

Brooks Development

157 York Way, London, N7 9LN

Daylight & Sunlight Assessment

Prepared for: Yurky Cross Chartered Architects
167 York Way
London
N7 9LN

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I Introduction

I.1 Introduction

- I.1.1 Brooks Development Practice Ltd was instructed by Yurky Cross Chartered Architects to prepare a Daylight and Sunlight Assessment for the proposed development at 157 York Way, London, N7 9LN.
- I.1.2 The purpose of this report is to assess the skylight and sunlight levels of the proposed new dwellings and 5 of the 6 existing dwellings, and to assess the impact that the proposed development may have on the skylight and sunlight of the existing surrounding buildings, in accordance with guidance set out in *BRE Report 209, Site Layout Planning for Daylight and Sunlight: A guide to good practice, Second Edition, 2011 (BR 209)*, and *BS 8206-2 Code of Practice for Daylighting*.
- I.1.3 This report is not to be used to determine any right to light for existing building windows. This report has been carried out using guidelines set out in BR 209 and cannot be used to replace or satisfy the legal requirements surrounding the right to light. The assessment of loss of light in rights to light cases is carried out in a different way to the methods used in BR 209 and this report. It should not be assumed that if the guidelines in BR 209 are satisfied within this report that a proposed development will not infringe rights to light.

I.2 Development Description

- I.2.1 The proposed development is for a rear extension to 157 York Way to create additional residential accommodation.

I.3 3D Models

- I.3.1 Two 3D models have been developed. The first model is of the existing development and existing nearby buildings. The second model is of the proposed development and existing nearby buildings. These are shown in Figures 1 and 2.
- I.3.2 The model and location of openings have been based on drawings provided by Yurky Cross Chartered Architects.
- I.3.3 LightUp Analytics, a program specifically developed to calculate skylight and sunlight levels in accordance with guidance provided in BR 209, has been used.
- I.3.4 Trees have not been modelled because skylight and sunlight is scarcest and most valuable in winter when the trees won't be in leaf.
- I.3.5 For the purposes of the Average Daylight Factor (ADF) calculations, and the Room Depth Check, the area-weighted average reflectance of the room surfaces has been calculated on the assumption that the rooms have a white ceiling (0.85), light (pale cream) coloured walls (0.81) and light coloured carpet/light wood flooring (0.4). The maintenance factor has been calculated as 0.92 for the majority of windows and 0.76 for windows sheltered by balconies/canopies. The glass transmission factor has been assumed to be 0.68 and the frame factor has been assumed to be 0.7.

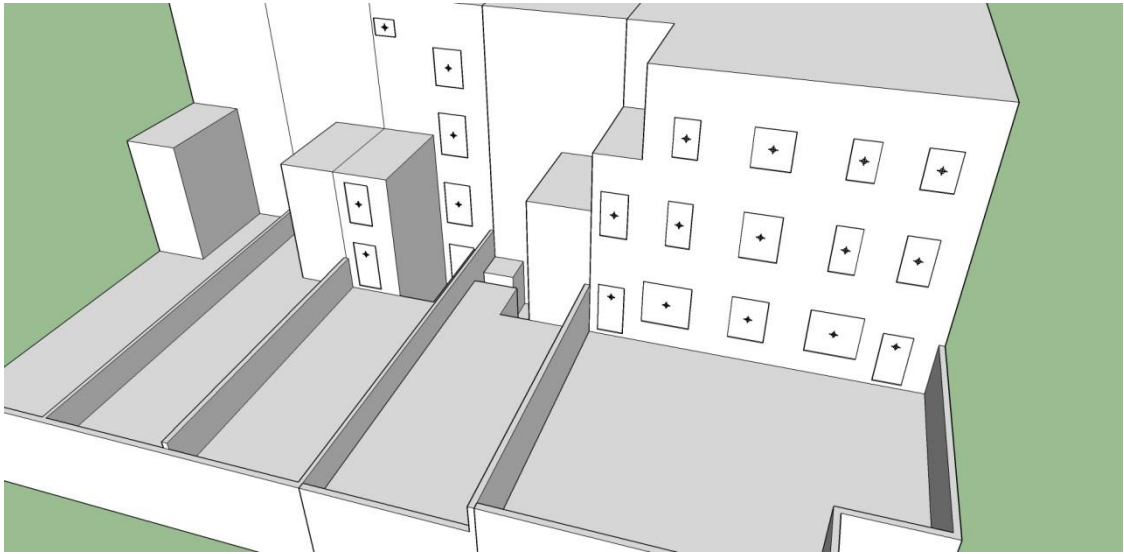


Figure 1 – Development area as existing

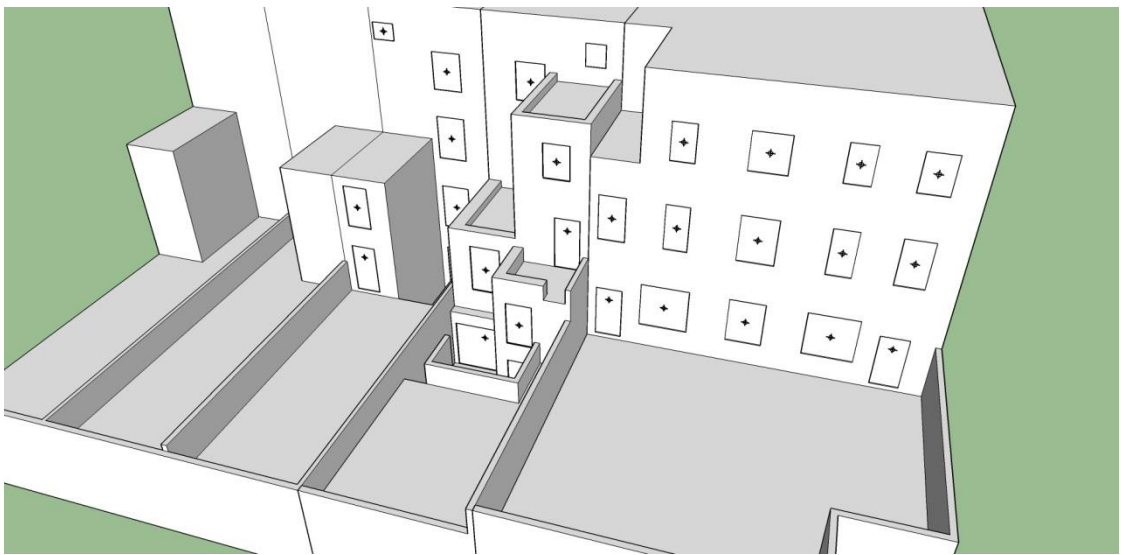


Figure 2 – Development area as proposed

2 Assessment

2.1 Skylight – Vertical Sky Component (VSC) – New Development

2.1.1 BR 209 Paragraph 2.1.6 states:

The amount of daylight a room needs depends on what it is being used for but roughly speaking, if... [the] VSC is at least 27%, conventional window design will usually give reasonable results.

2.1.2 Figures 3 to 5 provide a record of the assessment of the vertical sky component (VSC) of the windows of the existing and proposed development. The boundary between the model and the yellow banding represents a VSC of 27%. All areas with a VSC above 27% are white. All areas with a VSC below 27% are coloured. Lighter colours show areas with a VSC just below 27% and darker colours show area with a VSC further below 27%.

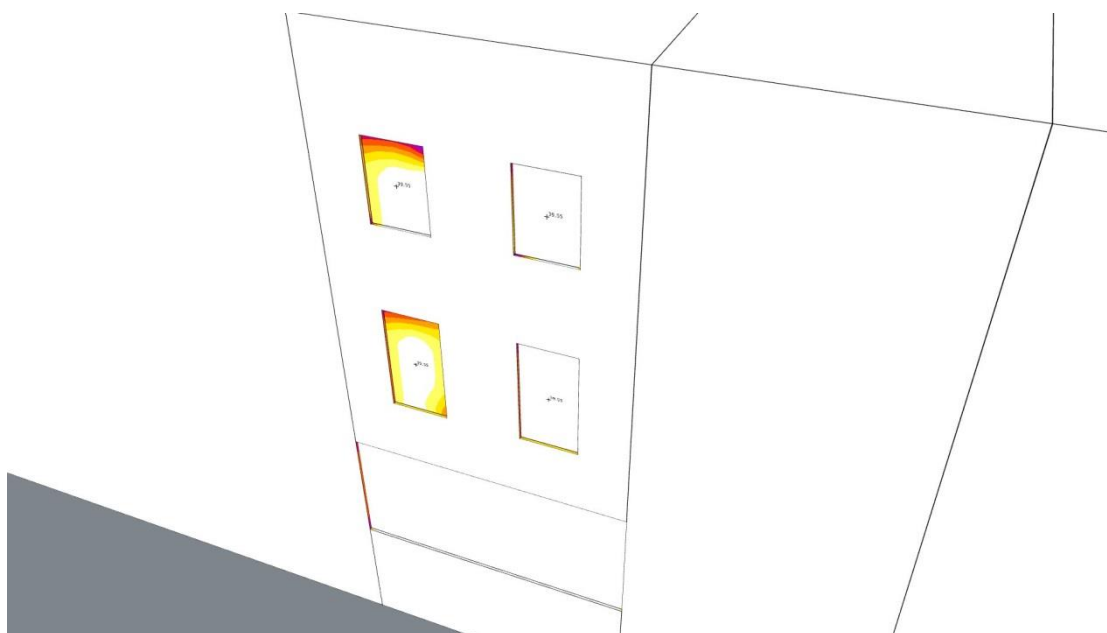


Figure 3 - VSC of the Front of 157 York Way as proposed

2.2 Skylight – ADFs and No Sky Line – New Development

2.2.1 BR 209 Paragraph 2.1.8 states:

Daylight provision in new rooms may be checked using the average daylight factor (ADF). The ADF is a measure of the overall amount of daylight in a space. BS 8206-2 Code of practice for daylighting...gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

2.2.2 BS 8206-2 Paragraph 5.6 further explains that:

Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%.

2.2.3 BR 209 Paragraph C16 states:

If a significant area of the working plane (normally more than 20%) 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.

2.2.4 Figures 6 to 9 provides a record of the assessment of the ADFs and the percentage of each room that receives direct skylight. Values circled in black are ADFs. Values circled in blue are the percentage of each room that receives direct skylight. Values highlighted in green achieve the numerical target values stated in BR 209. Values highlighted in orange fall below the numerical target values stated in BR 209. ADFs have been given to one decimal place in order to demonstrate whether the values stated in BR 209 have been met. However, when reviewing the ADFs, it is recommended that Peter Tregenza and Michael Wilson's observation below is taken into consideration.¹

We can say that there is a significant difference, in both the subjective character and the physical environment between a room with an average daylight factor of 2% and one with an average daylight factor of 5%. There may be a noticeable difference between rooms with daylight factors of 2% and 3%. However, not only would a difference between 2% and 2.1% be almost certainly subjectively unnoticeable, but such a distinction would be completely unjustified scientifically. The level of uncertainty in the parameters and the simplifying assumptions in the models preclude such pretensions to precision. Average daylight factor calculations have little absolute meaning beyond the decimal place.

¹ Tregenza, P. and Wilson, M. (2011) *Daylighting: Architecture and Lighting Design*. Abingdon: Routledge.

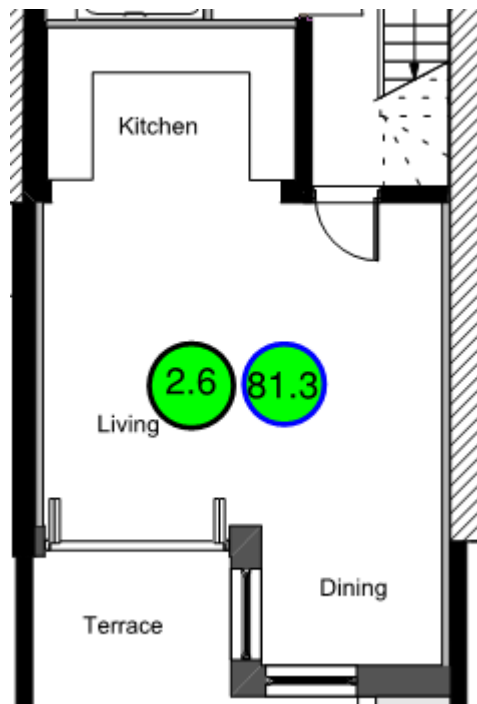


Figure 6 – ADFs and No-Sky line of Proposed Basement Level

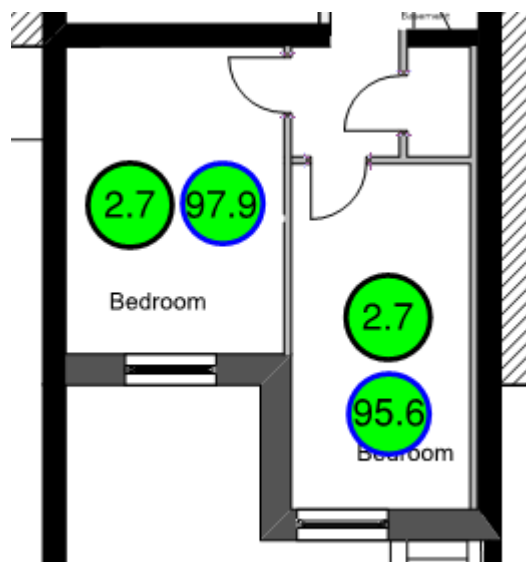


Figure 7 – ADFs and No-Sky line of Proposed Ground Floor Level



Figure 8 – ADFs and No-Sky line of Proposed First Floor Level

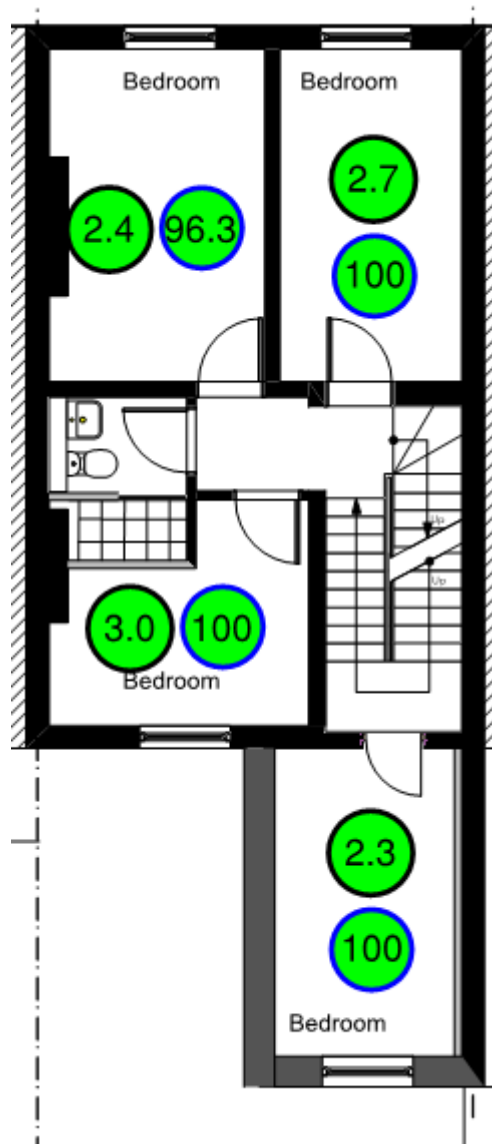


Figure 9 – ADFs and No-Sky line of Proposed Second Floor Level

2.2.5 All rooms of the proposed development achieve the ADF and no sky line recommendations set out in BR 209 and BS 8206-2.

2.3 Skylight – Room Depth – New Development

2.3.1 BR 209 paragraphs C13 and C14 state:

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:

$$(L/W) + (L/H) < 2/(1-R_b)$$

Where:

W is the room width,

H is the window head height above floor level

R_b is the average reflectance of surfaces in the rear half of the room (away from the window).

If L exceeds this value, the rear half of the room will tend to look gloomy and supplementary electric lighting will be required.

2.3.2 A room depth check has been carried out on all habitable rooms lit by windows in one wall only. All rooms meet the BR 209 guidance criteria for this issue.

2.4 Sunlight – Annual Probable Sunlight Hours (APSH) – New Development

2.4.1 BR 209 paragraph 3.1.15 states:

In general a dwelling, or non-domestic building, which has a particular requirement for sunlight will appear reasonably sunlit provided:

- At least one main window wall faces within 90° 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 annual probable sunlight hours in the winter months between 21 September and 21 March.

2.4.2 Table I provides a record of the assessment of the APSH of the windows of the main living rooms facing within 90° of due south. Climate Data² from the nearest climate station at Hampstead has been used. Annual probable sunlight hours for Hampstead are 1540 hours and 24 minutes (1540h24m). Therefore, to meet BR 209 numerical target values, windows should receive at least 385h06m (25%) annual probable sunlight hours and 77h01m (5%) annual probable sunlight hours in the winter months.

Table I: APSH and APSH in the Winter Months

Main Window	APSH	APSH in winter months
Flat 1	444h44m	162h48m

2.4.3 Flat 1 has a main window that faces within 90° of due south and achieve the annual probable sunlight hours (APSH) and the annual probable sunlight hours in the winter months (VPSH) recommended in BR 209. The existing and proposed living room to Flat 2 is a predominately north-east facing living room and is not affected by the proposal.

² <http://www.metoffice.gov.uk/public/weather/climate/gcpv7fnqu>

2.5 Sunlight – Gardens – New Development

2.5.1 BR 209 paragraph 3.3.17 states:

It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March.

2.5.2 The amenity area of the proposed development has been assessed. The area receives 68.3% of at least two hours of sunlight on 21 March. The proposed amenity meets the BR 209 guidance criteria for this issue.

2.6 Skylight – Vertical Sky Component (VSC) – Existing Buildings

2.6.1 BR 209 paragraph 2.2.7 states:

If the VSC (of the window in an existing building) is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight.

2.6.2 Figures 10 to 13 provide a pictorial record of the assessment of the VSC of windows of nearby existing residential buildings that may be affected by the proposed new development. The boundary between the model and the yellow banding represents a VSC of 27%. All areas with a VSC above 27% are white. All areas with a VSC below 27% are coloured. Lighter colours show areas with a VSC just below 27% and darker colours show areas with a VSC further below 27%.

2.6.3 Windows circled in black fall below the numerical target values stated in BR 209 and occupants may notice the reduction in the amount of skylight caused by the proposed new development. The fraction of the former VSC value is provided for all windows circled in black. This number will be lower than 0.8 as this is the numerical target value. Windows not circled in black achieve the numerical target values stated in BR 209.

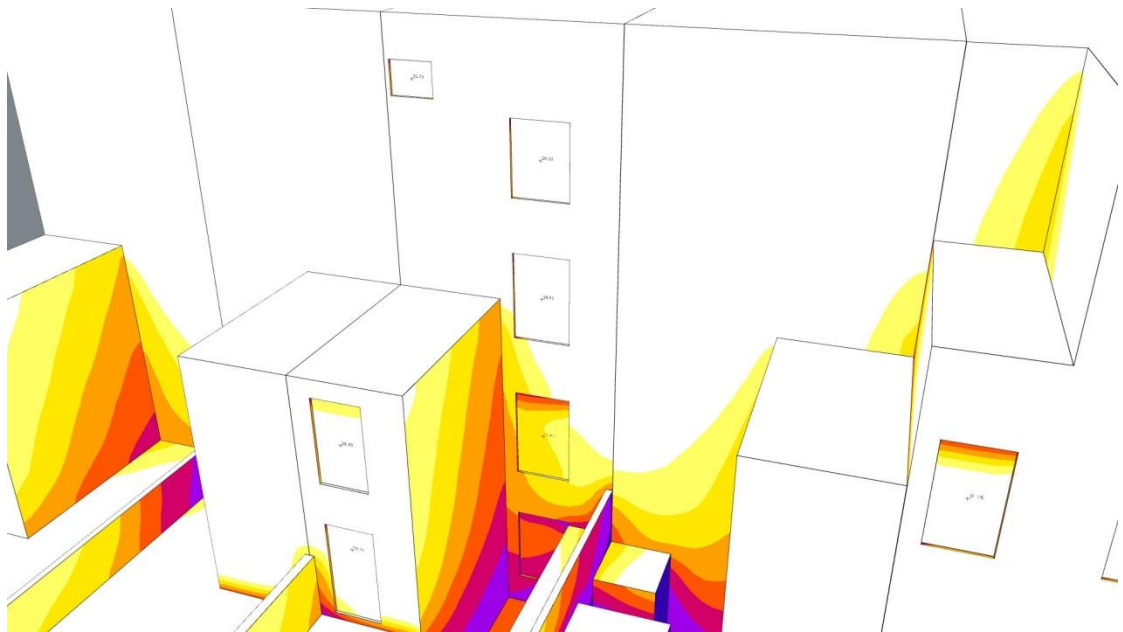


Figure 10 – VSC of rear of 159 York Way before development

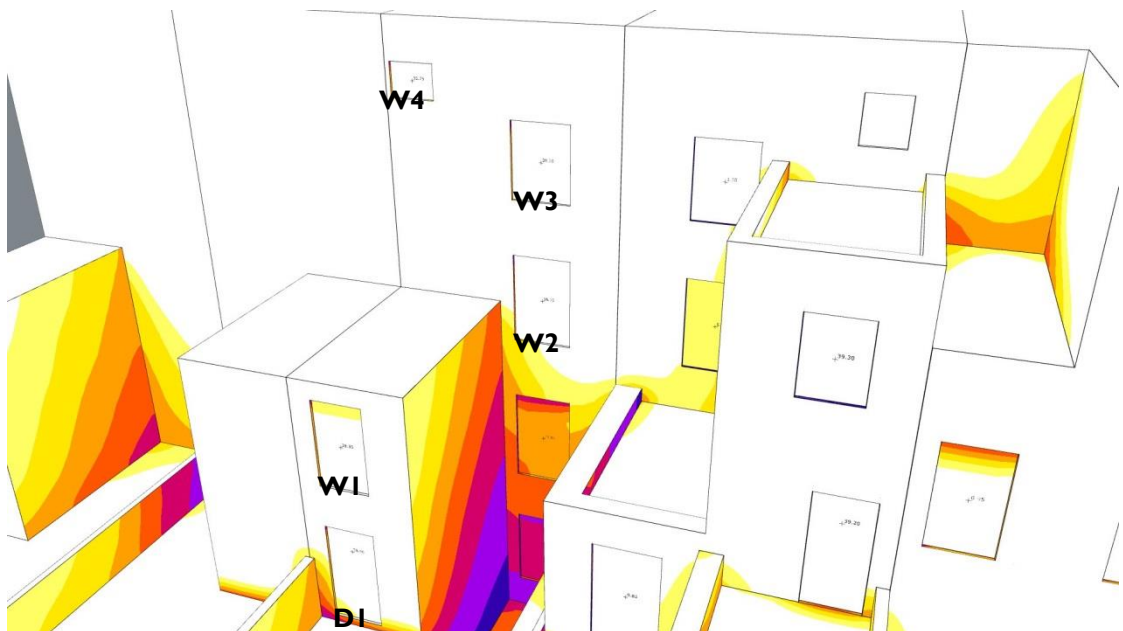


Figure 11 – VSC of rear of 159 York Way after development

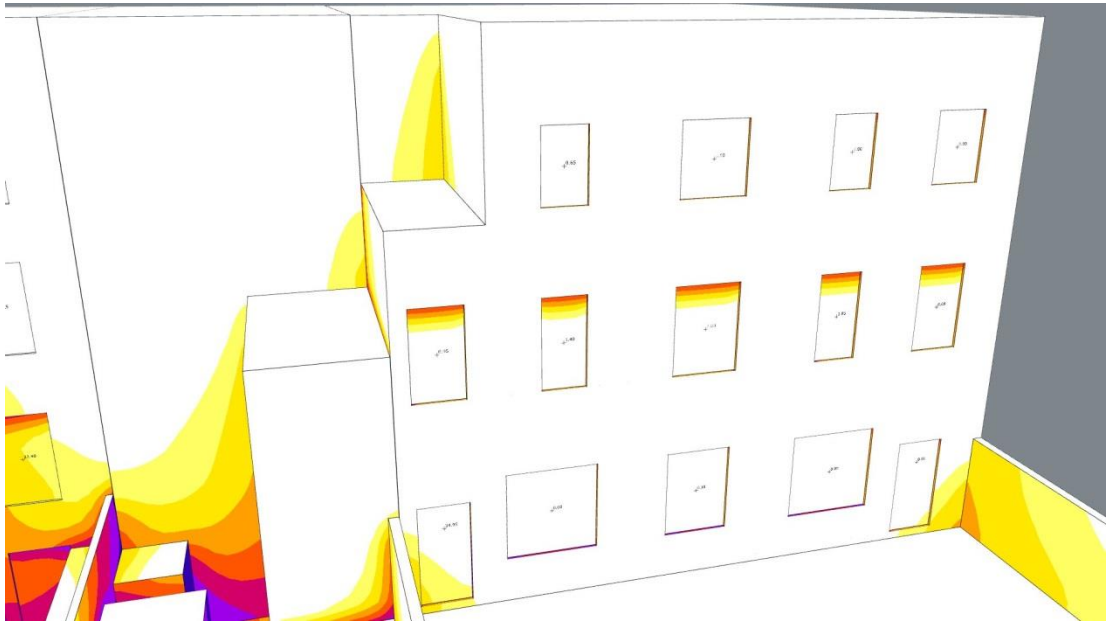


Figure 12 – VSC of rear of 155 York Way before development

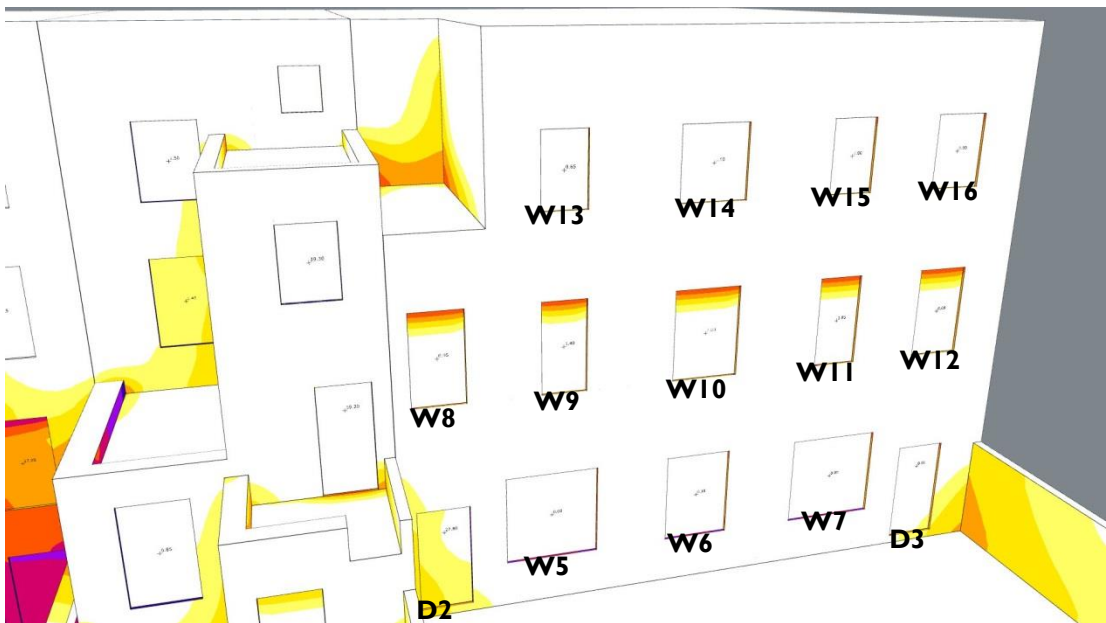


Figure 13 – VSC of rear of 155 York Way after development

2.6.4 Table 2 provides a numerical record of the assessment of the VSC of windows of nearby existing residential buildings that may be affected by the proposed new development.

Table 2: VSC – Existing Surrounding Buildings

Window	VSC before proposals	VSC after proposals	Fraction of former value
D1	39.35	39.15	0.99
W1	39.55	39.55	1.00
W2	38.35	36.30	0.95
W3	39.10	38.85	0.99
W4	39.35	39.35	1.00
D2	35.15	28.00	0.80
W5	38.25	36.75	0.96
W6	38.55	38.30	0.99
W7	38.35	38.30	1.00
W8	36.55	36.50	1.00
D3	39.55	39.55	1.00
W9	39.50	39.50	1.00
W10	39.55	39.55	1.00
W11	39.50	39.50	1.00
W12	39.55	39.55	1.00
W13	39.50	39.50	1.00
W14	39.55	39.55	1.00
W15	39.50	39.50	1.00
W16	39.50	39.50	1.00

2.6.5 The proposed development would have an imperceptible impact on the skylight levels to all windows / openings assessed of nearby existing residential buildings.

2.7 Sunlight – Annual Probable Sunlight Hours – Existing Buildings

2.7.1 BR 209 paragraph 3.2.3 states:

To assess the loss of sunlight to an existing building it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90 degrees of due south.

2.7.2 BR 209 paragraph 3.2.11 states:

If a living room of an existing dwelling has a main window facing within 90° of due south...the sunlighting of the existing dwelling may be adversely affected...if the centre of the window:

- Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21 September and 21 March and;
- Receives less than 0.8 times its former sunlight hours during either period and;
- Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

2.7.3 Table 3 provides a numerical record of the assessment of the annual probable sunlight hours (APSH) and the APSH in the winter months (WPSH) of the windows of nearby existing residential buildings that may be adversely affected by the proposed development. All windows within 90° of due south have been assessed since it is not known which windows serve as a main living room. Climate Data³ from the nearest climate station at Hampstead has been used. Annual probable sunlight hours for Hampstead are 1540 hours and 24 minutes (1540h24m). 25% of annual probable sunlight hours are 385h06m. 5% of annual probable sunlight hours are 77h01m. 4% of annual probable sunlight hours are 61h37m.

³ <http://www.metoffice.gov.uk/public/weather/climate/gcpv7fnqu>

Table 3: APSH and WPSH - Existing Surrounding Buildings

Window	APSH before development	APSH after development	Fraction of former value	WPSH before development	WPSH after development	Fraction of former value	% reduction in sunlight over the whole year (against 1540h24m)	Complies with BR 209 recommendations
D1	1118h38m	1106h21m	0.99	427h06m	414h49m	0.97	0.80	✓
P1	535h01m	424h25m	0.79	232h40m	170h51m	0.73	7.18	✓
W1	543h40m	452h12m	0.83	230h22m	172h39m	0.75	5.94	✓
W2	1125h46m	1125h46m	1.00	427h06m	427h06m	1.00	0.00	✓
W3	1065h00m	1012h18m	0.95	366h20m	313h38m	0.86	3.42	✓
W4	1109h12m	1109h12m	1.00	412h47m	412h47m	1.00	0.00	✓
W5	1109h22m	1109h22m	1.00	427h06m	427h06m	1.00	0.00	✓
D2	998h30m	740h39m	0.74	413h55m	372h11m	0.90	16.74	✓
W6	1129h20m	1014h50m	0.90	430h40m	430h40m	1.00	7.43	✓
W7	1127h48m	1104h49m	0.98	429h08m	429h08m	1.00	1.49	✓
W8	1129h20m	1129h20m	1.00	430h40m	430h40m	1.00	0.00	✓
D3	1100h46m	1100h46m	1.00	409h14m	409h14m	1.00	0.00	✓
W9	1125h46m	1125h46m	1.00	427h06m	427h06m	1.00	0.00	✓
W10	1121h44m	1121h44m	1.00	425h18m	425h18m	1.00	0.00	✓
W11	1127h48m	1127h48m	1.00	429h08m	429h08m	1.00	0.00	✓

Window	APSH before development	APSH after development	Fraction of former value	WPSH before development	WPSH after development	Fraction of former value	% reduction in sunlight over the whole year (against 1540h24m)	Complies with BR 209 recommendations
W12	1121h44m	1121h44m	1.00	425h18m	425h18m	1.00	0.00	✓
W13	1125h46m	1125h46m	1.00	427h06m	427h06m	1.00	0.00	✓
W14	1119h29m	1119h29m	1.00	425h18m	425h18m	1.00	0.00	✓
W15	1125h33m	1125h33m	1.00	429h08m	429h08m	1.00	0.00	✓
W16	1119h29m	1119h29m	1.00	425h18m	425h18m	1.00	0.00	✓
W17	1123h31m	1123h31m	1.00	427h06m	427h06m	1.00	0.00	✓

2.8 Sunlighting - Existing Gardens

2.8.1 BR 209 paragraph 3.3.17 states:

It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

2.8.2 An assessment to the amenity area of 159 and 155 York Way has been undertaken both before and after proposals. In both instances there are no changes in the amount the amenity space that receives direct sunlight during March 21.

2.8.3 The proposed development would have an imperceptible impact on the sunlight levels of the surrounding existing amenity areas complying with BR 209 guidance.

3 Conclusions

3.1.1 An assessment of the skylight and sunlight levels of the proposed development, and an assessment of the impact that the proposed development may have on the skylight and sunlight levels of existing surrounding buildings, has been undertaken in accordance with guidance set out in *BRE report 209, Site Layout Planning for Daylight and Sunlight: A guide to good practice, Second Edition, 2011 (BR 209)*, and *BS 8206-2 Code of Practice for Daylighting*.

3.1.2 Whilst BR 209 gives numerical guidelines for assessing skylight and sunlight levels, it is important to bear in mind that the guidance is predicated on a suburban model of development and that the numerical guidelines should be interpreted flexibly. BR 209 Paragraph 1.6 states:

The guide (BR 209) 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 taken 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.

3.1.3 The need for flexibility is of particular relevance in London due to the high density of development and tight proximity of buildings. This has been recognised in the *London Housing Supplementary Planning Guidance (March 2016)* which states that 'an appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves.'

3.1.4 With this in mind, the following conclusions have been drawn:

- 1) All of the habitable rooms of the dwellings assessed exceed the average daylight factors (ADF) and No Sky line recommended in BR 209 and BS 8206-2.
- 2) The proposed lower level flat has a main window that faces within 90° of due south and achieves the annual probable sunlight hours (APSH) and the annual probable sunlight hours in the winter months (WPSH) recommended in BR 209. The flat on the first-third floor has a predominately north-east facing living room and does not meet the above criteria.
- 3) The proposed amenity area achieves the sunlight levels recommended in BR 209.
- 4) The proposed development would have an imperceptible impact on the skylight levels all windows / openings assessed of nearby existing residential windows complying with BR 209 guidance.
- 5) The proposed development would have an imperceptible impact on the sunlight levels of all nearby existing windows complying with BR 209 guidance.
- 6) The proposed development would have an imperceptible impact on the sunlight levels of the nearby existing amenity areas complying with BR 209 guidance.