OCSC

O'CONNOR · SUTTON · CRONIN

MULTIDISCIPLINARY CONSULTING ENGINEERS

L333: FORTFIELD ROAD RESIDENTIAL DEVELOPMENT

DAYLIGHT, SUNLIGHT & OVERSHADOWING ASSESSMENT

For

1 Celbridge West Land Ltd.

10 December 2024

NOTICE

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EXECUTIVE SUMMARY

OCSC M&E have been appointed to carry out a Daylight, Sunlight and Overshadowing Assessment for the Fortfield Road Residential Development located in Terenure, Dublin 6.

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

Daylight and sunlight in the proposed development were assessed using the following methodology:

- The Building Research Establishment's "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 3rd Edition.
- This is guidance document makes references to BS EN 17037 (2018) and is also relevant to IS EN 17037;
- Therefore, the daylight assessment in this report also makes reference to the BS EN 17037 (2018) Annex;
- This report also references daylight targets detailed in Appendix 16 of the Dublin City Council (DCC) Development Plan 2022-2028.

1 INTRODUCTION

OCSC M&E have been appointed to carry out a Daylight, Sunlight and Overshadowing Assessment for the Fortfield Road Residential Development located in Terenure, Dublin 6.

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 dwellings, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels received by all the living/ kitchen and bedroom areas within the proposed development;
- The quality of amenity space being provided as part of the development, in relation to sunlight;
- Any potential daylight or sunlight 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 3rd Edition:

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

The calculation methodology for daylight and sunlight is based on the Building Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 3rd Edition.

Internal Daylight

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. This is supported by the results of two assessments conducted on the development. The first assessment evaluated compliance with the BRE Guide 3rd Edition, specifically against Criterion I and Criterion II, while the second assessment refers to compliance with the targets in Table 1 of Appendix 16 of the Dublin City Council Development Plan (DCDP).

The results demonstrate a 98.7% compliance rate with Criterion I of the BRE Guide 3rd Edition daylight standard and a 98.3% compliance rate with Criterion II. Additionally, the second assessment, based on the DCDP standards in Appendix 16, achieved a 99.7% compliance rate. Units that do not fully meet the daylight recommendations have been supplemented with various compensatory measures, as detailed in Section 5.

Sunlight to Windows

The sunlight assessment has shown that 81% of windows to bedrooms and living areas are receiving the minimum recommended levels of sunlight, as tested against the BRE Guide 3rd Edition. The BRE Guide 3rd

Edition states that compliance is to be calculated on a dwelling by dwellings basis. Using this methodology, the compliance rate is 97%, with 275 of the 284 units in the scheme achieving the BRE Guide 3rd Edition recommendations for sunlight.

Sunlight to Amenity Spaces

In relation to amenity space sunlight, all open amenity spaces in the development show compliance with BRE Guide 3rd Edition recommendations, with all amenity spaces receiving more than 2 hours of sunlight on March 21st test day – Achieving ranges of between 76% and 100%.

Impact to surrounding properties

The proposed development will not impact surrounding properties, as careful consideration has been given to maintaining a reasonable distance to prevent any loss of light to existing windows. Only two properties were identified as potentially affected and, therefore, required a Vertical Sky Component (VSC) analysis, one has no windows facing the development and the other demonstrated 100% compliance with Section 2.2.7 of the BRE Guidelines:

'If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing Building'.

Overshadowing Assessment

The overshadowing assessment has shown the shadow cast by the proposed development on March 21st from 9:00 a.m. to 6:00 p.m.

It has been shown through our overshadowing analysis that minimal impact can be perceived on the adjacent properties. This is further supported by the fact that the proposed development does not subtend more than 25 degree angle to the horizontal from the existing windows.

2 PROPOSED DEVELOPMENT

The development will comprise a Large-Scale Residential Development (LRD) on a site at Fortfield Road, Terenure of 284 no. units delivering 19 no. houses and 265 no. apartments made up of studios; 1 beds; 2 beds; 3 beds; and 4 beds. The development will also provide community, cultural and arts space and a creche. Communal internal space for residents will also be delivered. Provision of car, cycle and motorbike parking will be provided throughout the development, including at basement and surface level. Vehicular/pedestrian/cyclist access from Fortfield Road. Proposed upgrade works to the surrounding road network is also included. All associated site development works, open space, services provision, ESB substations, plant areas, waste management areas, landscaping (both public and communal) and boundary treatments.

Figure 1: Site Layout

3 PROPOSED BUILDING DESIGN

To ensure that daylight levels were maximised for the Fortfield Road Residential Development, a number of key design strategies were incorporated during concept design.

ORIENTATION AND LAYOUT

The orientation and layout of the proposed development were designed to maximise the use of natural daylight and sunlight, ensuring that all habitable rooms are naturally ventilated and well-lit. The size, shape, massing, and separation distances of the development have been optimised to minimise the impact on the surrounding properties. Additionally, balconies have been carefully staggered to avoid positioning them directly above one another, allowing for maximum daylight and sunlight exposure.

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. 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 dwellings.

Figure 2: Façade Views of Proposed Development (Block A South West Elevation)

GLAZING TO WALL RATIO

The primary function of the glazing to wall ratio is to maximise daylight within the space while reducing excessive solar gains within the proposed development. The other advantage in conjunction with appropriate materials is that the more light coloured, reflective materials used externally, the more ambient daylight will be reflected to the surrounding areas. Extensive analysis was undertaken on all building façades to ensure glazing widths were maximised to promote access to daylight. The image below illustrates the glazing to wall ratio of the proposed development.

Figure 3: Elevation Glazing to Wall Ratio (Block D North East Elevation)

4 GUIDELINES FOR DAYLIGHTING AND SUNLIGHT

The analysis of the development's potential and the quality of amenity spaces have been based on the Building Research Establishment (BRE) guidelines on "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice 3rd Edition (Building Research Establishment Report, 2022)".

These guidelines provide the criteria and methodology for calculations pertaining to daylight and sunlight and are the primary references 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.

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 3rd Edition:

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

In determining the suitability of a daylight and sunlight report, the planning authority note the sentiment within BR 209 that the results presented should be interpreted with flexibility as also mentioned in Section 7 of the Appendix 16 of the Dublin City Council (DCC) Development Plan 2022-2028:

"In determining the suitability of a daylight and sunlight report, the planning authority note the sentiment within BR 209 that the results presented should be interpreted with flexibility"

Daylight and sunlight in the proposed development were assessed using the following methodology:

- The Building Research Establishment's "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 3rd Edition.
- This is guidance document makes references to BS EN 17037 (2018) and is also relevant to IS EN 17037;
- Therefore, the daylight assessment in this report also makes reference to the BS EN 17037 (2018) Annex;
- This report also references daylight targets detailed in Appendix 16 of the Dublin City Council (DCC) Development Plan 2022-2028.

It is acknowledged that the planning authority requires the Average Daylight Factor (ADF) for daylighting assessments. However, it is important to note that Paragraph C2 in Appendix C: *Interior Daylighting Recommendations* of the BRE Guide 209 (3rd Edition) states that the ADF is no longer recommended.

5 DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT

ASSESSMENT CRITERIA – INTERNAL DAYLIGHT (BRE GUIDE 3RD EDITION)

The development's daylight levels have been tested to the BRE Guide 3rd Edition. The BRE Guide 3rd Edition methodology goes beyond the average daylight levels within a space, and accounts for the distribution of light within a space. The guidance given is not room type specific. The same target applies to all habitable rooms, regardless of their type (ie bedrooms, living rooms and kitchens all have the same daylight target).

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 4: BRE Guide 3rd Edition – Daylight Analysis Methodology – Table A.1

The BRE Guide 3rd Edition calculation method using illuminance level features two daylight criteria for compliance:

- Criterion I 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 II 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.

Table 1 of Appendix 16 of the Dublin City Council Development Plan prescribes room specific daylight targets. Rooms have been tested to these targets also. For this test, there is only one criterion for compliance, which is based on the room type.

- Bedrooms shall have an illuminance of ≥ 100 lux for half of the daylight time in a year (2,190 hours), across ≥ 50% of the floor area of the given space;
- Living Rooms shall have an illuminance of ≥ 150 lux for half of the daylight time in a year (2,190 hours), across ≥ 50% of the floor area of the given space;
- Kitchens (and combined kitchen/ living rooms) shall have an illuminance of ≥ 200 lux for half of the daylight time in a year (2,190 hours), across ≥ 50% of the floor area of the given space.

DAYLIGHT PARAMETERS

The surface reflectance values outlined in Table 1 have been used in the analysis, as per BRE Guide 3rd Edition.

Surface Type	Reflectance (%)
Interior walls	50
Ceilings	70
Floors	20
Exterior walls and obstructions	20
Exterior ground	20
Glazing Transmittance	70

Table 1: Surface Reflectance Values

The illuminance 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.

TREES

The BRE Guide 3rd Edition 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 Guide 3rd Edition the following statements are made:

> *"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.* "

When assessing the skylight in new dwellings:

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

When assessing the sunlight in gardens:

> *"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 per recommendations outlined above, trees have been excluded from this assessment.

DAYLIGHT RESULTS – INTERNAL DAYLIGHT IN PROPOSED DWELLINGS/ SPACES

This section outlines the assessment of internal daylight levels in the proposed Fortfield Road Residential Development.

In relation to the BRE Guide 3rd Edition recommendations, all but 9 of the analysed spaces meet Criterion I of the BRE Guide 3rd Edition. All rooms analysed but 12 meet Criterion II of the BRE Guide 3rd Edition. Only 2 rooms analysed fall short of the Dublin City Council (DCC) Appendix 16 room specific targets.

Location	Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
Block A 1st Floor	42	Living/ Kitchen	79%	N	39%	N	200	52%	Y
Block B 1st Floor	34	Living/ Kitchen	73%	N	38%	N	200	50%	Y
Block B 2nd Floor	34	Living/ Kitchen	97%	Y	43%	N	200	58%	Y
Block C 1st Floor	8	Living/ Kitchen	100%	Y	43%	N	200	64%	Y
Block C 1st Floor	14	Living/ Kitchen	79%	N	42%	N	200	53%	Y
Block C 1st Floor	34	Living/ Kitchen	72%	N	33%	N	200	45%	N
Block C 1st Floor	39	Living/ Kitchen	85%	N	44%	N	200	56%	Y
Block C 2nd Floor	14	Living/ Kitchen	86%	N	51%	Y	200	62%	Y
Block C 2nd Floor	34	Living/ Kitchen	72%	N	35%	N	200	46%	N
Block D 1st Floor	4	Living/ Kitchen	83%	N	54%	Y	200	65%	Y
Block D 1st Floor	11	Living/ Kitchen	77%	N	36%	N	200	51%	Y
Block D 1st Floor	12	Bedroom	100%	Y	46%	N	100	82%	Y
Block D 2nd Floor	11	Living/ Kitchen	96%	Y	40%	N	200	58%	Y
Block D 3rd Floor	11	Living/ Kitchen	100%	Y	49%	N	200	69%	Y

Table 2: Summary of spaces falling short of compliance

There is a 98.7% compliance rate against Criterion I, a 98.3% compliance rate against Criterion II, and a 99.7% compliance rate against the DCC Appendix 16 recommendations. In total, all units analysed bar 13 comply with Criterion I of the BRE Guide 3rd Edition, Criterion II, and the DCC Appendix 16 targets combined.

Units that fall short of Criterion I, Criterion II or DCC specific targets are compensated with the following measures:

1. Pleasing views out onto a landscaped communal courtyard spaces;
2. Internal amenity space has been provided in the development which includes a concierge, lounge, co-working space and meeting rooms;
3. Additional external amenity space has been provided at roof level. These areas will be well sunlit all year round;
4. Generous floor to ceiling heights have been designed into the project with glazing areas being increased to amplify the quality of daylight received. Floor to ceiling height for the ground floor units have been significantly increased with a corresponding positive impact on the results for these units. Careful consideration has been given to room layout design, generally aiming to allocate storage and circulation areas to the back of rooms, and living spaces to the front - where the highest level of daylight is expected;
5. The architectural design statements and associated layouts highlight units that have been oversized by 10% and have dual aspect views. The location of these units was chosen with access to daylight in mind.

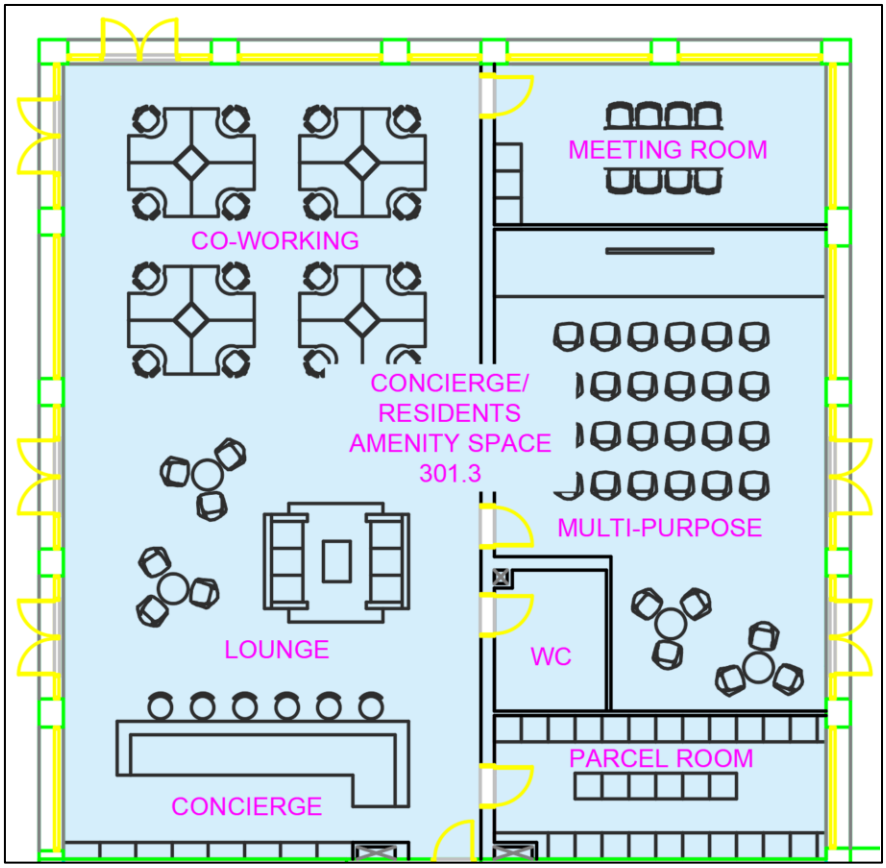

Figure 5. Block A – Concierge/ Residents amenity space

Table 3. BRE Guide 3rd Edition Daylight Results – Block A Concierge/ Residents Amenity space

Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance
Co-working/ Lounge/ Concierge	100%	Y	100%	Y
Meeting room	100%	Y	100%	Y
Multi-purpose	100%	Y	100%	Y

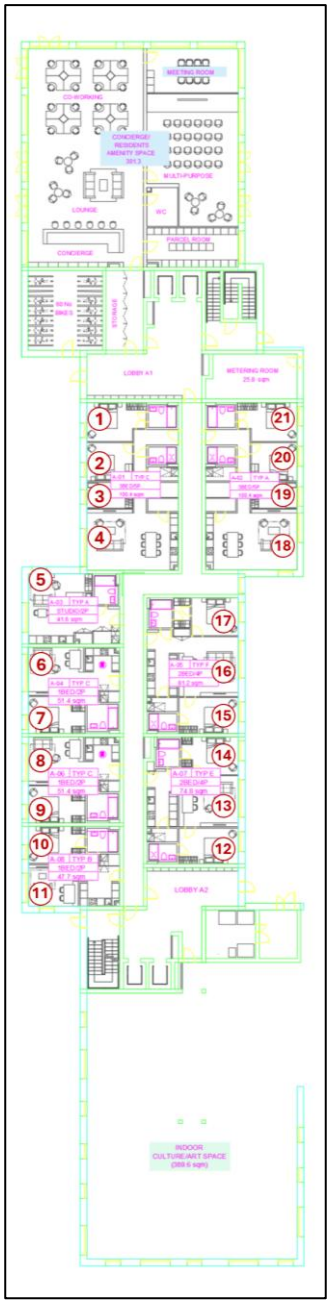

Figure 6. Block A -Ground Floor

Table 4. BRE Guide 3rd Edition Daylight Results – Block A Ground Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Bedroom	100%	Y	100%	Y	100	100%	Y
2	Bedroom	100%	Y	100%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
5	Living/ Kitchen	100%	Y	96%	Y	200	99%	Y
6	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
7	Bedroom	100%	Y	100%	Y	100	100%	Y
8	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	99%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	82%	Y	200	99%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
14	Bedroom	100%	Y	100%	Y	100	100%	Y
15	Bedroom	100%	Y	99%	Y	100	100%	Y
16	Living/ Kitchen	99%	Y	68%	Y	200	99%	Y
17	Bedroom	100%	Y	100%	Y	100	100%	Y
18	Living/ Kitchen	100%	Y	57%	Y	200	77%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Bedroom	100%	Y	98%	Y	100	100%	Y

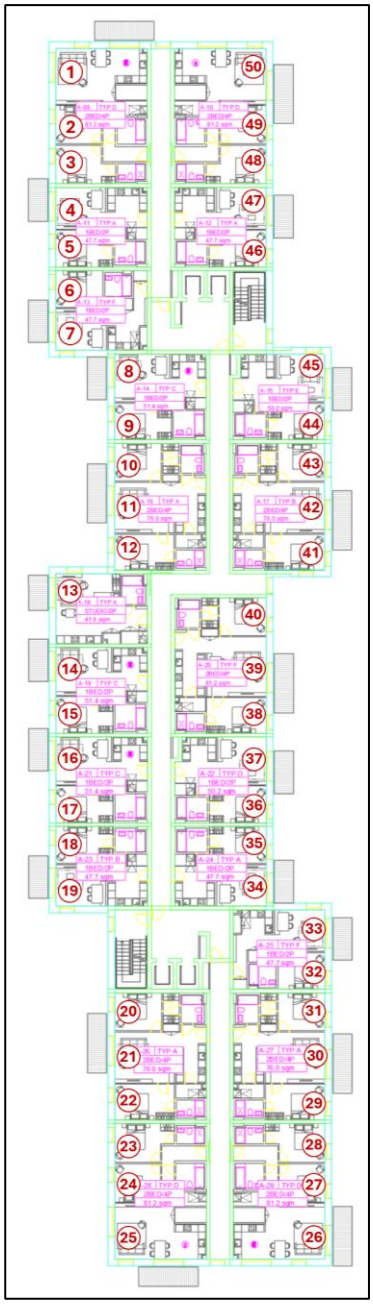

Figure 7. Block A -First Floor

The space that falls short of compliance is part of a unit that offers pleasing views of landscaped and communal courtyard areas and is part of block that offers includes a concierge, lounge, co-working space and meeting rooms.

Table 5. BRE Guide 3rd Edition Daylight Results – Block A First Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	100%	Y	99%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	75%	Y	200	79%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	99%	Y	71%	Y	200	99%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	67%	Y	200	80%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Studio	99%	Y	98%	Y	100	98%	Y
14	Living/ Kitchen	100%	Y	72%	Y	200	100%	Y
15	Bedroom	100%	Y	99%	Y	100	100%	Y
16	Living/ Kitchen	100%	Y	70%	Y	200	70%	Y
17	Bedroom	100%	Y	100%	Y	100	100%	Y
18	Bedroom	100%	Y	99%	Y	100	100%	Y
19	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
20	Bedroom	100%	Y	98%	Y	100	100%	Y
21	Living/ Kitchen	100%	Y	83%	Y	200	100%	Y
22	Bedroom	100%	Y	100%	Y	100	100%	Y
23	Bedroom	100%	Y	100%	Y	100	100%	Y
24	Bedroom	99%	Y	99%	Y	100	99%	Y
25	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
26	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
27	Bedroom	100%	Y	100%	Y	100	100%	Y
28	Bedroom	100%	Y	100%	Y	100	100%	Y
29	Bedroom	100%	Y	98%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	92%	Y	200	100%	Y
31	Bedroom	100%	Y	96%	Y	100	100%	Y
32	Bedroom	100%	Y	100%	Y	100	100%	Y
33	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
34	Living/ Kitchen	100%	Y	67%	Y	200	100%	Y
35	Bedroom	100%	Y	94%	Y	100	100%	Y
36	Bedroom	100%	Y	96%	Y	100	100%	Y
37	Living/ Kitchen	100%	Y	56%	Y	200	74%	Y
38	Bedroom	100%	Y	52%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	62%	Y	200	98%	Y
40	Bedroom	98%	Y	98%	Y	100	98%	Y
41	Bedroom	100%	Y	100%	Y	100	100%	Y
42	Living/ Kitchen	79%	N	39%	N	200	52%	Y
43	Bedroom	100%	Y	77%	Y	100	100%	Y
44	Bedroom	100%	Y	92%	Y	100	100%	Y
45	Living/ Kitchen	100%	Y	62%	Y	200	78%	Y
46	Bedroom	100%	Y	97%	Y	100	100%	Y
47	Living/ Kitchen	100%	Y	53%	Y	200	66%	Y
48	Bedroom	100%	Y	92%	Y	100	100%	Y
49	Bedroom	100%	Y	97%	Y	100	100%	Y
50	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

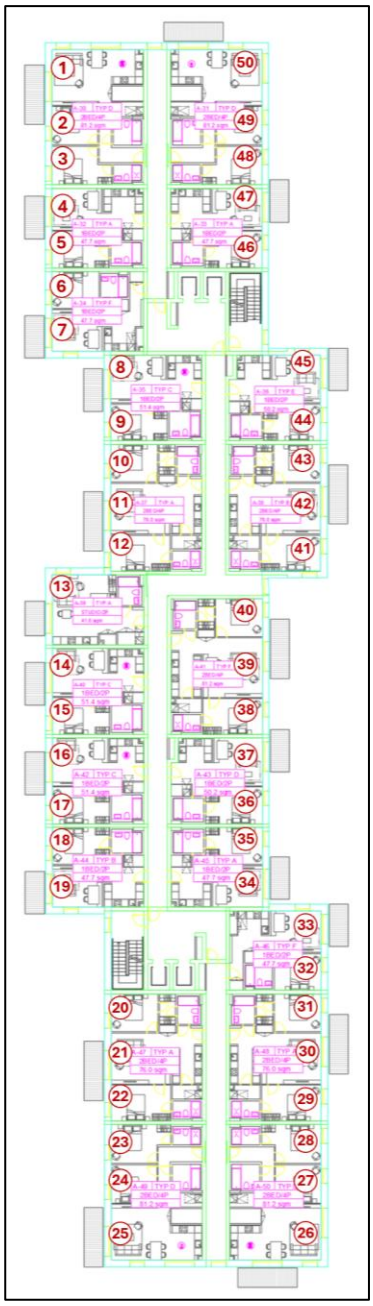

Figure 8. Block A -Second Floor

Table 6. BRE Guide 3rd Edition Daylight Results – Block A Second Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	99%	Y	99%	Y	100	99%	Y
4	Living/ Kitchen	100%	Y	97%	Y	200	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	99%	Y	200	99%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Living/ Kitchen	99%	Y	99%	Y	200	99%	Y
14	Living/ Kitchen	100%	Y	89%	Y	200	100%	Y
15	Bedroom	100%	Y	100%	Y	100	100%	Y
16	Living/ Kitchen	100%	Y	79%	Y	200	100%	Y
17	Bedroom	100%	Y	100%	Y	100	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Living/ Kitchen	100%	Y	94%	Y	200	100%	Y
22	Bedroom	100%	Y	100%	Y	100	100%	Y
23	Bedroom	100%	Y	100%	Y	100	100%	Y
24	Bedroom	100%	Y	99%	Y	100	100%	Y
25	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
26	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
27	Bedroom	100%	Y	100%	Y	100	100%	Y
28	Bedroom	100%	Y	100%	Y	100	100%	Y
29	Bedroom	100%	Y	99%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	94%	Y	200	100%	Y
31	Bedroom	100%	Y	100%	Y	100	100%	Y
32	Bedroom	100%	Y	99%	Y	100	100%	Y
33	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
34	Living/ Kitchen	100%	Y	94%	Y	200	100%	Y
35	Bedroom	100%	Y	96%	Y	100	100%	Y
36	Bedroom	100%	Y	98%	Y	100	100%	Y
37	Living/ Kitchen	100%	Y	57%	Y	200	73%	Y
38	Bedroom	100%	Y	63%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	64%	Y	200	93%	Y
40	Bedroom	98%	Y	98%	Y	100	98%	Y
41	Bedroom	100%	Y	100%	Y	100	100%	Y
42	Living/ Kitchen	100%	Y	97%	Y	200	99%	Y
43	Bedroom	100%	Y	95%	Y	100	100%	Y
44	Bedroom	100%	Y	94%	Y	100	100%	Y
45	Living/ Kitchen	100%	Y	88%	Y	200	99%	Y
46	Living/ Kitchen	100%	Y	98%	Y	200	86%	Y
47	Bedroom	100%	Y	66%	Y	100	100%	Y
48	Bedroom	100%	Y	96%	Y	100	100%	Y
49	Bedroom	100%	Y	98%	Y	100	100%	Y
50	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

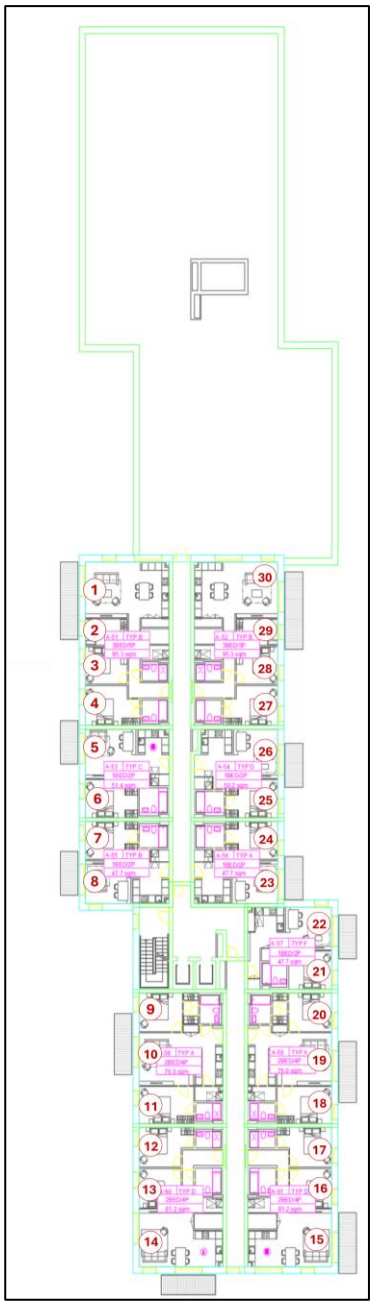

Figure 9. Block A -Third Floor

Table 7. BRE Guide 3rd Edition Daylight Results – Block A Third Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	100%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Bedroom	100%	Y	100%	Y	100	100%	Y
5	Living/ Kitchen	100%	Y	91%	Y	200	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Bedroom	100%	Y	99%	Y	100	100%	Y
8	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
11	Bedroom	100%	Y	100%	Y	100	100%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Bedroom	100%	Y	98%	Y	100	100%	Y
14	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
15	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
16	Bedroom	100%	Y	98%	Y	100	100%	Y
17	Bedroom	100%	Y	100%	Y	100	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
23	Living/ Kitchen	100%	Y	78%	Y	200	100%	Y
24	Bedroom	100%	Y	98%	Y	100	100%	Y
25	Bedroom	100%	Y	100%	Y	100	100%	Y
26	Living/ Kitchen	100%	Y	90%	Y	200	100%	Y
27	Bedroom	100%	Y	94%	Y	100	100%	Y
28	Bedroom	98%	Y	98%	Y	100	98%	Y
29	Bedroom	100%	Y	100%	Y	100	99%	Y
30	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

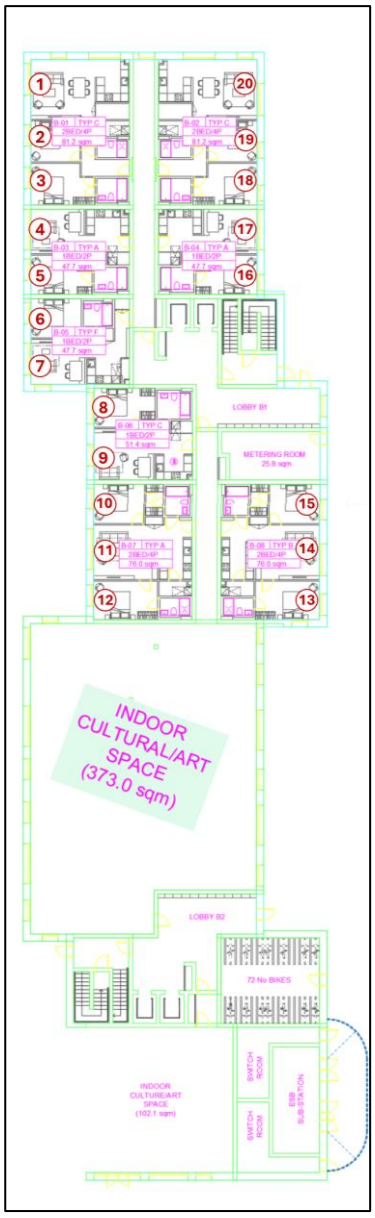

Figure 10. Block B -Ground Floor

Table 8. BRE Guide 3rd Edition Daylight Results – Block B Ground Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	100%	Y	100	100%	Y
3	Bedroom	100%	Y	98%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	78%	Y	200	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	84%	Y	200	99%	Y
8	Bedroom	100%	Y	100%	Y	100	100%	Y
9	Living/ Kitchen	100%	Y	70%	Y	200	89%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	80%	Y	200	100%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Bedroom	100%	Y	100%	Y	100	100%	Y
14	Living/ Kitchen	100%	Y	51%	Y	200	68%	Y
15	Bedroom	100%	Y	89%	Y	100	100%	Y
16	Bedroom	100%	Y	94%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	70%	Y	200	92%	Y
18	Bedroom	100%	Y	52%	Y	100	100%	Y
19	Bedroom	99%	Y	76%	Y	100	99%	Y
20	Living/ Kitchen	99%	Y	99%	Y	200	99%	Y

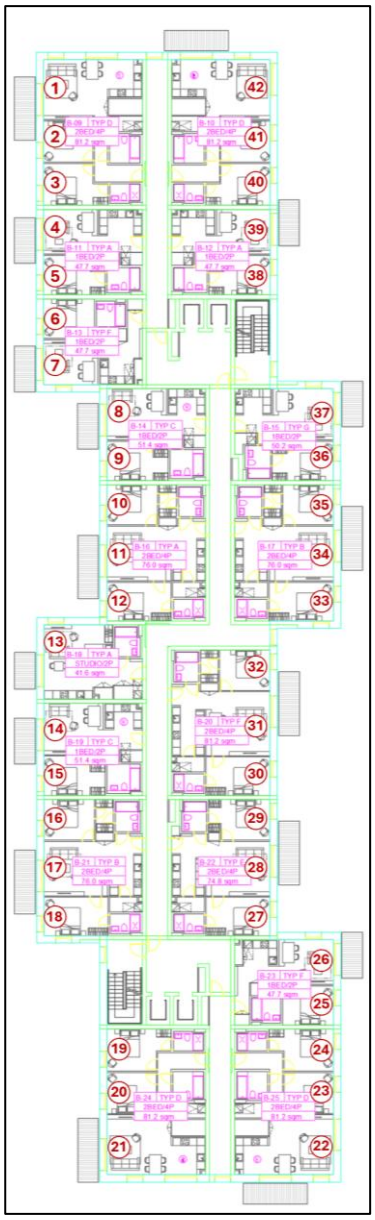

Figure 11. Block B -First Floor

The space that falls short of compliance is part of a unit that offers pleasing views of landscaped and communal courtyard areas.

Table 9. BRE Guide 3rd Edition Daylight Results – Block B First Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	99%	Y	100	100%	Y
3	Bedroom	100%	Y	98%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	63%	Y	200	79%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	97%	Y	200	100%	Y
8	Living/ Kitchen	99%	Y	61%	Y	200	97%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	95%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	58%	Y	200	80%	Y
12	Bedroom	100%	Y	62%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	78%	Y	200	95%	Y
14	Living/ Kitchen	99%	Y	55%	Y	200	67%	Y
15	Bedroom	100%	Y	97%	Y	100	100%	Y
16	Bedroom	100%	Y	98%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	57%	Y	200	75%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
23	Bedroom	100%	Y	98%	Y	100	100%	Y
24	Bedroom	100%	Y	94%	Y	100	100%	Y
25	Bedroom	100%	Y	98%	Y	100	100%	Y
26	Living/ Kitchen	100%	Y	67%	Y	200	86%	Y
27	Bedroom	100%	Y	61%	Y	100	100%	Y
28	Living/ Kitchen	97%	Y	95%	Y	200	99%	Y
29	Bedroom	100%	Y	77%	Y	100	100%	Y
30	Bedroom	100%	Y	63%	Y	100	100%	Y
31	Living/ Kitchen	100%	Y	54%	Y	200	95%	Y
32	Bedroom	100%	Y	100%	Y	100	100%	Y
33	Bedroom	100%	Y	99%	Y	100	100%	Y
34	Living/ Kitchen	73%	N	38%	N	200	50%	Y
35	Bedroom	100%	Y	71%	Y	100	100%	Y
36	Bedroom	100%	Y	77%	Y	100	100%	Y
37	Living/ Kitchen	100%	Y	64%	Y	200	78%	Y
38	Bedroom	100%	Y	95%	Y	100	100%	Y
39	Living/ Kitchen	96%	Y	51%	Y	200	62%	Y
40	Bedroom	100%	Y	94%	Y	100	100%	Y
41	Bedroom	100%	Y	90%	Y	100	100%	Y
42	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

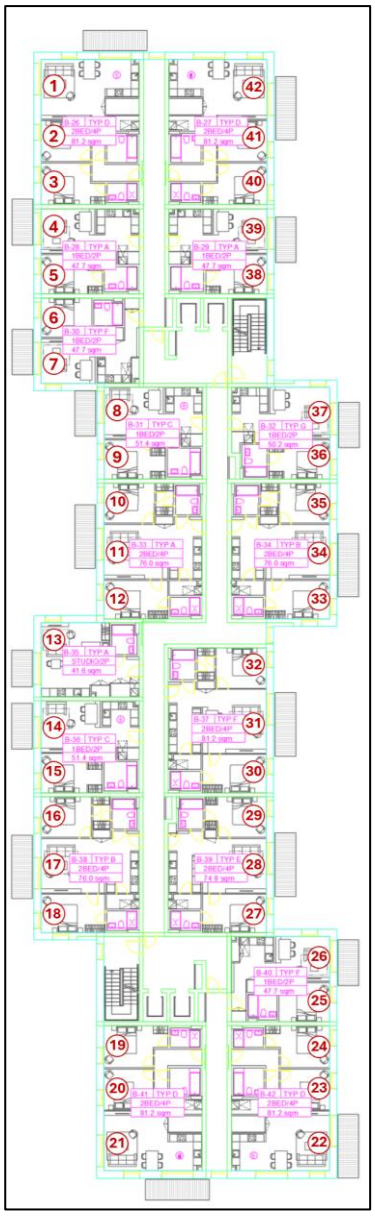

Figure 12. Block B -Second Floor

The space that slightly falls short of compliance with Criterion II is part of a unit that offers pleasing views of landscaped and communal courtyard areas.

Table 10. BRE Guide 3rd Edition Daylight Results – Block B Second Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	99%	Y	100	100%	Y
3	Bedroom	100%	Y	98%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	70%	Y	200	99%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	98%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	99%	Y	96%	Y	200	99%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	98%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	53%	Y	200	76%	Y
12	Bedroom	100%	Y	70%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	92%	Y	200	99%	Y
14	Living/ Kitchen	100%	Y	61%	Y	200	75%	Y
15	Bedroom	100%	Y	100%	Y	100	100%	Y
16	Bedroom	100%	Y	98%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	58%	Y	200	75%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
23	Bedroom	100%	Y	98%	Y	100	100%	Y
24	Bedroom	100%	Y	96%	Y	100	100%	Y
25	Bedroom	100%	Y	98%	Y	100	100%	Y
26	Living/ Kitchen	100%	Y	73%	Y	200	92%	Y
27	Bedroom	100%	Y	55%	Y	100	100%	Y
28	Living/ Kitchen	100%	Y	53%	Y	200	65%	Y
29	Bedroom	100%	Y	86%	Y	100	100%	Y
30	Bedroom	100%	Y	75%	Y	100	100%	Y
31	Living/ Kitchen	100%	Y	56%	Y	200	94%	Y
32	Bedroom	100%	Y	98%	Y	100	100%	Y
33	Bedroom	100%	Y	100%	Y	100	100%	Y
34	Living/ Kitchen	97%	Y	43%	N	200	58%	Y
35	Bedroom	100%	Y	87%	Y	100	100%	Y
36	Bedroom	100%	Y	94%	Y	100	100%	Y
37	Living/ Kitchen	100%	Y	71%	Y	200	91%	Y
38	Bedroom	100%	Y	98%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
40	Bedroom	100%	Y	96%	Y	100	100%	Y
41	Bedroom	100%	Y	96%	Y	100	100%	Y
42	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

Figure 13. Block B -Third Floor

Table 11. BRE Guide 3rd Edition Daylight Results – Block B Third Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	99%	Y	99%	Y	100	99%	Y
3	Bedroom	100%	Y	99%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	99%	Y	99%	Y	200	99%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
12	Bedroom	100%	Y	96%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	96%	Y	200	100%	Y
14	Living/ Kitchen	100%	Y	66%	Y	200	96%	Y
15	Bedroom	100%	Y	100%	Y	100	100%	Y
16	Bedroom	100%	Y	97%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	67%	Y	200	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
23	Bedroom	100%	Y	99%	Y	100	100%	Y
24	Bedroom	100%	Y	96%	Y	100	100%	Y
25	Bedroom	100%	Y	98%	Y	100	100%	Y
26	Living/ Kitchen	100%	Y	83%	Y	200	100%	Y
27	Bedroom	100%	Y	60%	Y	100	100%	Y
28	Living/ Kitchen	100%	Y	62%	Y	200	63%	Y
29	Bedroom	100%	Y	98%	Y	100	100%	Y
30	Bedroom	100%	Y	95%	Y	100	100%	Y
31	Living/ Kitchen	100%	Y	60%	Y	200	94%	Y
32	Bedroom	100%	Y	96%	Y	100	100%	Y
33	Bedroom	100%	Y	100%	Y	100	100%	Y
34	Living/ Kitchen	100%	Y	62%	Y	200	92%	Y
35	Bedroom	100%	Y	97%	Y	100	100%	Y
36	Bedroom	100%	Y	97%	Y	100	100%	Y
37	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
38	Bedroom	100%	Y	98%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
40	Bedroom	100%	Y	97%	Y	100	100%	Y
41	Bedroom	100%	Y	96%	Y	100	100%	Y
42	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

Figure 14. Block B -Fourth Floor

Table 12. BRE Guide 3rd Edition Daylight Results – Block B Fourth Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	98%	Y	96%	Y	100	98%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Bedroom	100%	Y	98%	Y	100	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
7	Bedroom	100%	Y	100%	Y	100	100%	Y
8	Bedroom	100%	Y	99%	Y	100	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
11	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
12	Bedroom	100%	Y	98%	Y	100	100%	Y
13	Bedroom	100%	Y	97%	Y	100	100%	Y
14	Bedroom	100%	Y	98%	Y	100	100%	Y
15	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
16	Bedroom	100%	Y	73%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	87%	Y	200	100%	Y
18	Bedroom	100%	Y	99%	Y	100	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

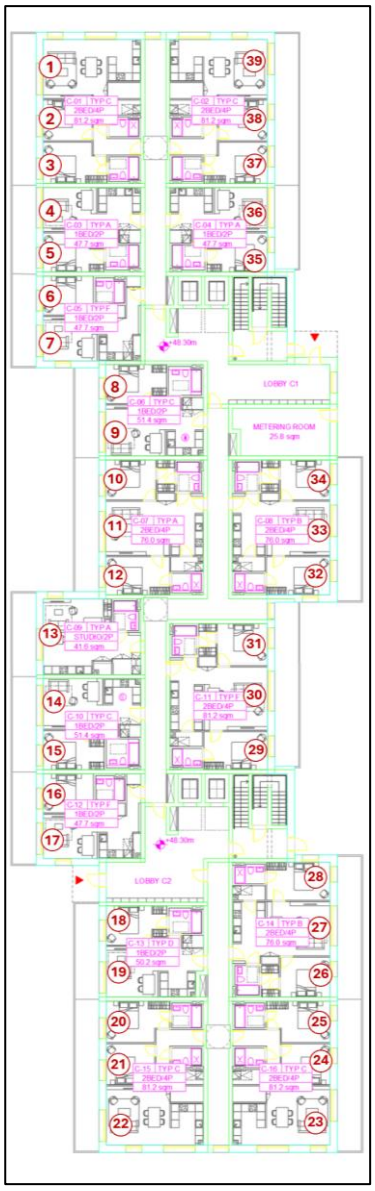

Figure 15. Block C -Ground Floor

Table 13. BRE Guide 3rd Edition Daylight Results – Block C Ground Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	99%	Y	98%	Y	200	99%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	73%	Y	200	98%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	99%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
8	Bedroom	100%	Y	100%	Y	100	100%	Y
9	Living/ Kitchen	100%	Y	89%	Y	200	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	80%	Y	200	99%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Living/ Kitchen	99%	Y	91%	Y	200	99%	Y
14	Living/ Kitchen	100%	Y	67%	Y	200	86%	Y
15	Bedroom	100%	Y	98%	Y	100	100%	Y
16	Bedroom	100%	Y	100%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Living/ Kitchen	99%	Y	85%	Y	200	85%	Y
20	Bedroom	99%	Y	98%	Y	100	99%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
23	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
24	Bedroom	100%	Y	98%	Y	100	100%	Y
25	Bedroom	100%	Y	96%	Y	100	100%	Y
26	Bedroom	100%	Y	98%	Y	100	100%	Y
27	Living/ Kitchen	100%	Y	98%	Y	200	98%	Y
28	Bedroom	99%	Y	99%	Y	100	99%	Y
29	Bedroom	100%	Y	100%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	75%	Y	200	100%	Y
31	Bedroom	100%	Y	100%	Y	100	100%	Y
32	Bedroom	100%	Y	100%	Y	100	100%	Y
33	Living/ Kitchen	100%	Y	58%	Y	200	92%	Y
34	Bedroom	100%	Y	90%	Y	100	100%	Y
35	Bedroom	100%	Y	97%	Y	100	100%	Y
36	Living/ Kitchen	100%	Y	73%	Y	200	95%	Y
37	Bedroom	100%	Y	99%	Y	100	100%	Y
38	Bedroom	100%	Y	94%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	99%	Y	200	99%	Y

Figure 16. Block C -First Floor

The units with spaces that fall short of compliance have pleasing views of landscaped and communal courtyard areas, in addition to a roof garden within the apartment block.

Table 14. BRE Guide 3rd Edition Daylight Results – Block C First Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	100%	Y	100	100%	Y
3	Bedroom	100%	Y	96%	Y	100	100%	Y
4	Living/ Kitchen	98%	Y	54%	Y	200	66%	Y
5	Bedroom	100%	Y	98%	Y	100	100%	Y
6	Bedroom	100%	Y	93%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	72%	Y	200	91%	Y
8	Living/ Kitchen	100%	Y	43%	N	200	64%	Y
9	Bedroom	100%	Y	98%	Y	100	100%	Y
10	Bedroom	100%	Y	95%	Y	100	100%	Y
11	Living/ Kitchen	99%	Y	54%	Y	200	67%	Y
12	Bedroom	100%	Y	99%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	69%	Y	200	95%	Y
14	Living/ Kitchen	79%	N	42%	N	200	53%	Y
15	Bedroom	100%	Y	95%	Y	100	100%	Y
16	Bedroom	100%	Y	74%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	72%	Y	200	98%	Y
18	Bedroom	100%	Y	98%	Y	100	100%	Y
19	Living/ Kitchen	100%	Y	53%	Y	200	68%	Y
20	Bedroom	100%	Y	98%	Y	100	100%	Y
21	Bedroom	100%	Y	91%	Y	100	100%	Y
22	Bedroom	99%	Y	98%	Y	100	99%	Y
23	Living/ Kitchen	100%	Y	99%	Y	200	99%	Y
24	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
25	Bedroom	100%	Y	99%	Y	100	100%	Y
26	Bedroom	100%	Y	98%	Y	100	100%	Y
27	Bedroom	100%	Y	99%	Y	100	100%	Y
28	Living/ Kitchen	100%	Y	57%	Y	200	97%	Y
29	Bedroom	100%	Y	79%	Y	100	100%	Y
30	Bedroom	100%	Y	89%	Y	100	100%	Y
31	Living/ Kitchen	100%	Y	61%	Y	200	95%	Y
32	Bedroom	100%	Y	97%	Y	100	100%	Y
33	Bedroom	100%	Y	99%	Y	100	100%	Y
34	Living/ Kitchen	72%	N	33%	N	200	45%	N
35	Bedroom	100%	Y	55%	Y	100	100%	Y
36	Bedroom	100%	Y	73%	Y	100	99%	Y
37	Living/ Kitchen	99%	Y	56%	Y	200	69%	Y
38	Bedroom	100%	Y	53%	Y	100	87%	Y
39	Living/ Kitchen	85%	N	44%	N	200	56%	Y
40	Bedroom	100%	Y	91%	Y	100	96%	Y
41	Bedroom	100%	Y	93%	Y	100	98%	Y
42	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y

Figure 17. Block C -Second Floor

The units with spaces that fall short of compliance have pleasing views of landscaped and communal courtyard areas, in addition to a roof garden within the apartment block.

Table 15. BRE Guide 3rd Edition Daylight Results – Block C Second Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	100%	Y	99%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	63%	Y	200	78%	Y
5	Bedroom	100%	Y	98%	Y	100	100%	Y
6	Bedroom	100%	Y	98%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	86%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	56%	Y	200	73%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	97%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	61%	Y	200	80%	Y
12	Bedroom	100%	Y	96%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	87%	Y	200	98%	Y
14	Living/ Kitchen	86%	N	51%	Y	200	62%	Y
15	Bedroom	100%	Y	96%	Y	100	100%	Y
16	Bedroom	100%	Y	96%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	79%	Y	200	99%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Living/ Kitchen	100%	Y	58%	Y	200	76%	Y
20	Bedroom	100%	Y	99%	Y	100	100%	Y
21	Bedroom	100%	Y	98%	Y	100	100%	Y
22	Bedroom	99%	Y	97%	Y	100	99%	Y
23	Living/ Kitchen	100%	Y	99%	Y	200	99%	Y
24	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
25	Bedroom	100%	Y	98%	Y	100	100%	Y
26	Bedroom	100%	Y	98%	Y	100	100%	Y
27	Bedroom	100%	Y	100%	Y	100	100%	Y
28	Living/ Kitchen	100%	Y	60%	Y	200	96%	Y
29	Bedroom	100%	Y	90%	Y	100	100%	Y
30	Bedroom	100%	Y	93%	Y	100	100%	Y
31	Living/ Kitchen	100%	Y	64%	Y	200	93%	Y
32	Bedroom	100%	Y	98%	Y	100	100%	Y
33	Bedroom	100%	Y	100%	Y	100	100%	Y
34	Living/ Kitchen	72%	N	35%	N	200	46%	N
35	Bedroom	100%	Y	58%	Y	100	89%	Y
36	Bedroom	100%	Y	74%	Y	100	99%	Y
37	Living/ Kitchen	100%	Y	58%	Y	200	69%	Y
38	Bedroom	100%	Y	62%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	53%	Y	200	64%	Y
40	Bedroom	100%	Y	95%	Y	100	100%	Y
41	Bedroom	100%	Y	94%	Y	100	100%	Y
42	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

Figure 18. Block C -Third Floor

Table 16. BRE Guide 3rd Edition Daylight Results – Block C Third Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	100%	Y	99%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	86%	Y	200	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	94%	Y	200	100%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	96%	Y	200	100%	Y
14	Living/ Kitchen	100%	Y	59%	Y	200	73%	Y
15	Bedroom	100%	Y	97%	Y	100	100%	Y
16	Bedroom	100%	Y	99%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	97%	Y	200	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Living/ Kitchen	100%	Y	74%	Y	200	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Bedroom	100%	Y	98%	Y	100	100%	Y
22	Bedroom	99%	Y	98%	Y	100	99%	Y
23	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
24	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
25	Bedroom	100%	Y	98%	Y	100	100%	Y
26	Bedroom	100%	Y	97%	Y	100	100%	Y
27	Bedroom	100%	Y	100%	Y	100	100%	Y
28	Living/ Kitchen	100%	Y	60%	Y	200	98%	Y
29	Bedroom	100%	Y	93%	Y	100	100%	Y
30	Bedroom	100%	Y	96%	Y	100	100%	Y
31	Living/ Kitchen	100%	Y	96%	Y	200	98%	Y
32	Bedroom	100%	Y	98%	Y	100	100%	Y
33	Bedroom	100%	Y	50%	Y	100	100%	Y
34	Living/ Kitchen	100%	Y	52%	Y	200	65%	Y
35	Bedroom	100%	Y	88%	Y	100	100%	Y
36	Bedroom	100%	Y	98%	Y	100	100%	Y
37	Living/ Kitchen	99%	Y	50%	Y	200	87%	Y
38	Bedroom	100%	Y	92%	Y	100	100%	Y
39	Living/ Kitchen	100%	Y	62%	Y	200	77%	Y
40	Bedroom	100%	Y	95%	Y	100	100%	Y
41	Bedroom	100%	Y	95%	Y	100	100%	Y
42	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

Figure 19. Block C -Fourth Floor

Table 17. BRE Guide 3rd Edition Daylight Results – Block C Fourth Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	100%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Bedroom	100%	Y	100%	Y	100	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
7	Bedroom	100%	Y	100%	Y	100	100%	Y
8	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Bedroom	100%	Y	99%	Y	100	100%	Y
12	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
13	Living/ Kitchen	100%	Y	99%	Y	200	99%	Y
14	Bedroom	100%	Y	99%	Y	100	100%	Y
15	Bedroom	100%	Y	98%	Y	100	100%	Y
16	Bedroom	100%	Y	100%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	76%	Y	200	100%	Y
18	Bedroom	100%	Y	98%	Y	100	100%	Y
19	Bedroom	100%	Y	99%	Y	100	100%	Y
20	Bedroom	100%	Y	100%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

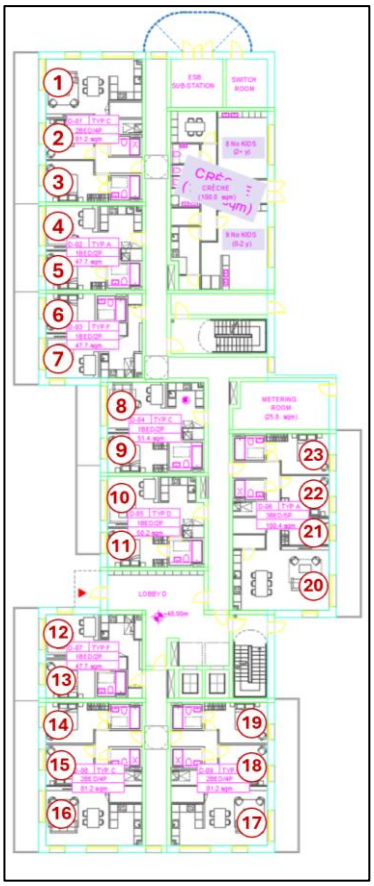

Figure 20. Block D -Ground Floor

Table 18. BRE Guide 3rd Edition Daylight Results – Block D Ground Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	99%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	71%	Y	200	98%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	85%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	83%	Y	200	100%	Y
9	Bedroom	100%	Y	99%	Y	100	100%	Y
10	Living/ Kitchen	100%	Y	80%	Y	200	100%	Y
11	Bedroom	99%	Y	98%	Y	100	99%	Y
12	Living/ Kitchen	100%	Y	80%	Y	200	100%	Y
13	Bedroom	100%	Y	100%	Y	100	100%	Y
14	Bedroom	100%	Y	96%	Y	100	100%	Y
15	Bedroom	100%	Y	99%	Y	100	100%	Y
16	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Bedroom	100%	Y	98%	Y	100	100%	Y
23	Bedroom	100%	Y	97%	Y	100	100%	Y

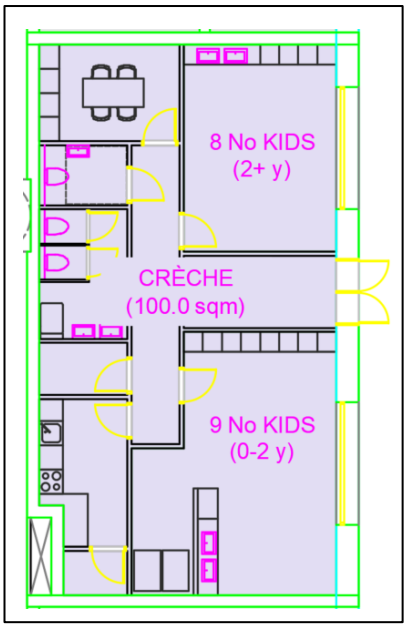

Figure 21. Block D -Crèche

Table 19. BRE Guide 3rd Edition Daylight Results – Block D Creche

Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance
8 No. Kids	100%	Y	100%	Y
9 No. Kids	100%	Y	97%	Y

Figure 22. Block D -First Floor

The units with spaces that fall short of compliance have pleasing views of landscaped and communal courtyard areas, in addition to generous expanded glazing to enhance natural daylight. The layouts have been thoughtfully designed, placing storage and circulation areas at the back and living spaces at the front to maximise daylight exposure.

Table 20. BRE Guide 3rd Edition Daylight Results – Block D First Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
2	Bedroom	95%	Y	80%	Y	100	95%	Y
3	Bedroom	99%	Y	96%	Y	100	99%	Y
4	Living/ Kitchen	83%	N	54%	Y	200	65%	Y
5	Bedroom	100%	Y	95%	Y	100	100%	Y
6	Bedroom	100%	Y	91%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	87%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	63%	Y	200	100%	Y
9	Bedroom	100%	Y	99%	Y	100	100%	Y
10	Bedroom	100%	Y	90%	Y	100	100%	Y
11	Living/ Kitchen	77%	N	36%	N	200	51%	Y
12	Bedroom	100%	Y	46%	N	100	82%	Y
13	Living/ Kitchen	100%	Y	76%	Y	200	90%	Y
14	Bedroom	100%	Y	78%	Y	100	100%	Y
15	Bedroom	100%	Y	73%	Y	100	100%	Y
16	Bedroom	100%	Y	97%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	98%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	70%	Y	200	100%	Y
23	Bedroom	100%	Y	100%	Y	100	100%	Y
24	Bedroom	100%	Y	100%	Y	100	100%	Y
25	Living/ Kitchen	99%	Y	99%	Y	200	99%	Y
26	Bedroom	100%	Y	100%	Y	100	100%	Y
27	Living/ Kitchen	100%	Y	84%	Y	200	100%	Y
28	Bedroom	100%	Y	98%	Y	100	100%	Y
29	Bedroom	100%	Y	98%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

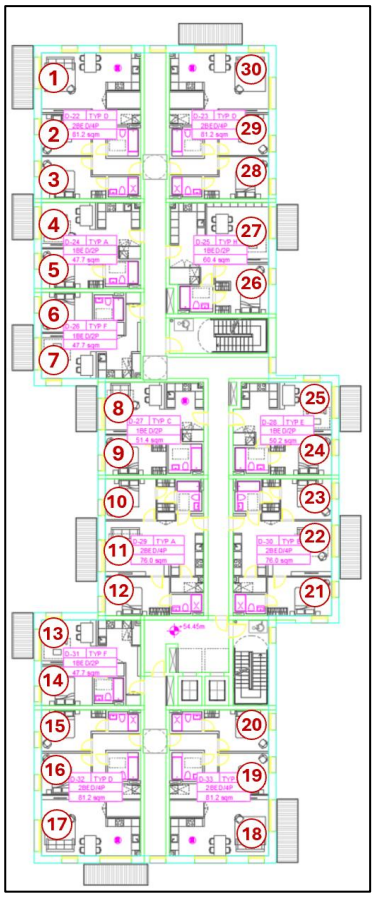

Figure 23. Block D -Second Floor

The space that slightly fall short of compliance with Criterion II have pleasing views of landscaped and communal courtyard areas.

Table 21. BRE Guide 3rd Edition Daylight Results – Block D Second Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
2	Bedroom	100%	Y	89%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	99%	Y	61%	Y	200	73%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	98%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	95%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	68%	Y	200	87%	Y
9	Bedroom	99%	Y	94%	Y	100	99%	Y
10	Bedroom	100%	Y	94%	Y	100	100%	Y
11	Living/ Kitchen	96%	Y	40%	N	200	58%	Y
12	Bedroom	100%	Y	60%	Y	100	100%	Y
13	Living/ Kitchen	100%	Y	82%	Y	200	98%	Y
14	Bedroom	100%	Y	96%	Y	100	100%	Y
15	Bedroom	100%	Y	82%	Y	100	100%	Y
16	Bedroom	100%	Y	97%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	96%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	68%	Y	200	100%	Y
23	Bedroom	100%	Y	100%	Y	100	100%	Y
24	Bedroom	100%	Y	100%	Y	100	100%	Y
25	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
26	Bedroom	100%	Y	98%	Y	100	100%	Y
27	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
28	Bedroom	100%	Y	99%	Y	100	100%	Y
29	Bedroom	100%	Y	98%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

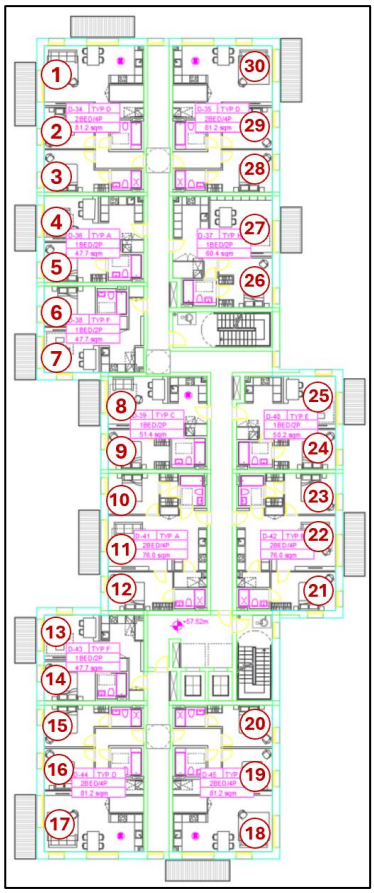

Figure 24. Block D -Third Floor

The space that slightly fall short of compliance with Criterion II have pleasing views of landscaped and communal courtyard areas.

Table 22. BRE Guide 3rd Edition Daylight Results – Block D Third Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
2	Bedroom	100%	Y	99%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	99%	Y	69%	Y	200	83%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	98%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	74%	Y	200	100%	Y
9	Bedroom	99%	Y	98%	Y	100	99%	Y
10	Bedroom	100%	Y	92%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	49%	N	200	69%	Y
12	Bedroom	99%	Y	55%	Y	100	99%	Y
13	Living/ Kitchen	100%	Y	96%	Y	200	100%	Y
14	Bedroom	100%	Y	100%	Y	100	100%	Y
15	Bedroom	100%	Y	97%	Y	100	100%	Y
16	Bedroom	100%	Y	98%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	98%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	69%	Y	200	100%	Y
23	Bedroom	100%	Y	100%	Y	100	100%	Y
24	Bedroom	100%	Y	100%	Y	100	100%	Y
25	Living/ Kitchen	99%	Y	99%	Y	200	99%	Y
26	Bedroom	100%	Y	100%	Y	100	100%	Y
27	Living/ Kitchen	100%	Y	81%	Y	200	100%	Y
28	Bedroom	100%	Y	98%	Y	100	100%	Y
29	Bedroom	100%	Y	100%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

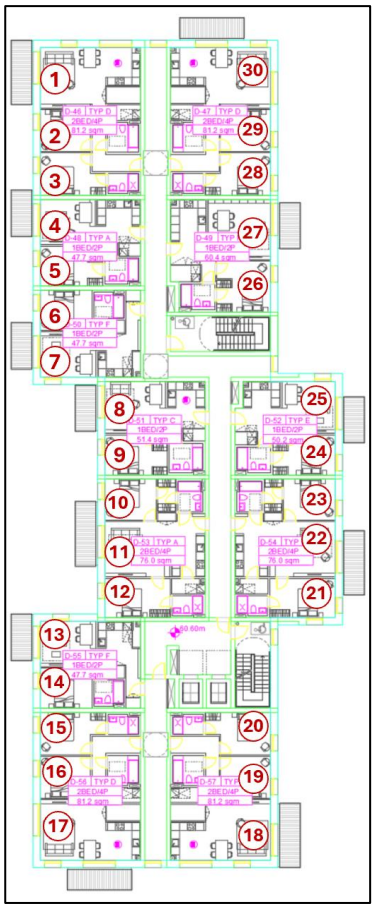

Figure 25. Block D -Fourth Floor

Table 23. BRE Guide 3rd Edition Daylight Results – Block D Fourth Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	99%	Y	200	99%	Y
2	Bedroom	100%	Y	100%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	99%	Y	93%	Y	200	99%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	86%	Y	200	100%	Y
9	Bedroom	99%	Y	98%	Y	100	99%	Y
10	Bedroom	100%	Y	95%	Y	100	100%	Y
11	Living/ Kitchen	100%	Y	63%	Y	200	100%	Y
12	Bedroom	99%	Y	78%	Y	100	99%	Y
13	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
14	Bedroom	100%	Y	98%	Y	100	100%	Y
15	Bedroom	100%	Y	98%	Y	100	100%	Y
16	Bedroom	100%	Y	98%	Y	100	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
19	Bedroom	100%	Y	100%	Y	100	100%	Y
20	Bedroom	100%	Y	98%	Y	100	100%	Y
21	Bedroom	100%	Y	100%	Y	100	100%	Y
22	Living/ Kitchen	100%	Y	71%	Y	200	100%	Y
23	Bedroom	100%	Y	99%	Y	100	100%	Y
24	Bedroom	100%	Y	98%	Y	100	100%	Y
25	Living/ Kitchen	99%	Y	99%	Y	200	99%	Y
26	Bedroom	100%	Y	100%	Y	100	100%	Y
27	Living/ Kitchen	100%	Y	95%	Y	200	100%	Y
28	Bedroom	100%	Y	100%	Y	100	100%	Y
29	Bedroom	100%	Y	99%	Y	100	100%	Y
30	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

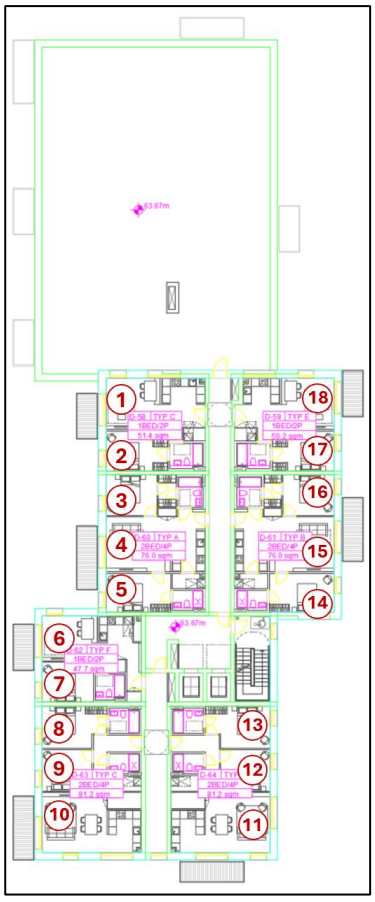

Figure 26. Block D -Fifth Floor

Table 24. BRE Guide 3rd Edition Daylight Results – Block D Fifth Floor

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	100%	Y	100%	Y	100	100%	Y
4	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
5	Bedroom	100%	Y	99%	Y	100	100%	Y
6	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
7	Bedroom	100%	Y	100%	Y	100	100%	Y
8	Bedroom	100%	Y	98%	Y	100	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
11	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
12	Bedroom	100%	Y	99%	Y	100	100%	Y
13	Bedroom	100%	Y	98%	Y	100	100%	Y
14	Bedroom	100%	Y	100%	Y	100	100%	Y
15	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
16	Bedroom	100%	Y	100%	Y	100	100%	Y
17	Bedroom	100%	Y	100%	Y	100	100%	Y
18	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y

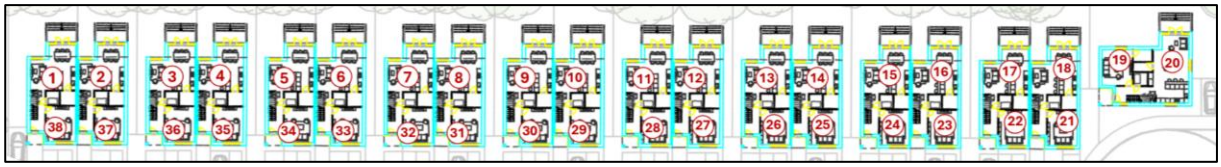

Figure 27. Houses – Ground floor

Table 25. BRE 3rd Edition Daylight Results – Ground Floor of Houses

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
2	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
3	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
4	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
5	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
6	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
7	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
8	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
9	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
10	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
11	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
12	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
13	Living/ Kitchen	100%	Y	99%	Y	200	100%	Y
14	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
15	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
16	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
17	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
18	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
19	Living Room	100%	Y	100%	Y	150	100%	Y
20	Living/ Kitchen	100%	Y	100%	Y	200	100%	Y
21	Living Room	100%	Y	100%	Y	150	100%	Y
22	Living Room	100%	Y	100%	Y	150	100%	Y
23	Living Room	100%	Y	100%	Y	150	100%	Y
24	Living Room	100%	Y	100%	Y	150	100%	Y
25	Living Room	100%	Y	99%	Y	150	100%	Y
26	Living Room	100%	Y	99%	Y	150	100%	Y
27	Living Room	100%	Y	99%	Y	150	100%	Y
28	Living Room	100%	Y	99%	Y	150	100%	Y
29	Living Room	100%	Y	99%	Y	150	100%	Y
30	Living Room	100%	Y	100%	Y	150	100%	Y
31	Living Room	100%	Y	98%	Y	150	98%	Y
32	Living Room	100%	Y	100%	Y	150	100%	Y
33	Living Room	100%	Y	100%	Y	150	100%	Y
34	Living Room	100%	Y	100%	Y	150	100%	Y
35	Living Room	100%	Y	100%	Y	150	100%	Y
36	Living Room	100%	Y	100%	Y	150	100%	Y
37	Living Room	100%	Y	100%	Y	150	100%	Y
38	Living Room	100%	Y	100%	Y	150	100%	Y

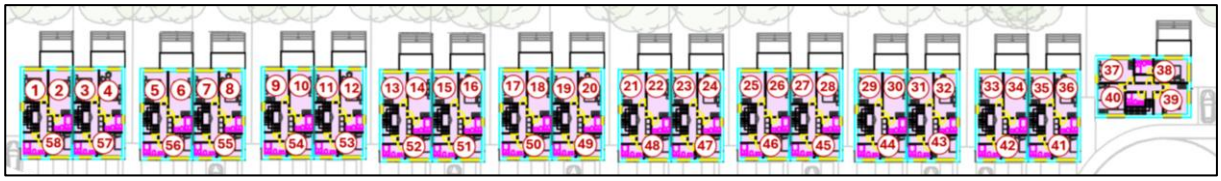

Figure 28. Houses – First floor

Table 26. BRE 3rd Edition Daylight Results – First Floor of Houses

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Bedroom	100%	Y	98%	Y	100	100%	Y
2	Bedroom	100%	Y	98%	Y	100	100%	Y
3	Bedroom	100%	Y	71%	Y	100	100%	Y
4	Bedroom	100%	Y	73%	Y	100	100%	Y
5	Bedroom	100%	Y	98%	Y	100	100%	Y
6	Bedroom	100%	Y	98%	Y	100	100%	Y
7	Bedroom	100%	Y	74%	Y	100	100%	Y
8	Bedroom	100%	Y	66%	Y	100	100%	Y
9	Bedroom	100%	Y	98%	Y	100	100%	Y
10	Bedroom	100%	Y	72%	Y	100	100%	Y
11	Bedroom	100%	Y	85%	Y	100	100%	Y
12	Bedroom	100%	Y	99%	Y	100	100%	Y
13	Bedroom	100%	Y	98%	Y	100	100%	Y
14	Bedroom	100%	Y	54%	Y	100	100%	Y
15	Bedroom	100%	Y	72%	Y	100	100%	Y
16	Bedroom	100%	Y	73%	Y	100	100%	Y
17	Bedroom	100%	Y	98%	Y	100	100%	Y
18	Bedroom	100%	Y	98%	Y	100	100%	Y
19	Bedroom	100%	Y	73%	Y	100	100%	Y
20	Bedroom	100%	Y	71%	Y	100	100%	Y
21	Bedroom	100%	Y	97%	Y	100	100%	Y
22	Bedroom	100%	Y	59%	Y	100	100%	Y
23	Bedroom	100%	Y	73%	Y	100	100%	Y
24	Bedroom	100%	Y	67%	Y	100	100%	Y
25	Bedroom	100%	Y	97%	Y	100	100%	Y
26	Bedroom	100%	Y	51%	Y	100	100%	Y
27	Bedroom	100%	Y	73%	Y	100	100%	Y
28	Bedroom	100%	Y	69%	Y	100	100%	Y
29	Bedroom	100%	Y	97%	Y	100	100%	Y

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
30	Bedroom	100%	Y	98%	Y	100	100%	Y
31	Bedroom	100%	Y	70%	Y	100	100%	Y
32	Bedroom	100%	Y	68%	Y	100	100%	Y
33	Bedroom	100%	Y	97%	Y	100	100%	Y
34	Bedroom	100%	Y	67%	Y	100	100%	Y
35	Bedroom	100%	Y	75%	Y	100	100%	Y
36	Bedroom	100%	Y	78%	Y	100	100%	Y
37	Bedroom	100%	Y	100%	Y	100	100%	Y
38	Bedroom	100%	Y	100%	Y	100	100%	Y
39	Bedroom	100%	Y	100%	Y	100	100%	Y
40	Bedroom	100%	Y	100%	Y	100	100%	Y
41	Bedroom	100%	Y	100%	Y	100	100%	Y
42	Bedroom	100%	Y	100%	Y	100	100%	Y
43	Bedroom	100%	Y	100%	Y	100	100%	Y
44	Bedroom	100%	Y	100%	Y	100	100%	Y
45	Bedroom	100%	Y	100%	Y	100	100%	Y
46	Bedroom	100%	Y	100%	Y	100	100%	Y
47	Bedroom	100%	Y	100%	Y	100	100%	Y
48	Bedroom	100%	Y	100%	Y	100	100%	Y
49	Bedroom	100%	Y	100%	Y	100	100%	Y
50	Bedroom	100%	Y	100%	Y	100	100%	Y
51	Bedroom	100%	Y	100%	Y	100	100%	Y
52	Bedroom	100%	Y	100%	Y	100	100%	Y
53	Bedroom	100%	Y	100%	Y	100	100%	Y
54	Bedroom	100%	Y	100%	Y	100	100%	Y
55	Bedroom	100%	Y	100%	Y	100	100%	Y
56	Bedroom	98%	Y	97%	Y	100	98%	Y
57	Bedroom	100%	Y	100%	Y	100	100%	Y
58	Bedroom	100%	Y	100%	Y	100	100%	Y

Figure 29. Houses – Second floor

Table 27. BRE 3rd Edition Daylight Results – Second Floor of Houses

Unit Ref.	Space	2022 Methodology Criterion I (%) (Compliance at ≥ 95% @100lux)	2022 Methodology Criterion I Compliance	2022 Methodology Criterion II (%) (Compliance at ≥ 50% @300lux)	2022 Methodology Criterion II Compliance	Room Specific Target Illuminance (lux)	(%) (Compliance at ≥ 50% @ room specific illuminance)	Room Specific Target Compliance
1	Bedroom	100%	Y	100%	Y	100	100%	Y
2	Bedroom	100%	Y	99%	Y	100	100%	Y
3	Bedroom	100%	Y	99%	Y	100	100%	Y
4	Bedroom	100%	Y	100%	Y	100	100%	Y
5	Bedroom	100%	Y	100%	Y	100	100%	Y
6	Bedroom	100%	Y	100%	Y	100	100%	Y
7	Bedroom	100%	Y	100%	Y	100	100%	Y
8	Bedroom	100%	Y	100%	Y	100	100%	Y
9	Bedroom	100%	Y	100%	Y	100	100%	Y
10	Bedroom	100%	Y	100%	Y	100	100%	Y
11	Bedroom	100%	Y	100%	Y	100	100%	Y
12	Bedroom	100%	Y	100%	Y	100	100%	Y
13	Bedroom	100%	Y	100%	Y	100	100%	Y
14	Bedroom	100%	Y	99%	Y	100	100%	Y
15	Bedroom	100%	Y	100%	Y	100	100%	Y
16	Bedroom	100%	Y	99%	Y	100	100%	Y
17	Bedroom	100%	Y	100%	Y	100	100%	Y
18	Bedroom	100%	Y	100%	Y	100	100%	Y
19	Living	100%	Y	100%	Y	150	100%	Y
20	Living	100%	Y	100%	Y	150	100%	Y
21	Living	100%	Y	100%	Y	150	100%	Y
22	Living	100%	Y	100%	Y	150	100%	Y
23	Living	100%	Y	100%	Y	150	100%	Y
24	Living	100%	Y	100%	Y	150	100%	Y
25	Living	100%	Y	100%	Y	150	100%	Y
26	Living	100%	Y	100%	Y	150	100%	Y
27	Living	100%	Y	100%	Y	150	100%	Y
28	Living	100%	Y	100%	Y	150	100%	Y
29	Living	100%	Y	100%	Y	150	100%	Y
30	Living	100%	Y	100%	Y	150	100%	Y
31	Living	100%	Y	100%	Y	150	100%	Y
32	Living	100%	Y	100%	Y	150	100%	Y
33	Living	100%	Y	100%	Y	150	100%	Y
34	Living	100%	Y	100%	Y	150	100%	Y
35	Living	100%	Y	100%	Y	150	100%	Y
36	Living	100%	Y	100%	Y	150	100%	Y

6 SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT

The BRE Guide 3rd Edition section 3.3.16 outlines the following for gardens and open spaces:

"It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March."

In order to show that sunlight levels within the development achieve compliance with current BRE Guide 3rd Edition recommendations a sunlight study has been carried out for the proposed development.

The red squares in Figure 30 and Figure 31 below illustrate the areas that receive a minimum of 2 hours of sunlight on the 21st of March for the proposed development. It is clear that the majority of the amenity spaces receive 2 hours or more of sunlight on March 21st. Therefore, compliance with BRE Guide 3rd Edition is achieved with regards to amenity space sunlight.

Figure 30: Amenity Space Sunlight – Main Spaces - Hours of Sunlight on March 21st

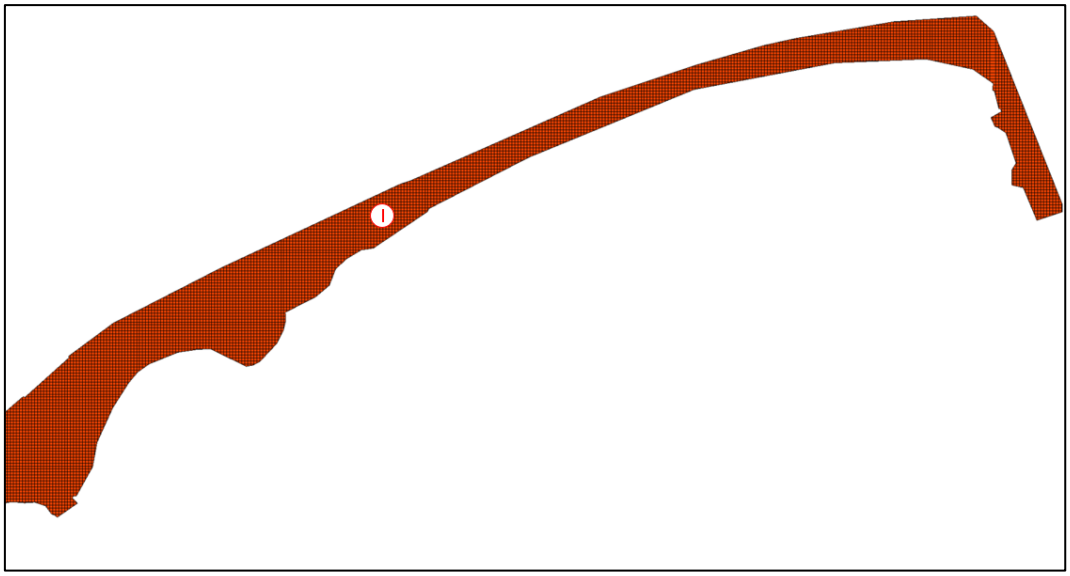

Figure 31: Amenity Space Sunlight – Woodlands Area - Hours of Sunlight on March 21st(Trees excluded from calculation)

Table 28: Amenity Space Sunlight Results

Unit Ref.	Area (m^2)	Area Required for Compliance (%)	Portion of Amenity Space receiving ≥ 2 hours Sunlight on 21st March (%)	Compliance
A	6621	50%	100%	Y
B	526	50%	100%	Y
C	951	50%	76%	Y
D	565	50%	100%	Y
E	977	50%	96%	Y
F	565	50%	100%	Y
G	1012	50%	86%	Y
H	487	50%	86%	Y
I	7057	50%	100%	Y

As seen in the table above, all the amenity space areas comply with the BRE 209, 3rd Edition, regarding sunlight recommendations for gardens and open spaces, as they receive at least 2 hours of sunlight on March 21st.

7 SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT

In order to assess the amount of sunlight that is received by windows within the proposed development, the calculation methodology as outlined in BRE Guide 3rd Edition (2022) has been used. All windows to all habitable rooms in the scheme have been assessed.

The BRE Guide 3rd Edition outlines 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. The BRE Guide 3rd Edition also states that sunlight is considered as less important in bedrooms and kitchens. The methodology states that a room in a dwelling shall ideally receive a minimum of 1.5 hours of direct sunlight on the test day, March 21st. Therefore, a dwelling may have a habitable room with a window which does not receive 1.5 hours of sunlight on March 21st, may still comply if the dwelling has another room which does feature a window receiving 1.5 hours of sunlight on March 21st.

This is based on section A.4 Recommendation for exposure to sunlight of the I.S. EN 17037:2018:
"The recommendation is that a space should receive possible sunlight for a duration according to Table A.6 (supposed to be cloudless) on a selected date between February 1st and March 21st. Table A.6 proposes three levels for sunlight exposure.
When applying the recommendation to a whole dwelling, the proposal is that at least one habitable room in the dwelling should have at least exposure to sunlight after Table A.6."

Table A.6 — Recommendation for daily sunlight exposure

Level of recommendation for exposure to sunlight	Sunlight exposure
Minimum	1,5 h
Medium	3,0 h
High	4,0 h

It must be noted that the results within this report should be treated with a certain degree of flexibility, based on the following statement in the BRE Guide 3rd Edition:

> *"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".*

In addition, the BRE Guide 3rd Edition states that:

> *"the degree of satisfaction is related to the expectation of sunlight. If a room is necessarily north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary".*

SUNLIGHT TO WINDOWS – RESULTS

The sunlight values experienced across the development as measured against the BRE Guide 3rd Edition are illustrated in the following images. Windows coloured red in Figure 32 to Figure 37 achieve the minimum standard for sunlight on the test day of March 21st.

Element	Sunlight Assessment BRE 3rd Edition Minimum Level
Total Windows Passing	799
Total No. of Windows Analysed	986
Percentage of Compliance	81%

Table 29: Sunlight Analysis 3rd Edition Results (Window Specific Summary)

Element	Sunlight Assessment BRE 3rd Edition Minimum Level
Residential Units Assessed	284
Residential Units Compliant	276
Amenity Space	Compliant
Creche Space	Compliant
Percentage of Compliance	97%

Table 30: Sunlight Analysis 3rd Edition Results (Residential Unit Specific Summary)

Element	Sunlight Assessment BRE 3rd Edition Minimum Level
Amenity Space	Compliant
Creche Space	Compliant
Percentage of Compliance	100%

Table 31: Sunlight Analysis 3rd Edition Results (Non-Residential Unit Specific Summary)

It should be noted that the BRE Guide 3rd Edition states:

> *"In general a dwelling, or non-domestic building that has a particular requirement for sunlight, will appear reasonably sunlit provided:*
>
> *a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21st March."*

Therefore, compliance is considered as achieved if a dwelling has a window which receives 1.5 hours of sunlight on March 21st. Many of the windows which do not receive 1.5 hours of sunlight on March 21st are from

dwellings which have another window which does receive 1.5 hours of sunlight on March 21st, or a room with multiple windows so the amount of sunlight added together provided the 1.5 hours of sunlight on March 21st as mentioned in the section 3.1.12 of the BRE Guide 3rd Edition - therefore the dwelling is considered as compliant.

In total, 276 of the 284 residential units in the scheme meet the sunlight recommendations from the BRE Guide 3rd Edition, therefore achieving a compliance rate of 97% across the development. The units falling short in sunlight provisions are mainly located on north, north-east & north-west aspects and therefore can only receive limited amounts of direct sunlight (early morning and late evening in summer for example to east and west facades). However there are numerous compensatory measures associated with each of these units in order to ensure a high quality space is achieved in all instances across the development.

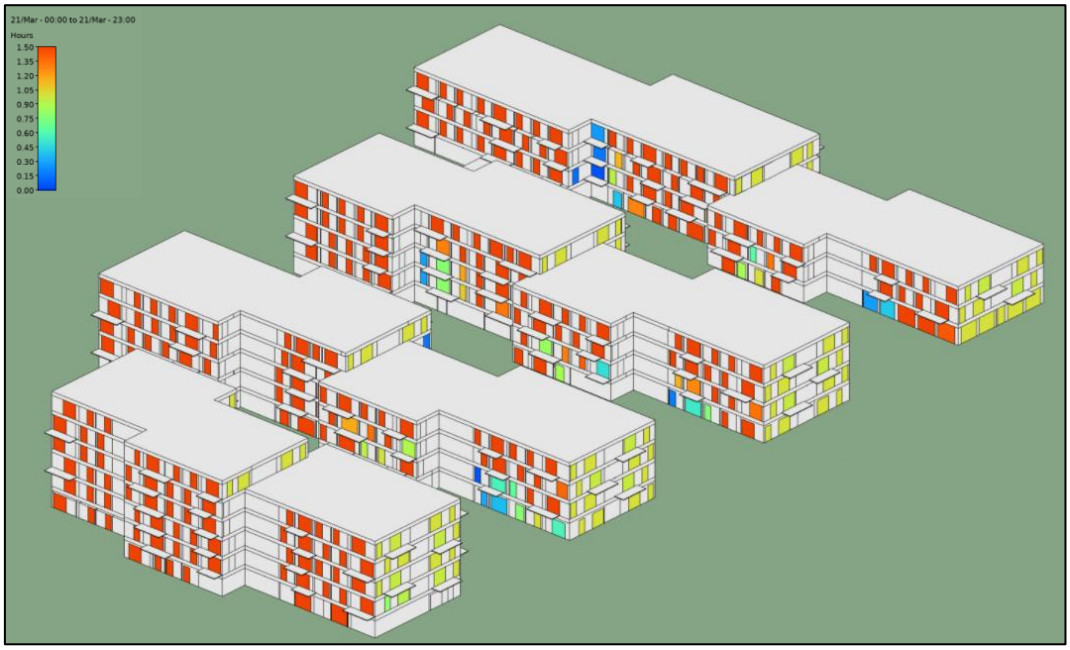

Figure 32: Sunlight Exposure March 21st BRE Guide 3rd Edition – Minimum Recommendation North East Elevation – Apartment Blocks

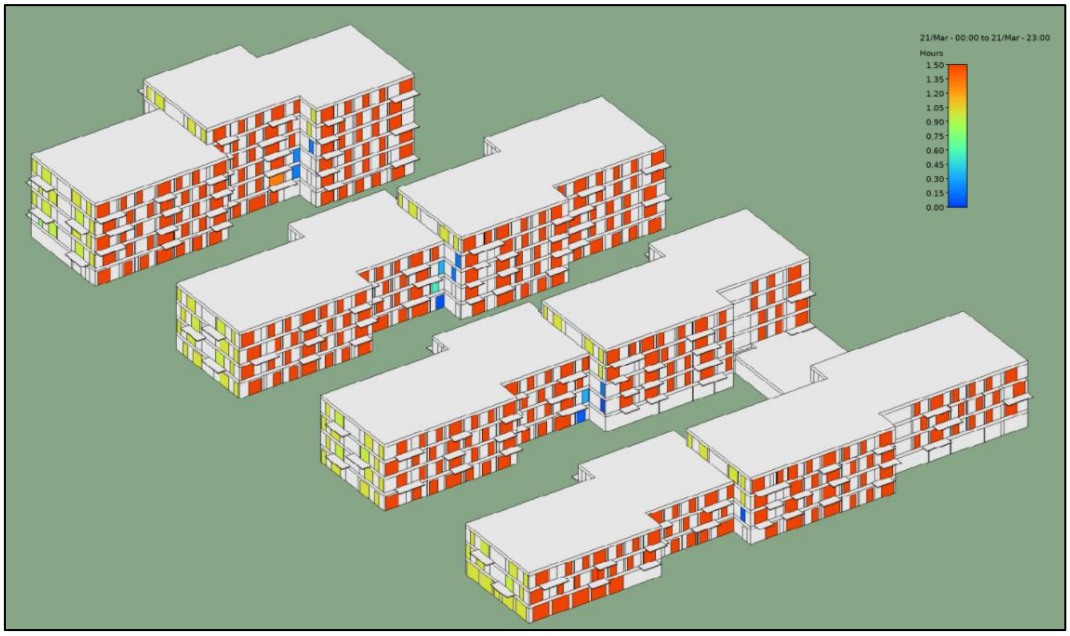

Figure 33: Sunlight Exposure March 21st BRE Guide 3rd Edition – Minimum Recommendation North West Elevation – Apartment Blocks

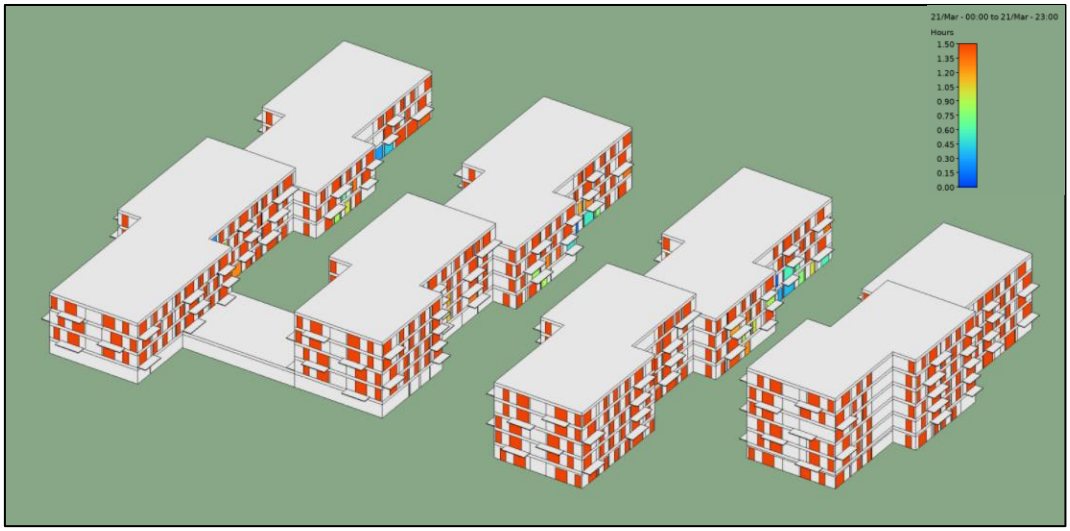

Figure 34: Sunlight Exposure March 21st BRE Guide 3rd Edition – Minimum Recommendation South East Elevation – Apartment Blocks

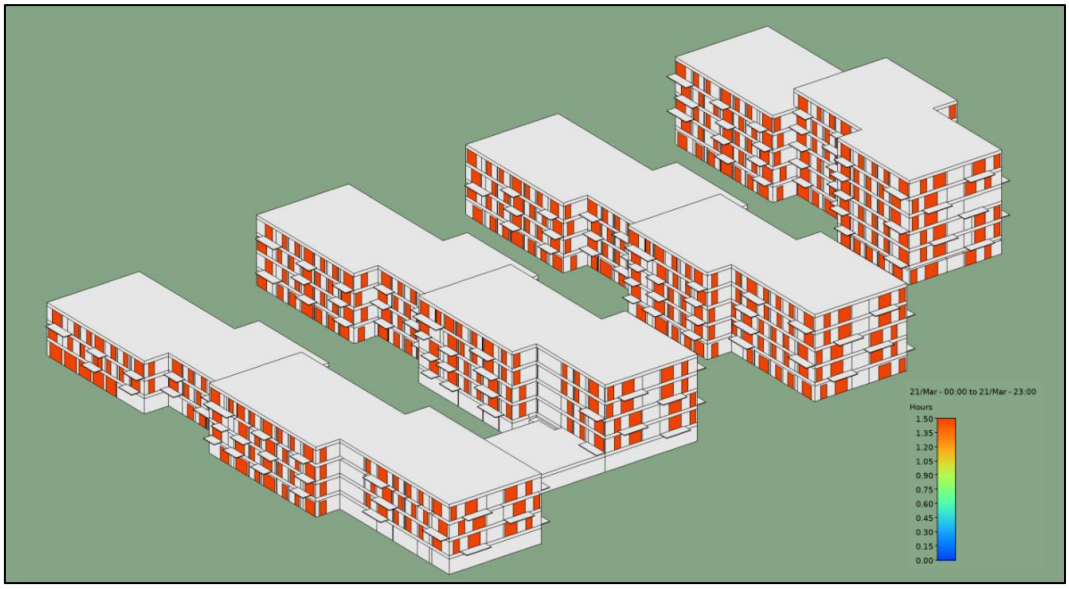

Figure 35: Sunlight Exposure March 21st BRE Guide 3rd Edition – Minimum Recommendation South West Elevation – Apartment Blocks

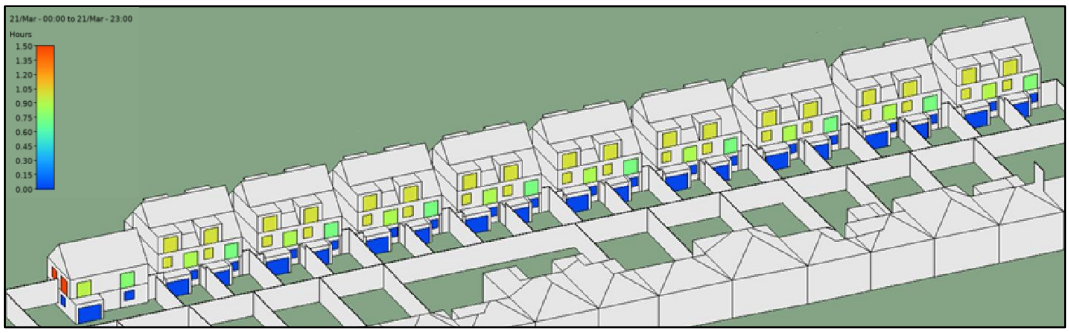

Figure 36: Sunlight Exposure March 21st BRE Guide 3rd Edition – Minimum Recommendation North Elevation – Houses

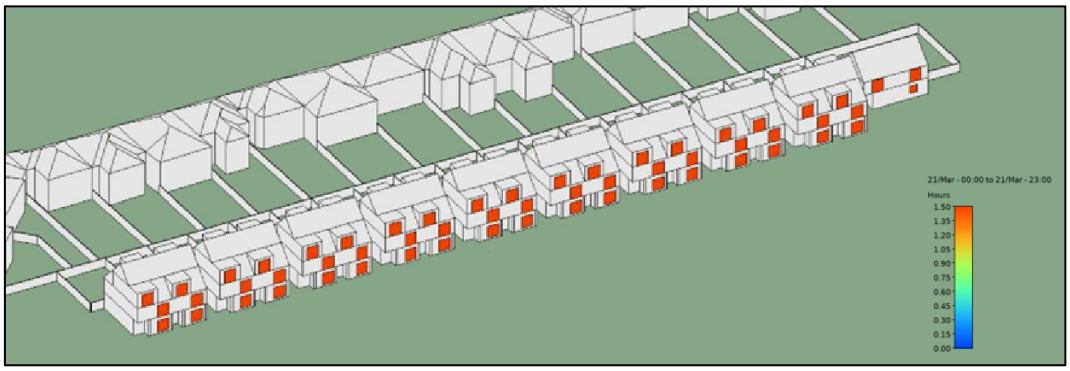

Figure 37: Sunlight Exposure March 21st BRE Guide 3rd Edition – Minimum Recommendation South Elevation – Houses

Figure 37 demonstrates that all south-facing windows in habitable rooms, including the main living room, meet the minimum sunlight recommendations. Consequently, all dwellings are well sunlit in accordance with the BRE Guide 3rd Edition recommendations.

8 ASSESSING THE IMPACT ON SURROUNDING PROPERTIES

DAYLIGHT & SUNLIGHT IMPACT METHODOLOGY

As per the BRE Guide 3rd Edition, 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 Guide 3rd Edition, to ascertain any potential impact to adjacent buildings from the proposed development.

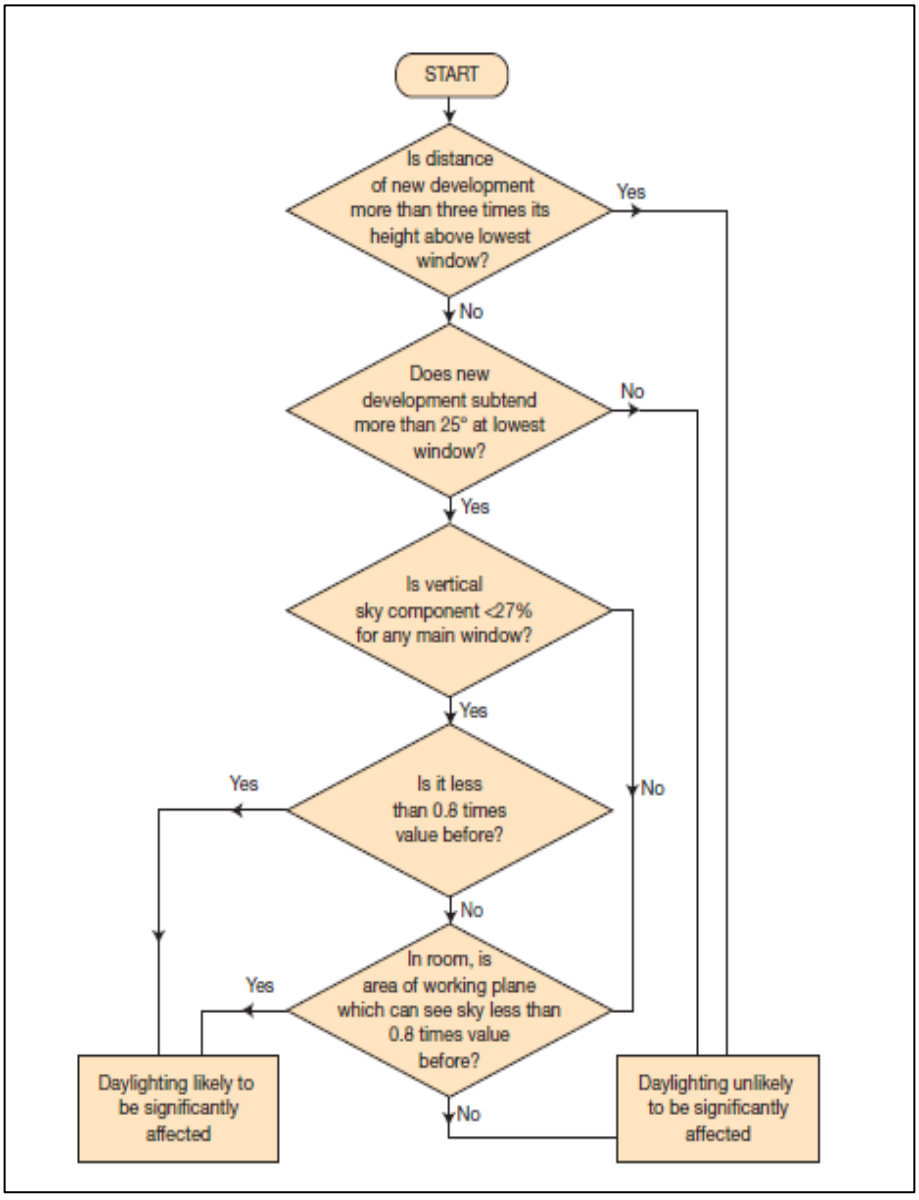

Figure 38: Daylight Assessment Methodology

As per the flow matrix, the BRE guidelines provide four main methods for assessing daylight availability:

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 Guide 3rd Edition provide the following methods for assessing daylight availability.

As can be seen in the Figure below the distance between the development and the majority of the existing houses are more than three times the height of the proposed development so most of the existing houses do not need to be considered under this step. However, there are houses that are closer to the development so need to be considered under Step 2.

Figure 39: Impact to Adjacent Buildings - Three times height of the proposed development

25° LINE CRITERIA – STEP 2

In the first instance, 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 Guide 3rd Edition 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).

Figure 40: Impact to Adjacent Buildings - 25° Line

Two of the existing adjacent properties fall within the 25° line of the proposed development, and therefore require further analysis.

The following figures demonstrate that neighbouring existing houses do not need required further assessment, as they do not fall below the 25° line of the proposed development.

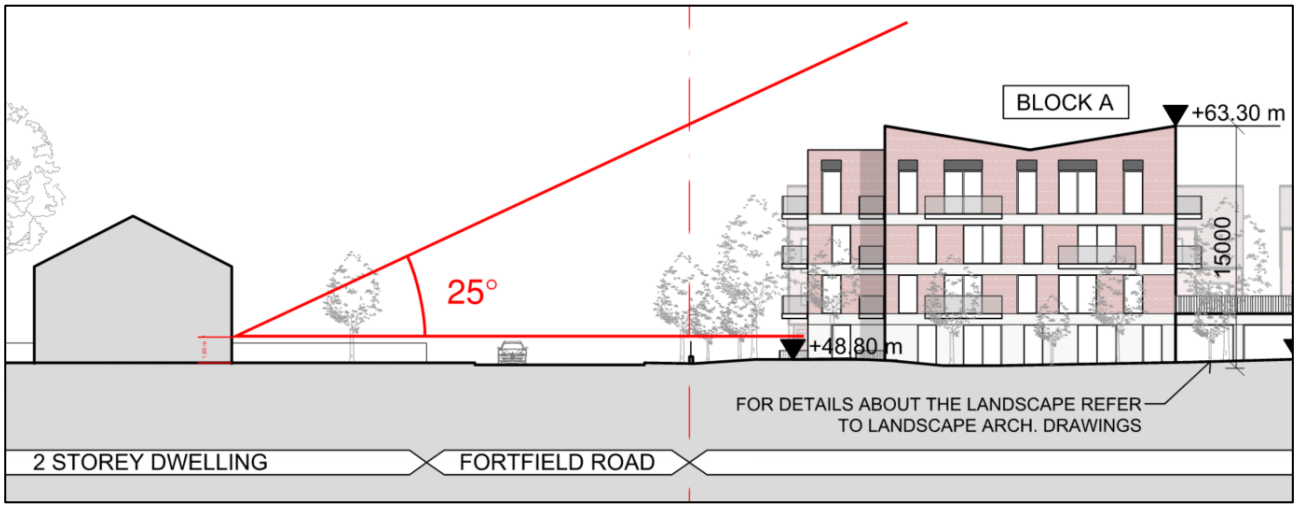

Figure 41: South-East contiguous elevation

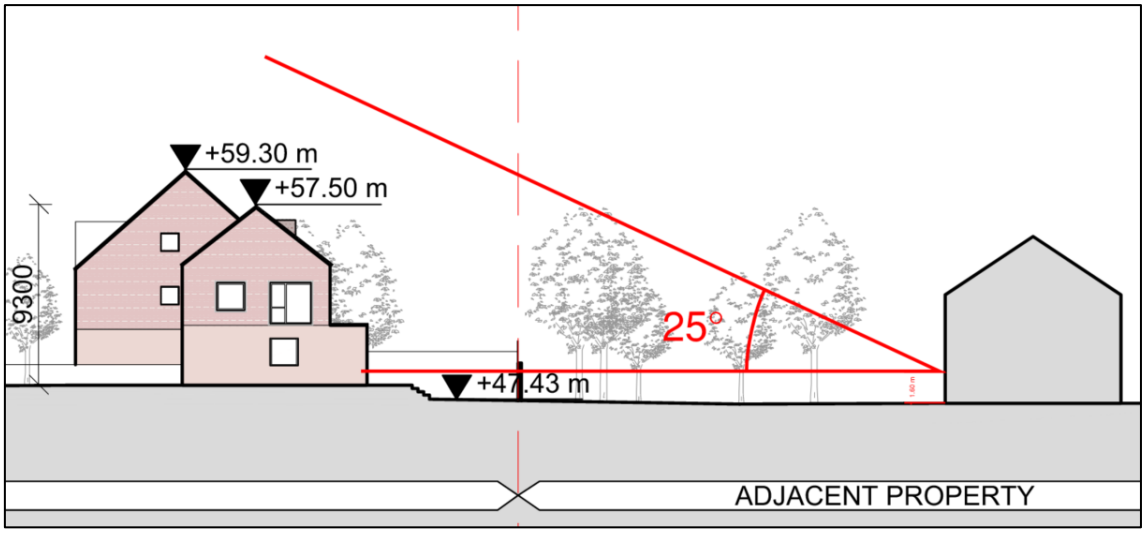

Figure 42: North-East contigous elevation

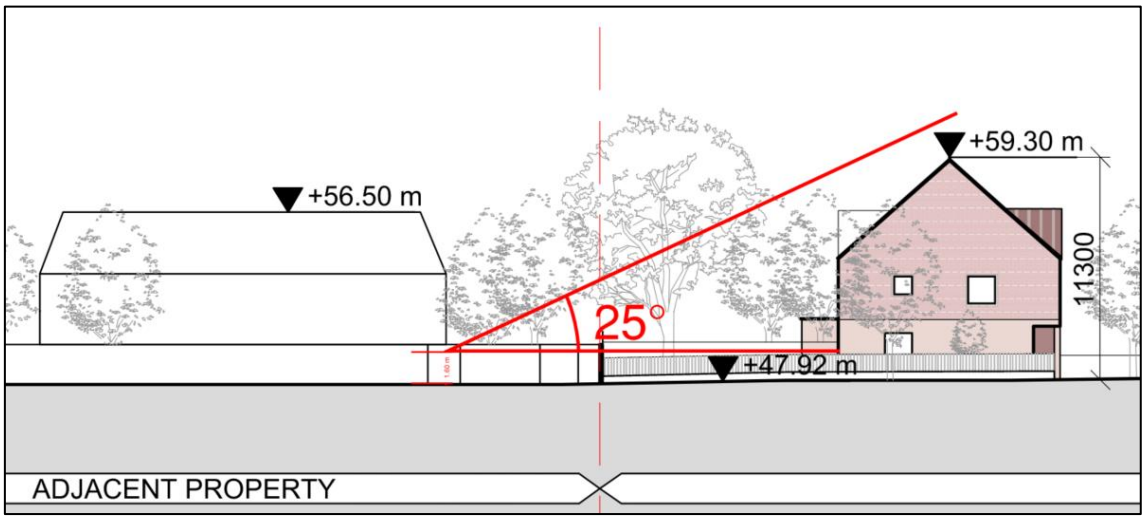

Figure 43: South-West contiguous elevation

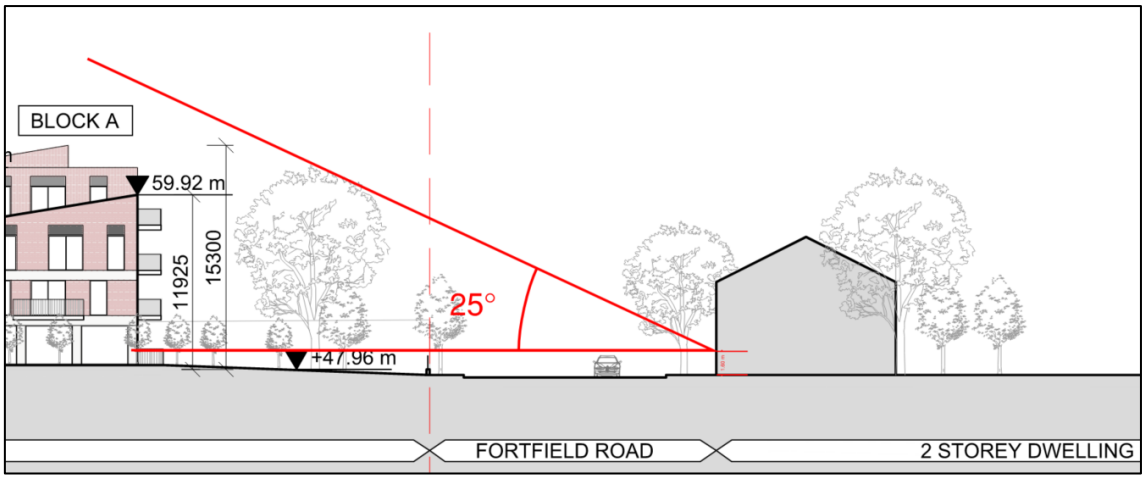

Figure 44: North-West contiguous elevation

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 the space. However, it does not assess or quantify the actual daylight levels inside the rooms.

Table 32: Properties falling within the 25° line of the Proposed Development

Ref.	Name	Comment
A	Horizons After School Care – Storage Shed	No expectation of daylight, and no windows facing the development
B	Horizons After School Care – Prefab Unit	VSC analysis required

Of the two properties which fall within the 25° line of the proposed development, one of these properties does not have windows facing the development, therefore it's VSC does not need to be analysed. The second building does have 14 windows facing the development, therefore the VSC to these windows does need to be analysed. The windows which require VSC analysis are shown in Figure 45. The results from the VSC analysis, as can be seen in Table 33, show that all 14 windows are compliant, as their VSC following the introduction of the proposed development is greater than 27%, therefore daylighting is unlikely to be significantly affected.

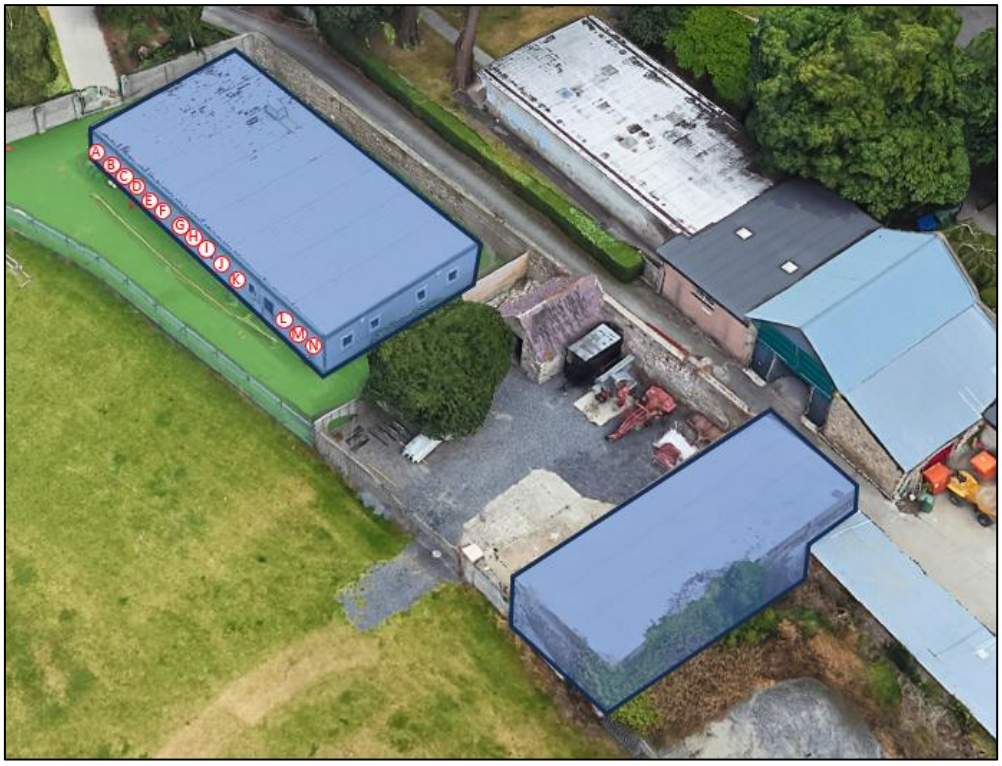

Figure 45: Windows requiring VSC analysis: Horizons After School Care – Prefab Unit

Table 33: VSC Analysis Results

Window Ref.	Name	VSC (%) With Proposed development in place (Compliance achieved at ≥27%)
A	Horizons After School Care – Prefab Unit	31.13%
B	Horizons After School Care – Prefab Unit	31.46%
C	Horizons After School Care – Prefab Unit	31.58%
D	Horizons After School Care – Prefab Unit	31.70%
E	Horizons After School Care – Prefab Unit	32.02%
F	Horizons After School Care – Prefab Unit	32.25%
G	Horizons After School Care – Prefab Unit	32.46%
H	Horizons After School Care – Prefab Unit	32.63%
I	Horizons After School Care – Prefab Unit	32.98%
J	Horizons After School Care – Prefab Unit	33.06%
K	Horizons After School Care – Prefab Unit	33.14%
L	Horizons After School Care – Prefab Unit	33.45%
M	Horizons After School Care – Prefab Unit	33.51%
N	Horizons After School Care – Prefab Unit	33.56%

9 SUNLIGHT IMPACT TO EXISTING SURROUNDING AMENITY SPACES

BRE Guide 3rd Edition recommends that for external amenity spaces to appear adequately sunlit throughout the year, at least half of the space should receive at least two hours of sunlight on March 21st. March 21st is chosen as the test date by BRE as it is the equinox and represents the average level of shading across the year.

The back gardens to the houses to the north of the proposed development fall within the 25° line shown in Figure 40, therefore the sunlight to these gardens should be assessed, to determine what impact, if any, the proposed development will have on these gardens.

The red squares in Figure 46 illustrate the areas that receive 2 hours or more of sunlight on the 21st of March for the existing gardens to the north of the proposed development. The image on the left of Figure 46 illustrates the results before the introduction of the proposed development, and the image on the right of Figure 46 illustrates the results after the introduction of the proposed development. All the gardens receive 2 hours or more of sunlight on March 21st, both before and after the construction of the proposed development. Therefore, compliance with BRE Guide 3rd Edition is achieved.

The proposed new development does not have a perceptible impact on sunlight in the existing garden spaces to the north.

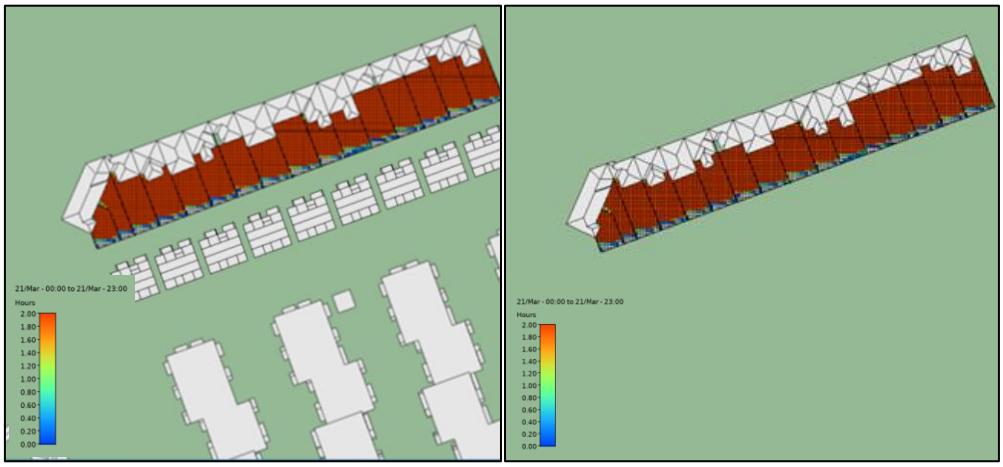

Figure 46: Adjacent Amenity Space Sunlight Analysis March 21st, After (left) and Before (right)

10 OVERSHADOWING IMPACT TO PROPERTIES

The overshadowing impact on the existing surrounding properties from the proposed development has been analysed. The overshadowing images in the following figures illustrate the overshadowing impact of the proposed development on March 21st.

The images demonstrate that the overshadowing impact of the proposed development on the surrounding properties will be limited to shading properties only at select time during the day.

MARCH 21ST

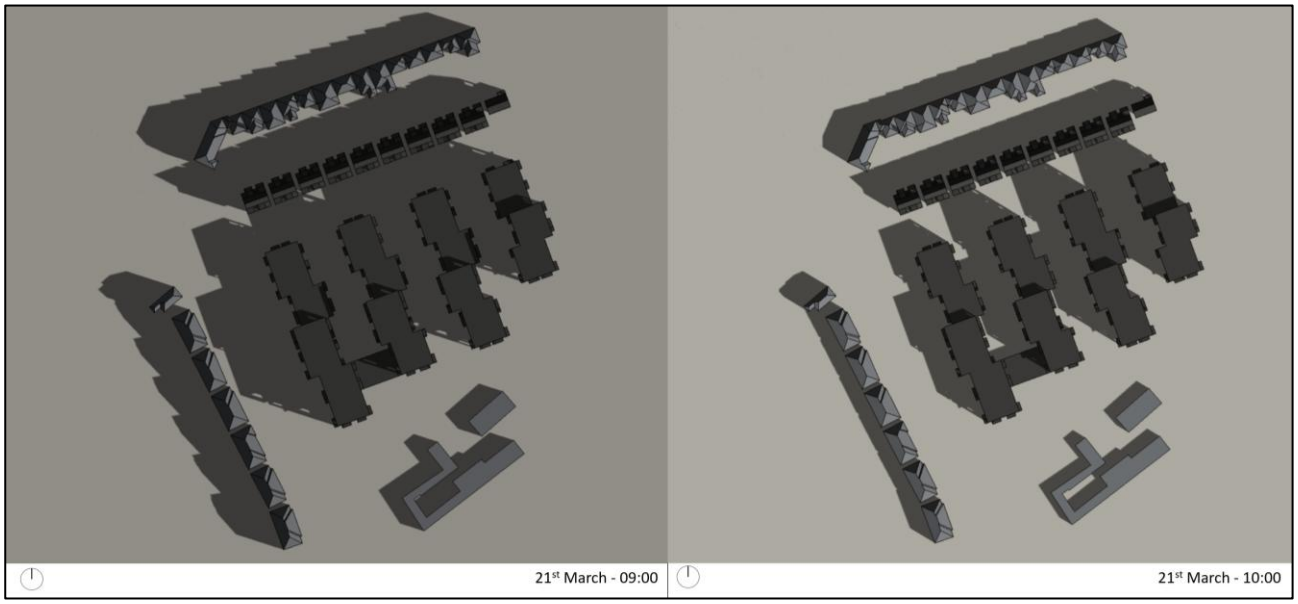

Figure 47: Overshadowing Images on March 21st at 9am and 10am

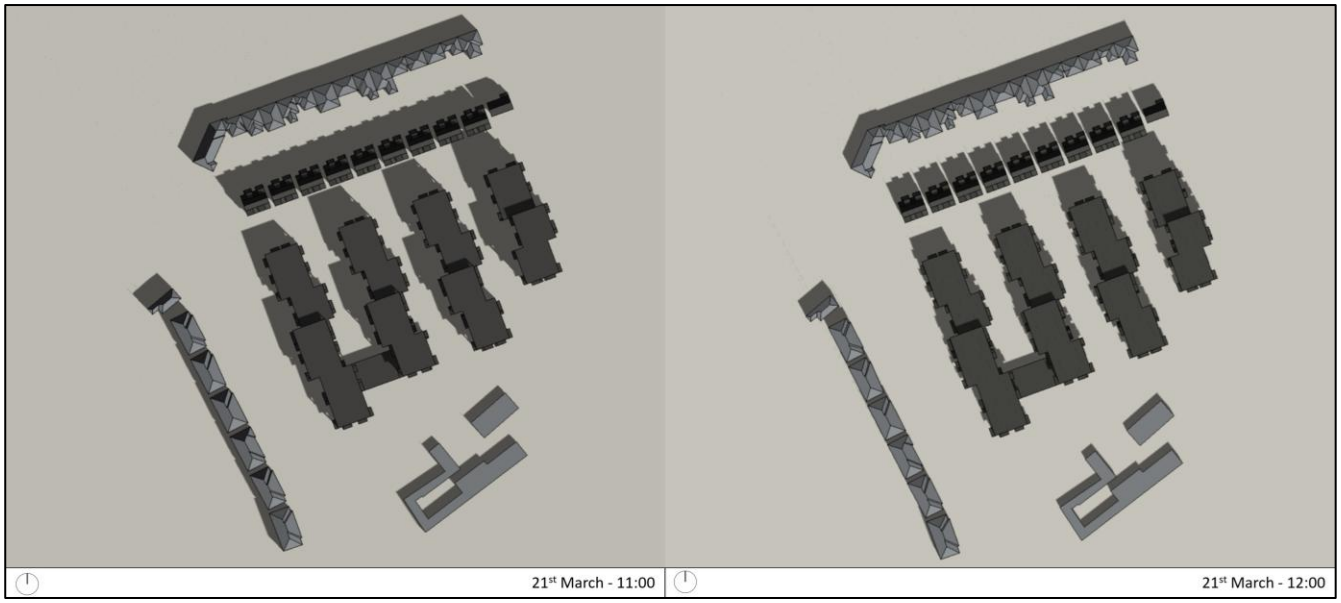

Figure 48: Overshadowing Images on March 21st at 11am and 12pm

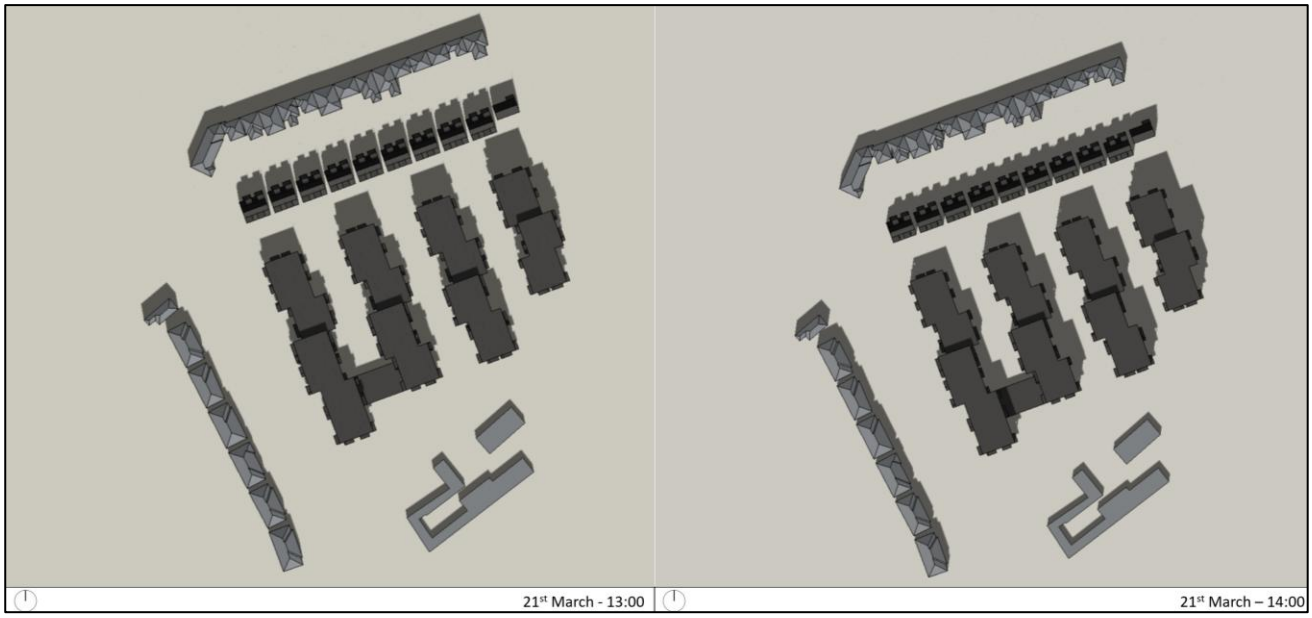

Figure 49: Overshadowing Images on March 21st at 1pm and 2pm

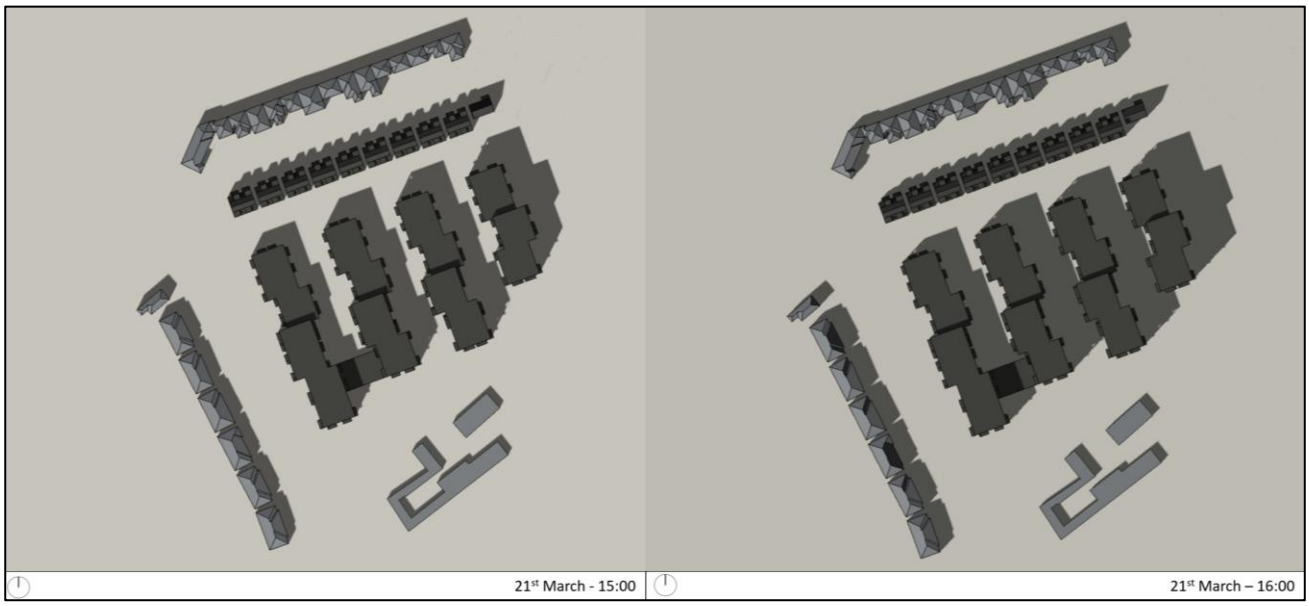

Figure 50: Overshadowing Images on March 21st at 3pm and 4pm

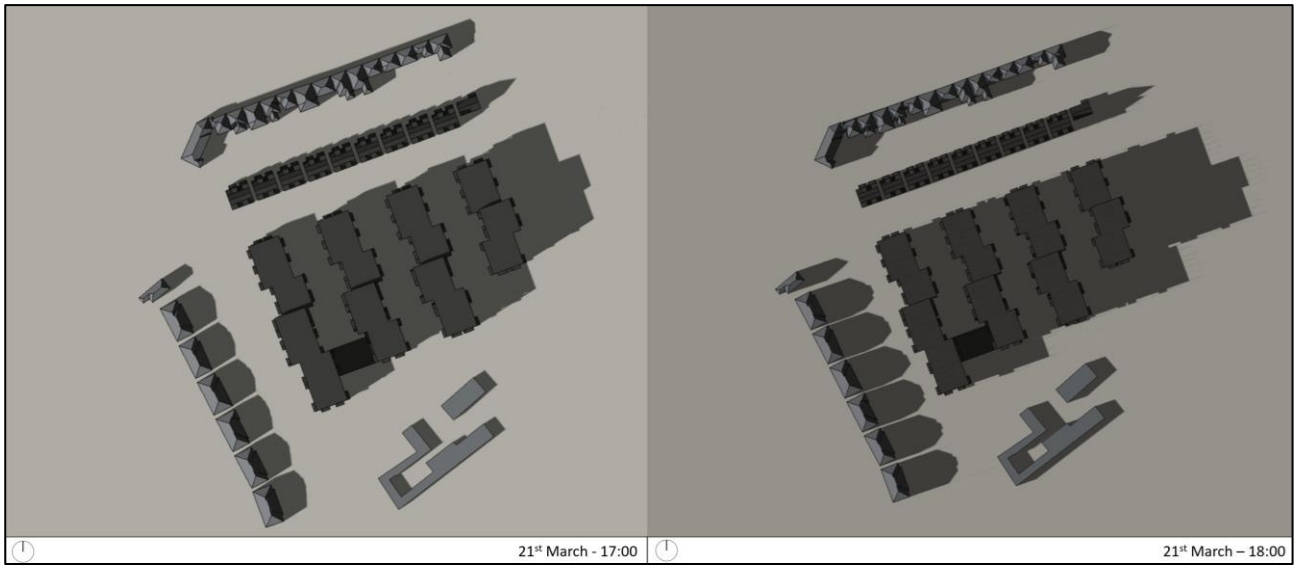

Figure 51: Overshadowing Images on March 21st at 5pm and 6pm

11 CONCLUSION

The proposed Fortfield Road Residential Development has been analysed in order to determine the following:

- The daylight levels within the living/ kitchen and bedroom areas throughout the proposed units within the development;
- The expected sunlight levels received by all the living/ kitchen and bedroom areas within the proposed development;
- The quality of amenity space being provided as part of the development, in relation to sunlight;
- Any potential daylight or sunlight 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 Building Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2022 3rd Edition. The following text from the BRE Guide 3rd Edition should be reiterated as previously noted:

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

Internal Daylight

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. This is supported by the results of two assessments conducted on the development. The first assessment evaluated compliance with the BRE Guide 3rd Edition, specifically against Criterion I and Criterion II, while the second assessment refers to compliance with the targets in Table 1 of Appendix 16 of the Dublin City Council Development Plan (DCDP).

The results demonstrate a 98.7% compliance rate with Criterion I of the BRE Guide 3rd Edition daylight standard and a 98.3% compliance rate with Criterion II. Additionally, the second assessment, based on the DCDP standards in Appendix 16, achieved a 99.7% compliance rate. Units that do not fully meet the daylight recommendations have been supplemented with various compensatory measures, as detailed in Section 5.

Sunlight to Windows

The sunlight assessment has shown that 81% of windows to bedrooms and living areas are receiving the minimum recommended levels of sunlight, as tested against the BRE Guide 3rd Edition. The BRE Guide 3rd Edition states that compliance is to be calculated on a dwelling by dwellings basis. Using this methodology, the compliance rate is 97%, with 275 of the 284 units in the scheme achieving the BRE Guide 3rd Edition

recommendations for sunlight. Both the amenity and Creche spaces also achieve compliance with guidance relating to sunlight.

Sunlight to Amenity Spaces

In relation to amenity space sunlight, all open amenity spaces in the development show compliance with BRE Guide 3rd Edition recommendations, with all amenity spaces receiving more than 2 hours of sunlight on March 21st test day – Achieving ranges of between 76% and 100%.

Impact to surrounding properties

The proposed development will not impact surrounding properties, as careful consideration has been given to maintaining a reasonable distance to prevent any loss of light to existing windows. Only two properties were identified as potentially affected and, therefore, required a Vertical Sky Component (VSC) analysis, one has no windows facing the development and the other demonstrated 100% compliance with Section 2.2.7 of the BRE Guidelines:

'If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing Building'.

Overshadowing Assessment

The overshadowing assessment has shown the shadow cast by the proposed development on March 21st from 9:00 a.m. to 6:00 p.m.

It has been shown through our overshadowing analysis that minimal impact can be perceived on the adjacent properties. This is further supported by the fact that the proposed development does not subtend more than 25 degree angle to the horizontal from the existing windows.

12 VERIFICATION

This report was compiled and verified by:

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