

73-84 Courtlands Close

**Daylight, Sunlight and
Overshadowing
Assessment**

October 2023

DOCUMENT CONTROL SHEET	
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1 EXECUTIVE SUMMARY

- 1.1 NRG Consulting have been commissioned to undertake a Daylight, Sunlight and Overshadowing Assessment on a proposed development consisting of a one storey roof extension to an existing building at 73-84 Courtlands Close, Watford, WD24 5GX.
- 1.2 The following guidelines have been followed to assess the proposed development:
- BRE's *Site Layout Planning for Daylight and Sunlight, A guide to good practice (BR 209)*, by P J Littlefair, 3rd Ed.
 - *BS EN 17037:2018 Daylight in Buildings*.
- 1.3 The BRE document is a guide whose stated aim "is to help rather than constrain the designer". The document provides advice and states that "it should not be mandatory and should not be seen as an instrument of planning policy. In special circumstances, the developer or planning authority may wish to use different target values".
- 1.4 The results of this report show that there is no adverse effect on the sunlighting levels to the neighbouring properties and spaces at 61-66, 67-72, 85-90 and 97-102 Courtlands Close.
- 1.5 In light of the above, it is considered that sunlight/daylight should not be a constraint to the granting of planning permission.

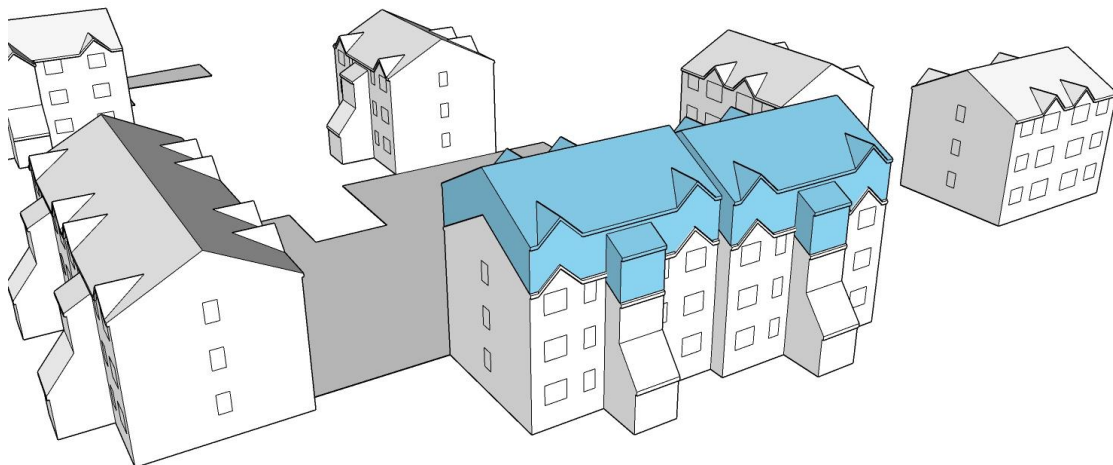


Figure 1: 3d Model of proposed buildings.

2 INTRODUCTION

2.1 Background

The Building Research Establishment (BRE) has set out in their handbook “Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice”, 3rd Ed, guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings. This document states that it is also 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 of the Chartered Institution of Buildings Services Engineers (CIBSE).

The guide also provides advice on site layout planning to determine the quality of daylight and sunlight within open spaces between buildings.

The BSI has set out in BS EN 17037:2018 Daylight in Buildings guidance to good practice in daylighting design, and presents 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 the local dwellings and their amenity areas with respect to the design proposals prepared by the design team.

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

- Prepare a 3D computer model to understand and visualize sunlight for the neighbours.
- Carry out daylight sunlight assessment using the methodologies set out in by BRE and British Standard Guidelines for diffuse daylight and sunlight conditions.

2.2 The Nature and Effect of Daylight and Sunlight

The BRE “Site layout planning for daylight and sunlight – A guide to good practice” 3rd edition by Paul J. Littlefair was released in June 2022 and superseded the second edition of the same guidance. The most important update from the previous version of the guidelines is represented by the methods for assessing daylight within a proposed building within section 2.1 and Appendix C of the handbook. These are based on the methods detailed in the BS EN 17037 which suggests two possible methodologies for appraising daylight across a room’s working plane: Illuminance Method Daylight Factor Method.



Figure 2: BRE guidelines

3 DAYLIGHT AND SUNLIGHT ASSESSMENT GUIDANCE

3.1 Assessment of the Effect of Daylight and Sunlight

When assessing the effects of proposed building projects and its potential to cause issues relating to light, it is important to recognize the distinction between daylight and sunlight. Daylight is the combination of all direct and indirect sunlight during the daytime, whereas sunlight comprises only the direct elements of sunlight. On a cloudy or overcast day, diffused daylight still shines through windows, even when sunlight is absent.

Care should also be taken when the development is situated to the south of existing buildings, as in the northern hemisphere, the majority of the sunlight comes from the south. In the UK (and other northern hemisphere countries) south-facing facades will, in general, receive most sunlight, while north-facing facades will receive fewer sunlight hours during summer months, specifically early mornings and late evenings.

The Building Research Establishment (BRE) report, BRE 209 “Site Layout Planning for daylight and sunlight- a guide to good practice” by P J Littlefair, looks at three separate areas when considering 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 to a dwelling and its garden and open spaces.

Appendix 1 in the BRE Report details the methodologies and criteria.

The BRE report provides guidelines for when the obstruction to sunlight 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.

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 21 March. If as a result of 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 21 st September and 21 st 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 and sunliting criteria

3.2 Angle to sky from horizontal.

In general, a building will retain the potential for good interior diffuse daylighting provided that, on all its main faces 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.

If this criterion is satisfied, no further calculations are required as it is unlikely that daylighting will be significantly affected.

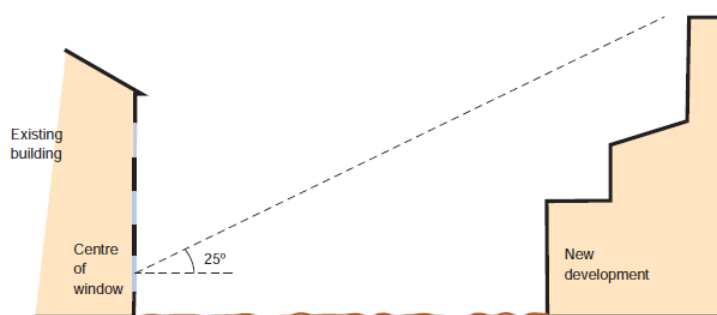


Figure 3: Section showing the angle to sky from horizontal criteria for diffuse daylighting

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 4: Aerial view of the site as existing.

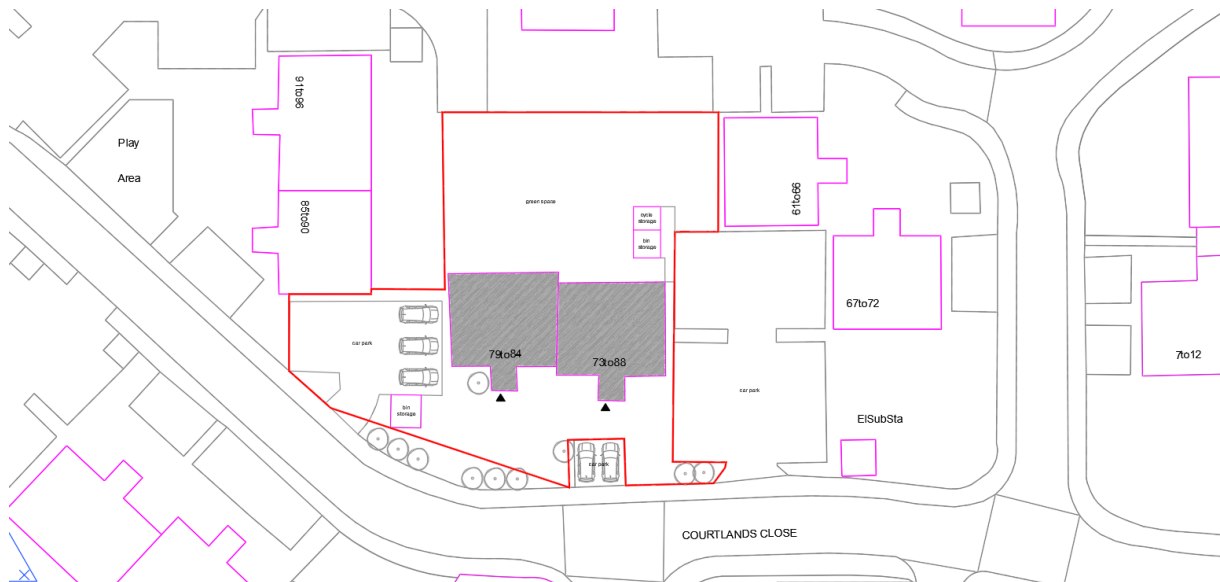


Figure 5: Proposed site plan

4.2 3D Model

To complete the daylight, sunlight and overshadowing assessment, a full-size 3D model of the existing area, including existing buildings and neighbouring properties was constructed in Trimble SketchUp 2021. The measure of the angle to sky from horizontal has been made manually within the model space, MBS Daylight software has been used to assess the Vertical Sky Component, the sunlight to the amenity areas and the APSH/WPSH.

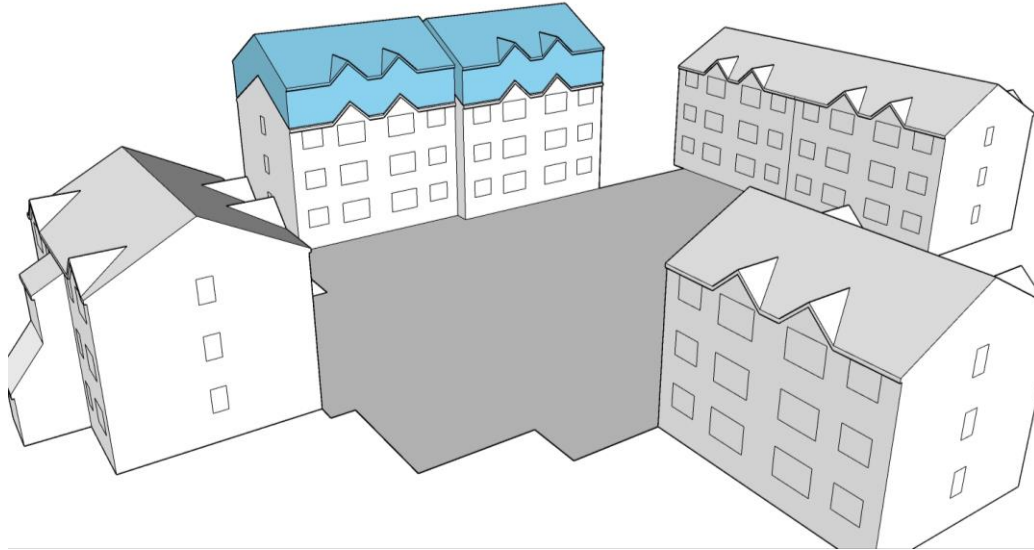



Figure 6: SketchUp 3D model of the proposed development.

4.3 Design Data

Architects: Metashape Architects

Drawing pack issued for Assessment on September 2023

 73-84 Courtlands CI - Proposed Drawings

DWG File

4,092 KB

5 RESULTS

5.1 Vertical Sky Component Analysis and APSH/WPSH Analysis

Our assessment of the Vertical Sky Component (VSC) reveals minimal 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 Tables 2 and 3 below. All are deemed compliant with BRE guidelines.

ADDRESS	WINDOW No	PRE CONSTRUCTION VSC	POST CONSTRUCTION VSC	AFFECT RATIO	MEETS BRE CRITERIA
85-90 Courtlands Close	1	38.33	37.93	0.99	YES
	2	38.78	38.33	0.99	YES
	3	39.26	38.79	0.99	YES
	4	28.93	26.98	0.93	YES
	5	30.25	28.35	0.94	YES
	6	31.92	30.22	0.95	YES
	7	32.93	31.46	0.96	YES
	8	32.34	29.5	0.91	YES
	9	33.41	30.92	0.93	YES
	10	34.66	32.7	0.94	YES
	11	35.27	33.77	0.96	YES
	12	35.63	32.24	0.9	YES
	13	36.56	33.96	0.93	YES
	14	36.98	35.3	0.95	YES
	15	36.69	35.41	0.97	YES
61-66 Courtlands Close	16	30.99	29.94	0.97	YES
	17	33.84	32.7	0.97	YES

ADDRESS	WINDOW No	PRE CONSTRUCTION VSC	POST CONSTRUCTION VSC	AFFECT RATIO	MEETS BRE CRITERIA
	18	36.99	36.02	0.97	YES
	19	30.98	29.15	0.94	YES
	20	31.76	30.24	0.95	YES
	21	32.34	31.23	0.97	YES
	22	32.51	31.64	0.97	YES
	23	34.02	32.07	0.94	YES
	24	34.41	32.96	0.96	YES
	25	34.75	33.71	0.97	YES
	26	34.89	34.06	0.98	YES
	27	36.02	34.39	0.95	YES
	28	36.71	35.43	0.97	YES
	29	36.87	35.93	0.97	YES
	30	36.42	35.66	0.98	YES
97-102 Courtlands Close	31	33.25	32.15	0.97	YES
	32	35.41	34.34	0.97	YES
	33	37.48	36.48	0.97	YES
67-72 Courtlands Close	34	29.15	28.05	0.96	YES
	35	32.61	31.46	0.96	YES
	36	36.46	35.39	0.97	YES

Table 2: Results of Vertical 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 AP SH	POST CONSTRUCTION AP SH	AFFECT RATIO	PRE CONSTRUCTION WPSH	POST CONSTRUCTION WPSH	AFFECT RATIO	MEETS BRE CRITERIA
85-90 Courtlands Close	1	82	76	0.93	28	28	1	YES
	2	84	82	0.98	28	28	1	YES
	3	88	84	0.95	30	28	0.93	YES
	4	33	28	0.85	10	10	1	YES
	5	38	30	0.79	9	9	1	YES
	6	44	38	0.86	9	9	1	YES
	7	44	42	0.95	9	8	0.89	YES
	8	42	33	0.79	12	10	0.83	YES
	9	44	38	0.86	10	9	0.9	YES
	10	45	44	0.98	10	9	0.9	YES
	11	47	44	0.94	12	9	0.75	YES
	12	46	41	0.89	12	12	1	YES
	13	46	42	0.91	12	9	0.75	YES
	14	47	44	0.94	13	10	0.77	YES
	15	48	46	0.96	14	12	0.86	YES
61-66 Courtlands Close	16	62	60	0.97	17	17	1	YES
	17	73	71	0.97	18	17	0.94	YES
	18	84	82	0.98	26	24	0.92	YES
	19	40	36	0.9	6	5	0.83	YES
	20	42	38	0.9	8	5	0.63	YES
	21	42	40	0.95	10	8	0.8	YES
	22	42	41	0.98	10	9	0.9	YES

ADDRESS	WINDOW No	PRE CONSTRUCTION APSH	POST CONSTRUCTION APSH	AFFECT RATIO	PRE CONSTRUCTION WPSH	POST CONSTRUCTION WPSH	AFFECT RATIO	MEETS BRE CRITERIA
	23	46	41	0.89	11	6	0.55	YES
	24	44	41	0.93	11	8	0.73	YES
	25	45	43	0.96	12	10	0.83	YES
	26	45	43	0.96	12	10	0.83	YES
	27	44	42	0.95	13	11	0.85	YES
	28	45	43	0.96	13	11	0.85	YES
	29	46	45	0.98	14	13	0.93	YES
	30	45	44	0.98	14	13	0.93	YES
97-102 Courtlands Close	31	81	77	0.95	23	19	0.83	YES
	32	84	83	0.99	26	25	0.96	YES
	33	86	86	1	28	28	1	YES
67-72 Courtlands Close	34	47	46	0.98	13	13	1	YES
	35	48	47	0.98	13	13	1	YES
	36	49	48	0.98	14	13	0.93	YES

Table 3: 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

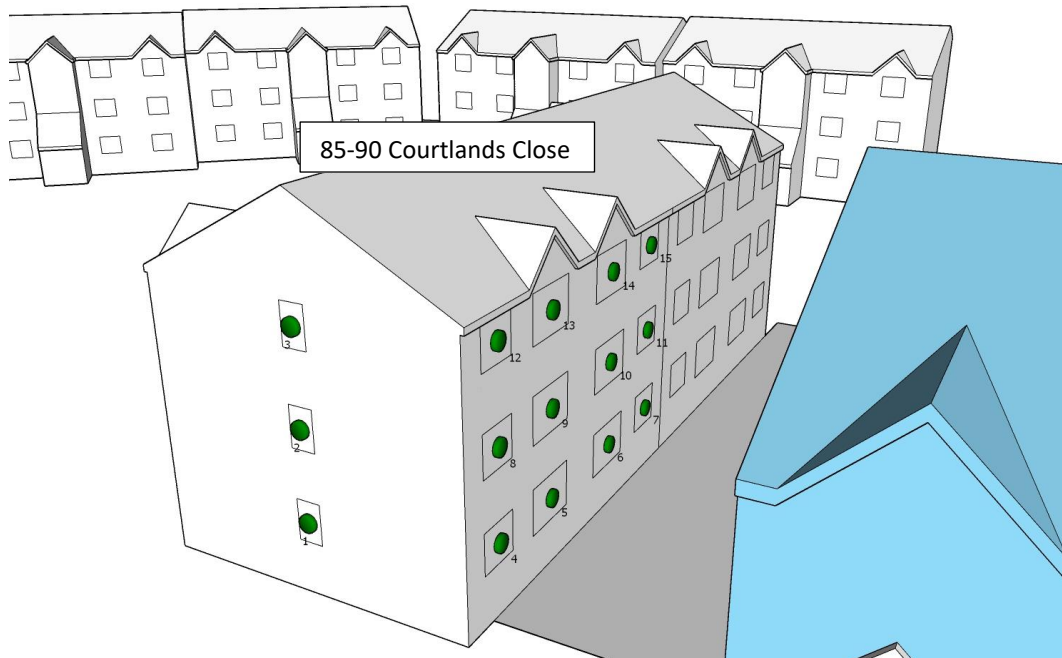


Figure 7: Window arrangement

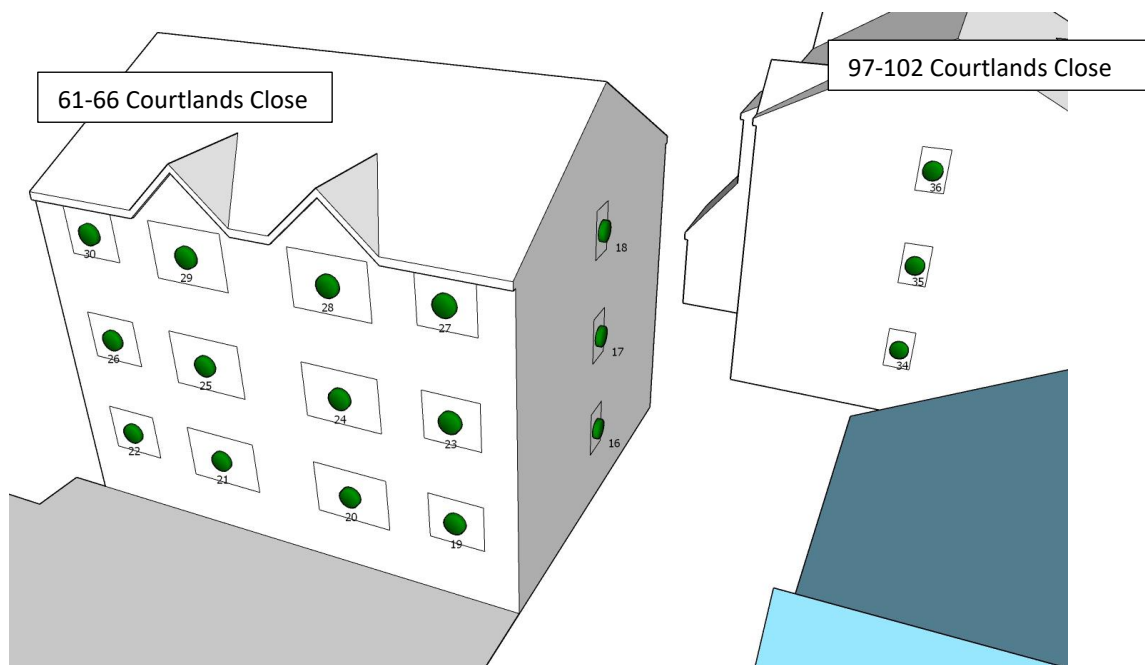


Figure 8: Windows arrangement

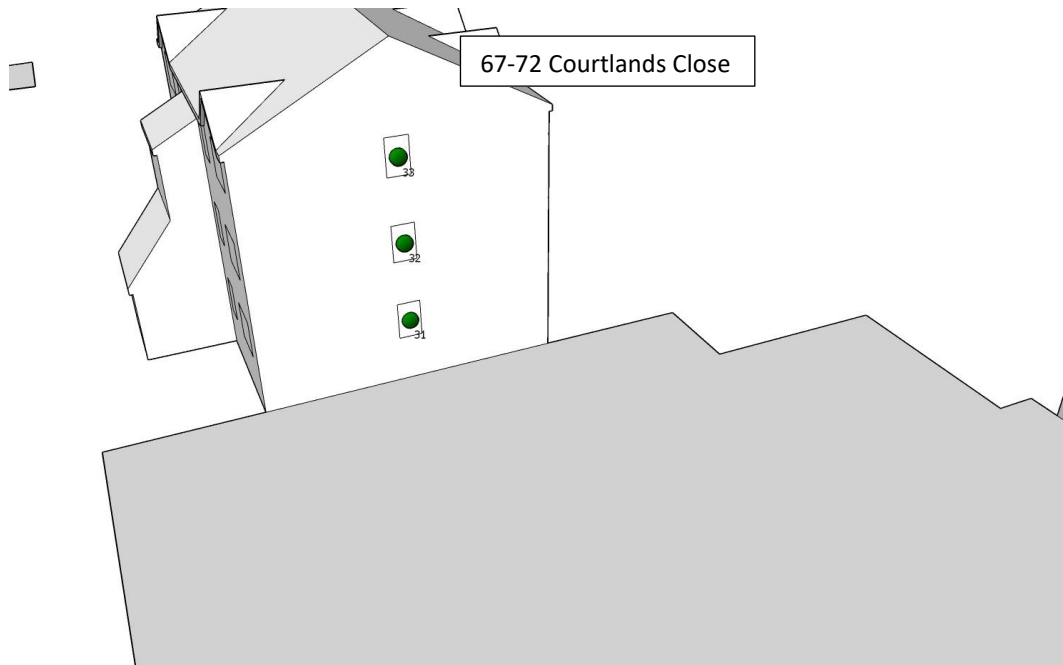


Figure 9: Windows arrangement

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 have been analysed using the 3D SketchUp model.

As depicted in Figures 10 and 11 below, our findings indicate that the proposed development does not significantly impact the sunlight received by adjoining amenity areas.

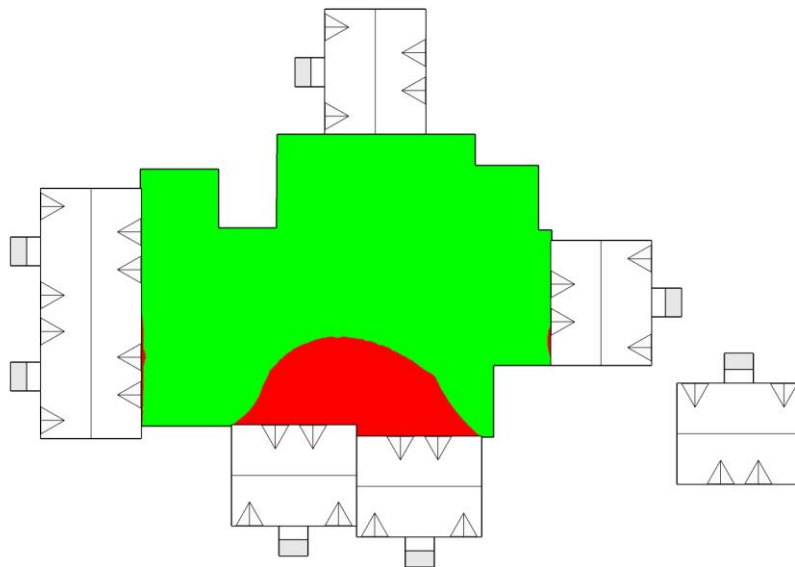


Figure 10: Existing amenity area sunlight

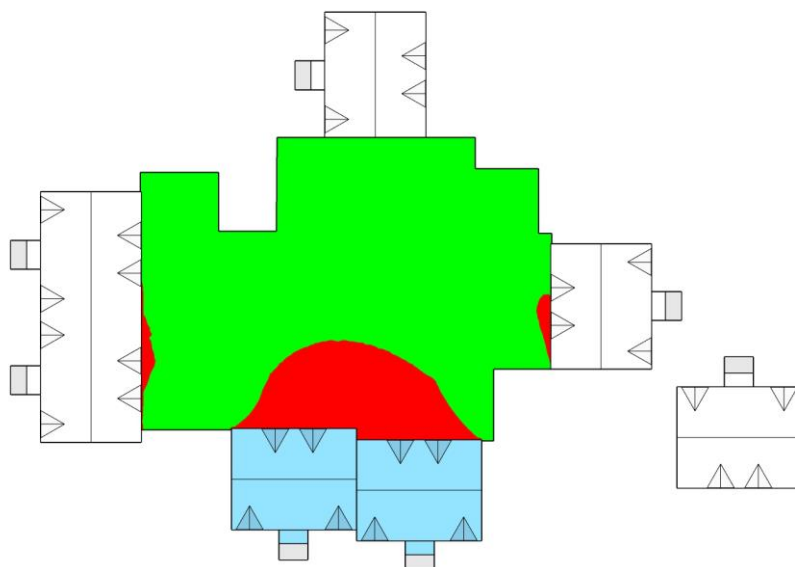


Figure 11: Proposed development amenity area sunlight

6 CONCLUSION

- 6.1 The daylight and sunlight analysis indicates that there will be no impact on the surrounding properties at 61-66, 67-72, 85-90 and 97-102 Courtlands Close arising from the proposed development at 73-84 Courtlands Close, Watford, WD24 5GX.
- 6.2 As detailed in Sections 5.1-5.3, our analysis shows that the neighbouring habitable windows/rooms meet the target requirements of the BRE Guide in terms of daylight and sunlight in the proposed situation, with no significant adverse material effect. Similarly, our assessment of amenity area shadowing indicates no adverse effect and compliance with BRE Guide target criteria.
- 6.3 The Vertical Sky Component (VSC) Analysis reveals minimal changes in daylight access to the existing buildings before and after the proposed development. All analysed windows comply comfortably with BRE guidelines for adequate daylighting [Section 5.1].
- 6.4 The APSH and 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].
- 6.5 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 5.4].
- 6.6 In summary, the proposed development fully complies with BRE Guidelines and will not impact daylight and sunlight access for surrounding buildings and amenity spaces within its vicinity. **Therefore, sunlight considerations should not pose a constraint to granting planning permission.**

