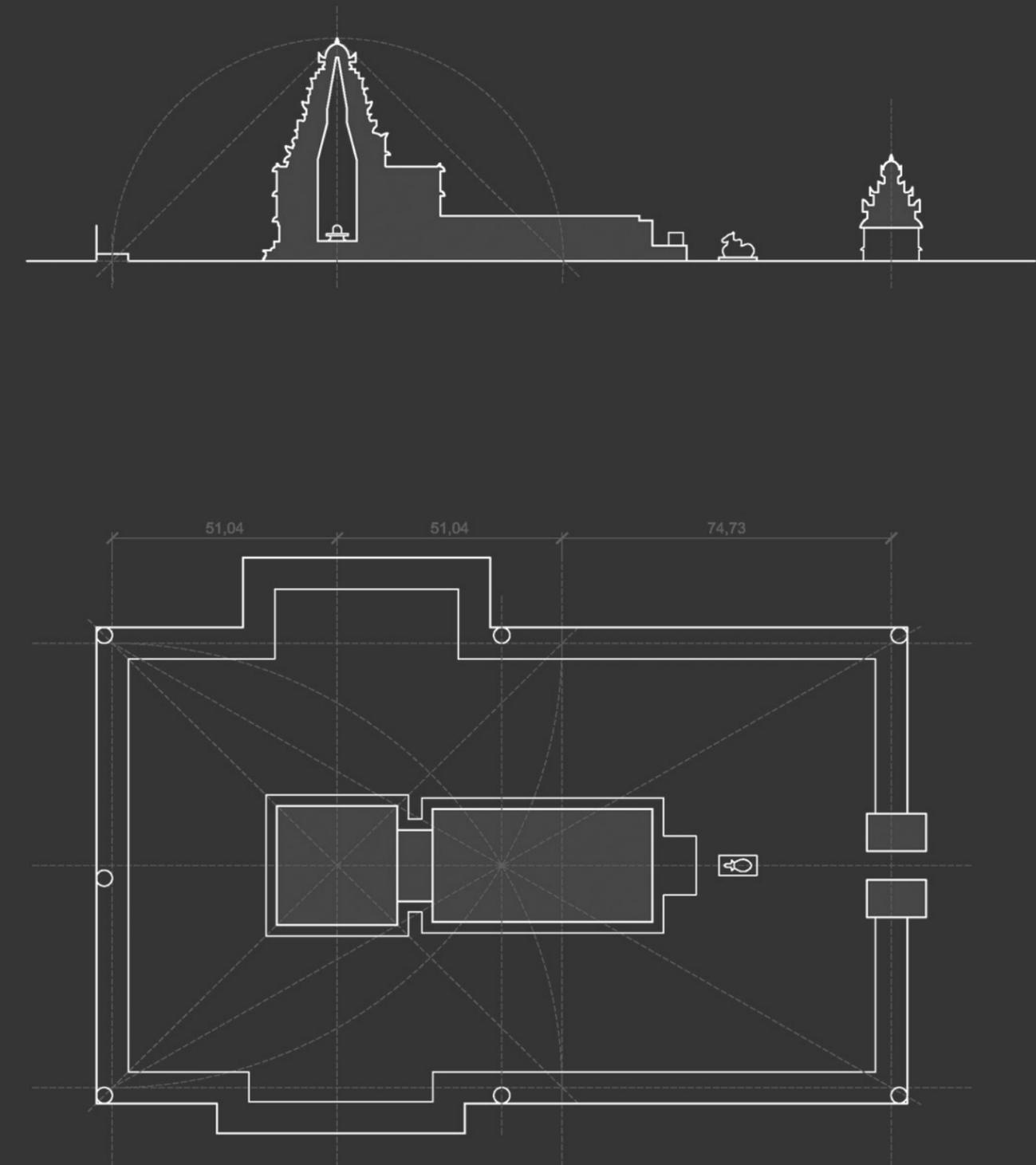
A Nandi stands high in front of the main shrine along with a bell pitha and a flag post. There is also a well and a shrine depicting a lion. The inscriptions on the walls tell stories of many conquests of the warrior king, land donated during the period, coronation of kings etc. angaikondacholapuram Temple has witnessed numerous wars in the past. It used to serve as a garrison and fortified cantonment of, first, the Pandyas and, later, of the British.

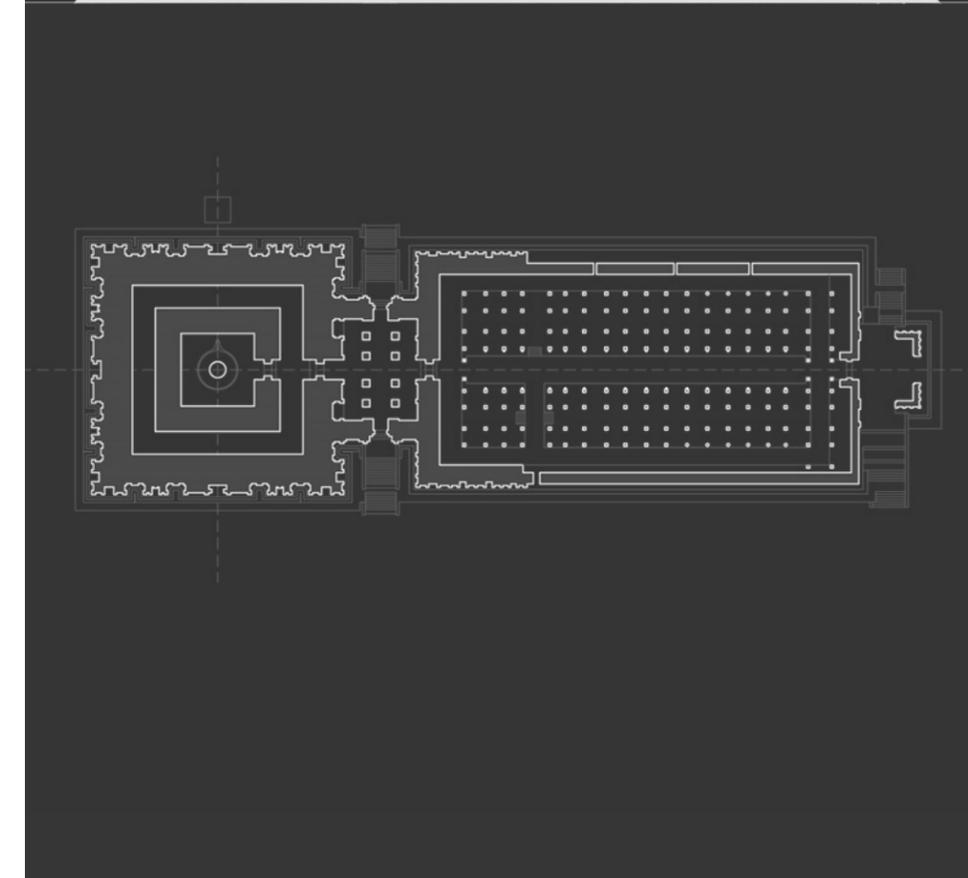
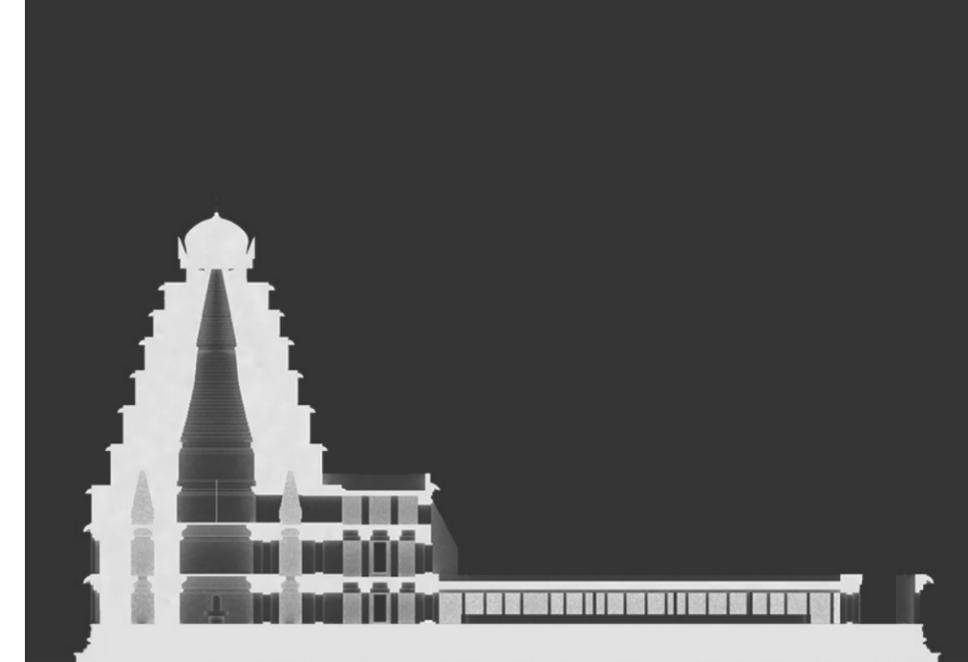
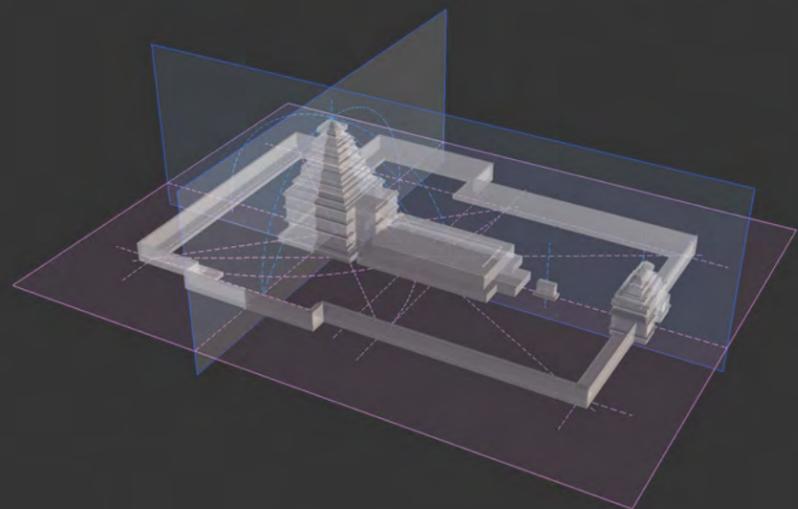
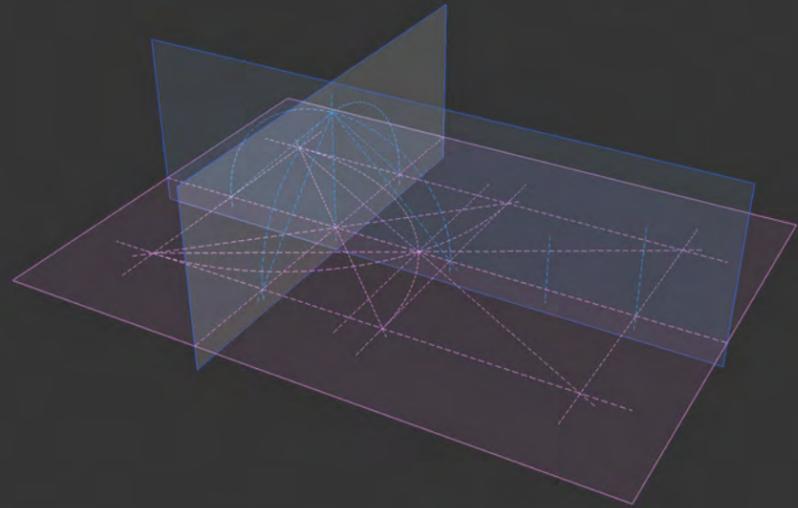
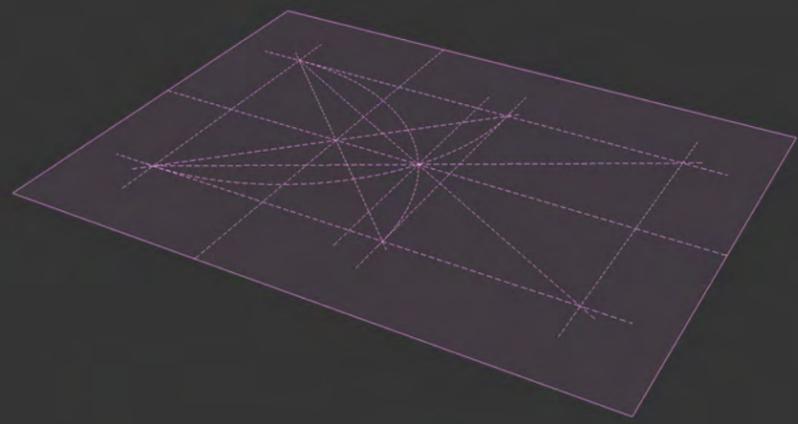
5.2.4. Deities

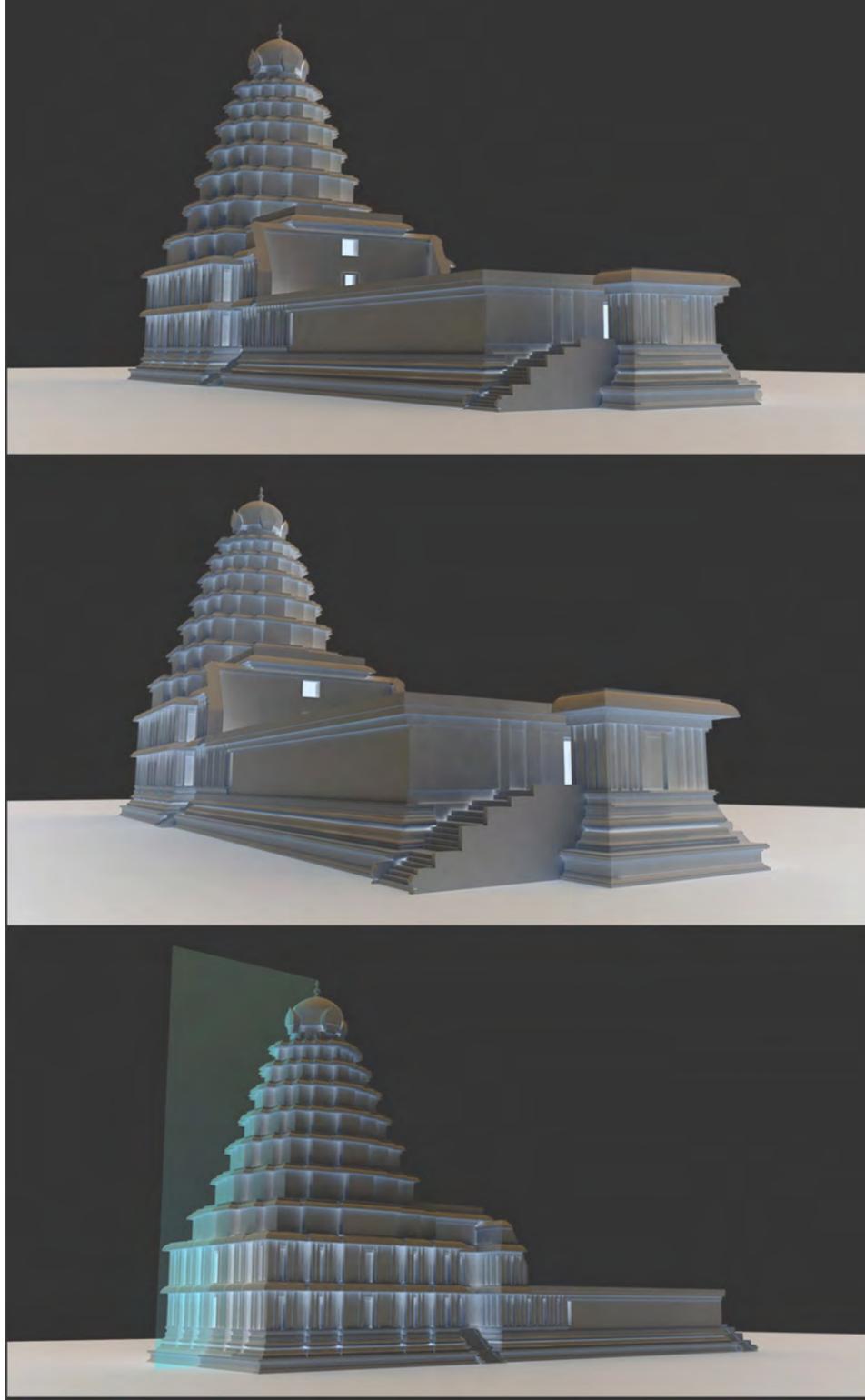
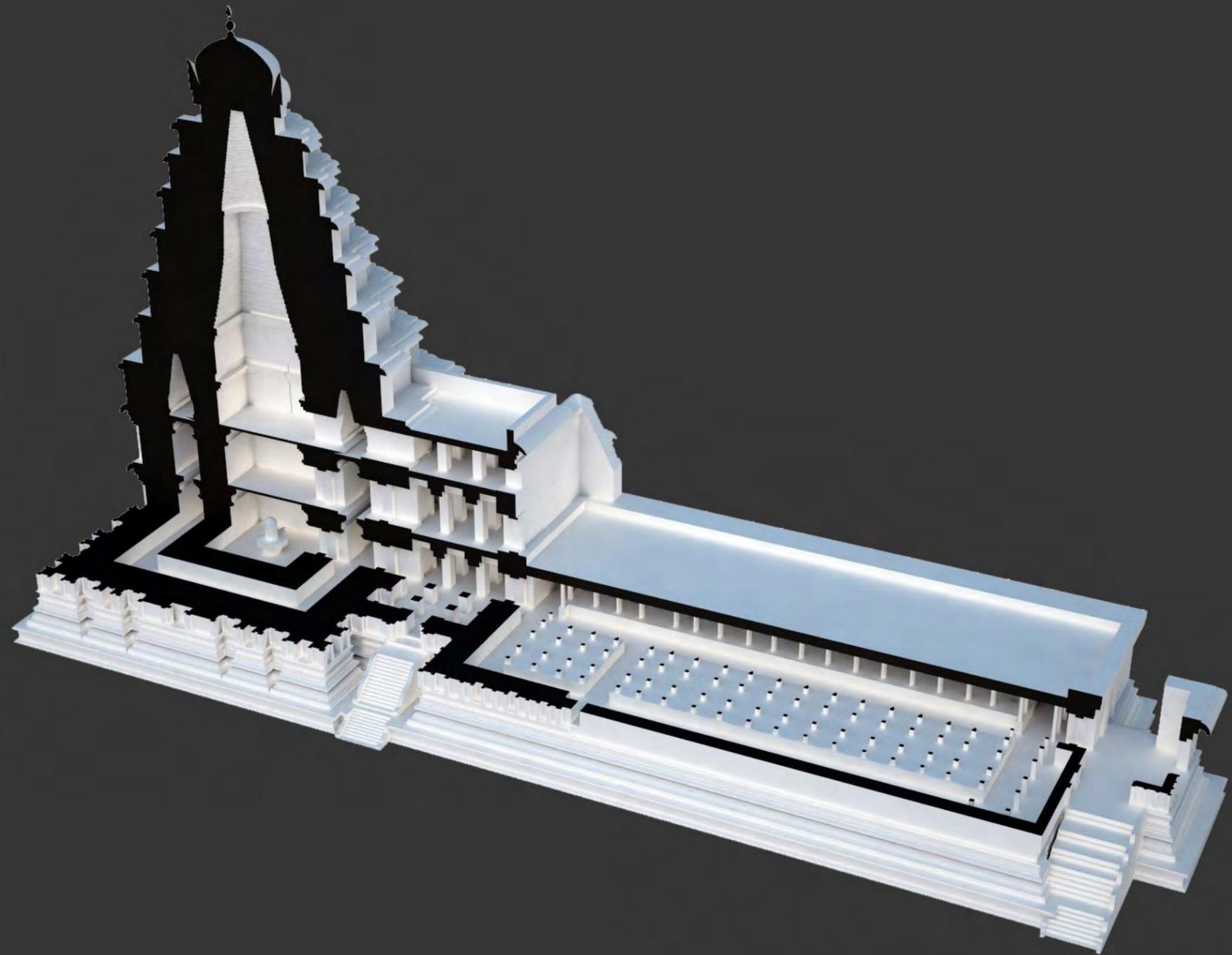
The prime deity of the temple is Lord Shiva. The three lower stages of the plinth houses many beautiful sculptures of chola period including the Laxmi (goddess of wealth), Gana Saraswathi (goddess of knowledge), Ardhanareeswarar (Shiva and Sakthi in equal but in one form), Shiva blessing Chandigeswarar with along Parvathi. Many shrines are also found in the second enclosure within the high granite walls- Mahisasuramardhini shrine, Amman shrine, Chandigeswara shrine, Ganapathy shrine etc.,

5.2.5. Adjoining structure

The main difference that is obvious is this Srivimana has 8 sided (Octagonal) in structure and Thanjavur Srivimana has 4 sided (Quadrangular) in structure. The second wall had the 'gopuram' completely destroyed and from the height of the entrance one could estimate the height of the second gopuram. There is also a shrine without any idol towards the east of the main shrine. Inside the sanctum sanctorum is a four meter high Shiva Lingam. Surrounding the sanctum are two walls, which were meant to provide a private worship area to the royal family.







SCOPE FOR FURTHER STUDY
AND
CONCLUSION

SCOPE FOR FURTHER STUDY

The Hindu temples of India has been a subject of study for numerous historians, religious scholars, art historians, photo-journalists, archaeologists, architects and other professionals. As India has an unbroken culture with a vast collection of scriptures with respect to every aspect of life there is scope for much study on Indian Architecture and the ancient scriptures related to them in different regions of India not just based on the iconography, form and transformation but more on their building technology and structural analysis; and understand the technological advancements and reasons behind the science which we more often consider as superstitions. Some studies have been undertaken. For example it is known that numerous temples have fallen due to different calamities from time to time, yet there are even today examples of temples which haven't fallen either due to earthquake or cyclone or other natural calamity as because these temples were constructed in the form of an interlocking system as per laid out in the ancient manuals. Therefore these structures tend to vibrate along with the earth's vibrations, and will sway but not fall under any circumstances during earthquakes or cyclones. Therefore there is scope for further understanding of the design aspects of Hindu temples, its relation to the religion and the cosmos as a whole. And it can be also subject to structural and geometrical analysis and study.

CONCLUSIONS

The Indian subcontinent in its long and varied history dating from 2500 BC to the colonial period has left behind in the form of its architectural legacy different types of buildings in a variety of architectural styles. The diversity of Indian culture is evident from the different forms of artistic expressions in its built heritage. Among them is the temple architecture of India which has given India a truly magnificent form of architecture. The temples in India are found everywhere varying from small villages to the metropolitan cities. The Indian Temples are not only the abode of God forming the link between God and man and a place of worship, but they are also the cradle of knowledge, art, architecture and culture.

The practices and traditions of temples has its influence on the social, economic and traditional values system in India even today as it was in the ancient times. Today even as new temples continue to be built the character of Hindu temples follow age old traditions though its architectural style is influenced by the local architectural styles and locally available building material and skills. This dissertation is a research into one of the scriptures on which the design of most of the Hindu temples are based. The distinctive architectural styles of Hindu temples have so developed due to its broad geographical, climatic, cultural, racial, historical and linguistic differences which are especially significant in the two major styles of Hindu temple architecture i.e., in the temples of the northern plains and in the southern peninsula of India. Hindu temples of these two regions have been classified as the Nagara or 'northern' style, the Dravidian or 'southern' style. While both the regions share a common origin in thatched huts and modest timber forms, as reflected in early bas-relief depictions and their actual rock-cut representations, further evolution of the structural shrine in each region charts an independent course. But even though the appearance of the temple differed the basic philosophy that guided their planning and layout was the same guided by manuals on architecture.

There are several ancient scriptures and books or manuals in Hinduism. Among these are the scriptures that have guided Hindus on techniques and structural rules of architecture. The technical treatises written in Sanskrit, which is an ancient language of India (the language of the Vedas), gives the

basic rules in the field of architecture and sculpture are called as the Shilpa Shastras and Vastu Shastras. The The Kamika Agama is a not so well known treatise of South India on architecture and iconography. The rules from these treatises were strictly followed for the construction of temples dating back from the 5th Century A.D and followed even today throughout the country in different temple forms and styles.

The temple is a link between the physical world of man and divine world of God. And to connect them, the plan of cosmos were graphically copied in the foundation of the temples. Thus the typical plan of a Hindu temple is an illustration of sacred geometry where the temple is representation of the mandala. Here the sacred geometry means the science the accurate laying out the ground floor of the temple in relation to the astronomical movements and positions and the cardinal directions. The mandala is the sacred form consisting of the intersection of the circle and the square. Thus the Hindu architecture, religious or vernacular, according to the sects in the ancient times were based on the geometry of the Vastupurushamandala.

The basic construction technique used in early Hindu temple was the trabeated system or the post and the beam method and which was extended by the use of corbelling techniques. This method was originally used for wooden construction in India and was later adopted for the stone structures as well. The column-beam-corbels method of construction however became the main structural principle governing the construction of every Hindu temples. Thus most of the available scriptures mainly talk about the methods of constructions mentioned above.

The construction technology used in the construction of the Hindu temple, the processes involved during its construction, the human skills required and methods utilized by architects and their team, all of this together bring out the art, science and philosophy behind the construction of the Hindu temple. This covers aspects relating to the site selection, examination of a site, determining the orientation of the temple, taking measurements and laying out the temple plan on the site, selection of material, carving of the stones, tool and equipments used, joinery details and the final assembly of the temple.

The 'north' and the 'south' Indian temple construction follow the same procedures leading up to the construction of the temple. The slight differences occur due to variability of materials used for construction, the climate and availability of human resources or the social structure of a particular period.

The tradition of temple construction is carried out by various organized groups of architects, artisans and workmen who were employed in the various aspects of temple construction. Today even though there are few of these associations remaining that still maintain the tradition of the construction of the temples On the basis of the above studies this dissertation concludes by undertaking a study of temples taking examples from primarily 'south' Indian temples in an attempt to graphically analyse their design with respect to its spatial organization.