



ABBEYCONSULTANTS

Sunlight and Daylight Report

North Bridge Nursery, 33 Fitzjohn's
Avenue, London, NW3 5JY

Cognita

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About Abbey Consultants (Southern) Ltd

Abbey Consultants (Southern) Ltd is an established consultancy practice specialising in providing building solutions throughout the UK.

We offer a full range of independent energy and sustainability services from pre-planning through to completion for both residential and commercial buildings from small individual properties through to highly complex mixed-use developments.

We are an industry leader in delivering a professional, accredited and certified service to a wide range of clients including architects, developers, builders, housing associations, the public sector and private householders.

Employing highly qualified staff, our team comes from a variety of backgrounds within the construction industry with combined knowledge of building design, engineering, assessment, construction, development, research and surveying.

Abbey Consultants maintains its position at the forefront of changes in building regulations as well as technological advances. Our clients, large or small are therefore assured of a cost effective, cohesive and fully integrated professional service.

About the Authors

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Assessment Information

Nature of Assessment:	Sunlight and Daylight Report-North Bridge Nursery
Project Name:	North Bridge Nursery
Project Address:	North Bridge Nursery, 33 Fitzjohn's Avenue, London, NW3 5JY
Client:	Cognita
Architect:	MAP Architecture
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2. GLOSSARY

Average daylight factors (ADF) - Ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance.

Daylight, natural light – Combined skylight and sunlight

Probable sunlight hours – The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account)

CIE standard overcast sky – A completely overcast sky for which the ratio of its luminance L_y at an angle of elevation y above the horizontal to the luminance L_z at the zenith is given by:

$$L_y = L_z (1+2\sin y)/3$$

A CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead)

Vertical sky component (VSC) – Ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of the sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings

Annual probable sunlight hours (APSH) – The number of annual sunlight hours an unobstructed area would receive.

Winter probable sunlight hours (APSH) – The number of winter sunlight hours an unobstructed area would receive.

No sky line – The outline on the working plane of the area from which no sky can be seen

Obstruction angle – The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.

Sky Factor – Ratio of the parts of illuminance at a point on a given plane that would be received directly through unglazed openings from a sky of uniform luminance, to illuminance on a horizontal plane due to the unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.

Working Plane – Horizontal, vertical or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85m above the floor in houses and factories, 0.7m above the floor in offices.

3. PROPOSED REDEVELOPMENT

1 Proposed Front Elevation
1:200

2 Proposed West Elevation
1:200

3 Proposed Rear Elevation
1:200

4 Proposed East Elevation
1:200

Vertical Scale (Left):
 Ridge
 Dormer
 13739
 03 Third Floor
 9939
 02 Second Floor
 7500
 01 First Floor
 4000
 00 Ground Floor
 Mezzanine
 -630
 00 Basement
 -3100

Vertical Scale (Right):
 Ridge
 Dormer
 13739
 03 Third Floor
 9939
 02 Second Floor
 7500
 01 First Floor
 4000
 00 Ground Floor
 Mezzanine
 -630
 00 Basement
 -3100

date	rev	note

2002 North Bridge School
 Status: Planning DRAFT
 Client: Cogitare
 Project Name: Proposed Elevations
 Drawing No: 2002-PR04 Rev: 1
 Drawn By: JMD
 Checked By: RM
 Scale: 1:200 @ A3

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4. EXECUTIVE SUMMARY

Abbey Consultants (Southern) Ltd have been instructed by Cognita to review the Sunlight and Daylight impacts as a result of the North Bridge Nursery development to determine if the proposed scheme complies with good practice guidelines.

The aim of the study is to assess how the proposals impact the external daylight available for the dwellings adjacent to the North Bridge Nursery, 33 Fitzjohn's Avenue. The study is based on the various numerical tests laid down in the Building Research Establishments (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a guide to good practice' by P J Littlefair 2011.

The VSC analysis concluded that 100% of the window casements to the existing dwellings at 35 Fitzjohn's Avenue exceed the good practice figure of 0.8x the pre-development values, averaging 0.986x pre-development levels across the assessment, well in excess of good practice guidance and therefore satisfying the BRE daylight requirements

All windows which face within 90 degrees of due south have been tested for direct sunlight. All windows pass both the total annual sunlight hours test and the winter sunlight hours test. The proposed development therefore satisfies the BRE direct sunlight to windows requirements.

Annual sunlight analysis has been carried out for the rear garden of 35 Fitzjohn's Avenue, which concluded (as per the results in appendix 6) that the garden would be scoring well in excess of the 50% recommendation outlined within the BRE guidance and the 80% of pre-development values.

The shadow analysis concludes that while there is some additional overshadowing in the mornings of the winter months, however due to the existing massing and roof line it doesn't represent a significant increase as confirmed by the annual sunlight calculations which confirmed that there was no decrease in area of the garden receiving at least 2 hours of sunlight per day.

The above numerical results confirm that the proposed development will have a low impact on the light received by its neighbouring properties and therefore the development design satisfies all of the requirements set out in the BRE guide 'Site Layout Planning for Daylight and Sunlight'.

5. INFORMATION SOURCES

5.1 DOCUMENTS CONSIDERED

This report has been produced based on the following drawings:

Table 1: Documents Considered

Drawing Title	Issue Date	Drawing Number
Proposed 35 Fitzjohn's Avenue	01.12.78	322/3
Stage 1 Pre-Application Advice Document	14.02.20	-
Existing Site Plan		2002.E001
Existing Basement, Mezzanine, Ground Floor & First Floor Plans		2002.E002
Existing Second Floor, Third Floor & Roof Plans		2002.E003
Existing Elevations		2002.E004
Existing Cross Section		2002.E005
Existing Long Section		2002.E006
Proposed Basement, Mezzanine, Ground Floor & First Floor Plans		2002.P002
Proposed Second Floor, Third Floor & Roof Plans		2002.P003
Proposed Elevations		2002.P004
Proposed Cross Section		2002.P005
Proposed Long Section		2002.P006
Proposed 3D View		2002.P007

6. NATIONAL PLANNING POLICY FRAMEWORK

The BRE numerical guidelines should be considered in the context of the National Planning Policy Framework (NPPF) 2019, which stipulates that local planning authorities should take a flexible approach to daylight and sunlight to ensure the efficient use of land. 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).”

7. METHODOLOGY OF THE STUDY

7.1 BRE GUIDE: SITE LAYOUT PLANNING FOR DAYLIGHT AND SUNLIGHT

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. In general, the BRE tests are based on the requirements of the British Standard, BS 8206 Part 2.

The standards set out in the BRE guide are intended to be used flexibly. The following sentiments are taken from the BRE guide:

(Its) "main aim is... to help to ensure good conditions in the local environment, considered broadly, with enough sunlight and daylight on or between buildings for good interior and exterior conditions." (Para 1.1)

"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 be seen as an instrument of planning policy; its aim is to help rather than constrain the designer." (Para 1.6)

"Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design." (Para 1.6)

The BRE guide is an advisory document, not a rigid set of rules. Care must therefore be taken to apply its recommendations in a manner fitting to the location of the proposed development.

In theory the BRE report's numerical guidelines may be applied to any setting, whether that is a city centre, suburban area or rural village. However, it notes, "In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings... The calculation methods...are entirely flexible in this respect." (Para 1.6)

At paragraph 2.2.3 it states "Note that numerical values given here are purely advisory. Different criteria may be used, based upon the requirements for daylighting in an area viewed against other site layout constraints." Appendix F of the BRE Guide gives advice on setting alternative target values for skylight access. At page 62 it states "different targets may be used, based on the special requirements of the proposed development or its location".

Rigid application of the numerical guidelines could well give rise to an inappropriate answer and form of development for city centre sites, in which case it may be appropriate to adopt lower target values that are more appropriate to the location concerned.

7.2 DAYLIGHT TO WINDOWS

Diffuse daylight is the light received from the sun which has been diffused through the sky. Even on a cloudy day when the sun is not visible, a room will continue to be lit with light from the sky. This is diffuse daylight.

Diffuse daylight calculations should be undertaken to all rooms where daylight is required, including living rooms, kitchens and bedrooms. Usually, if a kitchen is less than 13m² it is considered to be a non-habitable room and the daylight tests need not be applied. The BRE guide states that windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.

The BRE guide contains two tests which measure diffuse daylight:

7.2.1 Test 1 Vertical Sky Component

The percentage of the sky visible from the centre of a window is known as the Vertical Sky Component. Diffuse daylight may be adversely affected if after a development the Vertical Sky Component is both less than 27% and less than 0.8 times its former value.

7.2.2 Test 2 Daylight Distribution

The BRE guide states that where room layouts are known, the impact on the daylighting distribution can be found by plotting the 'no sky line' in each of the main rooms. The no-sky line is a line which separates areas of the working plane that can and cannot have a direct view of the sky. Daylight may be adversely affected if after the development the area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value.

7.3 SUNLIGHT AVAILABILITY TO WINDOWS

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 kitchens and bedrooms are less important, although care should be taken not to block too much sunlight.

The BRE guide states that sunlight availability 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

7.4 OVERSHADOWING TO GARDENS AND OPEN SPACES

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. 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 21st March is less than 0.8 times its former value, then the loss of light is likely to be noticeable.

8. RESULTS

8.1 DAYLIGHT TO WINDOWS

Vertical Sky Component is a measure of the amount of sky visible from a centre point of a window. A window that achieves 27% or more is considered to provide good levels of light, but if with the proposed development in place the figure is both less than 27% and would be reduced by 20% or more than pre-development values, the loss would be noticeable.

Pre and post development VSC calculations have been undertaken for dwellings at 35 Fitzjohn's Avenue, adjacent to the proposed extension to determine to what extent the existing dwellings would be affected by the proposals.

In the paper by Paul Littlefair "Site Layout Planning for Daylight and Sunlight: A guide to good practice" (2011), good practice in relation to VSC calculations to existing dwellings is defined as the post-development VSC achieving a minimum of 0.8x the pre-development value, which would be unnoticeable to the human eye and therefore not have a significant effect on the existing dwellings.

The VSC analysis concluded that 100% of the window casements to the existing dwellings at 35 Fitzjohn's Avenue exceed the good practice figure of 0.8x the pre-development values, averaging 0.986x pre-development levels across the assessment, well in excess of good practice guidance and therefore satisfying the BRE daylight requirements.

As the internal layouts of the existing dwellings was unknown the daylight distribution test could not be applied.

8.2 SUNLIGHT TO WINDOWS

Probable sunlight hours refers to the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

BS8206-2 recommends that interiors where the occupants expect sunlight should receive at least 25% of annual probable sunlight hours (APSH); in addition to, in the winter months between 21st September and 21st March at least 5% of APSH, otherwise known as Winter Probable Sunlight Hours (WPSH)

All windows which face within 90 degrees of due south have been tested for direct sunlight. All windows pass both the total annual sunlight hours test and the winter sunlight hours test with results of 0.917x and 0.833x pre-development values respectively. The proposed development therefore satisfies the BRE direct sunlight to windows requirements.

8.3 OVERSHADOWING TO GARDENS

Annual sunlight analysis has been carried out for the rear garden of 35 Fitzjohn's Avenue, which concluded (as per the results in appendix 6) that the garden would be scoring well in excess of the 50% recommendation outlined within the BRE guidance and the 80% of pre-development values.

In addition a shadow analysis has been carried out to assess any potential impact, with assessments being made on 3 dates spread throughout the year, March 21st, June 21st and September 21st and at 2 times, 10am and 4pm; to provide representative results for the entire year. Results prior to March and after September have not been included due to the low sun trajectory, as per the BRE guidance.

The shadow analysis concludes that while there is some additional overshadowing in the mornings of the winter months, however due to the existing massing and roof line it doesn't represent a significant increase as confirmed by the annual sunlight calculations which confirmed that there was no decrease in area of the garden receiving at least 2 hours of sunlight per day.

9. CONCLUSION

Abbey Consultants (Southern) Ltd have been instructed by Cognita to review the Sunlight and Daylight impacts on the proposed North Bridge Nursery development to determine if the proposed scheme complies with good practice guidelines.

The Sunlight and Daylight analysis reviews the scheme against the good practice guidance as set out in "Site Layout Planning for Daylight and Sunlight: A guide to good practice" by Paul Littlefair (2011), with regard to the existing dwellings available daylight.

The VSC analysis concluded that 100% of the window casements to the existing dwellings at 35 Fitzjohn's Avenue exceed the good practice figure of 0.8x the pre-development values, averaging 0.986x pre-development levels across the assessment, well in excess of good practice guidance and therefore satisfying the BRE daylight requirements

All windows which face within 90 degrees of due south have been tested for direct sunlight. All windows pass both the total annual sunlight hours test and the winter sunlight hours test. The proposed development therefore satisfies the BRE direct sunlight to windows requirements.

Annual sunlight analysis has been carried out for the rear garden of 35 Fitzjohn's Avenue, which concluded (as per the results in appendix 6) that the garden would be scoring well in excess of the 50% recommendation outlined within the BRE guidance and the 80% of pre-development values.

The shadow analysis concludes that while there is some additional overshadowing in the mornings of the winter months, however due to the existing massing and roof line it doesn't represent a significant increase as confirmed by the annual sunlight calculations which confirmed that there was no decrease in area of the garden receiving at least 2 hours of sunlight per day.

The above numerical results confirm that the proposed development will have a low impact on the light received by its neighbouring properties and therefore the development design satisfies all of the requirements set out in the BRE guide 'Site Layout Planning for Daylight and Sunlight'.

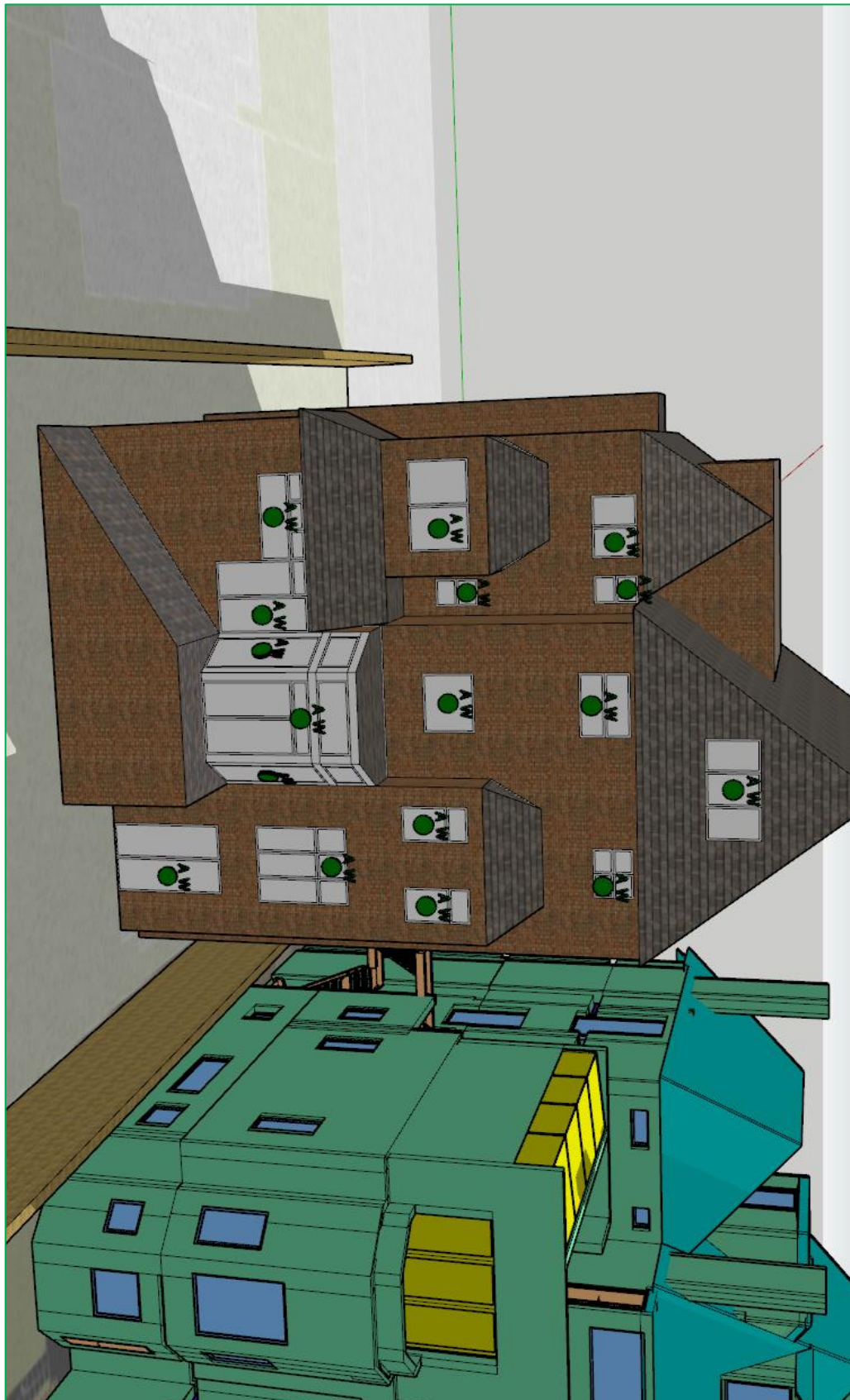
APPENDIX 1: 35 FITZJOHN'S AVENUE WINDOW SCHEDULE

Figure 1: 35 Fitzjohn's Avenue Window Schedule



APPENDIX 2: VERTICAL SKY COMPONENT ANALYSIS FOR THE PROPOSED DEVELOPMENT

Figure 2: 35 Fitzjohn's Avenue, West Façade VSC Analysis



APPENDIX 3: VERTICAL SKY COMPONENT RESULTS FOR THE EXISTING PROPERTIES AT 35 FITZJOHN'S AVENUE

Table 2: VSC Results for the existing properties at 35 Fitzjohn's Avenue

Dwelling	Window	Window Orientation	Floor	Pre-development VSC	Post-development VSC	Overall Compliance	Result
35 Fitzjohn's Avenue	1	West	Basement	30.48	30.08	0.987	Pass
	2	West	Ground Floor	38.91	38.91	1.000	Pass
	3	West	Ground Floor	33.52	33.52	1.000	Pass
	4	North West	Ground Floor	35.46	35.46	1.000	Pass
	5	West	Ground Floor	39.36	39.16	0.995	Pass
	6	South West	Ground Floor	28.49	25.79	0.905	Pass
	7	West	Ground Floor	37.63	36.26	0.964	Pass
	8	West	First Floor	39.11	38.97	0.996	Pass
	9	West	First Floor	14.96	14.96	1.000	Pass
	10	West	First Floor	38.34	38.34	1.000	Pass
	11	West	First Floor	39.46	38.50	0.976	Pass
	12	West	First Floor	39.37	37.11	0.943	Pass
	13	West	Second Floor	35.36	35.36	1.000	Pass
	14	West	Second Floor	29.20	29.20	1.000	Pass
	15	West	Second Floor	39.62	39.62	1.000	Pass
	16	West	Second Floor	39.62	39.62	1.000	Pass
	17	West	Third Floor	39.62	39.62	1.000	Pass

APPENDIX 4: ANNUAL PROBABLE SUNLIGHT HOURS RESULTS FOR THE EXISTING PROPERTIES AT 35 FITZJOHN'S AVENUE

Table 3: Annual Probable Sunlight Hours Results

Dwelling	Window	Window Orientation	Floor	Pre-development APSH	Post-development APSH	Overall Compliance	Result
35 Fitzjohn's Avenue	1	West	Basement			N/A	Pass
	2	West	Ground Floor			N/A	Pass
	3	West	Ground Floor			N/A	Pass
	4	North West	Ground Floor			N/A	Pass
	5	West	Ground Floor			N/A	Pass
	6	South West	Ground Floor	48.00	44.00	0.917	Pass
	7	West	Ground Floor			N/A	Pass
	8	West	First Floor			N/A	Pass
	9	West	First Floor			N/A	Pass
	10	West	First Floor			N/A	Pass
	11	West	First Floor			N/A	Pass
	12	West	First Floor			N/A	Pass
	13	West	Second Floor			N/A	Pass
	14	West	Second Floor			N/A	Pass
	15	West	Second Floor			N/A	Pass
	16	West	Second Floor			N/A	Pass
	17	West	Third Floor			N/A	Pass

APPENDIX 5: WINTER PROBABLE SUNLIGHT HOURS RESULTS FOR THE EXISTING PROPERTIES AT 35 FITZJOHN'S AVENUE

Table 4: Winter Probable Sunlight Hours Results

Dwelling	Window	Window Orientation	Floor	Pre-development WPSH	Post-development WPSH	Overall Compliance	Result	
35 Fitzjohn's Avenue	1	West	Basement			N/A	Pass	
	2	West	Ground Floor			N/A	Pass	
	3	West	Ground Floor			N/A	Pass	
	4	North West	Ground Floor			N/A	Pass	
	5	West	Ground Floor			N/A	Pass	
	6	South West	Ground Floor		12.00	10.00	0.833	Pass
	7	West	Ground Floor				N/A	Pass
	8	West	First Floor				N/A	Pass
	9	West	First Floor				N/A	Pass
	10	West	First Floor				N/A	Pass
	11	West	First Floor				N/A	Pass
	12	West	First Floor				N/A	Pass
	13	West	Second Floor				N/A	Pass
	14	West	Second Floor				N/A	Pass
	15	West	Second Floor				N/A	Pass
	16	West	Second Floor				N/A	Pass
	17	West	Third Floor				N/A	Pass

APPENDIX 6: AMENITY ANALYSIS RESULTS FOR THE EXISTING PROPERTIES AT 35 FITZJOHN'S AVENUE

Table 5: Amenity Analysis Results

Dwelling	Pre-development Amenity Sunlight Hours	Post-development Amenity Sunlight Hours	Overall Compliance	Result
35 Fitzjohn's Avenue	81.35	81.35	1.000	Pass

APPENDIX 7: SHADOW ANALYSIS FOR THE PROPOSED DEVELOPMENT

Figure 3: Shadow Analysis for March 21st at 10am



Figure 4: Shadow Analysis for March 21st at 4pm



Figure 5: Shadow Analysis for June 21st at 10am



Figure 6: Shadow Analysis for June 21st at 4pm



Figure 7: Shadow Analysis for September 21st at 10am



Figure 8: Shadow Analysis for September 21st at 4pm

