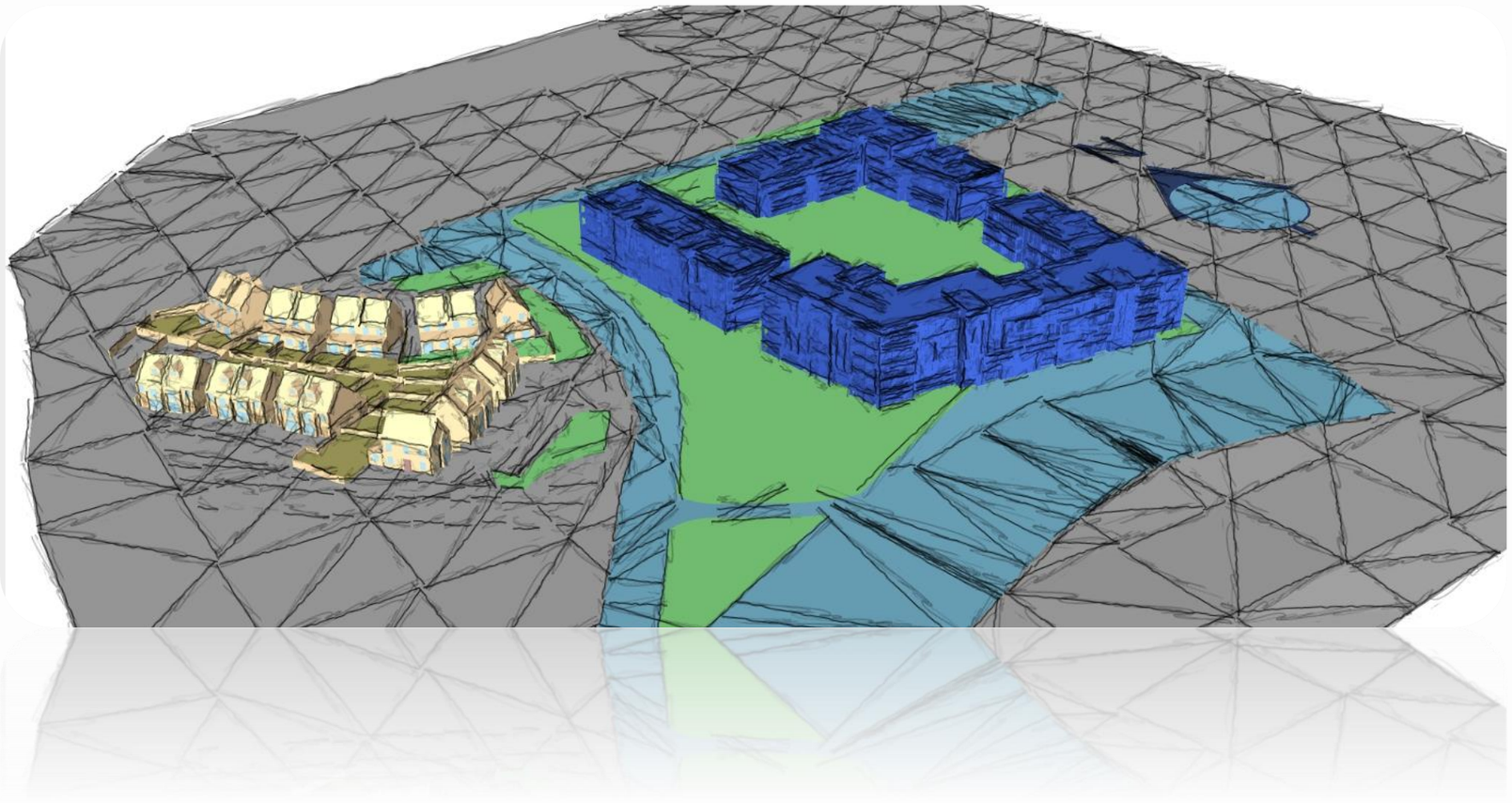
FINLAY PARK

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

V3



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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 **0.95**
- **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:**0.92** and WPSH: **0.90**
- **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**

Performance of the proposed design

- **Target Illuminance E_T**
  - **91%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
  - **97%** if we include marginal rooms
  - The average complaint areas achieving the relevant target Lx for
    - all bedrooms is **94%** and
    - all Living/Kitchen spaces **65%**
    - both are well in excess of the required 50%
- **Sunlight to rooms:**
  - **70%** of the preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
  - **89%** of apartments, however, will receive BRE qualifying sunlight (Appendix 1).
  - This is generally consistent with the BRE defined "careful layout design" 80% target.
- **Sunlight on the Ground SOG (Shadow)**
  - **100%** of the Communal & Public Amenity spaces pass the relevant requirements
  - These spaces are well served by sunlight with results of 87% & 90% well in excess of the 50% target.

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) and EN 17037 and Annex NA (BS/EN 17037) as and where called for in the above BRE guidance document.

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' & Planners' Commentary / Compensatory Measures

The Architect has provided detailed commentary and shown compensatory measures in their Design Statement which should be read in conjunction with this document. This specifically details the following under the 12 criteria for Urban Design – 5.8 Detailed Design:

- The majority of rooms comply with daylight requirement and those that don't are generally marginal.
- It is not unexpected that some lower floor apartments will receive less light than those on higher floors.
- Compensatory measures detailed include:
  - Living rooms have an excellent vista onto the significant podium landscaped park
  - Podium level apartments (1st Floor) have direct access to the podium
  - 85% of apartments have a floor area of >10% over the minimum requirement.
  - 77% of apartments are dual aspect
  - No single aspect units face only North
  - Specific comments have been made for apartment types where Target Illuminance values fall below compliance.
  - Connectivity with the urban design and landscape open spaces and green networks
  - Provision of private balconies connected to living spaces.

Please refer to the Architects' Design Statement for a detailed explanation.

Relevant pages from the Architect's Design Statement concerning compensatory measures and design strategy are reproduced in Appendix 3.

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 series of 3 apartment blocks arranged around a central courtyard. 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 B1 & B2. Neighbours to the South and East are over 100m distant and not evaluated.

Google Earth extract © Google 2022

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

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 habitable rooms on all floors

Response to LRD Opinion

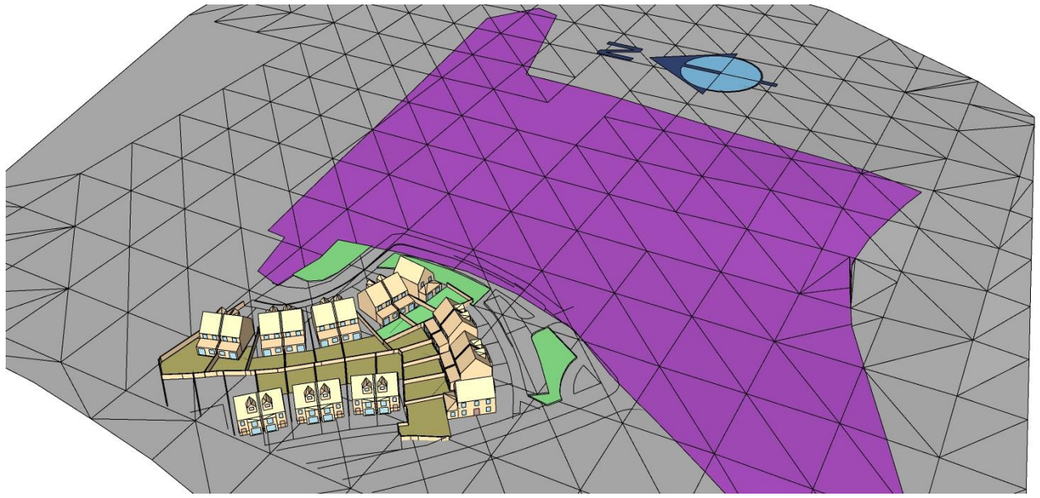
The relevant opinion item is under the heading "Design Strategy and Height" item 2, see extract below

> 2. There are concerns regarding the level of sunlight/daylight entering certain apartment buildings within Block A, Block C and especially Block B where it is noted that a number of apartments have failed the relaxed Living/Dining/Kitchen targets outlined with the Preliminary Sunlight, Daylight and Shadow Assessment. This would indicate a substandard form of development for a number of apartments in these blocks. The Applicant is requested to address this issue.

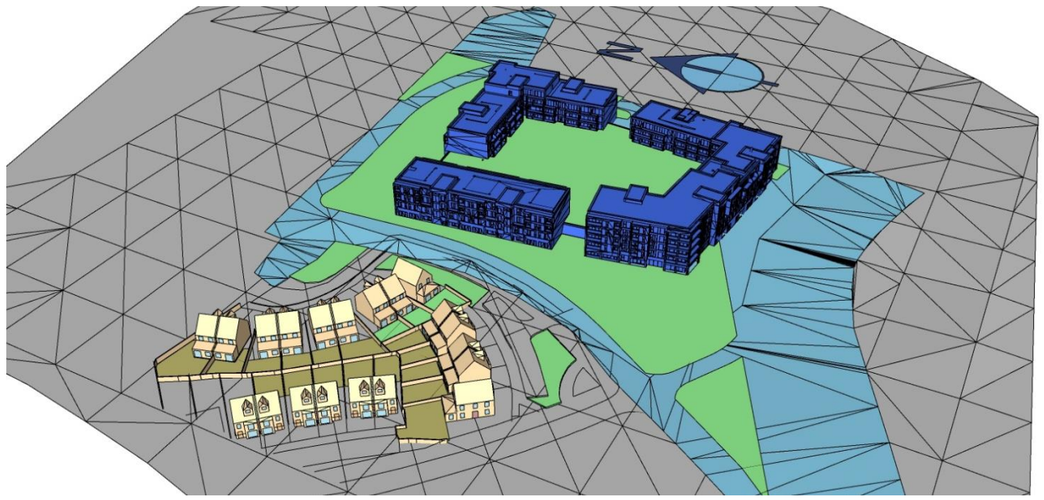
The initial design, testing and opinion was used to inform the architects' design and the floor layouts were substantially adjusted to ensure a high standard light in the development. This report addresses these concerns and analyses all rooms, on all floors at the full current target standards. The results show very high level of compliance, and the architect has outlined compensatory factors in their Design Statement. Relevant pages from the Architect's Design Statement concerning compensatory measures and design strategy are reproduced in Appendix 3.

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 greenfield site, “Blue” this proposal. The analysis is based on the information provided.



Existing Model



Proposed Model

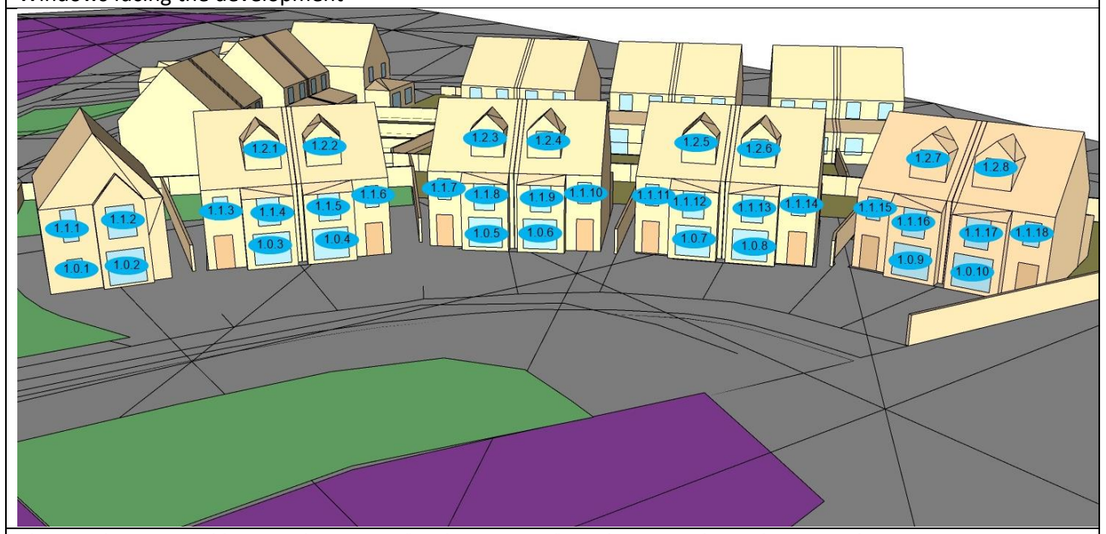
Adjacent Properties Details

The numbering used later for windows in each of the blocks is detailed below.

Neighbours – Window Group B1

Streetview imagery © Google 2022

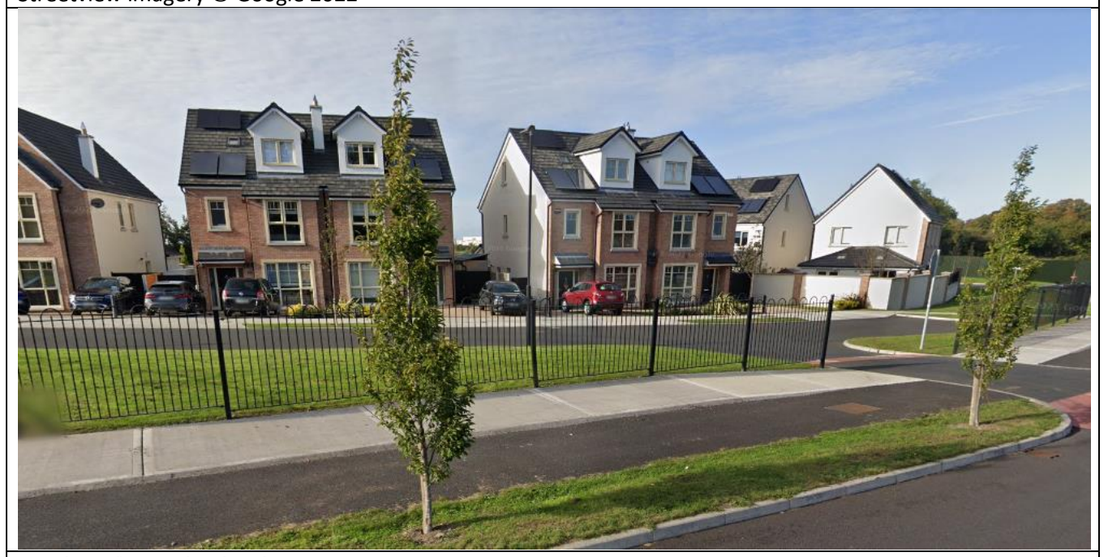
Windows facing the development



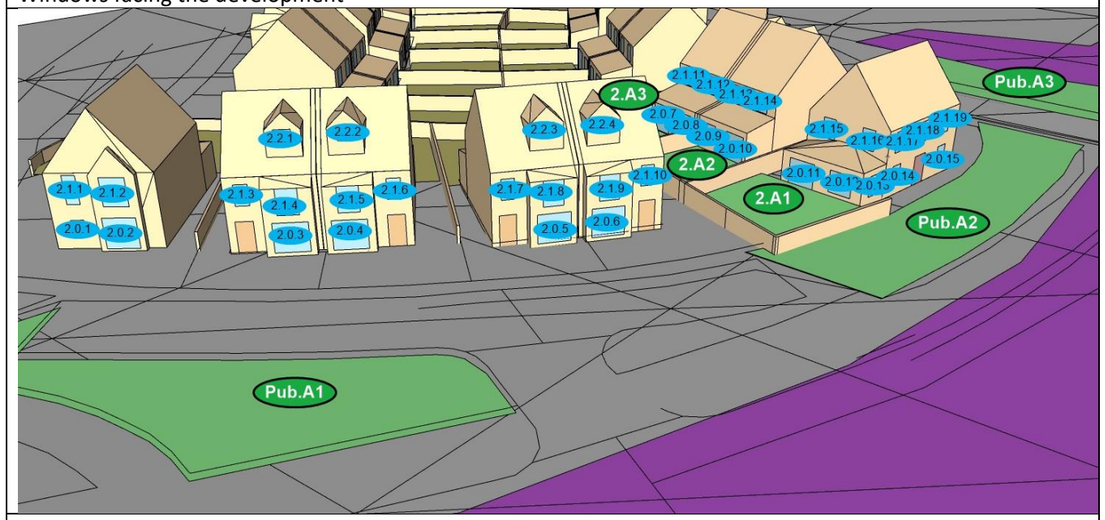
The numbering used later in this report for this group of windows is indicated in cyan above.

Neighbours – Window Group B2

Streetview imagery © Google 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

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							
Report	*Check > 27% or ratio > 0.8*						
Group	**Floor**	**Win**	**Ref**	**Existing**	**Proposed**	**Ratio**	**Result**
B1	F0	W1	1.0.1	38.5	36.4	0.95	Pass
B1	F0	W2	1.0.2	39.2	37.6	0.96	Pass
B1	F0	W3	1.0.3	39.1	37.8	0.97	Pass
B1	F0	W4	1.0.4	39.1	38.0	0.97	Pass
B1	F0	W5	1.0.5	38.7	37.4	0.97	Pass
B1	F0	W6	1.0.6	39.0	37.8	0.97	Pass
B1	F0	W7	1.0.7	39.1	38.0	0.97	Pass
B1	F0	W8	1.0.8	39.1	38.1	0.97	Pass
B1	F0	W9	1.0.9	38.1	36.9	0.97	Pass
B1	F0	W10	1.0.10	37.7	36.5	0.97	Pass
B1	F1	W1	1.1.1	38.8	37.2	0.96	Pass
B1	F1	W2	1.1.2	39.4	38.1	0.97	Pass
B1	F1	W3	1.1.3	37.7	36.6	0.97	Pass
B1	F1	W4	1.1.4	39.3	38.3	0.97	Pass
B1	F1	W5	1.1.5	39.3	38.5	0.98	Pass
B1	F1	W6	1.1.6	37.9	37.6	0.99	Pass
B1	F1	W7	1.1.7	36.8	35.8	0.97	Pass
B1	F1	W8	1.1.8	39.0	38.0	0.97	Pass
B1	F1	W9	1.1.9	39.3	38.3	0.98	Pass
B1	F1	W10	1.1.10	38.2	37.5	0.98	Pass
B1	F1	W11	1.1.11	37.9	37.0	0.98	Pass
B1	F1	W12	1.1.12	39.3	38.5	0.98	Pass
B1	F1	W13	1.1.13	39.4	38.6	0.98	Pass
B1	F1	W14	1.1.14	38.1	37.5	0.98	Pass
B1	F1	W15	1.1.15	37.1	36.2	0.97	Pass
B1	F1	W16	1.1.16	39.0	38.0	0.98	Pass
B1	F1	W17	1.1.17	39.2	38.2	0.98	Pass
B1	F1	W18	1.1.18	38.2	37.3	0.98	Pass
B1	F2	W1	1.2.1	39.4	38.8	0.98	Pass
B1	F2	W2	1.2.2	39.5	39.0	0.99	Pass
B1	F2	W3	1.2.3	39.4	38.7	0.98	Pass
B1	F2	W4	1.2.4	39.5	38.9	0.99	Pass
B1	F2	W5	1.2.5	39.5	39.0	0.99	Pass
B1	F2	W6	1.2.6	39.5	39.0	0.99	Pass
B1	F2	W7	1.2.7	39.4	38.7	0.98	Pass
B1	F2	W8	1.2.8	39.5	38.8	0.98	Pass

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

Skylight to habitable rooms							
VSC							
Report	*Check > 27% or ratio > 0.8*						
Group	**Floor**	**Win**	**Ref**	**Existing**	**Proposed**	**Ratio**	**Result**
B2	F0	W1	2.0.1	38.5	37.5	0.97	Pass
B2	F0	W2	2.0.2	39.4	38.1	0.97	Pass
B2	F0	W3	2.0.3	39.4	37.4	0.95	Pass
B2	F0	W4	2.0.4	39.4	37.2	0.94	Pass
B2	F0	W5	2.0.5	39.4	35.5	0.90	Pass
B2	F0	W6	2.0.6	39.4	35.1	0.89	Pass
B2	F0	W7	2.0.7	31.6	31.4	0.99	Pass
B2	F0	W8	2.0.8	32.1	31.9	0.99	Pass
B2	F0	W9	2.0.9	32.2	31.7	0.99	Pass
B2	F0	W10	2.0.10	31.0	30.8	0.99	Pass
B2	F0	W11	2.0.11	32.9	32.0	0.97	Pass
B2	F0	W12	2.0.12	35.1	34.0	0.97	Pass
B2	F0	W13	2.0.13	39.2	30.3	0.77	Pass
B2	F0	W14	2.0.14	39.5	30.3	0.77	Pass
B2	F0	W15	2.0.15	39.6	30.0	0.76	Pass
B2	F1	W1	2.1.1	38.9	38.1	0.98	Pass
B2	F1	W2	2.1.2	39.6	38.6	0.98	Pass
B2	F1	W3	2.1.3	38.3	37.2	0.97	Pass
B2	F1	W4	2.1.4	39.6	38.0	0.96	Pass
B2	F1	W5	2.1.5	39.6	37.8	0.95	Pass
B2	F1	W6	2.1.6	38.3	36.3	0.95	Pass
B2	F1	W7	2.1.7	38.3	35.8	0.94	Pass
B2	F1	W8	2.1.8	39.6	36.4	0.92	Pass
B2	F1	W9	2.1.9	39.6	36.1	0.91	Pass
B2	F1	W10	2.1.10	38.3	34.6	0.90	Pass
B2	F1	W11	2.1.11	35.7	35.4	0.99	Pass
B2	F1	W12	2.1.12	35.8	35.4	0.99	Pass
B2	F1	W13	2.1.13	36.0	35.6	0.99	Pass
B2	F1	W14	2.1.14	36.2	35.8	0.99	Pass
B2	F1	W15	2.1.15	37.4	36.4	0.97	Pass
B2	F1	W16	2.1.16	37.9	36.7	0.97	Pass
B2	F1	W17	2.1.17	39.6	32.4	0.82	Pass
B2	F1	W18	2.1.18	39.6	32.3	0.81	Pass
B2	F1	W19	2.1.19	39.6	32.2	0.81	Pass
B2	F2	W1	2.2.1	39.6	38.6	0.97	Pass
B2	F2	W2	2.2.2	39.6	38.5	0.97	Pass
B2	F2	W3	2.2.3	39.6	37.7	0.95	Pass
B2	F2	W4	2.2.4	39.6	37.4	0.94	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 **0.95**

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. All windows in Window Group B1 face Northwards and these are not tabulated.

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
B2	F0	W1	2.0.1	78.2	77.0	0.99	Pass		31.4	31.2	1.00	Pass
B2	F0	W2	2.0.2	78.9	76.7	0.97	Pass		31.3	31.2	1.00	Pass
B2	F0	W3	2.0.3	76.6	72.3	0.94	Pass		30.4	29.4	0.97	Pass
B2	F0	W4	2.0.4	76.7	72.0	0.94	Pass		30.5	29.3	0.96	Pass
B2	F0	W5	2.0.5	72.1	64.6	0.90	Pass		28.7	26.0	0.91	Pass
B2	F0	W6	2.0.6	72.2	63.6	0.88	Pass		28.7	25.6	0.89	Pass
B2	F0	W7	2.0.7	73.4	71.6	0.98	Pass		20.0	18.2	0.91	Pass
B2	F0	W8	2.0.8	75.1	73.0	0.97	Pass		21.6	19.5	0.90	Pass
B2	F0	W9	2.0.9	75.8	72.6	0.96	Pass		22.4	19.2	0.86	Pass
B2	F0	W10	2.0.10	72.7	71.4	0.98	Pass		19.4	18.1	0.93	Pass
B2	F0	W11	2.0.11	80.0	76.1	0.95	Pass		23.6	20.4	0.86	Pass
B2	F0	W12	2.0.12	83.8	78.8	0.94	Pass		27.6	23.4	0.85	Pass
B2	F0	W13	2.0.13	54.5	41.3	0.76	Pass		21.0	15.6	0.74	Pass
B2	F0	W14	2.0.14	54.9	40.3	0.74	Pass		21.3	15.0	0.70	Pass
B2	F0	W15	2.0.15	54.9	39.7	0.72	Pass		21.3	14.6	0.69	Pass
B2	F1	W1	2.1.1	78.2	77.3	0.99	Pass		31.4	31.2	1.00	Pass
B2	F1	W2	2.1.2	78.9	77.2	0.98	Pass		31.3	31.2	1.00	Pass
B2	F1	W3	2.1.3	74.1	72.2	0.97	Pass		30.5	29.9	0.98	Pass
B2	F1	W4	2.1.4	76.6	73.4	0.96	Pass		30.4	29.5	0.97	Pass
B2	F1	W5	2.1.5	76.7	73.2	0.95	Pass		30.5	29.4	0.96	Pass
B2	F1	W6	2.1.6	69.5	66.1	0.95	Pass		23.7	22.6	0.95	Pass
B2	F1	W7	2.1.7	71.3	68.1	0.96	Pass		28.7	27.0	0.94	Pass
B2	F1	W8	2.1.8	72.1	67.1	0.93	Pass		28.7	26.3	0.92	Pass
B2	F1	W9	2.1.9	72.2	66.4	0.92	Pass		28.7	26.0	0.91	Pass
B2	F1	W10	2.1.10	62.5	56.6	0.90	Pass		21.1	18.4	0.87	Pass
B2	F1	W11	2.1.11	83.5	81.3	0.97	Pass		30.1	27.8	0.93	Pass
B2	F1	W12	2.1.12	83.7	81.2	0.97	Pass		30.2	27.7	0.92	Pass
B2	F1	W13	2.1.13	82.8	80.2	0.97	Pass		29.4	26.7	0.91	Pass
B2	F1	W14	2.1.14	83.0	80.2	0.97	Pass		29.8	27.0	0.91	Pass
B2	F1	W15	2.1.15	85.9	81.8	0.95	Pass		29.5	25.5	0.86	Pass
B2	F1	W16	2.1.16	87.0	81.8	0.94	Pass		30.7	25.9	0.84	Pass
B2	F1	W17	2.1.17	54.9	43.0	0.78	Pass		21.3	15.7	0.74	Pass
B2	F1	W18	2.1.18	54.9	42.6	0.78	Pass		21.3	15.5	0.73	Pass
B2	F1	W19	2.1.19	54.9	42.6	0.78	Pass		21.3	15.5	0.73	Pass
B2	F2	W1	2.2.1	76.8	75.5	0.98	Pass		30.5	29.9	0.98	Pass
B2	F2	W2	2.2.2	76.3	74.8	0.98	Pass		30.1	29.4	0.98	Pass
B2	F2	W3	2.2.3	72.3	70.1	0.97	Pass		28.7	27.4	0.95	Pass
B2	F2	W4	2.2.4	71.8	68.7	0.96	Pass		28.6	27.0	0.95	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:**0.92** and WPSH: **0.90**

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).

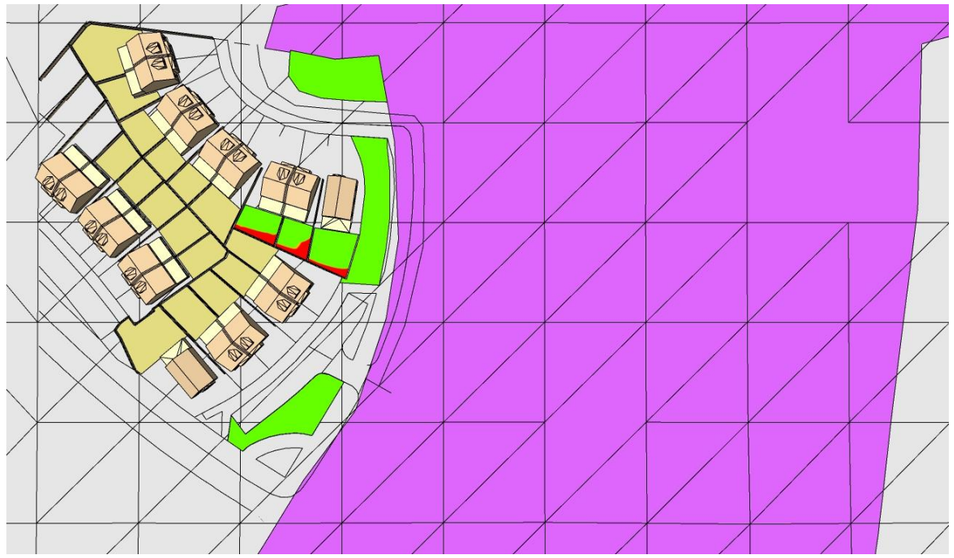
The amenities of the following properties were tested.

- Private Gardens - Representative from Window Group B2
- Public Spaces as defined

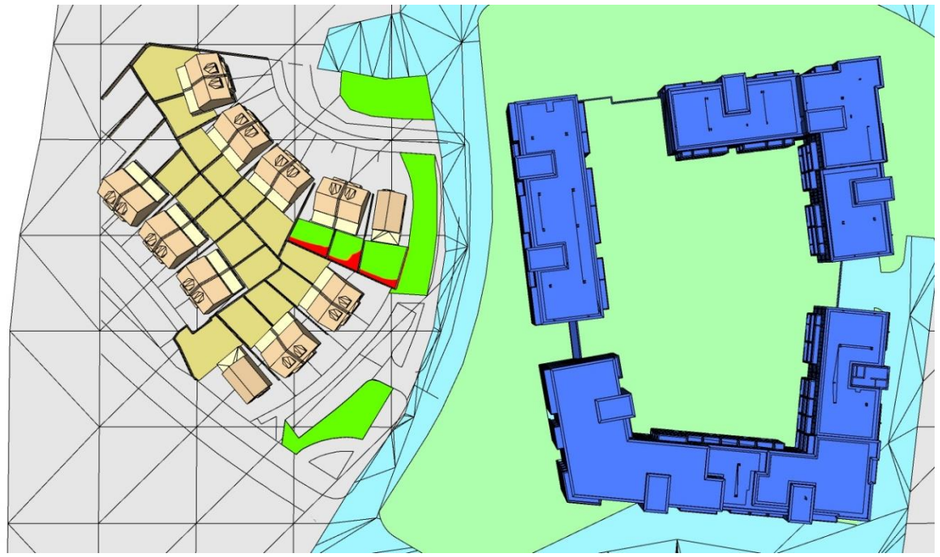
BRE 2-hour Shadow Plots

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			
			Design	**2-hour Sunlight - 21st March**			
				Check > 50% or ratio > 0.8			
Group	**Area**	**Ref**	**Description**	**Existing**	**Proposed**	**Ratio**	**Result**
B2	A1	2.A1	Private Amenity	88%	87%	0.98	Pass
B2	A2	2.A2	Private Amenity	69%	69%	1.00	Pass
B2	A3	2.A3	Private Amenity	73%	73%	0.99	Pass
BPub	A1	Pub.A1	Public Amenity	100%	100%	1.00	Pass
BPub	A2	Pub.A2	Public Amenity	100%	100%	1.00	Pass
BPub	A3	Pub.A3	Public 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 **0.95**
- **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:**0.92** and WPSH: **0.90**
- **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 – 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. No amendments were 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 in 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. Irish planning guidelines require development to have regard to "guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'", and as the next iteration of the BS guides, BS/EN 17037 and BRE 209 (2022) provide an appropriate updated standard from the perspective of national planning guidelines. 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***

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

Table NA.1 is 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 are as per Annex B (and/or as revised by Annex NA), analysis method 1 was used. The following Parameters were used 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.

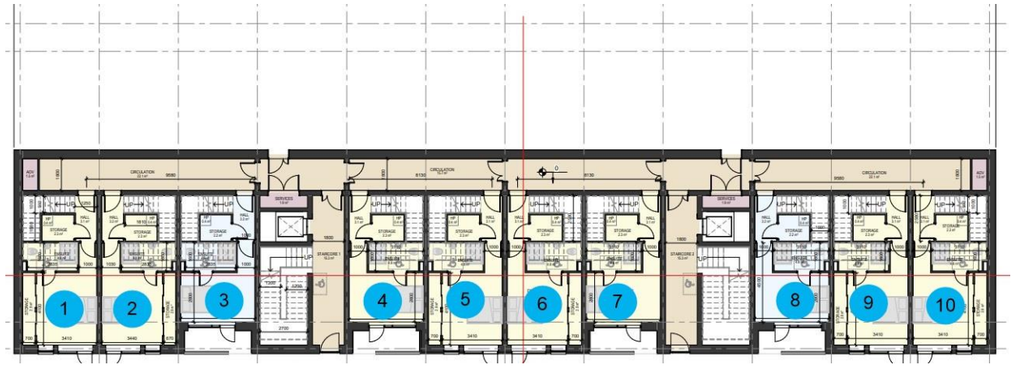
Surface	Description	Reflectance
External Plane	Earth	0.2
External Walls	Grey Render / Concrete	0.4
Floor	Light wood/ cream Carpet	0.4
Internal Wall	Cream	0.7
Ceiling	White	0.8
Frames	Medium Grey	0.5
	Transmittance	
Glazing clear	0.63 (incls. Maintenance Factor)	
Glazing Translucent	0.4 (incls. Maintenance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

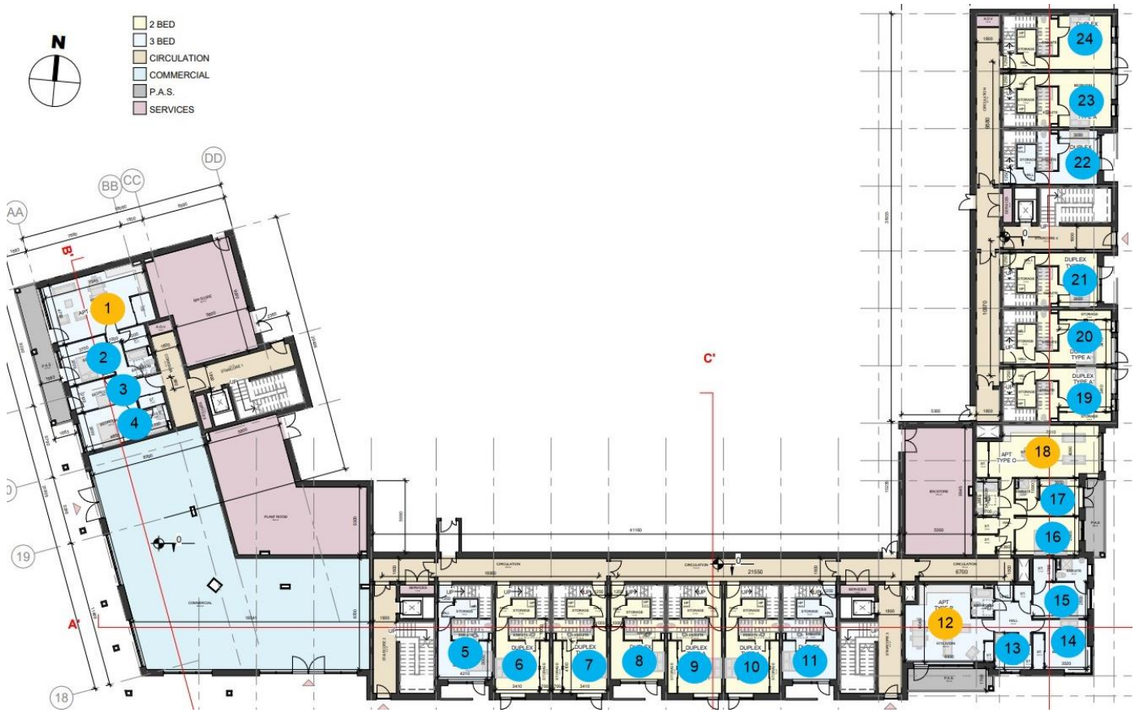
Reference plane or working plane

> ***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.***

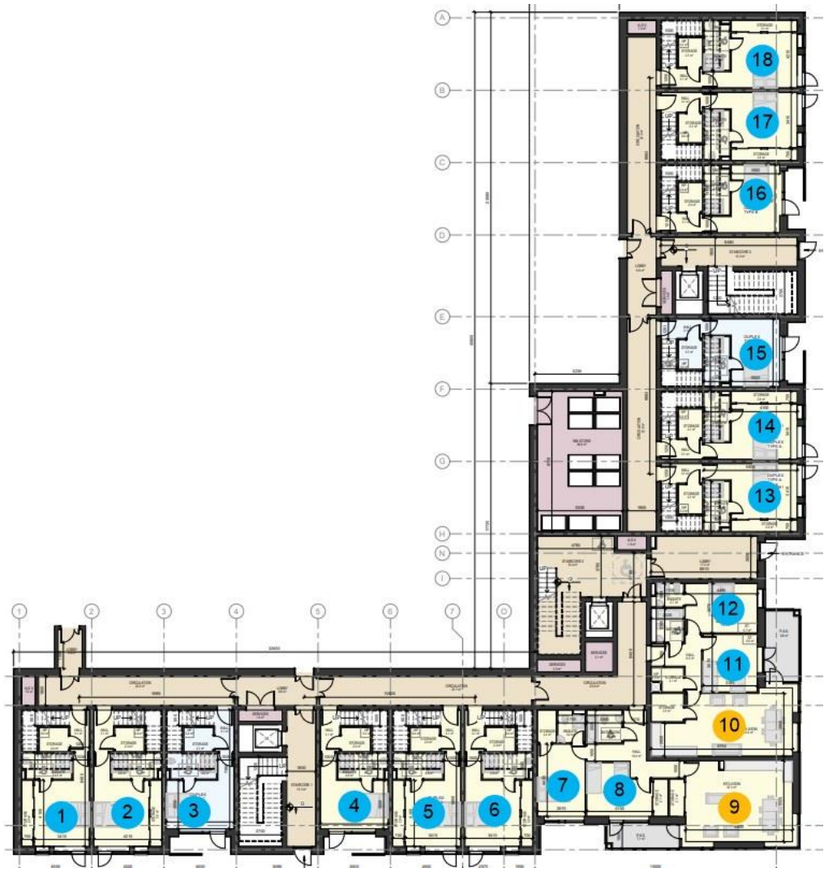
GFL Floor Layout A – Naming Convention



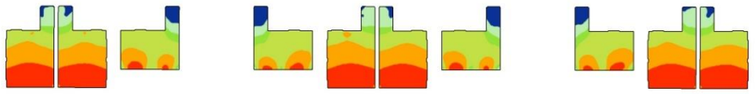
GFL Floor Layout B– Naming Convention



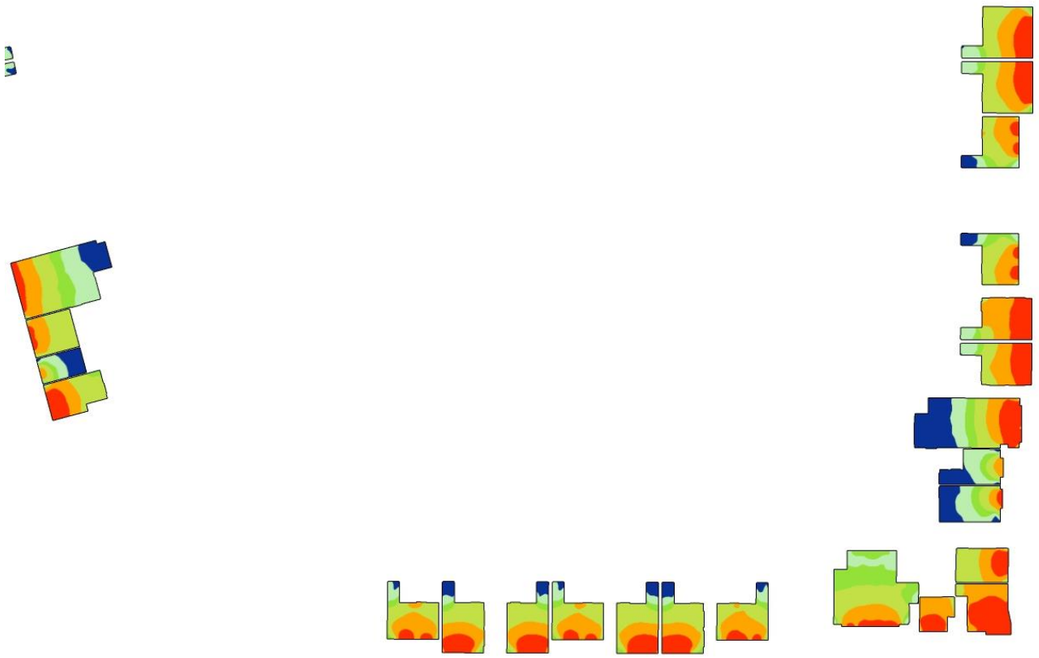
GFL Floor Layout C – Naming Convention



GFL Floor A – Target illuminance E_T - Radiance plot

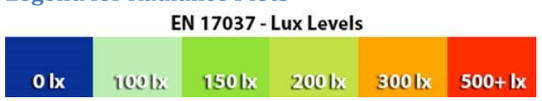


GFL Floor B– Target illuminance ET - Radiance plot

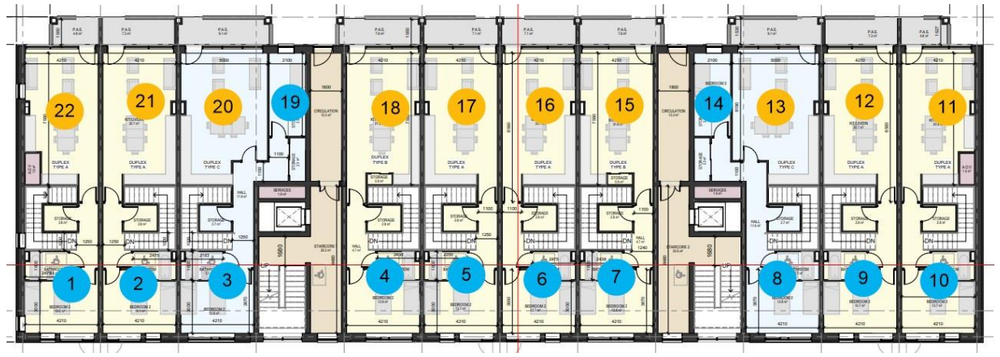


GFL Floor C – Target illuminance ET - Radiance plot

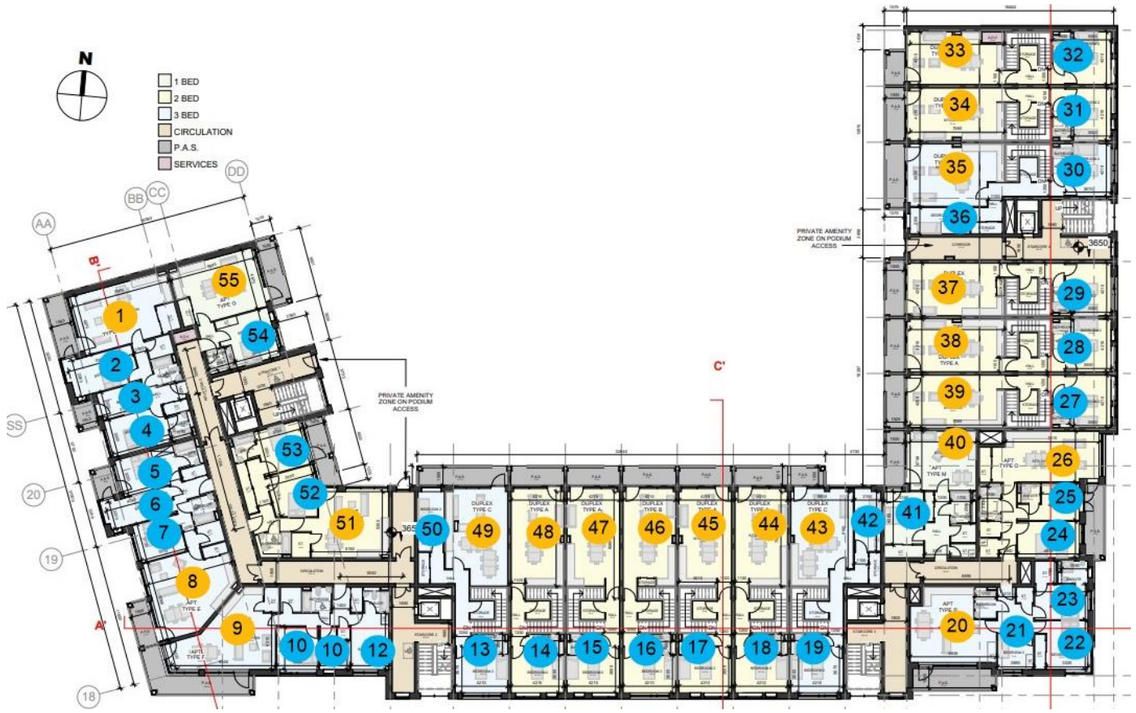
Legend for Radiance Plots



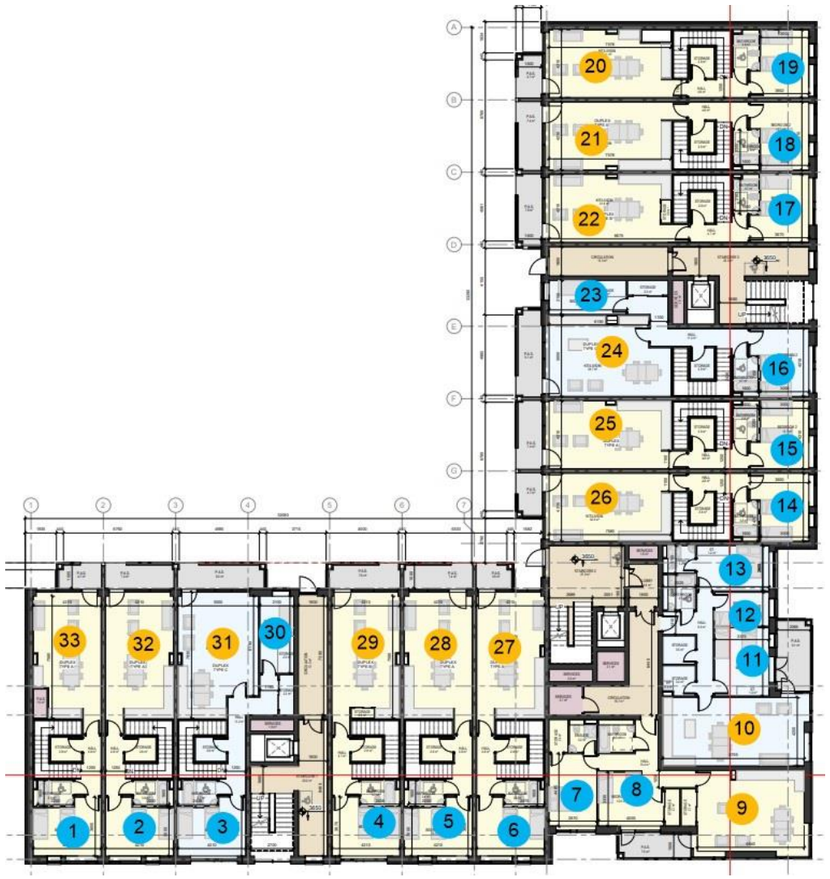
1st Floor Layout A – Naming Convention



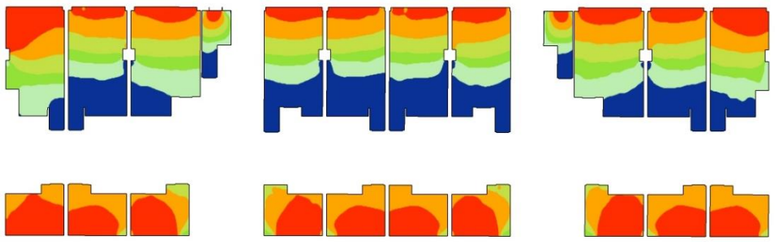
1st Floor Layout B– Naming Convention



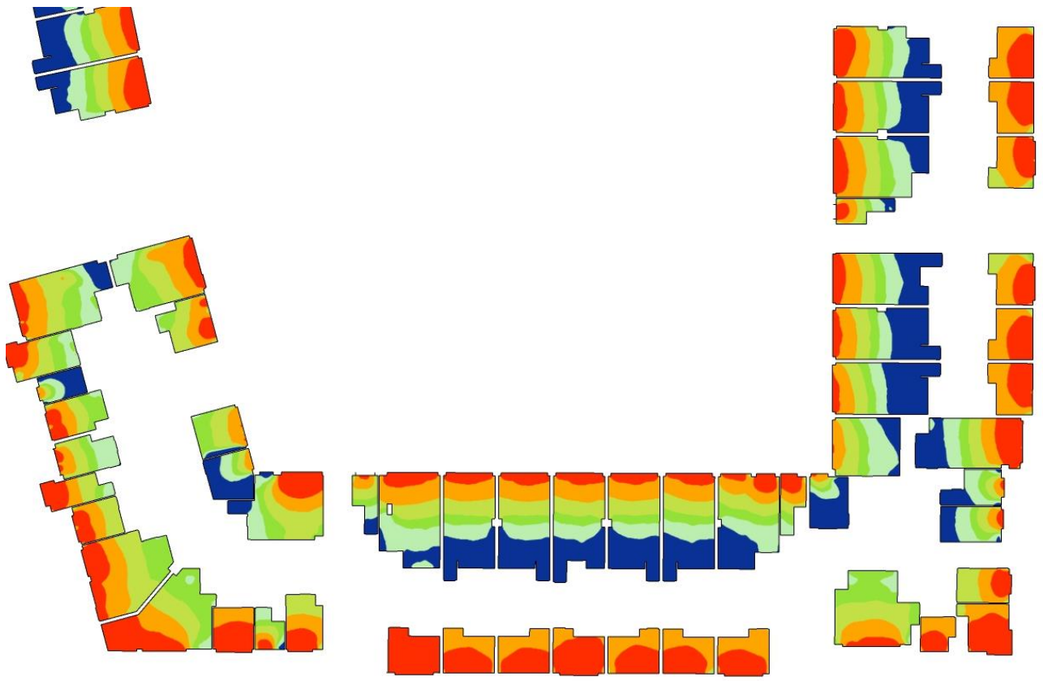
1st Floor Layout C – Naming Convention



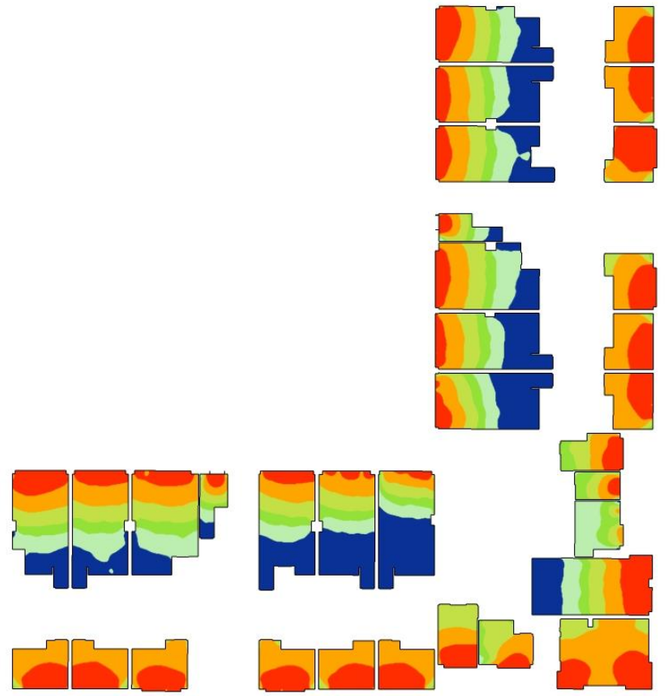
1st Floor A – Target illuminance E_T - Radiance plot



1st Floor B– Target illuminance ET - Radiance plot

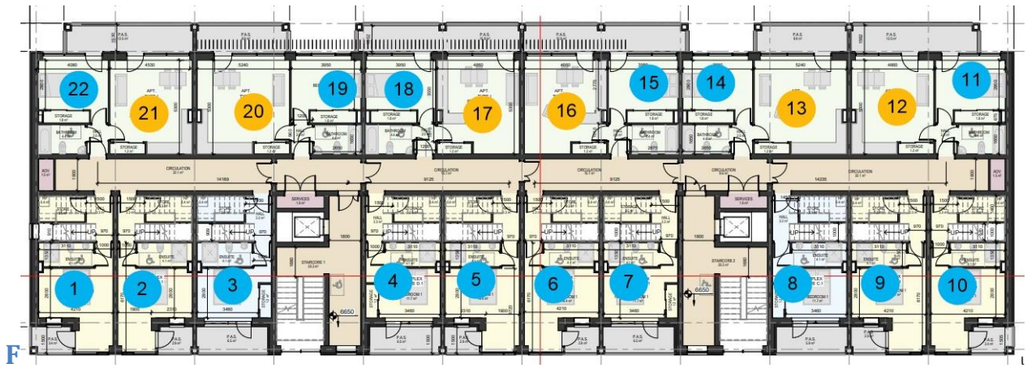


1st Floor C – Target illuminance ET - Radiance plot



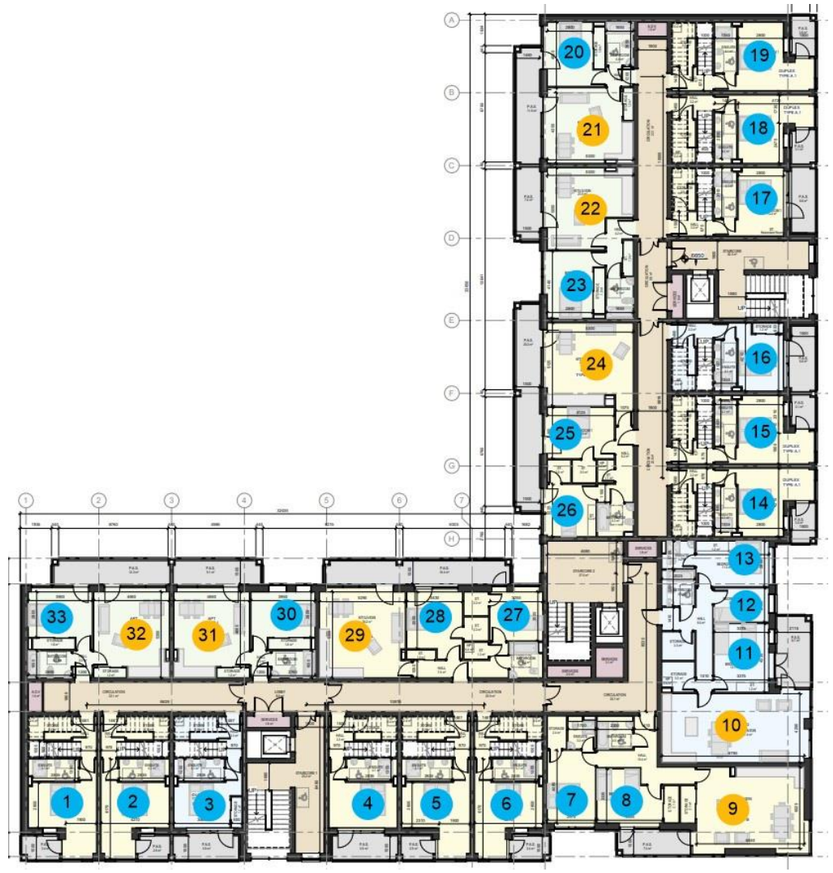
Legend for Radiance Plots

2nd Floor Layout A – Naming Convention

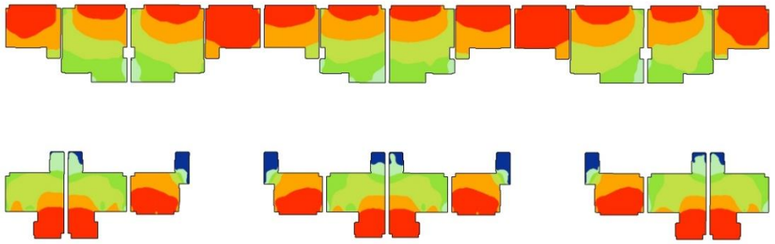


2nd Floor Layout B– Naming Convention

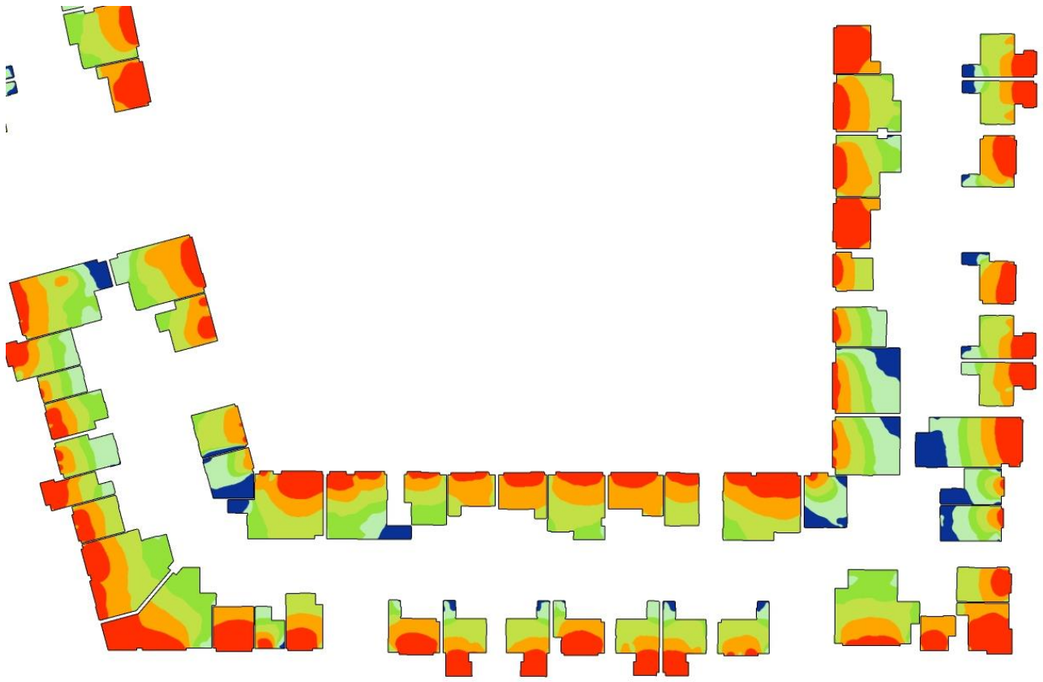
2nd Floor Layout C – Naming Convention



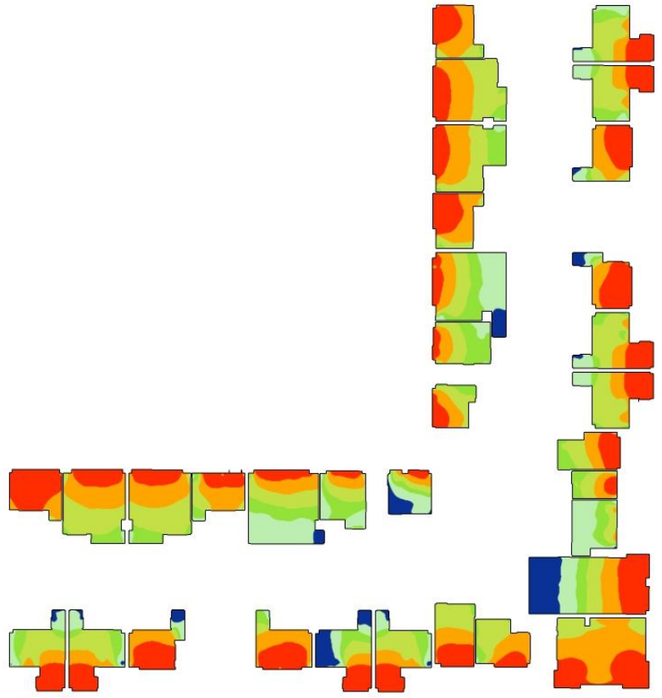
2nd Floor A – Target illuminance E_T - Radiance plot



2nd Floor B– Target illuminance ET - Radiance plot



2nd Floor C – Target illuminance ET - Radiance plot

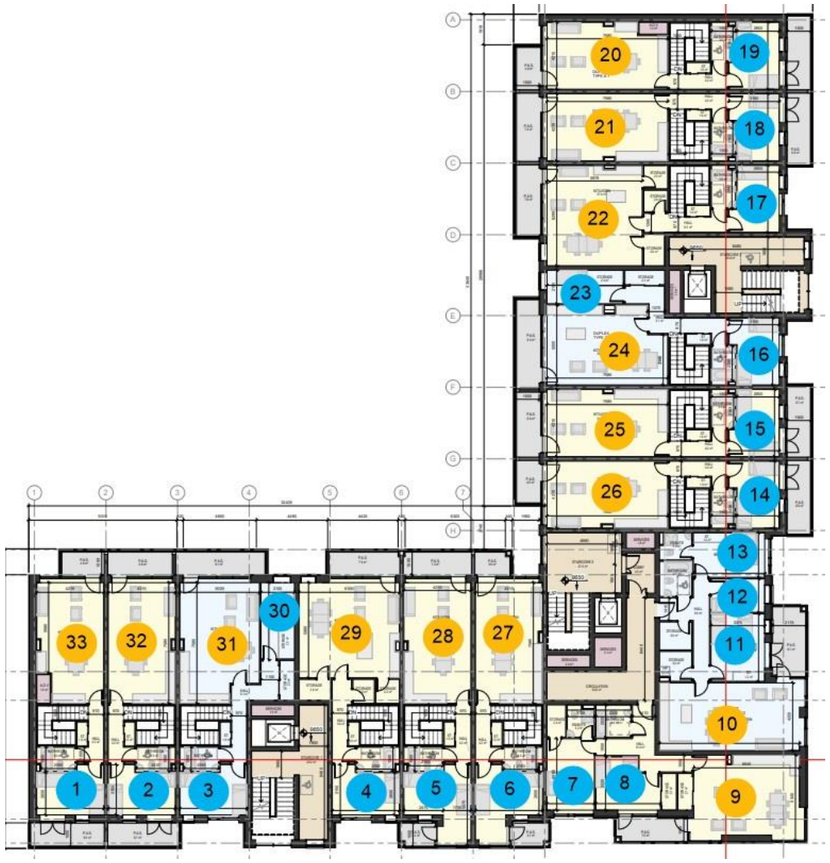


Legend for Radiance Plots

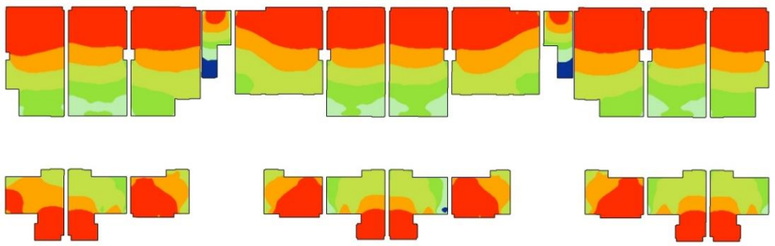
3rd Floor Layout A – Naming Convention

3rd Floor Layout B– Naming Convention

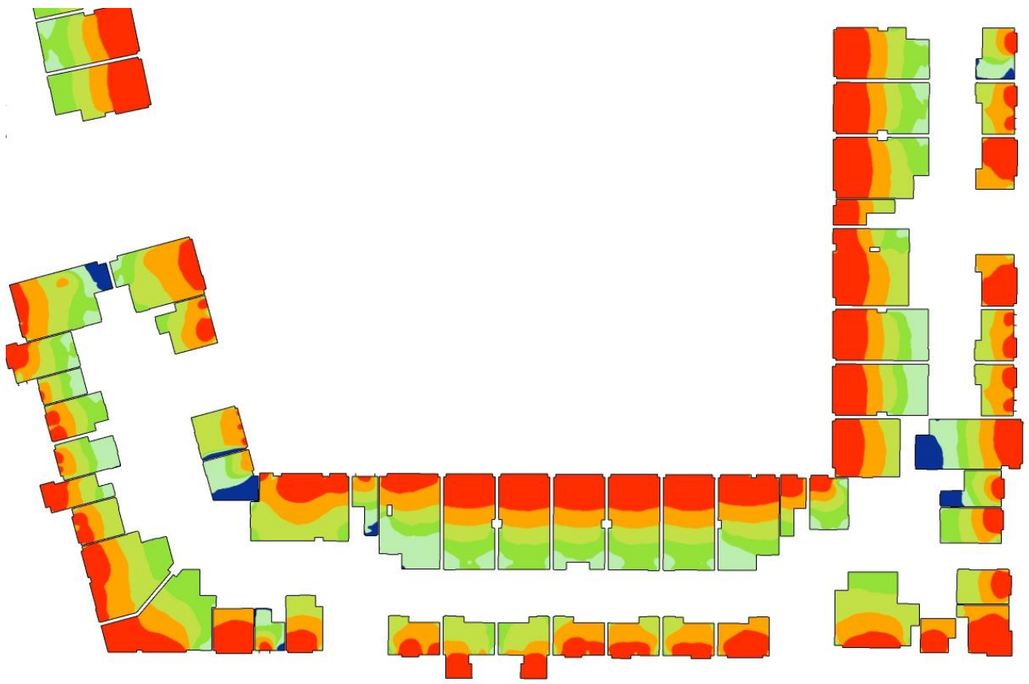
3rd Floor Layout C – Naming Convention



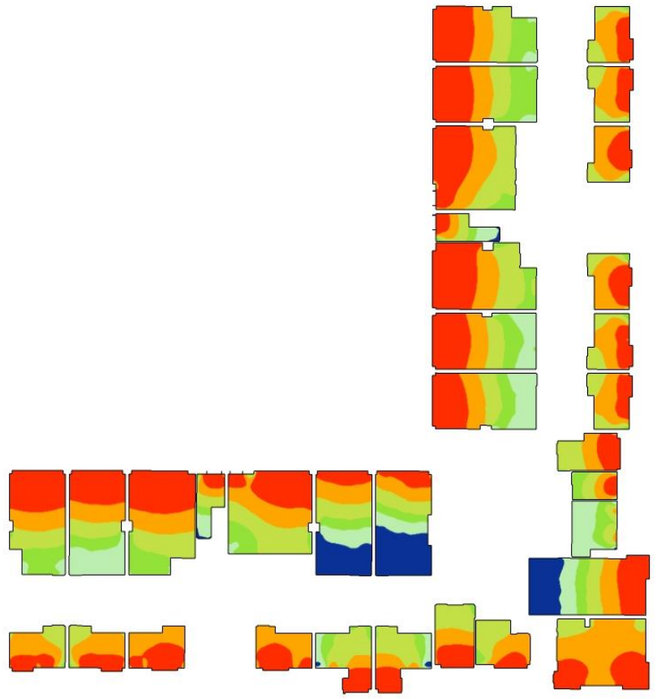
3rd Floor A – Target illuminance E_T - Radiance plot



3rd Floor B– Target illuminance ET - Radiance plot

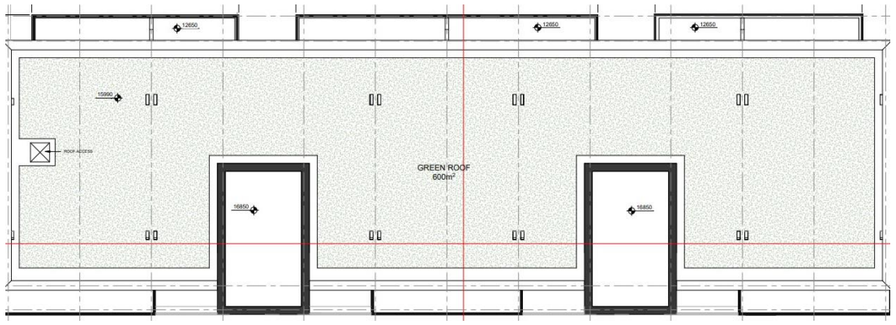


3rd Floor C – Target illuminance ET - Radiance plot

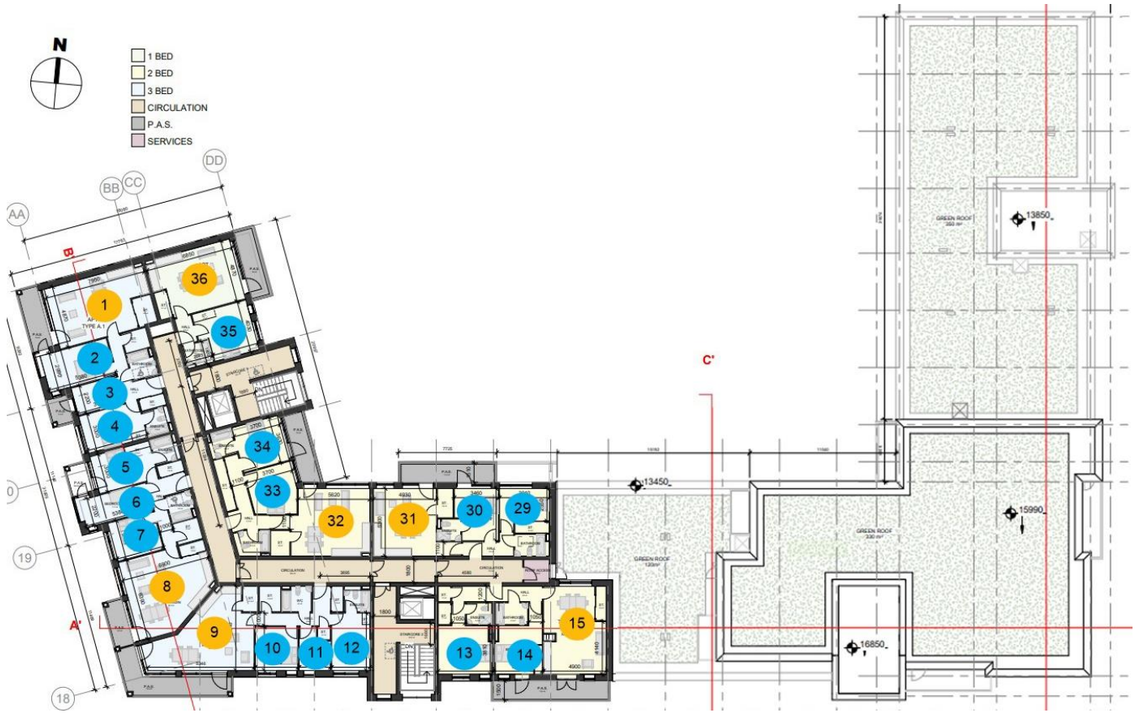


Legend for Radiance Plots

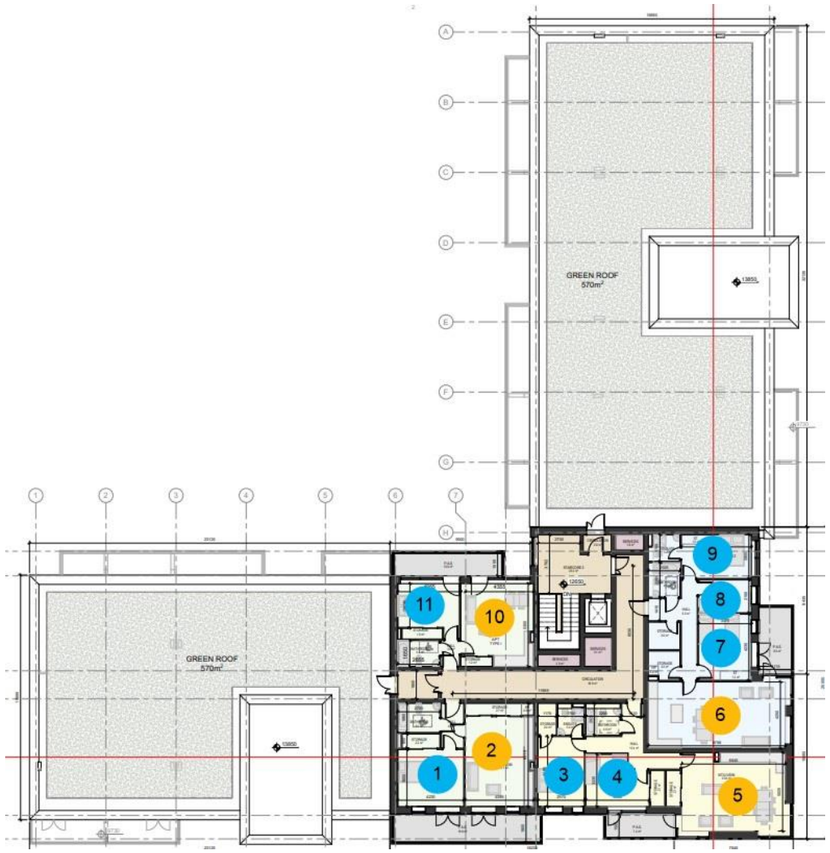
4th Floor Layout A – Naming Convention



4th Floor Layout B– Naming Convention



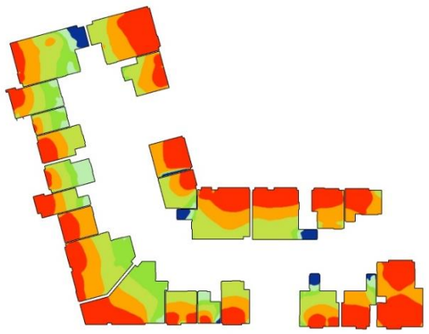
4th Floor Layout C – Naming Convention



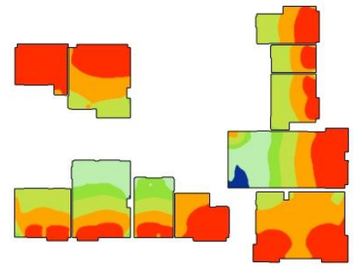
4th Floor A – Target illuminance E_T - Radiance plot

Block A has no Floor at this level.

4th Floor B– Target illuminance ET - Radiance plot



4th Floor C – Target illuminance ET - Radiance plot



Legend for Radiance Plots

Tabulated results.

Target is 50% of the floor area and an Lx based on the specific room usage.

We have classified results from 40%-50% as marginal as they are within 0.80 of the target.

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
0A-01	Bedroom	99	100	Pass
0A-02	Bedroom	99	100	Pass
0A-03	Bedroom	92	100	Pass
0A-04	Bedroom	88	100	Pass
0A-05	Bedroom	99	100	Pass
0A-06	Bedroom	98	100	Pass
0A-07	Bedroom	91	100	Pass
0A-08	Bedroom	92	100	Pass
0A-09	Bedroom	99	100	Pass
0A-10	Bedroom	99	100	Pass
1A-01	Bedroom	100	100	Pass
1A-02	Bedroom	100	100	Pass
1A-03	Bedroom	100	100	Pass
1A-04	Bedroom	100	100	Pass
1A-05	Bedroom	100	100	Pass
1A-06	Bedroom	100	100	Pass
1A-07	Bedroom	100	100	Pass
1A-08	Bedroom	100	100	Pass
1A-09	Bedroom	100	100	Pass
1A-10	Bedroom	100	100	Pass
1A-11c	Living/Kitchen	53	200	Pass
1A-12c	Living/Kitchen	44	200	Marginal
1A-13c	Living/Kitchen	52	200	Pass
1A-14	Bedroom	75	100	Pass
1A-15c	Living/Kitchen	44	200	Marginal
1A-16c	Living/Kitchen	41	200	Marginal
1A-17c	Living/Kitchen	40	200	Marginal
1A-18c	Living/Kitchen	45	200	Marginal
1A-19	Bedroom	74	100	Pass
1A-20c	Living/Kitchen	47	200	Marginal
1A-21c	Living/Kitchen	40	200	Marginal
1A-22c	Living/Kitchen	60	200	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
2A-01	Bedroom	99	100	Pass
2A-02	Bedroom	98	100	Pass
2A-03	Bedroom	86	100	Pass
2A-04	Bedroom	86	100	Pass
2A-05	Bedroom	95	100	Pass
2A-06	Bedroom	95	100	Pass
2A-07	Bedroom	89	100	Pass
2A-08	Bedroom	86	100	Pass
2A-09	Bedroom	95	100	Pass
2A-10	Bedroom	97	100	Pass
2A-11	Bedroom	100	100	Pass
2A-12c	Living/Kitchen	77	200	Pass
2A-13c	Living/Kitchen	83	200	Pass
2A-14	Bedroom	100	100	Pass
2A-15	Bedroom	100	100	Pass
2A-16c	Living/Kitchen	75	200	Pass
2A-17c	Living/Kitchen	71	200	Pass
2A-18	Bedroom	100	100	Pass
2A-19	Bedroom	100	100	Pass
2A-20c	Living/Kitchen	79	200	Pass
2A-21c	Living/Kitchen	70	200	Pass
2A-22	Bedroom	100	100	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
3A-01	Bedroom	100	100	Pass
3A-02	Bedroom	100	100	Pass
3A-03	Bedroom	100	100	Pass
3A-04	Bedroom	100	100	Pass
3A-05	Bedroom	100	100	Pass
3A-06	Bedroom	99	100	Pass
3A-07	Bedroom	100	100	Pass
3A-08	Bedroom	100	100	Pass
3A-09	Bedroom	100	100	Pass
3A-10	Bedroom	100	100	Pass
3A-11c	Living/Kitchen	80	200	Pass
3A-12c	Living/Kitchen	68	200	Pass
3A-13c	Living/Kitchen	86	200	Pass
3A-14	Bedroom	83	100	Pass
3A-15c	Living/Kitchen	94	200	Pass
3A-16c	Living/Kitchen	68	200	Pass
3A-17c	Living/Kitchen	69	200	Pass
3A-18c	Living/Kitchen	95	200	Pass
3A-19	Bedroom	80	100	Pass
3A-20c	Living/Kitchen	84	200	Pass
3A-21c	Living/Kitchen	68	200	Pass
3A-22c	Living/Kitchen	80	200	Pass
			Count	76
			Pass	69
			Pass rate Annex NA	91%
			Marginal	7
			Pass Margina	100%

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
0B-01c	Living/Kitchen	48	200	Marginal
0B-02	Bedroom	100	100	Pass
0B-03	Bedroom	55	100	Pass
0B-04	Bedroom	100	100	Pass
0B-05	Bedroom	97	100	Pass
0B-06	Bedroom	92	100	Pass
0B-07	Bedroom	94	100	Pass
0B-08	Bedroom	96	100	Pass
0B-09	Bedroom	94	100	Pass
0B-10	Bedroom	92	100	Pass
0B-11	Bedroom	93	100	Pass
0B-12c	Living/Kitchen	55	200	Pass
0B-13	Bedroom	100	100	Pass
0B-14	Bedroom	100	100	Pass
0B-15	Bedroom	100	100	Pass
0B-16	Bedroom	65	100	Pass
0B-17	Bedroom	67	100	Pass
0B-18c	Living/Kitchen	45	200	Marginal
0B-19	Bedroom	100	100	Pass
0B-20	Bedroom	99	100	Pass
0B-21	Bedroom	90	100	Pass
0B-22	Bedroom	89	100	Pass
0B-23	Bedroom	99	100	Pass
0B-24	Bedroom	98	100	Pass
1B-01c	Living/Kitchen	57	200	Pass
1B-02	Bedroom	100	100	Pass
1B-03	Bedroom	39	100	Fail
1B-04	Bedroom	100	100	Pass
1B-05	Bedroom	100	100	Pass
1B-06	Bedroom	100	100	Pass
1B-07	Bedroom	100	100	Pass
1B-08c	Living/Kitchen	83	200	Pass
1B-09c	Living/Kitchen	76	200	Pass
1B-10	Bedroom	100	100	Pass
1B-11	Bedroom	98	100	Pass
1B-12	Bedroom	100	100	Pass
1B-13	Bedroom	100	100	Pass
1B-14	Bedroom	100	100	Pass
1B-15	Bedroom	100	100	Pass
1B-16	Bedroom	100	100	Pass
1B-17	Bedroom	100	100	Pass
1B-18	Bedroom	100	100	Pass
1B-19	Bedroom	100	100	Pass
1B-20c	Living/Kitchen	61	200	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
1B-21	Bedroom	100	100	Pass
1B-22	Bedroom	100	100	Pass
1B-23	Bedroom	100	100	Pass
1B-24	Bedroom	75	100	Pass
1B-25	Bedroom	70	100	Pass
1B-26c	Living/Kitchen	52	200	Pass
1B-27	Bedroom	100	100	Pass
1B-28	Bedroom	100	100	Pass
1B-29	Bedroom	100	100	Pass
1B-30	Bedroom	100	100	Pass
1B-31	Bedroom	100	100	Pass
1B-32	Bedroom	100	100	Pass
1B-33c	Living/Kitchen	54	200	Pass
1B-34c	Living/Kitchen	44	200	Marginal
1B-35c	Living/Kitchen	53	200	Pass
1B-36	Bedroom	85	100	Pass
1B-37c	Living/Kitchen	43	200	Marginal
1B-38c	Living/Kitchen	36	200	Fail
1B-39c	Living/Kitchen	33	200	Fail
1B-40c	Living/Kitchen	37	200	Fail
1B-41	Bedroom	27	100	Fail
1B-42	Bedroom	100	100	Pass
1B-43c	Living/Kitchen	41	200	Marginal
1B-44c	Living/Kitchen	41	200	Marginal
1B-45c	Living/Kitchen	44	200	Marginal
1B-46c	Living/Kitchen	45	200	Marginal
1B-47c	Living/Kitchen	44	200	Marginal
1B-48c	Living/Kitchen	43	200	Marginal
1B-49c	Living/Kitchen	48	200	Marginal
1B-50	Bedroom	84	100	Pass
1B-51c	Living/Kitchen	64	200	Pass
1B-52	Bedroom	40	100	Marginal
1B-53	Bedroom	92	100	Pass
1B-54	Bedroom	100	100	Pass
1B-55c	Living/Kitchen	67	200	Pass
2B-01c	Living/Kitchen	59	200	Pass
2B-02	Bedroom	100	100	Pass
2B-03	Bedroom	100	100	Pass
2B-04	Bedroom	100	100	Pass
2B-05	Bedroom	98	100	Pass
2B-06	Bedroom	100	100	Pass
2B-07	Bedroom	100	100	Pass
2B-08c	Living/Kitchen	81	200	Pass
2B-09c	Living/Kitchen	72	200	Pass
2B-10	Bedroom	100	100	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
2B-11	Bedroom	98	100	Pass
2B-12	Bedroom	100	100	Pass
2B-13	Bedroom	100	100	Pass
2B-14	Bedroom	98	100	Pass
2B-15	Bedroom	96	100	Pass
2B-16	Bedroom	99	100	Pass
2B-17	Bedroom	96	100	Pass
2B-18	Bedroom	97	100	Pass
2B-19	Bedroom	97	100	Pass
2B-20c	Living/Kitchen	62	200	Pass
2B-21	Bedroom	100	100	Pass
2B-22	Bedroom	100	100	Pass
2B-23	Bedroom	100	100	Pass
2B-24	Bedroom	71	100	Pass
2B-25	Bedroom	69	100	Pass
2B-26c	Living/Kitchen	51	200	Pass
2B-27	Bedroom	100	100	Pass
2B-28	Bedroom	97	100	Pass
2B-29	Bedroom	90	100	Pass
2B-30	Bedroom	97	100	Pass
2B-31	Bedroom	98	100	Pass
2B-32	Bedroom	95	100	Pass
2B-33	Bedroom	100	100	Pass
2B-34c	Living/Kitchen	89	200	Pass
2B-35c	Living/Kitchen	78	200	Pass
2B-36	Bedroom	100	100	Pass
2B-37	Bedroom	100	100	Pass
2B-38	Bedroom	100	100	Pass
2B-39c	Living/Kitchen	35	200	Fail
2B-40c	Living/Kitchen	43	200	Marginal
2B-41	Bedroom	73	100	Pass
2B-42c	Living/Kitchen	91	200	Pass
2B-43	Bedroom	100	100	Pass
2B-44	Bedroom	100	100	Pass
2B-45c	Living/Kitchen	82	200	Pass
2B-46	Bedroom	100	100	Pass
2B-47	Bedroom	100	100	Pass
2B-48	Bedroom	100	100	Pass
2B-49c	Living/Kitchen	50	200	Pass
2B-50c	Living/Kitchen	83	200	Pass
2B-51	Bedroom	67	100	Pass
2B-52	Bedroom	92	100	Pass
2B-53	Bedroom	100	100	Pass
2B-54c	Living/Kitchen	73	200	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
3B-01c	Living/Kitchen	60	200	Pass
3B-02	Bedroom	100	100	Pass
3B-03	Bedroom	100	100	Pass
3B-04	Bedroom	100	100	Pass
3B-05	Bedroom	100	100	Pass
3B-06	Bedroom	100	100	Pass
3B-07	Bedroom	100	100	Pass
3B-08c	Living/Kitchen	83	200	Pass
3B-09c	Living/Kitchen	79	200	Pass
3B-10	Bedroom	100	100	Pass
3B-11	Bedroom	97	100	Pass
3B-12	Bedroom	100	100	Pass
3B-13	Bedroom	100	100	Pass
3B-14	Bedroom	100	100	Pass
3B-15	Bedroom	100	100	Pass
3B-16	Bedroom	100	100	Pass
3B-17	Bedroom	100	100	Pass
3B-18	Bedroom	100	100	Pass
3B-19	Bedroom	100	100	Pass
3B-20c	Living/Kitchen	64	200	Pass
3B-21	Bedroom	100	100	Pass
3B-22	Bedroom	100	100	Pass
3B-23	Bedroom	100	100	Pass
3B-24	Bedroom	77	100	Pass
3B-25	Bedroom	69	100	Pass
3B-26c	Living/Kitchen	54	200	Pass
3B-27	Bedroom	100	100	Pass
3B-28	Bedroom	100	100	Pass
3B-29	Bedroom	100	100	Pass
3B-30	Bedroom	100	100	Pass
3B-31	Bedroom	100	100	Pass
3B-32	Bedroom	92	100	Pass
3B-33c	Living/Kitchen	77	200	Pass
3B-34c	Living/Kitchen	69	200	Pass
3B-35c	Living/Kitchen	83	200	Pass
3B-36	Bedroom	100	100	Pass
3B-37c	Living/Kitchen	90	200	Pass
3B-38c	Living/Kitchen	68	200	Pass
3B-39c	Living/Kitchen	64	200	Pass
3B-40c	Living/Kitchen	100	200	Pass
3B-41	Bedroom	100	100	Pass
3B-42	Bedroom	100	100	Pass
3B-43c	Living/Kitchen	68	200	Pass
3B-44c	Living/Kitchen	71	200	Pass
3B-45c	Living/Kitchen	70	200	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
3B-46c	Living/Kitchen	72	200	Pass
3B-47c	Living/Kitchen	72	200	Pass
3B-48c	Living/Kitchen	67	200	Pass
3B-49c	Living/Kitchen	50	200	Pass
3B-50	Bedroom	87	100	Pass
3B-51c	Living/Kitchen	94	200	Pass
3B-52	Bedroom	65	100	Pass
3B-53	Bedroom	92	100	Pass
3B-54	Bedroom	100	100	Pass
3B-55c	Living/Kitchen	82	200	Pass
4B-01c	Living/Kitchen	64	200	Pass
4B-02	Bedroom	100	100	Pass
4B-03	Bedroom	100	100	Pass
4B-04	Bedroom	100	100	Pass
4B-05	Bedroom	100	100	Pass
4B-06	Bedroom	100	100	Pass
4B-07	Bedroom	100	100	Pass
4B-08c	Living/Kitchen	83	200	Pass
4B-09c	Living/Kitchen	71	200	Pass
4B-10	Bedroom	100	100	Pass
4B-11	Bedroom	98	100	Pass
4B-12	Bedroom	100	100	Pass
4B-13	Bedroom	90	100	Pass
4B-14	Bedroom	94	100	Pass
4B-15c	Living/Kitchen	100	200	Pass
4B-29	Bedroom	100	100	Pass
4B-30	Bedroom	100	100	Pass
4B-31c	Living/Kitchen	90	200	Pass
4B-32c	Living/Kitchen	92	200	Pass
4B-33	Bedroom	100	100	Pass
4B-34	Bedroom	92	100	Pass
4B-35	Bedroom	100	100	Pass
4B-36c	Living/Kitchen	99	200	Pass
			Count	**211**
			Pass	**192**
			Pass rate Annex NA	**91%**
			Marginal	**13**
			Pass Margina	**97%**

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
0C-01	Bedroom	99	100	Pass
0C-02	Bedroom	99	100	Pass
0C-03	Bedroom	100	100	Pass
0C-04	Bedroom	99	100	Pass
0C-05	Bedroom	100	100	Pass
0C-06	Bedroom	100	100	Pass
0C-07	Bedroom	100	100	Pass
0C-08	Bedroom	100	100	Pass
0C-09c	Living/Kitchen	100	200	Pass
0C-10c	Living/Kitchen	58	200	Pass
0C-11	Bedroom	30	100	Fail
0C-12	Bedroom	54	100	Pass
0C-13	Bedroom	99	100	Pass
0C-14	Bedroom	100	100	Pass
0C-15	Bedroom	90	100	Pass
0C-16	Bedroom	88	100	Pass
0C-17	Bedroom	99	100	Pass
0C-18	Bedroom	99	100	Pass
1C-01	Bedroom	100	100	Pass
1C-02	Bedroom	100	100	Pass
1C-03	Bedroom	100	100	Pass
1C-04	Bedroom	100	100	Pass
1C-05	Bedroom	100	100	Pass
1C-06	Bedroom	100	100	Pass
1C-07	Bedroom	100	100	Pass
1C-08	Bedroom	100	100	Pass
1C-09c	Living/Kitchen	100	200	Pass
1C-10c	Living/Kitchen	50	200	Pass
1C-11	Bedroom	98	100	Pass
1C-12	Bedroom	100	100	Pass
1C-13	Bedroom	100	100	Pass
1C-14	Bedroom	100	100	Pass
1C-15	Bedroom	100	100	Pass
1C-16	Bedroom	100	100	Pass
1C-17	Bedroom	100	100	Pass
1C-18	Bedroom	100	100	Pass
1C-19	Bedroom	100	100	Pass
1C-20c	Living/Kitchen	53	200	Pass
1C-21c	Living/Kitchen	44	200	Marginal
1C-22c	Living/Kitchen	47	200	Marginal
1C-23	Bedroom	85	100	Pass
1C-24c	Living/Kitchen	53	200	Pass
1C-25c	Living/Kitchen	41	200	Marginal

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
1C-26c	Living/Kitchen	36	200	Fail
1C-27c	Living/Kitchen	22	200	Fail
1C-28c	Living/Kitchen	35	200	Fail
1C-29c	Living/Kitchen	43	200	Marginal
1C-30	Bedroom	85	100	Pass
1C-31c	Living/Kitchen	53	200	Pass
1C-32c	Living/Kitchen	47	200	Marginal
1C-33c	Living/Kitchen	54	200	Pass
2C-01	Bedroom	97	100	Pass
2C-02	Bedroom	100	100	Pass
2C-03	Bedroom	93	100	Pass
2C-04	Bedroom	100	100	Pass
2C-05	Bedroom	74	100	Pass
2C-06	Bedroom	98	100	Pass
2C-07	Bedroom	100	100	Pass
2C-08	Bedroom	100	100	Pass
2C-09c	Living/Kitchen	100	200	Pass
2C-10c	Living/Kitchen	54	200	Pass
2C-11	Bedroom	98	100	Pass
2C-12	Bedroom	100	100	Pass
2C-13	Bedroom	100	100	Pass
2C-14	Bedroom	100	100	Pass
2C-15	Bedroom	99	100	Pass
2C-16	Bedroom	91	100	Pass
2C-17	Bedroom	98	100	Pass
2C-18	Bedroom	99	100	Pass
2C-19	Bedroom	98	100	Pass
2C-20	Bedroom	100	100	Pass
2C-21c	Living/Kitchen	93	200	Pass
2C-22c	Living/Kitchen	81	200	Pass
2C-23	Bedroom	100	100	Pass
2C-24c	Living/Kitchen	43	200	Marginal
2C-25	Bedroom	100	100	Pass
2C-26	Bedroom	100	100	Pass
2C-27	Bedroom	77	100	Pass
2C-28	Bedroom	100	100	Pass
2C-29c	Living/Kitchen	47	200	Marginal
2C-30	Bedroom	100	100	Pass
2C-31c	Living/Kitchen	87	200	Pass
2C-32c	Living/Kitchen	88	200	Pass
2C-33	Bedroom	100	100	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
3C-01	Bedroom	100	100	Pass
3C-02	Bedroom	100	100	Pass
3C-03	Bedroom	100	100	Pass
3C-04	Bedroom	100	100	Pass
3C-05	Bedroom	99	100	Pass
3C-06	Bedroom	99	100	Pass
3C-07	Bedroom	100	100	Pass
3C-08	Bedroom	100	100	Pass
3C-09c	Living/Kitchen	100	200	Pass
3C-10c	Living/Kitchen	52	200	Pass
3C-11	Bedroom	100	100	Pass
3C-12	Bedroom	100	100	Pass
3C-13	Bedroom	100	100	Pass
3C-14	Bedroom	100	100	Pass
3C-15	Bedroom	100	100	Pass
3C-16	Bedroom	100	100	Pass
3C-17	Bedroom	100	100	Pass
3C-18	Bedroom	100	100	Pass
3C-19	Bedroom	100	100	Pass
3C-20c	Living/Kitchen	78	200	Pass
3C-21c	Living/Kitchen	73	200	Pass
3C-22c	Living/Kitchen	95	200	Pass
3C-23	Bedroom	94	100	Pass
3C-24c	Living/Kitchen	92	200	Pass
3C-25c	Living/Kitchen	67	200	Pass
3C-26c	Living/Kitchen	63	200	Pass
3C-27c	Living/Kitchen	38	200	Fail
3C-28c	Living/Kitchen	45	200	Marginal
3C-29c	Living/Kitchen	87	200	Pass
3C-30	Bedroom	96	100	Pass
3C-31c	Living/Kitchen	84	200	Pass
3C-32c	Living/Kitchen	62	200	Pass
3C-33c	Living/Kitchen	80	200	Pass

NA.2 Minimum daylight provision

For all habitable rooms

Location	*Dublin*	*14,900*	*lx*	

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

v6	Type			
Ref	Type	Percentage within Target Lux	BS/EN17037 Annex AN Target Lux	Check
4C-01	Bedroom	100	100	Pass
4C-02	Bedroom	94	100	Pass
4C-03	Bedroom	100	100	Pass
4C-04	Bedroom	100	100	Pass
4C-05	Bedroom	100	100	Pass
4C-06	Bedroom	95	100	Pass
4C-07	Bedroom	100	100	Pass
4C-08	Bedroom	100	100	Pass
4C-09	Bedroom	100	100	Pass
4C-10	Bedroom	100	100	Pass
4C-11	Bedroom	100	100	Pass
			Count	128
			Pass	115
			Pass rate Annex NA	90%
			Marginal	8
			Pass Margina	96%

Summary Cumulative ALL Floors

E_T - BRE -V3 - 2022 (5) Floors GFL ... 04						
v6						
	Count	Pass	Rate		Marginal	Rate
A	76	69	91%		7	100%
B	211	192	91%		13	97%
C	128	115	90%		8	96%
Total	415	376	91%		28	97%

Summary

The majority of rooms comply with requirements.
Most of those that don't are marginal on the 50% floor area requirement which is the new metric.
We have classified results from 40%-50% as marginal as they are within 0.80 of the target.

There are compensatory factors outlined in the Architects Commentary relating to the design and specifics.

Please refer to the Architects' Design Statement for a detailed explanation.
Relevant pages from the Architect's Design Statement concerning compensatory measures and design strategy are reproduced in Appendix 3.

91% of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
(**97%** if we include marginal results)

The average complaint areas achieving the relevant target Lx for all bedrooms is **94%** and all Living/Kitchen spaces **65%** 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 that an 80% pass rate is considered careful layout design.

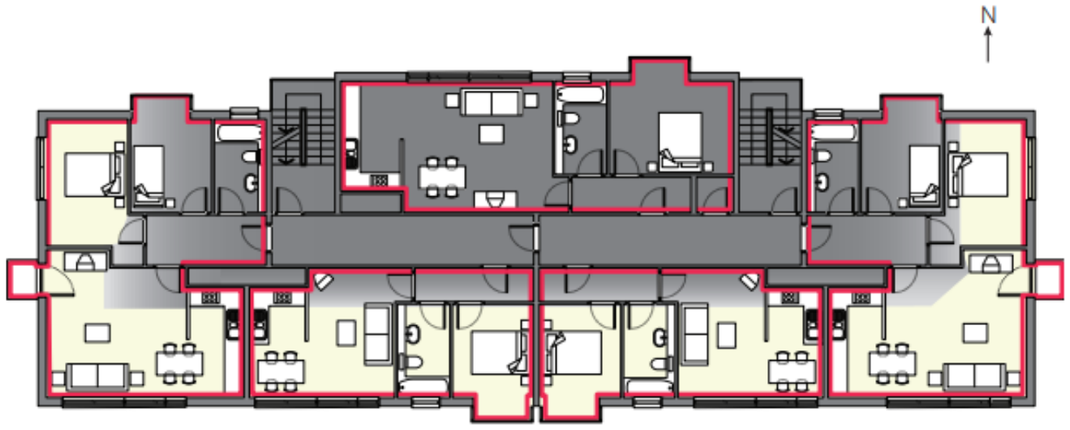


Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

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. …..*

We have classified results as marginal if they are within 0.80 of the relevant target.

Sunlight to rooms

Receives 1.5 hours of sunlight on 21st March

V5

Ref	Hrs of Sun	Pass		Quality		
1A-11c	3.3	Pass			*Medium*	
1A-12c	2.3	Pass		*Min*		
1A-13c	2.7	Pass		*Min*		
1A-15c	2.5	Pass		*Min*		
1A-16c	2.2	Pass		*Min*		
1A-17c	2.2	Pass		*Min*		
1A-18c	2.2	Pass		*Min*		
1A-20c	2.2	Pass		*Min*		
1A-21c	1.7	Pass		*Min*		
1A-22c	1.0	Fail				
2A-12c	2.7	Pass		*Min*		
2A-13c	3.0	Pass			*Medium*	
2A-16c	2.3	Pass		*Min*		
2A-17c	2.3	Pass		*Min*		
2A-20c	2.3	Pass		*Min*		
2A-21c	1.7	Pass		*Min*		
3A-11c	5.0	Pass				*High*
3A-12c	5.3	Pass				*High*
3A-13c	5.3	Pass				*High*
3A-15c	5.0	Pass				*High*
3A-16c	5.0	Pass				*High*
3A-17c	5.0	Pass				*High*
3A-18c	5.0	Pass				*High*
3A-20c	4.8	Pass				*High*
3A-21c	4.7	Pass				*High*
3A-22c	4.7	Pass				*High*

Sunlight to rooms

Receives 1.5 hours of sunlight on 21st March

V5

Ref	Hrs of Sun	Pass		Quality		
0B-01c	3.5	Pass			*Medium*	
0B-12c	0.7	Fail				
0B-18c	5.8	Pass				*High*
1B-01c	3.5	Pass			*Medium*	
1B-08c	3.5	Pass			*Medium*	
1B-09c	3.2	Pass			*Medium*	
1B-20c	0.7	Fail				
1B-26c	6.0	Pass				*High*
1B-33c	2.3	Pass		*Min*		
1B-34c	2.0	Pass		*Min*		
1B-35c	1.7	Pass		*Min*		
1B-37c	0.8	Fail				
1B-38c	0.0	Fail				
1B-39c	0.0	Fail				
1B-40c	0.0	Fail				
1B-43c	0.0	Fail				
1B-44c	0.0	Fail				
1B-45c	0.0	Fail				
1B-46c	0.0	Fail				
1B-47c	0.0	Fail				
1B-48c	0.0	Fail				
1B-49c	0.0	Fail				
1B-51c	0.0	Fail				
1B-5c	1.8	Pass		*Min*		
2B-01c	3.5	Pass			*Medium*	
2B-08c	3.5	Pass			*Medium*	
2B-09c	3.2	Pass			*Medium*	
2B-20c	0.7	Fail				
2B-26c	6.0	Pass				*High*
2B-34c	2.5	Pass		*Min*		
2B-35c	1.8	Pass		*Min*		
2B-39c	0.0	Fail				
2B-40c	0.0	Fail				
2B-42c	0.0	Fail				
2B-45c	0.0	Fail				
2B-49c	0.0	Fail				
2B-50c	0.0	Fail				
2B-54c	2.2	Pass		*Min*		

Sunlight to rooms

Receives 1.5 hours of sunlight on 21st March

V5

Ref	Hrs of Sun	Pass		Quality	
3B-01c	3.5	Pass		Medium	
3B-08c	3.5	Pass		Medium	
3B-09c	3.2	Pass		Medium	
3B-20c	3.5	Pass		Medium	
3B-26c	5.8	Pass			High
3B-33c	5.3	Pass			High
3B-34c	5.2	Pass			High
3B-35c	4.7	Pass			High
3B-37c	4.7	Pass			High
3B-38c	4.3	Pass			High
3B-39c	4.2	Pass			High
3B-40c	0.0	Fail			
3B-43c	0.0	Fail			
3B-44c	0.0	Fail			
3B-45c	0.0	Fail			
3B-46c	0.0	Fail			
3B-47c	0.0	Fail			
3B-48c	0.0	Fail			
3B-49c	0.0	Fail			
3B-51c	0.0	Fail			
3B-55c	2.5	Pass	Min		
4B-01c	3.5	Pass		Medium	
4B-08c	3.5	Pass		Medium	
4B-09c	3.2	Pass		Medium	
4B-15c	10.7	Pass			High
4B-31c	0.0	Fail			
4B-32c	0.0	Fail			
4B-36c	5.0	Pass			High
0C-09c	5.5	Pass			High
0C-10c	0.3	Fail			
1C-09c	5.5	Pass			High
1C-10c	0.3	Fail			
1C-20c	5.8	Pass			High
1C-21c	2.5	Pass	Min		
1C-22c	2.2	Pass	Min		
1C-24c	3.0	Pass		Medium	
1C-25c	1.3	Marginal			
1C-26c	0.0	Fail			
1C-27c	2.7	Pass	Min		
1C-28c	2.7	Pass	Min		
1C-29c	2.7	Pass	Min		
1C-31c	2.7	Pass	Min		
1C-32c	2.7	Pass	Min		
1C-33c	3.7	Pass		Medium	

Sunlight to rooms

Receives 1.5 hours of sunlight on 21st March

V5

Ref	Hrs of Sun	Pass		Quality	
2C-09c	5.5	Pass			High
2C-10c	0.3	Fail			
2C-21c	2.8	Pass	Min		
2C-22c	2.5	Pass	Min		
2C-24c	3.2	Pass		Medium	
2C-29c	3.0	Pass		Medium	
2C-31c	3.0	Pass		Medium	
2C-32c	3.0	Pass		Medium	
3C-09c	5.5	Pass			High
3C-10c	0.3	Fail			
3C-20c	10.2	Pass			High
3C-21c	9.7	Pass			High
3C-22c	9.5	Pass			High
3C-24c	9.0	Pass			High
3C-25c	7.8	Pass			High
3C-26c	6.7	Pass			High
3C-27c	3.3	Pass		Medium	
3C-28c	3.3	Pass		Medium	
3C-29c	5.8	Pass			High
3C-31c	5.8	Pass			High
3C-32c	5.8	Pass			High
3C-33c	5.8	Pass			High
4C-02c	5.2	Pass			High
4C-05c	5.5	Pass			High
4C-06c	0.3	Fail			
4C-10c	6.2	Pass			High
	Count	134			
	Pass	94	30	24	40
	Pass Rate	70%			

Please refer to the Architects comments for compensatory factors.

Please refer to the Architects' Design Statement for a detailed explanation.
Relevant pages from the Architect's Design Statement concerning compensatory measures and design strategy are reproduced in Appendix 3.

This is generally consistent with the guidelines example of "careful layout" design 80%.

The architect has placed special significance on the vista to the central courtyard area and thus all living rooms orientate in this direction. This view is an acceptable compensatory factor. ***"compensating factor such as an appealing view to the north."***

For apartments with living rooms which fail to achieve the relevant target we have additionally assessed alternative rooms to these apartments (see Appendix 1). The BRE guidelines note we should test sunlight compliance against ***"a habitable room, preferably a main living room"***. When the alternative habitable rooms (not living rooms) are tested all apartments would comply with the BRE sunlight requirements.

Summary

Sunlight to living rooms:

70% of all Living rooms (**72%** if we include marginals) receive 1.5hrs of sunlight on the test day of the 21st March
89% of apartments will receive qualifying sunlight (Appendix 1).

This is generally 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.

Development Performance - Shadow/Sunlight - 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). …***

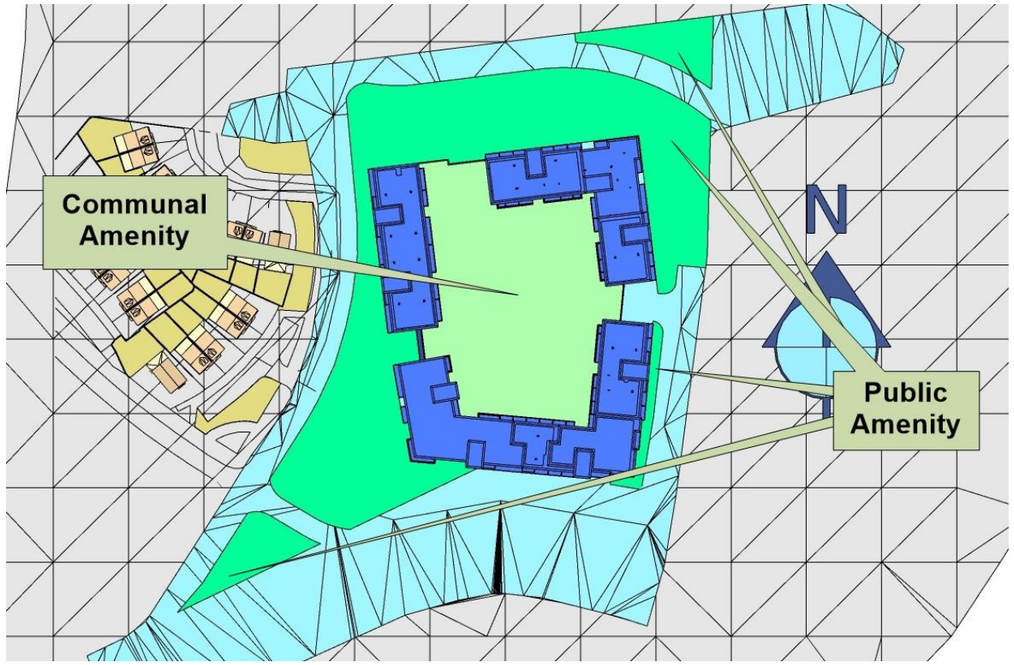
The amenities of the following were tested.

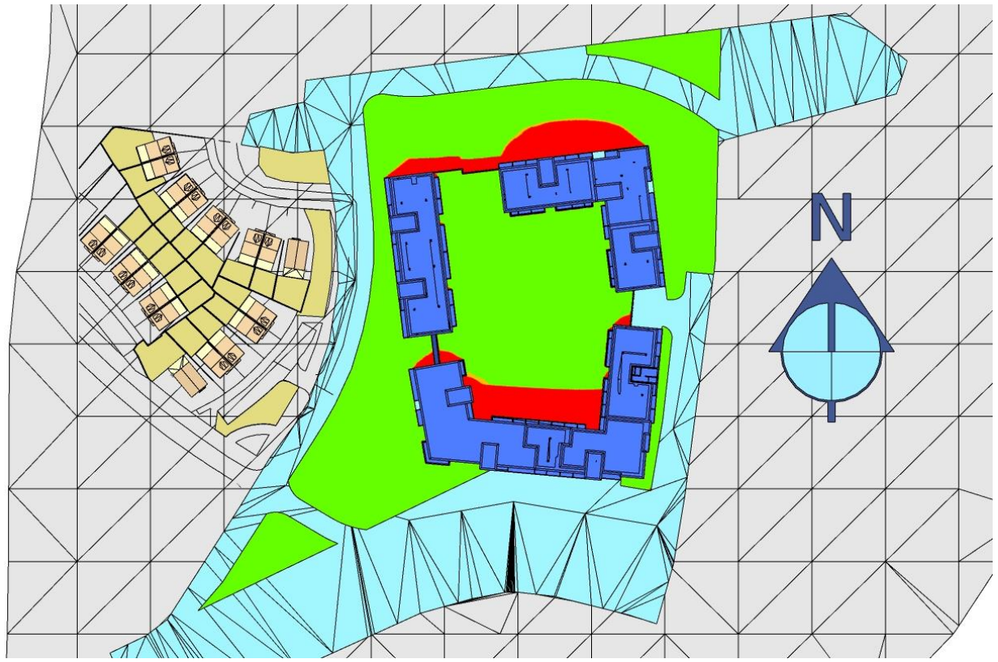
- Communal space is the central courtyard at Podium level
- Public space made of several Ground level areas and results shown are the combined
- Private balconies not required to be tested.

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
Communal	F1	A1	Communal	87	Pass
Public	F0	A1	Public	90	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

Conclusion

100% of new provided communal and public amenity spaces pass the BRE requirement.
Amenity spaces are well served by Sunlight.

The tested spaces comply with the requirements of the BRE guidelines

Architects Commentary Compensatory Measures.

The Architect has provided detailed commentary and shown compensatory measures in their Design Statement which should be read in conjunction with this document. This specifically details the following under the 12 criteria for Urban Design – 5.8 Detailed Design:

- The majority of rooms comply with daylight requirement and those that don't are generally marginal.
- It is not unexpected that some lower floor apartments will receive less light than those on higher floors.
- Compensatory measures detailed include:
  - Living rooms have and excellent vista onto the significant podium landscaped park
  - Podium level apartments (1st Floor) have direct access to the podium
  - 85% of apartments have a floor area of >10% over the minimum requirement.
  - 77% of apartments are dual aspect
  - No single aspect units face only North
  - Specific comments have been made for apartment types where Target Illuminance values fall below compliance.
  - Connectivity with the urban design and landscape open spaces and green networks
  - Provision of private balconies connected to living spaces.

Please refer to the Architects' Design Statement for a detailed explanation.

Relevant pages from the Architect's Design Statement concerning compensatory measures and design strategy are reproduced in Appendix 3.

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**
  - **91%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
  - **97%** if we include marginal rooms
  - The average complaint areas achieving the relevant target Lx for
    - all bedrooms is **94%** and
    - all Living/Kitchen spaces **65%**
    - both are well in excess of the required 50%
- **Sunlight to rooms:**
  - **70%** of the preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
  - **89%** of apartments, however, will receive BRE qualifying sunlight (Appendix 1).
  - This is generally consistent with the BRE defined "careful layout design" 80% target.
- **Sunlight on the Ground SOG (Shadow)**
  - **100%** of the Communal & Public Amenity spaces pass the relevant requirements
  - These spaces are well served by sunlight with results of 87% & 90% well in excess of the 50% target.

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" - BR209". It also references EN 17037 and Annex NA (BS/EN 17037) as and where called for in the above BRE guidance document.

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 **0.95**
- **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:**0.92** and WPSH: **0.90**
- **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**

Performance of the proposed design

- **Target Illuminance E_T**
  - **91%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
  - **97%** if we include marginal rooms
  - The average complaint areas achieving the relevant target Lx for
    - all bedrooms is **94%** and
    - all Living/Kitchen spaces **65%**
    - both are well in excess of the required 50%
- **Sunlight to rooms:**
  - **70%** of the preferred Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
  - **89%** of apartments, however, will receive BRE qualifying sunlight (Appendix 1).
  - This is generally consistent with the BRE defined "careful layout design" 80% target.
- **Sunlight on the Ground SOG (Shadow)**
  - **100%** of the Communal & Public Amenity spaces pass the relevant requirements
  - These spaces are well served by sunlight with results of 87% & 90% well in excess of the 50% target.

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) and EN 17037 and Annex NA (BS/EN 17037) as and where called for in the above BRE guidance document.

Appendix 1
Supplementary Analysis

Supplementary analysis for apartments where the Living Rooms fail to achieve the relevant BRE target .

Introduction

The BRE guidelines test sunlight to dwellings under 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. …..***

However, while there is a desire or preference to have the sunlight target met by the living rooms the specific requirement 17037 & BRE is that ***"For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion".***

In the main boy of the report, we have tested the preferred living rooms and achieved a 70% pass rate.

In this appendix we will test other habitable rooms for those apartments which did not achieve the relevant target for the living rooms.

Summary

Pass rate for Apartment Living rooms was **70%**

When we test the windows of other habitable rooms within the same apartments this pass rate rises to **89%**

This is consistent with the BRE defined "careful layout design" 80% target.

Sunlight to alternative rooms

Receives 1.5 hours of sunlight on 21st March

V5

Living room Ref	Alt Ref	Hrs of Sun	Pass			Quality
1A-22c	1A-01	6.2	Pass			High
0B-12c	0B-14	10.8	Pass			High
1B-20c	1B-22	10.8	Pass			High
1B-37c	1B-29	5.3	Pass			High
1B-38c	1B-28	6.0	Pass			High
1B-39c	1B-27	6.0	Pass			High
1B-40c	None	0.0	Fail			
1B-43c	1B-19	10.5	Pass			High
1B-44c	1B-18	11.0	Pass			High
1B-45c	1B-17	11.2	Pass			High
1B-46c	1B-16	10.5	Pass			High
1B-47c	1B-15	11.2	Pass			High
1B-48c	1B-14	11.0	Pass			High
1B-49c	1B-13	10.5	Pass			High
1B-51c	1B-53	0.0	Fail			
2B-20c	2B-22	10.8	Pass			High
2B-39c	2B-27	6.0	Pass			High
2B-40c	None	0.0	Fail			
2B-42c	None	0.0	Fail			
2B-45c	None	0.0	Fail			
2B-49c	None	0.0	Fail			
2B-50c	2B-52	0.0	Fail			
3B-20c	3B-22	11.0	Pass			High
3B-39c	3B-27	5.5	Pass			High
3B-40c	None	0.0	Fail			
3B-43c	3B-19	6.5	Pass			High
3B-44c	3B-18	8.5	Pass			High
3B-45c	3B-17	9.7	Pass			High
3B-46c	3B-16	5.8	Pass			High
3B-47c	3B-15	11.3	Pass			High
3B-48c	3B-14	11.3	Pass			High
3B-49c	3B-13	5.7	Pass			High
3B-51c	3B-53	0.0	Fail			
4B-31c	None	0.0	Fail			
4B-32c	4B-34	5.0	Pass			High
0C-10c	None	0.0	Fail			
1C-10c	None	0.0	Fail			
1C-25c	None	0.0	Fail			
1C-26c	None	0.0	Fail			
2C-10c	None	0.0	Fail			
3C-10c	None	0.0	Fail			
4C-06c	4C-09	1.0	Fail			
Count Living	134					
Pass Living	94	Pass Other	25	0	0	25
		Pass Rate	89%			

Appendix 2
Light Distribution
Target Illuminance ET Metric
Non-Annex Analysis
(Design Standards & Guidelines)

Light analysis results are presented on a block-by-block basis below.

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, here in Appendix 2. 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.

Block A – E_T results - Tabulated

Minimum daylight provision — *For all habitable room*

Location: Dublin 14,900 lx

Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
0A-01	Bedroom	69	Pass	99	Pass
0A-02	Bedroom	66	Pass	99	Pass
0A-03	Bedroom	26	Fail	92	Marginal
0A-04	Bedroom	24	Fail	88	Marginal
0A-05	Bedroom	66	Pass	99	Pass
0A-06	Bedroom	66	Pass	98	Pass
0A-07	Bedroom	20	Fail	91	Marginal
0A-08	Bedroom	23	Fail	92	Marginal
0A-09	Bedroom	65	Pass	99	Pass
0A-10	Bedroom	67	Pass	99	Pass
1A-01	Bedroom	100	Pass	100	Pass
1A-02	Bedroom	97	Pass	100	Pass
1A-03	Bedroom	91	Pass	100	Pass
1A-04	Bedroom	89	Pass	100	Pass
1A-05	Bedroom	96	Pass	100	Pass
1A-06	Bedroom	97	Pass	100	Pass
1A-07	Bedroom	86	Pass	100	Pass
1A-08	Bedroom	90	Pass	100	Pass
1A-09	Bedroom	97	Pass	100	Pass
1A-10	Bedroom	97	Pass	100	Pass
1A-11c	Living/Kitchen	40	Fail	81	Marginal
1A-12c	Living/Kitchen	30	Fail	68	Fail
1A-13c	Living/Kitchen	33	Fail	85	Marginal
1A-14	Bedroom	24	Fail	75	Fail
1A-15c	Living/Kitchen	31	Fail	68	Fail
1A-16c	Living/Kitchen	26	Fail	61	Fail
1A-17c	Living/Kitchen	26	Fail	58	Fail
1A-18c	Living/Kitchen	28	Fail	65	Fail
1A-19	Bedroom	25	Fail	74	Fail
1A-20c	Living/Kitchen	32	Fail	83	Marginal
1A-21c	Living/Kitchen	28	Fail	61	Fail
1A-22c	Living/Kitchen	46	Marginal	93	Marginal
2A-01	Bedroom	42	Marginal	99	Pass
2A-02	Bedroom	37	Fail	98	Pass
2A-03	Bedroom	76	Pass	86	Marginal
2A-04	Bedroom	77	Pass	86	Marginal
2A-05	Bedroom	33	Fail	95	Pass
2A-06	Bedroom	35	Fail	95	Pass
2A-07	Bedroom	76	Pass	89	Marginal
2A-08	Bedroom	77	Pass	86	Marginal
2A-09	Bedroom	35	Fail	95	Pass
2A-10	Bedroom	39	Fail	97	Pass
2A-11	Bedroom	97	Pass	100	Pass
2A-12c	Living/Kitchen	43	Marginal	100	Pass
2A-13c	Living/Kitchen	44	Marginal	100	Pass
2A-14	Bedroom	100	Pass	100	Pass
2A-15	Bedroom	97	Pass	100	Pass
2A-16c	Living/Kitchen	40	Marginal	100	Pass
2A-17c	Living/Kitchen	45	Marginal	100	Pass
2A-18	Bedroom	92	Pass	100	Pass
2A-19	Bedroom	100	Pass	100	Pass
2A-20c	Living/Kitchen	40	Marginal	100	Pass
2A-21c	Living/Kitchen	38	Fail	100	Pass
2A-22	Bedroom	93	Pass	100	Pass

Minimum daylight provision — *For all habitable room*

Location: Dublin 14,900 lx

Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
3A-01	Bedroom	84	Pass	100	Pass
3A-02	Bedroom	41	Marginal	100	Pass
3A-03	Bedroom	87	Pass	100	Pass
3A-04	Bedroom	86	Pass	100	Pass
3A-05	Bedroom	36	Fail	100	Pass
3A-06	Bedroom	38	Fail	99	Pass
3A-07	Bedroom	87	Pass	100	Pass
3A-08	Bedroom	88	Pass	100	Pass
3A-09	Bedroom	47	Marginal	100	Pass
3A-10	Bedroom	46	Marginal	100	Pass
3A-11c	Living/Kitchen	59	Pass	100	Pass
3A-12c	Living/Kitchen	53	Pass	100	Pass
3A-13c	Living/Kitchen	64	Pass	100	Pass
3A-14	Bedroom	28	Fail	83	Marginal
3A-15c	Living/Kitchen	64	Pass	100	Pass
3A-16c	Living/Kitchen	54	Pass	100	Pass
3A-17c	Living/Kitchen	53	Pass	100	Pass
3A-18c	Living/Kitchen	63	Pass	100	Pass
3A-19	Bedroom	32	Fail	80	Marginal
3A-20c	Living/Kitchen	60	Pass	100	Pass
3A-21c	Living/Kitchen	53	Pass	100	Pass
3A-22c	Living/Kitchen	62	Pass	100	Pass
		Count	76	Count	76
		Pass	41	Pass	54
		Pass Rate 300lx/50%	54%	Pass Rate 100lx/95%	71%
		Marginal	10	Marginal	14
		Pass Margina	67%	Pass Margina	89%

Block B – E_T results - Tabulated

Minimum daylight provision — *For all habitable room*

Location: Dublin 14,900 lx

Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
0B-01c	Living/Kitchen	26	Fail	85	Marginal
0B-02	Bedroom	36	Fail	100	Pass
0B-03	Bedroom	4	Fail	55	Fail
0B-04	Bedroom	51	Pass	100	Pass
0B-05	Bedroom	44	Marginal	97	Pass
0B-06	Bedroom	48	Marginal	92	Marginal
0B-07	Bedroom	46	Marginal	94	Marginal
0B-08	Bedroom	47	Marginal	96	Pass
0B-09	Bedroom	45	Marginal	94	Marginal
0B-10	Bedroom	43	Marginal	92	Marginal
0B-11	Bedroom	46	Marginal	93	Marginal
0B-12c	Living/Kitchen	22	Fail	100	Pass
0B-13	Bedroom	91	Pass	100	Pass
0B-14	Bedroom	95	Pass	100	Pass
0B-15	Bedroom	53	Pass	100	Pass
0B-16	Bedroom	8	Fail	65	Fail
0B-17	Bedroom	10	Fail	67	Fail
0B-18c	Living/Kitchen	31	Fail	69	Fail
0B-19	Bedroom	83	Pass	100	Pass
0B-20	Bedroom	72	Pass	99	Pass
0B-21	Bedroom	39	Fail	90	Marginal
0B-22	Bedroom	41	Marginal	89	Marginal
0B-23	Bedroom	50	Pass	99	Pass
0B-24	Bedroom	50	Pass	98	Pass

Minimum daylight provision — *For all habitable room*

Location: Dublin 14,900 lx

Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
1B-01c	Living/Kitchen	32	Fail	89	Marginal
1B-02	Bedroom	40	Marginal	100	Pass
1B-03	Bedroom	4	Fail	39	Fail
1B-04	Bedroom	45	Marginal	100	Pass
1B-05	Bedroom	23	Fail	100	Pass
1B-06	Bedroom	61	Pass	100	Pass
1B-07	Bedroom	57	Pass	100	Pass
1B-08c	Living/Kitchen	50	Pass	100	Pass
1B-09c	Living/Kitchen	51	Pass	100	Pass
1B-10	Bedroom	100	Pass	100	Pass
1B-11	Bedroom	29	Fail	98	Pass
1B-12	Bedroom	65	Pass	100	Pass
1B-13	Bedroom	100	Pass	100	Pass
1B-14	Bedroom	99	Pass	100	Pass
1B-15	Bedroom	99	Pass	100	Pass
1B-16	Bedroom	98	Pass	100	Pass
1B-17	Bedroom	98	Pass	100	Pass
1B-18	Bedroom	97	Pass	100	Pass
1B-19	Bedroom	99	Pass	100	Pass
1B-20c	Living/Kitchen	27	Fail	100	Pass
1B-21	Bedroom	97	Pass	100	Pass
1B-22	Bedroom	95	Pass	100	Pass
1B-23	Bedroom	52	Pass	100	Pass
1B-24	Bedroom	15	Fail	75	Fail
1B-25	Bedroom	11	Fail	70	Fail
1B-26c	Living/Kitchen	38	Fail	78	Marginal
1B-27	Bedroom	98	Pass	100	Pass
1B-28	Bedroom	97	Pass	100	Pass
1B-29	Bedroom	82	Pass	100	Pass
1B-30	Bedroom	81	Pass	100	Pass
1B-31	Bedroom	99	Pass	100	Pass
1B-32	Bedroom	98	Pass	100	Pass
1B-33c	Living/Kitchen	37	Fail	78	Marginal
1B-34c	Living/Kitchen	29	Fail	64	Fail
1B-35c	Living/Kitchen	35	Fail	86	Marginal
1B-36	Bedroom	36	Fail	85	Marginal
1B-37c	Living/Kitchen	29	Fail	69	Fail
1B-38c	Living/Kitchen	23	Fail	58	Fail
1B-39c	Living/Kitchen	19	Fail	52	Fail
1B-40c	Living/Kitchen	14	Fail	85	Fail
1B-41	Bedroom	7	Fail	27	Fail
1B-42	Bedroom	53	Marginal	100	Pass
1B-43c	Living/Kitchen	26	Fail	74	Fail
1B-44c	Living/Kitchen	27	Fail	66	Fail
1B-45c	Living/Kitchen	27	Fail	63	Fail
1B-46c	Living/Kitchen	27	Fail	66	Fail
1B-47c	Living/Kitchen	28	Fail	65	Fail
1B-48c	Living/Kitchen	29	Fail	66	Fail
1B-49c	Living/Kitchen	35	Fail	87	Marginal
1B-50	Bedroom	22	Fail	84	Marginal
1B-51c	Living/Kitchen	35	Fail	93	Marginal
1B-52	Bedroom	7	Fail	40	Fail
1B-53	Bedroom	24	Fail	92	Marginal
1B-54	Bedroom	44	Fail	100	Pass
1B-55c	Living/Kitchen	41	Fail	100	Pass

Block B – 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%
2B-01c	Living/Kitchen	32	Fail	90	Marginal	3B-01c	Living/Kitchen	34	Fail	92	Marginal
2B-02	Bedroom	40	Marginal	100	Pass	3B-02	Bedroom	36	Fail	100	Pass
2B-03	Bedroom	19	Fail	100	Pass	3B-03	Bedroom	19	Fail	100	Pass
2B-04	Bedroom	45	Marginal	100	Pass	3B-04	Bedroom	45	Marginal	100	Pass
2B-05	Bedroom	22	Fail	98	Pass	3B-05	Bedroom	22	Fail	100	Pass
2B-06	Bedroom	61	Pass	100	Pass	3B-06	Bedroom	61	Pass	100	Pass
2B-07	Bedroom	59	Pass	100	Pass	3B-07	Bedroom	52	Pass	100	Pass
2B-08c	Living/Kitchen	52	Pass	100	Pass	3B-08c	Living/Kitchen	53	Pass	100	Pass
2B-09c	Living/Kitchen	51	Pass	100	Pass	3B-09c	Living/Kitchen	51	Pass	100	Pass
2B-10	Bedroom	100	Pass	100	Pass	3B-10	Bedroom	100	Pass	100	Pass
2B-11	Bedroom	29	Fail	98	Pass	3B-11	Bedroom	20	Fail	97	Pass
2B-12	Bedroom	65	Pass	100	Pass	3B-12	Bedroom	65	Pass	100	Pass
2B-13	Bedroom	81	Pass	100	Pass	3B-13	Bedroom	75	Pass	100	Pass
2B-14	Bedroom	50	Pass	98	Pass	3B-14	Bedroom	38	Fail	100	Pass
2B-15	Bedroom	50	Pass	96	Pass	3B-15	Bedroom	37	Fail	100	Pass
2B-16	Bedroom	81	Pass	99	Pass	3B-16	Bedroom	85	Pass	100	Pass
2B-17	Bedroom	44	Marginal	96	Pass	3B-17	Bedroom	82	Pass	100	Pass
2B-18	Bedroom	43	Marginal	97	Pass	3B-18	Bedroom	72	Pass	100	Pass
2B-19	Bedroom	30	Fail	97	Pass	3B-19	Bedroom	97	Pass	100	Pass
2B-20c	Living/Kitchen	29	Fail	100	Pass	3B-20c	Living/Kitchen	29	Fail	100	Pass
2B-21	Bedroom	97	Pass	100	Pass	3B-21	Bedroom	97	Pass	100	Pass
2B-22	Bedroom	95	Pass	100	Pass	3B-22	Bedroom	95	Pass	100	Pass
2B-23	Bedroom	52	Pass	100	Pass	3B-23	Bedroom	52	Pass	100	Pass
2B-24	Bedroom	13	Fail	71	Fail	3B-24	Bedroom	15	Fail	77	Marginal
2B-25	Bedroom	11	Fail	69	Fail	3B-25	Bedroom	11	Fail	69	Fail
2B-26c	Living/Kitchen	38	Fail	79	Marginal	3B-26c	Living/Kitchen	39	Fail	83	Marginal
2B-27	Bedroom	45	Marginal	100	Pass	3B-27	Bedroom	54	Pass	100	Pass
2B-28	Bedroom	44	Marginal	97	Pass	3B-28	Bedroom	65	Pass	100	Pass
2B-29	Bedroom	79	Pass	90	Marginal	3B-29	Bedroom	94	Pass	100	Pass
2B-30	Bedroom	76	Pass	97	Pass	3B-30	Bedroom	97	Pass	100	Pass
2B-31	Bedroom	45	Marginal	98	Pass	3B-31	Bedroom	66	Pass	100	Pass
2B-32	Bedroom	46	Marginal	95	Pass	3B-32	Bedroom	26	Fail	92	Marginal
2B-33	Bedroom	100	Pass	100	Pass	3B-33c	Living/Kitchen	59	Pass	100	Pass
2B-34c	Living/Kitchen	51	Pass	100	Pass	3B-34c	Living/Kitchen	53	Pass	100	Pass
2B-35c	Living/Kitchen	50	Pass	99	Pass	3B-35c	Living/Kitchen	62	Pass	100	Pass
2B-36	Bedroom	99	Pass	100	Pass	3B-36	Bedroom	75	Pass	100	Pass
2B-37	Bedroom	60	Pass	100	Pass	3B-37c	Living/Kitchen	65	Pass	100	Pass
2B-38	Bedroom	30	Fail	100	Pass	3B-38c	Living/Kitchen	53	Pass	100	Pass
2B-39c	Living/Kitchen	18	Fail	86	Marginal	3B-39c	Living/Kitchen	53	Pass	100	Pass
2B-40c	Living/Kitchen	18	Fail	93	Marginal	3B-40c	Living/Kitchen	74	Pass	100	Pass
2B-41	Bedroom	12	Fail	73	Fail	3B-41	Bedroom	29	Fail	100	Pass
2B-42c	Living/Kitchen	62	Pass	100	Pass	3B-42	Bedroom	68	Pass	100	Pass
2B-43	Bedroom	54	Pass	100	Pass	3B-43c	Living/Kitchen	52	Pass	100	Pass
2B-44	Bedroom	95	Pass	100	Pass	3B-44c	Living/Kitchen	56	Pass	100	Pass
2B-45c	Living/Kitchen	43	Marginal	100	Pass	3B-45c	Living/Kitchen	56	Pass	100	Pass
2B-46	Bedroom	93	Pass	100	Pass	3B-46c	Living/Kitchen	58	Pass	100	Pass
2B-47	Bedroom	76	Pass	100	Pass	3B-47c	Living/Kitchen	56	Pass	100	Pass
2B-48	Bedroom	28	Fail	100	Pass	3B-48c	Living/Kitchen	54	Pass	100	Pass
2B-49c	Living/Kitchen	31	Fail	90	Marginal	3B-49c	Living/Kitchen	38	Fail	99	Pass
2B-50c	Living/Kitchen	48	Marginal	95	Pass	3B-50	Bedroom	27	Fail	87	Marginal
2B-51	Bedroom	8	Fail	67	Fail	3B-51c	Living/Kitchen	57	Pass	100	Pass
2B-52	Bedroom	30	Fail	92	Marginal	3B-52	Bedroom	8	Fail	65	Fail
2B-53	Bedroom	52	Pass	100	Pass	3B-53	Bedroom	40	Marginal	92	Marginal
2B-54c	Living/Kitchen	50	Pass	100	Pass	3B-54	Bedroom	52	Pass	100	Pass
						3B-55c	Living/Kitchen	55	Pass	100	Pass

Block C – 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%
4B-01c	Living/Kitchen	38	Fail	92	Marginal	0C-01	Bedroom	66	Pass	99	Pass
4B-02	Bedroom	39	Fail	100	Pass	0C-02	Bedroom	67	Pass	99	Pass
4B-03	Bedroom	19	Fail	100	Pass	0C-03	Bedroom	82	Pass	100	Pass
4B-04	Bedroom	61	Pass	100	Pass	0C-04	Bedroom	78	Pass	99	Pass
4B-05	Bedroom	22	Fail	100	Pass	0C-05	Bedroom	69	Pass	100	Pass
4B-06	Bedroom	61	Pass	100	Pass	0C-06	Bedroom	74	Pass	100	Pass
4B-07	Bedroom	99	Pass	100	Pass	0C-07	Bedroom	57	Pass	100	Pass
4B-08c	Living/Kitchen	53	Pass	100	Pass	0C-08	Bedroom	43	Marginal	100	Pass
4B-09c	Living/Kitchen	48	Marginal	100	Pass	0C-09c	Living/Kitchen	86	Pass	100	Pass
4B-10	Bedroom	66	Pass	100	Pass	0C-10c	Living/Kitchen	45	Marginal	86	Marginal
4B-11	Bedroom	29	Fail	98	Pass	0C-11	Bedroom	2	Fail	30	Fail
4B-12	Bedroom	65	Pass	100	Pass	0C-12	Bedroom	15	Fail	54	Fail
4B-13	Bedroom	46	Marginal	90	Marginal	0C-13	Bedroom	64	Pass	99	Pass
4B-14	Bedroom	78	Pass	94	Marginal	0C-14	Bedroom	66	Pass	100	Pass
4B-15c	Living/Kitchen	100	Pass	100	Pass	0C-15	Bedroom	39	Fail	90	Marginal
4B-29	Bedroom	95	Pass	100	Pass	0C-16	Bedroom	34	Fail	88	Marginal
4B-30	Bedroom	90	Pass	100	Pass	0C-17	Bedroom	63	Pass	99	Pass
4B-31c	Living/Kitchen	56	Pass	93	Marginal	0C-18	Bedroom	63	Pass	99	Pass
4B-32c	Living/Kitchen	61	Pass	96	Pass						
4B-33	Bedroom	48	Marginal	100	Pass	1C-01	Bedroom	96	Pass	100	Pass
4B-34	Bedroom	92	Pass	92	Marginal	1C-02	Bedroom	96	Pass	100	Pass
4B-35	Bedroom	66	Pass	100	Pass	1C-03	Bedroom	96	Pass	100	Pass
4B-36c	Living/Kitchen	77	Pass	100	Pass	1C-04	Bedroom	96	Pass	100	Pass
						1C-05	Bedroom	96	Pass	100	Pass
		Count	211	Count	211	1C-06	Bedroom	96	Pass	100	Pass
		Pass	109	Pass	150	1C-07	Bedroom	59	Pass	100	Pass
		Pass Rate 300lx/50%	52%	Pass Rate 100lx/95%	71%	1C-08	Bedroom	48	Marginal	100	Pass
						1C-09c	Living/Kitchen	86	Pass	100	Pass
						1C-10c	Living/Kitchen	39	Fail	74	Fail
		Marginal	26	Marginal	35	1C-11	Bedroom	4	Fail	98	Pass
		Pass Marginal	64%	Pass Marginal	88%	1C-12	Bedroom	34	Fail	100	Pass
						1C-13	Bedroom	54	Pass	100	Pass
						1C-14	Bedroom	96	Pass	100	Pass
						1C-15	Bedroom	96	Pass	100	Pass
						1C-16	Bedroom	86	Pass	100	Pass
						1C-17	Bedroom	93	Pass	100	Pass
						1C-18	Bedroom	96	Pass	100	Pass
						1C-19	Bedroom	96	Pass	100	Pass
						1C-20c	Living/Kitchen	38	Fail	79	Marginal
						1C-21c	Living/Kitchen	31	Fail	66	Fail
						1C-22c	Living/Kitchen	31	Fail	73	Fail
						1C-23	Bedroom	29	Fail	85	Marginal
						1C-24c	Living/Kitchen	32	Fail	83	Marginal
						1C-25c	Living/Kitchen	26	Fail	61	Fail
						1C-26c	Living/Kitchen	22	Fail	56	Fail
						1C-27c	Living/Kitchen	13	Fail	42	Fail
						1C-28c	Living/Kitchen	21	Fail	56	Fail
						1C-29c	Living/Kitchen	29	Fail	63	Fail
						1C-30	Bedroom	29	Fail	85	Marginal
						1C-31c	Living/Kitchen	34	Fail	85	Marginal
						1C-32c	Living/Kitchen	31	Fail	76	Fail
						1C-33c	Living/Kitchen	39	Fail	79	Marginal

Minimum daylight provision

For all habitable room

Location ***Dublin*** ***14,900*** *lx*

Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
2C-01	Bedroom	42	Marginal	97	Pass
2C-02	Bedroom	43	Marginal	100	Pass
2C-03	Bedroom	80	Pass	93	Marginal
2C-04	Bedroom	86	Pass	100	Pass
2C-05	Bedroom	32	Fail	74	Marginal
2C-06	Bedroom	38	Fail	98	Pass
2C-07	Bedroom	58	Pass	100	Pass
2C-08	Bedroom	47	Marginal	100	Pass
2C-09c	Living/Kitchen	85	Pass	100	Pass
2C-10c	Living/Kitchen	41	Marginal	79	Marginal
2C-11	Bedroom	4	Fail	98	Pass
2C-12	Bedroom	34	Fail	100	Pass
2C-13	Bedroom	55	Pass	100	Pass
2C-14	Bedroom	41	Marginal	100	Pass
2C-15	Bedroom	37	Fail	99	Pass
2C-16	Bedroom	81	Pass	91	Marginal
2C-17	Bedroom	80	Pass	98	Pass
2C-18	Bedroom	37	Fail	99	Pass
2C-19	Bedroom	36	Fail	98	Pass
2C-20	Bedroom	85	Pass	100	Pass
2C-21c	Living/Kitchen	55	Pass	100	Pass
2C-22c	Living/Kitchen	50	Marginal	100	Pass
2C-23	Bedroom	89	Pass	100	Pass
2C-24c	Living/Kitchen	22	Fail	92	Marginal
2C-25	Bedroom	25	Fail	100	Pass
2C-26	Bedroom	56	Pass	100	Pass
2C-27	Bedroom	19	Fail	77	Marginal
2C-28	Bedroom	26	Fail	100	Pass
2C-29c	Living/Kitchen	25	Fail	97	Pass
2C-30	Bedroom	70	Pass	100	Pass
2C-31c	Living/Kitchen	47	Marginal	100	Pass
2C-32c	Living/Kitchen	50	Marginal	100	Pass
2C-33	Bedroom	99	Pass	100	Pass
3C-01	Bedroom	76	Pass	100	Pass
3C-02	Bedroom	75	Pass	100	Pass
3C-03	Bedroom	98	Pass	100	Pass
3C-04	Bedroom	97	Pass	100	Pass
3C-05	Bedroom	34	Fail	99	Pass
3C-06	Bedroom	37	Fail	99	Pass
3C-07	Bedroom	59	Pass	100	Pass
3C-08	Bedroom	56	Pass	100	Pass
3C-09c	Living/Kitchen	91	Pass	100	Pass
3C-10c	Living/Kitchen	39	Fail	76	Marginal
3C-11	Bedroom	4	Fail	100	Pass
3C-12	Bedroom	40	Marginal	100	Pass
3C-13	Bedroom	64	Pass	100	Pass
3C-14	Bedroom	72	Pass	100	Pass
3C-15	Bedroom	68	Pass	100	Pass
3C-16	Bedroom	81	Pass	100	Pass
3C-17	Bedroom	84	Pass	100	Pass
3C-18	Bedroom	69	Pass	100	Pass
3C-19	Bedroom	71	Pass	100	Pass
3C-20c	Living/Kitchen	59	Pass	100	Pass

Minimum daylight provision

For all habitable room

Location ***Dublin*** ***14,900*** *lx*

Ref	Type	Percentage within 300lx	EN17037 Check @ 50%	Percentage within 100lx	EN17037 Check @ 95%
3C-21c	Living/Kitchen	56	Pass	100	Pass
3C-22c	Living/Kitchen	65	Pass	100	Pass
3C-23	Bedroom	35	Fail	94	Marginal
3C-24c	Living/Kitchen	65	Pass	100	Pass
3C-25c	Living/Kitchen	53	Pass	100	Pass
3C-26c	Living/Kitchen	50	Pass	100	Pass
3C-27c	Living/Kitchen	25	Fail	58	Fail
3C-28c	Living/Kitchen	29	Fail	69	Fail
3C-29c	Living/Kitchen	58	Pass	100	Pass
3C-30	Bedroom	35	Fail	96	Pass
3C-31c	Living/Kitchen	63	Pass	100	Pass
3C-32c	Living/Kitchen	50	Pass	100	Pass
3C-33c	Living/Kitchen	60	Pass	100	Pass
4C-01	Bedroom	40	Marginal	100	Pass
4C-02	Bedroom	27	Fail	94	Fail
4C-03	Bedroom	41	Marginal	100	Pass
4C-04	Bedroom	100	Pass	100	Pass
4C-05	Bedroom	91	Pass	100	Pass
4C-06	Bedroom	45	Marginal	95	Pass
4C-07	Bedroom	46	Marginal	100	Pass
4C-08	Bedroom	55	Pass	100	Pass
4C-09	Bedroom	65	Pass	100	Pass
4C-10	Bedroom	77	Pass	100	Pass
4C-11	Bedroom	100	Pass	100	Pass
		Count	128	Count	128
		Pass	70	Pass	97
		Pass Rate 300lx/50%	55%	Pass Rate 100lx/95%	76%
		Marginal	16	Marginal	17
		Pass Margina	67%	Pass Margina	89%

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 %
A	91%	100%	A	54%	67%	A	71%	89%
B	91%	97%	B	52%	64%	B	71%	88%
C	90%	96%	C	55%	67%	C	76%	89%
Total	**91%**	**97%**	**Total**	**53%**	**66%**	**Total**	**73%**	**88%**

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.

Appendix 3
Extract from the Architect's Design Statement

Relevant pages from the Architect's Design Statement relating to compensatory measures and design strategy.

5.0
The 12 Criteria Urban Design | 5.9 Detailed Design

Daylight & Sunlight

Compensatory Measures - *Daylight /Sunlight provision*

The majority of rooms comply with daylight requirements. Most of those that don't are marginal on the 50%. In large scale developments it is common to see lower floor apartments receive minor amounts of daylight when compared to the upper levels.

In order to combat this design constraint, compensatory measures have been incorporated into the design of the proposed development where rooms do not achieve the -daylight provision targets in accordance with the standards they were assessed against.

The compensatory measures are summarised as follows:

- All apartment blocks are immediately adjacent to a significant podium landscaped park and urban spaces as described either in this application or in future phases as set out in the LRD planning scheme. *(Refer to page 18 for proposed masterplan scheme and architectural drawing No. 0118 for more information*)

  The first-floor podium level units have less access to sunlight generally, this is compensated for in having direct access to the podium courtyard amenity. An adequately lit garden and open space will be proposed creating a rich ambience that any occupant would find appealing. The inclusion of greenery areas and amenity spaces will help to improve the sense of light and brightness within the apartments. A well-lit garden/open space will add value to the property; 10,437.10sqm of Open Space is provided, excluding the grand canal linear park area. (additional 5,000 s.q.m approx.)

- 100% of tested neighbouring amenity spaces pass the 2-hour test requirements for the 21st March.

- 85% of the apartment units have a floor area 10% greater than the minimum floor area requirements as required by the Design Standards (Dec 2020). Note that larger floor areas make it more difficult to achieve the recommended daylight levels. However, larger windows have been incorporated into the design which also improves the view out for the building occupants.

Refer to Housing Quality Assessment. - Drawing. PE17019-CWO-01-XX-SL-A-9001 , for more information

Grand Canal lineal park - Extract of Drawing No 1 - Landscape Architects.

First Floor Layout - Aparments View to podium landscaped area

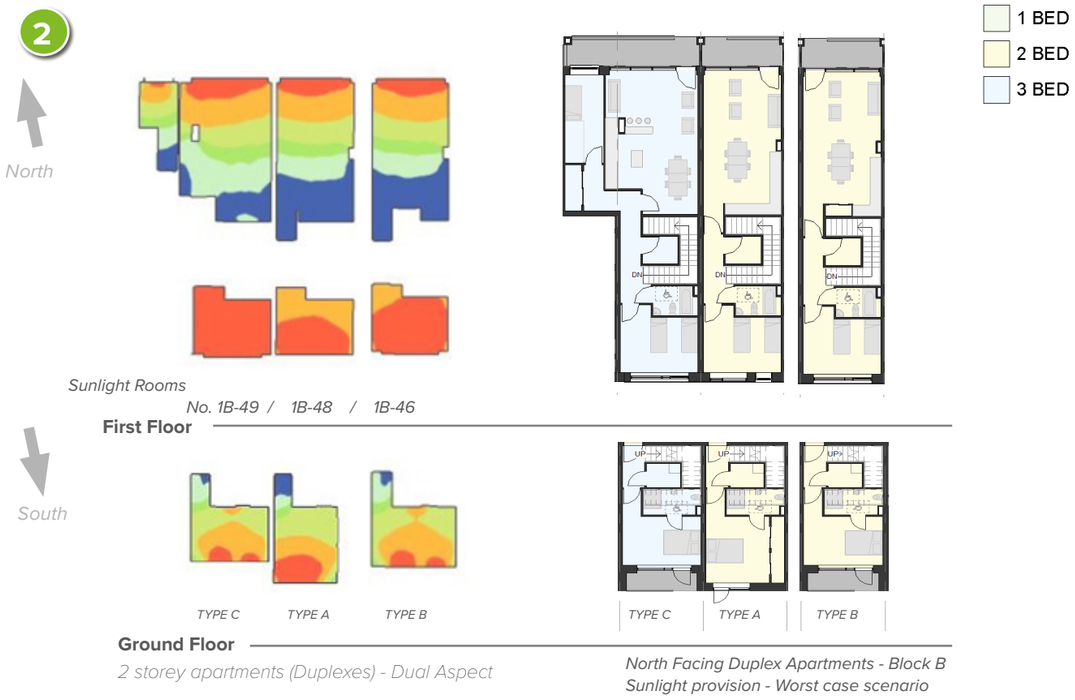
5.0
The 12 Criteria Urban Design | 5.9 Detailed Design

Sunlight & Daylight

- 85% of the apartment units (including apartment duplex units) are dual aspect which is above the 50% minimum required by the Design Standards (Dec 2020). As a result, more apartment units than the recommended minimum will achieve quality daylight from dual-aspect orientations.

There are no single aspect units facing only north, to allow for an overall high level of sunlight for most of the units. (*Refer to section No. 6 -page 40 for dual aspect ratios)*

For the rooms within apartments falling below compliance: In order to demostrate that excellent levels of daylight/sunlight are achieved in those units. The following images illustrates the ADF Levels being achieved throught a "worst case" living room/kitchen. As expected, daylight levels are excellent within close proximity to the external wall and begin to drop off as you move towards the kitchen area which are typically located to the rear of the open space. It must be noted that the duplexes apartments contain a kitchen which is designed to be used mainly for food preparation rather than occupants spending a long time sitting in the kitchen area. Instead, occupants are expected to spend most of their time in the living room area, where daylight penetration will be more appreciated. Therefore, it can be stated that even though some rooms fall short of the compliance target set, they will still receive excellent levels of daylight within the zone closest to the external wall, where sitting areas are located and where occupants are expected to spend the majority of their time. The same rationale can be applied to those bedrooms falling short of compliance, their daylight levels will begin to drop off as you move towards the back of the room, where the wardrobe and circulation spaces are located.



Apartment Type D

Dual Aspect

First Floor - Block C
Sunlight Room No. 1C-10

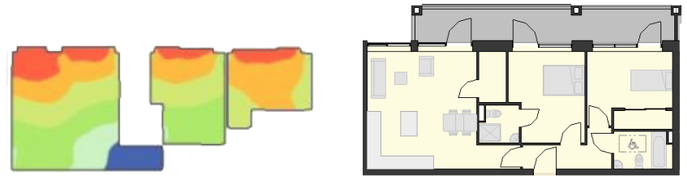
Apartment Type H

Dual Aspect

First Floor - Block B
Sunlight Room No. 1B-51

Apartment Type N

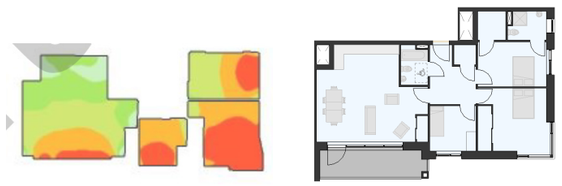
Single Aspect



Second Floor - Block B
Sunlight Room No. 2B-49

Apartment Type P

Dual Aspect



Second Floor - Block B
Sunlight Room No. 2B-20

Apartment Type V

Dual Aspect

Second Floor - Block B
Sunlight Room No. 2B-40

***Note: Sunlight Rooms - Worst case scenarios - Receives less than 1.5 hours of sunlight on 21st March*
Refer to Christ Shackleton report for more information

5.0
The 12 Criteria Urban Design | 5.9 Detailed Design

Sunlight & Daylight

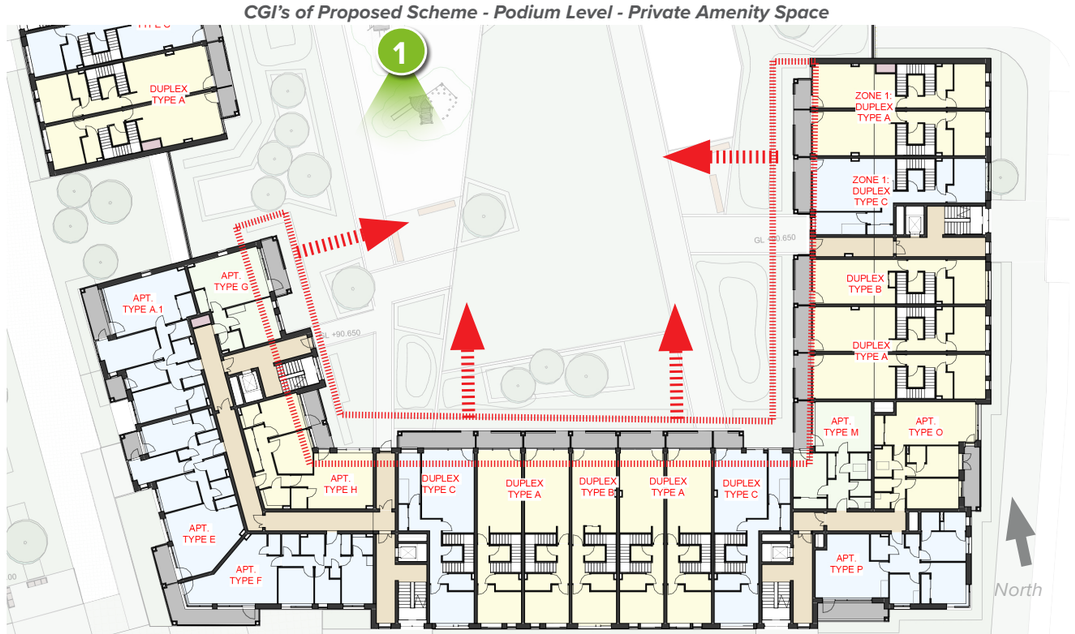
It is worth emphasising again the fact that the guidelines for daylight are not mandatory and that the Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities (December 2020) outlines that:*"where an applicant cannot fully meet all of the requirements of the 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 constraint 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 line with the objectives of the Sustainable Urban Housing: Design Standards for New Apartments, the proposed development seeks to balance ADF compliance with quality urban design and landscape. The proposed development seeks to deliver a high quality living environment through the provision of high quality open spaces, which residents can enjoy immediately adjacent to their homes, and connected via green networks to surrounding amenity areas. Additionally, the proposed development provides quality external private open space to all residential units, ensuring maximum opportunities to enjoy their residential living environment.

Also, The recommendation set out in BRE Guidelines state that in order to show that adequate sunlight reaches windows within occupied rooms, the centre of at least one window to a main living room must receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months between 21st September and 21st March. While the BRE criteria sets out these recommendations for living room windows to receive direct sunlight throughout the year, the guidance set out in the Sustainable Urban Housing: Design Standards for New Apartments states that balconies should adjoin and have a functional relationship with the main living areas of the apartment. They also state that it is preferable that balconies would be primarily accessed from living rooms, which can reduce the sunlight being received in someinstances.

As the location of balconies have been designed to primarily comply with the apartment design guidelines, the amount of sunlight reaching these living room windows in some areas will naturally be reduced and achieving the recommended values within BRE Guidelines can become challenging. The shortfall in compliance can be attributed to the projection of balconies in some areas, to the north facing windows and mainly to those units located within the courtyard. It is important to note that even though the projection of balconies will impact the sunlight reaching the windows in some areas, it will provide occupants with an outdoor amenity space that will receive excellent levels of sunlight. In addition, BRE Guidelines outline the difficulty in achieving the recommended targets within apartments and they recommend to aim for a good design to minimise the number of dwellings that are only facing north, north east or north west, unless there is some compensating factors such as an appealing view to the north, which it is the case for the Finlay Park Development

CGI's of Proposed Scheme - Podium Level - Private Amenity Space



Block B - Podium Level - Balconies located within courtyard view