



**EAL CONSULT BUILDING SUSTAINABILITY SINCE 2008**

# **DAYLIGHT, SUNLIGHT & OVERSHADOWING ASSESSMENT**

## **PROPERTY ADDRESS**

No 166 Northwood Way,  
Northwood,  
HA6 1RB

## **DATE**

January 2026

## **PREPARED BY**

EAL Consult

# CONTENTS

Executive Summary .....Page 3

Terms and Definitions.....Page 4

Current Policies, Regulations and Benchmarks .....Page 5

Methodology .....Page 7

Site.....Page 8

Daylight & Sunlight assessment.....Page 9

Overshadowing assessment.....Page 15

Conclusion .....Page 16

Windows assessed.....Appendix A

## EXECUTIVE SUMMARY

This daylight and sunlight assessment has been prepared to support the proposed design at No 166 Northwood Way, HA6 1RB. 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 a rear extension together with a loft conversion. 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

### Overshadowing Assessment

- **Existing Open Space – Rear Gardens**
  - a. Sunlight hours (on the 21<sup>st</sup> of March – Equinox)

**The assessment of daylight and sunlight to the surrounding residential properties, indicates that the proposed scheme, will not cause a noticeable change in light levels to existing occupants.**

**An overshadowing assessment was carried out for one rear garden. Results demonstrate that the amenity area will still receive the recommended sunlight hours set by BRE.**

A 3-dimensional site model has been created from information supplied by the architect, drawings, including location and site plan, existing and proposed drawings.

# 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 daylit 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 area, where the development could potentially affect the daylight and sunlight levels received by neighbouring properties. As such, a comprehensive daylight and sunlight assessment has been undertaken to assess the impact of the proposed scheme on the surrounding environment.

The proposal involves retaining the existing 2-storey dwelling and the construction of a rear infill extension together with a loft conversion, aimed at providing residential space for the specific site. In order to fully evaluate the potential effects of these changes, the assessment considers all neighbouring properties in close proximity to the proposed site, identifying those that could be impacted by the development in terms of daylight and sunlight access. The findings of this assessment aim to ensure that the design of the proposal respects the amenity of neighbouring properties, while achieving the desired improvements to the subject property.



Figure 1 – Existing Site Plan



Figure 2 – Proposed Site Plan

This assessment considers the following neighbouring properties:

1. No 164 Northwood Way – 9 windows were identified next to the proposed site.
2. No 36 & No 38 Pinner Road – 23 windows were identified facing the proposed site.

Additional notes: No other properties were found to have windows facing the proposed site. The roof ridge height will increase only by 1m. Thus, the proposed change of massing is considered minor.

# 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 neighbouring properties, Pre & Post Development**

Vertical Sky Component		Pre development	Post development	VSC after Proposal	Difference	Comments
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27		
No 164 Northwood Way	<b>Ground Floor</b>					Negligible impact
	Win01(rear elevation)	23.2	23.2	No	0	
	Win02(rear elevation)	24.0	23.8	No	0.2	
	<b>1<sup>st</sup> Floor</b>					
	Win03(rear elevation)	25.4	25.4	No	0	
	Win04(rear elevation)	27.2	27.1	Yes	0.1	
	Win05(side elevation)	20.4	20.0	No	0.4	
	Win06(side elevation)	20.5	20.3	No	0.2	
	<b>Top Floor</b>					
	Win07(rear elevation)	27.9	27.9	Yes	0	
	Win08(rear elevation)	28.0	28.0	Yes	0	
	Win09(side elevation)	25.5	25.5	No	0.1	

Results demonstrate the difference of the Vertical Sky Component, at pre- and post- construction phase, has been kept to a minimum (less than 0.8 ratio) for all windows. The proposed scheme will not cause a noticeable impact to the natural light levels for existing occupants at No 164 Northwood way.

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

Vertical Sky Component		Pre development	Post development	VSC after Proposal	Difference	Comments
Assessed neighbouring property:	Window no.	BRE VSC %	BRE VSC %	>27		
No 36 & No 38 Pinner Road	<b>Ground Floor</b>					Negligible impact
	Win01(side elevation)	22.8	22.8	No	0	
	Win02(side elevation)	21.1	20.9	No	0.2	
	Win03(side elevation)	23.5	23.2	No	0.3	
	Win04(side elevation)	23.3	23.1	No	0.2	
	Win05(side elevation)	23.9	23.7	No	0.2	
	Win06(side elevation)	24.7	24.6	No	0.1	
	Win07(side elevation)	24.9	24.9	No	0	
	<b>1<sup>st</sup> Floor</b>					
	Win08(side elevation)	24.4	24.4	No	0	
	Win09(side elevation)	23.6	23.5	No	0.1	
	Win10(side elevation)	25.5	25.3	No	0.2	
	Win11(side elevation)	21.2	21.1	No	0.1	
	Win12(side elevation)	25.4	25.3	No	0.1	
	Win13(side elevation)	25.6	25.5	No	0.1	
	Win14(side elevation)	26.7	26.7	No	0	
	Win15(side elevation)	26.8	26.8	No	0	
	<b>2<sup>nd</sup> Floor</b>					
	Win16(side elevation)	27.2	27.2	Yes	0	
	Win17(side elevation)	27.3	27.3	Yes	0	
	Win18(side elevation)	26.4	26.4	No	0	
	Win19(side elevation)	26.3	26.3	No	0	
	Win20(side elevation)	27.1	27.1	Yes	0	
Win21(side elevation)	27.3	27.3	Yes	0		
Win22(side elevation)	27.8	27.8	Yes	0		
Win23(side elevation)	27.9	27.9	Yes	0		

Results demonstrate the difference of the Vertical Sky Component, at pre- and post- construction phase, has been kept to a minimum (less than 0.8 ratio) for all windows. The proposed scheme will not cause a noticeable impact to the natural light levels for existing occupants at No 36 & 38 Pinner Road.

**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.

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.

Total recommended sunlight hours:

$$\begin{aligned} &= 25\% \text{ of APSH} \\ &= 25\% \text{ of } 1486\text{hrs} \\ &= (25/100) \times 1486 \\ &= 371.5\text{hrs/yr} \end{aligned}$$

Recommended sunlight hours for winter.

$$\begin{aligned} &= 5\% \text{ of APSH} \\ &= 5\% \text{ of } 1486\text{hrs} \\ &= (5/100) \times 1486 \\ &= 74.3\text{hrs/yr} \end{aligned}$$

**Table 3 – Annual Probable Sunlight Hours for neighbouring properties**

Annual Probable Sunlight Hours		Pre development	Post development	Comments
Assessed neighbouring property:	Window no.	>371.5hrs	>371.5hrs	
<b>No 164 Northwood Way</b>	<b>Ground Floor</b>			<b>Pass</b>
	Win01(rear elevation)	Yes	Yes	
	Win02(rear elevation)	Yes	Yes	
	<b>1<sup>st</sup> Floor</b>			
	Win03(rear elevation)	Yes	Yes	
	Win04(rear elevation)	Yes	Yes	
	Win05(side elevation)	Yes	Yes	
	Win06(side elevation)	Yes	Yes	
	<b>Top Floor</b>			
	Win07(rear elevation)	Yes	Yes	
	Win08(rear elevation)	Yes	Yes	
	Win09(side elevation)	Yes	Yes	

**Table 4 – Winter Probable Sunlight Hours for neighbouring properties**

Winter Probable Sunlight Hours		Pre development	Post development	Comments
Assessed neighbouring property:	Window no.	>74.3hrs	>74.3hrs	
<b>No 164 Northwood Way</b>	<b>Ground Floor</b>			<b>Pass</b>
	Win01(rear elevation)	Yes	Yes	
	Win02(rear elevation)	Yes	Yes	
	<b>1<sup>st</sup> Floor</b>			
	Win03(rear elevation)	Yes	Yes	
	Win04(rear elevation)	Yes	Yes	
	Win05(side elevation)	Yes	Yes	
	Win06(side elevation)	Yes	Yes	
	<b>Top Floor</b>			
	Win07(rear elevation)	Yes	Yes	
	Win08(rear elevation)	Yes	Yes	
	Win09(side elevation)	Yes	Yes	

Results show that all the assessed neighbouring windows at No 164 Northwood Way, will receive adequate sunlight hours during the year and winter period.

Table 5 – Annual Probable Sunlight Hours for neighbouring properties

Annual Probable Sunlight Hours		Pre development	Post development	Comments
Assessed neighbouring property:	Window no.	>371.5hrs	>371.5hrs	
No 36 & No 38 Pinner Road	<b>Ground Floor</b>			Pass
	Win01(side elevation)	Yes	Yes	
	Win02(side elevation)	Yes	Yes	
	Win03(side elevation)	Yes	Yes	
	Win04(side elevation)	Yes	Yes	
	Win05(side elevation)	Yes	Yes	
	Win06(side elevation)	Yes	Yes	
	Win07(side elevation)	Yes	Yes	
	<b>1<sup>st</sup> Floor</b>			
	Win08(side elevation)	Yes	Yes	
	Win09(side elevation)	Yes	Yes	
	Win10(side elevation)	Yes	Yes	
	Win11(side elevation)	Yes	Yes	
	Win12(side elevation)	Yes	Yes	
	Win13(side elevation)	Yes	Yes	
	Win14(side elevation)	Yes	Yes	
	Win15(side elevation)	Yes	Yes	
	<b>2<sup>nd</sup> Floor</b>			
	Win16(side elevation)	Yes	Yes	
	Win17(side elevation)	Yes	Yes	
	Win18(side elevation)	Yes	Yes	
	Win19(side elevation)	Yes	Yes	
	Win20(side elevation)	Yes	Yes	
Win21(side elevation)	Yes	Yes		
Win22(side elevation)	Yes	Yes		
Win23(side elevation)	Yes	Yes		

Table 6 – Winter Probable Sunlight Hours for neighbouring properties

Winter Probable Sunlight Hours		Pre development	Post development	Comments
Assessed neighbouring property:	Window no.	>74.3hrs	>74.3hrs	
No 36 & No 38 Pinner Road	<b>Ground Floor</b>			Pass
	Win01(side elevation)	Yes	Yes	
	Win02(side elevation)	Yes	Yes	
	Win03(side elevation)	Yes	Yes	
	Win04(side elevation)	Yes	Yes	
	Win05(side elevation)	Yes	Yes	
	Win06(side elevation)	Yes	Yes	
	Win07(side elevation)	Yes	Yes	
	<b>1<sup>st</sup> Floor</b>			
	Win08(side elevation)	Yes	Yes	
	Win09(side elevation)	Yes	Yes	
	Win10(side elevation)	Yes	Yes	
	Win11(side elevation)	Yes	Yes	
	Win12(side elevation)	Yes	Yes	
	Win13(side elevation)	Yes	Yes	
	Win14(side elevation)	Yes	Yes	
	Win15(side elevation)	Yes	Yes	
	<b>2<sup>nd</sup> Floor</b>			
	Win16(side elevation)	Yes	Yes	
	Win17(side elevation)	Yes	Yes	
	Win18(side elevation)	Yes	Yes	
	Win19(side elevation)	Yes	Yes	
	Win20(side elevation)	Yes	Yes	
Win21(side elevation)	Yes	Yes		
Win22(side elevation)	Yes	Yes		
Win23(side elevation)	Yes	Yes		

Results show that all the assessed neighbouring windows at No 36 & 38 Pinner Road, will receive adequate sunlight hours during the year and winter period.

# OVERSHADOWING ASSESSMENT

## Sunlight to Amenity Spaces

An assessment of the sunlight levels of the neighbouring open space was undertaken. One amenity area was identified.

BRE guidance states that the test should be run on 21 March which is the midpoint between the summer and winter solstices (equinox). According to BRE, the sunlight hours on this day should be no less than 2 hours.

The proposed rear extension and loft conversion has been designed with specific attention to safeguard the natural light of all the neighbouring gardens.

Detailed model study in Ecotect Analysis demonstrates that more than 50% of the rear garden will receive the minimum of 2hours of sunlight on the 21<sup>st</sup> March.

Specifically:

- No 164 Northwood Way, rear garden – Will receive approximately: 4.3hrs

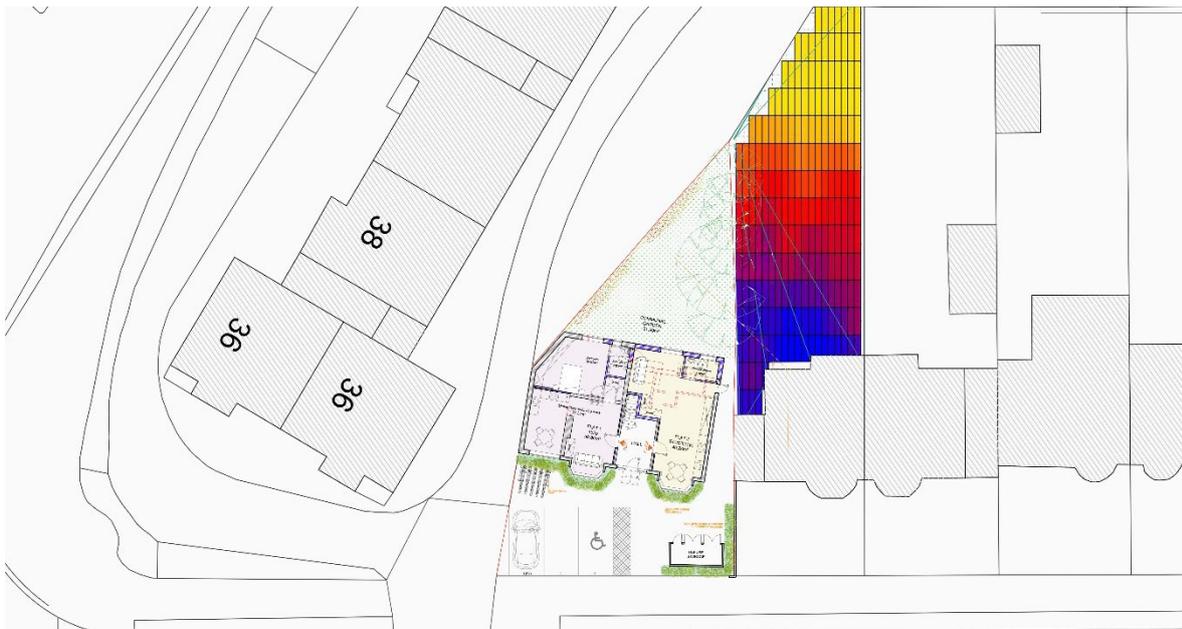


Figure 3 – Sunlight hours at the rear garden of No 164 Northwood Way

## CONCLUSION

The proposed rear extension and loft conversion at the existing dwelling at No 166 Northwood Way, in Northwood, 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.

Calculations confirm that the existing neighbouring properties (No 164 Northwood Way and No 36&38 Pinner Road) and their existing windows will still receive adequate annual probable sunlight hours and adequate sunlight hours during the winter period.

Daylight analysis, specifically the Vertical Sky Component (VSC), shows that the impact on neighbouring windows is minimal, with the difference in light levels between pre- and post-construction remaining within acceptable limits. As a result, the proposed scheme will not affect daylight access to habitable rooms in adjacent properties.

An overshadowing analysis of one rear garden surrounding the proposed site was also conducted. The results confirm that more than 50% of the existing garden will receive at least 2 hours of sunlight on 21st March, meeting the relevant daylight standards.

**Disclaimer:** This assessment and its conclusions are based on the information, drawings, and data provided at the time of review, and on the interpretation of BRE guidance as applied to this specific site. The results are indicative and intended for planning and design purposes only. No liability is accepted for decisions made by third parties based on this assessment, nor for any subsequent alterations to the development or changes to surrounding conditions that may occur after the date of this report.

# APPENDIX A



Figure 3 – Neighbouring Windows at No 164 Northwood Way (numbering is from left to right)



Figure 4 – Neighbouring Windows at No 36&38 Pinner Road (numbering is from left to right)