Reinforcing traditional Indian construction with modern structures – A planning

I Murugan* & C Natarajan
Department of Civil Engineering, National Institute of Technology, Tiruchirappalli 620 015, Tamil Nadu
E-mail: irumurugan2006@yahoo.com

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Traditional Indian structures exist beyond all ages and can be utilized by the people of every generation, since the truths of all times could also be expressed as the truth of present time. Based on this premise, traditional construction concepts will definitely provide inputs to supplement modern construction methods and this will pave a flexible run way by extracting the essence from ancient texts and interpret it to suit modern constructions. This is not mere repetition but one of the creative interpretation as traditional construction practices have come a long way without proper documentation and records. Imposing structures in India constructed before BC reflects the degree of civilization and cultural spectrum. If texts are repeated without reinterpreting them to suit modern practices and innovations, civilization becomes a phenomenon of arrested development. The aim of the study was to lay the foundation for synthesizing traditional Indian construction with modern construction and to augment the ways and means in which the structural design can be made to reflect tradition and speedy development.

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Traditional structures in India are contemporary of all ages and their synergic aspects can be adopted by the people of all generation since the fundamental nature of construction is always flexible and in tune with the rhythmic spatial forms to suit the taste of every generation. In the present context, the construction activity in India is a conglomeration of tradition and modern concepts. Western influence in materials and technology is predominant in modern construction. Synthetic materials like cement and steel forming reinforced cement concrete with admixtures plays a key role in the construction arena. Using high strength of steel and cement and rolled twisted rods, rolled twisted rods enhance the strength but not performance especially during seismic and unanticipated loads due to rigidity in the design. Even though development of plastic hinges at suitable predetermined location provide certain flexibility in framed structure, safety and collapses are still away when compare to the traditional structures like temples, which are designed as human forms to be flexible with nature have withstood the test of time against any untoward phenomena. Indian traditional structures, which are more than 5,000 yrs old like Mohanjedero is still a heritage monument of Indian civilization. It is more appropriate to blend the traditional concept with modern structures. The purpose of the study is to focus & develop the linkage from these two methodologies to synthesis a reasonable runway for future constructions. The blossoming of Vaasthu sastra in recent times indicates clearly that there are salient features in traditional construction, which can supplement present day approaches in an amicable way reinforcing traditional structural design concept into modern structural analysis. Any construction technology whether it is traditional or modern should be based on suitable aesthetic and functional aspects and structurally sound principles. Aesthetic and functional concepts are classified and analyzed under three phases: planning phase; investigation phase; design and execution phase.

Planning Phase

Traditional construction in India is based on Vaasthu shastra, which augments the traditional Indian sciences and technologies deals with three physical entities, energy and matter; time and space; and space and spatial forms. Interplay of these principles in the creation of subtle and gross material forms in the universe. Space being the primal and most significant of the five environmental envelopes – land, water, fire, wind and cosmic – called Pancha
boothas or the five elements is treated as the energy source for the creation of all forms in the universe. In the shastras four types of space are dealt with namely, earthly space, inner space, cosmic space and finally the built space. The earthly space is the gross material space, the cosmic space is the subtle space existing around us, the inner space is a part of the cosmic space residing within us and every other organic form and finally the built space enclosed within a building. As regards the attributes of these, the earthly space is the gross spaces; the cosmic space is subtle and free whereas the inner space and the built space are embodied space. To attain a cordial and peaceful living a harmony has to be struck among all the four spaces. If part of the vast space is isolated and enclosed by a four walled structure called building, it becomes an animated organism and starts pulsating with life in a particular order just like a human being.

![Diagram](image.png)

**Fig.1 — Science of manifestation**
having the same space enclosed in the physical body that pulsate and emit patterns of energy waves from within. These waveforms pulsate in a rhythmic order called Time – the Absolute Time. The vibration of space is responsible for the development of life forms in the universe. These vibrations occur in a rhythmic order and are evident in the growth of all organic forms in the universe like trees, plants, birds and animals. This is very much noticeable in the rhythmic growth of material bodies like bamboo, sugarcane, etc. Modern science has termed this as biological rhythm. This rhythm is quantifies as 8 and multiples of 8 as per the Vaasthu Purusha Mandala that is the direct outcome of the rhythmic time vibration is a square of 8 X 8 dimensions (Figs.1&2). Dynamics of space (Experience turns into expression). Casual element is Time. Space experience and vibrates into form. The solid cube of energy explodes (poetically it is melting like a wax on heat) and splits itself into a grid pattern called Vaastu Purusha Mandala. This also the inner order of the universal being due to self spin of the Vaastu mandala. This is also the inner order of the universal being due to self spin of the Vaastu mandala wave patterns representing gunas are generated.

After expression is over, the grid restores itself into a cube of energy attaining stillness or tranquility. Series of such explosions and implosions occur in the inner cube or space. What occurs in the inner space also occurs in the outer space. This inner manifestation is called enlightenment/vision. This is Shilpa/Vastu. This is the form that is repeated or replicated into the world of reality by physical efforts of a traditional architect. This is Shilpa in gross form. The cube (of energy) is the structure of OM light and OM sound. This alone experiences and goes into self spin–goes into action – emerges into Time– turns into three basic forms – square, octagon and sphere – technically called Nagara, Dravida and Vesara forms. Experience takes place only when the cube is still and luminous. This is grid less unitary anu, unfilled form, unfilled filed of energy and matter. The next development is that of the grid in the body of the subtle cube. On this grid, occur all thought–forms very sharply, tridensionally and in perfect order. This is inner experience or inner vision. This is replicated, into the material world by the Shilpi. The moment, the feeling to express erupts, the manduka grid blossoms into existence. This is Time (Kuada). It is movement. It is Time that moves into form at subtle inner level and later at gross level. To develop this subtle into gross form, the square mandala goes into self spin producing heat and finally turns into another mandala of 9 x 9 units. The turn of the subtle (8 X 8) into gross (9 X 9) is called Pranava, which signifies the turn of egg into chick.

This mandala is the plan of the universe (macrocosm) and also of the microcosm. They are tranquil and enjoyable. The Vaastu science has adopted this plan for the house–building, temple building and village and city layouts and creates little universes on the Earth. The polygonal and circular forms are aglitative and revolutionary and therefore disallowed in the design of living spaces. The traditional pattern of a house is therefore a paradise on Earth, where an individual lives in peace and bliss. This paradise lost is to be re-gained for the spiritual and material prosperity of the entire human race. This universal grammar is used in the creations of visuals and oral forms by men on earth in the fields of dance, music, poetry, sculpture and architecture, which are governed by the rhythm of vibrations, called Thalam (frequency of vibration). In this art and architectural forms, the rhythm indicates the time of vibration of the inner space of the performer like dance, musician, poet, shilpy are the architects producing the space of sound and space of light. This subtle space formed inside is transformed into the outer world of reality of gross material forms such as dance, music, poetry and sculpture and building architecture.

In the traditional construction, the building is designed in such a way that the vibration of the space contained inside should go in perfect harmony with the vibration of the inner space of the occupant. While designing a house building, the traditional builder
calculates the dimensions of the living space based upon a calculation called *Ayadi ganitham*, where the indwellers’ birth star is treated as the basis. When the layout is made as per frequency of vibration of the birth star, the resultant product, i.e. the house building and the vibration of the built space will be in tune with the psyche of the dweller. In the design process, after making the layout, which is an extended form of the *Vaasthu Purusha Mandala*, the geometric form in which the unmanifest manifests itself in the subtle state? *Vaasthu Shastra* prescribes rectangular layout as an extended form of the *Vaasthu Purusha Mandala* in which a proportion is prescribed in the ration of length: breadth. The general proportion prescribed between the shorter side and the longer side is 1:1¼, 1:1½, 1:1¾ or 1:2, which brings in an order and in turn beauty to the building. Here, arises the importance of grid pattern that is to be adopted in the layout of buildings. The earth as per the science of *Vaasthu shastra* is also considered as a living being which vibrates and gives out rhythmic pulsations leading to the formation of the basic grid of *Vaasthu Purusha Mandala*. These energy lines emanate from the center of the earth and spread over the entire surface of the earth forming a grid pattern. This is the same pattern that a traditional designer prescribes for house layouts. Both these layouts are congruent since they are the primary manifested state of the unmanifest energy. If a house laid out on this pattern is made to rest on the earths grid without any deviation, then both these spaces will exist in harmony with each other and in the *Vaasthu*

![Fig.3 — Position of Doors](image-url)
terminology, one can say that the spatial congruent are established between the building space and earth space. Once the layout of the house building is made, the next important factor is the location of the front entry and the rear exit points of the house. In the shastras it is said that there should be a passage running between and connecting the backdoor and the main door which is considered as the backbone or Vamsadanda of the living organism called house. The spiritual science holds that a free passage in this case will ensure the unobstructed flow of solar energy, thereby causing perennial supply of energy waves from Sun into the house as well as into the space surrounding the house. This passage is termed as Yoni is considered the life energy of the house. Another significant factor in the layout is the central area of the grid called the Bramasthan (Fig. 3).

It occupies an area of 3X3=9 at the center of the 9X9 square layouts, which can be interpreted as an energy intensive area of the house. This is said to be the lung of the house and one should be cautious enough to leave this space free and inbuilt, so that the living being, i.e. the house will enjoy free breath. Usually, in traditional houses, this area is left open to the sky through which the energetic space surrounding the earth and existing above is attracted into the house. Thus, deciding the basic features, the space inside the house is then configured. This is based on the quality of the corner zones of the enclosed space. Following the general rules lied down in Shastras, the Esana/water (Northeast quarter) is the source of power, Agni/Fire (Southeast) is the element of heat to activise the energy, Niruthi/Earth (Southwest) indicates supporting strength and coolness and the fourth one Vaayu/Air (Northwest) signifies movement. In this layout, the cordiality between features placed in the opposite corners is worth mentionning, since it leads to positive effect such as between fire (Agni) and earth (Vaaya) and between earth (Niruthi) and water (Esana). The elevation as well as the opening of doors, windows, configuration of living spaces etc are to be designed with reference to the modular space in the grid (Figs.4&5). Modern construction mostly caters to function or utility economy, safety and distinction as a land mark structure in the order of priority considering the Mass and the space required to house the mass modern buildings are designed with or without any proportion but use up to date modern construction techniques with materials of concrete composites high strength steel, aluminum, stainless steel and metal alloys. The recent high–rise residential buildings, cable stayed bridges, towers, air craft and hangers and pavilions are examples demonstrating why what and how of construction technology. To demonstrate features of traditional and modern construction, an example is presented.

For each student, the minimum space requirement is 1.3 sq m and maximum space is 1.5 sq m. Therefore, for 20 students the maximum space is required is 30 sq m. For circulation space and other facilities, over all space required is 1.5X30 = 45 sq m. The class room of size 5.00 mX6.00 m with 1.5 m verandah is planned at present without adopting any grid patterns as laid down in traditional construction. It is suggested while planning for the entire school, college or for residences the traditional concept of planning may be followed for harmony among occupants and structures.

**Conclusion**

Utilizing the planning concept both in traditional and modern construction, a new approach can be evolved to get Best of both worlds result. Bramasthan provided in planning will provide a lungs space for the structure and proper ventilation will be achieved throughout the structure. Modeling, detailed analysis and design can be done further.

**References**