

# Types of oak frames

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Oak frames can be designed in many different ways, but can usually be placed within certain styles of design.

- Aisled Frames
- Cruck frames
- Sling braced frames
- Queen post truss frames
- King post truss frames
- Mono-pitched

When trusses are incorporated into a frame, they are usually either 'open' or 'closed'.

With an open truss, the horizontal tie beam is 'interrupted' into another timber such as a cruck or sling brace.

A closed truss, the tie beam is jointed into two braces off of principle posts.

Further, you can have collar tie rafters and ridge beam.





## Closed trusses:

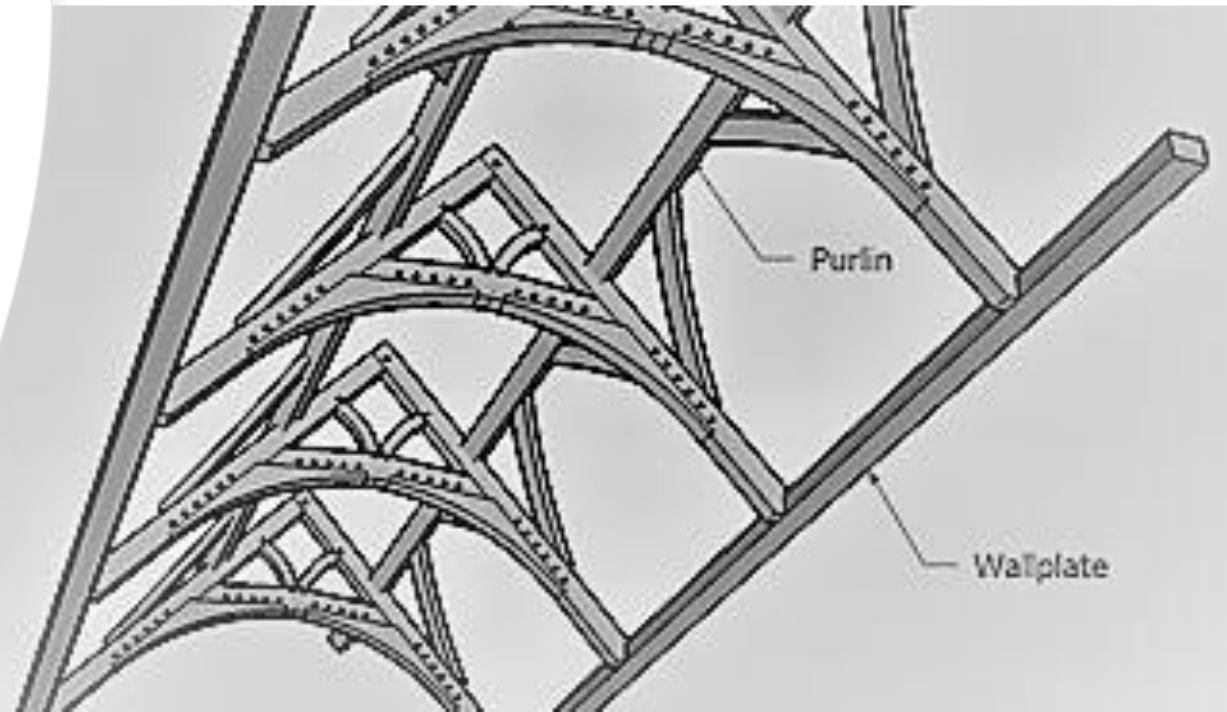
## Kings & Queens!

- Closed trusses can be further divided into two designs, a Queen post truss, and the King post truss. However, it is not unknown to have a King/Queen post truss!
- Queen post trusses have the triangular shape, with the two posts connected from the principle rafters to the tie beam or header beam.
- The king post truss has a simple central post running from the tie beam or header to either a ridge beam, or it connects to the two principle rafters.
- With a collar tie truss, the rafters are connected by a 'collar' in the top third of the two principle rafters.

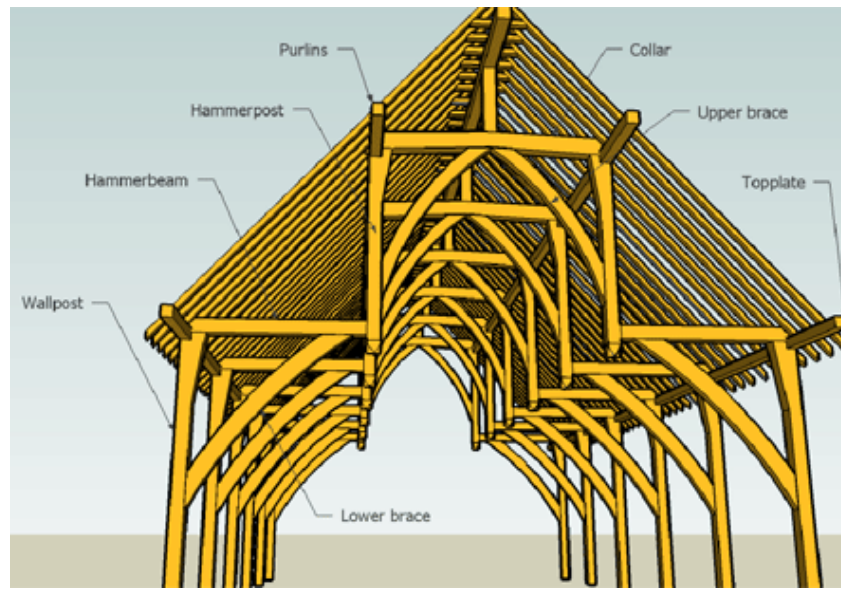
# Open trusses

Open trusses are divided in several designs too, with a braced truss, interrupted tie-beam truss, sling brace and cruck trusses.

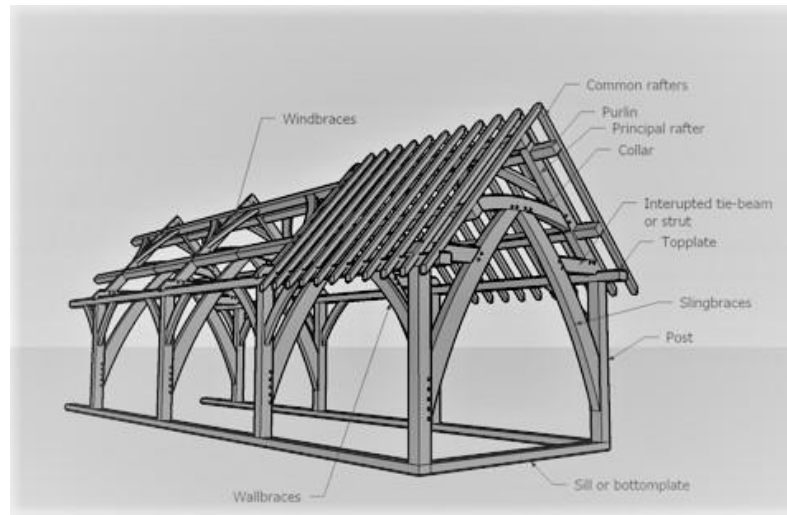
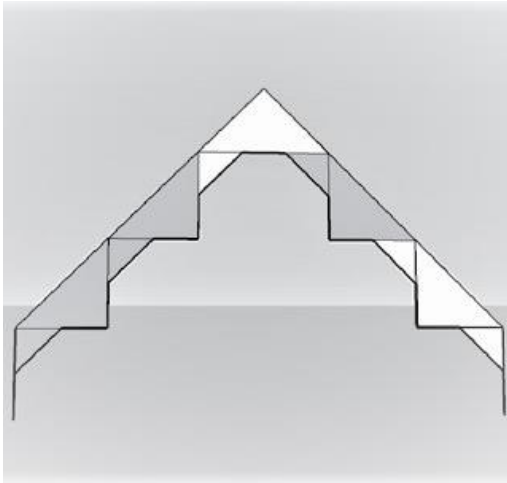
- The interrupted tie-beam truss is used when there isn't sufficient height between the floor and tie-beam. This may be due to height restrictions with planning. With an interrupted tie-beam, we are literally cutting out the middle section. The tie-beam then has to be connected to an upright principle post or some form of brace. This then stops any outward push from the rafters to the walls.
- An arch braced truss is a form of a collar truss, but with arched knee braces connected from the collar to the rafter.



# Open trusses cont'd



- The hammer-beam truss is effectively an interrupted tie-beam truss but is created with a triangular style formation. The tie-beam (hammer-beam) is connected to the hammer post, which in turn is connected into a purlin and then a collar. The interrupted tie-beam is supported with a large sling brace. This type of frame truss is a combination of several trusses in essence.



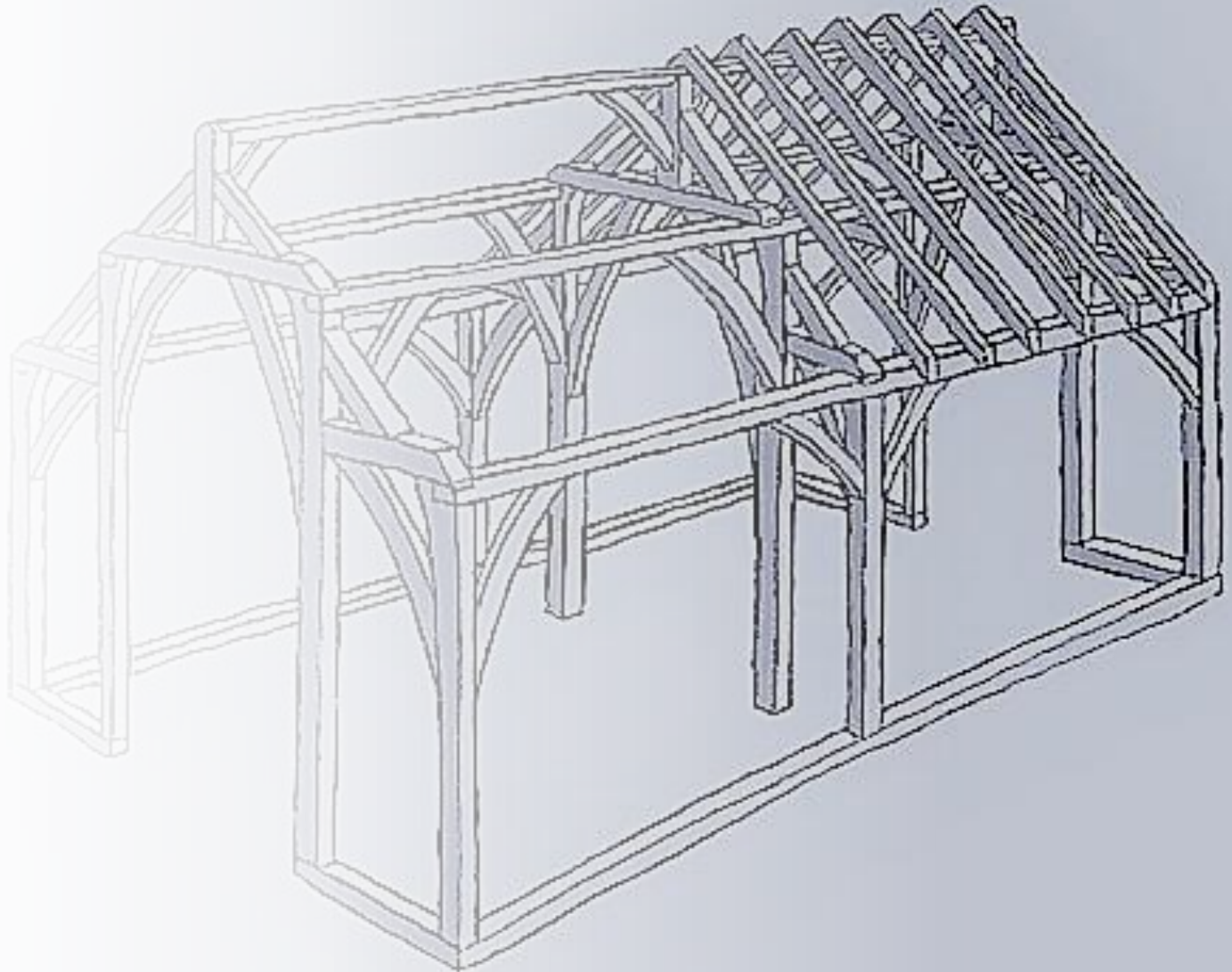
- In the sling brace truss and/or frame, two long curved braces run from a principal post up to a collar and are also connected to an interrupted tie-beam.

# Aisled Frame

This type of frame provides internal space by dividing the structure into a central nave and two side aisles.

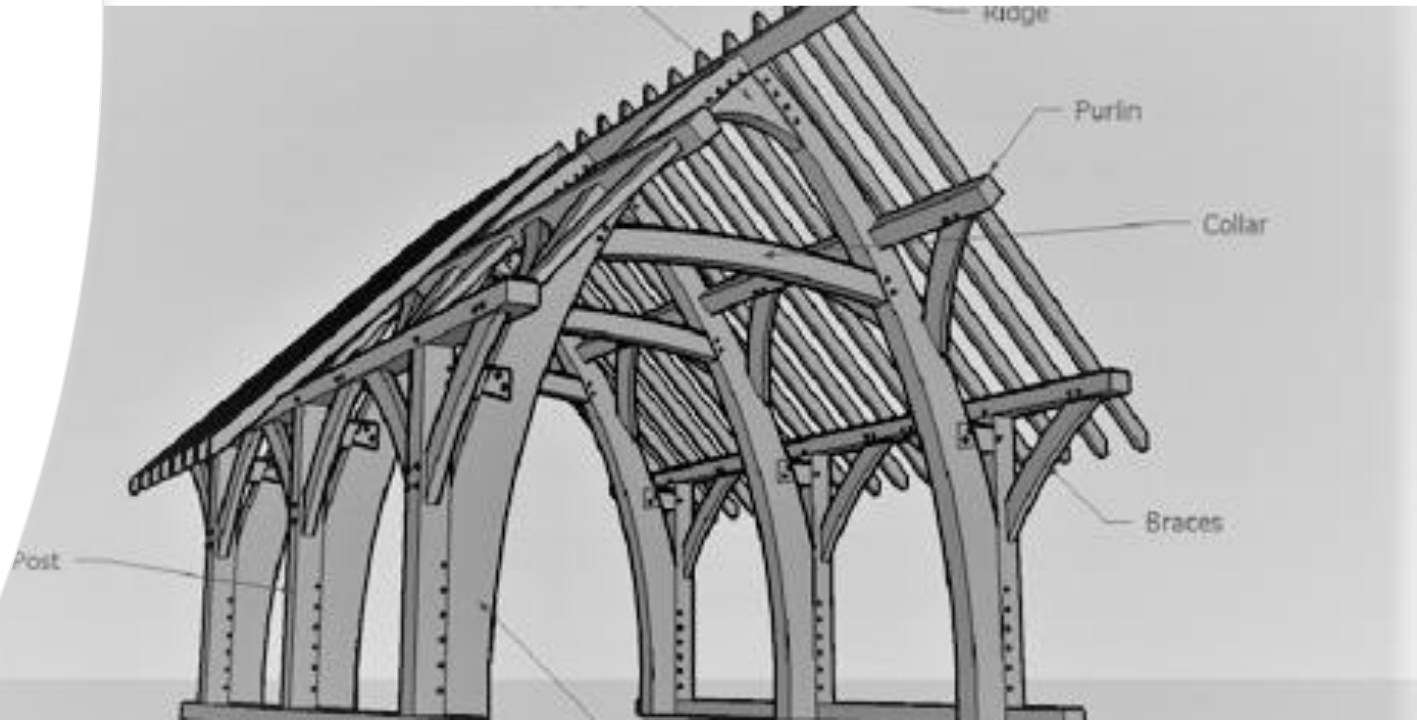
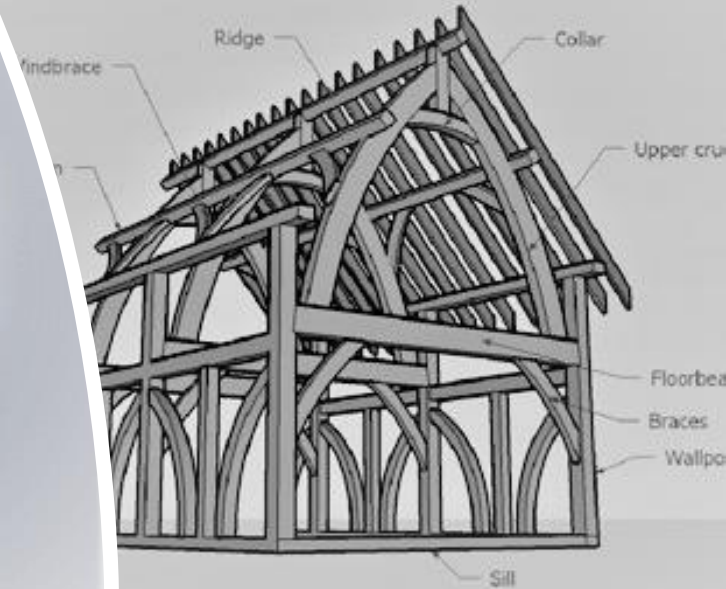
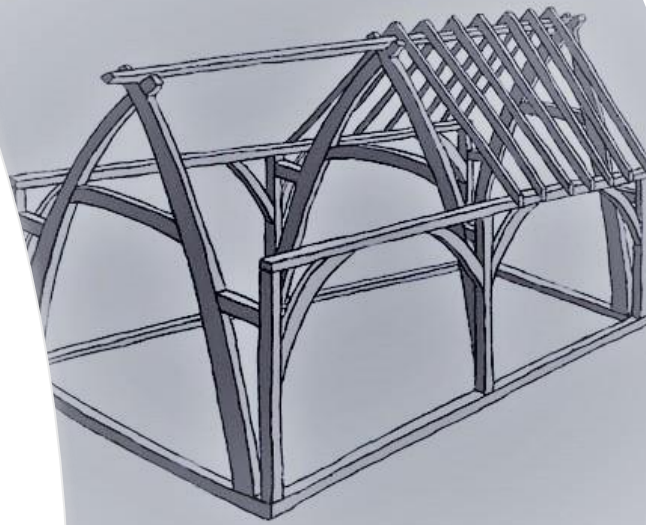
Internal wall posts, and roofed over aisles inside the main roof structure, within a primarily closed truss design.

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# Cruck trusses & frames

- A cruck frame is ideally designed with naturally occurring curved timbers, which are then spliced in half, which become two identical crucks. The strength is in the grain of the timber following the cruck.
- Alternatively you can create them by jointing pieces of oak together to form the cruck.
- A cruck frame can be from the sill plate to the ridge, a 'full cruck', over a single or two storey, or it can be formed on the upper floor only of a two storey, hence from the floor beam to the ridge.



# Collar tie truss



The collar tie (or tension tie) truss is probably the simplest of trusses. A horizontal beam is used in the upper third of the rafters (hence a 'collar' tie) to tie the two sides together. This 'tie' resists rafter spread from the ridge, or ridge beam, during moments of unbalanced loads. Those can arise from a strong wind uplift, or uneven snow loads on the roof.

# Mono-pitched

- A mono-pitched roof is a single sloping or flat roof, which typically will have tie beams connecting the front and rear sides of the frame.
- Where height is an issue for an extension, a mono-pitched is usually the answer. It doesn't have to be plane though! With the addition of either roof/sky lights, or a roof lantern, then these types of structures can often been quite striking.

