



**PROPOSED RESIDENTIAL DEVELOPMENT
Former Kingstone School, Broadway, Barnsley**

SUSTAINABLE CONSTRUCTION STATEMENT

On behalf of Taylor Wimpey

May 2014

Introduction

This report has been prepared by Award Energy Consultants on behalf of Taylor Wimpey in relation to a proposed housing development of 163 residential properties at the Former Kingstone School, Barnsley.

It has been produced to address Barnsley Metropolitan Borough Council's planning requirements as outlined in Policy CSP2 and CSP5 of the Barnsley Core Strategy;

"CSP 2 Sustainable Construction

Development will be expected to demonstrate how it minimises resource and energy consumption, compared to the minimum target under current Building Regulations legislation, and how it is located and designed to withstand the longer term impacts of climate change. All new dwellings will be expected to achieve at least a level 3 rating under the Code for Sustainable Homes or equivalent. This requirement will rise over the plan period and by 2013 new dwellings should achieve at least level 4, rising to level 6 by 2016. All non-residential development will be expected to achieve at least BREEAM standard of 'very good' or equivalent."

"CSP 5 Including Renewable Energy in Developments

All development (either new build or conversion) of 10 or more dwellings or 1000sqm of non-residential floorspace will be expected to incorporate decentralised, renewable or low carbon energy sources and other appropriate design measures sufficient to reduce the development's carbon dioxide emissions by at least 15% for applications submitted up to 2015, rising to 20% for applications submitted thereafter subject to such measures being practicable and not unacceptably prejudicing the viability of the development. Where it is not appropriate to incorporate such provisions within the development, an off site scheme, or contribution to such may be acceptable."

This report will demonstrate how Taylor Wimpey will utilise sustainable construction principles in the design and construction phases of the development and how sustainability will be carried through the lifetime of the dwellings. All dwellings on the site will achieve Code For Sustainable Homes Level 3 and the site will achieve a minimum of 15% reduction in carbon emissions.

Sustainable Design and Construction

The building fabric, the building services and the management of a building broadly determine the energy use of a dwelling. However sustainability is not limited to issues concerning energy consumption. In understanding this, design teams can take measures to advance sustainable design from the earliest stages of a development and consider the whole lifecycle of the construction and occupation of a dwelling. Material selection, the protection of local environments and the health and wellbeing of future occupants are all issues requiring consideration. Addressing all these issues in an integrated and intelligent manner will result in truly sustainable developments. To this end, the development will be designed and specified with all of the objectives in mind and also meet the Code for Sustainable Homes Level 3 requirement.

Code For Sustainable Homes

The Code for Sustainable Homes provides an all-round measure of the sustainability of new homes, ensuring that sustainable homes deliver real improvements in key areas such as carbon dioxide emissions and water use. It sets out sustainable design principles in nine key areas:

- Energy and CO2 Emissions
- Water
- Materials
- Surface Water Run-off
- Waste
- Pollution
- Health and Wellbeing
- Management
- Ecology

Each of these nine categories contains a number of performance targets and detailed assessment criteria. The targets are intended to represent sound best practice and exceed the minimum required to satisfy Building Regulations. The Code assessment method has minimum mandatory standards set for materials, waste and surface water run-off. These must be satisfied before the corresponding level of the Code can be achieved. An Interim Code certificate is awarded following a design stage assessment. A Final Code certificate will be awarded following a post construction stage assessment, showing that each dwelling has achieved Code Level 3.

Carbon Reduction

Taylor Wimpey is committed to considering measures to reduce the CO₂ emissions of the proposed development in line with Barnsley Metropolitan Council's Core Strategy Policy CSP2. Each house type within the former Kingstone School development has been rigorously assessed under SAP 2009 against Part L1a of the 2010 Building Regulations.

In order to show that carbon emissions at the development can be reduced by a minimum of 15%, Award Energy assessed the site for the most suitable plots for applying photovoltaics. This amounted to 25 south-facing plots (15% of the plots on site) that all had sufficient roof space for the PV systems. This results in a reduction of 10,865.75 kg/CO₂/yr, demonstrating a percentage reduction of 4.77% in site wide carbon emissions.

Award Energy also compared the carbon emissions of a specification that meets the requirements of AD Part L1A 2010 and the carbon emissions of Taylor Wimpey's enhanced fabric solution, as detailed in the tables below. With other appropriate design measures, as detailed in the CSP5, the resulting carbon emissions were reduced by a further impressive 13.41%.

The total reduction in carbon emissions at the former Kingstone School development is therefore intended to be **18.19%** which is 3.19% over the targets set out by Barnsley Metropolitan Borough Council.

Table 1

Element	Value required By 2010 regulations*	Baseline specification to achieve DER=TER	Enhanced specification to achieve 15% policy reduction
Walls (w/m ² k)	U=0.35	0.29-0.30	U= 0.27
Roofs (w/m ² k)	U=0.25	0.12-0.18	U=0.10
Floors (w/m ² k)	U=0.25	0.16-0.18	U=0.14
Windows & Doors (w/m ² k)	U=2.2	1.5	U=1.3-1.4
Design air pressure test (m ³ /h/m ²)	10	7-8	5
Thermal bridging	-	ACD	Taylor Wimpey linear thermal model results

* For U-values: See Approved Document L1a 2010 Building regulations

Table 2

Property Type	Carbon Emissions - Baseline specification (kg/CO ₂ /yr)	Carbon Emissions - enhanced specification (kg/CO ₂ /yr)	% reduction in Carbon Emissions
Semi-Detached	1408.10	1243.06	11.72%
Mid-Terrace	1135.62	1045.36	7.95%
Detached	2077.80	1743.05	16.11%

*calculated using SAP2009 software, orientating to the mid case scenario (East). Award Energy can, upon request, provide reports from SAP2009 as supporting evidence for these results

Table 3

Property Type	No	Carbon Emission- Baseline specification (kg/CO ₂ /yr)	Carbon Emissions - enhanced specification (kg/CO ₂ /yr)	% reduction in Carbon Emissions
Semi-Detached	98	137993.80	121819.88	11.72%
Mid-Terraced	11	12491.82	11498.96	7.95%
Detached	54	112201.20	94124.70	16.11%
TOTAL		262686.82	227443.54	13.42%

Energy Use

The performance of the building fabric, the efficiency of the building services and the management strategies of the occupants broadly determine the energy consumption of a dwelling. All thermal, mechanical and electrical elements are considered by Taylor Wimpey against minimum requirements within the Building Regulations and products are chosen with lowering the carbon footprint and energy demand of the development in mind. The following measures will be implemented at Former Kingstone School, Barnsley:

- Highly efficient space and hot water heating systems. These will be accompanied by thermostatic controls, zoned heating and override facilities to ensure that heating is optimally controlled to use the least amount of energy
- High levels of insulation across all thermal elements within the build
- Thermal blocks will be used on this development as they are made of a sustainable material which has a high recycled content and excellent insulation and acoustic absorption properties
- High levels of air tightness to be achieved within the construction of the dwelling to reduce unnecessary heat loss
- Addressing Thermal Bridging limits heat loss across junctions; Taylor Wimpey have looked at the standard details for thermal bridging and, in consultation with the Aircrete Products Association, the Concrete Products Association and the Energy Savings Trust, have modelled and proven enhancements from ACD standard details

Measures to Reduce Energy Use cont.

- Party Wall design will be considered for suitability of lowering u-value to 0 w/m²k
- 100% dedicated low energy lighting
- Windows and doors will be 25% more efficient than minimum standards with the Building Regulations
- Recycling facilities will be provided to each dwelling
- All external light fittings, including the communal lighting to the flats, will be provided with energy efficient light bulbs with appropriate control systems for efficient usage
- All dwellings will have rotary dryers for use in their private gardens
- Any fridges/freezers supplied will be A+ rated for energy efficiency, whilst washing machines and dishwashers will be rated as A. Any Tumble dryers and/or washer-dryers supplied will be rated B. If white goods are not fitted, information on the EU Energy Efficiency Labelling Scheme will be provided to each dwelling to explain the benefits of purchasing appliances with higher ratings
- All external light fittings will be provided with energy efficient light bulbs with appropriate control systems for efficient usage
- To encourage home working and reduce the need for commuting journeys, all suitable dwellings will have a suitable area for a home office provided in an appropriate room, with electrical sockets and a telephone point in an area with natural ventilation and sufficient daylight
- The benefits of passive solar design are well documented and have been considered by the design team of Taylor Wimpey. Sufficient glazing will be provided to the principal living rooms of each dwelling to ensure sufficient natural lighting, thus reducing the energy consumed in artificially lighting the room. In addition, it is well known that developments which are orientated to ensure that the principal glazed elevations are within 30 degrees of due south are most effective at utilising solar gain, thus reducing energy consumption. Where practicable and feasible this has been incorporated into the site design
- Natural ventilation is the most energy efficient form of ventilating a space. To this end, the dwellings will be naturally ventilated via open-able windows and trickle vents. Connected to this is the issue of air tightness or air permeability; dwellings with poor air tightness require greater levels of energy to condition their internal space. As part of its design and build strategy, Taylor Wimpey is committed robust monitoring of the standard of construction on site and pre-completion air testing.

Water Efficiency

The Approved Document G (2010) restricts new build dwellings to a maximum consumption of 125 litres per person per day. For homes constructed to Code for Sustainable Homes Level 3, such as those at the former Kingstone School, maximum internal water consumption of 105 litres per person per day will be achieved. It is proposed that eco-sanitary ware and restricted flow rates will be introduced into the design of each development to obtain the appropriate level of water efficiency. This is in line with best practice policies with regards to Approved Document G and Code Level 3. In addition, all suitable dwellings will be provided with an individual water butt, sized appropriately for the size of dwelling and Code requirements.

The following table has been extracted from the Water Efficiency Calculator, demonstrating that a high level of efficiency will be achieved.

Table 4 – Water Consumption

Installation Type	Unit of Measurement	Capacity/Flow Rate	Use Factor	Fixed Use	Litres Per Person/day
WC (Dual Flush)	Full Flush (litres)	6	1.46	0.00	8.76
	Part Flush (litres)	4	2.96	0.00	11.84
Taps (excluding kitchen tap)	Flow rate (litres/minute)	2.5	1.58	1.58	5.53
Baths (where shower present)	Capacity to overflow (litres)	140	0.11	0.00	15.40
Showers (where bath present)	Flow rate (litres/minute)	8	4.37	0.00	34.96
Kitchen sink tap	Flow rate (litres/minute)	4	0.44	10.36	12.12
Washing Machine	Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
	TOTAL				110.27
Total Internal Water Consumption		110.27			
Code For Sustainable Homes Water Calculation (Normalisation Factor of 0.91)		100.35			
External Use		5.00			
Part G Water Consumption		105.3			

Material Selection

Significant amounts of energy and natural resources are consumed in the production, transportation and disposal of building materials. Two issues are of significant importance in the specification of building materials; the environmental impact of materials and the responsible sourcing of materials. Taylor Wimpey is dedicated to taking pro-active measures to addressing these issues and commit to obtaining responsible sourcing certification for at least 90% of the building elements of each dwelling.

Surface Water Run-off

Taylor Wimpey have consulted extensively with Yorkshire Water, Barnsley Metropolitan Borough Council and the Environment Agency in order to ensure that surface water from the development is discharged responsibly. The site is located within an area of low Flood Risk.

Waste

The dwellings will be provided with adequate external space for storing household waste that caters for the widest range of users, including wheelchair users and older people, and internal recycling bins adequately sized and labelled to store at least 3 types of recyclable waste. Barnsley Metropolitan Borough Council provides refuse and recycling collection services, including garden waste, and external space at the dwellings will accommodate the Council's storage provision.

Taylor Wimpey has national policies to promote the reduction and effective management of construction related waste. Robust procedures are in place to share materials such as soil and aggregate between sites and to sort waste on and off site in order to divert waste from landfill.

The re-use and recycling of wooden pallets is encouraged to reduce the amount of wood waste sent to landfill and Taylor Wimpey work closely with suppliers to minimise and recycle packaging.

All construction activities will be carried out in order to minimise dust, fumes, discharges and any other form of pollution on site, in line with best practice policies.

Pollution

The dwellings will be constructed with insulating materials that have a Global Warming Potential of less than 5.

All dwellings will be heated by highly efficient gas condensing boilers, specially chosen so that they have NOx emissions of less than 40 mg/kWh

Health and Wellbeing

In achieving increased levels of energy efficiency, it is important that designers do not lose sight of the fact that they are building homes that people can live in and not just occupy. This is an integral part of sustainability, and a hugely important consideration if the population (and the market place) is to tolerate the sustainability agenda.

While it is quite difficult to measure or even quantify health and wellbeing, the following measures are a sample of the efforts made by Taylor Wimpey to address this issue:

1. Each of the principal living rooms has sufficient glazing to allow natural light to penetrate into the rooms. Numerous studies have shown this to be beneficial to the general health and happiness of occupants.
2. All houses will have access to a private garden and all garden areas will be fully accessible for disabled occupants.
3. The development has access to local facilities on foot and bicycle.

Management

All dwellings will be provided with a detailed Home User Guide that covers the operation and maintenance of the sustainable measures relating to the dwelling, advice on living in the home in an energy efficient manner and information about its site and surroundings. The Home User Guide will be available in alternative formats where required.

A commitment will be made to cover four out of the following items on site to in order to minimise the impact of construction on the site:

1. monitor and report CO₂ or energy arising from site activities
2. monitor and report CO₂ or energy arising from transport to and from site
3. monitor and report on water consumption from site activities
4. adopt best practice policies in respect of air (dust) pollution arising from the site
5. adopt best practice policies in respect of water (ground and surface) pollution occurring on the site
6. 80% of site timber is reclaimed, re-used or responsibly sourced.

Ecology

An ecological assessment of the site will be carried out by a Suitably Qualified Ecologist to ascertain the ecological value of the site. Acting on their recommendations, Taylor Wimpey will look to protect and enhance the ecological value of the site wherever possible.

Conclusion

In conclusion, Barnsley Metropolitan Borough Council can be assured that the measures outlined in this report will be followed and the proposed development the former Kingstone School, Barnsley will be achieve the highest standards of sustainability in energy consumption, water efficiency and site activities with the principle that the carbon reduction will last the lifetime of the development. All dwellings will achieve Code For Sustainable Homes Level 3 certification and achieve a minimum of 15% site-wide reduction in carbon emissions.

CAVEAT

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