

Hawkins environmental

Daylight Assessment: 65 Compayne Gardens, London NW6

Trust Property Management Group plc

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Table of Contents

1.	INTRODUCTION	4
2.	ASSESSMENT CRITERIA.....	5
2.1.	Sunlight Verses Daylight	5
2.2.	National Policy.....	5
2.3.	Daylight Assessment Criteria	5
3.	INTERIOR DAYLIGHTING CALCULATIONS.....	7
3.1.	Average Daylight Factor	7
3.2.	No-Sky Line and the Working Plane.....	8
3.3.	Overall Analysis.....	9
4.	CONCLUSIONS	11

List of Tables

Table 2.1: Daylight Factor Criteria	6
Table 3.1: Daylight Factor Calculations	8
Table 3.2: Daylight Factor Assessment	8
Table 3.3: No-Sky Line & Working Plane Calculations	9

List of Figures

Figure 3.1: Calculating the Angle of Visible Sky.....	7
Figure 3.2: Pictorial calculation of the No-Sky Line.....	9

1. INTRODUCTION

Hawkins Environmental Limited has been instructed by Trust Property Management Group plc to undertake a daylight assessment for the proposed redevelopment of the basement of 65 Compayne Gardens, in Camden, London NW6. Along with other alternations to the building, it is proposed to add additional accommodation in the basement.

A previous planning application (Application Reference: 2012/1667/P) was refused the London Borough of Camden. One of the reasons for refusal was lack of daylight to the rooms within the basement. Therefore, this report is being prepared to accompany a planning appeal and is being used to determine whether the redevelopment will receive enough daylight using the guidance contained within the Building Research Establishment (BRE) report, "*Site layout planning for daylight and sunlight- Second Edition - 2011*" by PJ Littlefair and British Standard BS 8206:2008 Lighting for buildings – Part 2: Code of practice for daylighting.

2. ASSESSMENT CRITERIA

The provision of daylight is as important as ensuring low levels of noise, or low levels of odour, in maintaining the enjoyment of one's property. Adequate levels of daylight are important not only to light and heat the home, but also for an occupant's emotional well being. Daylight is widely accepted to have a positive psychological effect on human beings and there is a great deal of evidence to suggest that people who are deprived of daylight are more susceptible to depression and mood swings. This is common in northern countries, such as Norway, Iceland and Canada where daylight is scarce during the winter months.

2.1. Sunlight Verses Daylight

When assessing daylight and sunlight, it is first necessary to understand the difference between the two terms. Daylight is all direct and indirect light from the sun during the daytime, whereas Sunlight is only the direct light from the sun. For example on an overcast day, only daylight would be visible, as this is the diffuse light that has penetrated the clouds; whereas on a sunny day, you may also experience sunlight, i.e. light directly from the sun.

2.2. National Policy

The Department for Communities and Local Government (DCLG) sets national planning policy. Their document 'The Planning System: General Principles (2005), published in conjunction with Planning Policy Statement 1: Delivering Sustainable Development, discusses the need to protect amenities in the public's interest, of which the need for daylight/sunlight could be considered one such amenity. However, the government does not have an adopted policy on daylight, sunlight and the effects of overshadowing, and does not have targets, criteria or relevant planning guidance, in the way it has for other environmental impacts such as noise, landscape or air quality. However three documents are relevant when considering daylight, sunlight and overshadowing in dwellings:

- **The Building Research Establishment (BRE) report, "Site layout planning for daylight and sunlight – a guide to good practice" by PJ Littlefair.** Although not Government guidance, this report is commonly referenced as the main guide in the UK in determining the minimum standards of daylight and sunlight and for determining the impact of a development;
- **British Standard BS 8206:2008 Lighting for buildings – Part 2: Code of practice for daylighting.** BS 8206:2008 contains guidance on the minimum recommended levels of interior daylighting and introduces some of the calculation procedures used in the BRE report;
- **The Code for Sustainable Homes – Technical Guidance.** The Code's Technical Guidance document determines its target criteria for well lit homes, building upon the calculation procedures within the BRE report and BS 8206:2008. It should be noted that the daylighting element of the Code is not mandatory.

2.3. Daylight Assessment Criteria

The BRE report contains guidance on how to design developments, whilst retaining good levels of daylight. As well as advice, the report contains a methodology to assess levels of daylight and contains criteria to determine

whether a development is well day lit. However, the report does state that the guidelines are not mandatory, but should be considered a guide to help rather than constrain the designer.

Two main assessment methods are used to determine whether a room is adequately day lit: the Average Daylight Factor and the Position of the No-Sky Line, with the Average Daylight Factor being the most important test.

The Average Daylight Factor (ADF) is a very common and easy to understand measure for expressing the daylight availability in a room. It describes the ratio of outside illuminance over inside illuminance, expressed as a percentage. The higher the ADF the more natural light is available in the room.

Rooms with an average DF of 2% give us a feeling of being day lit. However, it is only when the ADF rises above 5% that we perceive it as well day lit. Different types of rooms have different minimum requirements for daylighting. **Table 2.1** details the acceptable criteria for average daylight factor for habitable rooms.

Table 2.1: Daylight Factor Criteria

Criteria	Minimum Daylight Factor
Predominantly daylight without the need for supplementary electric lighting	5%
With supplementary electric lighting:	
Suitable for kitchens	2%
Suitable for living rooms	1.5%
Suitable for bedrooms	1%

Whilst the ADF is used to determine whether a room is adequately day lit, the position of the No-Sky Line (NSL) calculations and Room Depth Tests are used to determine how well distributed the light is within the room.

The NSL divides those areas of the working plane which can receive direct skylight, from those which cannot. The working plane is a notional surface, typically at about desk or table height, at which the daylight factor or the 'no-sky line' is calculated or plotted. For the calculations required here, it is set at 0.85 m above the floor.

3. INTERIOR DAYLIGHTING CALCULATIONS

3.1. Average Daylight Factor

The average daylight factor assessment has been calculated for all of the proposed development. Under the BRE guidelines, the minimum ADF recommended for bedrooms is 1%, living rooms is 1.5% and for kitchens is 2%.

The ADF is calculated by the following formula provided within the Building Research Establishment (BRE) report, "Site layout planning for daylight and sunlight – a guide to good practice" by PJ Littlefair:

$$\text{ADF} = \frac{T A_w \theta}{A (1 - R^2)}$$

Where:

T is the diffuse visible transmittance of the glazing (normally 0.7 for double glazing, or lower for roof lights that may be susceptible to soiling);

A_w is the net glazed area of the windows (in m^2);

θ is the angle of visible sky in degrees;

A is the total area of room surfaces (in m^2), which includes walls, ceilings and floors; and

R is the average room reflectance (normally 0.5).

Whilst most of the values in the calculation are self explanatory, the angle of visible sky (θ) is more complicated to calculate. **Figure 3.1** graphically shows the angle of concern. θ (the angle of visible sky), can be calculated by subtracting β (the angle of sky obscured by the thickness of the wall) and α (the angle to the sky from the horizontal) from 90° . The angle to the sky from the horizontal is the most important angle, and this is a function of the height of the main obstruction to the window, as well as the distance to this obstruction.

Figure 3.1: Calculating the Angle of Visible Sky

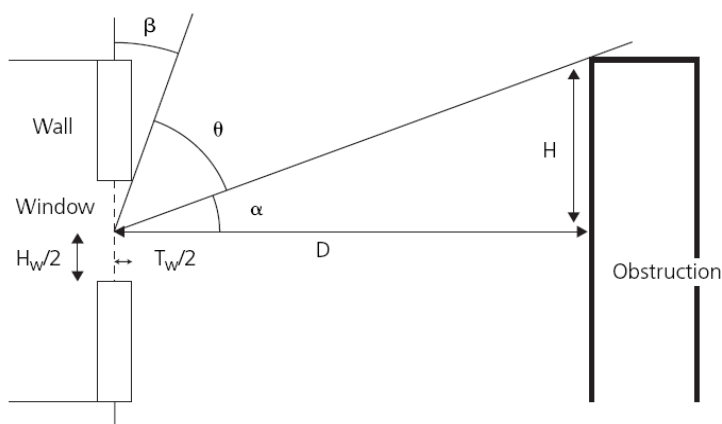


Table 3.1 shows the daylight factor calculations for each window. **Table 3.2** then shows the results of the daylight factor calculations for each room.

Table 3.1: Daylight Factor Calculations

Room/Window Description	T	A _w	θ	A	R
Studio 1- Front Window	0.68	4.9 m ²	52°	129.9 m ²	0.5
Studio 1- Side Window	0.68	0.7 m ²	10°	129.9 m ²	0.5
Ground Floor Flat - Bedroom	0.68	4.9 m ²	52°	78.6 m ²	0.5
Studio 2 - Side Window	0.68	1.4 m ²	10°	126.9 m ²	0.5
Studio 2 - Rear Window	0.68	3.8 m ²	69°	126.9 m ²	0.5
Studio 3 - Side Window	0.68	0.6 m ²	74°	138.1 m ²	0.5
Studio 3 - Rear Window	0.68	3.9 m ²	80°	138.1 m ²	0.5

Table 3.2: Daylight Factor Assessment

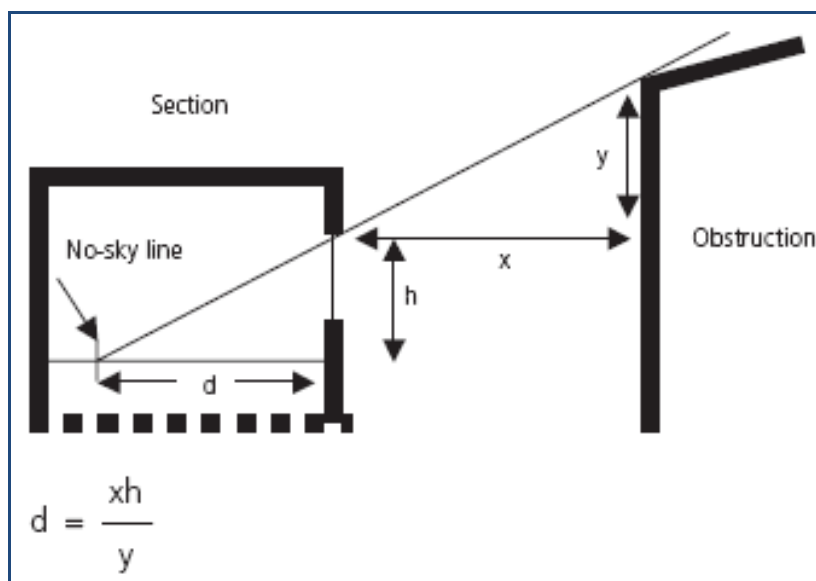
Room	Average Daylight Factor
Studio 1	1.9%
Ground Floor Flat - Bedroom	3.0%
Studio 2	2.0%
Studio 3	2.4%

The BRE Report suggests that kitchens should have a minimum ADF of 2%, living rooms 1.5% and bedrooms 1%.

3.2. No-Sky Line and the Working Plane

The no-sky line is used to determine how evenly distributed the daylight is distributed in the room. **Figure 3.2** illustrates how the no-sky line can be calculated. If 'd' is greater than the room depth, then no part of the room lies beyond this *no-sky line*. BS 8206: Part 2 suggests that at least 80% of a room has a direct view of the sky.

Figure 3.2: Pictorial calculation of the No-Sky Line



Where:

h = height of the window head above the working plane

y = height of the obstruction above the window head

x = distance from the window to the obstruction

Table 3.3 shows the no-sky line and working plane percentage for the same rooms which were assessed for the daylight factor assessment.

Table 3.3: No-Sky Line & Working Plane Calculations

Room	Amount of the working plane that receives direct light from the sky
Studio 1	51%
Ground Floor Flat - Bedroom	94%
Studio 2	100%
Studio 3	100%

3.3. Overall Analysis

In accordance with the BRE guidance, four rooms have been assessed to determine whether they are adequately daylight. Of the four rooms, three are studio rooms, i.e. they contain bedroom areas, kitchens and living spaces. Therefore, these rooms should achieve a minimum ADF of 2%; whilst two of these rooms have an ADF of 2% or greater and that have 100% of the working plane with a direct view of the sky, one of these

rooms (Studio 1) fails to achieve the minimum recommended ADF by a small amount at 1.9%. In addition, only 51% of the working plane receives direct light from the sky. It is important to note that the front half of the studio will be well lit, with the rear proportion of the room being less well lit, since the vast majority of the light in the room will come from the front window, rather than the side windows. This is significant, since the front well lit portion of the room houses the kitchen and the lounge, which have the greatest requirement for daylight, whereas the rear portion of the room houses the bedroom, which has a lesser requirement for good daylight availability. Although the calculation methodology requires the assessment of daylight across the whole room, if the front portion of the room were to be assessed in isolation, the ADF would be in excess of 2%; therefore the kitchen would be adequately daylight.

The fourth room is a bedroom, situated in the front right part of the building and as such has a minimum requirement of 1% ADF. This room has an ADF of 3% and 94% of the working plane has a direct view of the sky; consequently this room is seen as adequately daylight.

4. CONCLUSIONS

Calculations have been conducted in accordance with the BRE guidelines to determine the extent to which the proposed redevelopment of the basement of 65 Compayne Gardens will retain good levels of daylight.

Calculations have shown that based on the proposals, with the exception of Studio 1, which fails to meet the minimum recommended level of daylight by a small margin, all rooms receive at least the minimum recommended level of daylight and therefore should be considered adequately daylight.

Although Studio 1 fails to meet the guideline criteria for daylight as a result of the proposed development, it is important to note that failure to meet the guideline criteria is not an indicator as to whether a development is acceptable. The BRE report states that *“The advice given (in the report) is not mandatory and guide should not be seen 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 layout design.”* Furthermore, since the front portion of the room, which will be very well lit, houses the kitchen and the lounge which have the greatest requirement for daylight, and the rear portion of the room, which will be less well lit, houses the bedroom which has a lesser requirement for good daylight availability, it is clear that the architects have maximised the building design to allow as much daylight within the room as possible, therefore it should be considered that daylight should not be a constraint upon development of this site.