

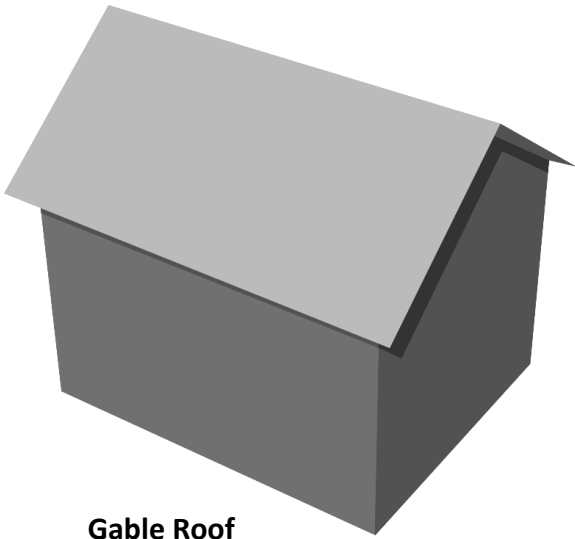
## **Roofing Notes**

The most important function of roofs is to provide protection from the weather.

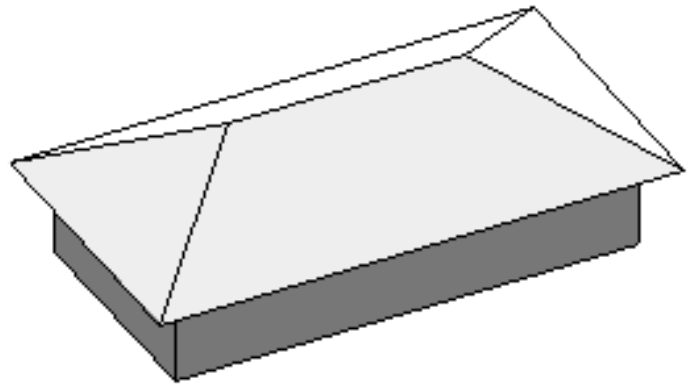
The main functional requirements of all roofs include the following:

- **Weather resistance.**
- **Strength and stability.** The roof must be able to support both dead and live loads. The effect of wind pressure requires special consideration. Wind speeds vary depending on the location of the site, its altitude, and the season of the year. Secure fixing is necessary because uplift in high wind pressure areas may exceed the dead weight of the roof.
- **Durability.** The quality of the original work and the quality of materials used are important factors in durability. Other factors that affect durability include industrial, natural pollutants and organisms that may attack the roofing materials.
- **Thermal insulation.** The provision of thermal insulation in roofs is essential to reduce heat loss from the interior of the building and to prevent excessive heat gain from the exterior in hot weather.
- **Ventilation.** The roof space must be adequately ventilated to prevent condensation.
- **Fire resistance.** This is necessary to give protection against the spread of fire to and from adjacent buildings, to prevent early roof collapse, and to protect means of escape where they occur through the roof.
- **Sound insulation.** When considering sound insulation the roof is as important as the walls. Most roofs offer adequate levels of sound insulation.

Roof Types



**Gable Roof**



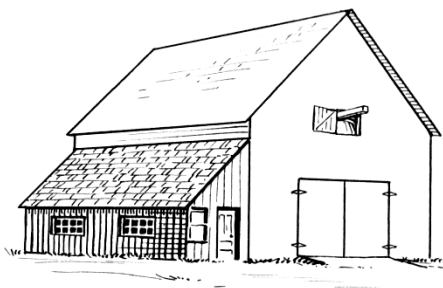
**Hipped Roof**



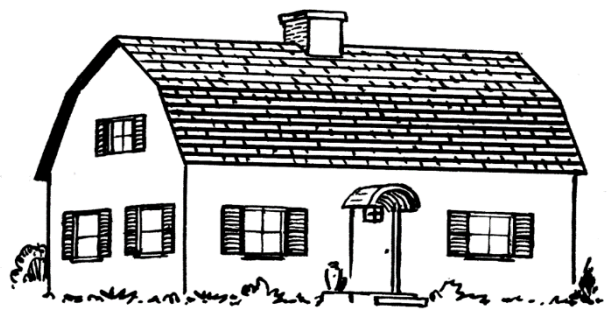
**Dormer Roof**



**Hipped Gable Roof**



**Lean to- Roof**

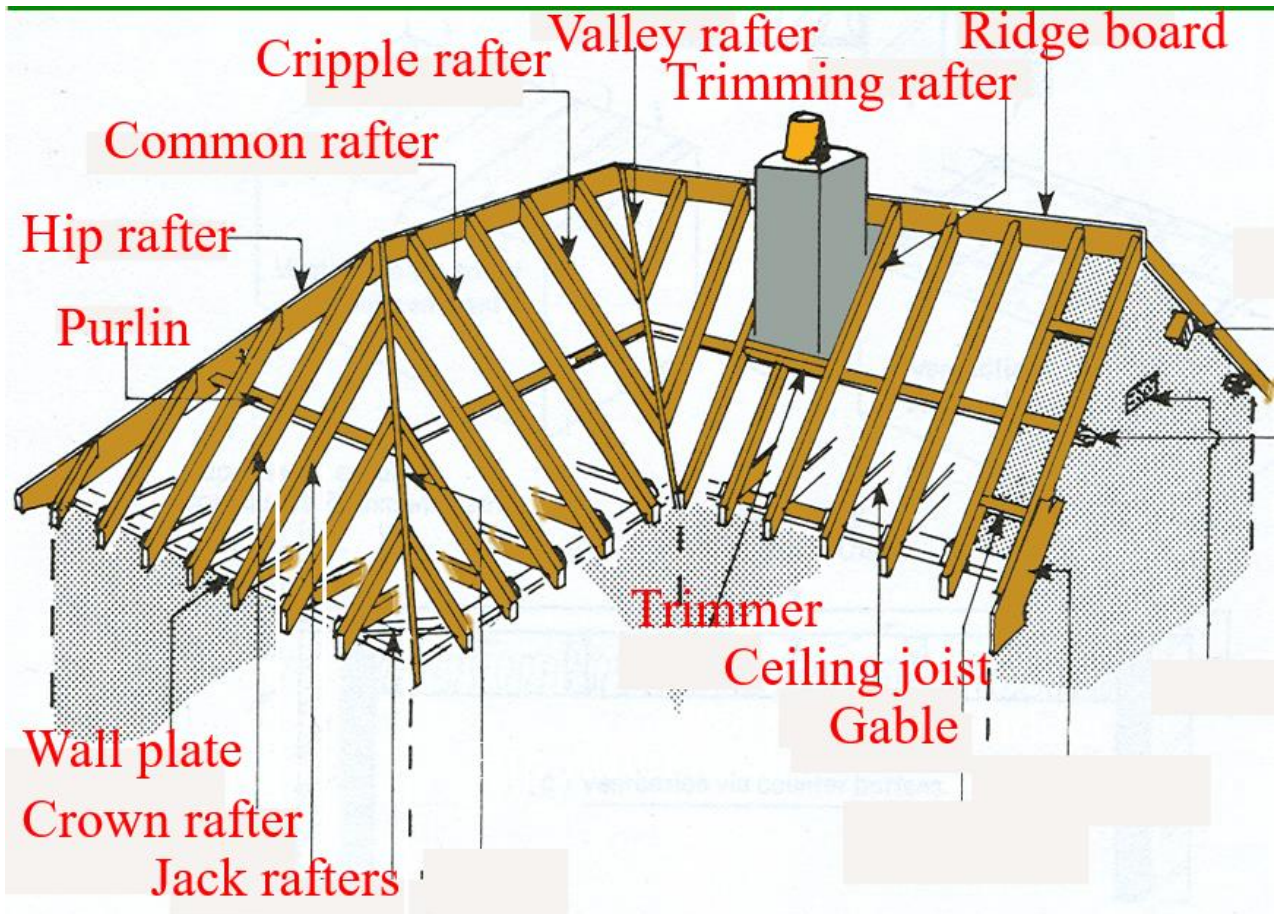


**Mansard Roof**



**Flat Roof**

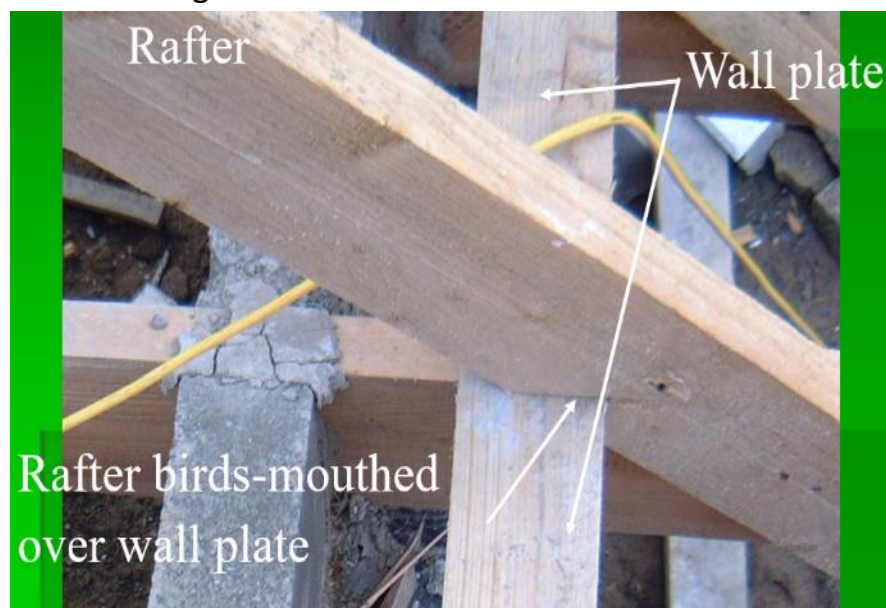
## Roofing Terminology



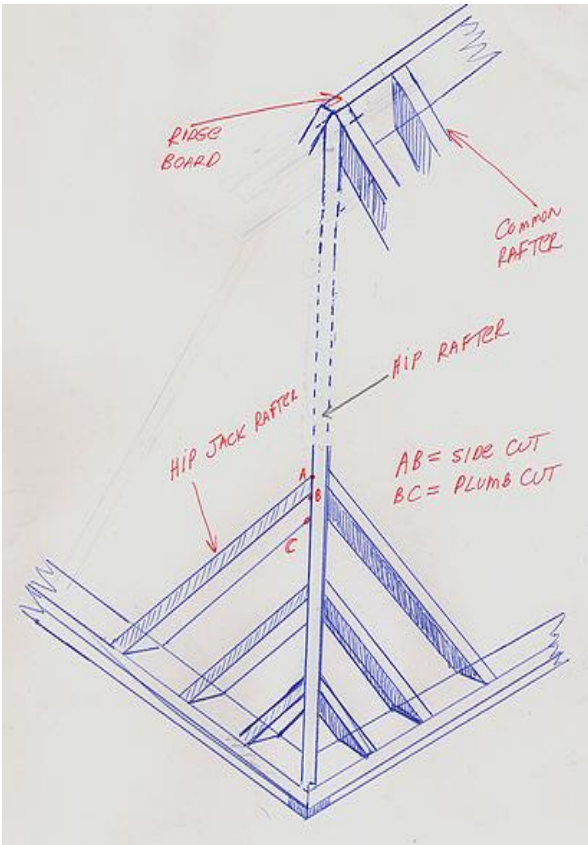
### Pitched Roof:

A pitched roof may be defined as any roof surface that makes an angle of between **10° and 70°** to the horizontal. Surfaces below 10° are categorized as flat roofs and surfaces greater than 70° are regarded as walls.

**Common rafters.** These are the main load-bearing elements of the roof. They span between the wall plate and the ridge. They are notched and nailed to a wall plate, which is in turn secured to a load bearing wall, usually the external cavity wall. The notch is referred to as the bird's *mouth*, and its depth should not exceed one-third the depth of the rafter.



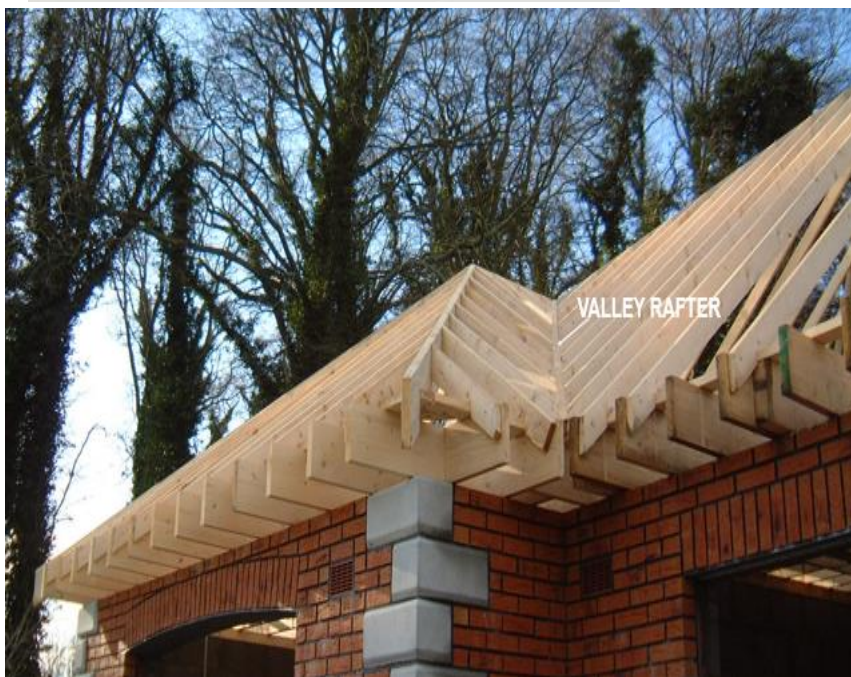




**RIDGE.** Every pair of common rafters is nailed to a ridge board at the apex of the roof

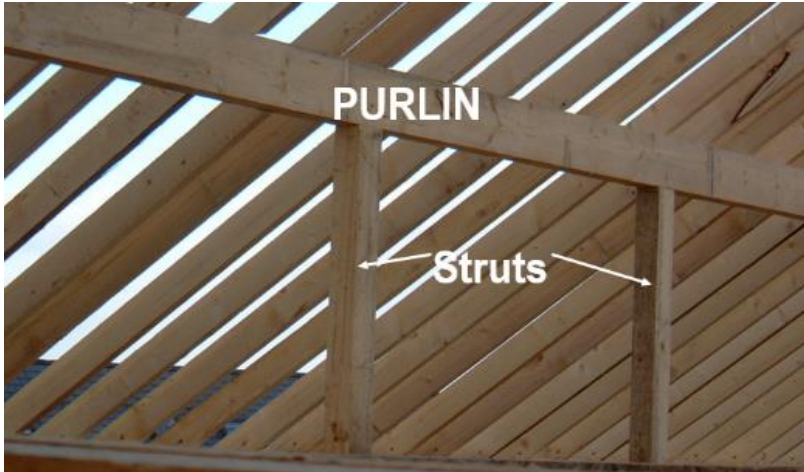
**HIP RAFTERS.** These are longer and heavier than common rafters and are located at the intersection of external angles.

**JACK RAFTERS.** These are used to fill in the area from ridge to valley rafter or from the hip rafter to the wall plate. Consecutive jack rafters decrease in length by a set amount. The longest jack rafter will be shorter than the common rafter.

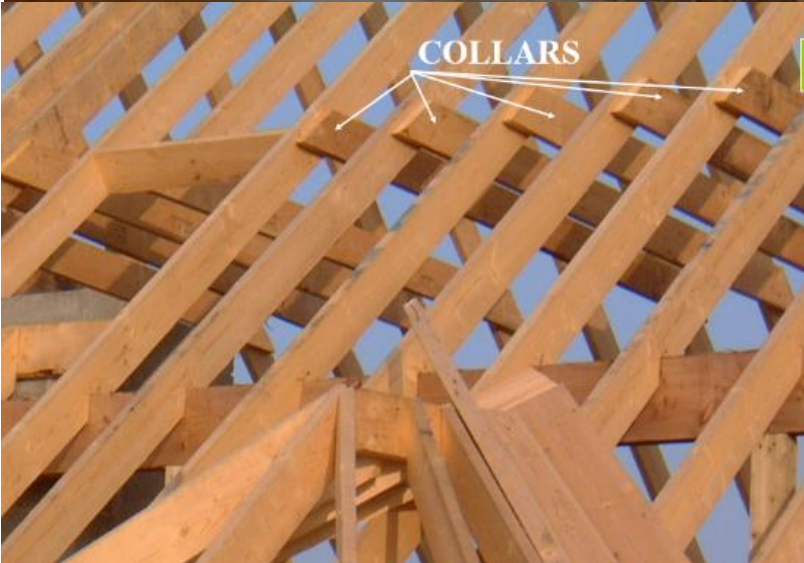


**VALLEY RAFTERS.** Similar to hip rafters except that they are located at the intersection of internal angles.

**WALL PLATES.** These are fixed to load-bearing walls using galvanised steel straps. The roof members are fixed to the wall plate. Wall plates distribute the loads evenly over the load-bearing walls.



**PURLINS.** These act as beams and provide support to the rafters. They are usually built-in to the wall in a gable roof. Purlins are supported by struts which bear onto a load-bearing wall. In a hipped roof they are mitred at the corners and supported by struts.



**STRUTS.** These transfer the loads from the purlin to roof members below. Struts are always in compression.

**COLLARS.** Usually referred to as *collar ties*, these connect the common rafters and prevent them from spreading outwards. They are usually positioned from one-third to one-half the height of the rise. Collar ties are in tension

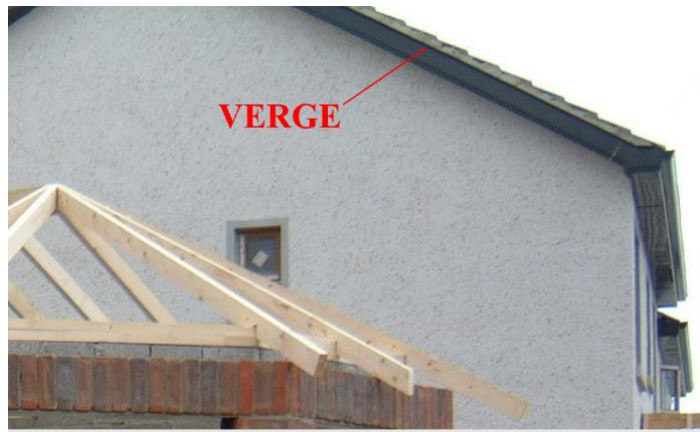


**CEILING JOISTS.** These tie the roof at the *base*, on top of the wall plate. They are connected to the rafters and to the wall plate. The spacing of the ceiling joists is important because the plaster boards, which form the ceiling, are fixed to the bottom of the ceiling joists.



**RUNNERS.** Also called *binders*, they stiffen and give support to the ceiling joists.





**EAVES.** The part of the roof that overhangs the walls.

**VERGE.** The part of the roof covering that overhangs the gable wall

**Roofing Ventilation** for roofs serves the same purpose as for all other locations, i.e. to remove water vapour and prevent condensation. Ventilation has become more important as a result of increased standards of insulation.

**Openings** should be provided on opposite side of the roof at least equal to a continuous ventilation strip running the full length of the eaves. The width of the strip depends on the roof type.

**Vapour barriers** reduce the amount of moisture reaching the roof, but are not an alternative to ventilation. Vapour barriers are fixed on the warm side of the insulation. Use 500 gauge polythene with sealed laps

