DAYLIGHT & SUNLIGHT ASSESSMENT

OCTOBER 2023, REF: 2351/DSA

CLIENT:
Mr & Mrs D Phantis
5 Leefe Way
Cuffley EN6 4DF

SITE ADDRESS:
82 London Road
Enfield EN2 6EW

CONTENTS:

AUTHOR:
William Pottinger

REVISIONS:
None

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
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1. Who We Are

1.1. The Daylight Lab work closely with architects, designers, and private clients throughout the UK, assisting with daylight and sunlight matters related to architectural design and planning. We take a proactive approach, engaging with all parties involved and providing input throughout the design process, to ensure that sites reach their fullest potential while not unduly impacting neighbouring amenity.

1.2. Any enquiries, including requests for copies of 3D models for cross-examination, should be directed to hello@thedaylightlab.co.uk.

2. Executive Summary

2.1. The proposed 2x dwellings at No.82 London Road will enjoy adequate levels of daylight and sunlight, complying with BRE guidelines for dwellings formed through the conversion of an existing building.

2.2. The Daylight Lab therefore support the scheme with regard to daylight and sunlight matters.

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3. Introduction & Site Description

3.1. This report has been commissioned by Mr & Mrs D Phantis and prepared by The Daylight Lab to assess the levels of daylight and sunlight within the proposed 2x dwellings at No.82 London Road.

3.2. The existing application site comprises a ground floor commercial premises with 3 storeys of flats over, making up part of a larger block, located on the east side of London Road.

3.3. It is proposed to convert the ground floor to form 1x studio flat to the front and 1x 1 bedroom flat to the rear.

3.4. Copies of the submitted application drawings referred to can be found in Appendix 1 of this report.

Fig 1. Location Plan. North to top. Not to scale.

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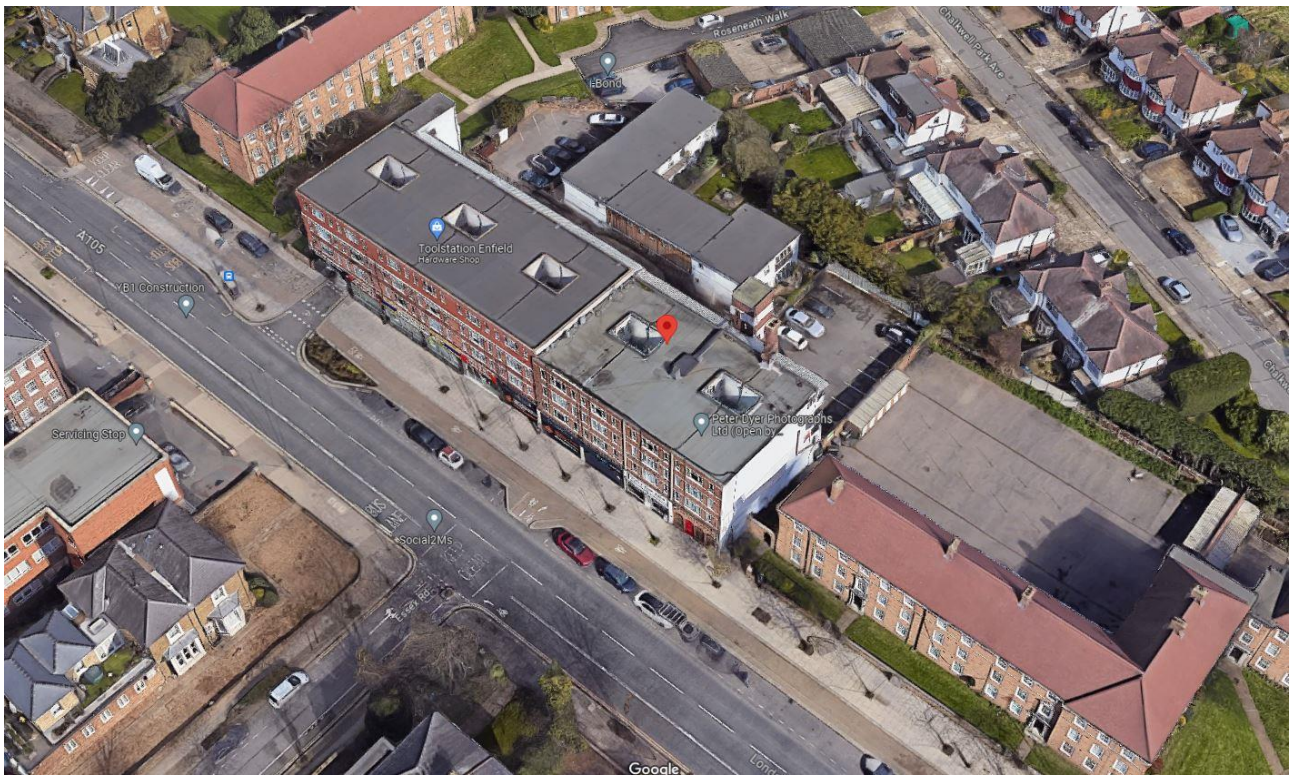

Fig 2. Aerial view of site from south west.

Fig 3. Aerial view of site from north east.

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4. Summary of Applicable Policy

4.1. Prior approval for the proposal is being sought under Class MA of The General Permitted Development Order, 2015, (the "GPDO") for the; *"change of use of a building and any land within its curtilage from a use falling within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order to a use falling within Class C3 (dwellinghouses) of Schedule 1 to that Order"*. Condition MA.2 (f) of the order states that for prior approval to be granted the development must provide; *"adequate natural light in all habitable rooms of the dwelling/houses".*

4.2. No guidance has been provided under the legislation to quantify what comprises *"adequate natural light"*, so for the purpose of this report it has been assumed appropriate to apply the guidance contained within the BRE's "Site layout planning for daylight and sunlight: A guide to good practice", third edition, 2022, which is generally accepted as good practice by local planning authorities in the UK.

4.3. It is important to note that the advice given in the BRE guide; *"is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design"* (page 7, paragraph 1.6).

5. Key Definitions

5.1. In order to understand this assessment, it is important to note the key difference between daylight and sunlight. These can be defined as follows:

5.2. **Daylight**

Daylight is the combination of all direct and indirect sunlight (see following definition of sunlight) during the daytime. This includes direct sunlight, diffuse sky radiation, and (often) both of these reflected by Earth and terrestrial objects, like landforms and buildings.

5.3. **Sunlight**

Sunlight is direct light that reaches Earth on an uninterrupted path from the sun.

6. Methodology

6.1. An as proposed 3D model of the site and surrounding properties was prepared by The Daylight Lab to a level of detail suitable for testing, based on measured survey information, OS data, photographs and the accompanying drawing set provided by John Perrin & Sons Ltd. Copies of the proposed drawings can be found in Appendix 1.

6.2. Tests were then carried out in accordance with relevant BRE guidelines, using the following methods of measurement and specialist analysis software (MBS Daylight & Daylight Visualiser):

6.3. **Daylight – Daylight Factor**

The latest edition of the BRE guidance (2022) refers to BS EN 17037 Daylight in Buildings, which states that daylight in new buildings may be checked either by making a direct prediction of illuminance levels using hourly climate data, or use of the daylight factor. Both are measures of the

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overall amount of daylight in a space. This report is based on measurements of the daylight factor.

6.4. This method involves the computation of the daylight factor at each calculation point on an assessment grid. The daylight factor is the illuminance at a point on the reference plane in a space, divided by the illuminance on an unobstructed horizontal surface outdoors, under the CIE standard overcast sky. The ratio is expressed as a percentage.

6.5. Since the calculation uses an overcast sky model, the daylight factor is independent of orientation and location. To account for different climatic conditions at different locations, BS EN 17037 gives equivalent daylight factor targets for each capital city in Europe.

6.6. The UK National Annex to BS EN 17037 provides minimum recommendations for habitable rooms in *"hard to light"* dwellings within the UK, such as those within buildings being refurbished or converted into dwellings. These figures are set out in Table 1 below. Where a room has a shared use the highest applicable target figure should usually apply.

Table 1. Target illuminances for room types in "*hard to light*" dwellings, as set out in the UK National Annex to BS EN 17037.

Room type	Target daylight factor (D) for 50% of assessment grid
Bedrooms	0.7%
Living rooms	1.1%
Kitchens	1.4%

6.7. In order to provide an accurate testing environment, surface/material reflectance values should be set to match materials specified (or the default figures provided in Appendix C of the BRE Guide, page 74).

6.8. In this instance the following materials were specified, with light reflectance values established using the methods set out in the Chartered Institution of Building Services Engineers (CIBSE) published document; "Lighting Guide 11: Surface reflectance and colour":

Table 2. Site/project specific surface reflectance values.

Surface	Material specified	Reflectance
Interior walls	White painted	0.80
Ceilings	White painted	0.80
Floors	Light coloured timber boards	0.40
Window and door frames	White painted timber/UPVC	0.40
External white rendered walls	White paint/render	0.60
All other exterior surfaces	Default	0.20

6.9. Glazing transmission factors, including maintenance factors, must also be included in the simulation along with modelling of the window framing. The Daylight Lab therefore modelled all windows with appropriate/accurate glazing bars and frame thicknesses and set a value of 0.68 set for diffuse transmission, which is typical for clean, clear double glazing with a low emissivity coating. An additional maintenance factor was then applied to each proposed window according to the figures set out in Table 3 below, resulting in figures for testing of 0.63 (0.68x0.92) for the exposed vertical windows, 0.52 (0.68x0.76) for the internal vertical glazing, 0.57 (0.68x0.84) for

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the sloping rooflights and 0.52 (0.68x0.76) for the horizontal rooflights.

Table 3. Maintenance factors for different window types.

Window type	Maintenance factor	
	Rural/suburban	**Urban**
Vertical, no overhang	0.96	0.92
Vertical, sheltered from rain by balcony or overhang	0.88	0.76
Sloping rooflight	0.92	0.84
Horizontal rooflight	0.88	0.76

6.10. Sunlight – Sunlight Exposure

The latest edition of the BRE guidance (2022) refers to BS EN 17037 Daylight in Buildings, which states that a space should receive a minimum of 1.5 hours of direct sunlight on the 21st March (equinox). The medium level of recommendation is 3 hours and the high level of recommendation 4 hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

6.11. To measure this a reference point on the inside face of a relevant window aperture at the centre of the opening width and at least 1.2m above the floor and 0.3m above the sill (whichever is the higher) is used. Sunlight blocked by window reveals and balconies or overhangs above the window should not be included, but the effect of window frames and bars can be discounted. Where a room has multiple windows, the amount of sunlight received is added together, provided they occur at different times and sunlight hours are not double counted.

7. 3D Model & Reference Images

7.1. The following figures 4-8 show the existing and proposed 3D models as tested. Specifically:

- Figures 4-5 provide external views of the proposed site and surrounding context.
- Figure 6 provides a horizontal section cut through the proposed model to show the plan view as tested.
- Figures 7-8 provide window references for those tested for sunlight exposure at the proposed new dwellings.

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Fig 4. Aerial view of proposed 3D model from west, showing front elevation.

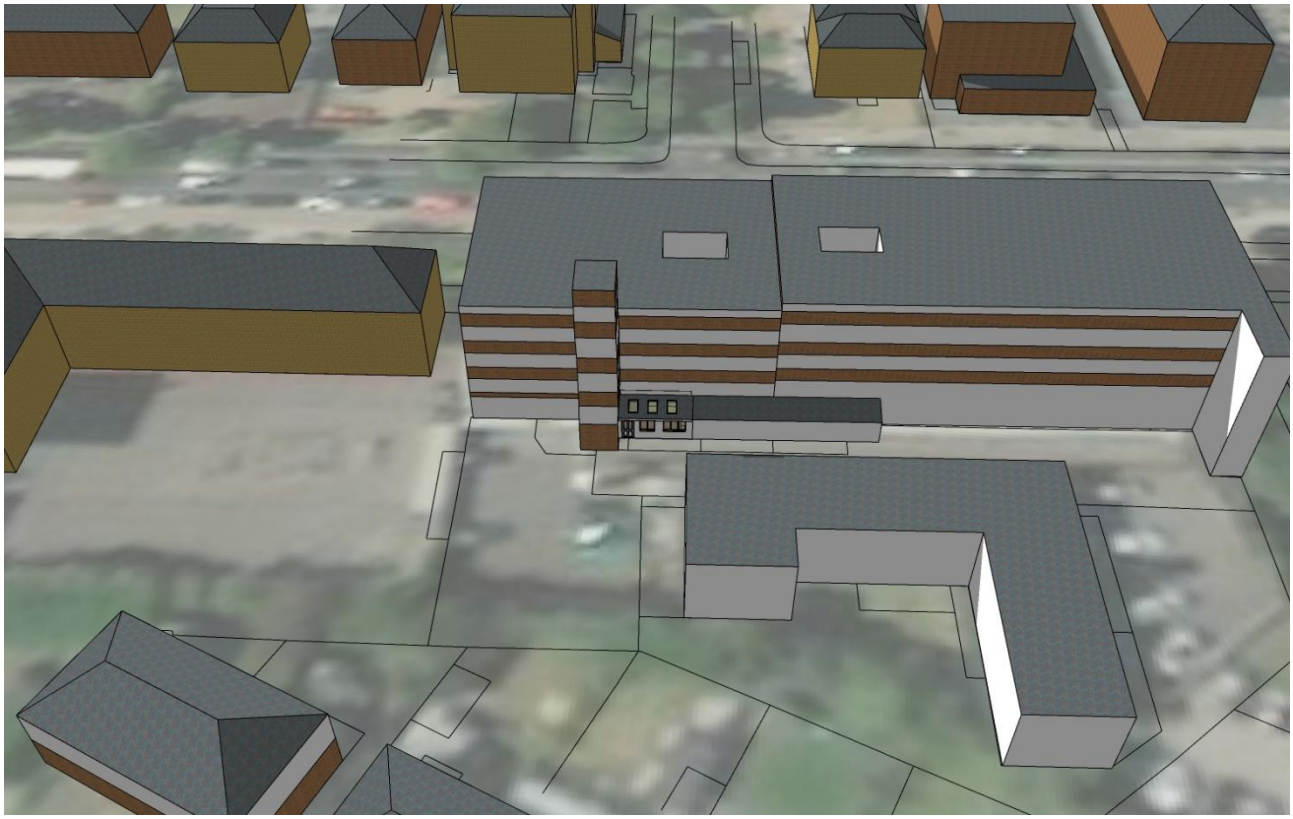

Fig 5. Aerial view of proposed 3D model from east, showing rear elevation.

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Fig 6. Horizontal section cut through proposed model showing plan view of ground floor with habitable rooms tested for daylight factor labelled. North to top.

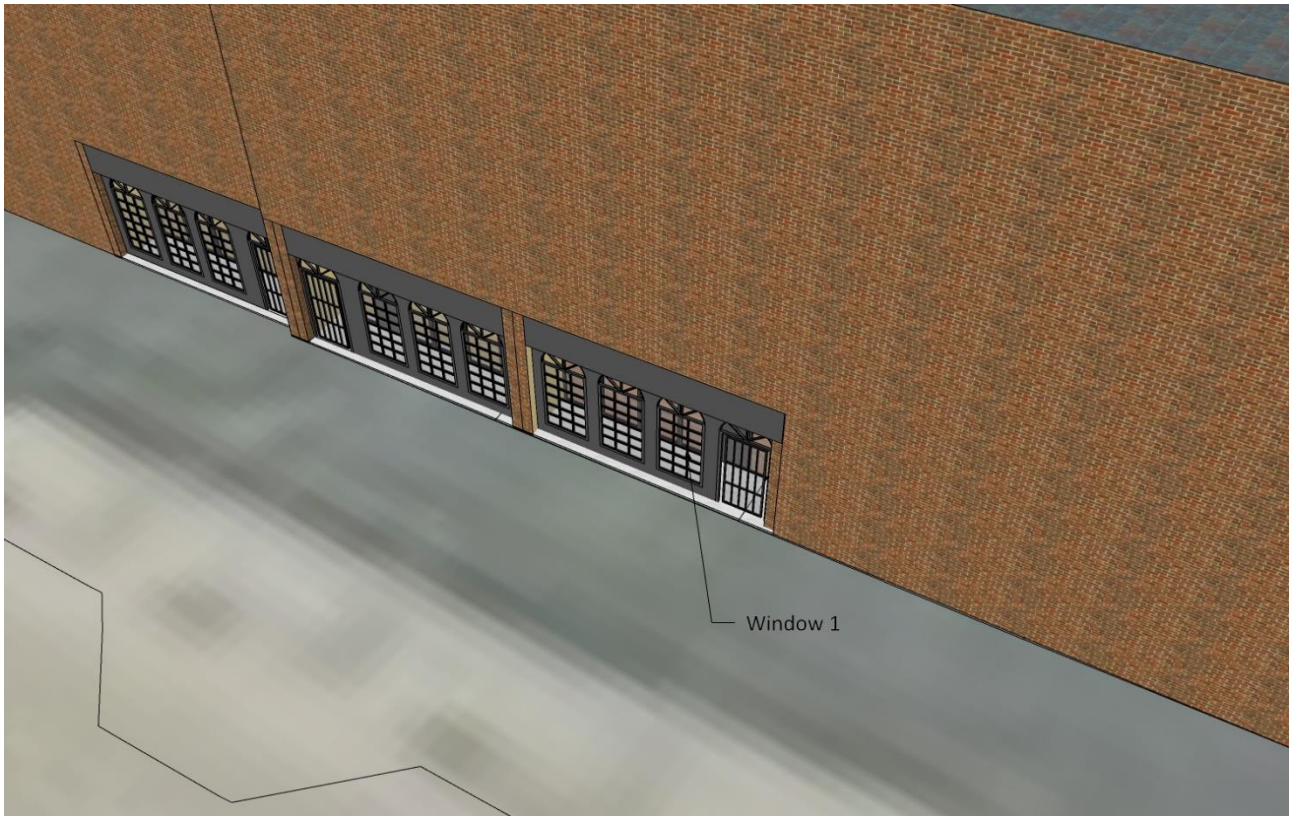

Fig 7. View of proposed model from south west with window tested for sunlight exposure at front studio labelled.

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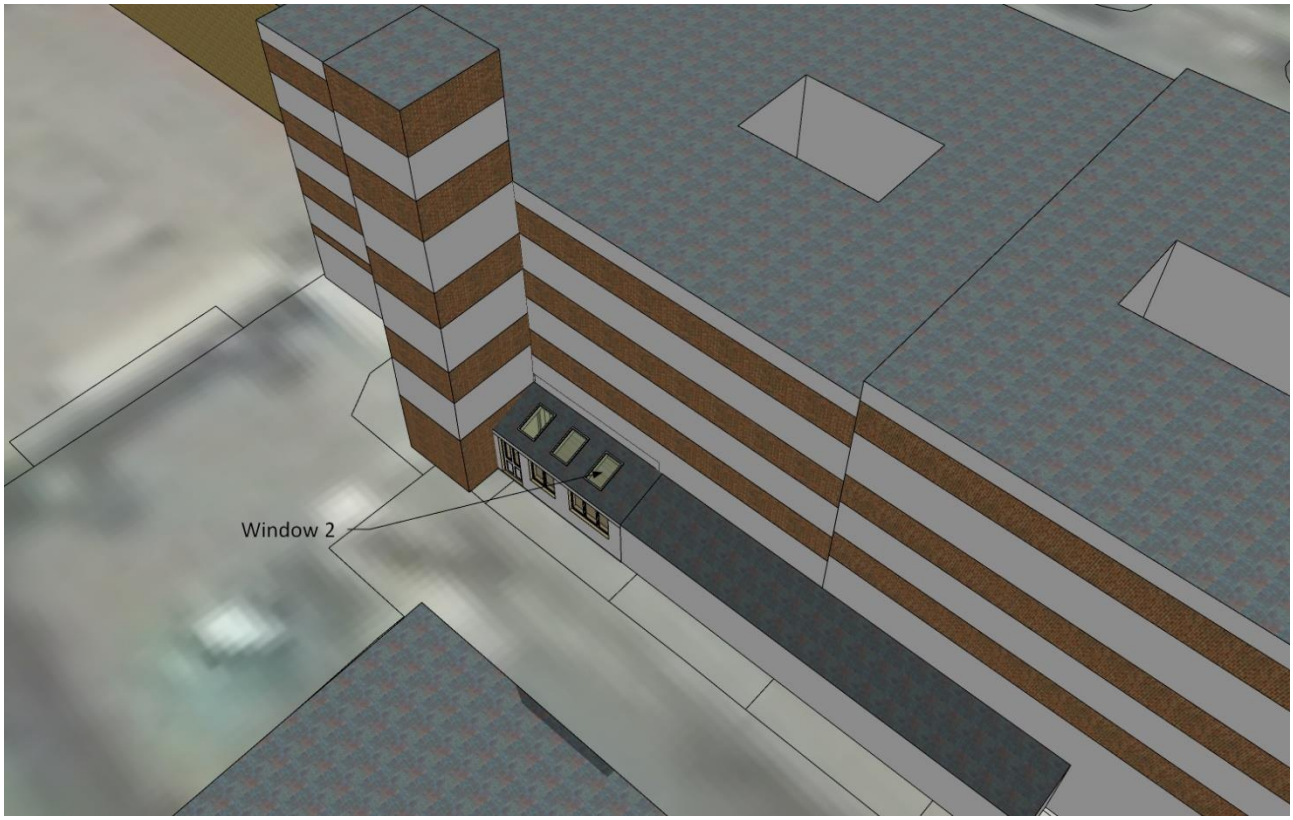

Fig 8. View of proposed model from north east with window tested for sunlight exposure at rear flat labelled.

8. Results

8.1. Test results are listed below, highlighted green, amber, or red, to indicate "pass", "borderline" or "fail".

Daylight – Daylight Factor

8.2. The following table compares proposed daylight factor results with BRE recommended figures for habitable rooms in "hard to light" new dwellings formed through the conversion of an existing building.

8.3. Gradient maps indicating the light distribution can be found in Appendix 2.

Table 4. Daylight factor results.

Room	Target daylight factor (D) for 50% of assessment grid (%)	Daylight factor achieved (D) for 50% of assessment grid (%)
Front Studio Living/Kitchen	1.4	1.34*
Front Studio Bedspace	0.7	1.84
Rear Flat Living/Kitchen	1.4	2.23
Rear Flat Bedroom	0.7	1.54

*See conclusion.

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Sunlight – Sunlight Exposure

8.4. The following table compares total sunlight exposure (in hours) with minimum BRE recommendations for windows serving habitable rooms in new dwellings.

Table 5. Sunlight exposure results.

Window	Room	Target sunlight hours on equinox	Proposed sunlight hours on equinox
1	Front Studio Living/Kitchen	1.5	6
2	Rear Flat Living/Kitchen	1.5	3.25

9. Conclusion

Daylight – Daylight Factor

9.1. The living/kitchen and bedroom within the proposed rear flat were found to exceed relevant minimum BRE figures for habitable rooms in *"hard to light"* new dwellings, such as those formed through the conversion of an existing building.

9.2. The bed area within the proposed front studio was also found to exceed relevant minimum BRE figures for habitable rooms in *"hard to light"* new dwellings, such as those formed through the conversion of an existing building.

9.3. The living/kitchen area within the proposed front studio was found to fall slightly below the recommended Daylight Factor of 1.4% for kitchens, at 1.34%, but exceeds the 1.1% Daylight Factor recommended for living rooms. When a room has a shared use, the higher target should usually apply, however this result is deemed acceptable considering the limited shortfall recorded (0.06%) and the wider aims of the BRE guidance, which is clear to state that it; *"is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design"* (page 7, paragraph 1.6).

9.4. It is therefore concluded that the proposed new dwellings will enjoy "adequate" levels of natural daylight.

Sunlight – Sunlight Exposure

9.5. Both units enjoy a living room window that enjoys in excess of minimum recommended BRE figures for sunlight exposure in new dwellings.

9.6. It is therefore concluded that the proposed new dwellings will enjoy "adequate" levels of natural sunlight.

Closing Statement

9.7. The proposed 2x dwellings will enjoy levels of daylight and sunlight that accord with the broad targets set out within the BRE document; "Site layout planning for daylight and sunlight: A guide to good practice", third edition, 2022, which is generally accepted as good practice by local

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planning authorities in the UK.

9.8. It is therefore concluded the scheme provides "*adequate natural light in all habitable rooms of the dwelling/houses*" and complies with the relevant requirements of Class MA of the General Permitted Development Order, 2015.

9.9. The Daylight Lab therefore support the scheme with regard to daylight and sunlight matters.

William Pottinger, The Daylight Lab, October 2023

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APPENDIX 1

Proposed application drawings - not to scale.

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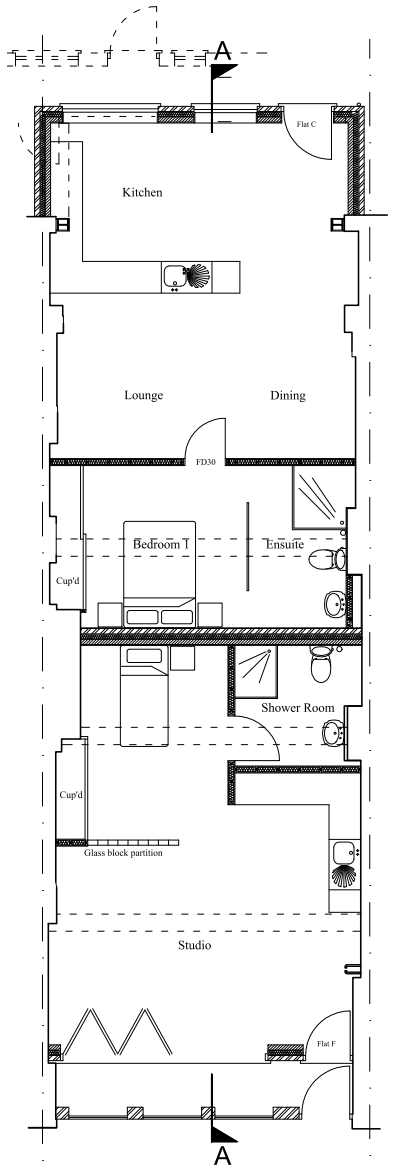
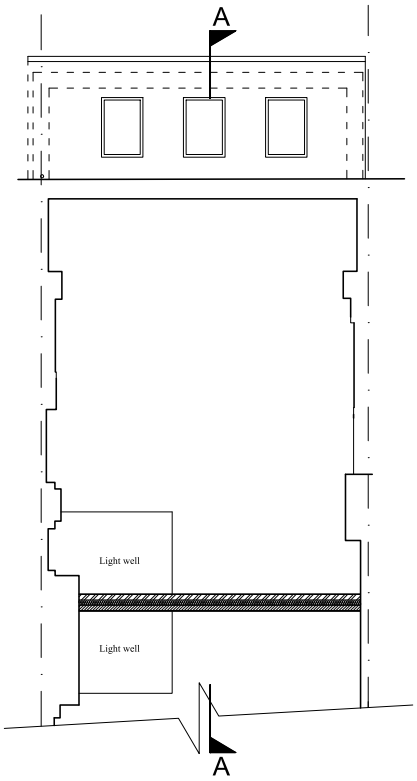
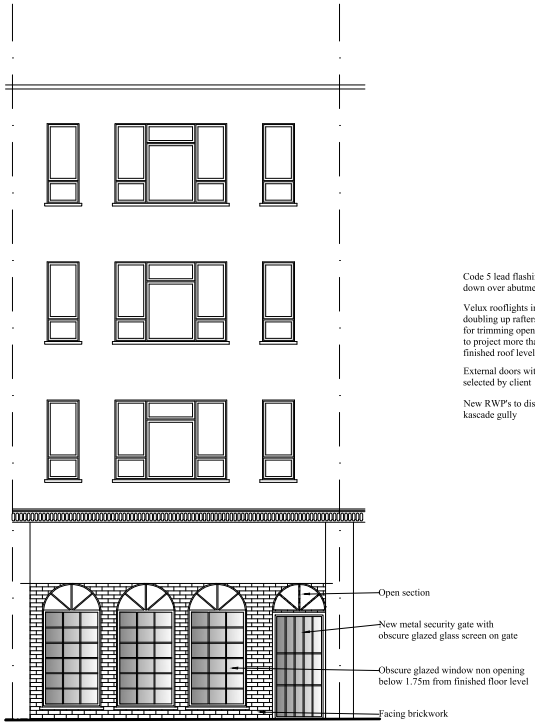


ground floor plan

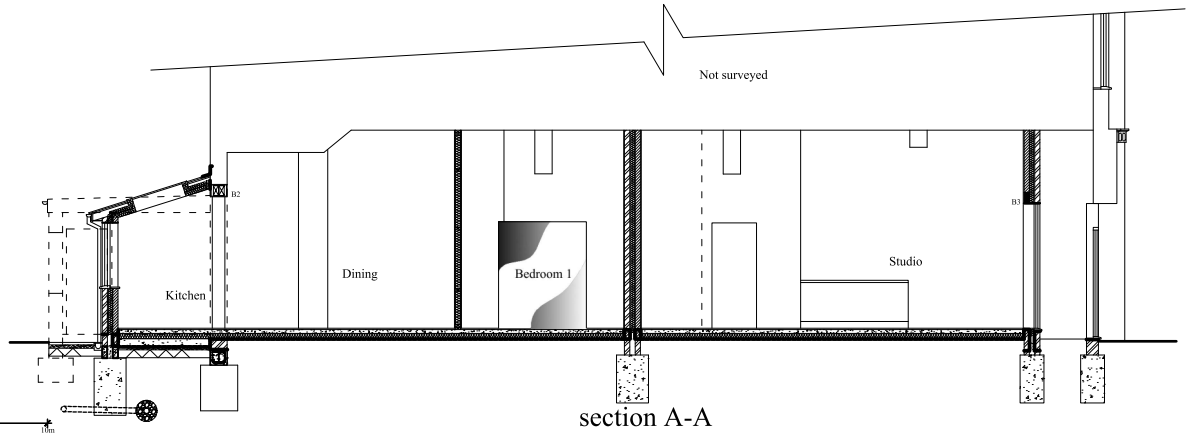


ceiling plan



front elevation

part rear elevation



section A-A

project
Proposed conversion of commercial unit to residential to include one 1 bedroom flat and one Studio flat

site
82 London Road, Enfield
EN2 6HU

date
November 2021

scale
1:100 @ A3

JOHN PERRIN & SONS Ltd
BUILDING SURVEYORS & DESIGNERS
885 Green Lanes, Winchmore Hill, London N21 2QS
Tel: 0208 364 0334 Email: mail@johnperrinandsons.com

All dimensions are to be checked on site.

drawing number
3267/10

APPENDIX 2

Daylight factor gradient maps for proposed habitable rooms.

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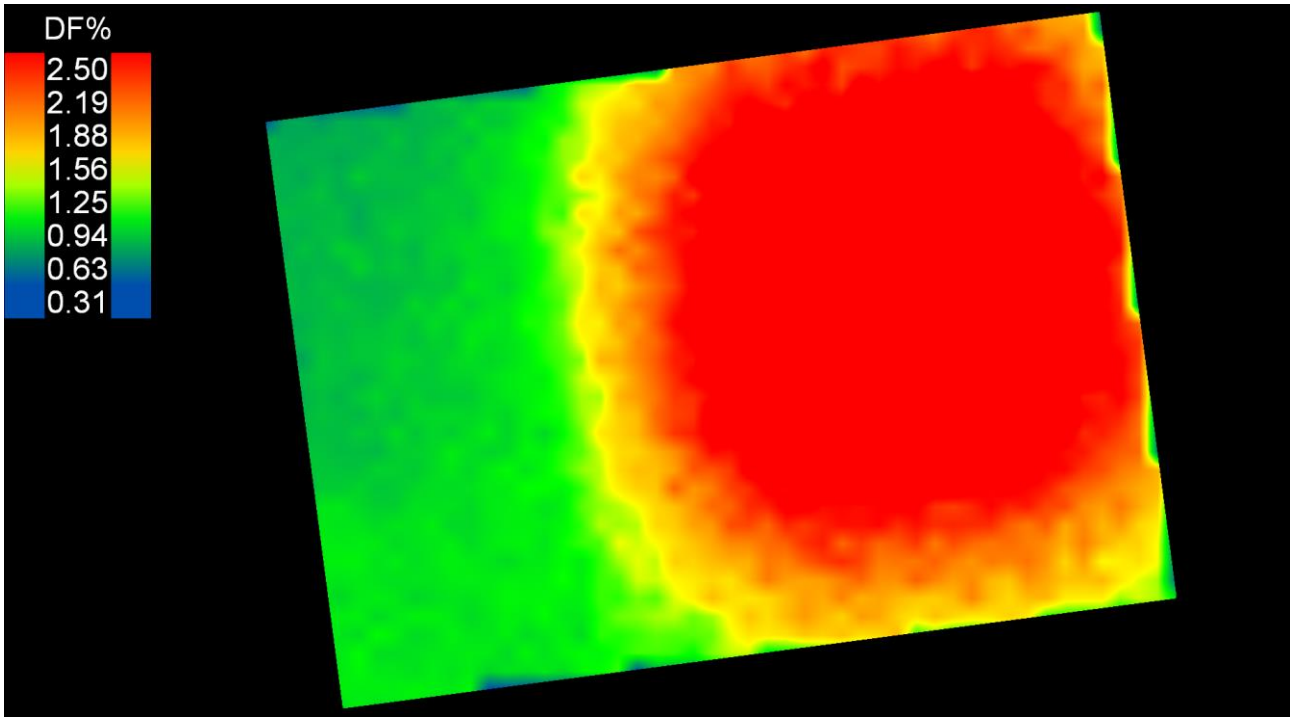
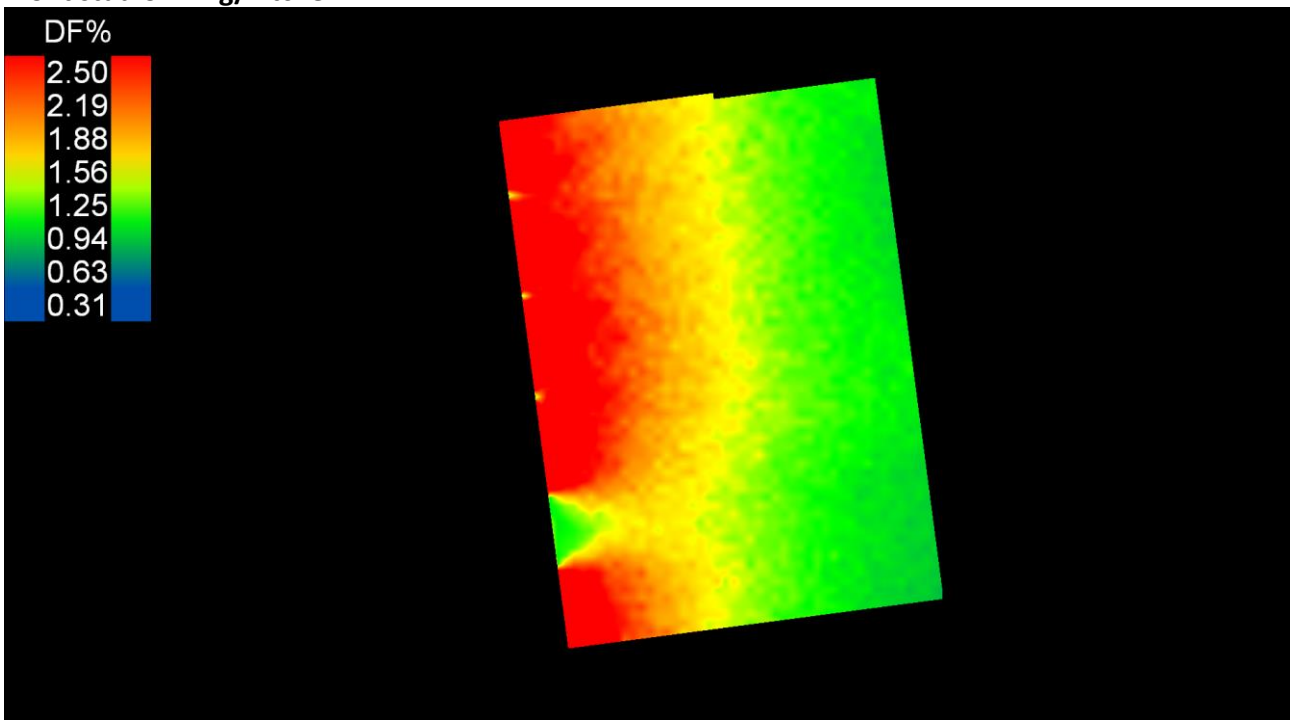
Front studio bed space



EN17037

$F_{plane,\%}$ ≥ 50% (median)	D_T	1.84 DF[%]

Front studio living/kitchen



EN17037

$F_{plane,\%}$ ≥ 50% (median)	D_T	1.34 DF[%]

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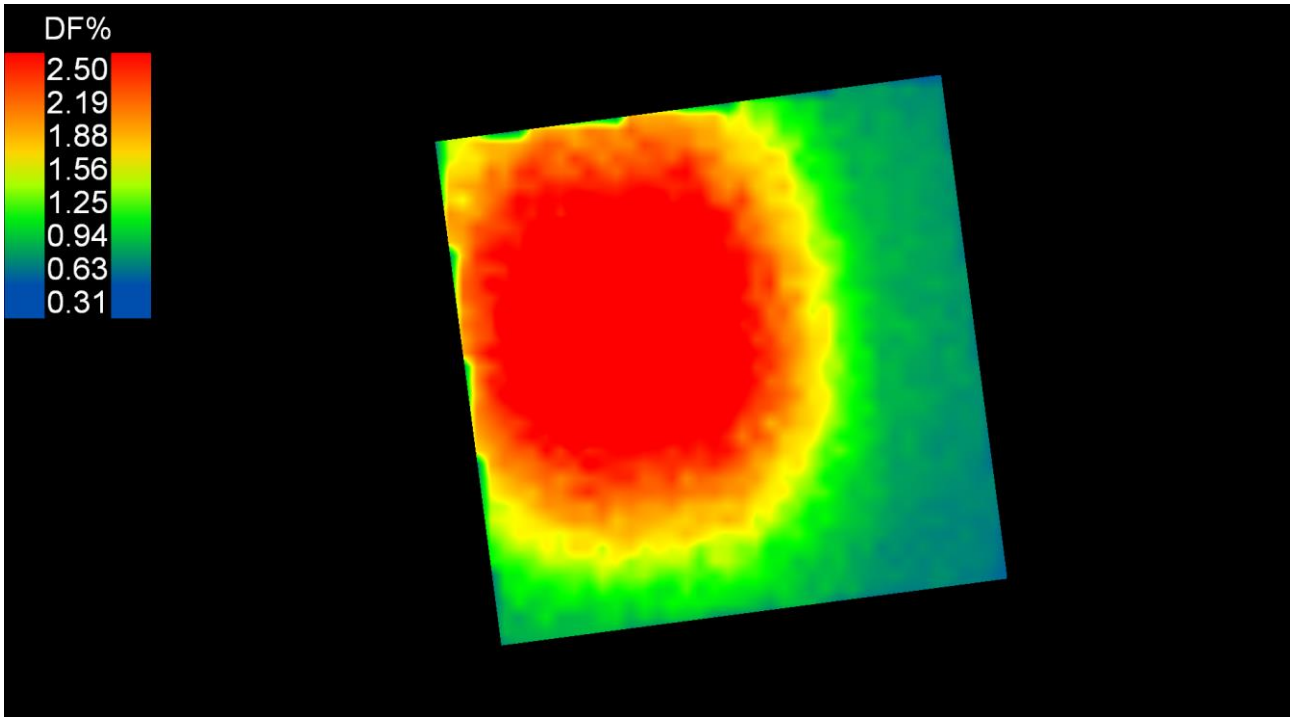
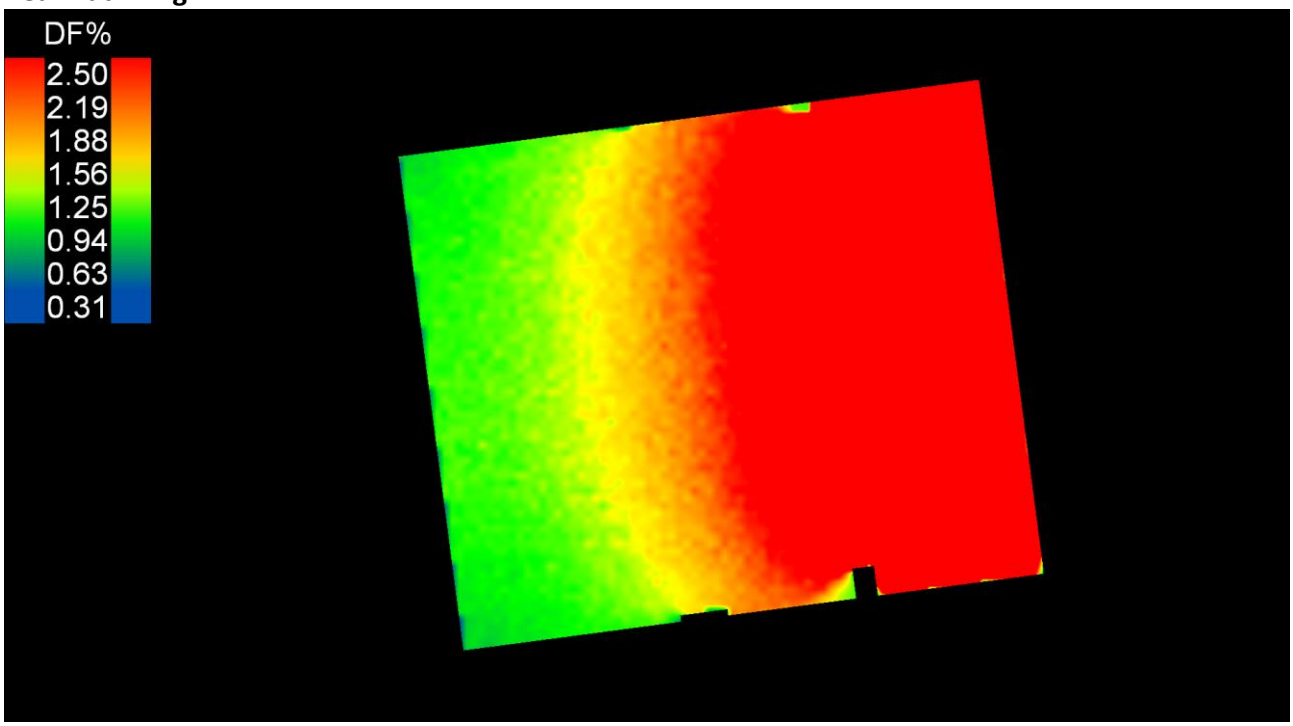
Rear flat bedroom



EN17037

$F_{plane,\%}$ ≥ 50% (median)	D_T	1.54 DF[%]

Rear flat living



EN17037

$F_{plane,\%}$ ≥ 50% (median)	D_T	2.23 DF[%]

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