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Daylight and Sunlight Study (Within Development)
1 Dumpton Place, London NW1 8JB

15th November 2011

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1 EXECUTIVE SUMMARY

1.1 Overview

1.1.1 Right of Light Consulting has been commissioned to undertake a daylight and sunlight study in connection with the development at 1 Dumpton Place, London NW1 8JB. The aim of the study is to check whether or not the proposed habitable rooms receive 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 1991.

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 design satisfies all of the requirements set out in the BRE guide 'Site Layout Planning for Daylight and Sunlight'.

2 INFORMATION SOURCES

2.1 Documents Considered

2.1.1 This report is based on the following drawings:

PMA Chartered Architects

1001	Location Plan and Existing Site Plan	Rev –
1002	Existing Plans	Rev –
1003	Existing Elevations	Rev –
1004	Existing Sections	Rev –
5001	Proposed Site Plan	Rev –
5002	Proposed Basement Plan	Rev –
5003	Proposed Ground Floor Plan	Rev –
5004	Proposed First Floor Plan	Rev –
5005	Proposed Second Floor Plan	Rev –
5006	Proposed Third Floor Plan	Rev –
5007	Proposed Roof Plan	Rev –
5011	North & East Elevations	Rev –
5012	South & West Elevations	Rev –
5013	Perspective Views	Rev –
5021	Sections A – A, B – B, C – C	Rev –
5022	Sections D – D, E – E, F – F	Rev –
5023	Sections Height Study	Rev –

Ramsden and Partners Chartered Architects

001	Block Plan	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 various numerical tests laid down in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a guide to good practice' 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 209 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
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.

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.

3.3.4 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.

The BRE guide recommends that at least 50% of the area of each amenity space listed above should receive at least 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 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 Living rooms and conservatories which face within 90 degrees of due south have been tested for direct sunlight. The results are presented in Appendix 2. Not all windows receive ideal levels of direct sunlight. However, the BRE guide acknowledges that it is not always possible for every dwelling to be well situated to receive direct sunlight.

4.5 Conclusion

4.5.1 Right of Light Consulting confirms that the proposed design satisfies all of the requirements set out in the BRE guide ‘Site Layout Planning for Daylight and Sunlight’.

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, reasonable 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 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

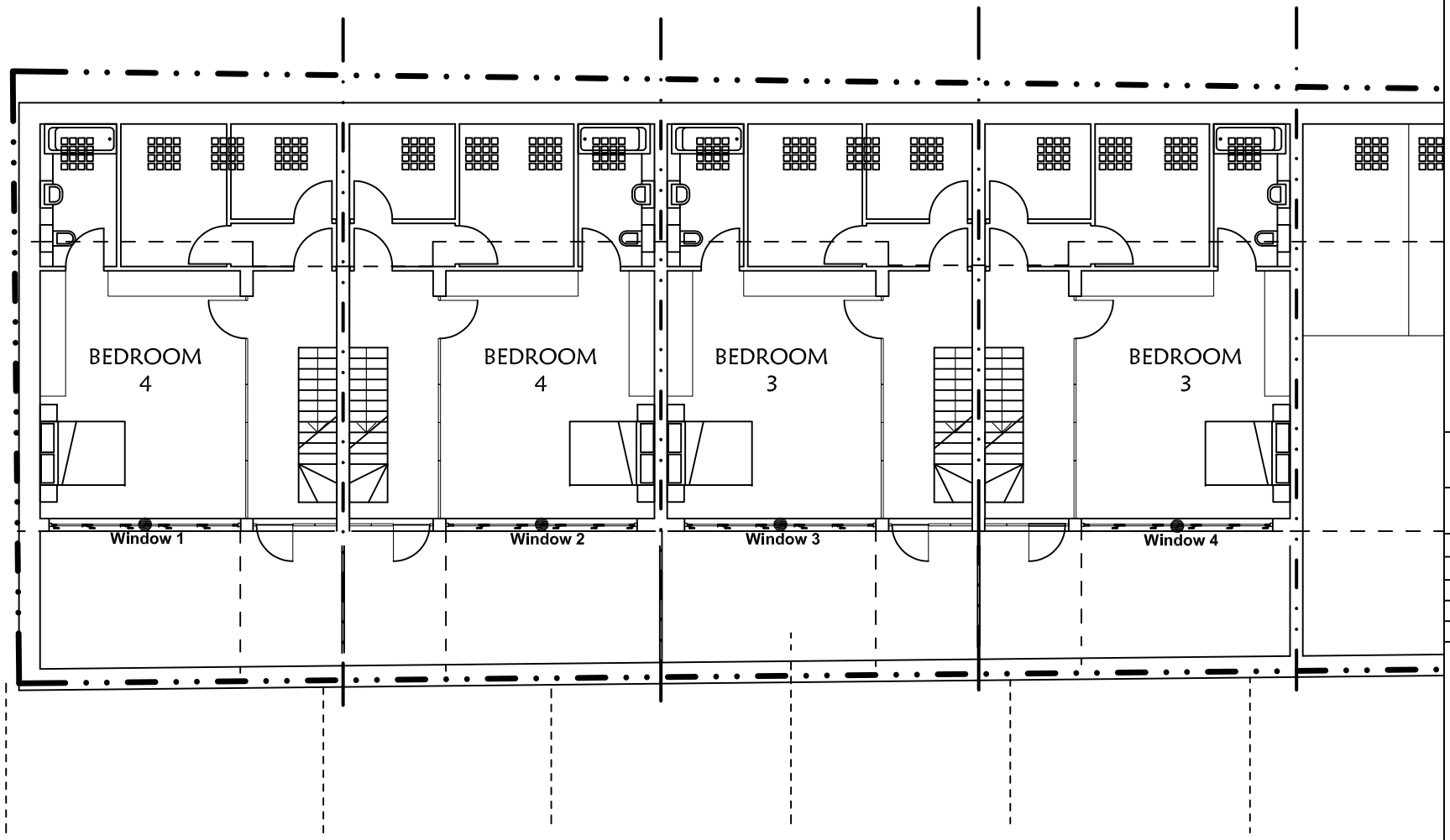
APPENDICES

APPENDIX 1

WINDOW KEY

Proposed Basement Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 1 of 4 | Rev. –

Rev	Date	Details of revision

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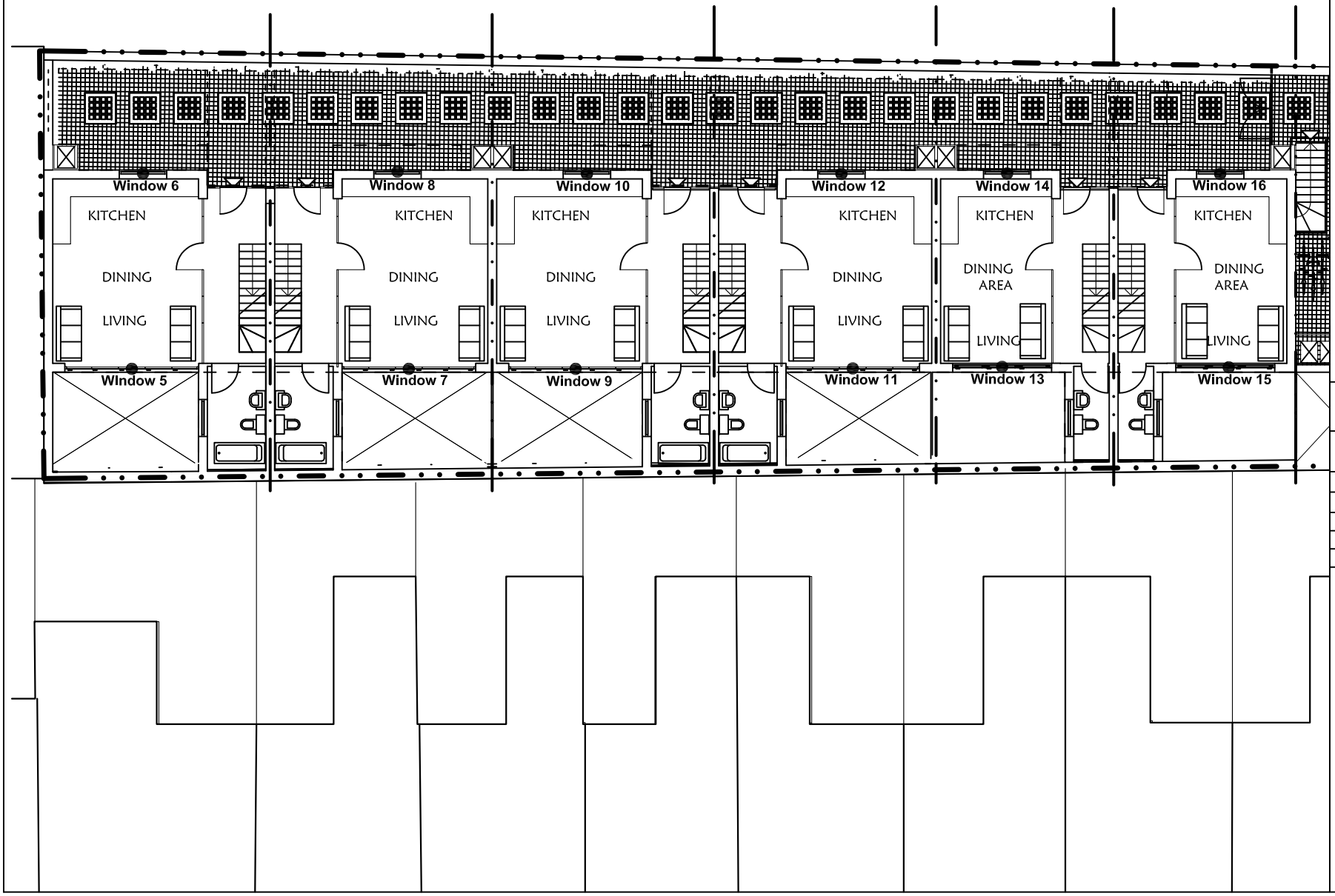
Proposed Ground Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 2 of 4 | Rev. –

Rev	Date	Details of revision

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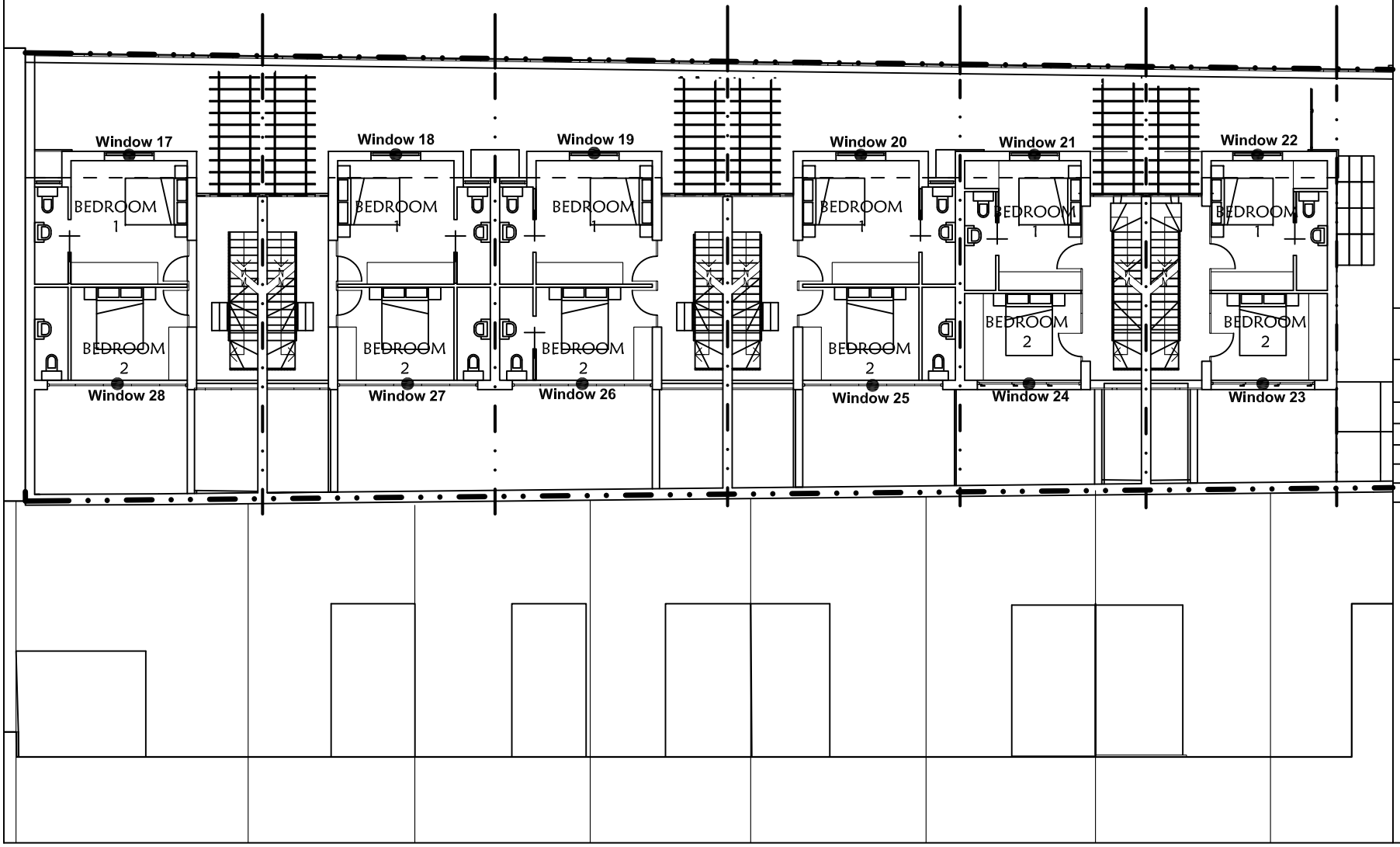
Proposed First Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 3 of 4 | Rev. –

Rev	Date	Details of revision

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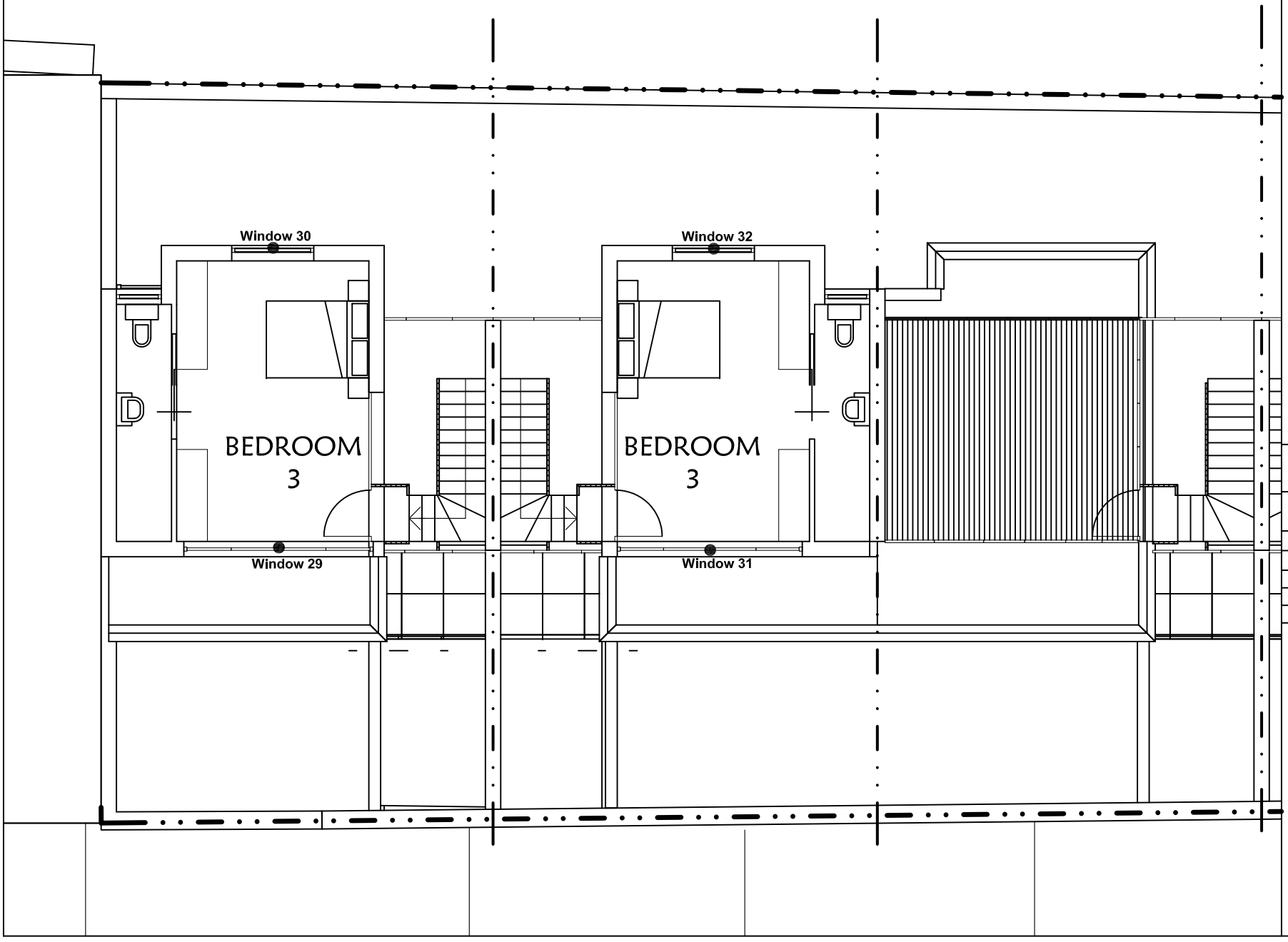
Proposed Second Floor

Appendix 1 Window Key



Key:

Window 1 ● Window reference

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 4 of 4 | Rev. –

Rev	Date	Details of revision

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APPENDIX 2

DAYLIGHT AND SUNLIGHT CALCULATIONS

Appendix 2 - Average Daylight Factor (ADF)
1 Dumpton Place, London NW1 8JB

Reference	Target ADF based on room use		Average Daylight Factor Coefficients					Actual ADF	
	Primary room use	ADF	T	Aw	A	R	Theta	ADF	Result
<u>Basement Floor</u>									
Window 1	Bedroom	1.0%	0.65	9.75	106.07	0.5	21.2	**1.7%**	**Pass**
Window 2	Bedroom	1.0%	0.65	9.73	111.22	0.5	21.8	**1.7%**	**Pass**
Window 3	Bedroom	1.0%	0.65	9.73	111.22	0.5	21.5	**1.6%**	**Pass**
Window 4	Bedroom	1.0%	0.65	9.73	111.22	0.5	20.8	**1.6%**	**Pass**
<u>Ground Floor</u>									
Window 5			0.65	9.77	115.01	0.5	37.3	2.7%	
Window 6			0.65	2.18	115.01	0.5	3.0	0.0%	
Total ADF for room	Kitchen/Living/Dining	2.0%						**2.7%**	**Pass**
Window 7			0.65	9.75	114.95	0.5	40.8	3.0%	
Window 8			0.65	2.18	114.95	0.5	2.8	0.0%	
Total ADF for room	Kitchen/Living/Dining	2.0%						**3.0%**	**Pass**
Window 9			0.65	9.75	114.95	0.5	40.8	3.0%	
Window 10			0.65	2.18	114.95	0.5	3.8	0.1%	
Total ADF for room	Kitchen/Living/Dining	2.0%						**3.1%**	**Pass**
Window 11			0.65	9.75	114.95	0.5	40.0	2.9%	
Window 12			0.65	2.18	114.95	0.5	3.3	0.1%	
Total ADF for room	Kitchen/Living/Dining	2.0%						**3.0%**	**Pass**
Window 13			0.65	7.21	94.66	0.5	38.4	2.5%	
Window 14			0.65	2.18	94.66	0.5	2.9	0.1%	
Total ADF for room	Kitchen/Living/Dining	2.0%						**2.6%**	**Pass**
Window 15			0.65	7.21	94.66	0.5	36.0	2.4%	
Window 16			0.65	2.18	94.66	0.5	4.3	0.1%	
Total ADF for room	Kitchen/Living/Dining	2.0%						**2.5%**	**Pass**
<u>First Floor</u>									
Window 17	Bedroom	1.0%	0.65	2.3	66.98	0.5	66.8	**2.0%**	**Pass**
Window 18	Bedroom	1.0%	0.65	2.3	66.98	0.5	68.1	**2.0%**	**Pass**
Window 19	Bedroom	1.0%	0.65	2.3	66.98	0.5	68.1	**2.0%**	**Pass**

Appendix 2 - Average Daylight Factor (ADF)
1 Dumpton Place, London NW1 8JB

Reference	Target ADF based on room use		Average Daylight Factor Coefficients					Actual ADF	
	Primary room use	ADF	T	Aw	A	R	Theta	ADF	Result
Window 20	Bedroom	1.0%	0.65	2.3	66.98	0.5	68.1	**2.0%**	**Pass**
Window 21	Bedroom	1.0%	0.65	2.3	62.22	0.5	67.9	**2.2%**	**Pass**
Window 22	Bedroom	1.0%	0.65	2.3	62.22	0.5	66.1	**2.1%**	**Pass**
Window 23	Bedroom	1.0%	0.65	5.61	52.44	0.5	51.7	**4.8%**	**Pass**
Window 24	Bedroom	1.0%	0.65	5.61	52.44	0.5	53.2	**4.9%**	**Pass**
Window 25	Bedroom	1.0%	0.65	7.59	54.9	0.5	53.6	**6.4%**	**Pass**
Window 26	Bedroom	1.0%	0.65	7.59	54.9	0.5	52.2	**6.3%**	**Pass**
Window 27	Bedroom	1.0%	0.65	7.59	54.9	0.5	51.5	**6.2%**	**Pass**
Window 28	Bedroom	1.0%	0.65	7.59	54.9	0.5	48.6	**5.8%**	**Pass**
Second Floor									
Window 29			0.65	6.64	85.37	0.5	62.8	4.2%	
Window 30			0.65	2.05	85.37	0.5	89.6	1.9%	
Total ADF for room	Bedroom	1.0%						**6.1%**	**Pass**
Window 31			0.65	6.64	85.37	0.5	64.4	4.3%	
Window 32			0.65	2.05	85.37	0.5	89.6	1.9%	
Total ADF for room	Bedroom	1.0%						**6.2%**	**Pass**

Appendix 2 - Room Depth Calculation
Project Name: 1 Dumpton Place, London NW1 8JB

Room	Room Depth Coefficients				Room Depth Calculation			Result
	L	W	H	Rb	L/W + L/H	<=	2/1-Rb	
Basement Floor								
Window 1	5.8	4.7	2.7	0.5	3.38	<=	4.0	Pass
Window 2	5.8	5.0	2.7	0.5	3.31	<=	4.0	Pass
Window 3	5.8	5.1	2.7	0.5	3.29	<=	4.0	Pass
Window 4	5.8	5.0	2.7	0.5	3.31	<=	4.0	Pass
Ground Floor								
Window 5	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 6	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 7	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 8	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 9	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 10	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 11	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 12	6.2	4.9	2.7	0.5	3.56	<=	4.0	Pass
Window 13	6.2	3.8	2.7	0.5	3.93	<=	4.0	Pass
Window 14	6.2	3.8	2.7	0.5	3.93	<=	4.0	Pass
Window 15	6.2	3.8	2.7	0.5	3.93	<=	4.0	Pass
Window 16	6.2	3.8	2.7	0.5	3.93	<=	4.0	Pass
First Floor								
Window 17	4.0	3.8	2.4	0.5	2.72	<=	4.0	Pass
Window 18	4.0	3.8	2.4	0.5	2.72	<=	4.0	Pass
Window 19	4.0	3.8	2.4	0.5	2.72	<=	4.0	Pass
Window 20	4.0	3.8	2.4	0.5	2.72	<=	4.0	Pass
Window 21	4.2	3.8	2.4	0.5	2.86	<=	4.0	Pass
Window 22	4.2	3.8	2.4	0.5	2.86	<=	4.0	Pass
Window 23	2.8	3.8	2.1	0.5	2.07	<=	4.0	Pass
Window 24	2.8	3.8	2.1	0.5	2.07	<=	4.0	Pass
Window 25	3.0	3.8	2.1	0.5	2.22	<=	4.0	Pass
Window 26	3.0	3.8	2.1	0.5	2.22	<=	4.0	Pass
Window 27	3.0	3.8	2.1	0.5	2.22	<=	4.0	Pass
Window 28	3.0	3.8	2.1	0.5	2.22	<=	4.0	Pass
Second Floor								
Window 29	5.5	3.8	2.3	0.5	3.84	<=	4.0	Pass
Window 30	5.5	3.8	2.2	0.5	3.95	<=	4.0	Pass
Window 31	5.5	3.8	2.3	0.5	3.84	<=	4.0	Pass
Window 32	5.5	3.8	2.2	0.5	3.95	<=	4.0	Pass

Appendix 2 - Sunlight to Windows
Project Name: 1 Dumpton Place, London NW1 8JB

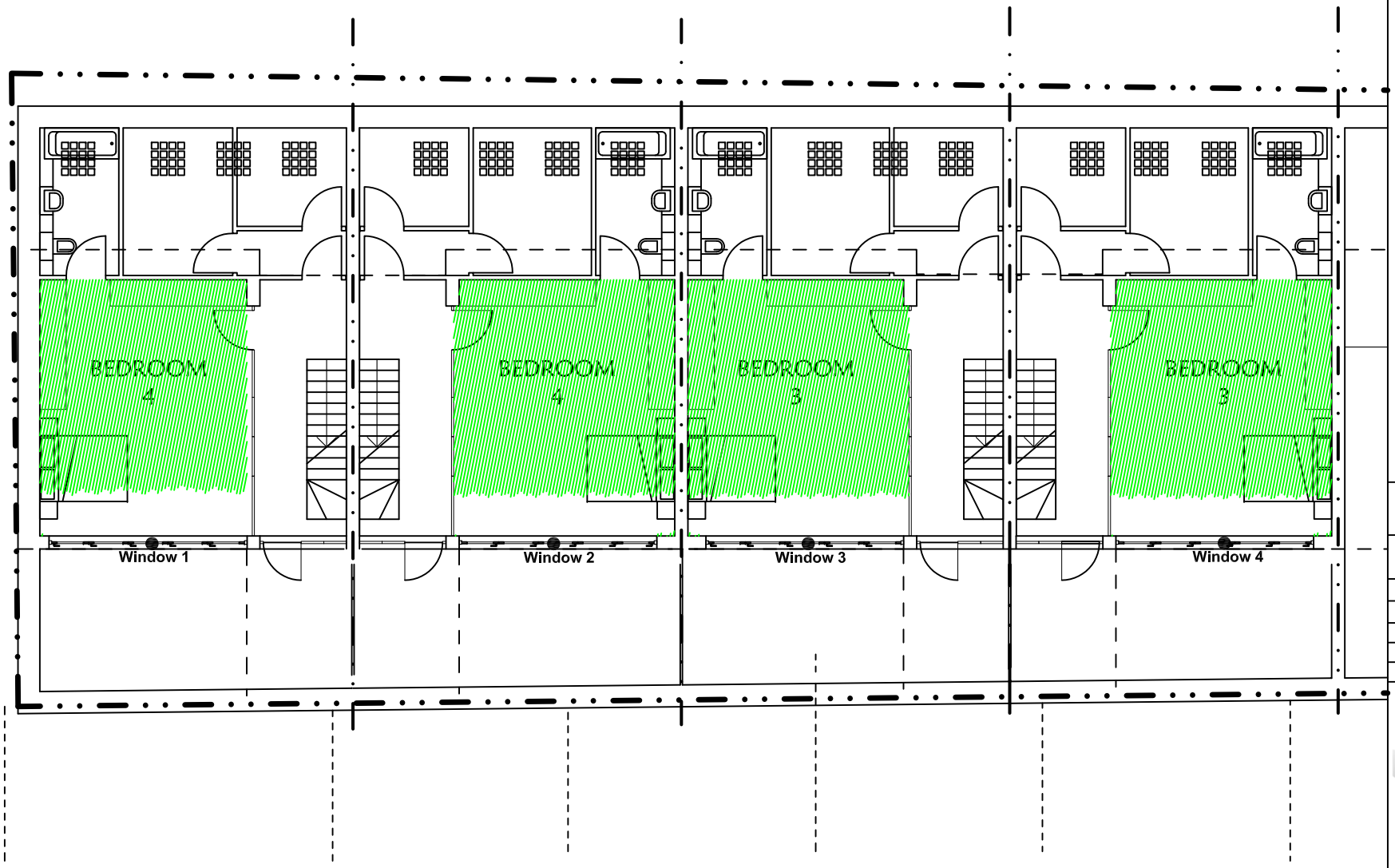
Reference	Use Class	Annual Probable Sunlight Hours	
		Total	Winter
Ground Floor			
Window 5	Kitchen/Living/Dining	22%	0%
Window 7	Kitchen/Living/Dining	28%	2%
Window 9	Kitchen/Living/Dining	23%	0%
Window 11	Kitchen/Living/Dining	27%	1%
Window 13	Kitchen/Living/Dining	19%	0%
Window 15	Kitchen/Living/Dining	18%	0%

APPENDIX 3

NO SKY LINE CONTOURS

Appendix 3 No Sky Line Contours

Proposed Basement floor



Key:

1 Window reference

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

Area does receive direct sky light.

Light aperture.

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: No Sky Line Contours

Scale: Do not scale

Drawing No: 1 of 4 | Rev. -

Rev	Date	Details of revision

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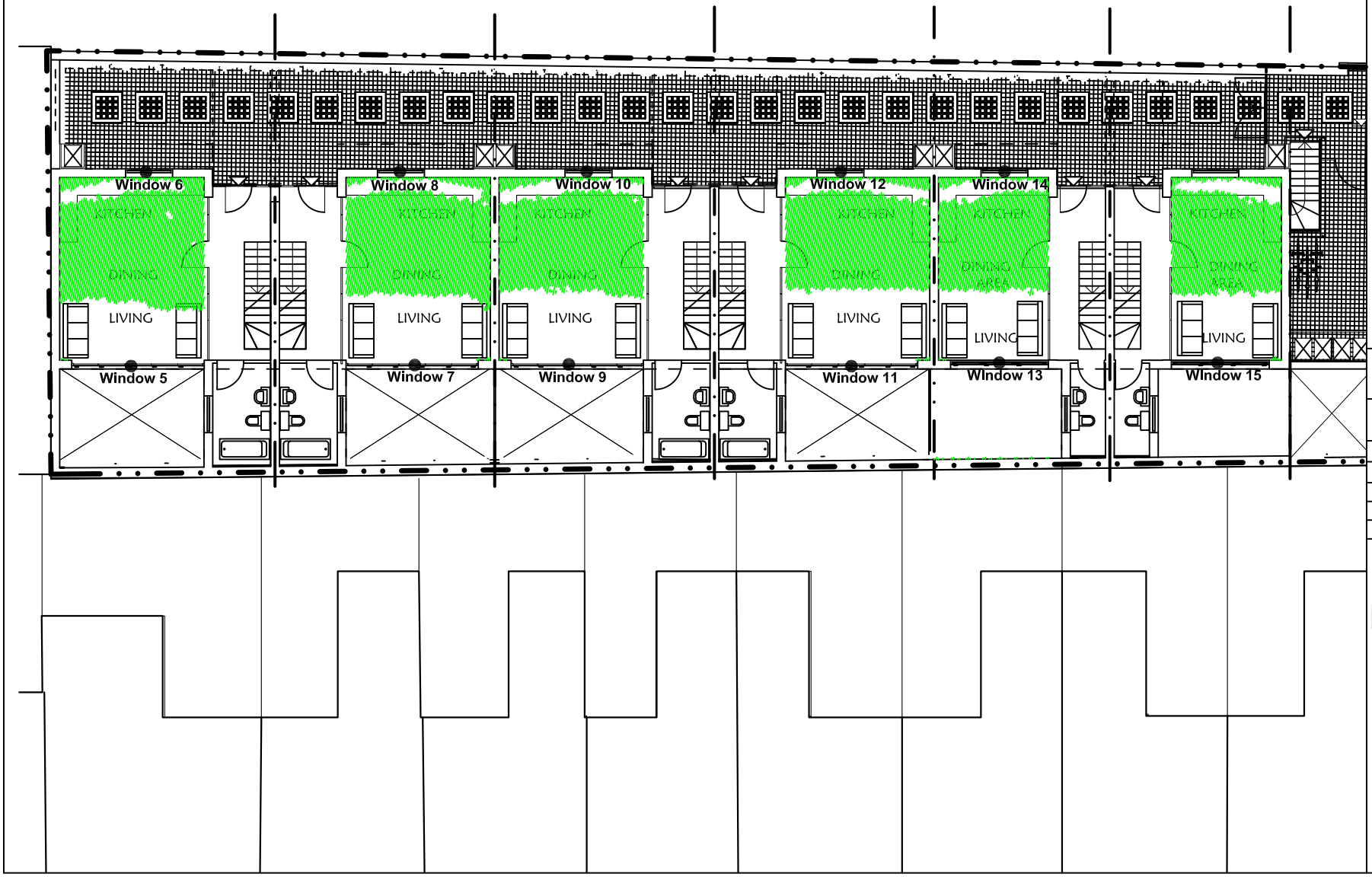
Appendix 3 No Sky Line Contours

Proposed Ground Floor



Key:

1 Window reference

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

Area does receive direct sky light.

Light aperture.

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: No Sky Line Contours

Scale: Do not scale

Drawing No: 2 of 4 Rev. -

Rev	Date	Details of revision

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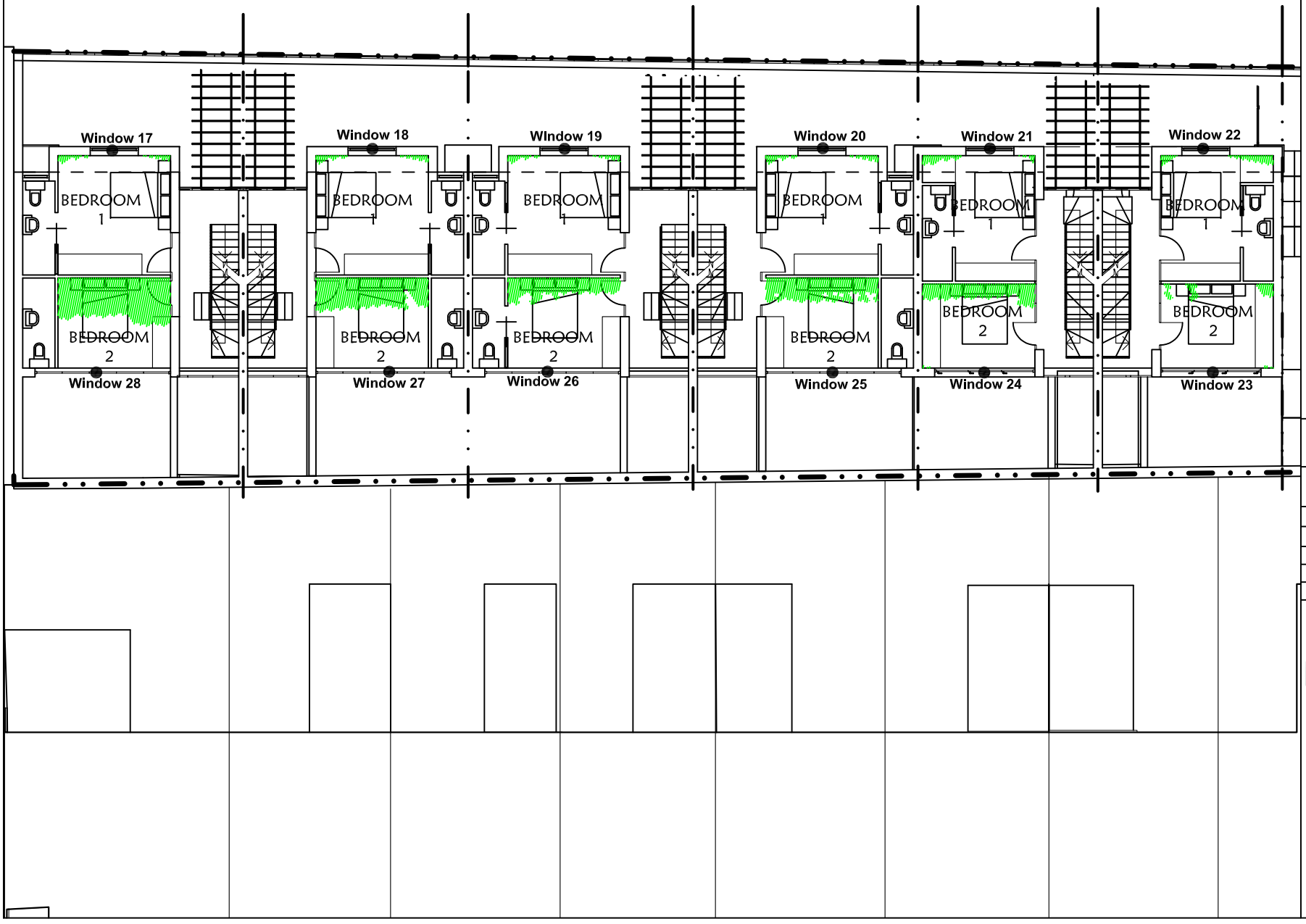
Appendix 3 No Sky Line Contours

Proposed First Floor



Key:

1 Window reference

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

Area does receive direct sky light.

Light aperture.

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: No Sky Line Contours

Scale: Do not scale

Drawing No: 3 of 4 Rev. -

Rev	Date	Details of revision

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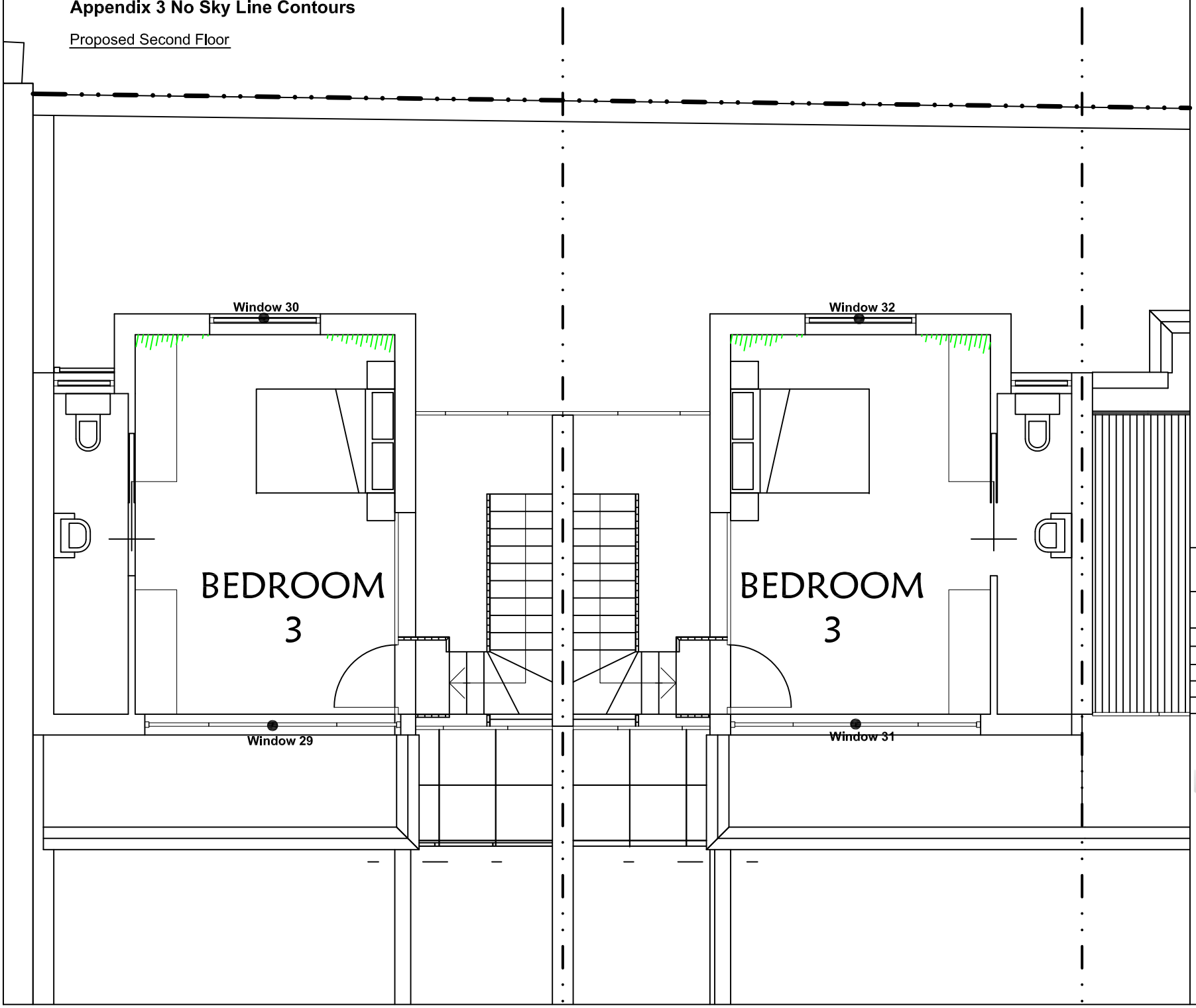
Appendix 3 No Sky Line Contours

Proposed Second Floor



Key:

1 Window reference

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

Area does receive direct sky light.

Light aperture.

Project Name: 1 Dumpton Place, London NW1 8JB

Drawing Title: No Sky Line Contours

Scale: Do not scale

Drawing No: 4 of 4 Rev. -

Rev	Date	Details of revision

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