SUSTAINABILITY STATEMENT

AYR ROAD, CHEADLE

JSP SUSTAINABILITY LTD
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CONTENTS

	Page
Executive Summary	**2**
1 Introduction	**3**
2 Sustainable Design & Construction	**4**
2.1 Material Selection	5
2.2 Pollution during Construction	6
2.3 Waste Management	7
2.4 Health and Wellbeing	8
2.5 Water Efficiency	9
2.6 CO_2 Emissions	11
3 Evaluation	15

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EXECUTIVE SUMMARY

- The proposed Persimmon Homes development at Ayr Road, Cheadle will see the construction of up to 300 no. properties and a primary school.
- Persimmon Homes has proposed the adoption of a Sustainability Strategy which incorporates robust practices with respect to site pollution, waste generation and material selection.
- The construction specification will be ensure each home is energy efficient and complies with national building standards.

1 INTRODUCTION

JSP Sustainability Ltd has been commissioned by Persimmon Homes to prepare a Sustainability Statement to accompany the planning application for the proposed residential development at Ayr Road, Cheadle. The application proposes the construction of up to 300 no. properties, a primary school, landscaping and associated highways works.

The purpose of this report is to identify and highlight the key sustainable practices to be incorporated into the design and construction of the development and determine if these are in line with current national best practice guidance and local policy. The following areas have been considered;

- Material Selection
- Pollution during construction
- Waste Management
- Health and Well being
- Water Use
- CO_2 Emissions

A number of documents have been used to complete this report. These include;

National Planning Policy Framework (NPPF) includes a presumption in favour of sustainable development. The Framework expands upon the guiding principles and objectives of a successful planning system. These include the building of a strong and competitive economy, delivering high quality housing, requiring good design and meeting the challenges of climate change.

Approved Document L1A sets fabric efficiency standards and together with SAP, establishes a maximum CO_2 emission rate for new build residential properties. The Approved Document is the Government's sustainable design benchmark in England and was most recently amended in April 2014.

Core Strategy Development Plan Document 2014 includes policy SD1 which requires the submission of details on sustainable construction including material selection and energy efficiency.

2 SUSTAINABLE DESIGN AND CONSTRUCTION

In line with Government directives and aspirations set out in the National Planning Policy Framework (NPPF), the development will incorporate sustainable design principles where possible. Clearly, sustainable construction is a key local and national policy objective which the house building industry is seeking to address in partnership with local and national government. Aside from energy efficiency, sustainable construction encompasses other important considerations such as material selection, waste and water efficiency. These issues will be commented on in detail in the sections that follow. However, in brief the scheme will endeavour to;

- Provide for a well-designed layout which provides for a safe, healthy, accessible and attractive place for residents to live.
- Maximise opportunities to connect to local public transport and cycling/walking routes to reduce the need to travel by car.
- Encourage social cohesion and reduction in crime and the fear of crime through adherence to secure by design principles.
- Follow the principles of localism by partaking in community consultation at pre and post application stages.
- Seek to provide energy efficient homes to help address the effects of climate change that go over and above building regulation targets.
- Provide for an efficient use of the site.
- Provide sufficient opportunities for recycling, of on-site material during construction and waste created by future residents

2.1 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 procurement of materials: the environmental impact of materials and the sourcing of materials. Persimmon Homes is dedicated to taking pro-active measures to addressing these issues.

Persimmon Homes operates a nationwide timber procurement policy. At its core is a requirement that timber products are only sourced from suppliers who can adequately demonstrate and provide appropriate evidence that the supplied material is responsibly and legally procured from a sustainable source. In all instances suppliers must present Chain of Custody or FSC certificates demonstrating compliance prior to the purchase of materials.

Included within Persimmon Homes environmental procurement policy is a commitment to afford advantage to those materials which have a lesser environmental impact than rival products and to review alternative materials that have a lower environmental impact when developing material specifications. As part of the procurement policy Persimmon Homes reviews the Environmental Management Systems of all suppliers and where possible sources materials from suppliers who have Environmental Management Systems in place which conform to the BES or ISO standard.

As part of the review of Persimmon Homes proposed Sustainability Strategy the environmental impact of the proposed build specification was assessed against the BRE Green Guide. The table overleaf summarises the ratings anticipated;

Table 1 – Green Guide Ratings

ELEMENT	GREEN GUIDE RATING
External Wall	A+
Internal Wall	A
Party Walls	C
Roof	A+
Glazing	A
Ground Floor	C
Intermediate Floor	A+

2.2 Pollution during Construction

The NPPF requires sustainable development proposals to take measures to protect the natural environment on site and adjacent to it. Measures concerning waste are detailed in other sections of this report and biodiversity in an accompanying report, instead this section concentrates on those measures to be included in the construction phase to mitigate the negative impacts of construction on the natural environment and public health.

The suburban location of the site means there will be no significant air or water quality risks arising from the scheme post construction. Therefore, measures will be targeted to reduce water and air pollution during the demolition and construction phases. Below are a sample of the measures to be undertaken by site operatives;

- Fuel and chemical stores will be located on impervious bases with a bund and secured. The base and walls of the container will be impermeable to the material stored.

- Where dust is generated in small quantities through the normal construction process, such as the cutting of bricks and, where significant volumes are required, specialist cutting equipment will be used i.e. brick saws which have dust suppression built in through the use of water jetting onto the cutting surface.

- If cutting is required on a lesser scale i.e. the cutting of pipes, bricks, blocks, paving slabs, chases etc. during installation or laying of these materials. This will be carried out in a part of the site which is considered the most appropriate at that time and, away from any sensitive receptors.

- Waste containers and skips will be covered.

- Just in time deliveries will prevent the stockpiling of unnecessary materials on site, but where unavoidable materials will be secured and covered where necessary to prevent pollution.

- Hard surfaced roads will be constructed as soon as possible or at the earliest time that the build programme allows.

The measures above will be implemented through induction and toolkit talks with all site operatives and the posting of literature and signs in the site compound.

2.3 Waste Management

In 2012 the Government repealed the Site Waste Management Plan Regulations, therefore there exists no legal obligation to operate such a plan at Ayr Road. However, as an environmentally responsible developer Persimmon Homes intends to operate such a Plan at the application site.

As an engaged partner in the WRAP initiative and with an eye to future regulatory changes Persimmon Homes conducts regular reviews of the Group's performance. At the present time the Group is engaged in a drive to reduce the volumes of waste generated on site and increase the percentage of waste diverted from landfill through reuse and recycling. Today some 93% of all site waste is recycled and diverted from landfill.

This level of performance is enforced through the adoption of a robust Site Waste Management Plan but also through effective and coordinated design and procurement. The following briefly summarises the policies contained within the Groups waste management policies.

- Design to minimise wastage during the construction phase.
- Landform design and mass balance exercises are undertaken to retain as much material on site and reduce disposable volumes. There should be careful sub and topsoil storage and accommodation within the predetermined landform.
- Maximise the value of recycled aggregates through the separation of physical and chemical contaminates and through the careful matching of the materials generated with appropriate site use.
- Regular inductions and toolkit talks to all contractors and sub-contractors are standard. Careful site management of stockpiling and storage, segregation of waste groups and the prevention of cross contamination are implemented as standard.
- Agreements are in place with suppliers to reduce the amount of packaging on goods delivered to site. Take back agreements and *"just in time delivery"* are in place with key suppliers.
- All waste contractors are required to segregate demolition waste off site and provide records of such.
- Landfill will be the last option when no economic solution can be found.

2.4 Health and Wellbeing

In achieving ever stricter levels of sustainability, it is important that we do not lose sight of the fact that we are building homes that people can live in and not just occupy. This is an integral part of sustainability. While it is quite difficult to measure health and wellbeing, the following are a sample of the measures that will be included in the detailed design to address this issue.

- Each property will have a large living/dining space or family space.
- Each of the principal living rooms will have sufficient glazing to allow natural light to penetrate into the rooms, reducing the need for artificial lighting. Numerous studies have also shown this to be beneficial to the general health and happiness of occupants.
- Each property will include a suitable room that can be operated as a home office.
- All properties will benefit from a garden or private space for recreation. Each property will also have a designated space for recycling facilities.
- Many of the properties will have private detached or integral garages. Each will be large enough to store bicycles. In addition each of the rear gardens will be of sufficient size for future residents to install other cycle storage facilities.
- The development will include open landscaped spaces.
- The site layout will be designed to ease travel for cyclists and pedestrians.
- The layout has been designed to make best use of the site, maintaining an active street frontage and allowing for natural surveillance over public spaces to maximise crime prevention.

2.5 Water Efficiency

Approved Document G of the Building Regulations requires each new home to achieve a water consumption rate of no more than 125 litres per person per day. This level of efficiency was re-affirmed in the Technical Housing Standards Review in 2013 with an optional lower standard equivalent to 110 litres per person per day included in the Government's new National Standards subject to need and viability.

Persimmon Homes proposes to avoid the use of complicated and expensive recycling technologies and instead plans to incorporate low flow sanitary ware and eco-sanitary products into the design of each property to achieve a low water consumption rate. This strategy will permanently reduce water consumption instead of compensating for a high usage through grey water recycling or rainwater harvesting. The tables below summarise the proposed flow rates and capacities and the water efficiency calculation.

Table 2 – Flow Rates & Capacities

Fitting	
Toilets	4 & 2.6 litre dual flush
WHB Taps	5 litres/min
Kitchen Taps	5 litres/min
Bath	181 litres
Shower	6 litres/min

Table 3 - Water Efficiency Calculation

Installation Type	Unit of Measurement	Capacity/Flow Rate (1)	Use Factor (2)	Fixed Use (litres/ person/ day) (3)	Litres per Person day. =[(1) x (2)] +(3) (4)
WC (Dual Flush)	Full Flush (litres)	6.00	1.46	0.00	8.76
	Part Flush (litres)	4.00	2.96	0.00	11.84
Taps (excluding kitchen tap)	Flow rate (litres/min)	5.00	1.58	1.58	9.48
Bath (where shower present)	Capacity to overflow (litres)	181	0.11	0.00	19.91
Shower (where bath present)	Flow rate (litres/min)	6.00	4.37	0.00	26.22
Kitchen/utility room sink taps	Flow rate (litres/min)	5.00	0.44	10.36	12.56
Washing machine	Litres/kg dry load	8.17	2.10	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
TOTAL	**(5)**				110.43

(5)	**Total Internal Water Consumption**	110.43
(6)	**Normalisation Factor**	0.91
(7)	**Internal Water Consumption [(5) x (6)]**	100.49
(8)	**External Water Use**	5.00
(9)	**Part G Water Consumption [(8) + (7)]**	105.49

An internal water consumption of 105.49 litres per person per day is calculated. This is marginally lower than the Government's higher water efficiency target confirmed in the Housing Standards Review, confirming that a high level of efficiency and sustainability will be achieved.

2.6 CO_2 Emissions

Policy SD1 does set any targets beyond those established in national policy. The NPPF directs Persimmon Homes to the Government's building policy which is currently benchmarked to Part L of the Building Regulations. Part L was most recently amended in 2013. The enhanced standards included in the Approved Document will deliver homes with an emission rate some 44% lower than comparable 2002 standards. On this basis, Persimmon Homes intends to advance the use of an energy efficient construction specification to ensure each home achieves the stringent standards of the Building Regulations.

2.6.1 Energy Efficiency Measures

Persimmon Homes exposure to the marketplace has confirmed that purchasers demand energy efficient homes with low operating costs and familiar user friendly technologies. As such the Group's current construction specification has been tailored to these demands and incorporates many of the lean and clean measures of the Energy Hierarchy. Listed below are some of the measures that will be incorporated into the detailed design of the scheme;

- The construction specification of every home will include high levels of insulation in the ground floor, external walls and roof spaces.
- The detailed house type designs will incorporate the thermal bridging guidance produced by Constructive Details and the Government, thereby reducing a significant source of heat loss.
- An efficient gas condensing boiler will be installed in each property. The heating designs of each house type will include dual zone controls with delayed start thermostats.
- Energy efficient lamps will be installed in every light fitting.
- Each property will be naturally ventilated using efficient decentralised extract fans to ensure the internal living environment will be healthy and comfortable.
- Each entrance will be illuminated with an energy efficient external light or provision will be made for a purchaser to install such a fixture.
- The white goods installed in each property or offered to purchasers will be energy efficient with an A+/A rating.

Some of the measures above will shrink the un-regulated sources of energy consumption within each home. However, they cannot be measured or modelled in SAP, but do demonstrate a

willingness on the behalf of Persimmon Homes to shrink the site's total energy demand and carbon footprint. The table below provides a summary of the likely energy efficiency standards targeted in the design and construction of each home;

Table 4 – Specification Summary

Element	Part L	Enhanced Specification
Wall	0.30W/m^2K	0.25W/m^2K
Party Walls	0.20W/m^2K	0.00W/m^2K
Cold Roof	0.20W/m^2K	0.11W/m^2K
Floor	0.25W/m^2K	0.22W/m^2K
Glazing	2.00W/m^2K	1.40W/m^2K
Door	2.00W/m^2K	1.40W/m^2K
Air Permeability	10 m^3/(h.m^2) @ 50 Pa	5.1 m^3/(h.m^2) @ 50 Pa

The targeted u-values go significantly beyond the minimum standards of Part L. This will ensure the thermal envelope of every home will be energy efficient, thereby reducing energy consumption and CO_2 emissions.

2.6.2 Site's Forecasted Emission Rate

The specification and proposed house types for the phase 1 development at Ayr Road were modelled in SAP 2012 to determine the site's forecasted emission rate. The results are summarised in the table below.

Table 3 – Ayr Road Reduced CO_2 Emission Rate

House Type	Target Emission Rate (kg/year)	Calculated Emission Rate (kg/year)
Winster	8,036.51	8,008.77
Chedworth	7,601.94	7,285.56
Kendal	39,393.78	38,579.04
Roseberry	30,705.26	30,535.43
Clayton	15,626.52	15,298.92
Hatfield	11,421.90	11,174.94
Souter	9,873.11	9,609.78
Chatsworth	23,442.03	23,312.52
Hanbury	47,162.05	45,861.91
Alnwick	6,851.13	6,635.50
TOTAL	**200,114.23**	**196,302.37**

A housing schedule is not available for phase 2, however working on the assumption that the mix of types will be similar to that on phase 1, we can calculate an estimate for the entire scheme. Therefore, using the results of phase 1, the site's forecasted emission rate is estimated to be 471,125.69kg/year. This represents a saving of 9,148.46kg/year over the target emission rate associated with current Part L. The Approved Document was amended in 2013 and includes a more stringent method of calculation for the target emission rate of a new home. Achieving a reduction over this difficult methodology is a validation of the energy efficiency measures proposed by the developer. They can therefore be described as sustainable as per the definition included in the NPPF.

2.6.3 Primary School

In the absence of a detailed design and mechanical and electrical specification, it is not possible to estimate the forecasted emission rate of the proposed primary school. However, it is possible to state the principles and practices which may guide the design;

- The construction specification will include high levels of insulation in the ground floor, external walls and roof spaces such that betterments over the minimum values stated in Part L2A will be achieved.

- Intelligent junction design and the incorporation of DCLGs Accredited Construction Details will limit heat loss at non-repeating junctions.

- Energy efficient low lux lighting should be designed and installed. Accompanying these should be motion sensors, timers or daylight sensors to reduce consumption. Note this requirement does not extend to safety lighting.

- The ventilation of kitchens and wet rooms should comply with the Non-Domestic Building Services Compliance Guide.

- Renewable technologies will be incorporated into the design if necessary to comply with Part L2A 2013.

3 EVALUATION

JSP Sustainability has been commissioned by Persimmon Homes to highlight and assess the key sustainability features to be incorporated into the design and construction of the proposed development at Ayr Road, Cheadle. The sustainability measures were highlighted previously but it is worthwhile summarising the key endeavours;

- Persimmon Homes operates a robust Sustainable Procurement Policy which emphasises the legal and sustainable sourcing of building materials.
- Persimmon Homes operates efficient and rigorous waste management plans across all developments.
- Best practice policies with respect to site pollution will be implemented as standard.
- Measures will be incorporated into the design to achieve a water consumption lower than 125 litres per person per day.
- Each property will be constructed to an energy efficient construction specification.

In conclusion we can state that should the measures detailed in this report be implemented then a sustainable development in line with the definition included in the NPPF will result. We therefore recommend the adoption of the proposed strategy by Persimmon Homes and its approval by Staffordshire Moorlands District Council.