

Norscot Kit Homes



Design Guide

Introduction

If none of our standard designs (or variations thereof) match your vision of a dream home, why not design your own? This guide sets out to explain the process you need to follow.

To begin with, you must have a site. It is extremely unlikely that the house design you come up with can simply be plonked on the site when you get it. In all probability, it will just end up being a bad design, based on unnecessary compromises.

Before buying your site you need to undertake a full site assessment. Download our [Site Assessment Checklist](#) to guide you through the process. This will establish if the site is suitable for your requirements and determine the ideal position and form of your new home.

At the same time it is advisable to consult the Local Development Plan (LDP) which your local authority will have drawn up. This should be available to view on their website. The LDP will set out the planning policy for building homes in your area and may provide useful design guidance.

We also recommend you consult Planning Department staff to make sure they are happy with what you are proposing. Print off our website page for the standard house design which most closely represents what you have in mind, as a guide.

Armed with this information you can now set about designing your dream home.

The Budget

It is important to bear in mind the available budget when designing your new home. Just remember the greater the floor area, the greater the cost.

Avoid wasting space. Do you need big bedrooms and bathrooms? A poor layout may create long corridors. Have you minimised circulation space?

Also, try to keep the plumbing in one area. If this is not possible keep the number of areas to a minimum. Keeping kitchens, utility rooms, bathrooms and en-suites close together will reduce pipework and reduce cost.

Whilst large houses are best designed in multiple blocks, to reduce mass and minimise circulation space, it should be noted that roof junctions add cost.

The Basics

Ideally your new home will maximise the benefits of natural light and solar gain. It is important to remember the sun rises in the east, passes through south and sets in the west.

All dayrooms (kitchen, dining, sitting) should face south / west. The only exception might be where there is a particular view you wish to capture, in which case rooms should be double or triple aspect so as to get at least one window facing south.

If you want early morning sunshine to enter bedrooms they need to face east. Utility rooms, bathrooms, en-suites and stores, which do not need much natural light can face north. Similarly, an attached garage should be positioned on the north or east elevation.

Layout

Design, is not merely an exercise in creating aesthetic appeal, it must offer a practical and cost effective solution. In the case of timber frame homes, designs should be based on a 600mm grid, inside the external walls, so as to make best use of sheet materials and suit basic timber frame panel production and roof truss centres.

Your design will comprise one or more 'blocks'. The main internal spans will typically be 6000 / 6600 / 7200 / 7800mm and so on. The blocks may be any length (based on a 600mm increment). The width of secondary / projecting blocks off the main block cannot be wider than the main block, so as to maintain the same roof pitch.

Where attic trusses are to be used the unsupported span should be no greater than 7200mm. In two storey houses the span for first floor joists should not exceed 4200mm. The optimum storey height is 2400mm.

Insert the internal layout of the rooms, working all dimensions inside the external walls. Allow 100mm for all internal partitions and a minimum width of 1100mm for corridors. The overall width of internal doors and frames will be 900mm (single) and 1730mm (double). Built in wardrobes will be 600mm deep (internally).

When designing the internal layout it is helpful if you can visualise the end result in 3D. Because at one and the same time as deciding where you want rooms you need to consider the impact windows, etc. will have on the elevations. As well as being right on the inside, you want your home to look right on the outside.

External Walls

Wall finishes can be whatever you want. The external skin is there simply to provide character and weather resistance. It is not load-bearing. Ideally, the external wall finishes will reflect local vernacular or otherwise be sympathetic to the surroundings of your site.

If building on poor load-bearing ground you may wish to consider simply cladding the structural kit with, for example, timber weatherboarding. This will reduce weight and simplify foundation design. This form of construction is ideal DIY self-builders since it requires no specific skills. A mix of external wall materials may enhance the design.

Roof

Ideally, roof forms should be restricted to lean-to, mono-pitch and duo-pitch styles. Hip-ends and the like are expensive and should be avoided, unless critical to the design concept. Where multi-directional roof layouts are planned, sufficient support must be provided at roof intersections.

The maximum roof pitch should be 45° and within an attic trussed roof, the minimum wall height, at the bottom of the coomb (sloping ceiling), needs to be 1200mm, to be of practical use.

As with external wall finishes the roof finish can be whatever you want. Similarly, it should reflect local vernacular or be appropriate to you surroundings.

Again, if building on poor ground, weight can be saved by using something like plastic coated profiled steel sheeting. This finish works well with timber cladding and, again, requires no specific skills.

Windows

Windows are available in a range of materials, styles, shapes and sizes (visit www.norscotwindows.co.uk, for full details). But, individual windows / screens should be restricted to a maximum overall size of 3m in any direction, to limit wind movement. However, windows can be joined to produce larger glazed areas. Upstairs windows will need to provide adequate means of escape, in the case of fire, and be cleanable from the inside. At least one external door will need to provide wheelchair access.

Bay windows may add aesthetic appeal but are disproportionately expensive for the practical benefits derived. Consequently, they should be used sparingly and square bays are preferable to angled bays.

Dormer windows, like bay windows, may add aesthetic appeal but 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.

Dormer windows are supported on multi-ply girder roof trusses. So, to keep cost to a minimum, dormers occurring on opposite sides of the roof should be positioned directly opposite each other. Roof windows, such as those supplied by 'Velux' are much cheaper than dormer windows.

Within certain parameters we can make windows to more or less any style, shape and size. However, individual windows are restricted to a maximum overall size of 3.0m wide x 2.1m high.

In general, our preference is for side/top-hung casement windows. 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. 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.

Entrance Doors

External doors are available in a wide range of materials, styles, shapes and sizes (visit www.norscotwindows.co.uk, for full details) and come as pre-hung door sets, ready to simply fit in the opening. Door sets will be 1000mm wide x 2135mm high for single doors and may be up to 1800mm wide x 2135mm high for French doors. Sidelights are available, but a waste of money if too narrow.

Patio Doors

The only patio door available is the tilt and slide style in PVCu type which can be manufactured up to 2400mm wide x 2135 high. Doors can be joined together and we can supply coupled sidelights to provide wider glazed areas. It should be noted, however, that openings over 3m wide may cause structural issues with lintels requiring intermediate support.

Bay Windows

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'Velux' Roof Windows

Wherever possible models CK02, CK04 and CK06, which fit between trusses, should be used.

If larger 'Velux' windows are desired a 2-ply girder truss will be required each side.

Where 'Velux' windows are desired on opposite sides of the roof it is important they are positioned directly opposite each other and not over-lapping, so as to maximise the use of the girder trusses.

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). There must be a minimum 50mm nib showing either side of the door opening.

The use of single / double glass doors is preferable to internal glazed screens. Sliding and other non-standard door types may be used for room doors.

Cupboard / wardrobe doorsets are based on a minimum 726mm wide door leaf and have an overall width of 795mm (800mm wide opening in partition) for a single doorset. Double door sets have an overall width of 1525mm (1530mm wide opening in partition). There must be a minimum 50mm nib showing either side of the door opening.

Alternatively, if cupboards / wardrobes are over 1200mm wide (internally), you may use our own sliding door system which offers three optimum widths being 1200 / 1800 / 2400mm. But, any width between 1200 and 2400mm can be accommodated.

Staircases

Where 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. The Building Standards impose requirements which greatly restrict stair layouts. The optimum layout will be a straight flight, but there must be a minimum 2 metre headroom above the stairs and associated landings.

Garages

Integral garages will be of timber frame construction, to match the house (allow 200mm for the wall between house and garage). If the Garage is intended to house a car – which they rarely are these days! – it needs to be a minimum 5400mm deep.

The maximum width of main door opening(s) will be 2400mm.

Heating

Norscot Kit Homes are built off a concrete floor slab. This floor slab creates a heat store and is the ideal base for warm water underfloor heating. Although not the only acceptable heat source, we recommend the use of an air source heat pump. A full design service for self-builders is provided by Nu-Heat (www.nu-heat.co.uk).

Ventilation

Building regulations require new homes are built with low leakage rates, making them more energy-efficient. More air-tight construction methods can result in poor indoor air quality as condensation and pollutants generated from cooking, cleaning, washing and bathing remain trapped inside the home.

Norscot Kit Homes are designed to achieve very low rates of air leakage. So as to counter-balance this scenario we recommend the installation of mechanical ventilation with heat recovery (MVHR), which offers year-round, whole home ventilation that will remove condensation and pollutants, improving the indoor air quality, whilst recovering the heat that would otherwise be lost outside.

A proven low-energy and highly efficient ventilation method, MVHR is fast becoming the most common method of whole home ventilation for new build properties. MVHR systems work by combining supply and extract in one unit. Moisture-laden, stale air is extracted from 'wet' areas, such as kitchens and bathrooms. The heat from this stale air is recovered via a heat exchanger, and this tempered air delivered into the living areas of the home.

A full design service for self-builders is available from Nuaire (www.nuaire.co.uk).

Conclusion

Norscot has a strong bias towards the self-build market, where it believes it can add most value and enhance customer service. We have over 30 years' experience in the design, manufacture, delivery and erection of timber frame houses. Consequently, we have a clear understanding as to what works, and what doesn't, in practical terms. Many self-builders have no previous experience and very little knowledge. Where necessary, we provide a certain amount of 'hand-holding', particularly with regard to the initial design."

The Next 25 Years!

U-values and airtightness for the building fabric are going to continue to become more demanding which will necessitate the use of mechanical ventilation with heat recovery. The Government's ambition is to achieve total-life zero carbon buildings by 2030.

In reality, this means south facing elevations of houses will need large areas of glass, to harvest heat from the sun, solar thermal roof panels for water heating and solar photovoltaic (PV) roof panels to produce electricity. Other renewable energy features may need to be provided too, such as ground/air source heat pumps and wind turbines.

The ideal building form will be a two storey rectangular box, with large areas of glass on the south elevation and the least number of small windows on all other elevations. Houses will need to be airtight and highly insulated. The ultimate design will produce a 'passive' house, requiring no heating, except for a wood burning stove or similar in the sitting room. The outcome will be houses which are significantly more expensive to build but very cheap to run.

Norscot is currently developing a range of eco homes, with new forms of wall construction and a package of renewable energy options, which will meet or exceed future building standards.