

DAYLIGHT AND SUNLIGHT STUDY

Erection of a new one-bedroom,
two-storey dwelling.

17 Marlborough Rd, London, N22 8NB
(Access via Thorold Road)

11.09.2024

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Introduction

This is a comprehensive daylight and sunlight study in connection with an application for the erection of a two-story, one-bedroom dwelling at the rear of 17 Marlborough Road with access situated on Thorold Road, London. The aim of the study is to meticulously check whether the proposed lower ground-floor bedroom will receive satisfactory levels of daylight and sunlight.

The study rigorously adheres to the numerical tests in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: A Good Practice Guide' by P J Littlefair 2011, ensuring the credibility of our findings.

The results confirm that the proposed development design achieves a standard level of compliance with the BRE recommendations.

Information Sources

This report is based on the Proposed Floor Plans.

Methodology of the Study

The study is based on the numerical tests in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: A Good Practice Guide' by P J Littlefair 2011.

The standards in the BRE guide are intended to be used flexibly. Higher levels may be deemed necessary when there is a special requirement for daylight or sunlight. Lower daylight and sunlight levels may be unavoidable in other situations, such as urban developments. The following statement is quoted directly from the BRE guide:

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory, and this document should not be considered an instrument of planning policy. It aims to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."

The interior daylighting recommendations in the BRE guide are based on British Standard BS 8206 Part 2 and the Chartered Institute of Building Services Engineers Applications Manual on window design.

The Average Daylight factor test is applied to habitable rooms within domestic properties. A kitchen is generally deemed a habitable room if it is large enough to accommodate a dining area. The proposed kitchen space is small, with a separate dining area, and the accepted practice is to treat the kitchen as a non-habitable room.

For this study, we have assumed BRE internal reflectance values about medium wooden floors (Coefficient value of 0.4), light-painted walls (0.8) and matte white painted ceilings (0.85). The guide recommends an Average Daylight Factor of 5% or more if there is no supplementary electric lighting or 2% or more if supplementary lighting is provided. Additional minimum recommendations for dwellings are 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

If a significant area of the working plane lies beyond the no skyline (i.e. it receives no direct skylight), then the distribution of daylight in the room will look poor and supplementary electric lighting will be required. The BRE guide recommends that, where possible, each dwelling should have at least one main living room window that faces within 90 degrees of due south.

The BRE sunlight tests should be applied to all main living rooms and conservatories with windows facing within 90 degrees of due south. The guide states that sunlight is viewed as less important in kitchens and bedrooms. In non-domestic buildings, any spaces deemed to have a specific requirement for sunlight should be checked.

The BRE guide recommends that main living room windows receive 25% of the total annual probable sunlight hours, including 5% of the annual probable sunlight hours during the winter months between 21 September and 21 March.

Average Daylight Factor (ADF)

ADF is a more precise measure that considers the size of the two-pane glazed sliding doors, the surface reflectance inside the room, and the glazing transmittance to assess the adequacy of daylight within the room.

BRE Target for ADF: The BRE Guide recommends:

Bedrooms: An ADF of at least 1%.

Living Rooms: An ADF of at least 1.5%.

The formula for ADF is:

$$ADF = \frac{T \times W \times \theta}{A \times (1 - R)}$$

Where:

T is the transmittance of glazing (typically 0.68 for double glazing).

W is the window area (m²).

θ is the angle of the visible sky.

A is the room area (m²).

R is the average reflectance of room surfaces (typically 0.5).

Calculations

$$ADF = 0.68 \times 3.8 \times 29 / 17.8 \times (1-0.5)$$

$$ADF = 8.4\%$$

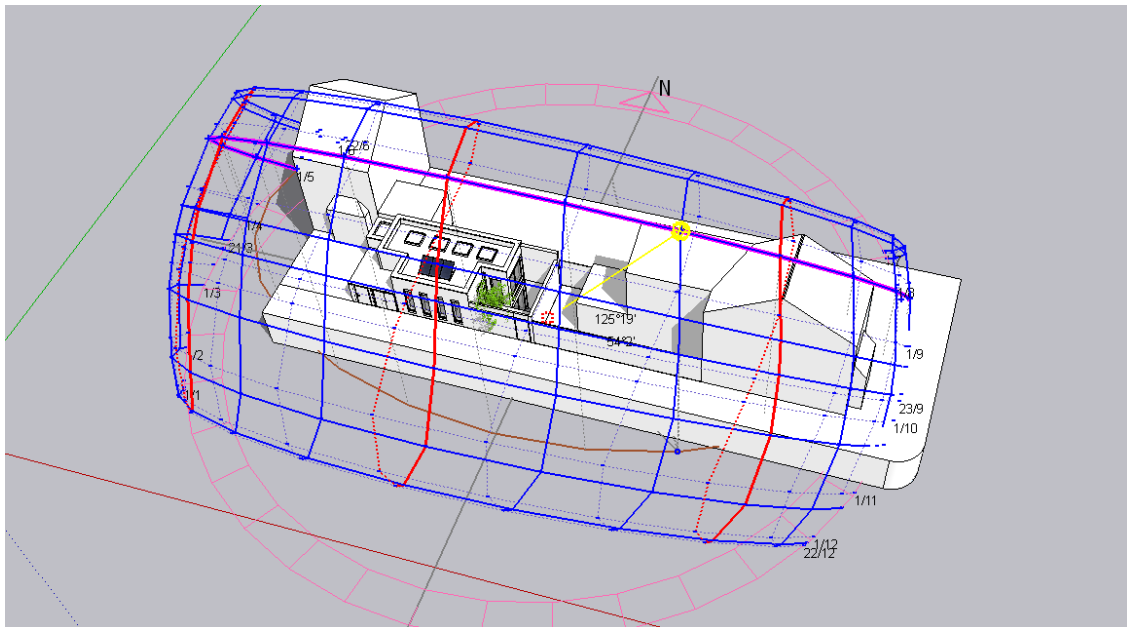
3D Light Model Study

A detailed 3D light study, a significant part of this assessment, demonstrates that during this period, the orientation of the building and the large glazed sliding doors allow for direct sunlight to enter the room, providing consistent natural light. The positioning of windows maximizes exposure to sunlight, ensuring that the room receives sufficient daylight, even on overcast days.

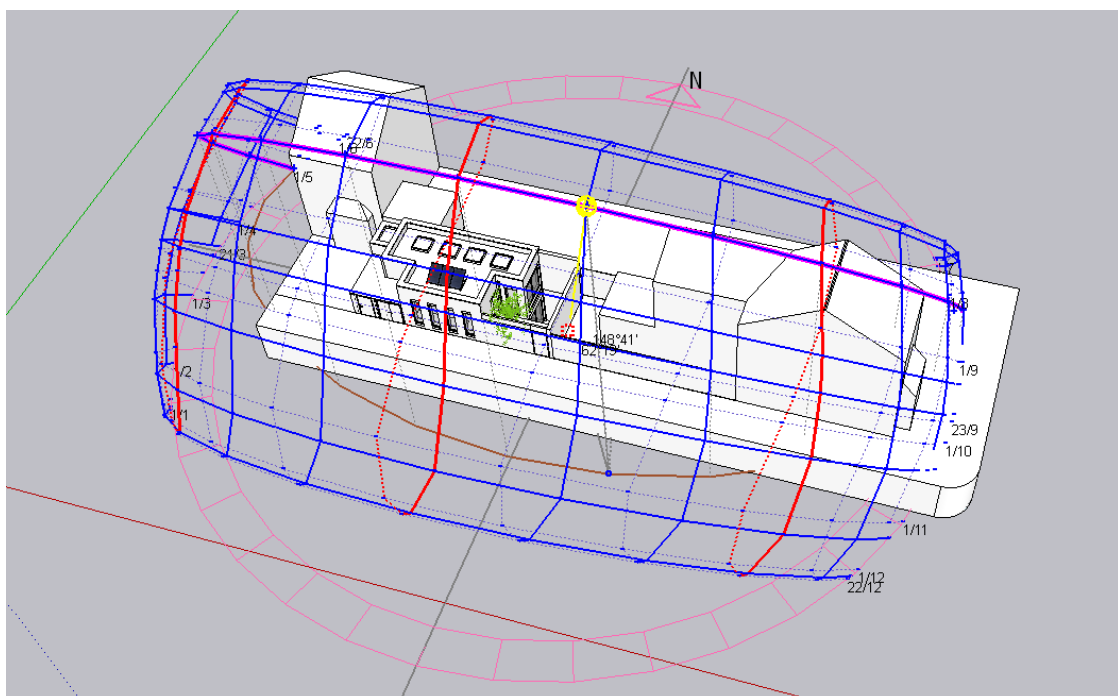
The study highlights how natural light is effectively distributed across the bedroom in terms of light refraction, a process where light bends as it passes through the glass. The glazing in the sliding doors, with a typical transmittance of 0.68, allows a substantial portion of the incoming light to pass through while minimizing glare. Refraction at the glass surface disperses light deeper into the room, ensuring that the farthest corners also benefit from daylight. This process reduces the reliance on artificial lighting during the morning and midday hours, contributing to energy efficiency and improving the room's overall ambience.

The analysis demonstrates that light penetration into the room is consistent, even with slight external obstructions. The 3D model shows how sunlight angles shift throughout the day, ensuring

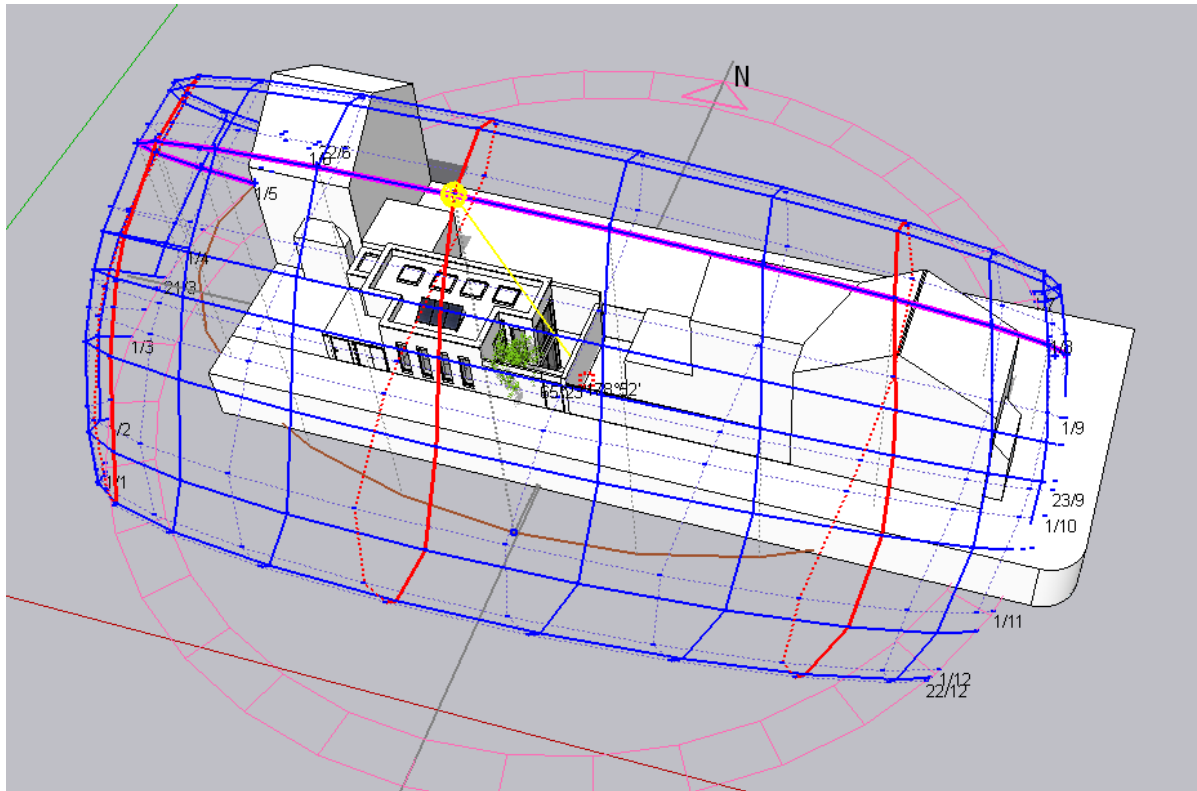
continued light entrance between 10:00 and 13:00, critical hours for maintaining a well-lit space. The results confirm that the lower ground floor bedroom receives adequate natural lighting, meeting the practical needs of future occupants and BRE guidelines for daylight in habitable spaces.



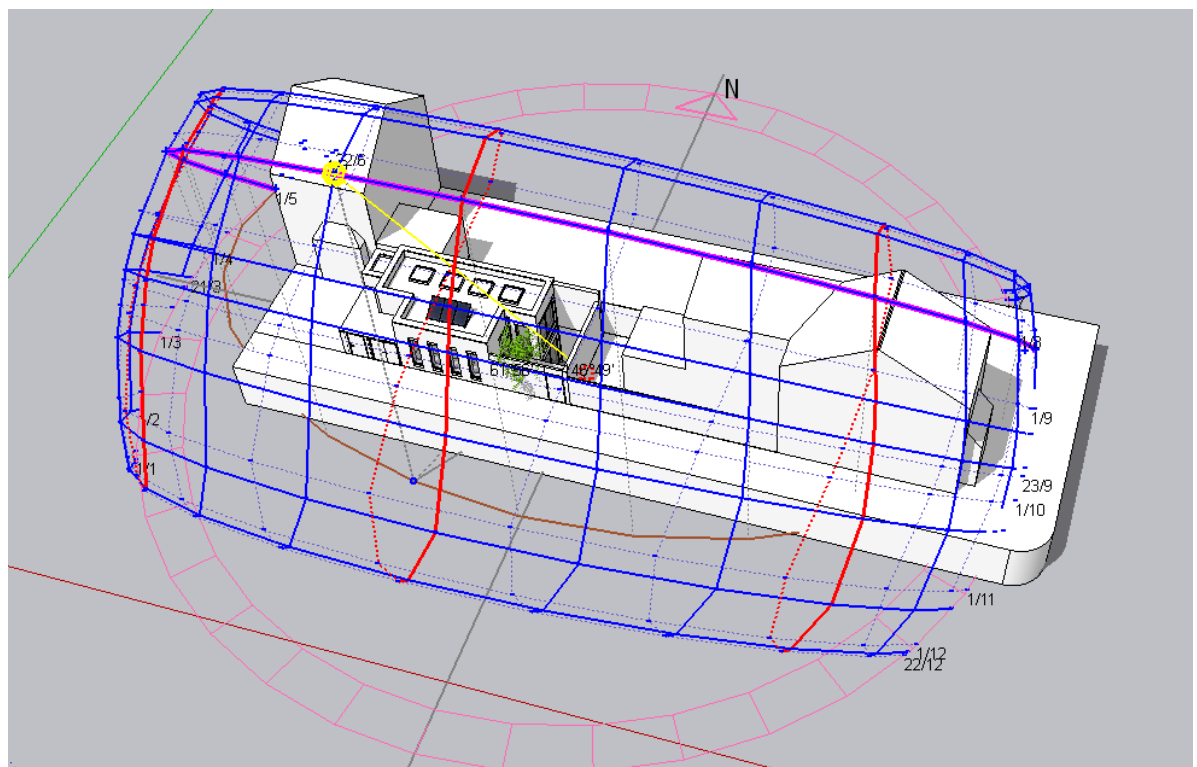
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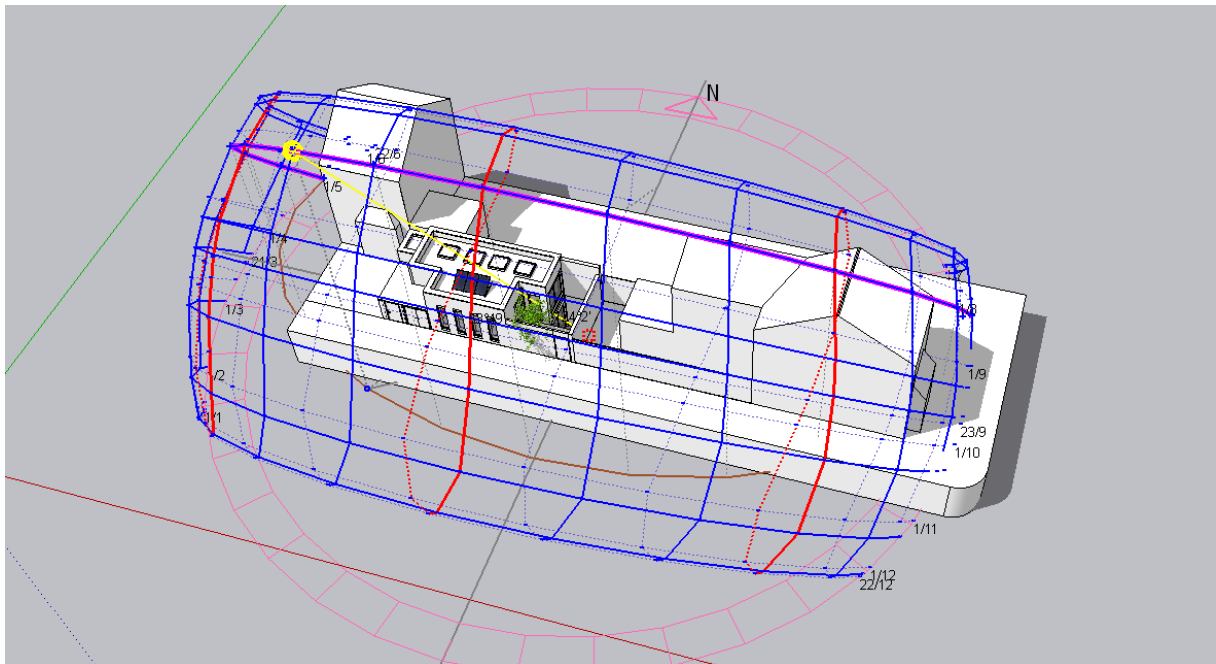
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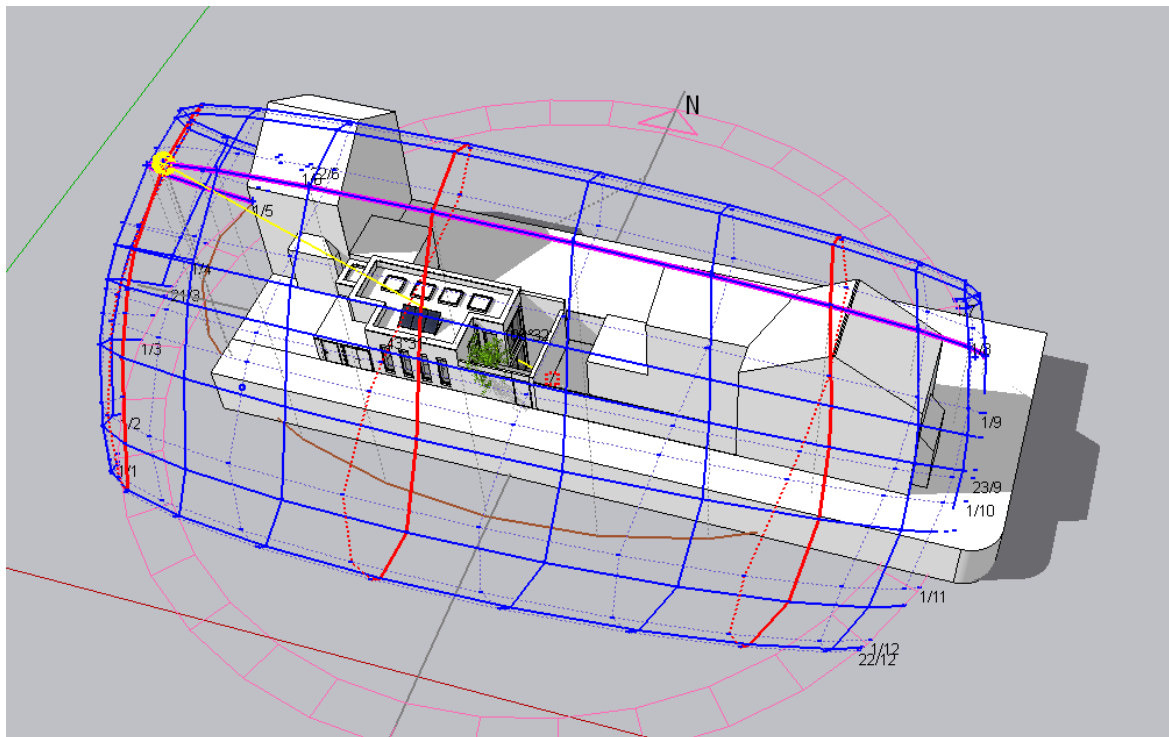
1200 hrs



1300 hrs



1400 hrs



1500 hrs

Sunlight Assessment

Annual Probable Sunlight Hours (APSH)

Background

APSH measures the number of hours per year a room receives direct sunlight. It is particularly relevant for living rooms and main habitable spaces. The BRE guidelines suggest:

At least 25% of annual probable sunlight hours should be achieved in habitable rooms, including at least 5% in winter months (between 21 September 1st and 21 March 21).

For the 21st March dwelling, the APSH assessment is based on window orientation, shading from nearby structures, and other site conditions. This specific date is chosen as it marks the beginning of the spring season, a time when the angle of the sun is more favorable for daylight penetration.

Assessment of Sunlight Hours

Given the design features (including the large glazed sliding doors) and the site's orientation, it is expected that the living spaces will receive a good level of sunlight. Although no exact APSH values are provided here, the large glazed openings are well-positioned to ensure that sunlight enters the space, meeting BRE guidelines for sunlight exposure.

Conclusion

The proposed two-storey, one-bedroom dwelling at 17 Marlborough Road achieves excellent daylight levels, with an ADF of 8.4%, which is well above the recommended minimums for habitable rooms. The glazing and room design ensure sufficient natural light, enhancing the living quality within the space.

The APSH assessment indicates that the living spaces will receive adequate sunlight throughout the year, aligning with BRE sunlight exposure standards. Overall, the daylight and sunlight provisions for the proposed dwelling meet and exceed the guidelines, ensuring a well-lit and comfortable environment for future occupants.

This study is based upon and subject to the scope of work set out in Right of Light Consulting's quotation and standard terms and conditions. This report confirms that they have used their best endeavours to ensure that the facts stated in this report are correct and that the opinions expressed represent an accurate and complete professional opinion.