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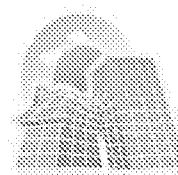
NORTH BERSTED – PHASE 4C



ENERGY STATEMENT

- BE/27/19/PL - Chichester Road Re-Plan

10th February 2020



About Southern Energy Consultants Ltd

Southern Energy Consultants Ltd are a construction consultancy specialising in sustainability, energy conservation, the application of renewable technologies and statutory utilities infrastructure design and management. As a consultancy we do not sell or have financial interest in any products so are able to take an objective view of developments to assist developers with incorporating cost effective and practical solutions.

Our services include Planning Energy Statements, energy calculations for Building Regulation compliance, Code for Sustainable Homes assessments and utilities design and management. Our team of consultants include registered SAP, SBEM and Code for Sustainable Homes assessors, Planning Specialists, Renewable Energy Specialists, CAD Specialist, Utilities Specialists and Civil Engineers.

Within SEC Ltd we have over 25 years experience working with and for National Developers, Construction and Design and Build Contractors we apply our expertise not only to assist with developers understanding of new energy and sustainability obligations but also in a way that ensures that the needs and responsibilities of all stakeholders are wholly respected.

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1.0 Introduction

1.1 This Energy Statement has been commissioned by Berkeley Homes (the Applicant) and carried out by Southern Energy Consultants in response to Planning Condition 8 of the planning consent (Ref: BE/27/19/PL, dated 21st June 2019) for the Phase 4C development at North Bersted. Planning application BE/27/19/PL relates to the construction of 15 dwellings, however, this Statement shall provide a response pertaining to all 46 dwellings proposed for Phase 4C, as set out in the outline planning application (Ref: BE/45/04) and the reserved matters application (Ref: BE/8/09).

1.2 An array of planning applications pertain to Phase 4C, including the re-plan of 15 plots under application BE/27/19/PL. 11 of these dwellings are required to be constructed according to Building Regulations L1A 2013 standards, with the remainder falling under the preceding L1A 2006 requirements. In addition, 7 new dwellings relate to a re-plan of dwellings on Chichester Road, also to be assessed under L1A 2013 standards. Application BE/27/19/PL triggered Condition 8, which is underpinned by Policy ECC SP2 of the Arun District Council Local Plan 2011-2031 (adopted July 2018).

1.3 Condition 8 states the following:

“The new dwellings shall not be occupied unless and until the applicant has submitted a scheme for approval by the Local Planning Authority to demonstrate that the new houses will incorporate decentralised, renewable and low carbon energy supply systems. The approved scheme shall thereafter be implemented prior to occupation of the dwellings and any approved renewable energy supply systems shall be permanently retained & maintained in good working order thereafter.”

1.4 Condition 8 is justified through Policy ECC SP2 (Energy and Climate Change Mitigation) of Arun District Council’s Local Plan (2018). This policy requires all major developments of 10 or more dwellings to incorporate decentralised, renewable and low carbon energy supply systems, which must be responsible for producing at least 10% of the total predicted energy requirements from renewable or low carbon energy generation on site. It is stated that all

new residential developments will be expected to be energy efficient and to demonstrate how they will achieve energy efficiency measures that reflect current standards applicable at the time of submission. Furthermore, the policy outlines that 'allowable solutions' (i.e. not involving renewable technologies) will be permitted to meet or exceed the 10% target.

Summary of Requirements

- 1.5 The aim of this Statement is to set out the Applicant's approach which will comply with Condition 8 and Policy ECC SP2 by exceeding the regulatory standards for carbon dioxide emissions pertaining to Phase 4c of the North Bersted development. This will involve designing and constructing the 28 dwellings falling under 2006 L1A standards to the current, 2013 L1A, requirements. In so doing, it will be demonstrated how this strategy exceeds the requirements of Policy ECC SP2, thus reducing carbon dioxide emissions by more than 10% against the applicable regulatory baseline for Phase 4C as a whole.
- 1.6 In order to arrive at the optimal strategy for Phase 4C of the North Bersted development, Southern Energy Consultants have carried out Standard Assessment Procedure (SAP) calculations on the proposed dwellings, using Government approved Elmhurst software. These have been conducted according to either the 2006 or 2013 L1A standard, depending on the regulations applicable to the specific dwellings. The eighteen dwellings falling under the 2013 L1A standard are plots 9, 10, 11, 12, 13, 18, 19, 20, 21, 22, 23, 336a, 336b, 337a, 337b, 338a, 338b and 338c.
- 1.7 Section 2 of this Statement calculates the baseline emissions for the development. These are the carbon dioxide emissions equivalent to the regulatory standard set by Part L1a of 2006/2013 Building Regulations, encompassing the sources of space heating, hot water and fixed electrical items. The Applicant's array of best practice energy efficiency measures are then outlined and the emissions performance compared to the baseline standard. It is their preference to deliver reductions in carbon dioxide emissions without recourse to renewable energy technologies, which can be visually intrusive and have a limited lifespan of only around 25 years, as opposed to energy efficiency measures which remain in situ and deliver

emissions reductions across the whole lifespan (usually 100 years or more) of a development.

2.0 Calculation of Baseline Carbon Dioxide Emissions and Emissions Performance

Calculation of Emissions Baseline

- 2.1 In order that an energy assessment can be conducted, the theoretical baseline for carbon dioxide emissions first has to be calculated for the range of twelve proposed dwelling types. The estimated regulated carbon dioxide emissions for the dwellings have been calculated using SAP 2005 and 2012 methodology for dwellings constructed according to 2006 and 2013 Building Regulations (L1A) standards, respectively. SAP calculates the regulated carbon dioxide emissions associated with space heating, hot water and fixed electrical items.
- 2.2 The Appendix to this Statement provides a plot-by-plot breakdown of the regulatory emissions standard. For each dwelling, the Target Emission Rate (TER) is multiplied by the floor area (m²) to arrive at the Total TER for each dwelling in kgCO₂/year. These are then aggregated according to whether the plots fall under 2006 or 2013 Building Regulations, and these two aggregations are then combined to arrive at the total baseline emissions for Phase 4C.
- 2.3 Table 1 below summarises the aggregation of the regulatory baseline for Phase 4C of the North Bersted development.

Table 1: Baseline emissions calculation – Phase 4C, North Bersted

DWELLINGS (APPLICABLE REGULATIONS)	NUMBER OF DWELLINGS	TOTAL EMISSIONS (kgCO ₂ /yr)
2006 L1a	28	62,730
2013 L1a	18	27,691
TOTAL	46	90,421

- 2.4 The regulatory baseline for Phase 4C of the North Bersted development is **90,421 kgCO₂/year**. Therefore, in order to comply with the 10% emissions reduction target set by Condition 8 and Policy ECC SP2 of the Arun District Council's Local Plan, the Applicant must reduce emissions by at least **9,042 kgCO₂/year**.

Applicant's Measures to Better the Baseline Scenario

- 2.5 In addition to the passive solar gains secured by orientating the majority of dwelling living areas in a southerly, south-westerly or south-easterly direction and maximising opportunities to increase the area of glazing on these elevations, the Applicant would comply with the baseline scenario by meeting the fabric performance for the main thermal elements (walls, roofs, floors and glazing) listed in Table 2 below. The fabric performance standards are superior overall to the limiting area-weighted standards set by Part L1a of Building Regulations (2013) and even more superior to their 2006 counterparts.

Table 2: Fabric Performance Standards – Phase 4C, North Bersted

Thermal Element	U-value (W/m ² K) Allowable (L1a 2006)	U-value (W/m ² K) Allowable (L1a 2013)	Proposed U-value (W/m ² K)	Improvement (%) on 2006 Allowable U-Value Standard	Improvement (%) on 2013 Allowable U-Value Standard
Main external walls	0.35	0.30	0.23-0.24	31.43-34.29	36.67-40.00
Roof (joists)	0.25	0.20	0.09	64.00	55.00
Roof (rafters)	0.25	0.20	0.28	0.00	0.00
Ground floor	0.25	0.25	0.14-0.16	36.00-44.00	36.00-44.00
Windows	2.20	2.00	1.40	36.36	30.00

- 2.6 The space heating requirement for the development will be reduced as a consequence of the fabric measures detailed above. In addition, the Applicant will specify ATAG A325CX

Combi boilers with a SEDBUK 2009 efficiency of more than 88.5%. The proposed dwellings will also benefit from enhanced heating controls to maximise efficiency in use. As well as having independent temperature controls such as thermostatic radiator valves, all dwellings will be supplied with programmers, timers, room thermostats, and Time and Temperature Zone Controls.

- 2.7 Air tightness standards will be improved by the Applicant adopting predominantly Aircrete Product Association psi values for non-repeating thermal bridges, which better the thermal heat loss results delivered via traditional Accredited Construction Details. The Applicant's details incorporate thermal heat loss improvements by reducing air leakage loss and convective bypass of insulation. This approach will assist all dwellings in delivering a reduction in air permeability from $10\text{m}^3/\text{hm}^2$ to not more than $5\text{m}^3/\text{hm}^2$.
- 2.8 Ventilation will be provided via high-efficiency, low energy centralised extract fans (Greenwood CMEV.4e model). It is not proposed to provide any mechanical cooling to the proposed dwellings. Instead it is the intention of the Applicant to reduce the need for active cooling as far as possible. This will be achieved through the specification of mainly non-mechanical measures such as good thermal insulation and an air tight build. Openable windows will be installed as a necessary fixture in all dwellings to facilitate natural ventilation. These will help facilitate cross-ventilation, convective-ventilation and night purging.
- 2.9 All internal lighting throughout Phase 4C of the North Bersted development will be of the dedicated low energy type. External lighting will also be low energy and some will be controlled through PIR sensors or daylight cut-off devices.

Carbon Dioxide Emissions Analysis – After Best Practice Energy Efficiency Measures

- 2.10 The Appendix to this Statement provides a plot-by-plot breakdown of the emissions following the Applicant's adoption of best practice energy efficiency measures to all dwellings. For each dwelling, the Dwelling Emission Rate (DER) is multiplied by the floor

area (m²) to arrive at the Total DER for each dwelling in kgCO₂/year. These are then aggregated according to whether the plots fall under 2006 or 2013 Building Regulations.

- 2.11 Table 3 below summarises the aggregation of the dwelling emission (as-designed) performance for Phase 4C of the North Bersted development.

Table 1: As-designed emissions calculation – Phase 4C, North Bersted

DWELLINGS (APPLICABLE REGULATIONS)	NUMBER OF DWELLINGS	TOTAL EMISSIONS (kgCO₂/yr)
2006 L1a	28	50,908
2013 L1a	18	27,212
TOTAL	46	78,120

- 2.12 As a result of the best practice energy efficiency measures, the Applicant's carbon dioxide emissions are reduced from the regulatory baseline scenario of **90,421 kgCO₂/year** to **78,120 kgCO₂/year**. This is a reduction of **12,301 kgCO₂/year**, or **13.60%** in proportional terms. This thus exceeds the 10% target set by Condition 8 and Policy ECC SP2 of Arun District Council's Local Plan.

3.0 Conclusion

- 3.1 This Energy Statement has set out the Applicant's proposed energy strategy for Phase 4C of the North Bersted development. In response to the stipulations of Planning Condition 8, the Applicant has proposed an approach that seeks to minimise energy consumption and carbon dioxide emissions at the point of demand through the installation of highly efficient fabric, ventilation and heating systems, together with the benefits of passive solar gains, all features which will also help to lower the fuel bills of future occupants.
- 3.2 The Applicant's proposed approach will reduce emissions by **13.60%** compared to the applicable regulatory standard set by Building Regulations (Part L1A) for the 46 dwellings. This is in excess of the 10% requirement set by Condition 8 and its underpinning Policy ECC SP2. It is thus the case that the Applicant is proposing an approach that is compliant with Condition 8 and local policy.

Appendix

Phase 4C, TER/DER Review

House Name	Plot Number	DER	TER	Total floor area	Total DER/year	Total TER / Year
CHICHESTER ROAD REPLAN	1	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN
CHICHESTER ROAD REPLAN	2	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN
CHICHESTER ROAD REPLAN	3	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN
CHICHESTER ROAD REPLAN	4	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN
CHICHESTER ROAD REPLAN	5	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN	CHICHESTER ROAD REPLAN
3H50	7	17.04	21.10	122.48	2,087	2,584
3H50	8	17.12	21.10	122.48	2,097	2,584
REPLAN 1	9	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	10	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	11	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	12	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	13	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
3H50	14	17.04	21.10	122.48	2,087	2,584
3H50a	15	17.34	17.34	122.48	2,124	2,124
3H50	16	17.04	21.10	122.48	2,087	2,584
3H50a	17	17.34	17.34	122.48	2,124	2,124
REPLAN 1	18	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	19	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	20	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	21	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	22	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
REPLAN 1	23	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1	REPLAN 1
3H1	24	18.37	22.86	88.12	1,619	2,014
3H1	25	16.76	20.25	88.12	1,477	1,784
3H3e	26	17.44	22.13	99.13	1,729	2,194
2H3a	27	19.42	24.15	78.10	1,517	1,886
2H3a	28	19.46	24.15	78.10	1,520	1,886
2H3	29	19.18	23.82	78.10	1,498	1,860
2H2a	30	17.77	21.57	70.96	1,261	1,531
2H2	31	17.51	21.22	70.96	1,243	1,506
2H3a	32	19.46	24.15	78.10	1,520	1,886
2H3	33	19.18	23.82	78.10	1,498	1,860
2H2	34	17.51	21.22	70.96	1,243	1,506
3H1	35	18.18	22.86	88.12	1,602	2,014
3H10b	36	19.40	25.21	113.93	2,210	2,872
2H3a.1	37	20.01	24.97	78.10	1,563	1,950
3H1b	38	19.96	25.62	89.16	1,780	2,284
3H1b	39	18.27	22.92	89.16	1,629	2,044
3H1b	40	18.28	22.92	89.16	1,630	2,044
3H8.1	41	17.62	22.77	118.70	2,091	2,703
4H7	42	16.77	21.64	148.81	2,496	3,220
4H30	43	16.90	21.50	148.00	2,501	3,182
3H8.2	44	17.86	22.73	118.70	2,120	2,698
4H7	45	17.19	21.64	148.81	2,558	3,220
					50,908	62,730

Fabric Gains KgCO ₂ /yr	L1A 2006 % Improvement
11,822	-18.85

Dwellings Under L1a 2013
SAP Performance Calculation

House Name	Plot Number	DER	TER	Total floor area	Total DER/year	Total TER / Year	
3H1	9	18.30	18.44	88.12	1,613	1,625	REPLAN 1
2H2	10	17.86	18.32	70.76	1,264	1,296	
2H2a	11	17.97	18.56	70.76	1,272	1,313	
2H2	12	17.86	18.32	70.76	1,264	1,296	
3H1	13	18.20	18.35	88.12	1,604	1,617	
3H1b	18	18.58	18.77	88.12	1,637	1,654	
2H2	19	17.86	18.32	70.76	1,264	1,296	
2H2a	20	17.97	18.56	70.76	1,272	1,313	
2H2	21	17.75	18.32	70.76	1,256	1,296	
2H2a	22	18.08	18.56	70.76	1,279	1,313	
3H1b	23	18.52	18.68	88.12	1,632	1,646	
					15,355	15,667	

3H20(b)ex	336a	17.63	17.99	103.55	1,826	1,863	CHICHESTER ROAD REPLAN
3H20A	336b	17.65	18.00	101.54	1,792	1,828	
3H20(b)ex	337a	17.63	17.99	103.55	1,826	1,863	
3H20A	337b	17.65	18.00	101.54	1,792	1,828	
3H1	338a	19.64	19.64	88.51	1,738	1,738	
2H2	338b	19.63	19.79	70.84	1,391	1,402	
2H3	338c	19.10	19.23	78.14	1,492	1,503	
					11,857	12,024	

27,212	27,691
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Fabric Gains KgCO ₂ /yr	L1A 2013 % Improvement
479	-1.73

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