DAYLIGHT & SUNLIGHT ASSESSMENT

FEBRUARY 2023, REF: 2312/LIGHT

CLIENT:
Shalini Aujla
16 Windsor Road
Finchley
N3 3SS

SITE ADDRESS:
163 Malden Road
London NW5 4HT

CONTENTS:

AUTHOR:
William Pottinger

REVISIONS:
None

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Who We Are

The Daylight Lab work closely with architects, designers and private clients throughout the UK, assisting with daylight and sunlight matters related to architecture and planning. Projects are led by William Pottinger, who draws on 15+ years' experience working within a charted practice environment, to ensure sites reach their maximum potential while impartially addressing any issues relating to natural light and amenity.

Executive Summary

The proposed 1 bedroom flat to be formed through the conversion of the ground floor commercial unit at No.163 Malden Road shall enjoy acceptable levels of daylight and sunlight, in accordance with BRE guidelines for new dwellings formed through the conversion of an existing building.

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

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Introduction & Site Description

This report has been commissioned by Shalini Aujla and prepared by The Daylight Lab to assess the levels of daylight and sunlight within the proposed 1 bedroom flat at No.163 Malden Road.

The existing application site comprises a 3 storey mid-terrace property with commercial space at ground floor and residential over. The front/street elevation faces approximately north.

It is proposed to covert the ground floor to form a 1x bedroom flat.

Copies of the existing and proposed application drawings can be viewed in Appendix 1.

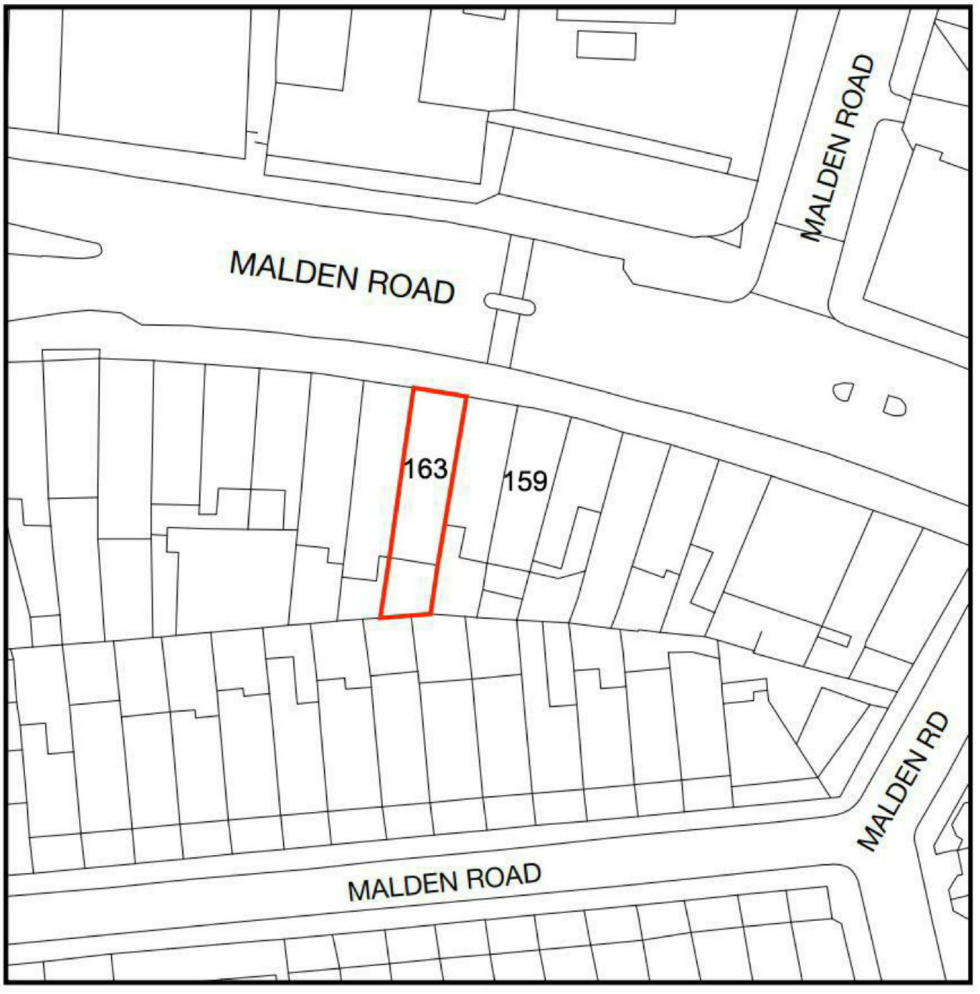


Fig 1. Location Plan. North to top. Do not scale.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

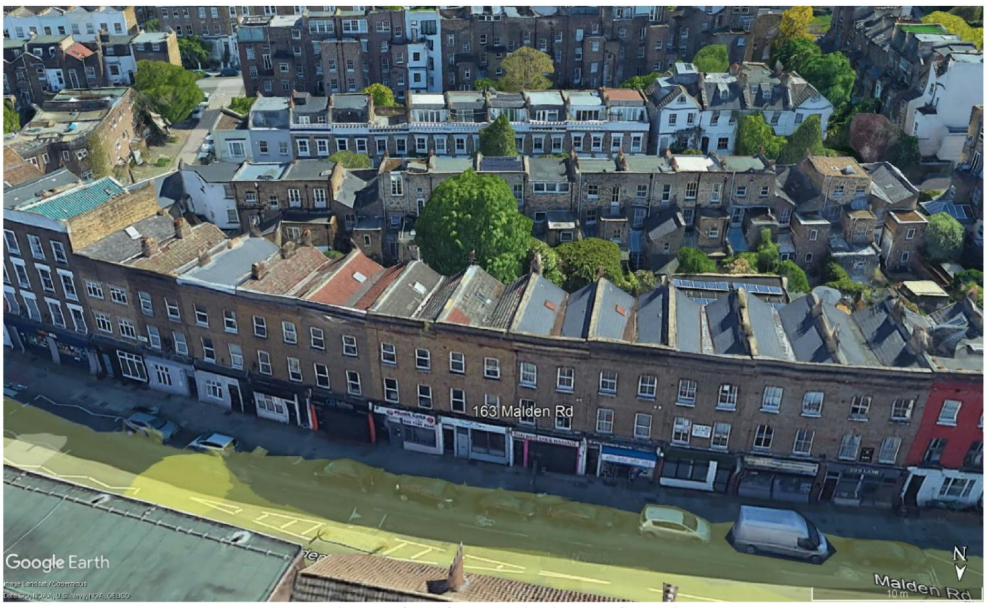


Fig 2. Aerial view of site from north, showing front elevation.

Fig 3. Aerial view of site from south, showing rear elevation.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Summary of Applicable Policy

Prior approval for the scheme 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".*

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.

It is important to note that the advice given in the 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).

In addition to the BRE guidance, attention is given to the National Planning Policy Framework (NPPF), July 2021. Specifically, paragraph 125 which states; *"when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide adequate living standards)."*

Methodology

An as proposed 3D model of the site and surroundings was prepared for testing by The Daylight Lab to a level of detail suitable for testing, based on drawings provided by the client, OS site plan data and photographs.

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

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

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.

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.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

For spaces with side windows, equivalent daylight factor targets to achieve a target illuminance over at least half of the daylight hours in a year are based on the formula; D = Target illuminance / Median external diffuse horizontal illuminance x 100 (%), where the median external diffuse horizontal illuminance is the illuminance from the sky on an unobstructed horizontal surface achieved for half of the yearly daylight hours at a particular location.

The UK National Annex to BS EN 17037 gives minimum recommendations for habitable rooms in "*hard to light*" dwellings within the UK, such as those formed through the conversion of an existing building. These figures are set out in Table 1 below. Where a room has a shared use the highest applicable target figure should 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%

In order to provide an accurate testing environment, surface/material reflectance values must also be set to match materials specified or the default figures provided in Appendix C of the BRE Guide.

In this instance the client specified the following materials, which were therefore used for testing:

Table 2. Site/project specific surface reflectance values.

Surface	Material specified	Reflectance value
Interior walls	White painted	0.8
Ceilings	White painted	0.8
Floors	Light coloured timber boards	0.4
Rear amenity area walls	White painted	0.6
Rear amenity area paving	White ceramic/porcelain pavers	0.4

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, frame thicknesses etc, according to the supplied drawings, 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 a transmission figure of 0.63 (0.68x0.92) for the proposed vertical windows.

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 over-hang	0.88	0.76

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Sunlight – Sunlight Hours

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 a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used. 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.

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. If a room has multiple windows, the amount of sunlight received can be added together provided they occur at different times and sunlight hours are not double counted.

The BS EN 17037 criteria are intended to apply to minimum, medium, and high levels of sunlight in a range of situations however, in special circumstances the designer or planning authority may wish to choose a different target value for hours of sunlight. If sunlight is particularly important in a building, a higher target value or different target date may be chosen, although the risk of overheating needs to be borne in mind. Conversely, if in a particular development sunlight is deemed to be less important but still worth checking for, a lower target value could be used.

3D Model & Reference Images

The following figures 4-9 show the existing and proposed 3D models as tested.

Specifically:

- Figures 4-7 provide external views of the site and surrounding context.
- Figure 8 provides a horizontal section cut through the model showing the ground floor plan layout as tested, with rooms tested for daylight and windows tested for sunlight labelled.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Fig 4. Aerial view of 3D model from south.

Fig 5. Aerial view of 3D model from west.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Fig 6. Aerial view of 3D model from north.

Fig 7. Aerial view of 3D model from east.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Fig 8. Section cut through ground floor showing proposed layout with habitable rooms and windows tested for sunlight hours labelled. North to top.

Results

Test results are listed below, with a traffic light system of green, amber, and red, to indicate "pass", "borderline" or "fail".

Daylight – Daylight Factor

The following table compares daylight factor results with the relevant minimum BRE recommendations for "hard to light" new dwellings in the UK, such as those formed through the conversion of an existing building.

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	Proposed daylight factor (D) for 50% of assessment grid
Living//Dining	1.1%	1.14%
Kitchen	1.4%	2.22%
Bedroom	0.7%	3.04%

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

Sunlight – Sunlight Hours

The following table compares proposed sunlight hours for the south facing living/kitchen/dining room window, as referenced in Figure 8, with the relevant minimum BRE recommendation for new dwellings.

Table 5. Sunlight hours results.

Room	Window ref	Target sunlight hours on equinox	Proposed sunlight hours on equinox
Living/Dining	1	1.5	5.2

Conclusion

Daylight – Daylight Factor

All proposed habitable rooms exceed relevant minimum BRE figures for daylight in "hard to light" new dwellings in the UK, such as those formed through the conversion of an existing building.

Sunlight – Sunlight Hours

The proposed living/dining room enjoys a south facing window that will receive in excess of minimum BRE requirements for sunlight hours in new dwellings.

Closing Statement

The proposed 1x bedroom flat at No.163 Malden Road will enjoy good levels of daylight and sunlight, in excess of relevant BRE numerical standards for new dwellings formed through the conversion of an existing building.

It is therefore concluded that the proposal will provide "adequate" natural light and accords with the requirements of Class MA of the General Permitted Development Order, 2015.

William Pottinger, The Daylight Lab, February 2023.

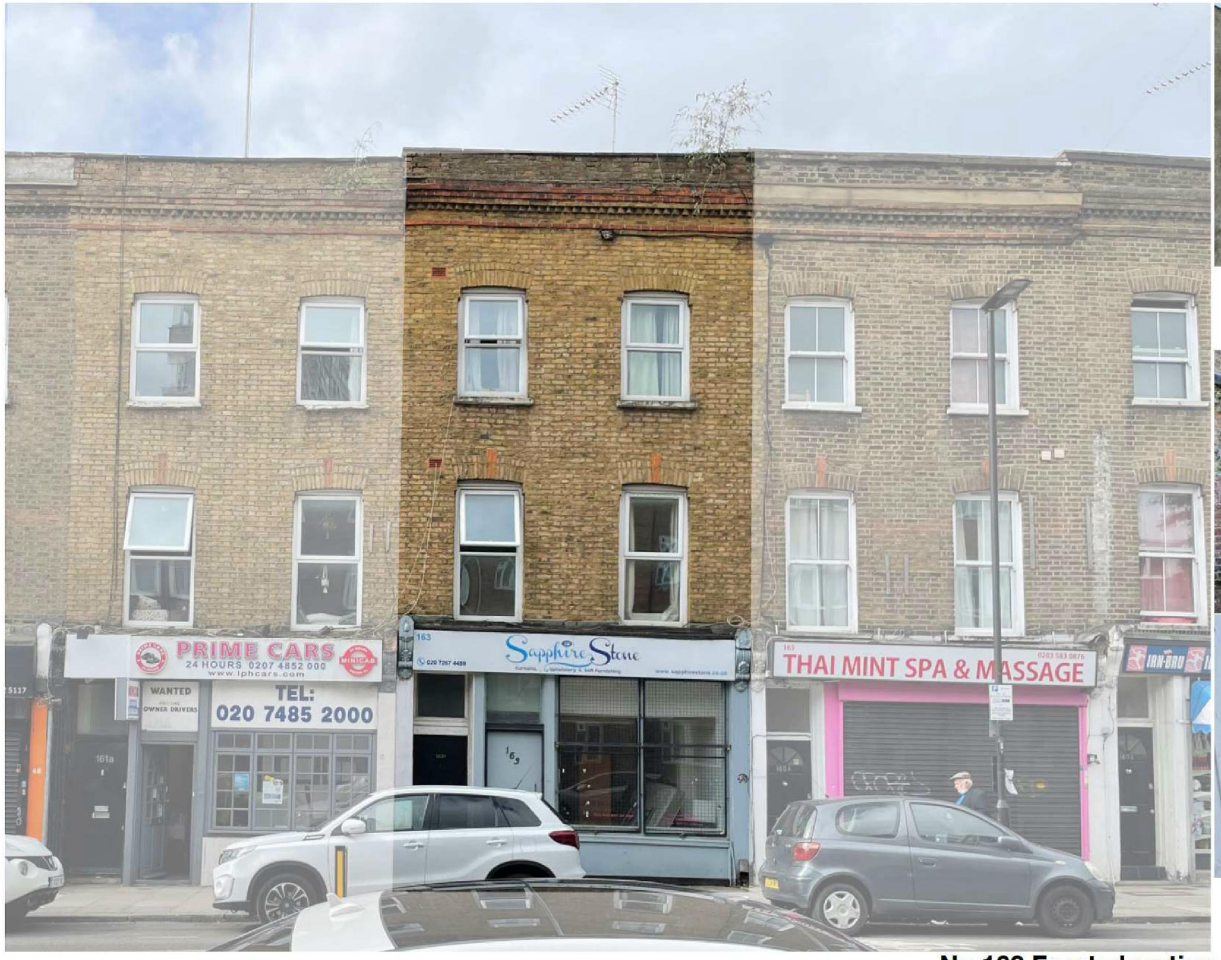
The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

APPENDIX 1

Existing and proposed drawings provided by client.
(do not scale)

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

163 Malden Road NW5 4HT



No 163 Front elevation

No 163 - Rear elevation

No 163 - rear garden

163 Malden Road NW5 4HT

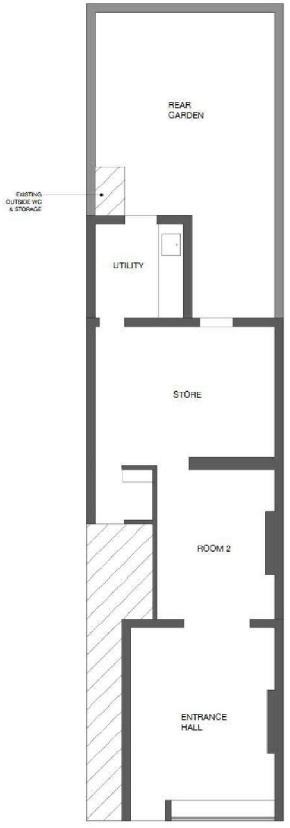
SITE LOCATION PLAN 1:1250

TITLE:	SITE PLAN
DWG No:	MALDENDWG200
SCALE:	1:200
REV:	A
DATE:	OCT 22

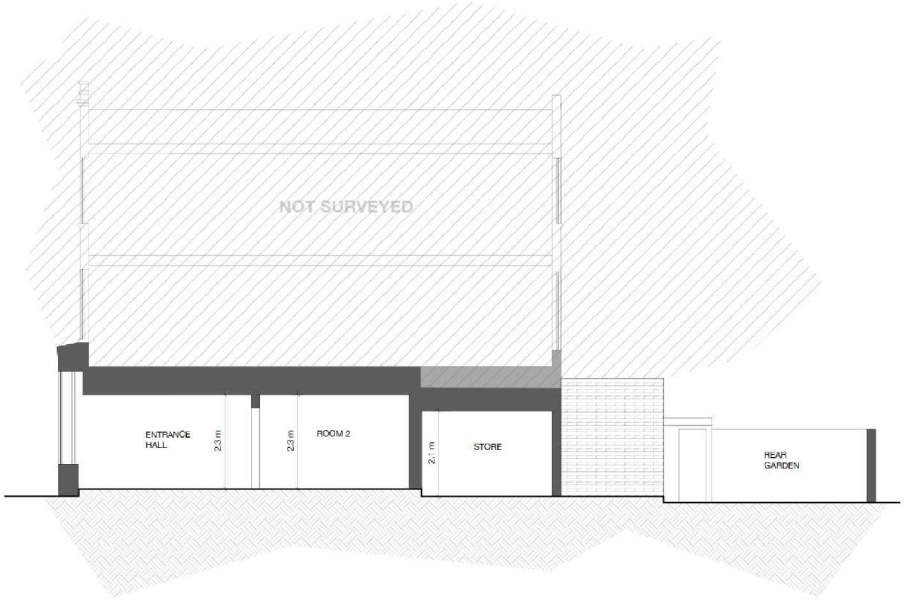
A3

163 Malden Road NW5 4HT

Existing



Section

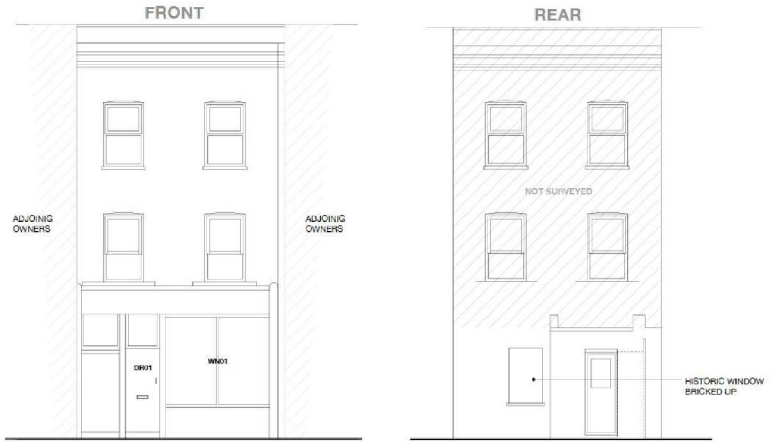


0 5m

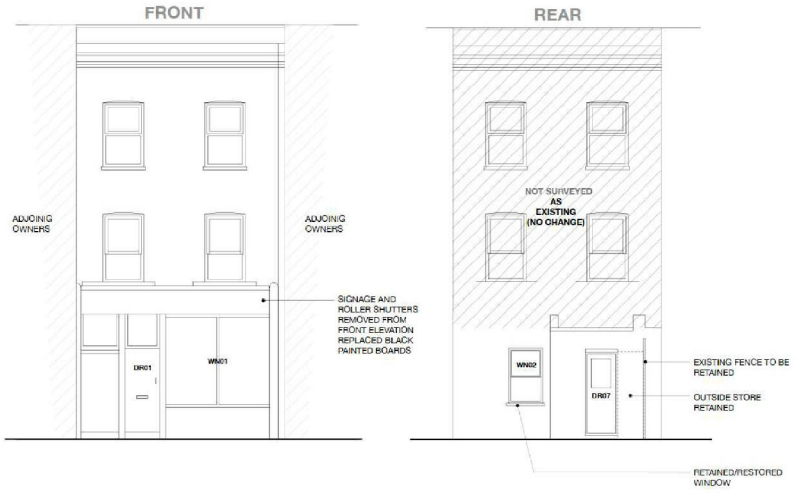
TITLE:	EXISTING PLAN & SECTION	
DWG No:	MALDENDWG203	
SCALE:	1:100	
REV:	A	A3
DATE:	JAN 23	

163 Malden Road NW5 4HT

Existing



Proposed

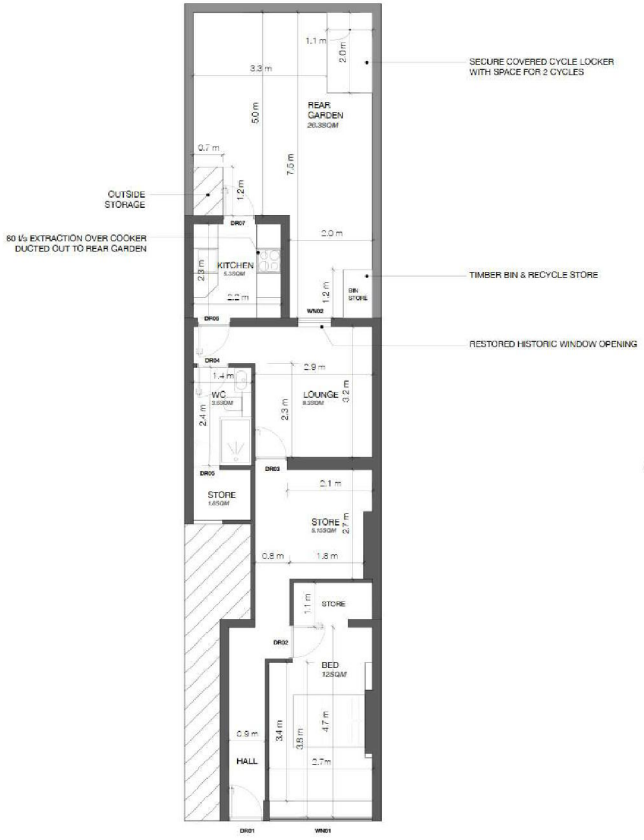


0 5m

TITLE:	ELEVATIONS	
DWG No:	MALDENDWG202	
SCALE:	1:100	
REV:	B	A3
DATE:	OCT 22	

163 Malden Road NW5 4HT

Proposed



Section

PROPOSED 1 BED FLAT

USE:	**C3**
INTERNAL	**48.3SQM**
EXTERNAL	**26.3SQM**

0 5m

TITLE:	PROPOSED PLAN & SECTION
DWG No:	MALDENDWG204
SCALE:	1:100
REV:	A
DATE:	JAN 23

A3

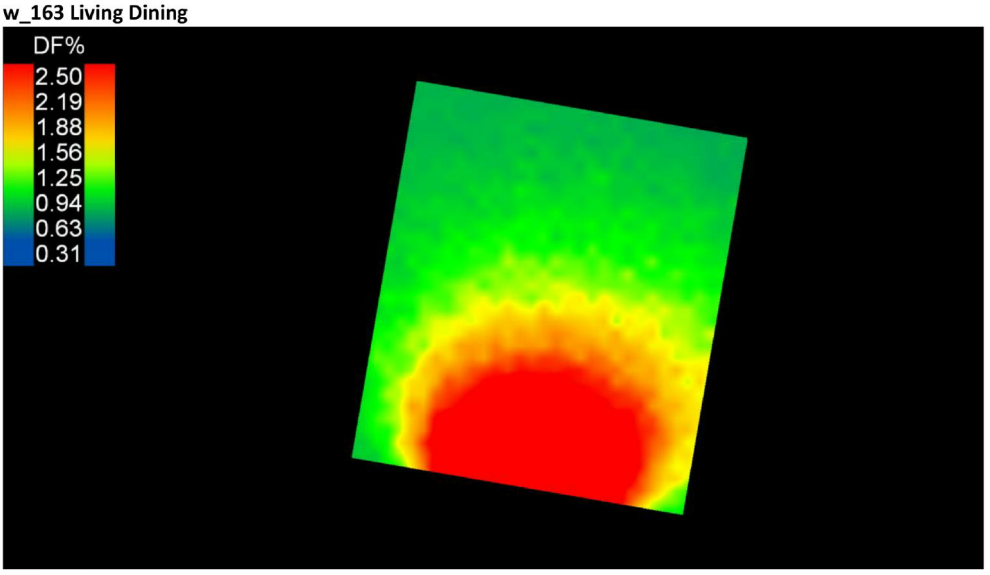
APPENDIX 2

Daylight factor gradient maps for proposed habitable rooms.

.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

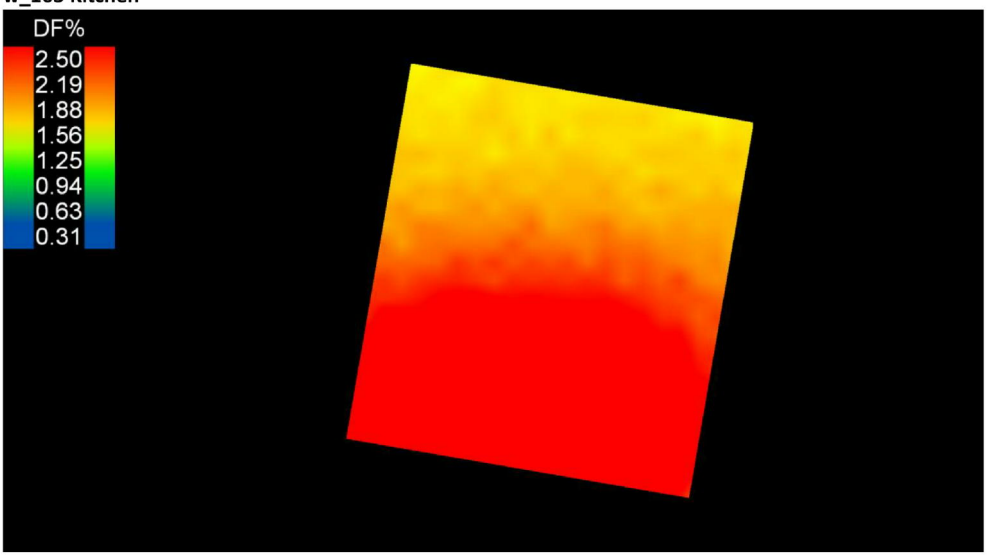
w_163 Living Dining



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	1.14 DF[%]

w_163 Kitchen

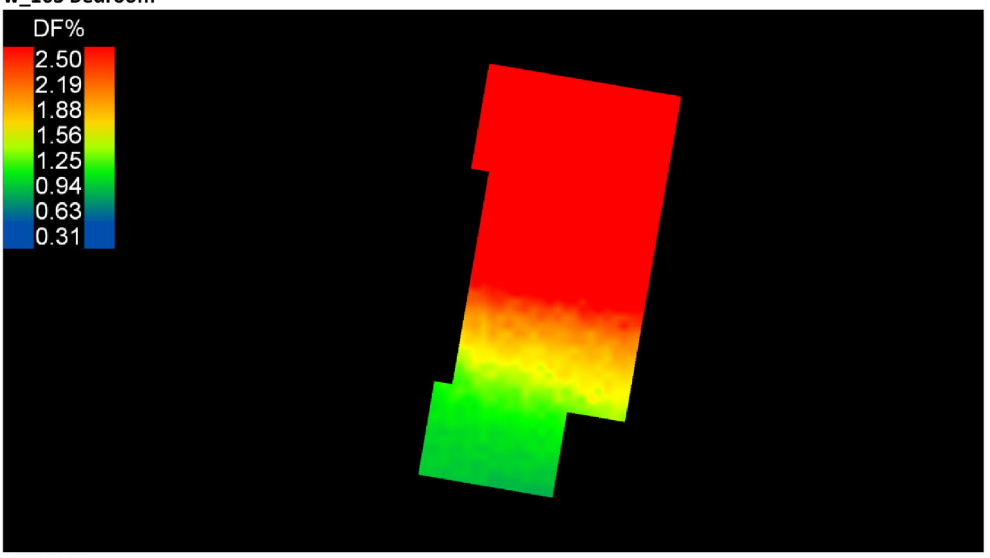


EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	2.22 DF[%]

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk

w_163 Bedroom



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.04 DF[%]

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:will@thedaylightlab.co.uk