

Revision	Date	Description	Prepared By	Checked By
2	11-Aug-23	300GIR - Energy & Sustainability Comments – GDM response	Maria Papantoni	Marion Delaney

## Introduction

This file note has been prepared in response to the London Borough of Camden's energy and sustainability comments issued on 14/07/2023 and updated 10/08/23. It provides additional information to address the comments and support the Energy and Sustainability Statement revision 04 issued on 28/07/2023.

## Energy

### Carbon reductions

- Issue 1: The proposals do not meet the requirement for zero carbon and therefore a carbon offset payment of £45,150 is required. ACTION: To be secured through s106. Please confirm agreement to this Head of Terms.
- Response 1: The Applicant agrees. This figure matches the team's calculation and was suggested as a Head of Terms within the Planning Statement.
- Issue 2: The office extension does not meet the 15% carbon reduction required at Be Lean through energy efficiency measures. ACTION: Further information required, options to meet the 15% requirement should be investigated.
- Response 2: The commercial development achieves a site-wide 56% improvement under Be Lean, with the refurbishment achieving 61% and the new extension (floors 7, 8 and 9) 7% improvement from Be Lean under the Part L 2021 of the Building Regulations.

It is very challenging to achieve the 15% target for the new extension under the new 2021 Building Regulations since the 'actual' building is compared against the 'notional' building that uses highly efficient fabric and system specifications. The proposed values are performing much better than the Part L 2021 limiting values and 'notional' building values, and demonstrate a U-value improvement of 22%, as shown in the following table.

It is worth mentioning that the new extension achieves 36% improvement under the old Part L 2013 of the Building Regulations. This shows that the development has been designed using extensive passive design measures and the high difference between the old and the new building regulations targets.

Element/ Characteristic (W/m²K)	Limiting Part L2 2021	Notional Building 2021	Proposed Scheme	% Improvement
Roof/ terrace (W/m²K)	0.18	0.15	0.12	20%
External wall (W/m²K)	0.26	0.18	0.15	17%
External window (including frame) (W/m²K)	1.60	1.40	1.00	29%
Opaque Panels (W/m²K)	1.60	1.40	1.40	
<b>Average U-value</b>				
Average U-value (W/m²K)		0.5	0.39	22%
<b>Glazing Specifications</b>				
Solar transmittance (G-value) (%)	0.40	0.29	0.27	7%
Visible Light Transmittance (VLT) (%)	0.60	0.60	0.50	17%
<b>Air Leakage</b>				
Air Permeability @ 50 Pascals (m³/hrm²)	8.0	3.0	3.0	
<b>Window to Wall Ratio (WWR)</b>				
Ext. Wall Area (m²)		1.5m high × full façade width OR 40% of exposed façade area	855.5	
Ext. Opening Area (m²)			348.6	
WWR (%)			41%	

#### Solar PV

- Issue 3: There is a proposed 66.5m<sup>2</sup> of panels for the commercial development and a proposed further 54.78m<sup>2</sup> for the domestic development. The location, extent and specification and maintenance schedule of the proposed system should be confirmed. There should be consideration of potential shading issues in locating the panels. Solar PV should be maximised across the available roof area. Our preference is for this to be combined with blue/green roof to maximise biodiversity and run-off attenuation benefits. ACTION: Further information required.
- Response 3: The location, extent and specification etc. will be secured by the S106 Agreement via an Energy, Renewable Energy Efficiency and Sustainability Plans. This is a proposed Head of Term within the Planning Statement.

The proposed design is for a combined blue/green roof system with Solar PVs. The commercial development's roof has no potential shading issues. The residential will be effected by the taller component of the building, but will still receive direct sunshine. Lower roofs do not have PVs due to shading issues. The proposals therefore maximises the available roofspace for solar PVs

## Sustainability

### Overheating & Cooling

- Issue 4: Active cooling is proposed within the non-domestic extension.

As stated in section 8.42 of the Local plan;

Active cooling (air conditioning) will only be permitted where dynamic thermal modelling demonstrates there is a clear need for it after all of the preferred measures are incorporated in line with the cooling hierarchy.

- Firstly the cooling hierarchy should be fully addressed to outline what else could be done to reduce cooling demand without active cooling i.e. night-time purge ventilation, shading by bris soleil etc. Appendix D - Overheating and Cooling outlines potential measures but it is unclear which will be adopted.
- Secondly dynamic thermal modelling should also be undertaken for a scenario without the active cooling installed. The installation of active cooling must be justified by showing that the building overheats without active cooling despite the inclusion of all viable measures from the cooling hierarchy. Dynamic thermal modelling should follow the methodology set out in Section 8 of the GLA Energy Assessment Guidance 2022.

ACTION: Further information required.

- Response 4: The proposed commercial development has been designed to minimise its use of energy intensive cooling systems through passive and energy efficient measures. To reduce the need for cooling and reduce the risk of overheating, the following measures have been taken in accordance with Camden's local plan policy 8.42 and in line with London Plan Policy SI 4.
  - Minimising internal heat generation - Plug-loads and occupant densities associated with office activities cannot be altered beyond the client's brief. Therefore, the only area that can be targeted is the lighting. Low energy, high efficacy, Light Emitting Diode (LED) lighting will be used through-out the development to minimize internal heat gains.
  - Reducing the amount of heat entering the building - The development's façades have undergone various design reviews to control the amount of solar gain entering internal spaces. The façade elements have been specified with a low solar transmission g-value of 0.27 and use carefully designed shading measures. There are external shading fins on all the façades, along with recessed windows which will also provide some shading to the windows.

The proposed bay is configured from a series of vertical and horizontal elements, providing shading and visual rhythm.

① Vertical Fins

Vertical elements work well to shade the Western elevation where the solar angles have lower altitude but higher azimuth. These work passively to reduce overheating in summer whilst retaining good daylight.

② Horizontal Overhang

Horizontal hanging acts as an overhang to provide shading from higher altitude angles during the summer, in particular on the south facade, but also the east and west.

③ Recessed Glazing

Glazing is being recessed to allow the fins to shade a greater proportion of the glazed panel.

④ Openable Ventilation Panel

Each bay has 2 operable panels which will provide a means for single-sided and cross-ventilation approaches. This will reduce cooling demand in summer and provides occupants with passive environmental controls.



- Use of thermal mass and high ceilings to manage the heat within the building.
- Passive ventilation – The proposed ventilation strategy is natural ventilation via openable windows where external conditions allow e.g. noise and pollution levels are appropriate.
- Mixed Mode Cooling – local mechanical ventilation/cooling where required. The building uses low energy mechanical ventilation systems and air conditioning.

- Mechanical ventilation and active cooling systems - To deliver the high-performance internal environment required by the client, a mechanical ventilation and cooling strategy has been recommended. All equipment and plant will exceed the minimum requirements of the Approved Document Part L2 2021 of the Building Regulations for conventional space heating/ cooling systems, hot water systems and ventilation systems. MVHR units are to be employed to provide fresh air with a heat recovery efficiency of at least 75%. The heating and cooling systems shall be appropriately zoned, with local fast responding controls.

Dynamic modelling has been undertaken without the active cooling and it demonstrated that none of the occupied spaces pass the TM52 overheating criteria during the summer months between May and September, therefore, cooling during summer is required.

Night time cooling is feasible as openable windows will be installed in the office area. Currently the strategy is that the windows shall be manually openable by the tenant. Each openable window shall be interfaced to a natural ventilation controls system. The controls system shall indicate to the tenant when there is a benefit to open the windows to save energy. If the windows are opened the mechanical ventilation system and VRF system will be modulated or isolated accordingly however this feature will be examined further as part of the tenant fit-out. The night time cooling will operate when the building is unoccupied from 7pm to 7am, therefore, the building manager should open the windows while the occupants are away or the windows will open by using an automated ventilation system with sensors. This strategy should be included within the tenant fit out so that the windows open while the occupants are away and only open when external conditions are appropriate.

Mitigation measures have been examined to reduce cooling demand without the use of active cooling such as the use of night-time purge ventilation, the use of internal blinds, and increasing the openable window areas. The overheating analysis shows that even with the incorporation of all the mitigation measures the commercial development still fails to pass the TM52 overheating criteria during the summer months. However, the use of night-time cooling helps reduce the overheating risk and cooling loads, therefore, will be incorporated within the design and be included within the tenant fit out.

All occupied spaces will be supplemented with cooling throughout the year to achieve occupant thermal comfort that the natural ventilation cannot achieve. The results of the overheating analysis are presented within the revised Energy and Sustainability Statement issued on 28-07-2023.

- Issue 5: Overheating is indicated within the residential apartments, it is unclear what is being proposed to mitigate this situation. Camden strongly discourages the use of active cooling in new development. Passive measures further up the cooling hierarchy should be preferentially included to mitigate the overheating risk. With reference to Section 8 of the GLA Energy Assessment Guidance 2022 it should be demonstrated how overheating risk will be reduced.

Please note - Active cooling (air conditioning) will only be permitted where dynamic thermal modelling demonstrates there is a clear need for it after all of the preferred measures are incorporated in line with the cooling hierarchy.

- Firstly the cooling hierarchy should be fully addressed to outline what else could be done to reduce cooling demand without active cooling i.e. night-time purge ventilation, openable windows etc.
- Secondly dynamic thermal modelling should also be undertaken for a scenario without the active cooling installed. The installation of active cooling must be justified by showing that the building overheats without active cooling despite the inclusion of all viable measures from the cooling hierarchy. Dynamic thermal modelling should follow the methodology set out in Section 8 of the GLA Energy Assessment Guidance 2022.

**ACTION:** Further information required

- Response 5: The proposed residential development has been designed to minimise its use of energy intensive cooling systems through passive and energy efficient measures. To reduce the need for cooling and reduce the risk of overheating, the following measures have been taken in accordance with Camden's local plan policy 8.42 and in line with London Plan Policy SI 4.
  - Minimising internal heat generation - Plug-loads and occupant densities associated with office activities cannot be altered beyond the client's brief. Therefore, the only area that can be targeted is the lighting. Low energy, high efficacy, Light Emitting Diode (LED) lighting will be used through-out the development to minimize internal heat gains.



- Reducing the amount of heat entering the building – The development facades have undergone design reviews to control the amount of solar gain entering internal spaces. The façade elements have been specified with a low solar transmission g-value of 0.50 and recessed windows and balconies to provide shading and limit overheating.



*Figure 1 Residential development south façade showing the recessed windows*

- Use of thermal mass and high ceilings to manage the heat within the building.
- Passive ventilation – The proposed ventilation strategy is natural ventilation via openable windows where external conditions allow e.g. noise and pollution levels are appropriate.
- Mixed Mode Cooling – local mechanical ventilation/cooling where required. The building uses low energy mechanical ventilation systems and air conditioning.
- Mechanical ventilation and active cooling systems – To deliver the high-performance internal environment required by the client, a mechanical ventilation and cooling strategy has been recommended. All equipment and plant will exceed the minimum requirements of the Approved Document Part L1 2021 of the Building Regulations for conventional space heating/ cooling systems, hot water systems and ventilation systems. MVHR units are to be employed to provide fresh air with a heat recovery efficiency of at least 91%. The heating and cooling systems shall be appropriately zoned, with local fast responding controls.

Dynamic modelling has been undertaken without the active cooling and based on the Part O methodology. The results demonstrated that all residential spaces pass the TM59 overheating criteria, for the current climate scenario using DSY1 weather file.

None of the spaces passed the assessment with harsher climate scenario, DSY2 and DSY3. Also, none of the rooms passed the assessment during the future climate scenario, 2050s and 2080s even with moderately summer temperature DSY1 weather file.

Compliance with the weather files DSY 2 and DSY 3 and future weather files is not mandatory, however, extra measures need to be applied in harsher summer and future climate scenarios to mitigate the overheating risks. Update the design by making the fixed windows openable, if there is no noise or pollution risk, might help with decreasing the interior temperature in the failed rooms. The occupants should also be able to mitigate overheating through use of local fans and shutting internal blinds during the particularly long or particularly intense hot periods. The design should follow the cooling hierarchy that includes:

- Passive ventilation: larger windows that do not let in too much direct sun or adding coating to the glazing that absorb excess solar gains, adding shading such as blinds, roller shutters with ventilation louvres.
- Mechanical ventilation; MVHR (Mechanical Ventilation with Heat Recovery); and
- Active cooling; heat pump or air conditioning.

#### BREEAM

The BREEAM overall base case score is 75.55% which meets the requirement for BREEAM Excellent.

- Energy targeted credits 14 out of 24 = 58.3% which does not meet the requirement of 60%
- Water targeted credits 6 out of 7 = 85.7% which meets the requirement of 60%
- Materials targeted credits 13 out of 14 = 92.9% which meets the requirement of 40%
- Issue 6: The minimum requirements for BREEAM Energy credits is narrowly not met in the targeted scenario. Further options should be explored to achieve at least 60% in Energy credits. ACTION: Further consideration of how to achieve additional Energy credits required.
- Response 6: The BREEAM Pre-Assessment suggests there is a potential for a further 3 credits in relation to Ene 01 – Twin & Earth / GDM to review and advise. The development is being assessed as a Bespoke Assessment, for the Refurbishment and Fit Out part of the assessment under the RFO 2014 criterion – 15 credits are achieved and for the New Construction under NC 2014 criterion – 11 credits achieved. Overall therefore ~22/24 therefore 92% of the energy credits are achieved.