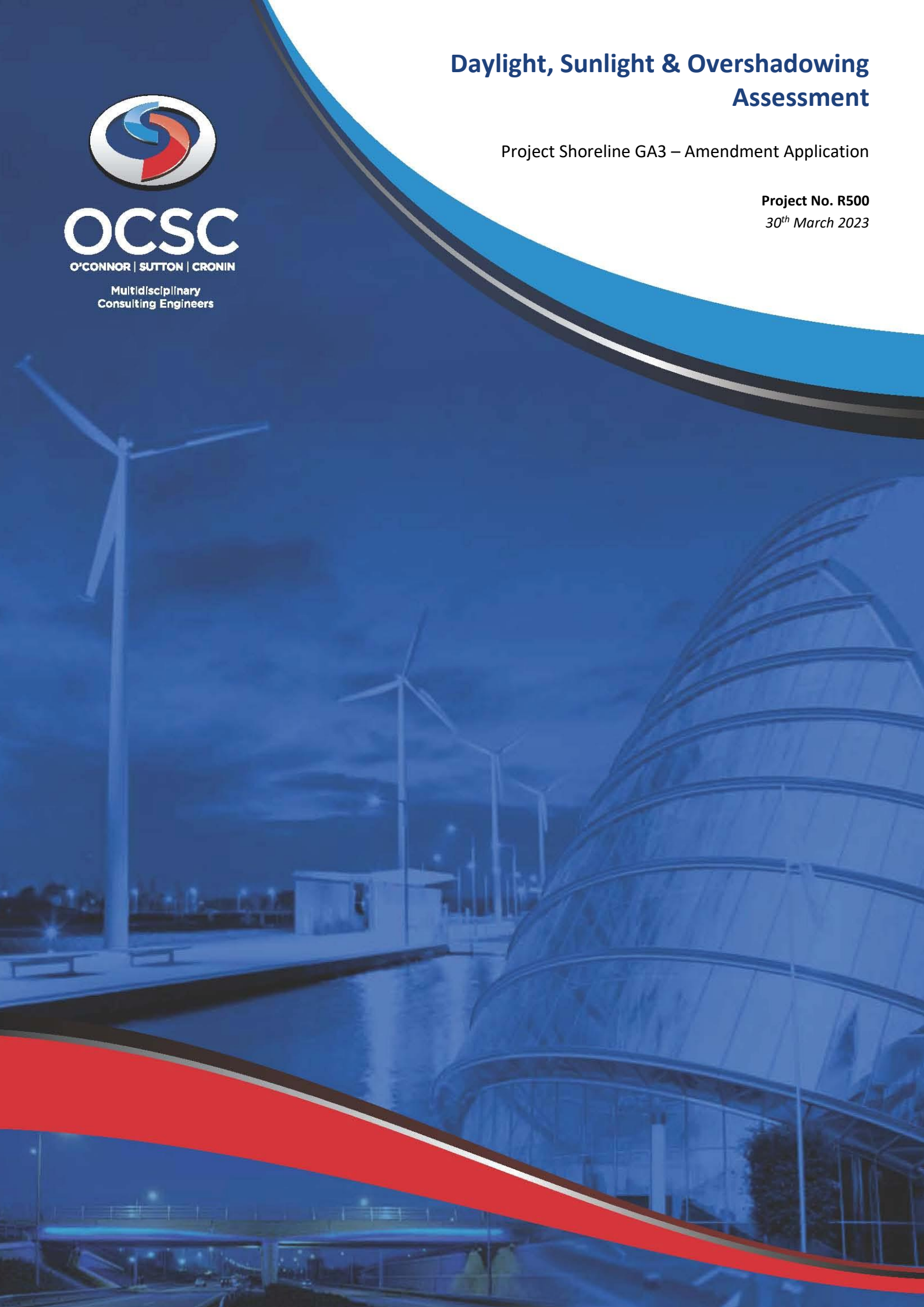


Daylight, Sunlight & Overshadowing Assessment

Project Shoreline GA3 – Amendment Application

Project No. R500
30th March 2023



Daylight, Sunlight & Overshadowing Assessment



NOTICE

This document has been produced by O'Connor Sutton Cronin & Associates for its Client. It may not be used for any purpose other than that specified by any other person without the written permission of the authors.

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	GA3	XX	RP	YS	0002	S4	P11
Rev.	Status	Authors	Checked	Authorised	Issue Date				
11	For Planning	CN	MT	MT	30/03/2023				
10	For Comment	CN	MT	MT	27/03/2023				
09	For Comment	CN	MT	MT	24/03/2023				
08	For Comment	CN	MT	MT	24/03/2023				
07	For Comment	CN	MT	MT	23/03/2023				
06	For Comment	CN	MT	MT	09/03/2023				
05	For Comment	CN	MT	MT	08/03/2023				
04	For Comment	CN	MT	MT	07/03/2023				
03	For Comment	CN	MT	MT	03/03/2023				
02	For Comment	CN/ MT	MT	MT	24/02/2023				
01	For Comment	CN	MT	MT	20/02/2023				

EXECUTIVE SUMMARY

The subject application site (hereafter called 'the site') is located at Baldoyle-Stapolin, Dublin 13, formerly known as The Coast, Baldoyle. It is a site of approx. 3.23ha within the wider GA3 SHD (permitted under ABP Reg. Ref. 311016 / FCC Reg. Ref. SHD/016/21) with a site area of approximately 6.89ha.

This proposed LRD application is an alteration to the above referenced permitted Strategic Housing Development. The amendments comprise of alterations and reduction in height, to permitted Blocks G1, G2, G3, G5, and Block E1 on the northern and eastern portion of GA3 lands. The proposed amendments seek to reduce the overall number of apartments in the permitted development by 97 no. units from 1221 no. units to 1124 no. units. Minor alterations to façade step backs and glazing areas are also proposed, however, a total of only 31 units will be subject to modifications.

The aim of the study is to record and analyse the impact of the proposed alterations, for blocks which are subject to modifications, namely E1, G1, G2, G3 and G5, in terms of the following:

- The daylight levels within the living and bedroom areas of selected apartments, within the blocks proposed to be modified, to give an indication of the expected daylight levels;
- The expected sunlight levels within the living areas and bedrooms within the blocks proposed to be modified;
- The impact of the modifications on the quality of sunlight to the amenity spaces of the blocks proposed to be modified;
- The impact of the modifications on any potential daylight or sunlight impact on surrounding properties.

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 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 British Research Establishments (BRE) "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, Second Edition (2011), as well as the Third Edition (2022).

The Third Edition was published following the submission of the application for the permitted development. It is used in this report to analyse the daylight both before and after the incorporation of the proposed modifications, both to the units subject to modification, and units in the modified blocks in general.

The Second Edition was used for the daylight analysis for the permitted development and is used again here in this report to allow for a fair comparison, and an accurate assessment of the impact of the proposed changes on daylight, on the same selection of apartments as the daylight analysis submitted for the permitted development.

Internal daylight within the blocks proposed to be amended

It is the expert opinion of OCSC, that the proposed reductions in block height in this amendment will result in an overall improvement in daylight in the modified blocks, as well as the adjoining blocks. The results detailed in Section 5.3 of this report confirm this to be the case.

In Section 5.3, using the BRE Guide Third Edition, the impact of the proposed height reduction modifications on daylight within the blocks proposed to be modified, is assessed. The daylight to a select number of units is tested both before and after the incorporation of the proposed changes to provide proof to support OCSC's expert opinion. As is to be expected considering the reduction in massing, the daylight to these units improves following the incorporation of the proposed changes. The compliance rate against the Third Edition daylight standard is 80%.

In Section 5.4, the daylight to the 31 units subject to modifications (ie those which will have an increase in façade setback, or a change in glazing area) are analysed, both before and after the incorporation of the proposed changes. All 31 rooms comfortably comply with the Second Edition daylight requirements, both before and after the incorporation of the proposed changes. As measured by the Second Edition daylight methodology, 16 of these units see a minor reduction in daylight, (<0.5% ADF reduction), while 15 see a significant increase in daylight (>1.9% ADF increase), resulting in an overall improvement in daylight due to the proposed modifications. All 16 units which are experiencing a reduction following the incorporation of the proposed modifications feature an increase in façade

setback, while all 15 which improve feature a change in glazing area. When measured against the Third Edition daylight standard, all 31 units subject to modifications comply both before and after the incorporation of the proposed changes. As measured by the Third Edition daylight standard, 23 units are unchanged, while 3 see a marginal reduction in daylight, and 5 see an increase in daylight.

Furthermore, the analysis in Section 5.5, which is done for comparison purposes, confirms that when tested using the BRE Guide Second Edition, that for the five blocks which are proposed to be amended, excellent levels of internal daylight continue to be achieved following the incorporation of the proposed changes, with the compliance rate increasing from 97.8% to 98.6%. This is in line with expectations, considering the overall reduction in massing.

Overall, the results show that the daylight in the blocks proposed to be modified, will be improved following the incorporation of the proposed amendments, as is to be expected considering the reduction in massing proposed.

Sunlight to windows within the blocks proposed to be amended

It is the opinion of OCSC, that a reduction in massing, as is proposed in this amendment, will result in an improvement in sunlight in the modified blocks.

The annual probable sunlight hours assessment in Section 7.1 has shown that following the incorporation of the proposed changes, the sunlight to windows in the blocks proposed to be amended improves slightly. Although some windows in the blocks proposed to be amended are slightly under the BRE Guide Second Edition (2011) recommendations, acceptable levels of sunlight will still be achieved, following the incorporation of the proposed changes, as per permitted development. A small improvement is seen in sunlight to windows, following the incorporation of the proposed changes, as is to be expected considering the reduction in massing proposed.

Section 7.2 illustrates that good levels of sunlight will be achieved following the incorporation of the proposed changes when measured using the Third Edition (2022) standard also.

Sunlight to amenity spaces of blocks proposed to be amended

In terms of sunlight access, excellent levels of sunlight continue to be experienced in the amenity areas of the blocks proposed to be amended, following the incorporation of the proposed changes, as can be seen in Section 6. The communal amenity spaces provided to the apartment areas greatly exceeds

the BRE Second Edition guidelines (2011) for sunlight on the test day of 21st of March. (Note, The Third Edition (2022) Guidelines are identical to the Second Edition (2011) for amenity sunlight). A small increase in sunlight to these amenity areas is seen, as is to be expected considering the reduction in massing proposed.

Impact to neighbouring properties

Following the incorporation of the proposed changes to GA3, the 25° line method confirms that sensitive receptor ref. 1 is too far from the blocks proposed to be amended to perceive an impact on daylight or sunlight, as can be seen in Section 8.

In relation to the overshadowing impact, the sensitive receptors will not perceive an impact, as was the case for the proposed development. This is detailed further in Section 9.

Sensitive receptor ref. 2 is subject to a separate planning permission. A daylight and sunlight EIAR chapter was submitted as part of this application where the impact of GA3 was taken into account within the calculations.

Overall, the impact to surrounding properties is reduced following the incorporation of the proposed changes, as is to be expected considering the reduction in massing proposed.

DAYLIGHT & SUNLIGHT REPORT

INDEX	PAGE
EXECUTIVE SUMMARY	4
1. INTRODUCTION	9
2. PROPOSED DEVELOPMENT	11
3. PROPOSED BUILDING DESIGN.....	12
4. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT	14
5. DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT	16
6. SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT	52
7. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT (APSH)	54
8. ASSESSING THE IMPACT ON SURROUNDING PROPERTIES	62
9. OVERSHADOWING IMPACT TO SURROUNDING PROPERTIES	71
10. CONCLUSION	77

1. INTRODUCTION

The subject application site (hereafter called 'the site') is located at Baldoyle-Stapolin, Dublin 13, formerly known as The Coast, Baldoyle. It is a site of approx. 3.23ha within the wider GA3 SHD (permitted under ABP Reg. Ref. 311016 / FCC Reg. Ref. SHD/016/21) with a site area of approximately 6.89ha.

This proposed LRD application is an alteration to the above referenced permitted Strategic Housing Development. The amendments comprise of alterations and reduction in height, to permitted Blocks G1, G2, G3, G5, and Block E1 on the northern and eastern portion of GA3 lands. The proposed amendments seek to reduce the overall number of apartments in the permitted development by 97 no. units from 1221 no. units to 1124 no. units. Minor alterations to façade step backs and glazing areas are also proposed, however, a total of only 31 units will be subject to modifications.

The aim of the study is to record and analyse the impact of the proposed alterations, for blocks which are subject to modifications, namely E1, G1, G2, G3 and G5, in terms of the following:

- The daylight levels within the living and bedroom areas of selected apartments, within the blocks proposed to be modified, to give an indication of the expected daylight levels;
- The expected sunlight levels within the living areas and bedrooms within the blocks proposed to be modified;
- The impact of the modifications on the quality of sunlight to the amenity spaces of the blocks proposed to be modified;
- The impact of the modifications on any potential daylight or sunlight impact on surrounding properties.

The calculation methodology for daylight and sunlight is based on the British Research Establishments (BRE) "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, Second Edition (2011), as well as the Third Edition (2022).

The Third Edition was published following the submission of the application for the permitted development. It is used in this report to analyse the daylight both before and after the incorporation

of the proposed modifications, both to the units subject to modification, and units in the modified blocks in general.

The Second Edition was used for the daylight analysis for the permitted development and is used again here in this report to allow for a fair comparison, and an accurate assessment of the impact of the proposed changes on daylight, on the same selection of apartments as the daylight analysis submitted for the permitted development.

2. PROPOSED DEVELOPMENT

This proposed LRD application is an alteration to the permitted Strategic Housing Development ABP Reg. Ref. 311016 / FCC Reg. Ref. SHD/016/21). The proposed amendments comprise of alterations to Block G1, Block G2, Block G3, Block G5, and to Block E1 on the northern and eastern portion of GA3 lands. No works are proposed to Block G4 and Block E2 and will remain as permitted under ABP Reg. Ref. 311016 / FCC Reg. Ref. SHD/016/21.

As the proposed change constitutes only a reduction in height to the blocks, an overall reduction in massing, and minor alterations to façade step backs and glazing areas, any impact to daylight or sunlight is expected to be positive.



Figure 1: Proposed Site Plan

3. PROPOSED BUILDING DESIGN

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

3.1. BUILDING MATERIAL SELECTION

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



Figure 2: Façade Views of Proposed Development – Block E1 (East)

The primary function of the glazing to wall ratio is to maximise 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. Extensive analysis was undertaken on all building facades 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: Typical Elevation Glazing to Wall Ratio - Block G5 (East)

4. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT

The analysis of the impact of the proposed modifications on the daylight and sunlight, has been based on the Building Research Establishment (BRE) Second Edition guidelines on “Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice (2011), as well as the Third Edition (2022).

Two units in each block, both before and after the proposed changes, were assessed using the BRE Guide Third Edition (2022), to determine the impact of the proposed changes on daylight within the blocks proposed to be modified.

Units subject to modification (ie units which have had façade setbacks increased, or glazing areas changed) have been assessed against both the Second Edition (2011) and the Third Edition (2022), both before and after the incorporation of the proposed changes. Testing both before and after the incorporation of the changes, allows the impact of the modifications on daylight to be assessed.

For the permitted development, daylight and sunlight was assessed against the BRE Second Edition (2011) standard, as it was the latest standard at time of submission. In order to allow for a fair comparison to the permitted, and for an accurate assessment of the impact of the proposed reduction in height, the Second Edition (2011) is used.

The BRE 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 Guideline:

“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 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



Figure 4: Apartment Block Layout Plan

5. DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT

5.1. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT (2022 METHODOLOGY)

The daylight assessment methodology detailed in the BRE Guide Third Edition is used in this assessment. The Third Edition methodology goes beyond the average daylight levels within a space, and accounts for the distribution of light within a space also. Spaces must have both high quality of light, but also a relatively even spread of illuminance.

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

Figure 5: 2022 Methodology – Table A.1

The methodology features two daylight criteria for compliance.

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

5.2. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT (2011 METHODOLOGY)

One of the methods of analysis selected for the internal daylight analysis for this development is the Average Daylight Factor (ADF), as per the BRE Second Edition (2011). As this standard was in effect at the time of submission for the permitted scheme, it was used for that daylight assessment. It is used again in this report to facilitate a fair comparison, and to allow for an accurate assessment of the impact on daylight due to the proposed changes.

To quantify the quality of daylight within a space as per BRE Guidelines (2011), the British standards BS 8206 sets out minimum daylight factors to be achieved in 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 6: 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 space, the minimum recommended ADF value should be 2%.

In line with standard industry practice, units presented at the lower levels have been selected as 'worst case' for analysis. The theory being that as floor level height increases so too does access to daylight. The units selected for analysis are considered to be representative of the units across those blocks which are proposed to be modified, and therefore results are indicative of daylight levels to be expected across these blocks. If a unit is found to be below the minimum standard, then the equivalent unit one level higher is also tested. This process is continued until all units on a given level are in compliance. This allows all failing units to be identified, without having to test every unit.

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

Architectural plans and elevations provided by Henry J Lyons formed the basis for the assessment.

In order to analyse the daylight within the proposed residential development, simulations have been completed within the IES VE Software package. A detailed model of the development has been constructed using this software and includes the proposed development as well as the surrounding buildings adjacent to the site. Heights of surrounding buildings have been obtained from survey data.

5.3. DAYLIGHT RESULTS – INTERNAL DAYLIGHT TO APARTMENTS (2022 METHODOLOGY)

To determine what impact (if any) the proposed amendment will have on the daylight within the blocks proposed to be modified (E1, G1, G2, G3 and G5) two ground floor levels per block are analysed using the Third Edition of the BRE Guide. As the proposed amendment features reductions in block height, and in massing, an overall improvement is expected to be seen in the daylight results of the analysed units.

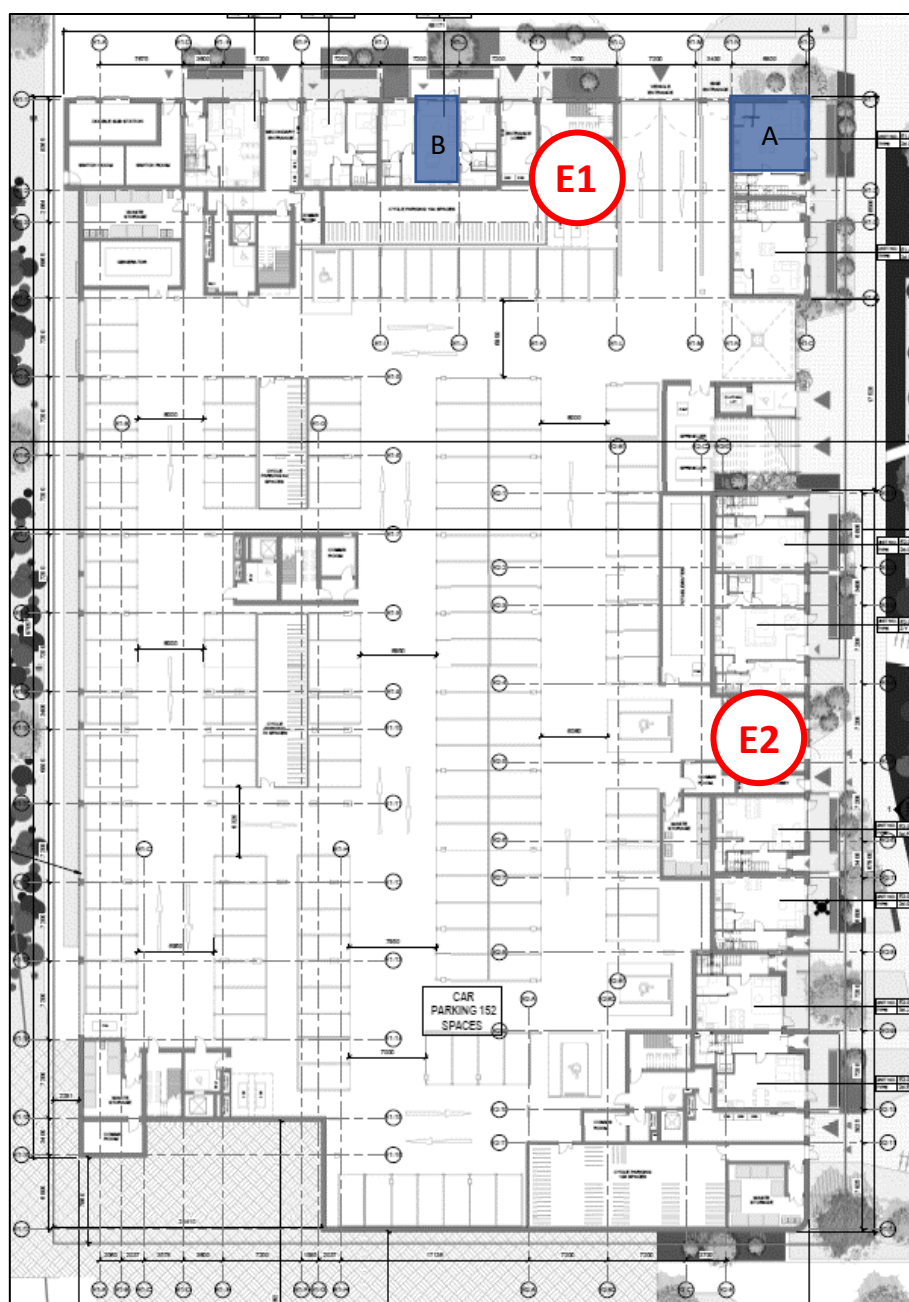


Figure 7: Block E1 – Ground Level Assessed Units – BRE Third Edition Daylight

Room Ref.	Block	BRE Third Edition Criterion 1 % Area > 100 lux Permitted	BRE Third Edition Criterion 2 % Area > 300 lux Permitted	BRE Third Edition Criterion 1 % Area > 100 lux Proposed	BRE Third Edition Criterion 2 % Area > 300 lux Proposed	Impact of Proposed Amendment on Daylight
A	E1	100%	100%	100%	100%	Unchanged
B	E1	100%	55%	100%	58%	Improved

Table 2: Block E1 – Ground Level Assessed Units – BRE Third Edition Daylight Results



Figure 8: Blocks G1 & G2 – Ground Level Assessed Checked Units – BRE Third Edition Daylight

Room Ref.	Block	BRE Third Edition Criterion 1 % Area > 100 lux Permitted	BRE Third Edition Criterion 2 % Area > 300 lux Permitted	BRE Third Edition Criterion 1 % Area > 100 lux Proposed	BRE Third Edition Criterion 2 % Area > 300 lux Proposed	Impact of Proposed Amendment on Daylight
A	G1	100%	100%	100%	100%	Unchanged
B	G1	100%	47%	100%	59%	Improved
C	G2	100%	26%	100%	31%	Improved
D	G2	100%	51%	100%	100%	Improved

Table 3: Block G1 & G2 – Ground Level Assessed Checked Units – BRE Third Edition Daylight Results



Figure 9: Block G3 – First Floor Level Assessed Checked Units – BRE Third Edition Daylight

Room Ref.	Block	BRE Third Edition Criterion 1 % Area > 100 lux Permitted	BRE Third Edition Criterion 2 % Area > 300 lux Permitted	BRE Third Edition Criterion 1 % Area > 100 lux Proposed	BRE Third Edition Criterion 2 % Area > 300 lux Proposed	Impact of Proposed Amendment on Daylight
A	G3	100%	26%	100%	28%	Improved
B	G3	100%	97%	100%	100%	Improved

Table 4: Block G3 – First Floor Level Assessed Checked Units – BRE Third Edition Daylight Results

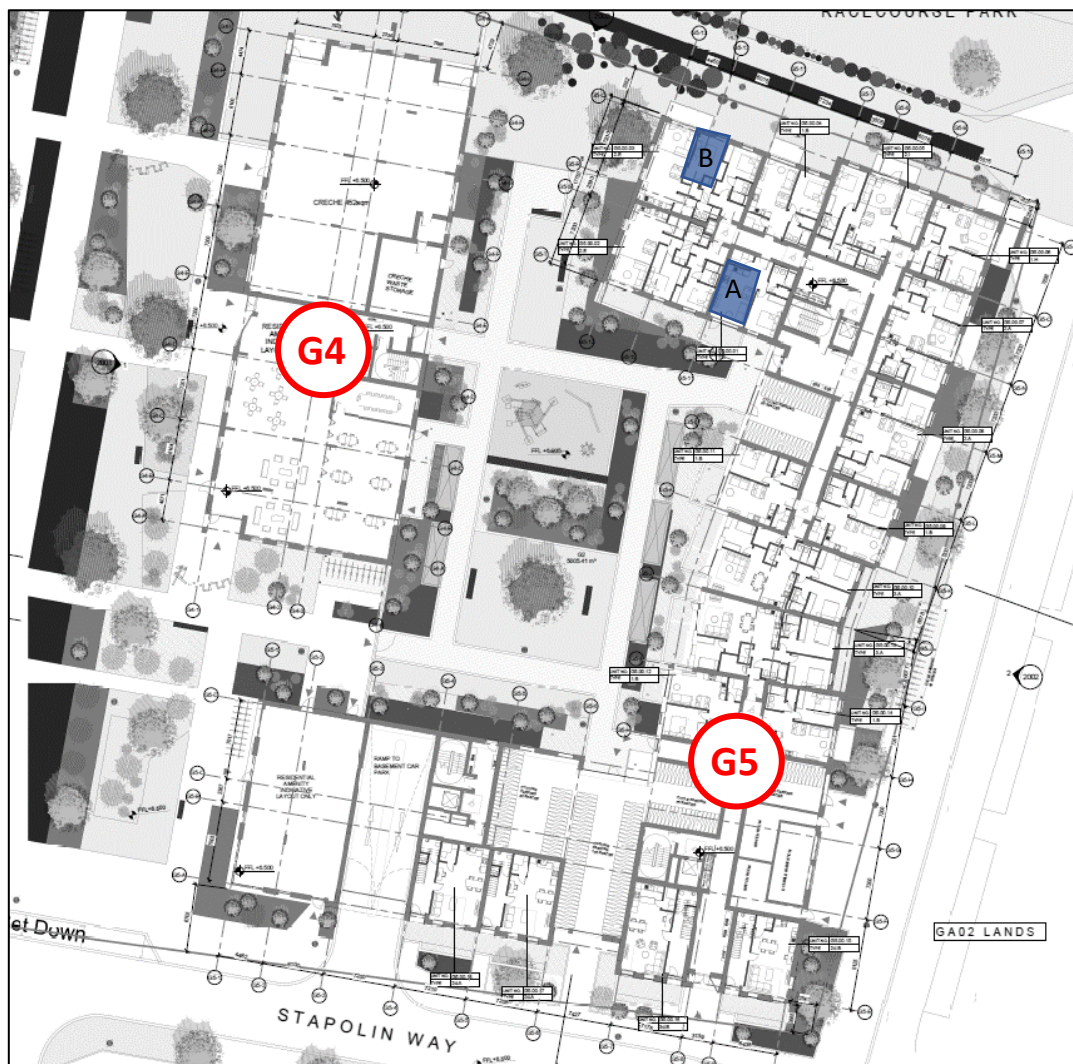


Figure 10: Blocks G5 – Ground Floor Level - Spot Checked Units – BRE Third Edition Daylight

Room Ref.	Block	BRE Third Edition Criterion 1 % Area > 100 lux Permitted	BRE Third Edition Criterion 2 % Area > 300 lux Permitted	BRE Third Edition Criterion 1 % Area > 100 lux Proposed	BRE Third Edition Criterion 2 % Area > 300 lux Proposed	Impact of Proposed Amendment on Daylight
A	G5	100%	100%	100%	100%	Unchanged
B	G5	100%	60%	100%	62%	Improved

Table 5: Block G5 – Ground Floor Level Assessed Checked Units – BRE Third Edition Daylight Results

Of the 10 units analysed with the newer Third Edition (2022) BRE Guide, 7 see an improvement in daylighting following the incorporation of the proposed modifications, the remaining 3 see no impact. The overall improvement is in line with expectations, given the proposed modifications include a reduction in overall massing.

Of the 10 units analysed, 8 pass both criteria of the BRE Guide Third Edition (2022), for a compliance rate of 80%. This sample tested includes only rooms on the lowest levels of each block, where daylight will be lowest. Therefore, the compliance rate would improve if all units were tested, as the access to daylight improves as you move up through the building.

5.4. DAYLIGHT TO UNITS SUBJECT TO MODIFICATIONS

The most significant proposed changes are to the overall block heights, however minor changes are also made to individual apartments. These changes include an increase in setback to two apartments on the 1st Level to the 8th Level each floor of Block G3 (for a total of 16 rooms), as well as the addition of glazing to one unit in each of Blocks G1, G2, and G5, for the Second Level to the 6th Level (for a total of 15 rooms). These 31 units are assessed against both the Second Edition (2011) and the Third Edition (2022) of the BRE Guide.



Figure 11: Block G1, G2 and G3 – Directly Affected Rooms

Room Ref.	Level	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved Before Amendment (%)	ADF Results Achieved After Amendment (%)	Impact of Proposed Amendment on Daylight
A	1	Bedroom	1.0	3.1%	2.8%	Decrease
B	1	Bedroom	1.0	4.0%	3.6%	Decrease
A	2	Bedroom	1.0	3.3%	3.1%	Decrease
B	2	Bedroom	1.0	4.3%	3.9%	Decrease
C	2	Living Room/ Kitchen	2.0	2.6%	4.4%	Increase

D	2	Living Room/ Kitchen	2.0	2.2%	4.4%	Increase
A	3	Bedroom	1.0	3.6%	3.3%	Decrease
B	3	Bedroom	1.0	4.6%	4.1%	Decrease
C	3	Living Room/ Kitchen	2.0	2.6%	4.6%	Increase
D	3	Living Room/ Kitchen	2.0	2.4%	4.7%	Increase
A	4	Bedroom	1.0	3.9%	3.5%	Decrease
B	4	Bedroom	1.0	4.7%	4.4%	Decrease
C	4	Living Room/ Kitchen	2.0	2.6%	4.7%	Increase
D	4	Living Room/ Kitchen	2.0	2.7%	4.9%	Increase
A	5	Bedroom	1.0	4.2%	3.9%	Decrease
B	5	Bedroom	1.0	5.0%	4.6%	Decrease
C	5	Living Room/ Kitchen	2.0	2.6%	4.8%	Increase
D	5	Living Room/ Kitchen	2.0	2.8%	5.0%	Increase
A	6	Bedroom	1.0	4.5%	4.2%	Decrease
B	6	Bedroom	1.0	5.2%	4.9%	Decrease
C	6	Living Room/ Kitchen	2.0	4.7%	7.0%	Increase
D	6	Living Room/ Kitchen	2.0	4.6%	6.9%	Increase
A	7	Bedroom	1.0	4.6%	4.4%	Decrease
B	7	Bedroom	1.0	5.3%	5.0%	Decrease
A	8	Bedroom	1.0	4.7%	4.7%	Decrease
B	8	Bedroom	1.0	5.3%	5.1%	Decrease

Table 6: Block G1, G2 and G3 – Directly Affected Rooms – BRE Guide Second Edition Daylight Results

Room Ref.	Level	BRE Third Edition Criterion 1 % Area > 100 lux Permitted	BRE Third Edition Criterion 2 % Area > 300 lux Permitted	BRE Third Edition Criterion 1 % Area > 100 lux Proposed	BRE Third Edition Criterion 2 % Area > 300 lux Proposed	Impact of Proposed Amendment on Daylight
A	1	100%	95%	100%	62%	Decrease
B	1	100%	100%	100%	100%	Unchanged
A	2	100%	92%	100%	89%	Decrease
B	2	100%	100%	100%	100%	Unchanged
C	2	100#5	96%	100%	100%	Increase
D	2	100%	100%	100%	100%	Unchanged
A	3	100%	100%	100%	100%	Unchanged
B	3	100%	100%	100%	100%	Unchanged
C	3	100%	96%	100%	100%	Increase
D	3	100%	100%	100%	100%	Unchanged
A	4	100%	100%	100%	100%	Unchanged
B	4	100%	100%	100%	100%	Unchanged
C	4	100%	96%	100%	100%	Increase
D	4	100%	100%	100%	100%	Unchanged
A	5	100%	100%	100%	100%	Unchanged
B	5	100%	100%	100%	100%	Unchanged
C	5	100%	98%	100%	100%	Increase
D	5	100%	100%	100%	100%	Unchanged

A	6	100%	100%	100%	100%	Unchanged
B	6	100%	100%	100%	100%	Unchanged
C	6	100%	98%	100%	100%	Increase
D	6	100%	100%	100%	100%	Unchanged
A	7	100%	100%	100%	100%	Unchanged
B	7	100%	100%	100%	100%	Unchanged
A	8	100%	100%	100%	100%	Unchanged
B	8	100%	100%	100%	100%	Unchanged

Table 17: Block G1, G2 and G3 – Directly Affected Rooms – BRE Guide Third Edition Daylight Results



Figure 12: Block G5 – Directly Affected Rooms

Room Ref.	Level	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved Before Amendment (%)	ADF Results Achieved After Amendment (%)	Impact of Proposed Amendment on Daylight
A	2	Living Room/ Kitchen	2.0	2.8%	4.8%	Increase
A	3	Living Room/ Kitchen	2.0	2.8%	4.9%	Increase
A	4	Living Room/ Kitchen	2.0	2.8%	5.0%	Increase
A	5	Living Room/ Kitchen	2.0	2.8%	5.1%	Increase
A	6	Living Room/ Kitchen	2.0	4.5%	6.7%	Increase

Table 7: Block G5 – Directly Affected Rooms - Average Daylight Factor Results

Room Ref.	Level	BRE Third Edition Criterion 1 % Area > 100 lux Permitted	BRE Third Edition Criterion 2 % Area > 300 lux Permitted	BRE Third Edition Criterion 1 % Area > 100 lux Proposed	BRE Third Edition Criterion 2 % Area > 300 lux Proposed	Impact of Proposed Amendment on Daylight
A	2	100%	100%	100%	100%	Unchanged
A	3	100%	100%	100%	100%	Unchanged
A	4	100%	100%	100%	100%	Unchanged
A	5	100%	100%	100%	100%	Unchanged
A	6	100%	100%	100%	100%	Unchanged

Overall, 31 rooms are subject to modifications in the proposed amendment, these directly affected rooms have a change in the area of glazing provided, or an increase in the setback from the façade. All 31 rooms comply with the BRE Second Edition (2011) recommendations for daylight both before and after the incorporation of the proposed changes. Of these 31 rooms, 16 see a minor reduction in ADF (the reduction in ADF is less than 0.5% in all cases), these 16 rooms have an increase in setback in the proposed amendment. The remaining 15 see a significant increase in ADF (an increase of 1.9% or greater), these 15 rooms saw an increase in glazing area in the proposed amendment.

When tested against the Third Edition of the BRE Guide (2022) 23 of the units are unchanged in terms of daylight levels, 3 are worsened, and 5 are improved.

In the aggregate, the 31 directly affected rooms will experience an overall improvement in daylight experienced following the proposed modifications, as is to be expected considering the most substantial changes in the proposed amendment are an overall reduction in massing.

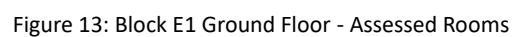
5.5. DAYLIGHT RESULTS – INTERNAL DAYLIGHT TO APARTMENTS (2011 METHODOLOGY)

This section outlines the apartments that were selected for assessment of internal daylight levels, within the blocks which are proposed to be modified, in the original daylight analysis for the permitted. The results of the analysis are outlined within the accompanying tables.

27 units fall short of compliance, however these 27 units also did so prior to the incorporation of the proposed changes. Internal daylight to all units is either improved, or unimpacted by the proposed changes. The proposed changes do not negatively impact daylight in any unit.

All units subject of this assessment are permitted under ABP Reg. Ref. 311016, and are included here for assessment to illustrate that no negative impact on daylight is occurring through the removal of units and height within this application.

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



Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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

Table 8: Block E1 Ground Floor - Average Daylight Factor Results

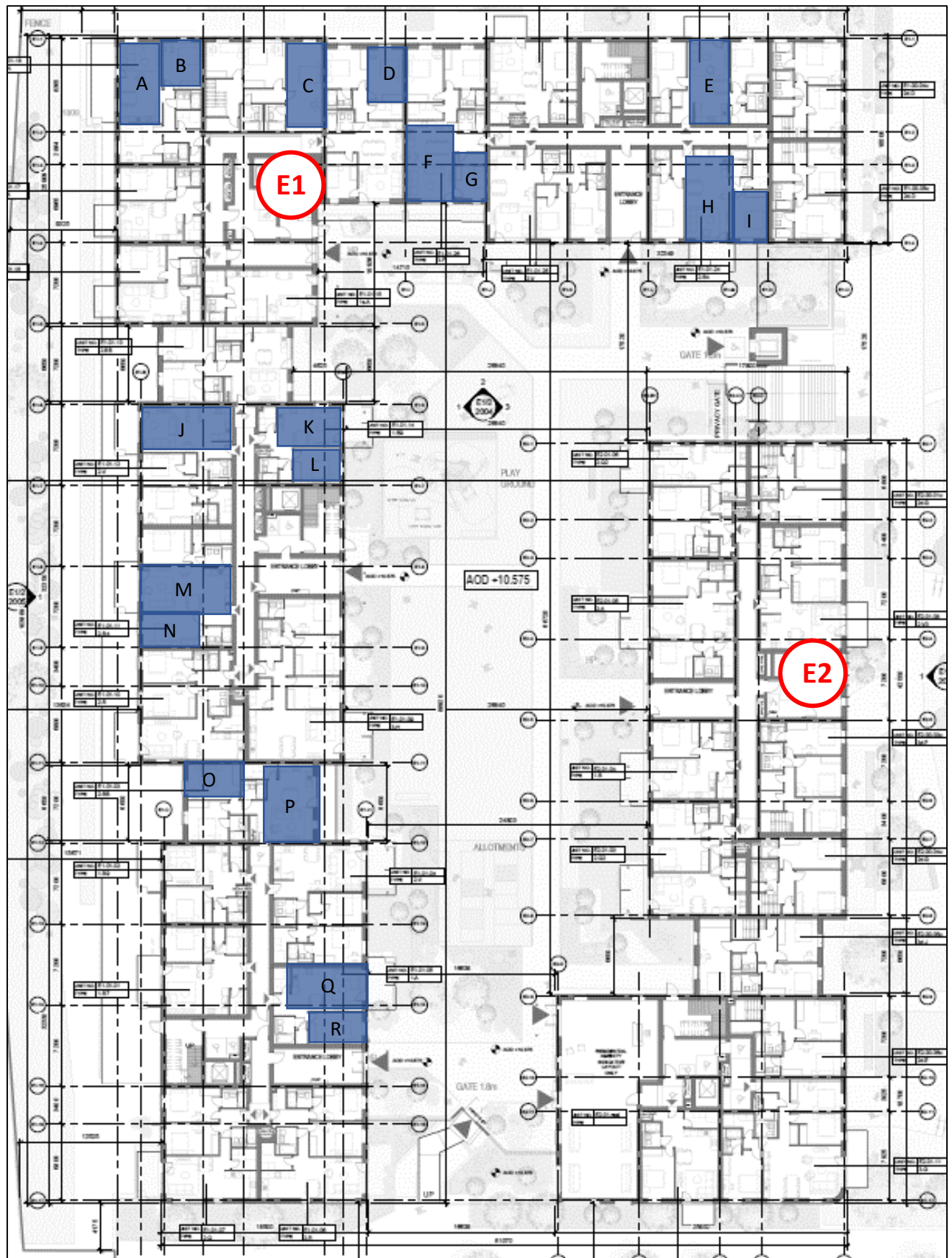


Figure 14: Block E1 Podium Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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

Table 9: Block E1 Podium Floor Level - Average Daylight Factor Results

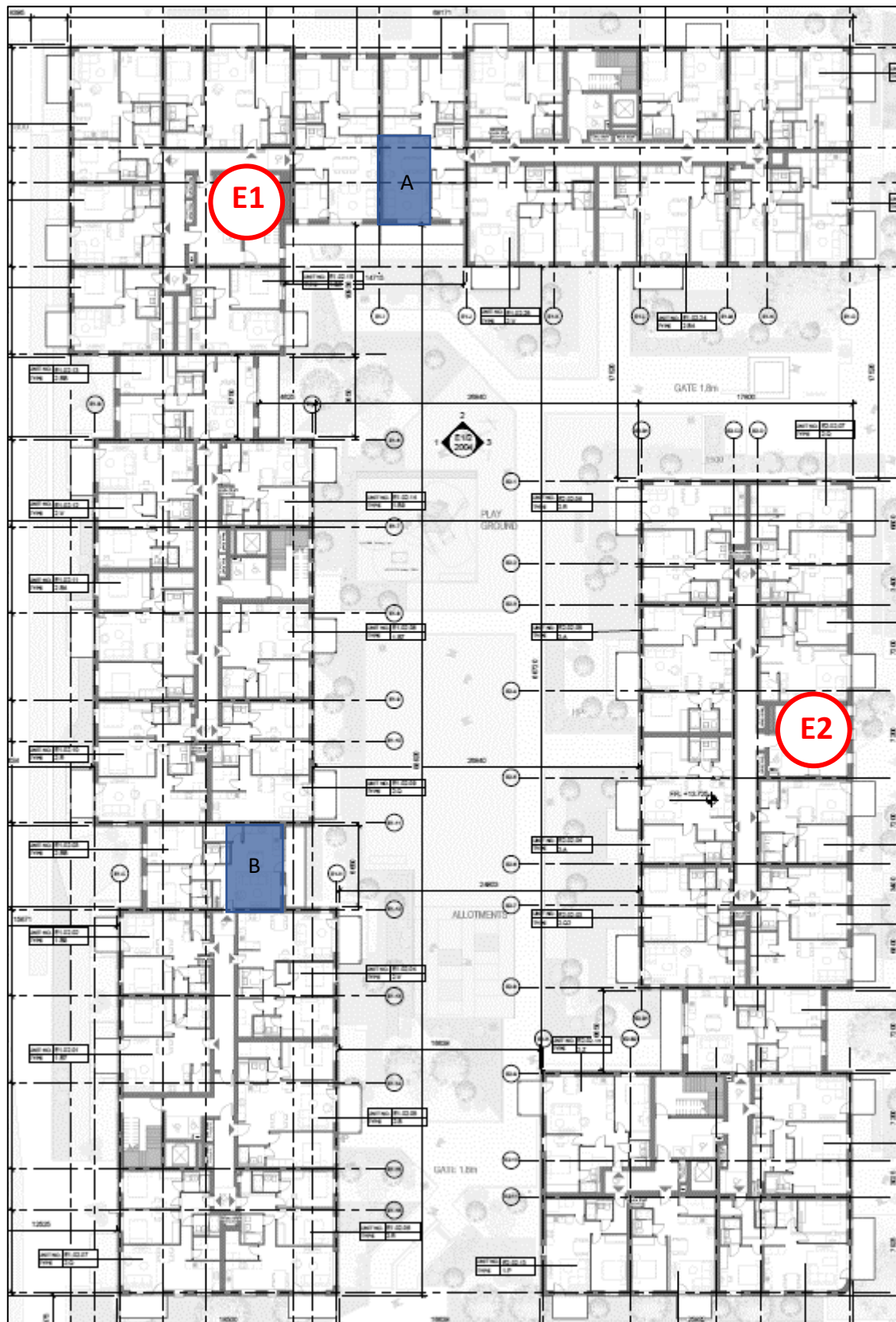


Figure 15: Block E1 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
A	Living Room / Kitchen	2.0	1.7	N
B	Living Room / Kitchen	2.0	2.1	Y

Table 10: Block E1 Second Floor Level - Average Daylight Factor Results

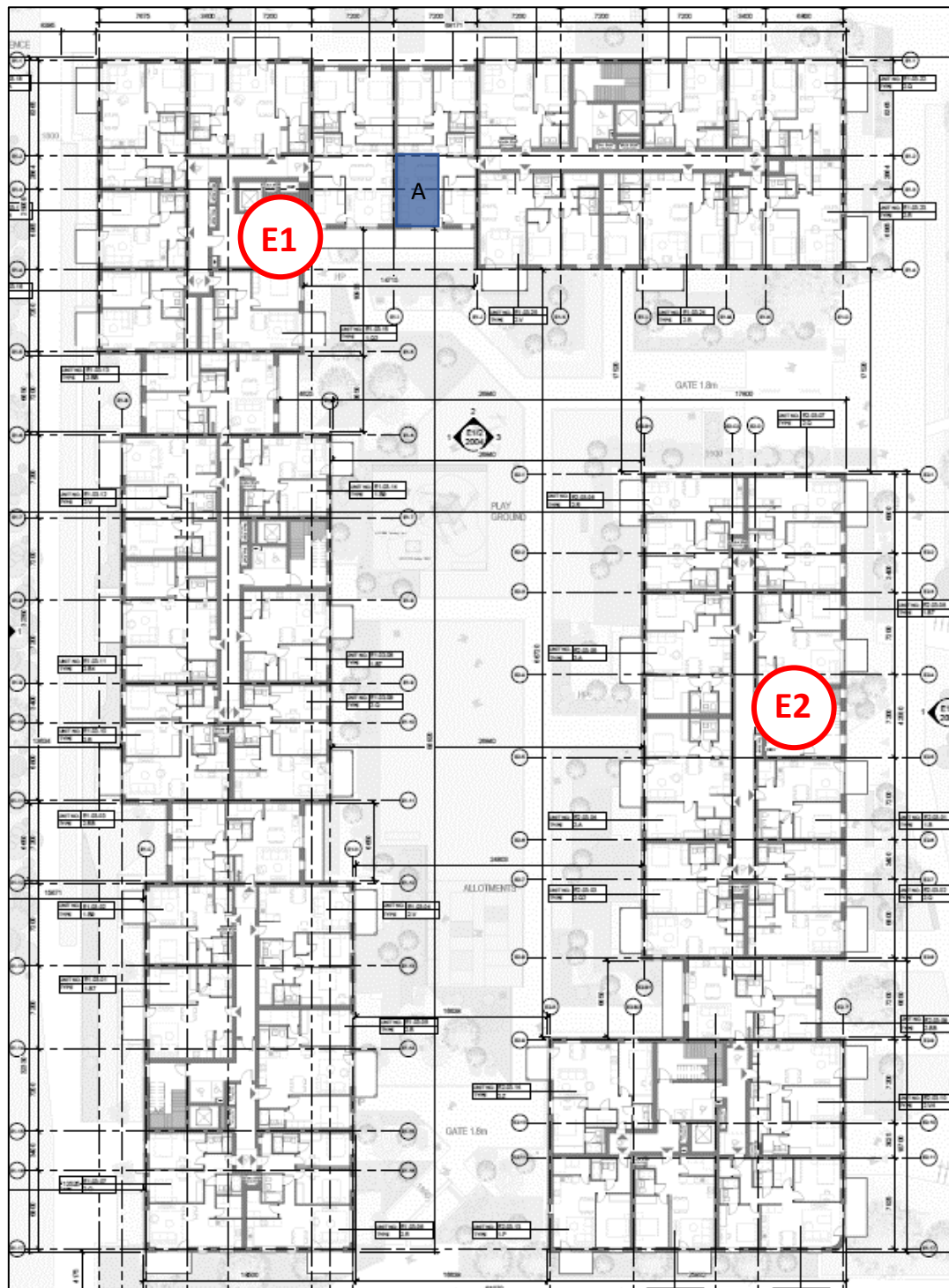


Figure 16: Block E1 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
A	Living Room / Kitchen	2.0	2.0	Y

Table 11: Block E1 Third Floor Level - Average Daylight Factor Results



Figure 17: Block G1/G2 Ground Floor - Assessed Rooms

There are no dwellings on the ground floor of Block G3, as such there are no daylight results at this level for this block.

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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
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 12: Block G1/G2 Ground Floor - Average Daylight Factor Results



Figure 18: Block G1/G2/G3 First Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
Q	Bedroom	1.0	3.5	Y
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 13: Block G1/G2/G3 First Floor Level - Average Daylight Factor Results

As all units assessed at the first level of Block G3 are compliant, and the units selected are 'worst case', it can be confidently stated, that all dwellings above the first level of Block G3 are compliant, and not in need of assessment.

All units subject of this assessment are permitted under ABP Reg. Ref. 311016, and are included here for assessment to illustrate that no negative impact on daylight is occurring through the removal of units and height within this application.



Figure 19: Block G1/G2 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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 14: Block G1/G2 Second Floor Level - Average Daylight Factor Results

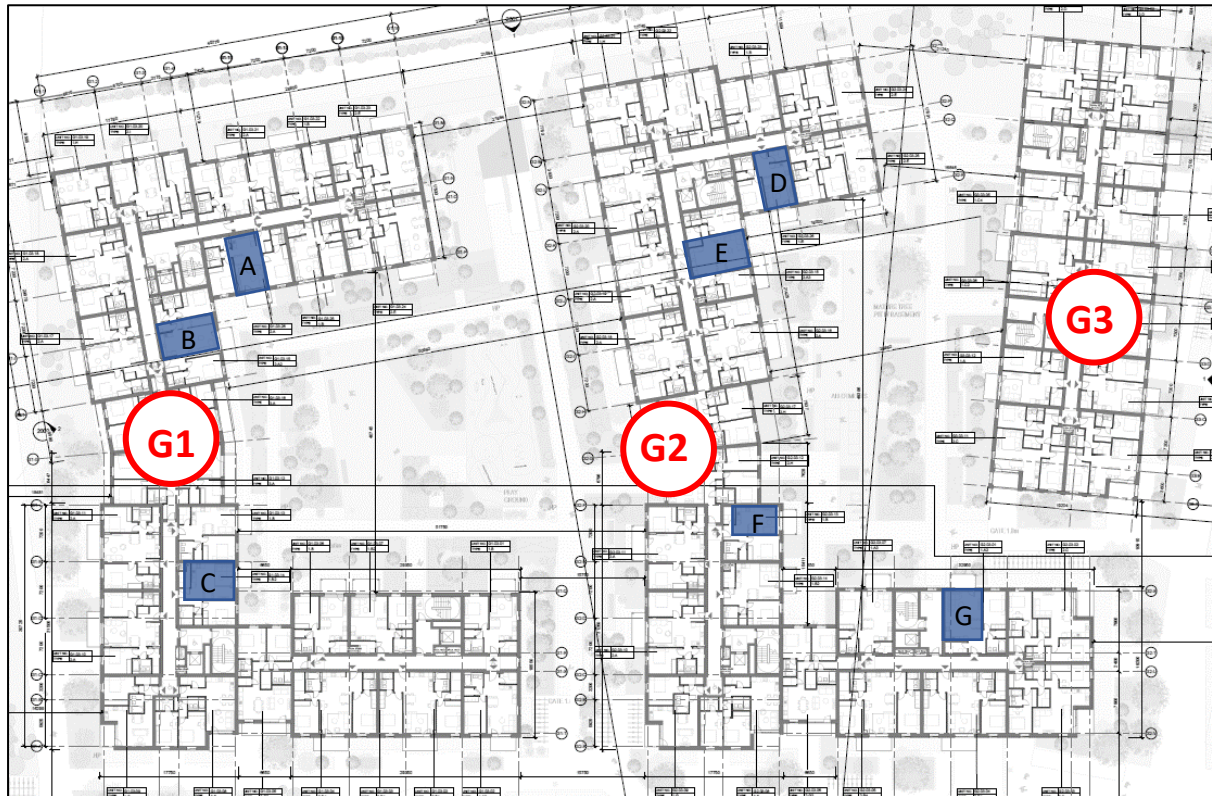


Figure 20: Block G1/G2 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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 15: Block G1/G2 Third Floor Level - Average Daylight Factor Results



Figure 21: Block G1/G2 Fourth Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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 16: Block G1/G2 Fourth Floor Level - Average Daylight Factor Results



Figure 22: Block G5 Ground Floor - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
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 17: Block G5 Ground Floor - Average Daylight Factor Results



Figure 23: Block G5 Podium Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
A	Living Room / Kitchen	2.0	3.4	Y
B	Bedroom	1.0	3.1	Y
C	Living Room / Kitchen	2.0	2.5	Y
D	Living Room / Kitchen	2.0	3.3	Y
E	Bedroom	1.0	3.0	Y
F	Living Room / Kitchen	2.0	1.2	N
G	Bedroom	1.0	2.4	Y
H	Living Room / Kitchen	2.0	3.4	Y
I	Bedroom	1.0	3.2	Y
J	Living Room / Kitchen	2.0	2.4	Y
K	Bedroom	1.0	3.6	Y
L	Living Room / Kitchen	2.0	2.5	Y
M	Living Room / Kitchen	2.0	2.2	Y
N	Living Room / Kitchen	2.0	1.9	N
O	Bedroom	1.0	2.2	Y
P	Bedroom	1.0	1.8	Y
Q	Bedroom	1.0	1.5	Y
R	Bedroom	1.0	2.7	Y
S	Living Room / Kitchen	2.0	2.2	Y

Table 18: Block G5 Podium Floor Level - Average Daylight Factor Results

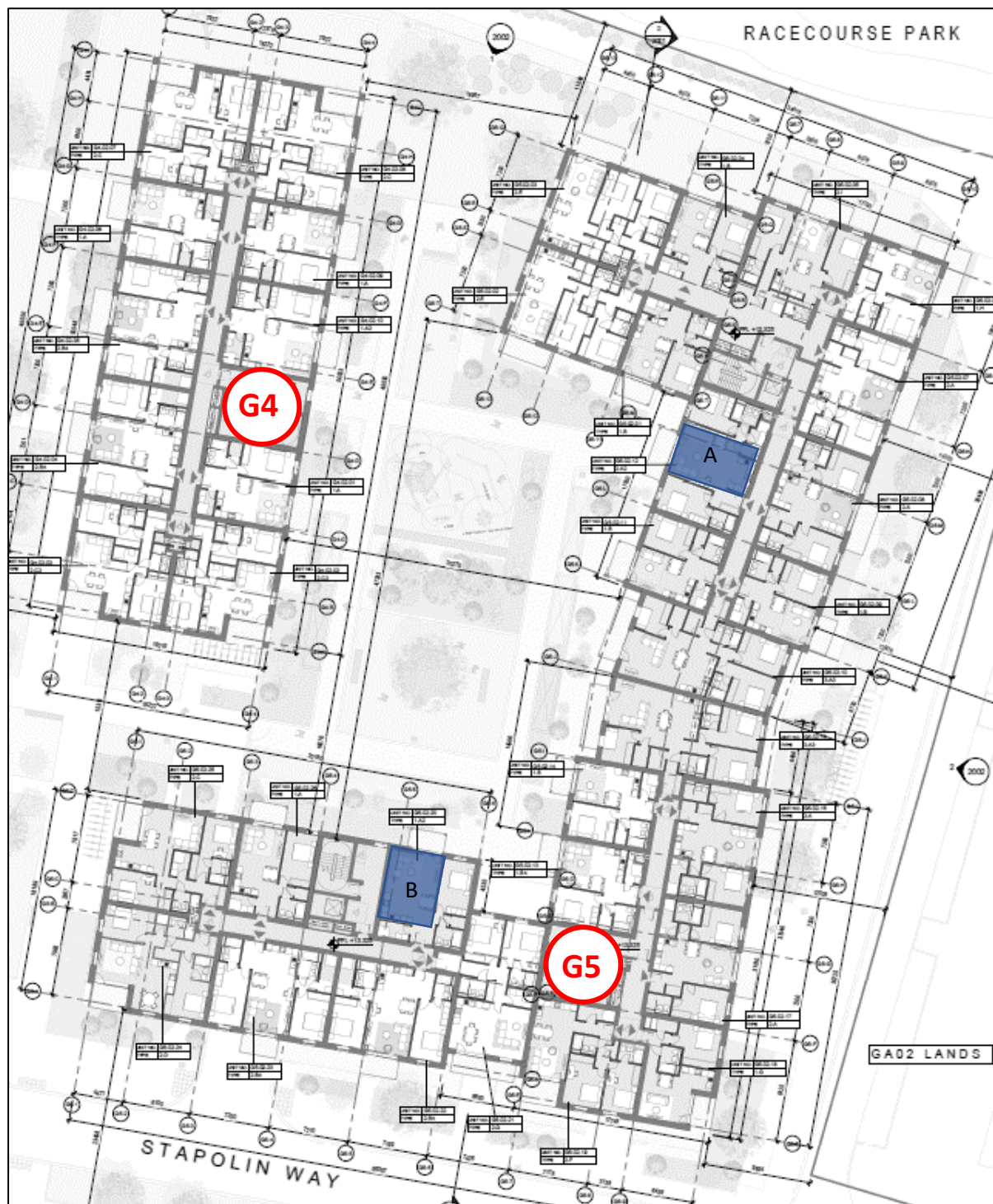


Figure 24: Block G5 Second Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
A	Living Room / Kitchen	2.0	1.4	N
B	Living Room / Kitchen	2.0	2.1	Y

Table 19: Block G5 Second Floor Level - Average Daylight Factor Results

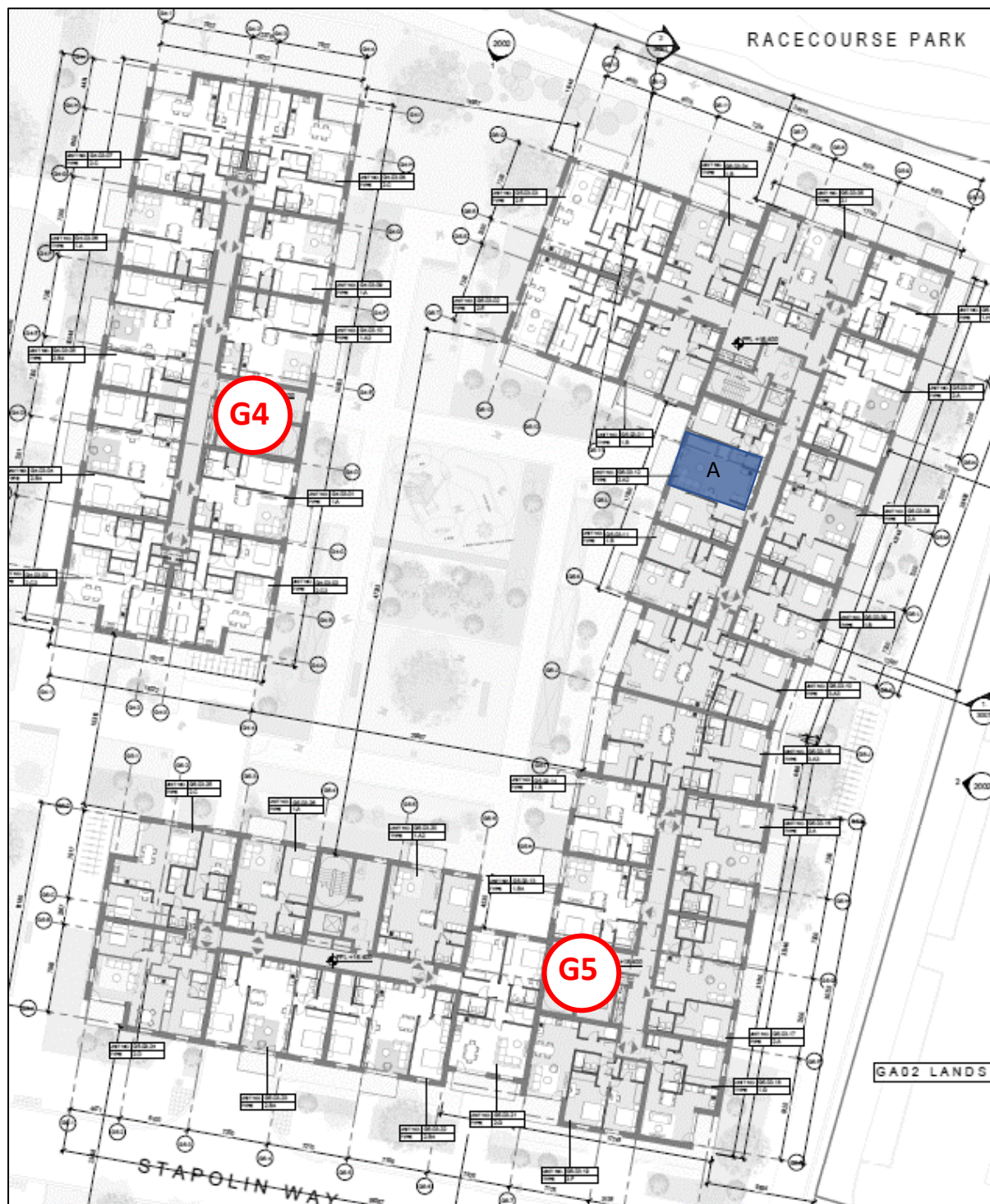


Figure 25: Block G5 Third Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
A	Living Room / Kitchen	2.0	1.6	N

Table 20: Block G5 Third Floor Level - Average Daylight Factor Results

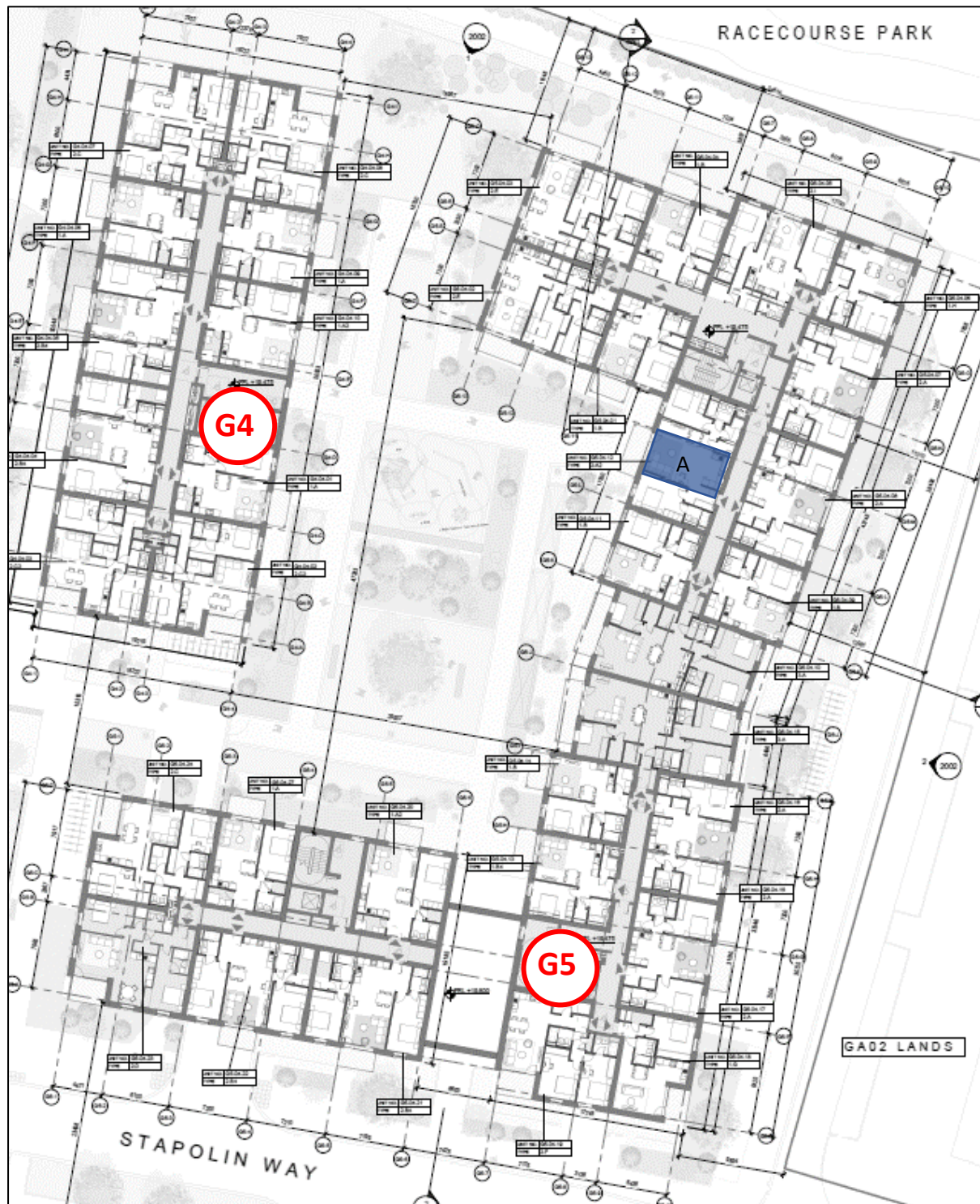


Figure 26: Block G5 Fourth Floor Level - Assessed Rooms

Room Ref.	Room Type	Minimum Recommended ADF Target in BRE Guide Second Edition (%)	ADF Results Achieved (%)	Meets Minimum Recommended ADF Target in BRE Guide Second Edition (%)
A	Living Room / Kitchen	2.0	2.1	Y

Table 21: Block 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 1,877 rooms which are in the blocks affected by the proposed alteration to the permitted development (Blocks E1, G1, G2, G3 and G5), only 27 fall short of the BRE Second Edition Guidelines, therefore a 98.6% compliance rate is achieved. Prior to the incorporation of the proposed changes, the compliance rate for the permitted scheme was 97.8%, therefore a small improvement in overall daylight to the scheme is seen, following the incorporation of the proposed changes.

The 27 units which fall short of compliance also did so prior to the incorporation of the proposed changes. Internal daylight to all units is either improved, or unimpacted by the proposed changes. The proposed changes do not negatively impact daylight in any unit.

All units subject of this assessment are permitted under ABP Reg. Ref. 311016, and are included here for assessment to illustrate that no negative impact on daylight is occurring through the removal of units and height within this application, as was expected.

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
1,877	27	0	27	98.6

Table 22: Percentage of Compliance – Internal Daylight - BRE Second Guide (2011)

6. SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT

The Second Edition (2011) of the BRE Guidelines recommends that for sunlight to external amenity spaces, they should appear adequately sunlit throughout the year, at least half of the garden or amenity space should receive at least two hours of sunlight on March 21st.

In order to show that sunlight levels within the amenity space of the development achieve compliance with the Second Edition (2011) of the BRE Guidelines following the reduction in block heights, a sunlight study has been carried out.



Figure 27: Amenity Spaces - Hours of Sunlight on March 21st (Subject of Assessment Within Red Line Boundary)

The red squares in Figure 27 illustrate the areas that receive a minimum of 2 hours of sunlight on the 21st of March for the proposed development. The majority of the communal amenity spaces receive 2 hours or more of sunlight on March 21st, therefore compliance with the BRE Guidelines is achieved,

as was the case prior to the incorporation of the proposed changes. The sunlight levels received within the amenity spaces of the development improve following the incorporation of the proposed changes.

The excellent daylight and sunlight access can also be attributed to the sunlight reflection from the building facades that have been carefully designed with light materials, thus creating comfortable and desirable spaces for the residents.

7. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT (APSH)

In order to assess the amount of sunlight that is received by windows within the proposed development, the Sunlight Hours calculation method as outlined in BRE Guide Second Edition (2011) has been used.

All units subject of this assessment are permitted under ABP Reg. Ref. 311016, and are included here for assessment to illustrate that no negative impact on sunlight is occurring through the removal of units and height within this application. Section 7.1 details how sunlight to windows has marginally improved following the incorporation of the proposed changes, with both annual and winter sunlight improving.

For the permitted, sunlight was assessed against the BRE Second Edition (2011) standard, as it was the latest standard at time of submission. In order to allow for a fair comparison to the permitted, and for an accurate assessment of the impact of the proposed reduction in height, only the Second Edition (2011) standard is used here.

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. All windows to occupied rooms within the blocks which are proposed to be altered (Blocks E1, G1, G2, G3, and G5) within the red line of the development have been included in the analysis.

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.

7.1. SUNLIGHT ASSESSMENT – (2011 METHODOLOGY)

Sunlight access is assessed against the methodology detailed in BRE Guide Second Edition, as was done for the permitted development. This methodology requires that a given window receives greater than or equal to 25% of available sunlight hours across the year, and greater than or equal to 5% of available sunlight hours across the winter months. Windows in red in Figure 28 to Figure 31 show the levels of compliance achieved over the annual period.

The Table 23 below summarises the annual probable sunlight hours for the annual period and for the winter period based on the BRE Second Edition recommendations, for the blocks affected by the proposed alterations. 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	BRE Guidelines Check 2	Additional Check 1	Additional Check 2
	APSH > 25%	APSH > 5%	APSH > 20%	APSH > 15%
	Annual Period	Winter Period	Annual Period	Annual Period
Percentage of Compliance	59%	69%	66%	78%

Table 23: APSH Summary Table (Blocks E1, G1, G2, G3 and G5) – Second Edition

The results from the analysis have shown that for the annual period, 59% of the analysed windows achieve the recommended APSH values stated in the BRE Guidelines, while 69% 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, 66% and 78% of the analysed windows achieve this alternative value, showing that acceptable levels of sunlight will be achieved across the blocks affected by the proposed alteration. The shortfall in compliance can be attributed to the projection of balconies and to the north facing windows, as was the case for the permitted scheme.

Prior to the proposed alteration to the development, the Annual APSH compliance rate was 57%, and the Winter APSH compliance rate was 67%. Both figures have improved following the incorporation of the proposed alterations.

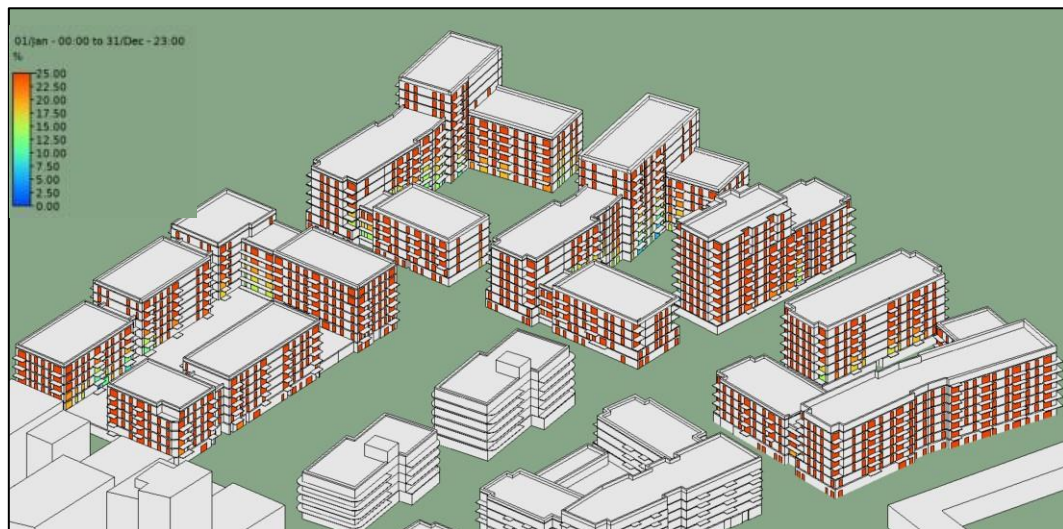


Figure 28: APSH (2011 Methodology) – South East Elevation



Figure 29: APSH (2011 Methodology) – South West Elevation

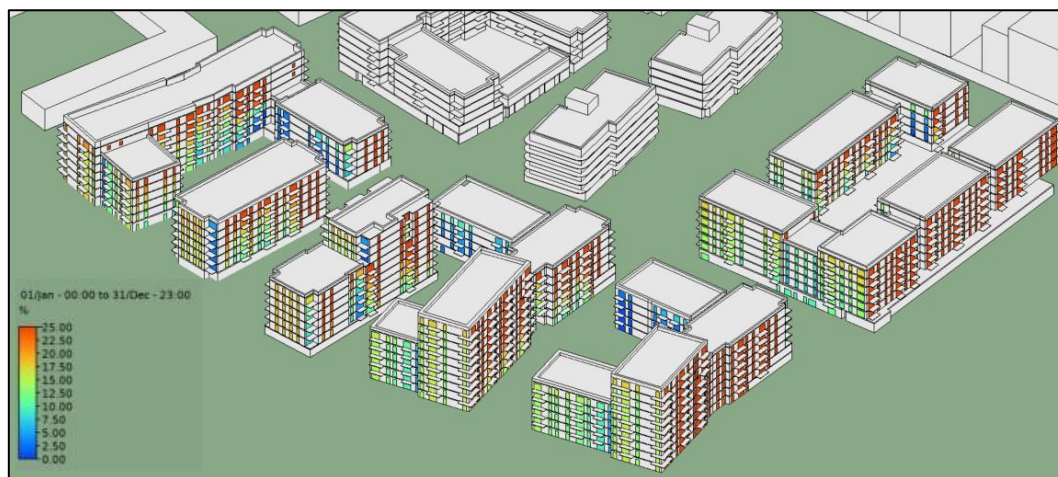


Figure 30: APSH (2011 Methodology) – North West Elevation

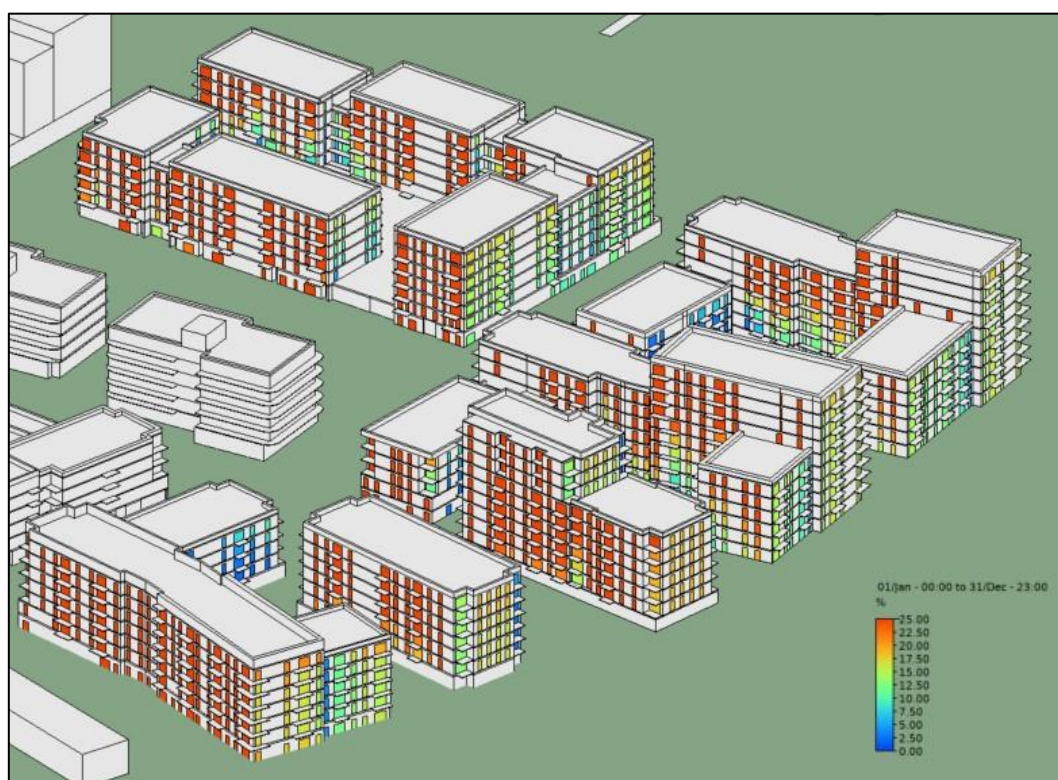


Figure 31: APSH (2011 Methodology) – North East Elevation

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, BRE guidelines 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”.*

7.2. SUNLIGHT ASSESSMENT – (THIRD EDITION METHODOLOGY)

The sunlight values experienced across the blocks affected by the proposed alteration are illustrated in the following images for the Third Edition requirements. In Figure 32 to Figure 35 Windows coloured red achieve the minimum standard as outlined in BRE Guide Third Edition (2022) on March 21st.

	BRE Guidelines Third Edition
	Sunlight > 1.5 Hrs (Minimum Standard)
	March 21 st
Percentage of Compliance	79%

Table 24: Sunlight Analysis (Blocks E1, G1, G2, G3, and G5) - BRE Guide Third Edition

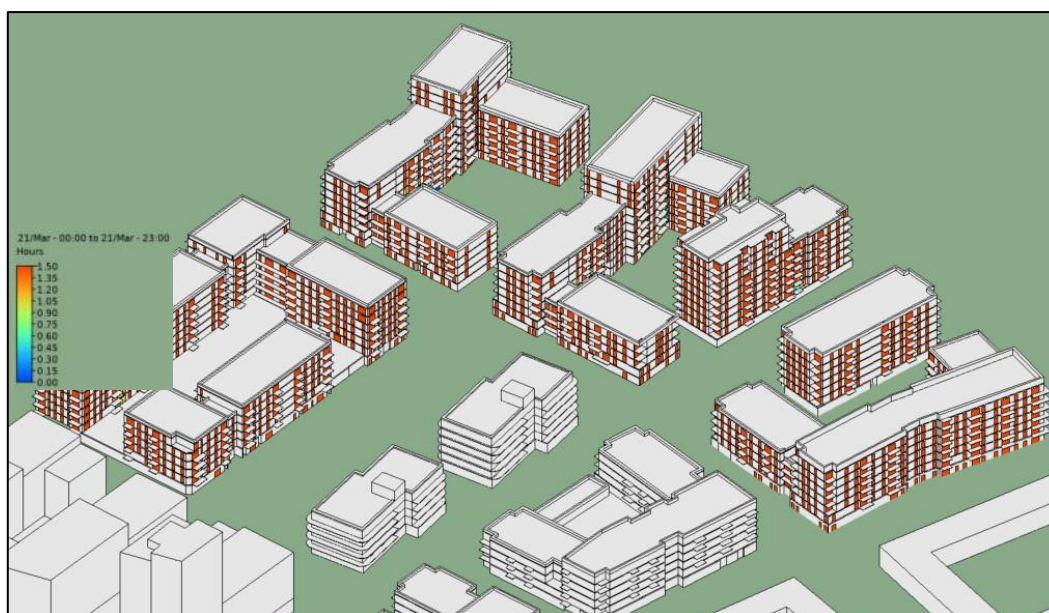


Figure 32: Sunlight Hours (2022 Methodology) Minimum Standard – South East Elevation



Figure 33: Sunlight Hours (2022 Methodology) Minimum Standard – South West Elevation

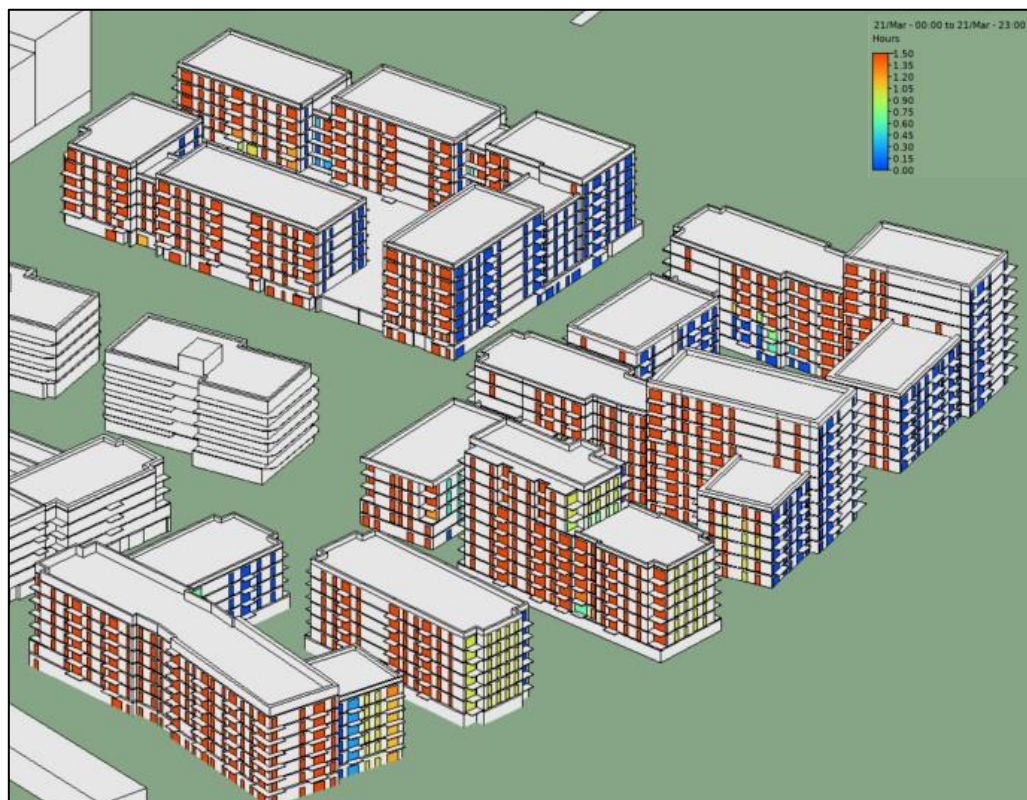


Figure 34: Sunlight Hours (2022 Methodology) Minimum Standard – North West Elevation

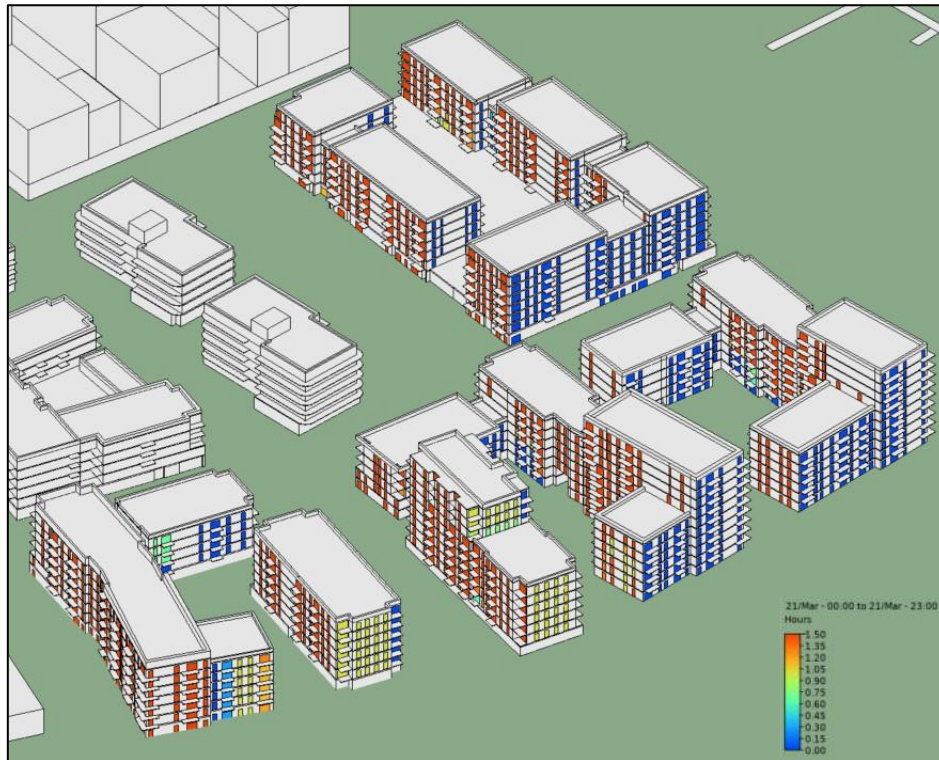


Figure 35: Sunlight Hours (2022 Methodology) Minimum Standard – North East Elevation

8. ASSESSING THE IMPACT ON SURROUNDING PROPERTIES

8.1. 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 alterations to the permitted development. The same flow matrix was followed for the permitted. The analysis shows that following the incorporation of the proposed changes, there is an improved/reduced impact on surrounding properties, as was expected.

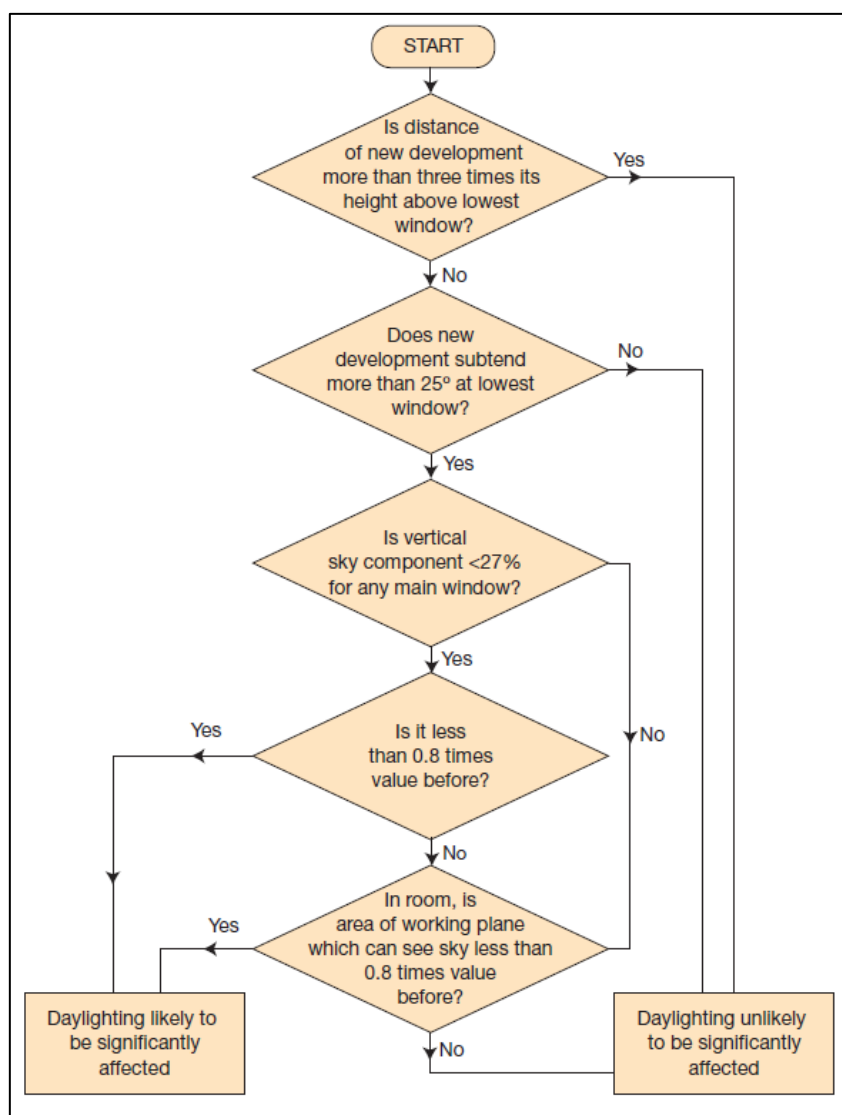


Figure 36: Daylight Assessment Methodology

As per the flow matrix, the BRE guidelines provide three main methods for assessing daylight availability. In order to assess the impact of the proposed development to surrounding buildings, the 25° line was selected as the method of analysis.

8.1.1 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).

8.1.2 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 analysis:

- 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, a more detailed assessment based on the Sky Line should be undertaken.

8.1.3 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.

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

8.2. IDENTIFYING SENSITIVE RECEPTORS

Prior to following the flow matrix, first the key sensitive receptors around the site need to be identified. According to the BRE Guidelines, 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 (including developments not yet permitted) where the occupants have a reasonable expectation of daylight. Table 25 identifies all sensitive receptors analysed, whilst Figure 37 identifies their location.

Development Ref.	Development name	Status
Ref. 1	Clongriffin Development (DCC Refs.: 2903/16, 3776/15, 2478/17, 4266/16, 2610/16, 3117/16, 4101/16 and 2569/17)	Permitted
Ref. 2	Shoreline GA01	Permitted

Table 25: Sensitive Receptors surrounding Project Shoreline GA3 Development

The previous revision of this report identified the site of GA2 as a sensitive receptor, located to the east of GA3, however this development has since had its planning permission rejected, as such, it is no longer included in this analysis.



Figure 37: Location of Sensitive Receptors

8.3. DAYLIGHT IMPACT ON SURROUNDING PROPERTIES

25° line

BRE Guidelines state that if a proposed development falls beneath a 25° line taken from a point 1.6 metres above ground level from any adjacent properties, then no impact is perceived and further analysis is not required. This methodology was followed for this analysis (to assess the impact of the reduction in block heights), as it was followed for the initial assessment for the permitted.

Ref. 1 could potentially be impacted by the proposed changes to Block E1. Ref. 3 could potentially be impacted by the proposed changes to Block E1.

As illustrated below, the properties located to the West (Ref. 1) of the proposed project fall outside the 25° line created, therefore, they are too far away and there will not be a perceptible impact. The properties located to the south of the proposed development (Ref. 2) are subject to a separate SHD permission. The daylight/sunlight analysis that was carried out for this application includes the impact of GA3. Therefore, sensitive receptor Ref. 2 was not selected for further analysis as the impact of GA3 has been accounted for within the daylight/sunlight results included within this application.

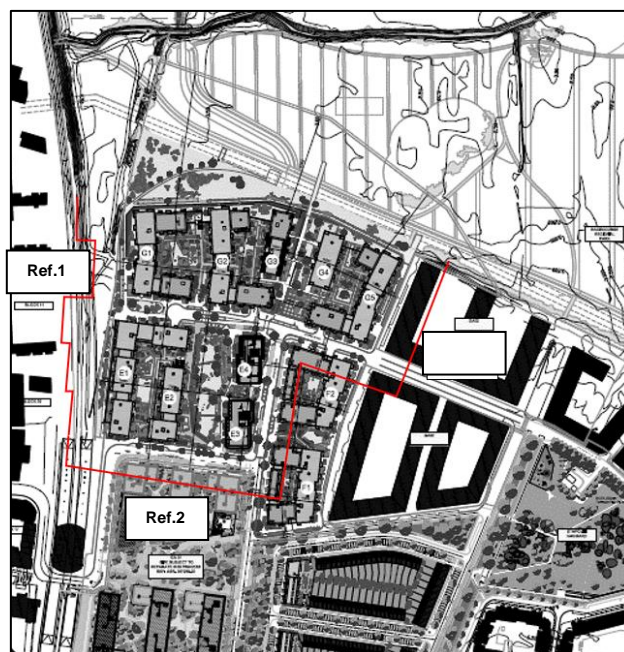


Figure 38: 25° Line

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) (permitted)	The distance is substantial from the proposed development and in compliance with the 25° line criteria. Therefore, imperceptible impact.
Ref. 2	Shoreline GA01 (permitted)	A daylight and sunlight EIAR chapter has been carried out for the separate subject application where the impact of GA3 was taken into account within the calculations.

Table 26: Summary of Daylight Impact to Sensitive Receptors

8.4. SUNLIGHT IMPACT TO NEIGHBOURING PROPERTIES (APSH)

In order to analyse the impact the proposed reductions in block height will have on sunlight access within the adjacent properties to the development, the Annual Probable Sunlight Hours (APSH) is the method used for this assessment, as it was done for the permitted. The results of this section confirm that there is no negative impact on neighbouring buildings sunlight due to the proposed reduction in block height.

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 41).

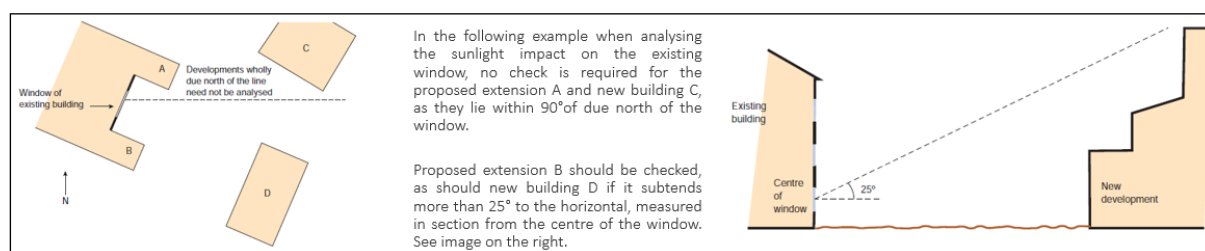


Figure 39: BRE Extract of the methodology for rooms selection - APSH

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 8.3, 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. 2 is subject to a separate permission. Further assessment was not required for sensitive receptor ref. 2 since a daylight and sunlight EIAR chapter has been carried out for the separate application, where the impact of the proposed GA3 has been taken into account within the calculations.

The results of this section confirm that there is no negative impact on neighbouring buildings sunlight due to the proposed reduction in block height.

9. OVERSHADOWING IMPACT TO SURROUNDING PROPERTIES

The overshadowing impact from the proposed development on surrounding buildings has been analysed for the blocks which are proposed to be amended, as was done for the permitted. The overshadowing images illustrate the overshadowing impact on March 21st from 8 a.m. – 6 p.m, on June 21st 7 a.m. – 7 p.m., and December from 10 a.m. – 4 p.m.



Figure 40: Overshadowing at 08:00 and 09:00 on March 21st

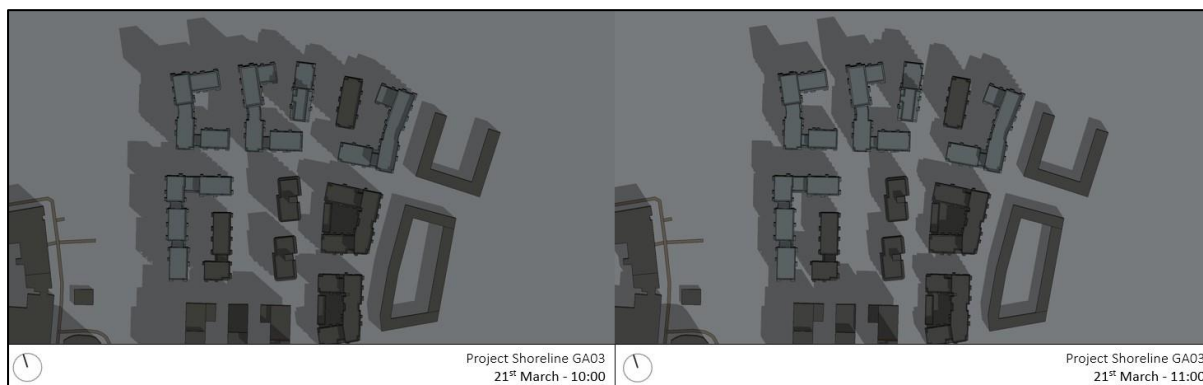


Figure 41: Overshadowing at 11:00 and 12:00 on March 21st



Figure 42: Overshadowing at 13:00 and 14:00 on March 21st

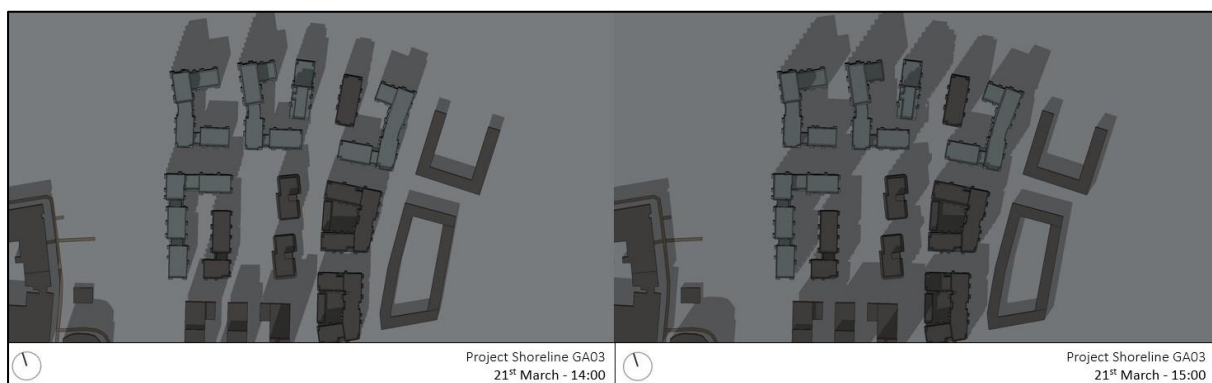


Figure 43: Overshadowing at 15:00 and 16:00 on March 21st



Figure 44: Overshadowing at 17:00 and 18:00 on March 21st



Figure 45: Overshadowing at 06:00 and 07:00 on June 21st



Figure 46: Overshadowing at 08:00 and 09:00 on June 21st



Figure 47: Overshadowing at 10:00 and 11:00 on June 21st

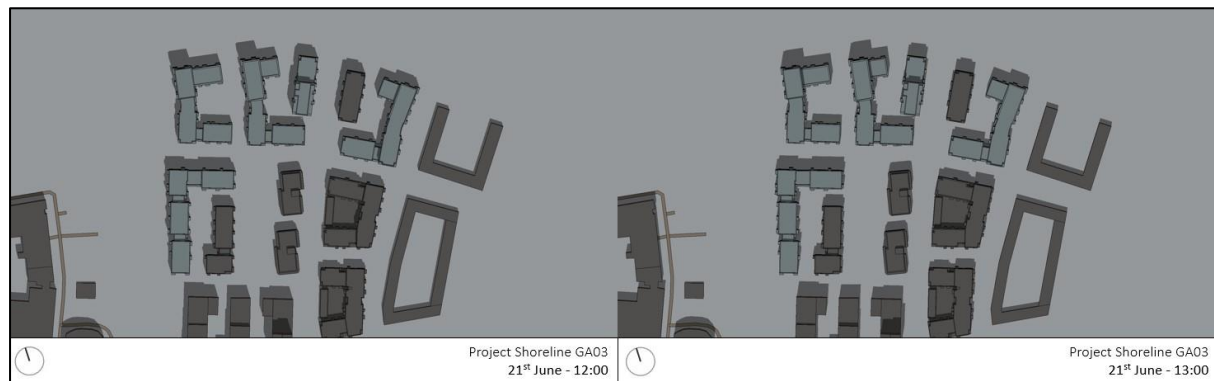


Figure 48: Overshadowing at 12:00 and 13:00 on June 21st

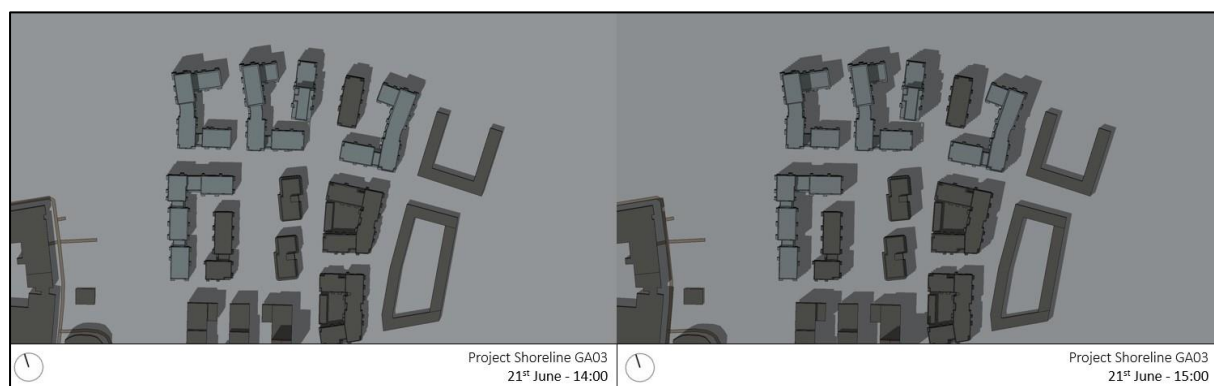


Figure 49: Overshadowing at 14:00 and 15:00 on June 21st

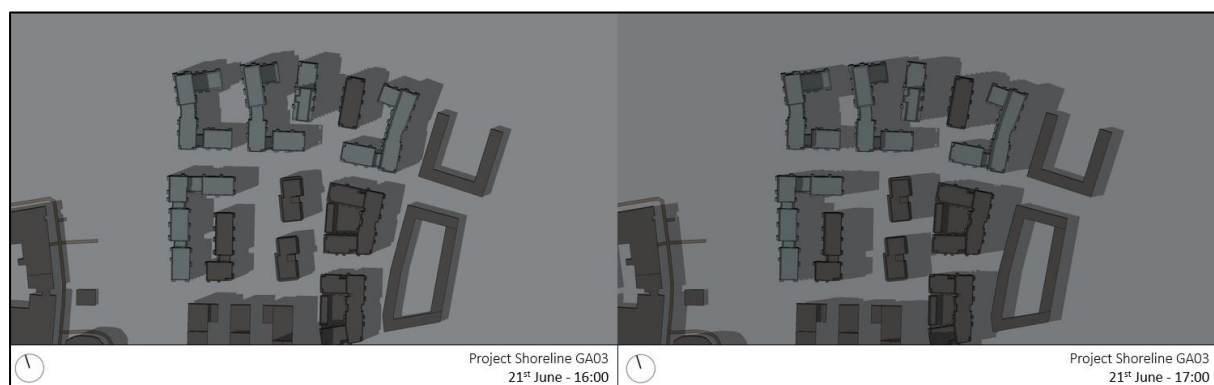


Figure 50: Overshadowing at 16:00 and 17:00 on June 21st

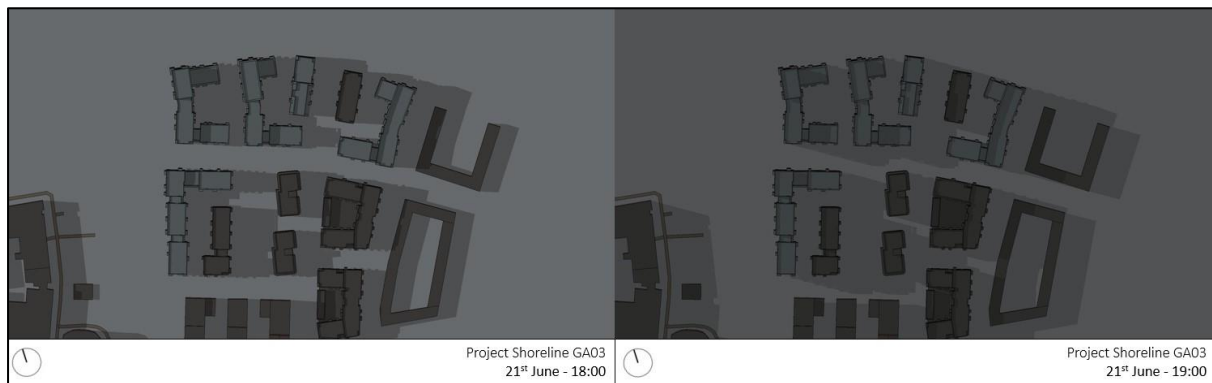


Figure 51: Overshadowing at 18:00 and 19:00 on June 21st



Figure 52: Overshadowing at 10:00 and 11:00 on December 21st



Figure 53: Overshadowing at 12:00 and 13:00 on December 21st



Figure 54: Overshadowing at 14:00 and 15:00 on December 21st

In relation to the overshadowing impact, the majority of sensitive receptors will not perceive an impact, with sensitive receptor ref. 2 receiving a non-significant impact, as was the case for the permitted development, therefore this proposed reduction in block height has no adverse impact on overshadowing.

10. CONCLUSION

The aim of the study is to record and analyse the impact of the proposed alterations, for blocks which are subject to modifications, namely E1, G1, G2, G3 and G5, in terms of the following:

- The daylight levels within the living and bedroom areas of selected apartments, within the blocks proposed to be modified, to give an indication of the expected daylight levels;
- The expected sunlight levels within the living areas and bedrooms within the blocks proposed to be modified;
- The impact of the modifications on the quality of sunlight to the amenity spaces of the blocks proposed to be modified;
- The impact of the modifications on any potential daylight or sunlight impact on surrounding properties.

The calculation methodology for daylight and sunlight is based on the British Research Establishments (BRE) “Site Layout Planning for Daylight and Sunlight: A Good Practice Guide” by PJ Littlefair, Second Edition (2011), as well as the Third Edition (2022).

The Third Edition was published following the submission of the application for the permitted development. It is used in this report to analyse the daylight both before and after the incorporation of the proposed modifications, both to the units subject to modification, and units in the modified blocks in general.

The Second Edition was used for the daylight analysis for the permitted development and is used again here in this report to allow for a fair comparison, and an accurate assessment of the impact of the proposed changes on daylight, on the same selection of apartments as the daylight analysis submitted for the permitted development.

“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”

Internal daylight within the blocks proposed to be amended

It is the expert opinion of OCSC, that the modifications proposed in this amendment (comprising a reduction in various block heights, and minor changes to façade setbacks and glazing areas), will result in an overall improvement in daylight in the modified blocks, as well as the adjoining blocks. The results detailed in Section 5 of this report confirm this to be the case.

In Section 5.3, using the BRE Guide Third Edition, the impact of the proposed height reduction modifications on daylight within the blocks proposed to be modified, is assessed. The daylight to a select number of units is tested both before and after the incorporation of the proposed changes to provide proof to support OCSC's expert opinion. As is to be expected considering the reduction in massing, the daylight to these units improves following the incorporation of the proposed changes. The compliance rate against the Third Edition daylight standard is 80%.

In Section 5.4, the daylight to the 31 units subject to modifications (ie those which will have an increase in façade setback, or a change in glazing area) are analysed, both before and after the incorporation of the proposed changes. All 31 rooms comfortably comply with the Second Edition daylight requirements, both before and after the incorporation of the proposed changes. As measured by the Second Edition daylight methodology, 16 of these units see a minor reduction in daylight, (<0.5% ADF reduction), while 15 see a significant increase in daylight (>1.9% ADF increase), resulting in an overall improvement in daylight due to the proposed modifications. All 16 units which are experiencing a reduction following the incorporation of the proposed modifications feature an increase in façade setback, while all 15 which improve feature a change in glazing area. When measured against the Third Edition daylight standard, all 31 units subject to modifications comply both before and after the incorporation of the proposed changes. As measured by the Third Edition daylight standard, 23 units are unchanged, while 3 see a marginal reduction in daylight, and 5 see an increase in daylight.

Furthermore, the analysis in Section 5.5, which is done for comparison purposes, confirms that when tested using the BRE Guide Second Edition, that for the five blocks which are proposed to be amended, excellent levels of internal daylight continue to be achieved following the incorporation of the proposed changes, with the compliance rate increasing from 97.8% to 98.6%. This is in line with expectations, considering the overall reduction in massing.

Overall, the results show that the daylight in the blocks proposed to be modified, will be improved following the incorporation of the proposed amendments, as is to be expected considering the reduction in massing proposed.

Sunlight to windows within the blocks proposed to be amended

It is the opinion of OCSC, that a reduction in massing, as is proposed in this amendment, will result in an improvement in sunlight in the modified blocks.

The annual probable sunlight hours assessment in Section 7.1 has shown that following the incorporation of the proposed changes, the sunlight to windows in the blocks proposed to be amended improves slightly. Although some windows in the blocks proposed to be amended are slightly under the BRE Guide Second Edition (2011) recommendations, acceptable levels of sunlight will still be achieved, following the incorporation of the proposed changes, as per permitted development. A small improvement is seen in sunlight to windows, following the incorporation of the proposed changes, as is to be expected considering the reduction in massing proposed.

Section 7.2 illustrates that good levels of sunlight will be achieved following the incorporation of the proposed changes when measured using the Third Edition (2022) standard also.

Sunlight to amenity spaces of blocks proposed to be amended

In terms of sunlight access, excellent levels of sunlight continue to be experienced in the amenity areas of the blocks proposed to be amended, following the incorporation of the proposed changes, as can be seen in Section 6. The communal amenity spaces provided to the apartment areas greatly exceeds the BRE guidelines for sunlight on the test day of 21st of March. A small increase in sunlight to these amenity areas is seen, as is to be expected considering the reduction in massing proposed.

Impact to neighbouring properties

Following the incorporation of the proposed changes to GA3, the 25° line method confirms that sensitive receptor ref. 1 is too far from the blocks proposed to be amended to perceive an impact on daylight or sunlight, as can be seen in Section 8.

In relation to the overshadowing impact, the sensitive receptors will not perceive an impact, as was the case for the proposed development. This is detailed further in Section 9.

Sensitive receptor ref. 2 is subject to a separate planning permission. A daylight and sunlight EIAR chapter was submitted as part of this application where the impact of GA3 was taken into account within the calculations.

Overall, the impact to surrounding properties is reduced following the incorporation of the proposed changes, as is to be expected considering the reduction in massing proposed.



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7 Ireland

T | +353 (0)1 8682000

F | +353 (0)1 8682100

W | www.ocsc.ie

Dublin | London | Belfast | Cork | Galway | Birmingham