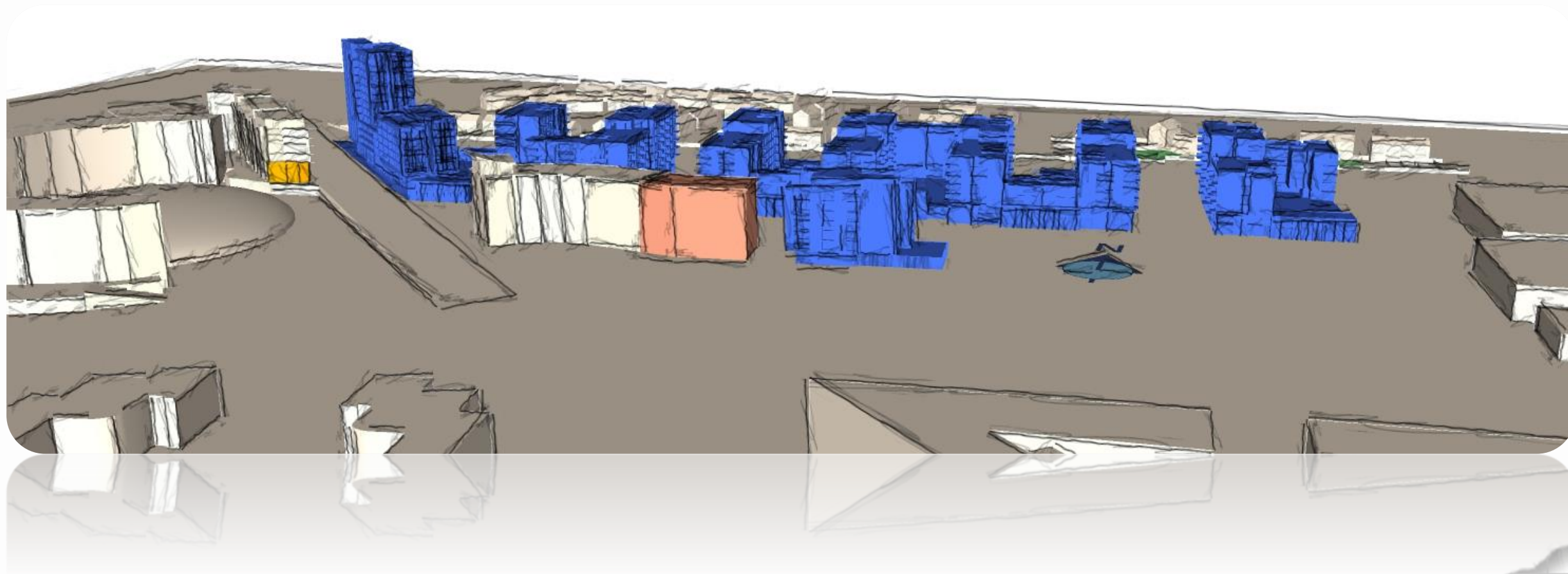


PARK WEST SHD

AT PARK WEST AVENUE AND PARK WEST ROAD, PARK WEST, DUBLIN 12.

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

V1



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" and BS 8206 Lighting for Buildings, Part 2: Code of Practice for Daylighting.

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:**
 - All facades with windows tested for Window Groups B1, B2 & B3 comply with the BRE requirements
 - The average change ratio for VSC is **0.89**
 - The facades of Window Group B4 comply against Appendix F mirrored development target as defined in this document.
- **Sunlight APSH & WPSH:**
 - All relevant and tested windows of Window Groups B1, B2 & B3 pass the relevant Annual APSH, Winter WPSH or overall sunlight checks.
 - The average change ratio annual is APSH: **0.88**
 - Facing windows to Window Group B4 are not orientated within 90° of due South and are not tested.
- **Shadow:**
 - All tested neighbouring gardens pass the 2-hour test requirements for the 21st March.
 - The average change ratio for shadow/sunlight is **0.99**

Performance of the proposed design

- **Light Distribution ADF:**
 - On the tested representative floors
 - 97% of rooms (99% if we include marginals) comply with the Strict BRE Guidelines
 - All pass the relaxed 1.5% target
 - Average high ADFs for all tested living rooms is 2.5% and for bedrooms 1.7%
 - Additional testing was also completed for the Ground & 1st Floors (Appendices 1 & 2)
 - When all tested rooms on all tested floors are taken into account the compliance rate with the strict BRE rises to 98% and against the relaxed target 99.7%
 - Almost all of the rooms which fail to achieve the strict target are marginal
 - The results for floors above the representative levels tested will of course improve since at higher levels the obstruction to skylight caused by surrounding blocks will lessen.

- **Sunlight to Living rooms:**
 - All Living rooms receive some sunlight over the course of the year.
 - In terms Strict BRE the percentage pass rate is 56% Annual and 85% Winter WPSH
 - However, there are many rooms which receive good sunlight and are marginal on the BRE targets. If we include the marginal results 73% pass a relaxed Annual APSH requirements and 91% pass the WPSH which is broadly in line with the guidelines example of "careful" design 80%.
 - These results should be considered in conjunction with the high daylight ADF results and balcony performance achieved throughout.
- **Shadow:**
 - All new provided shared amenity spaces pass the BRE requirement relating to the area receiving 2 hours of sunlight on the 21st of March > 50%.
 - 90% of the Private balconies also receive qualifying sunlight over most of their surface on the test day of the 21st March.
 - The number of balconies that face North is minimal and consistent with the BRE guidelines "Careful Layout Design" criteria.

Architects' Commentary and Compensatory Measures

The Architect has provided a commentary in which they have outlined how specific care was taken in this development's design in regard to light for both the impact on neighbours and the performance of the proposed residential units and their amenities.

As part of the design process the design went through a considerable iterative analysis to achieve the results presented here.

The Architect also provides a range of compensatory elements to offset any marginal results and proposed design generally achieves the relevant targets while balancing the other constraints.

WE WOULD DIRECT THE READER TO THIS SPECIFIC COMMENTARY AND TO THE ARCHITECT'S OWN REPORT ON THE DESIGN.

The application generally complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE 2011) and BS 8206 Lighting for Buildings and Part 2: Code of Practice for Daylighting.

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.

Introduction

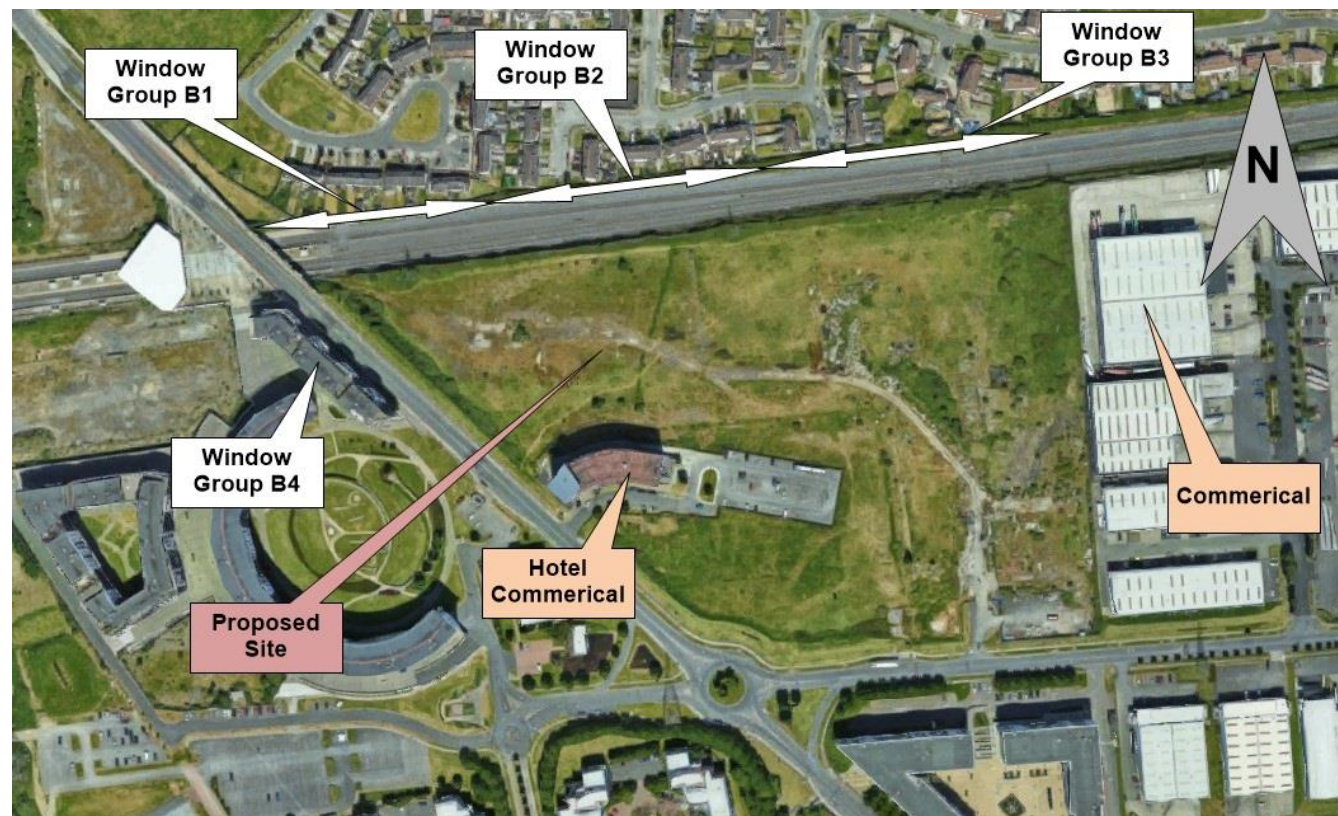
Chris Shackleton Consulting (CSC) have been asked to examine the impact that the proposed development will have on the existing neighbouring properties in terms of sunlight, daylight & shadow. The proposed development consists of 7 x apartment blocks on a greenfield site. We have also been asked to examine 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 (BRE 2011) and BS 8206 Lighting for Buildings and Part 2: Code of Practice for Daylighting.

All references quoted in this report are from BRE document "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice – Second Edition – 2011 (BR 209) by Paul Littlefair" 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 2021

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. The analysis is based on the information provided.

Here "Cream" indicates surrounding environment, "Purple" the existing development to be demolished, "Blue" this proposal. Additional colours "orange" shows the commercial element of the adjacent apartments and "red" an extant extension to the Hotel



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:

- Light distribution Average Daylight Factor – ADF – All habitable rooms
- Sunlight availability - Living room spaces APSH/WPSH.
- Shadow performance proposed shared amenity spaces
 - We have also provided results for the private balcony spaces

When examining the internal performance of the development we note that the layout and rooms follow similar design principles floor to floor. When testing the blocks performance, we have chosen to test the entire floor the following levels to provides a good representative indication of the overall building performance.

- Block A – 3rd Floor, Blocks B, C, D, E & F – 2nd Floor & Block G – 1st Floor

Following pre-app discussions, it was also agreed to run the ADF analysis for the lower floors Ground and 1st these are presented in Appendixes 1 & 2 and the results and summaries are also referenced in the main report.

Adjacent Properties Details

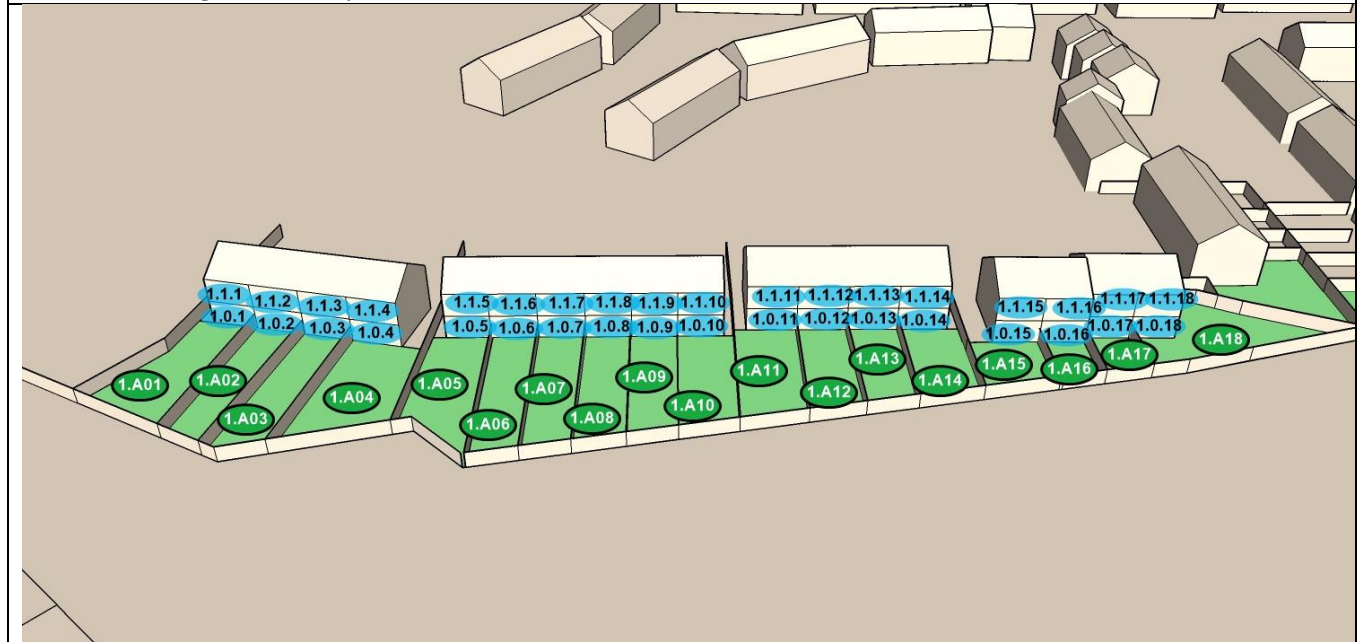
The numbering used later for windows in each of the Window Groups is detailed below.

Neighbours – (Window Group B1)

Oblique imagery © Google 2021



Windows facing the development



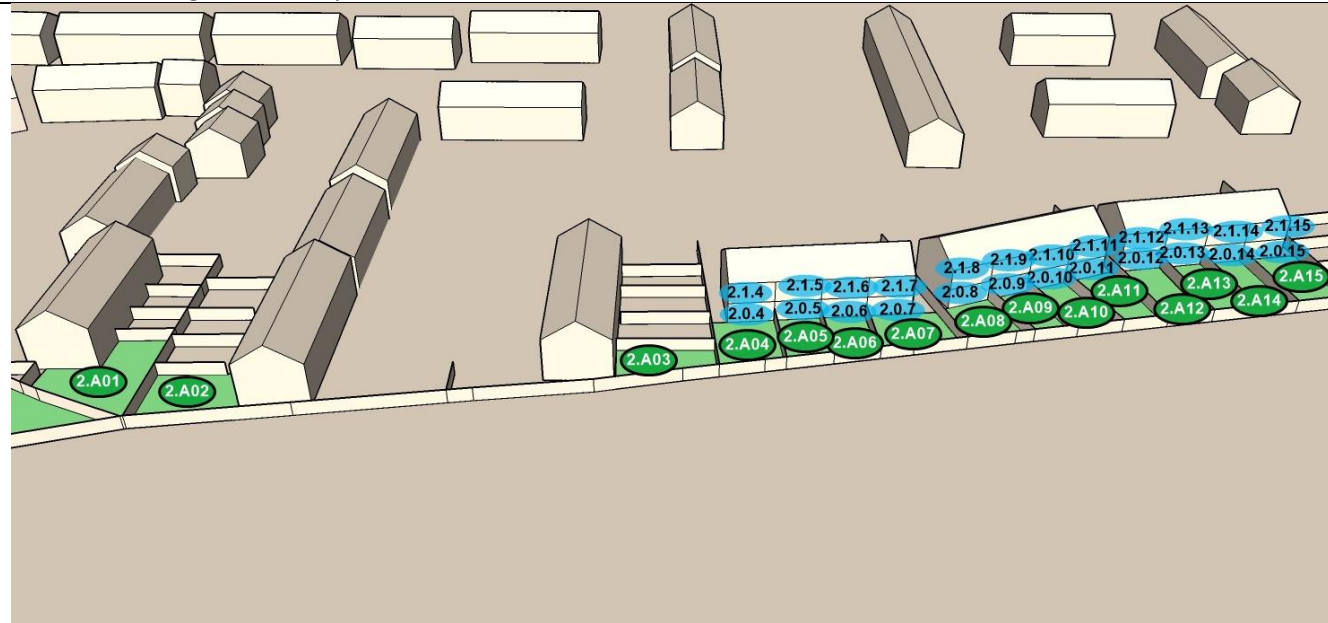
The rear of these private residential houses has not been surveyed. For testing purposes the center point of the façade at both Ground at 1st floor levels are tested. The numbering used later in this report for this group of windows is indicated in cyan above. Amenity spaces (gardens) are noted in green

Neighbours – (Window Group B2)

Oblique imagery © Google 2021



Windows facing the development



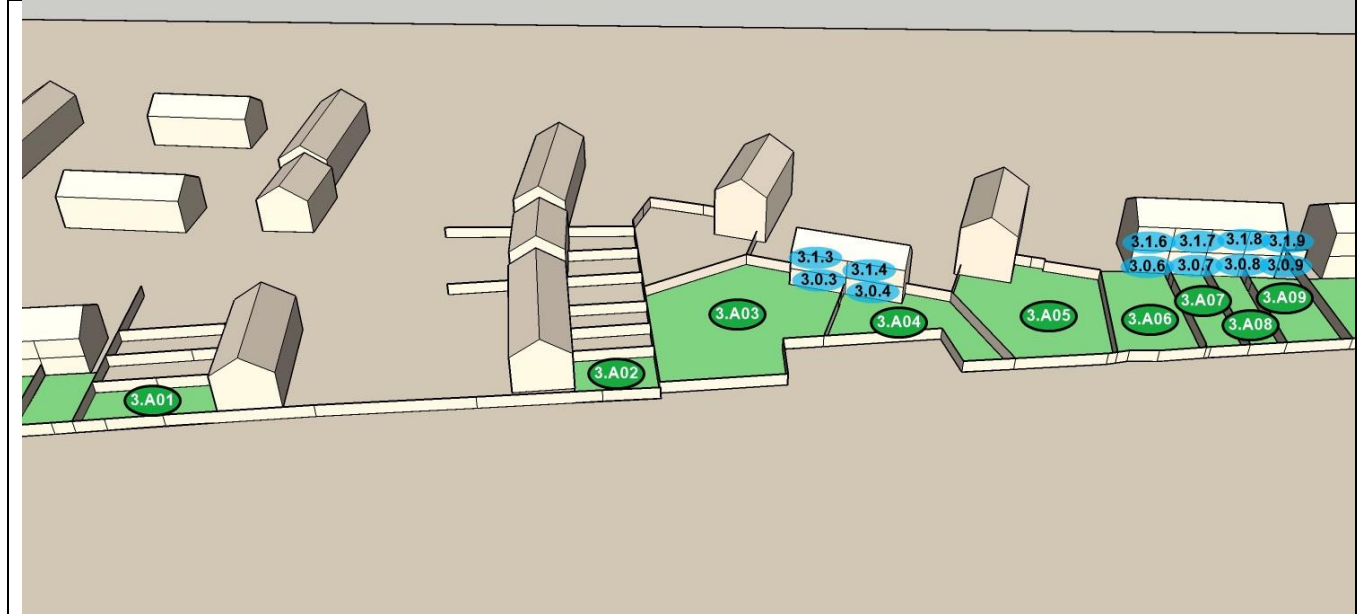
The rear of these private residential houses has not been surveyed. For testing purposes the center point of the façade at both Ground at 1st floor levels are tested. The numbering used later in this report for this group of windows is indicated in cyan above.
Amenity spaces (gardens) are noted in green

Neighbours – (Window Group B3)

Oblique imagery © Google 2021



Windows facing the development



The rear of these private residential houses has not been surveyed. For testing purposes the center point of the façade at both Ground at 1st floor levels are tested. The numbering used later in this report for this group of windows is indicated in cyan above.
Amenity spaces (gardens) are noted in green

Neighbours – (Window Group B4)

Oblique imagery © Google 2021



Windows facing the development



The main elements of the adjacent apartment have been modeled but specific fenestration has not been surveyed. For testing purposes the center point of the relevant façade element on residential levels 2nd .. 5th have been tested. Ground and 1st floors are commercial. The numbering used later in this report for this group of windows is indicated in cyan above.

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. 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 0.8 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 more gloomy, 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. . . .

In the results presented here with the lack of access to survey facades in private property the term window refers to a façade in which there are one or more windows.

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	33.5	32.1	0.96	Pass
B1	F0	W2	1.0.2	33.6	31.8	0.95	Pass
B1	F0	W3	1.0.3	33.6	31.5	0.94	Pass
B1	F0	W4	1.0.4	34.0	31.1	0.92	Pass
B1	F0	W5	1.0.5	33.7	30.0	0.89	Pass
B1	F0	W6	1.0.6	33.8	29.7	0.88	Pass
B1	F0	W7	1.0.7	33.9	29.5	0.87	Pass
B1	F0	W8	1.0.8	34.0	29.2	0.86	Pass
B1	F0	W9	1.0.9	34.1	29.1	0.85	Pass
B1	F0	W10	1.0.10	34.6	28.9	0.84	Pass
B1	F0	W11	1.0.11	34.5	28.9	0.84	Pass
B1	F0	W12	1.0.12	34.7	28.9	0.83	Pass
B1	F0	W13	1.0.13	34.8	28.9	0.83	Pass
B1	F0	W14	1.0.14	34.7	28.5	0.82	Pass
B1	F0	W15	1.0.15	35.2	28.9	0.82	Pass
B1	F0	W16	1.0.16	35.0	28.7	0.82	Pass
B1	F0	W17	1.0.17	34.3	28.0	0.82	Pass
B1	F0	W18	1.0.18	35.6	28.9	0.81	Pass
B1	F1	W1	1.1.1	35.4	33.7	0.95	Pass
B1	F1	W2	1.1.2	35.3	33.3	0.94	Pass
B1	F1	W3	1.1.3	35.2	32.8	0.93	Pass
B1	F1	W4	1.1.4	35.2	32.4	0.92	Pass
B1	F1	W5	1.1.5	35.3	31.2	0.88	Pass
B1	F1	W6	1.1.6	35.5	31.0	0.87	Pass
B1	F1	W7	1.1.7	35.6	30.8	0.86	Pass
B1	F1	W8	1.1.8	35.7	30.5	0.86	Pass
B1	F1	W9	1.1.9	35.8	30.3	0.85	Pass
B1	F1	W10	1.1.10	35.9	30.2	0.84	Pass
B1	F1	W11	1.1.11	36.0	30.1	0.84	Pass
B1	F1	W12	1.1.12	36.2	30.1	0.83	Pass
B1	F1	W13	1.1.13	36.2	30.2	0.83	Pass
B1	F1	W14	1.1.14	36.2	30.1	0.83	Pass
B1	F1	W15	1.1.15	36.5	30.0	0.82	Pass
B1	F1	W16	1.1.16	36.5	30.1	0.82	Pass
B1	F1	W17	1.1.17	36.1	29.7	0.82	Pass
B1	F1	W18	1.1.18	36.7	30.3	0.83	Pass

Skylight to habitable rooms							
VSC							
Report	Check > 27% or ratio > 0.8						
Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result
B2	F0	W4	2.0.4	36.1	31.1	0.86	Pass
B2	F0	W5	2.0.5	36.3	31.2	0.86	Pass
B2	F0	W6	2.0.6	36.4	31.1	0.86	Pass
B2	F0	W7	2.0.7	37.1	31.1	0.84	Pass
B2	F0	W8	2.0.8	37.0	31.3	0.85	Pass
B2	F0	W9	2.0.9	36.7	31.3	0.85	Pass
B2	F0	W10	2.0.10	36.8	31.4	0.85	Pass
B2	F0	W11	2.0.11	37.1	31.4	0.85	Pass
B2	F0	W12	2.0.12	36.9	31.2	0.85	Pass
B2	F0	W13	2.0.13	36.8	31.1	0.85	Pass
B2	F0	W14	2.0.14	36.7	31.0	0.85	Pass
B2	F0	W15	2.0.15	37.1	30.9	0.83	Pass
B2	F1	W4	2.1.4	37.5	32.3	0.86	Pass
B2	F1	W5	2.1.5	37.6	32.3	0.86	Pass
B2	F1	W6	2.1.6	37.7	32.3	0.86	Pass
B2	F1	W7	2.1.7	37.8	32.3	0.85	Pass
B2	F1	W8	2.1.8	38.1	32.5	0.85	Pass
B2	F1	W9	2.1.9	38.1	32.6	0.85	Pass
B2	F1	W10	2.1.10	38.1	32.6	0.86	Pass
B2	F1	W11	2.1.11	38.2	32.6	0.86	Pass
B2	F1	W12	2.1.12	38.1	32.4	0.85	Pass
B2	F1	W13	2.1.13	38.1	32.4	0.85	Pass
B2	F1	W14	2.1.14	38.1	32.3	0.85	Pass
B2	F1	W15	2.1.15	38.1	32.2	0.85	Pass
B3	F0	W3	3.0.3	37.3	33.4	0.90	Pass
B3	F0	W4	3.0.4	37.7	33.4	0.89	Pass
B3	F0	W6	3.0.6	38.2	35.2	0.92	Pass
B3	F0	W7	3.0.7	38.2	35.4	0.93	Pass
B3	F0	W8	3.0.8	38.3	35.6	0.93	Pass
B3	F0	W9	3.0.9	38.3	35.7	0.93	Pass
B3	F1	W3	3.1.3	38.3	34.6	0.90	Pass
B3	F1	W4	3.1.4	38.4	34.3	0.90	Pass
B3	F1	W6	3.1.6	38.7	36.2	0.94	Pass
B3	F1	W7	3.1.7	38.8	36.4	0.94	Pass
B3	F1	W8	3.1.8	38.8	36.5	0.94	Pass
B3	F1	W9	3.1.9	38.8	36.7	0.95	Pass

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

Window Group 4

The windows of Window Group 4 face the proposal and sit tight to Park West Avenue looking out over the current greenfield site where this development is proposed.



The guidelines provide clear direction in how developers and planners should approach these cases and how numerical target values within it may be varied to meet the needs of the development and its location.

Appendix F explains how this can be done in a logical way, while retaining consistency with the British Standard recommendations on interior daylighting.

Clause 2.2.3 Refers

2.2.3 Note that numerical values given here are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints. Another important issue is whether the existing building is itself a good neighbour, standing a reasonable distance from the boundary and taking no more than its fair share of light. Appendix F gives further guidance.

And Appendix F clarifies how to handle neighbours whose windows are close to site boundaries as is the case here.

F5 A similar approach may be adopted in cases where an existing building has windows that are unusually close to the site boundary and taking more than their fair share of light. Figure F3 shows an example, where side windows of an existing building are close to the boundary. To ensure that new development matches the height and proportions of existing buildings, the VSC and APSH targets for these windows could be set to those for a 'mirror-image' building of the same height and size, an equal distance away on the other side of the boundary.

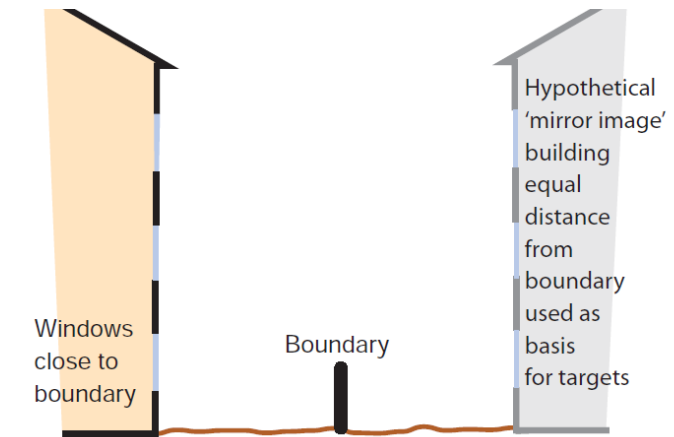
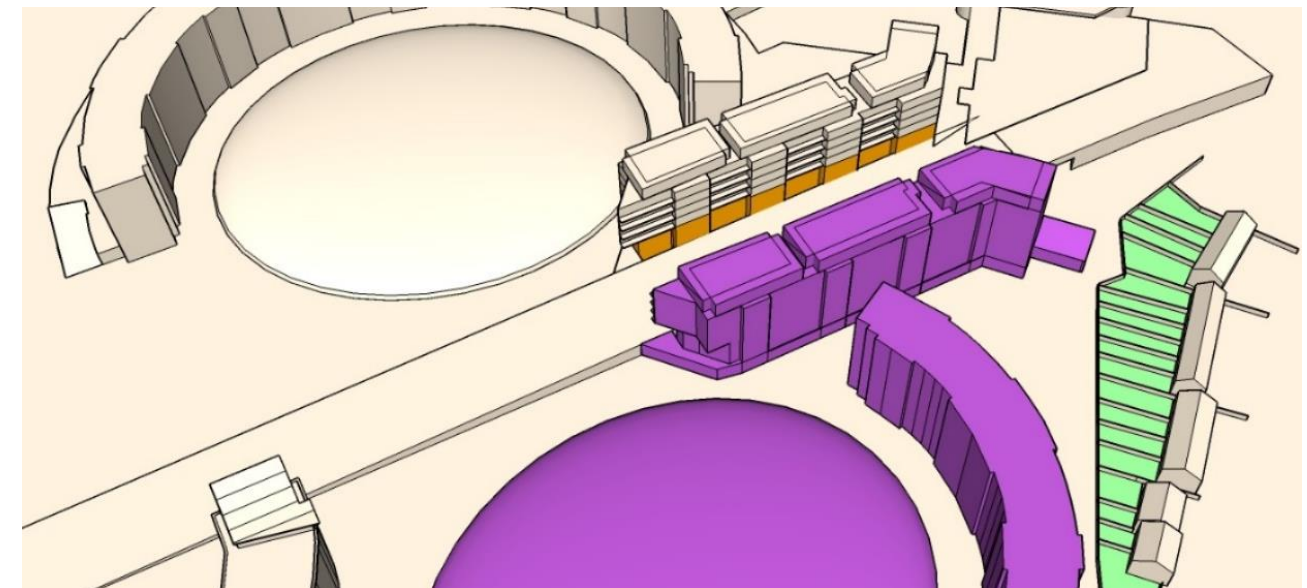


Figure F3: Use of a hypothetical mirror image building to set target daylight values

Mirrored Design Model

The image below shows the mirrored Development in "magenta" and the available skylight is used as the baseline reference for the VSC checks.



Adjacent Window Group B4 - Light from the Sky impact Neighbours

Tests for the quantity and quality of skylight (daylight) available to the room's windows. Locations are tested are based on guideline recommendations for the closest facades. In this case the first residential level is used to set targets for this floor and the ones above it. The Ground & 1st floor windows are excluded from the analysis as they are commercial.

This has been investigated under clause 2.2.7 on the basis of the mirrored development targets.

Revised targets for the neighbouring property. These are based on the mirrored development and targets are set at the first residential level which is the 2nd floor.

We will test the against these defined targets for all higher levels.

Tabulated results against the Mirrored Targets above.

Skylight to habitable rooms							
VSC							
Report	Check (Mirrored Target) or ratio > 0.8						
Group	Floor	Win	Ref	2nd Floor		Ratio	Result
				Mirrored	Proposed		
B4	F2	W1	4.2.1	27.7	24.2	0.87	Pass
B4	F2	W2	4.2.2	25.0	22.5	0.90	Pass
B4	F2	W3	4.2.3	23.3	19.0	0.81	Pass
B4	F2	W4	4.2.4	24.0	19.0	0.79	Marginal
B4	F2	W5	4.2.5	23.2	20.6	0.89	Pass
B4	F2	W6	4.2.6	24.9	27.2	1.09	Pass
B4	F2	W7	4.2.7	25.2	29.4	1.16	Pass
B4	F2	W8	4.2.8	28.9	34.5	1.19	Pass
B4	F3	W1	4.3.1	27.7	26.8	0.97	Pass
B4	F3	W2	4.3.2	25.0	24.8	0.99	Pass
B4	F3	W3	4.3.3	23.3	20.8	0.89	Pass
B4	F3	W4	4.3.4	24.0	20.2	0.84	Pass
B4	F3	W5	4.3.5	23.2	21.7	0.94	Pass
B4	F3	W6	4.3.6	24.9	27.8	1.12	Pass
B4	F3	W7	4.3.7	25.2	30.0	1.19	Pass
B4	F3	W8	4.3.8	28.9	34.8	1.21	Pass
B4	F4	W1	4.4.1	27.7	29.2	1.06	Pass
B4	F4	W2	4.4.2	25.0	26.9	1.07	Pass
B4	F4	W3	4.4.3	23.3	22.8	0.98	Pass
B4	F4	W4	4.4.4	24.0	21.5	0.89	Pass
B4	F4	W5	4.4.5	23.2	23.2	1.00	Pass
B4	F4	W6	4.4.6	24.9	28.4	1.14	Pass
B4	F4	W7	4.4.7	25.2	31.1	1.23	Pass
B4	F4	W8	4.4.8	28.9	35.2	1.22	Pass
B4	F5	W1	4.5.1	27.7	31.4	1.13	Pass
B4	F5	W2	4.5.2	25.0	28.6	1.14	Pass
B4	F5	W3	4.5.3	23.3	25.4	1.09	Pass
B4	F5	W4	4.5.4	24.0	22.8	0.95	Pass
B4	F5	W5	4.5.5	23.2	25.4	1.10	Pass
B4	F5	W6	4.5.6	24.9	29.2	1.17	Pass
B4	F5	W7	4.5.7	25.2	32.7	1.29	Pass
B4	F5	W8	4.5.8	28.9	35.6	1.23	Pass

2nd Floor level (1st Residential)

2nd Floor level (1st Residential)				
				VSC
Group	Floor	Win	Ref	Mirrored
B4	F2	W1	4.2.1	27.7
B4	F2	W2	4.2.2	25.0
B4	F2	W3	4.2.3	23.3
B4	F2	W4	4.2.4	24.0
B4	F2	W5	4.2.5	23.2
B4	F2	W6	4.2.6	24.9
B4	F2	W7	4.2.7	25.2
B4	F2	W8	4.2.8	28.9

Conclusion

All facades with windows tested for Window Groups B1, B2 & B3 comply with the BRE requirements
 The average change ratio for VSC is **0.89**
 The facades of Window Group B4 comply against Appendix F mirrored development targets
 The proposed development complies with the requirements of the BRE guidelines in relation to maintaining 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. . . .

3.2.11 . . . 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, or less than 5% of annual probable sunlight hours between 21 September and 21 March and
- receives less than 0.8 times its former sunlight hours during either period and
- 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 relevant. Note only windows which face within 90° of due South require testing and so no results are presented for window Group B4 since they orientate North.

The results are tabulated below:

Sunlight on windows to living room spaces check												
Annual - 25% and Winter - 5%												
Design		Check > 25% or ratio > 0.8						Check > 5% or ratio > 0.8				
Group	Floor	Win	Ref	Existing	Proposed	Ratio	Result	Existing	Proposed	Ratio	Result	
B1	F0	W1	1.0.1	80.2	75.3	0.94	Pass	24.6	19.7	0.80	Pass	
B1	F0	W2	1.0.2	81.3	75.7	0.93	Pass	25.6	20.0	0.78	Pass	
B1	F0	W3	1.0.3	81.2	74.8	0.92	Pass	25.6	19.2	0.75	Pass	
B1	F0	W4	1.0.4	82.3	72.3	0.88	Pass	26.7	16.7	0.63	Pass	
B1	F0	W5	1.0.5	77.5	68.4	0.88	Pass	25.8	16.6	0.64	Pass	
B1	F0	W6	1.0.6	82.9	72.8	0.88	Pass	26.4	16.3	0.62	Pass	
B1	F0	W7	1.0.7	82.8	70.9	0.86	Pass	26.3	14.5	0.55	Pass	
B1	F0	W8	1.0.8	82.4	72.0	0.87	Pass	26.0	15.5	0.60	Pass	
B1	F0	W9	1.0.9	82.4	72.0	0.87	Pass	25.9	15.5	0.60	Pass	
B1	F0	W10	1.0.10	82.8	72.3	0.87	Pass	26.0	15.5	0.60	Pass	
B1	F0	W11	1.0.11	78.2	66.0	0.84	Pass	26.6	14.4	0.54	Pass	
B1	F0	W12	1.0.12	83.1	70.2	0.84	Pass	27.3	14.3	0.52	Pass	
B1	F0	W13	1.0.13	83.4	70.5	0.84	Pass	27.6	14.6	0.53	Pass	
B1	F0	W14	1.0.14	79.4	67.0	0.84	Pass	27.9	15.5	0.55	Pass	
B1	F0	W15	1.0.15	83.1	69.5	0.84	Pass	27.1	13.5	0.50	Pass	
B1	F0	W16	1.0.16	83.8	69.6	0.83	Pass	27.7	13.7	0.49	Pass	
B1	F0	W17	1.0.17	76.8	62.0	0.81	Pass	27.8	13.1	0.47	Pass	
B1	F0	W18	1.0.18	84.8	69.6	0.82	Pass	29.2	14.1	0.48	Pass	
B1	F1	W1	1.1.1	84.2	78.5	0.93	Pass	28.6	22.8	0.80	Pass	
B1	F1	W2	1.1.2	84.3	77.9	0.92	Pass	28.7	22.2	0.78	Pass	
B1	F1	W3	1.1.3	84.1	76.8	0.91	Pass	28.5	21.2	0.74	Pass	
B1	F1	W4	1.1.4	83.8	73.9	0.88	Pass	28.1	18.3	0.65	Pass	
B1	F1	W5	1.1.5	86.0	75.8	0.88	Pass	28.7	18.6	0.65	Pass	
B1	F1	W6	1.1.6	86.2	75.0	0.87	Pass	28.9	17.7	0.61	Pass	
B1	F1	W7	1.1.7	85.8	73.0	0.85	Pass	28.5	15.7	0.55	Pass	
B1	F1	W8	1.1.8	86.0	74.7	0.87	Pass	28.7	17.4	0.61	Pass	
B1	F1	W9	1.1.9	86.3	75.1	0.87	Pass	29.1	17.8	0.61	Pass	
B1	F1	W10	1.1.10	86.3	75.2	0.87	Pass	29.1	17.9	0.62	Pass	
B1	F1	W11	1.1.11	86.2	73.1	0.85	Pass	29.2	16.1	0.55	Pass	
B1	F1	W12	1.1.12	86.1	73.0	0.85	Pass	29.3	16.2	0.55	Pass	
B1	F1	W13	1.1.13	85.5	72.7	0.85	Pass	29.4	16.6	0.56	Pass	
B1	F1	W14	1.1.14	85.2	73.7	0.87	Pass	29.3	17.9	0.61	Pass	
B1	F1	W15	1.1.15	86.6	72.3	0.84	Pass	29.7	15.5	0.52	Pass	
B1	F1	W16	1.1.16	86.9	72.4	0.83	Pass	30.1	15.5	0.52	Pass	
B1	F1	W17	1.1.17	82.0	67.5	0.82	Pass	30.3	15.9	0.52	Pass	
B1	F1	W18	1.1.18	87.5	74.4	0.85	Pass	30.6	17.6	0.57	Pass	

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	W4	2.0.4	85.7	74.2	0.87	Pass	30.0	18.5	0.62	Pass	
B2	F0	W5	2.0.5	86.2	74.9	0.87	Pass	30.0	18.7	0.62	Pass	
B2	F0	W6	2.0.6	86.3	75.9	0.88	Pass	30.1	19.7	0.65	Pass	
B2	F0	W7	2.0.7	88.2	75.0	0.85	Pass	31.4	18.2	0.58	Pass	
B2	F0	W8	2.0.8	84.2	72.2	0.86	Pass	30.6	18.6	0.61	Pass	
B2	F0	W9	2.0.9	83.1	72.1	0.87	Pass	30.4	19.3	0.64	Pass	
B2	F0	W10	2.0.10	81.8	70.7	0.86	Pass	30.5	19.3	0.64	Pass	
B2	F0	W11	2.0.11	82.8	70.2	0.85	Pass	30.8	18.3	0.59	Pass	
B2	F0	W12	2.0.12	85.1	73.0	0.86	Pass	30.5	18.4	0.60	Pass	
B2	F0	W13	2.0.13	86.7	74.6	0.86	Pass	30.5	18.3	0.60	Pass	
B2	F0	W14	2.0.14	86.4	73.8	0.85	Pass	30.3	17.7	0.58	Pass	
B2	F0	W15	2.0.15	86.4	73.0	0.84	Pass	31.1	17.6	0.57	Pass	
B2	F1	W4	2.1.4	88.9	77.2	0.87	Pass	32.1	20.4	0.64	Pass	
B2	F1	W5	2.1.5	88.9	77.2	0.87	Pass	32.1	20.4	0.63	Pass	
B2	F1	W6	2.1.6	88.9	77.9	0.88	Pass	32.1	21.1	0.66	Pass	
B2	F1	W7	2.1.7	88.9	77.2	0.87	Pass	32.1	20.4	0.63	Pass	
B2	F1	W8	2.1.8	86.9	75.8	0.87	Pass	32.0	20.9	0.65	Pass	
B2	F1	W9	2.1.9	85.2	74.5	0.87	Pass	32.0	21.4	0.67	Pass	
B2	F1	W10	2.1.10	86.9	75.8	0.87	Pass	32.0	21.0	0.66	Pass	
B2	F1	W11	2.1.11	84.6	72.3	0.85	Pass	32.0	19.7	0.61	Pass	
B2	F1	W12	2.1.12	89.0	77.5	0.87	Pass	32.0	20.6	0.64	Pass	
B2	F1	W13	2.1.13	89.0	77.8	0.87	Pass	32.0	20.8	0.65	Pass	
B2	F1	W14	2.1.14	88.6	76.8	0.87	Pass	31.9	20.1	0.63	Pass	
B2	F1	W15	2.1.15	88.3	76.2	0.86	Pass	31.9	19.8	0.62	Pass	
B3	F0	W3	3.0.3	86.0	79.2	0.92	Pass	30.5	23.7	0.78	Pass	
B3	F0	W4	3.0.4	86.7	79.0	0.91	Pass	31.2	23.5	0.75	Pass	
B3	F0	W6	3.0.6	88.3	85.3	0.97	Pass	31.5	28.5	0.90	Pass	
B3	F0	W7	3.0.7	88.3	85.3	0.97	Pass	31.5	28.5	0.90	Pass	
B3	F0	W8	3.0.8	88.4	85.2	0.96	Pass	31.5	28.4	0.90	Pass	
B3	F0	W9	3.0.9	88.5	85.3	0.96	Pass	31.5	28.4	0.90	Pass	
B3	F1	W3	3.1.3	86.9	82.4	0.95	Pass	31.5	27.0	0.86	Pass	
B3	F1	W4	3.1.4	86.9	80.8	0.93	Pass	31.5	25.3	0.80	Pass	
B3	F1	W6	3.1.6	89.0	87.3	0.98	Pass	32.0	30.3	0.95	Pass	
B3	F1	W7	3.1.7	89.0	86.9	0.98	Pass	32.0	30.0	0.94	Pass	
B3	F1	W8	3.1.8	89.0	86.9	0.98	Pass	32.0	30.0	0.94	Pass	
B3	F1	W9	3.1.9	89.0	87.4	0.98	Pass	32.0	30.5	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:
All façades with windows tested comply with the annual APSH and winter WPSH requirements for sunlight.

The average change ratio for sunlight is APSH:**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.

Adjacent Properties - Shadow/Sunlight - Gardens and Open spaces

Tests for the availability of sunlight in amenity areas.

Shadow/Sunlight - Clause 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 which can receive two hours of sun on 21 March is less than 0.8 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, usually the main back garden of a house
- parks and playing fields
- children's playgrounds
- outdoor swimming pools and paddling pools
- sitting out areas such as those between non-domestic buildings and in public squares
- focal points for views such as a group of monuments or fountains.

The amenities of the following properties were tested.

- Representative Rear Gardens Window Groups B1, B2 & B3

BRE 2-hour Shadow Plots

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

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



The results are tabulated below:

				Shadow to amenity spaces			
				2-hour Sunlight - 21st March			
				Check > 50% or ratio > 0.8			
Group	Area	Ref	Description	Existing	Proposed	Ratio	Result
B1	A1	1.A1	Amenity	89%	87%	0.97	Pass
B1	A2	1.A2	Amenity	90%	89%	0.99	Pass
B1	A3	1.A3	Amenity	88%	88%	1.00	Pass
B1	A4	1.A4	Amenity	86%	86%	1.00	Pass
B1	A5	1.A5	Amenity	91%	86%	0.95	Pass
B1	A6	1.A6	Amenity	89%	89%	0.99	Pass
B1	A7	1.A7	Amenity	89%	88%	0.99	Pass
B1	A8	1.A8	Amenity	88%	87%	0.99	Pass
B1	A9	1.A9	Amenity	87%	86%	0.99	Pass
B1	A10	1.A10	Amenity	87%	86%	0.99	Pass
B1	A11	1.A11	Amenity	87%	86%	0.99	Pass
B1	A12	1.A12	Amenity	85%	84%	0.99	Pass
B1	A13	1.A13	Amenity	85%	83%	0.99	Pass
B1	A14	1.A14	Amenity	83%	82%	0.99	Pass
B1	A15	1.A15	Amenity	77%	75%	0.98	Pass
B1	A16	1.A16	Amenity	71%	70%	0.98	Pass
B1	A17	1.A17	Amenity	70%	68%	0.98	Pass
B1	A18	1.A18	Amenity	77%	76%	0.98	Pass
B2	A1	2.A1	Amenity	86%	86%	1.00	Pass
B2	A2	2.A2	Amenity	75%	75%	1.00	Pass
B2	A3	2.A3	Amenity	69%	69%	1.00	Pass
B2	A4	2.A4	Amenity	79%	79%	1.00	Pass
B2	A5	2.A5	Amenity	77%	77%	1.00	Pass
B2	A6	2.A6	Amenity	76%	76%	1.00	Pass
B2	A7	2.A7	Amenity	73%	73%	1.00	Pass
B2	A8	2.A8	Amenity	74%	74%	1.00	Pass
B2	A9	2.A9	Amenity	77%	77%	1.00	Pass
B2	A10	2.A10	Amenity	79%	79%	1.00	Pass
B2	A11	2.A11	Amenity	83%	83%	1.00	Pass
B2	A12	2.A12	Amenity	83%	83%	1.00	Pass
B2	A13	2.A13	Amenity	82%	82%	1.00	Pass
B2	A14	2.A14	Amenity	82%	82%	1.00	Pass
B2	A15	2.A15	Amenity	82%	82%	1.00	Pass
B3	A1	3.A1	Amenity	74%	74%	1.00	Pass
B3	A2	3.A2	Amenity	80%	80%	1.00	Pass
B3	A3	3.A3	Amenity	93%	93%	1.00	Pass
B3	A4	3.A4	Amenity	82%	82%	1.00	Pass
B3	A5	3.A5	Amenity	93%	93%	1.00	Pass
B3	A6	3.A6	Amenity	89%	89%	1.00	Pass
B3	A7	3.A7	Amenity	89%	89%	1.00	Pass
B3	A8	3.A8	Amenity	88%	88%	1.00	Pass
B3	A9	3.A9	Amenity	87%	87%	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.

There is little to no impact on the rear gardens to the North.

Conclusion

All tested neighbouring amenity spaces pass the BRE requirement relating to the area receiving 2 hours of sunlight on the 21st of March > 50% or not breaching the 0.8 times its former value limit.

The average change ratio for the tested amenity spaces **0.99**

The proposed development h 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:**
 - All facades with windows tested for Window Groups B1, B2 & B3 comply with the BRE requirements
 - The average change ratio for VSC is **0.89**
 - The facades of Window Group B4 comply against Appendix F mirrored development target as defined in this document.
- **Sunlight APSH & WPSH:**
 - All relevant and tested windows of Window Groups B1, B2 & B3 pass the relevant Annual APSH, Winter WPSH or overall sunlight checks.
 - The average change ratio annual is APSH: **0.88**
 - Facing windows to Window Group B4 are not orientated within 90° of due South and are not tested.
- **Shadow:**
 - All tested neighbouring gardens pass the 2-hour test requirements for the 21st March.
 - The average change ratio for shadow/sunlight is **0.99**

The potential impact of the proposed development on neighbours generally complies with the requirements of "Site layout planning for daylight and sunlight a guide to good practice Second Edition" - 2011 by Paul J Littlefair - BR209

Development Performance

Development Performance - Average Daylight Factor - ADF

Internal light distribution within a room is examined by testing ADF (Average Daylight Factor) against pre-defined parameters. Calculation of average daylight factor is based the BRE guidance document BR 209 and the referenced *BS 8206-2:2008 Lighting for buildings – Part 2: Code of practice for daylighting*.

This is defined under **Clause 2.11.3**

Daylight Factor

Ratio of illuminance at a point on a given plane due to light received from a sky of known or assumed luminance distribution, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky [BS 6100-7:2008, 59011]

Defined in the **BRE 209 Glossary (similarly in the BS code Clause 2.11.4 and 5.5)**

Average daylight factor:

Ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance

The average daylight factor (see 2.11.4) is used as the measure of general illumination from skylight. It is considered good practice to ensure that rooms in dwellings and in most other buildings have a predominantly daylit appearance. In order to achieve this the average daylight factor should be at least 2%.

If the average daylight factor in a space is at least 5% then electric lighting is not normally needed during the daytime, provided the uniformity is satisfactory (see 5.7 BS or 2.1.8 BRE 209). If the average daylight factor in a space is between 2% and 5% supplementary electric lighting is usually required. Values greater than 6% might suggest that the room has too much daylight.

- For the purposes of the calculation of daylight factor in this standard, it is assumed that the sky has the luminance distribution of the standard overcast sky.
- Direct and reflected sunlight are excluded from all values of illuminance.

This Code also provides under **Clause 5.6** guidance for

Minimum values of average daylight factor in dwellings

Even if a predominantly daylit appearance is not achievable in a dwelling, it is recommended that the average daylight factor should be at least the relevant value as given in Table 2 or clause 2.1.8 BRE 209

Table 2 - Minimum average daylight factor

Room type	Minimum Average daylight factor %
Bedrooms	1
Living rooms	1.5
Kitchens	2

Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%.

In accordance with BRE 209 & BS 8206-2 computations are based on the standard CIE (Commission Internationale de l'Éclairage) overcast sky model. With the exclusion of direct and reflected sunlight from the computation of room average daylight factor it may be considered as worst-case scenario.

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 a radiance analysis on the same. This analysis was based on a standard working plane for residential of 0.850m and results are provided in terms of Average Daylight Factor for selected rooms. See code for definitions.

The following reflectance/transmittance values were used for the analysis

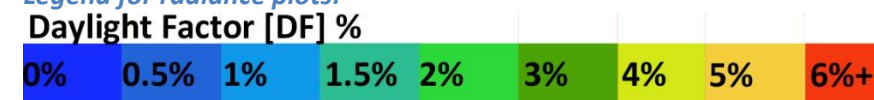
These are generally from BS 8206 Part 2 - tables A.1 & A.2

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	
Frame	Medium Grey	0.5	
Glass	Sealed double glazed unit	0.63	<Transmittance

We note that for apartment developments the majority of councils in Ireland and the UK accept the lower value of 1.5% assigned to living rooms to also include those with a small food preparation area (kitchen) as part of this space. The higher kitchen figure of 2.0% is more appropriate to a traditional house layout and room usage. The use of a reduced value accepted by Local Authorities is still compliant within the terms of the guidelines. This has been confirmed as acceptable and standard practice by the author Dr Paul Littlefair.

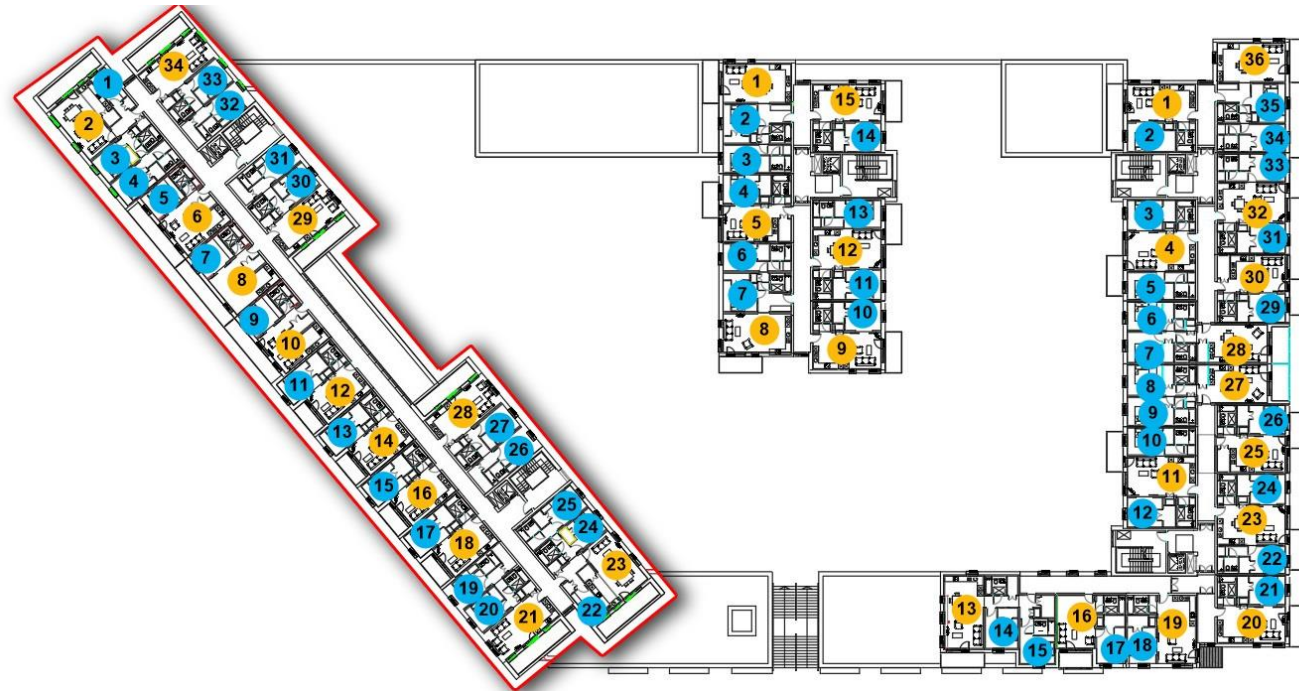
We have used the minimum value of 1.0% for bedrooms and tested against both 2.0% strict and also the 1.5% relaxed BRE targets for the Living room spaces.

Legend for radiance plots:

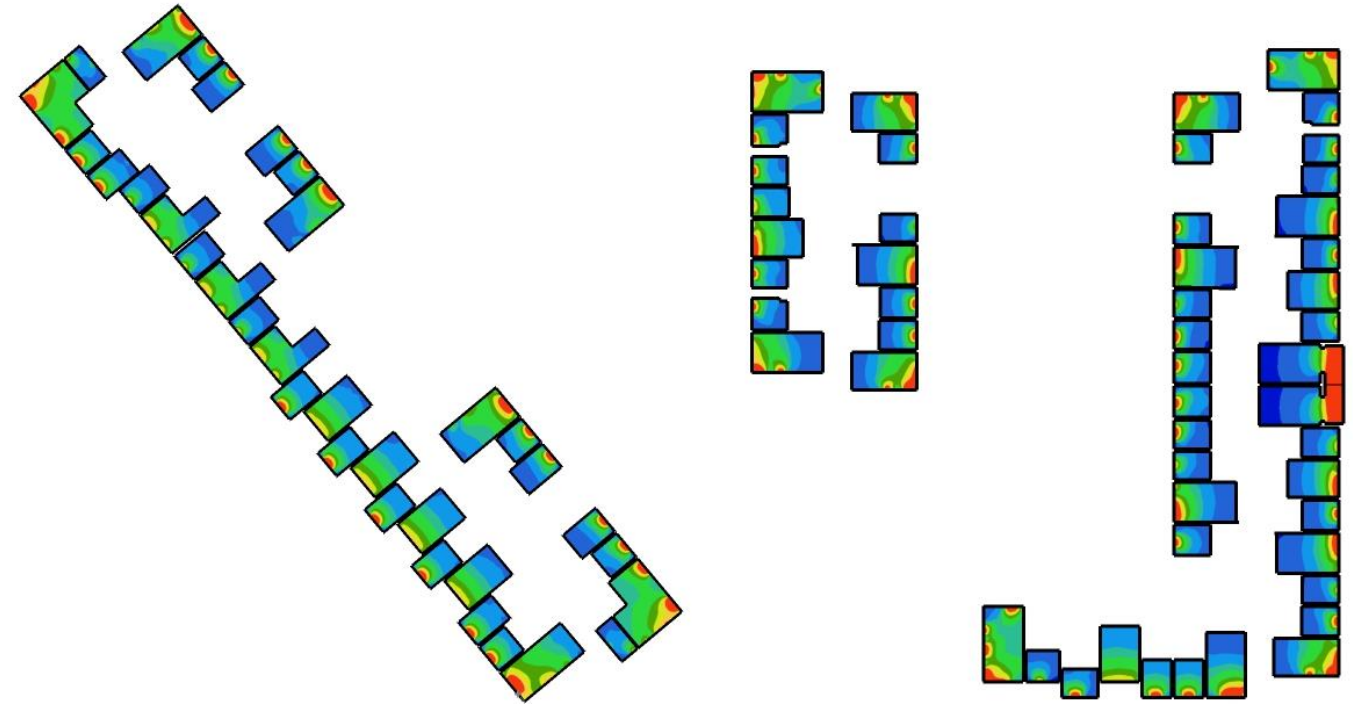


ABC Floor Layout – Naming Convention

Representative - 3rd Floor Block A and 2nd Floor Block B & C



Floor Analysis

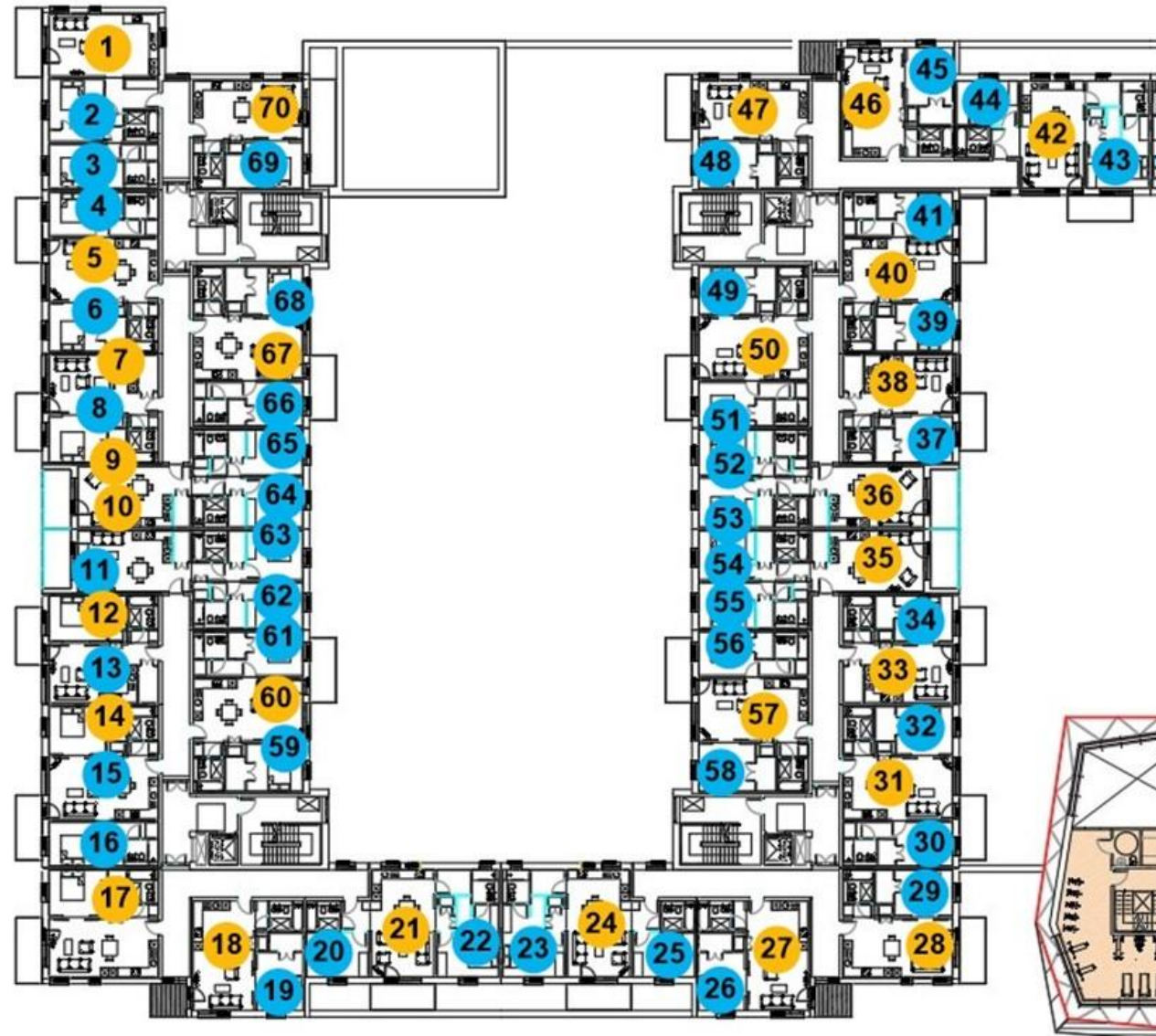


03A 02BC Average Daylight Factor							
V7 For all habitable rooms							
ADF Values from radiance 3D model Yes							
Type							
Ref	Ref	Type	ADF	Strict BRE		Relaxed L/D/K	
				Min	Check	Target	Check
A	03-A01	Bedroom	1.4	1.0	Pass	1.0	Pass
	03-A02L	Living Room	3.3	2.0	Pass	1.5	Pass
	03-A03	Bedroom	2.4	1.0	Pass	1.0	Pass
	03-A04	Bedroom	2.0	1.0	Pass	1.0	Pass
	03-A05	Bedroom	1.3	1.0	Pass	1.0	Pass
	03-A06L	Living Room	2.0	2.0	Pass	1.5	Pass
	03-A07	Bedroom	1.3	1.0	Pass	1.0	Pass
	03-A08L	Living Room	2.0	2.0	Pass	1.5	Pass
	03-A09	Bedroom	1.3	1.0	Pass	1.0	Pass
	03-A10L	Living Room	2.0	2.0	Pass	1.5	Pass
	03-A11	Bedroom	2.1	1.0	Pass	1.0	Pass
	03-A12L	Living Room	2.1	2.0	Pass	1.5	Pass
	03-A13	Bedroom	2.1	1.0	Pass	1.0	Pass
	03-A14L	Living Room	2.2	2.0	Pass	1.5	Pass
	03-A15	Bedroom	2.1	1.0	Pass	1.0	Pass
	03-A16L	Living Room	2.3	2.0	Pass	1.5	Pass
	03-A17	Bedroom	2.1	1.0	Pass	1.0	Pass
	03-A18L	Living Room	2.1	2.0	Pass	1.5	Pass
	03-A19	Bedroom	2.0	1.0	Pass	1.0	Pass
	03-A20	Bedroom	2.4	1.0	Pass	1.0	Pass
	03-A21L	Living Room	3.3	2.0	Pass	1.5	Pass
	03-A22	Bedroom	1.3	1.0	Pass	1.0	Pass
	03-A23L	Living Room	3.1	2.0	Pass	1.5	Pass
	03-A24	Bedroom	2.1	1.0	Pass	1.0	Pass
	03-A25	Bedroom	1.7	1.0	Pass	1.0	Pass
	03-A26	Bedroom	1.7	1.0	Pass	1.0	Pass
	03-A27	Bedroom	2.2	1.0	Pass	1.0	Pass
	03-A28L	Living Room	2.6	2.0	Pass	1.5	Pass
	03-A29L	Living Room	2.1	2.0	Pass	1.5	Pass
	03-A30	Bedroom	2.0	1.0	Pass	1.0	Pass
	03-A31	Bedroom	1.7	1.0	Pass	1.0	Pass
	03-A32	Bedroom	1.7	1.0	Pass	1.0	Pass
	03-A33	Bedroom	2.0	1.0	Pass	1.0	Pass
	03-A34L	Living Room	2.6	2.0	Pass	1.5	Pass
B	02-B01L	Living Room	3.1	2.0	Pass	1.5	Pass
	02-B02	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-B03	Bedroom	1.9	1.0	Pass	1.0	Pass
	02-B04	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-B05L	Living Room	2.5	2.0	Pass	1.5	Pass
	02-B06	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-B07	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-B08L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-B09L	Living Room	2.7	2.0	Pass	1.5	Pass
	02-B10	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-B11	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-B12L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-B13	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-B14	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-B15L	Living Room	2.9	2.0	Pass	1.5	Pass

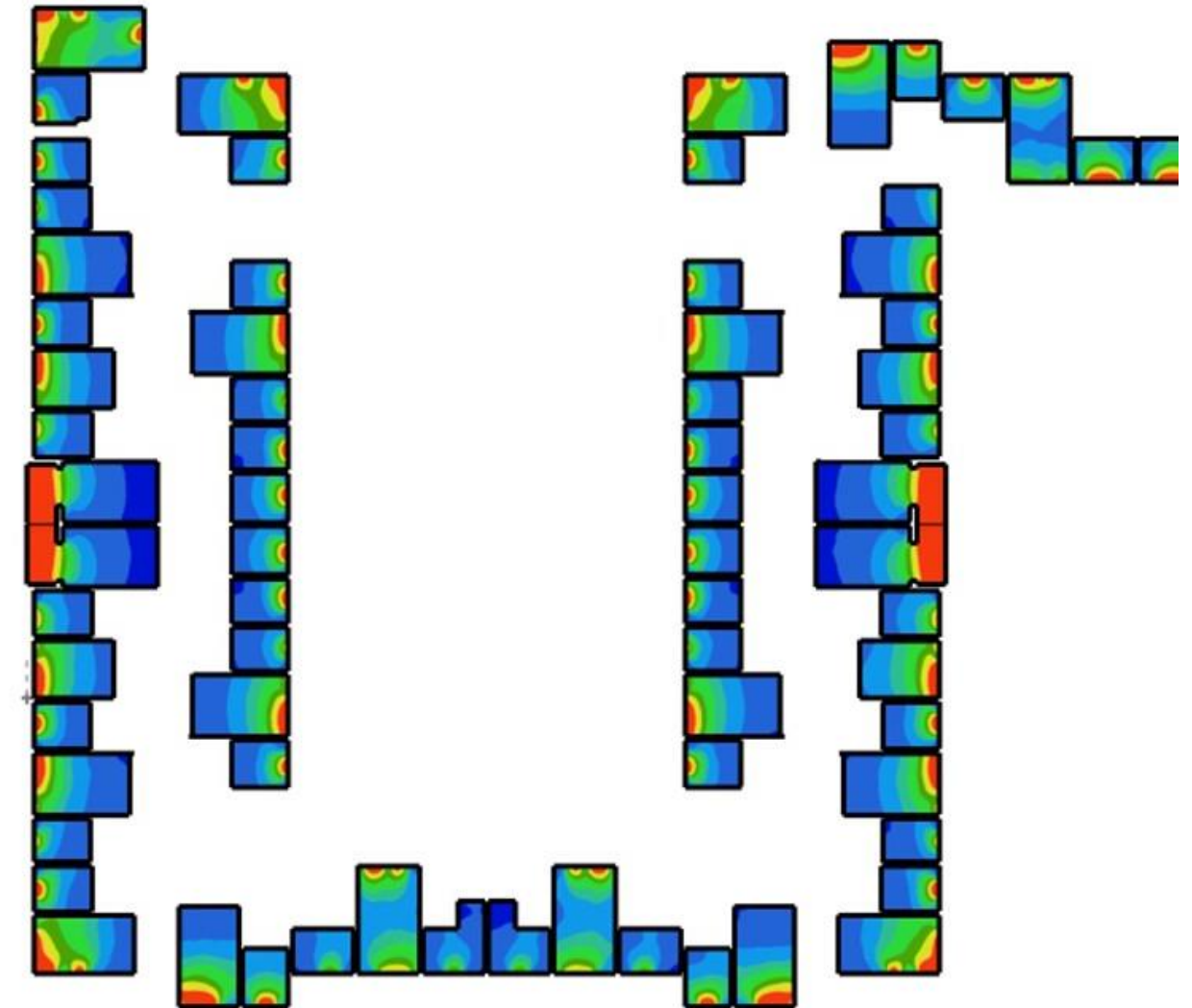
03A 02BC Average Daylight Factor								
V7 For all habitable rooms								
ADF Values from radiance 3D model Yes								
Type								
Ref	Ref	Type	ADF	Strict BRE		Relaxed L/D/K		
				Min	Check	Target	Check	
C	02-C01L	Living Room	3.0	2.0	Pass	1.5	Pass	
	02-C02	Bedroom	1.9	1.0	Pass	1.0	Pass	
	02-C03	Bedroom	1.7	1.0	Pass	1.0	Pass	
	02-C04L	Living Room	2.1	2.0	Pass	1.5	Pass	
	02-C05	Bedroom	1.2	1.0	Pass	1.0	Pass	
	02-C06	Bedroom	1.5	1.0	Pass	1.0	Pass	
	02-C07	Bedroom	1.8	1.0	Pass	1.0	Pass	
	02-C08	Bedroom	1.8	1.0	Pass	1.0	Pass	
	02-C09	Bedroom	1.6	1.0	Pass	1.0	Pass	
	02-C10	Bedroom	1.3	1.0	Pass	1.0	Pass	
	02-C11L	Living Room	2.0	2.0	Pass	1.5	Pass	
	02-C12	Bedroom	1.6	1.0	Pass	1.0	Pass	
	02-C13L	Living Room	3.1	2.0	Pass	1.5	Pass	
	02-C14	Bedroom	1.2	1.0	Pass	1.0	Pass	
	02-C15	Bedroom	1.9	1.0	Pass	1.0	Pass	
	02-C16L	Living Room	2.2	2.0	Pass	1.5	Pass	
	02-C17	Bedroom	2.3	1.0	Pass	1.0	Pass	
	02-C18	Bedroom	2.2	1.0	Pass	1.0	Pass	
	02-C19L	Living Room	2.4	2.0	Pass	1.5	Pass	
	02-C20L	Living Room	2.8	2.0	Pass	1.5	Pass	
	02-C21	Bedroom	1.7	1.0	Pass	1.0	Pass	
	02-C22	Bedroom	1.1	1.0	Pass	1.0	Pass	
	02-C23L	Living Room	2.0	2.0	Pass	1.5	Pass	
	02-C24	Bedroom	1.6	1.0	Pass	1.0	Pass	
	02-C25L	Living Room	2.3	2.0	Pass	1.5	Pass	
	02-C26	Bedroom	1.4	1.0	Pass	1.0	Pass	
	02-C27L	Living Room	3.5	2.0	Pass	1.5	Pass	
	02-C28L	Living Room	3.6	2.0	Pass	1.5	Pass	
	02-C29	Bedroom	1.4	1.0	Pass	1.0	Pass	
	02-C30L	Living Room	2.2	2.0	Pass	1.5	Pass	
	02-C31	Bedroom	1.5	1.0	Pass	1.0	Pass	
	02-C32L	Living Room	1.8	2.0	Marginal	m	1.5	Pass
	02-C33	Bedroom	1.1	1.0	Pass	1.0	Pass	
	02-C34	Bedroom	1.6	1.0	Pass	1.0	Pass	
	02-C35	Bedroom	1.5	1.0	Pass	1.0	Pass	
	02-C36L	Living Room	3.0	2.0	Pass	1.5	Pass	
					Pass	84	Pass	85
					Count	85	Count	85
					Percentage	99%	Percentage	100%
					Marginal	1		
					Percentage incl Marginal	100%		

D Floor Layout - Naming Convention

Representative - 2nd Floor Block D



Floor Analysis

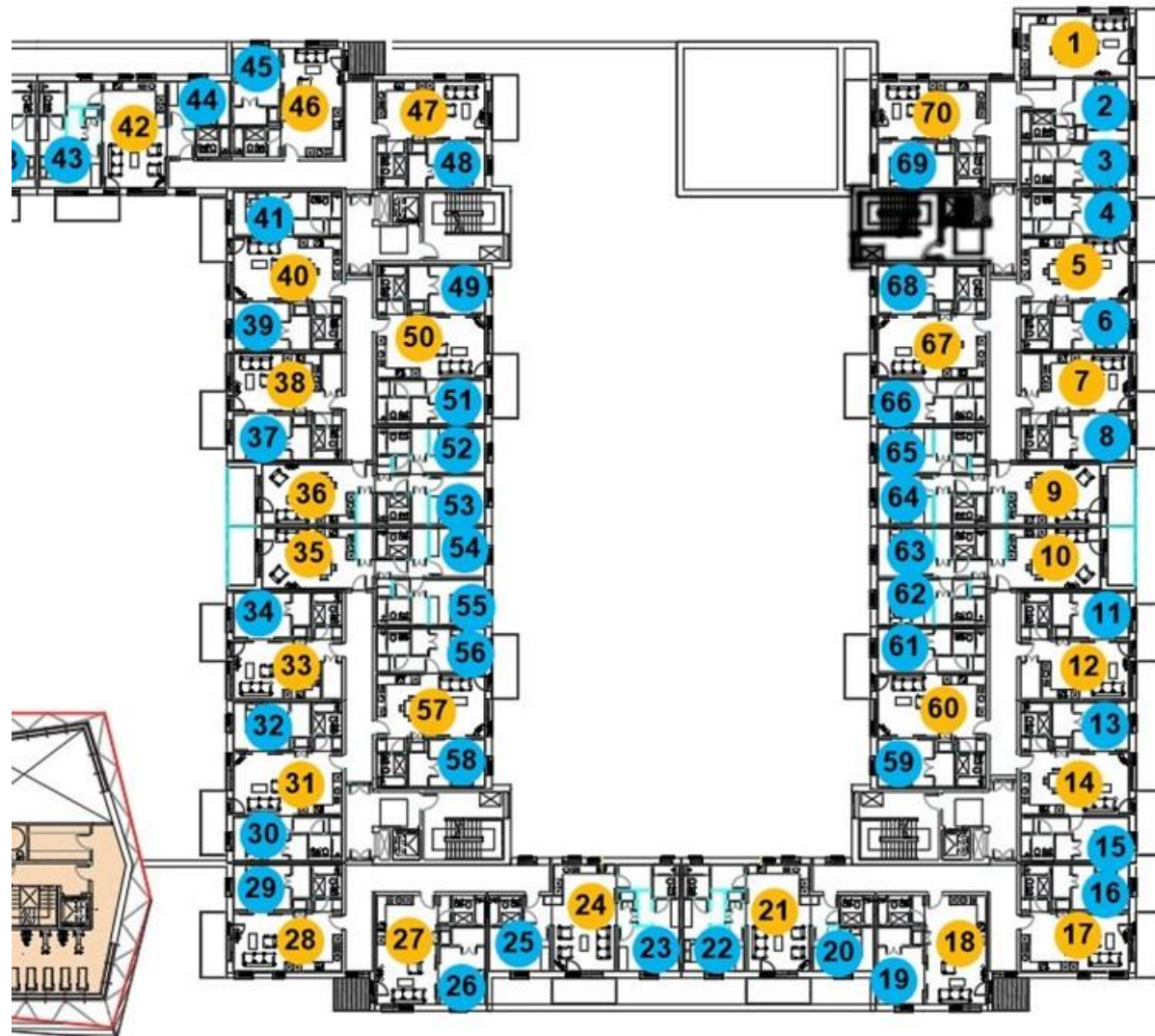


Average Daylight Factor							
02D	For all habitable rooms						
V7	ADF Values from radiance 3D model Yes						
Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	02-D01L	Living Room	3.1	2.0	Pass	1.5	Pass
	02-D02	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-D03	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D04	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-D05L	Living Room	1.8	2.0	Marginal	1.5	Pass
	02-D06	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-D07L	Living Room	2.2	2.0	Pass	1.5	Pass
	02-D08	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-D09L	Living Room	3.6	2.0	Pass	1.5	Pass
	02-D10L	Living Room	3.6	2.0	Pass	1.5	Pass
	02-D11	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-D12L	Living Room	2.4	2.0	Pass	1.5	Pass
	02-D13	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D14L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-D15	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-D16	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-D17L	Living Room	2.8	2.0	Pass	1.5	Pass
	02-D18L	Living Room	2.4	2.0	Pass	1.5	Pass
	02-D19	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-D20	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-D21L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-D22	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-D23	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-D24L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-D25	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-D26	Bedroom	2.0	1.0	Pass	1.0	Pass
	02-D27L	Living Room	2.2	2.0	Pass	1.5	Pass
	02-D28L	Living Room	2.6	2.0	Pass	1.5	Pass
	02-D29	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D30	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-D31L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-D32	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-D33L	Living Room	2.6	2.0	Pass	1.5	Pass
	02-D34	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-D35L	Living Room	3.7	2.0	Pass	1.5	Pass
	02-D36L	Living Room	3.7	2.0	Pass	1.5	Pass
	02-D37	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-D38L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-D39	Bedroom	1.3	1.0	Pass	1.0	Pass
	02-D40L	Living Room	1.6	2.0	Fail	1.5	Pass
	02-D41	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-D42L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-D43	Bedroom	2.6	1.0	Pass	1.0	Pass
	02-D44	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-D45	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-D46L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-D47L	Living Room	3.0	2.0	Pass	1.5	Pass
	02-D48	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-D49	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D50L	Living Room	2.1	2.0	Pass	1.5	Pass

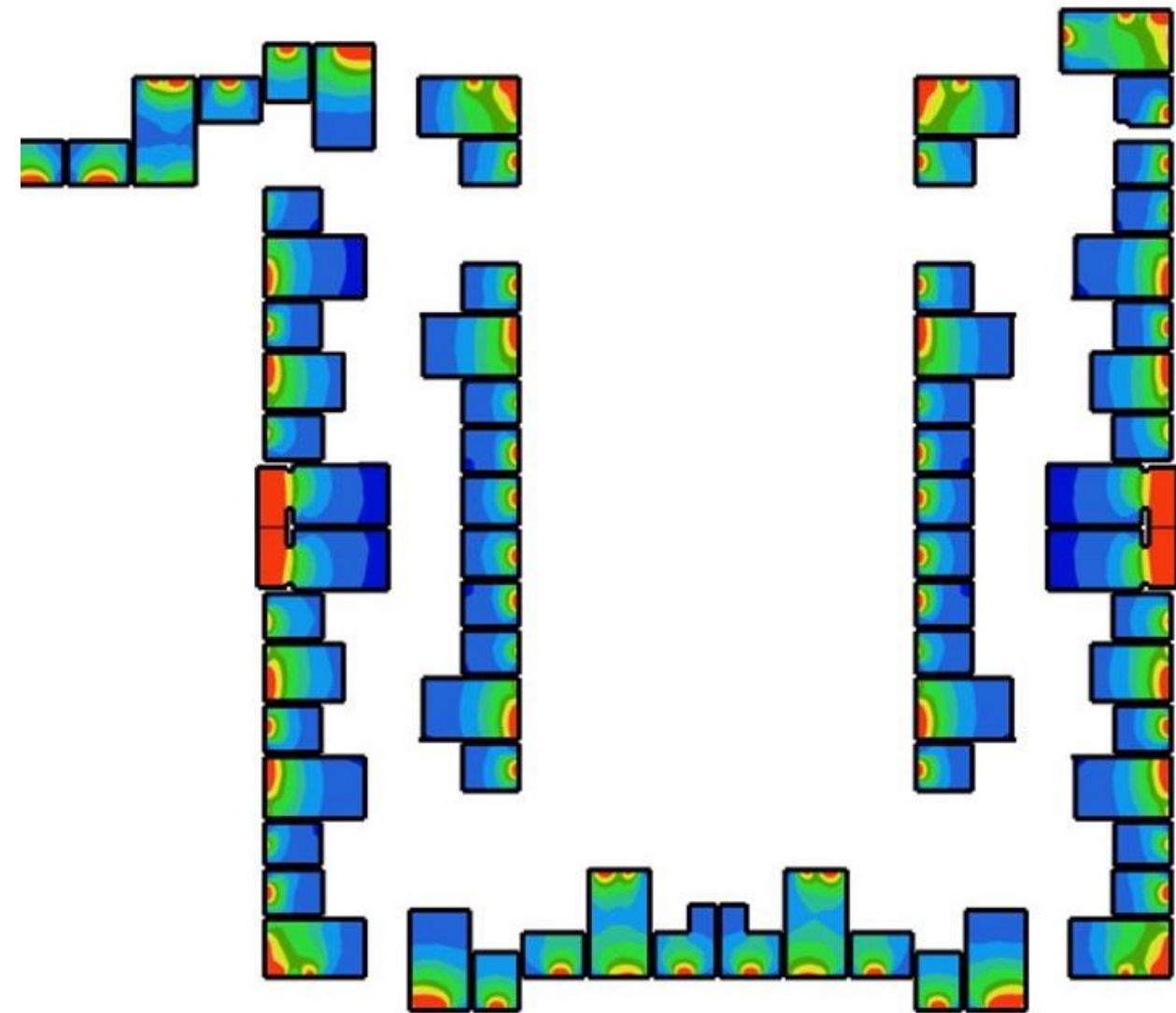
Average Daylight Factor							
02D	For all habitable rooms						
V7	ADF Values from radiance 3D model Yes						
Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	02-D51	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-D52	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-D53	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-D54	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D55	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-D56	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-D57L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-D58	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D59	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D60L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-D61	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-D62	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-D63	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-D64	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-D65	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-D66	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-D67L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-D68	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-D69	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-D70L	Living Room	2.8	2.0	Pass	1.5	Pass
				Pass	68	Pass	70
				Count	70	Count	70
				Percentage	97%	Percentage	100%
				Marginal	1		
				Percentage incl Marginal	99%		

E Floor Layout - Naming Convention

Representative - 2nd Floor Block E



Floor Analysis

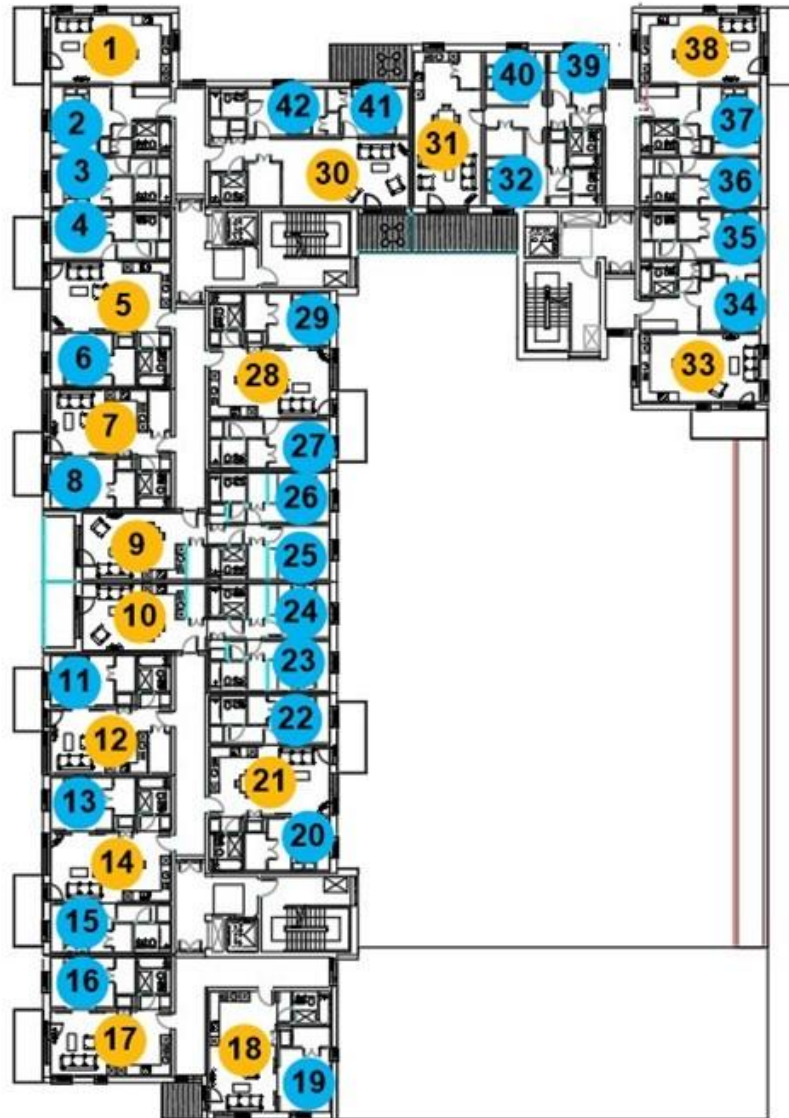


Average Daylight Factor							
02E	For all habitable rooms						
V7	ADF Values from radiance 3D model Yes						
Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	02-E01L	Living Room	3.1	2.0	Pass	1.5	Pass
	02-E02	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-E03	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-E04	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-E05L	Living Room	1.9	2.0	Marginal	1.5	Pass
	02-E06	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-E07L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-E08	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-E09L	Living Room	3.7	2.0	Pass	1.5	Pass
	02-E10L	Living Room	3.7	2.0	Pass	1.5	Pass
	02-E11	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E12L	Living Room	2.5	2.0	Pass	1.5	Pass
	02-E13	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-E14L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-E15	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-E16	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-E17L	Living Room	2.9	2.0	Pass	1.5	Pass
	02-E18L	Living Room	2.4	2.0	Pass	1.5	Pass
	02-E19	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-E20	Bedroom	2.1	1.0	Pass	1.0	Pass
	02-E21L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-E22	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-E23	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-E24L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-E25	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-E26	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-E27L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-E28L	Living Room	2.6	2.0	Pass	1.5	Pass
	02-E29	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E30	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-E31L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-E32	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-E33L	Living Room	2.5	2.0	Pass	1.5	Pass
	02-E34	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E35L	Living Room	3.7	2.0	Pass	1.5	Pass
	02-E36L	Living Room	3.7	2.0	Pass	1.5	Pass
	02-E37	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-E38L	Living Room	2.4	2.0	Pass	1.5	Pass
	02-E39	Bedroom	1.3	1.0	Pass	1.0	Pass
	02-E40L	Living Room	1.5	2.0	Fail	1.5	Pass
	02-E41	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-E42L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-E43	Bedroom	2.6	1.0	Pass	1.0	Pass
	02-E44	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-E45	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-E46L	Living Room	2.3	2.0	Pass	1.5	Pass
	02-E47L	Living Room	2.9	2.0	Pass	1.5	Pass
	02-E48	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-E49	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E50L	Living Room	2.1	2.0	Pass	1.5	Pass

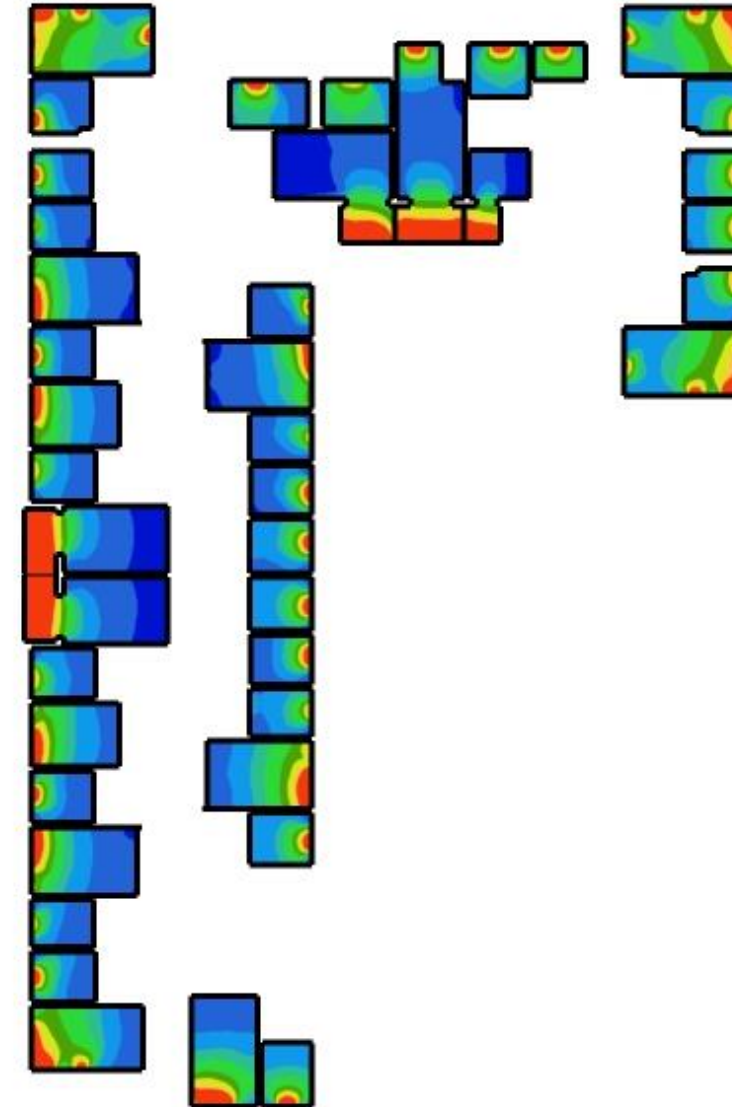
Average Daylight Factor							
02E	For all habitable rooms						
V7	ADF Values from radiance 3D model Yes						
Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	02-E51	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-E52	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-E53	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E54	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-E55	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-E56	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-E57L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-E58	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E59	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E60L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-E61	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-E62	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-E63	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-E64	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-E65	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-E66	Bedroom	1.1	1.0	Pass	1.0	Pass
	02-E67L	Living Room	2.1	2.0	Pass	1.5	Pass
	02-E68	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-E69	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-E70L	Living Room	3.1	2.0	Pass	1.5	Pass
				Pass	68	Pass	70
				Count	70	Count	70
				Percentage	97%	Percentage	100%
				Marginal	1		
				Percentage incl Marginal	99%		

F Floor Layout – Naming Convention

Representative - 2nd Floor Block F



Floor Analysis



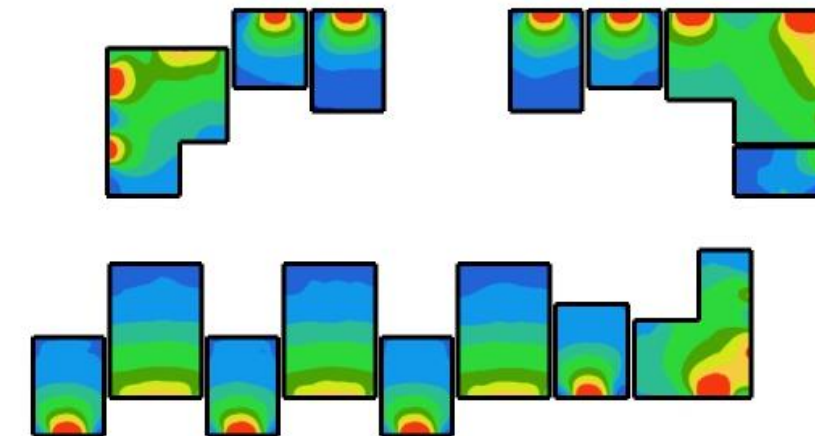
Average Daylight Factor							
02F							
V7	For all habitable rooms						
	ADF Values from radiance 3D model		Yes				
	Type						
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	02-F01L	Living Room	3.0	2.0	Pass	1.5	Pass
	02-F02	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-F03	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-F04	Bedroom	1.0	1.0	Pass	1.0	Pass
	02-F05L	Living Room	1.8	2.0	Marginal	1.5	Pass
	02-F06	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-F07L	Living Room	2.2	2.0	Pass	1.5	Pass
	02-F08	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-F09L	Living Room	3.6	2.0	Pass	1.5	Pass
	02-F10L	Living Room	3.6	2.0	Pass	1.5	Pass
	02-F11	Bedroom	1.4	1.0	Pass	1.0	Pass
	02-F12L	Living Room	2.4	2.0	Pass	1.5	Pass
	02-F13	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-F14L	Living Room	2.0	2.0	Pass	1.5	Pass
	02-F15	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-F16	Bedroom	1.7	1.0	Pass	1.0	Pass
	02-F17L	Living Room	2.8	2.0	Pass	1.5	Pass
	02-F18L	Living Room	2.4	2.0	Pass	1.5	Pass
	02-F19	Bedroom	2.3	1.0	Pass	1.0	Pass
	02-F20	Bedroom	2.1	1.0	Pass	1.0	Pass
	02-F21L	Living Room	2.6	2.0	Pass	1.5	Pass
	02-F22	Bedroom	1.5	1.0	Pass	1.0	Pass
	02-F23	Bedroom	1.8	1.0	Pass	1.0	Pass
	02-F24	Bedroom	2.0	1.0	Pass	1.0	Pass
	02-F25	Bedroom	1.9	1.0	Pass	1.0	Pass
	02-F26	Bedroom	1.6	1.0	Pass	1.0	Pass
	02-F27	Bedroom	1.2	1.0	Pass	1.0	Pass
	02-F28L	Living Room	1.7	2.0	Fail	1.5	Pass
	02-F29	Bedroom	1.3	1.0	Pass	1.0	Pass
	02-F30L	Living Room	1.9	2.0	Marginal	1.5	Pass
	02-F31L	Living Room	2.7	2.0	Pass	1.5	Pass
	02-F32	Bedroom	2.6	1.0	Pass	1.0	Pass
	02-F33L	Living Room	3.1	2.0	Pass	1.5	Pass
	02-F34	Bedroom	2.1	1.0	Pass	1.0	Pass
	02-F35	Bedroom	2.3	1.0	Pass	1.0	Pass
	02-F36	Bedroom	2.3	1.0	Pass	1.0	Pass
	02-F37	Bedroom	2.2	1.0	Pass	1.0	Pass
	02-F38L	Living Room	3.2	2.0	Pass	1.5	Pass
	02-F39	Bedroom	3.2	1.0	Pass	1.0	Pass
	02-F40	Bedroom	2.3	1.0	Pass	1.0	Pass
	02-F41	Bedroom	2.1	1.0	Pass	1.0	Pass
	02-F42	Bedroom	1.9	1.0	Pass	1.0	Pass
				Pass	39	Pass	42
				Count	42	Count	42
				Percentage	93%	Percentage	100%
				Marginal	2		
				Percentage incl Marginal	98%		

G Floor Layout - Naming Convention

Representative - 1st Floor Block G



Floor Analysis



Average Daylight Factor							
01G							
v7	For all habitable rooms						
	ADF Values from radiance 3D model		Yes				
	Type						
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed I/D/K Target	Check
	01-G01	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-G02L	Living Room	2.1	2.0	Pass	1.5	Pass
	01-G03	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-G04L	Living Room	2.1	2.0	Pass	1.5	Pass
	01-G05	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-G06L	Living Room	2.1	2.0	Pass	1.5	Pass
	01-G07	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-G08L	Living Room	3.1	2.0	Pass	1.5	Pass
	01-G09	Bedroom	1.3	1.0	Pass	1.0	Pass
	01-G10L	Living Room	3.2	2.0	Pass	1.5	Pass
	01-G11	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-G12	Bedroom	1.8	1.0	Pass	1.0	Pass
	01-G13	Bedroom	1.7	1.0	Pass	1.0	Pass
	01-G14	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-G15L	Living Room	2.7	2.0	Pass	1.5	Pass
				Pass	15	Pass	15
				Count	15	Count	15
				Percentage	100%	Percentage	100%
				Marginal	0		
				Percentage incl Marginal	100%		

Additional ADF Analysis

During the course of the SHD process focus was placed on the quality of light to the lower levels. While the selected floors were the lowest representative floors we have also provided ADF results for both the Ground Floor (Appendix 1) and 1st Floor (Appendix 2). The summary results for these floors are as follows:

GFL	Strict			Relaxed		
	Pass	Count		Pass	Count	
00-BC	35	35	100%	35	35	100%
00-D	32	32	100%	32	32	100%
00-E	32	32	100%	32	32	100%
00-F	30	30	100%	30	30	100%
V6	129	129		129	129	
		100%			100%	

1st Floor	Strict			Relaxed		
	Pass	Count		Pass	Count	
01-ABC	68	70	97%	70	70	100%
01-D	66	68	97%	67	68	99%
01-E	66	68	97%	67	68	99%
01-F	44	44	100%	44	44	100%
V7	244	250		248	250	
		98%			99%	
Strict BRE, Incl. Marginal		4				
		99%				

When all 3 floors are combined the results are as follows:

Overall Summary							
GFL	Strict			Relaxed			V6
	Pass	Count		Pass	Count		
1st	244	250	98%	248	250	99%	V7
Representative (Generally 2nd)	274	282	97%	282	282	100%	V7
Strict Pass Rate for all Tested	647	661	98%	659	661	99.7%	

Almost all of the few rooms which fail to achieve the strict target are marginal. The results for floors above the representative levels tested will of course improve since at higher levels the obstruction to skylight caused by surrounding blocks will lessen.

Summary

Representative	Strict			Relaxed		
	Pass	Count		Pass	Count	
03-A 02-BC	84	85	99%	85	85	100%
02-D	68	70	97%	70	70	100%
02-E	68	70	97%	70	70	100%
02-F	39	42	93%	42	42	100%
01-G	15	15	100%	15	15	100%
	274	282		282	282	
V7		97%			100%	
Strict BRE, Incl. Marginal		5				
		99%				

Average ADF all Living rooms **2.5%** and for all Bedrooms **1.7%** on the representative floors.

97% of rooms (**99%** if we include marginals) comply with the Strict BRE Guidelines in relation to ADF
All pass the relaxed 1.5% target

Proposed Development - Sunlight Annual & Winter

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

Clause 3.1.15 In general a dwelling, or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided:

- *at least one main window wall faces within 90° of due south and*
- *the centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March*

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.

3.1.12..... If a room has two windows on opposite walls, the APSH due to each can be added together.

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 further define:

*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.....
Arranging the flats so that living rooms are placed at the end corners of the building and hence can be dual aspect. That way, living rooms on the north side of the building can also have an east- or west-facing window which can receive some sun.....*

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 good design.



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

Tabulated results

Sunlight APSH - Living rooms							
			Annual > 25%		Winter > 5%		
Block	Floor	Room Ref	APSH		WPSH		
BA	F3	W2	55	Pass		12	Pass
BA	F3	W6	21	Marginal	m	7	Pass
BA	F3	W8	23	Marginal	m	9	Pass
BA	F3	W10	25	Pass		10	Pass
BA	F3	W12	20	Marginal	m	8	Pass
BA	F3	W14	23	Marginal	m	12	Pass
BA	F3	W16	26	Pass		14	Pass
BA	F3	W18	28	Pass		15	Pass
BA	F3	W21	74	Pass		28	Pass
BA	F3	W23	26	Pass		18	Pass
BA	F3	W28	19	Fail		3	Fail
BA	F3	W29	19	Fail		3	Fail
BA	F3	W34	22	Marginal	m	3	Fail
BB	F2	W1	11	Fail		6	Pass
BB	F2	W5	29	Pass		4	Marginal
BB	F2	W8	51	Pass		12	Pass
BB	F2	W9	61	Pass		15	Pass
BB	F2	W12	23	Marginal	m	5	Pass
BB	F2	W15	9	Fail		4	Marginal
BC	F2	W1	20	Marginal	m	8	Pass
BC	F2	W4	18	Fail		6	Pass
BC	F2	W11	22	Marginal	m	0	Fail
BC	F2	W13	32	Pass		20	Pass
BC	F2	W16	18	Fail		15	Pass
BC	F2	W19	73	Pass		16	Pass
BC	F2	W20	68	Pass		17	Pass
BC	F2	W23	10	Fail		4	Marginal
BC	F2	W25	30	Pass		9	Pass
BC	F2	W27	28	Pass		7	Pass
BC	F2	W28	31	Pass		10	Pass
BC	F2	W30	11	Fail		5	Pass
BC	F2	W32	28	Pass		9	Pass
BC	F2	W36	15	Fail		9	Pass
			Count	33		Count	33
			Pass	16		Pass	26
			Pass Rate	48%		Pass Rate	79%
			Marginal	8		Marginal	3
			Mrate	73%		Mrate	88%

Sunlight APSH - Living rooms							
			Annual > 25%		Winter > 5%		
Block	Floor	Room Ref	APSH		WPSH		
BD	F2	W1	17	Fail	9	Pass	
BD	F2	W5	35	Pass	10	Pass	
BD	F2	W7	21	Marginal	m	6	Pass
BD	F2	W9	39	Pass	12	Pass	
BD	F2	W10	38	Pass	9	Pass	
BD	F2	W12	41	Pass	12	Pass	
BD	F2	W14	22	Marginal	m	6	Pass
BD	F2	W17	69	Pass	17	Pass	
BD	F2	W18	75	Pass	17	Pass	
BD	F2	W21	23	Marginal	m	19	Pass
BD	F2	W24	23	Marginal	m	20	Pass
BD	F2	W27	78	Pass	20	Pass	
BD	F2	W28	74	Pass	23	Pass	
BD	F2	W31	15	Fail	9	Pass	
BD	F2	W33	34	Pass	13	Pass	
BD	F2	W35	30	Pass	9	Pass	
BD	F2	W36	33	Pass	12	Pass	
BD	F2	W38	11	Fail	6	Pass	
BD	F2	W40	28	Pass	9	Pass	
BD	F2	W42	13	Fail	11	Pass	
BD	F2	W46	6	Fail	0	Fail	
BD	F2	W47	18	Fail	7	Pass	
BD	F2	W50	16	Fail	4	Fail	m
BD	F2	W57	30	Pass	3	Fail	
BD	F2	W60	17	Fail	1	Fail	
BD	F2	W67	7	Fail	4	Marginal	m
BD	F2	W70	12	Fail	5	Pass	

Sunlight APSH - Living rooms							
			Annual > 25%		Winter > 5%		
Block	Floor	Room Ref	APSH		WPSH		
BE	F2	W1	16	Fail	10	Pass	
BE	F2	W5	30	Pass	10	Pass	
BE	F2	W7	13	Fail	7	Pass	
BE	F2	W9	35	Pass	13	Pass	
BE	F2	W10	33	Pass	9	Pass	
BE	F2	W12	37	Pass	13	Pass	
BE	F2	W14	20	Marginal	m	10	Pass
BE	F2	W17	83	Pass	32	Pass	
BE	F2	W18	89	Pass	32	Pass	
BE	F2	W21	43	Pass	31	Pass	
BE	F2	W24	42	Pass	30	Pass	
BE	F2	W27	86	Pass	29	Pass	
BE	F2	W28	79	Pass	28	Pass	
BE	F2	W31	22	Marginal	m	6	Pass
BE	F2	W33	41	Pass	13	Pass	
BE	F2	W35	37	Pass	9	Pass	
BE	F2	W36	39	Pass	13	Pass	
BE	F2	W38	20	Marginal	m	6	Pass
BE	F2	W40	35	Pass	10	Pass	
BE	F2	W42	13	Fail	11	Pass	
BE	F2	W46	5	Fail	0	Fail	
BE	F2	W47	10	Fail	5	Pass	
BE	F2	W50	9	Fail	5	Pass	
BE	F2	W57	17	Fail	1	Fail	
BE	F2	W60	30	Pass	3	Fail	
BE	F2	W67	16	Fail	4	Marginal	m
BE	F2	W70	18	Fail	7	Pass	
			Count	54	Count	54	
			Pass	28	Pass	45	
			Pass Rate	52%	Pass Rate	83%	
			Marginal	7	Marginal	3	
			Mrate	65%	Mrate	89%	

Sunlight APSH - Living rooms							
			Annual > 25%		Winter > 5%		
Block	Floor	Room Ref	APSH		WPSH		
BF	F2	W1	19	Fail	10	Pass	
BF	F2	W5	35	Pass	11	Pass	
BF	F2	W7	20	Marginal	m	6	Pass
BF	F2	W9	39	Pass	13	Pass	
BF	F2	W10	38	Pass	9	Pass	
BF	F2	W12	43	Pass	14	Pass	
BF	F2	W14	25	Pass	9	Pass	
BF	F2	W17	84	Pass	32	Pass	
BF	F2	W18	90	Pass	32	Pass	
BF	F2	W21	39	Pass	11	Pass	
BF	F2	W28	21	Marginal	m	11	Pass
BF	F2	W30	32	Pass	16	Pass	
BF	F2	W31	28	Pass	13	Pass	
BF	F2	W33	80	Pass	28	Pass	
BF	F2	W38	32	Pass	16	Pass	
BG	F1	W2	31	Pass	27	Pass	
BG	F1	W4	31	Pass	27	Pass	
BG	F1	W6	31	Pass	27	Pass	
BG	F1	W8	83	Pass	31	Pass	
BG	F1	W10	21	Marginal	m	8	Pass
BG	F1	W15	20	Marginal	m	6	Pass
			Count	21	Count	21	
			Pass	16	Pass	21	
			Pass Rate	76%	Pass Rate	100%	
			Marginal	4	Marginal	0	
			Mrate	95%	Mrate	100%	

Summary Sunlight for all Living rooms on the representative Floors

Sunlight APSH Summary						
	Annual APSH			Winter WPSH		
	Count	Pass	Marginal 0.8	Count	Pass	Marginal
ABC	33	16	8	33	26	3
DE	54	28	7	54	45	3
FG	21	16	4	21	21	0
Tots	108	60	19	108	92	6
			Annual APSH	Winter WPSH		
			Strict BRE Pass	56%	Strict BRE Pass	85%
			Incl Marginal	73%	Incl Marginal	91%

**1 100% of windows receive some sunlight and the number that face North are small.

In terms Strict BRE the percentage pass rate is 56% Annual and 85% Winter WPSH

However there are many rooms which receive good sunlight and are marginal on the BRE targets.

If we include the marginal results **73%** pass a relaxed Annual APSH requirements and **91%** pass the WPSH which is broadly in line with the guidelines example of “careful” design 80%.

This high quality of sunlight coupled with the excellent ADF, balcony performance results detailed in this report show that the living rooms to the apartments tested will receive an excellent quality of light

See the Architects Statement and Compensatory Measures section of this report.

Sunlight to Living rooms - Summary

All Living rooms receive some sunlight over the course of the year.

In terms Strict BRE the percentage pass rate is **56%** Annual and **85%** Winter WPSH

However there are many rooms which receive good sunlight and are marginal on the BRE targets.

If we include the marginal results **73%** pass a relaxed Annual APSH requirements and **91%** pass the WPSH which is broadly in line with the guidelines example of “careful” design 80%.

These results should be considered in conjunction with the high daylight ADF results and balcony performance achieved throughout.

The proposed development generally complies with the requirements of the BRE guidelines in relation to Sunlight availability and careful layout design.

Development Performance - Shadow/Sunlight - Gardens and Open spaces

Tests for the availability of sunlight in amenity areas.

Shadow/Sunlight - Clause 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.

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

- gardens, usually the main back garden of a house
- parks and playing fields
- children’s playgrounds
- outdoor swimming pools and paddling pools
- sitting out areas such as those between non-domestic buildings and in public squares
- focal points for views such as a group of monuments or fountains.

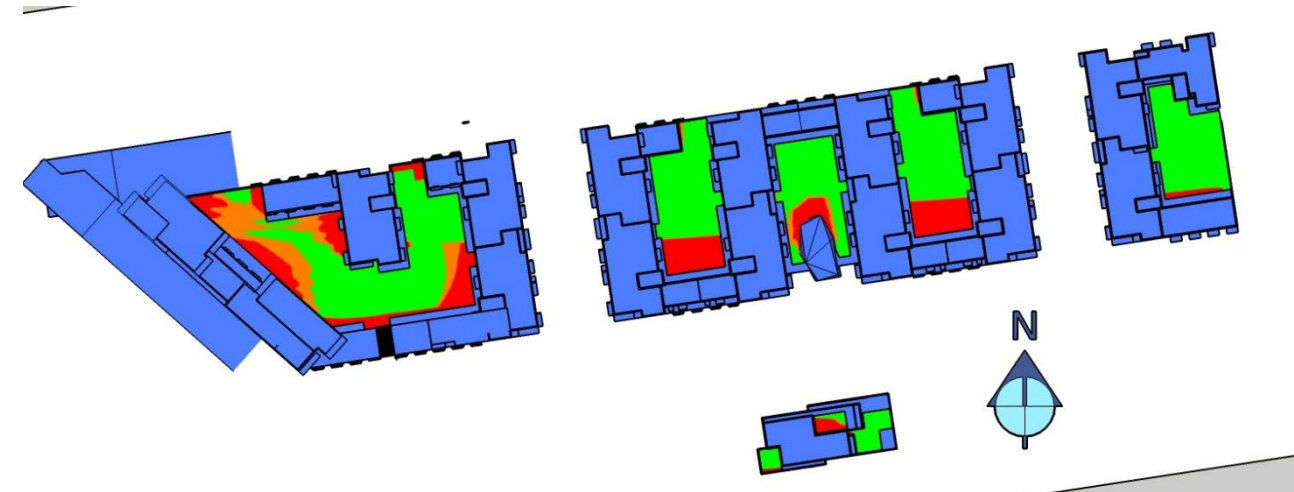
The amenities of the following properties were tested.

- Shared Amenity spaces as defined.
- While not called for in the BRE documents we have also tested private balconies for this project.

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



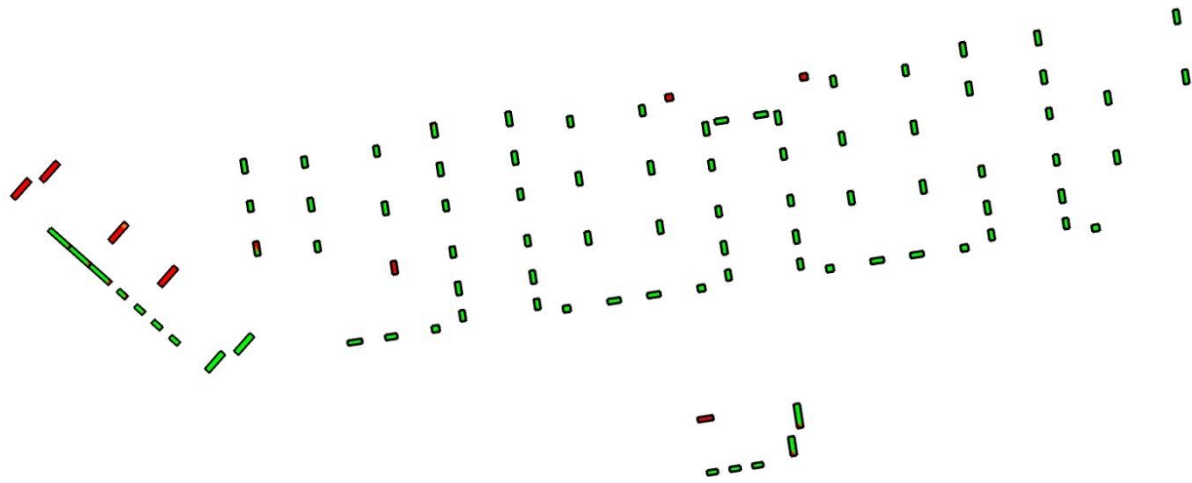
Proposed – Shared Amenity Spaces

The results are tabulated below:

Shared Shadow / Sunlight Amenity					
>50% receives 2 hours of sunlight on 21st March)					
Type	Floor	Zone	Ref	% 2hr Sunlight	Check
AS	F1	A1	ABC	56%	Pass
AS	F1	A2	D	74%	Pass
AS	F1	A3	DE	71%	Pass
AS	F1	A4	E	74%	Pass
AS	F1	A5	F	95%	Pass
AS	F1/F7	A6/A7/A8	G (combined)	79%	Pass
				Count	6
				Pass	6
				Pass Rate	100%

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.

All shared spaces pass the BRE requirements.



Proposed – Balcony Amenity Spaces at the most representative floor levels as noted above.

The results are tabulated below:

Balconies					
Shadow / Sunlight Amenity					
Rep Floors					
>50% receives 2 hours of sunlight on 21st March)					
Type	Floor	Zone	Ref	% 2hr Sunlight	Check
BA	F3	A2	A.3.2	0%	North Facing
BA	F3	A6	A.3.6	89%	Pass
BA	F3	A8	A.3.8	88%	Pass
BA	F3	A10	A.3.10	87%	Pass
BA	F3	A12	A.3.12	76%	Pass
BA	F3	A14	A.3.14	86%	Pass
BA	F3	A16	A.3.16	90%	Pass
BA	F3	A18	A.3.18	97%	Pass
BA	F3	A21	A.3.21	100%	Pass
BA	F3	A23	A.3.23	100%	Pass
BA	F3	A28	A.3.28	0%	North Facing
BA	F3	A29	A.3.29	0%	North Facing
BA	F3	A34	A.3.34	0%	North Facing
BB	F2	A1	B.2.1	99%	Pass
BB	F2	A5	B.2.5	98%	Pass
BB	F2	A8	B.2.8	36%	North Facing
BB	F2	A9	B.2.9	93%	Pass
BB	F2	A12	B.2.12	91%	Pass
BB	F2	A15	B.2.15	76%	Pass
BC	F2	A1	C.2.1	92%	Pass
BC	F2	A4	C.2.4	98%	Pass
BC	F2	A11	C.2.11	0%	North Facing
BC	F2	A13	C.2.13	100%	Pass
BC	F2	A16	C.2.16	99%	Pass
BC	F2	A19	C.2.19	100%	Pass
BC	F2	A20	C.2.20	99%	Pass
BC	F2	A23	C.2.23	99%	Pass
BC	F2	A25	C.2.25	99%	Pass
BC	F2	A30	C.2.30	99%	Pass
BC	F2	A32	C.2.32	92%	Pass
BC	F2	A36	C.2.36	81%	Pass

Balconies					
Shadow / Sunlight Amenity					
Rep Floors					
>50% receives 2 hours of sunlight on 21st March)					
Type	Floor	Zone	Ref	% 2hr Sunlight	Check
BD	F2	A1	D.2.1	88%	Pass
BD	F2	A5	D.2.5	95%	Pass
BD	F2	A7	D.2.7	98%	Pass
BD	F2	A12	D.2.12	99%	Pass
BD	F2	A14	D.2.14	98%	Pass
BD	F2	A17	D.2.17	98%	Pass
BD	F2	A18	D.2.18	100%	Pass
BD	F2	A21	D.2.21	99%	Pass
BD	F2	A24	D.2.24	100%	Pass
BD	F2	A27	D.2.27	100%	Pass
BD	F2	A28	D.2.28	99%	Pass
BD	F2	A31	D.2.31	99%	Pass
BD	F2	A33	D.2.33	99%	Pass
BD	F2	A38	D.2.38	99%	Pass
BD	F2	A40	D.2.40	93%	Pass
BD	F2	A42	D.2.42	97%	Pass
BD	F2	A46	D.2.46	0%	North Facing
BD	F2	A47	D.2.47	92%	Pass
BD	F2	A50	D.2.50	95%	Pass
BD	F2	A57	D.2.57	95%	Pass
BD	F2	A60	D.2.60	93%	Pass
BD	F2	A67	D.2.67	93%	Pass
BD	F2	A70	D.2.70	76%	Pass
BE	F2	A1	E.2.1	84%	Pass
BE	F2	A5	E.2.5	96%	Pass
BE	F2	A12	E.2.12	99%	Pass
BE	F2	A14	E.2.14	98%	Pass
BE	F2	A17	E.2.17	98%	Pass
BE	F2	A18	E.2.18	100%	Pass
BE	F2	A21	E.2.21	99%	Pass
BE	F2	A24	E.2.24	99%	Pass
BE	F2	A27	E.2.27	100%	Pass
BE	F2	A28	E.2.28	98%	Pass
BE	F2	A31	E.2.31	98%	Pass
BE	F2	A33	E.2.33	98%	Pass
BE	F2	A38	E.2.38	98%	Pass
BE	F2	A40	E.2.40	94%	Pass
BE	F2	A42	E.2.42	98%	Pass
BE	F2	A46	E.2.46	0%	North Facing
BE	F2	A47	E.2.47	76%	Pass
BE	F2	A50	E.2.50	92%	Pass
BE	F2	A57	E.2.57	92%	Pass
BE	F2	A60	E.2.60	96%	Pass
BE	F2	A67	E.2.67	97%	Pass
BE	F2	A70	E.2.70	92%	Pass

Architects' Commentary & Compensatory Design Measures

Compensatory Design Measures

Care has been taken in the design of the Apartment units to receive an excellent rating of 97% compliance with ADF requirements (99% if we include marginals). The design of the individual units has exercised every opportunity to maximize quality where possible. This includes providing generous living room areas, storage areas, private open space, exceeding the minimum width of living /dining spaces where possible, and maximizing the amount of glazing and natural light. All design measures result in generous and positive living spaces for future residents.

Care has also been taken to ensure there are no single aspect apartment units facing only north, to allow for a high level of sunlight and an excellent level of ADF for most of all units. The design and layout of the floor plans ensures that most of all living spaces will receive a high quality of sunlight, which if we include marginal results we see relaxed compliance at 73% Annual APSH and 91% Winter WPSH (Strict BRE APSH: 56%, WPSH: 85%). Given that the proposed development is a high-density proposal, the results for ADF and sunlight is deemed as compliant and positive for the scale of the apartment units. This is coupled with positive sunlight for external Communal Open Spaces for the apartment residents, as these are also orientated to receive a maximum level of sunlight.

Summary of site & urban blocks

The proposed Building Form is divided into 4no. distinct urban perimeter blocks with each block carefully modulated to maximise access to natural light to the first floor/ podium communal courtyards, adjacent streets and to the individual apartment interiors and their associated balconies & terraces.

The N/W corner of the site acts a gateway to the proposed development, marked by a 15-storey landmark tower which is anchored at ground level by a retail unit with a formal public plaza in front.

A linear park and promenade acts as a central axis joining Park West Avenue to the central public park and forming the spine upon which the primary building volumes are orientated along. Blocks A-F range in height from 2-15 storeys with a predominant baseline height of 7-8 storeys. They are grouped into three zones, each linked by a continuous podium level which houses undercroft carparking at ground level and communal courtyards at podium level above. The podiums are lined on their perimeters by a mix of apartments and own-door units that provide active street frontages and lend a more human scale at street level. Block G is a standalone volume which continues the building line as established by the Aspect Hotel and provides definition and enclosure to the linear park and central park as well as creating a street frontage facing south which will ensure a dialogue with future developments to come.

The proposal creates 3no. urban blocks A/B/C, D/E, F avoiding long, uninterrupted walls of the building form with articulations such as recessed 2 storey own door unit plinths with own door entrances, the sculptural Amenity volume, lobby & carpark entrances. These 3 urban blocks are further modulated with heights

increasing from south to north to open courtyards to the south & reduce overshadowing of these communal amenity areas.

The design and configuration of the apartment blocks have specific regard to the orientation of the site and will allow for a high level of daylight & sunlight penetration into the communal courtyards & link spaces. The courtyards are opened to the south. The distance between parallel, double-loaded north-south 8/7-storey blocks is at least 24 m. The depth of the protruding balconies is balanced with great floor to floor heights and large glazed openings. In Block A in particular, these performance criteria helped shape the layout of the Park West Avenue building, where the roadside block tended to shade at the courtyard level, which was addressed by incorporating proprietary two-tier door units into the lower levels that were most exposed to shading.

Summary of Apartments Apartment Variety

Throughout the scheme there are 26 no. apartment unit types in total, with 7 of those repeating most frequently. There are 6 no. 2 storey own-door apartment types proposed. They vary in aspect: 1-, 2- & 3-bedroom single storey apartment units and 2&3-bedroom own door two storeys apartment units.

The apartments are proposed in seven different Blocks to form a series of interlinked communal amenity courtyards.

The enclosing apartment blocks have units facing east & west off a double loaded corridor to avoid any north facing single aspect apartments. Block G is an 8-storey single core block that extends the Hotel building form to overlook the linear & central parks. It has 5 no. 2 bedroom units per floor with 4 no. dual aspect with generous recessed balconies.

The majority of apartments are designed as open plan resulting in high levels of daylight penetration into each of the units

Good access to daylight is a primary design driver. As a principle, 3-bedroom units and 2 storey own door units are always dual aspect units, with dual aspect living spaces where possible. 2-bedroom units also have a high proportion of dual aspect and where they are single aspect, they tend to have a very wide and shallow floor plan ensuring a good frontage and access to daylight. One-bedroom units, due to their size, tend mostly to be single aspect but there are some dual aspect units provided at corners and where site constraints allow

Summary

A careful collaboration between Darmody Architecture and Chris Shackleton Consulting helped to inform design changes at both a macro and micro level to ensure compliance whilst also ensuring that the design intent and expression of the built form would not be negatively impacted. On a macro level, Block C south part was substantially re-designed in order that the courtyard space to blocks A-B-C would achieve the necessary 2 hours of sunlight over greater than 50% of its area. A more detailed study of the other spaces including the linear park and the courtyard D-E have also confirmed that these spaces also meet the requirement which was not explicitly clear in the Stage 2 submission. At a micro level, the design of some apartment types also underwent changes such as positioning to balconies, size of fenestration and the introduction of wintergardens to ensure that the necessary values for the ADF and APSH were all achieved.

Overall Summary

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

- **Skylight- VSC:**
 - All facades with windows tested for Window Groups B1, B2 & B3 comply with the BRE requirements
 - The average change ratio for VSC is **0.89**
 - The facades of Window Group B4 comply against Appendix F mirrored development target as defined in this document.
- **Sunlight APSH & WPSH:**
 - All relevant and tested windows of Window Groups B1, B2 & B3 pass the relevant Annual APSH, Winter WPSH or overall sunlight checks.
 - The average change ratio annual is APSH: **0.88**
 - Facing windows to Window Group B4 are not orientated within 90° of due South and are not tested.
- **Shadow:**
 - All tested neighbouring gardens pass the 2-hour test requirements for the 21st March.
 - The average change ratio for shadow/sunlight is **0.99**

Performance of the proposed design

- **Light Distribution ADF:**
 - On the tested representative floors
 - 97% of rooms (99% if we include marginals) comply with the Strict BRE Guidelines
 - All pass the relaxed 1.5% target
 - Average high ADFs for all tested living rooms is 2.5% and for bedrooms 1.7%
 - Additional testing was also completed for the Ground & 1st Floors (Appendixes 1 & 2)
 - When all tested rooms on all tested floors are taken into account the compliance rate with the strict BRE rises to 98% and against the relaxed target 99.7%
 - Almost all of the rooms which fail to achieve the strict target are marginal
 - The results for floors above the representative levels tested will of course improve since at higher levels the obstruction to skylight caused by surrounding blocks will lessen.
- **Sunlight to Living rooms:**
 - All Living rooms receive some sunlight over the course of the year.
 - In terms Strict BRE the percentage pass rate is 56% Annual and 85% Winter WPSH
 - However, there are many rooms which receive good sunlight and are marginal on the BRE targets. If we include the marginal results 73% pass a relaxed Annual APSH requirements and 91% pass the WPSH which is broadly in line with the guidelines example of “careful” design 80%.
 - These results should be considered in conjunction with the high daylight ADF results and balcony performance achieved throughout.

- **Shadow:**
 - All new provided shared amenity spaces pass the BRE requirement relating to the area receiving 2 hours of sunlight on the 21st of March > 50%.
 - 90% of the Private balconies also receive qualifying sunlight over most of their surface on the test day of the 21st March.
 - The number of balconies that face North is minimal and consistent with the BRE guidelines “Careful Layout Design” criteria.

Architects’ Commentary and Compensatory Measures

The Architect has provided a commentary in which they have outlined how specific care was taken in this development’s design in regard to light for both the impact on neighbours and the performance of the proposed residential units and their amenities.

As part of the design process the design went through a considerable iterative analysis to achieve the results presented here.

The Architect also provides a range of compensatory elements to offset any marginal results and proposed design generally achieves the relevant targets while balancing the other constraints.

WE WOULD DIRECT THE READER TO THIS SPECIFIC COMMENTARY AND TO THE ARCHITECT’S OWN REPORT ON THE DESIGN.

The application generally complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE 2011) and BS 8206 Lighting for Buildings and Part 2: Code of Practice for Daylighting.

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.

Appendix 1

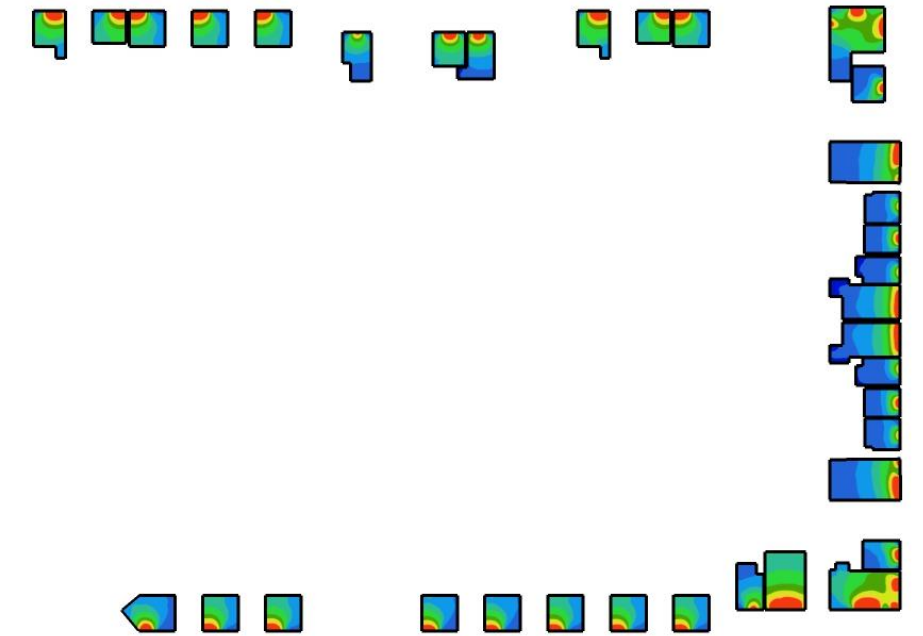
Additional ADF Analysis for GFL

ABC Floor Layout – Naming Convention

GFL Blocks ABC



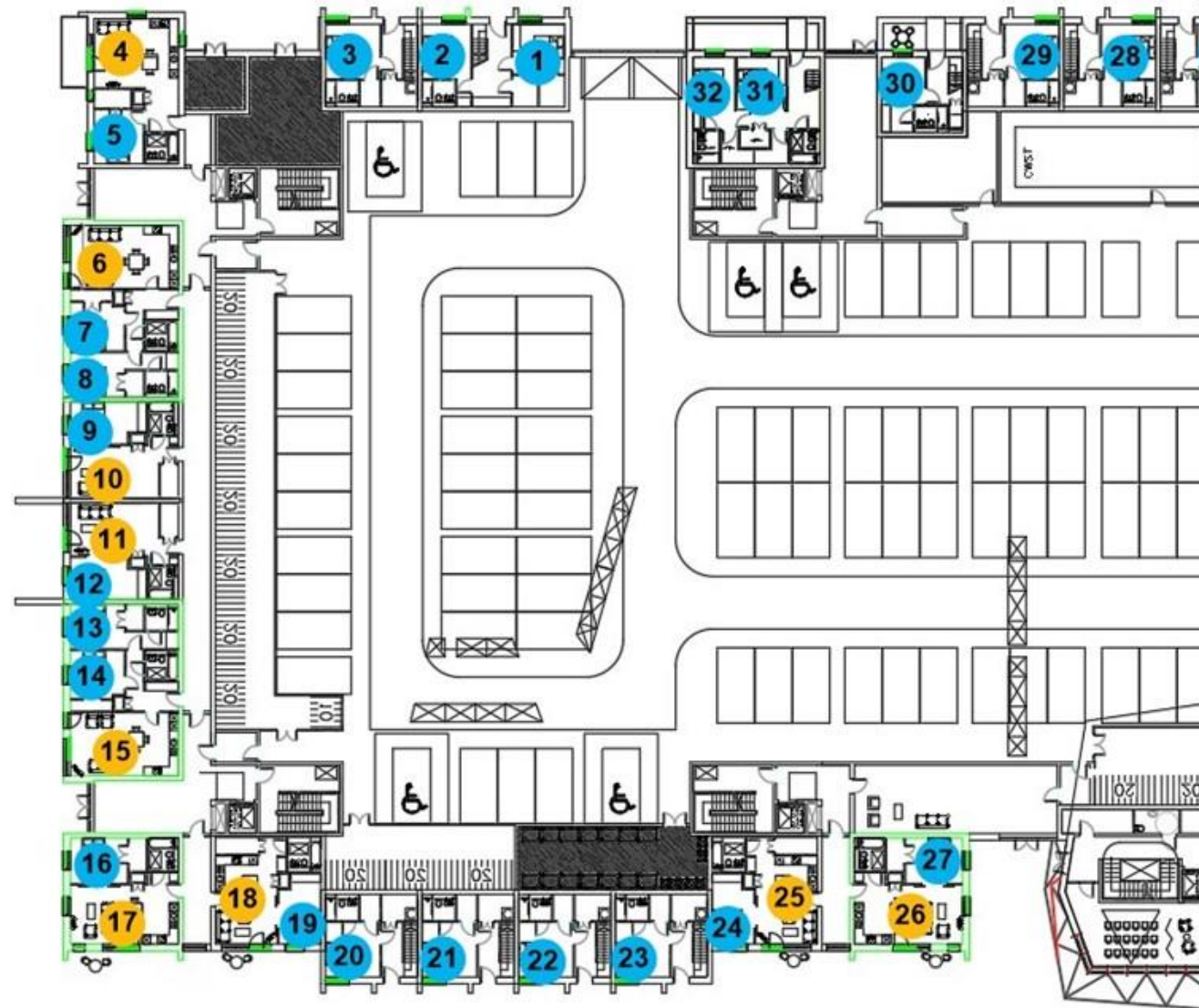
Floor Analysis



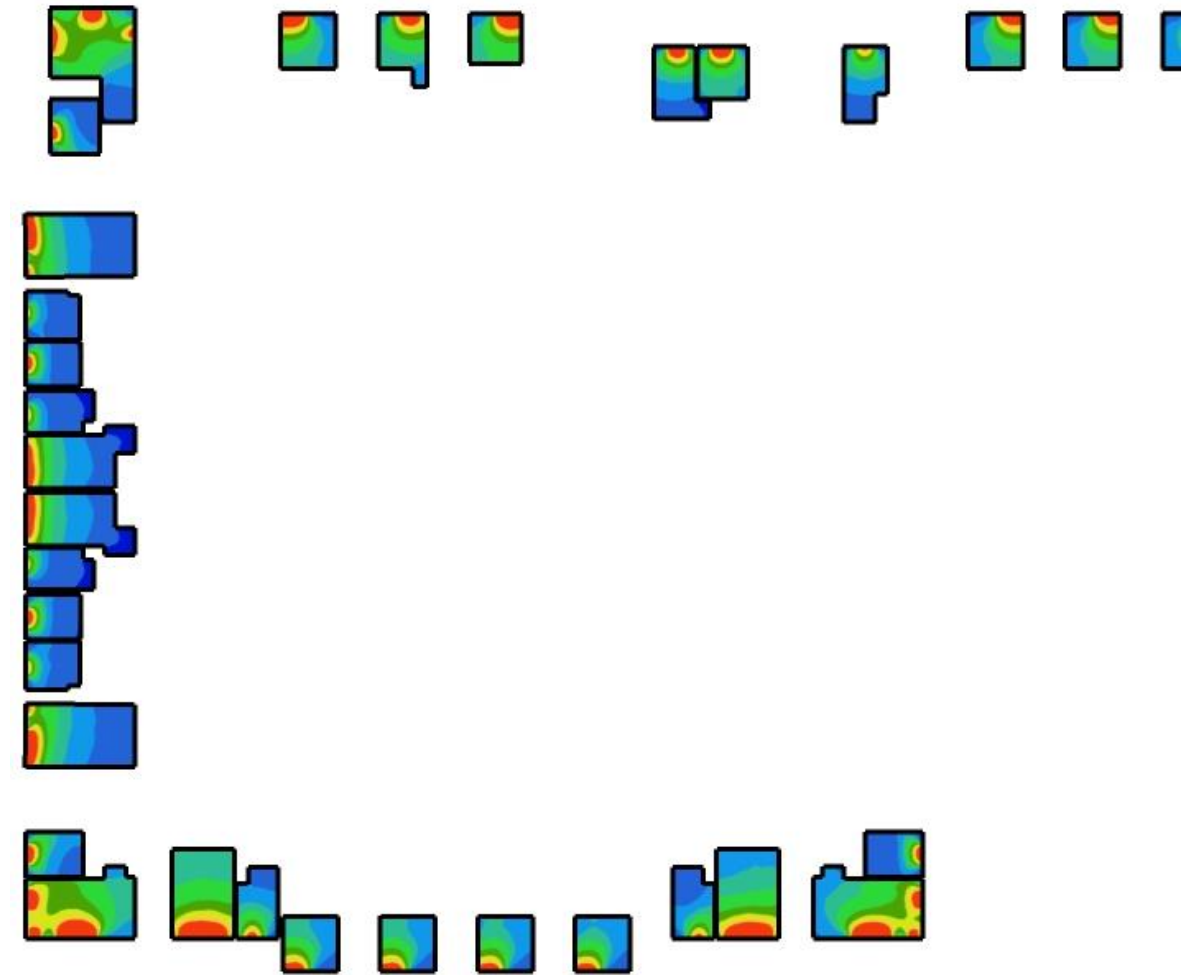
Average Daylight Factor							
00-ABC	For all habitable rooms						
V6	ADF Values from radiance 3D model						
	Yes						
	Type						
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed I/D/K Target	Check
	00-BC01	Bedroom	2.0	1.0	Pass	1.0	Pass
	00-BC02	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-BC03	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-BC04	Bedroom	2.1	1.0	Pass	1.0	Pass
	00-BC05	Bedroom	2.1	1.0	Pass	1.0	Pass
	00-BC06	Bedroom	2.4	1.0	Pass	1.0	Pass
	00-BC07	Bedroom	2.4	1.0	Pass	1.0	Pass
	00-BC08	Bedroom	2.4	1.0	Pass	1.0	Pass
	00-BC09	Bedroom	1.7	1.0	Pass	1.0	Pass
	00-BC10L	Living Room	3.7	2.0	Pass	1.5	Pass
	00-BC11L	Living Room	4.0	2.0	Pass	1.5	Pass
	00-BC12	Bedroom	1.9	1.0	Pass	1.0	Pass
	00-BC13L	Living Room	2.1	2.0	Pass	1.5	Pass
	00-BC14	Bedroom	1.3	1.0	Pass	1.0	Pass
	00-BC15	Bedroom	1.7	1.0	Pass	1.0	Pass
	00-BC16	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-BC17L	Living Room	2.1	2.0	Pass	1.5	Pass
	00-BC18L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-BC19	Bedroom	1.0	1.0	Pass	1.0	Pass
	00-BC20	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-BC21	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-BC22L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-BC23	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-BC24L	Living Room	2.9	2.0	Pass	1.5	Pass
	00-BC25	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-BC26	Bedroom	3.0	1.0	Pass	1.0	Pass
	00-BC27	Bedroom	3.3	1.0	Pass	1.0	Pass
	00-BC28	Bedroom	2.1	1.0	Pass	1.0	Pass
	00-BC29	Bedroom	2.7	1.0	Pass	1.0	Pass
	00-BC30	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-BC31	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-BC32	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-BC33	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-BC34	Bedroom	3.0	1.0	Pass	1.0	Pass
	00-BC35	Bedroom	3.2	1.0	Pass	1.0	Pass
				Pass	35	Pass	35
				Count	35	Count	35
				Percentage	100%	Percentage	100%
				Marginal	0		
					100%		

D Floor Layout - Naming Convention

GFL Block D



Floor Analysis



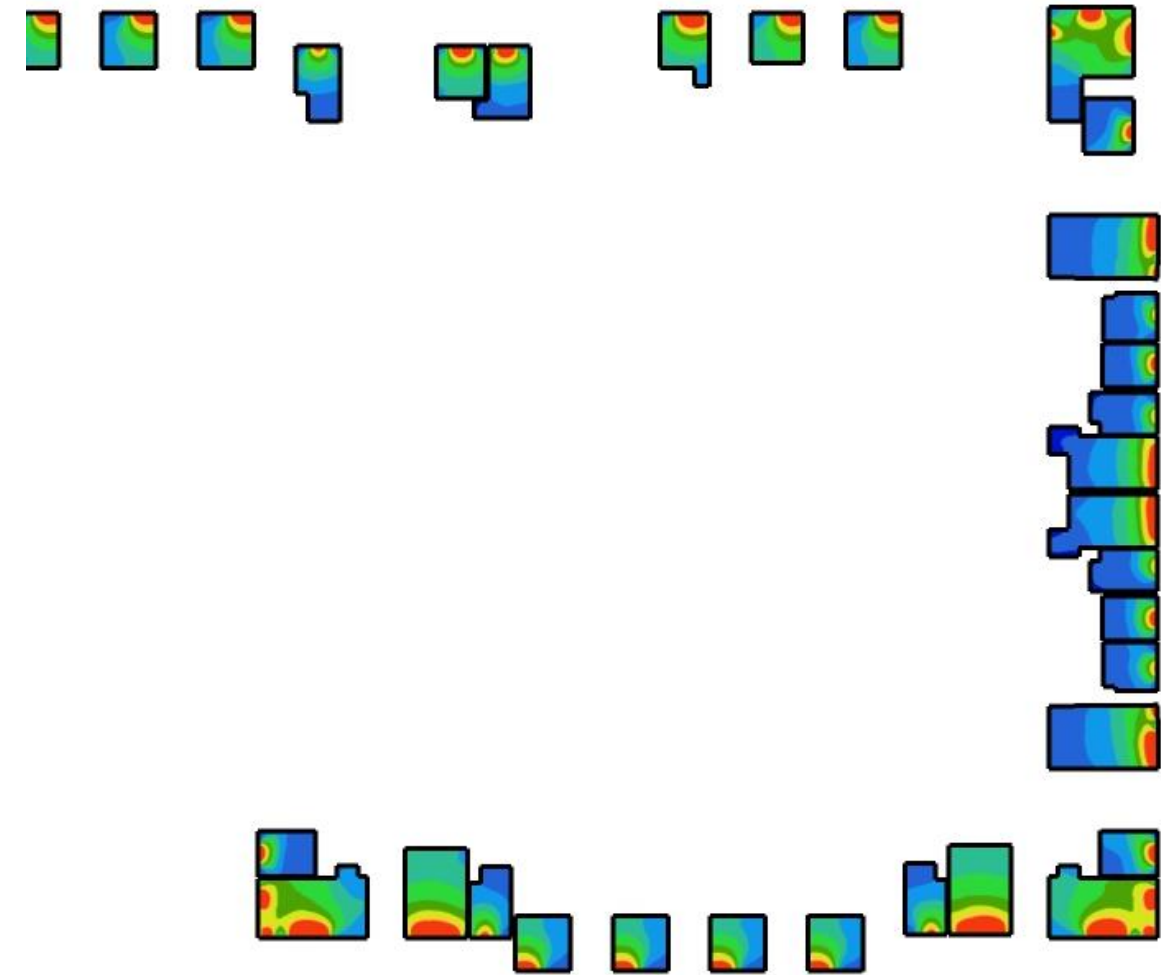
Average Daylight Factor							
00-D							
V6	For all habitable rooms						
	ADF Values from radiance 3D model		Yes				
	Type						
Ref	Ref	Type	ADF	Strict BRE		Relaxed L/D/K	
				Min	Check	Target	Check
	00-D01	Bedroom	3.5	1.0	Pass	1.0	Pass
	00-D02	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-D03	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-D04L	Living Room	2.8	2.0	Pass	1.5	Pass
	00-D05	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-D06L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-D07	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-D08	Bedroom	1.5	1.0	Pass	1.0	Pass
	00-D09	Bedroom	1.0	1.0	Pass	1.0	Pass
	00-D10L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-D11L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-D12	Bedroom	1.0	1.0	Pass	1.0	Pass
	00-D13	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-D14	Bedroom	1.2	1.0	Pass	1.0	Pass
	00-D15L	Living Room	2.1	2.0	Pass	1.5	Pass
	00-D16	Bedroom	1.9	1.0	Pass	1.0	Pass
	00-D17L	Living Room	4.0	2.0	Pass	1.5	Pass
	00-D18L	Living Room	3.5	2.0	Pass	1.5	Pass
	00-D19	Bedroom	1.8	1.0	Pass	1.0	Pass
	00-D20	Bedroom	2.3	1.0	Pass	1.0	Pass
	00-D21	Bedroom	2.2	1.0	Pass	1.0	Pass
	00-D22	Bedroom	2.2	1.0	Pass	1.0	Pass
	00-D23	Bedroom	2.1	1.0	Pass	1.0	Pass
	00-D24	Bedroom	1.5	1.0	Pass	1.0	Pass
	00-D25L	Living Room	3.2	2.0	Pass	1.5	Pass
	00-D26L	Living Room	3.5	2.0	Pass	1.5	Pass
	00-D27	Bedroom	1.4	1.0	Pass	1.0	Pass
	00-D28	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-D29	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-D30	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-D31	Bedroom	2.6	1.0	Pass	1.0	Pass
	00-D32	Bedroom	2.0	1.0	Pass	1.0	Pass
				Pass	32	Pass	32
				Count	32	Count	32
				Percentage	100%	Percentage	100%
				Marginal	0		
					100%		

E Floor Layout - Naming Convention

GFL Block E



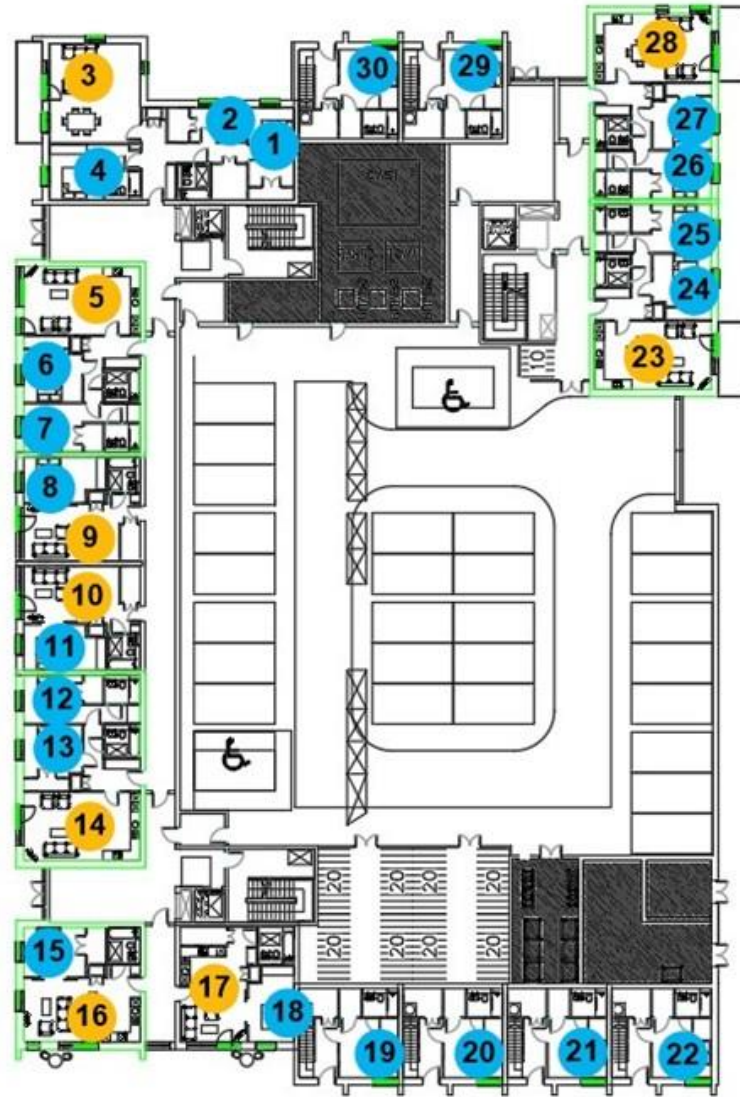
Floor Analysis



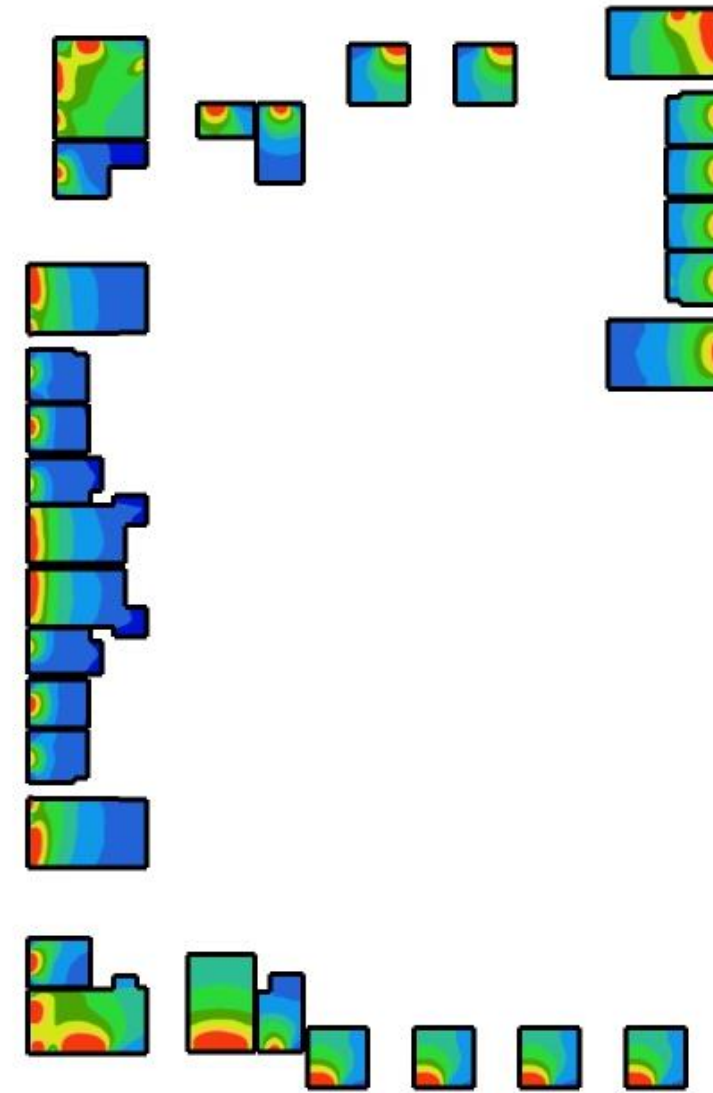
Average Daylight Factor							
00-E							
V6	For all habitable rooms						
	ADF Values from radiance 3D model			Yes			
	Type						
Ref	Ref	Type	ADF	Strict BRE		Relaxed L/D/K	
				Min	Check	Target	Check
	00-E01	Bedroom	3.3	1.0	Pass	1.0	Pass
	00-E02	Bedroom	3.1	1.0	Pass	1.0	Pass
	00-E03	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-E04L	Living Room	2.9	2.0	Pass	1.5	Pass
	00-E05	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-E06L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-E07	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-E08	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-E09	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-E10L	Living Room	2.1	2.0	Pass	1.5	Pass
	00-E11L	Living Room	2.3	2.0	Pass	1.5	Pass
	00-E12	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-E13	Bedroom	1.8	1.0	Pass	1.0	Pass
	00-E14	Bedroom	1.4	1.0	Pass	1.0	Pass
	00-E15L	Living Room	2.2	2.0	Pass	1.5	Pass
	00-E16	Bedroom	2.0	1.0	Pass	1.0	Pass
	00-E17L	Living Room	4.1	2.0	Pass	1.5	Pass
	00-E18L	Living Room	3.6	2.0	Pass	1.5	Pass
	00-E19	Bedroom	1.7	1.0	Pass	1.0	Pass
	00-E20	Bedroom	2.4	1.0	Pass	1.0	Pass
	00-E21	Bedroom	2.4	1.0	Pass	1.0	Pass
	00-E22	Bedroom	2.3	1.0	Pass	1.0	Pass
	00-E23	Bedroom	2.3	1.0	Pass	1.0	Pass
	00-E24	Bedroom	1.7	1.0	Pass	1.0	Pass
	00-E25L	Living Room	3.4	2.0	Pass	1.5	Pass
	00-E26L	Living Room	3.7	2.0	Pass	1.5	Pass
	00-E27	Bedroom	1.5	1.0	Pass	1.0	Pass
	00-E28	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-E29	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-E30	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-E31	Bedroom	2.7	1.0	Pass	1.0	Pass
	00-E32	Bedroom	2.1	1.0	Pass	1.0	Pass
				Pass	32	Pass	32
				Count	32	Count	32
				Percentage	100%	Percentage	100%
				Marginal	0		
					100%		

F Floor Layout - Naming Convention

GFL Block F



Floor Analysis



Average Daylight Factor							
00-F	For all habitable rooms						
V6	ADF Values from radiance 3D model						
	Yes						
	Type						
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed I/D/K Target	Check
	00-F01	Bedroom	1.7	1.0	Pass	1.0	Pass
	00-F02	Bedroom	3.1	1.0	Pass	1.0	Pass
	00-F03L	Living Room	3.2	2.0	Pass	1.5	Pass
	00-F04	Bedroom	1.3	1.0	Pass	1.0	Pass
	00-F05L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-F06	Bedroom	1.1	1.0	Pass	1.0	Pass
	00-F07	Bedroom	1.5	1.0	Pass	1.0	Pass
	00-F08	Bedroom	1.0	1.0	Pass	1.0	Pass
	00-F09L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-F10L	Living Room	2.0	2.0	Pass	1.5	Pass
	00-F11	Bedroom	1.0	1.0	Pass	1.0	Pass
	00-F12	Bedroom	1.6	1.0	Pass	1.0	Pass
	00-F13	Bedroom	1.2	1.0	Pass	1.0	Pass
	00-F14L	Living Room	2.1	2.0	Pass	1.5	Pass
	00-F15	Bedroom	1.9	1.0	Pass	1.0	Pass
	00-F16L	Living Room	4.1	2.0	Pass	1.5	Pass
	00-F17L	Living Room	3.7	2.0	Pass	1.5	Pass
	00-F18	Bedroom	1.8	1.0	Pass	1.0	Pass
	00-F19	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-F20	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-F21	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-F22	Bedroom	2.8	1.0	Pass	1.0	Pass
	00-F23L	Living Room	2.2	2.0	Pass	1.5	Pass
	00-F24	Bedroom	2.6	1.0	Pass	1.0	Pass
	00-F25	Bedroom	2.6	1.0	Pass	1.0	Pass
	00-F26	Bedroom	2.5	1.0	Pass	1.0	Pass
	00-F27	Bedroom	2.6	1.0	Pass	1.0	Pass
	00-F28L	Living Room	3.9	2.0	Pass	1.5	Pass
	00-F29	Bedroom	2.3	1.0	Pass	1.0	Pass
	00-F30	Bedroom	2.4	1.0	Pass	1.0	Pass
				Pass	30	Pass	30
				Count	30	Count	30
				Percentage	100%	Percentage	100%
				Marginal	0		
					100%		

Summary

GFL	Strict			Relaxed		
	Pass	Count		Pass	Count	
00-BC	35	35	100%	35	35	100%
00-D	32	32	100%	32	32	100%
00-E	32	32	100%	32	32	100%
00-F	30	30	100%	30	30	100%
V6	129	129		129	129	
		100%			100%	

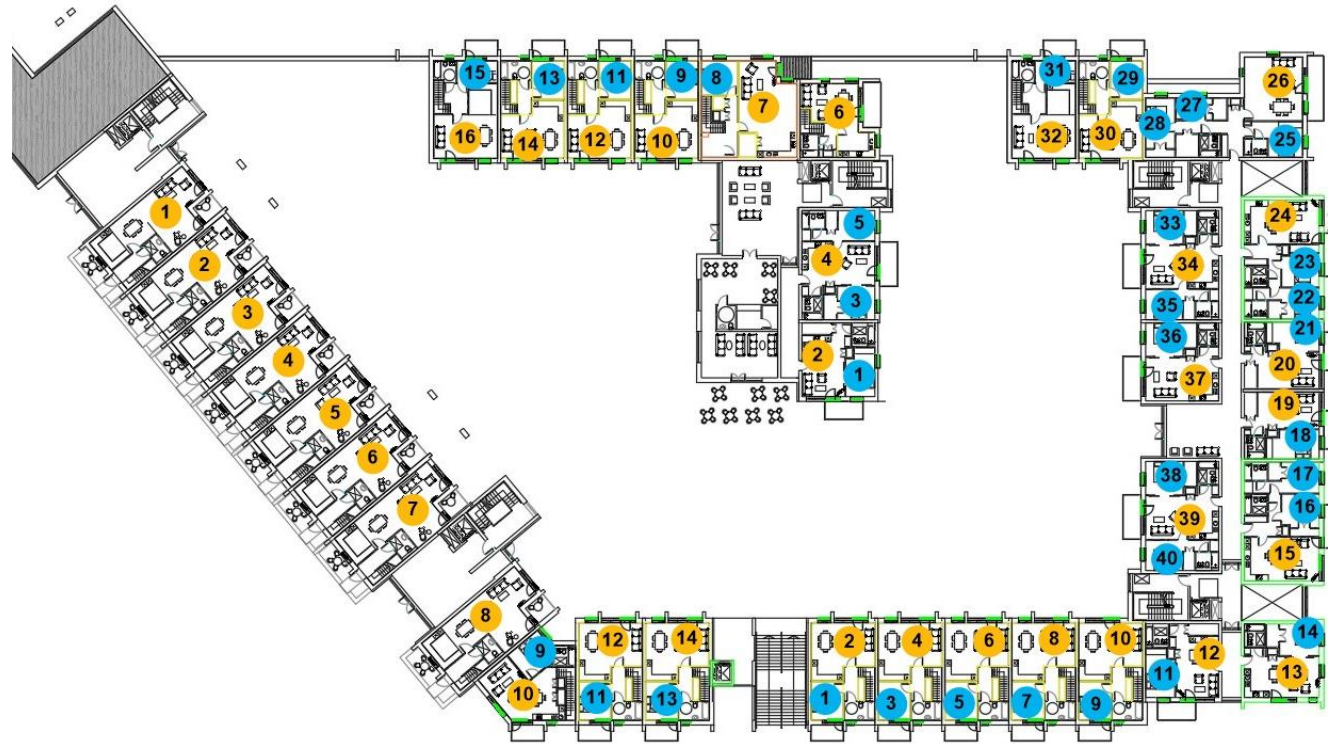
100% rooms comply with the Strict BRE Guidelines in relation to ADF

Appendix 2

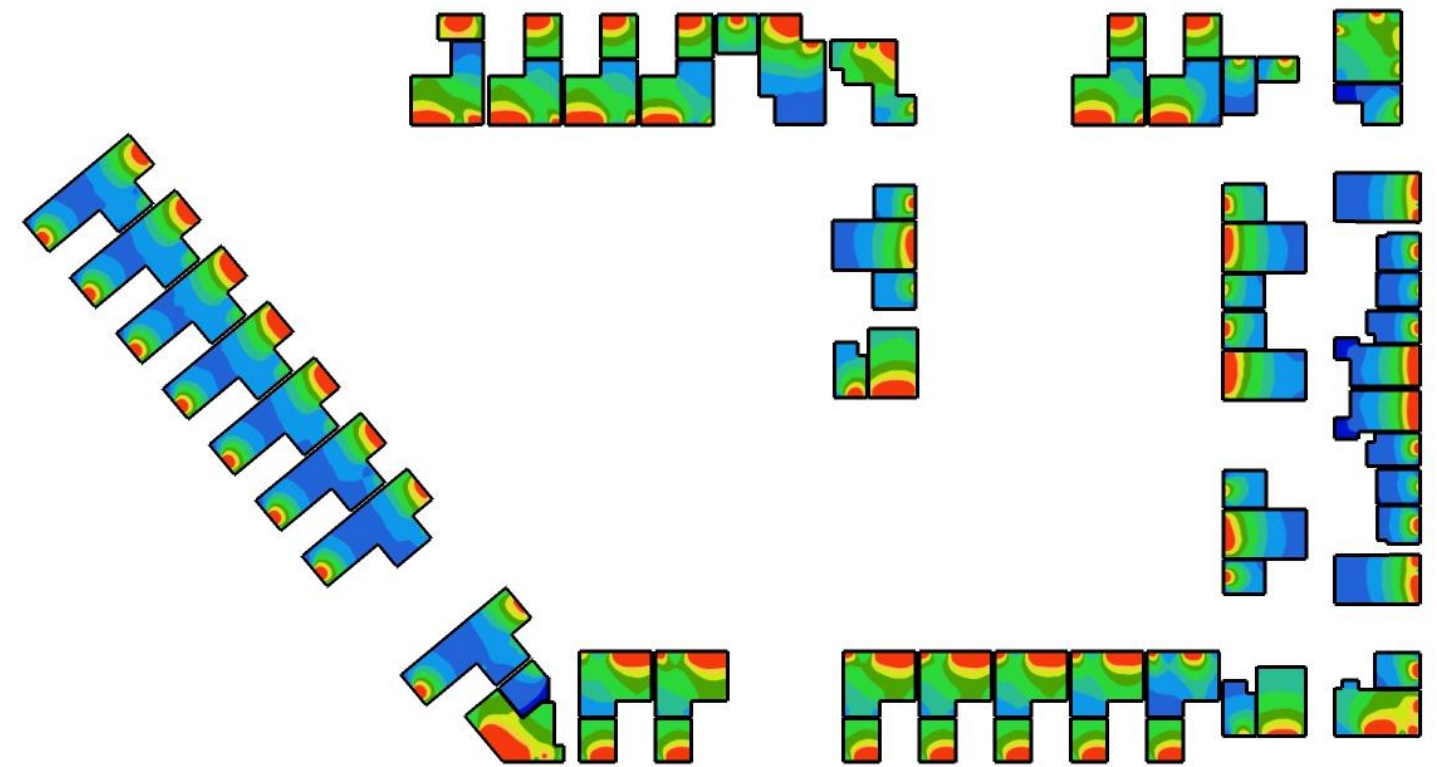
Additional ADF Analysis for 1st Floor

ABC Floor Layout – Naming Convention

1st Floor Blocks A, B & C



Floor Analysis

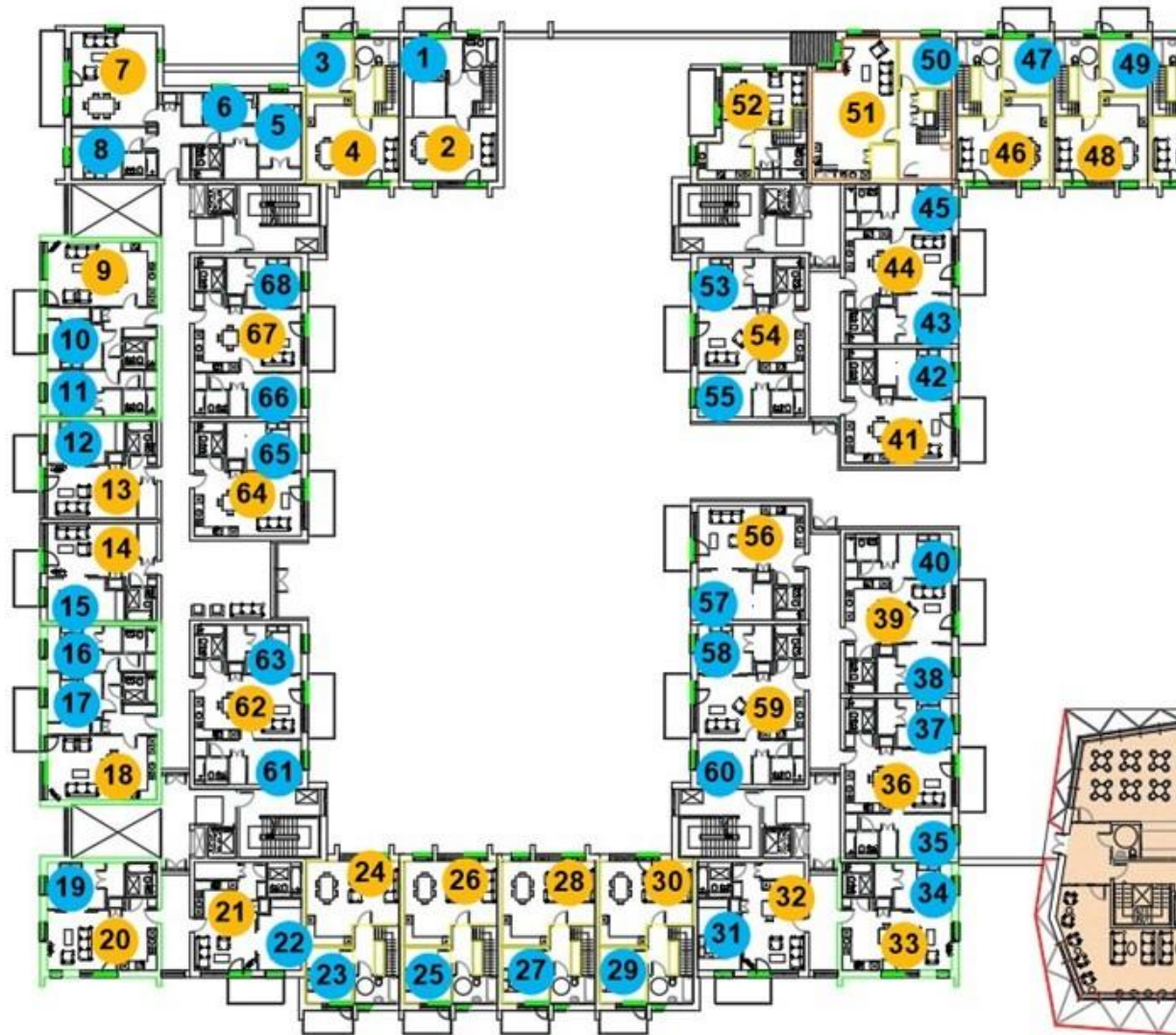


Average Daylight Factor								
01-ABC	For all habitable rooms							
V7	ADF Values from radiance 3D model Yes							
	Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check	
A	01-A01L	Living Room	2.1	2.0	Pass	1.5	Pass	
	01-A02L	Living Room	2.2	2.0	Pass	1.5	Pass	
	01-A03L	Living Room	2.5	2.0	Pass	1.5	Pass	
	01-A04L	Living Room	2.4	2.0	Pass	1.5	Pass	
	01-A05L	Living Room	2.3	2.0	Pass	1.5	Pass	
	01-A06L	Living Room	2.0	2.0	Pass	1.5	Pass	
	01-A07L	Living Room	1.8	2.0	Marginal	m	1.5	Pass
	01-A08L	Living Room	1.8	2.0	Marginal	m	1.5	Pass
	01-A09	Bedroom	1.0	1.0	Pass	1.0	Pass	
	01-A10L	Living Room	5.2	2.0	Pass	1.5	Pass	
	01-A11	Bedroom	4.8	1.0	Pass	1.0	Pass	
	01-A12L	Living Room	3.5	2.0	Pass	1.5	Pass	
	01-A13	Bedroom	4.8	1.0	Pass	1.0	Pass	
	01-A14L	Living Room	4.0	2.0	Pass	1.5	Pass	
B	01-B01	Bedroom	2.7	1.0	Pass	1.0	Pass	
	01-B02L	Living Room	4.5	2.0	Pass	1.5	Pass	
	01-B03	Bedroom	1.5	1.0	Pass	1.0	Pass	
	01-B04L	Living Room	2.3	2.0	Pass	1.5	Pass	
	01-B05	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-B06L	Living Room	3.4	2.0	Pass	1.5	Pass	
	01-B07L	Living Room	2.9	2.0	Pass	1.5	Pass	
	01-B08	Bedroom	3.0	1.0	Pass	1.0	Pass	
	01-B09	Bedroom	4.8	1.0	Pass	1.0	Pass	
	01-B10L	Living Room	2.8	2.0	Pass	1.5	Pass	
	01-B11	Bedroom	4.8	1.0	Pass	1.0	Pass	
	01-B12L	Living Room	3.4	2.0	Pass	1.5	Pass	
	01-B13	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-B14L	Living Room	3.6	2.0	Pass	1.5	Pass	
	01-B15	Bedroom	6.2	1.0	Pass	1.0	Pass	
	01-B16L	Living Room	3.8	2.0	Pass	1.5	Pass	

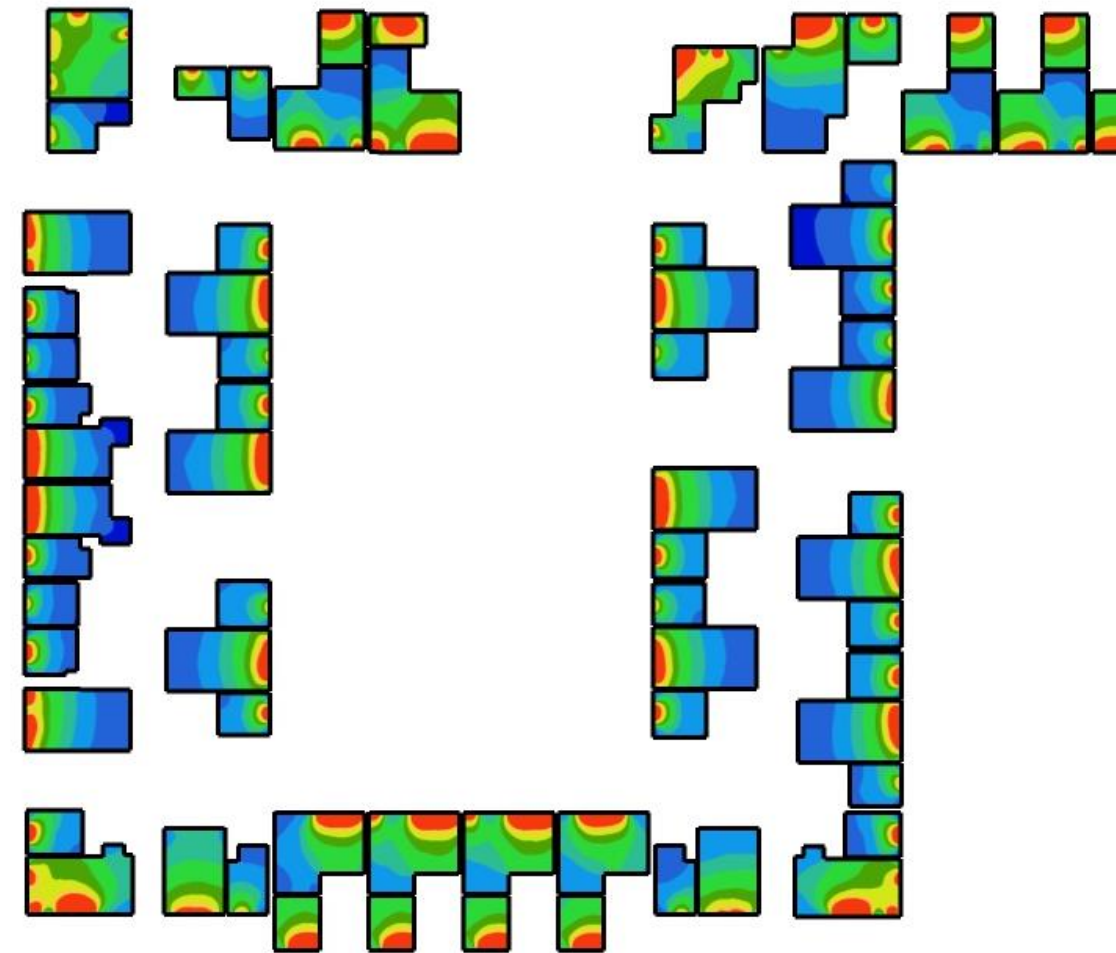
Average Daylight Factor							
01-ABC	For all habitable rooms						
V7	ADF Values from radiance 3D model Yes						
	Type						
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
C	01-C01	Bedroom	4.8	1.0	Pass	1.0	Pass
	01-C02L	Living Room	4.0	2.0	Pass	1.5	Pass
	01-C03	Bedroom	4.8	1.0	Pass	1.0	Pass
	01-C04L	Living Room	4.0	2.0	Pass	1.5	Pass
	01-C05	Bedroom	4.8	1.0	Pass	1.0	Pass
	01-C06L	Living Room	3.8	2.0	Pass	1.5	Pass
	01-C07	Bedroom	4.7	1.0	Pass	1.0	Pass
	01-C08L	Living Room	3.4	2.0	Pass	1.5	Pass
	01-C09	Bedroom	4.7	1.0	Pass	1.0	Pass
	01-C10L	Living Room	2.0	2.0	Pass	1.5	Pass
	01-C11	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-C12L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-C13L	Living Room	4.2	2.0	Pass	1.5	Pass
	01-C14	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-C15L	Living Room	2.2	2.0	Pass	1.5	Pass
	01-C16	Bedroom	1.9	1.0	Pass	1.0	Pass
	01-C17	Bedroom	1.2	1.0	Pass	1.0	Pass
	01-C18	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-C19L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-C20L	Living Room	2.8	2.0	Pass	1.5	Pass
	01-C21	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-C22	Bedroom	1.1	1.0	Pass	1.0	Pass
	01-C23	Bedroom	1.8	1.0	Pass	1.0	Pass
	01-C24L	Living Room	2.1	2.0	Pass	1.5	Pass
	01-C25	Bedroom	1.3	1.0	Pass	1.0	Pass
	01-C26L	Living Room	2.7	2.0	Pass	1.5	Pass
	01-C27	Bedroom	2.6	1.0	Pass	1.0	Pass
	01-C28	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-C29	Bedroom	4.7	1.0	Pass	1.0	Pass
	01-C30L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-C31	Bedroom	4.7	1.0	Pass	1.0	Pass
	01-C32L	Living Room	3.6	2.0	Pass	1.5	Pass
	01-C33	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-C34L	Living Room	2.5	2.0	Pass	1.5	Pass
	01-C35	Bedroom	1.8	1.0	Pass	1.0	Pass
	01-C36	Bedroom	2.4	1.0	Pass	1.0	Pass
	01-C37L	Living Room	3.1	2.0	Pass	1.5	Pass
	01-C38	Bedroom	1.7	1.0	Pass	1.0	Pass
	01-C39L	Living Room	2.4	2.0	Pass	1.5	Pass
	01-C40	Bedroom	2.1	1.0	Pass	1.0	Pass
				Pass	68	Pass	70
				Count	70	Count	70
				Percentage	97%	Percentage	100%
				Marginal	2		
				Percentage incl Marginal	100%		

D Floor Layout – Naming Convention

1st Floor Block D



Floor Analysis



01-D Average Daylight Factor								
V7 For all habitable rooms								
ADF Values from radiance 3D model				Yes				
Type								
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check	
	01-D01	Bedroom	6.2	1.0	Pass	1.0	Pass	
	01-D02L	Living Room	3.6	2.0	Pass	1.5	Pass	
	01-D03	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-D04L	Living Room	2.1	2.0	Pass	1.5	Pass	
	01-D05	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-D06	Bedroom	2.6	1.0	Pass	1.0	Pass	
	01-D07L	Living Room	2.8	2.0	Pass	1.5	Pass	
	01-D08	Bedroom	1.4	1.0	Pass	1.0	Pass	
	01-D09L	Living Room	2.1	2.0	Pass	1.5	Pass	
	01-D10	Bedroom	1.9	1.0	Pass	1.0	Pass	
	01-D11	Bedroom	1.2	1.0	Pass	1.0	Pass	
	01-D12	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-D13L	Living Room	2.9	2.0	Pass	1.5	Pass	
	01-D14L	Living Room	2.9	2.0	Pass	1.5	Pass	
	01-D15	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-D16	Bedroom	1.3	1.0	Pass	1.0	Pass	
	01-D17	Bedroom	2.0	1.0	Pass	1.0	Pass	
	01-D18L	Living Room	2.3	2.0	Pass	1.5	Pass	
	01-D19	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-D20L	Living Room	4.2	2.0	Pass	1.5	Pass	
	01-D21L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-D22	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-D23	Bedroom	4.6	1.0	Pass	1.0	Pass	
	01-D24L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-D25	Bedroom	4.6	1.0	Pass	1.0	Pass	
	01-D26L	Living Room	3.4	2.0	Pass	1.5	Pass	
	01-D27	Bedroom	4.5	1.0	Pass	1.0	Pass	
	01-D28L	Living Room	3.4	2.0	Pass	1.5	Pass	
	01-D29	Bedroom	4.4	1.0	Pass	1.0	Pass	
	01-D30L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-D31	Bedroom	1.3	1.0	Pass	1.0	Pass	
	01-D32L	Living Room	2.4	2.0	Pass	1.5	Pass	
	01-D33L	Living Room	3.7	2.0	Pass	1.5	Pass	
	01-D34	Bedroom	2.0	1.0	Pass	1.0	Pass	
	01-D35	Bedroom	1.5	1.0	Pass	1.0	Pass	
	01-D36L	Living Room	2.3	2.0	Pass	1.5	Pass	
	01-D37	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-D38	Bedroom	1.9	1.0	Pass	1.0	Pass	
	01-D39L	Living Room	2.1	2.0	Pass	1.5	Pass	
	01-D40	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-D41L	Living Room	2.0	2.0	Pass	1.5	Pass	
	01-D42	Bedroom	1.4	1.0	Pass	1.0	Pass	
	01-D43	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-D44L	Living Room	1.3	2.0	Fail	1.5	Fail	
	01-D45	Bedroom	1.0	1.0	Pass	1.0	Pass	
	01-D46L	Living Room	1.8	2.0	Marginal	m	1.5	Pass
	01-D47	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-D48L	Living Room	2.5	2.0	Pass	1.5	Pass	
	01-D49	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-D50	Bedroom	2.9	1.0	Pass	1.0	Pass	

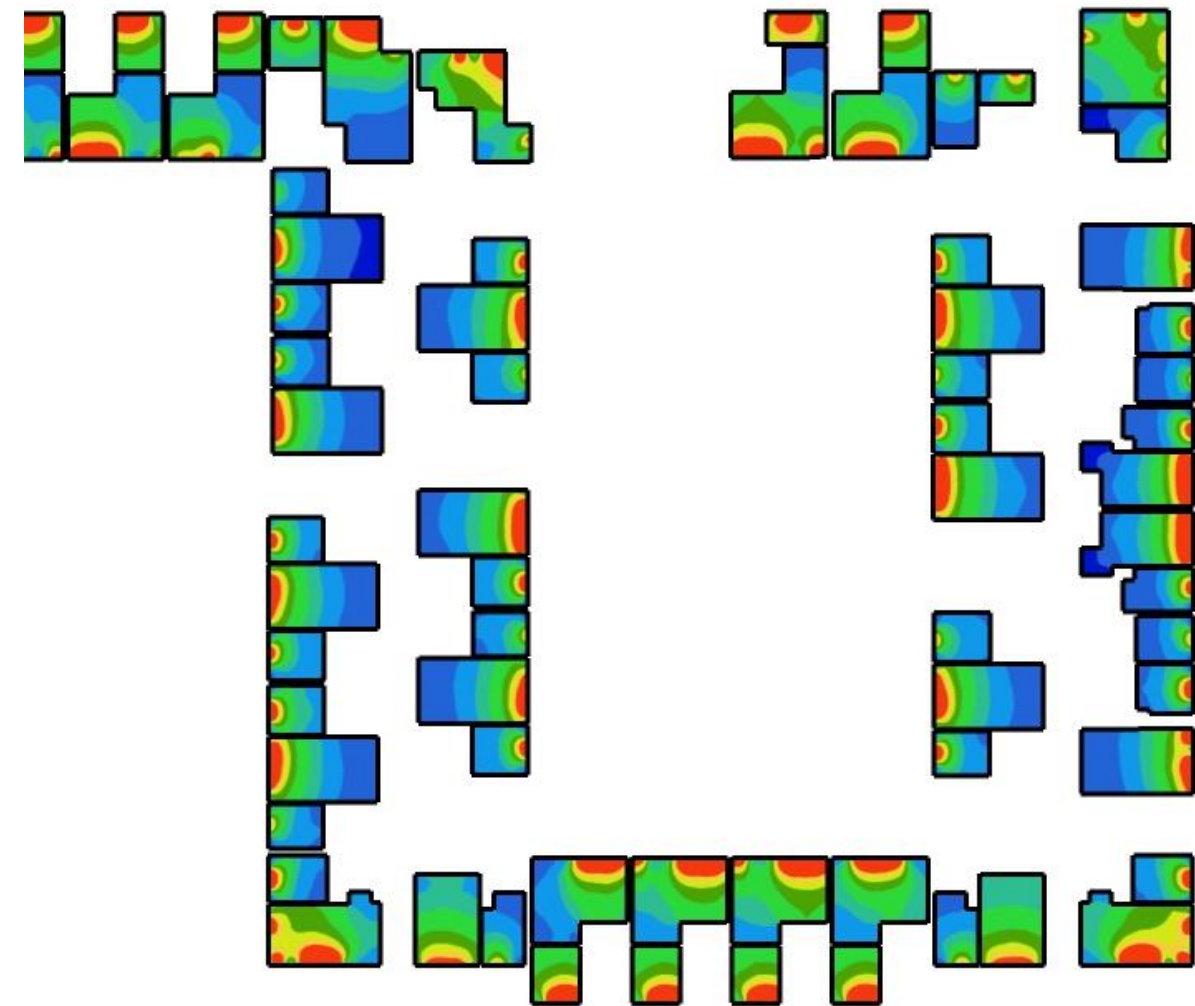
01-D Average Daylight Factor							
V7 For all habitable rooms							
ADF Values from radiance 3D model				Yes			
Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	01-D51L	Living Room	2.5	2.0	Pass	1.5	Pass
	01-D52L	Living Room	3.6	2.0	Pass	1.5	Pass
	01-D53	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-D54L	Living Room	2.4	2.0	Pass	1.5	Pass
	01-D55	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-D56L	Living Room	2.8	2.0	Pass	1.5	Pass
	01-D57	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-D58	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-D59L	Living Room	2.2	2.0	Pass	1.5	Pass
	01-D60	Bedroom	2.0	1.0	Pass	1.0	Pass
	01-D61	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-D62L	Living Room	2.2	2.0	Pass	1.5	Pass
	01-D63	Bedroom	1.4	1.0	Pass	1.0	Pass
	01-D64L	Living Room	2.8	2.0	Pass	1.5	Pass
	01-D65	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-D66	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-D67L	Living Room	2.3	2.0	Pass	1.5	Pass
	01-D68	Bedroom	2.1	1.0	Pass	1.0	Pass
				Pass	66	Pass	67
				Count	68	Count	68
				Percentage	97%	Percentage	99%
				Marginal	1		
				Percentage incl Marginal	99%		

E Floor Layout - Naming Convention

Representative - 2nd Floor Block E



Floor Analysis

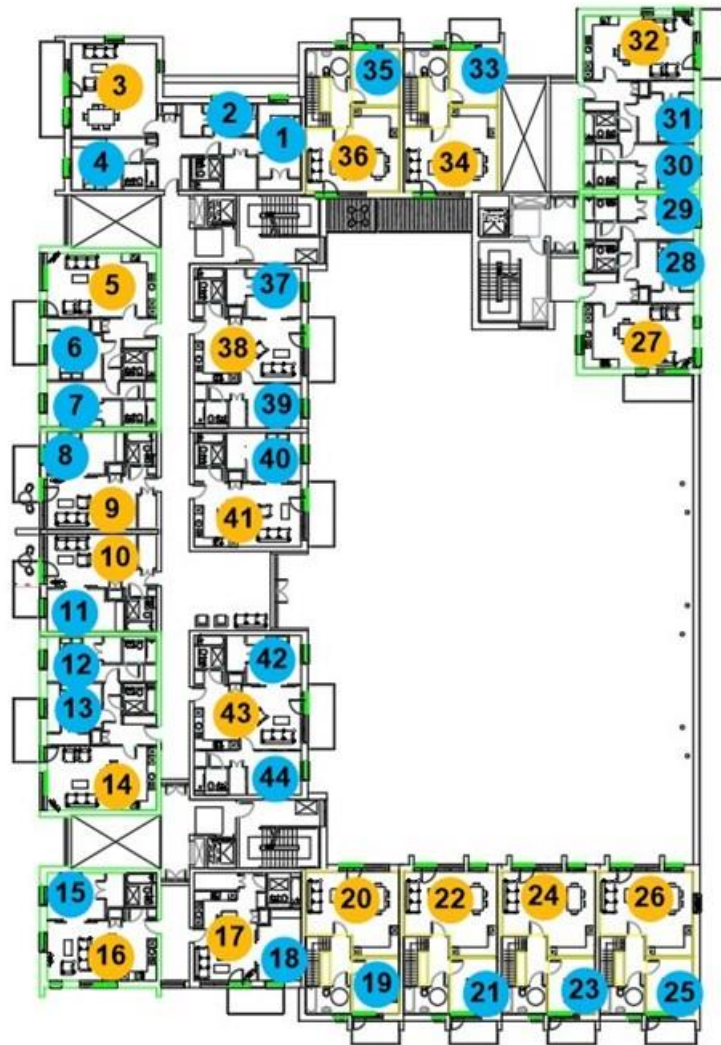


01-E Average Daylight Factor								
V7 For all habitable rooms								
ADF Values from radiance 3D model				Yes				
Type								
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check	
	01-E01	Bedroom	6.2	1.0	Pass	1.0	Pass	
	01-E02L	Living Room	3.6	2.0	Pass	1.5	Pass	
	01-E03	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-E04L	Living Room	2.9	2.0	Pass	1.5	Pass	
	01-E05	Bedroom	1.5	1.0	Pass	1.0	Pass	
	01-E06	Bedroom	2.5	1.0	Pass	1.0	Pass	
	01-E07L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-E08	Bedroom	1.3	1.0	Pass	1.0	Pass	
	01-E09	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-E10	Bedroom	1.9	1.0	Pass	1.0	Pass	
	01-E11	Bedroom	1.1	1.0	Pass	1.0	Pass	
	01-E12	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-E13L	Living Room	3.0	2.0	Pass	1.5	Pass	
	01-E14L	Living Room	3.0	2.0	Pass	1.5	Pass	
	01-E15	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-E16	Bedroom	1.3	1.0	Pass	1.0	Pass	
	01-E17	Bedroom	2.1	1.0	Pass	1.0	Pass	
	01-E18L	Living Room	2.3	2.0	Pass	1.5	Pass	
	01-E19	Bedroom	2.3	1.0	Pass	1.0	Pass	
	01-E20L	Living Room	4.3	2.0	Pass	1.5	Pass	
	01-E21L	Living Room	2.9	2.0	Pass	1.5	Pass	
	01-E22	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-E23	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-E24L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-E25	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-E26L	Living Room	3.4	2.0	Pass	1.5	Pass	
	01-E27	Bedroom	4.6	1.0	Pass	1.0	Pass	
	01-E28L	Living Room	3.4	2.0	Pass	1.5	Pass	
	01-E29	Bedroom	4.6	1.0	Pass	1.0	Pass	
	01-E30L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-E31	Bedroom	1.5	1.0	Pass	1.0	Pass	
	01-E32L	Living Room	2.7	2.0	Pass	1.5	Pass	
	01-E33L	Living Room	4.0	2.0	Pass	1.5	Pass	
	01-E34	Bedroom	2.1	1.0	Pass	1.0	Pass	
	01-E35	Bedroom	1.6	1.0	Pass	1.0	Pass	
	01-E36L	Living Room	2.3	2.0	Pass	1.5	Pass	
	01-E37	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-E38	Bedroom	1.9	1.0	Pass	1.0	Pass	
	01-E39L	Living Room	2.2	2.0	Pass	1.5	Pass	
	01-E40	Bedroom	2.2	1.0	Pass	1.0	Pass	
	01-E41L	Living Room	2.1	2.0	Pass	1.5	Pass	
	01-E42	Bedroom	1.5	1.0	Pass	1.0	Pass	
	01-E43	Bedroom	1.7	1.0	Pass	1.0	Pass	
	01-E44L	Living Room	1.4	2.0	Fail	1.5	Fail	
	01-E45	Bedroom	1.1	1.0	Pass	1.0	Pass	
	01-E46L	Living Room	1.9	2.0	Marginal	m	1.5	Pass
	01-E47	Bedroom	4.8	1.0	Pass	1.0	Pass	
	01-E48L	Living Room	3.0	2.0	Pass	1.5	Pass	
	01-E49	Bedroom	4.7	1.0	Pass	1.0	Pass	
	01-E50	Bedroom	2.8	1.0	Pass	1.0	Pass	

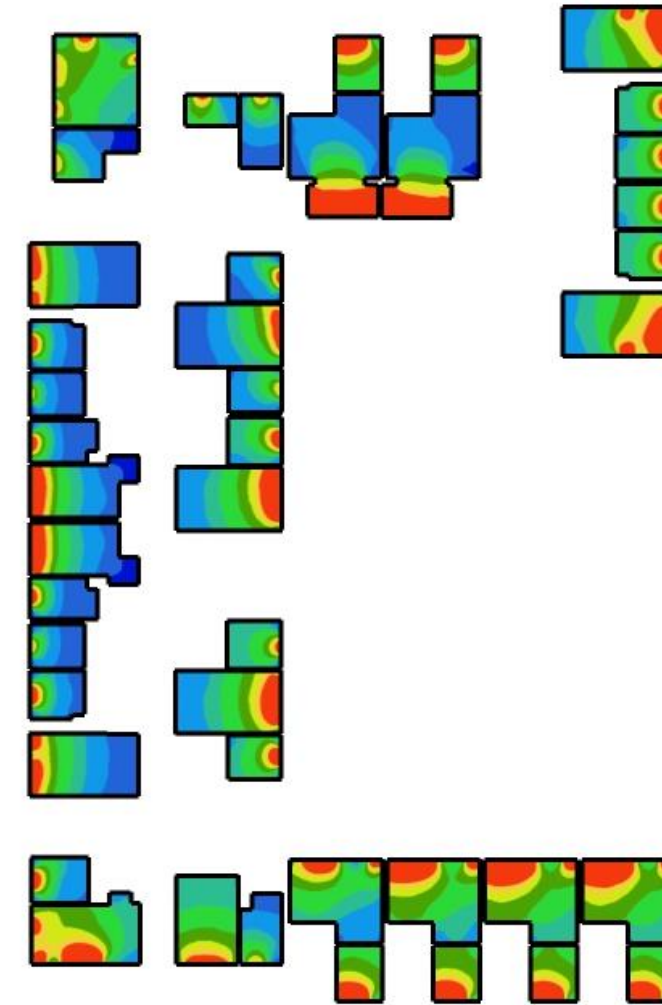
01-E Average Daylight Factor							
V7 For all habitable rooms							
ADF Values from radiance 3D model				Yes			
Type							
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed L/D/K Target	Check
	01-E51L	Living Room	2.4	2.0	Pass	1.5	Pass
	01-E52L	Living Room	3.5	2.0	Pass	1.5	Pass
	01-E53	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-E54L	Living Room	2.3	2.0	Pass	1.5	Pass
	01-E55	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-E56L	Living Room	2.8	2.0	Pass	1.5	Pass
	01-E57	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-E58	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-E59L	Living Room	2.1	2.0	Pass	1.5	Pass
	01-E60	Bedroom	2.0	1.0	Pass	1.0	Pass
	01-E61	Bedroom	2.1	1.0	Pass	1.0	Pass
	01-E62L	Living Room	2.3	2.0	Pass	1.5	Pass
	01-E63	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-E64L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-E65	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-E66	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-E67L	Living Room	2.5	2.0	Pass	1.5	Pass
	01-E68	Bedroom	2.1	1.0	Pass	1.0	Pass
				Pass	66	Pass	67
				Count	68	Count	68
				Percentage	97%	Percentage	99%
				Marginal	1		
				Percentage incl Marginal	99%		

F Floor Layout - Naming Convention

1st Floor Block F



Floor Analysis



Average Daylight Factor							
01-F							
V7	For all habitable rooms						
	ADF Values from radiance 3D model		Yes				
	Type						
Ref	Ref	Type	ADF	Strict BRE Min	Check	Relaxed I/D/K Target	Check
	01-F01	Bedroom	1.5	1.0	Pass	1.0	Pass
	01-F02	Bedroom	2.5	1.0	Pass	1.0	Pass
	01-F03L	Living Room	2.8	2.0	Pass	1.5	Pass
	01-F04	Bedroom	1.4	1.0	Pass	1.0	Pass
	01-F05L	Living Room	2.2	2.0	Pass	1.5	Pass
	01-F06	Bedroom	1.9	1.0	Pass	1.0	Pass
	01-F07	Bedroom	1.2	1.0	Pass	1.0	Pass
	01-F08	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-F09L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-F10L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-F11	Bedroom	1.6	1.0	Pass	1.0	Pass
	01-F12	Bedroom	1.3	1.0	Pass	1.0	Pass
	01-F13	Bedroom	2.0	1.0	Pass	1.0	Pass
	01-F14L	Living Room	2.4	2.0	Pass	1.5	Pass
	01-F15	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-F16L	Living Room	4.3	2.0	Pass	1.5	Pass
	01-F17L	Living Room	3.1	2.0	Pass	1.5	Pass
	01-F18	Bedroom	1.7	1.0	Pass	1.0	Pass
	01-F19	Bedroom	4.9	1.0	Pass	1.0	Pass
	01-F20L	Living Room	2.7	2.0	Pass	1.5	Pass
	01-F21	Bedroom	4.9	1.0	Pass	1.0	Pass
	01-F22L	Living Room	4.1	2.0	Pass	1.5	Pass
	01-F23	Bedroom	5.0	1.0	Pass	1.0	Pass
	01-F24L	Living Room	4.5	2.0	Pass	1.5	Pass
	01-F25	Bedroom	5.2	1.0	Pass	1.0	Pass
	01-F26L	Living Room	4.7	2.0	Pass	1.5	Pass
	01-F27L	Living Room	3.9	2.0	Pass	1.5	Pass
	01-F28	Bedroom	2.9	1.0	Pass	1.0	Pass
	01-F29	Bedroom	2.9	1.0	Pass	1.0	Pass
	01-F30	Bedroom	2.9	1.0	Pass	1.0	Pass
	01-F31	Bedroom	2.9	1.0	Pass	1.0	Pass
	01-F32L	Living Room	3.8	2.0	Pass	1.5	Pass
	01-F33	Bedroom	4.7	1.0	Pass	1.0	Pass
	01-F34L	Living Room	2.9	2.0	Pass	1.5	Pass
	01-F35	Bedroom	4.8	1.0	Pass	1.0	Pass
	01-F36L	Living Room	3.2	2.0	Pass	1.5	Pass
	01-F37	Bedroom	1.7	1.0	Pass	1.0	Pass
	01-F38L	Living Room	2.1	2.0	Pass	1.5	Pass
	01-F39	Bedroom	1.8	1.0	Pass	1.0	Pass
	01-F40	Bedroom	2.7	1.0	Pass	1.0	Pass
	01-F41L	Living Room	3.6	2.0	Pass	1.5	Pass
	01-F42	Bedroom	2.2	1.0	Pass	1.0	Pass
	01-F43L	Living Room	3.3	2.0	Pass	1.5	Pass
	01-F44	Bedroom	3.1	1.0	Pass	1.0	Pass
				Pass	44	Pass	44
				Count	44	Count	44
				Percentage	100%	Percentage	100%
				Marginal	0		
				Percentage incl Marginal	100%		

Summary

1st Floor	Strict		Relaxed			
	Pass	Count		Pass	Count	
01-ABC	68	70	97%	70	70	100%
01-D	66	68	97%	67	68	99%
01-E	66	68	97%	67	68	99%
01-F	44	44	100%	44	44	100%
V7	244	250		248	250	
			98%			99%
Strict BRE, Incl. Marginal		4				
			99%			

98% of rooms (99% if we include marginals) comply with the Strict BRE Guidelines in relation to ADF