# Land accessed from private lane between 25a & 25c Frognal

## Daylight modelling

**Daylight Statement**
November 2019

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## Revision Schedule

Daylight statement
November 2019

| Rev | Date | Details | Prepared by | Reviewed by | Approved by |
|---|---|---|---|---|---|
| 01 | Nov 2019 | Final | P Giesberg | S. Bamford | P Giesberg |

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# 1 Introduction

In November 2018 Planning for Sustainability issued a sustainability statement to support the planning application for the provision of two detached houses at the back of 29 and 33 Arkwright Road in London. This report included an appraisal of the impact on daylight and sunlight on surrounding buildings. Although the report concluded that the proposed development would comply with the guidelines that are set out in the document BRE 209: Site layout planning for daylight and sunlight (second edition) by Paul Littlefair, concerns have been raised by neighbouring residents. Further information has been provided regarding one of the properties (Frognal 25e) and it was requested to carry out further detailed analysis of daylight effects on this property.

## Site and development

It has been proposed to develop a section of the rear garden area to the rear of 29 and 33 Arkwright Road. This site lies within the boundary of the London Borough of Camden (Fig. 1).

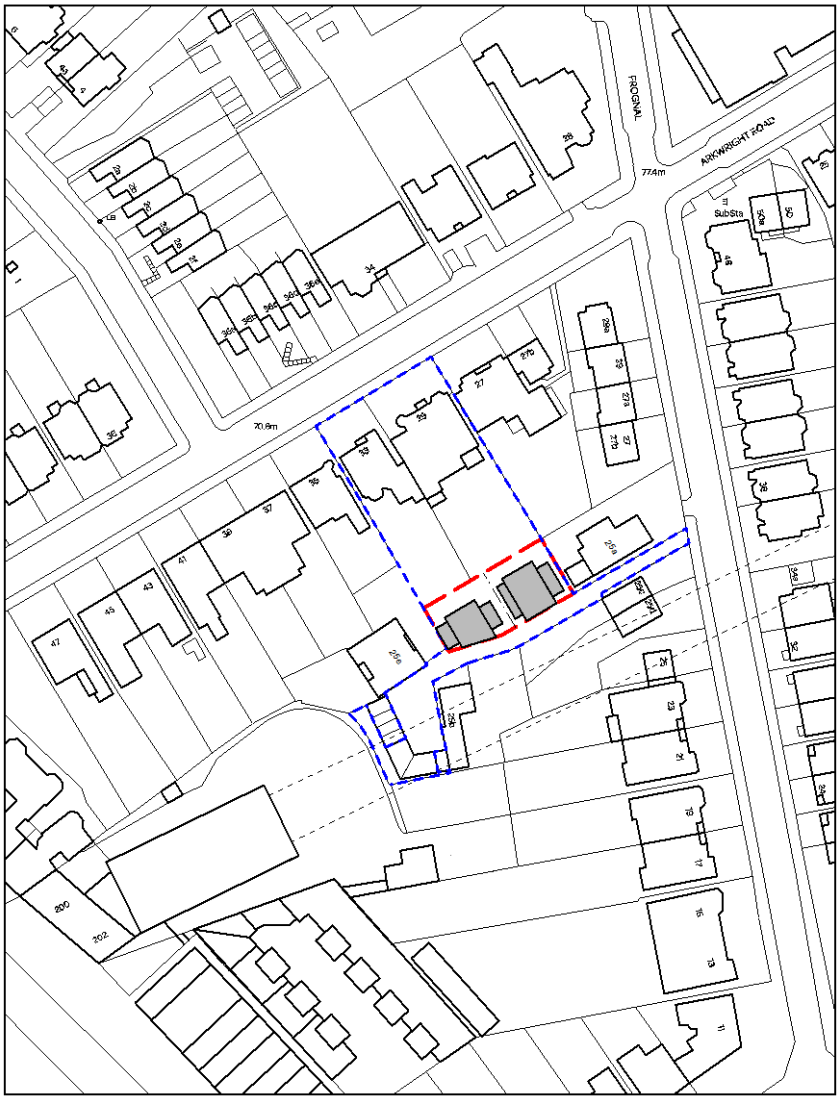

Figure 1. Site Location Plan

The application site lies within the Redington/Frognal Conservation area. The site is subject to a significant gradient and contains a number of mature trees.

It is proposed to erect two detached dwellings at this location (Fig. 2). The development proposals have been subject of discussions with the local planning authority and a Design Review Panel has recently provided positive feedback on the current state of the design evolution.


Figure 2. Overview of external layout and landscaping of the proposed development.

# 2 Methodology and assessment criteria

The effects of the proposed buildings on the availability of daylight on the existing buildings have been considered. The appraisal has been carried out using the methodology set out by Paul Littlefair in BR209 "*Site layout planning for daylight and sunlight: a guide to good practice*" (2011) (BRE Trust)

**Light from the sky**

It is important to safeguard the daylight that is available for nearby buildings in living rooms, kitchens and bedrooms. The Vertical Sky Component (VSC) is a measure of available daylight on a particular surface or window. The guidelines in the BRE209 document state that where a window has a VSC of 27 % or more daylighting is unlikely to be affected. In cases where the VSC is less than 27%, it is unlikely that a change in daylighting will be noticeable if a reduction in VSC is not less than 0.8 times the original value. Where information about internal layout is available a further test is the reduction in the area with a view of the sky is not more than 20%.

Where a room has more than 1 window the average weighted VSC should be used.
The VSC has been determined using the Virtual Environment building modelling software by IES (version 2019.1.0.0).

**Daylight Factor**

The daylight factor is a measure of available light within a room. It is determined by a variety of parameters including the size and location of windows, the colour of the walls and the presence of shading objects in the vicinity of the windows. Detailed room layouts are required to calculate the daylight factor of a room. For the rooms in Frognal 25e with windows facing the proposed development the daylight factor was determined using the Virtual Environment building modelling software by IESVE (version 2019.1.0.0). The simulation was set to medium/high level of calculation quality suitable for the complex layout of the main living space.

An Average Daylight Factor of more than 5% points to a well daylit space and 2% to a partially daylit space. These are recommended values and it would depend on the use of the space how much weight to the recommendations should be given. For instance, daylight provision in a bedroom is less important than in a sitting room or kitchen. There are also a set of minimum standards for daylight availability:

- 2% for kitchens
- 1.5% for sitting and dining rooms
- 1% for bedrooms

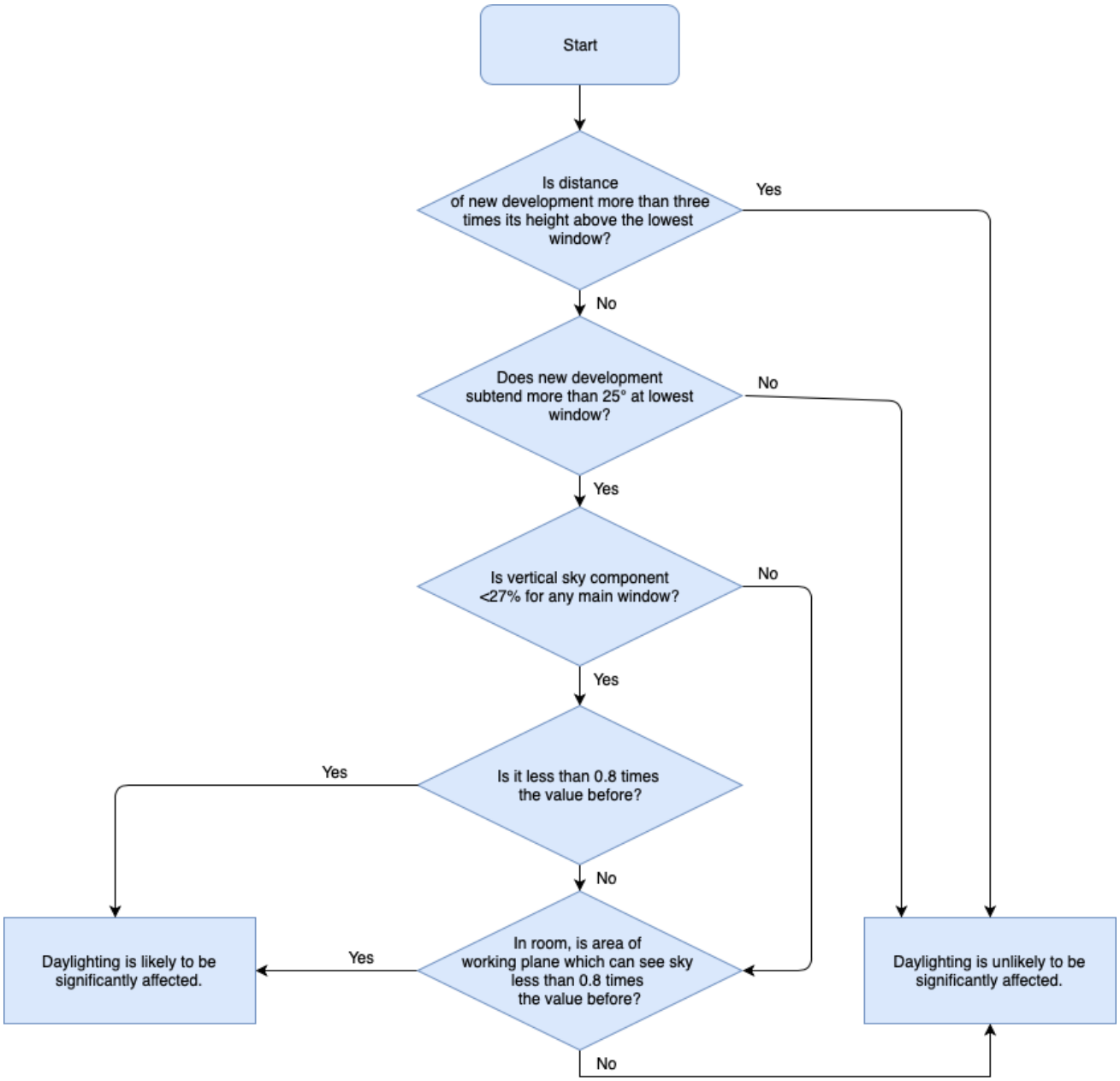


Figure 4. Decision chart daylight in existing buildings.

Figures 5 and 6 provide an overview of the model used from two angles.

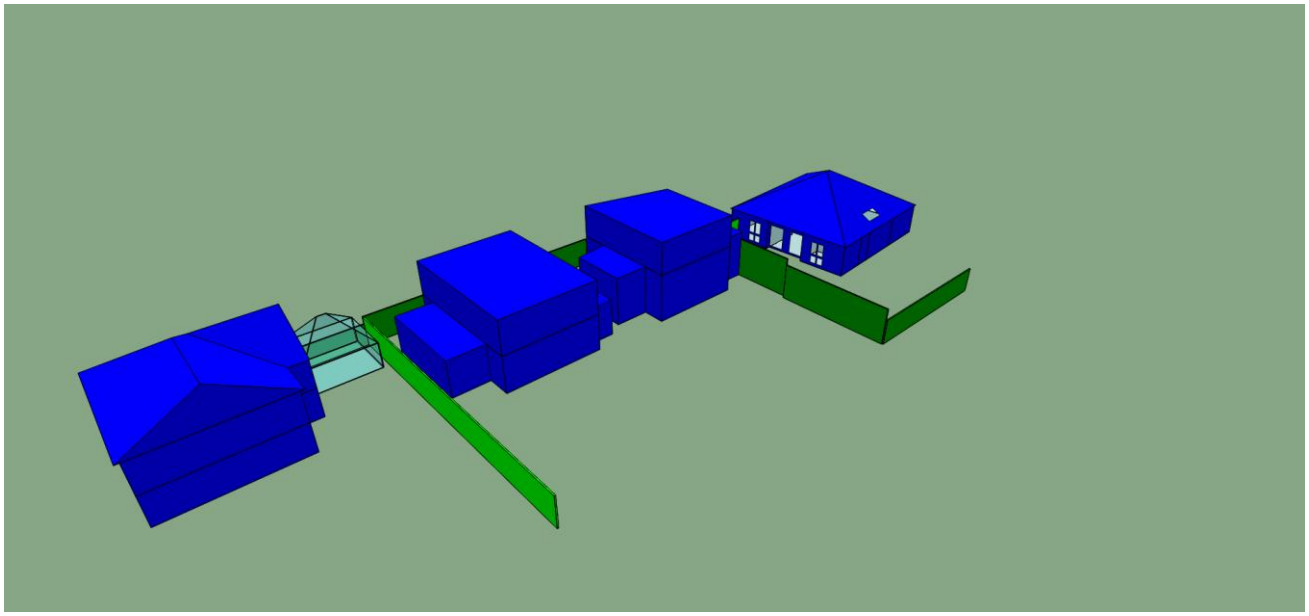

Figure 5 Birds-eye view of the proposed development and surrounding buildings

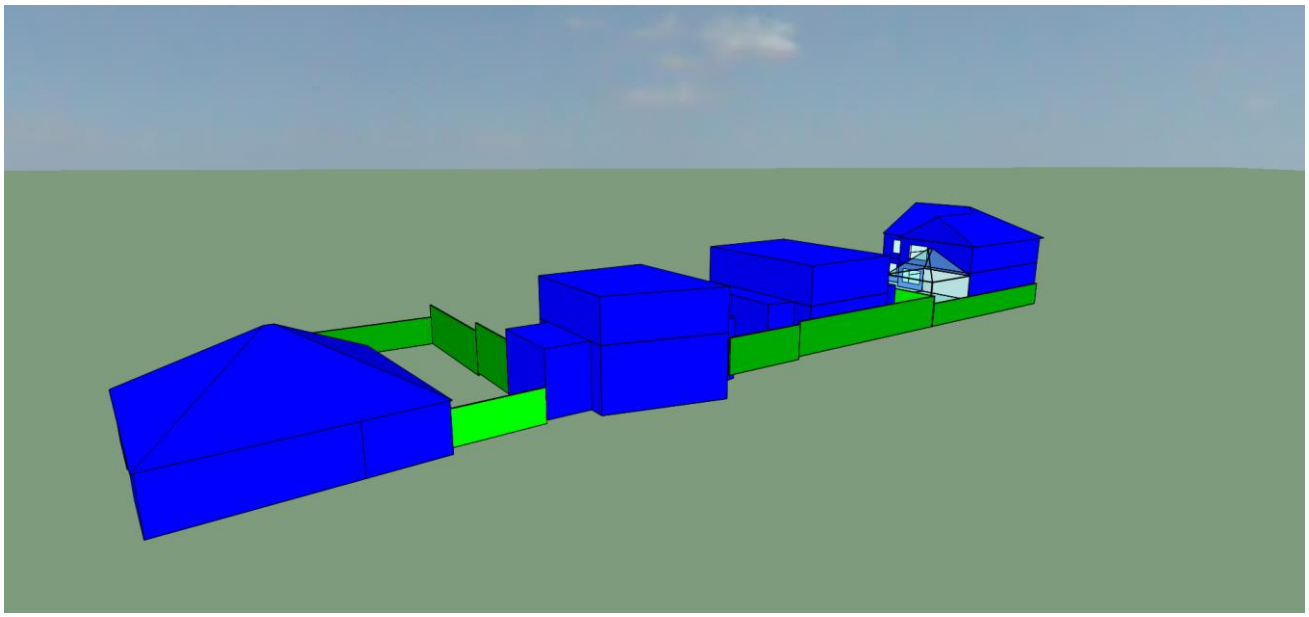

Figure 6 Birds-eye view of the proposed development and surrounding buildings

# 3 Results

## 3.1 Vertical Sky Component

### Frognal 25a

The following windows were considered in detail:

1. Serving the conservatory
2. The first-floor windows facing the new development
3. Assumed ground floor windows facing the new development

Table 1 provides the results for the VSC before and after completion of proposed new development

Table 1. Vertical Sky Component in the windows to rooms of Frognal 25a

| Window | Baseline | Post Development | Percentage remaining |
|---|---|---|---|
| **Ground floor 1** | 31.7 | 35.7 | 89% |
| **Ground floor 2** | 31.6 | 35.1 | 90% |
| **First floor 1** | 40.0 | 38.5 | 95% |
| **First floor 2** | 39.4 | 35.6 | 90% |
| **Conservatory** | 35.8 | 33.8 | 94% |

The results show that both before and after any development all the rooms will receive good levels of light. The reduction in VSC is slight and varies between 5 and 11%.

The impact of the proposed development on the daylight availability in the rooms of Frognal 25a is not significant.

### Frognal 25e

The relevant windows facing the development in the dwelling at Frognal 25e are those in bedroom 2 and bedroom 4. The detailed plans that were now made available (figure 7), indicate an open plan interior with regards to the entrance hall and the living area including the kitchen. It is assumed that there is no light obstruction in the interior of the building between the entrance and the living space. Entrance halls are not considered to be daylight sensitive and therefore usually not considered in the assessment. However, as there appears to be a light connection between the entrance hall and the living space the windows adjacent the front entrance to the building have now been considered.

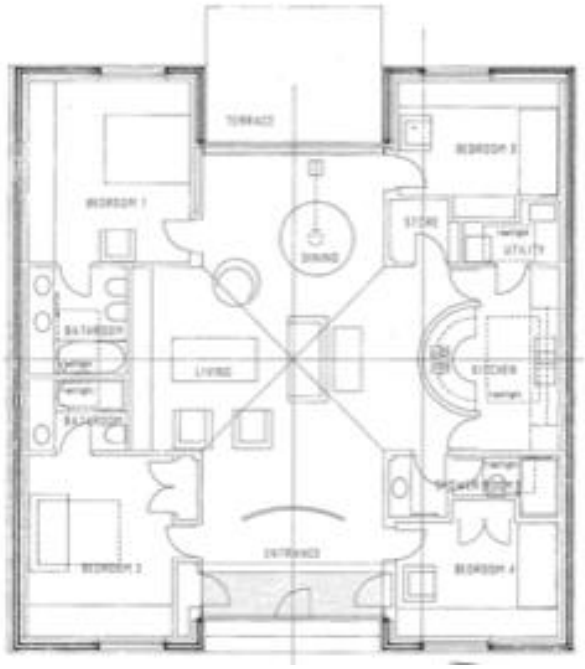

Figure 7 Layout Frognal 25e

The retaining wall between Frognal 25e and the proposed development is covered with dense ivy. Vegetation such as hedges and trees can have a significant effect on the available daylight and sunlight in buildings. It is a matter of judgement whether to include the effects of vegetation on the available daylight and the density and type of the vegetation are factors in the consideration. Decideous trees for instance shed their leaves in winter, just as available light levels become more critical, and are therefore less important a factor than for instance evergreens.

Figure 8 Overview of Ivy stand.

Because of the density and height of the ivy at this location it should be taken into consideration here. Therefore two baseline scenarios have been considered here: a simple baseline that only takes account of hard

landscaping elements such as walls and fences and one that takes into consideration the ivy. The width of the ivy growth merits a transparency factor of 0.

Table 2 shows the results of the VSC calculations.

Table 2. Vertical Sky Component in the windows to rooms of Frognal 25e

| Window | Simple baseline | Ivy baseline | Development | Development v Simple baseline | Development v Ivy baseline |
|---|---|---|---|---|---|
| **Bedroom 2** | 33.6 | 28.9 | 27.1 | 81% | 94% |
| **Bedroom 4** | 33.5 | 30.2 | 30.3 | 90% | 100% |
| **Hallway** | 30.2 | 25.6 | 24.2 | 80% | 95% |

Because the VCN on the hallway windows is below the 27%, the area of no-sky should be considered too. The open plan layout with windows from two directions and the presence of skylights in the roof in the kitchen area mean that a view from the sky is available from all directions.

The impact of the proposed development on the daylight availability of the two bedrooms and the hall-way is not significant.

## 3.2 Daylight Factor

The daylight factor of the bedroom 2 and 4 as well as to the whole of the living space was calculated and the results are shown in figure 9 and table 3.

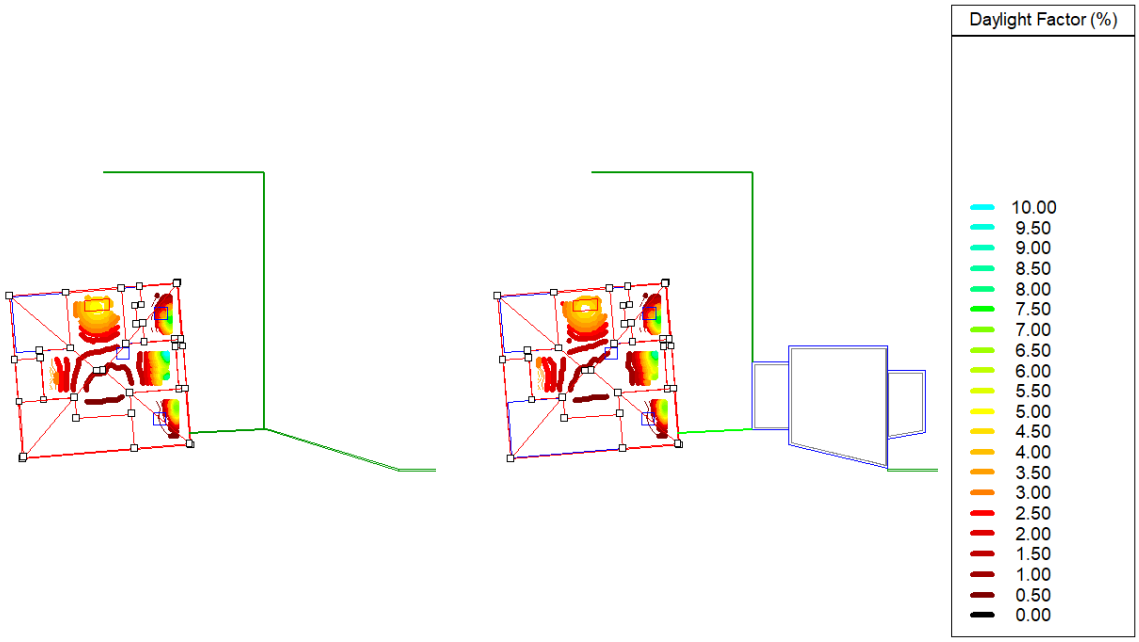


Figure 9 Baseline (L) and Post Development (R) Average Daylight Factor in Frognal 25e

Table 3 Average Daylight Factors of the potentially affected rooms in Frognal 25e

| Room | Simple Baseline | Development |
|---|---|---|
| **Living area** | 2.3 | 2.0 |
| **Bedroom 2** | 1.1 | 1.1 |
| **Bedroom 4** | 2.2 | 2.2 |

The Average Daylight Factor in bedroom 2 and 4 is unaffected by the proposed development. There is a slight reduction in the value of the Average Daylight Factor for the living area, but the overall value remains compliant with the minimum standard for dwellings.

# 4 Discussion and conclusion

This document reports on the results of the analysis of the Vertical Sky Component on the windows in Frognal 25a and Frognal 25e facing the proposed new development, as well as an analysis of the Average Daylight Factor in Frognal 25e.

The results demonstrate that with regards to daylight Frognal 25a will not suffer a significant reduction in available daylight by the proposed new development.

The current line of sight between Frognal 25e and the site of the proposed development is currently dominated by a significant of ivy. When comparing the daylight availability to Frognal 25e following implementation of the proposed development with the current situation, taking account of the presence of the ivy, the effect of the proposed development is negligible. When the presence of the ivy is ignored there would be a slight reduction in available daylight on one of the spaces (signified by the windows on the hallway) within the dwelling, although this reduction remains within the acceptable criteria as set-out in the BRE209 document.

An analysis of the Average Daylight Factor in the potentially affected rooms also indicates that the slight reduction remains within the available minimum standards.

It is therefore concluded that the proposed building will not lead to a significant deterioration of the daylight availability in the nearby properties.