8 Fitzroy Stre London W1T 4BJ United Kingd www.arup.co	et om m	t +44 20 7636 1531 d +44 20 7755 4559
Project title	2 Roxwell - Daylight Studies	Job number
		279888-01
cc	Demetris Hadjigeorgiou	File reference
Prepared by	Nicola Rigoni	Date
		1 June 2021
Subject	Daylight Studies for Planning Application (BR 209) – 2 London	Roxwell, Hartland Road,

### 1 Executive Summary

Arup Lighting was instructed to carry out a daylight and sunlight availability assessment of the effects of the proposed development of 2 Roxwell, Hartland Road on surrounding buildings and amenity areas.

The effect of the development on the surrounding buildings have been analysed using the metrics and methodologies described in the guidance document BR 209<sup>1</sup>.

The conclusion of the assessment is that the effect of the proposed development on sunlight and daylight availability for the surrounding properties and amenities is negligible. This conclusion is supported by the guidance of BR 209.

# ARUP

<sup>&</sup>lt;sup>1</sup> BRE document BR 209 *Site layout planning for daylight and sunlight - A guide to good practice*: 2011 https://arup.sharepoint.com/sites/LightIngteam\_ukimea/shared documents/general/projects/279888-01 - 2 ROXWELL dayLight studies/BRE - 2 ROXWELL-GA

279888-01 1 June 2021

#### 2 Introduction

This note illustrates the daylight and sunlight effects of the proposed massing for 2 Roxwell on surrounding existing buildings and amenity areas.

The results of the assessment of the effect of the proposed development on the surrounding buildings are shown in section 3.

The results of the assessment of sunlight penetration in the amenity areas are shown in Section 4.

The 3D computer model used in the assessment has been supplied by Demetris Hadjigeorgiou to Arup.



Figure 1: Baseline (red) and proposed development (blue) for 2 Roxwell.

279888-01 1 June 2021

For these assessment two options are considered: the *proposed* configuration, which is the proposed design as per May 2021, and the *baseline* configuration, which is representative of the existing situation.

For the purpose of this study, these two configurations differ only in the height of the building at 2 Roxwell.

The criteria used in comparing baseline to proposed conditions are based on the recommendations from the BR document 209 "*Site layout planning for daylight and sunlight; A guide to good practice*". This document is the *de facto* standard for planning and daylight and sunlight availability. BR 209 sets targets for sunlight and daylight availability and describes the methodology to assess the daylight and sunlight availability for buildings and open areas.

The following metrics have been used in the assessment:

- Daylight availability for existing buildings measured in terms of the 'vertical skylight component' (VSC).
- Sunlight availability for existing buildings measured in terms of the 'sunlight annual and winter probable hours' (PASH, PWSH)
- Sunlight availability for existing amenity areas buildings measured in terms of the amount of sunlight hours the areas receive for the 21<sup>st</sup> of March.

279888-01 1 June 2021

#### **3** Daylight and sunlight availability assessment

#### **3.1** Daylight availability (Vertical Skylight Component, VSC)

In designing a new development or an extension it is important to safeguard the daylight to nearby buildings. Daylight availability is measured in terms of the 'vertical skylight component' (VSC).

This parameter is defined as the ratio of the direct sky illuminance falling on the vertical wall at a reference point, to the simultaneous horizontal illuminance under an unobstructed sky.

BR 209 states that "loss of light to existing windows need not to be analysed if the distance of each part to the new development from the existing windows is three or more times its height above the centre of the existing window."

The design for the proposed development is within 7.6m of height.

The effect of the proposed development to the dwellings in Heybridge building and those in the eastern block of Widford building is deemed to be negligible as these receptors are too far from the proposed massing to be affected by it.



Figure 2: Distances of existing dwellings from the proposed development.

279888-01 1 June 2021

BR 209 also states that: "*if the proposed development is taller or closer than this* [referenced to the above section ] *Measure the angle to the horizontal subtended by the new development at the level of the centre of the lowest window. If this angle is less than 25° for the whole of the development, then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building.*"

As presented in the image below this is the case for the dwelling in Widford building opposite to the proposed development:



Figure 3: Angle to the horizontal subtended by the new development at the level of the centre of the lowest window.

The proposed development subtends and horizontal angle which is less than 20° on the centre of the lowest windows, therefore according to BR 209 daylight is unlikely to have a substantial effect on the surrounding property at Widford building.

#### **3.2** Sunlight availability (Probable Annual Sunlight Hours PASH, Probable Winter Sunlight Hours PWSH)

Probable Annual Sunlight Hours is the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

BRE209 states that "if a living room of an existing dwelling has a main window facing within 90° of due south, and any part of the new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected.

As for daylight availability (see Figure 3) the proposed development subtends an horizontal angle which is less than 20° on the centre of the lowest windows therefore according to BR 209. Therefore, the proposed massing is unlikely to have a substantial effect.

279888-01 1 June 2021

#### **3.3** Sunlight availability for existing amenity areas

The solar penetration is defined as the percentage of area exposed to sunlight for a set amount of time.

BR209 proposes that "at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable."

The open areas surrounding the proposed development are identified in green in the image below; these are private gardens to Flat 1-8 of the Widford building (Figure 4); an amenity area is also next to 1 Roxwell (n.9 in the Figure 4):



Figure 4: Location of amenities areas surrounding the proposed development.

Results of the assessment shows that for all gardens/amenity areas analysed at least 71% of the area receives in excess of 2 hours of sunlight on  $21^{st}$  of March.

#### 279888-01

1 June 2021

Amenity area	Area % receiving more than 2 hours			
designation	baseline	proposed	comparison	
1	71.2	71.2	1.00	
2	76.5	76.5	1.00	
3	73.7	73.7	1.00	
4	81.0	74.5	0.92	
5	81.6	79.9	0.98	
6	79.1	79.1	1.00	
7	84.5	84.2	1.00	
7	78.6	78.6	1.00	
9	90.7	90.7	1.00	

Table 1: Sunlight access for amenity areas and garden spaces.

279888-01 1 June 2021

#### 4 Conclusions

This assessment has demonstrated that:

- For the residential properties in Heybridge building the reductions in sunlight and daylight availability are negligeable because the receptors are at a distance exceeding 3.5 time the height of the proposed massing.
- For the residential properties in Wilford building the reductions in sunlight and daylight availability are negligeable because the proposed development subtends and horizontal angle which is less than 20° on the centre of the lowest windows.
- The effects of the proposed development for sunlight availability for the surrounding amenity areas are negligible because all open areas achieve the targets set in BR 209.

It is concluded that the effect of the proposed development on sunlight and daylight availability are negligible for the surrounding properties and open areas.