OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
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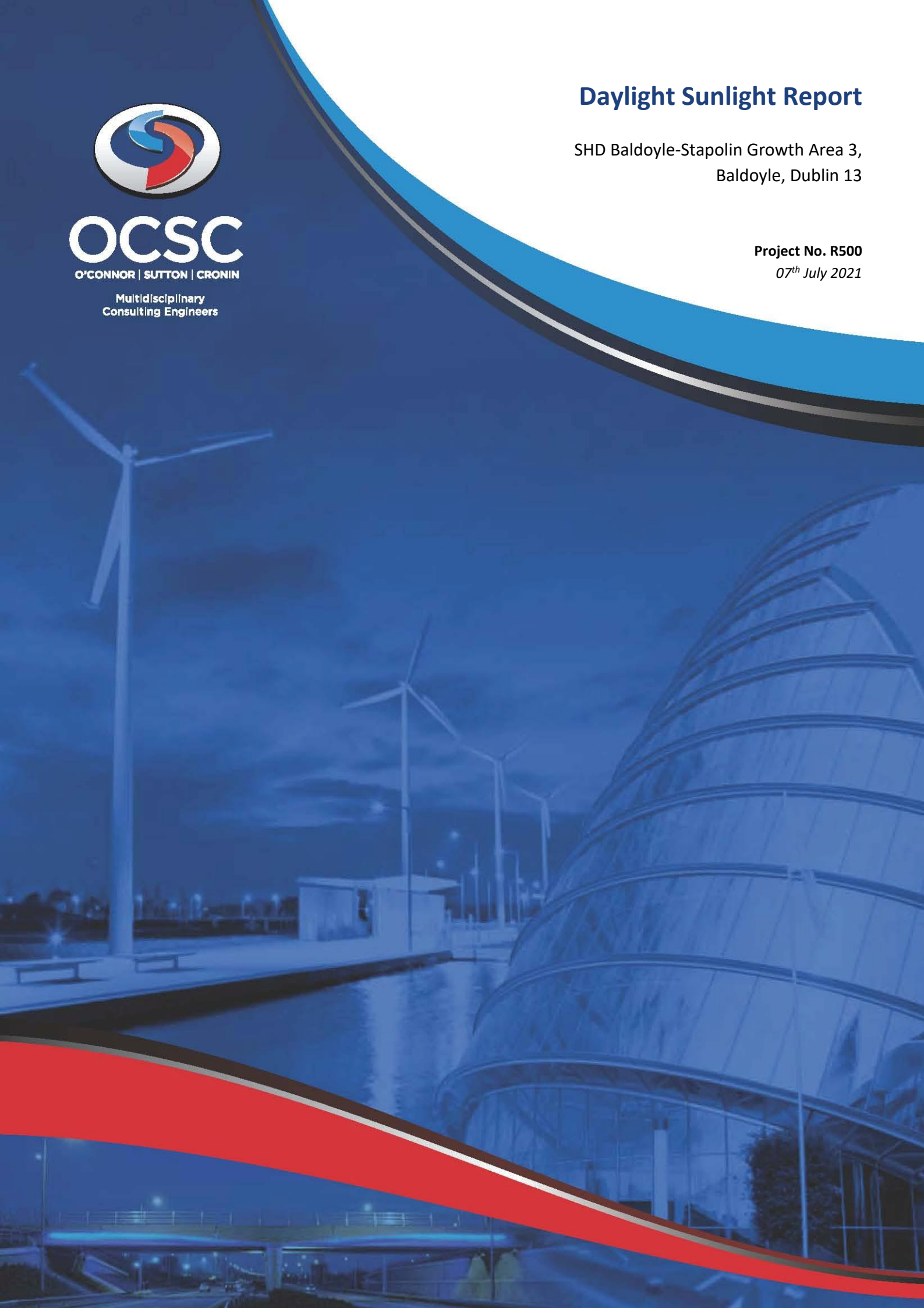
Daylight Sunlight Report

SHD Baldoyle-Stapolin Growth Area 3,
Baldoyle, Dublin 13

Project No. R500
07th July 2021



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NOTICE

DOCUMENT CONTROL & HISTORY

OCSC Job No.: R500	Project Code	Originator Code	Zone Code	Level Code	File Type	Role Type	Number Series	Status/ Suitability Code	Revision
	R500	OCSC	XX	XX	RP	YS	0002	S4	P05

Rev.	Status	Authors	Checked	Authorised	Issue Date
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1	For Comment	CA	DOC	DOC	19/10/2020

EXECUTIVE SUMMARY

OCSC (M&E) Ltd. have been appointed to carry out a Daylight / Sunlight study for the proposed Baldoyle-Stapolin GA03 residential development.

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 selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living, kitchen and bedrooms 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:

"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 numerical guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."

Internal daylight within the proposed development

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. The majority of apartments not only meet but greatly exceed the recommendations outlined within the BRE Guidelines and British Standard BS8206, achieving a 97.8% compliance rate across the proposed apartments.

Sunlight to proposed development amenity spaces

In terms of sunlight access, excellent levels of sunlight are experienced across the development. The communal amenity spaces provided to the apartment areas greatly exceeds 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 even though some windows are slightly under the BRE recommendations, acceptable levels of sunlight will still be achieved within the proposed development.

Impact to neighbouring properties

The analysis has shown that imperceptible impact will be perceived for sensitive receptor ref. 1 and for the South block within sensitive receptor ref. 2 when compared to the Baldoyle-Stapolin LAP. The North block of sensitive receptor ref. 2 will perceive a non-significant impact.

In relation to the overshadowing impact, the majority of sensitive receptors will present an imperceptible impact, with sensitive receptor ref. 2 receiving a non-significant impact.

The annual probable sunlight hours analysis has sown that imperceptible impact will be perceived by sensitive receptor ref. 2 when compared to the Baldoyle-Stapolin LAP.

Sensitive receptor ref. 3 is subject to a separate planning application. A daylight and sunlight EIAR chapter has been submitted as part of this application where the impact of GA03 has been taken into account within the calculations.

All calculations within this report follow the methodology for daylight and sunlight outlined on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.

Daylight Sunlight Report

PROJECT NO. R500

1. INTRODUCTION

OCSC (M&E) Ltd. have been appointed to carry out a Daylight / Sunlight study for the proposed Baldoyle-Stapolin GA03 residential development located in Baldoyle, Dublin 13.

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 selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living, kitchen and bedrooms 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.

The calculation methodology for daylight and sunlight is based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.

2. DEVELOPMENT DESCRIPTION

The proposed development site is located at Baldoyle-Stapolin, Dublin 13. It is a site of c. 6.89 hectares, and comprises lands referred to as Growth Area 3 (GA3) within the Baldoyle-Stapolin Local Area Plan. The lands are bound by the Dublin-Belfast / DART train line to the west, existing and proposed residential areas to the south and east, and future Racecouse Park to the north.

The proposed development will consist of the development of 1,221 no. residential apartment/duplex dwellings in 11 no. blocks ranging in height from 2 to 15 storeys and including for residential tenant amenity, restaurant/cafe, crèche, car and bicycle parking and public realm. Residential Tenant Amenity Facilities are located in Blocks E3, E4, G3, G4 & G5 and external communal amenity space is provided at ground, podium and terrace levels throughout the scheme. Car Parking is provided in a mix of undercroft for Blocks E1-E2, F1 and F2 and at basement level for Blocks G1-G3 and G4-G5. Cycle parking spaces are provided for residents, visitors and commercial uses, in secure locations and within the public realm throughout the scheme. A new central public space between Blocks E1-E2 and E3 and E4 and a new linear space between Blocks G2-G3 and G4-G5 provides pedestrian and cycle connectivity from Longfield Road to the proposed future Racecourse Park to the north. A proposed new bus, cycle, pedestrian and taxi ramp to the south of the site and north of Stapolin Square provides access from Longfield Road to Clongriffin Train Station. For a full description of the development please see the Statutory Notices.

Figure 1 – Proposed Site Plan (Outlined in Red)

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 Baldoyle-Stapolin GA03 development.

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."*

The **Fingal County Council Development Plan (2017-2023)** outlines that *"high levels of daylight and sunlight provide for good levels of amenity for residents. The internal layout of residential units should be designed to maximise use of natural daylight and sunlight. Daylight and sunlight levels, as a minimum, should be in accordance with Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE2011) and British Standard (B.S.). 8206 Lighting for Buildings, Part 2 2008: Code of Practice for Daylighting or any update on these documents."*

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."*

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. PROPOSED BUILDING DESIGN

In order to ensure that daylight levels were maximised for the Baldoyle-Stapolin GA03 residential development, a number of key design strategies were analysed during concept design.

4.1. BUILDING MATERIAL SELECTION

The selection of materials play an important role in ambient daylight levels. The façade of the proposed buildings have been carefully selected to promote a sense of brightness and light. The Baldoyle-Stapolin GA03 façades are composed of light materials. This will ensure light is reflected throughout the development. The inclusion of greenery areas and amenity spaces will help to improve the sense of light and brightness within the apartments.

4.2. 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 that 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 maximised 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 – South Elevation Blocks G4/G5 Glazing to Wall Ratio

5. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT

Based on the corresponding planning policies outlined, the analysis of the proposed scheme 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)."

These guidelines provide the criteria and methodology for calculations pertaining to daylight and sunlight, and is 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:

"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 numerical guidelines these should be interpreted flexibly 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 IS EN 17037:2018 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.

6. DAYLIGHT ANALYSIS WITHIN THE PROPOSED DEVELOPMENT

6.1. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT

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 Henry J Lyons Architects 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 3- BS 8206 – 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%.

However, targeting a minimum ADF of 2% in open space kitchen/living rooms, results in significant challenges while seeking to comply with all other elements of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (December 2020) , which are as follows:

- Amenity spaces: the guidance set out in the Sustainable Urban Housing: Design Standards for New Apartment document states that private amenity spaces shall be provided in the form of

balconies at the upper levels. It is also stated that balconies are preferably accessed from living rooms. In order to achieve the 2% in living/ kitchen spaces balcony spaces would need to be removed at the lower floors.

- Floor to ceiling height: in order to achieve an ADF of 2%, the floor to ceiling heights would have to be increased on all levels which would have a planning height impact.
- Solar gains: with the removal of the balconies, increased floor to ceiling height and extensive glazing area there is a risk of overheating within the apartments.

In addition, it must be also noted that the apartments within the Baldoyle-Stapolin GA03 development contain a kitchen which is expected to be used mainly for food preparation rather than occupants spending a long period of time sitting in the kitchen area. Instead, occupants are expected to spend most of their time in the living room area.

Based on the above, it has been a typical approach and common industry practice to set a benchmark of 1.5% (BS 8206 recommended ADF for living rooms) for open plan spaces that contain a kitchen and a living space.

The ADF benchmark of 1.5% was set out for living/kitchen spaces within the proposed apartments of the Baldoyle-Stapolin GA03 development during the assessment carried out for the initial pre-planning stage submitted in November 2020. The assessment completed for the pre planning meeting indicated a pass rate of 98.3% when compared to the 1.5% ADF. The 2% ADF benchmark was also assessed at the pre-planning stage and showed a compliance rate of 97.8%. It should be noted that whether the 1.5% or the 2.0% ADF is set as the benchmark for compliance, the same level of daylight will be experienced within the scheme, with the only change being the benchmark to which the compliance rate is calculated.

However, for this final application report, the higher ADF benchmark of 2%, in line with BS 8206 has been utilised to calculate the percentage rate of compliance.

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 in the IES VE software package to ascertain the ADFs achieved within the dwellings of the proposed development.

6.2. METHODOLOGY FOR SELECTION OF ROOMS FOR DAYLIGHT MODELLING

In line with common industry approach, units presented at the lower levels have been selected for analysis. Units are selected at the lower levels on the basis that they will receive the lowest levels of daylight due to their location, obstruction and position within the development. Another factor in unit selection is the layout of the apartment. Room depth and location of balconies also play an important role when it comes to daylight penetration within the room. Different types of rooms across the lower levels have been analysed, prioritizing the deep plan and more obstructed rooms.

As previously outlined, the daylight analysis is completed within the IES software and all room results are tabulated. Where a room ADF result falls short of the compliance benchmark, the same apartment type directly above is also modelled to show if that room achieves the compliance benchmark in the above level. This process is reiterated on each level above until the compliance benchmark is achieved. Where units at the lower level achieve the compliance benchmark, it is taken that the same unit type directly above will also achieve the compliance benchmark and therefore, no further modelling is required.

Figure 4 illustrates an example of the rationale applied within Block E1/E2 to calculate the percentage rate of compliance based on a sample of analysed rooms. The rooms highlighted in blue and identified with a text reference (A, B, C etc.) were selected for analysis. The results recorded for the assessed rooms will show as a pass or fail against the compliance benchmark. This pass or fail result is then applied to rooms with similar characteristics (room configuration, location or level of obstructions) and this rationale is shown in Figure 4, where rooms expected to receive a similar ADF result have been identified with a circle of the same colour.

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.

Figure 4 – Example of room's assumption in Blocks E1/E2

6.3. DAYLIGHT REFLECTANCES

The surface reflectance values outlined in Table 1 have been used in the analysis.

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

Table 1 – Surface Reflectance Values

6.4. DAYLIGHT RESULTS – INTERNAL DAYLIGHT WITHIN PROPOSED APARTMENTS

This section outlines the apartments that were selected for assessment of internal daylight levels within the proposed Baldoyle-Stapolin GA03 residential development. The results of the analysis are outlined within the accompanying tables.

Figure 5 – Apartment Block Layout Plan

The following images illustrate the rooms tested and their subsequent results are outlined in the accompanying tables.

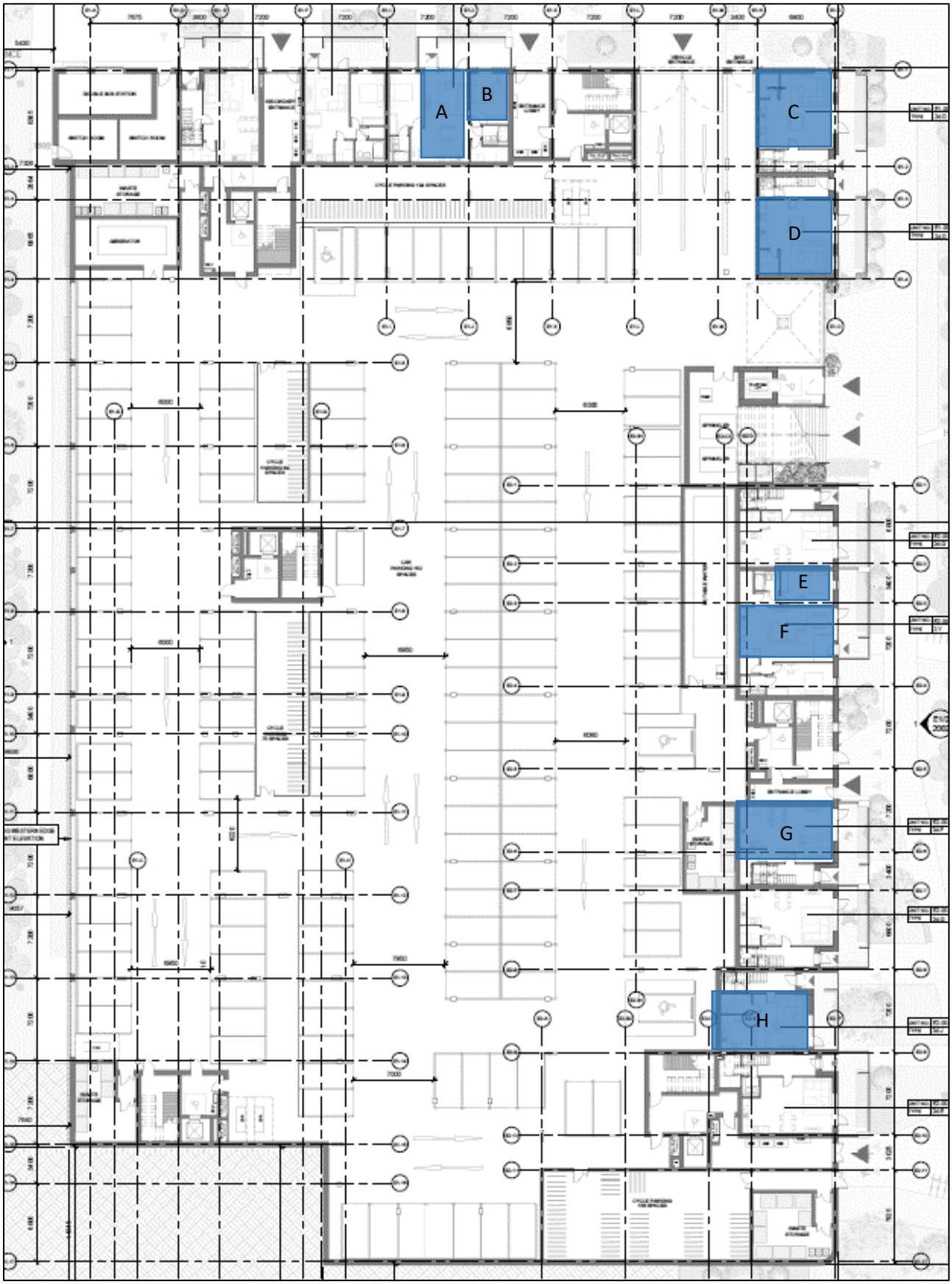

Figure 6 - Block E1/E2 Ground Floor - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.2	Y
B	Bedroom	1.0	1.8	Y
C	Living Room / Kitchen	2.0	5.0	Y
D	Living Room / Kitchen	2.0	2.5	Y
E	Bedroom	1.0	1.6	Y
F	Living Room / Kitchen	2.0	2.5	Y
G	Living Room / Kitchen	2.0	2.3	Y
H	Living Room / Kitchen	2.0	1.9	N

Table 2 - Block E1/E2 Ground Floor - Average Daylight Factor Results

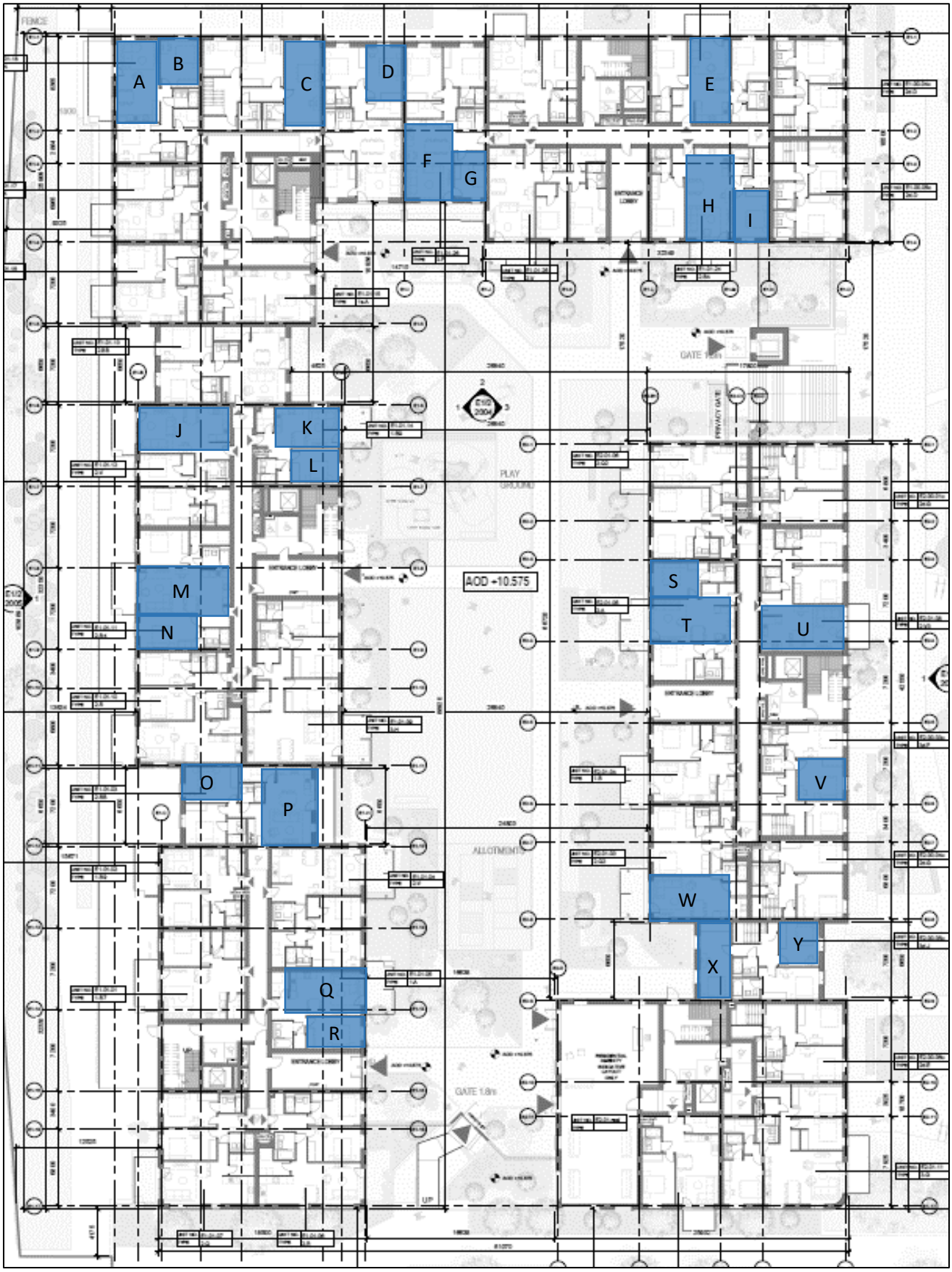

Figure 7 - Block E1/E2 Podium Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	6.8	Y
B	Bedroom	1.0	3.0	Y
C	Living Room / Kitchen	2.0	2.2	Y
D	Bedroom	1.0	2.5	Y
E	Living Room / Kitchen	2.0	2.3	Y
F	Living Room / Kitchen	2.0	1.5	N
G	Bedroom	1.0	1.2	Y
H	Living Room / Kitchen	2.0	2.3	Y
I	Bedroom	1.0	2.5	Y
J	Living Room / Kitchen	2.0	2.0	Y
K	Living Room / Kitchen	2.0	2.9	Y
L	Bedroom	1.0	1.2	Y
M	Living Room / Kitchen	2.0	2.0	Y
N	Bedroom	1.0	2.6	Y
O	Bedroom	1.0	2.6	Y
P	Living Room / Kitchen	2.0	1.8	N
Q	Living Room / Kitchen	2.0	2.8	Y
R	Bedroom	1.0	1.2	Y
S	Bedroom	1.0	1.9	Y
T	Living Room / Kitchen	2.0	1.8	N
U	Living Room / Kitchen	2.0	3.0	Y
V	Bedroom	1.0	2.7	Y
W	Living Room / Kitchen	2.0	1.8	N
X	Bedroom	1.0	1.2	Y
Y	Bedroom	1.0	2.8	Y

Table 3 - Block E1/E2 Podium Floor Level - Average Daylight Factor Results

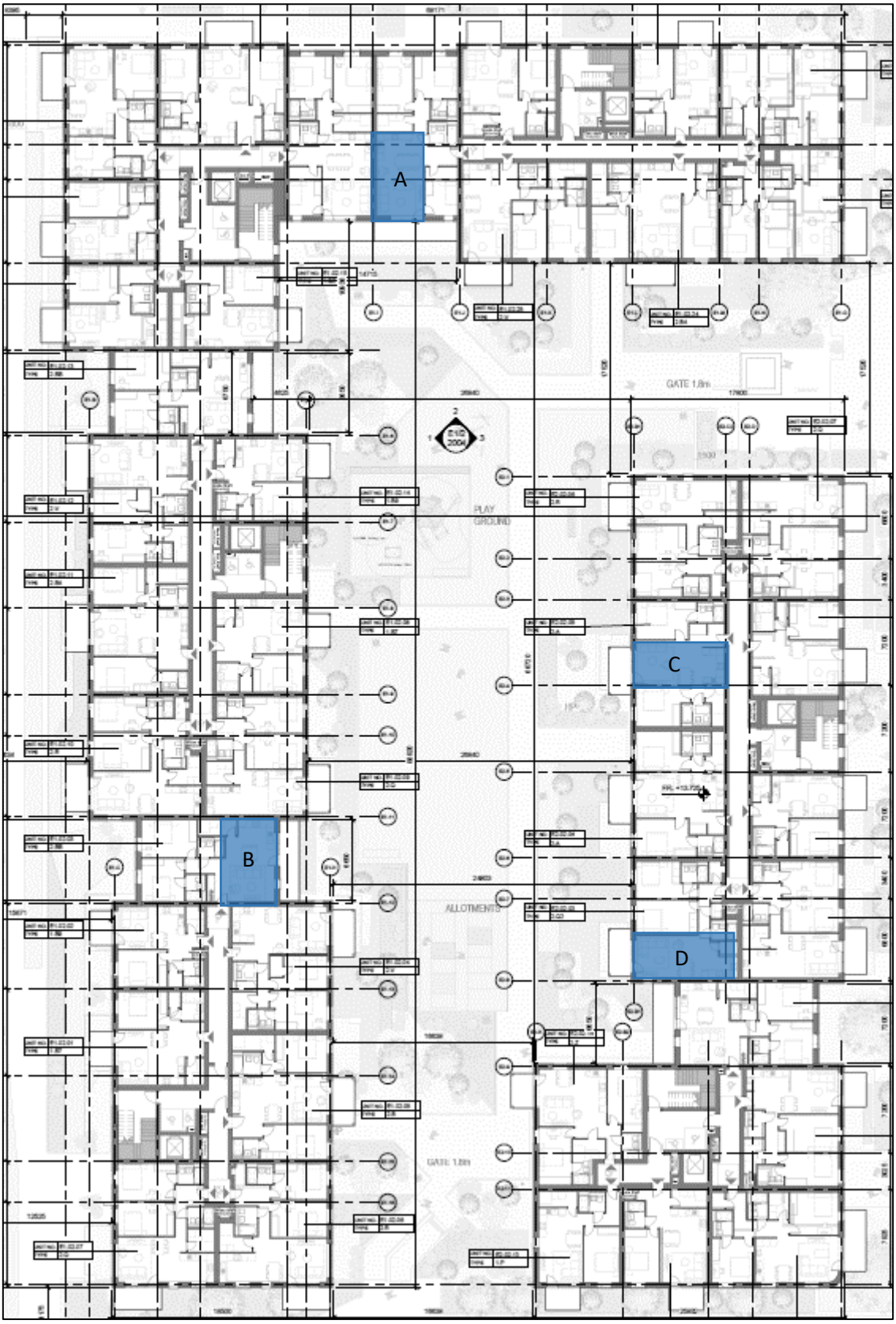

Figure 8 - Block E1/E2 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.7	N
B	Living Room / Kitchen	2.0	2.1	Y
C	Living Room / Kitchen	2.0	2.1	Y
D	Living Room / Kitchen	2.0	2.1	Y

Table 4 - Block E1/E2 Second Floor Level - Average Daylight Factor Results

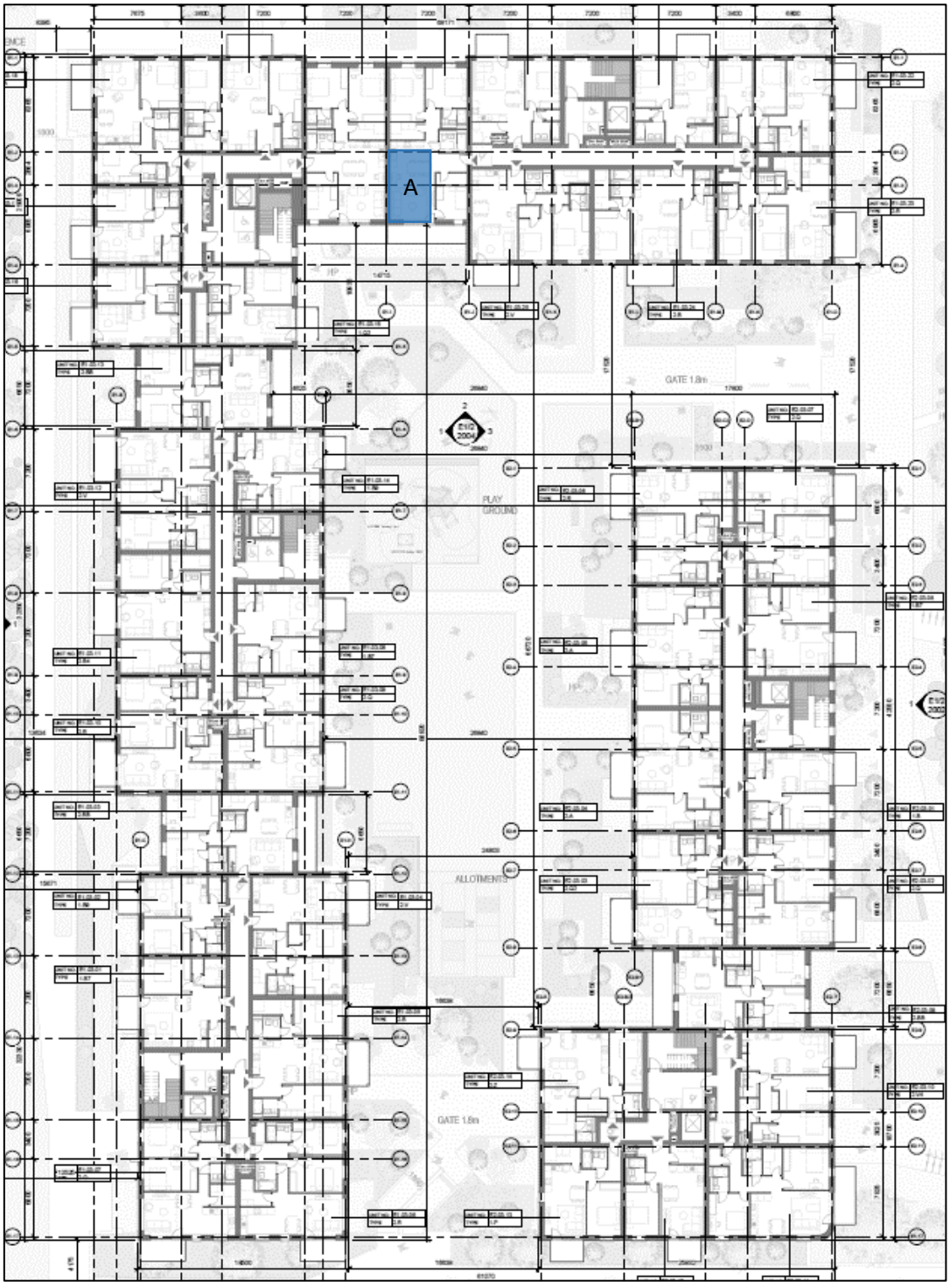

Figure 9 - Block E1/E2 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.0	Y

Table 5 - Block E1/E2 Third Floor Level - Average Daylight Factor Results

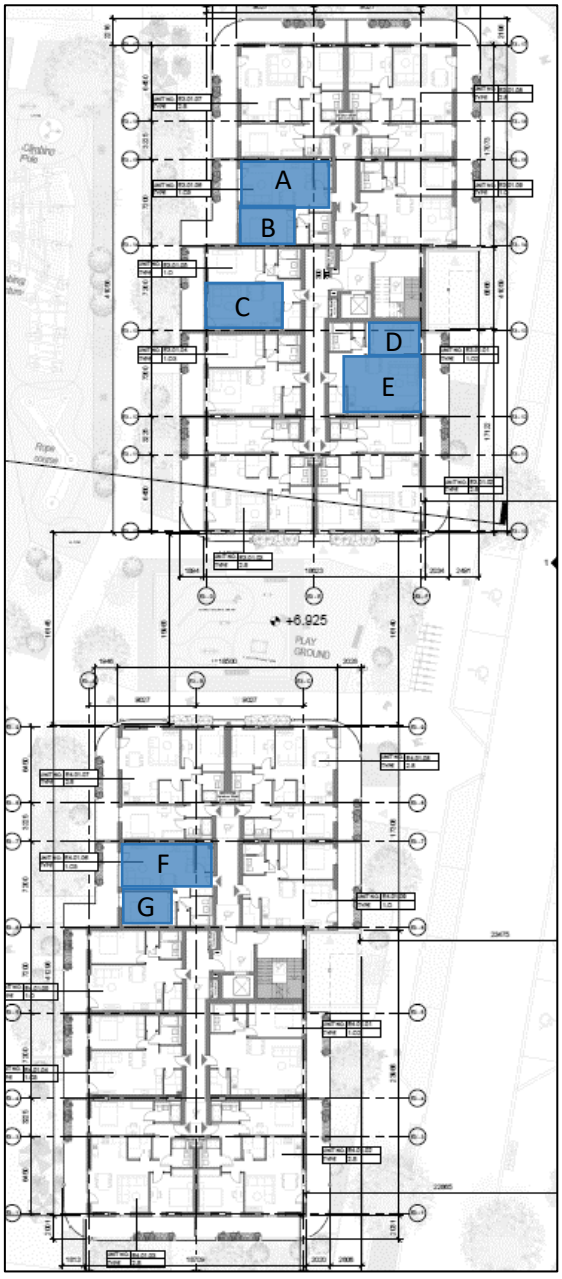

Figure 10 - Block E3/E4 Podium Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.0	Y
B	Bedroom	1.0	1.4	Y
C	Living Room / Kitchen	2.0	2.4	Y
D	Bedroom	1.0	1.3	Y
E	Living Room / Kitchen	2.0	1.5	N
F	Living Room / Kitchen	2.0	2.0	Y
G	Bedroom	1.0	1.4	Y

Table 6 - Block E3/E4 Podium Floor Level - Average Daylight Factor Results

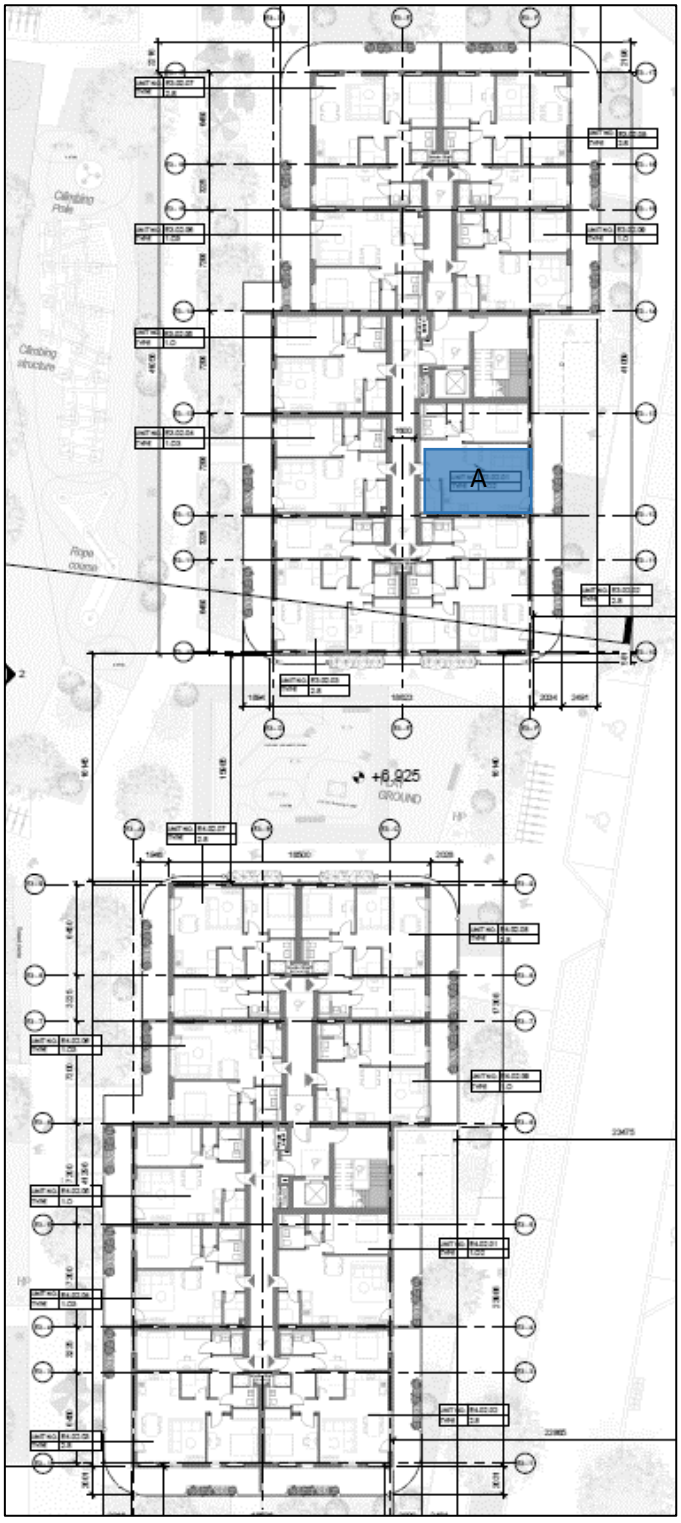

Figure 11 - Block E3/E4 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.6	N

Table 7 - Block E3/E4 Second Floor Level - Average Daylight Factor Results

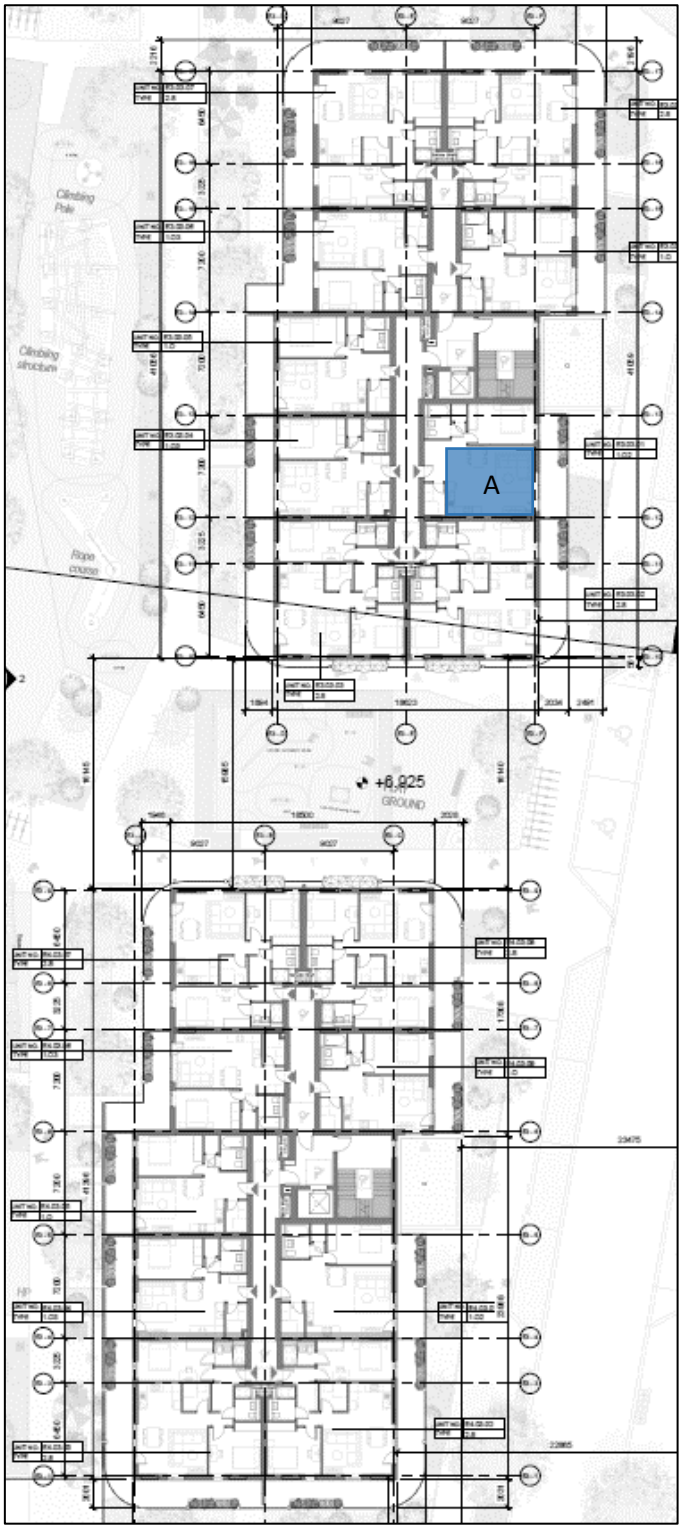

Figure 12 - Block E3/E4 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.8	N

Table 8 - Block E3/E4 Third Floor Level - Average Daylight Factor Results

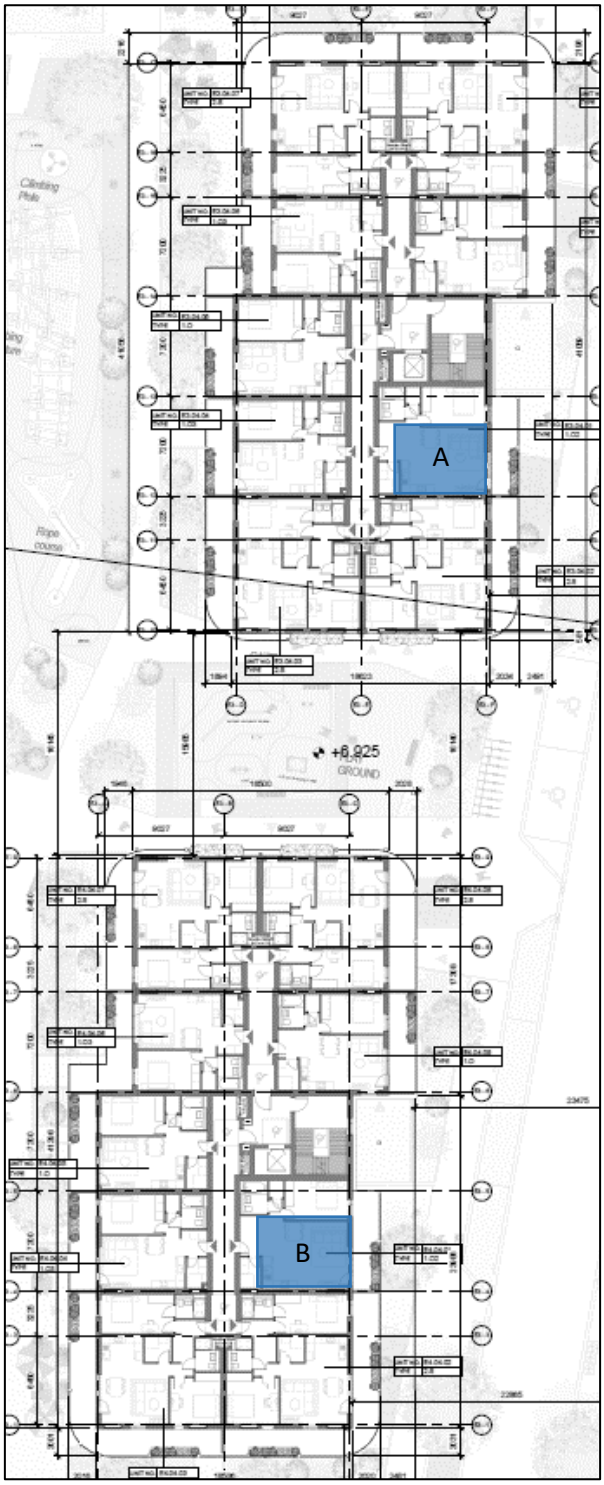

Figure 13 - Block E3/E4 Fourth Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	3.5	Y
B	Living Room / Kitchen	2.0	2.3	Y

Table 9 - Block E3/E4 Fourth Floor Level - Average Daylight Factor Results

Figure 14 - Block F1 Ground Floor - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	3.9	Y
B	Bedroom	1.0	2.7	Y
C	Living Room / Kitchen	2.0	2.0	Y
D	Living Room / Kitchen	2.0	2.6	Y
E	Bedroom	1.0	3.0	Y
F	Bedroom	1.0	2.8	Y
G	Living Room / Kitchen	2.0	3.6	Y

Table 10 - Block F1 Ground Floor - Average Daylight Factor Results

Figure 15 - Block F1 First Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	3.2	Y
B	Bedroom	1.0	2.3	Y
C	Living Room / Kitchen	2.0	2.7	Y
D	Bedroom	1.0	3.0	Y
E	Living Room / Kitchen	2.0	2.1	Y
F	Bedroom	1.0	3.0	Y
G	Living Room / Kitchen	2.0	2.5	Y
H	Living Room / Kitchen	2.0	2.4	Y
I	Bedroom	1.0	3.5	Y
J	Living Room / Kitchen	2.0	2.7	Y
K	Bedroom	1.0	2.2	Y

Table 11 – Block F1 First Floor Level - Average Daylight Factor Results

Figure 16 - Block F2 Ground Floor - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Bedroom	1.0	2.4	Y
B	Living Room / Kitchen	2.0	2.8	Y
C	Living Room / Kitchen	2.0	3.2	Y
D	Bedroom	1.0	2.6	Y
E	Bedroom	1.0	3.5	Y
F	Bedroom	1.0	3.5	Y
G	Living Room / Kitchen	2.0	2.2	Y

Table 12 – Block F2 Ground Floor - Average Daylight Factor Results

Figure 17 - Block F2 First Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.1	Y
B	Bedroom	1.0	2.1	Y
C	Bedroom	1.0	2.3	Y
D	Living Room / Kitchen	2.0	2.0	Y
E	Bedroom	1.0	2.4	Y
F	Bedroom	1.0	3.0	Y
G	Living Room / Kitchen	2.0	2.4	Y
H	Living Room / Kitchen	2.0	2.1	Y
I	Bedroom	1.0	1.7	Y
J	Bedroom	1.0	2.8	Y
K	Bedroom	1.0	3.2	Y
L	Living Room / Kitchen	2.0	2.5	Y
M	Living Room / Kitchen	2.0	2.3	Y
N	Bedroom	1.0	1.8	Y
O	Living Room / Kitchen	2.0	2.2	Y
P	Bedroom	1.0	1.6	Y

Table 13 – Block F2 First Floor Level - Average Daylight Factor Results

Figure 18 - Block G1/G2/G3 Ground Floor - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	3.6	Y
B	Living Room / Kitchen	2.0	1.8	N
C	Bedroom	1.0	1.9	Y
D	Living Room / Kitchen	2.0	2.8	Y
E	Bedroom	1.0	3.9	Y
F	Living Room / Kitchen	2.0	2.1	Y
G	Bedroom	1.0	1.9	Y
H	Bedroom	1.0	1.5	Y
I	Living Room / Kitchen	2.0	1.7	N
J	Living Room / Kitchen	2.0	2.5	Y
K	Bedroom	1.0	2.9	Y
L	Living Room / Kitchen	2.0	1.9	N
M	Living Room / Kitchen	2.0	3.1	Y
N	Bedroom	1.0	2.4	Y
O	Living Room / Kitchen	2.0	2.3	Y
P	Living Room / Kitchen	2.0	2.1	Y
Q	Bedroom	1.0	1.7	Y
R	Bedroom	1.0	1.0	Y
S	Living Room / Kitchen	2.0	1.1	N

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
T	Bedroom	1.0	2.2	Y
U	Living Room / Kitchen	2.0	1.7	N
V	Living Room / Kitchen	2.0	1.4	N
W	Bedroom	1.0	1.2	Y
X	Bedroom	1.0	1.4	Y
Y	Living Room / Kitchen	2.0	2.5	Y
Z	Living Room / Kitchen	2.0	2.2	Y

Table 14 - Block G1/G2/G3 Ground Floor - Average Daylight Factor Results

Figure 19 - Block G1/G2/G3 First Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.1	Y
B	Bedroom	1.0	2.9	Y
C	Living Room / Kitchen	2.0	2.5	Y
D	Bedroom	1.0	3.2	Y
E	Living Room / Kitchen	2.0	1.6	N
F	Bedroom	1.0	1.9	Y
G	Living Room / Kitchen	2.0	1.2	N
H	Living Room / Kitchen	2.0	2.4	Y
I	Bedroom	1.0	2.9	Y
J	Living Room / Kitchen	2.0	1.5	N
K	Bedroom	1.0	1.5	Y
L	Living Room / Kitchen	2.0	2.5	Y
M	Bedroom	1.0	3.3	Y
N	Living Room / Kitchen	2.0	2.3	Y
O	Bedroom	1.0	2.0	Y
P	Living Room / Kitchen	2.0	2.8	Y
Q	Bedroom	1.0	3.5	Y

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
R	Living Room / Kitchen	2.0	1.8	N
S	Bedroom	1.0	1.8	Y
T	Living Room / Kitchen	2.0	1.0	N
U	Bedroom	1.0	1.8	Y
V	Living Room / Kitchen	2.0	2.5	Y
W	Bedroom	1.0	2.4	Y
X	Living Room / Kitchen	2.0	1.4	N
Y	Bedroom	1.0	2.0	Y
Z	Living Room / Kitchen	2.0	1.7	N
AA	Bedroom	1.0	1.9	Y
AB	Living Room / Kitchen	2.0	2.0	Y
AC	Living Room / Kitchen	2.0	2.6	Y
AD	Bedroom	1.0	2.0	Y
AE	Living Room / Kitchen	2.0	2.1	Y
AF	Bedroom	1.0	1.8	Y
AG	Bedroom	1.0	1.8	Y
AH	Living Room / Kitchen	2.0	1.3	N
AI	Bedroom	1.0	1.6	Y
AJ	Living Room / Kitchen	2.0	2.2	Y

Table 15 - Block G1/G2/G3 First Floor Level - Average Daylight Factor Results

Figure 20 - Block G1/G2/G3 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.7	N
B	Living Room / Kitchen	2.0	1.3	N
C	Living Room / Kitchen	2.0	1.8	N
D	Living Room / Kitchen	2.0	1.8	N
E	Living Room / Kitchen	2.0	1.3	N
F	Living Room / Kitchen	2.0	1.5	N
G	Living Room / Kitchen	2.0	2.0	Y
H	Living Room / Kitchen	2.0	1.4	N

Table 16 - Block G1/G2/G3 Second Floor Level - Average Daylight Factor Results

Figure 21 - Block G1/G2/G3 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.8	N
B	Living Room / Kitchen	2.0	1.5	N
C	Living Room / Kitchen	2.0	2.2	Y
D	Living Room / Kitchen	2.0	1.9	N
E	Living Room / Kitchen	2.0	1.6	N
F	Living Room / Kitchen	2.0	1.8	N
G	Living Room / Kitchen	2.0	1.6	N

Table 17 - Block G1/G2/G3 Third Floor Level - Average Daylight Factor Results

Figure 22 - Block G1/G2/G3 Fourth Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.3	Y
B	Living Room / Kitchen	2.0	2.0	Y
C	Living Room / Kitchen	2.0	2.4	Y
D	Living Room / Kitchen	2.0	2.0	Y
E	Living Room / Kitchen	2.0	2.1	Y
F	Living Room / Kitchen	2.0	2.5	Y

Table 18 - Block G1/G2/G3 Fourth Floor Level - Average Daylight Factor Results

Figure 23 - Block G4/G5 Ground Floor - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	4.6	Y
B	Bedroom	1.0	2.8	Y
C	Living Room / Kitchen	2.0	3.0	Y
D	Living Room / Kitchen	2.0	2.8	Y
E	Bedroom	1.0	1.4	Y
F	Bedroom	1.0	2.6	Y
G	Living Room / Kitchen	2.0	3.1	Y
H	Bedroom	1.0	1.7	Y
I	Living Room / Kitchen	2.0	2.4	Y
J	Living Room / Kitchen	2.0	2.7	Y
K	Bedroom	1.0	1.4	Y
L	Living Room / Kitchen	2.0	2.1	Y

Table 19 - Block G4/G5 Ground Floor - Average Daylight Factor Results

Figure 24 - Block G4/G5 Podium Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Bedroom	1.0	2.3	Y
B	Living Room / Kitchen	2.0	1.8	Y
C	Bedroom	1.0	1.3	Y
D	Living Room / Kitchen	2.0	1.7	Y
E	Living Room / Kitchen	2.0	3.4	Y
F	Bedroom	1.0	3.1	Y
G	Living Room / Kitchen	2.0	2.5	Y
H	Living Room / Kitchen	2.0	3.3	Y
I	Bedroom	1.0	3.0	Y
J	Living Room / Kitchen	2.0	1.2	N
K	Bedroom	1.0	2.4	Y
L	Living Room / Kitchen	2.0	3.4	Y
M	Bedroom	1.0	3.2	Y
N	Living Room / Kitchen	2.0	2.4	Y
O	Bedroom	1.0	3.6	Y
P	Living Room / Kitchen	2.0	2.5	Y
Q	Living Room / Kitchen	2.0	2.2	Y
R	Living Room / Kitchen	2.0	1.9	N
S	Bedroom	1.0	2.2	Y
T	Bedroom	1.0	1.8	Y
U	Bedroom	1.0	1.5	Y
V	Bedroom	1.0	2.7	Y
W	Living Room / Kitchen	2.0	2.2	Y

Table 20 - Block G4/G5 Podium Floor Level - Average Daylight Factor Results

Figure 25 - Block G4/G5 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.4	N
B	Living Room / Kitchen	2.0	2.1	Y

Table 21 - Block G4/G5 Second Floor Level - Average Daylight Factor Results

Figure 26 - Block G4/G5 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	1.6	N

Table 22 - Block G4/G5 Third Floor Level - Average Daylight Factor Results

Figure 27 - Block G4/G5 Fourth Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BS 8206 Guideline (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BS 8206 Guideline (%)
A	Living Room / Kitchen	2.0	2.1	Y

Table 23 - Block G4/G5 Fourth Floor Level - Average Daylight Factor Results

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. Of the 3,241 rooms that comprise the development, only 70 fall short of the BRE Guidelines and BS 8206 recommendations, therefore a 97.8% compliance rate is achieved across the development.

Total No. of Rooms	No. Living/ Kitchen Rooms Not Compliant with BS 8206 Guidelines (2.0% ADF)	No. Bedrooms Not Compliant with BS 8206 Guidelines (1.0% ADF)	Total No. Rooms Not Compliant with BS 8206 Guidelines	% of compliance with BS 8206
3,241	70	0	70	97.8

Table 24 – Percentage of Compliance

As outlined in Section 6.1, for this final application report, an ADF benchmark of 2% for living/ kitchen spaces, in line with BS 8206 has been utilised to calculate the percentage rate of compliance. However, during the assessment completed for the pre planning meeting, a pass rate of 98.3% when compared to a 1.5% ADF benchmark for living/kitchens was achieved. The 2% ADF benchmark was also assessed at the pre-planning stage and showed a compliance rate of 97.8% and this remains unchanged. It should be noted that whether the 1.5% or the 2.0% ADF is set as the benchmark for compliance, the same level of daylight will be experienced within the scheme, with the only change being the benchmark to which the compliance rate is calculated.

The following table outlines the percentage of compliance based on the 1.5% ADF benchmark for living/ kitchen.

Total No. of Rooms	No. Living/ Kitchen Rooms Not Compliant with 1.5% Benchmark	No. Bedrooms Not Compliant with BS 8206 Guidelines (1.0% ADF)	Total No. Rooms Not Compliant with ADF target	% of compliance
3,196	54	0	54	98.3

Table 25 – Percentage of Compliance Based on 1.5% ADF Benchmark for Living/Kitchen Spaces

6.5. DAYLIGHT RESULTS – ROOMS WITHIN APARTMENTS FALLING BELOW COMPLIANCE

As previously stated, of the 3,241 rooms that comprise the development, only 70 fall short of the BRE Guidelines and BS 8206 recommendations, therefore a 97.8% compliance rate is achieved across the development.

In order to demonstrate that excellent levels of daylight are achieved in those units falling short of compliance, the following image illustrates the ADF levels being achieved throughout a 'worst case' living room/kitchen. As expected, daylight levels are excellent within close proximity to the external wall and begin to drop off as you move towards the kitchen area which are typically located to the rear of the open space. It must be noted that the apartments within the Baldoyle-Stapolin GA03 development contain a kitchen which is designed to be used mainly for food preparation rather than occupants spending a long time sitting in the kitchen area. Instead, occupants are expected to spend most of their time in the living room area, where daylight penetration will be more appreciated. Therefore, it can be stated that even though some rooms fall short of the compliance target set, they will still receive excellent levels of daylight within the zone closest to the external wall, where sitting areas are located and where occupants are expected to spend the majority of their time.

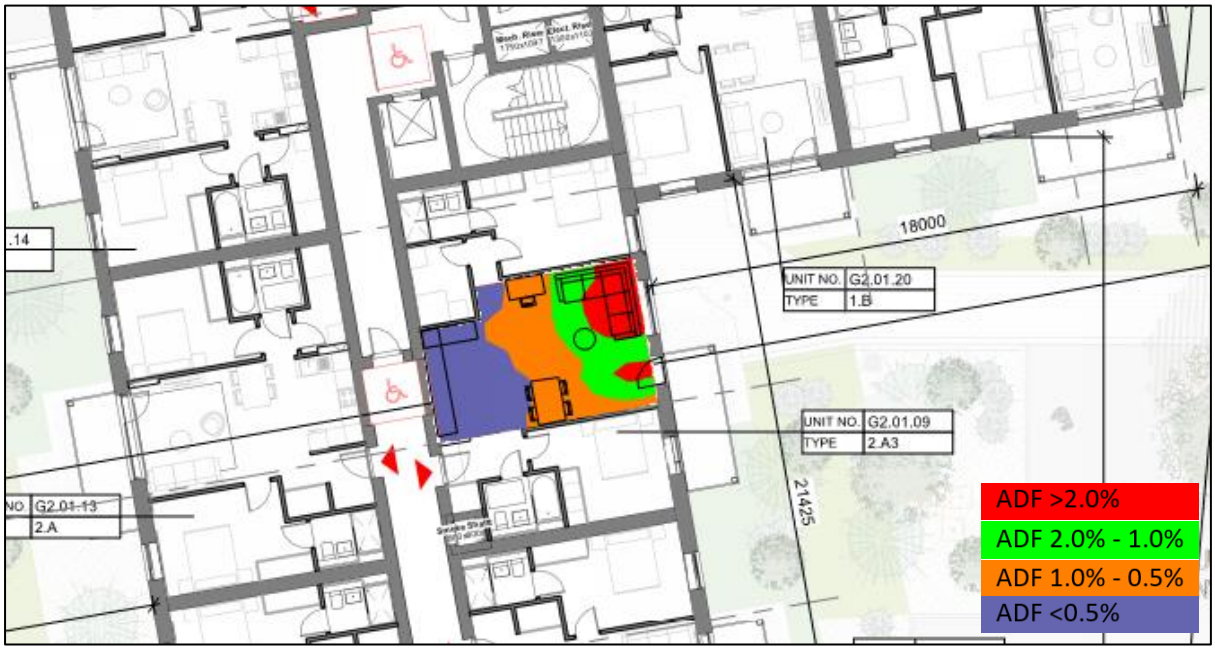

Figure 28 – Block G1/G2/G3 First Floor Level Unit T – 'Worst Case' Living Room – Assessment with ADF Contours

It is worth emphasising again the fact that the guidelines for daylight are not mandatory and that the Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities (December 2020) outlines that *"where an applicant cannot fully meet all of the*

requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraint associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

The proposed development seeks to deliver a high quality living environment through the provision of high quality open spaces, which residents can enjoy immediately adjacent to their homes, and connected via green networks to surrounding amenity areas. Additionally, the proposed development provides quality external private open space to all residential units, ensuring maximum opportunities to enjoy their residential living environment.

7. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT AMENITY SPACES

BRE Guidelines 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.

The sunlight assessment has been analysed for all communal amenity spaces.

The red squares in Figure 29[2] highlight the areas that receive a minimum of 2 hours of sunlight on the 21st of March for the proposed development. It is evident that the majority of the amenity spaces receives 2 hours or more of sunlight on March 21st, therefore compliance with BRE Guidelines is achieved.

2 Adjacent properties were included as part of the analysis. However, they have been removed for the purpose of the image.

Figure 29 – Communal amenity spaces – hours of sunlight on March 21st

Table 26 outlines the percentage of each amenity space receiving at least 2 hours sunlight on March 21st. All communal amenity spaces receive the recommended values in more than 50% of the area, therefore, compliance with BRE Guidelines is achieved.

Garden	Percentage of area receiving ≥ 2hours sunlight on March 21st	Meets compliance with BRE Guidelines
Blocks E1/E2/E3/E4 Communal	94%	Y
Block F1 Courtyard	53%	Y
Block F2 Courtyard	50%	Y
Blocks F1/F2 Communal	96%	Y
Blocks G1/G2/G3	78%	Y
Blocks G4/G5	88%	Y

Table 26 – Sunlight results – Communal amenity spaces

8. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT (APSH)

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 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, however, all windows to occupied rooms within the development have been included within the analysis.

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 at lower floors will naturally be reduced and achieving the recommended values within BRE Guidelines can become challenging. Therefore, in addition to assessing the criteria recommended in the BRE Guidelines, a relaxed value has been set to give further reference in relation to sunlight levels.

The below table summarises the annual probable sunlight hours for the annual period and for the winter period based on the BRE recommendations. Two additional checks with relaxed benchmarks have been carried out to show the majority of windows still achieve good levels of sunlight across the development.

	BRE Guidelines Check 1 **APSH > 25%** **Annual Period**	**BRE Guidelines Check 2** **APSH > 5%** **Winter Period**	**Additional Check 1** **APSH > 20%** **Annual Period**	**Additional Check 2** **APSH > 15%** **Annual Period**
Percentage of Compliance	57%	68%	64%	77%

Table 27 – APSH Summary Table

The results from the analysis have shown that for the annual period, 57% of the analysed windows achieve the recommended APSH values stated in the BRE Guidelines, while 68% of windows achieve the recommended values during the winter months, when sunlight is more valuable. When a relaxed benchmark of 20% and 15% is applied, 64% and 77% of the analysed windows achieve this alternative value, showing that acceptable levels of sunlight will be achieved across the development. The shortfall in compliance can be attributed to the projection of balconies and to the north facing windows.

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".*

In addition, BS8206 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".*

The following images[3] illustrate the sunlight levels achieved within the development.

Figure 30 - APSH – East Elevation

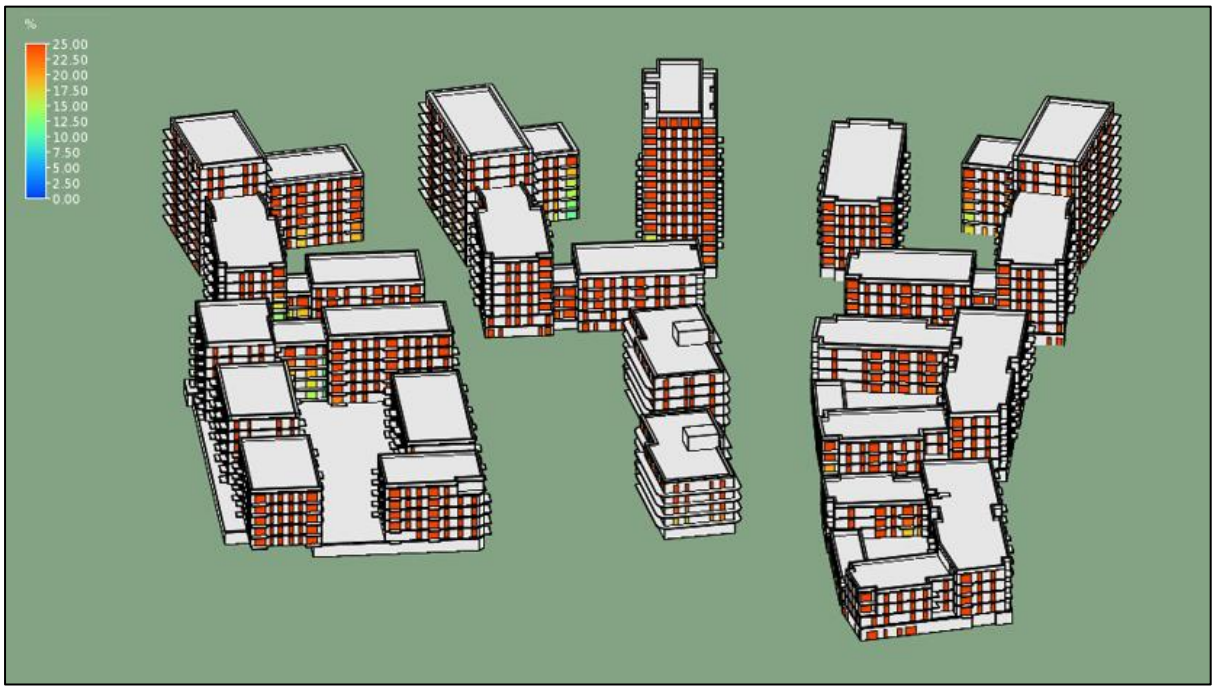

Figure 31 - APSH – South Elevation

3 Adjacent properties were included as part of the analysis. However, they have been removed for the purpose of the image.

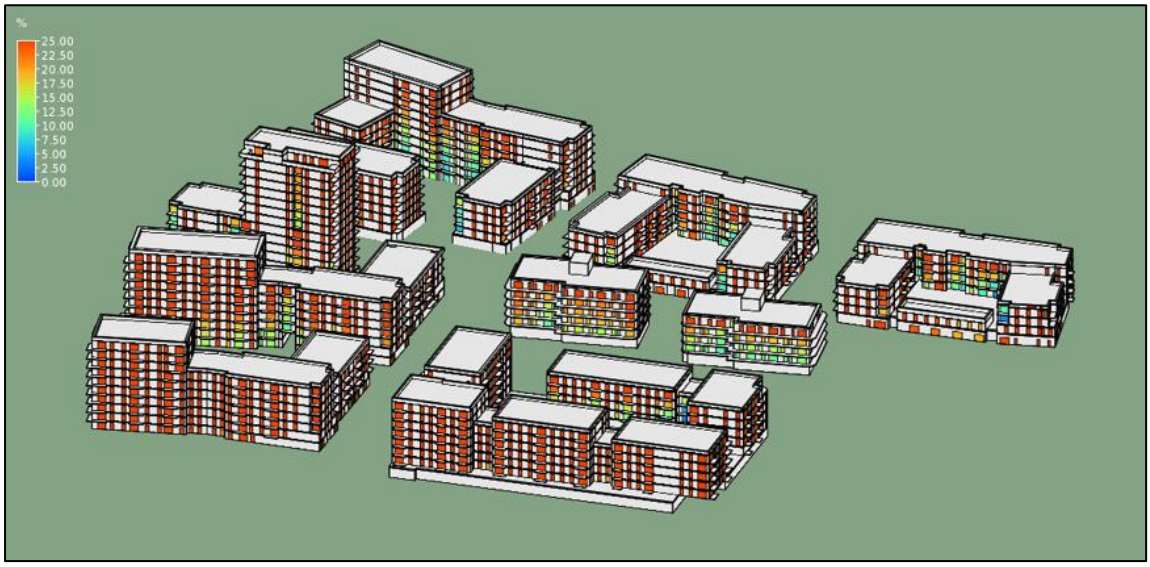

Figure 32 - APSH – West Elevation

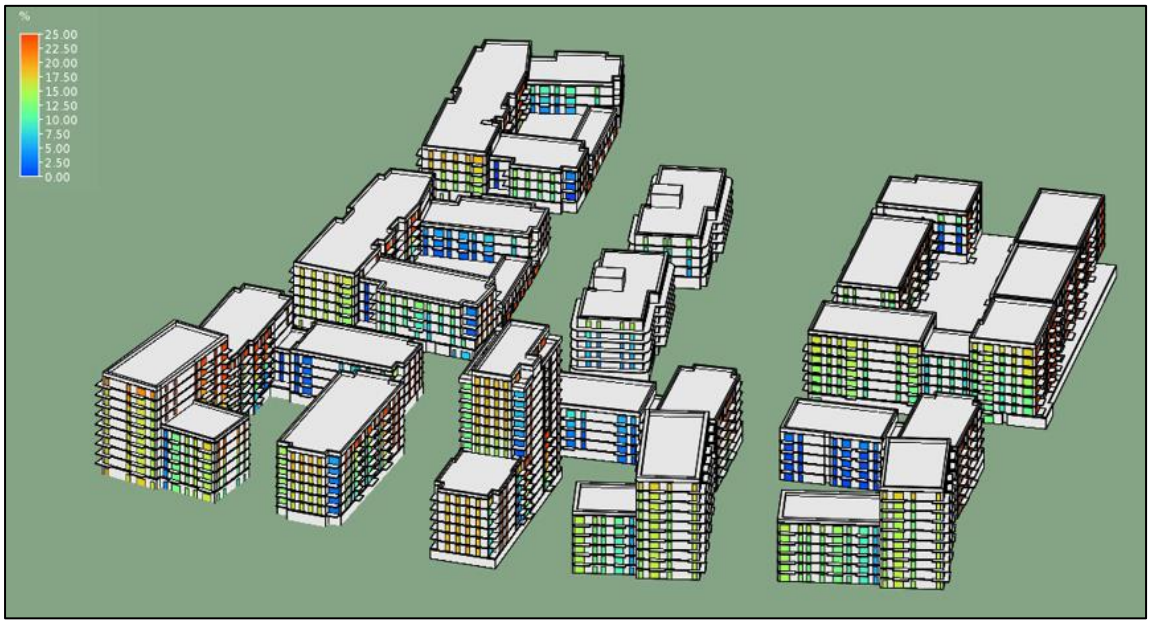

Figure 33 - APSH – North Elevation

It is important to note that the projection of balconies will impact the sunlight reaching the windows, however, it will provide occupants with an outdoor amenity space that will achieve excellent levels of sunlight.

In addition, the Sustainable Urban Housing: Design Standards for New Apartments document outlines that if an applicant cannot fully meet all the requirements of the daylight provisions from the BRE Guidelines and BS 8206, compensatory design solutions must be set out. Even though certain windows are falling slightly short of compliance with the APSH due to their location and/or the projection of balconies, the proposed development has been designed to provide excellent views of high-quality green spaces as well as the provision of high-quality balconies within all apartments.

9. ASSESSING THE IMPACT ON NEIGHBOURING PROPERTIES

9.1. DAYLIGHT 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.

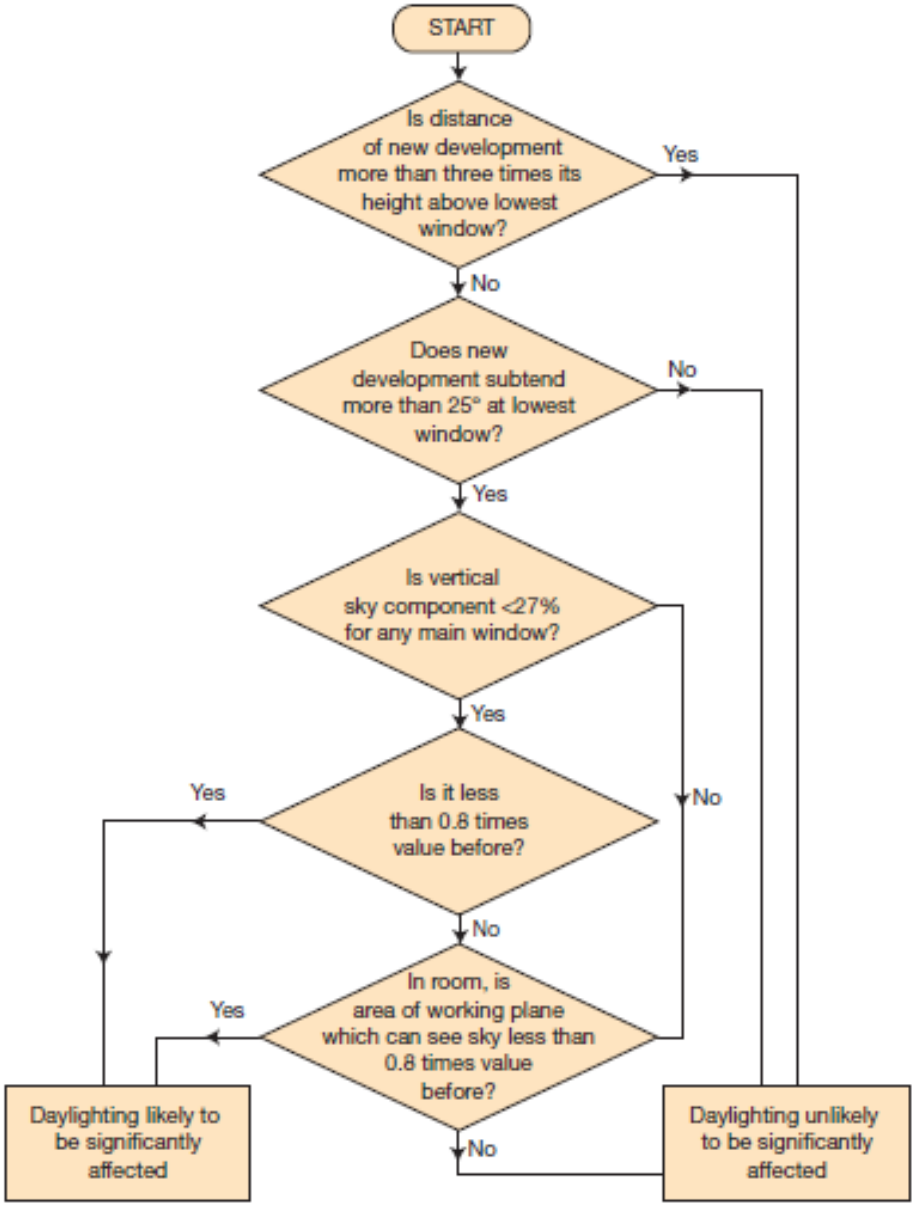

Figure 34 – Daylight Assessment Methodology

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 provide three main methods for assessing daylight availability.

9.1.1 25° LINE CRITERIA

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 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 2).

9.1.2 VERTICAL SKY COMPONENT

The second 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. If the VSC standard is not met on any window, Step 3 is then followed

9.1.3 NO SKY LINE

The third 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. Thus, as this method is limited, Step 2 is considered more appropriate.

Sections 9.2 and 9.3 on the following pages outline the details of the analysis undertaken.

9.2. IDENTIFYING SENSITIVE RECEPTORS

Prior to following the flow matrix, first the key sensitive receptors around the site 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, amenities and 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 28 identifies all sensitive receptors analysed, whilst Figure 35 identifies their location.

Development Ref.	Development name
Ref. 1	Clongriffin Development (DCC Refs.: 2903/16, 3776/15, 2478/17, 4266/16, 2610/16, 3117/16, 4101/16 and 2569/17)
Ref. 2	Growth Area 2 (FCC Reg. Ref. F11A/0290 (/E1), PL06F.239732 – GA2)
Ref. 3	Shoreline GA01 – Site Subject to separate SHD process

Table 28 – Sensitive Receptors surrounding Baldoyle-Stapolin GA03 Development

The image below identifies the location of the sensitive receptors.

Figure 35 - Location of Sensitive Receptors

9.3. DAYLIGHT IMPACT ON NEIGHBOURING PROPERTIES

25 º line criteria

In order to analyse any potential impact on the properties adjacent to the proposed Baldoyle-Stapolin GA03 development, a line has been created which is reflective of a 25° angle taken from a horizontal level at 1.6m above ground to the highest point on the proposed structures.

As illustrated below, the properties located to the West (Ref. 1) of the proposed Project fall outside the 25° line created, therefore, they are to substantial distance and imperceptible impact will be perceived. The properties to the East (Ref. 2) of the proposed Project fall inside the 25° line and have been selected for VSC analysis. The properties located to the south of the proposed development (Ref. 3) are subject to a separate SHD application. The daylight/sunlight analysis that was carried out for this application includes the impact of GA03. Therefore, sensitive receptor Ref. 3 was not selected for further analysis as the impact of GA03 has been accounted for within the daylight/sunlight results included within this application.

Figure 36 – 25° Line Adjacent Properties

Development Ref.	Development name	Impact Perceived
Ref. 1	Clongriffin Development (DCC Refs.: 2903/16, 3776/15, 2478/17, 4266/16, 2610/16, 3117/16, 4101/16 and 2569/17)	The distance is substantial from the proposed development and in compliance with the 25° line criteria. Therefore, imperceptible impact.
Ref. 2	Growth Area 2 (FCC Reg. Ref. F11A/0290 (/E1), PL06F.239732 – GA2)	The properties to the West of Growth Area 02 development fall inside the 25° line perimeter. This area has been selected for VSC analysis.
Ref. 3	Shoreline GA01 – Site Subject to separate SHD process Reg. Ref.	A daylight and sunlight EIAR chapter has been carried out for the separate subject application where the impact of GA03 was taken into account within the calculations.

Table 29 – Summary of Daylight Impact to Sensitive Receptors

VSC > 27%

As previously outlined, sensitive receptor ref. 2 falls inside the 25° line and has been selected for VSC analysis. Regents Park Development Ltd. were granted permission on appeal on 11th April 2013 and given a further extension of duration of permission in 2018 (FCC Reg. Ref. F11A/0290/E1) on lands at Growth Area 2 ('GA02'), as per Baldoyle-Stapolin Local Area Plan (LAP). It is understood that a future application will be submitted.

Detailed information on the future development was not available, therefore, a sample of 'worst case' windows located at the lower levels were modelled to give a good indication of the daylight impact that will be perceived by sensitive receptor ref. 2.

Since the VSC with the proposed development in place is less than 27%, the VSC levels achieved have been compared to a baseline scenario to assess if the reduction of light is in accordance with BRE Guideline recommendations and continues to achieve at least 80% of its former value (baseline) once the proposed development is in place. When analysing the VSC of the proposed scenario to the existing scenario (empty greenfield) a daylight impact will be perceived for sensitive receptor ref. 2. This is normal due to the comparison between an empty site and the construction of any new development. However, the Baldoyle-Stapolin LAP presents a development plan for the site, where it allows for 4 to 4.5 storey buildings within the area, therefore, the comparison to an empty site would not be a fair approach.

Based on the permitted heights within the Baldoyle-Stapolin LAP, a new baseline has been established for the assessment. The image below illustrates the building heights within the area. The new baseline has been modelled with the same shape and floor to floor height of the proposed development, with the number of storeys recommended within the Baldoyle-Stapolin LAP.

Figure 37 – Baldoyle-Stapolin Local Area Plan Building Heights

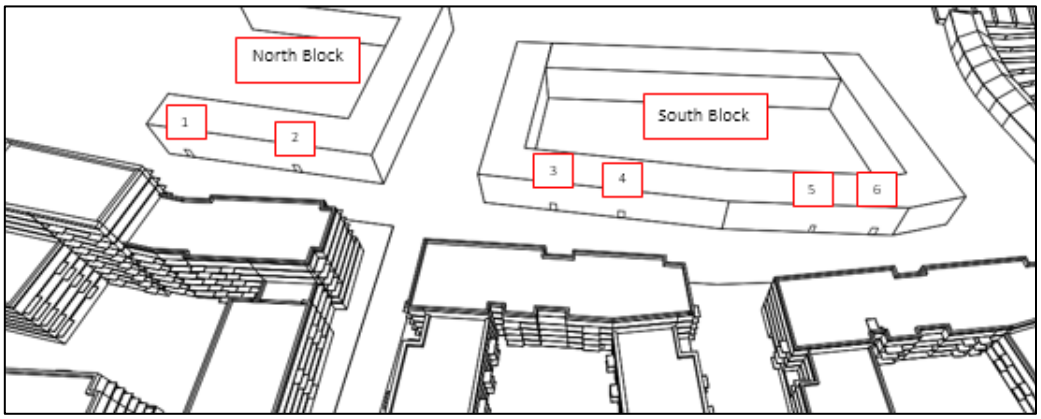

Figure 38 – Sensitive Receptor Ref. 2 – Window references

Window Ref.	VSC received Baldoyle-Stapolin LAP (%)	VSC received once the proposed development is built (%)	Percentage of its former value (%)	Meets BRE Guidelines VSC>80% of its former value
1	26.5	18.9	71	N
2	26.4	18.6	70	N
3	26.9	21.9	81	Y
4	27	22.5	83	Y
5	25.5	23.3	91	Y
6	23.8	21.5	90	Y

Table 30 – VSC Result

The analysis has shown that imperceptible impact will be perceived by the South block within sensitive receptor ref. 2 when compared to the Baldoyle-Stapolin LAP. The North block will perceive a non-significant impact.

9.4. OVERSHADOWING ASSESSMENT

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 British Summer Times (BST)".*

Based on the recommendations within the BRE Guidelines, March 21st has been used to create the overshadowing images and analyse any potential impact due to the proposed Project. 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.

As outlined in section 9.3, the majority of adjacent properties are located a substantial distance from the proposed development and comply with the 25° line criteria except for sensitive receptor ref. 2 and sensitive receptor ref. 3. However due to the location of sensitive receptor ref. 2 to the East of the proposed Project, there will be only a non-significant overshadowing impact after 4pm on March 21st. As previously stated, a daylight and sunlight EIAR chapter has been submitted for the separate subject application for sensitive receptor ref. 3 where the impact of GA03 has been taken into account within the calculations.

Figure 39 - Overshadowing image on March 21st at 8 a.m. and 9 a.m.

Figure 40 - Overshadowing image on March 21st at 10 a.m. and 11 a.m.

Figure 41 - Overshadowing image on March 21st at 12 p.m. and 1 p.m.

Figure 42 - Overshadowing image on March 21st at 2 p.m. and 3 p.m.

Figure 43 - Overshadowing image on March 21st at 4 p.m. and 5 p.m.

Figure 44 - Overshadowing image on June 21st at 8 a.m. and 9 a.m.

Figure 45 - Overshadowing image on June 21st at 10 a.m. and 11 a.m.

Figure 46 - Overshadowing image on June 21st at 12 p.m. and 1 p.m.

Figure 47 - Overshadowing image on June 21st at 2 p.m. and 3 p.m.

Figure 48 - Overshadowing image on June 21st at 4 p.m. and 5 p.m.

Figure 49 - Overshadowing image on June 21st at 6 p.m. and 7 p.m.

Figure 50 - Overshadowing image on December 21st at 10 a.m. and 11 a.m.

Figure 51 - Overshadowing image on December 21st at 12 p.m. and 1 p.m.

Figure 52 - Overshadowing image on December 21st at 2 p.m. and 3 p.m.

In addition to the sunlight analysis on March 21st and the overshadowing images, a monthly assessment has been carried out for the communal open spaces in response to the ABP request *"a month-by-month assessment of average daylight hours within the public open space should be provided within the daylight and sunlight analysis document to allow for a full understanding of the year round level of overshadowing of the primary outdoor recreation areas for the development should be submitted."* As previously stated, the communal amenity areas are in compliance with BRE Guidelines criteria, achieving 2 hours or more of sunlight on March 21st on at least 50% of the proposed open spaces. The additional assessment[4] has also shown that excellent levels of sunlight will be achieved across all communal open spaces during the whole year. January, February, October, November and December show some open spaces which do not achieve the 2 hours on sunlight on at least 50% of the area, this is normal due to the lower position of the sun during the winter month. It must be noted that BRE Guidelines only set out recommendations for March 21st since this day gives an average level of shadowing for the year, therefore, the values for the other months must be seen only as additional information.

4 Adjacent properties were included as part of the analysis. However, they have been removed for the purpose of the image.

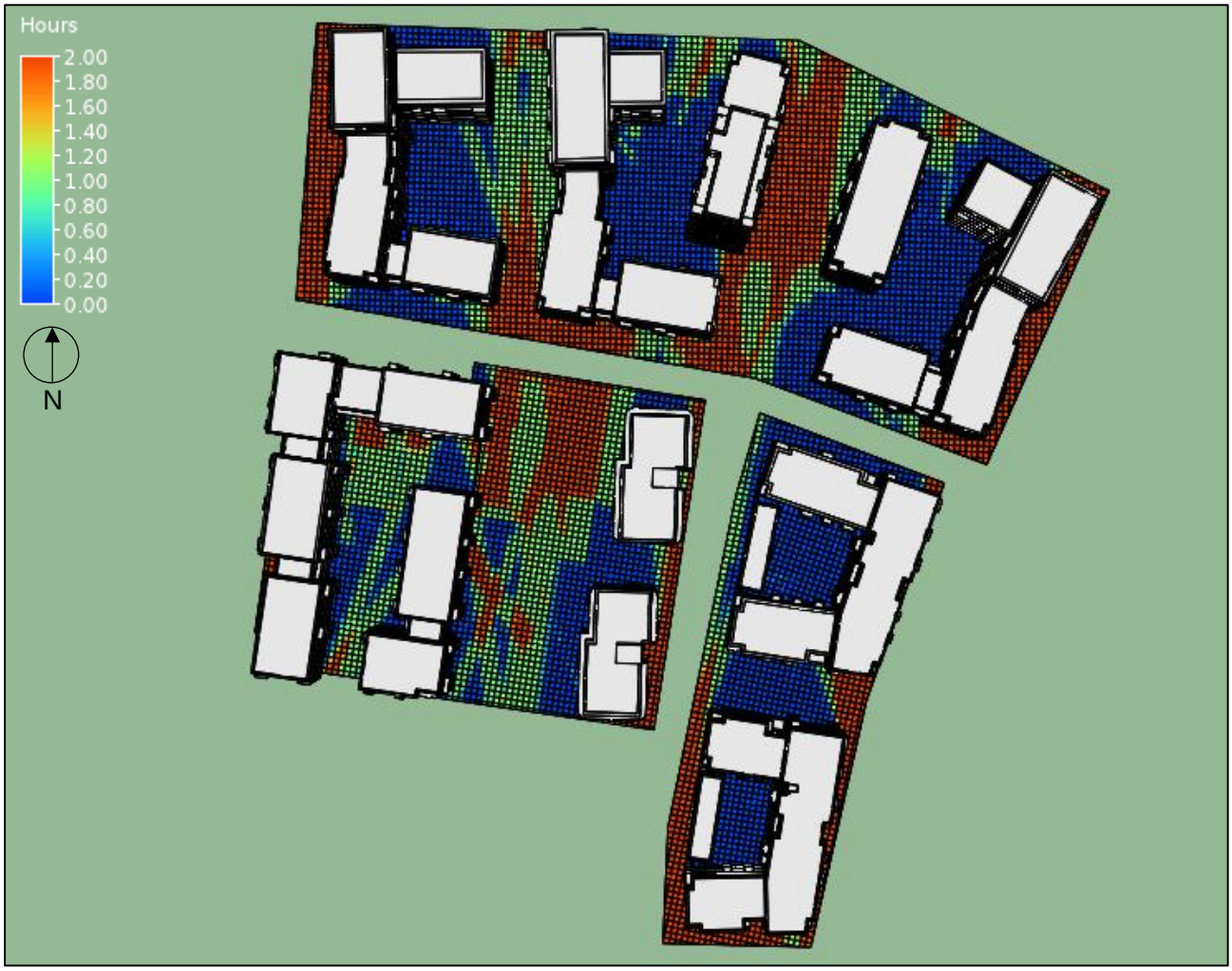

Figure 53 – Sunlight Analysis January 21st

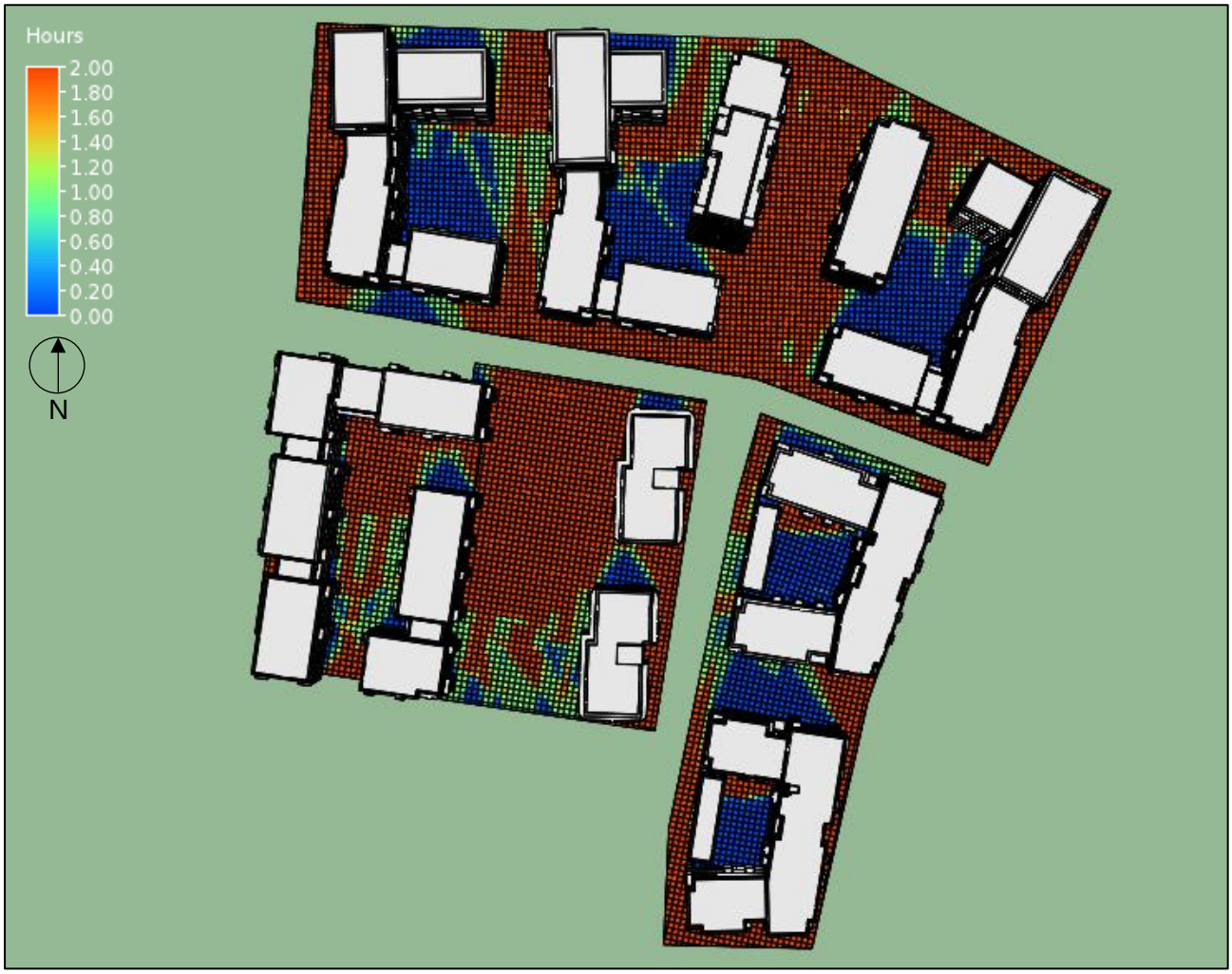

Figure 54 – Sunlight Analysis February 21st

Figure 55 – Sunlight Analysis March 21st

Figure 56 – Sunlight Analysis April 21st

Figure 57 – Sunlight Analysis May 21st

Figure 58 – Sunlight Analysis June 21st

Figure 59 – Sunlight Analysis July 21st

Figure 60 – Sunlight Analysis August 21st

Figure 61 – Sunlight Analysis September 21st

Figure 62 – Sunlight Analysis October 21st

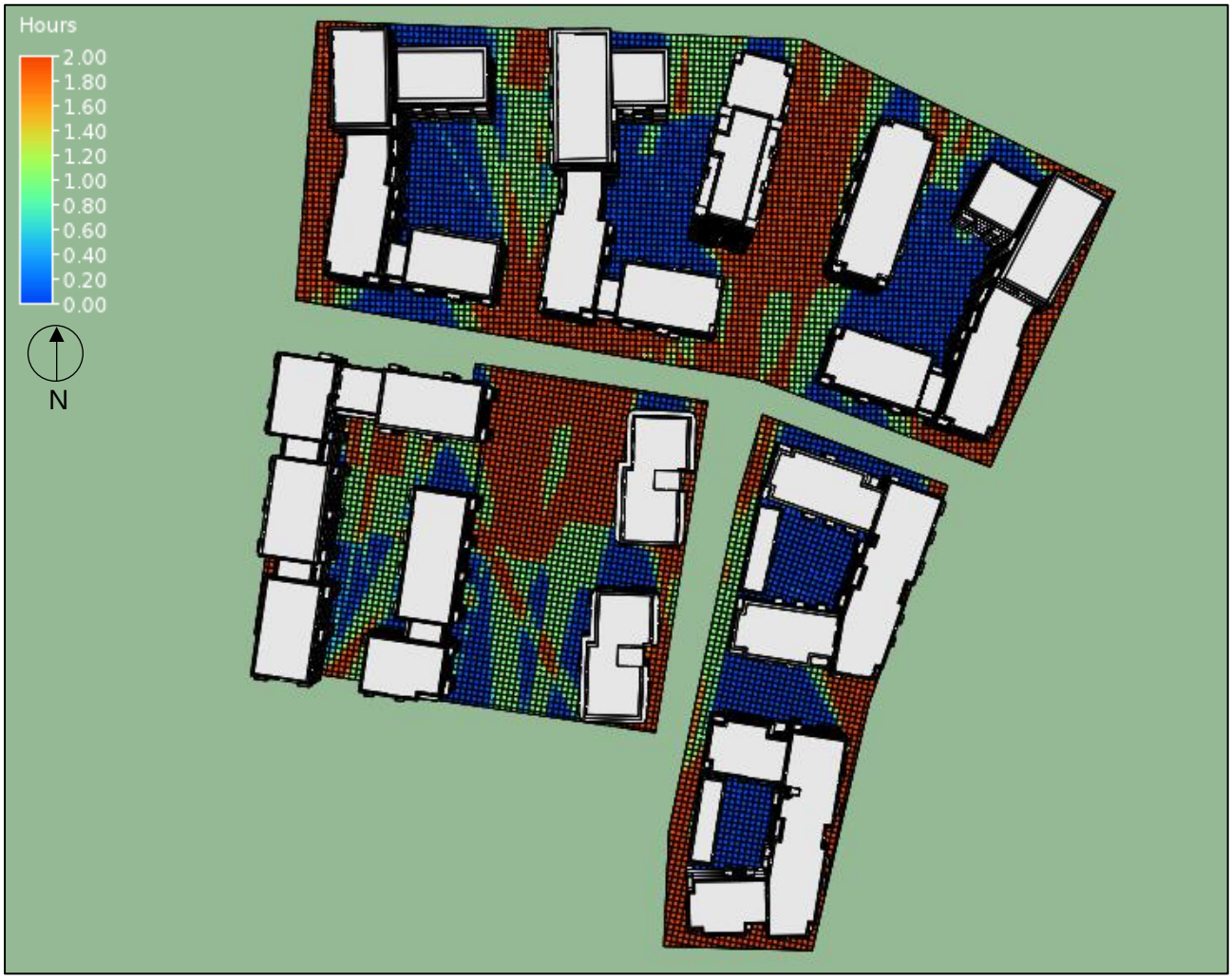

Figure 63 – Sunlight Analysis November 21st

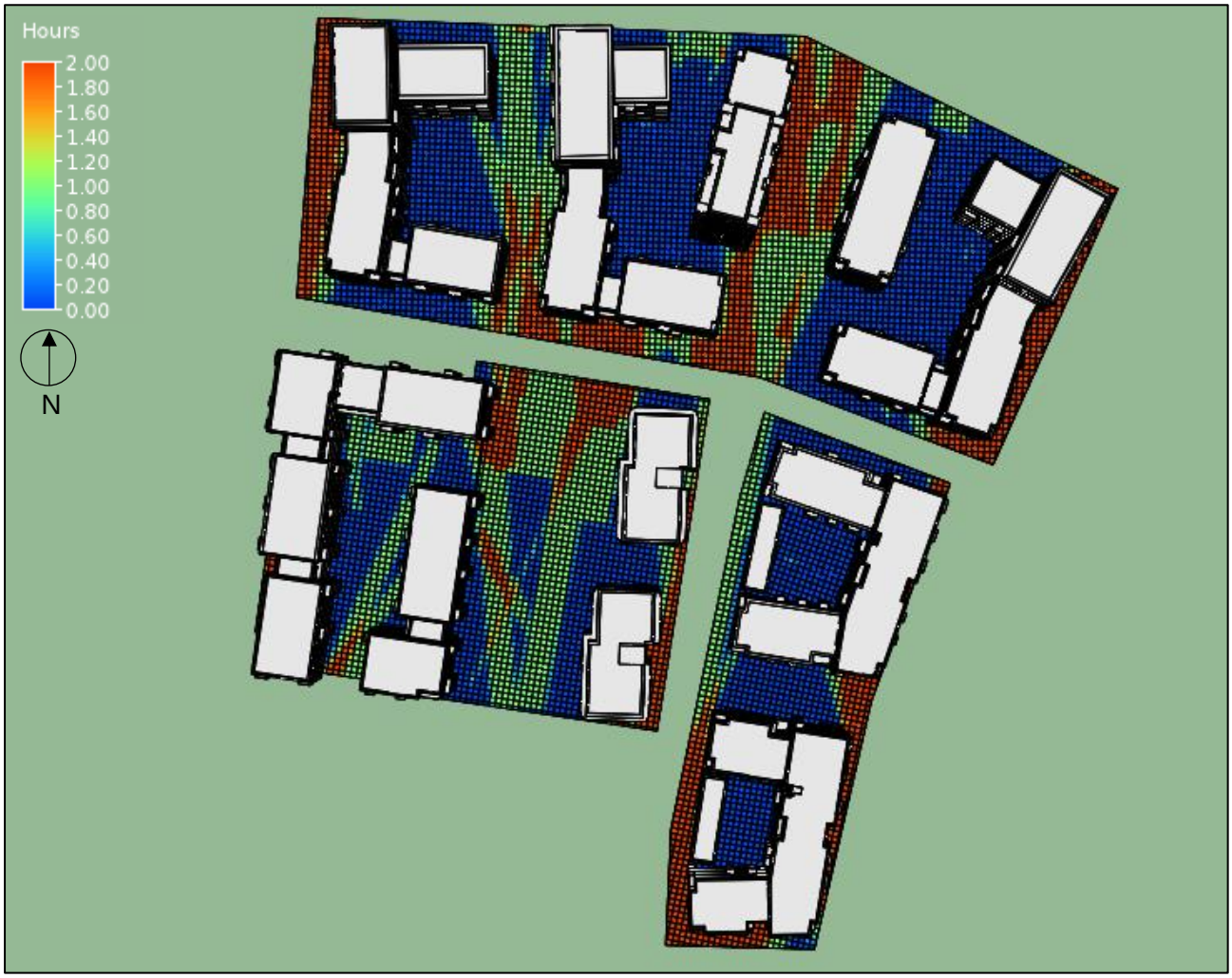

Figure 64 – Sunlight Analysis December 21st

9.5. SUNLIGHT IMPACT TO NEIGHBOURING PROPERTIES (APSH)

In order to analyse the sunlight access within the adjacent properties to the Baldoyle-Stapolin GA03 development, the Annual Probable Sunlight Hours (APSH) is the method used for this assessment.

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 65).

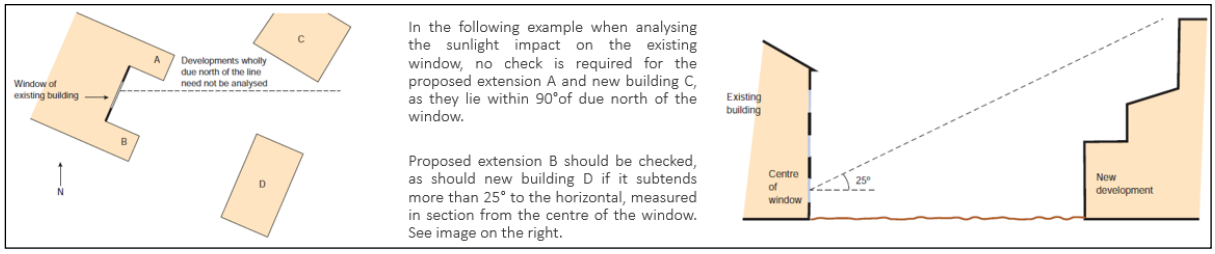

Figure 65 – BRE Extract of the methodology for rooms selection - APSH

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% of 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 outlined within section 9.3, the adjacent properties within sensitive receptor ref. 1 are outside the 25° line criteria, therefore, they are to substantial distance from the proposed Project and imperceptible impact will be perceived. Sensitive receptor ref. 3 is subject to a separate planning application. Further assessment was not required for sensitive receptor ref. 3 since a daylight and

sunlight EIAR chapter has been carried out for the separate application, where the impact of the proposed GA03 has been taken into account within the calculations.

The following table outlines the results achieved for sensitive receptor ref. 2.

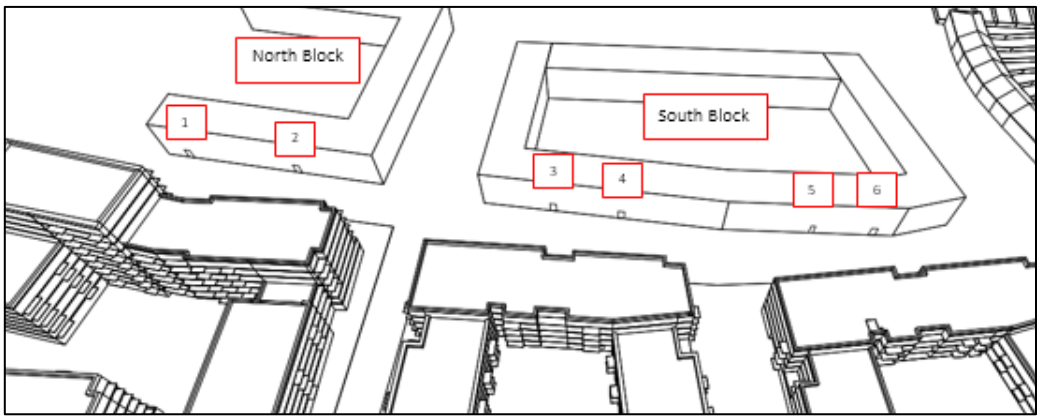

Figure 66 – Sensitive Receptor Ref. 2 – Window references

Window Ref.	APSH received Baldoyle-Stapolin LAP (%)		APSH received once the proposed development is built (%)		Percentage of its former value (%)	
	Annual	Winter (Sep 21st – Mar 21st)	Annual	Winter (Sep 21st – Mar 21st)	Annual	Winter (Sep 21st – Mar 21st)
1	19.8	NA [5]	17.0	5.5	86	NA [5]
2	20.4	NA [5]	17.1	5.6	84	NA [5]
3	21.9	NA [5]	19.6	7.0	89	NA [5]
4	21.4	NA [5]	17.3	5.6	81	NA [5]
5	18.1	NA [5]	17.7	6.2	98	NA [5]
6	18.5	NA [5]	18.1	5.7	98	NA [5]

Table 31 – APSH Result

Since the APSH for the annual period with the proposed development in place is less than 25%, the APSH levels achieved have been compared to a baseline scenario to assess if the reduction of sunlight is in accordance with BRE Guideline recommendations and continues to achieve at least 80% of its former value (baseline) once the proposed development is in place. When analysing the APSH of the proposed scenario to the existing scenario (empty greenfield) a sunlight impact is expected for sensitive receptor ref. 2. This is normal due to the comparison between an empty site and the

[5] Achieves the minimum recommended value with the proposed project in place, therefore, it is not required to calculate the reduction from its former value.

construction of any new development. However, as previously outlined the Baldoyle-Stapolin LAP presents a development plan for the site, where it allows for 4 to 4.5 storey buildings within the area, therefore, the comparison to an empty site would not be a fair approach.

The analysis has shown that imperceptible impact will be perceived by sensitive receptor ref. 2 when compared to the Baldoyle-Stapolin LAP.

10. CONCLUSION

The proposed Baldoyle-Stapolin GA03 development has been analysed in order to determine the following:

- The daylight levels within the living, kitchen and bedroom areas of selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living, kitchen and bedrooms 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 British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition, however, the following should be reiterated as previously outlined:

"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 numerical guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design"

Internal daylight within the proposed development

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. The majority of apartments not only meet but greatly exceed the recommendations outlined within the BRE Guidelines and British Standard BS8206, achieving a 97.8% compliance rate across the proposed apartments.

Throughout the full development, comfortable and desirable spaces have been designed with floor to ceiling heights maximised to further enhance the opportunity for improved daylight levels and extensive glazing to every room enabling deep daylight penetration and providing enhanced views to a beautiful landscaped area.

Sunlight to proposed development amenity spaces

Sunlight analysis has shown that excellent levels of sunlight will be achieved within the proposed development, with all amenity spaces in compliance with BRE Guideline recommendations.

Sunlight to windows within the proposed development

The annual probable sunlight hours assessment has shown that even though some windows are slightly under the BRE recommendations, acceptable levels of sunlight will still be achieved within the proposed development.

Impact to neighbouring properties

The analysis has shown that imperceptible impact will be perceived for sensitive receptor ref. 1 and for the South block within sensitive receptor ref. 2 when compared to the Baldoyle-Stapolin LAP. The North block of sensitive receptor ref. 2 will perceive a non-significant impact.

In relation to the overshadowing impact, the majority of sensitive receptors will present an imperceptible impact, with sensitive receptor ref. 2 receiving a non-significant impact.

The annual probable sunlight hours analysis has shown that imperceptible impact will be perceived by sensitive receptor ref. 2 when compared to the Baldoyle-Stapolin LAP.

Sensitive receptor ref. 3 is subject to a separate planning application. A daylight and sunlight EIAR chapter has been submitted as part of this application where the impact of GA03 has been taken into account within the calculations.

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