

PRELIMINARY DAYLIGHT AND SUNLIGHT ASSESSMENT

9657 – 2-4 SEND ROAD

24/02/2021 by EL, reviewed by SP

INTRODUCTION

A pre-app stage preliminary Daylight and Sunlight analysis was carried out for the proposed development at 2-4 Send Road, located in Reading. The design note outlines the results of the analysis, assessing the daylight, sunlight and overshadowing impacts the proposed new build residential development may have on the existing properties and open spaces surrounding the site, as well as evaluating daylight and sunlight levels within residential units of the proposed scheme.

The methodology set out in this report is in accordance with BRE's "Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice" by PJ Littlefair (2011) which is accepted as good practice by Planning Authorities. The following assessments were carried out:

ASSESSMENT OF NEIGHBOURING BUILDINGS

The following assessments were carried out:

- Daylight: 25 Degree Line
- Daylight: Vertical Sky Component for neighbouring properties
- Sunlight: Sunlight Access
- Sunlight: Sunlight Overshadowing

ASSESSMENT OF THE PROPOSED SCHEME

The following assessments were carried out for a sample of residential units within the proposed scheme:

- Daylight: Average Daylight Factor for proposed scheme
- Sunlight: Sunlight Access
- Sunlight: Sunlight Overshadowing

This report is based on proposed drawings received on 8 and 11 February 2021. Desktop research was also undertaken to further inform this report.

SITE

The proposed development is located in 2-4 Send Road, Lower Caversham, within the town of Reading. The scheme entails the demolition of the existing buildings and the construction of two small terraces of houses. The buildings are residential houses with a height up to 3 storeys. The location of the development site is shown in Figure 1.



Site Location



Figure 1: Site location

METHODOLOGY

Computer modelling software was used to carry out the assessments. The model used was based on drawings received (8 and 11 February, 2021).

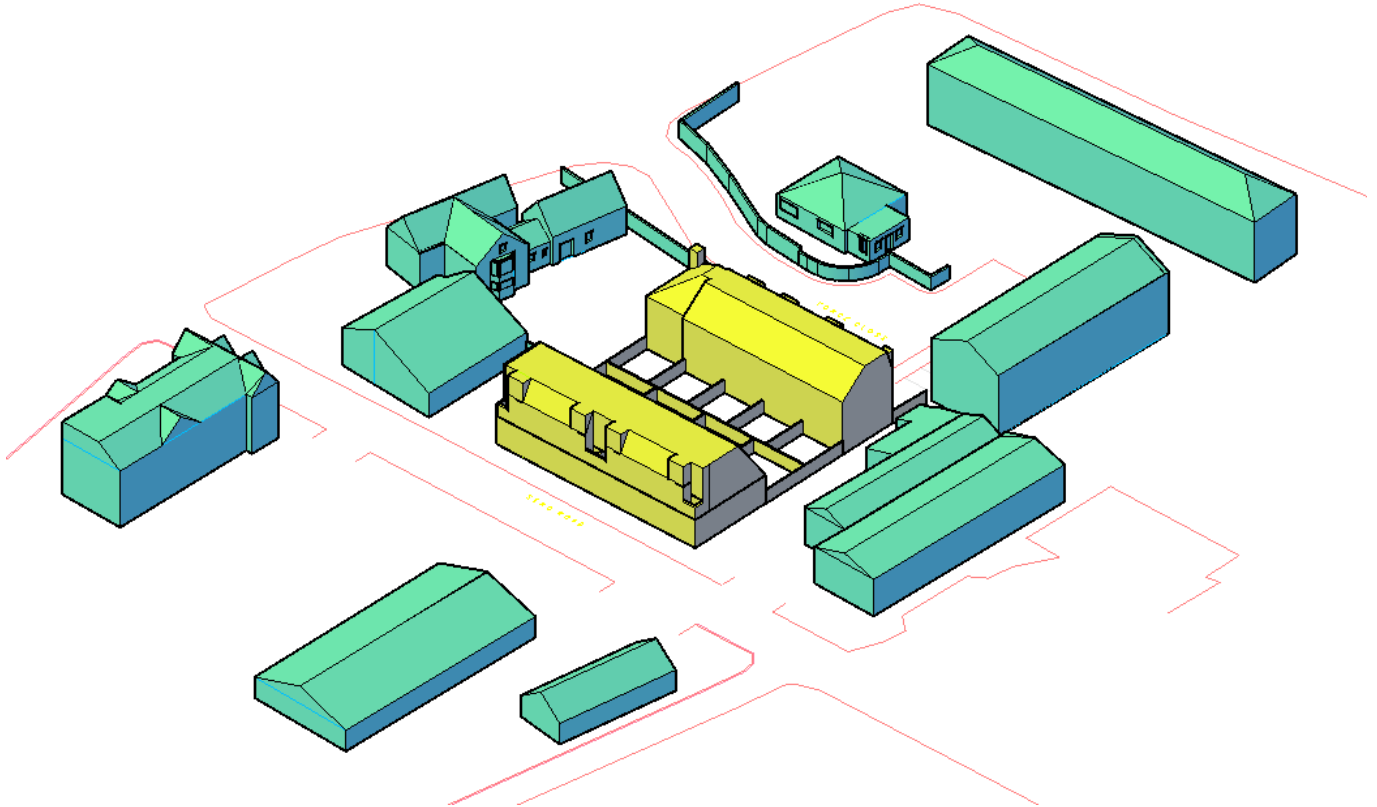


Figure 3: South-west axonometric view of 2-4 Send Road

DAYLIGHT

DAYLIGHT IMPACT ASSESSMENT

25 Degree Line Test

A plane is drawn at 25 degrees from the horizontal, at the centre of an existing window. If the new development intersects with this plane, the internal daylight levels of the surrounding windows may be reduced. When an obstruction of the 25-degree plane occurs, a more detailed assessment involving the Vertical Sky Component of the affected window would need to be carried out.

Absolute Vertical Sky Component (VSC)

The Vertical Sky Component is 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. To maintain good levels of daylight, the Vertical Sky Component of a window needs to be 27% or greater. If the VSC is less than 27%, then a comparison of existing and proposed levels of VSC level would need to be calculated.

Relative Vertical Sky Component

Good levels of daylighting can still be achieved if VSC levels are within 0.8 of their former value.

DAYLIGHT ASSESSMENT (PROPOSED SCHEME)

Average Daylight Factor

The BRE guidelines use the average daylight factor calculation (ADF). The ADF is a measure of internal daylight indicating the ratio of inside illuminance to the outside illuminance expressed as a percentage. The BRE states that daylighting in new rooms can be determined using average daylight factor (ADF) calculations. BS8206-2 Code of Practice for Daylighting recommends different average daylight factors for different habitable spaces. These are as follows:

- 1% for bedrooms
- 1.5% for living rooms and
- 2% for kitchens, or rooms with kitchens

For housing, BS8206 Part 2 states that where a room has a share use the higher target should apply. However, in practice, many local authorities will accept the target values for living rooms in a shared kitchen/living space, as small kitchens may not be considered habitable spaces. In such situations, the living space usually represents the majority of the room area.

SUNLIGHT

SUNLIGHT IMPACT ASSESSMENT

The BRE test relates mainly to existing living room windows, although care should be taken to ensure that kitchens and bedrooms receive reasonable amounts of sunlight. Annual Probable Sunlight Hour (APSH) assessment is carried out when there is an obstruction within the 25-degree line and the window is facing within 90 degrees due south. The APSH assessment states that the existing living room window should receive at least:

- 25% of annual probable sunlight hours (APSH) throughout the year;
- 5% of annual probable sunlight hours during the winter months;
- not less than 80% of its former sunlight hours during either period;
- not more than a 4% reduction in sunlight received over the whole year (APSH).

The term 'annual probable sunlight hours' refers to the long-term average of the total of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account). The 'winter probable sunlight hours' is used to mean the same but only for the winter period (21 September – 21 March).

SUNLIGHT ASSESSMENT (PROPOSED SCHEME)

The BRE guide states that "in general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided: at least one main window faces within 90° of due south and the centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March".

Note that the BRE sunlight tests relate mainly to living room windows, although care should be taken to ensure that kitchens and bedrooms receive reasonable amounts of sunlight.

OVERSHADOWING

Open spaces should retain a reasonable amount of sunlight throughout the year. The BRE states that for an amenity space to "appear adequately sunlit throughout the year, at least half of the area should receive at least two hours of sunlight on 21 March".

RESULTS

DAYLIGHT AND SUNLIGHT ASSESSMENT (OF NEIGHBOURING PROPERTIES)

Site analysis was carried out to identify any potential daylight and sunlight impacts on the surrounding properties. Relevant properties tested in this report adjacent to the proposed development are annotated in the figure below.

The following neighbouring buildings were tested in detail for the daylight and sunlight impact assessment:

- 399 Gosbrook Road
- 1-5 Forge Cl
- Ivy Farmhouse, 393 Gosbrook Road

 **Site Location**



Figure 2: Site location and neighbouring buildings assessed

The following buildings are associated with non-residential spaces which have lower daylight expectations or residential spaces that complied perfectly with the 25° drawn plane regarding the proposed development. Therefore, they have been excluded from the assessment:

- 1 Send Road
- 3 Send Road
- 6 Send Road

- 389 Gosbrook Road
- Gosbrook House on Star Road

DAYLIGHT ASSESSMENT (OF NEIGHBOURING PROPERTIES)

A total of 13 representative worst-case windows from buildings surrounding the site were highlighted as being in close proximity to and facing the proposed development at 2-4 Send Road. Daylighting levels for potentially affected windows to surrounding properties were found to be acceptable.

In summary,

- 5 out of 13 windows passed the 25-degree lined test;
- all remaining 8 windows achieved VSCs greater than 27%.

Table 1: Daylight results summary

Total number of windows assessed for daylight criteria	13
Number of windows passing the 25° initial test	5
Number of windows achieving a VSC >27%	8
Number of windows that do not meet any of the above criteria	0

Table 2: Daylight results summary per building

Property	399 Gosbrook	1-5 Forge CI	393 Gosbrook
Number of windows tested	4	6	3
Number of windows passing the 25° initial test	4	0	1
Number of windows with a VSC higher than 27%	4	6	3
Number of windows that do not meet any of the above criteria	0	0	0

SUNLIGHT ASSESSMENT (OF NEIGHBOURING PROPERTIES)

A total of 7 representative worse case windows within 90 degrees due south from buildings surrounding the site were assessed for sunlight access. The analysis showed that 5 windows passed the 25-degree line test. The remaining 2 windows satisfy the BRE criteria for annual probable sunlight hours (APSH) and winter probable sunlight hours (WPSH). Therefore, the proposed development at 2-4 Send Road is not considered to have any notable impact on sunlight access to windows of neighbouring properties.

Table 3: Sunlight results summary

Total number of windows facing within 90° of south	7
Number of south facing windows passing the 25° initial test	5
Number of south facing windows with APSH greater than 25% and WPSH greater than 5%, or of at least 0.8 of their former existing value	7
Windows that do not meet any of the above criteria	0

OVERSHADOWING ASSESSMENT (OF NEIGHBOURING PROPERTIES)

A review of the site plan showed that there is one amenity or open space near the proposed development and outside the proposed development's site boundary, as shown in the figure below. This is the garden of the listed building, Ivy Farmhouse, 393 Gosbrook Road. A Solar Access Analysis was undertaken on this amenity area on 21 March as set out by the BRE.

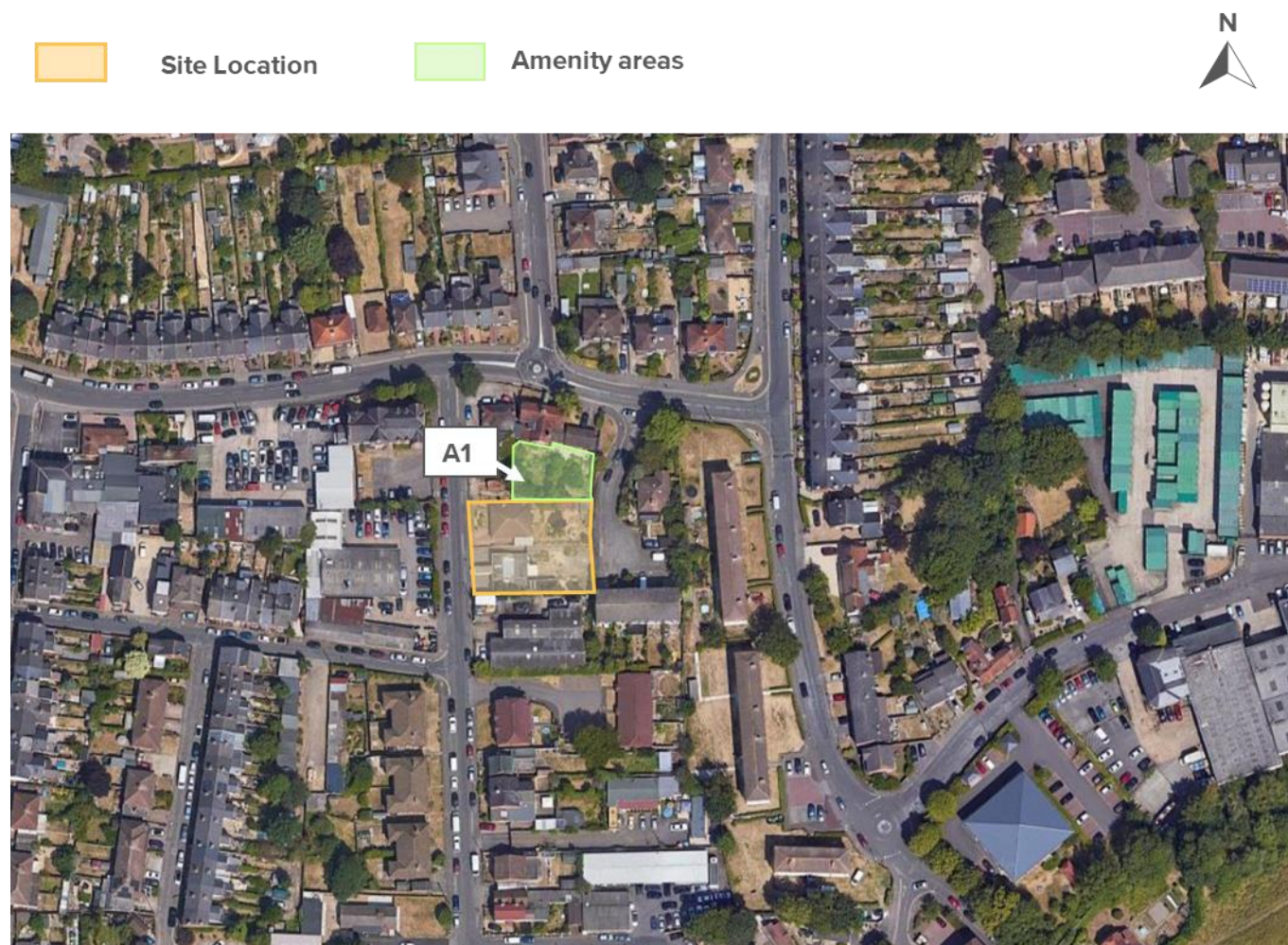


Figure 3: Amenity and open spaces in close proximity to development site

The table below indicates the results showing that at least 89% of the analysed space will receive more than two hours of sunlight on 21 March under proposed conditions, which notable exceeds the BRE recommendation of 50%. The relative change in area receiving more than 2 hours of sunlight on 21 March as a result of the proposed development is only 1%. Therefore, the proposed development is not considered to have any significant impact on sunlight access to the neighbouring amenity and open space.

Table 4: Amenity overshadowing results for the proposed development

Amenity Ref.	Area Receiving at Least Two Hours of Sunlight (sqm)		Proposed/Existing
	Existing	Proposed	
A1	343 (89%)	341 (89%)	0.99

DAYLIGHT AND SUNLIGHT ASSESSMENT (OF PROPOSED SCHEME)

The rooms evaluated in the internal daylight assessment include open plan kitchen, living room, dining spaces within the proposed development. The assessment was carried out for 2 no. dwellings, considered to be the worst-case units in terms of daylight access across the scheme. The private amenity areas belonging to the 2 dwellings were also included in the overshadowing assessment. In the following figures, dwellings, rooms, and amenity areas assessed are highlighted in red, blue, and green respectively.

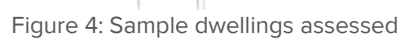




Figure 6: Sample bedrooms assessed



Figure 7: Sample amenity spaces assessed

AVERAGE DAYLIGHT FACTOR

A total of 2 no. dwellings located on the ground floor that are considered to be the worst-case representative units in terms of daylight access were included in the assessment. For the calculations, the following assumptions were made:

- 50% average internal surface reflectivity
- 68% light transmission for vertical glazing

The results indicate that the one KLD room (ground floor of Unit 03) achieves an ADF of 3.9%. The second assessed KLD room (ground floor of Unit 09) achieves an ADF of 2.9%. Both of these sample KLDs meet the ADF target of 2.0% set out by BRE guidance.

The five bedrooms achieve an ADF greater than 1.0%. Bedrooms 1 and 2 at first floor of Unit 03 achieve an ADF of 2.9% and 1.9%, respectively, whereas the bedroom at second floor (Bedroom 3) achieves an ADF of 1.1%. Bedrooms 1 and 2 at first floor of Unit 09 achieve an ADF of 2.1% and 2.8%, respectively. A summary of daylight results is presented in Table 5.

Table 5: Daylight results summary.

Number of habitable rooms tested	7
Number of kitchen/living/dining rooms	2
Number of kitchen/living/dining rooms with ADF meeting 2% target for kitchens	2
Number of kitchens that achieve ADF marginally below the BRE recommendations	0
Number of kitchen/living/dining rooms	5
Number of bedrooms with ADF meeting 1% target	5
Number of bedrooms with ADF marginally below the BRE recommendations	0

SUNLIGHT ASSESSMENT (OF PROPOSED SCHEME)

A sunlight access assessment has been carried out for the KLDs within the 2 no. sample dwelling units in line with the BRE methodology. Both KLDs have at least one main window facing within 90° of due south.

The analysis indicates that the 2 living room spaces analysed will achieve adequate annual and winter sunlight based on the BRE guide. The windows for included in the living room spaces of both assessed units benefit from an appropriated size and an outdoor amenity space which provides access to direct sunlight.

OVERSHADOWING ASSESSMENT (OF PROPOSED SCHEME)

The private amenity areas for the 2 no. sample units have been included as part of this assessment.

The results show that all amenity spaces analysed will receive more than 2 hours of sunlight on 21st March on at least 50% of the area, under proposed conditions, meeting the BRE requirements for overshadowing.

Table 6: Amenity overshadowing results for the proposed development

Amenity Ref.	Proposed Lit Area (%)
A3	70%
A9	66%

CONCLUSIONS

In conclusion, the proposed scheme performs well in relation to daylight and sunlight access for windows and amenity spaces in general, and is considered to have no significant impact to daylight and sunlight levels to surrounding properties and amenity spaces.