



**TECHNICAL GUIDANCE
NOTE 18**

Approved Document L1B 2006

**A Guide to Compliance When Designing
Domestic Extensions**

(Issued June 2006)



Introduction

Approved Document L1B provides guidance on complying with the requirements of Regulation 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. The Herts Building Control Technical Forum (HTF) has produced this guide to clarify the documents contents in relation to the design of extensions to dwelling houses. A separate guide is available dealing with schemes involving a change of use to a dwelling.

Scope

The document outlines the energy performance standards required for 'Thermal Elements'. These are walls floors or roofs that separate the heated space from the external environment or from unheated spaces or such as garages. The four types of thermal element are 'new', 'replacement', 'renovated' and 'retained' although it is mainly new elements that are relevant to this particular guide.

The document also gives guidance on the specification of 'Controlled Fittings' such as windows, doors and rooflights and 'Controlled Services' such as lighting, heating, mechanical ventilation and air conditioning. Section 3 advises on the need for the builder to provide the house owner with simple instructions on how to use heating and hot water systems and associated controls in a way that achieves maximum energy efficiency.

U- Values for New Elements

These are as follows; -

Element	U-Value (W/m ² °K)
Wall	0.30
Pitched Roof – insulation at ceiling level	0.16
Pitched roof – insulation at rafter level	0.20
Flat Roof or Roof with integral insulation	0.20
Floors	0.22

Lesser standards of floor insulation are acceptable where there is a significant problem in matching floor level to existing. When calculating the perimeter and area of a floor this can be taken as that of the enlarged dwelling. To help designers meet these standards, the Herts Technical Forum has updated its **Technical Note 10** (U-Values of Elements). This suggests a variety of specifications using commonly available insulation materials.

Windows, Rooflights and Doors

The standards for these have been raised in the new Part L and new methods of rating are now considered. Window Energy Rating Bands are introduced and 'centre-pane' U-values. The values given below are the required area weighted averages. All units must be draft proofed. Lesser standards apply to replacement fittings to existing openings.

Energy Ratings and U-values for Windows, Doors and Rooflights

Fitting	Standard
Windows and Rooflights	Maximum 1.8W/m ² °K <u>or</u> Window energy rating band D <u>or</u> Centre-pane U-value maximum 1.2W/m ² °K
Doors with more than 50% of their internal face area glazed	Maximum 2.2W/m ² °K <u>or</u> Centre-pane U-value maximum 1.2W/m ² °K
Other Doors	Maximum 3.0W/m ² °K

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

Limits on the Total Area of Openings

Rules are similar to the superseded document L1 in that the area of openings to an extension must not exceed 25% of the floor area of the extension plus the area of any existing openings enclosed by the extension. Where this can not be achieved, there are new provisions allowing for greater areas and these are described below in the following two paragraphs.

Optional Approaches

To allow for more design flexibility, L1B makes provision for extensions that may not accord strictly with the U-value and opening area restrictions described above. A designer has the option to show compliance by carrying out a calculation demonstrating that the 'Area Weighted U-Value' of all the thermal elements and exposed openings is no greater than that of an extension of the same size and shape that complies with the elemental U-value standards. The method of calculation is described in paragraphs 18 and 19 of the document which include absolute upper limits for U values when using this method.

A designer can exploit even more design flexibility by using a SAP calculation for the whole extended dwelling (2005 version) to make a comparison with the equivalent compliant extension. This method gives the potential for 'trade-off' by improving the performance of the existing house in accordance with limits listed in table 5 of the Approved Document.

Conservatories and Similar Extensions

A conservatory is a ground level extension that is thermally separated (see a. below) from the dwelling and has not less than three quarters of its roof area and one half its exposed wall area made from translucent material. Conservatories less than 30 m² in floor area and having safety glazing in critical zones are exempted from building regulations control by Schedule 7 to the Building Regulations.

It is common for conservatories that are not exempted from control to 'fall foul' of the limits placed on areas of openings. Other extensions that do not fit under the definition of a conservatory may also result in these limits being exceeded where the designer wishes to maximise the amount of natural daylight entering the building. The document recognises this and states that such designs can be acceptable if all the following criteria are followed:

- a. The extension must be separated from the existing by walls, doors and windows giving a level of thermal insulation equal to or better than exposed elements to the existing dwelling. Openings must be draft-proofed.
- b. It must have independent temperature and on/off controls and any heating appliance must be reasonably efficient.
- c. U values for thermal elements and openings must accord with the table below

Element	Maximum U-Value (W/m ² °K)
Wall	0.35
Pitched Roof – insulation at ceiling level	0.16
Pitched roof – insulation at rafter level	0.20
Flat Roof or Roof with integral insulation	0.25
Floors	0.25
Windows and rooflights (inc. glazed roof areas)	2.0 or energy rating band E or centre-pane U-value 1.2
Doors with more than 50% area glazed	2.2 or Centre-pane U-value 1.2
Other doors	3.0

Controlled Services (Heating and Hot water)

Where schemes include the extension or replacement of an existing system, the new rules aim to ensure that the new system meets a minimum standard of energy efficiency and is not significantly less 'carbon efficient' than the original. The designer can establish the adequacy of a new system by referring to the 'Domestic Heating Compliance Guide 2006' published by TSO and NBS. Where there is a change in the fuel type, SAP 2005 gives carbon dioxide emission factors with which to calculate equivalent ratings.

The above guide is a lengthy and highly detailed document giving standards for many types of heating system, fuel and controls. A typical specification for a replacement natural gas boiler would be a unit with a SEDBUK (efficiency) rating of at least 86% linked to a fully pumped system with boiler interlock (switches off when no demand for heating) and zone, timing and temperature controls. Different standards apply to dwellings with floor areas over 150m².

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)

Energy efficient lighting is classed as fittings that only take lamps having a luminous efficacy greater than 40 lumens per circuit-watt. It is generally only fluorescent or compact fluorescent fittings that meet this standard. The guidance on internal lighting to extensions is that the number of such fittings is not less than one per 25m² of extension floor area (excluding garages) or part thereof or one in every four fittings whichever is the greater. Fittings in cupboards or similar areas do not count towards the total and it is permissible for the designer to site the efficient fittings in part of the existing house if preferred. External lighting must either meet the above efficiency standard or must consist of fittings that have movement and daylight sensors and lamp capacity not exceeding 150 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 TSO Robust Details guide 'Limiting Thermal Bridging and Air Leakage' suggests suitable details for achieving this with typical methods of construction.

...In Conclusion

We hope that this guide will help you to understand Part L1B of the building regulations as applicable to the design of domestic extensions. 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.