# 4 – 6 Bedford Place, London, WC1B 5JD

# Daylight, Sunlight, and Overshadowing Study

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| **Rev:** | A |
| **Date:** | 27th February 2023 |

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## SCOPE

Model Environments was appointed by Nebra Properties 2022 Limited to assess the potential impact upon natural light access to neighbouring buildings, due to a proposed development at 4 – 6 Bedford Place. The proposal comprises the refurbishment of the existing hotel and the construction of ground and lower ground floor rear extensions.

Impact has been assessed using the criteria set out in '*Site layout planning for daylight and sunlight – a guide to good practice'* by PJ Littlefair, published by the Building Research Establishment (BRE, 2022). Whilst the guide itself states that its guidelines are not mandatory, they are those predominantly referenced for daylight and sunlight standards in the UK.

It is important to note that with any modelling exercise there are assumptions and approximations that must be made. As far as possible, details of all assumptions and approximations used are supplied as part of the report: these should be read carefully. All results are based on the output from computer modelling software and should be taken as an indication of the likely final situation, but these conditions cannot be guaranteed.

## EXECUTIVE SUMMARY

The proposal is fully compliant with BRE guidance for external impacts to neighbouring access to daylight and sunlight.

Six neighbouring windows assessed for daylight access were predicted to experience impacts well within the limits set out in the current BRE report.

The impact of the proposal on neighbouring access to sunlight is negligible.

The rear garden of 3 Bedford Place was tested for overshadowing impacts and was predicted to experience no change in access to sunlight.

## METHODOLOGY

There are no national planning policy guidelines on sunlight, daylight and the effects of overshadowing. At the local level, the document *Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice'* by Paul Littlefair of the Building Research Establishment (BRE, 2022) has been adopted into many councils' Local Plans and, even where some local authorities have not explicitly adopted the methodology, it is widely recognised as the best available means of determining potential impacts of this type. This assessment has been carried out in accordance with the best practice guidelines stated in this reference.

It should be noted that the guide says of itself that the intention is to help rather than constrain the designer, and that its advice is not mandatory. Further, whilst the document provides numerical guidelines for various natural light derived parameters, it advises that these should be applied flexibly.

### Daylight Assessment Methodology

The BRE guidelines describe three parameters to quantify potential effects of a new building on the light levels of its neighbours:

- **Daylight** – i.e. the impacts of all direct and indirect sunlight during the daytime;
- **Sunlight** – i.e. the impacts of only the direct sunlight; and
- **Overshadowing of Gardens and Open spaces**.

The BRE guidelines propose several methods to assess daylight. Firstly, the 25° rule is used as a screening method to select windows requiring full investigation. If a construction subtends an angle greater than 25° from the horizontal when viewed from a neighbouring window, that window requires further investigation.

Next, the Vertical Sky Component (VSC) is calculated for the selected windows and compared for the situations with and without the proposed building. The VSC is a general measure of the potential daylight available to a window and depends on the amount of unobstructed sky visible from the window's centre.

A VSC of 27% is the good practice minimum. The BRE guide recommends that the VSC is calculated for selected windows in the existing and proposed cases and the values compared. If, in the proposed case, the value of the VSC drops below 27% or the value of drops below 0.80 of its former value, then occupants of the affected building will notice the reduction in daylight.

## Sunlight Assessment Methodology

The BRE Report states that a new development may adversely affect the level of sunlight at an existing building if the centre of the window in a main living room receives less than one quarter of the Annual Probable Sunlight Hours (APSH) in a year, or less than 5% of the Winter Probable Sunlight Hours between 21 September - 21 March, *and* is less than 0.80 times its former value in either period, *and* has a reduction of APSH over 4%. It is recommended that only main living rooms that face within 90° of south be tested for impacts to sunlight access.

## Overshadowing Assessment Methodology

The 21st March is an indicative date for shadows. If an area receives no direct sunlight at any time on that date, it will not have received any sunlight all winter. After 21st March, the shadows will become shorter over the summer and then start to lengthen again, returning to an equal length on 21st September. This means that any garden or amenity areas receiving sunlight on 21st March will continue to receive sunlight for the coming six summer months, i.e. the growing period. Hourly shadow plots can be used to show areas which are in shade from 21st September to 21st March.

The good practice guideline states that: *"no more than 50% of a garden should receive less than 2 hours sunlight on 21st March and, if as the result of a new development, an existing garden does not meet these guidelines, and the area that can receive 2 hours of direct sun on March 21st is less than 0.80 time its former value, then the loss of sunlight is likely to be noticeable".*

## THE MODEL

The calculations were made using Ecotect 5.6 software from Autodesk Ltd and Radiance from Lawrence Berkeley Laboratories. Three-dimensional electronic models suitable for daylight/sunlight analysis were constructed to represent the current site conditions and the proposed development.

The model included a representation of buildings adjacent to the development site up to a distance judged to have an influence on the availability of natural light using the 25° screening test. The model was based on photographs, drawings, and information supplied by the design team in February 2023, as well as information found concurrently online. Estimations were made in the absence of other information, and these are made explicit where applicable throughout the report.

The reflectance values of the building surfaces in the model were set to BRE default values, these were: interior walls, R=0.5; ceilings, R=0.7; floors, R=0.2; exterior walls, R=0.2.

## WINDOW IDENTIFICATION

The 25° test was performed for windows in the neighbouring buildings. It was found that five windows at the rear of 3 Bedford Place and one window at the rear of 7 Bedford Place may require further testing. Images showing the location of the windows tested appear below.

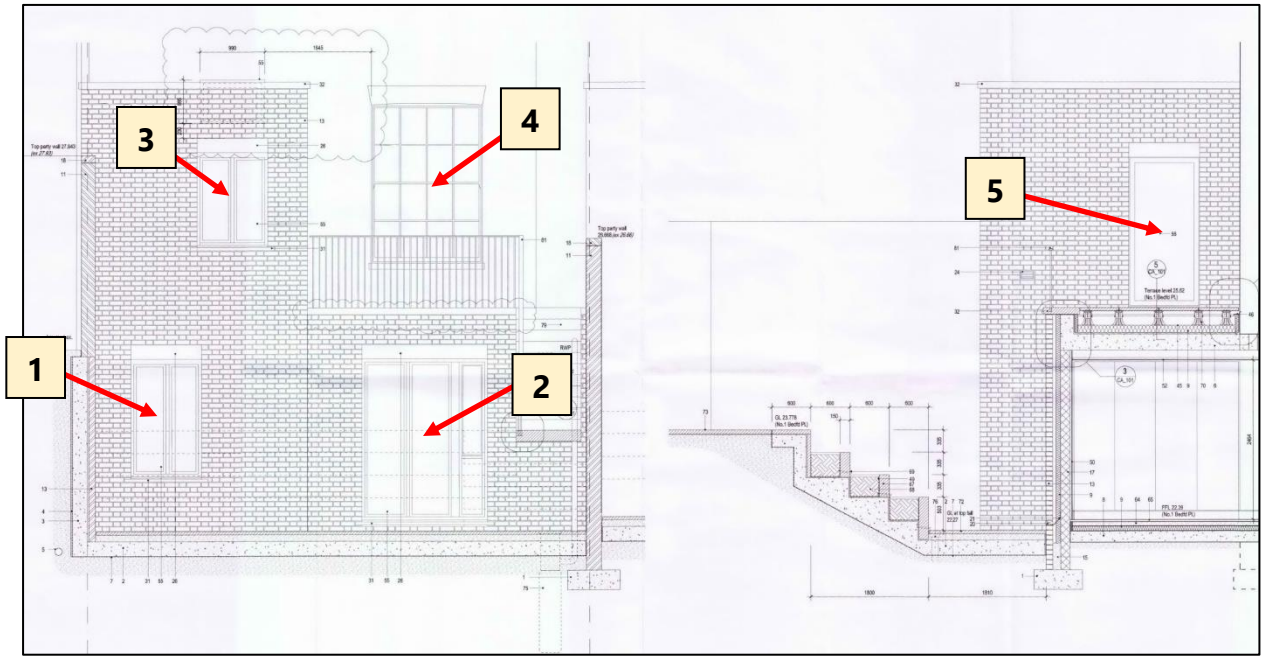


*Image 1: Identification of windows, 3 Bedford Place.*

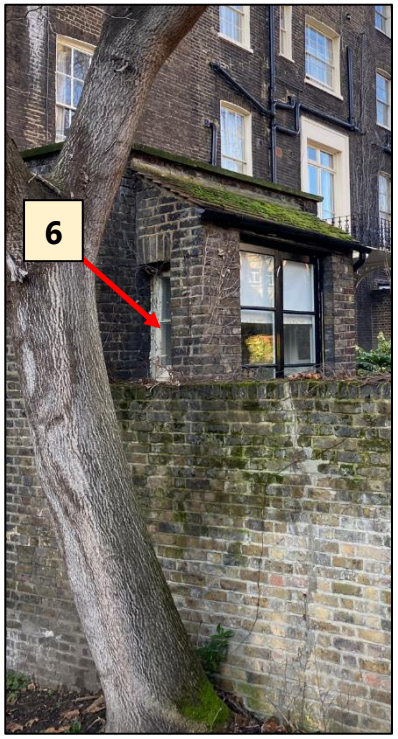


*Image 2: Identification of windows, 7 Bedford Place.*

## DAYLIGHT RESULTS

| Property | Window Number | Existing VSC | Proposed VSC | Ratio | BRE Compliance |
|---|---|---|---|---|---|
| 3 Bedford Place | 1 | 23.4% | 23.4% | 1.00 | **Pass** |
| | 2 | 22.4% | 22.3% | 1.00 | **Pass** |
| | 3 | 33.0% | 33.0% | 1.00 | **Pass** |
| | 4 | 27.7% | 25.7% | 0.93 | **Pass** |
| | 5 | 17.8% | 15.0% | 0.84 | **Pass** |
| 7 Bedford Place | 6 | 26.1% | 26.1% | 1.00 | **Pass** |

The BRE guide recommends that a window achieve a VSC of at least 27%, or not be reduced to less than 0.80 times its former value.

All the window tested pass BRE daylight impact guidance.

## SUNLIGHT RESULTS

The BRE guide states that main windows facing within 90° of south which serve living rooms should be tested for their access to sunlight. The five windows selected for testing at 3 Bedford Place did not qualify for BRE sunlight tests due to their orientation. Window number 6 at 7 Bedford Place was not a main window serving its room, however this window faced within 90° of south and could serve a living room. For completeness this window was tested for impacts to sunlight access. The table below shows the result of the Annual (APSH) and Winter (WPSH) Probable Sunlight Hours test in the existing and proposed conditions.

| Property | Window | APSH Existing | APSH Proposed | Ratio | BRE Compliance | WPSH Existing | WPSH Proposed | Ratio | BRE Compliance |
|---|---|---|---|---|---|---|---|---|---|
| 7 Bedford Place | 6 | 36.7% | 36.7% | 1.00 | **Pass** | 12.0% | 12.0% | 1.00 | **Pass** |

The BRE Report recommends that windows qualifying for sunlight tests receive a minimum of 25% of available Annual Probable Sunlight Hours (APSH), and at least 5% of available Winter Probable Sunlight Hours (WPSH). Window number 6 exceeds these limits for both APSH and WPSH in the proposed condition; this indicates that window 6 is predicted to receive good access to sunlight throughout the year.

## OVERSHADOWING RESULTS

The BRE guide states that an outdoor amenity area or garden should receive 2+ hours of sunlight on 21st March over at least 50% of its area, measured at ground level; if this condition is not met in the proposed condition, the reduction in the area receiving 2+ hours of sunlight on 21st March should be to no more than 80% of its former value.

The rear garden of 3 Bedford Place was tested for access to sunlight on 21st March in the existing and proposed conditions, due to its proximity to the proposal. The result appears in the table below.

| Garden | Existing % Area Receiving 2+ Hours Sunlight on 21st March | Proposed % Area Receiving 2+ Hours Sunlight on 21st March | Ratio | BRE Compliance |
|---|---|---|---|---|
| 3 Bedford Place | 70.6% | 70.6% | 1.00 | **Pass** |

The garden tested passed BRE guidance for impacts to overshadowing.

## CONCLUSION

The overall impact of this proposal in terms of daylight and sunlight is fully compliant with BRE good practise.

The impact of the proposal on neighbouring windows access to daylight is well within the limits set out in the BRE guide.

The proposal has a negligible impact on neighbouring windows access to sunlight.

Neighbouring gardens are predicted to experience no change in their access to sunlight.

| Issue | Date | Remarks | Prepared | Checked |
|---|---|---|---|---|
| A | 27th February 2023 | | Harry Westaway | IW |