

Brooks Development

I-2 Marlborough Parade, Uxbridge, UB10 0LR

Daylight & Sunlight Assessment

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I Introduction

I.1 Introduction

- I.1.1 Brooks Development Practice Limited was instructed by SHA Architecture to prepare a Daylight and Sunlight Assessment for the proposed development at 1-2 Marlborough Parade, Uxbridge, UB10 0LR.
- I.1.2 The purpose of this report is to assess the daylight and sunlight levels of the proposed development, in accordance with guidance set out in *BRE Report 209, Site Layout Planning for Daylight and Sunlight: A guide to good practice, Second Edition, 2011 (BR 209)*, and *BS 8206-2 Code of Practice for Daylighting*.

I.2 Development Description

- I.2.1 The proposed development comprises of a three storey side extension and two storey rear extension to create ground floor retail unit, 2 x studio flats, 2 x 2-bed flats, 1 x 3-bed flat and 1 existing 2-bed flat with associated amenity and refuse store.

I.3 3D Models

- I.3.1 A 3D model of the proposed development, with existing nearby buildings, has been provided by SHA Architecture, and edited by Brooks Development. This is shown in Figure 1.
- I.3.2 LightUp Analytics, a program specifically developed to calculate daylight and sunlight levels in accordance with guidance provided in BR 209, has been used.
- I.3.3 For the purposes of the Average Daylight Factor (ADF), the area-weighted average reflectance of the room surfaces has been calculated on the assumption that the rooms have a white ceiling (0.85), light (pale cream) coloured walls (0.81) and light coloured carpet/light wood flooring (0.4). The maintenance factor has been calculated as 0.92 for the windows and 0.7 for the roof lights to units 1-3. The diffuse visible transmittance of the glazing has been assumed to be 0.68 and the effective net area glazing has been measured from the elevations.



Figure 1 – Proposed development with existing nearby buildings

2 Assessment

2.1 Daylight – Vertical Sky Component (VSC) – New Development

2.1.1 BR 209 Paragraph 2.1.6 states:

The amount of daylight a room needs depends on what it is being used for but roughly speaking, if... [the] VSC is at least 27%, conventional window design will usually give reasonable results.

2.1.2 Of relevance to this report BR 209 Paragraph 2.1.13 further states:

Living rooms and kitchens need more daylight than bedroom, so where there is a choice it is best to site the living room or kitchen away from obstructions. Dual storey maisonette-type apartments may be planned with the main living rooms on the upper storey and the bedrooms on the lower floor for this reason.

2.1.3 An assessment of the VSC to the proposed flats has been carried out. Although some windows fall below the recommended target value of 27% for VSC, it is still possible for a room to achieve good daylight levels.

2.1.4 BR 209 2.1.22 states:

To check that adequate daylight is provided in new rooms, the ADF may be calculated and compared with the recommendation in BS 8206-2 Code of practice for daylighting

2.1.5 Further analysis is provided in Chapter 2.2 to determine whether BR 209 and BS 8206-2 numerical target values are met.

2.2 Daylight – Average Daylight Factor (ADFs) – New Development

2.2.1 BR 209 Paragraph 2.1.8 states:

Daylight provision in new rooms may be checked using the average daylight factor (ADF). The ADF is a measure of the overall amount of daylight in a space. BS 8206-2 Code of practice for daylighting...gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

2.2.2 BS 8206-2 Paragraph 5.6 further explains that:

Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%.

2.2.3 Figures 2 to 4 provide a record of the assessment of the ADFs to all habitable rooms of the proposed development. Figures highlighted in green achieve the numerical target values stated in BR 209. Figures highlighted in orange fall below the numerical target values stated in BR 209. ADFs have been given to one decimal place in order to demonstrate whether the values stated in BR 209 have been met. However, when reviewing the ADFs, it is recommended that Peter Tregenza and Michael Wilson's observation below is taken into consideration.¹

We can say that there is a significant difference, in both the subjective character and the physical environment between a room with an average daylight factor of 2% and one with an average daylight factor of 5%. There may be a noticeable difference between rooms with daylight factors of 2% and 3%. However, not only would a difference between 2% and 2.1% be almost certainly subjectively unnoticeable, but such a distinction would be completely unjustified scientifically. The level of uncertainty in the parameters and the simplifying assumptions in the models preclude such pretensions to precision. Average daylight factor calculations have little absolute meaning beyond the decimal place.

2.2.4 All of the habitable rooms of the proposed development achieve the ADF recommendations set out in BR 209 and BS 8206-2.

¹ Tregenza, P. and Wilson, M. (2011) *Daylighting: Architecture and Lighting Design*. Abingdon: Routledge.

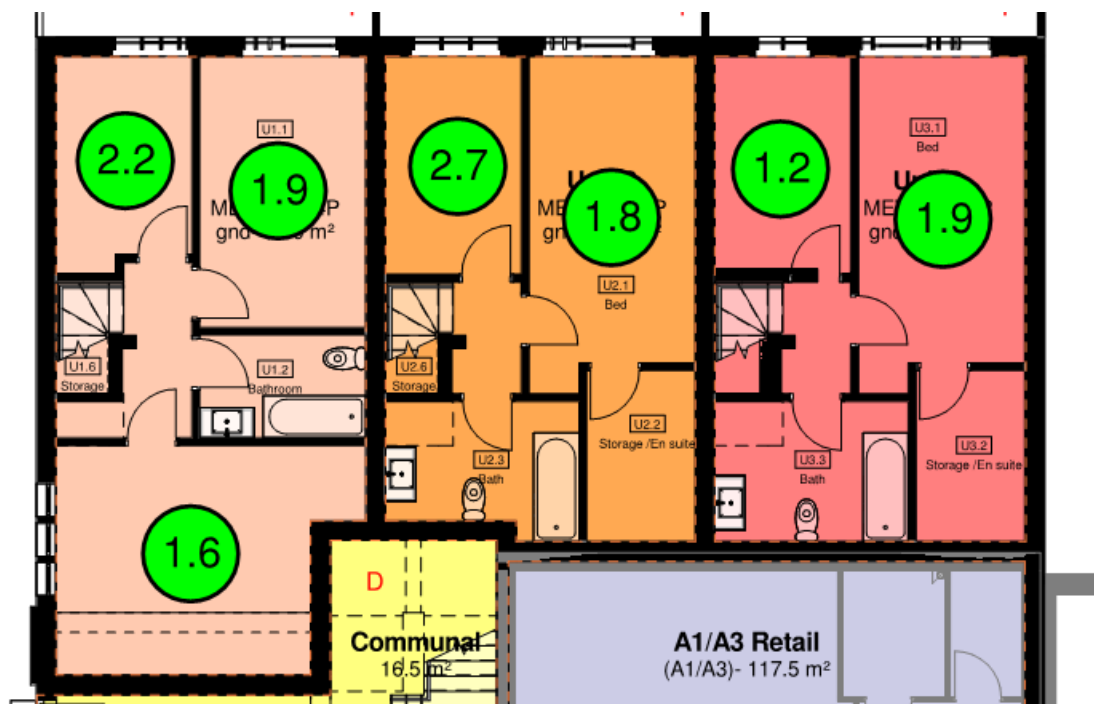


Figure 2 – ADFs of the ground floor of the proposed development

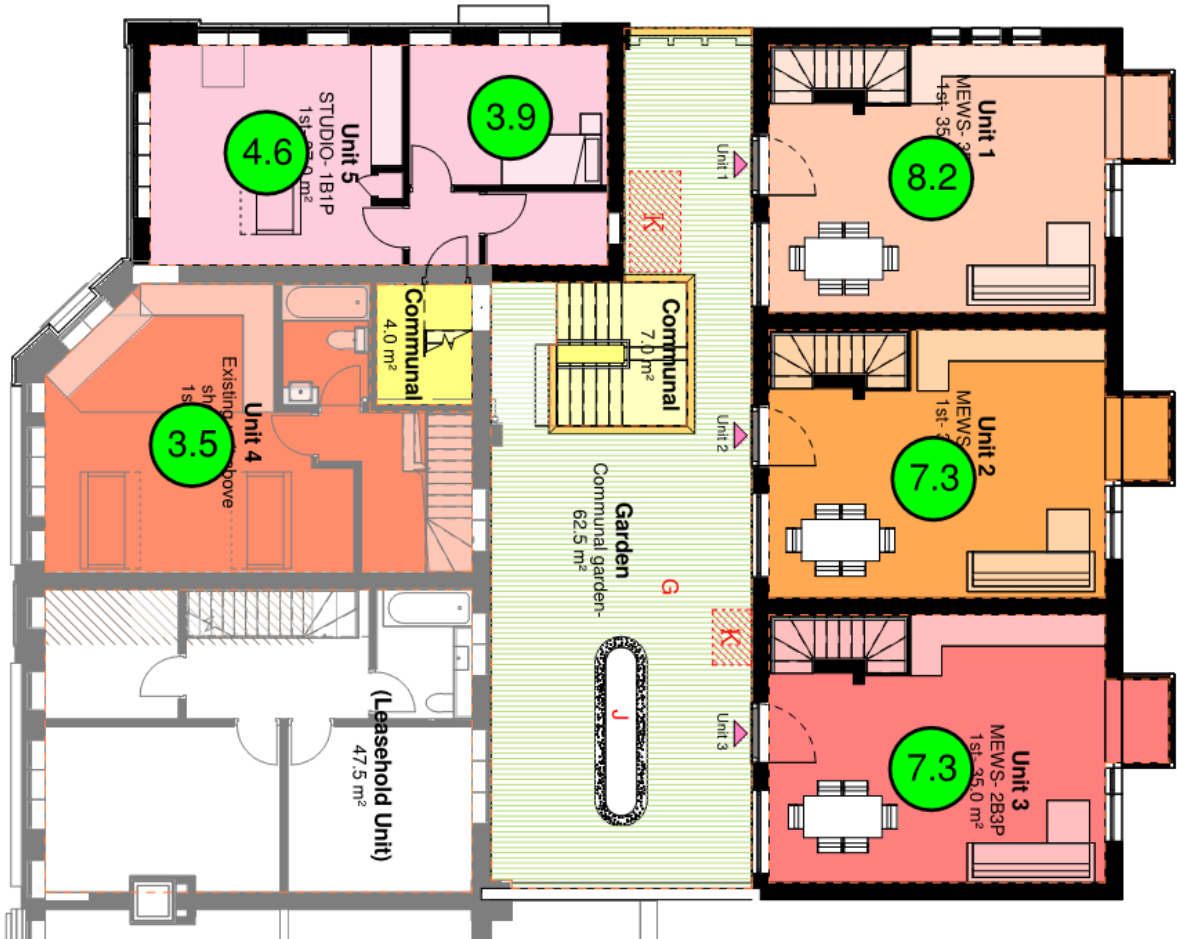


Figure 3 – ADFs of the first floor of the proposed development

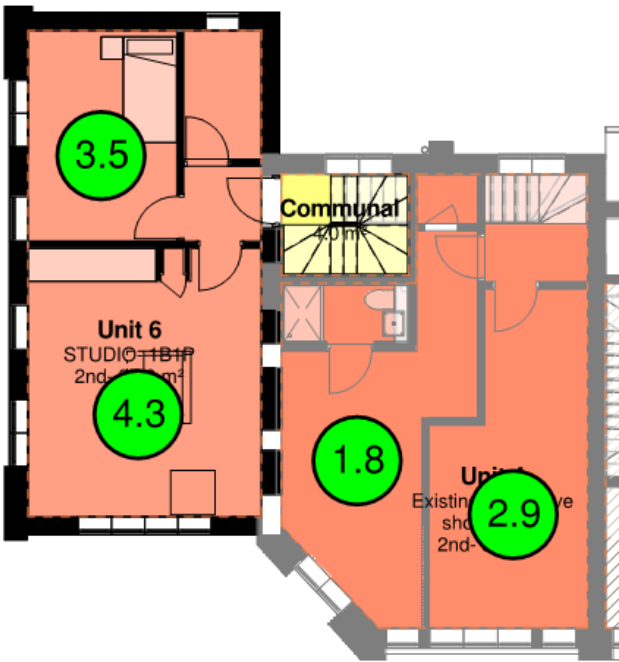


Figure 4 – ADFs of the second floor of the proposed development

2.3 Sunlight –Annual Probable Sunlight Hours (APSH) – New Development

2.3.1 BR 209 paragraph 3.1.15 states:

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

- At least one main window wall faces within 90° of due south and;
- The centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March.

2.3.2 Of relevance to this report BR 209 3.1.12 further states:

If a room has multiple windows on the same wall or on adjacent walls, the highest value of APSH should be taken. If a room has two windows on opposite walls, the APSH due to each can be added together.

2.3.3 Table 1 provides a record of the assessment of APSH of the windows of the proposed living rooms facing within 90° of due south. Climate Data² from the nearest climate station at Heathrow has been used. Annual probable sunlight hours for Heathrow are 1632 hours and 36 minutes (1632h36m). Therefore, to meet BR 209 numerical target values, windows should receive at least 408h09m (25%) annual probable sunlight hours and 81h38m (5%) annual probable sunlight hours in the winter months (WPSH).

Table 1: APSH and WPSH

Unit	APSH	WPSH
1	1198h09m (73.4%)*	134h08m (8.2%)*
2	1192h32m (73.0%)*	118h50m (7.3%)*
3	1271h35m (77.9%)*	184h17m (11.3%)*
4	1203h46m (73.7%)	495h06m (30.3%)
5	1054h23m (64.6%)	461h09m (28.2%)
6	1028h45m (63.0%)	459h12m (28.1%)

*Rooflight

2.3.4 All main living rooms of the proposed development have a window that faces within 90° of due south and, achieves the recommended annual probable sunlight hours (APSH) and the recommended annual probable sunlight hours in the winter months (WPSH) suggested in BR 209.

² <https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcpsvg3nc>

3 Conclusions

- 3.1.1 An assessment of the daylight and sunlight levels of the proposed development, has been undertaken in accordance with guidance set out in *BRE report 209, Site Layout Planning for Daylight and Sunlight: A guide to good practice, Second Edition, 2011* (BR 209), and *BS 8206-2 Code of Practice for Daylighting*.
- 3.1.2 Whilst BR 209 gives numerical guidelines for assessing daylight and sunlight levels, it is important to bear in mind that the guidance is predicated on a suburban model of development and that the numerical guidelines should be interpreted flexibly. BR 209 Paragraph 1.6 states:

The guide (BR 209) 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 taken 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.

- 3.1.3 The need for flexibility is of particular relevance in London due to the high density of development and tight proximity of buildings. This has been recognised in the *London Housing Supplementary Planning Guidance (March 2016)* which states that ‘an appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves.’
- 3.1.4 With this in mind, the following conclusions have been drawn:
- 1) All habitable rooms of the proposed development achieve the ADF recommendations set out in BR 209 and BS 8206-2.
 - 2) All main living rooms of the proposed development have a window that faces within 90° of due south and, achieves the recommended annual probable sunlight hours (APSH) and the recommended annual probable sunlight hours in the winter months (WPSH) set out in BR 209.