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A NEW NATIONAL STANDARD

The Code for Sustainable Homes has been developed to enable a step change in sustainable building practice for new homes. It has been prepared by the Government in close working consultation with the Building Research Establishment (BRE) and Construction Industry Research and Information Association (CIRIA), and through consultation with a Senior Steering Group consisting of Government, industry and NGO representatives.

The Code is intended as a single national standard to guide industry in the design and construction of sustainable homes. It is a means of driving continuous improvement, greater innovation and exemplary achievement in sustainable home building.

The Code will complement the system of Energy Performance Certificates which was introduced in June 2007 under the Energy Performance of Buildings Directive (EPBD). The EPBD will require that all new homes (and in due course other homes, when they are sold or leased) have an Energy Performance Certificate providing key information about the energy efficiency/ carbon performance of the home. The HIP package now contains an energy assessment of each home as it is sold but there is no compulsion to improve on the energy efficiency of the existing home.

THE NEED FOR SUSTAINABLE HOMES

The Stern Review highlighted, there is now an overwhelming body of scientific evidence showing that climate change is a serious and urgent issue. In 2004, more than a quarter of the UK's carbon dioxide emissions – a major cause of climate change – came from the energy we use to heat, light and run our homes. So it's vital to ensure that homes are built in a way that minimises the use of energy and reduces these harmful emissions.

Construction and use of our homes has a range of other environmental impacts, for example through water use, waste generation and use of polluting materials, all of which can be significantly reduced through the integration of higher sustainability performance standards within the design of a home.

Current house building plans therefore offer an important opportunity to build high standards of sustainability into the home we will use in the future. It is incumbent upon the local authorities to support , wherever possible, homes that both limit the energy use in the selection of materials during the construction and the energy consumption for the completed home.

SUSTAINABLE DESIGN PRINCIPLES THAT WILL LEAD THIS PROPOSAL FOR A NEW HOME AT 62 AVENUE ROAD

The Code for Sustainable Homes measures the sustainability of a home against numerous design categories, rating the 'whole home' as a complete package.

The nine design categories included within the Code are:

- energy/CO_2
- water
- materials
- surface water run-off
- waste
- pollution
- health and well-being
- management
- ecology

THE EXISTING HOUSE

The existing house at 62 Avenue Road was built 60 years ago and has little energy conservation features. The walls are of un-insulated brick construction: there is no insulation under floor; the windows are single glazed and draughty; poor roof insulation. The energy that goes into heating this home in considerable. The lighting throughout the house is high energy tungsten.

In short the energy consumption for the existing house is far beyond modern standards and is burning fossil fuel at an alarming rate compared to new housing standards. Adding an extension and altering the existing house will improve the situation. However, in this instance, there is the chance to "start again" and create a modern family home, with a traditional look, a sustainable home for the family through their old age and a home that will use far less fossil fuel energy for its lifetime.

THE OBJECTIVE FOR THE PROPOSED NEW HOUSE

In this era, with a more environmentally conscious public, aware of the urgent need to limit their effects on climate change, there is a growing appetite amongst consumers for more sustainable products and services. With greater demand for homes that offer reduced environmental impact, lower running costs and features that enhance health and well-being, there is an increased need for home builders to demonstrate their capacity in sustainable home building, and to market the sustainability of their homes to homebuyers.

My client needs the support of the local authority to allow a new home that can be built to achieve the highest standards in design and sustainability

The new building will be very highly insulated to prevent heat loss through the external structure. The U value of each element of wall and floor will exceed those required by the Building Control Department.

The general heating of the building will be provided by the latest energy efficient condensing boiler.

A grey water recycling plant is to be installed in the plant room to reduce water usage. The water from the rainwater, showers and bath will be collected and stored in large containers and used for flushing W.C., washing machine and garden watering. Thus re-cycling a natural resource at least once.

Wherever possible materials will be sourced from UK suppliers. It is hoped that no material will be required that shall need to be sourced from any country further than Europe.

BENEFITS FOR THE ENVIRONMENT

• **Reduced greenhouse gas emissions:** With maximum standards for energy efficiency, there will be a reduction in greenhouse gas emissions to the environment. This will enable us to reduce the threat from climate change.

• **Better adaptation to climate change:** The Building Regulations (Approved Document L – 2006) already limit the effects of solar gains in Summer. With maximum standards for water efficiency, including better management of surface water run-off, the proposed house will be better adapted to cope with the impacts of climate change which are already inevitable.

• **Reduced impact on the environment overall:** Inclusion of measures which promote the use of less polluting materials, and encourage household recycling, will ensure that the proposed house has fewer negative impacts overall on the environment.

BENEFITS FOR LOCAL AUTHORITY

BY SUPPORTING THE OBJECTIVES SET ABOVE THE BOROUGH OF CAMDEN WILL BE ABLE TO SHOW THE FOLLOWING POSITIVE

• **A mark of quality:** Increasing media attention and public concern over environmental issues, notably climate change, has given rise to a growing appetite among the electorate for more sustainable homes. The support of new fully Sustainable Homes can be used by the media to demonstrate the sustainability performance of the authority.

• **Regulatory certainty:** The levels of performance for energy efficiency indicate the future direction of the Borough, bringing greater regulatory certainty for other home builders, and acting as a guide to support effective and sustainable development within Camden.

• **Raised sustainability credentials:** In supporting this application the Borough of Camden demonstrate their sustainability credentials to the public and central Government.

BENEFITS FOR THE CLIENT

• **Lower running costs:** Homes built to high thermal efficiency will allow considerably lower running costs through greater energy and water efficiency so helping to reduce fuel poverty.

• **Improved comfort and satisfaction:** The new home built to achieve a comfort level that will enhance the comfort and satisfaction of the applicant, his immediate family, and all those who visit and use the house.

• **Reducing environmental 'footprint':** By building an energy efficient house the applicant and his family will reduce their own 'carbon footprint' on the environment.

THE CODE FOR SUSTAINALBE HOMES

The Code for Sustainable Homes has been developed using the Building Research Establishment's (BRE) EcoHomes System, which has already achieved success in reducing the impact of affordable housing projects, in particular within the social housing sector.

The Code builds upon EcoHomes in a number of ways, for example:

- the Code introduces minimum standards for energy and water efficiency at every level of the Code, therefore requiring high levels of sustainability performance in these areas for achievement of a high Code rating;

- the Code uses a simpler system of awarding points, with more complex weightings removed;

- the Code includes new areas of sustainability design, such as Lifetime Homes and inclusion of composting facilities;

ACHIEVING A SUSTAINABILITY RATING

The sustainability rating that a home achieves represents its overall performance across the nine Code design categories.

The tables that follow shows the minimum standards, and number of points required in order to achieve each level of the Code: It is the clients aim to achieve a minimum of Grade 4 to comply with "New basement Development" - Code for Sustainable Homes Assessment - Any proposals for basement development will be required to adopt sustainable design and construction measures to meet Level 4 of the Code for Sustainable Homes or BREEAM 'very good' or 'excellent' ratings.

Upon receiving planning permission Leematec Technologies will be employed to advise on Sustainable performance to achieve Level 4.

Achieving a sustainability rating

	Minimum Standards				
	Energy		Water		
Code Level	Standard (Percentage better than Part L[1] 2006)	Points Awarded	Standard (litres per person per day)	Points Awarded	Other Points[4] Required
1(★)	10	1.2	120	1.5	33.3
2(★★)	18	3.5	120	1.5	43.0
3(★★★)	25	5.8	105	4.5	46.7
4(★★★★)	44	9.4	105	4.5	54.1
5(★★★★★)	100[2]	16.4	80	7.5	60.1
6(★★★★★★)	A zero carbon home[3]	17.6	80	7.5	64.9

Notes

1. Building Regulations: Approved Document L (2006) – 'Conservation of Fuel and Power.'
2. Zero emissions in relation to Building Regulations issues (i.e. zero emissions from heating, hot water, ventilation and lighting).
3. A completely zero carbon home (i.e. zero net emissions of carbon dioxide (CO_2) from **all** energy use in the home).
4. All points in this document are rounded to one decimal place.

ASSESSING THE SUSTAINABILITY RATING

Assessment procedures will be transparent and technically rigorous, whilst at the same time straightforward and beneficial to all parties.

The method will be similar to BRE's EcoHomes System which depends on a network of specifically trained and accredited independent assessors.

A design stage assessment will need to be carried out on once planning permission has been established

Once planning permission has been granted it is intended to have the independent assessor advise on the most suitable forms of energy saving suitable for this site and aim to achieve a high rated home. It will be at this stage that the materials and methods of construction together with energy saving features are looked at as a whole in order to minimize the energy consumption during the building of the home and the running costs of living in the completed home.

Category 1 – Energy/CO_2		
Issue	**Measurement Criteria**	**Points Awarded**
Target Emission Rate (TER) as defined by 2006 Building Regulation Standards	Points for percentage improvement over Building Regulations Approved Document L (2006) – Conservation of Fuel & Power; calculated using SAP:2005	One of the following Point scores
	10%	1.2
	14%	2.4
	18%	3.5
	22%	4.7
	25%	5.8
	31%	7.0
	37%	8.2
	44%	9.4
	52%	10.5
	60%	11.7
	69%	12.9
	79%	14.0
	89%	15.2
	100%	16.4
	a 'zero carbon home'	17.6
Building fabric	Heat Loss Parameter (HLP)	
	EITHER	EITHER
	≤1.3	1.2
	OR	OR
	≤1.1	2.4
Internal lighting	Where the following percentage of fixed fittings are dedicated energy efficient fittings	
	EITHER	EITHER
	≥40% of fittings	1.2
	OR	OR
	≥75% of fittings	2.4
Other Energy		
Drying space	For providing space and posts, footings and fixings for drying clothes in a secure environment for each unit on the site	1.2

GREEN OR BROWN ROOF

Development Policy DP22 states that schemes must incorporate green or brown roofs and green walls wherever suitable. Due to the number of environmental benefits provided by green and brown roofs and green walls, where they have not be designed into a development the Council will require developers to justify why the provision of a green or brown roof or green wall is not possible or suitable.

In this proposal it is considered unsuitable to incorporate a Green or Brown roof for the following reasons.

1) The roof is not visible from any vantage point. This will mean that if the roof should require attention it will not be able to be seen.
2) Maintenance will prove a "safety' problem. The flat rood area is over 10M above the surrounding levels. A guard rail, or the like, would be required to allow anyone onto the roof for maintenance. Any guard rail would look inappropriate in this location when seen from Avenue Road.
3) The habitat created would be very limited due to the height of the roof above ground level.
4) The drainage of the Green or Brown roof could not be taken down the sloping sides of the mansard roof as this would cause unsightly staining. The rainwater would have to taken internally and it would not be possible to maintain the outlets to see if they are blocked.

GREEEN WALL

In this proposal it is considered unsuitable to incorporate a Green Wall for the following reason.

1) The appearance of a green wall would be visually inappropriate in this traditional design of house.

RENEWABLE ENERGY TECHNOLOGIES

The new house will incorporate a range of renewable energy technology in order to achieve the Level 4 of the Code for Sustainable Homes.

Leematec Technologies will be employed to advise on the use of Solar Panels: Photovoltaic Panels (PVs) and Ground Source heat Pumps.

On approval from the local authority a full assessment will be made to determine the best combination of the above options for renewable energy resources.

ADAPTING TO CLIMATE CHANGE

Policy DP22 requires development to be resilient to climate change by ensuring schemes include appropriate adaptation measures.

On approval of planning permission Leematec Technologies will be employed to advise on the measures to best reduce the impact of climate change

The measures considered are

Insulation

Materials should be selected to prevent penetration of heat, including the use of reflective building materials to the roof and walls. Appropriate levels of glazing, which facilitates natural daylighting but prevent excessive over heating is also to be considered when specifying the glass.

Re-using water

Use of Grey Water recycling is to be incorporated. Collecting rainwater from roof and other surfaces for reuse (for example in flushing toilets or irrigation). By reducing the amount of water entering the drains, water reuse also reduces the risk of surface water flooding.

Planting

Plants and trees in the rear garden.-The existing mature trees are to be retained.

Fully grown mature trees can prevent shrinking and heave as they retain moisture in the soil.

Foundation design

The new foundations can be designed to be strong enough and

will extend downward below the zone that will be affected by seasonal variations in moisture content. This will avoid the need for any future underpinning.

Table: Category 1 – Energy/CO_2 (continued)

Category 1 – Energy/CO_2 *(continued)*		
Issue	**Measurement Criteria**	**Points Awarded**
Ecolabelled white goods	EITHER Where fridges, freezers and fridge/freezers have an A+ rating under EU Energy Efficiency Labelling Scheme	EITHER 1.2
	AND OPTIONALLY Where washing machines and dishwashers have an A rating and/or washer driers and tumble driers have a B rating under EU Energy Efficiency Labelling Scheme	AND OPTIONALLY +1.2
	OR Information is provided on purchasing and benefits of efficient white goods, where such goods are not supplied with the new home	OR 1.2
External lighting	Where all space lighting is provided by dedicated energy efficient fittings, taking into account the needs of people who have visual impairments	1.2
	AND OPTIONALLY Where all burglar security lighting is: • A maximum of 150W • Fitted with movement detecting and daylight shut-off devices Where all other security lighting is provided with energy efficient fittings and daylight shut-off devices	AND OPTIONALLY +2.4

Table: Category 1 – Energy/CO_2

Category 1 – Energy/CO_2 *(continued)*		
Issue	**Measurement Criteria**	**Points Awarded**
Low or Zero Carbon Energy Technologies	EITHER Where at least 10% of total energy demand is supplied from local renewable or low carbon energy sources	EITHER 1.2
	OR Where at least 15% of total energy demand is supplied from local renewable or low carbon energy sources	OR 2.4
Cycle storage	Where provision is made for the safe, weather-proof and secure storage of cycles as follows: • 1 and 2 bedroom dwellings – storage for 1 cycle • 3 bed dwellings – storage for 2 cycles • 4 bed dwellings and larger – storage for 4 cycles	
	EITHER In 50% or more of dwellings in a development	EITHER 1.2
	OR In 95% or more of dwellings in a development	OR 2.4
Home office	For the provision of a space and services which allows the occupants to set up a home office in a quiet room	1.2

Table: Category 2 – Water

Category 2 – Water		
Issue	**Measurement Criteria**	**Points Awarded**
Internal potable water consumption	Where predicted water consumption (calculated using the Code water calculator) accords with the following levels:	One of the following point scores
	≤120 l/p/d	1.5
	≤110 l/p/d	3
	≤105 l/p/d	4.5
	≤90 l/p/d	6
	≤80 l/p/d	7.5
External potable water consumption	For providing a system to collect rain water for use in external irrigation/watering e.g. water butts	1.5

Table: Category 3 – Materials

Category 3 – Materials		
Issue	**Measurement Criteria**	**Points Awarded**
Environmental impact of materials	Where the total building points achieved under the CSH materials calculator is as follows: • Score of at least 3 points • Score of at least 6 points • Score of at least 9 points • Score of at least 12 points • Score of 15 points Scores are achieved as follows for each of the specifications: • A+ rating = 3 • A rating = 2 • B rating = 1 • C, D or E = 0 Scores achieved for each of the following elements are added to give the total building score: • Roof • External Walls • Internal Walls (incl. party walls and partitions) • Floors – upper and ground floors • Windows	One of the following point scores 0.9 1.8 2.7 3.6 4.5
Responsible sourcing of materials – basic elements	Where materials used in key building elements are responsibly sourced (e.g. timber certification, EMS etc.)	Between 0.3 points and 1.8 points (for details see Technical Guidance Manual)
Responsible sourcing of materials – finishing elements	Where materials used in secondary building and finishing elements are responsibly sourced (e.g. timber certification, EMS etc.)	Between 0.3 Points and 0.9 Points (for details see Technical Guidance Manual)

Table: Category 4 – Surface Water Run-off

Category 4 – Surface Water Run-off		
Issue	**Measurement Criteria**	**Points Awarded**
Reduction of surface water run-off from site	Where rainwater holding facilities/ sustainable drainage (SUD) is used to provide attenuation of water run-off to either natural water courses or municipal systems. Points for attenuation covering • Hard surfaces	0.5
	AND OPTIONALLY • Roofs	AND OPTIONALLY +0.5
	The percentage peak time attenuation should be provided as follows • 50% in low flooding risk areas • 75% in medium flooding risk areas • 100% in high flooding risk areas	
Flood risk	Where evidence is provided to demonstrate that the assessed development is located in an area of EITHER • low annual probability of flooding	EITHER 1
	OR • medium/high annual probability of flooding (subject to plans being approved by the relevant statutory bodies) and where • the ground level of buildings, car parks and access routes are above the flood level; • an appropriate assessment of how the building will react to flooding (including the use of resilient construction where necessary) to mitigate residual risk	OR 0.5

Table: Category 5 – Waste

Category 5 – Waste		
Issue	**Measurement Criteria**	**Points Awarded**
Household recycling facilities	EITHER Where the following recycling facilities are provided: • 3 internal storage bins for recyclable waste with – min total capacity of 60ltr – no individual bin smaller than 15ltr – all bins in a dedicated position that is accessible to disabled people	EITHER 1.8
	OR Where full recycling facilities are provided: • 3 internal storage bins with – min total capacity of 30ltr – no individual bin smaller than 7ltr – all bins in a dedicated position that is accessible to disabled people AND EITHER • A Local Authority collection scheme for recyclable materials covering at least three streams of waste with sufficient space for the storage of the bins provided without stacking (within 10m of an external door) and which is accessible to disabled people OR • Where there is not a Local Authority collection scheme for recyclable materials, 3 external bins with: – min total capacity of 180ltr – no individual bin smaller than 40ltr • All bins to be in a dedicated position (within 10m of an external door), which is accessible to disabled people	OR 3.6

Table: Category 7 – Health and well-being

Category 7 – Health and well-being		
Issue	**Measurement Criteria**	**Points Awarded**
Daylight	Homes must meet the following standards before points can be awarded: • Kitchen to achieve minimum average daylight factor of at least 2% • Living rooms, dining rooms and studies to achieve a minimum average daylight factor of at least 1.5% • Kitchens, living rooms, dining rooms and studies to be designed to have a view of the sky	Up to 4 points (for details see Technical Guidance Manual)
Sound insulation	Points are awarded for achieving higher standards of sound insulation than required by Part E of the Building Regulations, and demonstrating it by either using post-completion testing (PCT) or Robust Details (RD)	Between 1 and 4 points (for details see Technical Guidance Manual)
Private space	For the provision of outside space that is at least partially private, and that is accessible to disabled people	1
Lifetime Homes	Where all the standards of Lifetime Homes have been complied with, that is: • access to the dwelling (Standards 1-5); • general standards of accessibility within the dwelling (Standards 6-7, 11, 14, 15 and 16); • potential future adaptability of the dwelling (Standards 8, 9, 10, 12 and 13)	4

Table: Category 8 – Management

Category 8 – Management		
Issue	**Measurement Criteria**	**Points Awarded**
Home user guide	Where there is provision in each home of a simple user guide that covers information relevant to the 'non-technical' tenant/ occupant on the operation and environmental performance of their home, together with information that the user guide is available in alternative accessible formats	2.2
	AND OPTIONALLY Where the guide also covers information relating to the site and its surroundings	AND OPTIONALLY +1.1
Considerate Constructors Scheme	EITHER Where there is a commitment to comply with best practice site management principles and a regular audit under a nationally or locally recognised independent certification scheme such as or comparable to the Considerate Contractors Scheme	EITHER 1.1
	OR Where the commitment is to go significantly beyond best practice including a regular audit under a nationally or locally recognised independent certification scheme such as, or comparable to, the Considerate Contractors Scheme	OR 2.2

Table: Category 5 – Waste (continued)

Category 5 – Waste *(continued)*		
Issue	**Measurement Criteria**	**Points Awarded**
Construction waste	EITHER Where the site waste management plan includes procedures and commitments that minimise waste generated on site in accordance with WRAP/Envirowise guidance	EITHER 0.9
	OR Where the above is achieved and the plan includes procedures and commitments to sort, reuse and recycle construction waste either on site or through a licensed external contractor	OR 1.8
Composting facilities	Where home composting facilities are provided in houses with gardens or a communal/community composting service provided in other dwelling types suitable for normal domestic non-woody garden, food and other compostable household wastes. Account should be taken concerning the accessibility of these facilities to disabled people	0.9

Table: Category 6 – Pollution

Category 6 – Pollution		
Issue	**Measurement Criteria**	**Points Awarded**
Global warming potential (GWP) of insulant	Where all insulating materials avoid the use of substances that have a global warming potential (GWP) of 5 or more (and an Ozone Depleting Potential of zero) in either their manufacture or composition for the following elements • Roof (including loft access) • Walls internal and external (including doors, lintels and all acoustics insulation) • Floor (including foundations) • Hot water cylinder, pipe insulation and other thermal stores	0.5
Nitrous Oxide (NOx) emissions	Where NOx emissions from any space heating and hot water systems accord with the following EITHER • Dry NOx level <=100mg/KWh OR • Boiler class 4 under BS EN 297:1994	Between 0.5 points and 2 points (for details see Technical Guidance Manual)

Table: Category 8 – Management (continued)

Category 8 – Management *(continued)*		
Issue	**Measurement Criteria**	**Points Awarded**
Construction site impacts	EITHER Where there is a commitment and strategy to operate site management procedures on site that cover 2 or more of the following items: • CO_2 or energy arising from site activities • CO_2 arising from transport to and from site • Water consumption arising from site activities • Best practice air pollution controls • Best practice water pollution controls • 80% of site timber is reclaimed, reused or responsibly sourced	EITHER 1.1
	OR Where there is a commitment as above that covers 4 or more of the items listed	OR 2.2
Security	Points are achieved by complying with 'Secured by Design – New Homes' (Section 2: Physical Security). This will include working closely with an Architectural Liaison Officer or Crime Prevention Design Advisor from the local Police Force	2.2

Table: Category 9 – Ecology

Category 9 – Ecology		
Issue	**Measurement Criteria**	**Points Awarded**
Ecological value of the site	Where development land is of low ecological value as defined by either • The BRE Ecological Value Checklist	1.2
	OR • A report prepared by a suitably qualified ecologist	
	OR Where a suitably qualified ecologist confirms that the site will remain undisturbed by the works	
Ecological enhancement	Where ecological features have been designed for positive enhancement in accordance with the recommendations of a suitably qualified ecologist	1.2
Protection of ecological features	Where all existing features of ecological value are maintained and adequately protected from damage during site preparation and construction works	1.2
Change in ecological value of the site	Where the resulting change in ecological value is as follows calculated using the Code Change (see Technical Guidance Manual for details) in Ecological Value Calculator • Minor negative change (-9 to -3) • Neutral (<-3 to +3) • Minor enhancement (<+3 to +9 • Major enhancement (>+9	One of the following point scores 1.2 2.4 3.6 4.8
Building footprint	EITHER 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	EITHER 1.2
	OR Where the total combined floor area: footprint ratio for all dwellings on the site is greater than 3.5:1	OR 2.4