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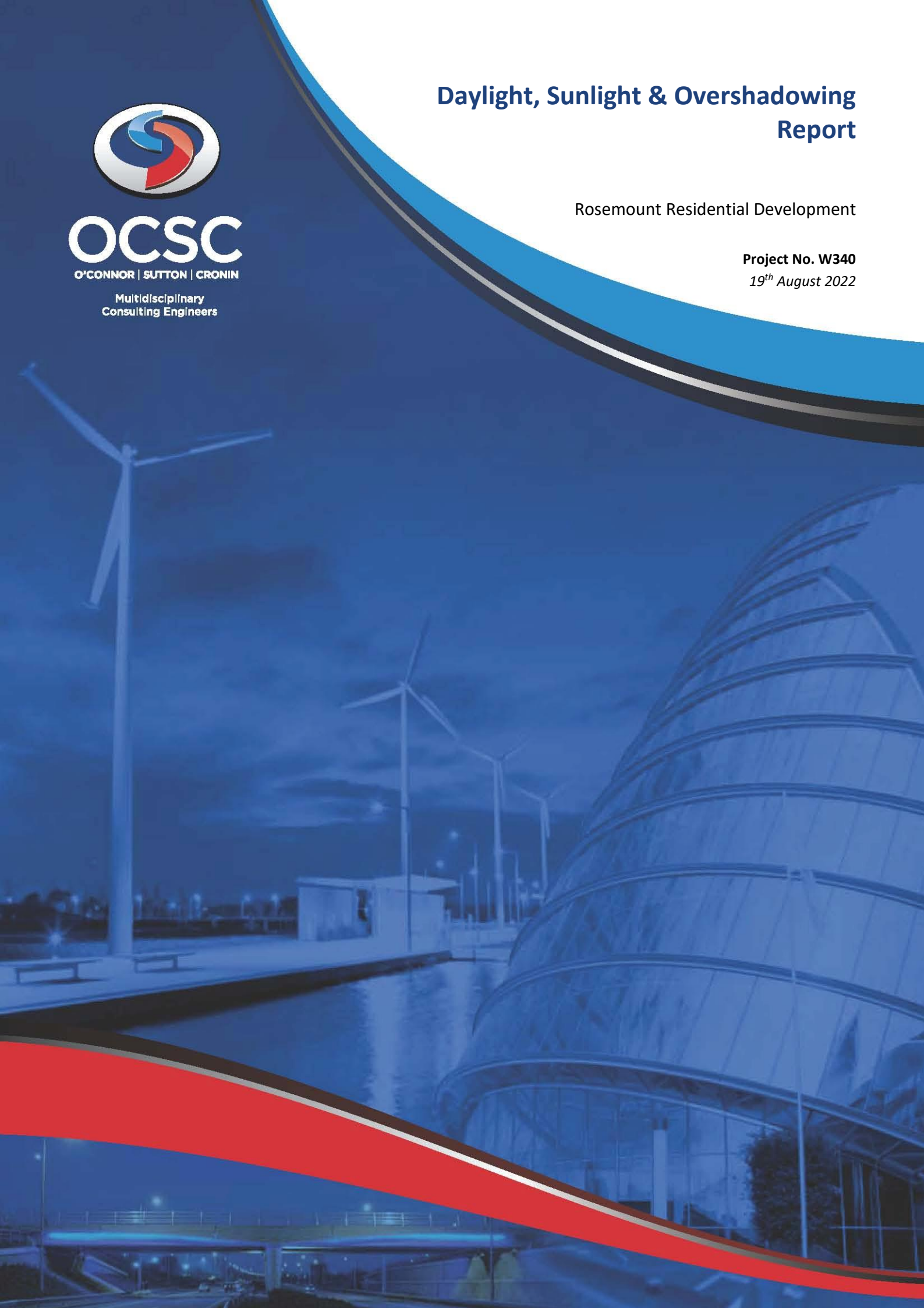
Daylight, Sunlight & Overshadowing Report

Rosemount Residential Development

Project No. W340

19th August 2022



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EXECUTIVE SUMMARY

OCSC have been appointed to carry out a Daylight, Sunlight & Overshadowing study for the Rosemount Development located at Northern Cross, Malahide Road, Dublin 17.
The aim of the study is to record and analyse the results for the following:

- The daylight levels within the living, kitchen and bedroom areas of all apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The quality of amenity space, being provided as part of the development, in relation to sunlight;
- Any potential daylight, sunlight or overshadowing impact the proposed development may have on properties adjacent to the site.

It is important to note that the performance targets which are included should be used with a degree of flexibility as per the extract below from the BRE Guide, 2022 Third Edition:

"The advice given here is not mandatory and this document should <u>not be seen as an instrument of planning policy</u>. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines these <u>should be interpreted flexibly</u> because natural lighting is only one of the many factors in site layout design."

<u>Internal daylight within the proposed development</u>
The analysis confirms that across the entire development, excellent levels of internal daylight are achieved. All the apartments not only meet but greatly exceed the recommendations outlined within the BRE Guidelines 2011 and British Standard BS8206, achieving a 100% compliance rate across the proposed apartments.

95% of apartments meeting the requirements within the new BRE Guidelines and British Standard set out in BRE "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 Third Edition.

Sunlight to proposed development amenity spaces

In terms of sunlight access, excellent levels of sunlight are experienced across the proposed development. The communal amenity space provided exceed the BRE guidelines 2011 & BRE Guidelines 2022 for sunlight on the test day of 21st of March.

Sunlight to windows within the proposed development

The annual probable sunlight hours assessment has shown that 48% of the living room windows across the development achieve the recommended APSH values stated in the BRE Guidelines 2022, while 60% of the living room windows achieve the recommended values during the winter months, when sunlight is more valuable.

Daylight Impact to surrounding properties

The VSC analysis has shown that there is a daylight impact being perceived by the permitted Block 2 development and proposed development at Block 10 , when compared to the existing scenario. However, the ADF analysis, a more detailed method, has shown that good levels of daylight will still be available for a sample of 'worst case' rooms when the proposed development is built, with only one unit falling short in compliance.

Sunlight Impact to surrounding properties

The overshadowing analysis has shown that an impact to Block 2 will be perceived on March 21st. Block 10 does experience certain degree of overshadowing on the test day of 21st of March. However, further sunlight analysis has demonstrated compliance with BRE Guidelines 2022, with 73% of the amenity spaces in Block 2 and 51% in Block 10 achieving at least 2 hours of sunlight on the test day (March 21st) – more than the recommended 50% value.

In relation to sunlight to windows, the analysis has shown that some of the analysed windows will perceive an impact due to the proposed development. However, this is normal due to the existing scenario of the proposed site and any other development will cause an impact on the permitted Block 2 & proposed development at Block 10 development. It must be noted that some of the windows falling short in compliance were not achieving the recommended values during the existing scenario.

Daylight and sunlight in the proposed development were assessed under two methodologies:

1) The British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.
2) The British Research Establishment's "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 Third Edition.

Out of the two methodologies above the principal methodology considered is The British Research Establishment's "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 Third Edition. However, since the BRE Guidelines and some planning policy guidelines continue to make reference to the second edition, this standard has also been used throughout the report.

DAYLIGHT, SUNLIGHT & OVERSHADOWING REPORT

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1. Introduction

OCSC have been appointed to carry out a Daylight, Sunlight & Overshadowing study for the Rosemount Development, located at Northern Cross, Malahide Road, Dublin 17

The aim of the study is to record and analyse the results for the following:

- The daylight levels within the living, kitchen and bedroom areas of all apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The quality of amenity space, being provided as part of the development, in relation to sunlight;
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2. Site Description

The proposal comprises the demolition of an existing 3 storey office building and the construction of a mixed-use development in a single block (up to 9 storeys over basement) including 176 no. apartments, office and café use.
The proposed development shall consist of:

Demolition of existing c. 3,315 sq.m, 3 storey office building on site and existing ancillary facilities and the construction of a single mixed-use block (Block A) of up to 9 storeys (over basement), consisting of a 4-sided structure based around a central courtyard area.

c. 1,050 sq.m. of office space at ground floor level with own door access and associated infrastructure including staff kitchen, meeting rooms and designated car parking (7 spaces) at basement level.

A café unit of c. 143.7 sq.m at ground floor level with own door access to the south and east, accessed via proposed public open space.

176 no. residential units from 1st to 8th floor level comprising 72 no. 1 bed units (41%), 57 no. 2 bed units (32%) and 47 no. 3 bed units (27%) [each with private amenity space in the form of balcony or terrace], with separate access to the proposed commercial uses at ground floor level.

c. 1,846 sq. m. of communal open space at ground floor, first floor podium, 4th floor and 7th floor level, and public open space of c. 1,577 sq.m. at ground floor level, including a public courtyard area located to the southeast of the proposed block.

Resident amenity and support services are proposed at ground floor level to include a cinema room, post room, games room, co-working spaces, gym and concierge services.

134 no. car parking spaces, 7 of which are accessible, and 7 no. motorcycle parking spaces, located at basement level and accessed by a vehicular ramp via Mayne River Avenue to the west (with a vehicular

set down areas fronting Mayne River Avenue), in addition to 2 no. car club spaces at the southern boundary.

434 no. bicycle parking spaces, 426 of which at ground floor and at surface level and 8 no. spaces at basement level.

All associated vehicular and pedestrian access routes (including links to the adjoining site to the north), external communal play facilities, E.S.B substation, Meter rooms, foul and surface water drainage, hard and soft landscaping, lighting, plant at basement level, bin stores, PV panels and green roof, telecommunications infrastructure all associated and ancillary site works.

The application contains a statement setting out how the proposal will be consistent with the objectives of the relevant development plan and local area plan. The application contains a statement indicating why permission should be granted for the proposed development, having regard to a consideration specified in section 37(2)(b) of the Planning and Development Act, 2000, as amended, notwithstanding that the proposed development materially contravenes a relevant development plan or local area plan other than in relation to the zoning of the land.

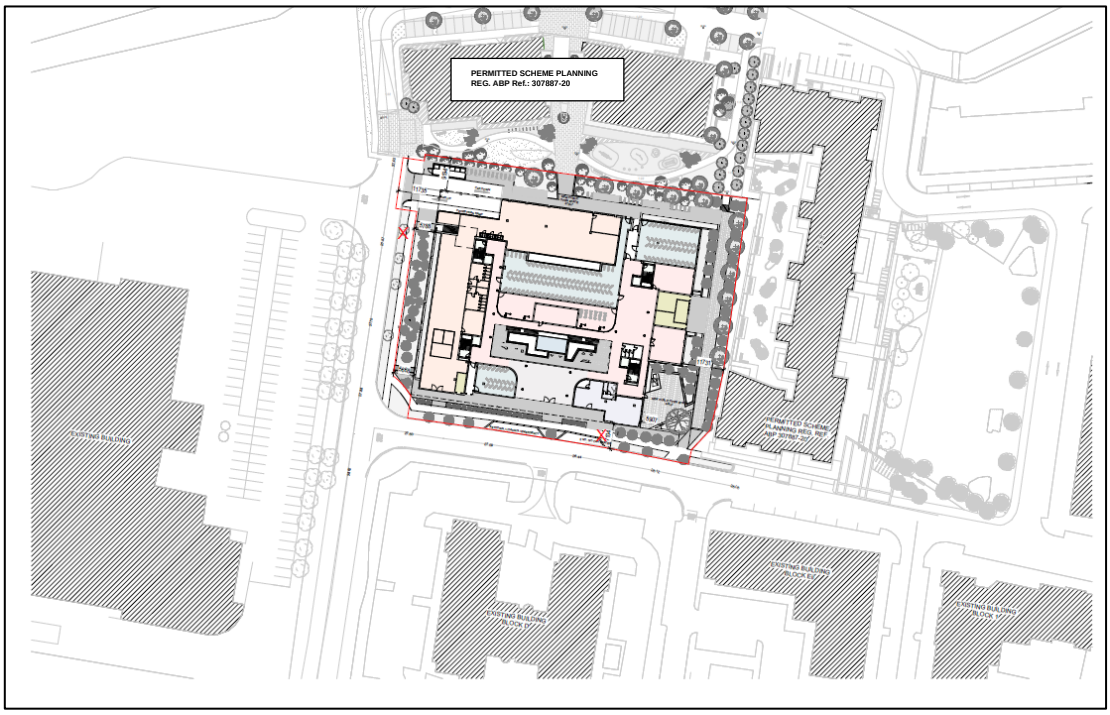


Figure 1 - Proposed Site Plan

3. RELEVANT PLANNING POLICIES

The following planning policies have been used as a point of reference within the daylight and sunlight assessment for the proposed development.

Relevant Planning Policy Number 1

The **Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities (December 2020)** outlines that**:**

"Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd Edition) or BS 8206-2:2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision."

They also outline that:

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

Relevant Planning Policy Number 2

The **Sustainable Residential Development in Urban Areas, DoEHLG 2009** outlines that:

"Overshadowing will generally only cause problems where buildings of significant height are involved or where new buildings are located very close to adjoining buildings. Planning authorities should require that daylight and shadow projection diagrams be submitted in all such proposals. The recommendations of "Site Layout Planning for Daylight and Sunlight: A Guide to good Practice" (BRE 1991) or BS 8206 "Lighting for Buildings, Part 2 1992: Code of Practice for Daylighting" should be followed in this regard."

Relevant Planning Policy Number 3

The **Urban Development and Building Heights – Guidelines for Planning Authorities (March 2018)** outlines the following:

"At the scale of the site/building:

• The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.

• Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'.

• Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

4. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT

The analysis of the development's potential and the quality of amenity for the new development, as well as for the surrounding properties once the scheme has been implemented, has been based on the Building Research Establishment (BRE) guidelines on "Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice (Building Research Establishment Report, 2011)" and BRE "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022

These guidelines provide the criteria and Methodology for calculations pertaining to daylight and sunlight, and are the primary reference for this matter. The guide gives simple rules for analysing sites where the geometry of the surroundings is straightforward, supplementing them with graphical methods for complex sites.

However, it is important to note that the performance targets which are included should be used with a degree of flexibility as per the extract below from the BRE Guide 2022:

"The advice given here is not mandatory and this document should <u>not be seen as an instrument of planning policy</u>. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines these <u>should be interpreted flexibly</u> because natural lighting is only one of the many factors in site layout design."

BRE Guidelines refers to BS 8206[1] "Lighting for Buildings, Part 2 1992: Code of Practice for Daylighting" for guidance on the recommended internal daylight levels.

[1] The British Standard BS 8206: Part 2 (BS8206-02) has been withdrawn and replaced with BR209 Daylight in Buildings. However, since the BRE Guidelines and some planning policy guidelines continue to make reference to the BS 8206, this standard has been used throughout the report.

5. PROPOSED DEVELOPMENT DESIGN

In order to ensure that daylight levels were maximised for the Rosemount development, a number of key design strategies were analysed during concept design.

5.1. BUILDING MATERIAL SELECTION

The selection of materials play an important role in ambient daylight levels. The façade of the proposed development has been carefully selected to promote a sense of brightness and light and is composed of light materials. This will ensure light is reflected throughout the development. The inclusion of greenery to the amenity spaces will help to improve the sense of light and brightness within the apartments.

5.2. GLAZING TO WALL RATIO

The primary function of the glazing to wall ratio is to maximize daylight within the space while reducing solar gains within the proposed development. The other advantage (in conjunction with appropriate materials) is the more light coloured, reflective materials used externally, the more ambient daylight will be reflected to the surrounding areas. In addition, floor to ceiling heights have been assessed to further enhance the opportunity for improved daylight levels. Extensive analysis was undertaken on all building facades to ensure glazing widths were maximized to promote access to daylight. The image below illustrates the glazing to wall ratio of the proposed development.

Figure 2 - East Elevation Glazing to Wall Ratio

5.3. AMENITY OPEN SPACES

Within the development high quality green open spaces have been included to allow occupants to spend quality time outdoors. The main ground floor courtyard has been carefully designed to accommodate large areas of planting, with seating and playing areas. The courtyards will ensure a light, bright and airy amenity space. The configuration of the podium courtyard will assist in improving the daylight levels of the apartments in this area and the sunlight penetration into the amenity spaces. Roof top terraces are also included within the proposed development. The terrace areas will be effectively landscaped to provide a mix of greenery and seating areas for occupants.

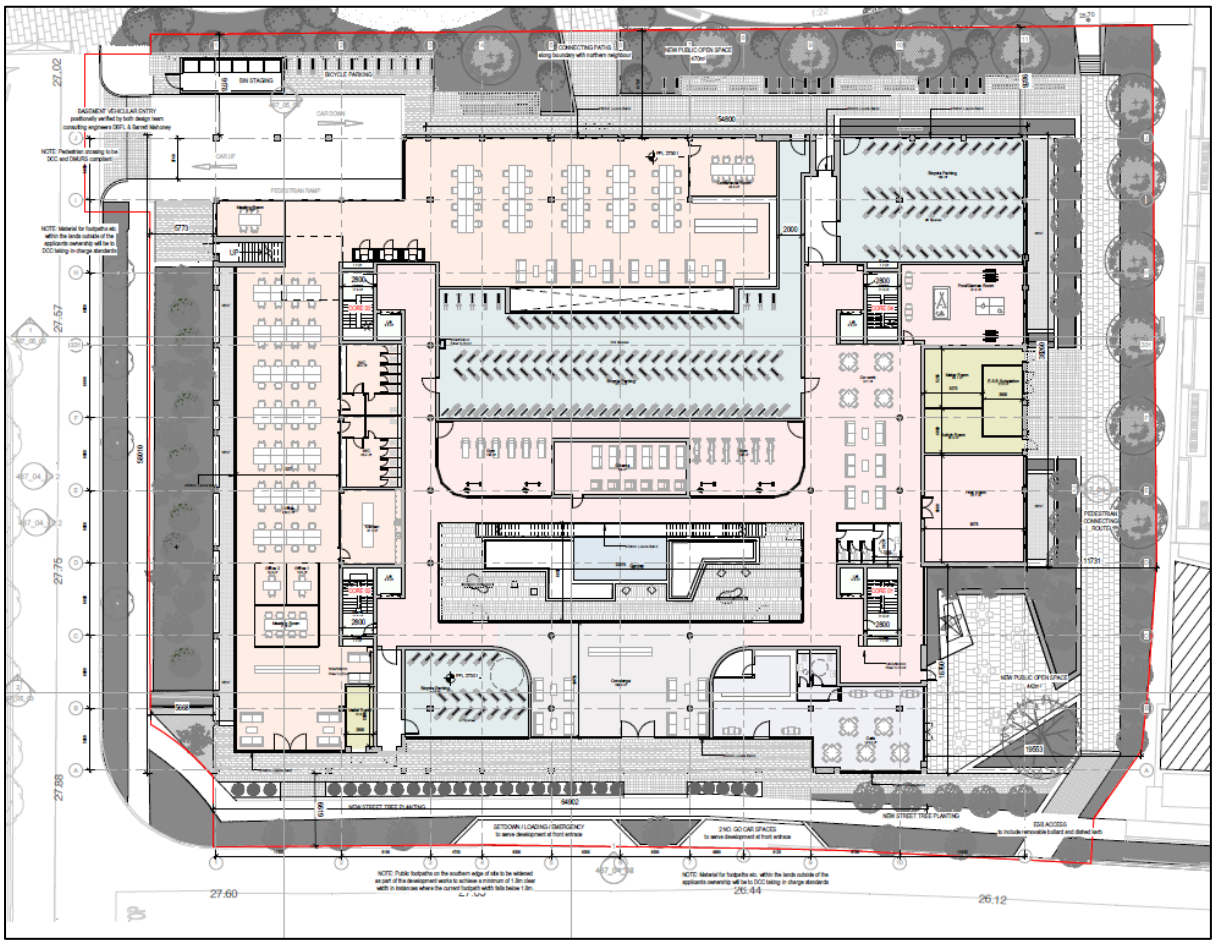


Figure 3 – Amenity Open Spaces

6. DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT

6.1. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT (2011 METHODOLOGY)

The method of calculation selected for the internal daylight analysis for this development is the Average Daylight Factor (ADF). This is the most detailed and thus most accurate method which considers not only the amount of sky visible from the vertical face of the window, but also the window size, room size and room use.

Architectural plans and elevations provided by Plus Architecture formed the basis for the internal daylight assessment.

As previously stated, in order to quantify the quality of daylight within a space, BRE Guidelines refer to the British standards BS 8206, which sets out minimum daylight factors to be achieved in the various room types within new build residential units.

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%.

Figure 4 - BS 8206 Extract (Table 2)

BS 8206 outlines that for a room that serves more than one purpose, the minimum ADF should be that for the room type with the highest value. For example, in a combined living/kitchen spaces, the minimum recommended ADF value should be 2%.

In order to analyse the daylight requirements for the development, a detailed 3D model was constructed of the entire development, in the Integrated Environmental Solutions Virtual Environment (IES VE) software package. A number of computer simulations were then undertaken to ascertain the ADFs achieved within the dwellings of the proposed development.

6.2. DAYLIGHT RESULTS – INTERNAL DAYLIGHT APARTMENTS

The design and layout of each apartment type has been carefully considered with generous window openings being provided. Where the opportunity arises, rooms have been designed as dual aspect and bathroom and storage areas have been provided to the back of apartments to give living spaces greater access to daylight.

6.3. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT (2022 METHODOLOGY)

In addition to the BS 8206 standard, the development's daylight levels have also been tested to the more recently published 2022 METHODOLOGY standard. The 2022 METHODOLOGY standard goes beyond the average daylight levels within a space, and accounts for the distribution of light within a space.

Level of recommendation for vertical and inclined daylight opening	Target illuminance E_T lx	Fraction of space for target level $F_{plane,\%}$	Minimum target illuminance E_{TM} lx	Fraction of space for minimum target level $F_{plane,\%}$	Fraction of daylight hours $F_{time,\%}$
Minimum	300	50 %	100	95 %	50 %
Medium	500	50 %	300	95 %	50 %
High	750	50 %	500	95 %	50 %
NOTE Table A.3 gives target daylight factor (D_T) and minimum target daylight factor (D_{TM}) corresponding to target illuminance level and minimum target illuminance, respectively, for the CEN capital cities.					

Figure 5: 2022 METHODOLOGY – Table A.1

2022 METHODOLOGY features two daylight criteria for compliance.

- Criterion one recommends that in the analysed space an illuminance of ≥ 100 lux must be achieved for half of the daylight time in a year (2,190 hours), across ≥ 95% of the floor area of the given space.
- Criterion two recommends that in the analysed space an illuminance of ≥ 300 lux must be achieved for half of the daylight time in a year (2,190 hours), across ≥ 50% of the floor area of the given space.

In order to analyse the daylight performance for the development a detailed 3D model was constructed of the entire development, in the Integrated Environmental Solutions Virtual Environment (IES VE) software package. A number of computer simulations were then undertaken in

the IES VE software package to ascertain the ADFs and lux levels achieved within the dwellings of the proposed development.

6.4. DAYLIGHT PARAMETERS

The surface reflectance values as specified by project architect outlined in Table 1.

Surface Type	Reflectance (%)
External Wall	40
Internal Partitions	70
Ceiling	70
Floor	40
Adjacent Buildings	40
Glazing Transmittance	70

Table 1 – Surface Reflectance Values

The ADF calculations are carried out in a working plane that lies 850mm above the floor and it is offset 500mm from the perimeter of the room. A grid of 250mm is used to calculate all different points within the room and the average of these points determines the ADF achieved.

6.5. TREES

BRE Guideline outlines the following in relation to the inclusion of trees within daylight and sunlight calculations.

"The question of whether trees or fences should be included in the calculation depends upon the type of shade they produce. Normally trees and shrubs need not to be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building (this applies specially to deciduous trees)."

Within Appendix H of the BRE Guidelines the following statements are outlined:

"It is generally more difficult to calculate the effects of trees on daylight because of their irregular shapes and because some light will generally penetrate through the tree crown. Where the effect of a new building on existing buildings nearby is being analysed, it is usual to ignore the effect of existing trees. This is because daylight is at its scarcest and most valuable in winter when most trees will not be in leaf."

<u>When assessing the skylight in new dwellings:</u>

"Sometimes, however, trees should be taken into account, e.g. where a new dwelling is proposed near to large existing trees."

<u>When assessing the sunlight in gardens:</u>

"In assessing the impact of buildings on sunlight in gardens, trees and shrubs are not normally included in the calculation unless a dense belt or group of evergreens is specifically planned as a windbreak or for privacy purposes."

As above mentioned, it is typical to ignore the effect of trees with only a few exceptions in specific scenarios. Therefore, no trees have been included within the calculations.

6.6. DAYLIGHT RESULTS – INTERNAL DAYLIGHT WITHIN PROPOSED APARTMENTS

This section outlines the apartment units that were selected for assessment of internal daylight levels for the proposed Rosemount development. The results of the analysis are outlined in the accompanying tables.

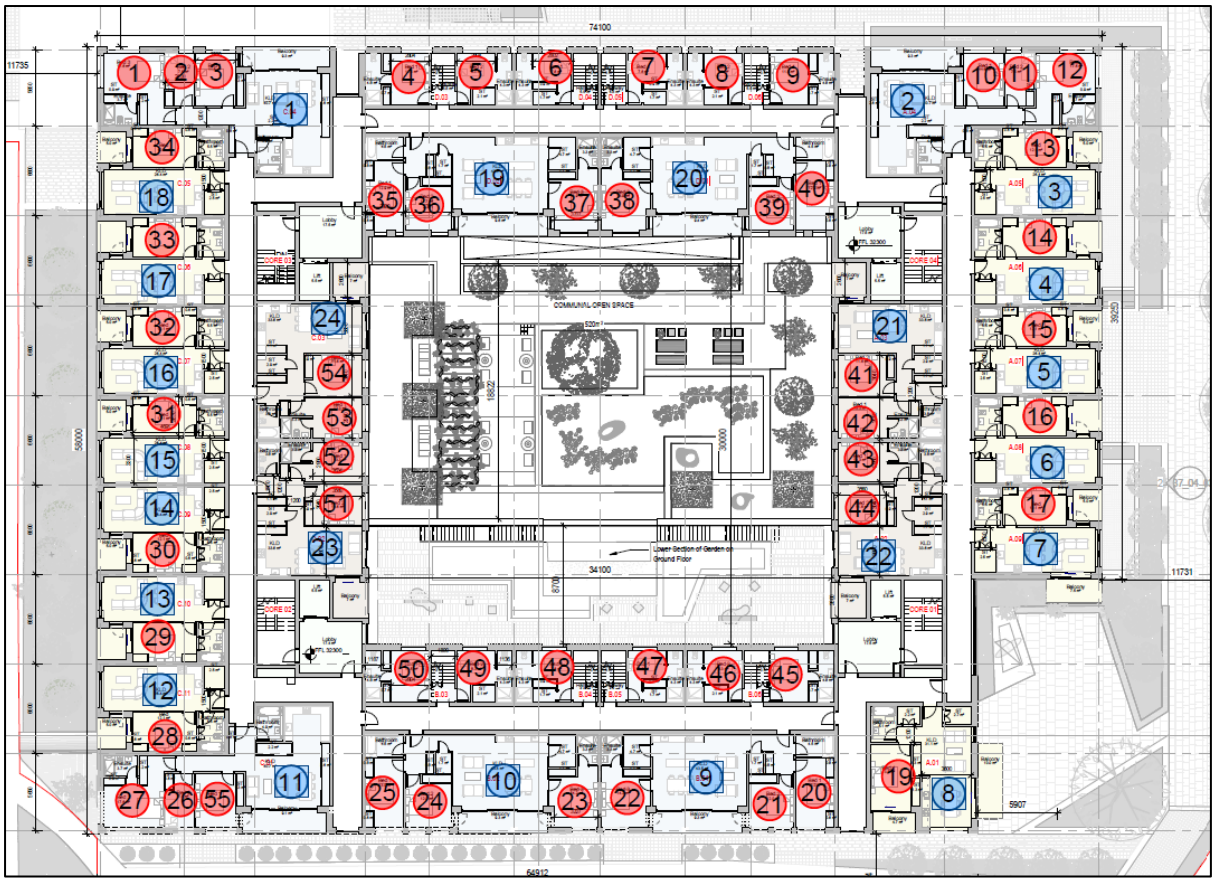


Figure 6 – Assessed Units (First Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L01 - Bedroom 01	1.00	9.85	Y
2	L01 - Bedroom 02	1.00	2.73	Y
3	L01 - Bedroom 03	1.00	4.93	Y
4	L01 - Bedroom 04	1.00	5.04	Y
5	L01 - Bedroom 05	1.00	6.03	Y
6	L01 - Bedroom 06	1.00	3.98	Y
7	L01 - Bedroom 07	1.00	3.36	Y
8	L01 - Bedroom 08	1.00	5.55	Y
9	L01 - Bedroom 09	1.00	4.98	Y
10	L01 - Bedroom 10	1.00	5.81	Y
11	L01 - Bedroom 11	1.00	3.45	Y
12	L01 - Bedroom 12	1.00	9.38	Y
13	L01 - Bedroom 13	1.00	1.15	Y
14	L01 - Bedroom 14	1.00	1.10	Y
15	L01 - Bedroom 15	1.00	1.05	Y
16	L01 - Bedroom 16	1.00	1.06	Y
17	L01 - Bedroom 17	1.00	1.09	Y
18	L01 - Bedroom 19	1.00	3.29	Y
19	L01 - Bedroom 20	1.00	4.89	Y
20	L01 - Bedroom 21	1.00	7.56	Y
21	L01 - Bedroom 22	1.00	4.93	Y
22	L01 - Bedroom 23	1.00	5.43	Y
23	L01 - Bedroom 24	1.00	7.07	Y
24	L01 - Bedroom 25	1.00	5.18	Y
25	L01 - Bedroom 26	1.00	5.46	Y
26	L01 - Bedroom 27	1.00	10.12	Y
27	L01 - Bedroom 28	1.00	1.83	Y
28	L01 - Bedroom 29	1.00	1.79	Y
29	L01 - Bedroom 30	1.00	1.72	Y
30	L01 - Bedroom 31	1.00	1.83	Y
31	L01 - Bedroom 32	1.00	1.83	Y
32	L01 - Bedroom 33	1.00	1.84	Y
33	L01 - Bedroom 34	1.00	1.89	Y
34	L01 - Bedroom 35	1.00	2.11	Y
35	L01 - Bedroom 36	1.00	3.43	Y
36	L01 - Bedroom 37	1.00	5.09	Y
37	L01 - Bedroom 38	1.00	4.89	Y
38	L01 - Bedroom 39	1.00	3.55	Y
39	L01 - Bedroom 40	1.00	2.46	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
40	L01 - Bedroom 41	1.00	6.72	Y
41	L01 - Bedroom 42	1.00	5.51	Y
42	L01 - Bedroom 43	1.00	5.47	Y
43	L01 - Bedroom 44	1.00	6.58	Y
44	L01 - Bedroom 45	1.00	5.29	Y
45	L01 - Bedroom 46	1.00	6.93	Y
46	L01 - Bedroom 47	1.00	4.03	Y
47	L01 - Bedroom 48	1.00	4.17	Y
48	L01 - Bedroom 49	1.00	6.75	Y
49	L01 - Bedroom 50	1.00	5.15	Y
50	L01 - Bedroom 51	1.00	3.86	Y
51	L01 - Bedroom 52	1.00	4.05	Y
52	L01 - Bedroom 53	1.00	4.03	Y
53	L01 - Bedroom 54	1.00	3.87	Y
54	L01 - Bedroom 55	1.00	3.21	Y
55	L01 - LKD 01	2.00	2.20	Y
56	L01 - LKD 02	2.00	2.43	Y
57	L01 - LKD 03	2.00	2.00	Y
58	L01 - LKD 04	2.00	2.20	Y
59	L01 - LKD 05	2.00	2.35	Y
60	L01 - LKD 06	2.00	2.46	Y
61	L01 - LKD 07	2.00	5.76	Y
62	L01 - LKD 08	2.00	5.30	Y
63	L01 - LKD 09	2.00	9.19	Y
64	L01 - LKD 10	2.00	4.54	Y
65	L01 - LKD 11	2.00	3.15	Y
66	L01 - LKD 12	2.00	3.86	Y
67	L01 - LKD 13	2.00	3.80	Y
68	L01 - LKD 14	2.00	3.86	Y
69	L01 - LKD 15	2.00	4.05	Y
70	L01 - LKD 16	2.00	3.75	Y
71	L01 - LKD 17	2.00	4.83	Y
72	L01 - LKD 18	2.00	4.20	Y
73	L01 - LKD 19	2.00	2.90	Y
74	L01 - LKD 20	2.00	3.09	Y
75	L01 - LKD 21	2.00	3.28	Y
76	L01 - LKD 22	2.00	3.53	Y
77	L01 - LKD 23	2.00	3.42	Y
78	L01 - LKD 24	2.00	3.09	Y

Table 2 – 2011 Methodology Average Daylight Factor Results (First Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L01 - Bedroom 01	100	Y	100	Y
2	L01 - Bedroom 02	100	Y	100	Y
3	L01 - Bedroom 03	100	Y	100	Y
4	L01 - Bedroom 04	100	Y	100	Y
5	L01 - Bedroom 05	100	Y	100	Y
6	L01 - Bedroom 06	100	Y	100	Y
7	L01 - Bedroom 07	100	Y	85	Y
8	L01 - Bedroom 08	100	Y	100	Y
9	L01 - Bedroom 09	100	Y	100	Y
10	L01 - Bedroom 10	100	Y	100	Y
11	L01 - Bedroom 11	100	Y	100	Y
12	L01 - Bedroom 12	100	Y	100	Y
13	L01 - Bedroom 13	100	Y	0	N
14	L01 - Bedroom 14	100	Y	0	N
15	L01 - Bedroom 15	100	Y	0	N
16	L01 - Bedroom 16	100	Y	0	N
17	L01 - Bedroom 17	100	Y	0	N
18	L01 - Bedroom 19	100	Y	100	Y
19	L01 - Bedroom 20	100	Y	100	Y
20	L01 - Bedroom 21	100	Y	100	Y
21	L01 - Bedroom 22	100	Y	100	Y
22	L01 - Bedroom 23	100	Y	100	Y
23	L01 - Bedroom 24	100	Y	100	Y
24	L01 - Bedroom 25	100	Y	100	Y
25	L01 - Bedroom 26	100	Y	100	Y
26	L01 - Bedroom 27	100	Y	100	Y
27	L01 - Bedroom 28	100	Y	66	Y
28	L01 - Bedroom 29	100	Y	66	Y
29	L01 - Bedroom 30	100	Y	73	Y
30	L01 - Bedroom 31	100	Y	60	Y
31	L01 - Bedroom 32	100	Y	73	Y
32	L01 - Bedroom 33	100	Y	66	Y
33	L01 - Bedroom 34	100	Y	70	Y
34	L01 - Bedroom 35	100	Y	100	Y
35	L01 - Bedroom 36	100	Y	100	Y
36	L01 - Bedroom 37	100	Y	100	Y
37	L01 - Bedroom 38	100	Y	100	Y
38	L01 - Bedroom 39	100	Y	100	Y
39	L01 - Bedroom 40	100	Y	100	Y
40	L01 - Bedroom 41	100	Y	100	Y
41	L01 - Bedroom 42	100	Y	100	Y
42	L01 - Bedroom 43	100	Y	100	Y
43	L01 - Bedroom 44	100	Y	100	Y
44	L01 - Bedroom 45	100	Y	100	Y
45	L01 - Bedroom 46	100	Y	100	Y
46	L01 - Bedroom 47	100	Y	100	Y
47	L01 - Bedroom 48	100	Y	100	Y
48	L01 - Bedroom 49	100	Y	100	Y
49	L01 - Bedroom 50	100	Y	100	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L01 - Bedroom 51	100	Y	100	Y
51	L01 - Bedroom 52	100	Y	100	Y
52	L01 - Bedroom 53	100	Y	100	Y
53	L01 - Bedroom 54	100	Y	100	Y
54	L01 - Bedroom 55	100	Y	87	Y
55	L01 - LKD 01	97	Y	89	Y
56	L01 - LKD 02	100	Y	86	Y
57	L01 - LKD 03	85	N	30	N
58	L01 - LKD 04	82	N	30	N
59	L01 - LKD 05	80	N	30	N
60	L01 - LKD 06	100	Y	62	Y
61	L01 - LKD 07	100	Y	100	Y
62	L01 - LKD 08	100	Y	100	Y
63	L01 - LKD 09	100	Y	100	Y
64	L01 - LKD 10	100	Y	100	Y
65	L01 - LKD 11	97	Y	92	Y
66	L01 - LKD 12	100	Y	64	Y
67	L01 - LKD 13	100	Y	61	Y
68	L01 - LKD 14	100	Y	66	Y
69	L01 - LKD 15	100	Y	69	Y
70	L01 - LKD 16	100	Y	65	Y
71	L01 - LKD 17	100	Y	91	Y
72	L01 - LKD 18	100	Y	73	Y
73	L01 - LKD 19	100	Y	100	Y
74	L01 - LKD 20	100	Y	100	Y
75	L01 - LKD 21	100	Y	100	Y
76	L01 - LKD 22	100	Y	100	Y
77	L01 - LKD 23	100	Y	100	Y
78	L01 - LKD 24	100	Y	100	Y

Table 3 – 2022 Methodology Results (First Floor Assessed Units)

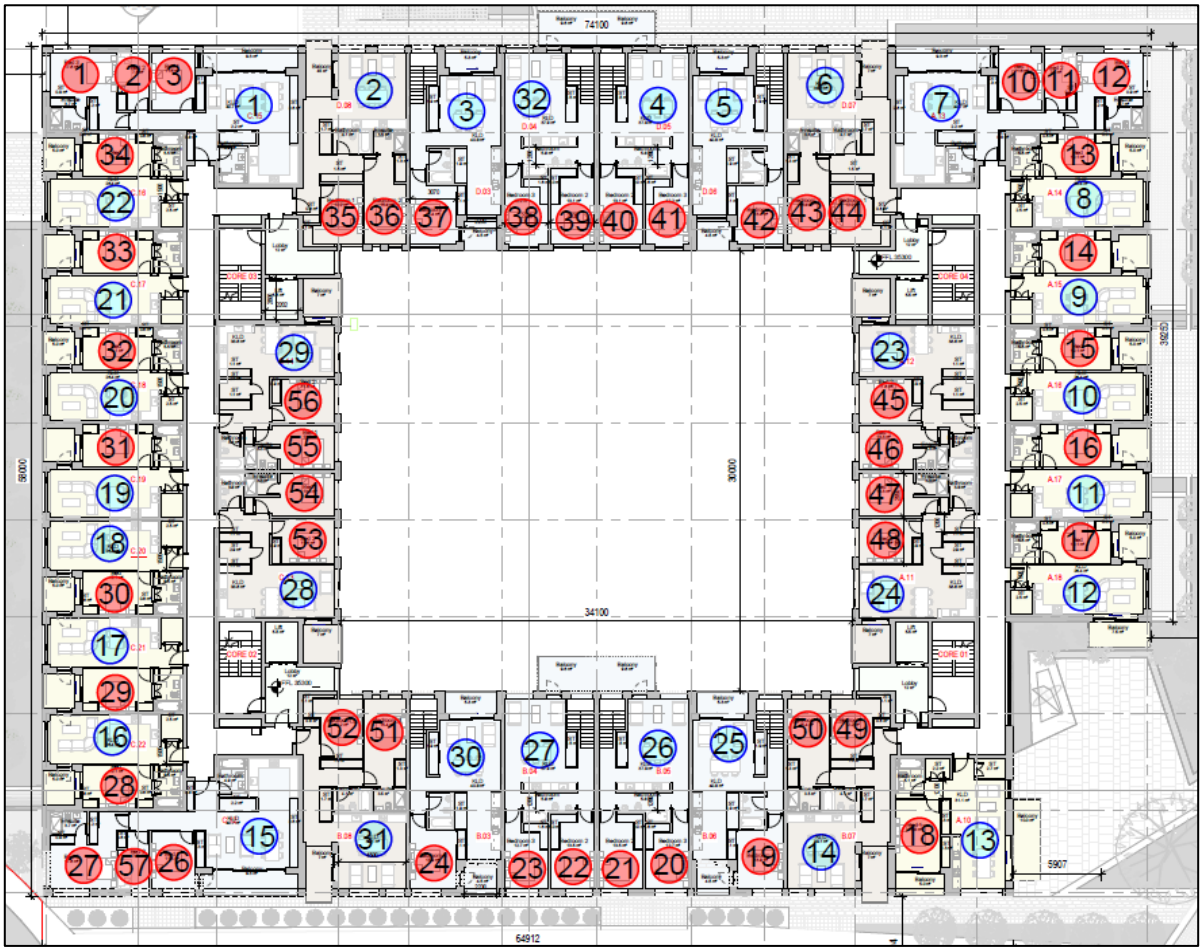


Figure 7 – Assessed Units (Second Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L02 - Bedroom 01	1.00	10.03	Y
2	L02 - Bedroom 02	1.00	2.86	Y
3	L02 - Bedroom 03	1.00	5.33	Y
4	L02 - Bedroom 10	1.00	6.20	Y
5	L02 - Bedroom 11	1.00	3.67	Y
6	L02 - Bedroom 12	1.00	10.02	Y
7	L02 - Bedroom 13	1.00	1.00	Y
8	L02 - Bedroom 14	1.00	1.10	Y
9	L02 - Bedroom 15	1.00	1.02	Y
10	L02 - Bedroom 16	1.00	1.06	Y
11	L02 - Bedroom 17	1.00	1.07	Y
12	L02 - Bedroom 18	1.00	3.83	Y
13	L02 - Bedroom 19	1.00	5.16	Y
14	L02 - Bedroom 20	1.00	5.28	Y
15	L02 - Bedroom 21	1.00	4.71	Y
16	L02 - Bedroom 22	1.00	5.07	Y
17	L02 - Bedroom 23	1.00	5.06	Y
18	L02 - Bedroom 24	1.00	5.19	Y
19	L02 - Bedroom 26	1.00	6.08	Y
20	L02 - Bedroom 27	1.00	10.22	Y
21	L02 - Bedroom 28	1.00	1.90	Y
22	L02 - Bedroom 29	1.00	1.87	Y
23	L02 - Bedroom 30	1.00	1.78	Y
24	L02 - Bedroom 31	1.00	1.82	Y
25	L02 - Bedroom 32	1.00	1.82	Y
26	L02 - Bedroom 33	1.00	1.89	Y
27	L02 - Bedroom 34	1.00	1.90	Y
28	L02 - Bedroom 35	1.00	1.99	Y
29	L02 - Bedroom 36	1.00	1.96	Y
30	L02 - Bedroom 37	1.00	3.81	Y
31	L02 - Bedroom 38	1.00	3.82	Y
32	L02 - Bedroom 39	1.00	3.63	Y
33	L02 - Bedroom 40	1.00	3.43	Y
34	L02 - Bedroom 41	1.00	4.03	Y
35	L02 - Bedroom 42	1.00	3.23	Y
36	L02 - Bedroom 43	1.00	2.12	Y
37	L02 - Bedroom 44	1.00	2.27	Y
38	L02 - Bedroom 45	1.00	5.60	Y
39	L02 - Bedroom 46	1.00	4.69	Y
40	L02 - Bedroom 47	1.00	4.70	Y
41	L02 - Bedroom 48	1.00	5.90	Y
42	L02 - Bedroom 49	1.00	2.21	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
43	L02 - Bedroom 50	1.00	3.15	Y
44	L02 - Bedroom 51	1.00	3.52	Y
45	L02 - Bedroom 52	1.00	1.85	Y
46	L02 - Bedroom 53	1.00	3.31	Y
47	L02 - Bedroom 54	1.00	3.39	Y
48	L02 - Bedroom 55	1.00	3.35	Y
49	L02 - Bedroom 56	1.00	3.06	Y
50	L02 - Bedroom 57	1.00	3.24	Y
51	L02 - LKD 01	2.00	2.04	Y
52	L02 - LKD 02	2.00	5.27	Y
53	L02 - LKD 03	2.00	2.07	Y
54	L02 - LKD 04	2.00	3.15	Y
55	L02 - LKD 05	2.00	2.02	Y
56	L02 - LKD 06	2.00	5.10	Y
57	L02 - LKD 07	2.00	2.57	Y
58	L02 - LKD 08	2.00	2.04	Y
59	L02 - LKD 09	2.00	1.99	Y
60	L02 - LKD 10	2.00	2.02	Y
61	L02 - LKD 11	2.00	2.61	Y
62	L02 - LKD 12	2.00	3.98	Y
63	L02 - LKD 13	2.00	4.41	Y
64	L02 - LKD 14	2.00	5.71	Y
65	L02 - LKD 15	2.00	3.23	Y
66	L02 - LKD 16	2.00	3.89	Y
67	L02 - LKD 17	2.00	3.90	Y
68	L02 - LKD 18	2.00	4.05	Y
69	L02 - LKD 19	2.00	4.11	Y
70	L02 - LKD 20	2.00	3.77	Y
71	L02 - LKD 21	2.00	4.84	Y
72	L02 - LKD 22	2.00	4.23	Y
73	L02 - LKD 23	2.00	2.84	Y
74	L02 - LKD 24	2.00	3.28	Y
75	L02 - LKD 25	2.00	2.13	Y
76	L02 - LKD 26	2.00	3.00	Y
77	L02 - LKD 27	2.00	3.20	Y
78	L02 - LKD 28	2.00	3.13	Y
79	L02 - LKD 29	2.00	2.67	Y
80	L02 - LKD 30	2.00	2.08	Y
81	L02 - LKD 31	2.00	5.60	Y
82	L02 - LKD 32	2.00	3.10	Y

Table 4 – 2011 Methodology Average Daylight Factor Results (Second Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L02 - Bedroom 01	100	Y	100	Y
2	L02 - Bedroom 02	100	Y	75	Y
3	L02 - Bedroom 03	100	Y	100	Y
4	L02 - Bedroom 10	100	Y	100	Y
5	L02 - Bedroom 11	100	Y	87	Y
6	L02 - Bedroom 12	100	Y	100	Y
7	L02 - Bedroom 13	100	Y	13	N
8	L02 - Bedroom 14	100	Y	13	N
9	L02 - Bedroom 15	100	Y	20	N
10	L02 - Bedroom 16	100	Y	20	N
11	L02 - Bedroom 17	100	Y	27	N
12	L02 - Bedroom 18	100	Y	100	Y
13	L02 - Bedroom 19	100	Y	100	Y
14	L02 - Bedroom 20	100	Y	100	Y
15	L02 - Bedroom 21	100	Y	100	Y
16	L02 - Bedroom 22	100	Y	100	Y
17	L02 - Bedroom 23	100	Y	100	Y
18	L02 - Bedroom 24	100	Y	100	Y
19	L02 - Bedroom 26	100	Y	100	Y
20	L02 - Bedroom 27	100	Y	100	Y
21	L02 - Bedroom 28	100	Y	73	Y
22	L02 - Bedroom 29	100	Y	73	Y
23	L02 - Bedroom 30	100	Y	73	Y
24	L02 - Bedroom 31	100	Y	73	Y
25	L02 - Bedroom 32	100	Y	73	Y
26	L02 - Bedroom 33	100	Y	73	Y
27	L02 - Bedroom 34	100	Y	80	Y
28	L02 - Bedroom 35	100	Y	91	Y
29	L02 - Bedroom 36	100	Y	100	Y
30	L02 - Bedroom 37	100	Y	100	Y
31	L02 - Bedroom 38	100	Y	100	Y
32	L02 - Bedroom 39	100	Y	100	Y
33	L02 - Bedroom 40	100	Y	100	Y
34	L02 - Bedroom 41	100	Y	100	Y
35	L02 - Bedroom 42	100	Y	100	Y
36	L02 - Bedroom 43	100	Y	100	Y
37	L02 - Bedroom 44	100	Y	100	Y
38	L02 - Bedroom 45	100	Y	100	Y
39	L02 - Bedroom 46	100	Y	100	Y
40	L02 - Bedroom 47	100	Y	100	Y
41	L02 - Bedroom 48	100	Y	100	Y
42	L02 - Bedroom 49	100	Y	50	Y
43	L02 - Bedroom 50	100	Y	100	Y
44	L02 - Bedroom 51	100	Y	100	Y
45	L02 - Bedroom 52	100	Y	33	N
46	L02 - Bedroom 53	100	Y	100	Y
47	L02 - Bedroom 54	100	Y	85	Y
48	L02 - Bedroom 55	100	Y	100	Y
49	L02 - Bedroom 56	100	Y	100	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L02 - Bedroom 57	95	Y	87	Y
51	L02 - LKD 01	95	Y	86	Y
52	L02 - LKD 02	100	Y	100	Y
53	L02 - LKD 03	100	Y	79	Y
54	L02 - LKD 04	100	Y	85	Y
55	L02 - LKD 05	100	Y	95	Y
56	L02 - LKD 06	100	Y	100	Y
57	L02 - LKD 07	100	Y	83	Y
58	L02 - LKD 08	85	N	37	N
59	L02 - LKD 09	85	N	30	N
60	L02 - LKD 10	87	N	40	N
61	L02 - LKD 11	100	Y	60	Y
62	L02 - LKD 12	100	Y	100	Y
63	L02 - LKD 13	100	Y	96	Y
64	L02 - LKD 14	100	Y	100	Y
65	L02 - LKD 15	97	Y	97	Y
66	L02 - LKD 16	100	Y	64	Y
67	L02 - LKD 17	100	Y	63	Y
68	L02 - LKD 18	100	Y	73	Y
69	L02 - LKD 19	100	Y	71	Y
70	L02 - LKD 20	100	Y	69	Y
71	L02 - LKD 21	100	Y	91	Y
72	L02 - LKD 22	100	Y	73	Y
73	L02 - LKD 23	100	Y	100	Y
74	L02 - LKD 24	100	Y	77	Y
75	L02 - LKD 25	100	Y	100	Y
76	L02 - LKD 26	100	Y	89	Y
77	L02 - LKD 27	100	Y	100	Y
78	L02 - LKD 28	100	Y	66	Y
79	L02 - LKD 29	100	Y	100	Y
80	L02 - LKD 30	100	Y	100	Y
81	L02 - LKD 31	100	Y	101	Y
82	L02 - LKD 32	100	Y	85	Y

Table 5 – 2022 Methodology Results (Second Floor Assessed Units)

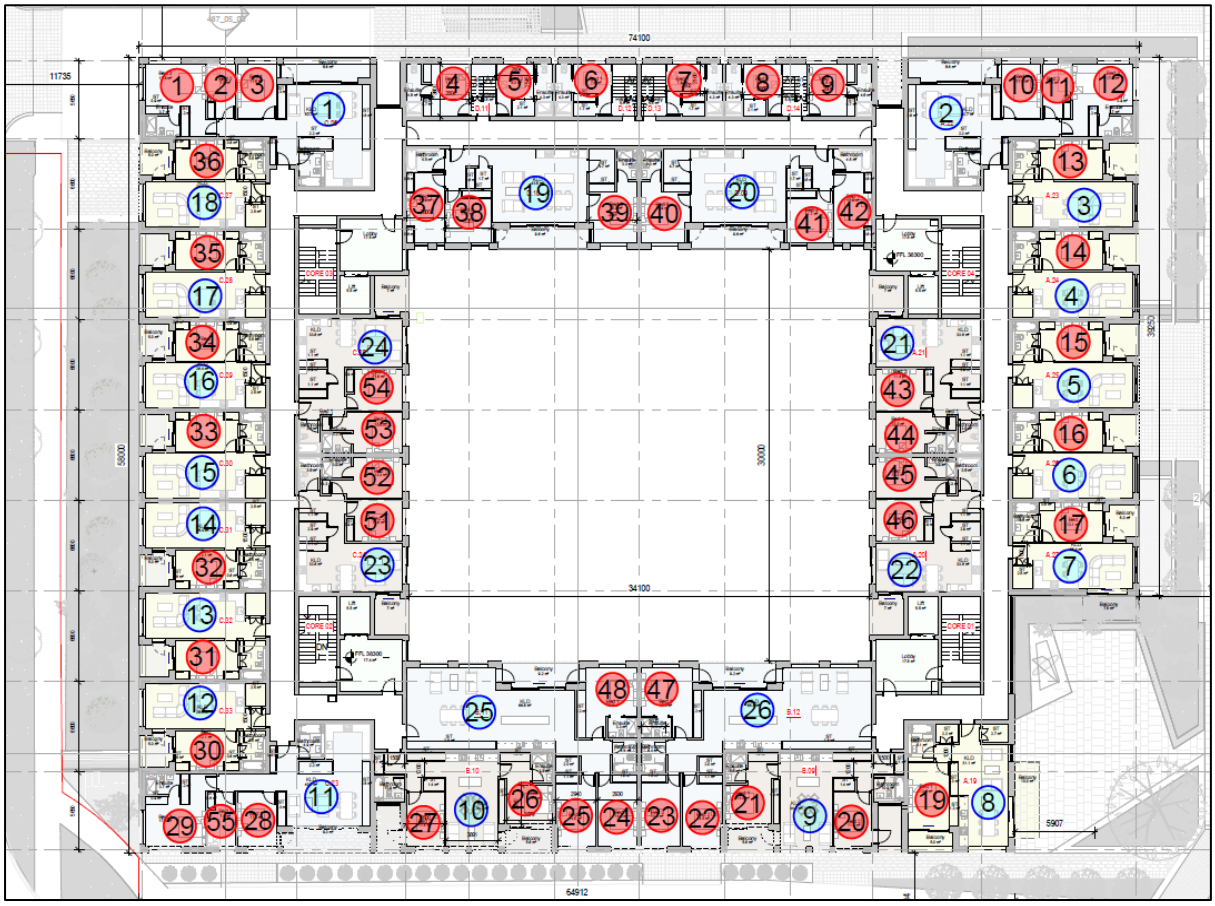


Figure 8 – Assessed Units (Third Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L03 - Bedroom 01	1.00	10.39	Y
2	L03 - Bedroom 02	1.00	3.11	Y
3	L03 - Bedroom 03	1.00	5.82	Y
4	L03 - Bedroom 04	1.00	5.66	Y
5	L03 - Bedroom 05	1.00	6.73	Y
6	L03 - Bedroom 06	1.00	4.19	Y
7	L03 - Bedroom 07	1.00	3.73	Y
8	L03 - Bedroom 08	1.00	6.35	Y
9	L03 - Bedroom 09	1.00	5.76	Y
10	L03 - Bedroom 10	1.00	6.74	Y
11	L03 - Bedroom 11	1.00	3.91	Y
12	L03 - Bedroom 12	1.00	10.81	Y
13	L03 - Bedroom 13	1.00	1.11	Y
14	L03 - Bedroom 14	1.00	1.08	Y
15	L03 - Bedroom 15	1.00	1.10	Y
16	L03 - Bedroom 16	1.00	1.12	Y
17	L03 - Bedroom 17	1.00	1.15	Y
18	L03 - Bedroom 19	1.00	5.16	Y
19	L03 - Bedroom 20	1.00	6.00	Y
20	L03 - Bedroom 21	1.00	5.69	Y
21	L03 - Bedroom 22	1.00	4.69	Y
22	L03 - Bedroom 23	1.00	4.74	Y
23	L03 - Bedroom 24	1.00	4.90	Y
24	L03 - Bedroom 25	1.00	5.18	Y
25	L03 - Bedroom 26	1.00	5.73	Y
26	L03 - Bedroom 27	1.00	7.13	Y
27	L03 - Bedroom 28	1.00	6.15	Y
28	L03 - Bedroom 29	1.00	10.28	Y
29	L03 - Bedroom 30	1.00	3.97	Y
30	L03 - Bedroom 31	1.00	1.91	Y
31	L03 - Bedroom 32	1.00	1.86	Y
32	L03 - Bedroom 33	1.00	1.90	Y
33	L03 - Bedroom 34	1.00	1.88	Y
34	L03 - Bedroom 35	1.00	1.90	Y
35	L03 - Bedroom 36	1.00	1.91	Y
36	L03 - Bedroom 37	1.00	2.26	Y
37	L03 - Bedroom 38	1.00	3.33	Y
38	L03 - Bedroom 39	1.00	4.83	Y
39	L03 - Bedroom 40	1.00	4.66	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
40	L03 - Bedroom 41	1.00	3.39	Y
41	L03 - Bedroom 42	1.00	2.58	Y
42	L03 - Bedroom 43	1.00	6.10	Y
43	L03 - Bedroom 44	1.00	5.05	Y
44	L03 - Bedroom 45	1.00	5.09	Y
45	L03 - Bedroom 46	1.00	6.42	Y
46	L03 - Bedroom 47	1.00	4.36	Y
47	L03 - Bedroom 48	1.00	4.11	Y
48	L03 - Bedroom 51	1.00	3.68	Y
49	L03 - Bedroom 52	1.00	3.73	Y
50	L03 - Bedroom 53	1.00	3.65	Y
51	L03 - Bedroom 54	1.00	3.40	Y
52	L03 - Bedroom 55	1.00	3.26	Y
53	L03 - LKD 01	2.00	2.25	Y
54	L03 - LKD 02	2.00	2.88	Y
55	L03 - LKD 03	2.00	2.23	Y
56	L03 - LKD 04	2.00	2.22	Y
57	L03 - LKD 05	2.00	2.25	Y
58	L03 - LKD 06	2.00	2.88	Y
59	L03 - LKD 07	2.00	4.33	Y
60	L03 - LKD 08	2.00	4.64	Y
61	L03 - LKD 09	2.00	4.95	Y
62	L03 - LKD 10	2.00	4.82	Y
63	L03 - LKD 11	2.00	3.31	Y
64	L03 - LKD 12	2.00	4.21	Y
65	L03 - LKD 13	2.00	3.93	Y
66	L03 - LKD 14	2.00	4.09	Y
67	L03 - LKD 15	2.00	4.11	Y
68	L03 - LKD 16	2.00	3.80	Y
69	L03 - LKD 17	2.00	4.89	Y
70	L03 - LKD 18	2.00	4.25	Y
71	L03 - LKD 19	2.00	2.86	Y
72	L03 - LKD 20	2.00	2.99	Y
73	L03 - LKD 21	2.00	2.90	Y
74	L03 - LKD 22	2.00	3.77	Y
75	L03 - LKD 23	2.00	3.59	Y
76	L03 - LKD 24	2.00	2.75	Y
77	L03 - LKD 25	2.00	5.51	Y
78	L03 - LKD 26	2.00	5.49	Y

Table 6 – 2011 Methodology Average Daylight Factor Results (Third Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L03 - Bedroom 01	100	Y	100	Y
2	L03 - Bedroom 02	100	Y	100	Y
3	L03 - Bedroom 03	100	Y	100	Y
4	L03 - Bedroom 04	100	Y	100	Y
5	L03 - Bedroom 05	100	Y	100	Y
6	L03 - Bedroom 06	100	Y	100	Y
7	L03 - Bedroom 07	100	Y	100	Y
8	L03 - Bedroom 08	100	Y	100	Y
9	L03 - Bedroom 09	100	Y	100	Y
10	L03 - Bedroom 10	100	Y	100	Y
11	L03 - Bedroom 11	100	Y	100	Y
12	L03 - Bedroom 12	100	Y	100	Y
13	L03 - Bedroom 13	100	Y	20	N
14	L03 - Bedroom 14	100	Y	20	N
15	L03 - Bedroom 15	100	Y	20	N
16	L03 - Bedroom 16	100	Y	26	N
17	L03 - Bedroom 17	100	Y	44	N
18	L03 - Bedroom 19	100	Y	100	Y
19	L03 - Bedroom 20	100	Y	100	Y
20	L03 - Bedroom 21	100	Y	100	Y
21	L03 - Bedroom 22	100	Y	100	Y
22	L03 - Bedroom 23	100	Y	100	Y
23	L03 - Bedroom 24	100	Y	100	Y
24	L03 - Bedroom 25	100	Y	100	Y
25	L03 - Bedroom 26	100	Y	100	Y
26	L03 - Bedroom 27	100	Y	100	Y
27	L03 - Bedroom 28	100	Y	100	Y
28	L03 - Bedroom 29	100	Y	100	Y
29	L03 - Bedroom 30	100	Y	100	Y
30	L03 - Bedroom 31	100	Y	73	Y
31	L03 - Bedroom 32	100	Y	73	Y
32	L03 - Bedroom 33	100	Y	73	Y
33	L03 - Bedroom 34	100	Y	73	Y
34	L03 - Bedroom 35	100	Y	66	Y
35	L03 - Bedroom 36	100	Y	80	Y
36	L03 - Bedroom 37	100	Y	100	Y
37	L03 - Bedroom 38	100	Y	100	Y
38	L03 - Bedroom 39	100	Y	100	Y
39	L03 - Bedroom 40	100	Y	100	Y
40	L03 - Bedroom 41	100	Y	100	Y
41	L03 - Bedroom 42	100	Y	100	Y
42	L03 - Bedroom 43	100	Y	100	Y
43	L03 - Bedroom 44	100	Y	100	Y
44	L03 - Bedroom 45	100	Y	100	Y
45	L03 - Bedroom 46	100	Y	100	Y
46	L03 - Bedroom 47	100	Y	100	Y
47	L03 - Bedroom 48	100	Y	100	Y
48	L03 - Bedroom 51	100	Y	100	Y
49	L03 - Bedroom 52	100	Y	92	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L03 - Bedroom 53	100	Y	92	Y
51	L03 - Bedroom 54	100	Y	100	Y
52	L03 - Bedroom 55	95	Y	87	Y
53	L03 - LKD 01	97	Y	89	Y
54	L03 - LKD 02	100	Y	88	Y
55	L03 - LKD 03	95	Y	40	Y
56	L03 - LKD 04	95	Y	40	Y
57	L03 - LKD 05	95	Y	45	Y
58	L03 - LKD 06	100	Y	57	Y
59	L03 - LKD 07	100	Y	100	Y
60	L03 - LKD 08	100	Y	96	Y
61	L03 - LKD 09	100	Y	100	Y
62	L03 - LKD 10	100	Y	100	Y
63	L03 - LKD 11	97	Y	95	Y
64	L03 - LKD 12	100	Y	73	Y
65	L03 - LKD 13	100	Y	63	Y
66	L03 - LKD 14	100	Y	78	Y
67	L03 - LKD 15	100	Y	76	Y
68	L03 - LKD 16	100	Y	71	Y
69	L03 - LKD 17	100	Y	100	Y
70	L03 - LKD 18	100	Y	73	Y
71	L03 - LKD 19	100	Y	100	Y
72	L03 - LKD 20	100	Y	100	Y
73	L03 - LKD 21	100	Y	100	Y
74	L03 - LKD 22	100	Y	77	Y
75	L03 - LKD 23	100	Y	72	Y
76	L03 - LKD 24	100	Y	65	Y
77	L03 - LKD 25	100	Y	100	Y
78	L03 - LKD 26	100	Y	100	Y

Table 7 – 2022 Methodology Results (Third Floor Assessed Units)

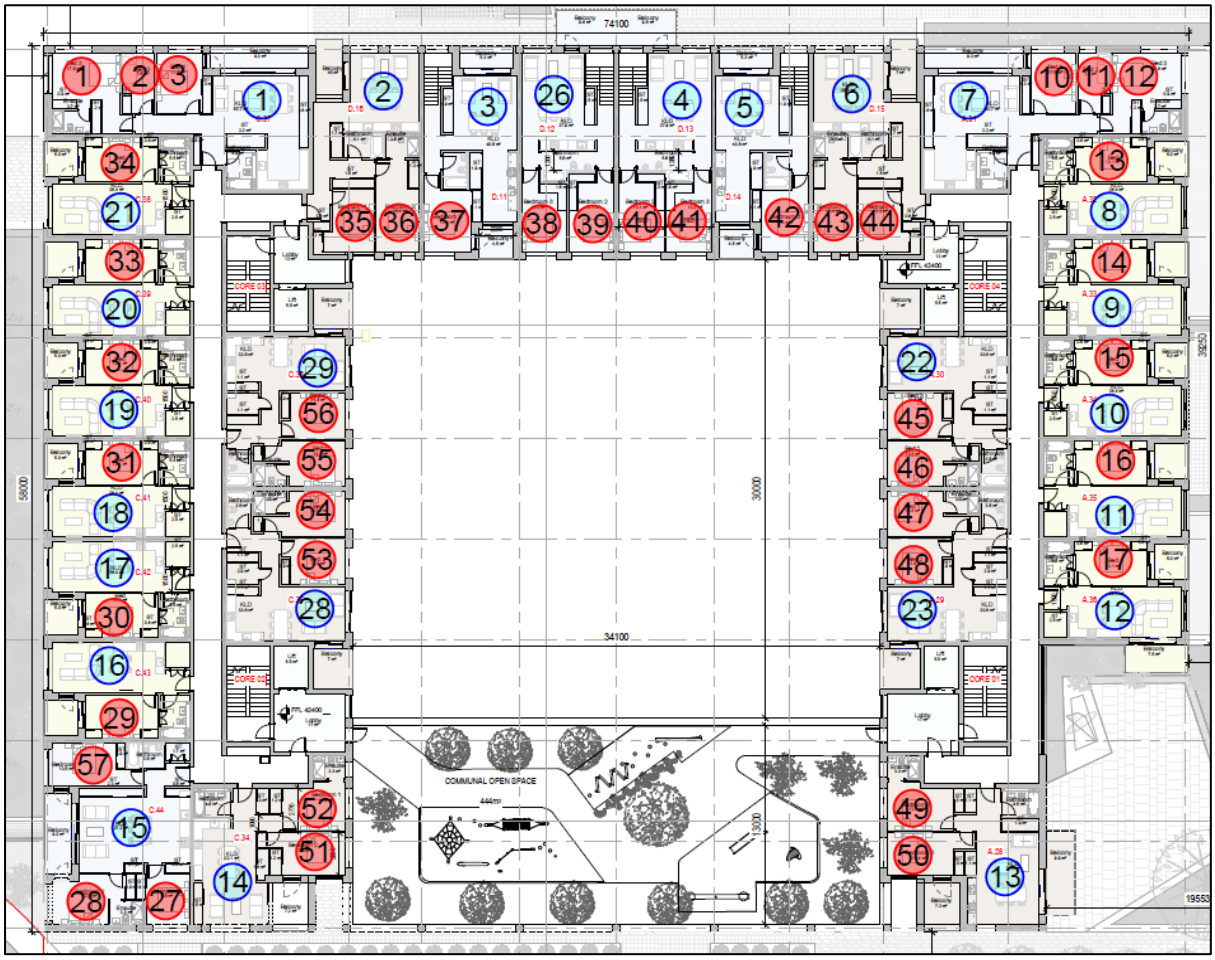


Figure 9 – Assessed Units (Fourth Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L04 - Bedroom 01	1.00	10.81	Y
2	L04 - Bedroom 02	1.00	3.40	Y
3	L04 - Bedroom 03	1.00	6.44	Y
4	L04 - Bedroom 10	1.00	7.24	Y
5	L04 - Bedroom 11	1.00	4.23	Y
6	L04 - Bedroom 12	1.00	11.62	Y
7	L04 - Bedroom 13	1.00	1.06	Y
8	L04 - Bedroom 14	1.00	1.04	Y
9	L04 - Bedroom 15	1.00	1.05	Y
10	L04 - Bedroom 16	1.00	1.03	Y
11	L04 - Bedroom 17	1.00	1.00	Y
12	L04 - Bedroom 27	1.00	6.55	Y
13	L04 - Bedroom 28	1.00	6.10	Y
14	L04 - Bedroom 29	1.00	1.90	Y
15	L04 - Bedroom 30	1.00	1.78	Y
16	L04 - Bedroom 31	1.00	1.86	Y
17	L04 - Bedroom 32	1.00	1.87	Y
18	L04 - Bedroom 33	1.00	1.92	Y
19	L04 - Bedroom 34	1.00	1.92	Y
20	L04 - Bedroom 35	1.00	2.09	Y
21	L04 - Bedroom 36	1.00	2.06	Y
22	L04 - Bedroom 37	1.00	4.21	Y
23	L04 - Bedroom 38	1.00	4.21	Y
24	L04 - Bedroom 39	1.00	3.92	Y
25	L04 - Bedroom 40	1.00	3.75	Y
26	L04 - Bedroom 41	1.00	4.44	Y
27	L04 - Bedroom 42	1.00	3.63	Y
28	L04 - Bedroom 43	1.00	2.25	Y
29	L04 - Bedroom 44	1.00	2.38	Y
30	L04 - Bedroom 45	1.00	6.55	Y
31	L04 - Bedroom 46	1.00	5.42	Y
32	L04 - Bedroom 47	1.00	5.44	Y
33	L04 - Bedroom 48	1.00	6.81	Y
34	L04 - Bedroom 49	1.00	5.94	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
35	L04 - Bedroom 50	1.00	8.74	Y
36	L04 - Bedroom 51	1.00	9.59	Y
37	L04 - Bedroom 52	1.00	4.59	Y
38	L04 - Bedroom 53	1.00	3.99	Y
39	L04 - Bedroom 54	1.00	4.01	Y
40	L04 - Bedroom 55	1.00	3.96	Y
41	L04 - Bedroom 56	1.00	3.72	Y
42	L04 - Bedroom 57	1.00	3.24	Y
43	L04 - LKD 01	2.00	2.66	Y
44	L04 - LKD 02	2.00	6.20	Y
45	L04 - LKD 03	2.00	2.51	Y
46	L04 - LKD 04	2.00	3.71	Y
47	L04 - LKD 05	2.00	2.66	Y
48	L04 - LKD 06	2.00	6.06	Y
49	L04 - LKD 07	2.00	3.27	Y
50	L04 - LKD 08	2.00	2.45	Y
51	L04 - LKD 09	2.00	2.42	Y
52	L04 - LKD 10	2.00	2.48	Y
53	L04 - LKD 11	2.00	3.19	Y
54	L04 - LKD 12	2.00	4.77	Y
55	L04 - LKD 13	2.00	3.91	Y
56	L04 - LKD 14	2.00	4.97	Y
57	L04 - LKD 15	2.00	3.17	Y
58	L04 - LKD 16	2.00	4.50	Y
59	L04 - LKD 17	2.00	3.92	Y
60	L04 - LKD 18	2.00	4.07	Y
61	L04 - LKD 19	2.00	4.12	Y
62	L04 - LKD 20	2.00	3.79	Y
63	L04 - LKD 21	2.00	4.91	Y
64	L04 - LKD 22	2.00	4.50	Y
65	L04 - LKD 23	2.00	3.43	Y
66	L04 - LKD 24	2.00	4.09	Y
67	L04 - LKD 28	2.00	3.92	Y
68	L04 - LKD 29	2.00	3.22	Y

Table 8 – 2011 Methodology Average Daylight Factor Results (Fourth Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L04 - Bedroom 01	100	Y	100	Y
2	L04 - Bedroom 02	100	Y	100	Y
3	L04 - Bedroom 03	100	Y	100	Y
4	L04 - Bedroom 10	100	Y	100	Y
5	L04 - Bedroom 11	100	Y	100	Y
6	L04 - Bedroom 12	100	Y	100	Y
7	L04 - Bedroom 13	100	Y	33	N
8	L04 - Bedroom 14	100	Y	40	N
9	L04 - Bedroom 15	100	Y	40	N
10	L04 - Bedroom 16	100	Y	33	N
11	L04 - Bedroom 17	100	Y	72	Y
12	L04 - Bedroom 27	100	Y	100	Y
13	L04 - Bedroom 28	100	Y	100	Y
14	L04 - Bedroom 29	100	Y	73	Y
15	L04 - Bedroom 30	100	Y	86	Y
16	L04 - Bedroom 31	100	Y	80	Y
17	L04 - Bedroom 32	100	Y	73	Y
18	L04 - Bedroom 33	100	Y	86	Y
19	L04 - Bedroom 34	100	Y	70	Y
20	L04 - Bedroom 35	100	Y	100	Y
21	L04 - Bedroom 36	100	Y	100	Y
22	L04 - Bedroom 37	100	Y	100	Y
23	L04 - Bedroom 38	100	Y	100	Y
24	L04 - Bedroom 39	100	Y	100	Y
25	L04 - Bedroom 40	100	Y	100	Y
26	L04 - Bedroom 41	100	Y	100	Y
27	L04 - Bedroom 42	100	Y	100	Y
28	L04 - Bedroom 43	100	Y	100	Y
29	L04 - Bedroom 44	100	Y	100	Y
30	L04 - Bedroom 45	100	Y	100	Y
31	L04 - Bedroom 46	100	Y	100	Y
32	L04 - Bedroom 47	100	Y	100	Y
33	L04 - Bedroom 48	100	Y	100	Y
34	L04 - Bedroom 49	100	Y	100	Y
35	L04 - Bedroom 50	100	Y	100	Y
36	L04 - Bedroom 51	100	Y	100	Y
37	L04 - Bedroom 52	100	Y	100	Y
38	L04 - Bedroom 53	100	Y	100	Y
39	L04 - Bedroom 54	100	Y	92	Y
40	L04 - Bedroom 55	100	Y	92	Y
41	L04 - Bedroom 56	100	Y	100	Y
42	L04 - Bedroom 57	100	Y	87	Y
43	L04 - LKD 01	97	Y	91	Y
44	L04 - LKD 02	100	Y	100	Y
45	L04 - LKD 03	100	Y	100	Y
46	L04 - LKD 04	100	Y	100	Y
47	L04 - LKD 05	100	Y	100	Y
48	L04 - LKD 06	100	Y	100	Y
49	L04 - LKD 07	100	Y	88	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L04 - LKD 08	95	Y	50	Y
51	L04 - LKD 09	95	Y	50	Y
52	L04 - LKD 10	95	Y	50	Y
53	L04 - LKD 11	100	Y	75	Y
54	L04 - LKD 12	100	Y	100	Y
55	L04 - LKD 13	100	Y	100	Y
56	L04 - LKD 14	100	Y	100	Y
57	L04 - LKD 15	100	Y	100	Y
58	L04 - LKD 16	100	Y	90	Y
59	L04 - LKD 17	100	Y	70	Y
60	L04 - LKD 18	100	Y	83	Y
61	L04 - LKD 19	100	Y	78	Y
62	L04 - LKD 20	100	Y	73	Y
63	L04 - LKD 21	100	Y	100	Y
64	L04 - LKD 22	100	Y	100	Y
65	L04 - LKD 23	100	Y	100	Y
66	L04 - LKD 24	100	Y	100	Y
67	L04 - LKD 28	100	Y	100	Y
68	L04 - LKD 29	100	Y	87	Y

Table 9 – 2022 Methodology Results (Fourth Floor Assessed Units)

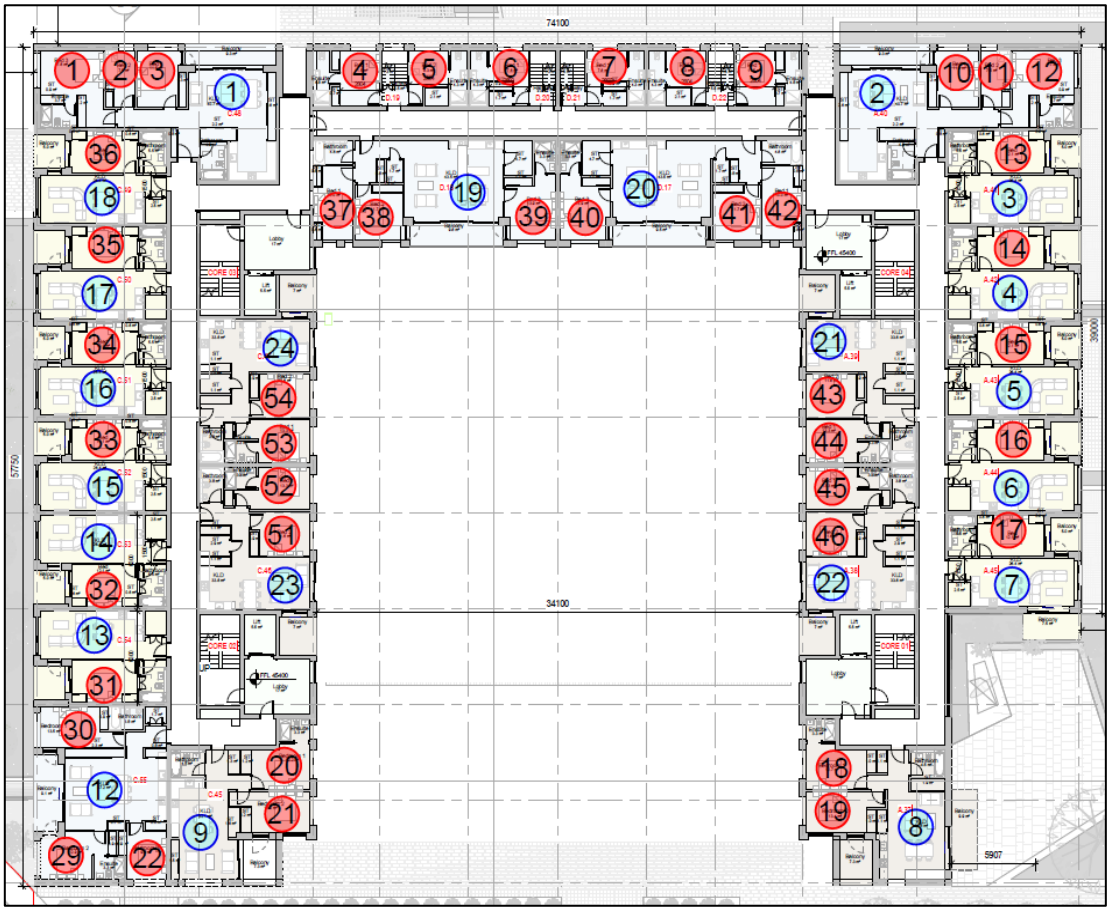


Figure 10 – Assessed Units (Fifth Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L05 - Bedroom 01	1.00	6.44	Y
2	L05 - Bedroom 02	1.00	3.72	Y
3	L05 - Bedroom 03	1.00	7.07	Y
4	L05 - Bedroom 04	1.00	6.38	Y
5	L05 - Bedroom 05	1.00	7.57	Y
6	L05 - Bedroom 06	1.00	5.00	Y
7	L05 - Bedroom 07	1.00	4.60	Y
8	L05 - Bedroom 08	1.00	7.42	Y
9	L05 - Bedroom 09	1.00	6.83	Y
10	L05 - Bedroom 10	1.00	7.64	Y
11	L05 - Bedroom 11	1.00	4.56	Y
12	L05 - Bedroom 12	1.00	5.40	Y
13	L05 - Bedroom 13	1.00	1.23	Y
14	L05 - Bedroom 14	1.00	1.25	Y
15	L05 - Bedroom 15	1.00	1.22	Y
16	L05 - Bedroom 16	1.00	1.19	Y
17	L05 - Bedroom 17	1.00	1.12	Y
18	L05 - Bedroom 18	1.00	7.30	Y
19	L05 - Bedroom 19	1.00	10.75	Y
20	L05 - Bedroom 20	1.00	5.57	Y
21	L05 - Bedroom 21	1.00	9.34	Y
22	L05 - Bedroom 22	1.00	6.69	Y
23	L05 - Bedroom 29	1.00	7.11	Y
24	L05 - Bedroom 30	1.00	7.40	Y
25	L05 - Bedroom 31	1.00	1.94	Y
26	L05 - Bedroom 32	1.00	1.85	Y
27	L05 - Bedroom 33	1.00	1.90	Y
28	L05 - Bedroom 34	1.00	1.89	Y
29	L05 - Bedroom 35	1.00	1.89	Y
30	L05 - Bedroom 36	1.00	1.92	Y
31	L05 - Bedroom 37	1.00	2.38	Y
32	L05 - Bedroom 38	1.00	3.73	Y
33	L05 - Bedroom 39	1.00	5.31	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
34	L05 - Bedroom 40	1.00	5.16	Y
35	L05 - Bedroom 41	1.00	3.79	Y
36	L05 - Bedroom 42	1.00	2.68	Y
37	L05 - Bedroom 43	1.00	6.99	Y
38	L05 - Bedroom 44	1.00	5.76	Y
39	L05 - Bedroom 45	1.00	5.69	Y
40	L05 - Bedroom 46	1.00	7.11	Y
41	L05 - Bedroom 51	1.00	4.20	Y
42	L05 - Bedroom 52	1.00	4.27	Y
43	L05 - Bedroom 53	1.00	4.21	Y
44	L05 - Bedroom 54	1.00	4.04	Y
45	L05 - LKD 01	2.00	3.02	Y
46	L05 - LKD 02	2.00	3.74	Y
47	L05 - LKD 03	2.00	2.64	Y
48	L05 - LKD 04	2.00	2.61	Y
49	L05 - LKD 05	2.00	2.71	Y
50	L05 - LKD 06	2.00	3.50	Y
51	L05 - LKD 07	2.00	5.30	Y
52	L05 - LKD 08	2.00	6.42	Y
53	L05 - LKD 09	2.00	5.56	Y
54	L05 - LKD 12	2.00	5.07	Y
55	L05 - LKD 13	2.00	3.95	Y
56	L05 - LKD 14	2.00	4.10	Y
57	L05 - LKD 15	2.00	4.13	Y
58	L05 - LKD 16	2.00	3.79	Y
59	L05 - LKD 17	2.00	4.93	Y
60	L05 - LKD 18	2.00	4.25	Y
61	L05 - LKD 19	2.00	3.21	Y
62	L05 - LKD 20	2.00	3.36	Y
63	L05 - LKD 21	2.00	3.62	Y
64	L05 - LKD 22	2.00	4.33	Y
65	L05 - LKD 23	2.00	4.12	Y
66	L05 - LKD 24	2.00	3.40	Y

Table 10 – 2011 Methodology Average Daylight Factor Results (Fifth Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L05 - Bedroom 01	100	Y	100	Y
2	L05 - Bedroom 02	100	Y	100	Y
3	L05 - Bedroom 03	100	Y	100	Y
4	L05 - Bedroom 04	100	Y	100	Y
5	L05 - Bedroom 05	100	Y	100	Y
6	L05 - Bedroom 06	100	Y	100	Y
7	L05 - Bedroom 07	100	Y	100	Y
8	L05 - Bedroom 08	100	Y	100	Y
9	L05 - Bedroom 09	100	Y	100	Y
10	L05 - Bedroom 10	100	Y	100	Y
11	L05 - Bedroom 11	100	Y	100	Y
12	L05 - Bedroom 12	100	Y	100	Y
13	L05 - Bedroom 13	100	Y	53	Y
14	L05 - Bedroom 14	100	Y	50	Y
15	L05 - Bedroom 15	100	Y	53	Y
16	L05 - Bedroom 16	100	Y	73	Y
17	L05 - Bedroom 17	100	Y	100	Y
18	L05 - Bedroom 18	100	Y	100	Y
19	L05 - Bedroom 19	100	Y	100	Y
20	L05 - Bedroom 20	100	Y	100	Y
21	L05 - Bedroom 21	100	Y	100	Y
22	L05 - Bedroom 22	100	Y	100	Y
23	L05 - Bedroom 29	100	Y	100	Y
24	L05 - Bedroom 30	100	Y	100	Y
25	L05 - Bedroom 31	100	Y	86	Y
26	L05 - Bedroom 32	100	Y	86	Y
27	L05 - Bedroom 33	100	Y	80	Y
28	L05 - Bedroom 34	100	Y	73	Y
29	L05 - Bedroom 35	100	Y	73	Y
30	L05 - Bedroom 36	100	Y	90	Y
31	L05 - Bedroom 37	100	Y	100	Y
32	L05 - Bedroom 38	100	Y	100	Y
33	L05 - Bedroom 39	100	Y	100	Y
34	L05 - Bedroom 40	100	Y	100	Y
35	L05 - Bedroom 41	100	Y	100	Y
36	L05 - Bedroom 42	100	Y	100	Y
37	L05 - Bedroom 43	100	Y	100	Y
38	L05 - Bedroom 44	100	Y	100	Y
39	L05 - Bedroom 45	100	Y	100	Y
40	L05 - Bedroom 46	100	Y	100	Y
41	L05 - Bedroom 51	100	Y	100	Y
42	L05 - Bedroom 52	100	Y	100	Y
43	L05 - Bedroom 53	100	Y	92	Y
44	L05 - Bedroom 54	100	Y	100	Y
45	L05 - LKD 01	100	Y	93	Y
46	L05 - LKD 02	100	Y	94	Y
47	L05 - LKD 03	100	Y	60	Y
48	L05 - LKD 04	100	Y	60	Y
49	L05 - LKD 05	100	Y	67	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L05 - LKD 06	100	Y	97	Y
51	L05 - LKD 07	100	Y	100	Y
52	L05 - LKD 08	100	Y	100	Y
53	L05 - LKD 09	100	Y	100	Y
54	L05 - LKD 12	100	Y	100	Y
55	L05 - LKD 13	100	Y	70	Y
56	L05 - LKD 14	100	Y	83	Y
57	L05 - LKD 15	100	Y	73	Y
58	L05 - LKD 16	100	Y	69	Y
59	L05 - LKD 17	100	Y	100	Y
60	L05 - LKD 18	100	Y	80	Y
61	L05 - LKD 19	100	Y	100	Y
62	L05 - LKD 20	100	Y	100	Y
63	L05 - LKD 21	100	Y	100	Y
64	L05 - LKD 22	100	Y	100	Y
65	L05 - LKD 23	100	Y	100	Y
66	L05 - LKD 24	100	Y	100	Y

Table 11 – 2022 Methodology Results (Fifth Floor Assessed Units)

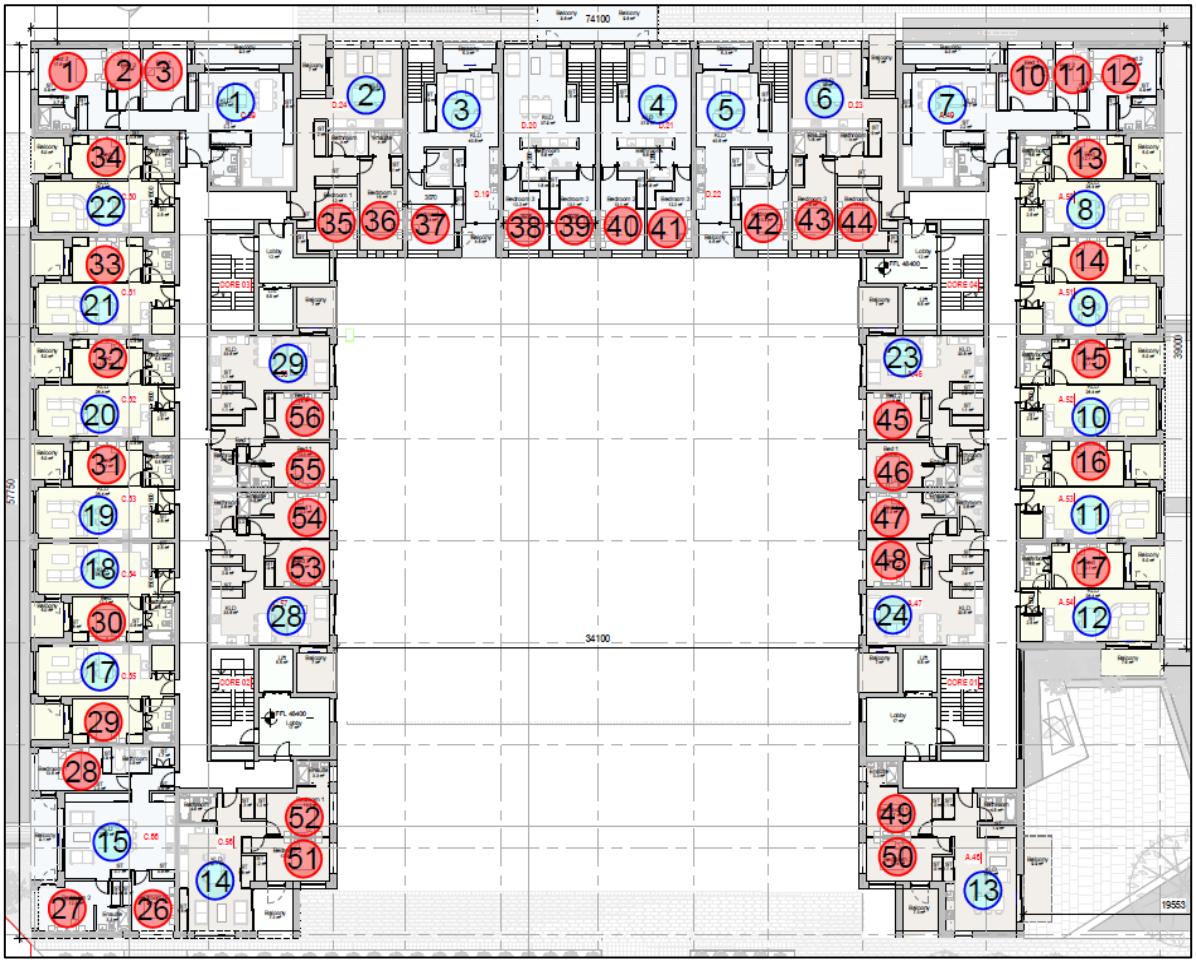


Figure 11 – Assessed Units (Sixth Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L06 - Bedroom 01	1.00	6.46	Y
2	L06 - Bedroom 02	1.00	3.98	Y
3	L06 - Bedroom 03	1.00	8.30	Y
4	L06 - Bedroom 10	1.00	8.13	Y
5	L06 - Bedroom 11	1.00	4.82	Y
6	L06 - Bedroom 12	1.00	5.65	Y
7	L06 - Bedroom 13	1.00	1.35	Y
8	L06 - Bedroom 14	1.00	1.32	Y
9	L06 - Bedroom 15	1.00	1.34	Y
10	L06 - Bedroom 16	1.00	1.35	Y
11	L06 - Bedroom 17	1.00	1.29	Y
12	L06 - Bedroom 26	1.00	7.30	Y
13	L06 - Bedroom 27	1.00	6.81	Y
14	L06 - Bedroom 28	1.00	4.54	Y
15	L06 - Bedroom 29	1.00	4.14	Y
16	L06 - Bedroom 30	1.00	1.78	Y
17	L06 - Bedroom 31	1.00	1.86	Y
18	L06 - Bedroom 32	1.00	1.85	Y
19	L06 - Bedroom 33	1.00	4.13	Y
20	L06 - Bedroom 34	1.00	1.93	Y
21	L06 - Bedroom 35	1.00	2.20	Y
22	L06 - Bedroom 36	1.00	2.36	Y
23	L06 - Bedroom 37	1.00	4.97	Y
24	L06 - Bedroom 38	1.00	4.47	Y
25	L06 - Bedroom 39	1.00	4.20	Y
26	L06 - Bedroom 40	1.00	3.98	Y
27	L06 - Bedroom 41	1.00	4.78	Y
28	L06 - Bedroom 42	1.00	5.61	Y
29	L06 - Bedroom 43	1.00	2.55	Y
30	L06 - Bedroom 44	1.00	2.52	Y
31	L06 - Bedroom 45	1.00	7.38	Y
32	L06 - Bedroom 46	1.00	6.03	Y
33	L06 - Bedroom 47	1.00	5.92	Y
34	L06 - Bedroom 48	1.00	7.32	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
35	L06 - Bedroom 49	1.00	5.25	Y
36	L06 - Bedroom 50	1.00	8.14	Y
37	L06 - Bedroom 51	1.00	7.82	Y
38	L06 - Bedroom 52	1.00	3.92	Y
39	L06 - Bedroom 53	1.00	4.40	Y
40	L06 - Bedroom 54	1.00	4.45	Y
41	L06 - Bedroom 55	1.00	4.46	Y
42	L06 - Bedroom 56	1.00	4.29	Y
43	L06 - LKD 01	2.00	5.59	Y
44	L06 - LKD 02	2.00	8.18	Y
45	L06 - LKD 03	2.00	5.28	Y
46	L06 - LKD 04	2.00	4.47	Y
47	L06 - LKD 05	2.00	6.06	Y
48	L06 - LKD 06	2.00	6.78	Y
49	L06 - LKD 07	2.00	4.15	Y
50	L06 - LKD 08	2.00	2.83	Y
51	L06 - LKD 09	2.00	2.79	Y
52	L06 - LKD 10	2.00	2.88	Y
53	L06 - LKD 11	2.00	3.73	Y
54	L06 - LKD 12	2.00	5.89	Y
55	L06 - LKD 13	2.00	3.61	Y
56	L06 - LKD 14	2.00	4.04	Y
57	L06 - LKD 15	2.00	3.27	Y
58	L06 - LKD 17	2.00	4.12	Y
59	L06 - LKD 18	2.00	4.09	Y
60	L06 - LKD 19	2.00	4.13	Y
61	L06 - LKD 20	2.00	3.81	Y
62	L06 - LKD 21	2.00	5.25	Y
63	L06 - LKD 22	2.00	4.23	Y
64	L06 - LKD 23	2.00	4.01	Y
65	L06 - LKD 24	2.00	4.46	Y
66	L06 - LKD 28	2.00	4.31	Y

Table 12 – 2011 Methodology Average Daylight Factor Results (Sixth Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L06 - Bedroom 01	100	Y	100	Y
2	L06 - Bedroom 02	100	Y	100	Y
3	L06 - Bedroom 03	100	Y	100	Y
4	L06 - Bedroom 10	100	Y	100	Y
5	L06 - Bedroom 11	100	Y	100	Y
6	L06 - Bedroom 12	100	Y	100	Y
7	L06 - Bedroom 13	100	Y	66	Y
8	L06 - Bedroom 14	100	Y	66	Y
9	L06 - Bedroom 15	100	Y	73	Y
10	L06 - Bedroom 16	100	Y	73	Y
11	L06 - Bedroom 17	100	Y	100	Y
12	L06 - Bedroom 26	100	Y	100	Y
13	L06 - Bedroom 27	100	Y	100	Y
14	L06 - Bedroom 28	100	Y	100	Y
15	L06 - Bedroom 29	100	Y	100	Y
16	L06 - Bedroom 30	100	Y	80	Y
17	L06 - Bedroom 31	100	Y	80	Y
18	L06 - Bedroom 32	100	Y	80	Y
19	L06 - Bedroom 33	100	Y	100	Y
20	L06 - Bedroom 34	100	Y	80	Y
21	L06 - Bedroom 35	100	Y	100	Y
22	L06 - Bedroom 36	100	Y	100	Y
23	L06 - Bedroom 37	100	Y	100	Y
24	L06 - Bedroom 38	100	Y	100	Y
25	L06 - Bedroom 39	100	Y	100	Y
26	L06 - Bedroom 40	100	Y	100	Y
27	L06 - Bedroom 41	100	Y	100	Y
28	L06 - Bedroom 42	100	Y	100	Y
29	L06 - Bedroom 43	100	Y	100	Y
30	L06 - Bedroom 44	100	Y	100	Y
31	L06 - Bedroom 45	100	Y	100	Y
32	L06 - Bedroom 46	100	Y	100	Y
33	L06 - Bedroom 47	100	Y	100	Y
34	L06 - Bedroom 48	100	Y	100	Y
35	L06 - Bedroom 49	100	Y	100	Y
36	L06 - Bedroom 50	100	Y	100	Y
37	L06 - Bedroom 51	100	Y	100	Y
38	L06 - Bedroom 52	100	Y	100	Y
39	L06 - Bedroom 53	100	Y	100	Y
40	L06 - Bedroom 54	100	Y	100	Y
41	L06 - Bedroom 55	100	Y	100	Y
42	L06 - Bedroom 56	100	Y	100	Y
43	L06 - LKD 01	97	Y	93	Y
44	L06 - LKD 02	100	Y	100	Y
45	L06 - LKD 03	100	Y	100	Y
46	L06 - LKD 04	100	Y	100	Y
47	L06 - LKD 05	100	Y	100	Y
48	L06 - LKD 06	100	Y	100	Y
49	L06 - LKD 07	100	Y	97	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L06 - LKD 08	100	Y	70	Y
51	L06 - LKD 09	100	Y	67	Y
52	L06 - LKD 10	100	Y	67	Y
53	L06 - LKD 11	100	Y	100	Y
54	L06 - LKD 12	100	Y	100	Y
55	L06 - LKD 13	100	Y	100	Y
56	L06 - LKD 14	100	Y	100	Y
57	L06 - LKD 15	100	Y	100	Y
58	L06 - LKD 17	100	Y	72	Y
59	L06 - LKD 18	100	Y	83	Y
60	L06 - LKD 19	100	Y	76	Y
61	L06 - LKD 20	100	Y	71	Y
62	L06 - LKD 21	100	Y	100	Y
63	L06 - LKD 22	100	Y	80	Y
64	L06 - LKD 23	100	Y	100	Y
65	L06 - LKD 24	100	Y	100	Y
66	L06 - LKD 28	100	Y	100	Y
67	L06 - LKD 29	100	Y	100	Y

Table 13 – 2022 Methodology Results (Sixth Floor Assessed Units)

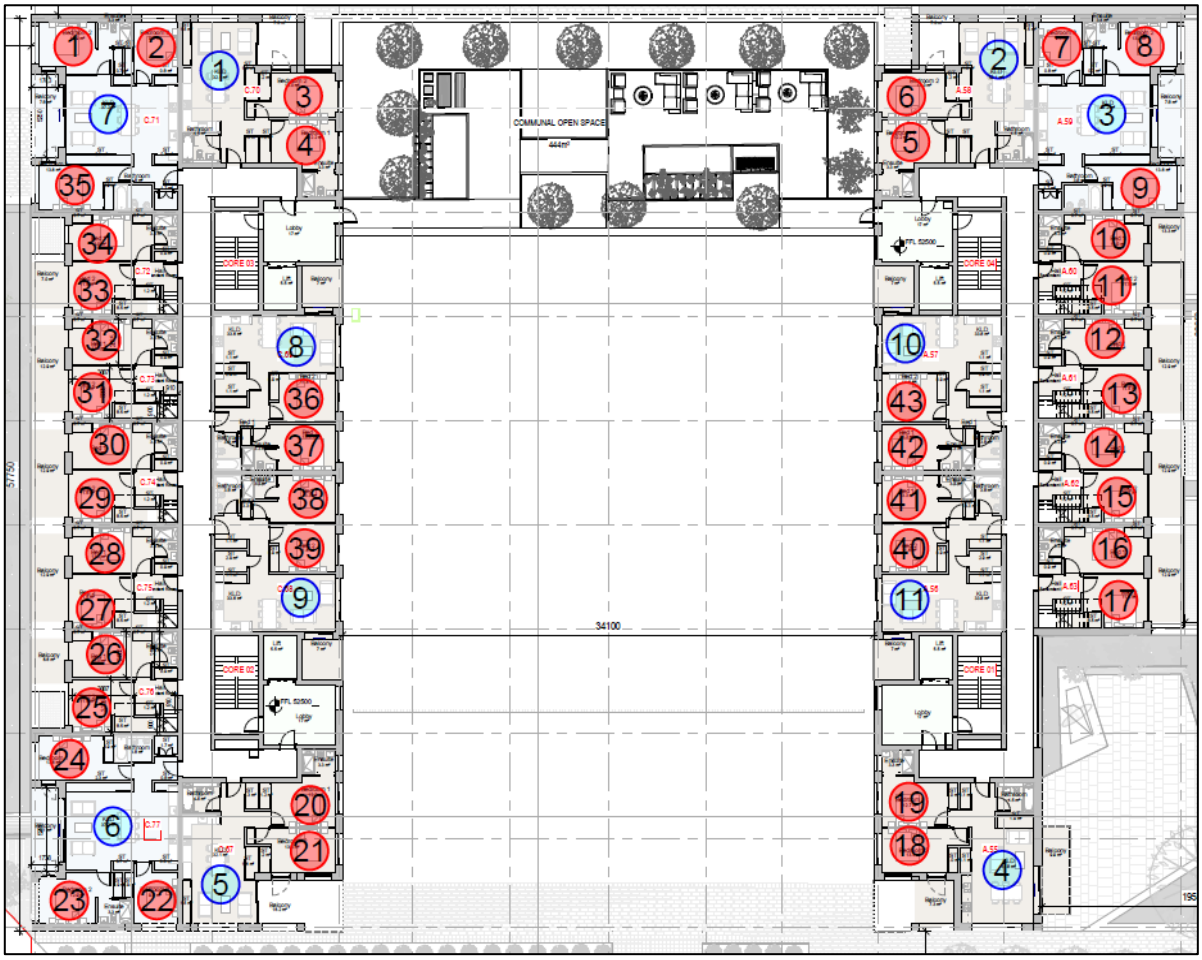


Figure 12 – Assessed Units (Seventh Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L07 - Bedroom 01	1.00	11.56	Y
2	L06 - Bedroom 02	1.00	8.79	Y
3	L07 - Bedroom 03	1.00	13.50	Y
4	L07 - Bedroom 04	1.00	6.85	Y
5	L07 - Bedroom 05	1.00	7.05	Y
6	L07 - Bedroom 06	1.00	13.59	Y
7	L07 - Bedroom 07	1.00	9.27	Y
8	L07 - Bedroom 08	1.00	8.35	Y
9	L07 - Bedroom 09	1.00	7.13	Y
10	L07 - Bedroom 10	1.00	3.35	Y
11	L07 - Bedroom 11	1.00	10.06	Y
12	L07 - Bedroom 12	1.00	3.53	Y
13	L07 - Bedroom 13	1.00	10.08	Y
14	L07 - Bedroom 14	1.00	3.53	Y
15	L07 - Bedroom 15	1.00	10.13	Y
16	L07 - Bedroom 16	1.00	3.54	Y
17	L07 - Bedroom 17	1.00	9.84	Y
18	L07 - Bedroom 18	1.00	11.45	Y
19	L07 - Bedroom 19	1.00	6.40	Y
20	L07 - Bedroom 20	1.00	7.30	Y
21	L07 - Bedroom 21	1.00	14.26	Y
22	L07 - Bedroom 22	1.00	6.00	Y
23	L07 - Bedroom 23	1.00	7.79	Y
24	L07 - Bedroom 24	1.00	8.50	Y
25	L07 - Bedroom 25	1.00	7.09	Y
26	L07 - Bedroom 26	1.00	3.67	Y
27	L07 - Bedroom 27	1.00	6.81	Y

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
28	L07 - Bedroom 28	1.00	3.38	Y
29	L07 - Bedroom 29	1.00	9.66	Y
30	L07 - Bedroom 30	1.00	5.88	Y
31	L07 - Bedroom 31	1.00	9.39	Y
32	L07 - Bedroom 32	1.00	6.00	Y
33	L07 - Bedroom 33	1.00	11.17	Y
34	L07 - Bedroom 34	1.00	5.66	Y
35	L07 - Bedroom 35	1.00	8.08	Y
36	L07 - Bedroom 36	1.00	6.43	Y
37	L07 - Bedroom 37	1.00	7.06	Y
38	L07 - Bedroom 38	1.00	7.40	Y
39	L07 - Bedroom 39	1.00	6.62	Y
40	L07 - Bedroom 40	1.00	7.27	Y
41	L07 - Bedroom 41	1.00	6.32	Y
42	L07 - Bedroom 42	1.00	6.51	Y
43	L07 - Bedroom 43	1.00	7.26	Y
44	L06 - LKD 01	2.00	9.51	Y
45	L06 - LKD 02	2.00	4.83	Y
46	L06 - LKD 03	2.00	5.64	Y
47	L07 - LKD 04	2.00	10.73	Y
48	L07 - LKD 05	2.00	8.34	Y
49	L07 - LKD 06	2.00	6.37	Y
50	L07 - LKD 07	2.00	5.60	Y
51	L07 - LKD 08	2.00	4.13	Y
52	L07 - LKD 09	2.00	7.62	Y
53	L07 - LKD 10	2.00	6.67	Y
54	L07 - LKD 11	2.00	6.86	Y

Table 14 – 2011 Methodology Average Daylight Factor Results (Seventh Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L07 - Bedroom 01	100	Y	100	Y
2	L07 - Bedroom 02	100	Y	100	Y
3	L07 - Bedroom 03	98	Y	98	Y
4	L07 - Bedroom 04	100	Y	100	Y
5	L07 - Bedroom 05	100	Y	100	Y
6	L07 - Bedroom 06	100	Y	100	Y
7	L07 - Bedroom 07	100	Y	100	Y
8	L07 - Bedroom 08	96	Y	100	Y
9	L07 - Bedroom 09	100	Y	100	Y
10	L07 - Bedroom 10	100	Y	99	Y
11	L07 - Bedroom 11	100	Y	100	Y
12	L07 - Bedroom 12	100	Y	100	Y
13	L07 - Bedroom 13	100	Y	100	Y
14	L07 - Bedroom 14	100	Y	100	Y
15	L07 - Bedroom 15	100	Y	100	Y
16	L07 - Bedroom 16	100	Y	100	Y
17	L07 - Bedroom 17	100	Y	100	Y
18	L07 - Bedroom 18	100	Y	100	Y
19	L07 - Bedroom 19	100	Y	100	Y
20	L07 - Bedroom 20	100	Y	97	Y
21	L07 - Bedroom 21	100	Y	95	Y
22	L07 - Bedroom 22	100	Y	96	Y
23	L07 - Bedroom 23	99	Y	100	Y
24	L07 - Bedroom 24	100	Y	100	Y
25	L07 - Bedroom 25	100	Y	100	Y
26	L07 - Bedroom 26	98	Y	97	Y
27	L07 - Bedroom 27	100	Y	100	Y
28	L07 - Bedroom 28	100	Y	98	Y
29	L07 - Bedroom 29	100	Y	100	Y
30	L07 - Bedroom 30	100	Y	100	Y
31	L07 - Bedroom 31	100	Y	100	Y
32	L07 - Bedroom 32	100	Y	98	Y
33	L07 - Bedroom 33	100	Y	100	Y
34	L07 - Bedroom 34	100	Y	100	Y
35	L07 - Bedroom 35	100	Y	100	Y
36	L07 - Bedroom 36	100	Y	100	Y
37	L07 - Bedroom 37	100	Y	100	Y
38	L07 - Bedroom 38	98	Y	98	Y
39	L07 - Bedroom 39	100	Y	100	Y
40	L07 - Bedroom 40	100	Y	100	Y
41	L07 - Bedroom 41	100	Y	100	Y
42	L07 - Bedroom 42	100	Y	100	Y
43	L07 - Bedroom 43	100	Y	100	Y
44	L07 - LKD 01	100	Y	100	Y
45	L07 - LKD 02	100	Y	100	Y
46	L07 - LKD 03	100	Y	100	Y
47	L07 - LKD 04	100	Y	100	Y
48	L07 - LKD 05	100	Y	100	Y
49	L07 - LKD 06	100	Y	100	Y

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
50	L07 - LKD 07	100	Y	100	Y
51	L07 - LKD 08	100	Y	100	Y
52	L07 - LKD 09	100	Y	100	Y
53	L07 - LKD 10	100	Y	100	Y
54	L07 - LKD 11	100	Y	100	Y

Table 15 – 2022 Methodology Results (Seventh Floor Assessed Units)

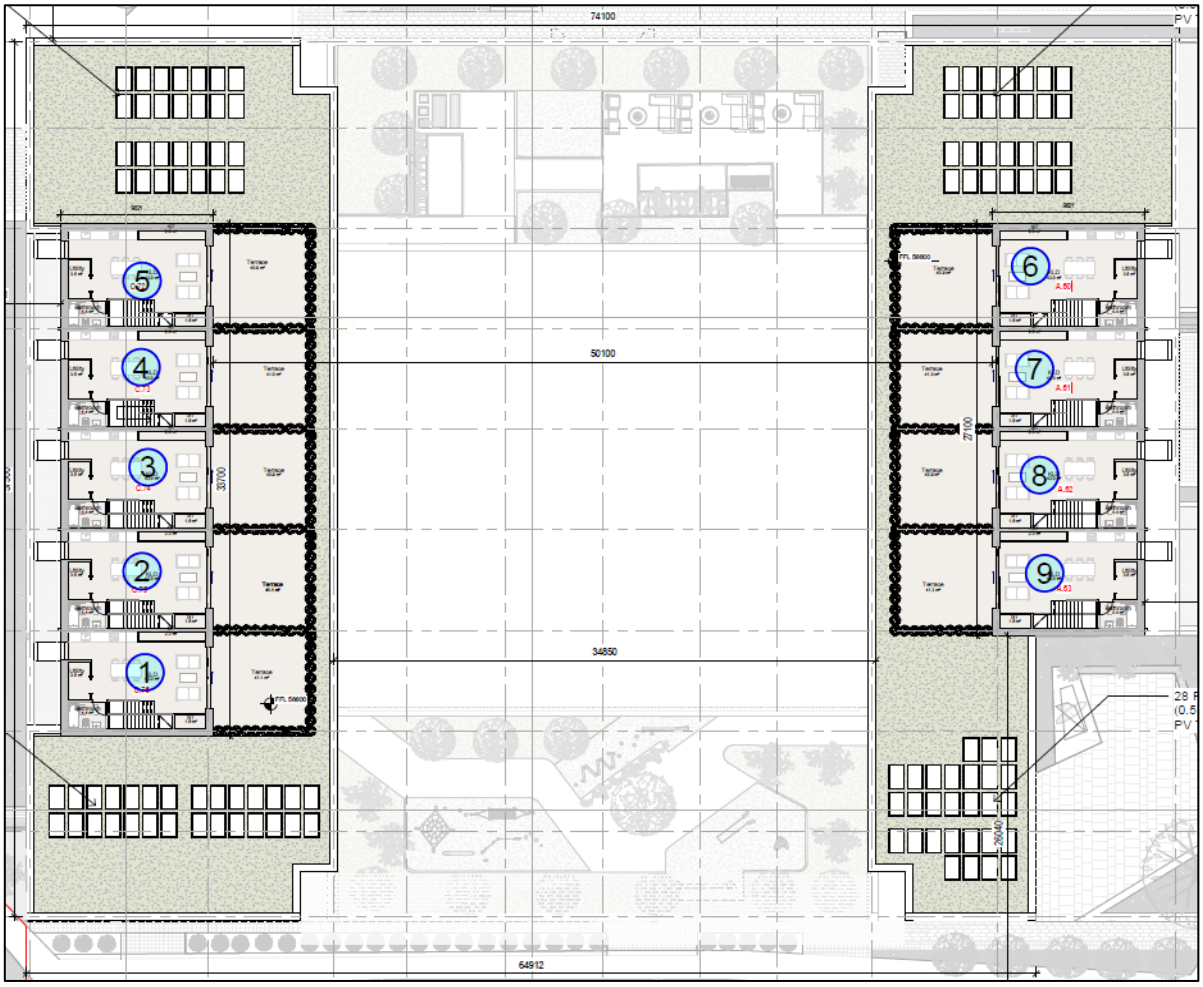


Figure 13 – Assessed Units (Eighth Floor) (Bedrooms in Red and Living rooms are in Blue)

Unit		2011 Methodology ADF target (%)	2011 Methodology ADF results (%)	2011 Methodology Meets minimum ADF target
1	L08 - LKD 01	2.00	6.18	Y
2	L08 - LKD 02	2.00	6.08	Y
3	L08 - LKD 03	2.00	6.12	Y
4	L08 - LKD 04	2.00	7.33	Y
5	L08 - LKD 05	2.00	6.39	Y
6	L08 - LKD 06	2.00	6.43	Y
7	L08 - LKD 07	2.00	6.43	Y
8	L08 - LKD 08	2.00	6.45	Y
9	L08 - LKD 09	2.00	6.49	Y

Table 16 – 2011 Methodology Average Daylight Factor Results (Eighth Floor Assessed Units)

Unit		2022 Methodology Criterion 1 (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion 1 Compliance	2022 Methodology Criterion 2 (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion 2 Compliance
1	L08 - LKD 01	100	Y	100	Y
2	L08 - LKD 02	100	Y	100	Y
3	L08 - LKD 03	100	Y	100	Y
4	L08 - LKD 04	100	Y	100	Y
5	L08 - LKD 05	100	Y	100	Y
6	L08 - LKD 06	100	Y	100	Y
7	L08 - LKD 07	100	Y	100	Y
8	L08 - LKD 08	100	Y	100	Y
9	L08 - LKD 09	100	Y	100	Y

Table 17 – 2022 Methodology Results (Eighth Floor Assessed Units)

In summary, the vast majority of units not only meet but in the majority of cases exceed the Average Daylight Factor target recommended in BS 8206. Therefore a 100% compliance rate is achieved across the development, when compared to the 2011 Methodology.

Also 94.8% of the spaces meets the 2022 Methodology criteria. Of the 502 rooms that comprise the development, only 26 fail to meet the 2022 Methodology recommendations.

Total No. of Rooms	No. Living/ Kitchen Rooms Not Compliant with 2011 Methodology (2.0% ADF)	No. Bedrooms Not Compliant with 2011 Methodology (1.0% ADF)	Total No. Rooms Not Compliant with 2011 Methodology	% of compliance 2011 Methodology
502	0	0	0	100

Total No. of Rooms	No. Living/ Kitchen Rooms Not Compliant with 2022 Methodology	No. Bedrooms Not Compliant with BS 8206 with 2022 Methodology	Total No. Rooms Not Compliant with 2022 Methodology	% of compliance with 2022 Methodology
502	6	20	26	94.8

Table 18 – Percentage of Compliance

It is important to note that even though the projection of balconies will impact the daylight reaching the windows in some areas, it will provide occupants with an outdoor amenity space that will receive excellent levels of sunlight. In addition, BRE Guidelines outline the difficulty in achieving the recommended targets within apartments and they recommend to aim for a good design to minimise the number of dwellings that are only facing north, north east or north west. This is unless there is some compensating factors such as an appealing view to the north for instance, which is the case for some units in the proposed development, which will have views into the green courtyard. In addition, all units will have access into the high quality amenity area.

6.7. SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT

BRE Guidelines (2022) recommend that for external amenity spaces to appear adequately sunlit throughout the year, at least half of the garden or amenity space should receive at least two hours of sunlight on March 21st.

In order to show that sunlight levels within the development achieve compliance with current BRE Guidelines, a sunlight study has been carried out for the proposed development.

The red squares in 10 below highlight the areas that receive a minimum of 2 hours of sunlight on the 21st of March for the proposed development. It is evident at least 50% of the overall communal amenity spaces receive 2 hours or more of sunlight on March 21st, therefore compliance with BRE Guidelines is achieved.

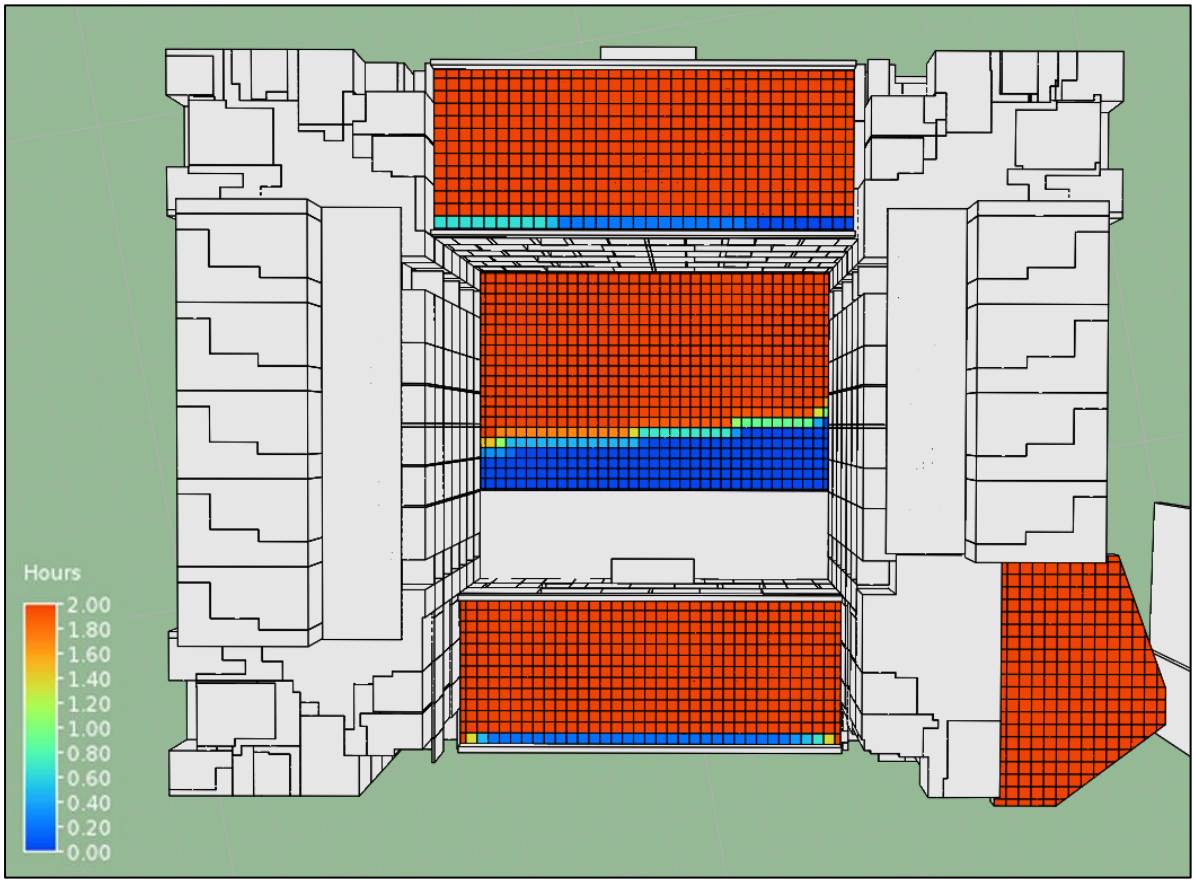


Figure 14 - Amenity Spaces - Hours of Sunlight on March 21st

Table 19 outlines the percentage of amenity space receiving at least 2 hours sunlight on March 21st. Communal amenity spaces receive the recommended values in more than 50% of the area, therefore, compliance with BRE Guidelines is achieved. When the courtyard space is analysed on its own, compliance with BRE Guidelines is also achieved.

	Percentage of area receiving ≥ 2 hours sunlight on March 21st	Meets compliance with BRE Guidelines
Total external amenity (roof top terraces + courtyard)	90%	Y
Courtyard Amenity on its own	72%	Y
Public Open Space	100%	Y

Table 19 – Sunlight results (Communal Amenity Space)

The Public Open Space proposed as part of the development includes a southern facing square (in the south east corner of the site), new public permeable paths connecting to the adjacent lands to the east and north and a contribution to a shared new public open space the north of the site.

Even though BRE Guidelines does not give specific recommendation for balconies, these have been assessed against the benchmark for open amenity spaces. The red squares in the following figures highlight the areas that receive a minimum of 2 hours of sunlight on March 21st for the balconies within the development. It is clear that the vast majority of balconies received at least 2 hours of sunlight on March 21st, and would comply with the BRE Guidelines.

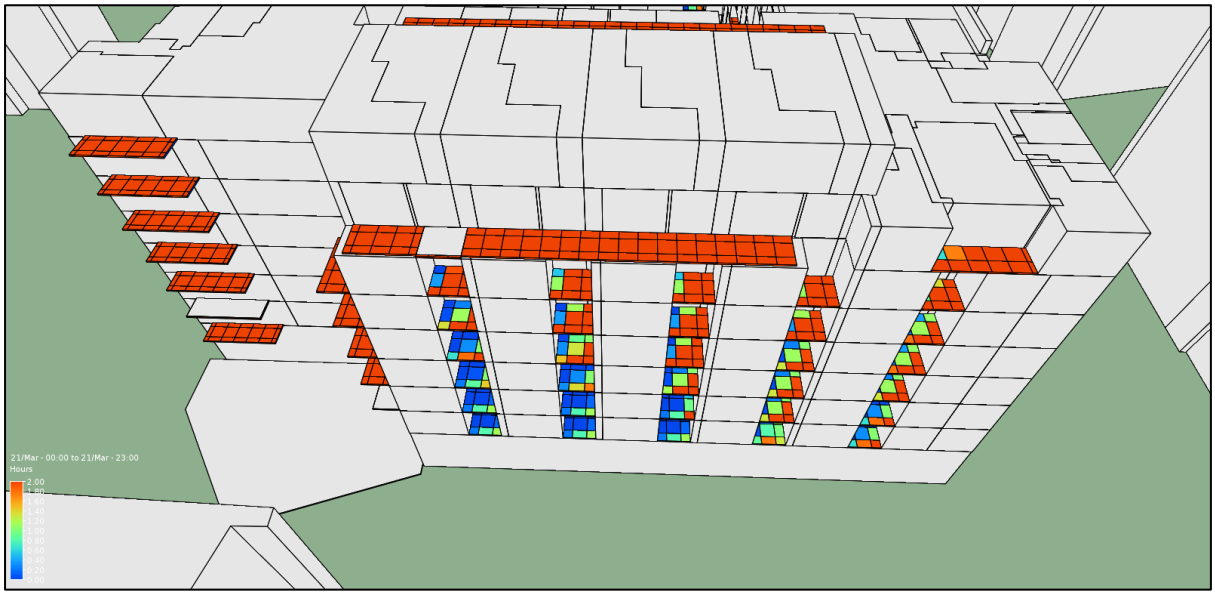


Figure 15 – Balconies – East Elevation - Hours of Sunlight on March 21st

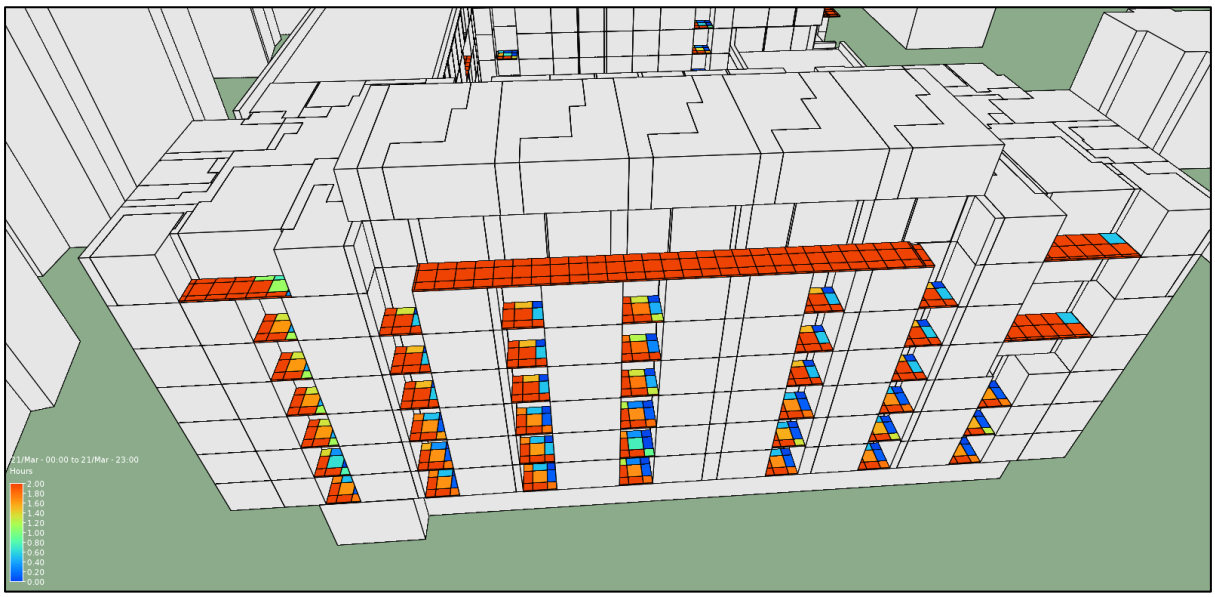


Figure 16 - Balconies – West Elevation - Hours of Sunlight on March 21st

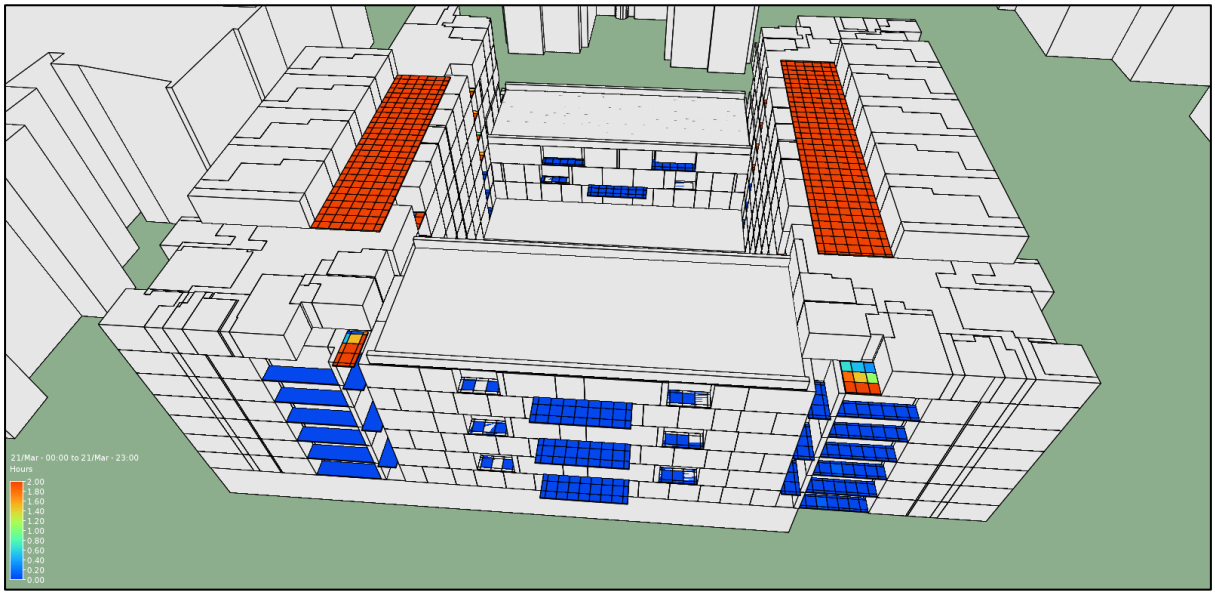


Figure 17 - Balconies – North Elevation - Hours of Sunlight on March 21st

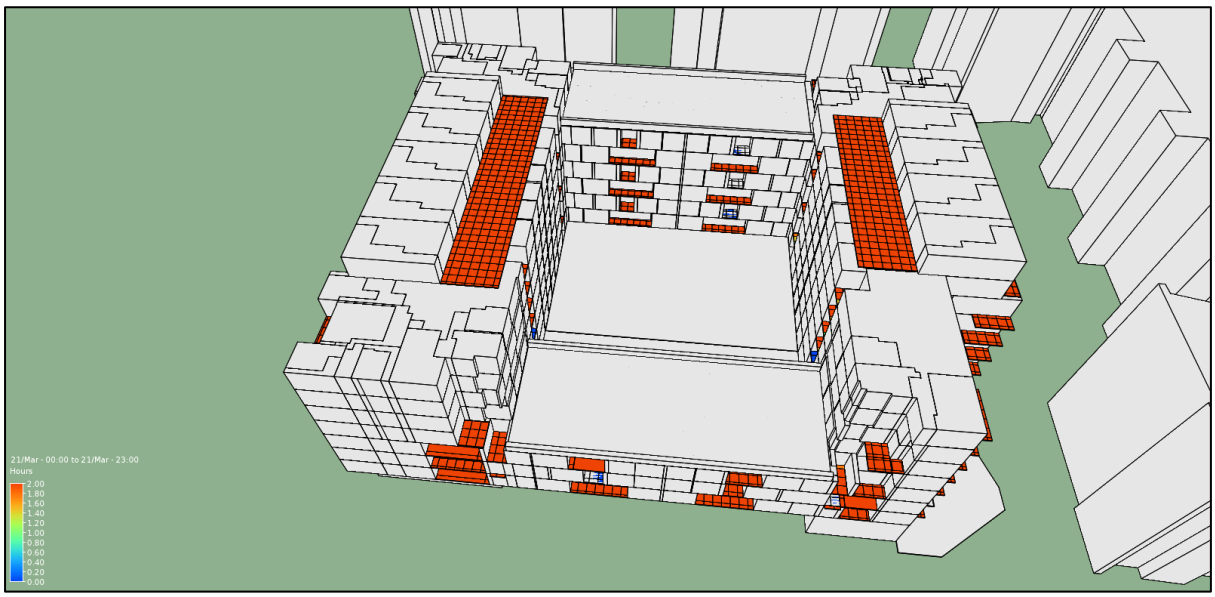


Figure 18 - Balconies – South Elevation - Hours of Sunlight on March 21st

6.8. COMPENSATORY MEASURES FOR UNITS FALLING SHORT OF RECOMMENDED DAYLIGHT VALUES

It is important to note that even though the projection of balconies will impact the daylight reaching the windows in some areas, it will provide occupants with an outdoor amenity space that will receive excellent levels of sunlight. In addition, BRE Guidelines outline the difficulty in achieving the recommended targets within apartments and they recommend to aim for a good design to minimise the number of dwellings that are only facing north, north east or north west. This is unless there is some compensating factors such as an appealing view to the north for instance, which is the case for some units in the proposed development, which will have views into the green courtyard. In addition, all units will have access into the high quality amenity area.

The proposed development includes compensatory design solutions through the significant regeneration of an underutilised site and provides a mixed-use development of high-quality architecture which will vastly enhance the visual appearance of the streetscape Northern Cross, provides permeability through the site for pedestrians and cyclists and includes well-lit public open spaces, improved public realm and publicly accessible facilities. This will assist in achieving the Z14 land use zoning objective for the site and the wider objective of the Strategic Development & Regeneration Area as specified within the current and draft Dublin City Development Plans.

7. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT (APSH)

7.1. SUNLIGHT ASSESSMENT – BS 8206 (2011 METHODOLOGY)

In order to determine the amount of sunlight that is received by windows within the proposed development, the Annual Probable Sunlight Hours (APSH) calculation method, as outlined in BRE Guidelines (2022), has been used.

BRE Guidelines outline that in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day but especially in the afternoon. BRE Guidelines also state that sunlight is less important in bedrooms and kitchens. Therefore, the analysis has been focused on the main windows to living spaces.

The recommendation set out in BRE Guidelines state that in order to show that adequate sunlight reaches windows within occupied rooms, the centre of at least one window to a main living room must receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months - between 21st September and 21st March.

While the BRE criteria sets out these recommendations for living room windows to receive direct sunlight throughout the year, the guidance set out in the Sustainable Urban Housing: Design Standards for New Apartments states that balconies should adjoin and have a functional relationship with the main living areas of the apartment. They also state that it is preferable that balconies would be primarily accessed from living rooms, which can reduce the sunlight being received in some instances.

As the location of balconies have been designed to primarily comply with the apartment design guidelines, the amount of sunlight reaching these living room windows in some areas will naturally be reduced and achieving the recommended values within BRE Guidelines can become challenging.

The below table summarises the annual probable sunlight hours for the annual period and for the winter period based on the BRE recommendations.

	BRE Guidelines Check 1 **APSH > 25%** **Annual Period**	**BRE Guidelines Check 2** **APSH > 5%** **Winter Period**
Percentage of Compliance	48%	60%

Table 20 – APSH Summary Table

The results from the analysis have shown that for the annual period, 48% of the living room windows across the development achieve the recommended APSH values stated in the BRE Guidelines, while 60% of the living room windows achieve the recommended values during the winter months, when sunlight is more valuable. The shortfall in compliance can be attributed to the projection of balconies in some areas, and to the north facing windows.

It is important to note that even though the projection of balconies will impact the sunlight reaching the windows in some areas, it will provide occupants with an outdoor amenity space that will receive excellent levels of sunlight. In addition, BRE Guidelines outline the difficulty in achieving the recommended targets within apartments and they recommend to aim for a good design to minimise the number of dwellings that are only facing north, north east or north west. This is unless there is some compensating factors such as an appealing view to the north for instance, which is the case for some units in the proposed development, which will have views into the green courtyard. In addition, all units will have access into the high quality amenity area.

It must be noted that the results within this report should be treated with certain degree of flexibility, based on the following statement in the BRE Guidelines:

"the guide is intended for building designers and their clients, consultants and planning officials. 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 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."

The following images[2] illustrate the sunlight levels achieved within the proposed development.

[2] Adjacent properties and bike storages were included as part of the analysis. However, they have been removed for the purpose of the image to allow better visibility.

Figure 19 - Annual Probable Sunlight Hours – Annual Period (South Elevation)

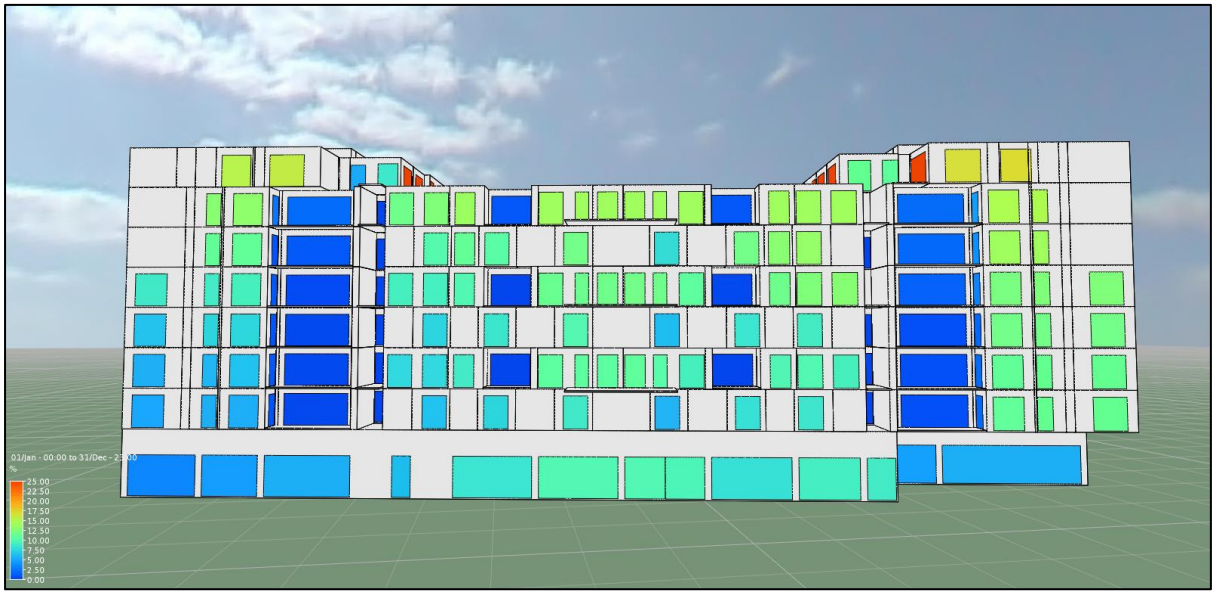


Figure 20 - Annual Probable Sunlight Hours – Annual Period (North Elevation)

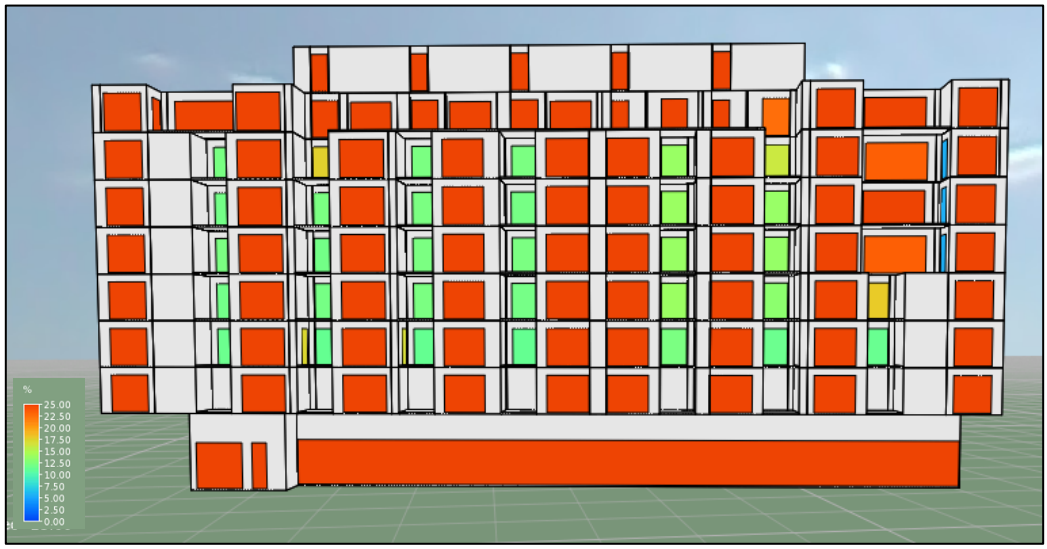


Figure 21 - Annual Probable Sunlight Hours – Annual Period (West Elevation)

Figure 22 - Annual Probable Sunlight Hours – Annual Period (East Elevation)

7.2. SUNLIGHT ASSESSMENT – EN17037 (2022 METHODOLOGY)

In addition to the BS 8206 standard, the daylight has also been assessed against the newer 2022 Methodology standard. The 2022 Methodology standard states that windows shall receive a minimum of 1.5 hours of direct sunlight on the test day, March 21st. The 2022 Methodology also sets out a standard for medium (2 hours), and high (4 hours) levels of direct sunlight. Of the 1,215 analysed windows in the development, 55% achieve the minimum levels of direct sunlight recommended by 2022 Methodology.

The following images illustrate in red the windows that achieve the recommended minimum values for direct sunlight within the 2022 Methodology guidelines on March 21st

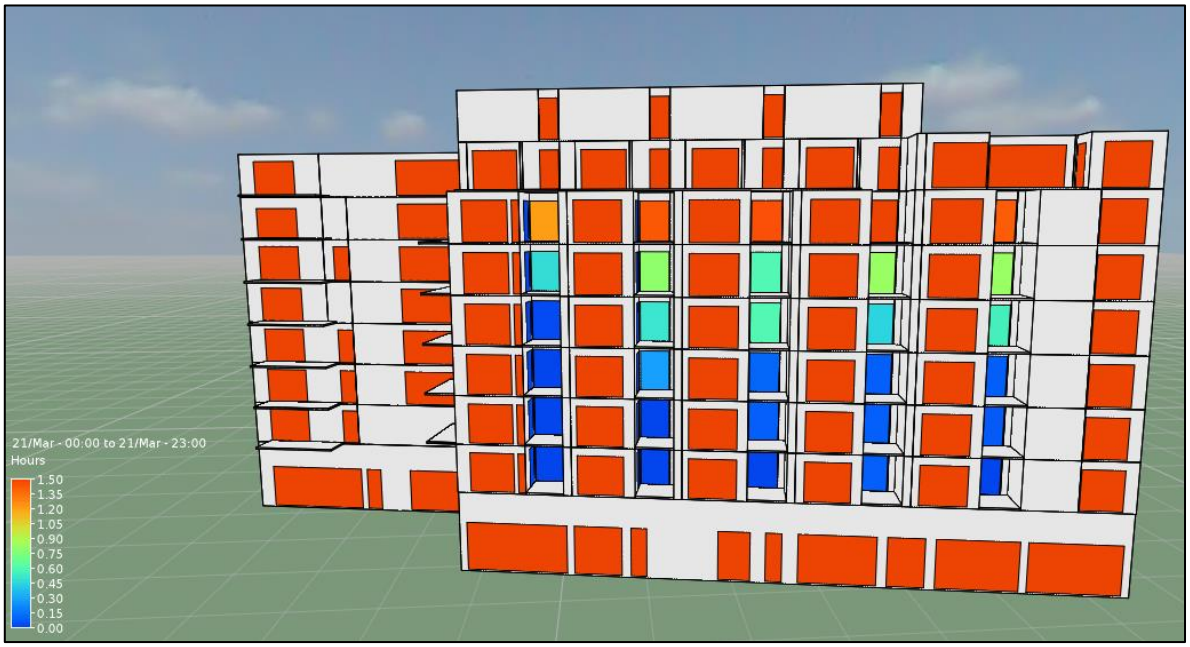


Figure 23 - Sunlight Exposure March 21st (2022 Methodology Min Recommendation) – East Elevation

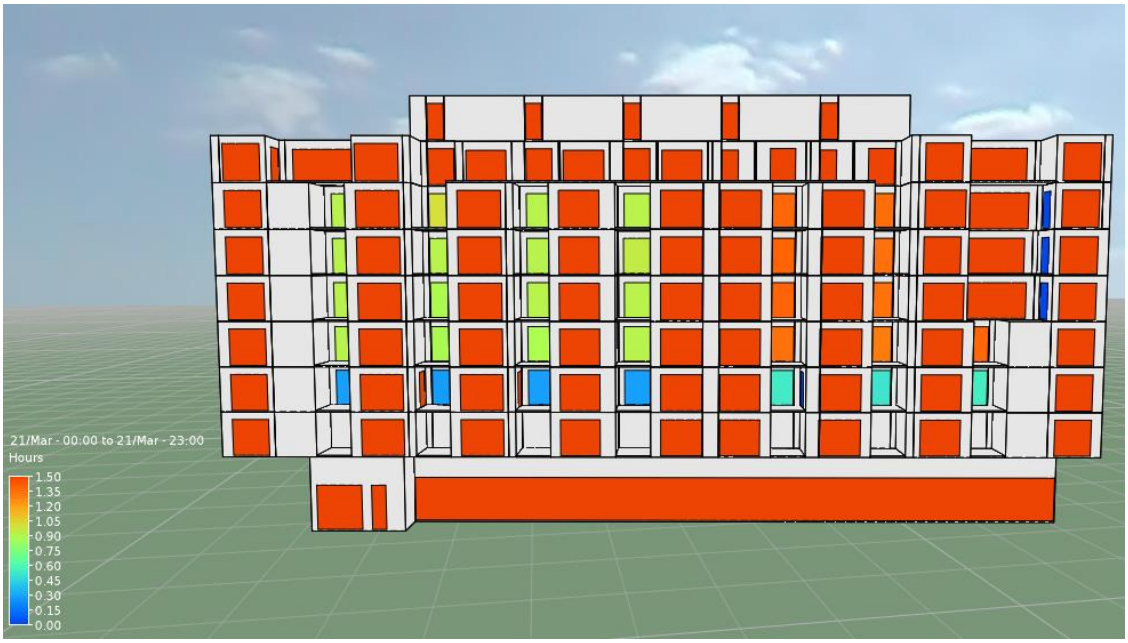


Figure 24 - Sunlight Exposure March 21st (2022 Methodology Min Recommendation) – West Elevation

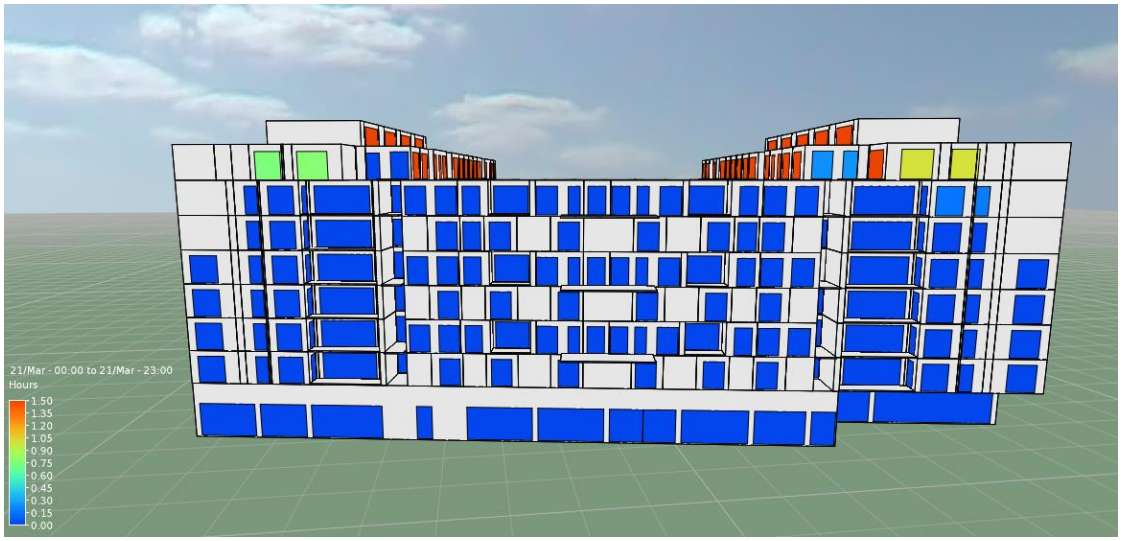


Figure 25 - Sunlight Exposure March 21st (2022 Methodology Min Recommendation) – North Elevation

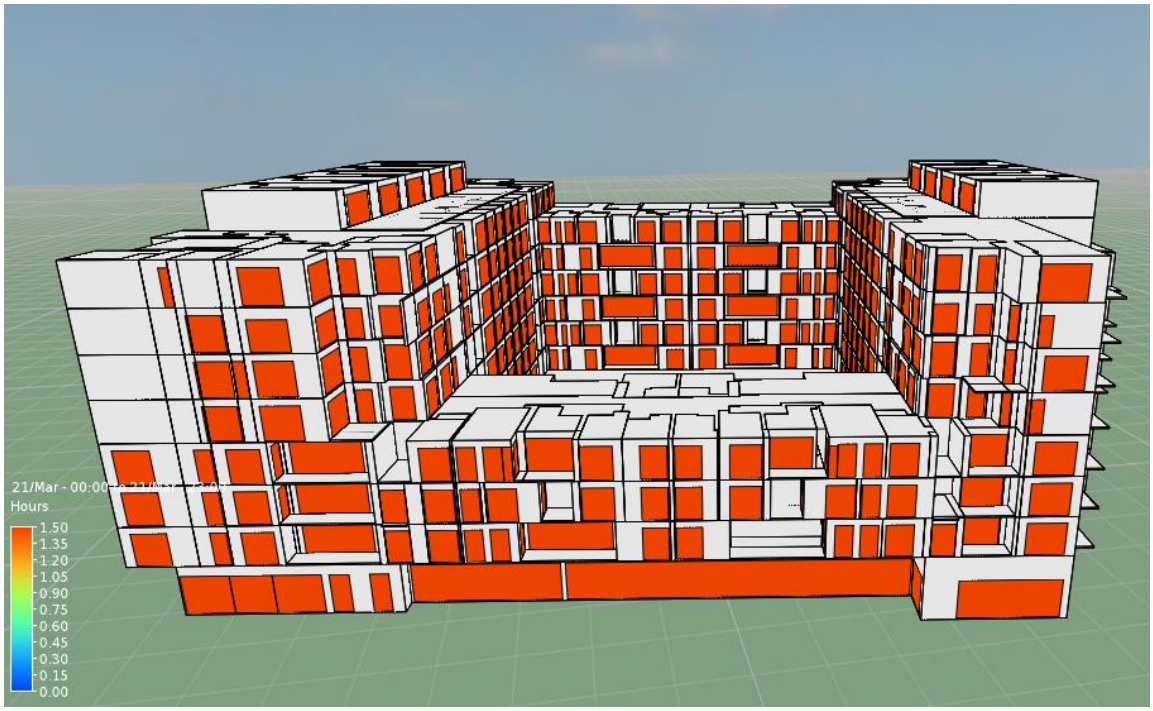


Figure 26 – Sunlight Exposure March 21st (2022 METHODOLOGY Min Recommendation) – South Elevation

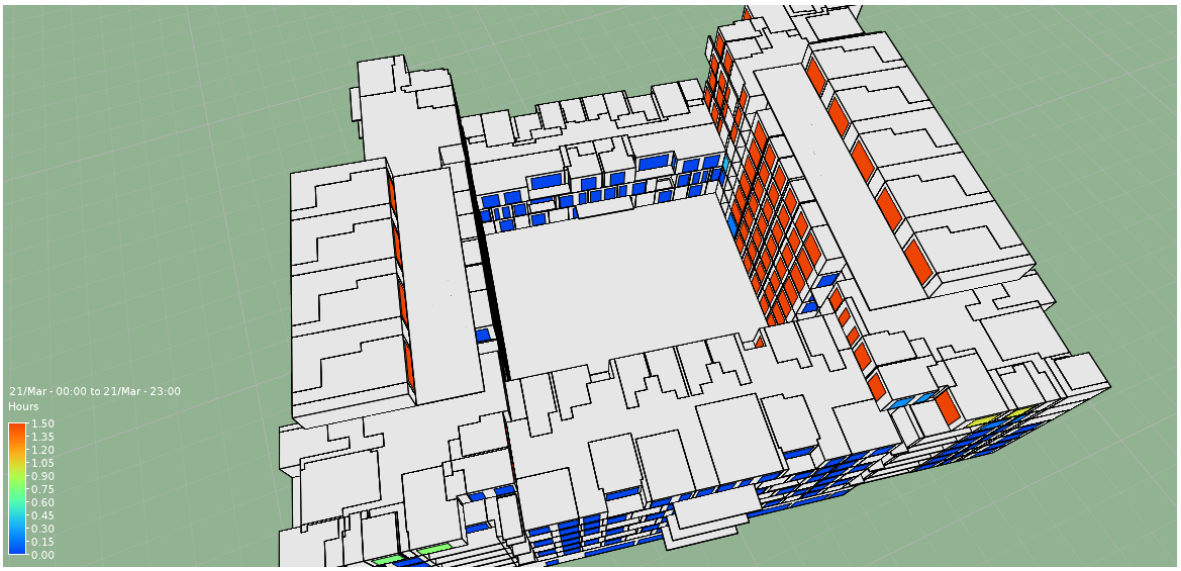


Figure 27 - Sunlight Exposure March 21st (2022 METHODOLOGY Min Recommendation) – Courtyard Southwest Elevation

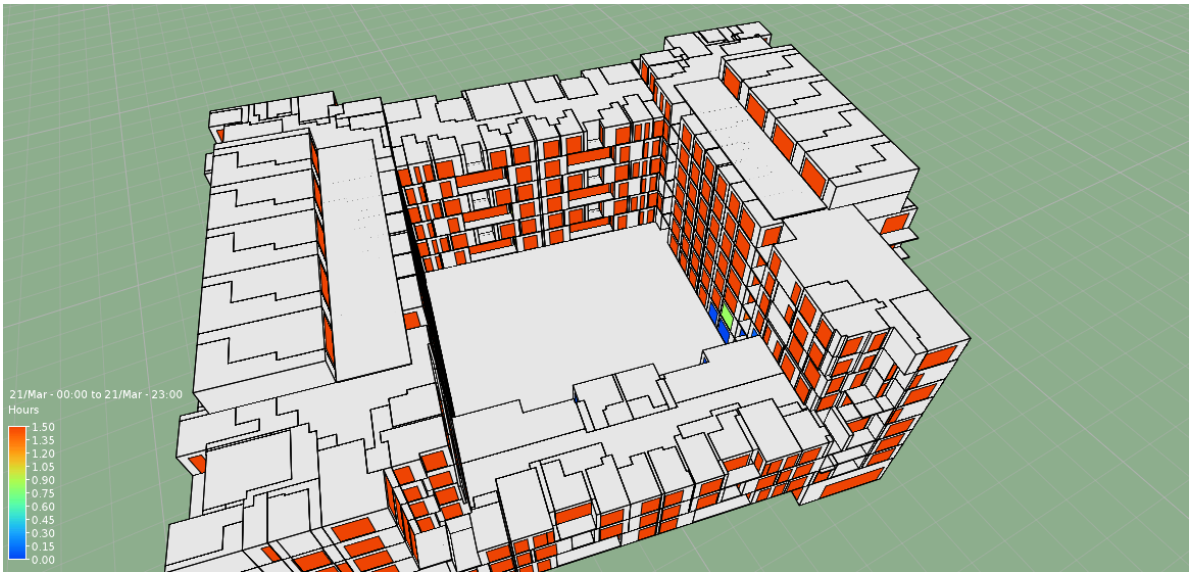


Figure 28 - Sunlight Exposure March 21st (2022 METHODOLOGY Min Recommendation) – Courtyard Northeast Elevation

The following images illustrate in red the windows that achieve the medium level of direct sunlight within the 2022 METHODOLOGY guidelines on March 21st.

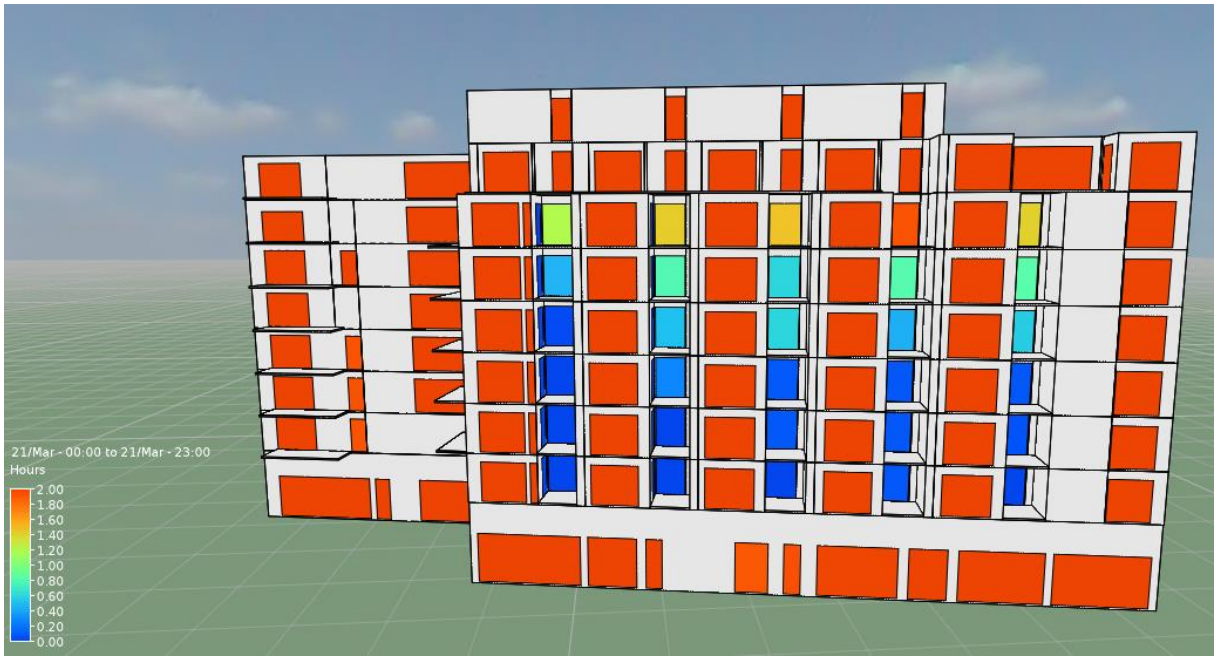


Figure 29 - Sunlight Exposure March 21st (2022 METHODOLOGY Medium Level) – East Elevation

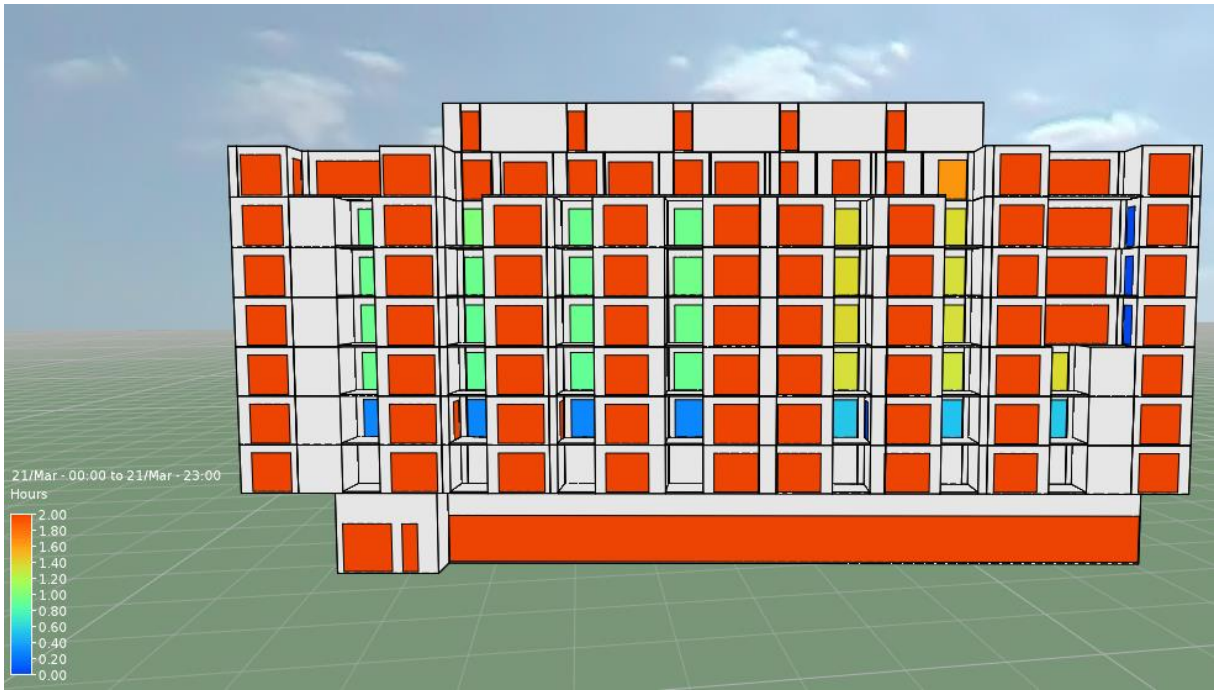


Figure 30 - Sunlight Exposure March 21st (2022 METHODOLOGY Medium Level) – West Elevation

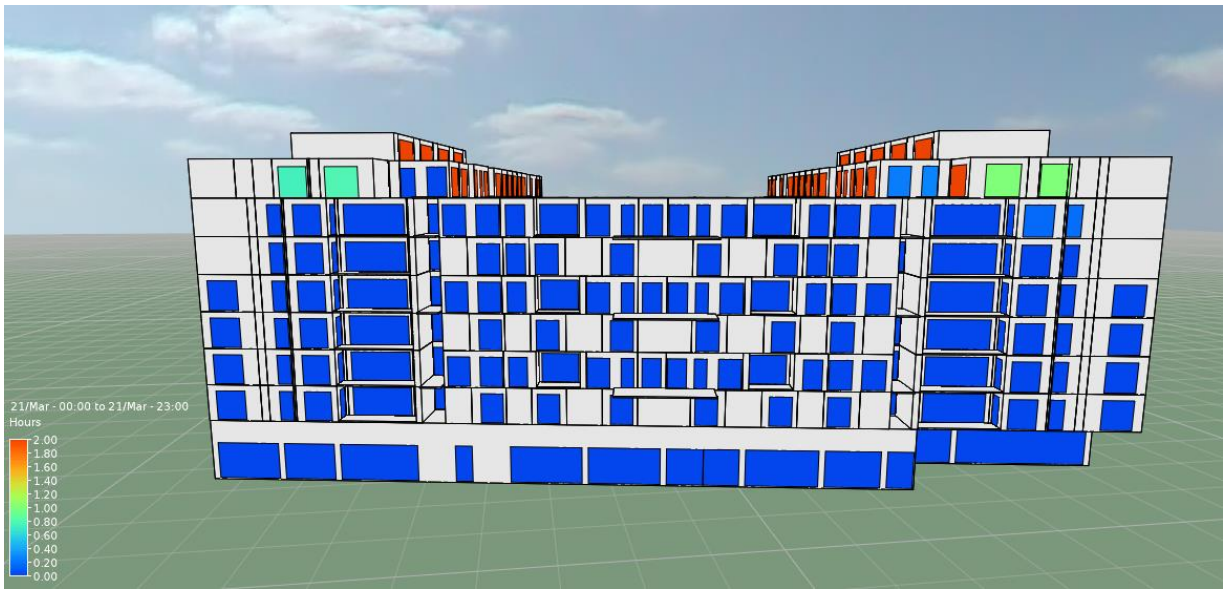


Figure 31 - Sunlight Exposure March 21st (2022 METHODOLOGY Medium Level) – North Elevation

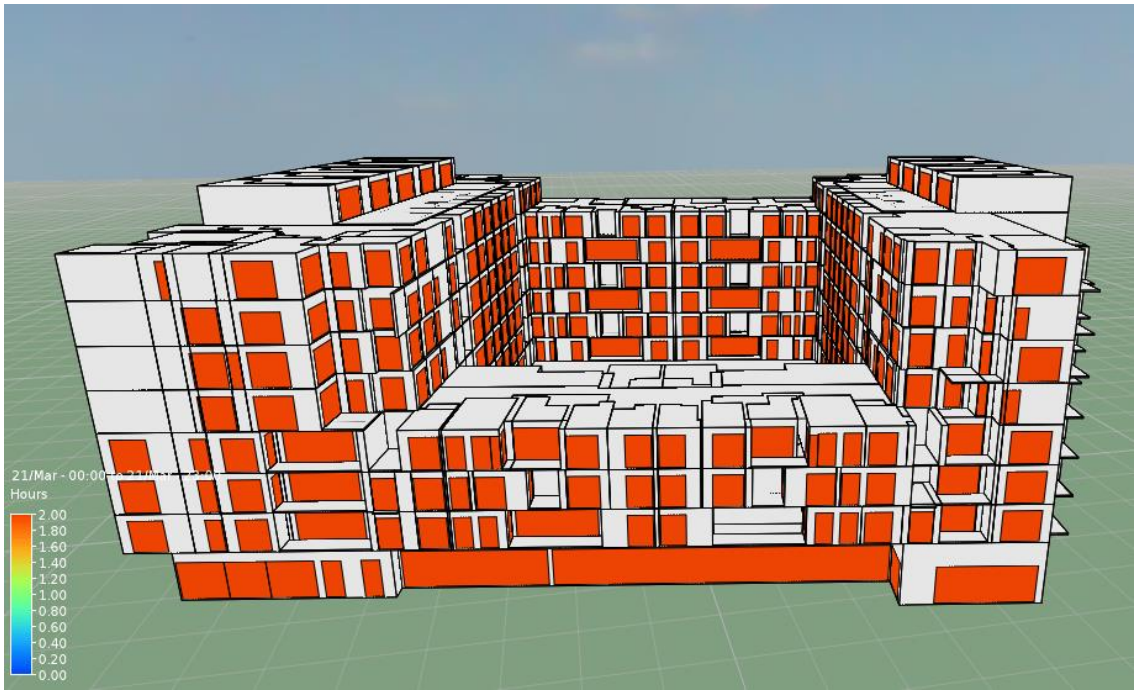


Figure 32 - Sunlight Exposure March 21st (2022 METHODOLOGY Medium Level) – South Elevation

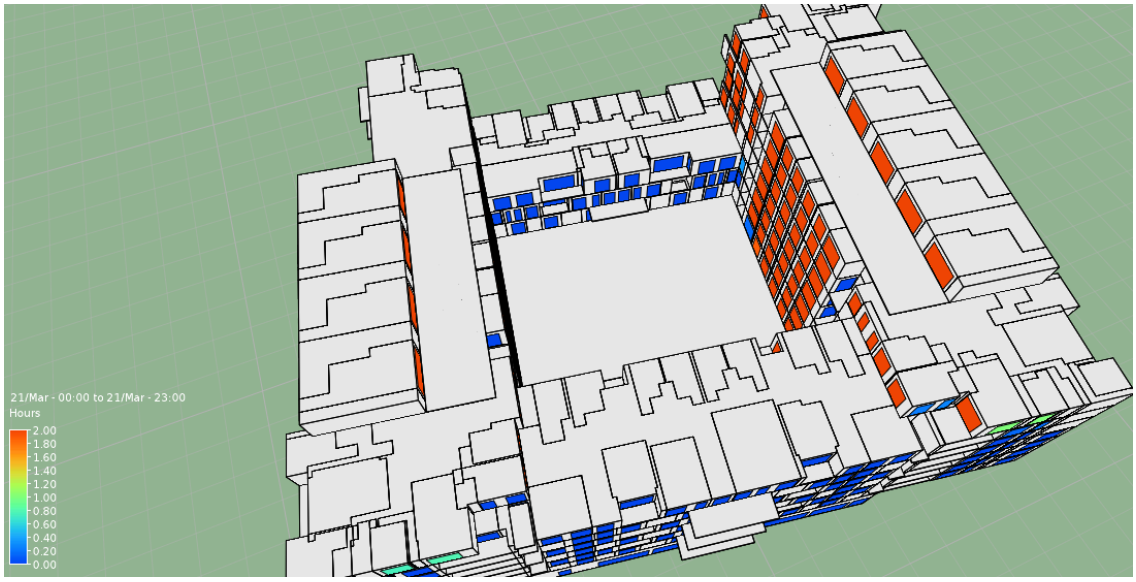


Figure 33 - Sunlight Exposure March 21st (2022 METHODOLOGY Medium Level) – Courtyard South West Elevation

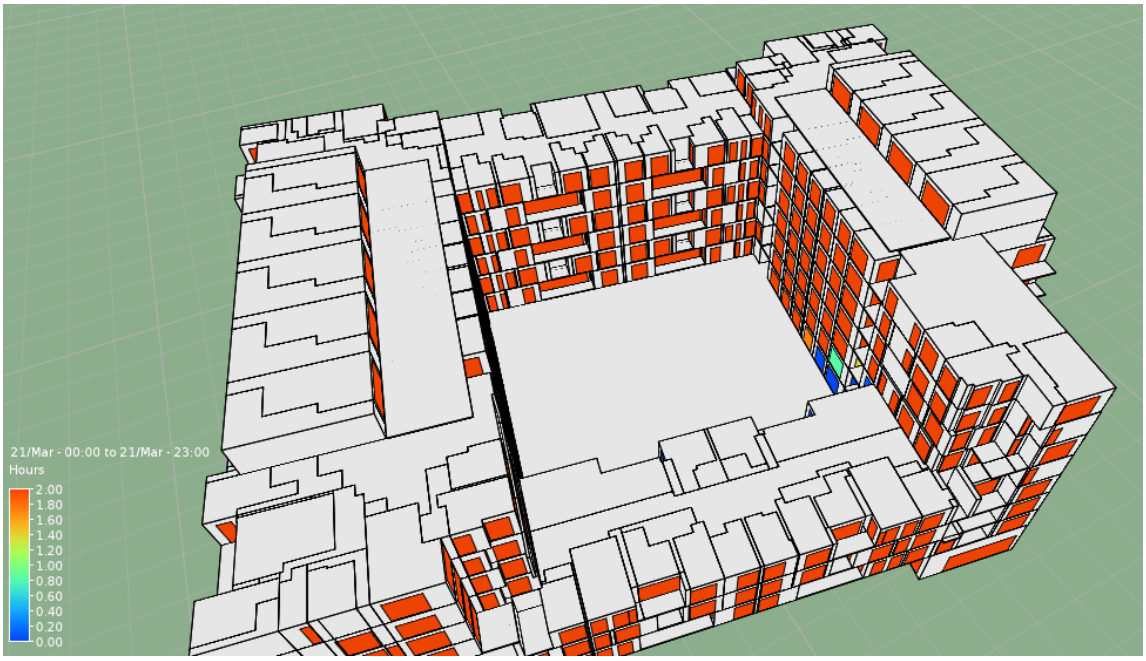


Figure 34 - Sunlight Exposure March 21st (2022 METHODOLOGY Medium Level) – Courtyard Northeast Elevation

The following images illustrate in red the windows that achieve the high level of direct sunlight within the 2022 METHODOLOGY guidelines on March 21st.

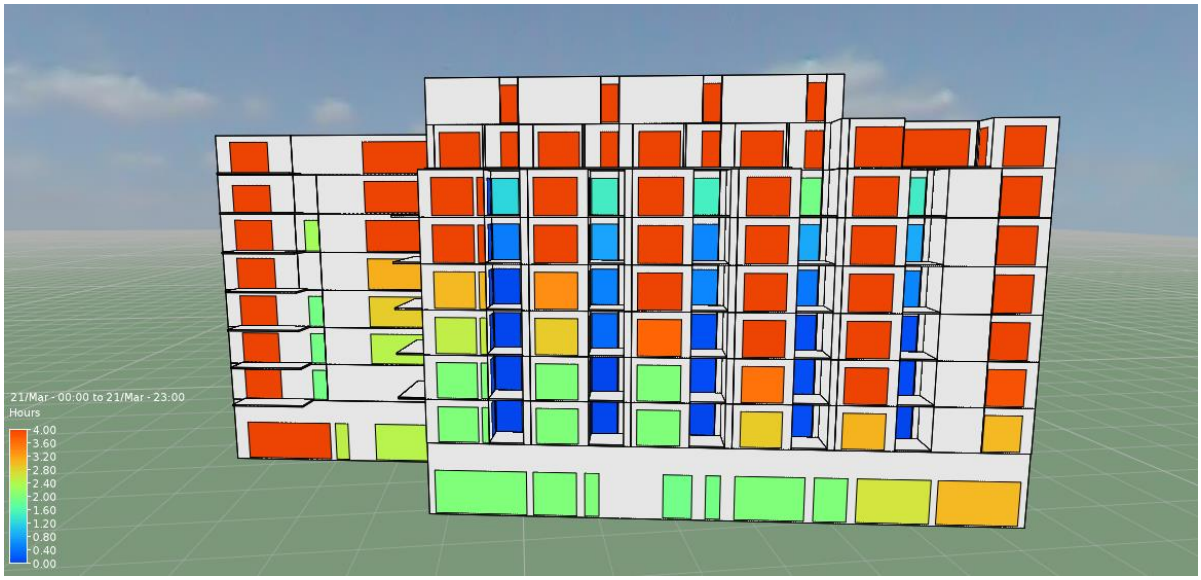


Figure 35 - Sunlight Exposure March 21st (2022 METHODOLOGY High Level) – East Elevation

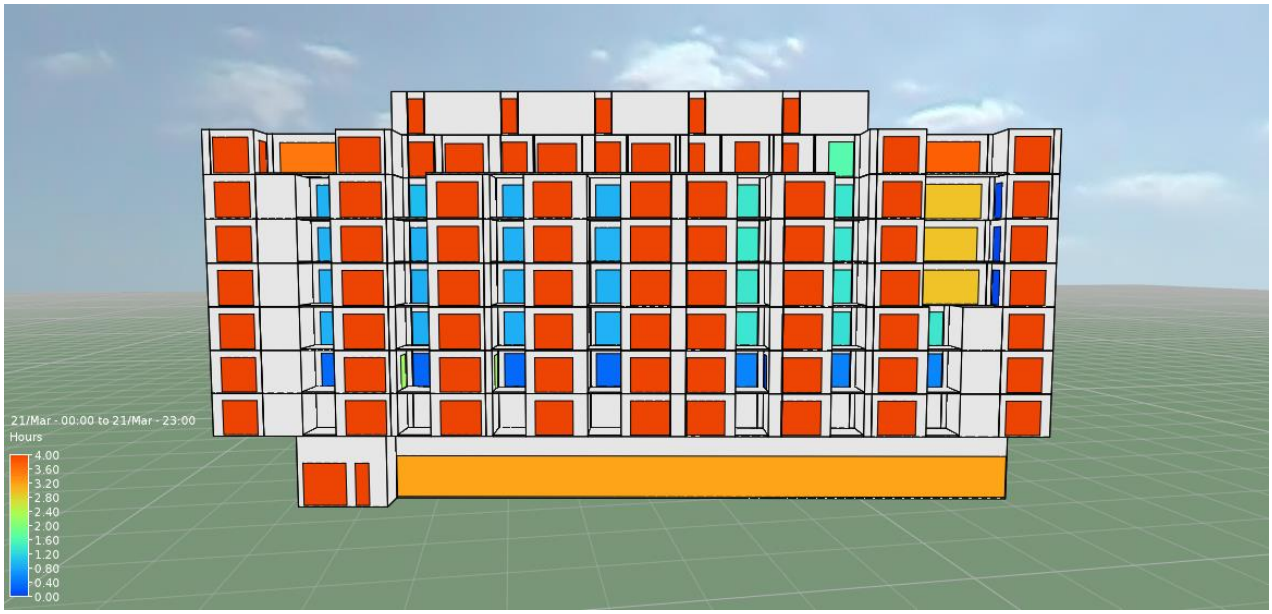


Figure 36 - Sunlight Exposure March 21st (2022 METHODOLOGY High Level) – West Elevation

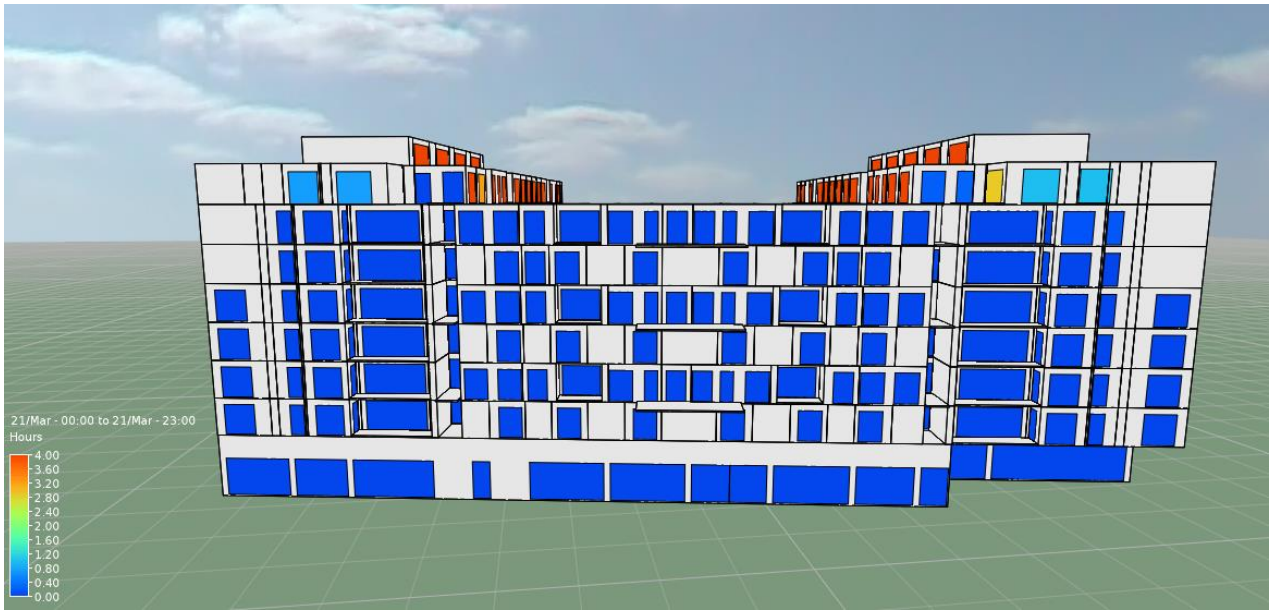


Figure 37 - Sunlight Exposure March 21st (2022 METHODOLOGY High Level) – North Elevation

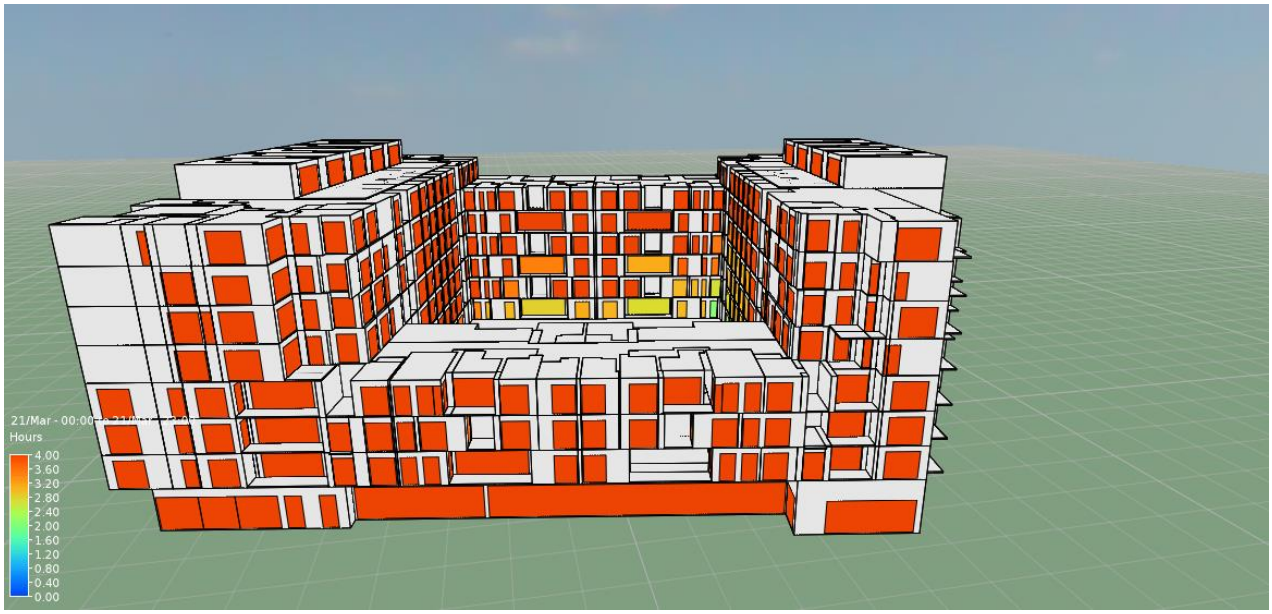


Figure 38 - Sunlight Exposure March 21st (2022 METHODOLOGY High Level) – South Elevation

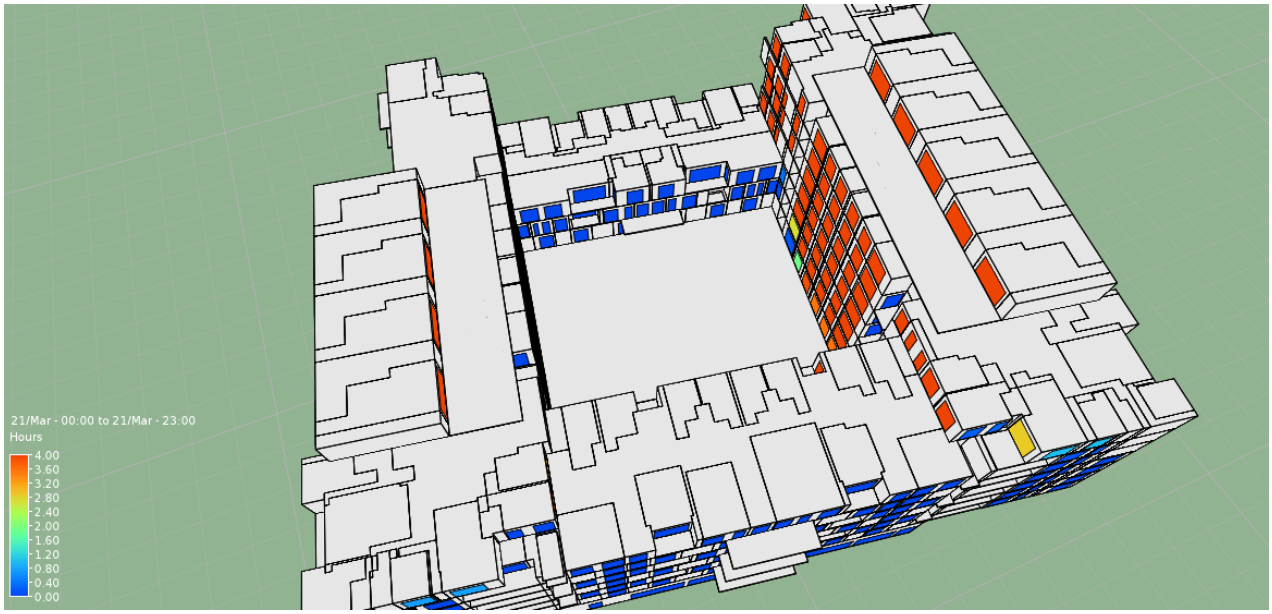


Figure 39 - Sunlight Exposure March 21st (2022 METHODOLOGY High Level) – Southwest Elevation

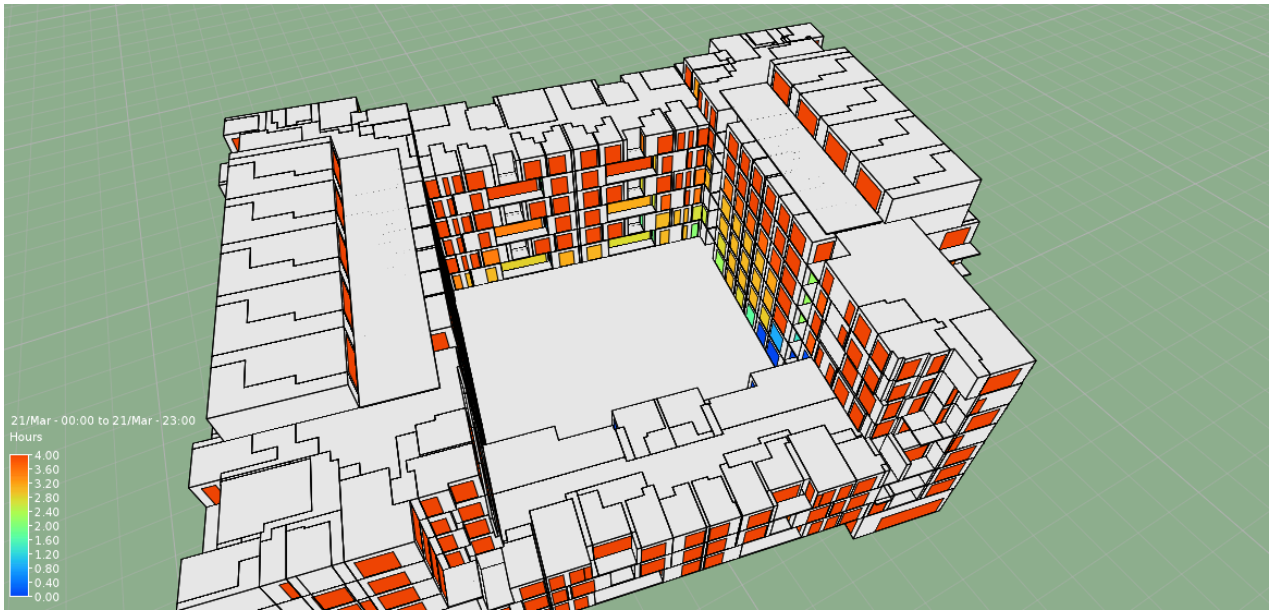


Figure 40 - Sunlight Exposure March 21st (2022 METHODOLOGY High Level) – Northeast Elevation

8. ASSESSING THE IMPACT ON SURROUNDING PROPERTIES

8.1. DAYLIGHT & SUNLIGHT IMPACT METHODOLOGY

As per the BRE Guidelines it is important to safeguard the daylight to nearby buildings, from a proposed development, where a reasonable expectation of daylight is required. The flow matrix below outlines the criteria to be assessed, as per the BRE Guidelines, in order to ascertain any potential impact to adjacent buildings from the proposed development.

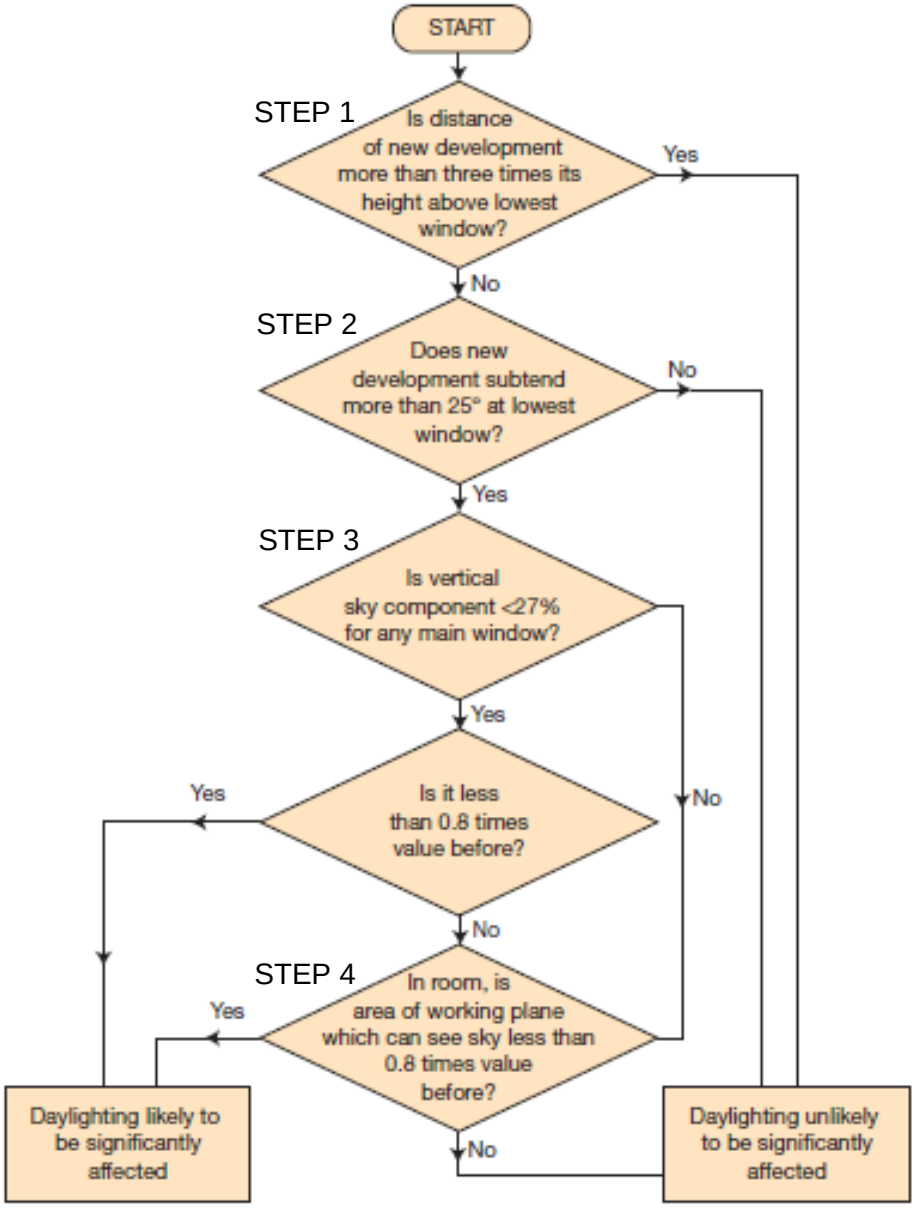


Figure 40 - Daylight Assessment Methodology

8.1.1 DISTANCE FROM THE PROPOSED DEVELOPMENT – STEP 1

As per the flow matrix, the loss of light to existing windows is not required to be analysed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing windows. Otherwise, BRE guideline 2022 provide the following methods for assessing daylight availability.

8.1.2 25° LINE CRITERIA – STEP 2

If a proposed development falls beneath a 25° angle taken from a point 1.6 metres above ground level from any adjacent properties, then the BRE Guidelines say that no further analysis is required in relation to impact on surrounding properties as adequate skylight will still be available. If the proposed development extends beyond the 25° line then further analysis is required (Step 3).

8.1.3 VERTICAL SKY COMPONENT – STEP 3

The following method is known as the Vertical Sky Component (VSC). The VSC calculation is the ratio of the direct sky illuminance falling on the outside of a window, to the simultaneous horizontal illuminance under an unobstructed sky. The BRE Guide sets out two guidelines for the VSC:

- If the VSC at the centre of the existing window exceeds 27% with the new development in place, then enough sky light should still be reaching the existing window;
- If the VSC with the new development in place is both less than 27% and less than 80% its former value, then the reduction in light to the window is likely to be noticeable;
- This means that even if the VSC is less than 27%, as long as the VSC value is still greater than 80% of its former value, this would be acceptable and thus the impact would be considered negligible.

It is important to note that the VSC is a simple geometrical calculation which provides an early indication of the potential for daylight entering a space. However, it does not assess or quantify the actual daylight levels inside the rooms. If the VSC standard is not met on any window, Step 4 is then followed

8.1.4 NO SKY LINE – STEP 4

This method is the No Sky Line or Daylight Distribution Method. This method assesses the change in position of the No Sky Line between the existing and proposed situations. It does take into account the number and size of windows to a room, but still does not give any qualitative or quantitative assessment of the light in the room, only where sky can or cannot be seen. As a result, as this method is limited, Step 3 is considered more appropriate.

8.1.5 AVERAGE DAYLIGHT FACTOR (ADF)

This last method is not outlined within the BRE Guidelines as one of the steps for assessing the impact to adjacent properties. However, this method not only considers the amount of sky visible from the vertical face of the window, but also the window size, room size and room use and where dimensions for the room to be assessed are available, this is an accurate method of assessment.

Therefore, even though this step is not outlined within the BRE Guidelines for assessment of adjacent properties, as the internal information for the adjacent properties was available and the previous steps have shown that some properties are due to experience an impact, this method has been used to demonstrate that the surrounding properties will continue to receive good levels of daylight with the proposed development in place.

Sections 8.2 and 8.3 on the following pages outline the details of the analysis undertaken.

8.2. IDENTIFYING SENSITIVE RECEPTORS

Prior to following the flow matrix, the key sensitive receptors around the site firstly need to be identified. According to the BRE Guide, sensitive receptors are described as:

- Habitable rooms in residential buildings, where the occupants have a reasonable expectation of daylight;
- Other sensitive receptors are gardens and open spaces on adjacent properties to the new scheme, excluding public footpaths, front gardens and car parks;
- In accordance with the BRE Guide, windows are selected as sensitive receptors on the basis of being a habitable room facing the proposed development.

Similarly, amenity areas and other open spaces are selected on the basis of being in the immediate vicinity of the proposed development. The primary purpose of a daylight, sunlight and overshadowing assessment is to determine the likely loss of light to adjacent buildings resulting from the construction of the proposed development.

Therefore, in this case, the proposed development is identified as the potential source of impact. The sensitive receptors identified for this study are windows of habitable rooms facing the site where the occupants have a reasonable expectation of daylight. Table 21 identifies all sensitive receptors analysed, whilst Figure 41 identifies their location.

Development name
Block 2 SHD Development to the East (Permitted)
Site 10 Development to the North (SHD Pre-app completed and SHD Application imminent)

Table 21 – Sensitive Receptors surrounding the Rosemount Development

The image below identifies the location of the sensitive receptors located in closest proximity to the proposed site.

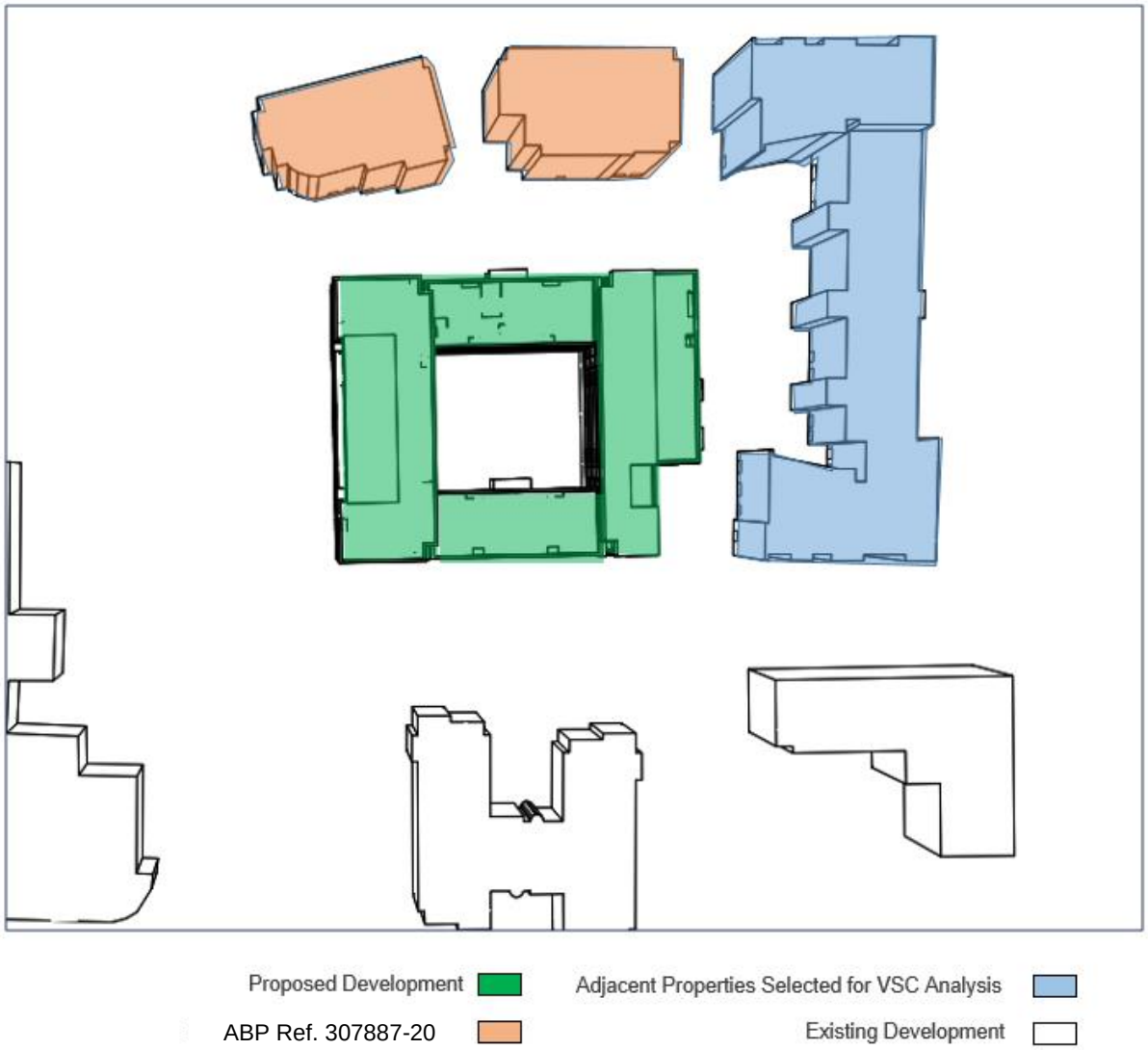


Figure 41 – Location of Sensitive Receptors

As the development to the East of the proposed site is the only residential scheme currently permitted, only this development has been selected as a sensitive receptor and it is highlighted in blue above. In order to give preliminary results, VSC analysis has been undertaken for windows at ground floor level since they are representative of a 'worst case' scenario.

In relation to the proposed development to the North, has carried out as part of their planning application, taking fully into account the Rosemount development to the South.

8.3. DAYLIGHT IMPACT ON SURROUNDING PROPERTIES

25° line criteria

BRE Guidelines state that if a proposed development falls beneath a 25° line taken from a point 1.6 metres above ground level from any adjacent properties, then no impact is perceived and further analysis is not required.

Due to the proximity of the adjacent developments to the proposed development, this method has not been successful and further analysis was carried out.

Vertical Sky Component

BRE Guidelines state that if the VSC is ≥ 27% with the new development in place, then enough sky light should still be reaching the existing window. If the VSC value is under 27%, in order for the window to perceive a negligible impact, the VSC with the proposed development in place should still be ≥ 80% of its former value.

As previously outlined, the adjacent Block 2 and Block 10 property has been selected for VSC analysis. In order to analyse the VSC levels within the selected adjacent properties, 'worst case' windows located at lower level were modelled for each unit being analysed. The theory being that as floor level heights increase, so too does access to daylight. Therefore, if those windows located at lower levels are in line with BRE Guidelines recommendations, so will those located on the upper levels.

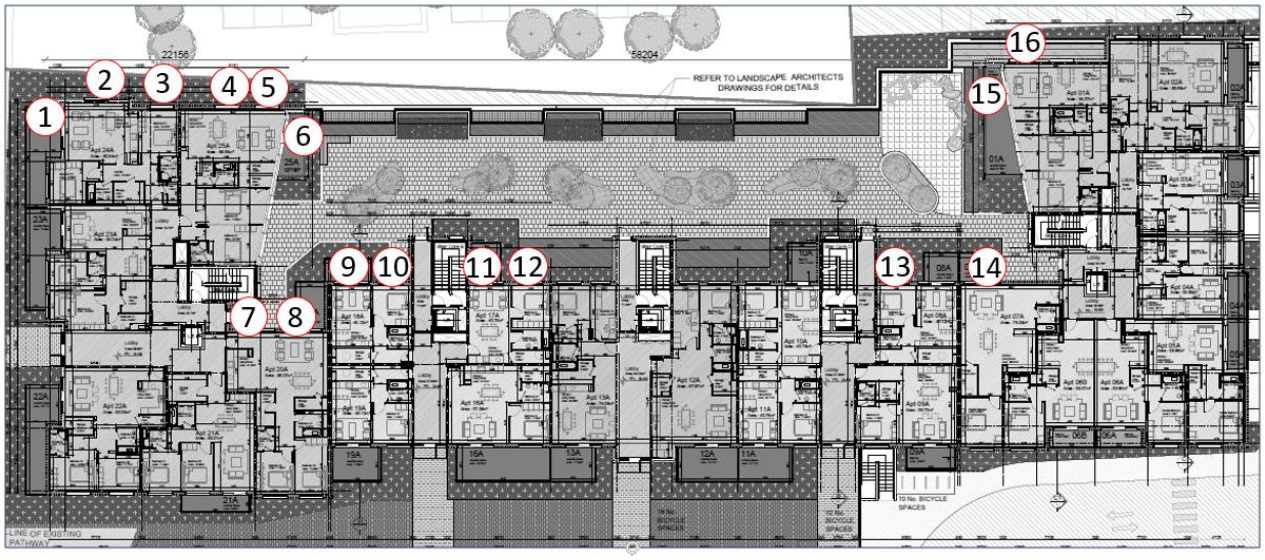


Figure 42 – Window References (Block 2)

The figure above illustrates the windows selected for analysis with the VSC results outlined further below.

For those windows achieving a VSC under 27%, the VSC of the proposed development has been compared to the existing scenario (baseline).

Window Ref.	VSC existing development (%)	VSC proposed development (%)	Percentage (%) of its former value	Meets VSC >80% of its former value
1	24.6	24.6	100	Y
2	34.7	21.3	61	N
3	33.8	17.4	52	N
4	33.8	15.9	47	N
5	33.2	14.0	42	N
6	18.2	15.2	84	Y
7	10.6	6.4	60	N
8	8.3	4.7	56	N
9	18.3	9.8	53	N
10	17.2	8.0	46	N
11	22.4	13.0	58	N
12	27.5	16.0	58	N
13	15.0	13.0	87	Y
14	17.2	13.4	78	N
15	22.3	17.6	79	N
16	22.4	18.4	82	Y

Table 22 – Block 2 Vertical Sky Component Results

Figure 43 – Window References (Block 10)

Window Ref.	VSC existing development (%)	VSC proposed development (%)	Percentage (%) of its former value	Meets VSC >80% of its former value
1	32.11	25.010	78	N
2	30.61	22.16	72	N
3	25.94	17.03	66	N
4	25.80	15.95	62	N
5	28.92	18.53	64	N
6	29.11	17.80	61	N
7	29.44	17.92	61	N
8	14.32	12.23	85	Y
9	24.52	15.67	64	N
10	23.50	14.76	63	N
11	16.44	13.55	82	Y
12	29.36	18.31	62	N
13	28.99	18.14	63	N
14	29.10	18.05	62	N
15	28.88	17.85	62	N
16	28.52	17.79	62	N
17	12.40	10.76	87	Y
18	21.10	12.31	58	N
19	28.56	18.99	66	N
20	28.16	19.28	68	N
21	13.25	12.76	96	Y
22	21.50	14.97	70	N

Table 23 – Block 10 Vertical Sky Component Results

As previously outlined, the VSC analysis has shown that an impact will be perceived by the adjacent Block 2 & Block 10 property due to the proposed development. This is normal due to the existing structures on the proposed site and any other development will cause an impact on the permitted Block 2 & Block 10 development.

The daylight/ sunlight analysis carried out as part of the application for Block 2 noted a similar impact from Block 10 and proposed block on the adjacent permission. The planning report carried out for the adjacent Block 2 development outlines that the residential Nursing home located to the eastern of the permitted site will perceive an impact due to the permitted development.

Average Daylight Factor

In order to demonstrate that the surrounding properties will continue to receive good levels of daylight even though some properties will perceive an impact a more detailed method has been carried out. This method not only considers the amount of sky visible from the vertical face of the window, but also the window size, room size and room use. Where dimensions for the room to be assessed are available, this is an accurate method of assessment, subject to the information on the adjacent developments being correct. It gives guidance as to the qualitative and quantitative change in daylight and is related to the British Standard BS 8206 Part II. Units assessed for the calculations are outlined in Figure 44 & Figure 45.

This step is not recommended for assessing the impact to adjacent properties because typically there is not enough information of the surrounding properties, however, internal information for the adjacent properties was found in the planning file. The selected apartments assessed under the ADF method have shown that the units in questions will achieve excellent levels of daylight once the development is in place.

In order to give an idea of the expected daylight levels within the adjacent Block 2 & Block 10 a sample of apartments have been selected for analysis. 'Worst case' apartments are the properties in close proximity to the proposed development and placed at the lower levels.

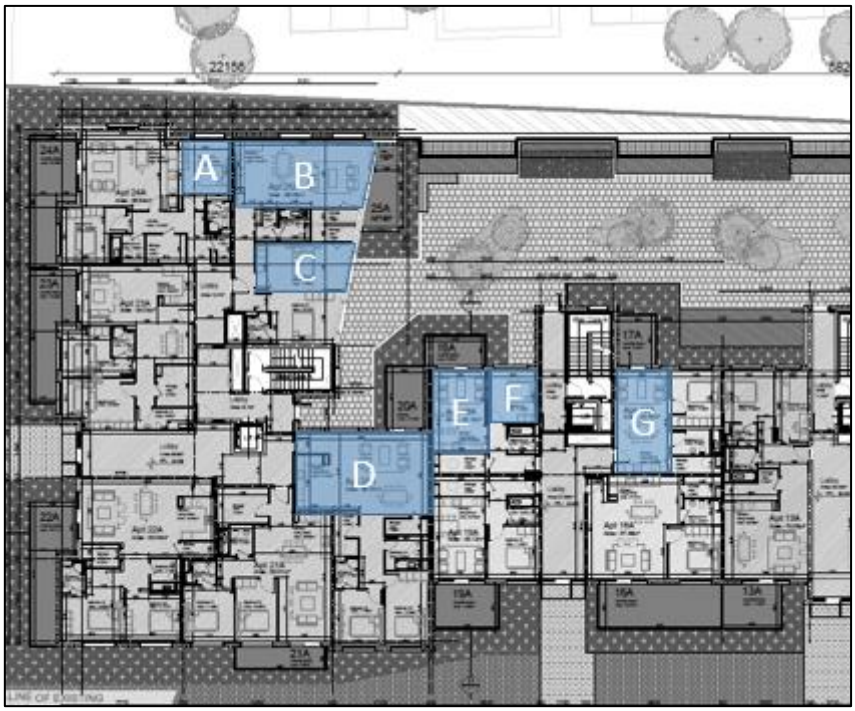


Figure 44 – Assessed Units Block 2

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Bedroom	1.0	2.2	Y
B	Living/Dining/Kitchen	2.0	3.0	Y
C	Bedroom	1.0	1.1	Y
D	Living/Dining/Kitchen	2.0	1.5	N[3]
E	Living/Dining/Kitchen	2.0	2.4	Y
F	Bedroom	1.0	1.5	Y
G	Living/Dining/Kitchen	2.0	2.0	Y

Table 24 – Average Daylight Factor Results – Block 2

Figure 45 – Assessed Units Block 10

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living Room	2.00	8.64	Y
B	Bedroom	1.00	3.91	Y
C	Bedroom	1.00	3.50	Y
D	Bedroom	1.00	3.22	Y
E	Living Room	2.00	4.39	Y
F	Living Room	2.00	4.16	Y
G	Living Room	2.00	5.04	Y

[3] It is important to note that in the D/S report carried out for the permitted Block 2 development at planning, the L/K/D Unit D achieved an ADF of 1.8%. The space was considered to comply with BRE using a benchmark of 1.5%. However, if the 2% target was set out the unit would fall short in compliance.

Please note that if the 1.5% benchmark was used within this assessment, Unit D would achieve compliance.

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
H	Bedroom	1.00	3.63	Y
I	Bedroom	1.00	3.60	Y
J	Bedroom	1.00	3.23	Y
K	Living Room	2.00	4.02	Y
L	Bedroom	1.00	3.50	Y
M	Living Room	2.00	3.95	Y

Table 25 – Average Daylight Factor Results – Block 10

The analysis has shown that of the sample of analysed 'worst case' units, only 1 unit IN Bock 2 type falls slightly short of the recommended BRE Guidelines 2011 and BS 8206 values for ADF analysis. However, that unit is located in an obstructed area for the development itself (obstructed set back unit with stair core obstruction and balcony above). That unit type is not repeated within that area; therefore, it is expected that the rest of units within the permitted Block 2 will receive ADF values within the recommended values.

It should also be noted that any development within the proposed area will cause an impact on the permitted Block 2 & Block 10 development, therefore, the results should be taken with a degree of flexibility as outlined in the BRE Guideline.

9. SUNLIGHT IMPACT ON ADJACENT PROPERTIES (APSH)

The Annual Probable Sunlight Hours (APSH) is used to determine the amount of sunlight that is received by windows within the proposed development.

BRE Guidelines outline that if a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlight of the existing dwelling may be adversely affected (refer to Figure 46).

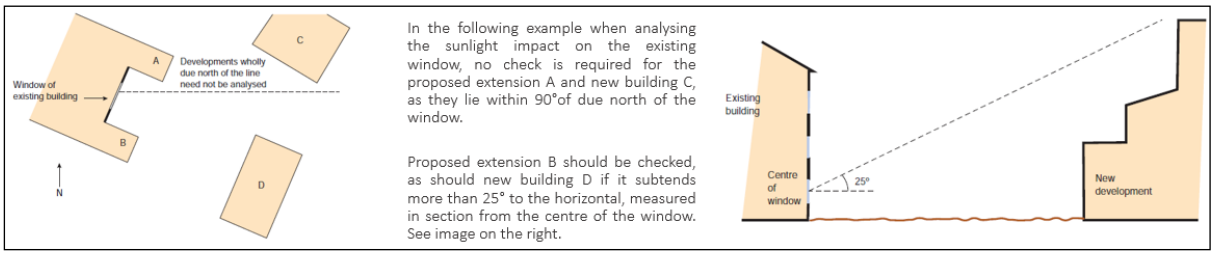


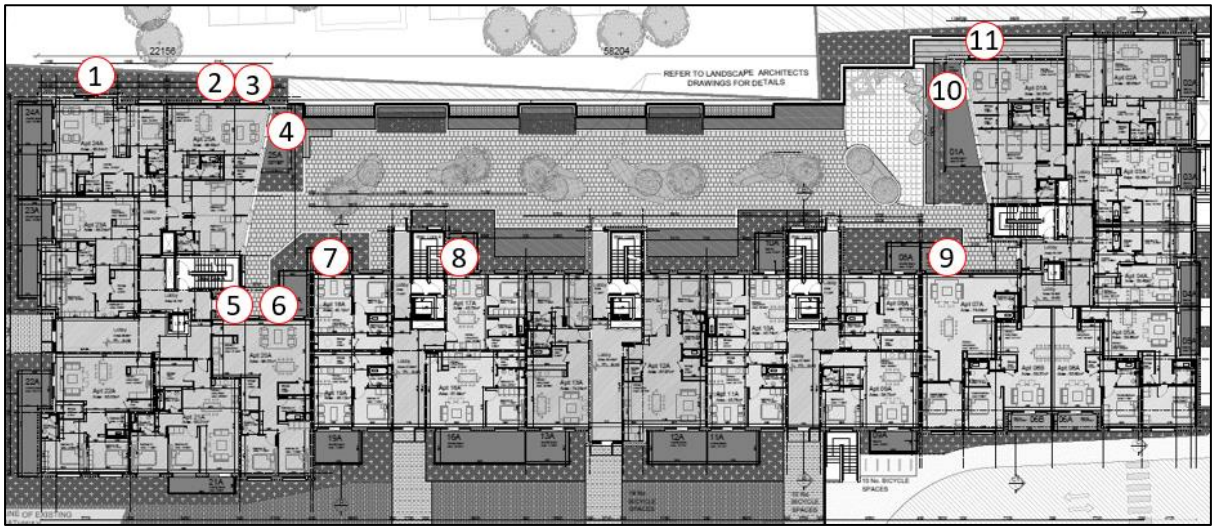
Figure 46 – BRE Extract of the Methodology for room selection (APSH)

The sunlight within adjacent properties may be adversely affected if the center of the window:

- Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between September 21st and March 21st;
- Receives less than 80% its former sunlight hours during either period;
- Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

It must be noted that BRE Guidelines states that to assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings should be checked if they have a window facing within 90° of due south and that kitchen and bedrooms are less important, although care should be taken not to block too much sun. As internal layouts for the adjacent property were available, a selection of 'worst case' windows to living rooms located at lower level have been selected for analysis.

The image below illustrates the windows selected for analysis and the accompanying table outlines the APSH results.



Figuren 47 – Window References (Block 2)

Window Ref.	APSH (%) - Existing development		APSH (%) - Proposed development		Percentage (%) of its former value >80%		Meets BRE Compliance	
	Annual ≥25%	Winter (Sep 21st – Mar 21st) ≥5%	Annual ≥25%	Winter (Sep 21st – Mar 21st) ≥5%	Annual	Winter (Sep 21st – Mar 21st)	Annual	Winter (Sep 21st – Mar 21st)
1	37.09	9.52	31.72	9.52	NA	NA	Y	Y
2	31.54	8.91	19.54	8.77	62	NA	N	Y
3	31.28	9.01	18.48	8.31	59	NA	N	Y
4	0.0	0.0	0.0	0.0	100	100	Y	Y
5	0.0	0.0	0.0	0.0	100	100	Y	Y
6	0.99	0.0	0.0	0.0	0	100	N	Y
7	4.43	0.0	0.0	0.0	0	100	N	Y
8	8.21	0.28	0.44	0.0	5	0	N	N
9	24.90	6.27	17.74	2.17	71	35	N	N
10	29.74	11.04	22.93	6.14	77	NA	N	Y
11	31.61	9.13	21.88	2.79	69	31	N	N

Table 26 – Annual Probable Sunlight Hours Results

Figure 48 – Window References (Block 10)

Window Ref.	APSH (%) - Existing development		APSH (%) - Proposed development		Percentage (%) of its former value >80%		Meets BRE Compliance	
	Annual ≥25%	Winter (Sep 21st – Mar 21st) ≥5%	Annual ≥25%	Winter (Sep 21st – Mar 21st) ≥5%	Annual	Winter (Sep 21st – Mar 21st)	Annual	Winter (Sep 21st – Mar 21st)
1	60.63	41.26	50.64	14.73	84	36	Y	N
2	55.95	38.96	44.83	11.71	80	30	Y	N
3	45.55	30.81	35.19	9.40	77	31	N	N
4	40.70	29.05	26.66	3.75	66	13	N	N
5	47.00	33.43	32.32	4.38	69	13	N	N
6	52.05	38.42	36.95	3.34	71	9	N	N
7	51.27	37.59	36.02	3.50	70	9	N	N
8	24.54	17.90	17.74	0.70	72	4	N	N
9	35.12	23.81	22.25	0.70	63	3	N	N
10	33.21	23.50	22.07	1.40	66	6	N	N
11	26.50	20.61	18.77	1.40	71	7	N	N
12	47.15	35.21	31.27	1.33	66	4	N	N
13	50.90	39.52	35.90	1.40	71	4	N	N
14	50.86	39.91	36.02	1.04	71	3	N	N
15	50.51	39.86	35.76	1.40	71	4	N	N
16	50.07	39.70	35.96	1.78	72	4	N	N
17	21.87	15.11	17.19	2.80	79	19	N	N
18	26.28	17.20	16.74	1.96	64	11	N	N
19	29.73	21.60	35.43	2.50	119	12	Y	N
20	20.96	16.16	35.49	2.45	169	15	Y	N
21	48.43	38.47	18.96	2.80	39	7	N	N
22	47.30	38.46	23.49	3.37	50	9	N	N

Table 27 – Annual Probable Sunlight Hours Results

The analysis has shown that some of the analysed windows will perceive an impact due to the proposed development. However, as per the daylight analysis, this is normal due to the undeveloped character of the proposed site and any other development will cause an impact on the permitted Block 2 development. It must be noted that some of the windows falling short in compliance were not achieving the recommended values during the existing scenario.

9. OVERSHADOWING IMPACT TO SURROUNDING OPEN SPACES

BRE Guidelines state that:

"if a space is used all year round, the equinox (March 21st) is the best date for which to prepare shadow plots as it gives an average level of shadowing. Lengths of shadows at the autumn equinox (September 21st) will be the same as those for March 21st, so a separate set of plots for September is not required. However, clock times for September will be one hour later, because of British Summer Times (BST)".

BRE Guidelines identify gardens (usually the main back garden of a house) as sensitive receptors that must be selected for analysis in order to assess the impact that will be perceived once the proposed development takes place. Therefore, the open spaces to the adjacent properties have been selected for analysis.

Based on the recommendations within the BRE Guidelines, March 21st has been used to create the overshadowing images. In addition, overshadowing images for June and December 21st have also been created to give an indication of the sunlight levels that will be received during the summer and winter months.

Figure 49 - Overshadowing Images on March 21st at 8 a.m. and 9 a.m.

Figure 50 - Overshadowing Images on March 21st at 10 a.m. and 11 a.m.

Figure 51 - Overshadowing Images on March 21st at 12 p.m. and 1 p.m.

Figure 52 - Overshadowing Images on March 21st at 2 p.m. and 3 p.m.

Figure 53 - Overshadowing Images on March 21st at 4 p.m. and 5 p.m.

Figure 54 - Overshadowing Images on June 21st at 7 a.m. and 8 a.m.

Figure 55 - Overshadowing Images on June 21st at 9 a.m. and 10 a.m.

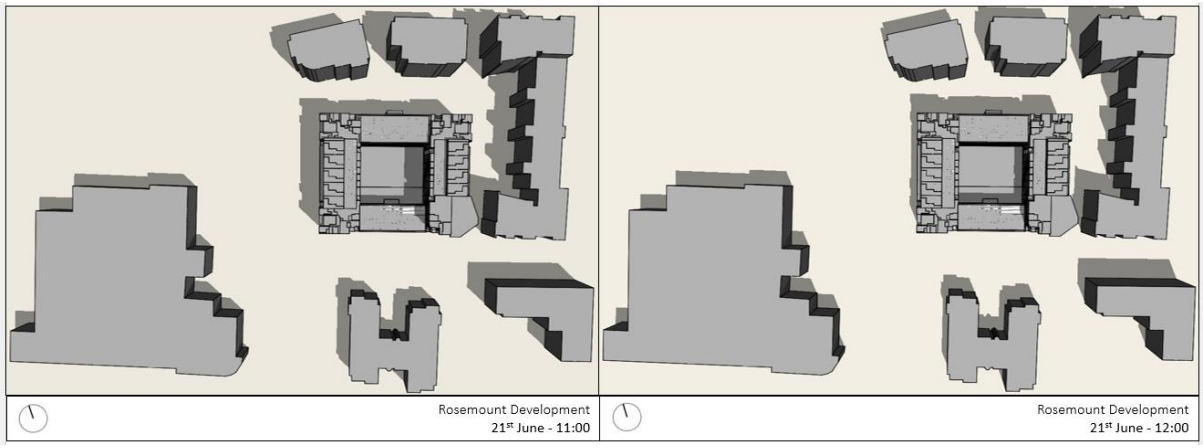


Figure 56 - Overshadowing Images on June 21st at 11 a.m. and 12 p.m.

Figure 57 - Overshadowing Images on June 21st at 1 p.m. and 2 p.m.

Figure 58 - Overshadowing Images on June 21st at 3 p.m. and 4 p.m.

Figure 59 - Overshadowing Images on June 21st at 5 p.m. and 6 p.m.

Figure 60 - Overshadowing Images on June 21st at 7 p.m. and 8 p.m.

Figure 61 - Overshadowing Images on December 21st at 10 a.m. and 11 a.m.

Figure 62 - Overshadowing Images on December 21st at 12 p.m. and 1 p.m.

Figure 63 - Overshadowing Images on December 21st at 2 p.m. and 3 p.m.

It can be outlined that on March 21st after 3 p.m., an impact to the eastern property, Block 2, will be perceived. Block 10 does experience certain degree of overshadowing on the test day of 21st of March. Further analysis has been carried out to assess the magnitude of this impact. The following image outlines the sunlight levels being received by the adjacent amenity spaces on March 21st.

Figure 64 - Overshadowing Images on March 21st

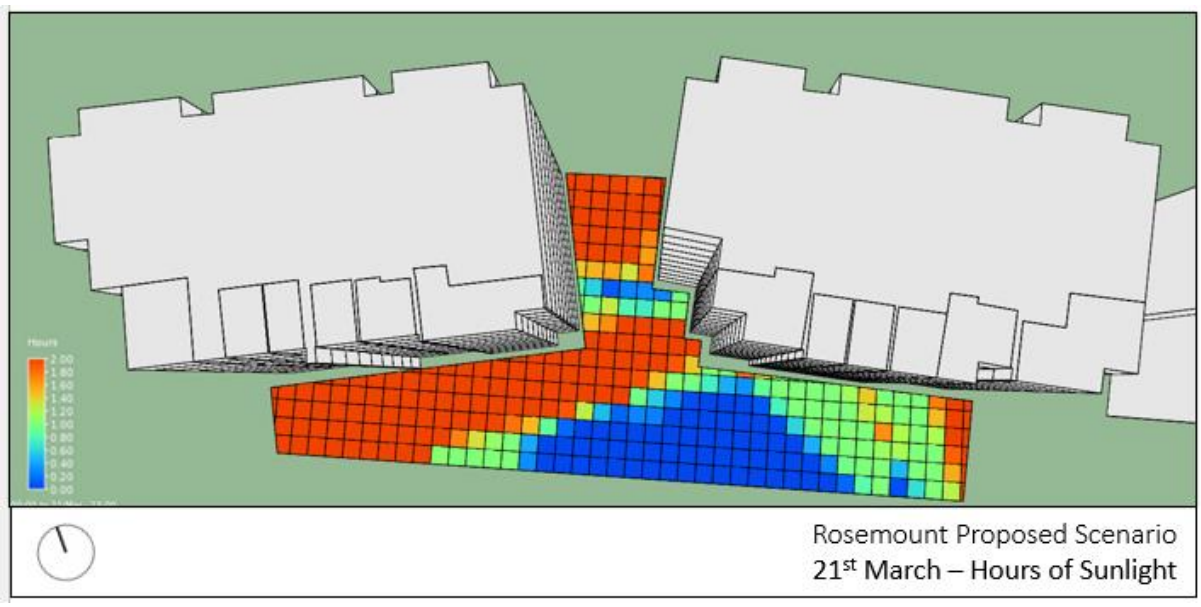


Figure 65 – Block 10 Overshadowing Images on December 21st

As previously outlined, BRE Guidelines recommend that for an open space to appear adequately sunlit throughout the year then at least half of the open space should receive 2 hours of sunlight on March 21st. If, as a result of a new development, an existing amenity does not meet the above requirement, the area which can receive two hours of sun on March 21st should be at least 80% of its former value. The analysis has shown that even though an impact will be perceived due to the proposed development, compliance with BRE Guidelines is achieved with the proposed development in place. Therefore, receiving good levels of sunlight.

	Percentage of area receiving ≥ 2 hours sunlight on March 21st	**Meets compliance with BRE Guidelines**
Block 2 Amenity Spaces	73%	Y
Block 10 Amenity Spaces	51%	Y

Table 28 – Sunlight results (Communal Amenity Space)

10. CONCLUSION

The proposed Rosemount development has been analysed in order to determine the following:

- The daylight levels within the living, kitchen and bedroom areas of all apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living room areas within the proposed development;
- The quality of amenity space, being provided as part of the development, in relation to sunlight;
- Any potential daylight, sunlight or overshadowing impact the proposed development may have on properties adjacent to the site.

Calculations and Methodology used are in accordance with BRE Guidelines for daylight and sunlight and based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 Third Edition, however, the following should be reiterated as previously outlined:

"The advice given here is not mandatory and this document should <u>not be seen as an instrument of planning policy</u>. Its aim is to help rather that constrain the designer. Although it gives numeral guidelines these <u>should be interpreted flexibly</u> because natural lighting is only one of the many factors in site layout design"

<u>Internal daylight within the proposed development</u>

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. 100% meet but greatly exceed the recommendations outlined within the BRE Guidelines and British Standard BS8206, when assessed against 2011 methodology.

95% apartments meeting the requirements within the new BRE Guidelines and British Standard set out in BRE "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 Third Edition.

Based on the findings outlined the previous results 95% of the spaces are compliant with 2022 Methodology whereas 100% of the spaces are compliant with 2011 methodology. As a result of these

findings, the development can be shown to achieve excellent level of daylight across both methodologies.

Sunlight to proposed development amenity spaces

In terms of sunlight access, excellent levels of sunlight are experienced across the proposed development. The communal amenity space provided exceed the BRE guidelines for sunlight on the test day of 21st of March.

Sunlight to windows within the proposed development

The annual probable sunlight hours assessment has shown that 48% of the living room windows across the development achieve the recommended APSH values stated in the BRE Guidelines, while 60% of the living room windows achieve the recommended values during the winter months, when sunlight is more valuable.

Daylight Impact to surrounding properties

The VSC analysis has shown that there is a daylight impact being perceived by the permitted Block 2 & Block 10 development, when compared to the existing scenario. However, the ADF analysis, a more detailed method, has shown that good levels of daylight will still be available for a sample of 'worst case' rooms when the proposed development is built, with only one unit falling short in compliance.

Sunlight Impact to surrounding properties

The overshadowing analysis has shown that an impact to Block 2 and Block 10 will be perceived on March 21st. However, further sunlight analysis has demonstrated compliance with BRE Guidelines, with 73% of the amenity spaces for Block 2 and 51% of the amenity spaces for Block 10 achieving at least 2 hours of sunlight on the test day (March 21st) – more than the recommended 50% value.

In relation to sunlight to windows, the analysis has shown that some of the analysed windows will perceive an impact due to the proposed development. However, this is normal due to existing scenario of the proposed site and any other development will cause an impact on the permitted Block 2 developments. It must be noted that some of the windows falling short in compliance were not achieving the recommended values during the existing scenario.

OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7
Ireland

T | +353 (0)1 8682000
F | +353 (0)1 8682100
W | www.ocsc.ie