



RIGHT OF LIGHT
CONSULTING
Chartered Surveyors

Daylight and Sunlight Report

(Within Development)

18 August 2022

22 to 25 New Road
Gravesend
Kent
DA11 0AA

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CONTENTS

1 EXECUTIVE SUMMARY	2
1.1 Overview	2
2 INFORMATION SOURCES	3
2.1 Documents Considered	3
3 METHODOLOGY OF THE ASSESSMENT	4
3.1 Local Planning Policy.....	4
3.2 National Planning Policy Framework.....	4
3.3 Interior Daylighting.....	5
3.4 Sunlight to Windows	7
4 RESULTS OF THE ASSESSMENT.....	8
4.1 Window Reference Points and No Sky Line Contours	8
4.2 Daylight & Sunlight Data.....	8
4.3 Interior Daylighting.....	8
4.4 Sunlight to Windows	8
4.5 Conclusion.....	9
5 CLARIFICATIONS	10
5.1 General.....	10

APPENDICES

APPENDIX 1	WINDOW KEY & NO SKY LINE CONTOURS
APPENDIX 2	DAYLIGHT & SUNLIGHT DATA

1 EXECUTIVE SUMMARY

1.1 Overview

- 1.1.1 Right of Light Consulting has been commissioned by CGL Architects to undertake a daylight and sunlight assessment of the proposed development at 22 to 25 New Road, Gravesend, Kent DA11 0AA. The assessment is in connection with a full planning application for the subdivision of the existing residential unit into 6 flats. The aim of the assessment is to check whether the proposed accommodation will provide its future occupiers with adequate levels of natural light.
- 1.1.2 The assessment 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, 2nd Edition' by P J Littlefair 2011.
- 1.1.3 Appendix 1 identifies the windows analysed in this assessment. The no sky line contours for the habitable rooms are also presented in Appendix 1. The numerical results of the BRE daylight and sunlight tests are provided in Appendix 2.
- 1.1.4 The numerical results demonstrate that the proposed development design achieves an extremely high level of compliance with the BRE recommendations. In our professional opinion, the proposed design will provide the development's future occupiers with adequate levels of natural light. We consider the proposed development to be consistent with the NPPF, which requires developments to provide acceptable living standards whilst making efficient use of land.

2 INFORMATION SOURCES

2.1 Documents Considered

2.1.1 This report is based on the following drawings:

Child Graddon Lewis

050311

Proposed First Floor Plan

Rev -

050312

Proposed Second Floor Plan

Rev -

050313

Proposed Third Floor Plan

Rev -

3 METHODOLOGY OF THE ASSESSMENT

3.1 Local Planning Policy

3.1.1 We understand that the Local Authority takes the conventional approach of considering daylight and sunlight amenity with reference to 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, 2nd Edition' by P J Littlefair 2011. We have therefore applied the numerical tests within this edition of the BRE guide. A new European standard BS EN 17037 'Daylight in Buildings' was published in May 2019. An update to the BRE guide to take into account the European standard was published on 8 June 2022. We anticipate that Local Authorities will begin adopting the updated BRE guidance after a period of transition.

3.1.2 The standards set out in the BRE guide are intended to be used flexibly. The BRE guide states:

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here 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."

3.2 National Planning Policy Framework

3.2.1 The BRE numerical guidelines should be considered in the context of the National Planning Policy Framework (NPPF), which stipulates that local planning authorities should take a flexible approach to daylight and sunlight to ensure the efficient use of land. Paragraph 125c of the NPPF states:

"Local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."

3.3 Interior Daylighting

- 3.3.1 The interior daylighting recommendations set out in the 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:

Test 1 - Average Daylight Factor

- 3.3.2 The Average Daylight Factor (ADF) can be calculated using the following formula:

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

where

T is the diffuse visible transmittance of the glazing
A_w is the net glazed area of the window (m²)
A is the total area of the room surfaces (m²)
R is their average reflectance
θ is the angle of visible sky in degrees

- 3.3.3 For the purpose of this assessment, we have assumed BRE internal reflectance coefficients pertaining to medium wooden floors (0.4), light painted walls (0.8) and matt white painted ceilings (0.85).
- 3.3.4 We have assumed that each window is double-glazed and has a glazed area that equates to 85% of the structural opening size. A glazing transmittance value, inclusive of a maintenance to allow for the effect of dirt and grime on the glazing, of 0.68 has been used.
- 3.3.5 The BRE guide gives minimum ADF recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms which have been applied in this assessment. In the case of permitted development, the 2% target is only applied to habitable kitchens - i.e. kitchens that are not used solely for cooking purposes.
- 3.3.6 The BRE guide does not give guidance on how to apply the ADF test to spaces which contain a mix of room uses e.g. open plan living, dining and kitchen areas. For this assessment we have set a target of 2%.

-
- 3.3.7 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.
- 3.3.8 Reflected light can be factored into the ADF calculation. For example, where a window has a large obstruction in front of it, the angle of visible sky can be increased by around 6°, assuming the obstruction is painted a light colour.

Test 2 - Room Depth

- 3.3.9 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

Test 3 - Position of the no sky line (Daylight Distribution)

- 3.3.10 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.
- 3.3.11 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.

3.4 Sunlight to Windows

3.4.1 The BRE guide states that, in general, a dwelling will appear reasonably sunlit if:

- at least one main window wall faces within 90 degrees of due south, and
- the centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of the annual probable sunlight hours during the winter months between 21st September and 21st March.

3.4.2 The guide states that, where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

3.4.3 The guide states that sunlight is viewed as less important in kitchens and bedrooms.

4 RESULTS OF THE ASSESSMENT

4.1 Window Reference Points and No Sky Line Contours

4.1.1 Appendix 1 identifies the positions of the windows analysed in this assessment. The no skyline contours for the habitable rooms are also presented in Appendix 1.

4.2 Daylight & Sunlight Data

4.2.1 The numerical results of the BRE daylight and sunlight tests are provided in Appendix 2.

4.3 Interior Daylighting

4.3.1 All habitable rooms meet or surpass the BRE minimum Average Daylight Factor (ADF) recommendations.

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. However, for completeness, we have illustrated the no sky line contours in Appendix 1. The contours illustrate good access to direct skylight over a significant part of the working plane.

4.4 Sunlight to Windows

4.4.1 The BRE guide acknowledges that, in some cases, it may not be possible for every dwelling to achieve ideal levels of sunlight. The guide explains that, where groups of dwellings are planned, the aim should be to maximise the number of dwellings that:

- have at least one main window that faces within 90 degrees of due south, and
- have at least one window to a main living room that meets the BRE numerical targets.

4.4.2 In the case of the proposed development, 4 of the 6 flats have a living room window which faces within 90 degrees of due south. 3 of the 6 flats have a living room window which meets the BRE numerical targets.

-
- 4.4.3 In our opinion, the proposed development represents good site layout design. Since the design maximises sunlight availability, as far as practically possible given the constraints of the site, the BRE direct sunlight to windows recommendations for groups of dwellings have been met.

4.5 Conclusion

- 4.5.1 The numerical results demonstrate that the proposed development design achieves an extremely high level of compliance with the BRE recommendations. In our professional opinion, the proposed design will provide the development's future occupiers with adequate levels of natural light. We consider the proposed development to be consistent with the NPPF, which requires developments to provide acceptable living standards whilst making efficient use of land.

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 The assessment is limited to assessing daylight and sunlight of the proposed development as set out in section 2.1 and 3.1 of the BRE Guide.
- 5.1.3 The assessment is based on the information listed in section 2 of this report. The assessment has been undertaken without access to the proposed development site or neighbouring properties.
- 5.1.4 We have undertaken the survey following the guidelines of the RICS publication "Surveying Safely". Where limited access is available, assumptions will have been made.
- 5.1.5 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.

APPENDICES

APPENDIX 1

WINDOW KEY & NO SKY LINE CONTOURS



Proposed
Development

20

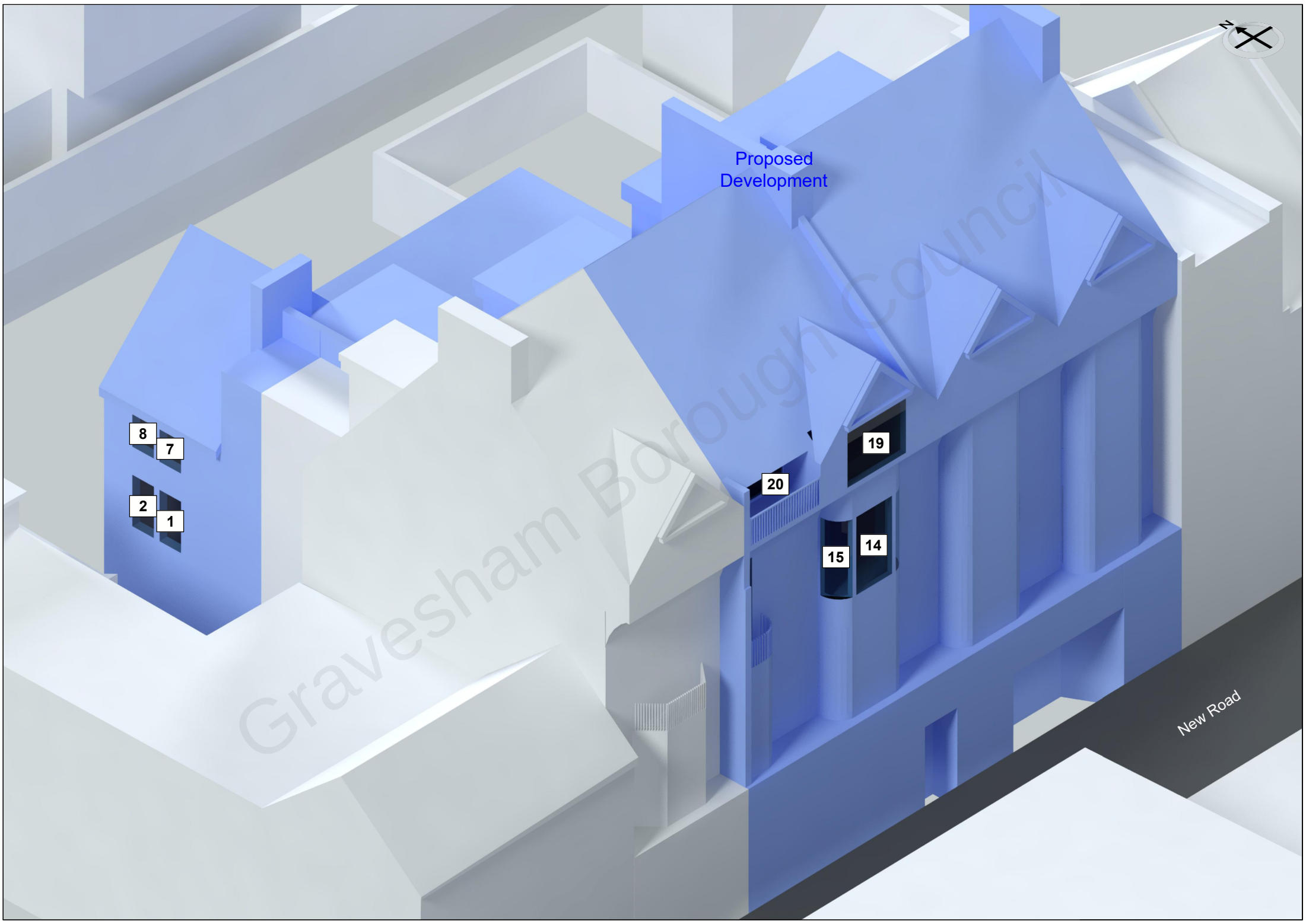
19

16

14

13

New Road



Proposed
Development

8

7

2

1

19

20

15

14

New Road



Proposed
Development

18

17

12

11

10

6

5

9

4

3

Gravesham Borough Council

New Road



Proposed
Development

18

17

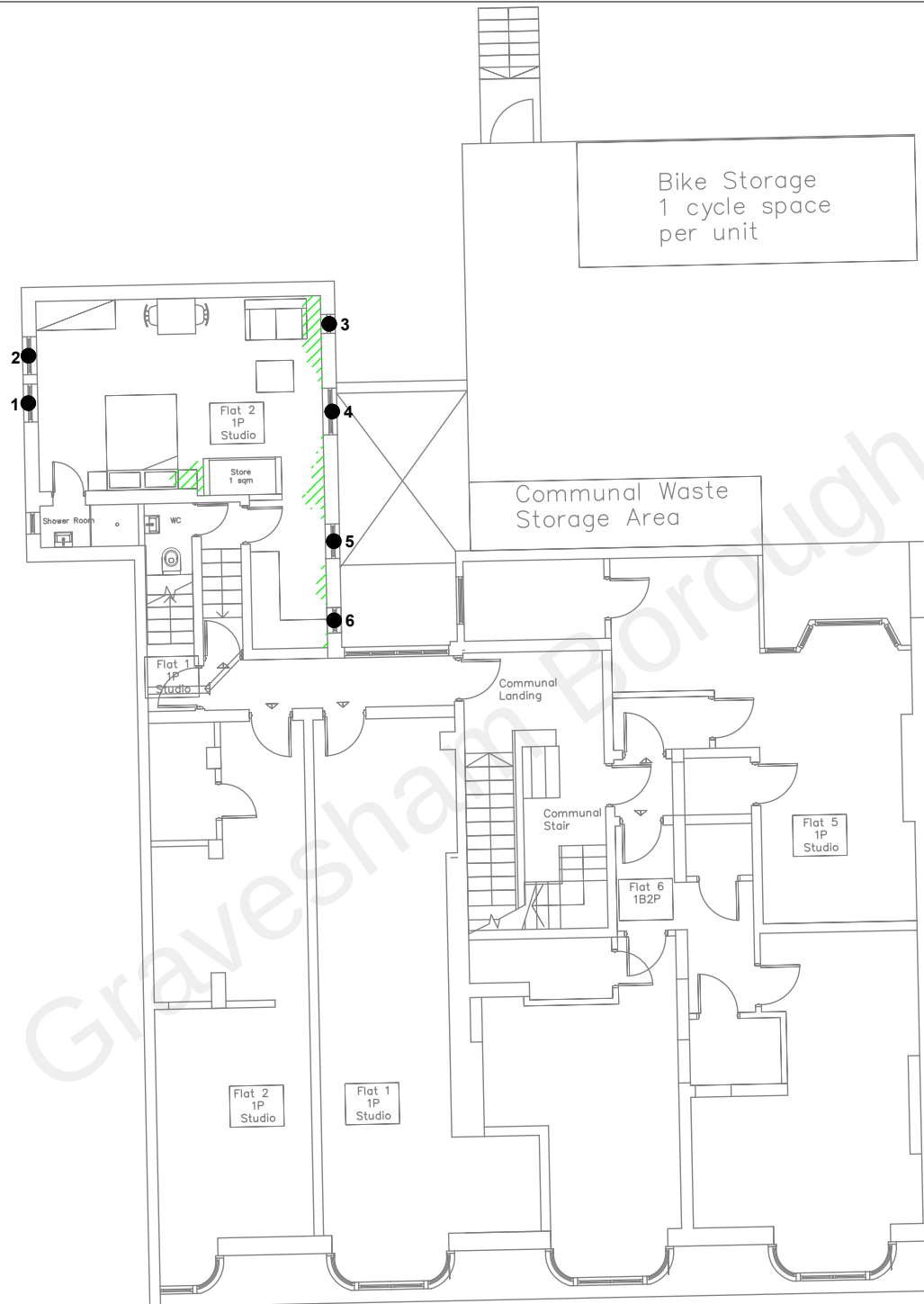
12

8

7

2

1



Key:

- Window reference
- G1 Gardens and Amenity Areas
- Area receives no direct sky light
(applied to habitable rooms)
- Area does receive direct sky light.
- Light aperture.

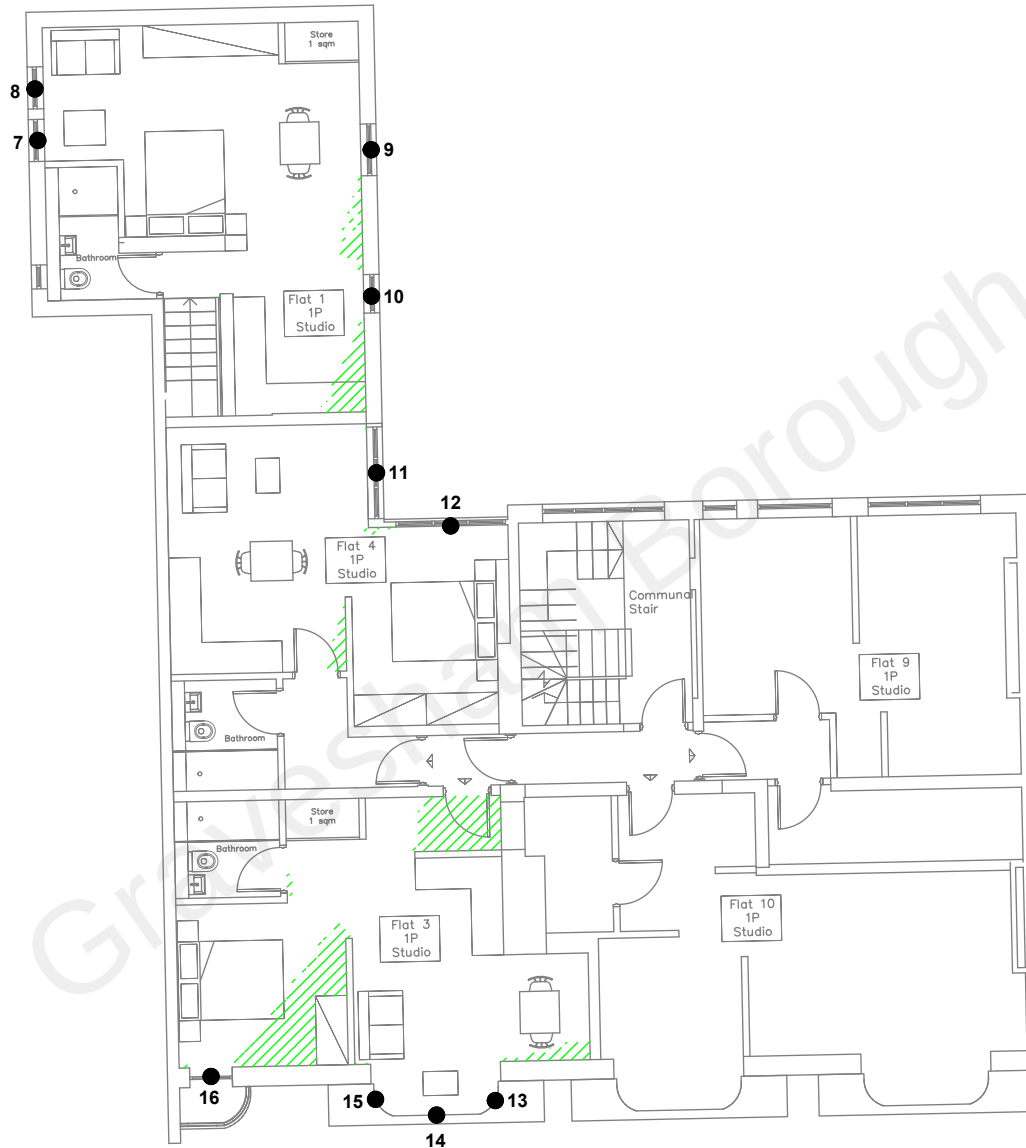
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Scale: Do not scale

Drawing No: 1 of 3

Rev. .

Rev	Date	Details of revision



Key:

- Window reference
- G1 Gardens and Amenity Areas
- Area receives no direct sky light (applied to habitable rooms)
- Area does receive direct sky light.
- Light aperture.

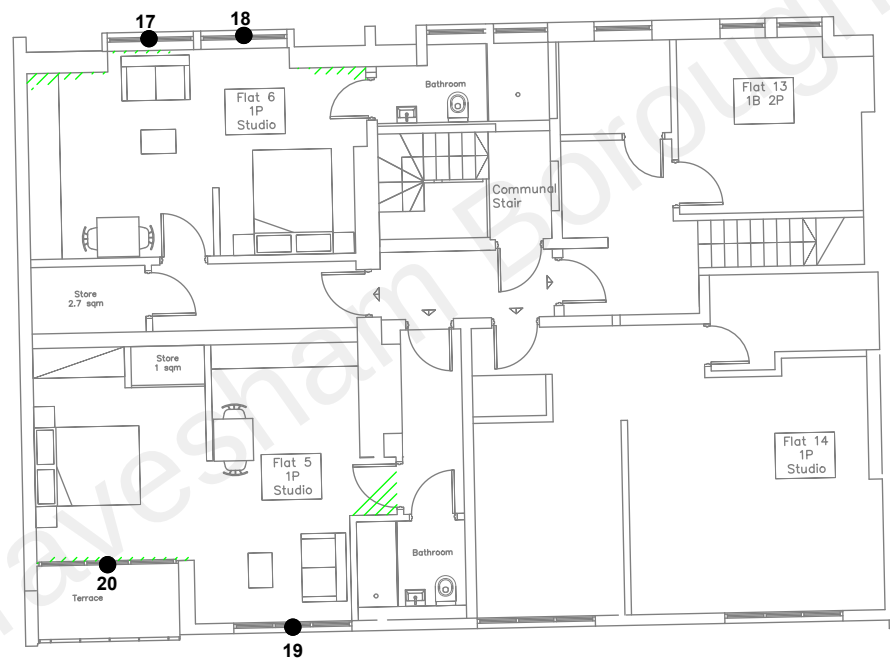
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Scale: Do not scale

Drawing No: 2 of 3

Rev. .

Rev	Date	Details of revision



Key:

- Window reference
- G1 Gardens and Amenity Areas
- Area receives no direct sky light (applied to habitable rooms)
- Area does receive direct sky light.
- Light aperture.

Drawing Title: Window Key and No Sky Line Contours

Scale: Do not scale

Drawing No: 3 of 3

Rev. .

Rev	Date	Details of revision



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APPENDIX 2

DAYLIGHT & SUNLIGHT DATA

Appendix 2 - Average Daylight Factor (ADF)
22 to 25 New Road, Gravesend, Kent DA11 0AA

Reference	Target ADF based on room use		Average Daylight Factor Coefficients					ADF
	Primary room use	ADF	T	Aw	A	R	θ	
Flat 1								
First Floor								
Window 1 (lower)			0.68	0.02	131.32	0.7	54.3	0.0%
Window 1 (upper)			0.68	1.12	131.32	0.7	60.2	0.7%
Window 2 (lower)			0.68	0.02	131.32	0.7	54.5	0.0%
Window 2 (upper)			0.68	1.12	131.32	0.7	60.2	0.7%
Window 3			0.68	0.18	131.32	0.7	66.3	0.1%
Window 4 (lower)			0.68	0.0	131.32	0.7	63.1	0.0%
Window 4 (upper)			0.68	1.35	131.32	0.7	65.3	0.9%
Window 5 (lower)			0.68	0.0	131.32	0.7	54.0	0.0%
Window 5 (upper)			0.68	1.0	131.32	0.7	57.0	0.6%
Window 6 (lower)			0.68	0.0	131.32	0.7	37.5	0.0%
Window 6 (upper)			0.68	0.73	131.32	0.7	44.7	0.3%
Total ADF for room	Studio	2.0%						3.3%
Flat 2								
Second Floor								
Window 7 (lower)			0.68	0.21	138.5	0.71	72.9	0.1%
Window 7 (upper)			0.68	0.62	138.5	0.71	69.3	0.4%
Window 8 (lower)			0.68	0.21	138.5	0.71	72.4	0.1%
Window 8 (upper)			0.68	0.62	138.5	0.71	68.6	0.4%
Window 9 (lower)			0.68	0.25	138.5	0.71	68.0	0.1%
Window 9 (upper)			0.68	0.78	138.5	0.71	61.8	0.5%
Window 10 (lower)			0.68	0.14	138.5	0.71	64.3	0.0%
Window 10 (upper)			0.68	0.69	138.5	0.71	65.6	0.4%
Total ADF for room	Studio	2.0%						2.0%
Flat 3								
Second Floor								
Window 11 (lower)			0.68	0.37	130.96	0.7	55.8	0.1%
Window 11 (upper)			0.68	2.2	130.96	0.7	57.3	1.3%
Window 12 (lower)			0.68	0.57	130.96	0.7	62.3	0.1%
Window 12 (upper)			0.68	3.18	130.96	0.7	64.2	2.1%
Total ADF for room	Studio	2.0%						3.6%
Flat 4								
Second Floor								
Window 13 (lower)			0.68	0.39	167.89	0.7	62.9	0.1%
Window 13 (upper)			0.68	1.56	167.89	0.7	63.4	0.8%
Window 14 (lower)			0.68	0.59	167.89	0.7	76.0	0.1%
Window 14 (upper)			0.68	2.37	167.89	0.7	79.9	1.5%
Window 15 (lower)			0.68	0.37	167.89	0.7	59.9	0.1%
Window 15 (upper)			0.68	1.5	167.89	0.7	60.9	0.7%
Window 16 (lower)			0.68	0.59	167.89	0.7	53.5	0.1%
Window 16 (upper)			0.68	1.37	167.89	0.7	59.2	0.6%
Total ADF for room	Studio	2.0%						4.0%

Appendix 2 - Average Daylight Factor (ADF)
22 to 25 New Road, Gravesend, Kent DA11 0AA

Reference	Target ADF based on room use		Average Daylight Factor Coefficients					ADF
	Primary room use	ADF	T	Aw	A	R	θ	
<u>Flat 5</u>								
<u>Third Floor</u>								
Window 17	Studio	2.0%	0.68	2.23	107.5	0.69	85.8	2.3%
Window 18			0.68	2.23	107.5	0.69	85.6	2.3%
Total ADF for room								4.6%
<u>Flat 6</u>								
<u>Third Floor</u>								
Window 19 (lower)	Studio	2.0%	0.68	0.1	118.1	0.69	85.9	0.0%
Window 19 (upper)			0.68	3.28	118.1	0.69	85.2	3.1%
Window 20			0.68	2.17	118.1	0.69	46.7	1.1%
Total ADF for room								4.2%

Appendix 2 - Room Depth Calculation
22 to 25 New Road, Gravesend, Kent DA11 0AA

Reference	Room Depth Coefficients				Room Depth Calculation		
	L	W	H	Rb	L/W + L/H	<=	2/1-Rb
<u>Flat 3</u>							
<u>Second Floor</u>							
Window 11	3.8	5.2	2.3	0.7	2.38	<=	6.6
Window 12	3.2	6.5	2.6	0.7	1.72	<=	6.6

Appendix 2 - Sunlight to Windows
22 to 25 New Road, Gravesend, Kent DA11 0AA

Reference	Room Use	APSH	
		Total	Winter
<u>Flat 1</u>			
<u>First Floor</u>			
Window 1	Studio	18%	2%
Window 2	Studio	17%	2%
Window 3	Studio	18%	1%
Window 4	Studio	22%	0%
Window 5	Studio	10%	0%
Window 6	Studio	2%	0%
<u>Flat 2</u>			
<u>Second Floor</u>			
Window 7	Studio	25%	6%
Window 8	Studio	25%	6%
Window 9	Studio	20%	0%
Window 10	Studio	18%	0%
<u>Flat 3</u>			
<u>Second Floor</u>			
Window 11	Studio	6%	0%
Window 12	Studio	1%	0%
<u>Flat 4</u>			
<u>Second Floor</u>			
Window 13	Studio	56%	22%
Window 14	Studio	76%	28%
Window 15	Studio	56%	22%
Window 16	Studio	33%	16%
<u>Flat 5</u>			
<u>Third Floor</u>			
Window 17	Studio	7%	0%
Window 18	Studio	7%	0%
<u>Flat 6</u>			
<u>Third Floor</u>			
Window 19	Studio	79%	30%
Window 20	Studio	28%	22%