



# Mathematical and Scriptural Aspect of Yagya Mandap Construction

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**Abstract.** Yagya Mandap is the place where the activities of Yagya take place. Yagya- Mandap is consist of 8 parts which are Mandap base, pillars, Valliya, Ganduk, Vedi, Toran, Dhvaja and Pataka. All these parts play a significant role in Yagya as they represent a particular deity depending upon the type of yagya. There are several variations in the dimensions of all these parts which are believed to be dependent on the Purpose and type of yagya and also the availability of the sources for the construction of yagya Mandap. The Mandap is classified on the basis of category, purpose, size and number of instruments used for its constructions. Yagya Mandap plays a vital role in the procedure of Yagya and its final outcome. The purpose of the present paper is to discuss the mathematical aspect of the construction of the Yagya Mandap i.e. deciding the size of Yagya Mandap, ii) preparing Mandap base, iii) placing Pillars, and iv) preparing the roof. The study summarized scriptural dimensions, types and placements of Mandap Base, pillars, roof for different sizes of Yagya Mandap. Mandap can be classified on the basis of area i.e. adham (small), madhyam (medium) and uttam (large), for upto 20 hast 16 pillars and 32 Valliya ( column creating roof structure) used for creating Mandap, where as big Yagya Mandap can be from 20 hast to 100 hast and required more number of pillars and Valliya depending upon the size of the particular yagya Mandap. Mandap must be at the height of 12 angul or 1 hast from the ground level where base is of square shape and the area varies with a number of kund. Stambh are of two sizes the inner-pillar of 8 hast and outer pillar of 5 hast. Ganduk is the top most portion of roof of Mandap and is situated at the top of the Mandap and consists of 4 valliaya. Summarily, the depth of attention for Yagya kund construction indeed stresses out the need of Yagya Mandap to be very beautiful and systematic with reasonable efforts.

**Keywords.** Yagya Mandap, Mandap Base, Types, Pillars, Stambh, Vallika, Ganduk, Ventilation

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## Introduction

Yagya is considered the physical form of lord Vishnu, where Yagya Mandap is considered as his Temple. Therefore, it should be built very carefully, precisely, and beautifully. Just like the truth and the lord Shiva, beauty is also considered a deity therefore one should be very careful about aesthetics and appearance as well at the time of Yagya Mandap construction [1, 2]. There are scriptures which suggest fine details for the construction of Yagya Mandap. These scriptures speak about the procedure for the construction of Yagya-Kund of different dimensions and a number of protocols to build a beautiful Yagya Mandap. According to Pandit Shriram Sharma Acharya, if it is not possible to build Yagya Mandap by following scriptural protocol word by word, a few changes can be done but the root element of Yagya Mandap cannot be changed i.e. the objective of all these ancient Indian scriptures is to build a Yagya Mandap which is systematic and beautiful [1].

In Indian scriptures, the word Mandap is used for a temporary shed for a festival, religious gathering, temple or similar purposes [3, 4]. Basically, a Yagya Mandap is the place where activities of Yagya take place. A systematic Yagya-Mandap consists of i) Mandap base, ii) pillars, iii) Valliya, iv) Ganduk, v) Toran, vi) Dhvaja, vii) Pataka, viii) Vedi and Kund. The construction of Vedi and Kund itself is a vast subject. Basic construction of Yagya Mandap i.e. i) Mandap base, ii) pillars, iii) Valliya, iv) Ganduk is considered in the present paper. The construction of Toran, Dhvaja, and Pataka along with scriptural preparation of pillars, Dwar needed a separate introduction to the worship of deities in the ritual, which is not included in the present paper. All these parts play a significant role in Yagya as they represent a particular deity depending upon the type of yagya. There are several variations in the dimensions of all these parts as per the purpose, type, and availability of Yagya Mandap.

Mandap constructed for yagya contains parts. They are Mandap base, Stham (स्तंभ) (pillar), Valliya (वलििया), dvar (द्वार), (door), Toran (तोरण), Vedi (वेदी), Dhavja (ध्वजा (flag), pataka (पताका). Each one have their signif-

icant role in the procedure of Yagya and Mandap. All these parts of the Mandap signifies a particular deity and conducts an energy channel. In the present paper, only the construction of various parts of Mandap and the introduction of their significant deity is been considered which includes the dimension and purpose of the particular material used for construction only. Significance and role of the Deity representing and mechanism of conducting a particular energy channel in that particular part of Mandap and the role of colour and particular material used for the construction of Yagya Mandap are beyond the scope of the present paper.

The initiation of Yagya Mandap construction (मंडप निर्माण) takes place in a specific auspicious Mahurat (astrological time). From Disha Chayan (selection of direction) to Bhumichayan (selection of land) every single step takes place in a specific pre-decided Mahurat. The selection of Mahurat takes place on the bases of Yagyakarta's desire form yagya or Sthir Mahurat (स्थिर महूर्त) [1]. In addition, other steps of Yagya Mandap construction includes leveling of land (Bhumisamikaran) (भूमिसमिकरण), Examination of land (Bhumichayan) (भूमि चयन और परीक्षा), selection of Plants for construction of Yagyashala (यज्ञ वृक्ष), Purification of land (Pavitrikaran) (पवित्रीकरण) [4], and consideration of items used for Yagya Mandap construction.

The present manuscript focuses on the dimensions and construction of Yagya Mandap and its part covering mathematical and scriptural aspects i.e. deciding the size of Yagya Mandap, ii) preparing Mandap base, iii) placing Pillars, and iv) preparing the roof.

## Yagya Mandap

### Mandap size or area

Yagya Mandaps of square shape are considered in the present paper. In order to make square Yagya Mandap, the size of Yagya Mandap is decided first. Usually there are three types of Mandap defined by various scriptures from small scale purposes to large scale purposes, they are decided as per the need i.e. small (adham), medium (madhyam) and large (uttam) (Table 1)

[5, 6]. Various scriptures defined Mandap area in three categories i.e. small, medium and large size mandap. There exists slight variation in their units (Table 1). Summarily, small (Adham) mandap ranged from 8 to 12 hast unit, medium (Madhyam) mandap ranged from 12 to 16 hast unit, and large (Uttam) mandap ranged from 16 to 24 hast unit; only Sharda Tilak Tantram defined them as 5, 7 and 9 accordingly.

| Mandap type as per size (unit - hast) |                  |               | Reference Book  |
|---------------------------------------|------------------|---------------|---|
| Adham (small)                         | Madhyam (medium) | Uttam (large) |   |
| 5                                     | 7                | 9             | Sharda Tilak Tantram [7]  |
| 10                                    | 12               | 16            | 'Yagya-Madhusoodan, Yagya Ka gyaan Vigyaan, Kundmartand-shloka 19 [1, 5, 8] |
| 12                                    | 14               | 18            | Sharda Tilak Tantram [7]  |
| 10                                    | 14               | 16            | Sharda Tilak Tantram [7]  |
| 8/12                                  | 14/16/12         | 18/20         | Kundkomudini-shloka 32 [8]  |
| 10/12                                 | 12/14            | 16/18/20      | Sharda Tilak Tantram, 'Yagya-Madhusoodan, Yagya Ka gyaan Vigyaan [1, 5, 7]  |
| 12                                    | 12/14/16         | 16/18/22/24   | Kundarnvah shloka 42,43 [8]   |
| 8/10                                  | 12/14            | 16/18/20      | Kundtaptapradeep shloka 17, 18 [8]  |
| 12/10/8                               | 16/12            | 24/20/18/16   | Kundkalpdrumah shloka 21 [8]  |
| 10/11/12                              | 12/13/14         | 14/15/16      | KundMandap- shloka 17 [8]   |
| 10/12                                 | 12/14            | 16/18         | Kundramvajpaye shloka 21 [8]  |

Table 1: Yagya Mandap Type on the basis of area in different texts.

### Large size Mandaps

In addition to defining Yagya Mandap in three categories i.e. small, medium and large for routine purposes with area varies from 8 hast to 20 hast, Large Mandaps for Yagyas are also mentioned in scripture Kundoghotah, Shloka 20 with increasing order of 2 hast [8]. The same has been stated by Sharda Tilak Tantram too [7]. Though kundMandap in shloka 18 suggested 50 hast Mandap is the largest [10], Bhavishya Purana mentioned that the maximum length of the Mandap upto 100 hast. Kundmandap, Shloka18 speaks that no Mandap is larger than 100 hast [8] as a single unit, it also implied that there may be different units of 100 hast if needed.

### Odd size Mandaps

Sharda Tilak Tantram speaks about different dimensions of the Mandap which are 5 hast, 7 hast and 9 hast) [7]. This is the only reference received which suggests odd number dimensions of the Mandap construction. In addition,

there is also a reference in book Kundoghotah, shloka 19 which states that according to Ravan, 25 hast kund is duemukh (द्विमुख) Mandap [8], in which the Mandap is divided into equal 25 parts 5 square in each direction [9].

### Mandap size and Kund numbers

The size of Mandap depends on the number of Kunds required. The size and number of the Kund depends on the total number of offerings to the sacred fire. The total number of offerings depends on the Anushtan containing the total number of Mantra chanting. Hence, to decide the size or type of Mandap i.e. small, medium or large, the total number of Kund required needs to be considered.

As per Kundmandap, Shloka 14, the size of Mandap should be 8 times of the size of the kund inside it [8], probably considering comfortable conduction. It might imply that mandap with 1 hast kund should be a minimum of 8 hast in size.

| Traditional Name as per land covered | Traditional Name as per Shri Madhusudan Ojha | Mandap Size (hast) | Mandap Side in hast (feet) | Area (hast X hast) | Area (Square feet) | Area (Square meter) |
|--------------------------------------|--|--------------------|----------------------------|--------------------|--------------------|---------------------|
| Ekbhu                                |  | 5                  | 5(7.48)                    | 25                 | 55.96              | 5.20                |
|                                      |  | 7                  | 7(10.47)                   | 49                 | 109.67             | 10.19               |
|                                      |  | 9                  | 9(13.46)                   | 81                 | 181.29             | 16.84               |
| Dvebhu (8 to 18 hast Mandap)         | Dhanah                                       | 8                  | 8(11.97)                   | 64                 | 143.25             | 13.31               |
|                                      | Ghor   | 10                 | 10(14.96)                  | 100                | 223.82             | 20.79               |
|                                      | Viramah                                      | 12                 | 12(17.95)                  | 144                | 322.30             | 29.94               |
|                                      | Kanchan                                      | 14                 | 14(20.94)                  | 196                | 438.69             | 40.76               |
|                                      | Kaamrajah                                    | 16                 | 16(23.94)                  | 256                | 572.98             | 53.23               |
|                                      | Sughoshah                                    | 18                 | 18(26.93)                  | 324                | 725.18             | 67.37               |
| Tribhu (20 to 28 hast Mandap)        | Gharghar                                     | 20                 | 20(29.92)                  | 400                | 895.28             | 83.17               |
|                                      | Daksh  | 22                 | 23(32.91)                  | 484                | 1083.29            | 100.64              |
|                                      | Gahan  | 24                 | 24(35.91)                  | 576                | 1289.21            | 119.77              |
|                                      |  | 25                 | 25(37.40)                  | 625                | 1398.88            | 129.96              |
|                                      |  | 28                 | 28(41.89)                  | 784                | 1754.75            | 163.02              |
| Chaturbhu (30 to 75 hast Mandap)     |  | 30                 | 30(44.88)                  | 900                | 2014.38            | 187.14              |
|                                      |  | 40                 | 40(59.84)                  | 1600               | 3581.13            | 332.70              |
|                                      |  | 45                 | 45(67.32)                  | 2025               | 4532.36            | 421.07              |
|                                      |  | 50                 | 50(74.80)                  | 2500               | 5595.51            | 519.84              |
|                                      |  | 75                 | 75(112.20)                 | 5625               | 12589.90           | 1169.64             |
|                                      |  | 100                | 100(149.61)                | 10000              | 22382.05           | 2079.36             |

Table 2: Area of Yagya Mandap in scriptural and modern units and their traditional names as per the size of the Mandap; 1 hast = 24 angul; where 1 angul = 1.9 cm.

The size of Mandap can vary according to the number of kund present in it. According to the book Yagya ka gyan Vigyan by Pt. Shriram Sharma Acharya, the size of Yagya Mandap with 1, 5 and 9 Kunds and people it can accommodate is as follows [1]. i) Mandap with 1 Kund: Yagya Mandap with 1 kund should not be less than 8 by 8 hast, but if required it can be increased by 2 or more feet and 4 pillars are sufficient for such a Mandap. In this kind of Yagya Mandap 6 people can perform Yagya at a time. ii) Mandap with 5 Kund: For Yagya Mandap with 5 kund, generally, the size is about 15 by 15 feet and 12 pillars are used. In this Yagya Mandap 38 people can perform Yagya at a time. iii) Mandap with 9 Kund: For 9 kundiya Mandap, the size is of about 24 by 24 hast and the height should be 9 to 15 hast. The size of the pillar at the center should be placed at a distance of 6 by 6 or 8 by 8; in this Yagya Mandap 70 people can perform Yagya at a time.

In addition, Yagya Mandap Size can also be adjusted based on the number of participants. Generally, up to 9 people can perform yagya in

Yagya Mandap with 1 kunda at a time. 100 people can be accommodated to perform Yagya in Yagya Mandap with 5 kunda, and for 100 to 400 people, a Mandap containing 9 kund would be appropriate [1].

#### *Mandap dimensions in ancient and modern Units*

As described in Table 1 Mandaps are of different sizes i.e. ranges from 5 hast to 24 hast. Here, 5 hast Mandap would be 5 hast length and 5 hast width as the Mandap base is in two dimensions. Similarly, the area of 8 hast Mandap would be 8 X 8 hast. Different Yagya Mandap area in hast and m<sup>2</sup> is calculated as described in Table 2. It is to be noted that 1 hast of Yagya kund is calculated as 1 hast X 1 hast X 1 hast (length X breadth X height) as, it is in three dimensions while Mandap is two dimensional where 5 hast Mandap would have area of 5 hast X 5 hast (length X breadth).

### Traditional names of the Mandap

i) Name as per land covered by the Yagya Mandap: Yagya Mandap are further named according to the area of the land they have been built on. The Mandap which is made on the area with the side of 7 hast length Land is known as Ekbhu, from 8 to 18 hast length of the side, is known as Dvebhu, from 20 to 28 hast length of the side, is known as Tribhu and from 30 to 75 hast length of the side, is known as Chaturbhu [9] (Table 2).

ii) Names as per Smartkund samiksha II: Smartkund samiksha II by Madhusudan Ojha speaks about the name of Mandap with different sizes ranging from 8 hast to 24 hast [5] and Vishvakarma Prakashah by Abhay katyayan

speaks about 27 types of mandap on the basis of stambh, but some shloka's are missing in that book thus only 14 names are been given [12]. (Table 2)

iii) Names as per Varna (personality traits): Ancient literature Smart-Kund-Samiksha, Mandap kund siddhi, kundratnavali suggests that Mandap can also be classified according to Varn similar to that of Yagya kund classification as per Varna [2, 5, 6, 10, 13]; they are classified as Bramhim (20 hast), Kshatriya (16 hast), Vaishya (12 hast) and Shudra (10 hast), Hinvarna (8 hast). It should be noted that the classification as per Varna in ancient times was defined as per the personality traits and purpose of the performer.

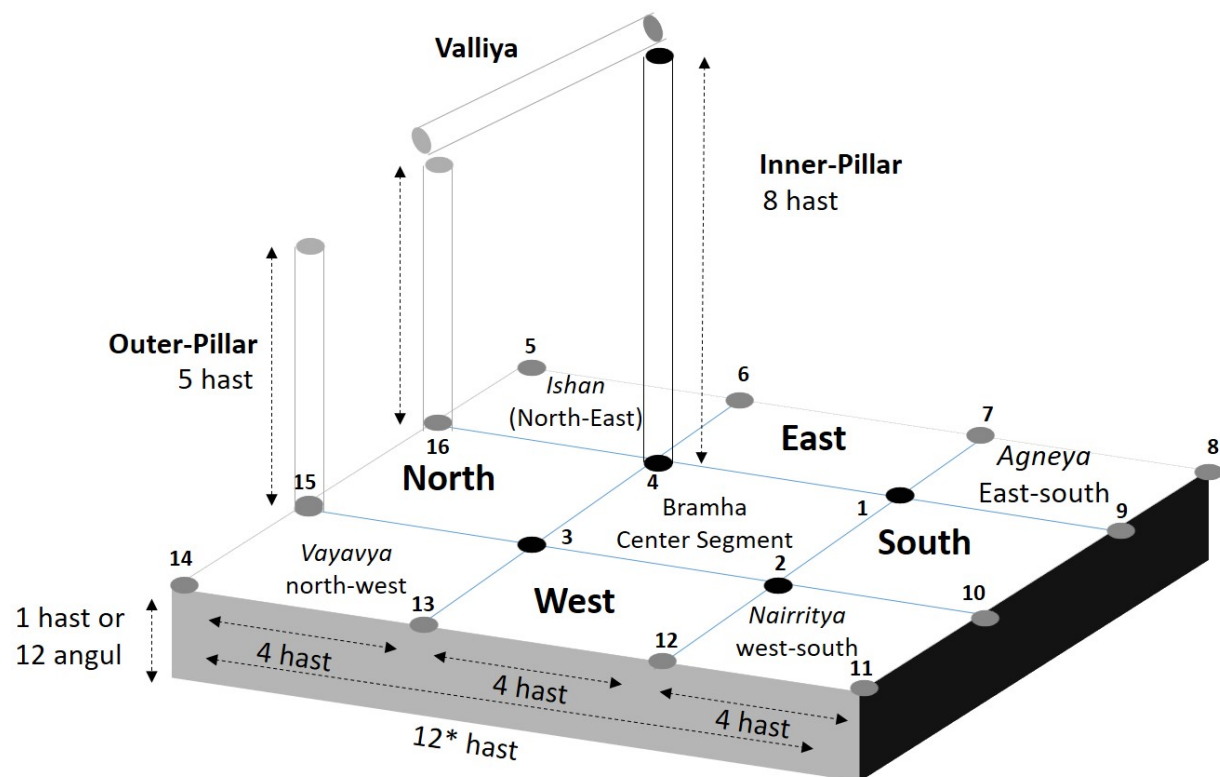


Figure 1: Yagya Mandap base and partition for placement of pillars and Valliya. Black circles on Mandap base are for inner pillars (1 to 4), gray-colored circles on the Mandap base are for the outer pillars (5 to 16). The numbering of pillars indicates placement order and directions (Pradiksana kram) as per scriptures. Pillar number 6-7, 9-10, 12-13, 15-16 act as the doors of Yagya Mandap. Sample representation of horizontal column - Valliya placed on outer and inner pillars creating a skeleton network for the roof of Yagya Mandap.

## Mandap base

### *Height of the Yagya Mandap Base*

According to the Mandap Kund Siddhi (Shloka 15), उच्चं भूमिं मण्डपस्य प्रकुर्याद्धिदस्तोन्मानामर्धहस्तोन्मितां वा | मध्ये भूमिं मण्डपेनोन्मितां च त्यक्त्वा कुर्यान्मण्डपश्चेद् द्वितीयः || (*Uchham bhumim mandpasya prakuryadhastostomanamardhhastonimitam va | Madhye bhumim Mandapenonimitam ch tyaktyatva kurya nmadapshcheD dvtiyah* ||) It implies that the Yagya Mandap should be constructed at the height of 1 hast (24 angul) or ½ hast (12 angul). The same is stated in book Smart-Kund-Samiksha, Chapter 'Atha-Mandapayatanam by Madhusudan Ojha and in book chapter Mandap Stambh nevheshanam shloka 21 of book Sharda Tilak Tantram, and also in books Mandap Kund Siddhi (Shloka 15), Kundmartand (Shloka 18), KundTatvapradeep (Shloka 18) [5, 7, 8]. Pandit Shriram Sharma Acharya has also suggested the height of the mandap as 6 to 9 inches i.e. 8 to 12 angul considering the need of modern time [1]. KundtativaPradeep Shloka 19 also suggests the height of Mandap base as 4 angul or 2 angul from the ground in another opinion [8].

Most literature on Mandap construction recommended either 1 or ½ hast while kapilpanjtraratre mentioned Mandap base of 1 hast only ["उच्छ्रायो हस्तमानं स्यत्सूसमं च सुशोभनम्" (*uchchhrayao hastmaanam syatsusamam cha sushobhanam*)] [7]. Regardless, the purpose of elevated Mandap base from ground is to maintain the purity of the Yagyashala, by preventing entry of animals, insects, etc while not in use.

### *Partition of Mandap base*

After deciding the size of the Mandap, and preparing the elevated base of Mandap height, the Mandap base is divided into nine equal squares to arrange Kund and Vedi in the YagyaShala properly. The scriptures state that the base should be divided into equal parts in the shape of a square. The base of the Mandap must be very strong as it holds the weight of Pillars (Stambh) and the roof of the Mandap [1]. The partition of the Mandap base should be done carefully as follows.

i) Take a rope, whose length is equal to the length of the side of the Mandap and fold it in such a way that it is distributed in 3 equal parts. For example, if 12 hast, Mandap is going to be constructed then take a rope of 12 hast and then fold the rope in three equal parts, in that case, the length of the rope will be 4 hast.

ii) Then, using one part which is of the size of 4 hast, make a square starting from the corner of Mandap and prepare the next adjacent to it. That is square with the side 4 hast. This way the Mandap will be divided into 9 equal parts in the form of 9 squares (Figures 1) resulting in 16 intersection points (12 outer and 4 inner intersection points) where Stambh (pillars) will be inserted to prepare the Mandap. The partition of Yagya Mandap Base into 9 parts is also done to obtain 8 directions and the central segment (Figure 1) where Kund and Vedi are placed in a prescribed segment based on direction as per scriptural recommendation.

### *Distance between two Yagya Mandap*

If more than one Mandap is needed to be constructed then it is important to keep safe and workable distance between Mandaps. As per Mandap Kund Siddhi, shloka 15 the distance between the two Mandap should be equal to the length of the Mandap side [5, 8]. Kundratnakar, Shloka 15 suggested if two Mandap are being constructed near the house then the distance between the Mandap and house should either be equal to the height of the house or be at some distance. If the space is less in that case, scripture Rudrayamala (रुद्रयामल) suggests that Mandap can be constructed near each other [5, 7, 8].

## Stambh (Pillar)

After deciding the size of the yagya kund, preparing the base, and deciding the intersection points of the base, the next step is to place the pillar at the intersection points of the yagya mandap base. In this section, we are describing the size of Stambh and their placements. Stamps are placed all around the Mandap and at the centre segment to support the roof of the Mandap (Figure 1), which also holds spiritual importance [1].

| Mandap Size    | Number of Segments | Number of Stambh | Number of Outer Stambh | Number of Inner Stambh |
|----------------|--------------------|------------------|------------------------|------------------------|
| 16 to 24 hast  | 9                  | 16               | 12                     | 4                      |
| 21 to 28 hast  | 25                 | 36               | 32                     | 4                      |
| 30 to 75 hast  | 49                 | 64               | 60                     | 4                      |
| 76 to 100 hast | 100                | 121              | 117                    | 4                      |

Table 3: Number of Stambh (pillars) as per area and resultant segments.

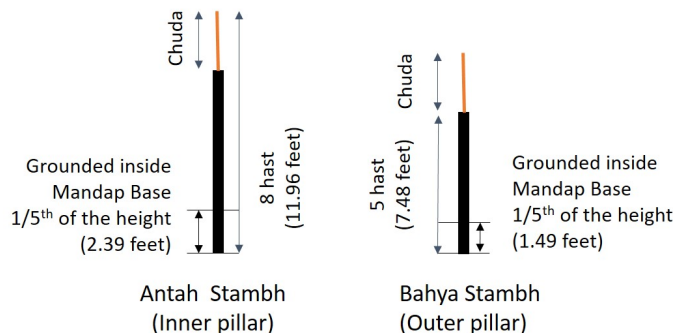


Figure 2: The diagram of Inner and Outer Pillars (Stambh) showing dimensions and structure of Chuda.

## Number of Stambh as per the size of Mandap

The position of Stambh is fixed on Mandap but their number varies with the area of the Mandap. Most literature describes the 16 Stambh for Yagya Mandap where Uttam (Large) size Yagya Mandap are considered up to 16 to 24 hast (Table 1) [8]. However, when there is a need for a bigger Yagya Mandap in Large Yagya, the stambh number increases with an increase in area (Table 3) [11].

As per the Mandap size, the number of Stambh is decided, which is also in coordination with Mandap base preparation resulting in segments as shown in Table 3. When the Mandap base is divided into a number of segments, i.e. Mandap is divided into equal parts in square shape, the intersection point of these squares is the point where Stambh will be placed (Figure 2) [1, 5, 7–9, 13].

The Stambh of Yagya Mandap are of two types, i.e. Antah Stambh (inner pillars), and Bahya Stambh (outer pillars). i) Antan Stambh (inner-pillars)- The 4 pillars at the center i.e. around the center square are Antah Stambh.

Their height is larger as compared to the outer pillars. Inner pillars are also responsible for giving a pyramid like structure to the roof of the Mandap and they also give the final shape to the peak of the Mandap. Their number is always fixed irrespective of the area of the Mandap which is 4 [1, 8]. ii) Bahya Stambh (outer-pillars) – they are present in the outer skirt of the Mandap base and also act as the door of the Mandap in four directions. The number of outer pillars varies with the area of Mandap. It can be from 12 to 117 (Table 3). According to Mandakund Siddhi Shloka 21, for up to 20 hast Mandap, among these 12 pillars, 8 pillars act as a door to each side of the Mandap while 4 pillars are placed at the corner of the Mandap base (Figure 1, Table 3) [1, 8]

## Dimensions and Characteristic of the pillars for Yagya Mandap construction

The wood of the Stambh should be straight and free of any pest or any kind of infection. Most of the scripture described Antah Stambh (inner pillar) length as 8 hast in which 1/5th of its total height ( $8/5 = 1$  hast 4 angul) is buried

under the surface of Mandap base. Sharda Tilak tantram book said, “पञ्च मांशेन वा खातं सर्वेषाञ्च शिवोदितम्” *panchmaashen va khatam sarveshagych shivoditam*; it implies that all the stambh should be buried 1/5th of the total height of the stambh. According to the smart kund samiksha II by Madhusudan Ojha [5], the Uttam (large) Mandap may have an inner pillar of 9 hast or as per dimension of Mandap that is half of the length of the Mandap.

The other side of the pillar contains a sharp structure known as chuda (Figure 1, 2). Chuda of Pillar works for fixation of Valliya (horizontal pillar placed over the vertical pillar as skeletons for the roof) [5, 7]. The length of the outer pillar is of 5 hast. In which 1/5th of the total height ( $5/5 = 1$  hast = 24 angul) is buried under the Mandap Base. They also contain chuda at the other end for fixation of the Valliya [5, 7]. According to Sharma tilak tantram, tritiya patal (shloka 24) the breadth (diameter) of the stambh should be 10 angul [7]. Also as per Yagya Madhusudan Smart Kund Samiksha, the stambh can be square or circular with side or diameter as 12 angul. The chuda can be 6 angul or as per the size of the Stambh [5].

### Placement of the pillars as scriptural order

The pillars are placed in a specific order. According to the Indian scripture Shardttilak स्तम्भोच्छ्राये शिलान्यसे सूत्रयोजनकिलके | खननावटसंस्कारे प्रारंभो वहीगोचरे || (*Stambhochchhraye shilayense sutrayojankilke, Khannavatsanskare prarambho vhrigochre.*) It implies that the initiation of placement of pillars should start from Agneya kon (South-East direction) and then continue placing other pillars in the clockwise circle, as shown in Figure 1 numbered from 1 to 16. There is specific scriptural order of placing Stambh which is called Pradikshina kram. First, bury the inner pillar then the outer pillar. First place pillar at the intersection point of southeast direction then to south followed by south west, west, northwest, north, northeast then east and end at again south east. [5, 7].

## Roof of Yagya Mandap

### Valliya

Valliya are the horizontal pillars placed over the vertical pillars as skeletons for the roof of the Yagya Mandap. If the total number of pillars is 16, in such a case there would be a total of 32 Valliya. Among them (Figure 3), i) 12 Valliya will connect outer pillars, ii) 4 Valliya will contact the inner pillars, iii) 12 Valliya will connect outer and inner pillars creating a pyramid-like structure because Inner pillars are of 8 hast while outer pillars are of 5 hast. Valliya used to join the corner of the outer-endo pillar are known as Karn (कर्ण), iv) remaining 4 valliya will be used for creating the second pyramid-like structure (Shikhar) which is described in the following section. Some scripture mentioned that these 4 pillars will have one end stuck in the chuda of the inner pillars and another sharp end inserted in the Ganduk (a top portion of the second pyramid), however, exact details are unknown to the author with available books resources.

The above calculations are for Yagya Mandap upto 20 hast with 16 pillars where total 32 (16+12+4) Valliya are used in the construction of the rooftop. The number of Valliya also varies with the number of pillars. For construction of Yagya Mandap of Large size above 20 hast, the number of Valliya are unknown to the Author and is part of future research [1, 5, 8, 11].

### Placement of the Valliya

1. Place 4 Valliya having holes at both ends, placing one end to the chuda of the outer pillar and the other to the chuda of the other outer pillar. Thus place 12 Valliya over bahya Stambh (outer-pillar) (Figure 3).
2. Place 8 Valliya from the center outer pillars i.e. 2 from each direction to the inner pillar.
4. Place 4 Valliya from the corner of the outer pillar to the corner of the inner pillar.
5. Place 4 large Valliya from the inner-pillar to the center of four inner pillars in the upward direction by creating a pyramid like structure.
6. Lastly, cover the roof of Mandap with the help of leaves and grass.



## Shikhar (peak) of Mandap

Mandap topmost pyramid like structure is Shikhar. It has Ganduk where 4 valliya are inserted and are connected to the Inner pillars. Ac-

ording to the Matasya puran, the Peak of the Mandap are of different shapes. They can be made triangular, circular, semicircular, octagonal, decagonal and square. [9].

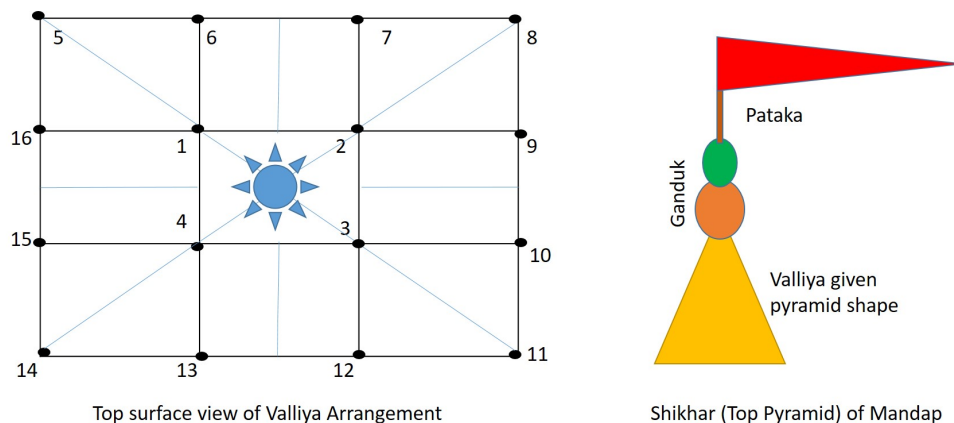


Figure 3: Arrangement of Valliya over Pillars. The star-shaped symbol represents Ganduk, part of Shikhar.

## Discussion

The practice of Yagya is ancient so thus the procedure of yagya. With time several Rishis had updated the procedure as per the availability of the raw material, climate, time, space and native land keeping the core purpose intact. The updates in the procedures are well documented in the Indian scriptures resulting in various opinions on the procedure of yagya and constructions of yagya Mandap as reflected in Table 1. Specifications of Yagya Mandap can be different based on the basis of various parameters like size [5, 7–9], the shape of roof [9], the purpose of yagya [5, 7–9], number of pillars [7, 11, 12], and the deity of the yagya [5, 11]. The refereed literature also categorized the Yagya Mandap in small, medium and large upto 20 hast for small scale purposes with almost similar range variation. Different sizes of Yagya Mandap are prepared based on the purpose in which herbal mixture can be of small size or large size affecting the size of yagya kund and thus Yagya Mandap [8]. For small scale purposes, the size of Yagya shala can be 4 times the size of yagya kund inside it [1], which finally results in the variation of the size of the Yagya shala. For big Yagyas there are different types of calculations for its

construction which are discussed except its roof preparation.

In the current paper the author discussed 16 pillars for up to 20 hast Yagya Mandap, whereas the number of pillars varies with an increase in the size of the yagya mandap from 20 hast and so thus the valliya [5, 8]. If the Mandap is small that is of size 8 hast only then 4 pillars are enough, and the roof is constructed over them only by giving a pyramidal shape as per YugRishi Pandit Shriram Acharya Sharma [1].

The number of valliya is not well described for beyond 20 hast Yagya Mandap in the current paper due to lack of information in the available literature to the author. In future if proper reference is available separate study on valliya can be performed.

In addition to the Valliya for big size Yagya Mandap, the roof construction described in available literature is missing some critical information or it may be well carried by generations to generations without proper documentation, i) according to the literature referred, 4 valliya of endo-pillars are subjected to Ganduk (Darukumbh) which provides the top most pyramidal shape to the yagya Mandap, which would

result pyramid without ventilation. ii) Also according to the book “Mandap kund sangrah” [8], the roof can be of many shapes which have been also confirmed by the book Kundark [9]. However, these books [8, 9] don’t describe fine details of different shaped roofs of Yagya Mandap. iii) For the construction of a pyramidal shaped roof, 4 Valliya are considered. They are joined together by a Ganduk but there is no description of how much space between the lower roof (which is constructed by joining the outer-pillar and inner-pillar) and the upper roof (which is constructed by joining the inner-pillars together through Ganduk). Either that details are missing or that was common knowledge at the time when the literature was written. iv) All the refereed scriptures lastly state that there is scope for the changes in the size of pillars, valliya and size of mandap and kund as per the requirement which proves the importance of acharya or experts of that time for the construction of the yagya Mandap and for the procedure of the yagya. Thus, further study is required on the systematic construction of the roof of the yagya mandap by surveying more ancient literature describing the yagya mandap construction. The material for Yagya Mandap construction as per scripture such as types of woods, clay, grass, etc are not covered in the present paper.

## Conclusion

Summarily, Yagya Mandap is the platform where yagya and yagya-related activities take place. The size of the Yagya Mandap varies with the number of kund placed in the Yagyashala. Depending on the purpose and number of participants i.e. 1 kundiya, 5 kundiya and 9 kundiya Yagyas, different sizes of Yagya Mandap are constructed. Mandap can be classified on the basis of area i.e. adham (small), madhyam (medium) and uttam (large) for upto 20 hast with 16 pillars and 32 Valliya, while big Yagya Mandap can be from 20 hast to 100 hast. Mandap must be at the height of 12 angul or 1 hast from the ground. Mandap base is of square shape and the area varies with a number of kund. Stambh are of two sizes the inner-pillar of 8 hast and outer pillar of 5 hast. According to scriptures the size

of inner and outer pillars varies depending upon the type of yagya Mandap. Ganduk is situated at the top of the Mandap and consists of 4 valliya inserted to it. Valliya is the column used to prepare the roof of the Mandap. Thus, the depth of attention for Yagya kund construction indeed stresses out the need of Yagya Mandap to be very beautiful and systematic with reasonable efforts.

**Compliance with ethical standards** Not required.

**Conflict of interest** The authors declare that they have no conflict of interest.

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