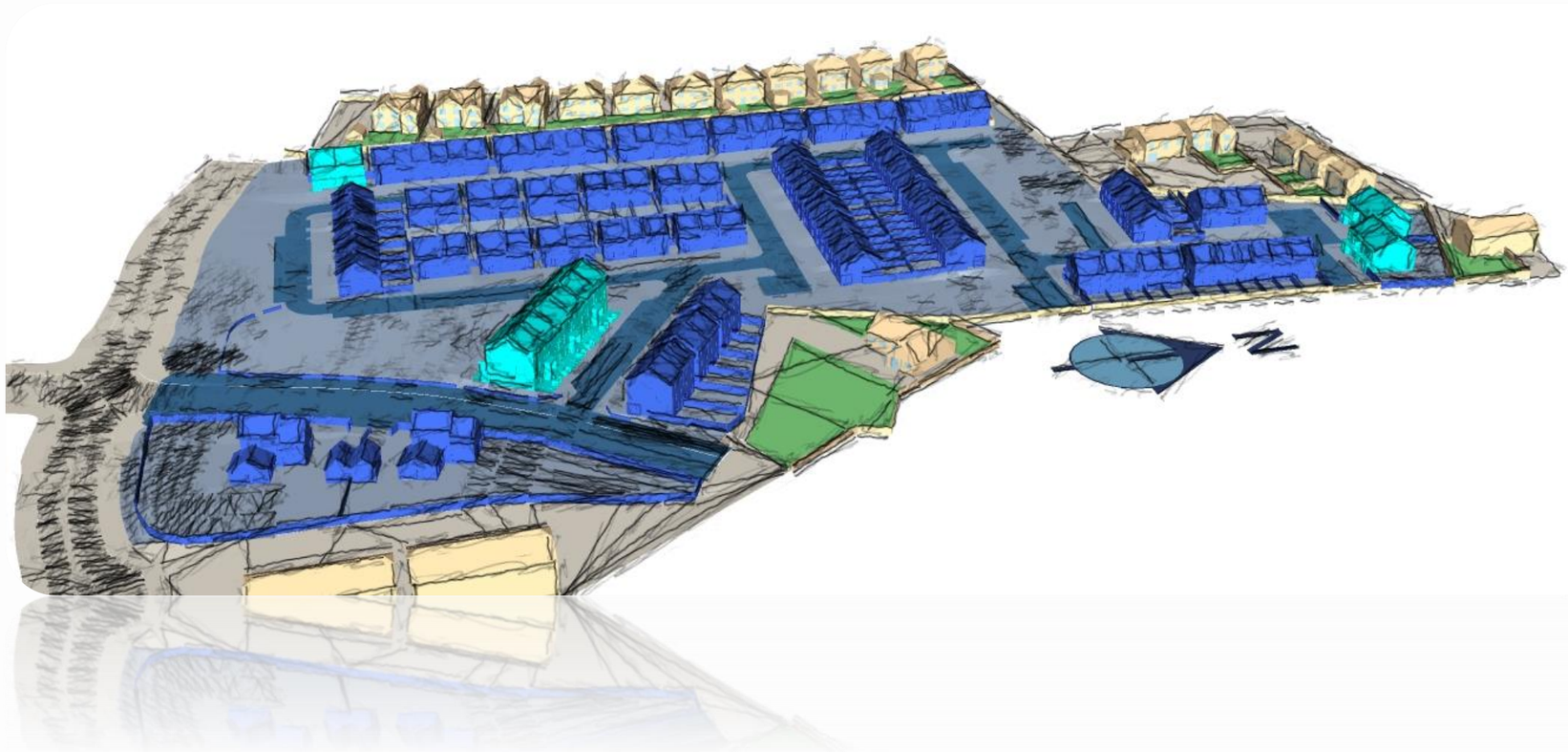
BALLYBIN ROAD LRD

Sunlight, Daylight & Shadow Assessment (Impact Neighbours and Development Performance)

v2b



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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: **0.93**
- **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**
- As expected, the proposed design has negligible impact on Neighbours.

Performance of the proposed design

- **Target Illuminance E_T**
  - **98%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
  - *(100% if we include the one marginal bedroom)*
  - The average compliant areas achieving the relevant target Lx for
    - all bedrooms is **89%** and
    - all Living/Kitchen spaces **87%**
    - both are well in excess of the required 50%
- **Sunlight to Apartments (living rooms):**
  - **100%** of apartments receive qualifying sunlight.
    - **83%** of all preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
    - *This is consistent with the BRE defined "careful layout design" 80% target.*
- **Sunlight on the Ground SOG (Shadow)**
  - **100%** of new proposed communal/shared amenity spaces pass the BRE requirement.
  - The proposed development complies with the requirements of the BRE guidelines in relation to Sunlight/Shadow.

The application generally complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BR209 - 2022).

This development has been successfully designed to maximise the occupant's access to light and 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.

Architects Commentary / Compensatory Measures.

Clauses 6.7 of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities – amended July 2023 refers to compensatory measures:

6.7 Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.

In relation to the one non-compliant ground floor bedroom reference 00-m102

- The bedroom in question is marginal at 48% against a 50% target
- Unit is dual aspect.
- Unit exceeds the minimum required floor area by 11.5 sq m of 25.6%.
- Unit provided with private amenity space that exceeds the minimum requirement by 5 sq m or 100%.
- Unit's share of communal amenity space exceeds the minimum requirement by 64.25 sq m or 1,285%.

See main body of this and the Architects & Planners own reports for further details on the design.

Introduction

GNet 3D 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 duplex, maisonettes and traditional low-rise housing. 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

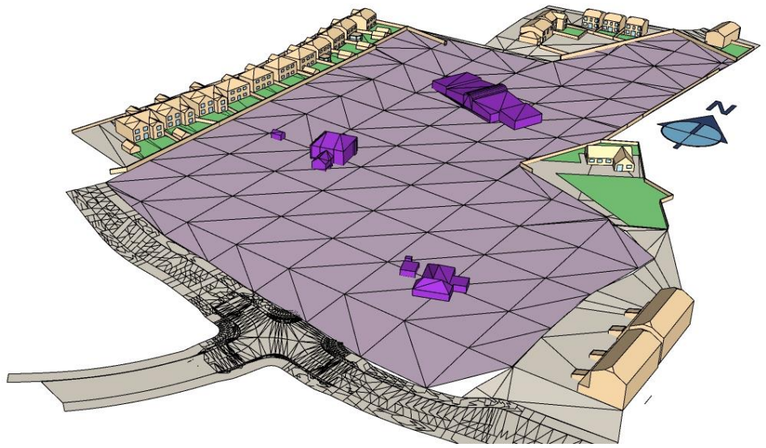
The aerial view shows the context for the site and the closest neighbour groups.

Google Earth extract © Google 2024

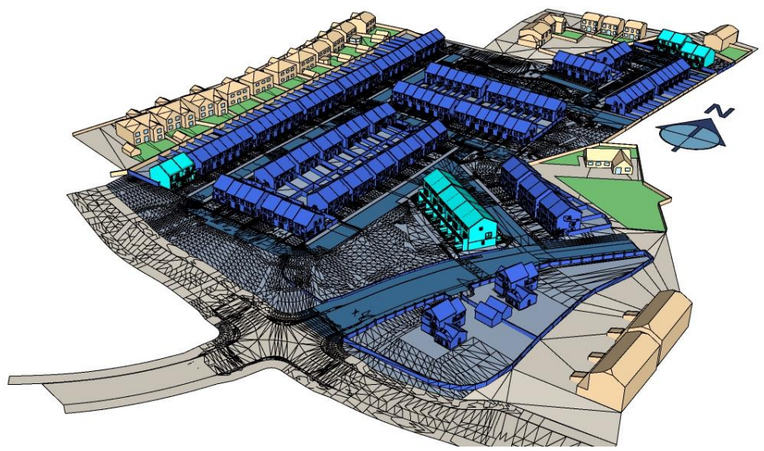
Design Model

A 3D model of the proposed development and the surrounding neighbouring properties was provided by the Design Team. 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 (Apartments/Duplexes/Maisonettes are coloured Cyan).

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 – **V**ertical **S**ky **C**omponent - VSC
  - Impact/Change for **P**robable **S**unlight **H**ours – Annual APSH and Winter WPSH
- Existing amenity spaces for impact/change on Sunlight/Shadow

Where rear fenestration is obscured it may be difficult to accurately access where windows are located. In these cases we will used experience and best judgement to place windows logically in the relevant façade.

Where multiple properties with multiple widows and the same orientation face the proposed development a selection of windows are tested to avoid duplication. In the selection worst-case/closest windows are tested.

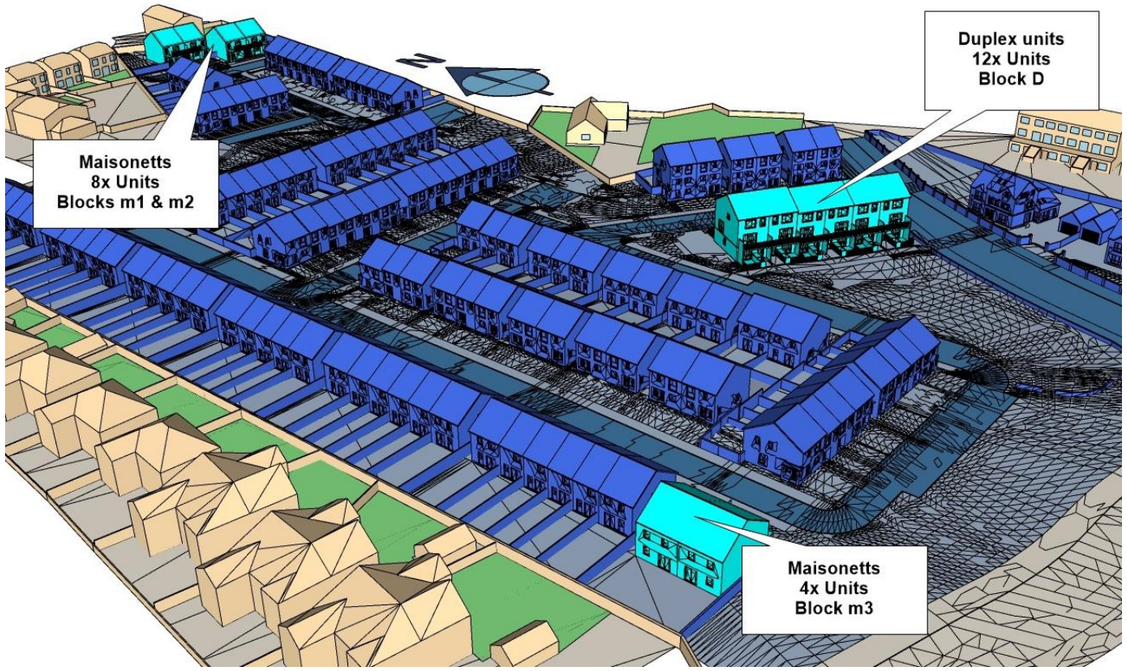
The above will have little/no impact on the results of the analysis and/or its conclusions.

Development Performance

For the proposed development we will examine the performance of the development under the following headings:

- Target Illuminance – E_T – All habitable rooms
- Sunlight to rooms – A room preferably a living space.
- Sunlight on the Ground SOG (Shadow) - Proposed Public & Shared amenity spaces

When examining the internal performance of the development we have tested all rooms, all floors for the apartments (i.e. duplexes and maisonettes). These units are highlighted in cyan.



Compact Settlements

As noted above we will examine Impact on neighbours and the Performance of all apartments (which includes Duplexs & Maisonettes) as per the Department Apartment Guidelines. However, we note that assessment of low-rise traditional houses which comply with recommended separation distance should not require detailed technical assessment as per clause 5.3.7(a) of the Compact Settlement Guidelines 2024.

5.3.7(a) The potential for poor daylight performance in a proposed development or for a material impact on neighbouring properties will generally arise in cases where the buildings are close together, where higher buildings are involved, or where there are other obstructions to daylight. Planning authorities do not need to undertake a detailed technical assessment in relation to daylight performance in all cases. It should be clear from the assessment of architectural drawings (including sections) in the case of low-rise housing with good separation from existing and proposed buildings that undue impact would not arise, and planning authorities may apply a level of discretion in this regard.

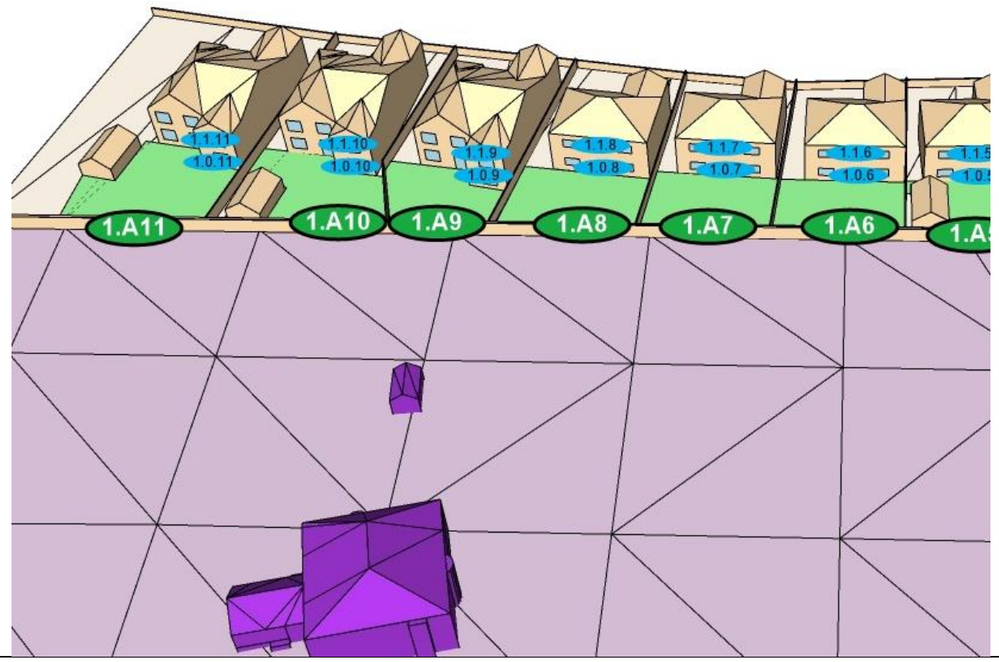
Adjacent Properties Details

The referencing used later in this report is detailed below.

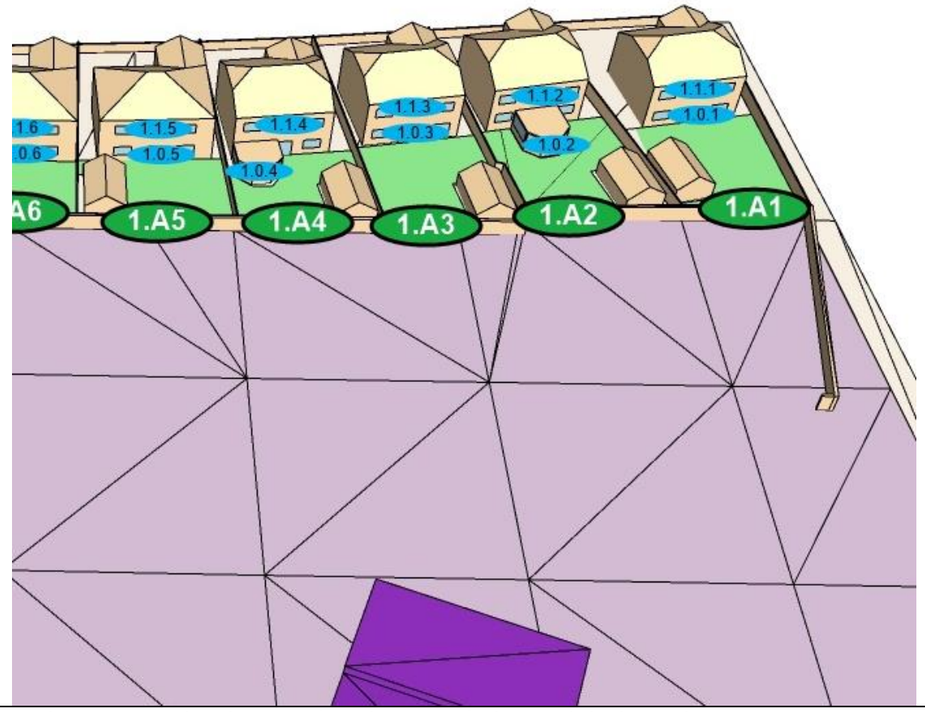
Neighbour Group B1 - 1/2

Streetview imagery © Google 2024

Windows facing the development



Neighbour Group B1 - 2/2

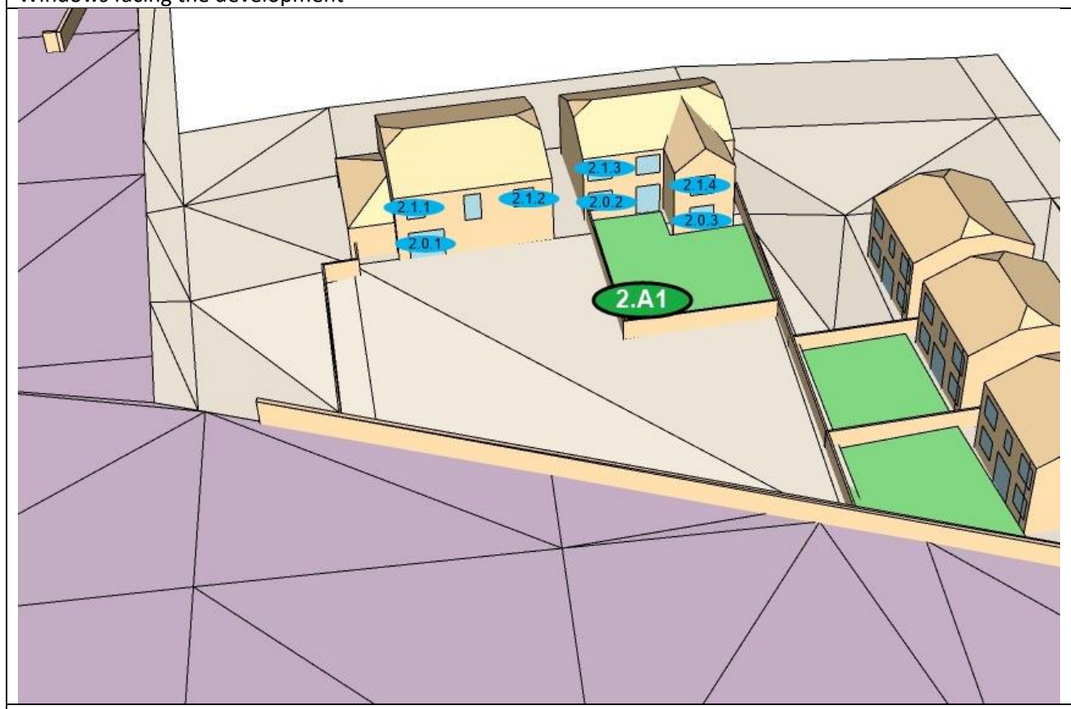


The numbering used later in this report for this group of windows is indicated in cyan above.
Amenity spaces (gardens) are noted in green.

Neighbour Group B2

Streetview imagery © Google 2024

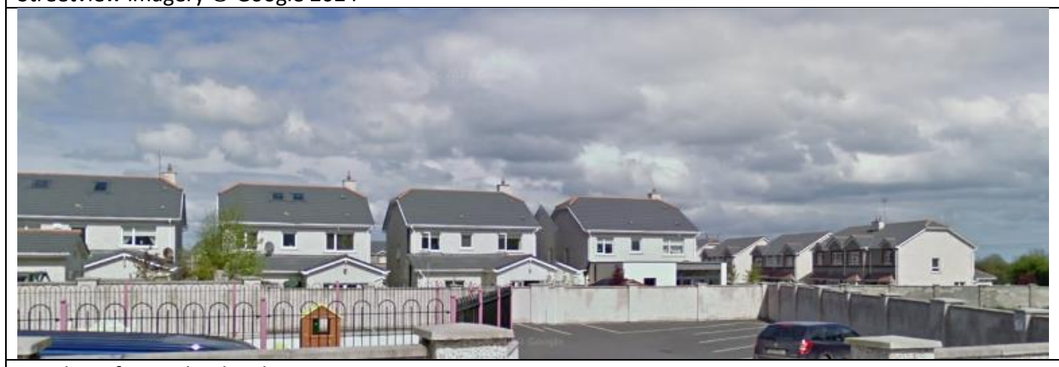
Windows facing the development



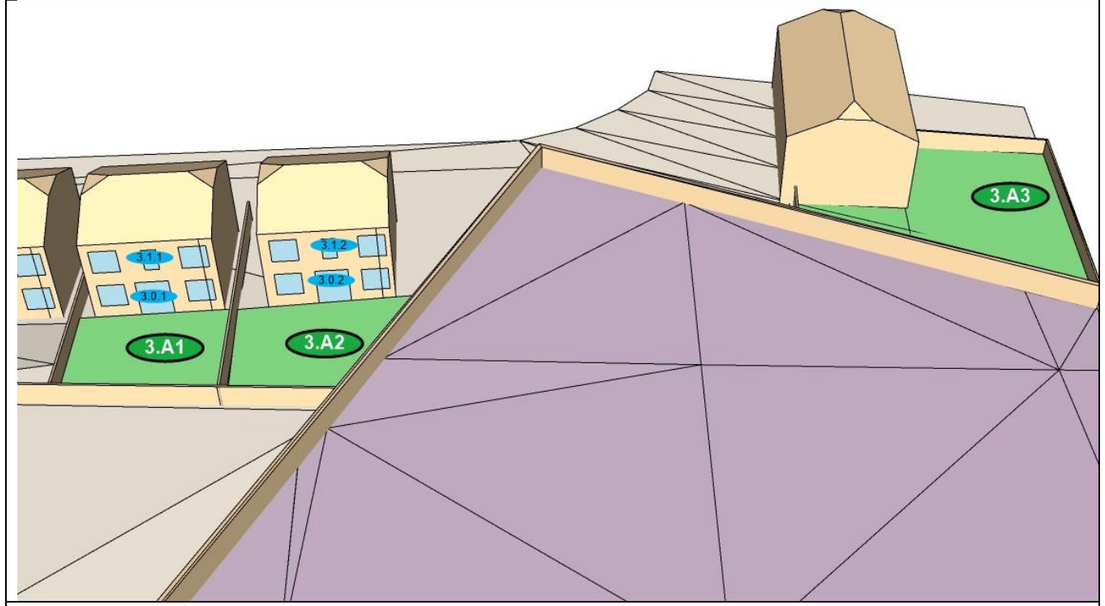
The numbering used later in this report for this group of windows is indicated in cyan above.
Amenity spaces (gardens) are noted in green.

Neighbour Group B3

Streetview imagery © Google 2024



Windows facing the development

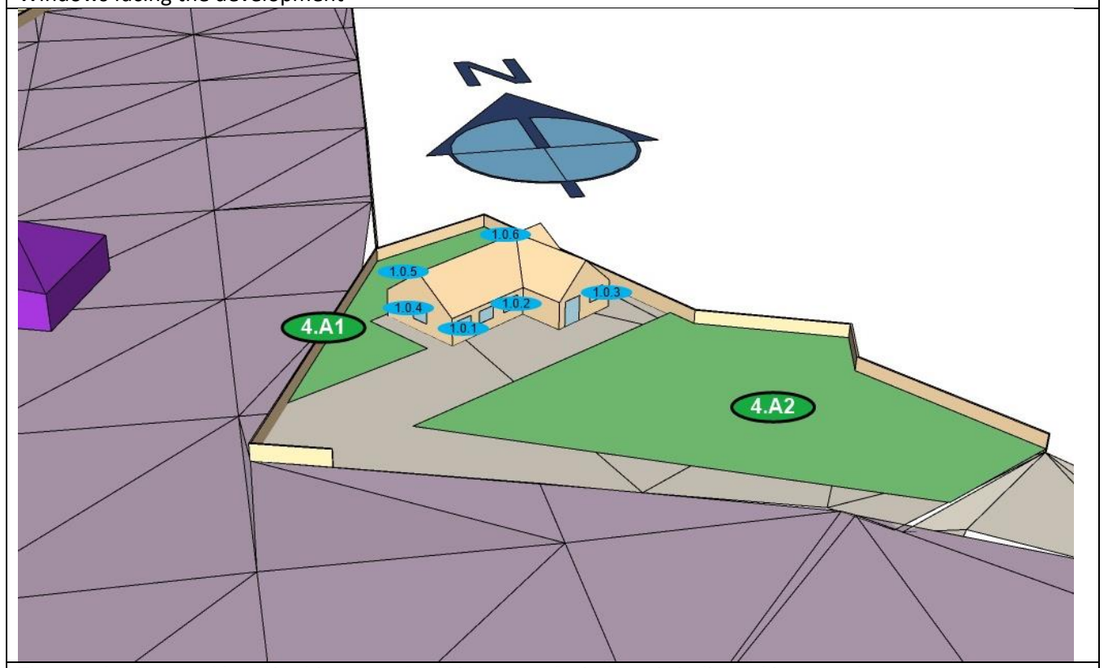


The numbering used later in this report for this group of windows is indicated in cyan above.
Amenity spaces (gardens) are noted in green.

Neighbour Group B4

Streetview imagery © Google 2024

Windows facing the development

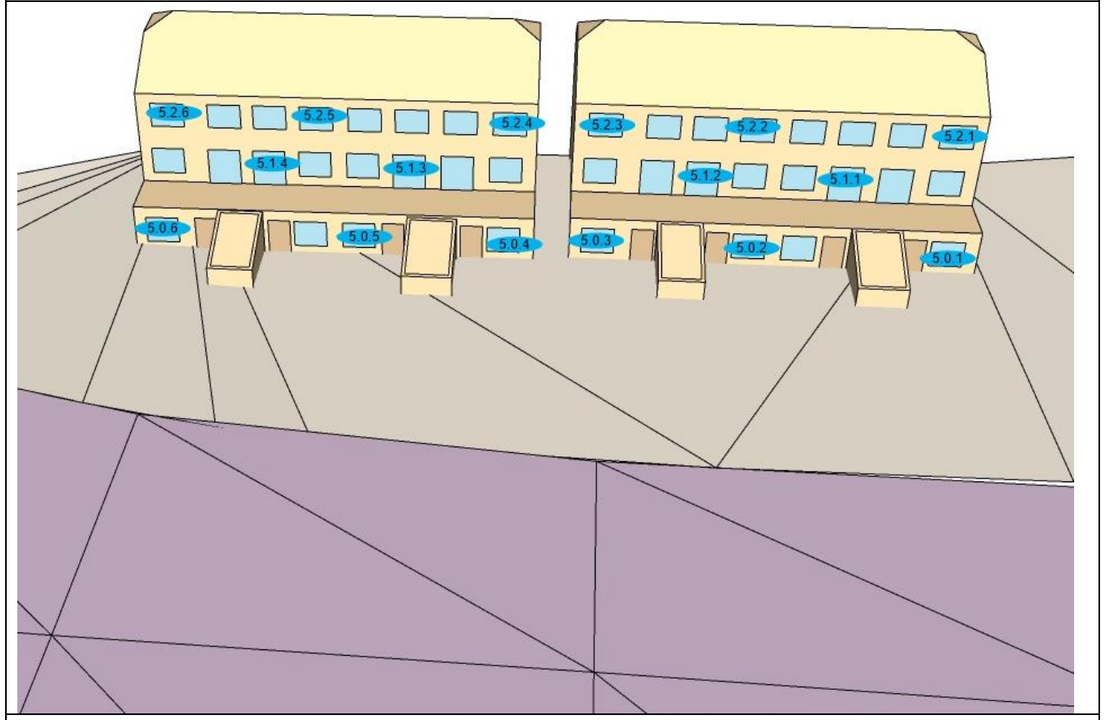


The numbering used later in this report for this group of windows is indicated in cyan above.
Amenity spaces (gardens) are noted in green.

Neighbour Group B5

Streetview imagery © Google 2024

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

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. . . .***

Tabulated results

	Skylight to habitable rooms							
	VSC							
Design	*Check > 27% or ratio > 0.8*							
Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result
B1	F0	W1	1.0.1	37.1%	36.4%	0.98	Pass
B1	F0	W2	1.0.2	37.2%	33.9%	0.91	Pass
B1	F0	W3	1.0.3	37.3%	34.7%	0.93	Pass
B1	F0	W4	1.0.4	37.5%	33.0%	0.88	Pass
B1	F0	W5	1.0.5	37.1%	33.5%	0.90	Pass
B1	F0	W6	1.0.6	38.0%	33.9%	0.89	Pass
B1	F0	W7	1.0.7	37.4%	33.5%	0.90	Pass
B1	F0	W8	1.0.8	37.9%	33.4%	0.88	Pass
B1	F0	W9	1.0.9	38.4%	33.2%	0.86	Pass
B1	F0	W10	1.0.10	38.2%	33.7%	0.88	Pass
B1	F0	W11	1.0.11	37.7%	34.0%	0.90	Pass
B1	F1	W1	1.1.1	39.4%	38.2%	0.97	Pass
B1	F1	W2	1.1.2	39.4%	37.5%	0.95	Pass
B1	F1	W3	1.1.3	39.4%	37.2%	0.94	Pass
B1	F1	W4	1.1.4	39.5%	37.0%	0.94	Pass
B1	F1	W5	1.1.5	39.5%	36.8%	0.93	Pass
B1	F1	W6	1.1.6	39.4%	36.8%	0.93	Pass
B1	F1	W7	1.1.7	39.4%	36.7%	0.93	Pass
B1	F1	W8	1.1.8	39.2%	36.4%	0.93	Pass
B1	F1	W9	1.1.9	39.4%	36.1%	0.92	Pass
B1	F1	W10	1.1.10	39.4%	36.6%	0.93	Pass
B1	F1	W11	1.1.11	39.5%	36.8%	0.93	Pass
B2	F0	W1	2.0.1	39.0%	36.3%	0.93	Pass
B2	F0	W2	2.0.2	35.6%	33.9%	0.95	Pass
B2	F0	W3	2.0.3	37.8%	36.2%	0.96	Pass
B2	F1	W1	2.1.1	39.4%	38.3%	0.97	Pass
B2	F1	W2	2.1.2	39.3%	38.3%	0.97	Pass
B2	F1	W3	2.1.3	37.9%	37.2%	0.98	Pass
B2	F1	W4	2.1.4	39.0%	38.3%	0.98	Pass
B3	F0	W1	3.0.1	37.4%	35.4%	0.95	Pass
B3	F0	W2	3.0.2	38.5%	35.6%	0.92	Pass
B3	F1	W1	3.1.1	38.5%	37.2%	0.96	Pass
B3	F1	W2	3.1.2	39.0%	37.4%	0.96	Pass
B4	F0	W1	4.0.1	38.6%	36.0%	0.93	Pass
B4	F0	W2	4.0.2	33.5%	31.5%	0.94	Pass
B4	F0	W3	4.0.3	39.3%	37.8%	0.96	Pass
B4	F0	W4	4.0.4	38.4%	35.0%	0.91	Pass
B4	F0	W5	4.0.5	38.5%	36.4%	0.94	Pass
B4	F0	W6	4.0.6	38.7%	37.3%	0.96	Pass

	Skylight to habitable rooms						
	VSC						
Design	*Check > 27% or ratio > 0.8*						
Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result
B5	F0	W1	5.0.1	37.6%	36.5%	0.97	Pass
B5	F0	W2	5.0.2	37.3%	35.7%	0.96	Pass
B5	F0	W3	5.0.3	37.6%	35.7%	0.95	Pass
B5	F0	W4	5.0.4	37.2%	35.3%	0.95	Pass
B5	F0	W5	5.0.5	36.9%	34.7%	0.94	Pass
B5	F0	W6	5.0.6	37.6%	35.4%	0.94	Pass
B5	F1	W1	5.1.1	39.2%	38.4%	0.98	Pass
B5	F1	W2	5.1.2	39.2%	38.2%	0.98	Pass
B5	F1	W3	5.1.3	39.1%	37.9%	0.97	Pass
B5	F1	W4	5.1.4	39.1%	37.8%	0.97	Pass
B5	F2	W1	5.2.1	39.4%	39.1%	0.99	Pass
B5	F2	W2	5.2.2	39.4%	38.9%	0.99	Pass
B5	F2	W3	5.2.3	39.4%	38.8%	0.99	Pass
B5	F2	W4	5.2.4	39.4%	38.9%	0.99	Pass
B5	F2	W5	5.2.5	39.4%	38.8%	0.98	Pass
B5	F2	W6	5.2.6	39.4%	38.7%	0.98	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 BRE guidelines in relation to neighbours skylight availability.

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 results are tabulated below:

Sunlight on windows to living room spaces check													
Annual - 25% and Winter - 5%													
Design				*Check > 25% or ratio > 0.8*					*Check > 5% or ratio > 0.8*				
Group	**Floor**	**Win**	**Ref**	**Existing**	**Proposed**	**Ratio**	**Result**		**Existing**	**Proposed**	**Ratio**	**Result**	
B1	F0	W1	1.0.1	46.9%	45.9%	0.98	Pass	*North*	13.4%	13.3%	0.99	Pass	*North*
B1	F0	W2	1.0.2	48.9%	43.9%	0.90	Pass	*North*	15.4%	13.1%	0.85	Pass	*North*
B1	F0	W3	1.0.3	48.2%	44.0%	0.91	Pass	*North*	15.6%	13.5%	0.87	Pass	*North*
B1	F0	W4	1.0.4	52.0%	43.3%	0.83	Pass		18.5%	13.8%	0.75	Pass	
B1	F0	W5	1.0.5	47.3%	42.0%	0.89	Pass		13.8%	11.9%	0.86	Pass	
B1	F0	W6	1.0.6	53.8%	46.5%	0.86	Pass		20.3%	16.3%	0.80	Pass	
B1	F0	W7	1.0.7	53.7%	46.0%	0.86	Pass		18.4%	14.3%	0.78	Pass	
B1	F0	W8	1.0.8	55.9%	48.6%	0.87	Pass		17.6%	13.4%	0.76	Pass	
B1	F0	W9	1.0.9	62.9%	53.7%	0.85	Pass		23.2%	18.1%	0.78	Pass	
B1	F0	W10	1.0.10	61.1%	53.1%	0.87	Pass		22.7%	17.8%	0.78	Pass	
B1	F0	W11	1.0.11	62.2%	55.4%	0.89	Pass		23.4%	19.0%	0.81	Pass	
B1	F1	W1	1.1.1	51.3%	49.4%	0.96	Pass	*North*	17.8%	16.2%	0.91	Pass	*North*
B1	F1	W2	1.1.2	51.3%	49.4%	0.96	Pass	*North*	17.8%	16.4%	0.92	Pass	*North*
B1	F1	W3	1.1.3	52.8%	50.8%	0.96	Pass	*North*	19.3%	17.8%	0.92	Pass	*North*
B1	F1	W4	1.1.4	52.8%	50.3%	0.95	Pass		19.3%	17.6%	0.91	Pass	
B1	F1	W5	1.1.5	52.8%	50.4%	0.96	Pass		19.3%	17.5%	0.91	Pass	
B1	F1	W6	1.1.6	54.3%	52.1%	0.96	Pass		20.8%	19.3%	0.93	Pass	
B1	F1	W7	1.1.7	57.0%	54.6%	0.96	Pass		21.7%	20.0%	0.92	Pass	
B1	F1	W8	1.1.8	61.8%	59.4%	0.96	Pass		23.5%	21.8%	0.93	Pass	
B1	F1	W9	1.1.9	63.3%	59.8%	0.94	Pass		23.5%	21.5%	0.91	Pass	
B1	F1	W10	1.1.10	62.1%	59.2%	0.95	Pass		23.6%	21.8%	0.92	Pass	
B1	F1	W11	1.1.11	63.4%	59.9%	0.94	Pass		23.6%	21.6%	0.91	Pass	
B2	F0	W1	2.0.1	52.8%	48.9%	0.93	Pass		19.3%	16.2%	0.84	Pass	
B2	F0	W2	2.0.2	43.4%	41.8%	0.96	Pass		11.9%	10.3%	0.86	Pass	
B2	F0	W3	2.0.3	51.8%	50.1%	0.97	Pass		19.3%	17.7%	0.92	Pass	
B2	F1	W1	2.1.1	52.8%	51.9%	0.98	Pass		19.3%	18.4%	0.96	Pass	
B2	F1	W2	2.1.2	52.8%	51.9%	0.98	Pass		19.3%	18.4%	0.96	Pass	
B2	F1	W3	2.1.3	48.9%	48.4%	0.99	Pass		15.4%	14.9%	0.97	Pass	
B2	F1	W4	2.1.4	52.8%	52.1%	0.99	Pass		19.3%	18.6%	0.97	Pass	
B3	F0	W1	3.0.1	87.8%	84.0%	0.96	Pass		31.0%	28.1%	0.91	Pass	
B3	F0	W2	3.0.2	89.1%	83.4%	0.94	Pass		32.2%	29.1%	0.90	Pass	
B3	F1	W1	3.1.1	89.1%	87.8%	0.99	Pass		32.2%	31.4%	0.98	Pass	
B3	F1	W2	3.1.2	89.1%	86.9%	0.97	Pass		32.2%	30.8%	0.96	Pass	
B4	F0	W1	4.0.1	80.8%	78.4%	0.97	Pass		32.0%	29.6%	0.92	Pass	
B4	F0	W2	4.0.2	68.4%	66.1%	0.97	Pass		28.0%	25.7%	0.92	Pass	
B4	F0	W3	4.0.3	84.8%	83.2%	0.98	Pass		32.0%	30.4%	0.95	Pass	
B4	F0	W4	4.0.4	61.8%	59.8%	0.97	Pass		21.4%	19.3%	0.91	Pass	
B4	F0	W5	4.0.5	15.2%	14.9%	0.98	Pass	*North*	0.2%	0.2%	1.00	Pass	*North*
B4	F0	W6	4.0.6	15.2%	15.2%	1.00	Pass	*North*	0.2%	0.2%	1.00	Pass	*North*

Sunlight on windows to living room spaces check													
Annual - 25% and Winter - 5%													
Design				*Check > 25% or ratio > 0.8*					*Check > 5% or ratio > 0.8*				
Group	**Floor**	**Win**	**Ref**	**Existing**	**Proposed**	**Ratio**	**Result**		**Existing**	**Proposed**	**Ratio**	**Result**	
B5	F0	W1	5.0.1	45.7%	45.7%	1.00	Pass	*North*	11.3%	11.3%	1.00	Pass	*North*
B5	F0	W2	5.0.2	44.9%	44.9%	1.00	Pass	North	10.6%	10.6%	1.00	Pass	*North*
B5	F0	W3	5.0.3	41.9%	41.9%	1.00	Pass	North	7.5%	7.5%	1.00	Pass	*North*
B5	F0	W4	5.0.4	46.2%	46.2%	1.00	Pass	North	11.8%	11.8%	1.00	Pass	*North*
B5	F0	W5	5.0.5	40.7%	40.7%	1.00	Pass	North	6.4%	6.4%	1.00	Pass	*North*
B5	F0	W6	5.0.6	42.9%	42.9%	1.00	Pass	North	8.5%	8.5%	1.00	Pass	*North*
B5	F1	W1	5.1.1	45.7%	45.7%	1.00	Pass	North	11.3%	11.3%	1.00	Pass	*North*
B5	F1	W2	5.1.2	45.7%	45.7%	1.00	Pass	North	11.3%	11.3%	1.00	Pass	*North*
B5	F1	W3	5.1.3	46.2%	46.2%	1.00	Pass	North	11.8%	11.8%	1.00	Pass	*North*
B5	F1	W4	5.1.4	46.2%	46.2%	1.00	Pass	North	11.8%	11.8%	1.00	Pass	*North*
B5	F2	W1	5.2.1	45.7%	45.7%	1.00	Pass	North	11.3%	11.3%	1.00	Pass	*North*
B5	F2	W2	5.2.2	45.7%	45.7%	1.00	Pass	North	11.3%	11.3%	1.00	Pass	*North*
B5	F2	W3	5.2.3	45.7%	45.7%	1.00	Pass	North	11.3%	11.3%	1.00	Pass	*North*
B5	F2	W4	5.2.4	46.2%	46.2%	1.00	Pass	North	11.8%	11.8%	1.00	Pass	*North*
B5	F2	W5	5.2.5	46.2%	46.2%	1.00	Pass	North	11.8%	11.8%	1.00	Pass	*North*
B5	F2	W6	5.2.6	46.2%	46.2%	1.00	Pass	North	11.8%	11.8%	1.00	Pass	*North*

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: **0.93**

The proposed development complies with 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).

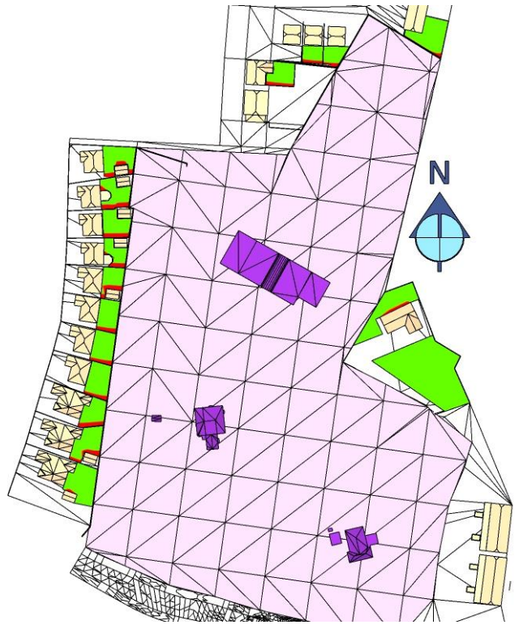
The amenities of the following properties were tested.

- Representative Rear Gardens

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			
Design				*Check > 50% or ratio > 0.8*			
Group	**Area**	**Ref**	**Description**	**Existing**	**Proposed**	**Ratio**	**Result**
B1	A1	1.A1	Amenity	85%	85%	1.00	Pass
B1	A2	1.A2	Amenity	77%	76%	0.99	Pass
B1	A3	1.A3	Amenity	82%	82%	1.00	Pass
B1	A4	1.A4	Amenity	82%	81%	0.99	Pass
B1	A5	1.A5	Amenity	75%	75%	1.00	Pass
B1	A6	1.A6	Amenity	87%	87%	1.00	Pass
B1	A7	1.A7	Amenity	87%	87%	1.00	Pass
B1	A8	1.A8	Amenity	89%	88%	0.99	Pass
B1	A9	1.A9	Amenity	81%	81%	1.00	Pass
B1	A10	1.A10	Amenity	84%	83%	0.99	Pass
B1	A11	1.A11	Amenity	97%	96%	0.99	Pass
B2	A1	2.A1	Amenity	85%	85%	1.00	Pass
B3	A1	3.A1	Amenity	75%	75%	1.00	Pass
B3	A2	3.A2	Amenity	86%	86%	1.00	Pass
B3	A3	3.A3	Amenity	94%	94%	1.00	Pass
B4	A1	4.A1	Amenity	93%	93%	1.00	Pass
B4	A2	4.A2	Amenity	100%	100%	1.00	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: **0.93**
- **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**
- As expected, the proposed design has negligible impact on Neighbours.

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 – 2022)

Development Performance

Development Performance - Target Illuminance E_T Metric

National Standards Authority of Ireland have adopted EN 17037 to directly become IS/EN 17037. There are no amendments made to this document and no national Annex localising the same was developed as can be found in BS/EN 17037. The standard document provides only a single target for rooms of new buildings and does not include specific usage targets for spaces for commercial, office and residential (living, bedroom, Kitchen).

The UK variant referenced is more suitable to use in temperate climates where the median external diffuse illuminance is low. We would concur with the UK committee that the recommendations for daylight provision in a space may not be achievable for some buildings, particularly dwellings, which are the subject of this report.

We note the reasoning put forward by the UK committee and concur with their conclusions that different room usage should be assigned different light requirements/targets. Design in Ireland quite often follows the practice and precedent set in the UK. With similar climates, light and receiving environments it is reasonable to adopt BS/EN 17037 / Annex NA which itself was derived from the now withdrawn BS 8206-2:2008 Lighting for buildings – Part 2: Code of practice for daylighting, Subclause 5.6. This provides alignment between the new and old standards and with the levels of light we are used to and deemed acceptable in new developments.

> ***Target illuminance (ET) :***
> ***Illuminance from daylight that should be achieved for at least half of annual daylight hours across a specified fraction of the reference plane in a daylit space***

Reference in Irish Government Publications:

Clause 6.6 of the Department Apartment Guidelines "Sustainable Urban Housing: Design Standards for New Apartments" directly reference this annex and the BRE guide (Emphasis Added):

Planning authorities should ensure appropriate expert advice and input where necessary, and have regard to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings EN17037 or UK National Annex BS EN17037 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future guidance specific to the Irish context, when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

Clause 5.3.7 (b) of "Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities" also directly reference this annex the BRE guide (Emphasis Added):

In cases where a technical assessment of daylight performance is considered by the planning authority to be necessary regard should be had to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings IS EN17037:2018, UK National Annex BS EN17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context.

NA.2 - Minimum daylight provision in UK dwellings

Even if a predominantly daylit appearance is not achievable for a room in a UK dwelling, the UK committee recommends that the target illuminance values given in Table NA.1 are exceeded over at least 50 % of the points on a reference plane 0.85 m above the floor, for at least half of the daylight hours.

Table NA.1 — Values of target illuminance for room types in UK dwellings

Room type	Target illuminance E_T (lx)
Bedroom	100
Living room	150
Kitchen	200

Derived from BS 8206-2:2008 Lighting for buildings – Part 2: Code of practice for daylighting

Where one room in a UK dwelling serves more than a single purpose, the UK committee recommends that the target illuminance is that for the room type with the highest value – for example, in a space that combines a living room and a kitchen the target illuminance is recommended to be 200 lx.

It is the opinion of the UK committee that the recommendation in Clause A.2 – that a target illuminance level should be achieved across the entire (i.e. 95 %) fraction of the reference plane within a space – need not be applied to rooms in dwellings.

This is echoed in The BRE Guidelines

> ***C16 The UK National Annex gives illuminance recommendations of 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens. These are the median illuminances, to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours. The recommended levels over 95% of a reference plane need not apply to dwellings in the UK.***
>
> ***C17 Where a room has a shared use, the highest target should apply. For example in a bed sitting room in student accommodation, the value for a living room should be used if students would often spend time in their rooms during the day. Local authorities could use discretion here. For example, the target for a living room could be used for a combined living/dining/kitchen area if the kitchens are not treated as habitable spaces, as it may avoid small separate kitchens in a design. The kitchen space would still need to be included in the assessment area … in rooms with a particular requirement for daylight, such as bed sitting rooms in homes for the elderly, higher values … may be taken.***

Analysis Parameters

Analysis parameters are as per Annex B (and/or as revised by Annex NA), analysis method 1 was used. The following Parameters were used which are within the recommended ranges and reflect the materials/finishes specified in this application. The Median External Diffuse Illuminance used is noted in the relevant results tables.

Surface	Description	Reflectance
External Plane	Earth	0.2
External Walls	Grey Render / Concrete	0.4
Floor	Light wood/ cream Carpet	0.4
Internal Wall	Cream	0.7
Ceiling	White	0.8
Frames	Medium Grey	0.5
	Transmittance	
Glazing clear	0.63 (incls. Maintenance Factor)	
Glazing Translucent	0.4 (incls. Maintenance Factor)	

Light distribution was computed by modelling the internal configuration of rooms and windows placed within the existing topography and the adjacent buildings and then running an analysis on the same. This analysis was based on a standard working plane for in this case residential of 0.850m.

Reference plane or working plane

> ***Horizontal, vertical, or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85 m above the floor in houses and factories, 0.7 m above the floor in offices.***

Legend for Radiance Plots

In the radiance plots provided below we shall use the following demarcation of Lx results which is compatible with the target values from Annex NA

Assessment Areas

Where rooms have small annexed entrances or corridors they need not be included in the assessment grid area, (unless it is wide enough to be part of the usable space in a room, typically over 1.5m wide).

Fig C2 – Fixed floor to ceiling units

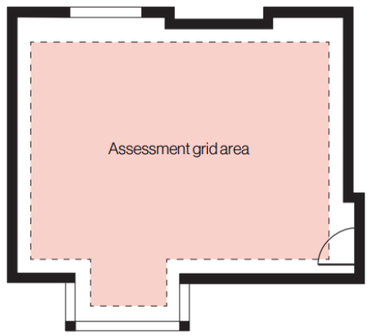


Figure C2: Where room layouts have small variations or alcoves along a wall's length, the inner or dominant section should be taken as a basis for the 0.3m gap to the assessment grid area. Fixed floor to ceiling cupboards can be excluded from the room area, but not kitchen units incorporating a worktop. Areas in bay windows may be included unless they are winter gardens separated from the room by a fixed partition.

Fig C3 - Corridors/entrances

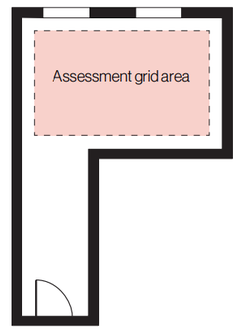


Figure C3: In a room with a corridor, or annexed entrance, the corridor need not be included in the assessment grid area (unless it is wide enough to be part of the usable space in a room, typically over 1.5m wide). The room layout and surfaces, including the corridor would still need to be included in the calculation model.

Fig C2 also notes that: Fixed floor to ceiling cupboards can be excluded from the room area, but not kitchen units incorporating a worktop. And also The BRE guidelines note the following in relation to the assessment grid.

> ***The standard states that the assessment grid should exclude a band of 0.5m from the walls, unless otherwise specified. In dwellings it is recommended that a band of 0.3m should be excluded, to avoid excluding parts of the room that are used by the occupants. Professional judgement should be used in cases with irregular shaped spaces or rooms with corridor or annex areas.***

Vegetation Check

We note that there are no proposed significant planting or existing trees near the assessed apartments thus no additional vegetative check assessment is required.

Room referencing

- Rooms tested are referenced specifically for this report.
- This referencing is used to identify rooms rather than apartments.
- Numbering is generally sequential but may vary to keep similar room types on different floors consistent.
- Graphics are provided on a floor-by-floor basis to show the referencing for this project.
- Room numbers are coloured orange = Living/Kitchen/Dining room and Blue = Bedroom.
- Where Living and Kitchens are separated Green = Living room and yellow = Kitchens.

In the result tables the following referencing is used.

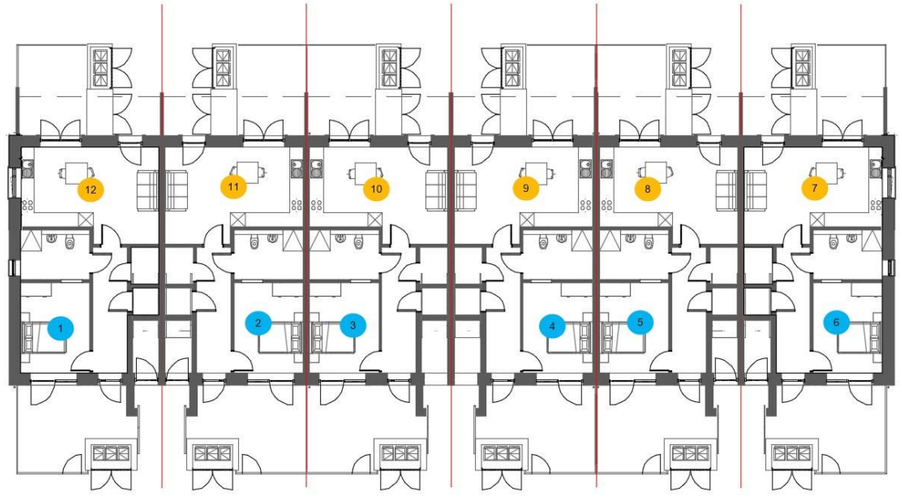
- Two-digit Floor reference 00=GFL, 01=1st Floor
- A single letter block reference
- Two-digit room reference (as per layout naming in the plans below
  Combined Living/Kitchen/Dining rooms have the suffix “c” added to the name
  This would also be the reference for a Studio apartment.

Typical Example of the naming, not specifically project related:

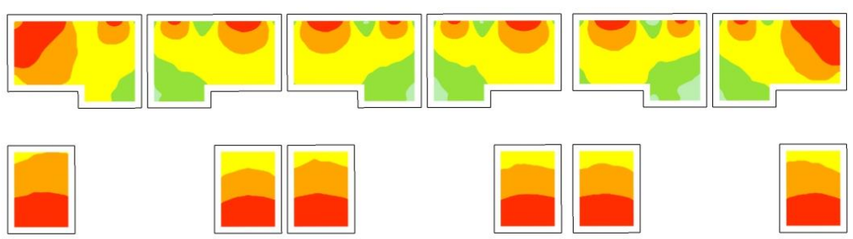
00D07c = Ground Floor, Block D, room 7 which is an LKD (Living/Kitchen/Dining room).
02D04 = 2nd Floor, Block D, room 4 which is a bedroom.

Duplex - Target Illuminance E_T

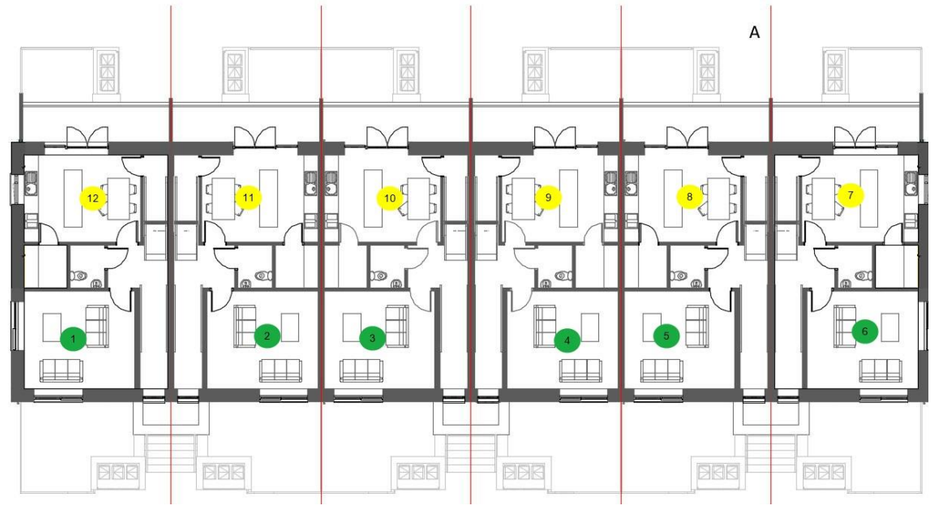
GFL Floor Layout – Naming Convention



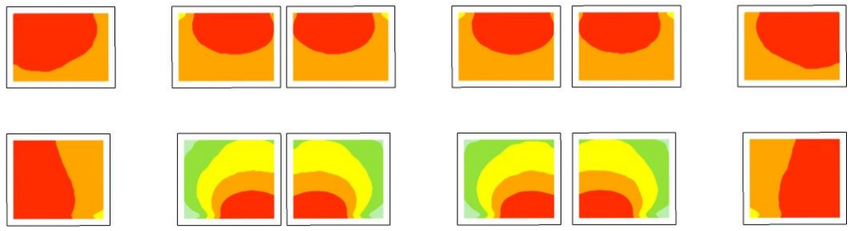
Radiance Plot



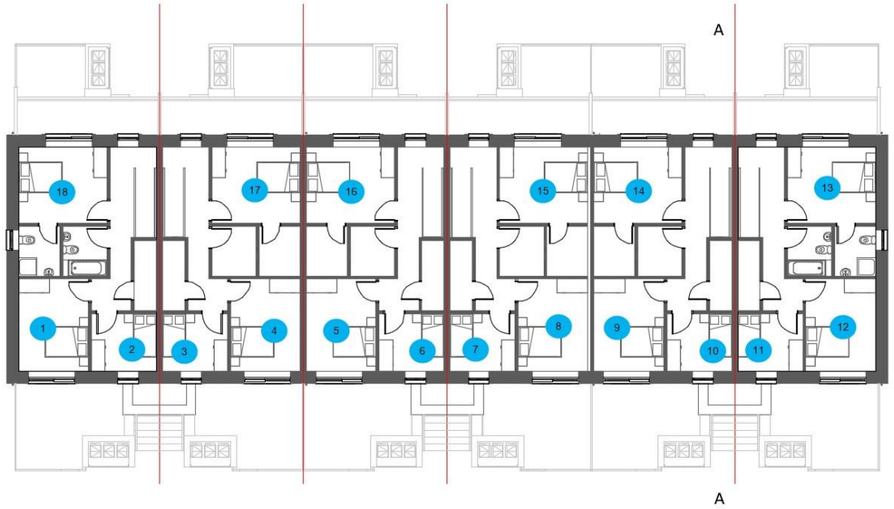
1st Floor Layout – Naming Convention



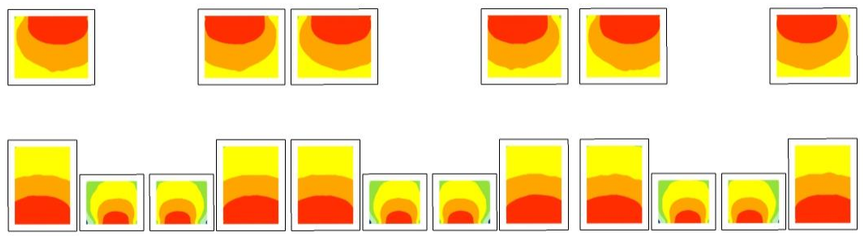
Radiance Plot



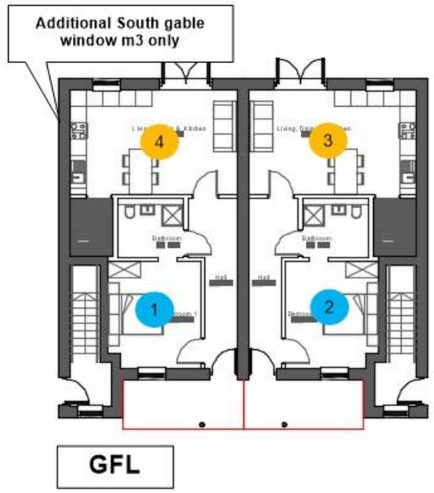
2nd Floor Layout – Naming Convention

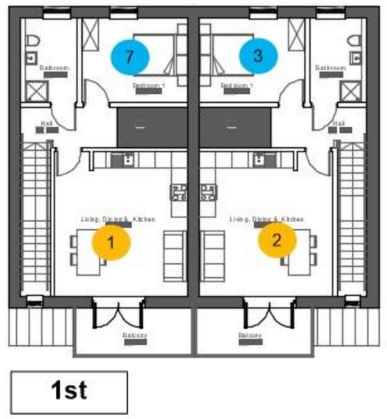


Radiance Plot

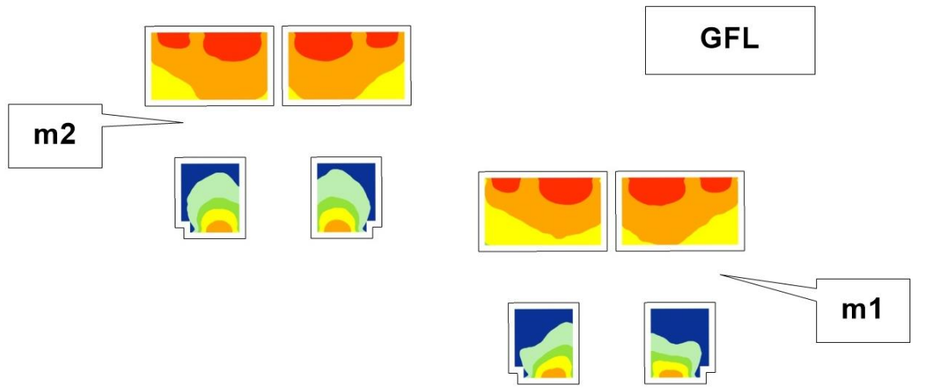


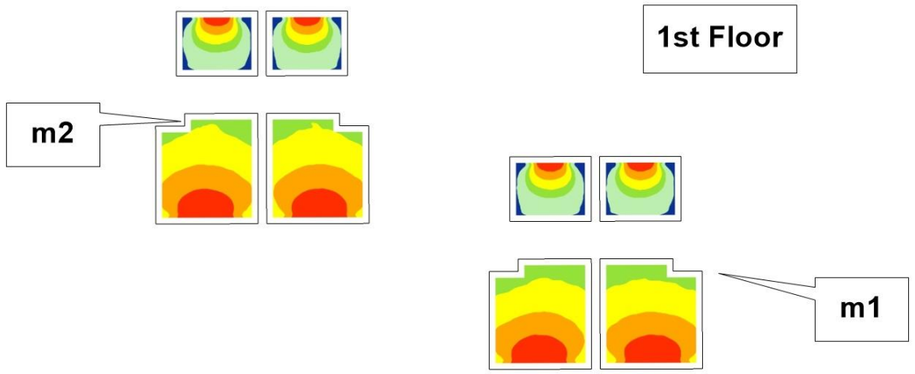
Maisonette - GFL & 1st Floor Layout Typical – Naming Convention



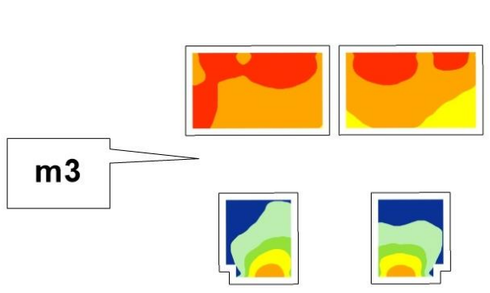


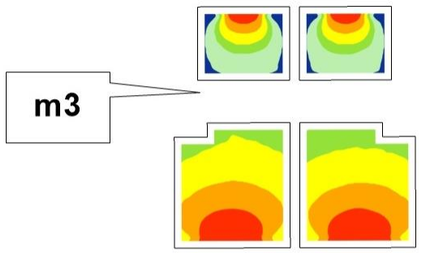
Radiance Plot M1 & M2 (GFL & 1st)





Radiance Plot M3 (GFL & 1st)





NA.2 Minimum daylight provision

For all habitable rooms

Median External Diffuse Illuminance **14,900** lx

>50 % of the points on a reference plane to exceed

Duplex-v2 **Type**

Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
00D01	Bedroom	100	100	Pass
00D02	Bedroom	100	100	Pass
00D03	Bedroom	100	100	Pass
00D04	Bedroom	100	100	Pass
00D05	Bedroom	100	100	Pass
00D06	Bedroom	100	100	Pass
00D07c	Living/Kitchen	78	200	Pass
00D08c	Living/Kitchen	66	200	Pass
00D09c	Living/Kitchen	69	200	Pass
00D10c	Living/Kitchen	72	200	Pass
00D11c	Living/Kitchen	71	200	Pass
00D12c	Living/Kitchen	91	200	Pass
01D01L	Living	100	150	Pass
01D02L	Living	91	150	Pass
01D03L	Living	92	150	Pass
01D04L	Living	94	150	Pass
01D05L	Living	93	150	Pass
01D06L	Living	100	150	Pass
01D07k	Kitchen	100	200	Pass
01D08k	Kitchen	100	200	Pass
01D09k	Kitchen	100	200	Pass
01D10k	Kitchen	100	200	Pass
01D11k	Kitchen	100	200	Pass
01D12k	Kitchen	100	200	Pass
02D01	Bedroom	100	100	Pass
02D02	Bedroom	96	100	Pass
02D03	Bedroom	100	100	Pass
02D04	Bedroom	100	100	Pass
02D05	Bedroom	100	100	Pass
02D06	Bedroom	96	100	Pass
02D07	Bedroom	96	100	Pass
02D08	Bedroom	100	100	Pass
02D09	Bedroom	100	100	Pass
02D10	Bedroom	96	100	Pass
02D11	Bedroom	100	100	Pass
02D12	Bedroom	100	100	Pass
02D13	Bedroom	100	100	Pass
02D14	Bedroom	100	100	Pass
02D15	Bedroom	100	100	Pass
02D16	Bedroom	100	100	Pass
02D17	Bedroom	100	100	Pass
02D18	Bedroom	100	100	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Median External Diffuse Illuminance **14,900** lx

>50 % of the points on a reference plane to exceed

Maisonette-v2 Type

Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
00m1-01	Bedroom	50	100	Pass
00m1-02	Bedroom	48	100	Marginal
00m1-03c	Living/Kitchen	100	200	Pass
00m1-04c	Living/Kitchen	100	200	Pass
01m1-01c	Living/Kitchen	78	200	Pass
01m1-02c	Living/Kitchen	79	200	Pass
01m1-03	Bedroom	80	100	Pass
01m1-04	Bedroom	82	100	Pass
00m2-01	Bedroom	57	100	Pass
00m2-02	Bedroom	59	100	Pass
00m2-03c	Living/Kitchen	100	200	Pass
00m2-04c	Living/Kitchen	100	200	Pass
01m2-01c	Living/Kitchen	83	200	Pass
01m2-02c	Living/Kitchen	83	200	Pass
01m2-03	Bedroom	82	100	Pass
01m2-04	Bedroom	79	100	Pass
00m3-01	Bedroom	64	100	Pass
00m3-02	Bedroom	50	100	Pass
00m3-03c	Living/Kitchen	100	200	Pass
00m3-04c	Living/Kitchen	100	200	Pass
01m3-01c	Living/Kitchen	83	200	Pass
01m3-02c	Living/Kitchen	77	200	Pass
01m3-03	Bedroom	82	100	Pass
01m3-04	Bedroom	80	100	Pass

Summary

98% of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested. (100% if we include the one just marginal bedroom)

The average compliant areas achieving the relevant target Lx for all bedrooms is 89% and all Living/Kitchen spaces 89% both are well in excess of the required 50%

Development Performance - Sunlight to rooms (living spaces)

Clause 3.1.2 of the guidance document BRE indicates that special checks should be applied to living rooms to ensure that these core rooms receive the necessary sunlight.

> *In Housing, the main requirement for sunlight is in living rooms. where it is valued at any time of day but especially in the afternoon.*

Check Clauses

> *3.1.15 In general 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.*
>
> *3.1.16 Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations*

The guidelines accept the difficulty imposed by this requirement and that it will not always be possible to achieve this requirement for ALL living spaces. While it is preferred to have sunlight the guidelines are pragmatic in this regard. The guidelines note that:

> *3.1.8……. For larger developments of flats, especially those with site constraints, it may not be possible to have every living room facing within 90° of south…….*

A view or similar may be considered a compensating factor to North facing windows

> *3.1.7 …. compensating factor such as an appealing view to the north.*

It then follows with an example of a careful layout for a relatively small block where 4/5 flats have south facing living rooms, and one North which would receive no sunlight at all. From this layout and results we can conclude or infer that an 80% pass rate is considered careful layout design.

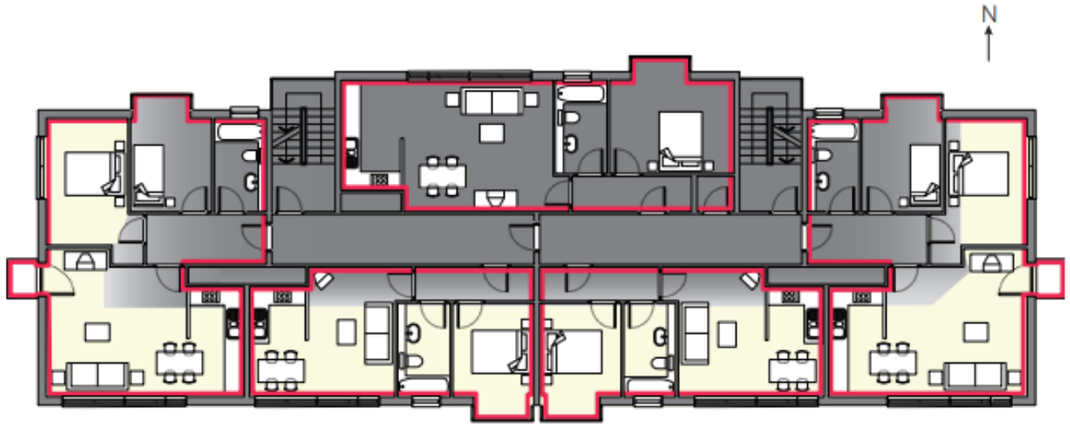


Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

Quality of light minimum/medium/high is defined in clause 3.1.10

> ***3.1.10 … For interiors, access to sunlight can be quantified. BS EN 17037 recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used. The medium level of recommendation is three hours and the high level of recommendation four hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion. …..***

Sunlight to living rooms

Receives 1.5 hours of sunlight on 21st March

Block	Floor	Window/Room	Ref	Hrs of Sun	Pass		Quality	
D	F0	R07	00.D.07	4.0	Pass			*High*
D	F0	R08	00.D.08	4.3	Pass			*High*
D	F0	R09	00.D.09	4.3	Pass			*High*
D	F0	R10	00.D.10	4.5	Pass			*High*
D	F0	R11	00.D.11	4.7	Pass			*High*
D	F0	R12	00.D.12	5.2	Pass			*High*
D	F1	R01	01.D.01	8.2	Pass			*High*
D	F1	R02	01.D.02	2.8	Pass	*Min*		
D	F2	R03	02.D.03	2.8	Pass	*Min*		
D	F2	R04	02.D.04	2.8	Pass	*Min*		
D	F2	R05	02.D.05	2.7	Pass	*Min*		
D	F2	R06	02.D.06	2.8	Pass	*Min*		
M1	F0	R01	00.M1.01	0.7	Fail	***1**		
M1	F0	R02	00.M1.02	0.8	Fail	***1**		
M1	F1	R01	01.M1.01	10.8	Pass			*High*
M1	F1	R02	01.M1.02	10.8	Pass			*High*
M2	F0	R01	00.M2.01	0.8	Fail	***1**		
M2	F0	R02	00.M2.02	1.0	Fail	***1**		
M2	F1	R01	01.M2.01	10.0	Pass			*High*
M2	F1	R02	01.M2.02	9.0	Pass			*High*
M3	F0	R01	00.M3.01	5.0	Pass			*High*
M3	F0	R02	00.M3.02	5.2	Pass			*High*
M3	F1	R01	01.M3.01	5.8	Pass			*High*
M3	F1	R02	01.M3.02	5.2	Pass			*High*

*1 While there is a "preference" to test living rooms, we note that 3.1.10 does state *"For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion."* The testing next examines the alternative rooms within the apartments for the GFL of Maisonette m1 & m2 which open onto the shared amenity space but face North. These apartments are dual aspect with alternate windows tested below.

Sunlight to Apartments *1

Receives 1.5 hours of sunlight on 21st March

Block	Floor	Window/Room	Ref	Hrs of Sun	Pass	Quality	
M1	F0	R01	00.M1.01	4.2	Pass		*High*
M1	F0	R02	00.M1.02	2.8	Pass	*Min*	
M2	F0	R01	00.M2.01	5.0	Pass		*High*
M2	F0	R02	00.M2.02	2.8	Pass	*Min*	

Summary

Sunlight to living rooms:

100% of apartments receive qualifying sunlight.
83% of all preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
This is consistent with the BRE defined “careful layout design” 80% target.

Development Performance - Sunlight on the Ground SOG (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).

3.3.9 … Normally trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building (this applies especially to deciduous trees). …

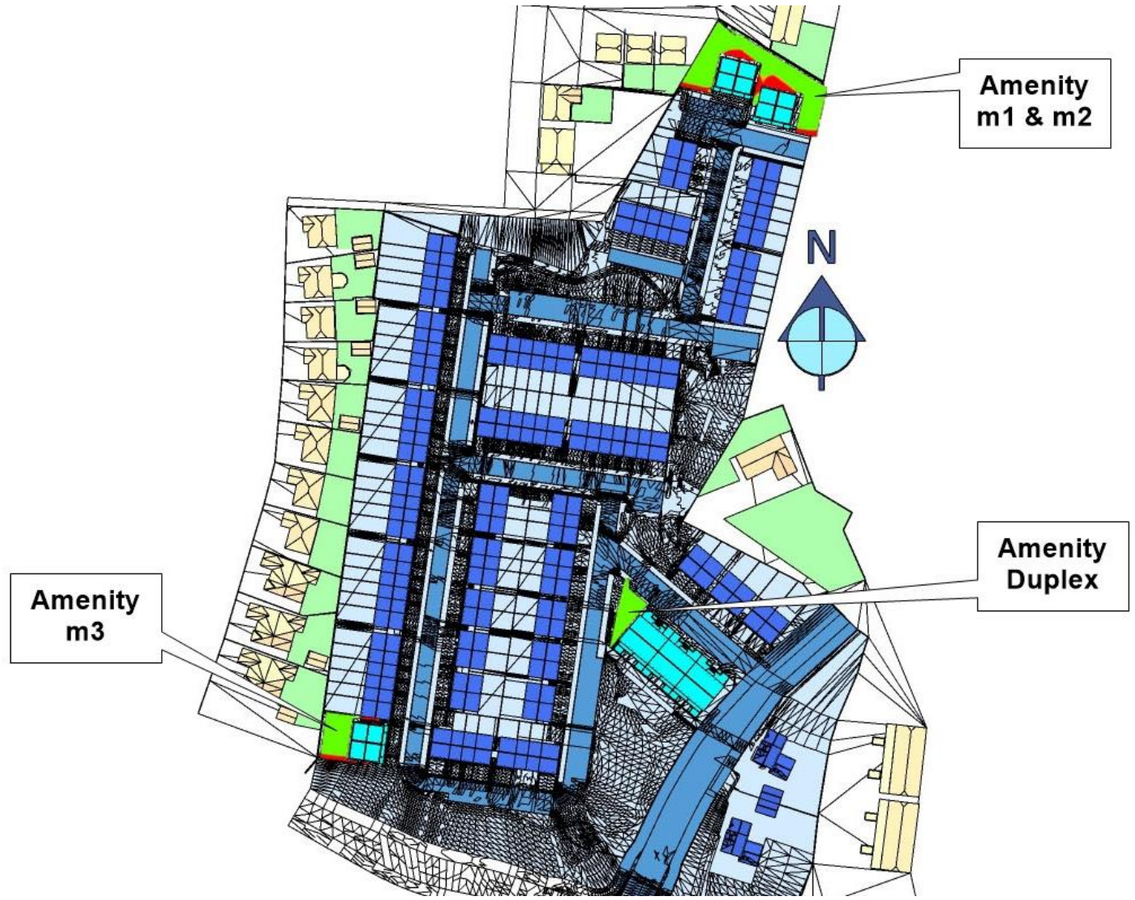
The amenities of the following Building Groups were tested.

- Shared / communal Spaces but not Private balconies are tested.

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



Proposed

The results are tabulated below:

		Shadow / Sunlight Amenity			
		>50% receives 2 hours of sunlight on 21st March)			
Group	Floor	Ref	Ref	% 2hr Sunlight	Check
D	F0	A1	D.A1	100%	Pass
M12	F0	A2	M12.A2	80%	Pass
M3	F0	A3	M3.A3	80%	Pass

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 new proposed communal/shared amenity spaces pass the BRE requirement.
The tested spaces generally comply with the requirements of the BRE guidelines

Architects Commentary Compensatory Measures.

General

The design is constrained by its location, site shape and orientation. The scheme has competing design constraints and objectives and clauses 6.6/6.7 of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities – amended July 2023 apply:

6.6 Planning authorities should ensure appropriate expert advice and input where necessary, and have regard to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in BuildingsEN17037 or UK National Annex BS EN17037 and the associated BRE Guide 209 2022 Edition (June 2022),or any relevant future guidance specific to the Irish context, when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

6.7 Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.

Similarly, department document "Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities" 5.3.7 references the same documents and also notes the following when drawing conclusions:

In drawing conclusions in relation to daylight performance, planning authorities must weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision, against the location of the site and the general presumption in favour of increased scales of urban residential development. Poor performance may arise due to design constraints associated with the site or location and there is a need to balance that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.

In relation to the one non-compliant ground floor bedroom reference 00-m102

- The bedroom in question is very marginal hitting 48% against a 50% target
- Unit is dual aspect.
- Unit exceeds the minimum required floor area by 11.5 sq m of 25.6%.
- Unit provided with private amenity space that exceeds the minimum requirement by 5 sq m or 100%.
- Unit's share of communal amenity space exceeds the minimum requirement by 64.25 sq m or 1,285%.

Summary – Development Performance

This report is in compliance with: "Site layout planning for daylight and sunlight a guide to good practice" - BR209". It also references EN 17037 and Annex NA (BS/EN 17037) as and where called for in the above BRE guidance document.

Performance of the proposed design

- **Target Illuminance E_T**
  - **98%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
  - *(100% if we include the one marginal bedroom)*
  - The average compliant areas achieving the relevant target Lx for
    - all bedrooms is **89%** and
    - all Living/Kitchen spaces **89%**
    - both are well in excess of the required 50%
- **Sunlight to Apartments (living rooms):**
  - **100%** of apartments receive qualifying sunlight.
    - **83%** of all preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
    - *This is consistent with the BRE defined "careful layout design" 80% target.*
- **Sunlight on the Ground SOG (Shadow)**
  - **100%** of new proposed communal/shared amenity spaces pass the BRE requirement.
  - The proposed development complies with the requirements of the BRE guidelines in relation to Sunlight/Shadow.

The application generally complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice – BR209.

Summary – Overall

This report is in compliance with "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice" BRE version 3, 2022 and EN 17037:2018 Daylight in buildings.

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: **0.93**
- **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**
- As expected, the proposed design has negligible impact on Neighbours.

Performance of the proposed design

- **Target Illuminance E_T**
  - **98%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
  - *(100% if we include the one marginal bedroom)*
  - The average compliant areas achieving the relevant target Lx for
    - all bedrooms is **89%** and
    - all Living/Kitchen spaces **87%**
    - both are well in excess of the required 50%
- **Sunlight to Apartments (living rooms):**
  - **100%** of apartments receive qualifying sunlight.
    - **83%** of all preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
    - *This is consistent with the BRE defined "careful layout design" 80% target.*
- **Sunlight on the Ground SOG (Shadow)**
  - **100%** of new proposed communal/shared amenity spaces pass the BRE requirement.
  - The proposed development complies with the requirements of the BRE guidelines in relation to Sunlight/Shadow.

The application generally complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice BR209 (Version 3, 2022) when considered in terms of an infill and regeneration project in an un-developed lot

Appendix 1
Light Distribution
Alternative Target Illuminance ET Metric
Non-Annex Analysis

Comparison between the Annex and non-Annex results

And reasoning behind adoption and applicability of the BS/EN Annex

This is a supplementary analysis which does not reflect the performance of the proposed design in temperate climates such as Ireland / UK. There should be no expectation that the design would comply with these requirements.

The NA-annex results in the main body of this report reflect design in such conditions. This is as defined by the UK committee and directly referenced in Irish Department publications such "Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities" July 2023, the "Sustainable and Compact Settlements: Guidelines for Planning Authorities 2024" and many Development Plans.

Design Standards / Guidelines
Light Distribution.

BRE v2 – 2011 / BS 8206-2

The original BRE guidelines "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice – Second Edition - 2011" was cross-referenced to and from the now withdrawn BS 8206-2 : 2008.

It looked at light distribution within a room based on Average Daylight Factor ADF (an average over the entire room surface) and was based off the CIE overcast sky and results of rooms were based on obstructions, room geometry, ope sizes, radiance and transmittance but was constant from location to location on the globe.

The guidelines and BS standard took into account room usage placing higher degrees of importance on living spaces than to bedrooms, which is a reasonable consideration, given that bedrooms are typically used more at night.

Given that these Standard and Guidelines are withdrawn tests such as ADF are no longer relevant.

BRE v3 – 2022 / EN 17037

The new BRE guidelines "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice – Third Edition - 2022" provides best guidelines for analysing development while referencing relevant elements of EN 17037 similar to how the withdrawn BRE v2 – 2011 provided best guidelines for analysing development referencing relevant elements of withdrawn BS 8206- 2.

This best practice guideline has been considered the de-facto standard since 1991 and details how to apply EN 17037.

Impact on neighbours and shadow elements are handled only within the BRE guidelines but the EN standard covers some elements of development performance.

EN 17037 also looks at internal light distribution/daylight but in terms of target illuminance over a specific percentage of a room. Target illuminance is driven by the available external light which varies by location on the globe. However, the internal room lux targets Lx we strive to achieve remain unchanged.

There are various tables of requirements (minimum, medium and high), and these are defined for all rooms and do not consider the rooms usage. The minimum targets are:

Rooms	300lx over 50% of room area
AND	100lx over 95% of room area

Localisation

The EN 17037 is designed to be localised and a blank National Annex is provided in for that purpose.

This is an acknowledgement that design will vary in different countries and that adjustment will be needed to take into account available external light which itself drives the internal lux results and other design constraints / objectives. The Irish version of this standard IS EN17037 currently has no specific National Annex

The UK committee, in their examination of this provided recommendations which are pulled through to the National Annex in the UK variant of this document BS EN 17037

Given the similarity of weather, light and design patterns between Ireland and the UK in many areas and the absence of specific localisation Annex information in the IS version it is not unreasonable to apply the BS recommendations at this time. There is considerable precedence in the adoption of such technical recommendations in the engineering and indeed legal professions.

The UK committee acknowledged the difficulty of achieving the primary lux targets outlined in the main body of the report particularly in dwellings in our climates. The Annex recommendations are focused on dwellings which is the subject of the vast majority of our reports. The committee again re-affirmed their commitment that room usage should be considered and set lower target illuminance values accordingly for dwellings based on the same.

Bedroom	100lx over 50% of room area
Living Rooms	150lx over 50% of room area
Kitchens	200lx over 50% of room area

Dual usage rooms use the higher value.

These targets were derived from BS 8206-2:2008 Lighting for buildings – Part 2: Code of practice for daylighting, targets have served us well in the past and which have been the staple for design for years. We have dual run multiple projects BRE v2 (ADF) vs BRE v3 Annex (Et) and as expected they show very similar compliance rates.

Furthermore, the UK committee decided that the target illuminance across the entire (i.e. 95 %) **need not** be applied to rooms in dwellings.

Analysis

We concur with the UK committees' recommendations for daylight provision in a space may not be achievable for some buildings, particularly dwellings and that a target illuminance level should be achieved across the entire (i.e. 95 %) fraction of the reference plane within a space – need **not** be applied to rooms in dwellings.

The targets defined in the National Annex are linked to the targets have served us well in the past and have been the staple for design for years. The primary results have thus been compiled based on the UK Annex NA targets, tabulated in the report main body.

We have for the avoidance of doubt also provided results based on the non-annex Standard, in Appendix 1. The results for which show that the conclusions of the UK committee were justified and that the standard (non-Annex) targets are unlikely to be achieved in a more densely developed residential sites.

This is in accordance with the Departments "Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities" July 2023 and clause 6.6 which directly references the UK National Annex BS EN17037:2019.

Block Sample – E_T results - Tabulated

	Minimum daylight provision						Minimum daylight provision					
					For all habitable room						For all habitable room	
	Location	Dublin	14,900	lx			Location	Dublin	14,900	lx		
Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%	Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
00D01	Bedroom	76	Pass	100	Pass	00m1-01	Bedroom	6	Fail	50	Fail
00D02	Bedroom	69	Pass	100	Pass	00m1-02	Bedroom	4	Fail	48	Fail
00D03	Bedroom	69	Pass	100	Pass	00m1-03c	Living/Kitchen	74	Pass	100	Pass
00D04	Bedroom	68	Pass	100	Pass	00m1-04c	Living/Kitchen	63	Pass	100	Pass
00D05	Bedroom	70	Pass	100	Pass	01m1-01c	Living/Kitchen	40	Marginal	100	Pass
00D06	Bedroom	76	Pass	100	Pass	01m1-02c	Living/Kitchen	42	Marginal	100	Pass
00D07c	Living/Kitchen	40	Marginal	100	Pass	01m1-03	Bedroom	14	Fail	80	Marginal
00D08c	Living/Kitchen	19	Fail	100	Pass	01m1-04	Bedroom	13	Fail	82	Marginal
00D09c	Living/Kitchen	20	Fail	100	Pass						
00D10c	Living/Kitchen	22	Fail	100	Pass	00m2-01	Bedroom	8	Fail	57	Fail
00D11c	Living/Kitchen	21	Fail	100	Pass	00m2-02	Bedroom	9	Fail	59	Fail
00D12c	Living/Kitchen	50	Pass	100	Pass	00m2-03c	Living/Kitchen	81	Pass	100	Pass
01D01L	Living	98	Pass	100	Pass	00m2-04c	Living/Kitchen	83	Pass	100	Pass
01D02L	Living	36	Fail	100	Pass	01m2-01c	Living/Kitchen	44	Marginal	100	Pass
01D03L	Living	36	Fail	100	Pass	01m2-02c	Living/Kitchen	43	Marginal	100	Pass
01D04L	Living	36	Fail	100	Pass	01m2-03	Bedroom	14	Fail	82	Marginal
01D05L	Living	36	Fail	100	Pass	01m2-04	Bedroom	14	Fail	79	Marginal
01D06L	Living	97	Pass	100	Pass						
01D07k	Kitchen	99	Pass	100	Pass	00m3-01	Bedroom	9	Fail	64	Fail
01D08k	Kitchen	98	Pass	100	Pass	00m3-02	Bedroom	8	Fail	50	Fail
01D09k	Kitchen	97	Pass	100	Pass	00m3-03c	Living/Kitchen	82	Pass	100	Pass
01D10k	Kitchen	99	Pass	100	Pass	00m3-04c	Living/Kitchen	100	Pass	100	Pass
01D11k	Kitchen	98	Pass	100	Pass	01m3-01c	Living/Kitchen	43	Marginal	100	Pass
01D12k	Kitchen	100	Pass	100	Pass	01m3-02c	Living/Kitchen	40	Marginal	100	Pass
02D01	Bedroom	59	Pass	100	Pass	01m3-03	Bedroom	14	Fail	82	Marginal
02D02	Bedroom	28	Fail	96	Pass	01m3-04	Bedroom	14	Fail	80	Marginal
02D03	Bedroom	29	Fail	100	Pass						
02D04	Bedroom	60	Pass	100	Pass						
02D05	Bedroom	60	Pass	100	Pass			Count	24	Count	24
02D06	Bedroom	28	Fail	96	Pass			Pass	6	Pass	12
02D07	Bedroom	28	Fail	96	Pass			Pass Rate 300lx/50%	25%	Pass Rate 100lx/95%	50%
02D08	Bedroom	60	Pass	100	Pass						
02D09	Bedroom	58	Pass	100	Pass						
02D10	Bedroom	28	Fail	96	Pass						
02D11	Bedroom	28	Fail	100	Pass			Marginal	6	Marginal	6
02D12	Bedroom	59	Pass	100	Pass			Pass Margina	50%	Pass Margina	75%
02D13	Bedroom	64	Pass	100	Pass						
02D14	Bedroom	65	Pass	100	Pass						
02D15	Bedroom	65	Pass	100	Pass						
02D16	Bedroom	67	Pass	100	Pass						
02D17	Bedroom	65	Pass	100	Pass						
02D18	Bedroom	67	Pass	100	Pass						
		Count	42	Count	42						
		Pass	27	Pass	42						
		Pass Rate 300lx/50%	64%	Pass Rate 100lx/95%	100%						
		Marginal	1	Marginal	0						
		Pass Margina	67%	Pass Margina	100%						

Summary – Light Distribution all habitable rooms for all blocks.

A summary for pass results for all blocks is detailed below.
And compared with the analysis from Light Distribution – Target Illuminance (Annex NA)

	Annex NA E_T % Pass			Non-Annex 300lx @ 50%			Non-Annex 100lx @ 95%	
	BRE v3	Incl Marginal			Incl Marginal			Incl Marginal
	Pass %	Pass %		Pass %	Pass %		Pass %	Pass %
D	100%	100%	D	64%	67%	D	100%	100%
M	96%	100%	M	25%	50%	M	50%	75%
Total	98%	100%	Total	50%	61%	Total	82%	91%

It is our opinion that this concurs with the UK committees' position that the non-annex targets are too stringent for use for residential buildings and that (in the absence of an Irish National Annex) that the targets provided in the UK Annex NA are reasonable to apply to residential housing in this case.

The above is further endorsed in the Departments "Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities" July 2023 and clause 6.6 which directly references the UK National Annex BS EN17037:2019 as does the "Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities" 2024.

This is a supplementary analysis which does not reflect the performance of the proposed design in temperate climates such as Ireland / UK. There should be no expectation that the design would comply with these requirements.

The NA-annex results in the main body of this report reflect design in such conditions. This is as defined by the UK committee and directly referenced in Irish Department publications such "Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities" July 2023, "Sustainable and Compact Settlements: Guidelines for Planning Authorities 2024" and many Development Plans.