



Office of the
Deputy Prime Minister

Creating sustainable communities

The Building Regulations 2000

Conservation of fuel and power

**APPROVED
DOCUMENT**

L1A

**L1A Conservation of fuel and power
in new dwellings**

Coming into effect 6 April 2006

2006 edition

MAIN CHANGES IN THE 2006 EDITIONS

1. This Approved Document L1A comes into force on 06 April 2006 in support of the Building and Approved Inspectors (Amendment) Regulations 2006, SI 2006/652. From that date the 2002 edition of Approved Document L1 will become obsolescent. The main changes in the legal requirements and the supporting technical guidance in this edition of Approved Document L1A are as follows.

Changes in the legal requirements

2. The main legal changes are reproduced at the front of this Approved Document and interleaved as well in the relevant text for ease of reference. In cases of doubt however refer to the SI itself.
3. Part L of Schedule 1 has been consolidated into a single requirement L1, covering all types of building with no limits on application.
4. As well as changes to Part L, there are significant changes to the definitions of works and exempt works, new minimum energy performance requirements, and new requirements for pressure testing, commissioning and energy calculations. The main legal changes are reproduced at the front of this Approved Document and interleaved as well in the relevant text for ease of reference. In cases of doubt however refer to the SI itself.

Changes in the technical guidance

5. Four Approved Documents are published reflecting the specialisation in the construction market. In the new Approved Documents regulatory requirements are shown on a green background and defined terms are highlighted. More use has been made of more comprehensive and detailed technical reference publications that therefore form part of the approved guidance. Commentary text has been added in places to explain, for instance, the aims of the guidance and how outcomes are calculated.
6. In this Approved Document the Elemental Method and the Target U-value Method are omitted. There is now only one approach to showing compliance with the energy efficiency requirements. This addresses five criteria:
 - a. The annual CO₂ emission rate of the completed dwelling, as calculated using SAP 2005, must not exceed the target set by reference to a notional building.
 - b. Building fabric and services performance specifications are within reasonable limits.
 - c. Solar shading and other measures to limit risks of summer overheating are reasonable.

- d. Fabric insulation and airtightness, as built, are as intended. More guidance is given on testing the achievement of the intended energy performance including arrangements for pressure testing samples of dwellings. Special arrangements apply in the period up to October 2007 to help in managing dwellings that fail pressure tests.
 - e. Satisfactory information must be provided enabling occupiers to achieve energy efficiency in use.
7. New technical references from the ODPM give guidance on ways of complying when providing heating and hot water services systems and the benefits of low and zero carbon systems.
 8. The technical provisions will mean that higher fabric, heating, ventilation and lighting systems designs will be necessary, delivering an overall improvement of on average 20%.
 9. Appendix A contains a new checklist for builders and building control bodies to help in assessing compliance. An example of a completed form is given and an editable blank form can be downloaded from the ODPM web site.
 10. Appendix B lists the threshold performance values that if exceeded will cause SAP 2005 approved software to warn of the possibility of failing to comply. Using this facility is not obligatory but it will assist in establishing certainty for builders and building control bodies at the design stage.
 11. New competent persons schemes have been approved for pressure testing and energy performance calculations, the scope of the existing schemes has been widened, and more scheme operators have been approved. Engaging an approved Competent Person is not obligatory but building control bodies are authorised to accept self-certification by such persons enabling reduced administrative burdens, delays and costs.

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Use of guidance

THE APPROVED DOCUMENTS

This document is one of a series that has been approved and issued by the Secretary of State for the purpose of providing practical guidance with respect to the technical requirements of the Building Regulations 2000 for England and Wales.

At the back of this document is a list of all the documents that have been approved and issued by the Secretary of State for this purpose.

Approved Documents are intended to provide guidance for some of the more common building situations. However, there may well be alternative ways of achieving compliance with the requirements. Thus, there is no obligation to adopt any particular solution contained in an Approved Document if you prefer to meet the relevant requirement in some other way.

OTHER REQUIREMENTS

The guidance contained in an Approved Document relates only to the particular requirements of the Regulations which the document addresses. The building work will also have to comply with the requirements of any other relevant paragraphs in Schedule 1 to the Regulations.

There are Approved Documents which give guidance on each of the parts of Schedule 1 and on Regulation 7.

LIMITATION ON REQUIREMENTS

In accordance with Regulation 8, the requirements in Parts A to D, F to K and N (except for paragraphs H2 and J6) of Schedule 1 to the Building Regulations do not require anything to be done except for the purpose of securing reasonable standards of health and safety for persons in or about buildings (and any others who may be affected by buildings or matters connected with buildings). This is one of the categories of purpose for which Building Regulations may be made.

Paragraphs H2 and J6 are excluded from Regulation 8 because they deal directly with prevention of the contamination of water. Parts E and M (which deal, respectively, with resistance to the passage of sound, and access to and use of buildings) are excluded from Regulation 8 because they address the welfare and convenience of building users. Part L is excluded from Regulation 8 because it addresses the conservation of fuel and power. All these matters are amongst the purposes, other than health and safety, that may be addressed by Building Regulations.

MATERIALS AND WORKMANSHIP

Any building work which is subject to the requirements imposed by Schedule 1 to the Building Regulations should, in accordance with Regulation 7, be carried out with proper materials and in a workmanlike manner.

You may show that you have complied with Regulation 7 in a number of ways. These include the appropriate use of a product bearing CE marking in accordance with the Construction Products Directive (89/106/EEC)¹, the Low Voltage Directive (73/23/EEC and amendment 93/68/EEC)² and the EMC Directive (89/336/EEC)³ as amended by the CE Marking Directive (93/68/EEC)⁴ or a product complying with an appropriate technical specification (as defined in those Directives), a British Standard, or an alternative national technical specification of any state which is a contracting party to the European Economic Area which, in use, is equivalent, or a product covered by a national or European certificate issued by a European Technical Approval Issuing body, and the conditions of use are in accordance with the terms of the certificate. You will find further guidance in the Approved Document supporting Regulation 7 on materials and workmanship.

INDEPENDENT CERTIFICATION SCHEMES

There are many UK product certification schemes. Such schemes certify compliance with the requirements of a recognised document which is appropriate to the purpose for which the material is to be used. Materials which are not so certified may still conform to a relevant standard.

Many certification bodies which approve such schemes are accredited by UKAS.

TECHNICAL SPECIFICATIONS

Building Regulations are made for specific purposes: health and safety, energy conservation and the welfare and convenience of disabled people. Standards and technical approvals are relevant guidance to the extent that they relate to these considerations. However, they may also address other aspects of performance such as serviceability, or aspects which although they relate to health and safety are not covered by the Regulations.

¹ As implemented by the Construction Products Regulations 1991 (SI 1991/1620).

² As implemented by the Electrical Equipment (Safety Regulations 1994) (SI 1994/3260).

³ As implemented by the Electromagnetic Compatibility Regulations 1992 (SI 1992/2372).

⁴ As implemented by the Construction Products (Amendment) Regulations 1994 (SI 1994/3051) and The Electromagnetic Compatibility (Amendment) Regulations 1994 (SI 1994/3080).

When an Approved Document makes reference to a named standard, the relevant version of the standard is the one listed at the end of the publication. However, if this version has been revised or updated by the issuing standards body, the new version may be used as a source of guidance provided it continues to address the relevant requirements of the Regulations.

The appropriate use of a product which complies with a European Technical Approval as defined in the Construction Products Directive will meet the relevant requirements.

The Office intends to issue periodic amendments to its Approved Documents to reflect emerging harmonised European Standards. Where a national standard is to be replaced by a European harmonised standard, there will be a co-existence period during which either standard may be referred to. At the end of the co-existence period the national standard will be withdrawn.

THE WORKPLACE (HEALTH, SAFETY AND WELFARE) REGULATIONS 1992

The Workplace (Health, Safety and Welfare) Regulations 1992 as amended by The Health and Safety (Miscellaneous Amendments) Regulations 2002 (SI 2002/2174) contain some requirements which affect building design. The main requirements are now covered by the Building Regulations, but for further information see: *Workplace health, safety and welfare: Workplace (Health, Safety and Welfare) Regulations 1992, Approved Code of Practice*, L24, HMSO, 1992 (ISBN 0 71760 413 6).

The Workplace (Health, Safety and Welfare) Regulations 1992 apply to the common parts of flats and similar buildings if people such as cleaners and caretakers are employed to work in these common parts. Where the requirements of the Building Regulations that are covered by this part do not apply to dwellings, the provisions may still be required in the situations described above in order to satisfy the Workplace Regulations.

MIXED USE DEVELOPMENT

In mixed use developments part of a building may be used as a dwelling while another part has a non-domestic use. In such cases, if the requirements of this part of the Regulations for dwelling and non-domestic use differ, the requirements for non-domestic use should apply in any shared parts of the building.

The Requirement

This Approved Document, which takes effect on 6 April 2006, deals with the energy efficiency requirements in the Building Regulations 2000 (as amended by SI 2001/3335 and SI 2006/652). The energy efficiency requirements are conveyed in Part L of Schedule 1 to the Regulations and regulations 4A, 17C and 17D as described below.

<i>Requirement</i>	<i>Limits on application</i>
Part L Conservation of fuel and power	
L1. Reasonable provision shall be made for the conservation of fuel and power in buildings by:	
a. limiting heat gains and losses:	
i. through thermal elements and other parts of the building fabric; and	
ii. from pipes, ducts and vessels used for space heating, space cooling and hot water services;	
b. providing and commissioning energy efficient fixed building services with effective controls; and	
c. providing to the owner sufficient information about the building, the fixed building services and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.	

Other changes to the Regulations

There are new Regulations that introduce new energy efficiency requirements and other relevant changes to the existing regulations. For ease of reference the principal elements of the regulations that bear on energy efficiency are repeated below and, where relevant, in the body of the guidance in the rest of this Approved Document. However it must be recognised that the Statutory Instrument takes precedence if there is any doubt over interpretation.

Interpretation

Regulation 2(1) is amended to include the following new definitions.

‘Change to a building’s energy status’ means any change which results in a building becoming a building to which the energy efficiency requirements of these Regulations apply, where previously it was not.

‘Energy efficiency requirements’ means the requirements of regulations 4A, 17C and 17D and Part L of Schedule 1.

‘Fixed building services’ means any part of, or any controls associated with:

- a. fixed internal or external lighting systems, but does not include emergency escape lighting or specialist process lighting; or
- b. fixed systems for heating, hot water service, air conditioning or mechanical ventilation.

‘Renovation’ in relation to a thermal element means the provision of a new layer in the thermal element or the replacement of an existing layer, but excludes decorative finishes, and ‘renovate’ shall be construed accordingly.

New paragraphs (2A) and (2B) are added to Regulation 2 as follows.

(2A) ‘In these Thermal element’ means a wall, floor or roof (but does not include windows, doors, roof windows or roof-lights) which separates a thermally conditioned part of the building (‘the conditioned space’) from:

- a. the external environment (including the ground); or
- b. in the case of floors and walls, another part of the building which is:
 - i. unconditioned;
 - ii. an extension falling within class VII in Schedule 2; or
 - iii. where this paragraph applies, conditioned to a different temperature,

and includes all parts of the element between the surface bounding the conditioned space and the external environment or other part of the building as the case may be.

(2B) Paragraph (2A)(b)(iii) only applies to a building which is not a dwelling, where the other part of the building is used for a purpose which is not similar or identical to the purpose for which the conditioned space is used.

Meaning of building work

Regulation 3 is amended as follows.

3.–(1) In these Regulations ‘building work’ means:

- a. the erection or extension of a building;
- b. the provision or extension of a controlled service or fitting in or in connection with a building;
- c. the material alteration of a building, or a controlled service or fitting, as mentioned in paragraph (2);
- d. work required by regulation 6 (requirements relating to material change of use);
- e. the insertion of insulating material into the cavity wall of a building;
- f. work involving the underpinning of a building;
- g. work required by regulation 4A (requirements relating to thermal elements);
- h. work required by regulation 4B (requirements relating to a change of energy status);
- i. work required by regulation 17D (consequential improvements to energy performance).

(2) An alteration is material for the purposes of these Regulations if the work, or any part of it, would at any stage result:

- a. in a building or controlled service or fitting not complying with a relevant requirement where previously it did; or
- b. in a building or controlled service or fitting which before the work commenced did not comply with a relevant requirement, being more unsatisfactory in relation to such a requirement.

(3) In paragraph (2) ‘relevant requirement’ means any of the following applicable requirements of Schedule 1, namely:

Part A (structure)
 paragraph B1 (means of warning and escape)
 paragraph B3 (internal fire spread – structure)
 paragraph B4 (external fire spread)
 paragraph B5 (access and facilities for the fire service)
 Part M (access to and use of buildings).

Requirements relating to building work

Regulation 4 is amended as follows

4.–(1) Subject to paragraph 1A building work shall be carried out so that:

- a. it complies with the applicable requirements contained in Schedule 1; and
- b. in complying with any such requirement there is no failure to comply with any other such requirement.

(1A) Where:

- a. building work is of a kind described in regulation 3(1)(g), (h) or (i); and
 - b. the carrying out of that work does not constitute a material alteration,
- that work need only comply with the applicable requirements of Part L of Schedule 1.

(2) Building work shall be carried out so that, after it has been completed:

- a. any building which is extended or to which a material alteration is made; or
 - b. any building in, or in connection with, which a controlled service or fitting is provided, extended or materially altered; or
 - c. any controlled service or fitting,
- complies with the applicable requirements of Schedule 1 or, where it did not comply with any such requirement, is no more unsatisfactory in relation to that requirement than before the work was carried out.

Requirements relating to thermal elements

A new regulation 4A is added as follows:

4A.–(1) Where a person intends to renovate a thermal element, such work shall be carried out as is necessary to ensure that the whole thermal element complies with the requirements of paragraph L1(a)(i) of Schedule 1.

(2) Where a thermal element is replaced, the new thermal element shall comply with the requirements of paragraph L1(a)(i) of Schedule 1.

Requirements relating to a change to energy status

A new regulation 4B is added as follows:

4B.–(1) Where there is a change to a building's energy status, such work, if any, shall be carried out as is necessary to ensure that the building complies with the applicable requirements of Part L of Schedule 1.

(2) In this regulation 'building' means the building as a whole or parts of it that have been designed or altered to be used separately.

Requirements relating to a material change of use

Regulation 6 is updated to take account of the changes to Part L.

Exempt buildings and work

Regulation 9 is substantially altered as follows.

9.–(1) Subject to paragraphs (2) and (3) these Regulations do not apply to:

- a. the erection of any building or extension of a kind described in Schedule 2; or
- b. the carrying out of any work to or in connection with such a building or extension, if after the carrying out of that work it is still a building or extension of a kind described in that Schedule.

(2) The requirements of Part P of Schedule 1 apply to:

- a. any greenhouse;
- b. any small detached building falling within class VI in Schedule 2; and
- c. any extension of a building falling within class VII in Schedule 2,

which in any case receives its electricity from a source shared with or located inside a dwelling.

(3) The energy efficiency requirements of these Regulations apply to:

- a. the erection of any building of a kind falling within this paragraph;
- b. the extension of any such building, other than an extension falling within class VII in Schedule 2; and
- c. the carrying out of any work to or in connection with any such building or extension.

(4) A building falls within paragraph (3) if it:

- a. is a roofed construction having walls;
- b. uses energy to condition the indoor climate; and
- c. does not fall within the categories listed in paragraph (5).

(5) The categories referred to in paragraph (4)(c) are:

- a. buildings which are:
 - i. listed in accordance with section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990;
 - ii. in a conservation area designated in accordance with section 69 of that Act; or
 - iii. included in the schedule of monuments maintained under section 1 of the Ancient Monuments and Archaeological Areas Act 1979,

where compliance with the energy efficiency requirements would unacceptably alter their character or appearance;

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- b. buildings which are used primarily or solely as places of worship;
 - c. temporary buildings with a planned time of use of two years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demand;
 - d. stand-alone buildings other than dwellings with a total useful floor area of less than 50m².
- (6) In this regulation:
- a. 'building' means the building as a whole or parts of it that have been designed or altered to be used separately; and
 - b. the following terms have the same meaning as in European Parliament and Council Directive 2002/91/EC on the energy performance of buildings:
 - i. 'industrial sites';
 - ii. 'low energy demand';
 - iii. 'non-residential agricultural buildings';
 - iv. 'places of worship';
 - v. 'stand-alone';
 - vi. 'total useful floor area';
 - vii. 'workshops'

Giving of a building notice or deposit of plans

Regulation 12 is substantially amended as follows.

12.—(1) In this regulation 'relevant use' means a use as a workplace of a kind to which Part II of the Fire Precautions (Workplace) Regulations 1997 applies or a use designated under section 1 of the Fire Precautions Act 1971.

(2) This regulation applies to a person who intends to:

- a. carry out building work;
- b. replace or renovate a thermal element in a building to which the energy efficiency requirements apply;
- c. make a change to a building's energy status; or
- d. make a material change of use.

(2A) Subject to the following provisions of this regulation, a person to whom this regulation applies shall:

- a. give to the local authority a building notice in accordance with regulation 13; or
- b. deposit full plans with the local authority in accordance with regulation 14.

(3) A person shall deposit full plans where he intends to carry out building work in relation to a building to which the Regulatory Reform (Fire Safety) Order 2005 applies, or will apply after the completion of the building work.

(4) A person shall deposit full plans where he intends to carry out work which includes the erection of a building fronting on to a private street.

(4A) A person shall deposit full plans where he intends to carry out building work in relation to which paragraph H4 of Schedule 1 imposes a requirement.

(5) A person who intends to carry out building work is not required to give a building notice or deposit full plans where the work consists only of work:

- a. described in column 1 of the Table in Schedule 2A if the work is to be carried out by a person described in the corresponding entry in column 2 of that Table, and paragraphs 1 and 2 of that schedule have effect for the purposes of the descriptions in the Table; or
- b. described in Schedule 2B.

(6) Where regulation 20 of the Building (Approved Inspectors etc.) Regulations 2000 (local authority powers in relation to partly completed work) applies, the owner shall comply with the requirements of that regulation instead of with this regulation.

(7) Where:

- a. a person proposes to carry out work which consists of emergency repairs;
- b. it is not practicable to comply with paragraph (2A) before commencing the work; and
- c. paragraph (5) does not apply,

he shall give a building notice to the local authority as soon as reasonably practicable after commencement of the work.

Regulation 13 (particulars and plans where a building notice is given) and 14 (full plans)

These are amended to apply to renovation or replacement of a thermal element and a change to a building's energy status.

Provisions applicable to self certification schemes

16A.—(1) This regulation applies to the extent that the building work consists only of work of a type described in column 1 of the Table in Schedule 2A and the work is carried out by a person who is described in the corresponding entry in column 2 of that Table in respect of that type of work.

(2) Where this regulation applies, the local authority is authorised to accept, as evidence that the requirements of regulations 4 and 7 have been satisfied, a certificate to that effect by the person carrying out the building work.

(3) Where this regulation applies, the person carrying out the work shall, not more than 30 days after the completion of the work:

- a. give to the occupier a copy of the certificate referred to in paragraph (2); and
- b. give to the local authority:
 - i. notice to that effect; or
 - ii. the certificate referred to in paragraph (2).

(4) Paragraph (3) of this regulation does not apply where a person carries out the building work described in Schedule 2B.

New Part VA

Energy Performance of buildings

New Regulations are added as follows.

Methodology of calculation of the energy performance of buildings

17A. The Secretary of State shall approve a methodology of calculation of the energy performance of buildings.

Minimum energy performance requirements for buildings

17B. The Secretary of State shall approve minimum energy performance requirements for new buildings, in the form of target CO₂ emission rates, which shall be based upon the methodology approved pursuant to regulation 17A.

New buildings

17C. Where a building is erected, it shall not exceed the target CO₂ emission rate for the building that has been approved pursuant to regulation 17B.

Consequential improvements to energy performance

17D.—(1) Paragraph (2) applies to an existing building with a total useful floor area over 1000m² where the proposed building work consists of or includes:

- a. an extension;
- b. the initial provision of any fixed building services; or
- c. an increase to the installed capacity of any fixed building services.

(2) Subject to paragraph (3), where this regulation applies, such work, if any, shall be carried out as is necessary to ensure that the building complies with the requirements of Part L of Schedule 1.

(3) Nothing in paragraph (2) requires work to be carried out if it is not technically, functionally and economically feasible.

Interpretation

17E. In this Part ‘building’ means the building as a whole or parts of it that have been designed or altered to be used separately.

Part VI – Miscellaneous

New Regulations are added as follows.

Pressure testing

20B.–(1) This regulation applies to the erection of a building in relation to which paragraph L1(a)(i) of Schedule 1 imposes a requirement.

(2) Where this regulation applies, the person carrying out the work shall, for the purpose of ensuring compliance with regulation 17C and paragraph L1(a)(i) of Schedule 1:

- a. ensure that:
 - i. pressure testing is carried out in such circumstances as are approved by the Secretary of State; and
 - ii. the testing is carried out in accordance with a procedure approved by the Secretary of State; and
- b. subject to paragraph (5), give notice of the results of the testing to the local authority.

(3) The notice referred to in paragraph (2)(b) shall:

- a. record the results and the data upon which they are based in a manner approved by the Secretary of State; and
- b. be given to the local authority not later than seven days after the final test is carried out.

(4) A local authority is authorised to accept, as evidence that the requirements of paragraph (2)(a)(ii) have been satisfied, a certificate to that effect by a person who is registered by the British Institute of Non-destructive Testing in respect of pressure testing for the air tightness of buildings.

(5) Where such a certificate contains the information required by paragraph (3)(a), paragraph (2)(b) does not apply.

Commissioning

20C.–(1) This regulation applies to building work in relation to which paragraph L1(b) of Schedule 1 imposes a requirement, but does not apply where the work consists only of work described in Schedule 2B.

(2) Where this regulation applies the person carrying out the work shall, for the purpose of ensuring compliance with paragraph L1(b) of Schedule 1, give to the local authority a notice confirming that the fixed building services have been commissioned in accordance with a procedure approved by the Secretary of State.

(3) The notice shall be given to the local authority:

- a. not later than the date on which the notice required by regulation 15(4) is required to be given; or
- b. where that regulation does not apply, not more than 30 days after completion of the work.

CO₂ emission rate calculations

20D.–(1) Subject to paragraph (4), where regulation 17C applies the person carrying out the work shall provide to the local authority a notice which specifies:

- a. the target CO₂ emission rate for the building; and
- b. the calculated CO₂ emission rate for the building as constructed.

(2) The notice shall be given to the local authority not later than the date on which the notice required by regulation 20B is required to be given.

(3) A local authority is authorised to accept, as evidence that the requirements of regulation 17C would be satisfied if the building were constructed in accordance with an accompanying list of specifications, a certificate to that effect by a person who is registered by:

- a. FAERO Limited; or
- b. BRE Certification Limited,

in respect of the calculation of CO₂ emission rates of buildings.

(4) Where such a certificate is given to the local authority:

- a. paragraph (1) does not apply; and
- b. the person carrying out the work shall provide to the local authority not later than the date on which the notice required by regulation 20B is required to be given a notice which:
 - i. states whether the building has been constructed in accordance with the list of specifications which accompanied the certificate; and
 - ii. if it has not, lists any changes to the specifications to which the building has been constructed.

Schedule 2A

Schedule 2A is amended as follows:

Self-certification schemes and exemptions from requirement to give building notice or deposit full plans.

Column 1	Column 2
<i>Type of work</i>	<i>Person carrying out work</i>
1. Installation of a heat-producing gas appliance.	A person, or an employee of a person, who is a member of a class of persons approved in accordance with regulation 3 of the Gas Safety (Installation and Use) Regulations 1998.
2. Installation of heating or hot water service system connected to a heat-producing gas appliance, or associated controls.	A person registered by CORGI Services Limited in respect of that type of work.
3. Installation of: <ol style="list-style-type: none"> an oil-fired combustion appliance which has a rated heat output of 100 kilowatts or less and which is installed in a building with no more than 3 storeys (excluding any basement) or in a dwelling; oil storage tanks and the pipes connecting them to combustion appliances; or heating and hot water service systems connected to an oil-fired combustion appliance. 	An individual registered by Oil Firing Technical Association Limited, NAPIT Certification Limited or Building Engineering Services Competence Accreditation Limited in respect of that type of work.
4. Installation of: <ol style="list-style-type: none"> a solid fuel burning combustion appliance which has a rated heat output of 50 kilowatts or less which is installed in a building with no more than 3 storeys (excluding any basement); or heating and hot water service systems connected to a solid fuel burning combustion appliance. 	A person registered by HETAS Limited, NAPIT Certification Limited or Building Engineering Services Competence Accreditation Limited in respect of that type of work.
5. Installation of a heating or hot water service system, or associated controls, in a dwelling.	A person registered by Building Engineering Services Competence Accreditation Limited in respect of that type of work.
6. Installation of a heating, hot water service, mechanical ventilation or air conditioning system, or associated controls, in a building other than a dwelling.	A person registered by Building Engineering Services Competence Accreditation Limited in respect of that type of work.
7. Installation of an air conditioning or ventilation system in an existing dwelling, which does not involve work on systems shared with other dwellings.	A person registered by CORGI Services Limited or NAPIT Certification Limited in respect of that type of work.
8. Installation of a commercial kitchen ventilation system which does not involve work on systems shared with parts of the building occupied separately.	A person registered by CORGI Services Limited in respect of that type of work.
9. Installation of a lighting system or electric heating system, or associated electrical controls.	A person registered by The Electrical Contractors Association Limited in respect of that type of work.
10. Installation of fixed low or extra-low voltage electrical installations.	A person registered by BRE Certification Limited, British Standards Institution, ELECSA Limited, NICEIC Group Limited or NAPIT Certification Limited in respect of that type of work.
11. Installation of fixed low or extra-low voltage electrical installations as a necessary adjunct to or arising out of other work being carried out by the registered person.	A person registered by CORGI Services Limited, ELECSA Limited, NAPIT Certification Limited, NICEIC Group Limited or Oil Firing Technical Association Limited in respect of that type of electrical work.
12. Installation, as a replacement, of a window, rooflight, roof window or door (being a door which together with its frame has more than 50 per cent of its internal face area glazed) in an existing building.	A person registered under the Fenestration Self-Assessment Scheme by Fensa Ltd, or by CERTASS Limited or the British Standards Institution in respect of that type of work.

<p>13. Installation of a sanitary convenience, washing facility or bathroom in a dwelling, which does not involve work on shared or underground drainage.</p>	<p>A person registered by CORGI Services Limited or NAPIT Certification Limited in respect of that type of work.</p>
<p>14.–(1) Subject to paragraph (2), any building work, other than the provision of a masonry chimney, which is necessary to ensure that any appliance, service or fitting which is installed and which is described in the preceding entries in column 1 above, complies with the applicable requirements contained in Schedule 1.</p> <p>(2) Paragraph (1) does not apply to:</p> <ul style="list-style-type: none"> c. building work which is necessary to ensure that a heat-producing gas appliance complies with the applicable requirements contained in Schedule 1 unless the appliance: <ul style="list-style-type: none"> i. has a rated heat output of 100 kilowatts or less; and ii. is installed in a building with no more than 3 storeys (excluding any basement), or in a dwelling; or d. the provision of a masonry chimney. 	<p>The person who installs the appliance, service or fitting to which the building work relates and who is described in the corresponding entry in column 2 above.</p>

Section 0: General guidance

CONVENTIONS USED IN THIS DOCUMENT

1 In this document the following conventions have been adopted to assist understanding and interpretation:

- a. Texts shown **against a green background** are extracts from the Building Regulations as amended and convey the legal requirements that bear on compliance with Part L. It should be remembered however that building works must comply with all the other relevant provisions. Similar provisions are conveyed by the Building (Approved Inspectors) Regulations as amended.
- b. Key terms are printed in **bold italic text** and defined for the purposes of this Approved Document in Section 5 of this document.
- c. References given as footnotes and repeated as end notes are given as ways of meeting the requirements or as sources of more general information as indicated in the particular case. The Approved document will be amended from time to time to include new references and to refer to revised editions where this aids compliance.
- d. Additional *commentary in italic* text appears after some numbered paragraphs. The commentary is intended to assist understanding of the immediately preceding paragraph or sub-paragraph, but is not part of the approved guidance.

TYPES OF WORK COVERED BY THIS APPROVED DOCUMENT

2 This Approved Document is intended to give guidance on what, in ordinary circumstances, would be accepted as reasonable provision in fulfilment of the requirements of Part L, Regulations 17C, 20B, 20C and 20D for those creating new **dwellingings** through new construction works.

*Buildings containing rooms for residential purposes such as nursing homes, student accommodation and similar are not **dwellingings**, and in such cases, Approved Document L2A would apply.*

3 If part of a unit that contains living accommodation also contains space to be used for commercial purposes (e.g. workshop or office), it should be treated as a **dwelling** if the commercial part could revert to domestic use on a change of ownership. This could be the case if:

- a. there is direct access between the commercial space and the living accommodation; and
- b. both are contained within the same thermal envelope; and
- c. the living accommodation occupies a substantial proportion of the total area of the building.

*Sub para c. means the presence of (e.g.) a small manager's flat in a large non-domestic building would not result in the whole building being treated as a **dwelling**.*

4 Approved Document L1B applies where a **dwelling** is being created as the result of a material change of use.

'Material Change of Use' is defined in Regulation 5.

5 When constructing a **dwelling** as part of a larger building that contains other types of accommodation, this Approved Document L1A should be used for guidance in relation to the individual **dwellingings**. Approved Document L2A gives guidance relating to the non-dwelling parts of such buildings such as heated common areas, and in the case of mixed-use developments, the commercial or retail space.

TECHNICAL RISK

6 Building work must satisfy all the technical requirements set out in Regulations 4A, 4B, 17C, 17D, and Schedule 1 of the Building Regulations. Part B (Fire safety), Part E (Resistance to the passage of sound), Part F (Ventilation), Part C (Site preparation and resistance to moisture), Part J (Combustion appliances and fuel storage systems) and Part P (Electrical safety) are particularly relevant when considering the incorporation of energy efficiency measures.

7 The inclusion of any particular energy efficiency measure should not involve excessive technical risk. BR 262⁵ provides general guidance on avoiding risks in the application of thermal insulation.

⁵ BR 262 *Thermal insulation: avoiding risks*, BRE, 2001.

DEMONSTRATING COMPLIANCE

8 In the Secretary of State's view, compliance with Part L and Regulation 17C would be demonstrated by meeting the five criteria set out in the following paragraphs. Appendix A contains a checklist that can be used to confirm that all the provisions have been met satisfactorily.

The checklist can benefit both developers and building control.

9 Criterion 1: the predicted rate of CO₂ emissions from the **dwelling** (the Dwelling Emission Rate **DER**) is not greater than the Target Emission Rate (**TER**), which is determined by following the procedures set out in paragraphs 19 to 23; and

The results of showing compliance with this criterion will also provide the information needed to prepare the Energy Performance Certificate required by the Energy Performance of Buildings Directive.

10 Criterion 2: the performance of the building fabric and the **fixed building services** should be no worse than the design limits set out in paragraphs 32 to 45; and

This is intended to place limits on design flexibility to discourage excessive and inappropriate trade-off – e.g. buildings with poor insulation standards offset by renewable energy systems with uncertain service lives.

11 Criterion 3: the **dwelling** has appropriate passive control measures to limit the effect of solar gains on indoor temperatures in summer. The guidance given in paragraphs 46 to 48 of this Approved Document provide a way of demonstrating that reasonable provisions have been made; and

The aim is to counter excessive internal temperature rise in summer to reduce or eliminate the need for air conditioners.

12 Criterion 4: the performance of the **dwelling**, as built, is consistent with the **DER**. The guidance in Section 2 should be used to demonstrate this criterion has been met; and

Pressure tests, commissioning etc.

13 Criterion 5: the necessary provisions for energy efficient operation of the **dwelling** are put in place. This would be achieved by following the guidance in Section 3.

Common areas in buildings with multiple dwellings

14 Any common areas of buildings containing multiple **dwellings** are not classified as dwellings, and therefore fall outside the scope of the five criteria outlined above. For such areas, reasonable provision would be:

- a. if they are heated, to follow the guidance in Approved Document L2A; or
- b. if they are unheated, to provide fabric elements that meet the fabric standards set out in paragraphs 33 to 36.

Conservatories and substantially glazed spaces

15 If a conservatory is built as part of the new **dwelling**, then the performance of the **dwelling** should be assessed as if the conservatory were not there. The guidance in Approved Document L1B should be followed in respect of the construction of the conservatory itself.

*This means that the thermal separation between **dwelling** and conservatory must be constructed to a standard comparable to the rest of the external envelope of the **dwelling**. Note that conservatories with a floor area not exceeding 30m² and built at ground level are currently exempt from the Building Regulations⁶.*

16 If any substantially glazed space is integral with the **dwelling** (i.e. there is no thermal separation and by definition the space is therefore not a conservatory), then the space should be included as part of the new **dwelling** when checking against the five compliance criteria.

BUILDINGS THAT ARE EXEMPT FROM THE REQUIREMENTS IN PART L

17 The provisions for exempting buildings and building work from the Building Regulations requirements have changed and the new provisions are given in Regulation 9⁶.

⁶ See copy of Regulation 9 on page 7.

Section 1: Design standards

REGULATIONS 17A AND 17B

18 Regulations 17A, 17B and 17C implement Articles 3, 4 and 5 of the Energy Performance of Buildings Directive and state that:

Methodology of calculation of the energy performance of buildings

17A.–The Secretary of State shall approve a methodology of calculation of the energy performance of buildings.

Minimum energy performance requirements for buildings

17B.–The Secretary of State shall approve minimum energy performance requirements for new buildings, in the form of target CO₂ emission rates, which shall be based upon the methodology approved pursuant to regulation 17A.

Target CO₂ Emission Rate (TER)

19 The Target CO₂ Emission Rate (TER) is the minimum energy performance requirement for new dwellings approved by the Secretary of State in accordance with Regulation 17B. It is expressed in terms of the mass of CO₂, in units of kg per m² of floor area per year emitted as a result of the provision of heating, hot water, ventilation and internal fixed lighting for a standardised household when assessed using approved calculation tools.

20 In accordance with the methodology approved by the Secretary of State in ODPM Circular 03/2006, the TER must be calculated using the following approved calculation tools:

- a. for individual dwellings no greater than 450m² total floor area, the 2005 edition of Government's Standard Assessment Procedure (SAP 2005)⁷.
- b. for individual dwellings larger than the above threshold, the Simplified Building Energy Model (SBEM)⁸.

21 The target is calculated in two stages:

- a. First calculate the CO₂ emissions from a notional **dwelling** of the same size and shape as the actual **dwelling** and which is constructed according to the reference values as set out in Appendix R of SAP 2005. In the specific circumstances set out in paragraph 61 the **air permeability** used in the calculation of the TER may be varied from the value set out in Appendix R. No other values may be varied. The calculation tool will report the CO₂ emissions arising from:
 - i. the provision of heating and hot water, C_H (which includes the energy used by pumps and fans); and
 - ii. the use of internal fixed lighting C_L.
- b. Secondly, determine the TER using the following formula:

$$TER = (C_H \times \text{fuel factor} + C_L) \times (1 - \text{improvement factor})$$

Where the fuel factor⁹ is taken from Table 1 in accordance with the guidance in paragraph 22. The improvement factor for this revision of Part L is 0.2, i.e. 20%.

Table 1 Fuel factor

Heating Fuel	Fuel factor
Mains gas	1.00
LPG	1.10
Oil	1.17
Grid electricity (for direct acting, storage and electric heat pump systems)	1.47
Solid mineral fuel ¹	1.28
Renewable energy including bio-fuels such as wood pellets	1.00
Solid multi-fuel ¹	1.00

Notes:

1. The specific fuel factor should be used for those appliances that can only burn the particular fuel. Where an appliance is classed as multi-fuel, the multi-fuel factor should be used, except where the **dwelling** is in a Smoke Control Area. In such cases the solid mineral fuel figure should be used, unless the specific appliance type has been approved for use within Smoke Control Areas.

⁷ The Government's Standard Assessment Procedure for Energy Rating of Dwellings, SAP 2005 edition, Defra, 2005.

⁸ Simplified Building Energy Model (SBEM) user manual and Calculation Tool. Available from www.odpm.gov.uk

⁹ The fuel factor is the greater of 1.0 and the square root of the ratio of the CO₂ emission factor for the fuel to the emission factor for mains gas rounded to two decimal places. The derivation of the emission factors is described in CO₂ Emission Figures for Policy Analysis BRE July 2005., <http://www.bre.co.uk/filelibrary/CO2EmissionFigures2001.pdf>.

22 The fuel factor used to calculate the **TER** should be based on the following fuel:

- a. Where all the heating appliances are served by the same fuel, the fuel used in those appliances.
- b. Where a **dwelling** has more than one heating appliance and these are served by different fuels the fuel used for the TER calculation should be:
 - i. mains gas if any of the heating appliances are fired by mains gas; otherwise

Designers could choose (e.g.) solid fuel central heating if they wish but the target performance should be based on gas because it is available.

- ii. the fuel used in the main heating system.
- c. Where a **dwelling** is served by a community heating scheme, the principal fuel used by the community heating system.

Buildings containing multiple dwellings

23 Where a building contains more than one **dwelling** (such as in a terrace of houses or in a block of flats), an average **TER** can be calculated for all the dwellings in the building. In such cases, the average **TER** is the floor-area-weighted average of all the individual **TERs**, and is calculated according to the following formula:

$$\frac{\{(TER^1 \times \text{Floor area}^1) + (TER^2 \times \text{Floor area}^2) + (TER^3 \times \text{Floor area}^3) + \dots\}}{\{(\text{Floor area}^1 + \text{Floor area}^2 + \text{Floor area}^3) + \dots\}}$$

CRITERION 1 – ACHIEVING THE TER

24 Regulation 17C states that:

New buildings

17C. Where a building is erected, it shall not exceed the target CO₂ emission rate for the building that has been approved pursuant to regulation 17B.

Calculating the CO₂ emissions from the actual dwelling

25 To comply with Regulation 17C, the proposed Dwelling CO₂ Emission Rate (**DER**) must be no worse than the **TER** calculated as set out in paragraphs 19 to 23. The final calculation produced in accordance with Regulation 20D must be based on the building as constructed, incorporating:

- a. any changes to the performance specifications that have been made during construction.
- b. the measured **air permeability**, ductwork leakage and fan performances as commissioned.

26 Regulation 20D states:

CO₂ emission rate calculations

20D.–(1) Subject to paragraph (4), where regulation 17C applies the person carrying out the work shall provide to the local authority a notice which specifies:

- a. the target CO₂ emission rate for the building; and
- b. the calculated CO₂ emission rate for the building as constructed.

(2) The notice shall be given to the local authority not later than the date on which the notice required by regulation 20B is required to be given.

(3) A local authority is authorised to accept, as evidence that the requirements of regulation 17C would be satisfied if the building was constructed in accordance with an accompanying list of specifications, a certificate to that effect by a person who is registered by:

- a. FAERO Limited; or
- b. BRE Certification Limited,

in respect of the calculation of CO₂ emission rates of buildings.

(4) Where such a certificate is given to the local authority:

- a. paragraph (1) does not apply; and
- b. the person carrying out the work shall provide to the local authority not later than the date on which the notice required by regulation 20B is required to be given a notice which:
 - i. states whether the building has been constructed in accordance with the list of specifications which accompanied the certificate; and
 - ii. if it has not, lists any changes to the specifications to which the building has been constructed.

27 In addition to this final calculation it would be useful to both builder and building control body if the builder carries out a preliminary calculation before construction starts based on plans and specifications and shares the results. The calculation tool will give a firm indication of whether a design is compliant and it produces a list of those features of the design that are critical to achieving compliance.

BCBs may ask for this information as part of their preparations for checking compliance.

Secondary heating

28 When calculating the **DER**, it shall be assumed that a secondary heating appliance meets part of space heat demand. The fraction provided by the secondary heating system shall be as defined by SAP 2005 for the particular combination of primary heating system and secondary heating appliance. The following

secondary heating appliance shall be used when calculating the **DER**:

- a. Where a secondary heating appliance is fitted, the efficiency of the actual appliance with its appropriate fuel shall be used in the calculation of the **DER**.
- b. Where a chimney or flue is provided but no appliance is actually installed, then the presence of the following appliances shall be assumed when calculating the **DER**:
 - i. If a gas point is located adjacent to the hearth, a decorative fuel effect fire open to the chimney or flue with an efficiency of 20%.
 - ii. If there is no gas point, then an open fire in grate with an efficiency of 37% burning multi-fuel, unless the dwelling is in a smoke control area when the fuel should be taken as smokeless solid mineral fuel.
- c. Otherwise an electric room heater shall be taken as the secondary heating appliance.

Lighting

29 In all cases the **DER** should be calculated using a fixed assumption of 30% low energy lighting.

This means low energy lighting provision is non-tradable. The minimum amount that should be provided in the actual building is given in paragraph 43, but builders may wish to include a greater level of provision than that detailed there.

Buildings containing multiple dwellings

30 Where a building contains more than one **dwelling** (such as in a terrace of houses or in a block of flats), Regulation 17C is achieved if:

- a. EITHER every individual **dwelling** has a **DER** that is no greater than its corresponding **TER**;
- b. OR the average **DER** is no greater than the average **TER**. The average **DER** is the floor-area-weighted average of all the individual **DERs**, and is calculated in the same way as the average **TER** (see paragraph 23).

*When adopting the average **DER** approach, it will still be necessary to provide information for each individual **dwelling**, as required by Regulation 20D.*

Achieving the target

31 In appropriate circumstances, low and zero carbon (LZC) energy supply systems such as solar hot water, photo-voltaic power, biofuels (e.g. wood fuels and oil blends), combined heat and power (at the **dwelling**, block or community levels), and heat pumps can make substantial and cost-effective contributions to meeting the **TER**. *Low or Zero Carbon Energy Sources – Strategic Guide*¹⁰ describes a range of possible systems and how their contribution to the **DER** can be assessed.

CRITERION 2 – LIMITS ON DESIGN FLEXIBILITY

32 Whilst the approach to complying with Criterion 1 allows considerable design flexibility, requirement L1(a)(i) states that reasonable provision should be made to limit heat gains and losses through the fabric of the building, and requirement L1(b) states energy efficient building services and effective controls should be provided. These requirements would be met by specifying performance standards that are no worse than those given in paragraphs 33 to 45.

Design Limits for envelope standards

*Note: To achieve the **TER**, the envelope standards for most of the elements will need to be significantly better than those set out in the following paragraphs.*

U-values

33 U-values shall be calculated using the methods and conventions set out in BR 443, 'Conventions for U-value calculations'¹¹.

34 The U-values for roof windows and rooflights given in this Approved Document are based on the U-value having been assessed with the roof window or rooflight in the vertical position. If a particular unit has been assessed in a plane other than the vertical, the standards given in this Approved Document should be modified by making a U-value adjustment following the guidance given in BR 443.

For example: the standard for the replacement rooflight in Table 2 is 2.0 W/m²·K. This is for the unit assessed in the vertical plane. The performance of a double glazed rooflight in the horizontal plane, based on the guidance given in BR 443, would be adjusted by 0.5 W/m²·K to 2.0 + 0.5 = 2.5W/m²·K.

35 Table 2 sets out the reasonable limits for plane element U-values for each of the elements of building fabric:

- a. column (a) gives the reasonable limits for area-weighted average U-values for the elements of the stated type.

The area-weighted U-value is given by the following expression:

$$\frac{\{(U_1 \times A_1) + (U_2 \times A_2) + (U_3 \times A_3) + \dots\}}{\{(A_1 + A_2 + A_3 + \dots)\}}$$

*This is to make the design robust for future changes in heating system type, e.g. if a **dwelling** has a large renewable energy system, it would not be appropriate to allow this to completely compensate for a poor envelope.*

¹⁰ *Low or Zero Carbon Energy Sources: Strategic Guide*, NBS, 2006.

¹¹ BR 443 *Conventions for U-value calculations*, BRE, 2006.

- b. column (b) gives the reasonable limits for U-values for individual elements of the stated type.

To minimise condensation risk in localised parts of the envelope. An individual element is defined as those areas of the given element type that have the same construction details. In the case of windows, doors and rooflights, the assessment should be based on the whole unit (i.e. in the case of a window, the combined performance of the glazing and the frame).

36 When comparing against the values in Table 2, the U-value of a window, roof window or rooflight, or door unit can be taken as the value for either:

- the standard configuration set out in BR 443; or
- the particular size and configuration of the actual unit. In either case, the U-value should be determined with the unit in the vertical plane.

SAP 2005 Table 6e gives values for different window configurations that can be used in the absence of test data or calculated values.

Air permeability

37 A reasonable limit for the **design air permeability** is $10\text{m}^3/(\text{h}\cdot\text{m}^2)$ at 50 Pa. Guidance on some ways of achieving this is given in *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings*¹².

Achieving the TER may need the design air permeability to be better than the limit value. Significantly better standards of air permeability are technically desirable in dwellings with mechanical ventilation, especially when using balanced systems with heat recovery.

Table 2 Limiting U-value standards ($\text{W}/\text{m}^2\cdot\text{K}$)

Element	a. Area-weighted average U-value	b. Limiting U-value
Wall	0.35	0.70
Floor	0.25	0.70
Roof	0.25	0.35
Windows, roof windows, rooflights and doors ¹	2.2	3.3

Notes:

- See paragraph 34.

¹² *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings*, Amendment 1, TSO, 2002. See www.est.org.uk.

Design Limits for fixed building services

Heating and hot water system(s)

38 Reasonable provision for the performance of heating and hot water system(s) would be

- a. the use of an appliance with an efficiency not less than that recommended for its type in the Domestic Heating Compliance Guide¹³; and
- b. the provision of controls that meet the minimum control requirements as given in the Domestic Heating Compliance Guide for the particular type of appliance and heat distribution system.

Insulation of pipes, ducts and vessels

39 Reasonable provision would be demonstrated by insulating pipes, ducts and vessels to standards that are not worse than those set out in the Domestic Heating Compliance Guide.

The TIMSA Guide¹⁴ explains the derivation of the performance standards and how they can be interpreted in practice.

Mechanical ventilation

40 Where the work involves the provision of a mechanical ventilation system or part thereof, reasonable provision would be to install systems no worse than those described in GPG 268¹⁵ which also have specific fan powers and heat recovery efficiency not worse than those in Table 3.

*GPG 268 also includes guidance on appropriate **air permeability** standards for different ventilation strategies. See comments at paragraph 37.*

Mechanical cooling

41 Fixed air conditioners should have an energy efficiency classification equal to or better than class C in Schedule 3 of the labelling scheme adopted under The Energy Information (Household Air Conditioners) (No. 2) Regulations 2005¹⁶.

Fixed internal lighting

42 A way of showing compliance would be to provide lighting fittings (including lamp, control gear and an appropriate housing, reflector, shade or diffuser or other device for controlling the output light) that only take lamps having a luminous efficacy greater than 40 lumens per circuit-Watt. Circuit-Watts means the power consumed in lighting circuits by lamps and their associated control gear and power factor correction equipment.

Fluorescent and compact fluorescent lighting fittings would meet this standard. Lighting fittings for GLS tungsten lamps with bayonet cap or Edison screw bases, or tungsten halogen lamps would not.

Table 3 Limits on design flexibility for mechanical ventilation systems

System type	Performance
Specific Fan Power (SFP) for continuous supply only and continuous extract only	0.8 litre/s.W
SFP for balanced systems	2.0 litre/s.W
Heat recovery efficiency	66%

¹³ Domestic Heating Compliance Guide, NBS, 2006.

¹⁴ HVAC Guidance for Achieving Compliance with Part L of the Building Regulations, TIMSA, 2006.

¹⁵ GPG268 Energy efficient ventilation in dwellings – a guide for specifiers, EST, 2006.

¹⁶ Statutory Instrument SI 2005/1726, the Energy Information (Household Air Conditioners) (No. 2) Regulations 2005.

43 Reasonable provision would be to provide in the areas affected by the building work, fixed energy efficient light fittings that number not less than the greater of:

- a. one per 25m² of **dwelling** floor area (excluding garages) or part thereof; or
- b. one per four fixed lighting fittings.

A light fitting may contain one or more lamps.

Installing mains frequency fluorescent lighting in garages may cause dangers through stroboscopic interaction with vehicle engine parts or machine tools. Fluorescent lamps with high frequency electronic ballasts substantially reduce this risk.

44 Lighting fittings in less frequented areas like cupboards and other storage areas would not count. GIL 20¹⁷ gives guidance on identifying suitable locations.

Fixed external lighting

*Fixed external lighting means lighting fixed to an external surface of the **dwelling** supplied from the occupier's electrical system. It excludes the lighting in common areas in blocks of flats and other access-way lighting provided communally.*

45 Reasonable provision would be to enable effective control and/or the use of efficient lamps such that:

- a. EITHER: Lamp capacity does not exceed 150W per light fitting and the lighting automatically switches off:
 - i. When there is enough daylight; and
 - ii. When it is not required at night
- b. OR: the lighting fittings have sockets that can only be used with lamps having an efficacy greater than 40 lumens per circuit watt.

Compact fluorescent lamps would meet the standard in (b). GLS tungsten lamps with bayonet cap or Edison screw bases, or tungsten halogen lamps would not.

CRITERION 3 – LIMITING THE EFFECTS OF SOLAR GAINS IN SUMMER

46 As required by Part L1(a)(ii), provision should be made to limit internal temperature rise due to solar gains. This can be done by an appropriate combination of window size and orientation, solar protection through shading and other solar control measures, ventilation (day and night) and high thermal capacity. CE 129 Reducing overheating – a designer's guide¹⁸ offers guidance on strategies to control overheating.

47 SAP 2005 Appendix P contains a procedure enabling designers to check whether solar gains are excessive. Reasonable provision would be achieved if the SAP assessment indicates the **dwelling** will not have a high risk of high internal temperatures.

Energy use for cooling is not addressed directly by SAP 2005. The procedure referred to here will help to identify the risk of excessive solar gains. This will help designers to limit peak temperatures in dwellings without mechanical cooling, and, together with the guidance in paragraph 41, should prevent excessive energy demand in dwellings with mechanical cooling.

Designers may wish to go beyond the requirements in the current Building Regulations to consider the impacts of future global warming on the risks of higher internal temperatures occurring more often. CIBSE TM 36 Climate Change and the indoor environment¹⁹ gives guidance on this issue.

48 When seeking to limit solar gains, consideration should be given to the provision of adequate levels of daylight. BS8206 Part 2 Code of practice for daylighting²⁰ gives guidance on maintaining adequate levels of daylighting.

The Building Regulations do not specify minimum daylight requirements. However, reducing window area produces conflicting impacts on the predicted CO₂ emissions: reduced solar gain but increased use of electric lighting.

¹⁷ GIL20, *Low energy domestic lighting*, EST, 2006.

¹⁸ CE129, *Reducing overheating – a designer's guide*, EST, 2006.

¹⁹ TM 36 *Climate change and the indoor environment: impacts and adaptation*, CIBSE, 2005.

²⁰ BS 8206-2:1992 *Lighting for buildings. Code of practice for daylighting*.

Section 2: Quality of construction and commissioning

49 As required by Regulation 17C, dwellings should be constructed and equipped so that performance is consistent with the predicted **DER**. As indicated in paragraph 25, a final calculation of the **DER** is required to reflect any changes in performance between design and construction and to demonstrate that the building as constructed meets the **TER**.

The provision of information referred to in paragraph 27 and Appendix B will assist BCBs in checking the key features of the design are included during the construction process.

CRITERION 4 – BUILDING FABRIC

50 In accordance with Part L and Regulation 7, the building fabric should be constructed to a reasonable quality of construction so that:

- a. the insulation is reasonably continuous over the whole building envelope; and
- b. the air permeability is within reasonable limits.

Continuity of insulation

51 The building fabric should be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements, at the joints between elements, and at the edges of elements such as those around window and door openings.

52 Reasonable provision would be to:

- a. adopt approved design details such as those set out in the reference in footnote¹²; or

A list of additional approved details may be provided in due course.

- b. to demonstrate that the specified details deliver an equivalent level of performance using the guidance in reference in footnote²¹.

53 In addition, the builder would have to demonstrate that an appropriate system of site inspection is in place to give confidence that the construction procedures achieve the required standards of consistency. For those using the approved details approach (paragraph 52a)) a way of achieving this would be to produce a report demonstrating that the construction checklists included in the reference at footnote¹² have been completed and show satisfactory results.

It could be helpful to builders and building control bodies if such reports are signed by a suitably qualified person.

Air permeability and pressure testing

54 In order to demonstrate that the specified **air permeability** has been achieved, Regulation 20B states:

Pressure testing

20B.–(1) This regulation applies to the erection of a building in relation to which paragraph L1(a)(i) of Schedule 1 imposes a requirement.

(2) Where this regulation applies, the person carrying out the work shall, for the purpose of ensuring compliance with regulation 17C and paragraph L1(a)(i) of Schedule 1:

- a. ensure that:
 - i. pressure testing is carried out in such circumstances as are approved by the Secretary of State; and
 - ii. the testing is carried out in accordance with a procedure approved by the Secretary of State; and
- b. subject to paragraph (5), give notice of the results of the testing to the local authority.

(3) The notice referred to in paragraph (2)(b) shall:

- a. record the results and the data upon which they are based in a manner approved by the Secretary of State; and
- b. be given to the local authority not later than seven days after the final test is carried out.

(4) A local authority is authorised to accept, as evidence that the requirements of paragraph (2)(a)(ii) have been satisfied, a certificate to that effect by a person who is registered by the British Institute of Non-destructive Testing in respect of pressure testing for the air tightness of buildings.

(5) Where such a certificate contains the information required by paragraph (3) paragraph (2)(b) does not apply.

55 The approved procedure for pressure testing is given in the ATTMA publication ‘Measuring Air Permeability of Building Envelopes’²². The manner approved for recording the results and the data on which they are based is given in section 4 of that document.

²¹ Information Paper IP01/06 *Assessing the effects of thermal bridging at junctions and around openings in the external elements of buildings*, BRE, 2006.

²² *Measuring Air Permeability of Building Envelopes*, ATTMA, 2006.

56 The approved circumstances under which the Secretary of State requires pressure testing to be carried out are set out in paragraphs 57 to 63.

*This means that if a design adopted a low design air permeability in order to achieve a performance better than the **TER**, it would not fail to comply with Part L if the pressure test achieved the limit value and the **TER** was achieved.*

Dwellings that have adopted approved construction details

57 On each development, an air pressure test should be carried out on a unit of each **dwelling type** selected by the **BCB**. For the purposes of this Approved Document, a block of flats should be treated as a separate development irrespective of the number of blocks on the site. The **dwelling(s)** to be tested should be taken from the first completed batch of units of each **dwelling type**.

Most larger developments will include many dwelling types – and one of each type should be tested to confirm the robustness of the designs and the construction procedures.

Dwellings that have NOT adopted approved construction details

58 Air pressure tests should be carried out on each **dwelling type** in the development to the number specified in Table 4. For the purposes of this Approved Document, a block of flats should be treated as a separate development irrespective of the number of blocks on the site.

59 The specific dwellings making up the test sample may be selected by the **BCB** in consultation with the builder. They should be selected so that about half of the scheduled tests for each **dwelling type** are carried out during construction of the first 25% of each **dwelling type**.

The aim is to enable lessons to be learned and adjustments to design and/or site procedures made before the majority of the dwellings are built.

Consequences of failing a pressure test

60 Compliance with the requirements would be demonstrated if:

- a. the measured **air permeability** is not worse than the limit value set out in paragraph 37; and
- b. the **DER** calculated using the measured **air permeability** is not worse than the **TER**.

*This means that if a design adopted a low design air permeability in order to achieve a performance better than the **TER**, it would not fail Part L if the pressure test achieved the limit value and the **TER** was achieved.*

Table 4 Number of pressure tests for dwellings that have not adopted accredited construction details

Number of instances of the dwelling type	Number of tests to be carried out on the dwelling type
4 or less	One test of each dwelling type
Greater than 4, but equal or less than 40	Two tests of each dwelling type
More than 40	At least 5% of the dwelling type , unless the first 5 units of the type that are tested achieve the design air permeability , when the sampling frequency can be subsequently reduced to 2%

61 If satisfactory performance is not achieved, then remedial measures should be carried out on the **dwelling** and a new test carried out until the **dwelling** achieves the criteria set out in paragraph 60. In the period up to 31 October 2007, however if the initial test result on a **dwelling** is unsatisfactory, reasonable provision would be to:

- a. carry out remedial measures such that on retest, a result was achieved that showed:
 - i. an improvement of 75% of the difference between the initial test result and the **design air permeability**; or
 - ii. if less demanding, a test result within 15% of the required **design air permeability**.
- b. revise the **TER** by substituting the measured **air permeability** obtained by following paragraph 61a) for the value set out in Appendix R of SAP2005, and demonstrate that the **DER** is not worse than the revised **TER**.

*This allows some time for builders to develop the techniques for constructing to reasonable standards of airtightness, but the poorer airtightness will be reflected in the Energy Performance Certificate, which will impact on the value of the **dwelling**.*

To illustrate the revised target following an initial failure, if the initial test result was 18.0, and the design air permeability was 8.0, the revised pass level to reach in tests following remedial action would be $[18.0 - 0.75 \times (18.0 - 8.0)] = 10.5 \text{m}^3/(\text{h.m}^2)$ at 50 Pa. However, if the initial test result was 9.5, the pass level to be achieved in tests following remedial action would be $8.0 \times 1.15 = 9.2$.

62 In addition to the remedial work on a **dwelling** that failed the initial test, one additional **dwelling** of the same **dwelling type** should be tested, thereby increasing the overall sample size.

Alternative to pressure testing on small developments

63 As an alternative approach to specific pressure testing on development sites where no more than two dwellings are to be erected, reasonable provision would be:

- a. to demonstrate that during the preceding 12 month period, a **dwelling** of the same **dwelling type** constructed by the same builder had been pressure tested according to the procedures given in paragraphs 54 to 59 and had achieved the specified **air permeability**.
- b. avoid the need for any pressure testing by using a value of $15 \text{m}^3/(\text{h.m}^2)$ for the **air permeability** at 50 Pa when calculating the **DER**.

*The effect of using this cautious value would then have to be compensated for by improved standards elsewhere in the **dwelling** design.*

CRITERION 4 – COMMISSIONING OF HEATING AND HOT WATER SYSTEMS

64 The heating and hot water system(s) should be commissioned so that at completion, the system(s) and their controls are left in the intended working order and can operate efficiently for the purposes of the conservation of fuel and power. In order to demonstrate that the heating and hot water systems have been adequately commissioned, Regulation 20C states that:

Commissioning

20C.–(1) This regulation applies to building work in relation to which paragraph L1(b) of Schedule 1 imposes a requirement, but does not apply where the work consists only of work described in Schedule 2B.

(2) Where this regulation applies the person carrying out the work shall, for the purpose of ensuring compliance with paragraph L1(b) of Schedule 1, give to the local authority a notice confirming that the fixed building services have been commissioned in accordance with a procedure approved by the Secretary of State.

(3) The notice shall be given to the local authority:

- a. not later than the date on which the notice required by regulation 15(4) is required to be given; or
- b. where that regulation does not apply, not more than 30 days after completion of the work.

65 The procedure approved by the Secretary is set out in the Domestic Heating Compliance Guide.

66 The notice should include a declaration signed by a suitably qualified person that the manufacturer's commissioning procedures have been completed satisfactorily.

One option would be to engage a member of an approved Competent Person scheme.

Section 3: Providing information

CRITERION 5 – OPERATING AND MAINTENANCE INSTRUCTIONS

67 In accordance with Requirement L1(c), the owner of the building should be provided with sufficient information about the building, the **fixed building services** and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.

68 A way of complying would be to provide a suitable set of operating and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand. The instructions should be directly related to the particular system(s) installed in the **dwelling**.

The aim is that this information will eventually form part of the Home Information Pack.

69 Without prejudice to the need to comply with health and safety requirements, the instructions should explain to the occupier of the **dwelling** how to operate the system(s) efficiently. This should include

- a. the making of adjustments to the timing and temperature control settings; and
- b. what routine maintenance is needed to enable operating efficiency to be maintained at a reasonable level through the service life(s) of the system(s).

70 An energy rating shall be prepared and fixed in a conspicuous place in the dwelling as required by Regulation 16, which states that:

16.–(1) This regulation applies where a new dwelling is created by building work or by a material change of use in connection with which building work is carried out.

(2) Where this regulation applies, the person carrying out the building work shall calculate the energy rating of the dwelling by means of a procedure approved by the Secretary of State and give notice of that rating to the local authority.

(3) The notice referred to in paragraph (2) shall be given not later than the date on which the notice required by paragraph (4) of regulation 15 is given, and, where a new dwelling is created by the erection of a building, it shall be given at least five days before occupation of the dwelling.

(4) Where this regulation applies, subject to paragraphs (6) and (7), the person carrying out the building work shall affix, as soon as practicable, in a conspicuous place in the dwelling, a notice stating the energy rating of the dwelling.

(5) The notice referred to in paragraph (4) shall be affixed not later than the date on which the notice required by paragraph (4) of regulation 15 is given, and, where a new dwelling is created by the erection of a building, it shall be affixed not later than five days before occupation of the dwelling.

(6) Subject to paragraph (7), if, on the date the dwelling is first occupied as a residence, no notice has been affixed in the dwelling in accordance with paragraph (4), the person carrying out the building work shall, not later than the date on which the notice required by paragraph (4) of regulation 15 is given, give to the occupier of the dwelling a notice stating the energy rating of the dwelling calculated in accordance with paragraph (2).

(7) Paragraphs (4) and (6) shall not apply in a case where the person carrying out the work intends to occupy, or occupies, the dwelling as a residence.

71 The approved calculation procedure is SAP 2005 as announced in ODPM Circular 03/2006.

72 Guidance on the preparation of the notices is given in DTLR Circular 3/2001.

Section 4: Model designs

73 Some builders may prefer to adopt model design packages rather than to engage in design for themselves. These model packages of fabric U-values, boiler seasonal efficiencies, window opening allowances etc would have been shown to achieve compliant overall performance within certain constraints. The construction industry may develop model designs for this purpose, with information about such designs being made available at www.modeldesigns.info.

74 It will still be necessary to demonstrate compliance in the particular case by going through the procedures described in paragraphs 24 to 30.

Section 5: Definitions

75 Air permeability is the physical property used to measure airtightness of the building fabric. It is defined as air leakage rate per envelope area at the test reference pressure differential across the building envelope of 50 Pascal (50N/m²). The envelope area of the building, or measured part of the building, is the total area of all floors, walls and ceilings bordering the internal volume subject to the test. This includes walls and floors below external ground level. Overall internal dimensions are used to calculate this area and no subtractions are made for the area of the junctions of internal walls, floors and ceilings with exterior walls, floors and ceilings.

The envelope area of a terraced house includes the party wall(s). The envelope area of a flat in a multiple storey building includes the floors, walls and ceilings to adjacent apartments.

76 BCB means Building Control Body: a local authority or an approved inspector.

77 A conservatory is an extension which has:

- a. not less than three quarters of its roof area and not less than one half of its external wall area made from translucent material; and
- b. is thermally separated from the **dwelling** by walls, windows and doors with U-value and draught-stripping provisions as least as good as provided elsewhere in the **dwelling**.

78 DER is the Dwelling CO₂ Emission Rate.

79 The design air permeability is the value of air permeability selected by the dwelling designer for use in the calculation of the **DER**.

80 Dwelling means a self-contained unit designed to accommodate a single household. **Rooms for residential purposes** are not dwellings so Approved Document L2A is applicable to their construction.

81 A dwelling type is defined as a group of dwellings on a site having the same generic form (detached, semi-detached including end-terrace, mid-terrace, mid-floor flat, ground-floor flat, top-floor flat) and where the same construction methods are used for each of the main elements (walls, floors, roofs etc). Small variations in floor area do not constitute a different dwelling type.

The use of a consistent set of accredited details would be a way of indicating the use of the same construction method.

Fixed building services means any part of, or any controls associated with:

- a. fixed internal or external lighting systems, but does not include emergency escape lighting or specialist process lighting; or
- b. fixed systems for heating, hot water service, air conditioning or mechanical ventilation.

82 Room for residential purposes is defined in Regulation 2 (1) as follows:

Room for residential purposes means a room, or a suite of rooms, which is not a dwelling-house or a flat and which is used by one or more persons to live and sleep and includes a room in a hostel, a hotel, a boarding house, a hall of residence or a residential home, whether or not the room is separated from or arranged in a cluster group with other rooms, but does not include a room in a hospital, or other similar establishment, used for patient accommodation and, for the purposes of this definition, a 'cluster' is a group of rooms for residential purposes which is:

- a. separated from the rest of the building in which it is situated by a door which is designed to be locked; and
- b. not designed to be occupied by a single household.

83 TER is the Target CO₂ Emission Rate.

Appendix A: Checklist

1 The following table provides a checklist of the evidence that could be compiled to facilitate for builders and building control bodies the processes of demonstrating compliance with Part L. The checklist prompts for the evidence that needs to be provided to allow the check to be made, and who could produce the evidence.

An example of how the checklist may be used is also included.

2 The evidence could be provided by someone suitably qualified to do so or as an alternative in some cases, by an approved Competent Person and may be accepted at face value at the discretion of the **BCB** dependent upon the credentials of the person making the declaration. In the checklist, the 'Produced by' column indicates the expected source of the evidence, and the header and footer blocks allow opportunity for the credentials of those submitting the evidence to be declared.

3 The final two columns enable recording the results of the checks.

4 As an aid to monitoring during construction and compliance checking two versions of the checklist could be produced, one for the **dwelling** as designed, the other for the **dwelling** as built (see paragraph 27 in the main body of the approved Document). The parts of the checklist that are not relevant at the design stage are shown on the checklist as N/A. Values entered onto the form can facilitate checking, as shown in the examples.

5 Editable versions of the compliance checklist can be downloaded from the ODPM website.

6 Other than the CO₂ target which is mandatory, the other checks represent reasonable provision in normal circumstances. In unusual circumstances, alternative limits may represent reasonable provision, but this would have to be demonstrated in the particular case.

Checklist for dwelling as designed or as built (delete as applicable)

Site reference		Plot reference		
Builder		Contact		☎
Building Control Body		Contact		☎
SAP assessment by		Contact		☎


*Evidence of competency
(e.g. Part L competent Person, Authorised SAP Assessor)*

No.	Check	Evidence	Produced by	Design OK?	As built OK?
1	Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target				
1.1	TER (kg CO ₂ /m ² .a)	Standard output from SAP calculation	SAP	N/A	N/A
1.2	DER for dwelling as designed (kg CO ₂ /m ² .a)	Standard output from SAP calculation	SAP	N/A	N/A
1.3	Are emissions from dwelling as designed/as built less than or equal to the target?	Compare TER and DER as designed/built	SAP		N/A
2	Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits				
	Fabric U-values				
2.1	Are all U-values better than the design limits in Table 2?	Schedule of U-values produced as standard output from SAP	SAP		
	Common areas in buildings with multiple dwellings (where relevant)				
2.2	If the common areas are un-heated, are all U-values better than the limits in Table 2? (If heated, use L2A)	Schedule of U-values	Builder's submission		
	Heating and hot water systems				
2.3	Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Schedule of appliance efficiencies as standard output from SAP	SAP		
2.4	Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder insulation specification as output from SAP	SAP		
2.5	Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Controls specification as output from SAP	SAP		
2.6	Does the heating and the hot water system meet the other minimum provisions in the Domestic Heating Compliance Guide	Schedule of compliance provisions	Builder's submission		
	Fixed internal and external lighting				
2.7	Does fixed internal lighting comply with paragraphs 42 to 44	Schedule of installed fixed internal lighting	Builder's submission (see schedule below)		
2.8	Does the external lighting comply with paragraph 45	Schedule of installed external lighting	Builder's submission (see schedule below)		
3	Criterion 3: the dwelling has appropriate passive control measures to limit solar gains				
3.1	Does the dwelling have a strong tendency to high summertime temperatures?	Prediction produced as standard output from SAP	SAP		
4	Criterion 4: the performance of the dwelling, as built, is consistent with the DER				
4.1	Have the key features of the design been included (or bettered) in practice?	List of key features produced as standard output from SAP to facilitate sample checking by BCB and enable builder to control construction on site	SAP	N/A	

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Fabric construction					
4.2	Have accredited details been adopted?	Schedule of details used and their reference codes	Builder's submission		
4.3	Have non-accredited details been used?	Evidence that details conform to standards set out in IP1/06	Builder's submission		
4.4	Has satisfactory documentary evidence of site inspection checks been produced?	Completed pro-formas showing checklists have been completed	Builder's submission	N/A	
4.5	Design air permeability (m ³ /(h.m ²) at 50Pa)	Standard output from SAP calculation	SAP		N/A
4.6	Has evidence been provided which demonstrates that the design air permeability has been achieved satisfactorily (see paragraph 56)	Sample pressure test results in comparison to design value (<i>Note that the sampling regime depends on whether or not accredited details have been used or not</i>)	Builder's submission (see schedule below)	N/A	
Commissioning heating and hot water systems					
4.7	Evidence that the heating and hot water systems have been commissioned satisfactorily	Commissioning completion certificate	Builder's submission (see schedule below)	N/A	
5	Criterion 5: the necessary provisions for energy-efficient operation of the dwelling are put in place				
5.1	Has all the relevant information been provided?	O&M instructions SAP rating as required by Regulation 16	Builder's submission	N/A	

Schedule of supporting competencies

Check no.	Organisation providing evidence		Evidence of competency
2.6			e.g. Part P Authorised Competent Person
2.7			e.g. Part P Authorised Competent Person
4.6			e.g. ATTMA member
4.7			e.g. Authorised Part J/P Competent Person

Example completed checklist


Site reference		Plot reference		
Builder		Contact		☎
Building Control Body		Contact		☎
SAP assessment by	<i>A.N. Other</i>	Contact	<i>XYZ Rating Company</i>	☎ <i>01212 123123</i>
Evidence of competency (e.g. Part L competent Person, Authorised SAP Assessor)			<i>Authorised SAP Assessor registered with XYZ Rating Company</i>	

No.	Check	Evidence	Produced by	Design OK?	As built OK?
1	Criterion 1: predicted carbon dioxide emission from proposed dwelling does not exceed the target				
1.1	TER (kg CO ₂ /m ² .a)	<i>Main fuel – gas Fuel factor = 1 TER = 23.14</i>	<i>Authorised SAP Assessor</i>	N/A	N/A
1.2	DER for dwelling as designed (kg CO ₂ /m ² .a)	<i>DER = 23.74</i>	<i>Authorised SAP Assessor</i>	N/A	N/A
1.3	Are emissions from dwelling as designed/as built less than or equal to the target	<i>DER 22.74 < TER 23.14</i>	<i>Authorised SAP Assessor</i>	OK	N/A
2	Criterion 2: the performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits				
Fabric U-values					
2.1	Are all U-values better than the design limits in Table 2?	<i>Element Average Highest Wall 0.30 (0.35) 0.30 (0.7) Floor 0.225 (0.25) 0.22 (0.7) Roof 0.16 (0.25) 0.16 (0.35) Openings 1.80 (2.20) 1.80 (3.30)</i>	<i>Authorised SAP Assessor</i>	OK	
Common areas in buildings with multiple dwellings (where relevant)					
2.2	If the common areas are un-heated, are all U-values better than the limits in Table 2? (If heated, use L2A)	Schedule of U-values	Builder's submission	N/A	N/A
Heating and hot water systems					
2.3	Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide	<i>Main heating system: Gas boiler, <boiler identification> SEDBUK = 90.7% Minimum: 86% Secondary heater Electric (assumed)</i>	<i>Authorised SAP Assessor</i>	OK	
2.4	Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	<i>Cylinder volume = 150 litres Maximum permitted cylinder loss = 2.62kWh/day Labelled: Measured loss = 2.50kWh/day Primary hot water pipes are insulated</i>	<i>Authorised SAP Assessor</i>	OK	
2.5	Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	<i>Space heating control: Programmer, roomstat and TRVs Hot water control: Boiler interlock Cylinder thermostat Separate water control</i>	<i>Authorised SAP Assessor</i>	OK	
2.6	Does the heating and hot water system meet the other minimum provisions in the Domestic Heating Compliance Guide	Schedule of compliance provisions	Builder's submission		
Fixed internal and external lighting					
2.7	Does fixed internal lighting comply with paragraphs 42 to 44	Schedule of installed fixed internal lighting	Builder's submission (see schedule below)		

L1A CHECKLIST

2.8	Does the external lighting comply with paragraph 45?	Schedule of installed fixed internal lighting	Builder's submission (see schedule below)		
3	Criterion 3: the dwelling has appropriate passive control measures to limit solar gains				
3.1	Does the dwelling have a strong tendency to high summertime temperatures?	<i>Region: Southern England</i> <i>Thermal mass parameter = 8.2; Ventilation rate in hot weather = 1.9 ach</i> <i>Light-coloured curtains closed all day</i> <i>Overshading risk – average</i> <i>Overhangs – none</i> <i>Overheating – Medium</i>	<i>Authorised SAP Assessor</i>	<i>OK</i>	
4	Criterion 4: the performance of the dwelling, as built, is consistent with the DER				
4.1	Have the key features of the design been included (or bettered) in practice?	<i>Boiler efficiency 90.7%</i>	<i>Authorised SAP Assessor</i>	N/A	
Fabric construction					
4.2	Have accredited details been adopted?	Schedule of details used and their reference codes	Builder's submission		
4.3	Have non-accredited details been used?	Evidence that details conform to standards set out in IP1/06	Builder's submission		
4.4	Has satisfactory documentary evidence of site inspection checks been produced?	Completed pro-formas showing checklists have been completed	Builder's submission	N/A	
4.5	Design air permeability (m ³ /(h.m ²) at 50Pa)	<i>Design air permeability = 7.0</i>	<i>Authorised SAP Assessor</i>	<i>OK</i>	N/A
4.6	Has evidence been provided that demonstrates that the design air permeability has been achieved satisfactorily (see paragraph 56)	Sample pressure test results in comparison to design value	Builder's submission (see schedule below)	N/A	
Commissioning heating and hot water systems					
4.7	Evidence that the heating and hot water systems have been commissioned satisfactorily	Commissioning completion certificate	Builder's submission (see schedule below)	N/A	
5	Criterion 5: the necessary provisions for energy-efficient operation of the dwelling are put in place				
5.1	Has all the relevant information been provided?	O&M instructions <i>SAP = 81</i>	Builder's submission	N/A	

Schedule of supporting competencies

Check no.	Organisation providing evidence		Evidence of competency
2.6			
2.7			
4.6	Typhoon Entrances Ltd		ATTMA member, membership no. 12345
4.7			

Appendix B: Important design features

SAP 2005 produces a checklist of design features that have unusual performance standards. The checklist can help in determining whether the input data is correct, and whether compliance with regulation 17C is in jeopardy. This information would be useful to both builders and **BCBs** in the context described in paragraph of the main text in this Approved Document.

The unusual values reported are:

- a. A wall U-value less than $0.28\text{W/m}^2\cdot\text{K}$
- b. A floor U-value less than $0.20\text{W/m}^2\cdot\text{K}$
- c. A roof U-value less than $0.15\text{W/m}^2\cdot\text{K}$
- d. A window or door U-value less than $1.8\text{W/m}^2\cdot\text{K}$
- e. Thermal bridging less than the default value for accredited details
- f. A design air permeability less than $7\text{m}^3/(\text{h}\cdot\text{m}^2)$ at 50 Pa
- g. A main heating system efficiency more than 4 percentage points better than that recommended for its type in the Heating Compliance Guide
- h. The use of any low carbon or renewable energy technology such as:
 - i. bio-fuel used for the main heating system (including multi-fuel appliances).
 - ii. CHP or community heating
 - iii. Heat pumps
 - iv. A solar panel
 - v. A photovoltaic array
- i. Any item involving the application of SAP 2005 Appendix Q.

Documents referred to

Air Tightness Testing and Measurement Association (ATTMA) **www.attma.org**

Measuring Air Permeability of Building Envelopes, 2006.

BRE **www.bre.co.uk**

BR 262 *Thermal insulation: avoiding risks*, 2001. ISBN 1 86081 515 4

BR 443 *Conventions for U-value calculations*, 2006. (Available at www.bre.co.uk/uvalues.)

Information Paper IP1/06 *Assessing the effects of thermal bridging at junctions and around openings in the external elements of buildings*, 2006. ISBN 1 86081 904 4

Delivered energy emission factors for 2003. (Available at www.bre.co.uk/filelibrary/2003emissionfactorupdate.pdf.)

CO₂ emission figures for policy analysis, July 2005. (Available at www.bre.co.uk/filelibrary/co2emissionfigures2001.pdf.)

Simplified Building Energy Model (SBEM) user manual and Calculation Tool. (Available at www.odpm.gov.uk.)

CIBSE **www.cibse.org**

TM 36 *Climate change and the indoor environment: impacts and adaptation*, 2005. ISBN 1 90328 750 2

Department of the Environment, Food and Rural Affairs (Defra) **www.defra.gov.uk**

The Government's Standard Assessment Procedure for energy rating of dwellings, SAP 2005. (Available at www.bre.co.uk/sap2005.)

Department of Transport, Local Government and the Regions (DTLR)

Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings, Amendment 1. Published by TSO, 2002. ISBN 0 11753 631 8

(Available to download from Energy Saving Trust (EST) website on <http://portal.est.org.uk/housingbuildings/calculators/robustdetails/>.)

Energy Saving Trust (EST) **www.est.org.uk**

CE129 *Reducing overheating – a designer's guide*, 2006.

GPG268 *Energy efficient ventilation in dwellings – a guide for specifiers*, 2006.

GIL20 *Low energy domestic lighting*, 2006.

Health and Safety Executive (HSE) **www.hse.gov.uk**

L24 *Workplace Health, Safety and Welfare: Workplace (Health, Safety and Welfare) Regulations 1992, Approved Code of Practice and Guidance*, The Health and Safety Commission, 1992. ISBN 0 71760 413 6

NBS (on behalf of ODPM) **www.thebuildingregs.com**

Domestic Heating Compliance Guide, 2006. ISBN 1 85946 225 1

Low or Zero Carbon Energy Sources: Strategic Guide, 2006. ISBN 1 85946 224 3

Thermal Insulation Manufacturers and Suppliers Association (TIMSA) **www.timsa.org.uk**

HVAC Guidance for Achieving Compliance with Part L of the Building Regulations, 2006.

Legislation

SI 1991/1620 Construction Products Regulations 1991.

SI 1992/2372 Electromagnetic Compatibility Regulations 1992.

SI 1994/3051 Construction Products (Amendment) Regulations 1994.

SI 1994/3080 Electromagnetic Compatibility (Amendment) Regulations 1994.

SI 1994/3260 Electrical Equipment (Safety) Regulations 1994.

SI 2001/3335 Building (Amendment) Regulations 2001.

SI 2005/1726 Energy Information (Household Air Conditioners) (No. 2) Regulations 2005.

SI 2006/652 Building And Approved Inspectors (Amendment) Regulations 2006.

Standards referred to

BS 8206-2:1992 Lighting for buildings. Code of practice for daylighting.

APPROVED DOCUMENTS

The following documents have been approved and issued by the First Secretary of State for the purpose of providing practical guidance with respect to the requirements of the Building Regulations 2000 (as amended).

Approved Document A: Structure

2004 edition incorporating 2004 amendments

Approved Document B: Fire safety

2000 edition incorporating 2000 and 2002 amendments

Approved Document C: Site preparation and resistance to contaminants and moisture

2004 edition

Approved Document D: Toxic substances

1992 edition incorporating 2002 amendments

Approved Document E: Resistance to the passage of sound

2003 edition incorporating 2004 amendments

Approved Document F: Ventilation

2006 edition

Approved Document G: Hygiene

1992 edition incorporating 1992 and 2000 amendments

Approved Document H: Drainage and waste disposal

2002 edition

Approved Document J: Combustion appliances and fuel storage systems

2002 edition

Approved Document J: 2002 Edition: Guidance and Supplementary Information on the UK Implementation of European Standards for Chimneys and Flues

2002 edition

Approved Document K: Protection from falling collision and impact

1998 edition incorporating 2000 amendments

Approved Document L1A: Conservation of fuel and power

New dwellings
2006 edition

Approved Document L1B: Conservation of fuel and power

Existing dwellings
2006 edition

Approved Document L2A: Conservation of fuel and power

New buildings other than dwellings
2006 edition

Approved Document L2B: Conservation of fuel and power

Existing buildings other than dwellings
2006 edition

Approved Document M: Access to and use of buildings

2004 edition

Approved Document N: Glazing – safety in relation to impact, opening and cleaning

1998 edition incorporating 2000 amendments

Approved Document P: Electrical safety – Dwellings

2006 edition

Approved Document to support regulation 7: Materials and workmanship

1992 edition incorporating 2000 amendments

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