

Maple Place

Daylight, Sunlight &
Overshadowing Assessment

March 2025

CONTENTS

1	Executive Summary	3
2	Introduction	4
2.1	Background	4
2.2	The Nature and Effect of Daylight and Sunlight	4
3	Daylight and Sunlight Assessment Guidance	5
3.1	Assessment of the Effect of Daylight and Sunlight	5
3.2	Angle to sky from horizontal	6
3.3	Internal Daylight Assessment	6
4	Methodology Applied	8
4.1	Data	8
4.2	3D Model	9
4.3	Internal Surface Reflectance and Glazing Transmission	9
4.4	Design Data	9
5	Results	10
5.1	Vertical Sky Component Analysis and APSH/WPSH Analysis	10
5.2	Window Arrangement	13
5.3	Sunlight Assessment Results – Open Areas	14
5.4	Target Illuminance Factor – Proposed Development	15
6	Conclusion	17

Document Control Sheet

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1 Executive Summary

NRG Consulting have been commissioned to undertake a Daylight, Sunlight and Overshadowing Assessment on a proposed development at **237 Chamberlayne Road and 5b Derby Road, Eastleigh, S050 5HX**.

The proposed description of development is: *Construction of 12no. dwellings comprising of 9no. apartments and 3no houses, with associated landscaping, parking and access from Derby Road.*

Our assessment of the proposed development is in adherence to the following best-practice guidance and industry standards:

- BRE's Site Layout Planning for Daylight and Sunlight, A guide to good practice (BR 209), 3rd Ed. (2022)
- Daylight in Buildings – (BS EN 17037:2018)

The BRE document serves as a guide designed to assist rather than restrict the designer. While it provides valuable advice, it is not mandatory and should not be viewed as a tool for planning policy. In unique circumstances, developers or planning authorities may opt for different target values.

The findings of this report indicate that the proposed development will only have a minor adverse impact on the sunlight levels experienced by neighbouring properties and spaces at 20,20a,22a, 22b, and 23 Derby Road, 176-182 and 239-241 Chamberlayne Road. Furthermore, all rooms within the proposed development meet the internal daylight requirements stipulated in BS EN 17037:2018.

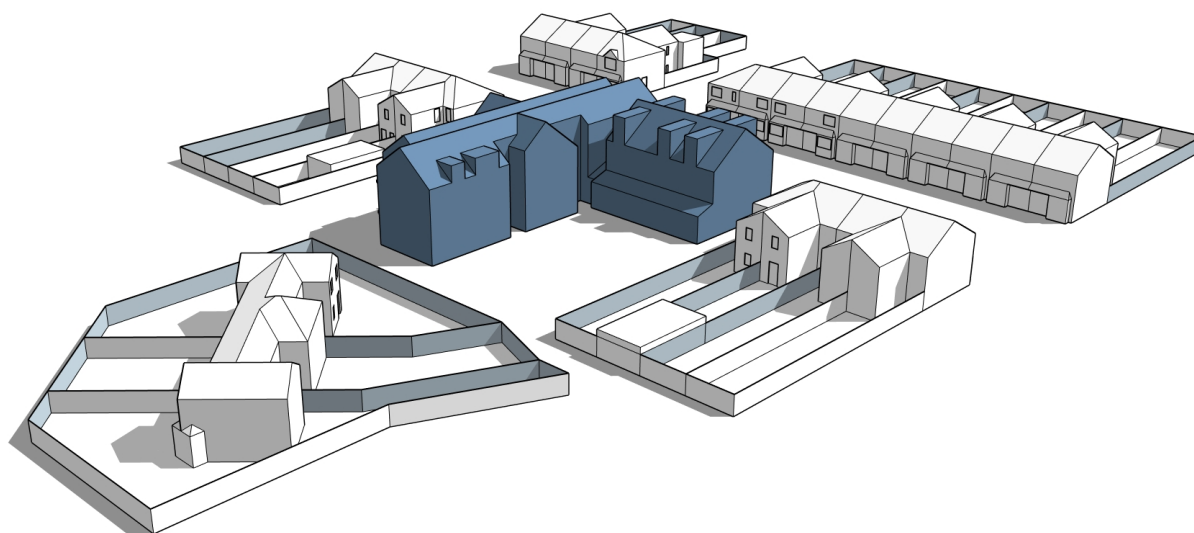


Figure 1: 3D model of proposed buildings

2 Introduction

2.1 Background

The Building Research Establishment (BRE) has outlined guidelines and methodologies for measuring and assessing daylight and sunlight within proposed buildings in their handbook, “*Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice*”, 3rd Ed. The guide also offers advice on site layout planning to determine the quality of daylight and sunlight within open spaces between buildings. This document is intended to be used in conjunction with the interior daylight recommendations found within the British Standard BS EN 17037:2018 and the Applications Manual on Window Design from the Chartered Institution of Buildings Services Engineers (CIBSE).

The British Standards Institution (BSI) has provided guidance on good practice in daylighting design in BS EN 17037:2018 Daylight in Buildings, presenting criteria intended to enhance the well-being and satisfaction of people in buildings.

This study assesses the availability of Daylight and Sunlight to the façades of local dwellings and their amenity areas with respect to the design proposals prepared by the design team, as well as the availability of internal daylight to the proposed building.

NRG Consulting has proposed the following methodology to assess the proposed layouts:

- Prepare a 3D computer model to:
 - a) understand and visualize sunlight for neighbouring properties.
 - b) assess the internal daylight/illuminances for the living rooms, kitchens, and bedrooms of the proposed development.
- Carry out an assessment using the methodologies set out by above for diffuse daylight and sunlight conditions.

This comprehensive approach ensures a thorough evaluation of both external and internal daylight conditions, taking into account both existing structures and proposed developments.

2.2 The Nature and Effect of Daylight and Sunlight

The 3rd edition of the “Site Layout Planning for Daylight and Sunlight” guide by Paul J. Littlefair, released in June 2022, replaces the second edition. The key update is the methods for assessing daylight in a proposed building, as per section 2.1 and Appendix C of the handbook. These methods are based on BS EN 17037, which offers two methodologies for evaluating daylight across a room’s working plane: the Illuminance Method and the Daylight Factor Method.



Figure 2: BRE guidelines



Figure 3: BS EN 17037

3 Daylight and Sunlight Assessment Guidance

3.1 Assessment of the Effect of Daylight and Sunlight

When evaluating the potential light-related impacts of proposed developments it is crucial to distinguish between daylight and sunlight. Daylight encompasses all direct and indirect sunlight during daytime hours, while sunlight refers solely to direct sunlight. Even on cloudy or overcast days, diffuse daylight can illuminate rooms through windows, despite the absence of sunlight. Particular attention should be paid when the development is located south of existing buildings. In the northern hemisphere, most sunlight comes from the south. In the UK, south-facing facades generally receive the most sunlight, while north-facing facades receive less sunlight during summer months, specifically in early mornings and late evenings.

The BRE Guidance considers separate areas when assessing the impacts of a new development on an existing property:

- Daylight - The impacts of all direct and indirect sunlight during daytime.
- Sunlight - The impacts of only the direct sunlight on a dwelling and its garden and open spaces. This comprehensive approach ensures a thorough evaluation of both external and internal light conditions, taking into account both existing structures and proposed developments.

The BRE report provides guidelines for when sunlight obstruction may become an issue:

- If the proposed or existing development has a window that faces within 90° of due south, and;
- On this window wall, all points on a line 2m above ground level are within 4m (measured sideways) of a point which receives at least a quarter of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months, between 21st September and 21st March.

Table 1 below summarises the criteria used in this report to assess the impacts from new development on the sunlight reaching existing properties, and for internal daylight.

Parameter	Report Reference	Acceptability Criteria
Sunlight to Amenity Areas	BRE 209 Section 3.3	It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March. If as a result of the new development, an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.
Vertical Sky Component	BRE 209 Section 2.2	Any reduction in the total amount of skylight can be calculated by finding the VSC at the centre of each existing window. If the VSC is both less than 27%, and less than 0.8 times its former value occupants will notice the reduction in the amount of skylight..
APSH/WPSH	BRE 209 Section 3.2	It is recommended that interiors where the occupants expect sunlight receive at least one quarter (25%) of Annual Probable Sunlight Hours (APSH), including the winter months between 21st September and 21st March at least 5% of Annual Probable Sunlight Hours (WPSH). If the available sunlight hours are both less than these values and less than 0.8 times their former value, then the occupants will notice the loss of sunlight.
Table 1: BRE Daylighting Criteria		

3.2 Angle to sky from horizontal

Generally, a building will maintain the potential for good interior diffuse daylighting as long as no obstruction, measured in a vertical section perpendicular to the main face from the centre of the lowest window, subtends an angle of 25° to the horizontal or less on all its main faces.

If this criterion is met, further calculations are typically not required as it is unlikely that daylighting will be significantly affected. This approach ensures that buildings are designed with optimal daylighting in mind, enhancing the overall quality of the interior environment.

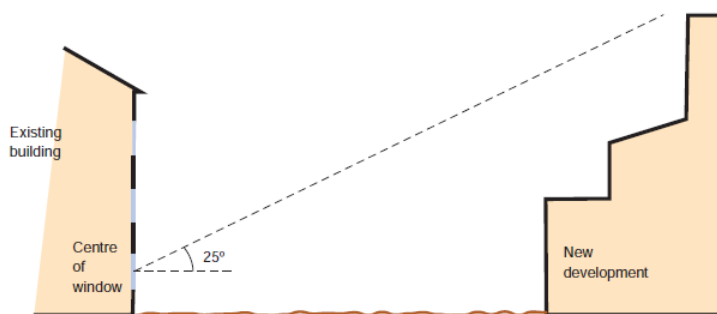


Figure 4: Section showing the angle to sky from horizontal criteria for diffuse daylighting

3.3 Internal Daylight Assessment

In evaluating the internal daylight levels of proposed building projects, it is crucial to differentiate between daylight and sunlight. Daylight encompasses all direct and indirect sunlight during daytime hours, while sunlight refers solely to direct sunlight. Even on cloudy or overcast days, diffuse daylight can illuminate rooms through windows, despite the absence of sunlight.

The BS EN 17037 outlines criteria for two methodologies: the Illuminance Method and the Daylight Factor Method.

Target illuminances from daylight over at least half of the daylight hours		
Level of recommendation	Target illuminance E_T (lx) for half of assessment grid	Target illuminance E_{TM} (lx) for 95% of assessment grid
Minimum	300	100
Medium	500	300
High	750	500
Target daylight factors (D) for London		
Level of recommendation	Target daylight factor D for half of assessment grid	Target daylight factor D for 95% of assessment grid
Minimum	2.1%	0.7%
Medium	3.5%	2.1%
High	5.3%	3.5%

Table 2: Targets for each internal daylight calculation method

Specific Recommendations for Daylight Provision in UK Dwellings

It is opinion of the UK committee that the recommendations for daylight provision set out in the BS EN 17037 may not be achievable for some buildings, particularly dwellings. It also highlights the relation between high internal daylight levels and risk of summer-time overheating recommending that any room in a dwelling where a daylight illuminance of 500lx is exceeded on 50% of the grid point for more than half of the daylight hours is checked for overheating.

The UK National Annex (Appendix C of the BRE Guidance) gives specific recommendations for habitable rooms in dwellings built in the United Kingdom. These recommendations are particularly relevant for 'hard to light' dwellings, such as those located in basements, those with significant external obstructions, or existing buildings being refurbished or converted into dwellings.

The National Annex therefore provides the UK guidance on minimum daylight provision in all UK dwellings, superseding the figure shown in Table 1.

Furthermore, the recommended levels of illuminance achieved over 95% of a reference plane need not apply to dwellings in the UK and thus are not included in this report.

Target illuminances from daylight over at least half of the daylight hours	
Room	Target illuminance E_T (lx) for half of assessment grid
Kitchen	200
Living room	150
Bedroom	100
Table 3: Specific recommendations for daylight provision in UK dwellings	

Target daylight factors (DT) to achieve over at least 50% of the assessment grid			
Location	DT for 100 lx (Bedroom)	DT for 150 lx (Living room)	DT for 200 lx (Kitchen)
London	0.7%	1.1%	1.4%
Table 4: Daylight factor target for UK dwellings			

4 Methodology Applied

4.1 Data

All data utilised in this report has been sourced directly from digital files supplied by the Design Team. The height of any potential obstructions has been determined using survey data or derived from publicly accessible aerial photographs.



Figure 5: Aerial view of the site as existing

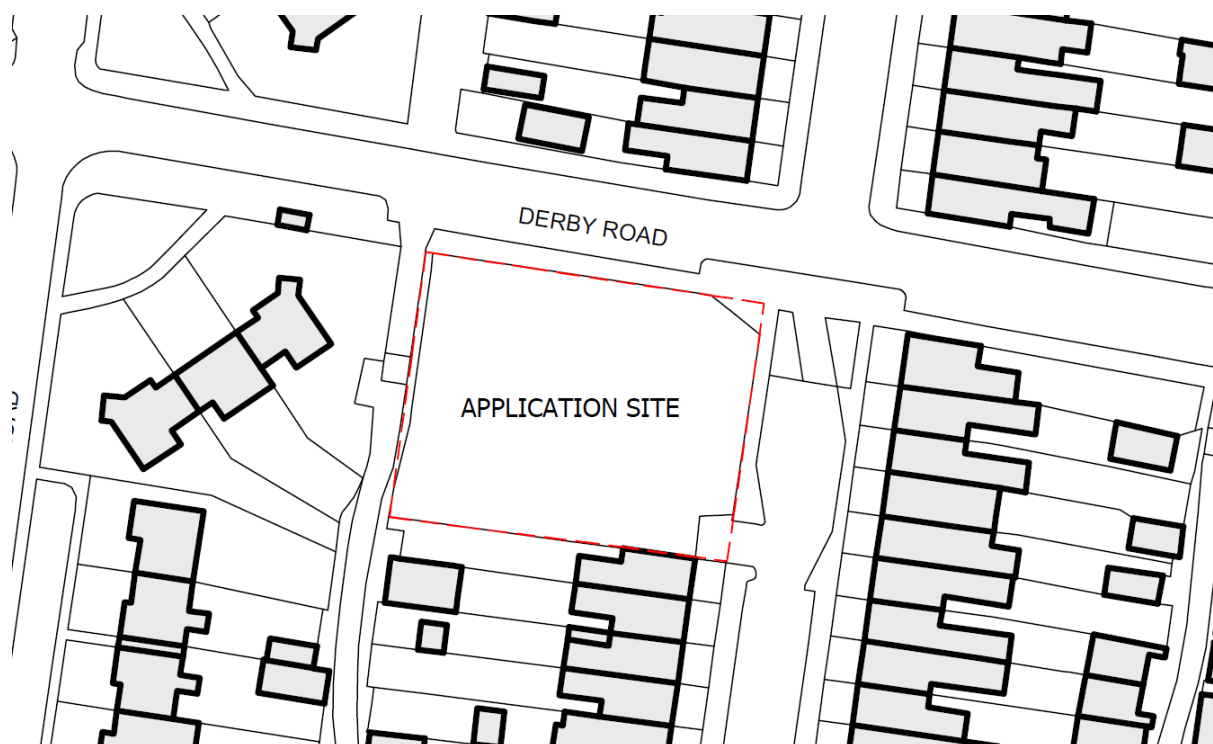


Figure 6: Proposed Site Plan

4.2 3D Model

To carry out the internal daylight assessment, a full-scale 3D model of the proposed development was created using IES ModelIT. The internal daylight was then evaluated using IES Radiance, a program designed for thermal and environmental analysis.

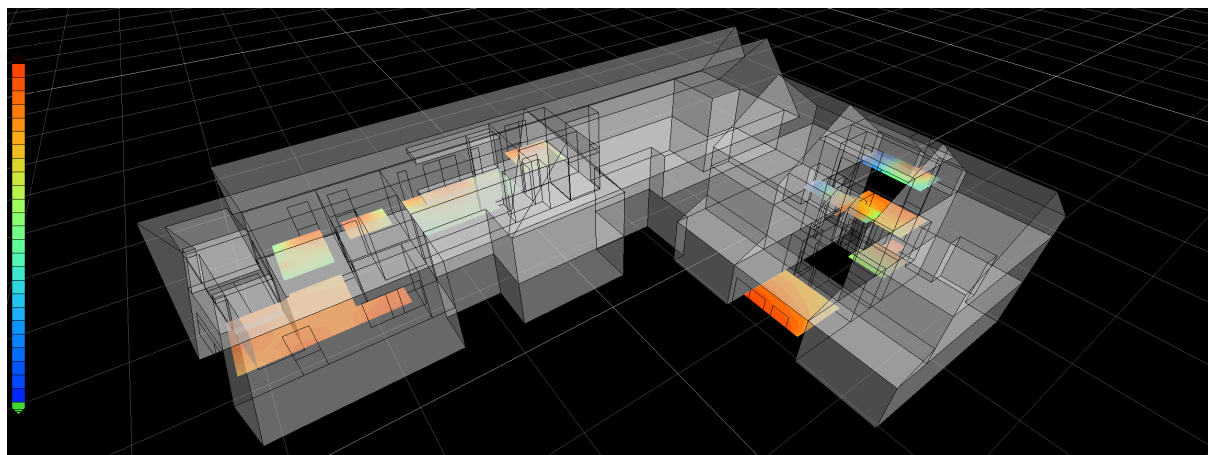


Figure 7: 3D model of the proposed development

4.3 Internal Surface Reflectance and Glazing Transmission

The reflectance of a room's internal surfaces significantly influences the internal daylight result. Lighter colours result in higher reflectance (white: 1.0; black: 0.0). The glazing transmission factors including the appropriate maintenance factor have also been included in the simulation along with window framing factor. The internal surface and windows properties used in this assessment are detailed in the table below:

Surface	Reflectance	
Floor	0.4 (e.g. light wood or grey tiles)	
Walls	0.7 (e.g. light pastel or white paint)	
Ceiling	0.7 (e.g. light pastel or white paint)	
Window	Light Transmittance	0.68
Table 5: Surface Properties		

4.4 Design Data

The architectural design for this project was provided by MH Architects.
The drawing pack used for this assessment was issued in March 2026.

5 Results

5.1 Vertical Sky Component Analysis and APSH/WPSH Analysis to Adjacent Buildings

Our assessment of the Vertical Sky Component (VSC) reveals some minor changes between the existing VSC available to the analysed windows and the VSC post-development. Furthermore, our analysis of Annual and Winter Probable Sunlight Hours indicates no adverse effects on existing properties.

The windows analysed, along with their addresses, are listed in the tables below. Only 4 out of 47 tested windows (8.5%) are affected by the proposed development. It has to be noted that these windows serve either kitchens or bedrooms which according to BRE guidelines, have lower requirement for natural daylight than living rooms.

ADDRESS	WINDOW No	PRE CONSTRUCTION VSC	POST CONSTRUCTION VSC	AFFECT RATIO	MEETS BRE CRITERIA
22a and b Derby Road	1	35.25	35.25	1	YES
	2	37.02	37.02	1	YES
	3	36.72	27.19	0.74	YES
	4	30.05	29.17	0.97	YES
	5	26.5	24.16	0.91	YES
	6	33.93	24.71	0.73	NO
	7	28.17	20.72	0.74	NO
	8	21.37	20.04	0.94	YES
	9	37.46	36.4	0.97	YES
	10	31.76	25.37	0.8	YES
	11	30.67	28.78	0.94	YES
235 Chamberlayne Road	12	32.79	32.7	1	YES
	13	39.49	38.43	0.97	YES
	14	37.49	36.73	0.98	YES
20 and 20a Derby Road	15	35.94	33.78	0.94	YES
	16	37.62	36.19	0.96	YES
	17	34.11	32.63	0.96	YES
	18	19.56	19.56	1	YES
	19	23.78	23.78	1	YES
	20	29.66	29.36	0.99	YES
	21	29.97	29.97	1	YES
	22	30.54	30.54	1	YES
	23	34.01	33.66	0.99	YES
	24	37.03	32.33	0.87	YES

ADDRESS	WINDOW No	PRE CONSTRUCTION VSC	POST CONSTRUCTION VSC	AFFECT RATIO	MEETS BRE CRITERIA
176-182 Chamberlayne Road	25	37.73	34.61	0.92	YES
	26	35.65	32.21	0.9	YES
	27	36.27	36.27	1	YES
	28	37.09	31.3	0.84	YES
	29	37.77	33.98	0.9	YES
	30	37.06	31.06	0.84	YES
	31	37.75	33.84	0.9	YES
	32	36.85	31.21	0.85	YES
	33	37.64	33.96	0.9	YES
239-241 Chamberlayne Road	34	33.71	33.55	1	YES
	35	35.99	35.73	0.99	YES
	36	37.39	20.28	0.54	NO
	37	23.22	19.27	0.83	YES
	38	32.39	22.5	0.69	NO
	39	35.03	34.29	0.98	YES
	40	37.19	36.54	0.98	YES
	41	32.21	32.21	1	YES
	42	37.21	36.73	0.99	YES
23 Derby Road	43	35.45	34.01	0.96	YES
	44	35.85	33.79	0.94	YES
	45	36.62	32.41	0.89	YES
	46	37.61	36.44	0.97	YES
	47	37.56	35.96	0.96	YES

Table 6: Results of Visual Sky Component Analysis. If a window were to achieve less than 27% Post Construction VSC the Affect Ratio must be at least 0.80 to ensure BRE compliance

ADDRESS	WINDOW No	PRE CONSTRUCTION APSH	POST CONSTRUCTION APSH	AFFECT RATIO	PRE CONSTRUCTION WPSH	POST CONSTRUCTION WPSH	AFFECT RATIO	MEETS BRE CRITERIA
22a and b Derby Road	1	48	48	1	15	15	1	YES
	2	50	50	1	15	15	1	YES
	3	77	63	0.82	28	14	0.5	YES
	4	North facing window						

ADDRESS	WINDOW No	PRE CONSTRUCTION APSH	POST CONSTRUCTION APSH	AFFECT RATIO	PRE CONSTRUCTION WPSH	POST CONSTRUCTION WPSH	AFFECT RATIO	MEETS BRE CRITERIA
	5	59	55	0.93	16	12	0.75	YES
	6	66	55	0.83	26	15	0.58	YES
	7	57	45	0.79	23	11	0.48	YES
	8	North facing window						
	9	North facing window						
	10	63	56	0.89	22	15	0.68	YES
	11	North facing window						
235 Chamberlayne Road	12	North facing window						
	13	North facing window						
	14	North facing window						
20 and 20a Derby Road	15	North facing window						
	16	North facing window						
	17	76	73	0.96	27	24	0.89	YES
	18	38	38	1	12	12	1	YES
	19	53	53	1	23	23	1	YES
	20	60	60	1	24	24	1	YES
	21	44	44	1	14	14	1	YES
	22	64	64	1	23	23	1	YES
	23	68	67	0.99	26	25	0.96	YES
176-182 Chamberlayne Road	24	North facing window						
	25	North facing window						
	26	North facing window						
	27	North facing window						
	28	North facing window						
	29	North facing window						
	30	North facing window						
	31	North facing window						
	32	North facing window						
	33	North facing window						
239-241 Chamberlayne Road	34	46	46	1	13	13	1	YES
	35	48	48	1	14	14	1	YES

ADDRESS	WINDOW No	PRE CONSTRUCTION APSH	POST CONSTRUCTION APSH	AFFECT RATIO	PRE CONSTRUCTION WPSH	POST CONSTRUCTION WPSH	AFFECT RATIO	MEETS BRE CRITERIA
	36	North facing window						
	37	North facing window						
	38	North facing window						
	39	North facing window						
	40	North facing window						
	41	North facing window						
	42	North facing window						
23 Derby Road	43	66	62	0.94	22	22	1	YES
	44	70	65	0.93	24	23	0.96	YES
	45	North facing window						
	46	71	70	0.99	25	25	1	YES
	47	71	67	0.94	25	25	1	YES

Table 7: Results of Annual Probable Sunlight Hours. If a window were to achieve less than 25% Post Construction APSH or 5% WPSH the Affect Ratio must be at least 0.80 to ensure BRE compliance

5.2 Window Arrangement

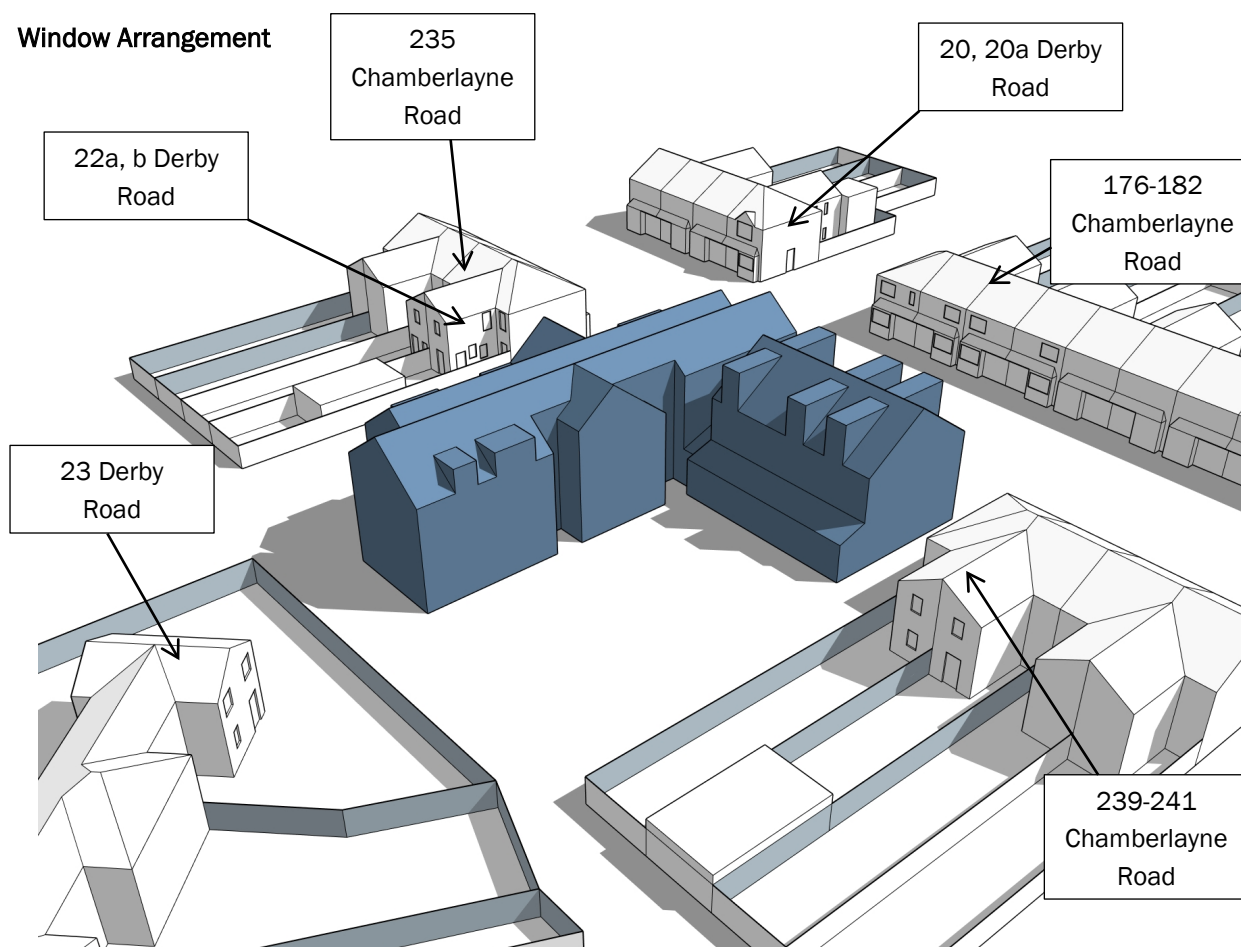


Figure 8: Window arrangement

5.3 Sunlight Assessment Results – Open Areas

In evaluating the impact of a development on existing neighbouring amenity or garden areas, the BRE guide suggests that at least 50% of each amenity space should receive a minimum of two hours of sunlight on March 21st. If a garden or amenity area fails to meet this 50% criterion due to the new development, and the area receiving two hours of sunlight on March 21st is less than 0.8 times its previous value, then the loss of sunlight is likely to be noticeable.

The existing and post development amenity areas at 20,20a,22a, 22b, and 23 Derby Road, 176-182 and 239-241 Chamberlayne Road have been analysed using the 3D SketchUp model.

As depicted in Figure 10 below, our findings indicate that the proposed development does not impact the sunlight received by adjoining close by amenity areas.

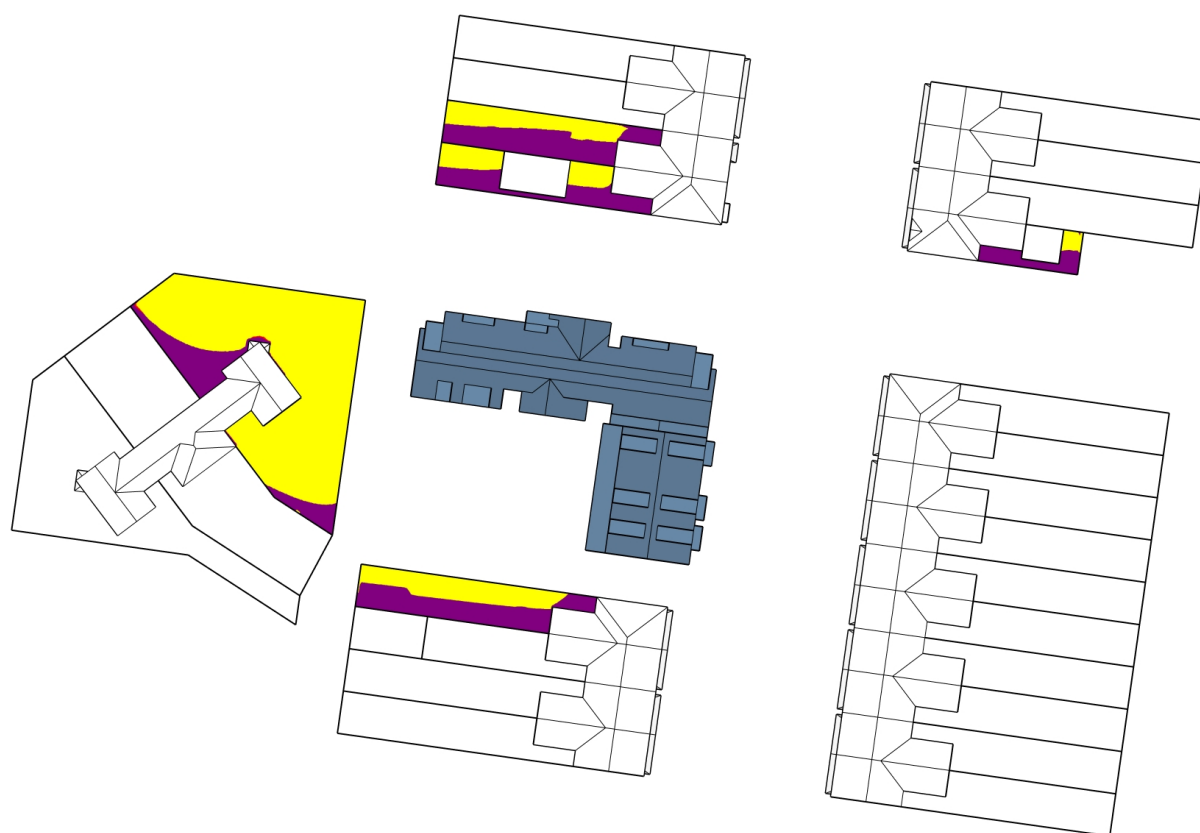


Figure 9: Adjacent amenity area sunlight – no change

ADDRESS	PRE CONSTRUCTION	POST CONSTRUCTION	AFFECT RATIO	MEETS BRE CRITERIA
22a and b Derby Road	45%	45%	1.00	YES
235 Chamberlayne Road	41%	41%	1.00	YES
20 and 20a Derby Road	25%	25%	1.00	YES
239 Chamberlayne Road	46%	46%	1.00	YES
23 Derby Road	86%	86%	1.00	YES

Table 8: Results of amenity areas direct sunlight. If a garden were to achieve less than 50% post construction direct sunlight the Affect Ratio must be at least 0.80 to ensure BRE compliance

5.4 Target Illuminance Factor – Proposed Development

We have evaluated the proposed new accommodation to ascertain if the internal spaces will receive adequate daylight, referencing Target Illuminance (ET) Factor. This method calculates the illuminance level at each point on an assessment grid.

Our analysis of the internal space of the proposed development reveals that the assessed rooms comfortably exceed both the BRE Guide and BS EN 17037:2018 acceptable criteria in terms of Illuminance Factor.

Room	Floor area that achieves the target (%)	Target to be achieved over 50% of the floor area (E _r)	BRE Compliant
Flat 04 – Kitchen/living room	100	200	YES
Flat 04 – Bedroom 1	100	100	YES
Flat 04 – Bedroom 2	100	100	YES
Flat 05 – Kitchen/living room	96	200	YES
Flat 05 – Bedroom	100	100	YES
House 11 – Kitchen	100	200	YES
House 11 – Living room	100	150	YES
House 11 – Study	100	150	YES
House 11 – Bedroom 1	100	100	YES
House 11 – Bedroom 2	76	100	YES
House 11 – Bedroom 3	82	100	YES
Table 9: Internal daylight results			

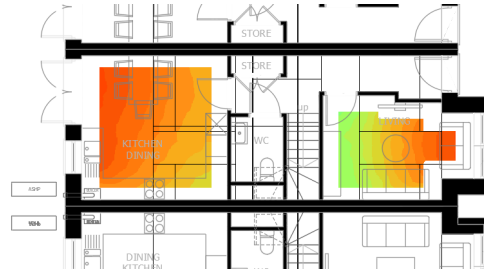


Figure 10: Internal daylight results – Ground floor

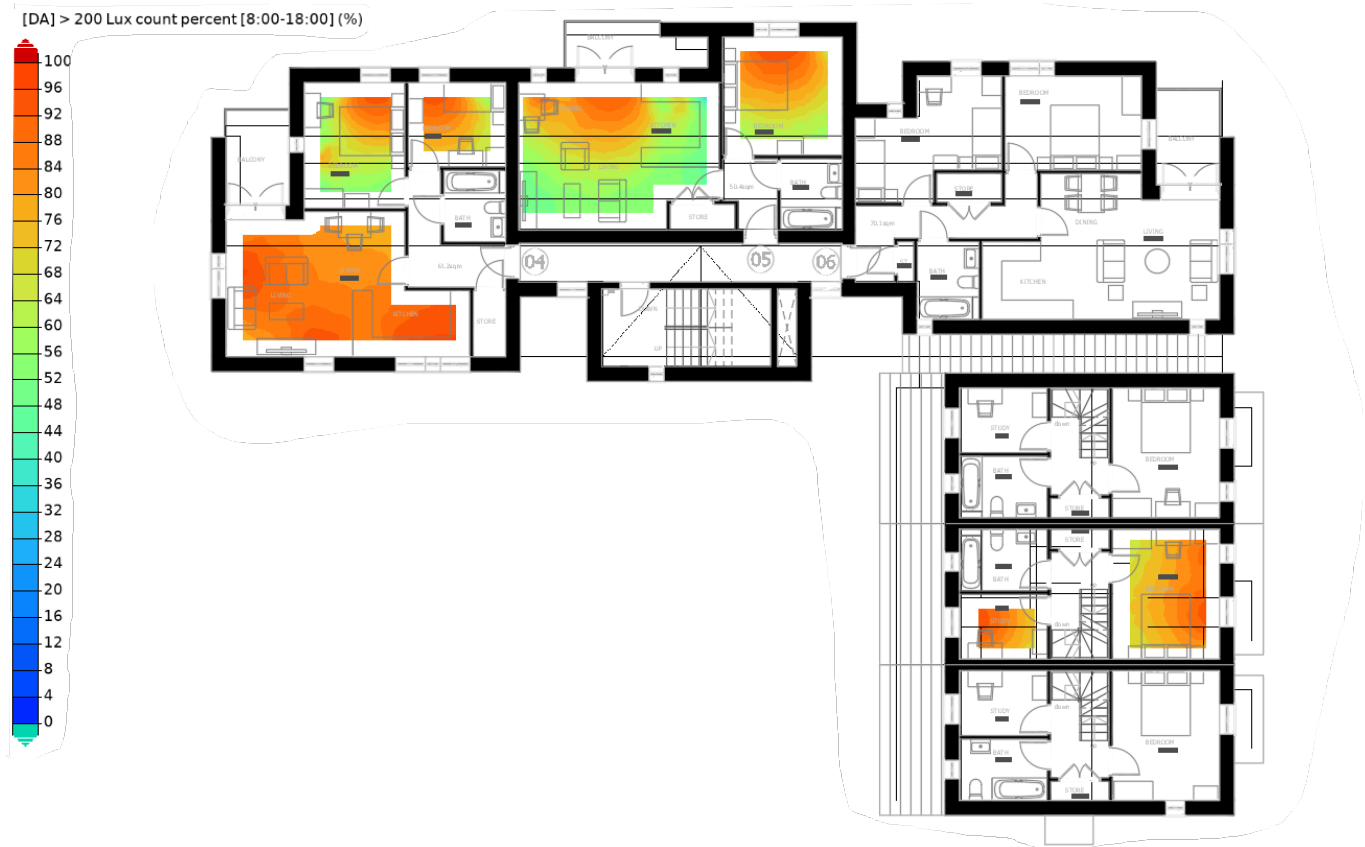


Figure 11: Internal daylight results – First floor

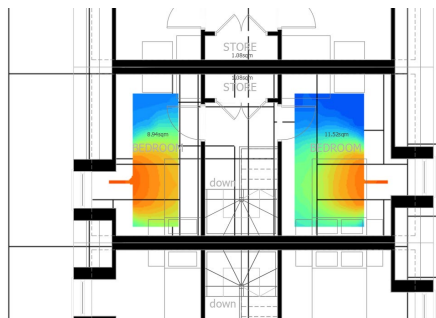


Figure 12: Internal daylight results – Second floor

6 Conclusion

Our daylight and sunlight analysis indicates that the proposed development at **237 Chamberlayne Road and 5b Derby Road, Eastleigh, SO50 5HX** will only have a minor impact on the surrounding properties at 20,20a,22a, 22b, and 23 Derby Road, 176-182 and 239-241 Chamberlayne Road.

As detailed in Sections 5.1-5.4, our analysis shows that the neighbouring habitable windows/rooms largely meet the target requirements of the BRE Guide in terms of daylight and sunlight in the proposed situation, with just a minor adverse material effect. Our assessment of amenity area shadowing indicates no adverse effect and compliance with BRE Guide target criteria.

The Vertical Sky Component (VSC) Analysis reveals minor changes in daylight access to the existing buildings before and after the proposed development. 43 out of 47 (91.5%) of the analysed windows comply comfortably with BRE guidelines for adequate daylighting [Section 5.1].

Our Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) assessment demonstrates that the proposed development will not significantly affect the existing buildings. All analysed windows comply comfortably with BS EN 17037:2018 [Section 5.1].

To ensure a garden or open space appears adequately sunlit throughout the year, at least half of it should receive a minimum of two hours of sunlight on March 21st. Our results confirm that existing open spaces will not be adversely affected by the proposed development [Section 5.3].

The internal daylight for the internal spaces of the proposed development has been assessed as part of this study. We conclude that daylight levels within the proposed habitable rooms are adequate and surpass the target criteria outlined in BS EN 17037:2018 and the BRE publication "Site Layout Planning for Daylight & Sunlight – A Guide to Good Practice" [Section 5.4].

Disclaimer

The contents of this report are based on drawings, specifications, and information provided by the Design Team, supplemented by assumptions and sourced data by NRG to undertake the assessment in the most accurate manner possible.

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