1328 Uxbridge Road, London Borough of Hillingdon

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 1328 Uxbridge Road, UB4 8JG, London. The site is located in the London Borough of Hillingdon. The development comprises of the conversion of an existing floor that has a storage area to 2 flats. 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' (2011).

Figure 1-1 - Site Location

2 Guidance

2.1 Daylighting

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.

BS 8206-2 gives minimum values for ADF for all new residential properties, outlined in Table 2-1.

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

Table 2-1 Room criteria requirements

2.2 Sunlighting

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.

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.

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 datal.

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 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 700mm from the finished floor level.

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

- Average internal surface reflectance = 0.65
- BRE factor for floor reflectance = 0.15
- External object reflectance = 0.20
- Glazing visible light transmittance = 0.70

The kitchen areas of the two flats have no external windows and that makes them be considered non-daylit internal kitchens. According to the Building Research Establishment (BRE) guide 'Site layout planning for daylight and sunlight: a guide to good practice' (2011), this type should be avoided, especially if it is used as a dinning area, unless it is directly linked to a well daylit living room. In the proposed development the kitchen area of the two flats are directly connected to living rooms. The kitchens in the development are also not used for dinning, as the dining area is located within the living area which is daylit.

3.2 Sunlighting

Sunlighting was assessed using the IES SunCast module. The site location was set as London/Heathrow, United Kingdom. For the new development, the highest performing main window to each primary living space was selected.

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.

Unit No.	Minimum ADF (%)	ADF (%)	Pass?
L01_Flat A_LD	1.5	3.9	✓
L01_Flat A_bed 1	1	5.1	✓
L01_Flat A_bed 2	1	4.3	✓
L01_Flat A_bed 3	1	6.7	✓
L01_Flat B_LD	1.5	4.2	✓
L01_Flat B_bed 1	1	5.7	✓
L01_Flat B_bed 2	1	4.5	✓
L01_Flat B_bed 3	1	7.8	✓
Total Passes			8/8

Table 4-1 – Internal Daylight Assessment Results

The results shown that all the assessed occupied spaces easily meet or exceed the ADF requirements. These results indicate that all units are likely to receive good levels of natural light.

Although kitchens are non-daylit kitchens, they are directly linked to the living areas meet or exceed the BRE requirements

4.2 Sunlight

The sunlighting results for the units 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
L01_Flat A_LD	19.44	×	0.69	×	×
L01_Flat B_LD	19.44	×	0.69	×	×
Total Passes					0/2

Table 4-2 – Internal Sunlight Assessment Results

The results show of the units meet the BRE recommendations for sunlighting in living spaces. This happens because the windows in these areas are located on the north façade of the building. They still have a APSH of close to 20%, and the BRE recognises that getting all units to pass this recommendation is not possible.

5 Conclusion

Internal daylight and sunlight calculations have been carried out for the proposed development of the redevelopment of the , to assess its internal levels of natural light and. redevelopment of the building located on 1328 Uxbridge Road, UB4 8JG, London. The site is located in the London Borough of Hillingdon. The development comprises of the conversion of an existing floor that has a storage area to 2 flats.

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. This accounts for both the existing development of the surrounding site. The report therefore demonstrates that the proposal would result in adequate daylight but not adequate sunlight for future occupiers of the site, based on the surrounding existing building

The results show that all units meet the BRE requirement for daylight, and as such will be well daylit space. Neither units living areas meet the recommendation for sunlight, however this was to be expected, due to the requirement to located living areas on the north façade of the building. the BRE recognises that getting all units to pass this recommendation is not possible.

6 Appendix - Daylight plots

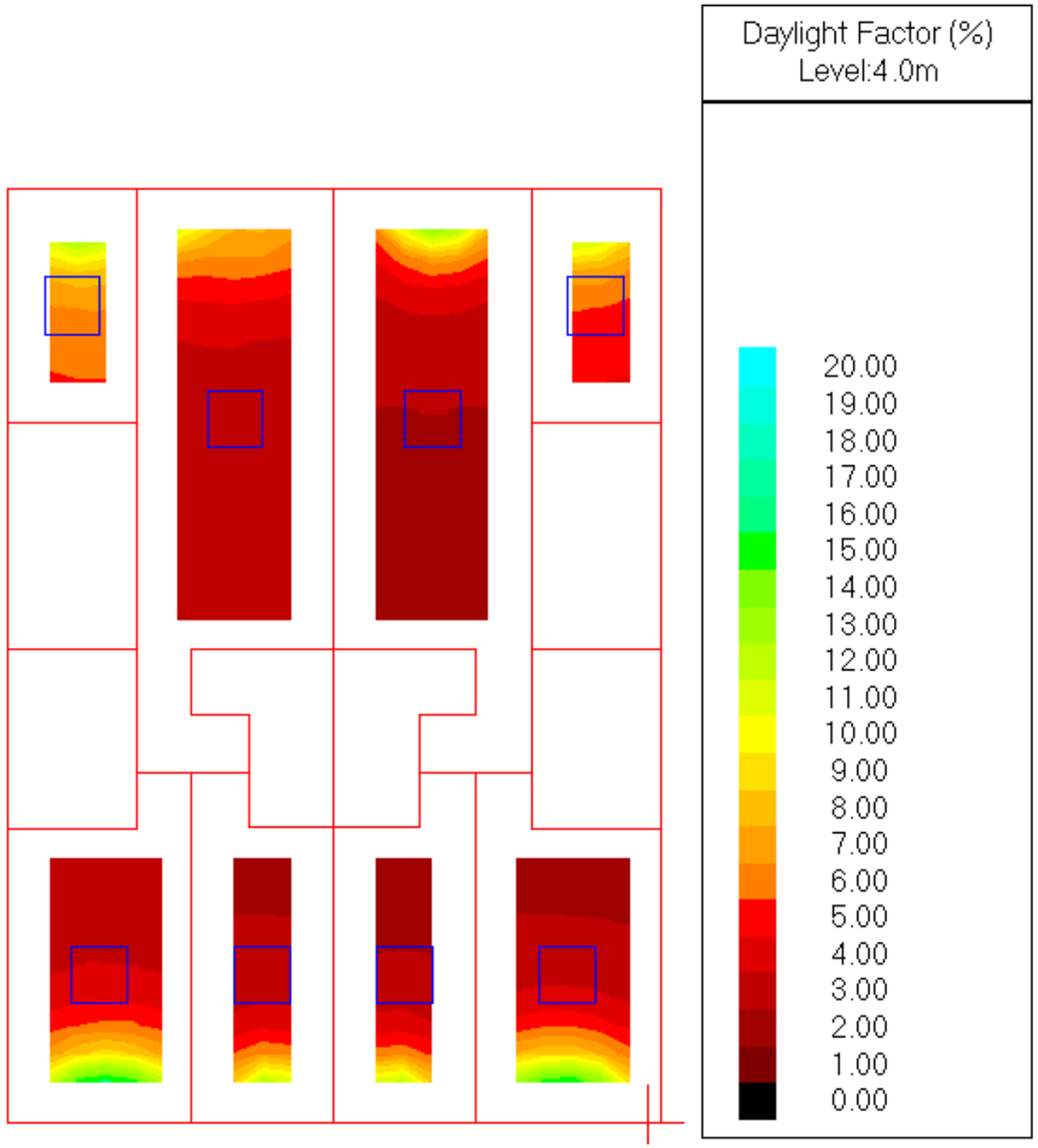

Figure 6-01 – L01 FlucsDL Daylight Plots