

**bream:ecohomes**

**Ecohomes 2006 –  
The environmental rating for homes**

**The Guidance – 2006 / Issue1.2**

April 2006

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## EH06 Guidance

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## Introduction

This document is the reference guidance that details the credit requirements under BRE's Ecohomes Scheme.

It has been designed for use by individuals trained and licensed as assessors under the scheme, and will be used in conjunction with the Ecohomes Developer Sheets (completed by the Developer) to calculate the Ecohomes rating.

The document is laid out in individual credits within the main credit categories listed in the Ecohomes Scheme, as follows:

- Energy (Credits are coded Ene 1 – Ene 6 )
- Transport (Credits are coded Tra1 – Tra 4)
- Pollution (Credits are coded Pol 1 – Pol 5)
- Materials (Credits are coded Mat 1 – Mat 4)
- Water (Credits are coded Wat 1 – Wat 2)
- Land Use and Ecology (Credits are coded Eco 1 – Eco 5)
- Health and Wellbeing (Credits are coded Hea1 – Hea 3)
- Management (Credits are coded Man 1 – Man 4)

The Developer is strongly urged to appoint an Ecohomes Assessor as early in the design process as possible to ensure the Ecohomes features can be incorporated smoothly into the development process and at little additional cost.

### ***Applicability of Ecohomes***

Ecohomes covers all standard housing developments in England, Scotland, Wales and Northern Ireland:

- private and social housing schemes
- flats/apartments and houses
- new build and major refurbishment.

For other types of housing – most sheltered homes, nursing homes, student accommodation etc, a bespoke Ecohomes assessment will have to be carried out. For more information on this, please contact the BRE.

### ***Documentary requirements***

For all assessments, it is the Developer's responsibility to ensure that the correct evidence is provided. Without the evidence, the assessor cannot award the credits. It is to everyone's advantage to ensure that the evidence is as complete as possible when first submitted. Where a credit is not being sought, evidence need not be provided.

There is a separate document to be completed for the assessment – *Ecohomes: Developer Sheets – 2006*. This can be downloaded from the Ecohomes website: [www.Ecohomes.org](http://www.Ecohomes.org)

There **must** be documentary evidence to support the submission, and BRE will accept evidence in the following form/s (in order of preference):

1. Specific wording in the development specification.

2. Specific information on the drawings. (This may be a reference to the relevant clause in the specification.)
3. A letter of instruction to a contractor/supplier.
4. A formal letter from the developer to the Ecohomes Assessor, giving the specific undertaking. (This should only be used if there is a late change to the development and options 1-3 cannot be carried out in time for the Ecohomes submission.)

### ***Quality Assurance***

As part of the BRE Quality Assurance scheme, BRE reserves the right to audit any assessment. This may include inspection of documentary evidence and the properties submitted for assessment.

## Ene 1 Dwelling Emission Rate

**Credits available: 15**

### Aim

To minimise emissions of carbon dioxide (CO<sub>2</sub>) to the atmosphere arising from the operation of a home and its services.

### Credit Requirements

Credits are awarded on the basis of SAP 2005 related average CO<sub>2</sub> emissions in accordance with the following criteria.

Credits	CO <sub>2</sub> emissions/ DER (kg/m <sup>2</sup> /yr)
1	≤ 40
2	≤ 35
3	≤ 32
4	≤ 30
5	≤ 28
6	≤ 26
7	≤ 24
8	≤ 22
9	≤ 20
10	≤ 18
11	≤ 15
12	≤ 10
13	≤ 5
14	≤ 0
15	≤ - 10

Note: Dwellings using gas will normally score better than those using other fossil fuels, as the CO<sub>2</sub> emissions from gas are the lowest of all fossil fuels.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development are included in the calculation of the average CO<sub>2</sub> emissions.

### Main Information to be Provided by the Developer

1. SAP 2005 worksheets for each home (from an accredited SAP assessor).

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2. The Dwelling Emission Rate (DER) and Target Emission Rate (TER, if applicable) for each home (from an accredited SAP assessor)
  3. Proof of Building Regulation compliance.
  4. The appropriate drawings and/or specification should show details sufficient to meet the *Credit Requirements* and the *Guidance* below.
- 

### Guidance

5. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, detail plans/elevations, sufficient to check building details.
6. An accredited SAP assessor should carry out the SAP (2005) assessment for all homes on the development. In the case of identical homes (including orientation) then only one SAP assessment is required for those homes.
7. Note that only the use of SAP2005 is acceptable for the purpose of this credit, regardless of Building Control requirements (see *Special Cases Guidance Note 14*).
8. To assess CO<sub>2</sub> emissions, the Dwelling Emissions Rate (DER) is taken directly from the SAP 2005 worksheets for each home.
9. As a minimum acceptable each home must show Building Regulation compliance. Written confirmation is required that this is the case for an Ecohomes rating to be awarded.
10. The Whole Development Credits are calculated using *Supplementary Guidance B*.
11. SAP 2005 assumes that 30% of fixed light fittings are energy efficient (required for new build, part L1a building regulation compliance and can be assumed for other building regulation requirements as well for the purpose of Ecohomes). Although CO<sub>2</sub> emissions from additional energy efficient lights and appliances are not taken into account here there are separate credits available for these, see Ene 4, Ene 5 and Ene
12. Green tariffs cannot be used to discount CO<sub>2</sub> emissions, as it is not possible to ensure occupiers will continue to use green electricity.
13. For schemes with air conditioning the details of the system should be submitted to BRE. BRE will calculate the emissions due to the air conditioning and provide this figure to the assessor. See *Supplementary Guidance A*.

### Flats

14. There is no specific guidance for refurbishment. The standards approach, using SAP 2005, should be followed.

### Refurbishment

15. There is no specific guidance for refurbishment. The standards approach, using SAP 2005, should be followed. The U-values for some elements may have to be assumed (using typical U-values for that type of construction and year) if not calculated as part of the refurbishment.

### Special Cases

16. Combined heat and power (CHP) and community heating

These systems are now largely dealt with under SAP. For any type of systems that are not covered under SAP please contact BRE for guidance. In such instances a full feasibility study will need to be provided.

#### 17. Renewables

Most renewable systems can be dealt with under SAP 2005. For those systems that are not covered please contact BRE for guidance. In such instances manufacturer information with efficiency figures and energy performance will need to be provided.

#### 18. Scottish and Northern Ireland Building Regulations.

Whilst the energy components of the building regulations in Scotland and Northern Ireland differ from the English Part L (2006) this credit is not affected by those differences. Each country will have to show compliance against their individual regulations but SAP 2005 should be used under Ecohomes to show compliance against the Ecohomes credit scale. SAP 2005 is a robust and flexible calculation tool applicable across the UK. It is therefore used within Ecohomes regardless of statutory requirements.

At the date of publishing Ecohomes 2006 the following timetable for updating of the Building Regulations in Northern Ireland and Scotland applies (these maybe subject to changes):

- Northern Ireland, amendments to Part F – Conservation of Fuel and Power, expected to be in force from November 2006.
- Scotland, proposed revisions to Section 6, Energy, of the Technical handbooks 2005 were issued to consultation on 1<sup>st</sup> March 2006 ([www.sbsa.gov.uk/current\\_standards/sectionsixconsultation.htm](http://www.sbsa.gov.uk/current_standards/sectionsixconsultation.htm)) and are intended to come into force in May 2007.

## Supplementary Guidance

### A: Energy Requirement for Air Conditioning

Where dwellings have air conditioning installed, the following information should be supplied to BRE.

**Table 3: Requirements for Air Conditioning**

House Type	No of units	Proportion of floor area cooled (0-1)	Heat loss coefficient (SAP box 37)	Description of air conditioning system including fuel type, controls and seasonal coefficient of performance.
<b>Cooling degree days for the region</b>				

The total emissions for dwellings with air conditioning is then calculated as: DER (taken from SAP 2005) + emissions due to air conditioning (BRE will calculate this figure from information provided above).



**B: Calculation for the Whole Development**

The calculations should be completed for each home (or for each house type if identical units) and then averaged for the whole development using the following formula. The credits awarded are based on this final answer.

$$\text{Average CO}_2 \text{ Emissions} = \frac{\sum_1^n [(\text{CO}_2 \text{ emissions for house type } N) \times (\text{No. of units type } N)]}{\text{Total number of house units}}$$

Where:

$n$  = the total number of house types  
 $N$  = each individual house type

Note that only identical homes can be classed as a 'house type'.

Assign the appropriate number of credits, according to the average CO<sub>2</sub> emissions calculated, by referring to the credit requirements.

**Further Information**

*Energy Saving Trust*  
[www.est.org.uk](http://www.est.org.uk)

*Building Regulations (England and Wales)*  
[www.odpm.gov.uk](http://www.odpm.gov.uk)

*Building (Scotland) Regulations 2004*  
[www.sbsa.gov.uk](http://www.sbsa.gov.uk)

*Building Regulations (Northern Ireland)*  
[www.dfpni.gov.uk](http://www.dfpni.gov.uk)

*Quality Assurance for Combined Heat and Power*  
[www.chpqa.com](http://www.chpqa.com)

**Background**

This credit assesses the amount of carbon dioxide (CO<sub>2</sub>) emitted from the dwellings, as a result of space heating, hot water, and lighting.

CO<sub>2</sub> is selected as the measured quantity as it has a direct environmental impact and allows the type of primary fuel to be taken into consideration. The credit scale relates to the operational energy requirements of the home in a standard operational situation rather than actual energy use. This is used to compare the basic performance characteristics of the dwellings against others. It should be noted that the actual energy consumption may be markedly different, as a range of user-specific issues will affect it, such as the hours of operation of space heating, type and size of household, use of white goods, etc.

**References**

Office of the Deputy Prime Minister. *Building Regulations Approved Document L1a and L1b – Conservation of fuel and power* (2006)

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Building Research Establishment Ltd. *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, 2005 Edition.

Scottish Building Standards Agency. *Building (Procedure) (Scotland) Regulations 2004, Section 6- Energy, of the Technical Handbooks 2005*

Northern Ireland, Department of Finance and Personnel, Building Regulations (Northern Ireland) 2000 DFP *Technical Booklet F: 1998 Conservation of fuel and power*

## Ene 2 Building Fabric

**Credits available: 2**

### Aim

To future proof the efficiency of dwellings over their whole life, and to encourage refurbished dwellings to improve their insulation standards through good fabric performance.

### Credit Requirements

Credits are awarded (see table) on the basis of the average heat loss across the whole site .

Credits	Average heat loss parameter (HLP) across the whole site	
	New build	Refurbishment
1	≤ 1.3	≤ 2.2
2	≤ 1.1	≤ 1.75

### Applicability

The same approach is taken for both new build and refurbishment although performance standards vary.

ALL dwellings throughout the development are included in the calculation of the average heat loss.

### Main Information to be Provided by the Developer

1. For all dwellings SAP 2005 worksheets for all homes should be provided. (These are the same as for the DER/ CO<sub>2</sub> credit.)

### Guidance

In order to assess this credit, it is necessary to calculate the average heat loss parameter across the whole site.

1. To assess the building fabric, the Heat Loss Parameter (HLP) is taken directly from the SAP 2005 worksheets (SAP box 38) for each home.
2. Calculate the average across the Whole Development according to *Supplementary Guidance A*.
3. Whilst the energy components of the building regulations in Scotland and Northern Ireland differ from the English Part L (2006) this credit is not affected by those differences. Each country will have to show compliance against their individual regulations but SAP 2005 should be used under Ecohomes to show compliance against the Ecohomes credit scale. SAP 2005 is a robust and flexible calculation tool applicable across the UK. It is therefore used within Ecohomes regardless of statutory requirements (see *Guidance Note 13 under Special Cases Ene 1 – Dwelling Emission Rate*).

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*Flats*

4. There is no specific guidance for flats/apartments. The standard approach should be followed.

*Refurbishment*

5. There is no specific guidance for refurbishment. The standard approach, using SAP 2005 to establish the Heat Loss Parameter, should be followed.

*Special Cases*

There are currently none for this issue.

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**Supplementary Guidance***A: Whole Site Improvement and final credits*

To establish the number of credits, the Heat Loss Parameter for each home (or for each house type if identical units) must then be averaged over the whole site, as follows:

$$\text{Average HLP} = \frac{\sum_1^n [(HLP \text{ house type } N) \times (\text{No. of units type } N)]}{\text{Total number of house units}}$$

Where:

$n$  = the total number of house types

$N$  = each individual house type

Note that only identical homes can be classified as a 'house type'.

The final credits awarded are based on this final answer.

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**Further Information**

*Energy Saving Trust*

[www.est.org.uk](http://www.est.org.uk)

*Building Regulations (England and Wales)*

[www.odpm.gov.uk](http://www.odpm.gov.uk)

*Building (Scotland) Regulations 2004*

[www.sbsa.gov.uk](http://www.sbsa.gov.uk)

*Building Regulations (Northern Ireland)*

[www.dfpni.gov.uk](http://www.dfpni.gov.uk)

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**Background**

This credit assesses the thermal performance and air tightness of the building envelope. Although innovative systems for provision of services to the building may reduce the energy consumption, it is the building envelope that can have the most significant long-term effect, as the envelope is unlikely to be radically altered during its life, other than having extensions added.

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## References

Office of the Deputy Prime Minister. *Building Regulations Approved Document L1a and L1b – Conservation of fuel and power* (2006)

Building Research Establishment Ltd. *The Government's Standard Assessment Procedure for Energy Rating of Dwellings, 2005 Edition*

Scottish Building Standards Agency. *Building (Procedure) (Scotland) Regulations 2004. Section 6 Energy of the Technical Handbooks 2005*

Northern Ireland, Department of Finance and Personnel, *Building Regulations (Northern Ireland) 2000 DFP Technical Booklet F: 1998 Conservation of fuel and power*

## Ene 3 Drying Space

Credits available: 1

### Aim

To minimise the amount of energy used to dry clothes.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	For providing space and posts, footings and fixings for drying clothes in a secure environment for each unit on the site. This may be external or internal.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the type of drying appliance, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the type of drying appliance, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement or similar, where the drying space location and layout is shown.
2. Adequate space needs to be provided, either in a garden, or in an adequately ventilated room (such as a utility room).
3. The requirements for suitable internal and external drying spaces are as follows.
  - External space:
    - private or communal garden (which is secure), or
    - balcony (which is openable at least on the whole front side) or roof terrace
    - posts, footings and fittings to hold a minimum of 6m line for three (or more) bed units, or 4m for one or two bed units. Note that it is not sufficient to only supply the footings, posts (or a rotary dryer) will also need to be provided.
  - Internal space:
    - an unheated space with good natural ventilation, or

- 
- a heated space with adequate, controlled ventilation, i.e. extract fan with humidistat or passive vents (note: standard trickle vents and extractor fans connected to the light switch do not comply).
  - heating devices that are sized and installed for space heating purposes only, i.e. the space must not be supplied with additional heating for the purposes of drying clothes
  - Fixings/fittings to hold a minimum of 6m line for three (or more) bed units, or 4m for one or two bed units. The fixing/ fitting needs to be a permanent feature of the room and should not be able to be moved to another location/ room.
4. Spaces used for drying should not prevent the intended use of that area.
  5. If dwellings have a tumble dryer, the credit would be achieved if there is provision for an alternative natural drying method.
  6. If only external space is to be provided, this is adequate, even for winter use.
  7. Examples of compliance include:
    - for houses or apartments with gardens – posts, footing and fixings for an external line (or rotary line) within the garden
    - internal drying space may be provided in a utility room or similar, provided it is adequately ventilated, i.e. an extract fan with humidistat control or passive vents, and not additionally heated; drying of clothes does not qualify for credits under Ecohomes in the following rooms: living room, kitchen, dining room, main hall or bedrooms
    - for homes with a shared drying provision – this space must be secure, either in a shared garden or dedicated drying room; access should only be made available by key or code lock for those using the facility
    - a line or fixings over the bath, where no other suitable external or internal space exists, and providing all other criteria are met.

### *Flats*

There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

*Energy Saving Trust*  
[www.est.org.uk](http://www.est.org.uk)

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## Background

This credit was introduced to encourage the drying of clothes 'naturally' rather than using a tumble dryer. It has become increasingly common practice to include a place for a tumble dryer without necessarily attempting to design in a space for natural drying. This credit is especially important for those dwellings without a large garden.

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## References

See Further Information above.



## Ene 4 EcoLabelled Goods

**Credits available: 2**

### Aim

To encourage the provision or purchase of energy efficient white goods, thus reducing the CO<sub>2</sub> emissions from the dwelling.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	Where the following appliances have an <b>A+</b> rating under the EU Energy Efficiency Labelling Scheme: <b>Fridges, freezers and fridge/freezers.</b>
1	Where the following appliances have an <b>A</b> rating under the EU Energy Efficiency Labelling Scheme: <b>Washing machines and dishwashers,</b> And the following have a <b>B</b> rating: <b>Washer dryers and tumble dryers.</b>
OR	
1	If <b>no white goods are provided</b> , but information on purchasing energy efficient white goods is provided.

### Applicability

The same approach is taken for both new build and refurbishment.

### Main Information to be Provided by the Developer

1. Details of the relevant white goods that will be specified, or the performance criteria, should be stated in the specifications.
2. If white goods are not to be provided, or if not all appliances within a category are to be provided, confirmation of this should be stated in the specifications. Also confirm that information regarding the EU Energy Efficiency Labelling Scheme and the purchasing of energy efficient appliances will be given to the occupier. The information provided should explain what energy labels are and how they work.

### Guidance

1. The developer must provide details of relevant white goods that are to be supplied in the development, or the performance requirements in the contract documents where individual products are not being specified.
2. If no white goods are supplied, 1 credit will be awarded if information about the EU Energy Efficiency Labelling Scheme is to be supplied to the occupier. A copy of the advice must be included in the submission. The information should clearly state what the energy labels are and how they work.

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3. For communal washing facilities, e.g. laundry room in a block of flats, the development will achieve the credit if it is proved that the energy used per person does not exceed that used in an A-rated personal washing machine.
  4. If no information regarding the provision of white goods or the EU Energy Efficiency Labelling Scheme is supplied, credits cannot be achieved.

#### *Flats*

5. There is no specific guidance for flats/apartments. The standard approach should be followed.

#### *Refurbishment*

6. There is no specific guidance for refurbishment. The standard approach should be followed.

#### *Special Cases*

7. If not all appliances within a credit category are to be supplied.

If not all types of appliances within a credit category are to be supplied, the credit can still be achieved provided the white goods supplied have the appropriate rating, and information on purchasing energy efficient white goods is also provided. Eg. Washing machines are to be supplied but not dishwashers or tumble dryers. Provided the washing machines supplied are A rated and information about EU Energy Efficiency Labelling is also supplied, 1 credit can be awarded.

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### **Supplementary Guidance**

There is currently none for this issue.

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### **Further Information**

#### *Energy Saving Trust (EST)*

EST helps you find energy efficient products and gives you information on the EU energy efficiency labelling scheme.

<http://www.est.org.uk/myhome/efficientproducts/recommended/index.cfm>

<http://www.est.org.uk/myhome/efficientproducts/energylabel/>

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### **Background**

For a typical new (Part L 2006) semi-detached dwelling, the CO<sub>2</sub> emissions from lights and appliances will make up about 43% of the total CO<sub>2</sub> emissions. Emissions from lights and appliances are now higher than both space and water heating emissions. In such a typical semi, space heating would account for 26% of the CO<sub>2</sub> emissions, water heating 22% and cooking 9%.

The choice of appliances will therefore play an important role in terms of reducing total CO<sub>2</sub> emissions. Up to 190kg of CO<sub>2</sub> can be saved by each house hold for choosing an energy efficient fridge freezer compared to a more 'traditional' model. This equates to a monetary saving of around £35 a year.

Lights and appliances represents the area of greatest growth in residential energy use. Over the past 30 years energy use for lights and appliances have increased at around 2% per annum.

There is increasing likelihood that when occupants choose their own white goods they will consider the energy consumed during use, especially for products of equal cost.

To encourage them to do so, the developer must provide information to help the occupier to select the most energy efficient and cost effective appliances, where no white goods are provided.

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### **References**

See Further Information above.

## Ene 5 Internal Lighting

**Credits available: 2**

### Aim

To encourage the provision of energy efficient internal lighting, thus reducing the CO<sub>2</sub> emissions from the dwelling.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	40% of fixed internal light fittings are dedicated energy efficient fittings
2	75% of fixed internal light fittings are dedicated energy efficient fittings

### Applicability

The same approach is taken for both new build and refurbishment but for the definition of internal lights for flats see the Guidance below.

ALL dwellings, throughout the development, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the type of lighting, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the type of lighting, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
3. Manufacturers literature confirming that the low energy fittings are dedicated and have an efficiency of at least 40 lumens per watt (Fluorescent fittings including CFL's will normally meet this requirement).

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, electrical or similar, where the location is shown and type of fittings and control method are stated.
2. A dedicated energy efficient light fitting must comprise of the lamp, control gear, **and** an appropriate housing, reflector, shade or diffuser. The fitting must be capable of **only** accepting lamps having a luminous efficacy greater than 40 lumens per circuit Watt. Tubular fluorescent and compact fluorescent lighting fittings would meet this requirement. Lighting fittings for GLS tungsten lamps with bayonet cap or Edison screw bases, or tungsten halogen lamps would not comply.
3. Credits are only awarded for fixed internal light fittings. Non fixed light fittings are not appropriate for this credit as they could be replaced by the occupant.
4. Fixed internal light fittings must be in a habitable room to be included. Light fittings located in cupboards cannot be included.

### *Flats*

5. For flats, fixed internal light fittings do not include the following:

- Communal lobbies, main external entrances, internal entrance porches, hallways, landings, stairwells, internal corridors and garages. Specific communal rooms (laundries, cycle and other storage spaces etc)  
These are dealt with under *Ene 6 – External Lighting*.

### *Refurbishment*

There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

### *Energy Saving Trust (EST)*

EST site giving information of goods, suppliers, and energy efficiency:  
[www.est.org.uk](http://www.est.org.uk)

### *Energy Efficiency Best Practice and Housing (EEBPH)*

<http://www.est.org.uk/housingbuildings/professionals/>

### *The Carbon Trust*

The Carbon Trust provides free, practical advice to business and public sector organisations to help reduce energy use:  
<http://www.thecarbontrust.co.uk/energy/pages/home.asp>

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## **Background**

As only a fixed amount of internal lighting is included in the CO<sub>2</sub> emission calculation, the inclusion of any additional light fittings are assessed separately. It includes all internal fixed light fittings. The requirement is to provide energy efficient lighting to minimise energy consumption.

In most homes, lighting accounts for around 10-15 per cent of an electricity bill. Traditional bulbs waste a lot of their energy by turning it into heat. Each energy saving bulb can reduce a household's electricity bill by up to £7 a year. This equates to a reduction in CO<sub>2</sub> emissions of 43 kg/yr. Compact fluorescent light bulbs (CFL's) use at least 60% less electricity than the traditional incandescents while lasting ten to twelve times as long. Their long life means they need replacing less often and so are particularly suitable for use in inaccessible fixtures.

The Building Regulations England and Wales, Part L1a and L1b requires fixed energy efficient light fittings (that only takes lamps having a luminous efficacy greater than 40 lumens per circuit-watt) to be installed in the most frequented locations in the dwelling to a number not less than one per 25m<sup>2</sup> floor area or one per four fixed light fittings. Ecohomes requires a greater amount of fixed low energy light fittings to be installed.

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## References

Office of the Deputy Prime Minister. *Building Regulations Approved Document L1a and L1b – Conservation of fuel and power* (2006)

*Energy Saving Trust (EST)*

[www.est.org.uk](http://www.est.org.uk)

## Ene 6 External Lighting

**Credits available: 2**

### Aim

The purpose of this credit is to encourage the provision of energy efficient external lighting.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	<p><b>Space lighting</b></p> <p>Where all space lighting is specifically designed to accommodate only compact fluorescent lamps (CFL) luminaires or strip lights.</p>
1	<p><b>Security lighting</b></p> <p>Where all security light fittings are designed for energy efficiency and are adequately controlled such that:</p> <p>all burglar security lights have:</p> <ul style="list-style-type: none"> <li>- a maximum wattage of 150W,</li> <li>- AND are fitted with:             <ul style="list-style-type: none"> <li>▪ movement detecting shut-off devices (PIR)</li> <li>▪ AND daylight cut-off devices</li> </ul> </li> </ul> <p>all other security lighting is:</p> <ul style="list-style-type: none"> <li>- specially designed to only accommodate CFL, luminaires or strip lights</li> <li>- AND be fitted with dawn-to-dusk sensors OR timers.</li> </ul>

### Applicability

The same approach is taken for both new build and refurbishment but for the definition of spaces for houses and flats see the Guidance below.

ALL dwellings, throughout the development, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the type of lighting, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the type of lighting, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
3. Manufacturers literature confirming type of fittings, highlighting details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.

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- Relevant drawings would be the general arrangement, electrical or similar, where the location is shown and type of fittings and control method are stated.
  2. For the definition of Space, Security and Safety lighting please see *Supplementary Guidance A – C*.
  3. Credits are only awarded for Space and Security lighting. Safety lighting is outside the scope of this credit.
  4. The assessor needs to confirm that:
    - all specified Space lighting fittings have sockets that **only** accept lamps with an efficacy greater than 40 lumens per circuit watt. Such lamps include compact fluorescent lamps. Light fittings that also accept GLS tungsten lamps with bayonet cap or Edison screw bases, or tungsten halogen lamps will not count towards this credit.
    - All specified Security light fittings either
      - do not accept lamps with a greater light capacity than 150W and are fitted with movement detection shut-off sensors and day light cut off devices
      - or
      - only accommodate lamps with an efficacy greater than 40 lumens per circuit watt and are fitted with dawn to dusk sensors or timers (also see *Flats* below).
  5. Credits can also be achieved by using luminaires that are solar powered or powered from any other type of renewable energy source. Details must be provided on the type and effectiveness of the lighting, i.e. the lighting must be fit for purpose.
  6. If no security lighting is installed, then this credit can be awarded by default provided all the conditions of the first credit covering space lighting have been met.
  7. Credits **cannot** be awarded by default if no space lighting is installed, even though the credit requirements for security lighting is met.
  8. For houses, external light fittings (space and security) serving the following areas should be included in the assessment:
  9. External door, front porch, patio, garage, garden, carports and any other outbuildings.

### *Flats*

10. For flats, fittings serving the following areas should be included in the assessment of **space** lighting:
  - Communal lobbies, main external entrances, internal entrance porches, external steps and pathways.
    - These areas should be equipped with dedicated fluorescent fittings (or more efficient luminaires like SON) and should be controlled by a timeclock or daylight sensor.
  - Hallways, landings, stairwells, internal corridors and garages
    - These areas should be equipped with dedicated fluorescent fittings that are controlled by push button time switches/ occupant sensors or equivalent.



- Specific communal rooms (laundries, cycle and other storage spaces etc)
  - These areas should be equipped with dedicated fluorescent fittings and manual switching or occupant sensors

11. **Security** lighting in flats would normally be external and should follow the same requirements as stated in the *Credit Requirements*.

### *Refurbishment*

12. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

### *A: Ecohomes definition of Space lighting*

Space lighting is defined as the normal lighting required to illuminate a space when in use and is normally controlled by a simple switching. It can be used outside the entrance to the home, in outbuildings like garages and external spaces such as patios, decks, porches and verandas. Space lighting is usually designed to be switched off when the space is uninhabited.

Fittings that meet the requirements are:

- Dedicated Fluorescent Fittings:
  - Fixed fluorescent strip lights
  - Compact Fluorescent Lamps (CFL) with dedicated 2-pin or 4-pin caps.

Note: Standard Edison screw or standard bayonet cap bulbs do NOT qualify.

- other lights and fittings where the efficacy is 40 lumens per circuit-watt or better.

### *B: Ecohomes definition of Security Lighting*

The purpose of security lighting is to deter burglars or intruders and to protect property. There are two types of security lighting commonly used in dwellings – high wattage intruder lights that are operated via PIR sensors which only switch on for a short time, and low wattage lighting that is controlled by time switches and sensors.

### *C: Ecohomes definition of Safety Lighting*

Safety lighting is usually provided in multi-residential buildings like block of flats to illuminate stairwells and exit routes when the main lighting system fails. Its design is specified by regulation and is therefore outside the scope of Ecohomes.

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## **Further Information**

### *Energy Saving Trust (EST)*

EST site giving information of goods, suppliers, and energy efficiency:  
<http://www.est.org.uk/myhome/>

### *Energy Efficiency Best Practice and Housing (EEBPH)*

<http://www.est.org.uk/housingbuildings/professionals/>

*The Carbon Trust*

The Carbon Trust provides free, practical advice to business and public sector organisations to help reduce energy use:

<http://www.thecarbontrust.co.uk/energy/pages/home.asp>

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**Background**

As external lighting is not included in SAP and the CO<sub>2</sub> emission calculation, it is assessed separately. It includes garage lighting, lighting by external doors, security lighting; and for flats, lighting in halls and stairwells, which is to be fitted by the developer. The requirement is to provide energy efficient lighting that is adequately controlled to minimise energy consumption.

Intruder security lighting for domestic uses is normally fitted with halogen or bright tungsten luminaires. Whilst these are not particularly energy efficient, there are few alternatives. In view of this, the main objective is to ensure that appropriate wattage fittings are installed to avoid over-specification.

The current Building Regulations England and Wales, Part L1a and L1b (2006), requires fixed external lighting i.e. lighting fixed to an external surface of the dwelling, to be either fixed low energy light fittings or, for security lighting, max 150 W with PIR and daylight cut off sensors. However, the Building Regulations do not cover any external lighting such as lighting attached to garages or outhouses or any feature lighting. Nor does it cover lighting in communal areas in block of flats. That is why external lighting is still covered under Ecohomes.

There are currently no requirements for external low energy lighting for domestic dwellings under the relevant Scottish and Northern Ireland regulations.

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**References**

Office of the Deputy Prime Minister. *Building Regulations Approved Document L1a and L1b – Conservation of fuel and power* (2006)

*Energy Saving Trust (EST)*

[www.est.org.uk](http://www.est.org.uk)

## Tra 1 Public Transport

**Credits available: 2**

### Aim

To encourage developers to provide a choice of transport modes for residents, with the aim of reducing the level of car use.

### Credit Requirements

#### Urban and suburban locations

Credits	
1	<p>If 80% of the development is within 1000m (via a safe walking route) of a transport node providing a service to a local centre, town, city or a major transport node, at the following frequency levels:</p> <ul style="list-style-type: none"> <li>• 07:30 – 10:00 and 17:00 – 19:00 Monday to Friday – half hourly</li> <li>• All other times between 07:00 and 22:00 Monday to Saturday - hourly</li> </ul>
2	<p>If 80% of the development is within 500m (via a safe walking route) of a transport node providing a service to a local centre, town, city or a major transport node, at the following frequency levels:</p> <ul style="list-style-type: none"> <li>• 07:30– 10:00 and 17:00 – 19:00 Monday to Friday – every 15 min</li> <li>• All other times between 07:00 and 22:00 Monday to Saturday – half hourly</li> </ul>

#### Rural locations

Credits	
1	<p>If 80% of the development is within 1000m (via a safe walking route) of a transport node providing a service to a local centre, town, city or a major transport node, at the following frequency levels:</p> <ul style="list-style-type: none"> <li>• 07:30 and 22:00 Monday to Saturday - hourly</li> </ul>
2	<p>If 80% of the development is within 500m (via a safe walking route) of a transport node providing a service to a local centre, town, city or a major transport node, at the following frequency levels:</p> <ul style="list-style-type: none"> <li>• 07:30 and 22:00 Monday to Saturday - hourly</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• A community bus service is in place which operates at the request of the residents.</li> </ul>

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development, taking into account the 80% rule, must meet the requirements.

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## Main Information to be Provided by the Developer

1. A plan of the site and surrounding area highlighting the public transport nodes. Indicate the timescale over which the transport node will be made available if this is not already in place.
2. Indicate the most obvious safe pedestrian route to the transport node and the scale of the plan, giving details of the pedestrian crossing points of any major roads as defined in the *Guidance*.
3. Include details of the frequency of service of these public transport nodes.

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## Guidance

1. Urban locations are defined as conurbations (such as cities and large towns) with a population in excess of 100,000
2. Suburban locations (conurbations adjoining a city or large town) or rural towns and may have a population between 1,000 and < 100,000
3. Rural locations are generally in the country (although this definition could vary in areas such as the Home Counties). For this credit 'rural' is defined as a town, village or hamlet having a population of <20,000 which is separated by at least 5 miles from any other single population centre or group of smaller centres with a total population of >20,000.
4. The transport node needs to be within 500m, or 1km, **walking** distance (including any detours required to safely cross major roads) of 80% of dwellings on the development. The distance is not to be measured as a straight-line distance between the development and the transport node, but as the actual distance occupiers need to walk from their front doors to get to the transport mode.
5. Information needs to be provided on the location of ALL transport nodes that may qualify. The distance from these transport nodes to the development must be provided.
6. A transport node can be either a bus stop, tram stop, underground station or railway station.
7. A half hourly service could be a mix of different transport options i.e. a bus on the hour and a train at 30 min past the hour. The same system would apply for the 15 min and hourly service. In some instances a certain degree of flexibility can be allowed. For example if a bus runs 9.00, 9.25, 10.00 and 10.25 this can still be classified as a half hourly service. However, BRE would normally not accept more than +/- 5 min variation on any service and all such cases will need to be confirmed by BRE prior to awarding credits.
8. Information on the service routes available and the frequency of the services needs to be provided. An example of compliance is:
  - timetables for the relevant public transport nodes, and details of centres served
  - the appropriate maps and plans supporting the written information, with the optimum route marked on them.
9. A safe pedestrian route to the transport node is defined as:
 

BOTH

  - any pavement, or specific walking path >900mm wide subject to the following conditions:

- Lit in all areas which are either built up or where there is significant on street parking.
  - Any footpaths indicated as possible routes, are official 'rights of way' and are safe to use (i.e. with artificial lighting)
  - A grass verge can be accepted in rural areas to demonstrate compliance provided that this is reasonably level, is at least 900mm unobstructed width and is continuous.
- The carriageway of low-traffic roads with a speed limit of 20mph or below
  - In rural areas only, the main carriageway of roads without a 20 mph limit, provided that:
    - The road is well lit and is provided with traffic calming measures such as chicanes/ traffic humps/ other traffic calming measures designed to reduce speeds to no more than 30 mph.
    - OR where the speed limit is 50 mph, the road is well lit and the pedestrian route is entirely contained within the length of road without sharp bends or significant junctions and where there is a clear line of sight for at least 300m in either direction from the crossing point.

**AND**

- When any of the above pedestrian routes cross a vehicular road with a speed limit above 20 mph (except if in a rural area and any of above exceptions comply) a safe crossing point should be provided. A safe crossing point includes a subway, footbridge, traffic island, zebra, pelican, toucan or puffin crossing, or where there is a crossing point controlled by a police officer, a school crossing patrol or a traffic warden.
  - Where none of the above safe crossing points are provided crossing can be allowed in exceptional circumstances on a 30mph road if it can be proven that significant measures have been taken to reduce the speed to 20 mph or below. Such measures include chicanes, traffic humps or any other type of traffic calming measures. At the point of crossing the road must also be well lit and there should be a clear line of sight for at least 300 m in each direction
10. A community bus service should operate for the benefit of the local residents and be a 'dial-a-ride' or similar service. There should be no restriction on the type of service provide e.g. the service is not restricted to medical journeys, is not for the elderly or infirm only, is not for people without their own transport etc.
  11. Where the development is located in a designated 'dark village' (enforced by the Local Authority or other statutory body), pedestrian routes/footpaths are exempt from the lighting requirements. Verification of this will need to be included.
  12. Developments located in the centre of a town or a local urban centre, close to local amenities, are not excluded from the credit requirements. This is to ensure that occupants have the opportunity to use public transport to travel beyond their local area.

**Flats**

13. The distance should be measured from the front door of the block of flats. However, 80% of the flat units assessed need to be situated in blocks that are within the distance required.

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### Refurbishment

14. There is no specific guidance for refurbishment. The standard approach should be followed.

### Special Cases

15. New developments.

Where a new development does not yet have a public transport service, but one is planned, the credits can be awarded if the following **additional** criteria are met:

- a written statement from the transport provider stating that public transport will be provided that meets the requirements
- the public transport will be provided:
  - before 25% of the homes have been completed and are ready for occupation
  - OR, within 25% of the total build time of the part of the overall development that is within the required distances of the transport node required under these credits (for this credit only, 'development' may include adjacent sites not covered by the assessment).

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## Supplementary Guidance

There is currently none for this issue.

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## Further Information

Highways Agency  
[www.highways.gov.uk](http://www.highways.gov.uk)

Department for Transport  
[www.dft.gov.uk](http://www.dft.gov.uk)

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## Background

The use of the private car is becoming a significant issue, with congestion getting worse, longer journey times and increasing pollution. By providing easy access to public transport, the home occupier has a choice of transport options, reducing the need to use the car and helping to ease the congestion and pollution problems. Public transport also helps to make the site accessible to those who do not have a car, those choosing not to drive or those not being able to drive, such as senior or disabled citizens or those under 17.

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## References

Office of the Deputy Prime Minister:  
*Planning Policy Guidance Note 13 – Transport* (2002)  
*Better places to live by design: a companion guide to PPG3* (2001)

Department for Transport:  
Local Transport Note: 1/95. *The Assessment of Pedestrian Crossings* (1998)  
Local Transport Note: 2/95. *The Design of Pedestrian Crossings* (1998)

## Tra 2 Cycle Storage

**Credits available: 2**

### Aim

To encourage the wider use of bicycles as transport, and thus reduce the need for short car journeys, by providing adequate and secure cycle storage facilities.

### Credit Requirements

Dwellings in the development must meet the following criteria.

Credits	
1	<p>If 50% of dwellings have provision for the adequate storage of cycles. The provision is determined by the number of bedrooms within a dwelling:</p> <ul style="list-style-type: none"> <li>• 1 and 2 bedroom flat/house – storage for 1 cycle</li> <li>• 3 bedroom flats/houses – storage for 2 cycles</li> <li>• 4 bedrooms and above – storage for 4 cycles.</li> </ul> <p>The storage provision should be safe and weather-proof.</p>
2	<p>If 95% of dwellings have provision for the adequate storage of cycles, and the criteria above are met.</p>

### Applicability

The same approach is taken for both new build and refurbishment.

Dwellings throughout the development must meet the requirements, numbers dependent on the credits required.

### Main Information to be Provided by the Developer

1. Specifications must state the cycle storage location, and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the cycle storage location, and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the site plan, general arrangement, dwelling plans or similar, where the location is shown and type of fittings stated.
2. All storage should meet the following criteria:
  - the storage needs to be **protected from the weather**, (this would normally mean at least a roof and three walls).

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- the storage needs to be **secure**. This is achieved either by:
    - storing the cycle/s in a secure fully enclosed structure with a secure entrance lock (a permanent lock, not a padlock).or
    - locking the cycle/s to a secure fixing/s, e.g. steel fixing set in concrete (for communal storage areas, and for storage areas not fully enclosed, individual secure fixings are always required). Note: Fixings should allow both a wheel and the frame to be locked securely.
  - **direct access** should be provided from the storage to a public right of way i.e. access to the cycle storage should not be through the dwelling. Nor can cycles be stored inside the dwelling.
  - the **minimum storage area** to be provided where a propriety storage system is not being used, or the cycles are not on hanging mountings, is:
    - 1 cycle: 2m long x 0.75m wide
    - 2 cycles: 2m long x 1.5m wide
    - 4 cycles: 2m long x 2.5m wide.
3. If a specially designed cycle store facility is **not** available, storage can be allowed in other areas, providing the cycles are not prohibiting the intended use of that area. Examples include the following.
- Garages.
    - Whether stored on the floor or in a hanging position, there must be enough space to store both the bicycle/s and the car/s at the same time.
    - You must be able to get the bicycle/s in and out when the car/s are parked in the garage, and there should be enough space to move around without a risk of scratching the car/s.
    - For double garages, it must be assumed that each garage space is occupied by a car.
    - The typical architectural minimum garage sizes (single 2.4m x 4.9m, double 5m x 5.2m) are **NOT** sufficient to meet the Ecohomes requirements.
  - Garden sheds.
    - The shed must be large enough to store the garden tools, in addition to the required number of cycles. The amount of space required for garden tools will depend on the size of the garden but should never be less than 1m<sup>2</sup> and must not obstruct the manoeuvring of the bike/s in and out of the shed.
    - If the shed is not a solid structure (for example a timber clad structure such as a shed), secure fixings needs to be provided to lock the cycle/s to. These fixings must be set in concrete or other solid foundation.
    - Note that if the garden shed is in the back garden, external access must be provided to/ from a public right of way.
4. Communal cycle store. Apart from the requirements under *Guidance Note 2* the following applies:



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- The store should be sized to meet the requirements for the number of dwellings it serves. The number of cycles per dwelling is the same as the standard requirements.
  - Keys should only be issued to those using the store.
  - It must be possible to lock all cycles safely to secure fixings.
  - 80% of the dwellings using the facility should be within 100m (from the entrance of the block to the cycle store door). If for strategic reasons outside the developers control the store cannot be located within 100m, exceptions to the rule may be allowed. Full details must be provided and BRE consulted prior to awarding credits
  - Storage can in some circumstances be allowed in porches and lobby areas provided it does not interrupt the intended use of that area, the basic requirements under *Guidance Note 2* are met, and there is easy access to and from the area.
5. In no circumstances can this credit be achieved where bicycles are stored inside individual units/ homes.
6. No exemptions to the storage requirement can be made if foldable bicycles are supplied. It is very likely that these will be taken with the tenants when they move and any new occupants will need to have a storage space large enough to cater for a normal size bicycle.

#### *Flats*

7. There is no specific guidance for flats/apartments. The standard approach should be followed.

#### *Refurbishment*

8. There is no specific guidance for refurbishment. The standard approach should be followed.

#### *Special Cases*

There are currently none for this issue.

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### **Supplementary Guidance**

There is currently none for this issue.

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### **Further Information**

*Sustrans National Cycle Routes*  
[www.sustrans.org.uk](http://www.sustrans.org.uk)

*London Cycling Campaign*  
[www.lcc.org.uk](http://www.lcc.org.uk)

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### **Background**

The majority of all car journeys made are less than five miles. One viable alternative for those journeys is the bicycle. This will not only reduce air/noise pollution and provide more space on the streets, but also improve the health and fitness of the cyclist. In order to make cycling a practical alternative people, need somewhere

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convenient and safe to store their bicycles when they are at home. Ecohomes therefore accredit developers who provide such a space.

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## References

Office of the Deputy Prime Minister:  
*Better places to live by design: a companion guide to PPG3* (2001)  
Planning guidance and advice: [www.planning.odpm.gov.uk/advice.htm](http://www.planning.odpm.gov.uk/advice.htm)

## Tra 3 Local Amenities

**Credits available: 3**

### Aim

To encourage developers to plan new housing developments that are close to, or include, local shops and amenities. This will help to reduce the reliance of local residents on their cars.

### Credit Requirements

80% of the development is to be within walking distance of local amenities, and credits are awarded on the following criteria.

Credits	
1	For proximity to a food shop and a post box within 500m.
1	For proximity to 5 of the following amenities within 1000m: postal facility, food shop*, bank/ cash point, pharmacy, primary school, medical centre, leisure centre, community centre, place of worship, public house, children's play area, outdoor open access public area
1	For providing safe pedestrian routes to the local amenities where one/ both of above criteria has been achieved.

\* Note: a food shop only qualifies for this credit, where it is greater than 500m from the development and has not been used to justify for the 1<sup>st</sup> credit.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development, taking into account the 80% rule, must meet the requirements.

### Main Information to be Provided by the Developer

1. Provide a plan of the site and surrounding area highlighting the location of the local amenities you wish to be assessed against. Outline the timescale over which the amenities will be made available if they are not already in place.
2. Indicate the most obvious safe pedestrian routes to the amenities and the scale of the plan, giving details of pedestrian crossing points as defined in the *Guidance - Tra 1*.

### Guidance

1. The distance from the dwellings to the amenity must be measured as the walking route, in accordance with the following:
  - Distances should be from the individual front doors to the amenity. 80% of these distances should be less than the required distance, i.e. 80% of dwellings on the development should be within the distance.
  - Distances should take into account any detours required to safely cross roads, rivers etc.

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- Distances measured over a straight line are not acceptable.
2. In order to qualify for the third credit 'For providing safe pedestrian routes to the local amenities' there need to be **safe pedestrian routes** to all amenities that are within the required distances and which have been used to justify the 1<sup>st</sup> and 2<sup>nd</sup> credit/s. Safe pedestrian routes do not need to be provided to amenities which have not contributed towards achieving the credit/s. The definition of safe pedestrian routes is set out in Tra 1, *Guidance* note 8.
  3. The third credit can only be awarded if the requirements of at least one of the other two credits have been met.
  4. The amenities must be as described in the *Credit Requirements*, e.g. a restaurant or take-away shop will not qualify as a food shop.
  5. A children's play area will only classify as such under Ecohomes if it is a clearly defined and designated publicly available play area maintained by the Local Authority or other body.
  6. A postal facility can be a post office or a postal subsidiary within for example a supermarket.
  7. If a post office provides a cash service then this can also be counted towards the 'bank/cash machine' amenity.
  8. Leisure centres must be open for public use although an entry fee may be charged (i.e. not a subscription). Members only facilities would not classify under Ecohomes.
  9. An outdoor open access public area can be a public park, village green, national park, network of public footpaths, public bathing beach or any other type of outdoor amenity area with unrestricted public access.
  10. The following should be clearly marked on the plan/map:
    - the plan/map scale
    - all suitable and safe routes with the distances
    - crossing points across major roads
    - amenities should be labelled, preferably with the trading name.

### *Flats*

11. The distance requirement is based on the distance from the front door of the block. 80% of the blocks need to be within the distance requirement.

### *Refurbishment*

12. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

13. Planned amenities.

In the case of a large development where amenities are to be provided as a part of the overall development, but built at a later stage than the dwellings being assessed, the following should apply.

- The amenities must be available for use by the time 25% of the assessed homes have been completed and are ready for occupation, or

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- The amenities should be available for use within 25% of the total build time of the part of the overall development that is within the required distance of the amenities required under these credits.

Use the most appropriate rule for the development in question, ensuring that the time occupiers have to wait before having use of the amenities is as short as possible. If there is any doubt regarding this issue please contact BRE.

A commitment to provide amenities should be made in the General Contract Specification or in the form of a Section 106 Agreement.

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### Supplementary Guidance

There is currently none for this issue.

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### Further Information

*Better places to live by design: a companion guide to PPG3 (2001)*  
[www.planning.odpm.gov.uk/betrplac/index.htm](http://www.planning.odpm.gov.uk/betrplac/index.htm)

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### Background

The majority of journeys by car are under 5 miles. By reducing these short car journeys, significant reductions in transport emissions can be made. This is due in part to combustion engines running less efficiently when cold. Local congestion problems can also be eased.

Although it is not suggested that it is possible to reduce the use of the cars for all journeys, positioning developments close to local amenities may reduce the number of journeys for short distances for simple goods (e.g. bread, milk, newspapers, etc.). If people feel able to walk or cycle to local amenities, car use could be dramatically reduced.

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### References

Office of the Deputy Prime Minister:  
*Planning Policy Guidance Note 13 – Transport* (2002) Department for Transport:  
Local Transport Note: 1/95. *The Assessment of Pedestrian Crossings* (1998)  
Local Transport Note: 2/95. *The Design of Pedestrian Crossings* (1998)



## Tra 4 Home Office

**Credits available: 1**

### Aim

To reduce the need to commute to work by providing residents with the necessary space and services to be able to work from home.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	For the provision of a space and services which allows the occupants to set up a home office in a quiet room.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the home office location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the home office location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, electrical or similar, where the location and office layout is shown and type of fittings are stated.
2. The required space and services are, as a minimum:
  - two double sockets; sockets should be positioned to avoid the use of extension leads
  - two telephone points (or double telephone point) or equivalent (in the case of access to broadband, cable network, etc). The provision of splitters do not comply with the criteria. (Note: It is not necessary to have two separate telephone lines to the dwelling.)
  - window
  - adequate ventilation, either through an openable window or with alternative ventilation such as passive stack, etc. Trickle vents would not comply.
  - minimum size (1.8m wall length) to allow a desk and filing cabinet or bookshelf to be installed, with space to move around and open the door (the 1.8m wall size requirement can, in some circumstances, be altered if drawings can prove that a desk can be fitted in any other type of arrangement, i.e. alcove or similar, fulfilling all the above criteria).

3. For dwellings with three or more bedrooms, the space should be in a room other than the kitchen, living room, master bedroom or bathroom.
4. For one and two bedroom or studio homes, the space may be in the living room, one of the bedrooms or any other suitable area in the home such as a large hall or dining area (provided the minimum service requirements under *Guidance note 2* are met). However, the room must be large enough not to prevent the intended use of that room i.e. if a home office is to be set up in the main bedroom that room also needs to be able to fit in a double bed and other necessary furnishing.
5. If the development is connected to any cable network, broadband or similar, this can replace the requirement for two telephone points, subject to the following conditions:
  - the necessary infrastructure to support the service is in place and that the connection goes all the way up to the individual dwellings
  - two items can be plugged in at the same time (but not necessarily be used at the same time).

### *Flats*

6. There is no specific guidance for flats. The standard approach should be followed.

### *Refurbishment*

7. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

*Better places to live by design: a companion guide to PPG3* (2001)  
[www.planning.odpm.gov.uk/betrplac/index.htm](http://www.planning.odpm.gov.uk/betrplac/index.htm)

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## **Background**

The number of self-employed people is increasing, as is the number of people who work from home. Many job functions can readily be performed remotely, so it is quite feasible for individuals to work from home (or elsewhere) either on a full-time basis or for several days each week. Currently there are 1.1 million people in the UK who have such non-traditional work patterns. Information from social trends indicates that 29% and 24% of employed men and women respectively have, at some time, worked from home. The benefits of working from home include reductions in transport movements, increased time available for the home worker and greater opportunity to participate within community activities.

Working from home for many people requires a telephone line as well as a connection to the internet for data transference and even video conferencing. Two telephone points or broadband will enable residents to use the telephone and the computer at the same time.



## References

Office of the Deputy Prime Minister:

*Planning Policy Guidance Note 08. – Telecommunications (2001)*

*Planning Policy Guidance Note 13. – Transport (2002)*

## Pol 1 Insulant GWP

**Credits available: 1**

### Aim

To reduce the potential global warming from substances used in the manufacture or composition of insulating materials.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	<p>Specifying insulating materials, that avoid the use of substances that have a global warming potential (GWP) of 5 or more (and a ODP of zero) , in either manufacture or composition, for the following elements:</p> <ul style="list-style-type: none"> <li>• roof (including loft access)</li> <li>• wall – internal and external (including doors, lintels and all acoustic insulation)</li> <li>• floor (including foundations).</li> <li>• Hot water cylinder, pipe insulation and other thermal store</li> </ul>

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the insulation used, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the insulation used, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
3. Manufacturer's details confirming for those insulation materials not inherently having a GWP of less than 5, giving sufficient information to check that the insulation meets the Credit Requirements both in composition and manufacture.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.  
Relevant drawings would be the general arrangement, plumbing, construction details or similar, where the location and type of insulation is stated.
2. The compliance requirements apply to:
  - any blowing agents used in the manufacture of an insulant,
  - blowing agent used to spray the insulant in place,
  - the materials used in the product itself.

3. For insulants that do not inherently have a GWP of less than 5 (and an ODP of zero), in either manufacture or composition, the developer will need to confirm that the insulant has a GWP of less than 5 (and is free from ozone depleting substances).
  - Manufacturer's confirmation is required that the material has a GWP of less than 5 (and a zero ODP). Typically this may be supported by an independent UKAS accredited certification body.
  - Typical insulants that inherently have a GWP of less than 5 (and a zero ODP) will include insulation materials (if not blown) such as:
 

mineral fibre	cellulose insulation
glass fibre	wood fibre board
cork	wool
cellular glass	flax
nitrile rubber	recycled newspaper and jute
  - The manufacturing process of insulating materials changes regularly. Because of this Ecohomes does not include a complete list of specific insulating materials that comply. When blown insulants are specified, it is likely that only those products using CO<sub>2</sub> or pentane as a blowing agent will comply at present.
4. In determining the GWP, BRE recognise the IPCC methodology using a 100 year time horizon.
5. Note that the use of ozone depleting substances (ODP) in the manufacture or composition of insulating materials is now prohibited in the UK /EU. However there may be a limited amount of such materials stock piled for use. Only products with absolute zero ODP are acceptable. Negligible levels of ODP will not comply.
6. If there is no insulation in any of the elements described, the relevant credits will be given as default.
7. If a combi-boiler is specified, and no hot water cylinder or thermal store is required, the credit for hot water cylinder is achieved, provided the combi-boiler and any insulated pipes do not use ozone-depleting substances in their manufacture.
8. Ensure that information is provided for:
  - both external and internal walls
  - insulation in the foundations, loft access doors and other doors
9. Ensure that all elements/ parts of elements are checked. For example, the roof construction may be pitched with mineral fibre insulation specified. However, there may be a small amount of flat roof construction where extruded polystyrene is used.

### *Flats*

10. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

11. Assess any **new** insulation to be put in.
12. Existing insulants will be deemed to satisfy these criteria as default, as no new Global Warming Potential or Ozone Depleting substances are emitted.

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*Special Cases*

There are currently none for this issue.

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**Supplementary Guidance***A: Definition of Global Warming Potential*

Global Warming Potential (GWP) is defined as the potential for damage that a chemical has relative to 1 unit of carbon dioxide, the primary greenhouse gas.

*B: Definition of Ozone Depletion Potential*

Ozone Depletion Potential (ODP) is defined as the total change in ozone, per unit mass, when the substance has reached a steady state in the atmosphere.

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**Further Information**

See *References* below.

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**Background**

The 'Greenhouse Effect' results from increased emissions of certain gases associated with modern day life. Most of the heat from the sun (short wave solar radiation) that reaches the Earth is absorbed by the surface and warms it up, while about a third is reflected back through the atmosphere into space. Some of this reflected radiation is trapped at the top of the atmosphere by a layer of gases which absorb and recycle the heat back towards the Earth's surface and so warm it still further. These gases act in a similar, yet different, way to the glass in a greenhouse – heat is allowed in but cannot get out – hence we have the 'Greenhouse Effect'.

Global warming potential (GWP) is a relative measure of how effective a gas is at preventing the passage of infra-red radiation (i.e. the Earth's heat). The GWP measures the total energy absorbed by 1 kg of released gas over a fixed period of time. CO<sub>2</sub> is given a GWP of 1.0.

The Kyoto Protocol has set limits to six specific gases that contribute towards global warming. These are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. In the table below show the GWP for each of these gases.

Gas	GWP
Carbon Dioxide	1
Methane	21
Nitrous oxide	310
Hydrofluorocarbons – HFC's	140-11700
Perfluorocarbons –PFC's	6500-9200
Sulphurhexafluoride –SF6	23900

Reference: *National Atmospheric Emissions Inventory, UK Emissions of Air Pollutants 1970-2003*, DEFRA, UK, (GWP) based on 100 year time horizon.

Following the Montreal Protocol the production of CFC's is now banned. The use of HCFCs as the blowing agent for insulating materials has also been phased out in the

UK and Europe. However, as there may still be stockpiles available the ODP must also be verified for this credit.

Many insulation blowing agents have significant global warming potential (GWP), including HFCs which are commonly used as replacements for HCFCs. Therefore this credit requires that substances with a significant GWP are avoided in the manufacture of any insulating materials used in the building.

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## References

*Guidance on the EC Regulation No 2037/2000 on Substances that deplete the ozone layer, October 2000, DTI.* Available on-line at <http://www.dti.gov.uk/access/ozone.htm>

*Defra, Environmental statistics*

<http://www.defra.gov.uk/environment/statistics/globalatmos/gagginvent.htm>

## Pol 2 NO<sub>x</sub> Emissions

**Credits available: 3**

### Aim

To reduce the nitrous oxides (NO<sub>x</sub>) emitted into the atmosphere.

### Credit Requirements

Credits are awarded on the basis of NO<sub>x</sub> emission arising from the operation of all space heating and hot water systems across the development in accordance with the following criteria.

Credits	Dry NO <sub>x</sub> level (mg/kWh)	Boiler class (BS EN 297: 1994)
1	≤100	4
2	≤70	5
3	≤40	above

### Applicability

The same approach is taken for both new build and refurbishment.

95% of dwellings throughout the development must be served by heating and hot water systems with an average NO<sub>x</sub> emission rate of less than or equal to the levels listed above.

### Main Information to be Provided by the Developer

1. Details of primary and secondary space and hot water heating systems. Such details should include the estimated annual consumption (from the SAP calculations).
2. Where fossil fuel boilers are present:
  - Make, model and dry NO<sub>x</sub> levels and/or class of boiler specified.
  - Confirmation of NO<sub>x</sub> levels and/or class from manufacturer, e.g. manufacturer's literature. Printouts from manufacturers' websites are acceptable if the web address is included. (Note: If NO<sub>x</sub> levels are not in the literature, details can generally be obtained from the technical sales department of the relevant manufacturer. Full details of the source must be given in the assessor's report.)
  - Type of flue i.e. open or balanced.
  - NO<sub>x</sub> levels may be stated in the general contract specification as an alternative to supplying the make and model of a specific boiler.
3. Where any other system (apart from grid electricity) is present:
  - Details of the system
  - Confirmation of NO<sub>x</sub> levels from manufacturer.

- 
4. Where the heat load is estimated to be less than 8% of the heat load of a Building Regulation (2006) compliant home of the same type and size, SAP calculations for both the base case and the '8% home case' are required.
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### Guidance

1. If a dwelling contains more than one type of heating and hot water system calculate the average NO<sub>x</sub> emissions for that house type according to *Supplementary Guidance A*.
2. NO<sub>x</sub> emissions are based on the British Standards BS EN 297: 1994, and credits are awarded according to this classification and are measured as dry NO<sub>x</sub> (at 0% excess O<sub>2</sub>). Where figures supplied are other than dry NO<sub>x</sub>, see *Supplementary Guidance C*.
3. The emissions should be estimated under normal operating conditions (not standby).
4. The NO<sub>x</sub> levels and standards principally apply to natural gas boilers, but other fuels may meet the standards (See *Special Cases* below).
5. For standard boilers, the NO<sub>x</sub> information will be available from the manufacturer.
6. Where the heat load (i.e. heating and hot water) for a super insulated/ exemplar home is 8% of the heat load for a Building Regulations compliant building of the same size and type, 1 credit can be awarded regardless of the primary fuel used. 2 credits if this figure is 6% and 3 credits if it is 3%. SAP sheets/ calculations need to be provided for both the base case and the super insulated/ exemplar case.
7. Other heating sources – such as open flue installations, secondary heating, electricity, CHP, heat pumps, renewables and wood – have additional guidance in *Special Cases*.
8. If air conditioning is present this has to be taken into account, provided it accounts for more than 8% of the total energy demand.

### Flats

9. There is no specific guidance for flats/apartments. The standard approach should be followed.

### Refurbishment

10. There is no specific guidance for refurbishment. The standard approach should be followed.

### Special Cases

11. Open flue installations.

Credits will not be awarded where open flue installations are specified, except where they are a secondary heating source as defined below. In open flue installations, low NO<sub>x</sub> boilers can emit levels of carbon monoxide (CO), which can cause serious health risks.

12. Secondary/supplementary heating/hot water.

Information on the NO<sub>x</sub> emissions is not required, provided the secondary heating supplies less than 8% of total heat and hot water demand in any dwelling. (The split may be calculated from the SAP worksheet, which details energy from the primary [main] and secondary heating systems and hot water. Any system

classified as a secondary heating system under SAP will also be classified as a secondary heating system under this credit)

### 13. Electricity.

The source of the electricity needs to be considered. If it is sourced from the national grid, the emissions are approximately 1200mg/kWh, and it is therefore unlikely that a development with a significant proportion of electric heating will meet the requirements. A commitment to use a Green Tariff to supply electricity to heat the dwellings is not sufficient to comply with this credit. Use of local or on site dedicated renewable electricity is acceptable however.

### 14. CHP

The developer must provide information on the NO<sub>x</sub> emissions from the CHP plant. Only the heat-related emissions should be considered, and specific calculation will be carried out by the assessor. See *Supplementary Guidance B, C & D*.

### 15. District heating systems.

The developer must provide information on the NO<sub>x</sub> emissions from the system. Systems that incinerate waste usually have NO<sub>x</sub> emission rates higher than the levels set to achieve any Ecohomes credits.

### 16. Zero Emission Energy source/s:

Three credits can be awarded where all heat and hot water is supplied by a local zero emission renewable energy source, e.g. photovoltaics, wind power (see *Pollution 4 – Renewable and Low Emission Energy Source* for full details of acceptable zero emission energy sources) For these energy sources there are no resulting emissions including NO<sub>x</sub>. Details must be supplied.

### 17. Low emissions energy source/s:

For systems such as biomass/ wood burning information on the NO<sub>x</sub> emissions must be provided. Even though the emission levels are likely to be low, they are not zero and will vary depending on system and fuel type.

### 18. Heat pumps

If the electricity required to run the heat pump is less than 8% of the electricity that would have been required should the home not have had the heat pump system, 1 credit can be awarded. 2 credits if this figure is 6% and 3 credits if it is 3%. SAP calculations for both the heat pump case and the non heat pump case must be provided.

Where electricity for heat pumps is provided from a local zero emission renewable source such as PV's, wind etc., there are no resulting emissions. This source of heating can therefore also be counted as having zero NO<sub>x</sub> emissions and 3 credits can be awarded.

For any other system, or for clarification on how to estimate the NO<sub>x</sub> emission, please contact BRE.

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## Supplementary Guidance

### *A: Calculating the average NO<sub>x</sub> emissions for house types with more than one heating/hot water system*

Where heat and hot water is provided by more than one system in a dwelling (i.e. there is a 'main' and 'secondary' systems) it may be necessary to calculate the total NO<sub>x</sub> emissions for the combined systems. This is necessary when the secondary system



satisfies more than 8% of a the dwelling’s combined total heating and hot water demand. The calculation procedure is detailed below in Table 1:

As for the calculation of credit Ene 1, refer to the SAP worksheet for the water heating and space heating demand for each house type. This is usually given in GJ and will need to be converted to kWh.

**Table 1: Calculation of average NO<sub>x</sub> emission for a dwelling type.**

Dwelling Type:			
	Heating and Hot Water Demand kWh/year (from SAP)	NO <sub>x</sub> Emission rate for Each System (mg/kWh)	Total NO <sub>x</sub> Emission per System (mg)
Water Heating	[1] <input type="text"/> (51) x [4] <input type="text"/>	= [7] <input type="text"/>	
Space Heating (Primary)	[2] <input type="text"/> (85) x [5] <input type="text"/>	= [8] <input type="text"/>	
Space Heating (Secondary)	[3] <input type="text"/> (85a) x [6] <input type="text"/>	= [9] <input type="text"/>	
Total Energy Demand (kWh)	[10] <input type="text"/>		
Total NO <sub>x</sub> emissions (mg) for Dwelling Type		[7]+[8]+[9]	= [11] <input type="text"/>
Average NO <sub>x</sub> Emissions (mg/kWh) for Dwelling Type		[11] ÷ [10]	= [18] <input type="text"/>

Numbers in square brackets [ ] are the box reference numbers  
 Numbers in ordinary ( ) brackets are the SAP table reference boxes

**B: Calculation Method for Combined Heat and Power (CHP).**

Where CHP systems are present or specified, only the heat-related emissions should be considered. The NO<sub>x</sub> emissions should be allocated to heat and electricity in line with the respective power outputs using a NO<sub>x</sub> emission rate for the electrical output that is equivalent to the current rate for grid electricity (see *Guidance Note 13*), and allocating the remaining NO<sub>x</sub> to the heat output. The heat-related component only should then be compared to the credit scale. The following formula should be used to determine this:

$$X = (A - B) / C$$

Where:

$$X = \text{NO}_x \text{ emissions per unit of heat supplied (mg/kWh}_{\text{heat}})$$

$$A = \text{NO}_x \text{ emissions per unit of electricity generated (mg/kWh}_{\text{elec}})$$

Note: This is the NO<sub>x</sub> emitted by the CHP system per unit of electricity generated and should be obtained from the supplier

Where data is provided in different units, or at a level of excess oxygen above zero, the manufacturer/ supplier should be asked to convert this to comply with the Ecohomes requirements, alternatively the assessor may correct these using the factors below.

$$B = \text{NO}_x \text{ emissions per unit of electricity supplied from the grid (mg/kWh}_{\text{elec}}).$$

Note: this should be assumed to be 1200mg/kWh<sub>elec</sub> (in line with the figure provided in *Guidance Note 13* above).

C = Heat to Electricity Ratio of the CHP scheme

The above methodology determines the net NO<sub>x</sub> emissions from CHP generated electricity compared to central generation of electricity and allocates this amount to the heat production. Where X is calculated to be negative it should be assumed zero.

Where the CHP system operates in conjunction with other heat sources the general approach outlined under *Supplementary Guidance A* above should be used to calculate the average NO<sub>x</sub> emissions.

### C: Conversion Factors

Manufacturers should be asked to supply dry NO<sub>x</sub> emissions data in mg/kWh. Where this is not possible the assessor may use the following conversion factors to convert figures in mg/m<sup>3</sup>, ppm or wet NO<sub>x</sub>. It should be noted that these conversion factors assume worst-case efficiencies and are likely to give conservative answer. This could have the effect of lowering the number of credits achieved.

- Figures in **mg/m<sup>3</sup>** should be multiplied by 0.857 in order to gain emissions in mg/kWh. A conversion may also be necessary for data not calculated at 0% excess oxygen (see below).
- Figures in **parts per million (ppm)** should be multiplied by 1.76 in order to obtain mg/kWh. A conversion may also be necessary for data not calculated at 0% excess oxygen (see below).
- The Ecohomes criteria is based on dry NO<sub>x</sub> values – almost all manufacturers will quote emissions in dry NO<sub>x</sub>. However if **wet NO<sub>x</sub>** figures are supplied, these should be converted to dry NO<sub>x</sub>. This can be done by multiplying the wet NO<sub>x</sub> figure by 1.75.

### D: Excess Oxygen Correction

If a NO<sub>x</sub> emission rate is quoted by the manufacturer in mg/m<sup>3</sup> or ppm, then it should be established at what % oxygen this emission was made.

The greater the amount of excess oxygen in the flue gases at the time of measurement, the more 'diluted' the NO<sub>x</sub>. It is therefore important to convert any emission rate back to 0% excess oxygen. For the purpose of Ecohomes, use the following conversion factors for the most frequently used rates supplied by manufacturers:

% excess O <sub>2</sub>	Conversion (c)
3%	x 1.17
6%	x 1.40
15%	x 3.54

Conversion factor  $c = 20.9 / (20.9 - x)$

where  $x = \% \text{ excess O}_2$  (NOT excess air) and 20.9 is the percentage of O<sub>2</sub> in the air.

## Further Information

### *Sedbuk database*

Has all domestic boiler and quotes efficiencies, but does not include the NO<sub>x</sub> levels:  
[www.sedbuk.com](http://www.sedbuk.com)

*British Standards*

[www.bsi.co.uk](http://www.bsi.co.uk)

*Action Energy and energy advice and Government energy programme*

Replaces the Best Practice Programme: [www.actionenergy.org.uk](http://www.actionenergy.org.uk)

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## **Background**

Nitrous oxides (NO<sub>x</sub>) are emitted from the burning of fossil fuels and contribute to both acid rain and to global warming in the upper atmosphere. At ground level, they react to form ozone, a serious pollutant and irritant at low level.

Burners in domestic heating systems are a significant source of low-level NO<sub>x</sub>, while power stations (and therefore electric heating) are a significant source of NO<sub>x</sub> in the upper atmosphere. Whereas CO<sub>2</sub> is produced simply in proportion to quantity of gas burned, the amount of NO<sub>x</sub> emissions varies from product to product. This credit rewards developers who include low-NO<sub>x</sub> boilers or other low NO<sub>x</sub> systems, such as renewables, in their schemes.

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## **References**

British Standards EN 297:1994, A1:1995, A2:1996, A3:1996, A5:1998 and A6:2003  
*Gas-fired central heating boilers*, page 42, table 14, section 3.6.2

## Pol 3 Reduction of Surface Runoff

**Credits available: 2**

### Aim

To reduce and delay water run-off from the hard surfaces of a housing development to public sewers and watercourses, thus reducing the risk of localised flooding, pollution and other environmental damage.

### Credit Requirements

The development must meet the following criteria.

Credits	
	Where rainwater holding facilities and/ or sustainable drainage techniques are used to provide attenuation of water run-off to either natural watercourses and/or municipal drainage systems, achieve attenuation by 50%* in areas of low probability of flooding, 75%* in areas of medium flood risk and 100%* in areas of high flood risk, at peak times from:
1	<ul style="list-style-type: none"> <li>• Hard Surfaces</li> </ul>
1	<ul style="list-style-type: none"> <li>• Roofs</li> </ul>

\* Where a statutory body requires a greater attenuation then the higher requirement should be met in order to achieve these credits.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the aim, location and details of any run-off attenuation devices sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the location and details of any run-off attenuation devices sufficient to meet the *Credit Requirements* and the *Guidance* below.
3. Design team calculations relevant to the credit Including:
  - The type and storage volume (l) of the attenuation measures.
  - Total area of hard surfaces and roofs (m<sup>2</sup>), the peak flow rate (l/s) and the rainfall intensity and duration of the design storm event and for soakaways the soil infiltration rate.
4. Written confirmation of advice and approval from the relevant statutory body for the attenuation facilities specified.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.

- 
- Relevant drawings would be the site layout, drainage or similar, where the location and layout is shown and attenuation is stated.
2. The level of attenuation required will vary depending on where (in which flood risk area) the development is being built (see Pol 5 – Flood Risk *Supplementary Guidance A: United Kingdom Flood risk areas*)
    - Where the assessed development is situated in an area (flood zone) that is defined as having a **low annual probability of flooding**, rainwater holding facilities and/ or sustainable drainage techniques need to be able to attenuate at least **50%** of the peak flow during a design storm event.
    - Where the assessed development is situated in an area (flood zone) that is defined as having a **medium annual probability of flooding**, rainwater holding facilities and/ or sustainable drainage techniques need to be able to attenuate at least **75%** of the peak flow during a design storm event.
    - Where the assessed development is situated in an area (flood zone) that is defined as having a **high annual probability of flooding**, rainwater holding facilities and/ or sustainable drainage techniques need to be able to attenuate **100%** of the peak flow during a design storm event.
  3. Note where the local authority (or other statutory body) requires a greater attenuation than the percentages above, and/or a more onerous design flooding frequency than that recommended in BS EN752-4, then the higher requirements must be met in order to achieve the credit.
  4. The requirements for water run-off attenuation in a flood zone defined as having a high annual probability of flooding can be reduced by 25% to 75%, where the site was previously occupied by buildings or hard surfaces. The easing of the requirements in such cases is to recognise the benefit of not locating the development on an undeveloped site in a zone with a high annual probability of flooding, and therefore not contributing further to the flooding risk in such zones.
  5. The credits can be awarded where one or more of the following are provided for run-off from roofs and hard areas, subject to them meeting the full criteria and other guidance:
    - Holding ponds, swales, reed beds etc.
    - Permeable paving (in areas where local geological and hydrological conditions allow this to function), e.g. block paved surface on permeable sub-base over gravel bed to store the water and allow it to seep in to the soil (in less-permeable soil the gravel layer might be deeper and the water taken through to a soakaway)
    - Local or centralised soakaways either as full systems or as ‘overflow’ or ‘holding’ systems (in areas where local geological and hydrological conditions allow them to function)
    - For all the above when used to collect run-off from vehicular areas and other areas subject to potential pollution risks, they must be covered by appropriate pollution – control measures such as interceptors etc. Specialist advice should be sought from the local authority and/ or Environment Agency or other statutory body on what is appropriate in such instances.
    - Run-off from roofs is collected as a part of a rainwater harvesting system (see additional guidance on water butts below.)
    - Run-off from roofs is directed to a local soakaway or other holding facility such as tanks, ponds, swales etc.

- Green roofs. Note: For soil based grass roofs, calculation should be made on the basis of the infiltration, moisture retention and depth of soil. For sedum roofs, infiltration data should be provided by the manufacturer/installer.

6. External hard surfaces.

These include:

- all drives and other surfaces with vehicular access
- communal car parking
- patio areas, pathways and other hard surfaces.

These do NOT include:

- site distribution roads and associated pavements
- footpaths less than 1.5m wide that have free drainage to soft landscaping areas on both sides.

7. The assessor should check that the calculations for the attenuation device, provided by the design team, comply with the requirements i.e. if the attenuation device will be able to attenuate (hold) 50, 75 or 100% of a peak flow (see *Supplementary Guidance A: Establishment of Storage Volume*). Information provided by the developer/ design team should include the following:

- Type and specification for holding facilities/ soakaways.
- The area of hard surfaces and roofs.
- Design storm and/ or flooding frequency (refer to BS EN 752-4, Section 11-Table 1 or statutory body requirements if they require a more onerous design flooding frequency.). The frequency is depending on the size of the development and the area.
- The design rainfall for the site (calculated for prescribed storm and/ or flooding frequency for 60 min peak rainfalls, unless otherwise required by a statutory body).
- For soakaways the soil infiltration rate and the method of measurement and/ or calculation.
- Calculations for the peak flow (run-off) rates (refer to BS EN 752-4 for hard surfaces and BS EN 12056-3 for roof run-off).
- Calculations for the storage volume of the holding facility/ soakaway. The storage volume of the soak-away must be at least 50, 75 or 100% - depending on flood risk area - of the volume of a peak storm (rainfall) with a duration of 60 minutes (unless otherwise required by a statutory body).
- Where soakaways or other such systems are proposed, the developer must provide evidence that advice and approval has been obtained from the relevant statutory body. Local geological or hydrological conditions can dictate the type(s) of system that may be used. See *Supplementary Guidance B*.
- Planned maintenance which will depend on selected event frequency.

8. Note that the assessor is **not** required to perform any calculation as this should be provided by the design team. However, BS EN 752-4 and BS EN 12056-3 contain guidance on calculating the peak flow rate and determining the design flooding frequency should this information be required.

9. To ensure effective operation of the water run-off attenuation measures, the facilities must discharge half their volume within 24-48 hours (unless advised otherwise by a statutory body) of the storm event in readiness for any subsequent storm inflow. Most soakaways are designed for a 24 hours half discharge.
10. If all run off is discharged directly from the site to either the sea, estuaries covered by a shoreline management plan or designated wildlife/SSSI areas (as part of habitat management), then the credit may be awarded without the need to specify additional attenuation measures.
11. Where the drainage system already discharges all surface runoff to a properly designed soakaway system (for example to BRE Digest 365, See *References*) for the appropriate design storms then the credit may be awarded without the need to specify additional attenuation measures. Soakaway design calculations must be supplied and verified.
12. Run-off from roofs to water butts **does not** automatically comply with the requirements of this credit, as water use is dependent on the occupier and excess water is normally discharged direct to drainage systems. Where such excess is then stored in such a manner as to meet the requirements, this credit can be awarded.
13. None of the credits can be awarded where the assessed development has proceeded against the recommendation of the relevant Flood Defence Agency on the basis that the flooding implications are too great.

#### *Flats*

14. There is no specific guidance for flats/apartments. The standard approach should be followed.

#### *Refurbishment*

15. There is no specific guidance for refurbishment. The standard approach should be followed.

#### *Special Cases*

There are currently none for this issue.

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## Supplementary Guidance

### *A: Establishment of Storage Volume*

The assessor should first establish if soakaways, porous surfaces to car parking and road/pedestrian circulation areas, or water run-off holding facilities such as tanks and ponds have been specified, or are present on the site.

In cases where such facilities are specified, the Design Team will have carried out their own sizing calculations. The Assessor should ask for a copy of these to determine whether the target of 50%, 75% or 100% reduction of peak run-off will be achieved.

When determining whether the specified facilities meet the required target, the Assessor should establish the potential impermeable surface area (m<sup>2</sup>) for the site (i.e. building area and 'hard' surfaces areas such as car parking and paths). Using the design rainfall for the site and the surface areas, the storage volumes should be checked. When storage facilities contain gravel or other fill materials then evidence of how the available void space was determined should be supplied.

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The storage volume of the soakaway must be 50, 75 or 100% or more of the volume of the rainfall for peak rainfall levels and duration.

### *B: Soakaway design*

Local geological or hydrological conditions can prevent soakaways or other such systems relying on natural ground absorption from working (for further information see BRE Digest 365, see *References*). There needs to be a geo-textile wrap around soakaways and land drains to prevent clogging with mobile sediment and reduce the resulting possibility of localised flooding, which may kill the surrounding planting. The backfill needs to be inert and unlikely to affect soil-water chemistry that can harm planting (e.g. no limestone).

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## Further Information

*The Met Office* (incl. figures for UK rainfall)  
[www.met-office.gov.uk](http://www.met-office.gov.uk)

*British Standards Online*  
<http://bsonline.techindex.co.uk/>

*The Environment Agency*  
[www.environment-agency.gov.uk/](http://www.environment-agency.gov.uk/)

*Scottish Environment Protection Agency*  
[www.sepa.org.uk](http://www.sepa.org.uk)

*Rivers Agency – Northern Ireland*  
[www.riversagencyni.gov.uk](http://www.riversagencyni.gov.uk)

*CIRIA*  
Source control using constructed pervious surfaces (CIRIA publication C582)

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

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## Background

Around 5 million people, (i.e. 2 million properties), live in flood risk areas in England and Wales. Excessive surface run-off can cause significant flash flooding problems to natural watercourses, rivers and municipal systems. The need to cater for such peak run-off means that systems are sized accordingly and are oversized for most of the year.

On many sites it should be possible to include holding facilities to delay the release of storm water from the site and statutory authorities may require this in certain sensitive areas, usually where natural watercourses are affected.

The main intention of this credit is to reduce the overall surface run-off of rainwater from hard landscaped surfaces and roofs within the development. In housing developments this can be done either by specifying porous paving for all hard surfaces in the development, or by the adoption of soakaways or other systems (including green roofs) that reduce peak run-off loads.

Porous paving will allow water to soak through the paving into natural water tables rather than direct collected rainwater into public sewers and watercourses. Care needs to be taken to ensure that the local conditions will permit a soakaway to function



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adequately, and advice should be sought from the relevant statutory body to confirm this. Conventional hard landscaping can be specified in conjunction with systems that direct all collected rainwater into holding ponds or tanks. Some porous paving systems specifically designed for parking areas, collect the water and pass it through an interceptor or constructed wetland before it is returned to the natural drainage system.

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## References

CIRIA. – *C523 – Sustainable urban drainage systems – best practice manual for England, Scotland, Wales and Northern Ireland* (2001)

BS EN 752-4 – *Drain and sewer systems outside buildings – Hydraulic design and environmental considerations* (1998)

BS EN 12056-3 – *Gravity drainage inside buildings – Roof drainage, layout and calculations* (2000)

BRE Digest 365 - *Soakaway design* (1991)

## Pol 4 Renewable and Low Emission Energy Source

**Credits available: 3**

### Aim

To reduce atmospheric pollution by encouraging locally generated renewable and low emission energy to supply a significant proportion of the development's energy demand.

### Credit Requirements

The development should meet the following criteria.

Credits	
1	Where evidence provided demonstrates that a feasibility study considering renewable and low emission energy has been carried out and the results implemented.
2	Where evidence provided demonstrates that the first credit has been achieved and 10% of total energy demand for the development is supplied from local renewable, or low emission energy, sources*
3	Where evidence provided demonstrates that the first credit has been achieved and 15% of total energy demand for the development is supplied from local renewable, or low emission energy, sources*.

\* In line with the recommendations of the feasibility study.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, should be included in the calculation of the heat (space and hot water) demand or the electricity consumption.

### Main Information to be Provided by the Developer

1. SAP worksheets for each house type (from accredited SAP assessor).
2. The appropriate drawings and/ or specification should show the type of renewable source/s location and details sufficient to meet the *Credit Requirement* and the *Guidance* below.
3. Manufacturer's details, or similar, about the renewable or low emission energy system stating estimated heat or electricity output.
4. Calculations showing the anticipated annual energy production from any renewable sources.
5. Confirmation that a feasibility has been carried out.

### Guidance

1. Total energy demand include energy demand for heating and hot water as well as the electrical demand (pumps and fans and lights and appliances).

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## 2. Feasibility study.

The developer must confirm that a feasibility study has been commissioned/undertaken to establish the most appropriate renewable or low emission energy source for the building/development. This study must cover as a minimum:

- Payback
- Land use
- Local planning requirements
- Noise
- Whole life cost/ life cycle impact of the potential specification in terms of carbon emissions
- Any available grants
- All technologies appropriate to the site and energy demand of the development.
- Reasons for excluding other technologies.

The developer must **also** confirm that a renewable and/or low emission energy technology has been specified for the development in line with the recommendations of the above feasibility study.

Note that the feasibility study should be carried out at outline proposal (RIBA stage C). Where the feasibility study has been carried out at other stages please contact BRE for advice.

3. Note that in order to achieve the second and third credit the first credit must be achieved and a local renewable and/or low emission energy technology implemented to provide at least 10 or 15% of the total energy demand, in line with the recommendations of the feasibility study
4. Figures used for calculations of the percentage of energy provided by renewables are based on SAP.
5. The assessor should ask for copies of calculations showing the anticipated annual energy production from any renewable or low emission energy sources and compare this with the total annual energy demand for the development as appropriate. See *Supplementary Guidance A*.
6. Electricity from a local renewable or low emission energy source that has been designed to supply the building directly, may be included in the calculations as if it were generated within the building.
7. Any electricity from a local renewable or low emission source that is exported to the grid at times of low demand in the dwelling/ development may be included in the calculation as if it was used within the dwelling/development (provided that there is a direct supply to the dwelling/ development in times of demand)..
8. Note that energy supply from remote sources such as the National Grid, will not comply, this includes electricity procured through 'green tariffs'
9. The percentage can be made up from a number of different renewable or low emission sources/ technologies.
10. 'Local' does not have to mean 'on site' and could include community schemes, however electricity should not be supplied via the National Grid in such cases.

11. Where the development under assessment forms part of a larger mixed use development and renewable generation is provided for the whole site then the amount of renewable energy counted for this credit should be proportional to the development's energy demand compared to the total energy demand for the whole site.

*Flats*

12. There is no specific guidance for flats/apartments. The standard approach should be followed.

*Refurbishment*

13. There is no specific guidance for refurbishments. The standard approach should be followed

*Special Cases*

There are currently none for this issue.

**Supplementary Guidance**

*A: Calculation of percent heat (space heating and hot water) and/ or electricity consumption contributed from renewable and zero emission energy sources.*

1. Use Table 1 to calculate the total energy demand (space and water heating and non heat electrical demand) for **each house type** (for the definition of house type see Ene 1).
2. Use Table 2 to calculate the percent contribution from Renewable and Zero Emission Energy Sources for heat and/ or electricity for the **whole development**.

**Table 1: Total Energy Demand for Each House Type.**

Dwelling Type:	No.of dwellings [A]:	
<b>Space Heating and Hot Water Demand</b>		
	Heating Demand (kWh from SAP)	Totals (kWh)
Water Heating	[1] <input type="text"/> (51)	
Space Heating (Primary)	[2] <input type="text"/> (85)	
Space Heating (Secondary)	[3] <input type="text"/> (85a)	
Total Space Heating and Hot Water Demand		[1]+[2]+[3] = [4] <input type="text"/>
<b>Non Heating Electrical Demand</b>		
Pumps and Fans	[5] <input type="text"/> (87)	
Lights and Appliances	[6] <input type="text"/> (EH)	
Total Electrical Demand		[5] + [6] = [7] <input type="text"/>

**NOTES**

Figures in square brackets [ ] are box references for the table

Figures in parentheses ( ) are box references from the SAP sheet

(EH) calculation (box [6]) refer to the EcoHomes/ BREDEM calculations of energy for lights and appliance below.

**Calculation of energy required for lights and appliances:**

The energy requirement for lights and appliances, and an allowance for low energy lights (if present), must be taken into account in *Table 1*. Use the following equation for each dwelling type, and the answer is used in *Table 1 Box [6]*.

Energy for lights and appliances is:

$$E_L = E_{LA} - E_{red} \quad (\text{GJ/yr})$$

$$E_{LA} = 2.24 + 0.087 \times \text{TFA}$$

$$E_{RED} = 0.8 \times 0.16 \times E_{LA} \times \text{LEL}$$

Where:

$E_L$  = overall electricity consumption for lights and appliances

$E_{LA}$  = energy requirement for lights and appliances

$E_{RED}$  = reduction due to low energy lights

$\text{LEL}$  = Low energy light factor, and

= 0 where zero low energy light fittings are fitted, or

= 0.30 where 30% low energy light fittings are fitted (assumed by SAP2005)

= 0.40 where 40% low energy light fittings are fitted (1 credit under Ene 5)

= 0.75 where 75% low energy light fittings are fitted (2 credits under Ene 5)

or any other percentage up to 100% low energy light fittings fitted.

$\text{TFA}$  = total floor area ( $\text{m}^2$ )

Multiply  $E_L$  with 277.8 in order to convert to **kWh** before inserting the value into box 6 in the Table 1 above (1 GJ = 277.8 kWh).

(Note: In calculating the energy reduction for low energy lights, it has been assumed that 16% of the 'lights and appliances' is lighting energy, and that low energy lighting will save 80% of that energy.)

**Table 2: Percent Total Energy Demand from Renewable and Zero Emission Energy Sources for the Whole Development**

Percent of total Energy Demand from Renewables and Low Emission Energy Sources for the Whole Development			
Total Space and Water Heating Demand for the <b>Whole Development</b> =			
Total Space and Water Heating Demand for Each House Type			
x Number of Units of Each House Type [A]	Σ For All House Types	( [4] x [A] ) = [8]	<input type="text"/>
Non Heat Electrical Demand for <b>Whole Development</b> =			
Total Non Heat Electricity Demand			
x Number of Units of Each House Type [A]	Σ For All House Types	( [7] x [A] ) = [9]	<input type="text"/>
Total Energy Demand for the whole Development (kWh)		( [8] + [9] ) = [10]	<input type="text"/>
Output from Renewable Source(s) Supplying Space Heating and/or Hot Water and/or Electricity for Whole Development (kWh)			[11] <input type="text"/>
% Total Energy Demand Supplied by Renewable Source(s) - Whole Development		$\frac{([11] + [10])}{x 100} =$	[12] <input type="text"/>

**B: Definition of local renewable and low emission energy sources**

The following **renewable/ zero emission energy technologies** may be considered:

Solar:

- Solar hot water – flat plate collectors or evacuated tubes
- Photovoltaics

Water (Technologies under this heading can be considered renewable or zero emission energy where any energy used for any pumps is generated from any of the other 'renewable' sources stated here):

- Small scale hydro power
- Tidal power
- Wave power

Wind:

- Wind turbines

Other:

- Fuel cells using hydrogen generated from any of the above 'renewable' sources
- Heat pumps powered by energy generated from any of the above 'renewable' sources

The following **low emission energy technologies** may be considered:

Biomass (whilst in some instances this is considered carbon neutral this is not a zero emission fuel):

- Biomass single room heaters/stoves
- Biomass boilers
- Biomass community heating

Combined Heat and Power (CHP):

- Biomass CHP

Heat Pumps:

- Air source heat pumps
- Ground source heat pumps
- Water source heat pumps

For any technologies not mentioned here, please contact the BRE to ensure compliance.

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## Further Information

There is currently none for this issue.

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## Background

The use of zero emission energy sources will not only lead to reduced emissions of greenhouse gases (as assessed in Ene 1) and other pollutants, but will also help to conserve the finite global fossil fuel resources and develop a market for such technologies.

The government has set a target that 10% of energy in the UK should be generated from renewable sources by 2010. The greater the number of individual buildings that obtain 10% or more of their energy from renewable sources, the easier this target will be to achieve.

This credit rewards energy efficient design in addition to the inclusion of renewable energy technology. Supplying energy efficient buildings with 10% of their energy demand from renewable sources will be easier than for less energy efficient buildings since their total demand is lower.

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## References

ODPM, *Planning Policy Statement 22: Renewable Energy*, HMSO (2004)

ODPM, *Planning for Renewable Energy A companion Guide to PPS22*, HMSO (2004)

Faber Maunsell (2004) London Renewables Toolkit, available to download from [http://www.london.gov.uk/mayor/environment/energy/renew\\_resources.jsp](http://www.london.gov.uk/mayor/environment/energy/renew_resources.jsp),

*Scottish Executive Planning*, [www.scotland.gov.uk/planning](http://www.scotland.gov.uk/planning)

*Scottish Executive Environment and Rural Affairs Department*, [www.scotland.gov.uk/erad](http://www.scotland.gov.uk/erad)

## Pol 5 Flood Risk

**Credits available: 2**

### Aim

To encourage developments in areas with low risk of flooding or if developments are to be situated in areas with a medium risk of flooding, that appropriate measures are taken to reduce the impact in an eventual case of flooding.

### Credit Requirements

The development must meet the following criteria.

Credits	
2	Where evidence provided demonstrates that the assessed development is located in a zone defined as having a low annual probability of flooding.
OR	
1	Where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium annual probability of flooding and the ground level of the building, car parking and access is above the design flood level for the site's location.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the flood zone or annual probability of flooding for the site, location and details of any flood protection measures sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the location and details of any flood protection measures sufficient to meet the *Credit Requirements* and the *Guidance* below.
3. Written confirmation from the developers/ design team of the flood zone or annual probability of flooding in their sites location. The information must state how/where this definition/information was sourced i.e. from the Local Authority, EA or SEPA, flood maps etc.
4. Where appropriate to awarding the credit, confirmation from the developer/ design team or third party of;
  - The design flood level for the site/flood zone
  - Site plans or specification outlining the range of ground levels of the dwellings, car park and site access (lowest to highest).



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## Guidance

1. If the details are stated in the specification, they should also be clearly indicated on the drawings.
  - Relevant drawings would be the site layout, section or similar, where the location and layout is shown and the height above design flood level is stated.
2. Where the assessed development is situated in a flood zone that is defined as having a **medium annual probability** of flooding, the ground level of all dwellings, and access to them and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the flood zone in which the assessed development is located. (see *Guidance Note 3 and 4* below)
3. It is accepted that, for dwellings located in a medium flood zone, areas of the car park and site access may be allowed to flood and therefore fall below the 600mm threshold. In such cases the credit is still achievable provided safe access to the site and the dwellings can be maintained (i.e. they are 600mm above the design flood level) to ensure the dwelling/ site does not become an 'island' in the event of a flood.
4. Where the development has been permitted and the ground levels of the topography/infrastructure immediately adjacent to the site fall below the 600mm threshold, the credit can still be awarded. Provided there are no other practical solutions for access to the site above this level and the assessed dwellings, and access to it, meet the credit requirements. As much of the external site area as possible (or as required by LA/Flood defence agency) should be designed at or above the threshold.
5. None of the credits can be awarded where the assessed development has proceeded against the recommendation of the relevant Flood Defence Agency on the basis that the flooding implications are too great.

### *Flats*

6. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

7. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## Supplementary Guidance

### *A: United Kingdom Flood zones and Probabilities of Flooding*

Flood zones are defined in the relevant planning, policy and technical guidance documents for each country in the UK. PPG25 (England), TAN15 (Wales), SPP7 (Scotland), PPS15 (N. Ireland; note, currently in draft form only). PPS15 does not categorize flood risk zones. Therefore, in the absence of a site specific assessment of annual flooding probability, assessments in N. Ireland should use the same definitions as those outlined for England (table below).

Whilst the definitions of flood zones and probabilities of flooding are generally the same throughout the UK, there are some differences. The definitions are outlined in the table below.

Definition	England	Wales	Scotland
Low annual probability of flooding	<b>Zone 1</b> Less than 1 in 1000 chance of river and sea flooding (<0.1%)	<b>Zone A</b> Considered to be at little or no risk <b>Zone B</b> If site levels are greater than the flood levels used to define adjacent extreme flood outline.	<b>Little or no risk area</b> As defined for England
Medium annual probability of flooding	<b>Zone 2</b> Between 1 in 100 and 1 in 1000 chance of river flooding (1% – 0.1%) and between a 1 in 200 and 1 in 1000 chance of sea flooding (0.5% – 0.1%).	<b>Zone B</b> If site levels are not greater than the flood levels used to define adjacent extreme flood outline. <b>Zone C</b> Equal to or greater* than 0.1% (river, tidal or coastal flooding).  * For the purposes of Ecohomes assume upper probability of flooding no greater than that specified for England.	<b>Low to medium risk area</b> Watercourse, tidal or coastal flooding in the range 0.1% – 0.5% (1:1000 – 1:200).
High annual probability of flooding	<b>Zone 3a High Probability</b> 1 in 100 or greater chance of river flooding(>1%) and a 1 in 200 or greater chance of flooding from the sea (>0.5%).  <b>Zone 3b The Functional Floodplain</b> Land where water has to flow or be stored in times of flood.	<b>Zone C1 &amp; C2</b> * For the purposes of Ecohomes assume the same lower and upper probability of flooding as that specified for England.	<b>Medium to high risk areas</b> Annual probability of watercourse, tidal or coastal flooding: greater than 0.5% (1:200)

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Historic rainfall data can be obtained from the Meteorological Office. Where historic rainfall series are not available, it is now possible to generate synthetic rainfall time series for locations in the UK. (refer to BS EN752-4 for more detail).

### *B: Glossary of terms*

**Design flood level:** The maximum estimated water level during the design event. The design flood level for a site can be determined through either known historical data or modelled for the specific site.

**Design flood event:** An historic or notional flood event of a given annual flood probability, against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

**Flood Defence Agency:** refers to either Environment Agency (England & Wales), The Scottish Environment Protection Agency (Scotland) and Rivers Agency (N. Ireland) and the local authorities and Internal Drainage Boards.

**Flood risk:** the combination of the flood probability and the magnitude of the potential consequences of the flood event.

**Flood event:** A flooding incident characterised by its peak level or flow, or by its level or flow hydrograph.

**Flood probability:** The estimated probability of a flood of given magnitude occurring or being exceeded in any specified time period.

**Flood storage:** The temporary storage of excess runoff or river flow in ponds, basins, reservoirs or on the flood plain during a flood event.

**Shoreline Management Plan:** SMP's provide a large scale assessment of the risks associated with coastal processes and presents a policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner.

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## **Further Information**

*The Met Office* (incl. figures for UK rainfall)  
[www.met-office.gov.uk](http://www.met-office.gov.uk)

*British Standards Online*  
<http://bsonline.techindex.co.uk/>

*The Environment Agency*  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

*Scottish Environment Protection Agency*  
[www.sepa.org.uk](http://www.sepa.org.uk)

*Rivers Agency – Northern Ireland*  
[www.riversagency.ni.gov.uk](http://www.riversagency.ni.gov.uk)

*CIRIA*  
Source control using constructed pervious surfaces (CIRIA publication C582)

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## **Background**

Flooding in the United Kingdom is increasing due to more extreme weather patterns brought about by global warming. Other reasons may have to do with increased run-off

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from hard surfaces and from some agricultural land. Coastal flooding is exacerbated by rising sea levels, also a result of global warming.

Floods are now on average nearly twice as frequent as they were one hundred years ago.

Over seven percent of the land area of England and Wales is at risk from flooding and around 5 million people, (i.e. 2 million properties), live in flood risk areas in England and Wales.

The Meteorological Office predict a very significant increase in the incidence of flooding over the next century as a result of climate change. If property development continues to increase in high-risk areas, the frequency and intensity of natural catastrophes will inevitably increase too - even if the number of natural events remains constant.

A way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1% chance of occurring in any given year.

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## References

*Development and flood risk, guidance for the construction industry*, Lancaster et. al, CIRIA (2004).

*Standards for the repair of buildings following flooding*, C623, CIRIA (2005).

*BRE Good Repair Guide 11, "Repairing Flood Damage" Part 1-4*, CRC Ltd, (1997)

*Design guidance on flood damage to dwellings*, The Scottish Office (1996)

*Consultation on planning policy statement 25, "Development and flood risk"*, ODPM (2005).

*Planning Policy Wales Technical Advice Note 15, "Development and flood risk"*, Welsh Assembly Government (2004).

*Scottish Planning Policy 7, "Planning and flooding"*, Scottish Executive (2004).

*PAN 69 Planning and Building Standards Advice on Flooding*, Scottish Executive (2004)

BS EN 752-4: 1998, *"Drain and sewer systems outside buildings – Part 4: Hydraulic design and environmental considerations"*, British Standard Institute (1998)

BS EN 12056-3: 2000, *"Gravity drainage inside buildings – Part 3: Roof drainage, layout and calculation"*, British Standard Institute (2000)

*BRE Digest 365, "Soakaway design"*, Building Research Establishment (1991).

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

*Department for food and rural affairs, England and Wales*  
[www.defra.gov.uk](http://www.defra.gov.uk)

*Scottish Executive Planning*  
[www.scotland.gov.uk/planning](http://www.scotland.gov.uk/planning)

*Scottish Executive Environment and Rural Affairs Department*  
[www.scotland.gov.uk/erad](http://www.scotland.gov.uk/erad)

## Mat 1 Environmental Impact of Materials

**Credits available: 16**

### Aim

To encourage the use of materials that have less impact on the environment, taking account of the full life-cycle.

### Credit Requirements

Credits are achieved by obtaining an 'A' rating from the Green Guide for Housing Specification, for 80% by area of the element, for each of the following elements.

Credits	Element
3	Roof
3	External walls
3	Internal walls – party walls and internal partitions
3	Floors – upper and ground floor
2	Windows
1	External surfacing – driveways, paths and patios
1	Boundary protection

All dwellings in the development must meet the criteria.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements.

The credit for boundary protection should be assessed on a site wide basis i.e. credits can be awarded if 80% of the total area of boundary protection on all assessed dwellings is A rated.

Blocks of flats can be assessed on a block by block basis.

### Main Information to be Provided by the Developer

1. Specifications must state the materials, location and details for each element sufficient to meet the Credit Requirements and the Guidance below.
2. The appropriate drawings should show the materials, location and details for each element sufficient to meet the Credit Requirements and the Guidance below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, plans, details or similar, where the location and details of materials are stated.

2. BRE's extensive quantitative data on materials has been translated into simple environmental profiles for building elements in the Green Guide for Housing Specification. An 'A,B,C' rating system is used to rank elements and components, where 'A' represents the least environmental impact. This will be used to assess the major building elements.
3. In cases where an element is made up of a series of sub elements 80% of the total area of these elements must be A rated for the appropriate number of credits to be awarded. For example, the party walls and internal partitions are considered part of the internal wall element. 80% of the total area of these sub elements must be A rated for credits to be awarded.
4. Whilst exact matches in specifications are not always possible, you are likely to be able to find a similar one. If no similar specification is listed in the Green Guide, the assessor should contact BRE for a bespoke rating. In order to obtain a bespoke rating the assessor needs to provide BRE with the following:
  - the development reference number
  - scaled, dimensioned and fully labelled construction drawing clearly showing the specified element, all materials and specification references.
  - All materials and specification references.Bespoke ratings can also be provided for Modern Methods of Construction (MMC), until the release of the updated Green Guide which will contain some generic ratings for these.
5. Please note that if an element (new build) contains CFCs, HCFCs it cannot achieve an A rating.
6. Any doors with a large expanse of glazing, such as patio doors, should be assessed as windows for the purpose of this credit.
7. The Green Guide makes reference to softwood being pre-treated. This can not be a simple coating of paint, but needs to be pre-treated in the factory, so that the timber is completely impregnated. The treatment will be to stop rot and insect infestation. Treatment must be in line with relevant BS or ISO standards.
8. External surfacing would include driveways, paths and patios but not planted or grassed amenity/ garden areas.
9. Note that hedges or any other type of planted barrier defining the plot boundary will count towards the Boundary protection credit.
10. Elements of the building such as balcony railings are not included in the assessment of boundary protection.
11. Note that ALL assessed dwellings must meet the 80% area requirement in order to score credits i.e. 80% of the windows in all individual dwellings must be A rated. For houses this is all houses and for block of flats this is all blocks of flats. The credit can not be awarded if, for example, one house has no A rated windows even though the remainder of the houses have 100% A rated windows. The only exception to this rule is for boundary protection which should be assessed on a site wide basis i.e. credits can also be awarded if 80% of the total areas of boundary protection on all assessed dwellings is A rated (see *Applicability*) even where boundary protection for one dwelling fails to meet the A rating (Note: the fence area on this dwelling must be less than 20% of the total fence area on the site for this criteria to be met).
12. If the development has been designed to specifically remove the need for either boundary protection or external surfacing (including any communal areas), these credits can be awarded as appropriate by default. The credits cannot be awarded

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where the developer has omitted these elements from the development to allow for a future purchaser to make their own arrangements.

### *Flats*

13. Flats should be assessed as per block of flats rather than per individual unit.

### *Refurbishment*

14. Any existing element within the building that will be reused in-situ, will automatically get an A rating, as the environmental impact of replacing that element is far greater than reusing the element already in place.

15. If an existing element contains CFCs or HCFCs, that element will still count as an A rating.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

*BRE environmental profiles*  
[www.bre.co.uk/envprofiles](http://www.bre.co.uk/envprofiles).

For further information on sourcing of reclaimed and recycled materials visit the Materials Information Exchange at: [www.bre.co.uk/waste](http://www.bre.co.uk/waste)

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## **Background**

BRE and NHBC have developed a guide that enables developers to specify the most environmentally sound components for their given situation. This includes the embodied energy content of the materials, toxicity and the expected life of the components. The Guide is designed to meet the requirements of the housing sector. The components are ranked on a scale from A to C, with A being the most environmentally sound.

The production, use and disposal of building materials accounts for significant quantities of energy and resources, both internationally and in the UK. BRE's Green Guide for Housing Specification provides a simple tool to aid specifiers in considering the environmental implications of their choices. The Green Guide and BRE's Environmental Profiles Methodology are based on a 60 year building design life. Included in this is any repair and maintenance over the 60 year life, and impacts relating to an assumed dismantling/demolition of the building at the end of its life.

The environmental issues considered reflect the generally accepted areas of concern related to the production of building materials used in the UK and are rated separately. The same weighting system that underpins the Ecohomes scoring procedure is used to calculate a summary score, again on the 'A,B,C' scale. It is this that Ecohomes considers for the seven key elements above. Materials and components are presented in their typical, as-built elemental form. They are compared on a like-for-like basis, as components that fulfil the same or very similar functions; important variables such as the mass of a material required to fulfil a particular function are taken into account.



An updated version of the Green Guide for Housing Specification is planned to be released in summer 2006 as a web based guide. This tool will cover both commercial and domestic properties. A hard copy is due to be published in 2007.

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**References**

Building Research Establishment Ltd. The *Green Guide for Housing Specification*, (2000)

## Mat 2 Responsible sourcing of Materials: Basic Building Elements

**Credits available: 6**

### Aim

To recognise and encourage the specification of responsibly sourced materials for key building elements.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1-6	Where materials used in key building elements are responsibly sourced.

### Applicability

This credit covers all new materials used in the basic building elements as described in the Guidance.

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development must meet the requirements.

### Main Information to be Provided by the Developer

Specifications must state details sufficient to meet the Credit Requirements and the Guidance below.

Documentation from the supplier/s/ manufacturer/s and or developer sufficient to meet the Credit Requirements and the Guidance below (see *Ecohomes Documentation Requirements*).

The volumes (m<sup>3</sup>) of materials used for all basic building elements listed below.

### Guidance

1. The majority of materials in the following basic building elements must be responsibly sourced.
  1. Frame
  2. Ground floor
  3. Upper floors (including any loft boarding)
  4. Roof (structure and cladding)
  5. External walls (including external cladding)
  6. Internal walls (including internal partitions)
  7. Foundation/substructure
  8. Staircase (includes the tread, rises and stringers)

The following describes how this can be demonstrated for the purposes of this credit:

2. For each of the elements above determine what proportion of the following materials (by volume) form part of the element.
  1. Brick
  2. Composites
  3. Concrete (including blocks, tiles etc.)
  4. Glass
  5. Plastics
  6. Metals (steel, aluminium etc.)
  7. Stone
  8. Timber

Note that insulation materials, fixings, adhesives, additives and other materials not listed above are also to be excluded from the assessment of this credit.

3. All materials (including those listed above) which form less than 10% of a total element can also be excluded from the credit assessment (e.g. steel screws if there is not other steel in the element).
4. For each element, select the materials that make up the largest contribution by volume (up to a maximum four). These should amount to at least 80% of the total remaining materials (given the exclusions in *Guidance Note 2* above). If these do not form the required 80%, contact BRE for advice on how to proceed.
5. The next step is to determine which of the materials identified meet the requirements for the responsible sourcing. Ecohomes defines four 'tiers' of compliance which can be used to gain credits. Points are allocated according to the rigorousness of the method used. See table 1 below.

**Table 1: Tier levels**

Tier level	Issue assessed	Points available per element	Evidence / measure assessed	Examples of compliant schemes
1	Legality & responsible sourcing	3	Certification scheme	FSC, CSA, SFI with CoC
2	Legality & responsible sourcing	2	Certification scheme	PEFC
3	Legality & responsible sourcing	1.5	Certification scheme/ EMS	Certified EMS at process and extraction stage (see <i>Guidance Note 14 and 15</i> )
4	Legality & additional issues	1	Certification scheme/EMS	MTCC, Verified*, SGS, TFT, certified EMS at process stage (see <i>Guidance Note 14 and 15</i> )

\* Verified is the name of a scheme.

Timber demonstrates compliance via timber certification schemes. Other material sectors are currently likely to demonstrate compliance through an EMS certification scheme at either the process stage or both the process and extraction phases for each material. Chain of custody, third party certification schemes, covering other materials,

may be developed in the future and these may comply. Seek guidance from BRE on the acceptability of any such schemes. Assessors can download a Checklist, Checklist Mat ,1 from the extranet which provides some guidance on this.

6. A calculation tool to assist with the calculations of this credit is available for use by licensed assessors and can be downloaded from the Ecohomes extranet.
7. Each volume (or proportion) of materials is then multiplied with the points available in that tier. At least 80% of each material must comply with one or more of the tiers to gain points (i.e. 20% of the timber in a timber frame can be allowed to not be certified). The total number of points achieved for all elements is used to determine the number of credits.
8. The following scale is then used to award credits (provided all elements are present in the development):
 

≥18 points	6 credits awarded
≥12 points	4 credits awarded
≥ 9 points	3 credits awarded
≥ 6 points	2 credits awarded
9. Where an element is not present in a dwelling (e.g. there may not be a frame), the points for this/ these element/s are redistributed to reward only the elements being assessed. Table 2 below outlines the point/ credits distribution according to the number of elements being assessed.

**Table 2: Credit Structure**

	Credits available			
	6	4	3	2
No. of elements present	Points range			
8	≥18	≥12	≥9	≥6
7	≥15.75	≥10.25	≥7.87	≥5.25
6	≥13.5	≥9	≥6.75	≥4.5
5	≥11.25	≥7.5	≥5.625	≥3.75

It is expected that a minimum of 5 elements will be present.

10. *Supplementary Guidance A: Calculation Methodology* – An example outlines an example of the process of credit assessment.
11. Where **any** non-certified timber is used in the development, the developer/supplier **must** confirm, in a letter, that it comes from a legal source and that it is not included on the CITES (Convention of International Trade in Endangered Species of wild fauna and flora) list (see *Ecohomes Documentation Requirement, Supplementary Guidance C: Documentation, D: Legally Sourced Timber – Ecohomes Definition, E: CITES*, and the *Background* section).
12. Reused materials count as Tier 1, however materials reused in-situ are excluded as the credit is focussing on responsible sourcing.
13. Where materials being assessed (including timber) are part of a pre- or post-consumer waste stream, the EMS sections of the credit can be applied for, however using an EMS scheme (ISO, EMAS etc.) for new timber does not demonstrate timber certification and therefore does not qualify for any of these Ecohomes credits.

14. The extraction stage is considered to be the stage of extraction of the raw materials e.g. clay, aggregate, hematite, bauxite, stone etc. (See Table 2 in *Mat 2 and 3 Checklist* for further details).
15. The process stage is considered to be the stage at which either the product or the components of a product are processed e.g. brick, cement, metals, glass, etc. or the reclamation of materials such as PFA (See Table 2 in *Mat 2 and 3 Checklist* for further details).
16. Appendices I and II of the CITES list illustrate species of timber that are protected outright. Appendix III of the CITES list illustrates species that are protected in at least one country. If a timber species used in the development is on Appendix III it can be included as part of the assessment as long as the timber is not obtained from the country/s seeking to protect this species.

### *Flats*

17. Include materials used in communal areas, e.g. stairwells and foyers.

### *Refurbishment*

18. In the case of a refurbishment, the materials assessed will only be the new and re-used materials (re-used as defined in *Guidance Note 12* above). As with 'new build' the materials considered are only those listed in *Guidance Note 2*. 80% of these new and re-used materials must comply with the criteria as outlined above.

### *Ecohomes Documentation Requirement*

Specific documentation required at this stage:

19. For materials certified through the EMS route, any one of the following must be provided as appropriate:
  - a. If suppliers are unknown, a letter of intent to use suppliers who can provide an EMS certificate (or equivalent) for the process and/or extraction stages of their product (see *Mat 2 and 3 Checklist*, Table 2 for process/ extraction definition).
  - b. ISO 14001 certificate OR signed and dated letter from manufacturer to the developer outlining the following ISO 14001 accreditation information: name of the certifying body, certificate approval date, certificate expiry date, certificate approval number.
  - c. EMAS certificate OR signed and dated letter from manufacturer to the developer outlining the following EMAS accreditation information: name of the certifying body, certificate approval date, certificate expiry date, certificate approval number.
  - d. For SME's (generally companies of less than 30 staff) confirmation that the company EMS is structured in compliance with BS8555 2003 (or equivalent) and the EMS has completed phase audits one to four as outlined in BS8555. This evidence can be found from company documentation demonstrating the process and typical outputs from phase four audits such as an EMS manual/paperwork and guidance to staff. Where independent certification is obtained to demonstrate these phases, the certificates can be used as evidence.
20. For materials certified through the timber certification scheme route the following must be provided as appropriate:

- 
- a. A letter of intent from the timber supplier/s confirming that they can supply the required timber elements and quantities of certified timber (where not supplied/ ordered yet).
  - b. Purchase order forms from the supplier/s (if the timber has been ordered) showing Chain of Custody (CoC) numbers for all timber elements gaining the credit/s.
  - c. A copy of the Chain of Custody (CoC) certificate/s (if the timber has already been supplied).
21. Where any non certified timber is used, written confirmation from the supplier/s or developers (where a timber supplier has yet not been appointed and no certified timber is being supplied) confirming that:
- a. All timber comes from a legal source.
  - b. All timber species and sources used in the development are not listed on any of the CITES appendices for endangered or threatened species (Appendix I, II, or III). The following statement must be provided, signed by the timber supplier/s and included in the assessment report:
 

“I confirm that none of the timber species used within this development are identified on the CITES list (Appendices I, II and III)” OR

“I confirm that none of the timber species used within this development are identified on the CITES list (Appendices I and II) and where a timber species used in the development is listed in Appendix III of the CITES list, I confirm that it has not been or will not be sourced from the country seeking to protect this species as listed in Appendix III”

Timber species compliance can be established by searching, using the common or scientific name of the tree species, on the CITES website ([www.cites.org/eng/resources/species.html](http://www.cites.org/eng/resources/species.html)). See *Background* for further information on CITES.

22. Reused timber.

Documentation should be kept that demonstrates that the timber within the development is reused. This can be in the form of trade information, a letter from the supplier or a letter from the developer.

### *Special Cases*

23. If an element being considered is made up primarily of a material not specified in this credit (e.g. straw bales), contact BRE for guidance on how to proceed.

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## Supplementary Guidance

### *A: Calculation Methodology – An example*

1. Consider an element, for example the roof.
2. Take away all those materials that are not to be included for the case of this assessment, for example the insulation.
3. Take away all those materials which form less than 10% of the element, for example steel screws.

4. Select the materials making up the largest contribution by volume. In this case timber and tiles (these materials must make up at least 80% of the total remaining materials i.e. after taking away the insulation in step 2 above).
5. Calculate the volume of these materials. For example timber 5 m<sup>3</sup> and tiles 3 m<sup>3</sup>.
6. Calculate the percentage of each material which complies with Tiers 1-4. For example timber 62% and tiles 38% (An explanation of what is required for each of these tiers is detailed in *Mat 2 and 3 Checklist* and the *Guidance Notes* above).
7. The number of credits achieved is based on the percentage of compliant material in each element, and the overall percentage of compliant elements.

Example of tiers and percentages within the roof element:

Element	Main material/s	Tier/measure	% proportion of element	Points
Roof	Timber and Tiles	Tier 2 certification scheme and Tier 3 EMS	62 and 38 %	1.81 points

The roof in this case will hence contribute with 1.81 points towards the credit. Another 4.19 points will be required from other elements in order to score 2 credits (6-1.81 = 4.19).

### B: Calculation of Volumes

Most of the information on areas, lengths and volumes of materials will be available from the component manufacturers or estimator, both of whom will have a detailed breakdown of quantities of materials.

For example, in order to calculate the volume of wood in timber frame windows, the total length of frame must be obtained. This can then be converted to a volume by multiplying the length of frame on fixed windows by 0.00653 and the length of frame on opening windows by 0.01089.

In order to calculate the volume of timber in composite timber doors such as a flush door, calculate the total area of all doors summed over the whole building and multiply this by 0.02187, (this factor gives the total volume of timber in the doors and frames).

### C: Documentation

1. *Mat 2 and 3 Checklist* is a checklist of information that is required to demonstrate compliance and this is provided to assist assessors. Relevant information will include the documentation outlined above however exact documentation may vary depending on the stage of assessment.
2. If an element or material is omitted from the information supplied, it must be assumed it does not comply.
3. All appropriate documentation must be collected for the credits to be awarded.
4. Evidence supplied must be consistent where there is more than one potential supplier for an element.
5. If the purchase invoice is supplied as evidence for the timber credits but does not give a CoC number, the assessor must ask the supplier to provide the CoC number/relevant information prior to awarding the credit/s.

6. If the CoC number is supplied the assessor can verify this through the website of the applicable scheme.
7. It is the responsibility for the third party certification schemes to provide all necessary documentation and assistance to their clients.
8. A Government licence e.g. UK Forestry Commission felling licence certificates, does not comply as a third party timber certification scheme for this credit but can be used as evidence of legally sourced timber.
9. As part of a Post Construction Review (PCR) documentation must be kept that demonstrates responsible sourcing of materials through independent certification in accordance with the principles and criteria of a particular scheme. The assessor must include a note to the developer in the assessment report outlining that proof of the source of supply will be held by the developer or their agent for five years, as BRE may audit this as part of the quality assurance system. BRE reserves the right to request to see this documentation. Exact documentation requirements may vary for each assessment depending on the information available to the assessor but the documentation must demonstrate the timber is certified as claimed.
10. The documentation provided as part of a Post Construction Review (PCR) must demonstrate that the commitment made at the design stage has been implemented. In all cases the assessor must confirm ALL the compliance requirements have been achieved.

#### *D: Legally Sourced Timber – Ecohomes Definition*

For timber to be defined as legally sourced, harvesting and all relevant activities should be carried out in line with relevant forest management laws and codes of practice in the product's country of origin and throughout its subsequent supply chain. Relevant documentation demonstrating the above should either be provided or made available on request subject to the availability of such materials in the country concerned.

Examples of country dependent documentation include:

- Bill of landing (export – import of goods), and
- Rights and permits, payment of taxes and dues, and
- Relevant transportation certificate indicating law compliance
- Certificate of origin
- Contracts of sale (legally owned and traded goods)
- UK FC documents for legal harvesting & sale
- Certification from any of the schemes identified in tiers 1, 2 and 4 for this credit

A standard definition of legal timber is currently being developed within the Forest Law Enforcement, Governance and Trade (FLEGT) Action plans. Therefore future requirements regarding legality will follow these international developments.

#### *D: CITES- Convention on International Trade in Endangered Species of wild fauna and flora*

Extract taken from the CITES website:

"CITES works by subjecting international trade in specimens of selected species to certain controls. All import, export, re-export and introduction from the sea of species covered by the Convention has to be authorized through a licensing system. Each Party to the Convention must designate one or more Management Authorities in charge of



administering that licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of the species.

The species covered by CITES are listed in three Appendices, according to the degree of protection they need.

Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances.

Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.

Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade.”

#### *F: Certification Schemes (in alphabetical order)*

*Canadian Standard's Association (CSA)*  
[www.csa-international.org/](http://www.csa-international.org/)

*Forest Stewardship Council Certification Scheme (FSC)*  
[www.fsc-uk.info](http://www.fsc-uk.info)

*Malaysian Timber Certification Council (MTCC)*  
[www.mtcc.com.my](http://www.mtcc.com.my)

*Programme for the Endorsement of Forestry Certification (PEFC), formerly the Pan European Forest Certification scheme*  
[www.pefc.org](http://www.pefc.org)

*Sustainable Forestry Initiative (SFI)*  
[www.aboutsf.org](http://www.aboutsf.org)

*SGS timber tracking programme*  
[www.sgs.com](http://www.sgs.com)

*Tropical Forest Trust (TFT)*  
[www.tropicalforesttrust.com](http://www.tropicalforesttrust.com)

*Verified*  
[www.timbmet.com/html/certifiedverifiedtimbers.php](http://www.timbmet.com/html/certifiedverifiedtimbers.php)

*EU Eco-Management and Audit Scheme (EMAS)*  
[www.emas.org.uk/aboutemas/mainframe.htm](http://www.emas.org.uk/aboutemas/mainframe.htm)  
[http://europa.eu.int/comm/environment/emas/index\\_en.htm](http://europa.eu.int/comm/environment/emas/index_en.htm)

*International Standards for Organisation (ISO)*  
[www.iso.org/iso/en/ISOOnline.frontpage](http://www.iso.org/iso/en/ISOOnline.frontpage)

#### *F: Verification of Chain Of Custody Numbers*

Chain of Custody numbers should be verified as accurate/authentic. If copies of certificates are not supplied. The number provided should be verified as accurate The certifying body website should be able to provide this information. If not, a general search on the www should aid in determining the accuracy of the CoC number.

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## Further information

*FERN - European NGO campaigning for forests*  
[www.fern.org](http://www.fern.org)

*ProForest*  
[www.ProForest.net](http://www.ProForest.net)

*WWF*  
[www.panda.org](http://www.panda.org)

*UK Tropical Forest forum*  
[www.forestforum.org.uk](http://www.forestforum.org.uk)

*Greenpeace Ancient Forest Campaign*  
[www.greenpeace.org.uk](http://www.greenpeace.org.uk)

*Forests Forever Campaign*  
[www.forestsforever.org.uk](http://www.forestsforever.org.uk)

*UK Woodland Assurance Scheme*  
[www.forestry.gov.uk/ukwas](http://www.forestry.gov.uk/ukwas)

*Wood for Good*  
[www.woodforgood.com](http://www.woodforgood.com)

*Tropical Forest Trust publication 'Good Wood, Good Business'*  
[www.tropicalforesttrust.com](http://www.tropicalforesttrust.com)

*Friends of the Earth/ Flora and Fauna International Good Wood Guide (2002)*  
[www.goodwoodguide.com](http://www.goodwoodguide.com)

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## Background

Credits are awarded for responsible sourcing of timber i.e. through auditable third party certification schemes. Ecohomes/ BREEAM currently recognises a number of certification schemes, based on the UK Government's CPET (Central Point of Expertise on Timber) study.

Responsibly sourced timber products are arguably the most renewable and low impact construction material in common use. Forests provide a carbon sink and growing trees absorb carbon. Forests can also provide the habitat for a wide variety of plant and animal life, and give amenity value to society. Increasingly, emphasis is being placed on ensuring that forests are managed in a responsible way. The independent certification that timber and forest products have originated from well-managed forests is an issue that is gaining rapidly in importance for governments, the public and the industries that produce and use them. It is a very complex and dynamic issue that embraces political, economic and social dimensions in addition to environmental aspects such as conservation and sustainability.

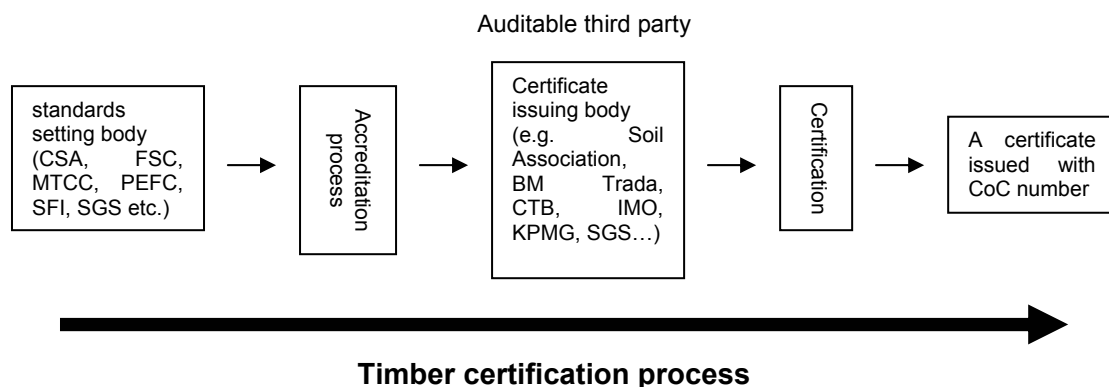
Tiers have been allocated based on the CPET report and BRE work advised by the Ecohomes Timber credits advisory groups. A number of issues were considered when allocating certification schemes to tiers. The process took account of issues such as sustainable forest management practices, consultation process with local community by forest management company/owner at the forest management level, and Chain of Custody procedures.

Currently many construction materials do not have a third party CoC certification scheme to demonstrate compliance, Ecohomes/ BREEAM recognises that an EMS at the extraction and initial process stage of a material goes some way towards demonstrating responsible sourcing and is therefore recognised as such in this credit. In future, compliant certification schemes may be developed to cover other materials. BRE should be contacted for guidance if any are claimed so that these can be evaluated prior to awarding the credits.

#### *Chain of Custody - definition*

This is a process used to maintain and document the chronological history of the evidence/path for products from forests to consumers. Wood must be tracked from the certified forest to the finished product. All the steps, from transporting wood from the forest to a sawmill until it reaches the customer must maintain adequate inventory control systems that allow for separation and identification of the certified product. Chain-of-custody certification ensures that a facility has procedures in place to track wood from certified forests and avoid confusing it with non certified wood. Chain-of-custody is established and audited according to relevant forest certification systems rules.

Third party certification process:



## References

Department for Environment, Food and Rural Affairs. *The Environment in Your Pocket* (2001)

Building Research Establishment Ltd. *Certification of Forest Products* (1999)

Friends of the Earth. Briefing Sheet – *The UK's Footprint: The UK Timber Industry and its Impact on the Worlds Forest* (2000)

Saving the Wood, Building for a Future (Autumn 2001)

FERN - European NGO campaigning for forests - [www.fern.org](http://www.fern.org)

ProForest - [www.ProForest.net](http://www.ProForest.net)

WWF - [www.panda.org](http://www.panda.org)

UK Tropical Forest forum - [www.forestforum.org.uk](http://www.forestforum.org.uk)

Greenpeace Ancient Forest Campaign - [www.greenpeace.org.uk](http://www.greenpeace.org.uk)

Forests Forever Campaign - [www.forestsfuture.org.uk](http://www.forestsfuture.org.uk)

UK Woodland Assurance Scheme - [www.forestry.gov.uk/ukwas](http://www.forestry.gov.uk/ukwas)

Wood for Good - [www.woodforgood.com](http://www.woodforgood.com)

Tropical Forest Trust publication 'Good Wood, Good Business'  
[www.tropicalforesttrust.com](http://www.tropicalforesttrust.com)

Friends of the Earth/ Flora and Fauna International Good Wood Guide (2002)  
[www.goodwoodguide.com](http://www.goodwoodguide.com)

Convention on International Trade in Endangered Species of Wild Flora and Fauna  
(CITES)  
[www.cites.org](http://www.cites.org)

EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan  
[http://europa.eu.int/comm/development/body/theme/forest/initiative/index\\_en.htm](http://europa.eu.int/comm/development/body/theme/forest/initiative/index_en.htm)

## Mat 3 Responsible sourcing of Materials: Finishing Elements

**Credits available: 3**

### Aim

To recognise and encourage the specification of responsibly sourced materials for secondary building and finishing elements.

### Credit Requirements

All dwellings in the development must meet one of the following criteria.

Credits	
1-3	Where materials used in secondary building and finishing elements are responsibly sourced.

### Applicability

This credit covers all new materials used in the finishing elements as described in the Guidance.

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development must meet the requirements.

### Main Information to be Provided by the Developer

Specifications must state details sufficient to meet the Credit Requirements and the Guidance below.

Documentation from the supplier/s/ manufacturer/s and or developer sufficient to meet the Credit Requirements and the Guidance below (see *Ecohomes Documentation Requirements*).

The volumes (m<sup>3</sup>) of materials used for all secondary building and finishing elements listed below.

### Guidance

1. The majority of materials in the following secondary building and finishing elements must be responsibly sourced.
  1. stair (including handrails, balustrades, banisters, other guarding/rails (excluding staircase))
  2. window (including sub-frames, frames, boards, sills)
  3. external & internal door: (including sub-frames, frames, linings, door)
  4. skirting (including architrave, skirting board & rails)
  5. panelling (including any other trim)
  6. furniture (including fitted; kitchen, bedroom and bathroom)
  7. fascias (soffit boards, bargeboards, gutter boards, others)
  8. any other significant use.

2. All other Guidance notes and conditions are as *Credit Mat 2*. The only difference is the credit scale below (*Guidance Note 3 and 4*).
3. The following scale is used to award credits (provided all elements are present in the development):
- |            |                   |
|------------|-------------------|
| ≥18 points | 3 credits awarded |
| ≥12 points | 2 credits awarded |
| ≥ 6 points | 1 credit awarded  |
4. Where an element is not present in a project (e.g. there is not stair), the points for this/these element/s will be redistributed to reward only the elements being assessed. Table 1 below outlines the point/ credits distribution according to the number of elements being assessed

**Table 1: Credit Structure**

	Credits available		
	3	2	1
No. of elements present	Points range		
8	≥18	≥12	≥6
7	≥15.75	≥10.25	≥5.25
6	≥13.5	≥9	≥4.5
5	≥11.25	≥7.5	≥3.75

A minimum of 5 elements is assumed to be present.

### Special Cases

There are currently none for this issue.

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### Supplementary Guidance

Refer to Credit Mat 2.

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### Further Information

Refer to Credit Mat 2.

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### Background

Refer to Credit Mat 2.

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### References

Refer to Credit Mat 2.

## Mat 4 Recycling Facilities

**Credits available: 6**

### Aim

To encourage developers to provide homeowners with the opportunity and facilities to recycle household waste.

### Credit Requirements

All dwellings in the development must meet the following criteria for the storage of recyclable household waste.

Credits	
2	<p>Providing one of the following recycling facilities.</p> <ul style="list-style-type: none"> <li>• Three internal storage bins with:                             <ul style="list-style-type: none"> <li>- minimum total capacity of 60 litres</li> <li>- no individual bin smaller than 15 litres</li> <li>- all bins in a dedicated position.</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Three external bins with:                             <ul style="list-style-type: none"> <li>- minimum total capacity of 180 litres*</li> <li>- no individual bin smaller than 40 litres</li> <li>- all bins in a dedicated position (within 2m of an external door).</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• A local authority collection scheme for recyclable material*.</li> </ul>
6	<p>Provide full recycling facilities of:</p> <ul style="list-style-type: none"> <li>• Three internal storage bins with:                             <ul style="list-style-type: none"> <li>- minimum total capacity of 30 litres</li> <li>- no individual bin smaller than 7 litres</li> <li>- all bins in a dedicated position.</li> </ul> </li> </ul> <p>AND EITHER</p> <ul style="list-style-type: none"> <li>• Three external bins with:                             <ul style="list-style-type: none"> <li>- minimum total capacity of 180 litres*</li> <li>- no individual bin smaller than 40 litres</li> <li>- all bins in a dedicated position (within 10m of the external door).</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• A local authority collection scheme for recyclable material*.</li> </ul>

\* Special requirements apply for block of flats. See Guidance for flats.

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## Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements.

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## Main information to be Provided by the Developer

1. Specifications must state the recycling bin location(s), and details sufficient to meet the Credit Requirements and the Guidance below.
2. The appropriate drawings should show the recycling bin location(s) and details sufficient to meet the Credit Requirements and the Guidance below.

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## Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, dwelling and site plans or similar, where the location and layout is shown and sizes are stated.
2. Three bins for recyclable materials should be provided in addition to the normal waste bins, both externally and internally to award all credits.
3. All recycling bins should be specifically designed for this purpose and labelled for recycling.
4. The internal recycling bins should be located in a dedicated non obstructive position, ideally in the cupboard under the sink or any other cupboard in the kitchen, next to the non-recyclable waste bin. The bins should be easy to access and be assumed to be used on a daily basis. Where a kitchen cupboard location is not possible, the bins can be located near to the kitchen, in a utility room or connected garage. If a bin or storage container for recyclable paper is provided, this could be in any location in the home provided it is a dedicated, practical and non obstructive space. Any bins not provided inside a cupboard must be covered. Note that stand-alone free standing recycling bins placed directly on the floor will not be accepted under Ecohomes.
5. Hard standing (or equivalent) should be provided for the external bins. All external bins must be covered.
6. If there is an appropriate local authority kerbside collection scheme for at least three types of recyclable waste, which will operate on the site, appropriate credits will be given. The bin sizes quoted in the Credit Requirements do not apply if the local authority supplies dedicated recycling bins.
7. Where a local authority collects at least three types of recyclable waste in a single bin or sack, (i.e. for post collection sorting) it is necessary to provide only one internal bin in order to gain the credits. In this case the single bin must have the same overall capacity as if three separate bins were provided, i.e.30 litres, in order to achieve six credits. Note that the internal bin itself can not be replaced by an external bin provided by the Local Authority.
8. Credits can be awarded for developments in areas not yet covered by the local authority recyclable waste collection scheme where a written statement from the local authority can be provided stating when the collection will commence (this date should be within one year of the completion date).

## Flats

9. Internal storage within the dwelling must meet the standard requirements.



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10. Where communal external bins are supplied, they should be large enough to cater for all dwellings allocated to the bins, and suitable for the collection/emptying service envisaged.
- The bin sizes will depend on the frequency of collection. The total capacity of the external storage may be less than the total capacity based on the individual dwelling requirements in the credit table.
  - There must be a written agreement for the local authority or other company to maintain and empty the bins on a regular basis.
  - An example of compliance would be a weekly collection service, where the storage capacity is at least 6 litres per bin per flat (in the case of no internal storage), and 3 litres per bin per flat (where internal storage is provided).
11. If internal bins are available, the distance to the external bins can be up to 50m from the front door of the block of flats (In the case of several blocks on a larger site, 80% of the blocks need to be within the required distance.). If for strategic reasons outside the developers control the bins cannot be located within 50m, exceptions to the rule may be allowed. Full details must be provided and BRE consulted prior to awarding credits.
12. Where only external bins are supplied, they can be up to 10m from the front door of the block of flats.

### *Refurbishment*

13. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

*WRAP – The Waste and Resource Action Plan*  
[www.wrap.org.uk](http://www.wrap.org.uk)

*Recycle now*  
[www.recyclenow.com](http://www.recyclenow.com)

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## **Background**

Domestic waste is a significant contributor to landfill sites. As the provision for waste disposal becomes scarcer, then the cost will continue to increase. Much domestic waste can be recycled, and some of it can be reduced significantly.

In England and Wales, the amount of household waste increased by around 15% in total and by 12% per person, between 1996/97 and 2002/03. During 2002/03, over 26 million tonnes (an average of around 500kg per person) was collected by local authorities. Just over 14% of this waste is recycled or composted. Most recycling comes from 'bring' sites such as bottle banks and, increasingly, from kerbside collections.

A target to recycle or compost 25% of household waste by 2005 was set in the UK's Waste Strategy 2000.

## References

Office of the Deputy Prime Minister. *Buildings Regulations Approved Document H – Drainage and waste disposal* (2001)

[www.safety.odpm.gov.uk/bregs/brads.htm](http://www.safety.odpm.gov.uk/bregs/brads.htm)

Defra. *The environment in your pocket 2004*. e-digest of Environmental Statistics:

[www.defra.gov.uk/environment/statistics/index.htm](http://www.defra.gov.uk/environment/statistics/index.htm)

WRAP – The waste Resource Action Plan

[www.wrap.org.uk](http://www.wrap.org.uk)

## Wat 1 Internal Potable Water Use

**Credits available: 5**

### Aim

To reduce consumption of potable water in the home.

### Credit Requirements

Credits are awarded on the basis of average water consumption in accordance with the following criteria.

Credits	Water consumption (m <sup>3</sup> /bedspace/year)
1	<52
2	≤ 47
3	≤ 42
4	≤ 37
5	≤ 32

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development should be included in the calculation of the average water consumption.

### Main Information to be Provided by the Developer

1. Specifications must state details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the location of water consuming items and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, plumbing or similar, where the location and type of fittings are stated.
2. Calculate the water consumption for each house type using the water calculation tables in *Supplementary Guidance A: Calculation of the Internal Potable Water Consumption*.
3. Calculate the average water consumption for the whole development according to *Supplementary Guidance B: Calculation the average water consumption for the whole development*.
4. Where a type of fitting is not specified by the developer, assume current building regulations or 'typical practice', e.g. regular taps, high flow shower and bath, 60 litres washing machine and no dishwasher. If the volume of the WCs is not specified, assume 6 litres for new build, and 9 litres for refurbishment.

5. In the case of both a shower and bath installed, use the given approximate number of uses per day, i.e. 0.7 and 0.3. Otherwise, assume one usage per day of **either** shower or bath, i.e. if **no** shower, assume 1 use of bath per day and vice versa. A wall-mounted shower above a bath or a bath/ basin mounted hand held shower will classify as a shower under Ecohomes.
6. Make sure that the specified shower flow rates are the flow rates at the water pressure applicable to the home. If no additional pumps are specified this is normally 0.3MPa (at 37° C).
7. A standard bath is considered to fall within the following dimensions:
  - Length (external) 1500mm – 1700mm
  - Width (external) 650mm – 800mm
  - Height (external) 450mm – 580mm

Baths with dimensions greater than those provided above should be considered as large baths. Baths with dimensions lower than those provided above should be considered as small baths.

8. Note that the use of washing machines must always be assumed, even where the developer is not providing them. Assume typical practice unless best practice machines are to be supplied (The provision of information about the EU EcoLabelled scheme of white goods - as defined under Ene 4 - does not exempt from this requirement).
9. If communal washing machines have been provided these should be included in the calculations as if used within the homes i.e. 0.3 uses per day per bed space. Note however that the water consumption figures may be different for these machines. The actual figure can be inserted into the water calculation table/ tool.
10. If the space and plumbing is provided for dishwashers, typical practice dishwashers can be assumed. Note that the space on top of a work surface would not qualify.
11. If washing machines and dishwashers are to be provided and the exact water usage is known, these figures can be used (manufacturer information/ copy of the label needs to be provided to the assessor).
12. Large water-using features (e.g. pools, hot tubs, etc), fed by mains water, gain no credits (this rule applies whether the feature is internal or external to the dwelling). Credits can only be awarded if such features use 100% rainwater or 100% recycled water.
13. If water recycling is used, deduct the volume of water collected from where it is to be used (See Table 2, *Supplementary Guidance A: Calculations of the Internal Water Consumption*). Grey-water recycling systems normally collect shower, bath and tap water and recycle this for toilet flushing. Rainwater recycling systems use collected rainwater for toilet flushing, washing machines, etc.
14. If exact figures for the collection of grey water or rainwater (for internal use) can be provided these can be used instead of the estimated calculation method in Table 2 (*Supplementary Guidance A: Calculations of the Internal Potable Water Consumption*).
15. Rainwater collector systems for watering gardens and landscaped areas are dealt with in credit Wat 2 – External Potable Water Use.
16. Water extracted locally from a borehole should be counted in the same way as potable water extracted from the mains. The credit seeks to reduce total water abstraction from whatever source through the use of water efficient fittings,

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appliances and recycling systems. In addition, borehole well water use does not reduce the burden on drainage and treatment systems.

### *Flats*

17. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

18. New regulations state that all new properties should be fitted with WCs with a flush capacity of not more than 6 litres per use. However, in the case of refurbishment projects, existing fittings with a greater capacity may still be in use.

19. Any water-consuming appliances within the home will be assessed, whether it is an existing or newly installed appliance.

20. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

### *A: Calculation of the Internal Potable Water Consumption*

Calculate the water consumption for each different dwelling type (i.e. those dwellings with different **types** (not numbers) of appliances) in accordance to the tables and guidance below.

Table 1: Calculation of internal potable water use

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Installation type	Installation item	Litres/use	Proportion in dwelling max=1	No days /year used	No of uses/ day per bed-space	litres water used /bed-space/year	m <sup>3</sup> water used /bed-space/year
WC	9 l flush	9.5		365	6		
	7.5 l flush	8			6		
	6 l flush	6.5			6		
	6/4 l dual flush	4.5			6		
	4 l flush	4			6		
	4/2 l dual flush	3			6		
	0 l flush	0			6		
Wash hand basin	Regular taps	1		365	12		
	Taps with flow regulators	0.5			12		
	Auto shut off	0.5			12		
	Aerating taps	0.5			12		
Shower*	>15 l/min	112.5		365	0.7		
	12 < flow rate ≤ 15	67.5			0.7		
	9 < flow rate ≤ 12	52.5			0.7		
	6 < flow rate ≤ 9	37.5			0.7		
	4.5 < flow rate ≤ 6	26.5			0.7		
	Flow rate ≤ 4.5	22.5			0.7		
Bath*	Large	100		365	0.3		
	Standard	80			0.3		
	Small	60			0.3		
Kitchen sink	Typical use no dish washer	17		365	1		
	Typical use with dish washer	12			1		
Washing machine	Typical practice	60		365	0.3		
	Best practice	40			0.3		
Dish washer	Typical practice	25		365	0.25		
	Best Practice	12			0.25		
<b>Total internal use</b>							

\* In the case of both a shower and bath installed, use the given approximate number of uses per day, i.e. 0.7 and 0.3, otherwise assume **one** usage per day of **either** shower or bath.

### Table 1 Notes

The water calculation table above is divided into 8 different columns [1] – [8].

In all cases, the following formula applies:

$$[3] \times [4] \times [5] \times [6] = [7] \div 1000 = [8]$$

Column [1] details the type of installation, column [2] lists relevant details, and column [3] lists how much water that type of fitting uses.

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Column [4] refers to the proportion of the fittings throughout the dwelling. For instance, if only one type of toilet is installed, the proportion of the fitting throughout the house should be 1 (or 100%). If two different types of toilet are fitted in a property that has a total of two WCs, the proportion for each type of toilet would be 0.5 (representing 50% each).

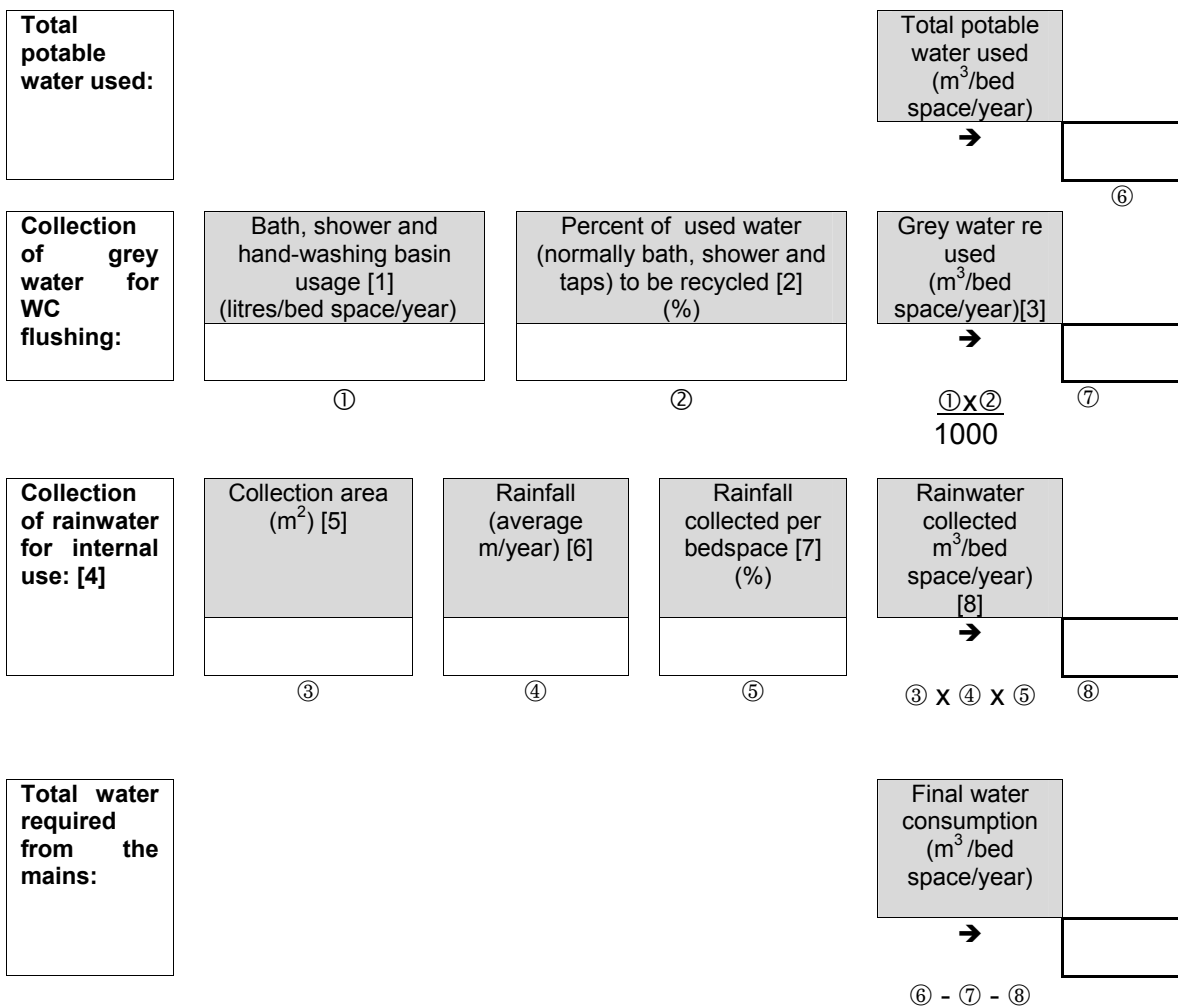
Column [5] will tell you how many days a year that type of fitting is used, and column [6] how many times that fitting is used per day and bed space. (The term bed space represents the number of occupants the dwelling is designed to accommodate. For example, a three bedroom house with one double bedroom, one twin bedroom and a single bedroom has 5 bed spaces. Note: For the sake of the Ecohomes water calculation it is not necessary to know how many persons/ occupants are going to live in a dwelling. The number of bed spaces is purely a theoretical measurement that provides a useful unit to compare potential consumption.)

By multiplying the 'litres/use', the 'proportion in house', the 'number of days/year used' and 'number of uses/day/bed space', the total water usage in 'litres/bed space/year' can be calculated (i.e. column 3 x 4 x 5 x 6 = 7).

By dividing column [7] by 1000, the total water use in m<sup>3</sup> can be calculated (column [8]).

The final measured unit - m<sup>3</sup> water used/bed space/year - represents a measure how much water would typically be used per occupant per year within the specified dwelling given the flow rates of water consuming devices specified.

**Table 2: Calculation of total potable water needed from the mains, for internal use, taking into account any grey or rain water recycling**



**Table 2 Notes**

[1] Include only usage of these fittings from which water will be recycled. If other sources please amend as appropriate.

[2] The manufacturer/ designer of the grey water recycling system should be able to provide this figure.

[3] Note that if grey water is only used for flushing the WC the amount of water deducted for re-use cannot be greater than the amount of water estimated to be needed for flushing the WC (See first row of table 1).

[4] Only rainwater recycling systems providing water for internal use are dealt with here. Rainwater collection for watering the garden is covered in Wat 2 – External Potable Water Use.

[5] Rainwater collection area is the area the rainwater is collected from, i.e. if for example the water is collected from the roof, the area = the roof area.

[6] For the average rainfall in the UK see map in *Supplementary Guidance C*.

[7] If no exact figures for the collection of rainwater can be provided, assume 60% of the rainwater is collected for re-use. The following formula should be used to determine the percentage rainwater collected per bed space.



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% of rainwater collected per bed space =  
percentage collection (60%) / total number of bed spaces

[8] Note that the volume of water deducted for re-use cannot be greater than the volume estimated to be needed by those appliances where the rainwater is going to be re-used (Normally for flushing the WC but possibly also the washing machine).

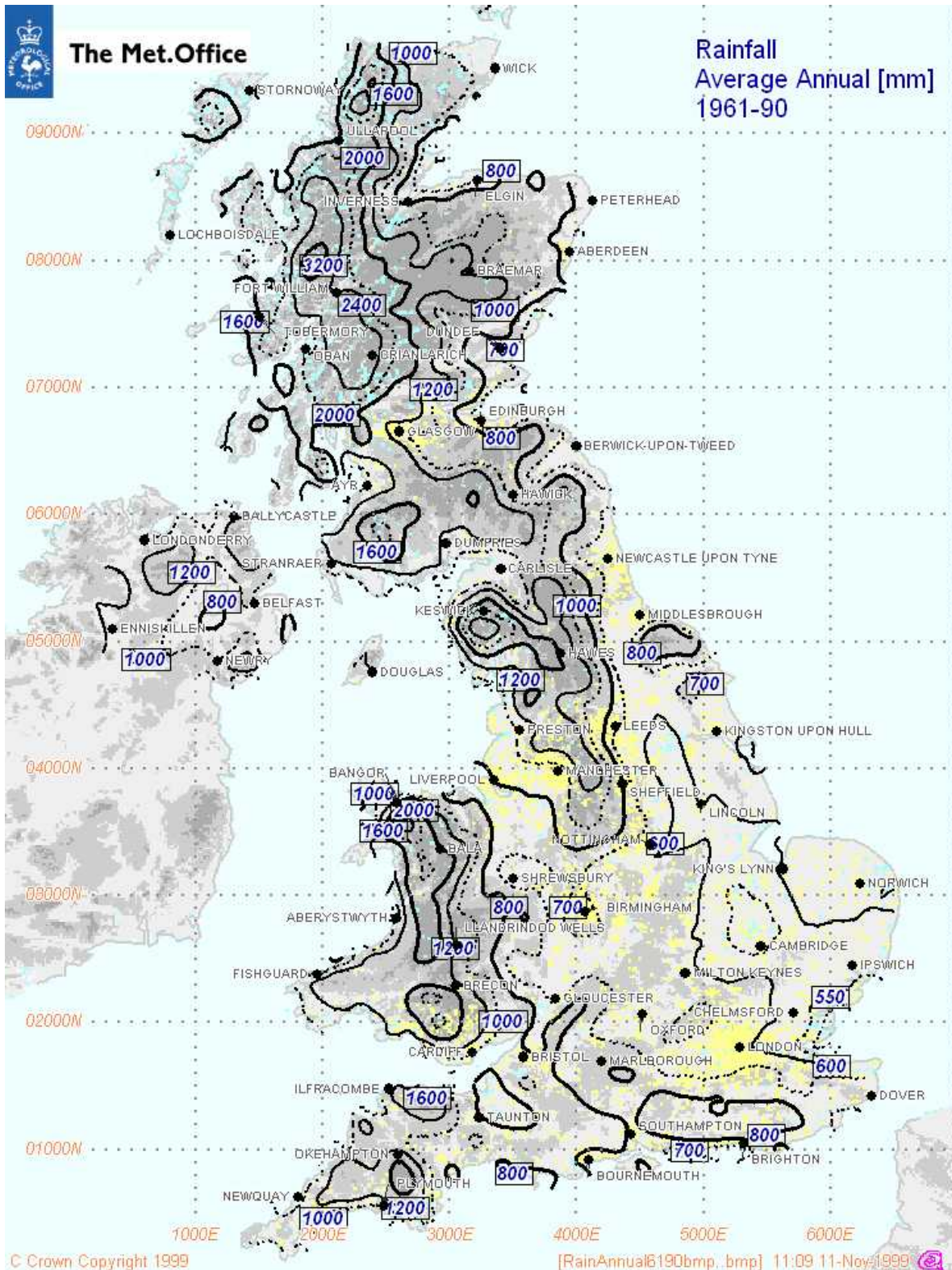
*B: Calculation of the average potable water consumption for the whole development*

The final water consumption figure, on which credits are awarded, is the average water consumption of the whole site.

$$\text{Ave. water consump.} = \frac{\sum_{1}^{n} [(\text{Final water consumption dwelling type } N) \times (\text{No. of dwellings type } N)]}{\text{Total number of dwellings}}$$

C: Mean Annual Rainfall in the UK

Source: Met Office, 2002, Map of average annual rainfall 1961-1990



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## Further Information

*UK Building Regulations*

[www.safety.odpm.gov.uk/bregs/brads.htm](http://www.safety.odpm.gov.uk/bregs/brads.htm)

*UK water companies*

[www.water.org.uk](http://www.water.org.uk)

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## Background

Water is becoming an increasingly scarce resource as demand continues to increase dramatically. There are many actions that can be taken to minimise water consumption and all should be considered. Water consumption figures will be predicted based on the types of WCs, showers, taps and white goods installed in the properties being assessed. Use of grey-water systems and garden watering shall be looked at as typical usage factors to be included in the calculations.

Sanitary use of water within a dwelling is significant and a number of steps can be taken to minimise consumption. This credit allows for the use of low-water-use WCs, showers, taps and appliances, as well as wastewater recycling and rainwater harvesting.

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## References

CIRIA. C522, *Sustainable Urban Drainage Systems – design manual for England and Wales*, (2000)

Environment Agency National Water Demand Management Centre. *Conserving Water in Buildings* (2001)

Office of the Deputy Prime Minister, *Buildings Regulations Approved Document H – Drainage and waste disposal*, (2002)

Water Regulations Advisory Scheme. Information and Guidance Note 09-02-04. *Reclaimed Water Systems. Information about Installing, Modifying or Maintaining Reclaimed Water Systems* (1999)

Office of the Deputy Prime Minister, *Housing Quality Indicators Form (version 2)*, ([www.odpm.gov.uk/housingqualityindicators](http://www.odpm.gov.uk/housingqualityindicators))

Environment Agency, *Conserving Water in Buildings 4: Rainwater reuse*, ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk))

Environment Agency, *Rainwater reuse* ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk))

Market Transformation Programme, *BN DW BATHS: Bath design and efficiency – Briefing Note relating to Policy Scenario Objectives in Policy Brief*

Market Transformation Programme, *BNWAT02: Domestic baths specification and stock model information*

## Wat 2 External Potable Water Use

**Credits available: 1**

### Aim

To encourage the recycling of rainwater, and reduce the amount of water taken from the mains, for use in landscape/garden watering.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	For specifying a system that will collect rain water for use in external irrigation/ watering , e.g. water butts, central rainwater collection systems, etc.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the water collector, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the water collection, location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, site plan or similar, where the location and layout is shown.
2. The specification of the rainwater collector should meet the following criteria:
  - without open access at the top (a lid is allowed)
  - provided with a tap or other suitable arrangement for drawing-off water
  - connected to the rainwater down pipes with automatic overflow into the conventional rainwater drainage system
  - detachable from the rainwater down pipe with a removable top or base for cleaning the interior.
3. Examples of collector systems include:
  - water butts
  - central water collection systems.
4. All individual gardens, terraces and patios and communal outdoor spaces need to have a system.

- 
5. Size requirements for homes with individual gardens, patios and terraces:
    - If only terraces and patios a minimum of 100 litres,
    - If 1-2 bedroom home with private garden a minimum of 150 litres,
    - If 3 + bedroom home with private garden a minimum of 200 litres.
  6. Above volume requirements can be halved if there is no planting provided and the whole of the external space is covered by a hard surface.
  7. Size requirement for communal gardens:

A minimum 1 litre capacity for each square metre of land allocated to the dwelling (either uniquely allocated or shared with neighbouring dwellings), which is either planted (including grass) or left as unplanted soil (up to 30 litres/ home allocated to the area). Above requirements can be halved where planting requiring little water has been specified (as recommended by a Registered Ecological Consultant, see *Eco 1, Guidance note 5*) A minimum of 200 litres needs to be provided (even though no planting or low water planting is provided and all surfaces are hard).
  8. Any internal communal garden will also need to be considered for this credit, such as an atrium with planting, a winter garden or a large conservatory.
  9. If no individual or communal outdoor spaces are specified, the credit will be awarded by default. Note that the credit can also be given by default if the development only provides balconies and there are no communal areas.

### *Flats*

10. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

11. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

*Water UK*  
[www.water.org.uk](http://www.water.org.uk)

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## **Background**

Water is an increasingly scarce resource with an associated increasing degree of financial and environmental cost from the development of new sources. As more and more homes have metered water supplies, householders have to pay for any water they use. Rainwater is a water resource that could be collected to reduce the overall amount of water being discharged into drains and watercourses, thus reducing the risk of localised flooding and reducing overall water bills for householders. The simplest and most cost effective system for rainwater collection is the water butt. More complex communal systems, using the same principles as the water butt, are available for

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apartment blocks that involve central collection for irrigation. Collection of rainwater for use in the dwelling, i.e. for WC flushing, is covered in Credit *Wat 1*.

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**References**

Se Further Information above.

## Eco 1 Ecological Value of Site

**Credits available: 1**

### Aim

To encourage development on land that already has a limited value to wildlife and discourage the development of ecologically valuable sites.

### Credit Requirements

The development must meet the following criteria.

Credits	
1	<p>For developing land of inherently low ecological value and demonstrating this by either:</p> <ul style="list-style-type: none"> <li>• meeting the defined criteria for low ecological value (using the Ecohomes checklist)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• providing an ecological report of the site prepared by a suitably qualified ecologist, which should state that the land being developed:               <ul style="list-style-type: none"> <li>- is of low or insignificant ecological value</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>- will remain undisturbed by the construction works in areas of ecological value.</li> </ul>

### Applicability

The same approach is taken for both new build and refurbishment.

The entire development must meet the requirements.

### Main Information to be Provided by the Developer

Plans of the site AND surrounding area, both before and after the proposed development. These should show natural and built features. The drawings should show details sufficient to meet the *Credit Requirements* and the *Guidance* below.

Where using an appointed ecologist; details of the ecologist's survey/report, with details sufficient to meet the *Credit Requirements* and the *Guidance* below, and membership details of the 'Suitably Qualified Ecologist' (See *Guidance Note 2* below and *Eco 2 - Ecological Enhancement, Supplementary Guidance A: 'Suitably Qualified Ecologist's'* ).

### Guidance

1. The Assessor should verify that the land used for development (the '*Development site*', See *Guidance note 2* below) is of low ecological value by:
  - using the Ecohomes checklist for defining land of Low Ecological Value

OR

- by checking that a comprehensive site report has been provided by a 'Suitably Qualified Ecologist' stating that the land is of low or insignificant ecological value or will remain undisturbed by the construction works in areas of ecological value.
2. The land that should be considered for this credit, the '*Development site*', include any land used for buildings, hard standing, landscaping or for site access, including any other land where construction work is carried out (or land being disturbed in any other way) plus a 3m boundary in either direction around these areas. It also includes any area used for temporary site storage and buildings.
  3. The Ecohomes checklist in *Supplementary Guidance A, Checklist for Land of Low Ecological Value*, is to be used by the assessor to assess if the land is of low ecological value. It is important to check that the *Land Type* definitions are correct.
  4. Where the credit is awarded based on the advice of an ecological consultant, the appointed ecologist must be suitably qualified, as defined in Eco 2: Ecological Enhancement, *Supplementary Guidance A*.
  5. Where an appointed ecologist identifies areas of the site as having ecological value, the ecological consultant is to provide advice/recommendations on avoidance/protection measures for all these areas/features. All features of ecological value need to be clearly marked on the drawings and the client is to provide written commitment to implement all protection measures advised by the ecologist. Where any existing features of ecological value are not protected, or removed as part of site clearance, then this credit cannot be achieved.
  6. The suitably qualified ecologist is to base their findings on data collected from a site visit conducted at appropriate time(s) of the year when different plant and animal species are evident. The contents of the Ecology Report is to be representative of the existing site's ecology immediately prior to the commencement of initial site preparation works. Where the ecologist has made no on-site visit, the credit cannot be awarded on the basis of the ecologist's report.

### *Flats*

7. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

8. If there is no new building or infrastructure (e.g. access roads, carparking or landscaping), the credit will be achieved.

### *Special Cases*

There are currently none for this issue.

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## Supplementary Guidance

### *A: Ecohomes Checklist for Land of Low Ecological Value*

#### Section 1: Ecological features of the site.



<p><b>Instruction:</b> criteria 1.1-1.5 can be used to determine the presence of existing ecological features across the site. If YES is recorded against <b>any</b> question in Section 1 then the site cannot be defined as having <i>land of low ecological value</i> and the credit cannot be awarded. If NO is recorded against <b>all</b> the questions in Section 1 then proceed to Section 2.</p>		
1.1	Does the site contain any trees or hedges above 1m high or with a trunk diameter greater than 100mm?	YES <input type="checkbox"/> NO <input type="checkbox"/>
1.2	Are there any ponds, streams or rivers on, or running through the site?	YES <input type="checkbox"/> NO <input type="checkbox"/>
1.3	Is there any marsh or other wetland present on the site?	YES <input type="checkbox"/> NO <input type="checkbox"/>
1.4	Are there any meadows or species-rich grassland present on the site?	YES <input type="checkbox"/> NO <input type="checkbox"/>
1.5	Is there any heath land such as heather present on site?	YES <input type="checkbox"/> NO <input type="checkbox"/>
<p><b>Section 2: Type of land to be used for the new buildings, hardstanding, landscaping or for site access<sup>1</sup></b></p>		
<p><b>Instruction:</b> in addition to answering NO to all the questions in Section 1, if YES is recorded against one or more of the questions in Section 2, the <i>development site</i> can be defined as having <i>land of low ecological value</i> and the credit can be awarded. (The assessor <b>MUST</b> check that these agree with the site drawings.)</p>		
2.1	Does the <i>development site</i> consist of land which is entirely within the floor plan(s) of existing building(s) or building(s) demolished within the past 2 years?	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.2	Does the <i>development site</i> consist of land which is entirely covered by other constructions such as sporting hard surfaces, car parking or such constructions which have been demolished within the past two years?	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.3	Does the <i>development site</i> consist of land which is contaminated by industrial or other waste to the extent that it would need decontamination before building?	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.4	Does the <i>development site</i> consist of land which is a mixture of either existing building, hard surfaces and/or contaminated land?	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.5	Does 80% of the land within the <i>development site</i> comply with statements 2.1, 2.2 or 2.3 and the remaining 20% of the ground area of the building extend into land which has been either; Used for single-crop arable farming for at least 5 years, OR Consists of regularly cut lawns and sports fields	YES <input type="checkbox"/> NO <input type="checkbox"/>

**Further Information**

British Standard BS5837: 2005 'Trees in relation to Construction'  
www.bsi-global.com

<sup>1</sup> Including any other land where construction work is carried out (or land being disturbed in any way) plus a 3m boundary in either direction around these areas.

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*The Hedgerows Regulations* 1997. London: Office of Public Sector Information (formerly The Stationary Office)

*RSPB Good Practice Guide for Prospective Developments* – Available from the RSPB. [www.rspb.org.uk](http://www.rspb.org.uk)

*Environmental Good Practice on Site* (CIRIA C502) [www.ciria.org.uk](http://www.ciria.org.uk)

*Environmental Good Practice – Working on Site* (CIRIA C503) [www.ciria.org.uk](http://www.ciria.org.uk)

*Working with Wildlife Site Guide* (CIRIA C567) [www.ciria.org.uk](http://www.ciria.org.uk)

*The Environment Agency* [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

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## Background

Wherever possible there is a benefit in development being restricted to land that already has a limited value to wildlife. The ecological value of a site is affected by previous uses and the presence of ecological features such as trees, hedges, watercourses, wetlands, meadows, etc. Both recently derelict and mono-cultural sites are often low in value. Therefore, the reuse of existing sites will help to slow down the destruction of natural habitats and the wildlife they support, as well as preventing loss of land used for agriculture, parkland, etc. Wherever homes are constructed, there is always a risk that however environmentally benign the building or development itself is, it may present a threat to local ecology or areas of natural beauty. The principle here is to minimise the damage to existing local ecology and then, where possible, to enhance it.

Damage can be minimised either by selecting a site of low ecological value or by developing a site in a way that protects the most important ecological attributes. House building need not reduce the ecological value of the site; it may enhance it in many cases. Of course, there will always be some temporary disturbance to the local ecology, but wildlife will return once the construction is complete, provided there is the right habitat available for it to do so.

One attractive option is to build on and revitalise a previously derelict site. Care must be exercised if it has been derelict for some time, because the site may be inhabited by rare, protected or locally important species. The site may, therefore, have high but hidden ecological value.

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## References

Department of the Environment, Transport and the Regions. *Digest of Environmental Statistics*, No 19, Vol 2.

## Eco 2 Ecological Enhancement

**Credits available: 1**

### Aim

To enhance the ecological value of a site.

### Credit Requirements

The development must meet the following criteria.

Credits	
1	Where ecological features have been designed-in for positive enhancement of the site ecology in accordance with advice from a 'suitably qualified ecologist'.

### Applicability

The same approach is taken for both new build and refurbishment.

The entire development must meet the requirements.

### Main Information to be Provided by the Developer

1. A copy of the Ecology Report with details of the full ecological site survey and the planned works by the developer based on that survey, with details sufficient to meet the *Credit Requirements* and the Guidance below.
2. Membership details of the 'Suitably Qualified Ecologist'.

### Guidance

1. To achieve the credit for ecological enhancement:
  - the developer will be asked to confirm that the appointed ecologist is 'suitably qualified', as defined in *Supplementary Guidance A*, below, **AND**
  - the developer will be asked to confirm their commitment to adopt/implement **all** key recommendations and over 30% of additional recommendations made by this ecologist.
  - a copy of the Ecology Report will be required, together with details of all the recommendations.
2. The suitably qualified ecologist is to base their findings on data collected from a site visit(s) conducted at appropriate time(s) of the year when different plant and animal species are evident. The contents of the Ecology Report is to be representative of the existing site's ecology immediately prior to the commencement of initial site preparation works. Where the ecologist has made no on-site visit, the credit cannot be awarded on the basis of the ecologist's report.
3. The developer/client will need to confirm compliance with all current EU and UK legislation relating to protected species and habitats applicable to the development site. However, only those recommendations which relate to **enhancing** the ecology of the development site will be considered for this credit, i.e. legislative measures will not be considered as either a 'key' or 'additional' recommendation.

4. Recommendations may include, apart from the planting of native species, measures such as: horticultural good practice (e.g. no, or low, use of non-residual pesticides); installing bird, bat and/or insect boxes at appropriate locations on site; avoiding clearance/works at key times of the year, e.g. breeding seasons; etc.
5. Only native floral species or those with a known attraction or benefit to local wildlife can be considered for the purpose of enhancing the ecological value of the site.
6. Where no consultation has taken place with a suitably qualified ecologist the credit cannot be awarded.

### *Flats*

7. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

8. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## Supplementary Guidance

### *A: 'Suitably Qualified Ecologist's'*

Where an individual has been appointed to assess and provide advice and recommendations for site ecology under Ecohomes, it must be confirmed that either this individual is 'suitably qualified', or that the report they produce has been verified by an individual who meets the requirements of a 'Suitably Qualified Ecologist'.

1. An individual who meets all of the following requirements is deemed to be a 'Suitably Qualified Ecologist' under BREEAM and Ecohomes:
  - Holds a degree or equivalent qualification (e.g. N/SVQ level 5) in ecology or a related subject.
  - Is a practising ecologist, with a minimum of 3 years relevant experience (within the last 5 years). Such experience must clearly demonstrate a practical understanding of factors affecting ecology in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for ecological protection, enhancement and mitigation measures. Examples of relevant experience are; ecological impact assessments; Phase 1 and 2 habitat surveys and habitat restoration.
  - Is covered by a professional code of conduct and subject to peer-review.
2. Peer review is defined as the process employed by a professional body to demonstrate that potential or current full members maintain a standard of knowledge and experience required to ensure compliance with a code of conduct and professional ethics.
3. **Full members** of the following organisations, who meet the above requirements (Note 1) are deemed *Suitably Qualified Ecologists*:
  - Association of Wildlife Trust Consultancies (AWTC)

- Chartered Institution of Water and Environmental Management (CIWEM)
  - Institute of Ecology and Environmental Management (IEEM)
  - Institute of Environmental Management and Assessment (IEMA)
  - Landscape Institute (LI)
4. As a minimum, a 'Suitably Qualified Ecologist' verifying an Ecology Report must have read and reviewed the report and confirmed in writing they found it to:
- represent sound industry practice
  - report and recommend correctly, truthfully and objectively
  - be appropriate given the local site conditions and scope of works proposed
  - avoids invalid, biased and exaggerated statements.

Additionally, written confirmation from the third party verifier that they comply with the definition of a suitably qualified ecologist will also be required.

The following contact details will be useful in arranging ecological advice. It should be confirmed **before** appointment that the individual meets the criteria for a suitably qualified ecologist.

- **Association of Wildlife Trust Consultancies (AWTC)** – Please contact the current chairman of the Association who will provide details of your local advisor. Contact details can be downloaded from [www.awtc.co.uk/contact.htm](http://www.awtc.co.uk/contact.htm)
- **Chartered Institution of Water and Environmental Management (CIWEM)** - 15 John Street, London, WC1N 2EB. Tel: 020 78313110 Fax: 020 74054967 [admin@ciwem.org](mailto:admin@ciwem.org) [www.ciwem.org](http://www.ciwem.org)
- **The Institute of Ecology and Environmental Management (IEEM)** – 45 Southgate Street, Winchester, Hampshire SO23 9EH. [www.ieem.co.uk](http://www.ieem.co.uk)
- **Institute of Environmental Management and Assessment (IEMA)** – St Nicholas House, 70 Newport, Lincoln, LN1 3DP. Tel 01522 540069. Fax 01522 540090. E-mail [info@iema.net](mailto:info@iema.net)  
 Advisors from the IEMA must have a 'registered' level status on the IEMA register of environmental impact assessors. To obtain details of a suitably qualified member from the register contact IEMA, or visit [www.iema.net](http://www.iema.net).
- **The landscape Institute (LI)** – The Chartered Institute of the UK for Landscape Architects, 33 Great Portland Street, W1W 8QG. [www.li.org.uk](http://www.li.org.uk)

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## Further information

*British Standard BS5837: 2005 'Trees in relation to Construction'*  
[www.bsi-global.com](http://www.bsi-global.com)

*Environmental Good Practice on Site (CIRIA 502)*  
[www.ciria.org.uk](http://www.ciria.org.uk)

*Working with Wildlife Site Guide (CIRIA 502)*  
[www.ciria.org.uk](http://www.ciria.org.uk)

*Working with Wildlife Site Guide (CIRIA C567)*  
[www.ciria.org.uk](http://www.ciria.org.uk)

*The Environment Agency*  
www.environment-agency.gov.uk

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## **Background**

In many cases it is possible to improve the ecological value of the site. However, achieving this requires careful consideration of the existing and neighbouring features as well as careful selection of plant species and habitats. This is an area of specialist expertise and requires input from experts at site master planning and detailed design stages.

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## **References**

There are no references.

## Eco 3 Protection of Ecological Features

**Credits available: 1**

### Aim

To protect existing ecological features from substantial damage during the clearing of the site and the completion of construction works.

### Credit Requirements

The development must meet the following criteria.

Credits	
1	All existing features of ecological value are maintained and adequately protected from damage during site preparation and construction works.

### Applicability

The same approach is taken for both new build and refurbishment.

The entire development must meet the requirements.

### Main Information to be Provided by the Developer

- Specifications must state the protection measure to be undertaken, with details sufficient to meet the *Credit Requirements* and the *Guidance* below.
- The appropriate drawings showing the location and protection measures for all features of ecological value, with details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

- All existing features of ecological value on the site and boundary area are to be adequately protected from damage during clearance, preparation and construction works. The following must be included in the specification and shown on relevant drawings.
  - Trees of over 100 mm trunk diameter, and/or designated to be of significant ecological amenity value, are to be protected by barriers. Barriers must prohibit any works or storage in the area between itself and the tree trunk. Minimum distance between tree trunk and barriers must be either the distance of the branch spread or half the height of the tree, whichever is the greater.  
In all cases trees should be protected from direct impact and from severance or asphyxiation of the roots.
  - Hedges and natural areas requiring protection must either have barriers erected and be protected, or, when remote from site works or storage areas, be protected with a prohibition of construction activity in their vicinity..
  - Watercourses and wetland areas are to be protected by bunds, cut off ditches and site drainage to prevent run-off to the natural watercourse (as this may cause pollution, silting or erosion). Specialist advice should be obtained from the Environment Agency, English Nature or specialist ecological consultants.

2. In all cases, the contractor is required to construct ecological protection prior to any preliminary construction or preparation works commencing in the vicinity (e.g. clearing of the site or erection of temporary site facilities).
3. Protection of **all** existing features of ecological value on site will need to include, but go beyond, current EU and UK legislation relating to protected species and habitats applicable to the development site.
4. If a suitably qualified ecologist has confirmed a feature to be removed or has no significant ecological value and all other features have been adequately protected the credit can be awarded.
5. If the site is defined as being of low or insignificant ecological value (either as defined in Eco 1 – Table 1, or according to a ‘Suitably Qualified Ecologist’) the credit can be awarded by default.
6. A number of guidance documents are available on how to protect ecological features during construction. See *Further Information*.

### *Flats*

7. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

8. There is no specific guidance for refurbishment. The standard approach should be followed.
  - Even for a refurbishment project there is likely to be some disturbance on the site around the building and care needs to be taken not to damage any existing features.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There is currently none for this issue.

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## **Further Information**

The Environment Agency publishes guidance on measures for protecting and preventing ecological features from pollution during construction. The following may be helpful and can be downloaded from the Environment Agency’s website : [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) :

Pollution Prevention Guideline (PPG06): *Working at construction and demolition sites*

Pollution Prevention Guideline (PPG05): *Works in, near, or liable to effect watercourses*

British Standard BS5837: *‘Trees in relation to construction’* BSI (2005) Provides detailed guidance on measures for the protection of trees during the construction process. The standard recommends types of protection and minimum distance for protective fencing around trees and prevention of damage to roots. The standard also lists organisations from which additional advice can be obtained. [www.bsi-global.com](http://www.bsi-global.com)



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*Environmental good practice on site* (CIRIA C502): Guidance on how to avoid causing environmental damage and the financial penalties that can be imposed.

*Environmental good practice – Working on site* (CIRIA C503): Practical advice on how to carry out construction works without harming the environment. [www.ciria.org.uk](http://www.ciria.org.uk)  
*Working with wildlife site guide* (CIRIA C567) 2005: Guidance to understand and implement good practice in relation to wildlife on development and construction projects.

*RSPB Good Practice Guide for Prospective Developments* – available free of charge from the RSPB.

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## Background

On construction sites, there are often existing features such as watercourses, trees, hedges, etc, that should be protected, as they are very vulnerable to direct or indirect damage. Damage can be caused by impacts, fires, pollution, soil compaction, changes in the water table, etc. Steps need to be taken to minimise the risk of such damage.

Although many developers will not intend to cause damage, specific actions need to be taken to ensure the protection of these features and avoid inadvertent damage.

Protecting the ecological features on site from clearing and construction works can have a number of benefits to the existing site ecology and subsequent development. Protection ensures that the local 'wild' areas are sustained and they can subsequently influence the type of landscaping selected following construction. Maintaining native species can also lead to cost savings through reduced maintenance and reduced risk of liabilities under protection of wildlife legislation, as well as increasing and maintaining the aesthetic qualities of a development.

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## References

See *Further Information* above.

## Eco 4 Change of Ecological Value of Site

**Credits available: 4**

### Aim

The aim of this credit is to reward steps taken to minimise reductions in ecological value and to encourage an improvement.

### Credit Requirements

The development must meet the following criteria.

Credits	
1	For a change of ecological value of between –9 and –3 natural species.
2	For a change of ecological value of between –3 and +3 natural species.
3	For a change of ecological value of between +3 and +9 natural species.
4	For a change of ecological value of greater than +9 natural species.

### Applicability

The same approach is taken for both new build and refurbishment.

The whole development must meet the requirements.

### Main Information to be provided by the Developer

1. Plans of the site AND surrounding area, both before the proposed development, and the proposed layout. These should show natural and built features, and any proposed planting schemes.
2. The plans should be marked up according to the landscape and plot categories in the *Guidance* and *Supplementary Guidance*. Lists of areas will need to be calculated for the *Developer Sheets*.

### Guidance

1. The change in the site's ecological value is calculated by comparing the estimated diversity of plant species before and after construction. The estimated ecological value of the site is expressed as an area-weighted average of plant species for the different vegetation plot-types of the site.
2. Details of the appropriate vegetation plot-types and average number of species per vegetation plot-type to be used in the calculations are provided in *Supplementary Guidance B and C*.
3. It is important to ensure the appropriate vegetation plot types for the site and their areas are correctly defined.
4. To calculate the Change of Ecological Value follow the methodology provided in the *Supplementary Guidance A-C*.
5. In table 2 (*Supplementary Guidance B*), 'garden planting (typical)' and 'wildlife garden planting' will always record a score of zero, unless a suitably qualified ecologist has been appointed: whereby they will make the distinction between 'typical' and 'wildlife' garden planting species and record 'actual' species numbers.

6. Where a suitably qualified ecologist (as defined in Eco2: Ecological Enhancement) has been appointed and has been able to identify more specific habitat types and more accurate species numbers per habitat type for the development site, this information can be used to calculate the Change in Ecological Value (refer to *Supplementary Guidance A*). This information (contained within an ecology report) must be based on an ecological site survey conducted at appropriate time(s) of the year when different species are evident and represent existing site ecology immediately prior to the commencement of initial site preparation works. A copy of the Ecologist Report must be provided along with details of habitat types, their areas, and number of species surveyed per habitat type. Where the ecologist has made no on-site visit, the credit cannot be awarded on the basis of the ecologist's report.
7. Where new habitats are to be created or where floral species are to be planted as part of a landscape design, only those species which are native or have a known attraction to local wildlife can be included in the calculations based on the advice and recommendations of a suitably qualified ecologist.
8. Note that the species value figures in Table 2 (*Supplementary Guidance A: Ecological value*) are figures given for an **existing, well established site**. It takes many years before the ecological value of a specific landscape type is established naturally. It is therefore **not** possible to assume that for example a newly developed urban parkland has between 13.8 and 17.6 species just after construction **without** the expert knowledge of a 'Suitably Qualified Ecologist'. However, if the homes are to be built on an existing urban parkland and part of the site is left undisturbed the ecological value of that part of the site can be assumed unchanged.
9. The ecological value of derelict sites is time dependant (*Supplementary Guidance B*, table 2); a linear scale has been used to determine intermediate values between zero ecological value at 1 year from dereliction/demolition to a value at 30 years based on marginal upland figures. This presents a worst case figure which can be amended on the advice of a suitably qualified ecologist.

#### *Flats*

10. There is no specific guidance for flats/apartments. The standard approach should be followed.

#### *Refurbishment*

11. Assess in the same way as for new build; but as no land is taken away for the footprint of any new buildings, refurbishment projects often score favourably.

#### *Special Cases*

There are currently none for this issue.

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**Supplementary Guidance**
*A: Calculation of the Change in Ecological Value*

The **average** number of species for the site before development is calculated by multiplying the area of the different plot types and the equivalent number of 'species' for those plot types (values taken from Table 2 or given by a 'Suitably Qualified Ecologist'), adding these values and then dividing with the area of the whole site. The same procedure is carried out after the development, and the two values are compared to establish the change.

$$Species_{\text{Before development}} = \frac{\sum_{1}^n (\text{Area plot type } N \times \text{Species plot type } N)}{\text{Total site area}}$$

$$Species_{\text{After development}} = \frac{\sum_{1}^m (\text{Area plot type } M \times \text{Species plot type } M)}{\text{Total site area}}$$

$$Species_{\text{Change}} = Species_{\text{After development}} - Species_{\text{Before development}}$$

Where:

n = total number of types of plots before development

m = total number of types of plots after development

A negative value represents a decrease in species diversity and therefore a decrease in ecological value, whilst a positive value represents an increase in the site's ecological value.

**Follow steps 1-5 below to complete the calculation (using Table 1) and award the appropriate number of credits.**

**Before Development:**

Step 1. Select the most appropriate landscape type from table 2 (*Supplementary Guidance B*). This will be based on the typology of the land surrounding the site (refer to *Supplementary Guidance C* for further explanations of landscape types) and is unlikely to change throughout the development. [Please note, in some cases it may change, such as when a disused site is developed as part of a master plan for a mixed-use development. Typical of this would be a *new town* development (e.g. Milton Keynes), or the development of an inner-city derelict site.]

Step 2. Select all those plot types from table 2 (*Supplementary Guidance B*) which are applicable to the development site, calculate the area of each of these plot types.

Step 3. Enter the following details into table 1 below; the name of each plot type, its area, and number of species per plot type (from table 2, *Supplementary Guidance B*). Follow the prompts to calculate the total average number of species before development.

**After Development:**

Step 4. Repeat steps 1-3 above to calculate the total average number of species after development. [Note, where new habitats are being created or where floral species are to be planted as part of a landscape design, this must be based on the advice and

recommendations of a suitably qualified ecologist in order for these to be included within this calculation See *Guidance notes 6, 7 and 8* above.]

**Total Change in Species:**

Step 5. Subtract the total number of species before development away from the total number of species after development to attain the overall total change in species for the site. This value is then used to award the appropriate number of credits.

**Suitably Qualified Ecologist:**

Where a suitably qualified ecologist has been appointed and an ecological site survey has been conducted, the habitat types, their areas, and number of species per habitat type can be entered into table 1 below to calculate the 'change of ecological value of the site'. Where new habitats are to be created or where floral species are to be planted as part of a landscape design, only those species which are native or have a known attraction to local wildlife can be included in the calculations. Please refer to *Guidance notes 6, 7 and 8* above for compliance requirements.

**Table 1: Calculation of the Change in Ecological Value of the Site Before and After Development.**

**Before development**

Plot Type	Area of Plot Type [m <sup>2</sup> ]		Species [No.] (From Table 2 or a SQE*)		Species x Area of Plot Type
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
<b>(1)Total site area =</b>				<b>(2)Total =</b>	
<b>Species before development =</b>					
Total species x area of plot type / Total site area = (2)/(1) =					

**After development**

Plot Type	Area of Plot Type [m <sup>2</sup> ]	Species [No.] (From Table 1 or a SQE*)		Species x Area of Plot Type
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
		X	=	
<b>(1)Total site area =</b>			<b>(2)Total =</b>	
<b>Species after development =</b>				
Total Species x Area of plot type / Total site area = (2)/(1) =				

\* SQE = 'Suitably Qualified Ecologist'

Total no. of species after development		Total no. of species before development		Total change in species
	-		=	

**B: Ecological Value**

Table 2 below provides default values to be used when calculating the change of ecological value of the site. This information is based on national figures from the Countryside Survey prepared for the Digest of Environmental Statistics No 20, 1998 (DEFRA).

**Table 2 – Average Number of Species per Landscape and Vegetation Plot Type for Existing Habitats.**

Plot Type	Landscape Type			
	Arable	Pastoral	Marginal upland	Upland
Crops weeds	5.4	8.3	-	-
Tall grassland/herb	12.7	15.0	-	-
Fertile grassland	11.6	12.7	15.3	-
Infertile grassland	17.1	17.6	21.1	-
Lowland wooded	12.9	12.5	-	-
Upland wooded	-	12.7	13.8	20.4
Moorland grass/mosaic	-	2.0	20.4	21.0
Heath/bog	-	-	14.3	20.0
Hard landscaping	0	0	0	0
Buildings	0	0	0	0
Garden planting (typical)	-	-	-	-
Wildlife garden planting	-	-	-	-

Plot Type	Landscape Type					
	Existing building/ hard landscaped areas	Parkland	Industrial derelict land <1 years	Industrial derelict land <10 years	Industrial derelict land <20years	Industrial derelict land ≥30 years
Crops weeds	-	-	-	-	-	-
Tall grassland/herb	-	17.6	0	6.3	15.8	21.1
Fertile grassland	-	11.6	0	4.6	11.5	15.3
Infertile grassland	-	17.6	0	6.3	15.8	21.1
Lowland wooded	0	13.8	-	-	-	-
Upland wooded	0	13.8	-	-	-	-
Moorland grass/mosaic	-	-	-	-	-	-
Heath/bog	-	-	-	-	-	-
Hard landscaping	0	0	0	0	0	0
Buildings	0	0	0	0	0	0
Garden planting (typical)	0	0	-	-	-	-
Wildlife garden planting	0	0	-	-	-	-

- insufficient data to produce national averages, as not all vegetation plot types are found in all landscape types.

Only where criteria in *Guidance note 6* and *Supplementary Guidance A, 'Suitably Qualified Ecologist'*, has been met can 'actual' species values be used instead of those provided in table 2 above.

Values in italics is data from: DEFRA "Digest of Environmental Statistics" No.20. HMSO, 1998

*C: Guidance on terminology used in Table 2*

When using Table 2 it is important that the landscape category is selected first. This is based on the typology of the surrounding sites. It is unlikely to change through the development, although in some cases it may, such as when a disused site is developed as part of a master plan for a mixed-use development. Typical of this would be a *new town* development (e.g. Milton Keynes), or the development of an inner-city derelict site.

Landscape types applicable to Table 2:

- Pastoral:** Mainly grasslands used for grazing purposes.
- Arable:** Land dominated by cereals and other arable crops, as well as intensively managed grasslands.
- Marginal upland:** Areas that are on the periphery of the uplands, and are dominated by mixtures of low-intensity agriculture, forestry and semi-natural vegetation.
- Upland:** Land generally above a height suitable for mechanised farming and frequently dominated by semi-natural vegetation.

Vegetation plot types applicable to Table 2:

- Crops/weeds:** Mostly highly disturbed vegetation of arable fields and their boundaries; includes cereal and vegetable crops.
- Tall grassland/herb\*:** Typical vegetation of overgrown lowland field boundaries, stream sides, ditches and roadside verges.
- Fertile grass:** The bulk of agriculturally improved grasslands, intensive pasture and silage crops; but also includes mown areas of improved grasslands for recreational and amenity purposes, as well as resown roadside verges.
- Infertile grass\*:** A diverse group of semi-improved and semi-natural grasslands; includes acidic to basic, wet to dry grasslands, and tall-herb vegetation mainly present in the lowlands; often found on stream sides and roadside verges.
- Lowland wooded\*:** Includes wooded vegetation of hedges and broadleaved woods in the lowlands.
- Upland wooded\*:** A varied group of acidic vegetation types usually associated with upland woods, including: semi-natural woodland; conifer plantations; bracken; and wooded streamsides.
- Moorland grass/mosaic\*:** Typically grazed moorland vegetation, including extensive upland acidic and peaty grassland; and species-rich but very localised flushes.
- Heath/bog\*:** Mostly heather moorland, blanket bog and upland heath, but also lowland heath and raised bog.
- 'Wildlife' garden planting\*:** Garden planting that uses native species and those that have a known attraction or benefit to local fauna, based on the advice of a suitably qualified ecologist.

Note that the ecological value figures in Table 2 are figures given for **existing, well established habitats**. It is therefore **not** possible to use a species value from the table for after construction if the land use has changed without the confirmation by a 'Suitably Qualified Ecologist'. For example if an urban parkland is being developed on part of the site the number of species on this part of the site will need to be confirmed



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by a 'Suitably Qualified Ecologist' (taken from actual number of indigenous species being planted) rather than assuming that the new parkland will immediately have a species value of 11.6 (assuming fertilisers are going to be used).

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### Further Information

*Countryside Survey 2000*  
[www.cs2000.org.uk](http://www.cs2000.org.uk)

*Environment Agency*  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

*Government Planning Department*  
[www.planning.odpm.gov.uk/advice.htm](http://www.planning.odpm.gov.uk/advice.htm)

*Construction Industry Key Performance Indicators*  
[www.kpizone.com](http://www.kpizone.com)

Environment Key Performance Indicator Handbook & Wall Chart  
Constructing Excellence; DTI

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### Background

Any development of land will result in some change in its ecological value. The development might improve on it, or it might reduce the value. The purpose of this Credit is to reward steps taken to minimise reductions in ecological value and to encourage improvement. This is to be done by comparing the value of a site before and after development and making a direct comparison in terms of plant species (this is used as a proxy for biodiversity). The method takes account of the local landscape type and the different habitats that exist to calculate an average value for the site.

#### *Eco 4 and the Environment KPIs*

The Construction Industry's Environmental Key Performance Indicator (KPI) on 'Area of Habitat Retained/Created', adopts the same approach as the credit above. It subtracts the area of ecologically valuable habitat after development from that before development, and expresses the change as a percentage of total site area. The difference between this credit and the KPI, is that the KPI does not assign specific ecological values to habitat types (for simplicity).

In the KPI approach the vegetation groups marked \* above, and derelict urban/industrial land with a more diverse number of species both fall into the category of 'ecologically valuable habitat'. This makes it possible to use the figures derived for this credit, to determine the project's KPI score.

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### References

Department of the Environment, Transport and the Regions. *Digest of Environmental Statistics*, No 19, Vol 2 (now published online by DEFRA)

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## Eco 5 Building Footprint

**Credits available: 2**

### Aim

To promote the most efficient use of a building's footprint by ensuring that land and material use is optimised across the development.

### Credit Requirements

Credits	
1	Where the total combined Floor Area: Footprint ratio for all houses on the site is greater than 2.5:1. AND Where the total combined Floor Area: Footprint ratio for all flats on the site is greater than 3.5:1.
2	Where the total combined Floor Area: Footprint ratio for all dwellings on the site is greater than 3.5:1.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings on the development must be included in the calculation and assessed against above requirements.

### Main Information to be Provided by the Developer

1. The appropriate drawings showing dimensioned floor plans for all dwellings (and other buildings, e.g. garages), and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. The developer needs to provide details of both the floor area and building footprint.
2. Calculate the total combined Floor area: Foot print ratio for the whole site (or for all houses and/or all block of flats separately) using below definitions/ methodology:
  - the total combined floor area of all dwellings on the site = the sum of all individual floor areas for all units (flats and/or houses) built on site (For the definition of Floor area see Guidance note 3).
  - the total combined footprint area of all dwellings on the site = the sum of all footprint areas created by all buildings (flats and/or houses) on the site (For the definition of Footprint see Guidance note 4.).
  - The total combined Floor area: Foot print ratio for the whole site = the total combined Floor area / the total combined Footprint area of the whole site

### 3. Definition of Floor Area

The area contained within the inner leaf of the external walls, including that taken up by halls, stairwells, cupboards and partitions, but for semi-detached or terraced dwellings, excluding the area of the party walls.

- Habitable **loft space and basements** should be counted in the Floor Area. These are defined as heated space with safe access by a permanent stairway or other means which complies with the requirements of relevant national building regulations AND where the space is 'finished' with floor, walls, lighting and electric points.
- Where **flats** are being assessed, the floor area is measured as the area contained within the inner leaf of the external walls including any communal areas such as hall and staircases. Party walls and separating walls to common areas should be included in the floor area.
- Where residential accommodation is constructed above **other occupied space** such as shops or offices, these areas can be counted as part of the Floor Area but ONLY where they are situated directly beneath the residential space. Note that garages space would not be included.

#### 4. Definition of **Footprint Area**

The area that the dwelling imprints on the ground surface, including any other outbuildings with permanent foundations, that are part of the home.

- The total area enclosed within the external faces of the building where detached. In the case of party walls the centreline of the wall should be taken for the purpose of this calculation.
- Areas that normally count towards the footprint include conservatories, garages, permanent outhouses, communal garages or storage rooms.
- Areas that will **NOT** normally count towards the footprint include hard landscaping, semi-enclosed external spaces, pergolas and carports.
- Garden sheds will not count unless they are built on a permanent solid foundation and are fitted out as habitable space with heating, lighting and power (i.e. cycle sheds are unlikely to count).
- If a dwelling is raised above ground level on columns or other structures (OR if it is situated above another occupied area such as a shop or office), the Footprint Area should be assumed to be the area that the dwelling would have imprinted had it been constructed at ground level (i.e. the total area enclosed within the external faces of the lowest floor of the dwelling).
- Where **flats** are being assessed, the footprint will include:
  - the area the residential block imprints on the ground, plus
  - the areas that any other permanent buildings used by the occupiers imprints on the ground (such as communal garage blocks, storage rooms, etc.).
  - Where commercial premises form the ground floor, under the flats, the footprint is the area the flats would have imprinted on the ground had they been constructed at ground level.

#### *Flats*

5. Definitions of Floor areas and Footprint Areas for block of flats are included above.

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*Refurbishment*

6. There is no specific guidance for refurbishment. The standard approach should be followed.

*Special Cases*

There are currently none for this issue.

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**Supplementary Guidance**

There is currently none for this issue.

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**Further Information**

*CIRIA*

[www.ciria.org.uk](http://www.ciria.org.uk)

*Government Planning Department*

[www.planning.odpm.gov.uk/advice.htm](http://www.planning.odpm.gov.uk/advice.htm)

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**Background**

Land available for development will become increasingly expensive as land resources come under pressure. Use of 'greenfield' sites is already being limited and developers are likely to experience hostility from the local community. To make best use of the available land and other resources, including materials and energy, it is important to ensure effective use of the building footprint by maximising the useable space.

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**References**

Office of the Deputy Prime Minister. *Planning Policy Guidance Note 3 – Housing* (2000)

## Hea 1 Daylighting

**Credits available: 3**

### Aim

To improve the quality of life in homes through good daylighting, and to reduce the need for energy to light a home.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	Kitchen to achieve a minimum average daylight factor of at least 2%*.
1	Living rooms, dining rooms and studies to achieve a minimum average daylight factor of at least 1.5%*.
1	Kitchens, living rooms, dining rooms and studies to be designed to have a view of the sky*.

\* calculated according to the method set out below. Targets based on British Standard BS 8206: Part 2 recommendations.

### Applicability

The same approach is taken for both new build and refurbishment.

The site layout should be designed such that all dwellings can meet these credits. However, where existing site features prevent compliance in up to 10% of dwellings, these credits will still be allowed.

### Main Information to be Provided by the Developer

1. Professionally produced calculations (the output from daylighting software is acceptable) for each house type and sufficient information to enable the assessor to perform a 'reasonableness' check on the daylight factors. The following information is needed in order to carry out the calculations and should be provided to the assessor:
  - room dimensions, both plan and elevation
  - window schedules, including the type of glazing (e.g. double, low-e, etc), and preferably the glazing transmission factor
  - location, distance and height of all adjacent buildings or obstacles (if the additional credit is sought).

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement, plans, details or similar, where the location and details of the windows and any obstructions are shown.
2. Carry out a 'reasonableness check' on provided daylight and view of the sky calculations.

- 
- Check that the calculation **input** details, such as room dimensions, window type, sizes and locations and site layout are consistent with development specification and drawings for each house type.
  - Carry out at least two random **calculation** checks on the development (making sure that at least the worst cases are covered). Calculate the average daylight factor and view of the sky following the calculation procedure set out in *Supplementary Guidance A-D* or by using the Ecohomes daylight calculation tool and compare the result with the daylight figures given.
3. If the daylight or 'view of the sky' calculations have not been provided, please calculate the daylight factor for all house types and the view of the sky for the worst case homes according to *Supplementary Guidance A-D* or by using the Ecohomes daylight calculation tool.
  4. Where the View of Sky Credit is being sought, the view of the sky should be from a height of 0.85m from the floor for 80% of the room area for living room, dining room and studies, and from every work-surface and table in the kitchen.
  5. If there is an opening between rooms, it may be possible to use windows in the adjacent room to help achieve the credits. However, this will only apply if there is substantial light infiltration, e.g. through a conservatory, and it can be proved that daylighting is improved.

### *Flats*

6. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

7. There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

8. Sun pipes

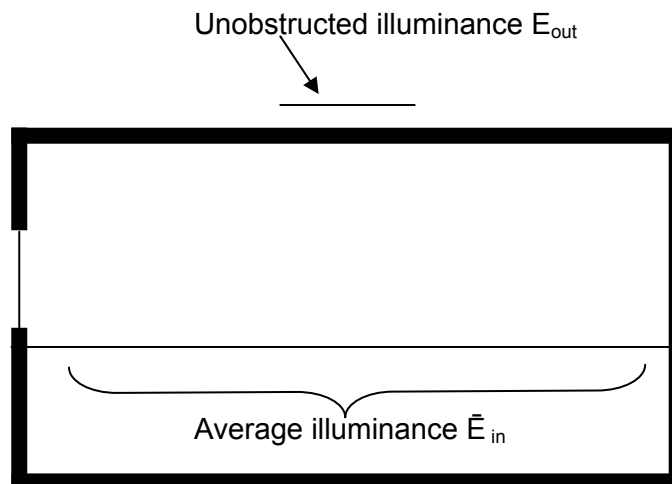
As a general rule treat sun pipes as roof lights i.e. if there are no obstructions use a  $\theta$  of  $180^\circ$ . There are a wide range of light pipes on the market, with different reflective materials lining them and some including lenses/mirrors etc. If no transmission factor is stated use  $T = 0.5$  for a 1 m length pipe and  $T = 0.25$  for a 2 m length pipe.

## Supplementary Guidance

### A: Daylight Calculations

Under standard overcast conditions:

$$\text{Average daylight factor } \overline{DF} = \frac{\bar{E}_{in}}{E_{out}} \times 100\%$$



**Figure 1** Definition of average daylight factor

### B: Average Daylight Factor Calculation

Crisp and Littlefair derived the following formula, based on earlier work by Lynes, for average daylight factor in rooms with a side window or rooflights:

$$\overline{DF} = \frac{M W \theta T}{A(1-R^2)} \%$$

Where:

- W = total glazed area of windows or rooflights
- A = total area of all the room surfaces (ceiling, floor, walls and windows)
- R = area-weighted average reflectance of the room surfaces
- M = a correction factor for dirt
- T = glass transmission factor
- $\theta$  = angle of visible sky (Figures 2 and 3)

Guide values for a typical dwelling with light-coloured walls are as follows:

- R = 0.5
- M = 1.0 (vertical glazing that can be cleaned easily)  
0.8 (sloping glazing)  
0.7 (horizontal glazing)
- T = 0.7 (double glazing)  
0.6 (double glazing with low-emissivity coating)  
0.6 (triple glazing)
- $\theta$  = 65° (vertical glazing)

If actual values are available, these should be used in preference to the guide values.

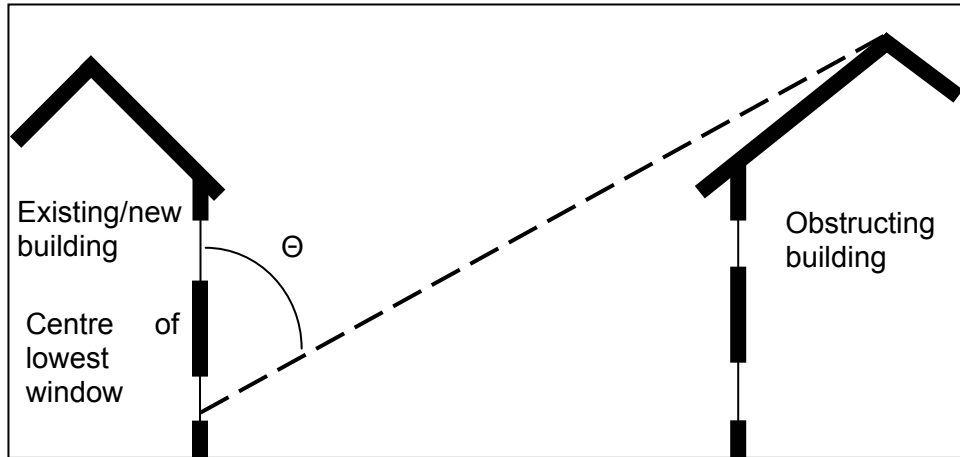
*B: Window area*

The glazed area of the windows can be obtained from either:

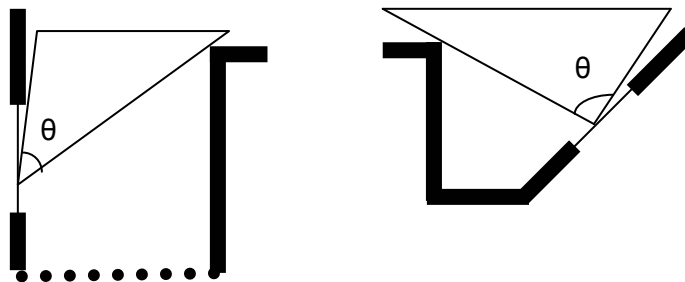
- measuring off scaled drawings,
- glazing schedules (if the specific glazing area is listed),
- measuring the window opening and multiply with below correction factors (from BS 8206 Part 2):

Type of frame	Correction factor
metal patent glazing	0.9
metal frame large pane	0.8
wood frame large pane	0.7
wood frame "Georgian" pane	0.6

*C: Angle of Visible Sky*



**Figure 2** Section in plane perpendicular to the main face of the building



**Figure 3** Definition of theta  $\theta$ , the angle subtended, in the vertical plane normal to the window, by the sky visible from the centre of the window

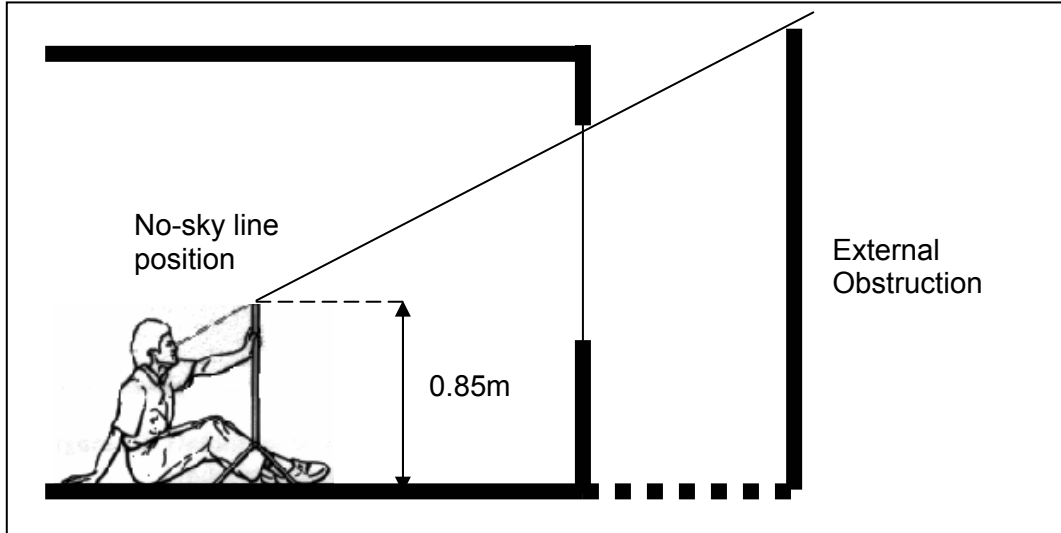
*If, for any part of the development, the angle of visible sky (theta  $\theta$ ) is less than 65 degrees, the actual angle must be determined to find the loss of daylight to the building.*

If the obstructions are more complicated than indicated here, BR209. *Site layout planning for daylight and sunlight: a guide to good practice* (1991) includes skylight indicators and Waldram diagrams, and guidance on their use.



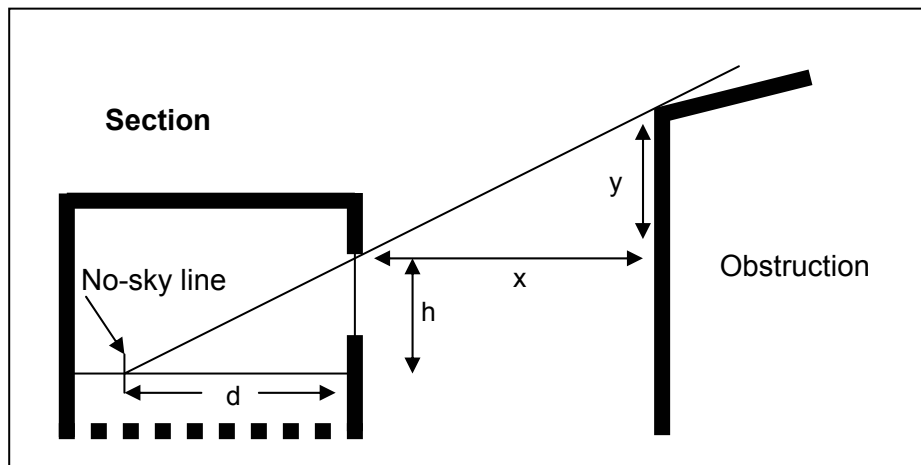
*D: View of the Sky*

The no-sky line divides those areas of the working plane, which can receive direct skylight, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.



**Figure 4** At the no-sky line, that last visible patch of sky above the obstructions will just disappear when the window head is slighted through a point at working plane height

*How to calculate the no-sky line:*



**Figure 5.** Calculating the no-sky line

$$d = \frac{xh}{y}$$

Where:

- h = height of the window head above the working plane
- y = height of the obstruction above the window head
- x = its distance from the outside wall

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If  $d$  is greater than the room depth, then no part of the room lies beyond this no-sky line.

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### Further Information

There is currently none for this issue.

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### Background

People expect good natural lighting in their homes. Daylight makes an interior look more attractive and interesting, as well as providing light to work or read by, and is also beneficial to health. Access to sunlight and daylight also helps to make a building energy efficient; effective daylighting will reduce the need for electric lighting, while winter solar gain can meet some of the heating requirements.

The quality and quantity of natural light in an interior depends both on the design of the interior environment (size and position of windows, depth and shape of rooms, colours of internal surfaces) and the design of the external environment (obstructing buildings and objects).

The quantity and quality of daylight inside a room will be impaired if obstructing buildings are large in relation to their distance from the room. The distribution of light in the room will be affected, as well as the total amount received.

CIBSE Lighting Guide 10 'Daylighting and window design' states: 'an average daylight factor of 5% or more will ensure that an interior looks substantially daylit, except early in the morning, late in the afternoon, or on exceptionally dull days. An average daylight factor below 2% generally makes a room look dull; electric lighting is likely to be in frequent use.'

Ecohomes award credits for meeting the minimum average daylight factor suggested by BS 8206-2, as this is good practice, but not often achieved in modern developments.

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### References

British Standards. BS 8206-2 *Lighting for buildings. Code of practice for daylighting* (1992)

Building Research Establishment Ltd:

BR209. *Site layout planning for daylight and sunlight: a guide to good practice* (1991)

IP4/92. *Site layout for sunlight and solar gain* (1992)

BR 288. *Designing buildings for daylight*. James Bell and Bill Burt (1995)

CIBSE LG 10 *Lighting Guide: Daylighting and window design* (1999)

## Hea 2 Sound Insulation

Credits available: 4

### Aim

To ensure the provision of sound insulation and reduce the likelihood of noise complaints.

### Credit Requirements

Credits	
1	<ul style="list-style-type: none"> <li>A commitment to carry out a programme of pre-completion testing based on the frequency listed in <i>Table 2, column A (Supplementary Guidance A: Frequency of Testing Required)</i> for every group or sub-group of houses or flats*</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>A commitment to achieve the performance standards set out in the Building Regulations for England and Wales, Approved Document E (2003 Edition).</li> </ul>
2	<ul style="list-style-type: none"> <li>A commitment to carry out a programme of pre-completion testing based on the frequency listed in <i>Table 2, column B (Supplementary Guidance A: Frequency of Testing Required)</i> for every group or sub-group of houses or flats*</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>A commitment to achieve the performance standards set out in the Building Regulations for England and Wales, Approved Document E (2003 Edition).</li> </ul>
3	<ul style="list-style-type: none"> <li>A commitment to carry out a programme of pre-completion testing based on the frequency listed in <i>Table 2, column B (Supplementary Guidance A: Frequency of Testing Required)</i> for every group or sub-group of houses or flats*</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>A commitment to achieve airborne sound insulation values that are at least 3dB higher, and impact sound insulation values that are at least 3dB lower, than the performance standards set out in the Building Regulations for England and Wales, Approved Document E (2003 Edition).</li> </ul>
4	<ul style="list-style-type: none"> <li>A commitment to carry out a programme of pre-completion testing based on the frequency listed in <i>Table 2, column B (Supplementary Guidance A: Frequency of Testing Required)</i> for every group or sub-group of houses or flats*</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>A commitment to achieve airborne sound insulation values that are at least 5dB higher, and impact sound insulation values that are at least 5dB lower, than the performance standards set out in the Building Regulations for England and Wales, Approved Document E (2003 Edition).</li> </ul>

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\* For the definition of groups and sub-groups, see Section 1 in the Building Regulations England and Wales, approved Document E (2003 Edition).

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## Applicability

The same approach is taken for new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements of the relevant Ecohomes performance standards.

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## Main Information to be Provided by the Developer

1. Specifications must state details sufficient to meet the *Credit Requirements* and the *Guidance* below. This would include the details of the programme of pre-completion testing to be carried out on the development, including the number of groups and sub-groups.
  2. Evidence that the proposed building design has the potential to achieve the performance standards associated with the Ecohomes credit. This evidence could be field test data from previous developments or expert advice from an acoustic consultant.
  3. Confirmation that the acoustic consultancy is accredited by UKAS or a European equivalent for field sound insulation testing, OR that the testing is carried out in accordance with the relevant ISO requirements and the report and all measurement data are checked and verified by an organisation with UKAS accreditation for field sound insulation testing.
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## Guidance

1. The Ecohomes performance standards are based on the requirements set out in Part E (2003) of the Building Regulations for England and Wales. However, Ecohomes does not currently accept details built to Robust Standards Details and requires additional tests, UKAS accreditation of testers and higher performance levels (for Credit 4 and 5) than those required by part E. For more details see the *Background* section.
2. Note that the same Ecohomes requirements are set throughout the UK i.e. even though the performance levels are based on the regulations in England and Wales, the same should apply for homes assessed in Northern Ireland and Scotland. For more details see the *Background* section.
3. The assessor needs to confirm that the acoustic consultancy carrying out/ set to carry out the testing is accredited by UKAS or a European equivalent for field sound insulation testing. If the testing has been carried out/ will be carried out according to the relevant ISO requirements this will also be accepted provided that the test reports and all measurement data have been/ will be checked and verified by an organisation with UKAS accreditation for field sound insulation testing.

4. The following table is a simplified form of the credit requirements for reference only.

**Table 1: Credit Summary – Improvement on part E**

Credits	Improvement on Regulations (dB)	
	Airborne sound $D_{nT,w} + C_{tr}$	Impact sound $L'_{nT,w}$
1	0	0
2	0	0
3	+3	-3
4	+5	-5

Notes to the Table:

- a. A commitment to carry out a programme of pre-completion testing based on the stated number of tests (Table 2) for houses or flats in a group or sub-group. For the definition of groups and sub-groups, see Section 1 in Approved Document E (2003 Edition) of the Building Regulations (England and Wales).
  - b. A commitment to achieve sound insulation values that are better, by the stated amount in Table 1, than the performance standards in Approved Document E (2003 Edition).
  - c. All criteria have to be met for the credit(s) to be awarded.
5. The commitments to pre-completion testing and to achieve the performance standards means that if any test is failed (according to either the performance standards in Approved Document E, for England and Wales, or the enhanced performance standards in Ecohomes, which are 3dB or 5dB higher) then remediation work shall be carried out on the construction and re-tests carried out to confirm that the performance standards have been met.
  6. Evidence that the proposed building design has the potential to achieve the performance standards could be field test data from previous developments, or expert advice from an acoustic consultant.
  7. Specifying structures to the typical types found in Sections 2, 3, 4 and 6 of the Approved Document E (2003 edition, Building regulations England and Wales) will NOT, in itself, be sufficient to achieve the credits. All other conditions of the Credit must be met.
  8. Building regulations England and Wales, approved Document E sections 1.13 to 1.16 describe the grouping procedures to be followed. For example, houses and flats are usually considered as two separate groups, and if there are significant differences in construction type then the groups will need to be broken down into sub-groups.
  9. Detached homes achieve all 4 credits by default as this section is only concerned with direct transfer of neighbour noise. It is rare however to have a development consisting entirely of detached homes.
  10. Testing should be between habitable rooms (i.e. bedroom to bedroom; living room to living room; living room to bedroom etc). If there are no habitable rooms with separating walls or floors no testing is needed, and the dwellings can be treated as detached homes. If habitable rooms only share separating walls or floors with spaces which cannot be tested, such as halls, stairways or small bathrooms, alternative evidence of performance should be provided.

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11. Where there are insufficient separating walls or floors in a development to carry out the number of tests specified in Table 2, all of the available separating walls or floors should be tested. Where all the available separating walls and floors have been tested this will be considered to be equivalent to column B of Table 2, and 2 or more credits will be awarded as appropriate.
  12. No more than two airborne and two impact sound insulation tests should be undertaken between a pair of houses or flats i.e. a maximum of two airborne sound insulation tests should be carried out on any separating wall and a maximum of two airborne and two impact tests on any separating floor.

### *Flats*

There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

### *A: Frequency of Testing Required*

The table below sets out the number of airborne and/or impact sound insulation tests to be conducted on each group or sub-group. A unit is either a flat or a house. Where units contain a single habitable room i.e. bedsits, the number of tests required is halved (see example 5).

For the definition of groups and sub-groups, see Section 1 in Approved Document E (2003) edition of the Building Regulations (England and Wales). Below examples will also give some guidance on how to define groups and subgroups.

Table 2: Frequency of testing required

Number of units of same group or sub-group on the site	Number of tests on separating walls and/or floors for one credit (Column A)	Number of tests on separating walls and/or floors for two or more credits (Column B)	Number of units of same group or sub-group on the site	Number of tests on separating walls and/or floors for one credit (Column A)	Number of tests on separating walls and/or floors for two or more credits (Column B)
1	0	0	31	16	20
2	2	2	32	16	22
3	2	2	33	16	22
4	2	2	34	18	22
5	2	4	35	18	24
6	4	4	36	18	24
7	4	4	37	18	24
8	4	6	38	20	26
9	4	6	39	20	26
10	6	6	40	20	26
11	6	8	41	20	28
12	6	8	42	22	28
13	6	8	43	22	28
14	8	10	44	22	30
15	8	10	45	22	30
16	8	10	46	24	30
17	8	12	47	24	30
18	10	12	48	24	30
19	10	12	49	24	30
20	10	14	50	26	30
21	10	14	51	26	30
22	12	14	52	26	30
23	12	16	53	26	30
24	12	16	54	28	30
25	12	16	55	28	30
26	14	18	56	28	30
27	14	18	57	28	30
28	14	18	58	30	30
29	14	20	59	30	30
30	16	20	60	30	30

*B: Example of Testing Series and Compliance.*

**Example 1 - Two rows of identical terraced dwellings.**

Each row consists of 6 houses, giving a total of 12 units. Reading from Table 2, this development needs 6 or 8 airborne tests performed on their separating walls, as set out in Table 3. As there are no separating floors, that is all the testing required.

Table 3: Credit requirements for Example 1.

Credits	Number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)
1	6	45
2	8	45
3	8	48
4	8	50

**Example 2 - Three blocks of flats, with four floors in each block. There are two identical flats per floor and a stairway divides the flats.**

There are 24 flats in total. Walls only need airborne tests performed, floors need both airborne and impact tests. As testing is only required between habitable rooms. In this case there are no separating walls so only the floors need testing as set out in Table 4 below.

Table 4: Credit requirements for Example 2

Credits	Number of floor tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Maximum impact sound insulation levels to be achieved $L'_{nT,w}$ (dB)
1	12	45	12	62
2	16	45	16	62
3	16	48	16	59
4	16	50	16	57

**Example 3 - Three blocks of flats with four floors in each block. There are two adjoining identical flats per floor.**

There are 24 flats in total. This is the same number of dwellings as in example 2, but in this case there are both separating walls and floors. The number of tests will therefore increase as the walls also need to be tested, see Table 5 below.



Table 5: Credit requirements for Example 3.

Credits	Number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Maximum impact sound insulation levels to be achieved $L'_{nT,w}$ (dB)
1	12	45	12	45	12	62
2	16	45	16	45	16	62
3	16	48	16	48	16	59
4	16	50	16	50	16	57

**Example 4 - A warehouse is to be converted into 21 identical flats over three floors.**

Each flat has two separating walls, except for the end ones. For the purposes of Ecohomes, these can be grouped with the other flats. This means that there are either 10 or 14 separating walls and 10 or 14 separating floors that need testing, as set out in Table 6 below. 5 or 7 pairs of flats would be used for the testing.

Table 6: Credit requirements for Example 4.

Credits	Number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Maximum impact sound insulation levels to be achieved $L'_{nT,w}$ (dB)
1	10	43	10	43	10	64
2	14	43	14	43	14	64
3	14	46	14	46	14	61
4	14	48	14	48	14	59

**Example 5 - 56 bedsits, with en-suite bathrooms, over two floors.**

As the bedsits consist of only one habitable room, there cannot be two floor tests or two wall tests between a pair of dwellings. This means the usual number of required tests is halved, as set out in Table 7 below.

Table 7: Credit requirements for Example 5.

Credits	Number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Maximum impact sound insulation levels to be achieved $L'_{nT,w}$ (dB)
1	28/2=14	43	28/2=14	45	28/2=14	62
2	30/2=15	43	30/2=15	45	30/2=15	62
3	30/2=15	46	30/2=15	48	30/2=15	59
4	30/2=15	48	30/2=15	50	30/2=15	57

**Example 6 – A development comprising of 66 flats, 20 detached houses and 86 semi-detached houses.**

The block of flats (66 flats) is built over seven floors. The development also contains 20 detached houses and 86 semi-detached houses (of which 56 are of identical traditional brick and block construction and 30 are of identical timber frame construction). There are therefore four subgroups on this development (one group for the flats, one group for the detached homes, one group for the timber frame semis and one group for the brick and block semis).

- Sub group 1 - 66 flats

**Table 8: Number of walls to be tested for the flats**

Credits	Number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)
1	30	45
2	30	45
3	30	48
4	30	50

**Table 9: Number of floors to be tested for the flats.**

Credits	Number of floor tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)	Number of floor tests needed	Maximum impact sound insulation levels to be achieved $L'_{nT,w}$ (dB)
1	30	45	30	62
2	30	45	30	62
3	30	48	30	59
4	30	50	30	57

The maximum number of tests required for any group or subgroup is 30. Consequently 30 airborne sound insulation tests of the separating walls, plus 30 airborne sound insulation tests of the separating floors and 30 impact sound insulation tests of the separating floors are required. 15 or more pairs of flats would be used to get the 30 tests (it would be necessary to use more than 15 pairs if there were not two suitable separating walls between a pair of flats).

- Sub group 2 - 20 detached houses – no field tests required
- Sub group 3 - 56 semi detached houses (brick and block construction)

**Table 10: Number of walls to be tested for the brick and block semis.**

Credits	Number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)
1	28	45
2	30	45
3	30	48
4	30	50

Consequently 28 or 30 airborne sound insulation tests of the separating walls are required. 14 or 15 pairs of houses would be used for testing.

- Subgroup 4 - 30 semi detached houses (timber frame construction)

**Table 11: Number of walls to be tested for the timber frame semis.**

credits	number of wall tests needed	Minimum airborne sound insulation levels to be achieved $D_{nT,w} + C_{tr}$ (dB)
1	16	45
2	20	45
3	20	48
4	20	50

Consequently 16 or 20 airborne sound insulation tests of the separating walls are required. 8 or 10 pairs of houses would be used for testing.

## Further Information

*England and Wales Building Regulations*  
[www.odpm.gov.uk](http://www.odpm.gov.uk)

*Robust Details*  
<http://www.robustdetails.com/>

## Background

One of the most common causes for disputes between neighbours is noise. Environmental Health Officers in England and Wales received nearly 6000 noise complaints per million people in 2003/2004 from domestic premises. This accounts for 75% of all noise complaints received.

There are two aims with this credit:

- to ensure the provision of sound insulation through a commitment to pre-completion testing
- to encourage higher standards of sound insulation through a commitment to design and build constructions that exceed the minimum performance

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standards in the Building Regulations, England and Wales, Approved Document E (2003 Edition),.

Section 0: Performance, Approved Document E (2003 Edition) '*Resistance to the passage of sound*' contains performance standards in terms of airborne and impact sound insulation for walls, floors and stairs that have a separating function.

To ensure that the design intent for sound insulation is achieved on site, sound insulation testing is covered by Regulation 20A or 12A of the Building Regulations (England and Wales). The normal way of satisfying Regulation 20A or 12A is to implement a programme of sound insulation testing, called pre-completion testing, according to the guidance set out in Section 1: Pre-completion testing, Approved Document E (2003 Edition). This guidance describes the normal programme of testing, based on at least one set of tests for every 10 houses, flats or rooms for residential purposes in a group or sub-group.

Ecohomes aims to ensure that the performance standards for sound insulation in Approved Document E (2003 Edition) are achieved through a commitment to pre-completion testing using, or checked by, test bodies with UKAS accreditation. It also aims to reward developments that make a commitment to achieve higher levels of sound insulation than the minimum performance standards in Approved Document E (2003 Edition).

Whilst the sound insulation components of the Building regulations in Scotland and Northern Ireland differ from the English Part E (2003) this credit is not affected by those differences. The sound insulation levels set out in the English Regulations, Part E 2003, provides the highest standards throughout the UK and are therefore used as a basis for Ecohomes.

From 1<sup>st</sup> July 2004, Robust Details have been introduced as an alternative to pre-completion testing for demonstrating compliance with Part E. Robust details have been developed for separating wall and floor constructions. These have been tested in the field against the performance standards in Approved Document E. The constructions are described in a guidance produced by Robust Details Ltd ([www.robustdetails.com](http://www.robustdetails.com)). At present these are not accepted under Ecohomes as proof of compliance with Part E standards as data is not currently available to demonstrate their robustness. BRE is discussing this with Robust Details Ltd and are awaiting field test data from them.

Further guidance on how to define a group or sub-group may be found in a BRE publication due to be published in 2006 "Practical Guidance on what constructions should be tested on a development".

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## References

Office of the Deputy Prime Minister. *Building Regulations Approved Document E – Resistance to the passage of sound* (2003)

Scottish Building Standards Agency. *Building (Procedure) (Scotland) Regulations 2004, Section 5 Noise*

Northern Ireland, Department of Finance and Personnel, *Building Regulations (Northern Ireland) 2000 DFP Technical Booklet G and G1: Sound*

## Hea 3 Private Space

**Credits available: 1**

### Aim

To improve the occupiers' quality of life by providing an outdoor space for their use, which is at least partially private.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	For the provision of outside space that is at least partially private.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings throughout the development must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state the private or semi private space location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. The appropriate drawings should show the private space location and details sufficient to meet the *Credit Requirements* and the *Guidance* below.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the general arrangement plans or similar, where the private or semi-private space location and layout is shown.
2. The outdoor space should:
  - be of a size that allows all occupants to sit outside
    - Private space: 1.5 m<sup>2</sup>/bedspace(i.e. number of occupants the home is designed for), minimum 3m<sup>2</sup>/ home
    - Shared space: minimum 1m<sup>2</sup>/bedspace(i.e. number of occupants estimated to live in the homes served by the space).
  - allow easy access by all occupants
  - be accessible only to occupants of designated dwellings.
3. Examples of compliance:
  - a private garden
  - a communal garden or courtyard (the garden must provide a pleasant and secluded environment large enough for all occupants of designated dwellings to share (see above). and should be designed in a way that makes it clear that the space is only to be used by occupants of designated dwellings. This could

be achieved by using the buildings themselves, fencing, planting or other barrier to seal off the space.)

- balconies (the front must be open to air or, if glazed, should be entirely openable, and the balconies should not unnecessarily reduce daylighting)
- roof terraces.
- patios

### Flats

4. There is no specific guidance for flats. The standard approach should be followed.

### Refurbishment

5. There is no specific guidance for refurbishment. The standard approach should be followed.

### Special Cases

There are currently none for this issue.

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## Supplementary Guidance

There is currently none for this issue.

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## Further Information

There is currently none for this issue.

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## Background

The availability of external space around and close to the home is one of the key aspects affecting the quality of life of the occupiers. The external space can be a private garden as well as a shared garden, balcony or roof terrace.

For occupants of flats, many of whom are located in city centres, there is often no easy access to outside space, especially that which is relatively private. Therefore the availability of a shared garden, balcony or roof terrace will be of great benefit to those occupiers.

*'It seems important that the open space directly connected to dwellings should be demonstrably private, no matter what tenure arrangements apply, and that the territorial rights of the occupiers should be clearly marked.'*

*'Gardens and balconies are popular but only if they are a reasonable size. A flat located near the centre of a city may be preferred to a house with a garden away from the centre, even for a proportion of families with older children, especially if a usable balcony is available.'*

New Metric Handbook, Section 2.09, p302

*'Intuitively, we all understand the benefits of open space: a walk, a breath of fresh air, a change of scene. We know we feel better for it and research from Japan goes to show that good neighbourhood green spaces promote longer life expectancy for local people.'*

CABE - The Value of Public Space

## References

Architectural Press. *New Metric Handbook – Planning and Design Data*, Section 2.09, (1999)

CABE - *The Value of Public Space*  
[www.cabe.org.uk](http://www.cabe.org.uk)

## Man 1 Home User Guide

**Credits available: 3**

### Aim

To recognise and encourage the provision of guidance to enable home owners/occupiers to understand and operate their home efficiently, in line with current good practice and in the manner envisaged by the developer, and to make best use of local facilities

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
2	Where evidence can be provided to demonstrate that there is provision, in each home, of a simple guide that covers information relevant to the 'non-technical' tenant/occupant on the operation and environmental performance of their home.
1	Where evidence can be provided to demonstrate that the guide also covers information relating to the site and its surroundings.

### Applicability

The same approach is taken for both new build and refurbishment.

ALL dwellings, throughout the development, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state that a guide is to be supplied to all homes and outline its content sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. A copy of the Home User Guide, or a contents list describing what the proposed Home User Guide will include, sufficient to meet the *Credit Requirements* and the *Guidance* below.
3. Where the guide is not yet complete, a written confirmation/specification clause is required confirming that the Guide will be developed to the Ecohomes standard.

### Guidance

1. The following documentation will prove compliance:
  - A copy of the Home User Guide containing the required information (as described in *Guidance note 4* below).
  - If the stage of design does not permit the Guide to be examined, a copy of the contents list showing that the Guide will contain the required information (as described in *Guidance note 4* below) AND written confirmation from the developer confirming that the Guide is going to be developed to the required standards and supplied to all homes.
2. The guide must be relevant to the **non-technical** home owner/tenant.



3. The guide can be incorporated into the Home Information Pack, but must be an extractable or 'stand alone' section.
4. Home User Guide contents

The list below indicates the type of information that should be included.

To achieve the first **two credits** the following must be included:

a. Environmental strategy/ design and features

- Details of any specific environmental/energy design strategy/features including an overview of the reasons for their use (e.g. environmental and economic savings) and how they should best be operated (if not passive features such as insulation). Strategies/ features can include passive solar design, super insulation, energy efficient timber windows, heat recovery systems, solar hot water systems, photovoltaic, passive vents, the use of certified timber, etc.
- Ecohomes issues – where the home/ development scored well, what environmental features have been designed into the home
- Copy, or photocopy, of the Ecohomes certificate

b. Energy

- Information as set out by the Building Regulations Part L1 (See *Further Information*)

AND

- Details of any renewable system/s and how it/they operate.
- Details of low energy light fittings and their use and benefits, e.g. how much energy they save compared to traditional light fittings and what this can mean in terms of reduced energy bills.
- General information on heat loss from the home, draughts etc. For refurbishments also information on what further measures, if appropriate, can be taken to insulate the home.
- Tips on other energy saving measures such as no leaving your TV on standby, no leaving mobile phone chargers in the socket, buying low energy appliances etc and examples on how much/ what impact these measures will have.

c. Water Use

- Details of water saving features and their use and benefits, e.g. aerating taps, low flush toilets, low flow showers etc. How much water is saved by using these appliances and what can be done to save more water on a day to day basis i.e. having a quick shower instead of a bath, not letting the tap run when you brush your teeth etc.
- External water use and efficiency, e.g. the use of water butts or other type of rain water recycling systems.

d. Recycling and Waste

- Information on the location and use of recycle bins
- Information on the location and use of possible compost bins.
- Information about Local Authority collection scheme/s.

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- If the home is not covered by a Local Authority collection scheme, details and location of communal recycling bins/ skips/ facilities.
- e. Sustainable DIY
- Environmental recommendations for consideration in any home improvement works
  - Low VOC products
  - Certified timber
- f. Emergency Information
- Information on smoke detector/s
- g. Links, References and Further Information
- This should include references/ links to other information including websites, publications and organisations providing information on how to run the home efficiently and in the best environmentally sound way. In particular, the 'Energy Savings Trust' programme should be referenced ([www.est.org.uk/myhome](http://www.est.org.uk/myhome)) and links provided to its website and good practice guidance. Information and links should also be provided to the Local Authority, the company responsible for the construction and, if applicable, the organisation responsible for management of the home.
  - In all instances both an address/ telephone contact number and a web link will need to be provided.

To achieve the additional **one credit** the following must be included in addition to the above:

- h. Recycling and Waste
- Information on what to do with waste not covered by the standard weekly Local Authority collection scheme for example fridges/ freezers, computer equipment, batteries and other potentially hazardous equipment. In some areas the Local Authority will collect these items but in this case details and information of such a collection.
  - Information and location of local recycling facilities and waste tips.
- i. Public Transport
- Details of local public transport facilities including maps and timetables and the location of nearby bus stops and/ or train/tube stations.
  - Details of cycle storage and cycle paths in the area including, if available, cycle path network maps for the whole town/ local area.
  - Details of car parking and information on available park and ride, car sharing schemes and/ or car pools/ renting in the area.
  - Details on how to get to local amenities in the area by public transport or cycling
- j. Local amenities
- The location of food shops, post box's, postal facilities, bank/cash points, pharmacies, schools, medical centres, leisure centres, community centres, places of worship, public houses, children's play areas, outdoor open

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- access public areas (the amenities used to score under Tra 3 must be covered)
  - and/ or
  - other local amenities such as dentists, places of interest/ cultural value, areas of beauty/ wildlife/ conservation, allotments etc.
- k. Responsible Purchasing
- White goods (low energy and water use)
  - Electrical equipment including light fittings and bulbs
  - Timber products from sustainable sources
  - Organic / food procurement / food growing / Local produce / Local food provision , e.g. farmers markets, organic basket schemes etc
- l. Emergency Information
- Contact details for emergency services including location of local minor injuries clinics and A&E departments
- m. Links, References and Further Information.
- This should include references/ links to other information including websites, publications and organisations providing information on how to reduce the environmental impact in terms of transport, the use of local amenities, responsible purchasing etc. Such links/ references may include links to sustrans (for cycle net works, [www.sustrans.org.uk](http://www.sustrans.org.uk)), the local authority (including information about recycling and waste tips), local transport providers (eg. bus or train companies), local amenities (such as leisure centres etc.)
  - In all instances both an address/ telephone contact number and a web link will need to be provided.

### *Flats*

5. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

6. This should be provided in addition to the Home Information Pack.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There are currently none for this issue..

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## **Further Information**

### *UK Building Regulations*

[www.safety.odpm.gov.uk/bregs/brads.htm](http://www.safety.odpm.gov.uk/bregs/brads.htm)

Part L1 (2006) requires the following information to be provided:  
Section 3: Criterion 5 – Providing Information

66 The building owner should be given information on the operations and maintenance of the heating and hot water systems and any mechanical ventilation and or cooling system. A way of complying would be the provision of a suitable set of operating and maintenance instructions in a format that households can understand. The instructions should be directly related to the particular system(s) installed in the dwelling. (This information will eventually form part of the Home Information Pack.)

67 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 seasonal adjustments to control settings and
- b) what routine maintenance is needed to enable operating efficiency to be maintained at a reasonable level through the service live(s) of the system(s).

*Home Information Pack (HIP)*

[www.odpm.gov.uk/homeinformationpacks](http://www.odpm.gov.uk/homeinformationpacks)

Home Information Packs are due to be introduced throughout England and Wales from the beginning of 2007.

*Home Conditions Review (HCR)*

The Home Conditions Review is likely to include the following:

Section A – terms of engagement

Section B – general information about the property

Section C – matters for further consideration by the conveyancer

Section D – condition of the exterior

Section E – condition of the interior

Section F – condition of the services

Section G – outbuildings, grounds, boundary walls and fences

Section H – energy performance certificate

*Energy Performance Certificate*

From certificate:

An Energy Performance Certificate gives a home's performance rating. This is calculated using the UK Standard Assessment Procedure for dwellings which gives you an energy efficiency rating based on fuel costs and an environmental impact rating based on carbon dioxide (CO<sub>2</sub>) emissions.

*Energy Savings Trust*

[www.est.org.uk/myhome](http://www.est.org.uk/myhome)

*UK water companies*

[www.water.org.uk](http://www.water.org.uk)

*WRAP – The Waste and Resource Action Plan*

[www.wrap.org.uk](http://www.wrap.org.uk)

*Recycle now*

[www.recyclenow.com](http://www.recyclenow.com)

*Sustran*

[www.sustrans.org.uk](http://www.sustrans.org.uk)

Find Local authority websites/ information through:

[www.direct.gov.uk/DI1/Directories/LocalCouncils](http://www.direct.gov.uk/DI1/Directories/LocalCouncils)

[www.oultwood.com/localgov](http://www.oultwood.com/localgov)  
[www.info4local.gov.uk](http://www.info4local.gov.uk)

[www.nationalrail.co.uk](http://www.nationalrail.co.uk)

[www.nationalexpress.co.uk](http://www.nationalexpress.co.uk)

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## Background

The Building Regulations Part L1 require on handover, the provision of information on the operation and maintenance of the heating and hot water systems and any mechanical ventilation and/or cooling system. Ecohomes requires an additional 'Home User's Guide' that contains the necessary details about the everyday use of the home in a form that is easy for the intended users to understand.

Without the provision of adequate information and guidance it is likely that the home may be used inappropriately leading to the dissatisfaction of occupants and wasted resources.

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## References

*Energy Savings Trust*  
[www.est.org.uk/myhome](http://www.est.org.uk/myhome)

*Building Regulations, Approved Documents Part L1a and L1b*  
[www.safety.odpm.gov.uk/bregs/brads.htm](http://www.safety.odpm.gov.uk/bregs/brads.htm)

## Man 2 Considerate Constructors

**Credits available: 2**

### Aim

To recognise and encourage construction sites managed in an environmentally and socially considerate and accountable manner.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	Where evidence can be provided to demonstrate that there is a commitment to comply with best practice site management principles.
2	Where evidence provided demonstrates that there is a commitment to go significantly beyond best practice site management principles.

### Applicability

The same approach is taken for both new build and refurbishment.

The whole development/site under assessment, must meet the requirements.

### Main Information to be Provided by the Developer

- Specifications must state a requirement for the appointed contractor to comply with the *Credit Requirements* and the *Guidance* below.
- Information must be provided that confirms:
 

EITHER

  - a commitment from the contractor, or on the contractor (if not yet appointed), to comply with the Considerate Constructors Scheme and achieve the appropriate score.

OR

  - a commitment from the contractor, or on the contractor (if not yet appointed), to comply with an equivalent local or nationally recognised independent scheme.
- The necessary information should be provided to allow the assessor to satisfactorily complete the appropriate checklist detailed in the *Supplementary Guidance* below.

### Guidance

- EITHER** of the following demonstrates compliance:
  - Considerate Constructors Scheme
 

A commitment from the contractor, or on the contractor (if yet not appointed) to comply with the Considerate Constructors Scheme (CCS) and achieve formal certification under the scheme. (See *Supplementary Guidance A: Checklist A1 – Considerate Constructors*)

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The two credits should be awarded as follows:

- One credit where there is a commitment to achieve a CCS score between 24 and 31.5;
- Two credits where there is a commitment to achieve a CCS score between 32 and 40.

Note: No credits can be awarded for the Considerate Constructors Scheme where any of the section scores within the scheme are less than 3, as this represents non compliance with the CCS code.

## OR

- Compliance with alternative scheme

A commitment from the contractor, or on the contractor (if yet not appointed), to comply with an **alternative, independently assessed scheme** monitoring construction site impacts and achieve the set out performance levels (See *Supplementary Guidance A: Checklist A2 – Compliance with an Alternative Scheme*)

The two credits should be awarded as follows:

- One credit can be awarded where the site is to be independently assessed using the alternative scheme and the alternative scheme addresses all the mandatory items plus 50% of the optional items in *Checklist A2*.
- Two credits can be awarded where the site is to be independently assessed using the alternative scheme and the alternative scheme addresses all the mandatory items plus 80% of the optional items in *Checklist A2*.

Note: It is the scheme or assessment criteria and NOT the project/development that is assessed against *checklist A2*.

2. Where the contractor is not yet appointed, the developer must either include within the specification, or commit to include, a requirement for the appointed contractor to comply with one of the above requirements. This requirement must clearly demonstrate that the site will comply with the relevant criteria. The assessor must use this information to complete the appropriate checklist.

### *Flats*

3. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

4. There is no specific guidance for refurbishments. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

**Supplementary Guidance**

*A: Checklist A1 – Considerate Constructors*

Checklist A1 is applicable where the Considerate Constructors Scheme (CCS) will be used.

**Checklist A1: Considerate Constructors**

NOTE: The Considerate Constructors Scheme awards scores on a scale of 0 to 5 with half points for each of the eight sections. The scores achieved or required are entered into the boxes 1-8 below i.e. EITHER 0; 0.5; 1; 1.5; 2.0; 2.5; 3.0; 3.5; 4.0; 4.5; OR 5.0.

- When a firm commitment is made to achieve certification under the Considerate Constructors Scheme without reference to particular scores, a score of 3 should be entered in each of the boxes 1-8 below. This gives a total score of 24 in box 9 below and subsequently one credit will be achieved.
- When a firm commitment is made to require the constructor to achieve certification AND a score greater than 3 is required in one or more sections, the scores required should be added in boxes 1 to 8 below.

**POST CONSTRUCTION REVIEW**

When certification can be demonstrated the actual scores achieved in each section should be quoted. No points will be achieved if any score falls below 3 as certification will not be achieved.

<b>Considerate Section</b> – Score achieved –	<input type="text"/>	1
<b>Environmentally Aware Section</b> – Score achieved –	<input type="text"/>	2
<b>Site Cleanliness Section</b> – Score achieved –	<input type="text"/>	3
<b>Good Neighbour Section</b> – Score achieved –	<input type="text"/>	4
<b>Respectful Section</b> – Score achieved –	<input type="text"/>	5
<b>Safe Section</b> – Score achieved –	<input type="text"/>	6
<b>Responsible Section</b> – Score achieved –	<input type="text"/>	7
<b>Accountable Section</b> – Score achieved –	<input type="text"/>	8
<b>TOTAL Considerate Constructors Score</b> (sum of 1-8)	<input type="text"/>	9

Total CC score achieved is less than 24	0 credits
Total CC score is between 24 to 31.5 incl.	1 credit
Total CC score is between 32 and 40 incl.	2 credits

**Award Credits based on total CC Score based on the table above**  10

*B: Checklist A2 – Compliance with an Alternative Scheme*

Checklist A2 is only applicable where the developer/ contractor has not used the Considerate Constructors Scheme (CCS) but has made a firm commitment to adopt



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an alternative independently assessed scheme covering the key issues in *Checklist A2*. To award these credits the contractor must comply with the criteria in the checklist.

The checklist is available on the Ecohomes extranet and can be accessed by licensed Ecohomes assessors.

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### Further Information

*Considerate Constructors*  
[www.ccscheme.org.uk](http://www.ccscheme.org.uk)

*Construction Industry Key Performance Indicators*  
[www.kpizone.com](http://www.kpizone.com)

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### Background

The Considerate Constructors Scheme is a UK certification scheme that encourages the considerate management of construction sites. It has been in operation since 1997 and was developed from local schemes in the City of London and City of Westminster. The scheme is operated by the Construction Confederation and is widely used in major or sensitive schemes.

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### References

See *Further Information* above.

## Man 3 Construction Site Impacts

**Credits available: 3**

### Aim

To recognise and encourage construction sites managed in an environmentally sound manner in terms of resource use, energy consumption, waste management and pollution.

### Credit Requirements

All dwellings in the development must meet the following criteria.

Credits	
1	Where evidence provided demonstrates that there is a commitment and a strategy to monitor, sort and recycle construction waste on site. AND
1	Where evidence provided demonstrates that 2 or more of items a-f, listed below are achieved. OR
2	Where evidence provided demonstrates that 4 or more of items a-f, listed below are achieved.
	<ul style="list-style-type: none"> <li>a. monitor and report CO<sub>2</sub> or energy arising from site activities;</li> <li>b. monitor and report CO<sub>2</sub> or energy arising from transport to and from site;</li> <li>c. monitor and report on water consumption from site activities;</li> <li>d. adopt best practice policies in respect of air (dust) pollution arising from the site;</li> <li>e. adopt best practice policies in respect of water (ground and surface) pollution occurring on the site.</li> <li>f. 80% of site timber is reclaimed, reused or responsibly sourced.</li> </ul>

### Applicability

The same approach is taken for both new build and refurbishment.

The whole development/site under assessment, must meet the requirements.

### Main Information to be Provided by the Developer

1. Specifications must state a commitment sufficient to meet the *Credit Requirements* and the *Guidance* below.
2. Confirmation, in writing, or documentary evidence is required from the developer that confirms that the requirements of the *Credit Requirements* and the *Guidance* below have been met.

### Guidance

1. EITHER of the following demonstrates compliance

- Where the developer can confirm, in writing, or provide documentary evidence that confirms that the requirements of checklist A3 'Construction Site Impacts' will be adhered to. The assessor must ask the project team for the name or job title of the individual/stakeholder who will have responsibility for ensuring compliance with each requirement.

OR

- Where the developer has made it a requirement in the contractor's contract that the site impacts are monitored and minimised in line with the requirements of checklist A3 'Construction Site Impacts' . The assessor must ask for written confirmation to demonstrate this and check that the requirements are in line with those required to achieve the credit/s.
2. Please see checklist A3 in the *Supplementary Guidance* for compliance requirements. To consider an item achieved, the requirements in the relevant box must be met.

### *Flats*

3. There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

4. There is no specific guidance for refurbishments. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

## **Supplementary Guidance**

### *A: Construction Site Impacts Checklists*

#### **Checklist A3 Construction Site Impacts**

<p><b>Commitment to monitor site construction waste</b></p> <p>The objective of monitoring site construction waste is to identify methods of waste reduction, reuse and/or recycling.</p> <p>1. Confirmation is required that the site's construction waste is being monitored. Confirmation can either be in the form of:</p> <ol style="list-style-type: none"> <li>a site specific waste policy or procedure,</li> <li>specification,</li> <li>letter of appointment or</li> <li>other formally written document.</li> </ol> <p>2. This point can be awarded where the client or contractor confirms that BRE's SMARTStart™ (part of the SMARTWaste™ system) scheme is to be used.</p> <p>Notes:</p> <p>1. Targets for waste minimisation during the construction process can be set using DTI's Environmental KPI benchmarks or BRE's Environmental KPI benchmarks. These documents do not specify targets but facilitate projects in setting appropriate targets by providing benchmark figures(see references section for further details).</p>
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2. Ecohomes does not require targets to be met but is encouraging the process of setting, monitoring and reporting against targets.
3. The implementation of a Site Waste Management Plan, will also help to manage the site construction waste produced. Data obtained from monitoring site construction waste can then be used to check performance against benchmarks set for site construction waste and the effectiveness of any solutions implemented.
4. For details on creating a Site Waste Management Plan see DTI's Voluntary Code of Practice: Site Waste Management Plans, Guidance for Construction Contractors and Clients or alternatively continuous improvement measures such as BRE's SMARTAudit waste reduction tool can be used. In England, DEFRA are looking to regulate for the use of Site Waste Management Plans by April 2007.
5. There are two Environmental KPI's used for waste generation on site. Firstly, waste from the construction process measured by waste generated in m<sup>3</sup> per 100m<sup>2</sup> of floor area. Secondly, waste measured from the construction process by waste generated in m<sup>3</sup> per £100,000 of project value. Constructing Excellence produces annual benchmarks for the second KPI. Significant reductions in waste and better management can be achieved through good design, improved logistics, better on-site construction practices and re-use/recycling wherever possible. The national average figures for construction waste are still evolving. Data from all types of construction sites is continuously collected, with the aim of developing benchmarks for different types of construction and waste. BRE's SMARTWaste System automatically calculates the Environmental KPI's for a project from the waste data collected and input into the system. Environmental KPIs have been used to benchmark waste minimisation for a number of schemes, including Greenwich Millennium Village and Chiswick Park.

#### Commitment to sort and recycle site construction waste

1. Waste must either be:
  - a. Re-cycled on site or
  - b. sorted on site and collected for recycling locally.
2. Confirmation is required that the site's construction waste will be sorted into at least five of the following categories and recycled / reused as appropriate. This confirmation can be in the form of a site specific waste policy or procedure, specification, letter of appointment for a waste / recycling contractor, or other formally written document.

Key Waste Group	Examples of Products in the Key Waste Group
Ceramics *	Bricks, ceramic tiles, clay roof tiles, ceramic toilets and sinks
Inert *	Solids, clays, sand, gravel, natural stone
Metals *	Radiators, metal formwork, metal sinks, cables and wires, metal bars
Packaging	Paint pots, pallets, cardboard, bubble wrap, cable drums, wrapping bands
Plastic	Gutters and downpipes, DPC, upvc windows and doors, socket boxes
Concrete *	Concrete pipes, kerb stones, paving slabs, concrete rubble, solid blocks
Insulation	Glass fibre, mineral wool, purlboard, breather paper
Miscellaneous	Office waste, canteen waste, vegetation, ad hoc materials
Plaster / Cement	Plasterboard, render, plaster, cement, fibre cement sheets, mortar

Timber *	Plywood, chipboard, noggins, battens, doors, windows, mdf, timber off cuts and surplus materials
Liquids and Oils	Hydraulic oil, engine oil, lubricating oil, transmission oil, liquid fuel, cleaning agents, mould oil
Architectural Features	Chimneys, façades, fireplaces, roof tiles and reclaimed bricks.

3. In some cases such as minor refurbishments it will not be feasible to recycle 5 of the key waste groups. This may be because the materials are not present or because there is insufficient quantity (i.e. less than 4.5m<sup>3</sup> of material). In such cases the point may be awarded if all applicable groups on the list above are being recycled.

4. It should be possible to recycle the five basic materials (marked\*) locally, other recyclable material groups will be dependent on local facilities / sites. Note: [www.bremap.co.uk](http://www.bremap.co.uk) can be used to locate the nearest recycling facilities.

5. Where space on site is too limited to allow waste materials to be segregated, a waste contractor may be used to separate and process recyclable materials off site. Where this is the case, sufficient documentary evidence must be produced which demonstrates that segregation of materials is carried out to the correct standards and that materials are re-used / recycled as appropriate.

**a. Commitment to monitor, report and set targets for CO<sub>2</sub> production or energy use arising from site activities**

1. Confirmation is required that monthly measurements of energy use will be recorded and displayed on site.
2. Appropriate target levels of energy consumption must be set and displayed (targets could be annual, monthly, or project targets).
3. As a minimum monitoring must include checking the meters and displaying some form of graphical analysis in the site office to show consumption over the project duration and how actual consumption compares to the targets set.
4. The design/site management team is to nominate an individual who will be responsible for the monitoring and collection of data.

Note:

1. Targets for energy consumption during the construction process can be set using DTI's Environmental KPI benchmarks. These documents do not specify targets but facilitate projects in setting appropriate targets (see references section of main credit for further details).
2. Ecohomes does not require targets to be met but is encouraging the process of setting, monitoring and reporting against targets.

**b. Commitment to monitor and report CO<sub>2</sub> or energy arising from commercial transport to and from the site**

1. Confirmation is required that a site monitoring system will be in place to monitor and record deliveries. This system will need to record:
  - a. The number of deliveries,
  - b. The mode of transport,

## c. The kilometres/miles travelled for all deliveries.

- Where the delivery is specifically for the site, a figure of total distance travelled should be used, i.e. a round trip (from the point of origin, to the site and back to the point of origin).
  - Where the delivery to the site is part of a multiple delivery route, the recorded figure for distance travelled should be the distance travelled to the site (from the previous delivery), plus the distance to the next delivery or return.
2. This information can then be used to estimate a total figure for kg of CO<sub>2</sub> for the project. Ecohomes does not require this information to be converted to CO<sub>2</sub> but the information must be made available to the senior project and site management staff / suppliers to establish benchmarks and aid future decision making towards improving site and transport efficiency. If the project team wishes to convert this information into CO<sub>2</sub> emissions, there are tables provided at the end of this checklist, which can be used.
  3. If the design team or contractor confirms that the project is aiming to achieve the "Construction Site Transport" 'measures for traffic movements and distances' (published April 2003, see references) then this aspect has been achieved automatically. The information obtained for this item can also be used to satisfy the DTI's Environmental KPI on transport.
  4. The design/site management team is to nominate an individual who will be responsible for the monitoring and collection of data.

Note: Please see further information below on monitoring site transport CO<sub>2</sub>.

**c. Commitment to monitor, report and set targets for water consumption arising from site activities**

1. Compliance is demonstrated by the design / site management team confirming, in writing, that monthly measurements of water consumption will be recorded and displayed on site.
2. Appropriate target levels of water consumption must be set and displayed (targets could be annual, monthly or project targets).
3. As a minimum monitoring must include checking the meters and displaying some form of graphical analysis in the site office to show consumption over the project duration and how actual consumption compares to targets set.
4. The design/site management team is to nominate an individual who will be responsible for the monitoring and collection of data.

Note:

1. Targets for water consumption during the construction process can be set using DTI's Environmental KPI benchmarks. These documents do not specify targets but facilitate projects in setting appropriate targets (see references section of main credit for further details).
2. Ecohomes does not require targets to be met but is encouraging the process of setting, monitoring and reporting targets.

**d. Commitments to adopt best practice policies in respect to air (dust) pollution**

1. Confirmation is required of the site's procedures to minimise air / dust pollution. This can include
  - a. 'dust sheets',
  - b. regular proposals to damp down the site in dry weather,
  - c. covers to skips etc.
2. The site team must indicate how this information is disseminated to site operatives.

Note:

DTI/BRE publications 'Control of Dust from Construction and Demolition Activities' and Pollution Control Guide Parts 1-5 provide good practice guidelines on construction related pollution (refer to References)

**e. Commitment to adopt best practice policies in respect to water (ground and surface) pollution**

1. Confirmation is required of the site's procedures to minimise water pollution following best practice guidelines outlined in the following documents.
  - a. PPG 1 – General guide to the prevention of pollution. Environment Agency
  - b. PPG 5 – Works in, near or liable to affect watercourses. Environment Agency
  - c. PPG 6 – Working at demolition and construction sites. Environment Agency
2. The site team must also indicate how this information is disseminated to site operatives.

**f. Commitment to source timber used during construction from sustainably managed sources**

80% of timber used during construction, including formwork, site hoardings and other temporary site timber used for the purpose of facilitating construction, is to be procured from sustainably managed sources, independently certified by one of the top two levels as set out in the Responsible Sourcing of Materials credit, MW8, in the Materials section.

1. Re-used timber from off site can be counted as equivalent but reusable formwork only complies if it meets the above criteria.
2. This credit can be awarded where all the timber used is reclaimed timber

**Assessor Information for Monitoring on Site Transport CO<sub>2</sub>**

Good Practice Guide (GPG) 273 describes types of software systems available to monitor transport routes. These systems could be adapted to provide the information requested by the transport section of this credit in addition to providing the other benefits outlined in GPG 273 (such as savings in cost and time).

The following tables are taken from the DEFRA 'Guidelines for Company Reporting on Greenhouse Gas Emissions' and COPERT II emission factors, and can be used to convert the information gathered from monitoring deliveries into total kg CO<sub>2</sub>.

**Table 1: Standard road transport fuel conversion factors**

Fuel used	Total units used	Units	x	kg CO <sub>2</sub> per unit	total kg CO <sub>2</sub>
Petrol		litres	x	2.31	
Diesel (inc. low sulphur)		litres	x	2.68	
Compressed Natural Gas		kg	x	2.67	
Liquid Petroleum Gas		litres	x	1.51	

Source: *Guidelines for Company Reporting on Greenhouse Gas Emissions, DEFRA. National Air Emissions Inventory, UK Greenhouse Gas Inventory, Digest of UK Energy Statistics DTI 1998, Greenhouse Gas Inventory Reference Manual IPPC 1996.*

**Table 2: Standard road transport fuel conversion factors**

Size of car and distance units	Total units travelled	Units	x	kg CO <sub>2</sub> per unit	total kg CO <sub>2</sub>
Small Petrol Car Max. 1.4 litre engine.		litres	x	0.28	
		km	x	0.17	
Medium Petrol Car Max. 1.4 -2.1 litre engine.		litres	x	0.36	
		km	x	0.22	
Large petrol car above 2.1 litres		litres	x	0.44	
		km	x	0.27	
Average Petrol Car		litres	x	0.33	
		km	x	0.20	

Source: *Guidelines for Company Reporting on Greenhouse Gas Emissions, DEFRA. COPERT II emission factors and Transport Research Laboratory data, combined with real road testing data*

**Table 3: Standard road transport fuel conversion factors**

Size of car and distance units	Total units travelled	Units	x	kg CO <sub>2</sub> per unit	total kg CO <sub>2</sub>
Small Diesel Car 2.0 litres and under		litres	x	0.19	
		km	x	0.12	
Large diesel car over 2.0 litres Petrol Car Max. 1.4 -2.1 litre engine.		litres	x	0.23	
		km	x	0.14	
Average Diesel Car		litres	x	0.20	



		km	x	0.12	
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Source: Guidelines for Company Reporting on Greenhouse Gas Emissions, DEFRA. COPERT II emission factors and Transport Research Laboratory data, combined with real road testing data

**Table 4: Freight road mileage Conversion Factors**

Type of lorry	Total km travelled	X	Litres fuel per km	x	Fuel conversion factor	Total kg CO <sub>2</sub>
Articulated		X	0.35	x	Petrol 2.31	
				x	Diesel 2.68	
				x	LPG 1.51	
Rigid		X	0.40	x	Petrol 2.31	
				x	Diesel 2.68	
				x	LPG 1.51	

Source: Guidelines for Company Reporting on Greenhouse Gas Emissions, DEFRA. Continuing Survey of road Goods Transport 2001.

**Further Information**

See References below.

**Background**

Construction sites are responsible for significant impacts, especially at a local level. These arise from disturbance, pollution and waste. Impacts such as energy and water use are also significant (although minor in relation to the overall impacts of the building).

**Pollution**

Construction has the potential for major pollution, largely through pollution to air (through dust emission), and to watercourses and ground water. BRE publishes guidance on construction site dust management, whilst the Environment Agency publishes guidance on water pollution control measures. There are significant statutory requirements in this area under environmental health legislation and the Environmental Protection Act. The Environment Agency and local Environmental Health Officers police these.

**Energy**

Energy Management on site has been a key focus for the Construction Confederation, and they have published specific guidance (referenced below) to help achieve this. Monitoring and reporting at site level are the key factors in raising awareness of the impacts of energy consumption. Whilst total energy is frequently monitored this information is predominantly used to feedback into the tendering process and is seldom used to seek improvements on the site in question.

**Waste**

Waste management on site is an important issue. BRE, CIRIA and others publish detailed guidance on waste minimisation referenced below. BRE operates the SMARTWASTE™ [18] system. SMARTstart™, a key part of the SMARTWASTE™ system, monitors construction and demolition wastes, segregation targets, and calculates Environmental Performance Indicators (EPI's). The system also identifies opportunities for reuse and recycling and the location of suitable facilities for this.

The ability to segregate waste will depend on the stage that has been reached in the construction project as the production of waste varies with the type of building work being carried out.

The removal of construction waste from site is subject to legislative requirements. It is not the responsibility of the assessor to ensure compliance with such legislation.

### Targets

Targets are requested in the Ecohomes credit to promote the process of setting, monitoring and achieving targets. Ecohomes does not set targets, as these are very project specific. For guidance on setting targets refer to DTI's Construction Industry KPI Pack, this series of documents guides the reader through setting targets for their own projects.

### References

*Sustainability Action Plan* (or *Achieving Sustainability in Construction Procurement*); Government Construction Client's Panel (GCCP), Office of Government Commerce (OGC)

*DTI Construction Industry KPI Pack*, includes Methods of Measurement, Handbook, KPI Wall Chart, ([www.constructingexcellence.org.uk](http://www.constructingexcellence.org.uk)), 2005

"Construction Site Transport", April 2003. *Measures for traffic movements and distances*, BRE and DTI. Available from: [www.bre.co.uk/pdf/constructiontraffic.pdf](http://www.bre.co.uk/pdf/constructiontraffic.pdf)

*Guidelines for Company Reporting on Greenhouse Gas Emissions*, Annex 6 Transport conversion tables, DEFRA 2002.

*COPERT II Computer programme to Calculate Emissions from Road Transport - Methodology and Emissions Factors*. Technical report No <http://reports.eea.eu.int/TEC06/en>

Good Practice Guide (GPG) 273

*NERA Report on lorry track and environmental costs* – DETR 1999  
<http://www.roads.dtlr.gov.uk/nerarep/index.htm>  
[www.ccscheme.org.uk](http://www.ccscheme.org.uk)

PPG 1 – *General guide to the prevention of pollution*. Environment Agency  
PPG 5 – *Works in, near or liable to affect watercourses*. Environment Agency  
PPG 6 – *Working at demolition and construction sites*. Environment Agency

*Control of Dust from Construction and Demolition Activities*; BRE (Feb 2003)  
Pollution Control Guide Parts 1-5; BRE (2003)

*Waste minimisation, an environmental good practice guide for industry* – Environment Agency, 2001.

Special Publication 133: *Waste minimisation in construction, a site guide* – CIRIA 1997.

*Waste minimisation and recycling in construction* – Technical review: CIRIA 1999  
*Waste minimisation and recycling in construction* – Design Manual: CIRIA 1998

**SMARTWASTE™**

<http://www.bre.co.uk/search.jsp?q=smartwaste> or [www.smartwaste.co.uk](http://www.smartwaste.co.uk)

Site Waste Management Plans, *Guidance for Construction Contractors and Clients, Voluntary Code of Practice*, DTI, 2004

*BREMAP, a geographical information system of waste management facilities:*  
[www.bremap.co.uk](http://www.bremap.co.uk)

BRE Good Building Guide GBG57 Part 1 and 2, *Construction and Demolition Waste*, 2003

IP9/03 *Best Practice of Timber Waste Management*, 2003

IP8/02 *Construction Site Packaging Wastes: A market position report*, 2002

Digest 447 *Waste Minimisation on a Construction Site*, 2000

Greenwich Millennium Village *Waste Audit and Minimisation Scheme: Site Guide and Project Management Guide*, 2003, [www.smartwaste.co.uk/smartaudit/gmv.jsp](http://www.smartwaste.co.uk/smartaudit/gmv.jsp)

*The Carbon Trust* [www.thecarbontrust.co.uk/energy](http://www.thecarbontrust.co.uk/energy) (formally the Energy Efficiency Best Practice Programme (EEBPP), and Action Energy.)

## Man 4 Security

**Credits available: 2**

### Aim

To encourage the design of developments where people feel safe and secure; where crime and disorder, or the fear of crime, does not undermine quality of life or community cohesion.

### Credit Requirements

Credits	
1	A commitment to work with an Architectural Liaison Officer and to achieve the Secured by Design award.
1	Security standards for external doors and windows to achieve a minimum of either: <ul style="list-style-type: none"> <li>• LPS1175 SR1 (All doors and windows) OR</li> <li>• PAS24-1 (All external pedestrian doorsets falling within scope of PAS24-1) AND BS7950 (All windows falling within the scope of BS7950)</li> </ul>

### Main Information to be Provided by the Developer

1. Specifications or similar document must state details sufficient to meet the *Credit Requirements* and the *Guidance* below. This should include:
  - a commitment to work with an Architectural Liaison Officer and achieve the Secure By Design award for the development. Details of features that will be included in the development in order to achieve the award should also be included.
  - and/or
  - details of the external doors and windows and their third party certification levels.
2. Evidence that an Architectural Liaison Officer (ALO) has been contacted at an early stage of the design, preferably before detailed planning and that their advice will be followed.

### Guidance

1. If the details are stated in the specification, they should also be on the drawings.
  - Relevant drawings would be the site layout, general arrangement, electrical or similar, where the location and details of all security measures are shown, including features such as external lighting, door/ window locks etc.
2. As the 'Secured by Design' scheme covers site layout, external lighting, car-parking, planting, footpaths, communal areas, doors and windows etc, the advice of the Architectural Liaison Officer (ALO) should be sought at a very early stage in the design.
3. The assessor needs to verify that an Architectural Liaison Officer (ALO) has been appointed and that the developer has sought and adopted the ALO's

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recommendations in the early design stages. There should be a firm commitment to follow the advice of the ALO during the latter design stages and to achieve the 'Secure By Design' award. The ALO also needs to confirm that the developer is designing the development in a way that is likely to grant them the award.

4. The Assessor needs to confirm that specified doors and windows comply with the minimum security standards. If specific doors or windows have been specified details of those should also be on the drawings.
5. Door and window certification details and/or a copy of the Secure By Design Award will need to be kept for the Post Construction Review stage or in case of a BRE audit.

### *Flats*

There is no specific guidance for flats/apartments. The standard approach should be followed.

### *Refurbishment*

There is no specific guidance for refurbishment. The standard approach should be followed.

### *Special Cases*

There are currently none for this issue.

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## **Supplementary Guidance**

There are currently none for this section

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## **Further Information**

### *Secured by Design*

<http://www.securedbydesign.com/index.asp>

### *Safer Places - The Planning System & Crime Prevention*, ODPM.

[www.odpm.gov.uk](http://www.odpm.gov.uk)

*Guide to Security Standards for Doors and Windows* (May 2002) prepared with the support of LPCB, Secured by Design and BSIA, and is available from <http://securebydesign.com/index.asp>

LPS 1175: Issue 5.1, 2004: *Specification for testing and classifying the burglary resistance of building components, strong-points and security enclosures.*

<http://www.brecertification.co.uk/pdf/LPS1175-5.2.pdf>

BS 7950:1997 *Specification for enhanced security performance of windows for domestic applications.*

PAS 24-1:1999 *Enhanced security performance requirements for door assemblies. Single and double leaf, hinged external door assemblies to dwellings.*

### *British Standards Online (PAS24-1 and BS7950)*

<http://www.bsonline.bsi-global.com/server/index.jsp>

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## Background

“Safety and security are essential to successful, sustainable communities. Not only are such places well-designed, attractive environments to live and work in, but they are also places where freedom from crime, and from the fear of crime, improves the quality of life.

Sustainable communities are communities which succeed now, economically, socially and environmentally, and respect the needs of future generations. They are well-designed places where people feel safe and secure; where crime and disorder, or the fear of crime, doesn't undermine quality of life or community cohesion.”

(from Safer Places - The Planning System & Crime Prevention, ODPM)

‘Secured by Design’ is a free certification scheme run by the police, who provide an Architectural Liaison Officer to give advice to a developer. The scheme covers site layout, external lighting, car-parking, planting, footpaths, communal areas, doors and windows etc.

The ‘Secure By Design’ award does not signify that premises are crime proof, but that they have been subjected to a minimum standard of security that, in the experience of the police service and other agencies, can significantly reduce the risk of crime. Local conditions may require additional or alternative measures.

Research shows that Secured by Design can reduce burglary and car crime by 50% and criminal damage by 25%.

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## References

See *Further Information*.