

09 / 1341



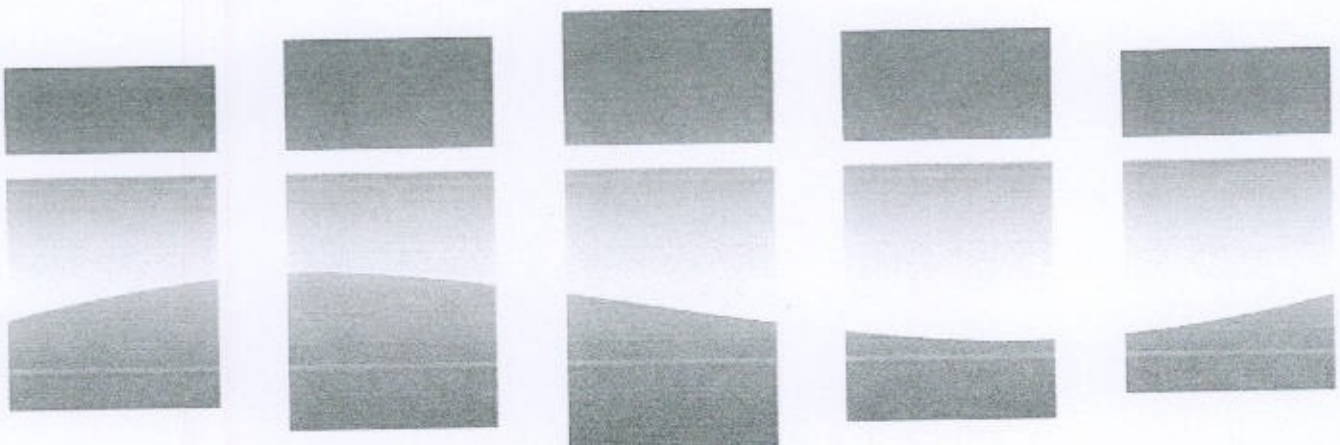
Residential Development
Watford Road, Croxley Green



Sustainability Statement
Stephen Howard Homes

May 2009

**This document is an amended version of the XCO2 report dated
December 2008 to relate to the new proposal**



Contents

Sustainability Statement	2
Introduction	2
The code for Sustainable Homes	3
Energy	5
Water	6
Materials	7
Runoff	7
Waste	8
Pollution	8
Health and Wellbeing	9
Management	9
Ecology	10
The Code Pre Assessment	10

Introduction

This document is used to explain how the development will address the sustainability issues under the Code for Sustainable Homes and meet the Sustainability Checklist of the Three Rivers District Council.

The Code for Sustainable Homes is the most widely used sustainable development standards in the UK and as described below is likely to set the path towards Zero carbon developments in the future.

The Code for Sustainable Homes was launched in December 2006 as a replacement of BREEAM EcoHomes for new residential buildings.

Although the Code is currently voluntary, many councils are now setting Code levels as mandatory targets and it is likely to become a national requirement in the near future.

Each standard requires the development to gain credits by meeting numerous sustainable design principles over a broad range of ten key areas:

- Energy
- Water
- Materials
- Surface Water Run-Off

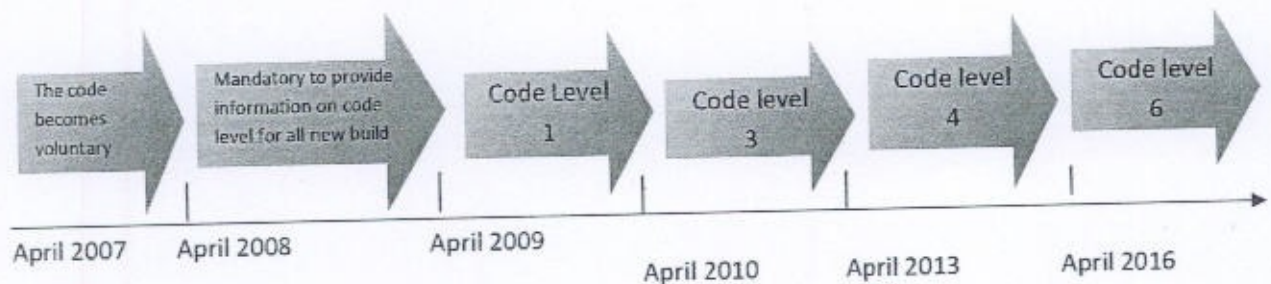
- Pollution
- Health and Wellbeing
- Management
- Ecology

The client is committed to apply the code for Sustainable Homes and achieve higher standards wherever possible.

The following issues are outlined in the Three Rivers District Council's Sustainability Checklist and are addressed in the report:

- Land Use (pg 8 and 9)
- Minerals and Soils (pg 11)
- Waste (pg 8 and 9)
- Energy (covered in the energy statement)
- Air, Water ,Noise, Light (pg 5,7 and 10)
- Nature (pg 8 and 9)
- Basic Needs (pg 6 and the energy statement)
- Health (pg 8)
- Access (pg 6)
- Leisure, Cultural Social Facilities (pg 10)

A code for Sustainable Homes preassessment result is included as an appendice at the end of this document.



In July 2007 the Department of Communities and Local Government released a document exploring the possibility of making the code for Sustainable Homes a mandatory target for new homes. In doing this a strategy towards zero carbon residential developments by 2016 would be set. Above is an estimation of how these levels might be implemented between now and 2016

Energy

CO2 reduction over Part L compliant Design

Our analysis used the methodology set out in part L of the building regulations, by performing a preliminary SAP assessment, to calculate the baseline for the energy consumption of representative dwellings. From this, the approximate energy consumption for all dwellings to pass Part L has been calculated.

The Dwelling Emissions Rate includes reduction from energy efficiency measures and on site renewable energy generation compared to a Target emissions Rate baseline of expected emissions for a typical development.

Energy efficiency measures include improvements in fabric performance and levels of energy efficient lighting compared to building regulations requirements. Preliminary SAP calculations have been carried out to assess the saving from these measures (details of the outputs from SAP calculations are within the Energy statement)

The preliminary SAP calculations demonstrate that the improvements bring about average energy efficiency savings (excluding CO2 from appliances which are only included when aiming for the Code level 6) of 25.3% which goes beyond the Code level 3 requirements of 25%

Heat Loss

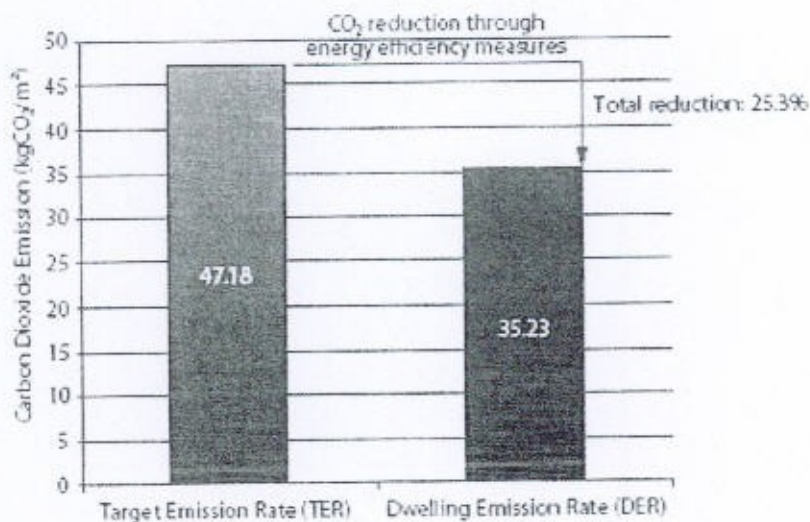
The heat loss through the different building elements are dependent upon the U-value of that element. The development will achieve the following U-values by incorporating good values of insulation and high spec window units.

- External Wall - 0.19
- Ground Floor - 0.21
- Roof - 0.15
- Window - 1.50

Infiltration heat loss occurs through small gaps in construction elements where heated internal air is able to pass through the envelope of the building. Infiltration losses occur mainly around the edge of the apertures (doors and windows) and through construction junctions.

Current part L building regulations set a maximum air permeability of 10m³/m² at 50Pa, through adopting good practice construction techniques, the development will aspire to improve upon this to achieve 4.5m³/m² at 50Pa.

The predicted heat loss parameter (HLP) achieved for the development has been estimated to be 0.57W/m².K on average. The low value demonstrates the efficient performance of the building fabric and good air tightness.



Internal Lighting

At least 75% of the fixed light fittings in habitable spaces will be dedicated and energy efficient.

Drying Space

Clothes drying spaces will be provided to each house in the gardens or within well ventilated bathroom areas. This will reduce the need for tumble dryers, which consume significant amounts of electricity.

Eco-labelled Goods

The developer will supply A rated energy efficient white goods under the EU Energy Labelling Scheme where possible.

External Lighting

External Security lighting is to be fitted with PIR sensors, daylight cut off devices and have a maximum power of 150W. Where possible solar powered lighting will be specified.

The measurements are intended to reduce the use of external lighting when not required and to ensure that a low energy strategy is installed. Light pollution from external lighting in the development during the night time will be minimised and controlled through appropriate design measures.

an example of an EU Energy labelling scheme

Cycle Storage

Safe, secure, convenient and weather-proof cycle storage will be provided in the private garage of each dwelling. This will help to encourage residents to reduce their transport CO2 emissions, particularly for short journeys and will also promote a healthy lifestyle.

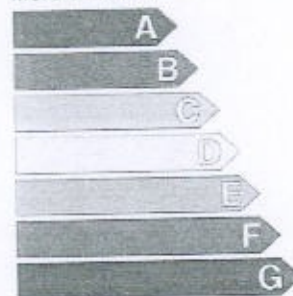
Home Office

Each unit will incorporate an area with additional electrical and data provisions where it is possible to setup a home office, possibly helping to reduce the need to commute to work and improve the quality of life.

Energy

Manufacturer
Model

More efficient



Less efficient

Energy consumption kWh/year
(Based on standard test results for 24 h)

Actual consumption will depend on how the appliance is used and when it is tested

Fresh food volume l
Frozen food volume l

Noise
(dB(A) re 1 pW)

Factual information is contained in product brochures

Norm EN 50518: 1999
Revised Label Directive 92/45/EEC



Water

Internal Potable Water Use

Through targeting the Code for Sustainable Homes Level 3 standard the development is committing to reach maximum water consumption of 105 litres per person per day.

Several efficiency measures will be taken to reduce consumption in order to meet the mandatory target and address issues of water shortage in the UK. The following are intended to be implemented at the Watford Road development.

- Dual flush WC's – 4 litre full flush 2.6 litre half
- Low flow showers – 6 litres/minute
- Spray taps and flow regulators – less than 3 litres/minute for hand basins and 4.5 litres/second for kitchen sinks.
- Bathtub – 140 litres overflow capacity

An example of how the development might meet the water requirement is shown in the table below.

Easily accessible pipes and fittings will be specified providing ease of maintenance. This will address the issue of water distribution losses, responsible for a significant part of water consumption.

External Potable Water Use

In each dwelling, rainwater will be collected from roof areas and stored in external storage butts for irrigation use. This will help to reduce the amount of mains potable water used for external water use



rain water storage for plant irrigation

Fitting	Consumption per use	Use per day	Use factor	Consumption (l/person/day)
WC (Full flush)	4 Litres Per flush	4.80	0.38	7.35
WC (Half flush)	2.6 Litres per flush	4.80	0.59	7.35
Wash basin Tap	3 Litres per min	7.90	0.45	10.60
Shower	6 Litres per min	0.60	5	18.00
Bath	140 Litres to overflow	0.40	0.4	22.40
Kitchen Sink Tap	4.5 Litres per min	7.90	0.45	15.90
Washing Machine	45 Litres per cycle	0.34	1	16.00
Dishwasher	13 Litres per cycle	0.30	1	3.90
			Total	101.50

Materials

Environmental Impact of Materials

Embodied energy is the energy that has gone into the manufacture, processing and transportation of the materials to site. Where possible materials with as low embodied energy as possible will be selected and where high embodied energy materials are specified their volume is to be minimised.

Below are the likely materials and build ups for the major building elements along with their environmental rating:

- Windows – PVC-U window with steel reinforcement, double glazed – A+ rating
- External Wall – Brickwork, cement mortar, cement-bonded particle board, timber frame with insulation, vapour control layer, plasterboard on battens, paint – A+ rating.
- External wall with weatherboard.
- Internal Walls- Timber stud, plasterboard, paint- A+-rating.
- Ground floor – Powerfloated in situ 50% GGBS concrete slab, over insulation on polyethylene dpm laid on blinded recycled aggregate sub-base- B rating
- Upper floor – Chipboard decking on timber joists – A+ rating

- Roof – Timber rafters and joists with insulation, roofing underlay, counterbattens battens and UK produced clay plain tiles – A+ rating.

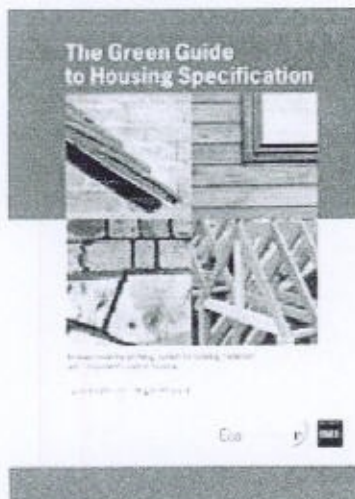
Durable building materials will be specified where possible to encourage long period of use.

Responsible Sourcing of Materials

Wherever timber is used in the development, it is intended to specify timber from sustainable sources, FSC-or PEFC-certified whenever possible. This will include both structural building elements as well as finishing materials.

Where practical, materials with high recycled or waste content will be specified. Use of ICE's (Institute of Civil Engineers') Demolition Protocol will be taken into consideration when specifying construction materials.

If possible aggregate from the demolition of the current hard landscaping on site will be crushed and used for the substrate materials for the building base, road and drive surfaces. On-site reuse is preferable to off-site recycling due to the lower transport emissions expected.



the Green Guide to Housing Specification



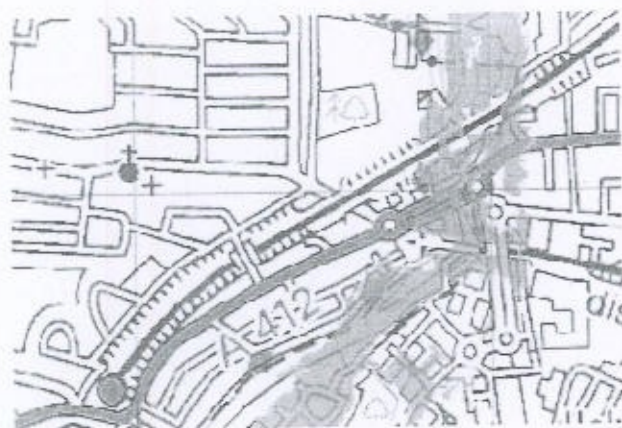
Runoff

Surface Water Runoff

The existing site comprises mainly of a commercial car sales site and a number of dwellings. Due to the significant proportion of hard landscaping on the car sales site, the peak run-off rates and annual run-off volumes are unlikely to be increased from the current level with the construction of the new development. A small amount of attenuation from roof water run-off will be provided by the use of external water storage for garden irrigation. The soft landscaping in the new development will also contribute to reduced surface runoff rates.

Flood Risk

The development site qualifies as having a low annual probability of flooding. This means that the chance of flooding each year is less than 0.1% (1 in 1000) or less.



Flood Risk Map – indicating the site to have a low flood risk. Source: Environment Agency Flood Risk Map

Waste

Waste Storage and Recycling Facilities

The developer will provide residents with dedicated area for waste and recycling storage that will comply with the minimum storage capacity set out in BS 5906. There will also be at least three separate bins provided with 30 litres total capacity in a dedicated internal storage space.

The development will also provide facilities for the dwelling to join in with Three Rivers District Council's recycling scheme.

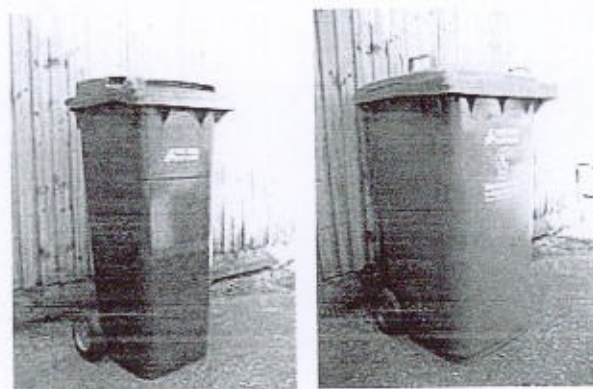
Site Waste Management plan

Demolition and construction waste accounts for 33% of all UK waste (Defra UK). CIRIA (Construction Industry Research and Information Association) estimates that 1/7th of all construction materials are wasted.

The development will minimise its impact by providing a Site Waste Management Plan (SWMP) to sort, reuse and recycle construction waste on site where possible.

Composting

The developer will provide dedicated places for brown composting bins provided by the Three Rivers District Council suitable for garden waste and kitchen wastes.



waste & composting bins provided by the Three Rivers District Council

Pollution

Global Warming Potential

Global warming potential (GWP) is a measure of how effective a gas is at preventing the passage of infra-red radiation (i.e the Earth's heat). The Kyoto Protocol has set limits to six specific gases that contribute towards global warming.

A common use of gases with high GWP is a blowing agent for producing some insulation materials.

The development will specify insulation materials that have a Global Warming Potential (GWP) of less than 5.

NOx Emissions

Since NOx has a GWP 310 times worse than CO2 it is important to reduce its production by avoiding its release during the burning of fossil fuels. Power stations are the main cause of the higher level NOx emissions whilst domestic boilers and heating systems can cause lower level emissions.

The development's heating is provided by gas boilers which produce low NOx emissions as compared to biomass or totally electric heating systems. Efficiency of supply will be a key concern when specifying the exact heating system.

Gas	GWP
Carbon Dioxide	1
Methane	21
Nitrous Oxide	310
Hydrofluorocarbons (HFC's)	140-11700
Perfluorocarbons	6500-9200
Sulphurhexafluoride	23900

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

Health and Wellbeing

Daylighting

The provision of good daylighting reduces the amount of artificial lighting used inside the development and has been proven to improve the health of occupants through the release of serotonin.

The development incorporates adequate glazed areas which will provide good levels of natural light.

The development will aim for:

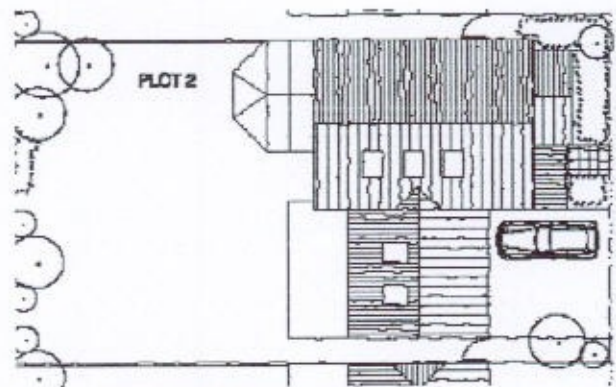
- Kitchens to achieve a minimum average daylight factor (adf) of 2% and studies, living and dining rooms a minimum of 1.5%

Sound Insulation

The development will meet the sound insulation level as given in Approved Document E of the Building Regulations and aspire to achieve higher standards.

Private Space

Spacious private gardens are provided for all the dwellings which is easily accessible to all occupants including wheelchair users.



the development includes large outdoor garden areas

Management

Home User Guide

The Watford Road development will provide 'Home User Guides' to all residents ensuring that residents are aware of how to achieve the energy consumption levels of the dwelling. The guide will include operational instructions for the building as well as maintenance information and a guide to the surrounding area and amenities.

Considerate Constructors Scheme

The specifications will require constructors to be compliant with the Considerate Constructors Scheme, achieve formal certification under it and to go significantly beyond best practice (a considerate constructors score of 32 or greater).

Construction Site Impacts

To mitigate the environment impacts from the construction site the developer will implement operational and management procedures to reduce waste and pollution wherever possible.

Ecology

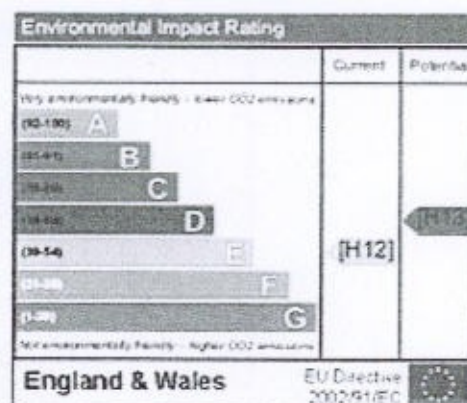
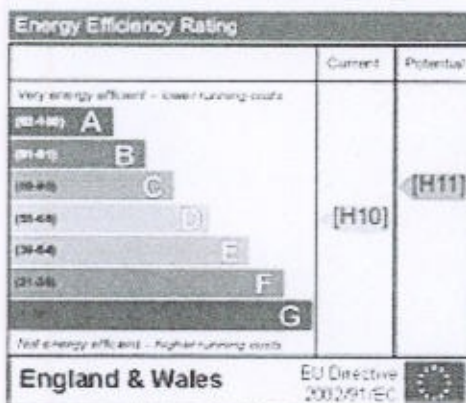
Ecological Enhancement

The planned scheme will improve upon the ecological value of the site by providing areas of planting and soft landscaping.

Native plant species are considered throughout the development which would contribute to conservation of nature on the site.

Soil

A site investigation has been carried out to identify areas of soil contamination and take correct measures for decontamination where necessary.



example of the energy performance certificate that will be provided. Source: communities & local government

The Code Pre Assessment

A Code for Sustainable Homes pre-assessment has been carried out using the aspirations and targets set out by the client: the results are shown below.

The development was found to achieve the Code Level 2 by implementing the measures discussed in this report

Development Name and dwelling description:

Watford Rd, Croxley Green

PREDICTED RATING – CODE LEVEL: 2

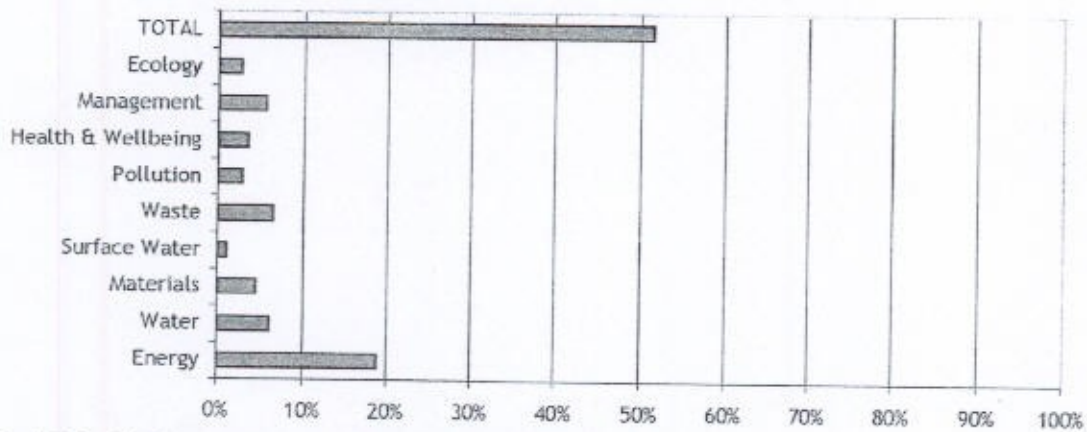
Breakdown: Energy – Code Level: 3

Mandatory Requirements: All met

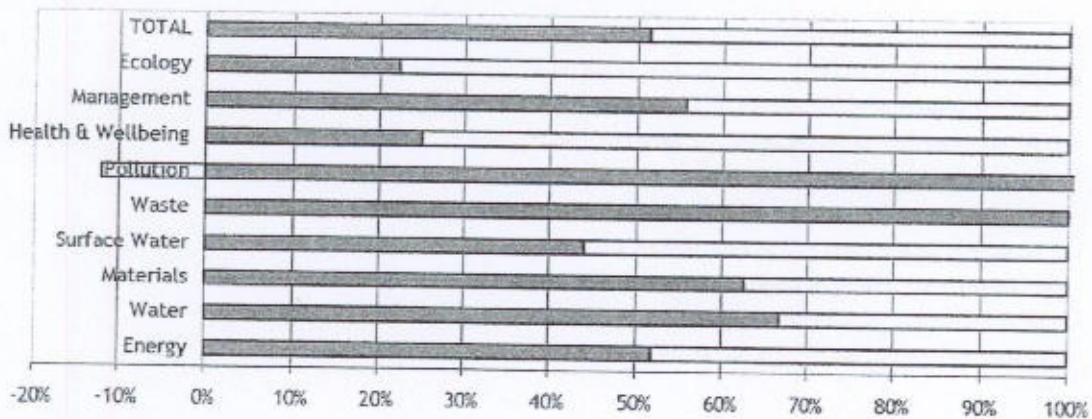
Water – CodeLevel: 4

% points 51.35% - Code level 2

Predicted contribution of individual sections to the total score



Graph 2: Predicted percentage of each credit and total score achievable



NOTE: The rating obtained by using this Pre Assessment Estimator is for guidance only. Predicted ratings may differ from those obtained through a formal assessment, which must be carried out by a licensed Code assessor.