

## A Guide to Compliance When Designing a Change of Use to Form a Dwelling



### Introduction

Approved Document L1B provides guidance on complying with Requirement L1 dealing with the conservation of fuel and power. It is one of four Part L Approved Documents and deals specifically with work to existing dwellings. This guide has been produced by the Herts Building Control Technical Forum (HTF) to help you to understand Part L1B of the Building Regulations as applicable to schemes involving the change of use of a building to a dwelling. This includes garage and loft conversions. It has not been possible to deal with every issue in full detail and you can contact your local authority Building Control office for further advice on any aspect. Separate HTF guides are available from your Local council's Building Control office dealing with extensions to dwellings, loft conversions and garage conversions.

## Scope

Approved Document L1B outlines the energy performance standards required for 'Thermal Elements' that form part of the conversion of a building to a dwelling. These are walls floors or roofs that separate the heated space from the external environment or from unheated spaces such as garages. The three types of thermal element are 'new / replacement', 'renovated' and 'retained' and all may be relevant to a change of use

The document also gives guidance on the specification of 'Controlled Fittings' such as windows, doors and roof lights and 'Controlled Services' such as lighting, heating, mechanical ventilation and air conditioning.

## New or Replacement Thermal Elements

Where a scheme involves the construction of new or replacement walls, roofs or floors, the U-values should meet the standards in Table 1 below

**Table 1 - U- Values for New or Replacement Elements**

	U-Value (W/m <sup>2</sup> °K)
Wall	0.28*
Pitched Roof – insulation at ceiling level	0.16
Pitched roof – insulation at rafter level	0.18
Flat Roof or Roof with integral insulation	0.18
Floors **	0.22

\* Area weighted average values

\*\* Lesser standards accepted where matching floor levels presents difficulties

To help designers, the Herts Technical Forum publishes **Technical Note 10** (U-Values of Elements). This guide suggests a variety of compliant specifications using commonly available insulation materials.

## Windows, Rooflights and Doors

Where the work involves the fitting of new windows, doors or rooflights in the external walls, they should meet the standards in Table 2 below.

Any existing unit that does not achieve a U-value less than 3.3W/m<sup>2</sup> °K should be replaced with units meeting the standards in Table 2 below. The values given are the required area weighted averages. All units must be draft proofed. See *Historic Buildings* below)

**Table 2 - Energy Ratings and U-values for Windows, Doors and Rooflights**

Fitting	Standard
Windows, Roof Windows and Rooflights	Maximum 1.6 W/m <sup>2</sup> °K <u>or</u> Window energy rating band C or better
Doors including glazed doors	Maximum 1.8W/m <sup>2</sup> °K or

You can find typical compliant specifications for fittings in the HTF Technical Note 10.

As for new buildings, there is an upper allowable limit on the area of doors windows and rooflights of 25% of the floor area of the building. If this is exceeded then you will either

need to reduce the area or prove that the proposed building will not create more carbon dioxide emissions than a notional equivalent conversion that is compliant with the 25% rule. This is usually done by a specialised energy assessor using accredited SAP 2009 software. The performance of other elements may need to be enhanced to compensate for the added heat loss through the openings.

### Renovated Thermal Elements

L1B requires the upgrading of performance in thermal elements where the developer proposes to renovate more than 25% of the surface area. This would typically be work to the inner or outer lining of an external wall, re covering of a roof or renovation of a ceiling. Re decking a floor would also be applicable.

The required standards are shown in column (b) of Table 3 below. An exception to the need to upgrade performance is where the upgrade is not technically or economically feasible. The document describes a method of assessing economic feasibility by calculating the 'simple payback period' or the amount of time it would take for energy cost savings to exceed the basic cost of upgrading the thermal performance. The section below dealing with historic buildings gives other exceptions.

### Retained Thermal Elements

These are thermal elements that exist in the building subject to a change of use and that the designer intends to retain. L1B requires that such walls, roofs and floors be upgraded if their U-value fails to meet the 'threshold value' in column (a) of Table 5 below. The target values for improvement are listed in column (b) however the exceptions rules on feasibility apply equally to this type of thermal element. If the upgrade is not technically or economically feasible then the designer should try to achieve the best standard that is possible within the criteria in the previous paragraph.

**Table 3 – Upgrading U-Values of Renovated and Retained Elements**

	(a) Threshold Value	(b) Improved Value
Cavity Wall (suitable for the installation of cavity insulation)	0.70 W/m <sup>2</sup> °K	0.55 W/m <sup>2</sup> °K
Other Wall	0.70 W/m <sup>2</sup> °K	0.30 W/m <sup>2</sup> °K
Pitched Roof – insulation at ceiling level	0.35 W/m <sup>2</sup> °K	0.16 W/m <sup>2</sup> °K
Pitched roof – insulation between rafters	0.35 W/m <sup>2</sup> °K	0.18 W/m <sup>2</sup> °K
Flat Roof or Roof with integral insulation	0.35 W/m <sup>2</sup> °K	0.18 W/m <sup>2</sup> °K
Floors*	0.70 W/m <sup>2</sup> °K	0.25 W/m <sup>2</sup> °K

\* Lesser standards accepted where matching floor levels presents difficulties

### Controlled Services (Heating and Hot water)

The new rules aim to ensure that new systems meet a minimum standard of energy efficiency. The designer can establish the adequacy of a system by referring to the 'Domestic Services Compliance Guide' published by NBS. This is a lengthy and highly detailed document giving standards for many types of heating system, fuel and controls. A typical specification for a natural gas fuelled system would be a condensing boiler with a SEDBUK (efficiency) rating of at least 88% (i.e. condensing type) linked to a fully pumped system with boiler interlock (switches off when no demand for heating) and zone, timing and temperature controls. There are different requirements for dwellings with floor areas over 150m<sup>2</sup>.

L1B requires that every new system is commissioned by a person competent to do so and that the owner is provided with sufficient written guidance to enable him to operate the system efficiently.

## **Controlled Services (Lighting)**

Light fittings also need to accord with the Domestic Building Services Compliance Guide. This means that at least three out of four fittings should be low energy type i.e. have luminous efficacy of not less than 45 lumens per circuit-watt and total output greater than 400 lamp lumens. Light fittings supplied by less than 5 watts can be excluded from the overall count. In recognising that low energy type lamps are now dominating the market A.D. L1B states that standard fittings fitted with low energy lamps are acceptable.

External lighting must either meet the above efficiency standard with fittings being both manually switched and automatically controlled to switch off when daylight is sufficient or must consist of fittings that have movement and daylight sensors and lamp capacity not exceeding 100 watts.

## **Other Controlled Services**

L1B places controls on the efficiency of mechanical ventilation systems by referring to the Energy Saving Trust's design guide GPG268 – Energy Efficient Ventilation in Dwellings. Fixed air conditioning systems are required to have an energy efficiency rating of Class C.

## **Construction Standards**

Irrespective of the quality of materials used, there is a major potential for heat loss and cold bridging caused by poor standards of construction in terms of airtightness and the continuity of insulation. For this reason it is important for the designer to ensure that the various insulated elements in a building are carefully detailed at junctions. Uncontrolled air leakage can be minimised by specifications calling for appropriate levels of sealing and the Accredited Construction Details produced by CLG suggest suitable details for achieving this with typical methods of construction. These are available for viewing along with Approved Document L1B at [www.planningportal.gov.uk/buildingregulations](http://www.planningportal.gov.uk/buildingregulations) .

## **Historic Building Conversions**

There is provision in the Approved Document to take account of the building's architectural or historic importance in applying the requirements and for listed buildings this may be mandatory. Whilst designers should strive to achieve the best possible energy efficiency, they must ensure that measures are sympathetic to the existing fabric and appearance. Building Control is able to organise joint consultations with Planning Conservation Officers to discuss and agree such issues.

## **Energy Performance Certificates**

In forming a new dwelling, a developer has the responsibility of obtaining an Energy Performance Certificate for the building from an energy assessor registered with a government accredited scheme. This can be produced in conjunction with a 'SAP' emissions calculation and is similar to the energy performance labels found on some electrical goods giving a rating on a scale of A to G. It includes information on how an owner can improve the efficiency of their property. Building Control need written confirmation that the EPC has been passed to the owner before issuing a completion certificate.

## **...In Conclusion**

We hope that this guide will help you to better understand Part L1B of the Building Regulations as applicable to the design of conversions to dwellings. It has not been possible to deal with every issue in full detail and you are very welcome to contact your local authority for further advice on any aspect.