

SBE House Design Guide 'Keep It Simple - Make It Better'



Introduction

Most self-builders are constrained by the depth of their pockets and keen to get maximum value for money. You simply want a comfortable roof over your head. What is the point of throwing money away? I have a mantra: 'Keep It Simple - Make It Better'. *NB If money is not an issue you can ignore this guide!*

You need to decide just how big your new home needs to be? Do you need a formal dining room? Can you sit in two rooms at the same time! How many bedrooms will you need, now and in the future? A young, growing, family may need to think about expanding into the roof. An older couple may need a guest bedroom, but don't plan to accommodate the whole family, if they only visit once or twice a year - a hotel is much cheaper! You may need a home office, study or workroom.

Just remember the bigger your floor area the greater the cost to build. So, keep room sizes to a minimum and aim to restrict circulation space (halls, landings and corridors) as much as possible. But don't, under any circumstances, sacrifice storage space - you will need more than you think.

Basic Layout

Your design should be based on a 600mm matrix, inside the external walls, so as to make best use of sheet materials (plasterboard, chipboard flooring, etc.) and suit basic timber frame panel production (if applicable) and roof truss centres. Therefore, main internal spans will typically be 6000 / 6600 / 7200 / 7800mm and so on.

Projections off the main house such as a porch, utility, conservatory, etc, (where spans will typically be 1800 / 2400 / 3000 and so on) are best positioned so that the eaves are at the same level as that of the external wall. This eliminates the added cost and potential maintenance issues of walling and damp-proofing to steps between roofs.

Where attic trusses are to be used the maximum unsupported span should be 7200mm. Where fink trusses are to be used the maximum span will be 9000mm. In two storey houses the maximum span for standard first floor joists will be 4200mm. Greater spans can be achieved by using ply web I-joists or metal open web joists, but these are more expensive. Storey heights will be 2400mm.

Roofs

Ideally, roof forms should be restricted to mono and duo-pitch styles. Hip-ends and the like should be avoided.

The maximum roof pitch will be 45° and within an attic trussed roof, the minimum wall height (at the bottom of the coomb) will be 1200mm.

To provide maximum flexibility for room layouts, use multi-ply girder trusses at roof intersections, in preference to load-bearing partitions. But, with larger spans there can be structural issues and any load-bearing partition below the girder (to reduce the span) will be helpful.

Glazed roofs to conservatories and other sun spaces will have glazing bars positioned at maximum 750mm centres. Ideally, sun spaces will be positioned so that the roof is an integral part of the main roof and can be flashed on three sides.

Windows

Windows come in many styles, shapes and sizes. But, to be cost effective, they should contain the least number of divisions and opening lights, be of regular shape (square or rectangular) and sized such that they do not require toughened glass.

In general, side/top-hung casement windows (side-hung with easy-clean / egress hinges, above ground floor) are to be preferred because they perform best. However, it is important to note that the maximum size for a side-hung sash is 600mm wide x 1500mm high and for a top-hung sash 1200mm wide x 1300mm high. Side-hung casement windows can also be supplied with double 'French' sashes, to provide means of escape through narrow windows (under 1200mm wide), if required. Alternative window types available are the top-swing (outward opening / fully reversible) and tilt- turn (inward opening) - maximum sash size (for both) 1200mm wide x 1500mm high / 1500mm wide x 1200mm high. Subject to appropriate sizing both these window types provide means of escape.

Entrance Doors

Single doors should be no wider than 1000mm and double 'French' doors no wider than 1800mm. Sidelights may be provided, but are a waste of money if too narrow. Patio doors should be no more than two panel (one fixed / one opening) and no wider than 2400mm.

Patio Doors

Standard patio doors come in either in-line slider or tilt and slide styles which can be manufactured up to 2400mm wide x 2135 high. Doors can be joined together and can be supplied with coupled sidelights to provide wider glazed areas.

A modern alternative to the standard patio door is the lift and slide patio door which, being much heavier (and expensive) in construction, can be manufactured up to 6.0m wide and 2.4m high.

These days there is a craze for multi-panel folding and sliding doors (also known as bi-fold doors). But, in my opinion, these are simply not fit for purpose in the UK and the easiest way to waste money. (See ['Beware The Bi-Fold Door!'](#))

It should be noted that openings over 3m wide may cause structural issues with standard lintels requiring intermediate support or the opening being framed with steelwork, at additional cost.

Bay Windows

Bay windows may add aesthetic appeal but they are disproportionately expensive for the practical benefits derived. Consequently, they should be used sparingly and square bays are preferable to angled bays. Bays should be provided with structural timber frame corner posts and a ring beam, to support the roof. Roofs however small, should not be supported on windows alone.

Dormer Windows

Dormer windows, like bay windows, may add aesthetic appeal but they are extremely expensive in relation to the additional floor area provided. Moreover, they will give rise to medium / long-term maintenance liabilities. Here again, they should be used sparingly.

A 3-ply girder roof truss needs to be provided each side of a dormer and the internal width of a dormer will be 1150 / 1750 / 2350mm and so on. Dormers should also be positioned such that the opening coincides with standard truss spacings.

Where dormers occur on opposite sides of the roof it is important they are positioned directly opposite each other, so as to maximise the use of the girder trusses. Under no circumstances should dormers on opposite sides of the roof over-lap each other, since this layout increases the distance between the girder trusses and creates structural issues.

Splayed dormers and dormers with side windows should not be used. Wherever possible, you should use either a gable window or 'Velux' style roof window in preference to a dormer.

'Velux' Style Roof Windows

Wherever possible models CK02, CK04 and CK06, which fit between trusses, should be used. Certainly for stairwells, landings and bathrooms / en-suites, these sizes are perfectly adequate. In bedrooms, especially where a means of escape in the case of fire is required, larger windows may have to be used.

These larger 'Velux' style windows require a 2-ply girder truss each side and, as with dormer windows, will ideally be positioned directly opposite each other (or a dormer window) and must not over-lap when on opposite sides of the roof.

Staircases

Ideally, for a standard 2.4m storey height, stairs will have 14 steps with a going of 225mm and a rise of approximately 190mm (40° pitch). Where standard attic / stub attic trusses are employed stairs should run parallel to and not across the roof trusses and be positioned such that the opening coincides with standard truss spacings.

In Scotland, the building standards impose requirements which greatly restrict stair layouts. A minimum width of 900mm means a dog-leg staircase will no longer fit between standard (1750mm) truss spacings. This is unfortunate because this stair layout is not only very popular it is also a very neat design solution, particularly in one and a half storey houses. So, whilst I would not suggest this layout should be avoided it is, perhaps, more cost effective to open it up to fit between 3 truss spacings (2350mm), rather than introduce additional trusses.

The optimum layout will be a straight flight because it simplifies the provision of a stairlift. However, this together with the stairlift parking / transfer requirements and landings will be difficult to accommodate within narrow span designs. Winders at the top and / or bottom may alleviate the problem, but it is something which needs to be given considerable thought. These stair layouts should fit between two truss spaces (1150mm).

Internal Doors

Room doorsets (including those for kitchens, bath/shower rooms and cloakrooms) are based on an 826mm wide door leaf and have an overall width of 895mm (900mm wide opening in partition) for a single doorset. Double door sets have an overall width of 1725mm (1730mm wide opening in partition). Ideally there be a minimum 50mm nib either side of the door to accommodate the architrave. All doors must be full height (nominally 2100mm) over their full width.

The use of single / double glass doors is preferable to internal glazed screens. Sliding, bi-fold and other non-standard door types should not be used for room doors.

Cupboard / wardrobe doorsets are based on a minimum 726mm wide door leaf. Alternatively, if cupboards / wardrobes are over 1200mm wide (internally), you may use a sliding door system which offers three optimum widths being 1200 / 1800 / 2400mm. But, any width between 1200 and 2400mm can be accommodated. This system will also produce shorter doors for situations where a full height door cannot be accommodated e.g. under coombs. Doors with a shaped head should be avoided.

Wardrobes are usually 600mm deep (internally) and within rooms in the roof should be positioned parallel to the coomb. Wardrobes at right angles to the coomb may not be able to accommodate a full size door and make access (over the full width of the wardrobe) awkward.

Garages

Integral garages should be constructed to match the house. Attached garages (with or without a door from the house) and detached / linked garages can be of block and pier construction with a block on flat (220mm thick wall at the front, either side of the main door).

Garages should be a minimum 3.0m wide and 6.0m deep, with vehicle door opening(s) restricted to maximum width of 2400mm. Wider door openings may cause problems in strong winds.