

Daylight and Sunlight Assessment (Proposed Scheme)

Heron House, 44-46 the Grove, Gravesend

For Substantia Capital

July 2026

ecolytik

This page has been left intentionally blank

Contents

1	Executive Summary	4
1.1	Daylight	4
1.2	Sunlight	4
2	Introduction	5
2.1	Site	5
2.2	Planning policies	5
2.3	Application of BRE’s guidance	5
3	Technical model	6
3.1	Sources of information and assumptions	6
3.2	Scope of assessment	6
4	Assessment results	7
4.1	Daylight	7
4.2	Sunlight	9
5	Conclusions	11
Appendix A – Detailed results		A
Appendix B – Planning policies		B
Appendix C – BRE guidance		C

Project number	990
Report status	Draft
Revision number	-
Prepared by	Kostas Mastronikolaou
Checked by	Sherleen Pang

1 Executive Summary

Daylight and Sunlight analysis was carried out for the proposed development at Heron House, 44-46 The Grove, within the jurisdiction of Gravesend Borough Council. This report outlines the results of the analysis for the planning application, evaluating daylight and sunlight access within the development.

The proposed development comprises repurposing the lower ground floor of the existing building to provide 5no. homes.

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 (2022) which is accepted as good practice by Planning Authorities. The numerical criteria suggested within the BRE guidelines were applied to the assessment and it is important to note that these guidelines are not a rigid set of rules but are advisory and often need to be applied flexibly according to the specific context of a site.

To carry out the assessment, a 3D computer model was generated for the existing site, the key surrounding properties and the proposed scheme. Using this model and specialist software, the daylight and sunlight levels were calculated for habitable spaces within the proposed dwellings.

1.1 Daylight

Three out of six habitable rooms were found to exceed BRE’s recommendations for daylight.

There remaining three rooms are open plan studios and were found to be marginally below the illuminance target for living rooms but above BRE’s target for bedrooms. Notably, the living areas of these studios are positioned closer to the glazed areas and achieved the 150 lux illuminance target for living rooms for 50% of the available daylight hours of the year in line with BRE’s recommendations. Given the distribution of daylight within these studios (i.e. the living areas achieving over 150 lux and the whole studio exceeding light levels recommended by the BRE

for bedrooms), the results are deemed to be satisfactory.

1.2 Sunlight

All habitable spaces were found to exceed BRE’s recommendations for sunlight.

Four out of five rear gardens proposed for the dwellings were found to exceed BRE’s sunlight recommendations. The remaining amenity space is fairly restricted from the surrounding context to the south of the application site, but was found to receive good levels of sunlight during the summer, when future residents are more likely to utilise the external amenity spaces in reality.

Overall, the proposed development is designed considering relevant industry standards and will provide good quality of accommodation to the future residents from a daylight and sunlight perspective, when taking into account the existing constraints of the site.

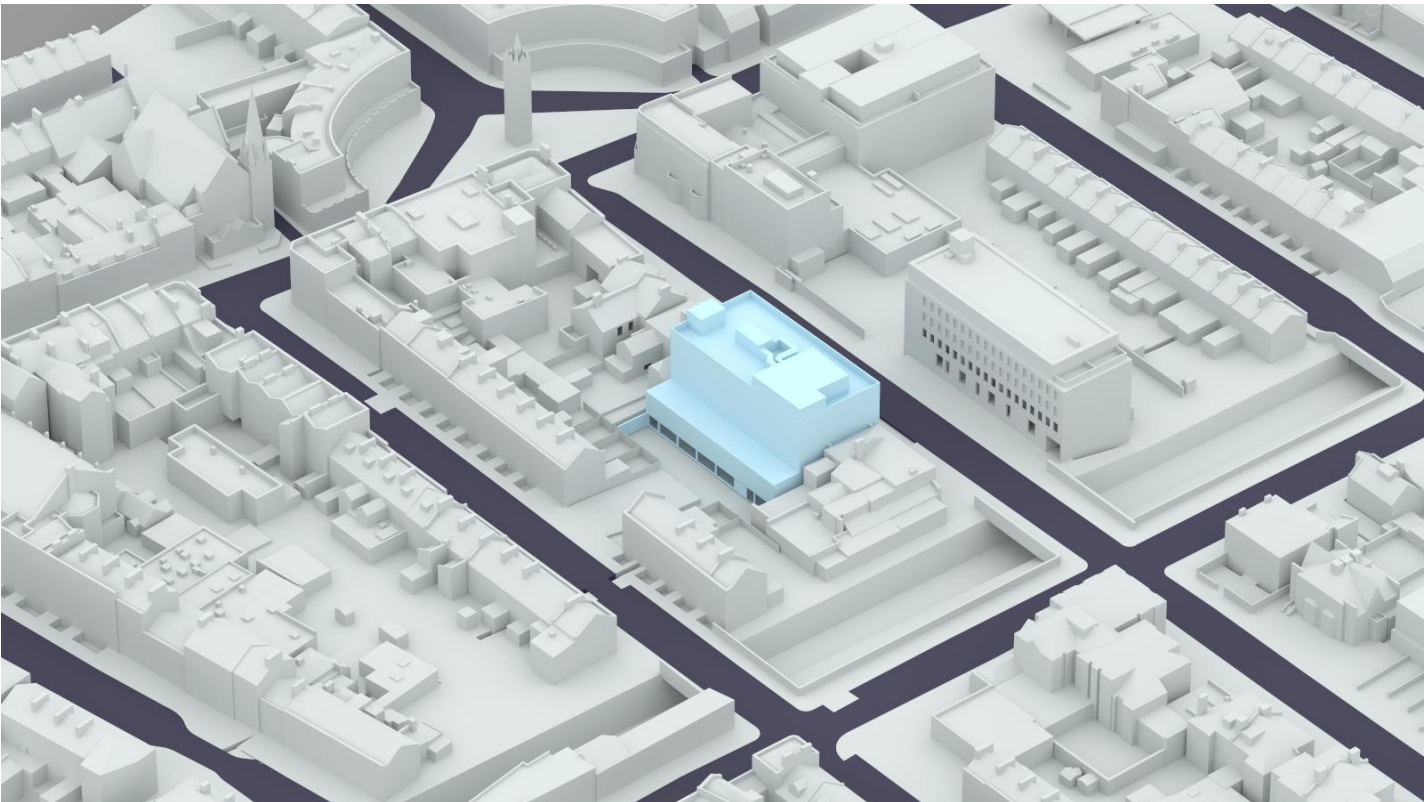


Figure 1. Technical 3D model of the proposed development and surrounding context (view from southwest).

2 Introduction

Ecolytik have been instructed to evaluate daylight and sunlight access within the proposed lower ground floor dwellings at Heron House. The assessment considers the latest proposal for the site.

2.1 Site

The proposed scheme comprises repurposing the lower ground floor of the existing building to provide five homes, consisting of four studios and one 1-bedroom flat. The site location is presented in Figure 2.

2.2 Planning policies

Local, regional and national planning policies relating to daylight and sunlight has been. In general terms, planning policy advises that new development should be making the best use of land and be designed in a way that enables appropriate levels of daylight and sunlight amenity. Provision of daylight and sunlight should be balanced against potential overheating risks. Policy requires new development to be assessed against BRE's guidelines. BRE's latest "Site layout planning for daylight and sunlight" document published in 2022 provides a set of recommendations for daylight and sunlight in new developments. It builds on British Standard EN 17037 (2018) and sets out criteria to evaluate both the quantity and quality of daylight and sunlight within new developments.

A full summary of the relevant policy landscape is presented in Appendix B.

2.3 Application of BRE's guidance

The BRE guidelines advise that the quality, quantity and distribution of daylight and sunlight within a habitable space would be notably affected if building obstructions are large in relation to their distance away. When assessing a proposed residential development, only those

windows and rooms that have a reasonable expectation of daylight and sunlight need to be considered. The main habitable rooms have been tested, with non-habitable spaces such as staircases, hallways, bathrooms, toilets, stores etc omitted.

Sunlight specifically is mainly sought in living rooms and external amenity spaces, although the BRE guide recognises that for housing specifically, at least one room of the dwelling should meet the minimum sunlight recommendation. It is therefore considered that any dwellings that have at least one habitable room receiving adequate sunlight to be performing satisfactorily.

In addition, it is worth highlighting the following excerpts from the guidance:

"The guide is intended for building designers and their clients, consultants, and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."

It is therefore important to apply the BRE guidance flexibly, with careful consideration of the specific site context. Its numerical targets theoretically apply to any built environment, from city centres to rural villages. However, in more tightly constrained environments, achieving the default BRE targets can be very challenging and can conflict with other beneficial factors of site layout design. With the above in mind, rigid adherence to the BRE in certain situations could result in an inappropriate form of development. The specific criteria and recommendations of the BRE guidance are presented in Appendix C of this report.



Figure 2. Approximate site location of Heron House.

3 Technical model

3.1 Sources of information and assumptions

Drawings and stereo photogrammetry were used to create a 3D computer model of the proposed development in the context of the surrounding site.

The full list of sources of information used in this assessment is as follows:

- 3D model generated from aerial mapping using stereo photogrammetry by AccuCities.
- Basement plan apartments (file: Base-2) by Hillman.
- Email correspondence with applicant team confirming rear garden walls will be less than 1.5m in height and glazed areas would be 2.1m high.

3.2 Scope of assessment

The images to the right show the technical 3D model developed for the analysis. All habitable rooms for the lower ground floor dwellings were modelled in detail and included in the analysis.

The model includes the following inputs with regards to surface reflectance which can influence the calculations:

- External walls 0.2
- Internal walls 0.8
- Floors 0.4
- Ceilings 0.9

The design team will adopt light-coloured internal finishes for the above reflectance values to be achieved.

A maintenance factor for dirt of 92% was applied to all glazing, which was modelled as double-glazed units, with a light transmission of 68%. The obscure window proposed for the southernmost studio of the scheme was also modelled with the same light transmission parameters.

The proposed 1-bedroom flat has an open plan kitchen/ living/ dining (KLD) area, with the kitchen located to the rear of the room and away from the façade. Therefore, the kitchen would be considered task lit. The kitchen was included in the calculation working plane but the target of 150 lux for living rooms was applied to the assessment as it would be more appropriate to the open plan space and to avoid separate kitchen in the design. The bedroom of the 1-bed flat was assessed against the 100-lux target.

Open planned studios were also modelled in a similar approach with an illuminance target of 150 lux. Given the proposed layouts of the studios, consideration was also given to the 100-lux target for the rear of the studios where the bedroom spaces are proposed to be located.

The working plane of each habitable room was set in line with BRE's guidance. Where there is an entrance corridor of less than 1.5m wide to reach the main occupied zone of the room, this was excluded from the assessed working plane.

The applicant team have confirmed that the rear gardens would not have solid fences of more than 1.5m in height. Therefore, in line with BRE guidance, garden walls were not included in the technical model.

The existing bridge and outbuilding to the rear of the site (shown in yellow in Figure 4) are proposed to be removed to improve daylight and sunlight access to the dwellings. Therefore, these structures were omitted from the calculation model.

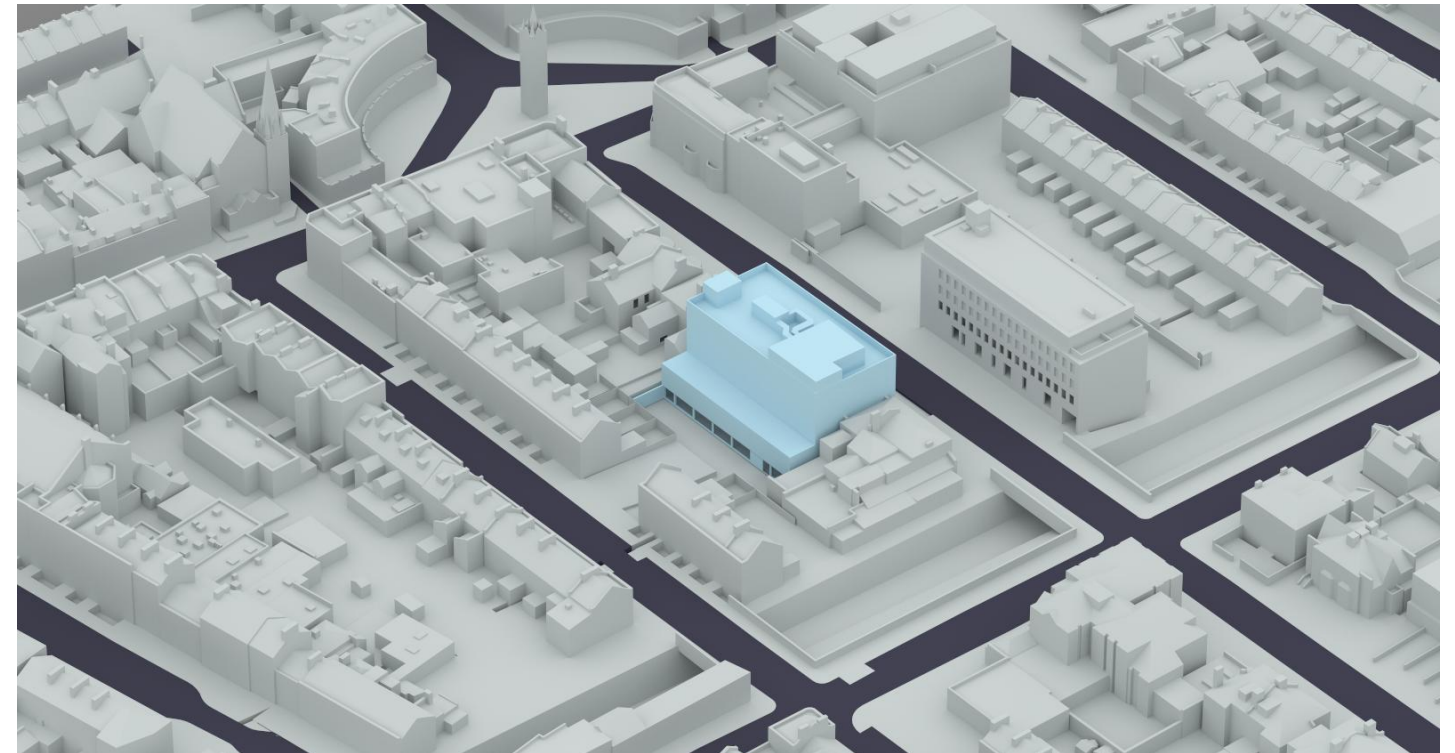


Figure 3. 3D model of the proposed development and context (view from southwest).

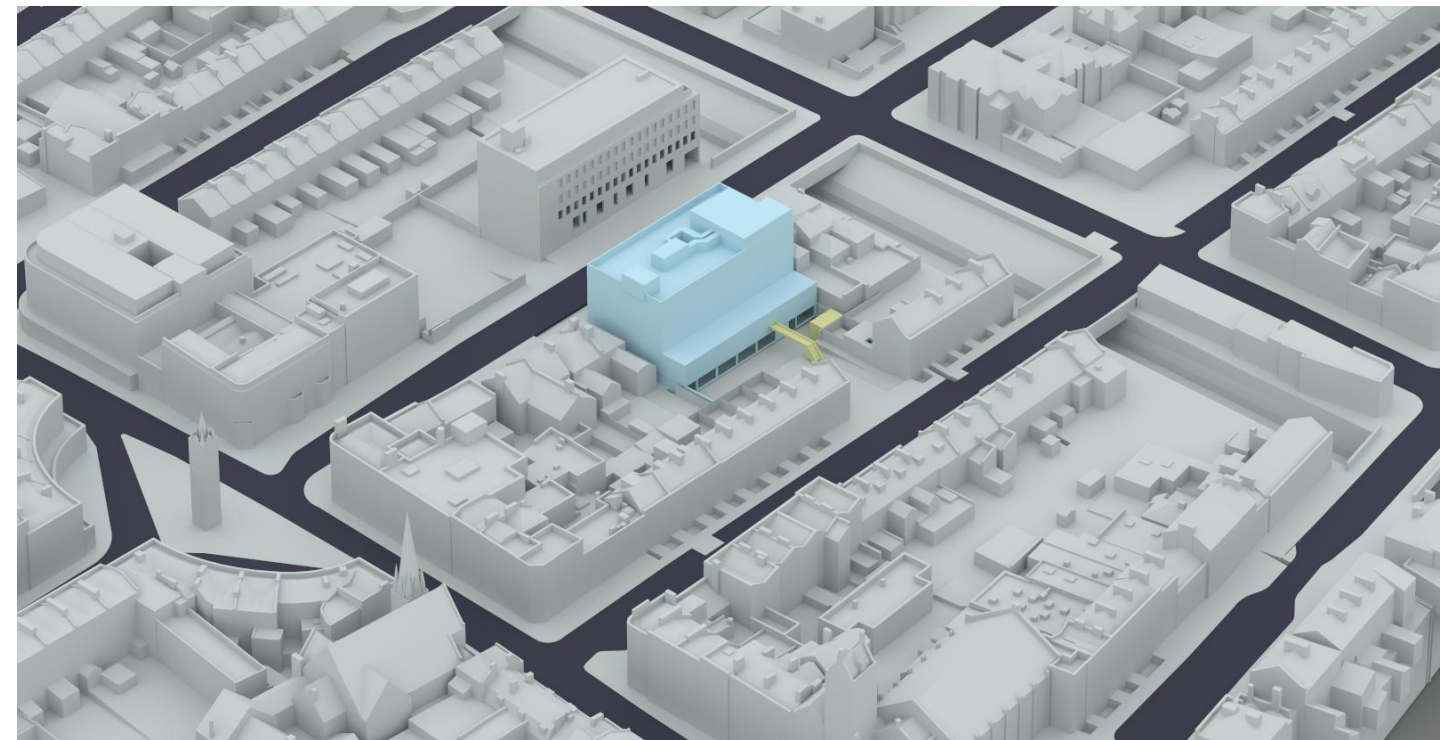


Figure 4. 3D model of the proposed development and context (view from northwest). The existing bridge and outbuilding shown in light yellow are proposed to be removed.

4 Assessment results

4.1 Daylight

Figure 5 and Figure 6 on the following page show the daylight assessment results for habitable rooms at lower ground floor level. Figure 5 shows the results for when all studio rooms were assessed against the living room criteria, and Figure 6 shows the results for when studio rooms R2, R3 and R4 were assessed against the bedroom criteria.

The yellow colour shows where a room achieves the required daylight illuminance for over 50% of the daylight hours of the year. If this area is more than 50% of the room's area, then the room exceeds BRE's daylight recommendations.

Three habitable rooms (R1, R5, R6) were found to exceed BRE's recommendations for daylight access to living rooms (Figure 5).

Three studio rooms (R2, R3, R4) were found to be marginally below BRE's recommendations for the 150-lux illuminance target for living rooms, achieving Spatial Daylight Autonomy (SDA) for over 44% of the rooms' areas. As can be seen from the visual illustrations on the following page, the front of these studios which is the living area achieved the 150 lux illuminance target; the rear of studios where bedrooms are located and where daylight expectations would be lower were found to receive less natural light.

The Median Illuminance of studios R2, R3 and R4 ranges from 125-136 lux, as shown in both figures on the following page. When studios R2-R4 are evaluated against the 100-lux illuminance target for bedrooms, it can be seen that they receive adequate daylight across the entire rooms (Figure 6). Given the distribution of daylight within these studios (i.e. the living areas achieving over 150 lux and the whole studio exceeding light levels recommended by the BRE for bedrooms), the results are deemed to be satisfactory.

The proposed design has maximised glazed areas for all dwellings and has optimised room depths to achieve reasonable levels of daylight for all

proposed homes at lower ground level whilst also providing rooms that are as spacious as feasible. Overall, it can be concluded that the scheme broadly complies with BRE's guidelines, and the proposed homes will benefit from reasonable levels of daylight for future residents.

The detailed numerical results are presented in Appendix A (Daylight) of this report.

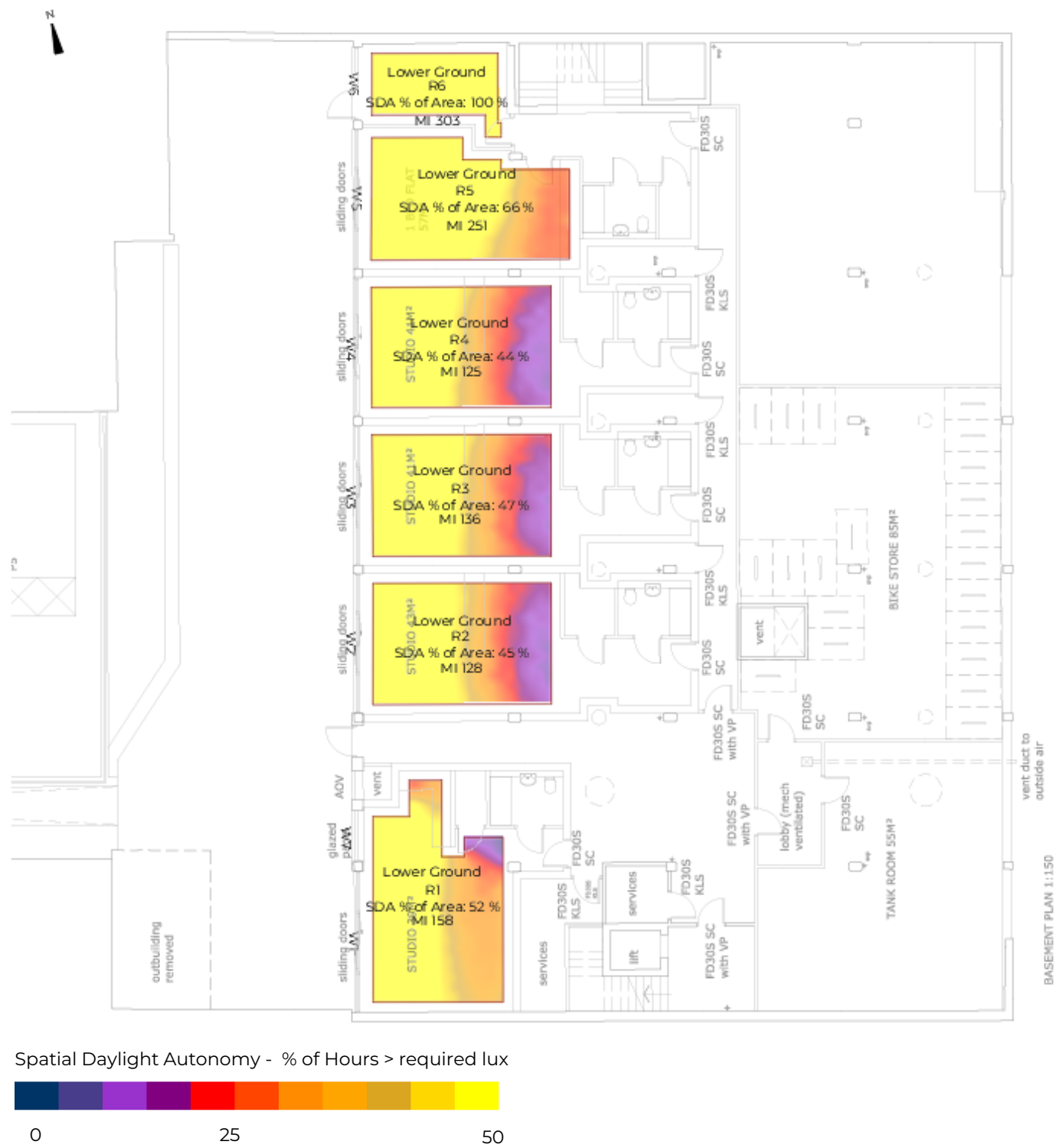


Figure 5. Spatial Daylight Autonomy (SDA) results for habitable rooms on lower ground floor (with window and room references).

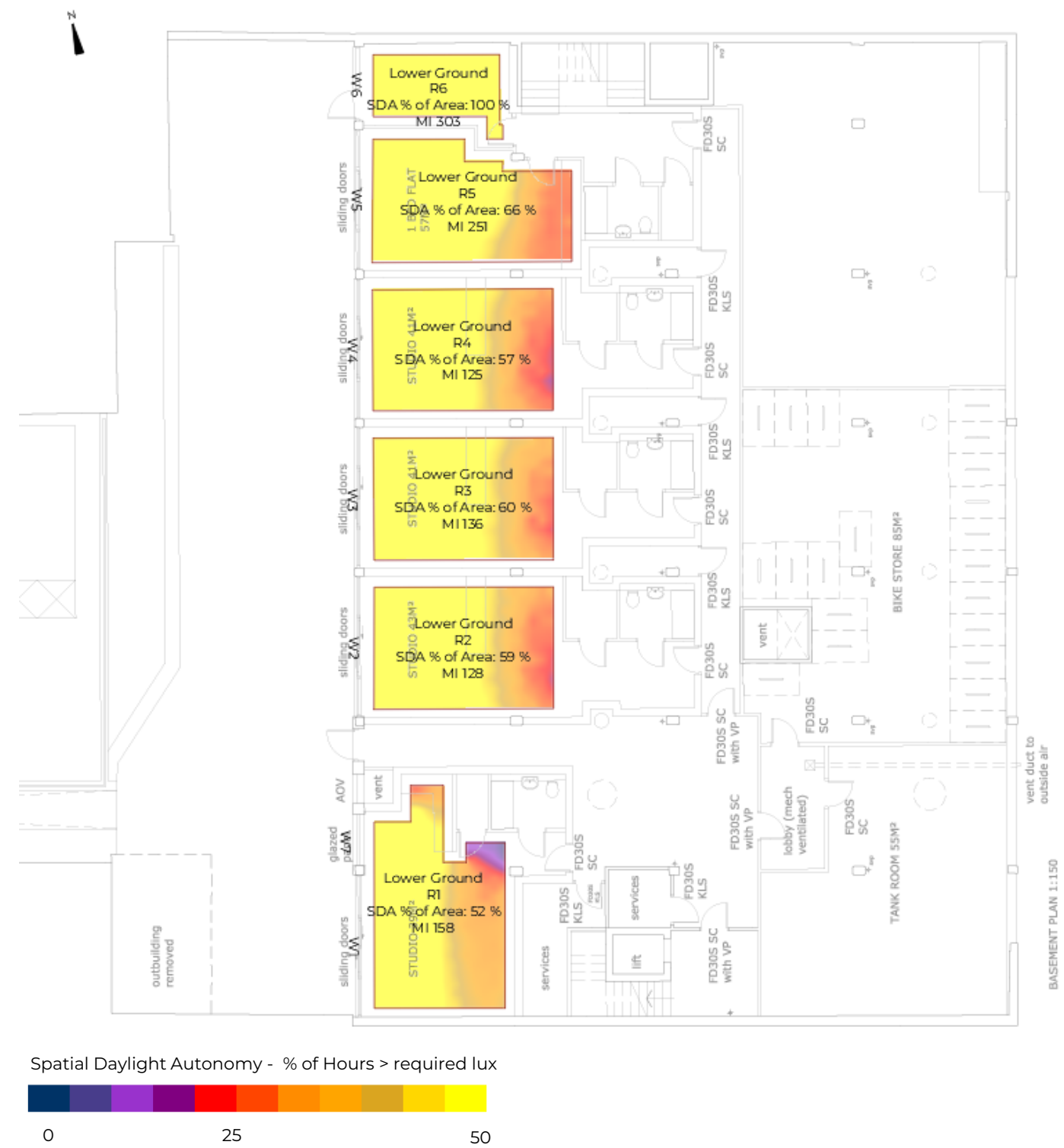


Figure 6. SDA results for habitable rooms on lower ground floor, where studios R2-R4 are assessed against the 100 lux target for bedrooms.

4.2 Sunlight

The detailed numerical results are presented in Appendix A (Sunlight to amenity) of the report.

4.2.1 Sunlight to rooms

All dwellings will have at least one window that achieves BRE's recommended sunlight criteria. Therefore, future residents of the development will enjoy levels of sunlight in line with BRE standards. The detailed results are presented in Appendix A (Sunlight to rooms).

4.2.2 Sunlight to amenity

Four out of five rear gardens proposed for the dwellings were found to exceed BRE's sunlight recommendations.

The southernmost garden (A1) is fairly restricted from the surrounding context to the south (please see and the model images on page 6) and would receive some sunlight on 21 March (6% of the area would achieve at least 2 hours of sunlight, as shown in Figure 7 on the following page). However, during the summer, when future residents are more likely to utilise the external space in reality, the results show that this amenity space would achieve at least 2 hours of sunlight for 82% of its area (Figure 8).

It should also be noted that the applicant team are proposing to remove the outbuilding to the west of this southernmost garden (highlighted by the red hatched box within the images on the following page) which was found to improve sunlight access. Further measures to increase sunlight exposure to this amenity space are not deemed feasible as they will entail changes that are outside of the site's boundary. Overall, the benefit of providing a private garden outweighs the reduced levels of sunlight on 21 March.

Overall, sunlight access to the proposed rear gardens is considered acceptable given the amount of sunlight received during the summer, the nature of the scheme and density of the surrounding context to the south.



Figure 7. Sunlight hours to amenity spaces on 21 March (with amenity space references).

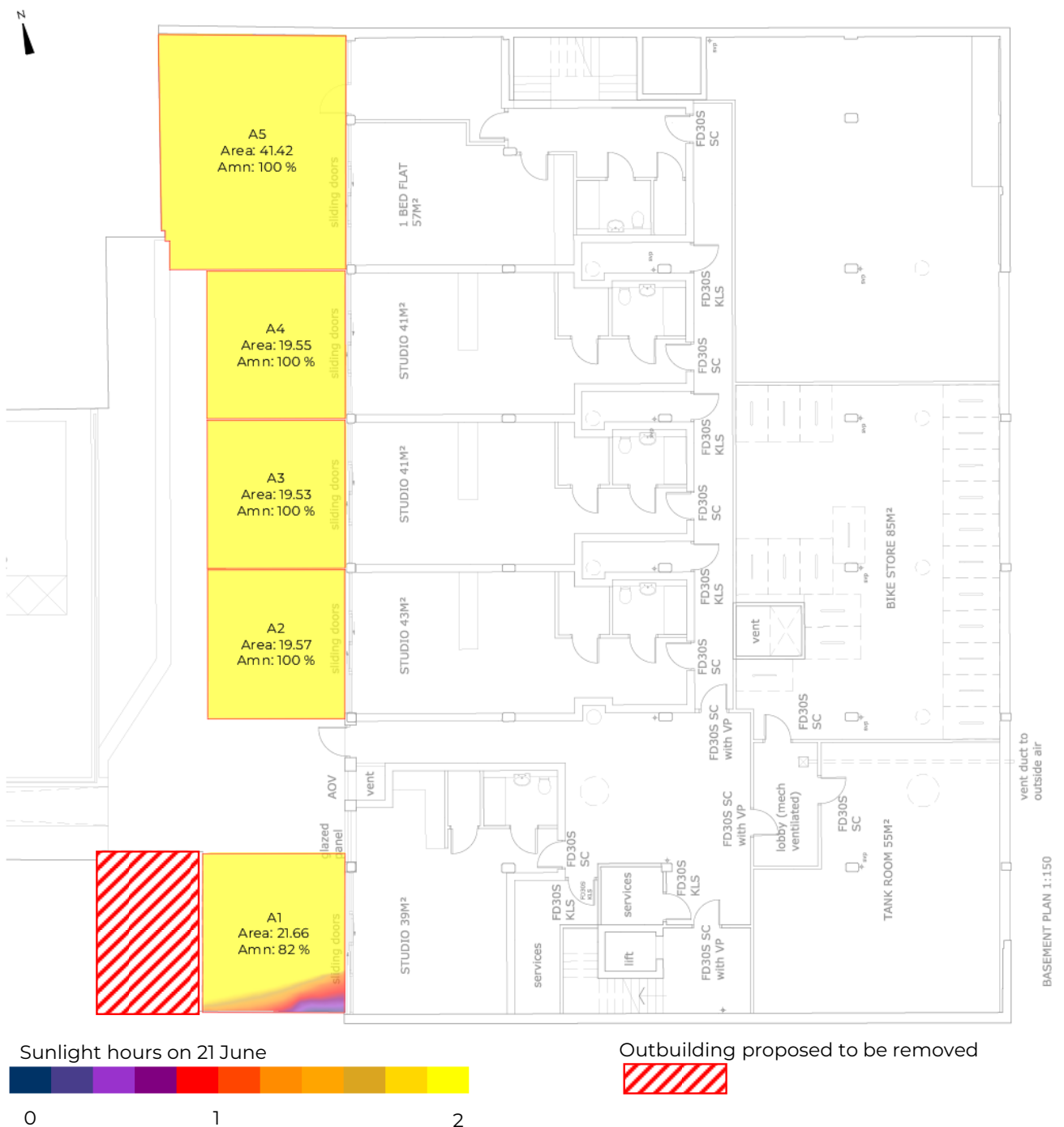


Figure 8. Sunlight hours to amenity spaces on 21 June (with amenity space references).

5 Conclusions

Based on the findings, it can be concluded that the proposed scheme will provide satisfactory levels of daylight and sunlight to future residents and their homes when the existing constraints to the site are considered. The planning application could be supported from a daylight and sunlight perspective.

Appendix A – Detailed results

Daylight to rooms

Floor Ref	Room Ref	Room Use	Room Area m²	Effective Area m²	Median Lux	Area Meeting Req Lux	% of Area Meeting Req Lux	Criteria				Meets BRE Criteria
								Req Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours	
Lower ground	R1	Studio	30.28	22.97	158	11.93	52%	150	50%	50%	4380	Yes
	R2	Studio	27.04	21.07	128	9.55	45%	150	50%	50%	4380	Meets 100 lux target for bedrooms
	R3	Studio	27.11	21.13	136	10.01	47%	150	50%	50%	4380	Meets 100 lux target for bedrooms
	R4	Studio	27.05	21.07	125	9.30	44%	150	50%	50%	4380	Meets 100 lux target for bedrooms
	R5	Living Room	27.00	20.63	251	13.53	66%	150	50%	50%	4380	Yes
	R6	Bedroom	12.23	7.88	303	7.88	100%	100	50%	50%	4380	Yes

Sunlight to rooms

Floor Ref	Room Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Meets BRE criteria
Lower Ground	R1	Studio	W1	284°N	0.0	Yes
			W7	284°N	1.7	
					1.7	
Lower Ground	R2	Studio	W2	284°N	1.5	Yes
					1.5	
Lower Ground	R3	Studio	W3	284°N	1.8	Yes
					1.8	
Lower Ground	R4	Studio	W4	284°N	2.1	Yes
					2.1	
Lower Ground	R5	Living Room	W5	284°N	2.6	Yes
					2.6	
Lower Ground	R6	Bedroom	W6	284°N	2.5	Yes
					2.5	

Sunlight to amenity

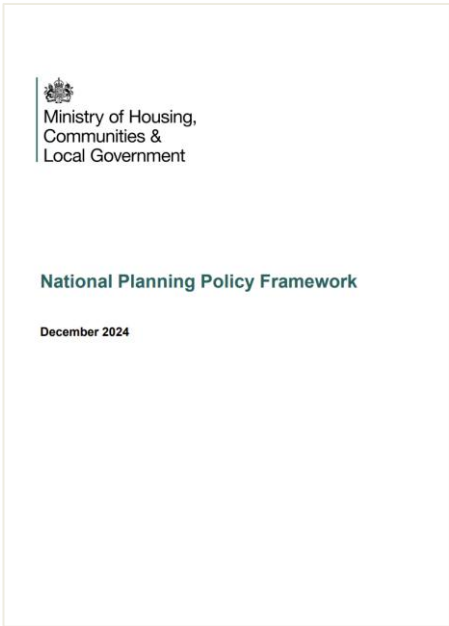
Amenity ref	Amenity area m²	21 March Lit Area proposed m²	21 March Lit area proposed %	Meets BRE criteria	21 June Lit Area proposed m²	21 June Lit area proposed %
A1	21,7	1.2	6%	No	21.7	82%
A2	19.6	19.6	100%	Yes	19.6	100%
A3	19.5	19.5	100%	Yes	19.5	100%
A4	19.6	19.6	100%	Yes	19.6	100%
A5	41.4	40.4	97%	Yes	41.4	100%

Appendix B – Planning policies

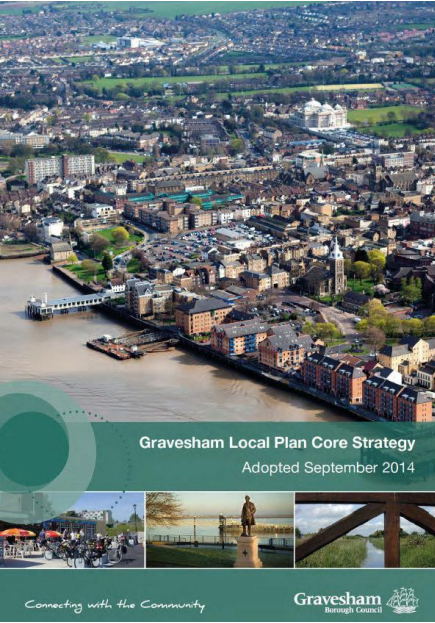
National Planning Policy Framework (2024)

This document provides a framework within which locally prepared plans for housing and other development can be produced.

For example, it sets out how the planning system could achieve sustainable development, effective use of land, well-designed places, protecting the green belt, meeting the challenge of climate change, among several other aspects which precipitate with more specificity into local planning policies.



Gravesend Local Plan Core Strategy (2014)



This document is the Council's adopted Core Strategy. It is accompanied by a Policies Map which shows the areas affected by the policies in the Core Strategy and saved policies from the Local Plan First Review (1994). It has been informed by a Sustainability Appraisal/Strategic Environmental Assessment and a Habitats Regulations Assessment.

The Core Strategy must be consistent with national planning policy, in particular the National Planning Policy Framework (NPPF). Relevant policies to daylight/sunlight are summarised below.

CS19 Development and Design Principles

Among other considerations for new development, this policy sets out daylight/sunlight principles expected for residential projects.

New development should “safeguard the amenity, including privacy, daylight and sunlight, of its occupants and those of neighbouring properties and land”.

Appendix C – BRE guidance

Daylight

The illuminance method is one of the approaches that could be adopted to determine whether a development meets daylight recommendations set out within the BRE guide (2022) and BS EN 17037 (2022). It entails the use of climatic data for the location of the site and the evaluation of the illuminance levels, measured in lux, over the working plane or assessment grid. The following should be achieved for at least 50% of the assessment grid:

- Bedrooms 100 lux
- Living rooms 150 lux
- Kitchens 200 lux

Where a room has a shared use, the higher target should apply although local authorities could use discretion. The target for living room could be used for a kitchen / living / dining area for example to avoid having small separate kitchens in a design. Conversely, a higher illuminance target may be set for a room in homes for the elderly.

Sunlight to windows

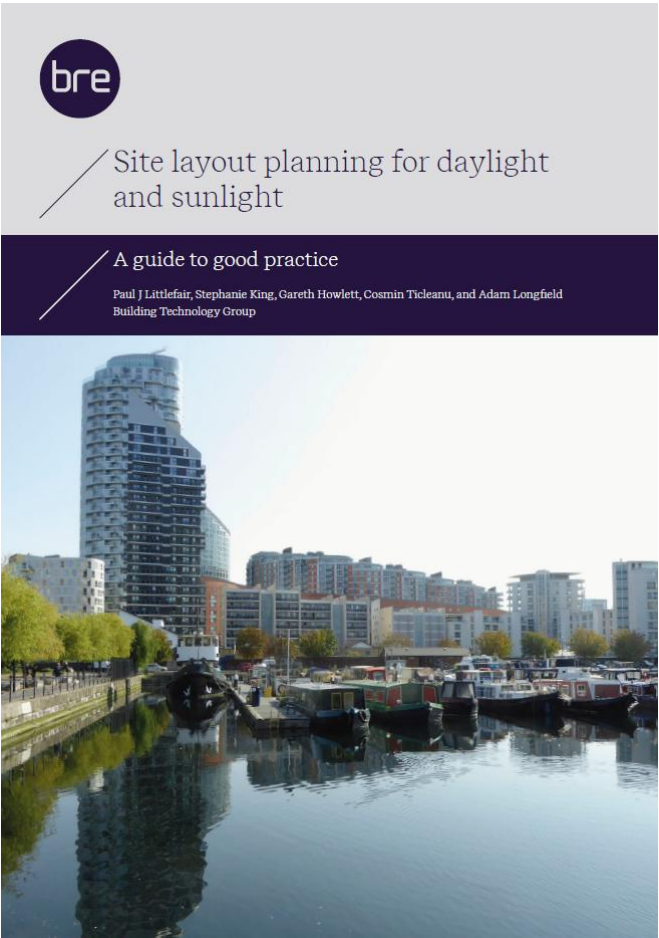
The BRE guide stipulates that in general, a dwelling or non-residential building that has a particular requirement for sunlight, will appear reasonably sunlit provided that:

- At least one window wall faces 90 degrees south.
- A habitable room, preferably a living room, can receive a total of 1.5 hours of sunlight on 21st of March. This analysis is carried out at the centre of the window(s) and sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.

Where groups of dwellings are planned, the design should aim to maximise the number of dwellings that have a main living room window that meets the above recommendations.

Sunlight to open spaces

For an open space to be adequately sunlit, the BRE guide recommends that at least half of the amenity area receives at least 2 hours of sunlight during the 21st of March.



ecolytik

86-90 Paul Street
London
EC2A 4NE

+44 (0) 0203 835 4114
mail@ecolytik.com
ecolytik.com