



DAYLIGHT & SUNLIGHT ASSESSMENT

DECEMBER 2021, REF: 2166/LIGHT/OPT2

CLIENT:

Omkara Ltd
3rd Floor Crown House
151 High Road
Loughton
Essex IG10 4LG

SITE ADDRESS:

121 Cowley Mill Road
Uxbridge
UB8 2QB

CONTENTS:

p2 - Introduction & Site Description
p4 - Methodology
p7 - Data
p8 - Conclusion
p9 - Appendices

AUTHOR:

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Introduction

This report has been commissioned by Omkara Ltd and produced by The Daylight Lab to assess the levels of daylight and sunlight within the proposed 1x bedroom flat at No.121 Cowley Mill Road, Uxbridge.

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 from E(b) café to C3 residential. Since August 2020 a requirement for *“the provision of adequate natural light in all habitable rooms of the dwelling/houses”* must be satisfied if prior approval is to be granted. No specific guidance has been provided under the legislation to quantify what comprises *“adequate natural light”* so it has been assumed appropriate to apply the guidance contained within the BRE document; *“Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice”*, Second Edition, PJ Littlefair 2011, which is generally accepted as good practice by Town and Country Planning authorities.

Existing and proposed plans and elevations can be found in Appendix 1.

Site Description

The application site comprises a two storey semi-detached property with commercial space at ground floor and residential over, fronting the corner of Cowley Mill Road and Bridge Road.

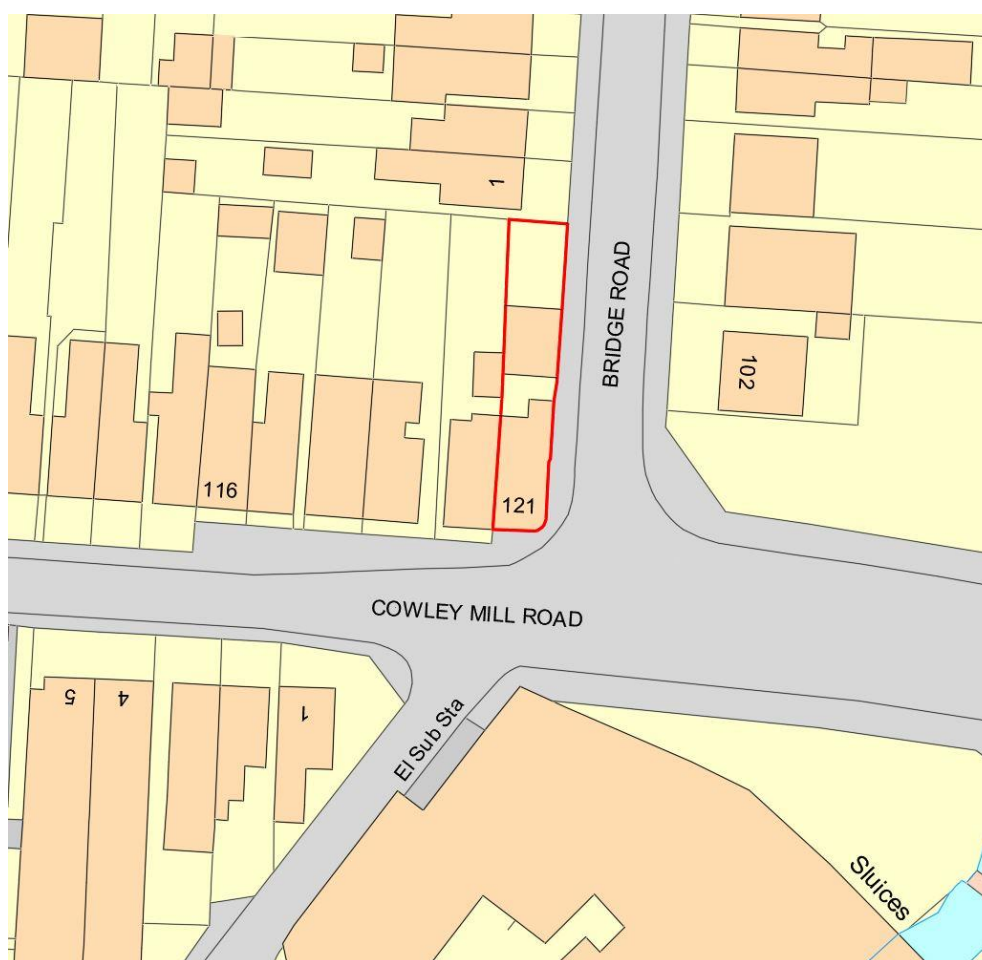


Fig 1. Location Plan. North to top. Do not scale.





Fig 2. View of application site looking north west towards corner of Cowley Mill Road and Bridge Road.



Fig 3. Aerial view of site from south west.

Methodology

An as proposed 3D CAD model of the application site and neighbouring properties was constructed to a level of detail suitable for testing using OS data and dimensions provided by the client.

Materials were set to provide accurate reflectance values with white painted walls and ceilings and polished wooden floors within the proposed new flat, and white render, yellow stock/red brick, slate, tarmac, and concrete elsewhere.

The following methods of measurement were then applied in full accordance with the BRE guidelines, using specialist analysis software (MBS Daylight & Daylight Visualiser).

Daylight - Average Daylight Factor (ADF)

Daylight provision in proposed rooms may be checked using the Average Daylight Factor (ADF). The ADF is a measure of the overall amount of daylight in a space and may be defined as the ratio of daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth of the outdoor unobstructed illuminance. BS 8206-2 *Code of practice for daylighting* recommends an ADF of 5% for a well day-lit space and 2% for a partly day-lit space with acceptable minimum values of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. A working plane of 850mm above floor level is recommended for residential accommodation.

Daylight - Room Depth

If a proposed habitable room has windows in only one wall the depth of the room should ideally not exceed the limiting value given by $(L/W) + (L/H) < (2/(1-R_b))$, where L is the room length, W the room width, H the window head height above floor level and R_b the average reflectance of the surface in the rear half of the room. If L exceeds this value supplementary electric lighting will be required.

Sunlight - Annual Probable Sunlight Hours (APSH)

In general, a dwelling or any non-domestic building where there is a particular requirement for sunlight, will appear reasonably sunlit provided that at least one main window to a living room faces within 90° of due South and receives at least 25% of the annual probable sunlight hours (APSH), including at least 5% during the winter (WPSH), between the 21st of September and 21st of March.

The following figures 4-7 show the proposed model as tested.

Figure 8 then shows the internal layout of the proposed flat with habitable rooms and the main living room window tested for sunlight labelled.



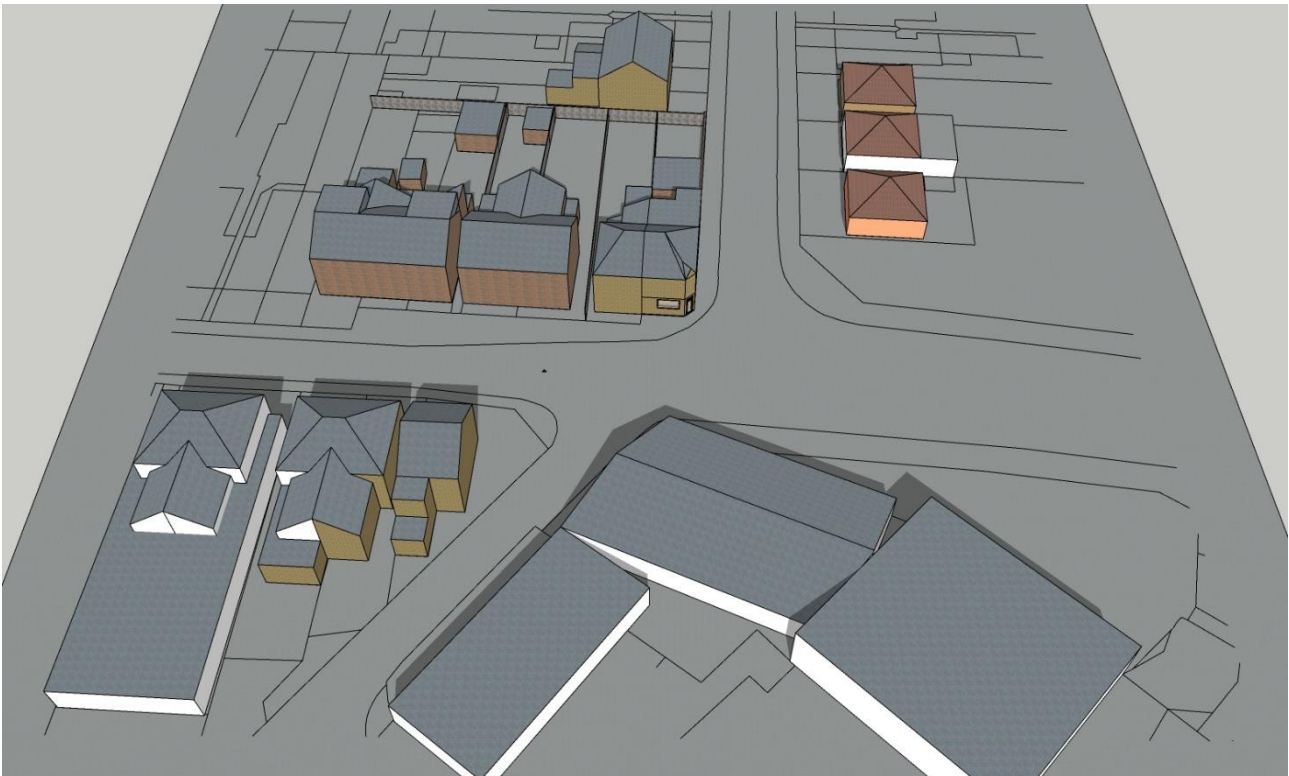


Fig 4. As proposed 3D model viewed from south. Shadows set to 12pm, 21st March (the equinox).

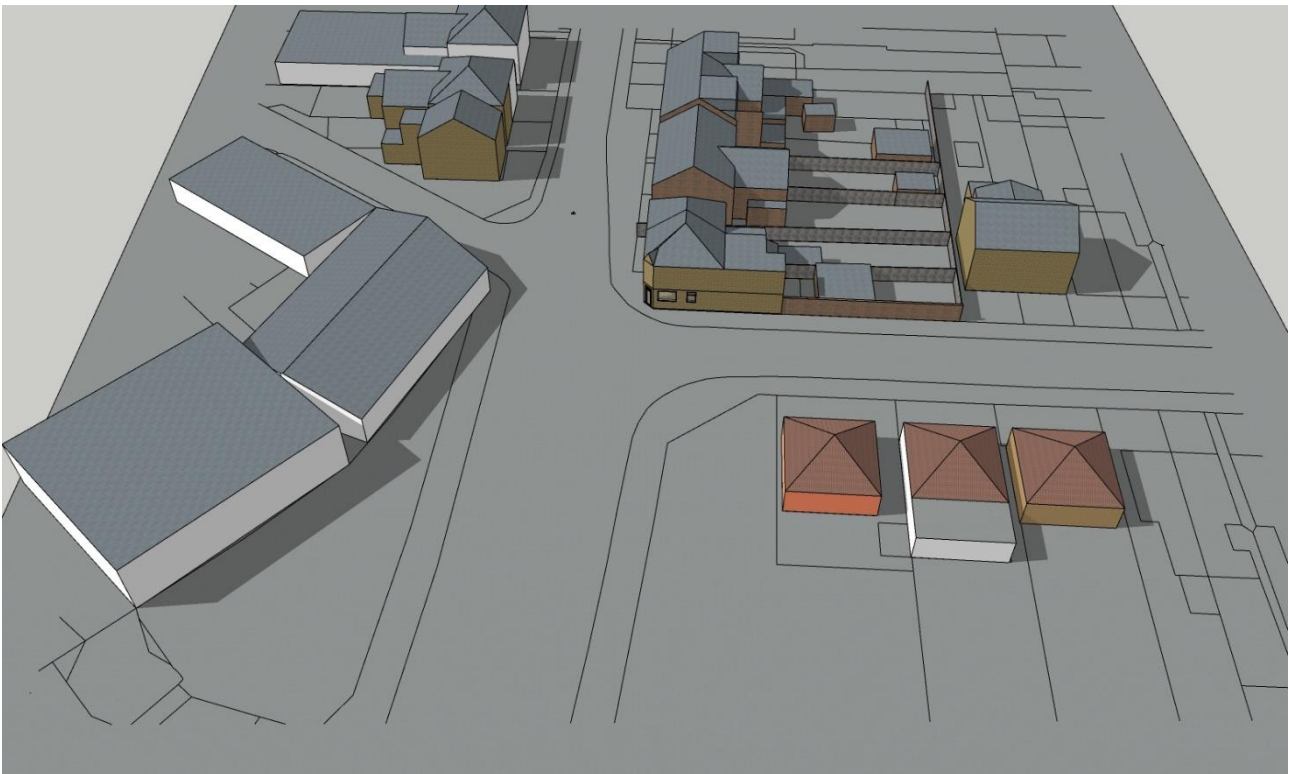


Fig 5. As proposed 3D model viewed from east. Shadows set to 12pm, 21st March (the equinox).

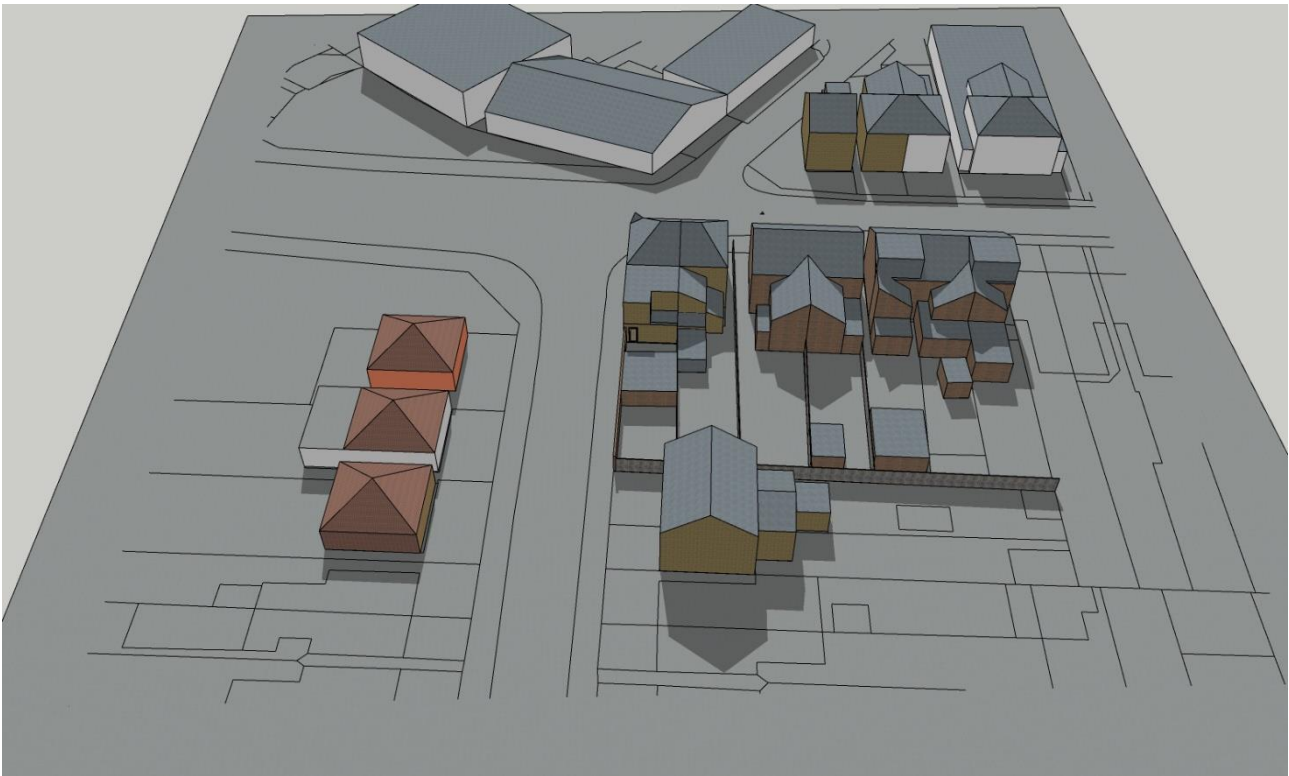


Fig 6. As proposed 3D model viewed from north. Shadows set to 12pm, 21st March (the equinox).

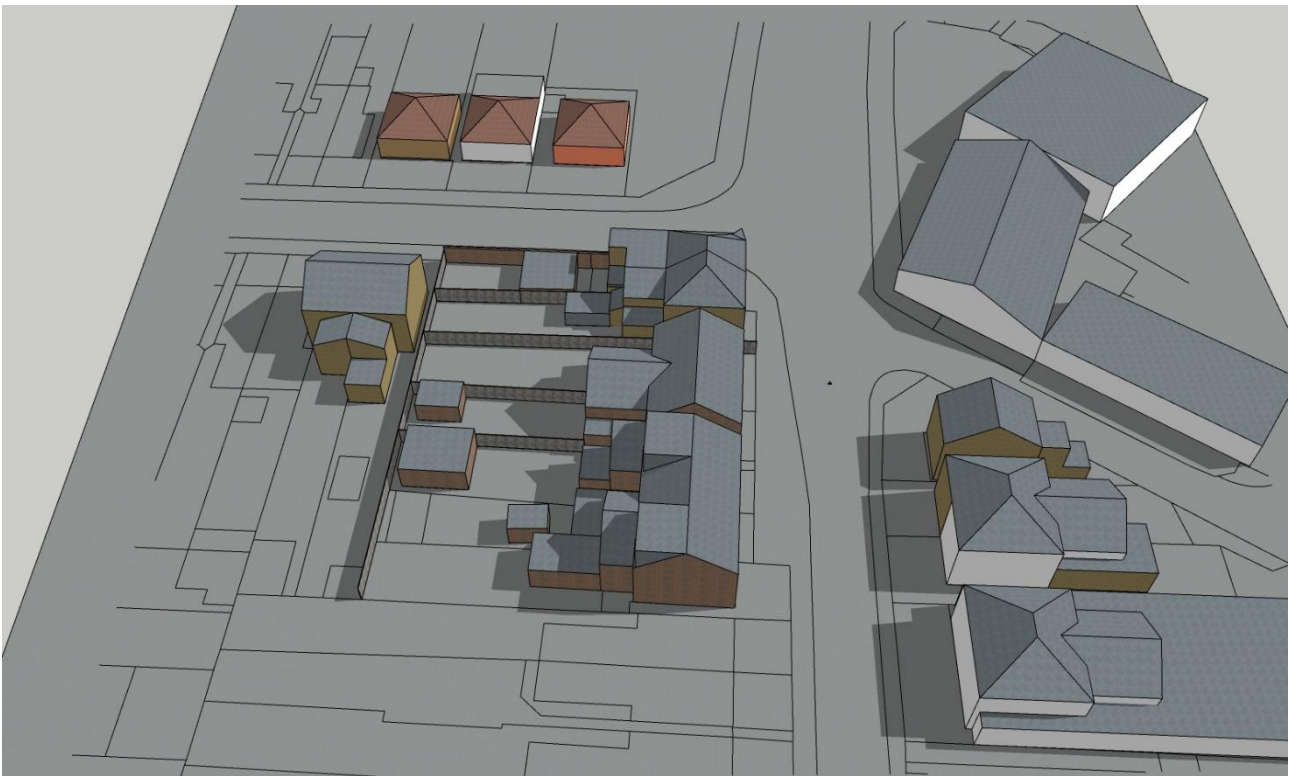


Fig 7. As proposed 3D model viewed from west. Shadows set to 12pm, 21st March (the equinox).





Fig 8. Horizontal section cut through model showing plan view with room names and main living room window labelled for reference. North to top.

Data

Daylight - Average Daylight Factor (ADF)

The following table compares ADF results for the proposed studios with BRE recommendations. Gradient maps indicating the daylight distribution can be found in Appendix 2.

Table 1. Average daylight factor test results.

Room	ADF (%)	Minimum Accepted (%)	Meets BRE?
Bedroom 1	1.12	1	YES
Bedroom 2	1.83	1	YES
Living/Kitchen/Dining	5.70	1.5	YES

Daylight - Room Depth

The following table provides room depth calculations for the single aspect bedrooms.

Table 2. Room depth test results.

Room	Length (L)	Width (W)	Window Head (H)	Average Room Reflectance (Rb)	$(L/W) + (L/H)$	$(2/(1-Rb))$	Supplementary lighting needed?
Bed-room 1	4.15	3	2.3	0.45	3.19	3.64	NO

Bed-room 2	2.15	4.64	2.3	0.45	1.40	3.64	NO
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Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

The following table provides proposed APSH and WPSH results for the main living room window that faces within 90° of due south.

Table 2. Annual and winter probable sunlight hours test results.

Window	Window Orientation	Prop APSH (%)	Over 25%?	Prop WPSH (%)	Over 5%?
1	184°	84	YES	29	YES

Conclusion

Daylight - Average Daylight Factor (ADF)

The proposed habitable rooms were found to exceed minimum accepted figures for Average Daylight Factor (ADF) in new dwellings, with the bedrooms being reasonably well daylit and the living/kitchen/dining room being very well daylit.

Daylight – Room Depth

The proposed bedrooms both meet BRE recommended figures for maximum room depth.

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

The proposed living/kitchen/dining room was found to exceed minimum accepted figures for annual and winter sunlight hours (APSH and WPSH) in new dwellings with exceptionally good results.

Closing Statement

The proposed flat enjoys very good levels of daylight and sunlight, with figures in excess of minimum BRE recommendations.

It is therefore the opinion of The Daylight Lab that the proposal achieves “adequate levels of natural light”, as expected under Class MA of the General Permitted Development Order 2015.



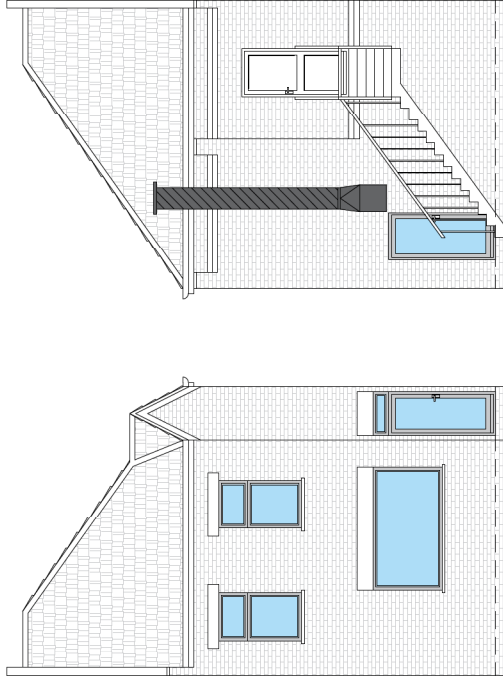
William Pottinger, The Daylight Lab, December 2021



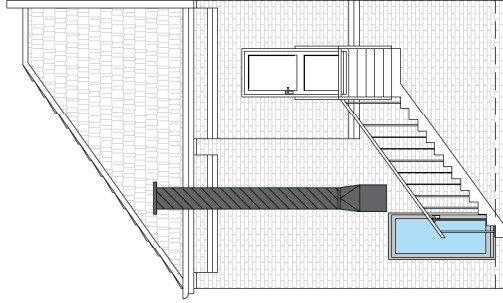
APPENDIX 1

Proposed Plans and Elevations
(do not scale).

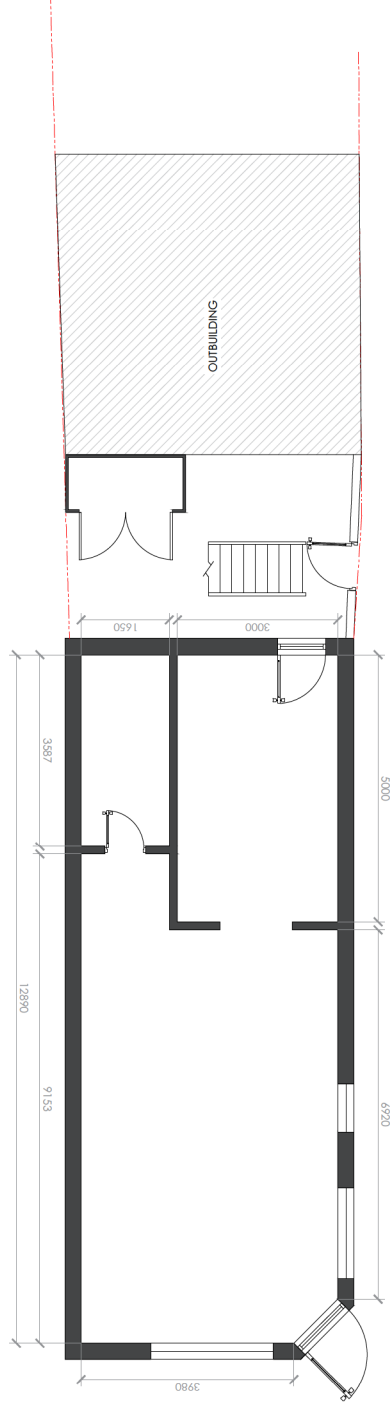




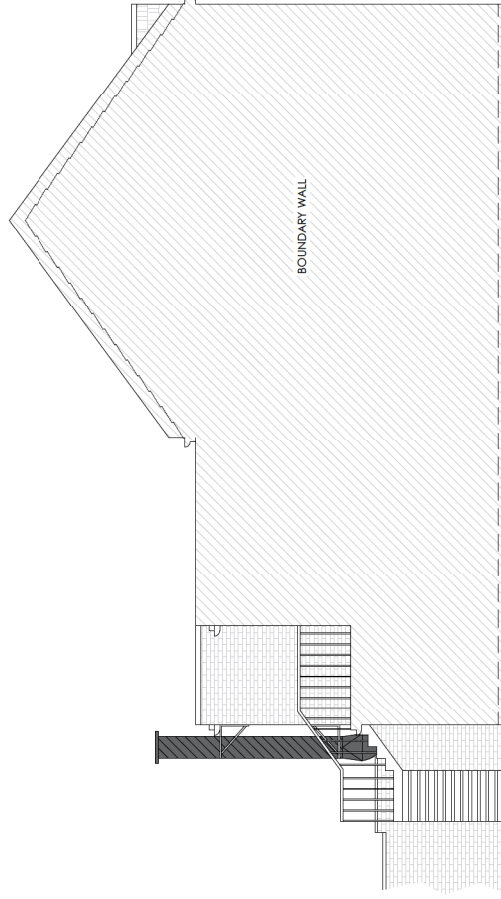
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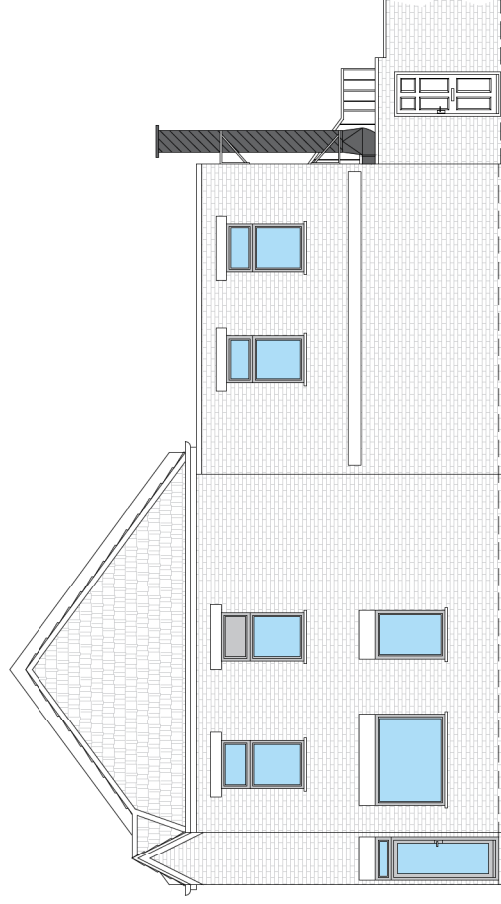
EXISTING REAR ELEVATION
1:100



EXISTING GROUND FLOOR PLAN
1:100



EXISTING SIDE ELEVATION
1:100



EXISTING SIDE ELEVATION
1:100



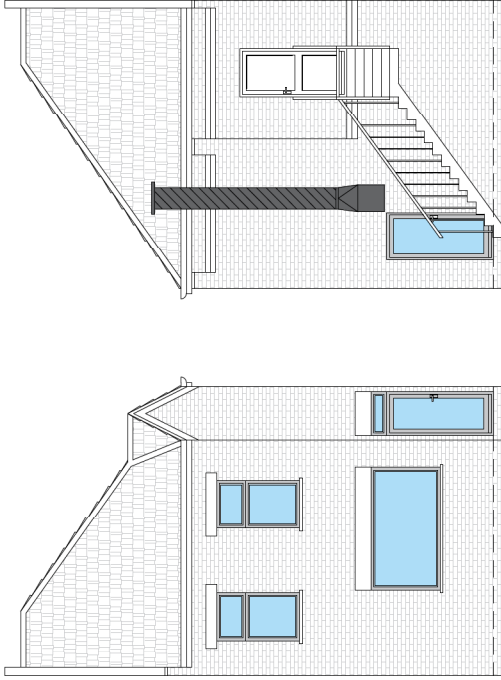
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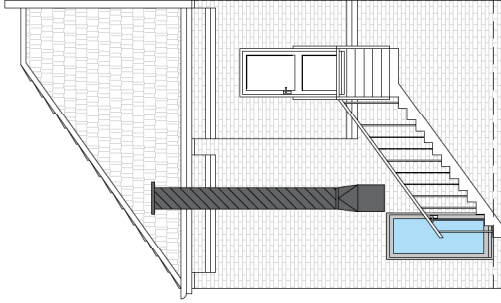
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EXISTING PLANS AND ELEVATIONS

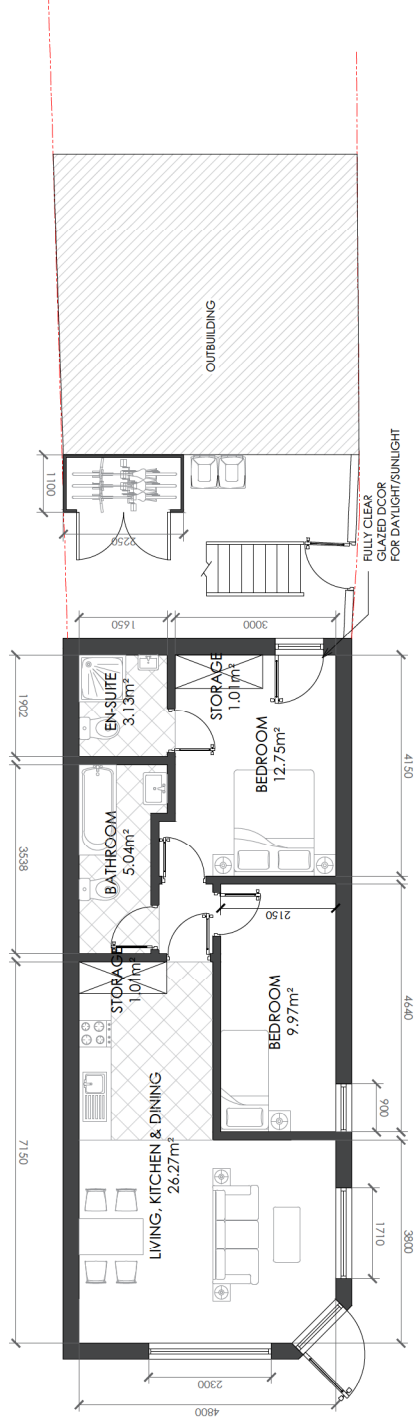
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DRAWN BY: MC
REVISION: -
DATE: 02 SEPTEMBER 2021
CHECKED BY: MA



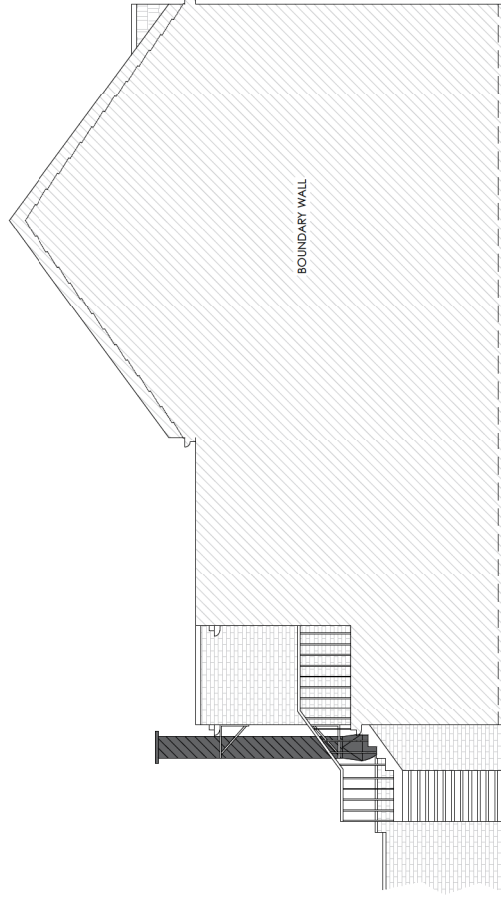
PROPOSED FRONT ELEVATION
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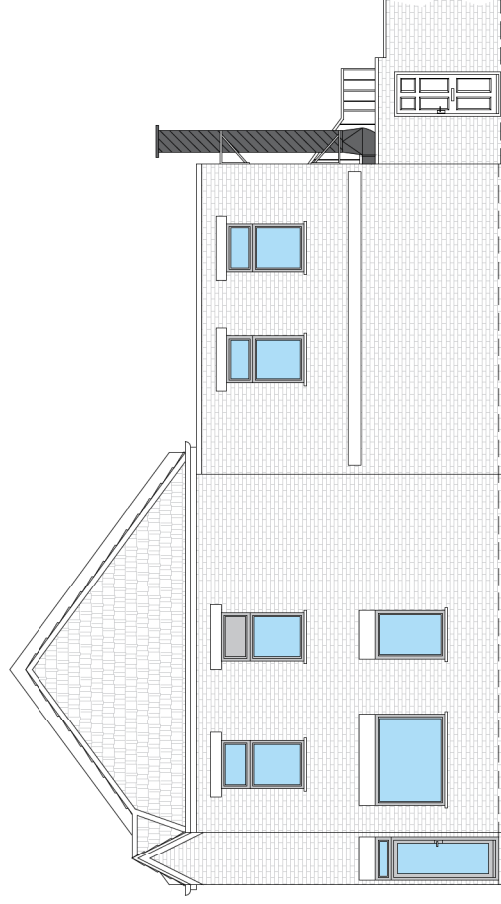
PROPOSED REAR ELEVATION
1:100



PROPOSED GROUND FLOOR PLAN
1:100



PROPOSED SIDE ELEVATION
1:100



PROPOSED SIDE ELEVATION
1:100



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PROPOSED PLANS AND ELEVATIONS

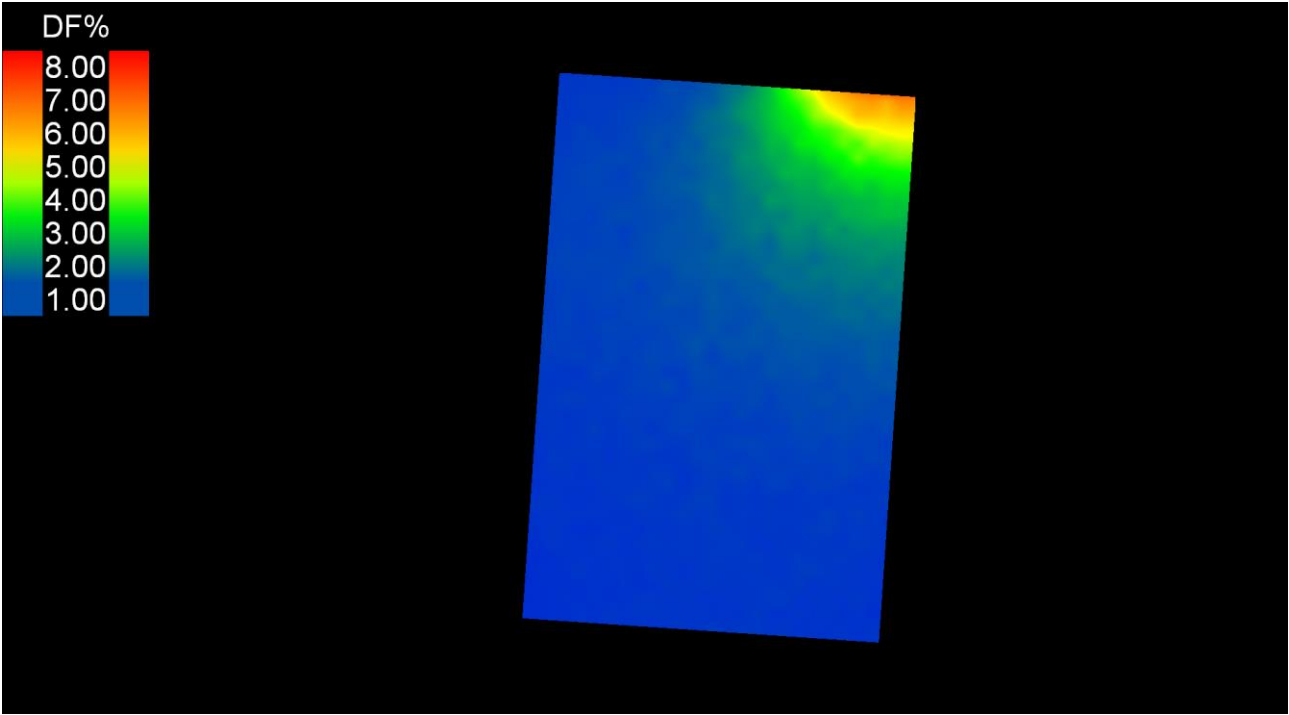
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DRAWN BY:	MC		

APPENDIX 2

Average Daylight Factor (ADF) gradient maps.



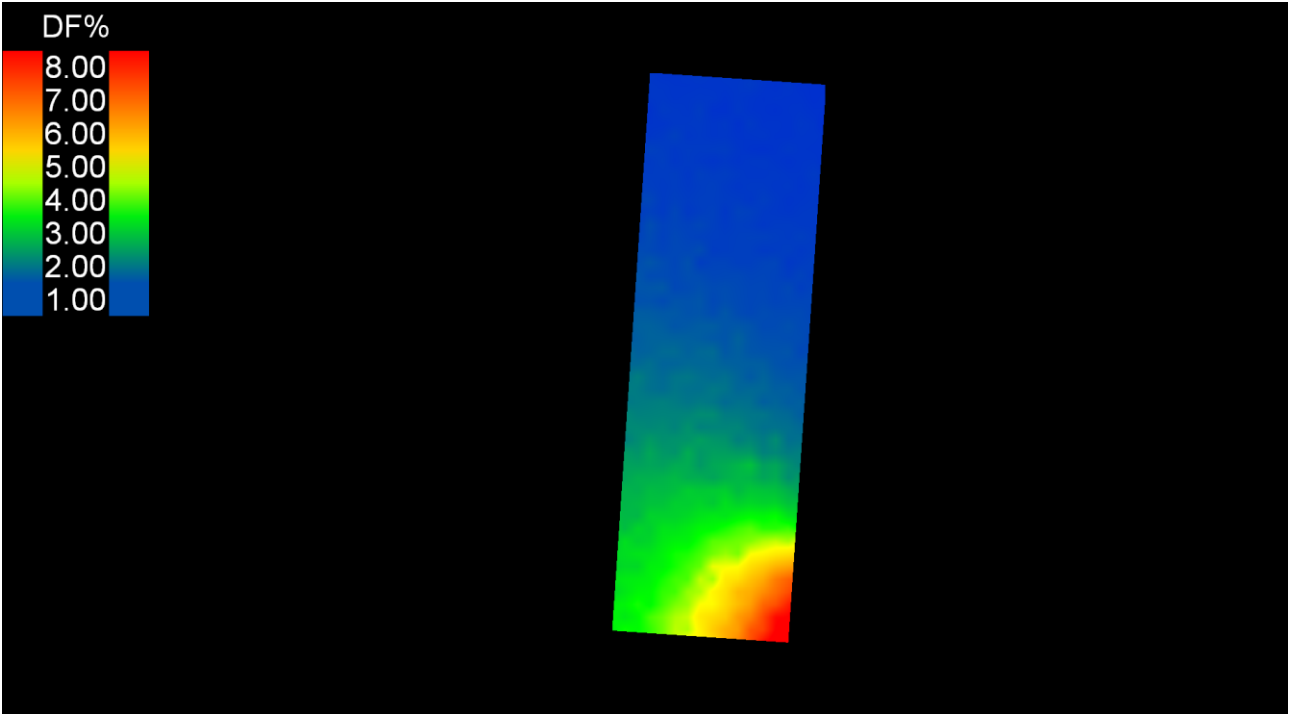
w_bedroom 1



Default

Average	$D_{average}$	1.12 DF[%]
Median	D_{median}	0.83 DF[%]
Minimum	D_{min}	0.56 DF[%]
Maximum	D_{max}	6.12 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.5008
Uniformity 2	D_{min}/D_{max}	0.0918

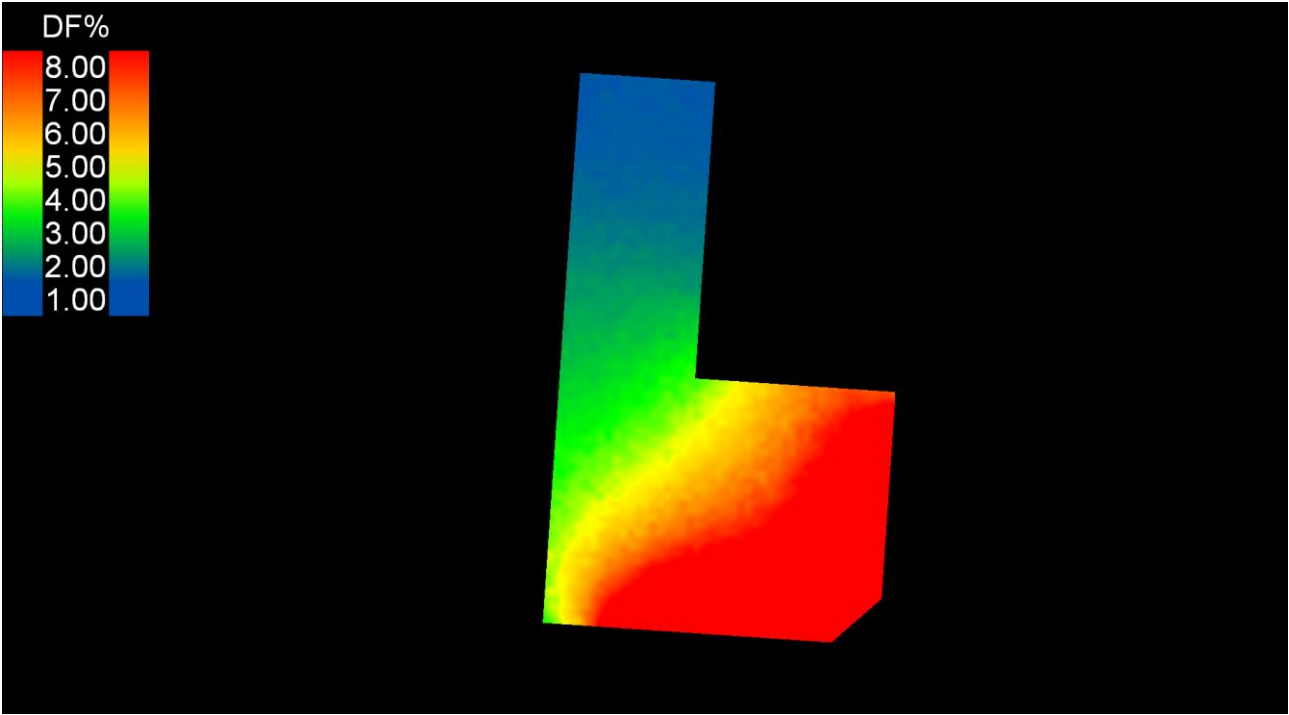
w_bedroom 2



Default

Average	$D_{average}$	1.83 DF[%]
Median	D_{median}	1.20 DF[%]
Minimum	D_{min}	0.59 DF[%]
Maximum	D_{max}	8.70 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.3242
Uniformity 2	D_{min}/D_{max}	0.0681

w_living kitchen dining



Default

Average	$D_{average}$	5.70 DF[%]
Median	D_{median}	4.61 DF[%]
Minimum	D_{min}	0.99 DF[%]
Maximum	D_{max}	17.96 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.1740
Uniformity 2	D_{min}/D_{max}	0.0552