London Borough of Camden

Energy Efficiency and Renewable Energy and Sustainability Plan

S106 Pro-forma v.1 – Part A

(To be submitted prior to implementation: planningobligations@camden.gov.uk)

Scheme address:	17 Branch Hill London NW3 7NA
Planning Reference:	2015/3377/P
Related Planning References:	Section 106 Obligations: Clause 4.3: Energy Efficiency and Renewable Energy Plan Clause 4.5: (Sustainability Plan)
Scheme Description:	Erection of a new build 3 storey single family dwelling (following demolition of existing) with plant room, swimming pool (including air handling unit) and air conditioning condenser units.
Person/s undertaking review on behalf of applicant *(include organisation name and registration number)*:	Reviewers: Christos Kollias Energy and Sustainability Engineer Licensed Domestic Energy Assessor – License number: STRO027678

This form must be completed by an appropriately qualified independent Energy and Sustainability Consultant, undertaking the review of the Energy Efficiency and Renewable Energy and Sustainability Plans, as required by the S106 Legal Agreement, on behalf of the applicant. Please complete the form in full. If you have any questions please contact planningobligations@camden.gov.uk

S106 CLAUSE DETAILS

Please summarise how the applicant is meeting their planning obligations relating to energy / sustainability as outlined within the S106 agreement (please add/ remove rows as applicable).

S106 clause no.	S106 clause wording	Summary of performance
ENERGY		
2.3.2.1	the incorporation of the measures set out in the submission document entitled "Renewable Energy Statement and Sustainability Report" prepared by ME7 referred to above in order to achieve a	Based on the information we have received, a different CHP unit (not the XRGi6) with an electrical efficiency of 27.2% and 66.8% heating efficiency has been set into the SAP models. Copies of the U-value reports for the windows, external Wall, basement wall, flat roof and

	37% reduction in CO2 emissions beyond the Part L2013 baseline;	basement floor have been provided which demonstrate that U-values have been improved compared to the 'RENEWABLE ENERGY STATEMENT AND SUSTAINABILITY REPORT FOR THE M&E SERVICES' report. A copy of the Mechanical Schedules Section IV T3 (page 4) shows the installed gas boiler (2XRemeha Quinta Pro 65). Copies of the detailed drawings have been provided by SHH architects which demonstrate the continuity of the insulation and application of the vapour control barriers with taped joints. All fenestrations will have mastic to the perimeter and walls will generally be plastered. All this complies with the robust details. Copies of the ACDs Checklist 'ADC Checkist Design Stage_20170504' have been provided by the SHH Architects for the Non-Repeating Thermal Bridging. It has been confirmed by the SHH Architects that the latest SAP calculations as prepared for the project are based on the current construction package for the project and there are no changes in the project in regards to the SAP assessment data/details.
2.3.2.2	further details including drawings, surveys, system specifications etc of how the Owner will reduce the development's carbon emissions from renewable energy technologies, ensuring that the Owner will target a reduction of at least 37% in carbon emissions using a combination of complimentary low and zero carbon technologies;	The planning energy and sustainability strategy is based on a CHP system as only LZC technology ('RENEWABLE ENERGY STATEMENT AND SUSTAINABILITY REPORT FOR THE M&E SERVICES' pages 17-21). A confirmation email has been provided by Inspire Consulting, project building services engineer, which demonstrates that a XRGi9 CHP system has been specified to contribute to the space heating & DHW demand. XRGI9 is a different CHP unit compared to the Viessmann Vitobloc EM-5/13 OR XRGi6 which is included in the Energy Strategy. This is a more efficient unit, which is positive and therefore will be accepted. In addition, according to SAV - manufacturer, the XRGi9 is quoted with a cleaner output than the Viessmann Vitobloc EM-5/13 or the XRGi6. Based on an email provided by Inspire Consulting, the CHP Unit was selected by SAV to meet the Camden Council NOx levels.
2.3.2.3	separate metering of all low and zero carbon technologies;	The planning energy and sustainability strategy is based on a CHP system as only LZC technology ('RENEWABLE ENERGY STATEMENT AND SUSTAINABILITY REPORT FOR THE M&E SERVICES' pages 17-21). Sub-metering of this system is discussed on item 2.3.2.7
2.3.2.4	a building management system being an electronic system to monitor the development's heating and cooling and	A copy of the "D06 – Electrical Specification V T2 report" developed by Inspire Consulting project building services engineers, demonstrates that (Page 26) a BMS is to be designed, installed and

	the hours of use of plant;	set to work. A copy of the "D12 – Environmental Controls Document' (page 4) states that the Mechanical Subcontractor shall incorporate within their tender the design, installation and commissioning costs associated with the 'BMS Controls Specialist.
2.3.2.5	the incorporation of a combined heat and power system of a size and specification to be agreed by the Council including details and methods of installation of this system and full energy calculations justifying the size of this system and limiting the use of electricity for any heating as reasonable;	A copy of the Design Guide has been provided for the proposed CHP Unit – Load Tracker XRGi9. The Design Guide provides further information for the CHP sizing, methods of installation & operation as well as the main key features of the system. A copy of the XRGi9 product datasheet (*LoadTracker CHP specification template October2015*) has been provided which shows the main characteristics (efficiency, output etc.) of the system. XRGI9 is a different CHP unit compared to the Viessmann Vitobloc EM-5/13 OR XRGi6 which is included in the Energy Strategy. This is a more efficient unit, which is positive and therefore will be accepted. Based on an email provided by Inspire Consulting, the CHP Unit was selected by SAV to meet the Camden Council NOx levels. A copy of a report has been provided 'Carbon Reduction Assessment 1 x XRGI 9_Branch Hill 17_02 May 17' which shows the expected CO2 emission reduction (of 9.7 tonnes of CO2 – 17%) by comparing a CHP unit to a conventional mains supply/gas boiler system. The same document includes further information for the CHP contribution to Electrical and Heat Needs. An email provided by CHP manufacturer – SAV, justifies the size of the unit. This is based on in house benchmark data for energy usage in a typical 2-bedroom residential apartment. This benchmark is calculated from average loads they receive from various consultants on numerous multi-residential projects.
2.3.2.6	a combined heat and power air quality assessment;	A copy of the Air Quality assessment 'CHP Air Quality Report Camden 17 Branch Hill J2891_F1' developed by Air Quality Consultants Ltd. has been provided which describes existing local air quality conditions (base year 2015), and the predicted impacts that emissions from the proposed CHP and Boilers will have on local air quality.
2.3.2.7	the provision of a meter on the combined heat and power unit so that the Council can monitor how much energy is being derived from it;	Paragraph 13.10.1 of the "*D12-Environmental Controls*" report states that The Controls Specialist shall design, install, commission and provide training for a metering and energy monitoring system to record meter readings for electricity, gas and water consumption for the property, including heat and power contributions from a CHP plant, and for possible connection to

		a future district heating scheme.
2.3.2.8	measures to enable future connection to a local energy network that has been designed in accordance with the "CIBSE heat networks code of practice for the UK" at the boundary of the property including:	Please see below for comments on each of the applicable items (points 1 to 11).
2.3.2.8.1	safeguarded space for a future heat exchanger;	A copy of a drawing 'IC - 01016 - PL - 090 - T4 - Plantroom Layout' has been provided by Inspire Consulting showing that a safeguarded space for a future heat exchanger has been allocated.
2.3.2.8.2	provisions made in the building fabric or such design such as soft points in the building plant room walls to allow pipes to be routed through from the outside;	Site services connections running between the plant room and the project site boundary are shown in the building services drawing "IC - 01016 - SW - 100 - T5 - Site Wide Services" developed by Inspire Consulting. The drawing shows the installation of spare 200mm diameter ducts for the future connection to a district heating scheme. An email has been provided by Inspire Consulting which states that the spare ducts are specified for installation.
2.3.2.8.3	the provision of domestic hot water isolation valves to facilitate the connection of an inter-facing heat exchanger;	A copy of the Heating Schematic Lower Ground Floor (IC - 01016 - SM - 102 - T2 - Heating Schematic) has been provided which demonstrates the provision of Isolation valves. It has also been confirmed by Inspire Consulting, M&E of the project that replacement of existing boilers would utilise existing connection points.
2.3.2.8.4	provision for external buried pipework routes to be safe-guarded to a nearby road or similar where connection to the DHN would be made;	A copy of a site wide services drawings *'IC - 01016 - SW - 100 - T5 - Site Wide Services'* has been provided which shows the provision for external buried pipework to the nearby road (safe guarder).
2.3.2.8.5	provision of contact details for the person responsible for the development's energy provision;	It has been confirmed by Inspire Consulting, M&E consultants of the project that Therm Energy Limited have been appointed as Inspire Consulting's SAP Assessor for the development and will provide As Built Sap calculations. Therm Energy Limited licence number (Joe Solti STRO003946)
2.3.2.9	measures to ensure a pre-implementation design stage review by an appropriately qualified and recognised independent professional in respect of the property including full design stage calculations certifying that the measures incorporated in the plan are achievable in the development and satisfy the aims and objectives of the Council's strategic policies on the reduction of carbon emissions contained within its	Twin&Earth have been appointed as a third party suitably qualified independent consultancy to review and verify the implementation of the design proposals stated within the Energy and Sustainability strategy submitted for planning in the final design proposals and specifications for the development. The review has been completed by Christos Kollias who is an engineer and a qualified and fully licensed energy assessor for commercial developments.

	development plan.	
2.3.2.10	measures to ensure a post-construction review of the development by an appropriately qualified and recognised independent professional including but not limited to photographs, installation contracts and full as built SAP calculations certifying that the measures incorporated in the plan have been achieved in the development and will be maintainable in the property's future management and occupation.	It has been confirmed by Inspire Consulting, M&E consultants of the project that Therm Energy Limited have been appointed as Inspire Consulting's SAP Assessor for the development and will provide As Built Sap calculations. Therm Energy Limited licence number (Joe Solti STRO003946).
2.3.2.11	identifying a means of ensuring the provision of information to the Council and a mechanism for review and update.	A package of supporting information compiled as part of this review has been issued as part of this submission.
SUSTAINABILITY		
2.4.3.1	achieve the target set out in the submission document entitled "Renewable Energy Statement and Sustainability Report" prepared by ME7 dated June 2015 and sustainable design measures and climate change adaption measures in line with policies contained in the Council's core strategy policy CS13 and development policy DP22;	It is our understanding that as Code for Sustainable Homes has been formally scrapped by the Government, a requirement no longer applies; however, the proposed energy strategy achieves a 37% improvement over Part L which largely exceeds the 19% minimum requirement by CfSH Level 4.
2.4.3.2	achieve a maximum internal water use of 105 litres per person per day allowing 5 litres per person per day for external water use.	A copy of the sanitary ware schedule has been provided, which shows the proposed sanitary ware fittings. These are: • WCs • Basin Taps • Shower • Bath A copy of the CfSH Wat 01 calculator has been provided which demonstrates that the dwelling's water efficiency is less than 105 L/min/person.
2.4.3.3	include measures to secure a pre-implementation review by an appropriately qualified recognised and independent professional in respect of the property certifying that the measures incorporated in the plan are achievable;	Twin&Earth have been appointed as a third party suitably qualified independent consultancy to review and verify the implementation of the design proposals stated within the Energy and Sustainability strategy submitted for planning in the final design proposals and specifications for the development. The review has been completed by Christos Kollias who is an engineer and a qualified and fully licensed energy assessor for commercial developments.
2.4.3.4	include details of maintenance and management relative to sustainability	Maintenance information has been provided the CHP system, which constitutes the main sustainability feature for the development.

	measures included in the plan;	Relevant documentation is included within the information package supporting the submission of this document.
2.4.3.5	include measures to secure a post-construction review of the development by an appropriately qualified, recognised and independent professional including the written report, photographs and installation contracts certifying that the measures incorporated in the plan have been achieved in the development and will be maintainable;	Twin&Earth have been appointed as third party consultants to undertake a review at Post Construction Stage.
2.4.3.6	identifying the means of showing the provision of information to the Council and provision for a mechanism for review and update;	A package of supporting information compiled as part of this review has been issued as part of this submission.

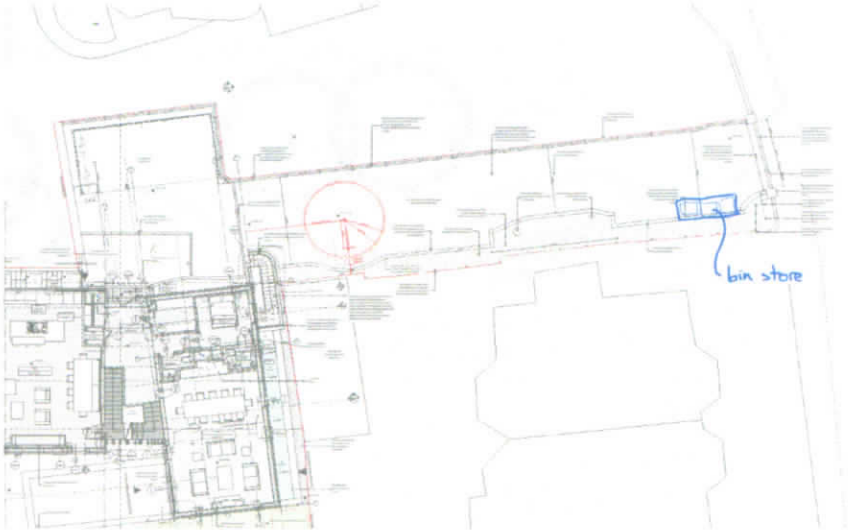
BUILDING SPECIFICATION TARGETS

Energy and Sustainability Statement key targets:

Please outline in the table below the key targets from the Energy and Sustainability Statements submitted at Full Planning stage, and summarise how the detailed design specification compares. Add or delete rows as necessary.

Please clearly outline any reasons for changes to the approved building specification.

	Full Planning: energy and sustainability statement targets	Detailed Design: performance against targets
Carbon reduction targets	37%	Please see validation statement provided against condition 2.3.2.1 within this document.
Building fabric u-values and air permeability	The following U-values have been assumed: External Walls: 0.16 Basement Walls: 0.16 Roofs: 0.13 Windows/doors/roof lights: 1.4 ACDs for lintels Air permeability: 5 m3/m2h	Please see validation statement provided against condition 2.3.2.1 within this document.
Low carbon technologies	It is not advisable to implement any LZC technology.	Only CHP system has been specified. Please see validation statement provided against condition 2.3.2.5.
Renewable energy	Same as above	-
Decentralised energy network connection	CHP system has been specified (Be Clean Scenario).	Please see validation statement provided against conditions 2.3.2.8.1, 2.3.2.8.2, 2.3.2.8.3.
Metering, monitoring and management		Please see validation statement provided against conditions 2.3.2.4 and 2.3.2.7.
Code for Sustainable Homes Rating	CfSH 4	Pleases see commentary to S106 requirements 2.4.3.1.
BREEAM	Not applicable	Not applicable

rating		
Materials, sourcing and waste	For further information please see page 41 of the 'Renewable Energy Statement and Sustainability Report – Part 1" prepared by ME7	A confirmation email has been provided by the SHH Architects, which states that all timber and timber-based products used on the project are Legally harvested and traded timber and is to be obtained from well managed forests. It has been confirmed by the architects that, there will be an enclosure by the gate allowing for the storage or 3no. 240 wheelie bins, 2 of which would be assumed dedicated to recycling or recycling and garden waste depending on the requirements. 
Green infrastructure	Provision of Green Roof – For further information please see pages 25/27/35/41 of the 'Renewable Energy Statement and Sustainability Report – Part 1" prepared by ME7.	Copies of drawings *(779)024_T02 Roof Level 1 & 2* showing the roof and (779)003_T02 Site Plan the proposed site plan have been provided which demonstrate that the development will incorporate green roofs.
Water efficiency and SuDS	For further information please see pages 41 (Surface Water Run Off) and 40 (Water efficiency) of the 'Renewable Energy Statement and Sustainability Report – Part 1" prepared by ME7.	• Please see validation statement provided against conditions 2.4.3.2. • Drawings of the roof plan and the proposed site plan confirm the provision of green roof. • Copies of the Proposed Water Drainage Plan have been provided showing drainage strategy across the whole site.
Other	Not applicable	Not applicable

ENERGY HIERARCHY

Please enter in the tables below carbon reductions for the development for each stage of the energy hierarchy (be lean, be clean, be green), following the guidance outlined in the GLAs *Guidance on Preparing Energy Assessments* and *Camden Planning Guidance CPG3*.

Please be aware that where carbon dioxide reduction targets are not met, the applicant will be required to either:

1. Retrofit on-site carbon reduction measures with a view to meeting targets
2. Implement carbon reduction measures elsewhere in the borough (prior agreement with the Council will be sought)

Key targets from Energy and Sustainability Statements (Regulated Emissions):

	New build commercial (includes major refurbishments assessed under Part L2A)		New build residential (includes major refurbishments assessed under Part L1A)		Commercial Refurbishment (assessed under Part L2B)		Residential Refurbishment (assessed under Part L1B)		Overall area weighted reductions	
	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage
Baseline	10,458	N/A	10,458	N/A		N/A		N/A		N/A
Be Lean	8,032	23.2	8,032	23.2						
Be Clean	5,023	37.46	5,023	37.46*						
Be Green	-	-	-	-						
TOTAL										
Shortfall					N/A	N/A	N/A	N/A		

* As all inputs in the SAP calculations submitted at planning stage are identical to the current design, with the exception of the CHP unit that has a higher efficiency and the roof U-value, which is slightly better, equal (and likely higher) carbon emissions savings to the claimed during the planning phase can be confirmed.

Detailed design stage targets:

	New build commercial (includes major refurbishments assessed under Part L2A)		New build residential (includes major refurbishments assessed under Part L1A)		Commercial Refurbishment (assessed under Part L2B)		Residential Refurbishment (assessed under Part L1B)		Overall area weighted reductions	
	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage
Baseline		N/A		N/A		N/A		N/A		N/A
Be Lean										
Be Clean										
Be Green										
TOTAL										
Shortfall					N/A	N/A	N/A	N/A		

EVIDENCE:

Detailed Design Stage

	Enclosed? Yes	N/A	Notes:
Copies of SAP/ SBEM worksheets	X		Please submit SAP/SBEM calculations evidencing the CO2 savings for each stage of the energy hierarchy, alongside this report. Pease provide details of which apartments have been sampled (if applicable). Results need to reflect the detailed design of the development. **Twin&Earth comment:** Copies of the SAP calculations have been included in the energy and sustainability statement submitted for planning which has been demonstrated reflect the current design and therefore are still valid.
Code for Sustainable Homes Pre-implementation assessment	☐	☐	This will need to be a "Pre-implementation" assessment. Although the Council is no longer able to condition new housing developments to achieve CfSH certification, any application which has already committed to achieving certification through S106 will be required to fulfil this obligation. **Applicant comment:** The applicant is seeking relaxation in relation to the CfSH application as has been done on previous projects in a similar situation. The main requirements from the CfSH have been transferred to the obligations under planning consent and Section 106 agreement and these have been complied with, namely: • Energy performance • Water performance • SUDs • Waste • Green roof • FSC certified timber
BREEAM In Design Review	☐	X	Please note: this will need to be the "In Design" review and not a copy of the "Pre-Implementation" review. Applicants should also submit Design Stage certificates.
Technical details/ plans/ drawings of installed CHP and other low/ zero carbon technologies (where relevant)	X	☐	Please submit details where relevant, as outlined in the S106.
CHP Air Quality	X	☐	Please follow the Council's guidance on completing air quality

Assessment			assessments outlined in *CPG6*.
Decentralised Energy Network connection details.	X	☐	Details should include: plans/drawings demonstrating: adequate plant room space provision; space for future heat exchanger; details of provisions made for connections (capped pipework, pipe routes, and provision of domestic hot water isolation valves); and any further details demonstrating that the connection has been designed in accordance with the CIBSE Heat Networks Code of Practice for the UK .

Please provide any further information relevant to this development – prior to implementation:

The agreed contents of this Energy Efficiency and Renewable Energy and Sustainability Plan must be complied with unless otherwise agreed in writing by the Council.

Signed:	
Print full name:	CHRISTOS GEORGIOS KOLLIAS.
Position:	ENERGY & SUSTAINABILITY ENGINEER
Date:	19/05/2017

Please submit to: planningobligations@camden.gov.uk

End of form - A

London Borough of Camden

Energy Efficiency and Renewable Energy and Sustainability Plan

S106 Pro-forma – Part B

(To be completed and submitted post completion)

S106 CLAUSE DETAILS

Please summarise how the applicant is meeting their planning obligations relating to energy / sustainability as outlined within the relevant S106 agreement (please add/remove rows as applicable).

S106 clause no.	S106 clause wording	Summary of performance

BUILDING SPECIFICATION TARGETS

Energy and Sustainability Statement key targets:

Please outline in the table below the key targets from the Energy and Sustainability Statements submitted at Full Planning stage, and summarise how the actual building compares. Add or delete rows as necessary.

Please clearly outline any reasons for changes to the approved building specification.

	Full Planning: energy and sustainability statement targets	Post completion: performance against targets
Carbon reduction targets		
Building fabric u-values and air permeability		
Low carbon technologies		

Renewable energy		
Decentralised energy network connection		
Metering, monitoring and management		
Code for Sustainable Homes Rating		
BREEAM rating		
Materials, sourcing and waste		
Green infrastructure		
Water efficiency and SuDS		
Other		

Post completion results:

Please enter in the tables below the carbon reductions for the development for each stage of the energy hierarchy (be lean, be clean, be green), following the guidance outlined in the GLAs *Guidance on Preparing Energy Assessments* and *Camden Planning Guidance CPG3*.

Please be aware that where carbon dioxide reduction targets are not met, the applicant will be required to either:

1. Retrofit on-site carbon reduction measures with a view to meeting targets
2. Implement carbon reduction measures elsewhere in the borough (prior agreement with the Council will be sought)
3. Make a carbon offset payment, where appropriate.

	New build commercial (includes major refurbishments assessed under Part L2A)		New build residential (includes major refurbishments assessed under Part L1A)		Commercial Refurbishment (assessed under Part L2B)		Residential Refurbishment (assessed under Part L1B)		Overall area weighted reductions	
	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage	Total tCO2	% reduction at each stage
Baseline		N/A		N/A		N/A		N/A		N/A
Be Lean										
Be Clean										
Be Green										
TOTAL										

Shortfall					N/A	N/A	N/A	N/A		

Post Completion Review

	Enclosed? Yes	N/A	Notes:
Copies of SAP/ SBEM worksheets	☐		Please submit SAP/SBEM calculations evidencing the CO2 savings for each stage of the energy hierarchy, alongside this report. Pease provide details of which apartments have been sampled (if applicable). Results will need to reflect the actual constructed building.
Code for Sustainable Homes Assessment and Certificate	☐	☐	This will need to be the final review and certificate. Although the Council is no longer able to condition new housing developments to achieve CfSH certification, any application which has already committed to achieving certification through S106 will be required to fulfil this obligation.
BREEAM Post Completion Review and Certificate	☐	☐	Please note: this will need to be the 'Post Completion" review and not a copy of the "Pre-Implementation" or "Design Stage" review. The Council recognises that formal certification can take several weeks therefore occupation can be permitted before certificates are received, subject to satisfactory Review.
Technical details/ plans/ drawing of installed CHP and other low/ zero carbon technologies (where relevant)	☐	☐	Please provide confirmation/ evidence that approved measures have been implemented.
Decentralised Energy Network connection details.	☐	☐	Please provide confirmation/ evidence that approved measures have been implemented.

Signed:	
Print full name:	CHRISTOS GEORGIOS KOLLIAS
Position:	ENERGY & SUSTAINABILITY ENGINEER
Date:	19/05/2017

Please submit to: planningobligations@camden.gov.uk

End of form - B