



SUSTAINABILITY STATEMENT

WINDMILL STREET, GRAVESEND

JSP SUSTAINABILITY LTD
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EXECUTIVE SUMMARY

- The proposed residential development at Windmill Street, Gravesend includes the construction of 75 no. retirement properties.
- The developer proposes to construct the development to an efficient fabric and building services specification.
- A large photovoltaic array will be installed on the roof space of the building.
- Each home will achieve a low internal water consumption.

Gravesend Borough Council



1 INTRODUCTION

JSP Sustainability Ltd has been commissioned by Churchill Retirement Living to prepare a Sustainability Statement to accompany the planning application for the proposed development off Windmill Street, Gravesend. The application seeks permission for the construction of 75 no. 1 and 2 bedroom retirement flats with associated communal space, landscaping and associated highway works.

This Statement provides details on the energy efficiency, renewable energy, water efficiency and material selection measures proposed by Churchill Retirement Living to deliver a sustainable development. 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 CO₂ emission rate for new build residential properties. The Approved Document is the Government's sustainable design benchmark in England.

Gravesham Local Plan Core Strategy 2014 includes policy CS18, Climate Change. The policy requires residential development to achieve a water consumption standard of no more than 110 litres per person per day. The policy also encourages carbon reduction targets in line with the Building Regulations Part L.



2 ENERGY STRATEGY

2.1 Policy Background and Proposals

The adopted Local Plan does not include a policy establishing higher energy efficiency standards beyond those already required by the Building Regulations Part L. As such, Churchill Retirement Living will construct the Windmill Street development in line with the principles of the Energy Hierarchy;

- Lean - use less energy through energy efficiency;
- Clean - consume energy efficiently; and
- Green - generate energy from renewable sources.

The new retirement building at Windmill Street will be constructed to high standards of energy efficiency and a roof mounted photovoltaic array will be installed capable of delivering compliance with the Building Regulations.



2.2 Energy Efficiency Measures

The energy strategy at Windmill Street will adhere to the principles of the Energy Hierarchy. Listed below are some of the measures that will be incorporated into the detailed design of the scheme. These represent the lean and clean measures of the Hierarchy and aim to reduce energy demand and efficiently consume energy if necessary;

- The construction specification of the building will include high levels of insulation in the ground floor, external walls and roof spaces;
- The detailed construction design will incorporate intelligent junction design. This will reduce heat losses caused by thermal bridging;
- Each retirement flat and the communal areas will be heated by 100% efficient electric heating systems. This will future proof the development and lessen its impact on the environment into the future. The carbon footprint of the occupied building will decrease steadily in the years ahead as the National Grid continues to be decarbonised as part of the Government's 2050 net zero carbon energy strategy;
- Energy efficient lamps will be installed in every light fitting;
- Each entrance will be illuminated with an energy efficient external light;
- Each flat will be naturally ventilated using efficient decentralised system 3 extract fans to ensure the internal living environment will be healthy and comfortable;
- The SAP 2012 methodology takes into consideration the positive benefits of solar gain when assessing energy consumption. Each of the principal living rooms will have sufficient glazing to take advantage of solar gain; and
- The glazing specification will achieve an overall solar transmittance value, or g-value of 0.73, thereby assisting the potential for solar gain.

The table overleaf provides a summary of the energy efficiency standards to be achieved in the design and construction of the building;



Table 1 – Specification Summary

Element	Part L	Enhanced Specification
Wall	0.30W/m ² K	0.23W/m ² K
Party Walls	0.20W/m ² K	0.00W/m ² K
Cold Roof	0.20W/m ² K	0.11W/m ² K
Flat Roof	0.20W/m ² K	0.20W/m ² K
Floor	0.25W/m ² K	0.12W/m ² K
Glazing	2.00W/m ² K	1.40W/m ² K
Air Permeability	10 m ³ /(h.m ²) @ 50 Pa	5.0 m ³ /(h.m ²) @ 50 Pa



2.3 Site Energy Requirement and Emission Rate

The application proposes the construction of 75 no. 1 and 2 bedroom retirement flats across six floors. We have modelled ground, mid and top floor flats to give an accurate forecast of the site's baseline emission rate and energy requirement.

Table 2 – Windmill Street Energy Requirement

	Energy Requirement (kWh/yr)
RESIDENTIAL	
Space Heating	91,638.69
Hot Water	123,148.80
Fans	3,568.35
Lights	25,817.25
TOTAL	244,173.09
COMMUNAL SPACES	
Space Heating	48,790.49
Water Heating	8,456.62
Fans & Aux	31,381.56
Total	88,598.66

Table 3 – Windmill Street Emission rate

	CO ₂ Emissions (kg/year)
RESIDENTIAL	
Part L Target	110,957.25
Calculated	126,749.86
COMMUNAL SPACES	
Part L Target	41,806.80
Calculated	45,098.42

The calculations confirm the building will have a forecasted energy requirement of 332,771.75kWh/year and associated CO₂ emissions of 171,848.28kg/year. The development proposals require further measures to offset an additional 19,084.23kg/year of CO₂.



2.4 Fabric Energy Efficiency

The specification summarised overleaf was modelled in SAP to determine the Target Fabric Energy Efficiency Rating and Dwelling Fabric Energy Efficiency Rating of the building. The table below summarises the calculations.

Table 4 – Windmill Street Energy Efficiencies

	Target Fabric Energy Efficiency (kWh/year)	Fabric Energy Efficiency (kWh/year)
Ground Floor	27,220.13	24,292.32
Mid Floor	85,574.59	78,103.30
Top Floor	37,209.98	32,155.87
TOTAL	150,004.70	134,551.49

The calculations confirm that the building will achieve a FEE betterment of 15,453.22kWh/year or 10.30% over the Building Regulations Part L.



2.5 Photovoltaic Panels

Churchill Retirement Living will install a sizeable photovoltaic array on the proposed roof of the building to generate 36,771.15kWh/year of electricity and offset 19,084.22kg/year of CO₂. The size of array will be determined at the detailed design stage when accurate SAP and SBEM calculations will be carried out as part of the Building Regulations submission. However, initial calculations confirm that a 42.80kWp PV array will be necessary to generate sufficient electricity to comply with Part L.

Gravesham Borough Council



3 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. Churchill Retirement Living proposes 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. The tables below summarise the proposed flow rates and capacities and the water efficiency calculation.

Table 5 – Flow Rates & Capacities

Fitting	
Toilets	4.5 & 3 litre dual flush
WHB Taps	4 litres/min
Kitchen Taps	5 litres/min
Bath	195 litres
Shower	8 litres/min



Table 6 - 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)	4.50	1.46	0.00	6.57
	Part Flush (litres)	3.00	2.96	0.00	8.88
Taps (excluding kitchen tap)	Flow rate (litres/min)	4.00	1.58	1.58	7.90
Bath (where shower present)	Capacity to overflow (litres)	195	0.11	0.00	21.45
Shower (where bath present)	Flow rate (litres/min)	8.00	4.37	0.00	34.96
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)				113.98

(5)	Total Internal Water Consumption	113.98
(6)	Normalisation Factor	0.91
(7)	Internal Water Consumption [(5) x (6)]	103.72
(8)	External Water Use	5.00
(9)	Part G Water Consumption [(8) + (7)]	108.72

A water consumption of 108.72 litres per person per day is calculated.



4 MATERIAL SELECTION

Churchill Retirement Living and its contractors operate an ethical timber procurement policy which has at its core a commitment to purchase legally and sustainably sourced timber. Suppliers of timber must produce full Chain of Custody Certificates right through the supply chain; from the initial timber yard, manufacturing process, transformation and distribution. Secure certificates must be produced by valid accrediting bodies – FSC, PEFC, CSA, SFI & MTCC.

When specifying materials at the design stage the sustainable credentials of a product are rated alongside their affordability, lifecycle costs, durability, availability and ease of use. This exercise guarantees Churchill Retirement Living gives due consideration to the environmental impact of materials at the earliest design and procurement stage.

As part of the review of the proposed Sustainability Strategy the environmental impact of the proposed build specification was assessed against the BRE Green Guide. The Guide assesses the relative environmental impact of construction materials commonly used in buildings. Materials are given an overall rating of A+ to E, based on Life Cycle Assessments using the BRE's Environmental Profiles Methodology. The table below summarises the ratings anticipated;

Table 7 – Green Guide Rating

	Description	Green Guide Reference	Rating
External Wall	Brickwork outer leaf, insulation, concrete blockwork inner leaf, cement mortar, plasterboard on dabs, paint.	806170615	A+
Party Wall	Twin leaf 100mm min. solid medium dense blocks (1350-1600kg/m ³), with 100mm min. cavity including insulation, type A wall ties, with gypsum-based board (9.8kg/m ²) on dabs and paint to each side.	1118190007	C
Ground Floor	Screed on suspended composite concrete floor on bonded insulation.	820100036	D
Party Floor	Sand, cement screed on precast concrete floor with gypsum-based board finish.	1229550009	D
Internal Wall	Galvanised steel stud, plasterboard, paint.	809760012	A
	Dense solid blockwork, plasterboard, paint.	809180014	C
Glazing	PVC-U window, double glazed	813100009	A
Roof	Timber rafters and joists with insulation, roof underlay, counterbattens, battens & tiles/slates.	812410012	A+



	Concrete, vapour control layer, insulation, waterproofing membrane	1212540067	D
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5 EVALUATION

Churchill Retirement Living is required by national and local policy to deliver a sustainable development. JSP Sustainability was instructed by the developer to review the sustainable development proposals for the site. Full details on the strategy are included on the previous pages, however the key conclusions are;

- The buildings will be constructed to a specification which incorporates insulation levels and fixings achieving u-values significantly beyond the benchmarks in Part L;
- The energy efficiency measures proposed will achieve a 10.30% saving over the Building Regulations Target Fabric Energy Efficiency metric;
- A PV array capable of generating 36,771.15kWh/year of electricity and offsetting 19,084.23kg/year of CO₂ will be installed on the roof of the building;
- Each home will achieve a water consumption rate less than 110 litres per person per day or less; and
- An ethical timber procurement policy will operate at the application site.

On the basis that the measures proposed by Churchill Retirement Living will achieve a sustainable development in line with national and local policy, we can recommend the approval of these measures by Gravesham Borough Council.