

Daylight and Sunlight Assessment (Proposed Scheme)

Heron House, 44-46 the Grove, Gravesend

For Substantia Capital.

September 2024

ecolytik

This page has been left intentionally blank

Contents

1	Executive Summary	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	7
5	Conclusions	8
	Appendix A – Detailed results	A
	Appendix B – Planning Policies	B
	Appendix C – BRE Guidance	C

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

1 Executive Summary

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

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 has been 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. All habitable rooms at ground floor and first floor were modelled in detail, which are the worst-case rooms as they would experience more obstruction to daylight/sunlight from the surrounding context. The layouts of the first, second and third floors are identical, therefore modelling the first floor is considered the worst-case representative of these habitable rooms.

All representative habitable spaces were found to exceed BRE’s recommendations for daylight, using the illuminance method and climate-based modelling (Table 1). All sample habitable spaces also exceeded BRE’s recommendations for sunlight (Table 1). It can therefore be concluded that all habitable rooms of the proposed development meet BRE’s guidelines for daylight and sunlight.

Overall, the proposed development is designed to meet relevant industry standards and will provide good quality of accommodation to the future residents from a daylight and sunlight perspective.

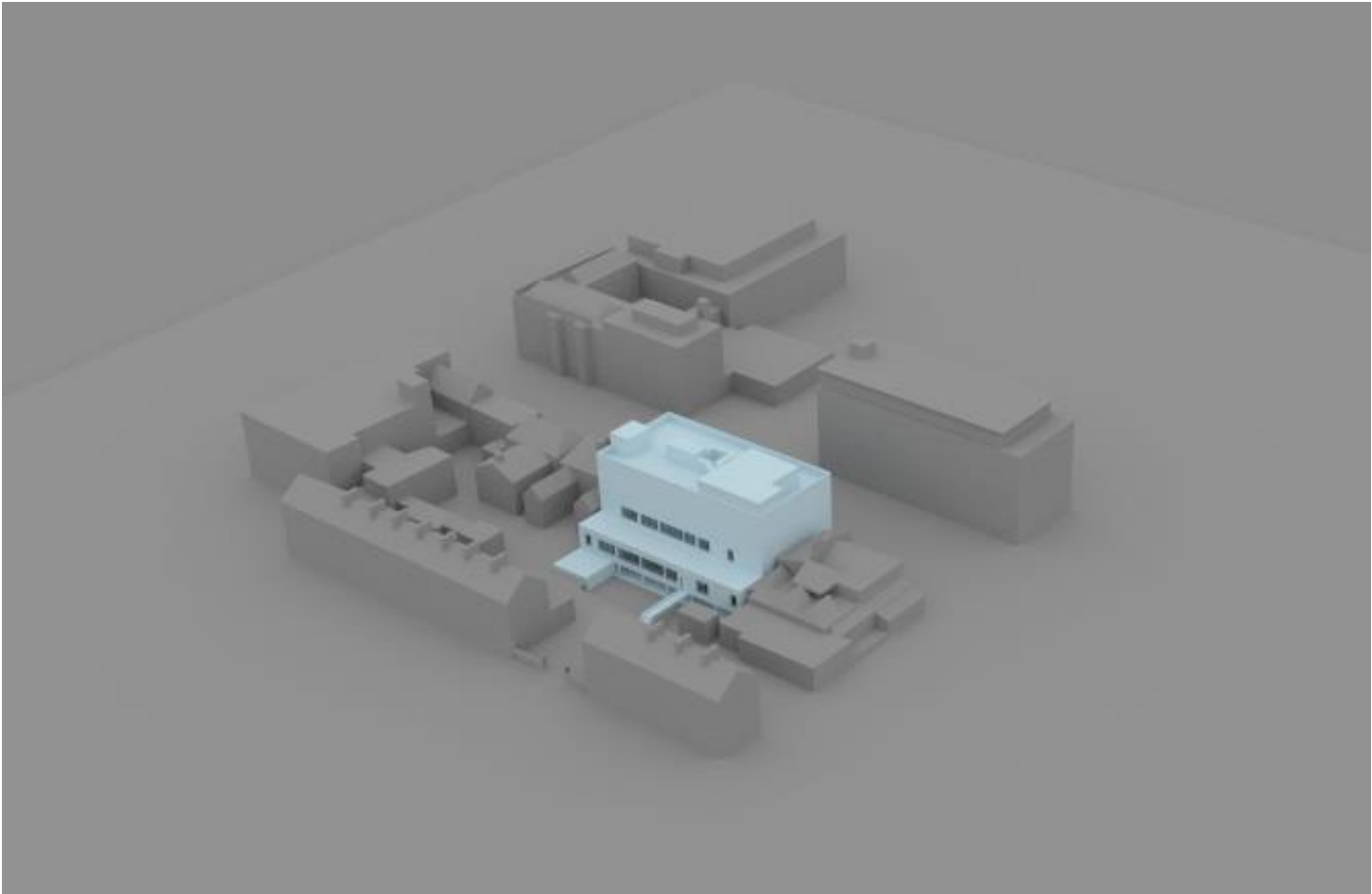


Figure 1: Technical 3D model of the proposed development and surrounding context (view from southwest).

Table 1. Daylight and sunlight results summary for all habitable rooms.

No. of rooms tested for daylight		Rooms above daylight recommendations		No. of rooms within 90 degrees due south		Rooms above sunlight recommendations	
23		23		100%		23	
						100%	

2 Introduction

Ecolytik have been instructed to evaluate daylight and sunlight access within the proposed dwellings at Heron House. The assessment considers the latest proposal for the site, dated September 2024.

2.1 Site

The proposed scheme comprises conversion of the existing building to residential units. The site location is presented to the right.

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

Survey data and architectural drawings have been used to create a 3D computer model of the proposed development.

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

- Survey data: Promap-2496128-2602189-720-0, 46TG-STAK-00-E1-DR-B-0001-S2, 46TG-STAK-00-SID-DR-B-0003-S2.
- Site plan: 001 Site Location Plan
- Proposed floor plans: 200.010 Proposed Plans, 200.011 Proposed Ground Floor Plan, 200.012 Proposed Typical Floor Plan
- Proposed elevations: 46TG-STAK-00-SID-DR-B-0003-S2 .

3.2 Scope of Assessment

The images to the right show the technical 3D model developed for the analysis. All habitable rooms in dwellings proposed for the ground and first floors were modelled in detail and included in the analysis. The dwellings in the second and third floors have identical layouts to the ones on the first floor; therefore, if the first floor dwellings perform well in terms of daylight/sunlight, the habitable rooms on the upper floors will also perform well.

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

- External walls 0.2
- Internal walls 0.8
- Floors 0.3
- Ceiling 0.9

The design team have confirmed they will adopt light internal finishes for the above reflectance values to be achieved.

A maintenance factor for dirt of 92% has been applied to all glazing, which is modelled as double-glazed units, with a light transmission of 68%.

All dwellings have open plan kitchen/living/dining (KLD) areas or are studios, with the kitchens most often located to the rear of the rooms and away from the façade, therefore would be task lit. The kitchens have been included in the working plane but the target of 150 lux for living rooms has been applied in the assessments as it would be more appropriate.

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.

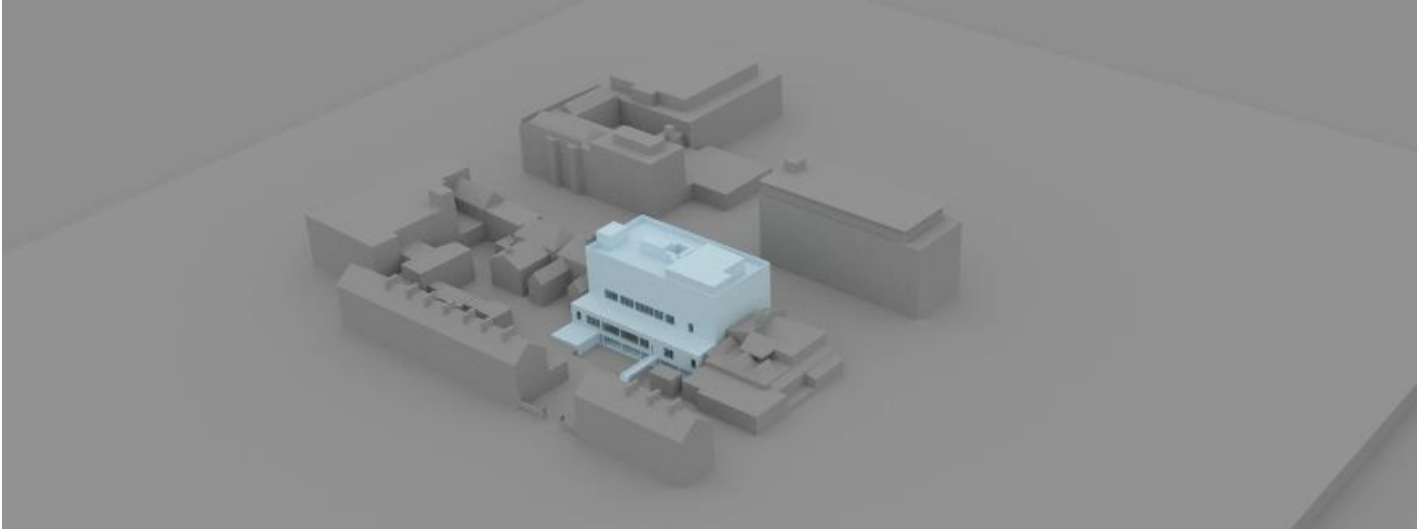


Figure 3: 3D model of the proposed development and context (view from southwest).

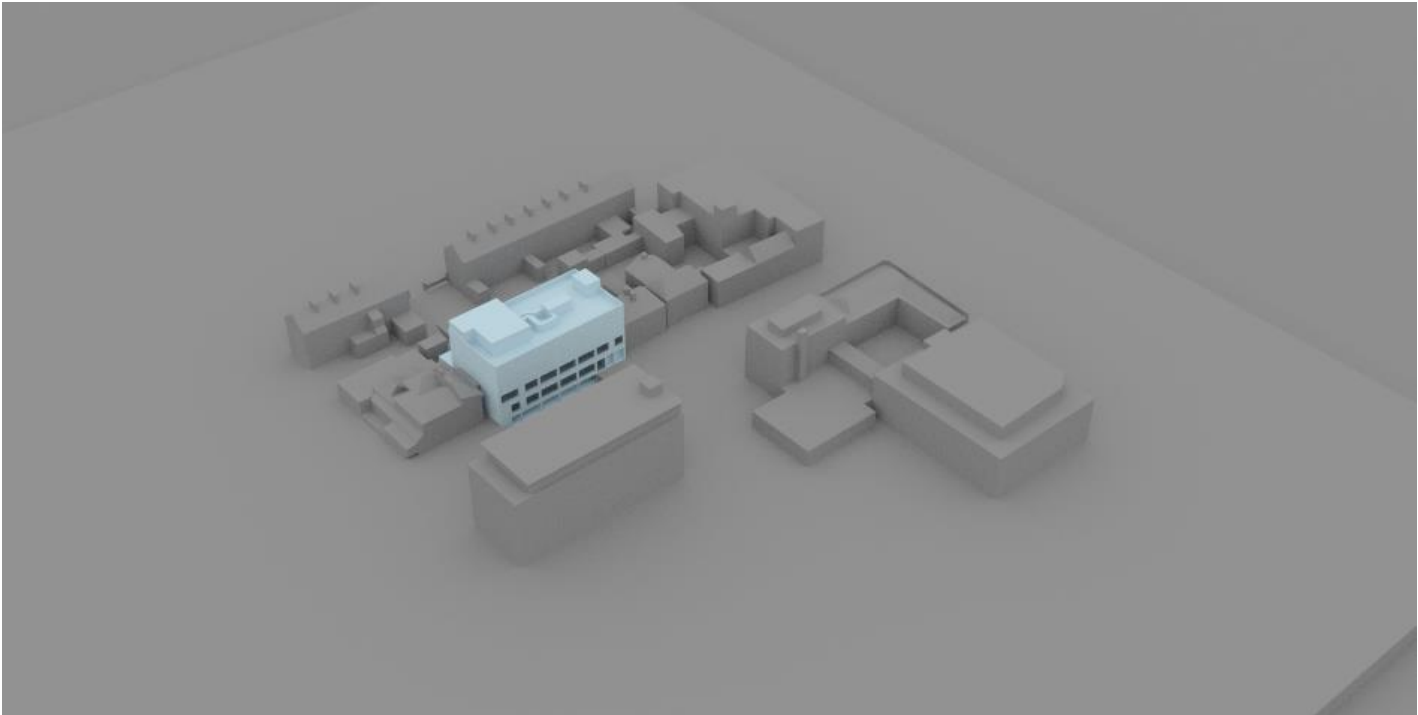


Figure 4: 3D model of the proposed development and context (view from southeast).

4 Assessment results

4.1 Daylight

All representative habitable rooms were found to exceed BRE's recommendations for daylight access. It can therefore be concluded that habitable rooms on the upper floors which have identical layout to the first floor will also meet BRE's recommendations.

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. Figure 5 shows results for the ground floor habitable rooms.

The detailed numerical results together with additional visual illustrations are presented in Appendix A (Daylight) of this report.

4.2 Sunlight

All homes with living room glazing facing within 90 degrees due south meet the sunlight criteria by the BRE. In addition, all bedrooms exceed sunlight recommendations. Therefore, future residents of the development will enjoy levels of sunlight consistent with industry standards.

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

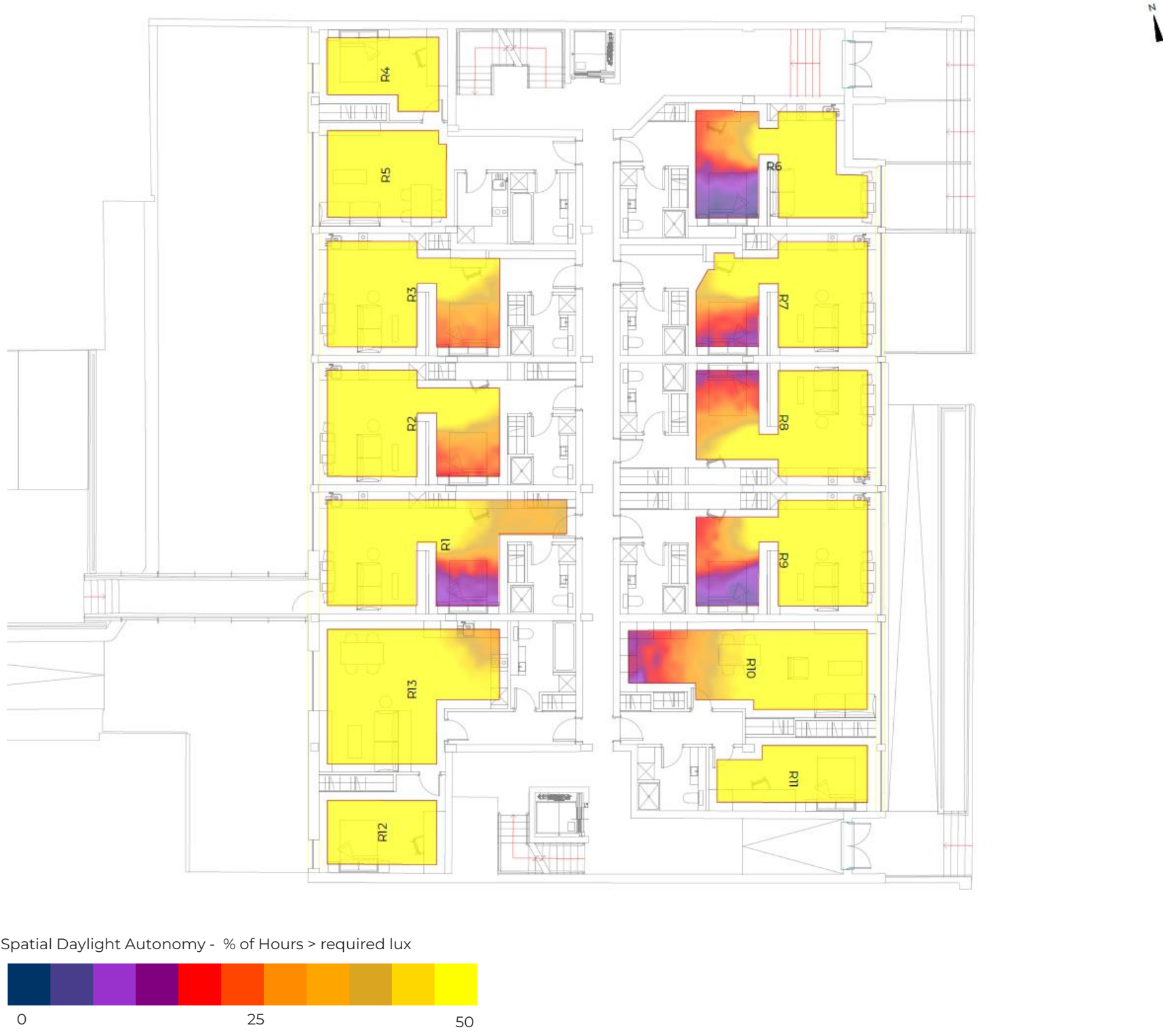


Figure 5. Spatial Daylight Autonomy (SDA) results for habitable rooms on ground floor.

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. The planning application could be supported from a daylight and sunlight perspective.

Appendix A – Detailed results

Daylight

Floor Ref	Room Ref	Room Use	Room Area m2	Effective Area	Median Lux	Area Meeting Req Lux	% of Area Meeting Req Lux	Req Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours	Meets Criteria
Heron House												
Ground	R1	Living Room	33.93	24.76	223	14.99	61%	150	50%	50%	4380	YES
	R2	Living Room	27.72	20.01	715	15.26	76%	150	50%	50%	4380	YES
	R3	Living Room	27.71	20.01	667	14.90	74%	150	50%	50%	4380	YES
	R4	Bedroom	13.46	9.11	270	9.11	100%	100	50%	50%	4380	YES
	R5	Living Room	17.93	13.14	615	13.14	100%	150	50%	50%	4380	YES
	R6	Living Room	26.95	18.88	231	10.37	55%	150	50%	50%	4380	YES
	R7	Living Room	27.28	19.59	644	14.71	75%	150	50%	50%	4380	YES
	R8	Living Room	27.62	19.93	538	14.08	71%	150	50%	50%	4380	YES
	R9	Living Room	27.59	19.90	447	13.02	65%	150	50%	50%	4380	YES
	R10	Living Room	28.60	21.39	197	12.49	58%	150	50%	50%	4380	YES
	R11	Bedroom	14.99	10.17	223	10.17	100%	100	50%	50%	4380	YES
	R12	Bedroom	13.09	9.00	268	9.00	100%	100	50%	50%	4380	YES
First	R13	Living Room	31.59	24.62	264	21.11	86%	150	50%	50%	4380	YES
	R1	Living Room	25.92	18.54	1136	18.54	100%	150	50%	50%	4380	YES
	R2	Living Room	26.83	19.48	1100	19.48	100%	150	50%	50%	4380	YES
	R3	Bedroom	12.27	8.23	708	8.23	100%	100	50%	50%	4380	YES
	R4	Living Room	23.25	16.49	598	15.34	93%	150	50%	50%	4380	YES
	R5	Living Room	29.35	21.66	610	20.55	95%	150	50%	50%	4380	YES
	R6	Living Room	29.19	21.56	523	18.22	85%	150	50%	50%	4380	YES
	R7	Living Room	23.25	16.05	665	11.07	69%	150	50%	50%	4380	YES
	R8	Living Room	24.01	16.38	479	8.77	54%	150	50%	50%	4380	YES
	R9	Living Room	23.33	16.05	703	9.31	58%	150	50%	50%	4380	YES
	R10	Living Room	25.56	18.54	558	18.54	100%	150	50%	50%	4380	YES

Sunlight

Floor Ref	Room Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Rating
Heron House						
Ground	R1	Living Room	W1	284°N	3.1	Medium
			W2	284°N	3.1	
			W37	284°N	3.3	
					3.3	
Ground	R2	Living Room	W3	284°N	3.3	Medium
			W4	284°N	3.3	
			W5	284°N	3.3	
			W6	284°N	3.3	
					3.3	Medium
Ground	R3	Living Room	W7	284°N	3.5	
			W8	284°N	3.7	
			W9	284°N	4	
			W10	284°N	4.1	
					4.1	High
Ground	R4	Bedroom	W11	284°N	4	
					4	Medium
Ground	R5	Living Room	W12	284°N	4.1	
			W13	284°N	4.1	
			W14	284°N	4.1	High
					4.1	
Ground	R6	Living Room	W15	103°	1.1	
			W16	104°	3.6	Medium
					3.9	
Ground	R7	Living Room	W17	104°	3.4	
			W18	104°	3.3	Medium
			W19	104°	3.1	
			W20	104°	3	
					3.4	
Ground	R8	Living Room	W21	104°	2.8	Minimum
			W22	104°	2.8	
			W23	104°	2.8	
			W24	104°	2.8	
					2.8	
Ground	R9	Living Room	W25	104°	2.8	
			W26	104°	2.8	

Floor Ref	Room Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Rating
Ground	R10	Living Room	W27	104°	2.8	Minimum
			W28	104°	2.8	
					2.8	
			W29	104°	2.8	Minimum
			W30	104°	2.8	
			W31	104°	2.8	
Ground	R11	Bedroom			2.8	Minimum
			W32	104°	2.8	
			W33	104°	2.8	
Ground	R12	Bedroom			2.8	Minimum
			W34	284°N	3.1	
					3.1	
Ground	R13	Living Room	W35	284°N	3.2	Medium
			W36	284°N	3.1	
First	R1	Living Room			3.2	Medium
			W1	284°N	4.1	
			W2	284°N	4.1	
			W9	284°N	4.1	
			W37	284°N	4.1	
			W38	284°N	4.1	
			W39	284°N	4.1	
					4.1	
First	R2	Living Room			4.1	High
			W3	284°N	4.1	
			W4	284°N	4.1	
			W5	284°N	4.1	
			W6	284°N	4.1	
			W7	284°N	4.1	
			W8	284°N	4.1	
First	R3	Bedroom			4.1	High
			W10	104°	5.5	
			W11	104°	5.5	
First	R4	Living Room			5.5	High
			W12	104°	4.6	
			W13	104°	4.3	
			W14	104°	4.2	
First	R5	Living Room			4.6	High
			W15	104°	4	
			W16	104°	3.8	

Floor Ref	Room Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Rating
First	R6	Living Room	W17	104°	3.7	Medium
			W18	104°	3.6	
					4	
			W19	104°	3.4	
			W20	104°	3.4	
			W21	104°	3.4	
			W22	104°	3.4	
First	R7	Living Room			3.4	Medium
			W23	104°	3.4	
			W24	104°	3.4	
			W25	104°	3.4	
			W26	104°	3.4	
First	R8	Living Room			3.4	Medium
			W27	104°	3.4	
			W28	104°	3.4	
			W29	104°	3.4	
First	R9	Living Room			3.4	Medium
			W30	104°	3.4	
			W31	104°	3.4	
			W32	104°	3.4	
First	R10	Living Room	W33	104°	3.4	Medium
					3.4	
			W34	284°N	4	
			W35	284°N	3.9	
			W36	284°N	4.1	High
					4.1	

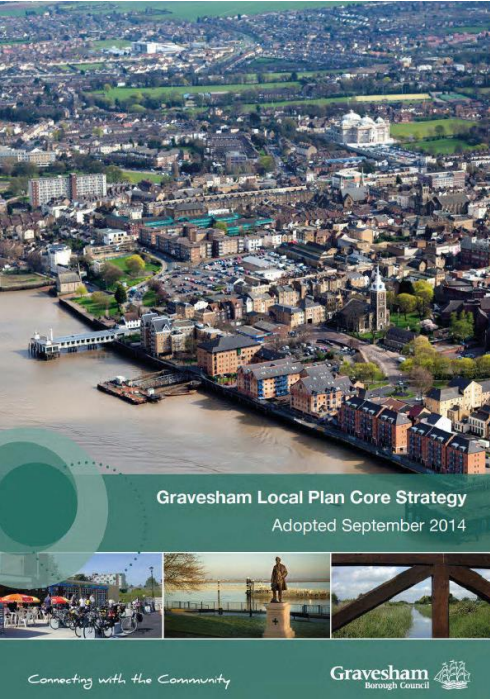
Appendix B – Planning Policies

National Planning Policy Framework (2023)

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

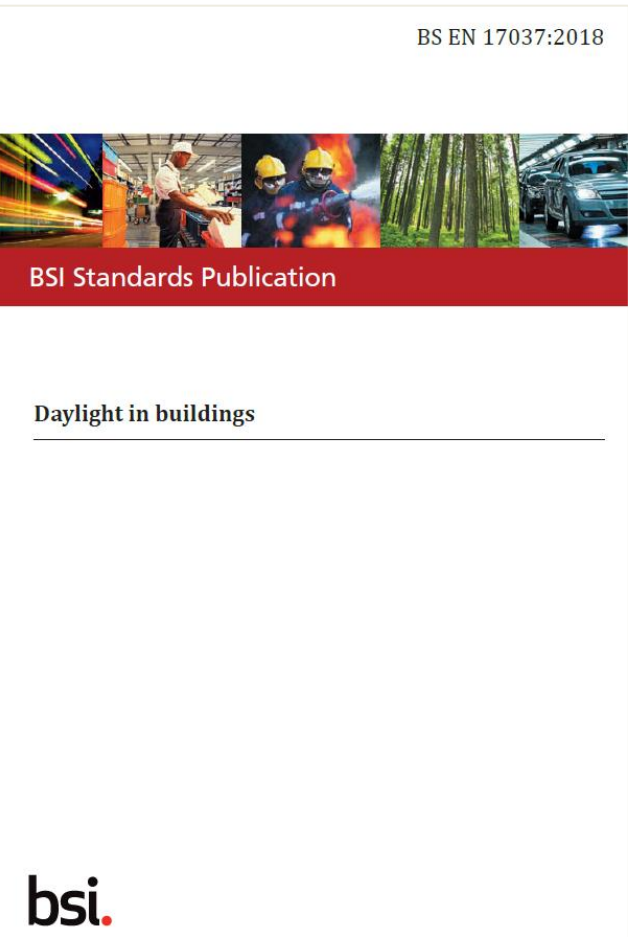
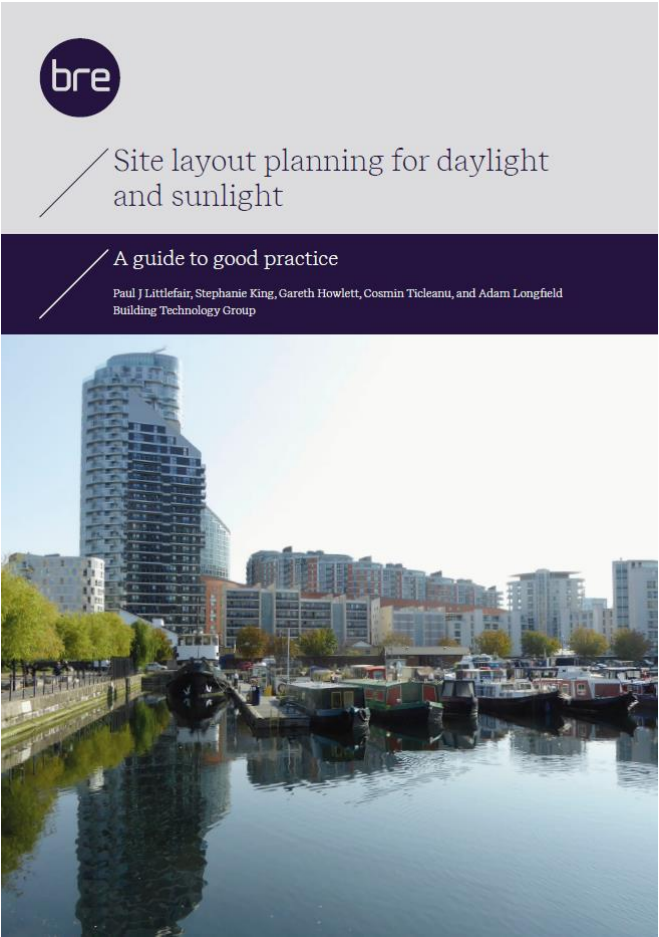
The BRE guide stipulates that in general, a dwelling or non-residential building that has a particular requirement for sunlight, will appear reasonably sunlit provided that:

- 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