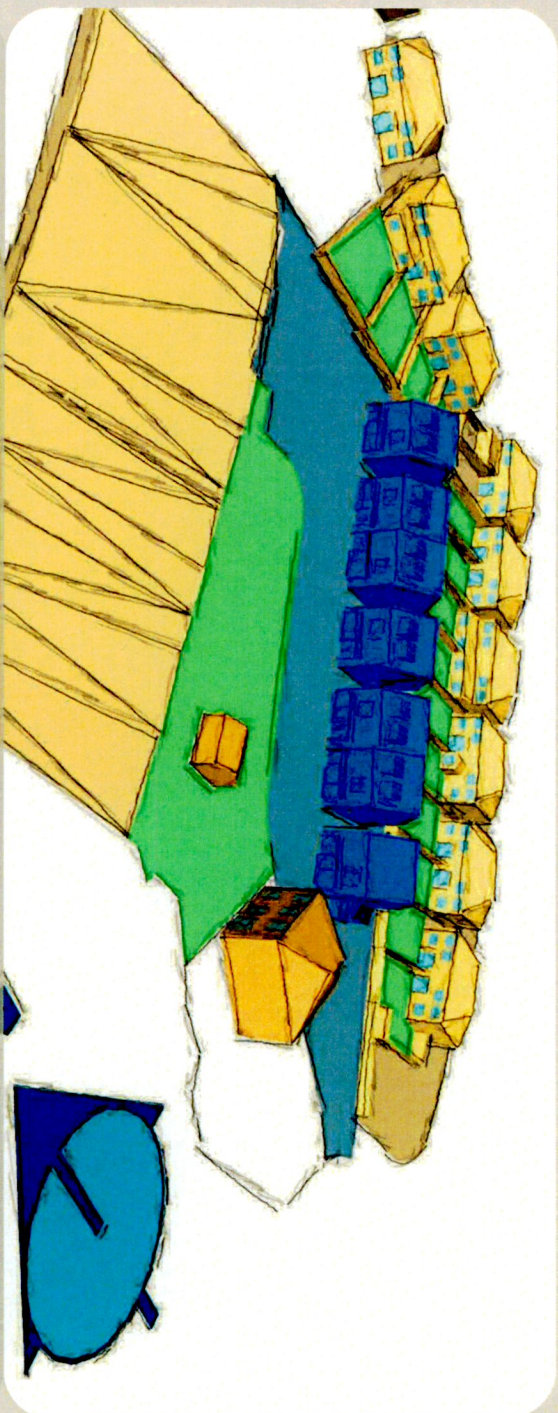


PROPOSED RESIDENTIAL DEVELOPMENT AT CLONBRONE

Sunlight, Daylight & Shadow Assessment (Impact Neighbours)



V1

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Executive Summary

This report examines the impact the proposed Development will have on neighbours in terms of daylight, sunlight & shadow. We will also examine how the proposed development performs in terms of light. The report is, in accordance with Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice - Third Edition - 2022.

It should be noted at the outset that the BRE document sets out in its introduction that:

"Summary Page . . . It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."

"1.6 . . . 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. . . ."

Change/Impact to neighbouring buildings in the adjoining residential areas.

- **Skylight- VSC**
 - 100% of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.
 - The average change ratio for VSC is **0.94**
- **Sunlight APSH & WPSH**
 - 100% of tested windows comply with the annual APSH and
 - 100% with the winter WPSH requirements for sunlight or overall requirement.
 - The average change ratio for sunlight is APSH:**0.96** and WPSH: **0.96**
- **Sunlight on the Ground SOG (Shadow)**
 - 100% of tested neighbouring amenity spaces pass the 2-hour test requirements for the 21st March.
 - The average change ratio for shadow/sunlight is **1.00**

The application complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE 2022).

This development has been successfully designed to reduce the impact on existing buildings. As such the design has used the guidelines in the spirit they have been written and balanced the requirements of this report with other constraints to arrive at this design.

Introduction

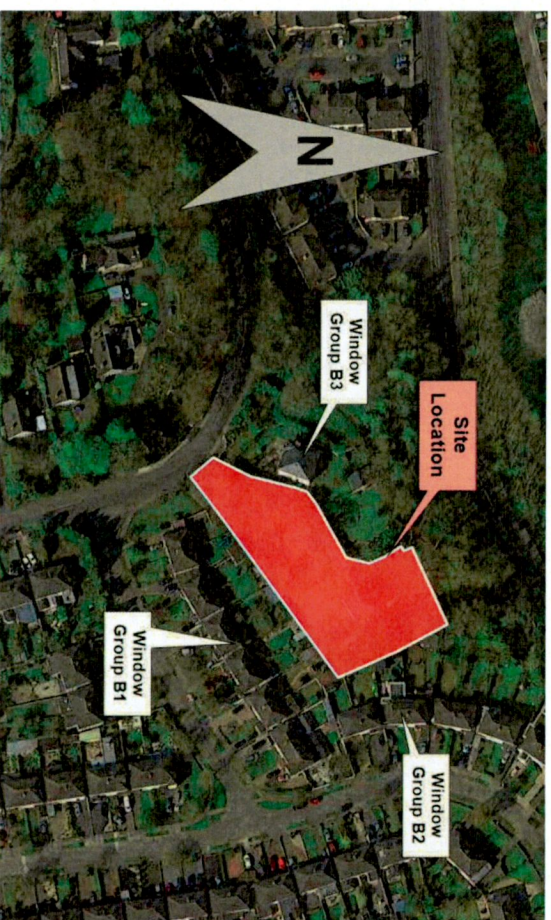
Chris Shackleton Consulting (CSC) have been asked to examine the impact that the proposed development will have on the existing neighbouring properties in terms of sunlight, daylight & shadow. The proposed development consists of seven houses. We have also been asked to examine how the proposed development performs in terms of light.

This analysis has been carried out in accordance with the recommendations of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice - Third Edition (BRE 2022).

All references quoted in this report are from BRE document "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice - Third Edition - 2022 (BR 209) by Paul Littlefair et al." unless specifically noted otherwise.

Preliminary Overview

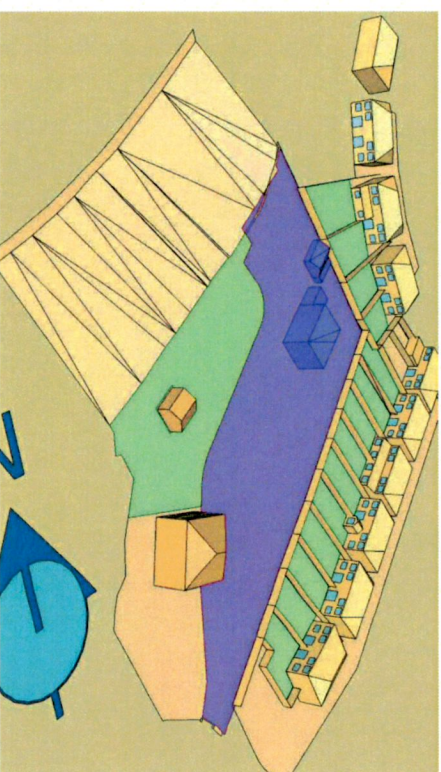
The aerial view shows the context for the site and the closest neighbouring window groups.



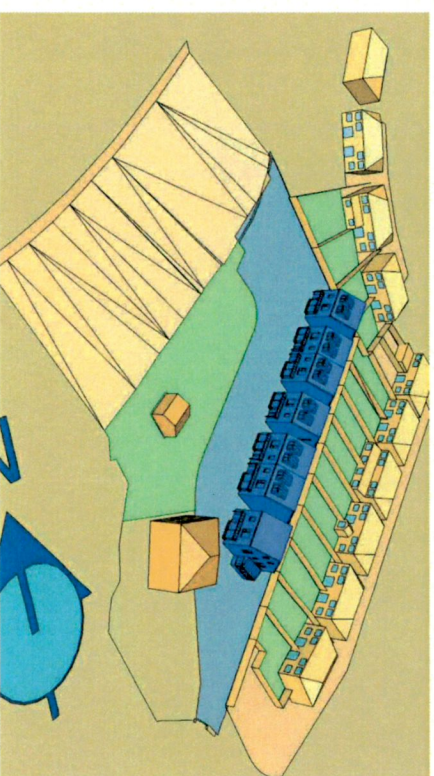
Google Earth extract © Google 2022

Design Model

A 3D model of the proposed development and the surrounding neighbouring properties was provided by the Architect. These had been modelled from survey information and drawings provided in plan, elevation and section formats. The model was geo-referenced to its correct location and an accurate solar daylight system was introduced. Here "Cream" indicates surrounding environment, "Purple" the existing development to be demolished, "Blue" this proposal. The analysis is based on the information provided.



Existing Model



Proposed Model

Scope of this Report

We have been asked to address the following specific items in this report and our scope is limited to the same:

Impact on Existing Neighbours

In this document we will assess the potential impact of the proposed development on the neighbouring residential houses. We will test for the following in relation to impact:

- Existing facing windows for:
 - Impact/Change for Skylight – Vertical Sky Component - VSC
 - Impact/Change for Probable Sunlight Hours – Annual APSH and Winter WPSH
- Existing amenity spaces for Impact/change on Sunlight/Shadow

Adjacent Properties Details

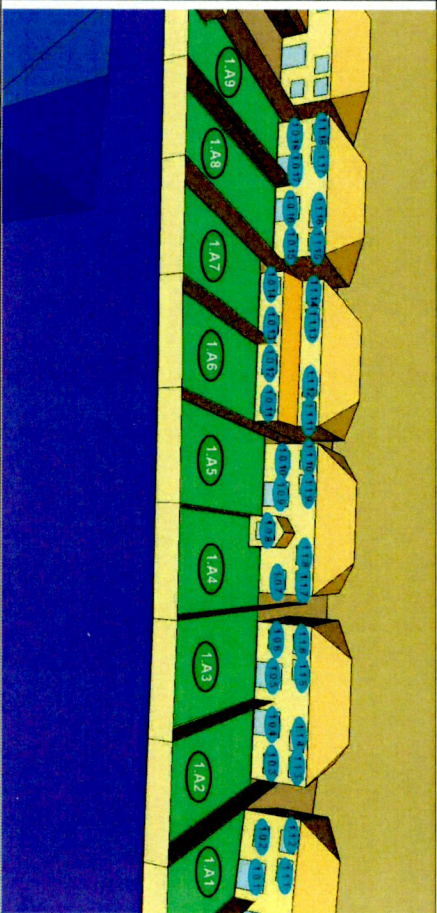
The numbering used later for windows and amenity spaces in each of the window groups is detailed below. Since the neighbours properties are private the facades have not been directly surveyed, so we have generalised the window locations in the facades.

Neighbours – Window Group B1

Oblique imagery extract Bing Bird's Eye, © Microsoft 2022



Windows facing the development



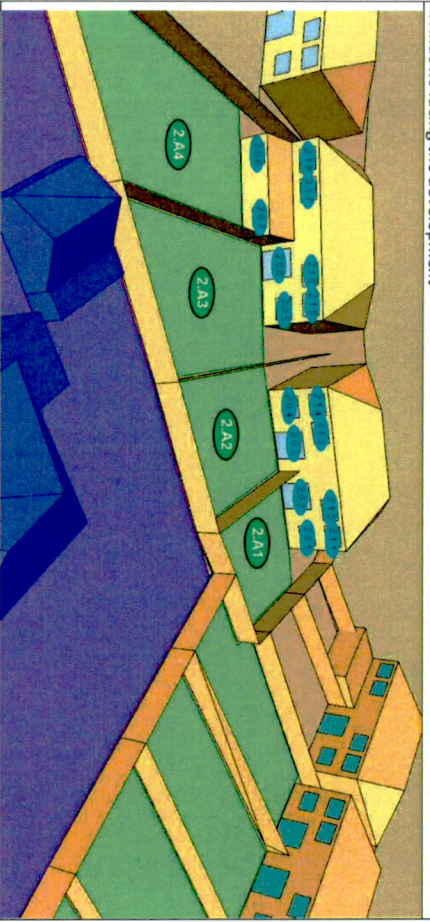
The numbering used later in this report for this group of windows is indicated in cyan above. Amenity spaces (gardens) are noted in green.

Neighbours – Window Group B2

Oblique imagery extract Bing Bird's Eye, © Microsoft 2022



Windows facing the development



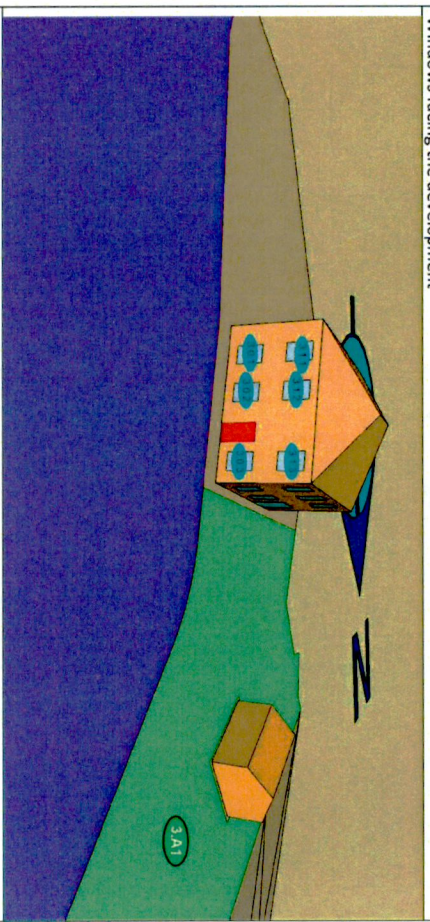
The numbering used later in this report for this group of windows is indicated in cyan above. Amenity spaces (gardens) are noted in green.

Neighbours – Window Group B3

Oblique imagery extract Bing Bird's Eye, © Microsoft 2022



Windows facing the development



The numbering used later in this report for this group of windows is indicated in cyan above. Amenity spaces (gardens) are noted in green.

Impact on neighbours

Tabulated results

Skylight to habitable rooms VSC

Report *Check > 27% or ratio > 0.8*

Group	Floor	W/in	Ref	Existing	Proposed	Ratio	Result
B1	F0	W1	1.0.1	37.9	35.0	0.92	Pass
B1	F0	W2	1.0.2	38.3	35.3	0.92	Pass
B1	F0	W3	1.0.3	37.9	34.9	0.92	Pass
B1	F0	W4	1.0.4	38.0	35.1	0.92	Pass
B1	F0	W5	1.0.5	38.1	34.7	0.91	Pass
B1	F0	W6	1.0.6	38.4	34.9	0.91	Pass
B1	F0	W7	1.0.7	37.5	34.0	0.91	Pass
B1	F0	W8	1.0.8	36.7	33.2	0.90	Pass
B1	F0	W9	1.0.9	36.0	32.8	0.91	Pass
B1	F0	W10	1.0.10	37.3	33.9	0.91	Pass
B1	F0	W11	1.0.11	36.2	33.3	0.92	Pass
B1	F0	W12	1.0.12	35.5	32.4	0.91	Pass
B1	F0	W13	1.0.13	35.3	33.0	0.93	Pass
B1	F0	W14	1.0.14	36.2	33.3	0.92	Pass
B1	F0	W15	1.0.15	37.4	35.2	0.94	Pass
B1	F0	W16	1.0.16	37.3	35.2	0.94	Pass
B1	F0	W17	1.0.17	37.1	35.7	0.96	Pass
B1	F0	W18	1.0.18	37.7	36.1	0.96	Pass
B1	F1	W1	1.1.1	39.0	36.9	0.95	Pass
B1	F1	W2	1.1.2	39.0	36.8	0.94	Pass
B1	F1	W3	1.1.3	38.9	36.7	0.94	Pass
B1	F1	W4	1.1.4	39.0	36.8	0.94	Pass
B1	F1	W5	1.1.5	39.1	36.6	0.94	Pass
B1	F1	W6	1.1.6	39.1	36.5	0.93	Pass
B1	F1	W7	1.1.7	39.1	36.4	0.93	Pass
B1	F1	W8	1.1.8	39.1	36.5	0.93	Pass
B1	F1	W9	1.1.9	39.0	36.5	0.93	Pass
B1	F1	W10	1.1.10	39.0	36.5	0.93	Pass
B1	F1	W11	1.1.11	39.0	36.5	0.94	Pass
B1	F1	W12	1.1.12	39.0	36.6	0.94	Pass
B1	F1	W13	1.1.13	39.0	36.7	0.94	Pass
B1	F1	W14	1.1.14	39.0	36.8	0.95	Pass
B1	F1	W15	1.1.15	38.9	37.1	0.95	Pass
B1	F1	W16	1.1.16	38.9	37.2	0.96	Pass
B1	F1	W17	1.1.17	38.8	37.5	0.96	Pass
B1	F1	W18	1.1.18	38.8	37.5	0.97	Pass

Adjacent Properties - Light from the Sky impact on neighbouring properties
 Tests were carried out to establish the quantity and quality of skylight (daylight) available to a room's windows. Locations tested are based on guideline recommendations for the closest facades which have windows with potential for impact.

We have investigated this impact under clause 2.2.7

2.2.7 If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. This value of VSC typically supplies enough daylight to a standard room when combined with a window of normal dimensions, with glass area around 10% or more of the floor area. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.80 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear gloomier, and electric lighting will be needed more of the time. . . .

2.2.6 Any reduction in the total amount of skylight can be calculated by finding the VSC at the centre of each main window. In the case of a floor-to-ceiling window such as a patio door, a point 1.6 m above ground (or balcony level for an upper storey) on the centre line of the window may be used. For a bay window, the centre window facing directly outwards can be taken as the main window. If a room has two or more windows of equal size, the mean of their VSCs may be taken. The reference point is in the external plane of the window wall. Windows to bathrooms, toilets, storerooms, circulation areas, and garages need not be analysed. . . .

Skylight to habitable rooms

VSC

Check > 27% or ratio > 0.8

Report	Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result
	B2	F0	W1	2.0.1	37.6	35.6	0.95	Pass
	B2	F0	W2	2.0.2	37.3	35.3	0.95	Pass
	B2	F0	W3	2.0.3	37.6	35.7	0.95	Pass
	B2	F0	W4	2.0.4	37.9	36.1	0.95	Pass
	B2	F0	W5	2.0.5	38.2	36.8	0.96	Pass
	B2	F0	W6	2.0.6	34.9	33.8	0.97	Pass
	B2	F0	W7	2.0.7	36.8	36.2	0.98	Pass
	B2	F0	W8	2.0.8	37.8	37.2	0.98	Pass
	B2	F1	W1	2.1.1	38.5	37.0	0.96	Pass
	B2	F1	W2	2.1.2	38.6	37.1	0.96	Pass
	B2	F1	W3	2.1.3	38.7	37.2	0.96	Pass
	B2	F1	W4	2.1.4	38.7	37.4	0.96	Pass
	B2	F1	W5	2.1.5	39.1	38.1	0.97	Pass
	B2	F1	W6	2.1.6	39.2	38.3	0.98	Pass
	B2	F1	W7	2.1.7	39.2	38.7	0.99	Pass
	B2	F1	W8	2.1.8	39.2	38.8	0.99	Pass
	B3	F0	W1	3.0.1	37.8	33.0	0.87	Pass
	B3	F0	W2	3.0.2	37.8	32.4	0.86	Pass
	B3	F0	W3	3.0.3	37.8	31.8	0.84	Pass
	B3	F1	W1	3.1.1	39.0	36.3	0.93	Pass
	B3	F1	W2	3.1.2	39.0	35.9	0.92	Pass
	B3	F1	W3	3.1.3	39.0	35.5	0.91	Pass

Note: When the proposed value exceeds the minimum requirement the ratio check is not required, and the result is coloured grey.

Conclusion

When tested with the new development in place
100% of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.
 The average change ratio for VSC is **0.94**
 The proposed development complies with the requirements of the BRE guidelines in relation to skylight availability for neighbours.

Adjacent Properties - Sunlight into living spaces

Tests for the amount of sunlight that windows to living room and/or conservatory can receive over both annual and winter periods.

3.2.3 To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun. Normally loss of sunlight need not be analysed to kitchens and bedrooms, except for bedrooms that also comprise a living space, for example a bed sitting room in an old people's home. . . .

3.2.4 To calculate the loss of sunlight over the year, a different metric, the annual probable sunlight hours (APSH), is used. Here 'probable sunlight hours' means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question (based on sunshine probability data). The sunlight reaching a window is quantified as a percentage of this unobstructed annual total. ... The APSH is a better way of quantifying loss of sunlight because it takes into account sunlight received over the whole year, not just on one particular date.

3.2.13 If a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected.

This will be the case if the centre of the window:

- receives less than 25% of annual probable sunlight hours and less than 0.80 times its former annual value; or less than 5% of annual probable sunlight hours between 21 September and 21 March and less than 0.80 times its former value during that period;
- and also has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

While not all windows relate to living rooms, we have for completeness tested all of them. Note only windows which face within 90° of due South require testing and those that do not, are notionally labelled as "North" in the table below.

The facing façade of window group B1 do not face within 90° of due South and therefore is not tested.

Tabulated results

Sunlight on windows to living room spaces check

Annual - 25% and Winter - 5%

Design	Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result	Existing	Proposed	Ratio	Result
					Check > 25% or ratio > 0.8				Check > 5% or ratio > 0.8			
B2	F0	W1	2.0.1	57.4	56.9	0.99	Pass	17.2	17.2	1.00	Pass	
B2	F0	W2	2.0.2	57.4	56.6	0.99	Pass	17.2	17.2	1.00	Pass	
B2	F0	W3	2.0.3	57.4	56.4	0.98	Pass	17.2	17.2	1.00	Pass	
B2	F0	W4	2.0.4	57.4	56.9	0.99	Pass	17.2	17.1	0.99	Pass	
B2	F0	W5	2.0.5	48.6	47.6	0.98	Pass	14.3	13.5	0.95	Pass	
B2	F0	W6	2.0.6	48.6	48.0	0.99	Pass	14.3	13.7	0.96	Pass	
B2	F0	W7	2.0.7	44.7	43.5	0.97	Pass	10.3	9.2	0.89	Pass	
B2	F0	W8	2.0.8	48.6	46.9	0.96	Pass	14.3	12.5	0.87	Pass	
B2	F1	W1	2.1.1	57.4	57.4	1.00	Pass	17.2	17.2	1.00	Pass	
B2	F1	W2	2.1.2	57.4	57.4	1.00	Pass	17.2	17.2	1.00	Pass	
B2	F1	W3	2.1.3	57.4	57.3	1.00	Pass	17.2	17.2	1.00	Pass	
B2	F1	W4	2.1.4	57.4	57.4	1.00	Pass	17.2	17.2	1.00	Pass	
B2	F1	W5	2.1.5	48.6	48.6	1.00	Pass	14.3	14.2	0.99	Pass	
B2	F1	W6	2.1.6	48.6	48.6	1.00	Pass	14.3	14.3	1.00	Pass	
B2	F1	W7	2.1.7	48.6	48.5	1.00	Pass	14.3	14.1	0.99	Pass	
B2	F1	W8	2.1.8	48.6	48.1	0.99	Pass	14.3	13.8	0.96	Pass	
B3	F0	W1	3.0.1	61.3	52.8	0.86	Pass	22.5	21.4	0.95	Pass	
B3	F0	W2	3.0.2	61.1	53.0	0.87	Pass	22.2	20.4	0.92	Pass	
B3	F0	W3	3.0.3	62.2	53.1	0.85	Pass	22.6	18.7	0.83	Pass	
B3	F1	W1	3.1.1	63.6	59.9	0.94	Pass	23.8	22.8	0.96	Pass	
B3	F1	W2	3.1.2	63.6	59.5	0.94	Pass	23.9	22.1	0.93	Pass	
B3	F1	W3	3.1.3	63.3	58.2	0.92	Pass	23.5	19.7	0.83	Pass	

Note: When the proposed value exceeds the minimum requirement the ratio check is not required, and the result is coloured grey.

Conclusion

When tested with the proposed development in place:
100% of tested windows comply with the annual APSH and **100%** with the winter WPSH requirements for sunlight or overall requirement.
 The average change ratio for sunlight is APSH: **0.96** and WPSH: **0.96**

The proposed development complies with the requirements of the BRE guidelines in relation to both annual and winter sunlight availability to neighbours as it applies to living rooms and conservatories.

Adjacent Properties – Sunlight on the Ground (Shadow) Gardens and Open spaces

Tests for the availability of sunlight in amenity areas:

3.3.17 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 that can receive two hours of sun on 21 March is less than 0.80 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March

3.3.3 The availability of sunlight should be checked for all open spaces where it will be required. This would normally include:

- *gardens, such as the main back garden of a house or communal gardens including courtyards and roof terraces*
- *parks and playing fields*
- *children's playgrounds*
- *outdoor swimming pools and paddling pools, and other areas of recreational water such as marinas and boating lakes*
- *sitting out areas such as those between non-domestic buildings and in public squares*
- *nature reserves (which may have special requirements for sunlight if rare plants are growing there).*

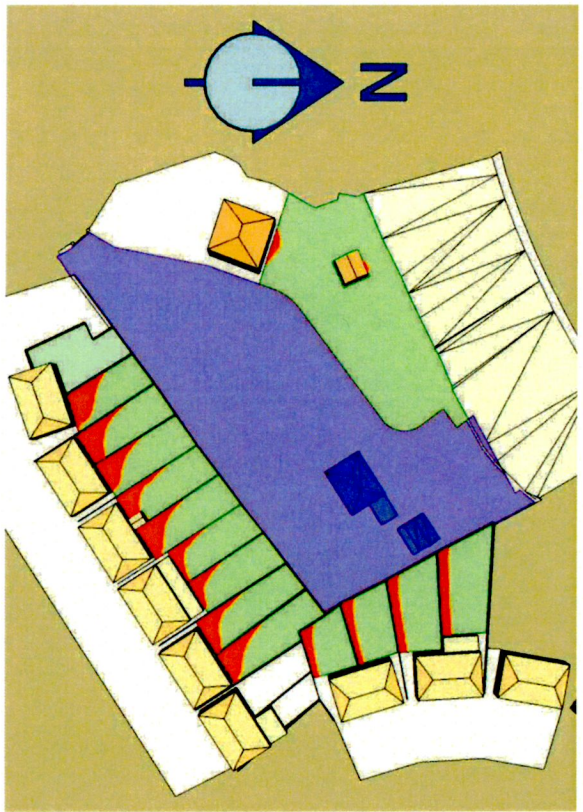
The amenities of the following properties were tested.

- Representative Rear Gardens, Window Group B1, B2 & B3

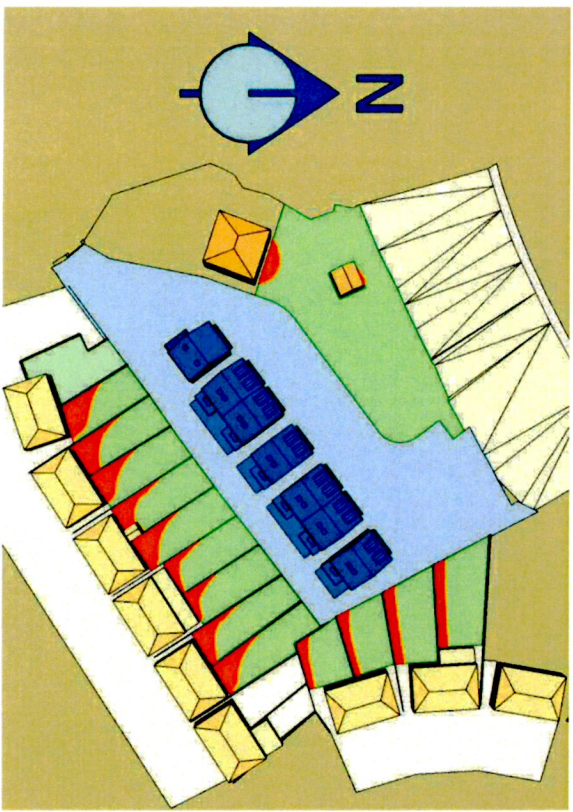
BRE 2-hour Shadow Plots

The graphic below indicates the areas which receive 2 hours of sunlight on the 21st March in accordance with the BRE guidelines.

- **Green** represents areas which exceed the 2-hour requirement - pass
- **Red** is less than the 2-hour requirement - fail
- **Orange** are marginal or borderline - just below the 2-hour requirement



Existing



Proposed

The results are tabulated below:

		Shadow to amenity spaces		2-hour Sunlight - 21st March			
		Check > 50% or ratio > 0.8					
Group	Area	Ref	Description	Existing	Proposed	Ratio	Result
B1	A1	1.A1	Amenity	68%	68%	1.00	Pass
B1	A2	1.A2	Amenity	72%	72%	1.00	Pass
B1	A3	1.A3	Amenity	77%	77%	1.00	Pass
B1	A4	1.A4	Amenity	79%	79%	1.00	Pass
B1	A5	1.A5	Amenity	74%	74%	1.00	Pass
B1	A6	1.A6	Amenity	84%	84%	1.00	Pass
B1	A7	1.A7	Amenity	86%	86%	1.00	Pass
B1	A8	1.A8	Amenity	78%	78%	1.00	Pass
B1	A9	1.A9	Amenity	76%	76%	1.00	Pass
B2	A1	2.A1	Amenity	82%	82%	1.00	Pass
B2	A2	2.A2	Amenity	82%	82%	0.99	Pass
B2	A3	2.A3	Amenity	81%	80%	0.98	Pass
B2	A4	2.A4	Amenity	81%	81%	1.00	Pass
B3	A1	3.A1	Amenity	99%	98%	0.99	Pass

Note: When the proposed value exceeds the minimum requirement the ratio check is not required, and the result is coloured grey.

Please note that passing the BRE requirements does not imply that shadows will not be cast over an amenity space at all. Shadows which are transient by nature may not impact on the percentage of the space which receives 2 hours of sunlight on the 21st of March.

Conclusion

100% of tested neighbouring amenity spaces pass the BRE 2-hours of sunlight on the 21st of March or 0.8 ratio requirement.
 The average change ratio for the tested amenity spaces 1.00
 The proposed development complies with the requirements of the BRE guidelines for impact on amenity Sunlight/Shadow.

Summary - Adjacent Properties

Neighbouring properties will generally not be affected by the proposed development and the impacts on Skylight, Sunlight and Shadow have been tested in accordance with the best practice guidelines.

Change/Impact to neighbouring buildings in the adjoining residential areas.

- **Skylight- VSC**
 - **100%** of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.
 - The average change ratio for VSC is **0.94**
- **Sunlight APSH & WPSH**
 - **100%** of tested windows comply with the annual APSH and
 - **100%** with the winter WPSH requirements for sunlight or overall requirement.
 - The average change ratio for sunlight is APSH:**0.96** and WPSH: **0.96**
- **Sunlight on the Ground SOG (Shadow)**
 - **100%** of tested neighbouring amenity spaces pass the 2-hour test requirements for the 21st March.
 - The average change ratio for shadow/sunlight is **1.00**

The potential impact of the proposed development on neighbours complies with the requirements of "Site layout planning for daylight and sunlight a guide to good practice " BR209