Energy, Sustainability and Air Quality Consultation Response

Scheme address	8-10 Southampton Row and 1 Fisher Street
Planning reference number	2019/2536/P
Description of development	Change of use of 8-10 Southampton Row from temporary Crossrail offices (B1) to hotel with ancillary bar and restaurant (C1), together with erection of an 8 storey building at 1 Fisher Street, containing 9 self-contained residential units (C3) and hotel floorspace connected to 8-10 Southampton Row (85 hotel rooms in total across the site), following demolition of part of rear façade and other internal and external alterations to 8-10 Southampton Row. Installation of associated plant, refuse and cycle storage areas.
No. of residential units	9
Non-residential floor space (GIA m2)	4,321m2
Type of non-residential floor space	C1 - hotel
Building regulations requirements	Assessed under L1A/L2A
Relevant documents for reference	Energy Strategy Report Stage 2, RES, 15/5/19 Sustainability Statement, Ensphere, May 2019 Thermal Comfort Analysis CIBSE TM59:2017 and CIBSE TM49:2014 Southampton Row Residential Units, RES, 10/5/19 Air Quality Assessment, Royal HaskoningDHV, draft 10 May 2019
Recommendation	Further information required
Consultee initials	KF

Nature of the scheme

Refurbishment of an existing building and a new extension to become a hotel. The remaining area of the new build with consist of 9 residential units.

POLICY REQUIREMENT:

MEDIUM RESIDENTIAL NEW BUILD 5-9 units >500sq.m and <1000sq.m floorspace (AND DEEP REFURBISHMENTS) ASSESSED UNDER PART L1A

Applicants must submit an **energy statement** showing how the development will meet the following policy requirements:

- Camden's Local Plan encourages developments to be Zero Carbon
- A minimum 19% reduction in regulated CO2 emissions below the maximum threshold allowed under Part L 2013.
- Follow the hierarchy of energy efficiency, decentralised energy and renewable energy technologies as set out in the London Plan (2016) Chapter 5 (particularly

Policy 5.2) GLA guidance on preparing energy assessments and CPG3 should be followed.[NOTE: Decentralised Energy Priority Areas are shown on this map]

- Camden's Local Plan (chapter 8) requires these developments to achieve a 20% reduction in CO2 emissions through renewable technologies (the 3rd stage of the energy hierarchy) wherever feasible, and this should be demonstrated through the energy statement.
- Where the reduction target cannot be met on-site, we may accept the provision of measures elsewhere in the borough or a financial contribution (charged at £60/tonne CO2/ yr over a 30 year period), which will be used to secure the delivery of carbon reduction measures elsewhere in the borough.

Applicants are also expected to submit **a sustainability statement** - the detail of which to be commensurate with the scale of the development showing how the development will:

- Be resilient to climate change through the implementation of the sustainable design principles as noted in policy CC2
- Ensure the development does not increase flood risk and reduces the risk of flooding where possible as noted in policy CC3 and specifically demonstrate that the residential development is capable of achieving a maximum internal water use of 105 litres per day (plus an additional 5 litres for external water use).

MAJOR NON-RESIDENTIAL NEW BUILD (AND DEEP REFURBISHMENTS) ASSESSED UNDER PART L2A

Applicants must submit an **energy statement** showing how the development will meet the following policy requirements:

- Follow the hierarchy of energy efficiency, decentralised energy and renewable energy technologies set out in the London Plan (2016 Chapter 5 (particularly Policy 5.2) to secure a minimum 35% reduction in regulated CO2 emissions below the maximum threshold allowed under Part L 2013. GLA guidance on preparing energy assessments and CPG3 should be followed.
- The London Plan (Policy 5.5) requires developers to prioritise connection to existing or planned decentralised energy networks where feasible. Camden's Local Plan Policy CC1) requires all major developments to assess the feasibility of connecting to an existing decentralised energy network, or where this is not possible establishing a new network. NOTE: Decentralised Energy Priority Areas are shown on this map].
- Camden's Local Plan (chapter 8) promotes zero carbon development and requires all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy. It also requires all developments to achieve a 20% reduction in CO2 emissions through renewable technologies (the 3rd stage of the energy hierarchy) wherever feasible, and this should be demonstrated through the energy statement.
- Where the London Plan carbon reduction target cannot be met on-site, we may accept the provision of measures elsewhere in the borough or a financial contribution (charged at £60/tonne CO2/ yr over a 30 year period), which will be used to secure the delivery of carbon reduction measures elsewhere in the borough.

Applicants are also expected to submit **a sustainability statement** - the detail of which to be commensurate with the scale of the development showing how the development will:

- Implement the sustainable design principles as noted in policy CC2
- Achieve a BREEAM 'Excellent' rating and minimum credit requirements under Energy (60%), Materials (40%) and Water (60%) as set out CPG3.

ENERGY STATEMENT

ENERGY HIERARCHY RESULTS:

Issue 1: From the information presented in Appendix A, the proposals **do not** meet the requirements to reduce overall carbon emissions of 35% for the new commercial elements and 19% for the residential new build. **Action: Revised proposals required to meet targets.**

The updated Energy Strategy demonstrates in Appendix A that the carbon emissions of the commercial elements of the development emit a total of 222,917kg.CO2 in comparison to the Base Case emissions of 386,185kg.CO2 giving a carbon emissions reduction of 42.28%. The residential elements of the development emit a total of 7,441kg.CO2 in comparison to the Base Case emissions of 9,308kg.CO2 giving a carbon emissions reduction of 20.1%.

Issue 2: From the information presented in Appendix A, the proposals **do not** meet the requirements for a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies across all elements. **Action: Revised proposals required to meet targets.**

The Southampton Row development achieves a 30.11% reduction in carbon emissions through Clean and Green measures with a 5.53% reduction in carbon emissions coming from renewable technology which consists of ASHP and PV. The Local Authority requires a 20% renewables contribution where feasible and to this end, Section 9 shows that the renewable technology appropriate for Southampton Row has been considered with each technology being deemed appropriate or not for the evelopment. As such the maximum renewable appropriate renewable technology has been applied to the development. It should be noted that the development achieves a 30.11% reduction in carbon emissions when CHP is also accounted for and an overall reduction of 41.75% when be Lean measures are also accounted for.

Energy Statement	Whole development		
	Total tCO2	Stage reduction, tCO2	Stage reduction, %
Baseline	380.84	N/A	N/A
Be Lean	365.05	15.80	4.1%
Be Clean	305.60	59.44	16.3%
Be Green	287.42	18.19	6.0%
TOTAL	**287.42**	**93.43**	**24.5%**
Target	*247.55*	*133.29*	*35.0%*
Shortfall	39.87	39.87	10.5%

Energy Statement	Commercial Refurbishment			Commercial New-Build			Residential New-Build		
	Total tCO2	Stage reduction, tCO2	Stage reduction, %	Total tCO2	Stage reduction, tCO2	Stage reduction, %	Total tCO2	Stage reduction, tCO2	Stage reduction, %
Baseline	232.73	N/A	N/A	138.80	N/A	N/A	9.31	N/A	N/A
Be Lean	205.08	27.65	11.9%	151.02	-12.22	-8.8%	8.94	0.36	3.9%
Be Clean	178.34	26.74	13.0%	118.32	32.71	21.7%	8.94	0.00	0.0%
Be Green	170.16	8.18	4.6%	108.31	10.01	8.5%	8.94	0.00	0.0%
TOTAL	**170.16**	**62.57**	**26.9%**	**108.31**	**30.49**	**22.0%**	**8.94**	**0.36**	**3.9%**
Target	N/A	N/A	N/A	*90.22*	*48.58*	*35.0%*	*7.54*	*9.31*	*100.0%*
Shortfall	N/A	N/A	N/A	18.09	18.09	13.0%	1.40	8.94	96.1%
Offset payment	N/A	N/A	N/A	£32,558			£2,528		

Issue 3: The commercial new build element of the proposal fails to reduce energy demand and increases it 8.8% over the baseline. This is contrary to requirements and needs to be addressed. Passive design measures, including optimising orientation and site layout, natural ventilation and lighting, thermal mass and solar shading, should be set out in the Design and Access Statement and cross-referenced in this document. Active design measures, including high efficiency lighting and efficient mechanical ventilation with heat recovery, must be set out in the energy assessment. **Action: Further information required.**

As shown in the updated Energy Strategy, the non-residential element of the development as a whole reduces its carbon emissions over the Base Case by 17% with all U-Values, air permeability, systems, lighting and controls improving upon the minimum performance requirements of Building Regulations Part L.

It should be noted that as we are required to use the existing property boundaries, are required to aesthetically fit in with surroundings, the ability to optimize the building orientation, site layout using these options are limited. The Energy Strategy includes the systems design information which shows that passive measures such as improved U-Values, glazing performance, high efficiency systems, low energy lighting and lighting controls are already included within the design.

BE LEAN:

Proposed specification:

Building fabric u-values (W/m²K)

Data	Unit	Value
Construction		
External Walls	W/m².K	3.20 (Existing Basement) 1.38 (Existing External Wall) 0.16 (New Wall)
Roof U-Value	W/m².K	0.45 (Existing Roof) 0.12 (New Roof)
Exposed Ground Floor U-Value	W/m².K	3.37 (Existing Basement and Ground Floor) 0.15 (New Basement)
Vertical Glazing U-Value (including frame)	W/m².K	1.8 (Existing, Secondary) 1.3 (New)
Vertical Glazing G-Value	W/m².K	0.72
Ventilation		
Air Permeability	m³/h.m² at 50Pa	15

Issue 4: It is not clear from this table if the retained thermal elements will be upgraded to meet the minimum Building

	Regulations part L2B table 5 (below) as required for a material change of use of the building. **Table 5 Upgrading retained thermal elements** **Element[1]** — **U-value W/(m²·K)**: **(a) Threshold** / **(b) Improved** Wall – cavity insulation: 0.70 / 0.55[2] Wall – external or internal insulation: 0.70 / 0.30[3] Floors[4,5]: 0.70 / 0.25 Pitched roof – insulation at ceiling level: 0.35 / 0.16 Pitched roof – insulation at rafter level[6]: 0.35 / 0.18 Flat roof or roof with integral insulation[7]: 0.35 / 0.18 **Notes:** 1 'Roof' includes the roof parts of dormer windows, and 'wall' includes the wall parts (cheeks) of dormer windows. 2 This applies only in the case of a cavity wall capable of accepting insulation. Where this is not the case it should be treated as for 'wall – external or internal insulation'. 3 A lesser provision may be appropriate where meeting such a standard would result in a reduction of more than 5% in the internal floor area of the room bounded by the wall. 4 The U-value of the floor of an extension can be calculated using the exposed perimeter and floor area of the whole enlarged building. 5 A lesser provision may be appropriate where meeting such a standard would create significant problems in relation to adjoining floor levels. 6 A lesser provision may be appropriate where meeting such a standard would create limitations on head room. In such cases, the depth of the insulation plus any required air gap should be at least to the depth of the rafters, and the thermal performance of the chosen insulant should be such as to achieve the best practicable U-value. 7 A lesser provision may be appropriate if there are particular problems associated with the load-bearing capacity of the frame or the upstand height. **Action:** Clearly set out the building fabric details of the retained and new elements separately. **Further information required.** The updated Energy Strategy breaks down the above table to provide additional information. There are areas of the existing building which cannot be upgraded due to the nature of the internal walls being of historical interest. Other areas of the existing building can be upgraded and have, for the moment been assumed to be upgraded to minimum Part L U-Values until it can be fully ascertained whether additional insulation will be suitable from a condensation perspective.
Air permeability (m3/hr/m2)	15 **Issue 5:** The air permeability is of particular concern and is significantly higher than the minimum 10 required for the new build elements. **Action: Further information required.** The air permeability previously shown was for the entire hotel and accounted for the fact that the retained element of the hotel was not, at the time, to be upgraded therefore leading to a higher air permeability overall. As there are now areas of the retained elements that can be upgraded, the air permeability for the hotel has been amended to 10 which reflectsthe new build and upgraded areas, which are expected to exceed this new target as well as the retained elements which are not being upgraded and so may have a higher air permeability.

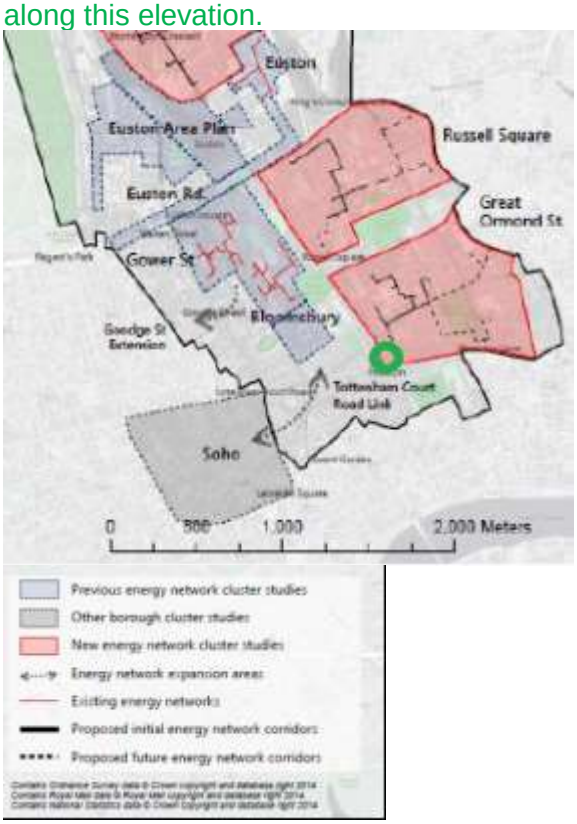
Low carbon technologies and building services	

Type of ventilation	
Bedrooms, Restaurant, Reception, Circulation, BOH	Mechanical with heat recovery
En Suites, Linen Store	Mechanical extract
Stairs, Residential	Natural Ventilation
Water Heating	
Source of Domestic Hot Water	Dedicated (Gas)
Boiler seasonal efficiency (%)	Hotel: 95.74 Residential: 96.03
Storage Volume (Hotel)	1500L
Standing Losses	3.75 kWh / day

Primary Heating			
VRF Seasonal Coefficient of Performance (SCOP)	kW/kW	2.93-4.4	
Gas Boiler	%	96.03	
Heating supply			
Bedroom, En Suites, Restaurant, Reception,		FCU	
En Suite Bathrooms, Stairs, Linen Store		Electric Radiator	
Residential		Underfloor Heating	
Primary Cooling			
Bedrooms, Restaurant, Reception, Circulation		4.60 - 4.85	
Residential		2.6	
Lighting			
Internal Lighting Gain			
BOH, Store, Basement	W/m²/100 lux	3.5	
Bedroom, En Suite		3.1	
Restaurant, Bar		1.24	
Reception		3.5	
New Circulation		1.17	
Existing Circulation		1.3	
Kitchen		3.5	
Lighting Control			
Parasitic power of lighting sensors	W/m²	0.10	
Space	**Control Type**	**Occupancy Sensing?**	**Daylight Sensing?**
Bedrooms	Switching	Auto	x
Restaurant	Switching	None	x
Reception	Switching	Auto	x
Circulation	Switching	Auto	x
BOH	Switching	Auto	x
Plant	Switching	Auto	x
En Suite Bathroom	Switching	Auto	x
Linen Store	Switching	Manual	x
Stairs	Switching	Auto	x
Management Factors			
Metering		Yes	
Out of range		Yes	
Power Factor Correction		Yes (0.9-0.95)	

BE CLEAN:

Connection to an existing decentralised energy network:	
Proximity to existing decentralised energy networks and proposals to connect	**Comment:** Not within 500m of an existing network therefore N/A

Future proofing:	
Opportunities to connect to a future network	**Issue 6:** Sites within 1km of a potential network should future proof unless demonstrated to be unfeasible. Using the London Heat Map the development is 0.8m/1.25km from the existing Citigen district heat network and from a potential Citigen extension. In addition the potential district heat network running along Euston Road is also 0.8m/1.25km from the development. The development is therefore outside the 1km requirement under which a development is required to future proof to connect to a future district network. However, a soft punch point will be allowed for within the development and design will include allowances for HIU and appropriate isolation valves and metering. It is expected that as the main thoroughfare, it is likely that a future district heat network would go along Southampton Row and as such all provisions will be made to allow connection along this elevation.  CO2 reductions can be included in the energy statement as long as connection is made within an agreed timescale/trigger point. If not then the shortfall will be offset or met through other means. **Action: Further information required including:** • Confirmation that the development is within 1km of a potential network The development is not within 1km of a heat network based on the London Heat Map.

	• Floor plan of energy centre and layout of plant demonstrating safeguarded space for a future heat exchanger. This is being developed and will be provided during the next stage of design • Confirmation that provision for external buried pipework routes from plant room to property boundary closest to expected route of network have been safeguarded. Details of these proposed pipe routes and connection points should be provided The required drawings showing safeguarded space will be provided durignteh next stage of design and will show detailed plant layouts and distribution routes including allowances for HUI, appropriate isolation valves and metering. It is expected that as the main throroughfare, it is likely that a future district heat network would go along Southampton Row and as such provisions will be made to allow connection along this elevation. • Details of provisions made in the building fabric/ design (such as soft-points in the building plant room walls) to allow pipes to be routed through from the outside at a later date a soft punch point will be allowed for within the development and design will include allowances for HIU and appropriate isolation valves and metering. • Details of provision of domestic hot water isolation valves to facilitate the connection of an interfacing heat exchanger. Design will include allowances for HIU and appropriate isolation valves and metering. • Triggers for connecting to a wider network (i.e. when a network becomes available or a particular date) It is expected that connection to any future district heat network will be considered at the end of life of the existing plant and also reviewed periodically from a financial perspective by comparing energy tariffs against the district heat network charges as they are made available or updated.
On-site CHP	
Suitability for on-site CHP	**CHP Information** Location: Plant Space Buffer Vessel: 3 x 1m³ Manufacturer: SAV Systems Model: Loadtracker CHP XRGI 20 No.: 3 Thermal Output: 38.7kWth Electrical Output: 20kWe Fuel: Gas Fuel Consumption: 67.2kW HHV Thermal Efficiency: 57.6% Electrical Efficiency: 29.8% Overall Efficiency: 79.5% Heat to Power Ratio: 1.9 Selective Catalytic Reduction: Yes NOx Emissions: 19mg/kWh (NCV)

Total energy exported per years (%)	Output to be used on site where possible. Remainder to be exported.
Life span (years)	10-15 years with maintenance. Major overhaul at 10-15 years will extend lifespan.
Noise Impact	Designed to appropriate sound standards for plant room None for residential.
Land use	Internal. Located in 8th floor plant space
Export electricity meter	Export meter required with network connection agreements

CHP Operation	
CHP estimated run hours	6,920
Annual heat generation (kWh)	803,357
Annual electricity generation (kWh)	415,172
Annual carbon saving (kg CO_2)	86,923 (based on Part L calculations)
Carbon saving contribution	22.22% over Lean Design
Annual provision of DHW to site	74.40%

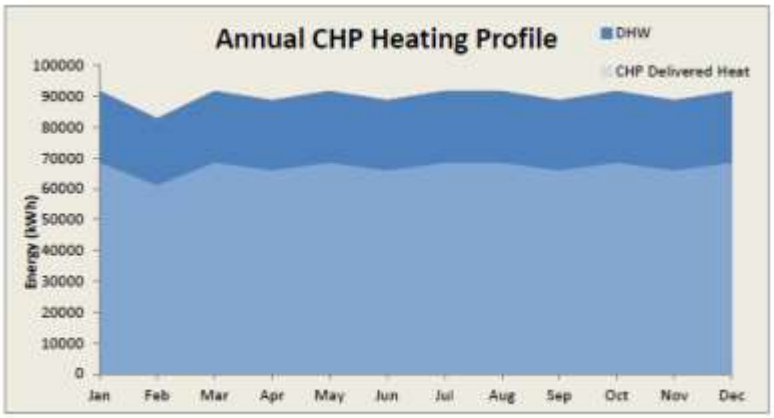


Figure 6 - Annual Heating Profile for the CHP system used for the hotel DHW demand

Issue 7: The applicant should provide further details to demonstrate the feasibility of CHP for the scheme. The heating profile should separate out space heat and hot water and include the ASHP and gas boilers. **Action: Further information required including:**

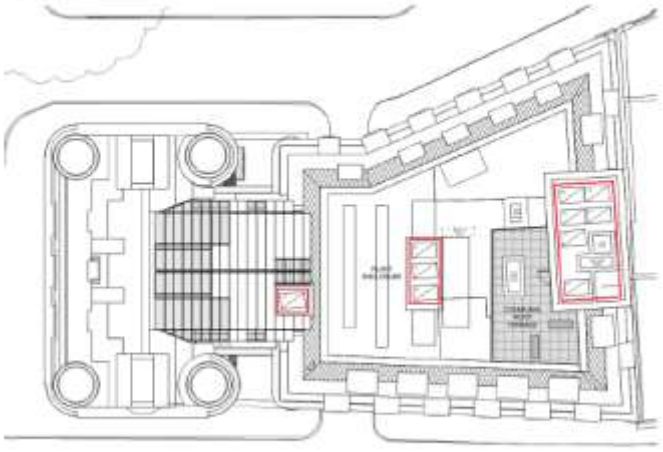
- Peak energy demands (kWh/year and kW) for the development for:
  - Heat demand (for hot water and space heating separately) Included in Appendix B of the updated Energy Strategy
  - Electricity demand (including unregulated energy) Included in Appendix B of the updated Energy Strategy
  - Cooling demand where district cooling is proposed District cooling is not proposed
- Details of the fuel used, including type of fuel and amount (kWh/yr). The applicant should review available heat sources and technologies including renewables and secondary heat sources where possible, with a comparison of whole life costs and contributions to CO2 reductions. The applicant should take account of future trends in energy prices and decarbonisation, and

	level of technology risk. electricity Details of CHP fuel consumption along with a payback period calculation (accounting for inflation to fuel prices) are included in Section 8.2.1 of the updated Energy Strategy. Alternative renewable/secondary heat sources are already included in Sections 8 and 9 (district heating, ASHP, and GSHP) and have discounted as discussed in the Energy Strategy,
	• Details of standby and top up boilers Included in Section 8.2.1 of the updated Energy Strategy.
	• Details of the proportion heat demand provided by CHP, thermal stores, boilers, and other technologies, illustrated as a heat profile showing monthly demand profiles and typical monthly design day profiles Included in Section 8.2.1 of the updated Energy Strategy.
	• Details of the NOx emissions associated with the plant and confirmation that a detailed Air Quality Assessment has been completed, including dispersion modelling. Appropriate mitigation should be in place. Cross-referencing the Air Quality Assessment, the energy assessment should confirm that the NOx emission standards set out in the SPG on Sustainable Design and Construction will be met.
	
	• An air quality assessment has been carried out as part of the planning application (reference PB9205 – Air Quality), including a dispersion modelling assessment to consider the impact of energy plant emissions at proposed and existing receptors. Impacts were predicted to be negligible at all considered receptor locations. Furthermore, this assessment is now considered to be conservative, as further evolution of the design has taken place and fewer items of gas-fired plant are proposed.
	
	• It should be noted that the air quality assessment incorrectly states that the CHP units are 37kWe; these units in fact have an electrical output of 20kW.
	
	• The Sustainable Design and Construction SPG states that boilers should achieve a NOx rating of <40mgNOx/kWh, and that CHP units should achieve 95mgNOx/Nm^3. The NOx ratings of the plant is as follows:
	  • Remeha Gas 210 Eco Pro 160 boiler – 38mgNOx/kWh.
	  • SAV Loadtracker XRGI 20 CHP unit – 18mgNOx/Nm^3
	
	• The proposed energy plant is therefore compliant with the requirements of the SPG. The NOx concentrations specified above were used in the calculation of the parameters used in the dispersion modelling assessment.
	
	• Confirmation that the CIBSE Code of Practice has

	been followed in designing the system and network. Included in Section 8.2.1 of the updated Energy Strategy. • Details of other potential developments which could connect to the network and whether they have been included in the assessment. The developer should consider the potential for scheme extensions and new connections. The development is not connecting to or creating a district heating network. • Details of how the scheme will be able to connect to a wider network, should one become available, including triggers for connecting to a wider network. AS per above comments • Details of the estimated electricity exported to grid (kWh/yr) and confirmation of who will be responsible for the CHP electricity sales and that the costs associated with this have been considered. Include any details of communications with ESCOs. Included in Section 8.2.1 of the updated Energy Strategy. • Details of operation, maintenance and monitoring arrangements and confirmation that the CHP will be economical to operate and maintain Included in Section 8.2.1 of the updated Energy Strategy. If, after carrying out this analysis the applicant decides that CHP is not appropriate for this development, we would expect the required CO2 savings to be achieved by alternative means.

BE GREEN

Proposed technologies:	
Solar Thermal	Not applicable
Solar PV:	Technical information Total area of PVs (m^2) 16.3 Area of one PV panel (m^2) 1.63 Tilt of collector (°) 10° Number of PV panels 10 Type of PV panels Monocrystalline Output per PV panel (W) 327Wp Total PV capacity (kW) 3.27kWp Life span (years) 20 Noise None Land of use Roof mounted PV panels

	PV Carbon saving Annual Energy Saving (kWh) 2,347 Annual carbon saving (kg CO_2) 1,218 PV contribution over Clean (%) 0.41% 13. Appendix C – PV Layout The proposed PV layout for the Southampton Row development is demonstrated in the figure below:  Figure 11 - PV layout on the roof of the development A total of 10 panels, each of area 1.63m², are placed on all available flat roof areas. **Issue 8:** It is not clear from the layout information provided that all potential roof space has been used to maximise PV potential. **Action: Further information required.** • Cross section and details of orientation. Once the final roof top and PV layout have been design a complete drawing will be submitted and will include plans and section across the roof, including the PV. The orientation, pitch and number of PV are included within Section 9 of the Energy Strategy as well as within Appendix C • Assumptions for the calculations of expected electricity generation. Included in Section 9 and Appendix C of the updated Energy Strategy. • Overshadowing impact assessment should be undertaken. The shading analysis should include an assessment of the height of existing buildings and any permissions granted for buildings near the application site. Included in Appendix C of the updated Energy Strategy. • Maintenance details should be provided Included in Appendix C of the updated Energy Strategy.
GSHP	Not applicable

ASHP	Technical Information Heating SCOP of ASHP: Heating = 2.93 - 4.4 Life span (years): 25 Noise: Minimal to Moderate dependant on location Visual Impact: Minimal – technology is normally low profile. Land of use: Plant Space / Roof Space Capital cost (£): £0[1] Annual Fuel Saving (£) using ASHP: £11,336 (using Part L consumptions) Maintenance (£): £1,200 (common for both boilers and ASHP) Payback period (years): -[1] ASHP Heating Carbon Saving Annual Energy Saving (kWh): 78,565 Annual carbon saving (kg CO_2): 16,970 ASHP contribution over Clean (%): 5.72%
Biomass:	Not applicable
Biodiesel:	Not applicable
Wind:	Not applicable

SUSTAINABILITY PLAN

Summary of proposed measures	
BREEAM rating	Should target BREEAM Excellent and minimum credit scores of 60% in Energy, 60% in Water, and 40% in Materials categories as set out in CPG3. Total score 72% = BREEAM Excellent Energy predicted score 18/25= 72% Water predicted score 6/8 = 75% Materials predicted score = 11/14 = 78.5% **Comment:** This would meet the requirement. **Suggested condition wording:** *Sustainability measures to be secured through S106 sustainability plan indicating BREEAM Excellent level and minimum credit targets in Energy (60%), Materials (40%) and Water (60%).*
Cooling hierarchy 1. Minimising internal heat generation through energy efficient design 2. Reducing the amount of heat entering the	The Thermal Comfort Residential Units report states: Due to the location of the development there are both air quality and acoustic issues meaning that openable windows cannot be used for controlling thermal comfort. In addition, controlling thermal comfort via mechanical cooling is not feasible due to the high air volumes required and as such, cooling is to be utilised within the living/kitchen and bedroom spaces of the dwellings.

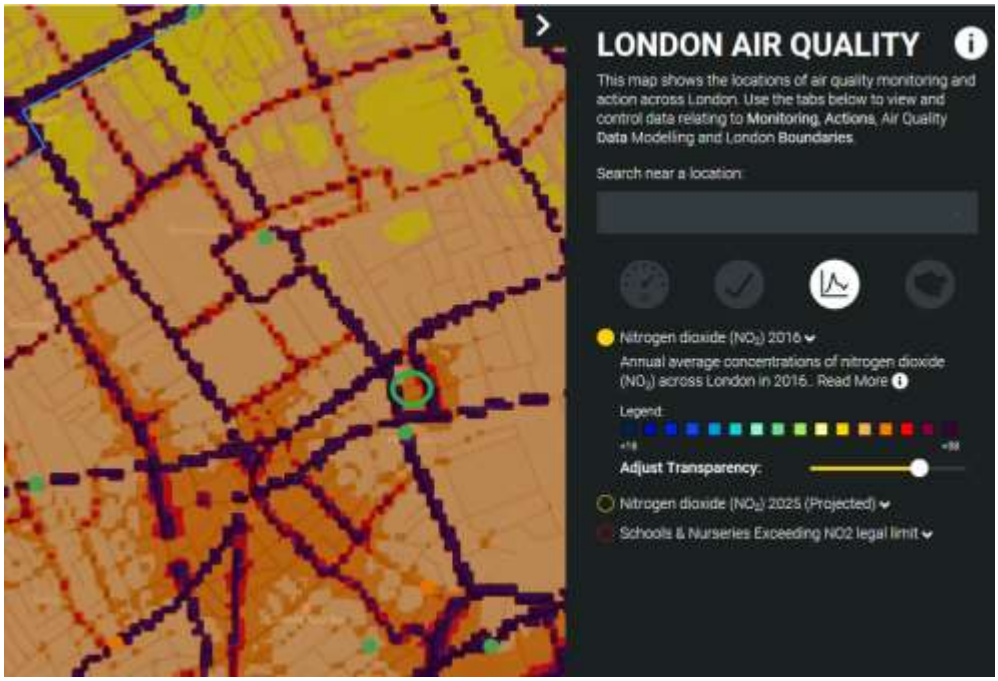
building in summer 3. Use of thermal mass and high ceilings to manage the heat within the building: 4. Passive ventilation: 5. Mechanical ventilation:	The results showing the risk of overheating, when using CIBSE TM59:2017 internal gains applied to the residential areas, with CIBSE TM49:2014 weather scenarios, tested against CIBSE TM59:2017 thermal comfort criteria, are presented below. **Issue 9:** It is not expected that active cooling will be proposed for any residential developments. Whilst it is accepted that in this development the air quality and acoustic issues mean that openable windows cannot be used, there is no mention of passive design measures to minimise the amount of cooling required. **Action: Further information on passive cooling required.** An updated residential thermal comfort report has been submitted and includes this information. **Issue 10:** All development should demonstrate that measures to adapt to climate change have been implemented and that overheating risk has been managed. Only the residential element has been assessed. **Action: The non-residential areas should also be modelled. Further information required.** A thermal comfort report was originally submitted for the hotel. In any case, an updated report has now been submitted.
Materials, sourcing and waste	The Sustainability Strategy states: Materials 6.27 The materials strategy for the development shall consider lifecycle environmental impacts, durability, responsible sourcing and pre-fabrication potential, with a view to optimising materials utilisation and safeguarding natural resources. Measures include: • The majority of major elements (walls, floors, roof) have been subjected to an IMPACT compliant Life Cycle Assessment (LCA) to assess embodied carbon in line with BREEAM 2018 and the requirements of the Mat01 *Environmental impacts from construction products – Building life cycle assessment (LCA)* issue. Detail design will further consider options for reducing impacts; • Use of all timber products that come from an accredited Forest Stewardship Council (FSC) source. Use of suppliers/products that operate Environmental Management Systems (e.g. ISO14001, EMS) as per minimum and BES 6001 certification for major applications; and • Consideration of durability, pre-fabrication and dismantling potential in selecting main elements.

Summer type	Year		Climate scenario	Spaces Passing CIBSE TM59 Overheating Criteria	Spaces Failing CIBSE TM59 Overheating Criteria
Current warm	2017	DSY1		100%	0%
	2020	DSY1	High 50%	100%	0%
	2050	DSY1	Medium 50%	100%	0%
	2080	DSY1	Medium 50%	100%	0%
Short and intense	2017	DSY2		100%	0%
	2020	DSY2	High 50%	100%	0%
	2050	DSY2	Medium 50%	100%	0%
	2080	DSY2	Medium 50%	100%	0%
Warm and persistent	2017	DSY3		100%	0%
	2020	DSY3	High 50%	100%	0%
	2050	DSY3	Medium 50%	100%	0%
	2080	DSY3	Medium 50%	100%	0%

Green infrastructure and biodiversity (including green/brown roofs)	The Council will expect all developments to incorporate brown roofs, green roofs and green walls unless it is demonstrated this is not possible or appropriate. This includes new and existing buildings. Please refer to CPG3 chapter 10 for further details. Under CC3 for water and flooding and CC2 adapting to climate change our preference is for green / blue hybrid roofs as these bring greater resistance to drought and hence longer sustainability. They also reduce strain on the sewers. For example we would expect to see minimum soil depth of 100mm, sufficient upstands to contain storm water, and suitable flow controls from the roof. Section 6.38 of the Sustainability statement refers to the potential for a green roof but there are no details or commitment 6.38 Specialist advice is currently being provided by a suitably qualified ecologist and the developer is committed to implement their recommendations to enhance the ecological value. It is anticipated that measures may include the incorporation of bird / bat boxes and species recommendations for planting the green roof. **Issue 11:** No brown or green roof or green wall details provided. **Action: Further information required.** Details required include: • the design objectives for the green or brown roof or green wall • details of its construction and the materials used, including a section at a scale of 1:20 • planting details, including details of the planting technique, plant varieties and planting sizes and densities. • a management plan detailed how the structure and planting will be maintained **WSP Response**: At Stage 2 planning submission, the level of information required to approach a green/brown roof manufacturer such as roof build-up sections, depths, loading capacities and calculations, etc. Therefore, the type the planting varities, sizes, densities, etc. cannot be determined until a manufacturer has designed these elements. We have however provided a typical cross-section within Appendix D.3 of the report showing how the green/brown roofs will be incorporated within the build-up, and interact spatially with the solar panels to ensure it is feasible.
Water efficiency and SuDS (including rainwater and greywater harvesting)	The sustainability statement states “6.18 Water saving fittings and appliances shall be installed and the following outlines the proposed maximum flow / consumption rates for each of the proposed installation types: • WCs Dual flush 6 litre / 3 litre; • Taps (excluding kitchen & external): Flow rate 5 litres / minute; • Showers 8 litres / minute; 6.19 It is proposed to reduce consumption levels in the residential part of the site to <105 litres / person / day.” **Comment:** This meets residential requirements. **Issue 12:** The Council will expect developments over 10 units or

	1000sq m and/or intense water use developments, such as hotels, hostels, student housing etc. to include a grey water harvesting system, unless the applicant demonstrates to the Council's satisfaction that this is not feasible. **Action: Further information required.** Applicants should submit a feasibility assessment for greywater harvesting which should consider the following: • the cost of the system; • cost savings for owner/occupier over a 10 year period; • projected grey water generation; • Projected demand for use of grey water • water savings as a result of the grey water system; and Following Local Plan policy CC3, the Council will expect payback for the system. (20 years is considered reasonable) **WSP Response**: Greywater recycling techniques were considered as part of the Stage 2 planning submission design. However, given that there is very limited space between the building edge and the site boundary, a greywater tank will not fit spatially in external areas of the site. A below ground greywater tank was also considered, however due to the presence of a basement and the large Crossrail shaft, there is no room left for a tank below ground. Lastly, a water re-use tank was also considered on top of the roof, however plant equipment and solar panels also pose spatial constraints where a large tank is not feasible.
Building Management Systems, metering, monitoring and management	**Issue 13:** The GLA Energy Assessment guidance requires information on how the building's actual energy performance will be monitored post-construction. **Action: Further information required.** Both the residential and commercial areas of the development will be provided meters in accordance with Part L. The non-residential element of the development will use the energy metering to monitor energy consumption/costs and, due to the required provision of sub-meters that allow the identification of end use consumption, will be able to discover and target excess energy consumptions as required. This checking of energy consumptions will be undertaken by both facilities management and a nominated energy champion to ensure that excess energy consumption is found and improved as quickly as possible to both minimise energy consumption and ensure plant maintenance/operation is correct.

Air Quality



The site is in an area of very poor air quality.

Construction phase:

Section 6.1.1. of the Air Quality Assessment states:

"*The dust assessment determined that there was a risk of impacts resulting from construction activities without the implementation of mitigation measures.*"

Further 6.1.1. states:

"*The GLA and London Councils guidance17 recommends that monitoring is undertaken prior to, and during, the construction phase works. Monitoring requirements would be agreed with LBCC prior to the start of the construction works and the monitoring methodology could be detailed within the DMP."*

Recommended condition:

Construction related impacts - Mitigation:

Mitigation measures to control construction-related air quality impacts should be secured within the Construction Management Plan as per the standard CMP Pro-Forma. The applicant will be required to complete the checklist and demonstrate that all mitigation measures relevant to the level of identified risk are being included.

Construction related impacts - Monitoring:

Air quality monitoring should be implemented on site. No development shall take place until

a. prior to installing monitors, full details of the air quality monitors have been submitted to and approved by the local planning authority in writing. Such details shall include the location, number and specification of the monitors, including evidence of the fact that they

have been installed in line with guidance outlined in the GLA's Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance;

b. prior to commencement, evidence has been submitted demonstrating that the monitors have been in place for at least 3 months prior to the proposed implementation date.

The monitors shall be retained and maintained on site for the duration of the development in accordance with the details thus approved.

Reason: To safeguard the amenity of adjoining premises and the area generally in accordance with the requirements of policies A1 and CC4 of the London Borough of Camden Local Plan Policies.

Operational Phase

6.2 of the Air Quality Assessment states:

"*Given that background pollutant concentrations across the site are above the annual mean NO2 Objective, the future use of the Proposed Development is considered to only be suitable with regard to air quality providing that forced air (mechanical) ventilation, incorporating an air filtration system with a sufficient rate of NO2 removal, is installed within each of the proposed residential units to reduce public exposure to annual mean concentrations of NO2."*

Recommend condition:

Mechanical Ventilation and NO2 Filtration
Prior to occupation evidence that an appropriate NO2 filtration system on the mechanical ventilation intake has been installed and a detailed mechanism to secure maintenance of this system should be submitted to the Local Planning Authority and approved in writing.

Reason: To protect the amenity of residents in accordance with London Borough of Camden Local Plan Policy CC4 and London Plan policy 7.14.

Air Quality Neutral

The Camden Plan clearly states that in order to help reduce air pollution and adhere to London planning policy, developments must demonstrate that they comply with Policy 7.14 of the London Plan (to be at least air quality neutral).

6.2 of the Air Quality Assessment states:

> An air quality neutral assessment was carried out in accordance with Air Quality Neutral Planning Support Update 2014 guidance. Emissions of NOx from the Proposed Development were predicted to be above the relevant building benchmarked emissions, and the relevant damage costs were identified. However, the information used in the assessment was derived from conservative assumptions regarding the hours of operation and loading, which is anticipated to be refined during the detailed design stage. The assessment confirmed that the relevant transport emission standards would be met based upon trip information provided in the Air Quality Neutral Planning Support Update 2014 guidance document.

Issue 14: The benchmarked NOx building emissions for air quality neutral are 330kg/year and the building was assessed to produce 410kg/year which is significantly in excess of the benchmark and means that the building would not be air quality neutral. **Action: This excess in emissions must be mitigated through appropriate amendments to scheme design. Further information required on refinements and any mitigation are required. If commitment to Air Quality neutral cannot be achieved, refusal is recommended.**

Following submission of the Air Quality Assessment (reference PB9205 – Air Quality) the scheme design has been revised. As such, the air quality neutral assessment has been amended to account for these changes. The changes are briefly summarised as follows:

- Removal of the 2no. 55kW boilers – these boilers have been replaced with Air Source Heat Pumps, which will be electrically powered, and therefore have zero NOx and PM_{10} emissions at point of use.
- The Air Quality Neutral Assessment presented in the report assumed that the energy plant would operate continually across the full duration of the year (8,760 hours). Calculations have now been undertaken to determine the actual annual hours of operation for each of the plant types:
    - The CHP units will operate for 7,900 hours per year; and
    - The 3no. 160kW boilers will run for 8,573 hours per year.

Furthermore, it has been calculated that the boilers will run, on average, at 20% load for the year, as during summer they will only be used to top up the domestic hot water supply, and would only occasionally reach 100% load in peak winter conditions. The boiler manufacturer (Remeha) was unable to provide the profile of NOx emissions as a function of loading. As such, the reduction in NOx emissions as a result of the low-load operation could not be quantified.

The revised air quality neutral assessment is presented below.

Plant	Emission Rate (g/s)	Annual Hours of Operation	Annual NOx Emissions (kg)
3x CHP Units (SAV Model XRGI)	0.001	7,900	28.4
3x Gas-fired Boilers (Rehema Gas 210 pro)	0.01	8,573	308.6
Total			**337**
Building Emission Benchmark			**330**

As shown above, the annual NOx emissions are slightly above the building emission benchmark of 330kg/year. However, as it has not been possible to account for the reduction in NOx as a result of the boiler loading, given that the boilers are the largest contributor, it is anticipated that the total annual NOx emissions for the development would be within the relevant benchmarks. As such, the proposed development is considered to be air quality neutral.