



**EAL CONSULT BUILDING SUSTAINABILITY SINCE 2008**

# **DAYLIGHT & SUNLIGHT ASSESSMENT**

## **PROPERTY ADDRESS**

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

## **DATE**

Rev III, July 2023

## **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 re-development of the existing site. Therefore, the proposed scheme 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 scheme, upon the current levels of sunlight & daylight being enjoyed by the existing surrounding buildings.

The methodology set out in this report is in accordance with BRE's 'Site Layout Planning for Daylight and Sunlight' (BR209, 2022), which is accepted as good practice by Planning Authorities. In June 2022 a new version of the Guidelines was published, which changes the criteria and methodology to assess daylight and sunlight within newly proposed schemes. However, the aim of the new guidance is the same as the old one, which is "to help ensure good conditions in the local environment considered broadly, with enough sunlight and daylight on or between the buildings for good interior and exterior conditions", as stated in Paragraph 1.5 of the new guidance.

The following assessments were carried out:

### Daylight & Sunlight Assessment

- **Existing neighbouring properties**
  - 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 is 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

**Daylight Factor (D)**

Ratio of total daylight illuminance at a reference point on the working plane within a space to outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% D would mean that the indoor illuminance at that point in the space would be one hundredth the outdoor unobstructed horizontal illuminance.

**Target Daylight Factor**

Daylight factor value equivalent to the target illuminance to be exceeded for more than half of annual daylight hours over a specified fraction of the reference plane within a daylight space.

**Minimum Target Daylight Factor**

Daylight factor value equivalent to the minimum target illuminance to be exceeded for more than half of annual daylight hours over 95% of the reference plane within spaces with vertical and/or inclined daylight apertures.

**CIE standard overcast sky**

A completely overcast sky for which the ratio of its luminance  $L_\gamma$  at an angle of elevation  $\gamma$  above the horizontal to the luminance  $L_z$  at the zenith is given by:  $L_\gamma = L_z \cdot 3 \cdot (1 + 2 \sin \gamma)$  A CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead).

**Daylight, natural light**

Combined skylight and sunlight.

**No sky line**

The outline on the working plane of the area from which no sky can be seen.

**Annual 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).

**Vertical sky component (VSC)**

This is a measure of the amount of light reaching a window. It is the 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 other buildings.

## CURRENT POLICIES, REGULATIONS AND BENCHMARKS

People expect good natural lighting in their homes and in a wide range of non-domestic buildings. Daylight makes an interior look more attractive and interesting as well as providing light to work or read by. Access to skylight and sunlight helps make a building energy efficient; effective daylighting will reduce the need for electric light, while winter solar gain can meet some of the heating requirements.

The quality and quantity of natural light in an interior depend on two main factors. The design of the interior environment is important: the size and position of windows, the depth and shape of rooms, and the colours of internal surfaces. But the design of the external environment also plays a major role: e.g. if obstructing buildings are so tall that they make adequate daylighting impossible, or if they block sunlight for much of the year.

Obstructions can limit access to light from the sky. This can be checked at an early design stage by measuring or calculating the angle of visible sky  $\theta$ , angle of obstruction or vertical sky component (VSC) at the centre of the lowest window where daylight is required. If VSC is:

- at least 27% ( $\theta$  is greater than  $65^\circ$ , obstruction angle less than  $25^\circ$ ) conventional window design will usually give reasonable results.
- between 15% and 27% ( $\theta$  is between  $45^\circ$  and  $65^\circ$ , obstruction angle between  $25^\circ$  and  $45^\circ$ ) special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight.
- between 5% and 15% ( $\theta$  is between  $25^\circ$  and  $45^\circ$ , obstruction angle between  $45^\circ$  and  $65^\circ$ ) it is very difficult to provide adequate daylight unless very large windows are used.
- less than 5% ( $\theta$  less than  $25^\circ$ , obstruction angle more than  $65^\circ$ ) it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed.

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

- at least one main window wall faces within  $90^\circ$  of due south and
- a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March. This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.

Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

If a living room of an existing dwelling has a main window facing within  $90^\circ$  of due south, and any part of a new development subtends an angle of more than  $25^\circ$  to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sun lighting of the existing dwelling may be adversely affected. This will be the case if the centre of the window:

receives less than 25% of annual probable sunlight hours and less than 0.80 times its former annual value; or less than 5% of annual probable sunlight hours between 21 September and 21 March and less than 0.80 times its former value during that period;

- and also has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

The British Standard “Daylight in buildings” (BS EN 17037) contains advice and guidance on interior daylighting. The guidance contained in this publication (BR 209) is intended to be used with BS EN 17037 and its UK National Annex[C1]. Other European countries have their own versions of EN17037, which do not include the UK National Annex.

BS EN 17037 supersedes BS 8206 Part 2 “Code of practice for daylighting”[C2], which contained a method of assessment based on Average Daylight Factor, which is now no longer recommended. For daylight provision in buildings, BS EN 17037 provides two methodologies. One is based on target illuminances from daylight to be achieved over specified fractions of the reference plane (a plane at table top height covering the room) for at least half of the daylight hours in a typical year. The other, alternative, method is based on calculating the daylight factors achieved over specified fractions of the reference plane.

**BS EN 17037 gives three levels of recommendation for daylight provision in interior spaces: minimum, medium and high. For compliance with the standard, a daylight space should achieve the minimum level of recommendation.**

### Daylight factor method

The daylight factor is the illuminance at a point on the reference plane in a space, divided by the illuminance on an unobstructed horizontal surface outdoors. The CIE standard overcast sky[C3] is used, and the ratio is usually expressed as a percentage.

Table C2 gives the daylight factor targets for side lit rooms in London.

Table C2 – Target daylight factors (D) for London		
Level of recommendation	Target daylight factor D for half of assessment grid	Target daylight factor D for 95% of assessment grid
Minimum	2.1%	0.7%
Medium	3.5%	2.1%
High	5.3%	3.5%

## METHODOLOGY

### Surface reflectance

Internal and exterior surfaces and obstructions need to be modelled including appropriate surface reflectances.

Surface reflectances should represent real conditions. Where reflectance values have not been measured or specified, default values to be used in the calculation are given in Table C4.

Table C4 – Recommended default surface reflectances	
Surface	Default reflectance
Interior walls	0.5
Ceilings	0.7
Floors	0.2
Exterior walls and obstructions	0.2
Exterior ground	0.2

Where surface finishes have been specified or measured on site, they can be used in the calculations with appropriate factors for maintenance and furniture. To allow for these factors, maximum reflectances for white painted surfaces in the calculations should not exceed 0.8 indoors, and 0.6 outdoors. Maximum reflectances for light pastel walls should not exceed 0.7 in the calculations, and maximum reflectances for light wood floors should not exceed 0.4. Surface reflectances used should be presented in the assessment, along with a specification of the materials if non-default reflectances are used.

### Glazing transmission

Glazing transmission factors, including maintenance factors, need to be included in the simulation along with account for, or modelling of, window framing. Where window frames are not specifically included in the model, frame factors should be applied based on the ratio of glass to overall window aperture area for the type of window to be used; this will generally vary with window size and whether the windows have opening lights. Where window types have not been specified, results for the overall window aperture should be multiplied by a default framing factor as given in Table C5.

Table C5 – Recommended default framing factors	
Window type	Default framing factor
Windows with small panes	0.5
Normal windows with opening lights	0.6
Patio doors	0.7

# 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 residential units within the existing building and the construction of an additional floor to provide further residential spaces. The proposed design aims to change the existing massing only by adding a fourth floor. Thus, the ridge height will only increase by one floor (approximately 3m).

Five neighbouring properties were identified that could possibly be affected from the proposed scheme.

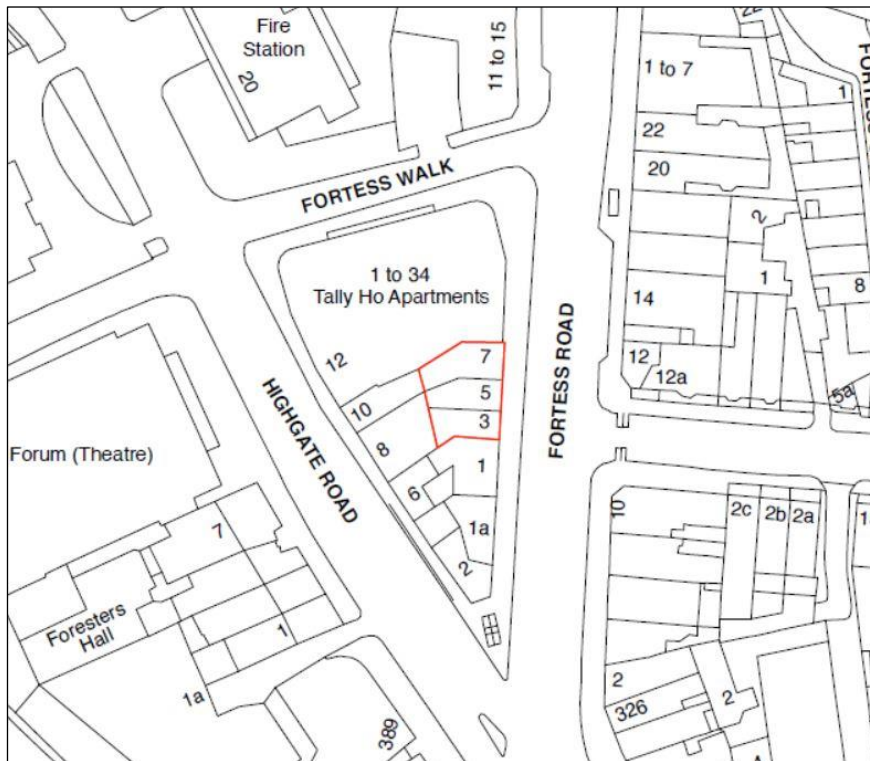


Figure 1 – Site Location





Figure 2 – 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	VSC after Proposal
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27
No 12 Fortess Road	Win01 - GF	25.6	25.0	No
	Win02 - FF	28.2	28.1	Yes
	Win03 - FF	28.2	28.1	Yes
	Win 04 - FF	28.1	28.0	Yes
	Win 05 - SF	29.4	29.4	Yes
	Win 06 - SF	29.4	29.4	Yes
	Win 07 - SF	29.3	29.3	Yes

Results demonstrate the minimum difference in light levels at pre-development and post-development following the re-development of No 3,5 & 7 Fortess Road.

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

Vertical Sky Component		Pre Development	Post Development	VSC after Proposal
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27
No 1 Fortess Road	Win01 - FF	12.4	12.3	No
	Win02 - FF	12.0	11.8	No
	Win03 - SF	14.5	14.4	No
	Win04 - SF	14.1	14.0	No
	Win05 - TF	19.1	18.9	No
	Win06 - TF	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 re-development of No 3,5 & 7 Fortess Road. 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	VSC after Proposal
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27
No 8 Highgate Road	Win01 - FF	10.5	9.0	No
	Win02 - FF	10.9	9.4	No
	Win03 - FF	11.0	9.4	No
	Win 04 - SF	17.9	15.1	No
	Win05 – SF	17.8	15.4	No
	Win06 – SF	17.9	15.6	No
	Win07 – SF	17.9	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 at pre-development and post-development following the re-development of No 3,5 & 7 Fortress Road.

A small impact on the light levels may be noticeable to the existing neighbouring property users located on the second floor of No 8 Highgate Road, 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	VSC after Proposal
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27
No 10 Highgate Road	Win01 - FF	10.3	7.8	No
	Win02 – FF mezzanine	10.2	7.9	No
	Win03 - SF	17.1	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 at pre-development and post-development following the re-development of No 3,5 & 7 Fortress Road.

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

Vertical Sky Component		Pre-Development	Post Development	VSC after Proposal
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27
No 1-34 Fortess Road	Win01 - FF	10.4	9.5	No
	Win02 – FF	10.2	9.5	No
	Win03 - FF	10.2	9.6	No
	Win04 - FF	9.1	8.2	No
	Win05 - FF	10.8	10.0	No
	Win06 - SF	15.7	15.0	No
	Win07 – SF	15.5	14.9	No
	Win08 – SF	15.5	14.9	No
	Win09 – SF	14.2	13.7	No
	Win010 – SF	15.9	15.2	No
	Win011 – TF	19.3	18.8	No
	Win012 – TF	19.3	18.8	No
	Win013 – TF	19.1	18.9	No
	Win014 – TF	18.5	18.3	No
	Win015 – TF	20.0	19.8	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 re-development of No 3,5 & 7 Fortess Road. Therefore, the proposal is considered appropriate for the specific site.

**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 21<sup>st</sup> to September 21<sup>st</sup> – Summer period and from the 21<sup>st</sup> September to 21<sup>st</sup> 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 1486hrs
- =  $(25/100) \times 1486$
- = 371.5hrs/yr

Recommended sunlight hours for winter

- = 5% of APSH for London
- = 5% of 1486hrs
- =  $(5/100) \times 1486$
- = 74.3hrs/yr

**Table 6 – Annual Probable Sunlight Hours for existing properties**

Annual Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;371.5hrs</b>
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**

Winter Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;74.3hrs</b>
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**

Annual Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;371.5hrs</b>
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**

Winter Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;74.3hrs</b>
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**

Annual Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;371.5hrs</b>
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**

Winter Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;74.3hrs</b>
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**

Annual Probable Sunlight Hours		Post Development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;371.5hrs</b>
No 10 Highgate Road	Win01 - FF	Yes
	Win02 – FF mezzanine	Yes
	Win03 - SF	Yes

**Table 13 – Winter Probable Sunlight Hours for existing properties**

Winter Probable Sunlight Hours		Post development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;74.3hrs</b>
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**

Annual Probable Sunlight Hours		Post development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;371.5hrs</b>
No 1-34 Fortress 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**

Winter Probable Sunlight Hours		Post development
<b>Assessed neighbouring property:</b>	<b>Window no.</b>	<b>&gt;74.3hrs</b>
No 1-34 Fortress 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 re-development and construction of an 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 compliant 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.