EAL CONSULT BUILDING SUSTAINABILITY SINCE 2008

DAYLIGHT & SUNLIGHT ASSESSMENT

PROPERTY ADDRESS

3, 5 & 7 Fortess Road,
Kentish Town, NW5 1AA

DATE

Rev II, October 2021

PREPARED BY

EAL Consult

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EXECUTIVE SUMMARY

This daylight & sunlight assessment has been prepared to support the Planning Application for the proposed development at 3, 5 & 7 Fortess Road, Kentish Town in Camden, NW5 1AA. This assessment should be consulted in conjunction with the accompanied planning drawings.

The primary purpose of this daylight, sunlight assessment is to determine the likely loss of light to adjacent buildings resulting from the construction of an additional floor to planning approval ref. 2019/1724/P. Therefore, the proposed roof extension can be identified as the potential source of impact.

The main objective to carry out this Daylight & Sunlight assessment is to:

- Assess the impact of the proposed development upon the current levels of sunlight/daylight being enjoyed by the existing neighbouring buildings.

The methodology set out in this report is in accordance with BRE's 'Site Layout Planning for Daylight and Sunlight' 2nd edition 2011, which is accepted as good practice by Planning Authorities.

The following assessments were carried out:

Daylight & Sunlight Assessment

- Existing dwellings
    a. Vertical Sky Component
    b. Annual Probability of Sunlight Hours (APSH) annual and winter calculations

A total of 5 neighbouring properties were identified, which may be impacted upon by the proposed development.

The assessment of daylight, sunlight to the surrounding residential properties indicates that the proposed development will not cause any noticeable change to existing occupants. As such the scheme is considered fully BRE compliant in terms of daylight, sunlight.

It is worth noting, that while the BRE methodology is a useful assessment for most developments in countryside and sub-urban settings, it does not however respect the lower daylight and sunlight levels found in city centres. Increased massing in cities are therefore more likely to fail these tests based on the target daylight and sunlight values set out in the BRE guidance.

The Autodesk Ecotect software was used to carry out the daylight and sunlight impact assessment. A 3-dimensional site model has been created from information supplied by the architect, drawings, including location and site plan, existing and proposed drawings.

No gardens or open spaces were identified within the site area and therefore an overshadowing assessment was not carried out.

TERMS AND DEFINITIONS

Average Daylight Factor (ADF)

The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'.

CIE Standard Overcast Sky

A completely overcast sky for which the ratio of its illuminance Ly at an angle of elevation y above the horizontal to the luminance Lz at the zenith is given by: Ly=Lz (1+2siny) /3
A CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead).

Working Plane

The working plane is a notional surface, typically at about desk or table height, at which daylight factor or the 'no-sky line' is calculated or plotted.

For the purpose of assessing useful daylight, a working plane of 850mm above finished floor level is assumed. It is generally expected that ceiling heights will not fall below 2.4m.

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.

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).

Sky Factor

Sky Factor is the 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 an unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.

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 this 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 the buildings.

CURRENT POLICIES, REGULATIONS AND BENCHMARKS

Regulations

European workplace directive – Assess to daylight required

Building Regulations – No minimum daylight standards

Rights of Light

In UK, "Rights of Light" legally protects individuals against newly constructed neighbouring properties and extensions that may affect their daylighting. It has been defined in terms of the position of the 0.2% Sky Factor Contour.

Standards

- BS 8206-2 2008 Code of Practice for Daylighting

Guides

- NPPF – Paragraph 123(c)
- GLA Housing SPG
- CIBSE SLL Daylighting and Window Design LG10 1999
- BRE Designing Buildings for Daylight
- BRE Designing with Innovative Daylighting
- BREEAM

Recommendations as to daylight in domestic buildings are to be found in the British Standard BS 8206-02 (BSI, 2002) on Lighting, specifically the section on day lighting, in the publications of the CIBSE and in the publication of BRE (1,2,3).

The recommendations for internal spaces are expressed in three ways:

- A minimum average Daylight Factor (2% for Kitchen, 1.5% for Living Rooms and 1% for Bed Rooms)
- The position of the No-Sky Line at working plane height (0.85m). If the area beyond the No- Skyline is more than 50% the room will look gloomy
- Limiting Depth Criteria

To put the first recommendation in context, a room with an average daylight factor of more than 5% is regarded as well daylit, that is electric lights would be used infrequently during daylight hours, but if it is below 2% electric lights would be used frequently. The requirements are therefore minimal.

These recommendations are illumination based so orientation is not considered a factor. As the perception of how well a space is daylit may be influenced by the factors orientation, shading control and view hence the orientation factor can be used to reflect the higher levels of illuminance on the South facade.

In regard to a new building affecting an existing recommendations have an origin in solar access in the UK. The new building should not reduce the Vertical Sky Component (VSC) below 27% or if it does it should not reduce it by more than 20%. Where there is horizontally facing window/skylight VSC can be up to 40%.

In most city centres the Vertical Sky Component is already below 27% at many windows of building. Planning Authorities have tended to use the 20% reduction guideline when assessing planning permission in such areas which unfortunately has its drawbacks, leading to creeping increased heights in urban areas reducing daylight access.

METHODOLOGY

BRE Guide: Site Layout Planning for Daylight and Sunlight, 2011

This assessment would be based on the various numerical tests laid out in the Building Research Establishment (BRE) Guidelines "Site Layout Planning for Daylight and Sunlight: a good practice guide" 2011. It is important to note that BRE tests in general are based on the requirements of the BS Standards 8206 Part 2.

Following factors will be calculated for the Sunlight/Daylight Assessment:

- Sunlight/Daylight to existing windows

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."

The first step in the methodology is to determine the key sensitive receptors, which windows may be affected by the existing buildings.
Key receptors are windows directly facing and located perpendicular - to the site.

Existing Buildings

Using simple geometry, it will be determined whether the daylight to existing buildings and amenity spaces is adversely affected and this will be done using 25 degree and 45 degree methods.

If new buildings are set out in accordance with the 25 degree method for daylight, this will be sufficient to show that the sunlight to the existing buildings will not be adversely affected.

If these two methods of assessments are satisfied, this will be sufficient in showing that the day lighting to existing buildings and their amenity spaces will not be adversely affected by the new development.

Calculation Method of Daylight to Surrounding Windows

A plane is drawn at 25 degrees from the horizontal, at the centre of an existing window. If a new development intersects with this plane, the internal daylight levels of the surrounding windows may be reduced. When an obstruction of the 25 degree plane occurs, a more detailed assessment involving the Vertical Sky Component of the affected window would need to be carried out.

Calculation Method of Vertical Sky Component (VSC)

The Vertical Sky Component is the ratio of the direct sky illuminance falling on the vertical wall at a reference point, to the simultaneous horizontal illuminance under an unobstructed sky.
To maintain good levels of daylight, the Vertical Sky Component of a window needs to be 27%

or greater. If the VSC is less than 27%, then a comparison of existing and proposed levels of VSC level would need to be calculated.

VSC can be determined by calculating the Obstruction angle: **Obstruction Angle= tan-1 (H/D)**

Where; H is the height of the obstruction above the middle of the window and D is the horizontal distance from the window to the obstruction

Good levels of daylighting can still be achieved if VSC levels are within 0.8 of their former value. Otherwise, the Average Daylight Factor of the internal rooms would need to be calculated.

SITE

The proposed site is located in a predominantly residential and commercial area and therefore, a daylight and sunlight assessment was undertaken to determine the potential impact of the proposed development on these neighbouring areas.

The proposal includes the re-development of No 3, 5 and 7 Fortess Road – a three storey terrace block – to create an additional floor which will provide a self-contained flat. The ridge height will increase approximately by 3.1meters.

Five neighbouring properties were identified that could possibly be affected from this proposed extension.

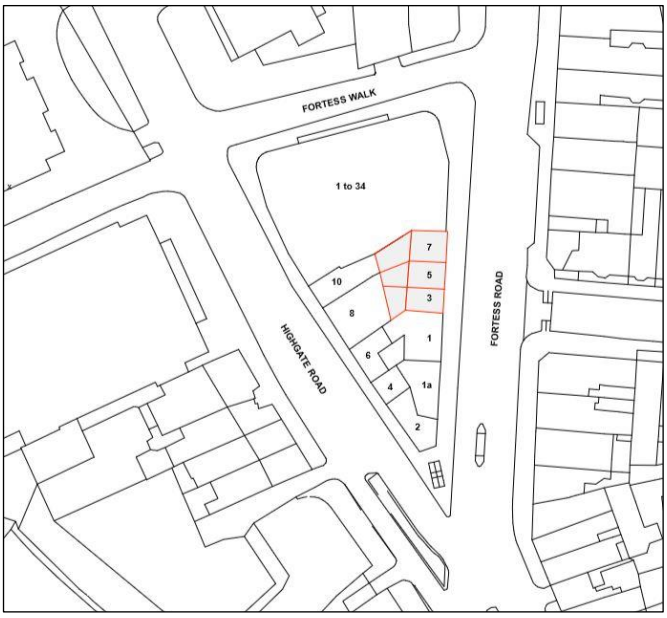

Figure 1 – Site Location

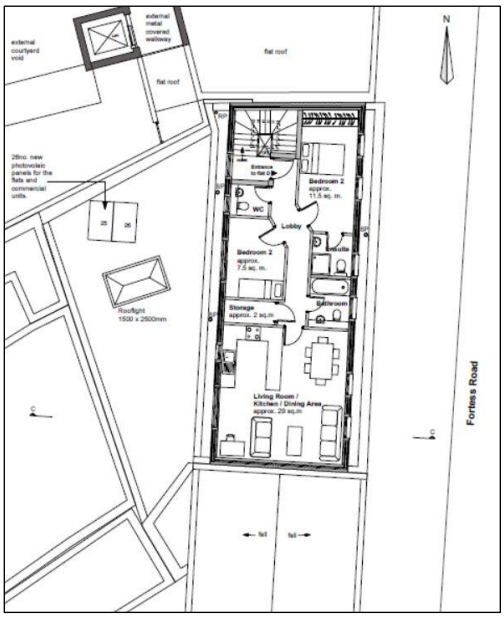

Figure 2 – Proposed Flat

Figure 3 – Possibly Affected Neighbouring Properties

Possibly affected properties:

1. No 12 Fortess Road
2. No 1 Fortess Road
3. No 8 Highgate Road
4. No 10 Highgate Road
5. No 1-34 Fortess Road

DAYLIGHT/SUNLIGHT ASSESSMENT

Vertical Sky Component (VSC)

VSC analysis of each window was carried out. The results are listed in the following pages. If the VSC is greater than 27%, then enough skylight should still be reaching the window and the levels of daylight experienced in the space should not be seriously affected.

Vertical Sky Component Assessment

Table 1 – Vertical Sky Component for the existing properties, Pre & Post Development

Vertical Sky Component		Pre Development	Post Development Previous approved scheme	Post Development Additional floor	VSC after Proposal
Assessed neighbouring property:	**Window no.**	**BRE VSC %**	**BRE VSC %**	**BRE VSC %**	**>27**
No 12 Fortess Road	Win01 - GF	25.6	25.0	25.0	No
	Win02 - FF	28.2	28.1	28.1	Yes
	Win03 - FF	28.2	28.1	28.1	Yes
	Win 04 - FF	28.1	28.0	28.0	Yes
	Win 05 - SF	29.4	29.4	29.4	Yes
	Win 06 - SF	29.4	29.4	29.4	Yes
	Win 07 - SF	29.3	29.3	29.3	Yes

Results demonstrate the minimum difference in light levels at pre-development and post-development following the construction of an addition floor at roof level.

Table 2 – Vertical Sky Component for the existing properties, Pre & Post Development

Vertical Sky Component		Pre Development	Post Development Previous approved scheme	Post Development Additional floor	VSC after Proposal
Assessed neighbouring property:	**Window no.**	**BRE VSC %**	**BRE VSC %**	**BRE VSC %**	**>27**
No 1 Fortess Road	Win01 - FF	12.4	12.3	12.3	No
	Win02 - FF	12.0	11.8	11.8	No
	Win03 - SF	14.5	14.5	14.4	No
	Win04 - SF	14.1	14.1	14.0	No
	Win05 - TF	19.1	19.1	18.9	No
	Win06 - TF	19.0	19.0	18.7	No

Results show that the Vertical Sky Component is less than the recommended value of 27% for all the windows. Further calculations demonstrate the minimum difference in light levels at pre-development and post-development following the construction of an addition floor at roof level. Therefore, the proposal is considered appropriate for the specific site.

Table 3 – Vertical Sky Component for the existing properties, Pre & Post Development

Vertical Sky Component		Pre Development	Post Development Previous approved scheme	Post Development Additional floor	VSC after Proposal
Assessed neighbouring property:	**Window no.**	**BRE VSC %**	**BRE VSC %**	**BRE VSC %**	**>27**
No 8 Highgate Road	Win01 - FF	10.5	9.4	9.0	No
	Win02 - FF	10.9	9.6	9.4	No
	Win03 - FF	11.0	9.6	9.4	No
	Win 04 - SF	17.9	15.3	15.1	No
	Win05 – SF	17.8	15.6	15.4	No
	Win06 – SF	17.9	15.8	15.6	No
	Win07 – SF	17.9	15.2	15.0	No

Results show that the Vertical Sky Component is less than the recommended value of 27% for all the windows. Further calculations demonstrate the minimum difference in light levels between the previously approved development and the construction of an addition floor at roof level.

A small impact on the light levels may be noticeable to the existing neighbouring property users, however, their location (windows) and use of the neighbouring rooms facing the proposed site has not been verified and therefore, the proposal is still considered appropriate for the specific site if these windows are located to non habitable rooms.

Table 4 – Vertical Sky Component for the existing properties, Pre & Post Development

Vertical Sky Component		Pre Development	Post Development Previous approved scheme	Post Development Additional floor	VSC after Proposal
Assessed neighbouring property:	**Window no.**	**BRE VSC %**	**BRE VSC %**	**BRE VSC %**	**>27**
No 10 Highgate Road	Win01 - FF	10.3	8.4	7.8	No
	Win02 – FF mezzanine	10.2	8.5	7.9	No
	Win03 - SF	17.1	15.2	14.9	No

Results show that the Vertical Sky Component is less than the recommended value of 27% for all the windows. Further calculations demonstrate the minimum difference in light levels

between the previously approved development and the construction of an addition floor at roof level.

Table 5 – Vertical Sky Component for the existing properties, Pre & Post Development

Vertical Sky Component		Pre Development	Post Development Previous approved scheme	Post Development Additional floor	VSC after Proposal
Assessed neighbouring property:	**Window no.**	**BRE VSC %**	**BRE VSC %**	**BRE VSC %**	**>27**
No 1-34 Fortess Road	Win01 - FF	10.4	10.4	9.5	No
	Win02 – FF	10.2	10.2	9.5	No
	Win03 - FF	10.2	10.2	9.6	No
	Win04 - FF	9.1	9.1	8.2	No
	Win05 - FF	10.8	10.8	10.0	No
	Win06 - SF	15.7	15.7	15.0	No
	Win07 – SF	15.5	15.5	14.9	No
	Win08 – SF	15.5	15.5	14.9	No
	Win09 – SF	14.2	14.2	13.7	No
	Win010 – SF	15.9	15.9	15.2	No
	Win011 – TF	19.3	19.3	18.8	No
	Win012 – TF	19.3	19.3	18.8	No
	Win013 – TF	19.1	19.1	18.9	No
	Win014 – TF	18.5	18.5	18.3	No
	Win015 – TF	20.0	20.0	19.8	No

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Results show that the Vertical Sky Component is less than the recommended value of 27% for all the windows. Further calculations demonstrate the minimum difference in light levels at pre-development and post-development following the construction of an addition floor at roof level. Therefore, the proposal is considered appropriate for the specific site.

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Sunlight Assessment – Annual Probable Sunlight Hours

Annual probable sunlight hours (APSH) is a measure of sunlight that a given window may expect over a year period. The BRE guidance recognises that sunlight is less important than daylight in the amenity of a room and is heavily influenced by orientation. North facing windows may receive sunlight on only a handful of occasions in a year, and windows facing eastwards or westwards will only receive sunlight for some of the day. Therefore, **BRE guidance states that only windows with an orientation within 90 degrees of south need be assessed.** Therefore, the surrounding properties located within the 90 degrees of south have been assessed.

For sunlight studies the APSH (annual probable hours) test calculates the percentage of statistically probable hours of sunlight received by each window in both the summer and winter months. From March 21st to September 21st – Summer period and from the 21st September to 21st of March – Winter period.

Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of APSH. Therefore, where no obstruction exists the total annual probable sunlight hours would amount to 1486 and therefore each spot equates to 14.86 hours of the total annual sunlight hours.

Following are the recommended Sunlight hours for London. Total recommended sunlight hours:

= 25% of APSH for London
= 25% of 1468hrs
= (25/100) x 1486
= 371.5hrs/yr

Recommended sunlight hours for winter

= 5% of APSH for London
= 5% of 1486hrs
= (5/100) x 1486
= 74.3hrs/yr

Table 6 – Annual Probable Sunlight Hours for existing properties, after the proposed roof extension

Annual Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>371.5hrs**
No 12 Fortess Road	Win01 - GF	Yes
	Win02 - FF	Yes
	Win03 - FF	Yes
	Win 04 - FF	Yes
	Win 05 - SF	Yes
	Win 06 - SF	Yes
	Win 07 - SF	Yes

Table 7 – Winter Probable Sunlight Hours for existing properties, after the proposed roof extension

Winter Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>74.3hrs**
No 12 Fortess Road	Win01 - GF	Yes
	Win02 - FF	Yes
	Win03 - FF	Yes
	Win 04 - FF	Yes
	Win 05 - SF	Yes
	Win 06 - SF	Yes
	Win 07 - SF	Yes

The existing neighbouring windows will still receive the recommended hours of sunlight during the year and winter period after the construction of the proposed residential unit at roof level.

Table 8 – Annual Probable Sunlight Hours for existing properties, after the proposed roof extension

Annual Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>371.5hrs**
No 1 Fortess Road	Win01 - FF	Yes
	Win02 - FF	Yes
	Win03 - SF	Yes
	Win04 - SF	Yes
	Win05 - TF	Yes
	Win06 - TF	Yes

Table 9 – Winter Probable Sunlight Hours for existing properties, after the proposed roof extension

Winter Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>74.3hrs**
No 1 Fortess Road	Win01 - FF	Yes
	Win02 - FF	Yes
	Win03 - SF	Yes
	Win04 - SF	Yes
	Win05 - TF	Yes
	Win06 - TF	Yes

The existing neighbouring windows will still receive the recommended hours of sunlight during the year and winter period after the construction of the proposed residential unit at roof level.

Table 10 – Annual Probable Sunlight Hours for existing properties, after the proposed roof extension

Annual Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>371.5hrs**
No 8 Highgate Road	Win01 - FF	Yes
	Win02 - FF	Yes
	Win03 - FF	Yes
	Win 04 - SF	Yes
	Win05 – SF	Yes
	Win06 – SF	Yes
	Win07 – SF	Yes

Table 11 – Winter Probable Sunlight Hours for existing properties, after the proposed roof extension

Winter Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>74.3hrs**
No 8 Highgate Road	Win01 - FF	Yes
	Win02 - FF	Yes
	Win03 - FF	Yes
	Win 04 - SF	Yes
	Win05 – SF	Yes
	Win06 – SF	Yes
	Win07 – SF	Yes

The existing neighbouring windows will still receive the recommended hours of sunlight during the year and winter period after the construction of the proposed residential unit at roof level.

Table 12 – Annual Probable Sunlight Hours for existing properties, after the proposed roof extension

Annual Probable Sunlight Hours		Post Development Additional floor
Assessed neighbouring property:	**Window no.**	**>371.5hrs**
No 10 Highgate Road	Win01 - FF	Yes
	Win02 – FF mezzanine	Yes
	Win03 - SF	Yes

Table 13 – Winter Probable Sunlight Hours for existing properties, after the proposed roof extension

Winter Probable Sunlight Hours		Post development
Assessed neighbouring property:	**Window no.**	**>74.3hrs**
No 10 Highgate Road	Win01 - FF	Yes
	Win02 – FF mezzanine	Yes
	Win03 - SF	Yes

The existing neighbouring windows will still receive the recommended hours of sunlight during the year and winter period after the construction of the proposed residential unit at roof level.

Table 14 – Annual Probable Sunlight Hours for existing properties, after the proposed roof extension

Annual Probable Sunlight Hours		Post development
Assessed neighbouring property:	**Window no.**	**>371.5hrs**
No 1-34 Fortess Road	Win01 - FF	Yes
	Win02 – FF	Yes
	Win03 - FF	Yes
	Win04 - FF	Yes
	Win05 - FF	Yes
	Win06 - SF	Yes
	Win07 – SF	Yes
	Win08 – SF	Yes
	Win09 – SF	Yes
	Win010 – SF	Yes
	Win011 – TF	Yes
	Win012 – TF	Yes
	Win013 – TF	Yes
	Win014 – TF	Yes
	Win015 – TF	Yes

Table 15 – Winter Probable Sunlight Hours for existing properties, after the proposed roof extension

Winter Probable Sunlight Hours		Post development
Assessed neighbouring property:	**Window no.**	**>74.3hrs**
No 1-34 Fortess Road	Win01 - FF	Yes
	Win02 – FF	Yes
	Win03 - FF	Yes
	Win04 - FF	Yes
	Win05 - FF	Yes
	Win06 - SF	Yes
	Win07 – SF	Yes
	Win08 – SF	Yes
	Win09 – SF	Yes
	Win010 – SF	Yes
	Win011 – TF	Yes
	Win012 – TF	Yes
	Win013 – TF	Yes
	Win014 – TF	Yes
	Win015 – TF	Yes

The existing neighbouring windows will still receive the recommended hours of sunlight during the year and winter period after the construction of the proposed residential unit at roof level.

CONCLUSION

The proposed additional floor at roof level has been designed with care so that it has minimum visual impact on its surroundings, achieving as much sunlight hours as possible despite un-avoidable site constraints and limitations.

From initial assessment five existing neighbouring properties could be slightly affected from the proposed residential unit at 3, 5 and 7 Fortess Road. Calculations confirmed that the existing properties will receive in most cases the same amount of daylight. Two properties may notice a difference in light levels, however, the use of the rooms (habitable – non habitable) facing the proposed site has not been confirmed and therefore, the additional floor with an approximately height of 3metres, is considered appropriate for the specific site.

No open spaces/gardens were identified within the area and therefore, an overshadowing assessment was not carried out.

Overall, the assessment of daylight and sunlight to the surrounding properties indicates that the proposal will not cause a noticeable change to existing occupants as the difference in the results has been kept to a minimum. As such the scheme is considered fully BRE complaint in terms of daylight and sunlight and should be considered acceptable.

The sunlight results indicate that none of the existing windows will see an annual noticeable loss in sunlight levels.

- All windows achieve in all cases (APSH and winter) the BRE requirement, with the percentage of sunlight hours exceeding the APSH 25% and 5% for winter period.

Please note that the No Sky Line[1] calculations have not been carried out for this assessment as the layout of the neighbouring properties is unknown. Therefore, an assessment would only have been based on room assumptions.

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[1] The no-sky line test involves the calculation of percentage of a room's area which can receive direct skylight.