

Daylighting Report

for 15 Iverson Road, London NW6 2QT

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1 Introduction

This report assesses the daylighting in the living spaces (kitchen, dining and living areas) of the lower ground floor flats in the proposed development at 15 Iverson Road, West Hampstead, London NW6 2QT.

2 Urban Context

The site of the proposed development is in a densely developed, mixed commercial and residential area with relatively tall obstructions to the north and south. This is illustrated in the photographs below:



Figure 1 Aerial view of the site

To the south of the property (across the road) is a terrace of houses three and a half storeys high. To the rear of the property is a high rear fence separating the site from a commercial property, and beyond that is a railway viaduct.



Figure 2 View from the south



Figure 3 View from the north

That is, there are tall and extensive obstructions to daylight both to the north and to the south of the site. These, together with the fact that the proposed flats are in a 'half-basement', constrain the daylight available. In response to this, the designers have enlarged the windows to the front flat and proposed replacing the masonry front fence with metal railings.

3 Method

Average Daylight Factors

Average Daylight Factors for the living spaces in the two proposed flats were calculated using the method proposed by Lynes:

$$DF_{av} = \frac{MW\theta T}{A(1-R^2)}$$

where:

 $DF_{av} = Average Daylight Factor$

W = total glazed area of windows or roof lights

A = total area of all the room surfaces (ceiling, floor, walls and windows)

R = area-weighted average reflectance of the room surfaces

M = a correction factor for dirt

- T = glass transmission factor
- $\boldsymbol{\theta} = \text{angle of visible sky}$

The following standard values were used in the calculations:

M = 1.0 (vertical glazing that can be cleaned easily)

T = 0.7 (standard double glazing)

An area-weighted average reflectance of the room surfaces of 0.5 (for a typical dwelling with light-coloured walls) was used for the rear flat, but for the more heavily obstructed front flat a value of 0.65 was calculated assuming white walls and ceiling, a light-coloured floor, and a white window frame.

Also because of the heavily obstructed site, the angle of visible sky was calculated for each window rather than being taken from standard values.

4 Data sources

The calculations were based on architect's drawings VC/45/P1/01, VC/45/P1/02, VC/45/P1/03, and VC/45/P1/04, and external distances and heights estimated from maps, satellite imagery and photographs.

The data are summarised in Tables 1 in the Appendix.

5 Results

In the proposed design, the kitchen, dining and living spaces in each flat are not separate but share the same room. The Average Daylight Factor for the living spaces were therefore calculated as one room. For the front flat he contributions of each of the five windows were summed to give the total Average Daylight Factor.

The calculations (see Tables 2 in the Appendix) show that the predicted Average Daylight Factor in the front flat will be 2.1% and in rear flat will be 2.8%.

Appendix

Table 1a Dimensions of living areas

	Area
	m²
Front flat	
Floor/Ceiling	28.226
Walls	61.778
Rear flat	
Floor/Ceiling	11.652
Walls	38.292

Note that the FFL for the flat is given as 1225mm below street level.

Table 1b Windows

Front flat, bay window, central window:	
Height of sill above FFL:	305 mm
Height of head above FFL:	2377 mm
Height of window void:	2072 mm
Width of window void:	1430 mm
Area of window void:	2.963 m ²
Height of upper glazing panel:	395 mm
Width of upper glazing panel:	1268 mm
Area of upper glazing panel:	0.501 m ²
Height of lower glazing panel:	1404 mm
Width of lower glazing panel:	1268 mm
Area of lower glazing panel:	1.780 m ²
Total area of glazing:	2.281 m ²
Frame factor (fraction of glazing):	0.770

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Front flat, bay window, flanking windows:	
Height of sill above FFL:	305 mm
Height of head above FFL:	2377 mm
Height of window void:	2072 mm
Width of window void:	755 mm
Area of window void:	1.564 m ²
Height of upper glazing panel:	395 mm
Width of upper glazing panel:	575 mm
Area of upper glazing panel:	0.227 m ²
Height of lower glazing panel:	1404 mm
Width of lower glazing panel:	575 mm
Area of lower glazing panel:	0.807 m ²
Total area of glazing:	1.034 m ²
Frame factor (fraction of glazing):	0.661

Rear flat, french doors:

Height of sill above FFL:	130 mm
Height of head above FFL:	2275 mm
Height of window void:	2145 mm
Width of window void:	1900 mm
Area of window void:	4.076 m ²
Height of glazing panel:	1970 mm
Width of glazing panel:	800 mm
Area of glazing panel:	1.576 m ²
Number of glazing panels:	2 no.
Total area of glazing:	3.152 m ²
Frame factor (fraction of glazing):	0.773

	Average Horizon Line above FFL (mm)	Height above window midpoint (mm)	Distance from window (mm)
Horizon to south:			
South facing windows:	2963	1591	1680
Flanking windows:	2749	1377	625
Horizon to north:	8725	7523	15900

Table1c Average horizon lines adopted

Height of window	Н	2072 mm	
Thickness of wall	Т	254 mm	
Distance to obstruction	D	1680 mm	
Height of obstruction	Н	1622 mm	
Angle of visible sky	θ	0.681°	<i>i.e</i> ., 39°
Total glazed area:	W	2.281 m ²	
Total room surface area	А	118.230 m ²	
Area-weighted av. reflectance	R	0.69	
Maintenance factor	Μ	1.0	
Glass transmission factor	T	0.7	
Daylight factor	DF	1.0 %	

Table 2a Front flat, central south facing window

Table 2b Front flat, flanking south facing window

Height of window	Н	2072 mm	
Thickness of wall	Т	254 mm	
Distance to obstruction	D	1680 mm	
Height of obstruction	Н	1622 mm	
Angle of visible sky	θ	0.681°	<i>i.e.</i> , 39°
Total glazed area:	W	1.034 m ²	
Total room surface area	А	118.230 m ²	
Area-weighted av. reflectance	R	0.69	
Maintenance factor	Μ	1.0	
Glass transmission factor	Т	0.7	
Daylight factor	DF	0.5 %	

Height of window	Н	2072 mm	
Thickness of wall	Т	254 mm	
Distance to obstruction	D	625 mm	
Height of obstruction	Н	1408 mm	
Angle of visible sky	θ	0.2958°	<i>i.e</i> ., 16.9°
Total glazed area:	W	1.034 m ²	
Total room surface area	А	118.230 m ²	
Area-weighted av. reflectance	R	0.69	
Maintenance factor	Μ	1.0	
Glass transmission factor	Т	0.7	
Daylight factor	DF	0.1%	

Table 2c Front flat, flanking east and west facing windows

Table 2d Rear flat, french doors

Height of window	Н	2145 mm	
Thickness of wall	Т	254 mm	
Distance to obstruction	D	15900 mm	
Height of obstruction	Н	7523 mm	
Angle of visible sky	θ	1.0110°	<i>i.e.</i> , 57.9°
Total glazed area:	W	3.152 m ²	
Total room surface area	А	61.597 m ²	
Area-weighted av. reflectance	R	0.50	
Maintenance factor	Μ	1.0	
Glass transmission factor	T	0.7	
Daylight factor	DF	2.8%	

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