A BUILDING REGS' GUIDE TO:
LOFT CONVERSIONS

Keen to extend upwards, but unsure how to keep on the right side of Building Regs? Building control officer Paul Hymers explains all

Paul Hymers

Paul Hymers has been a building control officer in Kent since 1984 and has written eight books on home improvements and developing, including the best-selling *Home Extensions – The Complete Handbook*, now in its fourth edition.

Loft conversions are an excellent way to create space in your home and are far more cost effective than extending. Regional variations aside, many can be completed for around £20,000 and provide that essential study or extra bedroom. However, before you begin, it is essential to understand what complying with the Building Regulations will entail and how it will affect the layout of your home.

Existing Structure

To begin with, some additional weight will be applied to the structure. Although it may amount to only a modest increase, your home needs to be able to support it without consequence. Existing foundations should be exposed and checked, together with any beams or lintels that will be asked to carry significantly more weight. Your building control officer will also want to see that these elements are satisfactory, so dig a small hole to expose the foundations first.

Most two-storey house built before the 1960s have a central internal wall that is load-bearing already, known as the spine wall. It supports the first floor joists and often continues up to roof level to support the roof ceiling joists and rafters via struts to purlins. This spine wall is therefore ideally placed to support the new floor joists in your loft, so establishing that this wall is load-bearing is a good place to start. If it isn't, underpinning works will be necessary and that could double your budget before you start. In practice, it is often the more modern homes that lack spine walls, together with some bungalows built in the earlier part of the twentieth century.

If the wall is known to be loadbearing but has been opened up on the ground floor to create an open plan room, then the RSJ or beam installed will need to be appraised by a structural engineer to see if it can accept increased loading or if it needs to be replaced.

Head Room

If you have engaged an architect, invite them to illustrate clearly how much headroom there will be across the floor once it is completed. Some people are disappointed by how much floor space they actually have that they can stand up in and on plans this isn't always conveyed.

The Building Regulations impose no minimum ceiling height for habitable rooms. The headroom standard for stairs applies, but can be relaxed to 1.9m or 1.8m on the edge of a stair if necessary. Ideally the new stair will need to rise above the existing one and not from within an existing bedroom, if you are only creating one additional room in the loft and so it follows that the existing staircase headroom must be preserved.

Without the roof space for water tanks and plumbing, the heating and hot water system may have to be replaced with a sealed system. Unvented hot water cylinders make a better choice than replacing the boiler with a Combi (combination boiler) but they do take up cupboard-size room and you will have to find it somewhere.

Loft conversions always need approval under the building regulations (aside from whether planning permission is needed or not) and it pays to adopt the full plans application approach and have a detailed scheme approved before you find a builder. Having an approved design will take much of the risk out of the work and also allow any builder the chance to give you a fixed quotation, rather than a vague estimate. Your Building Control surveyor will also inspect the work at various stages and on a final inspection be able to issue you with a completion certificate. It makes good sense not to settle any final accounts until you have received this. If your home is semi-detached or terraced don't forget to notify your neighbour of your proposals, which will usually fall under the Party

Wall (etc.) Act 1996 requirements if you are building in beams to bear on the party walls.

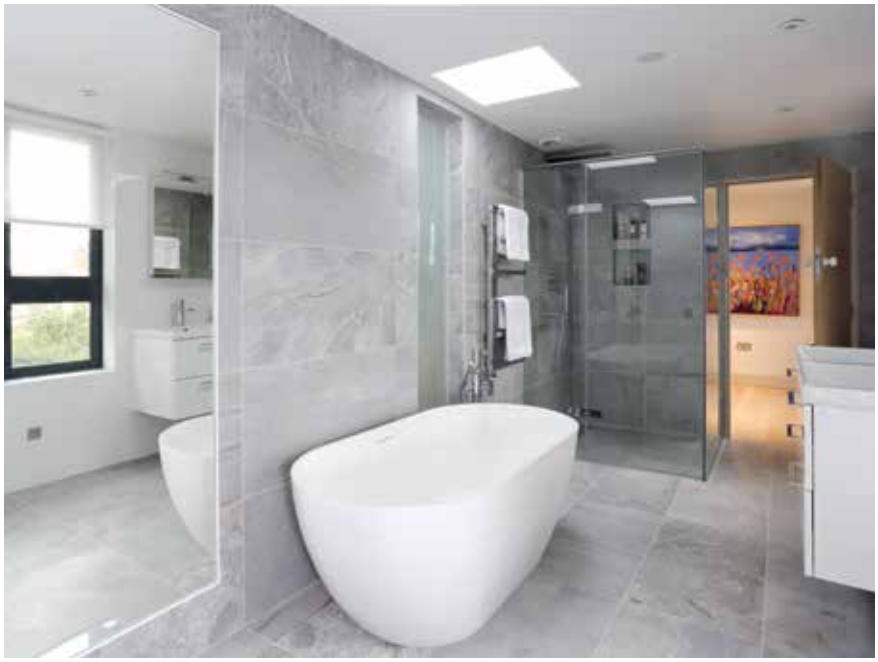
Altering the Roof Structure

Most roofs are constructed with some internal support struts in the loft, propping up the rafters and purlins in traditional cut and pitched roofs, and making up the web of braces in modern trussed rafter roofs. All have to be removed to make way for the new room and in some way replaced with new supports that don't impose on the space.

There are many ways of altering roof structures for loft conversions but they all have common elements to the design. The first is the ceiling joists that will almost certainly be inadequate for use as floor joists. Planting new timbers on top to increase them isn't considered acceptable and so new floor joists are usually installed alongside them instead, slightly raised above the ceiling plasterboard to avoid contact with it. These joists (often 200mm or 225mm in depth) will rise above the tops of the current ceiling joists, to form the new floor structure. Depending on their span, they will bear either directly on to the existing wall plates of external and internal load-bearing walls, or onto newly installed beams. In smaller lofts, it is often the case that the floor joists themselves will be used to support the sloping rafters. This is made possible by constructing a dwarf timber stud wall (known as ashlaring) between the two; invariably these walls are only 1m to 1.5m high. With the supporting ashlaring in place, the internal struts and braces can now safely be removed.

Skylight windows are much easier to build in since they require little structural alteration. The rafters either side are typically doubled-up and trimmed across the top of the opening. Dormer windows, on the other hand, are structures in themselves. At the rear of many homes they can fall into your 'permitted development' quota and not require planning permission. At the front, they would require planning permission, which is why skylight windows often appear on the front elevation instead.

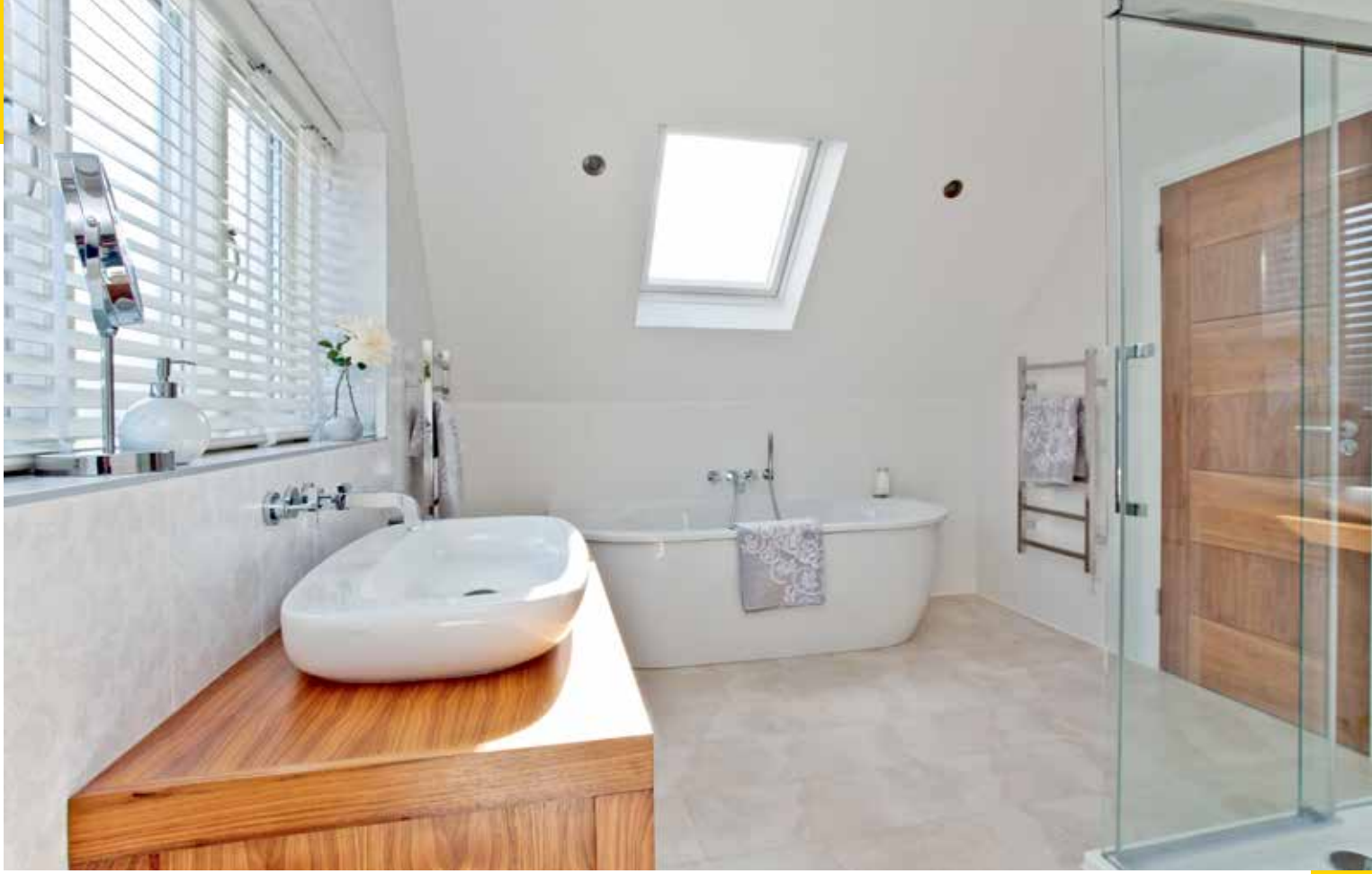
A dormer window on one side of the roof can be essential to maximise the headroom in the loft and provide a usable space, but if they occur on one side only (i.e. the rear elevation) the dormer roof will need to be supported at the apex point (ridge.) A ridge beam is installed beneath the apex before the dormer roof joists can themselves be fixed in place ➤



Master Suite

A previous loft extension in the 1970s had resulted in a basic home office, but the space was dark and poorly designed. So the homeowners of this Edwardian semi-detached property extended the loft further into the pitched roof (TOP) before creating a master suite with bedroom, dressing room and ensuite (ABOVE).

IMAGES: TONY TIMMINGTON



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and the roof weathered. It is at this stage, when the dormer windows are being constructed, that the roof is exposed to the elements and good temporary sheeting is needed to protect your home against the weather.

Insulating against Sound

The new floor needs some soundproofing, which can be easily achieved by a mineral fibre quilt laid between the joists. Use the heavier, denser sound insulation quilt and not the lighter thermal insulation material, which is of no help here. The same goes for any internal stud partitions between bedrooms or bathrooms. It might seem odd, but you may also need to consider insulating any party walls you have with your neighbours, both against heat loss and noise. A wall lining of timber studwork and mineral fibre insulation will allow you to achieve both and it can be covered with sound-rated plasterboard.

Stair Geometry

The new stairs are invariable tricky to design, since space for them is often tight. Narrow winding flights might be acceptable for Building Regulations and single rooms can have stair widths as narrow as 600mm. However, this can make it difficult to get furniture up. Purpose-made staircases are around ten times the cost of standard (off-the-shelf) ones and so it pays to consider all your options before you order. It is also worth having the design approved by your Building Control body before you commission them. Ask your joiner or builder to email them a copy for approval before they are fabricated.

Upgrading for Fire Safety

Loft conversions on bungalows that convert it to a two-storey home will have little effect on the fire safety, beyond making sure that the new windows are large enough and low enough to escape from. Egress window open-

New Bathroom
A loft conversion in a 1960s chalet-style bungalow in Surrey has replaced a dark and cramped loft storage space (LEFT) with a light and airy bathroom (ABOVE).

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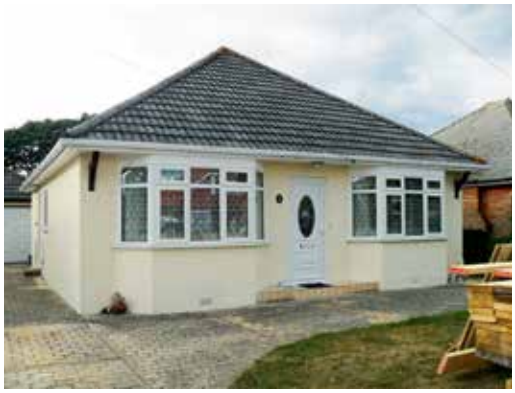
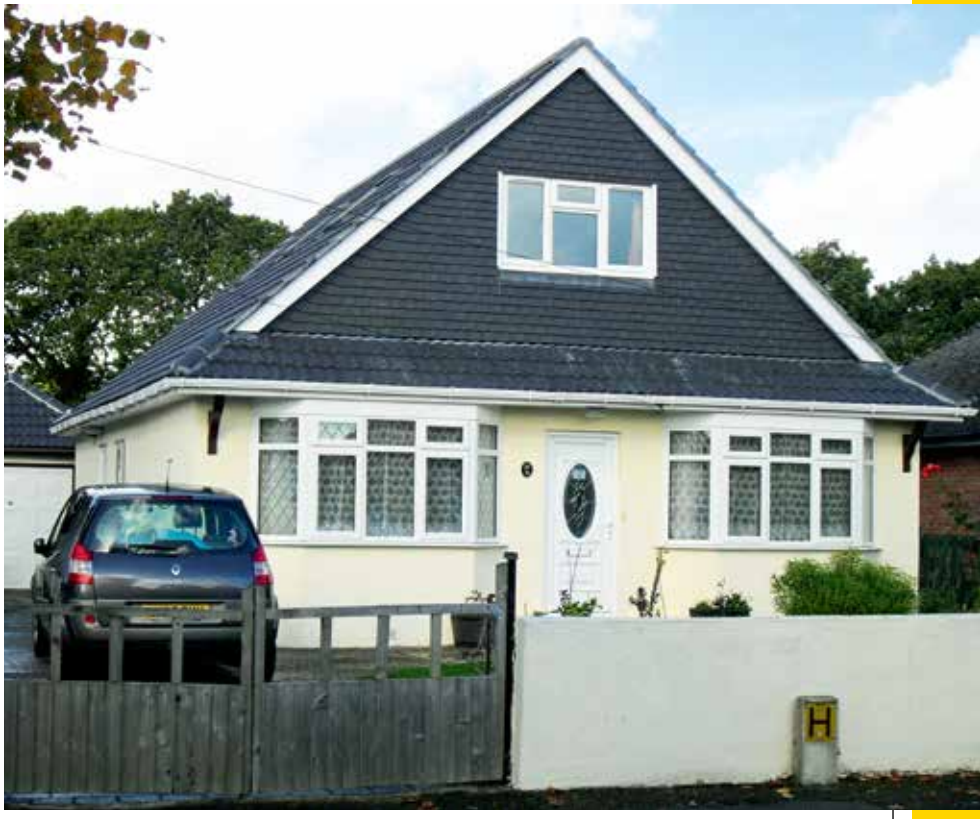




ings are needed to serve all first floor habitable rooms, but not bathrooms. Openings should be at least 450mm x 450mm and at least 0.33m^2 in area.

Rooflights are usually top opening and seem lower than you might expect, so ensure the bottom of the opening is between 800mm and 1,100mm from the floor.

For a house where two storeys become three, escape windows over 4.5m from ground level are not viable. Instead, Building Regulations require a protected stair enclosure right down to the final external door exit. If your home has its staircase rising from a room, rather than a hall, this becomes a problem for the new second floor.

If it can't be entirely enclosed within a hallway to the door, then it might still be possible to enclose it in a lobby at the base of the stairs from which two separate doors offer a choice of either a front or back route of escape. These doors and the lobby walls will need to be fire-resisting and most likely open outwards into the rooms to avoid fouling the bottom of the stairs but if they create viable options for escape, should a ground floor fire break out, they will be acceptable.

The new floor joists will need to offer at least 30 minutes' worth of fire-protection, which could mean re-plastering the ceilings in those first floor rooms below. The loft room will also have to be separated by a fire door, either at the top or bottom of the new stairs.

Since 1 April 2007, door self-closing devices are no longer required in homes, as they have proved to be a risk to children's fingers. To compensate for this, the existing doors on the stairway to both ground and first floor should be able to provide 20 minutes of fire resisting or be replaced. They can't contain glazing, so instead external windows or rooflights are needed to bring daylight to the stairway.

As part of the electrical installation, mains-powered smoke alarms should be installed on each floor of your home. These should be interlinked so that they all sound off when one is activated. Most have a re-chargeable battery as a back up that allows the supply to be extended from a lighting circuit if necessary. Wireless, radio-linked alarms can be fitted if you can't hardwire to the ground floor ceiling.

Insulating Against Heat Loss

Inevitably loft conversions lose some headroom, not only from the floor structure coming up but also the insulated ceilings coming down. In particular, the sloping ceiling to the rafters must be insulated to achieve a maximum U value of 0.18 W/m^{2}k (the same standard as a dormer flat roof.)

With the tiling left in untouched, phenolic foam insulation boards can be cut and fitted between the rafters leaving a 50mm air gap beneath the roofing felt for ventilation, but that is rarely enough. A second layer of more insulation beneath them is usually needed to get to the required U value.

Since the plasterboard will have to be fixed through the bottom layer of insulation into the rafters, this under-layer thickness needs to be kept to the minimum and it can pay to use a multi-foil laminate here. They are thinner and can also buy you some valuable headroom. The ashlare walls and dormers will also need insulating with similar products before they are plasterboarded.

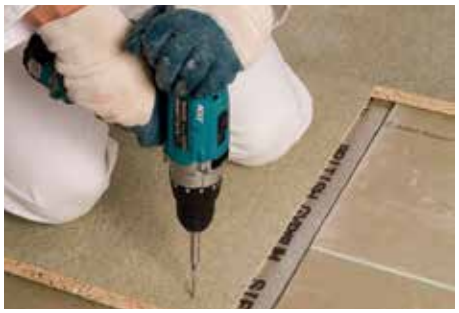
Hip to Gable Loft Conversion
With an existing extension to the rear of the property and a roof in need of repair (ABOVE LEFT), the Davidsons decided that a loft conversion (ABOVE) would be a more cost-effective option. The homeowners used design and build specialist Room Maker for the project, which involved replacing the old hipped roof with a larger gabled roof and increased ridge height.

Loft Conversion Solutions

We talk to industry experts about the latest solutions to some of the most common loft conversion challenges, from noise levels to converting lofts in period properties

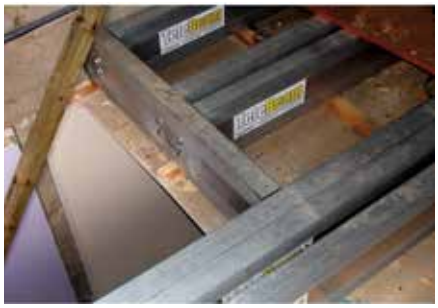
1 Soundproofing Route

British Gypsum's Silent Floor solution is achieved by removing and lifting the existing floor and skirting boards and placing 100mm Isover acoustic insulation placed between the joists. Gypframe SIF1 channels are then located over the joists and 19mm Gyproc Plank is cut to fit between the joists and laid onto the flanges of the floor channels. The walking surface is re-laid with all fixings into the flange of the floor channel, avoiding any fixing entering the joists. British Gypsum's Paul Howard explains: "Silent Floor will help any loft reduce the transference of noise between rooms. Think about how you will use the room, as this will ensure that the system is fit for its intended purpose and your investment will pay dividends in the long run. By using Gypframe SIF1 Channels, Gyproc Plank and acoustic insulation you will have a retrofit solution that will exceed Building Regulations."



2 Structural Considerations

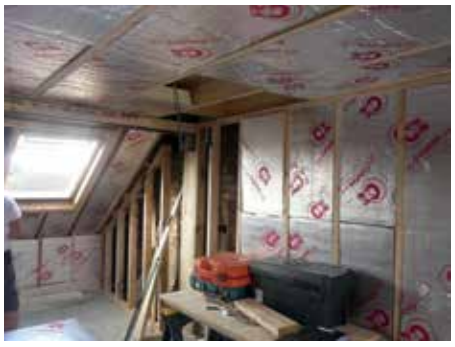
Craning in heavy steel beams into loft spaces can be challenging, says Digby Rowsell, who invented the Tele-Beam system of extruded aluminium beams to overcome the problem. He also points out that steel beams would not be suitable for houses with a T or L shape floorplan, or for period and modern timber frame houses, where the heavy beams would put undue pressure on the structure below. "People are often not aware that their house is timber frame, especially when it's been brick clad," he says. "We've had to dig a few people out of a hole before now, when they've had steel beams sitting on the front garden and only then realised that they had a timber frame house." Expect to take two days for a TeleBeam installation. "We'd be very happy for self-builders to install the Tele-beam structure – any competent DIYer could carry out this work," Digby adds.



3 Dormer Option

A dormer offers a lot of extra space, is often the most cost efficient loft conversion and is suitable for most property types, says Econoloft's xxx xxxxx xxxxxx.

One of the first jobs is to add flooring and then pre-wire before the insulation is laid. It is important to get electrics to the first fix stage. The correct insulation is also crucial: Econoloft's xxx xxxx advises against using fibreglass as this can lead to the loss of valuable headroom. xxx xxxxx also advises using rigid board insulation, which is thinner but still conforms to required insulation standards. Sound insulation needs to be laid on the floor and between party walls.



"The position of the staircase is arguably one of the most important elements of the loft conversion," he/she says. "It's important the staircase blends seamlessly from the original part of the property to the new loft conversion and it can be tricky when you are adding a staircase to a property that was not designed for it. Occasionally, in order to get the new staircase in, you may have to lose 200mm-400 mm from an existing room, usually a box room." However, people always agree that the gain far outweighs any small loss, he/she says. "Most people order an 'off the shelf' staircase – if you live in a period home and want the new one to have the same features as the original, it will be much more expensive."

4 Prefabricated Route

Bespoke prefabricated modular lofts, constructed offsite in a factory, are a good way of reducing construction time on site. Moduloft delivers lofts with fixtures and fittings in place, including doors, windows, electric sockets, radiators, bathrooms, kitchens and ensuites. "The owners of this property (BELOW) were keen to extend into the roof space and our solution was perfect as they didn't want major upheaval," says Moduloft's director Tim Benson. "The new loft space has created height, while the pitched windows were chosen to complement the style of the property."