



**21.13.0 BEST PRACTICE - WHOLE SITE
BREEAM ENVIRONMENTAL COMPETITION STANDARD (PLUS)**

The Building Research Establishment (BRE) Environmental Standard is an environmental standard for new housing which has been in use in the United Kingdom for 3 years[1]. It sets a range of criteria against which a housing development is assessed, where these criteria have been met credits are awarded. It is based on a pass/fail system, those schemes which meet the necessary number of criteria are awarded the environmental standard, those meeting a very high standard (the Competition level) are put forward for an annual competition for outstanding environmental design. This development will comply with the competition level set out in the published BRE document with a number of additional features. The features which are marked with a * go beyond the BREEAM competition standard.

The table below gives a detailed breakdown of the credits requirement to achieve both the Environmental Standard Award and the Competition level.

Environmental Standard Award - credit summary						
Key: M - Mandatory O - Optional		Standard		Competition		
		M	O	M	O	
Global credits	Carbon dioxide emissions < 30kg/m2/year	X		X		
	All insulants with ODP < 0.1	X		X		
	All solid timber from well managed sources	X		X		
	All timber panel products from well managed sources	X		X		
	Storage for recyclable materials	X		X		
	Carbon dioxide emissions < 19kg/m2/year		X	X		
	All insulants with ODP 0		X	X		
	Low energy lighting		X	X		
	gas cooking point		X		X	
	50% re-used or recycled material in the roof covering		X		X	
	50% re-used or recycled material walls or floor		X		X	
	Demolition materials for fill and hardcore		X		X	
	Timber frame construction		X		X	
	Credit requirement (mandatory + optional)		5	3	8	3
Local credits	Ecological damage to site minimised			X		
	Re-use of existing site				X	
	Ecological value enhanced				X	
	6 litre flush WCs				X	
	Rain water butt				X	
Credit requirement (mandatory + optional)		0	2	1	3	
Indoor credits	Formaldehyde, timber treatment, asbestos and lead			X		
	Control of fibrous insulation				X	
	House log book				X	
	Daylighting			X		
	Credit requirement (mandatory + optional)		1	1	2	1

21.13.1 Energy

As well as energy use for heating and hot water discussed in section 21.12.0, the following areas of energy consumption will also be addressed by the design:

Low energy light fittings

Low energy light fittings will be specified which separate the ballast/control gear from the tube in the compact fluorescent light. These have the advantage that when the tube eventually fails (after approximately 10,000 hours) it can be replaced without having to replace the ballast as well (as in a conventional low energy light bulb). The cost of the replacement tube is only about £2. Negotiation would need to be made with local retail units to ensure that replacement bulbs are easily available as the fittings would not take conventional tungsten filament bulbs.

Points for gas cooker

Providing points for gas cookers encourages the occupants to use gas cookers instead of electric cookers. Cooking by gas reduces primary energy consumption and carbon dioxide emissions.

Design for long life

By choosing long life low maintenance materials and ensuring quality of construction the life of the building can be extended in order to reduce the energy and cost implications of future maintenance, refurbishment or rebuilding.

Low energy appliances *

The occupants of the houses will be encouraged to buy low energy appliances (eg fridge, freezer, cooker, washing machine, tumble drier, dishwasher). Energy use can be indicated by the Energy Label system which has a rating system showing how much energy an electrical appliance consumes every year with normal use.

An A rated appliance will use about 55% of the electricity of a similar size appliance with a D rating. The labels are now compulsory with the European Union. Traditionally appliances have been built for convenience and not energy efficiency.

Ventilation

Passive stack ventilation systems (PSVs) will be considered for incorporation into all the housing to ventilate the kitchens and toilets.*

Although the energy costs associated with modern energy efficient extract fans are relatively small, tenants who are trying to cut down on the money they spend on energy can often take the fuses out to stop the system running with obvious knock on effects on condensation build up and damage to the internal paint work etc. PSVs have the advantages that they would not be turned off to save money and also no maintenance is required.

It is essential that the design of the psv is included very early in the design of the house, as integral design of the roof ridge tiles and the ducting is essential for the system to work effectively. Control will be provided by humidistats on the opening vents.

21.13.2 Health

Design for daylight

The housing will be designed to provide a daylight factor of 1.5% in living rooms and 2% in kitchens which is in line with the recommendations of the Building Research Establishment (BRE).

Low NOx boilers

Boilers will be chosen which have a low NOx emission rate (below 100 mg/kWh) of delivered energy, therefore reducing atmospheric pollution to the local environment.

Hazardous materials

The use of the following compounds will be minimised so that emissions to the indoor environment are minimised:

- Volatile Organic Compounds (VOCs)
- Formaldehyde (eg in medium density fibreboard, particleboard)
- Timber preservatives (only used where necessary)
- PVC

The use of the following materials will be prohibited:

- asbestos
- urea formaldehyde foam insulation (UFFI)

21.13.3 Materials with low environmental impact

Low embodied energy

Wherever possible preference will be given to materials which have a low embodied energy such as timber, recycled or waste materials (eg pulverised fuel ash in blockwork). Reference will be made to the Handbook of Sustainable Building in the selection of materials.*

Recycled cellulose fibre (eg warmcell) insulation will be specified for the roof. This will be also be specified if timber frame "breathing" wall construction is adopted for any of the housing.*

Ozone Depletion

No materials will be specified which have an ozone depletion potential. More specifically insulants containing CFC or HCFCs will be prohibited.

Timber

All solid timber or composite timber products will be sourced from well managed, sustainable sources. If possible preference will be given to local timber sources and to those certified by the Forest Stewardship Council (FSC).

21.13.4 Water

The following features will be specified to reduce water consumption:

- water butts to collect rainwater which can then be used for water gardens during dry periods.
- low flush WCs - 6 litre flush toilets will be specified. WCs with a lower flush will also be investigated as systems may become available over the course of the construction. WCs with a flushing capacity of 3.5 litres are common and well proven in some Northern European countries.
- Shower attachments for all the baths as well as shower curtain rails.

21.13.5 Transport

Cycle use

In order to encourage the use of bicycles, secure and sheltered bike storage will be considered at the front of the houses with easy access.

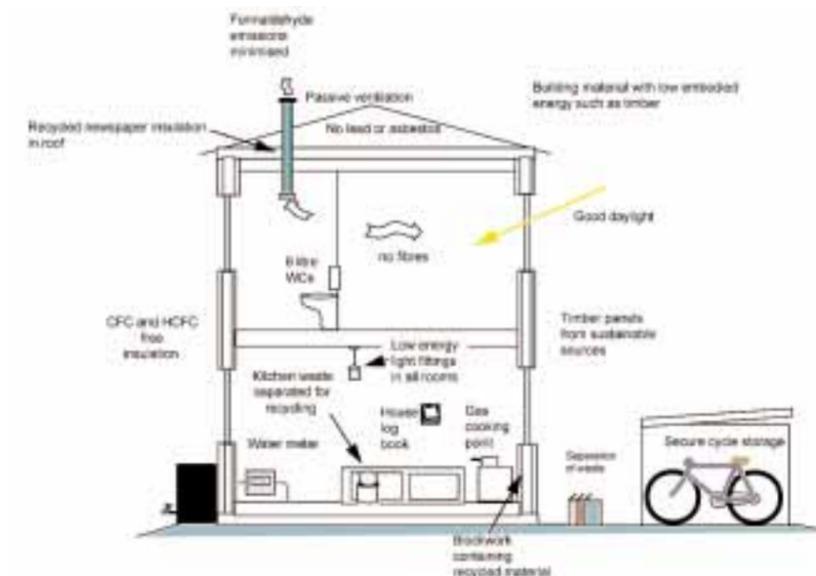
Home working

The facility for the installing high speed ISDN lines and cable television will be considered in all the housing. This will enable the occupants to work from home and if they wish and it will also mean that aerials will not be needed on the roofs of the houses. The house designers will also be encouraged to find ways of incorporating spaces which can be used as offices, either as separate rooms or on landings.*

21.13.6 Waste

A storage area will be provided outside the houses so that a number of bins can be provided for separating waste.

In addition construction waste will also be separated and the contractors will be required to train all staff using CIRIA waste minimisation in construction training pack (ref: CIRIA special publication 148).*



**Figure 3 - Best Practice:
BREEAM Environmental Competition Standard (Plus) - Site Wide**

21.14. BEYOND BEST PRACTICE - INNOVATION - 5% OF HOUSES (140 Houses)

21.14.1 Solar water heating

Solar water heating systems will be installed on the roofs of the houses. The water heated by the solar panels will run through a secondary coil in the hot water cylinder. Primary heating will be provided by a conventional boiler.

Low energy appliances

First time buyers will be offered a package of low energy white goods. The occupants of the houses will be encouraged to buy low energy appliances (see 21.13.1) and appliances with Ecolabels. Ecolabels give a complete lifecycle indication of the environmental impact of an electrical appliance. At present these are sought by manufacturers on a voluntary basis.

21.14.2 Health

Hazardous materials

The use of the following compounds will be prohibited in these houses:

- Formaldehyde (solid timber only - no mdf or particleboard)
- PVC - this may prove to be difficult in practice and may be moved into the experimental section. It is difficult at present to obtain alternatives to PVC at a similar cost, particularly in application such as wiring and fittings.

21.14.3 Materials with low environmental impact

The following natural materials will be used

- natural oils or waxes instead of varnishes and preservatives
- natural floor - linoleum
- timber floors
- grass blocks instead of asphalt/concrete

The following compounds will be used:

- fast drying water based paints
- fast drying glues instead of epoxies

Paint and plasterboard will be specified instead of wall paper.