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Daylight and Sunlight Study
118 Malden Road, London NW5 4BY

2 November 2017

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CONTENTS

1 EXECUTIVE SUMMARY

1.1 Overview

1.1.1 Right of Light Consulting has been commissioned by Dr Jill Dean to undertake a daylight and sunlight study in connection with the development at 118 Malden Road, London NW5 4BY. The aim of the study is to check whether or not the proposed development receives satisfactory levels of daylight and sunlight.

1.1.2 The study is based on the numerical tests laid down in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a good practice guide' by P J Littlefair 2011.

1.1.3 Appendix 1 identifies the windows analysed in this study. The numerical test results (including all calculation workings) are provided in Appendix 2. No sky line contours are presented in Appendix 3.

1.1.4 Right of Light Consulting confirms that the proposed development design achieves a very high level of compliance with the BRE recommendations. In our opinion there is no daylight/sunlight related reason why planning permission should not be granted for this scheme.

2 INFORMATION SOURCES

2.1 Documents Considered

2.1.1 This report is based on the following drawings:

Wharmby Kozdon architects

MR SK 101	Lower Ground Floor and Ground Floor Plans Existing	Rev –
MR SK 102	First and Second Floor Plans Existing	Rev –
MR SK 103	Third Floor and Roof Plans Existing	Rev –
MR SK 104	Front and Side Elevation Existing	Rev –
MR SK 106	Rear Elevation and Section AA Existing	Rev –
MR SK 107	Lower Ground Floor and Ground Floor Plans Proposed	Rev C
MR SK 108	First and Second Floor Plans Proposed	Rev –
MR SK 109	Third Floor and Rood Plans Proposed	Rev –
MR SK 110	Front and Side Elevation Proposed	Rev C
MR SK 111	Rear Elevation and Section AA Proposed	Rev B
MR SK 112	Block Plan	Rev –
MR SK 114	Existing and Proposed Rear Elevations	Rev –

3 METHODOLOGY OF THE STUDY

3.1 BRE Guide : Site Layout Planning for Daylight and Sunlight

3.1.1 The study is based on the numerical tests laid down in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a good practice guide' by P J Littlefair 2011.

3.1.2 The standards set out in the BRE guide are intended to be used flexibly. In instances where there is a special requirement for daylight or sunlight, higher levels may be deemed necessary. In other situations, such as with urban developments, lower daylight and sunlight levels may be unavoidable. The following statement is quoted directly from the BRE guide:

3.1.3 "The guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and this document should not be considered 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 because natural lighting is only one of the many factors in site layout design."

3.2 Interior Daylighting

3.2.1 The interior daylighting recommendations set out in BRE guide are based on British Standard BS 8206 Part 2 and the Chartered Institute of Building Services Engineers Applications Manual on window design. Collectively, the guides set out three main criteria for interior daylighting. These are summarised as follows:

3.2.2 Test 1 Average Daylight Factor *(df)*

The Average Daylight Factor can be calculated using the following formula:

$$df = \frac{T\ Aw\ \theta}{A\ (1-R^2)}\ \%$$

Where

T is the diffuse visible transmittance of the glazing (BRE standard of 0.68)
Aw is the net glazed area of the window (m^2)
A is the total area of the room surfaces (m^2)
R is their average reflectance
Θ is the angle of visible sky in degrees

The Average Daylight factor test is applied to habitable rooms within domestic properties. A kitchen is generally deemed to be a habitable room if it is large enough to accommodate a dining area. If the kitchen is small or if the property has a separate dining area then the accepted practice is to treat the kitchen as a non habitable room.

For the purpose of this study we have assumed BRE internal reflectance values pertaining to medium wooden floors, light painted walls and matte white painted ceilings.

The guide recommends an Average Daylight Factor of 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary lighting is provided. There are additional minimum recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

A special procedure is required for floor to ceiling windows such as patio doors. If part of a window is below the height of the working plane (a horizontal plane 0.85m above the floor in housing), this portion should be treated as a separate window. The ADF for this window has an extra factor applied to it, to take account of the reduced effectiveness of low level glazing in lighting the room. A value equal to the floor reflectance may be taken for this factor. The ADF for the portion of the window above the working plane is calculated in the normal way without this additional factor, and the ADFs for the two portions are added together.

3.2.3 Test 2 Room Depth

If a daylit room is lit by windows in one wall only, the depth of the room L should not exceed the limiting value given by:

$$\frac{L}{W} + \frac{L}{H} \leq \frac{2}{1-R_b}$$

Where

W is the room width
H is the window-head height above floor level
R_b is the average reflectance of the surfaces in the rear half of the room

3.2.4 Test 3 Position of the no sky line

If a significant area of the working plane lies beyond the no sky line (i.e. it receives no direct skylight), then the distribution of daylight in the room will look poor and supplementary electric lighting will be required.

The no sky line assessment is not applicable where a room derives its daylight solely from a light well or atrium. In these situations the room relies on borrowed light instead of direct skylight.

3.3 Sunlight to Windows

3.3.1 The BRE guide recommends that where possible each dwelling should have at least one main living room window that faces within 90 degrees of due south. However, the guide acknowledges that this is not always possible when it comes to flats.

3.3.2 The BRE sunlight tests should be applied to all main living rooms and conservatories which have a window which faces within 90 degrees of due south. The guide states that sunlight is viewed as less important in kitchens and bedrooms. In non-domestic buildings, any spaces which are deemed to have a specific requirement for sunlight should be checked.

3.3.3 The BRE guide recommends that main living room windows should receive 25% of the total annual probable sunlight hours, including 5% of the annual probable sunlight hours during the winter months between 21st September and 21st March.

3.4 Overshadowing to Gardens and Open Spaces

3.4.1 The availability of sunlight should be checked for all open spaces where sunlight is required. This would normally include:

- Gardens, usually the main back garden of a house
- Parks and playing fields
- Children's playgrounds
- Outdoor swimming pools and paddling pools
- Sitting out areas, such as those between non-domestic buildings and in public squares
- Focal points for views such as a group of monuments or fountains.

3.4.2 The BRE guide recommends that for an open space to appear adequately lit throughout the year, at least 50% of its area should receive two hours of sunlight on 21st March

4 RESULTS OF THE STUDY

4.1 Window Reference Points

4.1.1 Refer to Appendix 1 for a drawing which identifies the positions of the windows analysed in this study.

4.2 Numerical Results and No Sky Line Contours

4.2.1 The numerical test results including all calculation workings are provided in Appendix 2. No sky line contours for the habitable rooms are presented in Appendix 3.

4.3 Interior Daylighting

4.3.1 All rooms meet or surpass the BRE Average Daylight Factor targets.

4.3.2 All rooms pass the room depth test.

4.3.3 The BRE guide does not give fixed numerical pass/fail criteria for the No Sky Line test when applied to new dwellings (guidance is given for when this test is applied to existing neighbouring buildings). However, for completeness, we have illustrated the no sky line contours in Appendix 3.

4.4 Sunlight to Windows

4.4.1 The BRE guide explains that for apartments it may not be possible to have every living room facing with 90 degrees of due south. The guide goes on to explain that the number of north facing living rooms should be minimised. Figure 26 on page 15 of the guide illustrates an example of good layout design where only 1 out of 5 apartments (20%) have only north facing windows. In the case of the existing units at 118 Malden Road, none of the units have only north facing living room windows. The proposed development therefore satisfies the BRE direct sunlight to windows requirements.

4.5 Conclusion

4.5.1 Right of Light Consulting confirms that the proposed development design achieves a very high level of compliance with the BRE recommendations. In our opinion there is no daylight/sunlight related reason why planning permission should not be granted for this scheme.

5 CLARIFICATIONS

5.1 General

5.1.1 The report provided is solely for the use of the client and no liability to anyone else is accepted.

5.1.2 We have undertaken the survey following the guidelines of the RICS publication "Surveying Safely".

5.1.3 Where limited access is available, assumptions will have been made.

5.1.4 Right of Light Consulting have endeavoured to include in the report those matters, which they have knowledge of or of which they have been made aware, that might adversely affect the validity of the opinion given.

5.1.5 Right of Light Consulting will notify those instructing them immediately and confirm in writing if for any reason the report requires any correction or qualification.

5.1.6 This report is based upon and subject to the scope of work set out in Right of Light Consulting's quotation and standard terms and conditions.

5.1.7 Right of Light Consulting confirm that they have used their best endeavours to ensure that the facts stated in this report are correct and that the opinions expressed represent a true and complete professional opinion.

5.2 Project Specific

5.2.1 None.

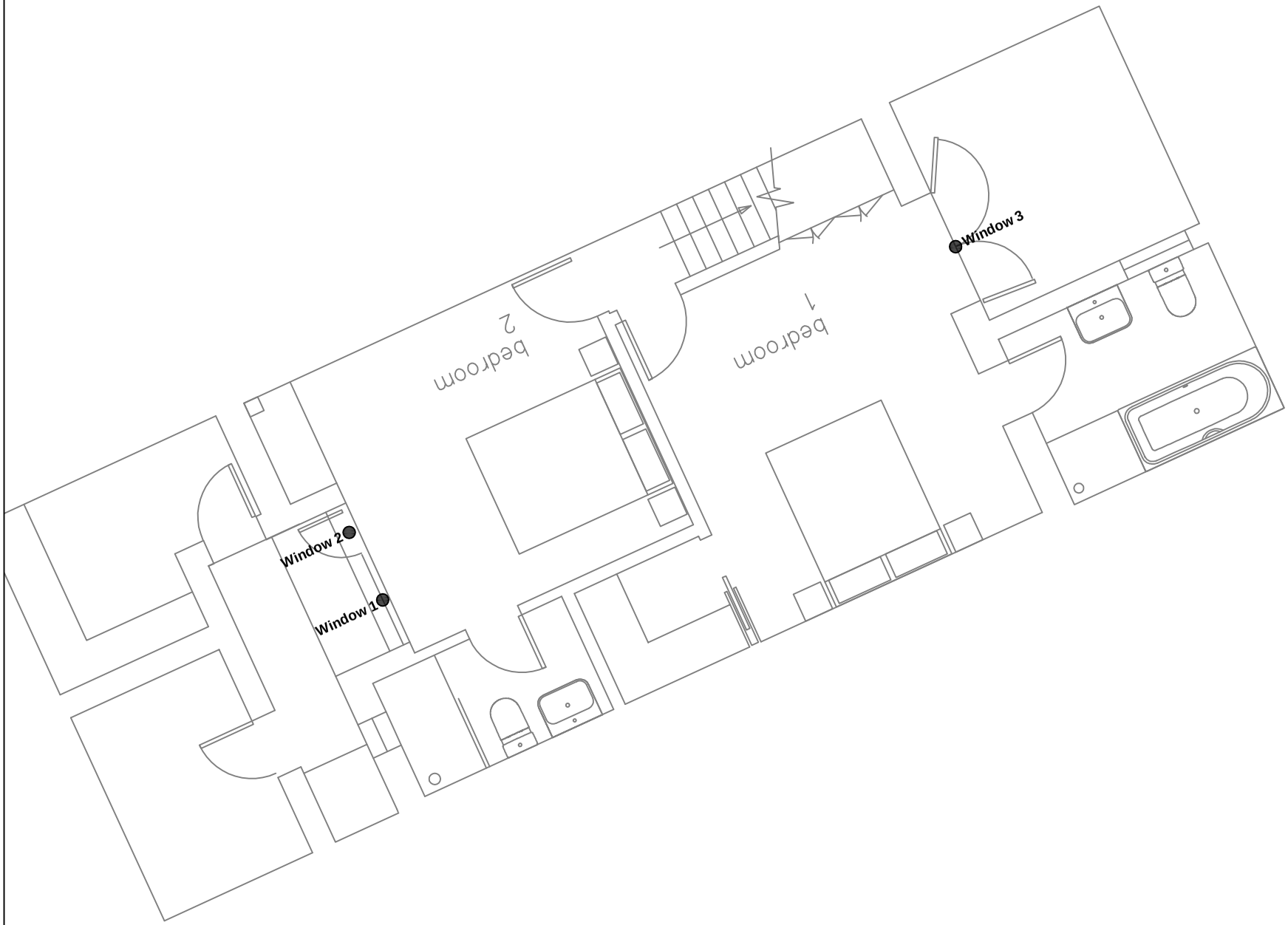
APPENDICES

APPENDIX 1

WINDOW KEY

Proposed Lower Ground Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: 118 Malden Road, London NW5 4BY

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 1 of 5 | Rev. -

Rev	Date	Details of revision

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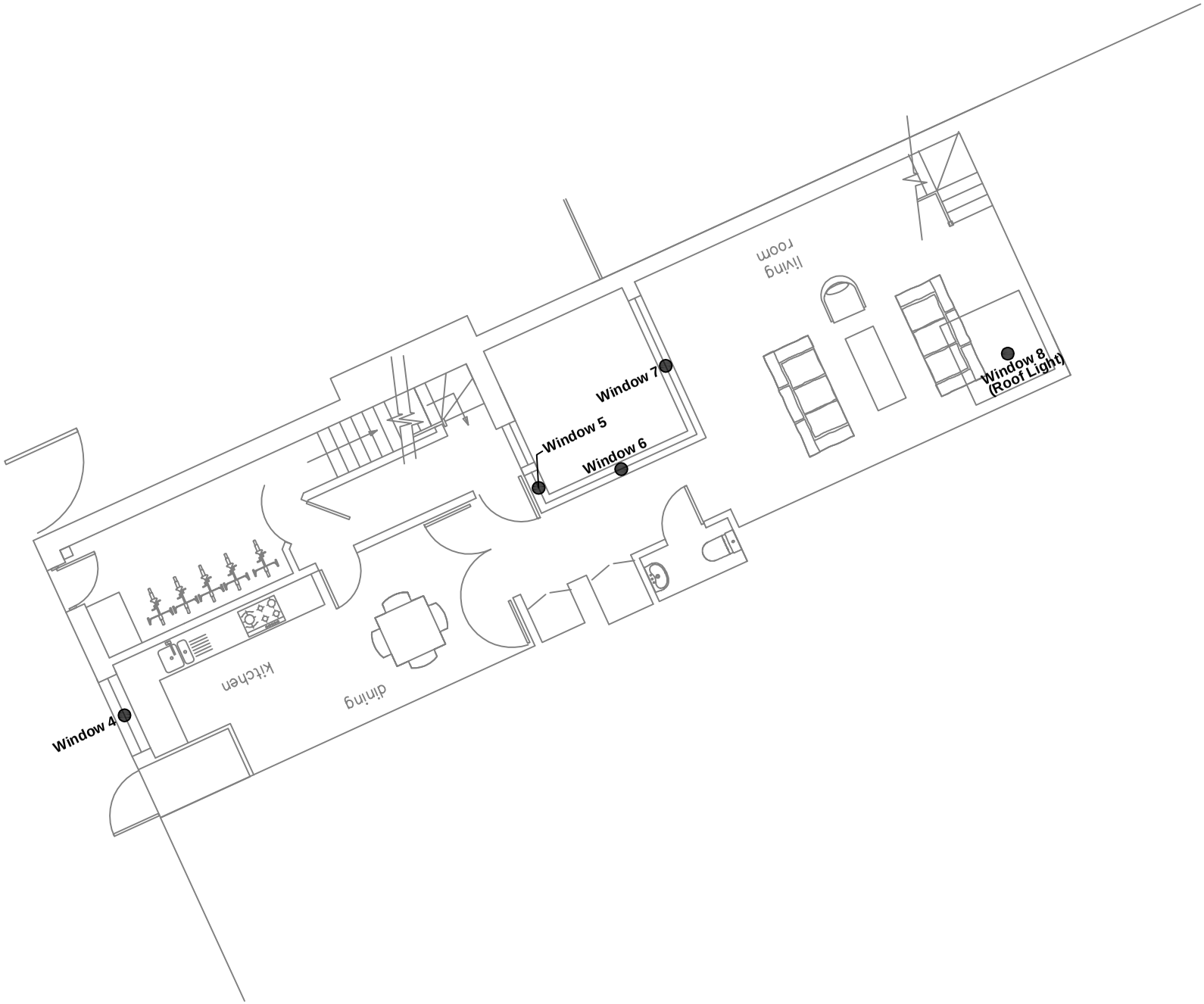
Proposed Ground Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: **118 Malden Road, London NW5 4BY**

Drawing Title: Window Key

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Drawing No: 2 of 5 | Rev. -

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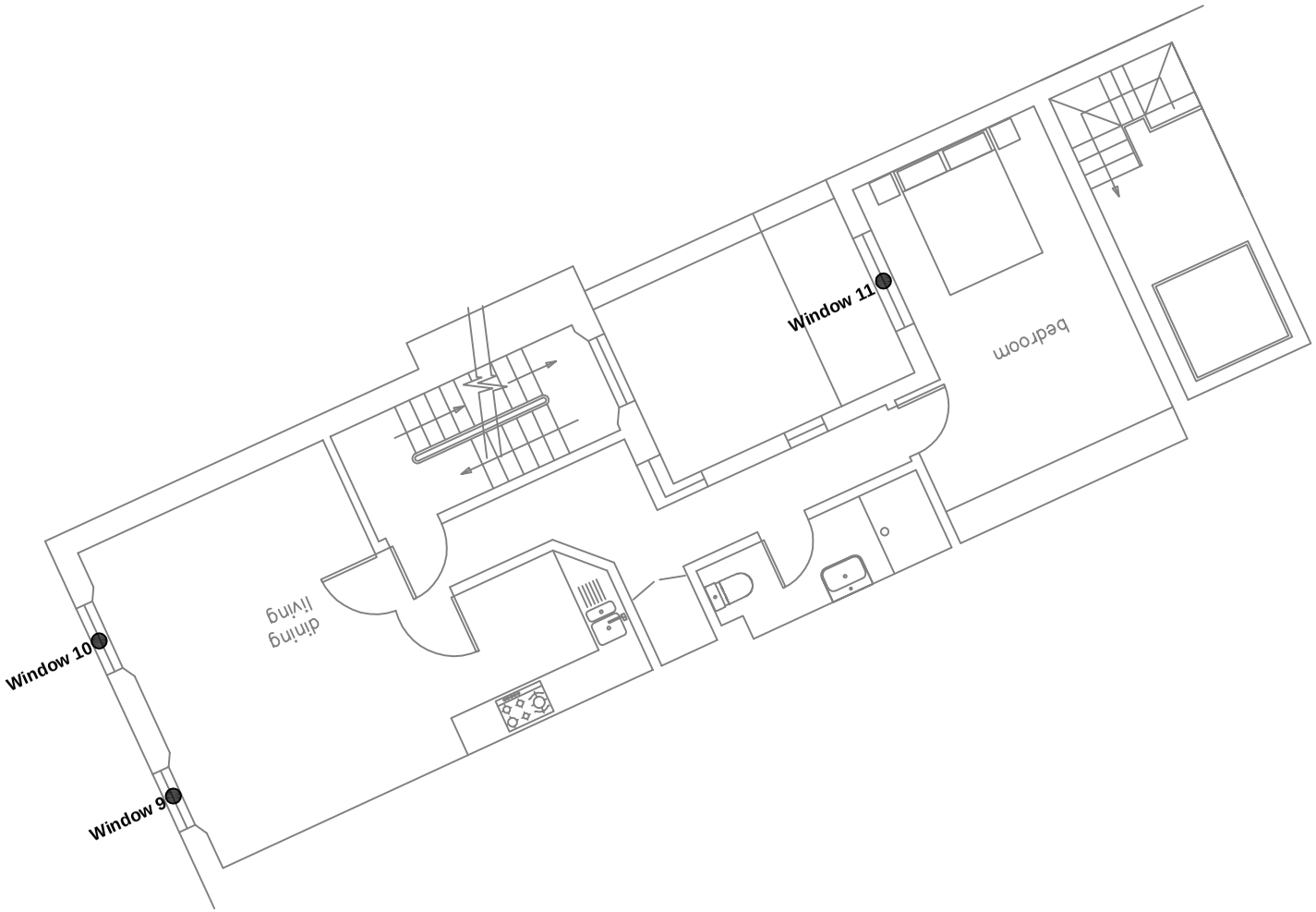
Proposed First Floor

Appendix 1 Window Key



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Window 1 ● Window reference

Project Name: **118 Malden Road, London NW5 4BY**

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 3 of 5 | Rev. -

Rev	Date	Details of revision

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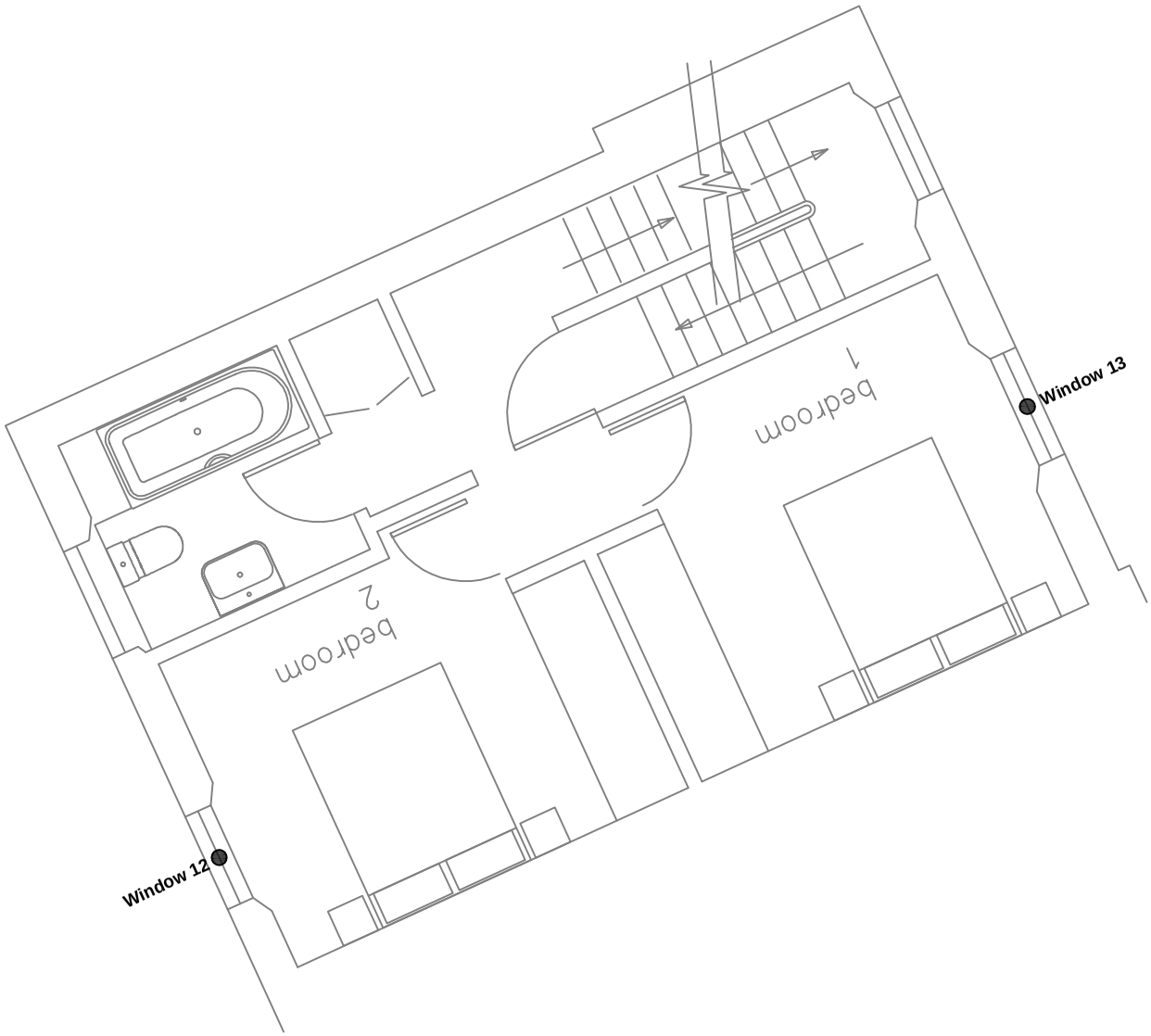
Proposed Second Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: **118 Malden Road, London NW5 4BY**

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 4 of 5 | Rev. -

Rev	Date	Details of revision

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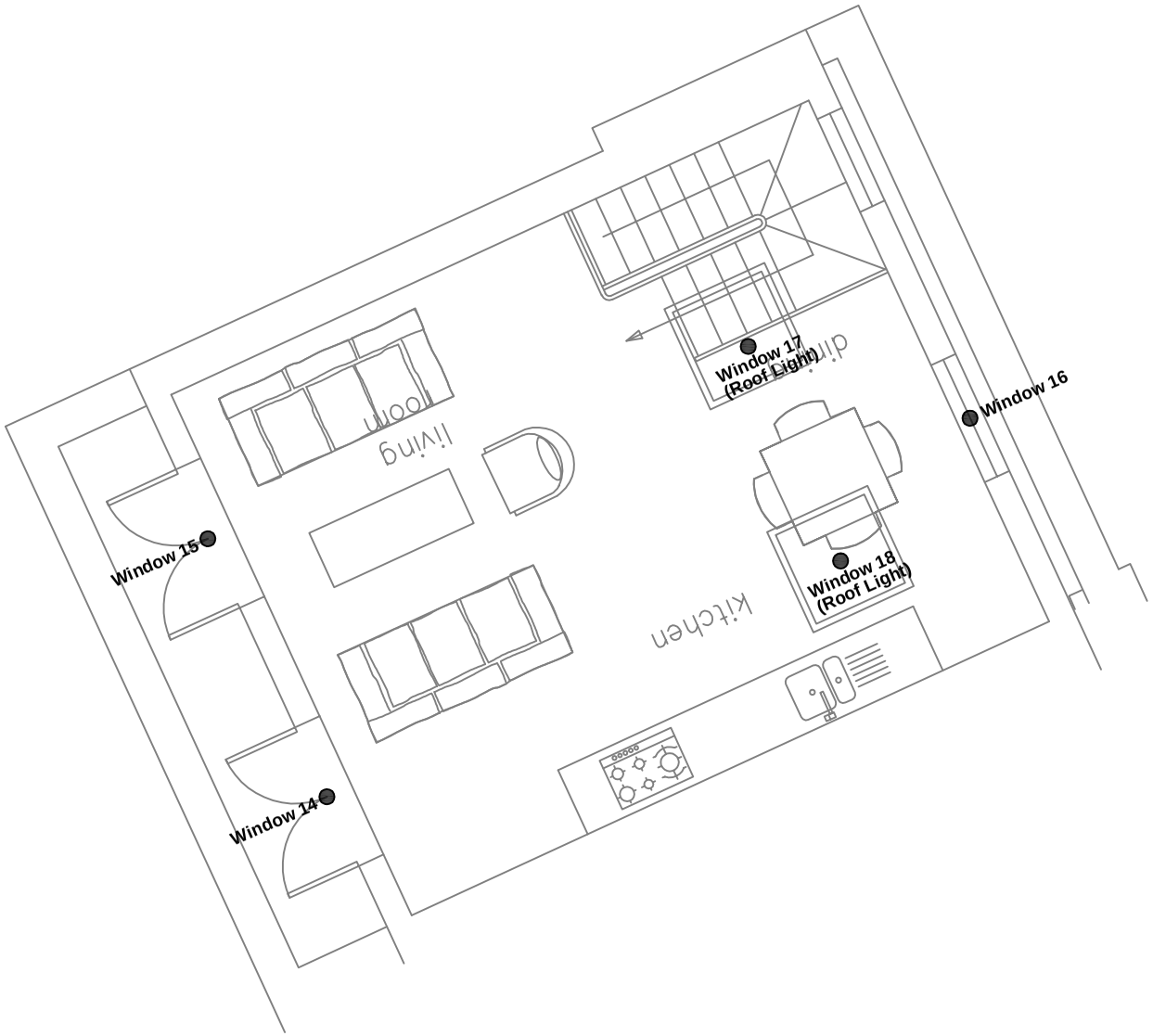
Proposed Third Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: 118 Malden Road, London NW5 4BY

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 5 of 5 | Rev. -

Rev	Date	Details of revision

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APPENDIX 2

DAYLIGHT AND SUNLIGHT CALCULATIONS

Appendix 2 - Average Daylight Factor (ADF)
118 Malden Road, London NW5 4BY

Reference	Target ADF based on room use		Average Daylight Factor Coefficients					Actual ADF	
	Primary room use	ADF	T	Aw	A	R	Theta	ADF	Result
Proposed Lower Ground Floor									
Window 1 (lower)			0.8	0.54	57.2	0.69	29.7	0.2%	
Window 1 (upper)			0.8	1.26	57.2	0.69	38.6	1.3%	
Window 2 (lower)			0.8	0.29	57.2	0.69	28.5	0.1%	
Window 2 (upper)			0.8	0.66	57.2	0.69	35.7	0.6%	
Total ADF for room	Bedroom	1.0%						**2.2%**	**Pass**
Window 3 (lower)			0.8	0.95	64.6	0.69	19.5	0.2%	
Window 3 (upper)			0.8	1.53	64.6	0.69	22.2	0.8%	
Total ADF for room	Bedroom	1.0%						**1.0%**	**Pass**
Proposed Ground Floor									
Window 4	Dining / Kitchen	2.0%	0.8	2.12	95.16	0.72	80.0	**2.9%**	**Pass**
Window 5 (lower)			0.8	0.34	157.1	0.67	25.4	0.0%	
Window 5 (upper)			0.8	0.59	157.1	0.67	29.8	0.2%	
Window 6 (lower)			0.8	1.86	157.1	0.67	20.4	0.1%	
Window 6 (upper)			0.8	3.17	157.1	0.67	23.4	0.7%	
Window 7 (lower)			0.8	1.75	157.1	0.67	15.4	0.1%	
Window 7 (upper)			0.8	2.98	157.1	0.67	17.3	0.5%	
Window 8			0.8	1.94	157.1	0.67	83.1	1.5%	
Total ADF for room	Living Room	1.5%						**3.1%**	**Pass**
Proposed First Floor									
Window 9			0.8	1.59	132.18	0.71	83.7	1.6%	
Window 10			0.8	1.83	132.18	0.71	83.9	1.9%	
Total ADF for room	Living / Dining / Kitchen	2.0%						**3.5%**	**Pass**
Window 11	Bedroom	1.0%	0.8	1.43	78.59	0.71	33.9	**1.0%**	**Pass**
Proposed Second Floor									
Window 12 (lower)			0.8	0.27	59.7	0.71	86.7	0.3%	
Window 12 (upper)			0.8	1.06	59.7	0.71	87.7	2.5%	
Total ADF for room	Bedroom	1.0%						**2.8%**	**Pass**
Window 13 (lower)			0.8	0.1	60.69	0.71	71.3	0.1%	
Window 13 (upper)			0.8	1.43	60.69	0.71	74.8	2.8%	
Total ADF for room	Bedroom	1.0%						**2.9%**	**Pass**
Proposed Third Floor									
Window 14 (lower)			0.8	0.96	119.93	0.67	57.8	0.3%	
Window 14 (upper)			0.8	1.29	119.93	0.67	84.2	1.3%	
Window 15 (lower)			0.8	0.96	119.93	0.67	60.9	0.3%	
Window 15 (upper)			0.8	1.29	119.93	0.67	88.6	1.4%	
Window 16			0.8	0.86	119.93	0.67	89.4	0.9%	
Window 17			0.8	0.84	119.93	0.67	155.7	1.6%	
Window 18			0.8	0.84	119.93	0.67	153.4	1.6%	
Total ADF for room	Living / Kitchen	2.0%						**7.4%**	**Pass**

Appendix 2 - Room Depth Calculation
118 Malden Road, London NW5 4BY

Room	Room Depth Coefficients				Room Depth Calculation			Result
	L	W	H	Rb	L/W + L/H	<=	2/1-Rb	
Proposed Lower Ground Floor								
Window 1	3.6	3.5	2.2	0.69	2.66	<=	6.43	Pass
Window 2	3.6	3.5	2.2	0.69	2.66	<=	6.43	Pass
Window 3	3.7	4.1	2.2	0.69	2.58	<=	6.49	Pass
Proposed Ground Floor								
Window 4	7.0	2.9	2.7	0.72	5.01	<=	7.05	Pass
Window 5	1.0	2.1	2.3	0.67	0.91	<=	5.98	Pass
Window 6	1.7	10.6	2.3	0.67	0.9	<=	5.98	Pass
Window 7	6.4	4.8	2.3	0.67	4.12	<=	5.98	Pass
Proposed First Floor								
Window 9	7.1	5.1	3.0	0.71	3.76	<=	6.91	Pass
Window 10	7.1	5.1	3.0	0.71	3.76	<=	6.91	Pass
Window 11	3.0	5.4	2.2	0.71	1.92	<=	6.88	Pass
Proposed Second Floor								
Window 12	4.1	3.3	2.3	0.71	3.03	<=	7.0	Pass
Window 13	4.0	3.3	2.5	0.71	2.81	<=	6.9	Pass
Proposed Third Floor								
Window 14	6.5	5.3	2.0	0.67	4.48	<=	6.06	Pass
Window 15	6.5	5.3	2.0	0.67	4.48	<=	6.06	Pass

Appendix 2 - Sunlight to Windows
118 Malden Road, London NW5 4BY

Reference	Use Class	Annual Probable Sunlight Hours	
		Total	Winter
Proposed Ground Floor			
Window 4	Dining / Kitchen	56%	17%
Window 5	Living Room	0%	0%
Window 6	Living Room	0%	0%
Window 7	Living Room	0%	0%
Window 8	Living Room	2%	0%
Proposed First Floor			
Window 9	Living / Dining / Kitchen	58%	19%
Window 10	Living / Dining / Kitchen	58%	19%
Proposed Third Floor			
Window 14	Living / Kitchen	56%	17%
Window 15	Living / Kitchen	60%	21%
Window 16	Living / Kitchen	41%	7%
Window 17	Living / Kitchen	97%	28%
Window 18	Living / Kitchen	97%	27%

APPENDIX 3

NO SKY LINE CONTOURS

Appendix 3 No Sky Line Contours

Proposed Lower Ground Floor at 118 Malden Road

Key:

1 Window reference

Area receives no direct sky light (applied to habitable rooms)

Area does receive direct sky light.

Light aperture.

Project Name:	118 Malden Road, London NW5 4BY
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	1 of 5
Rev.	-

Rev	Date	Details of revision

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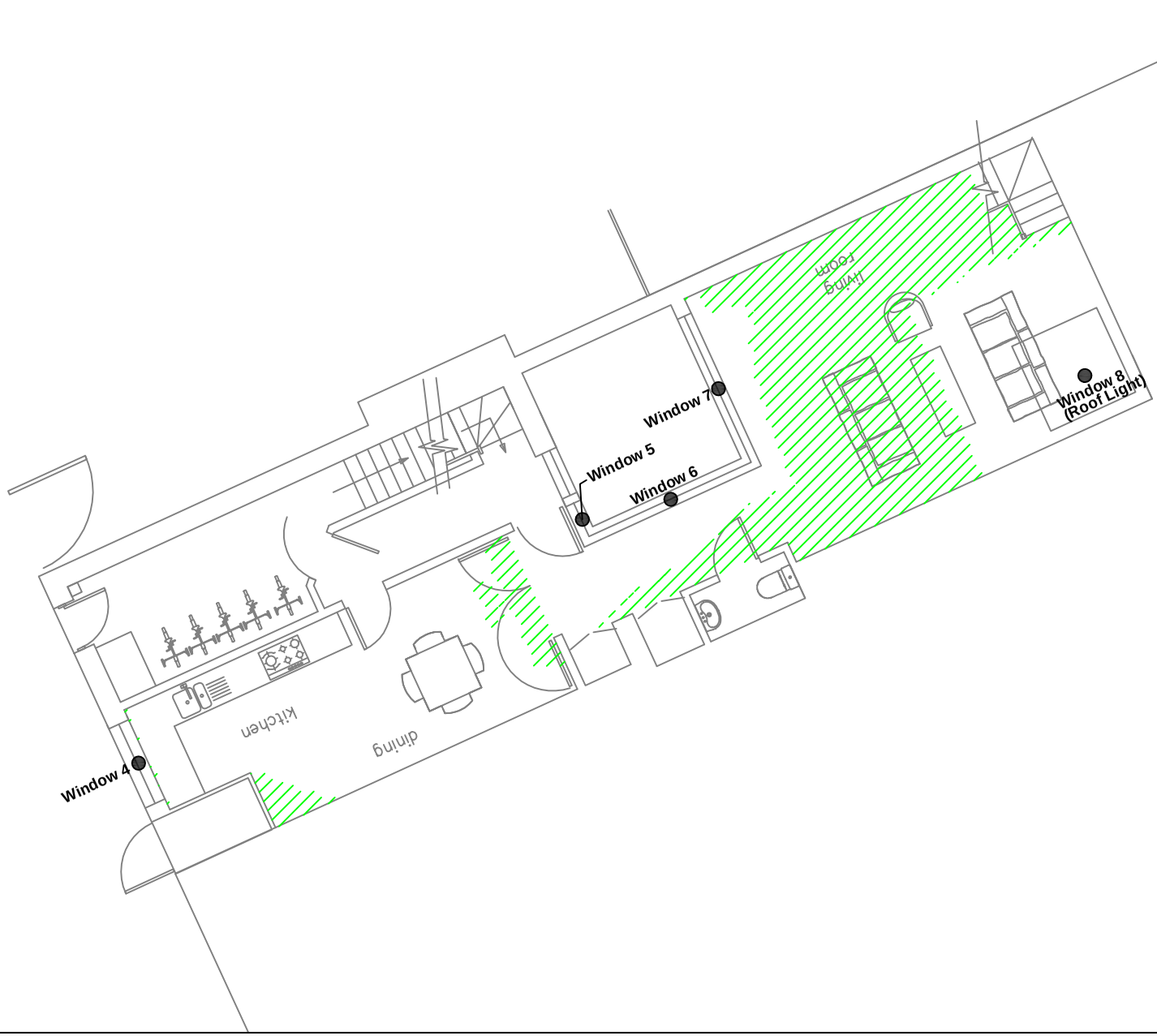
Appendix 3 No Sky Line Contours

Proposed Ground Floor at 118 Malden Road



Key:

1 Window reference

Area receives no direct sky light (applied to habitable rooms)

Area does receive direct sky light.

Light aperture.

Project Name:	118 Malden Road, London NW5 4BY
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	2 of 5
Rev.	-

Rev	Date	Details of revision

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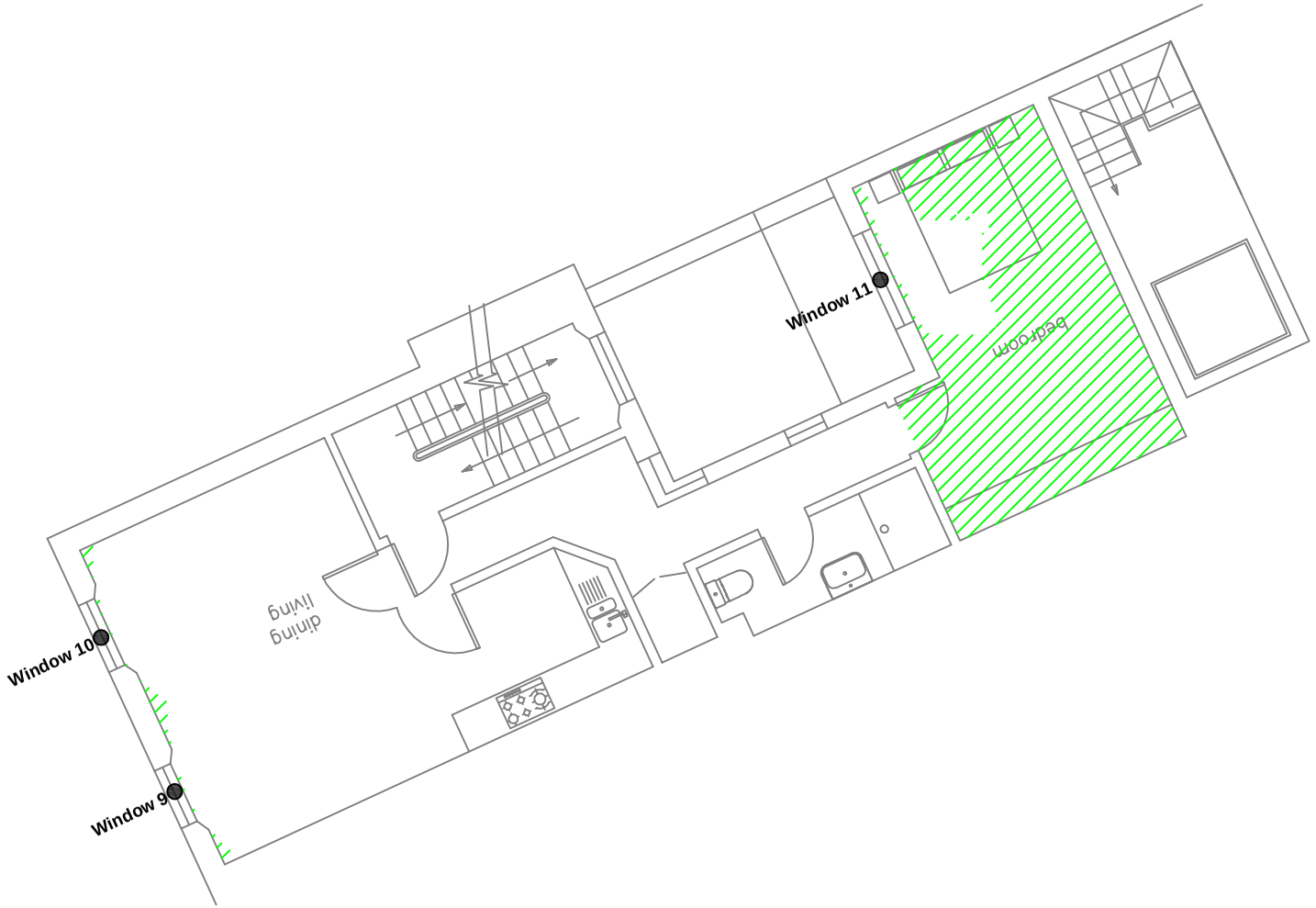
Appendix 3 No Sky Line Contours

Proposed First Floor at 118 Malden Road



Key:

1
Window reference

Area receives no direct sky light (applied to habitable rooms)

Area does receive direct sky light.

Light aperture.

Project Name:	118 Malden Road, London NW5 4BY
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	3 of 5
Rev.	-

Rev	Date	Details of revision

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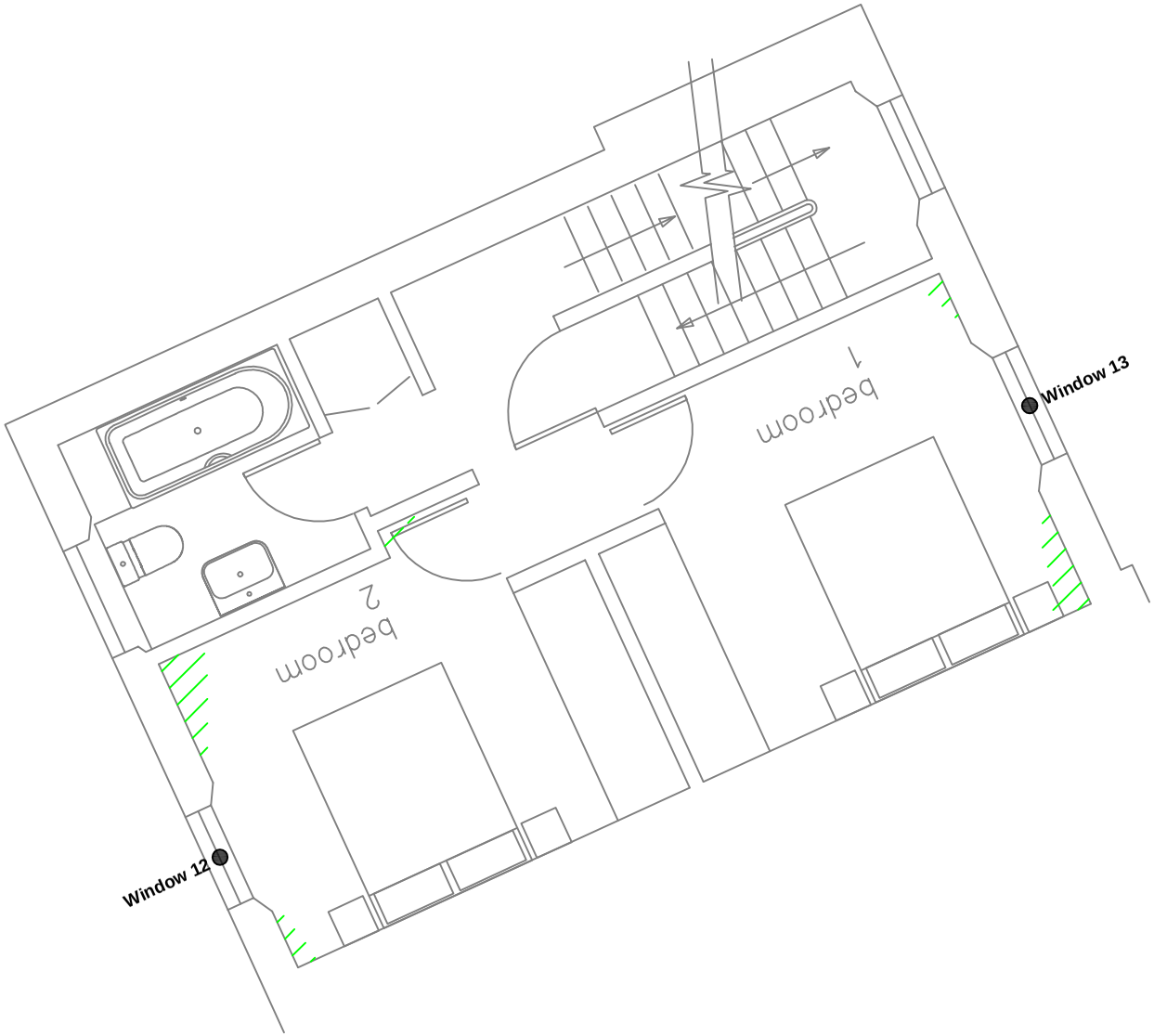
Appendix 3 No Sky Line Contours

Proposed Second Floor at 118 Malden Road



Key:

1 Window reference

Area receives no direct sky light (applied to habitable rooms)

Area does receive direct sky light.

Light aperture.

Project Name:	118 Malden Road, London NW5 4BY
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	4 of 5
Rev.	-

Rev	Date	Details of revision

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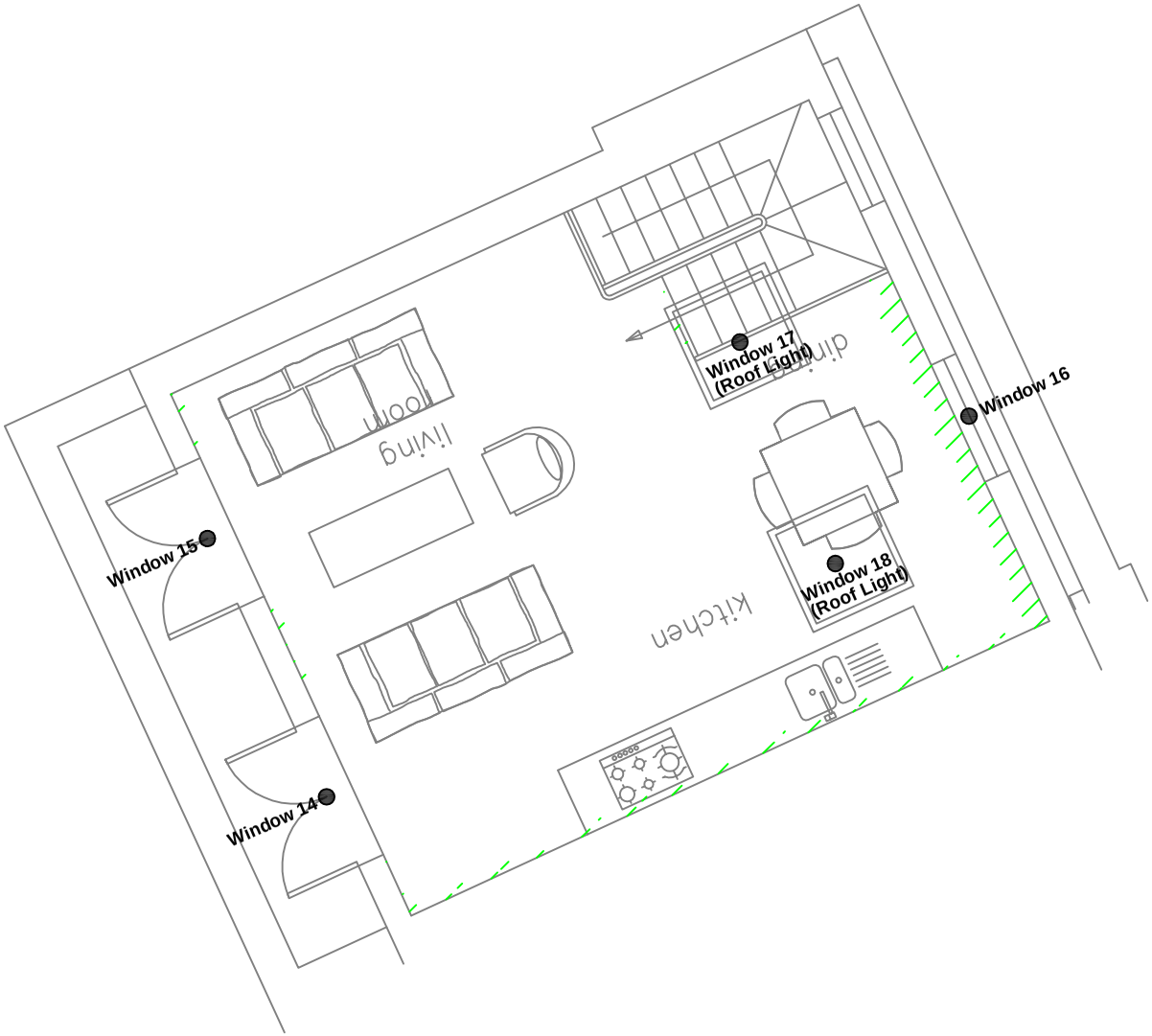
Appendix 3 No Sky Line Contours

Proposed Third floor at 118 Malden Road



Key:

1 Window reference

Area receives no direct sky light (applied to habitable rooms)

Area does receive direct sky light.

Light aperture.

Project Name:	118 Malden Road, London NW5 4BY
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	5 of 5
Rev.	-

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