

THE ROLE OF ORIENTATION IN THE PRACTICAL APPLICATION OF VASTU
SHASTRA IN INDIAN RESIDENTIAL DESIGNS

by

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Traditional Hindu architecture has a metaphysical origin. It is based on clearly delineated canons of geometry, proportion and orientation as described in many Hindu architectural treatises. These principles have been rejuvenated in the modern architectural designs of India. *Vastu Shastra's* complexity leads to partial understanding and many practitioners use the principles in an arbitrary and exploitive manner.

This thesis explicates the conceptual premises of *Vastu-Shastra* using Orientation as the focus of the study. *Vastu* orientation regulates the design of spaces in a building and dictates the flow of energies into spaces. According to the principles of *Vastu*, three residences in India are selected and studied, on the basis of their age starting with an old traditional residence, a new residence and a renovated residence. Based upon the analysis of the case study houses, conclusions are drawn concerning the physical application of the rules and its practice in the present time.

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Finally, I am appreciative of the unwavering patience and constant support of my family.

1. Introduction to Vastu Shastra

Ancient Hindu architecture originates in a metaphysical realm and is implemented through clearly delineated canons of geometry, proportion and orientation. Many Hindu architectural treatises prescribe in detail such aspects of architectural design.

Vastu Shastra are canons dealing with the subject of vastu (environment). They may be regarded as the codification of good practices of design, of buildings and cities, which will provide a setting for better conduct of human life in harmony with physical as well as metaphysical forces. These canons provide guidelines for the design of buildings in anticipation of peace and prosperity for the inhabitants. Mythological beliefs are the root of these canonical texts, the first of these relate to *Vastu Purusha*, it also appears to be a part of the vast cosmic space, the *Brahmand*.

Vastu Shastra has gained great importance because, it is result oriented and experience based applied science. It deals with natural forces and changes ones relationship with them. Vastu Shastra builds a beautiful bridge between inner spaces and outer space, transforms voids into spaces which are wombs of creation, care and comfort.¹ Vastu Shastra defines ones path effortlessly and subtracts natural hindrance and blockage, creating a positive relationship between microcosm (individual) and macrocosm (outer world).²

1. Dr. V.G.Sthapati , *Shtapatya Veda*, Chennai, India,1999,40.
2. D. N.Shukla, 1995, 31

Slight rectification in personal holistic alignment on the cosmic reference changes the goal, destiny and the end. Since it is holistic in nature it affects four levels of an individual, physical, phenomenal, psychological and spiritual, which are the basic dimensions of human existence.³

Vastu Shastra deals with the micro level of body, mind and intellect and its bylaws, rules and regulations present a comprehensive conception. Vastu explicates a comprehensive intellectual order of natural existence.

Vastu Shastra is presented as a metaphysical science. The concepts therein are based on practical observations, research and development spanning over hundreds of years, and are not derivatives of any speculative teleology.⁴

“Human life is full of events, both good and bad. Mind functions with equanimity between intellect and nature, then the eternal peace and happiness experienced by the person will not let such good and bad happenings disturb the equilibrium.”⁵

All the matter and energy in the entities have an interrelationship with one another, mediated by a web of electromagnetic forces. It is a scientific fact all events and happenings in this world are reflected in terms of light, sound, oscillations and resonance.⁶

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3. Dr. V.G.Sthapati , *Shtapatya Veda*, chennai, India,1999, 221-224
 4. D.N. Shukla, *Vastu Sastra*, 1994.
 5. Dagens, Bruno, 1994, vii
 6. Dr. V.G.Sthapati , *Shtapatya Veda*, chennai, India,1999

Vastu Shastra can be defined as harmonious, proportionate and positive interaction of all the matters encompassing human life. Vastu Shastra offers adequate representation to all the factors governing life to create, in a sense, harmonious and melodious music in human dimension.

Many concepts in Vastu Shastra are symbolic in nature and need a deep analysis for proper comprehension. The principles of vastu are, geological, geometrical, geophysical, botanical, and above all cosmological and celestial in nature

The Problem

The research is aimed at studying practical application and the effects of orientation in residences. This research studies residences of various ages and has documented their layouts for analysis.

The present day architecture in India is mostly influenced by *vastu*, as the effects of this science have been studied in more detail than ever before and have been implemented in the practical field with presumed success. But the actual reasons behind this science and its effects are not known to the layman. This leads to the exploitation of the sacred science, which is not just based on speculative teleology.

Many residences in India have been changed to vastu designs from contemporary design because the inhabitants tend to have some psychological and physical discomfort by residing in poorly designed contemporary environments.

The traditional designing process is not just a myth or a superstition, but is based on immense research of physical and psychological aspects of human behavior and abilities, stemming from ancient times. These evaluations have led to some rules and

principles upon which any town, village, residence, or the interiors of it, should be designed. It emphasizes orientation of spaces, according to the directions of sun, wind, and other climatic aspects. It is believed that by applying Vastu orientation principles any group of buildings and their surroundings can be made environmentally friendly.

Based on the hypothesis that the vastu shastra has practical effects and in particular regarding the orientation of the buildings and spaces, some selected primary resources, help in knowing vastu shastra and the theories behind it.

Primary Resources

1. *Bruno Dagens. Mayamatam: Treatise of Housing, Architecture and Iconography, Vol. I, Vol. II, Motilal Banarasidass Publishers pvt.Ltd, New Delhi. 1994*

Mayamatam occupies a fairly well defined place in widely disseminated range of works. It is a general treatise, a vastu shastra, written in Sanskrit but originated from *Dravidian* India (around 2000 B.C). Comprising about 3300 verses and divided into 36 chapters, it is identified as *vastu shastra*, a treatise on dwelling, for it defines vastu as “anywhere where immortals and mortals live”. This is followed by specifications, which show that the concept of housing is very wide and is divided into four categories: the earth, buildings, vehicles and seats.

The book comprises all independent works which can be classified under the general headings of “technical treatises” (*silpasastra*) or under the more precise one of “treatise on dwelling” (*vastu shastra*). The scope of these works, and that of the domain they cover, varies considerably and that goes for the comprehensive treatises as much as

for those which confine themselves to limited subjects, such as iconographical or astrological aspects of the foundation and the construction of a house.

Mayamatam is arranged in three large sections: the first (chapters 1-10) deals with dwelling sites, the second (chapters 11-30) section with buildings and the third (chapters 31-36) with vehicles, seats and iconography.⁷

These chapters are considered on the basis of the research intent, which is focused only on residences. The chapters start with the macro level of the village site and end with the individual spaces inside the dwelling.

2. *D.N.Shukla. Vastu Sastra, Hindu Science of Architecture, vol.1, vol.2,*
Munshiram Manoharlal Publishers pvt Ltd, Lucknow, India. **1995.**

The book comprises the Hindu canons of architecture and the history of the Hindu architecture in India. The first volume of the book deals with construction and design, while the second volume deals with the Hindu canons of iconography and painting. The second volume of this book is just used as a reference but not as a critical resource.

The first volume deals with the ancient history of designing and construction of the Hindu architecture. The chapters relating to residences are considered for this thesis. This volume starts with the history of *vastu shastra*, qualities of an architect, and approaches the macro level of the design and construction. The towns and village planning are described as per *vastu shastra*, then towards the micro subjects of residences.⁸

7. Of these 36 chapters the important ones for this thesis research are titled below from the larger macro terms to micro terms Chapter 2. Dwelling sites, 3. Examination of the site, 4. Taking possession of the site, 5. System of measurements, 6. Orientation, 7. Diagrams, 8. Offerings, 9. Village Planning, 11. The number of storeys and the dimensions, 12. The Foundation Deposit, 14. The Base, 15. Dimensions of Buildings, 17. Joinery, 18. Making of the roof and the completion of the building work, 26. Houses, 27. Features of the houses for the four classes, 28. First entry into a building, 30. Doors, 32. Beds and seats (Divans). Appendix – when and where a well is to be placed.

8. Various chapters reviewed in Vol I are; Part II – canons of town planning, which includes, villages, forts, and towns in general, road planning, deification of towns, fortification. Part III – civil or secular architecture. This part deals with buildings in general, development of houses, their planning, construction, structure of the houses, house decoration and other equipment's and he defects of houses.

3. *Dr. V. Ganapathi Sthapati. Building Architecture of Sthapatya Veda*, Dakshinaa Publishing House, Chennai, India. 1999

This book mainly deals with the technological aspects and science behind vastu shastra, explaining the history, the purpose and the definition of vastu. Many archetypal patterns of designs are provided in this volume, which are used as the basis for comparison of the thesis case studies and analyzing with respect to the literature provided in this scholarly work. Vastu Purusha Mandala and its relation with time and space, the technological and physical aspects of vastu are described in numerous chapters.⁹

9. 1. Sthapatya Veda, 2. Central theme of Sthapatya Veda, 3. Vastu shastra a scientific treatise 5. Traditional Indian science and technology, 7. Genesis of traditional Indian science, art and architecture, 8. Vastu shastra a class by itself, 11. Time and space, 15. *Mayan*, the great scientist of India, 18 *Taala* system of spatial measurements, 20. Orientation of buildings, cities and villages, 22. Vastu Purusha Mandala, 23. Concept of time and space and design of building spaces, 24. Effect of subtle and gross spaces on human system, 25. Designing of residences, 26. Archetypal patterns for residences, 29. Trees and plant in and around the buildings 33. Illustrations on residential architecture.

Research Intent (Hypothesis)

This research proposal is based on the hypothesis that effective practical application of Vastu principles provides coherent and consistent spatial designs. The rejuvenation of this ancient science in India after a long period of time has increased its understanding and values. During the past decade this science has gained importance as its principles are known better than before and are implemented in the traditional way, as they have to be. Vastu deals with the arrangement of spaces based on the location of site, its orientation, quality and topography. But there is still a general ignorance about Vastu and its principles among the architects and client exploitation is taking place.

This research is an attempt to know the practical application of the principle of Vastu orientation. I seek to provide a general knowledge for the architect and the client in understanding and implementing these principles.

Scope

Contemporary architecture in India is influenced by the principles of vastu in the building design. This thesis studies vastu shastra in more detail in order to know its application in professional practice. Vastu principles, based on the physical and psychological aspects of human beings, have been applied to the development of towns, villages and residences. A principle of vastu which is focused upon for this thesis is orientation which aims at providing better ventilation, lighting and also to control the flow of the positive and negative energies of nature in to the building.

Research Methodology

This research is intended to study the value of vastu shastra in professional practice, which is based on the initial literary studies of the scholarly work as described earlier. The research studies the effects of orientation in regards to particular residences where the spaces are well defined, executed and controllable. The major focus is given to the principles of orientation, as this involves the physical aspects of, climate, sun path, and cardinal directions.

Various factors are present in the research study, which are independent and dependent. The classification of the variables is based on the literature study.

Independent variables

- Tradition and Culture.
- Theories of vastu shastra.
- Architect (Sthapati).

Dependent variables

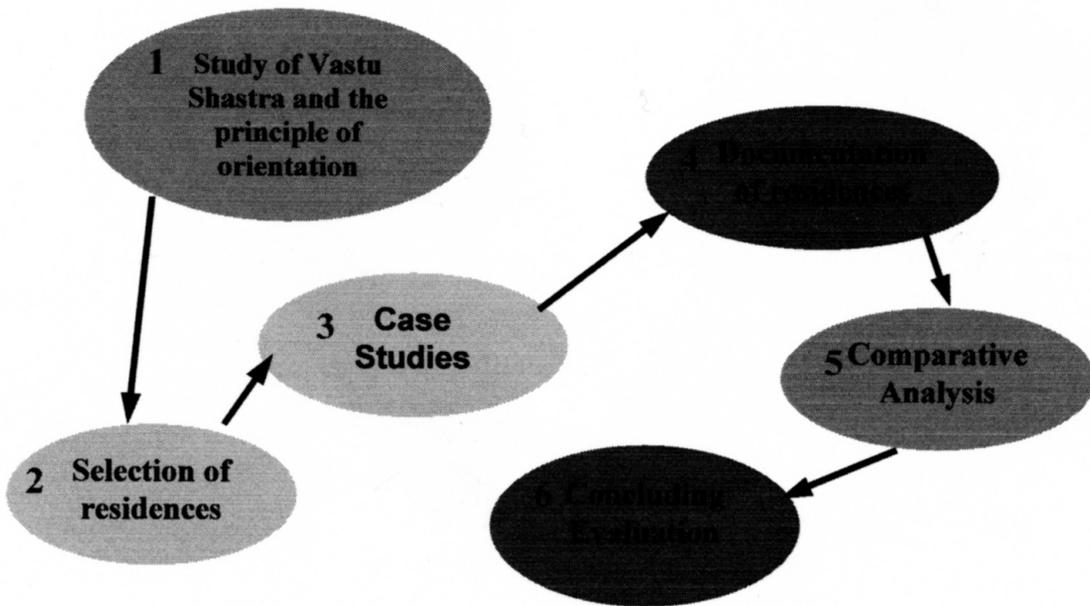
- Application in the practical field.
- Human beings/users, their individual responses.
- Effects of the principles.

Independent variables are the traditional methods of design which have been formulated centuries ago and can still be used in the modern context. Tradition and culture are made by human beings who in turn made the vastu theories which contains the building codes, planning regulations, resources.

Dependent variables are interrelated to each other and to the theories of vastu. The application of the principles is based on the architect, tradition and culture. Human

beings/users depend on the built form in which they reside which in turn affects their lives in positive or a negative manner.

Research Diagram



Vastu Shastra is a building science that deals with physical and psychological aspects. Psychological aspects are difficult to measure in rational terms, but the physical aspects can be. This study is therefore oriented towards a principle of vastu, which deals with the physical aspects.

The methods of the research are stated in the following manner;

1. Study of the vastu shastra theories, in order to identify the principles, which deal with the physical and psychological aspects.
 - The principle of vastu shastra, which is to be focused upon, is Orientation. This principle deals with the climate, spaces and people. The physical aspects can be measured and evaluated with the means of rational methods.
 - Identifying the relation of orientation to the other principles of vastu shastra.
2. Vastu methods/application to specific conditions.
3. Identification of case studies;
 - Selection of case study residences based on the following criteria;
 - Age of the building.
 - Authenticity of the vastu practitioner who has developed the building.
 - Renovated buildings – non-vastu to vastu.

Based on the above criteria three residences will be selected;

- I. A traditional residence built on the principles of vastu
- II. A new residence,
- III. A contemporary house remodeled to vastu.

These selections will contribute to an understanding of the traditional and contemporary way of vastu application.

4. Documentation of the residence.
 - Basic measurements of the residence.
 - Size, space organization and materials of the building.

- All detailed drawings with site plan, floor plans, sections, elevations, and other specific details.
- Qualitative characteristics of spatial organization and relationships that are particularly related to orientation.

Photographs of highlighted spaces where the effect of the orientation is present (this would be depending on the users experience which will be noted through interviews).

5. Comparative analysis of the three case study residences.

6. Concluding evaluation of the case studies:

- Integration of vastu principles into the design of architectural spaces
- Importance of orientation in the application of vastu principles in the practical field
- The role of architects in implementing vastu principles

When a man does not realize his kinship with the world,
he lives in a prison whose walls are alien to him.
When he meets the eternal spirit in all objects,
then is he emancipated, for then he discovers the fullest
significance of the world into which he is born; then
he finds himself in perfect truth, and his harmony
with the all is established.

-Rabindranath Tagore, *Sadhana*

2. Introduction

In this age of highly advanced modern science and technology, it would seem highly incredible, if the truth has been expressed, that in the past India had a science of its own, noted for its supremacy and uniqueness. It lay dormant during all the alien rules but today it is reemerging spectacularly. This is succinctly called the science of energy matter, time, space and spatial form. This is a science of the subtle energy turning into gross or embodied energy, which is other wise called material form.¹⁰ Further it may be added that it is a science of sound, light, word and form, based on which the material forms such as building architecture, temple architecture, town and city planning evolved. They are all space centric but not religious.

The uniqueness of this science lies hidden particularly in the concept of time, space and spatial forms. The concept of spirit and spiritual experiences of bliss and peace, material prosperity and physical welfare are interpreted scientifically. Enabling the human race to live in harmony with the gross nature and also with the subtle nature is the underlying concept of *Vastu Shastra*. This may be restated as a science of manifestation of energy into material form, which further led to the discovery that the universe is subject to a mathematical formula and

10. Dr. V.G.Sthapati , *Shtapatya Veda*, chennai, India,1999,40.

architecture is yet another manifestation of the formula.¹¹

Ancient Hindu architecture originates in a metaphysical realm, yet it is based on clearly delineated canons of geometry, proportion and orientation. Many Hindu architectural treatises prescribe in detail such aspects of architectural design.

The Vedic law of nature sees an innate order and harmony in the universe, nothing man-made should interface with this governing principle. This is when vastu comes in. There is nothing random in creation and nothing random about the design of any created form. Everything that exists in the natural world is endowed with an appropriate proportion and rhythm that give grace and beauty to all the creation.

Each created object or form has its function, its place in the mysterious scheme of the cosmos. If the harmony or order of the cosmos is disturbed, the result is chaos, disharmony and an absence of well being for all existence. This principle of absolute harmony and order in the universe is the governing rule behind the science of vastu.

“The Vedic texts say that everything created in the universe is living. Everything vibrates and pulsates. Quantum physics accepts this now as well. Within *Vedic* philosophy, two terms define the process that gives a specific form to invisible energy: *prakriti and purusha* (nature and human).”¹²

The Vedic texts also assert that everything in the universe is interconnected, and nothing exists in isolation. On one level this is a holistic theory; but in the *Vedic* texts and vastu this concept assumes a spiritual dimension. *Vastu* and *Vedic* philosophy connect this sense of wholeness to the principle that we must respect and preserve all creation.

11. Dr. V.G.Sthapati , *Shtapahya Veda*, chennai, India,1999,41.

12. Kathleen Cox, *Vastu Living*, New York,NY, 2000,19-23.

Vastu Shastra are canons dealing with the subject of vastu, which means environment. They may be regarded as the codification of good practices of design of buildings and cities that provide human life in harmony with physical as well as metaphysical forces. These canons provide guidelines promising peace and prosperity to the inhabitants. Mythological beliefs are the root of these canonical texts, the first of these relate to Vastu Purusha, it also appears to be the first step at ordering a part of the vast cosmic space (the *Brahmand*), for human inhabitation.¹³

Vastu Shastra has gained great importance, as it is result oriented and experience based science. Vastu Shastra changes the cosmic path leading to success, stability and sense, deals with natural forces and changes ones relationship with them. Vastu Shastra builds a beautiful bridge between inner spaces and outer space, transforms voids into spaces, which are wombs of creation, care and comfort. Vastu Shastra defines ones path effortlessly and subtracts natural hindrance and blockage, creating a positive relationship between microcosm (individual) and macrocosm (outer world).¹⁴ Little rectification in personal holistic alignment on the cosmic reference changes the goal, destiny and the end. Since it is holistic in nature it affects at four levels of individual physical, phenomenal, psychological and spiritual which are the basic dimensions of human existence.

As it deals on micro level of body, mind and intellect, its bylaws, rules and regulations need a comprehensive conceptual perception. The structure of events in

13. D.N.Shukla, Vastu-Sastra, New Delhi, 1995,34.

14. D.N.Shukla, 1995, 36-38.

human life being quite in an un-understood state of being, this comprehensive intellectual order of natural existence needs awareness.¹⁵

Human life is full of events, both good and bad. However, if the mind functions with equanimity between intellect and nature, then the eternal peace and happiness experienced by the person will not let such good and bad happenings disturb the equilibrium (Bruno Dagens 1994). According to ancient scriptures, the world is a storehouse of mind, movable and immovable objects, animates and the inanimate, flora and fauna, etc. All the matter and energy in the entities have an interrelationship with one another, mediate by a web of electromagnetic forces. It is a scientific fact all events and happenings in this world are reflected in terms of light, sound, oscillations and resonance.¹⁶

“ In the realm of the human mind, a chaotic wave pattern of this oscillatory energy leads to a sense of insecurity, fear, sorrow. Against this a sense of happiness, peace and good thoughts can be attributed to harmonious and proportionate combination of these waves”.¹⁷

Vastu Shastra can be defined as harmonious, proportionate and positive interaction of all the matters encompassing human life. Vastu Shastra offers adequate representation to all the factors governing life to create, in a sense, harmonious and melodious music in human dimension.¹⁸

15. D.N.Shukla, 1995,60-61

16. <http://www.arbitartionindia.com/book>, 1998.

17. Kathleen Cox, 2000,39-40

18. D.N.Shukla, 1995, 61

Many concepts in vastu shastra are symbolic in nature. The principles of vastu are geological, geometrical, geophysical, botanical, and above all cosmological and celestial in nature. ¹⁹

19. D.N.Shukla, 1995, 62

3. FUNDAMENTAL CONCEPTS OF THE HINDU TRADITION

Hindu Metaphysics

The material expressions of a culture at any moment in time result from its highest ideals in that era, and one must be aware of such subtle forces in order to understand the culture. The ideas of Hindu tradition originate in its philosophy. The most representative principles of Indian philosophy²⁰ were laid down in the *Vedas*, the oldest of the Hindu scriptures and are further developed in the *Upanishads*.²¹

According to such scriptures, all that exists physically in this finite world of space and time originates in an animated, transcendental and metaphysical reality- an infinite truth. Truth referred to as *Brahman*. As a result of this understanding, all the aspects of human reality in ancient times were closely knit together to work as a unified whole towards a single goal: that of the reunification of the individual with the infinite truth.

The Indian philosophical thought and action are fundamentally structured by Hindu myths, especially mythical accounts of creation of the universe. There are several cosmogony myths in the *Vedas*, which are further developed in the *Upanishads*. In these scriptures the imagery and motifs differ but the underlying idea is a constant – the creation of distinct elements out of the primeval cosmic flux, the evolution of order out of chaos.²²

20. "Most scholars interpret Indian philosophy as a collection of concepts, developed over a period of time. The first revealed principles in Vedas evolved into philosophic ideals of the Upanishads, which were the basis of the popularization and symbolization found later. Such development was a dialectical process rather than an historical one. Indian philosophy is also unique to its alliance to parallel religious superstructure". See Flew, *A Dictionary of Philosophy*, 1979, 171; Chennakesava, *concepts of Indian Philosophy*, 1978, 2.

21. The Vedas are four in number, namely, *Rg-Veda* (knowledge of figures), *Yagur-Veda* (knowledge of rites), *Sama-Veda* (knowledge of Chants), *Atharvan-Veda* (knowledge given by the sage, Atharva). Each consists of four parts: Hymns (samhitas), Ritual Texts (brahmanas), forest treatises (aryanakas) and Upanishads. Upanishads contain the quintessence of all the philosophical thinking and the basic philosophic presuppositions of Hindu religious thought of the highest form. Cf. Chennakesavan, 1978, 12; Raju, P.T., et al. *The Great Asian Religions*. London, 1969, 13.

22. O'Flaherty, Wendy, trans. *Hindu Myths*. Baltimore: Penguin Books Inc, 1975, 25.

In one of the cosmic myths in the *Rig-Veda*, the universe originates in *Purusha*,²³ the eternal essence, as a result of a primeval sacrifice. In this process, *purusha*, the universal being, is dismembered and distributed into multiplicity. He is not changed into the various forms of life but is immanent in those forms while always transcending them. It is important to note that as a result of creation, not only are the physical elements of the universe produced but also the social order in the world.²⁴

As is evident, the concept of creation of the cosmos from a single principle called by different names, *Brahman*, *Purusha*, etc., is fundamental to both Indian myths and Indian philosophy. Such creation of the cosmos in Hindu tradition is not considered a historical event. Instead, it is understood as a part of the eternal cycle of time. *Kala* (time) in Hindu tradition is not perceived as linear but is instead cyclic in nature. The Indian notion of cyclic time is based on the conception of cosmic cycles.²⁵ accordingly the universe is created, destroyed and created again in a perpetual cycle. Such an eternal repetition constitutes the fundamental rhythm of the cosmos.²⁶ The primary goal of the human life is to liberate itself from this cycle that is without beginning or ending in order to realize the ultimate truth. Since such a metaphysical reality is considered to be transcendent, intrinsically beyond our limited means of acquired knowledge, the daily actions in the Hindu world were necessarily transpersonal.

23. *Purusha* literally means man in Sanskrit, symbolizes the primeval man or first spirit that is the origin of the world and is equated to *Brahman* in Hindu tradition. *Purusha* also denotes the passive complement of the active creative principle, *Prakrti*, as per schools of Indian philosophy such as *Samkhya*. Stutley, James and Margaret Stutley. *Harpers Dictionary of Hinduism*. New York, 1977, 238-239.

24. Wendy O'Flaherty, 1975, 27.

25. According to the Indian notion of time, at the end of each aeon (*Kalpa*), the universe is destroyed and remains submerged in the cosmic waters while *Brahma* sleeps, until the time when all is to be created anew. Each *Kalpa* consists of four ages, named after four throws of the dice: the first, the *Krta* Age (age of truth), *Treta* Age, the *Dvapara* Age, and finally the *Kali* Age, the present age, when virtue is at its lowest ebb and the human life span is shortest. The notion of cyclic time is most clearly expressed in the myth from *Brahmavaivarta Purana*. In this myth *Vishnu*, one of the Hindu Trinity of Gods, shatters *Indra*'s vanity and makes him aware of the eternal nature of time. For detailed account of the myth refer *Heinrich Zimmer's Myths and Symbols in Indian Art and Civilization*, 3; O'Flaherty, 1975, 43.

26. Cf. *Eliade, Mircea. Images and Symbols*, 1991, 66.

One acted not to satisfy the personal ego or only for the functional purpose of the action but for the welfare of all humanity, and the ultimate spiritual purpose. To live was not an end in itself but a means to understand the ultimate nature of the cosmos.

Such principles of Indian philosophy crystallized into the main precepts of the Hindu religion, whose aim then was also to help its practitioners to realize their identity with the universal truth, and comprehend that each seemingly separate entity is but a manifestation of the one divine reality. Consequently, all actions in this world were guided towards the single purpose of comprehending such a metaphysical truth.

The ideas of the Hindu philosophy and religion are expressed vividly in numerous analogies and metaphors found in anecdotes, stories and myths. The religious practices and rituals give tangible form and structure to the subtle metaphysical principles. Similarly, all the traditional sciences in the ancient times were ways of affirming the absolute values as laid out in the *Vedas* and *Upanishads*. Their practice was a means to realize the infinite truth. This is evident in the fact that in the Indian classification of traditional literature, the treatise on auxiliary sciences such as medicine, grammar, architecture, astronomy, law and so on, are classified as *Vedanga* “limbs or powers of Veda,” or as *Upaveda*, “accessory with respect to the *Veda*.”²⁷

27. The Hindu traditional sciences have been classified in different ways. The Upanishads are: Sthapatya Veda, the science of Architecture, Ayurveda, the science of Longevity, medicine; Dhanurveda, Military science; Gandharva Veda, science of music; jyotisa, the science of the luminaries – astronomy and astrology. As a ritual, architecture is double linked with the Vedas, and is included in two of the sixvedangas, namely Jyotisa and Kalpa. Cf. Coomarraswamy, Ananda “Kha and other words Denoting Zero, in connection with the *Indian Metaphysics of Space*.” Coomarraswamy, 1977, 229; Kramrsich, Stella. *The Hindu Temple* Vol. I. New Delhi, 1976, 10-11.

4. ART AND ARCHITECTURE IN HINDU TRADITION

All forms of art²⁸ in ancient India were conscious and intense expression of the central formative ideals of philosophy and religion.²⁹ The highest purpose of ancient Indian art was to “disclose something of the self, the infinite, the divine to the regard of the soul, the self through its expressions, the infinite through its living finite symbols, the divine through his power.”³⁰

The underlying basis of such an artistic ideal was the concept that the comprehension of the infinite metaphysical truth, as conceived in Indian philosophy, was to come through the act of living in the physical world and could not be attained through a mere intellectual understanding of the metaphysical principle. In this sense, the environment and all the created entities in the physical world were instrumental in attaining the sense of unity.³¹ Thus, the practice of art (*shilpa*) was of utmost importance as a means for attaining the goals of Hindu philosophy and religion. Consequently, artistic creations that shaped the physical environment in the ancient times displayed an understanding of the cosmic truth, and instigated the society in comprehending the same. Then, the essential aim of every act of creation was to harmonize the manifest world with the non-manifest, the physical world of matter and form with the cosmic truths of the infinite.

“All the creations were a ‘materialization of their creators’ highest religious and philosophical ideals not just aesthetic expressions or exercises in color or form but visualizations of the transcendent, brought into the range of human understanding.”³²

28. Traditionally, the practice art of embraced painting, sculpture, architecture and engineering.

29. Sri Aurobindo, 1964, 1, 22; Anand, Mulk Raj. *The Hindu View of Art*, London, 1933, 37.

30. Sri Aurobindo. *The Significance of Indian Art*, Pondicherry, Sri Aurobindo Ashram, 1964, 19.

31. The use of unity in this context may be misinterpreted to exclude diversity, which is not true in the context of the Indian thought. Instead, unity transcends diversity. To clarify in Alan Watts' words: the duality in the world i.e., oneself and the world, the subject and object is an illusion and all these exceptional modes are in fact “a duality” or a unity. Cf. Watts, Alan, *Nature, Man and Woman*, New York, 1958, 119.

32. Huntington, Susan L. and John Huntington. *The Art of Ancient India*, New York, 1985, xxvi.

The *Mandalas*, myths, *mantras* (verbal incantations), *murtis* (images, icons, sculptures), and *Vastus* (architectural works and cities) comprised a multitude of such symbolic gestures. The arts and every act in ancient India were then, reifications of the metaphysical precepts, the purpose of which was to enable the devotee, or for that matter every social being, to comprehend the ultimate truth.

The *Shilpi*,³³ or artist, was the agent³⁴ who brought about the materialization of the highest ideals of the tradition. Since all the actions are deemed to be sacred in ancient tradition, the role of an artist-architect is deemed analogous to that of the creator of the universe.³⁵ According to the Hindu treatises on art, the manifested form first resides in the inner space of individual beings. The inner being is signified by the *shilpi* and the inner manifest subtle form, by a *shilpa*. The outside gross visual forms are the *Pratima*,³⁶ (images) of the inner *shilpas*. The created entity is the image of the subtle inner form projected outside.

The *Sthapati* (architect), according to Hindu treatise,³⁷ is knowledgeable of traditional sciences³⁸ and has practical experience. He is the possessor of the *Prajna* (personal insight) and equipped with immediate intuition.

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33. Shilpi, the artist is sculptor, painter, architect and visionary whose aim is essentially spiritual and aims to see first in his spiritual being the truth of the thing he intends to express and create its form, the inner Shilpa, in his intuitive mind express it as pratima, image of the inner model. Sri Aurobindo, 1964, 20.
 34. The artist as the creator and medium to translate universal principles into material forms is recurrent theme in Hindu tradition. Cf. Kramrisch, 1976, 8.
 35. Cf. Panikkar, R. "there is no outer without inner space." In Concepts of Space: Ancient and Modern, Ed. Vatsyayan, Kapila, 1991, 15.
 36. The word pratima means literally "counter-measuring" and denotes that, which is measured against and tailored to the original. The creative image is therefore the accurate copy of the phenomenon, and stands in relationship to the original. Cf. Zimmer, 1946, 31.
 37. For detailed discussion on nature of traditional Hindu architect refer, Shukla, 1995, 44-47; Dagens, Bruno, trans and ed. Mayamatam: Treatise of Housing, Architecture and Iconography, Vol. I, New Delhi, 1994, 25-27; Kramrisch, 1976, 10.
 38. The knowledge of vastu sastras, the science of architecture consists of canons of the site planning, architectural design, landscape design, town planning, building arts besides being a skilled mathematician, an astronomer and astrologer. The knowledge of Vedas and Upanishads is the foundation and precedes such an education into specific sciences. Cf. D. N. Shukla, 1995, 44-47.

Above all he is a man of good conduct and right character in order to perform the sacred task of architecture. It is only then that his actions bear fruit and in turn become harbingers of goodness on earth. This is a significant and necessary aspect of *Sthapati*'s character for what he creates in the world, are *pratimas* (images) of his inner self and that self must be pure, untainted by the immaterialities of the world.

The creativity³⁹ of such a traditional artist-creator originates from his intuitive understanding of the universal principle. It is certainly not bound by canonical rules laid out in the art treatises, for such rules are to art what laws of grammar are to a piece of a prose.⁴⁰ He is the medium to translate the universal principle into material form. It is understood that everything created in this world already resides as a potentiality in the *Brahman*, the infinite truth, and finally is a *pratima* (image) of *Brahman*.⁴¹ The traditional architects skill and expertise lie in his ability to intuitively understanding the nature of creation and purpose of the universe, and to create spatial entities along the lines of first creation.⁴²

39. Traditionally, there is no conflict between creativity and adherence to rules and principles. In contrast creativity in architecture, as understood today, is a field of limitless freedom, free from restraint of any kind of rules or perceptions of geometry and proportions, which are considered to be the antithesis of creativity.

40. Anand, 1933, 187-188.

41. Chennakesavan, 1978, 78.

42. Anand, 1933, 172-173.

5. HISTORY OF VASTU SHASTRA

Writers of the past have posed questions on antiquity and origin of Indian architecture. Indian culture is historic rather than being historical and architecture, being one of the hallmarks of the civilization, must have begun with the rise of civilization itself. A very advanced state of architectural objects unearthed there consequently cannot be disregarded of its historical value and as non-Indian. To surmise the origin is not only a problem but also a mystery, and modern rationalism is all against a mysterious approach. A scientific approach in relation to an architectural study must not solely rely on archeological evidences, the literary evidences must have an equal importance in reconstructing past history despite the absence of any archeological evidence.⁴³ There are innumerable references in *Rig-Veda*, which indicate a very advanced architecture of the day.⁴⁴

The ancient science of India is designated as *Mayonic* science and technology, this not only makes it distinct from the contemporary material sciences, but to restore and revalidate the unique spiritual science of a great scientist and technologist who lived during the *Sangam* days (around 5000-3000 B.C)⁴⁵ in the southern part of India, which is around the region of *Kanyakumari* of the present.

Mayan, the *Brahmarishi* (head of the saints) and *vishwakarma* (architect), so introduced by *Veda Vyasa*,⁴⁶ carried this vastu tradition from south to north and beyond in India, making it a national tradition.⁴⁷

43. D. N. Shukla, 1995, 50 –51

44. D. N. Shukla, 1995, 50 –51

45. The period mentioned here is an assumption based on the artifacts; Dr. V. G. Sthapati, 1999, 40

46. One of the ancient writers, of Hindu Religion; Dr. V. G. Sthapati, 1999, 41,

47. Dr. V. G. Sthapati, 1999, 41

All the *Shilpis* of India, belonging to the Mayan tradition carry the title of 'vishwakarma' until today. The aim of the *vishwakarma/Sthapati* is to reanchor the sacred science of *Vastu* and to popularize the science by following the rules of a *Sthapati*.⁴⁸

Mayan the founder architect of the so called *Dravidian Vastuvidya* (school of architecture), is one of the eighteen professors mentioned in the *Matsya Purana*.⁴⁹ In *Mahabharata*⁵⁰ Mayan is mentioned as master mason of the Gods and *Danavas* (the demons) respectively. He said to be the master of thousand arts, and superior of all architects. Many people for their livelihood followed his arts.⁵¹

Premises of ancient Indian Science:⁵²

- All objects of nature are unified entities (forms) of energy and matter
- The free space is the unified field of energy and matter and source of all forms in the material world
- All material forms of universe are musical forms or have taken shape on musical rhythm or musical scale.
- Time creates, sustains and destroys all, so created.
- The primal manifest form of the un manifest is square (primal pattern).
- The primal square pattern is designated as the diagram of embodied energy – *Vastu Purusha Mandala*.
- The free space is packed with cubical atoms of energy; they are building blocks of the structure of the universe.
- The cube is microcosm.

48. For detailed discussion on nature of traditional Hindu architect refer, Shukla, 1995, 44-47; Dagens, Bruno, trans and ed. *Mayamatam: Treatise of Housing, Architecture and Iconography*, Vol. I, New Delhi, 1994, 25-27

49. One of the epics of the Hindu religion, Kramrisch, 1976, 11

50. The largest epic of Hindu religion, Kramrisch, 1976, 11

51. The art of designing and construction were followed by many people influenced by Mayan, Dr. V. G. Sthapati, 1999, 41

52. Dr. V. G. Sthapati, 1999, 77

- Within the hall there is a vertical luminous shaft called *Brahma Sutra* (shaft of consciousness).
- The shaft vibrates in a particular order called the rhythm; this order is its nature.
- The rhythmic vibration of the shaft of consciousness is the space (dance of lord *Shiva*).
- The micro space, in the cubical shape is *foetus/Garbha or Bindu* (core).
- The micro adobe is the respiratory of light and sound.
- The free space is light and light is the *moolam*/source of the universe and universal forms.
- The embodied energy is *Vastu Brahman/Vastu Purusha*. The space enclosed in a building *Prasaada Purusha* (energized building).
- Building is a living organism, built of musical units of measure.

Vastu Shastra initially was used for constructing sacred (temples) and palatial buildings, later it was developed for the common people based on the caste system (division of people into groups based on the kind of work they do). A totally new process of designing was prescribed for construction of residences.

With time, these rules have been changed and reformed depending on its present day life. Today Vaastu Shastra is applied for the design process of residential and commercial buildings, to provide a harmonious relationship with the nature for the residents and to derive a friendly environment. These queries are addressed more clearly in the case studies and their analysis.

6. PRINCIPLES OF VASTU SHASTRA

The previous chapter explains the origin of the shastra. This chapter explains what exactly it means and the various principles that guide the shastra.⁵³

Defining the terms:

Vastu – Dwelling, surrounding nature/environment.

Shastra – science/treatise.

Combining the terms vastu shastra can be defined as ‘**the science of the nature/treatise of dwellings,**’ which is the basic underlying concept.

Defining vastu shastra in a speculative way means as harmonious, proportionate and positive interaction of all the matters encompassing the human life. According to ancient scripture, the world is a storehouse of mind, movable, immovable objects, animate and inanimate, flora and fauna. All the matter and energy in these entities have an interrelationship with one another.⁵⁴

Principles of Vastu Shastra:⁵⁵

Vastu is based upon various factors of nature that form a set of rules defining a comprehensive procedure for building construction. The basic elements on which vastu is dependent are defined below.

Five elements of the nature play an important role in the manifestation of the energy levels in any closed space;⁵⁶

53. This chapter explains the major principles and the elements on which vastu shastra is dependent.

54. Kathleen Cox, *Vastu Living*, 2000, 19-22

55. Chap-V, Major principles governing vastu shastra, D. N. Shukla, 1995, 104-106; Dagens Bruno, 1994, 7-8

56. Dr. V. G. Sthapati, 1999, 89-101

1. EARTH 2. WATER 3. FIRE 4. WIND 5. SKY

1. **Earth / *Bhuumi*** – Earth, the third planet in order from the Sun, is a big magnet with north and south poles as centers of attractions. Its magnetic field and gravitational force has effects on everything on Earth whether living or non-living. It is tilted by about $23\frac{1}{2}^{\circ}$ at the meridian and rotates on its own axis from West to East resulting in day and night. Its one orbit around sun takes $365\frac{1}{4}$ days (1- year) Three fourths of Earth's surface is water and one fourth is land. Earth's main characteristics become known through the senses, *Shabda*(sound), *Sparsha*(touch), *Roopa*(form), *Rasa*(taste), and *Guna* (quality).
2. **Water / *Jala*** - This is represented by rain, river, sea and is in the form of liquid, solid ice, and gas. It is a combination of hydrogen and oxygen in the ratio of two to one, perfectly neutral in reaction. In every plant and life on Earth water exists in certain proportion and its main characteristics are known through *Shabda*, *Sparsha*, *Roopa* and *Rasa* (taste).
3. **Fire/*Agni*** - Represents light and heat of fire (burning), lightning, volcanic or plutonic heat, the heat of fever or inflammation, energy, days and nights, seasons and such other aspects of Solar system, and also enthusiasm, ardor, passion, spirited vigor. It's main characteristics are known through *Shabda*, *Sparsha* and *Roopa* (form).
4. **Wind / *Vayu*** - Atmosphere of the Earth which is about 400 kms, in depth and consists of 21% Oxygen, Nitrogen 78%, Carbon-di-Oxide, Helium, other kinds of

gases, dust particles, humidity and vapor in certain proportion. Human life, plants and animals and even fire depends on this. Its main characteristics are known through *Shabda* and *Sparsha* (Sound).

5. **Sky / Aakaash** - It is the unending (Anantha) regions remote from the Earth, in which not only our Solar System but the entire Galaxy (Brahmaan) exists. Its effective forces are light, heat, gravitational force and waves, magnetic field and others. Its main characteristic is known through *Shabda* (Sound).

All living organisms are understood to be made up of these elements, so vastu shastra derived its basic set of rules from these elements:⁵⁷

- Earth: site selection and surveying are derived to verify the quality, bearing of the soil, topography and orientation to earths poles.⁵⁸
- Water: positioning of water bodies, wells, and water tanks.⁵⁹
- Fire (related to sun, as it is the main source of life in Hindu religion): positioning of kitchen, furnace, which in turn determines the hot zones in a residence, where the radiation and the energy levels are high.⁶⁰
- Wind: size of openings, ventilation.⁶¹
- Sky: orientation of building to know the flow of energies, in and out of a residence and to manipulate them.⁶²

57. Definite set of rules formed, on the basis of the five elements, Dr. V. G. Sthapati, 1999, 89-101

58. Site survey, selection and topography, for more details refer Dagens, Bruno, 1994, 11-17; Dr. V. G. Sthapati, 1999, 212-229

59. Study and positioning of water bodies, refer Dagens, Bruno, 1994, 121-124;

60. Positioning of hot zones, refer Dr. V. G. Sthapati, 1999, 308-316

61. Proportions of doors and windows, refer Dagens, Bruno, 1994, 681-715

62. Orientation of site, and spaces inside a building, Dagens, Bruno, 1994, 29-37; Dr. V. G. Sthapati, 1999, 229-249

Vastu works to preserve the balance of the five elements, by ensuring that each element is placed in its appropriate location in the main building and in each room. Each room has its own energy levels and vibrations, due to the addition of appurtenances, which has to be restored by proper use of these rules.⁶³

The three primary stages of applying Vastu Shastra:

Vastu principles are applied to the physical developments of a dwelling/temple/city. This application involves three stages of construction, starting from site selection and ending with the completion of building.⁶⁴

1. Orientation.
2. Site planning.
3. Construction.

The study of orientation is done in detail in this research study. The other rules are used for the study and are available for reference in the appendix of the thesis. A general description of the other two is given in this chapter.

Orientation:

Orientation marks the first step in Vastu design theory. It seeks to locate the site and make the building harmonious to its surroundings. Vastu Shastra depends on orientation, as all the archetypal layouts of buildings are based on orientation and Vastu Purusha Mandala. This theory for arranging spaces in a building is dependent on orientation, and can be called as its sub form.⁶⁵

63. Dr. V. G. Sthapati, 1999, 89-101

64. For complete description of the construction refer appendix

65. Orientation is the major principle on which Vastu Shastra depends, Vastu Purusha Mandala being developed on orientation it is a sub form of Orientation. Dr. V. G. Sthapati, 1999, 264

Site Planning:

A site has to be studied before constructing any sort of building on it. Vastu shastra prescribes a set of rules for the selection of site, studying its natural features as quality, bearing, topography, water levels and orientation. These rules are dependent on the prior applications of orientation.⁶⁶

Construction:

Construction is the process of physically developing a design and making it suitable for residing in it. This process is the later part, when all other sets of rules are implemented in the design, then construction plays a role. Vastu Shastra derives many forms of building construction depending on its size and proportions. The construction knowledge of Sthapati becomes active at this final stage of *Vastu*.⁶⁷

66. Dagens, Bruno, 1994, 11-17

67. For complete instructions refer, Dagens, Bruno, 1994, 37-41, 251-305, 821-897

“Orientation ensures spatial harmony of building with the earth. Orientation of cities and towns are of paramount importance in Indian vastu town planning. Orientation of residential, religious, educational and commercial spaces are of equal importance. Non-adherence of the rules of orientation would disturb harmonious life with nature”.

- Dr.V.G.Sthapthi, *Stapathya Veda*, 2000, 79.

7. ORIENTATION

Orientation is an important aspect of building design. It is the art of positioning of a building with respect to the cardinal directions. This concept is arrived at with sun's position to the earth's movement. According to vastu the sun and earth are living organic forms. The sun is rotating at a fixed point about its axis vertically. The energy contained in the sun attracts the celestial bodies like earth into its gravitational field.

The line of demarcation of a sphere, which divides it into two hemispheres, is given importance in vastu. The line of demarcation is called Equator that runs east west of earth, technically called as *Suddhapraachee* (true east) in Sanskrit. And the perpendiculars are the north south directions, which all together form four basic cardinal directions.

The lines of east west and north south are considered as lines emanating from the center of the earth. These lines in another sense are lines of conduits by which the energy, concentrated at the crust of the earth, flows and spreads over earth's surface. They are also lines of absorption of solar, lunar and stellar energies.

All planets including the earth are suspended or soaked in the ocean of space, which is the source and repository of energy that sustains all embodied energies including man and other animates that live on earth. This is a vital energy upon which vastu predicates its rules and codes for designing buildings.

The following process is for determining the cardinal points exactly for any given site;

The methods of determining cardinal points, with the help of a gnomon.⁶⁸

One should proceed at sunrise during a month when the solar path is towards the north⁶⁹ during a bright fortnight, when the sunrise is beautiful, the sun is in the position of the appropriate fortnight and when there are no spots on the solar disc.⁷⁰

A piece of ground in the middle of the chosen site should be leveled by the water method; this must be a square, and in its center the gnomon should be set.

The Gnomon

Herewith the dimensions of the gnomon; the best is one cubit long, its diameter is one digit at the top and five at the bottom, it is perfectly circular and without irregularities; one of medium size has a length of eighteen digits and a small one a length of twelve or nine digits, their diameter at the top and bottom being in all cases proportionate to their length.

The materials prescribed for the making of the gnomon are as follows: ivory, sandalwood, hard woods; its tip should be perfectly circular.⁷¹

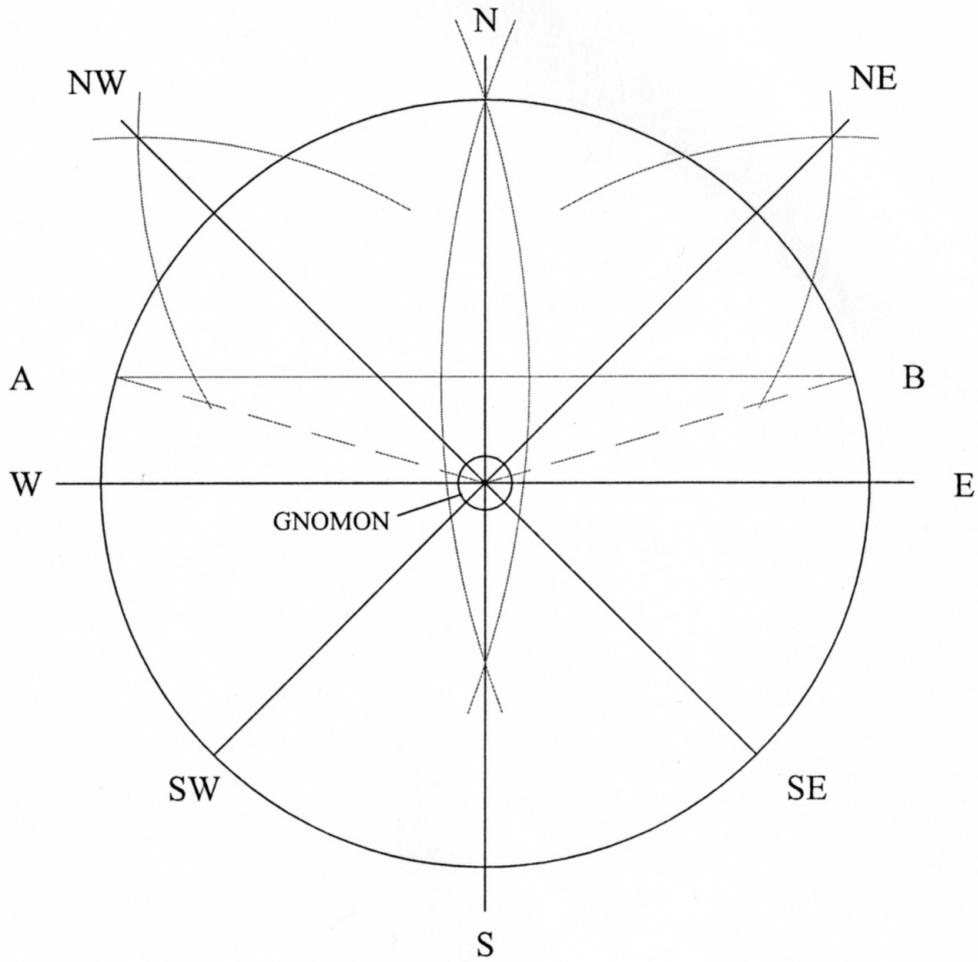
When the gnomon has been made it is setup in the chosen place at sunrise, then a circle is drawn of which the gnomon is the center of which the diameter is double the length of the gnomon. (Figure 1)

68. Dagens, Bruno, 1994, 39-35

69. However it is said that this operation can be done at any time of the year.

70. When clouds do not obscure the solar disc.

71. Citravrttaka: it is said that the tip of the gnomon is like an umbrella, that is to say conical.



ORIENTATION:
 A,B: POINTS WHERE THE SHADOW TOUCHES THE CIRCLE IN THE
 MORNING AND EVENING RESPECTIVELY

FIGURE - 1 LOCATING THE CARDINAL DIRECTIONS

Source: Mayamatam Vol II, Dagens Bruno, xiviii

The line, which joins the two points where the shadow of the gnomon has touched the circle, in the morning and in the evening, gives the east-west direction.⁷² The line, which passes through the space between these, two points and connects the head and tail is the north-south axis.⁷³

The Rope

The rope measures eight poles.⁷⁴ It has uniform thickness of one digit at most. For gods, Brahmins and kings it is made of three strands and it is without knots but for the other two classes it is made of no more than two.⁷⁵

The Stakes⁷⁶

Hardwoods should be used for the stakes. The length of the stakes goes from eleven to twenty-one digits, their diameter is that of a closed fist and their bottom end is pointed.

72. The radius of the circle being equal to the height of the gnomon, the shadow touches the circle when the sun is at 45° , in the morning and in the evening.

73. Refer page-33

74. Refer to Dagens, Bruno, 1994, 23-27

75. Thus the rope is to be the sacrificial thread.

76. These buried stakes will be used at the time of the laying-out to mark the place of the different parts of the building and will remain in the ground afterward.

Placing the Cords

A *pramana cord* is determined by the prescribed dimensions of the intended construction.⁷⁷ The *pariyanta* cord goes round the outside of that area determined by the *paramana cord*.⁷⁸

In towns villages and forts the cord must first of all be cast towards the northwest, then from south to north and east to west, then west to east and north to south.

In a house the cord which goes from the square of Brahma⁷⁹ towards the east is called *trisutra*, that going west is called *dhana* that going south *dhanya* and that which goes from the square of Brahma towards the north is called *sukha*.⁸⁰

The *pramana* is the cord, which gives the dimension of the *sukha-alaya*. For the sake of solidity the stakes are to be driven in all around the central pavilion⁸¹ at a distance of one, two or three cubits.

77. *Pramana* designates the reference dimension from which are calculated other dimensions of a building. It is from the *pramanasutra* that are calculated the projections of out going elements such as forepart, ediculae...etc.

78. The *paramansutra* is the line, which marks the limit of the building and of all its outgoing elements.

79. *Brahmasthan*: the square of Brahma is the center of any ground plan.

80. These cords correspond to the four main buildings of the house, which are called *sukhalya*, *annalaya*, *dhanalaya* and *dhanaalaya*.

81. The central pavilions in these cases are defined as a large pillared open courtyard for temple and palatial buildings.

It should be known that the spirit of the building has six bones (or lines), a single heart, four vulnerable points and four vessels (or diagonals) and that he lies upon the ground, his head is east.

-Bruno Dagens, *Mayamatam*, Vol. I

Vastu Purusha Mandala

According to one of the Hindu creation myths, long ago something undefined by the name and unknown in its proper form, blocked the heaven and the earth. Seeing that, the gods seized it and laid it upon the earth facing downwards. *Brahma* had the gods occupy it and called it 'Vastu Purusha'.⁸² The resulting form is called *Vastu Purusha Mandala*.⁸³ (Figure-2) *Purusha*, the cosmic man in the mandala, is the manifested aspect of universal essence, the supersensible origin of all things. In the *purusha*, supernal man, the supreme principle is beheld. Beyond form and non-contingent, it is beyond description. It is known by intellectual intuition, as residing in the man, the microcosm and in the universe the macrocosm.⁸⁴ *Vastu*⁸⁵ is the planned site of the building. It is the plan of manifestation and it represents the extent of existence in its ordered state. "The essential form of such a *mandala* is square, strictly oriented to the four directions of space".⁸⁶

The square *mandala* originates in its center addressed as *Brahmsthana*, the place of *Brahman*, the supreme principle that corresponds to the inner sanctum, or heart space, the place of Brahman in man. Thus, it also symbolizes the place of *akasa*, the primordial space in Hindu tradition. The square of *vastu purusha mandala* is further divided into

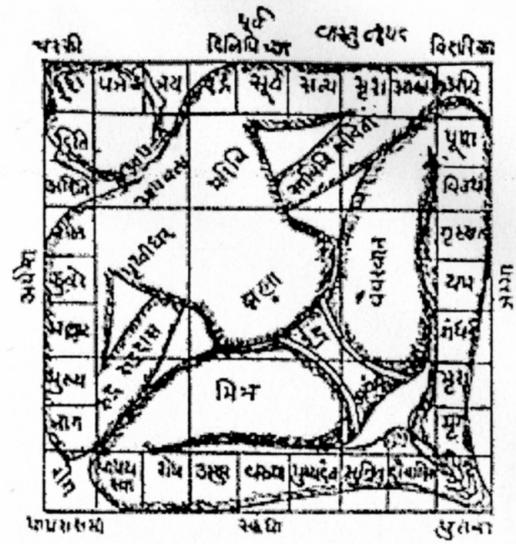
82. The origin of Vastu Purusha is told differently in numerous myths. For detailed accounts, refer to Kramrisch, 1976, 73-78.

83. Mandala is a Hindu Cosmogram (

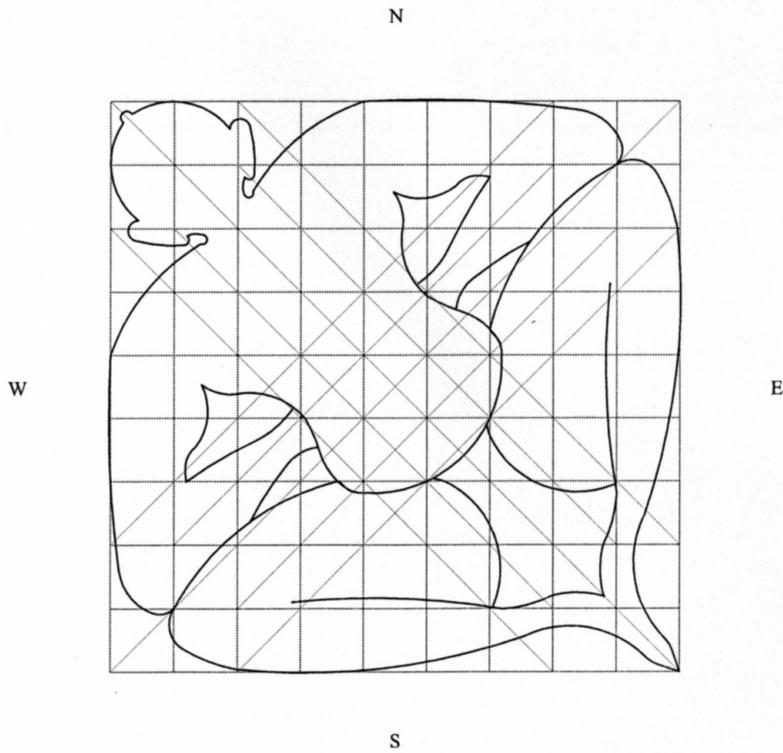
84. Kramrisch, 1976, 67.

85. The earth is one of the Panchamahabhutas, the five fundamental elemental substances and is considered the prime Vastu since it is the underlying stratum of existence. Prasada, the temple or place, Yana, the conveyance, and Sayana, the couch, are also considered as Vastu that find support on the prime vastu. Kramrisch, 1976, 21.

86. The transformation of square mandala into a triangle, hexagon, octagon and a circle of equal area in specific instances is allowed by the traditional treatises. Cf. Shukla, 1995, 185.



VASTU PURUSHA MANDALA WITH SANSKRIT DESCRIPTIONS



VASTU PURUSHA MANDALA

Figure - 2

smaller squares by a grid of lines developing into a system of thirty-two types of *mandala* formation starting with the mandala of one square, and increasing to mandalas with as many as 1024 (32x32) squares or pada.

Such a system of mandala is the basis of architectural design for all structures ranging from the house to the city. Therefore, drawing of mandala is imperative before any building activity can be undertaken. Appropriately, the knowledge of the meaning of mandala and its execution is the first discipline an architect must master.⁸⁷

The symbolism of vastu purusha mandala

The Hindu mandala is a *yantra*. A *yantra*⁸⁸ is a geometrical contrivance by which any aspect of the supreme principle may be bound to any spot for the purpose of invocation and worship. In laying *Vastu Purusha Mandala*, vastu, the ground, is converted into the extent of the manifested universe. The nameless and formless entity, *Vastu Purusha*, is bound to the square *mandala*.

The Form

The square form of the mandala is derived from the traditional Indian cosmology according to which the surface of the earth is demarcated by sunrise and sunset, points where the sun apparently emerges above and sinks below the horizon, i.e., the east and the west, and also by the north and south. It is therefore represented as a square.⁸⁹ So in Hindu tradition the earth in its physical external form is depicted as a square circumscribed by the circle of horizon. When structured by the cardinal points of a square, it is the manifestation of the universal, *Brahman*.

87. Volwahren, Andreas. *Living Architecture: India*, 1969, 43

88. D. N. Shukla, 1995, 36

89. The square does not refer to the outline of earth but only connects the cardinal directions, hence in Vedas earth is referred as Casurbhristi, four cornered and is symbolically called Prithvi-Mandala. Kramrisch, 1976, 17.

This is also apparent in the ritual of laying out the square of the *mandala* that is geometrically derived from the circle. The cycles of the sun are pinned to the four directions; the circle of the sun's rotation is squared. The square *mandala* also symbolizes the celestial, in contrast to the circular shape that represents the terrestrial world. The circular shape symbolizes growth and movement of time whereas the square is a stable and unequivocal form.

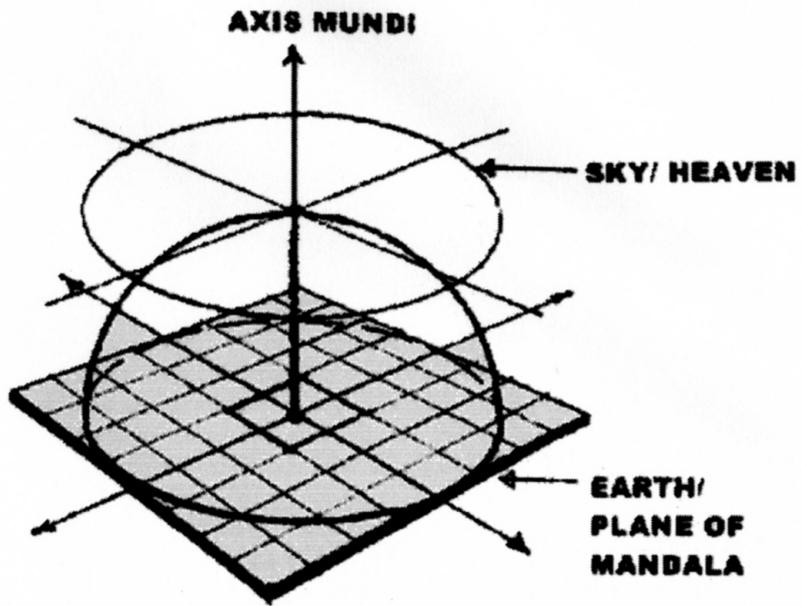
The Center (figure 3)

The center of *mandala* is the seat of *Brahman* and therefore also embodies *Akasa*, the primordial space. It corresponds to *Hrdyakasa*, the heart space located inside the human being, the microcosm. The significance of the center of the mandala is cosmogonic: the generation of the built form from its center symbolically equates the production of the world of multiplicity from unity.⁹⁰ The geometry of the mandala is generated from the center; its layout and geometrical configurations are developments of the formal possibilities held within the center; so the cosmic center is source and container of the worlds. The center is the space-less and timeless origin of space and time, the one that produces plurality. The sensible world is a disintegration and division of unity, just as the built form is the deployment of geometric potentialities held within its center.

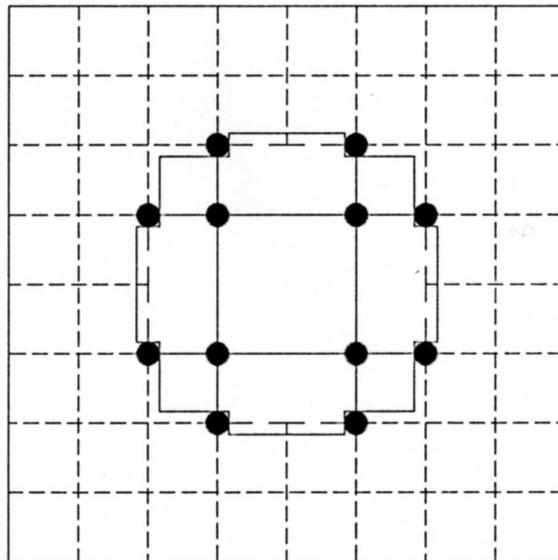
The center of the mandala also represents the base of the *axis mundi*, the vertical axis, the connection between the earth/world and sky/heaven. Such an axis connects this world to other states of existence and to the unitary and principal point from which they all derive.⁹¹ It is analogous to the mount *Meru* that rises at the center of cosmos.

90. Snodgrass, 1994, 58.

91. The symbolism of the axis mundi is perennial and occurs in many traditional societies. It is ritually setup a line of communication with other planes of existence as way to return to common source. Cf. Snodgrass, 1985, 163.



CENTER



VITAL POINTS OF MANDALA
FIGURE - 3

The vital points (Figure 3)

The lines, by which the square plan is divided into smaller squares, are not mere geometrical connections but have width and a direction. Instead their prototype has the measure of breath. Their points of intersection are *marmas* – vital or vulnerable points. The marmas measure one-eighth part of one square in the plan of 81 squares. No building or part of it should be placed on these vital points,⁹² since they represent the breath-knots in the boy of Purusha.

Theophanies

The squares in the Vastu Purusha Mandala are assigned to forty-five divinities, who are invited in rituals to descend into the mandala where they take up their allocated positions. The central squares⁹³ are assigned to Brahman and are called Brahmasthana, the station of Brahman, the creator, personification of the center from which the manifestation emanates. Forty-four *devatas*, or deities, are grouped around Brahman. These are normally distributed in two borders of three squares width. The twelve deities from the inner rim, immediately surrounding the Brahmasthana are the *adityas*, representing the twelve positions of the sun on the ecliptic in the cycle of the year. Four of the adityas occupy the cardinal directions around the Brahmasthana, (namely *aryaman*, *vivasan*, *mitra and prithvidhara*) and eight stand in corners in pairs (*savitri and savitri*, *indra and jaya*, *raja yakshman and rudra*, *apa and apvasta*).⁹⁴

In the outer rim at the periphery are stationed 32 gods, called *pada devatas*, or

92. These Marmas or the vital points, in the Hindu mandala distinguish it from the modern architectural grid. These junctions mark the structural supports in the modern grid where as in the Hindu mandala these are vital points that cannot be built upon. For more detail refer; Snodgrass, 1995, 115; Kramrisch, 1976, 51-576, D. N. Shukla, 1995, 187-188; Volwahn, 1969, 44.

93. Four in mandala of sixty-four squares and nine in the mandala of 81 squares.

94. Snodgrass observes that in some Mandala formations, only eight adityas are specified and the four corners are only reflection of the inner four corners deities and not separate divinity. Snodgrass, 1994, 143-144.

‘enclosing gods,’ representing twenty-eight lunar mansions, the constellations through which the moon passes in its monthly course, and the gods of the four directions. Thus, Brahmasthana is surrounded by the images of division of cycles of the sun and the moon held in an instantaneously simultaneity with in the confines of the mandala. Time is thus rendered static.⁹⁵ It is significant to note that the relative positions of the deities representing lunar mansions remain constant in various formations of mandalas, but the number of squares assigned to the various divinities varies in different plans.

The cruciform ordering, determined by the motions of the sun in the year, is the primary structuring principle within the mandala. The mandala is governed by the cross of the cardinal directions, corresponding to equinoctial and solstitial points in the annual cycle of the sun. All other divisions in the mandala are subservient to the rule. Therefore, lunar symbolism harmonizes with the dictates of the solar expansion. The outermost border of the mandala graphs the course of the moon on the ecliptic; and by the fact the four cardinal and its corners the four ordinal directions, it simultaneously traces the stations of the sun.

Time is spatially configured in the mandala in two ways: firstly, the diurnal movements of the sun are marked upon the mandala by the way of the ritual of orientation and secondly, the divisions of the cycle of times are established within the mandala by way of deification. Personified and divined, the cycles of the moon, the planets and the sun are brought from their celestial realm to take up their places upon the grid of the mandala where they occupy positions that correspond to the celestial locations.⁹⁶

95. Ibid. 98

96. Ibid. 102

Finally the square is the archetype and pattern of order, determining the geometry of the cosmos and the structure of society.⁹⁷ The circle represents the cycle of time in Hindu tradition. The union of the square of space and the circle of time generates universal order. Since the square and circle are the figures of space and time they are reconciled in mandala, it is the embodiment of the whole cosmic order.

By incorporating the above meanings, the mandala is a model of the cosmos. It is a sacred image that is a 'graphic mirror of supernatural essences.'⁹⁸ Vastu Purusha Mandala is a symbolic diagram of the manner in which the world comes to be manifested by emanation from a principal point. "It is a graph of the cosmogonic process in which multiplicity deploys from the principal point to unity. It is a microcosm that originates in its center, the place of Brahman".⁹⁹ The center, the immaterial principle, is the spiritual origin of the peripheral elements in mandala that signify the material aspect of the cosmos. Such symbolic meaning of space and time form the bedrock of the construction of houses, temples and cities in Hindu architecture.

The traditional architectural forms Temples, towns, residences, and palaces are based on the Vastu Purusha Mandala and are thus images of the cosmos. The mandala does not form the ground plan of these architectural structures, instead it regulates them.¹⁰⁰ The built form establishes space, confines it and determines the limits of meaningful space from out of the unlimited non significant space.¹⁰¹ The building as an image of the macrocosm, also images the microcosm of the human being. The architectural form signifying the center of the universe, is also the innermost center of each being, thus the

97. Kramrisch, 1976, 42

98. Cf. Zimmer, Heinrich. *Artistic form and yoga in the sacred images of India*, 1984, 13.

99. Snodgrass, 1985, 108.

100. Kramrisch, 1976, 6

101. Snodgrass, 1994, 62

body of the building equates with the body of the cosmos and the body of the man. By reason of this relationship between building, man and cosmos, architectural form can serve as a diagram of a spiritual journey.¹⁰² To return to the center of architectural space is symbolically equivalent to the return to the center of the universe and to one's own center. It is a return to the realm, which, being space-less, is infinite and, being timeless, is eternal.

102. Snodgrass, 1994, 62

Various Forms of Vastu Purusha Mandala Composition¹⁰³

There are two basic types of Vastu purusha mandala, one of $8 \times 8 = 64$ squares and another $9 \times 9 = 81$ squares. The former one is called *mandukapada* (subtle/sukshma), the later *parmasayika* (Figure 5) or *chanditapada* (gross/sthula).¹⁰⁴

The squares are called *pada*, which are represented, by *devatas* (as described (earlier in the chapter). The pada devatas (gods), which are found in a typical house pattern, are as follows: (Figure 4)

The padas are interpreted as consisting of concentric square belts (conduits for flow of energy) going around the central core-space with a concentrated energy called 'Brahma Bindu' or '*Brahma padam*', the adjacent belt is called *Deivika padam* (the field of luminosity), the third is called *Manusha padam* (the field of consciousness) and the fourth is called *Paisachika padam* (the field of grossness-matter).¹⁰⁵

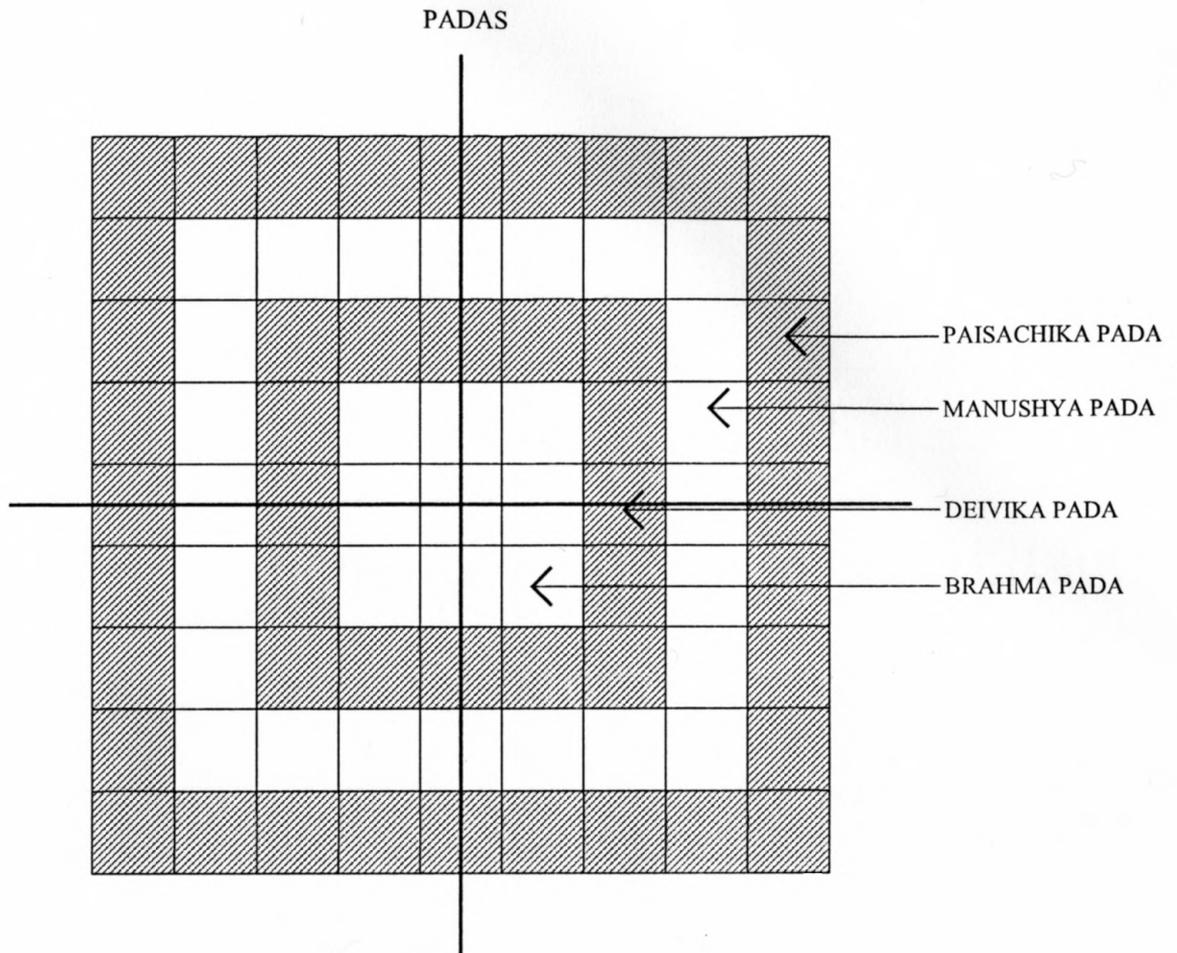
These Padas are primary wave patterns emanating from the inner space of individual beings and from the outer space of the universal being, the cosmos. These concentric square belts are linear at the atomic level and are a bundle of energy wires woven into threads running parallel to each other and also diagonally from corner to corner. Vastu Purusha Mandala is a bundle of energy lines (conduits) packed inside the cube, the flow of which takes place in an order which gives rise to the orderly form in the world of reality.¹⁰⁶

103. Dr. V. G. Sthapati, 1999, 269

104. The two type of mandalas are differentiated by the number of squares present. Dr. V. G. Sthapati, 1999, 269

105. The four padas are distribution of space in a given mandala and represents the cosmos. Dr. V. G. Sthapati, 1999, 269

106. The concentric belts are the padas and the central Brahma Bindu is a point where actually experience takes place. Every thing emanates from this point and spreads all over the mandala. Dr. V. G. Sthapati, 1999, 270



BRAHMA PADA - THE CENTRAL PART OF THE INNER MOST DIVISION IS **BRAHMA PADA** WHICH IS AN INTENSIVE ENERGY FIELD WITH IN THE BUILT SPACE AND IS THE HOTTEST ZONE OF THE ENERGY GRID.

DEIVIKA PADA - THE ADJOINING SURROUNDING BRAHMASTANA IS THE **DEIVIKA PADAM** - THE LUMINOUS SPACE. (THESE TWO SPACES ARE UNSUITABLE FOR HUMAN HABITATION DUE TO THE EXTREME HEAT).

MAANUSHA PADA - THE THIRD DIVISION IS THE **MAANUSHA PADAM** - MEANING HUMAN SPACE; IT IS A SPACE OF HUMAN CONCIUSNESS.

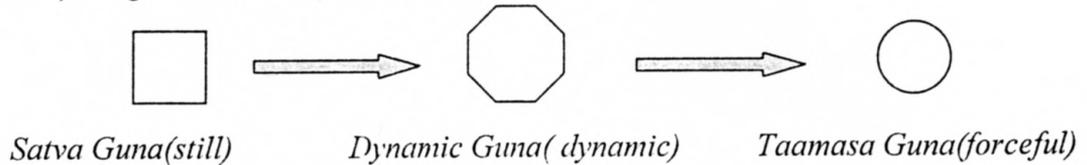
PAISACHIKA PADA - THE OUTER MOST ZONE IS THE **PAISACHIKA PADAM** - SPACE OF GROSS MATTER WITH HIGHLY MATERIALISTIC QUALITY.

FIGURE - 4 THE PARAMASAAYIKA VASTU PURUSHA MANDALA

Source: STHAPATYA VEDA, Dr.V.Ganapathi Stapathi, Chap-26, Page--310-314

Dynamics of Space

Space experiences and vibrates into form. The solid cube of energy explodes and splits itself into a grid pattern called *Vastu Purusha Mandala*.¹⁰⁷ This is also the inner order of the universal being. Due to self-spin of the vastu mandala wave patterns *Gunas* (qualities) are generated. They are as follows



The process

1. The cube of energy is the structure of OM light and OM sound. This alone experiences and merges into time. It turns into three basic forms; square, octagon and sphere.
2. Experience takes place only when the cube is still luminous. This is a grid-less unitary form and unified field of energy. The next development is that of the grid in the body of the subtle cube. On this grid occur all thought forms very sharply, tri-dimensionally and in perfect order. This is inner experience or inner vision. This is replicated, into the material world by the *shilpi* (architect).
3. The moment that the feeling to express erupts, the *manduka* grid blossoms into existence. The feeling of expression is consciousness, this is *Kala* (time), and it is movement.
4. To develop this subtle into gross form, the square *mandala* goes into self-spin producing heat and finally turns into another *mandala* of 9X9 units.
5. The turn of the subtle 8X8 into 9X9 is called *Pranava*.

107. This mandala is the plan of the universe (macrocosm) and also of the microcosm. They are tranquil and enjoyable. The vastu science has adopted this plan for the house –building, temple and village, city layouts and creates small microcosms. The traditional pattern of a house is therefore a paradise on earth where an individual lives in bliss and peace. Square is the primal manifest form of the non-manifest this is a unitary space without grid. With grid laid on it, is designated as vastu purusha mandala, signifying the inherent order in the structure of micro and macrocosms. The tri-dimensional cube is KARU and this manifest into the universe. This is taken as the basic form/pattern of a house. This is called Garbhagriha. OM is verb as it grows into form. OM is an active monosyllable.

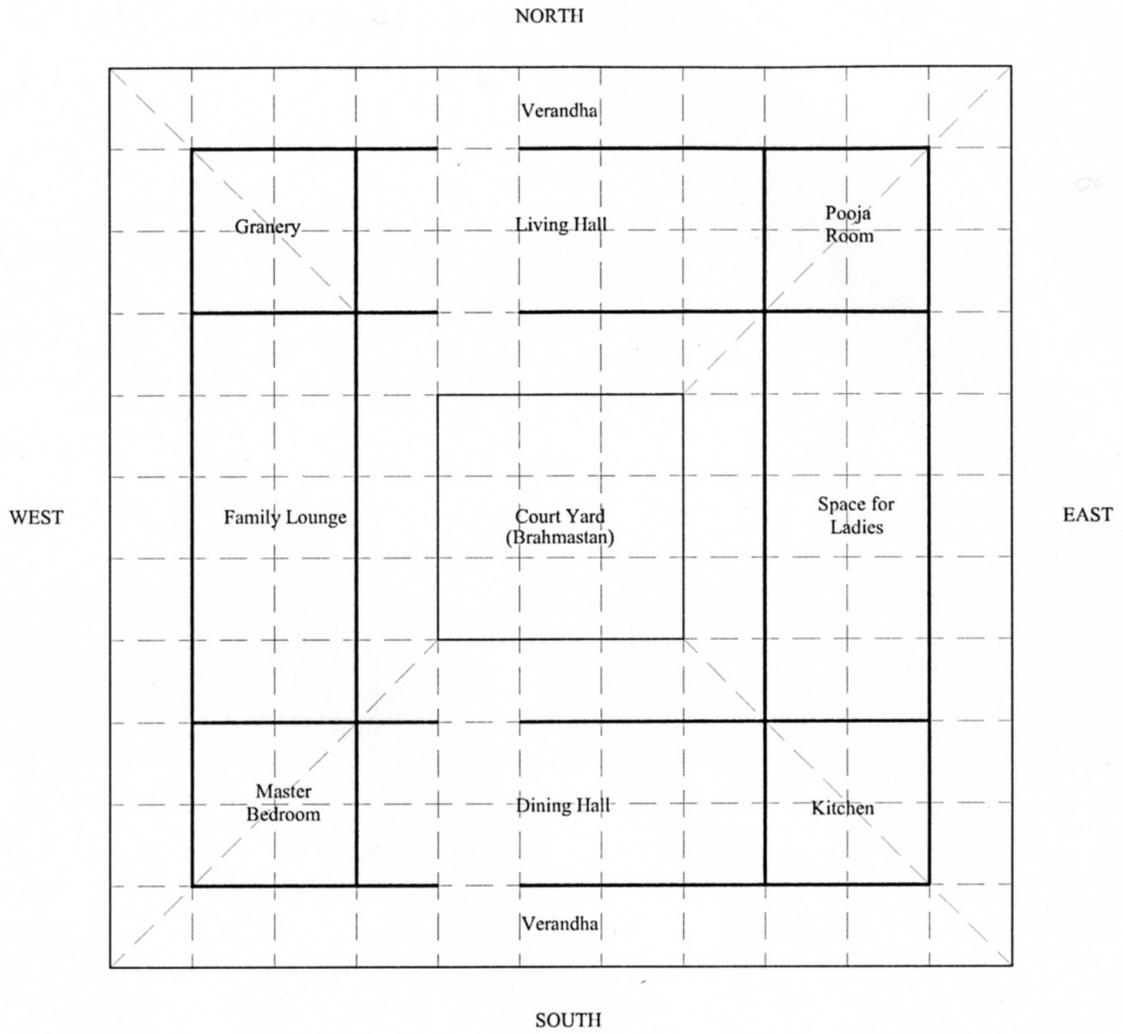


FIGURE - 5 PARMASAYIKA DIAGRAM 9 X 9 SQUARE GRID

Source: STHAPATYA VEDA, Dr.V.Ganapathi Stapathi, Chap-26, Page--310-314

8. ARCHETYPAL RESIDENCES

System of Measurements¹⁰⁸

All dwellings are defined by their dimensions; the system of measurements are presented in the following chapter.

The digit¹⁰⁹ is known to be the multiple of an atom; an atom is defined as that which can be perceived by the vision of those who have mastered their senses.

Eight atoms are equal to a speck of dust and, in multiplying each time by eight, we go from a speck of dust to the tip of a hair, then to a nit, to a louse and finally to a barley grain. Eight barley grains make a digit, which is called as well 'measure'.¹¹⁰ Twelve digits make a span¹¹¹twice which is a cubit, called by the learned, as well, "forearm";¹¹² twenty-five digits make a *prajapatya*, twenty-six a *dhanurmusti* and twenty-seven a *dhanurgraha*.

For vehicles and seats cubit is used, for buildings the *dhanurmusti* and for villages, and so on the *dhanurgraha*; the ordinary cubit however may serve for any building.¹¹³ it is also called *ratni*, *aranti*, *bhuja*, *bahu*, and *kara*. Four cubits make a pole,¹¹⁴ also called *yasti*; eight poles make a rope.¹¹⁵ Villages are to be measured in poles as are *pattana*, towns, *nigama*, *kheta*, palaces... etc; but houses are to be in cubits.

108. Although current Vastu practice does not utilize these units of measure, this system of measure does embody sets of proportions that are important to Vastu principles. It is the proportions that are being analyzed later in the case studies

109. *Matra*: this term is often used as a substitute to *angula*. We are given here the set of formless units, which goes from the paramanu up to the yava; this last is the one to be of practical use. Dagens, Bruno, 1994, 23.

110. *Vitasti*: also called *tala*; the last term is also applied to an iconometric relative unit. Dagens, Bruno, 1994, 23.

111. *Hasta* is the most often used term for naming the cubit; but several synonyms are also found: thus *kisku*(forearm). Dagens, Bruno, 1994, 23.

112. This appears to be the genuine rule; the distinction given above seems to remain largely theoretical. Dagens, Bruno, 1994, 25.

113. *Danda*: is also the name of the module, which is the basic relative unit of measurement in architecture. Dagens, Bruno, 1994, 25.

114. According to *Arthasastra* the *Rajju* is of ten *Danda*. Dagens, Bruno, 1994, 27.

115. Dagens, Bruno, 1994, 23-27

The sages should employ the span for vehicles and seats, the digit for small objects and the barley grain for very small ones. Such is the system of measurement.

The *matraingula* is equal to the middle phalanx of the middle finger of the official priest; it is to be used for measurements relating to sacrifices...etc: that which has just been mentioned is also called “digit taken from the body”. Knowing all this the architect must measure rigorously.

Description of Units

Grain is supposed to be the basic unit, but digit is used as a general unit.

- 8 Grains = 1 Digit
- 12 Digits = 1 Span
- 2 Spans = 1 Cubit
- 4 Cubits = 1 Pole
- 8 Poles = 1 Rope

Division of the units

- Digit is divided into 8 parts.
- Span is divided into 12 digits
- Cubit is divided into 24 digits
- Pole is divided into 96 digits
- Rope is divided into 768 digits.

The general units for measurements in residences are cubits, spans and digits.

Houses

There are six types of houses with one, two, three, four, seven or ten main buildings for gods, Brahmins, and other classes.¹¹⁶ These building blocks are not to be placed on the square of the *Aja*. They have a front verandah and either they are separate from each other or form a block.¹¹⁷ Their widths, lengths, heights are expressed in even and odd numbers of cubits.

Width of the building blocks

When a house has only one building blocks the eleven possible widths of that building go from three to twenty three cubits and four to twenty four by successive increments of two cubits. When there are two or three building blocks there are seven possible widths, from seven to nineteen cubits or from eight to twenty by successive increments of two cubits.¹¹⁸

Length of the building blocks

The length is one and a quarter, one and a half, one and a three quarters or twice the width; increased by a quarter, half three quarters; or is equal to three times the width, this being the maximum. There are eight ways of calculating the length from width. The length should not be more than twice the width when considering the residences.

Height of the building blocks

There are five ways to calculate the height from the width; the height is equal to

116. Dagens, Bruno, 1994, 515-570

117. Ajamasa: that Brahma square appears to be only the central square of Brahmas place in eighty-one square diagram. Houses with one to four main buildings are laid out on a site, which is basically square, and the main buildings, are placed inside that site, along one of its border lines. Each main building comprises of a main body closed by walls, with a front verandah facing the center of the site; in four main building house that center is occupied by the Brahmas altar which may be sheltered by a pavilion.

118. There are in fact two sets of dimensions, one in odd numbers and the other in even numbers.

the width, it is equal to the width increased by quarter, the increase is one half and three quarters; lastly the height is double the width.

Houses with Four Building Blocks

Description of houses with one, two, three and four building blocks is made below. This thesis focuses only upon houses with four building blocks.

Dimensions and types

There are twenty-nine possible widths for the four building blocks houses type. These widths go from nine to sixty-five cubits or from ten to sixty-six by successive increments of two cubits. The first fourteen are for houses whose central court is not covered.

The names of the houses with four building blocks are; first is *sarvatobhadra*; the second *vardhamana*; the third *svastika*; the fourth *nandyavarta* and the fifth *rucaka*.

Calculating the length

The initial type is a square house whose sides have the dimensions, which have been given for the width. The length is in line with the *jati* mode when it is two cubits more than the chosen width; if the difference is four cubits, it is in *chanda* mode; if six, *vikalpa*; finally, if the length is eight cubits, it is *abhasa*.

Sarvatobhadra House (Figure 6)

The total width of the house is eight parts; the central courtyard makes up two parts of the width; the passage around it is half as wide and the main building block makes up two parts of the width. Exterior to the four corners of the square formed by the four main buildings there are square outward rooms and a gallery extends on each side between these rooms.

The master's chamber is in either east or the west building block; the walls enclose it and it has a vaulted door; the walls have latticed windows on the outside and there are pillars along the interior surface.

The main entrance of the house occupies one part along the length of one of the lateral main buildings or of the eastern one; it has a door with plain shutters on the exterior and one with latticed shutters on the interior.¹¹⁹

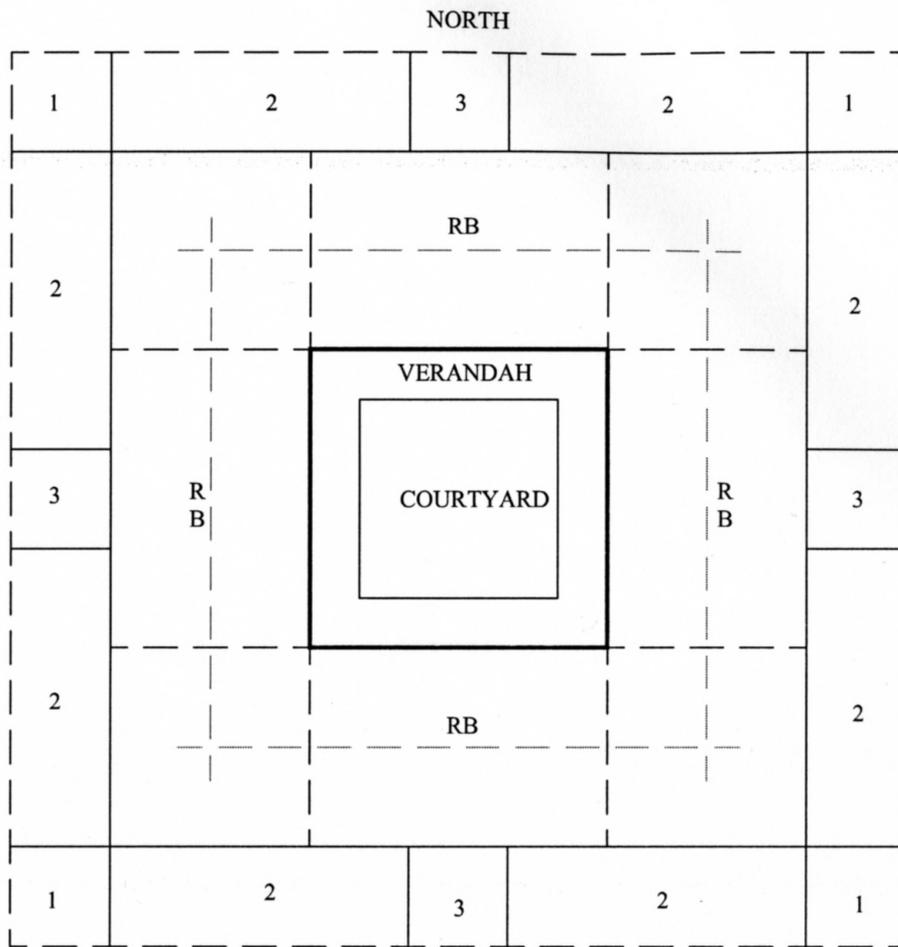
The ridge beams of the main building cross at right angles and thus there are eight gables, each of which has a projection. In the middle of the four faces of the house there is a forepart, in the shape of half an outward room.¹²⁰

At the corners there are inside projection rooms with roofing whose rafters are assembled conch-like.¹²¹ There is a pediment with *ardhakoti* (lotus shaped). All around there is a lean-to. A board along its eaves borders the roof. The entablature is provided with false dormer windows and with a sterobate. The rafters, doors and ridge beams are to be similar; any transgression of this rule would bring misfortune.

119. The main entrance should probably be in a side building when the principal building is to the east, and in the eastern building when the principal one is to the west. There must be two doors: one on the side of the entrance building facing outside and the other of its side facing the central court.

120. *Ardhasabhamukha*: those fore parts are similar to the outward corner rooms, but their backside is applied against the wall of the main building, hence they look like engaged structures of which the front half part only is visible.

121. *Sankhasangalupa*: this must correspond to a pyramid roof or a conical one.



FOUR MAIN BUILDING HOUSE: SARVTOBHADRA TYPE
 1. CORNER ROOM
 2. OUTWARD GALLERY
 3. FOREPART
 RB-RIDGE BEAM

FIGURE - 6

FOUR MAIN BUILDING BLOCKS HOUSE: SARVTOBHADRA TYPE

Source: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-27, PG-IXXX

In all empty spaces the appearance is that of pavilion.¹²² There are one or several storeys and the arrangement is like of a temple. Such a house is always fit to be dwellings of Brahmins, gods and kings.

For increase and decrease nothing less than one complete cubit is ever used; this is common to all the houses.

The gables, which are at the ends of the four building blocks, are at right angles; above these eight gables are second storey and an attic. There are finials on the ridge beam, which are all at the same level. There are loggias above the foreparts, accessible from inside and with a gable on the outside.

Vardhamana House¹²³ (Figure 7)

The total width of the house is six parts; the main building block takes up to two parts of the width, as does the central courtyard. There is a wall all around the outside. There is a one part wide passage to the east of the principal main building; this has a median partition wall and a vaulted door.

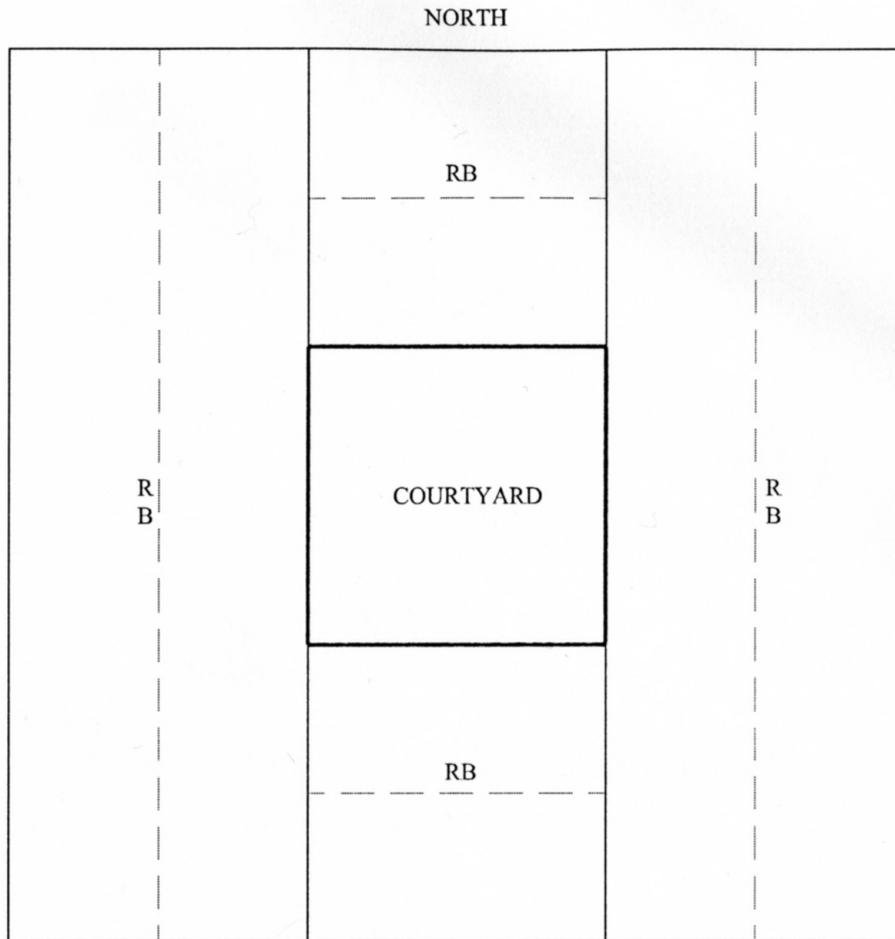
The western main building block is elongated and has two gables; it is higher than the others. The eastern main building block is a little less elevated than the western and a little more than the lateral main building and it is elongated. The lateral main building blocks have no gables and the ridge beams are lower.

There is a median porch with two-part projection on each of the house, the smaller pillars of which may be arranged as is convenient. Spiral stairways taking up two parts are to be arranged at the corners.¹²⁴

122. Muktamuktatala: all the free space, that is to say the place, which is not occupied by the main buildings; what is to be built here, are galleries and other pillared structures endowed with the three level elevation of pavilions.

123. Vardhamana houses have unequal main bodies, the two bigger ones being placed face to face and joined together by the two other.

124. Where that type of stairway is called Sankhamandala.



FOUR MAIN BUILDING HOUSE: VARDHAMANA TYPE
RB-RIDGE BEAM

FIGURE - 7

FOUR MAIN BUILDING BLOCKS HOUSE: VARDHAMANA TYPE

Source: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-28, PG-IXXXI

The house has false dormer windows, arcatures, pillars and latticed windows; the arrangement is as for a temple and everything not prescribed here must conform to what has been indicated above. This house has one, two or three storeys; if it is intended for kings, its door is not to be in the north.

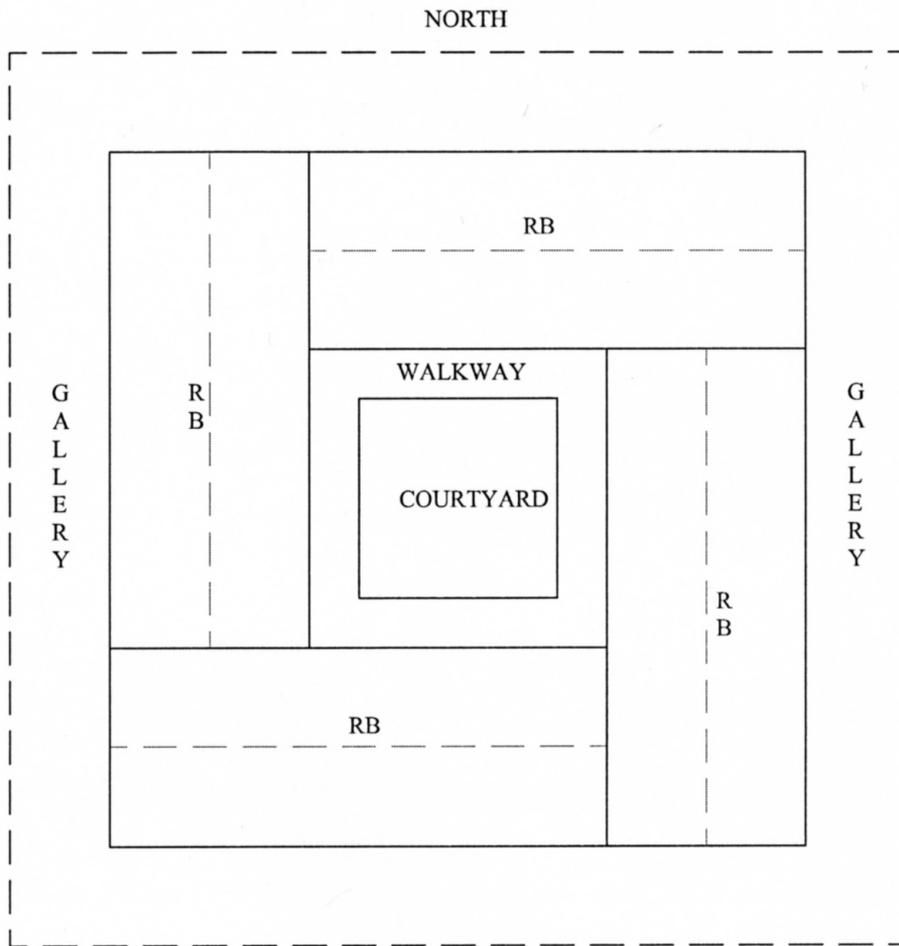
Nandyavarta House (Figure 8)

The total width of the house being six parts, the median courtyard makes up two parts of that width; the width of a main building block is two parts, which dimension is applicable to all four of them. The exterior gallery and exterior walls are to be arranged in *nandyavarta* shape.

There is one main building block with a door or else there are four doors. Doors have latticed shutters inside and plain ones outside.

A wall on each side closes the principal main building; it comprises an internal partition wall with a vaulted door and has a front verandah bordered by a colonnade within and a wall without. On each of the four facades of the house there is a forepart, half-aedicule shaped; there is a pent roof supported by consoles and the arrangement is that of a temple.

The house is fit for all the classes, but for *vaisya* and *sudra* the main façade must be in the east. This house may also have a one part wide gallery all around it, the exterior door of which is ornamented. Elements such as base and pillars are to be arranged in the manner previously indicated. This house has one, two or three storeys and looks like a temple with flat roof.



FOUR MAIN BUILDING HOUSE: NANDYAVARTA TYPE
RB-RIDGE BEAM

FIGURE - 8 FOUR MAIN BUILDING BLOCKS HOUSE: NANDYAVARTA TYPE

Source: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-29, PG-IXXXii

Svastika House

The total width of an *svastika* house is six parts, of which two are of central courtyard and the same manner for the width of the main building block. There is a vaulted door. There is an elongated outwork construction at the back and one in front too; on each side façade there is a square construction, perpendicular to the main building and provided with a pediment. The elongated construction at the back has no pediment; it is blind (no back).

The house has a lean-to, six gables and fore parts. A *svastika* house facing east is suitable for *vasiya* and *sudra*. Otherwise the house may be surrounded by a gallery, one part wide and decorated with engaged structures.

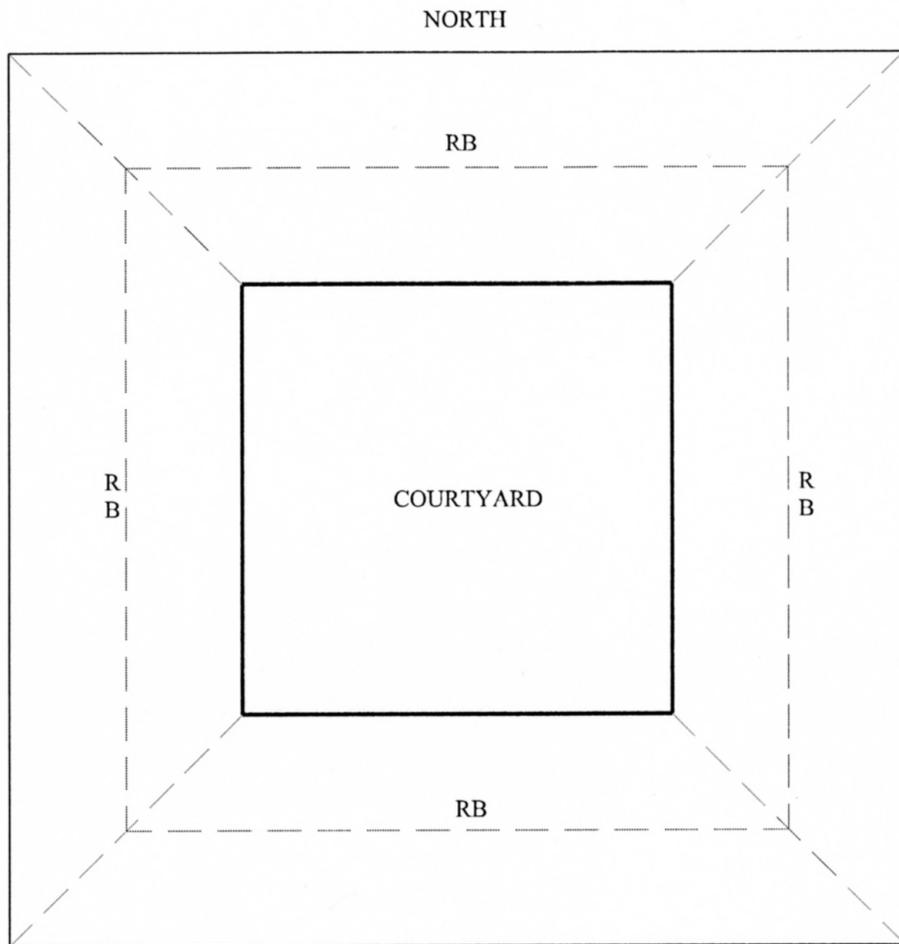
The total width of the house may be divided into twelve, fourteen or eighteen parts; there is a central court as well as an exterior verandah, a big courtyard and a gallery; in any case the width of the building block should be two parts.

Doors, pillars, walls as well as foreparts are to be arranged according to the specific case; there is to be a *harmayanga* if specific circumstance and required appearance warrant it. There is a wagon roof, a hipped roof or a flat roof.

Rucaka House (Figure 9)

A house is called *rucaka* when the ridge beams of its building blocks do not intersect and where there are corner rafters.¹²⁵ There are stairways at the corners, there are decorative elements and it is specified that there is no door in the north. It is appropriate for the dwelling of the heterodox, Brahmins and all other classes.

125. Literally, the main buildings have no cross beam and they have corner rafters. On a practical point of view the ridge beams of the roofs of the four main buildings join by their ends at the corners without intersecting cross-wise as when the roofs interpenetrate each other.



FOUR MAIN BUILDING HOUSE: RUCAKA TYPE
RB-RIDGE BEAM

FIGURE - 9 FOUR MAIN BUILDING BLOCKS HOUSE: RUCAKA TYPE

Source: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-30, PG-IXXXiii

General rules for houses with four main building blocks

Houses with four main buildings, which are regular quadrilateral shaped but not elongated, and which are of the prescribed width, are suitable for gods, Brahmins, ceremonies and all the heterodox sects.

The Number of Storeys and the Dimensions

The rules relating to the number and dimensions of storeys of Vastu houses.¹²⁶ There are differences between the buildings due to the layout of the plan, according to whether it is square, rectangular, round, elliptical, octagonal, hexagonal or apsidal. Other variations are due to increase or diminutions in the number of storeys.

There are four possible widths for single storeyed buildings, starting from three or four cubits and increasing successively by two cubits. For two storeyed buildings there are four possible widths, from five or six cubits to eleven or twelve with successive increments of two cubits. There are five possible widths for three storeyed buildings, from seven or eight cubits to fifteen or sixteen.¹²⁷ There are four possible widths for four and five storeyed buildings and so on. Lastly, it is stated that a very small single storeyed building measures one or two cubits.

Some say that in houses, divine or human, the measurements may be given in an odd or even number of cubits and that half a cubit may be added to or subtracted from that prescribed number.¹²⁸

The height is ten sevenths, nine sixths, eight fifths, seven fourths or six thirds the width according to whether the buildings are of *santika*, *paustika*, *jayada*, *adbutha* or *sarvakamika*,¹²⁹ or equally, the height may be double or one and half times or one and a quarter times the width.

126. Dagens Bruno chap-9.

127. Vikara = sixteen for according to sankhya prakriti.

128. This may be to obtain dimensions in accord with ayadi system.

129. Where Sarvakamika mode is omitted, proportions are slightly different.

One who is well versed in calculating proportions should construct buildings of ten to twelve storeys, with the aid of the proportions given for those, which have seven, eight or nine storeys.

The width is to be measured along the exterior face of pillars and the height from the base up to the capital, yet some say that the height is measured only up to the top of the roof.

The heights of large buildings have been given in cubits and they should be ten-sevenths the corresponding widths. Where small buildings are concerned the rule to be followed is that their height is double their width.

It is stated that buildings of up to twelve storeys are suitable for gods, those which have nine or ten are suitable for Brahmins; buildings with seven storeys are suitable for kings; those which have from seven to eleven storeys are for universal monarchs; those which have three or four storeys are suitable for merchants and sudra and lastly, those with five storeys are for *pattabhrt*.¹³⁰

Those who know the subject never plan constructions of more than one hundred cubits in height and seventy cubits in width.

130. *Pattabhrt*: they are most probably the pattadhara, one of the lowest categories of kings.

GENERAL PROPORTIONS¹³¹ (Figure 10)

- For all main buildings, the height of the top of the pillars is same as their greatest width.
- Height of walls is equal to that of pillars.
- Thickness of walls triple to the diameter of the pillars.
- Interval between pillars is $1/3^{\text{rd}}$ or $1/5^{\text{th}}$ the width of the main building.
- Diameter of the pillars is proportional to the width of the building.
- Middle of wall corresponds to the middle of the building and the middle of the pillars.
- There are as many digits in the diameter of the pillar as there are cubits in the width of the main building.

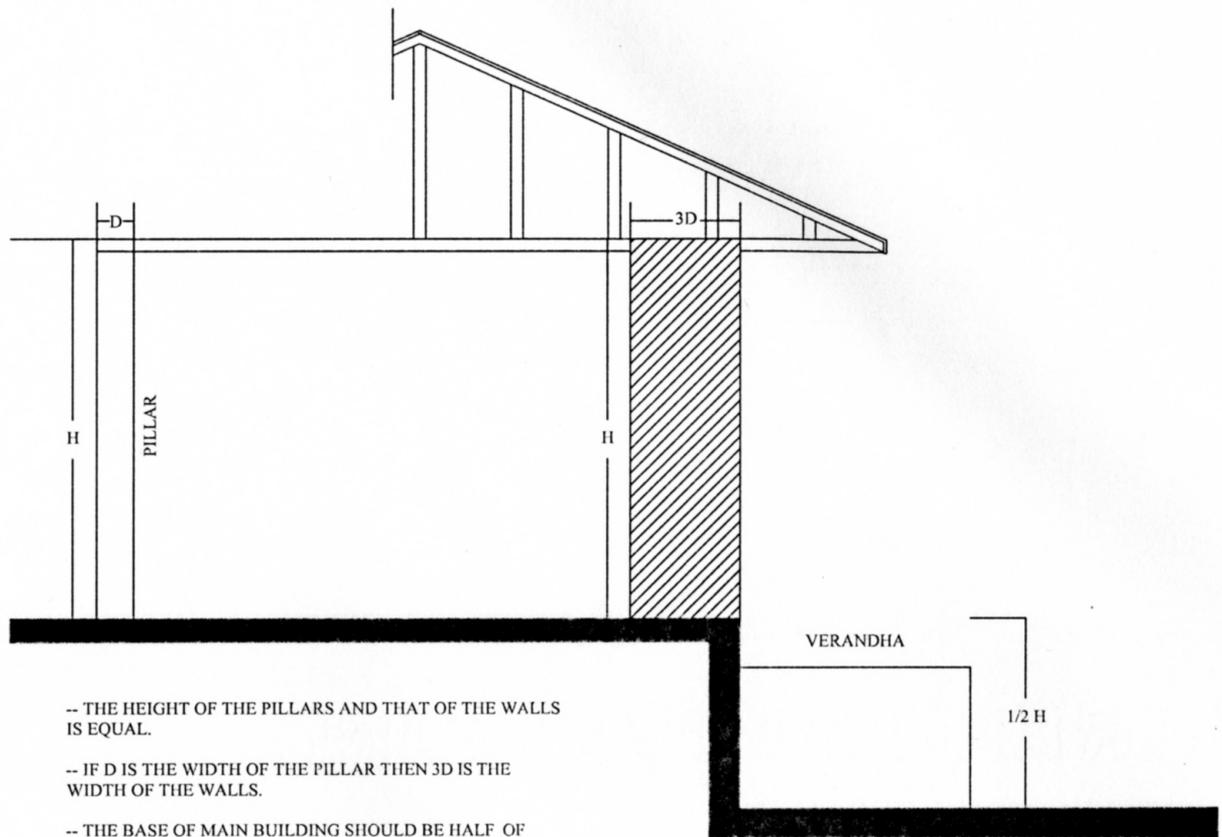
Proportions of the dwelling pavilions

- Dwelling pavilions width is from 4 to 32 units.
- For a small building the width is from 1 to 31 units.
- It is covered with coconut palms and tall tree palms, supported by pillars and intersecting beams.

The Verandah (Figure 11)

- When the width of the main building is 7 cubits, it must be divided into 6 parts of which 2 parts on the façade are for verandah.
- When the width is 9 cubits, it must be divided into 8 parts of which 3 parts on the façade are for verandah.

131. *Pattabhrt*: they are most probably the pattadhara, one of the lowest categories of kings. Dagens, Bruno, 1994, Chap-5, pg-23-27.



-- THE HEIGHT OF THE PILLARS AND THAT OF THE WALLS IS EQUAL.

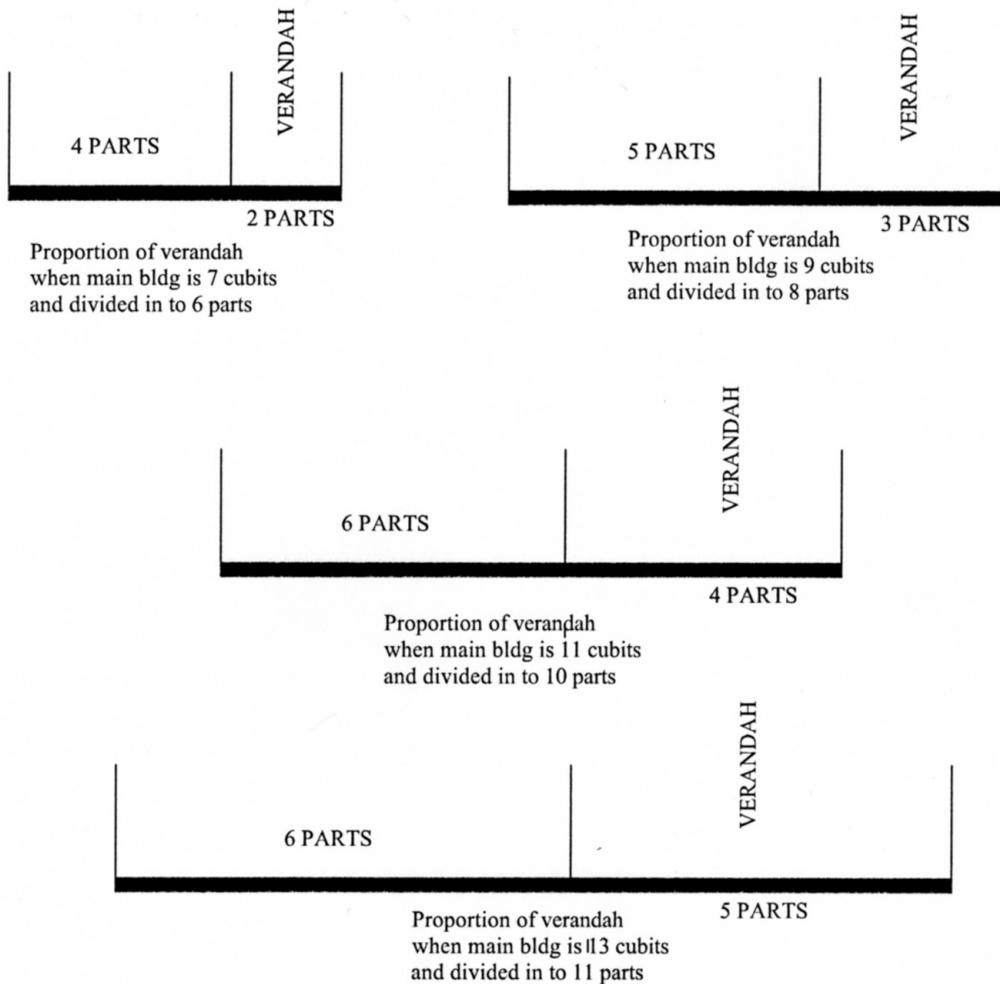
-- IF D IS THE WIDTH OF THE PILLAR THEN 3D IS THE WIDTH OF THE WALLS.

-- THE BASE OF MAIN BUILDING SHOULD BE HALF OF THE PILLAR HEIGHT.

--THE RAFTERS SHOULD ATLEAST PROJECT ONE PART OF THE WIDTH OF THE BUILDING.

FIGURE - 10 PROPORTIONS OF TYPICAL SECTION

Source: BRUNO DAGENS MAYAMATAM VOL-II, CHAP-27.



NOTE:
These proportions indicate that the size of verandah increases with the size of main building.

FIGURE - 11 PROPORTIONS OF VERANDAH WITH RESPECT TO WIDTH OF MAIN BUILDING

Source: MAYAMTAM VOL-II, BRUNO DAGENS, CHAP-27.

- When the width is 11 cubits, it must be divided into 10 parts of which 4 parts on the façade are for verandah.
- When the width is 13 cubits, it must be divided into 11 parts of which 5 parts on the façade are for verandah.
- This indicates that when the width increases the percentage of the verandah increases while the percentage of the building decreases.

The chamber of the master (master bedroom)

- Width of the chamber should be at least 54 units; in a big house it should be at least 78 digits, with successive increments of 6 digits causing 5 possibilities.
- The height of the pillars being divided into 60 parts, 16 parts are for the base of the master chamber, 32 for pillar 12 for entablature.
- Master chamber is constructed inside the main building with a verandah on its side.
- On no account should the bed in the master chamber, be positioned on the axis of the main building.

Roofing of the main building blocks

- Different types of rafters are arranged two by two above the main members.
- Neither the pillars nor the base nor the house of the men (Master bedroom, living areas for men) should be made of the stone.
- A cob work building is to be covered with thatch roof, where as for others it should be covered with tiles.
- The level of square of Brahma is lower than the base and is said to be the interior floor of the house.
- If the floor of the house is low, the entrance should be a covered shed providing shelter from rain.
- The height of the house base may be half that of the pillars. (Figure 12)

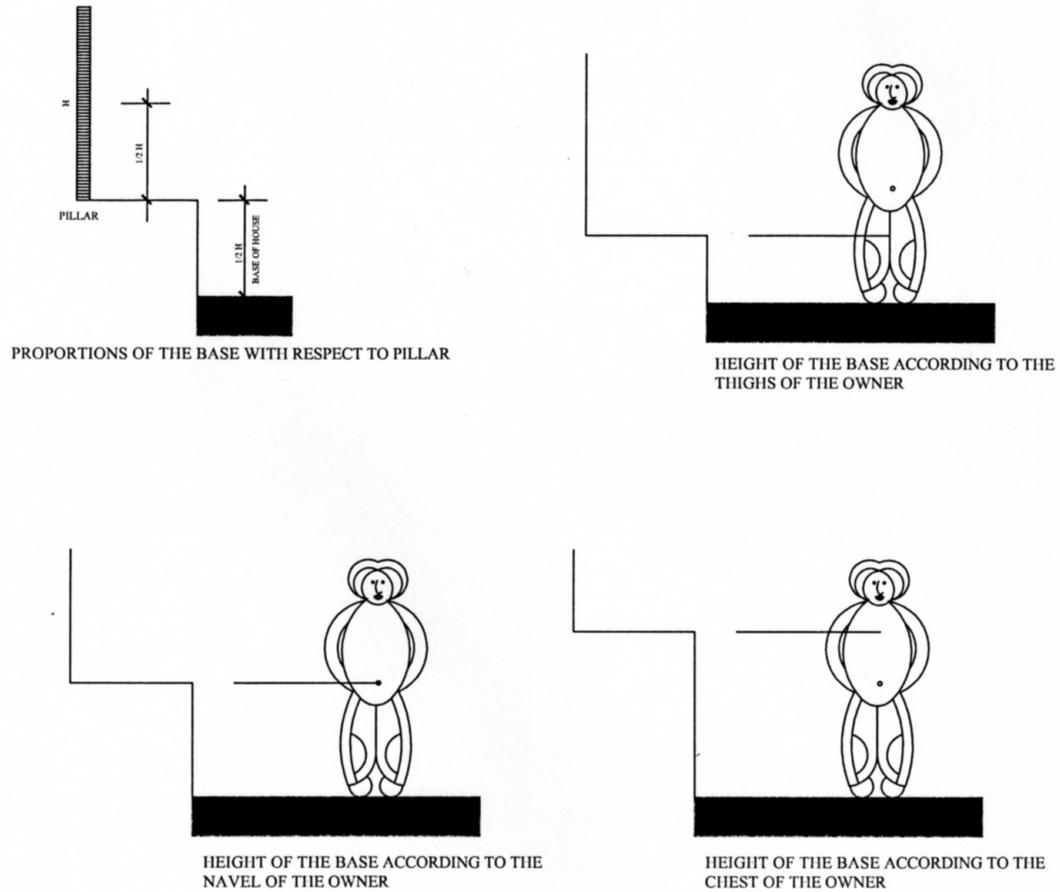


FIGURE - 12 PROPORTIONS OF THE BASE WITH RESPECT TO ANTHROPOMATICS OF THE OWNER

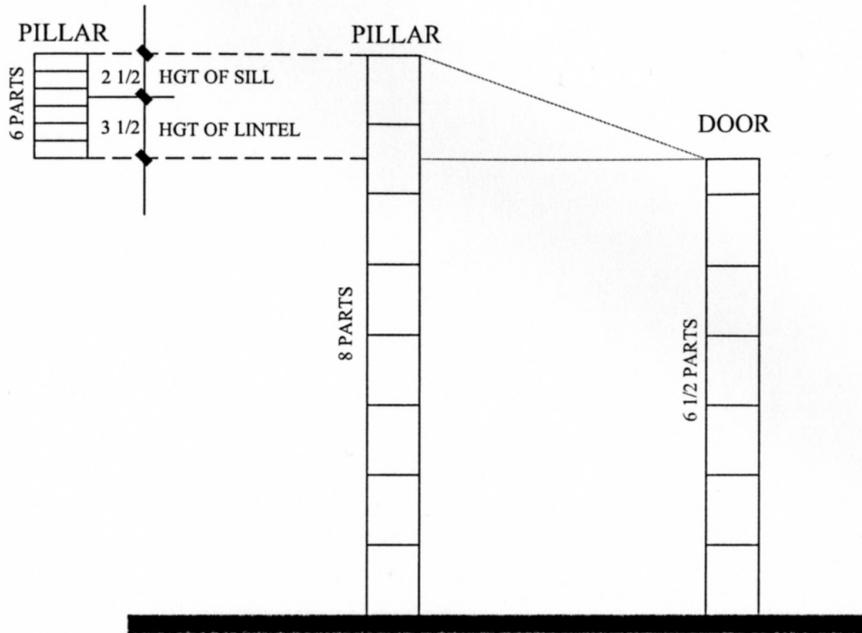
Source: MAYAMTAM VOL-II, BRUNO DAGENS, CHAP-27.

- The level of square of Brahma is lower than the base and is said to be the interior floor of the house.
- If the floor of the house is low, the entrance should be a covered shed providing shelter from rain.
- The height of the house base may be half that of the pillars. (Figure 12)
- The height of the house base can also be elevated to the height of the chest, thigh or navel of the owner.

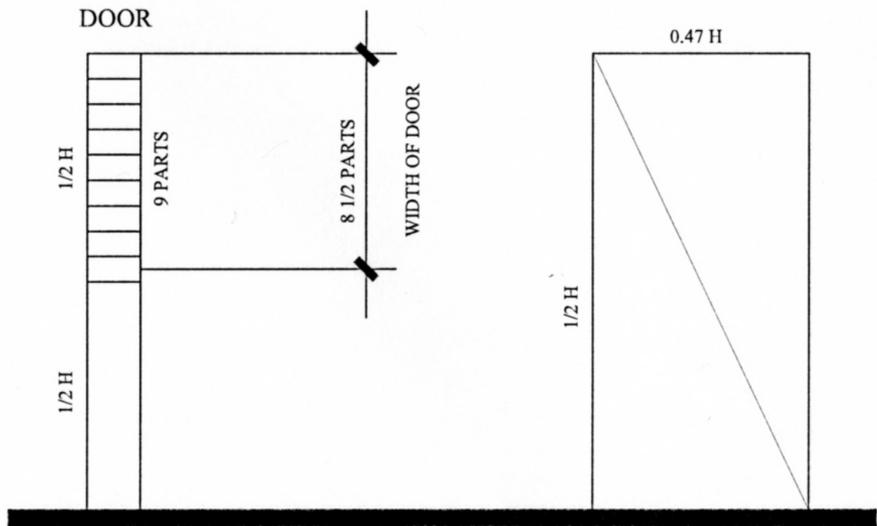
Proportions of the doors (Figure 13)

All the heights and widths of the doors are based on the width of the pillars of the corresponding storeys.

- If the height of a pillar is divided into 8 parts, then the door is $6 \frac{1}{2}$ parts.
- If the pillar divided into 5 parts then the door is 4 parts. If the remaining single part of the pillar is divided into six parts then $3 \frac{1}{2}$ parts equal the lintel height and the rest equals to the height of the door sill.
- If the height of the door is divided in half and again if the half is divided into 9 parts, $8 \frac{1}{2}$ parts will be the width of the door.



PROPORTION OF A DOOR WITH RESPECT TO A PILLAR



PROPORTIONS OF WIDTH AND HEIGHT OF A DOOR

FIGURE - 13 PROPORTIONS OF A DOOR

Source: MAYAMTAM VOL-II, BRUNO DAGENS, CHAP-27.

DOORS*

Dimensions of doors

A door is to be at least three spans wide and seven spans high; starting with this width and height and proceeding by successive increments of six digits for width and twelve for height. Using up to fifteen spans for width and thirty-one spans for height, there are twenty-five possible values for the width and height of the doors.

The first of these dimensions is appropriate for the door of a bedroom, the following twelve for a house, and lastly the twelve larger dimensions are suitable for towns, villages, forts and palaces.

The height of a door is double its width, with the addition of six or nine digits; this is appropriate in all cases.

Three possible widths are designated for a small door; two spans and six digits, two spans and three digits or two spans; the height is double the width, increased by six or two digits. Such a house is a good omen for a house meant for Brahmins or for other people.

In a human residence the height of the door is six and half ninths of the height of the pillars of corresponding storey; the width of the door is eight and half ninths of half the height. A small or medium door is prescribed for each storey; door whose height is exactly double its width is never appropriate for a human dwelling.

* This chapter describes doors (measurements, frame, leaves, etc.), and then it deals with their auspicious and inauspicious characteristics and with their positions and lastly gateways. Several points interrelated to doors are studied. Dagens Bruno, 1994, 681-713

Dimensions of the Jamb

The width of the door jambs is equal to that of the corresponding pillars or to that dimension less a quarter or increased by half; their thickness is half their width; the frame work which goes below the lintel and to the top of the elevated sill has a width three quarters that of the jambs.

Door-Leaves

The width of the leaves is a third, quarter or a fifth the width of the pillars, of the corresponding storey. The doors have one leaf except for gods, Brahmins and kings in which case they have two; two leaves are also prescribed for people as vassal princes.

The heights possible for the leaves are four and half a cubits, five, seven, nine, and eleven cubits. When there are two leaves one is larger than the other,¹³² the height of the one on the right is divided into five parts and the width into three parts. The door is to be strengthened and embellished with iron strap hinges.

The sockets interior diameter is to be determined with proportions, which are suitable according to whether the door is large, medium or small.¹³³ It is three, four, five or six digits or is half, two thirds, three quarters or a third of the exterior width of the socket; otherwise the diameter is ten digits or is equal to the width of the hinge pin; the point of the hinge pin is placed inside the socket in such a way that the whole thing resembles the articulation of a hip.¹³⁴

132. In *Silparatna* and *Vastuvidya*, the left-hand door leaf is the mother and the right-hand leaf is the daughter.

133. *Bhajana*: vase vessel, the socket receives the hinge pin.

134. The elevated sill (where the socket is) is called ankle. *Hastihasta*, this term when used in relation to staircase designates the handrail. Here it is apparently the hinge pin, which is placed at the bottom of door leaf (door side jamb).

A leaf is to be comprised of an odd number of planks and a joint in the middle of the leaf is to be avoided. On the leaf there are three, five, seven, nine or eleven laths whose thickness is half that of the leaf and whose width is double their thickness; their profile is in the shape of the horse shoulder or hoof, of a peepul leaf or of a swastika; or they are *Ghatika* or *Mirnaka*.¹³⁵

A leaf is to be provided with 'glory masks', breast like ornaments, *Pinjari*, gorges and inside and outside bolts,¹³⁶ with plaques covering, the joints and with strap hinges in the shape of bouquets, branches and bushes. It is provided with interior handles, tail like ornaments, with a ring in the middle and with protecting bars, which are in horn as are the small laths.¹³⁷

The door leaf is provided with a vertical bolt and it is made pleasant by all sorts of ornaments. It may be otherwisely strengthened, conveniently, with pieces made of various metals. Where the vertical bolt joins the sill in front, it is to be fixed solidly by iron strips, with care and grace. There is a sharp and elongated *Patratrinetra* between the lotus buds.¹³⁸

The sunken part of the jamb is to be a third of its total height or is to be calculated so as to be solid.

135. Danda: those rather thin and narrow pieces (laths) are probably applied on the door leaves in order to reinforce or to decorate them. The different expressions used to designate their profile shape are not clear.

136. Srimukha: 'glory masks' are better known as Kirtimukha; they are in the shape of lion's masks. The breast like ornaments are decorative heads of nails. The term Pinjari is not defined. Galaka: gorge or any recessed ornaments. Argala: bolts, which slide horizontally. Indrakila: bolts, which slide vertically.

137. Visanaparigha: horn as well as iron for the assembly and decoration of the door.

138. Patratrinetra: three eyed leaf.

Auspicious and inauspicious characteristics of doors

Whether a door has two leaves or one, attention should be paid to the noise it makes when it opened or closed by hand; if it is like a drum beat, like trumpeting or like roaring or like a note on a *vina*¹³⁹ or flute, that is good; on the other hand if it is like the clearing of a throat, a cry, an inarticulate sound or other noise of that kind, this is not appropriate.

If the interior bolt is smaller than its clasp or if this bolt rubs against the jamb, this always brings about the ruin of the family and attracts the calamity of sorrow inflicted by enemies. The door, which opens and closes by itself brings about the ruin of the family and is the cause of the destruction of happiness.

Similarly, when there is a door whose axis interferes with a tree, a boundary, a corner, a pillar, a well, a temple, an anthill or a heap of ashes, a vein or a vulnerable point or something else of that kind, such a door is river of excrement or a nest of snakes.¹⁴⁰

A door meant to protect a building must be solid and massive.

139. Vina: Indian musical instrument.

140. In astrology the expression designates very inauspicious conjunctions

Position of Doors (Figure 14)

A door situated on the median axis of a building is appropriate for gods, Brahmins, and kings; for all others it should be to the side of the median axis.

Among the thirty-two squares situated on the periphery of the diagram, those of *Mahendra, Rakasa, Puspadanta and Bhallanta*¹⁴¹ are the four where a door should be placed, if it is to be auspicious. It is forbidden to place a door opposite the square of Brahma so that one's back is turned to Brahma upon leaving.¹⁴² A door is not to be installed according to some fantasy unrelated to what this Shasta says.

The dimension of the width of the door must be fixed and a difference, whether of more or less, brings illness. The door when open and when closed, must stay in the same position in which it has been put. It is auspicious if the dimension of the opening were the same, at the top and at the bottom of the door.¹⁴³

The positions of the drains, corresponding to those indicated above for the doors, are the squares of *Jayant, Vitatha, Sugriva and Mukhya*; all other are to be avoided.¹⁴⁴

Secondary doors called underground passages are to be established on the squares of *Paranjaya, and Bhrsa; Pusan and Bhrnganrpa, Dauvarika and Sosa* as well as *Naga and Aditi*; these are buildings of one or two storeys provided with numerous defenses.

141. The diagram is the Paramsayika with eighty-one squares. Refer fig-13.

142. In any case a door facing or opposite to the Brahma square without a median door is an inauspicious one.

143. This is to say that the door leaves are to be installed in the same vertical plane and are not to be bent or out of shape.

144. Refer fig-13.

NORTH

VAYU	NAGA	MUKHYA	BHALATA	SOMA	MRGA	ADITI	UDITI	ISA	
ROJA	RUDRARAJA		BHUDHARA			APA		PRAJANYA	
SOSA	RUDRA					APAVATSA		JAYANTA	
ASURA	MITRA		BRAHMA			ARYAKA		MAHENDRA	
JALADHIPA								ADITYA	
PUSPADNATA								SATYAKA	
SUGRIVA	INDRAJAYA		VIVASVANTA			SAVINDRA		BHREA	
DAUVIRIKA	INDRA					SAVINDRA		ANTARIKSA	
PITR	MRSA	BHRNGARAJA	GANDHARVA	YAMA	RAKSASA	VITATHA	PUSAN	AGNI	

 POSITION OF DOORS
 POSITION OF DRAINS

FIGURE - 14

DOOR POSITIONS ON PARAMASAYINA DIAGRAM

Source: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6

Archetypal patterns for residential buildings:

Vastu shastra is a grammar book of forms, square being the primal pattern. This is the plan of the micro atoms of cube; the universe is filled with or composed of such cubical particles of energy. The plan of the microscopic cube is vastu purusha mandala. This cube contains all the five elements.¹⁴⁵

Vastu identifies four archetypal patterns called *ChaturMukha*, *Moulikam*, *Laangalam* or *Swastikam* and *Dandakam*. All other patterns are derived from these four archetypes.

ChaturMukha (Figure 15)

The *chaturmukha griha* layout is designed on the Vastu Purusha Mandala of 9 x 9 grid “*Paramasaayika Padam*”(refr-fig-4). This grid of 9 x 9 units is the standard measure for all residential buildings, while the 8 x 8 grid “*Manduka Padam*” is in common usage for temples and spiritual abodes.

The *Paramsaayika pada* vastu purusha mandala has four concentric belts called *Kosas* (sheaths). They are primal patterns of energy expanding from the core substance called *moolam/purusha/Brahman*. Each of these four divisions has its own characteristic quality based on which the various functions of a design are designated.

145. Dr. V. G. Sthapati, 1999, 330

The central part or the innermost division is “*Brahmasthanam*” which is intensive energy field within the built space and is the hottest zone of the energy grid. It is a zone with a point of exceptional light or brilliance, warranting preservation and protection within a house. The adjoining zone surrounding the Brahmasthana is the “*Deivika Padam*”- the luminous space,¹⁴⁶ it is in another sense a field around a magnet. These two concentric belts are unsuitable for human habitation due to the extreme heat.

The third division is “*Maanusha Padam*” – human space. It is a space of human consciousness and the outer most zone is the “*Paisachika Padam*” – space of gross matter with highly materialistic quality. It is just like the mantle of earth where the surface is well cooled down and consolidated for vegetation to grow, and human being to live in.¹⁴⁷ Thus the last two belts are the best suited for human habitation.

In *Chaturmukha griham*, the various functions of a house are distributed on the 9 x 9 grid, relative to the “*Panchabhutas* (five elements, refer pg-27). The central part is left open to sky, as it is the hottest region of space, the next concentric division is utilized as a walkway around which leads to various rooms.

The 2 x 2 grid of the southeast corner “*agni* quarter” is used as a kitchen, which is associated with fire.¹⁴⁸ The southern part acts as a dining hall which is also suitable for storage of vessels. The master bedroom is placed in the southwest corner, while the granary is located in the northwest. The western part is used as a family lounge and also can be used as a bedroom.

146. The immediate space around the central courtyard, which is used for circulation purposes. Dr. V. G. Sthapati, 1999, 332

147. The outer region of the square where the amount of radiation of energy is less and is the most habitable space of the mandala. Dr. V. G. Sthapati, 1999, 332

148. Agni/Fire is one of the five elements and the southern part is called as its quarter due to the direct sun. Dr. V. G. Sthapati, 1999, 332-see figure-14

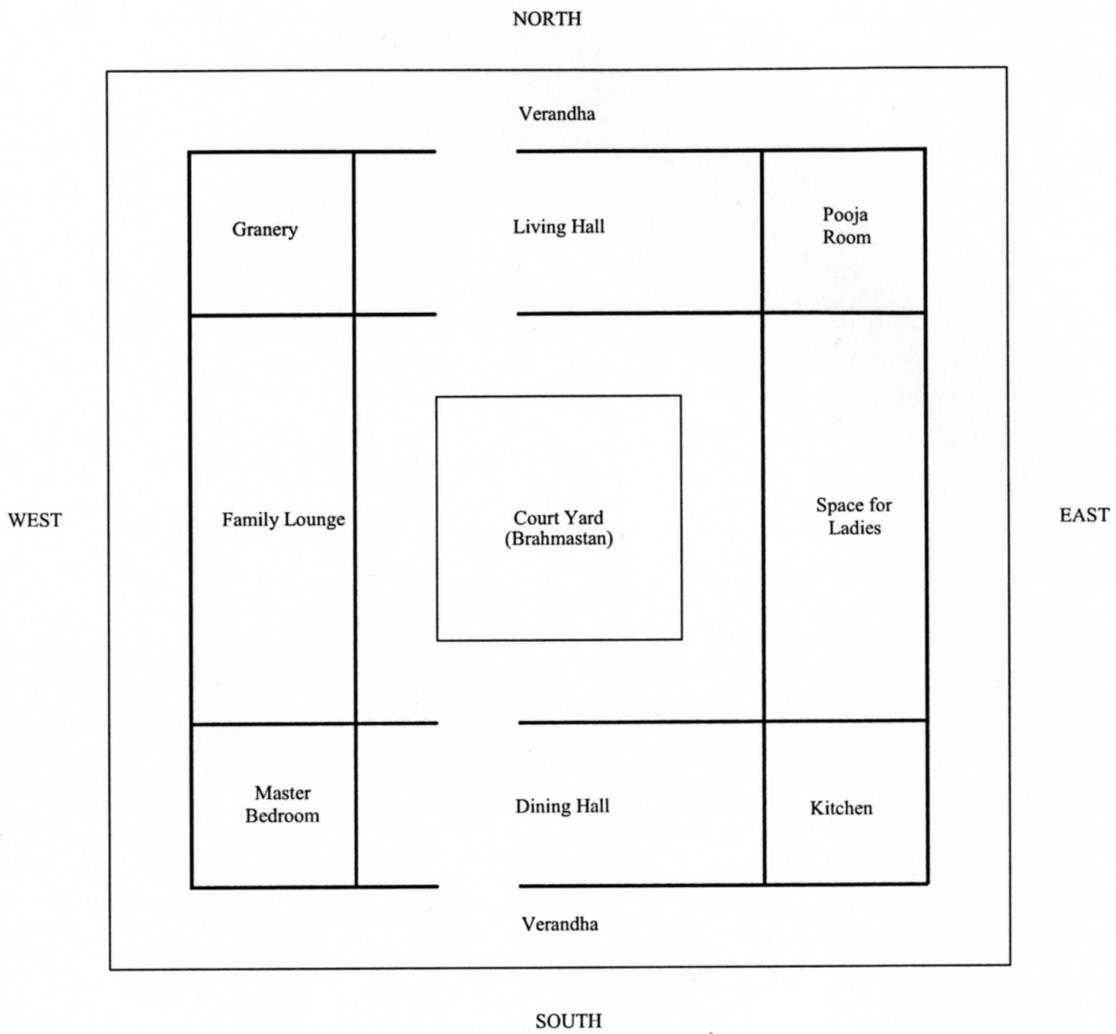


FIGURE - 15

CHATURMUKHA GRIHAM (FOUR BUILDING BLOCKS HOUSE)

Source: STHAPATYA VEDA, Dr.V.Ganapathi Stapathi, Chap-26, Page--310-314

Since the layout is designed as a north facing residence the living hall is in the north, led to from the entrance verandah, which runs on four sides. The measure and width of the verandah should be in terms of modules. The northeast corner is considered to be sacred, so is used as a shrine (pooja) room or a meditation hall. The eastern part is for ladies.

According to *Vastu* when a house is designed as per above, the house gets transformed into a living organism and shall start pulsating in harmony with the vibrations of the inmates.

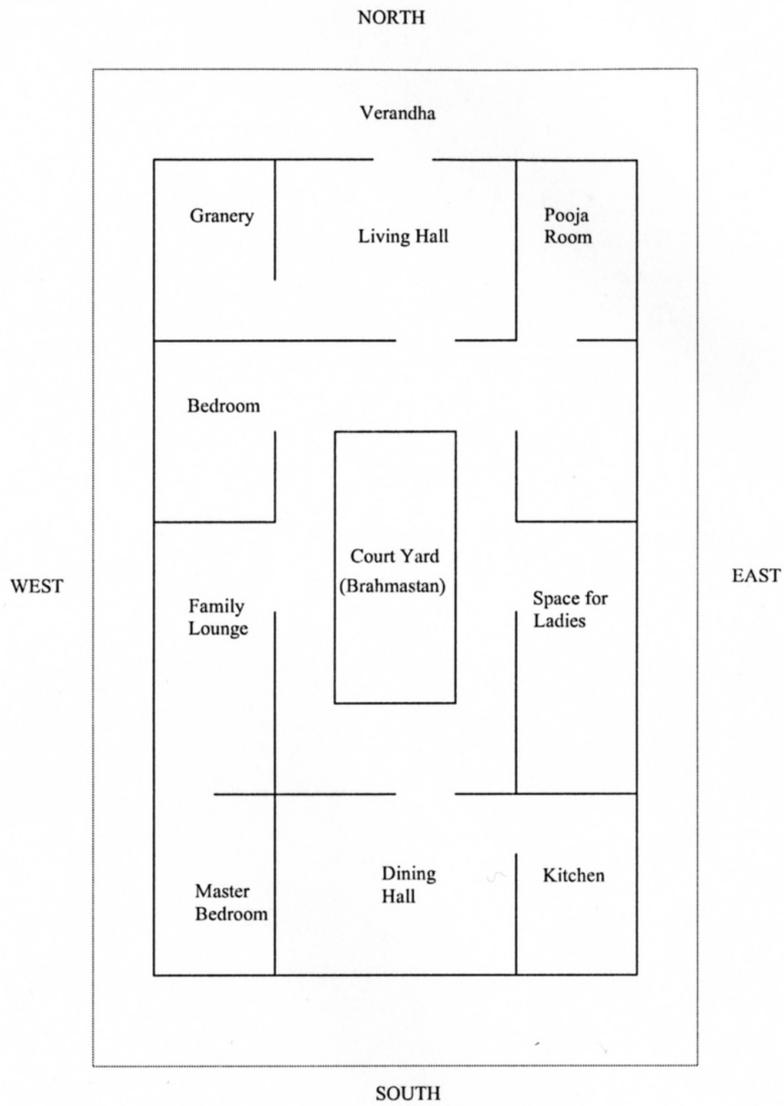
Rectangular Plan of Chaturmukha Griham

The *chaturmukha* house layout can also be designed or conceived in a rectangular four-side layout.

Figure-16 shows a typical layout of rectangular *chaturmukha* plan with entrance from north. The width of the house is fixed while the length varies in terms of the width. The width to the length ratio is always of the order of $1:1\frac{1}{4}$, $1:1\frac{1}{2}$, $1:1\frac{3}{4}$, or $1:2$. If the ratio of the width to length is high so as to give an elongated appearance of a stick (*Dandakam*), the *griham* is called *Dandaka griham*. The circulation and other functional aspects are the same as those of the *chaturmukha griham*.

Moulika Griham

Figure- 17 shows the typical *Moulika* Griham, with entrance from the north. In this type the southern part is deleted and the same could be done on the other three sides also. The primordial elements are maintained in this pattern and the placements of rooms are also well maintained in relation to the *Panchabutis*, five elements.



MOULIKA GRIHAM (FOUR BLOCK BUILDING)

Source: STHAPATYA VEDA, Dr.V.Ganapathi Stapathi, Chap-26, Page--310-314

FIGURE - 17

Laangala Griham

Figure-18 shows the typical *Laangala Griham*, where the direct north, northeast, and the direct eastern part is deleted. This orientation is the only acceptable L pattern for human residences, because the major elements of the *Panchabuthas* (five elements), are retained within the habitable area. The entrance is from the east, and can also be from west and south.

NORTH

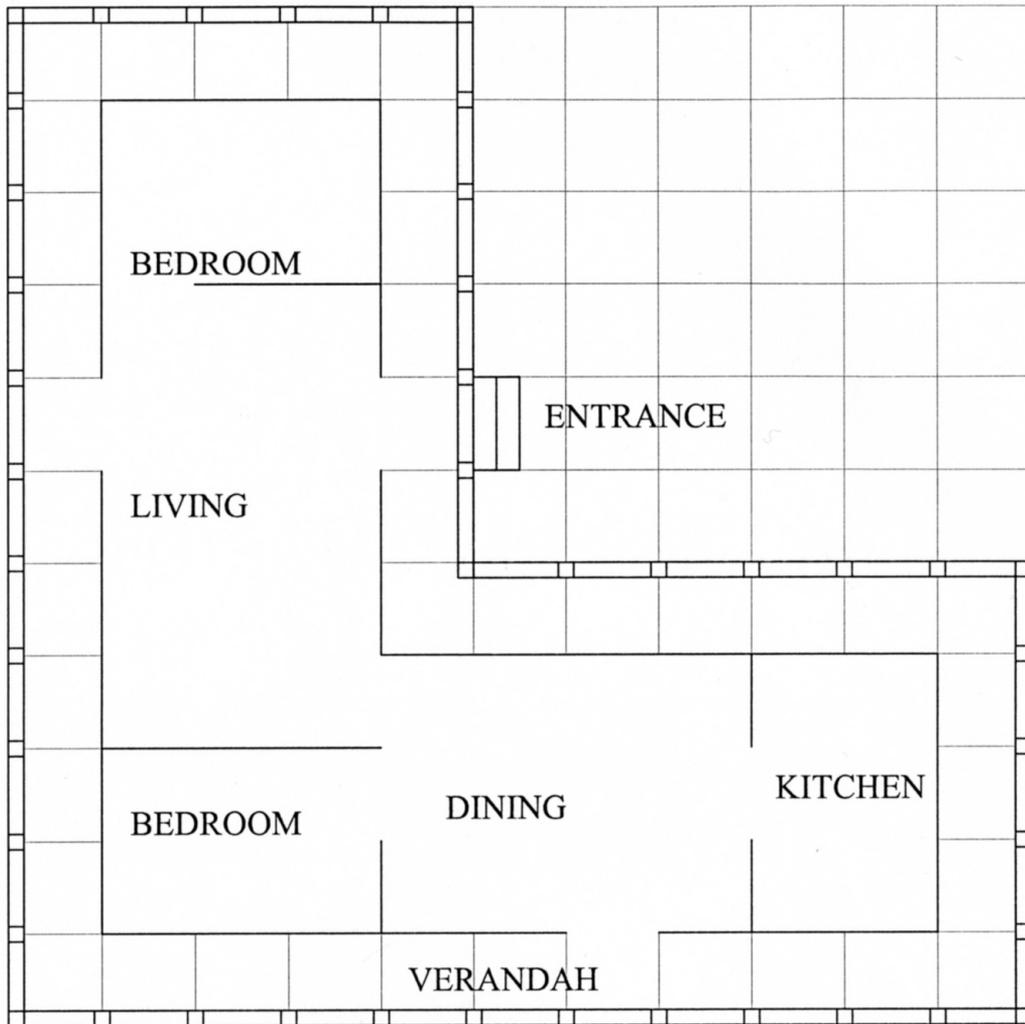


FIGURE - 18 LAANGALA GRIHAM

Source: STHPATHYA VEDA, V.G.STHAPATHI, CHAP-26, PG-336,337

9. CASE STUDIES

The theoretical approach of Vastu Shastra can be analyzed by studying designs of residences designed and built on the basis of Vastu. Three buildings are selected and studied on the following criteria:

- Age of the building; a traditional residence, a new residence and a renovated residence from contemporary design to Vastu based design.
- Location of the building (all the residences are in the similar climatic region)
- Type of design approach (type of archetypal design layout implemented).

These buildings were studied according to the following attributes;

- Materials used (flooring, structure and finishes)
- Details; door, windows, roofing systems.
- Circulation.
- Different types of layout patterns used in the building and their relation to Vastu principles.
- Proportions of the building.
- Documentation of the plans, elevation, sections and other details is performed to analyze the designs.

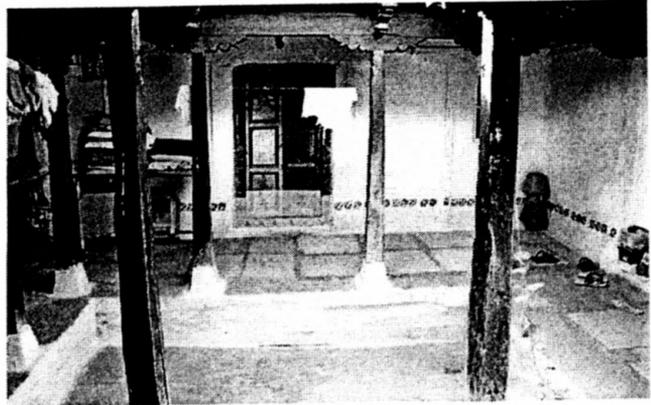
Case study I – Traditional residence

Location: Medak, Andhra Pradesh, India. 70 miles south of state capital, Hyderabad.

Climate: Hot-Humid climate

Built: 1932

No. Of residents: 6



Designer: Self-construction with the help of local builders.

Located in a hot-humid climatic region, the traditional residence was built during 1932. The residence was built for a middle class farmer and his family of 6 members. The residence is presently owned by the son of the original owner and is still used as a farmer's residence, although he isn't directly involved in farming.

A second floor addition was done on the west part of the building during the late 1970s and is utilized for storage purposes mainly. The building shares its outer walls with neighbors and is a typical row house.

The owner with the help of locally available workers has built this residence following the traditional rules.

This residence provides some basic information about how Vastu was implemented during times when technology was scarce. Use of traditional materials and construction systems is observed in this residence. A further analysis is done during the following chapters.

Case study II - New residence

Location: Hyderabad,
Andhra Pradesh, India.

Climate: Hot-Humid climate

Built: 1999

No. Of residents: 3

Designer: Architect (a vastu practitioner too)



Located in a hot-humid climatic region, the new residence is built in mid 1999. The owner of the residence is a retired official with two other family members. The residence is built on modern standards but still using basic *vastu* principles.

The residence was built by a registered firm called R.K Architects. They have tried to follow the rules of Vastu and implement them in the design.

The residence is of two floors with a double height living hall and other spaces surrounding the living space. This residence helps in studying the modern use of Vastu principles and their practical application. Use of technology is observed in construction and material usage. A further analysis is done during the following chapters.

Case study III – Renovated residence

Location: Hyderabad, Andhra Pradesh, India.

Climate: Hot-Humid climate

Built: 1980 and renovated in 1997

No. Of residents: 5

Designer: Builder and then later renovated by a vastu practitioner.



Located in a hot-humid climatic region, the residence was built in 1980 on the basis of a contemporary design. The residence was renovated in 1997 based on vastu principles. The owner of the residence is a business man and also a politician. Considering this factor, the residence is built in two floors, with the second floor being used as an office. There are 4 other residents excluding the owner.

The residence was formally built by a local builder and then it was remodeled in 1997 under the guidance of a Vastu Practitioner.

The residence was renovated with major changes in site shape and rearrangement of spaces within and outside the building. The building seems to not follow many principles of *Vastu* even though it is renovated on the basis of it.

This residence helps in studying the utilization of principles of Vastu in contemporary designs. Use of different modern materials and techniques is seen in this residence. A further analysis is done during the following chapters.

Case study I – Traditional Residence

General description:

Located on a plot of 55' x 41' (Figure 19), the residence resembles a typical row house with common outer walls and a back yard towards the south. The owner of the house is a part time farmer and a working class man. He lives with his family and parents in the house.

The main entrance to the house is from a 20' wide road towards the north. A common verandah of 3' wide for the whole street leads onto the residence, which acts as a transition and social space. All the houses on the street share a common stretch of verandah running through the length of the street.

Most of the residences use thatch roofing, mud plaster and brick masonry walls. This creates a rhythmic approach to the street, which is one of the principles of vastu for streetscape planning, with varying levels of roof and number of stories.

The building presents evidence of use of traditional materials and construction techniques. Wood is the main roofing material, which is rarely used for roof construction in the present day Indian architecture.

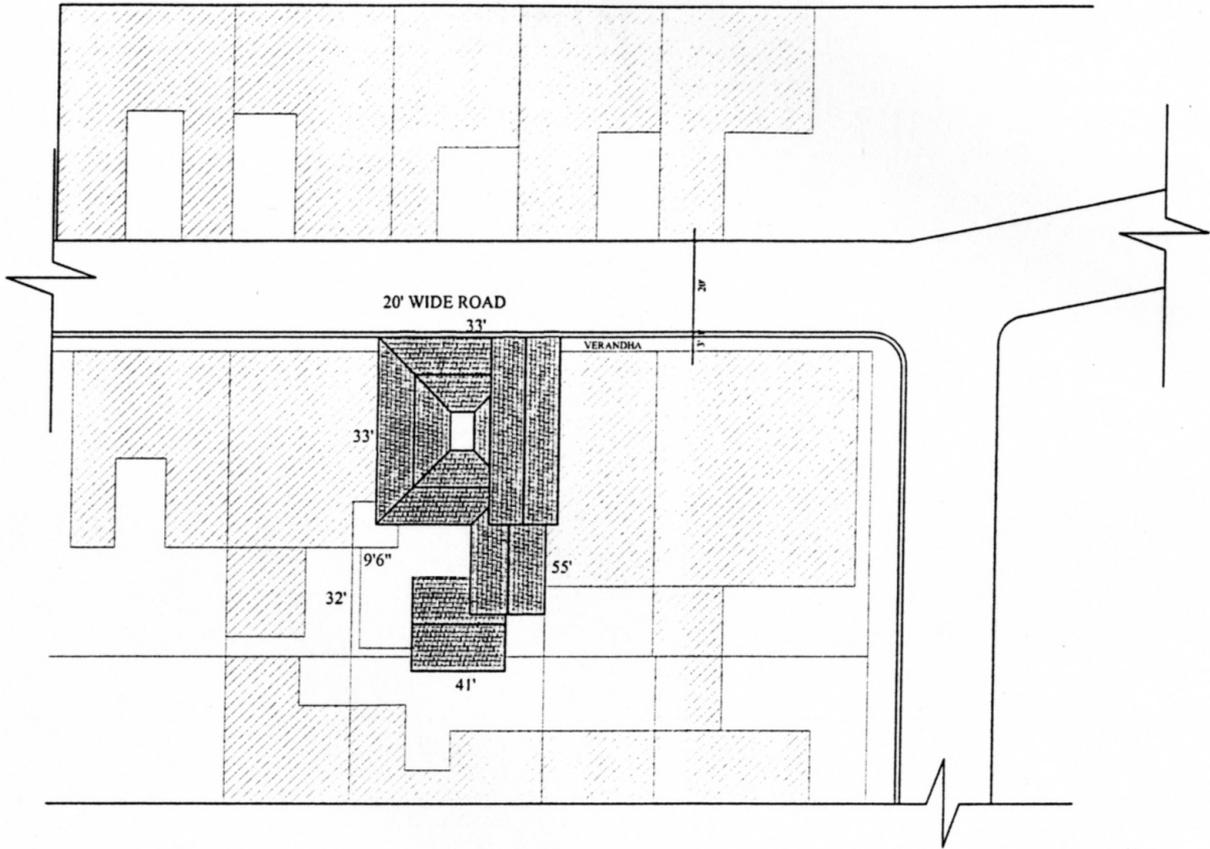


FIGURE - 19



SITE & SURROUNDINGS PLAN

Source: Author

Concept of Design

Considering the study of plans and sections, it is evident that the main design criteria is based on the '*Paramasayina Diagram*' (fig-14) of *Vastu Purusha Mandala*. The plan has a basic main building and an extension towards the south. The main building is a square with a central courtyard and a walkway around it, which provides access to other spaces of the square. The plan of the residence represents the *Chaturmukha* (fig-15) archetype with few exceptions. This residence is an example of the use of vastu principles during earlier times (i.e., following the vernacular architecture)

Plan (Figures 20-22)

The square plan is based on a 9x9 grid of Vastu Purusha Mandala with a central courtyard, which is left open to the sky and a walkway around it. The only exception to this plan is the central courtyard, which is not exactly in the center but drifts towards the west making a narrow walkway and a wider walkway towards the east of courtyard.

A plinth of 1/3rd height of the building is maintained around the house, (Figures 23-24) which is proportionate to the height of the pillars. The height of pillars is usually taken as the basic measurement module, according to which the height of roof and doors are calculated.

The central square comprises of living, dining, store, prayer and bedrooms. The outer portion of the square comprises of kitchen, granary and the bath. The backyard of the building is used for other utility purposes. A door connects the neighbor's backyard

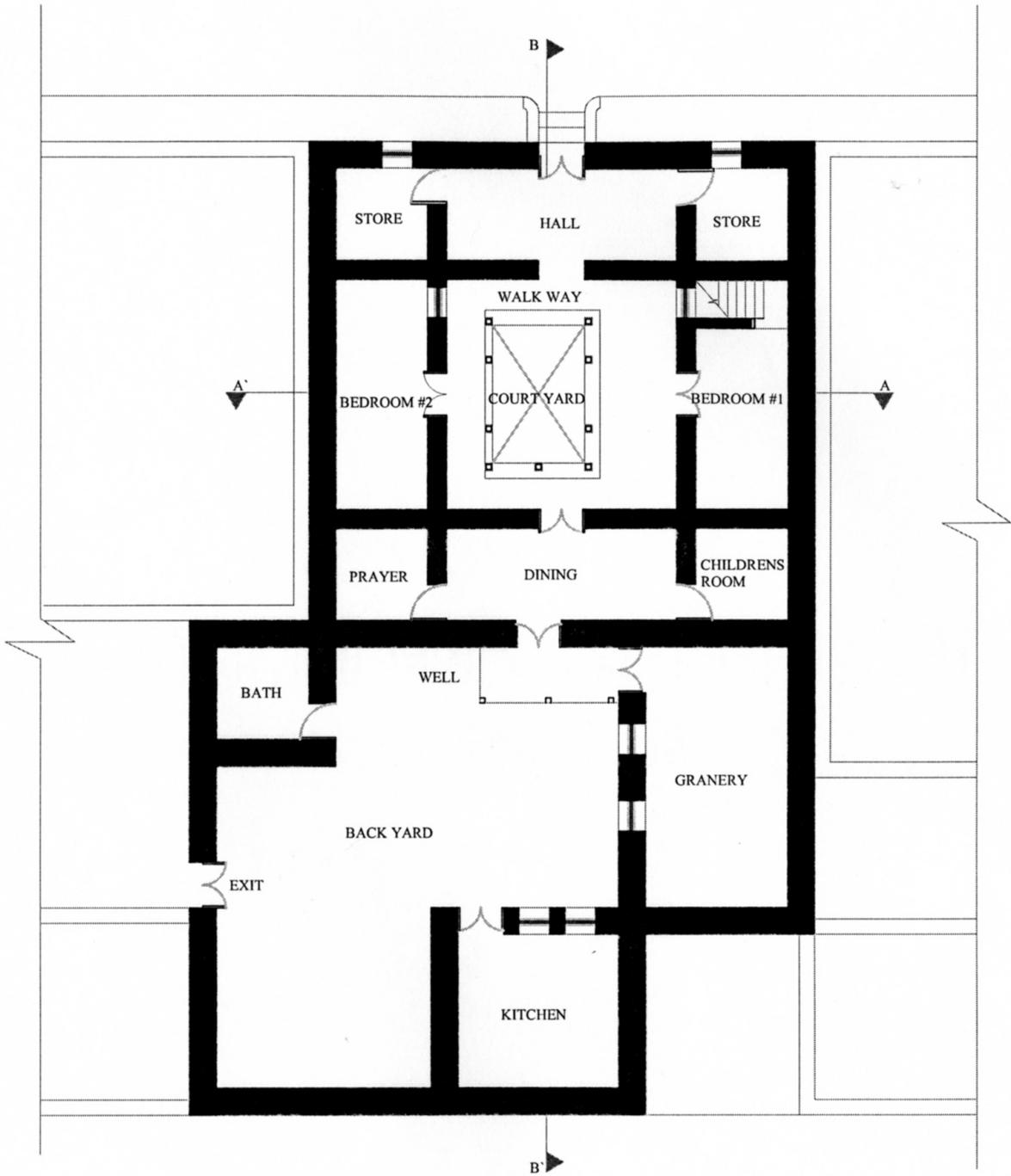


FIGURE - 20



GROUND FLOOR PLAN

Source: Author

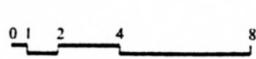
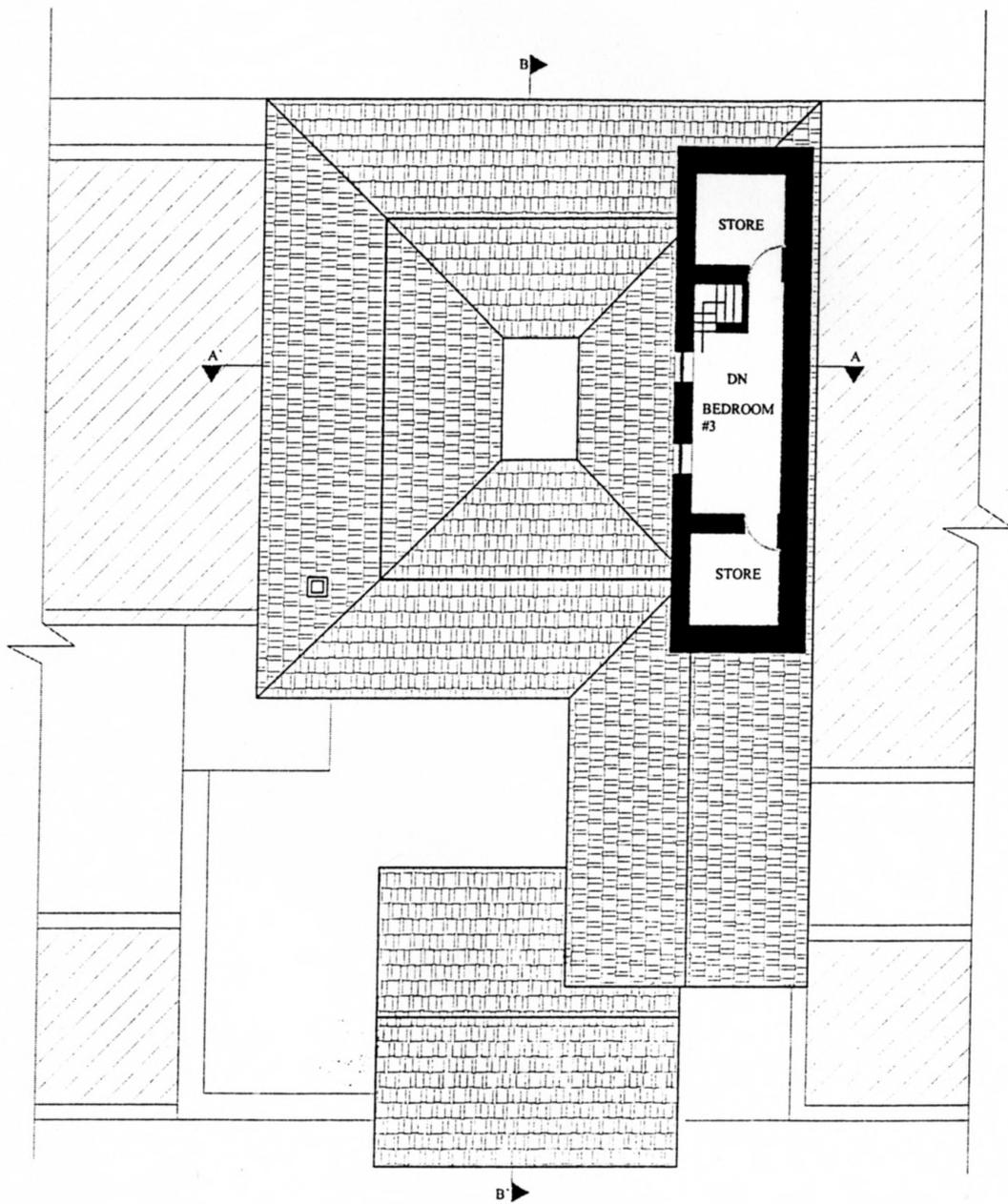


FIGURE - 21



SECOND FLOOR PLAN

Source: Author

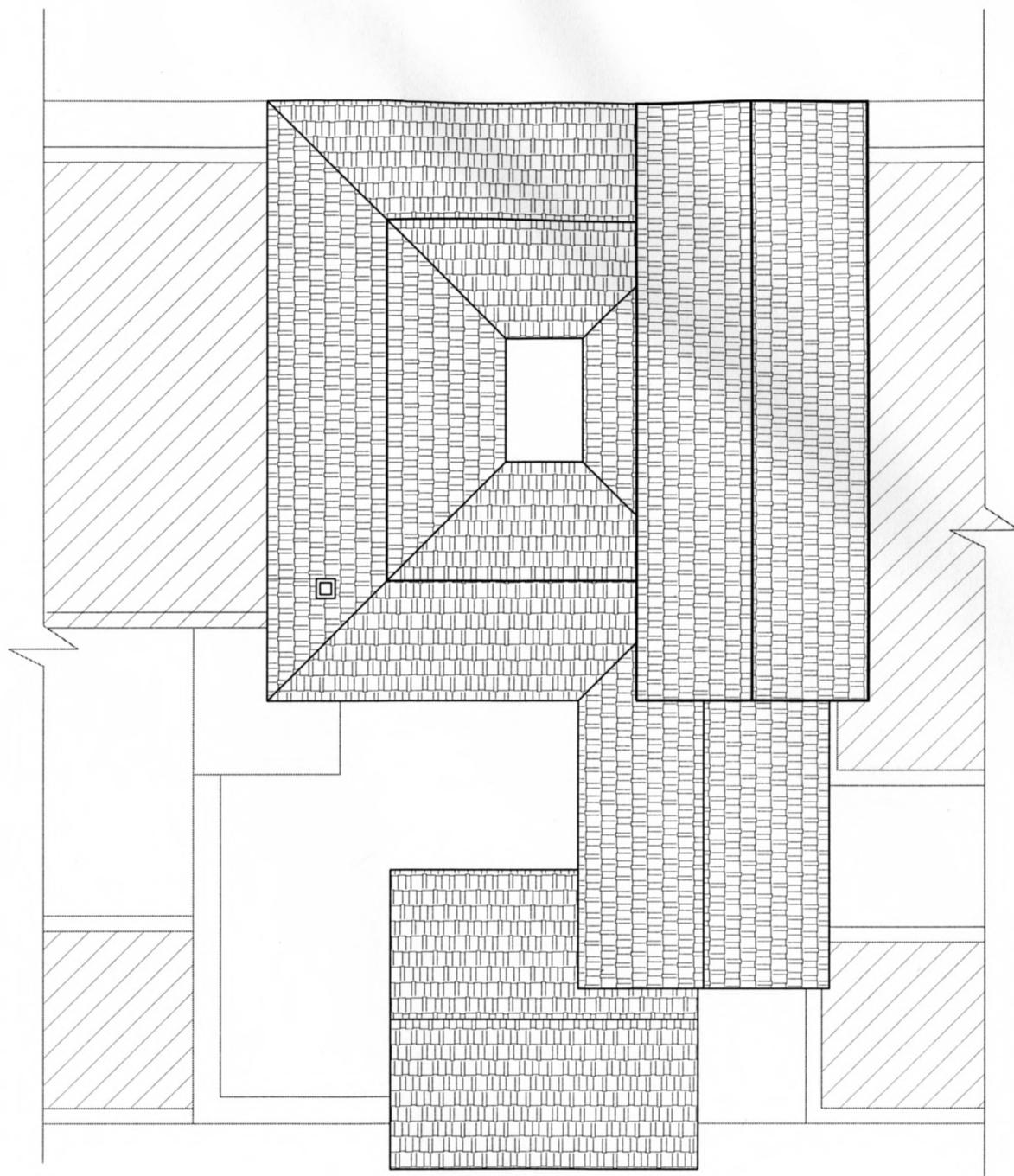


FIGURE - 22



ROOF PLAN

Source: Author

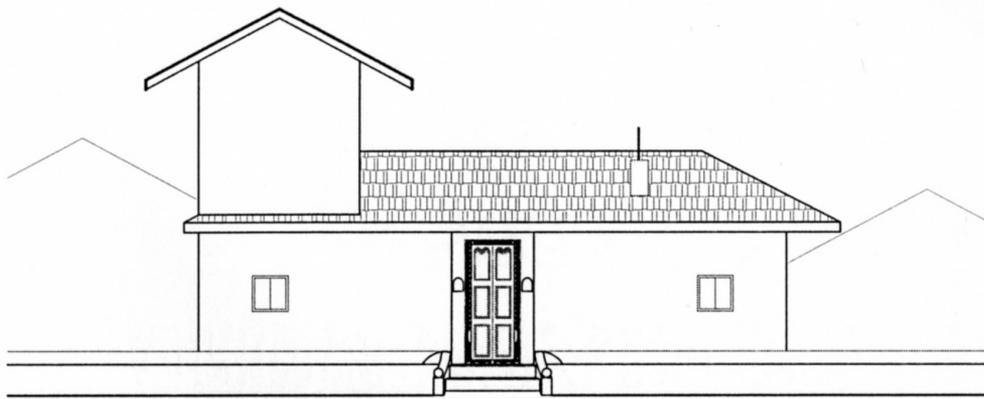
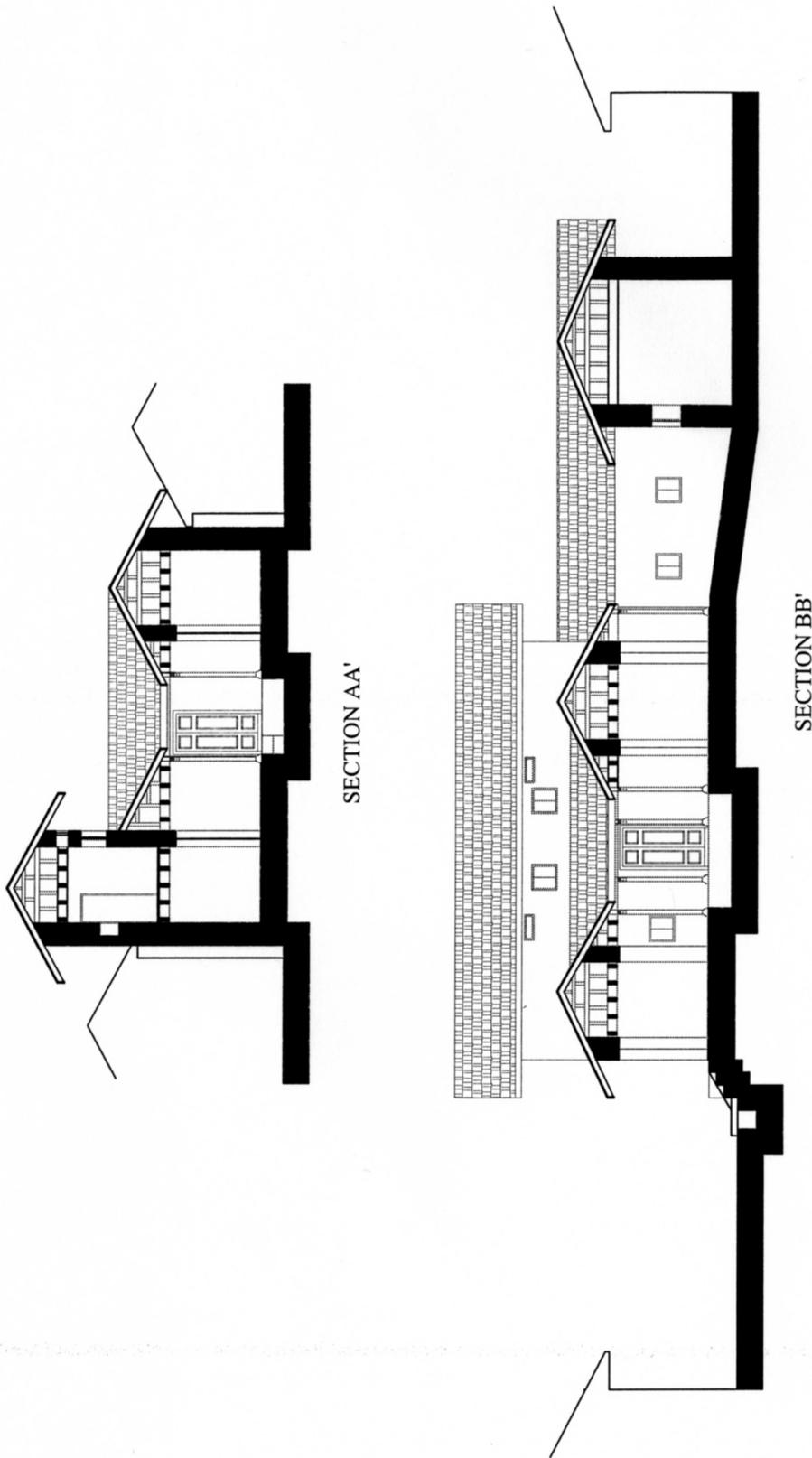


FIGURE - 23 FRONT ELEVATION

Source: Author



SECTION AA'

SECTION BB'

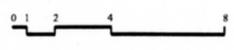


FIGURE - 24 BUILDING SECTIONS

Source: Author
96

for social interaction. Second floor on the eastern part comprises of storage and bedroom and can be accessed by a narrow staircase through the ground floor bedroom.

The entrance to the building faces north leading into the hall. The bedrooms are to the east and west of the courtyard. Dining is to south and the prayer hall to southwest. The orientation of the kitchen is towards south but out side the square and the granary to southeast.

Doors (Figure 25)

All the doors are centered to the walls, and are on an axis. The entrance and exit are on axis, even though the exit door is aligned towards the west. The position of doors around the courtyard is symmetrical and is on an axis.

The ornate main door of the building shows esteem of the owner and the house. It is different from other doors of the building, which are less ornate. The carvings on the jambs include nature, like flowers, vines etc. which is an attempt to harmonize nature in every minute detail.

Windows

The windows are at a $1/3^{\text{rd}}$ height of the walls from the plinth level and are typical windows with bar grills and leaves. The number of windows in the building is relative less compared to any new building, because of the central courtyard and the cross ventilation provided by the doors.

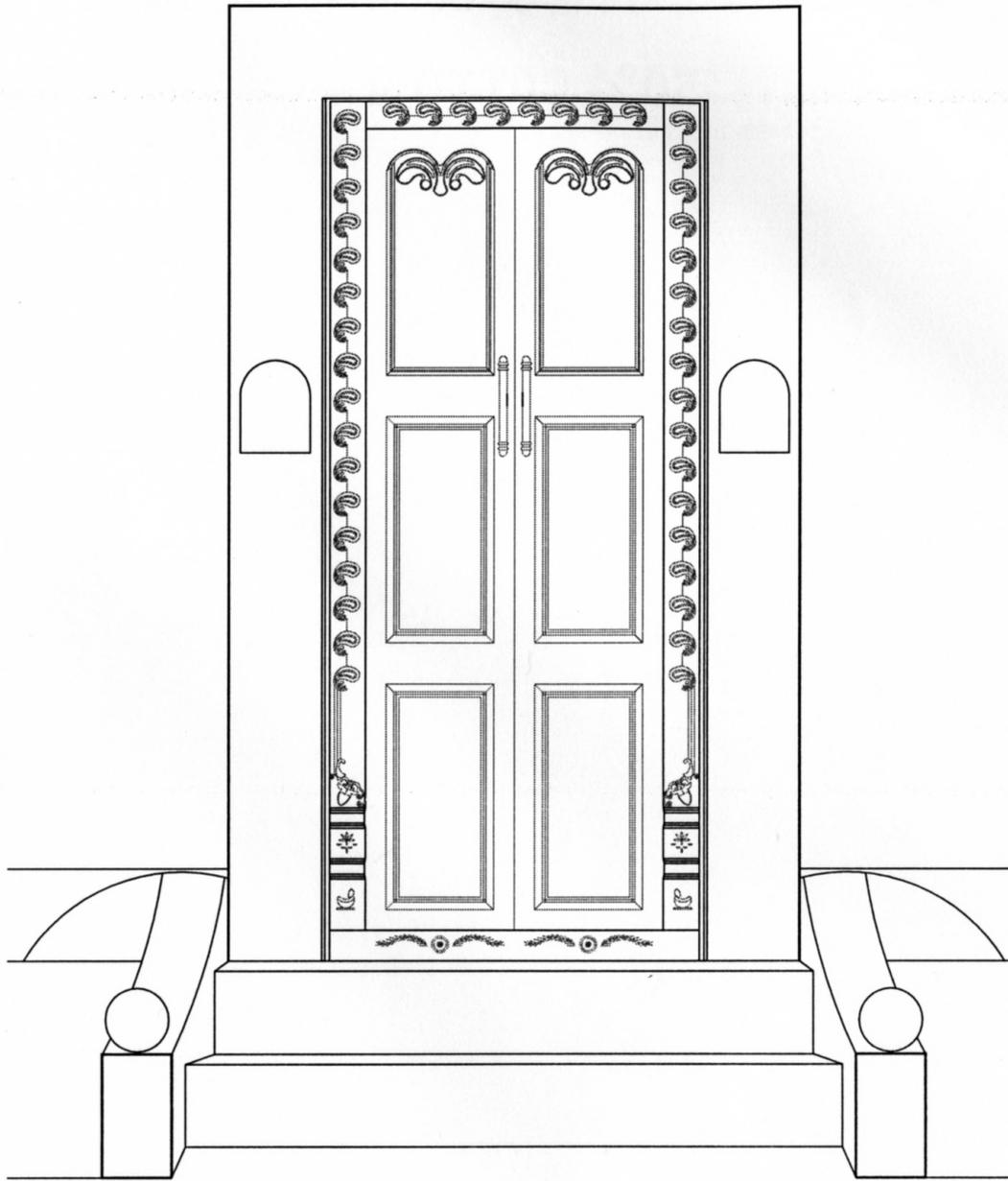


FIGURE - 25 DOOR DETAIL

Source: Author

Flooring Materials (Figure 26)

Various types of materials are used, based on the purpose of the space. The living, hall and bedrooms, are laid with *Tandur* Stone, which is a local stone and is used due to its cooling nature during the hot seasons. The backyard and the stairs are laid with dried mud. The backyard is open to sky due to which it accumulates more heat and mud can absorb more heat when it is wet. This allows the users work in the backyard even during extreme climates.

The granary and kitchen use concrete, which is not a contemporary material, but can be assumed as heavy duty material which can withstand heavy equipment and keep the flooring untarnished.

Flooring pattern (Figures 27)

The flooring pattern in the central square follows the pattern of that of the lower roof level (beam level) and can be seen through the photographs provided.

Roof and roof materials (Figure 28 - 29)

The roof is a typical contemporary type used during the early years of the 20th century. The typical arrangement of rafters and beams is not seen in the modern times. Wood is the main material used for the roof with shingles on it. The shingles are called Manglore Tiles, and are of reddish orange color.

Columns (Figure 30)

The use of wooden columns is seen in all parts of the buildings, which are typical for a traditional building. A detail of the column can be seen in, which shows the entablature and the capital of the column.

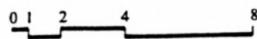
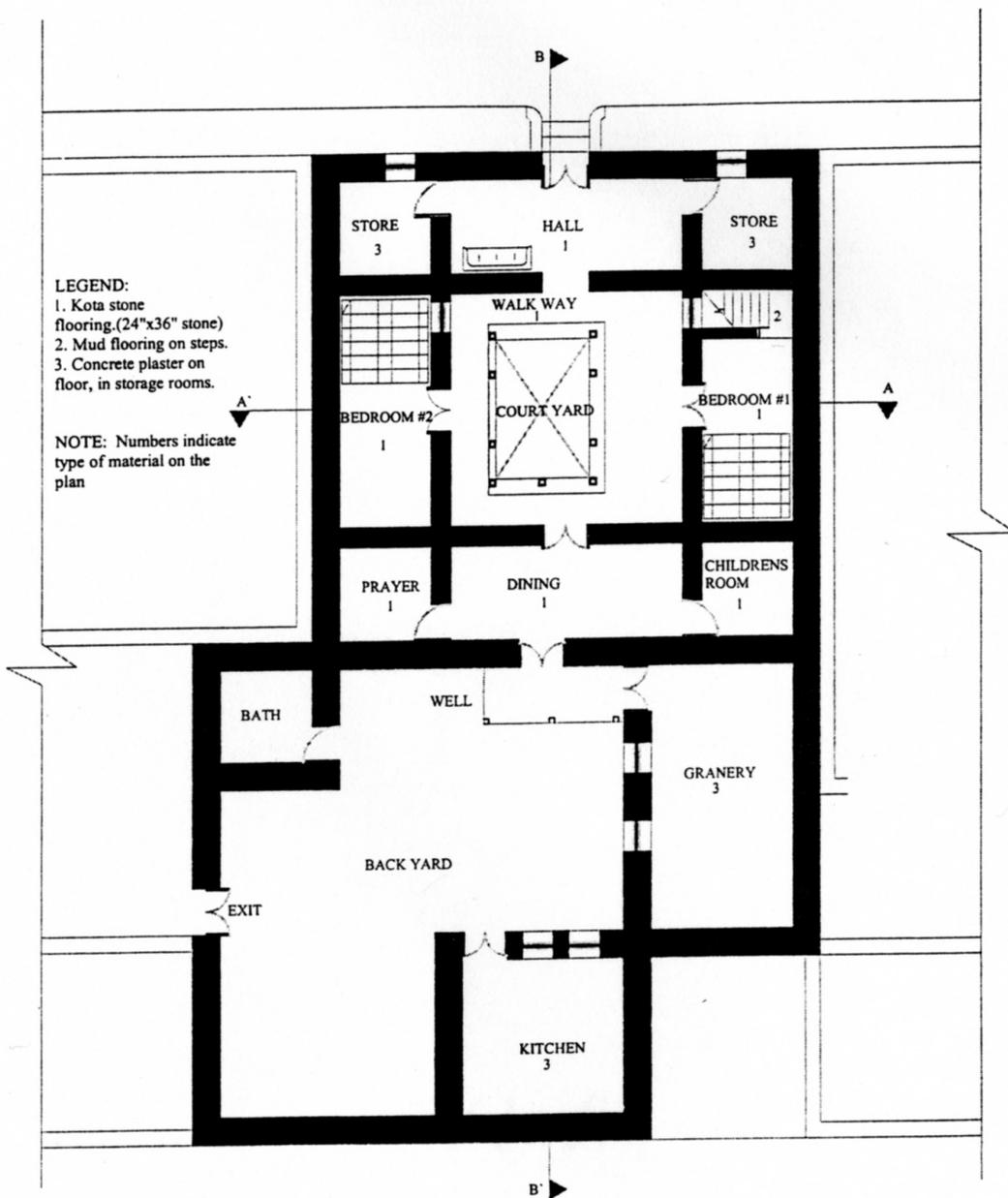


FIGURE - 26



GROUND FLOOR PLAN

MATERIALS PLAN

Source: Author

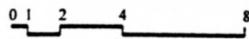
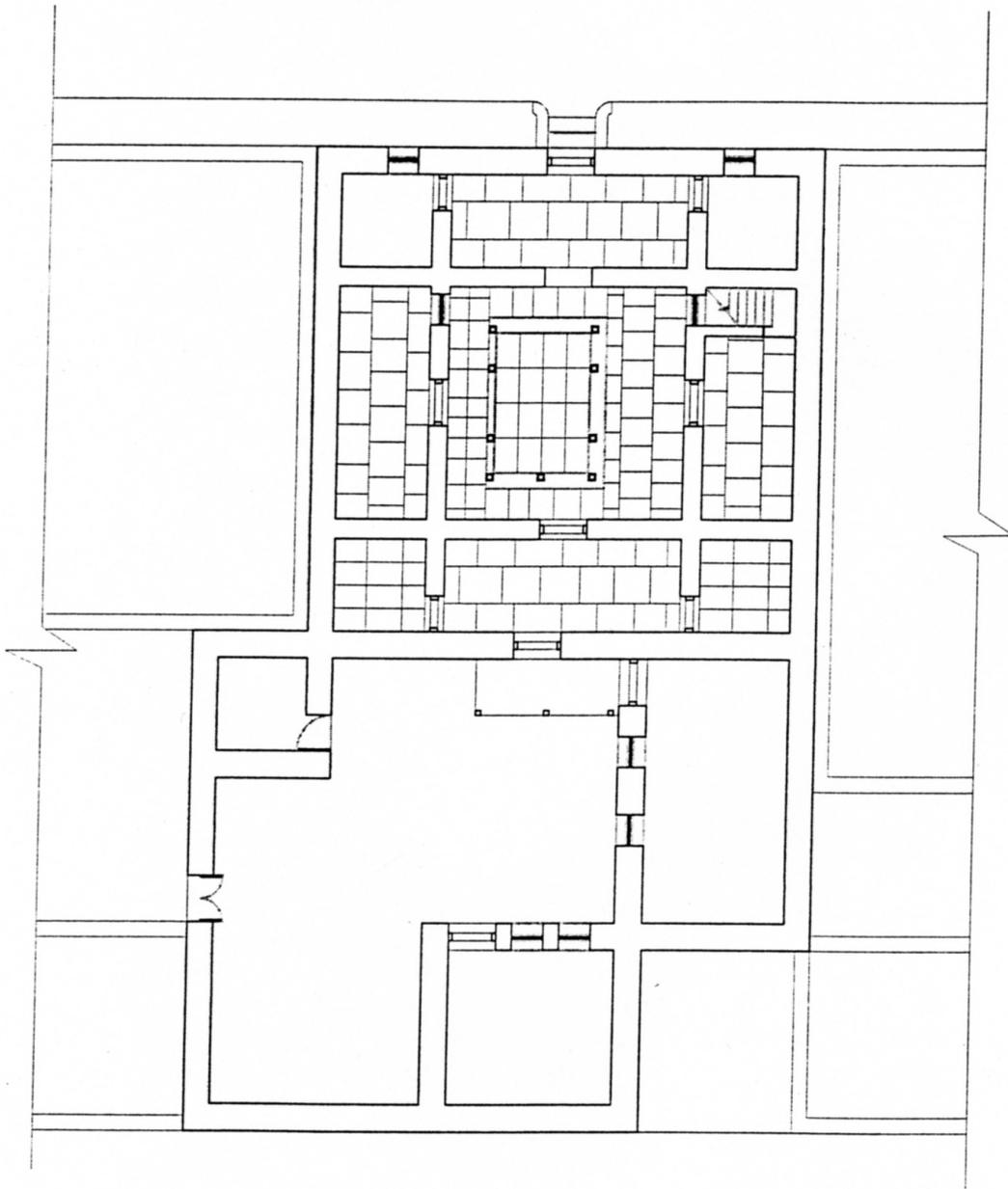


FIGURE - 27



FLOORING PATTERNS

Source: Author

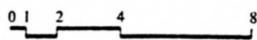
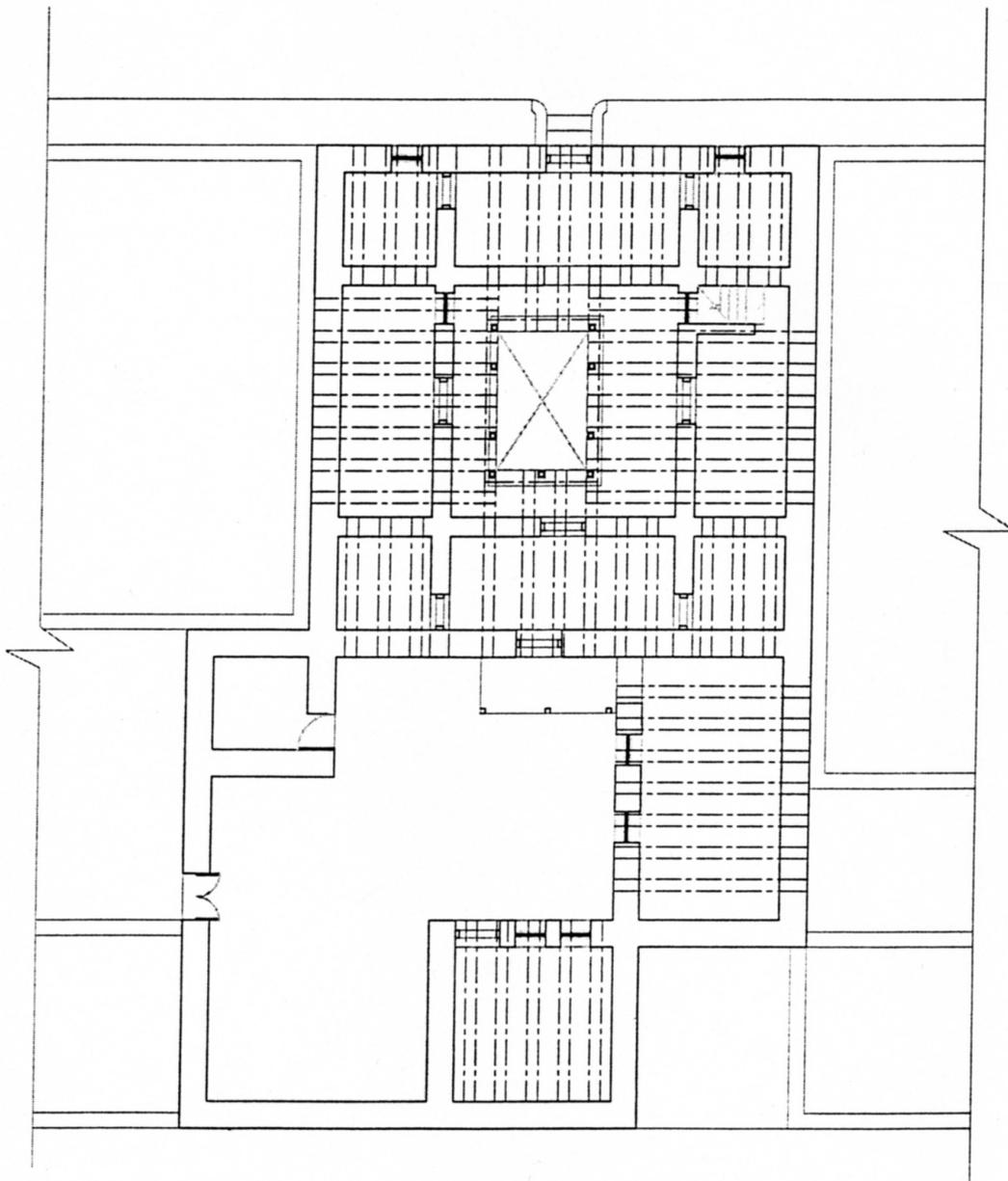


FIGURE - 28



STRUCTURAL PLAN

Source: Author

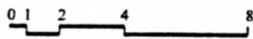
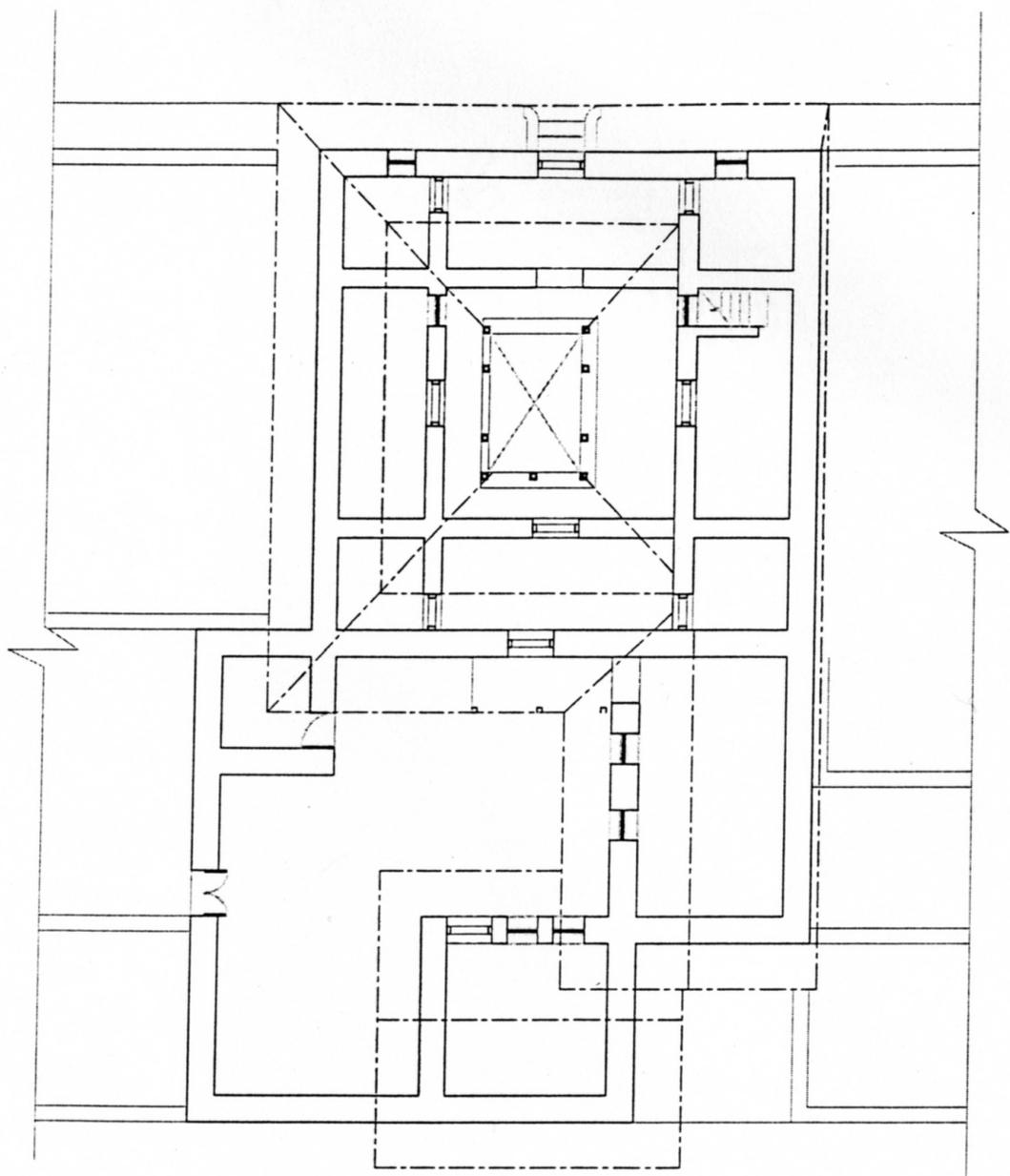


FIGURE - 29



STRUCTURAL PLAN
RAFTER LEVEL

Source: Author

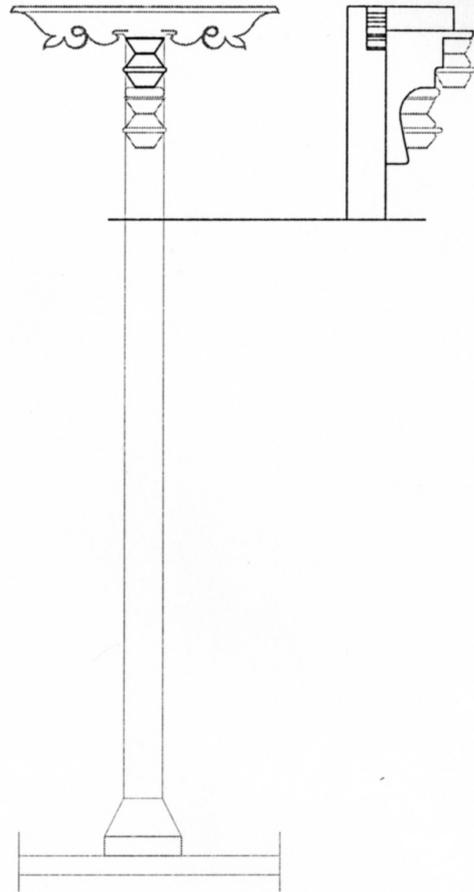


FIGURE - 30

COLUMN DETAIL

Source: Author

Division of spaces (Figure 31)

Spaces are divided horizontally according to plan, with different zones for men, women and other users (guests).

- Everyone including the guests uses the hall and the central courtyard.
- Bedrooms are used mostly by men and women.
- Dining, granary and prayer are used by all the residents.
- Kitchen and back yard are the places used mostly by women.

This division shows a pattern at a minute level. The arrangement of spaces makes this pattern function with efficiency.

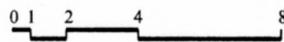
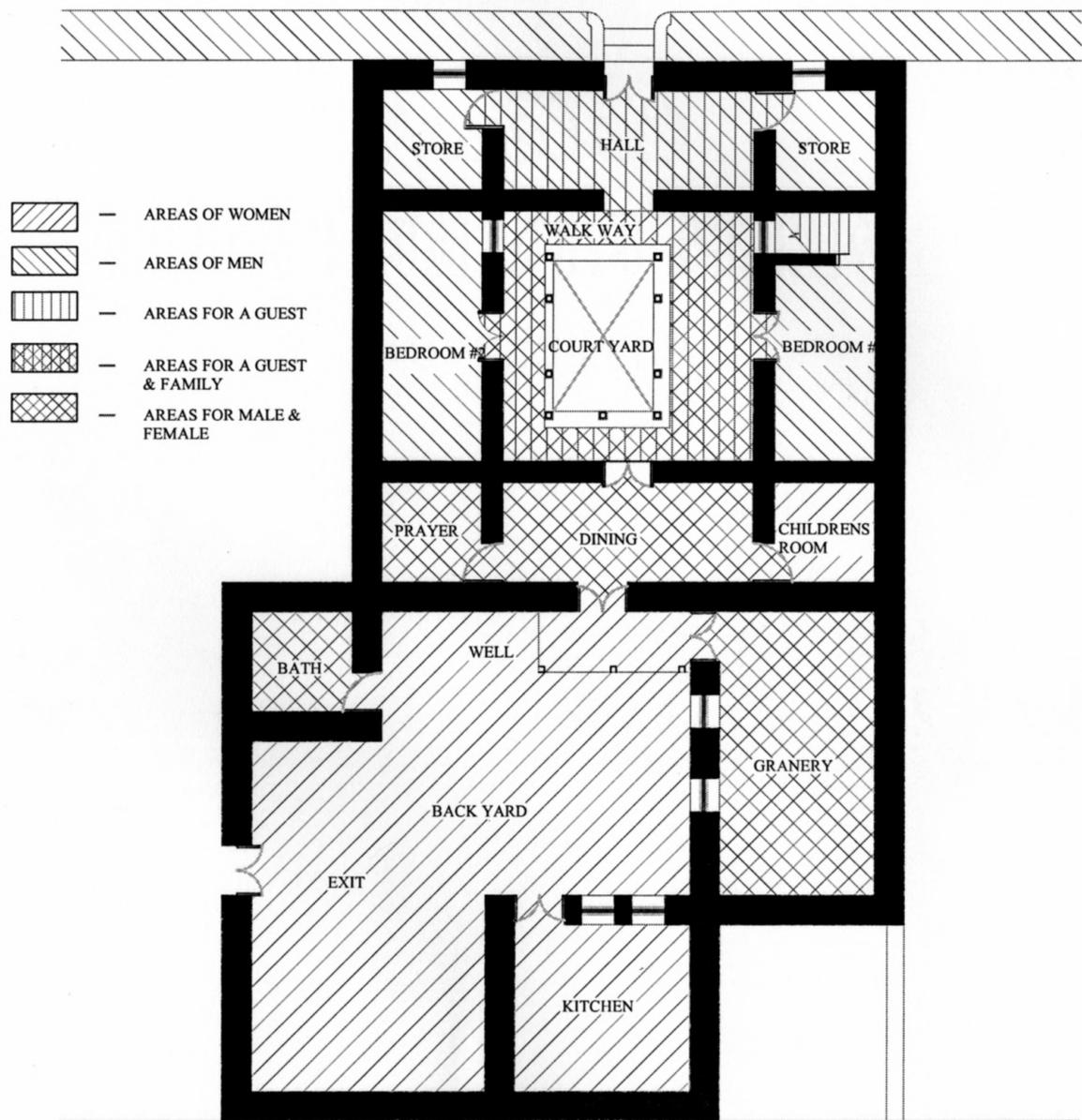


FIGURE - 31



GROUND FLOOR PLAN
 DISTRIBUTION OF AREAS
 (by sex and position)

Source: Author

Case Study II – New residence

General Description

The two-story residence was built in 1999 and is a vastu-based design. The building is located in a high-density neighborhood, and is on a site of 53'x55' (Figure 32). A 20' wide road approaches the site. The building occupy around 1700 sq. ft. of space on the site, with 5' offsets on the side and a 15' front yard. The resident is a retired government official who is accompanied by his wife and a grand son.

The residence is basically built for 6 people with three bedrooms and a spacious double height living room. A covered carport is in the front yard. The offsets on the sides are used for various utility purposes. The terrace is approached by a staircase, which can be accessed from outside and inside.

The building sets in to the calm neighborhood with its simple and elegant elevation and in turn helps in creating a fabric with the other buildings present on the street.

Concept of Design

The design of the building is based on one of the archetypal patterns of vastu shastra. The building resembles the 'Laangala Griham' with its L shape design around the living space. The design aims at providing sufficient light and ventilation, by arranging spaces around the living space.

The site is oriented towards northeast so a reference north is assumed for arrangement of spaces.

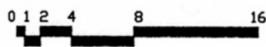
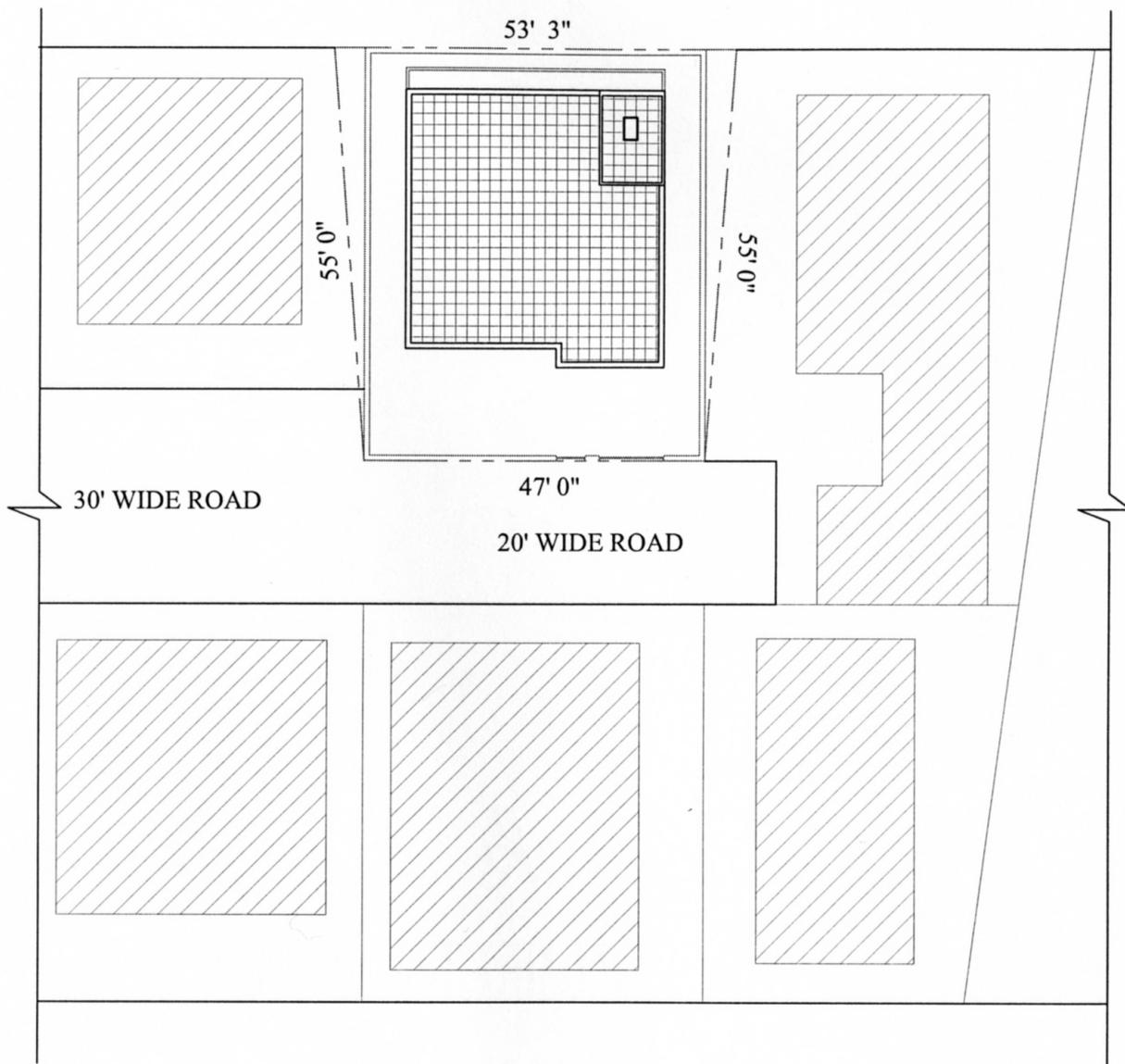


FIGURE - 32
Source: Author



SITE PLAN

Plan (Figures 33-35)

The site is of irregular shape, and has been corrected to make it a regular shape by leaving the uneven sides unbuilt, and a boundary wall surrounds the building in a regular shape. The main criteria of making the site regular is to provide even spaces around the building.

The building itself represents an articulate arrangement of spaces inside it. The main entrance of the building and site faces the east. The living room is oriented towards the east with other spaces around it, making it a central space (assumed center). Bedrooms on ground and second floor are oriented towards the west, while the kitchen is towards the south, dining is towards the southwest beneath the staircase. The prayer hall is oriented towards the east, which is a perfect location for any sacred spaces in a building as per vastu shastra. A circular staircase leads to second floor, where the third bedroom is oriented towards south and a balcony towards southeast making it a perfect place to relax during most times of the day. The side and back yards are used for utility purposes.

The double height living room resembles the courtyard; in this case it's closed above, but functions similar to an open courtyard. It provides light and ventilation to the whole spaces surrounding it. (Figures 36-37)

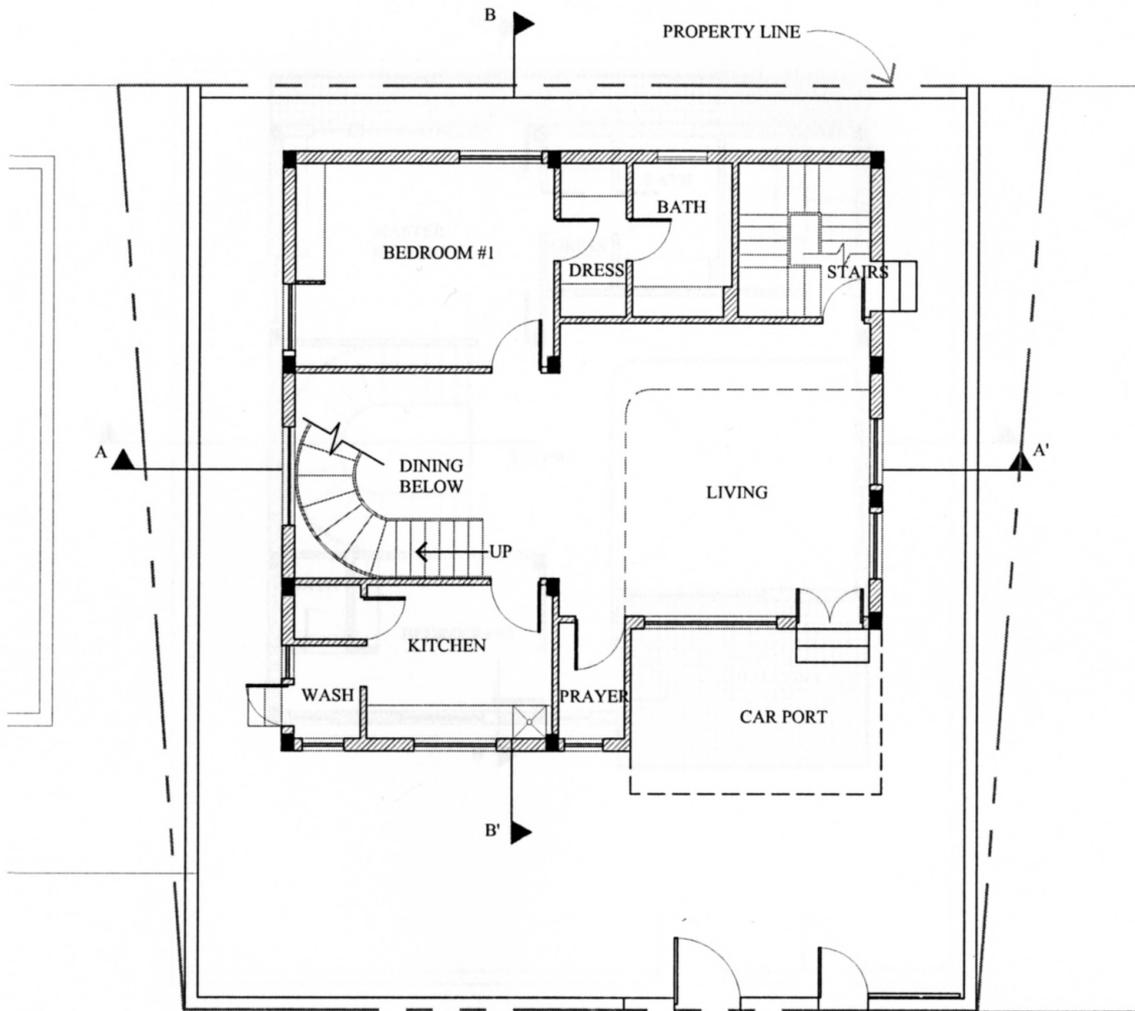


FIGURE - 33



GROUND FLOOR PLAN

Source: Author

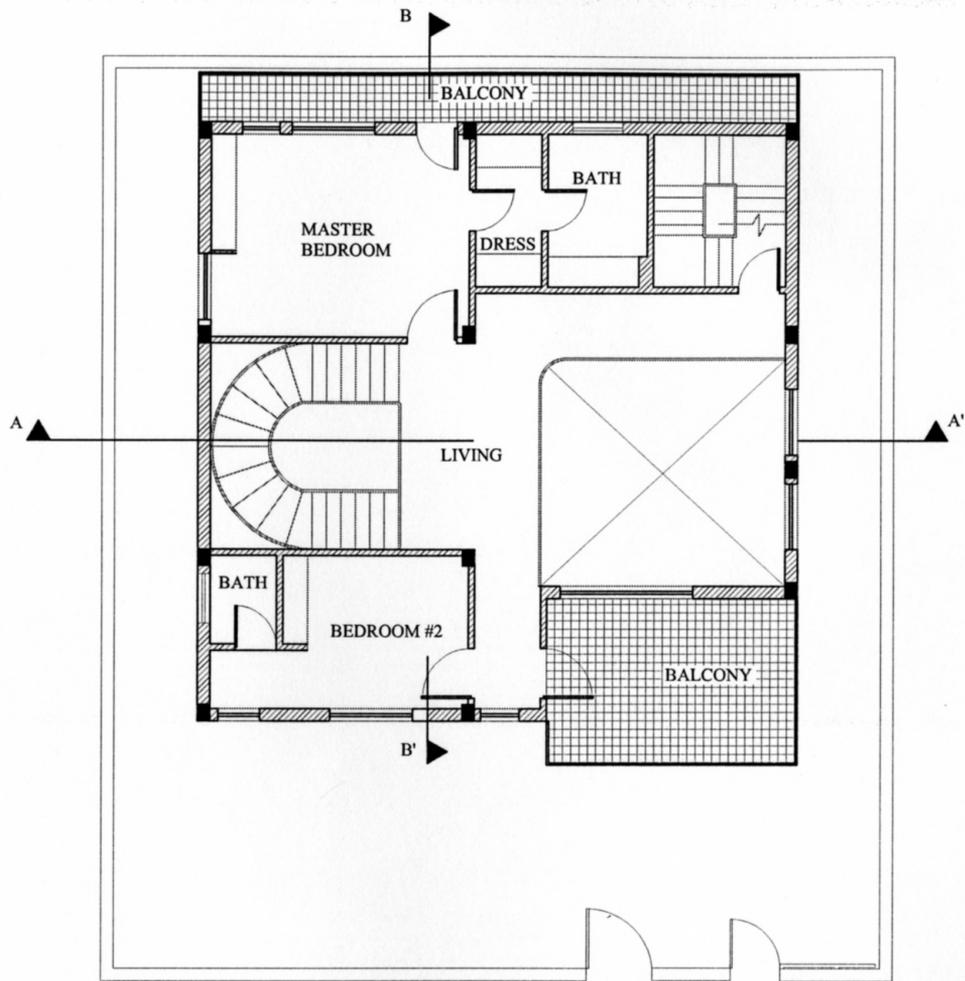


FIGURE - 34
Source: Author



SECOND FLOOR PLAN

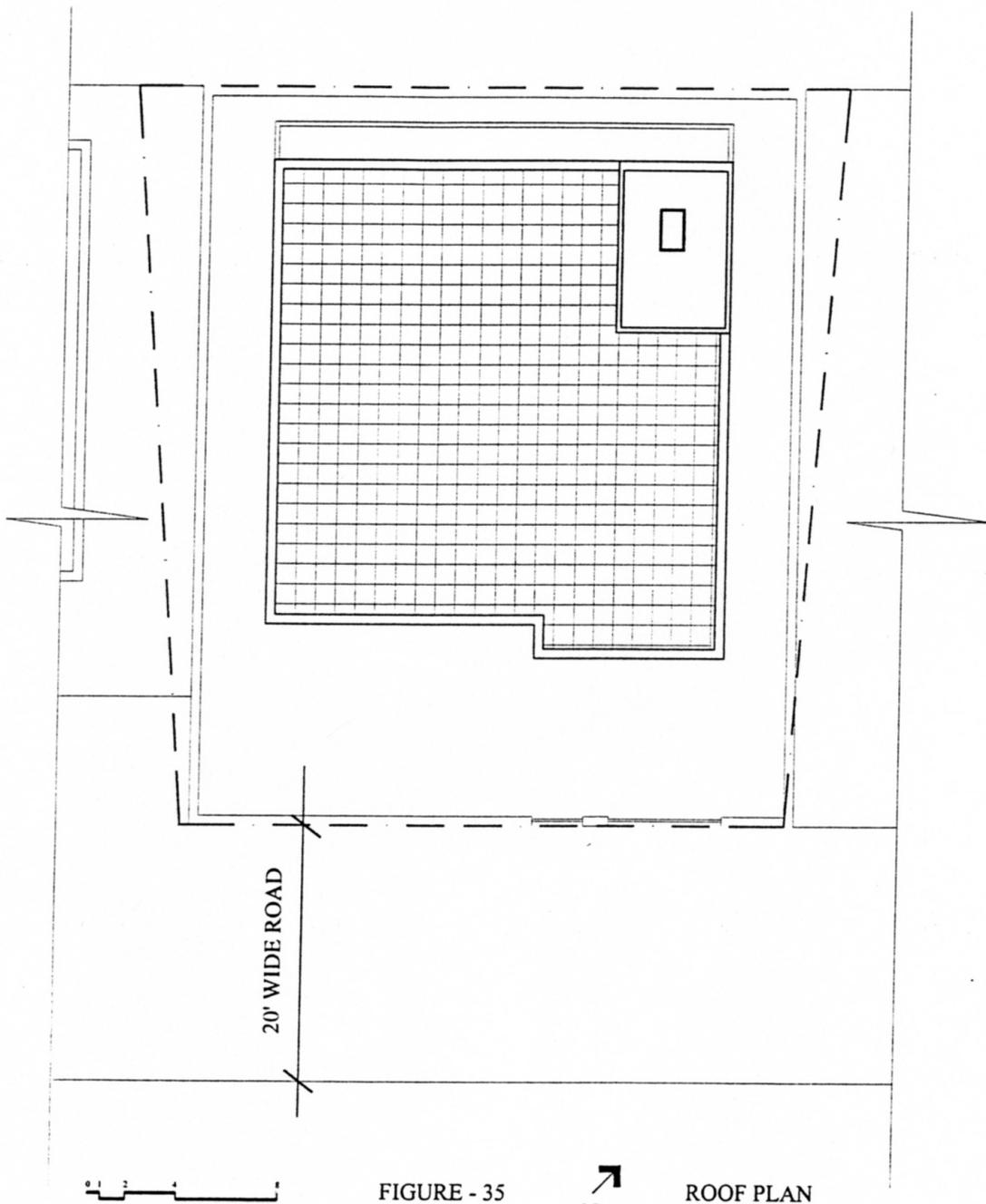


FIGURE - 35
 Source: Author

ROOF PLAN

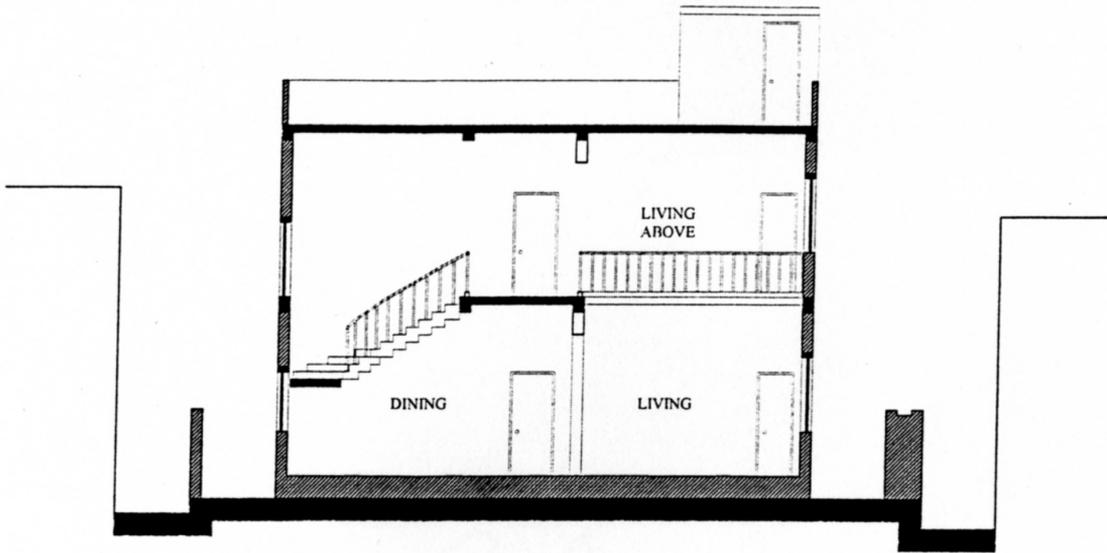


FIGURE - 36 BUILDING SECTION AA'
Source: Author

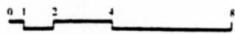
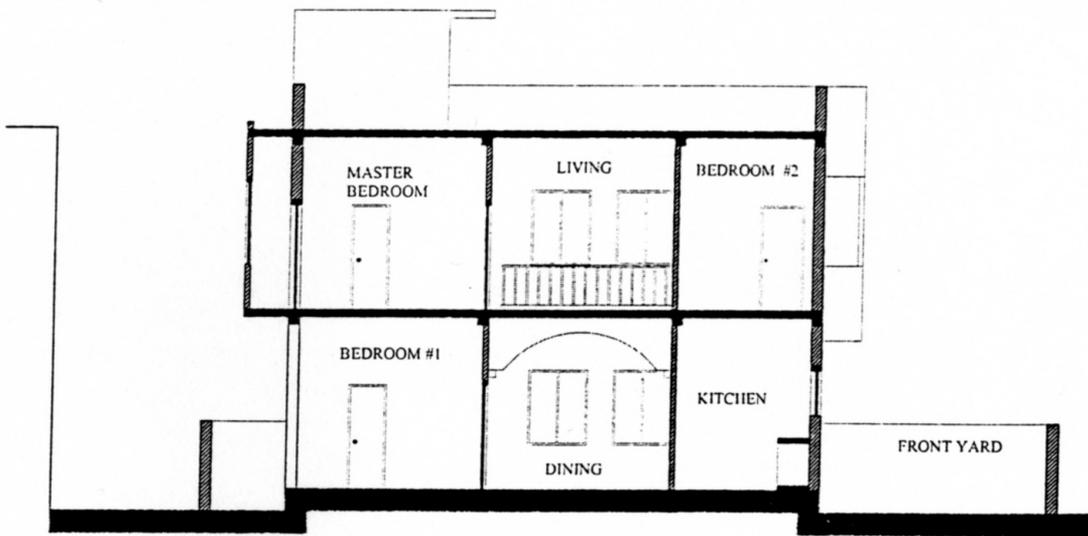


FIGURE - 37 BUILDING SECTION BB'
Source: Author

Doors

The main entrance door in this case study home is also ornate and shows the esteem of the owner. Other doors of the building are just single leaf doors with a modern touch to them.

Windows

The windows of the front elevation are of wood and are in combination with the elevation, but nothing special is noted about them. They are common to modern Indian house construction.

Flooring Materials

The flooring materials used are marble and *Tandur* stone. Marble is used inside the house with no pattern and *Tandur* stone used outside the building also with no pattern.

Columns

The columns of the house are made of steel reinforced concrete and are not exposed outside with no particular importance to them. The front elevation of the building has few exposed columns, which serve the purpose of decoration only.

Materials

The main structural materials used in this case are steel reinforced concrete and brick masonry. No particular visual importance is given to any of the materials and their usage.

Division of Spaces

Except for guests all other residents use the spaces commonly and no particular pattern or division of spaces is noticed. The bedroom on the first floor of the building is used as a guestroom.

Case Study III – Renovated residence

General Description

The resident of the house is a former politician and a businessman who lives with his family on the ground floor of the building, while using the top floor for the office of his firm. The building was constructed in 1980, and was renovated during 1997, because the former was not built according to vastu.

The site has a three-side approach road with the residence towards north. The main entry to the site at present is on to the east and a pedestrian entry towards the northwest. A parking space is provided towards the south of the site. The site was irregular in shape before renovation and it was made orthogonal during the renovation leaving the northwest and northeast parts of the site unbuilt and also by building a boundary wall around the regular site (Figure 38).

Concept of Design

The present design of the building is based on the principles of vastu with few exceptions. The main entrance to the building is towards the east and into the site is towards northeast. The spaces inside the building are arranged based on a central system, with a living room in the center and all other spaces surrounding it. The central living space is closed from all the sides without proper ventilation. Three bedrooms are arranged in the west and northwest directions, and other rooms follow the principles of vastu.

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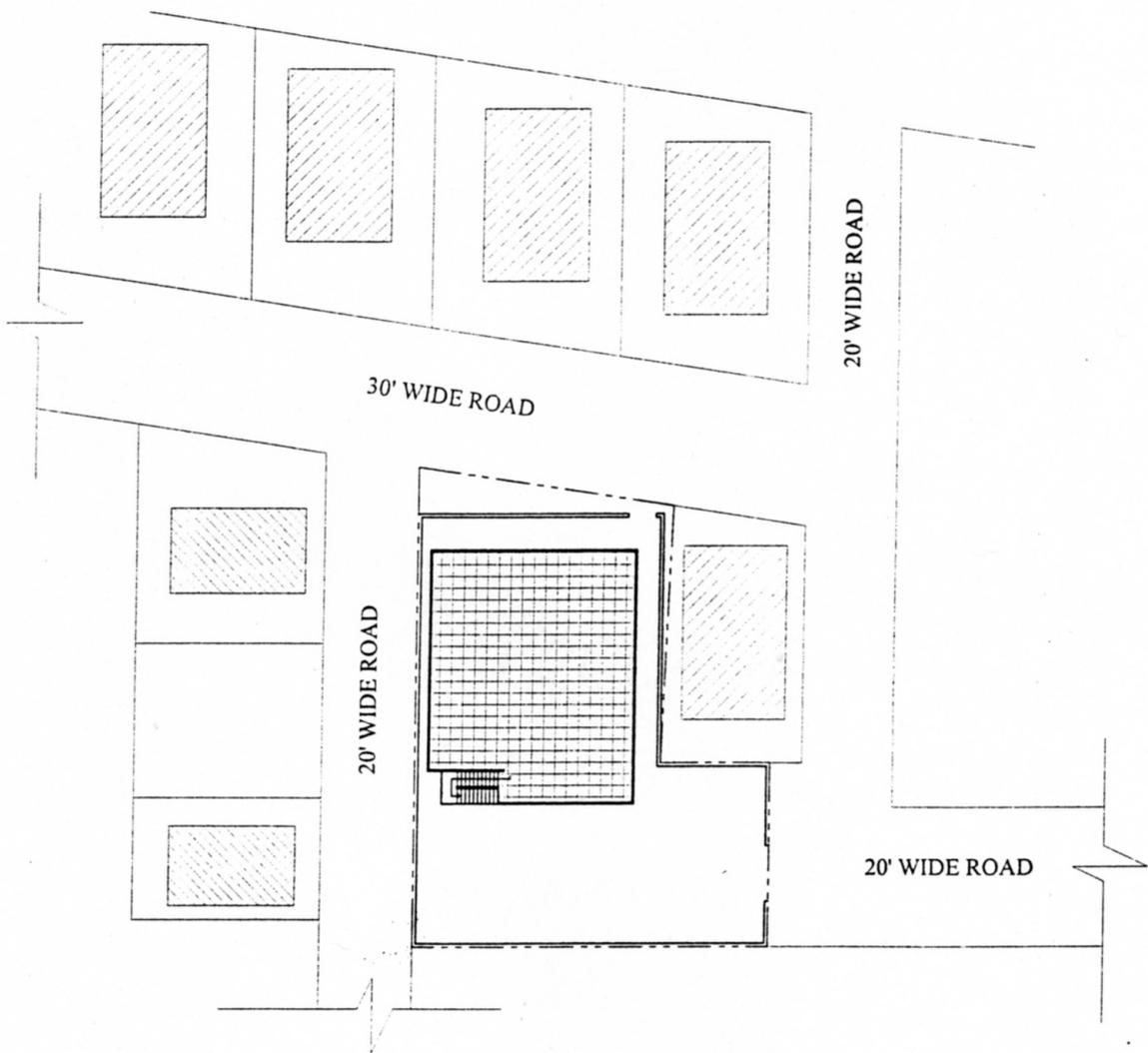




 FIGURE - 38 N SITE PLAN
 Source: Author

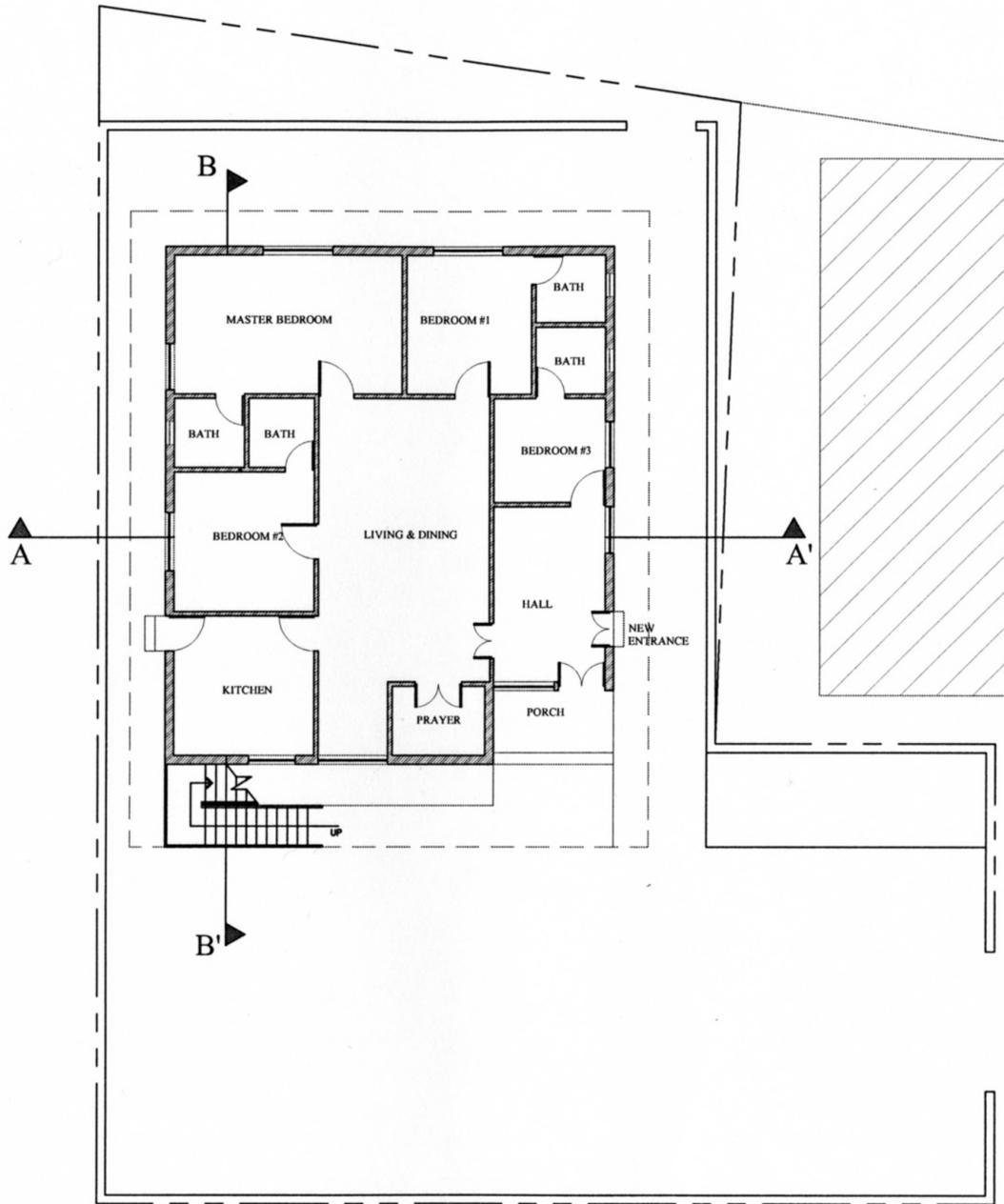


FIGURE - 39  N GROUND FLOOR PLAN

Source: Author

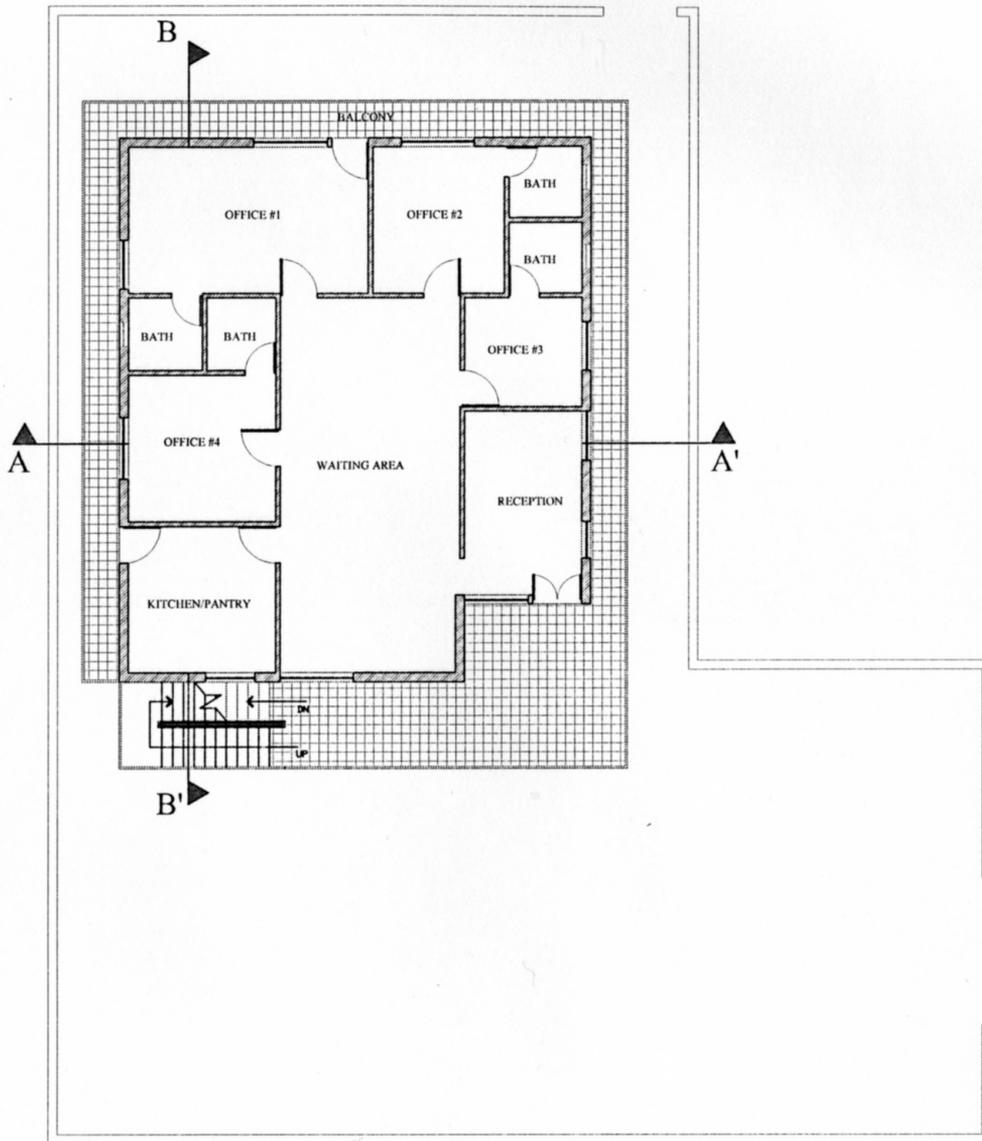


FIGURE - 40  SECOND FLOOR PLAN

Source: Author

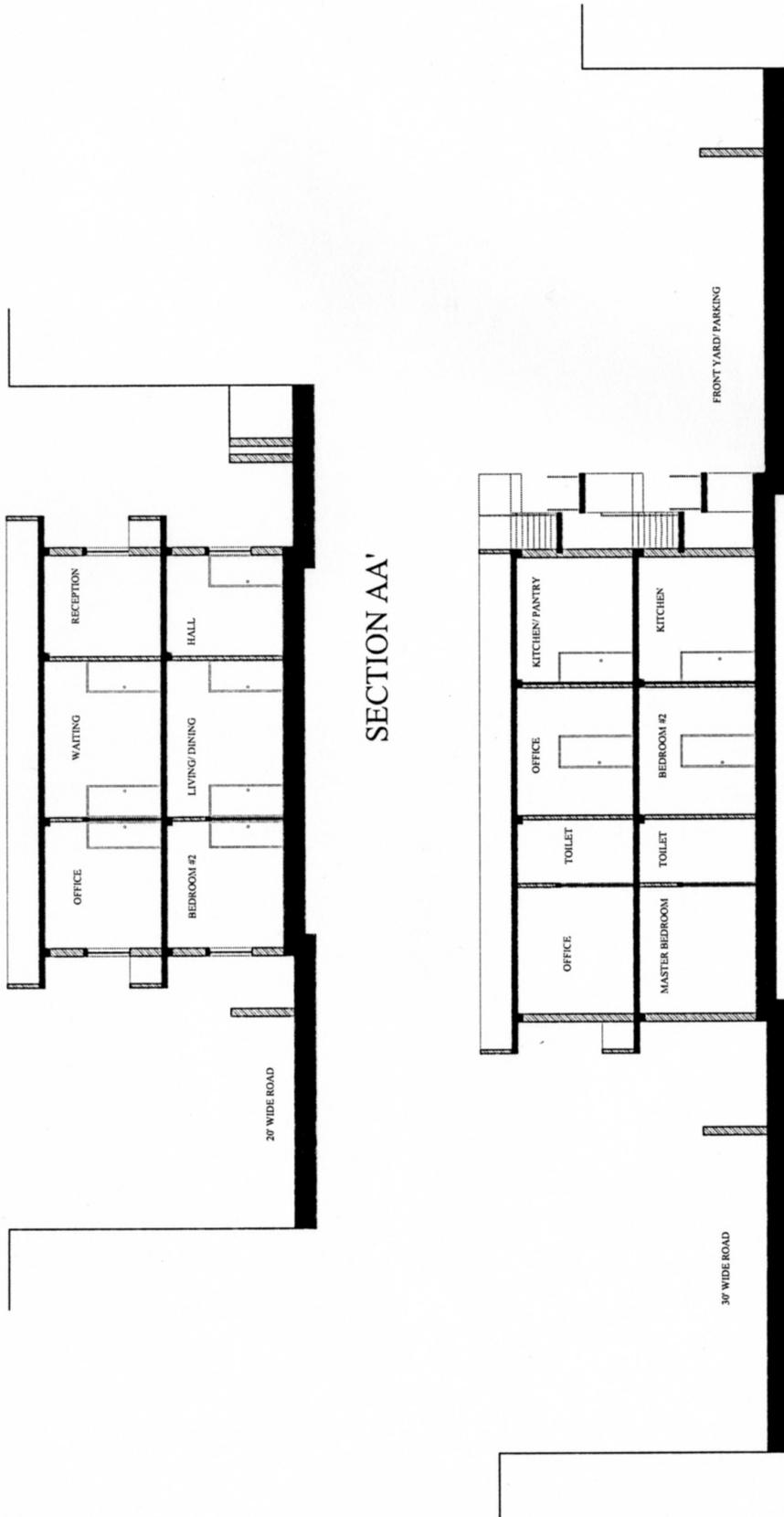


FIGURE - 41 BUILDING SECTIONS

Source: Author

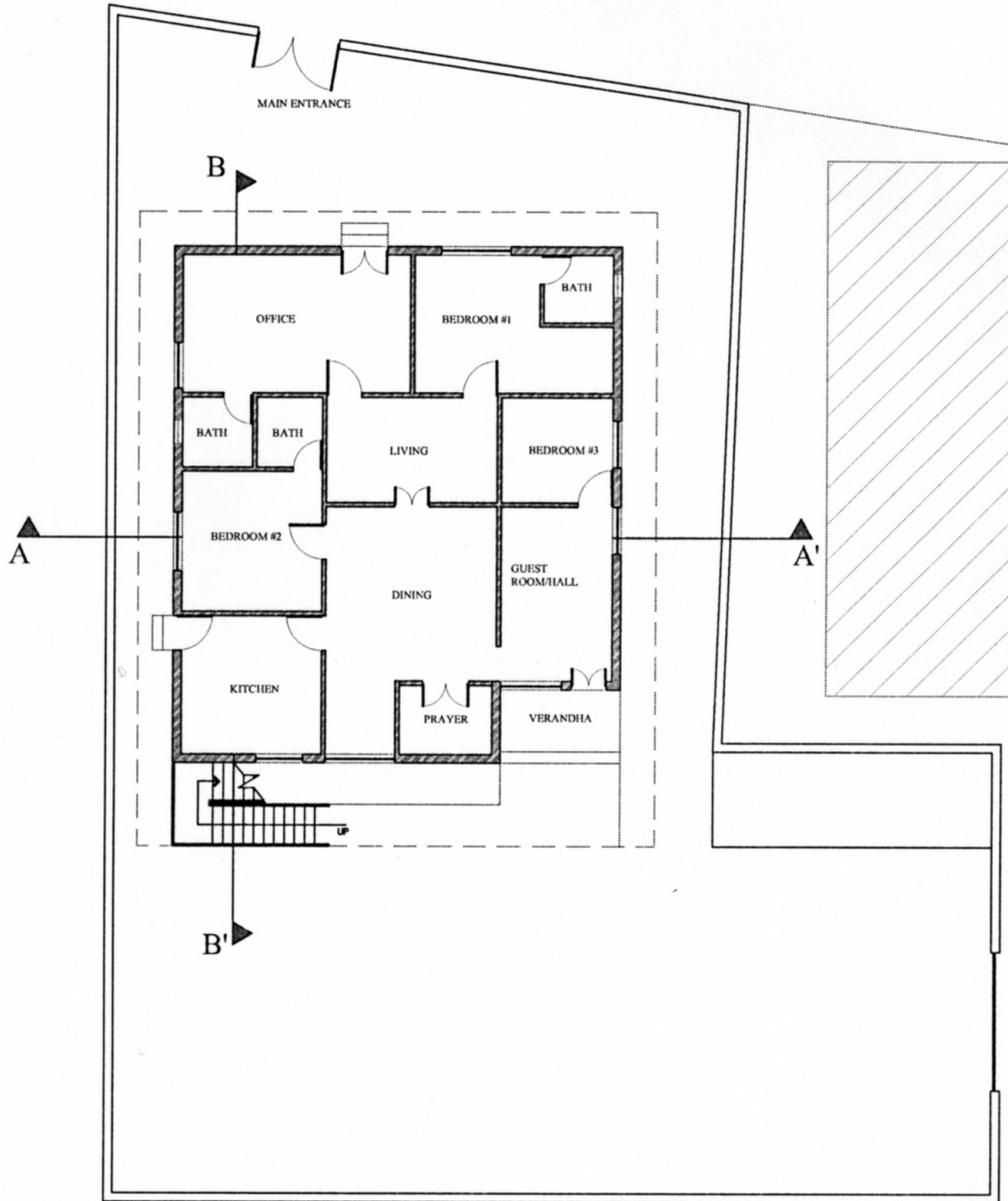


FIGURE - 42
Source: Author



GROUND FLOOR PLAN
BEFORE RENOVATION

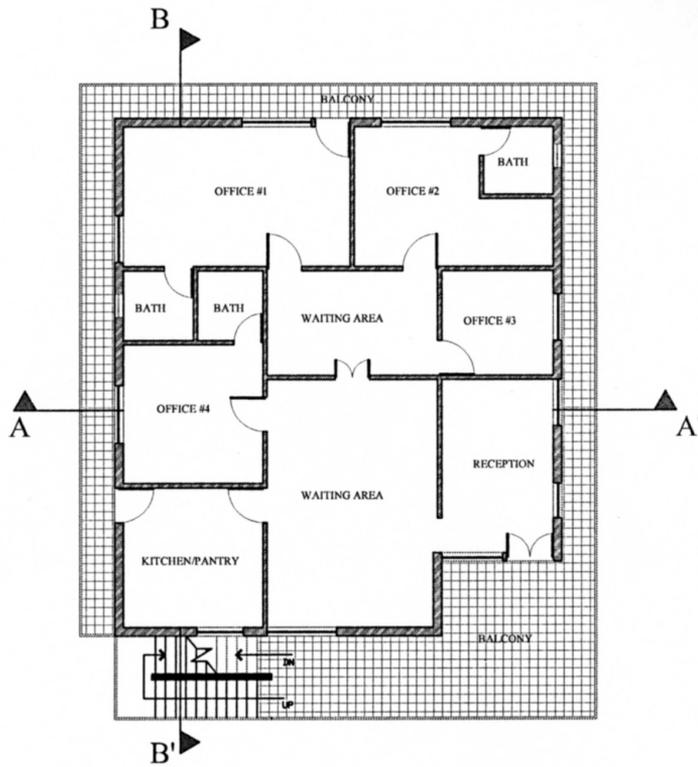


FIGURE - 43  SECOND FLOOR PLAN
 Source: Author BEFORE RENOVATION

The second floor also followed the same arrangement as the ground floor. The main reason for the renovation process was to provide a better arrangement of spaces and proper ventilation into the spaces designed. Comparison of renovated and before renovation designs is provided in the figure.

Doors & Windows

Except for the main door of the building, which is ornate and represents the esteem of the owner, the other doors in the building are simple and unadorned. No particular importance is given to windows. They are common to modern Indian home construction.

Materials

The materials used in this building are steel reinforced concrete floor and slabs with brick masonry infill and some Mangalore tiles for façade treatment. Few portions of the front and backyard are laid with *Tandur* Stone, which is used for pedestrian purposes. The flooring material used in this building is granite and does not follow any particular order and does not represent any thing.

Division of Spaces

The main division of space is vertically through the building, where office and residential spaces are on separate floor levels to provide privacy.

10. ANALYSIS

An analytical study between the case studies and the literary study is essential to satisfy the hypothesis of this research study i.e., to know the physical application of the principles of *Vastu Shastra* in the practical field.

The case studies done for this research study are selected based on the basis of age and geographical location of the buildings. Proportions are maintained in the layout of the building. They were studied with the help of photographs and onsite observations. The three buildings studied represent three different ages of design, construction and technology, although in the same climatic and geographical locations. This difference is due to the age of the selected buildings, the traditional residence being 72 years old, the new being 1 ½ years old and the renovated residence being around 20 years old.

After a complete study of the plans, elevations, sections and functionality, a comparison of the physical application of the principles of *vastu shastra* with the archetypal layouts is required. This chapter gives a thorough analysis of the three case studies and associated archetypal layouts. The traditional residence (considered most appropriate in design with regard to the principles of *Vastu Shastra*) is analyzed first. The other two case studies are then compared with the traditional residence to know the application with respect to age, while simultaneously being analyzed with the archetypal layouts.

TRADITIONAL RESIDENCE

Recognition of the Genre

Literature study provides an image of the dwellings with different numbers of main buildings and their sub forms. Considering these literary reviews, the traditional residence is categorized as a *Chaturmukha Griham* with four main buildings and is of the sub form *Rucaka* type. This characterization is done based on the following criterion: -

- Four building block residences have four blocks prearranged in the form of a square with a central open space called the *Brahmasthan*.
- The *Chaturmukha* type of residence is laid out on the square of vastu purusha mandala with specific endorsements for different spaces.
- The *Rucaka* type of four block building residence has four main ridge beams intersecting at the corners and has four hip rafters on the corners where the ridge beams meet.

Based on this analysis, the traditional residence can be considered as a four main building dwelling (*Chaturmukha Griham*). This provides an image of the design criteria that were used in the layout of the building. An in depth analysis of the spaces inside this layout with the *Chaturmukha Griham*, archetypal layout provides more clues for the practical application of *Vastu* principles.

Comparison with *Chaturmukha Griham*¹⁴⁹ (Fig - 44)

Similarities:

1. Positions of granary, living hall, bedrooms (space for ladies), dining are similar to the ideal layout of the vastu residence.
2. Doorways are on an axis.
3. Kitchen in the same orientation but outside the main building.

Differences:

1. Door ways are not off center.
2. Prayer hall in the opposite corner to the prescribed, i.e. in the southwest corner.
3. Rectangular courtyard rather than square.
4. Verandah only in front of the house.

Comparison with *Paramasayina diagram¹⁵⁰ (Fig 45-48)**

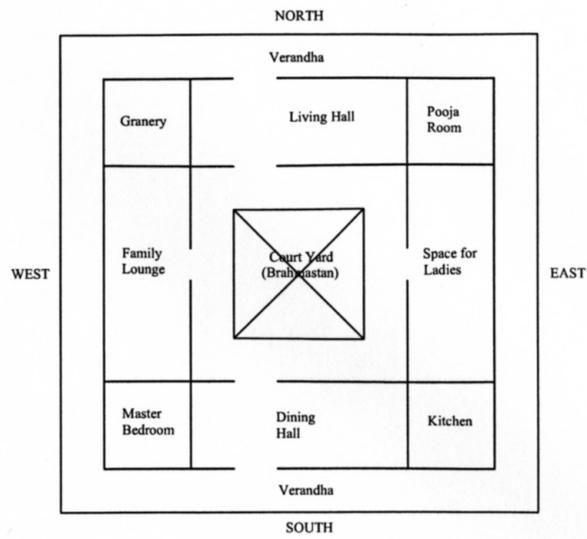
Similarities:

1. The position of the living room is same as the archetypal layout.
2. Orientation of the kitchen is the south where it has to be in southeast.
3. Orientation of the granary is slightly off from where it has to be but it is in southeast for it to be at south and south-southeast.
4. Dhanalaya means, place to store treasure and its positions represent that, it is in the bedrooms, where usually the vaults for keeping money are located. So it is interpreted that the treasury is in the appropriate

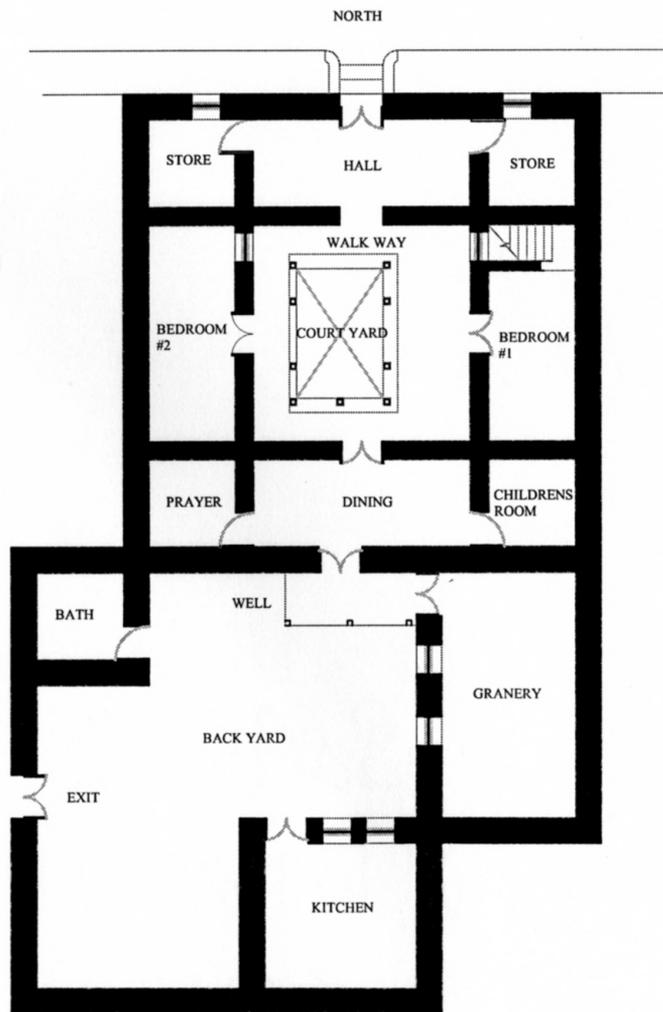
* Look the appendix for relationship between the 45 squares and their positioning.

149. Dr. V. G. Sthapati, 1999, 331

150. Dr. V. G. Sthapati, 1999, 269; Dagens Bruno, 1994, IV.



CHATURMUKHA GRIHAM
(FOUR BLOCK BUILDING)



COMPARISON OF TRADITIONAL RESIDENCE WITH CHATURMUKHA RESIDENCE



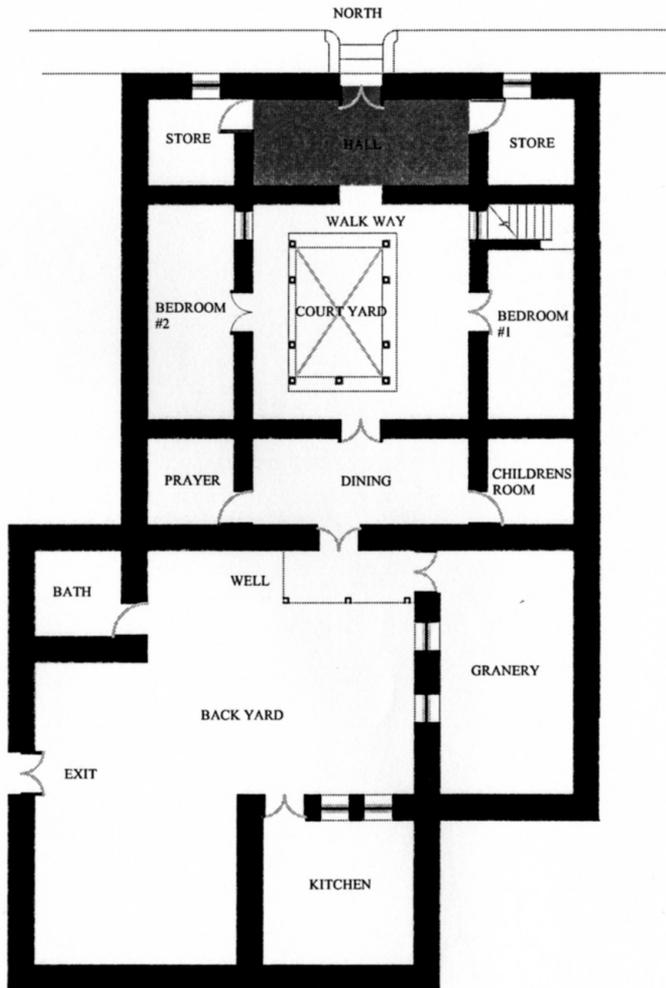
FIGURE - 44 Source: Author
128

NORTH

DRAIN										
VAYU	NAGA	MUKHYA	BHAIATA	SOMA	MARGA	ADITI	UDITI	ISA		
ROJA	RUDRARAJA		BHUDHARA				APA	PRAJANYA		
SOSA	RUDRA						APAVATSA	JAYANTA		
ASURA	MITRA		BRAHMA				ARYAKA		MAHENDRA	DOOR
JALADHIPA									ADITYA	
PUSPADNATA									SATYAKA	
SUGRIVA	INDRAJAYA	VIVASVANTA				SAVINDRA		BHIREA		
DAUVIRIKA	INDRA					SAVINDRA		ANTARIKSA		
PITR	MRSA	BHRNGARAJA	GANDHARVA	YAMA	RAKASA	VITATHA	PUSAN	AGNI		

SIMILARITIES:
 1. The position of the living room, is same as the archetypal layout.

REFR: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6
 PARAMASAYIN DIAGRAM SUKHALAYA(LIVING ROOM)



COMPARISON OF ARCHETYPAL AND THE TRADITIONAL RESIDENCE -- LIVING ROOM



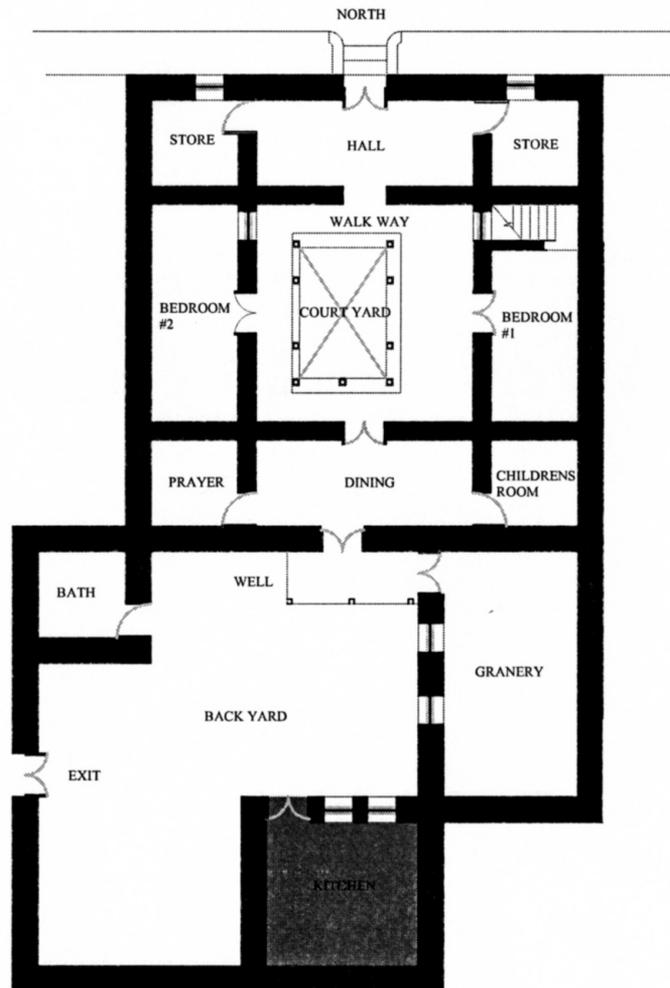
FIGURE - 45 Source: Author

NORTH

DRAIN									
VAYU	NAGA	MUKHYA	BHALATA	SOMA	MARGA	ADITI	UDITI	ISA	
ROJA	RUDRARAJA		BHUDHARA			APA	PRAJANYA		
SOSA	RUDRA					APAVATSA	JAYANTA		
ASURA			BRAHMA			ARYAKA	MAHENDRA		
JALADHIPA	MITRA						ADITYA		
PUSPADNATA			VIVASVANTA			SAVINDRA	SATYAKA		
SUGRIVA	INDRAJAYA					SAVINDRA	BHIREA		
DAUVIRIKA	INDRA					SAVINDRA	ANTARIKSA		
PITR	MRSA	BHRNGARAJA	GANDHARVA	YAMA	RAKASA	VITATHA	PUSAN	AGNI	

REFR: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6
PARAMASAYIN DIAGRAM KITCHEN

SIMILARITIES:
1. Orientation of the kitchen is the south where it has to be in southeast.



COMPARISON OF ARCHETYPAL AND THE TRADITIONAL RESIDENCE -- KITCHEN
FIGURE - 46 Source: Author

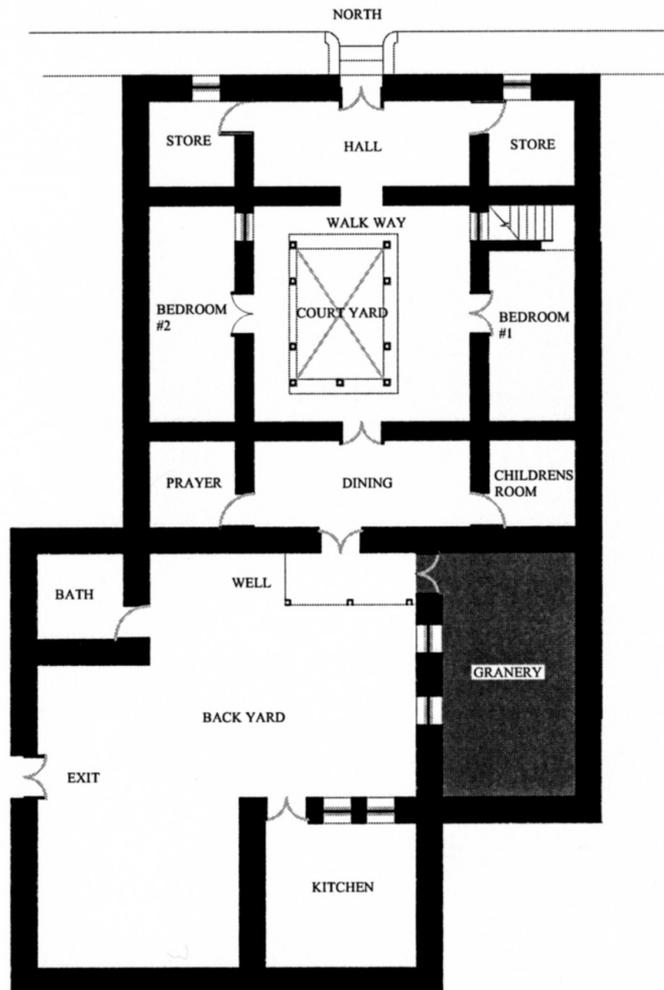


NORTH

DRAIN									
VAYU	NAGA	MUKHYA	BHAIATA	SOMA	MRGA	ADITI	UDITI	ISA	
ROJA	RUDRARAJA		BHUDHARA			APA		PRAJANYA	
SOSA	RUDRA					APAVATSA		JAYANTA	
ASURA								MAHENDRA	DOOR
JALADHIPA	MITRA		BRAHMA			ARYAKA		ADITYA	
PUSPADNATA								SATYAKA	
SUGRIVA	INDRAJAYA		VIVASVANTA			SAVINDRA		BHREA	
DALVIRIKA	INDRA					SAVINDRA		ANTARIKSA	
PITR	MRSA	BHIRNARAJA	GANDHARVA	YAMA	RAKSASA	VITATHA	PUSAN	AGNI	

SIMILARITIES:
 1. Orientation of the granary is slightly off from where it has to be, it is in south-east for it to be, it is in south and south-south-east.

REFR: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6
 PARAMASAYIN DIAGRAM GRANERY



COMPARISON OF ARCHETYPAL AND THE TRADITIONAL RESIDENCE -- GRANARY



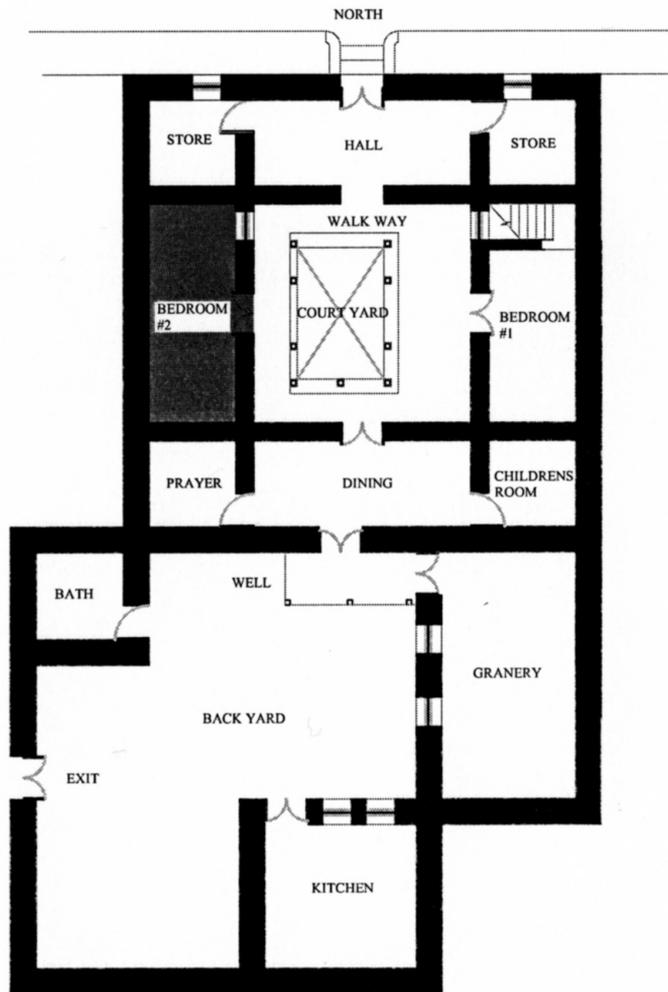
FIGURE - 47 Source: Author

NORTH

DRAIN										
VAYU	NAGA	MUKHYA	BHALATA	SOMA	MRGA	ADITI	UDITI	ISA		
ROJA	RUDRARAJA	BHUDHARA			APA	PRAJANYA				
SOSA	RUDRA				APAVATSA	JAYANTA				
ASURA	MITRA			BRAHMA			ARYAKA	MAHENDRA		
JALADHAPA							SAVINDRA		ADITYA	
PUSPADNATA							SAVINDRA		SATYAKA	
SUGRIVA	INDRAJAYA	VIVASVANTA			BIHREA					
DALVIRIKA	INDRA				ANTARIKSA					
PITR	MRSA	BIHNGARAJA	GANDHARVA	YAMA	RAKASA	VITATHA	PUSAN	AGNI		

NOTE:
 1. Here, dhanalaya means, place to store treasure and its positions represent that, it is in the bedrooms, where usually the vaults for keeping money are located. So it is interpreted that the treasury is in the appropriate position.

REFR: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6
 PARAMASAYIN DIAGRAM TREASURY(BEDROOM)



COMPARISON OF ARCHETYPAL AND THE TRADITIONAL RESIDENCE -- TREASURY



FIGURE - 48 Source: Author

The earlier comparisons describe the layout of spaces in the squared grid, but vastu shastra doesn't end with these layouts. The principles are more subjective and technical when considering aspects such as proportions, positions of doors and appurtenances.

Technical analysis of proportions¹⁵¹ (Fig - 49)

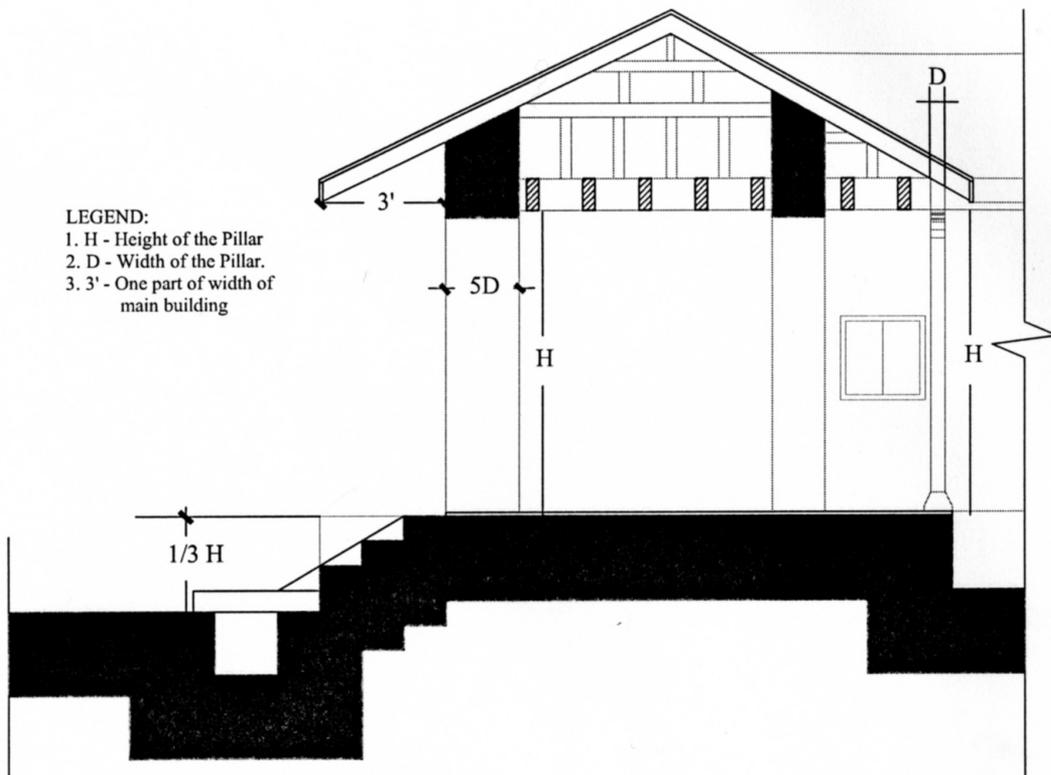
A very technical description of the proportions is obtained from the literary study. The proportions of the traditional residence are compared to those obtained from the literature review. The outcome of this analysis is summarized below:

- If the height of the pillar,¹⁵² is considered as 'H', then the height of all the walls of the building up to lower rafter level is also 'H'. This is true in this case.
- If the width of the pillar is 'D', then the thickness of the walls should be greater than or equal '3D', which is satisfied in this case.
- The height of the base should not be greater than ' $\frac{1}{2}H$ '. In this case it is ' $\frac{1}{3}H$ '.
- The rafter should project at least one part of the width of the main building. In this case the width of the main building is around 27'(9 units of 3' each)¹⁵³ and the rafters project 3' from the walls, which makes it one part of the width.
- The height of the door is equal to '0.8H' and the width of the door is less than 0.47 times the height of the door.
- The lintel and sill of the doors are equal to 0.12H and 0.8H respectively.

151. Ibid 64.

152. Height of the pillar is considered as a basic module.

153. This measurement is approximate.



PROPORTIONS OF THE TRADITIONAL RESIDENCE BUILDING SECTION

FIGURE - 49

Source: Author

Case Study II – New Residence

Recognition of the genre

Following literary reviews, the new residence can be characterized as a sub form of four main buildings residence. Giving an emphasis on site layout, it can be related to *Tulaniya* dwelling and the building layout resemble *Laangala/Swatika griham*. This characterization is done based on the following criterion: -

- The four main building residence have four blocks prearranged in the form of a square with a concentric central space, which is usually open.
- A *Tulaniya* dwelling (fig-50) is surrounded by enclosure wall on all the sides of building.
- The main entrance into the site is towards southeast.
- A *Laangala Griham* (fig-51) is an L shaped residence where the open central core is outside the residence and other spaces surround it. The entrance into the building is towards east.

Based on this analysis, the new residence can be considered as a combination of four main building residence with features of *Tulaniya* dwelling. An in depth analysis of spaces inside this layout with the *Laangala Griham*, archetypal layout provides more clues for the practical application of principles of *Vastu*. Comparisons with *Tulaniya*, *Laangala* and traditional residence are listed below with the help of some figures.

Comparison with *Tulaniya Dwelling* (Fig-50)

Similarities:

1. Both the buildings are surrounded by enclosure wall on all the sides.
2. The main entrance in to the building is towards east.

Comparison with *Laangala Griham* (Fig-51)

Similarities:

1. A central space surrounded by other spaces.
2. Bedrooms and kitchen are in the same orientation.
3. Both have a back yard, and the bounded by a wall.
4. The main entrance door is emphasized in both cases.

Differences:

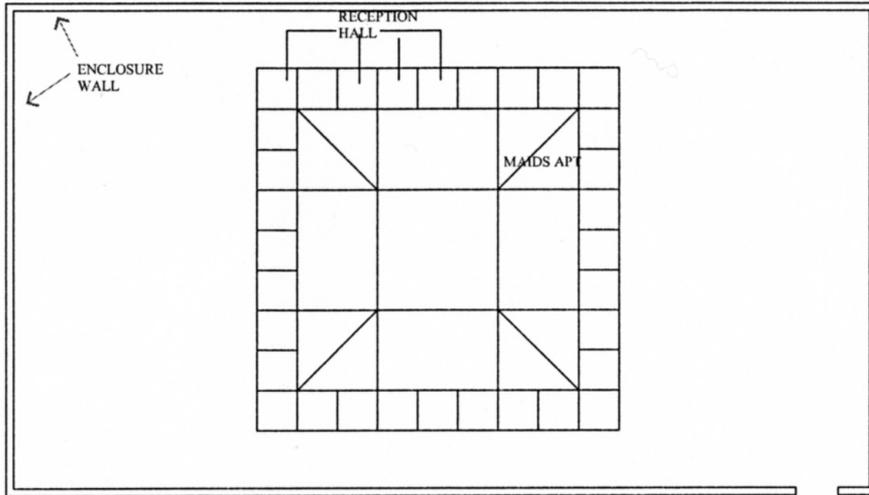
1. The central living portion is a covered double height area, compared to the traditional one, which is open.
2. The central space is not the living area in the traditional residence.
3. The new building is surrounded by space around it.
4. Use of materials is different.
5. The main entrance into the new building is to the east where as its towards north in the traditional residence.

Comparison with Traditional residence (Fig-52)

Similarities:

1. Orientation of bedrooms and living area are similar to archetype.

NORTH



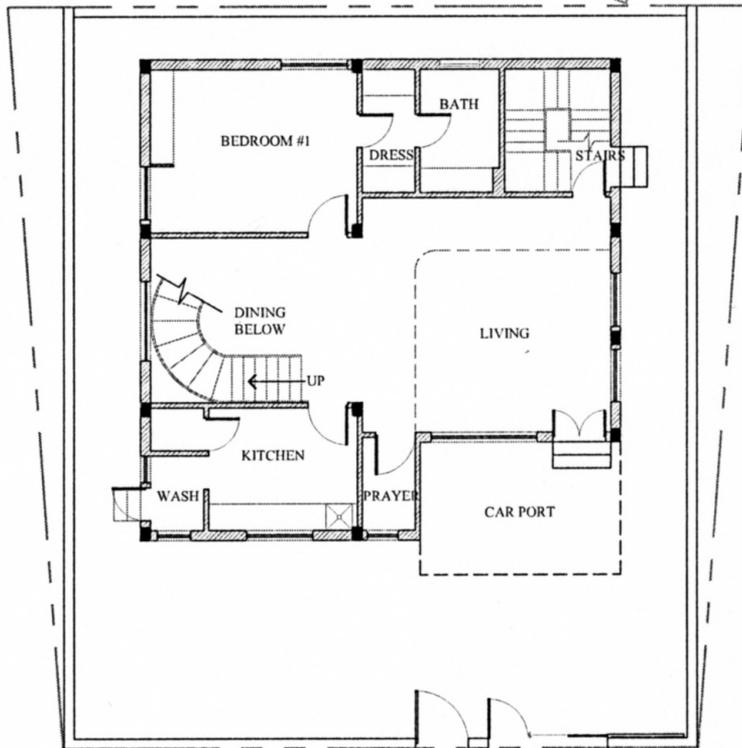
REFR. MAYAMTAM VOL-I, HRING DAGENS, FIG-33, pg-DXXXV

TULANIYA DWELLING

SIMILARITIES:

1. Both the buildings are surrounded by enclosure wall on all the sides.
2. The main entrance in to the building is towards east.

PROPERTY LINE



COMPARISON WITH TULANIYA ARCHETYPE



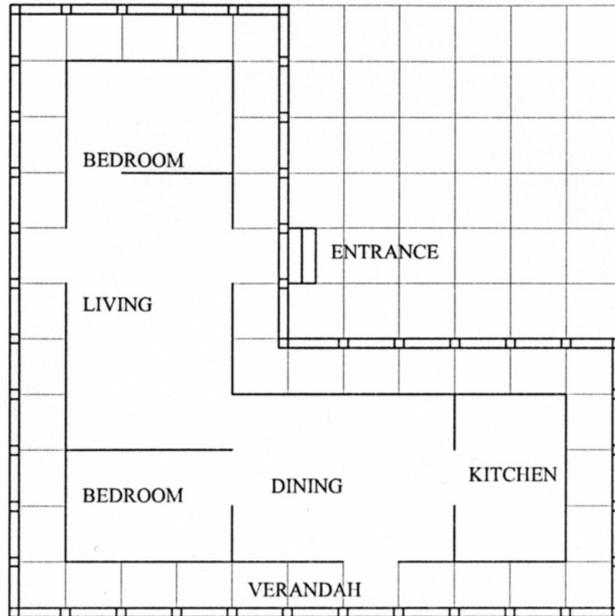
FIGURE - 50



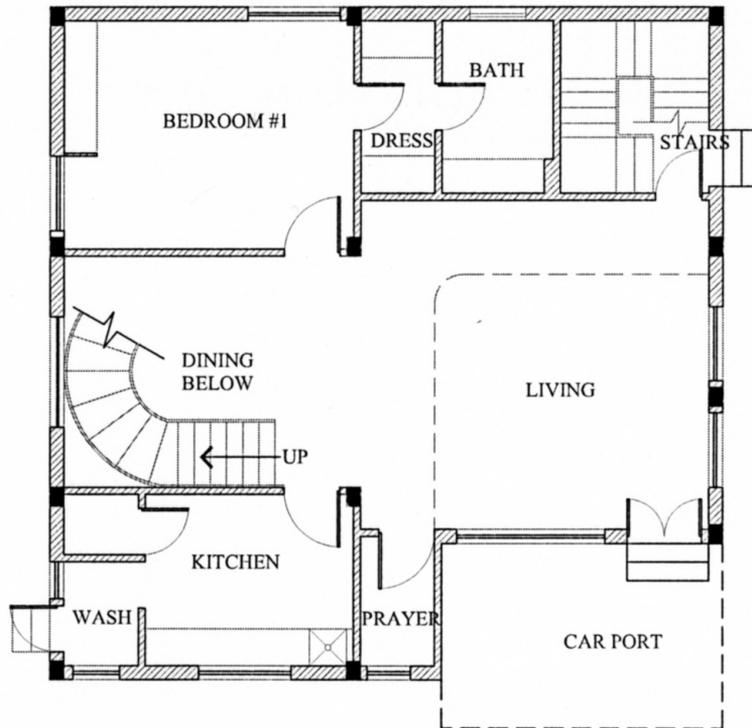
Source: Author

LAANGALA OR SWATIKA GRIHAM

NORTH



REFERENCE: STHPATHYA VEDA, V.G.STHAPATHI, CHAP-26, PG-336,337



COMPARISON OF ARCHETYPE AND THE NEW RESIDENCE PLANS

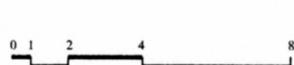
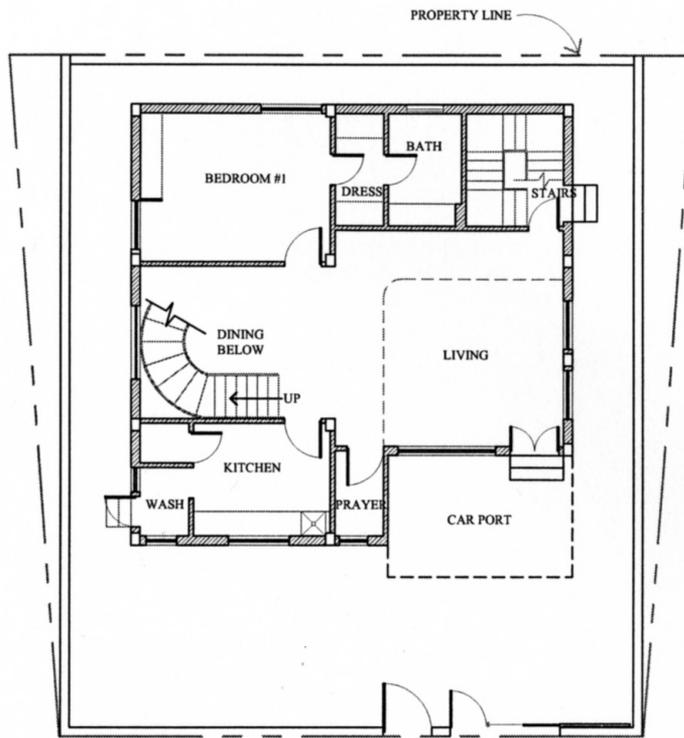


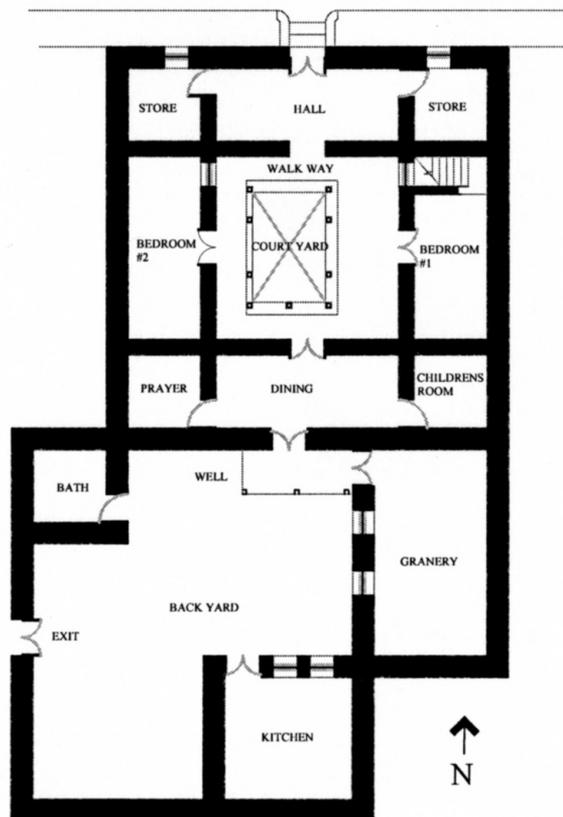
FIGURE - 51



Source: Author



GROUND FLOOR PLAN



COMPARISON OF NEW AND TRADITIONAL RESIDENCE PLANS



FIGURE - 52



Source: Author

2. The entrance in to the building is towards east.
3. The main building is surrounded by open space, which is similar to the verandah of archetype.

Differences:

1. Kitchen is onto south, where it should have been onto southeast.
2. The living area is surrounded by other spaces, which is not in the case of archetypal.
3. Proportions are followed in the case of traditional residence.

Technical Analysis of Proportions

A very technical description of the proportions is obtained from the literary study. The proportions of the new residence are compared to those obtained from the literature review. The outcome of this analysis is summarized below:

- No basic unit of measurement is observed, rather this residence follows the building bylaws of the city.
- Columns and walls are of same height, as prescribed in *Vastu* laws.
- Height of the base is not proportional to any other part of the building, which was not the case in traditional residence.

Case Study III - Renovated residence

Following literary reviews, the renovated residence can be characterized as a sub form of four main buildings residence. Giving an emphasis on site layout and basic plan, it can be related to the building layout of *Rectangular Chaturmukha griham*. This characterization is done based on the following criterion: -

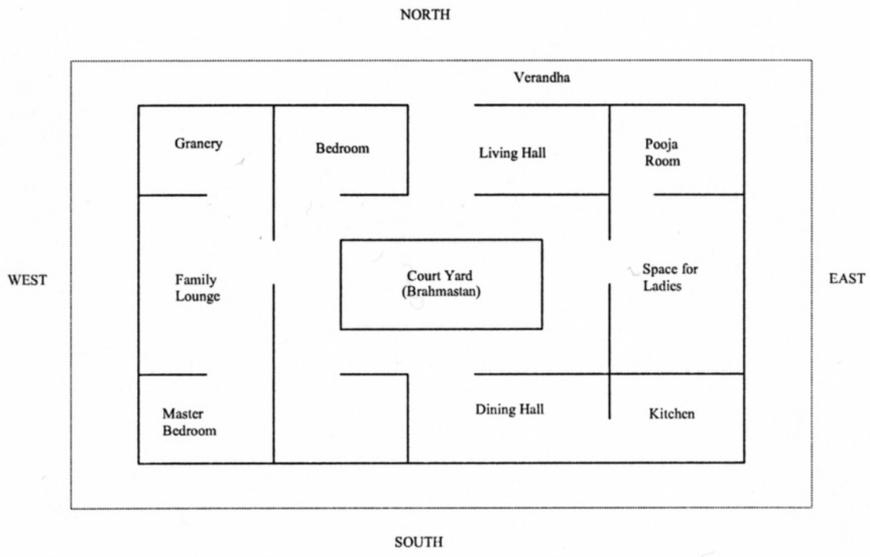
- The four main building residence have four blocks prearranged in the form of a square with a concentric central space, which is usually open.
- The basic shape of plan is a rectangle.
- A covered central space and east entrance into the building resembles the layout to rectangular *Chaturmukha griham*.

Based on this analysis, the renovated residence can be considered as a four main building residence with features of *Chaturmukha Griham*, archetypal layout provides more clues for the practical application of principles of *Vastu*. Comparisons with *Chaturmukha Griham*, *Paramasayina* diagram, traditional residence and with layout of this same residence before renovation are listed below with the help of some figures.

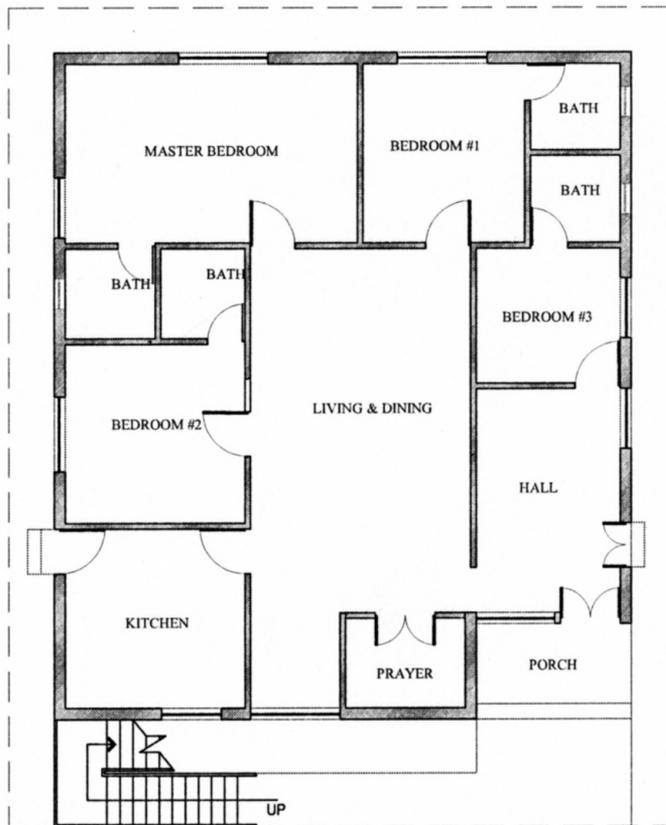
Comparison with Rectangular *Chaturmukha Griham* (fig-53)

Similarities:

1. Positions of living hall, bedrooms (space for ladies) are similar to the ideal layout of the vastu residence.
2. Has a verandah in front of the main entrance, but not shared with other residences on the street.



**RECTANGULAR CHATURMUKHA GRIHAM
(FOUR BLOCK BUILDING)**



COMPARISON OF ARCHETYPAL AND THE RENOVATED RESIDENCE



FIGURE - 53



N Source: Author

3. A central space is present which is surrounded by other spaces, but it is covered, contrary to the open central space in the ideal layout.
4. Prayer hall is in the same orientation as the ideal layout.

Differences:

1. Doorways are not on axis
2. Kitchen is completely on the opposite side, as of ideal layout.
3. Covered central space.
4. Main entrance not exactly to the north but to the northeast.
5. No proper ventilation, due to covered central portion.

Comparison with *Paramasayina* Diagram (Figures 54-56)

5. The position of living room is towards north-northeast, a slight shift from the archetype.
6. Orientation of kitchen is towards south, contrary to the southeast from the archetype.
7. The position of treasury/bedroom is in similar position to the archetype.

Comparison with Traditional residence (Figure-57)

Differences:

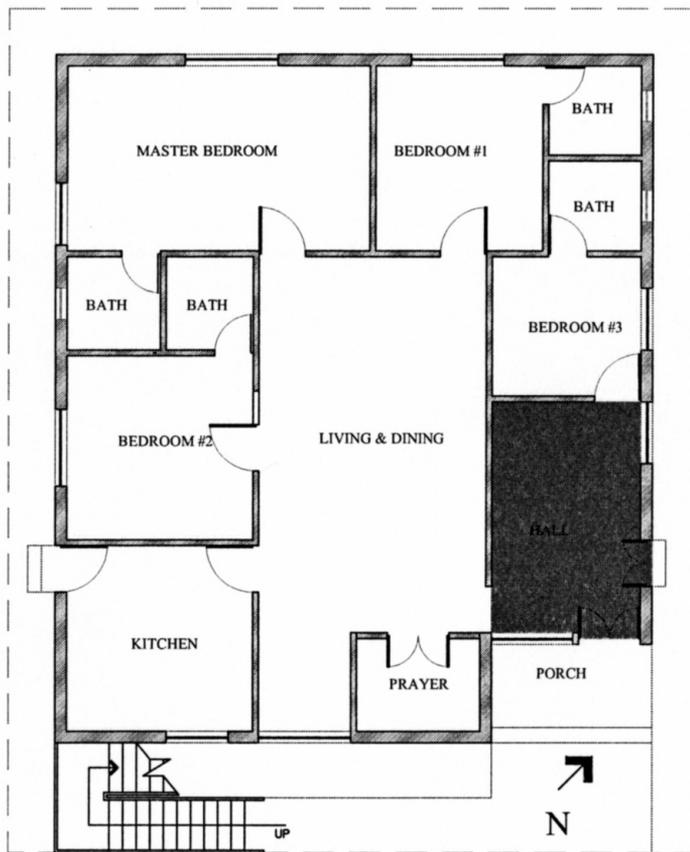
1. The main entry into the building is from the northeast for the renovated residence, while its north for the traditional residence.
2. The renovated building is surrounded by circulation space around it, while the traditional one has a back yard.
3. The central portion is covered in the renovated one, while its open in the traditional one with proper ventilation.
4. The baths are located in the building for the renovated residence while they are outside in the traditional one.

		DRAIN							
VAYU	NAGA	MUKHYA	BHAIKATA	SOMA	MARGA	ADITI	UDITI	ISA	
ROJA	RUDRARAJA	BHUDHARA			APA		PRAJANYA		
SOSA	RUDRA				APAVATSA		JAYANTA		
ASURA	MITRA	BRAHMA			ARYAKA		MAHENDRA		
JALADHIPA							ADITYA		
PUSPDNATA							SATYAKA		
SUGRIVA	INDRAJAYA	VIVASVANTA			SAVINDRA		BHIREA		
DAUVRIKA	INDRA				SAVINDRA		ANTARIKSA		
PITR	MRSA	BHRNGARAJA	GANDHARVA	YAMA	RAKASA	VITATHA	PUSAN	AGNI	

REFR: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6
 PARAMASAYIN DIAGRAM SUKHALAYA(LIVING ROOM)
 REFR PAGE- 43 OF THIS THESIS FOR THE MEANING OF WORDS LISTED IN ABOVE FIGURE

SIMILARITIES:

1. The position of living room is towards north-north-east, a slight shift from the archetype.



COMPARISON OF ARCHETYPE AND THE TRADITIONAL RESIDENCE -- LIVING ROOM



FIGURE - 54

Source: Author

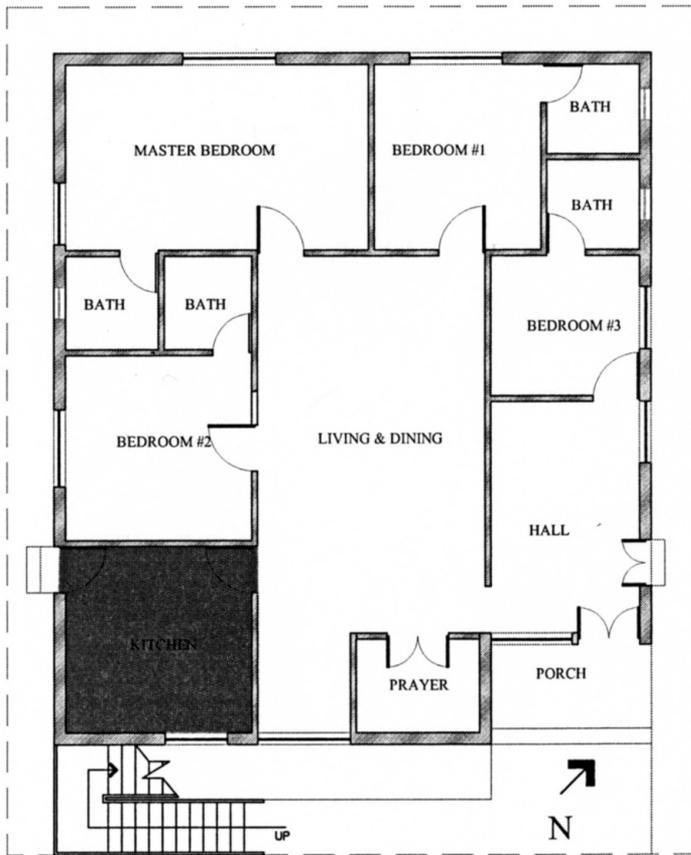
NORTH

DRAIN									
VAYU	NAGA	MUKHYA	BHALATA	SOMA	MRGA	ADITI	UDITI	ISA	
ROJA	RUDRARAJA		BHUDHARA			APA	PRAJANYA		
SOSA	RUDRA					APAVATSA	JAYANTA		
ASURA			BRAHMA			ARYAKA		MAHENDRA	
JALADHIPA	MITRA							ADITYA	
PUSPADNATA								SATYAKA	
SUGRIVA	INDRAJAYA		VIVASVANTA			SAVINDRA		BHREKA	
DAUVRIKA	INDRA					SAVINDRA		ANTARIKSA	
PITR	MRSA	BHRNGARAJA	GANDHARVA	YAMA	RAKASA	VITATHA	PUSAN	AGNI	

REFR: MAYAMTAM VOL-I, BRUNO DAGENS, FIG-6
PARAMASAYIN DIAGRAM KITCHEN

SIMILARITIES:

1. Orientation of kitchen is towards south, contrary to the southeast from the archetype.

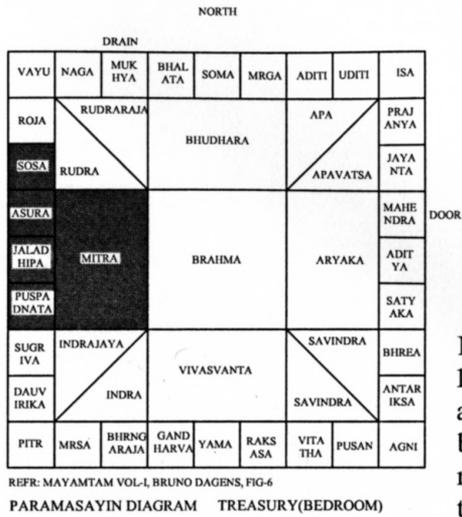


COMPARISON OF ARCHETYPE AND THE TRADITIONAL RESIDENCE -- KITCHEN

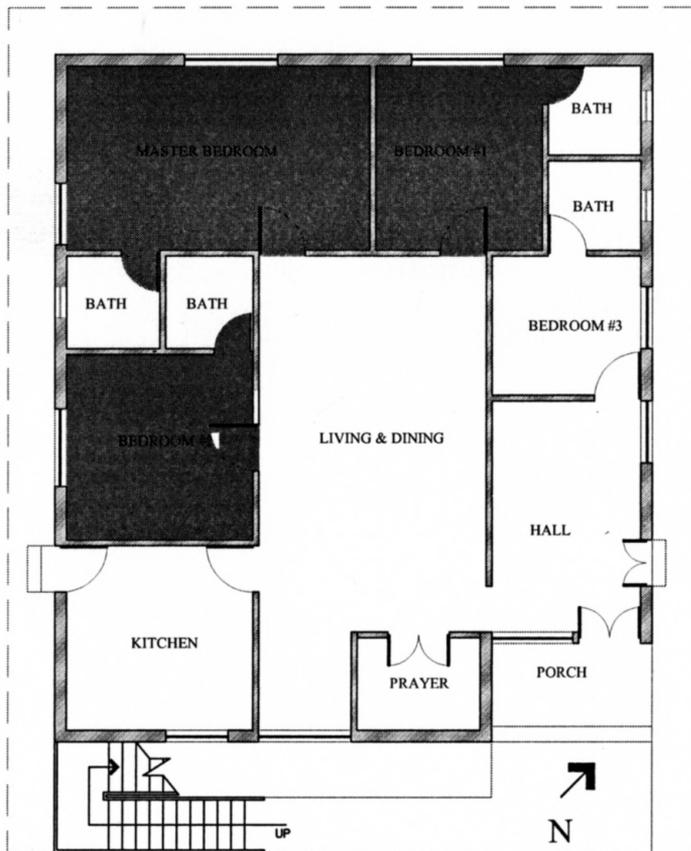


FIGURE - 55

Source: Author



NOTE:
1. Here dhanalaya means, place to store treasure and its positions represent that, it is in the bedrooms, where usually the vaults for keeping money are located. so it is interpreted that the treasury is in appropriate position.



COMPARISON OF ARCHETYPE AND THE TRADITIONAL RESIDENCE -- TREASURY

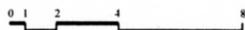
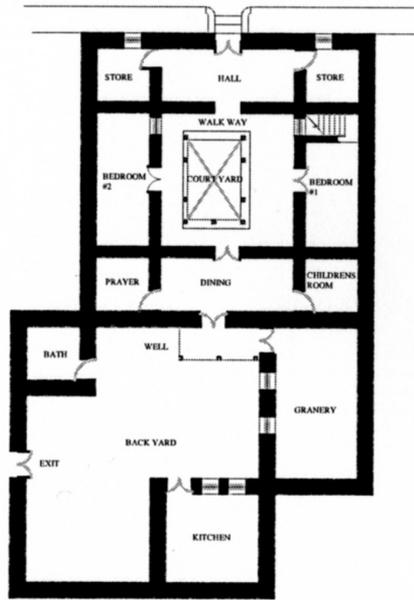
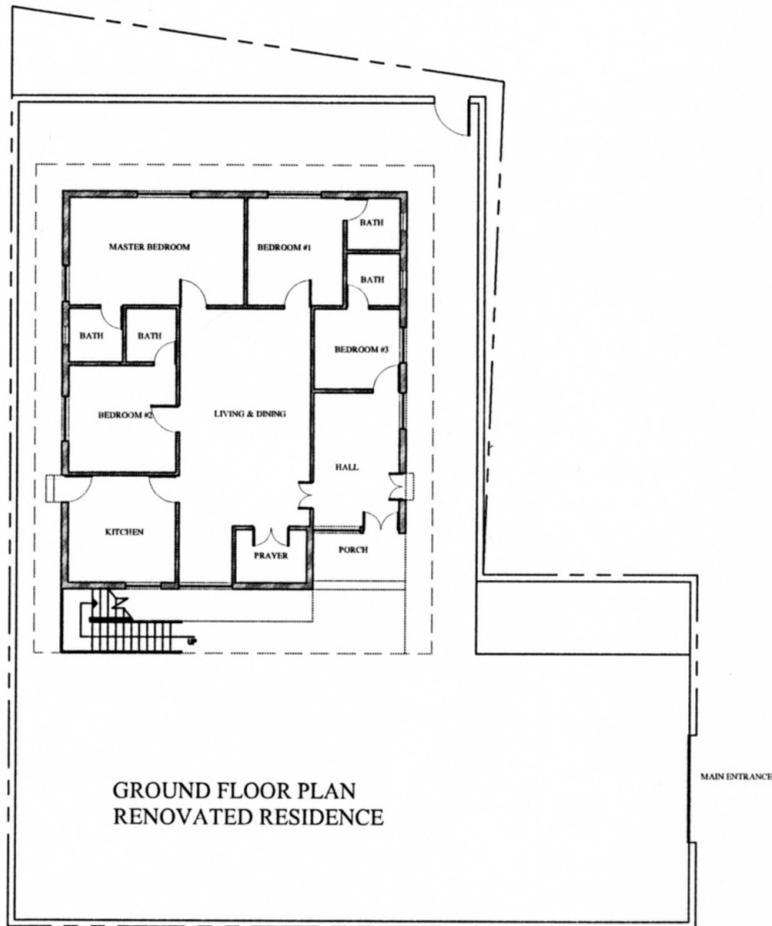


FIGURE - 56

Source: Author



GROUND FLOOR PLAN
TRADITIONAL RESIDENCE



GROUND FLOOR PLAN
RENOVATED RESIDENCE

COMPARISON OF PLANS OF TRADITIONAL AND RENOVATED RESIDENCES



FIGURE - 57
147



Source: Author

5. Use of materials is completely different, the traditional using stone, brick and wood, the renovated uses the new materials like concrete and bricks.
6. No particular patterns of flooring of any other kind are found in the renovated residence.

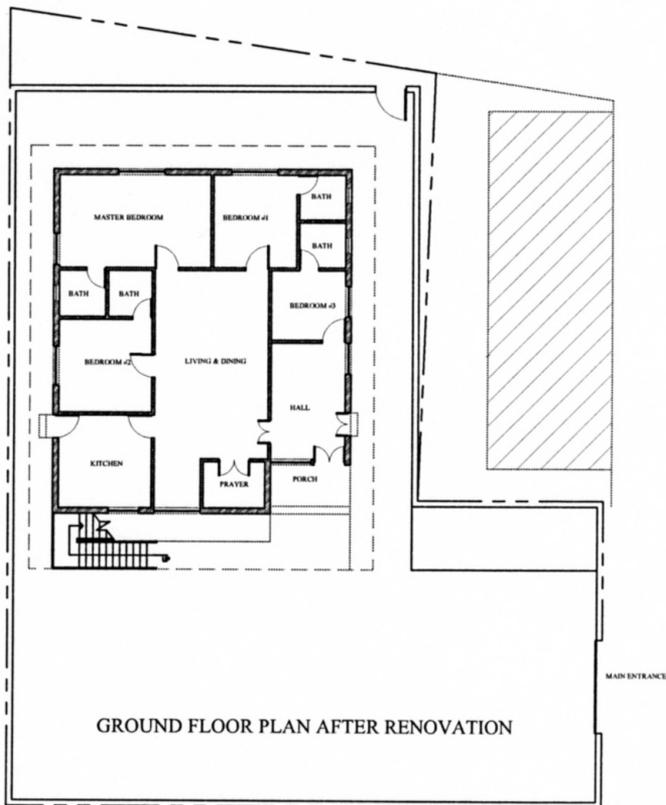
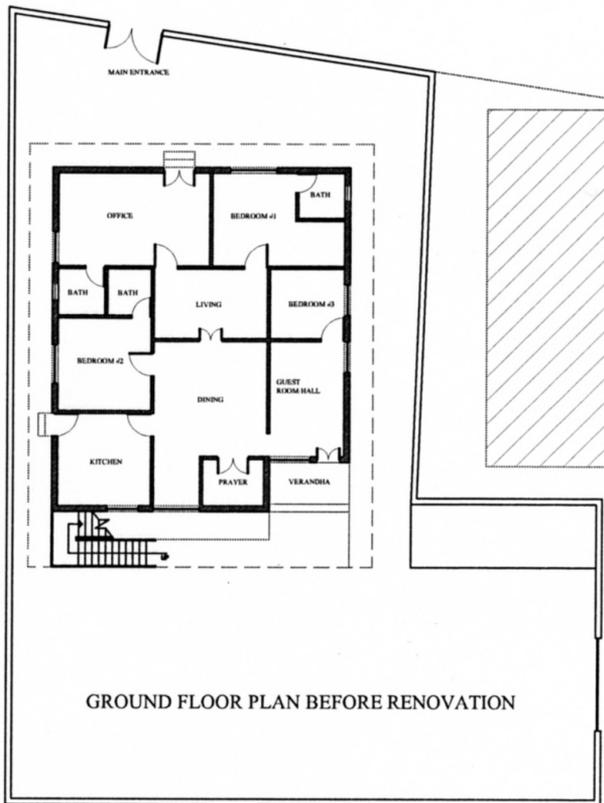
Similarities:

1. Both the residences share the idea of a central space surrounded by other spaces.
2. The orientation of kitchen is same in both the cases.
3. The idea of verandah is seen in both of them, which is not a shared one as in the traditional residence.
4. All the main doors (entry and exit) of both the residences are on an axis.

Comparison with layout before renovation (Figure-58)

Differences:

1. Main entry into the building is changed from the northwest to northeast.
2. The central living room at present is formed merging the dining and living, which were separate prior to renovation.
3. The site has been changed into a regular shape after leaving the uneven corners.
4. The main entry into the site has been changed from the northwest to east, which used to be just a car entrance.
5. The very significant change achieved in spatial sequence is by changing the main entry, which has improved the circulation sequence. This resembles the traditional residence where all the doors are on an axis and the archetypes of Vastu.



COMPARISON OF PLANS BEFORE AND AFTER RENOVATION



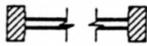
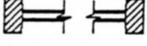
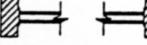
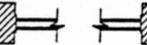
FIGURE - 58 N Source: Author

Technical Analysis of Proportions

A very technical description of the proportions is obtained from the literary study. The proportions of the renovated residence are compared to those obtained from the literature review. The outcome of this analysis is summarized below:

- No basic unit of measurement is observed. Rather, this residence follows the building bylaws of the city.
- Columns and walls are of same height.
- Height of the base is not proportional to any other part of the building, which was not the case in traditional residence.

Comparison of Design and Proportions of Doors with respect to Literature and Case studies

SOURCE	WIDTH/LENGTH	JAMBS	DOOR LEAVES	POSITION OF DOORS
LITERATURE	THREE SPANS WIDE AND SEVEN SPANS HIGH 	WIDTH OF JAMBS IS EQUAL TO THE CORRESPONDING PILLARS. THEIR THICKNESS IS HALF THEIR WIDTH. 	THE WIDTH OF THE LEAVES IS A 1/3, 1/4, 1/5 THE WIDTH OF THE PILLARS. THEIR POSSIBLE HEIGHTS ARE 4 1/2 CUBITS TO 5,7,9,11 CUBITS	DOORS SITUATED ON THE MEDIAN AXIS ARE SUITABLE FOR GODS, BRAHMINS, AND KINGS. FOR ALL OTHERS IT SHOULD BE TO THE SIDE OF THE MEDIAN AXIS.
CASE STUDY-I	THREE SPANS WIDE AND SEVEN SPANS HIGH 	WIDTH OF JAMBS IS NOT RELATED TO THE CORRESPONDING PILLARS AND IS 3 1/2" WHILE THEIR THICKNESS BEING 3 1/2" TOO. 	THE WIDTH OF THE LEAVES IS NOT RELATED TO THE PILLARS AND IS 1' 2 1/2" WHILE THEIR HEIGHT BEING 6' 5". IT IS A DOUBLE LEAVED DOOR	DOORS SITUATED ON THE MEDIAN AXIS, BUT THE INITIAL RESIDENTS ARE NOT KNOWN
CASE STUDY-II	THREE SPANS WIDE AND SEVEN SPANS HIGH 	WIDTH OF THE JAMBS DOES NOT RELATE TO THE PILLARS. THEIR WIDTH IS 3 1/2 INCHES AND THICKNESS 1 1/2 INCHES 	THE WIDTH OF THE LEAVES IS 1' 10 1/2", AND THEIR HEIGHT BEING 6' 1". IT IS A TWO LEAVED DOOR.	NO PARTICULAR AXIS OF THE ALIGNMENT OF DOORS.
CASE STUDY-III	THREE SPANS WIDE AND SEVEN SPANS HIGH 	WIDTH OF THE JAMBS DOES NOT RELATE TO THE PILLARS. THEIR WIDTH IS 3 1/2 INCHES AND THICKNESS 1 1/2 INCHES 	THE WIDTH OF THE LEAVES IS 1' 10 1/2", AND THEIR HEIGHT BEING 6' 1". IT IS A TWO LEAVED DOOR.	AN AXIS FOR THE MAIN DOORS OF THE RESIDENCE IS OBSERVED AFTER RENOVATION.

The primary observation of study of doors among the three residences is that the traditional residence follows the principles of Vastu in door alignments and maintaining an axis.

The new residence does not have any axis for the doors and nor even uses columns as a module of measurement for the construction purposes. Columns are used for structural purposes only.

The renovated residence shows a significant change in the circulation scheme, as the doors are aligned on an axis.

11. Conclusion

This thesis has only touched a tradition that is as vast and deep as an ocean. Nevertheless, it is hoped that the reader can get a sense of the immense richness and holistic vision of the Hindu tradition. Although I have attempted to honestly express the concepts underlying traditional Hindu architecture, it is important to realize that the ideas presented here are a personal reading of the traditional Hindu texts and related scholarly work. This presentation is only one of a number ways of explaining the rich symbolism of Hindu tradition and its multitude of expressions.

In the preceding discussions, it is apparent that the most significant aspect of Vastu Shastra is that there is an underlying metaphysical reality, which is the origin of architecture in Hindu tradition. This underlying reality has been recognized and practiced accordingly in Hindu traditional architecture. Also, it has been evident that the movement from conceptual metaphysical principles to the physical and final realization of the principles requires a physical pursuit.

Now it is clear that there is a deep connection between human life and architectural forms as exemplified in the Hindu traditional architecture based on Vastu Shastra. Also, it is established that the traditional architectural devices such as Vastu Purusha Mandala embody significant meanings and cannot be rejected as illogical and irrational. Considering that the aim of the present study is to understand how traditional principles of design are used practically in the present, the relevant question to ask is whether it is possible to acknowledge Vastu's faithfulness to the underlying premises of the principles in the present?

Such a project of appropriation can be addressed by considering the following questions: How can aspects of *Vastu Shastra* principles be integrated in the design of architectural spaces in the present? Secondly, what is the importance of its application in the practical field considering the principle of *Orientation*? Thirdly, what is the role of an architect in implementing the Vastu principles? I will now address these questions in above order to arrive at an understanding of the issues relating to the understanding and adoption of the principles of *Vastu Shastra*.

Integration of Vastu Principles into the Design of Architectural Spaces

The consideration of the observed relation between the principle orientation and the spatial order of the mandala observed in the traditional residence raises further more questions. Are the principles of vastu more physical in application? Does proportions of the building and its elements relate to the spatial order? What if these relationships don't match in every case? In such observation, the contemporary designs, which are purported to be based on Vastu, are either not completely functional or poorly designed.

The traditional residence is a good example to show the integration of Vastu principles into the design, with a few exceptions. These principles provide basic proportions of all the elements and spaces with a particular order, which in turn is based on human relations to the building physically and psychologically. As the study is particularly over physical aspects of the Vastu, spiritual side of Vastu Shastra isn't considered.

From the study of the contemporary design of the new and renovated residences, a conscious integration of Vastu principles can be observed. The effort to integrate the

principles in arranging spaces and creating a pattern in the designs is also observed. Even though both newer residences cannot exactly relate to the prescribed principles an attempt is made to integrate the principles of Vastu. Various aspects of Vastu principles may not be integrated in the present due to many social and physical constraints. The entire change in building technology that abandons the colonnaded central courtyard as the core or seed of the traditional vastu house, both metaphysically and constructionally has led to the loss of any coherent and consistent application of vastu principles. Contemporary architects have not reinterpreted the traditional canons for contemporary tectonics of construction, at least for the two new case study residences.

Importance of orientation in the application of Vastu Principles in the Practical Field

Vastu principles are formed on the basis of five elements of nature and their relation to human life. These principles are not just theoretical but also effective in the practical field when they are applied in a particular order. Applications of principles of Vastu are done by a scholarly architect (shilpi/Sthapati), who has complete knowledge of all the rules and regulations.

The spatial order provided by the principle of orientation and its sub forms has been evaluated based on the archetypal layouts and case studies. Each spatial order provides unique qualities based on the five elements of nature and in turn provide a rhythmic flow of spaces in an enclosed building.

The case studies provide a rather strong idea on the application of the vastu principles in practical field. The process of application not only considers construction

but also various other principles as spatial arrangements on the basis of orientation, proportions of the building in relation to the basic module, positioning of foundations, doors and other appurtenances in relation to the site.

Vastu principles applied in the traditional residence relate to the spatial arrangement of Vastu Purusha Mandala archetypes and 'Paramasayina' diagram (refer pg-48). This provides the arrangement of spaces in the 9x9 square and relating it to the site and climate with a central open courtyard, which is the Brahmasthana of the building. The energy is collected in this central core and as vastu depends on the flow of energy the central space is considered as an important rule. All the archetypes are based on this rule and this regulates the uneven distribution of spaces.

The arrangement of spaces around this courtyard is based on orientation of the main building and the site. Proportions of the building relate to the columns of the building and also consider the anthropomorphic principles. The height of doors and windows is also based on the module of the column. Though the modern doors and windows seem to ignore any particular anthropomorphic sizing special to a given building.

The contemporary design case studies do not provide a complete picture of application. Many aspects of the principle of orientation are either ignored or implemented improperly which implies that the architect is ignorant of many principles.

Many principles of vastu are based on the caste system that used to be observed very strictly in ancient India. This system has a separate set of rules for each caste, which are not completely followed in the present due to a change in the social beliefs and customs.

The Role of Architects in implementing Vastu principles

As evident, architects are primarily responsible for assimilating the traditional principles and transforming the current design practice. Thus, it is most important that architects themselves understand the Vastu Shastra principles. They have to assume the role of the traditional architects, as agents of change, who understand the traditional lore and are firmly resolved to give it a valid expression in their designs. Nevertheless such inventions demand highest character and right conduct from the architect, as were required of the traditional architect. The architect is charged with responsibly reinterpreting the manner of application of Vastu Shastra while remaining faithful to its relevant, metaphysical underpinnings.

Also, the architect's responsibility has increased in reference to an increased demand among many clients for adopting Vastu patterns in their buildings. Such growing public excitement does not, in most instances, reflect a genuine interest in the tradition but originates in a popular misconception that the use of Vastu principles brings immediate prosperity and health to the inhabitants. Guidance is needed to avoid the temptations of clients wishing to "consume" Vastu as a commercial commodity. Architects, who treat Vastu as such, are merely exploiting the current market conditions. It is the architect's responsibility to educate the clients about the subtle aspects of Vastu Shastra and remove illusions about them.

In part this is not difficult since most Indians share a common cultural background and a Hindu sensibility. A little effort on the part of the architect can make the inhabitants more aware of the significance of Vastu principles, allowing them to respond appropriately to the inherent symbolism of the traditional patterns.

Finally, the most important question raised at the beginning of the study is how the principles of Vastu are applied in the practical field of contemporary practice? As stated in the introduction of the thesis one must begin by thoughtfully considering the conceptual premises of Vastu Shastra. At the end, the thesis also clarified the difficulties involved in understanding the conceptual premises of Vastu Shastra and incorporating these principles in the present times. In part this is due to the fact that our perception and a comprehension of such a diverse tradition with multi-layered meanings, depends on our level of receptivity, sensitivity and understanding.

Furthermore, such intentions are defeated by the current practice of adopting a strict rational approach toward such studies. A purely rational approach is diametrically opposite to the need to intuitively grasp the intangible principles of the sacred tradition.

Recommendations:

From the above stated conclusions I would like to make some recommendations for further research study in the field of Vastu Shastra. It is evident that Vastu principles are implemented in residential design in India, but the exact implementation of these principles are not completely known, either to the architect or the client, so an educational development should be made providing knowledge to the architect and the client.

Secondly the psychological reasons behind the effects of these principles are also to be studied so that the exact reason for implementing these principles is known.

Finally the residences, which are dealt in this research, may not completely be satisfactory according to principles of Vastu. If various number of residences are studied based on their age and other factors a more detailed research can be done.

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Appendix

Description of names of the 45 squares of Paramasayika Diagram

1. Brahma - The center of the universe.
2. Vivasvantha – To live, dwell, to spend time.
3. Indra – The god of Indo Aryans; chief, first and best.
4. Rudra – The god of tempests. The furious one.
5. Apavatsa – Without a calf.
6. Savindra – Cause of generation.
7. Indrajaya – The place of victory, restrain.
8. Mitra – Friend.
9. Rudraraja – The king of the furious.
10. Bhudhara - Bearing or supporting the earth.
11. Apa – Away, Off.
12. Aryaka – An honorable man.
13. Savindra – Cause of generation.
14. Pusan - Of a Vedic divinity, often identified with the Sun.
15. Vithata – The main person.
16. Raksasa - Belonging to the Raksas, demoniacal, an evil demon.
17. Yama - The god of death, driver; restraint, self-control, any paramount moral duty or observance.
18. Gandharva - Of a genius, connected with Soma and the Sun.
19. Bhrngaraja -
20. Mrsa - In vain, uselessly, wrongly, falsely. Man with no belief.

21. Pitr – Father, head.
22. Dauvirika -
23. Sugriva – A mans or woman’s name.
24. Puspadanta – calm.
25. Jaladhipa – Dull, Stupid.
26. Asura - Spiritual, divine, the highest spirit, later a bad spirit, demon.
27. Sosa - Mixed with alkaline earth.
28. Roja – Soft but not reliable.
29. Vayu – Wind, desirable.
30. Naga – Venomous.
31. Mukhya – Main, being at the head or at the beginning, best.
32. Bhalata – Carrying weight.
33. Soma - The Soma (plant or juice, often personified as a god), the moon or the god of the moon.
34. Mrga – Wild animal, beast of the forest.
35. Aditi - Want, indigence, boundless, unlimited, infinite; infinity, person as the other of the gods
36. Uditi - Rising (of the sun); going away, setting (of the sun); disappearance, end.
37. Isa - Seeking, the pole of a carriage, vigorous, strong, fat, juicy, fruitful.
38. Prajanya – To grow, bring forth, to beget.
39. Jayanta – The son of the god Indra.
40. Mahendra – The great Indra.
41. Aditya – Belonging to or coming from aditi. The highest of gods.
42. Satyaka – Truth, sincerity, water.

43. Bhrea – Hurt.

44. Antariksa - intermediate region, i.e. the atmosphere or air. Aerial, celestial.

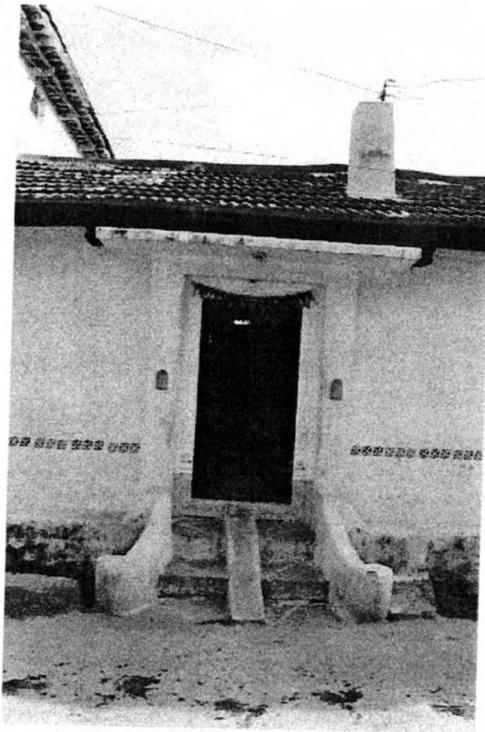
45. Agni – Fire, ardent.

The relation of these gods and their positions on the 9x9 Square grid are interrelated. The definitions of the gods are used for arranging spaces.

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a. <http://aa2411s.aa.tufs.ac.jp/~tjun/sktdic/>

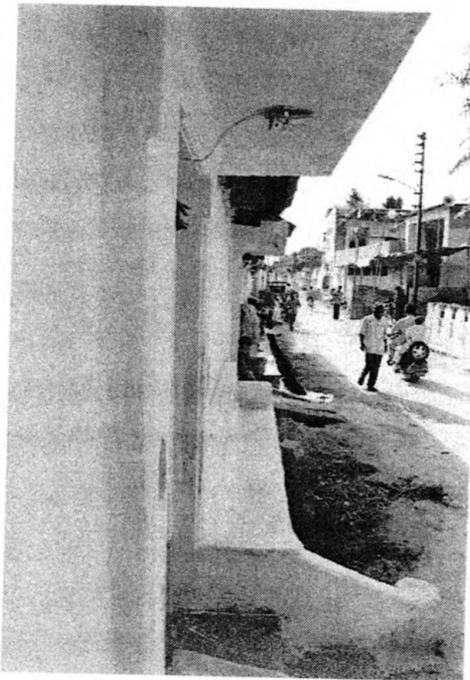
b. <http://pears2.lib.ohio-state.edu/SANSKRIT/GRAMMAR/skt-dict.htm>



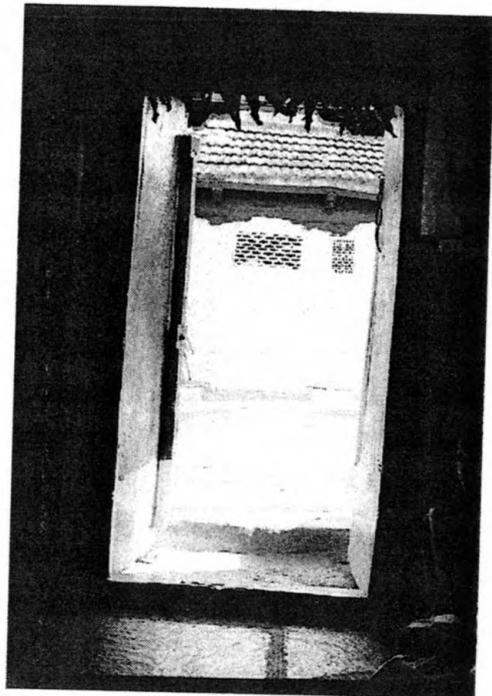
Entrance of the building



Street towards West



Street towards East



Looking towards the street

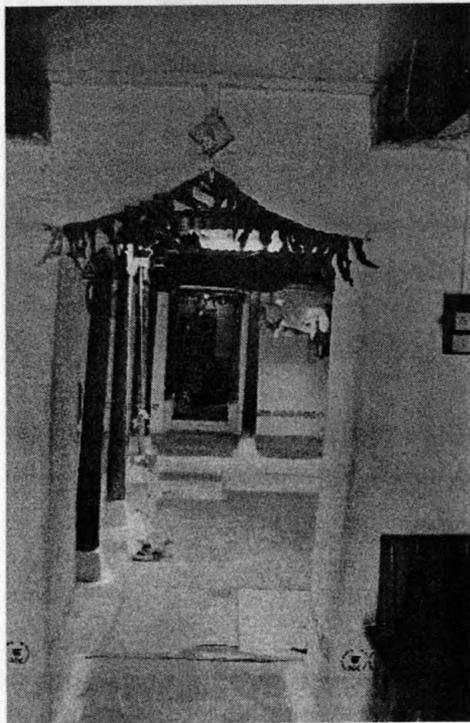
Plate. 1



Looking into the Hall



Looking into the Hall

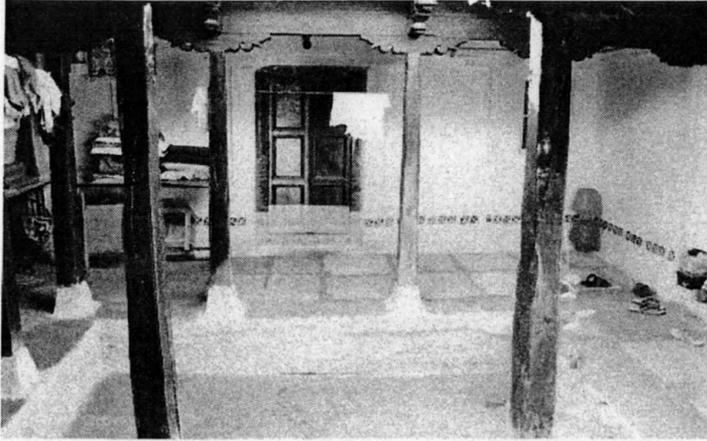


Looking towards Courtyard

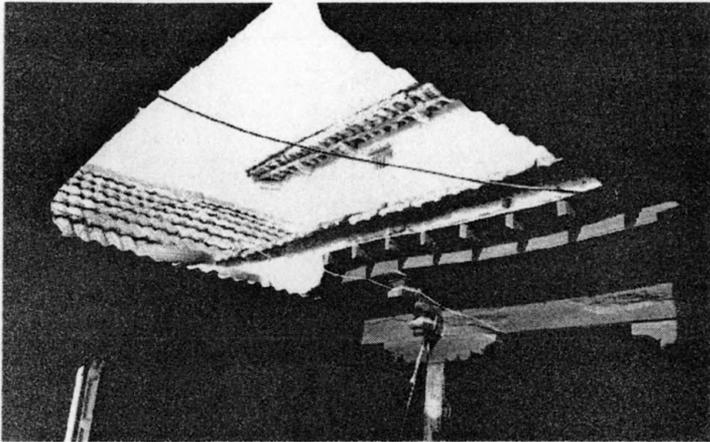


Looking towards Courtyard

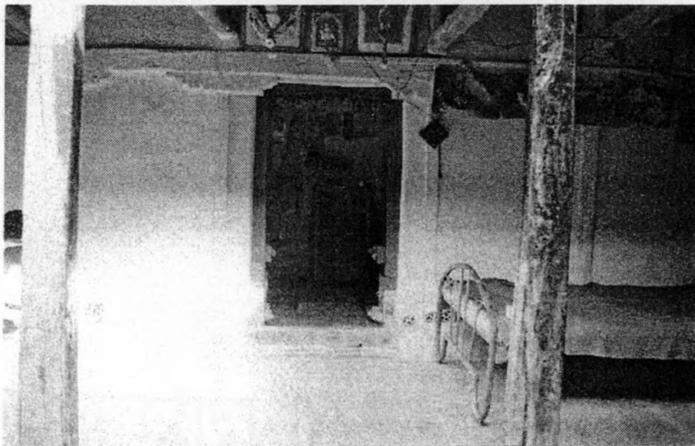
Plate 7



The central courtyard with walk way around it.



Looking towards the first floor of the building

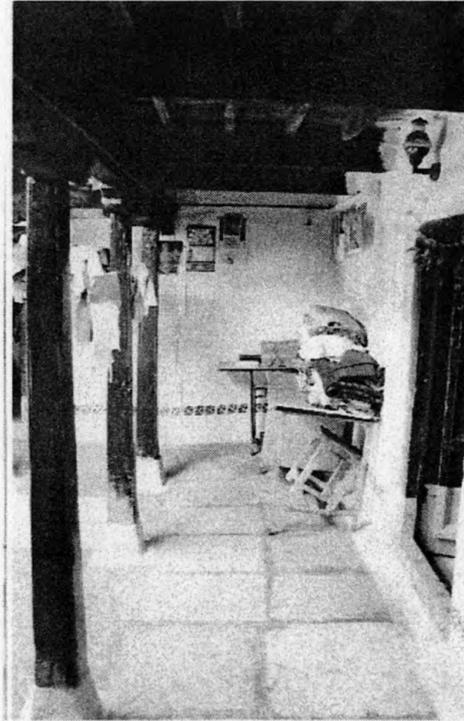


Looking towards the bedroom entrance.

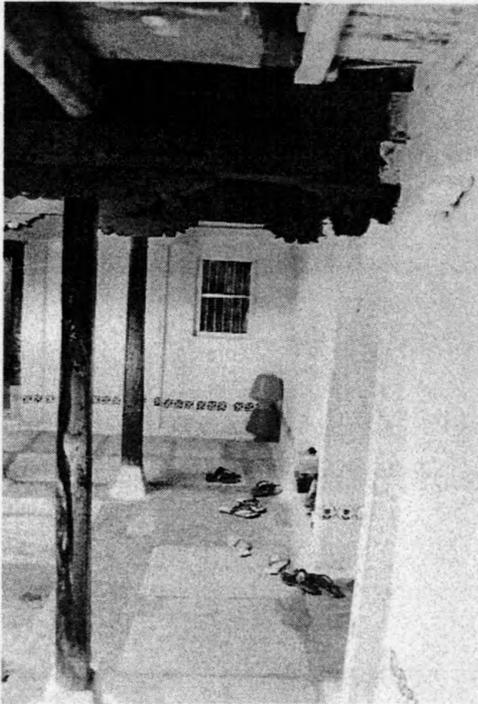
Plate-3



Detailed door of the bedroom



Walk way & wooden pillars



Entering the Walkway from the hall

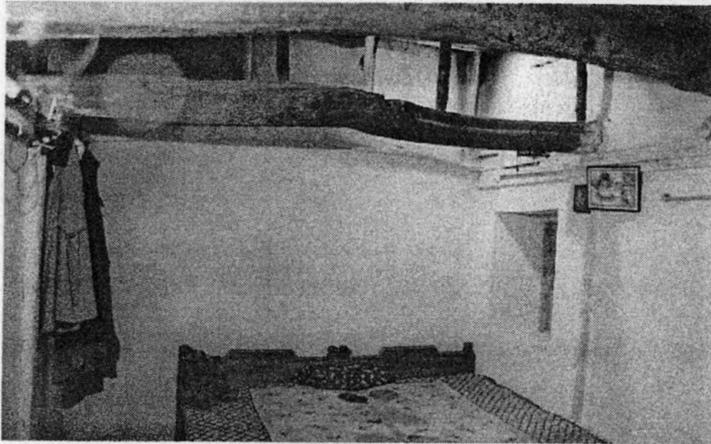


Use of walk way as a resting place

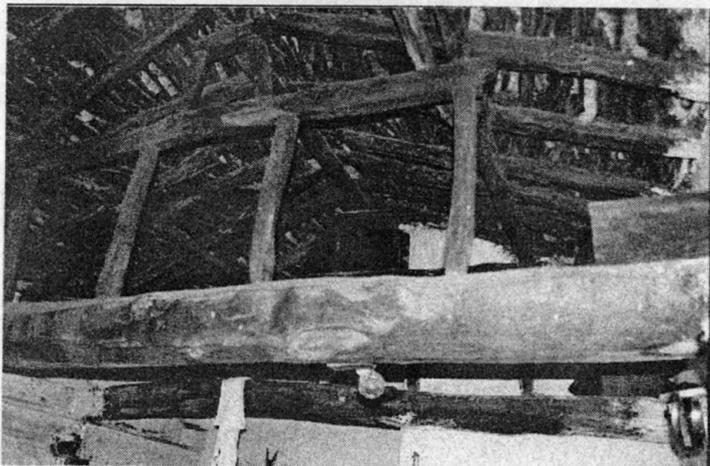
Plate-4



Bedroom #1



Bedroom #2

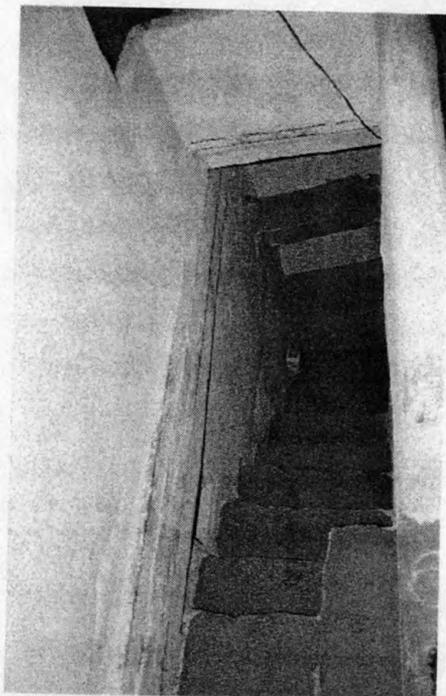


Roof Structure of the
bedroom

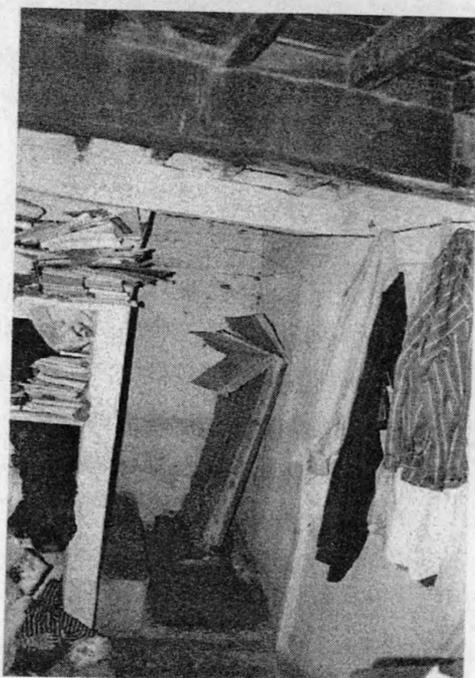
Plate-5



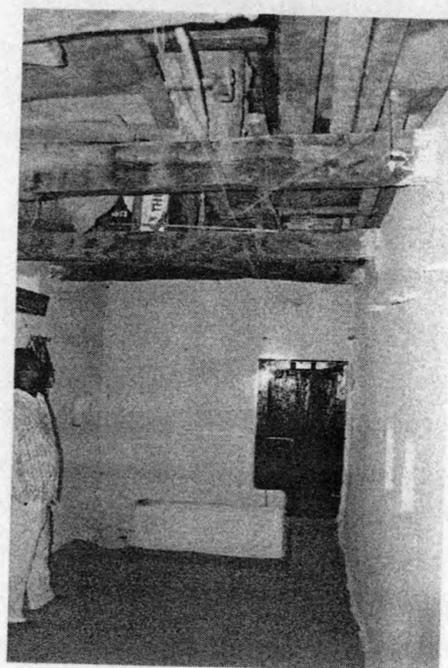
Looking towards the window



Stairway to first floor



Entering the stairs

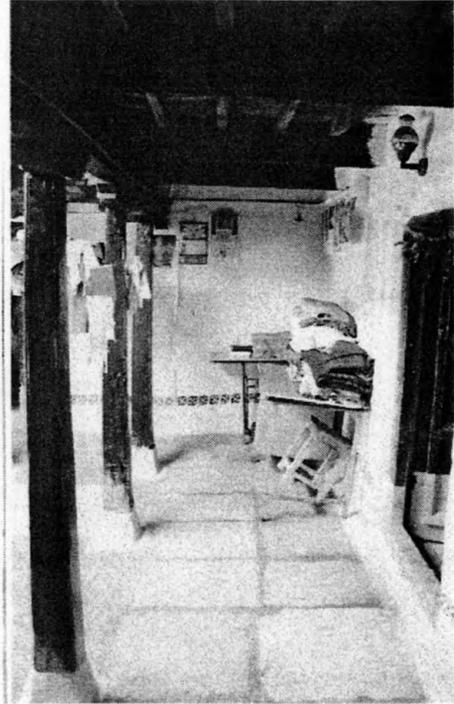


First floor

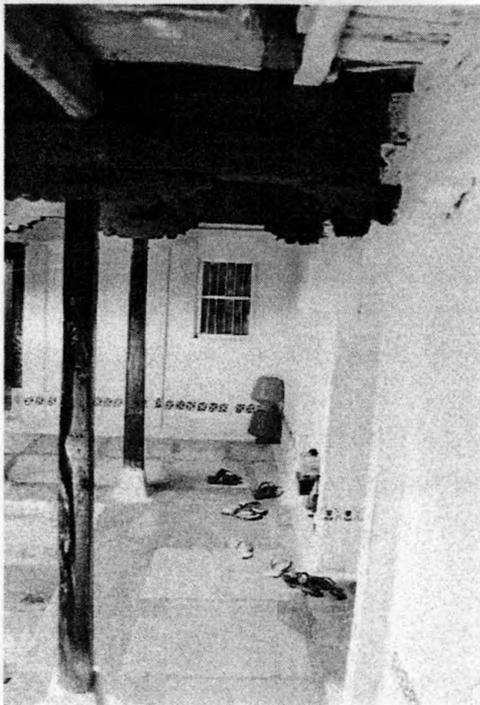
Plate-6



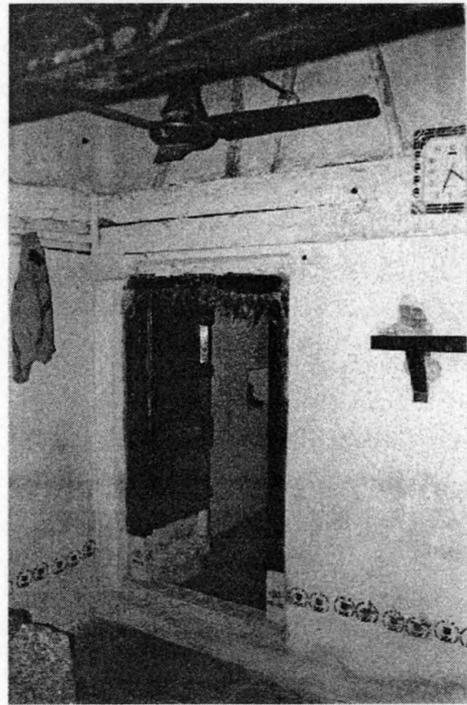
Detailed door of the bedroom



Walk way & wooden pillars



Entering the Walkway from the hall



Entrance to the Prayer hall

Plate-7



Looking towards the access door to the backyard and the granary

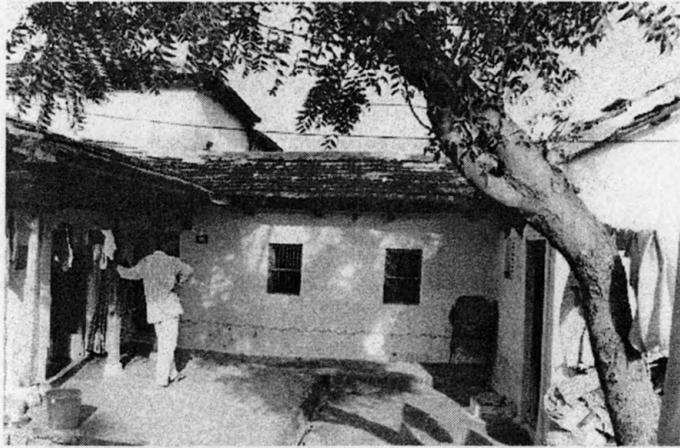


Looking towards the granary

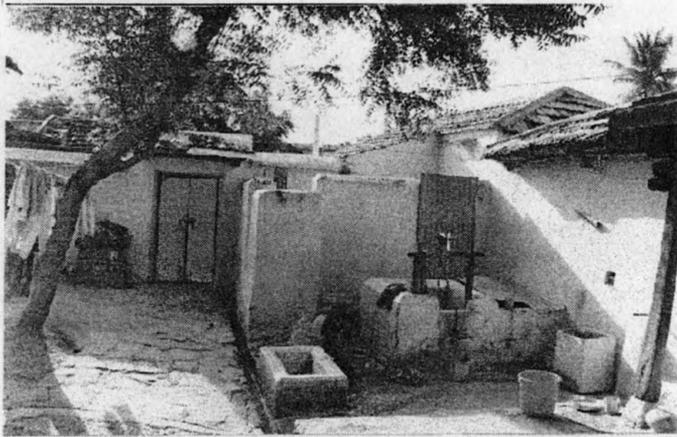


Looking towards the kitchen and backyard

Plate-8



From the backyard



Washing and restroom
area



Looking towards the
main building

Plate-9



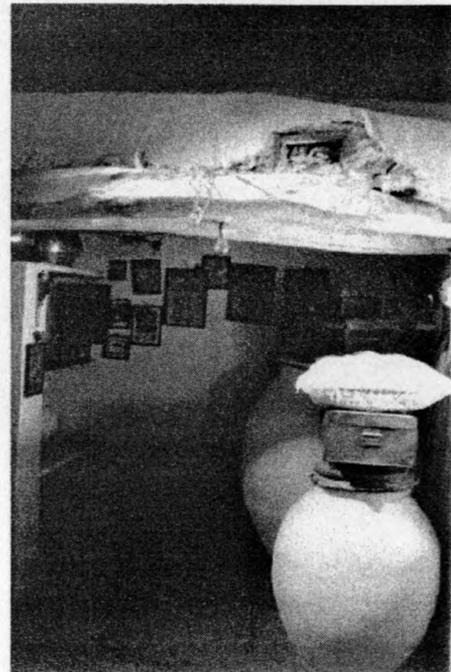
The granary



kitchen

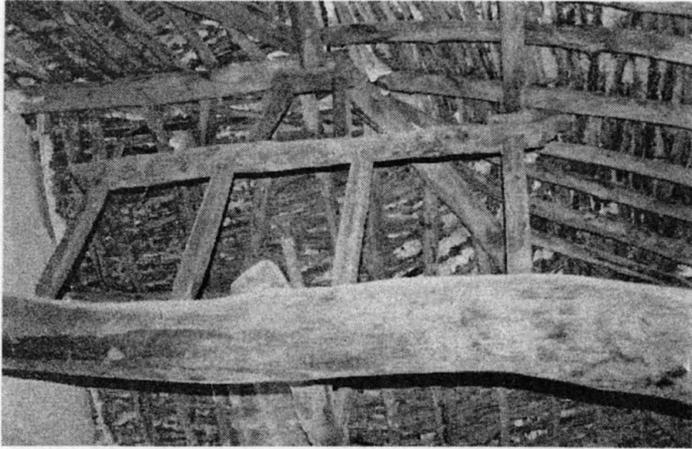


Roof outline of the kitchen

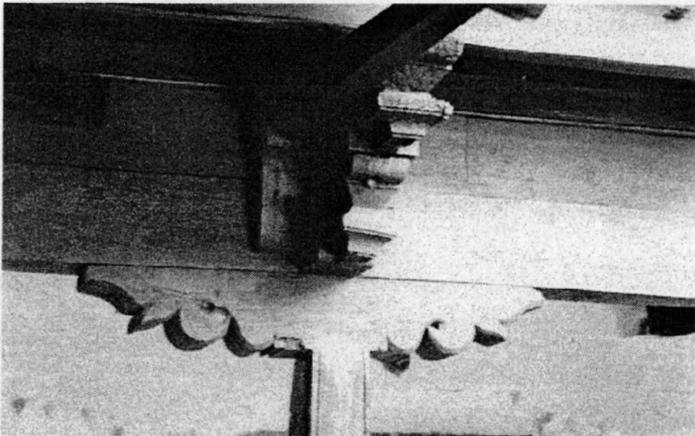


The prayer hall

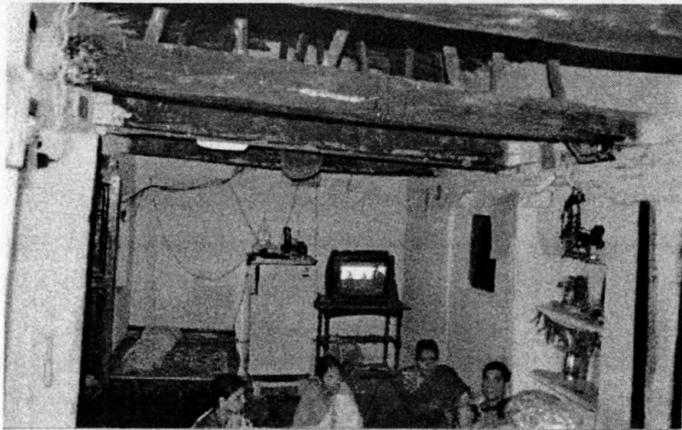
Plate-10



Roof structure showing
The rafters

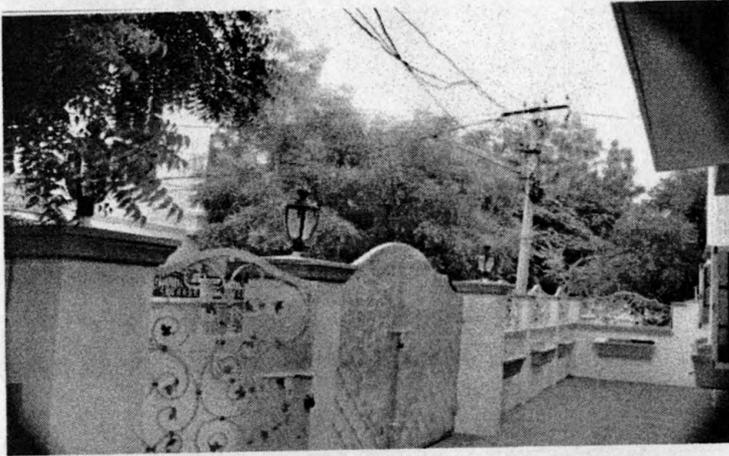


Column detail

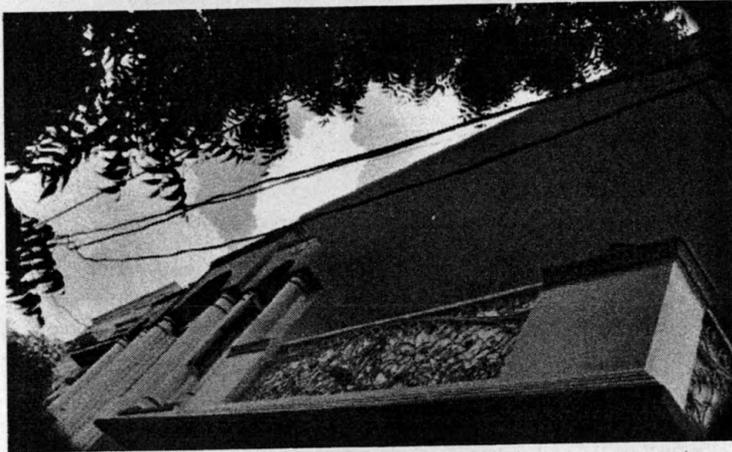


The dining and
ladies room

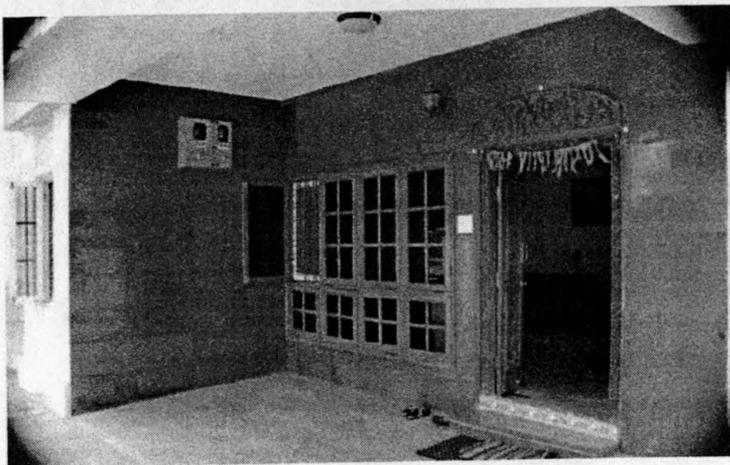
Plate-11



Looking towards the main gate to the site



A view of the front

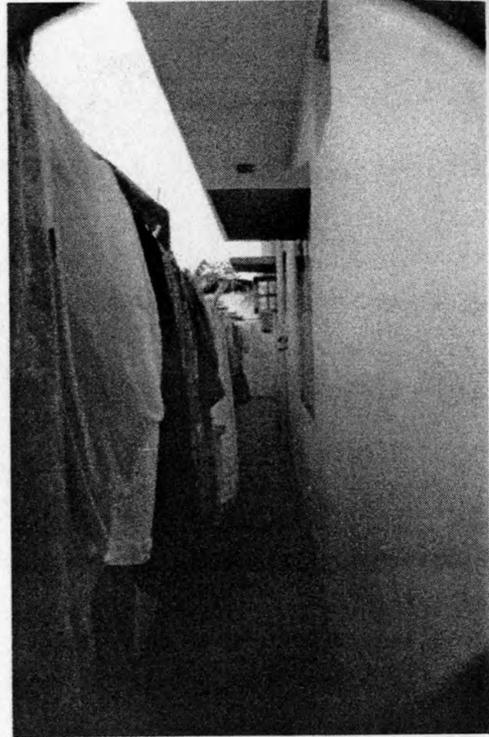


Entrance & porch

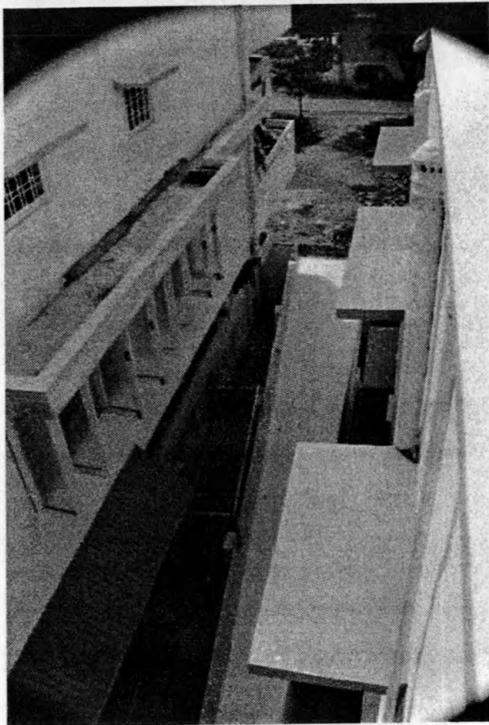
Plate-10



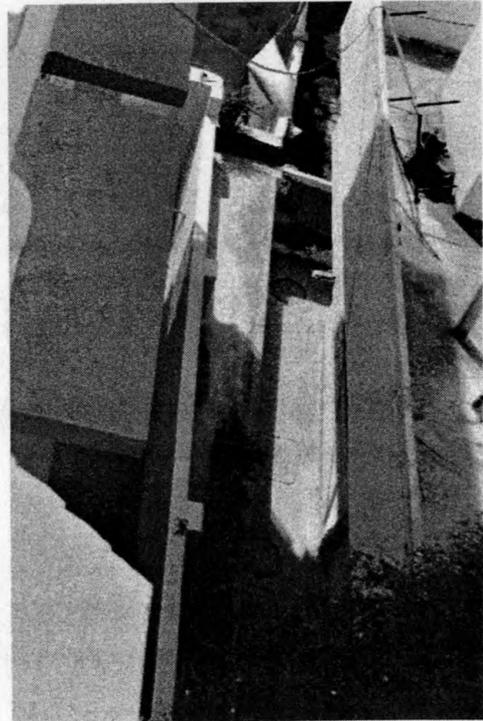
Front yard of the site



Alley at the back

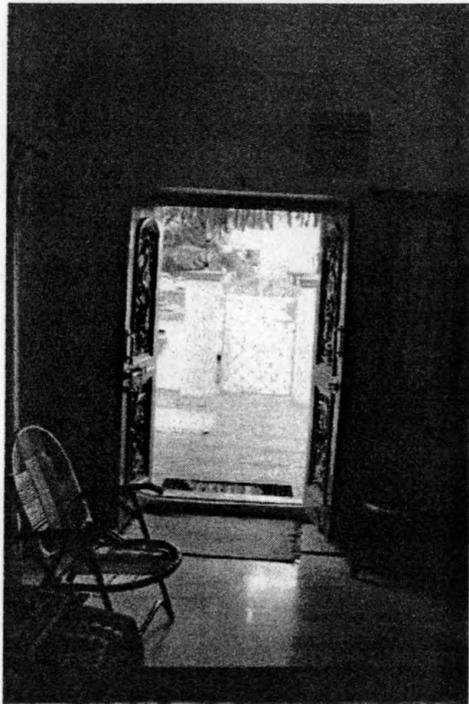


Site correction

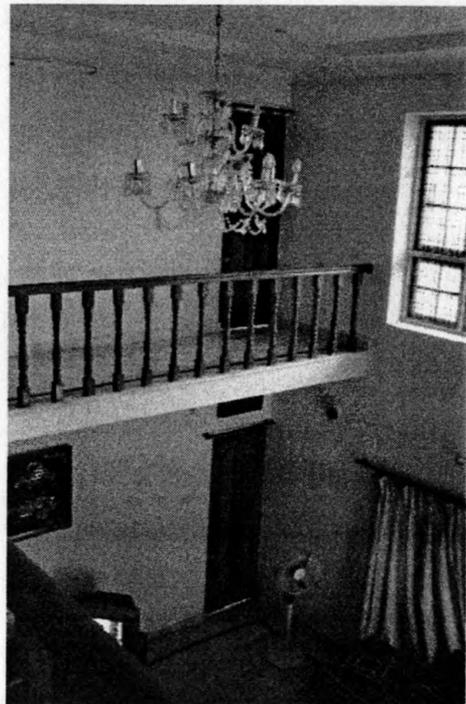


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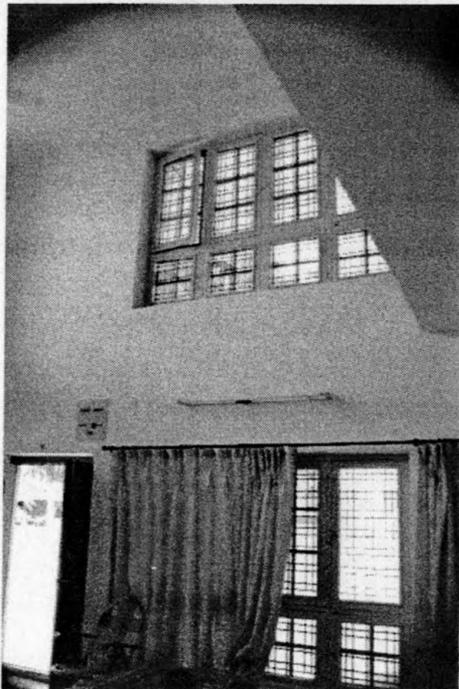
Plate-13



Entrance of the building



Looking into living room
from above



Double height living room



Corner detail of the living room

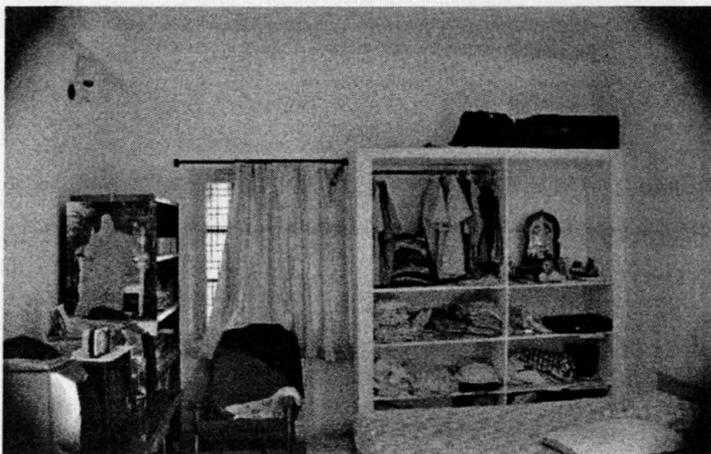
Plate-14



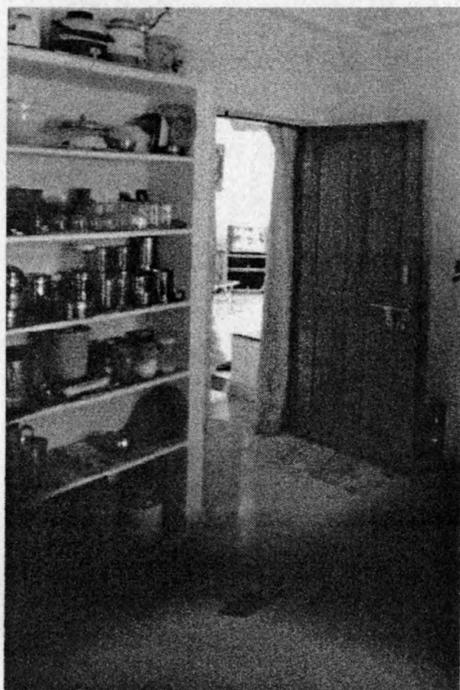
Living room



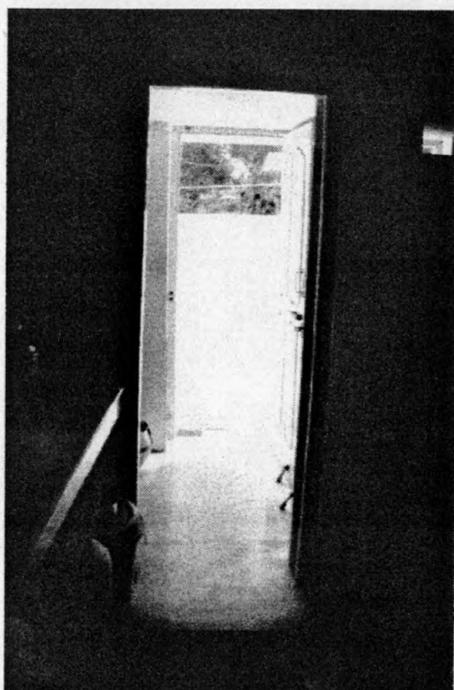
Master bedroom



Bedroom #2



Kitchen



Looking towards the alley



Stairway for upper floors

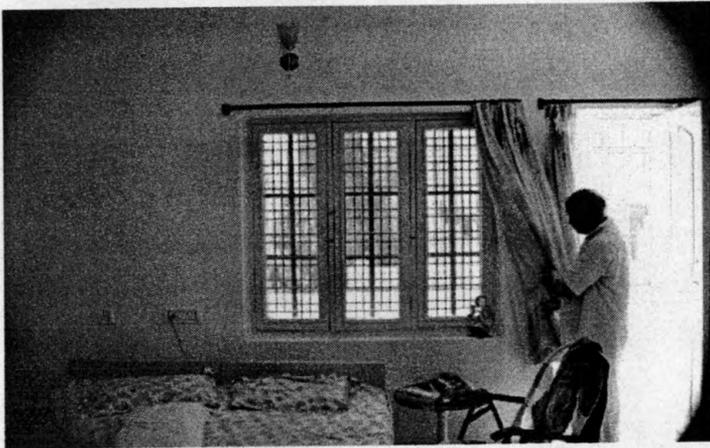


Corner detail of the living room

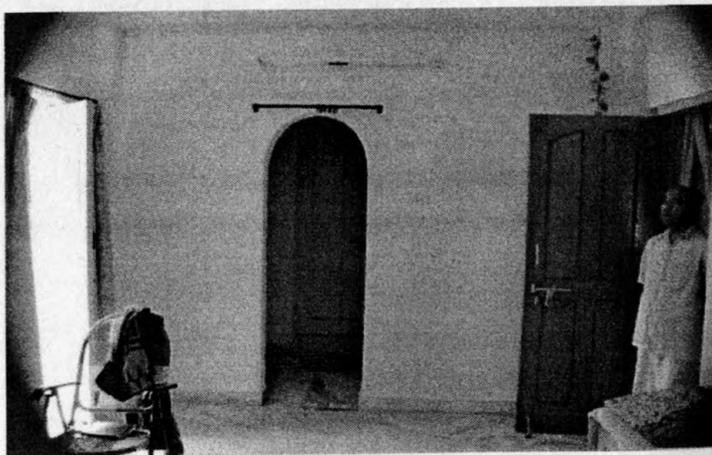
Plate-16



Stairs leading to the
Second floor

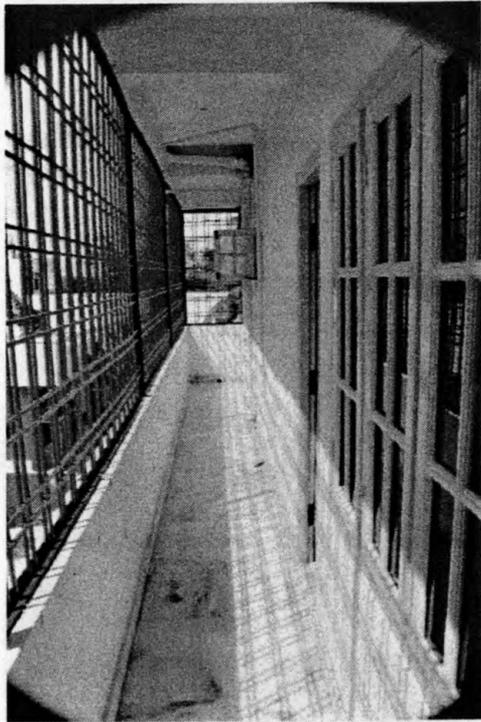


Bedroom#2, with access
door to the balcony

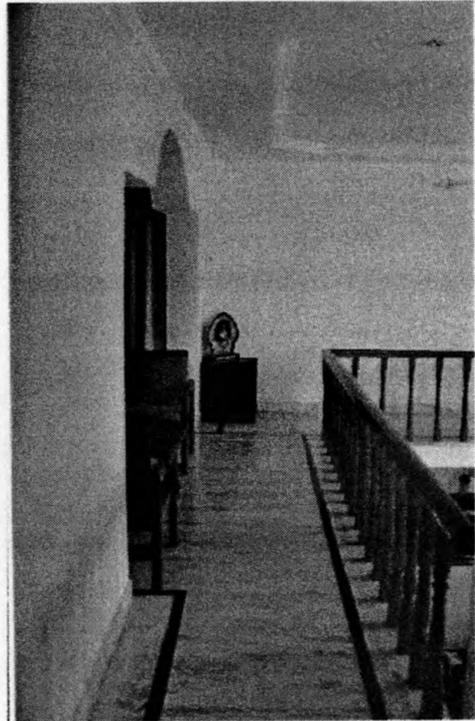


Bedroom #2

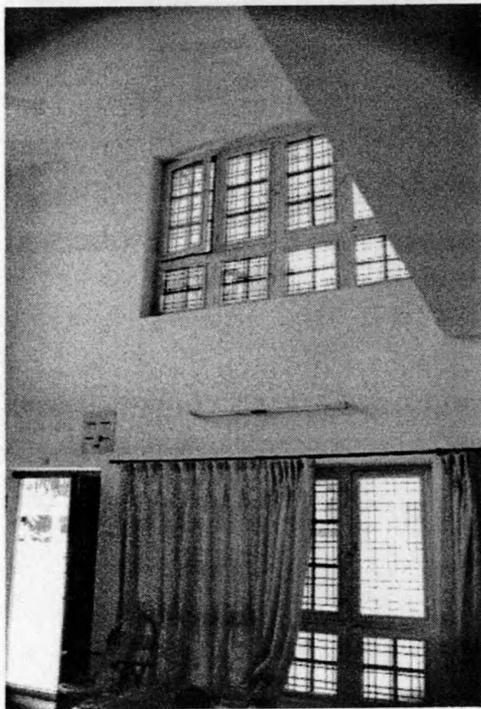
Plate-17



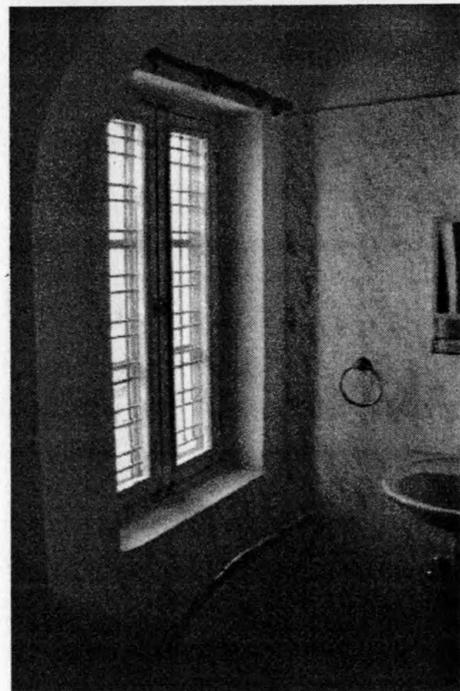
Balcony on the second floor



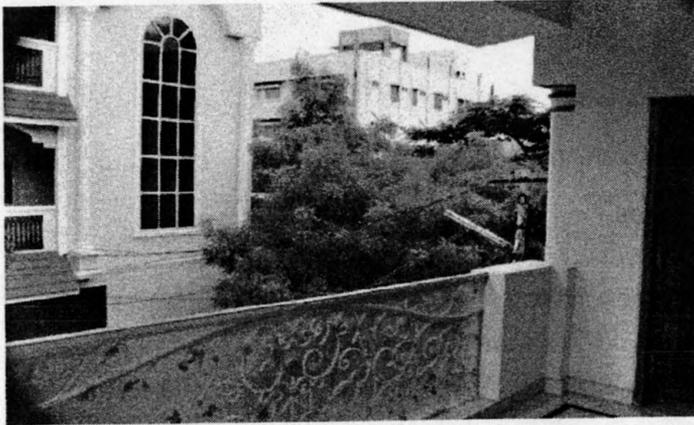
Living room on the second floor



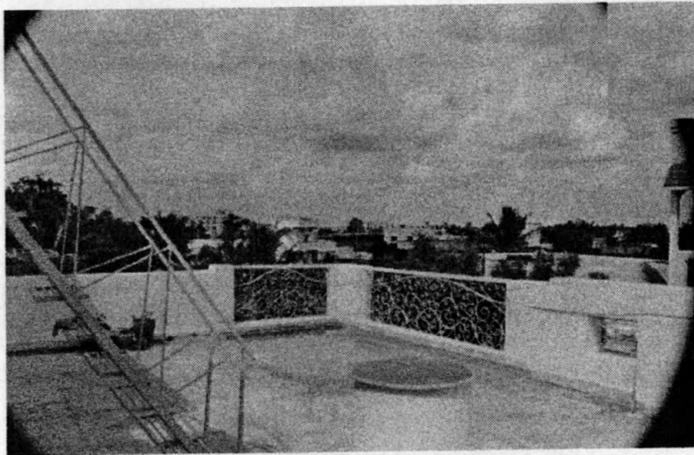
Double height living room



Positioning of window towards east



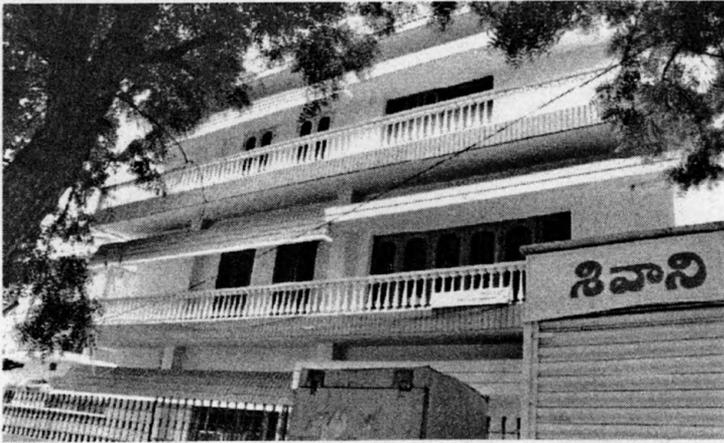
Looking onto the street from
first floor



View of the roof



Door detail



Street of the building



Main entrance into
the site

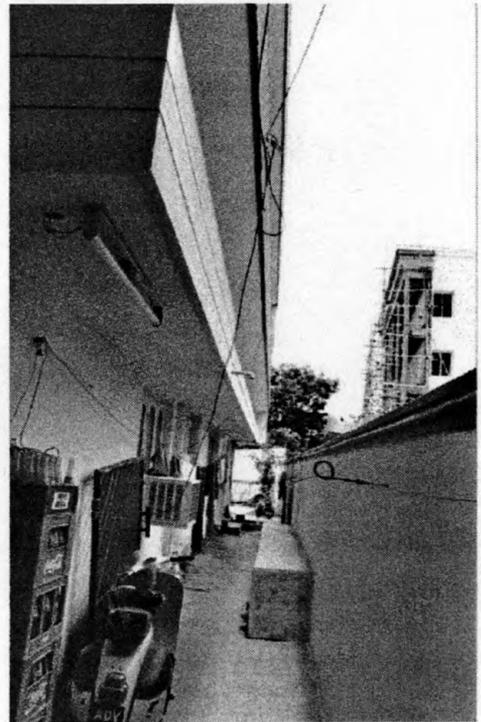


Main entrance into
the building

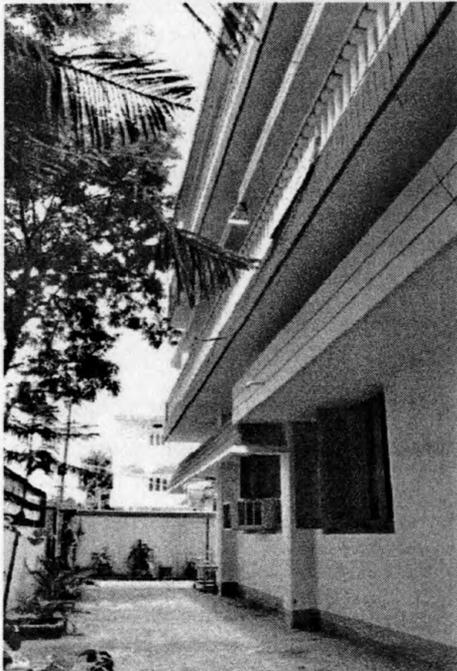
Plate-20



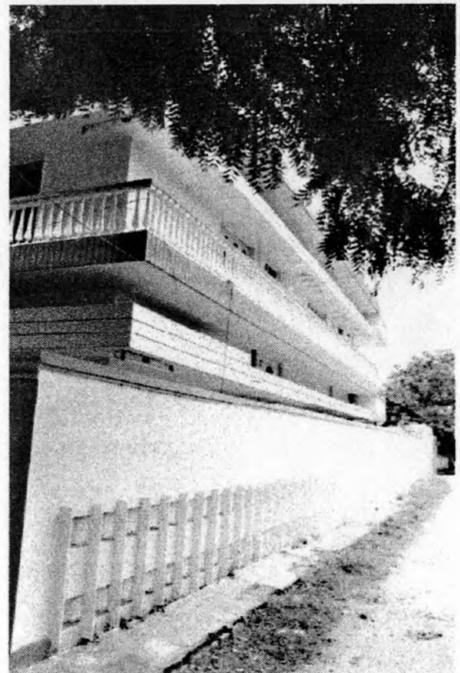
A view of the alley with Site corrections



Alley to the west



Front yard northwest

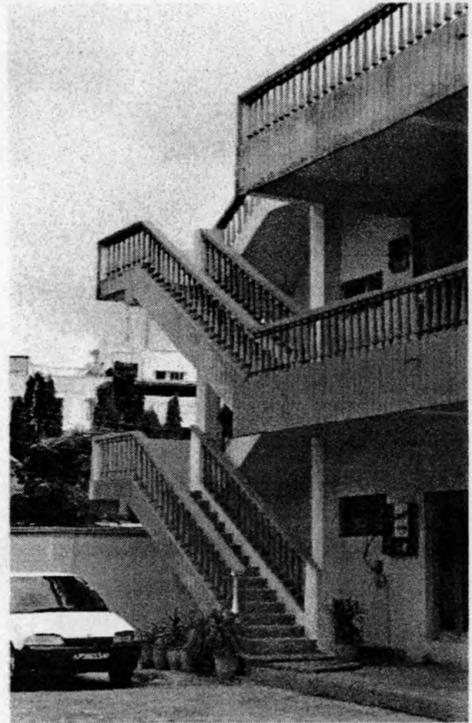


A view towards the west side of the building

Plate-21



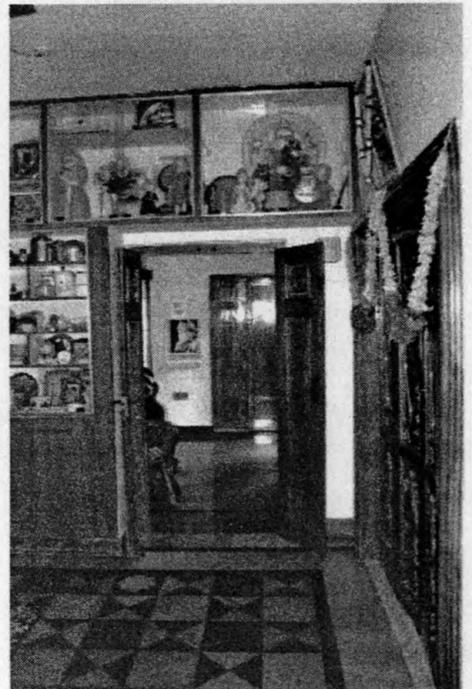
One of the entrances towards east



Staircase leading to the upper floors

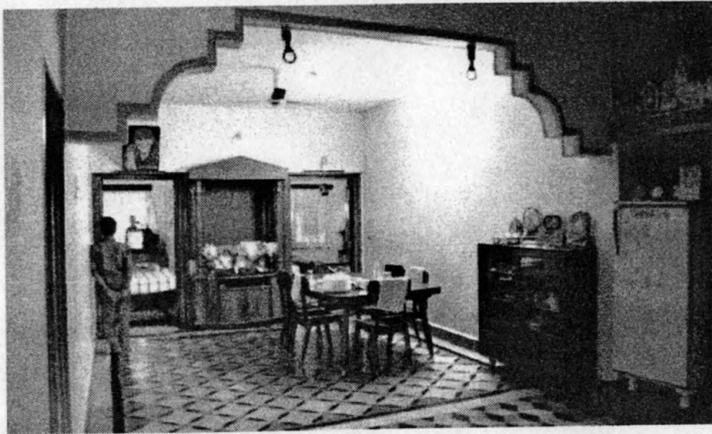


Main entrance of the building



Looking into the hall from living

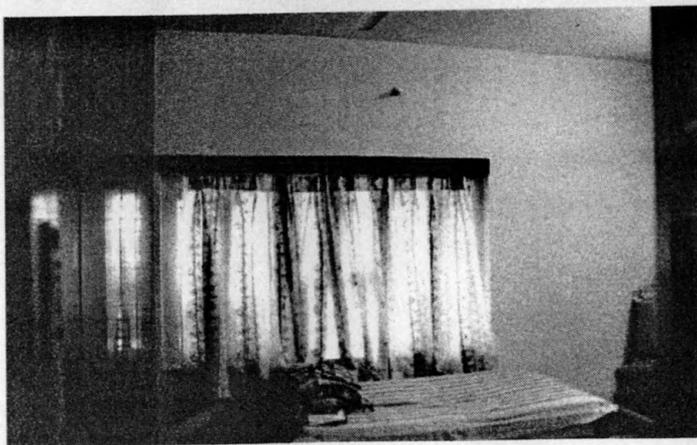
Plate-22



Living room after renovation

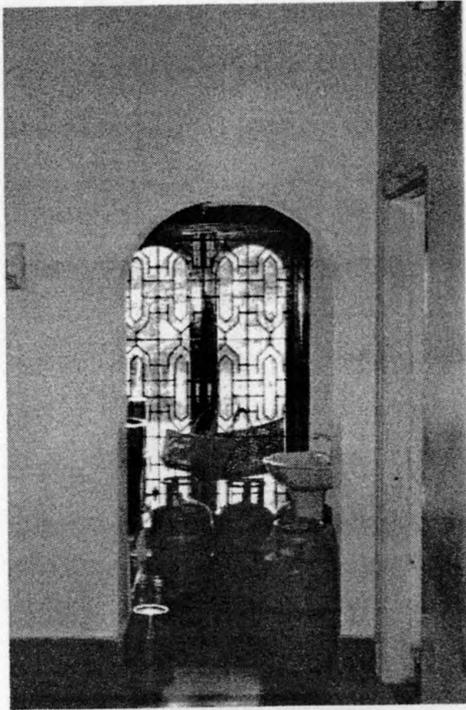


Looking towards the pooja room
From the living room

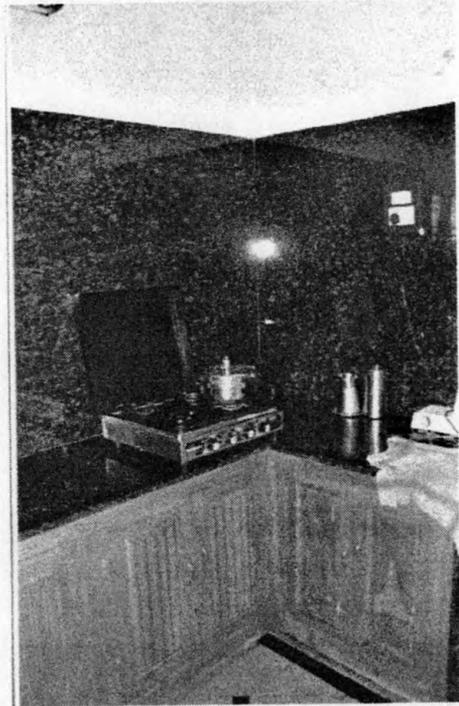


Looking into the master bedroom
where the main entrance was
located before renovation

Plate-23



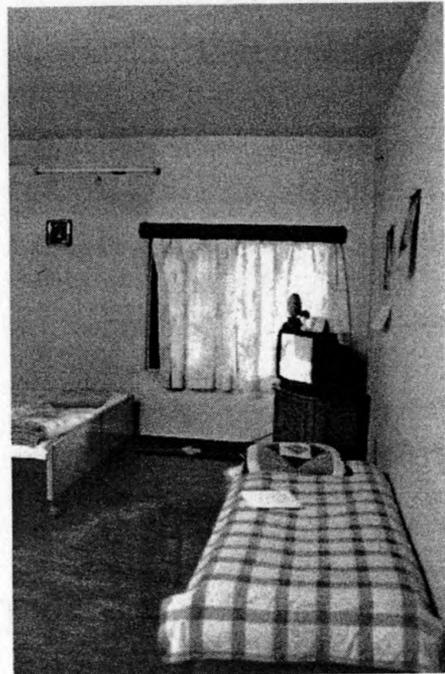
The open storage area



Kitchen platform



Looking into the kitchen



Bedroom#3

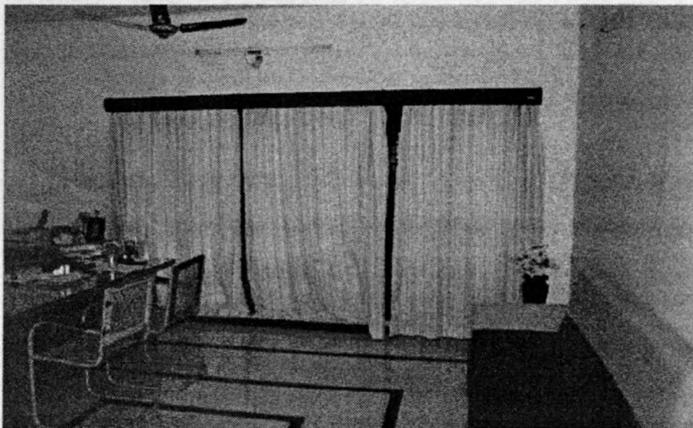
Plate-24



Waiting area on the
second floor

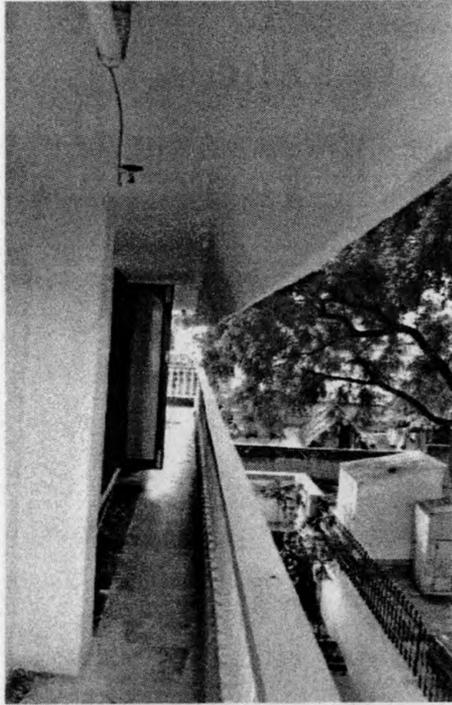


Office #1 on to the north

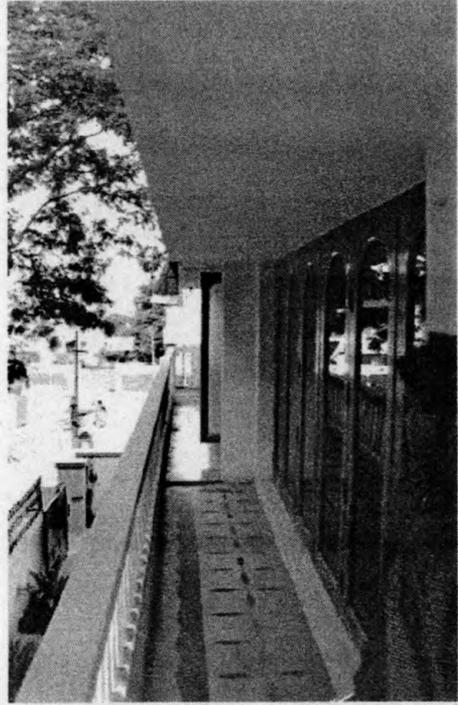


Main office on the
second floor with
access to the balcony

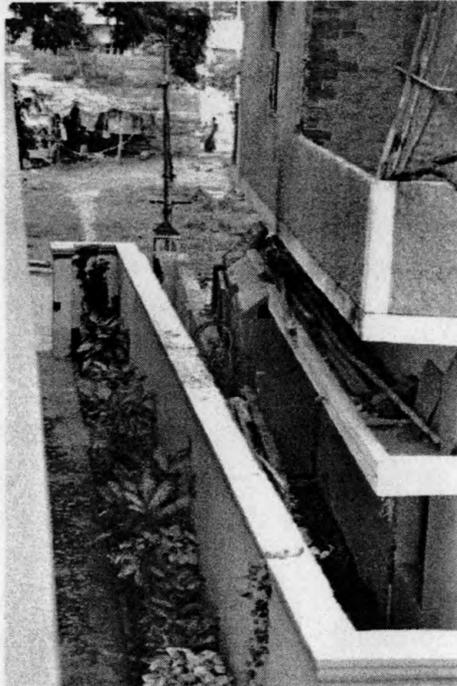
Plate-25



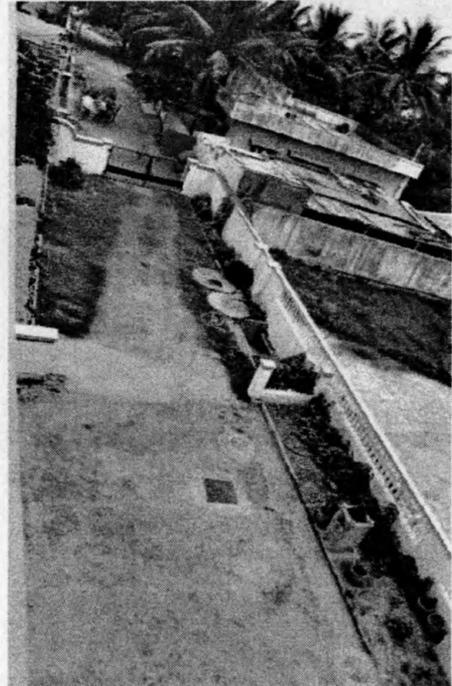
Balcony towards northeast



Balcony towards northwest

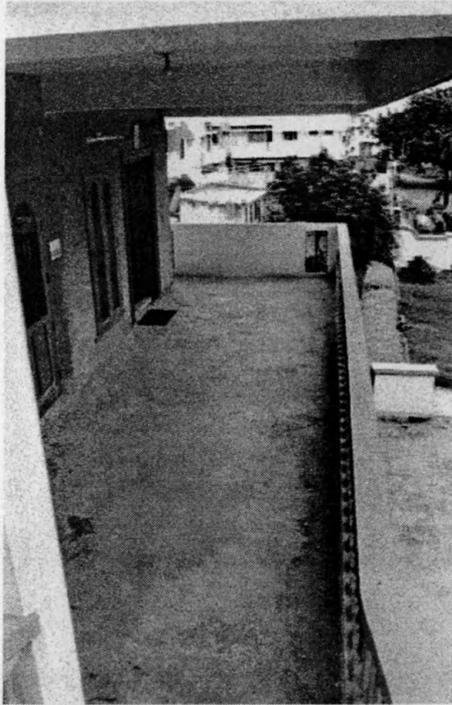


Looking towards the north alley

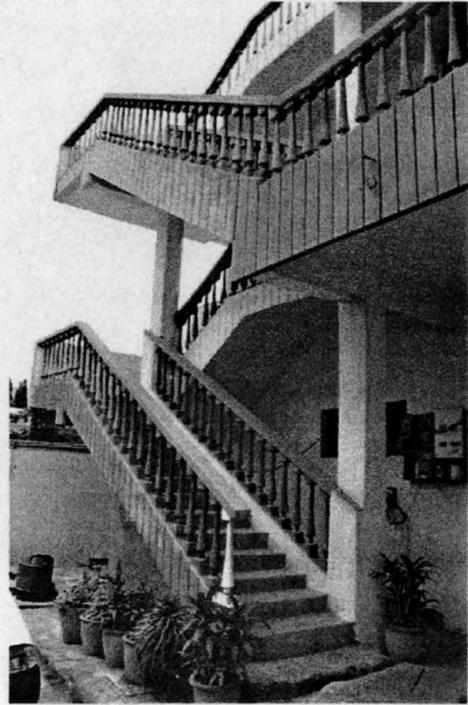


Looking towards the front yard

Plate-26



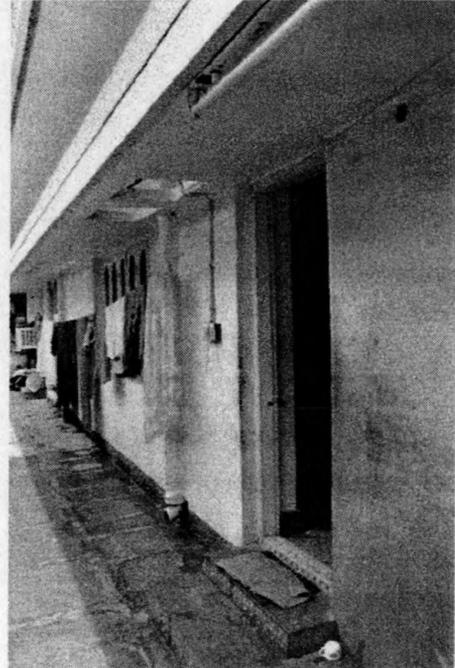
Balcony on the second floor



A close-up of the stairs



Looking into the kitchen from alley



Alley to the west of kitchen

Plate-27