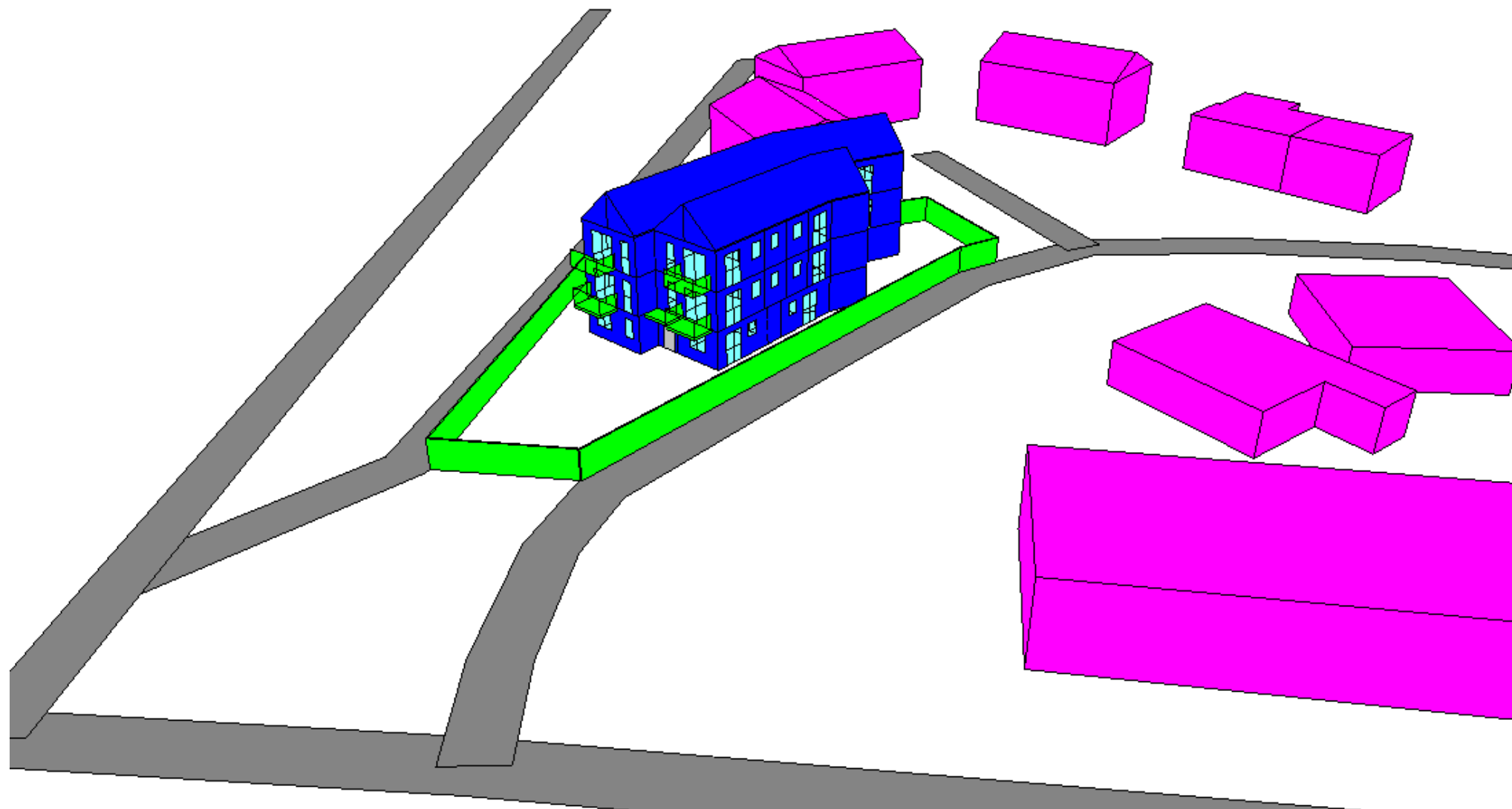


Proposed New Residential Development,
1 Castle Hill Crescent,
Rochdale,
OL11 4HZ

Daylight & Sunlight Report



Prepared by:

Northern Sustainability Consulting



1.0 EXECUTIVE SUMMARY

A daylight and sunlight analysis study has been undertaken on the eight proposed residential apartments at the 1 Castle Hill Crescent site in Rochdale, to assess the predicted daylight and sunlight levels of the current design proposals to the habitable spaces within the dwelling units using industry standard guidance and assessment criteria.

Digital models of each of the proposed development has been produced in the IES VE software which will be used to run the assessment, which has been based on the latest architectural drawings.

Using the native RadianceIES & SunCast tools within the software, the study follows the recommended procedures outlined in the Building Research Establishment's Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BR209, 2022), BS 8206-2:2008, and EN 17037:2018. The BRE's Home Quality Mark criteria were also referenced to provide additional insight into the daylighting performance of the spaces to predict the amount of natural lighting each habitable space can expect to receive.

Assessment Findings

The daylight and sunlight assessment indicates that the proposed three-storey residential development is expected to perform strongly when measured against the relevant industry guidance. Across the scheme, the vast majority of habitable rooms meet or exceed recommended daylight levels, with only isolated shortfalls identified in a small number of bedroom spaces. Overall, the development is considered to provide a good standard of internal daylight and sunlight for future occupants.

Daylight Performance

Modelling undertaken using RadianceIES demonstrated that the Average Daylight Factor (ADF) criteria of BS 8206-2 and BRE BR209 are achieved for almost all assessed spaces. Kitchens, living areas and the majority of bedrooms consistently exceeded their respective minimum thresholds, reflecting favourable room proportions and window configurations across the building. The BRE Home Quality Mark criteria were also met in most instances, with only a select few bedrooms—typically secondary bedrooms located deeper in plan—failing to achieve the higher HQM credit banding. These shortfalls are minor and do not affect compliance with statutory/baseline BRE guidance.

Sunlight Performance

Sunlight availability, measured through the Annual Probable Sunlight Hours (APSH) method, shows that all rooms with a qualifying orientation (i.e., within 90° of due south) achieve the BRE minimum annual and winter sunlight targets. Rooms facing east, west or north are exempt from APSH testing, and therefore their performance is not considered non-compliant. Where APSH was applicable, all living spaces and bedrooms achieved >25% annual sunlight and >5% winter sunlight, indicating favourable access to direct sunlight for much of the year.

Identified Areas of Lower Performance

A small number of bedrooms—principally secondary bedrooms on the upper floors—did not achieve the BRE Home Quality Mark threshold or recorded lower APSH values. These rooms are typically:

- Partially enclosed by adjacent external walls, or
- Benefit from only a single window with limited sky visibility.

These constraints naturally reduce daylight penetration and exposure to direct sunlight. Nevertheless, these rooms continue to comply with baseline BRE ADF requirements.

Summary

In summary, the assessment shows that the proposed three-storey development performs well overall, achieving industry daylight and sunlight benchmarks for nearly all habitable rooms. While a small number of bedrooms exhibit reduced daylight or sunlight potential, these instances are limited and largely attributable to localised design constraints rather than systemic issues. When considered across the site as a whole, the development is expected to deliver a strong level of natural light, supporting occupant comfort and wellbeing.

Assessment Results

Assessed Plot	Space	Assessed spaces meets the requirements of Average Daylight Factor (ADF)		Assessed spaces meets the requirements of Annual Probable Sunlight Hours
		Using BS 8206-2:2008 / BR209)?	Using BREs Home Quality Mark – Highest number of credits achieved for Credits 1 & 2?	Using BS 8206-2:2008 / BR209)?
1 Castle Hill Crescent				
Unit 1	Kitchen/Dining	✓	✓	✓
	Bedroom	✓	✓	✓
Unit 2	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✓	✓
	Bedroom 2	✓	✓	✓
Unit 3	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✓	✓
	Bedroom 2	✓	✗	✓
Unit 4	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✓	✓
	Bedroom 2	✓	✓	✓
Unit 5	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✗	✓
Unit 6	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✓	✓
	Bedroom 2	✓	✗	✓
Unit 7	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✓	✓
	Bedroom 2	✓	✓	✓
Unit 8	Kitchen/Dining	✓	✓	✓
	Bedroom 1	✓	✗	✓

2.0 INTRODUCTION

This report presents the results of a daylight and sunlight assessment for the eight proposed residential apartments at the 1 Castle Hill Crescent site in Rochdale. The primary objective is to determine whether the proposed internal environments will provide acceptable levels of natural light in line with current guidance and best practice.

The assessment focuses exclusively on habitable rooms within the dwellings—such as living rooms, kitchens, bedrooms, and studies—where access to daylight and sunlight is most critical for occupant wellbeing and comfort. All calculations have been carried out using IES VE software, applying physically accurate modelling techniques, and taking into account room geometry, window sizes, orientations, and surface reflectance values.

The following industry standards and guidance documents have been referenced throughout this assessment:

- BRE's Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BR209, 2022)
- British Standard BS 8206-2:2008 for Average Daylight Factor assessment
- European Standard EN 17037:2018 and its UK National Annex
- BRE Home Quality Mark – Technical Manual

Daylight and sunlight availability have been assessed using the Radiance-based simulations for dynamic daylight metrics (ADF), and solar exposure calculations using the SunCast module to evaluate Annual Probable Sunlight Hours (APSH).

The report also outlines the assumptions, methodologies, and criteria applied during the simulation process, providing transparency and consistency with recognised good practice.

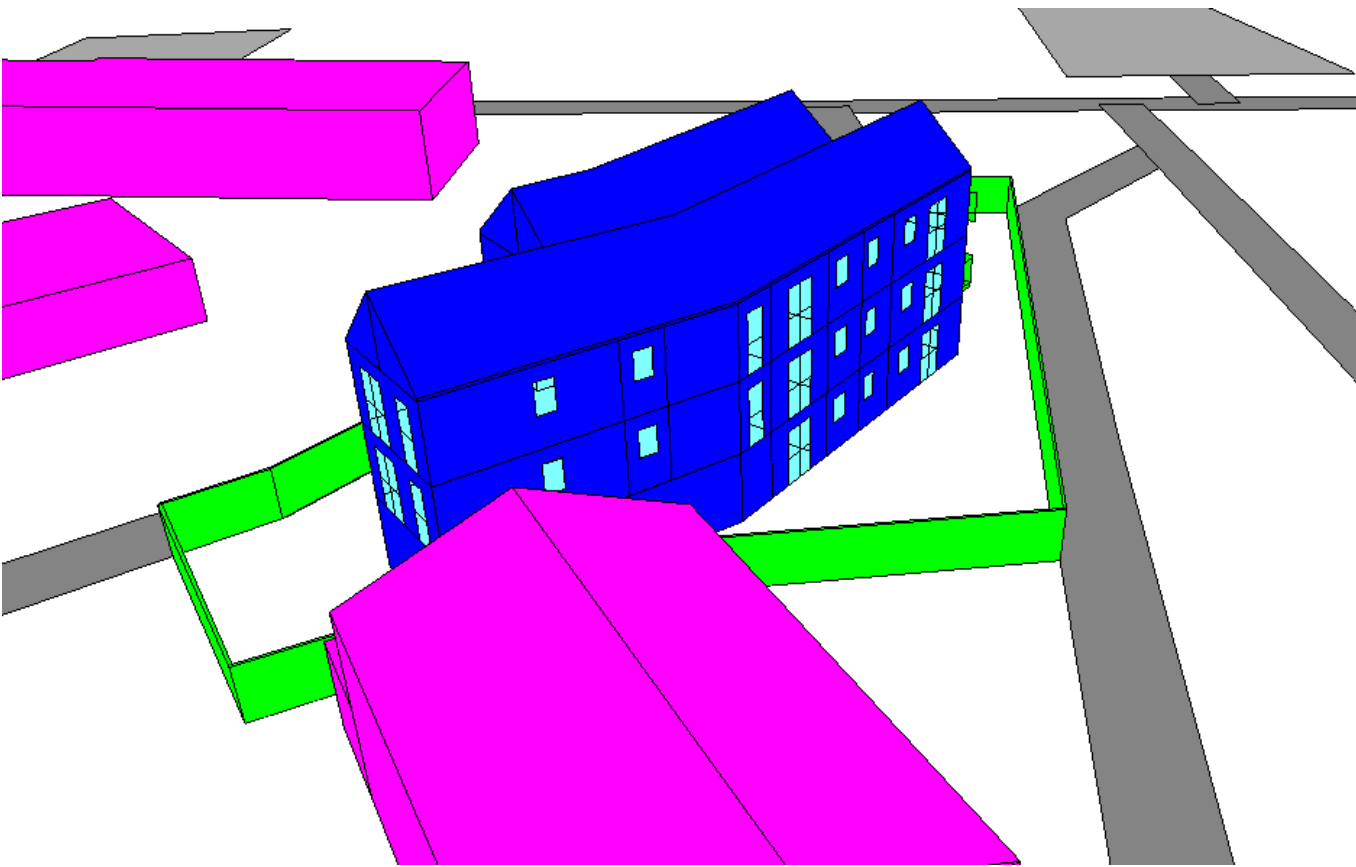
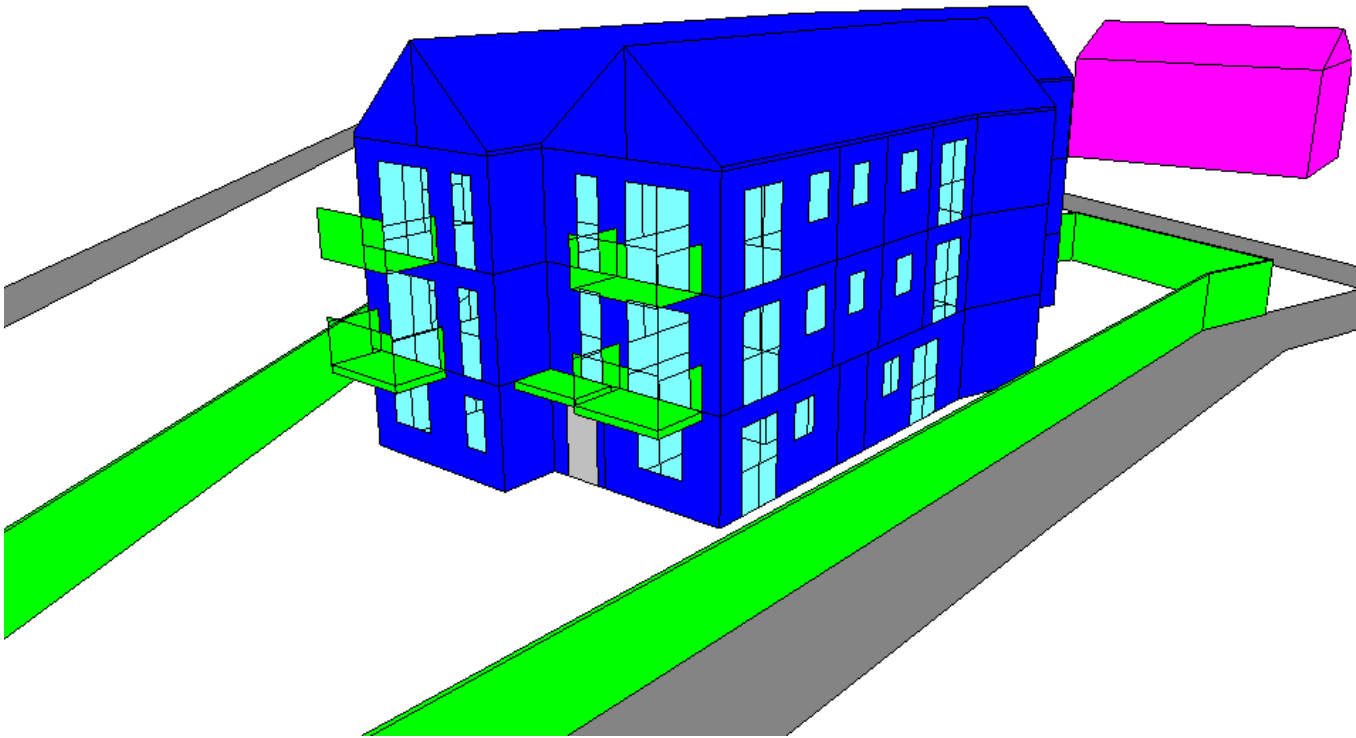


Figure 2: Site location of proposed scheme

Figure 3: Model Images of assessed residential block

3.0 DAYLIGHT ASSESSMENT METHODOLOGIES

The assessment methodology used for this analysis is taken from the BRE Guidance document (BR209) based on the standards set out in the British Standard BS8206:2. This analysis also refers to the standards outlined in European Standard EN 17037:2018 and the British national annex provided in the BS EN 17037 standard for additional information.

Average Daylight Factor (ADF) Using BS 8206-2:2008 / BR209

BRE's 2022 guidance document Site Layout Planning for Daylight and Sunlight states the following with respect to Average Daylight Factors (ADF).

C4 If a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These additional recommendations are minimum values of ADF which should be attained even if a predominantly daylit appearance is not achievable.

Above: From BRE's 2022 guidance document Site Layout Planning for Daylight and Sunlight therefore, in line with this guidance, minimum recommended average daylight factors are:

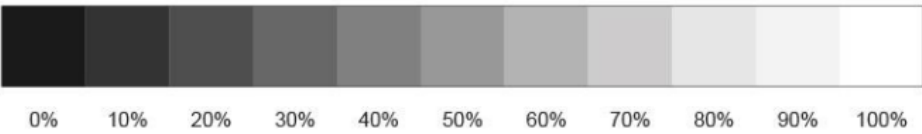
- Bedrooms/Studios – 1%
- Living Rooms – 1.5%
- Kitchens – 2%

The Following assumptions have been applied in this study:

- Sky Conditions: Standard CIE overcast sky
- Time (24hr): 12:00
- Date: 21 September
- Working Plane: 0.85m
- 0.5m boarder from perimeter to each space assumed

The following surface reflectance's were applied in this study:

Material Surface	Reflectance Value (%)	Light Transmittance (%)	Notes
External Wall	20	-	-
Internal Partition (Wall)	70	-	Light Colored Walls
Floor/Ceiling (Floor)	20	-	-
Floor/Ceiling (Ceiling)	70	-	Light Colored Ceiling
Window Glazing	-	70	-
Window Frames	25	-	-



BRE's Home Quality Mark

BRE Home Quality Mark – Technical Manual aims to support the assessment and rating of new homes. The technical manual also acts as a reference for any stakeholder involved in the development of a new home which is being (or has been) assessed against the standard.

There are two criteria with regards to Average Daylight Factor, for which a maximum of 5 credits for each is possible.

Credit Summary

Criterion number	Title	Credits
crit 1	01 Average daylight factor (kitchens)	5
crit 2	02 Average daylight factor (living spaces)	up to 5
crit 3	03 View of sky	3
Total credits available		13

Criteria

01 Average daylight factor (kitchens)

5 credits

crit 1 All kitchens achieve a minimum average daylight factor of at least 2%.

02 Average daylight factor (living spaces)

up to 5 credits

crit 2 Credits will be awarded based upon the minimum average daylight factor achieved for all living rooms, dining rooms and studies (see Table 19).

Table 19 Minimum average daylight factors and associated credits.

Minimum average daylight factor	Credits
1.5%	1
1.8%	3
2.0%	5

03 View of sky

3 credits

crit 3 80% of the working plane in each kitchen, living room, dining room and study receives direct light from the sky.

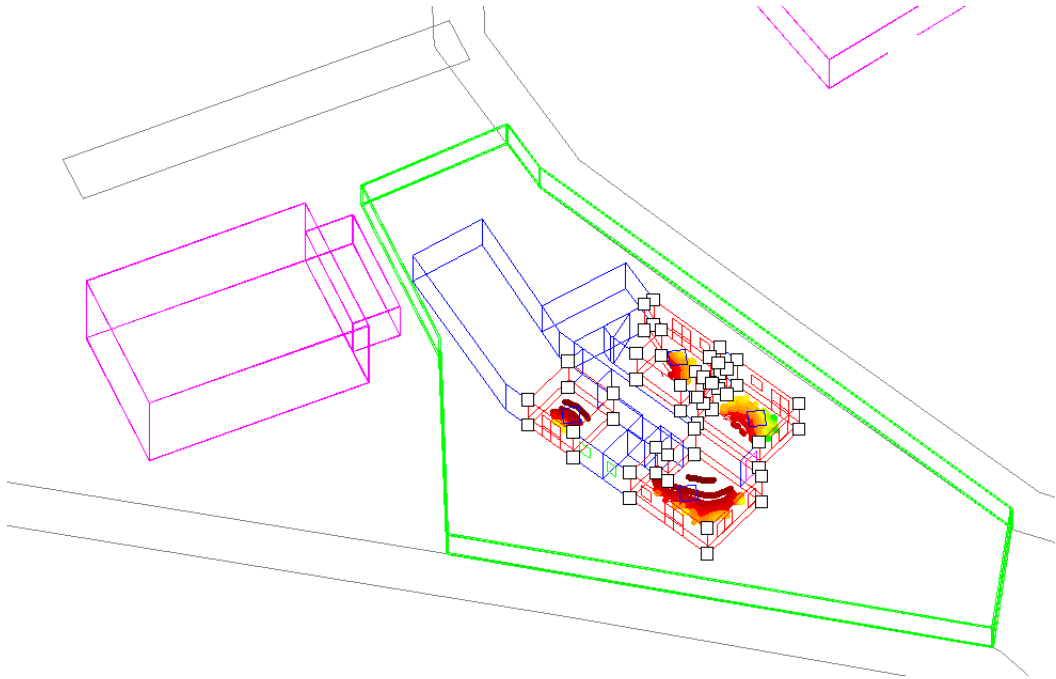


Figure 4: IES VE Radiance Assessment Visuals of exempld first floor of Block B

4.0 SUNLIGHT ASSESSMENT METHODOLOGIES

The sunlight analysis has been carried out in accordance with the guidelines set out in the Building Research Establishment (BRE) publication Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BR209, 2022), in conjunction with the British Standard BS8206-2 and European Standard EN 17037 where relevant. These documents provide methodologies for assessing sunlight availability within proposed developments and to nearby sensitive receptors.

Annual Probable Sunlight Hours

Sunlight availability is quantified using the Annual Probable Sunlight Hours (APSH) metric. APSH represents the total number of hours per year during which sunlight is expected to reach a window, allowing for average climatic conditions (i.e. cloud cover) at the site's location. BRE guidance recommends that:

- For rooms with windows facing within 90° of due south, at least 25% of annual probable sunlight hours should be available at the reference point on the window wall.
- At least 5% of sunlight hours should occur during winter months (21 September – 21 March).
- A reduction below 0.8 times the former APSH value, particularly when the total annual reduction exceeds 4%, may indicate a noticeable loss of sunlight.

These thresholds are applied to main living rooms only, as these are deemed most sensitive to sunlight availability. Kitchens and bedrooms are generally considered less critical in this respect unless combined with living functions (e.g. studio units or open-plan bed/living spaces).

Sunlight exposure is assessed using the SunCast module within IES VE software. The analysis is undertaken by simulating the sun path and calculating the hours of direct sunlight received at reference points on the glazed elements of habitable rooms.

The simulation is carried out for the 21st of March, which represents the equinox and provides a balanced annual assessment. Where more detailed dynamic sunlight simulations are required (e.g. for over-shadowing assessments or complex urban geometries), the Annual Sunlight Exposure (ASE) metric may also be employed, particularly where visual comfort or potential glare is a concern.

The following assumptions have been applied:

- All window positions and orientations are taken from the latest architectural plans.
- Only windows to habitable rooms are assessed.
- Trees, fences, or other external obstructions are excluded unless data was available.
- Reflective values and glazing transmittance are consistent with those used in the daylight simulation to ensure comparability across results.

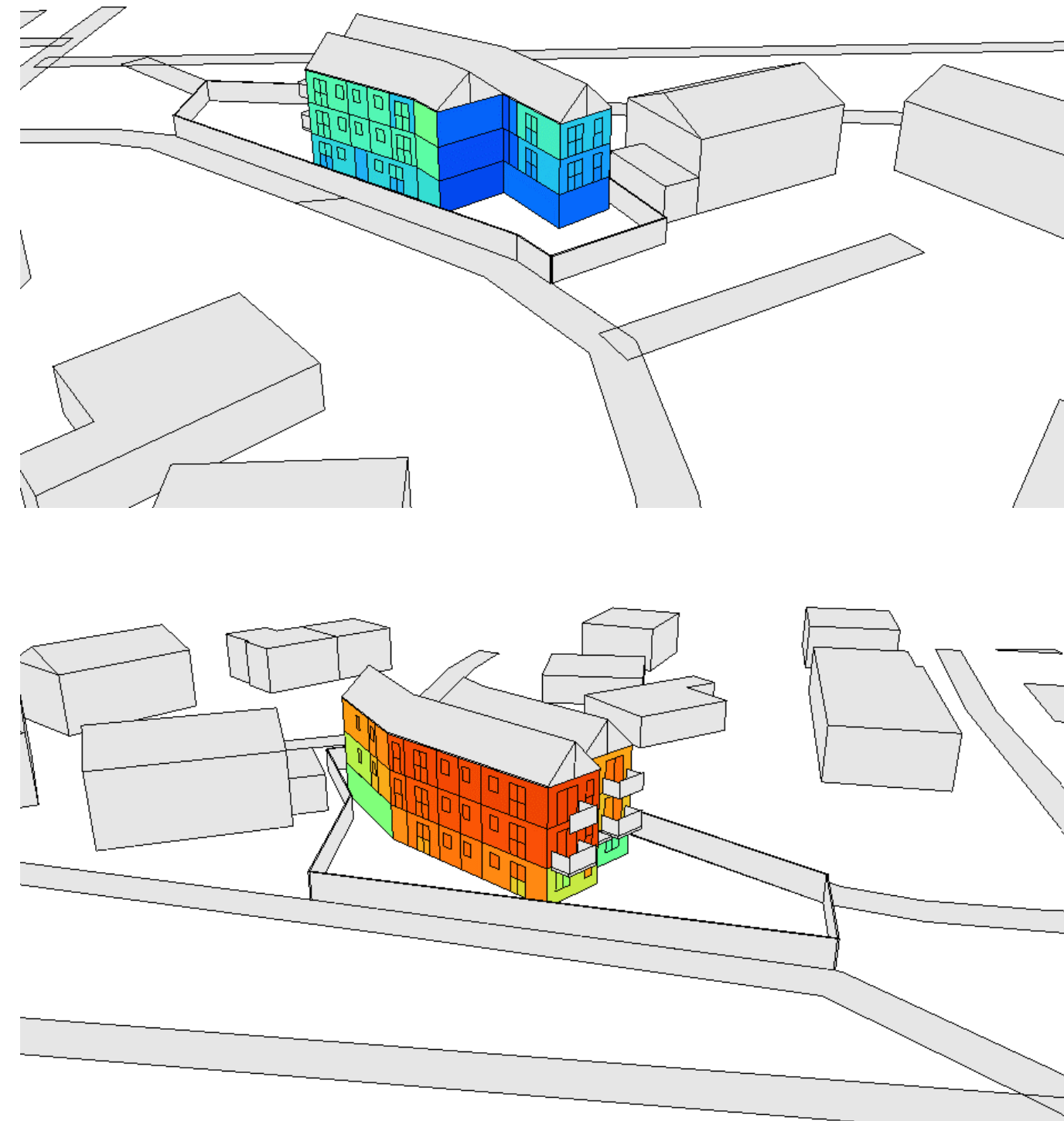


Figure 5: IES VE Suncast of the site

5.0 REFERENCE DRAWINGS

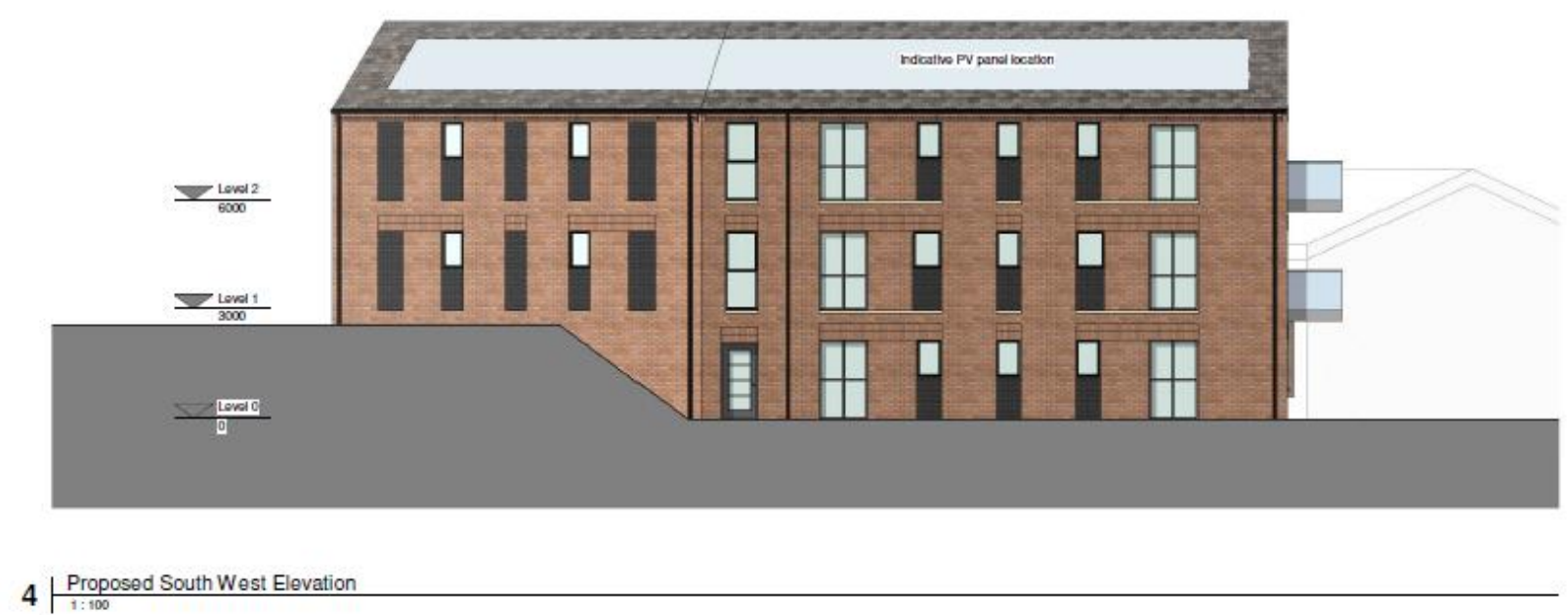


Figure 6: Elevations of the proposed development

Ground Floor

[illegible]

Daylight Factor (%)

13.00
12.50
12.00
11.50
11.00
10.50
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

Figure 8: IES VE Radiance Assessment Visuals of the ground floor

First Floor



Figure 9: Floorplan of the first floor

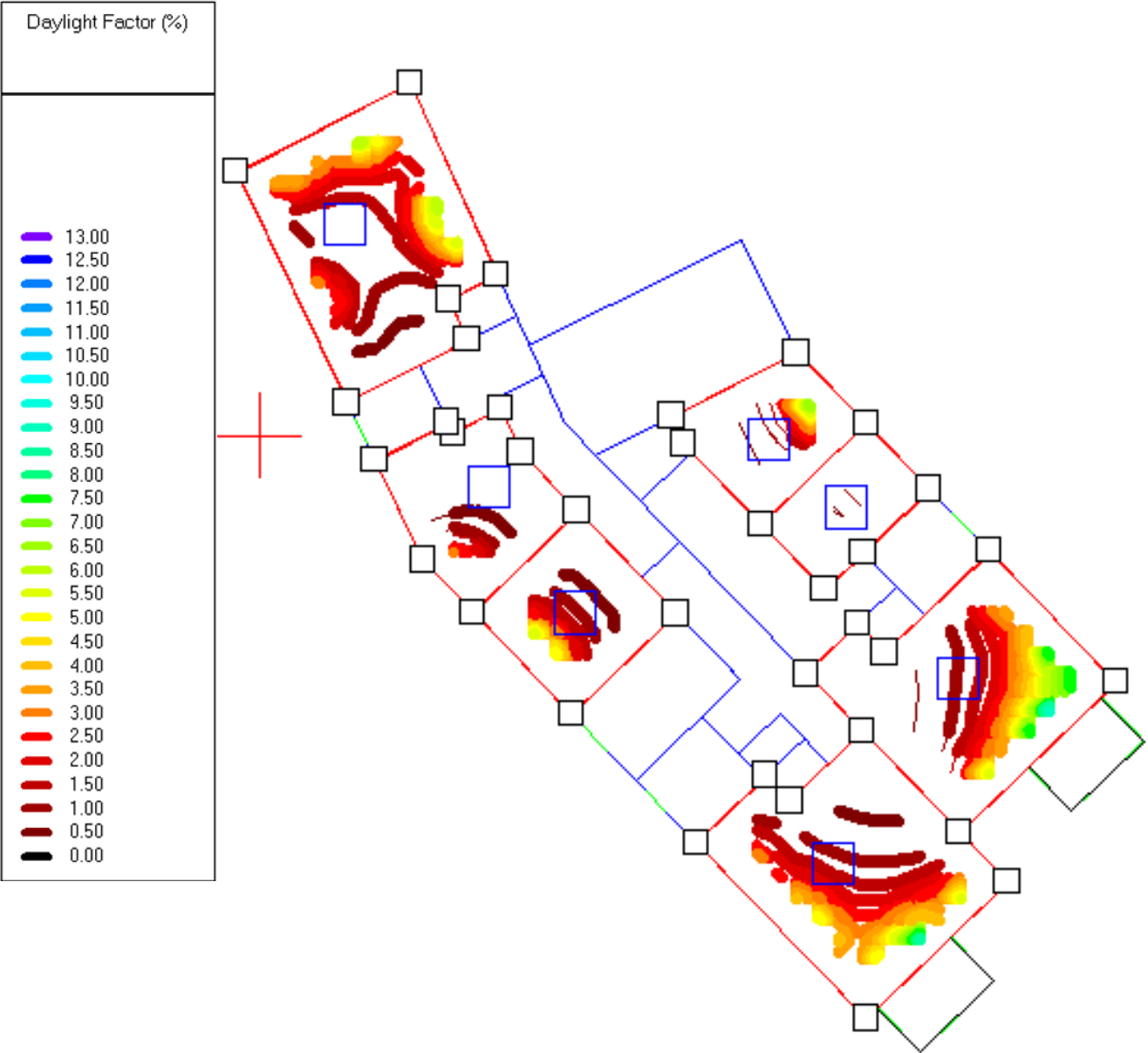


Figure 10: IES VE Radiance Assessment Visuals of the first floor

Second Floor



Figure 11: Floorplan of the second floor

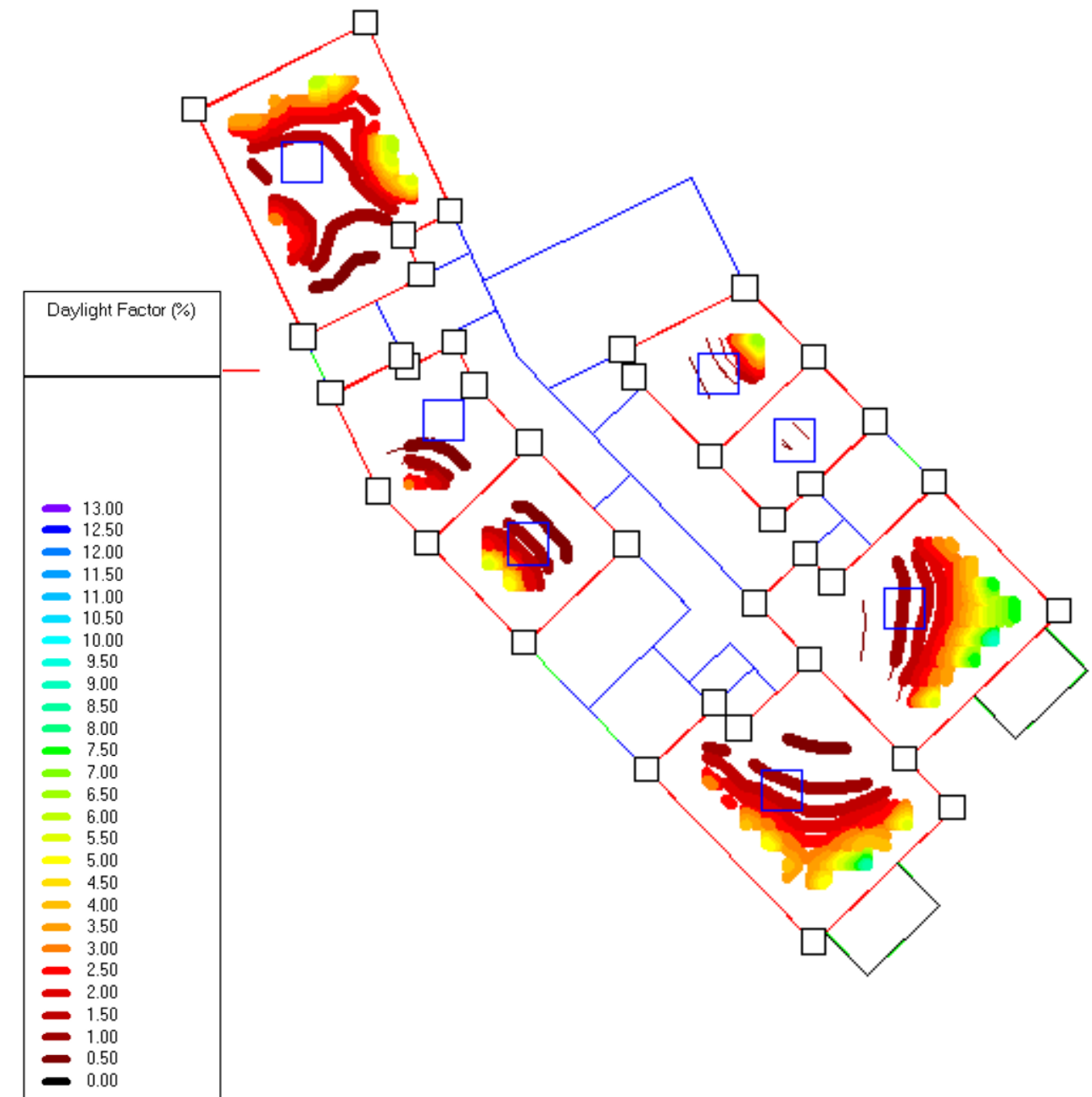


Figure 12: IES VE Radiance Assessment Visuals of the second floor

7.0 RESULTS – DAYLIGHT ASSESSMENT

Daylight Assessment Results – Block B						
Unit	Space	Target ADF (Average Daylight Factor) %		Measured ADF (Average Daylight Factor) %	Achieves the BRE Best Practice Guidelines?	Achieves BREs Home Quality Mark – Highest number of credits achieved for Credits 1 & 2?
		BS 8206- 2:2008 / BR209)	BRE's Home Quality Mark			
Unit 1	Kitchen/Dining	2%	2%	7.7%	✓	✓
	Bedroom 1	1%	2%	5.6%	✓	✓
Unit 2	Kitchen/Dining	2%	2%	3.7%	✓	✓
	Bedroom 1	1%	2%	3.0%	✓	✓
	Bedroom 2	1%	2%	2.2%	✓	✓
Unit 3	Kitchen/Dining	2%	2%	5.1%	✓	✓
	Bedroom 1	1%	2%	3.4%	✓	✓
	Bedroom 2	1%	2%	1.8%	✓	✗
Unit 4	Kitchen/Dining	2%	2%	4.3%	✓	✓
	Bedroom 1	1%	2%	3.0%	✓	✓
	Bedroom 2	1%	2%	2.2%	✓	✓
Unit 5	Kitchen/Dining	2%	2%	3.9%	✓	✓
	Bedroom 1	1%	2%	2.0%	✓	✗
Unit 6	Kitchen/Dining	2%	2%	5.0%	✓	✓
	Bedroom 1	1%	2%	3.4%	✓	✓
	Bedroom 2	1%	2%	1.8%	✓	✗
Unit 7	Kitchen/Dining	2%	2%	4.3%	✓	✓
	Bedroom 1	1%	2%	3.0%	✓	✓
	Bedroom 2	1%	2%	2.2%	✓	✓
Unit 8	Kitchen/Dining	2%	2%	3.9%	✓	✓
	Bedroom 1	1%	2%	1.4%	✓	✗

8.0 RESULTS – SUNLIGHT ASSESSMENT

Sunlight Assessment Results – Block B							
Unit	Space	APSH		Orientation	Measured APSH (Annual)?	Measured APSH (Winter)?	Meets BRE Criteria?
		Annual Target (≥25%)	APSH – Winter Target (≥5%)				
Unit 1	Kitchen/Dining	Exempt from calculation as not within 90° of true South					
	Bedroom 1	Exempt from calculation as not within 90° of true South					
Unit 2	Kitchen/Dining	✓	✓	South	30.0%	17.1%	✓
	Bedroom 1	✓	✓	South	25.4%	13.2%	✓
	Bedroom 2	✓	✓	South	26.4%	13.7%	✓
Unit 3	Kitchen/Dining	Exempt from calculation as not within 90° of true South					
	Bedroom 1	Exempt from calculation as not within 90° of true South					
	Bedroom 2	Exempt from calculation as not within 90° of true South					
Unit 4	Kitchen/Dining	✓	✓	South	28.7%	11.1%	✓
	Bedroom 1	✓	✓	South	26.4%	13.2%	✓
	Bedroom 2	✓	✓	South	26.3%	13.2%	✓
Unit 5	Kitchen/Dining	✓	✓	South	25.2%	11.1%	✓
	Bedroom 1	✓	✓	South	25.8%	13.2%	✓
Unit 6	Kitchen/Dining	Exempt from calculation as not within 90° of true South					
	Bedroom 1	Exempt from calculation as not within 90° of true South					
	Bedroom 2	Exempt from calculation as not within 90° of true South					
Unit 7	Kitchen/Dining	✓	✓	South	32.6%	14.6%	✓
	Bedroom 1	✓	✓	South	27.4%	13.2%	✓
	Bedroom 2	✓	✓	South	27.5%	13.2%	✓
Unit 8	Kitchen/Dining	✓	✓	South	25.4%	11.2%	✓
	Bedroom 1	✓	✓	South	27.3%	13.2%	✓