



Code for Sustainable Homes (2007)

Design Stage Pre Assessment of

Heath Park, Hampstead, London

Pre Assessment Report

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CODE FOR SUSTAINABLE HOMES

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1.0 Introduction

In order to show environmental performance as part of a planning submission to the London Borough of Camden, and a commitment to such issues by the client, an initial Code for Sustainable Homes (CSH) pre-assessment has been carried out for the Heath Park Site development in Hampstead, North London.

The scheme is a single unit on the site of existing hard standing (an outhouse to Heath House, also on the site) on the edge of Hampstead Heath.

This development has been assessed under the CSH (2007). The target rating for the unit is currently **Level 3**.

2.0 Summary

During the pre-assessment exercise, the assessor discussed all of the CSH credit criteria with various members of the design team. The draft pre-assessment was then circulated around all relevant stakeholders, and adjusted accordingly.

The mandatory requirements and further 'tradable' credits identified as potential targets in this exercise were used to give a pre-assessment score. The unit fell within the Level 3 ('★★★') category.

With the new CSH, it is important to address key areas of sustainability, namely energy demand (and carbon emissions) and water use. The Design Team are keen to meet and exceed the challenge of a 25% reduction in carbon emissions over Building Regulations 2006, and aim to achieve this by an early commitment to design energy efficient buildings, paying particular attention to the building fabric and the services e.g. the use of a ground source heat pump for example.

The minimum requirement for internal water use sets a new high standard of water efficiency which the design team will address by using low flow/flush and super-efficient fittings where feasible, and by investigating the use of rainwater collection to service the internal fittings such as the toilets.

The details in section 4.0 show how this Code Level 3 rating could be achieved (i.e. a feasible route at this stage to achieve the desired rating), along with further considerations and alternatives detailed in section 4.5.

3.0 The Code for Sustainable Homes Rating

3.1 Introduction

The Code for Sustainable Homes (CSH) has been launched on the 10th April 2007 by The Government, specifically the Department for Communities and Local Government (DCLG) and is maintained and Quality Assured by the BRE and by its registered assessors. The CSH is provided as a measure of future Building Regulations targets driven by increasingly taxing Government and EU targets. The Government will eventually make the current CSH requirements mandatory, possibly from as early as April 2008. The CSH is measured using star ratings from 1 to 6, 1 being the worst. These correlate to EcoHomes as follows:

CSH Level	EcoHomes Rating
★	Pass
★★	Good
★★★	Very Good
★★★★	Excellent
★★★★★	Better than Excellent
★★★★★★	Better than Excellent

This is not a precise correlation. The BRE estimate that the additional build cost of achieving a 3 star rating over an EcoHomes rating of Very Good is approximately £500- £1,500 per dwelling. This is due to mandatory requirements, individual assessments and post construction reviews required under the CSH.

3.2 Code for Sustainable Homes versus EcoHomes

The CSH is based on the EcoHomes 2006 methodology but with some significant changes. In summary the main changes are:

- The CSH assesses each individual dwelling and not the development as a whole. The only exception is where block compliance is sought under Part L1A of the Building Regulations, in which case the energy credit can be assessed based on the whole block.
- All CSH assessments will be subject to a post construction review. The BRE will issue an interim design certificate but the final certificate will not be issued until the dwellings are complete and an assessor has confirmed that the criteria have been met.
- There are minimum requirements in energy, water, materials and surface water run-off to achieve specific CSH levels.
- Energy is now measured as an improvement over Building Regulations Part L1A and the minimum requirements against each CSH level are as follows:

CSH Level	Improvement over Building Regs	Example Standards
★	10%	EST1 Good Practice standards
★★	18%	
★★★	25%	EST Best Practice standard
★★★★	44%	PassivHaus standard/EST exemplary
★★★★★	100%	
★★★★★★	Full Zero Carbon	

1 Energy Saving Trust

<http://www.saveyour20percent.org/housingbuildings/professionals/standards/intro/>

- The water credits have been changed to be assessed as litres/person/day and will include other water using appliances such as bidets and kitchen taps. The proposed minimum requirements are as follows:

CSH Level	Water Use (litres/person/day)
★	120
★★	120
★★★	105
★★★★	105
★★★★★	80
★★★★★★	80

- There is also a minimum requirement for materials for at least three of the following key elements of construction are specified to achieve a BRE Green Guide 2006 rating of at least D
 - Roof structure and finishes
 - External walls
 - Upper floor
 - Internal walls
 - Windows and doors
- Materials will be assessed on an area weighted basis against the new Green Guide. A draft new Green Guide has been made available to assessors from 10th April 2007 however, the formal publication has yet to be released.
- Materials credits are calculated against points for different ratings e.g. a D-rated wall would be calculated on the basis of 0.25 points and weighted by the area.
- The minimum requirement for surface water run-off is to ensure that peak run-off rates and annual volumes of run-off will be no greater than the previous conditions for the development site. For many sites this may require an appropriate consultant.
- There are also minimum requirements for construction site waste management and provision of recycling facilities for each dwelling.
- There are 2 new criteria. There are 4 credits for achieving the Lifetime Homes standard and an additional credit for providing compost bins.
- The sound testing credit now allows for the use of the Robust Standard Details, but does require that the detail has, at some point, been tested to ensure compliance.

3.3 Code for Sustainable Homes Scoring

Projects are assessed using a system of credits. These credits are grouped into the following categories:

- Energy
- Water
- Materials
- Surface Water
- Waste
- Pollution
- Health
- Management
- Ecology

In order for a score to give an appropriate balance across such a broad selection of issues, a weighting system has been developed through consultation with a range of industry representatives. This weighting system provides a relative importance to each of the credit categories. The current weightings are as follows:

Category	Weighting for CSH
Energy/CO ₂	36.4%
Water	9%
Materials	7.2%
Surface Water	2.2%
Waste	6.4%
Pollution	2.8%
Health	14%
Management	10%
Ecology	12%

The number of environmental criteria within each of the categories varies and as a result, there are a different number of credits within each category. Due to the different number of credits within each category and the differing category weightings, the overall value of each individual credit (as a percentage of the total number of credits in the assessment) is different depending on the category.

The mandatory points (discussed in 3.2 above) can be added to the other ‘tradable’ points achieved in all the other categories to achieve a total number of points. This can then be used to determine the CSH Level that has been achieved. For each level it is necessary to:

- Achieve the all mandatory minimum standards for that level
- Achieve the total tradable points needed for the level (the sum of both extra tradable points achieved for mandatory issues and tradable points for flexible issues)

In order to achieve credits, information must be submitted to the assessor who will then award credits based on the current CSH compliance criteria. The weightings are then applied to the sum total for each credit category to achieve an overall score. In the case of a pre-assessment, this is an informal process; for the full assessment, this information needs to be provided in full as confirmation of commitment to achieve each credit. This score is then used to identify the overall CSH level rating using the following ranges:

Rating	CSH Score
★	36 – 47
★★	48 – 56
★★★	57 – 67
★★★★	68 - 83
★★★★★	84 - 89
★★★★★★	90 - 100

3.4 Assessment Procedure

Assessments are carried out to award credits and points (after weighting) based on environmental features of the individual dwelling. These features either refer to:

- Features which the dwelling shares with all other dwellings on the site known as **Site Wide Issues**
- Features which have access to some common facility shared with a number of other dwellings known as **Shared Issues** (but less than the whole site)
- Features which relate to the performance of the dwelling itself known as **Dwelling Issues**

In order to reduce the number of different assessments, dwellings may be combined together as similar ‘CSH Dwelling Types’. To be of the same ‘CSH Dwelling Type’ dwellings must have exactly the

same set of CSH scoring features. Within each category, issues are scored initially as credits. They are then converted through category weightings to percentage scores known as 'Points'.

Some credits are always awarded for the site as a whole, whilst other credits can be awarded either for an individual dwelling or for a site wide approach or for a combination of the two (an example of this would be the provision of renewable energy).

Once the design stage assessment has been carried out, based on information submitted to the assessor, a report is written which describes which credits have been awarded. This report then goes to the BREEAM team at the BRE for QA procedures. If the QA is passed then an interim certificate is issued depending on the rating scale and will result in a building being awarded an 'Interim' CSH Level 1 to 6 rating.

The second part is carried out after construction (called the Post Construction Review) –and each 'Dwelling' is given a 'Final' CSH certificate at this stage.

4.0 Code for Sustainable Homes Results

4.1 Schedule of 'CSH Dwelling Types'

This development is made up of a single unit.

4.2 Credit Summary

The following table gives a summary of credits identified in order to achieve a feasible route to Code Level 3:

		Available	★★★
Energy			
ENE 1	Carbon Dioxide Emissions	15	5
ENE 2	Building Fabric U Values	2	0
ENE 3	Internal Lighting Efficiency	2	2
ENE 4	Drying Space	1	1
ENE 5	Energy Labelled White Goods	2	2
ENE 6	External Lighting Efficiency	2	2
ENE 7	Low and Zero Carbon Technologies	2	1
ENE 8	Cycle Storage	2	2
ENE 9	Home Office	1	1
		29	16
Water			
WAT 1	Internal Water Consumption	5	3
WAT 2	External Water Recycling	1	1
		6	4
Materials			
MAT 1	Environmental Impact of Materials	15	7
MAT 2	Basic Elements, Responsible Sourcing	6	3
MAT 3	Finishing Elements, Responsible Sourcing	3	2
		24	12
Surface Run-Off			
SUR 1	Reduction of Surface Run-Off	2	2
SUR 2	Flood Risk	2	2
		4	4
Waste			
WAS 1	Household Waste Storage	4	4
WAS 2	Construction Site Waste Management	2	2
WAS 3	Composting	1	1
		7	7
Pollution			
POL 1	Insulant GWP (and ODP)	1	1
POL 2	NOx Emissions	3	2
		4	3
Health and Well Being			
HEA 1	Daylighting in Room Spaces	3	3
HEA 2	Sound Insulation in Room Spaces	4	4
HEA 3	Private Space	1	1
HEA 4	Lifetime Homes	4	0
		12	8
Management			
MAN 1	Home User Guide	3	3
MAN 2	Considerate Contractors	2	1
MAN 3	Construction Site Impacts	2	1
MAN 4	Security	2	2
		9	7
Land Use and Ecology			

ECO 1	Ecological Value of Site	1	0
ECO 2	Ecological Enhancement	1	1
ECO 3	Protection of Ecological Features	1	0
ECO 4	Change of Ecological Value of Site	4	4
ECO 5	Building Footprint	2	2
		9	7
Total credits		104	68
Total Weighed % Score		100	66.8

These credit totals are translated into scores in Section 4.3

4.3 Pre-Assessment Results

The bar charts that follow shows where credits are in principle awarded against those that are available for each credit category. The total credits for each category are applied to the environmental weighting to achieve an overall score. This score is then compared against the ranges mentioned earlier to achieve a CSH rating.

A total of 68 credits have been identified which equates to a score of 66.8%.

This score is within the **Level 3 (★★★)** band. To provide security against score reduction during a formal assessment or the BRE’s QA processes, it is recommended that the final credits to be targeted should be discussed at the beginning of the full assessment.

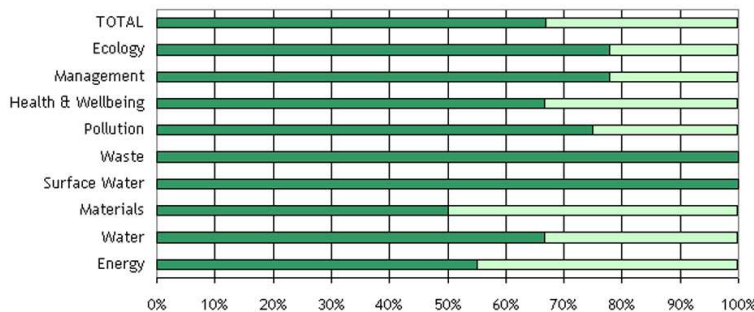


Fig 2. Bar chart showing percentage scores for each category

4.4 Key Features of the Pre-assessment

4.4.1 ENERGY

- **ENE1:** Heath Park needs to meet (and hopefully exceed) the mandatory CSH requirement of a 25% improvement of CO₂ emissions over Building Regulations 2006. This will be achieved, as indicated in the separate energy strategy, through:
 - Efficient building fabric and services
 - Potential use of efficient heating systems e.g. CHP
 - Potential use of renewable energy systems

- **ENE2:** Since the building is to be built to better standards than Building Regulations 2006 with a commitment by the Design Team to ‘design in’ good energy efficiency, it is possible that a Heat Loss Parameter of 1.3, and therefore one credit, could be targeted. However, since SBEM is being used to model the development, a Heat Loss Parameter result is not calculated so this credit is not currently targeted.

- **ENE3, ENE4&6:** The design team is also committed to providing adequate natural drying space and fully efficient internal and external light fittings, thereby achieving full credits in these sections.
- **ENE5:** White goods will be provided to the highest energy rating. Therefore both credits can be targeted.
- **ENE7:** The provision of a low and zero carbon feasibility study as part of the planning submission will demonstrate minimally that 10% of heating energy requirements will be offset, so one credit is currently targeted.
- **ENE8:** There is a commitment by the Design Team for provision of four covered, secure cycle storage spaces for the development. This space has been allocated within the development.
- **ENE9:** The Design Team will provide facilities for a home office e.g. two double sockets, two phone points, a 1.8m wall for the desk and an openable window and as such have provided a separate study. The Design Team realise the importance of reducing unnecessary travel to work so minimising the carbon impact of the residents.

4.4.2 WATER

- **WAT1:** The mandatory requirement of no more than 105 litres/person/day internal water use will be achieved. The Design Team could achieve this by using toilets with a 4/2l flush, taps with flow regulators (to 3 litres/min in the bathrooms and 4 litres/min in the kitchen), standard baths, and since the washing machines and dishwashers will be provided these are assumed to have high water efficiencies. However, it is likely that rainwater harvesting from the roofs will be investigated and used for toilet supply since the occupant may prefer higher flow rates for the showers (e.g. 12+ litres/min) and larger baths. A rainwater system would help offset this demand and keep the internal water use within the mandatory levels.
- **WAT2:** Rainwater will be collected from the roof either into water butts or as part of the rainwater recycling system mentioned above to water the external planting nearby.

4.4.3 MATERIALS

- **MAT1:** The mandatory requirement will be achieved since materials of at least three of the key elements of construction will be specified to achieve a BRE 'Green Guide to Housing Specification' rating of at least D. Seven further credits will minimally be achieved here as follows (full specifications chosen when final version of the Green Guide is released):
 - **Roof:** an A or A+ rating (3 credits).
 - **Ground and Upper Floors:** a B or C rating
 - **External walls:** an B or C rating (or above)
 - **Internal walls:** an A or A+ rating (3 credits)
 - **Windows:** an A rating (1 credit).
- **MAT2:** 3 out of 6 credits will initially be targeted, with an aim to source as much as is feasible of the materials for basic elements from recycled or responsible sources e.g. FSC (Forest Stewardship Council) or EMS (Environmental Management Systems).
- **MAT3:** 2 of a total of 3 credits will initially be targeted, with an aim to source as much as is feasible of the materials for finishing elements from recycled or responsible sources e.g. FSC (Forest Stewardship Council) or EMS (Environmental Management Systems).

4.4.4 SURFACE WATER RUN OFF

- **SUR1:** Since the run off will certainly be no worse than the previous use of the site, the mandatory requirement should also be achieved. With a low probability of flooding, attenuation of 50% run off at peak periods would need to be achieved for the hard surfacing and/or the roofs. The scheme includes provision of permeable blockwork and run-off collection from hard landscaping for irrigation and from roofs for potential rainwater harvesting systems, so it is hoped both credits can be achieved.
- **SUR2:** The development is not near any water course, so it is currently presumed that there is a low probability of flood and there will be local flood prevention measures provided for the basements and lower surrounding areas. Therefore this credit is currently targeted.

4.4.5 WASTE

- **WAS1:** Mandatory requirements for the provision of a large enough storage area for either Local Authority recycling bins or minimum British Standards will be met. Since there is a local recycling collection service and three internal storage bins of adequate size for recycling will be provided e.g. under the sink in the kitchen or in a kitchen cupboard, all four credits will be targeted here.
- **WAS2:** The mandatory requirement of a plan to monitor site construction and set targets (to promote resource efficiency) as part of a Site Waste Management Plan (SWMP) will be met. These commitments will include procedures to minimize and sort, reuse and recycle waste in order to achieve full credits.
- **WAS3:** Composting facilities will be provided since Camden Borough Council offer a kitchen waste recycling scheme and it may also be possible to use the compost in the surrounding grounds.

4.4.6 POLLUTION

- **POL1:** Insulation with GWP (Global Warming Potential) of less than five and Ozone Depleting Potential (ODP) of zero will be provided.
- **POL2:** In this category, the NOx emissions section (POL2) is targeted. It is hoped that NOx emissions of 70mg/kWh or less can be achieved, so therefore two of the three credits. This will be further investigated once the systems have been specified.

4.4.7 HEALTH AND WELLBEING

- **HEA1:** It is hoped that minimum daylighting standards will be achieved in the kitchen (2%), living room, dining room and studies (1.5%); and a view of the sky in all rooms, so all three credits are currently targeted.
- **HEA2:** Since the house is detached, all four credits can be achieved here by default.
- **HEA3:** The Private Space credit is targeted since there is private outdoor space provided.
- **HEA4:** The Lifetime Homes criterion is not being applied.

4.4.8 MANAGEMENT

- **MAN1:** A Home User Guide will be produced to target the full credits, providing information

information on the operation of Heath Park, as well as further information on the site and surrounding area.

- **MAN2:** A contractor will be employed who is part of the Considerate Constructor Scheme, and will achieve the basic CCS requirements (achieving a score of between 24 and 31.5) to target one of the two credits.
- **MAN3:** This contractor will also consider a number of construction site impacts: water consumption, air and water pollution and use of responsibly sourced or recycled site timber. Initially one of the two credits will be targeted.
- **MAN4:** Adequate security will be provided and a Secure by Design Award will be investigated, to achieve both security credits.

4.4.9 LAND USE AND ECOLOGY

- **ECO1:** The site is believed to be largely of no ecological value, however it cannot yet be confirmed, so this credit is currently not targeted.
- **ECO2:** There is an ecologist on board to encourage biodiversity and their recommendations carried out; the landscape architect is also working with the Camden Landscape Officer to incorporate biodiversity into the scheme, therefore this credit is currently targeted.
- **ECO3:** There may be some trees removed, therefore this credit is currently not targeted.
- **ECO4:** As an Ecological Consultant will be employed, it can be assumed that the development will leave the land at least as ecological rich as before it was built, and hopefully with a large improvement to biodiversity (greater than 9 species), therefore all of the four credits can be targeted.
- **ECO5:** Heath Park is three storeys high, therefore the floor area to footprint ratio is enough to achieve the both credits.

4.5 Further Considerations

Once the mandatory criteria have been met under the CSH, the other credits are tradable. Should the proposed route outlined above not be achievable, other credits will be investigated further, for example, further inroads into sustainable materials e.g. A or A+ rated.

The finalized route would be discussed and agreed at a more detailed design stage.