



**TECHNICAL
INFORMATION
NOTE**

**CONSEQUENTIAL
IMPROVEMENTS**

This guide on consequential improvements only highlights the main works likely to be encountered where consequential improvements will apply. The full requirements can be found within Approved Documents L1B and L2B of the Building Regulations 2000 (as amended)

Consequential Improvements

On 6 April 2006 the Government amended the Building Regulations and the Approved Documents dealing with the conservation of fuel and power (L1 and L2 became L1A, L1B, L2A and L2B). Within these amendments new requirements were included that meant the existing building stock would need to be improved when building work was to be carried out. This extra work was classed as consequential improvements.

Consequential Improvements Required under L2B (Buildings other than dwellings)

Where a building over 1000m² is being extended or having a fixed building service fitted for the first time, or having the installed capacity of any fixed building services increased, improvements to the existing building will be required.

Table 1 Improvements that are practical and economically feasible	
1	Upgrading heating systems more than 15 years old by the provision of new plant or improved controls
2	Upgrading cooling plant systems more than 15 years old by the provision of new plant or improved controls
3	Upgrading air handling systems more than 15 years old by the provision of new plant or improved controls
4	Upgrading general lighting systems that have an average lamp efficacy of less than 40 lamp lumens per circuit watt and that serve areas greater than 100m ² by the provision of new luminaries or improved controls
5	Installing energy metering following the guidance given in CIBSE TM 39
6	Upgrading thermal elements which have U values worse than those set out in column (a) of table 3 to that indicated in column (b)
7	Replacing existing windows, roof windows or rooflights (but excluding display windows) or doors (but excluding high usage entrance doors) which have a U value worse than 3.3 W/m ² K
8	Increasing the on-site low and zero carbon (LZC) energy generating systems if the existing on-site systems provide less than 10% of on-site energy demand, provided the increase would achieve a simple payback of seven years or less

Consequential improvements on installed building services

Where it is proposed to install a fixed building service where there was not one before, or as an installation which increases the installed capacity per unit area of the existing service, reasonable provision would be to:

a) firstly improve those parts of the building served by the service and;

b) then additionally make improvements in line with table 1 (please note that the costs for any improvements undertaken as a result of (a) above cannot be taken into account when complying with the additional works).

For the purpose of these regulations, the installed capacity of a fixed building service is defined as the design output of the distribution system output devices (the terminal units) serving the space in question, divided by the total useful floor area of that space.

Reasonable provision for improving those parts of the building served by the service [(a) above] would be to follow the guidance below providing the work is technically, functionally and economically feasible. (Please note that this work is not limited to the 10% threshold)

Where the installed capacity per unit area of a heating system is increased, the thermal elements which have U values worse than those set out in column (a) of table 3 should be upgraded to that indicated in column (b) and existing windows, roof windows or rooflights (but excluding display windows) or doors (but excluding high usage entrance doors) which have U values worse than 3.3 W/m²K should be replaced to the standard set out in column (b) of table 2.

Table 2 Standards for controlled fittings (W/m²K)		
Fitting	(a) Standard for new fittings in extensions	(b) Standard for replacement in an existing building
Windows, roof windows and glazed rooflights ^{1,4}	1.8 for the whole unit or 1.2 centre pane	2.2 for the whole unit or 1.2 centre pane
Alternative option for windows in buildings that are essentially domestic in character ² , a window energy rating ³ of	Band D	Band E
Plastic rooflights ⁴	2.2	2.2
Pedestrian doors with more than 50% of its area glazed	2.2	2.2 for whole unit or 1.2 centre pane
High usage entrance doors for people	6.0	6.0
Vehicle access and similar large doors	1.5	1.5
Roof ventilators (including smoke extract ventilators)	6.0	6.0
Curtain walling	No greater than 0.9 + 1.3X (where X is the fraction of the curtain wall that is glazed)	No greater than 0.9 + 1.3X (where X is the fraction of the curtain wall that is glazed)
¹ Display windows are not required to meet the standard given in this table ² For example, student accommodation, care homes and similar uses where the occupancy levels and internal gains are essentially domestic in character ³ As defined in 'windows for new and existing housing', CE66 EST. Controlled fittings ⁴ U values for roof windows/rooflights are based on the particular U value being assessed in the vertical position		

Where the installed capacity per unit area of a cooling system is increased, the thermal elements within heated areas which have U values worse than those set out in column (a) of table 3 should be upgraded and if the area of windows (but excluding display windows) within the area exceeds 40% of the façade or

the area of rooflights exceeds 20% of the area of the roof and the design solar load exceeds 25W/m² then solar control provisions should be upgraded such that at least one of the following criteria is met:

- i. the design solar load is no greater than 25W/m²
- ii. the design solar load is reduced by at least 20%
- iii. the effective g value is no worse than 0.3 (as CIBSE TM37)

Any lighting system which has an average lamp efficacy of less than 40 lamp lumens per circuit watt be upgraded with new luminaries that have an average efficacy of not less than 45 luminaire-lumens/circuit watt (office, industrial and storage areas) or an average initial (100 hour) lamp plus ballast efficacy of not less than 50 lamp lumens/circuit watt (elsewhere) and have suitable controls.

The distance on plan from any local switch to any luminaire it controls should be not more than six metres or twice the height of the light fitting above the floor if this is greater. These controls can also be supplemented with automatic controls that switch the lighting off when they sense the absence of occupants; or dim or switch the lighting off when there is sufficient daylight. Where the space is served by side windows, the perimeter row of lighting should, in general, be separately switched.

Table 3 Upgrading thermal elements		
Element ¹	(a) Threshold value W/m²K	(b) Improved value W/m²k
Cavity Wall	0.70	0.55 ²
Other wall type	0.70	0.35 ³
Floors ⁴	0.70	0.25 ⁵
Pitched roof - insulation at ceiling level	0.35	0.16
Pitched roof - insulation between rafters	0.35	0.20
Flat roof or roof with integral insulation	0.35	0.25
¹ Roof includes the roof parts of dormer windows and wall includes the wall parts (cheeks) of dormer windows. ² This only applies in the case of a cavity wall capable of accepting installation. Where this is not the case, it should be treated as for 'other wall type'. ³ A lesser provision may be appropriate where meeting such a standard would result in a reduction of more than 5% in the internal floor area of the room bounded by the wall. ⁴ The U value of the floor of an extension can be calculated using the exposed perimeter and floor area of the whole enlarged building. ⁵ A lesser provision may be appropriate where meeting such a standard would create significant problems in relation to adjoining floor.		

The details highlighted in this guidance note are for general scenarios and each case should be taken on its own merits.

Further copies of this Technical Note can be obtained free of charge from:
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