BRE DAYLIGHT & SUNLIGHT ASSESSMENT

JANUARY 2024, REF:2472/DSA

CLIENT:
3 Oceans Ltd

SITE ADDRESS:
106 Finchley Road
London NW3 5JJ

CONTENTS:

AUTHOR:

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REVISIONS:
None

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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. We aim for our assessments to be as clear and accessible as possible, and welcome enquires from anyone who might be affected by the issues discussed via hello@thedaylightlab.co.uk.

2. Executive Summary

2.1. The proposed 2x 2 bedroom flats, to be formed through the conversion of the first floor commercial area at No.106 Finchley Road, have been proven to enjoy adequate levels of levels of daylight and sunlight, when tested in accordance with BRE guidelines for daylight and sunlight in new dwellings formed the conversion of an existing building.

2.2. The Daylight Lab therefore conclude that the scheme meets the requirements of Class G of The General Permitted Development Order, 2015, (the "GPDO") for the change of use; *"from a use within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order, to a mixed use for any purpose within that Class and as up to 2 flats"*, in relation to daylight and sunlight.

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3. Introduction & Site Description

3.1. This report has been commissioned by 3 Oceans Ltd and prepared by The Daylight Lab to assess the levels of daylight and sunlight within the proposed 2x 1st floor flats at No.106 Finchley Road.

3.2. The existing site comprises a 3 storey property (plus basement) with vacant commercial space over basement, ground and 1st floors, previously occupied by NatWest Bank. The 2nd floor is under separate ownership and contains residential accommodation.

3.3. Copies of the existing and proposed application drawings referred to in this study, prepared by Savage & Pottinger Design (SPD), can be found in Appendix 1.

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

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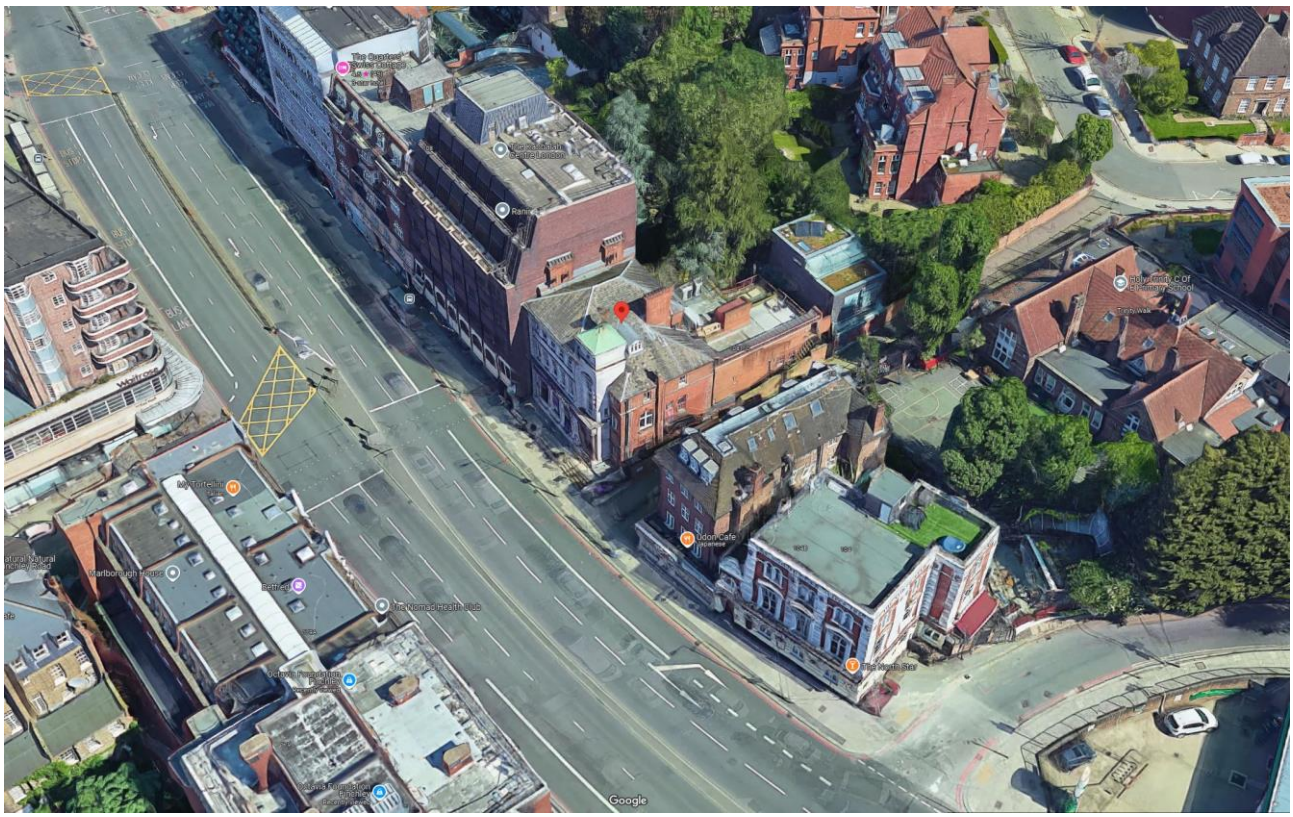

Fig 2. Aerial view of existing property from south (Google).

Fig 3. Aerial view of existing property from north-east (Google).

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4. Summary of Applicable Policy

4.1. Prior approval for the scheme is being sought under Class G of The General Permitted Development Order, 2015, (the "GPDO") for the change of use; *"from a use within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order, to a mixed use for any purpose within that Class and as up to 2 flats"*, which states that the before beginning development, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to; *"the provision of adequate natural light in all habitable rooms of the dwellinghouses"* (paragraph G.1 (d) (iv)).

4.2. No definition 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 relating to daylight and sunlight 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. It is important to note the key difference between daylight and sunlight. These can be defined as follows:

Daylight

5.2. 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.

Sunlight

5.3. 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 survey drawings, OS data and photographs.

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):

Daylight – Daylight Factor

6.3. The BRE guidance 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

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a space.

6.4. This report is based on measurements of the daylight factor, which 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. 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.

6.7. 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 within existing buildings being refurbished or converted into dwellings. These are the daylight factors to be exceeded over at least 50% of the assessment grid. Target 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 (DF) for 50% of assessment grid
Bedrooms	0.7%
Living rooms	1.1%
Kitchens	1.4%

6.8. 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).

6.9. 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	Specific reflectance
Interior walls & ceilings	White painted	0.8
Interior floors	Light coloured timber boards	0.4
Window frames	White painted	0.8
Brick	Red brick	0.2
Stone façade	Ashlar limestone	0.3
All other external surfaces	BRE default	0.2

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6.10. 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, resulting in a test figure of 0.63 (0.68x0.98) for all vertical windows and 0.57 for the sloping 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

Sunlight – Sunlight Exposure

6.11. The BRE guidance 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 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.

6.12. 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 can be 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 proposed 3D model as tested. Specifically:

- Figures 4-7 provide external views of the proposed site and surrounding context.
- Figures 8 provides a horizontal section cut through the model to show the proposed 1st floor plan layout, with habitable rooms tested for daylight and living room window tested for sunlight labelled.

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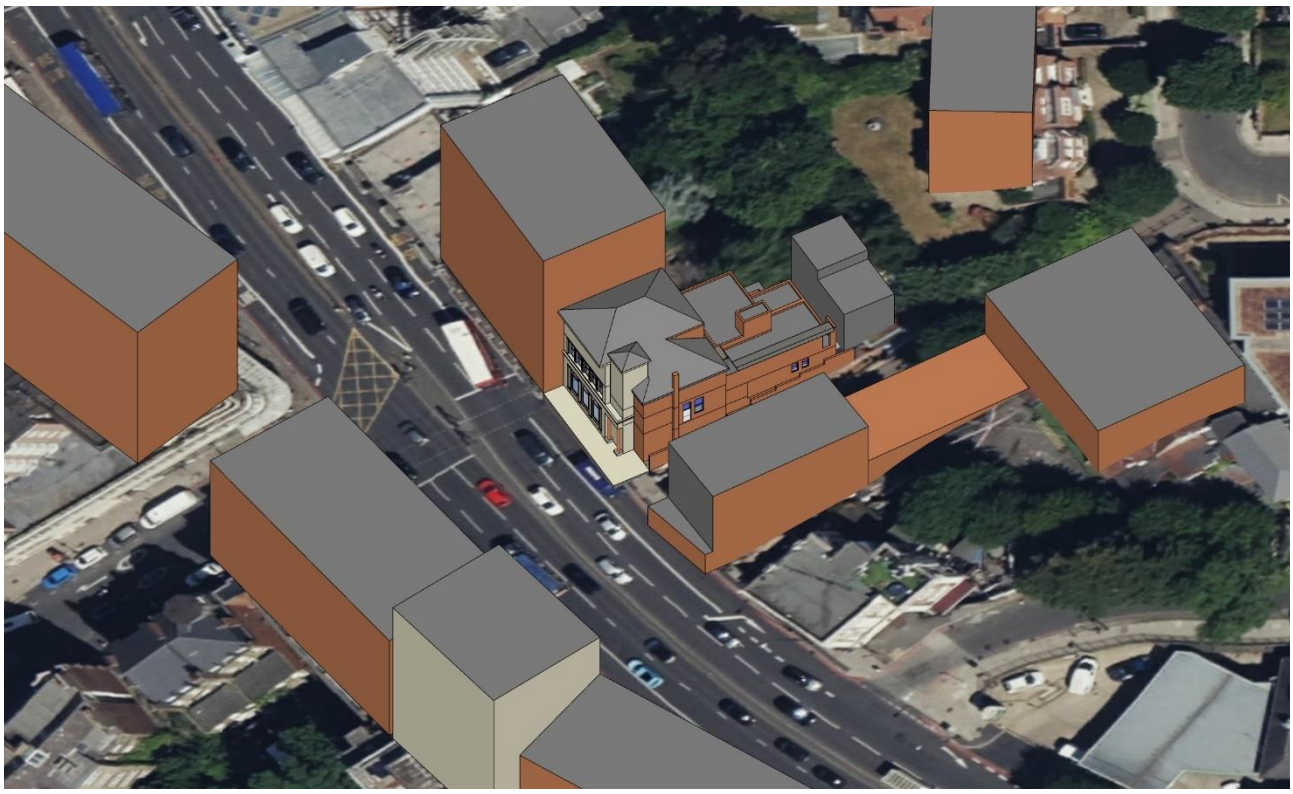

Fig 4. Aerial view of proposed 3D model from south.

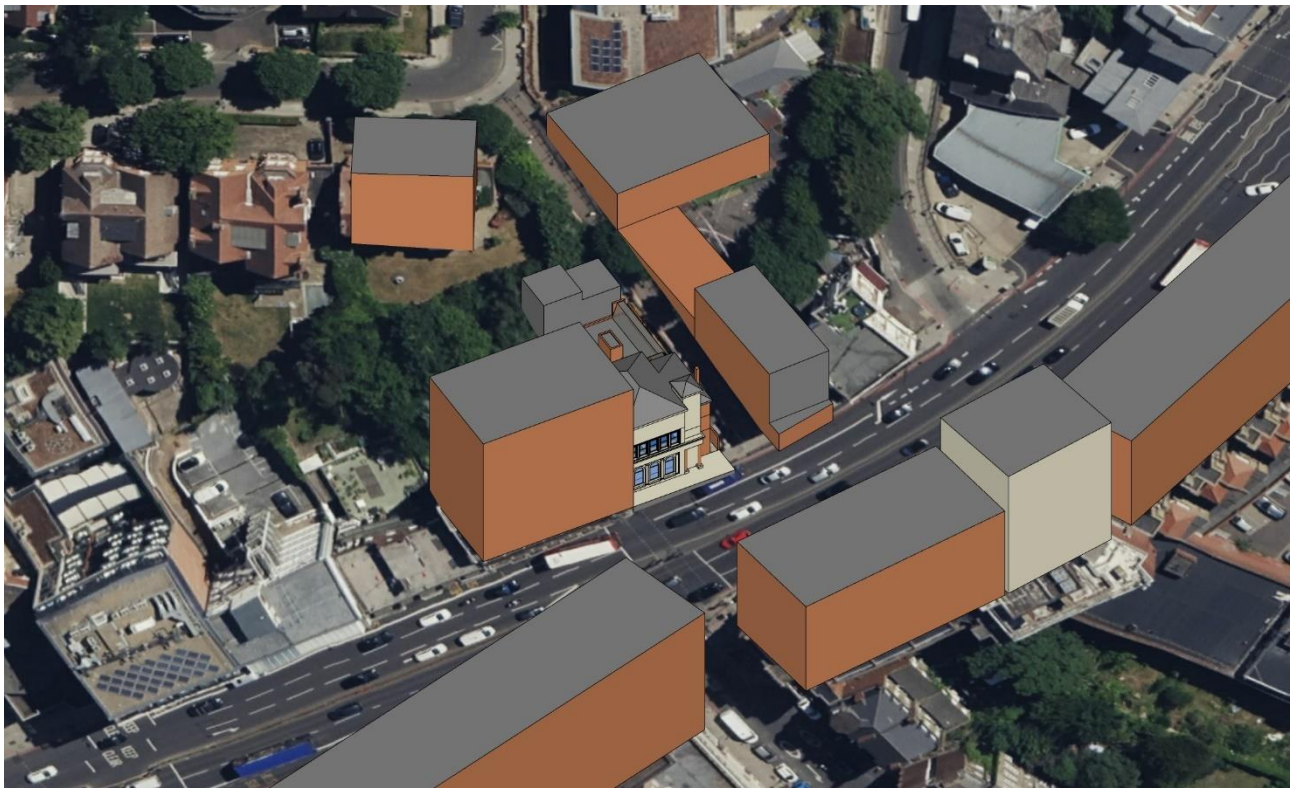

Fig 5. Aerial view of proposed 3D model from west.

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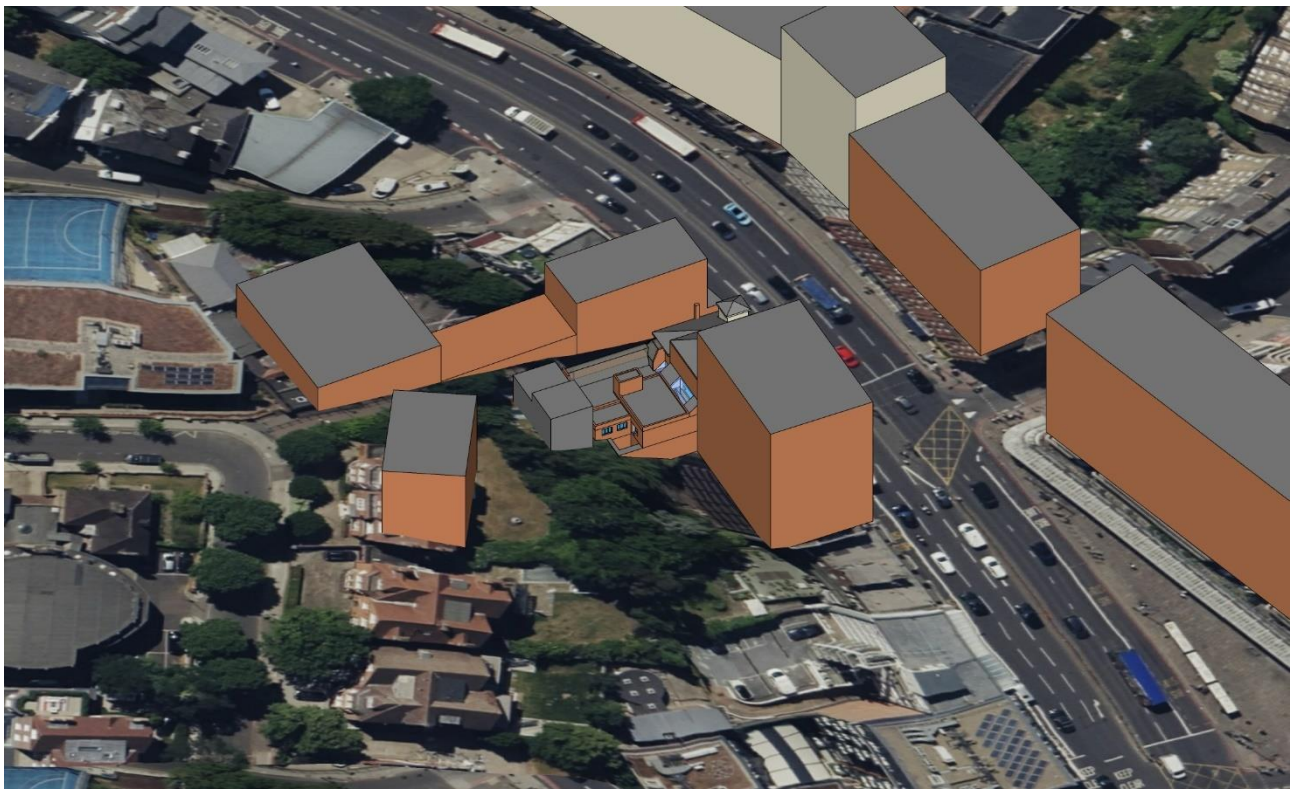

Fig 6. Aerial view of proposed 3D model from north.

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

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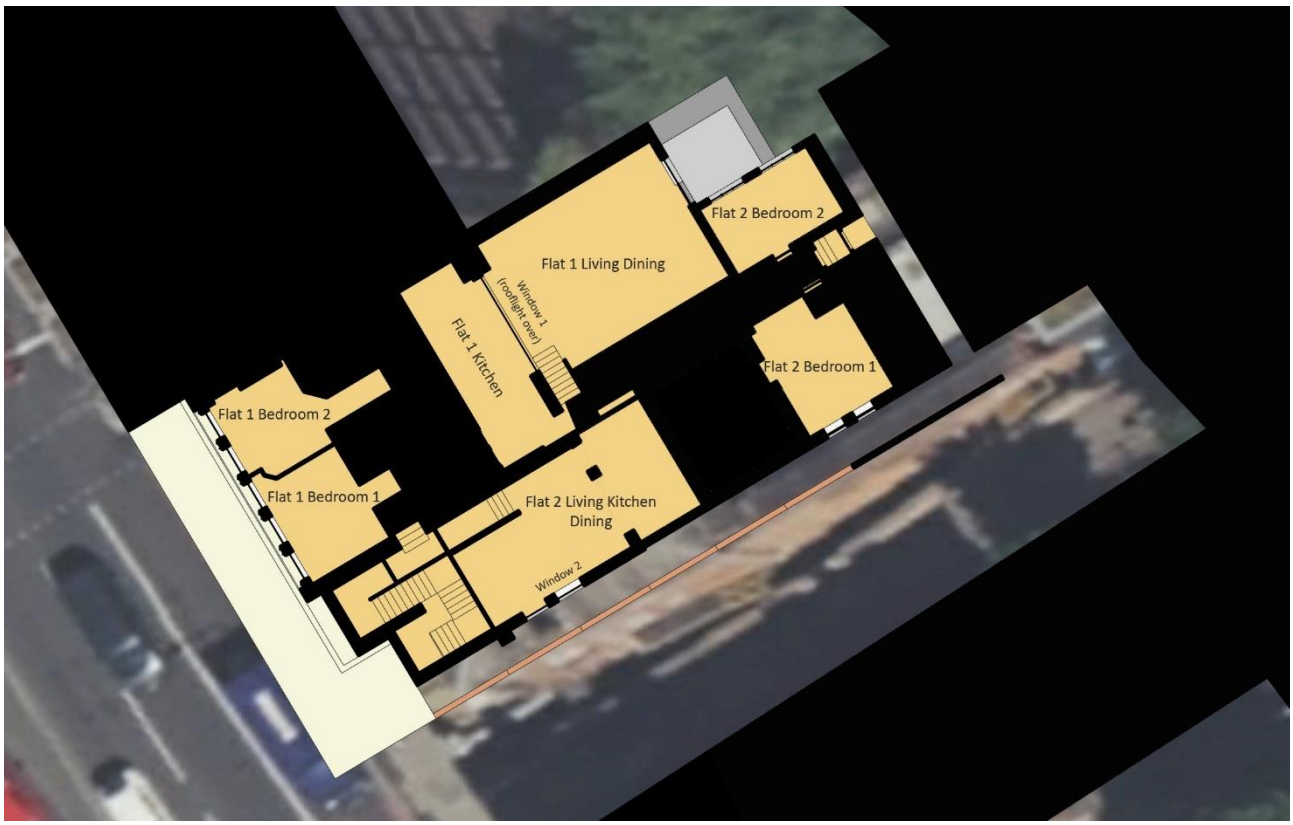

Fig 8. Section cut through proposed first floor with habitable rooms tested for daylight and living room windows tested for sunlight labelled. North to top.

8. Results

8.1. Test results are listed below, highlighted green, amber, or red, to indicate "above BRE guideline figures", "borderline" or "below BRE guideline figures".

8.2. Any results that require further calculations or explanation are marked with an asterisk, with additional information then provided as appropriate.

Daylight – Daylight Factor

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

8.4. Accompanying gradient diagrams indicating the daylight distribution can be found in Appendix 2.

Table 4. Daylight factor results.

Room	Target daylight factor (DF) for 50% of assessment grid	Daylight factor achieved (DF) for 50% of assessment grid (%)
Flat 1 Bedroom 1	0.7	3.87
Flat 1 Bedroom 2	0.7	2.74
Flat 1 Kitchen	1.4	4.70
Flat 1 Living/Dining	1.1	0.95*

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Flat 2 Bedroom 1	0.7	0.65*
Flat 2 Bedroom 2	0.7	2.66
Flat 2 Living/Kitchen/Dining	1.4	1.10**

8.5. *See conclusion.

8.6. **Where a room has a shared use the highest applicable target figure usually applies, however in this instance the kitchen area is in front of 2 large windows and is very well day- lit, with the majority of its area enjoying in excess of 1.4% Daylight Factor, as evidenced by the accompanying gradient map in Appendix 2.

Sunlight – Sunlight Exposure

8.7. The following table compares sunlight exposure on the equinox (in hours) received by the principal living room windows with the minimum BRE recommendation for new dwellings.

Table 5. Sunlight exposure results.

Window	Room	Target sunlight hours on equinox	Proposed sunlight hours on equinox
Window 1	Flat 1 Living/Dining	1.5	3.4
Window 2	Flat 2 Living/Kitchen/Dining	1.5	3.8

9. Conclusion

Daylight – Daylight Factor

9.1. 5 out of 7 proposed habitable rooms were found to meet or exceed minimum recommended BRE figures for daylight provision in *"hard to light"* dwellings, such as those formed through the conversion of an existing building.

9.2. Flat 1's Living/Dining room was found to receive slightly below the BRE recommended figure of 1.1%, at 0.95%, however it is noted that the room is of a generous size and that the majority of its area is very well lit, as evidenced by the gradient map/accompanying data in Appendix 2 and a generous average Daylight Factor figure for its entire area of 2.37%. It is also directly connected to the very well-lit kitchen area.

9.3. Flat 2's Bedroom 1 was found to receive slightly below the BRE recommended figure of 0.7%, at 0.65%, however this is a very minor shortfall and the majority of the room is well-lit, as evidenced by the gradient map/accompanying data in Appendix 2.

9.4. It is therefore concluded that all proposed habitable rooms enjoys "*adequate*" daylight, in accordance with the requirements of the GPDO and the overarching aims of the BRE guidance, which is clear to state that; "*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".*

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Sunlight – Sunlight Exposure

9.5. Both proposed flats were found to enjoy a window that receives in excess of the minimum recommended BRE figure for sunlight exposure within a new dwelling.

Closing Statement

9.6. The proposed dwellings have been proven to enjoy levels of daylight and sunlight throughout their habitable areas that accord with relevant BRE guidance for new dwellings formed through the conversion of an existing building.

9.7. It is therefore the opinion of the Daylight Lab that the proposed scheme provides; *"adequate natural light in all habitable rooms of the dwelling/houses",* as per the requirements of Class G of The General Permitted Development Order, 2015, (the "GPDO") for the change of use; *"from a use within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order, to a mixed use for any purpose within that Class and as up to 2 flats"*,

William Pottinger, The Daylight Lab, January 2024

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APPENDIX 1

Proposed application drawings – do not scale.

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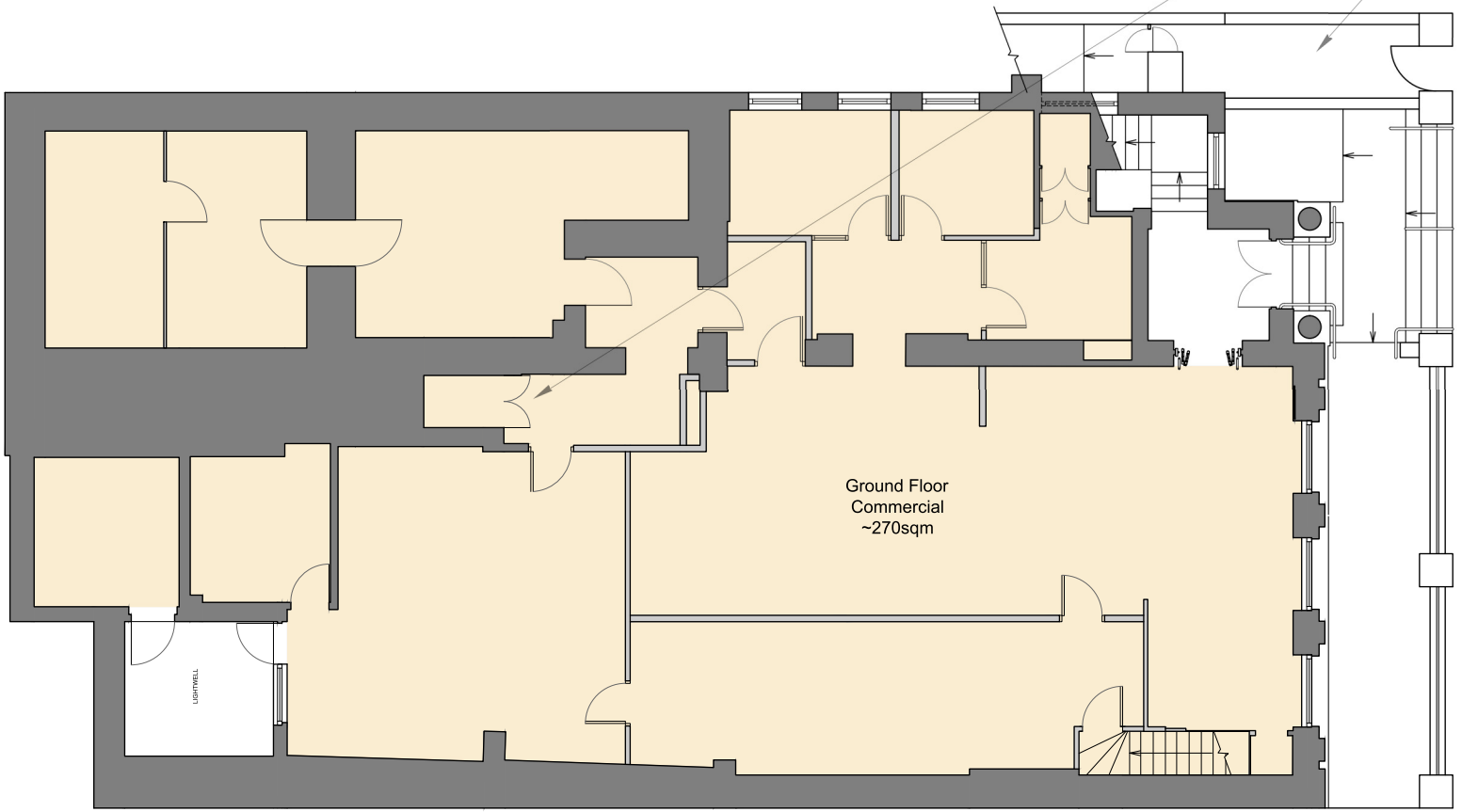
PROPOSED GROUND FLOOR PLAN - 1:100

1. STORAGE CUPBOARD IN PLACE OF EXISTING STAIRS TO 1ST FLOOR

2. AREA FOR REFUSE TO BE STORED ON COLLECTION DAY



FINCHLEY ROAD

0 1.0 2.0 3.0 4.0 5.0 6.0

BAR SCALE IN METRES 1:100

N

notes

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project
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title
PROPOSED GROUND FLOOR PLAN

date	drawn by
JANUARY 2024	WJP
scale	drawing number
1:100 @A3	2472/PA/07

SPD
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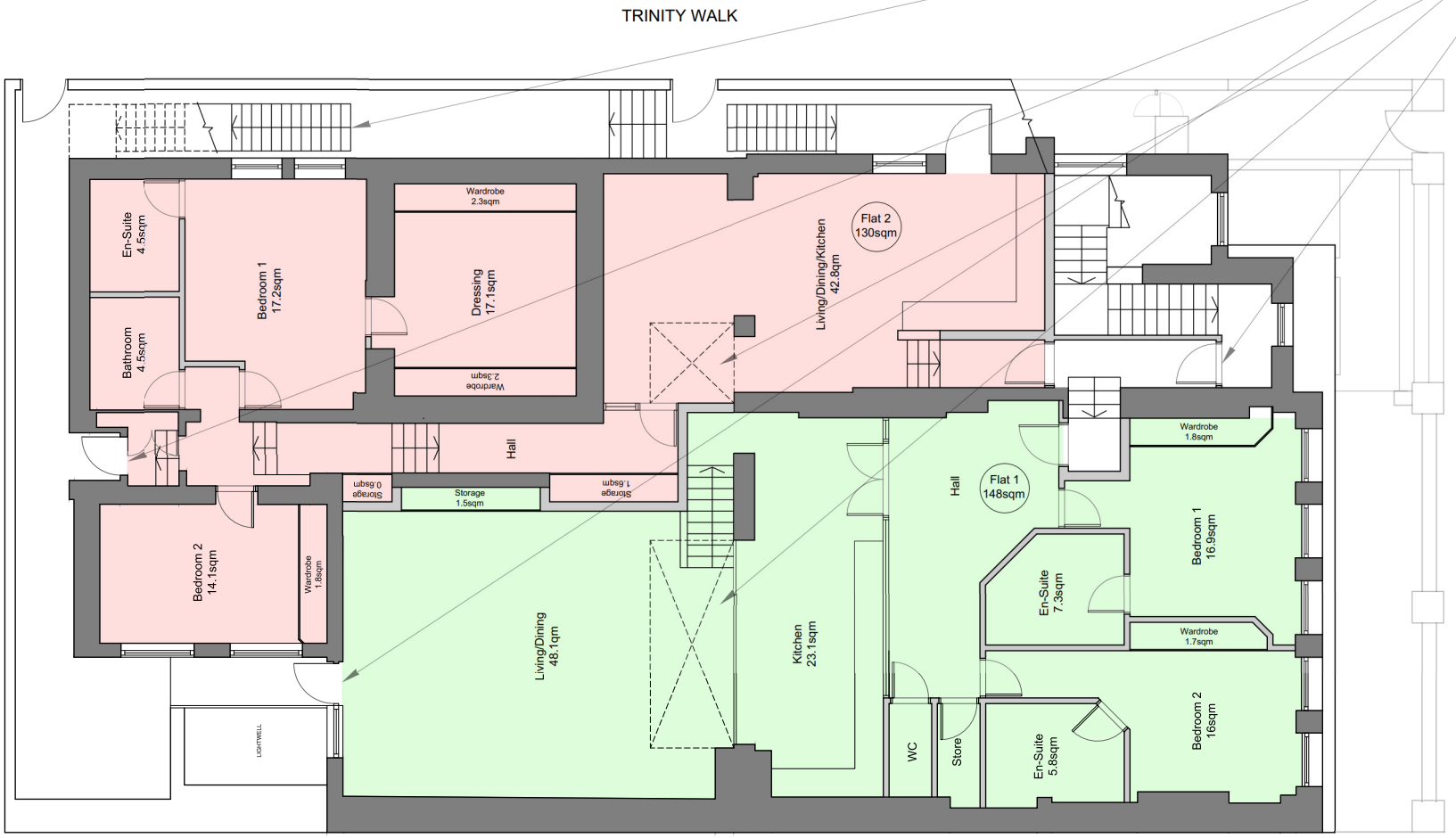
email: mail@spdconsult.co.uk - tel: +44 7521 606 980

PROPOSED FIRST FLOOR PLAN - 1:100

1. STAIRS TO SEPARATE 2ND FLOOR ACCOMMODATION
2. SECONDARY FIRE ESCAPE
3. ROOFLIGHTS OVER
4. INTERNAL DOOR TO PROVIDE SECURE SEPARATION OF 1ST FLOOR RESIDENTIAL AREA AND GROUND FLOOR COMMERCIAL AREA



0 1.0 2.0 3.0 4.0 5.0 6.0
BAR SCALE IN METRES 1:100

notes
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scale	drawing number
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EXISTING/PROPOSED SE ELEVATION, FRONTING FINCHLEY ROAD (NO CHANGE) - 1:100

0 1.0 2.0 3.0 4.0 5.0 6.0

BAR SCALE IN METRES 1:100

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project
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LONDON NW3 5JJ

title
EXISTING/PROPOSED SE ELEVATION
(NO CHANGE)

date	drawn by
JANUARY 2024	WJP
scale	drawing number
1:100 @A3	2472/PA/05

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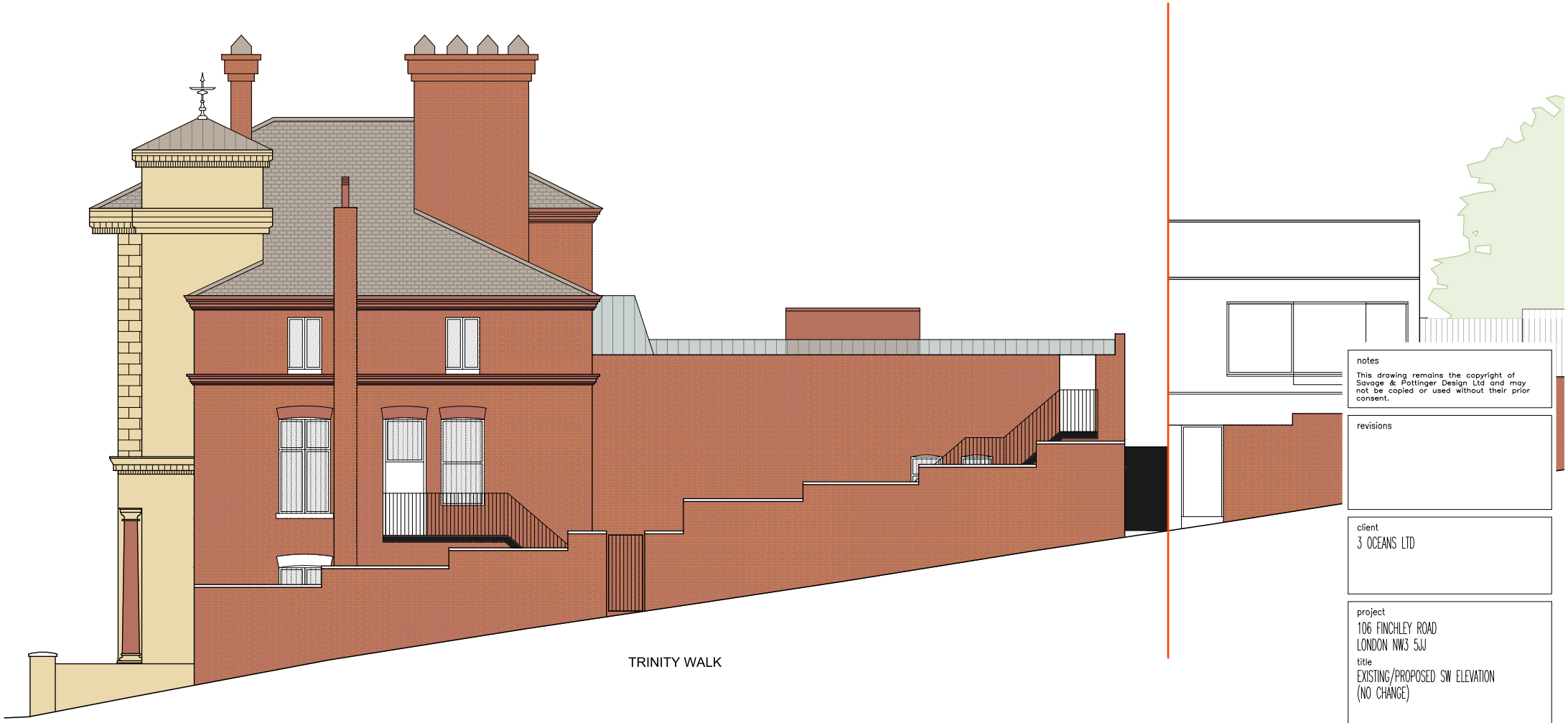
EXISTING/PROPOSED SW ELEVATION, FRONTING TRINITY WALK (NO CHANGE) - 1:100



TRINITY WALK

0 1.0 2.0 3.0 4.0 5.0 6.0

BAR SCALE IN METRES 1:100

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title
EXISTING/PROPOSED SW ELEVATION
(NO CHANGE)

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scale	drawing number
1:100 @A3	2472/PA/06

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APPENDIX 2

Daylight Factor (DF) gradient maps for proposed habitable rooms.

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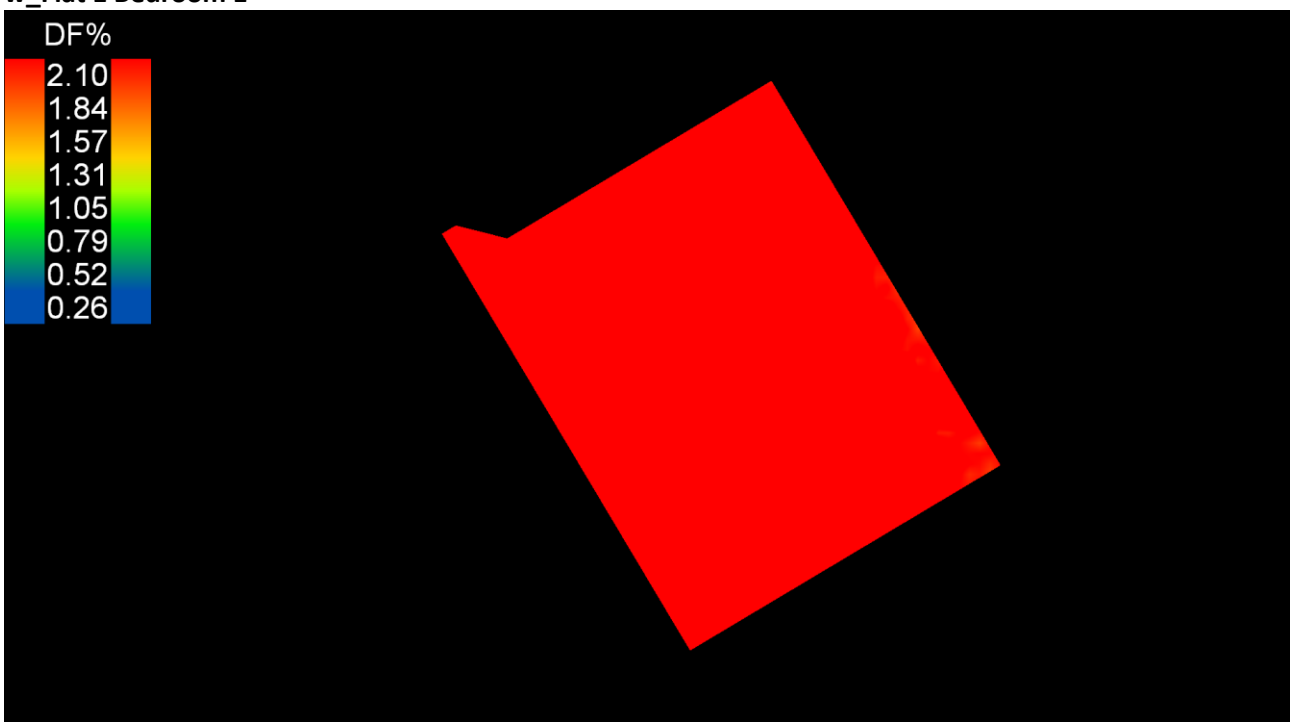
w_Flat 1 Bedroom 1



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	3.87 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	2.19 DF[%]	

Default

Average	$D_{average}$	4.50 DF[%]
Median	D_{median}	3.87 DF[%]
Minimum	D_{min}	1.87 DF[%]
Maximum	D_{max}	11.50 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.4145
Uniformity 2	D_{min}/D_{max}	0.1623

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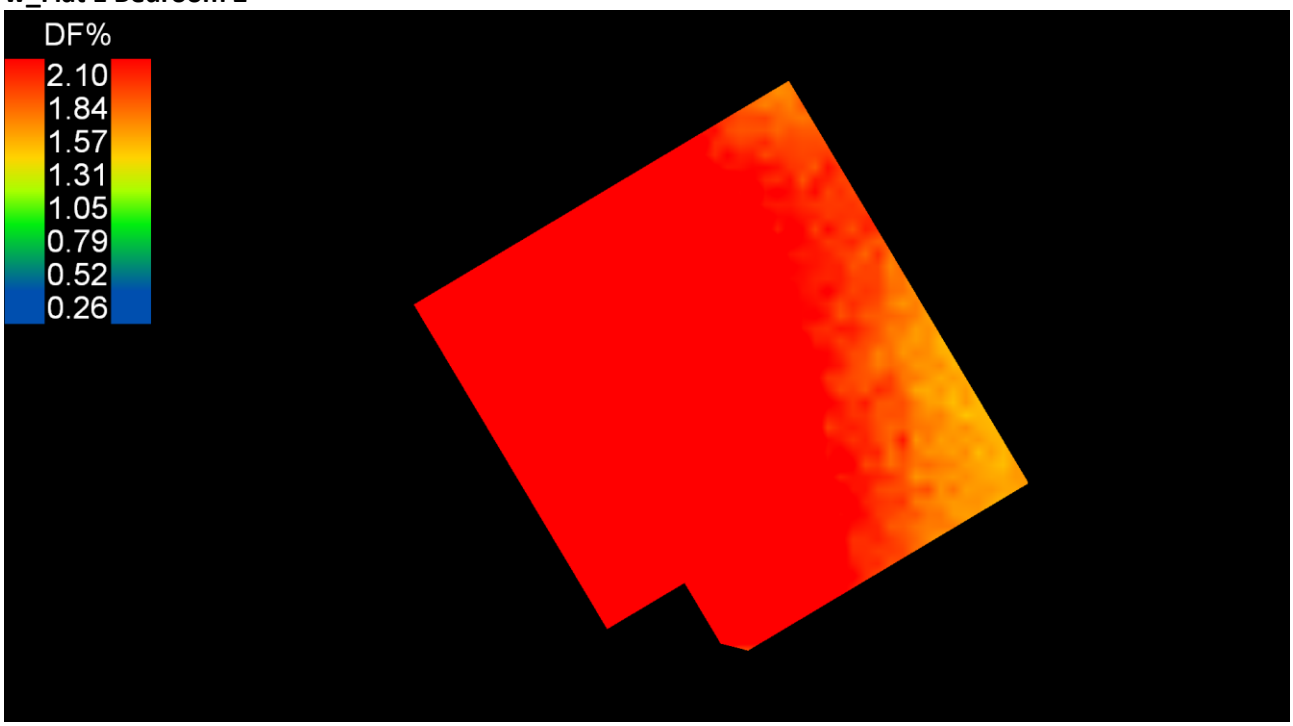
w_Flat 1 Bedroom 2



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	2.74 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	1.56 DF[%]	

Default

Average	$D_{average}$	3.39 DF[%]
Median	D_{median}	2.74 DF[%]
Minimum	D_{min}	1.36 DF[%]
Maximum	D_{max}	10.12 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.4020
Uniformity 2	D_{min}/D_{max}	0.1344

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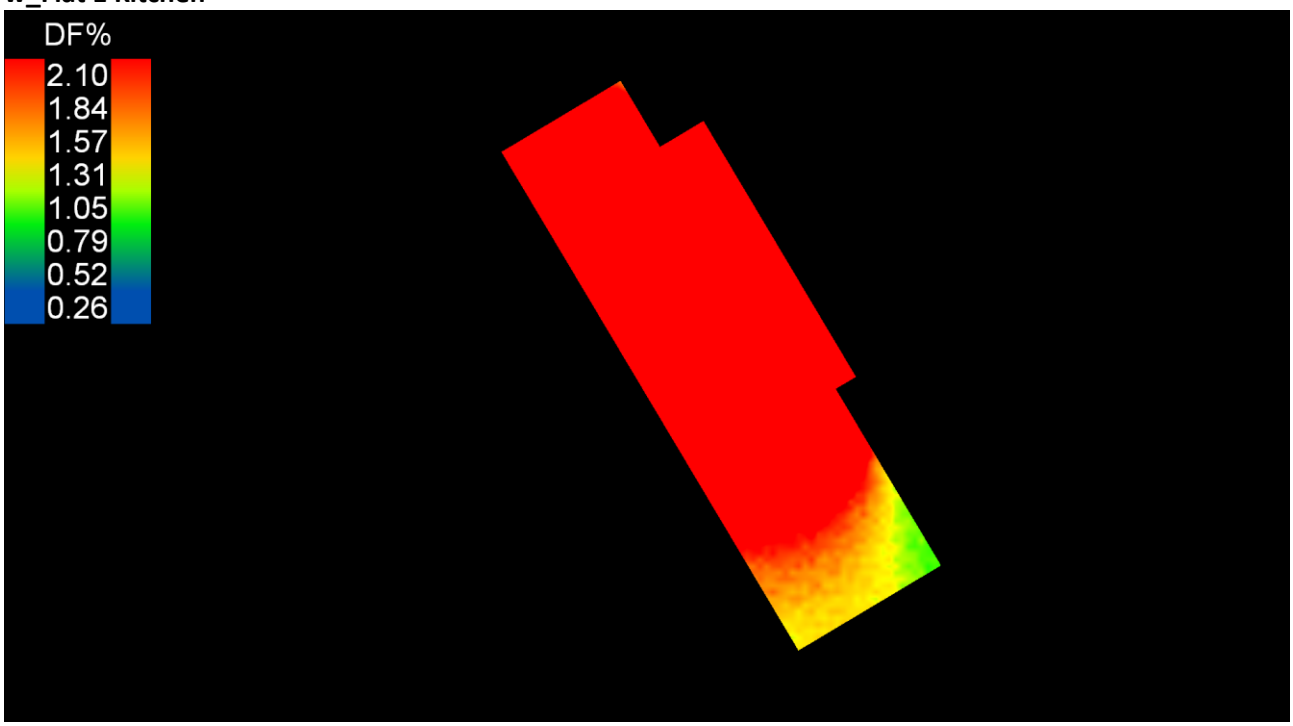
w_Flat 1 Kitchen



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	4.70 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	1.25 DF[%]	

Default

Average	$D_{average}$	6.03 DF[%]
Median	D_{median}	4.70 DF[%]
Minimum	D_{min}	0.88 DF[%]
Maximum	D_{max}	19.13 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.1464
Uniformity 2	D_{min}/D_{max}	0.0461

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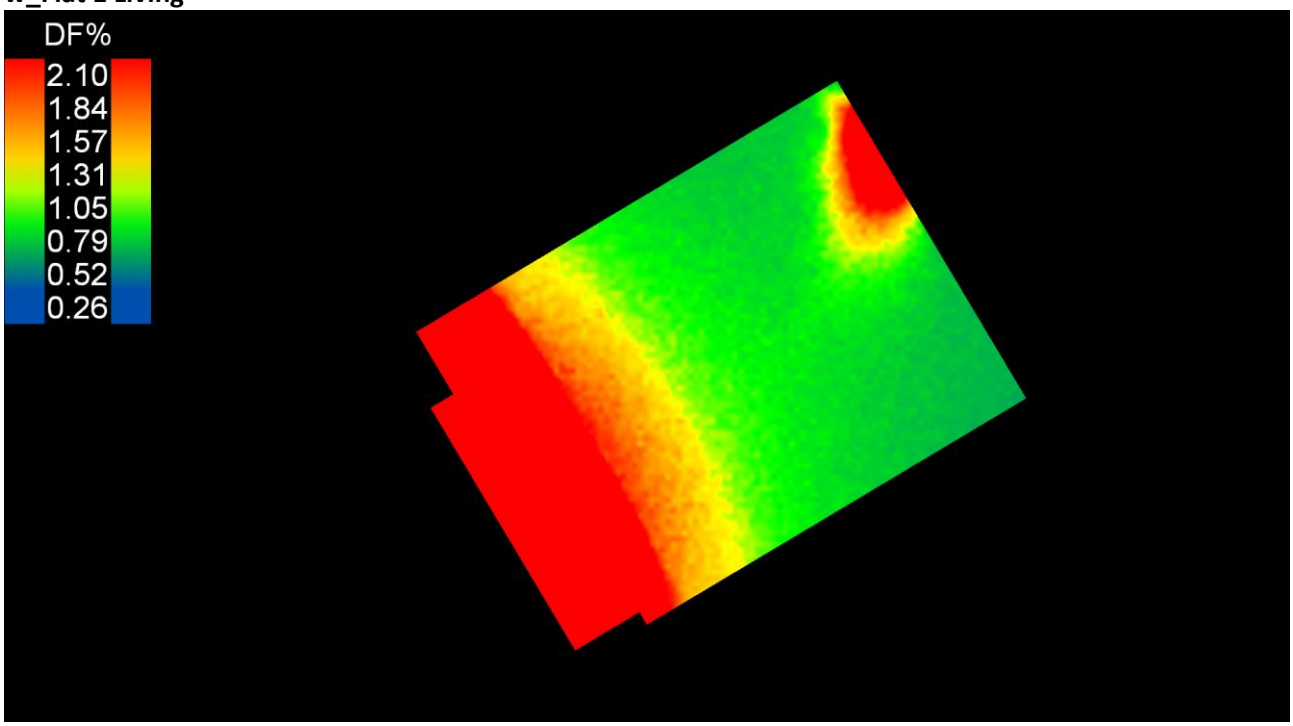
w_Flat 1 Living



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	0.95 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	0.64 DF[%]	

Default

Average	$D_{average}$	2.37 DF[%]
Median	D_{median}	0.95 DF[%]
Minimum	D_{min}	0.53 DF[%]
Maximum	D_{max}	14.32 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.2255
Uniformity 2	D_{min}/D_{max}	0.0373

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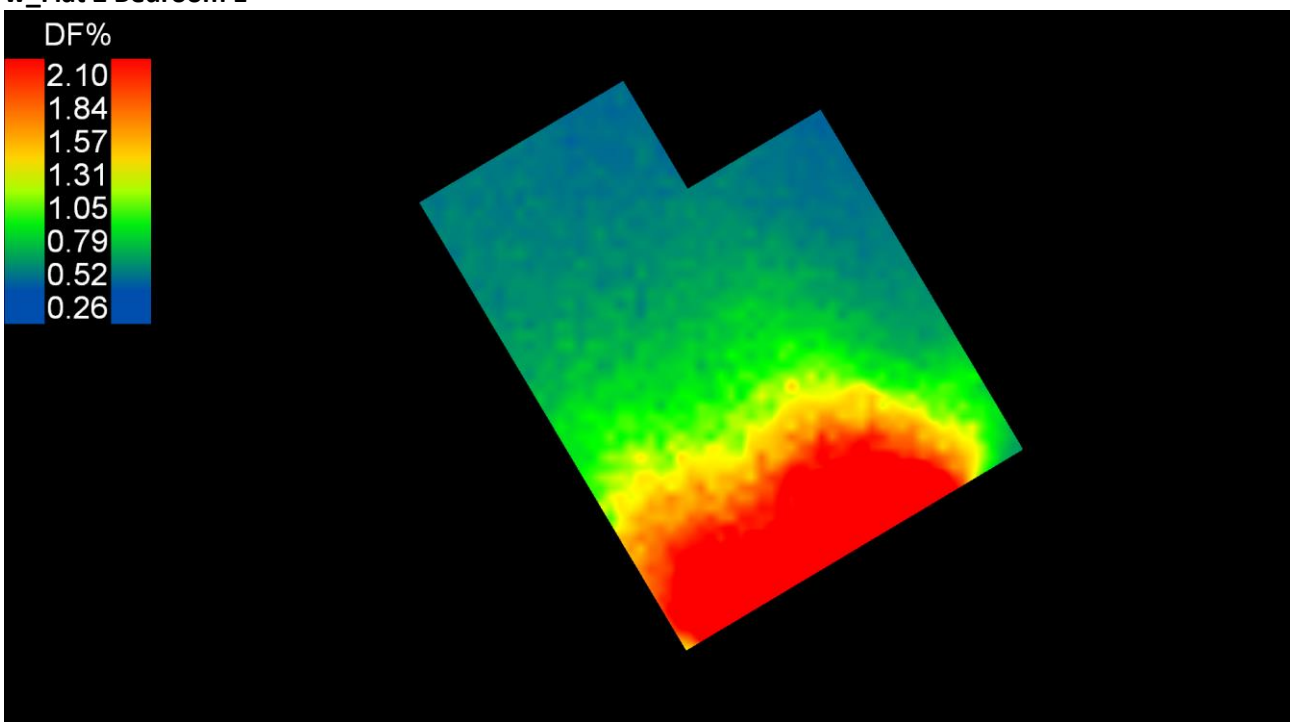
w_Flat 2 Bedroom 1



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	0.65 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	0.38 DF[%]	

Default

Average	$D_{average}$	1.03 DF[%]
Median	D_{median}	0.65 DF[%]
Minimum	D_{min}	0.31 DF[%]
Maximum	D_{max}	4.20 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.3039
Uniformity 2	D_{min}/D_{max}	0.0742

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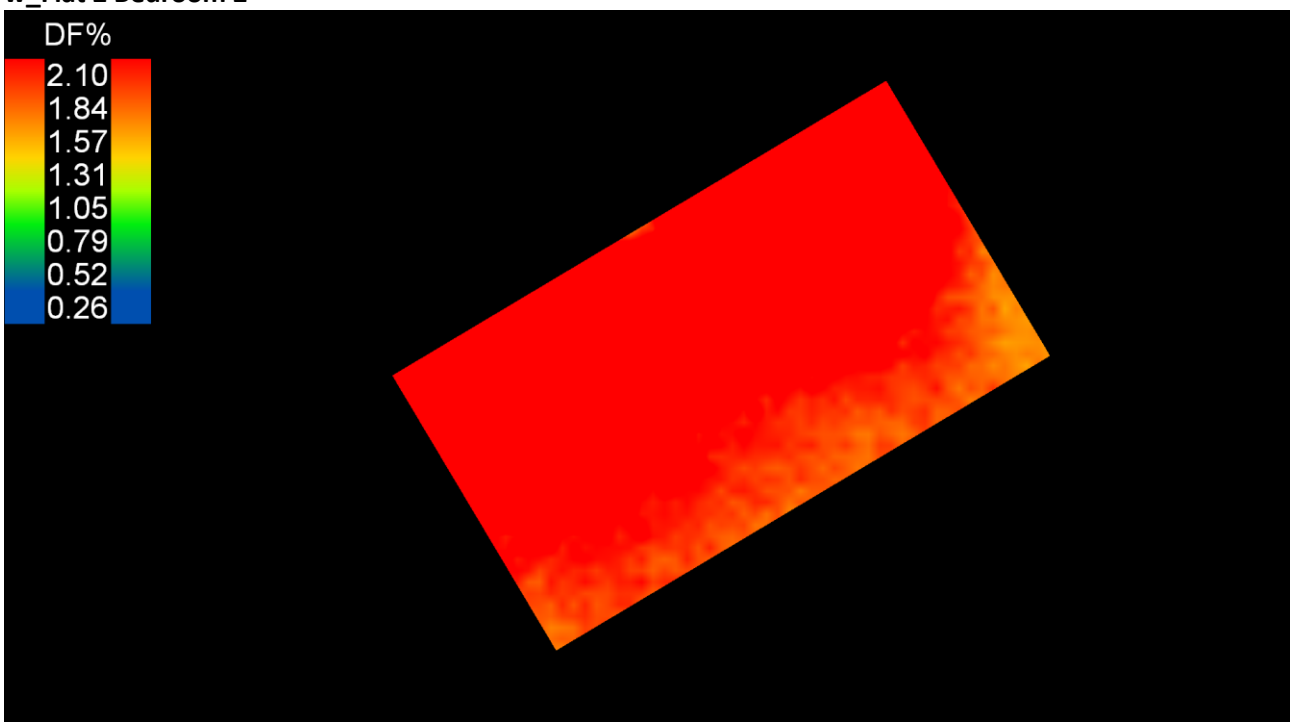
w_Flat 2 Bedroom 2



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	2.66 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	1.74 DF[%]	

Default

Average	$D_{average}$	3.00 DF[%]
Median	D_{median}	2.66 DF[%]
Minimum	D_{min}	1.48 DF[%]
Maximum	D_{max}	6.55 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.4944
Uniformity 2	D_{min}/D_{max}	0.2264

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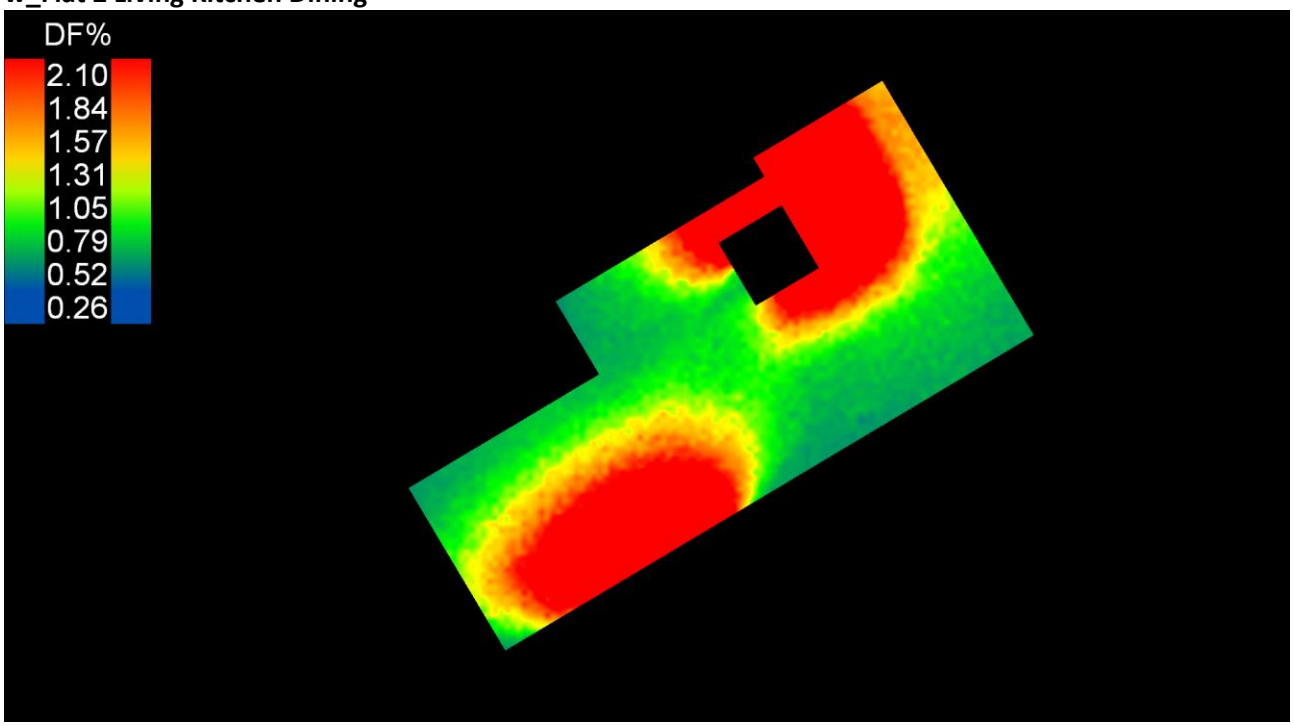
w_Flat 2 Living Kitchen Dining



EN17037

$F_{plane,\%} \geq 50\%$ (median)	D_T	1.10 DF[%]	
$F_{plane,\%} \geq 95\%$	D_{TM}	0.56 DF[%]	

Default

Average	$D_{average}$	1.87 DF[%]
Median	D_{median}	1.10 DF[%]
Minimum	D_{min}	0.43 DF[%]
Maximum	D_{max}	8.37 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.2317
Uniformity 2	D_{min}/D_{max}	0.0518

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