Daylight and Sunlight Report
for the Proposed Development at
115 Frognal, London, NW3

Prepared for:	**Studio Mark Ruthven**
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Job Reference:	**1364/JN**

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1.1.1 We have been instructed by Studio Mark Ruthven to consider the potential impact upon the amenity of the surrounding residential properties, which may arise from the proposed development at 115 Frognal, London, NW3.

1.2 BRE Assessment Criteria

1.2.1 To ensure that this assessment has been appropriately considered, daylight and sunlight assessments have been undertaken in accordance with the Building Research Establishment Report 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice' 2011 (the "BRE guide") and also on British Standard 8206 – 2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting', to which the BRE report refers.

1.2.2 The standards and tests applied within this assessment are briefly described in Appendix A.

1.3 Daylight and Sunlight

1.3.1 The proposed development meets the BRE guidelines for daylight, sunlight and overshadowing.

1.3.2 For daylight, the proposed development is in accordance with the BRE guidance, namely, the surrounding buildings will remain adequately lit.

1.3.3 For sunlight, the proposed development is in accordance with the BRE guidance, namely, the surrounding buildings will attain adequate sunlight throughout the year and during the winter months.

1.3.4 For overshadowing, the proposed development is in accordance with the BRE guidance, namely, the proposed development is situated north of the amenity areas of 113 Frognal.

1.4 Generally

1.4.1 When considering the numerical results, it is important to approach and interpret the BRE guidelines flexibly along with the following material mitigating factors:

- The BRE guidelines recognises that buildings located uncommonly close to the site boundary, as is the case here, may be considered as "bad" neighbours, taking more than their fair share of light. Accordingly, a greater reduction in daylight or sunlight may be unavoidable and so the local authority may wish to apply different target values.
- Where buildings match the height and proportions of existing surrounding buildings some transgressions will be inevitable.
- Kitchens and bedrooms are given less weighting than that of a living room; and
- The BRE guidelines are not intended to be mandatory, or applied in strict calculation terms.

1.4.2 Overall, it is considered that there are categorically no valid grounds to challenge the proposed development with regards to daylight and sunlight amenity.

2. Introduction

2.1 Scope of Service

2.1.1 We have been instructed by Studio Mark Ruthven to consider the potential impact upon the amenity of the surrounding residential properties, which may arise from the proposed development at 115 Frognal, London, NW3

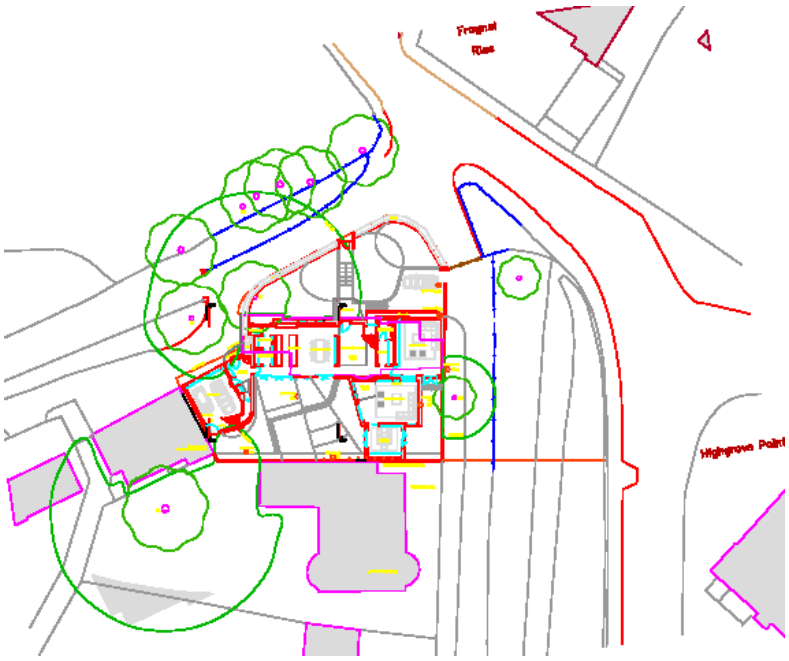
2.2 Assessment

2.2.1 To ensure that this assessment has been appropriately considered, daylight and sunlight assessments have been undertaken in accordance with the Building Research Establishment Report 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice' 2011 (the "BRE guide") and with the British Standard 8206 – 2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting', to which the BRE report refers.

2.2.2 The standards and tests applied within this assessment are briefly described in Appendix A.

2.2.3 The existing buildings adjacent to the site are shown on the Site Location Plan below.

Site Location Plan



2.2.4 The existing buildings adjacent to the site considered for this report are listed in the following table. Some of these buildings may not require a comprehensive assessment with the reasons for these findings given later in this report under section 3: Results and Consideration.

Adjacent Building Summary Table		
Name/Address of Building	**Assumed Use of Building**	**Position in Relation to the Proposed Development**
113 Frognal	Residential	South

2.3 Limitations

2.3.1 Our assessment is based on the proposed development drawings by Studio Mark Ruthven.

2.3.2 Topographical survey information was provided by Studio Mark Ruthven in relation to the existing buildings on site, ground heights and adjacent building. Where buildings were not surveyed, the locations and heights were derived from site photographs and oblique aerial photography.

2.3.3 We refer you to the drawings which accompany this report for a list of the third party information relied upon which our 3D computer model and resultant analyses are based.

3. Results and Consideration

3.1 Daylight

3.1.1 The table below shows a summary of the results for the buildings tested for daylight availability in accordance with the BRE recommendations. Detailed test results are shown in Appendix C.

Daylight Assessment Summary Table						
Building Reference	Vertical Sky Component Assessment			Daylight Distribution Assessment		
	No. of windows assessed	No. that meet the BRE Guidelines	No. that do not meet the BRE Guidelines	No. of rooms assessed	No. that meet the BRE Guidelines	No. that do not meet the BRE Guidelines
113 Frognal	7	6	1	4	4	0
Total	7	6	1	4	4	0

Existing Baseline

3.1.2 The Site is situated to the west side of Frognal at the junction of Oak Hill Way. It is an irregular strip land running east to west with a slight slope, see accompanying drawing 1364/DSO/01. A substantial 3-storey family dwelling, with single storey extensions to either side, currently fronts Oak Hill Drive.

Proposed Development

3.1.3 The proposed development comprises a complete modern redevelopment, utilising the existing footprint, extending westwards and southwards, see accompanying drawing 1364/DSO/01.

3.1.4 We have considered and/or assessed the habitable windows and rooms of the adjacent buildings at that are most likely to be affected by the proposed development.

113 Frognal

3.1.5 This dwelling lies immediately south of the site along the common boundary.

3.1.6 We have obtained detailed floor plans, elevations and sections of this building from Camden Planning dated mid to late 2006 to inform our assessments.

3.1.7 With reference to accompanying drawing 1364/DSO/01 there are four windows at ground and first floor level that face directly towards the site. At ground floor level, W1 and W2 (glazed door facing the site) serve a dual aspect "boot room". In accordance with the BRE guidelines, circulation space, hallways, storerooms, toilets and bathrooms, need not be assessed. Nonetheless, we have included this room in our calculations because we thought it would help to understand the context of our assessments.

3.1.8 At first floor level, W1 and W2 serve a dual aspect en-suite to a guest bedroom. W3 serves a stairwell. W4 and W5 serves a study.

3.1.9 Turning now to the assessment results, the windows and habitable rooms were assessed for Vertical Sky Component (VSC), Daylight Distribution (DD) respectively.

3.1.10 Regarding VSC, all windows assessed, save for the ground floor glazed door, comfortably meet the BRE guidelines. As outlined above, the glazed door serves a "boot room" i.e. a non-habitable, circulation space. In addition, it is dual aspect with its main east facing window remaining virtually unaffected.

3.1.11 Regarding DD, all rooms comfortably meet the BRE guidelines.

3.1.12 Strictly speaking, in terms of the BRE guidelines only one habitable room need be discussed here and that is the first floor study; all the other rooms need not be assessed for various reasons. Again, we have included them for completeness to help understand the context of our assessments. The study will remain more than adequately lit with the proposed development in place. This because first, it remains comfortably within the BRE criteria and second it is dual aspect with its additional west facing window remaining virtually unaffected.

3.1.13 Finally, it is probably worth mentioning the roof light to the ground floor extension. Roof lights by their nature are incredibly difficult to affect, let alone materially, at least in terms of the BRE guidelines. In any event, the south portion of the proposed development is set back too far away and at an oblique angle to cause any impact. Also, the extension is dual aspect with full width and full height windows to the west elevation. To put the above into context, a development would need to be a tower of significant height and situated along the boundary to even come close to affecting it.

3.1.14 It is therefore considered that this building would not be adversely affected by the proposed development.

Mitigating Factors

3.1.15 As with all development sites, it would be helpful at this stage to outline material mitigating factors. The main one being, is that the Site is underdeveloped. The high level of natural light enjoyed by the windows of adjacent buildings in the existing situation means that when the Site is developed, a higher proportion of non-compliance might be expected with a previously developed site even if the residual VSC values are very good.

3.1.16 Additionally, the BRE guidelines recognises that buildings located uncommonly close to the site boundary, as is the case here, may be considered as "bad" neighbours, taking more than their fair share of light. Accordingly, a greater reduction in daylight or sunlight may be unavoidable and so the local authority may wish to apply different target values.

3.1.17 Where buildings match the height and proportions of existing surrounding buildings, some transgressions will be inevitable.

3.1.18 Kitchens and bedrooms are generally given less weighting than that of a principle room such as a living

room.

Dual aspect rooms and residual light

3.1.19 Dual aspect and triple aspect rooms can withstand substantial losses and still remain adequately lit for the purposes of the BRE guidance, due to the remaining residual light from the additional windows, see the images below.

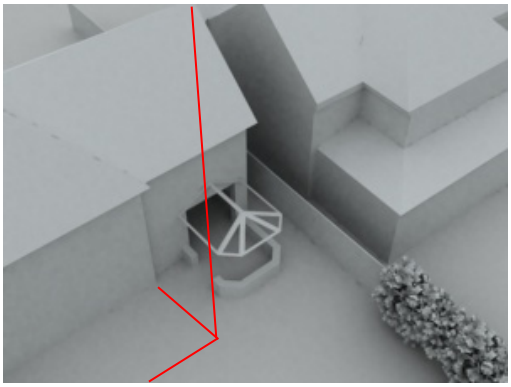


Image A

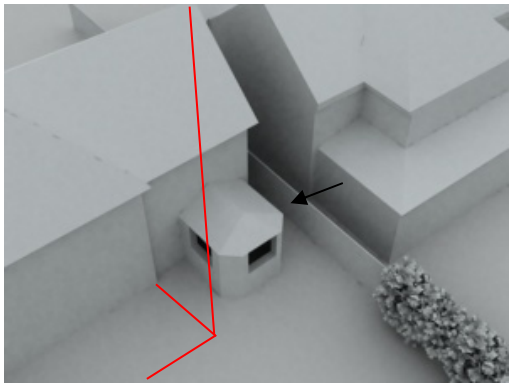


Image B (3 windows)

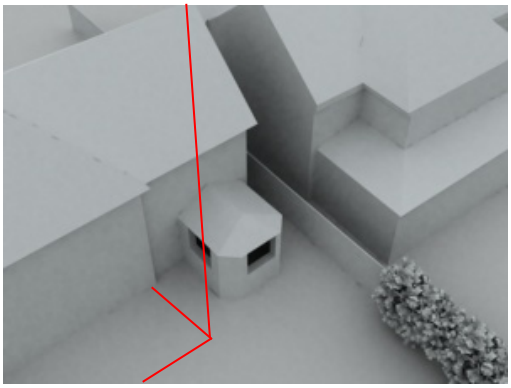


Image C (2 windows)

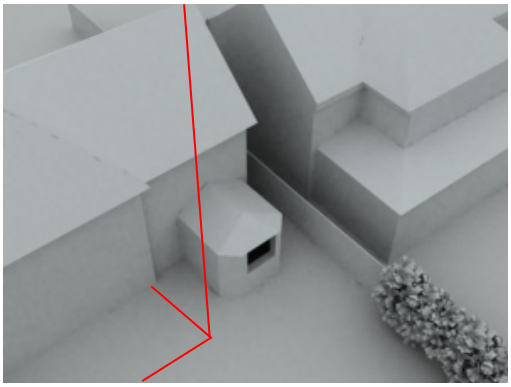


Image D (1 window)

3.1.20 Taking the above images if a structure of infinite height (red) was placed next to the conservatory, would it remain well lighted? Image A? Yes, no question. Image B, again yes, no question. Image C? There would be a substantial loss to the side window, though ample light would still come from the rear window, so, yes. Image D? The rear window would remain unaffected, so, again yes. In fact, there is no real difference between images C and D in panning terms.

3.1.21 The true answer for each of the images is actually - yes, no question. It is just that with reference to the BRE guidelines one tends to remain focused on the losses, or the calculation results in isolation i.e. a single pane of glass/window, rather than the potential for residual light from additional windows on another elevation and indeed the surrounding circumstances.

Daylight Summary

3.1.22 In summary for daylight, the proposed development is in accordance with the BRE guidance, namely, the surrounding buildings will not be materially affected.

3.2 Sunlight

3.2.1 In accordance with the BRE report, the buildings outlined below have been assessed for annual probable sunlight hours (APSH), where the windows face within 90 degrees of due south. Detailed test results are shown in Appendix C.

Sunlight (APSH) Assessment Summary Table						
Building Reference	Annual APSH			Winter APSH		
	No. of windows assessed	No. that meet the BRE Guidelines	No. that do not meet the BRE Guidelines	No. of windows assessed	No. that meet the BRE Guidelines	No. that do not meet the BRE Guidelines
113 Frognal	2	2	0	2	2	0
Totals	2	2	0	2	2	0

All properties

3.2.2 All windows satisfy the BRE criteria for sunlight over the course of the year and during the winter months. This is principally because those windows that face within 90 degrees of due south face perpendicular to the proposed development and so would remain virtually unaffected.

Sunlight Summary

3.2.3 In summary for sunlight, the proposed development is in accordance with the BRE guidance, namely, the surrounding buildings will attain adequate sunlight throughout the year and during the winter months.

Overshadowing Summary

3.2.4 In summary for overshadowing, it is considered that there is no requirement for an assessment here due to the fact that the proposed development is situated north of the amenity areas of 113 Frognal.

4. Conclusion

4.1 Daylight and Sunlight

4.1.1 The proposed development meets the BRE guidelines for daylight, sunlight and overshadowing.

4.1.2 For daylight, the proposed development is in accordance with the BRE guidance, namely, the surrounding buildings will remain adequately lit.

4.1.3 For sunlight, the proposed development is in accordance with the BRE guidance, namely, the surrounding buildings will attain adequate sunlight throughout the year and during the winter months.

4.1.4 For overshadowing, the proposed development is in accordance with the BRE guidance, namely, the proposed development is situated north of the amenity areas of 113 Frognal.

4.2 Generally

4.2.1 When considering the numerical results, it is important to approach and interpret the BRE guidelines flexibly along with the following material mitigating factors:

- The BRE guidelines recognises that buildings located uncommonly close to the site boundary, as is the case here, may be considered as "bad" neighbours, taking more than their fair share of light. Accordingly, a greater reduction in daylight or sunlight may be unavoidable and so the local authority may wish to apply different target values.
- Where buildings match the height and proportions of existing surrounding buildings some transgressions will be inevitable.
- Kitchens and bedrooms are given less weighting than that of a living room; and
- The BRE guidelines are not intended to be mandatory, or applied in strict calculation terms.

4.2.2 Overall, it is considered that there are categorically no valid grounds to challenge the proposed development with regards to daylight and sunlight amenity.

Appendix A

BRE Assessments

BRE Assessments

Introduction

The Building Research Establishment Report "Site Layout Planning for Daylight and Sunlight – a guide to good practice 1991" ("the BRE Guidelines") provides advice to building designers on site layout planning in order to achieve good daylight and sunlight amenity, not only to the proposed development and the open spaces between the proposed blocks, but also to the existing surrounding properties.

As part of this advice, the Building Research Establishment (BRE) have developed a series of assessments along with numerical guidelines so that the potential for good daylight and sunlight amenity can be achieved.

In general, the application of the BRE Guidelines are more appropriate for low density suburban development sites where there is a greater flexibility for site layout planning. In dense urban areas, however, development sites are usually constrained to a greater degree, often by immediately adjacent buildings etc. Accordingly, when dealing with dense urban areas the guidelines should be applied flexibly. This point is expressly recognised by the BRE Guidelines, which states in the introduction at page 1:

> *'The Guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not been 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 because natural lighting is only one of many factors in site layout design… … In special circumstances the developer or Planning Authority may wish to use different target values. For example, in a historic city centre a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings… ..'*

Daylight

The criteria for assessing daylight to existing surrounding buildings are outlined at pages 4 to 8 of the BRE Guidelines. Generally, daylight assessments should be undertaken to habitable rooms within dwellings and to principal rooms in non-domestic buildings such as schools, hospitals and offices where the occupants have a reasonable expectation of daylight.

Whilst the BRE Guidelines contain a number of rules of thumb that inform site layout design some relate to specific situations, such as domestic developments to the rear of a property, which although useful may not be considered appropriate for general site layout design.

The principal assessments used to assess daylight to existing surrounding buildings are outlined in more detail below along with a further daylight assessment, usually applied to proposed dwellings, which is admissible provided it is agreed with the local authority, or there are past precedents.

<u>25° section line assessment</u>

The first assessment is known as the [modified] 25° section line test. It is a simple rule of thumb that determines whether an existing building should still receive adequate daylight with the proposed development in place.

The BRE guide states at page 11:

> *"If any part of a new building or development, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of a lowest window, subtends an angle of more than 25°to the horizontal may be affected."*

This assessment is most appropriate for well spaced, low-density or low-rise, uniform proposed developments. It is not an appropriate assessment for dense urban environments, where the existing building on the development site already subtends at an angle greater than 25° to the horizontal from the subject window. It is for this reason this 25° assessment is generally dispensed with and the more detailed assessments outlined below are entered into at the outset.

The Vertical Sky Component ("VSC") Assessment

The Vertical Sky Component ("VSC") assessment represents the amount of available daylight received directly from the sky at a particular window. The reference point for this assessment is the centre of the window, on the plane of the outer window wall.

A VSC is expressed as a percentage, being a ratio of that part of illuminance on a vertical plane (a window) that is received from a Standard Overcast Sky (CIE Sky), to the illuminance received on a horizontal plane on an unobstructed hemisphere of Standard Overcast Sky. To put it another way it is simply the amount of direct sky visibility a window receives, howsoever obstructed, expressed as a percentage of the amount of direct sky a horizontal unobstructed roof-light would receive.

The maximum percentage of direct skylight a vertical window can receive from a Standard Overcast Sky is 39.62%, or 40% when rounded. The BRE have determined that where a VSC value of 27% is achieved, then enough skylight (direct daylight) should reach the window of an existing building. This value is roughly equivalent to a uniform obstruction of 25°, with reference to the above assessment. The Guidelines go on to state:

> *"If the vertical sky component, with the new development in place, is both less than 27% and less than 0.8 times its former value, (a 20% reduction), then the occupants of the existing building will notice the difference."*

Consequently, the daylight to an existing building, as a result of a proposed development, may be reduced by 20% before that loss becomes noticeable.

The Daylight Distribution ("DD") Assessment

The Daylight Distribution Assessment is undertaken at working plane level from within a subject room and represents the change in skyline when viewed through a subject window. The working plane level is set at 0.85m above floor level in dwellings and 0.70m in offices, however, in practice this distinction in height is not normally made, and so the working plane is generally set at 0.85m.

If significant areas beyond the no-sky line i.e. the point beyond the line where no sky can be seen at working plane level, the room will usually appear gloomy and supplementary electric lighting will be required. The BRE Guidance states:

> *"If, following construction of a new development, the no-sky line moves so that the area of the existing room which does not receive direct skylight is reduced to less than 0.8 times its former value, (a 20% reduction), then this will be noticeable to the occupants, and more of the room will be poorly lit."*

Consequently, the daylight to an existing building, as a result of a proposed development, may be reduced by 20% before that loss becomes noticeable.

The VSC and DD are the 2 principal assessments that are required to be undertaken in order to assess daylight to existing surrounding buildings.

The Average Daylight Factor ("ADF") Assessment

A further daylight assessment, which may be undertaken, provided it is accepted by the local authority, is known as the Average Daylight Factor (ADF). Strictly speaking ADF assessments are used to determine the daylight availability to units within a proposed development, however, in more recent times the ADF assessment has been accepted by local authorities as a valid assessment for existing surrounding buildings.

An ADF assessment takes into account the amount of direct sky visibility incident on a window serving a subject room, the transmittance of the light through the glass, and the reflectance of that resultant light from the entire surface area of the room, which is then expressed as a percentage.

The ADF values recommended in the British Standard BS8206 Part 2 to which the BRE refers are: 2% for kitchens or open plan living areas, 1.5% for living rooms and 1% for bedrooms, if supplementary electric lighting is provided.

Nb. The guidelines outlined in the latest edition of BS8206 Part 2: 2008 are now applied.

Sunlight

Sunlight is valued in both residential and commercial buildings. It is seen as providing warmth and cheerfulness to a room, whilst also giving the occupants a therapeutic effect and a sense of wellbeing.

In residential properties the main requirement for sunlight is in the living room or conservatories, which should be assessed if they have a main window facing within 90° of due south. Sunlight is considered less important in kitchens and bedroom, although care should be taken not to block out too much.

In commercial or non-domestic buildings, the requirement for sunlight varies according to the use of the building. The BRE recommends that for a commercial building any space that has a particular or special requirement for sunlight should be assessed.

Annual Probable Sunlight Hours (APSH) Assessment

The APSH assessment is undertaken to the main window of residential and commercial buildings, where the window faces within 90° of due south. "Probable Sunlight Hours" may be defined as the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness.

At page 17 of the BRE guidelines the criteria for the APSH assessment are as follows: -

'If a living room of an existing dwelling has a main window facing within 90º of due south, and any part of a new development subtends an angle of more than 25º to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely effected. This will be the case if a point at the centre of the window, in the plane of the inner window wall, received in the year less than one quarter (25%) of annual probable sunlight hours including at least 5% of annual probable sunlight hours between 21 September and 21 March, and less than 0.8 times its former sunlight hours during either period.'

Consequently, the sunlight to an existing building, as a result of a proposed development, may be reduced by 20% in either the annual or winter periods before that loss becomes noticeable.

Overshadowing

The BRE guidance also offers advice on how to preserve sunlight to both existing and proposed open amenity spaces. Areas such as main back gardens of dwellings, parks, playing fields, playgrounds, waterways and public spaces such should be assessed. Small front gardens to dwellings and parking areas need not be assessed.

<u>The permanent overshadowing assessment</u>

The permanent overshadowing assessment is undertaken on 21 March, the spring equinox. This assessment shows areas of a subject amenity area where no sunlight will be available during the winter period, however, the subject area may still receive some sunlight during the summer.

The BRE states at page 20:

"for it to appear adequately sunlight throughout the year, at least half of a garden or amenity area should receive at least 2 hours of sunlight on 21 March. If, as a result of new development, an existing garden or amenity area does not meet these guidelines, and the area which can receive 2 hours of sun on 21 March is less than 0.8 times its former value (a 20% reduction), then the loss of sunlight is likely to be noticeable".

Consequently, if an open amenity area, is more than 50% in shade for more than 2 hours in either existing or proposed situations, and is reduced by more than 20% of its existing value as a result of new development, then that loss is likely to be noticeable.

<u>The transient overshadowing assessment</u>

A further overshadowing assessment, sometimes requested by the local authority for larger developments, is the temporary, or transient overshadowing assessment. This assessment usually comprises hourly overshadowing images of the existing and proposed situations undertaken on key dates during the year such as 21 March, the spring equinox; 21 June, the summer solstice; and 21 December, the winter solstice.

The BRE guidance offers no express numerical values for this type of assessment, consequently it is purely subjective.

Appendix B

Context Drawings

Appendix C

Daylight Results / Sunlight Results

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Vertical Sky Component (VSC) Assessment/ Sunlight (APSH) Assessment

Floor Ref.	Room Ref.	Room Use.	Window Ref.	Scenario	VSC	Difference	Condtn	Available Sunlight Hours					
								Annual %	Diff %	Pass / Fail	Winter %	Diff %	Condtn
113 Frognal													
Ground	R1	Boot Room	W1	Existing	35.01	0.99	✓	47	1.00	✓	13	1.00	✓
				Proposed	34.65			47			13		
			W2	Existing	28.77	0.41	x	*North Facing					
				Proposed	11.93								
First	R1	En Suite	W1	Existing	36.04	1.00	✓	55	1.00	✓	18	1.00	✓
				Proposed	35.94			55			18		
			W2	Existing	37.2	0.94	✓	*North Facing					
				Proposed	34.88								
	R2	Stairwell	W3	Existing	36.31	0.91	✓	*North Facing					
				Proposed	33.08								
		Study	W3	Existing	36.71	0.93	✓	*North Facing					
				Proposed	34.26								
	R3		W4	Existing	35.14	0.99	✓	*North Facing					
				Proposed	34.77								

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Daylight Distribution (DD) Assessment

Floor Ref.	Room Ref.	Room Use.		Room Area	Lit Area Existing	Lit Area Proposed	Difference %	Conditn
113 Frognal								
Ground	R1	Boot Room	Area m2 % of room	10.39	9.85 95%	9.85 95%	1.00	✓
First	R1	En Suite	Area m2 % of room	9.30	9.06 97%	9.06 97%	1.00	✓
First	R2	Stairwell	Area m2 % of room	3.63	3.37 93%	3.37 93%	1.00	✓
First	R3	Study	Area m2 % of room	12.15	11.95 98%	11.95 98%	1.00	✓