



Energy Strategy – Addendum: Section 73

196-222 Kings Road

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1.0 INTRODUCTION

The original Planning Permission granted 02/09/2016 reference PP/15/04338 was supported with an Energy Statement which committed the scheme to deliver 25m² of PV panels. The submitted energy strategy at that time was prepared on this basis, and demonstrated that the scheme would suffer a shortfall of 9% (26% CO₂ reduction) in comparison to the GLA 35% target.

The original assessment is appended to this addendum report for reference. It was concluded at this time that an appropriate approach for mitigating the shortfall (9%) would be discussed and agreed with the GLA and RBKC. Through various discussions the GLA determined that the applicant try and accommodate a maximum of 176m² of PV panels, and that this be controlled through the submission of details under Planning Conditions. For the avoidance of doubt a shortfall financial contribution was not requested.

Since this time, the applicant has reviewed the space during the detailed design development and has identified availability at roof level to provide 152m² of PV panel, which equates to 121 PV panels or no less than a 27,830 kWp installation. This is deemed the maximum economically viable amount that can be provided for the scheme. The details of this proposed PV provision are included within this addendum report which has been prepared to support a Minor Material Amendment application.

2.0 SUMMARY

This Energy Strategy Addendum for Section 73 sets out to discuss the allocation and basis of the current Solar Photovoltaic (PV) allowance for 196-222 Kings Road and is subject to further detailed design development through Stage E (4).

A summary of the predicted PV allocation journey to date is shown below:

Table 1: Comparison of predicted PV allocations and resulting carbon offset payments

	Energy Statement (July 2015)	Planning Condition 54	Stage D Design	Stage E Design (current prediction)
Quantity of PV (m ²)	25m ²	176m ²	137m ²	152m ²

The above illustrates the variations between the planning submission statement and the recent Stage D and Stage E (current position) Designs predicted values. These variations are a result of the following design development items:

- Addition of the Roof mounted satellite farm (Block B)
- Design progression:
 - Thermal performance
 - Integration of improved g-values (Planning Condition 53)
 - System performance
- Area amendments (> Commercial to residential ratio)

The net impact of the above amendments has reduced the area availability for allocating PV on the identified roof area (see Image 1 & 2 below). For the avoidance of doubt due to townscape issues over sensitivities of residents overlooking the Waitrose roof area PV has been omitted from location.

The Stage D Design proposal allowed for up to 137m² (109no PV panels). Following further development during Stage E the design now currently allows for 152m² equating to 121no PV panels or no less than a 27,800 kWp installation. It should be noted green roofs are allocated on C1, C3 and the remainder of C2. Plant is allocated on the roof of Block A.

Image 1: Original unimpeded roof area identified in blue:

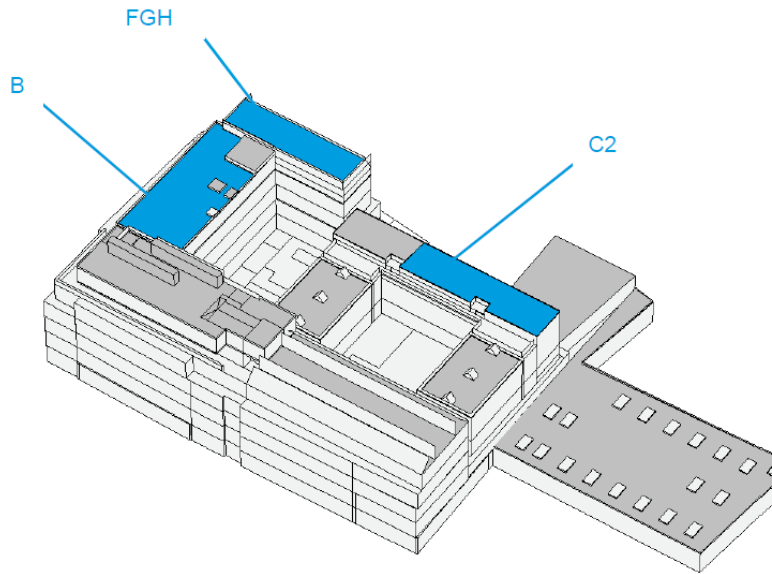
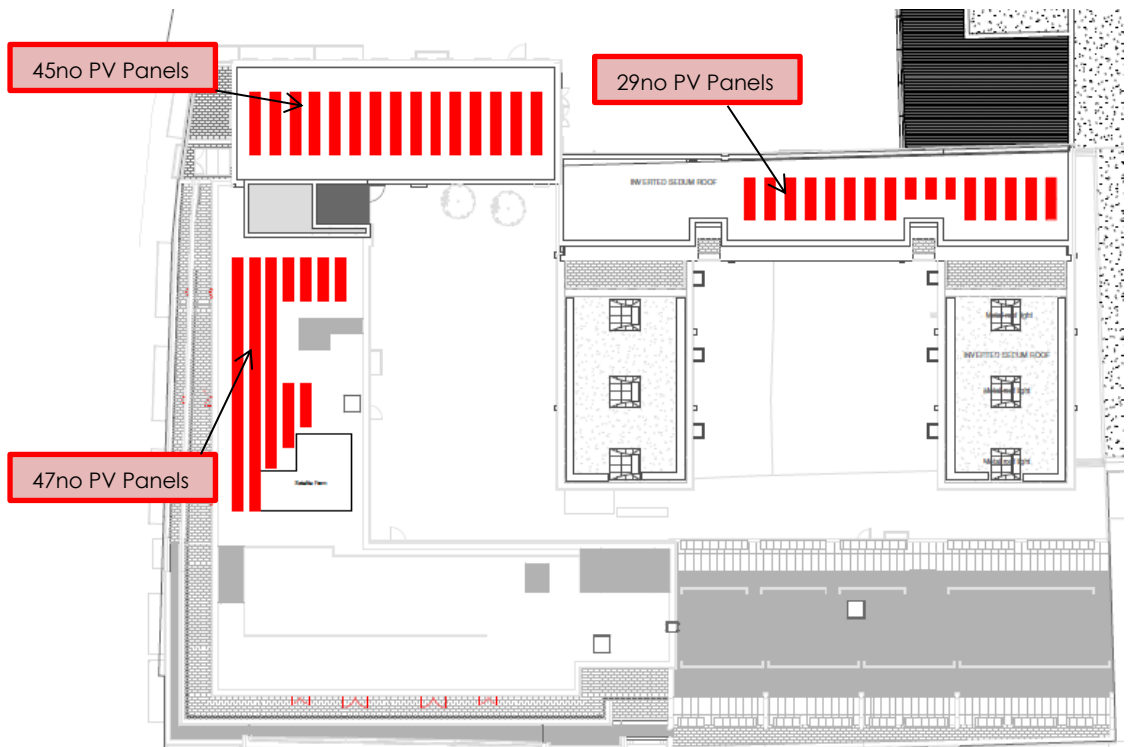


Image 2: Revised (Stage E) layout of the PV panels with reduced area on Block B due to design of satellite farm:



This variation in predicted PV provision (176m² to 152m²) does not negatively impact the current BREEAM 'Excellent' and CSH Level 4 scores for the King's Road development. See Section 4.0 'BREEAM & CSH Credits' for further details.

The proposed 152m² of installed PV panels on the viable roof area is approx. 500% greater provision than that proposed as part of the permitted scheme (25m²). Whilst the current proposals still fall short of the GLA's 35% by 7.9% this percentage is an improvement on the consented scheme's 9.0% shortfall. The applicant has committed to functionally, technically and economically maximising the extent of installed PV on the viable roof area of the development in the spirit and intent of the GLA and RBKC policies and consented conditions, and therefore a Carbon Offset Payment to mitigate the shortfall is not considered necessary in this instance.

ALL CO₂ and associated data reporting contained herein is subject to further design development, procurement, installation and commissioning.

3.0 BACKGROUND

The approved planning submission document (Energy Statement, July 2015) proposed providing 25m² of PV for the site-wide development. As requested by the GLA, the original Energy Statement contained a 'Solar Access analysis' report which was contained within Appendix J. This analysis report set out to identify the suitability and potential maximum viable roof area for allocating PV panels on the roof-scape of the development.

Following the planning process with the GLA and Local Authority an indicative PV provision of 176m² array was identified in the appended 'Solar Access Analysis' report. Image 1 above illustrates the findings of the analysis and associated roof space availability for PV panels.

Based on this indicative figure the design team set out to deliver the maximum amount of PV panels across the pre-identified suitable area for potentially maximising the on-site PV installation.

The project is currently in RIBA Stage E (04) design process which is targeting a September 2016 completion. This addendum report is based on the Energy strategy update that reflects the ongoing Stage E design and is submitted in support of the S73 application.

Following this most recent Stage E update of the energy strategy, results contained herein plus the proposed development, the scheme is predicted to deliver a site-wide **27.1% carbon dioxide emissions reduction over Part L 2013** which is 7.9% below the policy requirement of 35%.

Based on this ongoing Stage E reporting, the total number of PV panels is currently proposed to be 121 panels and allocated on blocks B, C and FGH:

- Dimensions of a PV panel: 798mm x 1580mm = **1.26m²**
- Design Wattage output of each PV panel is based on **230 W peak**
- Efficiency of each PV panel is based on **18.2%**
- Distribution:
 - **Block B** = 47no PV (**~59m²**)
 - **Block C** = 29no PV (**~37m²**)
 - **FGH** = 45no PV (**~57m²**)

The table below illustrates the change in resulting CO₂ savings between:

1. Energy Statement (July 2015) issued for planning,
2. Energy Strategy (March 2016) Stage D update, and
3. This report: Energy Strategy Addendum (June 2016) ongoing Stage E

The table shows that there has been a predicted increase in CO₂ savings of 8.1 tCO₂ per annum during the design process, to date, inclusive of the increased area of PV (25m² to 152m²). To further clarify this provision and for the avoidance of doubt the original (approved) proposed PV array consisted of 25m² equating to 16 panels.

Savings from:	July 2015 Energy Strategy		March 2016 Energy Strategy		June 2016 Addendum Ongoing Stage E (current prediction)	
	tonnes CO ₂ per annum	%	tonnes CO ₂ per annum	%	tonnes CO ₂ per annum	%
Baseline CO ₂ Site-Wide Emissions (TER)	293	-	311	-	311	-
Energy Efficiency Measures	35.9	12.3%	38.6	12.4%	38.6	12.4%
CHP	39	13.3%	35.6	11.4%	35.6	11.4%
Renewable energy (PV)	1.3	0.4%	9.3	3.0%	10	3.2%
Total cumulative savings	76.2	26.0%	83.6	26.8%	84.3	27.1%
GLA 35% Target:	102.6	35.0%	109.0	35.0%	109.0	35.0%
Shortfall	26.4	9.0%	25.4	8.2%	24.7	7.9%

From the table above it can be seen that the CHP is providing less benefit in the current Energy Strategy compared with the original July 2015 submission. This is due to an increase in commercial area leading to a reduction in area ratio of residential to commercial domestic hot water demand. This area change would have inadvertently reduced the reported CO₂ saving associated to CHP in the July 2015 Energy Strategy.

The overall result of this change in area ratio combined with a 500% increase in PV area results in a predicted net benefit of 1.1% in site-wide CO₂ savings when compared with the original Energy Strategy.

The design of the PV arrays has been informed by the Solar Access Analysis report (June 2015), which showed that areas of Block C is overshadowed by adjacent structures, and thus were not deemed viable for PV panels. Refer to HPF's Solar Access Analysis report (reference 14).

4.0 BREEAM & CSH CREDITS

The scheme is being assessed against the following 'Sustainable Assessments for the Built Environment' ("SABE"):

- Non-Residential: BREEAM 'Excellent'
(Office, Cinema, Retail, Public House and Roof Top Bar)
- Residential: CSH Level 4 Energy equivalent

The electricity from the allocated PV is being integrated in to the Landlord areas and as such is not planned to contribute directly to the non-landlord areas. The implications on the current BREEAM and CSH scores and credits are as follows:

- **BREEAM Ene 04: Low or zero carbon technologies**

No credits targeted in the Stage D reporting for BREEAM. As such the provision of PV does not impact the current CSH Assessment prediction.

- **CSH Ene 7 equivalent: Low or Zero Carbon Technologies**

No credits targeted in the Stage D reporting for CSH Level 4 energy equivalent. As such the provision of PV does not impact the current CSH energy equivalent assessment prediction.

5.0 CONCLUSION

The developments energy consumption and associated CO₂ emissions have changed as a result of the detailed design process such that the predicted Carbon emissions for the site-wide 'Baseline' value has increased by 6% before LEAN, CLEAN and GREEN measures.

Whilst the contribution of CO₂ savings directly from CHP has reduced by nearly 9% this has not impacted the proposal of a 25kW_e (38kW_{th}) CHP engine. The thermal store has been confirmed at 4m³ and the resulting annual run-hours are predicted at over 7,000 hours per annum. This provision results in only a 1.9% reduction in site-wide CO₂ savings from CHP, of the predicted cumulative 27.1% saving.

The applicant's provision of 152m² (121 panels delivering an approx. 27,800 kWp array) of PV to the viable roof areas of the development increases the PV's site-wide CO₂ savings from 0.4% to 3.2%, a 700% contribution improvement. This increased CO₂ savings of 8.7 tonnes of CO₂ per annum over compensates 3.4 tonnes of CO₂ per annum by 155%.

Overall the applicant has enabled the design to provide a greater site-wide CO₂ saving of 27.1% versus the consented proposal of 26.0% which equates to over a 4% improvement reducing the differential to the GLA's 35% target by approx. 14%.

The targeted BREEAM energy and CSH energy equivalent credits and overall score are not at risk by virtue of the change in Carbon Emissions and contributions of associated technologies.

6.0 REFERENCES

1. WED05917R – Energy Strategy, July 2015, Issue 9, Final.
2. WED05917R – Solar Access Analysis, June 2015, Issue 1, Final
3. WED05917R – Design Note – Residential: TM-52 and TM-49 Overheating analysis, 09/09/2015
4. WED09681R – Design Note – HPF Response to ESD related Planning Conditions, 26 January 2016
5. WED09681R – BREEAM 2011 Hea03 Thermal Comfort Study, February 2016, Issue 1, Final
6. Kings Road CSH pre-assessment – Stage D update and reporting
7. WED05917R – Office Pre-Assessment Stage D, 03/03/16, Issue 01, Final, (BREEAM 2011 NC v2 – Offices)
8. WED05917R – Cinema Pre-Assessment Stage D, 03/03/16, Issue 01, Final, (BREEAM 2011 NC v3 – Other Buildings)
9. WED05917R – Retail Pre-Assessment Stage D, 03/03/16, Issue 01, Final, (BREEAM 2011 NC v3 – Retail)
10. WED05917R – Pub and Roof Top Bar Pre-Assessment Stage D, 03/03/16, Issue 01, Final, (BREEAM 2011 NC v3 – Retail)
11. WED05917R Cadogan 202-222 Kings Road ESD BREEAM 2011_Stage D Summary.pdf
12. WED09681R – WED05917, Energy Strategy, March 2016, Issue 10, Final (Stage D update)
13. WED09681R – Design Note – Stage D PV Allocation, 25 May 2016
14. WED05917R – Solar Access Analysis, 30 June 2015

APPENDIX A
ORIGINAL ENERGY STATEMENT