94 Mill Lane, London Borough of Camden

Internal Daylight Assessment

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JAWSustainability

Contents

1 Introduction

This report assesses the levels of internal daylight and sunlight for the proposed redevelopment of the building located on 94 Mill Lane, NW6 1NH. The site is located in the London Borough of Camden. The development comprises of the conversion and extension of an existing building on the site to provide a number of flats. Daylight and sunlight calculations have only been undertaken for Flat 1, which provides the residential spaces on the basement and ground floor. The site is shown in Figure 1-1.

The daylight, sunlight and overshadowing assessment has been undertaken using IES Virtual Environment, in line with the guidance provided in the Building Research Establishment (BRE) guide 'Site layout planning for daylight and sunlight: a guide to good practice' (2022) and BS EN 17037. Further assessments have been conducted based on previously establish standards in the 2011 guidance and BS 8206-2, for clarity.

Figure 1-1 - Site Location

2 Guidance

2.1 Daylighting

2.1.1 Illuminance

Revised guidance has been provided for assessing daylight provision in BS EN17037. For residential buildings, the UK National Annex gives illuminance recommendations of 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens.

These are the median illuminances, to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours. The recommended levels over 95% of a reference plane need not apply to dwellings in the UK.

2.1.2 Average Daylight Factor

BS 8206-2 gives minimum values for ADF for all new residential properties, outlined in Table 2-1. Although BS 8206-2 has now been withdraw, it results have been included for clarity.

Building Area	ADF
Kitchens	2%
Living Rooms	1.5%
Bedrooms	1%

Table 2-1 Room criteria requirements

Average Daylight Factor (ADF) is used as the measure of general illumination from skylight and can also be used to assess the amount of daylight a room receives internally. The ADF is the ratio of total daylight flux incident on a reference area to the total area of the reference plane, expressed as a percentage of outdoor illuminance on a horizontal plane due to an unobstructed hemisphere of sky of assumed or known luminance distribution.

2.2 Sunlighting

2.1.3 Solar Exposure

Revised guidance for assessing sunlight within new dwelling in BS EN 17037.

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° 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.

2.1.4 Annual Probable Sunlight Hours

BS 8206-2 gives guidance for sunlight in residential properties, based on Annual Probably Sunlight Hours (APSH). Although BS 8206-2 has now been withdraw, it results have been included for clarity.

In general, a dwelling will appear reasonably sunlight provided:

- At least one main window to a main living room is within 90° of due South

- At least one main window to a main living room can receive 25% of APSH, including at least 5% of APSH in winter (21st September – 21st March)

The BRE recognises that it is not possible to get every unit in a development to meet these criteria. The BRE guidance suggests orientating the site and units to maximise the number of units that can meet these criteria.

The amount of sunlight reaching a window can be quantified and assessed using the Annual Probable Sunlight Hours (APSH). APSH is the ratio of probable sunlight hours that will reach a point on a building (usually the centre of a window) compared to the total amount that would reach the unobstructed point. It is calculated using the long-term average of the number of hours in a year that direct sunlight reaches the unobstructed ground, when clouds are taken into account. It is expressed as a percentage.

3 Assessment Methodology

A three-dimensional model was developed in Integrated Environmental Solutions (IES) ModelIt module using the drawings provided by the architects for the proposed development. The surrounding buildings have been modelled based on satellite imagery and OS map data.

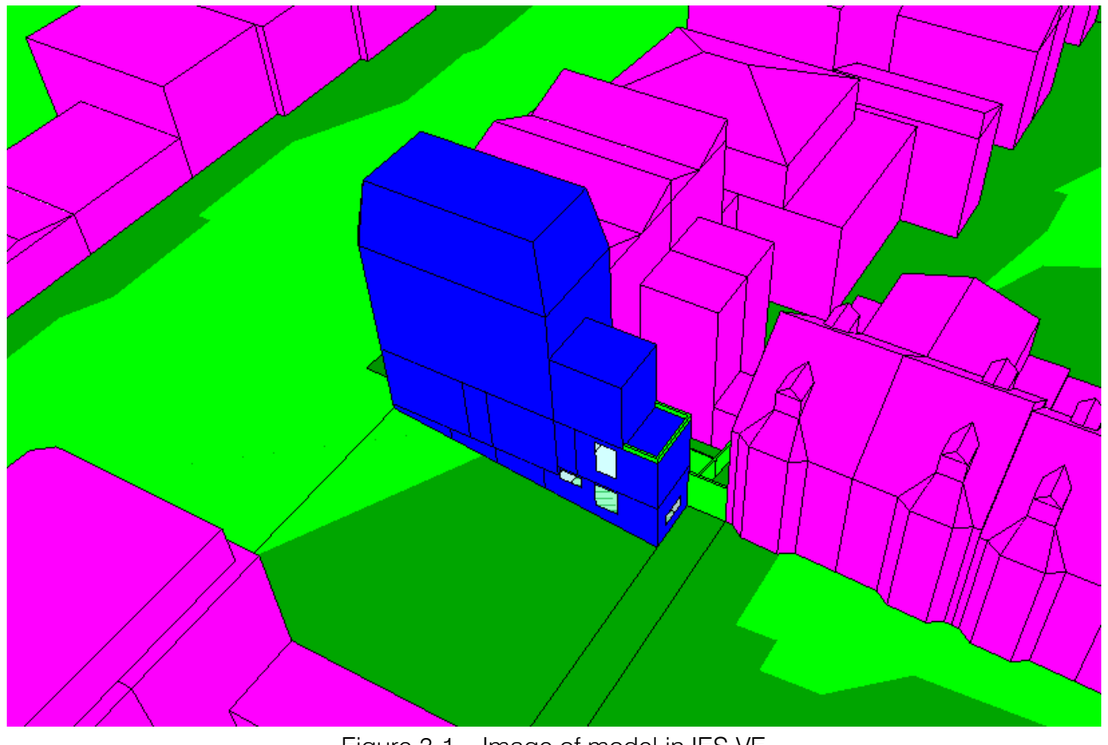

Figure 3-1 – Image of model in IES VE

In line with BRE guidance, the effect of trees has been ignored, due to difficulty assessing the exact size, shape and impact a tree may have. Trees also have a reduced impact on daylighting/sunlighting in winter when it is most essential. Plus, the dappled shade beneath some trees is deemed to be more pleasant that the shade caused by neighbouring buildings.

3.1 Daylighting

For the proposed new development, ADF & Illuminance values on the working plane were calculated using the FlucsDL module within IES. According to the guidance available in the BRE guide the working plane is considered at a height of 850mm from the finished floor level. A space of 300mm from the room edge has been excluded from assessment

The surface reflectance properties used for this assessment are as below:

- Interior walls 50%
- Ceilings 70%
- Floors 20%
- Exterior walls and obstructions 20%
- Exterior ground 20%

The glazing properties used in this assessment

- Frame factor 20%
- Transmission 70%

3.2 Sunlighting

Sunlighting was assessed using the IES SunCast module. The site location was set as London/Heathrow, United Kingdom.

4 Results and Discussion

4.1 Daylight

The result of the daylight assessment are shown in Table 4-1. The internal daylight plots can be found in the Appendix.

Room	BS EN17037			BS 8206-2			Overall Pass
	Illuminance			ADF			
	Minimum Average Illuminance (lux)	Average Illuminance (lux)	Pass	Minimum ADF (%)	ADF (%)	Pass	
LB Bedroom	100 lux	657.91 lux	✓	1.0%	5.4%	✓	✓
LB Lounge Dinning	150 lux	232.56 lux	✓	1.5%	1.9%	✓	✓
L00 Kitchen	200 lux	535.9 lux	✓	2.0%	4.4%	✓	✓
Total Passes							3/3

Table 4-1 – Internal Daylight Assessment Results

The results shown that all the assessed occupied spaces within Flat 1 easily meet or exceed the illuminance and previous ADF requirements. These results indicate that all rooms are likely to receive sufficient levels of natural light.

4.2 Sunlight

The results of the sunlight assessment identified that four windows of Flat 1 receive at least 1.5 hours of sunlight on the 21st March. Due to the restrictions of the existing building, orientation, and use of the basement, it is not feasible to locate the living area with windows that meet the recommendations for sunlight. however, one of the windows does lead to the Kitchen, as such occupants will have access to direct sunlight in some communal spaces. An image of the model demonstrating which windows comply with the recommendations for sunlight is shown in Figure 4-1.

Figure 4-1 – Windows receiving more then 1.5 hours sunlight on the 21st March

The APSH sunlighting results for Flat 1 are displayed in Table 4-2. The highest performing main window for the main living area of each unit was selected

Unit No.	APSH (%)	APSH > 25%?	APSH in Winter (%)	APSH in Winter > 5%?	BRE Guidance Met
LB Lounge Dinning	6.72	×	0.72	×	×
L00 Kitchen	44.02	✓	18.40	✓	✓
Total Passes					1/2

Table 4-2 – Internal Sunlight Assessment Results

The results show of that although the lounge dining area does not meet the recommendations, due to the restrictions of the existing building, orientation, and use of the basement, the kitchen does meet the recommendations for sunlight access. The BRE recognises it is not possible to get all units to meet this criteria.

5 Conclusion

Internal daylight and sunlight calculations have been carried out for the proposed development of 94 Mill Lane, NW6 1NH. The site is located in the London Borough of Camden. The development comprises of the conversion and extension of an existing building on the site to provide a number of flats. Daylight and sunlight calculations have only been undertaken for Flat 1, which provides the residential spaces on the basement and ground floor.

A three-dimensional model was developed in Integrated Environmental Solutions (IES) ModelIt module using the drawings provided for the proposed development. The surrounding buildings have been modelled based on satellite imagery in information from OS maps.

The report demonstrates that the proposal would result in adequate daylight for Flat 1. It also demonstrated that although the living area does not meet the sunlight recommendations, other spaces within Flat 1, such as the Kitchen, do meet the recommendations, as such residents should have sufficient access to sunlight.

6 Appendix

Surface	Quantity	Values			Uniformity (Min./Ave.)	Diversity (Min./Max.)
		Min.	Ave.	Max.		
Working plane 1 Reflectance=0% Transmittance=100% Grid size=0.50 m Area=9.200m² Margin=0.30 m	Daylight factor	3.0 %	5.4 %	10.1 %	0.56	0.3
	Daylight illuminance	367.3 lux	657.91 lux	1232.72 lux	0.56	0..3
	Sky view	1.00	1.00	1.00	1.00	1.00

Table 6-1 - LB Bedroom daylight results

Surface	Quantity	Values			Uniformity (Min./Ave.)	Diversity (Min./Max.)
		Min.	Ave.	Max.		
Working plane 1 Reflectance=0% Transmittance=100% Grid size=0.50 m Area=18.208m² Margin=0.30 m	Daylight factor	1.0 %	1.9 %	10.4 %	0.54	0.09
	Daylight illuminance	126.09 lux	232.56 lux	1275.78 lux	0.54	0.09
	Sky view	0.00	0.76	1.00	0.00	0.0

Table 6-1 - LB Lounge Dinning daylight results

Surface	Quantity	Values			Uniformity (Min./Ave.)	Diversity (Min./Max.)
		Min.	Ave.	Max.		
Working plane 1 Reflectance=0% Transmittance=100% Grid size=0.50 m Area=6.000m² Margin=0.30 m	Daylight factor	2.0 %	4.4 %	12.9 %	0.46	0.16
	Daylight illuminance	247.84 lux	535.90 lux	1574.26 lux	0.46	0.16
	Sky view	1.00	1.00	1.00	1.00	1.00

Table 6-1 - L00 Kitchen daylight results

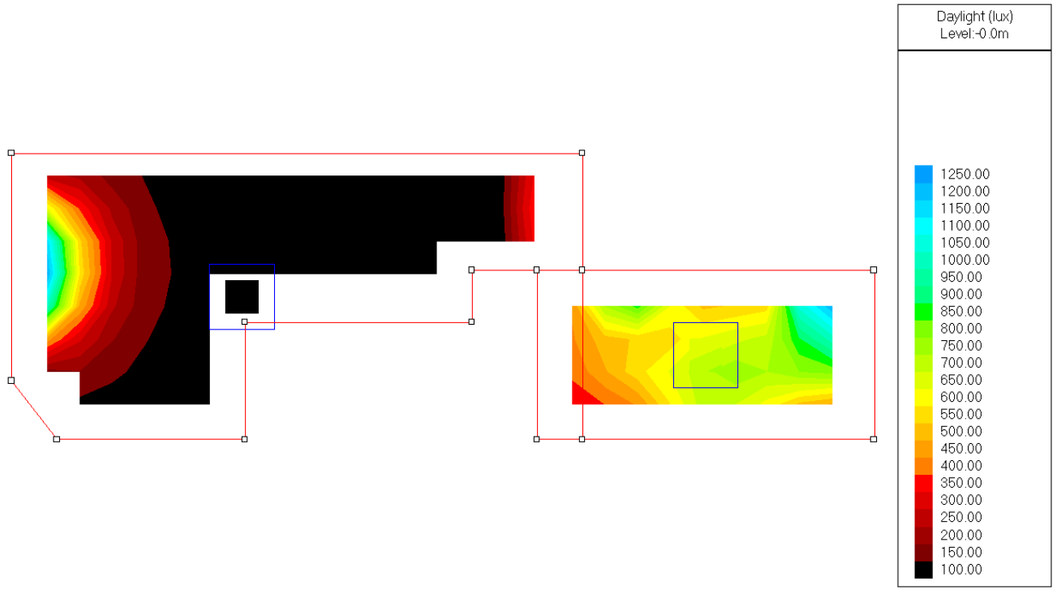

Figure 6-1 – LB daylight illuminance plots

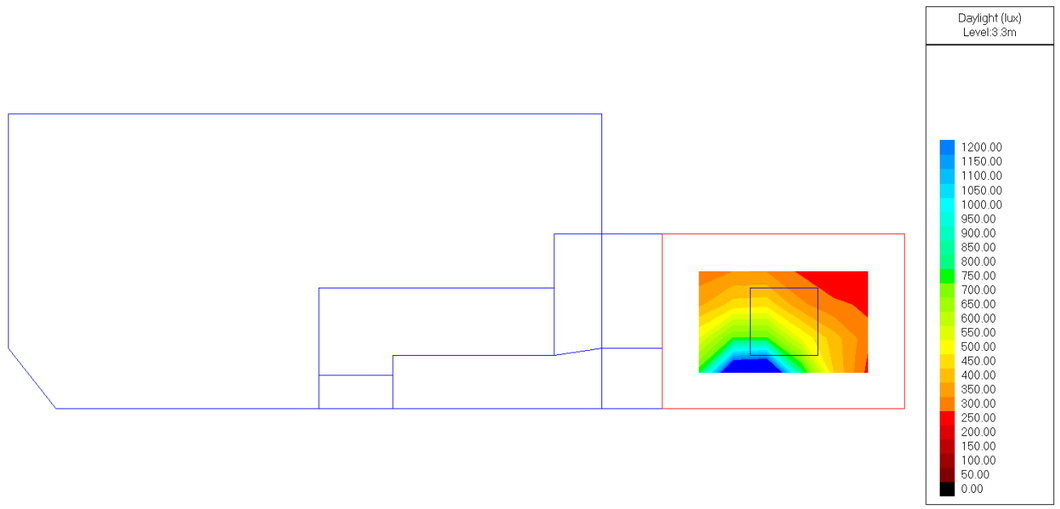

Figure 6-1 – L00 daylight illuminance plots