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### RESEARCH ARTICLE

#### PYRAMIDAL ROOF THAT HOLDS UP THE BEST.

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#### Manuscript Info

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#### Abstract

Pyramidal roof is a hip type of roof. It has no vertical sides or gables. The purpose of the project is to provide the roofing design with a small modification of installing draining water pipes from roof to the ground surface and ventilation facility. Pyramidal roof withstands and gives strength against hurricanes. Due to their aerodynamic shape, a pyramidal roof is less likely to be damaged by high winds than most other roof styles. With its even sides and overhanging eaves, the pyramidal roof gives the home a striking and distinctive appearance. This roof style looks good from all angles. The roofing design contains with a small modification of installation of draining water pipes from roof to ground surface and ventilation facility.

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#### Introduction:-

Pyramidal roof is a hip type of roof. It has no vertical sides or gables. This is a type of roof where all sides slope downwards to the walls, with a fairly gentle slope. Pyramidal roof is a shape of square hip roof. They almost have same pitch or slope, which makes them symmetrical about the centerlines. They often have a consistent level gutter that can be fitted all around.

#### Objective:

The various objectives to provide pyramidal roof are as follows:

1. To resist the wind. Due to equal pitch on both sides, it has good aerodynamics which gives ability to withstand strong winds.
2. To use pyramidal roof in coastal regions where tough winds & storm are common occurrence.
3. To provide natural insulation.
4. To maintain low interior temperature of room, this saves cost of air conditioner.
5. To provide efficient drainage.

As we know that, in India there are many regions which face wind storms and hurricanes. The problem to be found out is that during the weather of high winds or hurricanes, the houses in those areas are destroyed. Also during the rains the water makes the houses weak due to leakage and moisture. The houses become weak in the coastal regions. The pyramidal roof house gives resistance to the high winds or storms or hurricanes. It is also provided with the drainage and ventilation facility on the roof which helps draining the rain water immediately and gives light through ventilation windows in daytime.

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**Framing of roof:**

The process of framing a pyramid roof may get complicated sometimes, or easy to do it. The framing of roof depends on the size of roof and structure. Time taken for the framing of roof also depends on the size of roof.

The basic steps of the framing of roof are as follows:-

- i. A circular saw, a measuring tape, a 2-by-6 lumber, nails and a hammer will be needed.
- ii. The pitch of the pyramid roof should be decided as the pitch determines the final length of the hip rafters.
- iii. Section the rafters as per the decided pitch.
- iv. At initial install the two pairs of rafters in opposite direction that leans at each other. They should be diagonally joined by nailing them together.
- v. Again install the next pair of rafters. Do this till the frame of roof is obtained.
- vi.



**Fig.1:- ROOF FRAME**

**Rooflight in pyramidal roof:-**

The pyramidal roof light has no internal hip framework. It ensures that the maximum natural light will be given to room beneath. It also has greatly improved thermal efficiency resistance. The roof light can be used in double glazed or triple glazed. The thermal resistivity in both the roof light are more. They are provided with toughened safety glass.



**Fig.2:- ROOF LIGHT**

**Drainage in pyramidal roof:**

The drainage facility in roof plays one of the important role. According to drainage in roof, it decided the draining of rain water from roof. It can be done by providing the gutters at the end of roof at each side of roof with equal slope at all sides. At the end of gutters draining pipes should be connected which allows rain water to reach the ground level.



**Fig.3:- DRAINING GUTTER**

**Implementation:**

Earlier, prior to 1930's pyramidal roofing was a popular constructing structure for American houses which still in use are considered as American bungalows, log cabins and modern Victoria style homes.

As we know a pyramid roof is one of the type of hip roof which lacks gables or vertical sides, having constructed on top of a square or rectangular base the pyramidal roof is suitable for small structures of house. A pyramid roof having all the sides sloping downwards towards the wall may have three or more rectangular faces depending on the structure size and design preference of the individual.

Considering the conservative construction of the pyramid roof displays the efficiency of the structure in places with high winds which makes them less prone to wind damages, hence constant roof maintenance and repair is minimized.

Besides this, following are the reasons why pyramid roofs are implemented:

- A. Resistant to wind
  - B. Natural insulation
  - C. Efficient drainage capabilities
- a) Resistant to wind: - This is considered to be the most admirable feature for an individual looking to build a pyramid roof. Due to the shape with equal pitch on both sides, the structure allows to have a good aerodynamic feature, which gives the ability to withstand strong winds compared to roofs with normal gable, with this quality the pyramidal roof is therefore ideally suitable for coastal regions where winds and storms are considered as common occurrence.
- b) Natural insulation: - Insulation is considered to be the important aspect in all components of a building, which eventually determines the energy bills, considering especially in very hot and very cold seasons. These excellent insulating capability of pyramidal roof comes from the fact that they have eaves on all sides. With proper implement of pyramid roof, builders can allow sufficient roof for insulation materials. This design allows the interior temperature to remain low which on a long term helps in saving the cost of continuous air conditioning.
- c) Efficient drainage capabilities: - Drainage is considered to be the most bothersome problem which most of the usually roof faces. With poor drainage capabilities the collected rain water fails to direct it away, eventually causes major problems not only to the roof but also to other structures of the roof. Constructing pyramid roof allows an efficient drainage capabilities because of the equal slopes of the structure, which always drains away almost immediately. Therefore, problems like mold growth or leaking of the roofs is not experienced.

Therefore, the structure designed gives the best possible solution for the above described capabilities of the pyramid roof. The pyramidal roof typed structure can be implemented in coastal area where there is high wind storms and hurricanes. In the coastal regions, during hot seasons it gives cooling effect in the house. Due to sloping sides warm winds are resisted and it is converted into cooling effect which also saves electricity bills. In cold seasons, the electricity consumption is at minimum.

**Conclusion:-**

As we know that pyramidal roof is a high wind resistant roof, it can be applied to various places. Pyramidal roofs are generally used for the small structures like garages, cottages, etc. and it has been also used for bungalows. Pyramidal roof gives qualities such as traditional design, solidness and more comfort. It is mostly used for the advance architecture.

In the project, the design gives the strength to withstand the high winds, hurricanes, or storm like places. It also gives the facility of rain water drainage and roof lighting windows. Roof lighting windows allows beneath rooms the natural light in daytime.

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