



Green Oak^{ltd} Structures

Traditional and Contemporary Timber Frames
Houses, Extensions & Roofs. Sustainable timber
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- a) It is possible to design a structural timber-frame to suit an already-planned house or extension, though this is not the most efficient use of the structural system (and can often result in a re-design of the building layout).
- b) It is better to **design the layout of the house with the knowledge that it is to be built using a structural timber-frame**. Therefore room divisions and window openings can be based on an efficient structural grid and within the capabilities of timber as a material.
- c) The timber-frame structure can be thought of as a **series of cross-frames** spanning the width of the building **at various intervals (bays)** along the length of the building.
- d) The width of the building (or cross-frame) will be between 3 and 6.5 metres. A **lean-to on the side of the building, or the 'aisle barn' design, can increase width**.
- e) It is best to place partition **walls along the frame grid**. Some spaces can be defined with posts & beams only, creating an open plan arrangement.
- f) The size of a bay (i.e. distance between cross-frames) can be approximately 2.2 to 4.2 metres (7-14 ft.) This upper constraint is to keep the span and size of the roof purlins (which rest on the A-frames) within reasonable dimensions, **An average bay will be 3.5m**. and can vary throughout the building.
- g) **Rooms wider** than the upper constraint of 4.2m (Living rooms, kitchen/dining master bedrooms) are divided into two or more smaller bays and **with their intermediate cross frames**, add character to the space.

The **timber-frame structure is diagonally braced** both across the width and along the length of the building. The roof is braced in the roof plane.

- h) Window openings should ideally be placed centrally within the bays and not too close to the frame grid as the timber-frame structure is diagonally braced. Special consideration is required in fitting the glazing to the timber frame. The **glazing system will sit on the outside face of the timber frame.(not within it)**
- i) The structural **frame is exposed to the inside of the building**, to show off it's beauty and define spaces. Each room corner should ideally be defined by a post.

- j) The **outside of the frame is often clad** in the local venacular material (stone,brick,render or timber) with insulation external to, or within the frame.This creates a fully enclosed, weather-tight and thermally efficient building. Timber-frame porches , verandas and areas of glazing will allow the frame to be shown externally
- k) To achieve the traditional **‘black & white’ look** with externally exposed timber-frame and infill panels requires carefull detailing to avoid weather ingress. The simplest method is **‘not to expose the actual frame at all’ but to simulate the frame externally with applied heavy cover- boards** fixed over it, clamping the infill panels to the outside of the frame.This allows the green oak frame to shrink in it’s width as it seasons without a gap opening up between infill/glazing and frame (which would happen if the infill/glazing was placed between the frame, not external to it.) Large areas of glazing and conservatories uses this cover-board system. Copper or lead flashing, and seals complete the detail.
- l) The frames can sit on a **variety of foundations** (concrete slab - thickened at post positions, traditional strip, and concrete pad under post), bearing in mind there are point loads at the base of each main post. On sloping sites the posts can continue to ground-level pad foundations, creating a ‘building on stilts’.
- m)After the initial planning permission drawings are completed by your architect/designer, **we will design in detail the timber-frame** for engineer & building control acceptance. These will form the workshop production drawings, from which we at Green Oak (Ltd.) Structures will fabricate your frame.

