



Sustainability & Energy Comments – Response

The information contained in this note are the responses to the sustainability and energy comments for the 247 Tottenham Court Road scheme set out in the Senior Sustainability Officer's email of 16th December 2020. For ease of reference the responses to the comments are set out in the same policy order as they are contained in the Senior Sustainability Officer's email.

This document has been updated to reflect the Senior Sustainability Officer's further comments contained within their email of 22nd December 2020.

Energy/CC1

The further comments are summarised below.

Issue A *In order to ensure a net positive renewable heat input, we would not recommend accepting a product with COP for space heating lower than 4.0 or a seasonal performance factor lower than 2.5. This threshold is not demonstrated as being met here. (The lower COP and SCOP plus electrical top-up for domestic hot water may be deemed acceptable.)*

Issue B *the Response's stated EER of 4.05 also appears to contradict Appendix 10's stated value of 3.0.*

Action for applicant:

- *Confirm the actual proposed EER and COP, correcting statements as necessary, to resolve A; a product with COP 4 or greater should be selected.*
- *Calculate and report the minimum SCOP/SPF and SEER for the residential heating and cooling systems, to resolve B; product with SPF 2.5 or greater should be selected.*

For clarity the queries relate to the residential air source heat pumps only.

To confirm the SCOP/SPF and the SEER values definitively the information has been requested from the ASHP manufacturer, Panasonic. Panasonic have promised to confirm this information by 23rd December 2020.

However, the queries can be responded to with the information that is available.

Firstly, the appendix 10 quoted COP of 1.99 has been superseded by the choice of the Panasonic product from the SAP Q database. This is the initial value used in the original run of calculations before the Panasonic product was chosen to be used for the final planning submission SAP calculations. As noted above the definitive COP and SPF will be confirmed by Panasonic. However, as the product is in the SAP Q database it will have a minimum SPF of 2.5 as required by the Domestic Building Services Compliance Guide.

The cooling EER of 4.05 we have stated below is from line 209 of the SAP worksheet included in the Energy Strategy appendix document. This is a value that the SAP calculations generate. We confirm that the EER that was inputted into the SAP calculation is 3.00 as stated in the appendix 10 energy strategy parameters.

Original Comments

The Senior Sustainability Officer's issue/further information request is repeated below:

Renewables – Non-residential
ASHPs SCOP, SEER

Issue/further information: *Heat pump and system attributes to be confirmed*



The proposed residential apartment air source heat pump (ASHP) efficiency information is embedded in the SAP worksheets included in the submitted energy strategy appendix document. To respond to the comment the information has been extracted and is set out and explained below:

Heating	For the heating operation the details of the proposed Panasonic ASHP are part of the SAP database. Hence, the unit is referenced directly into the SAP calculations from the SAP database. SCOPs etc. are therefore not inputted manually for this item. The database reference number for the ASHP is 102594
Cooling	For the cooling operation the energy efficiency ratio (EER) needs to be inputted. The applicable EER is 4.05.

Sustainability/CC2

The further comments for policy CC2 relate to the residential overheating and the provision of comfort cooling. The BREEAM energy and the water efficiency comments are resolved.

Original Comments

There are three comments for policy CC2. These are dealt with separately in the text below.

The first issue/further information request is repeated below:

BREEAM

Issue/further information: *The scheme should be recommended to target one more BREEAM Energy credit for the Retail parts. This would bring the whole development up to compliance with policy CC3.*

The BREEAM retail pre-assessment energy section credit targets have been amended to include an increased target score for credit Ene 01. The energy section credit summary for the updated pre-assessment is as set out below:

	Max Credits	Target Achievable Credits
Ene 01: Reduction of Energy Use & Carbon Emissions	13	7
Ene 02: Energy Monitoring	2	2
Ene 03: External Lighting	1	1
Ene 04: Low Carbon Design	3	2
Energy Section Credit Total	19	12

The energy score is now targeted as 12 out of 19 credits i.e., 63.2%.

The second issue/further information request is repeated below:

Water Efficiency

Issue/further information: *I could not readily identify residential water calculations/efficiency proposals, nor adoption of the 105 (internal consumption + 5 external use) l/person/day policy target for residential schemes*

The water efficiency target for the residential scheme is confirmed as 105 litre per day per occupant. This is to be achieved using water efficient equipment, sanitary ware and brassware. The maximum limiting values for the equipment, sanitary ware and brassware to be incorporated into the scheme are as set out



below. These limiting values are based on the metrics from the Code for Sustainable Homes water efficiency calculator.

Fitting	Limiting Value	
WC	Ful flush volume	4.5 litres
	Part flush volume	3.0 litres
Taps (excluding kitchen and external)	5.0 litres/minute	
Bath	156 litres capacity to overflow	
Shower	9.0 litres/minute	
Kitchen sink taps	3.8 litres/minute	
Washing machine	6.0 litres/kg	
Dishwasher	0.64 litres/place setting	

The further comment associated with the residential overheating

Partially resolved

We can recommend accepting mechanical cooling for the 11 spaces where overheating has been predicted under criterion a – Appendix 7. The other 17 areas are not justified in receiving superfluous air conditioning as they pass both criteria, a and b.

Action for applicant:

Revise Statement, accordingly, confirming that the following areas will **not** have active cooling installed:

F1 U1 1 Bed	Bedroom	Pass
F1 U1 2 Bed	Bedroom	Pass
F1 U1 3 Kitchen Living	Living Room / Kitchen	Pass
F2 U2 2B 1 Bed	Bedroom	Pass
F2 U2 2B 2 Bed	Bedroom	Pass
F2 U2 2B 3 Kitchen Living	Living Room / Kitchen	Pass
F2 U2 3B 4 Kitchen Living	Living Room / Kitchen	Pass
F3 U1 3B 4 Kitchen Living	Living Room / Kitchen	Pass
F3 U2 2B 1 Bed	Bedroom	Pass
F3 U2 2B 2 Bed	Bedroom	Pass
F3 U2 2B 3 Kitchen Living	Living Room / Kitchen	Pass
F4 Duplex 1 Kitchen Reception	Living Room / Kitchen	Pass
F4 Duplex 4 Bed	Bedroom	Pass
F5 Duplex 1 Bed	Bedroom	Pass
F5 Duplex 2 Bed	Bedroom	Pass
F5 Duplex 5 Master	Bedroom	Pass
F5 U1 2B 4 Kitchen Living	Living Room / Kitchen	Pass

Due the site location on Tottenham Court Road there are other mitigating factors that need to be taken into account when considering if a natural ventilation philosophy is appropriate for the residential units. Primarily these are air quality and noise

Appendix B of the submitted Air Quality Assessment shows the following:



- The annual mean NO₂ objective are predicted to be exceed at all floors for the residential element of the Tottenham Court Road façade.
- The predicted annual mean NO₂ levels are technically acceptable (the results are in the range of 37.9 to 39.9) for the residential elements of the Morwell Street façade but as these values are so close to the objective level of 40, they should be regarded as not acceptable.

Hence, the residential overheating risk to all apartments needs to be mitigated by the use of comfort cooling and not natural ventilation.

Section 5, Outline Façade Recommendations, of the submitted Noise Assessment contains the following information:

Due to the ambient noise levels along Tottenham Court Road and Morwell Street, windows directly facing this road to lead to habitable rooms would be required to be closed to achieve internal noise criteria. When windows are opened (e.g. for purge ventilation) then internal ambient noise criteria may be exceeded, although opening windows for the purposes of ventilation would be at the discretion of the room occupant.

To comply with Building Regulations (Part F) (Ref 16)10, it will be necessary to provide ventilation so occupants can ventilate their property without breaking the acoustic seal of the building envelope. Mechanical ventilation has been chosen for the base build scheme. Mechanical ventilation will negate the need to open windows for ventilation and keep the building façade sealed keeping the attenuation performance of the glazed element of the façade.

Therefore, a natural ventilation philosophy does not provide a compliant internal noise criteria. Hence, to provide the internal noise criteria the windows and doors need to remain closed. Therefore, comfort cooling is required to all apartments to prevent overheating during the warm summer months.

Original Comment

The third issue/further information request is repeated below:

Residential

Issue/further information: The exercise has not satisfactorily demonstrated the criteria set out in the Local Plan 8.42 above. The cooling hierarchy includes mechanical ventilation (MV), which is to be preferred over mechanical cooling (the last and least passive option of the hierarchy). The most efficient version of MV (MV with heat recovery or MVHR) is actually proposed for all flats. However, it has not been shown to me that the MVHR was fully incorporated into the modelling exercise in particular with regard to scenario of the results presented.

It is confirmed that the results presented in the submitted residential overheating analysis contain the whole house mechanical ventilation rates for each dwelling.

The mechanical ventilation included in the assessment does not include heat recovery. The dynamic thermal modelling software utilised for the assessment is EDSL TAS. EDSL have confirmed that for residential overheating compliance calculations using their software that heat recovery should not be included in the mechanical ventilation as this would give unstable results. Hence, based on the technical advice from EDSL heat recovery is not included in the simulation.

For clarity, the heat recovery element of an MVHR system only reduces energy consumption when the treating the incoming fresh air when the internal air temperature is of a greater than the incoming air temperature for heating mode or when the internal air is cooler that the incoming air for cooling mode. As the overheating assessment does not include comfort cooling then the heat recovery element of an MVHR system will not be of any benefit to the overheating assessment as the internal air cannot be cooler than the outside air as no mechanical cooling is included in the assessment.

Therefore, the conclusions of the submitted residential overheating strategy remain unchanged i.e., parts of the residential development are at risk of overheating.