

## Daylight and sunlight assessment tests

### Purpose of this appendix

1 This appendix is intended to provide a factual explanation of the measures of diffuse daylight and sunlight used within the applicant's daylight and sunlight report - setting out the margins for establishing material impacts in this case, based on relevant assessment thresholds, and informed by an independent review of the applicant's daylight and sunlight report.

2 The applicant has used three measures of diffuse daylight (vertical sky component; average daylight factor; and, no-sky line), and one measure of sunlight (annual probable sunlight hours). An explanation of the methodology behind these assessments is set out under the corresponding sections below.

### Diffuse daylight

#### *Vertical sky component*

3 Vertical sky component (VSC) is a 'spot' measure of the skylight reaching the mid-point of a window from an overcast sky. It represents the amount of visible sky that can be seen from that reference point, from over and around an obstruction in front of the window. That area of visible sky is expressed as a percentage of an unobstructed hemisphere of sky, and, therefore, represents the amount of daylight available for that particular window. As it is a 'spot' measurement taken on the outside face of the window, its shortcoming is that it takes no account of the size or number of the windows serving a room, or the size and layout of the room itself.

#### Determining a material impact

4 For existing buildings, the Building Research Establishment (BRE) guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall. The BRE guidelines state that if the VSC at the centre of a window is more than 27% (or if not, then it is more than 80% of its former value), then the diffuse daylighting of the existing building will not be adversely affected.

5 It should, nevertheless, be noted that the 27% VSC target value is derived from a low density suburban housing model. The independent daylight and sunlight review states that in an inner city urban environment, VSC values in excess of 20% should be considered as reasonably good, and that VSC in the mid-teens should be acceptable. However, where the VSC value falls below 10% (so as to be in single figures), the availability of direct light from the sky will be poor.

6 With respect to the reduction factor, it should also be noted that whilst BRE guidelines state that a 20% reduction is the threshold for a materially noticeable change, the independent daylight and sunlight review sets out that given the underdeveloped nature of the site relative to its context, this percentage reduction should be increased to 30%, with an upper threshold of 40%.

### ***Average daylight factor***

7 Average daylight factor (ADF) is a measure of the adequacy of diffuse daylight within a room, and accounts for factors such as the size of a window in relation to the size of the room; the reflectance of the walls; and, the nature of the glazing and number of windows. Clearly a small room with a large window will be better illuminated by daylight than a large room with a small window, and the ADF measure accounts for this.

#### Determining a material impact

8 BRE guidelines confirm that the acceptable minimum ADF target value depends on the room use. That is 1% for a bedroom, 1.5% for a living room and 2% for a family kitchen. In cases where one room serves more than one purpose, the minimum ADF should be that for the room type with the higher value. Notwithstanding this, the independent daylight and sunlight review states that, in practice, the principal use of rooms designed as a 'living room/kitchen/dining room' is as a living room. Accordingly, it would be reasonable to apply a target of 1.5% to such rooms.

### ***No-sky line***

9 No-sky line (NSL) is a measure of the distribution of diffuse daylight within a room. The NSL simply follows the division between those parts of a room that can receive some direct skylight from those that cannot. If from a point in a room on the working plane (a plane 850mm above the floor) it is possible to see some sky then that point will lie inside the NSL contour. Conversely, if no sky is visible from that point then it would lie outside the contour.

10 Where large parts of the working plane lie beyond the NSL, the internal natural lighting conditions will be poor regardless of the VSC value, and where there is significant movement in the position of the NSL contour following a development, the impact on internal amenity can be significant.

#### Determining a material impact

11 When comparing the NSL for existing buildings against that proposed following development, BRE guidelines state that if the no-sky line moves so that the area of the existing room which does receive direct skylight is reduced to less than 0.8 times its former value, then this will be noticeable to the occupants, and more of the room will appear poorly lit.

## **Sunlight**

### ***Annual probable sunlight hours***

12 Annual probable sunlight hours (APSH) is a measure of sunlight that a given window may expect over a year period. The BRE guidance recognises that sunlight is less important than daylight in the amenity of a room and is heavily influenced by orientation. North facing windows may receive sunlight on only a handful of occasions in a year, and windows facing eastwards or westwards will only receive sunlight for some of the day. Therefore, BRE guidance states that only windows with an orientation within 90 degrees of south need be assessed.

#### Determining a material impact

13 BRE guidance recommends that the APSH received at a given window in the proposed case should be at least 25% of the total available, including at least 5% in winter. Where the proposed values fall short of these, and the loss is greater than 4%, then the proposed values should not be less than 0.8 times their previous value in each period.