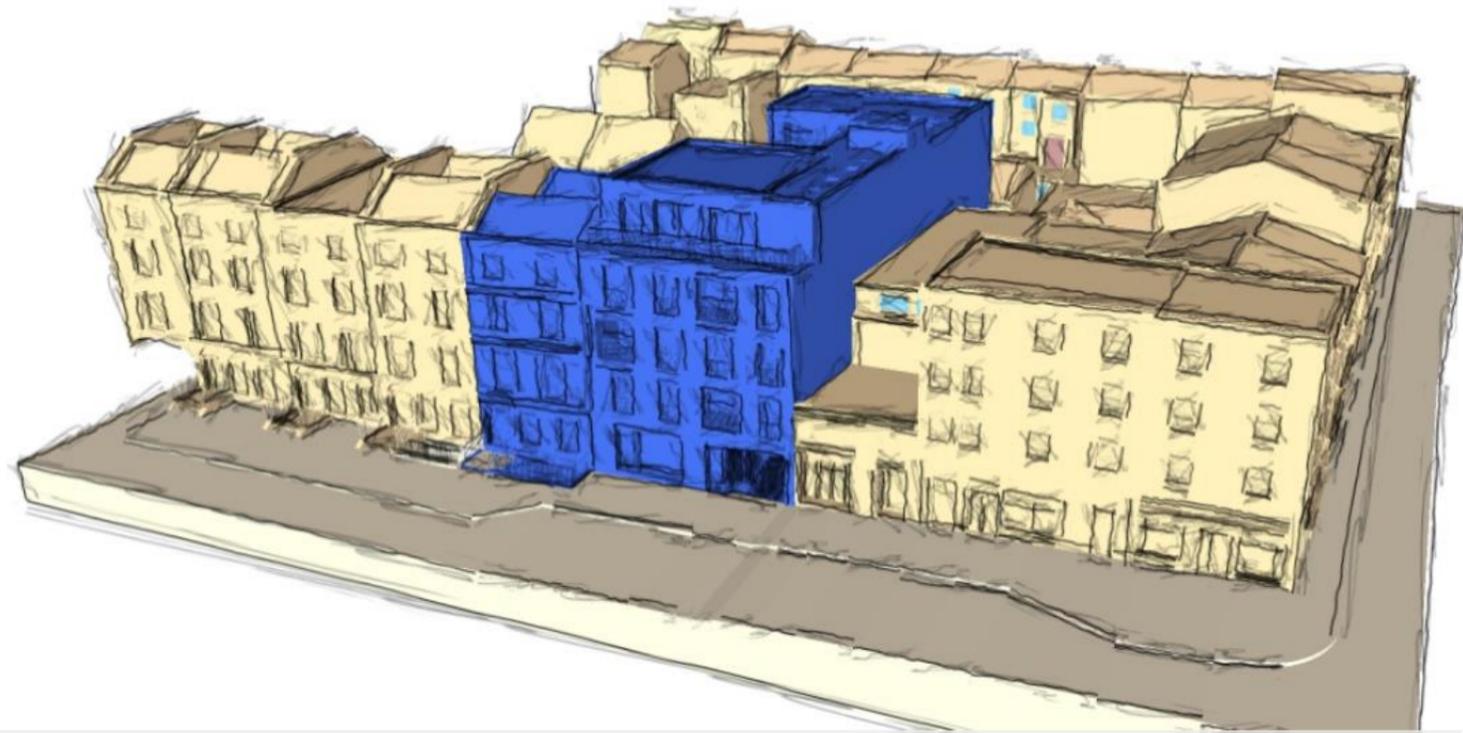


THOMAS STREET, LIMERICK

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



V3

Executive Summary

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

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

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

" 1.6 . . . The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. . . . "

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

- **Skylight- VSC**
 - 100% of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.
 - The average change ratio for VSC is **0.94**
- **Sunlight APSH & WPSH**
 - 100% of tested windows comply with the annual APSH and
 - 100% with the winter WPSH requirements for sunlight or overall requirement.
 - The average change ratio for sunlight is APSH:**0.96** and WPSH: **0.88**
- **Sunlight on the Ground SOG (Shadow)**
 - We cannot identify any amenity spaces that needs testing as the rear development is practically full ground floor coverage

Performance of the proposed design

- **Target Illuminance E_r**
 - 76% of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
 - The average complaint areas achieving the relevant target Lx for
 - all bedrooms is **87%** and
 - all Living/Kitchen spaces **63%**
 - both are well in excess of the minimum required 50%
- **Sunlight to rooms:**
 - 85% of Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
 - This is consistent with the BRE defined “careful layout design” 80% target.
- **Sunlight on the Ground SOG (Shadow)**
 - The Shared Amenity space sits to the North of the historic Georgian Building
 - The space will not receive sunlight on the test day 21st March
- **See Architects commentary for compensatory measures.**

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

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

Architects’ & Planners’ Commentary / Compensatory Measures

The site is constrained by its city centre location, site shape and orientation. As an urban infill scheme with competing design constraints and objectives it is specifically covered by clause 6.7 of the Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, 2020:

6.6 Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in 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’ when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

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

Specific commentary is provided under the following headings:

- Shared amenity space compensatory measures
- Minimum Daylight provision compensatory measures

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 renovations to the Georgian building a new apartment development over 5 storeys. We have also been asked to examine how the proposed development performs in terms of light.

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

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

Preliminary Overview

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



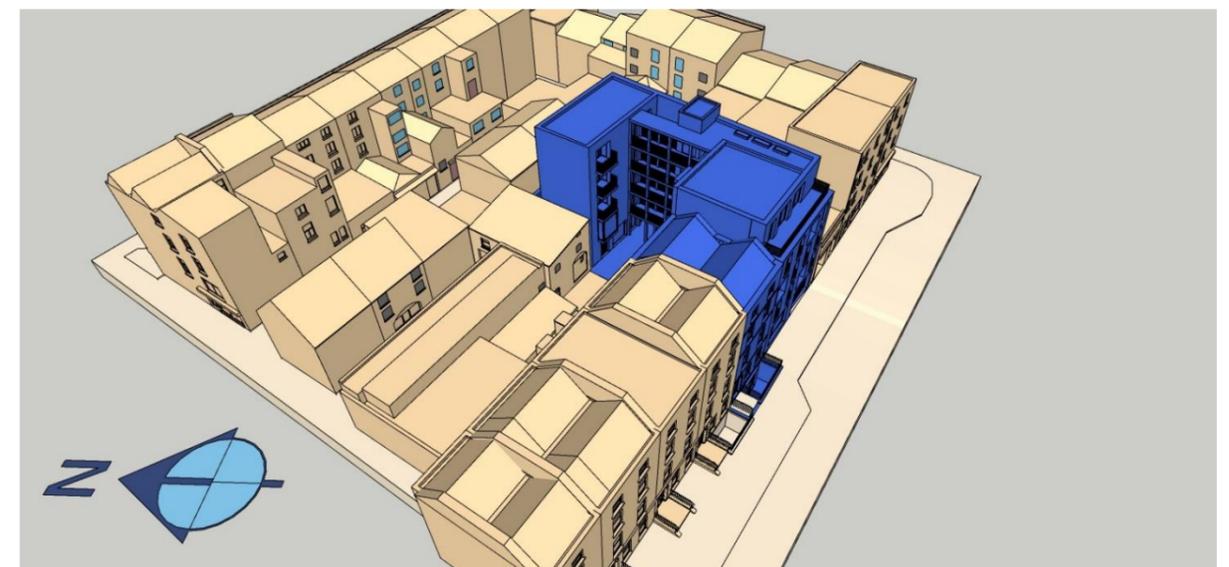
Google Earth extract © Google 2022

A 3D model of the proposed development and the surrounding neighbouring properties was provided by the Architect. These had been modelled from survey information and drawings provided in plan, elevation and section formats. The model was geo-referenced to its correct location and an accurate solar daylight system was introduced. Here "Cream" indicates surrounding environment, "Purple" the existing development to be demolished, "Blue" this proposal. (Note: The Georgian Building is not being demolished but it will be renovated)

The analysis is based on the information provided.



Existing Model



Proposed Model

Scope of this Report

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

Impact on Existing Neighbours

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

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

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 Shared amenity spaces

When examining the internal performance of the development we have tested ALL floors, ALL habitable rooms of the design.

Adjacent Properties Details

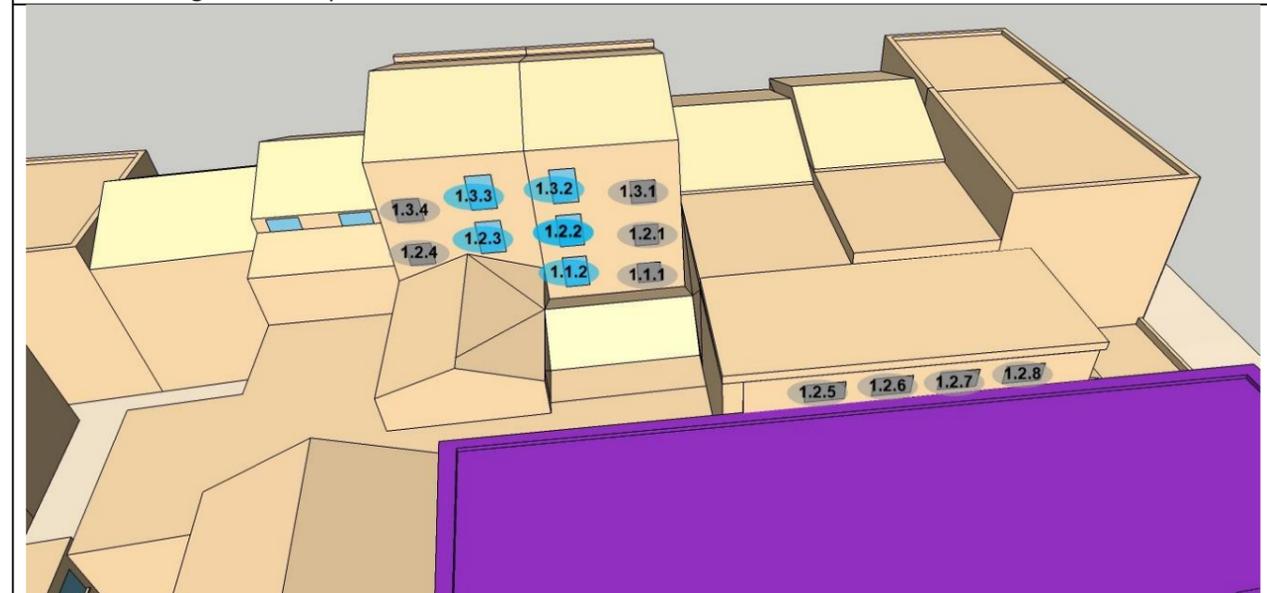
The numbering used later for windows in each of the blocks is detailed below.

Neighbours – East (Window Group B1)

Oblique panoramic imagery



Windows facing the development



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

Windows marked grey are to Non-Habitable rooms and not tested:

Ref: 1.1.1, 1.2.1, 1.3.1 & 1.2.4, 1.3.4 – non-habitable

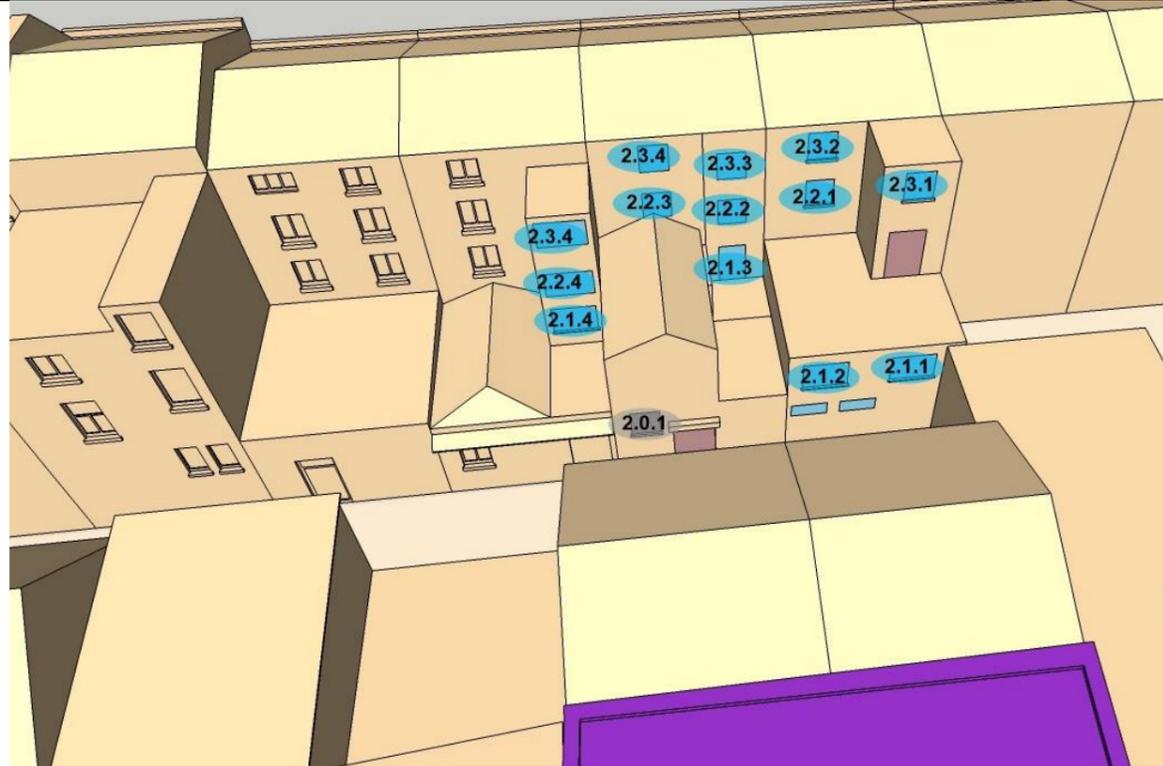
Ref: 1.2.5, 1.2.6, 1.2.7, 1.2.8 – Clerestory glazing that is part of our existing commercial building to be demolished as part of the works, on the new site boundary with no. 35 Thomas Street. Glazing to be blocked up as part of the works.

Neighbours– West (Window Group B2)

Oblique panoramic imagery



Windows facing the development



The numbering used later in this report for this group of windows is indicated in cyan above.
 Windows marked grey are to Commercial and not tested:
 Ref: 2.0.1 – commercial

Neighbours – North (Window Group B3)

Oblique panoramic imagery



Windows facing the development



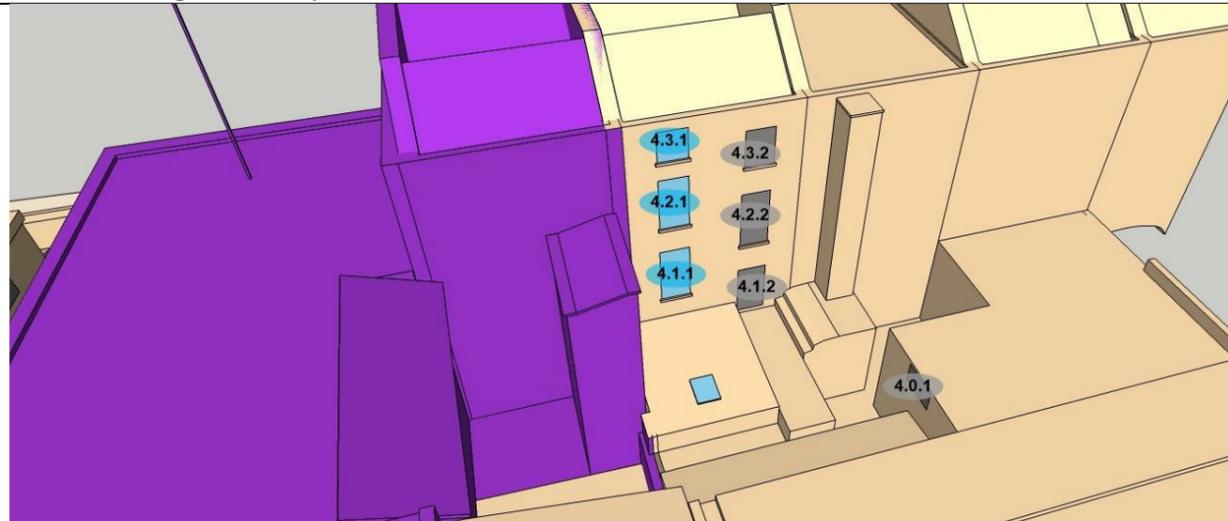
All windows are to commercial spaces and not tested:
 Ref: 3.0.1 – our window within the subject site boundary, to be removed as part of the works
 Ref: 3.0.2, 3.1.2, 3.1.1, 3.2.1 – commercial use. The building to the rear of the existing Georgian building, no. 33 (the crumbling brick façade) is occupied by Melody bar, see attached pic. The client has liaised with the property owner and tenant in relation to our proposed development.
 Ref: 3.1.3 & 3.1.4, 3.1.5, 3.2.2, 3.2.3 – commercial use

Neighbours – North (Window Group B4)

Oblique panoramic imagery



Windows facing the development



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

Windows marked grey are to commercial or Non-Habitable rooms and not tested:

4.0.1 – commercial

4.1.2, 4.2.2, 4.3.2 – non-habitable

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							
V3 <i>Check > 27% or ratio > 0.8</i>							
Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result
B1	F1	W2	1.1.2	31.8	26.1	0.82	Pass
B1	F2	W2	1.2.2	37.1	31.2	0.84	Pass
B1	F2	W3	1.2.3	37.3	33.0	0.88	Pass
B1	F3	W2	1.3.2	38.7	34.6	0.89	Pass
B1	F3	W3	1.3.3	38.7	35.8	0.92	Pass
B2	F1	W1	2.1.1	23.6	23.2	0.98	Pass
B2	F1	W2	2.1.2	24.2	23.7	0.98	Pass
B2	F1	W3	2.1.3	20.3	19.0	0.93	Pass
B2	F1	W4	2.1.4	25.8	24.9	0.97	Pass
B2	F2	W1	2.2.1	28.8	27.0	0.94	Pass
B2	F2	W2	2.2.2	33.4	31.5	0.94	Pass
B2	F2	W3	2.2.3	32.0	30.1	0.94	Pass
B2	F2	W4	2.2.4	34.3	32.4	0.94	Pass
B2	F3	W1	2.3.1	37.6	35.9	0.95	Pass
B2	F3	W2	2.3.2	35.0	33.5	0.96	Pass
B2	F3	W3	2.3.3	36.9	35.1	0.95	Pass
B2	F3	W4	2.3.4	37.8	36.3	0.96	Pass
B2	F3	W5	2.3.5	37.4	35.3	0.94	Pass
B4	F1	W1	4.1.1	28.3	31.4	1.11	Pass
B4	F2	W1	4.2.1	37.4	34.8	0.93	Pass
B4	F3	W1	4.3.1	38.8	37.1	0.96	Pass

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

Conclusion

When tested with the new development in place **100%** of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.

The average change ratio for VSC is **0.94**

The proposed development complies with the requirements of the BRE guidelines in relation to skylight availability for neighbours.

Adjacent Properties - Sunlight into living spaces

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

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

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

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

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

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

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

The results are tabulated below:

Sunlight on windows to living room spaces check												
Annual - 25% and Winter - 5%												
V3	Check > 25% or ratio > 0.8							Check > 5% or ratio > 0.8				
	Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result	Existing	Proposed	Ratio	Result
B1	F1	W2	1.1.2	North	North		Pass	North	North		Pass	
B1	F2	W2	1.2.2	North	North		Pass	North	North		Pass	
B1	F2	W3	1.2.3	North	North		Pass	North	North		Pass	
B1	F3	W2	1.3.2	North	North		Pass	North	North		Pass	
B1	F3	W3	1.3.3	North	North		Pass	North	North		Pass	
B2	F1	W1	2.1.1	46.7	45.8	0.98	Pass	6.0	6.0	1.00	Pass	
B2	F1	W2	2.1.2	52.7	52.1	0.99	Pass	10.2	10.0	0.98	Pass	
B2	F1	W3	2.1.3	34.1	31.5	0.92	Pass	9.0	6.4	0.71	Pass	
B2	F1	W4	2.1.4	46.2	45.1	0.98	Pass	8.1	7.0	0.86	Pass	
B2	F2	W1	2.2.1	48.1	44.4	0.92	Pass	15.3	11.6	0.76	Pass	
B2	F2	W2	2.2.2	64.9	60.1	0.93	Pass	23.6	18.8	0.80	Pass	
B2	F2	W3	2.2.3	66.3	62.5	0.94	Pass	29.2	25.5	0.87	Pass	
B2	F2	W4	2.2.4	73.8	68.9	0.93	Pass	28.4	23.6	0.83	Pass	
B2	F3	W1	2.3.1	78.8	76.6	0.97	Pass	33.4	31.2	0.93	Pass	
B2	F3	W2	2.3.2	64.7	63.2	0.98	Pass	19.7	18.2	0.92	Pass	
B2	F3	W3	2.3.3	73.4	70.6	0.96	Pass	28.0	25.2	0.90	Pass	
B2	F3	W4	2.3.4	77.7	76.0	0.98	Pass	32.4	30.6	0.95	Pass	
B2	F3	W5	2.3.5	78.3	75.4	0.96	Pass	32.9	30.0	0.91	Pass	
B4	F1	W1	4.1.1	North	North		Pass	North	North		Pass	
B4	F2	W1	4.2.1	North	North		Pass	North	North		Pass	
B4	F3	W1	4.3.1	North	North		Pass	North	North		Pass	

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

Conclusion

When tested with the proposed development in place:
100% of tested windows comply with the annual APSH and
100% with the winter WPSH requirements for sunlight or overall requirement.

The average change ratio for sunlight is APSH:**0.96** and WPSH: **0.88**

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).*

We cannot identify any amenity spaces that needs testing as the rear development is practically full ground floor coverage

Conclusion

There are no apparent neighbouring amenity spaces which need testing.

The proposed development thus complies with the requirements of the BRE guidelines.

Summary - Adjacent Properties

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

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

- **Skylight- VSC**
 - **100%** of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.
 - The average change ratio for VSC is **0.94**
- **Sunlight APSH & WPSH**
 - **100%** of tested windows comply with the annual APSH and
 - **100%** with the winter WPSH requirements for sunlight or overall requirement.
 - The average change ratio for sunlight is APSH:**0.96** and WPSH: **0.88**
- **Sunlight on the Ground SOG (Shadow)**
 - We cannot identify any amenity spaces that needs testing as the rear development is practically full ground floor coverage

The potential impact of the proposed development on neighbours complies with the requirements of “Site layout planning for daylight and sunlight a guide to good practice ” (BR209 – 2022)

Development Performance

Development Performance - Target Illuminance E_T Metric

National Standards Authority of Ireland have adopted EN 17037 to directly become IS/EN 17037. There are no amendments 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 new buildings and does not include specific usage targets for spaces for commercial, office and residential (living, bedroom, Kitchen).

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

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

*Target illuminance (E_T):
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

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.

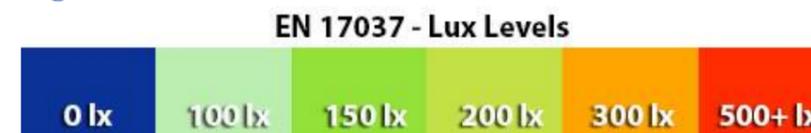
Surface	Description	Reflectance
External Plane	Earth	0.2
External Walls	Grey Render / Concrete	0.4
Floor	Light wood/ cream Carpet	0.4
Internal Wall	Cream	0.7
Ceiling	White	0.8
Frames	Medium Grey	0.5
	Transmittance	
Glazing clear	0.63 (incl. Maintenance Factor)	
Glazing Translucent	0.4 (incl. Maintenance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

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

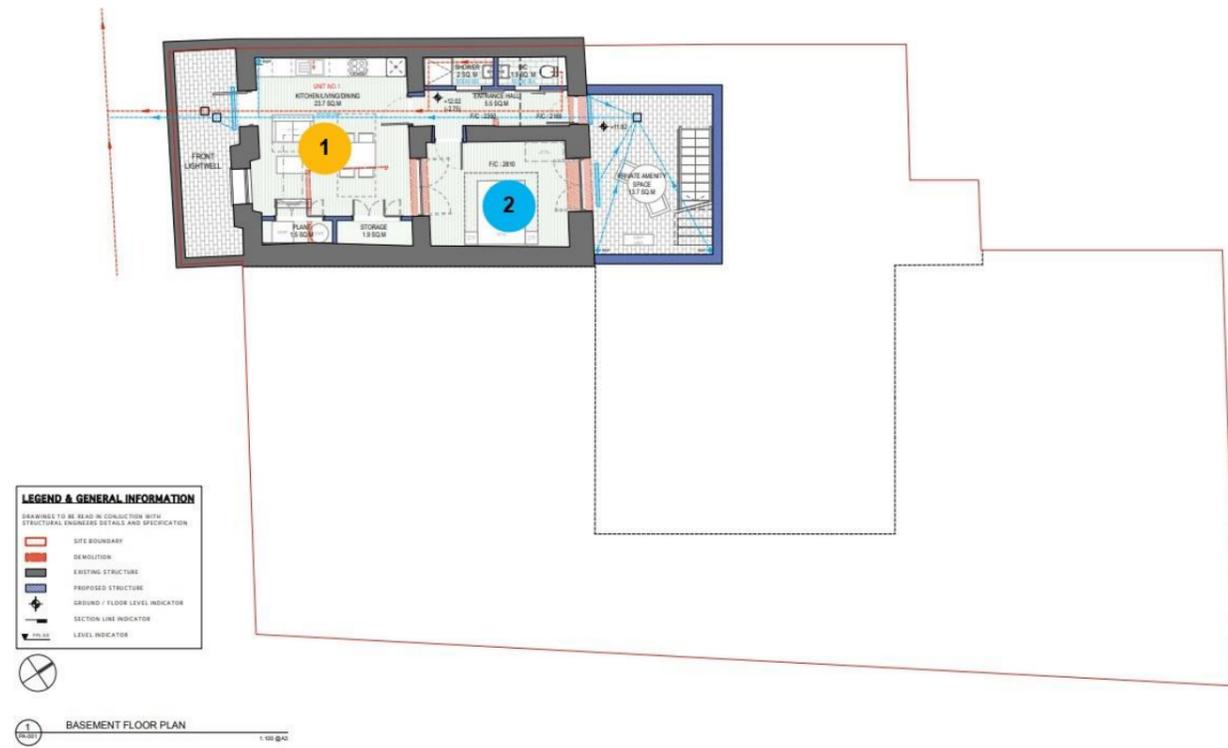
Reference plane or working plane

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

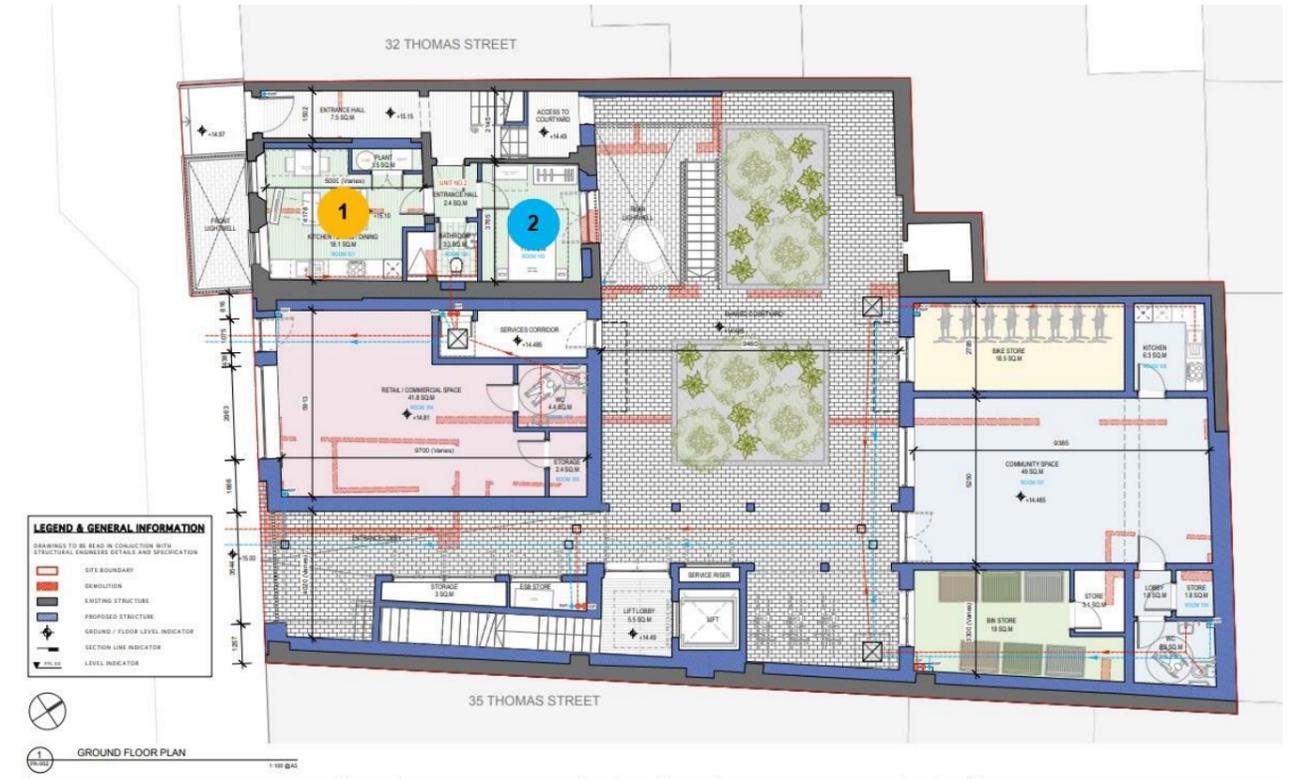
Legend for Radiance Plots



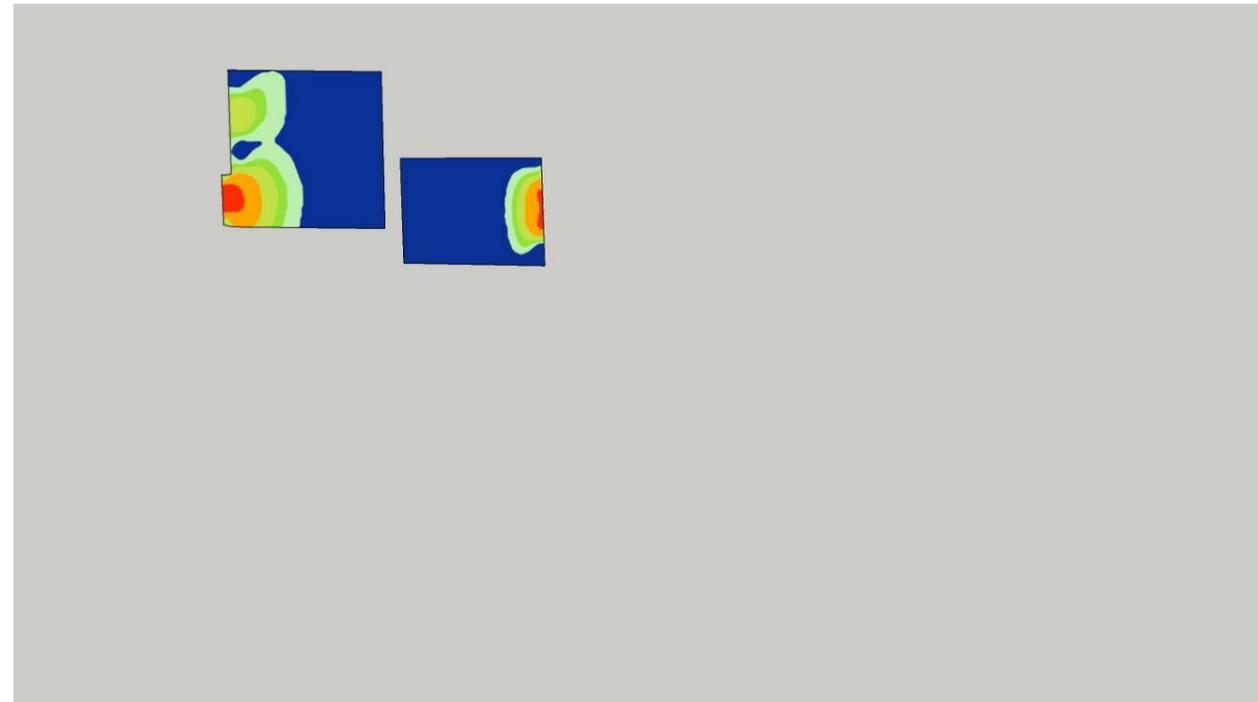
Basement Floor Layout - Naming Convention



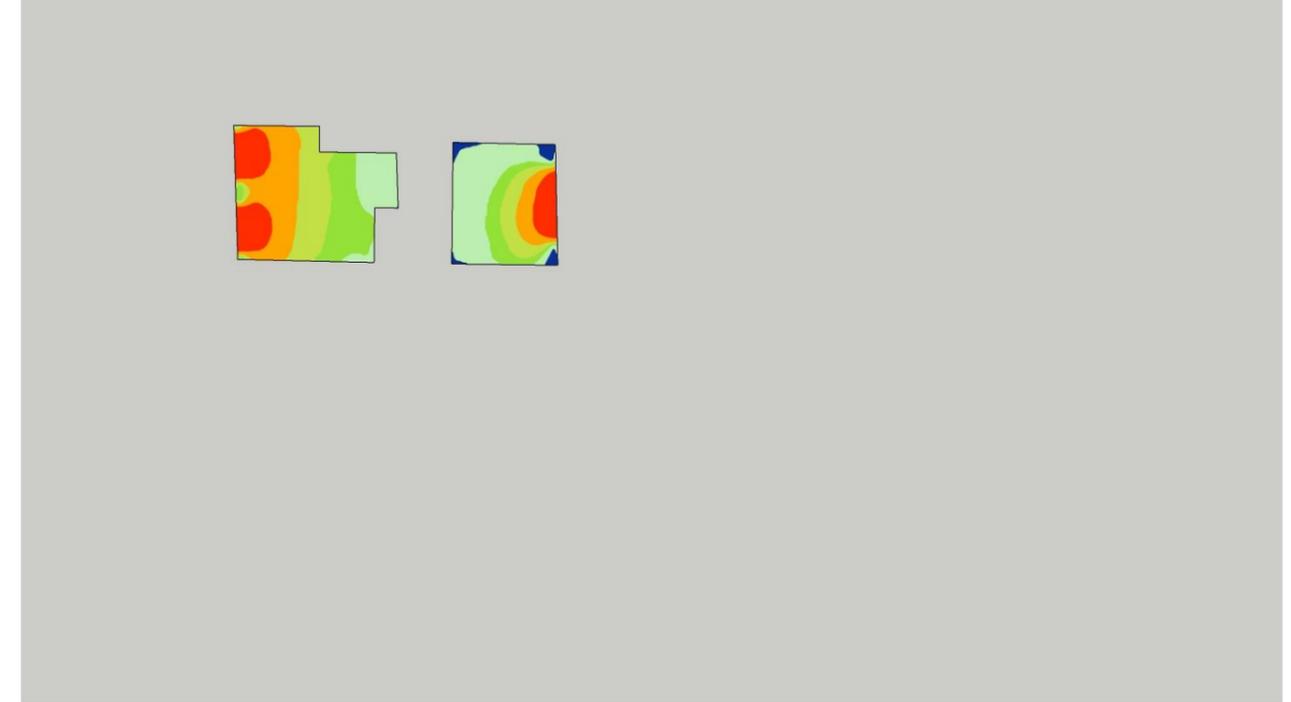
GFL Floor Layout - Naming Convention



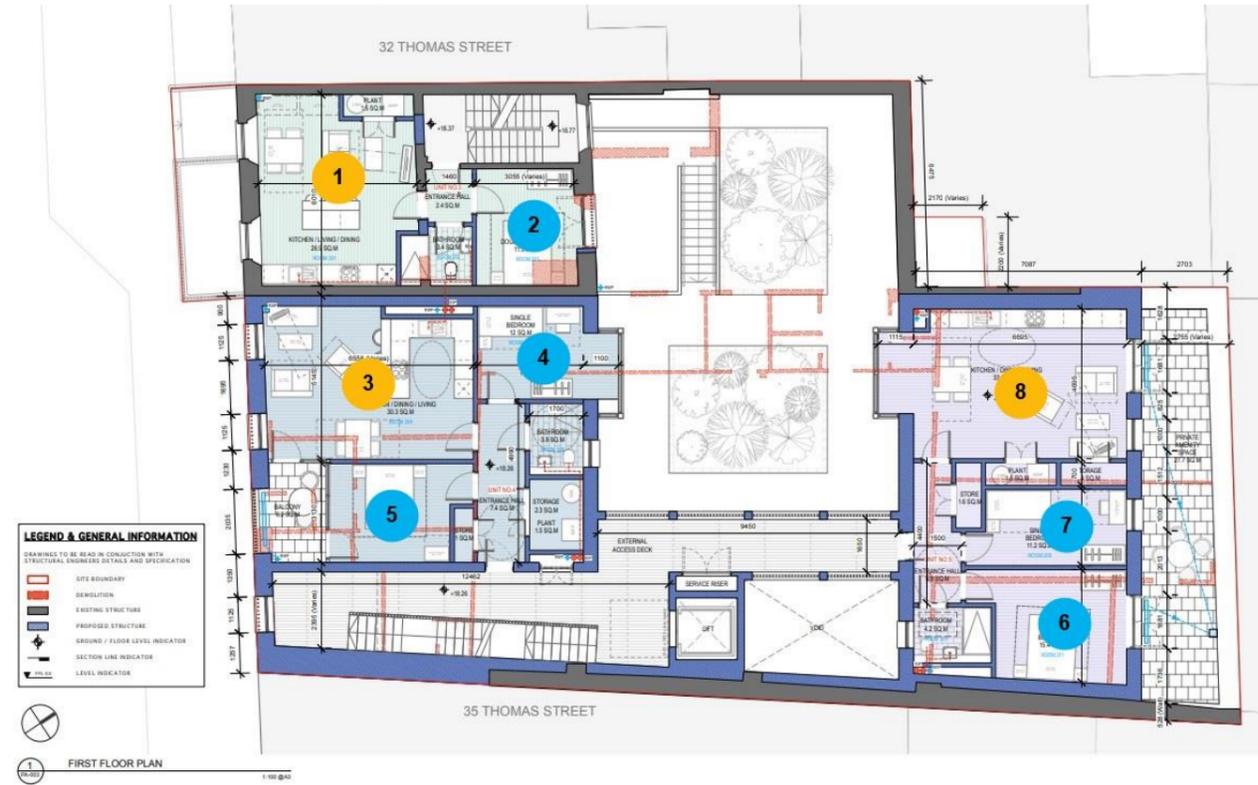
Radiance Plot



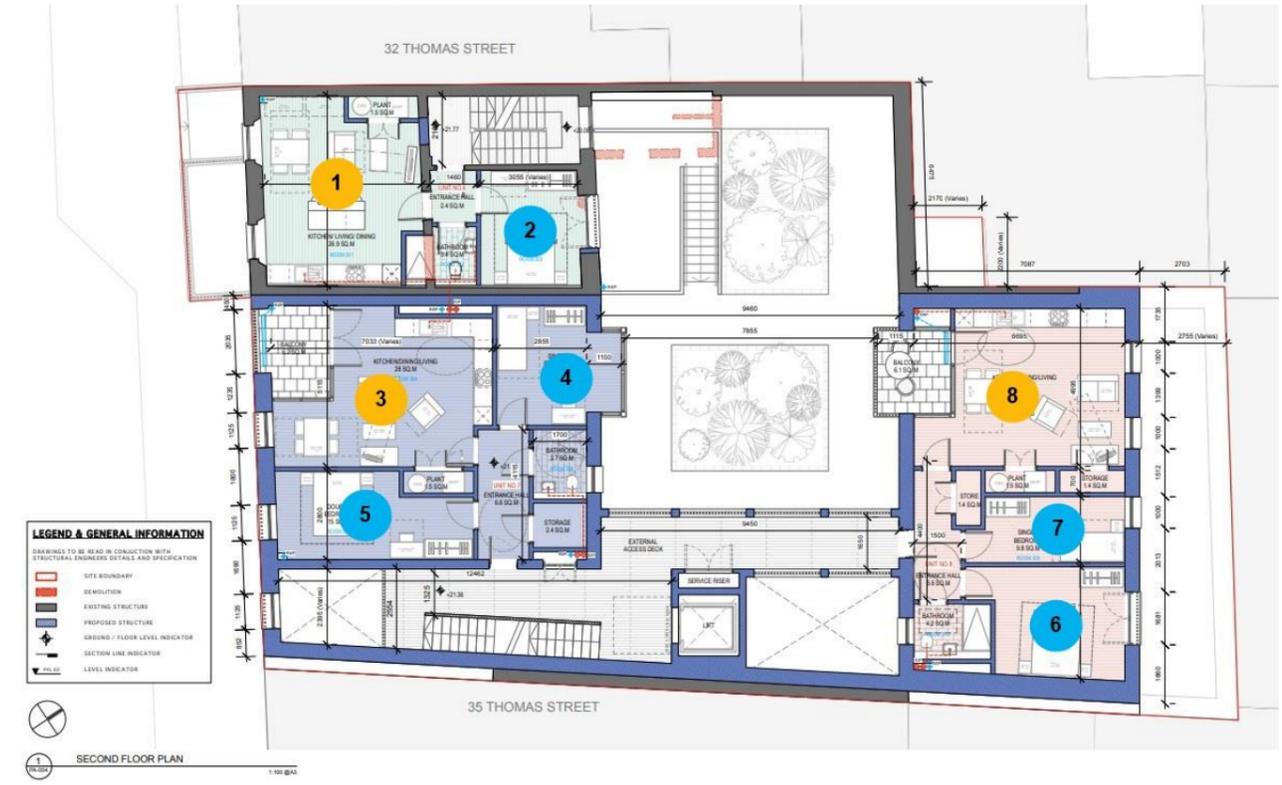
Radiance Plot



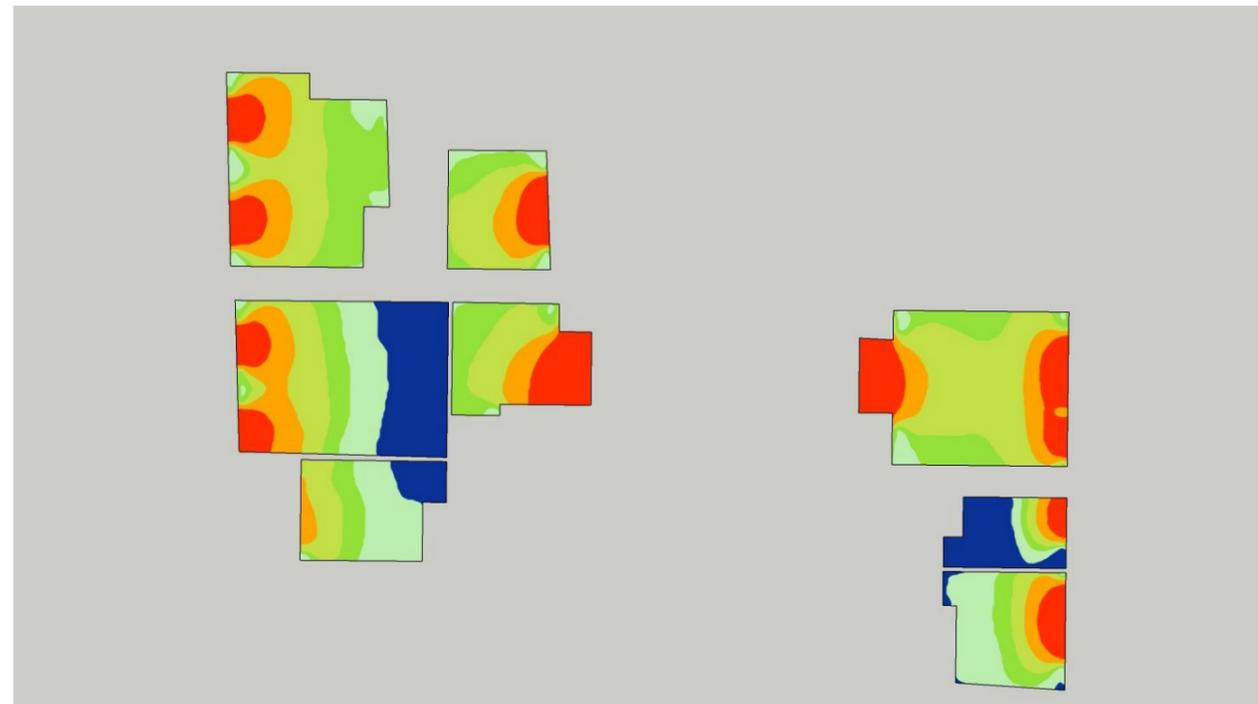
1st Floor Layout - Naming Convention



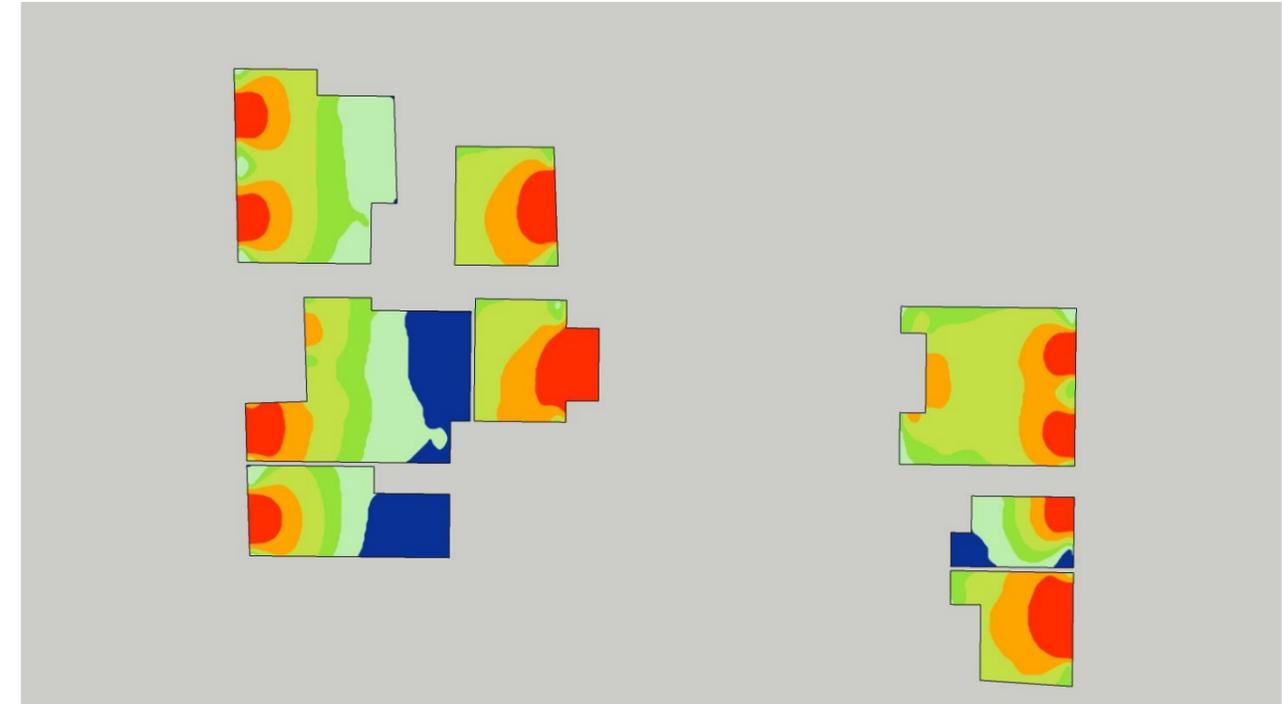
2nd Floor Layout - Naming Convention



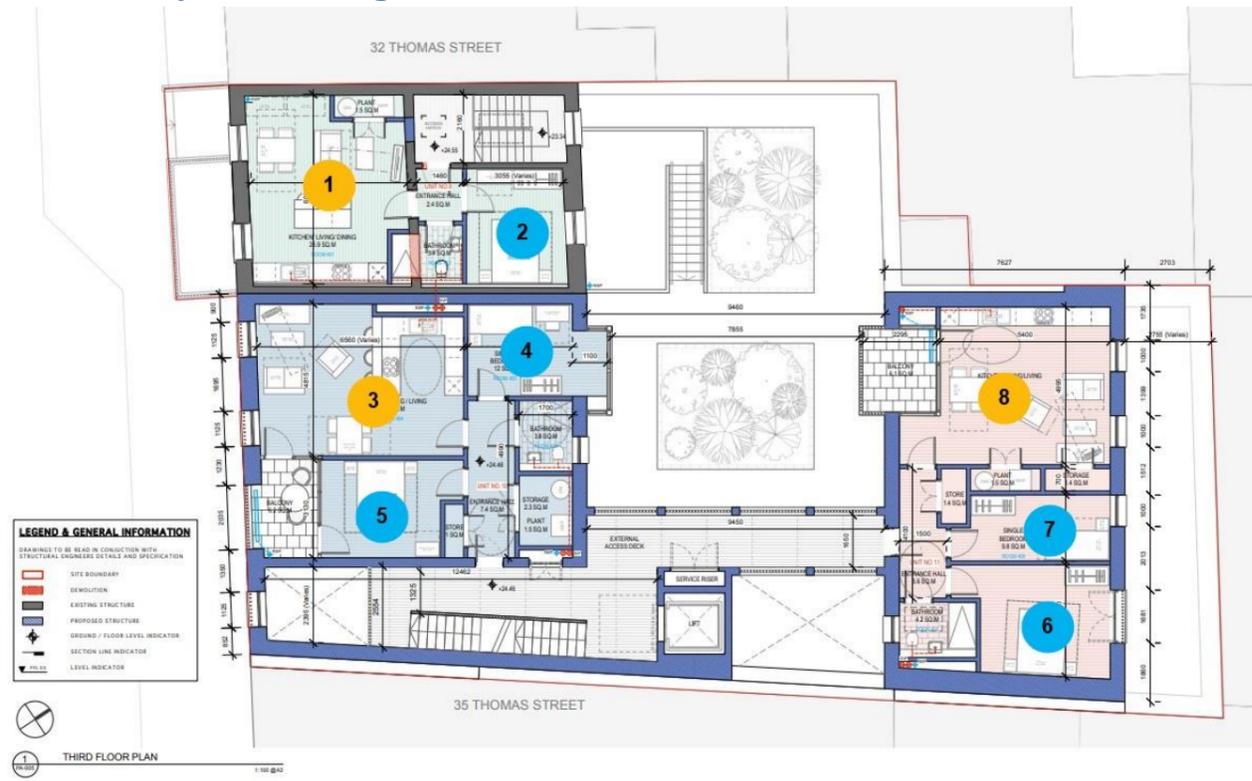
Radiance Plot



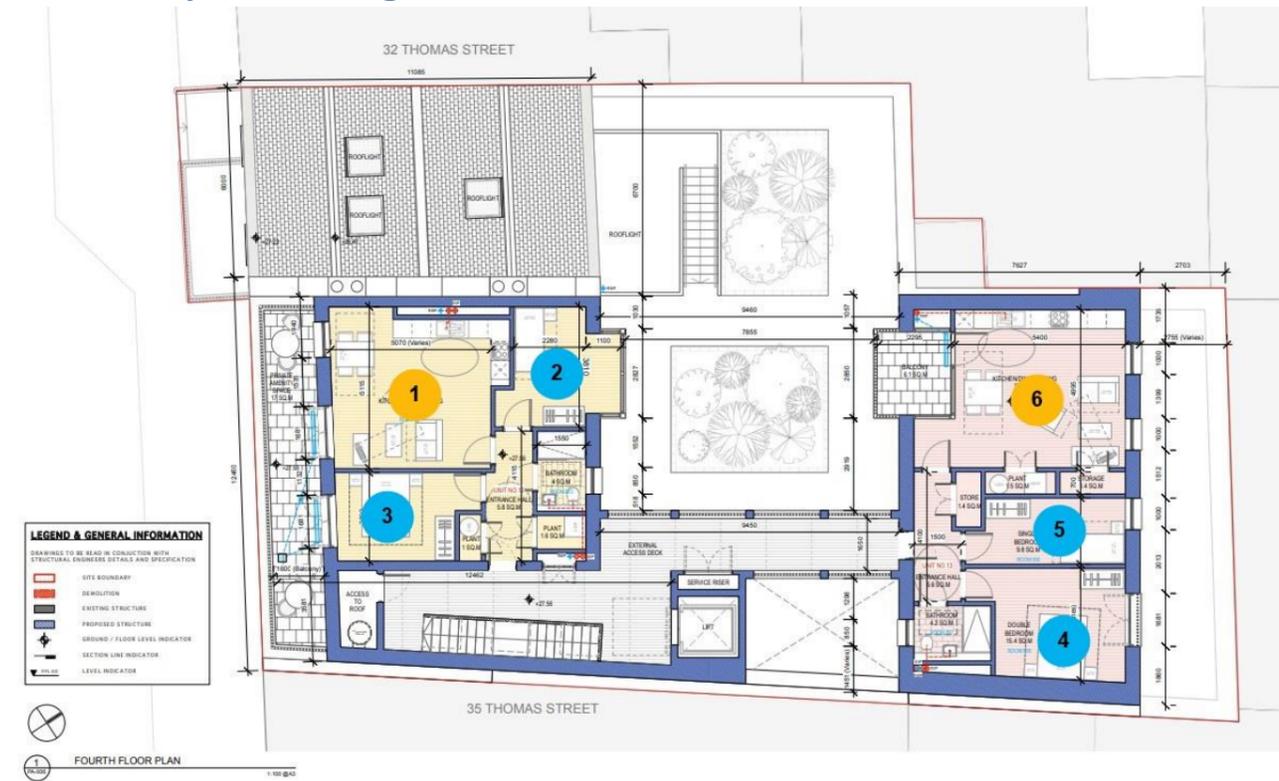
Radiance Plot



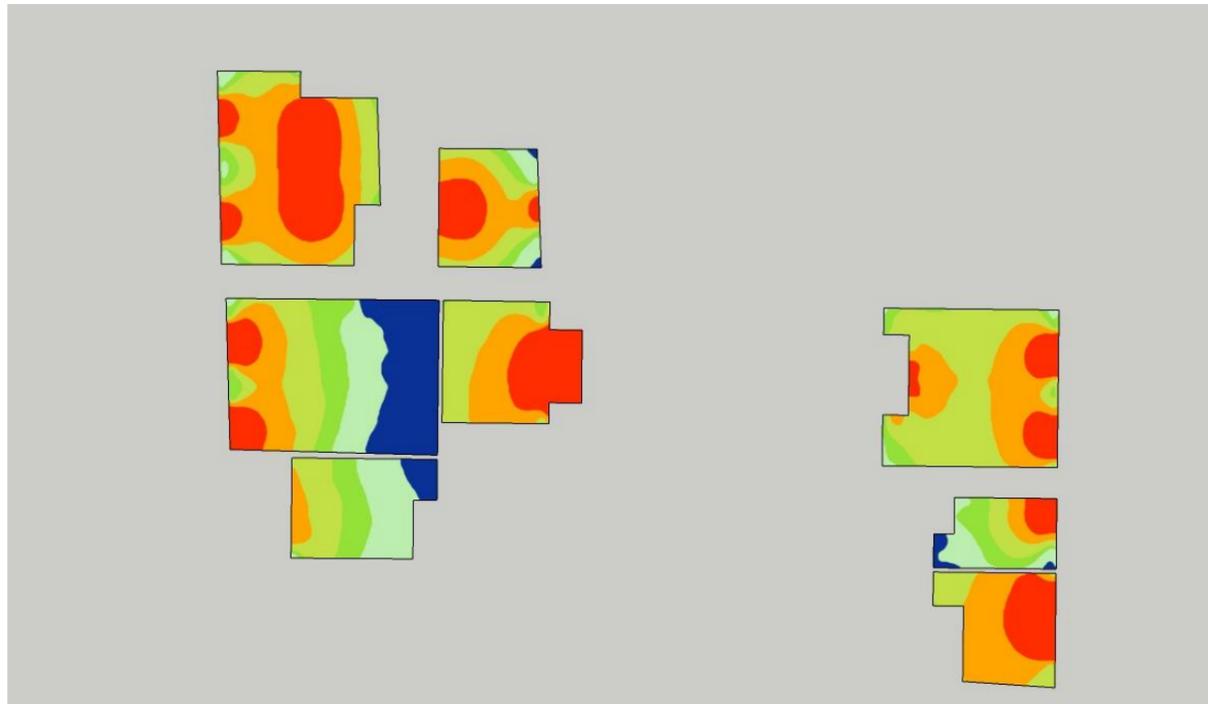
3rd Floor Layout - Naming Convention



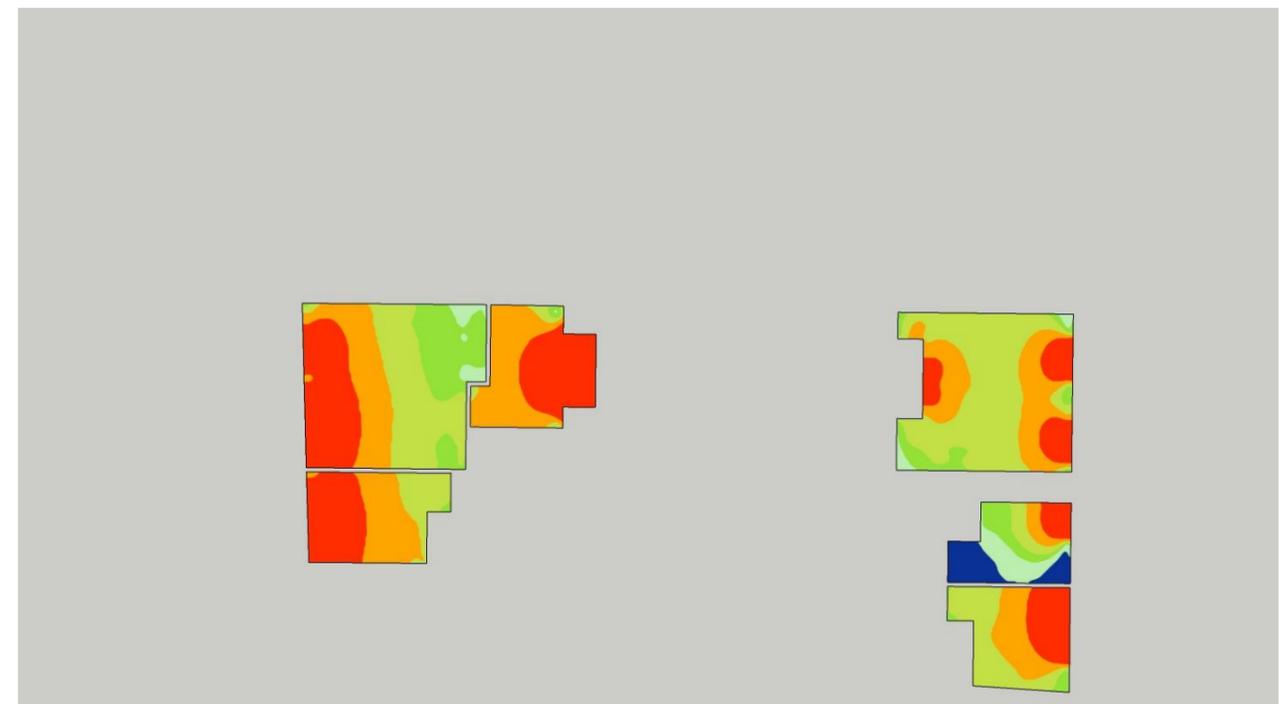
4th Floor Layout - Naming Convention



Radiance Plot



Radiance Plot



NA.2 Minimum daylight provision				
<i>For all habitable rooms</i>				
Location		14,900	<i>lx</i>	
>50 % of the points on a reference plane to exceed				
	Type			
		Percentage within	BS/EN17037 Annex AN	
Ref	Type	Target Lux	Target Lux	Check
-1-01c	Living/Kitchen	14	200	Fail
-1-02	Bedroom	17	100	Fail
00-01c	Living/Kitchen	65	200	Pass
00-02	Bedroom	92	100	Pass
01-01c	Living/Kitchen	59	200	Pass
01-02	Bedroom	100	100	Pass
01-03c	Living/Kitchen	38	200	Fail
01-04	Bedroom	100	100	Pass
01-05	Bedroom	86	100	Pass
01-06	Bedroom	97	100	Pass
01-07	Bedroom	35	100	Fail
01-08c	Living/Kitchen	80	200	Pass
02-01c	Living/Kitchen	52	200	Pass
02-02	Bedroom	100	100	Pass
02-03c	Living/Kitchen	33	200	Fail
02-04	Bedroom	100	100	Pass
02-05	Bedroom	67	100	Pass
02-06	Bedroom	100	100	Pass
02-07	Bedroom	78	100	Pass
02-08c	Living/Kitchen	82	200	Pass
03-01c	Living/Kitchen	94	200	Pass
03-02	Bedroom	98	100	Pass
03-03c	Living/Kitchen	38	200	Fail
03-04	Bedroom	100	100	Pass
03-05	Bedroom	86	100	Pass
03-06	Bedroom	100	100	Pass
03-07	Bedroom	88	100	Pass
03-08c	Living/Kitchen	93	200	Pass
04-01c	Living/Kitchen	77	200	Pass
04-02	Bedroom	100	100	Pass
04-03	Bedroom	100	100	Pass
04-04	Bedroom	100	100	Pass
04-05	Bedroom	72	100	Pass
04-06c	Living/Kitchen	86	200	Pass
			Count	34
			Pass	28
			Pass rate Annex NA	82%

Summary

The majority of rooms fully comply with requirements. There are compensatory factors outlined in the Architects Commentary relating to the design and specifics.

82% of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.

The average complaint areas achieving the relevant target Lx for all bedrooms is 87% and all Living/Kitchen spaces 63% 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.

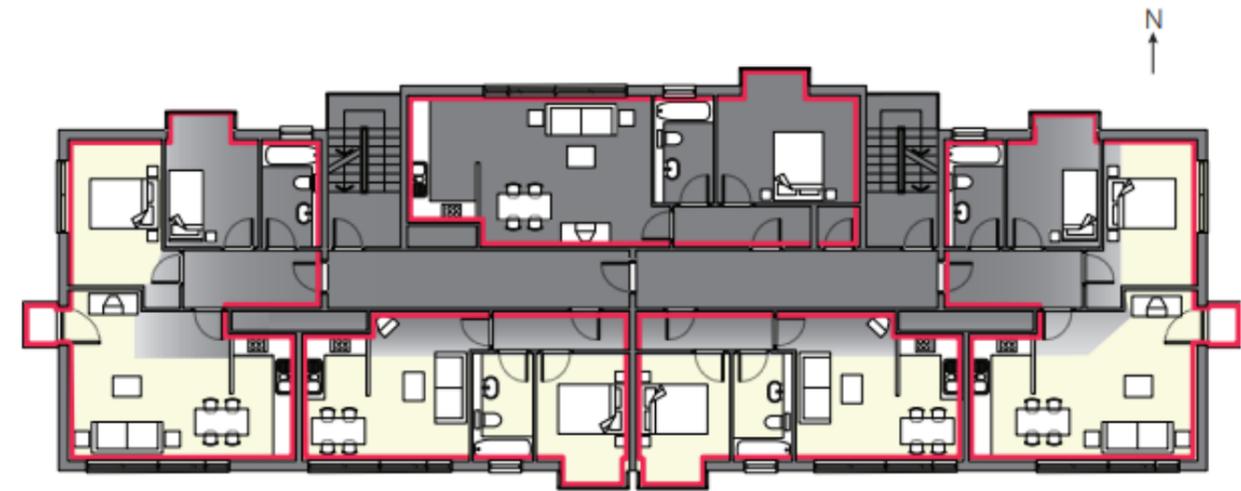


Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

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.

Sunlight to rooms						
Receives 1.5 hours of sunlight on 21st March						
Block	Floor	Window/Room	Ref	Hrs of Sun	Pass	Quality
A	F-1	R01	A.-1.01	5.5	Pass	High
A	F0	R01	A.0.01	8.7	Pass	High
A	F1	R01	A.1.01	8.7	Pass	High
A	F1	R03	A.1.03	7.7	Pass	High
A	F1	R08	A.1.08	0.0	Fail	
A	F2	R01	A.2.01	8.7	Pass	High
A	F2	R03	A.2.03	7.7	Pass	High
A	F2	R08	A.2.08	0.5	Fail	
A	F3	R01	A.3.01	8.7	Pass	High
A	F3	R03	A.3.03	7.7	Pass	High
A	F3	R08	A.3.08	3.3	Pass	Medium
A	F4	R01	A.4.01	8.8	Pass	High
A	F3	R06	A.3.06	4.8	Pass	High
				Count	13	
				Pass	11	0 1 10
				Pass Rate	85%	

85% of living room windows comply with the requirement and this is generally consistent with the guidelines example of “careful layout” design 80%, especially given that this is a city infill development.

Summary

Sunlight to living rooms:

85% of all Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
This is consistent with the BRE defined “careful layout design” 80% target.

Development Performance - 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 shared amenity space sits to the North of the Georgian building and between it and the rear extension. The orientation of the site means that light will not penetrate this space on the 21st March.

No test results are provided, but please refer to the Architects commentary.

Conclusion

The Shared Amenity space sits to the North of the historic Georgian Building

The space will not receive sunlight on the test day 21st March

The Architect has provided commentary / compensatory measures relating to this item.

Architects Commentary Compensatory Measures.

General comment on site:

The site is constrained by its city centre location, site shape and orientation. As an urban infill scheme with competing design constraints and objectives it is specifically covered by clause 6.7 of the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, 2020*:

6.6 Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in 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' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

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

Shared amenity space compensatory measures:

The site has specific constraints pertaining to its North/South orientation, its historical context and city centre location which directly affects the daylight/sunlight opportunities within the proposed development. As it can be seen on the diagram – Shadow / Sunlight Amenity, the area doesn't comply with the BRE guidelines. The low level of daylight received is due to the existing Georgian building which sits to the south of the shared amenity space and directly impacts on the amount of daylight reaching the shared amenity space. It is proposed to use shade tolerant plants in the courtyard to ensure that the planters are green all year round. Where possible private balconies and terraces are south and southwest facing as a compensatory measure for residents. It is noted that the proposed development's proximity to a number of public parks provide another compensatory measure for residents against the lack of daylight/sunlight received by the shared amenity space.

Minimum Daylight provision compensatory measures:

It is noted that some of the rooms do not comply with the BRE guidelines. For rooms ref. 01-03 & 03-03 on the table it is noted that the fenestration positions and sizes for these rooms are fixed by the Georgian façade. These rooms also exceed the minimum areas required in the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, 2020*. The over provision of roughly 15% should compensate the results. It is also noted that these rooms have direct access to private balconies which provide generous, south facing amenity spaces for these apartments.

All efforts have been made to comply with the BRE guidelines but in certain circumstances, due to design constraints, a small percentage of rooms receive limited sunlight due to orientation and location. A variety of compensatory measures were taken including, increased floor areas, dual aspect apartments, glass railings etc.

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**
 - **76%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
 - The average complaint areas achieving the relevant target Lx for
 - all bedrooms is **87%** and
 - all Living/Kitchen spaces **63%**
 - both are well in excess of the minimum required 50%
- **Sunlight to rooms:**
 - **85%** of Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
 - This is consistent with the BRE defined "careful layout design" 80% target.
- **Sunlight on the Ground SOG (Shadow)**
 - The Shared Amenity space sits to the North of the historic Georgian Building
 - The space will not receive sunlight on the test day 21st March
- **See Architects commentary for compensatory measures.**

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

Summary – Overall

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

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

- **Skylight- VSC**
 - **100%** of the tested windows comply with the 27%, 0.8 ratio requirements for habitable rooms.
 - The average change ratio for VSC is **0.94**
- **Sunlight APSH & WPSH**
 - **100%** of tested windows comply with the annual APSH and
 - **100%** with the winter WPSH requirements for sunlight or overall requirement.
 - The average change ratio for sunlight is APSH:**0.96** and WPSH: **0.88**
- **Sunlight on the Ground SOG (Shadow)**
 - We cannot identify any amenity spaces that needs testing as the rear development is practically full ground floor coverage

Performance of the proposed design

- **Target Illuminance E_r**
 - **76%** of rooms comply with the BS/EN 17037 Annex NA room targets for 50% of the floor area tested.
 - The average complaint areas achieving the relevant target Lx for
 - all bedrooms is **87%** and
 - all Living/Kitchen spaces **63%**
 - both are well in excess of the minimum required 50%
- **Sunlight to rooms:**
 - **85%** of Living rooms receive 1.5hrs of sunlight on the test day of the 21st March
 - This is consistent with the BRE defined "careful layout design" 80% target.
- **Sunlight on the Ground SOG (Shadow)**
 - The Shared Amenity space sits to the North of the historic Georgian Building
 - The space will not receive sunlight on the test day 21st March
- **See Architects commentary for compensatory measures.**

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