PRP

St Michael's Convent

Ham Common, Ham

Daylight, Sunlight & Overshadowing Assessment

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Architecture
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Masterplanning
Landscape
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Research

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Contents

Executive Summary

The Sustainability team at PRP has been commissioned by Beechcroft Developments Ltd to undertake a Daylight, Sunlight & Overshadowing Assessment with respect to two planning applications for St Michael's Convent in Ham, London.

Overview

1.1 This Daylight, Sunlight and Overshadowing Assessment has been prepared to accompany two planning applications for the proposed works to St. Michael's Convent, Ham in the London Borough of Richmond Upon Thames.

1.2 The site is currently occupied by The Community of the Sisters of the Church, who have been there since the 1940s. The Community is an international body of women within the Anglican Communion.

1.3 The site is located within a mainly residential conservation area. It is bounded by the Ham Common to the south, the pedestrian historic route to Ham House to the West and a 'no through' residential access road to the East and North (Martingales Close).

1.4 The aim of the study is to investigate the potential impact of the proposed scheme on daylight and sunlight access compared to what is currently being experienced by the surrounding adjacent properties.

1.5 The methodology used in this study is based on the guidance provided in the 2nd edition of Building Research Establishment (BRE) entitled: "Site Layout Planning for Daylight and Sunlight: a good practice guide" by PJ Littlefair (2011).

Daylight Impact on Surrounding Buildings

1.6 Vertical Sky Components and Ratio of Impact tests have been carried out on all surrounding windows overlooking the proposed development.

1.7 The results of the analysis indicate that the surrounding properties will experience negligible impacts on their daylight access as a result of the proposed development.

Sunlight Impact on Surrounding Buildings

1.8 Probable Sunlight Hours calculations have been carried out on all south-facing surrounding windows that could potentially be affected by the proposed development.

1.9 A small number of windows (7no) experience moderate adverse impacts in terms of winter or annual sunlight access, however they will still receive the minimum required amount of sunlight after the proposed development is put in place and therefore will still meet the criteria.

1.10 One window belonging to 2 Martingales Close receives less than the recommended amount of sunlight during the winter period and experiences a moderate adverse impact in terms of winter sunlight access. However, it is highly likely that this window serves a hallway and is therefore not relevant to habitable use, and not critical in terms of sunlight as the main living room of the house faces the rear garden, not the development.

1.11 All of the other windows facing the site either meet the annual and summer criteria for sunlight with the development in place, or have an acceptable degree of impact as per the BRE guidelines.

Overshadowing analysis of Surrounding Open Spaces

5.1 There are no amenity spaces to the east and north of the site that may be affected by the proposed development.

5.2 We have analysed the overshadowing on the garden of Avenue Lodge and the results indicate that it will meet the criteria with the proposed development in place, with over 86% of the open space receiving over two hours of sunlight on the 21st of March.

5.3 There will therefore be no significant negative impacts on the surrounding area resulting from the construction of the proposed development, in terms of overshadowing.

Guidelines and Policy

This analysis has been based on the BRE Site Layout Planning for Daylight and Sunlight guidance document, which considers the potential impact on the quality of daylight and sunlight for surrounding properties as well as for new buildings.

Guidelines for Daylight and Sunlight

2.1 The BRE guideline document provides the criteria and methodology for calculations pertaining to daylight and sunlight on both existing and proposed developments, and is the primary reference for this matter. Alongside this document, the BS 8206-02: Lighting for buildings - Part 2: Code of practice for daylight (2008), is also used as a guideline.

2.2 The BRE Guide is widely used to establish the extent to which the development meets current best practice guidelines, although it is not an official instrument of planning policy and there are no legal or statutory requirements to meet these guidelines.

2.3 There are no National Planning Policy guidelines for sunlight and daylight. However, most Local Authorities recognise these guidelines as the most appropriate method for carrying out daylight, sunlight and overshadowing assessments.

2.4 The methods given in the document are widely used in the industry, and are technically robust, however some level of flexibility should be applied where appropriate, particularly on sites with higher development densities, as these guidelines were primarily developed for characterising the nature of daylight and sunlight impact in general terms, which would include a range of rural, suburban and densely urban contexts.

Sensitive Receptors

2.5 In order to undertake the assessment, key sensitive receptors around the site need to be identified first. These include habitable rooms in domestic and non-domestic buildings facing the site where occupants have a reasonable expectation of daylight or sunlight. According to the BRE Guide these include:

- Living rooms, kitchens and bedrooms in domestic buildings.
- Other rooms in schools, hospitals, hotels and hostels, small workshops and offices.
- Open spaces such as gardens, parks, playgrounds, swimming and paddling pools, sitting areas and focal points for views.

2.6 Rooms and spaces which will not be permanently occupied such as bathrooms, toilets, storerooms, circulation areas, garages, public footpaths, small front gardens and car parks do not need to be analysed.

Relevant Definitions

2.7 “Natural light” refers to both daylight and sunlight.

2.8 For the purposes of this assessment, we have to distinguish between “daylight” and “sunlight” as the physical properties and therefore the perceived benefits for each type of light are different.

2.9 **Daylight** is used to describe diffuse light from the sky under overcast conditions. Daylight is orientation-independent and directly affects ambient light levels in internal spaces and the visual comfort related to the carrying out of day to day tasks.

2.10 Daylight for existing buildings is typically measured using Vertical Sky Component (VSC) and No-Sky Line (NSL), while daylight in proposed buildings are typically measured using Average Daylight Factor (ADF).

References

- BRE Site Layout and Planning for Daylight and Sunlight: a guide to good practice. Second Edition. P. J. Littlefair (2011)
- BS8206-02 Lighting for buildings - Part 2: Code of practice for daylight (2008)
- Greater London Authority London Plan (2011)
- Lighting Guide 10 (LG10): Daylight - A guide for designers (2014). CIBSE

2.11 **Sunlight** is used to describe light coming directly from the sun. Sunlight is highly dependent on the site location, orientation and the time of day, and directly affects factors such as solar gain, perceptions of warmth and health issues such as the access to Vitamin D. Direct sunlight is desirable in winter, and not only yields psychological benefit but also helps facilitate energy efficiency by reducing the need for heating, however excessive levels of sunlight without solar protection could also lead to summertime overheating.

2.12 Sunlight is typically measured using Probable Sunlight Hours (PSH) for both existing and new buildings. Sunlight availability on open spaces is measured using overshadowing criterion, which requires at least half of the open amenity area to receive at least two hours of sunlight on the 21st of March.

2.13 In order to characterise the magnitude of impact on existing properties, we model these criteria first with the existing buildings on site, to establish a baseline condition. The analysis results are then compared with the results when the proposed building is put in place. These "ratio-of-impact" calculations then form the basis for whether the development has a negligible, minor, moderate or significant adverse/ beneficial impact on the daylight and sunlight amenity of the surrounding properties.

2.14 The BRE and BS8206 guidelines provide three main methods for assessing daylight availability. The basic principle behind these guidelines is that the ground floor windows (and above) of a new or existing building should have an adequate view of the sky.

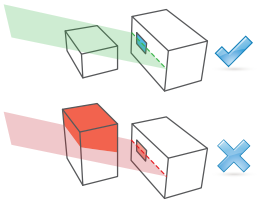
2.15 We have developed some visual illustrations to describe the various calculations and criteria that go into a typical daylight and sunlight assessment. These are presented on the following pages.

DAYLIGHT EXISTING BUILDINGS

START

25° LINE

Does the proposed development fall beneath a 25° angle taken from the lowest window?



Yes

No

VSC

Is the Vertical Sky Component (VSC) of the window at least 27%?

VSC ≥ 27%

VSC < 27%

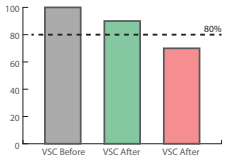
No

Yes

IF ROOM LAYOUTS ARE KNOWN

Ratio of Impact

Is the Vertical Sky Component (VSC) at least 80% of its former value?



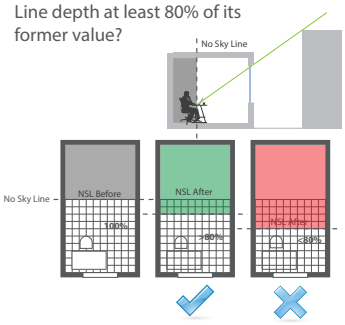
Yes

***Are balconies the problem?**

If the VSC ratio of impact is at least 80% of its former value without the balconies on the existing neighboring propety, then the presence of the balcony is the main factor contributing to the relative loss of sunlight.

No Sky Line

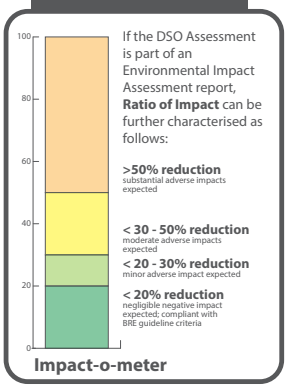
Is the area within the No Sky Line depth at least 80% of its former value?



Yes

No

No



If the DSO Assessment is part of an Environmental Impact Assessment report, **Ratio of Impact** can be further characterised as follows:

>50% reduction
substantial adverse impacts expected

< 30 - 50% reduction
moderate adverse impacts expected

< 20 - 30% reduction
minor adverse impact expected

< 20% reduction
negligible negative impact expected; compliant with BRE guideline criteria

IF ROOM LAYOUTS ARE KNOWN

Is the room a habitable room?

No → Daylight not required

Yes

FAIL

Last chance!

If the development fails based on the preceding criteria, there is now an option to set alternative targets if these conditions are met:

PASS

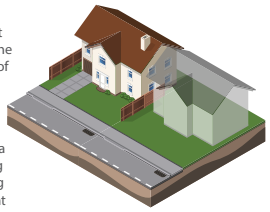
SETTING ALTERNATIVE TARGETS

Existing planning permission?

If planning permission has been granted for the site but for a different massing design, the local authority may allow the VSC and APSH for the permitted scheme to be used as alternative benchmarks. The values of the proposed scheme should either meet or improve on these benchmark values.

Too close for comfort? Use mirror images!

Neighbouring buildings sitting too close to the site boundary can be a problem in terms of daylight and sunlight, especially if you're building on an empty site. In cases like these, VSC and APSH targets for existing buildings can be set using a 'mirror-image' building of the same height and size, an equal distance away on the other side of the boundary.



25 degree line

2.16 In the first instance, if a proposed development falls beneath a **25° angle** plane taken from the centre point of the lowest window, along the extent of the window wall, then no further analysis is required as it is unlikely to have a substantial impact on natural light availability.

Vertical Sky Component

2.17 The second method tests the quantity of daylight. This is done through the **Vertical Sky Component (VSC)** percentage calculated in the centre of the window. The VSC takes into consideration any obstruction to the visible sky to calculate the possible daylight reduction.

2.18 The BRE Guide sets out the guidelines for the VSC:

- If the VSC at the centre of the existing window exceeds 27% with the new development in place, then enough sky light should still be reaching the existing window.
- If the VSC with the new development in place is both less than 27% and less than 80% its former value, then the reduction in light to the window is likely to be noticeable.
- If the VSC is less than 27% but the sky light reduction is not lower than 80% its former value, then the impact would be considered negligible.

2.19 It is important to note that VSC does not quantify the actual daylight levels inside a room, just the potential for receiving daylight. A more detailed assessment such as the Average Daylight Factor is better equipped to assess this, however for existing buildings the information for the calculation is not always available.

No Sky Line and Limiting Room Depth

2.20 Where internal room layouts are available, the third and final method is used to evaluate the distribution of daylight using the **No Sky Line (NSL)** and **Room Depth Criteria.** The no sky line divides areas of the working plane which can and cannot see the sky. Areas beyond the no sky line and the recommended maximum depth are usually darker as they receive no direct light.

2.21 The NSL analysis is undertaken at working plane height (0.85 m for dwellings and 0.7 for offices), its approach is similar to the VSC one in the sense that, if the area of the existing room beyond the no sky line is reduced less than 0.8 times its former value, then the reduction of light may be noticeable. In new buildings if a significant area of the working plane (normally more than 20%) is beyond the no sky line, then daylight will be poorly distributed.

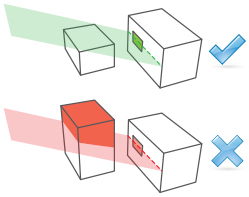
Assessment Criteria - Sunlight

SUNLIGHT EXISTING BUILDINGS

START

25° LINE

Does the proposed development fall beneath a 25° angle taken from the lowest window?

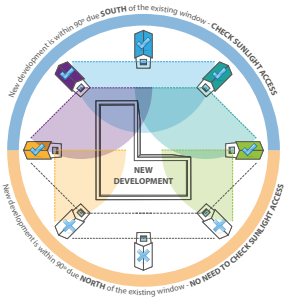


Yes

No

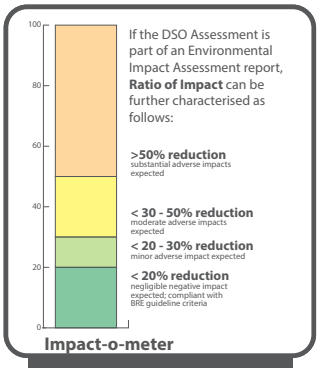
Orientation

Does the window face within 90° of due south?



No

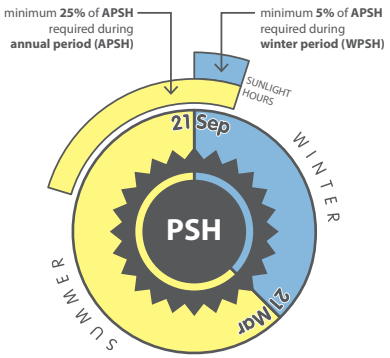
Sunlight unlikely to be affected



Yes

Probable Sunlight Hours

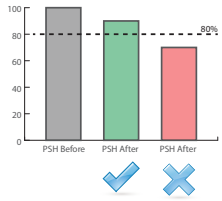
Do the windows of the main living room and/or conservatory receive at least **25% PSH** throughout the year, with at least **5% PSH** being received during the winter period between 21 March and 21 September?



No

Ratio of Impact

Is the PSH value at least 80% of its former value?



***Are balconies the problem?**
If the PSH ratio of impact is at least 80% of its former value without the balconies on the existing neighboring propety, then the presence of the balcony is the main factor contributing to the relative loss of sunlight.

Yes

Yes

No

Room Use

Is the room a living room or a conservatory?

Living Rooms: **sunlight essential!**

Bedrooms & Kitchens **sunlight less essential**

No

Yes

If the development fails based on the preceding criteria, there is now an option to set alternative targets if these conditions are met:

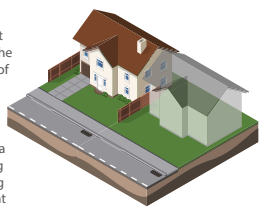
Last chance!

FAIL

SETTING ALTERNATIVE TARGETS

Existing planning permission?
If planning permission has been granted for the site but for a different massing design, the local authority may allow the VSC and APSH for the permitted scheme to be used as alternative benchmarks. The values of the proposed scheme should either meet or improve on these benchmark values.

Too close for comfort? Use mirror images!
Neighbouring buildings sitting too close to the site boundary can be a problem in terms of daylight and sunlight, especially if you're building on an empty site. In cases like these, VSC and APSH targets for existing buildings can be set using a 'mirror-image' building of the same height and size, an equal distance away on the other side of the boundary.



PASS

Probable Sunlight Hours

2.22 With regards to sunlight, the criteria is based on the **Probable Sunlight Hours (PSH)**, which considers the amount of sun available through out the year and the winter months. For surrounding buildings this analysis is performed on all windows to habitable rooms and conservatories facing within 90° of due south, while for the proposed development any orientation apply, and only main (living rooms) are considered.

2.23 Similar to daylight calculations, the first analysis prior to PSH is the 25° line test. This is explained in more detail in section "*25 degree line*".

2.24 The BRE Guide and the BS8206-02 recommend the PSH to be calculated for the whole year (Annual Probable Sunlight Hours, or APSH), and for the winter months (Winter Probable Sunlight Hours, or WPSH).

2.25 Interiors receiving more than 25% of APSH and at least 5% of WPSH (defined for these purposes between 21st September and 21st March), receive enough sunlight and the impact will therefore be negligible.

2.26 However, if the available sunlight hours are both, less than the amount described above and less than 0.8 times their former value, either over the whole year or during the winter months, then the occupants of the existing building will notice the loss of sunlight.

Sunlight criteria for Open Spaces

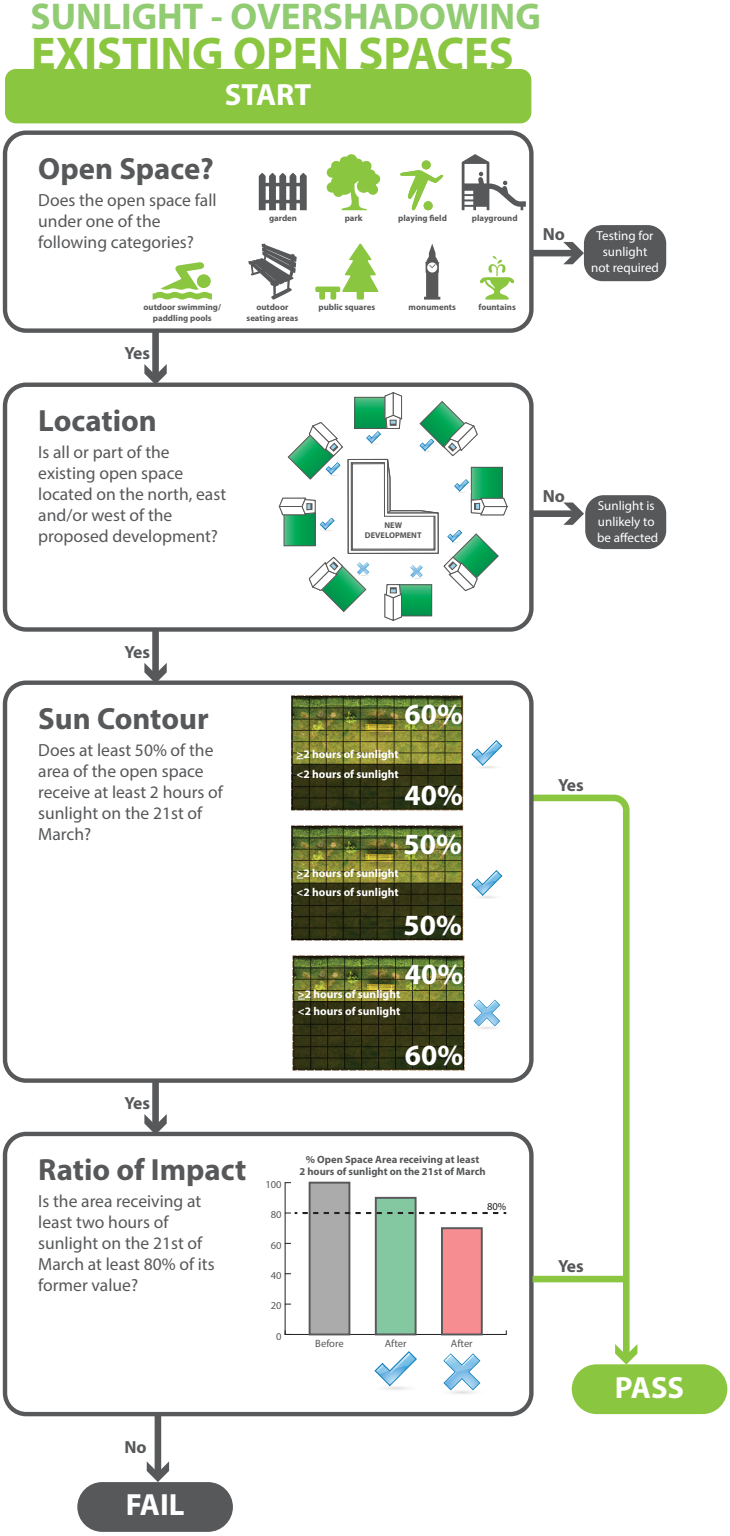
2.27 For open spaces, the BRE Guide suggests that at least half of the area should receive two (2) hours of direct sunlight on the Equinox (21st of March) with the proposed development in place (sunlight at an altitude of 10% or less is excluded).

2.28 If the area which can receive at least 2 hours of direct sunlight on the 21st of March is reduced to less than 0.8 times its former value, as a result of a new development, then loss of sunlight is significant.

2.29 This would normally include gardens (usually the main back garden of a house), allotments, parks and playing fields, children's playgrounds, outdoor swimming pools and paddling pools, sitting out areas between non-domestic areas and public squares, and focal points for views.

2.30 Driveways and hard standing for cars, as well as small front gardens are excluded. Normally the shadows from trees and shrubs do not need to be included unless there is a dense belt or group of evergreens planned as a windbreak or for privacy purposes.

2.31 The shadows cast by walls or opaque fences less than 1.5 metres high can be excluded from the calculation.



Project Background

Brief

3.1 The Sustainability team at PRP has been commissioned by Beechcroft Developments Ltd to undertake a
Daylight, Sunlight & Overshadowing Assessment with respect to two planning applications for the
St Michael's Convent located in Ham, London.

3.2 The aim of the study is to investigate the potential impact of the proposed scheme on daylight and sunlight access to the surrounding neighbouring properties and any overshadowing to the surrounding open spaces.

3.3 The methodology used in this study is based on the numerical tests set out in the 2nd edition of "Site Layout Planning for Daylight and Sunlight: a good practice guide" by PJ Littlefair of the BRE (2011).

The Site

3.4 St Michael's Convent is in the London Borough of Richmond upon Thames. It occupies a site of approximately 3.83 acres.

3.5 The site, which will be subject to 2 separate planning applications, is located within a mainly residential conservation area. It is bounded by the Ham Common to the south, the pedestrian historic route to Ham House to the West and a 'no through' residential access road to the East and North (Martingales Close).

3.6 The site itself is mainly occupied by Orford House (the original part of the main house), which was built between 1730 and 1734 and is a Grade II listed building. It has been the home of the Community of the Sisters of the Church and is in their ownership since 1949. In addition to the main house, there is also a small Coach House and some outbuildings around the walled garden.

3.7 The grounds feature large expanses of open spaces (grassland) and trees.

3.8 The development proposals by Beechcroft Developments include the refurbishment of existing buildings and the construction of new dwellings:

Application 1 – Ham Common (26 units)
- 7 apartments in retained listed building;
- 3 apartments in extension to retained building;
- 1 cottage in listed coach house;
- Further15 houses across the site;
- Car parking

Application 2 – Martingales Close (2 units)
- 2 stable buildings next to Orchard
- Car parking

Extent of the Study Area

3.9 The study area modelled for this analysis includes the site and all the immediate surrounding buildings.

3.10 Surrounding existing properties likely to be affected by the proposed development have been identified on the basis of the clause 2.2.4 of the BRE guide, which states that:

'*loss of light need not be analysed if the distance of the new development is three or more times its height above the centre of the existing window*'.

3.11 Within this proximity, all windows facing the proposed development that are likely to be served by habitable rooms are considered to be sensitive receptors and have therefore have been included in the study.

3.12 The properties listed below have been identified as those that are likely to be affected by the proposed development in terms of their daylight and sunlight,

- 1 Martingales Close
- 2 Martingales Close
- 3 Martingales Close
- 23 Martingales Close
- 24 Martingales Close
- 25 Martingales Close
- 26 Martingales Close
- 27 Martingales Close
- Avenue Lodge Cottage
- Avenue Lodge

3.13 Façades of these properties that are likely to be affected were then analysed in more detail as part of this assessment.

3.14 Other surrounding properties located further away, are not likely to be affected by the proposed development and were not included in the assessment.

Modelling Assumptions

3.15 Ordnance Survey 3D Promapping data was used to establish the massing of the exisitng buildings.

3.16 Elevational survey information on the surrounding properties was not available. Reasonable assumptions were therefore made with regards to the geometry and sizes of the windows based on site photographs, OS map data, Google Street View imagery and aerial photographs. This is normal practice where access to nearby properties is limited.

3.17 Trees and fences lower than 1.5m have been excluded from the model as per the BRE Guide paragraph 3.3.9 and 3.3.10.

3.18 The model of the proposed development was based on the proposed drawings (plans, elevations and sections) and 3D models provided by PRP design team.

Analysis and Calculations

3.19 Calculations have been undertaken using the computer program Ecotect Analysis 2011, in which a three dimensional model based on the architectural drawings and the 3D model provided was created.

Daylight and Sunlight Results

Surrounding properties

The results of the analysis show that the surrounding properties will continue to enjoy good daylight and sunlight amenity with the proposed development in place.

Daylight Impact on Surrounding Buildings

4.1 Vertical Sky Components and Ratio of Impact tests have been carried out on all surrounding windows overlooking the proposed development.

4.2 Detailed tables and window designations can be found in Appendix I.

1 Martingales Close

4.3 Three windows on this property overlook the site and were analysed for daylight impacts.

4.4 One window on the ground floor does not meet the criteria (VSC 15.2%) but retains 94% of its former value, indicating that the low VSC value is a pre-existing condition and not largely due to the proposed development.

4.5 The impact on daylight access to 1 Martingales Close is therefore not significant.

2 Martingales Close

4.6 Twelve windows on this property overlook the site and were analysed for daylight impacts.

4.7 6 out of 7 windows on the ground floor have less than 27% VSC, but all of them retain at least 80% of their former VSC values and therefore meet the criteria.

4.8 All five windows analysed on the first floow have VSC values exceeding 27% and should therefore have good daylight access.

4.9 The impact on daylight access to 2 Martingales Close is therefore not significant.

3 Martingales Close

4.10 All five windows analysed on 3 Martingales Close receive VSC values exceeding 27% and therefore meet the criteria with the proposed development in place.

23 Martingales Close

4.11 All three windows analysed on 23 Martingales Close receive VSC values exceeding 27% and therefore meet the criteria with the proposed development in place.

24 Martingales Close

4.12 All three windows analysed on 24 Martingales Close receive VSC values exceeding 27% and therefore meet the criteria with the proposed development in place.

25 Martingales Close

4.13 All three windows analysed on 25 Martingales Close receive VSC values exceeding 27% and therefore meet the criteria with the proposed development in place.

26 Martingales Close

4.14 All three windows analysed on 26 Martingales Close receive VSC values exceeding 27% and therefore meet the criteria with the proposed development in place.

27 Martingales Close

4.15 All three windows analysed on 27 Martingales Close receive VSC values exceeding 27% and therefore meet the criteria with the proposed development in place.

Avenue Lodge Cottage

4.16 Six windows on this property overlook the site and were analysed for daylight impacts.

4.17 1 out of 2 windows on the ground floor receives a VSC value marginally below 27% (26.7%), but retains 100% of its former value, indicating that the proposed development has no negative impacts on this window.

4.18 All other windows analysed for this property receive VSC values in excess of 27% and therefore meet the criteria.

4.19 The impact on daylight access to Avenue Lodge Cottage is therefore negligible.

Avenue Lodge

4.20 22 Windows on this property overlook the site and were analysed for daylight impacts.

4.21 1 out of 11 windows on the ground floor has less than

27% VSC, but retains 100% of its former value, indicating that the proposed development has no negative impact on this window.

4.22 All other windows analysed for this property receive VSC values in excess of 27% and therefore meet the criteria.

4.23 The impact on daylight access to Avenue Lodge is therefore negligible.

Sunlight Impact on Surrounding Buildings

4.24 Probable Sunlight Hours calculations have been carried out on all south-facing surrounding windows that could potentially be affected by the proposed development.

4.25 Detailed tables and window designations can be found in Appendix I.

1 Martingales Close

4.26 Three south-facing windows on this property overlook the site and were analysed for sunlight impacts.

4.27 All three windows receive annual and winter PSH values in excess of the minimum criteria and therefore retain good sunlight access.

4.28 The impact on sunlight access to 1 Martingales Close is therefore not significant.

2 Martingales Close

4.29 Twelve windows on this property overlook the site and were analysed for sunlight impacts.

4.30 3 out of the 12 windows have annual and/or winter PSH values less than the minimum recommended values, but retain at least 81% of their former value and therefore meet the criteria

4.31 One window on the ground floor receives winter PSH values below the recommended 5% threshold, and retains only 48% of its former value, thereby experiencing a negative impact. However, from the property photographs found online it appears that the living room windows (which are the most relevant for sunlight) face the rear garden of the property, and therefore it is not critical that this particular window receive direct sunlight.

3 Martingales Close

4.32 All five windows analysed on 3 Martingales Close meet the sunlight criteria with the proposed development in place.

23 Martingales Close

4.33 All three windows on 23 Martingales Close that face the site are northeast-facing and have no expectation of sunlight. These have not been analysed.

24 Martingales Close

4.34 All three windows on 24 Martingales Close that face the site are northeast-facing and have no expectation of sunlight. These have not been analysed.

25 Martingales Close

4.35 All three windows on 25 Martingales Close that face the site are northeast-facing and have no expectation of sunlight. These have not been analysed.

26 Martingales Close

4.36 All three windows on 26 Martingales Close that face the site are northeast-facing and have no expectation of sunlight. These have not been analysed.

27 Martingales Close

4.37 All three windows on 27 Martingales Close that face the site are northeast-facing and have no expectation of sunlight. These have not been analysed.

Avenue Lodge Cottage

4.38 Six windows on this property that face the site are northeast-facing and have no expectation of sunlight. These have not been analysed.

Avenue Lodge

4.39 12 Windows on this property that face the site are south-facing and have been analysed for annual and winter PSH. All of the other windows either do not overlook the site or are north-facing.

4.40 Two windows have WPSH values less than the recommended minimum value of 5%, but retain at least 80% of their previous value and therefore meet the criteria.

1.12 The main concern of the analysis is to determine whether living rooms receive adequate sunlight. In addition we have also carried out analysis on the greenhouse windows (while not habitable, they can be considered to have an expectation of sunlight) and they all meet the criteria with the proposed development in place.

Summary

1.13 The results of the daylight analysis indicate that all windows on the the surrounding properties with an expectation of daylight will experience negligible impacts on their daylight access as a result of the proposed development.

1.14 The results of the sunlight analysis indicate that all of the south facing living room windows overlooking the site meet the BRE guideline recommendations for sunlight with the proposed development in place.

Overshadowing Results

The results of the analysis show that there will be no significant negative impacts on the surrounding area resulting from the the proposed development, in terms of overshadowing.

Sunlight criteria for Open Spaces

5.4 The BRE Guide suggests that all open spaces should have minimum 2 hours of sun on at least 50% of the site on the 21st of March (Equinox), to be considered adequately sunlight throughout the year.

5.5 Low fences (<1.5m), trees and small front gardens have not been included in the study as per the BRE methodology. However, any fences that are higher than 1.5m are included within the assessment.

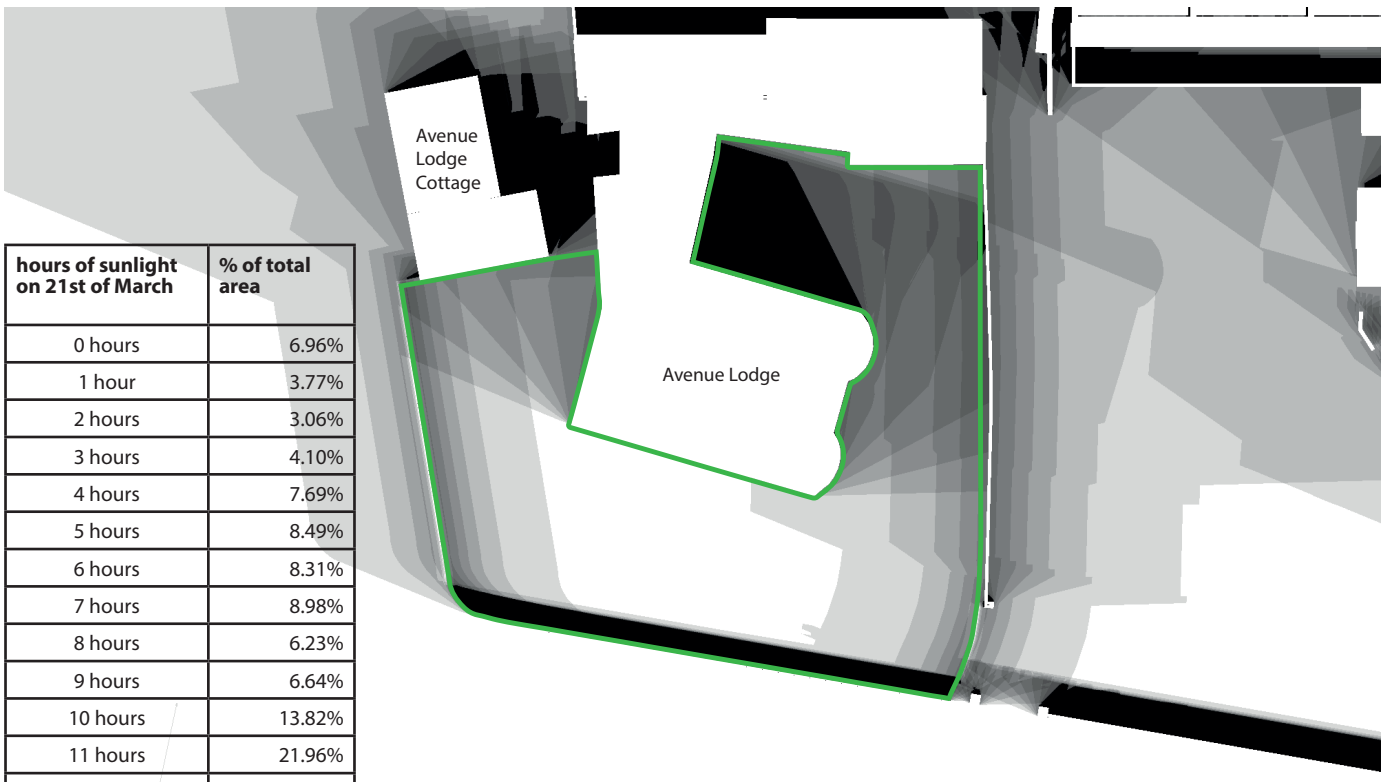
Overshadowing analysis of gardens and open spaces of surrounding properties

5.6 There are no amenity spaces to the east and north of the site that may be affected by the proposed development.

5.7 We have analysed the overshadowing on the garden of Avenue Lodge and the results indicate that it will meet the criteria with the proposed development in place, with over 86% of the open space receiving over two hours of sunlight on the 21st of March.

5.8 There will therefore be no significant negative impacts on the surrounding area resulting from the construction of the proposed development, in terms of overshadowing.

5.9 Open spaces to the south of the development and those too far away to be impacted have not been analysed as these will not be affected.



hours of sunlight on 21st of March	% of total area
0 hours	6.96%
1 hour	3.77%
2 hours	3.06%
3 hours	4.10%
4 hours	7.69%
5 hours	8.49%
6 hours	8.31%
7 hours	8.98%
8 hours	6.23%
9 hours	6.64%
10 hours	13.82%
11 hours	21.96%
% area with over 2 hours of sunlight	**86.22%**

Conclusion

Overview

6.1 The aim of the study is to investigate the potential impact of the proposed scheme on daylight and sunlight access and overshadowing compared to what is currently being experienced by the surrounding adjacent properties.

6.2 The methodology used in this study is based on the guidance provided in the 2nd edition of Building Research Establishment (BRE) entitled: "Site Layout Planning for Daylight and Sunlight: a good practice guide" by PJ Littlefair (2011).

Daylight Impact on Surrounding Buildings

1.15 Vertical Sky Components and Ratio of Impact tests have been carried out on all surrounding windows overlooking the proposed development.

1.16 The results of the analysis indicate that the surrounding properties will experience negligible impacts on their daylight access as a result of the proposed development.

Sunlight Impact on Surrounding Buildings

1.17 Probable Sunlight Hours calculations have been carried out on all south-facing surrounding windows that could potentially be affected by the proposed development.

1.18 A small number of windows experience moderate adverse impacts in terms of winter or annual sunlight access, however they will still receive the minimum required amount of sunlight after the proposed development is put in place and therefore will still meet the criteria.

1.19 One window belonging to 2 Martingales Close receives less than the recommended amount of sunlight during the winter period and experiences a moderate adverse impact in terms of winter sunlight access. However, it is highly likely that this window serves a hallway and is therefore not relevant to habitable use, and not critical in terms of sunlight as the main living room of the house faces the rear garden, not the development.

1.20 All of the other windows facing the site either meet the annual and summer criteria for sunlight with the development in place, or have an acceptable degree of impact as per the BRE guidelines.

Overshadowing analysis of Surrounding Open Spaces

5.10 There are no amenity spaces to the east and north of the site that may be affected by the proposed development.

5.11 We have analysed the overshadowing on the garden of Avenue Lodge and the results indicate that it will meet the criteria with the proposed development in place, with over 86% of the open space receiving over two hours of sunlight on the 21st of March.

5.12 There will therefore be no significant negative impacts on the surrounding area resulting from the construction of the proposed development, in terms of overshadowing.

Appendix A

Detailed Results Tables and Window Index

Sunlight Results

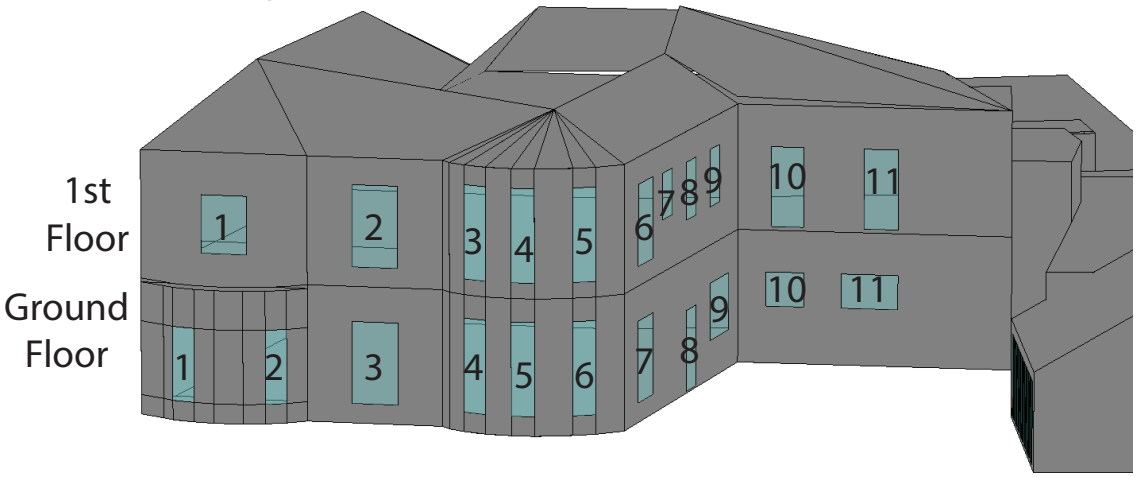
Building No.	Floor Level	Window No.	PSH % Existing	PSH % Proposed	Ratio of Impact	Compliance	Notes	WPSH % Existing	WPSH % Proposed	Ratio of Impact	Compliance	Notes
1 Martingales Close	0	1	32.6%	31.1%	95.6%	PASS		24.7%	14.8%	60.2%	PASS	The window experiences a moderate adverse impact in terms of winter sunlight access, however will still receive in excess of 5% WPSH and therefore meets the criteria.
	1	1	64.1%	63.2%	98.6%	PASS		24.3%	24.0%	98.7%	PASS	
	1	2	64.3%	64.0%	99.6%	PASS		24.4%	24.1%	98.8%	PASS	
2 Martingales Close	0	1	24.5%	22.4%	91.4%	PASS	APSH in the proposed scenario are less than 25%, however the window retains at least 80% of its former value and therefore meets the criteria.	6.8%	5.8%	85.2%	PASS	
	0	2	17.6%	16.1%	91.9%	PASS	APSH in the proposed scenario are less than 25%, however the window retains at least 80% of its former value and therefore meets the criteria.	1.5%	0.7%	48.1%	FAIL (but likely to not be habitable)	We do not have access to internal layouts for this property, however photographs from http://www.zoopla.co.uk/property-history/2-martingales-close/ham/richmond/tw10-7jj/13712996 indicate that the living room faces the rear garden of this property and that the large windows adjacent to this window facing the street are kitchen windows. This window most likely serves a hallway and is therefore not critical in terms of sunlight
	0	3	79.2%	79.6%	100.5%	PASS		30.3%	30.3%	100.0%	PASS	
	0	4	68.0%	68.0%	99.9%	PASS		23.6%	23.6%	100.0%	PASS	
	0	5	49.7%	49.7%	100.0%	PASS		12.9%	12.3%	95.1%	PASS	The window experiences a moderate adverse impact in terms of winter sunlight access, however will still receive in excess of 5% WPSH and therefore meets the criteria.
	0	6	44.4%	43.9%	98.9%	PASS		9.1%	8.7%	95.6%	PASS	
	0	7	43.7%	43.4%	99.3%	PASS		7.7%	7.4%	96.1%	PASS	
	1	1	55.1%	54.3%	98.6%	PASS		15.8%	14.2%	89.9%	PASS	
	1	2	43.2%	42.2%	97.9%	PASS		3.4%	2.9%	84.9%	PASS	WPSH in the proposed scenario are less than 5%, however the window retains at least 80% of its former value and therefore meets the criteria.
	1	3	65.1%	64.4%	98.8%	PASS		24.8%	24.4%	98.5%	PASS	
	1	4	64.8%	63.7%	98.3%	PASS		24.3%	24.3%	100.0%	PASS	
	1	5	64.9%	64.2%	98.9%	PASS		30.3%	24.4%	80.6%	PASS	
3 Martingales Close	0	1	58.3%	56.4%	96.8%	PASS		25.5%	19.4%	75.9%	PASS	The window experiences a minor adverse impact in terms of winter sunlight access, however will still receive in excess of 5% WPSH and therefore meets the criteria.
	1	1	65.7%	65.0%	98.9%	PASS		25.8%	24.8%	96.4%	PASS	
	1	2	65.8%	64.8%	98.4%	PASS		25.7%	24.5%	95.4%	PASS	
	1	3	65.7%	64.8%	98.6%	PASS		25.3%	24.5%	96.7%	PASS	
	1	4	65.6%	64.8%	98.7%	PASS		25.5%	24.5%	96.0%	PASS	
23 Martingales Close	0	1				North-facing					North-facing	
	1	1				North-facing					North-facing	
	1	2				North-facing					North-facing	
24 Martingales Close	0	1				North-facing					North-facing	
	1	1				North-facing					North-facing	
	1	2				North-facing					North-facing	
25 Martingales Close	0	1				North-facing					North-facing	
	1	1				North-facing					North-facing	
	1	2				North-facing					North-facing	
26 Martingales Close	0	1				North-facing					North-facing	
	1	1				North-facing					North-facing	
	1	2				North-facing					North-facing	
27 Martingales Close	0	1				North-facing					North-facing	
	1	1				North-facing					North-facing	
	1	2				North-facing					North-facing	
Avenue Lodge Cottage	0	1				North-facing					North-facing	
	0	2				North-facing					North-facing	
	1	1				North-facing					North-facing	
	1	2				North-facing					North-facing	
	1	3				North-facing					North-facing	
	1	4				North-facing					North-facing	
Avenue Lodge	0	1	67.9%	67.5%	99.3%	PASS		30.3%	30.3%	100.0%	PASS	
	0	2				North-facing					North-facing	
	0	3	55.6%	55.7%	100.1%	PASS		19.8%	19.8%	100.0%	PASS	
	0	4	64.4%	63.0%	97.8%	PASS		26.6%	26.6%	100.0%	PASS	
	0	5	55.1%	53.7%	97.4%	PASS		22.4%	22.4%	100.0%	PASS	
	0	6				North-facing					North-facing	
	0	7				North-facing					North-facing	
	0	8				North-facing					North-facing	
	0	9				North-facing					North-facing	
	0	10	44.2%	45.3%	102.5%	PASS		11.6%	11.6%	100.0%	PASS	
	0	11	30.3%	31.8%	104.9%	PASS		3.4%	3.4%	100.0%	PASS	WPSH in the proposed scenario are less than 5%, however this is not due to any negative impacts from the proposed development.
	1	1	66.1%	63.6%	96.3%	PASS		26.1%	26.0%	99.9%	PASS	
	1	2	65.8%	64.0%	97.2%	PASS		26.1%	26.0%	99.7%	PASS	
	1	3	73.1%	71.1%	97.2%	PASS		31.5%	30.6%	97.3%	PASS	
	1	4	60.3%	58.0%	96.2%	PASS		24.3%	24.2%	99.6%	PASS	
	1	5				North-facing					North-facing	
	1	6				North-facing					North-facing	
	1	7				North-facing					North-facing	
	1	8				North-facing					North-facing	
	1	9				North-facing					North-facing	
	1	10	27.5%	27.4%	99.6%	PASS		1.2%	1.1%	96.4%	PASS	WPSH in the proposed scenario are less than 5%, however it will retain 80% of its former value and therefore meets the criteria.
	1	11	45.6%	45.8%	100.6%	PASS		10.0%	10.0%	100.0%	PASS	

Note: the term 'north-facing' in this table includes all windows with a northerly aspect which have no expectation of sunlight, including predominantly northwest or northeast facing windows.

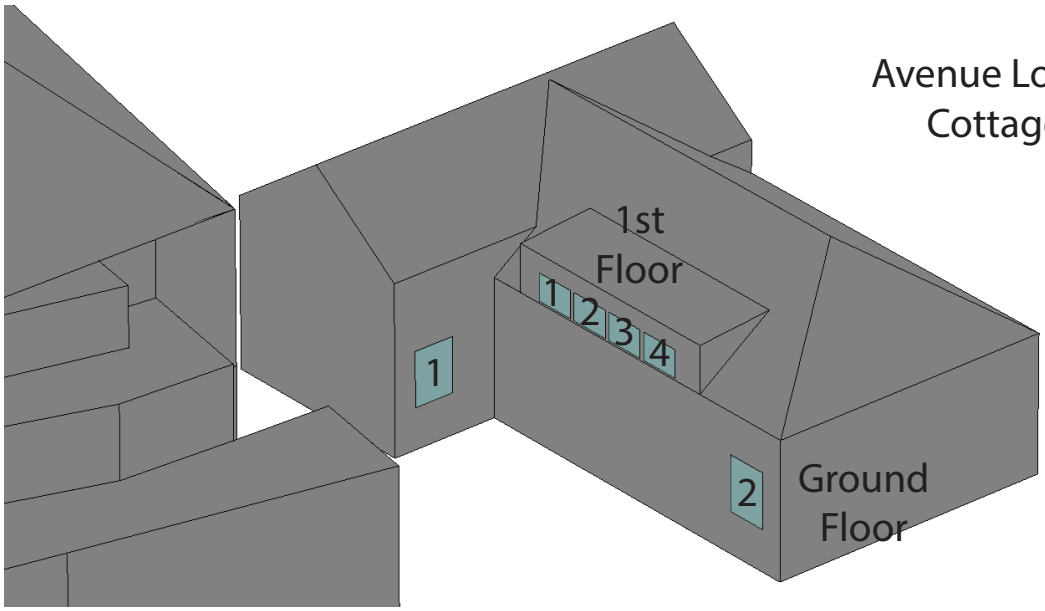
Daylight Results

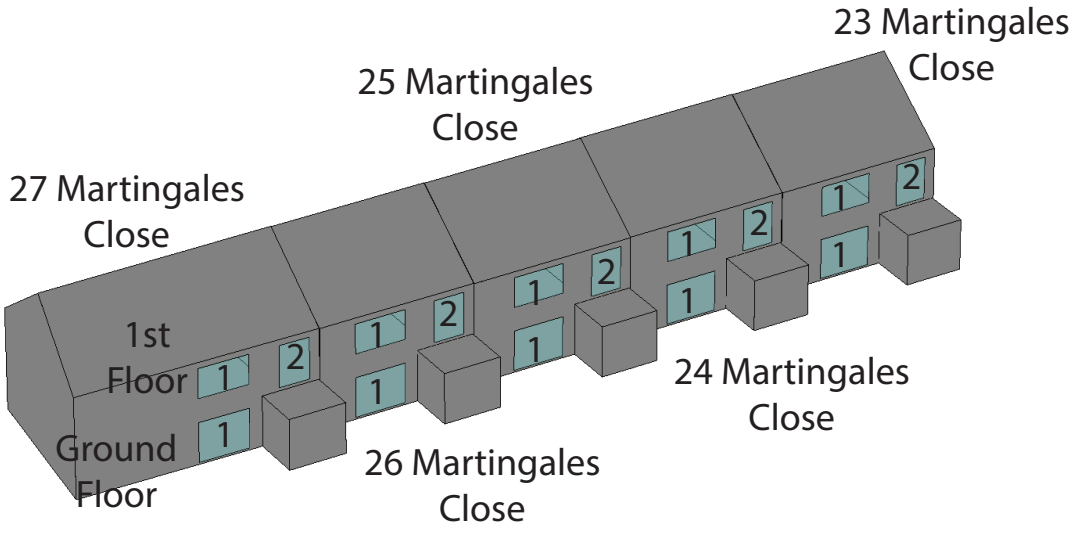
Building No.	Floor Level	Window No.	VSC Existing (%)	VSC Proposed (%)	Ratio of Impact	Compliance	Notes
1 Martingales Close	0	1	16.2	15.2	94%	PASS	VSC values under the proposed condition are less than the required 27%, however the window retains 80% of its former value and therefore meets the criteria
	1	1	37.2	36.5	98%	PASS	
	1	2	38.0	37.4	98%	PASS	
2 Martingales Close	0	1	15.8	14.2	90%	PASS	VSC values under the proposed condition are less than the required 27%, however the window retains 80% of its former value and therefore meets the criteria
	0	2	11.5	10.4	91%	PASS	VSC values under the proposed condition are less than the required 27%, however the window retains 80% of its former value and therefore meets the criteria
	0	3	31.2	31.2	100%	PASS	
	0	4	24.0	23.9	100%	PASS	VSC values under the proposed condition are less than the required 27%, however the window experiences no negative impacts arising from the proposed development and therefore meets the criteria.
	0	5	15.3	15.4	100%	PASS	VSC values under the proposed condition are less than the required 27%, however the window experiences no negative impacts arising from the proposed development and therefore meets the criteria.
	0	6	12.9	12.9	100%	PASS	VSC values under the proposed condition are less than the required 27%, however the window experiences no negative impacts arising from the proposed development and therefore meets the criteria.
	0	7	12.2	12.2	100%	PASS	VSC values under the proposed condition are less than the required 27%, however the window experiences no negative impacts arising from the proposed development and therefore meets the criteria.
	1	1	36.6	35.9	98%	PASS	
	1	2	32.6	31.8	98%	PASS	
	1	3	38.6	37.7	98%	PASS	
	1	4	38.4	37.3	97%	PASS	
	1	5	38.5	37.6	98%	PASS	
3 Martingales Close	0	1	35.7	34.2	96%	PASS	
	1	1	39.0	38.5	99%	PASS	
	1	2	39.0	38.3	98%	PASS	
	1	3	38.9	38.2	98%	PASS	
	1	4	38.7	37.9	98%	PASS	
23 Martingales Close	0	1	31.7	31.7	100%	PASS	
	1	1	37.0	36.9	100%	PASS	
	1	2	36.1	36.1	100%	PASS	
24 Martingales Close	0	1	31.7	31.7	100%	PASS	
	1	1	37.9	37.9	100%	PASS	
	1	2	37.5	37.4	100%	PASS	
25 Martingales Close	0	1	32.4	32.4	100%	PASS	
	1	1	38.3	38.2	100%	PASS	
	1	2	38.1	38.0	100%	PASS	
26 Martingales Close	0	1	32.4	32.4	100%	PASS	
	1	1	38.5	38.4	100%	PASS	
	1	2	38.3	38.1	100%	PASS	
27 Martingales Close	0	1	34.1	33.7	99%	PASS	
	1	1	38.7	38.4	99%	PASS	
	1	2	38.5	38.3	99%	PASS	
Avenue Lodge Cottage	0	1	26.6	26.7	100%	PASS	VSC values under the proposed condition are less than the required 27%, however the window experiences no negative impacts arising from the proposed development and therefore meets the criteria.
	0	2	31.8	31.8	100%	PASS	
	1	1	31.8	31.7	99%	PASS	
	1	2	33.2	33.1	100%	PASS	
	1	3	34.0	33.9	100%	PASS	
	1	4	35.0	34.8	100%	PASS	
Avenue Lodge	0	1	37.8	37.6	99%	PASS	
	0	2	33.0	33.0	100%	PASS	
	0	3	35.2	35.3	100%	PASS	
	0	4	36.6	36.4	99%	PASS	
	0	5	35.8	35.8	100%	PASS	
	0	6	34.1	34.1	100%	PASS	
	0	7	31.5	31.5	100%	PASS	
	0	8	27.4	27.7	101%	PASS	
	0	9	23.6	23.6	100%	PASS	VSC values under the proposed condition are less than the required 27%, however the window experiences no negative impacts arising from the proposed development and therefore meets the criteria.
	0	10	32.7	32.9	100%	PASS	
	0	11	28.9	28.9	100%	PASS	
	1	1	38.6	38.4	100%	PASS	
	1	2	38.0	37.7	99%	PASS	
	1	3	38.7	38.4	99%	PASS	
	1	4	38.4	37.9	99%	PASS	
	1	5	38.0	37.9	100%	PASS	
	1	6	38.2	38.2	100%	PASS	
	1	7	38.2	38.4	100%	PASS	
	1	8	37.3	37.4	100%	PASS	
	1	9	34.6	34.6	100%	PASS	
	1	10	29.3	29.2	100%	PASS	
	1	11	35.1	35.1	100%	PASS	

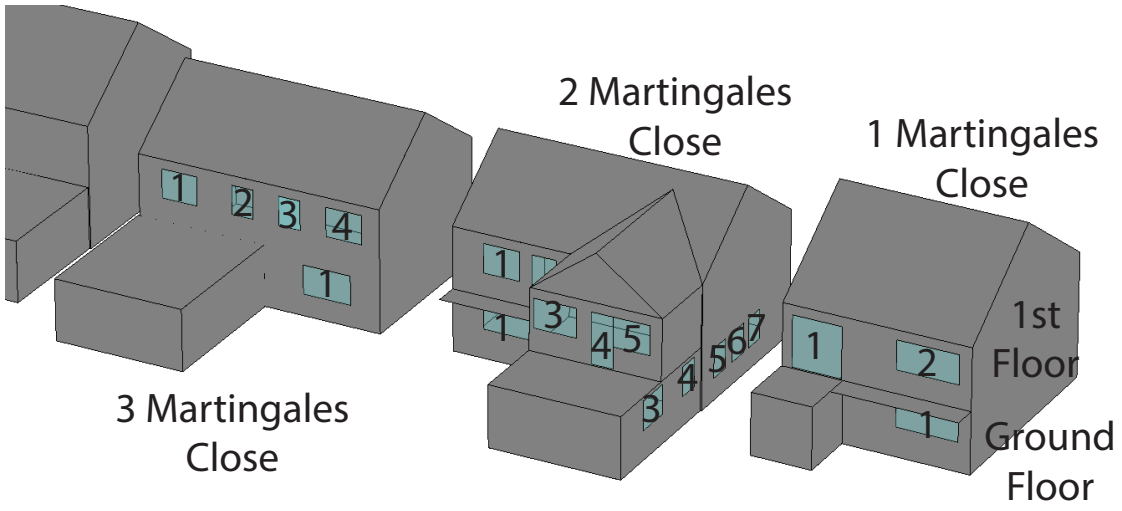
Avenue Lodge



Avenue Lodge
Cottage




23 Martingales Close
25 Martingales Close
27 Martingales Close
1st Floor
Ground Floor
24 Martingales Close
26 Martingales Close


2 Martingales Close
1 Martingales Close
3 Martingales Close
1st Floor
Ground Floor