

**Technical Report -
Daylight & Sunlight Analysis
Ref: Z54917.1A**

**41 Market Street
Watford**

For

DPA (London) Ltd






FS 560187

Energy Counsel
Viridor House
No.3 Bolholt Terrace
Bury/Gtr Manchester
BL8 1PP

Tel: +44 (0)161-762 1055
Fax: +44 (0)161-761 1094

Matthew.Gibson@energycounsel.co.uk
www.energycounsel.co.uk

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Produced by:		Matthew Adams	1 st December 2023
Checked by:		Tony Turner	1 st December 2023
Approved by:		Matthew Gibson	1 st December 2023

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1.0 Introduction

This report has been prepared to support the submission of a planning application for the change of use of Commercial space into residential at 41 Market Street, Watford. The proposed development consists of the creation of 8 dwellings within existing commercial space at the Ground and First floors. We have undertaken an assessment to demonstrate the quantity and quality of daylight and sunlight received by the new residential spaces.

In accordance with good practise and planning policy we have therefore reviewed the following against the BRE's daylight and sunlight standards:

- Vertical sky and sky component
- Daylight Illuminance
- Annual probable sunlight hours

Basis of Assessment

It is usual to assess daylight and sunlight in relation to the guidelines set out in the 'Site layout planning for daylight and sunlight, A guide to good practice – BR209 2022'.

The BRE guidelines provide two principal measures of quality of daylight achieved within new residential properties – namely Vertical Sky Component (VSC), and daylight illuminance. We have used IES Virtual Environment software to carry out the analysis, specifically the RadianceIES programme. These measures of daylight are discussed in the following report below.

Vertical Sky Component (VSC) - VSC is a measure of the skylight reaching a point from an overcast sky. For new buildings, the BRE guidelines state that the VSC at the centre of a window should not be less than 27%, in order to provide reasonable daylight amenity. If a room has two or more windows of equal size, the mean of their VSCs may be taken.

Daylight Illuminance Method - This method involves using climatic data for the location of the site to calculate the illuminance from daylight at each point on an assessment grid on the reference plane at an at least hourly interval for a typical year.

A target illuminance (ET) should be achieved across at least half of the reference plane in a daylit space for at least half of the daylight hours. Another target illuminance (ETM) should also

be achieved across 95% of the reference plane for at least half of the daylight hours; this is the minimum target illuminance to be achieved towards the back of the room.

Probable Sunlight Hours (PSH) - In relation to sunlight, the BRE recommends that a dwelling, or non-domestic building that has a particular requirement for sunlight, will appear reasonably sunlit provided:

- at least one main window wall faces within 90° of due south and
- a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March.

This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.

Trees and shrubs have not been included within the analysis, partly because their exact shape is very hard to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building or wall. Only where there is a dense belt or group of evergreen planting will this be included within and shading modelling.

We have only assessed occupied rooms, i.e. Living Rooms, Kitchens and Bedrooms, as these are the rooms where daylight and sunlight are most important.

2.0 Executive Summary

We have reviewed the proposals for the creation of 8 dwellings within existing commercial space against the BRE's criteria. Section 6.0 of our report shows the proposed massing after development.

We have modelled the proposed designs for the new dwellings at 41 Market Street, as provided by DPA. The submitted Site Plan and new dwelling arrangement has not resulted in any difficulties in meeting the BRE criteria, there are good levels of daylight and sunlight received by the windows and internal occupied space.

The analysis shows that for the proposed development:

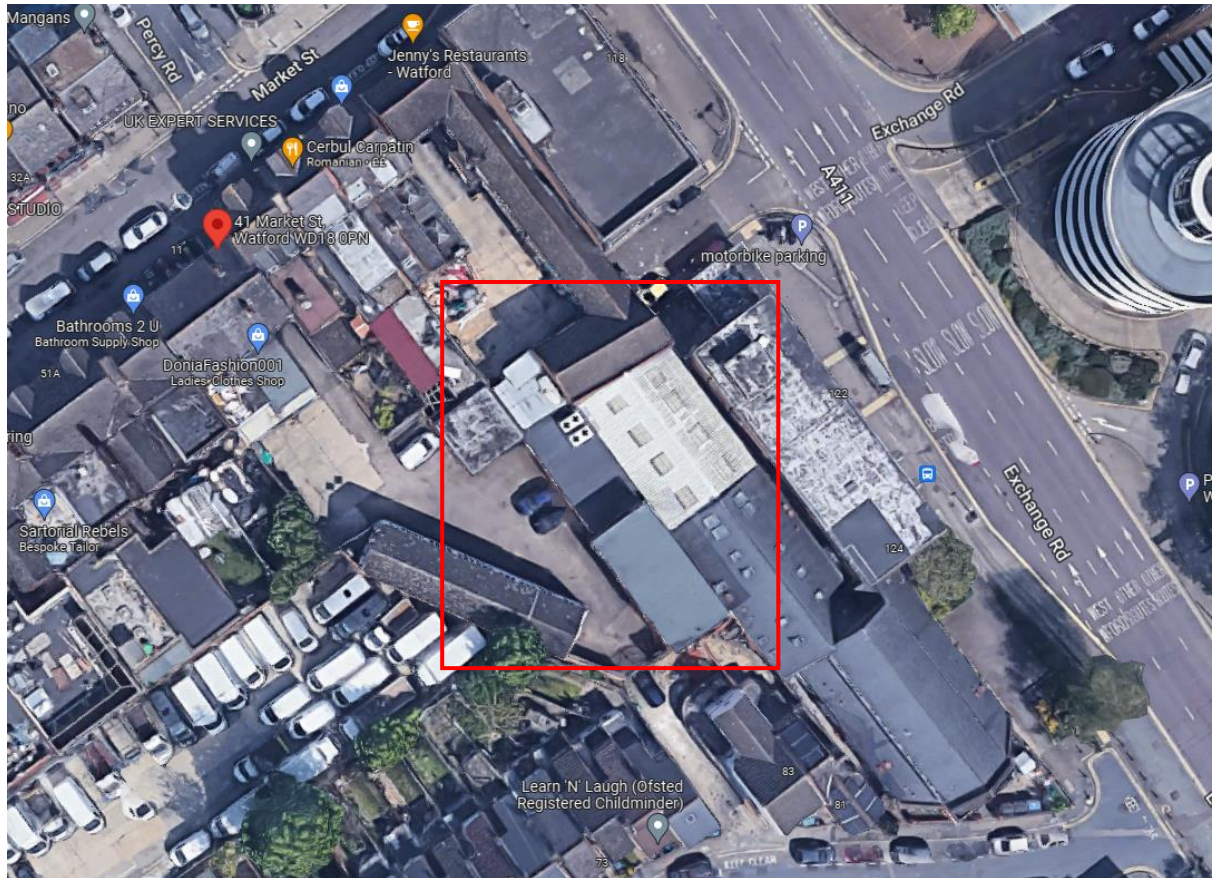
- 1. The new windows in the new Studio Apartment fully accord with the BRE VSC and SC criteria for a new development** – all windows and rooflights within the occupied spaces/orientations exceed the minimum VSC of 27%. The simulation software has determined that the angle of obstruction from the mid-point of these windows is more than 65°, therefore a good level of daylight is achieved.
- 2. All rooms comfortably achieve the BRE and BS EN 17037 Daylight Illuminance criteria** – all internal occupied spaces achieve more than 300 Lux for more than 50% of the daylight hours and more than 100 Lux for more than 95% of the daylight hours. Therefore, exceeding the minimum standards by a reasonable margin.
- 3. All windows fully accord with the BRE PSH criteria for a new development** – the proposed PSH values are very good considering the number of surrounding buildings. The simulation software has demonstrated that all windows will receive a minimum of 2.50 hours of direct sunlight on 21st March. Therefore achieving a good level of sunlight for a new dwelling (minimum 1.50 hours).

Conclusion

We therefore conclude that, in respect of the proposed development, the daylight/sunlight amenity to the new dwellings at 41 Market Street are in accordance with the current BRE BR209 guidance.

3.0 Existing Site

3.1 The existing Location plan of the development plot is shown below. The site is located on Market Street surrounded by existing Commercial and Residential buildings. The building is currently used for Commercial use at all floor levels. This report only considers the proposed residential space at Ground and First floor levels.



3.2 Existing Site Layout:



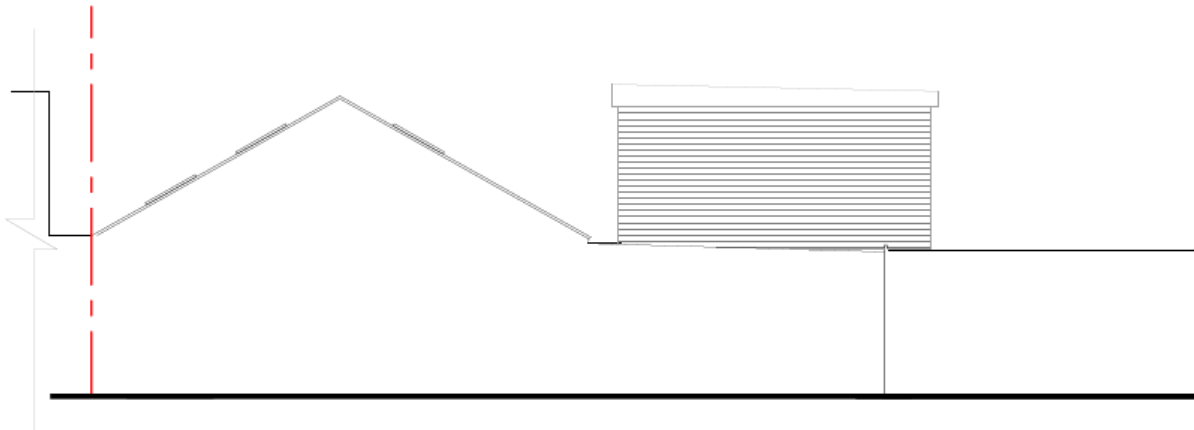
1 Existing Block Plan

4.0 Proposed Development

4.1 Proposed Elevations:



① **Proposed front elevation**
1:100



② **Proposed side elevation**
1:100

4.2 Proposed Floor Plans:





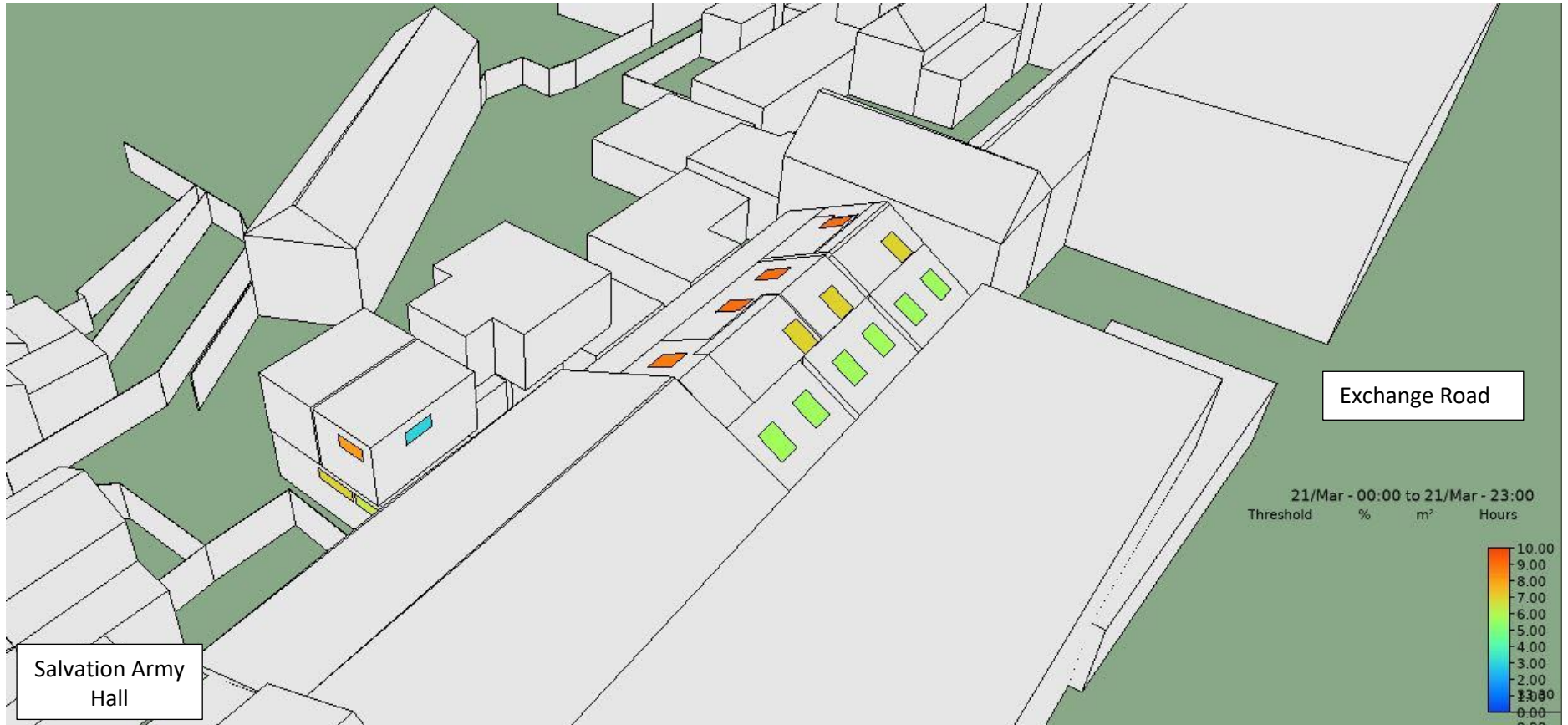
The new residential space is to replace commercial space at Ground and First floor levels as per the floor plans shown above.

5.0 Image of the Existing Site



6.0 Daylight and Sunlight Analysis

View of the site from the Southeast, showing the number of hours of direct sunlight received by each window on 21st March:

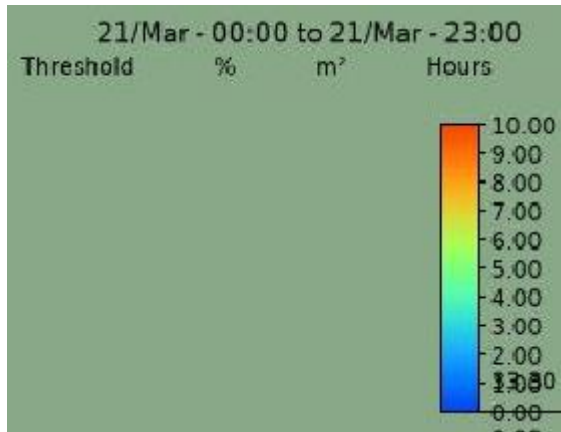


Z54917.1A Daylight & Sunlight Analysis

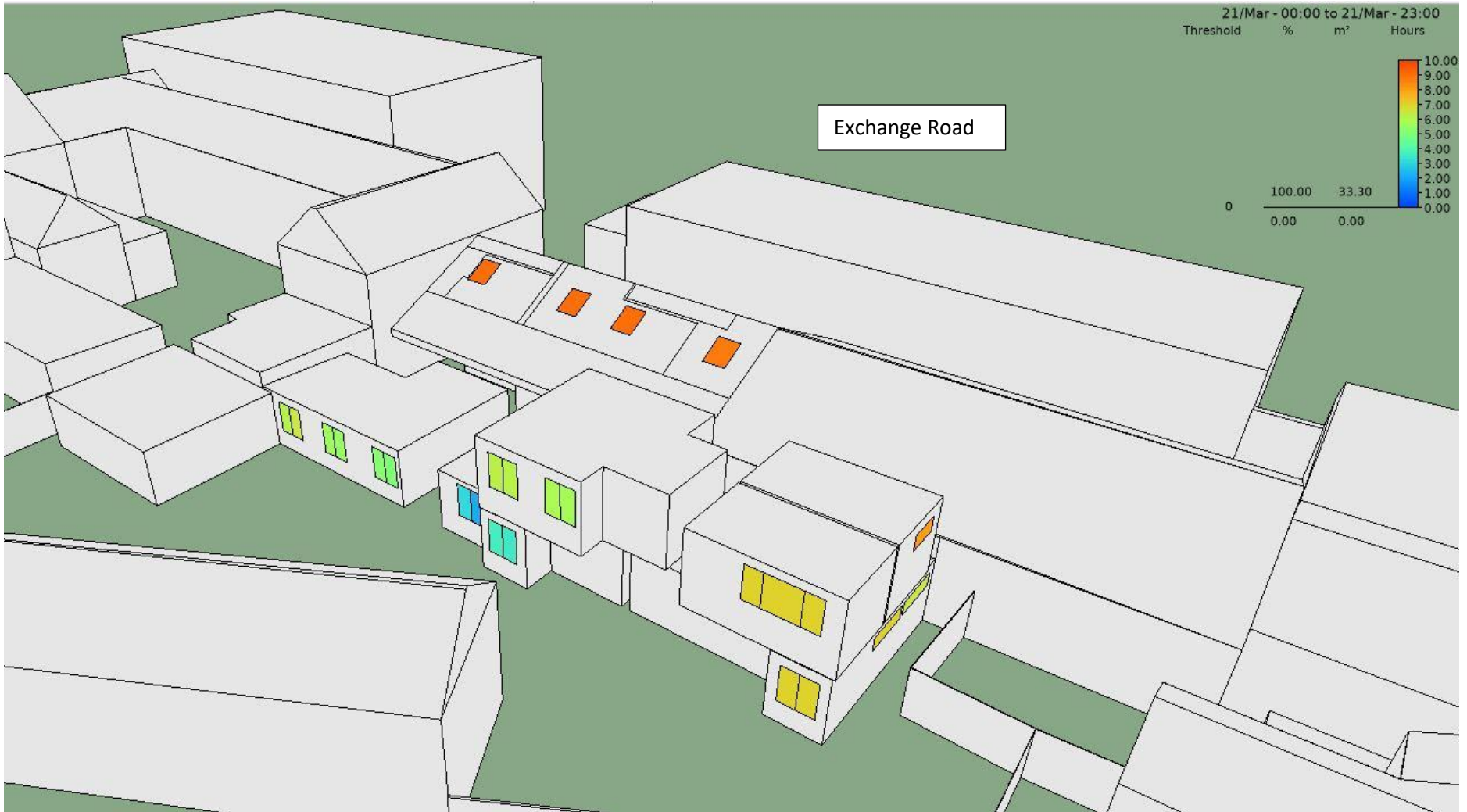
41 Market Street, Watford

The legend in the bottom right corner of the image shows the number of hours of direct sunlight received by each window on 21st March.

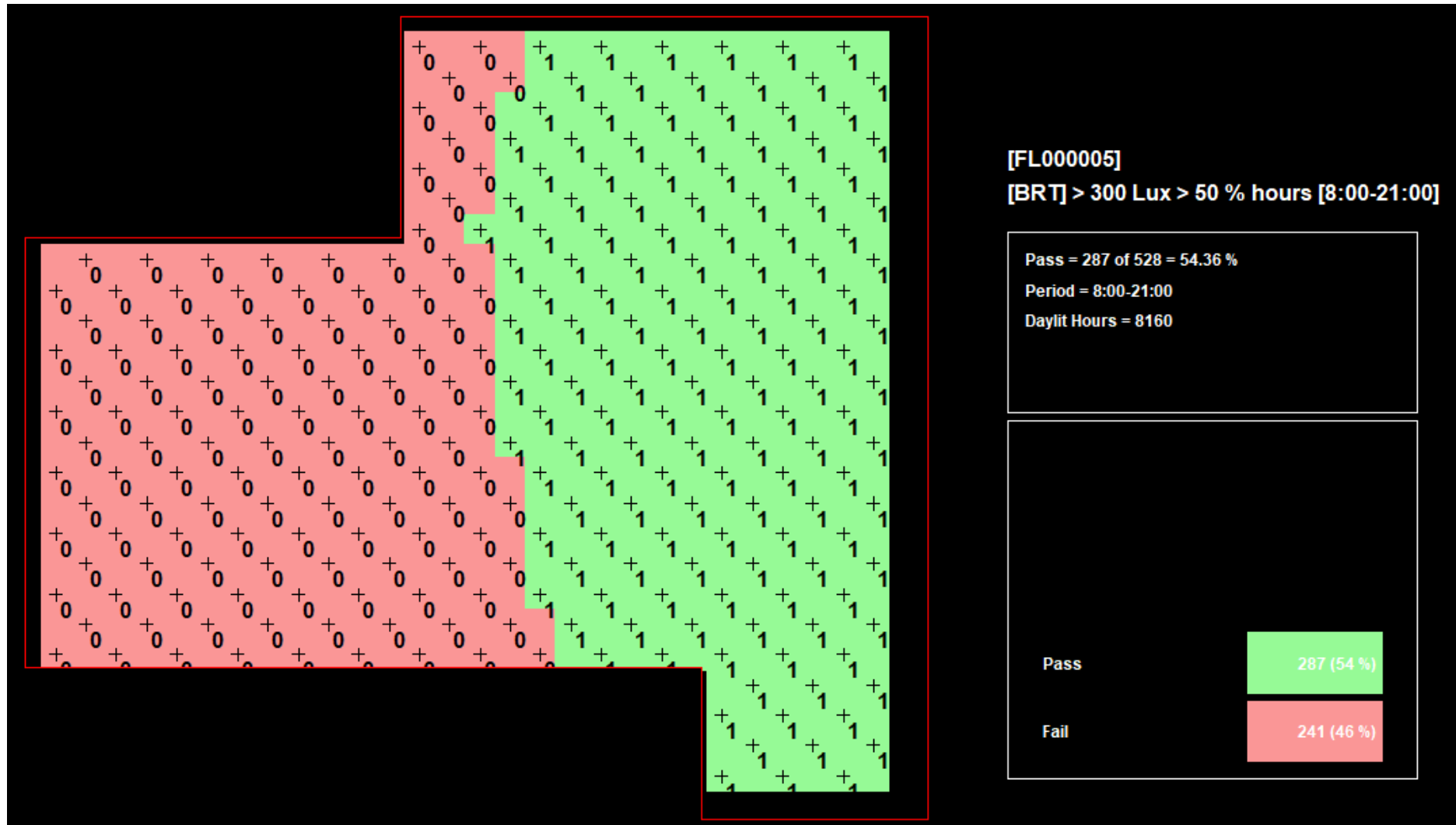
The warmer the colour, the higher the number of Sunlight Hours that are received by each window.



View of the site from the Southwest, including the proposed development:



An example image to demonstrate the grid point Daylight Illuminance for Flat 6.



Results table to confirm compliance

Location			Vertical Sky Component (VSC)						Daylight Illuminance, Er (Lux)			Window		Probable Sunlight Hours (PSH) 21st March		
Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	MEAN VSC	%LOSS VSC	Reduction Factor	PASS/ FAIL	> 300Lux % of Grid Points	> 100Lux % of Grid Points	PASS / FAIL	Angle from North	Aspect	PROPOSED Hours	Reduction Factor	PASS/ FAIL
Flat 1																
1/1	Studio Flat	W1	N/A	26.59	29.90	N/A	N/A	PASS	97.35	100.00	PASS	240.00	SW	6.00	N/A	PASS
1/2	Studio Flat	W2	N/A	31.80		N/A	N/A					240.00	SW	5.00	N/A	PASS
1/3	Studio Flat	W3	N/A	31.31		N/A	N/A					240.00	SW	5.00	N/A	PASS
Flat 2																
2/1	Studio Flat	W4	N/A	27.14	27.76	N/A	N/A	PASS	50.12	100.00	PASS	240.00	SW	2.50	N/A	PASS
2/2	Studio Flat	W5	N/A	28.38		N/A	N/A					240.00	SW	3.00	N/A	PASS
Flat 3																
3/1	Living/Dining/Kitchen	W6	N/A	79.09	78.48	N/A	N/A	PASS	60.12	100.00	PASS	60.00	NE	5.00	N/A	PASS
3/2	Living/Dining/Kitchen	W7	N/A	77.86		N/A	N/A					60.00	NE	5.00	N/A	PASS
3/4	Bedroom 1	W8	N/A	85.35	N/A	N/A	N/A	PASS	100.00	100.00	PASS	60.00	NE	6.00	N/A	PASS
3/5	Bedroom 2	W9	N/A	86.87	N/A	N/A	N/A	PASS	100.00	100.00	PASS	60.00	NE	8.00	N/A	PASS
Flat 4																
4/1	Studio Flat	W10	N/A	70.77	70.48	N/A	N/A	PASS	58.04	97.61	PASS	60.00	NE	5.00	N/A	PASS
4/2	Studio Flat	W11	N/A	70.18		N/A	N/A					60.00	NE	5.00	N/A	PASS
Flat 5																
5/1	Studio Flat	W12	N/A	69.86	69.99	N/A	N/A	PASS	65.77	86.59	PASS	60.00	NE	5.00	N/A	PASS
5/2	Studio Flat	W13	N/A	70.11		N/A	N/A					60.00	NE	5.00	N/A	PASS
Flat 6																
6/1	Studio Flat	W14	N/A	32.47	28.71	N/A	N/A	PASS	54.36	100.00	PASS	240.00	SW	7.00	N/A	PASS
6/2	Studio Flat	W15	N/A	28.70		N/A	N/A					150.00	SE	6.00	N/A	PASS
6/3	Studio Flat	W16	N/A	24.97		N/A	N/A					150.00	SE	6.50	N/A	PASS
Flat 7																
7/1	Living/Dining/Kitchen	W17	N/A	85.98	89.43	N/A	N/A	PASS	100.00	100.00	PASS	60.00	NE	6.00	N/A	PASS
7/2	Living/Dining/Kitchen	W18	N/A	89.58		N/A	N/A					240.00	SW	8.00	N/A	PASS
7/3	Living/Dining/Kitchen	W19	N/A	89.28		N/A	N/A					240.00	SW	8.00	N/A	PASS
7/3	Bedroom 1	W20	N/A	85.43		N/A	N/A					63.40	NE	7.00	N/A	PASS
Flat 8																
8/1	Living/Dining/Kitchen	W21	N/A	35.02	35.06	N/A	N/A	PASS	81.62	100.00	PASS	240.00	SW	6.00	N/A	PASS
8/2	Living/Dining/Kitchen	W22	N/A	35.09		N/A	N/A					240.00	SW	5.00	N/A	PASS
8/3	Bedroom 1	W23	N/A	34.00	N/A	N/A	N/A	PASS	81.11	100.00	PASS	60.00	NE	2.50	N/A	PASS
8/4	Bedroom 1	W24	N/A	35.22	N/A	N/A	N/A	PASS	100.00	100.00	PASS	150.00	SE	8.00	N/A	PASS
8/5	Bedroom 2	W25	N/A	37.37	N/A	N/A	N/A	PASS	100.00	100.00	PASS	240.00	SW	6.00	N/A	PASS