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Daylight and Sunlight Study (Within Development)
Regents Park Estate, London NW1 4BX
(Camden's People's Theatre)

26 June 2015

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CONTENTS

1 EXECUTIVE SUMMARY

1.1 Overview

1.1.1 Right of Light Consulting has been commissioned by the London Borough of Camden to undertake a daylight and sunlight study in connection with the development at the Camden's People's Theatre within the Regents Park Estate, London NW1 4BX. The aim of the study is to check whether or not the proposed habitable rooms receive satisfactory levels of daylight and sunlight. We have also been instructed to comment on the daylight and sunlight impact of the proposed development on its neighbouring properties.

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 Following our review of the proposed massing, we are of the opinion that the proposed development will have an acceptable impact on the daylight and sunlight achievable by its neighbouring properties.

1.1.5 Right of Light Consulting confirms that the proposed room within the proposed development design achieve a very high level of compliance against 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:

mae LLP Architects

1328-P7-101	CPT – Ground Floor Plan	Rev B
1328-P7-102	CPT – First Floor Plan	Rev B
1328-P7-103	CPT – Second Floor Plan	Rev –
1328-P7-104	CPT – Third Floor Plan	Rev –
1328-P7-105	CPT – Fourth Floor/Roof Plan	Rev B
1328-P7-301	CPT – Proposed Elevation	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 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.

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 habitable rooms achieve or surpass the minimum recommended Average Daylight Factor (ADF) targets with the exception of the bedroom served by window 24 (room achieves Average Daylight Factor score of 0.8% against the BRE target of 1%). This is a high level of compliance in the context of an urban development site.

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. The contours illustrate good access to daylight over a significant part of the working plane.

4.4 Sunlight to Windows

4.4.1 Whilst the aim is usually to maximise the number of south facing living rooms, the BRE guide does not give mandatory sunlight requirements for new flats. The living rooms which face within 90 degrees of due south have been tested for direct sunlight. The results are presented in Appendix 2. Not all living room windows receive ideal levels of direct sunlight. However, the BRE guide acknowledges that for larger developments of flats, especially those with site constraints, it may not always be possible to have every living room well situated to receive direct sunlight.

4.5 Conclusion

4.5.1 The numerical results confirm that the proposed development design achieves a high level of compliance against 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, 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

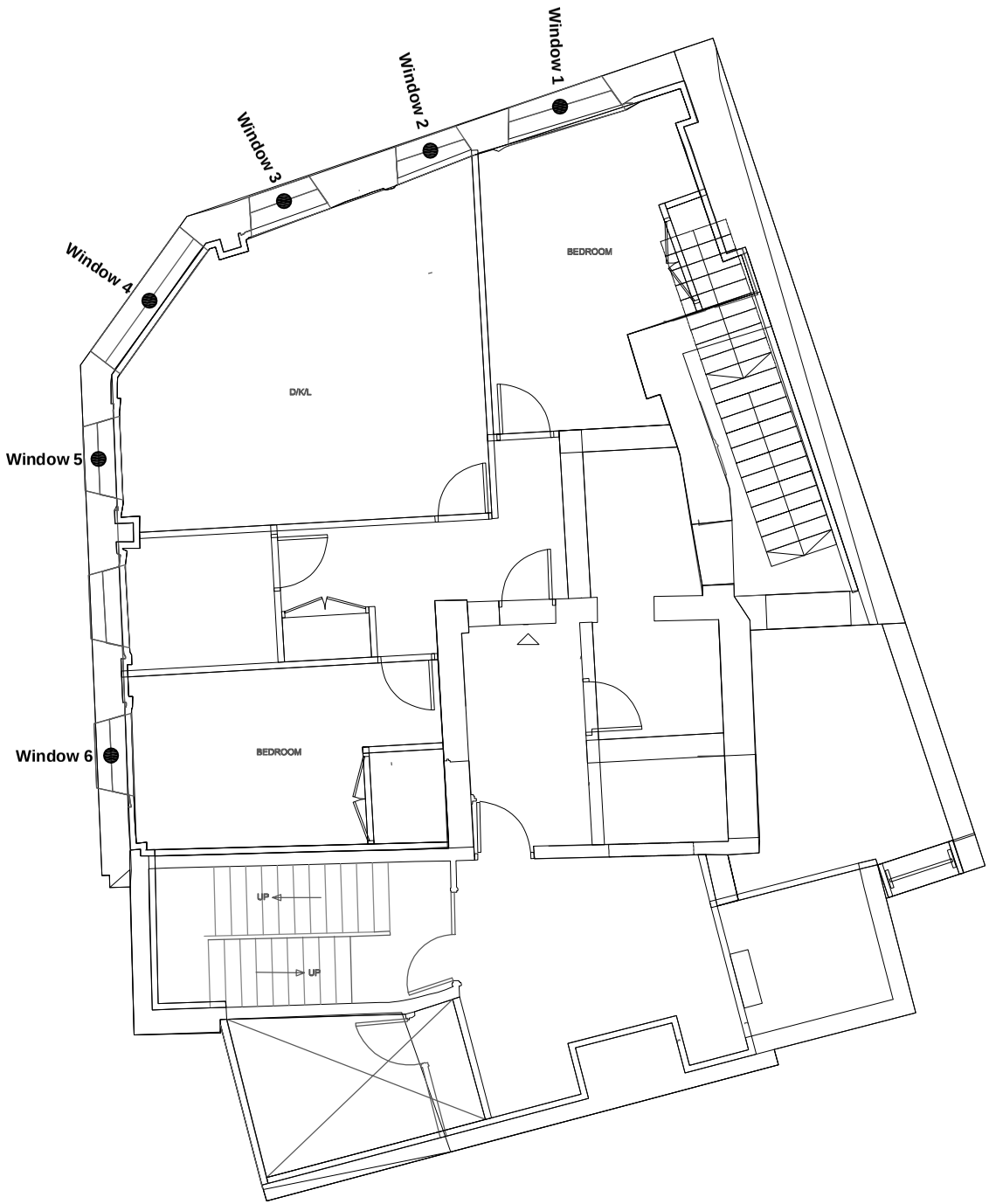
APPENDICES

APPENDIX 1

WINDOW KEY

Proposed First Floor

Appendix 1 Window Key



Key:

● Window reference

Project Name: Regents Park Estate, London NW1 4BX

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 1 of 3 Rev. -

Rev	Date	Details of revision

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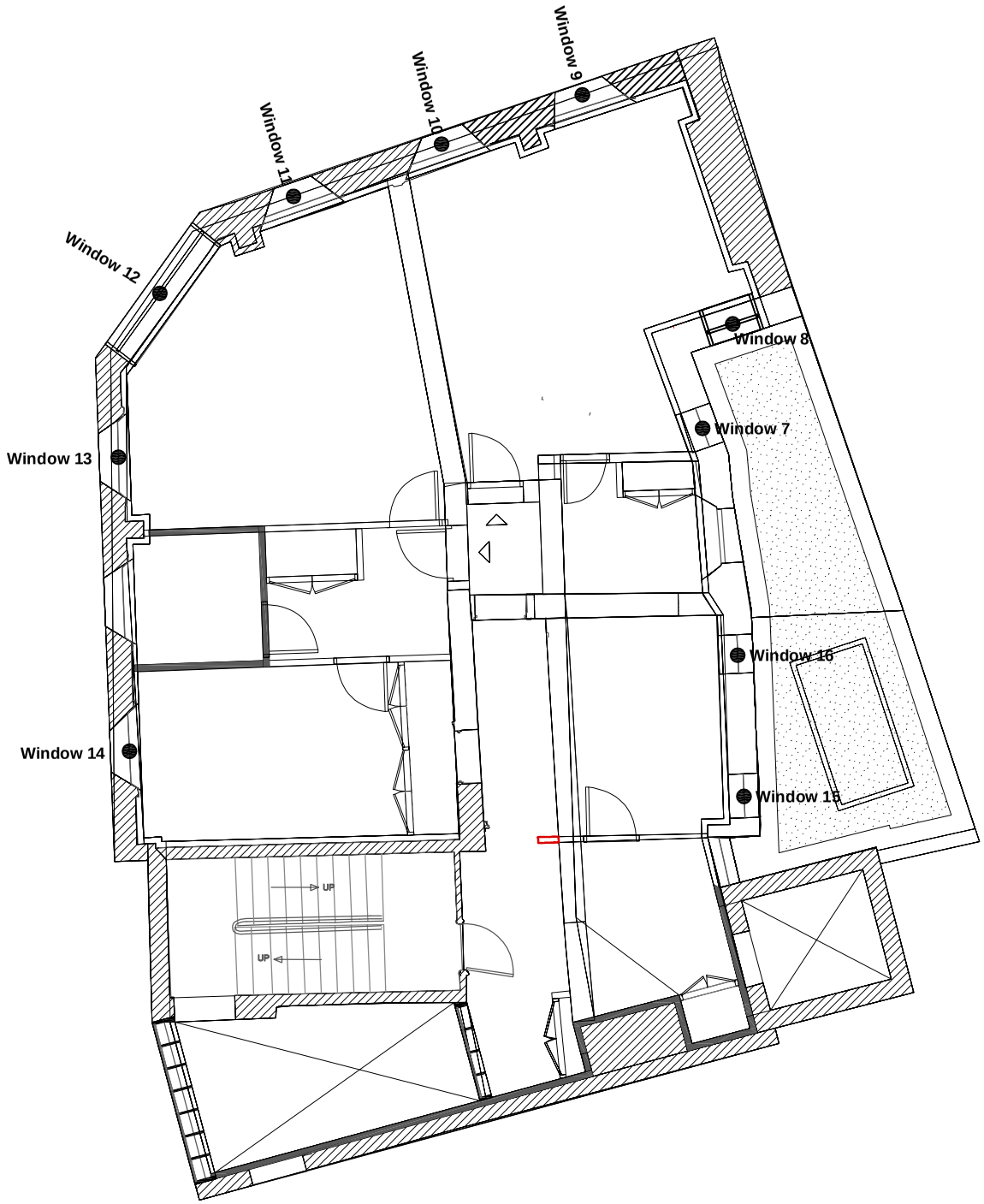
Proposed Second Floor

Appendix 1 Window Key



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Project Name: Regents Park Estate, London NW1 4BX

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 2 of 3 Rev. -

Rev	Date	Details of revision

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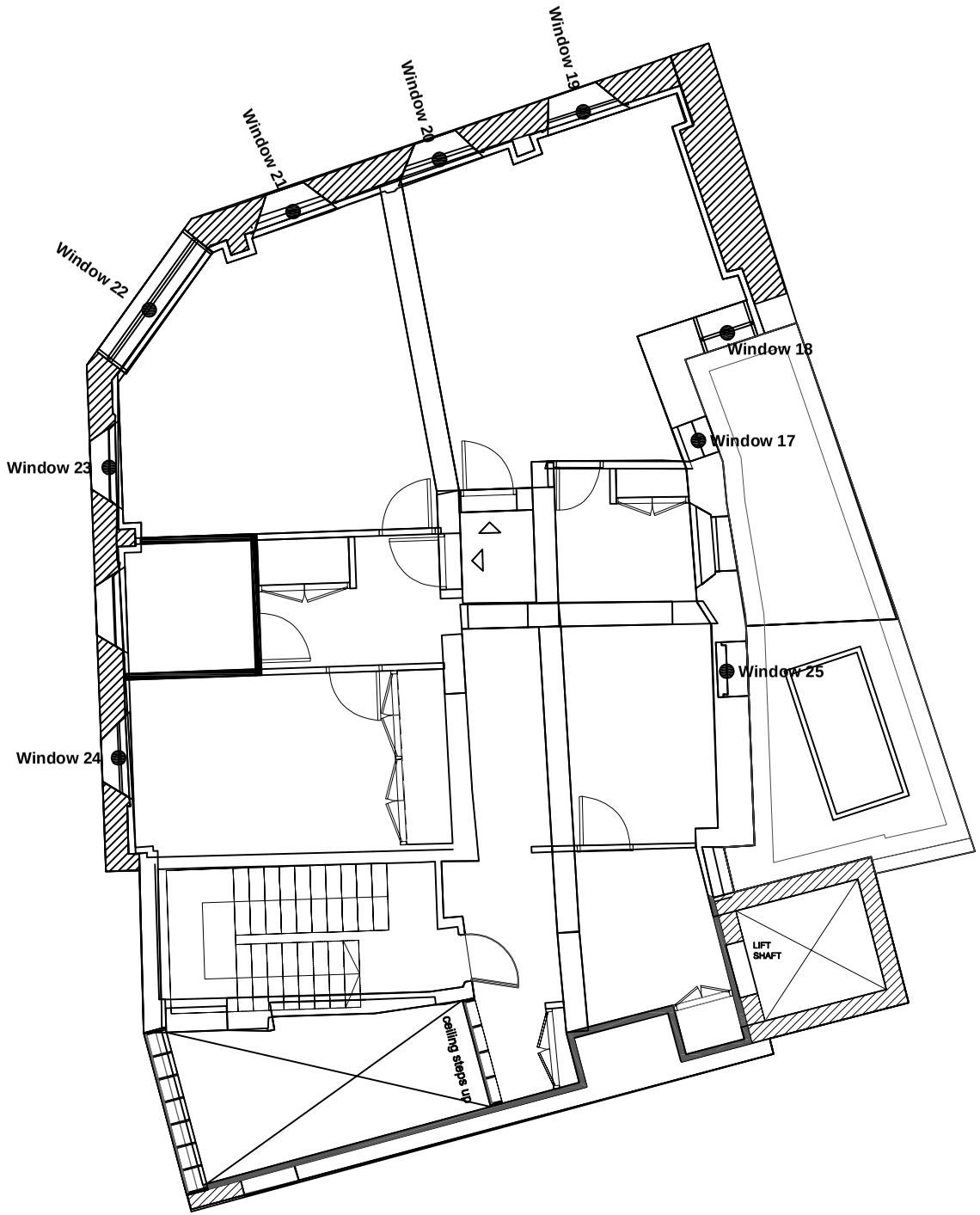
Proposed Third Floor

Appendix 1 Window Key



Key:

● Window reference

Project Name: Regents Park Estate, London NW1 4BX

Drawing Title: Window Key

Scale: Do not scale

Drawing No: 3 of 3 Rev. -

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APPENDIX 2

DAYLIGHT AND SUNLIGHT CALCULATIONS

Appendix 2 - Average Daylight Factor (ADF)

Regents Park Estate, London NW1 4BX (Camden's People's Theatre)

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 First Floor									
Window 1 (lower)			0.68	0.33	91.77	0.72	65.8	0.1%	
Window 1 (upper)			0.68	2.83	91.77	0.72	67.9	3.0%	
Total ADF for room	Bedroom	1.0%						**3.1%**	**Pass**
Window 2 (lower)			0.68	0.08	128.5	0.67	66.3	0.0%	
Window 2 (upper)			0.68	1.83	128.5	0.67	68.3	1.2%	
Window 3 (lower)			0.68	0.08	128.5	0.67	66.8	0.0%	
Window 3 (upper)			0.68	1.83	128.5	0.67	68.6	1.2%	
Window 4 (lower)			0.68	0.19	128.5	0.67	62.2	0.0%	
Window 4 (upper)			0.68	4.4	128.5	0.67	63.5	2.7%	
Window 5 (lower)			0.68	0.08	128.5	0.67	52.6	0.0%	
Window 5 (upper)			0.68	1.84	128.5	0.67	53.4	0.9%	
Total ADF for room	Dining/Kitchen/Living	2.0%						**6.1%**	**Pass**
Window 6 (lower)			0.68	0.08	78.47	0.73	49.7	0.0%	
Window 6 (upper)			0.68	1.87	78.47	0.73	50.5	1.7%	
Total ADF for room	Bedroom	1.0%						**1.7%**	**Pass**
Proposed Second Floor									
Window 9			0.68	1.13	117.19	0.71	74.5	1.0%	
Window 10			0.68	0.94	117.19	0.71	74.2	0.8%	
Window 8 (lower)			0.68	0.14	117.19	0.71	26.5	0.0%	
Window 8 (upper)			0.68	0.97	117.19	0.71	27.3	0.3%	
Window 7 (lower)			0.68	0.1	117.19	0.71	14.9	0.0%	
Window 7 (upper)			0.68	0.66	117.19	0.71	15.5	0.1%	
Total ADF for room	Dining/Kitchen/Living	2.0%						**2.2%**	**Pass**
Window 11			0.68	0.85	104.86	0.69	73.9	0.8%	
Window 12 (lower)			0.68	0.19	104.86	0.69	66.3	0.1%	
Window 12 (upper)			0.68	3.67	104.86	0.69	67.3	3.1%	
Window 13			0.68	1.09	104.86	0.69	56.0	0.8%	
Total ADF for room	Dining/Kitchen/Living	2.0%						**4.8%**	**Pass**
Window 14	Bedroom	1.0%	0.68	0.95	69.48	0.73	53.0	**1.1%**	**Pass**
Window 15			0.68	0.79	54.95	0.73	47.6	1.0%	

Appendix 2 - Average Daylight Factor (ADF)

Regents Park Estate, London NW1 4BX (Camden's People's Theatre)

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 16			0.68	0.79	54.95	0.73	43.6	0.9%	
Total ADF for room	Bedroom	1.0%						**1.9%**	**Pass**
Proposed Third Floor									
Window 19 (lower)			0.68	0.06	105.73	0.7	78.4	0.0%	
Window 19 (upper)			0.68	0.78	105.73	0.7	79.2	0.8%	
Window 20 (lower)			0.68	0.05	105.73	0.7	77.8	0.0%	
Window 20 (upper)			0.68	0.66	105.73	0.7	78.6	0.7%	
Window 18 (lower)			0.68	0.05	105.73	0.7	32.5	0.0%	
Window 18 (upper)			0.68	1.06	105.73	0.7	35.6	0.5%	
Window 17 (lower)			0.68	0.03	105.73	0.7	21.9	0.0%	
Window 17 (upper)			0.68	0.73	105.73	0.7	25.8	0.2%	
Total ADF for room	Dining/Kitchen/Living	2.0%						**2.2%**	**Pass**
Window 21 (lower)			0.68	0.05	94.91	0.69	77.2	0.0%	
Window 21 (upper)			0.68	0.59	94.91	0.69	78.0	0.6%	
Window 22 (lower)			0.68	0.19	94.91	0.69	70.0	0.1%	
Window 22 (upper)			0.68	2.58	94.91	0.69	70.6	2.5%	
Window 23 (lower)			0.68	0.06	94.91	0.69	57.9	0.0%	
Window 23 (upper)			0.68	0.76	94.91	0.69	58.2	0.6%	
Total ADF for room	Dining/Kitchen/Living	2.0%						**3.8%**	**Pass**
Window 24 (lower)			0.68	0.05	62.08	0.72	55.1	0.0%	
Window 24 (upper)			0.68	0.66	62.08	0.72	55.6	0.8%	
Total ADF for room	Bedroom	1.0%						**0.8%**	**Fail**
Window 25	Bedroom	1.0%	0.68	1.02	48.78	0.72	53.1	**1.6%**	**Pass**

Appendix 2 - Room Depth Calculation

Regents Park Estate, London NW1 4BX (Camden's People's Theatre)

Room	Room Depth Coefficients				Room Depth Calculation			Result
	L	W	H	Rb	L/W + L/H	<=	2/1-Rb	
Proposed First Floor								
Window 1	5.0	3.6	3.1	0.72	3.0	<=	7.16	Pass
Window 2	5.4	6.1	3.1	0.67	2.63	<=	6.08	Pass
Window 3	5.4	6.1	3.1	0.67	2.63	<=	6.08	Pass
Window 4	6.1	7.3	3.1	0.67	2.8	<=	6.08	Pass
Window 5	5.9	5.7	3.1	0.67	2.94	<=	6.08	Pass
Window 6	5.0	2.9	3.1	0.73	3.34	<=	7.38	Pass
Proposed Second Floor								
Window 7	3.6	5.7	2.2	0.71	2.27	<=	6.86	Pass
Window 8	3.6	5.2	2.2	0.71	2.33	<=	6.86	Pass
Window 9	5.7	5.2	2.7	0.71	3.21	<=	6.86	Pass
Window 10	5.7	5.2	2.7	0.71	3.21	<=	6.86	Pass
Window 11	5.4	5.2	2.7	0.69	3.04	<=	6.44	Pass
Window 12	5.6	6.7	2.7	0.69	2.91	<=	6.44	Pass
Window 13	5.1	5.5	2.7	0.69	2.82	<=	6.44	Pass
Window 14	4.3	2.8	2.7	0.73	3.13	<=	7.41	Pass
Window 15	2.4	3.6	3.1	0.73	1.44	<=	7.31	Pass
Window 16	2.4	3.6	3.1	0.73	1.44	<=	7.31	Pass
Proposed Third Floor								
Window 17	3.6	5.7	2.3	0.7	2.2	<=	6.71	Pass
Window 18	3.6	5.2	2.3	0.7	2.26	<=	6.71	Pass
Window 19	5.7	5.2	2.1	0.7	3.81	<=	6.71	Pass
Window 20	5.7	5.2	2.1	0.7	3.81	<=	6.71	Pass
Window 21	5.4	5.2	2.1	0.69	3.61	<=	6.44	Pass
Window 22	5.6	6.7	2.2	0.69	3.38	<=	6.44	Pass
Window 23	5.1	5.5	2.1	0.69	3.36	<=	6.44	Pass
Window 24	4.3	2.8	2.1	0.72	3.58	<=	7.25	Pass
Window 25	2.4	3.6	2.5	0.72	1.63	<=	7.27	Pass

Appendix 2 - Sunlight to Windows

Regents Park Estate, London NW1 4BX (Camden's People's Theatre)

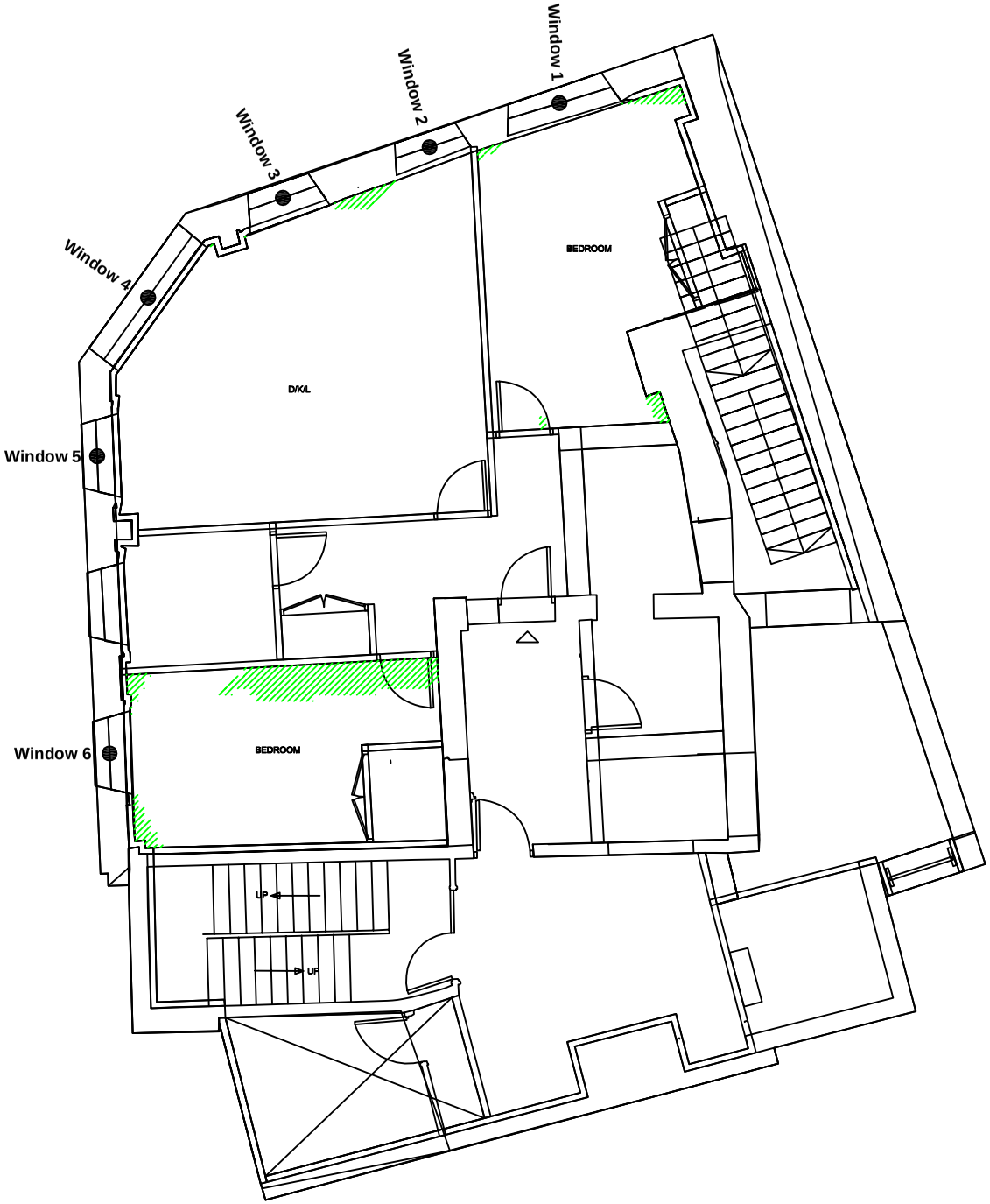
Reference	Use Class	Annual Probable Sunlight Hours	
		Total	Winter
Proposed First Floor			
Window 2	Dining/Kitchen/Living	0%	0%
Window 3	Dining/Kitchen/Living	0%	0%
Window 4	Dining/Kitchen/Living	8%	0%
Window 5	Dining/Kitchen/Living	9%	0%
Proposed Second Floor			
Window 7	Dining/Kitchen/Living	0%	0%
Window 8	Dining/Kitchen/Living	7%	4%
Window 9	Dining/Kitchen/Living	0%	0%
Window 10	Dining/Kitchen/Living	0%	0%
Window 11	Dining/Kitchen/Living	0%	0%
Window 12	Dining/Kitchen/Living	9%	0%
Window 13	Dining/Kitchen/Living	10%	0%
Proposed Third Floor			
Window 17	Dining/Kitchen/Living	0%	0%
Window 18	Dining/Kitchen/Living	10%	5%
Window 19	Dining/Kitchen/Living	0%	0%
Window 20	Dining/Kitchen/Living	0%	0%
Window 21	Dining/Kitchen/Living	0%	0%
Window 22	Dining/Kitchen/Living	10%	0%
Window 23	Dining/Kitchen/Living	11%	0%

APPENDIX 3

NO SKY LINE CONTOURS

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:	Regents Park Estate, London NW1 4BX
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	1 of 3
Rev.	-

Rev	Date	Details of revision

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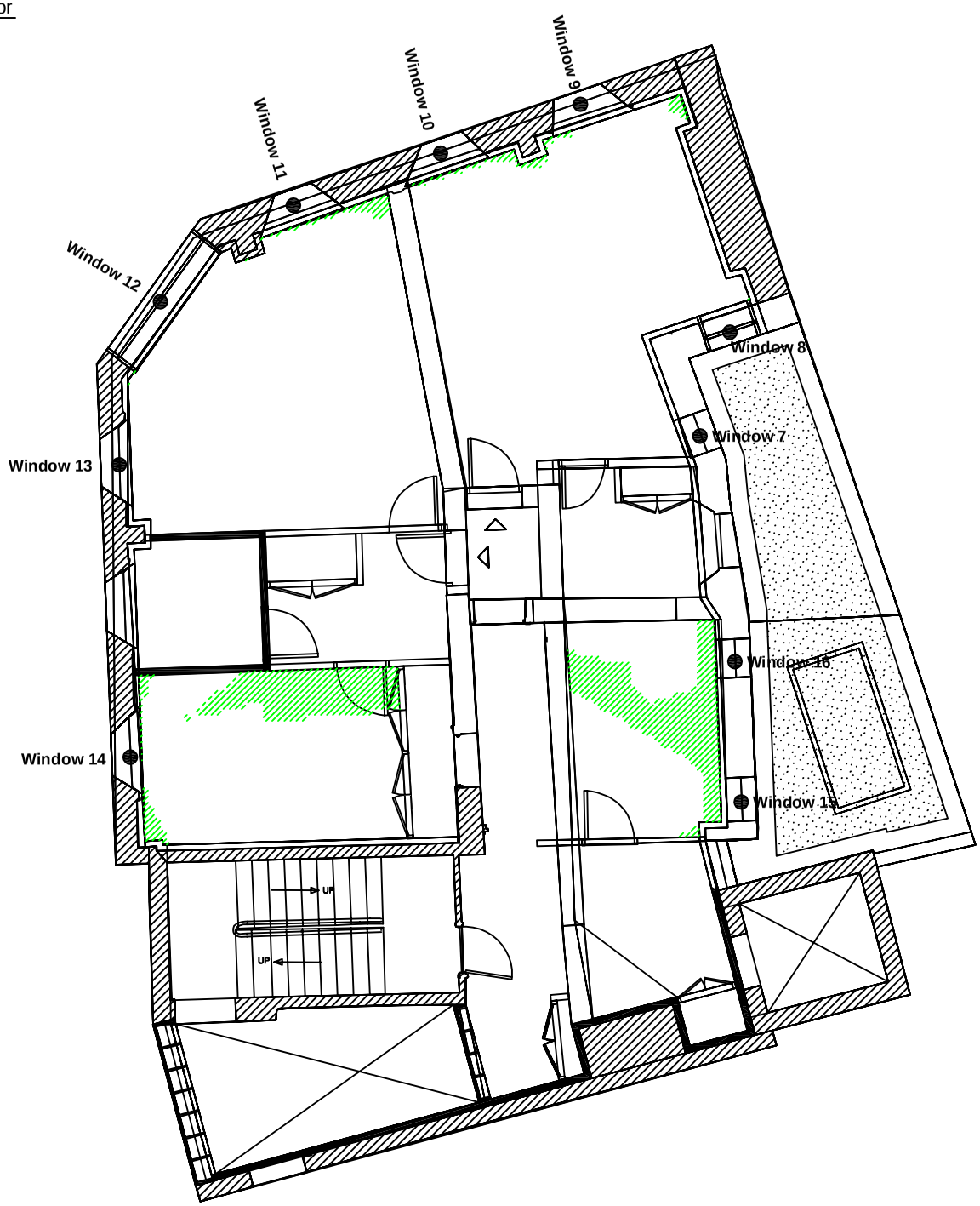
Appendix 3 No Sky Line Contours

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:	Regents Park Estate, London NW1 4BX
Drawing Title:	No Sky Line Contours
Scale:	Do not scale
Drawing No:	2 of 3
Rev.	-

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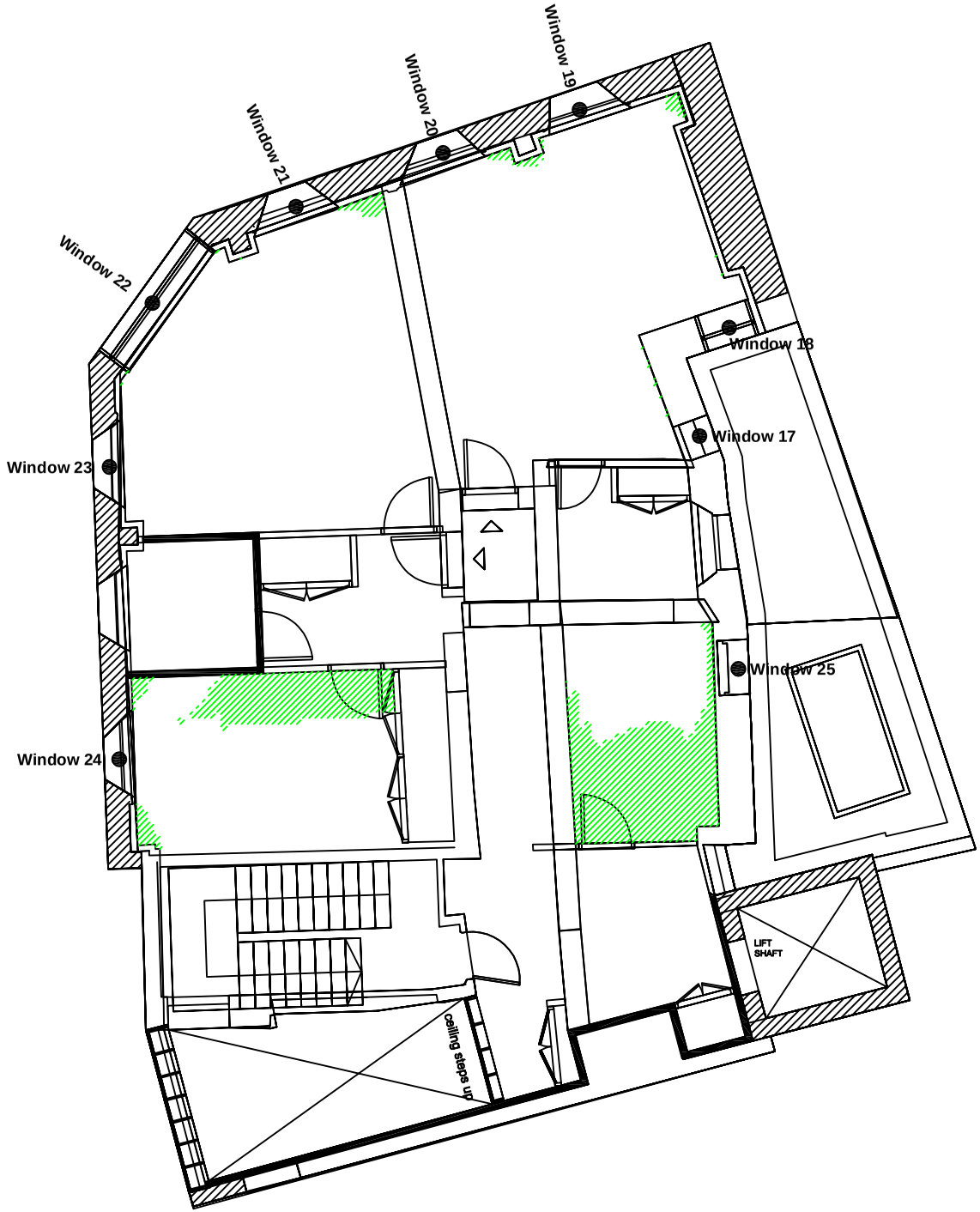
Appendix 3 No Sky Line Contours

Proposed Third floor



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Drawing Title: No Sky Line Contours

Scale: Do not scale

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