Planning Appeal Statement

40 Hillway, London, N6 6HH

Contents

1. Introduction

1.1 This planning appeal statement is submitted in support of an appeal against the refusal of planning permission (2023/2242/P) for the following development situated at 40 Hillway, London, N6 6HH. The description of development on the decision notice reads;

> *‘Installation of 3 x air condenser units with acoustic enclosure to the rear roof of the single storey ground floor extension. Part retrospective.’*

1.2 The application was refused on the 20th of December 2023 for the following reasons:

1. *The proposal has failed to justify the need for active cooling by reducing and mitigating the impact of dwelling overheating through the application of the cooling hierarchy, thereby failing to minimise carbon dioxide emissions, contrary to policies CC1 (Climate change mitigation) CC2 (Climate change adaptation measures) of the Camden Local Plan 2017.*

2. *The proposed external condenser unit and acoustic enclosure, by virtue of their size, design and location would add visual clutter to the detriment of the character and appearance of the host building and the wider Holly Lodge Conservation, contrary to Policy D1 (Design) and D2 (Heritage) of the Camden Local Plan 2017 and Policy DH1 and DH2 of the Highgate Neighbourhood Plan 2018.*

1.3 This statement sets out the appellant’s case which is summarised as followed:

- The proposal results in no increase in carbon dioxide emissions with the addition of the AC units, based on home improvements which counteract any change, to ensure no change from the emission percentage prior to installation of the AC unit.

- The proposal justifies the need for active cooling in relation to special circumstances, specifically the [redacted]

- The air conditioning (AC) units result in no harm to the Holly Lodge Estate within the Holly Lodge Conservation Area, continuing to preserve the character and appearance of the host building, the estate, and the wider Conservation Area.

- The location of the AC units to the rear of the site do not result in visual clutter within limited private views, mitigating any ‘public” impact or impact on the wider Conservation Area.

1.4 This statement should be read in conjunction with the drawings and supporting documents submitted in support of the application (2023/2242/P), especially the Energy and Overheating Assessment, prepared by EAL Consult, and appended to this document.

1.5 This statement will not repeat details set out in the drawings and documents submitted in support of the application unless they are directly relevant to the reasons for refusal. The statement will provide the appellant’s response to the reasons for refusal as supported by the officer’s report.

2. Matters Not In Dispute

2.1 The following matters are considered agreed between the Local Planning Authority (LPA) and the Appellant:

- The proposals do not cause any adverse impact on the residential amenity of neighbouring occupiers. There would be no adverse impact on neighbouring residents in terms of noise and vibration. Two compliance conditions are suggested by the council in relation to this noise criteria and are accepted by the Application as such.

- Due to the modest scale and rear siting on the unit, there is no adverse impact relating to outlook, daylight, or sunlight for occupiers or the site or adjacent neighbours.

3. Relevant Planning History & Policy

3.1 The previous planning decision on this site was for the same proposal, with the exception of a supporting overheating assessment. The application reference number was 2022/5452/P and was determined on 2nd May 2023. The accompanying officer report set out the assessment and solely notes the lack of an overheating assessment, with no other reasons for refusal. The assessment of heritage was deemed acceptable, and it was considered that no harm would result with the addition of the A/C units and associated enclosure on the Conservation Area. The officer's assessment in the previous application is set out below:

> *'4.3. The air-conditioning units would be located at the rear out of view from the public realm. Usually, AC units would not be accepted above the flat roof of a rear extension as this makes them appear more visually prominent from neighbouring gardens. However,* ***these units are relatively modest in scale and discreet in location and would not cause demonstrable harm to the character and appearance of the host building and conservation area. The design of the enclosure around them would also be acceptable and not make the units appear much more bulky.***
>
> *4.4.* ***Special attention has been paid to the desirability of preserving or enhancing the character or appearance conservation area****, under s. 72 of the Listed Buildings and Conservation Areas Act 1990 as amended by the Enterprise and Regulatory Reform Act 2013.'*
>
> (Previous Officer's Report, 2022/5452/P, Decision Date - 2nd May 2023).

3.2 As noted at the start of this appeal statement, the planning decision to which this appeal relates, was refused on harm to the Conservation Area. Prior to issue of the decision, the officer was made aware that the previous decision was not refused on heritage grounds and therefore it should not form a reason for refusal. The proposal had not been altered between applications, only the addition of an overheating assessment differentiated between each submission. Therefore, the Council's decision making is wholly inconsistent across the two applications and the heritage reason should not form a reason for refusal. Although it is considered that this reason for refusal (reason 2.) should not exist, a response to this shall still be provided for completeness, as it was included on the decision notice. The discussion above at point 3.1 should be taken into account in the Inspector's assessment of heritage and impact on the Conservation Area.

3.3 The following policies are extracted from the Decision Notice dated 20th December 2023 (2023/2242/P) and are considered to be relevant to this appeal. Policy DH1 (Demolition in Highgate's Conservation Areas) is not considered relevant as the proposal does not involve demolition, and therefore is not listed below.

3.4 Notwithstanding our response to the reasons for refusal set out later in this statement, we make the following comment about the application of planning policy in this case. The requirement for the application of the cooling hierarchy to these proposals seems unwarranted. The application of the cooling hierarchy is part of the Council's policy to require development to adopt appropriate climate change adaptation measures (Policy CC2, part d). The application of this does not seem appropriate for the type of development proposed, a householder application for A/C units in an enclosure. Reading paragraphs 8.41 – 8.43 would suggest it is more appropriately applied to proposals involving new buildings.

3.5 The justification refers to all new developments being expected to submit a statement demonstrating how the London Plan's 'colling hierarchy' has informed the building design. There is no new building design with this application, it is merely seeking the installation of A/C units on to a flat roof with an enclosure around it in order to mitigate against noise impacts and reduce visual impacts. When considering the London Plan, Policy SI 4 is where the colling hierarchy is mentioned. This policy deals with managing heat risk and refers to the colling hierarchy. It is clear in the policy that the cooling hierarchy is applicable to major development proposals only. A copy of this policy is appended.

3.6 Indeed, when considering the Council's own guidance on-line relating to proposals for ventilation, extraction and air conditioning equipment makes no reference to the requirement for an overheating assessment or demonstration of 'cooling hierarchy.' Rather, it is a noise, vibration and ventilation assessment that is required, and this was submitted with the application.

3.7 Local Plan 2017

- **Policy CC1 (Climate change mitigation)**

  'require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.'

- **Policy CC2 (Climate change adaptation measures)**

  'All development should adopt appropriate climate change adaptation measures such as: a. the protection of existing green spaces and promoting new appropriate green infrastructure; b. not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems; c. incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and d. measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

  Any development involving 5 or more residential units or 500 sqm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.'

- **Policy D1 (Design)**

  'The Council will seek to secure high quality design in development. The Council will require that development:
  a. respects local context and character;
  b. preserves or enhances the historic environment and heritage assets in accordance with Policy D2 Heritage;
  c. is sustainable in design and construction, incorporating best practice in resource management and climate change mitigation and adaptation;
  d. is of sustainable and durable construction and adaptable to different activities and land uses;
  e. comprises details and materials that are of high quality and complement the local character;
  f. integrates well with the surrounding streets and open spaces, improving
  movement through the site and wider area with direct, accessible, and easily recognised routes and contributes positively to the street frontage;
  g. is inclusive and accessible for all;
  h. promotes health;
  i. is secure and designed to minimise crime and antisocial behaviour;
  j. responds to natural features and preserves gardens and other open space;
  k. incorporates high quality landscape design (including public art, where appropriate) and maximises opportunities for greening for example through planting of trees and other soft landscaping,

l. incorporates outdoor amenity space;
m. preserves strategic and local views;
n. for housing, provides a high standard of accommodation; and
o. carefully integrates building services equipment.
The Council will resist development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions.

- **Policy D2 (Heritage)**

  'will preserve and, where appropriate, enhance Camden's rich and diverse heritage assets and their settings, including conservation areas, listed buildings, archaeological remains, scheduled ancient monuments and historic parks and gardens and locally listed heritage assets.

  Designated heritage assets
  Designed heritage assets include conservation areas and listed buildings. The Council will not permit the loss of or substantial harm to a designated heritage asset, including conservation areas and Listed Buildings, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:
  a. the nature of the heritage asset prevents all reasonable uses of the site;
  b. no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation;

  c. conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and
  d. the harm or loss is outweighed by the benefit of bringing the site back into use. The Council will not permit development that results in harm that is less than substantial to the significance of a designated heritage asset unless the public benefits of the proposal convincingly outweigh that harm.

  Conservation areas
  Conservation areas are designated heritage assets, and this section should be read in conjunction with the section above headed 'designated heritage assets.' In order to maintain the character of Camden's conservation areas, the Council will take account of conservation area statements, appraisals and management strategies when assessing applications within conservation areas. The Council will:
  e. require that development within conservation areas preserves or, where possible, enhances the character or appearance of the area;
  f. resist the total or substantial demolition of an unlisted building that makes a positive contribution to the character or appearance of a conservation area;
  g. resist development outside of a conservation area that causes harm to the character or appearance of that conservation area; and h. preserve trees and garden spaces which contribute to the character and appearance of a conservation area, or which provide a setting for Camden's architectural heritage.'

Highgate Neighbourhood Plan 2018

- **Policy DH2 (Development Proposals in Highgate's Conservation Areas)**
  'Development proposals, including alterations or extensions to existing buildings, should preserve or enhance the character or appearance of Highgate's conservation areas, and respect the setting of its listed buildings and other heritage assets. Development should preserve or enhance the open, semi-rural or village character where this is a feature of the area.'

Holly Lodge Conservation Area Appraisal

- Relevant areas of note in assessing special interest -

Page 6 - The Holly Lodge Estate is a distinctive planned development in the Garden Suburb tradition, dating to the interwar period (1920's) and located on the south facing slopes below Highgate Village. The buildings are designed in an English vernacular style influenced by the Arts and Crafts tradition.

Page 8 (printed figure) - The key factors that contribute to the character are:

- the architectural approach, which is low rise, predominantly two storeys in an English vernacular tradition with steep pitched roofs and gables, traditional materials, brick tile and render, and the harmony of the overall appearance of the houses, both detached and semi-detached, on the west and central parts of the estate;
- the setting of the dwellings: the houses which are set behind low walls, hedges, gates, and front gardens which reinforce the idea of the cottage garden, and the clipped hedges and lawns to the front of the flats.

Page 10 - The scale of the houses within the Holly Lodge Estate is a key factor in defining the character of the conservation area. Detached and semi-detached houses read as two-storey dwellings, (even if the roof space has been converted to provide a third level of accommodation)

3.8 London Plan 2021

Policy SI 4 Managing Heat Risk

A - Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials, and the incorporation of green infrastructure.

B - Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation, and the provision of green infrastructure
2) minimise internal heat generation through energy efficient design
3) manage the heat within the building through exposed internal thermal mass and high ceilings
4) provide passive ventilation
5) provide mechanical ventilation
6) provide active cooling systems.

Policy HC1 Heritage Conservation and Growth

A - Boroughs should, in consultation with Historic England, local communities and other statutory and relevant organisations, develop evidence that demonstrates a clear understanding of London's historic environment. This evidence should be used for identifying, understanding, conserving, and enhancing the historic environment and heritage assets, and improving access to, and interpretation of, the heritage assets, landscapes and archaeology within their area.
B - Development Plans and strategies should demonstrate a clear understanding of the historic environment and the heritage values of sites or areas and their relationship with their surroundings. This knowledge should be used to inform the effective integration of London's heritage in regenerative change by:
1) setting out a clear vision that recognises and embeds the role of heritage in place-making
2) utilising the heritage significance of a site or area in the planning and design process

3) integrating the conservation and enhancement of heritage assets and their settings with innovative and creative contextual architectural responses that contribute to their significance and sense of place
4) delivering positive benefits that conserve and enhance the historic environment, as well as contributing to the economic viability, accessibility and environmental quality of a place, and to social wellbeing.
C - Development proposals affecting heritage assets, and their settings, should conserve their significance, by being sympathetic to the assets' significance and appreciation within their surroundings. The cumulative impacts of incremental change from development on heritage assets and their settings should also be actively managed. Development proposals should avoid harm and identify enhancement opportunities by integrating heritage considerations early on in the design process.
D - Development proposals should identify assets of archaeological significance and use this information to avoid harm or minimise it through design and appropriate mitigation. Where applicable, development should make provision for the protection of significant archaeological assets and landscapes. The protection of undesignated heritage assets of archaeological interest equivalent to a scheduled monument should be given equivalent weight to designated heritage assets.
E Where heritage assets have been identified as being At Risk, boroughs should identify specific opportunities for them to contribute to regeneration and place-making, and they should set out strategies for their repair and reuse.

London Plan Guidance

Energy Assessment Guidance updates - Part L 2021 of building regulations

- Guidance for major development net zero carbon target
- On-site carbon reductions that can normally be achieved over Part L 2021 will vary for different development types: - Residential developments are expected to be able to achieve on-site savings beyond the minimum 35 per cent improvement.

3.9 National Planning Policy Framework (NPPF) 2023

Planning For Climate Change, Paragraph 162

162. In determining planning applications, local planning authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption

Proposals Affecting Heritage Assets, Paragraph 201

Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.

3.10 The Building Regulations 2010 (Amended 2021)

Overheating Mitigation – does not include householder development

3.11 Planning and Compulsory Purchase Act 2004

Section 38(6) If regard is to be had to the development plan for the purpose of any determination to be made under the planning Acts the determination must be made in accordance with the plan unless material considerations indicate otherwise.

The enactments are—
(a)this Act;
(b)the planning Acts;
(c)any other enactment relating to town and country planning;
(d)the Land Compensation Act 1961 (c. 33);
(e)the Highways Act 1980 (c. 66).

3.12 List of Appendices

The following documents are appended to this planning appeal statement and should be considered in the assessment of the proposal. These are discussed in the sections that follow:

- Updated Energy & Overheating Assessment Rev 2 March 2024 (EAL Consult)
- Doctor's Letter 02.01.24
- Camden Council's Air-Conditioning Application Requirements (snippet of web page)
- Rebuttal to Neighbour Objection issued 22.08.23
- London Plan 2021 Policy SI 4

4. Active Cooling

4.1 In relation to active cooling, the following considered policies are relevant:

- Policy CC1 (Climate change mitigation) &
- Policy CC2 (Climate change adaptation measures) of the Local Plan 2017
- Policy SI 4 (Managing Heat Risk) of the London Plan 2021

4.2 The reason for refusal states *'failed to justify the need for active cooling by reducing and mitigating the impact of dwelling overheating through the application of the cooling hierarchy, thereby failing to minimise carbon dioxide emissions, contrary to policies CC1 (Climate change mitigation) CC2 (Climate change adaptation measures) of the Camden Local Plan 2017.'*

4.3 The Appellant does not agree with this assessment as discussed below.

4.4 It is understood that policy CC1 should be applied to new major development proposals only, in relation to carbon dioxide emission targets. It is therefore considered that policy CC1 is not relevant to the assessment as the proposal is not for a new building/extension or major development.

4.5 In addition, Policy CC2 of the Local Plan and London Plan Policy SI 4 is to be applied to developments involving 5 or more residential units or 3500 sqm or more of floorspace. It should not be applied to the assessment of householder applications, especially those with no extensions. Therefore, Policy CC2 is not relevant and consequently the application of the cooling hierarchy in the assessment of the scheme is not applicable.

4.6 Furthermore, the Council's planning pages state that application for plant, i.e., air-conditioning units, solely require the submission of an acoustic report. There is no mention of an energy and overheating assessment as per the validation requirements. Consequently, this further negates as to why the assessment in relation to the cooling hierarchy is not required.

4.7 In the instance that the Inspector considers that the three policies above apply, the updated overheating assessment prepared for the application submission and updated for the appeal submission, states the following.

4.8 The document *'outlines an overall commitment to reducing energy consumption under occupancy through the adoption of a 'Fabric First' principle, which will seek enhanced insulation standards and improved heating and lighting efficiencies in comparison to the standard requirements of Approved Document Part L1 2013.'*

4.9 The proposal does not result in an increase in carbon emissions. This should be considered appropriately based on the scale of the proposal. This should be taken into account when assessing the level of detail and the required contribution to climate change mitigation and adaptation measures required for this householder proposal.

4.10 The proposal has been clearly justified in relation to the need for active cooling by mitigating the impact of dwelling overheating through the application of the cooling hierarchy, allowing no increase in carbon emissions as noted in the table below.

Table 3. Carbon Dioxide Savings from each stage of the Energy Hierarchy

	With Active cooling		Without Active cooling	
	Regulated Carbon dioxide savings (Tonnes CO_2)	% Improvement	Regulated Carbon dioxide savings (Tonnes CO_2)	% Improvement
Savings from energy efficiency measures	4.35	**38.7%**	4.35	**38.7%**

4.11 The results illustrate that carbon dioxide savings are similar with or without active cooling and therefore this does not lead to an increase in carbon emissions. The housing improvements noted within the document (i.e., improved insulation, and efficient heating and lighting) are considered by the Appellant to be at the limit of financial viability for a householder development. The resultant carbon dioxide savings noted above in combination with the home improvements as a whole, exceed the requirements set out in Part L of the Building Regulations (Conservation of fuel and power: Approved Document L).

4.12 The cooling strategy set out on page 17 of the document '*has been defined according to the cooling hierarchy*', set out in Table 10. 'Cooling Hierarchy.' This confirms that '*Improved U-values and passive measures have been implemented as outlined in section 4. The modelling results in section 6.2 show that energy efficient design alone, within the existing building is not sufficient.*'

4.13 Furthermore, if the Inspector still considers that there is a breach of planning control, then material considerations must be considered, as per Section 38(6) of the Planning and Compulsory Purchase Act 2004.

4.14 In this case, the need for active cooling should also be considered in relation to exceptional circumstances, specifically the Appellant's medical condition. [redacted] (See Doctors Letter appended). This means that the option to open a window to manually regulate the internal temperature of the property, is simply not an option. Weight should be given to this exceptional circumstance in the justification for the need for active cooling, in addition to the technical aspects noted above and discussed within the Energy and Overheating Assessment. These exceptional circumstances outweigh policies CC1 and CC2, should they apply, although it is considered that these policies are not relevant.

4.15 Although the use of personal permissions by condition are generally not considered appropriate, this may be a rare situation whereby such a condition could be imposed [redacted]

4.16 EAL Consult explain further within their technical assessment that passive and mechanical ventilation are simple not sufficient to recover the heat generated, as well as ensuring the requirement for filtered air and internal heat management which is necessary to ensure the [redacted] are not negatively impacted.

4.17 Finally, we return to an earlier point made about application of policy. The Council's approach to the application seems to be that other measures should be considered before proposing air conditioning and that air conditioning is only permissible if all other preferred measures in the cooling hierarchy are incorporated into a development. The Council is critical that no evidence has been given to a 'fabric first' approach and that at no point during the construction of the extension was any passive cooling measures incorporated into the design to negate the need for air conditioning. This would perhaps make sense and be rational for a new building proposal.

4.18 However, the extension was approved back in 2019 and has been built in accordance with the planning permission. It seems unreasonable that the Council are now suggesting that insufficient passive cooling measures were not incorporated into its design. It also suggests that they are not considering this application on its own merits, which is simply to add A/C units to an existing dwelling on top of an existing extension. The application of the 'cooling hierarchy' almost seems illogical and perverse to such proposals. There is no new building or new built fabric taking place to consider other passive measures. The report for EAL Consult shows that there is no increase in carbon emissions. That satisfies policy requirements.

5. Heritage

5.1 In regard to Impact on the Conservation Area, the following policies are relevant:

- Policy D1 (Design)
- Policy D2 (Heritage)
- Policy DH2 (Development Proposals in Highgate's Conservation Areas)
- Holly Lodge Conservation Area Appraisal (CAA)

5.2 The site falls within the Holly Lodge Conservation, however the site is not Listed. The site forms part of the Hillway character area. This key features of the area's character is described as;

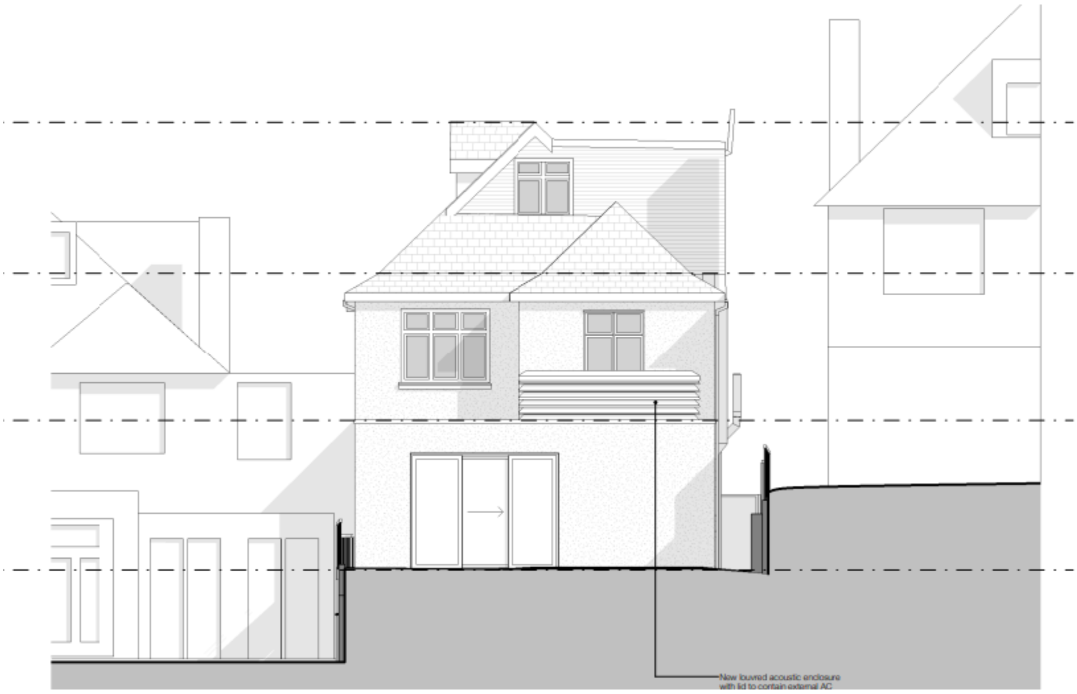
'*The buildings and the layout are substantially intact and reflect a progression of style from **the rendered cottage to half-timbered semi-detached houses** and then **substantial detached houses** at the top of Hillway all set in a **mature streetscape with wide verges, footpaths and front gardens'*** (CAA).

5.3 Furthermore, the estate is described as being much like a Garden Suburb with properties dating back to the 1920's, with influence from the **Arts and Crafts architectural style**. The areas of interest noted to contribute to the character of the area are – **two-storey dwellings**, (even with loft conversions/extensions), **with traditional materials, pitched roofs and gables. This also includes the setting of the dwellings with front gardens and low walls.** The rear of dwellings in the Hillway area is not described as forming part of the character of the area.

5.4 Policy D1 sections a and b state that development must respect local context and character and preserve or enhance the historic environment and heritage assets in accordance with Policy D2. Should any harm be considered in relation to the host building and/or wider Conservation Area, it is less than substantial, and can in any instance justified appropriately in the assessment below.

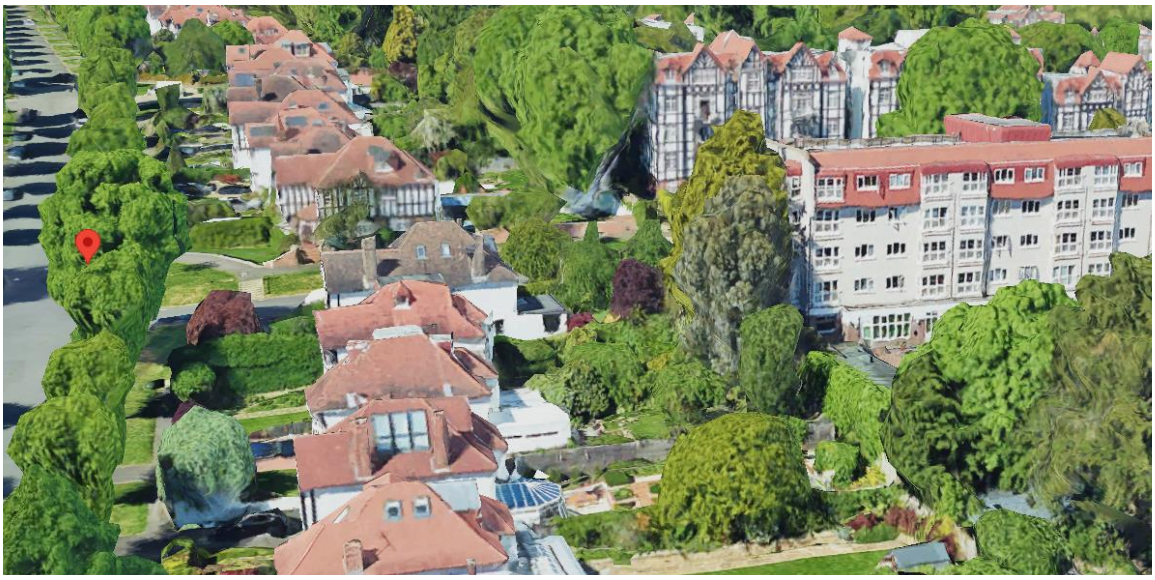
5.5 The installation of the three small scale air conditioning units adjacent to the rear elevation of the host building, do not impact the form or visual appearance of the key elements described above in the CAA, specifically the buildings layout, Arts and Craft frontage detailing, or front garden. These elements continue to be preserved and contribute to the character of the host building and the wider Holly Lodge Conservation Area. The form and materials of the building remain unaffected by the AC units and associated acoustic enclosure. This is further illustrated by the images and plans below.

Photographs of rear elevation illustrating the modest scale of the proposal and the highly restricted views (image excludes the acoustic enclosure). The A/C units would have limited visibility.



Proposed Rear Elevation drawing including acoustic enclosure

Neighbouring plots show stepped rear elevations. Neighbouring two-storey flank elevations further screen the A/C units and proposed acoustic enclosure.



Mature evergreen planting sits to the majority of boundaries surrounding the site to add to the already restricted views of the A/C units and acoustic enclosure from private and public views.

5.6 The proposal is located to the rear of the site and is well hidden from public view. The gardens to the rear are private and only accessible to the residents of each address. Views of the rear of the subject site are also screened by tall, mature, vegetation that runs along the boundary with both No.38 and 42 Hillway and the property to the rear on Marketplace Avenue. The addition of the A/C units and associated enclosure cannot be fairly assessed to cause any harm, relative to the single storey rear extension which was previously approved by the Council on 12th December 2018 (Reference: 2018/5659/P). This further adds to the position that there is no resultant harm to the Conservation Area with the addition of this proposal, in accordance with Policy D1 and D2 of the Local Plan, and DH2 of the Neighbourhood Plan.

5.7 Policy D2 goes further to note that the council '*will not permit development that results in harm that is less than substantial to the significance of a designated heritage asset unless the public benefits of the proposal convincingly outweigh that harm'*.

5.8 Should an Inspector assess that there is a level of harm, this can only be reasonably assessed at the lower end of less than substantial harm, to the significance of the Conservation Area.

5.9 Within the statutory procedure, and as part of the NPPF, the decision-maker must implement a sensible approach to assessing likely harm … and weighing the harm against any benefits (paragraph Lewison L.J. judgement in *Palmer [v Herefordshire Council [2017] 1 WLR 411].*

5.10 Overall, it is our view that in terms of the impact on the wider Conservation Area, this will only ever be limited, and it is not one that is considered to cause harm. The proposals are at the lower levels of the building where there is already change taking place. They will not be visible from any public vantagepoint and even in private views, there will be limited visibility due to the rear location, staggered rear building lines of the neighbouring properties and the existing vegetation along the boundaries. Where the A/C units can be seen, it will not be detrimental to appearance or character of the site of the Holly Lodge Conservation Area.

5.11 The proposed A/C units and associated acoustic enclosure, by virtue of their modest size, simple design and sensitive rear location will continue to preserve the character and appearance of the host building and the wider Holly Lodge Conservation Area. The proposal complies with Policies Policy D1 (Design) and D2 (Heritage) of the Camden Local Plan 2017 and Policy DH2 of the Highgate Neighbourhood Plan 2018.

6. Conclusion

6.1 The proposal illustrates the reduction and mitigation against the impact of dwelling overheating through the application of the cooling hierarchy, resulting in no increase in carbon dioxide emissions, in accordance with policies CC1 (Climate change mitigation) CC2 (Climate change adaptation measures) of the Camden Local Plan 2017.

6.2 The proposed A/C units and associated acoustic enclosure, by virtue of their modest size, simple design and rear location would continue to preserve the character and appearance of the host building and the wider Holly Lodge Conservation Area. The proposal complies with Policies Policy D1 (Design) and D2 (Heritage) of the Camden Local Plan 2017 and Policy DH2 of the Highgate Neighbourhood Plan 2018.

6.3 As noted in Section 38(6) of the Planning and Compulsory Purchase Act 2004, the act necessitates that *'If regard is to be had to the development plan for the purpose of any determination to be made under the planning Acts the determination must be made in accordance with the plan unless material considerations indicate otherwise.'*

6.4 The exceptional circumstance that is [redacted] should be given moderate weight in assessment of heritage and active cooling.

6.5 Based on this appeal statement and the information submitted as part of the planning application, the Appellant asks that the Inspector allows the appeal and grants planning permission for the;

6.6 *'Installation of 3 x air condenser units with acoustic enclosure to the rear roof of the single storey ground floor extension. Part retrospective.'*

Energy & Overheating Assessment

40 Hillway

Property Address

40 Hillway,
London,
N6 6HH,

Date

January 2024
Revised March 2024

Prepared By

EAL Consult

Contents

1. EXECUTIVE SUMMARY

This Sustainability statement has been prepared to support the installation of three new outdoor air condenser units within acoustic enclosures at No 40 Hillway. The strategy highlights how the development promotes sustainability through both design and operation and summarises the relevant regulatory and planning policies applicable and how the relevant policy targets are addressed and achieved. The report analyses also whether 40 Hillway has comfort level in accordance with the criteria set out in CIBSE TM59 and TM49 to assess the space against the cooling hierarchy presented in section 6 and confirm whether an active cooling system will be required.

The strategy reponds to the UK Planning and regulatory framework, the National Planning Policy Framework 2023, the New London Plan 2021 and Camden Local Plan 2017.

This statement outlines an overall commitment to reducing energy consumption under occupancy through the adoption of a 'Fabric First' principle, which will seek enhanced insulation standards and improved heating and lighting efficiencies in comparison to the standard requirements of Approved Document Part L1 2013.

Where an existing building is being assessed the dwelling emission rates (DER) of the notional dwelling and proposed/existing dwelling are compared to determine the level of improvement. This is in line with Building Regulations L1B for Existing Buildings.

The report also demonstrates that the dwelling achieves an average carbon emission reduction of **38.7%** over notional dwelling emissions (see table 3 below).

Table 1. Carbon Emission Rate

Dwelling	Notional DER	Lean DER (without active cooling)	Lean DER (with active cooling)
40 Hillway	59.31	36.36	36.37

SAP methodology and Building regulations Part L 2013 have been used in the assessment

Table 2. Carbon Dioxide emissions after each stage of the Energy Hierarchy

	Carbon dioxide emissions (Tonnes CO2 per annum) – without Active cooling		Carbon dioxide emissions (Tonnes CO2 per annum) – with Active cooling	
	Regulated	**Total**	**Regulated**	**Total**
Building Regs Notional Development	11.26	13.51	11.26	13.51
After Energy Demand Reduction	6.90	8.28	6.90	8.28

Table 3. Carbon Dioxide Savings from each stage of the Energy Hierarchy

	With Active cooling		Without Active cooling	
	Regulated Carbon dioxide savings (Tonnes CO_2)	% Improvement	Regulated Carbon dioxide savings (Tonnes CO_2)	% Improvement
Savings from energy efficiency measures	4.35	**38.7%**	4.35	**38.7%**

The results below show that the carbon dioxide savings are similar for both options (with or without active cooling) and therefore we can conclude that the use of active cooling does not lead to the increase in carbon emissions.

The reported improvements are also deemed to be at the limit of financial viability for a minor development which already exceeds Part L requirements.

2. INTRODUCTION

Site Description

The development is located at 40 Hillway

Methodology

This energy assessment outlines the energy demand from the development together with the associated CO_2 emissions, using the present Building Regulations Part L as a baseline. It demonstrates how the emissions from energy use in the development will be reduced through energy efficiency measures.

The scheme is required to achieve carbon emission reduction principles in accordance with the UK Planning and regulatory framework.

The methodology employed to determine the potential CO_2 savings is in accordance with the three-step Energy Hierarchy.

- **Be Lean -** Improve the energy efficiency of the scheme;
- **Be Clean -** Supply as much of the remaining energy requirement with low carbon; technologies such as district heating if available or combined heat and power (CHP); and
- **Be Green -** Offset a proportion of the remaining carbon dioxide emissions by using renewable technologies.

The government approved Standard Assessment Procedure (SAP) methodology software (2013) has been used to determine the CO_2 emissions and energy requirements. It compares CO_2 emissions from regulated energy use (DER) with those of an equivalent dwelling built to Part L1A 2013 (TER), a notional dwelling of the same size and shape. These calculations do not include emissions from cooking or appliances.

Opportunities for incorporating features into the development that contribute to the objectives of sustainable development were explored during the design process, to ensure that where possible, the proposals achieve best practice.

3. PLANNING POLICY CONTEXT

National Planning Policy Framework 2023

Emphasising the concept of sustainable development by encouraging local authorities to adopt proactive strategies to mitigate and adapt to climate change. It recommends the move to a low carbon future.

14. Meeting the challenge of climate change, flooding and coastal change

159. New development should be planned for in ways that:

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards

160. To help increase the use and supply of renewable and low carbon energy and heat, plans should:

(a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, and their future re-powering and life extension, while ensuring that adverse impacts are addressed appropriately (including cumulative landscape and visual impacts);

(b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

(c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

The London Plan 2021

Providing the strategic framework for an integrated socio-economic, transportation and environmental development plan across the capital to 2050. The Plan seeks to ensure new developments are designed to enable the efficient use of energy and support the development of sustainable energy infrastructure to produce energy more efficiently. It sets out a range of policies that apply to new developments.

Policy SI 2 Minimising Greenhouse Gas Emissions:

A. Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy: a) Be lean: use less energy and manage demand during operation, b) Be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly, c) Be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.

B. Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

C. A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either: 1) through a cash in lieu contribution to the borough's carbon offset fund, or 2) off-site provided that an alternative proposal is identified, and delivery is certain.

D. Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.
E. Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
F. Development proposals referable to the Mayor should calculate whole lifecycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

9.2.1 The Mayor is committed to London becoming a zero-carbon city. This will require reduction of all greenhouse gases, of which carbon dioxide is the most prominent. London's homes and workplaces are responsible for producing approximately 78 per cent of its greenhouse gas emissions. If London is to achieve its objective of becoming a zero-carbon city by 2050, new development needs to meet the requirements of this policy. Development involving major refurbishment should also aim to meet this policy.

9.2.2 The energy hierarchy should inform the design, construction, and operation of new buildings. The priority is to minimise energy demand, and then address how energy will be supplied and renewable technologies incorporated. An important aspect of managing demand will be to reduce peak energy loadings.

Policy SI 4 Managing heat risk and Policy 5.9 Overheating and Cooling

A. Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
B. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
   1. reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
   2. minimise internal heat generation through energy efficient design
   3. manage the heat within the building through exposed internal thermal mass and high ceilings
   4. provide passive ventilation
   5. provide mechanical ventilation
   6. provide active cooling systems.

<u>Camden Local Plan 2017</u>

Policy CC1 Climate change mitigation

The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.
We will:

a. promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
b. require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met;
c. ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
d. support and encourage sensitive energy efficiency improvements to existing buildings;
e. require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
f. expect all developments to optimise resource efficiency.

For decentralised energy networks, we will promote decentralised energy by:

g. working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
h. protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and
i. requiring 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.

To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.

Policy CC2 Adapting to climate change

All new developments will be expected to submit a statement demonstrating how the London Plan's 'cooling hierarchy' has informed the building design. Any development that is likely to be at risk of overheating (for example due to large expanses of south or south west facing glazing) will be required to complete dynamic thermal modelling to demonstrate that any risk of overheating has been mitigated.

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

The cooling hierarchy includes:

- Minimise internal heat generation through energy efficient design;
- Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls;
- Manage the heat within the building through exposed internal thermal mass and high ceilings;
- Passive ventilation;
- Mechanical ventilation; and
- Active cooling

4. ENERGY STRATEGY

The energy strategy for the building is based on the Building Regulations Part L1A; it adopts a set of principles to guide design and decisions regarding energy, balanced with the need to optimise environmental and economic benefits. It seeks to incorporate energy efficiency through the approach detailed below.

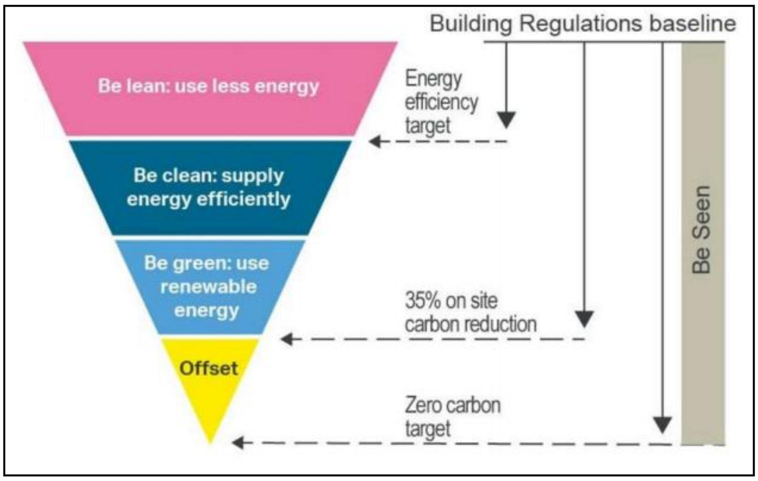


Figure 1. Energy Hierarchy

Be 'Lean' - Demand Reduction

The building fabric performance and engineering systems have been optimised in order to use less energy through passive design measures.

Passive Design Measures:

Fabric Performance - The fabric performance values aim to reduce unwanted heat loss and heat gains, whilst maintaining a comfortable internal environment.

Table 3 below outlines the U-values applied in accordance with Building Regulations Part L minimum standards for existing buildings. Table 4 reflects the improvements. These same U-values have been applied to the CIBSE TM59 and TM49 calculations for the purposes of the cooling hierarchy.

Table 3. Fabric Energy Efficiency Standard

Thermal element	Part L1A Minimum Standard
Wall	0.30W/m^{2}k
Roof	0.20 W/m^{2}k
Floor	0.25 W/m^{2}k
Glazing	1.2 W/m^{2}k
Doors	1.2 W/m^{2}k

Table 4. Fabric Energy Efficiency Specified

Thermal element	specification
Wall	0.28/m^2k
Roof	0.18W/m^2k
Floor	0.22 W/m^2k
Doors	1.8 W/m^2k

Space Heating & Cooling - Space heating is provided by radiators.

Efficient Lighting and Controls - Throughout the development natural lighting will be optimised. The development will also incorporate low energy light fittings throughout. All light fittings will be specified as low energy lighting and will accommodate LED luminaries only.

Ventilation - The use of natural ventilation is proposed for the building but not at all times.

Domestic hot water (DHW) system – domestic hot water will be provided by the combi-boiler & cylinder.

Be 'Clean' – Supply Energy Efficiently

The Be Clean step of the energy hierarchy refers to the use of 'Clean energy supply'. This includes, but is not limited to, the use of Combined Heat and Power (CHP) and District Heat Networks. Policy TP1 seeks for new development to promote the use of CHP and district heating.

In light of the small-scale nature of the project, it is apparent that the use of CHP is also technically and financially unviable in this instance.

Be 'Green' - Renewable Energy

Once energy demand reduction measures have been applied, methods for generating low and zero carbon energy can be assessed. The following renewable technologies to be considered for the project: Biomass, Water source heat pump, air source heat pump, Wind energy and solar photovoltaic panels.

A 38.7% improvement in carbon emissions has already been achieved through passive measures. In light of the retrospective nature of this case, renewable technologies have been considered but ruled not feasible as the inclusion of renewable technology would not provide a solution to the overheating issue in question.

5. SUSTAINABLE DESIGN

The dwelling incorporates sustainable design and construction measures capable of mitigating and adapting to climate change to meet future needs. This section details site-specific initiatives which demonstrates how the dwelling meets the sustainability objectives set out in the National Planning Framework 2023.

Energy Use and Pollution

The design of the development has taken into consideration day lighting to habitable spaces to improve the wellbeing of occupants. Good levels of daylight will offer occupants a pleasant and highly valued connection to the outdoors and plenty of natural light. It will also reduce the use of artificial lighting and therefore energy use. All light fittings are low energy lighting.

Pollution: Air, Noise and Light

The layout of the development and the use of openable windows will create horizontal airflow. However, due to the [redacted] it is not possible to have windows open during certain times of the year when pollen levels and heat are high.

An air purifier may go some way to improve internal air quality. As it can only work effectively when the windows are shut, it is not sufficient to eliminate overheating and therefore there is a need for air conditioning. See Section 6.

The development will not increase the air pollution of the area by reducing as a start, its energy consumption, which in turn will reduce emissions that lead to air pollution.

Light pollution can best be described as artificial light that is allowed to illuminate or intrude upon areas not intended to be lit. Light in the wrong place at the wrong time can be intrusive.

Intrusive light is over bright or poorly directed lights shining onto neighbouring property which affect the neighbours' right to enjoy their property. The dwelling does not include lighting that may cause a nuisance.

Water: Water Efficiency

In domestic and non-domestic buildings, the demand for water can be reduced as much as 50% using a variety of simple and innovative strategies that are integrated into the plumbing and mechanical systems. In order to reduce water consumption, the dwelling includes efficient fixtures with low flow rates. Total internal water consumption does not exceed 105 litres/person/day.

Noise Pollution

Noise levels have been considered during the evaluation process of the cooling hierarchy. However, air conditioning units are the only option to provide the occupant with comfort levels in terms of overheating with regards to the occupant’s health condition.

Flood Risk

The development site is located in a Low Flood Risk Area on the Environment Agency Flood Risk Map.

6. COOLING STRATEGY

A dynamic overheating analysis has been carried out to identify the overheating risk of the dwelling at 40 Hillway, using dynamic thermal modelling via TM59 & TM49 and the principles set in Building regulations Part O - Overheating.

The following Cooling Hierarchy has been followed in accordance with Policy SI4 of the London Plan and Policy CC2 of Camden's Local Plan.

- Minimise internal heat generation through energy efficient design;
- Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls;
- Manage the heat within the building through exposed internal thermal mass and high ceilings;
- Passive ventilation;
- Mechanical ventilation; and
- Active cooling

Assessment Criteria

CIBSE TM59:2017 is the design methodology for the assessment of overheating risk in homes. It defines overheating criteria for residential buildings. The building will be predominantly naturally ventilated and hence the relevant TM59 criteria will be used for the assessment.

Naturally Ventilated Buildings: The criteria below can be applied to homes which are predominantly naturally ventilated buildings. The compliance is based on passing both of the following two criteria.

A. **Living rooms, Kitchens and Bedrooms:** The number of hours () during which Δ is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours. Please refer to CIBSE TM59.
B. **Bedrooms only:** The operative temperature in the bedroom between 10:00pm to 7:00am shall not exceed 26°C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26°C will be recorded as a fail).

CIBSE TM49:2014 is the design methodology for the assessment of overheating risk in homes in London during the summertime. In line with guidance from the Greater London Authority, 3 weather files from the CIBSE TM49 document have been applied.

Modelling Input

Weather File & Description

- London_GTW_DSY1_2020High50.epw - London Gatwick Weather data: 2020 (high emission) DSY 1 - Moderately warm summer
- London_GTW_DSY2_2020High50.epw - London Gatwick Weather data: featuring short intense warm spell
- London_GTW_DSY3_2020High50.epw - London Gatwick Weather data: featuring long, less intense warm spell

Building Category

- Category II - all units: Normal expectation

Window

- Windows not openable

Lighting Gain

- The internal gains from the lighting are based on CIBSE TM59 5.2

Small Power Gains

The house is modelled to include small power gains that are representative of typical equipment use in an everyday occurrence. There are associated with an assumed usage profile to represent which times of the day such appliances would result in a heat gain into the space. Small power gains include appliances such as TV's, fridge/freezers, toasters, kettles, hairdryers etc.

A list of anticipated heat gains in the dwellings are:

- Kitchen and Living spaces: 250W maximum power consumption
- Bedroom spaces: 150W maximum power consumption

6.1 Summary of Results

CIBSE TM59:2017 is the design methodology for the assessment of overheating risk in homes. It defines overheating criteria for residential buildings. The building will be predominantly naturally ventilated and hence the relevant TM59 criteria will be used for the assessment.

CIBSE TM49:2014 is the design methodology for the assessment of overheating risk in homes in London during the summertime. In line with guidance from the Greater London Authority, 3 weather files from the CIBSE TM49 document have been applied.

The model has been run for the diving/living room and kitchen areas using the new extension as the model on the basis that it is the most energy efficient space, due to the extension upgrades alongside being the largest east facing room of the house, thus being the least likely to overheat.

6.2 Passive Ventilation

Due to the [redacted] this model has been run with the windows shut. The [redacted] Opening windows to reduce the heat in the residence, will allow pollen entry, which will likely [redacted]

Whilst it is possible to implement allergy window screens, due to the nature and design of these filters it would not allow for effective passive ventilation through the windows sufficiently to provide adequate cooling.

The table below demonstrates a sample that has been assessed on CIBSE TM59 Criteria using weather file Gatwick DSY 1:

Table 04: Summary of Results for Dining/living rooms and kitchens

Room Name	Criteria A (During The Period May to September)	TM59 Criteria met
Dining/Living Room and Kitchen		
Rear Extension		
Open plan living	4.8%	**Fail**

The tables below demonstrate a sample that has been assessed on CIBSE TM59 Criteria using weather file Gatwick DSY 2:

Table 05: Summary of Results for Dining/living rooms and kitchens

Room Name	Criteria A (During The Period May to September)	TM59 Criteria met
Dining/Living Room and Kitchen		
Rear Extension		
Open plan living	4.0%	**Fail**

The tables below demonstrate a sample that has been assessed on CIBSE TM59 Criteria using weather file Gatwick DSY 3:

Table 06: Summary of Results for Dining/living rooms and kitchens

Room Name	Criteria A (During The Period May to September)	TM59 Criteria met
Dining/Living Room and Kitchen		
Rear Extension		
Open plan living	4.4%	**Fail**

CIBSE TM49: 2014 Compliance

DYS1 (1989) Weather Data Results

	Criteria 1 ≤3.0%	Criteria 2 We≤6	Criteria 3 ΔT ≤4	**TM49 Compliance**
% of spaces pass	**0**	**0**	**0**	**Fail**
% of spaces fail	**100**	**100**	**100**	

DYS2 (2003) Weather Data Results

	Criteria 1 ≤3.0%	Criteria 2 We≤6	Criteria 3 ΔT ≤4	**TM49 Compliance**
% of spaces pass	**0**	**0**	**0**	**Fail**
% of spaces fail	**100**	**100**	**100**	

DYS2 (1976) Weather Data Results

	Criteria 1 ≤3.0%	Criteria 2 We≤6	Criteria 3 ΔT ≤4	**TM49 Compliance**
% of spaces pass	**0**	**0**	**0**	**Fail**
% of spaces fail	**100**	**100**	**100**	

6.3. Mechanical Ventilation

Mechanical cooling, from Mechanical Ventilation Heat Recovery (MVHR), to maintain comfortable internal temperatures has been considered. On a hot summer's day, the internal temperature of the dwelling could reach 32 degrees. With the implementation of MVHR the internal temperature will lower to 28 degrees. This will not be sufficient to maintain comfort levels for the occupant who [redacted]

The occupant has [redacted] Opening windows to reduce the heat in the residence, will allow pollen entry, which will likely [redacted] The occupant also suffers from [redacted] therefore if the windows remain shut the comfort level decreases because despite the reduction in the temperature created by the MVHR it is not sufficient to maintain good health for the occupant in this instance.

Consideration has been given to the implementation of anti-pollen filters within a mechanical ventilation heat recover unit. There are specific filters that can be added to MVHRs, to improve air quality, to deal with NOx and basic Indoor Air Quality (IAQ) materials. but dealing specifically with pollens is clinical. With hay fever, for example, it is not known what triggers it and, where MVHR may address some elements, it cannot address all of them. However, when the internal space is isolated by closing windows there is no form of infiltration of particles and the risk to the occupant's condition is minimised.

6.4. Active Cooling

Consideration has been given to alternative measures of active cooling. This would consist of free-standing air conditioning units available on the market. They are less sustainable and more expensive to run when in use and take up a certain amount of room space. The air conditioning units in situ are only switched on when required in the same way the free-standing unit would be plugged in. This dwelling is the client's forever home and they are looking to stay there long term. Dismantling and disposing of the units, at this stage, would be environmentally detrimental. Under the principles of circular economy, to replace one type of air conditioning unit with another that will be used in the same way is counter intuitive.

6.5 Active Cooling Results

The tables of results below show a pass for the implementation of active cooling provided the air conditioning units.

CIBSE TM59: 2014 Compliance

The table below demonstrate a sample that has been assessed on by CIBSE TM59 Criteria using weather file Gatwick DSY 1:

Table 7: Summary of Results for Dining/Living Room and Kitchen

	Criteria A (During The Period May to September)	TM59 Criteria met
Dining/Living Room and Kitchen		
Rear Extension		
Open plan living	2.3%	Pass

The tables below demonstrate a sample that has been assessed on by CIBSE TM59 Criteria using weather file Gatwick DSY 2:

Table 8: Summary of Results for Dining/Living Room and Kitchen

Room Name	Criteria A (During The Period May to September)	TM59 Criteria met
Dining/Living Room and Kitchen		
Rear Extension		
Open plan living	2.5%	Pass

The tables below demonstrate a sample that has been assessed on by CIBSE TM59 Criteria using weather file Gatwick DSY 3:

Table 9: Summary of Results for Dining/Living Room and Kitchen

Room Name	Criteria A (During The Period May to September)	TM59 Criteria met
Dining/Living Room and Kitchen		
Open plan living	2.6%	Pass

CIBSE TM49: 2014 Compliance

DYS1 (1989) Weather Data Results

Room Name	Criteria 1 ≤3.0%	Criteria 2 We≤6	Criteria 3 ΔT ≤4	**TM59 Compliance**
% of spaces pass	**100**	**100**	**100**	**Pass**
% of spaces fail	**0**	**0**	**0**	

DYS2 (2003) Weather Data Results

Room Name	Criteria 1 ≤3.0%	Criteria 2 We≤6	Criteria 3 ΔT ≤4	TM59 Compliance
% of spaces pass	**100**	**100**	**100**	**Pass**
% of spaces fail	**0**	**0**	**0**	

DYS2 (1976) Weather Data Results

Room Name	Criteria 1 ≤3.0%	Criteria 2 We≤6	Criteria 3 ΔT ≤4	TM59 Compliance
% of spaces pass	**100**	**100**	**100**	**Pass**
% of spaces fail	**0**	**0**	**0**	

Cooling Strategy:

The following strategy has been defined according the cooling hierarchy in Policy SI4 of the London Plan and Policy CC2 of Camden's Local Plan.

Table 10. Cooling Hierarchy

Cooling Hierarchy category	**40 Hillway**
1. Minimise internal heat generation through energy efficient design	Improved U-values and passive measures have been implemented as outlined in section 4. The modelling results in section 6.2 show that energy efficient design alone, within the existing building is not sufficient.
2. Reduce the amount of heat entering the building through orientation, shading, high albedo material, fenestration, insulation and the provision of green infrastructure.	The assessment relates to an existing building, where there is no scope to further reduce the amount of heat entering through orientation, high albedo materials, fenestration or changing the green infrastructure. There is already some shading provided through curtains/blinds. This is not sufficient.

3. Manage the heat within the building through exposed internal thermal mass and high ceilings.	As this is an existing building it is not viable to change the ceiling heights or thermal mass. Even if these elements were to be changed, it would not contribute sufficiently.
4. Provide passive ventilation	The occupant has a documented medical condition requiring windows to remain shut during summer months (see Appendix II). Therefore, passive ventilation is not enough to recover the heat generated as demonstrated in the results provided in section 6.2. Therefore, there is a need for alternative active cooling measures for selected areas.
5. Provide mechanical ventilation	Mechanical ventilation heat recovery (MVHR) has been considered. The unit could include anti-pollen filters within the unit. There are specific filters that can be added to MVHRs, to improve air quality, to deal with NOx and basic Indoor Air Quality (IAQ) materials. but dealing specifically with pollens is clinical. With hay fever, for example, it is not known what triggers it and, where MVHR may address some elements, it cannot address all of them. However, when the internal space is isolated by closing windows there is no form of infiltration of particles and the risk to the occupant's condition is minimised
6. Provide active cooling system	The use of the existing air conditioning units will provide the required occupant comfort levels given their health condition. Refer to section 6.5 for results.

7. CONCLUSION

Until recently, it has been rare to engage with a retrospective cooling hierarchy and overheating assessment. However, over the last 18 months this has become more prevalent.
There is the practice of planting of male trees throughout cities to minimise fruit waste deposited by female trees. This, in turn, increases the amount of pollen and causes more severe allergies. This tied together with global warming and increasing summertime temperatures has led to more challenging health management for the occupant than initially expected when the original planning application was submitted.

The layout of the development and the use of openable windows will create airflow. However, due to the clients medical condition it is not possible to have windows open during certain times of the year when pollen levels and external heat temperatures are high.

Consideration has been given to alternative measures of active cooling. This would consist of free-standing air conditioning units available on the market together with an air purifier.

Free standing air conditioning units are less sustainable and more expensive to run when in use and take up a certain amount of room space. The air conditioning units in situ are only switched on when required in the same way the free-standing unit would be plugged in. This dwelling is the client's forever home and they are looking to stay there long term. Dismantling and disposing of the units, at this stage, would be environmentally detrimental. Under the principles of circular economy, to replace one type of air conditioning unit with another that will be used in the same way is counter intuitive. An air purifier may go some way to improve internal air quality. As it can only work effectively when the windows are shut, it is not sufficient to eliminate overheating and therefore there is a need for air conditioning.

Noise levels have been considered during the evaluation process of the cooling hierarchy. Air conditioning units are the only option to provide the occupant with comfort levels in terms of overheating with regards to the occupants health condition.

The development has been designed to exceed Part L1A building regulations requirements. In line with the national and local policies, regulated CO_2 emissions from the development will be improved by **38.7%** from the notional emissions once energy efficiency measures, lean measures and active cooling are taken into account.

The required carbon emissions reduction has been achieved as demonstrated in the report and outlined in section 4, pages 9-10. The overheating analysis outlined in section 6 supports the use of air conditioning units to provide a comfortable space for the occupant given their medical condition.

This appraisal of the development was undertaken against key sustainability objectives identified from relevant policy guidance. The framework for the appraisal was guided by the National Planning Policy Framework 2023. This process has ensured that the development responds to the sustainable development objectives that are relevant to the area.

8. APPENDIX

I. SAP Calculations
II. Doctors Letter

Project Information

Building type Semi-detached house

Reference
Date 5 May 2023
Project 40 Hillway
LONDON
N6 6HH

SAP 2012 worksheet for New extension to existing dwelling - calculation of energy ratings

1. Overall dwelling dimensions

	Area (m²)	Av. Storey height (m)	Volume (m³)	
Ground floor (1)	73.31	2.76	202.34	(3a)
Ground floor (2)	24.73	2.39	59.10	(3b)
First floor	69.13	2.92	201.86	(3c)
Second floor	22.65	2.60	58.89	(3d)
	189.82			**(4)**
			522.19	**(5)**

2. Ventilation rate

	main + seondary + other heating		m³ per hour	
Number of chimneys	0 + 0 + 0	x 40	0.00	(6a)
Number of open flues	0 + 0 + 0	x 20	0.00	(6b)
Number of intermittent fans	3	x 10	30.00	(7a)
Number of passive vents	0	x 10	0.00	(7b)
Number of flueless gas fires	0	x 40	0.00	(7c)

			Air changes per hour	
			0.06	**(8)**
(ns)	3			(9)
			0.20	**(10)**
			0.35	**(11)**
			0.00	**(13)**
		100.00		**(14)**
			0.05	**(15)**
Infiltration rate			0.66	(16)
Air permeability			0.66	(18)
			2.00	**(19)**
			0.85	**(20)**
Infiltration rate incorporating shelter factor			0.56	(21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
5.10	5.00	4.90	4.40	4.30	3.80	3.80	3.70	4.00	4.30	4.50	4.70

52.50 (22)

Wind Factor

1.27	1.25	1.23	1.10	1.07	0.95	0.95	0.93	1.00	1.07	1.13	1.18

13.13 (22a)

Adjusted infiltration rate (allowing for shelter and wind speed)

0.71	0.70	0.68	0.61	0.60	0.53	0.53	0.52	0.56	0.60	0.63	0.66

7.33 (22b)

Ventilation : natural ventilation, intermittent extract fans
Effective air change rate

0.75	0.74	0.73	0.69	0.68	0.64	0.64	0.63	0.66	0.68	0.70	0.72	(25)

3. Heat losses and heat loss parameter

Element	Gross area, m²	Openings m²	Net area A, m²	U-value W/m²K	A x U W/K	kappa-value kJ/m²K	A x K kJ/K	
Window - Double-glazed, argon filled, low-E, En=0.2, hard coat (East) REAR			**4.430**	**1.94 (2.10)**	8.58			(27)
Window - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**1.370**	**1.68 (1.80)**	2.30			(27)
Solid door FRONT			**2.340**	**3.00**	7.02			(26)
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**6.830**	**1.80**	12.29			(26)
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**6.830**	**1.80**	12.29			(26)
Rooflight at 70° or less - Double-glazed, argon filled, low-E, En=0.1, soft coat (n/a) ROOF			**4.330**	**1.68 (1.80)**	7.27			(27)
Walls ROOF VOID WALL			12.79	0.22 (Ru=0.90)	2.86	18.00	230.22	(29)
Walls EXTERNAL #WINDOWS & DOORS #PROPOSED			51.51	0.28	14.42	150.00	7726.50	(29)
Walls EXTERNAL #WINDOWS & DOORS			146.79	1.55	227.52	135.00	19816.65	(29)
Ground floors EXISTING, UNDERGROUND			73.31	0.73	53.52	110.00	8064.10	(28)
Ground floors PROPOSED, UNDERGROUND			24.73	0.22	5.44	110.00	2720.30	(28)
Flat roofs DORMER ROOF			13.61	0.18	2.45	9.00	122.49	(30)
Flat roofs GF REAR #ROOFLIGHTS			23.90	0.18	4.30	9.00	215.10	(30)
Pitched roofs with integrated insulation ROOF VOID ABOVE FF TO SF			46.48	0.15 (Ru=0.90)	7.20	9.00	418.32	(30)
Pitched roofs insulated between rafters MAIN ROOF			9.04	0.16	1.45	9.00	81.36	(30)
Party wall SOLID			26.50	0.00	0.00	180.00	4770.00	
Internal floor SF			22.65	0.00	0.00	18.00	407.70	
Internal floor FF			69.13	0.00	0.00	18.00	1244.34	
Internal ceiling FF			22.65	0.00	0.00	9.00	203.85	

4. Water heating energy requirements	**kWh/year**	
Assumed occupancy, N	2.99	(42)
Annual average hot water usage in litres per day Vd,average	110.72	(43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Hot water usage in litres per day for each month	121.79	117.36	112.93	108.50	104.07	99.64	99.64	104.07	108.50	112.93	117.36	121.79	(44)
Energy content of hot water used	180.61	157.96	163.00	142.11	136.36	117.67	109.03	125.12	126.61	147.56	161.07	174.91	

Energy content (annual)	1742.00	(45)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Distribution loss	27.09	23.69	24.45	21.32	20.45	17.65	16.36	18.77	18.99	22.13	24.16	26.24	(46)

Cylinder volume, l	250.00		(47)
Manufacturer's declared cylinder loss factor (kWh/day)	2.14		(48)
Temperature Factor	0.5400		(49)
Energy lost from hot water cylinder (kWh/day)		1.16	(55)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Total storage loss	35.82	32.36	35.82	34.67	35.82	34.67	35.82	35.82	34.67	35.82	34.67	35.82	(56)
Net storage loss	35.82	32.36	35.82	34.67	35.82	34.67	35.82	35.82	34.67	35.82	34.67	35.82	(57)
Primary loss	43.31	39.12	43.31	41.92	43.31	41.92	43.31	43.31	41.92	43.31	41.92	43.31	(59)
Total heat required for water heating calculated for each month	259.75	229.44	242.14	218.69	215.49	194.25	188.17	204.26	203.20	226.69	237.65	254.05	(62)
Output from water heater for each month, kWh/month	259.75	229.44	242.14	218.69	215.49	194.25	188.17	204.26	203.20	226.69	237.65	254.05	(64)

	2673.77	(64)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Heat gains from water heating, kWh/month	123.36	109.70	117.51	108.52	108.65	100.39	99.56	104.91	103.37	112.37	114.82	121.47	(65)

5. Internal gains

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Metabolic gains, Watts												
179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	(66)
Lighting gains												
101.52	90.17	73.33	55.52	41.50	35.04	37.86	49.21	66.05	83.86	97.88	104.34	(67)
Appliances gains												
539.20	544.80	530.70	500.68	462.79	427.18	403.39	397.79	411.89	441.91	479.80	515.41	(68)
Cooking gains												
55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	(69)
Pumps and fans gains												
3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	(70)
Losses e.g. evaporation (negative values)												
-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	(71)
Water heating gains												
165.81	163.25	157.94	150.72	146.03	139.43	133.82	141.01	143.56	151.04	159.48	163.26	(72)
Total internal gains												
925.22	916.91	880.66	825.61	769.01	720.34	693.76	706.70	740.19	795.50	855.85	901.71	(73)

6. Solar gains (calculation for January)

	Area & Flux	g & FF	Shading	Gains	
Window - Double-glazed, argon filled, low-E, En=0.2, hard coat (East) REAR	0.9 x 4.430 19.64	0.72 x 0.70	0.77	30.3889	
Window - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 1.370 19.64	0.57 x 0.80	0.77	8.5029	
Solid door FRONT	0.9 x 2.340 0.00	0.00 x 0.70	0.77	0.0000	
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 6.830 19.64	0.57 x 0.80	0.77	42.3903	
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 6.830 19.64	0.57 x 0.80	0.77	42.3903	
Rooflight at 70° or less - Double-glazed, argon filled, low-E, En=0.1, soft coat (n/a) ROOF	0.9 x 4.330 26.00	0.63 x 0.80	1.00	51.0663	
Total solar gains, January				174.74	(83-1)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Solar gains												
174.74	347.99	586.98	875.69	1089.24	1121.81	1065.24	904.52	689.25	416.70	219.02	142.95	(83)
Total gains												
1099.96	1264.90	1467.64	1701.30	1858.25	1842.15	1759.00	1611.23	1429.45	1212.20	1074.87	1044.66	(84)

7. Mean internal temperature

Temperature during heating periods in the living area, Th1 (°C) 21.00 (85)
Heating system responsiveness 0.75

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau												
23.01	23.08	23.15	23.48	23.54	23.83	23.83	23.89	23.72	23.54	23.41	23.28	
alpha												
2.53	2.54	2.54	2.57	2.57	2.59	2.59	2.59	2.58	2.57	2.56	2.55	
Utilisation factor for gains for living area												
1.00	0.99	0.99	0.98	0.95	0.90	0.82	0.86	0.95	0.99	0.99	1.00	(86)
Mean internal temperature in living area T1												
18.55	18.70	19.01	19.47	19.94	20.38	20.63	20.58	20.21	19.61	19.02	18.54	(87)
Temperature during heating periods in rest of dwelling Th2												
18.77	18.77	18.78	18.80	18.80	18.82	18.82	18.82	18.81	18.80	18.79	18.78	(88)
Utilisation factor for gains for rest of dwelling												
0.99	0.99	0.98	0.96	0.92	0.80	0.58	0.64	0.89	0.97	0.99	1.00	(89)
Mean internal temperature in the rest of dwelling T2												
15.70	15.92	16.38	17.05	17.73	18.32	18.59	18.56	18.12	17.26	16.39	15.70	(90)

Living area fraction (19.20 / 189.82) 0.10 (91)
Mean internal temperature (for the whole dwelling)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
15.99	16.20	16.64	17.30	17.95	18.53	18.79	18.76	18.33	17.50	16.66	15.99	(92)
Apply adjustment to the mean internal temperature, where appropriate												
15.99	16.20	16.64	17.30	17.95	18.53	18.79	18.76	18.33	17.50	16.66	15.99	(93)

8. Space heating requirement

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains												
0.99	0.99	0.98	0.95	0.89	0.77	0.57	0.63	0.87	0.96	0.99	0.99	(94)
Useful gains												
1090.11	1247.95	1432.48	1616.59	1660.95	1422.84	1005.80	1022.62	1237.00	1167.53	1060.35	1036.56	(95)
Monthly average external temperature												
4.30	4.90	6.50	8.90	11.70	14.60	16.60	16.40	14.10	10.60	7.10	4.20	(96)
Heat loss rate for mean internal temperature												
6582.9	6343.3	5677.6	4635.4	3442.2	2135.7	1192.43	1280.39	2309.2	3796.8	5289.9	6558.2	(97)
Fraction of month for heating												
1.00	1.00	1.00	1.00	1.00	-	-	-	-	1.00	1.00	1.00	
Space heating requirement for each month, kWh/month												
4086.6	3424.1	3158.4	2173.5	1325.21	-	-	-	-	1956.18	3045.3	4108.1	

Total space heating requirement per year (kWh/year) (October to May) 23277.36 (98)
Space heating requirement per m² (kWh/m²/year) 122.63 (99)

8c. Space cooling requirement - not applicable

9a. Energy requirements

		kWh/year	
No secondary heating system selected			
Fraction of space heat from main system(s)	1.0000		(202)
Efficiency of main heating system	90.40%		(206)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	4086.6	3424.1	3158.4	2173.5	1325.21	-	-	-	-	1956.18	3045.3	4108.1	(98)
Appendix Q - monthly energy saved (main heating system 1)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(210)
Space heating fuel (main heating system 1)	4520.6	3787.7	3493.8	2404.4	1465.94	-	-	-	-	2163.9	3368.6	4544.3	(211)
Appendix Q - monthly energy saved (main heating system 2)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(212)
Space heating fuel (main heating system 2)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(213)
Appendix Q - monthly energy saved (secondary heating system)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(214)
Space heating fuel (secondary)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(215)

<u>Water heating</u>

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Water heating requirement	259.75	229.44	242.14	218.69	215.49	194.25	188.17	204.26	203.20	226.69	237.65	254.05	(64)
Efficiency of water heater 79.70													(216)
	89.68	89.64	89.54	89.30	88.73	79.70	79.70	79.70	79.70	89.16	89.53	89.70	(217)
Water heating fuel	289.63	255.94	270.41	244.89	242.85	243.73	236.10	256.28	254.95	254.26	265.44	283.22	(219)

Annual totals	kWh/year	
Space heating fuel used, main system 1	25749.30	(211)
Space heating fuel (secondary)	0.00	(215)
Water heating fuel	3097.72	(219)
Electricity for pumps, fans and electric keep-hot		
central heating pump	30.00	(230c)
boiler with a fan-assisted flue	45.00	(230e)
Total electricity for the above, kWh/year	75.00	(231)
Electricity for lighting (100.00% fixed LEL)	717.15	(232)
Energy saving/generation technologies		
Appendix Q -		
Energy saved or generated ():	0.000	(236a)
Energy used ():	0.000	(237a)
Total delivered energy for all uses	29639.17	(238)

10a. Fuel costs using Table 12 prices

	kWh/year	Fuel price p/kWh	£/year	
Space heating - main system 1	25749.297	3.480	896.08	(240)
Space heating - main system 2	0.000	0.000	0.00	(241)
Water heating cost	3097.72	3.480	107.80	(247)
Mech vent fans cost	0.000	13.190	0.00	(249)
Pump/fan energy cost	75.000	13.190	9.89	(249)
Energy for lighting	717.155	13.190	94.59	(250)
Additional standing charges			120.00	(251)
Electricity generated - PVs	0.000	0.000	0.00	(252)
Appendix Q -				
Energy saved or generated ():	0.000	0.000	0.00	(253)
Energy used ():	0.000	0.000	0.00	(254)
Total energy cost			1228.36	(255)

11a. SAP rating

	0.42	**(256)**
	2.20	**(257)**
SAP value	69.35	
	69	(258)
SAP band	**C**	

12a. Carbon dioxide emissions

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating, main system 1	25749.30	0.216	5561.85	(261)
Space heating, main system 2	0.00	0.000	0.00	(262)
Space heating, secondary	0.00	0.519	0.00	(263)
Water heating	3097.72	0.216	669.11	(264)
Space and water heating			6230.96	(265)
Electricity for pumps and fans	75.00	0.519	38.93	(267)
Electricity for lighting	717.15	0.519	372.20	(268)
Electricity generated - PVs	0.00	0.519	0.00	(269)
Electricity generated - µCHP	0.00	0.000	0.00	(269)
Appendix Q -				
Energy saved ():	0.00	0.000	0.00	(270)
Energy used ():	0.00	0.000	0.00	(271)
Total CO2, kg/year			6642.08	(272)

	kg/m²/year	
CO2 emissions per m²	**34.99**	(273)
EI value	62.10	(273a)
EI rating	**62**	(274)
EI band	**D**	

Calculation of stars for heating and DHW

Main heating energy efficiency	(3.48 / 0.9040) x (1 + (0.29 x 0.25)) = 4.1287, stars = 4
Main heating environmental impact	(0.2160 / 0.9040) x (1 + (0.29 x 0.25)) = 0.2563, stars = 4
Water heating energy efficiency	3.48 / 0.8617 = 4.0383, stars = 4
Water heating environmental impact	0.2160 / 0.8617 = 0.2507, stars = 4

Project Information

Building type Semi-detached house

Reference	
Date	5 May 2023
Project	40 Hillway LONDON N6 6HH

REGULATION COMPLIANCE REPORT - Approved Document L1A, 2012 Edition, England
assessed by program JPA Designer version 6.05.054, printed on 21/05/2023 at 21:39:31

New extension to existing dwelling

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1 TER and DER

Fuel for main heating system: Gas (mains) (fuel factor = 1.00)

Target Carbon Dioxide Emission Rate	TER = 15.88	
Dwelling Carbon Dioxide Emission Rate	DER = 36.36	Fail

Excess emissions = 20.49kg/m² (129.0%)

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	TFEE = 59.0	
Dwelling Fabric Energy Efficiency (DFEE)	DFEE = 136.2	Fail

2a Thermal bridging

Thermal bridging calculated using default y-value of 0.15

2b Fabric U-values

Element	Average	Highest	
Wall	1.16 (max. 0.30)	1.55 (max. 0.70)	Fail
Floor	0.60 (max. 0.25)	0.73 (max. 0.70)	Fail
Roof	0.17 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.96 (max. 2.00)	3.00 (max. 3.30)	OK

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3 Air permeability

Air permeability at 50 pascals:	10.00	OK
Maximum :	10.00	

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4 Heating efficiency

Main heating system:

Boiler and underfloor heating, mains gas
Vaillant ecoTEC plus 630 H system A

Source of efficiency: from boiler database
Vaillant ecoTEC plus 630 H system A VU GB 306/5-5 A
Efficiency: 89.4% SEDBUK2009
Minimum: 88.0% OK

Secondary heating system:
None -

5 Cylinder insulation

Hot water storage			
	Manufacturer's declared cylinder loss factor (kWh/day)	2.14	
	Permitted by DBSCG	2.56	OK
Primary pipework insulated	No		Fail

6 Controls

(Also refer to "Domestic Building Services Compliance Guide" by the DCLG)

Space heating controls	Time and temperature zone control	OK
	Cylinderstat - Yes	OK
	Independent timer for DHW - Yes	OK
Boiler Interlock	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings: 100.0%

Minimum: 75.0% OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames Valley):		OK
	Not significant	OK
Based on:		
Thermal mass parameter :	245.72	
Overshading :	Average or unknown (20-60 % sky blocked)	
Orientation : West		
Ventilation rate :	8.00	
Blinds/curtains :		

None with blinds/shutters closed 0.00% of daylight hours

10 Key features

None

EAL CONSULT
Assessor : Mark Simons
17 Dobree Avenue
LONDON
NW10 2AD
0208 930 5668

Project Information

Building type Semi-detached house

Reference
Date 5 May 2023
Project 40 Hillway
LONDON
N6 6HH

REGULATION COMPLIANCE REPORT - Approved Document L1A, 2012 Edition, England
assessed by program JPA Designer version 6.05.074, printed on 05/05/2023 at 16:29:50

Existing dwelling

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1 TER and DER

Fuel for main heating system: Gas (mains) (fuel factor = 1.00)

Target Carbon Dioxide Emission Rate	TER = 16.04	
Dwelling Carbon Dioxide Emission Rate	DER = 59.31	Fail

Excess emissions = 43.27kg/m² (269.8%)

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	TFEE = 59.0	
Dwelling Fabric Energy Efficiency (DFEE)	DFEE = 139.0	Fail

2a Thermal bridging

Thermal bridging calculated using default y-value of 0.15

2b Fabric U-values

Element	Average	Highest	
Wall	1.16 (max. 0.30)	1.55 (max. 0.70)	Fail
Party Wall	0.50 (max. 0.20)	-	Fail
Floor	0.60 (max. 0.25)	0.73 (max. 0.70)	Fail
Roof	0.17 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.96 (max. 2.00)	3.00 (max. 3.30)	OK

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3 Air permeability

Air permeability at 50 pascals:	10.00	OK
Maximum :	10.00	

4 Heating efficiency

Main heating system:			
	Boiler and radiators, mains gas		
	Vaillant Combicompact		
Source of efficiency:	from boiler database		
	Vaillant Combicompact vcw280h		
		Efficiency: 65.0% SEDBUK2009	
		Minimum: 88.0%	Fail
Secondary heating system:			
	None -		

5 Cylinder insulation

Hot water storage   No cylinder

6 Controls

(Also refer to "Domestic Building Services Compliance Guide" by the DCLG)

Space heating controls	Programmer, no thermostat	Fail
Hot water controls	No cylinder	
Boiler Interlock	Yes	OK
Hot water controls	No cylinder	

7 Low energy lights

Percentage of fixed lights with low-energy fittings: 0.0%

Minimum: 75.0%   Fail

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames Valley):		OK
	Not significant	OK
Based on:		
Thermal mass parameter :	245.72	
Overshading :	Average or unknown (20-60 % sky blocked)	
Orientation : West		
Ventilation rate :	8.00	
Blinds/curtains :		

None with blinds/shutters closed 0.00% of daylight hours

10 Key features

Fixed cooling system

EAL CONSULT
Assessor : Mark Simons
17 Dobree Avenue
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0208 930 5668

Project Information
Building type Semi-detached house

Reference
Date 5 May 2023
Project 40 Hillway
LONDON
N6 6HH

SAP 2012 worksheet for Existing dwelling - calculation of energy ratings

1. Overall dwelling dimensions

	Area (m²)	Av. Storey height (m)	Volume (m³)	
Ground floor (1)	73.31	2.76	202.34	(3a)
Ground floor (2)	24.73	2.39	59.10	(3b)
First floor	69.13	2.92	201.86	(3c)
Second floor	22.65	2.60	58.89	(3d)
	189.82			**(4)**
			522.19	**(5)**

2. Ventilation rate

	main + seondary + other heating		m³ per hour	
Number of chimneys	0 + 0 + 0	x 40	0.00	(6a)
Number of open flues	0 + 0 + 0	x 20	0.00	(6b)
Number of intermittent fans	3	x 10	30.00	(7a)
Number of passive vents	0	x 10	0.00	(7b)
Number of flueless gas fires	0	x 40	0.00	(7c)

			Air changes per hour	
			0.06	**(8)**
(ns)	3			(9)
			0.20	**(10)**
			0.35	**(11)**
			0.00	**(13)**
		100.00		**(14)**
			0.05	**(15)**
Infiltration rate			0.66	(16)
Air permeability			0.66	(18)
			2.00	**(19)**
			0.85	**(20)**
Infiltration rate incorporating shelter factor			0.56	(21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
5.10	5.00	4.90	4.40	4.30	3.80	3.80	3.70	4.00	4.30	4.50	4.70

52.50 (22)

Wind Factor

1.27	1.25	1.23	1.10	1.07	0.95	0.95	0.93	1.00	1.07	1.13	1.18

13.13 (22a)

Adjusted infiltration rate (allowing for shelter and wind speed)

0.71	0.70	0.68	0.61	0.60	0.53	0.53	0.52	0.56	0.60	0.63	0.66

7.33 (22b)

Ventilation : natural ventilation, intermittent extract fans
Effective air change rate

0.75	0.74	0.73	0.69	0.68	0.64	0.64	0.63	0.66	0.68	0.70	0.72	(25)

3. Heat losses and heat loss parameter

Element	Gross area, m²	Openings m²	Net area A, m²	U-value W/m²K	A x U W/K	kappa-value kJ/m²K	A x K kJ/K	
Window - Double-glazed, argon filled, low-E, En=0.2, hard coat (East) REAR			**4.430**	**1.94 (2.10)**	8.58			(27)
Window - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**1.370**	**1.68 (1.80)**	2.30			(27)
Solid door FRONT			**2.340**	**3.00**	7.02			(26)
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**6.830**	**1.80**	12.29			(26)
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**6.830**	**1.80**	12.29			(26)
Rooflight at 70° or less - Double-glazed, argon filled, low-E, En=0.1, soft coat (n/a) ROOF			**4.330**	**1.68 (1.80)**	7.27			(27)
Walls ROOF VOID WALL			12.79	0.22 (Ru=0.90)	2.86	18.00	230.22	(29)
Walls EXTERNAL #WINDOWS & DOORS #PROPOSED			51.51	0.28	14.42	150.00	7726.50	(29)
Walls EXTERNAL #WINDOWS & DOORS			146.79	1.55	227.52	135.00	19816.65	(29)
Ground floors EXISTING, UNDERGROUND			73.31	0.73	53.52	110.00	8064.10	(28)
Ground floors PROPOSED, UNDERGROUND			24.73	0.22	5.44	110.00	2720.30	(28)
Flat roofs DORMER ROOF			13.61	0.18	2.45	9.00	122.49	(30)
Flat roofs GF REAR #ROOFLIGHTS			23.90	0.18	4.30	9.00	215.10	(30)
Pitched roofs with integrated insulation ROOF VOID ABOVE FF TO SF			46.48	0.15 (Ru=0.90)	7.20	9.00	418.32	(30)
Pitched roofs insulated between rafters MAIN ROOF			9.04	0.16	1.45	9.00	81.36	(30)
Party wall SOLID			26.50	0.50	13.25	180.00	4770.00	
Internal floor SF			22.65	0.00	0.00	18.00	407.70	
Internal floor FF			69.13	0.00	0.00	18.00	1244.34	
Internal ceiling FF			22.65	0.00	0.00	9.00	203.85	

4. Water heating energy requirements

	kWh/year	
Assumed occupancy, N	2.99	(42)
Annual average hot water usage in litres per day Vd,average	110.72	(43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Hot water usage in litres per day for each month	121.79	117.36	112.93	108.50	104.07	99.64	99.64	104.07	108.50	112.93	117.36	121.79	(44)
Energy content of hot water used	180.61	157.96	163.00	142.11	136.36	117.67	109.03	125.12	126.61	147.56	161.07	174.91	

Energy content (annual)	1742.00	(45)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Distribution loss	27.09	23.69	24.45	21.32	20.45	17.65	16.36	18.77	18.99	22.13	24.16	26.24	(46)

	0.00	**(50)**
Hot water cylinder loss factor (kWh/day)	0.0000	(51)
Volume factor	0.0000	(52)
Temperature factor	0.0000	(53)
Energy lost from store (kWh/day)	0.00	(55)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Total storage loss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(56)
Net storage loss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(57)
Primary loss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(59)
Combi loss calculated for each month	50.96	46.03	50.96	49.32	50.96	49.14	50.78	50.96	49.32	50.96	49.32	50.96	(61)
Total heat required for water heating calculated for each month	231.57	203.99	213.96	191.42	187.32	166.81	159.81	176.08	175.93	198.51	210.38	225.87	(62)
Output from water heater for each month, kWh/month	231.57	203.99	213.96	191.42	187.32	166.81	159.81	176.08	175.93	198.51	210.38	225.87	(64)

	2341.65	(64)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Heat gains from water heating, kWh/month	72.79	64.03	66.94	59.58	58.08	51.41	48.95	54.34	54.43	61.80	65.88	70.90	(65)

5. Internal gains

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Metabolic gains, Watts	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	(66)
Lighting gains	203.04	180.34	146.66	111.03	83.00	70.07	75.71	98.42	132.09	167.72	195.76	208.68	(67)
Appliances gains	539.20	544.80	530.70	500.68	462.79	427.18	403.39	397.79	411.89	441.91	479.80	515.41	(68)
Cooking gains	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	(69)
Pumps and fans gains	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	(70)
Losses e.g. evaporation (negative values)	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	(71)
Water heating gains	97.84	95.28	89.97	82.75	78.06	71.40	65.79	73.04	75.59	83.07	91.51	95.29	(72)
Total internal gains	958.77	939.11	886.02	813.16	742.54	687.34	663.58	687.94	738.27	811.39	885.75	938.08	(73)

6. Solar gains (calculation for January)

	Area & Flux	g & FF	Shading	Gains	
Window - Double-glazed, argon filled, low-E, En=0.2, hard coat (East) REAR	0.9 x 4.430 19.64	0.72 x 0.70	0.77	30.3889	
Window - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 1.370 19.64	0.57 x 0.80	0.77	8.5029	
Solid door FRONT	0.9 x 2.340 0.00	0.00 x 0.70	0.77	0.0000	
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 6.830 19.64	0.57 x 0.80	0.77	42.3903	
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 6.830 19.64	0.57 x 0.80	0.77	42.3903	
Rooflight at 70° or less - Double-glazed, argon filled, low-E, En=0.1, soft coat (n/a) ROOF	0.9 x 4.330 26.00	0.63 x 0.80	1.00	51.0663	
Total solar gains, January				174.74	(83-1)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Solar gains	174.74	347.99	586.98	875.69	1089.24	1121.81	1065.24	904.52	689.25	416.70	219.02	142.95	(83)
Total gains	1133.51	1287.10	1473.00	1688.85	1831.78	1809.15	1728.83	1592.46	1427.52	1228.09	1104.77	1081.03	(84)

7. Mean internal temperature

Temperature during heating periods in the living area, Th1 (°C) 21.00 (85)
Heating system responsiveness 1.00

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau												
22.48	22.55	22.61	22.93	22.99	23.27	23.27	23.32	23.16	22.99	22.87	22.74	
alpha												
2.50	2.50	2.51	2.53	2.53	2.55	2.55	2.55	2.54	2.53	2.52	2.52	
Utilisation factor for gains for living area												
1.00	0.99	0.99	0.98	0.95	0.90	0.83	0.86	0.95	0.98	0.99	1.00	(86)
Mean internal temperature in living area T1												
17.84	18.03	18.45	19.05	19.69	20.27	20.62	20.55	20.06	19.25	18.46	17.83	(87)
Temperature during heating periods in rest of dwelling Th2												
19.48	19.49	19.49	19.51	19.52	19.53	19.53	19.54	19.53	19.52	19.51	19.50	(88)
Utilisation factor for gains for rest of dwelling												
0.99	0.99	0.99	0.97	0.93	0.85	0.70	0.75	0.92	0.98	0.99	1.00	(89)
Mean internal temperature in the rest of dwelling T2												
16.65	16.84	17.26	17.88	18.50	19.08	19.37	19.33	18.88	18.08	17.28	16.64	(90)

Living area fraction (19.20 / 189.82) 0.10 (91)
Mean internal temperature (for the whole dwelling)

16.77	16.96	17.38	18.00	18.62	19.20	19.50	19.45	19.00	18.20	17.40	16.76	(92)
Apply adjustment to the mean internal temperature, where appropriate												
17.37	17.56	17.98	18.60	19.22	19.80	20.10	20.05	19.60	18.80	18.00	17.36	(93)

8. Space heating requirement

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains												
0.99	0.99	0.98	0.96	0.93	0.86	0.76	0.80	0.92	0.97	0.99	0.99	(94)
Useful gains												
1125.02	1273.20	1446.02	1628.31	1700.85	1556.99	1313.57	1273.05	1311.23	1196.35	1092.98	1073.95	(95)
Monthly average external temperature												
4.30	4.90	6.50	8.90	11.70	14.60	16.60	16.40	14.10	10.60	7.10	4.20	(96)
Heat loss rate for mean internal temperature												
7530.9	7275.1	6575.9	5479.7	4240.7	2893.7	1947.86	2029.8	3074.4	4621.3	6178.2	7499.3	(97)
Fraction of month for heating												
1.00	1.00	1.00	1.00	1.00	-	-	-	-	1.00	1.00	1.00	
Space heating requirement for each month, kWh/month												
4766.0	4033.3	3816.6	2773.0	1889.63	-	-	-	-	2548.1	3661.3	4780.5	

Total space heating requirement per year (kWh/year) (October to May) 28268.48 (98)
Space heating requirement per m² (kWh/m²/year) 148.92 (99)

8c. Space cooling requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
External temperaturers	-	-	-	-	-	14.60	16.60	16.40	-	-	-	-		
Heat loss rate W	-	-	-	-	-	5234.5	4120.8	4222.6	-	-	-	-		(100)
Utilisation factor for loss	-	-	-	-	-	0.35	0.41	0.38	-	-	-	-		(101)
Useful loss W	-	-	-	-	-	1830.93	1704.25	1588.47	-	-	-	-		(102)
Internal gains W	0.00	0.00	0.00	0.00	0.00	684.34	660.58	684.94	0.00	0.00	0.00	0.00		
Solar gains W	0.00	0.00	0.00	0.00	0.00	1244.89	1182.42	1005.17	0.00	0.00	0.00	0.00		
Gains W	-	-	-	-	-	1929.23	1843.00	1690.11	-	-	-	-		(103)
Fraction of month for cooling	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00		(103a)
Space heating kWh	-	-	-	-	-	717.67	162.27	148.15	-	-	-	-		(98)
Space cooling kWh	-	-	-	-	-	70.78	103.23	75.62	-	-	-	-		(104)
Total													249.63	(104)
Cooled fraction													0.22	(105)
Intermittency factor	-	-	-	-	-	0.25	0.25	0.25	-	-	-	-		(106)
Space cooling requirement for month	-	-	-	-	-	3.89	5.68	4.16	-	-	-	-		
Space cooling (June to August)													13.73	(107)
Space cooling requirement per m² (kWh/m²/year)													0.07	(108)

9a. Energy requirements

kWh/year

No secondary heating system selected

Fraction of space heat from main system(s)	1.0000	(202)
Efficiency of main heating system	66.00%	(206)
Cooling system energy efficiency ratio	0.00%	(209)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	4766.0	4033.3	3816.6	2773.0	1889.63	-	-	-	-	2548.1	3661.3	4780.5		(98)
Appendix Q - monthly energy saved (main heating system 1)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(210)
Space heating fuel (main heating system 1)	7221.2	6111.0	5782.8	4201.5	2863.1	-	-	-	-	3860.8	5547.5	7243.2		(211)
Appendix Q - monthly energy saved (main heating system 2)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(212)
Space heating fuel (main heating system 2)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(213)
Appendix Q - monthly energy saved (secondary heating system)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(214)
Space heating fuel (secondary)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(215)
<u>Water heating</u>														
Water heating requirement	231.57	203.99	213.96	191.42	187.32	166.81	159.81	176.08	175.93	198.51	210.38	225.87		(64)
Efficiency of water heater													57.00	(216)
	65.52	65.50	65.45	65.33	65.07	57.00	57.00	57.00	57.00	65.26	65.44	65.53		(217)
Water heating fuel	353.43	311.42	326.90	292.99	287.85	292.64	280.37	308.91	308.65	304.21	321.50	344.66		(219)

Annual totals	kWh/year	
Space heating fuel used, main system 1	42831.03	(211)
Space heating fuel (secondary)	0.00	(215)
Water heating fuel	3733.54	(219)
Space cooling fuel used	0.00	(221)

-	-	-	-	-	0.00	0.00	0.00	-	-	-	-	(221)

Electricity for pumps, fans and electric keep-hot		
central heating pump	30.00	(230c)
Total electricity for the above, kWh/year	30.00	(231)
Electricity for lighting (0.00% fixed LEL)	1434.31	(232)
Energy saving/generation technologies		
Appendix Q -		
Energy saved or generated ():	0.000	(236a)
Energy used ():	0.000	(237a)
Total delivered energy for all uses	48028.87	(238)

10a. Fuel costs using Table 12 prices

	kWh/year	Fuel price p/kWh	£/year	
Space heating - main system 1	42831.026	3.480	1490.52	(240)
Space heating - main system 2	0.000	0.000	0.00	(241)
Water heating cost	3733.54	3.480	129.93	(247)
Space cooling	0.000	13.190	0.00	(248)
Mech vent fans cost	0.000	13.190	0.00	(249)
Pump/fan energy cost	30.000	13.190	3.96	(249)
Energy for lighting	1434.310	13.190	189.19	(250)
Additional standing charges			120.00	(251)
Electricity generated - PVs	0.000	0.000	0.00	(252)
Appendix Q -				
Energy saved or generated ():	0.000	0.000	0.00	(253)
Energy used ():	0.000	0.000	0.00	(254)
Total energy cost			1933.59	(255)

11a. SAP rating

	0.42	**(256)**
	3.46	**(257)**
SAP value	51.75	
	52	(258)
SAP band	**E**	

12a. Carbon dioxide emissions

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating, main system 1	42831.03	0.216	9251.50	(261)
Space heating, main system 2	0.00	0.000	0.00	(262)
Space heating, secondary	0.00	0.519	0.00	(263)
Water heating	3733.54	0.216	806.44	(264)
Space and water heating			10057.95	(265)
Space cooling	0.00	0.519	0.00	(266)
Electricity for pumps and fans	30.00	0.519	15.57	(267)
Electricity for lighting	1434.31	0.519	744.41	(268)
Electricity generated - PVs	0.00	0.519	0.00	(269)
Electricity generated - µCHP	0.00	0.000	0.00	(269)
Appendix Q -				
Energy saved ():	0.00	0.000	0.00	(270)
Energy used ():	0.00	0.000	0.00	(271)
Total CO2, kg/year			10817.92	(272)

	kg/m²/year	
CO2 emissions per m²	**56.99**	(273)
EI value	41.98	(273a)
EI rating	**42**	(274)
EI band	**E**	

Calculation of stars for heating and DHW

Main heating energy efficiency	(3.48 / 0.6600) x (1 + (0.29 x 0.00)) = 5.2727, stars = 4
Main heating environmental impact	(0.2160 / 0.6600) x (1 + (0.29 x 0.00)) = 0.3273, stars = 4
Water heating energy efficiency	3.48 / 0.6259 = 5.5598, stars = 3
Water heating environmental impact	0.2160 / 0.6259 = 0.3451, stars = 3

EAL CONSULT
Assessor : Mark Simons
17 Dobree Avenue
LONDON
NW10 2AD
0208 930 5668

Project Information
Building type Semi-detached house

Reference	
Date	5 May 2023
Project	40 Hillway LONDON N6 6HH

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New extension to existing dwelling

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1 TER and DER
Fuel for main heating system: Gas (mains) (fuel factor = 1.00)

Target Carbon Dioxide Emission Rate	TER = 15.88	
Dwelling Carbon Dioxide Emission Rate	DER = 36.37	Fail

Excess emissions = 20.50kg/m² (129.1%)

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	TFEE = 59.0	
Dwelling Fabric Energy Efficiency (DFEE)	DFEE = 136.2	Fail

2a Thermal bridging
Thermal bridging calculated using default y-value of 0.15

2b Fabric U-values

Element	Average	Highest	
Wall	1.16 (max. 0.30)	1.55 (max. 0.70)	Fail
Floor	0.60 (max. 0.25)	0.73 (max. 0.70)	Fail
Roof	0.17 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.96 (max. 2.00)	3.00 (max. 3.30)	OK

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3 Air permeability

Air permeability at 50 pascals:	10.00	OK
Maximum :	10.00	

4 Heating efficiency

Main heating system:			
	Boiler and underfloor heating, mains gas		
	Vaillant ecoTEC plus 630 H system A		
Source of efficiency:	from boiler database		
	Vaillant ecoTEC plus 630 H system A VU GB 306/5-5 A		
		Efficiency: 89.4% SEDBUK2009	
		Minimum: 88.0%	OK
Secondary heating system:			
	None -		

5 Cylinder insulation

Hot water storage			
	Manufacturer's declared cylinder loss factor (kWh/day)	2.14	
	Permitted by DBSCG	2.56	OK
Primary pipework insulated	No		Fail

6 Controls

(Also refer to "Domestic Building Services Compliance Guide" by the DCLG)

Space heating controls	Time and temperature zone control	OK
	Cylinderstat - Yes	OK
	Independent timer for DHW - Yes	OK
Boiler Interlock	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings: 100.0%	
Minimum: 75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames Valley):		OK
	Not significant	OK

Based on:

Thermal mass parameter : 245.72

Overshading : Average or unknown (20-60 % sky blocked)

Orientation : West

Ventilation rate : 8.00

Blinds/curtains :

None with blinds/shutters closed 0.00% of daylight hours

10 Key features

Fixed cooling system

EAL CONSULT
Assessor : Mark Simons
17 Dobree Avenue
LONDON
NW10 2AD
0208 930 5668

Project Information
Building type Semi-detached house

Reference
Date 5 May 2023
Project 40 Hillway
LONDON
N6 6HH

SAP 2012 worksheet for New extension to existing dwelling - calculation of energy ratings

1. Overall dwelling dimensions

	Area (m^2)	Av. Storey height (m)	Volume (m^3)	
Ground floor (1)	73.31	2.76	202.34	(3a)
Ground floor (2)	24.73	2.39	59.10	(3b)
First floor	69.13	2.92	201.86	(3c)
Second floor	22.65	2.60	58.89	(3d)
	189.82			**(4)**
			522.19	**(5)**

2. Ventilation rate

	main + seondary + other heating		m³ per hour	
Number of chimneys	0 + 0 + 0	x 40	0.00	(6a)
Number of open flues	0 + 0 + 0	x 20	0.00	(6b)
Number of intermittent fans	3	x 10	30.00	(7a)
Number of passive vents	0	x 10	0.00	(7b)
Number of flueless gas fires	0	x 40	0.00	(7c)

			Air changes per hour	
			0.06	**(8)**
(ns)	3			(9)
			0.20	**(10)**
			0.35	**(11)**
			0.00	**(13)**
		100.00		**(14)**
			0.05	**(15)**
Infiltration rate			0.66	(16)
Air permeability			0.66	(18)
			2.00	**(19)**
			0.85	**(20)**
Infiltration rate incorporating shelter factor			0.56	(21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
5.10	5.00	4.90	4.40	4.30	3.80	3.80	3.70	4.00	4.30	4.50	4.70

52.50 (22)

Wind Factor

1.27	1.25	1.23	1.10	1.07	0.95	0.95	0.93	1.00	1.07	1.13	1.18

13.13 (22a)

Adjusted infiltration rate (allowing for shelter and wind speed)

0.71	0.70	0.68	0.61	0.60	0.53	0.53	0.52	0.56	0.60	0.63	0.66

7.33 (22b)

Ventilation : natural ventilation, intermittent extract fans
Effective air change rate

0.75	0.74	0.73	0.69	0.68	0.64	0.64	0.63	0.66	0.68	0.70	0.72	(25)

3. Heat losses and heat loss parameter

Element	Gross area, m²	Openings m²	Net area A, m²	U-value W/m²K	A x U W/K	kappa-value kJ/m²K	A x K kJ/K	
Window - Double-glazed, argon filled, low-E, En=0.2, hard coat (East) REAR			**4.430**	**1.94 (2.10)**	8.58			(27)
Window - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**1.370**	**1.68 (1.80)**	2.30			(27)
Solid door FRONT			**2.340**	**3.00**	7.02			(26)
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**6.830**	**1.80**	12.29			(26)
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR			**6.830**	**1.80**	12.29			(26)
Rooflight at 70° or less - Double-glazed, argon filled, low-E, En=0.1, soft coat (n/a) ROOF			**4.330**	**1.68 (1.80)**	7.27			(27)
Walls ROOF VOID WALL			12.79	0.22 (Ru=0.90)	2.86	18.00	230.22	(29)
Walls EXTERNAL #WINDOWS & DOORS #PROPOSED			51.51	0.28	14.42	150.00	7726.50	(29)
Walls EXTERNAL #WINDOWS & DOORS			146.79	1.55	227.52	135.00	19816.65	(29)
Ground floors EXISTING, UNDERGROUND			73.31	0.73	53.52	110.00	8064.10	(28)
Ground floors PROPOSED, UNDERGROUND			24.73	0.22	5.44	110.00	2720.30	(28)
Flat roofs DORMER ROOF			13.61	0.18	2.45	9.00	122.49	(30)
Flat roofs GF REAR #ROOFLIGHTS			23.90	0.18	4.30	9.00	215.10	(30)
Pitched roofs with integrated insulation ROOF VOID ABOVE FF TO SF			46.48	0.15 (Ru=0.90)	7.20	9.00	418.32	(30)
Pitched roofs insulated between rafters MAIN ROOF			9.04	0.16	1.45	9.00	81.36	(30)
Party wall SOLID			26.50	0.00	0.00	180.00	4770.00	
Internal floor SF			22.65	0.00	0.00	18.00	407.70	
Internal floor FF			69.13	0.00	0.00	18.00	1244.34	
Internal ceiling FF			22.65	0.00	0.00	9.00	203.85	

4. Water heating energy requirements

	kWh/year	
Assumed occupancy, N	2.99	(42)
Annual average hot water usage in litres per day Vd,average	110.72	(43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Hot water usage in litres per day for each month	121.79	117.36	112.93	108.50	104.07	99.64	99.64	104.07	108.50	112.93	117.36	121.79	(44)
Energy content of hot water used	180.61	157.96	163.00	142.11	136.36	117.67	109.03	125.12	126.61	147.56	161.07	174.91	

Energy content (annual)		1742.00	(45)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Distribution loss	27.09	23.69	24.45	21.32	20.45	17.65	16.36	18.77	18.99	22.13	24.16	26.24	(46)

Cylinder volume, l	250.00		(47)
Manufacturer's declared cylinder loss factor (kWh/day)	2.14		(48)
Temperature Factor	0.5400		(49)
Energy lost from hot water cylinder (kWh/day)		1.16	(55)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Total storage loss	35.82	32.36	35.82	34.67	35.82	34.67	35.82	35.82	34.67	35.82	34.67	35.82	(56)
Net storage loss	35.82	32.36	35.82	34.67	35.82	34.67	35.82	35.82	34.67	35.82	34.67	35.82	(57)
Primary loss	43.31	39.12	43.31	41.92	43.31	41.92	43.31	43.31	41.92	43.31	41.92	43.31	(59)
Total heat required for water heating calculated for each month	259.75	229.44	242.14	218.69	215.49	194.25	188.17	204.26	203.20	226.69	237.65	254.05	(62)
Output from water heater for each month, kWh/month	259.75	229.44	242.14	218.69	215.49	194.25	188.17	204.26	203.20	226.69	237.65	254.05	(64)
												2673.77	(64)
Heat gains from water heating, kWh/month	123.36	109.70	117.51	108.52	108.65	100.39	99.56	104.91	103.37	112.37	114.82	121.47	(65)

5. Internal gains

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Metabolic gains, Watts	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	179.32	(66)
Lighting gains	101.52	90.17	73.33	55.52	41.50	35.04	37.86	49.21	66.05	83.86	97.88	104.34	(67)
Appliances gains	539.20	544.80	530.70	500.68	462.79	427.18	403.39	397.79	411.89	441.91	479.80	515.41	(68)
Cooking gains	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	(69)
Pumps and fans gains	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	(70)
Losses e.g. evaporation (negative values)	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	-119.55	(71)
Water heating gains	165.81	163.25	157.94	150.72	146.03	139.43	133.82	141.01	143.56	151.04	159.48	163.26	(72)
Total internal gains	925.22	916.91	880.66	825.61	769.01	720.34	693.76	706.70	740.19	795.50	855.85	901.71	(73)

6. Solar gains (calculation for January)

	Area & Flux	g & FF	Shading	Gains	
Window - Double-glazed, argon filled, low-E, En=0.2, hard coat (East) REAR	0.9 x 4.430 19.64	0.72 x 0.70	0.77	30.3889	
Window - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 1.370 19.64	0.57 x 0.80	0.77	8.5029	
Solid door FRONT	0.9 x 2.340 0.00	0.00 x 0.70	0.77	0.0000	
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 6.830 19.64	0.57 x 0.80	0.77	42.3903	
Full glazed door - Triple-glazed, air-filled, low-E, En=0.1, soft coat (East) REAR	0.9 x 6.830 19.64	0.57 x 0.80	0.77	42.3903	
Rooflight at 70° or less - Double-glazed, argon filled, low-E, En=0.1, soft coat (n/a) ROOF	0.9 x 4.330 26.00	0.63 x 0.80	1.00	51.0663	
Total solar gains, January				174.74	(83-1)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Solar gains	174.74	347.99	586.98	875.69	1089.24	1121.81	1065.24	904.52	689.25	416.70	219.02	142.95	(83)
Total gains	1099.96	1264.90	1467.64	1701.30	1858.25	1842.15	1759.00	1611.23	1429.45	1212.20	1074.87	1044.66	(84)

7. Mean internal temperature

Temperature during heating periods in the living area, Th1 (°C) 21.00 (85)
Heating system responsiveness 0.75

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau												
23.01	23.08	23.15	23.48	23.54	23.83	23.83	23.89	23.72	23.54	23.41	23.28	
alpha												
2.53	2.54	2.54	2.57	2.57	2.59	2.59	2.59	2.58	2.57	2.56	2.55	
Utilisation factor for gains for living area												
1.00	0.99	0.99	0.98	0.95	0.90	0.82	0.86	0.95	0.99	0.99	1.00	(86)
Mean internal temperature in living area T1												
18.55	18.70	19.01	19.47	19.94	20.38	20.63	20.58	20.21	19.61	19.02	18.54	(87)
Temperature during heating periods in rest of dwelling Th2												
18.77	18.77	18.78	18.80	18.80	18.82	18.82	18.82	18.81	18.80	18.79	18.78	(88)
Utilisation factor for gains for rest of dwelling												
0.99	0.99	0.98	0.96	0.92	0.80	0.58	0.64	0.89	0.97	0.99	1.00	(89)
Mean internal temperature in the rest of dwelling T2												
15.70	15.92	16.38	17.05	17.73	18.32	18.59	18.56	18.12	17.26	16.39	15.70	(90)

Living area fraction (19.20 / 189.82) 0.10 (91)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Mean internal temperature (for the whole dwelling)												
15.99	16.20	16.64	17.30	17.95	18.53	18.79	18.76	18.33	17.50	16.66	15.99	(92)
Apply adjustment to the mean internal temperature, where appropriate												
15.99	16.20	16.64	17.30	17.95	18.53	18.79	18.76	18.33	17.50	16.66	15.99	(93)

8. Space heating requirement

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains												
0.99	0.99	0.98	0.95	0.89	0.77	0.57	0.63	0.87	0.96	0.99	0.99	(94)
Useful gains												
1090.11	1247.95	1432.48	1616.59	1660.95	1422.84	1005.80	1022.62	1237.00	1167.53	1060.35	1036.56	(95)
Monthly average external temperature												
4.30	4.90	6.50	8.90	11.70	14.60	16.60	16.40	14.10	10.60	7.10	4.20	(96)
Heat loss rate for mean internal temperature												
6582.9	6343.3	5677.6	4635.4	3442.2	2135.7	1192.43	1280.39	2309.2	3796.8	5289.9	6558.2	(97)
Fraction of month for heating												
1.00	1.00	1.00	1.00	1.00	-	-	-	-	1.00	1.00	1.00	
Space heating requirement for each month, kWh/month												
4086.6	3424.1	3158.4	2173.5	1325.21	-	-	-	-	1956.18	3045.3	4108.1	

Total space heating requirement per year (kWh/year) (October to May) 23277.36 (98)
Space heating requirement per m² (kWh/m²/year) 122.63 (99)

8c. Space cooling requirement

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
External temperaturers												
-	-	-	-	-	14.60	16.60	16.40	-	-	-	-	
Heat loss rate W												
-	-	-	-	-	5110.0	4022.7	4121.9	-	-	-	-	(100)
Utilisation factor for loss												
-	-	-	-	-	0.36	0.43	0.39	-	-	-	-	(101)
Useful loss W												
-	-	-	-	-	1857.41	1725.29	1602.32	-	-	-	-	(102)
Internal gains W												
0.00	0.00	0.00	0.00	0.00	717.34	690.76	703.70	0.00	0.00	0.00	0.00	
Solar gains W												
0.00	0.00	0.00	0.00	0.00	1244.89	1182.42	1005.17	0.00	0.00	0.00	0.00	
Gains W												
-	-	-	-	-	1962.22	1873.18	1708.88	-	-	-	-	(103)
Fraction of month for cooling												
0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	(103a)
Space heating kWh												
-	-	-	-	-	392.92	44.28	6.04	-	-	-	-	(98)
Space cooling kWh												
-	-	-	-	-	75.47	110.03	79.27	-	-	-	-	(104)

Total	264.77	(104)
Cooled fraction	0.22	(105)
Intermittency factor		

-	-	-	-	-	0.25	0.25	0.25	-	-	-	-	(106)
Space cooling requirement for month												
-	-	-	-	-	4.15	6.05	4.36	-	-	-	-	

Space cooling (June to August)	14.56	(107)
Space cooling requirement per m² (kWh/m²/year)	0.08	(108)

9a. Energy requirements

kWh/year

No secondary heating system selected		
Fraction of space heat from main system(s)	1.0000	(202)
Efficiency of main heating system	90.40%	(206)
Cooling system energy efficiency ratio	4.05%	(209)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	4086.6	3424.1	3158.4	2173.5	1325.21	-	-	-	-	1956.18	3045.3	4108.1		(98)
Appendix Q - monthly energy saved (main heating system 1)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(210)
Space heating fuel (main heating system 1)	4520.6	3787.7	3493.8	2404.4	1465.94	-	-	-	-	2163.9	3368.6	4544.3		(211)
Appendix Q - monthly energy saved (main heating system 2)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(212)
Space heating fuel (main heating system 2)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(213)
Appendix Q - monthly energy saved (secondary heating system)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(214)
Space heating fuel (secondary)	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00		(215)
<u>Water heating</u>														
Water heating requirement	259.75	229.44	242.14	218.69	215.49	194.25	188.17	204.26	203.20	226.69	237.65	254.05		(64)
Efficiency of water heater													79.70	(216)
	89.68	89.64	89.54	89.30	88.73	79.70	79.70	79.70	79.70	89.16	89.53	89.70		(217)
Water heating fuel	289.63	255.94	270.41	244.89	242.85	243.73	236.10	256.28	254.95	254.26	265.44	283.22		(219)

Annual totals	kWh/year	
Space heating fuel used, main system 1	25749.30	(211)
Space heating fuel (secondary)	0.00	(215)
Water heating fuel	3097.72	(219)
Space cooling fuel used	3.60	(221)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	-	-	-	-	1.02	1.49	1.08	-	-	-	-	(221)

Electricity for pumps, fans and electric keep-hot		
central heating pump	30.00	(230c)
boiler with a fan-assisted flue	45.00	(230e)
Total electricity for the above, kWh/year	75.00	(231)
Electricity for lighting (100.00% fixed LEL)	717.15	(232)
Energy saving/generation technologies		
Appendix Q -		
Energy saved or generated ():	0.000	(236a)
Energy used ():	0.000	(237a)
Total delivered energy for all uses	29642.77	(238)

10a. Fuel costs using Table 12 prices

	kWh/year	Fuel price p/kWh	£/year	
Space heating - main system 1	25749.297	3.480	896.08	(240)
Space heating - main system 2	0.000	0.000	0.00	(241)
Water heating cost	3097.72	3.480	107.80	(247)
Space cooling	3.596	13.190	0.47	(248)
Mech vent fans cost	0.000	13.190	0.00	(249)
Pump/fan energy cost	75.000	13.190	9.89	(249)
Energy for lighting	717.155	13.190	94.59	(250)
Additional standing charges			120.00	(251)
Electricity generated - PVs	0.000	0.000	0.00	(252)
Appendix Q -				
Energy saved or generated ():	0.000	0.000	0.00	(253)
Energy used ():	0.000	0.000	0.00	(254)
Total energy cost			1228.84	(255)

11a. SAP rating

	0.42	**(256)**
	2.20	**(257)**
SAP value	69.34	
	69	(258)
SAP band	**C**	

12a. Carbon dioxide emissions

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating, main system 1	25749.30	0.216	5561.85	(261)
Space heating, main system 2	0.00	0.000	0.00	(262)
Space heating, secondary	0.00	0.519	0.00	(263)
Water heating	3097.72	0.216	669.11	(264)
Space and water heating			6230.96	(265)
Space cooling	3.60	0.519	1.87	(266)
Electricity for pumps and fans	75.00	0.519	38.93	(267)
Electricity for lighting	717.15	0.519	372.20	(268)
Electricity generated - PVs	0.00	0.519	0.00	(269)
Electricity generated - µCHP	0.00	0.000	0.00	(269)
Appendix Q -				
Energy saved ():	0.00	0.000	0.00	(270)
Energy used ():	0.00	0.000	0.00	(271)
Total CO2, kg/year			6643.95	(272)

	kg/m²/year	
CO2 emissions per m²	**35.00**	(273)
EI value	62.09	(273a)
EI rating	**62**	(274)
EI band	**D**	

Calculation of stars for heating and DHW

Main heating energy efficiency	(3.48 / 0.9040) x (1 + (0.29 x 0.25)) = 4.1287, stars = 4
Main heating environmental impact	(0.2160 / 0.9040) x (1 + (0.29 x 0.25)) = 0.2563, stars = 4
Water heating energy efficiency	3.48 / 0.8617 = 4.0383, stars = 4
Water heating environmental impact	0.2160 / 0.8617 = 0.2507, stars = 4

Parliament Hill Medical Centre

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Dr Ann-Marie Tully

GPs Dr Marta Buszewicz
Dr Beth Freedman
Dr Marie-Laure Morelli
Dr Miles Johnston

Housing Letter

2 January 2024

To Whom It May Concern,

Re: [redacted]
40 Hillway, London, N6 6HH
Tel: [redacted]

I hope this letter finds you well. This is a letter in support for Susanne's application for air conditioning/filtering to be installed in her current residence. [redacted]

I would be grateful if you could consider this letter in support of her application for air conditioning/filtering.

Yours sincerely,

Dr Niran Yoganayagam
GMC: 7602373
MBBS BSc (Hons) DFSRH

c.c.
PRIVATE AND CONFIDENTIAL
Ms S Bandak
40 Hillway
London
N6 6HH

Plant, ventilation, extraction and air conditioning equipment and planning permission

You can use our new tool to check if your project needs planning permission .

You must apply for full planning permission to install, alter, replace or move plant, air conditioning, ventilation or extraction equipment. This is where any part of the equipment will be fixed to the outside of the property.

If the property is a listed building (or part of) and the equipment will be fixed to either the internal or external walls, you must also apply for listed building consent .

Very small external equipment may not need planning permission if it does not change the external appearance of the property very much. An example might be a small extractor fan that cannot be seen from the surrounding streets.

More information

- Camden Local Plan Policy A4
- Camden Planning Guidance Amenity - Noise and vibration

You must send a noise, vibration and ventilation assessment with a planning application. This is for the installation, alteration or replacement of plant, ventilation, extraction or air conditioning equipment.

Can I get confirmation that I do not need planning permission?

Apply for a Lawful Development Certificate to prove an existing or proposed piece of equipment is lawful.

Am I likely to get planning permission?

If you want to find out whether your proposal is likely to be accepted, you can apply for pre-planning application advice.

How do I apply?

You can apply via the national planning portal . To find out what information is required with your application, see making a planning application.

Still not sure whether you need planning permission?

If you need further advice about whether you need planning permission, contact planning advice and information.

22 August 2023

Development Management
Regeneration and Planning
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WC1H 9JE

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40 HILLWAY, LONDON, N6 6HH

RETROSPECTIVE PLANNING APPLICATION FOR THE INSTALLATION OF A/C UNITS & ACOUSTIC ENCLOSURE (RESUBMISSION WITH OVERHEATING ASSESSMENT ADDED)

On behalf of our client and homeowner Mr Tony Bandak, please find enclosed our response to the neighbour comment uploaded to Camden's website on 19/07/2023. The letter is signed by Rachel Hermer and David Burnside, assumed occupiers of No.42 Hillway, N6 6HH.

This rebuttal is in relation to the resubmission of a retrospective planning application for the installation of 3 No. external air conditioning units (A/C), an associated acoustic enclosure and the addition of an overheating assessment at the application site.

This letter should be read in conjunction with the planning application documents submitted, as listed below:

- Application form;
- Location plan, existing and proposed drawings (prepared by HUT Architects);
- Design and Access Statement (prepared by HUT Architects);
- Planning and heritage letter (prepared by Savills);
- Noise Impact Assessment (prepared by Clement Acoustics);
- A/C Specification Sheet, and AC Design and Technical Manual (split into two parts);
- Photograph of the Existing AC Units;
- Energy and Overheating Assessment (prepared by EAL Consult).

The neighbour letter focuses on three key points - sustainability, noise, and visual appearance – to which we respond to on behalf of the Applicant.

1. *Sustainability - Overheating Assessment*

The energy and overheating assessment provided outlines an overall commitment to reducing energy consumption under occupancy through the adoption of a <u>'Fabric First' principle, which will seek enhanced insulation standards and improved heating and lighting efficiencies </u>in comparison to the standard requirements of Approved Document Part L 2013.

The neighbour comments suggest these alterations should have been incorporated earlier and that these will not be undertaken. This is an incorrect assumption as the enhancements to the property are included in the sustainability statement, which will form part of the approved document list as per the decision notice and the Applicant will therefore bound to providing this. Although not normal practice, the applicant is happy to accept a condition in addition to the approved document list, to emphasise compliance of these enhancements, although already covered by the decision notice.

It is worth reiterating that the overheating assessment also demonstrates that the dwelling, by incorporating the measures underlined above, can achieve an average carbon emission reduction of 38.7% which is no greater with the addition of active cooling (AC units). This is illustrated in Table 3 found on page 4 of the assessment. See below.

Table 3. Carbon Dioxide Savings from each stage of the Energy Hierarchy

	With Active cooling		Without Active cooling	
	Regulated Carbon dioxide savings (Tonnes CO_2)	% Improvement	Regulated Carbon dioxide savings (Tonnes CO_2)	% Improvement
Savings from energy efficiency measures	4.35	38.7%	4.35	38.7%

Therefore, as submitted, the use of active cooling will not lead to an increase in carbon emissions. The reported improvements, which also exceed Part L building requirements, are also deemed to be at the limit of financial viability for this minor development and are therefore the most reasonable enhancement measures for the site.

We trust that the enclosed assists in the assessment of the scheme and highlights the suitability of the scheme in relation to no impact on the heating/cooling and carbon emissions, as professionally assessed by EAL Consult.

2. *Amenity - Noise Levels*

Details of noise generation from the enclosure have been provided within this planning application. It is anticipated that there will not be any detrimental impact upon nearby residential properties, given the low noise frequency from the condensers, the acoustic enclosure, and the staggered nature of neighbouring dwellings, increasing the distance from the units.

The neighbour comments note that the assessment refers to 'partially open' windows. This has been undertaken as this is the average position for most windows, as windows are infrequently fully open due to general ideas of perceived privacy and security of properties and their occupiers. Therefore, assessment of a partially open window is a reasonable approach. The results of the survey have enabled criteria to be set for noise emissions from the plant in accordance with the requirements of Camden London Borough Council. Calculations show that noise emissions from the plant units could meet the requirements of Camden London Borough Council with the recommended acoustic enclosure installed as stated.

We trust this assists with suitable assessment of the scheme, in accordance with local planning policy for acceptable noise levels in residential areas.

3. *Conservation Area -Visual Appearance*

As referred to above, the proposal includes the provision of 3 air conditioning units which are to be located within a purpose-built acoustic enclosure. The enclosure is located on the flat roof on the existing single-storey rear extension (east), set away from the neighbouring properties No.42 and 38 Hillway. This rear location allows for limited visibility from public views as well as limited visibility from neighbouring windows, allowing for protection of the appearance of the conservation area.

Furthermore, any visibility from neighbouring windows will be from side windows that are not the sole window that serves the associated internal space. Ground floor windows will only view the AC at exceptionally acute angles, when stood right adjacent to the window. The extension of the neighbouring properties to the rear has resulted in a staggered rear elevation, across No.38, 40 and 42 Hillway. This further increases the distance that the A/C units can be viewed from, specifically the rear garden space of either neighbour. See the photos below which illustrate this.

Rear of application site illustrating limited visibility of the AC units from either neighbour, with limited direct overlooking from ground floor side windows on either side of the boundary fence.

View towards No.42 - adjacent ground floor side windows serving living spaces (not sole windows). The windows appear non-opening. These windows will have extremely limited acute views and noise impact from the AC.

View towards No.38 – No visibility of the proposed A/C and enclosure location.

Given that the air conditioning units are located to the rear, as well as within an enclosure, there will not be a negative impact upon the external appearance of the building or the Holly Lodge Conservation Area that the site forms part of. This is considered in accordance with planning policy as assessed within the supporting planning statement.

Planning History

It is worth reiterating that the previous application (planning reference: 2022/5452/P) was refused solely on the lack of an overheating assessment. The reason for refusal is set out below:

> *'The proposal has failed to justify the need for active cooling in order to reduce and mitigate the impact of dwelling overheating and thereby fails to demonstrate that carbon dioxide emissions will be minimised, contrary to policies CC1 (Climate Change Mitigation) and CC2 (Adapting to climate change) of the London Borough of Camden Local Plan 2017.'*

The proposal was not refused on amenity or conservation grounds, and therefore the current revised submission could not be reasonably refused on this basis. This is confirmed by the previous officer as per Paragraph 4.3 and 5.2 of the officer's report;

> *'… these units are relatively modest in scale and discreet in location and would not cause demonstrable harm to the character and appearance of the host building and conservation area. The design of the enclosure around them would also be acceptable and not make the units appear much more bulky.'*

and;

> '*The applicant has submitted an acoustic report which has been reviewed by the Council's Environmental Health Officer, and it has been concluded that there would be no adverse impact on neighbouring residents in terms of noise and vibration. … Because of the scale and siting on the unit, there would be no adverse impacts relating to outlook, daylight, or sunlight.'*

Consequently, the proposal could not be reasonably refused on conservation or amenity grounds due to the council's acceptance of these points previously, to which these elements remain unchanged.

The overheating assessment shows appropriate review and no resultant increase in carbon emissions or overheating of the property with the addition of A/C. Therefore, the proposal is considered acceptable.

We respectfully request that the application is approved without delay.

Please feel free to contact myself or my colleague Simon Wallis (SWallis@savills.com) on the content above, if you have any queries or you would like to discuss anything further.

Yours sincerely,

Saffron Frost
Senior Planner

Policy SI 4 Managing heat risk

A Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.

B Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
2) minimise internal heat generation through energy efficient design
3) manage the heat within the building through exposed internal thermal mass and high ceilings
4) provide passive ventilation
5) provide mechanical ventilation
6) provide active cooling systems.

9.4.1 Climate change means London is already experiencing higher than historic average temperatures and more severe hot weather events. This, combined with a growing population, urbanisation and the urban heat island effect, means that **London must manage heat risk** in new developments, using the cooling hierarchy set out above. Whilst the cooling hierarchy applies to major developments, the principles can also be applied to minor development.

9.4.2 In managing heat risk, new developments in London face two challenges – the need to ensure London does not overheat (the urban heat island effect) and the need to ensure that individual buildings do not overheat. **The urban heat island effect** is caused by the extensive built up area absorbing and retaining heat during the day and night leading to parts of London being several degrees warmer than the surrounding area. This can become problematic on the hottest days of the year as daytime temperatures can reach well over 30°C and not drop below 18°C at night. These circumstances can lead many people to feel too hot or not be able to sleep, but for those with certain health conditions, and 'at risk' groups such as some young or elderly Londoners, the effects can be serious and worsen health conditions. Green infrastructure can provide some mitigation of this effect by shading roof surfaces and through evapotranspiration. Development proposals should incorporate green infrastructure in line with Policy G1 Green infrastructure and Policy G5 Urban greening.

9.4.3 Many aspects of building design can lead to increases in overheating risk, including high proportions of glazing and an increase in the air tightness of buildings. Single-aspect dwellings are more difficult to ventilate naturally and are more likely to overheat, and should normally be avoided in line with Policy D6 Housing quality and standards. There are a number of low-energy measures that can **mitigate overheating risk**. These include solar shading, building orientation and solar-controlled glazing. Occupant behaviour will also have an impact on overheating risk. The Mayor's London Environment Strategy sets out further detail on actions being taken to address this.

9.4.4 Passive ventilation should be prioritised, taking into account external noise and air quality in determining the most appropriate solution. The increased use of **air conditioning systems** is not desirable as these have significant energy requirements and, under conventional operation, expel hot air, thereby adding to the urban heat island effect. If active cooling systems, such as air conditioning systems, are unavoidable, these should be designed to reuse the waste heat they produce. Future district heating networks are expected to be supplied with heat from waste heat sources such as building cooling systems.

9.4.5 The Chartered Institution of Building Services Engineers (CIBSE) has produced **guidance on assessing and mitigating overheating risk in new developments**, which can also be applied to refurbishment projects. TM 59 should be used for domestic developments and TM 52 should be used for non-domestic developments. In addition, TM 49 guidance and datasets should also be used to ensure that all new development is designed for the climate it will experience over its design life. Further information will be provided in guidance on how these documents and datasets should be used.