

# A free advice pack

Information to help you comply with and obtain approval for building regulations from Southampton and Eastleigh Building Control Partnership.

## Loft conversions and the building regulations 2000



# Contents

	<b>Page</b>
Introduction	3
How to apply	4
Structural requirements	5
Fire safety	7
Sound insulation	12
Ventilation	13
New staircase	14
Thermal insulation of new room(s)	16

# Introduction

All roof conversions must comply with the statutory Building Regulations and therefore will require Building Regulation approval from Southampton City Council or Eastleigh Borough Council.

If structural works, i.e. new flooring or other alterations, are intended Building Regulation Consent will be required whether or not the room is for habitable purposes. The main parts of the Regulations which you need to comply with, are listed below and are explained in more detail throughout this handout.

- Part A – Structure
- Part B – Fire safety
- Part E – Sound insulation
- Part F – Ventilation
- Part K – Protection from falling, collision & impact
- Part L1B – Thermal insulation

Although at first this list may appear daunting, it is worth recognising that some of the Regulations only form a minor part.

“Approved Documents” are documents that give guidance on how to comply with the Building Regulations. They are available online at the planning portal website <http://www.planningportal.gov.uk/>

# How to apply

Please note Building Regulation consent and Planning Permission are two separate approval processes. For advice on planning permission within the Southampton area you can either drop into Gateway Reception at the Civic Centre or contact the Planning Department on 023 8083 2603. For planning advice within the Eastleigh area you can contact Eastleigh Planning Department on 023 8068 8344.

## Building Regulation Consent

There are two methods of informing us of your proposed building work.

### 1. Full Plans Submission

This is the most used method. Plans are produced and submitted to the Local Authority with the appropriate form and charge. The plans are examined and we will notify you normally within 21 days whether or not they meet the minimum requirements of the Building Regulations. We will advise you of any amendments required to bring the proposal up to this standard. This notification will normally happen before you actually commence the work. Waiting for Building Regulation approval however will give you the confidence that if the work is carried out in accordance with the approved plans you will comply with the Building Regulations. The Building Control Surveyors will visit the property to inspect the work and will issue a completion certificate when the work is completed satisfactorily.

### 2. A Building Notice

You may also choose to use the Building Notice approach. With this method we do ask for 48 hours notice before the conversion work starts. You must also allow for a Building Control Surveyor to visit and inspect the work as it proceeds. It is worth mentioning that with a Building Notice, plans and structural calculations are normally requested. Confirmation of satisfactory completion will be issued when the work is complete.

## THE PARTY WALL ACT

The Party Wall Act will apply to building work affecting a party wall. Neighbours written consent should be obtained prior to commencing work. Further advice can be obtained by contacting a local Party Wall Act surveyor.

**For further advice on the Building Regulations procedure, you can contact Southampton Building Control on 023 8083 2558 or Eastleigh Building Control on 023 8068 8327.**

Information is available at:

[www.southampton.gov.uk/building-control](http://www.southampton.gov.uk/building-control)

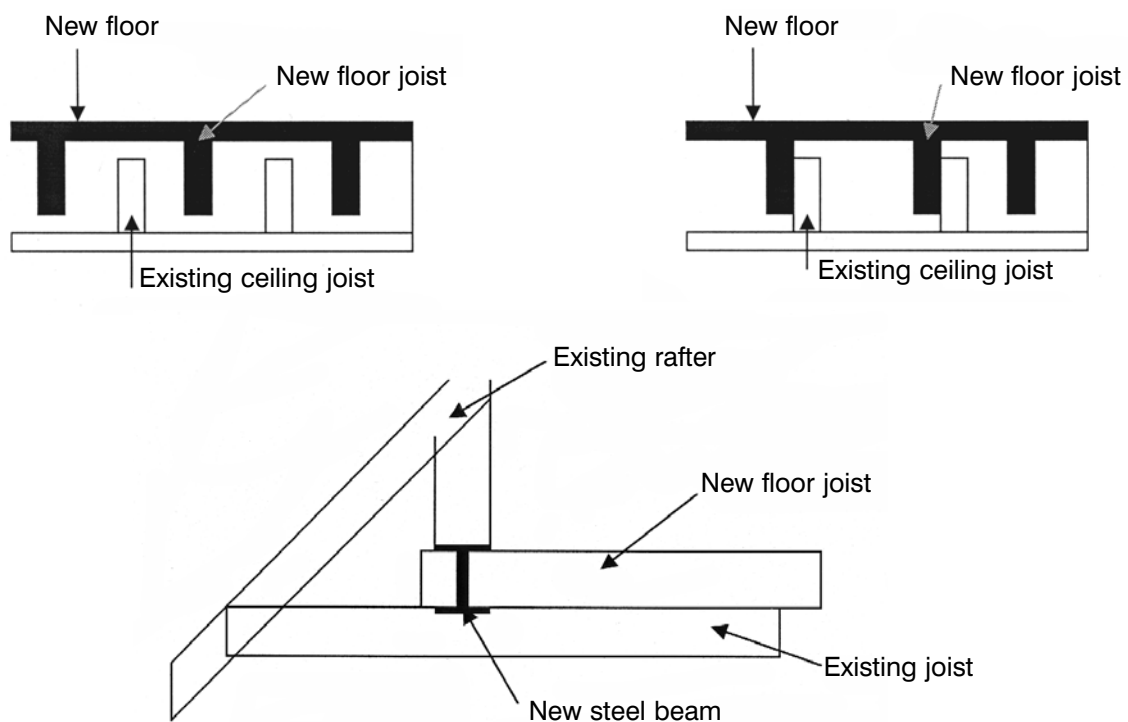
[www.eastleigh.gov.uk/ebc](http://www.eastleigh.gov.uk/ebc)

We also provide a duty surveyor based at Southampton Building Control who can deal with your general technical questions every afternoon, Monday to Friday, from 1pm to 5pm (4.30pm on Friday). You can contact the duty surveyor on 023 8083 2558.

# Part A - Structural requirements

## New floor

Existing ceiling joists are very unlikely to be adequate to act as floor joists. The diagrams below demonstrate 3 popular methods of constructing a new floor:



A Structural Engineer should be involved where there is introduction or removal of structural members (joists, rafters, binders, purlins, steel beams or where alterations to truss rafters are undertaken etc). Structural calculations will ensure that both the stability of the existing structure and that the new structure will be adequate. Structural calculations submitted will be checked by the Councils engineer to ensure that they comply with the Regulations.

## Existing structure - foundations

Because your proposals are to form another storey within the building, there will be an increase in loading on the foundations of your property. It is therefore important to ensure that any new loading is carried by existing load bearing walls that are considered adequate for the additional loading. If your property is already suffering from some form of distress for example ground movement, any proposal should be checked with a professional advisor. In addition we may require you to expose your existing foundations to ensure their suitability to carry additional loading. Additional work such as underpinning of your existing foundations may be necessary.

## **Existing structure - supporting elements**

It is important that your structural investigation covers the existing elements that will be supporting the new structure, for example internal walls, beams etc. These elements need to be load bearing and capable of carrying additional loads. To ensure these elements are adequate they may need to be exposed for inspection prior to the work being carried out. Any previous structural work to the house for example the removal of a wall and introduction of a steel beam between a dining room and sitting rooms, will require checking to ensure the additional loading it may take is acceptable.

## **Roof covering**

If converting the loft involves the replacement of the roof covering, the following structural issues should be considered:

- 1) If the new roof material is heavier, the additional loading on the structure must be calculated and the structure upgraded accordingly.
- 2) Conversely, if the new roof material is lighter, the possibility of increased wind uplift must also be considered.

## **Notches and holes in Joists**

Notches and holes in simply supported floor and roof joists should be within the following limits:

Notches should be not deeper than 0.125 times the depth of a joist and should not be cut closer to the support than 0.07 of the span, nor further away than 0.25 times the span.

Holes should have a diameter not greater than 0.25 times the depth of a joist and should be drilled at the joist centre line. They should be not less than 3 diameters (centre to centre) apart and should be located between 0.25 and 0.4 times the span from the support.

Notches or holes should not be cut in rafters, purlins or binders unless approved by the building designer.

Rafters restrained by ceiling ties at eaves level may be birdsmouthed at supports to a depth not exceeding one third of the rafter depth.

## Part B - Fire safety

Specifically the Building Regulations acknowledge that the risk to life from a fire occurring in a three storey property is greater than that in a one or two storey dwelling. A dwelling, which is altered to include a third storey, should comply with the following requirements of the Building Regulations:

- Means of escape
- Installation of smoke detectors
- Internal fire spread (structure)
- External fire spread

Although the previous list might at first appear complex when it is broken down and applied to your loft conversion, the requirements are usually quite easy to apply.

### Means of escape

Means of escape is the structural means whereby in the event of a fire a safe route is provided for people to get from any point in a building to a place of safety without outside assistance.

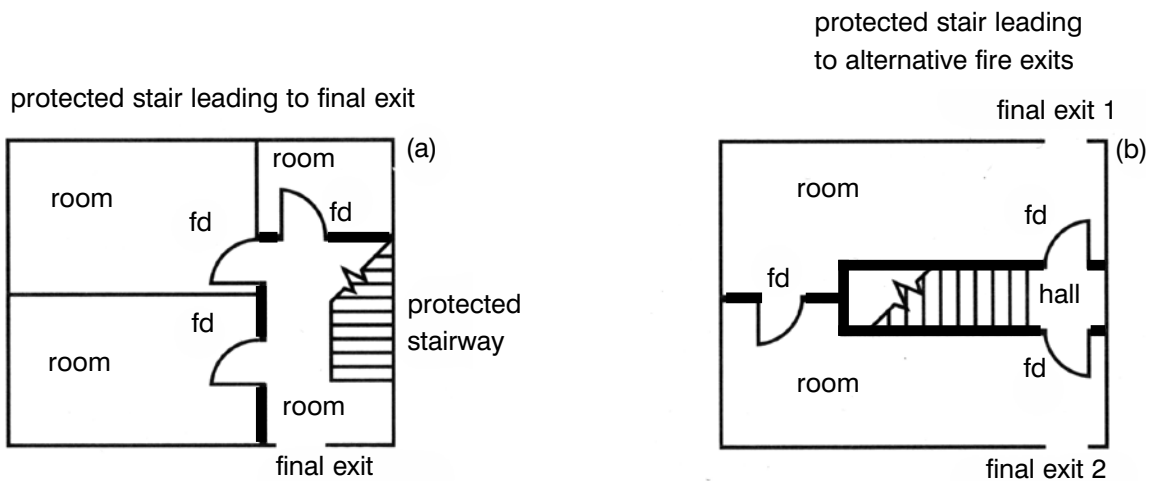
Regulation B1 requires that a building shall be constructed so that the means of escape is capable of being used at all times.

#### **FIRE ESCAPE (PROTECTED STAIRWAY)**

For an existing two storey house with an additional storey level added by the conversion of the loft space, the stairs must be protected by fire resisting walls and fire doors (FD20) which should either:

- a) Enter into a hall that leads to an external door, or
- b) Give access to at least two separate escape routes, giving access to alternative exits, see diagrams over.

## Alternative arrangements for final exits



### Key

- fd FD20 Fire door
- 30 minute fire resisting construction

If you already have an open plan staircase it will need to be enclosed. Alternatively, it may be possible to provide sprinkler protection to the open-plan area, in conjunction with a fire resisting partition and door, separating the ground floor from the upper storeys. This door should be so arranged to allow occupants of the loft room to access an escape window at first floor level in the event of a fire in the open plan area. Any cooking facilities should be separated from the open-plan area with fire-resisting construction.

### Staircase design

The new stair may be located either as a continuation of the existing stairway, or in an enclosure that is separated from the existing rooms. It must open into the existing stairway at first floor level in order to form a protected route.

In a loft conversion a pull down ladder is not acceptable. An alternating tread stair or a fixed ladder may form an acceptable approach in certain circumstances. Guidelines for the new staircase are covered by Part K and are covered later in this document.

### **Guidance where upgrading the fire resistance of existing doors to protected stairs.**

The approved document to regulation B1 requires FD20 doors to all habitable rooms in a new or altered dwelling houses with one floor more than 4.5m above ground level, where they form part of the enclosure to the stair.

If there is desire to retain existing doors within a dwelling house, when undertaking alterations to form habitable rooms, with one floor more than 4.5m above ground level the following may be considered as suitable alternatives to replacing some or all doors.

#### **General provisions**

1. In addition to smoke detectors at every storey level, detectors should also be provided at half landing levels adjacent to habitable rooms. A heat detector should be provided in the kitchen and smoke detectors in all habitable rooms entered from the stair enclosure. All alarms should be mains powered with standby battery backup, interlinked so that detection of heat or smoke in one unit operates the alarm in all others.
2. BS 5839:6 recommends optical smoke detectors in circulation areas with ionization detectors better for living and dining rooms. Optical may be better in bedrooms although either type would be considered acceptable.
3. There should be at least one window at first floor level of a size that would permit emergency egress to either a rear garden of sufficient depth or to the front elevation. Window to be a minimum size 0.450m x 0.450m equal to 0.33m<sup>2</sup> with a sill height between 0.800 and 1100mm above floor.

#### **Panel doors in excess of 32mm thickness**

1. The door should be attached to the door frame with steel hinges, not be visibly warped, fits well into its frame and there should be no visible defects particularly in the panels.
2. Any existing glazing to doors or fanlights should be replaced with wired glass or similar fire resistant glazing to provide adequate resistance for integrity and stability.
3. There should be no significant defects to adjacent walls or around door frames forming the stair enclosure.

#### **Existing panel doors less than 32mm in thickness**

1. In addition to the recommendations for panel doors in excess of 32mm indicated above, if it is intended to retain doors less than 32mm in thickness a proprietary solution should be sought to upgrade the door. This may include the application of fire resistance materials to the panels and stiles on the room side of the door. Such doors can be provided with a certificate from a specialist supplies confirming their upgraded suitability.
2. Alternatively, the door can be upgraded, on the room side, by infilling the panel with a fire resistant board and applying a similar board glued and screwed over the entire door.

#### **Hardboards flush doors**

Existing hardboard or other lightweight flush doors are not considered adequate to provide a reasonable level of fire protection to a stair enclosure and should be replaced with FD20 doors in accordance with the recommendations of the approved document.

## Installation of smoke detectors

The following statements are from the Approved Document B

### Positioning of smoke and heat alarms

Detailed guidance on the design and installation of fire detection and alarm systems in dwelling houses is given in BS 5839-6:2004. However, the following guidance is appropriate to most common situations.

Smoke alarms should normally be positioned in the circulation spaces between sleeping spaces and places where fires are most likely to start (e.g. kitchens and living rooms) to pick up smoke in the early stages of a fire.

There should be at least one smoke alarm on every storey of a dwelling house.

Where more than one alarm is installed they should be interlinked so that the detection of smoke or heat by one unit operates the alarm signal in all of them. The manufacturers' instructions about the maximum number of units that can be linked should also be observed.

### Smoke alarms/detectors should be sited so that:

- a) there is a smoke alarm in the circulation space within 7.5m of the door to every habitable room;
- b) they are ceiling-mounted and at least 300mm from walls and light fittings (unless, in the case of light fittings, there is test evidence to prove that the proximity of the light fitting will not adversely affect the efficiency of the detector). Units designed for wall-mounting may also be used provided that the units are above the level of doorways opening into the space and they are fixed in accordance with manufacturers' instructions;
- c) the sensor in ceiling mounted devices is between 25mm and 600mm below the ceiling (25-150mm in the case of heat detectors). Note: This guidance applies to ceilings that are predominantly flat and horizontal.

It should be possible to reach the smoke alarm to carry out routine maintenance, such as testing and cleaning, easily and safely. For this reason smoke alarms should not be fixed over a stair or any other opening between floors.

Smoke alarms should not be fixed next to or directly above heaters or air-conditioning units. They should not be fixed in bathrooms, showers, cooking areas or garages, or any other place where steam, condensation or fumes could give false alarms.

Smoke alarms should not be fitted in places that get very hot (such as a boiler room) or very cold (such as an unheated porch). They should not be fixed to surfaces which are normally much warmer or colder than the rest of the space, because the temperature difference might create air currents which move smoke away from the unit.

## **Internal fire spread (structural)**

Normally a floor in a three storey property will require a full 30 minutes fire resistance. However, provided the following conditions are satisfied, namely:

- a) Only one storey is being added;
- b) The new storey contains no more than 2 habitable rooms, and;
- c) The total area of the new storey does not exceed 50m<sup>2</sup>;

Then the existing first floor may have a modified 30mins fire resistance in places where the floor only separates rooms (not stairways or landings).

## **External fire spread**

Occasionally dormer cheeks, and gable ends that are built as a result of the conversion and may be in close proximity to the boundary. In this instance additional precautions will be required to improve the fire resistance (30 minutes fire resistance required) internally and externally of the new construction.

## Part E - Sound insulation

Loft conversions will be effected by Regulation E2, which requires sound insulation measures to certain the internal walls and floors of buildings. The guidance relating to this part of the regulations is contained in Section 5 of the Approved Document. In a typical domestic situation stud walls around bedrooms and bathrooms need 75mm studwork with either two layers of plasterboard on each side, and 25mm of sound insulation incorporated within the wall.

Separating timber floors are required to achieve a reasonable level of protection. The new floor should be covered with floor boarding which achieves  $15\text{kg/m}^2$  (i.e. 21mm tongued and grooved boarding) and this should cover the entire floor and remaining ceiling joists to the eaves. This boarding should also be provided with screw fixings. 100mm mineral wool insulation should be provided between the new floor joists, insulation to be a minimum of  $10\text{kg/m}^2$  (see diagram below).

Diagram 5.1 Internal wall type A

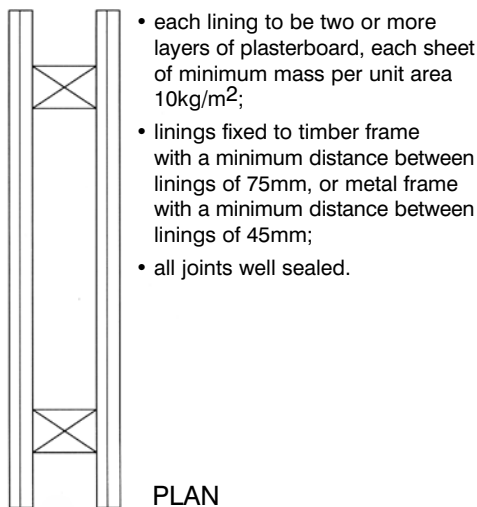


Diagram 5.2 Internal wall type B

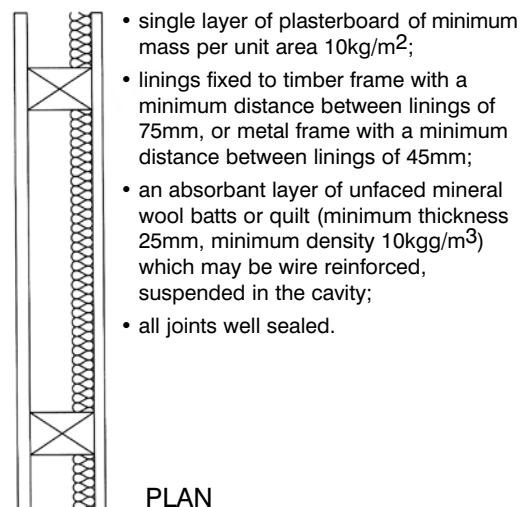
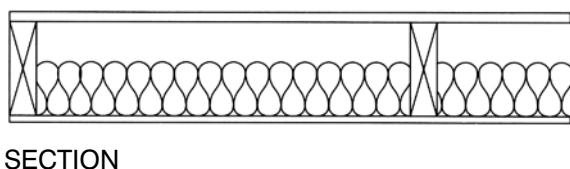


Diagram 5.7 Internal floor type C



- floor surface of timber - or wood - based board, minimum mass per unit area  $15\text{kg/m}^2$ ;
- ceiling treatment of single layer of plasterboard, minimum mass per unit area  $10\text{kg/m}^2$ , fixed using any normal fixing method;
- an absorbant layer of mineral wool (minimum thickness 100mm, minimum density  $10\text{kg/m}^3$ ) laid in the cavity.

In attached properties the existing separating walls may also require upgrading. Whilst there is no requirement for these walls to be brought up to new build standards, reasonable provision should be made to improve their sound resistance.

# Part F - Ventilation

## New habitable rooms

Windows to newly formed habitable rooms must include an opening proportional to the floor area of the room (the new windows must achieve a minimum of  $\frac{1}{20}$ th of the floor area of the room). There must also be background ventilation provided by window trickle vents minimum  $8000 \text{ mm}^2$ .

## Bathrooms

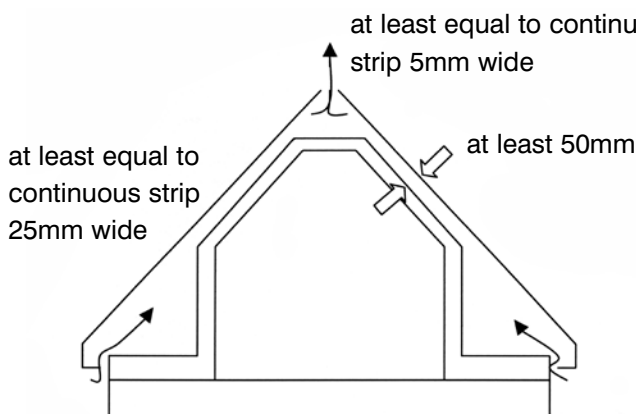
A new bathroom must either have an openable window plus background ventilation minimum  $4000 \text{ mm}^2$  and extract ventilation of 15 litres/second. If no windows are present mechanical extract must be provided with a minimum 15 minute overrun.

## WC's

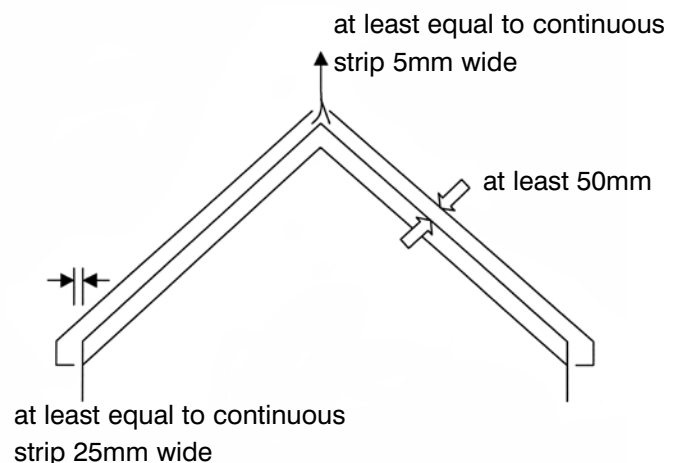
If a window is not present mechanical extract of 6 litres/second with a 15 minute overrun must be provided. If a window is present it must have an opening of  $\frac{1}{20}$ th of the floor area.

## Roof (cold roof)

The introduction of a room into a previously open roof space will restrict the existing cross ventilation and could cause condensation to form on the underside of the roof. To prevent this the existing eaves ventilation (if any) will need to be increased to at least a continuous strip 25mm wide. An air gap of at least 50mm is needed between the pitched roof and any insulation fitted to ensure cross ventilation. Roof vents must also be added at the ridge equivalent to a continuous strip 5mm wide.



(a) Ceiling not following pitch of roof



(b) Ceiling following pitch of roof

## BREATHABLE FELT

An Alternative approach to roof ventilation is where a breathable sarking felt is used. The sarking felt should have an appropriate BBA Certificate and be installed in accordance with the manufacturers specification. If this already exists to the roof system additional ventilation will not be necessary.

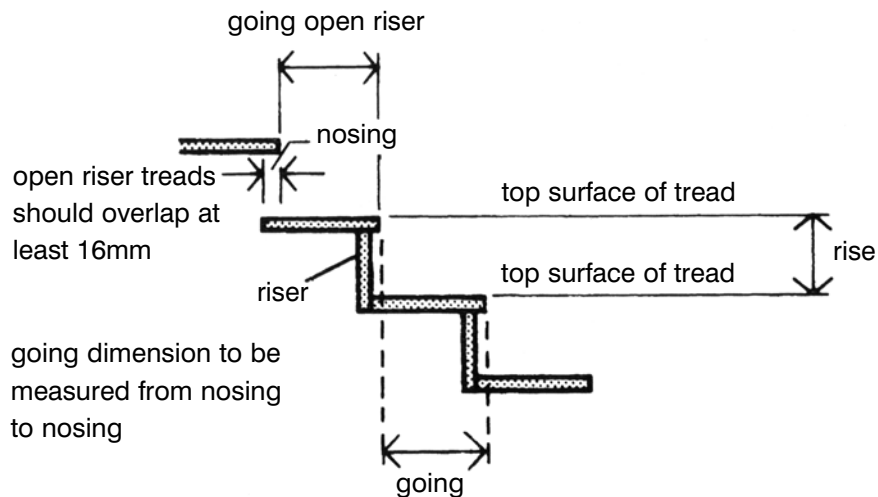
## Part K - New staircase

The following paragraph describes the main requirements of Approved Document K staircase design. Often the most critical areas relate to headroom, rise and going and landing provision.

### Steepness of stairs – rise and going

The diagram below illustrates what is meant by the rise and going of a flight of stairs.

Diagram 1 **Measuring rise and going**



The minimum going which a new stair should have is 220mm the maximum rise is also 220mm. However it is not possible to use these two in combination as the result would be a staircase which is too steep (45 degrees). The normal relationship is that twice the rise plus the going should be between 550mm and 700mm.

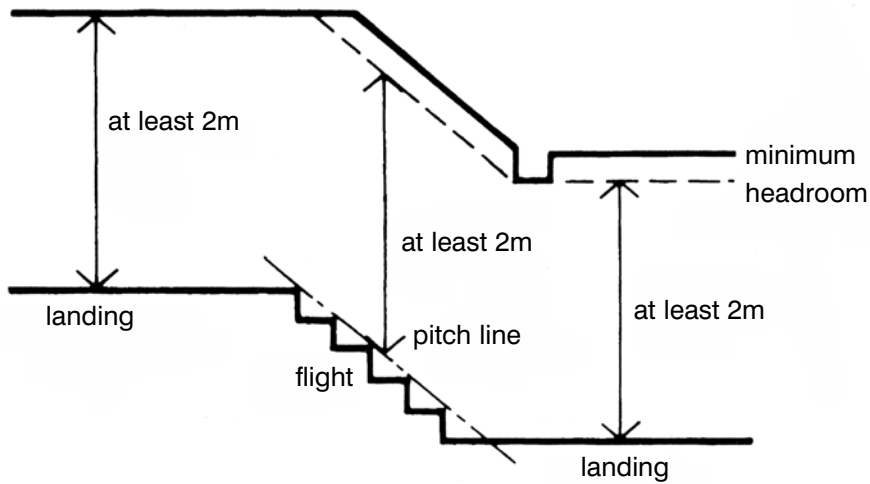
### Open riser stairs

It is possible to use a stairway that is open at the back. This open type of stair requires an overlap of at least 16mm (shown on the diagram above). The Approved Document recommends that if children under the age of 5 are likely to use this stair the open rise must not allow the passage of a 100mm sphere to pass through any of the gaps.

## Headroom

The diagram below indicates the preferred arrangement for headroom to a new stair.

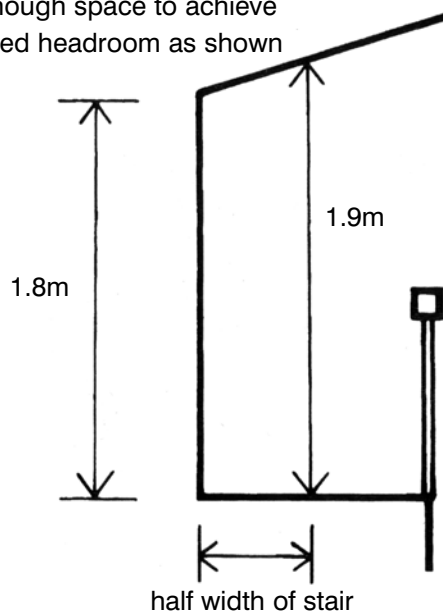
Diagram 2 **Measuring headroom**



However the Building Regulations acknowledge that space is at a premium in some loft conversions and provided the arrangements shown in the next diagram are met less headroom may be acceptable.

Diagram 3 **Reduced headroom for loft conversions**

Where there is not enough space to achieve 2m headroom, reduced headroom as shown will be satisfactory



## Part L - Thermal insulation

The walls, roof slopes and ceilings around the new rooms are required to have a resistance against heat loss (known in the Building Regulations as a 'U' Value). The minimum standard that each element is required to meet is shown in the table below:

<b>Standards for thermal elements of W/m<sup>2</sup>K or U-values</b>		
<b>Element</b>	<b>(a) Standard for new elements in an extension</b>	<b>(b) Standard for replacement elements in an existing dwelling</b>
Wall	0.30	0.35
Pitched roof - insulation between rafters	0.20	0.20
Flat roof or roof with integral insulation	0.20	0.25
Window, roof window and rooflight	U-value = 1.8 W/m <sup>2</sup> K or Window energy rating = Band D or Centre-pane U-value = 1.2 W/m <sup>2</sup> K	U-value = 2.0 W/m <sup>2</sup> K, or Window energy rating = Band E or Centre-pane U-value = 1.2 W/m <sup>2</sup> K

The loft conversion should be constructed so that there are no avoidable 'cold spots' in the insulation caused by gaps between materials, at the joints and at the edges, such as those around window and door openings.

Reasonable provision should also be made to reduce unwanted air leakage through the new loft conversion, ie sealing gaps around window openings and floor edges.

This written information is available on request in other formats or languages. Please contact 023 8083 2558 for help.

**[www.southampton.gov.uk](http://www.southampton.gov.uk)**

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INVESTOR IN PEOPLE