

**Daylight & Sunlight Assessments of a  
Strategic Housing Development at  
Glenamuck Road North, Carrickmines, Dublin 18.**

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# 1. Introduction

This Daylight and Sunlight Report is prepared on behalf of Moran Park Homebuilders Limited, who intend to apply to An Bord Pleanála for planning permission for a strategic housing development on an overall site of c. 0.92 ha (c. 0.74 ha relates to the main development site and c. 0.18 ha relates to additional lands for drainage and access proposals) at Glenamuck Road North, Carrickmines, Dublin 18 (bounded by 'Tullybeg' to the north, 'Chigwell' to the northeast, 'Stafford Lodge' to the south and 'Carricáil' to the southeast).

The proposed development shall provide for the construction of (a) 118 no. residential apartment units in the form of 3 no. residential blocks of apartments ranging in height from 4 storeys and transitioning to 6-7 storeys overall.

The overall development proposal shall provide for the following:

- Block A (7 storeys) comprising 44 no. units (13 no. 1 bed units, 28 no. 2 bed units and 3 no. 3 bed units);
- Block B (6-7 storeys overall) comprising 38 no. units (11 no. 1 bed units, 26 no. 2 bed units and 1 no. 3 bed units); and
- Block C (6 storeys overall) comprising 36 units (10 no. 1 bed units; 22 no. 2 bed units and 4 no. 3 bed units);

Each new residential unit has an associated area of private open space in the form of balcony / terrace area and set back upper floor levels.

Open space (approx. 2,071 sqm) is provided by one major centrally located public open space (1158.4 sqm) between blocks A and B which include a play area of 63.2 sqm, two further communal open space areas are provided adjoining Blocks B (471.8 sqm) & Block C (440.8 sqm).

Communal Area located at the ground floor of Block B (approx. 161.3 sqm) comprising of a shared working space (35.6 sqm), meeting rooms (42.2 sqm.), a gym (36.6 sqm) and changing/tea stations (46.7 sqm) is also proposed.

2 no. basement level areas (approx. 2,340.9 sqm) are also proposed at lower ground / ground floor level of Blocks A, B (1,470.0 sqm) and C (834.9 sqm) and include car parking, bicycle parking, refuse storage areas, plant areas and ESB Substation which is located between Block B and C.

A total of 103 no. car parking spaces (67 no. at basement level and 36 no. at surface level to include 17 no. electric power points and 5 no. accessible parking spaces) are proposed. In addition, 5 no. motorcycle parking spaces (3 no. at basement level A and B, and 2 no. at basement level C). A total of 280 no. bicycle parking spaces (254 no. at basement level and 26 no. at surface level) are also proposed.

Proposals for vehicular and pedestrian access comprise via Glenamuck Road North and all associated upgrade works; The access point to the south (via Carricáil) is for pedestrians and cyclists only.

Associated site and infrastructural works including the provision for water services, foul and surface water drainage and connections; attenuation proposals; permeable paving; all landscaping works to include new tree and hedge planting; green roofs; boundary treatments; internal roads and footpaths; and electrical services.

## 1.1 Executive Summary

The report assesses the impact of the proposed development for Daylight and Sunlight on the neighbouring buildings and the quality of daylight and sunlight to within the proposed development. This analysis is carried out based on the drawings of McGrane & Partners Ltd.

### Assessment of quality of sunlight and daylight to adjacent properties

There will be minimal reduction to the daylight and sunlight of the adjacent dwellings. There will be minimal reduction in the sunlight to any of the amenity spaces to the adjacent properties. All the adjacent properties assessed meet or exceed the recommendations of the BRE guidelines and any impact will be negligible.

### Assessment of the quality of the proposed development.

All the units within the proposed development exceed the recommendations of the BRE guidelines for quality of Daylight. The bedroom and living space layouts have been optimised for daylight and sunlight. All the living spaces with a kitchen exceed the target ADF value of 2% and all the bedrooms exceed the target ADF value of 1%. The proposed amenity spaces will be bright and achieve sunlight levels that exceed 2 hours sunlight over 50% of the amenity space on the 21st March. This meets the recommendations of the BRE guidelines.

The results find that any impact on the adjacent residential structures would be minimal and imperceptible. There would be a good quality of daylight in the apartments analysed and the amenity areas would have sufficient sunlight to be bright and pleasant spaces. The proposed development meets the recommendations of the BS 8206-2 2008 and BRE guidance document (2011) Site layout planning for daylight and sunlight. The proposed apartments were also assessed for daylight provision in accordance with EN17037:2018 and all the units exceed the minimum target levels.

## 2. Methodology

### 2.1 Notes on the use of BS 8206-2 2008 and BRE guidance document (2011) Site layout planning for daylight and sunlight (BR209).

This Daylight and Sunlight Assessment demonstrates compliance with the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) and BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'. This in accordance with the most relevant S.28 Ministerial Guidelines including Section 6.6 of the Sustainable Urban Housing: Design Standards for New Apartments (2020), and Section 3.2 of the Urban Development and Building Heights Guidelines for Planning Authorities (2018).

Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2020) directs planning authorities to 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 British Standard BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'. The standards for daylight and sunlight access in buildings (and the methodologies for assessment of same) suggested in both of these documents have been referenced in this Sunlight and Daylight Access Analysis.

The former standard BS 8206-2 was read in conjunction with BRE BR209 Site layout planning for daylight and sunlight and CIBSE LG10 as guidance only, but the launch of BS EN 17037 directly impacts on the recommendations of these other technical documents due to the withdrawal of BS8206-2:2008. The new standard can no longer be interpreted as guidance and cannot be incorporated into BR209 but BR209 continues to reference a standard that no longer exists. The updated 3rd Edition of the BRE guide 'Site Layout Planning for Daylight and Sunlight' intends to address this and is due to be published in spring 2022.

Neither the British Standard nor the BRE Guide set out rigid standards or limits. The BRE Guide is preceded by the following very clear warning as to how the design advice contained therein should be used:

*"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aims is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."*

That the recommendations of the BRE Guide are not suitable for rigid application to all developments in all contexts is of particular importance in the context of national and local policies for the consolidation and densification of urban areas.

### 2.2 Daylight to the existing dwellings

A proposed development could potentially have a negative effect on the level of daylight that a neighbouring property receives, if the obstructing building is large in relation to their distance from the existing dwelling. To ensure a neighbouring property is not adversely affected, the Vertical Sky Component (also referred to as VSC) is calculated and assessed. VSC can be defined as the amount of skylight that falls on a vertical wall or window. The site is analysed in plan, section and building use. Windows and amenity area are selected to test for impact from the proposed development.

BRE guidelines recommend that: *"Loss of light to existing windows need not be assessed 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 window."*

The diffuse light of the existing building may be adversely affected if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal. If a window falls within a 45° angle both in plan and elevation with a new development in place then the window may be affected and should be assessed.

For loss of daylight and sunlight to existing buildings BRE guidance document (2011) "Site layout planning for daylight and sunlight" is used and BS8206 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.

For loss of light the report recommends calculation of the Vertical Sky Component. This is the ratio of direct sky illuminance falling on the outside window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE Overcast Sky is used and the ratio is usually expressed as a percentage. The maximum value is just under 40% for a completely unobstructed vertical wall. The Vertical Sky Component on a window is a good measure of the amount of daylight entering it.

The BRE guidelines recommend one of two criteria is met when assessing for the Vertical Sky Component:

- a) Where the Vertical Sky Component at the centre of the existing window exceeds 27% with the new development in place then enough sky light should still be reached by the existing window.
- b) Where the Vertical Sky Component with the new development in place is both less than 27% and less than 0.8 times its former value, then the area lit by the window is likely to appear more gloomy, and electric light will be needed more of the time.

The BRE Guidelines state that if the VSC is:

- At least 27%, then conventional window design will usually give reasonable results;
- Between 15% and 27%, then special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight;
- Between 5% and 15%, then it is very difficult to prove adequate daylight unless very large windows are used;
- Less than 5%, then it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed

This report assesses the percentage of direct sky illuminance that falls on the centre point of neighbouring windows that could be affected by the proposed development.

## 2.3 Sunlight

The BRE guidelines recommend assessing the loss of sunlight to the main living rooms and conservatories if they have a window wall facing within 90° of due south. Kitchens and bedrooms are less important but care should be taken not to block too much sun. If the proposed development is fully north then sunlight need not be assessed.

The Annual Probable Sunlight Hours (APSH) is used to assess the quantity of sunlight for a given location. This is the total amount sunshine for a given location on an unobstructed horizontal surface taking cloud cover into account. Statistical data from the Irish Meteorological Service is used to assess the APSH and the Probable Sunlight Hours for winter. Table 1 shows the average sunlight hours for each month and the maximum possible without any cloud cover. This gives the factor of possible sunlight hours for each month.

Met Eireann Sunlight Hours Data Set 1981-2010													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Sunlight Hours/ Day	1:54	2:45	3:36	5:32	6:44	6:40	5:17	5:13	4:16	3:17	2:10	1:44	
Average Sunlight Hours/ Month	58:54	77:00	111:36	166:00	208:44	200:00	163:47	161:43	128:00	101:47	65:00	53:44	1496.25
Total Available Sunlight Hours	252	265	358	412	488	485	496	451	375	320	250	248	4383
Probable Sunlight Hours Ratio	23.37%	29.06%	31.17%	40.29%	42.77%	41.24%	33.02%	35.86%	34.13%	31.81%	26.00%	21.67%	34.14%

**Table 1: Average monthly sunlight hours recorded at Dublin Airport - Data set 1981-2010**

The BRE guidelines recommend that the centre of a window or 1.6m above ground for a door be assessed and receive at least 25% of the APSH and at least 5% during the period of 21st September to 21st March. If the available APSH is less than this then it should not be reduced below 0.8 times its former value or noticeable loss of sunlight may occur.

## 2.4 Sunlight to gardens and open spaces

For calculations of sunlight analysis it is general practice to use March 21 and the recommendations of the BRE guidance document (2011) "Site layout planning for daylight and sunlight". P.J Littlefair, in relation to Gardens and open spaces section 3.3.17 state:

*"It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March."*

## 2.5 Calculations of Trees & Hedges

Trees are not usually included in the assessments of impact, unless specified otherwise. In relation to the effects of trees and hedges the BRE guidelines states,

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



## 2.6 Daylight in the Proposed Development.

The rooms are assessed for Average Daylight Factor (ADF) and compliance with EN 17037 (2018). Table 2 contains the Input values for material used in the assessment model.

Surface Reflectance			
Element	Reflectance	Transmissivity	Material Description
Internal walls	84%	0%	White Painted Walls
Internal ceiling	88%	0%	White Painted Ceiling
Floor	52%	0%	Light wood Flooring
External walls - proposed development	58.3%	0%	Light yellow Brick
External walls - outside site	20%	0%	CIBSE
External ground	20%	0%	CIBSE
Glass	20.1%	68.8%	Triple glazed clear glass

**Table 2: Surface reflectance parameters for ADF calculation.**

Additional assessment model input parameters:

- Sensor Grid spacing 0.6m
- Sensor grid inset 0.35m
- Minimum inset 0.3m
- Work plane offset 0.85

## 2.7 EN17037:2018

EN 17037 is a unified daylighting standard published by the European Committee for Standardization (CEN) in 2018 (CEN 17037:2018). It is applicable across all countries within the EU including Ireland with the Irish edition IS EN17037:2018. The assessment is carried out in addition to the assessment of the Average Daylight Factor as specified in the BRE guidelines and BS8206 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.

The EN17037:2018 Standard was enacted prior to the publication of Sustainable Urban Housing: Design Standards for New Apartments in 2020 which has no reference to the new standard. Additionally to date it is not referenced in any planning guidance document by any local authority.

The standard deals exclusively with new developments and does not give guidance or metrics on loss of light or sunlight to existing properties. EN17037:2018 sets out values for Minimum and Target levels but does not give guidance on the number of units within a development that should achieve these values. Additionally it does not differentiate between room use and weighted targets for rooms which would have a lesser requirement and to date there are no guidelines or directives on the implementation of their use.

The compliance calculation is based on an annual, climate-based simulation of interior illuminance distributions. For each hour of the year, the percentage of the floor area achieving minimum and target illuminance thresholds is measured on a room-by-room basis. To meet the standard, a room must achieve both of the following criteria:

- Target Illuminance: 300 lux over 50% of floor area for at least 50% of daylight hours.
- Minimum Illuminance: 100 lux over 95% of floor area for at least 50% of daylight hours.

Daylight hours are defined as the 4380 hours with the most diffuse horizontal illuminance in the weather file. In addition to this baseline (Minimum) requirement, rooms can achieve Medium and High levels of compliance by meeting higher illuminance thresholds, as outlined in the table below:

Minimum Illuminance			Target Illuminance		
High	500 lux	95%	High	750 lux	50%
Medium	300 lux	95%	Medium	500 lux	50%
Minimum	100 lux	95%	Minimum	300 lux	50%

**Table 3: EN 17037:2018 Compliance threshold levels.**

## 2.8 Environmental Impact Assessment (BRE Guidelines Appendix I)

The BRE guidelines sets out criteria for classification for assessment of impact where a new development affects a number of existing buildings or open spaces. The guide does not give a specific range or percentages but sets out parameters set out below.

*“Where the loss of skylight or sunlight fully meets the guidelines in this book, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines, and a larger number of windows or open space area are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space.*

*Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:*

- only a small number of windows or limited area of open space are affected*
- the loss of light is only marginally outside the guidelines*
- an affected room has other sources of skylight or sunlight*
- the affected building or open space only has a low level requirement for skylight or sunlight*
- there are particular reasons why an alternative, less stringent, guideline should be applied.*

*Factors tending towards a major adverse impact include:*

- a large number of windows or large area of open space are affected*
- the loss of light is substantially outside the guidelines*
- all the windows in a particular property are affected*
- the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, eg a living room in a dwelling or a children’s playground.*

*Beneficial impacts occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space.*

*Beneficial impacts should be worked out using the same principles as adverse impacts. Thus a tiny increase in light would be classified as a negligible impact, not a minor beneficial impact.”*

A flexible approach should be taken when assessing the impact with daylight and sunlight being one of many factors that influence the environment when planning a new development.



### 3. Daylight to adjacent buildings.

#### 3.1 Site Overview

The location is a greenfield site on Glenamuck Road North. There are detached dwellings to the North, East and South, as indicated in Figure 1 below. An apartment scheme has permission 'Carracail' to the South of the site. There are many mature trees being retained along the boundaries, which would reduce any perceptible impact on Daylight and Sunlight.



Figure 1: Aerial view of site looking toward North.

#### 3.2 Preliminary assessment of adjoining dwellings

The BRE guidelines recommend that loss of light to existing windows need not be assessed 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 window. The zone of influence 3 times the height of the proposal is plotted in Figure 2 in yellow.

Section planes perpendicular to the window wall of the adjacent properties facing the proposed development are indicated in blue in Figure 3 and 4. The planes at locations A to G extend and if they intersect the proposed development, they are plotted in Figure 5.

The BRE guidelines also state that if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than  $25^\circ$  to the horizontal, then the diffuse light of the existing building may be adversely affected. If a window falls within a  $45^\circ$  angle both in plan and elevation with a new development in place then the window may be affected and should be assessed.

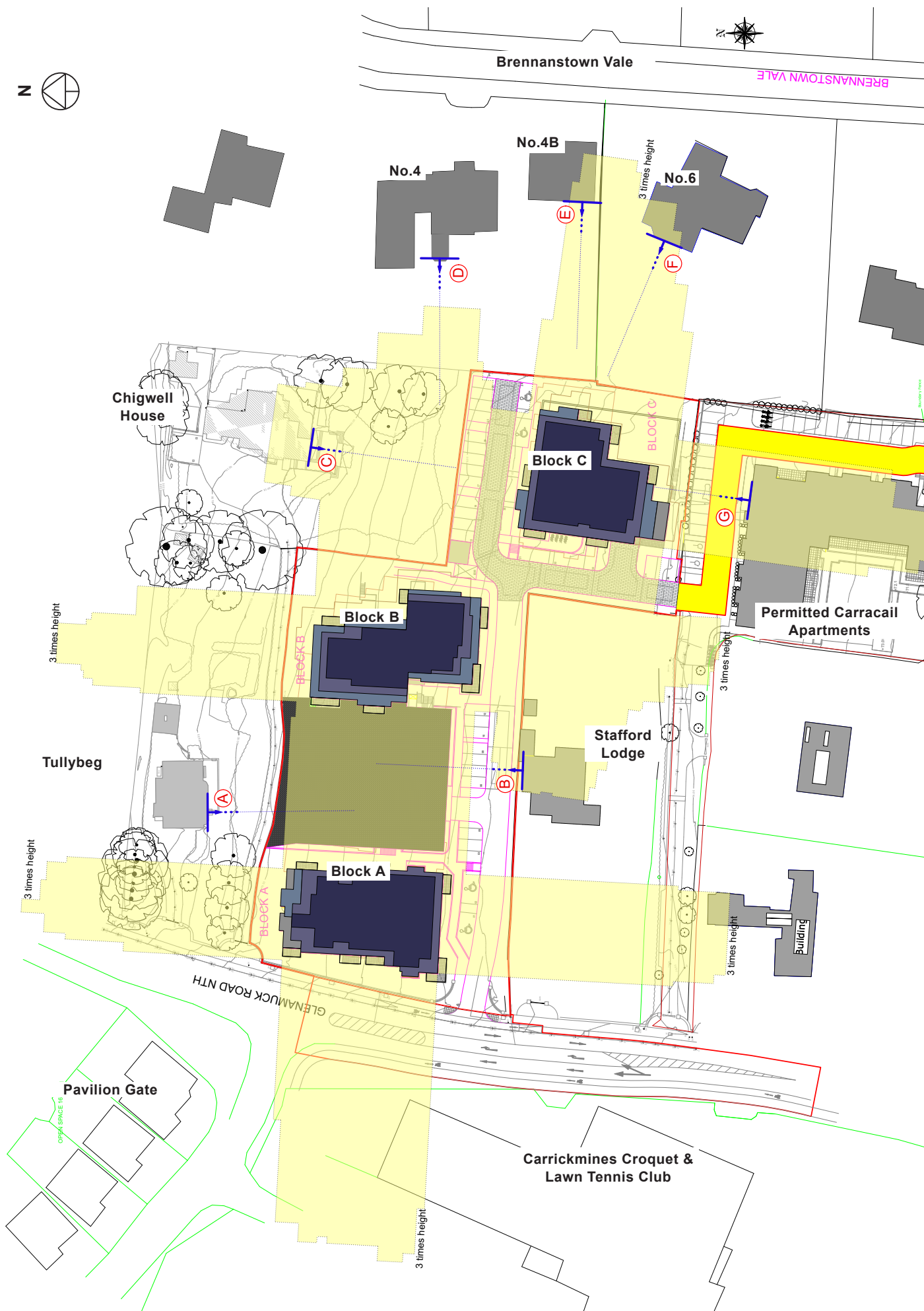
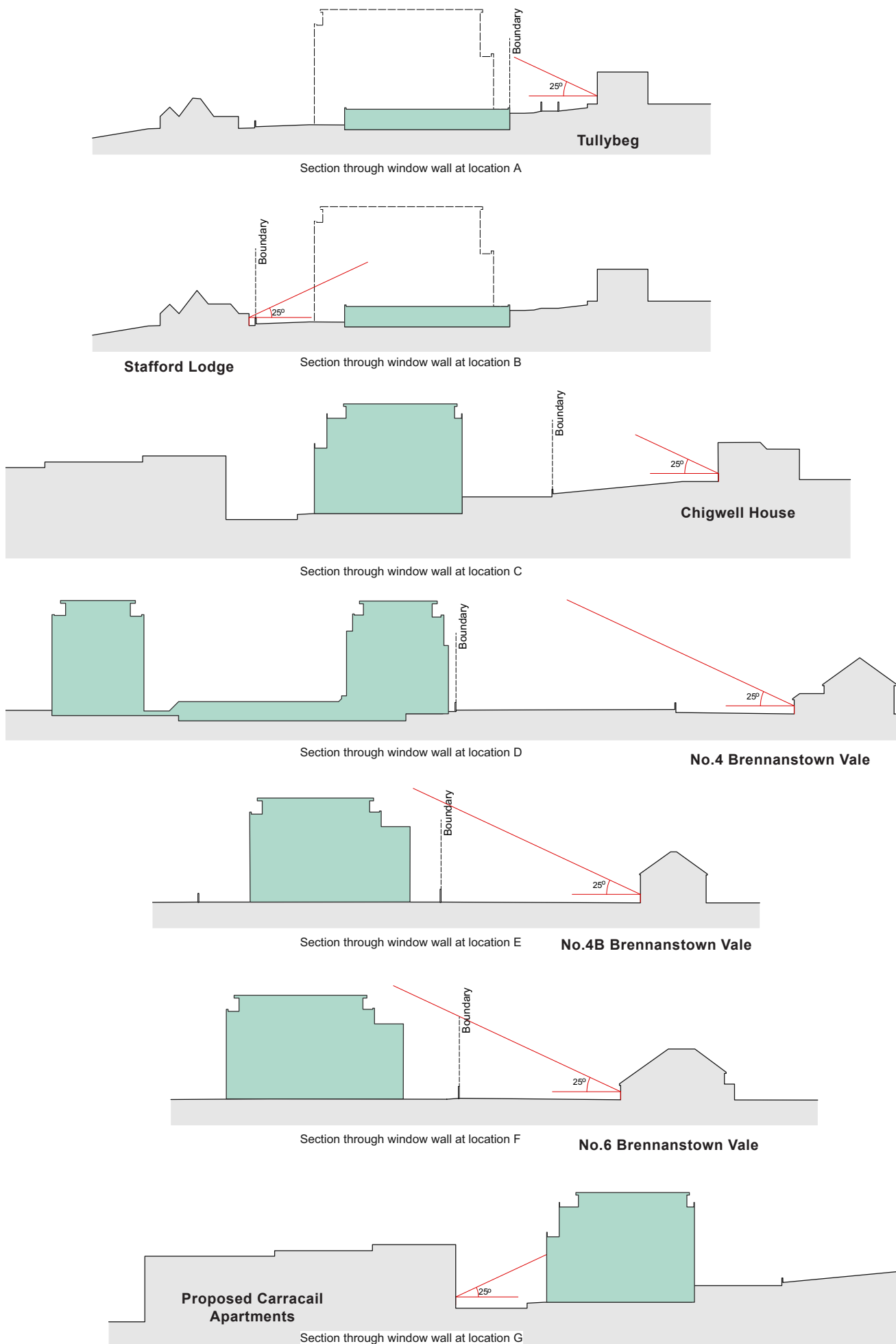


Figure 2: Site plan of the proposed development with window walls to the adjacent dwellings identified at locations A-G





**Figure 3: Section perpendicular to window wall at locations indicated in Figure 2.**

### 3.3 Comment on the assessment of daylight in adjacent dwellings.

The BRE document states that if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse light of the existing building may be adversely affected.

Window walls within the 'Zone of Influence' facing the proposed development are assessed with a section through the window wall at the locations indicated in Figure 2. Although the Zone of Influence does not reach Tullybeg or No.4 Brennanstown Vale, they were assessed for completeness. The daylight in the houses in Pavilion Gate would not be impacted.

Carrickmines Lawn Tennis Club has no windows facing the proposed development on this elevation and no particular requirement for daylight under the BRE guidelines.

Sectional analysis shown in Figure 3 indicates the following:

Section A though the ground floor windows of Tullybeg, Section B though the ground floor windows of Stafford Lodge and Section C though the ground floor windows of Chigwell House all show that the 25° angle would not be subtended by the proposed development. These windows will continue to have good access to the sky but they have been selected for detailed assessment for completeness.

Sections D and E though the ground floor windows of No.4 and 4B Brennanstown Vale Stafford Lodge, shows that the 25° angle would not be subtended by the proposed development.

In Section F though the ground floor windows of No. 6 Brennanstown Vale the 25° angle is close to the roof line of the proposed development. All of these windows will continue to have good access to the sky but they have been selected for detailed assessment for completeness.

There is an apartment scheme, Carracail, that has planning permission to the South of the proposed development. Section G through the ground floor windows, shows that the 25° angle would be subtended by the proposed development, indicating a potential impact. These windows have been selected for detailed assessment.

### 3.4 Detailed assessment to adjoining dwellings

The BRE guidelines recommends assessing the Vertical Sky Component (VSC) where room layouts are not known. Following the preliminary analysis the relevant windows were assessed for an impact on their VSC. Test points locations are indicated on the generated model in Figures 4 - 9 and the results are displayed in Table 3 below.

Window locations are represented as accurately as possible and are determined based on available information from Architectural and survey drawings, Local Authority planning records, Google earth and on site observation. Access to private rear gardens was not possible and any omissions or inaccurate window locations are unintentional.

There is a planning permission for an apartment scheme 'Carracail', it is assessed for an impact on VSC, with results shown in Table 4 below. As the layout of Carracail is known it has been a further assessed for Average Daylight Factor in Section 3.8 below.

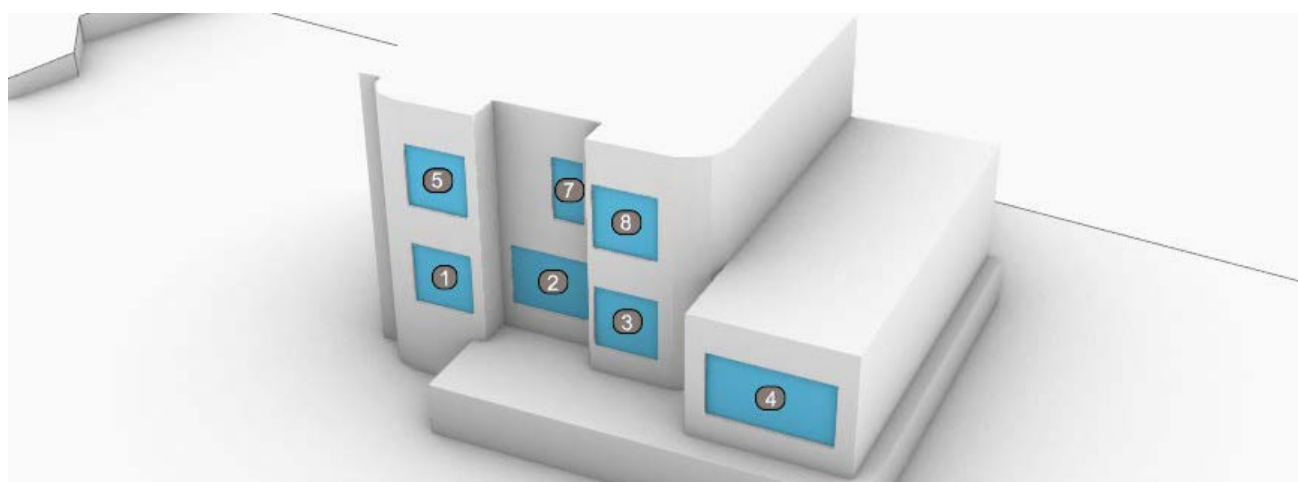
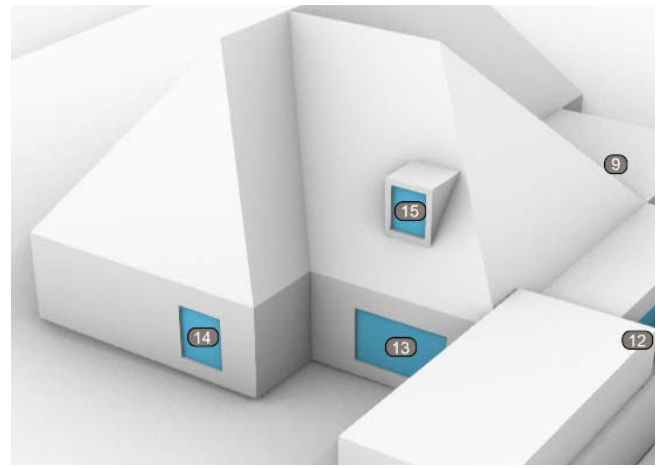
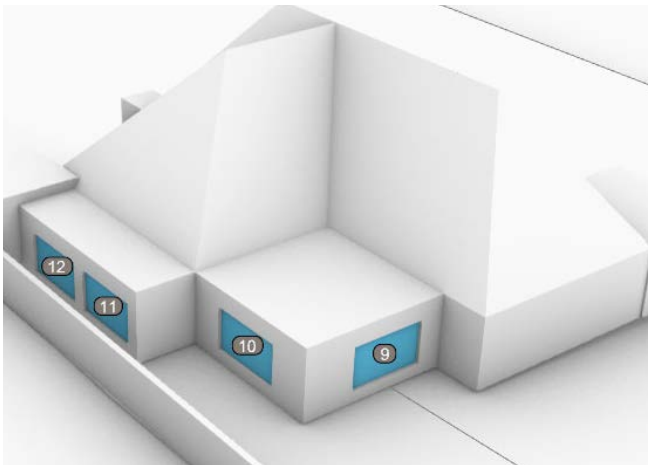
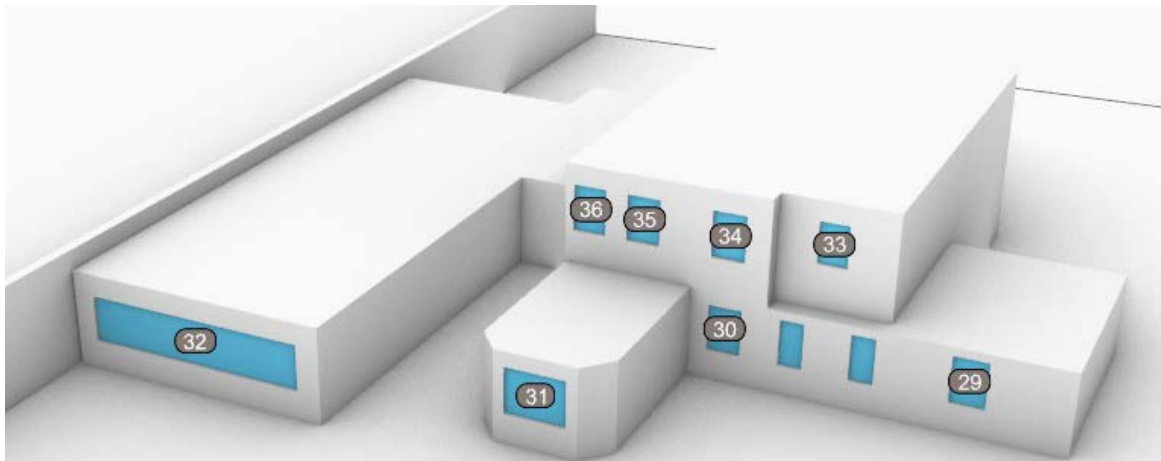


Figure 4: Tullybeg - Side view of model, locating VSC and ADF test points.



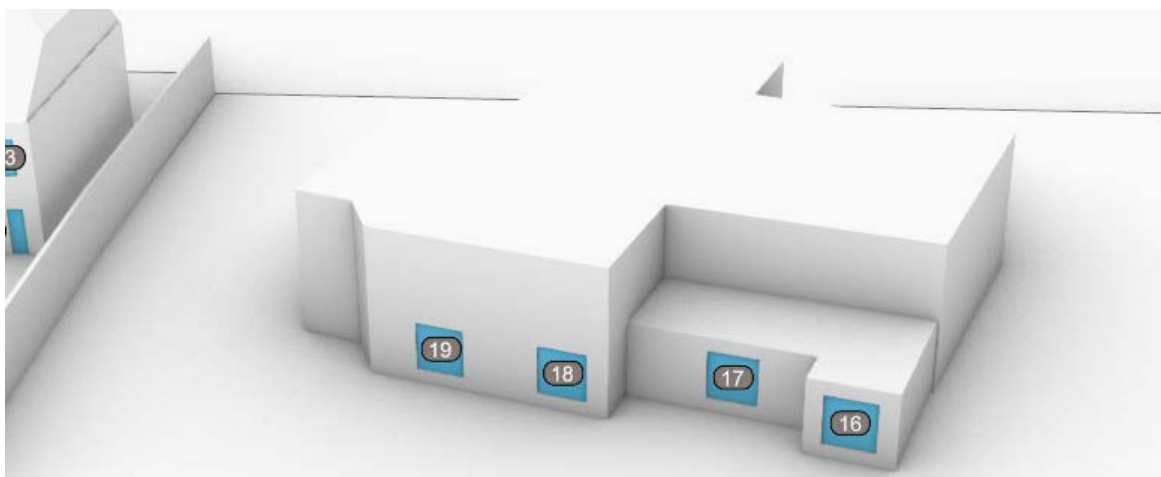
**Figure 8: Stafford Lodge - Side & rear views of model, locating VSC and APSH test points.**



**Figure 5: No.4 Brennanstown Vale - Rear view of model, locating VSC and APSH test points.**



**Figure 6: No.4B Brennanstown Vale - Rear view of model, locating VSC test points.**



**Figure 7: No.6 Brennanstown Vale - Rear view of model, locating VSC test points.**





**Figure 9: Chigwell House - Front & side view of model, locating VSC and APSH test points.**

Vertical Sky Component				
Test Point	Vertical Sky Component Recommended Value > 27%		Ratio: Proposal to Existing Recommended > 80%	Meets criteria of >27% VSC Or <27% but >80% Existing Value
	Existing	Proposed		
Tullybeg				
1	38.7	30.9	80.0%	Y
2	32.4	25.6	78.8%	Y
3	36.6	29.6	80.7%	Y
4	38.7	31.4	81.1%	Y
5	38.8	32.5	83.7%	Y
6	38.8	32.5	83.7%	Y
7	32.0	26.8	83.9%	Y
8	38.8	33.0	85.2%	Y
Stafford Lodge				
9	35.5	31.0	87.2%	Y * Dual Aspect
10	33.9	25.7	76.0%	
11	29.5	22.8	77.5%	Y
12	28.0	22.0	78.3%	Y
13	30.9	26.1	84.5%	Y
14	37.5	29.4	78.3%	Y
15	37.3	29.6	79.3%	Y
No.6 Brennanstown Vale				
16	37.9	32.9	86.8%	Y
17	35.4	30.8	87.0%	Y
18	37.7	32.8	87.1%	Y
19	37.5	32.6	87.1%	Y
No.4B Brennanstown Vale				
20	34.8	31.6	90.6%	Y
21	36.2	32.6	90.1%	Y
22	35.4	32.0	90.4%	Y
23	37.8	34.4	91.0%	Y
24	37.8	34.4	91.0%	Y
25	37.8	34.4	91.0%	Y
26	37.6	34.3	91.1%	Y
27	37.5	34.2	91.3%	Y
28	37.5	35.3	94.0%	Y

Vertical Sky Component				
Test Point	Vertical Sky Component Recommended Value > 27%		Ratio: Proposal to Existing Recommended > 80%	Meets criteria of >27% VSC Or <27% but >80% Existing Value
	Existing	Proposed		
No.4 Brennanstown Vale				
29	36.7	33.2	90.4%	Y
30	29.6	26.6	89.7%	Y
31	36.9	32.9	89.3%	Y
32	34.7	31.3	90.2%	Y
33	36.9	33.8	91.7%	Y
34	37.7	34.6	91.8%	Y
35	37.6	34.7	92.2%	Y
36	37.6	34.7	92.3%	Y
37	38.3	33.7	87.9%	Y
Chigwell House				
38	38.7	33.6	86.9%	Y
39	29.4	27.6	93.9%	Y
40	35.4	33.3	93.9%	Y
41	38.6	34.7	89.9%	Y
42	32.4	31.1	96.0%	Y
43	37.0	35.3	95.5%	Y

**Table 4: Vertical sky component for windows existing adjacent residential properties**

\* The BRE guidelines recommends where there are more than one window to a room the cumulative average should be used.

### 3.5 Conclusions

There will be a minor reduction in available daylight to some of the windows to the adjacent existing houses but all windows retain a VSC in excess of 27% or the VSC is not reduced below 80% of its former value and there will be no perceived reduction in available daylight. The proposed development meets the requirements of the BRE Guidelines and any impact will be negligible.

### 3.6 Vertical Sky Component in Carracail Apartments

The drawings of the proposed adjacent scheme 'Carracail' have been provided. The relevant windows are assessed for an impact on VSC, with results shown in Table 5 below.



**Figure 10: Carracail Apartments - View of model's North Elevation of showing location of windows assessed for VSC.**

Vertical Sky Component - Carracail Apartments					
Apartment No	Use	Vertical Sky Component Recommended Value > 27%		Ratio: Proposal to Existing Recommended > 80%	Meets criteria of >27% VSC Or <27% but >80% Existing Value
		Existing	Proposed		
44	Liv/ Kit	37.2	26.3	70.8% Average Value 85.4%	Yes * Dual Aspect
45	Bedroom	37.2	24.4	65.7%	Minor
46	Bedroom	37.2	25.3	68.1%	Minor
47	Circulation	37.2	22.4	60.1%	N/A Use
48	Liv/ Kit	37.4	26.8	71.7%	Minor
49	Liv/ Kit	37.3	28.0	75.1%	Y
50	Liv/ Kit	37.3	29.1	78.0%	Y
51	Liv/ Kit	38.1	28.3	74.2%	Y
52	Bedroom	38.2	26.5	69.5%	Minor
53	Bedroom	38.2	27.4	71.9%	Y**
54	Bedroom	38.2	24.5	64.0%	Minor
55	Bedroom	38.3	28.7	74.8%	Y
56	Ensuite	38.4	23.6	61.4%	N/A Use
57	Bedroom	38.3	29.9	78.0%	Y
58	Ensuite	38.4	24.4	63.5%	N/A Use
59	Bedroom	38.3	30.8	80.2%	Y
60	Ensuite	38.4	27.9	72.6%	Y
61	Liv/ Kit	38.8	30.4	78.4%	Y
62	Bedroom	38.8	29.3	75.5%	Y
63	Bedroom	38.8	29.4	75.8%	Y
64	Circulation	38.8	29.0	74.7%	N/A Use
65	Kitchen	38.9	30.0	77.2%	Y
66	Circulation	38.9	30.8	79.0%	N/A Use
67	Kitchen	38.9	31.0	79.7%	Y
68	Circulation	38.8	31.5	81.1%	N/A Use
69	Kitchen	38.9	31.7	81.5%	Y
70	Circulation	38.8	32.2	82.9%	N/A Use
71	Liv/ Kit	39.0	32.1	82.5%	Y
72	Bedroom	39.0	31.8	81.5%	Y
73	Bedroom	39.0	31.5	80.9%	Y
74	Bedroom	39.1	31.7	81.1%	Y
75	Bedroom	39.1	31.6	80.8%	Y
76	Bedroom	39.1	31.1	79.5%	Y
77	Bedroom	39.1	32.6	83.4%	Y
78	Bedroom	39.0	31.7	81.2%	Y
79	Bedroom	39.0	33.2	85.1%	Y
80	Bedroom	39.0	32.2	82.5%	Y

**Table 5: Vertical sky component for windows on the proposed Carracail Apartments**

\* The BRE guidelines recommends where there are more than one window to a room the cumulative average should be used.

### 3.7 Discussion

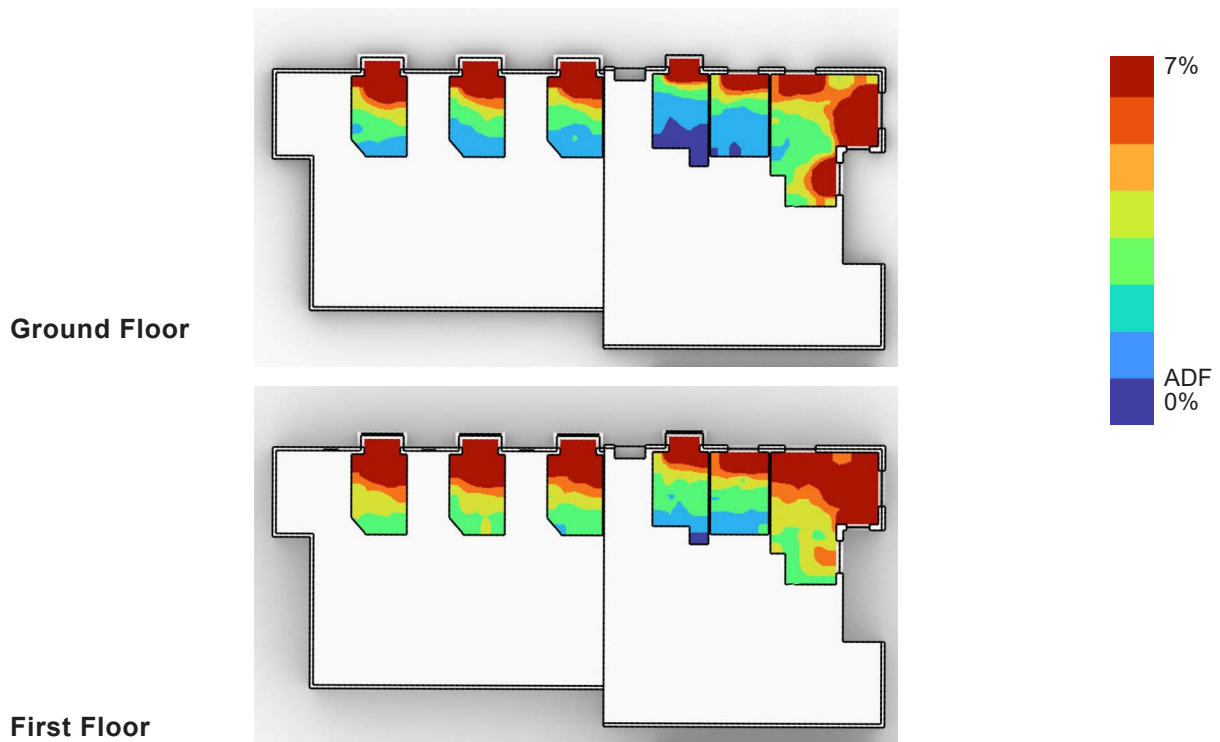
An assessment of VSC is used to assess possible impacts on daylight when the room layout is not known. It does not take into account room depth, shape and size of opening. A value below the recommended value does not mean there will be a loss of noticeable light and the assessment of the Average Daylight Factor (ADF) can be used where the room layout is known to give a better indication of the available daylight to the room.

The windows in Carracail would have quite high levels of VSC, (the maximum possible is 40%) as they would face low rise structures at a distance. The plan of these apartments are known, the relevant habitable rooms on the ground and first floor were assessed for an impact on their ADF.

### 3.8 Average Daylight Factor in Carracail Apartments

The BRE guidelines recommend that the Average Daylight Factor (ADF) be assessed in habitable rooms of new developments. BS 8206-2 gives minimum values of ADF of 2% for kitchens and living rooms which include a kitchen, 1.5% for living rooms and 1% for bedrooms. An average daylight factor of 5% is a well daylit space.

The results are shown in Table 6 below, with the associated false colour plans representing the analysis of ADF.



**Figure 11: Carracail False Colour Plan of Ground and First floors indicating habitable rooms assessed for ADF**

Average Daylight Factor - Block Carracail						
Space ID	Description	Area m2	Sensor Count	ADF	Minimum ADF	Comment
Ground Floor						
CH01.01	Liv /Kit	16.7	39	7.0%	2	Meets Criteria
CH02.01	Liv /Kit	16.7	39	6.4%	2	Meets Criteria
CH03.01	Liv /Kit	16.7	39	6.2%	2	Meets Criteria
CH04.01	Liv /Kit	38.5	100	5.9%	2	Meets Criteria
CH04.02	Bed	16.5	48	3.4%	1	Meets Criteria
CH04.03	Bed	17.0	36	3.3%	1	Meets Criteria
First Floor						
CH05.01	Liv /Kit	16.7	39	8.2%	2	Meets Criteria
CH06.01	Liv /Kit	16.7	39	8.0%	2	Meets Criteria
CH07.01	Liv /Kit	16.7	39	7.7%	2	Meets Criteria
CH08.01	Liv /Kit	38.5	100	6.6%	2	Meets Criteria
CH08.02	Bed	16.5	48	4.4%	1	Meets Criteria
CH08.03	Bed	17.0	36	4.9%	1	Meets Criteria

**Table 6: Carracail - Average Daylight Factor of Ground & First Floor Habitable Rooms**

### 3.9 Conclusion

The proposed apartment is within the same ownership of the proposed development. All the rooms assessed considerably exceed the minimum recommendations for the Average Daylight Factor and will be well daylit. The proposed development meets the recommendations of the BRE Guidelines and BS8206 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.

## 4. Sunlight in Adjoining Residential Living Areas

### 4.1 Annual Probable Sunlight Hours

The BRE guidelines recommends assessing walls for the APSH that face within 90° of due south. For a proposed development to have a noticeable impact on the annual Probable Sunlight Hours the value need to be reduced below the recommended 25% annual or 5% in the winter period from September to March. If the value is either below this to begin with or is reduced below this then it should not be reduced below 0.8 times its former value.

The guidelines states only the main living spaces need to be assessed. Bedrooms do not need to be assessed. The windows identified in the preliminary assessment that face within 90° of due south are assessed and the results are set out in Table 7.

Annual Probable Sunlight Hours							
Location ID	APSH >25% Target			Sept 21 - Mar 21 PSH >5% Target			Meets criteria of >25% APSH and >5% PSH Or <25% or <5% PSH but >80% Existing Value
	Existing	Proposed	Ratio	Existing	Proposed	Ratio	
	% of APSH	% of APSH	If less than 25% APSH Target >80%	% PSH	% PSH	If less than 5% PSH Target >80%	
Tullybeg							
1	80.5%	61.8%	76.8%	31.3%	15.9%	50.9%	Y
2	56.9%	39.7%	69.9%	27.1%	12.9%	47.4%	Y
3	71.2%	53.3%	74.9%	29.1%	14.2%	49.0%	Y
4	81.8%	62.8%	76.7%	31.4%	16.1%	51.1%	Y
5	82.2%	66.2%	80.5%	31.8%	18.4%	58.1%	Y
Stafford Lodge							
14	48.9%	39.2%	80.1%	15.5%	11.9%	76.8%	Y
No.4 Brennanstown Vale							
29	46.4%	40.7%	87.7%	13.9%	11.6%	83.5%	Y
30	42.4%	36.8%	86.8%	14.4%	11.2%	77.5%	Y
31	47.1%	39.0%	82.8%	14.7%	10.8%	73.2%	Y
32	44.5%	38.0%	85.2%	14.7%	10.5%	71.7%	Y
Chigwell House							
38	79.7%	67.6%	84.9%	30.6%	22.8%	74.8%	Y
39	51.9%	50.6%	97.5%	21.8%	20.8%	95.1%	Y
40	66.9%	63.0%	94.2%	27.6%	24.4%	88.3%	Y

**Table 7: Annual Probable Sunlight hours to adjoining properties**

### 4.2 Discussion

All the windows assessed to main living spaces have an APSH percentage greater than the recommended 25% (414 hours) and 5% (75 hours) from 21 September to 21 March.

### 4.3 Conclusion

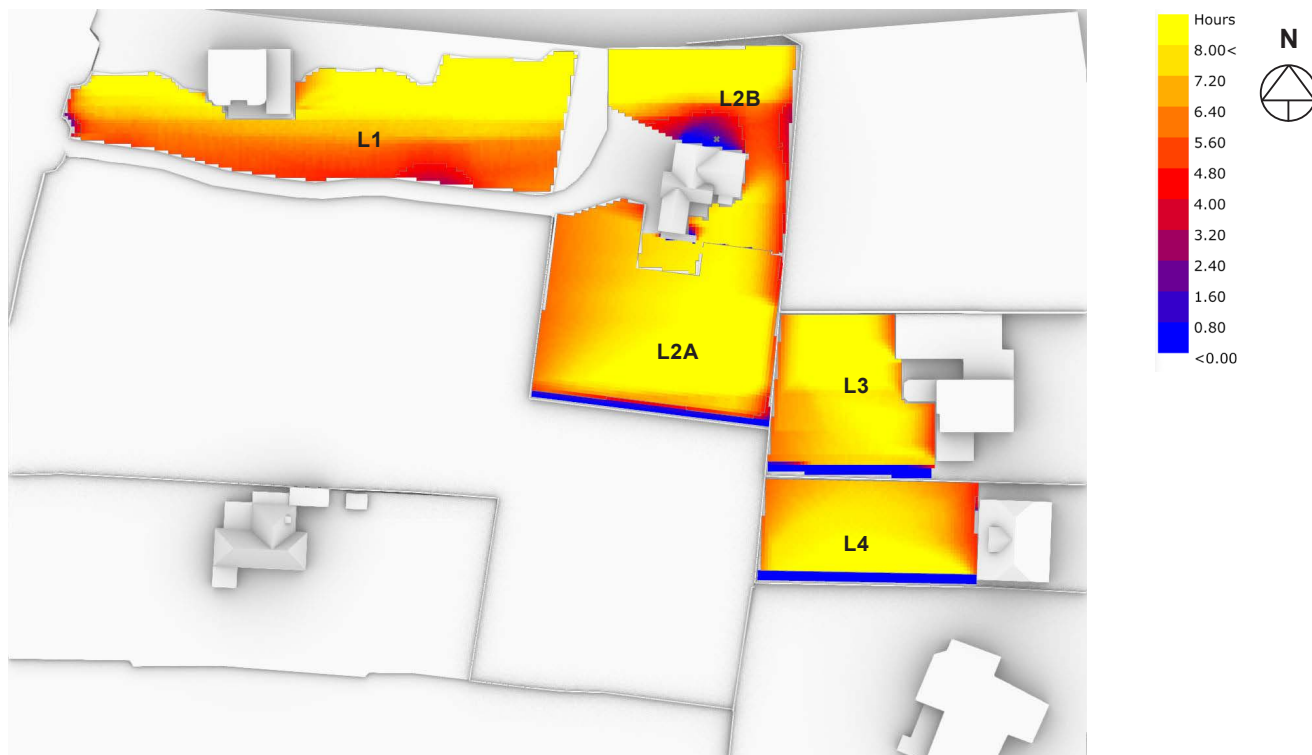
All windows assessed exceed the target values set out for sunlight. The proposed development meets the recommendations of the BRE guidelines.

## 5. Sunlight to Adjacent Gardens and Open Spaces

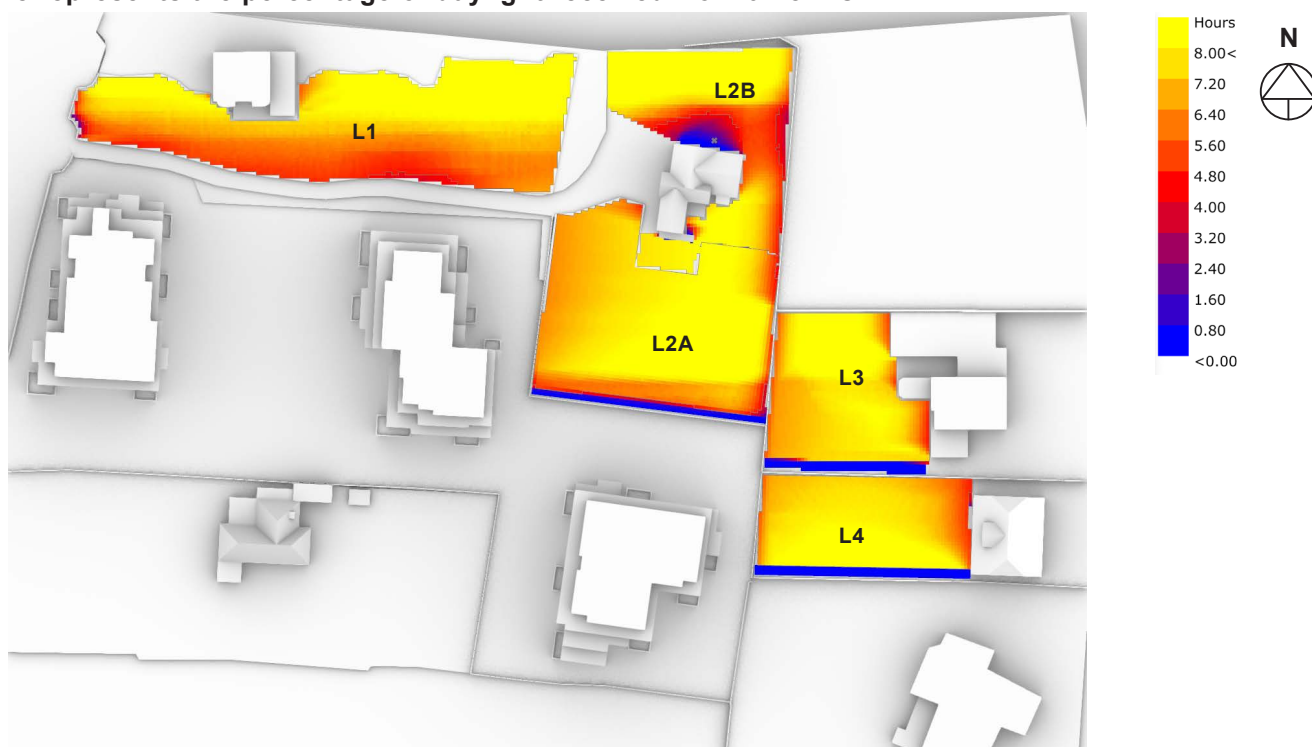
The BRE document indicates that for an amenity area to have good quality sunlight throughout the year, 50% should receive in excess of 2 hours sunlight on the 21st March. It also states that front gardens need not be assessed for sunlight.

### 5.1 Amenity space to neighbouring properties.

The amenity spaces of the adjacent properties that would be North or East of the proposed development were assessed for impact on their sun of the ground. The existing and proposed generated analysis are shown in Figures 12 & 13, the results are shown in Table 8 below. Stafford Lodge and No.6 Brennanstown Vale are to the South and so would not experience an impact on its sunlight to amenity spaces from the proposed development.



**Figure 12: Existing Radiation map of amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.**



**Figure 13: Proposed Radiation map of amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.**

Sunlight on the ground - Adjacent residential properties					
No.	Location	Existing	Proposed	Ratio of Proposed: Existing	Comment
L1	Tullybeg	99.0	98.5	99.5%	Meets criteria
L2A	Chigwell House South site	96.0	94.4	98.3%	Meets criteria
L2B	Chigwell House North site	91.0	87.5	96.2%	Meets criteria
L3	No. 4 Brennanstown Vale	91.0	91.0	100.0%	Meets criteria
L4	No.4 A Brennanstown Vale	90.0	89.2	99.1%	Meets criteria

**Table 8: Calculation of Sun on the Ground to adjacent amenity areas**

## 5.2 Conclusion

All the amenity spaces in the neighbouring properties will retain 2 hours sunlight to an area in excess of 50% of the amenity space. The proposed development will not reduce the existing availability of sunlight below 80% of the current levels.



## 6. Daylight to Proposed Development.

Daylight has been assessed for compliance with the BRE guide by calculation of Average Daylight Factor. For supplementary information, compliance is also demonstrated with a calculation of Daylight Provision under EN 17037:2018.

### 6.1 Assessment for Average Daylight Factor

The BRE guidelines recommend that the Average Daylight Factor (ADF) be assessed in habitable rooms of new developments. BS 8206-2 gives minimum values of ADF of 2% for kitchens and living rooms which include a kitchen, 1.5% for living rooms and 1% for bedrooms. An average daylight factor of 5% is a well 'daylit' space. Where there are two room uses within a space then the higher ADF value should be used. The assessment plane covers 100% of living space being considered.

The factors that affect ADF are room depth, aspect, window size relative to floor area and closeness to an adjacent obstruction. A full schedule of results and the associated false colour plans representing the analysis of ADF are shown in Appendix A. The room numbering follows the architectural drawings. A summary of the results are displayed in the table below.

Summary of results of the assessment of Average Daylight Factor				
	Total Apt & Duplex Units	No. of Rooms Assessed	No. Meets Criteria	% Meets Criteria
Block A	122	122	122	100%
Block B	104	104	104	100%
Block C	102	102	102	100%

**Table 9: Summary of ADF results of multi - dwelling units assessed for ADF.**

### 6.2 Conclusion

100% of the rooms assessed exceed the minimum recommendations for the Average Daylight Factor and will be well daylit. The proposed development meets the recommendations of the BRE Guidelines and BS8206 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.

### 6.3 Assessment for Daylight Provision EN17037:2018

For supplementary information, compliance is also demonstrated with a calculation of Daylight Provision under EN 17037:2018. A complete set of results are shown in Appendix B. A summary of the results are displayed in the table below.

Fraction of rooms at each compliance level (area-weighted)					
		Fail	Minimum	Medium	High
Block A, B & C	Target Illuminance	0.9%	17.5%	11.7%	69.9%
	Minimum Illuminance	0.0%	22.0%	10.4%	67.6%

**Table 10: Summary of room compliance with EN 17037:2018. Individual room results can be viewed in Appendix B**

### 6.4 Conclusion

The proposed development exceeds the minimum values for daylight provision set out in EN17037:2018.

## 7. Sunlight to Habitable Rooms of Proposed Apartment Blocks

### 7.1 Annual Probable Sunlight Hours

The BRE guidelines recommends that living rooms with window that face within 90° of due South be assessed for Annual Probable Sunlight Hours (APSH) and Probable Sunlight Hours (PSH) for the winter period from September to March. It is recommended that the APSH be greater than 25% of the total sunlight hours possible and that the PSH in winter be greater than 5%.

All windows to living rooms in the apartment blocks have been assessed. Bedrooms need not be assessed. Appendix C shows the results per block, indicating if this room has a relevant South facing window. The apartment numbering follows that of the architectural drawings. A summary of the results are displayed in the table below.

Annual Probable Sunlight Hours Summary Table					
	Total Units	No. of units with a living room window within 90° South	Ratio of units that have a window within 90° South	No. of windows that meet criteria	Ratio that meet criteria
Block A	44	27	61.4%	24	54.5%
Block B	38	22	57.9%	20	52.6%
Block C	36	21	58.3%	23	63.9%
Total	82	49	59.8%	44	53.7%

**Table 11: Summary of results of assessment of APSH & PSH.**

### 7.2 Comment on the assessment of Annual Probable Sunlight Hours

The BRE Guidelines recommend maximising the amount of units that have a window within 90° due South but does not have set targets. Additionally windows with an aspect of greater than 90° due South, like West or North East, will still receive sunlight, but it is likely to be lesser amounts especially in the winter period.

In the apartment blocks, A, B & C there are 49 No. Living / Dining spaces that have windows facing within 90° of due South. 53.7% of the apartments meet the criteria to have both an APSH percentage greater than the recommended 25% (414 hours) and 5% (75 hours) from September 21st to March 21st.

In assessing the overall quality of light within a space it is important to note that sunlight is of lesser importance than good quality daylight. Direct sunlight is intermittent and a bright well lit living space is more desirable than a gloomy living space with spells of sunshine.

### 7.3 Conclusion

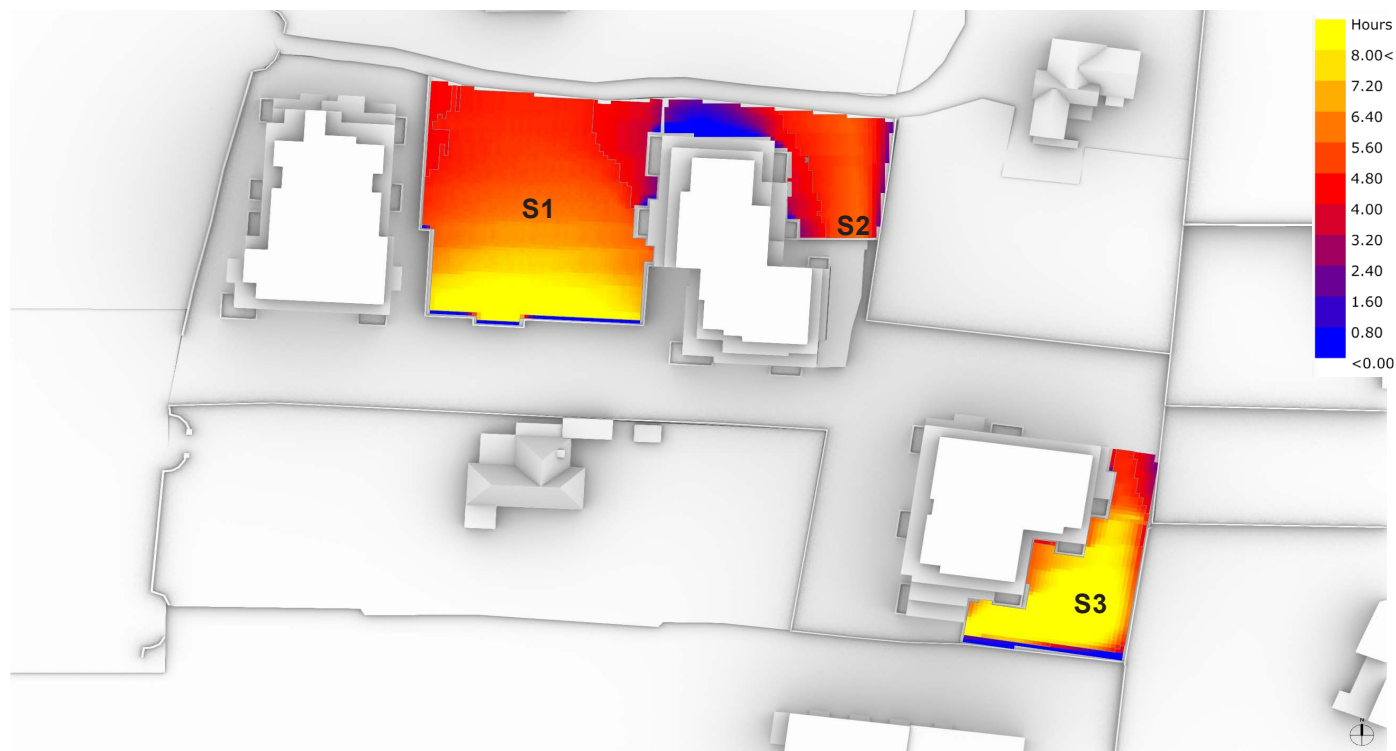
The design and layout of the apartment blocks is optimised to receive the available sunlight 59.8% of the units have a window wall within 90° of due South. 53.7% of the apartments exceed the target values set out for sunlight. The majority of the main living spaces to the apartments have an overhanging balcony due to the requirement for private external space which restricts the availability of direct sunlight.

## 8. Sunlight to gardens and open spaces within proposed development

The BRE document indicates that for an amenity area to have good quality sunlight throughout the year, 50% should receive in excess of 2 hours sunlight on the 21st March.

### 8.1 Sunlight to amenity within the proposed development

The amenity within the proposed development was assessed through the calculation of sun on the ground, on the 21st March as per BRE guidelines. The result is shown in Table 12 and a radiation map of generated analysis are shown in Figure 14 below.



**Figure 14: Radiation map of amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.**

Sunlight on the Ground - Proposed Development			
Location ID	Description	Proposed: % Area receiving 2 hours sunlight on 21st March	Meets criteria if >50% area receives 2 hours sunlight on 21st March
S1	Block A & B - Public Open Space with Playground	98.0%	Y
S2	Block B - Public Open Space	93.7%	Y
S3	Block C - Public Open Space	94.3%	Y

**Table 12: Calculation of Sun on the Ground to public amenity spaces within the development**

### 8.2 Comment on the assessment of Sun on the Ground

The site has a variety of public & communal amenity spaces designed into the scheme. The BRE recommends that 50% of the area receive more than 2 hours of sunlight on the 21st March and all three areas meet this criteria.

### 8.3 Conclusion

The proposed development meets and exceeds the criteria set out in the BRE guidelines for gardens and open spaces.

## 9. Shadow Diagrams

### 9.1 BRE Guidance on Shadow Studies

The BRE guidelines recommends using the March Equinox due the equal length of the day and night time. It states:

*“If a space is used all year round, the equinox (21 March) 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 (21 September) will be the same as those for 21 March, so a separate set of plots for September is not required.”*

The shadows cast on the September equinox are the same as the March Equinox. They are included here with the Daylight Saving Time (DST) applied, as with the Summer Solstice diagrams.

June 21st and December 21st are provided below for information but it should be noted that the summer solstice is the best case scenario with shadows at their shortest. In Winter even low buildings will cast long shadows and it is common for large areas of the ground to be in shadow throughout the day especially in a built up area and sun barely rises above an altitude of 10° during the course of the day. The guidelines recommends that Sunlight at an altitude of 10° or less does not count. Below are the times for the Equinox and Solstice that the sun is above 10° altitude rounded to the nearest half hour.

Equinox: between 8:30 and 17:30

Summer Solstice: Between 6:30 and 20:00

Winter Solstice: Between 10:30 and 14:00

Section 9.2 shows the proposed shadow diagrams for the Equinox on the 21st March at hourly intervals during the day between 09:00 and 17:00.

Section 9.3 shows the proposed shadow diagrams for the Summer Solstice on the 21st June at 2 hourly intervals during the day between 10:00 and 18:00.

Section 9.4 shows the proposed shadow diagrams for the Equinox on the 21st September at 2 hourly intervals during the day between 09:00 and 17:00.

Section 9.5 shows the proposed shadow diagrams for the Winter Solstice on the 21st December at 2 hourly intervals during the day between 10:00 and 14:00.

In relation to the effects of trees and hedges the BRE guidelines states,

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

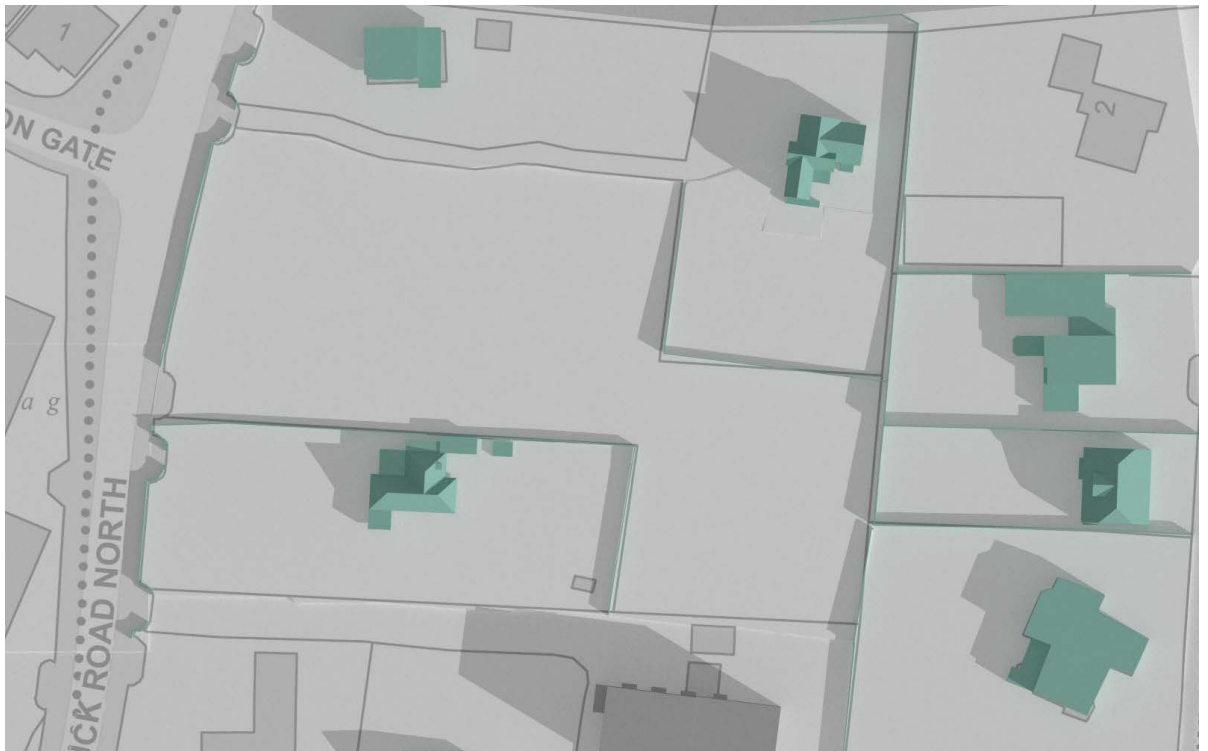
The trees were not included because they are mostly deciduous and guidelines recommends only including trees where there are dense bands of evergreen trees.

Shadow diagrams are a visual aid to understand where possible shading may occur. The use of shadow diagrams as an assessment method should be taken over the course of the day and not a specific time due to the transient nature of the sun and the shade caused by obstructions. As the site is a greenfield, where there is no shadows cast from any structures on the site at present. The shadows are cast with the adjacent Carracail Apartments in place.

## 9.2 Shadow Casting diagrams March Equinox



Existing



Proposed

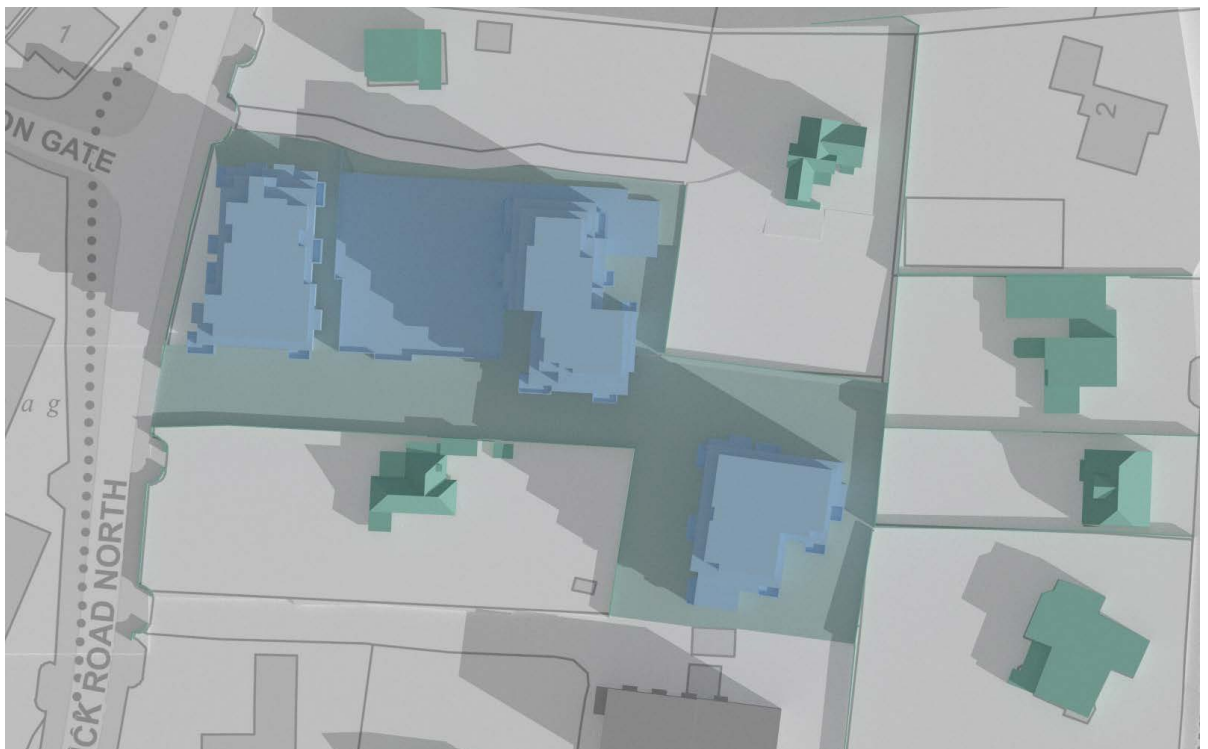
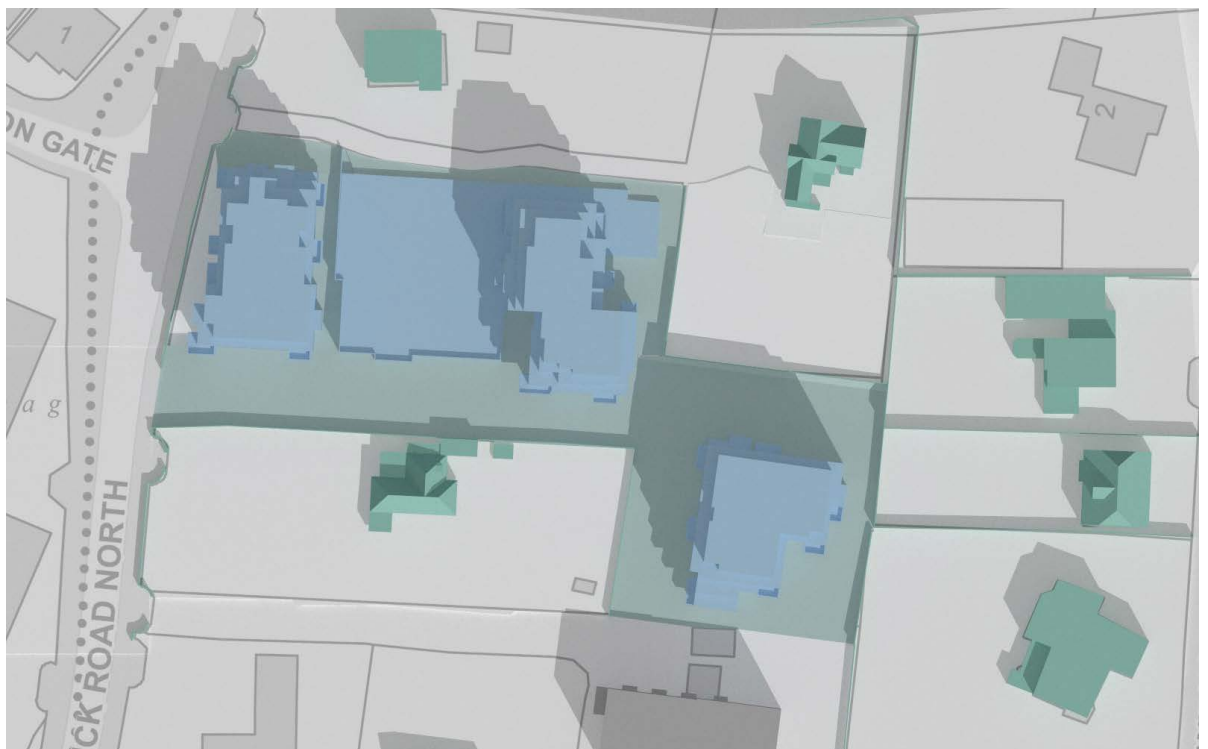


Figure 15: Shadow diagrams 21 March 09:00 GMT

## Shadow Casting diagrams March Equinox



Existing



Proposed

Figure 16: Shadow diagrams 21 March 11:00 GMT



## Shadow Casting diagrams March Equinox



Existing



Proposed

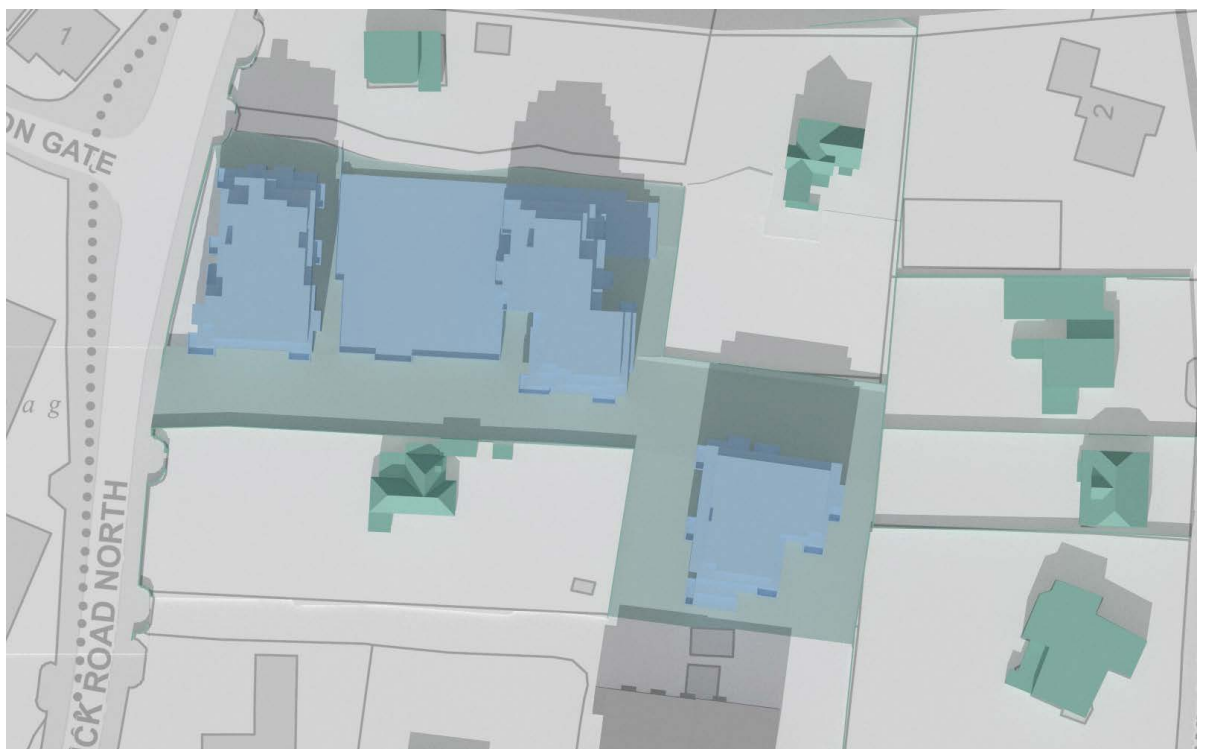


Figure 17: Shadow diagrams 21 March 13:00 GMT



## Shadow Casting diagrams March Equinox



Existing



Proposed



Figure 18: Shadow diagrams 21 March 15:00 GMT

## Shadow Casting diagrams March Equinox



Existing



Proposed

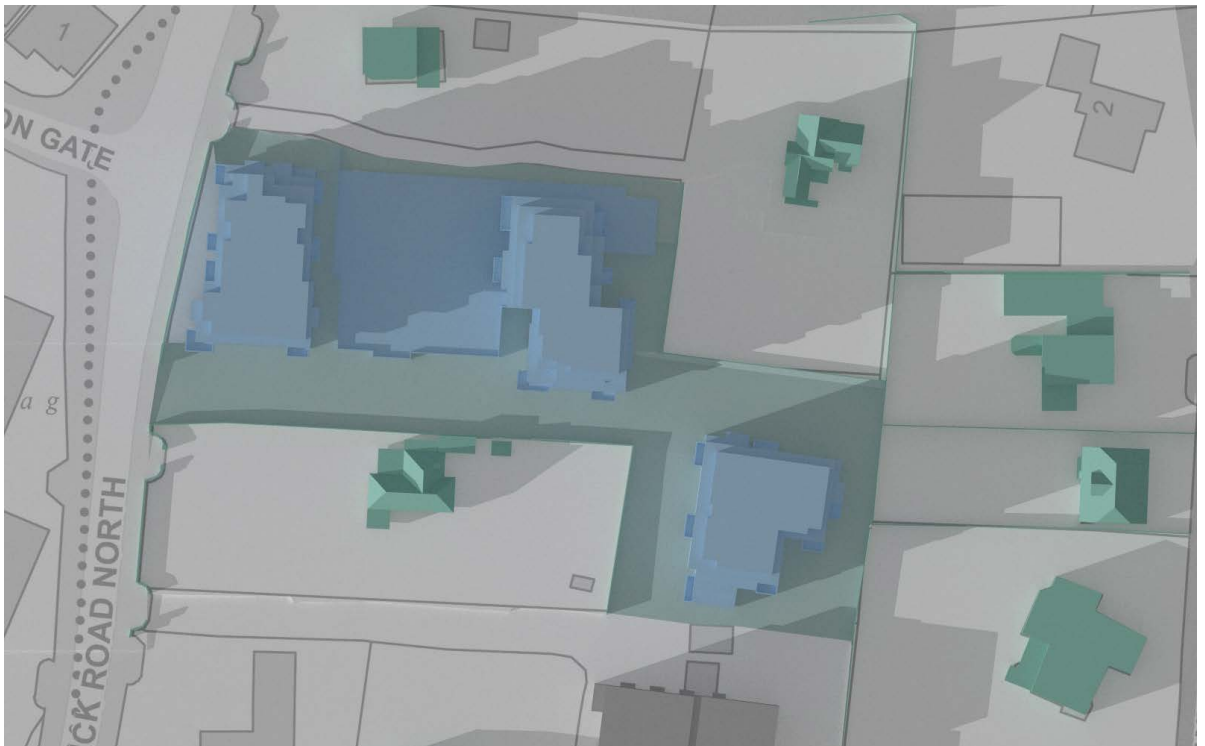


Figure 19: Shadow diagrams 21 March 17:00 GMT

### 9.3 Shadow Casting diagrams June Solstice



Existing



Proposed

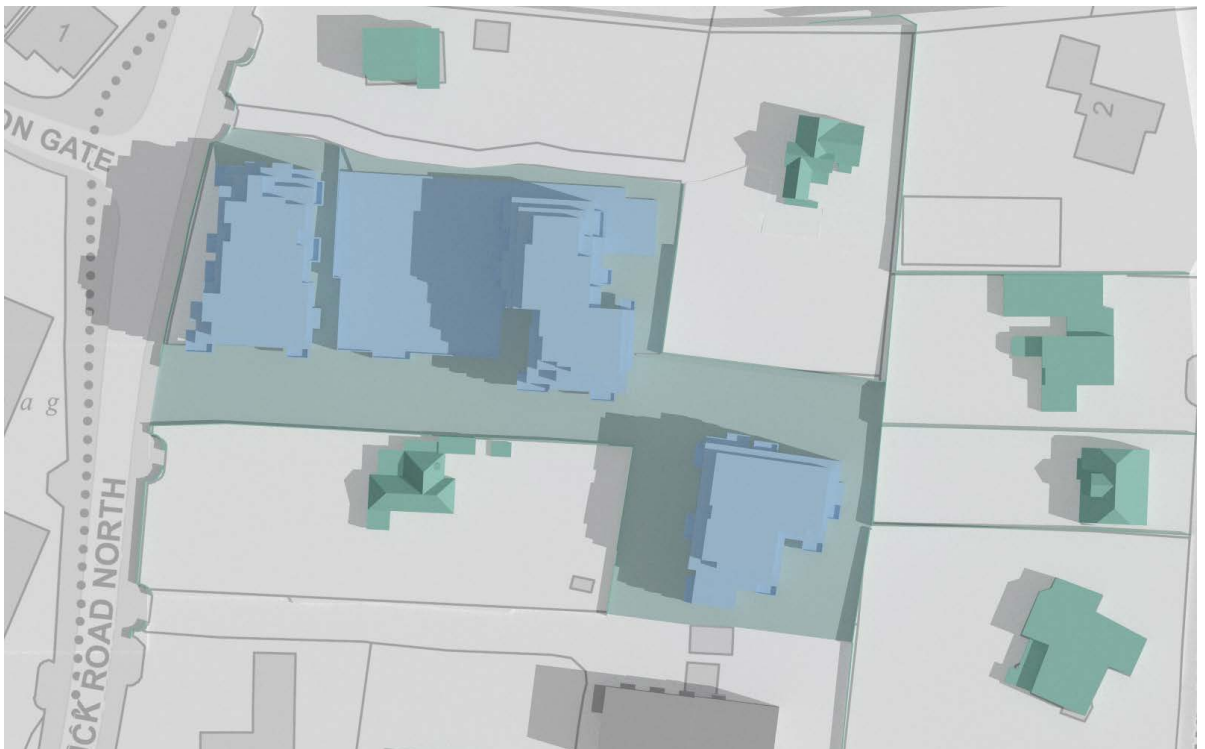


Figure 20: Shadow diagrams 21 June 10:00 GMT+1 (DST)

Shadow Casting diagrams June Solstice



Existing



Proposed

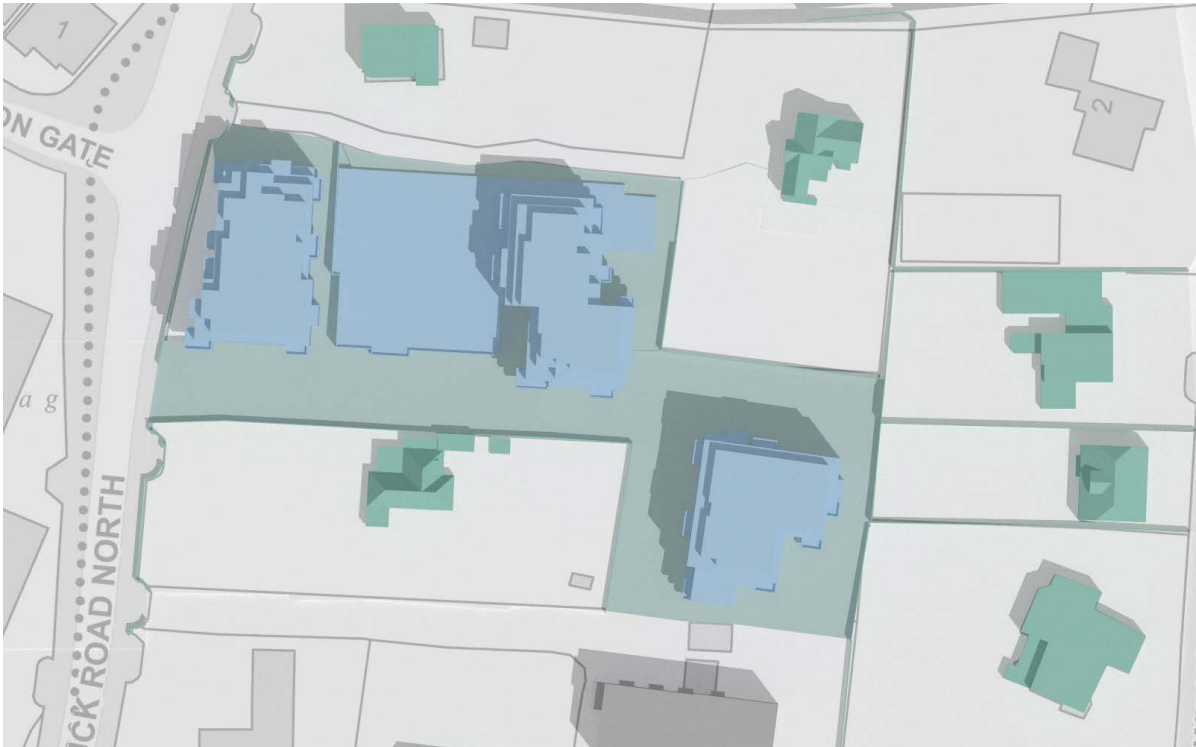


Figure 21: Shadow diagrams 21 June 12:00 GMT+1 (DST)

## Shadow Casting diagrams June Solstice



Existing



Proposed

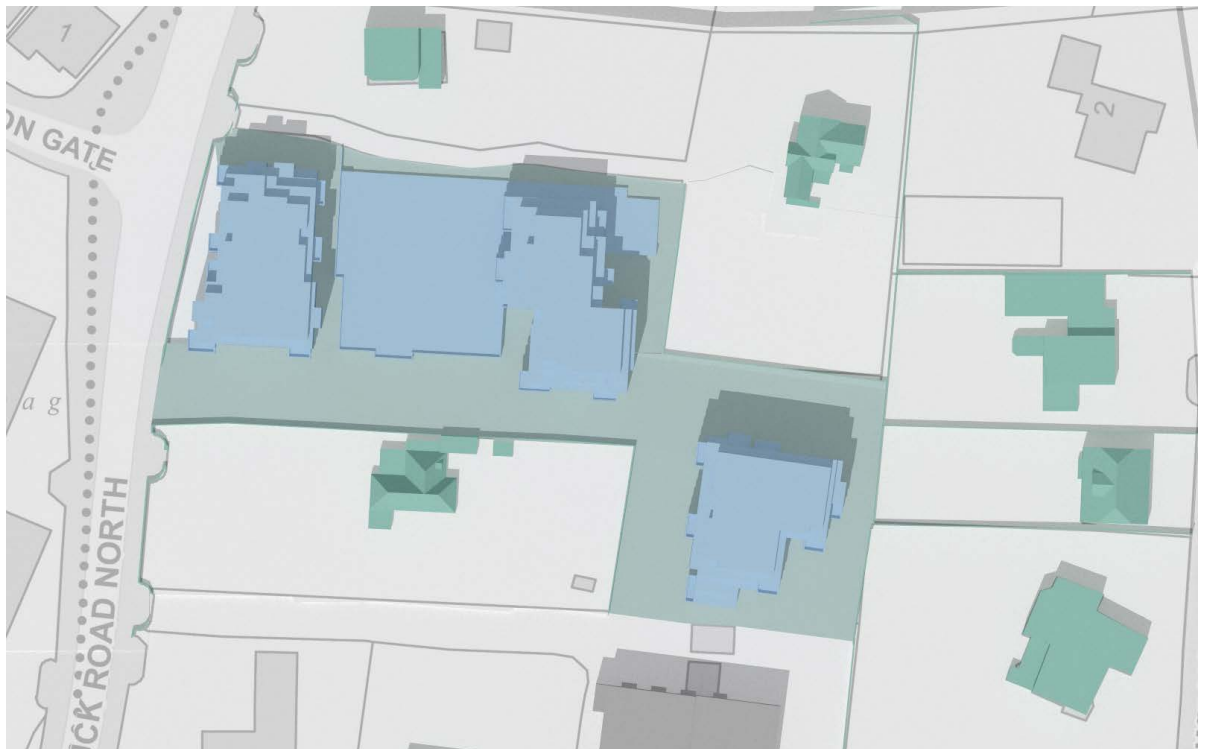


Figure 22: Shadow diagrams 21 June 14:00 GMT+1 (DST)



## Shadow Casting diagrams June Solstice



Existing



Proposed



Figure 23: Shadow diagrams 21 June 16:00 GMT+1 (DST)

## Shadow Casting diagrams June Solstice



Existing



Proposed

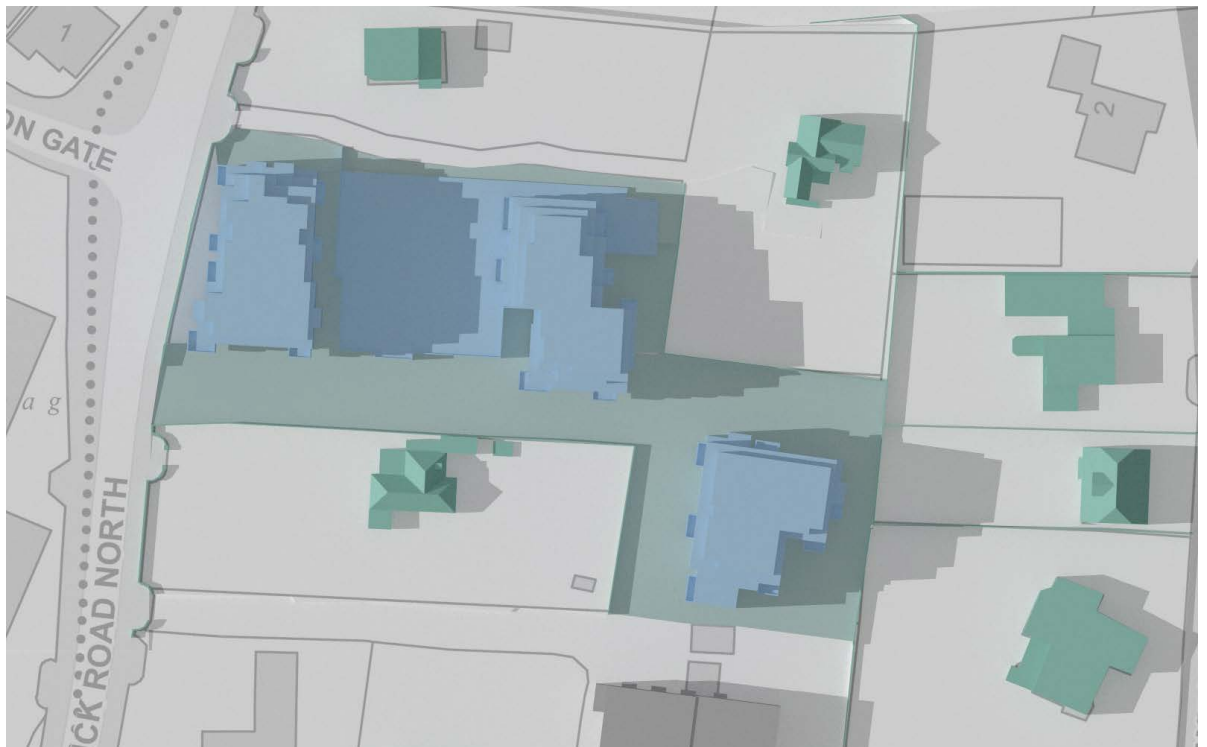


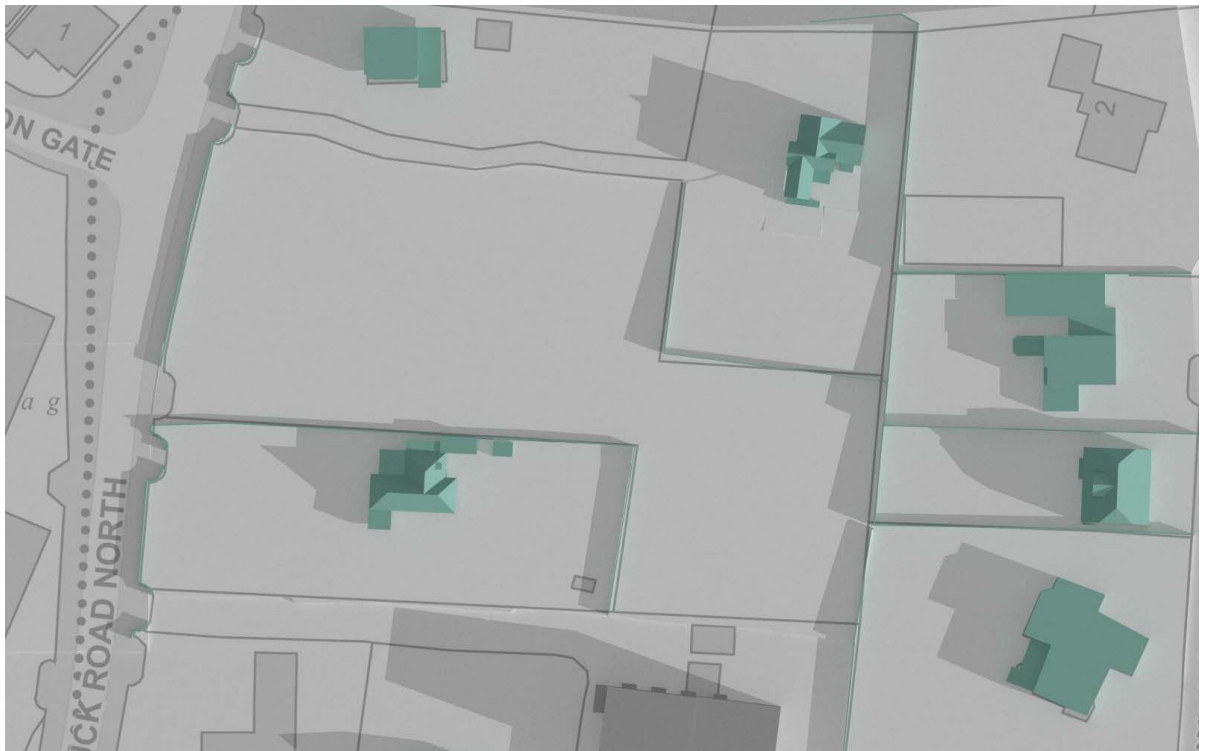
Figure 24: Shadow diagrams 21 June 18:00 GMT+1 (DST)



#### 9.4 Shadow Casting diagrams September Equinox



Existing



Proposed

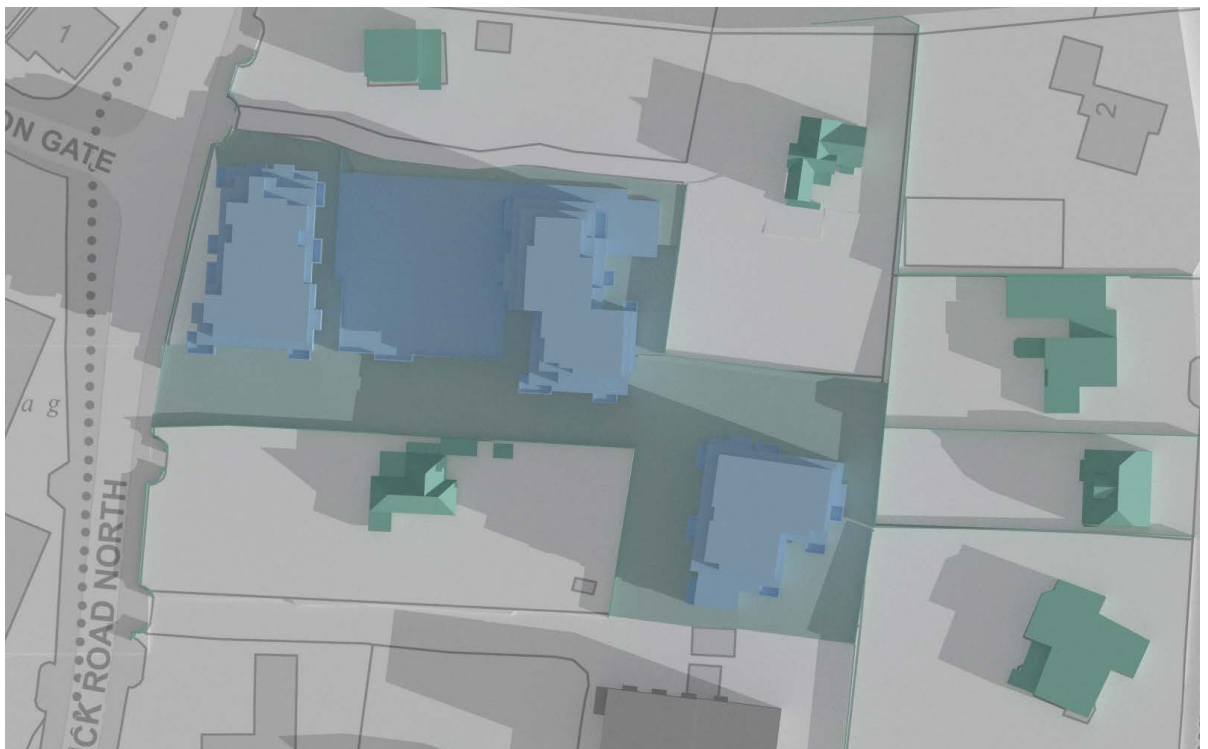


Figure 25: Shadow diagrams 21 September 09:00 GMT+1 (DST)

## Shadow Casting diagrams September Equinox



Existing



Proposed

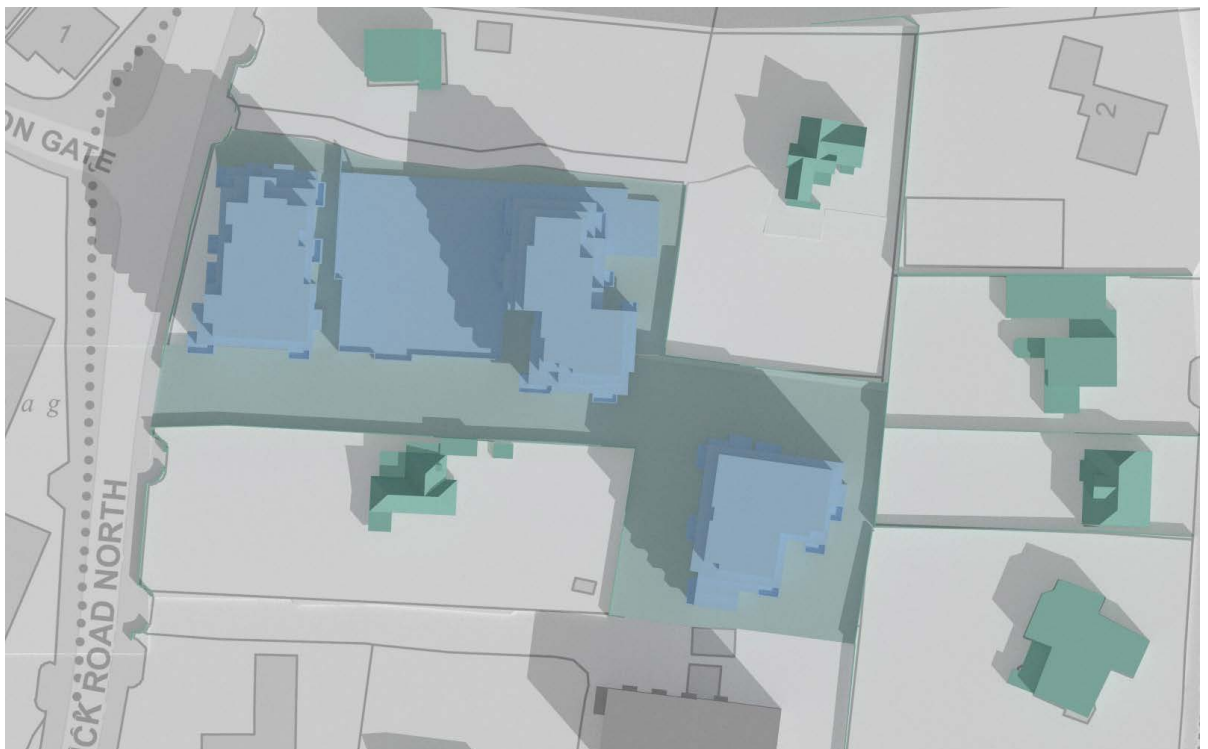


Figure 26: Shadow diagrams 21 September 11:00 GMT+1 (DST)

## Shadow Casting diagrams September Equinox



Existing



Proposed

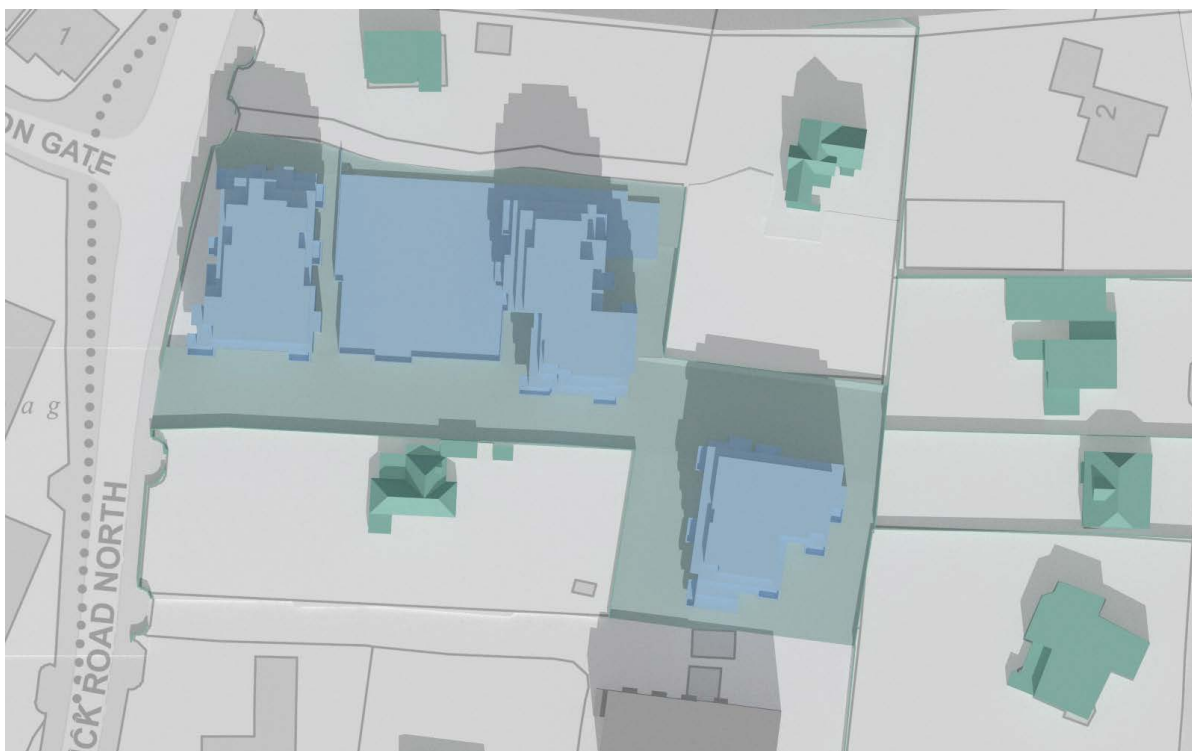


Figure 27: Shadow diagrams 21 September 13:00 GMT+1 (DST)

## Shadow Casting diagrams September Equinox



Existing



Proposed



Figure 28: Shadow diagrams 21 September 15:00 GMT+1 (DST)

## Shadow Casting diagrams September Equinox



Existing



Proposed

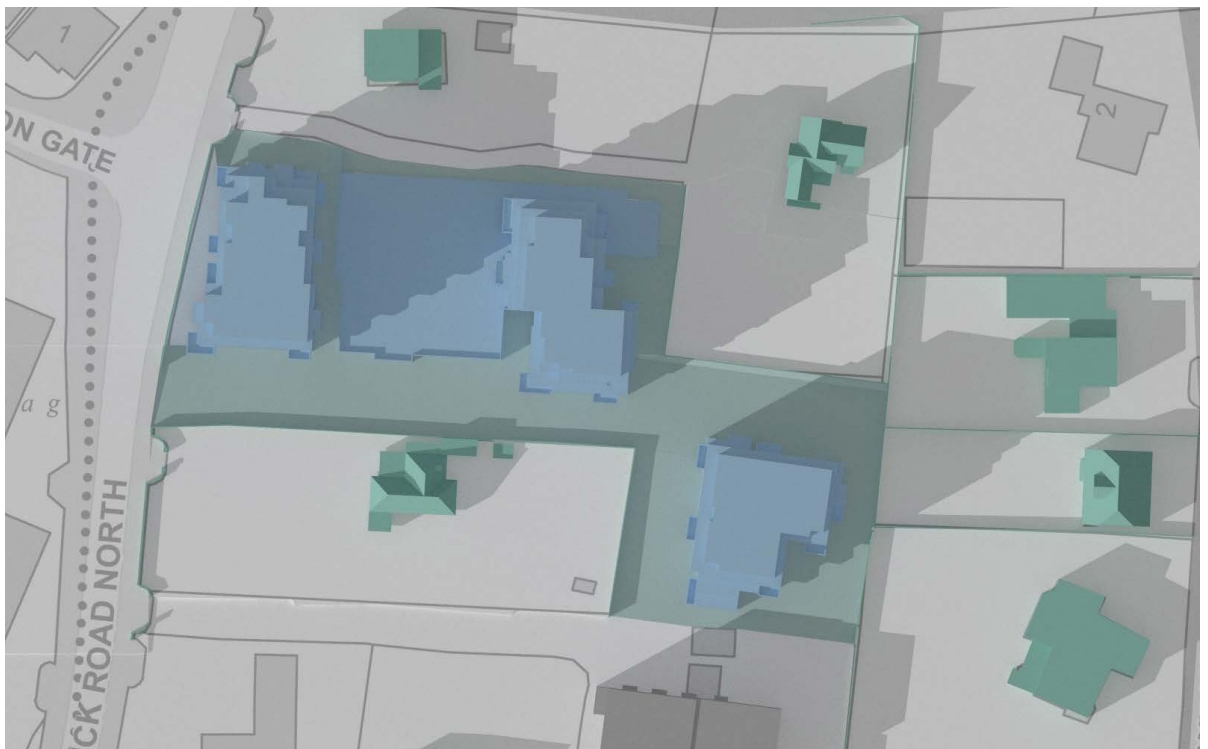


Figure 29: Shadow diagrams 21 September 17:00 GMT+1 (DST)



## 9.5 Shadow Casting diagrams December Solstice



Existing



Proposed

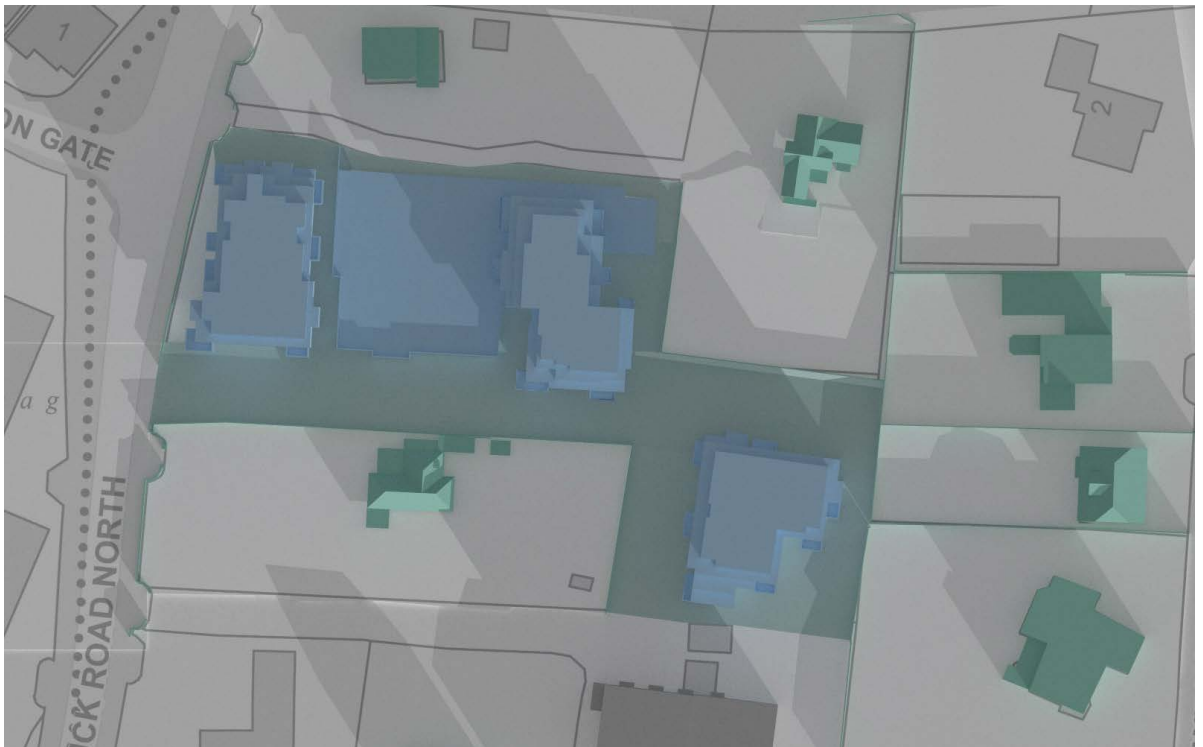
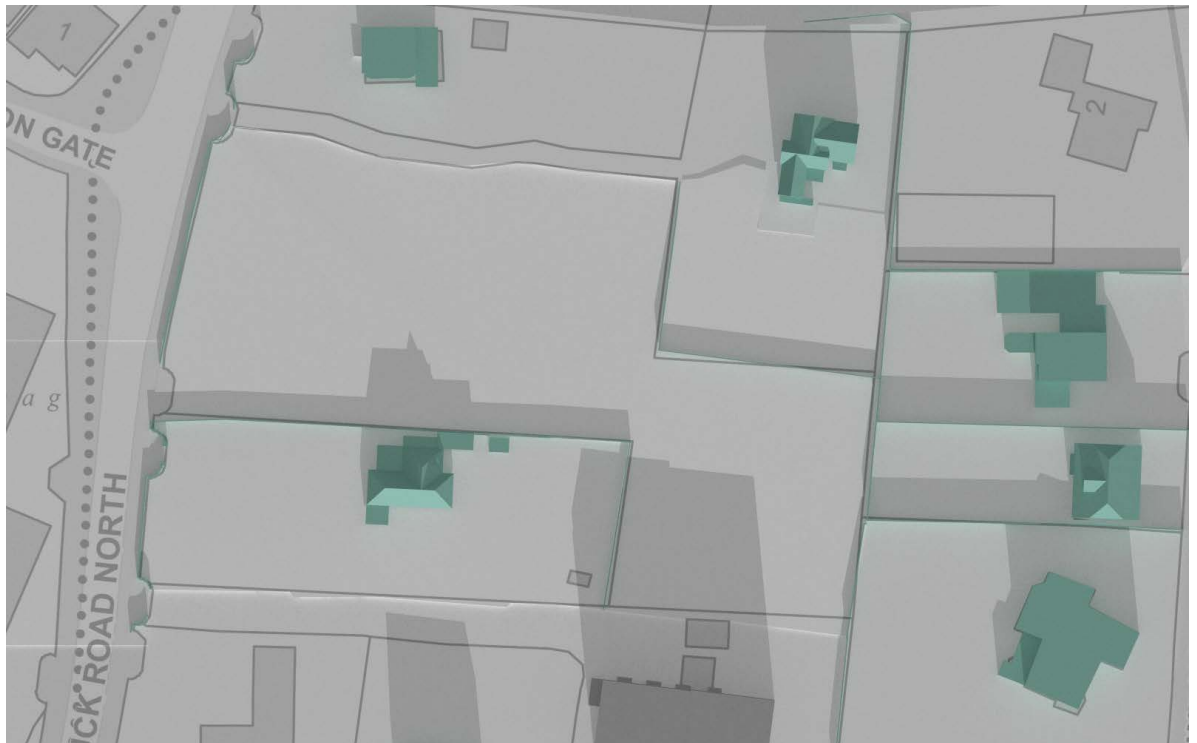


Figure 30: Shadow diagrams 21 December 10:00 GMT

## Shadow Casting diagrams December Solstice



Existing



Proposed

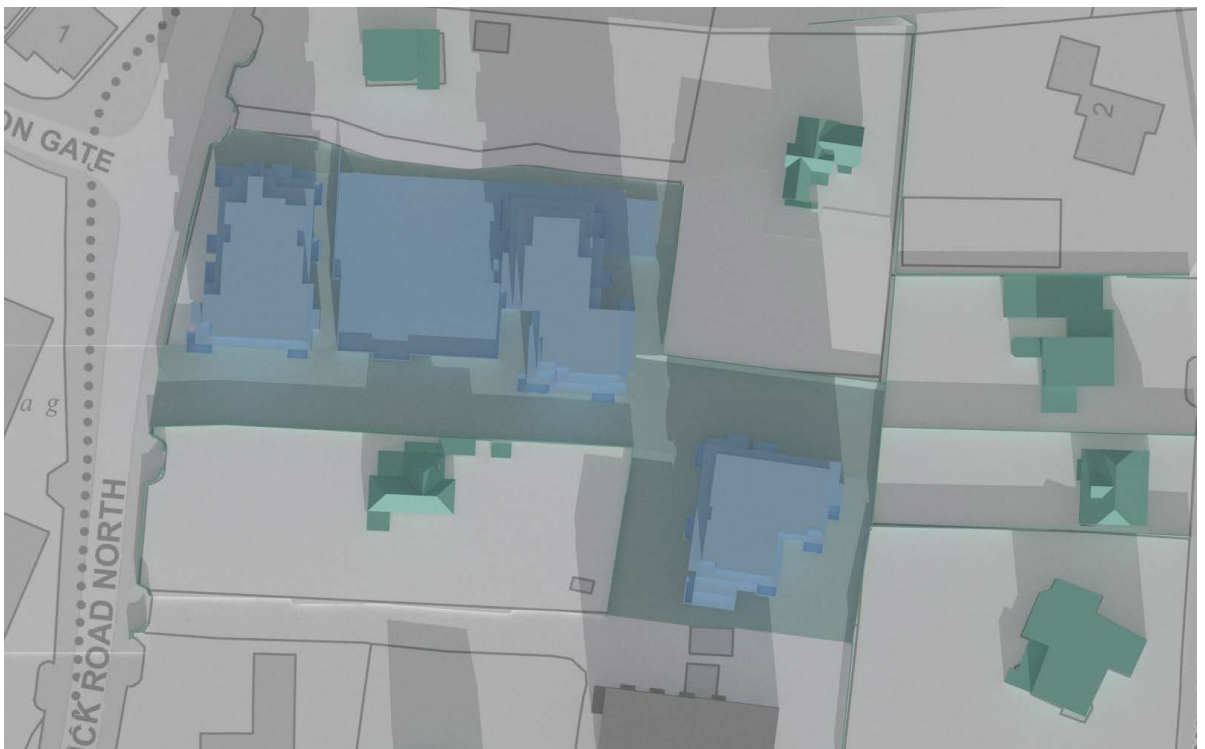


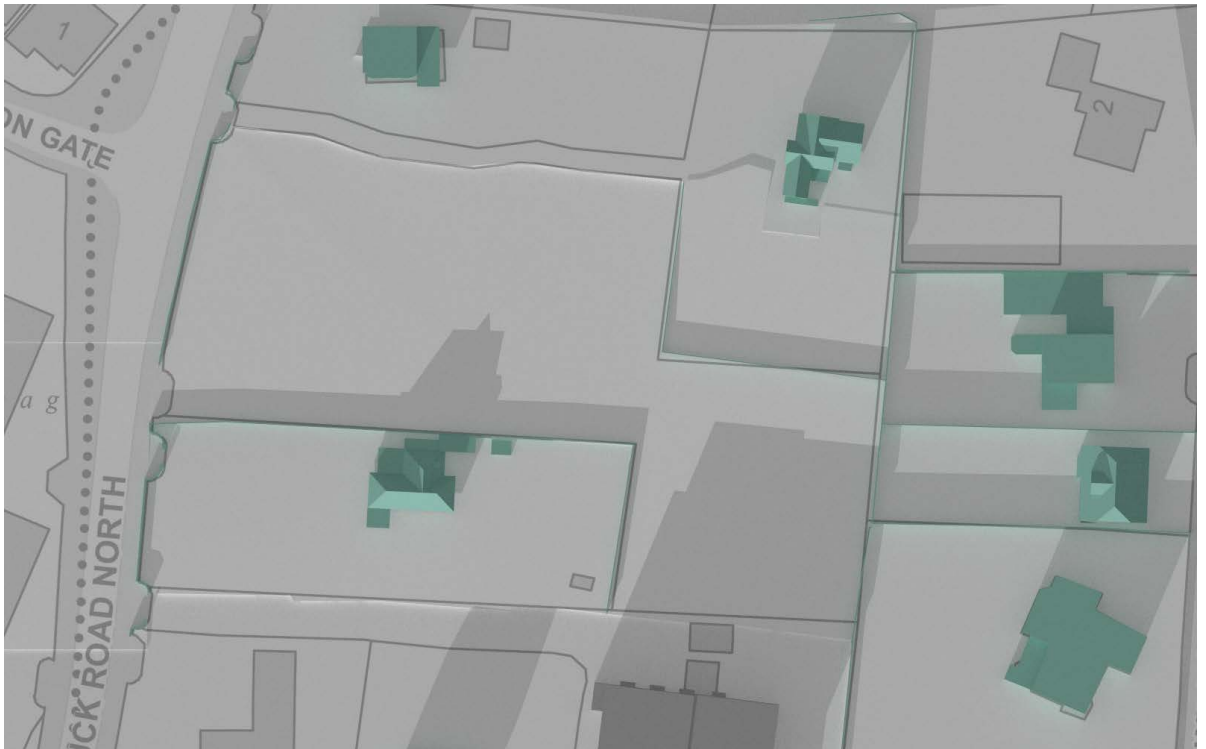
Figure 31: Shadow diagrams 21 December 12:00 GMT



## Shadow Casting diagrams December Solstice



Existing



Proposed

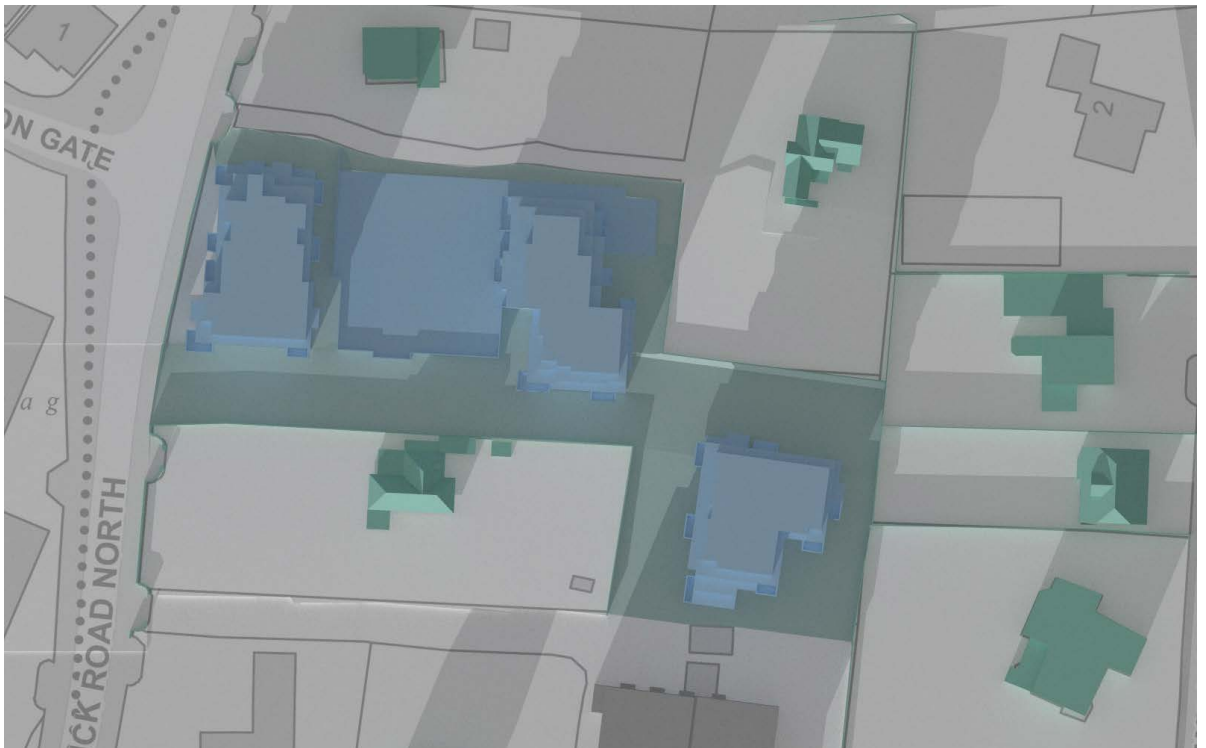


Figure 32: Shadow diagrams 21 December 14:00 GMT

## Appendix A - Average Daylight Factor Tables for Habitable Rooms



Figure 33: Block A - Ground to sixth floor false colour plans of ADF. Scale 0 - 5%

## Average Daylight Factor - Block A

Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
Ground Floor						
A 01.1	LKD	33.6	87	10.02%	2%	Y
A 01.2	Bed	11.7	35	6.44%	1%	Y
A 01.3	Bed	14.1	42	6.15%	1%	Y
A 02.1	LKD	32.6	80	9.50%	2%	Y
A 02.2	Bed	11.7	35	6.87%	1%	Y
A 02.3	Bed	14.1	42	6.15%	1%	Y
A 03.1	LKD	28.5	78	3.08%	2%	Y
A 03.2	Bed	14.7	35	5.09%	1%	Y
A 04.1	LKD	27.8	76	2.86%	2%	Y
A 04.2	Bed	14.7	35	4.34%	1%	Y
A 05.1	LKD	28.8	74	7.66%	2%	Y
A 05.2	Bed	11.7	35	5.78%	1%	Y
A 05.3	Bed	14.4	42	5.16%	1%	Y
A 06.1	LKD	31.8	80	6.71%	2%	Y
A 06.2	Bed	11.7	35	3.82%	1%	Y
A 06.3	Bed	14.4	42	4.13%	1%	Y
A 07.1	LKD	27.0	71	2.00%	2%	Y
A 07.2	Bed	13.2	31	3.48%	1%	Y
First Floor						
A 08.1	LKD	33.6	87	10.62%	2%	Y
A 08.2	Bed	11.7	35	6.62%	1%	Y
A 08.3	Bed	14.1	42	6.26%	1%	Y
A 09.1	LKD	32.6	80	9.34%	2%	Y
A 09.2	Bed	11.7	35	6.88%	1%	Y
A 09.3	Bed	14.1	42	6.19%	1%	Y
A 10.1	LKD	28.5	78	2.81%	2%	Y
A 10.2	Bed	14.7	35	5.64%	1%	Y
A 11.1	LKD	27.8	76	2.78%	2%	Y
A 11.2	Bed	14.7	35	4.14%	1%	Y
A 12.1	LKD	28.8	74	8.11%	2%	Y
A 12.2	Bed	11.7	35	6.73%	1%	Y
A 12.3	Bed	14.4	42	5.87%	1%	Y
A 13.1	LKD	31.8	80	7.22%	2%	Y
A 13.2	Bed	11.7	35	4.10%	1%	Y
A 13.3	Bed	14.4	42	4.96%	1%	Y
A 14.1	LKD	28.5	72	2.00%	2%	Y
A 14.2	Bed	11.7	35	3.92%	1%	Y
A 14.3	Bed	14.4	42	3.77%	1%	Y
Second Floor						
A 15.1	LKD	33.6	87	11.28%	2%	Y
A 15.2	Bed	11.7	35	6.65%	1%	Y
A 15.3	Bed	14.1	42	6.34%	1%	Y
A 16.1	LKD	32.6	80	9.60%	2%	Y
A 16.2	Bed	11.7	35	6.98%	1%	Y
A 16.3	Bed	14.1	42	6.39%	1%	Y
A 17.1	LKD	28.5	78	2.90%	2%	Y
A 17.2	Bed	14.7	35	5.80%	1%	Y
A 18.1	LKD	27.8	76	2.87%	2%	Y
A 18.2	Bed	14.7	35	4.25%	1%	Y

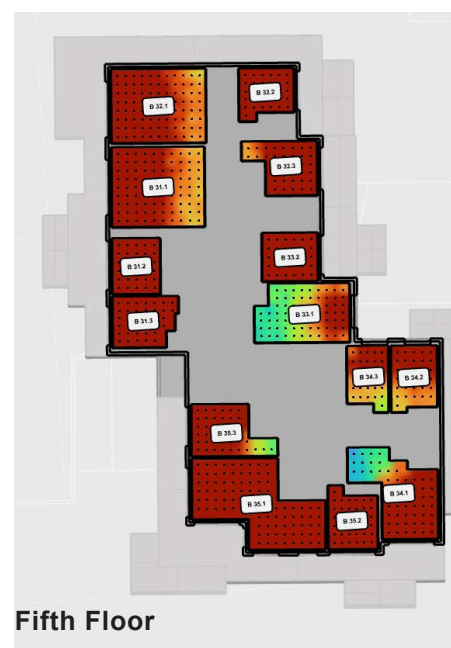
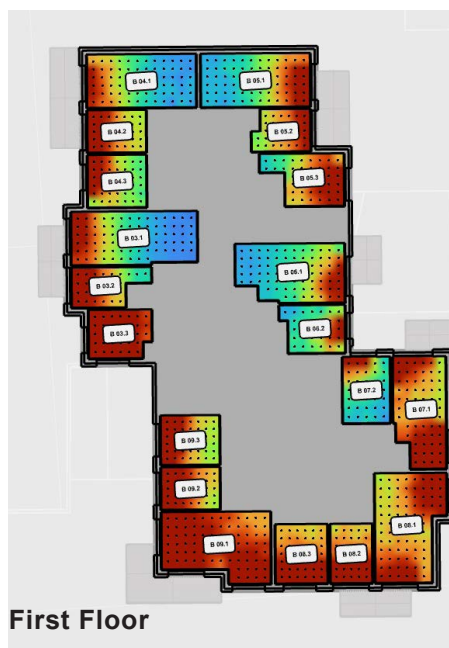
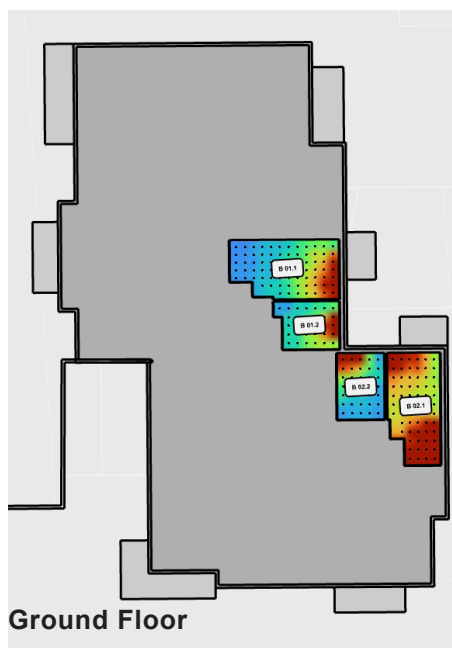
## Average Daylight Factor - Block A

Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
A 19.1	LKD	28.8	74	8.36%	2%	Y
A 19.2	Bed	11.7	35	6.98%	1%	Y
A 19.3	Bed	14.4	42	6.10%	1%	Y
A 20.1	LKD	31.8	80	7.55%	2%	Y
A 20.2	Bed	11.7	35	4.48%	1%	Y
A 20.3	Bed	14.4	42	5.45%	1%	Y
A 21.1	LKD	28.5	72	2.14%	2%	Y
A 21.2	Bed	11.7	35	4.37%	1%	Y
A 21.3	Bed	14.4	42	4.19%	1%	Y
Third Floor						
A 22.1	LKD	33.6	87	11.68%	2%	Y
A 22.2	Bed	11.7	35	6.88%	1%	Y
A 22.3	Bed	14.1	42	6.40%	1%	Y
A 23.1	LKD	32.6	80	9.90%	2%	Y
A 23.2	Bed	11.7	35	7.17%	1%	Y
A 23.3	Bed	14.1	42	6.48%	1%	Y
A 24.1	LKD	28.5	78	2.94%	2%	Y
A 24.2	Bed	14.7	35	5.84%	1%	Y
A 25.1	LKD	27.8	76	2.91%	2%	Y
A 25.2	Bed	14.7	35	4.37%	1%	Y
A 26.1	LKD	28.8	74	8.50%	2%	Y
A 26.2	Bed	11.7	35	6.37%	1%	Y
A 26.3	Bed	14.4	42	6.30%	1%	Y
A 27.1	LKD	31.8	80	7.67%	2%	Y
A 27.2	Bed	11.7	35	4.73%	1%	Y
A 27.3	Bed	14.4	42	5.57%	1%	Y
A 28.1	LKD	28.5	72	2.25%	2%	Y
A 28.2	Bed	11.7	35	4.59%	1%	Y
A 28.3	Bed	14.4	42	4.43%	1%	Y
Fourth Floor						
A 29.1	LKD	33.6	87	11.67%	2%	Y
A 29.2	Bed	11.7	35	6.86%	1%	Y
A 29.3	Bed	14.1	42	6.49%	1%	Y
A 30.1	LKD	32.6	80	9.80%	2%	Y
A 30.2	Bed	11.7	35	7.20%	1%	Y
A 30.3	Bed	14.1	42	6.48%	1%	Y
A 31.1	LKD	28.5	78	2.85%	2%	Y
A 31.2	Bed	14.7	35	6.28%	1%	Y
A 32.1	LKD	27.8	76	3.14%	2%	Y
A 32.2	Bed	14.7	35	4.47%	1%	Y
A 33.1	LKD	26.8	73	5.88%	2%	Y
A 33.2	Bed	12.7	30	7.03%	1%	Y
A 34.1	LKD	26.2	67	5.61%	2%	Y
A 34.2	Bed	8.2	21	12.29%	1%	Y
A 34.3	Bed	12.8	29	4.94%	1%	Y
A 35.1	LKD	28.5	72	2.47%	2%	Y
A 35.2	Bed	11.7	35	5.01%	1%	Y
A 35.3	Bed	14.4	42	4.56%	1%	Y

Average Daylight Factor - Block A						
Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
Fifth Floor						
A 36.1	LKD	33.6	87	14.59%	2%	Y
A 36.2	Bed	11.7	35	7.52%	1%	Y
A 36.3	Bed	14.1	42	6.47%	1%	Y
A 37.1	LKD	32.6	80	13.93%	2%	Y
A 37.2	Bed	11.7	35	7.38%	1%	Y
A 37.3	Bed	14.1	42	6.43%	1%	Y
A 38.1	LKD	30.6	78	4.30%	2%	Y
A 38.2	Bed	11.4	30	8.35%	1%	Y
A 38.3	Bed	14.7	35	7.49%	1%	Y
A 39.1	LKD	27.0	59	6.84%	2%	Y
A 39.2	Bed	14.0	37	6.53%	1%	Y
A 39.3	Bed	14.0	29	7.75%	1%	Y
A 40.1	LKD	26.8	64	9.25%	2%	Y
A 40.2	Bed	11.3	26	9.62%	1%	Y
A 41.1	LKD	28.5	72	4.34%	2%	Y
A 41.2	Bed	11.7	35	8.88%	1%	Y
A 41.3	Bed	14.4	42	4.82%	1%	Y
Sixth Floor						
A 42.1	LKD	52.6	136	10.99%	2%	Y
A 42.2	Bed	11.0	30	8.51%	1%	Y
A 42.3	Bed	11.7	30	11.27%	1%	Y
A 42.4	Bed	14.8	42	18.09%	1%	Y
A 43.1	LKD	45.3	117	9.64%	2%	Y
A 43.2	Bed	11.7	35	9.34%	1%	Y
A 43.3	Bed	12.7	35	8.88%	1%	Y
A 43.4	Bed	15.0	42	7.49%	1%	Y
A 44.1	LKD	42.9	118	9.63%	2%	Y
A 44.2	Bed	8.1	25	11.19%	1%	Y
A 44.3	Bed	13.0	35	9.15%	1%	Y
A 44.4	Bed	15.7	44	7.37%	1%	Y

**Table 13: Block A - Average Daylight Factor of all habitable rooms**





**Figure 34: Block B - Ground to sixth floor false colour plans of ADF. Scale 0 - 5%**

## Average Daylight Factor - Block B

Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
Ground Floor						
B 01.1	LKD	27.8	76	2.15%	2%	Y
B 01.2	Bed	13.4	31	2.49%	1%	Y
B 02.1	LKD	25.3	64	4.74%	2%	Y
B 02.2	Bed	14.7	35	1.96%	1%	Y
First Floor						
B 03.1	LKD	30.4	79	2.37%	2%	Y
B 03.2	Bed	12.1	27	4.95%	1%	Y
B 03.3	Bed	13.6	33	8.17%	1%	Y
B 04.1	LKD	26.9	72	2.16%	2%	Y
B 04.2	Bed	11.7	35	4.42%	1%	Y
B 04.3	Bed	14.4	42	3.99%	1%	Y
B 05.1	LKD	27.0	72	2.77%	2%	Y
B 05.2	Bed	10.8	32	3.89%	1%	Y
B 05.3	Bed	16.6	42	5.20%	1%	Y
B 06.1	LKD	27.8	76	2.40%	2%	Y
B 06.2	Bed	13.4	31	2.77%	1%	Y
B 07.1	LKD	25.3	64	5.31%	2%	Y
B 07.2	Bed	14.7	35	2.22%	1%	Y
B 08.1	LKD	31.8	80	4.87%	2%	Y
B 08.2	Bed	11.7	35	5.13%	1%	Y
B 08.3	Bed	14.4	42	5.91%	1%	Y
B 09.1	LKD	31.8	80	6.66%	2%	Y
B 09.2	Bed	11.7	35	6.10%	1%	Y
B 09.3	Bed	13.6	42	5.15%	1%	Y
Second Floor						
B 10.1	LKD	30.4	79	2.53%	2%	Y
B 10.2	Bed	12.1	27	5.19%	1%	Y
B 10.3	Bed	13.6	33	8.71%	1%	Y
B 11.1	LKD	26.9	72	2.33%	2%	Y
B 11.2	Bed	11.7	35	4.70%	1%	Y
B 11.3	Bed	14.4	42	4.13%	1%	Y
B 12.1	LKD	27.0	72	2.85%	2%	Y
B 12.2	Bed	10.8	32	3.97%	1%	Y
B 12.3	Bed	16.6	42	5.27%	1%	Y
B 13.1	LKD	27.8	76	2.61%	2%	Y
B 13.2	Bed	13.4	31	2.90%	1%	Y
B 14.1	LKD	25.3	64	5.64%	2%	Y
B 14.2	Bed	14.7	35	2.40%	1%	Y
B 15.1	LKD	31.8	80	5.10%	2%	Y
B 15.2	Bed	11.7	35	5.34%	1%	Y
B 15.3	Bed	14.4	42	6.02%	1%	Y
B 16.1	LKD	31.8	80	6.93%	2%	Y
B 16.2	Bed	11.7	35	6.44%	1%	Y
B 16.3	Bed	13.6	42	5.74%	1%	Y

## Average Daylight Factor - Block B

Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
Third Floor						
B 17.1	LKD	30.4	79	2.64%	2%	Y
B 17.2	Bed	12.1	27	5.40%	1%	Y
B 17.3	Bed	13.6	33	9.35%	1%	Y
B 18.1	LKD	26.9	72	2.45%	2%	Y
B 18.2	Bed	11.7	35	5.05%	1%	Y
B 18.3	Bed	14.4	42	4.39%	1%	Y
B 19.1	LKD	27.0	72	2.88%	2%	Y
B 19.2	Bed	10.8	32	4.13%	1%	Y
B 19.3	Bed	16.6	42	5.33%	1%	Y
B 20.1	LKD	27.8	76	2.76%	2%	Y
B 20.2	Bed	13.4	31	3.16%	1%	Y
B 21.1	LKD	25.3	64	5.98%	2%	Y
B 21.2	Bed	14.7	35	2.59%	1%	Y
B 22.1	LKD	31.8	80	5.25%	2%	Y
B 22.2	Bed	11.7	35	5.46%	1%	Y
B 22.3	Bed	14.4	42	6.14%	1%	Y
B 23.1	LKD	31.8	80	7.20%	2%	Y
B 23.2	Bed	11.7	35	6.87%	1%	Y
B 23.3	Bed	13.6	42	6.08%	1%	Y
Fourth Floor						
B 24.1	LKD	30.4	79	2.81%	2%	Y
B 24.2	Bed	12.1	27	5.68%	1%	Y
B 24.3	Bed	13.6	33	9.89%	1%	Y
B 25.1	LKD	26.9	72	2.55%	2%	Y
B 25.2	Bed	11.7	35	5.41%	1%	Y
B 25.3	Bed	14.4	42	4.58%	1%	Y
B 26.1	LKD	27.0	72	2.97%	2%	Y
B 26.2	Bed	10.8	32	4.17%	1%	Y
B 26.3	Bed	16.6	42	5.45%	1%	Y
B 27.1	LKD	27.8	76	3.05%	2%	Y
B 27.2	Bed	13.4	31	3.88%	1%	Y
B 28.1	LKD	25.3	64	6.24%	2%	Y
B 28.2	Bed	14.7	35	3.26%	1%	Y
B 29.1	LKD	31.8	80	5.38%	2%	Y
B 29.2	Bed	11.7	35	5.59%	1%	Y
B 29.3	Bed	14.4	42	6.29%	1%	Y
B 30.1	LKD	31.8	80	7.40%	2%	Y
B 30.2	Bed	11.7	35	6.94%	1%	Y
B 30.3	Bed	13.6	42	6.32%	1%	Y
Fifth Floor						
B 31.1	LKD	34.0	90	7.43%	2%	Y
B 31.2	Bed	12.5	30	14.80%	1%	Y
B 31.3	Bed	14.4	36	10.10%	1%	Y
B 32.1	LKD	32.1	88	8.03%	2%	Y
B 32.2	Bed	12.0	31	11.81%	1%	Y
B 32.3	Bed	15.1	36	10.67%	1%	Y
B 33.1	LKD	24.4	71	3.88%	2%	Y
B 33.2	Bed	12.5	30	10.47%	1%	Y
B 34.1	LKD	25.1	56	7.98%	2%	Y

Average Daylight Factor - Block B						
Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
B 34.2	Bed	13.5	31	6.22%	1%	Y
B 34.3	Bed	11.8	31	5.49%	1%	Y
B 35.1	LKD	38.9	92	14.52%	2%	Y
B 35.2	Bed	13.1	37	12.86%	1%	Y
B 35.3	Bed	16.2	41	9.12%	1%	Y
Sixth Floor						
B 36.1	LKD	32.4	85	12.06%	2%	Y
B 36.2	Bed	16.1	38	11.33%	1%	Y
B 36.3	Bed	16.5	40	10.37%	1%	Y
B 37.1	LKD	44.9	117	13.67%	2%	Y
B 37.2	Bed	17.0	44	10.05%	1%	Y
B 37.3	Bed	10.2	26	9.95%	1%	Y
B 37.4	Bed	8.8	24	11.46%	1%	Y
B 38.1	LKD	27.7	77	11.82%	2%	Y
B 38.2	Bed	15.1	41	9.93%	1%	Y
B 38.3	Bed	13.5	30	11.12%	1%	Y

**Table 14: Block B - Average Daylight Factor of all habitable rooms**

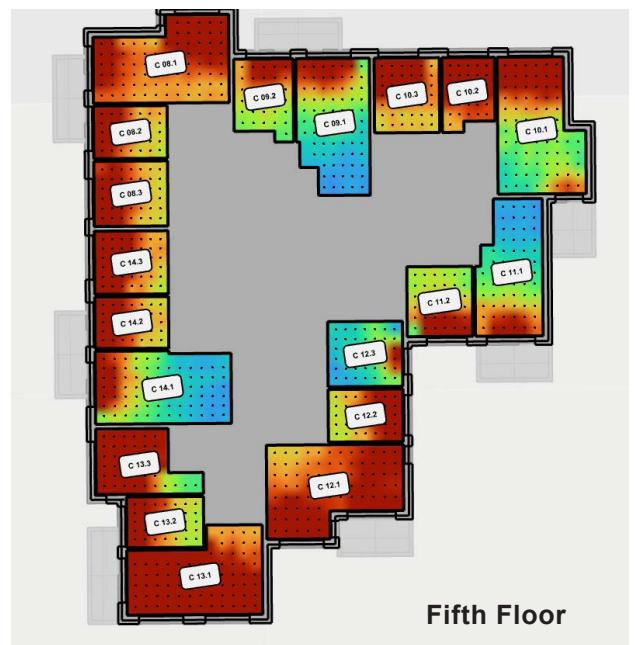
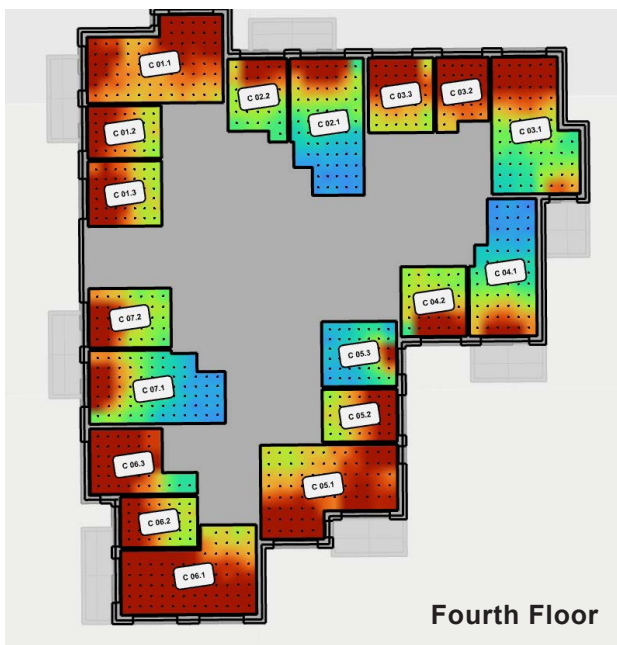
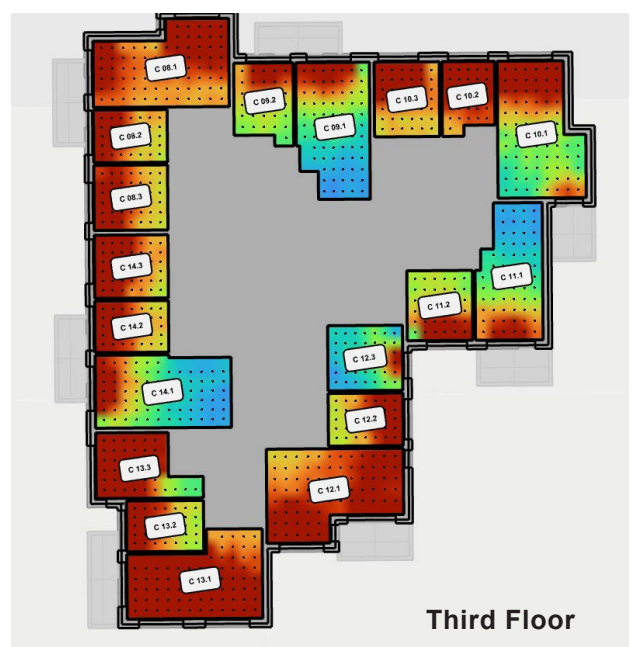
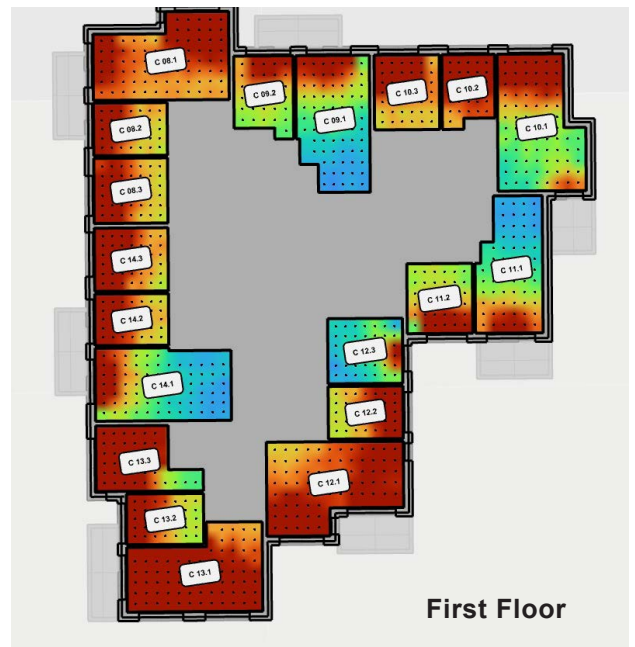
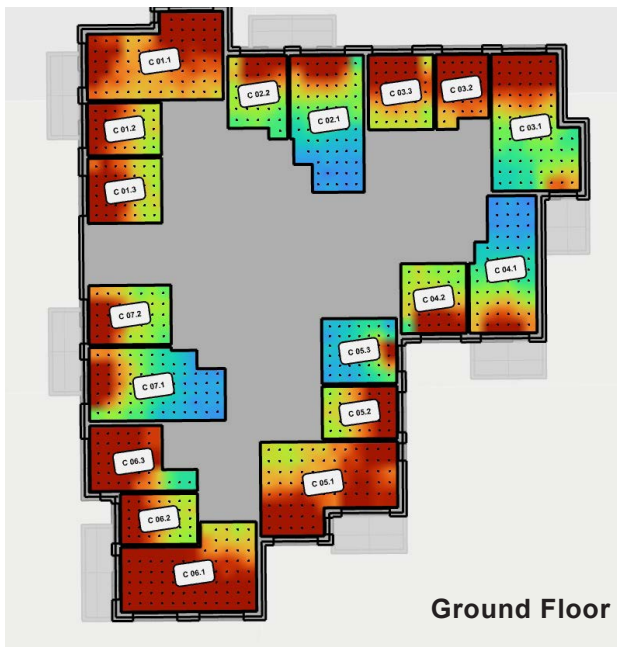


Figure 35: Block C - Ground to sixth floor false colour plans of ADF. Scale 0 - 5%



Average Daylight Factor - Block C						
Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
Ground Floor						
C 01.1	LKD	31.1	82	5.43%	2%	Y
C 01.2	Bed	11.7	35	4.46%	1%	Y
C 01.3	Bed	14.4	42	5.36%	1%	Y
C 02.1	LKD	28.1	76	2.41%	2%	Y
C 02.2	Bed	13.6	31	3.48%	1%	Y
C 03.1	LKD	31.3	82	3.99%	2%	Y
C 03.2	Bed	10.9	31	7.18%	1%	Y
C 03.3	Bed	14.7	42	5.51%	1%	Y
C 04.1	LKD	24.9	62	2.20%	2%	Y
C 04.2	Bed	13.8	36	3.98%	1%	Y
C 05.1	LKD	32.4	75	5.17%	2%	Y
C 05.2	Bed	11.9	35	5.14%	1%	Y
C 05.3	Bed	14.7	42	1.85%	1%	Y
C 06.1	LKD	30.4	73	7.59%	2%	Y
C 06.2	Bed	11.8	35	4.53%	1%	Y
C 06.3	Bed	16.6	40	7.88%	1%	Y
C 07.1	LKD	27.8	76	2.45%	2%	Y
C 07.2	Bed	14.7	35	3.92%	1%	Y
First Floor						
C 08.1	LKD	31.1	82	5.69%	2%	Y
C 08.2	Bed	11.7	35	4.76%	1%	Y
C 08.3	Bed	14.4	42	5.56%	1%	Y
C 09.1	LKD	28.1	76	2.50%	2%	Y
C 09.2	Bed	13.6	31	3.66%	1%	Y
C 10.1	LKD	31.3	82	4.05%	2%	Y
C 10.2	Bed	10.9	31	7.37%	1%	Y
C 10.3	Bed	14.7	42	5.71%	1%	Y
C 11.1	LKD	24.9	62	2.39%	2%	Y
C 11.2	Bed	13.8	36	4.21%	1%	Y
C 12.1	LKD	32.4	75	5.61%	2%	Y
C 12.2	Bed	11.9	35	5.29%	1%	Y
C 12.3	Bed	14.7	42	2.02%	1%	Y
C 13.1	LKD	30.4	73	8.39%	2%	Y
C 13.2	Bed	11.8	35	4.70%	1%	Y
C 13.3	Bed	16.6	40	8.25%	1%	Y
C 14.1	LKD	29.1	78	2.49%	2%	Y
C 14.2	Bed	11.5	35	4.92%	1%	Y
C 14.3	Bed	14.0	42	6.13%	1%	Y
Second Floor						
C 15.1	LKD	31.1	82	5.88%	2%	Y
C 15.2	Bed	11.7	35	4.94%	1%	Y
C 15.3	Bed	14.4	42	5.81%	1%	Y
C 16.1	LKD	28.1	76	2.61%	2%	Y
C 16.2	Bed	13.6	31	3.73%	1%	Y
C 17.1	LKD	31.3	82	4.16%	2%	Y
C 17.2	Bed	10.9	31	7.47%	1%	Y
C 17.3	Bed	14.7	42	5.89%	1%	Y
C 18.1	LKD	24.9	62	2.48%	2%	Y
C 18.2	Bed	13.8	36	4.48%	1%	Y

Average Daylight Factor - Block C						
Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
C 19.1	LKD	32.4	75	6.01%	2%	Y
C 19.2	Bed	11.9	35	5.64%	1%	Y
C 19.3	Bed	14.7	42	2.04%	1%	Y
C 20.1	LKD	30.4	73	10.56%	2%	Y
C 20.2	Bed	11.8	35	7.00%	1%	Y
C 20.3	Bed	16.6	40	8.66%	1%	Y
C 21.1	LKD	29.1	78	2.58%	2%	Y
C 21.2	Bed	11.5	35	5.16%	1%	Y
C 21.3	Bed	14.0	42	6.37%	1%	Y
Third Floor						
C 22.1	LKD	31.1	82	6.13%	2%	Y
C 22.2	Bed	11.7	35	5.10%	1%	Y
C 22.3	Bed	14.4	42	6.01%	1%	Y
C 23.1	LKD	28.1	76	2.67%	2%	Y
C 23.2	Bed	13.6	31	3.95%	1%	Y
C 24.1	LKD	31.3	82	5.27%	2%	Y
C 24.2	Bed	10.9	31	7.52%	1%	Y
C 24.3	Bed	14.7	42	5.95%	1%	Y
C 25.1	LKD	24.9	62	2.56%	2%	Y
C 25.2	Bed	13.8	36	4.74%	1%	Y
C 26.1	LKD	32.4	75	6.44%	2%	Y
C 26.2	Bed	11.9	35	6.16%	1%	Y
C 26.3	Bed	14.7	42	2.53%	1%	Y
C 27.1	LKD	34.6	85	10.76%	2%	Y
C 27.2	Bed	11.0	32	11.53%	1%	Y
C 28.1	LKD	29.1	78	2.67%	2%	Y
C 28.2	Bed	11.5	35	5.23%	1%	Y
C 28.3	Bed	14.0	42	6.66%	1%	Y
Fourth Floor						
C 29.1	LKD	34.7	90	9.89%	2%	Y
C 29.2	Bed	10.6	31	7.68%	1%	Y
C 29.3	Bed	12.6	36	7.42%	1%	Y
C 30.1	LKD	26.9	66	4.79%	2%	Y
C 30.2	Bed	11.7	31	9.08%	1%	Y
C 30.3	Bed	14.0	31	6.54%	1%	Y
C 31.1	LKD	34.1	84	6.93%	2%	Y
C 31.2	Bed	11.2	27	7.84%	1%	Y
C 31.3	Bed	16.0	36	5.92%	1%	Y
C 31.4	Bed	9.8	26	8.46%	1%	Y
C 32.1	LKD	28.2	69	5.03%	2%	Y
C 32.2	Bed	17.2	44	9.49%	1%	Y
C 32.3	Bed	12.0	33	4.57%	1%	Y
C 33.1	LKD	34.6	87	8.57%	2%	Y
C 33.2	Bed	9.4	25	5.71%	1%	Y
C 33.3	Bed	12.9	33	10.42%	1%	Y
C 33.4	Bed	15.3	34	7.67%	1%	Y

Average Daylight Factor - Block C						
Space ID	Description	Area m2	Sensor Count	ADF	Minimum Recommended ADF	Meets Criteria
Fifth Floor						
C 34.1	LKD	29.6	74	9.26%	2%	Y
C 34.2	Bed	12.6	31	10.81%	1%	Y
C 34.3	Bed	15.6	40	11.88%	1%	Y
C 35.1	LKD	43.6	114	7.49%	2%	Y
C 35.2	Bed	12.2	35	12.65%	1%	Y
C 35.3	Bed	10.9	26	11.62%	1%	Y
C 35.4	Bed	16.2	38	8.87%	1%	Y
C 36.1	LKD	39.5	101	13.50%	2%	Y
C 36.2	Bed	12.3	33	11.56%	1%	Y
C 36.3	Bed	11.5	36	13.31%	1%	Y
C 36.4	Bed	8.6	24	5.69%	1%	Y

**Table 15: Block C - Average Daylight Factor of all habitable rooms**

## Appendix B - EN17037:2018 Daylight Provision Room Compliance Complete Results

Minimum Illuminance			Target Illuminance		
High	500 lux	95%	High	750 lux	50%
Medium	300 lux	95%	Medium	500 lux	50%
Minimum	100 lux	95%	Minimum	300 lux	50%

### EN 17037:2018 Compliance threshold levels.



**Figure 36: Block A - Daylight Provision to habitable rooms on all floors.**

# Block A - EN17037:2018 Daylight Provision Room Compliance

Space ID	Description	Area [m²]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A 01.1	LKD	33.6	87	High	86.8%	82.3%	75.2%	High	91.3%	82.1%	73.4%
A 01.2	Bed	11.7	35	High	83.7%	76.2%	68.5%	High	89.7%	78.3%	68.3%
A 01.3	Bed	14.1	42	High	83.2%	75.2%	67.2%	High	89.8%	78.5%	68.8%
A 02.1	LKD	32.6	80	High	87.1%	82.1%	75.8%	High	93.3%	84.3%	77.4%
A 02.2	Bed	11.7	35	High	83.4%	75.7%	67.8%	High	90.0%	78.9%	69.1%
A 02.3	Bed	14.1	42	High	82.7%	74.6%	66.3%	High	89.5%	77.9%	67.9%
A 03.1	LKD	28.5	78	Medium	70.1%	52.8%	32.1%	Minimum	79.6%	48.5%	21.7%
A 03.2	Bed	14.7	35	High	77.5%	65.7%	50.1%	High	87.4%	71.3%	54.3%
A 04.1	LKD	27.8	76	Minimum	64.8%	45.0%	24.7%	Minimum	75.9%	35.1%	16.4%
A 04.2	Bed	14.7	35	High	77.2%	65.1%	50.3%	High	87.4%	71.4%	55.5%
A 05.1	LKD	28.8	74	High	85.0%	77.3%	68.5%	High	90.2%	78.2%	67.6%
A 05.2	Bed	11.7	35	High	79.8%	69.7%	56.8%	High	87.9%	72.8%	57.3%
A 05.3	Bed	14.4	42	High	79.3%	69.0%	55.3%	High	87.7%	72.4%	56.4%
A 06.1	LKD	31.8	80	High	83.4%	74.2%	62.9%	High	89.0%	75.0%	60.7%
A 06.2	Bed	11.7	35	Medium	72.6%	59.4%	41.2%	Medium	83.7%	60.0%	38.0%
A 06.3	Bed	14.4	42	Medium	70.2%	53.9%	33.3%	Medium	81.1%	52.1%	26.1%
A 07.1	LKD	27.0	71	Minimum	51.2%	22.9%	12.4%	Minimum	51.3%	9.2%	2.4%
A 07.2	Bed	13.2	31	Medium	70.6%	56.4%	36.2%	Medium	81.7%	55.8%	31.5%
A 08.1	LKD	33.6	87	High	87.2%	82.8%	76.2%	High	92.8%	84.0%	76.0%
A 08.2	Bed	11.7	35	High	83.7%	76.3%	68.5%	High	89.7%	78.2%	68.3%
A 08.3	Bed	14.1	42	High	83.5%	75.8%	67.9%	High	89.5%	77.7%	67.7%
A 09.1	LKD	32.6	80	High	86.7%	81.3%	75.0%	High	93.8%	85.0%	78.1%
A 09.2	Bed	11.7	35	High	84.1%	77.1%	69.4%	High	90.0%	79.3%	69.5%
A 09.3	Bed	14.1	42	High	82.7%	74.7%	66.2%	High	89.5%	77.9%	67.9%
A 10.1	LKD	28.5	78	Medium	68.1%	50.1%	31.2%	Minimum	79.4%	48.4%	24.2%
A 10.2	Bed	14.7	35	High	79.3%	69.0%	55.2%	High	87.9%	72.8%	57.1%
A 11.1	LKD	27.8	76	Minimum	63.8%	44.3%	25.3%	Minimum	75.8%	38.4%	16.5%
A 11.2	Bed	14.7	35	Medium	76.6%	64.2%	49.1%	High	87.0%	70.3%	54.8%
A 12.1	LKD	28.8	74	High	86.0%	78.7%	71.4%	High	91.8%	81.5%	72.4%
A 12.2	Bed	11.7	35	High	82.8%	74.7%	63.7%	High	90.0%	78.1%	67.0%
A 12.3	Bed	14.4	42	High	80.8%	71.6%	59.9%	High	89.3%	76.7%	64.2%
A 13.1	LKD	31.8	80	High	84.8%	76.5%	67.7%	High	90.3%	78.2%	67.1%
A 13.2	Bed	11.7	35	High	76.5%	65.7%	53.0%	High	85.7%	67.1%	50.6%
A 13.3	Bed	14.4	42	High	75.8%	65.3%	52.0%	High	86.2%	68.7%	52.2%
A 14.1	LKD	28.5	72	Minimum	51.6%	26.7%	9.8%	Minimum	63.8%	15.3%	1.1%
A 14.2	Bed	11.7	35	High	75.5%	64.7%	51.0%	Medium	84.7%	65.3%	49.6%
A 14.3	Bed	14.4	42	Medium	72.2%	58.1%	41.5%	Medium	83.3%	59.2%	38.8%
A 15.1	LKD	33.6	87	High	88.0%	83.7%	77.6%	High	93.5%	85.1%	78.1%
A 15.2	Bed	11.7	35	High	83.5%	76.1%	68.2%	High	90.0%	79.5%	69.6%
A 15.3	Bed	14.1	42	High	83.3%	75.6%	67.6%	High	89.5%	77.9%	67.9%
A 16.1	LKD	32.6	80	High	86.7%	81.4%	75.2%	High	93.7%	84.9%	78.1%
A 16.2	Bed	11.7	35	High	83.9%	76.7%	69.2%	High	90.2%	79.7%	70.1%
A 16.3	Bed	14.1	42	High	83.0%	75.1%	67.1%	High	89.9%	78.6%	69.1%
A 17.1	LKD	28.5	78	Medium	69.8%	52.6%	34.8%	Minimum	78.9%	48.2%	23.0%
A 17.2	Bed	14.7	35	High	80.7%	71.1%	57.8%	High	88.5%	74.7%	60.8%
A 18.1	LKD	27.8	76	Minimum	64.4%	45.7%	26.5%	Minimum	76.7%	42.5%	17.7%
A 18.2	Bed	14.7	35	Medium	76.2%	63.5%	48.4%	High	87.0%	70.5%	54.7%
A 19.1	LKD	28.8	74	High	86.1%	79.2%	72.2%	High	92.2%	82.2%	73.1%
A 19.2	Bed	11.7	35	High	83.6%	75.8%	65.6%	High	89.9%	77.8%	66.6%



# Block A - EN17037:2018 Daylight Provision Room Compliance

Space ID	Description	Area [m²]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A 19.3	Bed	14.4	42	High	81.6%	73.0%	62.0%	High	89.5%	77.1%	65.1%
A 20.1	LKD	31.8	80	High	85.3%	77.7%	69.3%	High	90.8%	79.5%	69.4%
A 20.2	Bed	11.7	35	High	77.8%	67.6%	56.1%	High	86.4%	70.3%	56.3%
A 20.3	Bed	14.4	42	High	79.0%	69.3%	57.6%	High	86.8%	71.6%	58.2%
A 21.1	LKD	28.5	72	Minimum	55.8%	33.3%	13.8%	Minimum	67.4%	19.4%	3.2%
A 21.2	Bed	11.7	35	High	77.5%	67.8%	56.8%	High	85.9%	68.9%	53.4%
A 21.3	Bed	14.4	42	Medium	74.7%	62.2%	46.7%	Medium	85.0%	64.5%	45.3%
A 22.1	LKD	33.6	87	High	88.4%	84.3%	78.4%	High	93.9%	85.7%	79.1%
A 22.2	Bed	11.7	35	High	83.9%	76.6%	68.9%	High	90.0%	79.1%	69.3%
A 22.3	Bed	14.1	42	High	83.6%	76.1%	68.2%	High	89.8%	78.6%	68.9%
A 23.1	LKD	32.6	80	High	87.0%	81.9%	75.5%	High	93.8%	85.1%	78.4%
A 23.2	Bed	11.7	35	High	84.0%	76.8%	69.2%	High	90.3%	79.8%	70.3%
A 23.3	Bed	14.1	42	High	83.5%	76.1%	67.9%	High	89.9%	78.8%	69.1%
A 24.1	LKD	28.5	78	Medium	67.9%	50.5%	31.8%	Minimum	79.3%	48.8%	24.5%
A 24.2	Bed	14.7	35	High	80.2%	70.2%	56.6%	High	88.0%	73.7%	58.7%
A 25.1	LKD	27.8	76	Minimum	66.8%	49.2%	30.1%	Minimum	76.4%	42.7%	18.5%
A 25.2	Bed	14.7	35	High	77.0%	65.1%	50.7%	High	86.6%	69.7%	53.4%
A 26.1	LKD	28.8	74	High	86.2%	79.6%	72.5%	High	91.8%	81.8%	72.6%
A 26.2	Bed	11.7	35	High	83.1%	75.1%	64.7%	High	89.7%	77.7%	66.0%
A 26.3	Bed	14.4	42	High	81.6%	73.2%	62.2%	High	89.6%	77.2%	65.4%
A 27.1	LKD	31.8	80	High	85.8%	78.5%	70.5%	High	91.4%	80.6%	71.0%
A 27.2	Bed	11.7	35	High	78.6%	68.8%	58.1%	High	87.3%	72.6%	59.1%
A 27.3	Bed	14.4	42	High	79.3%	70.0%	59.4%	High	87.4%	72.9%	59.4%
A 28.1	LKD	28.5	72	Minimum	58.2%	36.5%	16.5%	Minimum	69.1%	23.9%	4.5%
A 28.2	Bed	11.7	35	High	78.7%	69.3%	58.3%	High	86.5%	71.0%	56.7%
A 28.3	Bed	14.4	42	Medium	75.9%	64.6%	49.5%	Medium	85.7%	67.0%	48.6%
A 29.1	LKD	33.6	87	High	88.4%	84.4%	78.4%	High	94.2%	85.8%	79.3%
A 29.2	Bed	11.7	35	High	83.9%	76.7%	69.1%	High	90.1%	79.5%	69.8%
A 29.3	Bed	14.1	42	High	83.6%	76.2%	68.4%	High	89.7%	78.5%	68.7%
A 30.1	LKD	32.6	80	High	86.9%	81.8%	75.7%	High	93.8%	85.3%	78.7%
A 30.2	Bed	11.7	35	High	84.5%	77.4%	70.0%	High	90.5%	80.2%	71.0%
A 30.3	Bed	14.1	42	High	83.4%	75.5%	67.5%	High	90.0%	79.2%	69.4%
A 31.1	LKD	28.5	78	Minimum	67.3%	49.4%	30.9%	Minimum	78.2%	47.0%	23.3%
A 31.2	Bed	14.7	35	High	81.9%	72.8%	61.0%	High	88.9%	75.7%	62.7%
A 32.1	LKD	27.8	76	Medium	68.7%	52.1%	33.5%	Minimum	78.0%	45.9%	21.7%
A 32.2	Bed	14.7	35	High	77.4%	65.7%	51.9%	High	87.4%	71.7%	56.4%
A 33.1	LKD	26.8	73	High	81.2%	72.1%	60.0%	High	89.0%	76.0%	62.9%
A 33.2	Bed	12.7	30	High	83.6%	76.0%	66.0%	High	90.3%	78.6%	68.2%
A 34.1	LKD	26.2	67	High	83.4%	75.0%	66.2%	High	89.4%	76.3%	65.3%
A 34.2	Bed	8.2	21	High	89.8%	85.6%	80.0%	High	95.8%	87.1%	81.3%
A 34.3	Bed	12.8	29	High	80.5%	71.5%	62.0%	Medium	83.1%	63.1%	46.1%
A 35.1	LKD	28.5	72	Minimum	64.3%	46.2%	25.1%	Minimum	72.2%	32.1%	9.0%
A 35.2	Bed	11.7	35	High	80.4%	71.6%	62.3%	High	88.0%	74.1%	62.1%
A 35.3	Bed	14.4	42	High	77.1%	66.7%	52.8%	High	86.5%	69.8%	53.0%
A 36.1	LKD	33.6	87	High	90.2%	86.1%	82.1%	High	95.1%	86.6%	82.0%
A 36.2	Bed	11.7	35	High	84.8%	77.9%	70.6%	High	90.5%	80.2%	71.3%
A 36.3	Bed	14.1	42	High	83.6%	76.1%	68.4%	High	90.1%	79.4%	69.6%
A 37.1	LKD	32.6	80	High	89.7%	85.6%	80.6%	High	95.0%	86.5%	80.8%
A 37.2	Bed	11.7	35	High	84.1%	77.0%	69.7%	High	90.4%	80.0%	70.7%
A 37.3	Bed	14.1	42	High	83.5%	75.9%	68.0%	High	89.7%	78.5%	68.7%

Block A - EN17037:2018 Daylight Provision Room Compliance											
Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A 38.1	LKD	30.6	78	Medium	73.6%	59.1%	42.3%	Medium	81.1%	53.8%	30.3%
A 38.2	Bed	11.4	30	High	85.8%	78.5%	70.3%	High	91.9%	81.9%	72.3%
A 38.3	Bed	14.7	35	High	83.9%	75.9%	65.8%	High	90.0%	77.9%	66.7%
A 39.1	LKD	27.0	59	High	83.0%	74.1%	62.6%	High	88.2%	73.2%	57.0%
A 39.2	Bed	14.0	37	High	81.1%	72.0%	61.3%	High	88.8%	75.4%	62.4%
A 39.3	Bed	14.0	29	High	85.0%	77.7%	69.2%	Medium	85.9%	66.7%	49.7%
A 40.1	LKD	26.8	64	High	86.8%	81.3%	74.2%	High	93.2%	84.1%	75.6%
A 40.2	Bed	11.3	26	High	87.0%	81.8%	74.8%	High	92.7%	83.7%	75.3%
A 41.1	LKD	28.5	72	Medium	74.7%	62.6%	46.6%	Medium	80.1%	53.3%	27.6%
A 41.2	Bed	11.7	35	High	86.0%	79.4%	71.6%	High	91.8%	82.1%	73.1%
A 41.3	Bed	14.4	42	High	78.2%	67.9%	54.6%	High	87.2%	71.8%	57.2%
A 42.1	LKD	52.6	136	High	88.1%	83.4%	77.7%	High	93.4%	84.7%	77.9%
A 42.2	Bed	11.0	30	High	86.1%	80.3%	73.1%	High	92.3%	83.1%	75.0%
A 42.3	Bed	11.7	30	High	88.4%	83.9%	78.1%	High	94.1%	85.8%	79.8%
A 42.4	Bed	14.8	42	High	93.0%	89.2%	86.0%	High	98.0%	90.1%	86.0%
A 43.1	LKD	45.3	117	High	86.3%	79.8%	72.3%	High	90.8%	79.5%	69.5%
A 43.2	Bed	11.7	35	High	86.5%	80.3%	73.1%	High	92.4%	82.6%	74.3%
A 43.3	Bed	12.7	35	High	85.8%	78.9%	71.0%	High	91.7%	81.5%	72.3%
A 43.4	Bed	15.0	42	High	84.1%	75.9%	64.7%	High	90.8%	79.2%	68.7%
A 44.1	LKD	42.9	118	High	86.0%	79.2%	71.2%	High	91.2%	80.3%	70.1%
A 44.2	Bed	8.1	25	High	88.3%	83.7%	76.9%	High	94.8%	86.4%	80.4%
A 44.3	Bed	13.0	35	High	86.2%	79.9%	72.3%	High	91.8%	82.1%	72.9%
A 44.4	Bed	15.7	44	High	84.5%	76.2%	67.7%	High	90.2%	78.4%	67.9%

**Table 16: Block A - EN17037:2018 Daylight Provision individual room compliance values.**

Minimum Illuminance			Target Illuminance		
High	500 lux	95%	High	750 lux	50%
Medium	300 lux	95%	Medium	500 lux	50%
Minimum	100 lux	95%	Minimum	300 lux	50%

EN 17037:2018 Compliance threshold levels.



Figure 37: Block B - Daylight Provision to habitable rooms on all floors.

# Block B - EN17037:2018 Daylight Provision Room Compliance

Space ID	Description	Area [m²]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
B 01.1	LKD	27.8	76	Minimum	56.9%	32.3%	16.4%	Minimum	70.6%	22.7%	9.3%
B 01.2	Bed	13.4	31	Minimum	56.6%	32.1%	12.9%	Minimum	76.1%	35.1%	11.5%
B 02.1	LKD	25.3	64	Medium	75.8%	62.8%	45.5%	Medium	86.6%	68.3%	47.7%
B 02.2	Bed	14.7	35	Minimum	53.1%	24.5%	3.5%	Minimum	74.3%	27.8%	2.9%
B 03.1	LKD	30.4	79	Minimum	55.1%	33.7%	15.5%	Minimum	58.4%	9.1%	0.4%
B 03.2	Bed	12.1	27	High	78.3%	68.4%	57.4%	Medium	83.3%	61.7%	44.2%
B 03.3	Bed	13.6	33	High	86.0%	80.1%	73.5%	High	91.1%	80.9%	72.6%
B 04.1	LKD	26.9	72	Minimum	58.2%	37.5%	17.6%	Minimum	70.2%	26.9%	5.8%
B 04.2	Bed	11.7	35	High	77.4%	66.4%	54.4%	High	87.0%	71.7%	56.7%
B 04.3	Bed	14.4	42	Medium	72.4%	56.8%	41.0%	Medium	83.7%	60.5%	41.2%
B 05.1	LKD	27.0	72	Minimum	63.9%	41.5%	23.2%	Minimum	75.6%	38.1%	15.3%
B 05.2	Bed	10.8	32	Medium	76.5%	64.5%	49.0%	High	86.6%	69.1%	51.1%
B 05.3	Bed	16.6	42	High	78.9%	68.1%	52.8%	Medium	81.7%	55.6%	30.0%
B 06.1	LKD	27.8	76	Minimum	61.6%	39.0%	19.1%	Minimum	75.0%	34.9%	12.3%
B 06.2	Bed	13.4	31	Minimum	62.4%	41.0%	17.7%	Minimum	74.5%	32.7%	11.4%
B 07.1	LKD	25.3	64	High	78.1%	67.0%	52.6%	High	87.6%	71.1%	53.7%
B 07.2	Bed	14.7	35	Fail	48.4%	18.8%	3.0%	Minimum	71.8%	22.4%	2.3%
B 08.1	LKD	31.8	80	High	78.7%	70.0%	59.9%	High	88.1%	74.3%	62.9%
B 08.2	Bed	11.7	35	High	81.5%	72.9%	63.9%	High	89.2%	77.0%	66.2%
B 08.3	Bed	14.4	42	High	82.1%	73.3%	64.1%	High	89.1%	76.8%	65.9%
B 09.1	LKD	31.8	80	High	83.8%	76.8%	69.4%	High	90.3%	80.0%	70.8%
B 09.2	Bed	11.7	35	High	80.7%	72.2%	61.3%	High	87.7%	73.6%	59.4%
B 09.3	Bed	13.6	42	High	79.1%	69.5%	57.9%	High	86.3%	69.9%	54.3%
B 10.1	LKD	30.4	79	Minimum	58.5%	39.4%	19.1%	Minimum	62.6%	13.1%	0.7%
B 10.2	Bed	12.1	27	High	80.2%	71.5%	60.9%	Medium	82.8%	60.1%	43.4%
B 10.3	Bed	13.6	33	High	86.3%	80.2%	73.8%	High	91.5%	81.5%	73.9%
B 11.1	LKD	26.9	72	Minimum	59.6%	41.8%	20.8%	Minimum	71.4%	31.2%	6.2%
B 11.2	Bed	11.7	35	High	79.4%	70.3%	59.1%	High	87.3%	72.7%	58.9%
B 11.3	Bed	14.4	42	Medium	73.9%	59.8%	45.2%	Medium	84.7%	64.2%	45.8%
B 12.1	LKD	27.0	72	Minimum	64.7%	44.6%	25.1%	Minimum	75.7%	40.3%	16.3%
B 12.2	Bed	10.8	32	High	78.4%	67.4%	52.6%	High	87.2%	71.3%	54.9%
B 12.3	Bed	16.6	42	High	78.3%	67.5%	53.5%	Medium	82.8%	57.5%	32.3%
B 13.1	LKD	27.8	76	Minimum	64.7%	44.2%	23.6%	Minimum	75.6%	39.3%	14.4%
B 13.2	Bed	13.4	31	Minimum	63.1%	42.3%	20.1%	Minimum	77.5%	41.7%	15.1%
B 14.1	LKD	25.3	64	High	79.5%	69.1%	56.3%	High	88.1%	72.7%	57.1%
B 14.2	Bed	14.7	35	Minimum	51.0%	23.6%	4.2%	Minimum	71.9%	24.9%	2.5%
B 15.1	LKD	31.8	80	High	80.1%	71.5%	62.5%	High	88.7%	75.4%	64.7%
B 15.2	Bed	11.7	35	High	82.1%	73.7%	65.0%	High	89.4%	77.9%	67.3%
B 15.3	Bed	14.4	42	High	82.8%	74.5%	65.5%	High	89.3%	77.5%	66.6%
B 16.1	LKD	31.8	80	High	84.5%	77.9%	70.8%	High	90.5%	80.4%	71.6%
B 16.2	Bed	11.7	35	High	81.3%	73.0%	62.4%	High	88.6%	75.4%	62.8%
B 16.3	Bed	13.6	42	High	80.7%	72.0%	61.0%	High	87.4%	73.4%	59.9%
B 17.1	LKD	30.4	79	Minimum	60.3%	42.8%	21.6%	Minimum	66.2%	19.2%	2.2%
B 17.2	Bed	12.1	27	High	81.2%	73.4%	63.2%	Medium	82.1%	59.4%	42.1%
B 17.3	Bed	13.6	33	High	86.7%	81.1%	74.8%	High	91.5%	81.5%	73.9%
B 18.1	LKD	26.9	72	Minimum	62.1%	44.8%	26.4%	Minimum	73.6%	37.0%	9.0%
B 18.2	Bed	11.7	35	High	80.2%	71.7%	61.2%	High	88.2%	74.8%	62.6%
B 18.3	Bed	14.4	42	Medium	75.0%	62.0%	47.1%	Medium	85.9%	67.8%	49.8%
B 19.1	LKD	27.0	72	Minimum	66.5%	47.5%	27.4%	Minimum	76.7%	42.9%	16.7%
B 19.2	Bed	10.8	32	High	77.8%	66.7%	52.4%	High	88.1%	73.3%	58.7%

# Block B - EN17037:2018 Daylight Provision Room Compliance

Space ID	Description	Area [m²]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
B 19.3	Bed	16.6	42	High	79.6%	69.5%	56.6%	Medium	82.3%	58.1%	33.3%
B 20.1	LKD	27.8	76	Minimum	66.1%	46.6%	26.0%	Minimum	76.8%	42.8%	16.6%
B 20.2	Bed	13.4	31	Minimum	66.0%	46.0%	24.1%	Minimum	80.9%	49.2%	21.8%
B 21.1	LKD	25.3	64	High	80.4%	70.5%	58.4%	High	88.4%	73.5%	59.0%
B 21.2	Bed	14.7	35	Minimum	53.7%	29.0%	7.2%	Minimum	74.8%	33.8%	6.1%
B 22.1	LKD	31.8	80	High	80.5%	72.0%	63.1%	High	88.9%	76.2%	66.0%
B 22.2	Bed	11.7	35	High	82.1%	74.0%	65.3%	High	89.7%	78.6%	68.9%
B 22.3	Bed	14.4	42	High	82.8%	74.7%	65.8%	High	89.6%	78.0%	67.7%
B 23.1	LKD	31.8	80	High	85.2%	78.7%	71.9%	High	90.6%	80.6%	72.6%
B 23.2	Bed	11.7	35	High	82.9%	75.2%	64.9%	High	88.9%	76.0%	63.9%
B 23.3	Bed	13.6	42	High	81.2%	72.8%	62.8%	High	88.3%	74.9%	62.5%
B 24.1	LKD	30.4	79	Minimum	63.0%	46.8%	26.8%	Minimum	69.2%	26.0%	3.3%
B 24.2	Bed	12.1	27	High	82.6%	74.7%	65.0%	High	84.8%	66.3%	50.3%
B 24.3	Bed	13.6	33	High	87.4%	82.5%	76.3%	High	92.8%	83.6%	76.3%
B 25.1	LKD	26.9	72	Minimum	64.1%	47.1%	28.2%	Minimum	74.9%	41.1%	14.2%
B 25.2	Bed	11.7	35	High	81.7%	73.6%	63.4%	High	89.2%	77.0%	66.0%
B 25.3	Bed	14.4	42	High	76.9%	64.7%	50.4%	High	86.3%	69.1%	51.5%
B 26.1	LKD	27.0	72	Minimum	66.1%	47.3%	27.5%	Minimum	77.8%	45.7%	19.6%
B 26.2	Bed	10.8	32	High	78.2%	67.4%	53.4%	High	88.2%	73.6%	59.3%
B 26.3	Bed	16.6	42	High	79.5%	69.3%	57.2%	Medium	82.5%	59.1%	35.0%
B 27.1	LKD	27.8	76	Minimum	68.5%	49.3%	30.9%	Minimum	78.2%	45.5%	20.5%
B 27.2	Bed	13.4	31	Medium	71.9%	55.0%	36.5%	Medium	82.8%	54.1%	30.4%
B 28.1	LKD	25.3	64	High	82.7%	73.4%	62.9%	High	89.4%	75.8%	63.3%
B 28.2	Bed	14.7	35	Minimum	59.4%	36.3%	13.9%	Minimum	77.3%	38.8%	9.1%
B 29.1	LKD	31.8	80	High	81.1%	72.9%	64.0%	High	89.1%	76.6%	66.5%
B 29.2	Bed	11.7	35	High	83.0%	75.4%	66.8%	High	90.0%	79.1%	69.5%
B 29.3	Bed	14.4	42	High	82.9%	75.1%	66.5%	High	89.9%	78.7%	68.8%
B 30.1	LKD	31.8	80	High	85.5%	79.1%	72.5%	High	90.8%	80.8%	72.9%
B 30.2	Bed	11.7	35	High	83.6%	75.9%	66.0%	High	89.7%	77.7%	66.7%
B 30.3	Bed	13.6	42	High	82.0%	73.9%	63.6%	High	89.2%	76.7%	64.8%
B 31.1	LKD	34.0	90	High	83.6%	75.8%	66.0%	High	89.1%	76.6%	64.4%
B 31.2	Bed	12.5	30	High	90.5%	86.5%	82.1%	High	96.9%	88.7%	84.0%
B 31.3	Bed	14.4	36	High	87.0%	81.4%	75.1%	High	91.8%	82.4%	74.2%
B 32.1	LKD	32.1	88	High	83.9%	76.5%	67.0%	High	89.4%	77.0%	65.2%
B 32.2	Bed	12.0	31	High	88.7%	84.1%	77.6%	High	94.4%	85.8%	78.8%
B 32.3	Bed	15.1	36	High	88.1%	83.4%	76.5%	High	89.7%	76.6%	65.6%
B 33.1	LKD	24.4	71	Medium	71.3%	54.8%	36.3%	Medium	82.8%	54.6%	30.9%
B 33.2	Bed	12.5	30	High	87.6%	82.5%	74.7%	High	93.5%	84.5%	76.1%
B 34.1	LKD	25.1	56	High	85.7%	79.5%	72.3%	Medium	76.5%	50.1%	37.1%
B 34.2	Bed	13.5	31	High	80.4%	70.0%	54.9%	High	88.7%	73.4%	56.3%
B 34.3	Bed	11.8	31	Medium	77.3%	64.6%	48.2%	High	87.2%	69.7%	50.8%
B 35.1	LKD	38.9	92	High	90.4%	86.3%	82.4%	High	96.0%	87.6%	83.1%
B 35.2	Bed	13.1	37	High	89.5%	85.5%	80.5%	High	94.7%	86.3%	81.2%
B 35.3	Bed	16.2	41	High	86.4%	80.2%	73.0%	High	87.6%	73.3%	60.1%
B 36.1	LKD	32.4	85	High	89.3%	85.2%	80.2%	High	93.3%	84.6%	77.8%
B 36.2	Bed	16.1	38	High	88.2%	83.4%	77.2%	High	90.3%	78.6%	68.8%
B 36.3	Bed	16.5	40	High	88.2%	83.3%	77.1%	High	86.3%	69.2%	53.0%
B 37.1	LKD	44.9	117	High	89.5%	85.4%	79.8%	High	93.8%	85.2%	77.9%
B 37.2	Bed	17.0	44	High	88.0%	83.0%	76.9%	High	85.4%	66.8%	50.4%
B 37.3	Bed	10.2	26	High	86.7%	81.2%	74.0%	High	92.0%	82.6%	73.4%

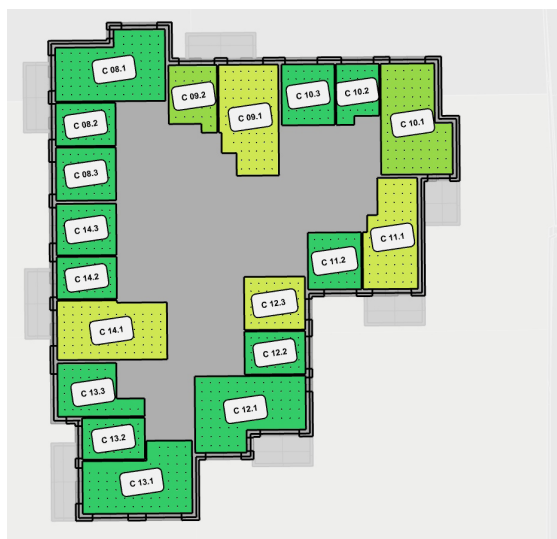


Block B - EN17037:2018 Daylight Provision Room Compliance											
Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
B 37.4	Bed	8.8	24	High	88.6%	83.9%	77.1%	High	94.6%	86.0%	78.7%
B 38.1	LKD	27.7	77	High	89.2%	85.1%	80.0%	High	94.4%	86.1%	80.8%
B 38.2	Bed	15.1	41	High	86.1%	79.7%	71.8%	High	92.4%	83.3%	74.6%
B 38.3	Bed	13.5	30	High	88.9%	84.7%	79.6%	High	86.5%	71.5%	58.8%

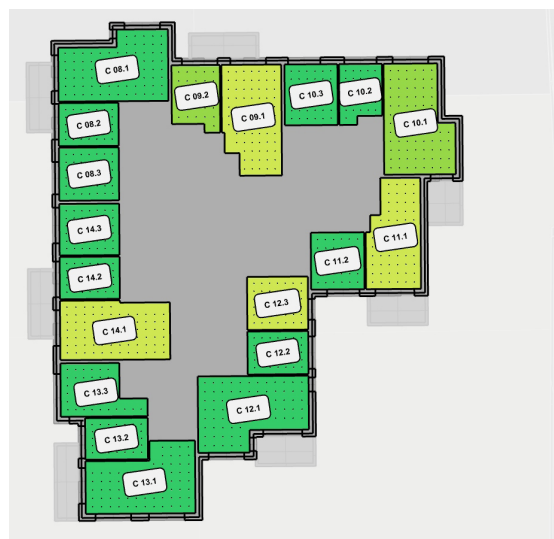
**Table 17: Block B - EN17037:2018 Daylight Provision individual room compliance values.**

Minimum Illuminance			Target Illuminance		
High	500 lux	95%	High	750 lux	50%
Medium	300 lux	95%	Medium	500 lux	50%
Minimum	100 lux	95%	Minimum	300 lux	50%

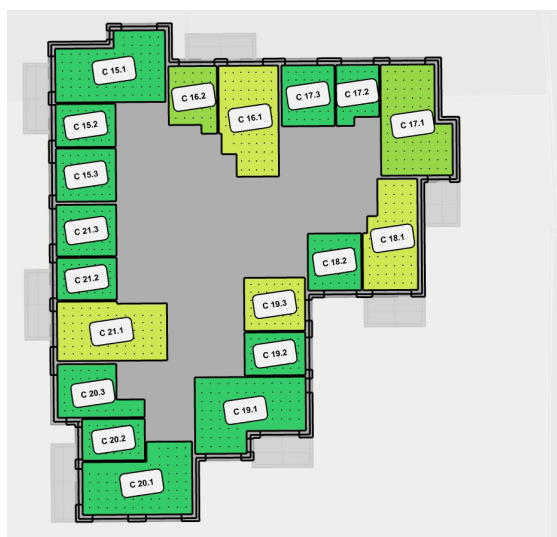
EN 17037:2018 Compliance threshold levels.



Ground Floor



First Floor



Second Floor



Third Floor



Fourth Floor



Fifth Floor

Figure 38: Block C - Daylight Provision to habitable rooms on all floors.

# Block C - EN17037:2018 Daylight Provision Room Compliance

Space ID	Description	Area [m²]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
C 01.1	LKD	31.1	82	High	79.2%	69.9%	56.6%	High	88.7%	74.8%	60.8%
C 01.2	Bed	11.7	35	High	77.6%	66.7%	55.3%	High	87.1%	71.7%	56.8%
C 01.3	Bed	14.4	42	High	79.1%	69.0%	57.0%	High	87.6%	72.8%	58.8%
C 02.1	LKD	28.1	76	Minimum	54.6%	27.2%	1.9%	Minimum	68.4%	10.4%	0.0%
C 02.2	Bed	13.6	31	Medium	72.0%	54.8%	34.9%	Medium	84.8%	59.7%	36.6%
C 03.1	LKD	31.3	82	Medium	71.9%	58.1%	41.3%	Medium	82.0%	57.7%	35.0%
C 03.2	Bed	10.9	31	High	82.4%	72.6%	59.2%	High	89.4%	75.5%	60.5%
C 03.3	Bed	14.7	42	Medium	77.0%	63.8%	46.4%	High	87.7%	70.9%	52.3%
C 04.1	LKD	24.9	62	Medium	64.8%	50.5%	36.9%	Minimum	72.4%	39.2%	22.6%
C 04.2	Bed	13.8	36	High	75.0%	63.4%	51.9%	High	85.4%	67.3%	52.6%
C 05.1	LKD	32.4	75	High	80.3%	71.7%	61.5%	High	88.0%	74.2%	62.9%
C 05.2	Bed	11.9	35	High	78.8%	69.0%	58.3%	High	87.6%	72.4%	59.8%
C 05.3	Bed	14.7	42	Minimum	58.2%	38.7%	26.0%	Minimum	74.5%	42.9%	25.8%
C 06.1	LKD	30.4	73	High	85.9%	80.3%	73.4%	High	87.9%	74.5%	62.5%
C 06.2	Bed	11.8	35	High	77.3%	65.6%	51.8%	High	87.4%	71.4%	55.5%
C 06.3	Bed	16.6	40	High	84.9%	77.9%	69.7%	Medium	84.9%	64.9%	46.5%
C 07.1	LKD	27.8	76	Minimum	63.1%	43.8%	26.3%	Minimum	71.6%	31.1%	15.2%
C 07.2	Bed	14.7	35	Medium	75.6%	63.3%	48.3%	High	85.8%	67.4%	50.2%
C 08.1	LKD	31.1	82	High	79.6%	70.4%	58.3%	High	89.1%	76.1%	64.0%
C 08.2	Bed	11.7	35	High	78.6%	68.5%	57.7%	High	87.8%	74.0%	61.0%
C 08.3	Bed	14.4	42	High	79.9%	70.5%	59.0%	High	88.0%	74.2%	60.6%
C 09.1	LKD	28.1	76	Minimum	57.5%	33.8%	5.1%	Minimum	71.2%	19.0%	0.0%
C 09.2	Bed	13.6	31	Medium	73.3%	56.8%	38.9%	Medium	85.7%	64.2%	42.0%
C 10.1	LKD	31.3	82	Medium	72.5%	59.5%	43.5%	Medium	83.3%	60.6%	40.3%
C 10.2	Bed	10.9	31	High	84.0%	75.0%	63.7%	High	89.6%	76.3%	63.3%
C 10.3	Bed	14.7	42	High	78.2%	66.7%	50.5%	High	88.2%	72.6%	55.0%
C 11.1	LKD	24.9	62	Medium	67.3%	53.5%	40.0%	Minimum	73.4%	42.2%	26.5%
C 11.2	Bed	13.8	36	High	75.9%	65.5%	54.2%	High	86.8%	72.1%	59.2%
C 12.1	LKD	32.4	75	High	82.2%	73.6%	65.2%	High	89.3%	76.7%	67.0%
C 12.2	Bed	11.9	35	High	80.0%	70.6%	60.4%	High	87.7%	72.7%	60.4%
C 12.3	Bed	14.7	42	Minimum	58.7%	40.1%	27.6%	Minimum	76.2%	46.7%	27.0%
C 13.1	LKD	30.4	73	High	86.7%	82.0%	75.7%	High	89.8%	78.2%	69.2%
C 13.2	Bed	11.8	35	High	77.9%	66.8%	54.7%	High	87.6%	72.5%	58.0%
C 13.3	Bed	16.6	40	High	85.7%	78.9%	71.8%	High	85.5%	66.7%	50.6%
C 14.1	LKD	29.1	78	Minimum	63.6%	45.3%	28.3%	Minimum	74.6%	38.2%	17.6%
C 14.2	Bed	11.5	35	High	79.7%	70.4%	59.7%	High	88.2%	74.7%	61.4%
C 14.3	Bed	14.0	42	High	81.9%	73.0%	62.1%	High	88.4%	75.0%	62.5%
C 15.1	LKD	31.1	82	High	80.6%	71.7%	60.3%	High	89.6%	77.5%	66.5%
C 15.2	Bed	11.7	35	High	79.7%	70.6%	60.2%	High	88.1%	74.4%	61.8%
C 15.3	Bed	14.4	42	High	80.5%	71.4%	60.2%	High	88.6%	75.3%	62.6%
C 16.1	LKD	28.1	76	Minimum	59.5%	37.1%	7.8%	Minimum	72.3%	25.8%	0.0%
C 16.2	Bed	13.6	31	Medium	73.9%	58.6%	40.8%	Medium	85.8%	65.2%	44.5%
C 17.1	LKD	31.3	82	Medium	73.2%	60.5%	45.5%	Medium	83.3%	60.7%	41.3%
C 17.2	Bed	10.9	31	High	83.3%	73.7%	62.1%	High	89.7%	76.7%	64.3%
C 17.3	Bed	14.7	42	High	78.6%	67.4%	51.4%	High	88.3%	73.1%	56.2%
C 18.1	LKD	24.9	62	Medium	70.0%	56.2%	43.1%	Minimum	75.9%	47.4%	31.9%
C 18.2	Bed	13.8	36	High	77.0%	66.9%	56.2%	High	86.8%	72.0%	59.0%
C 19.1	LKD	32.4	75	High	83.6%	75.7%	68.1%	High	90.0%	78.5%	69.6%
C 19.2	Bed	11.9	35	High	80.3%	71.1%	61.4%	High	88.3%	74.2%	62.6%

# Block C - EN17037:2018 Daylight Provision Room Compliance

Space ID	Description	Area [m²]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
C 19.3	Bed	14.7	42	Minimum	59.9%	42.5%	28.6%	Minimum	76.3%	47.8%	29.1%
C 20.1	LKD	30.4	73	High	88.4%	83.9%	78.7%	High	91.2%	81.5%	74.0%
C 20.2	Bed	11.8	35	High	83.5%	75.8%	65.6%	High	89.9%	77.9%	67.0%
C 20.3	Bed	16.6	40	High	86.0%	79.5%	72.5%	High	86.2%	68.4%	53.7%
C 21.1	LKD	29.1	78	Minimum	64.3%	46.9%	29.7%	Minimum	75.8%	41.2%	19.7%
C 21.2	Bed	11.5	35	High	80.2%	70.9%	60.2%	High	88.8%	75.8%	63.6%
C 21.3	Bed	14.0	42	High	82.4%	73.7%	63.2%	High	89.3%	76.8%	65.1%
C 22.1	LKD	31.1	82	High	81.8%	73.0%	62.0%	High	90.0%	77.8%	67.5%
C 22.2	Bed	11.7	35	High	80.3%	71.6%	61.2%	High	88.7%	75.8%	63.9%
C 22.3	Bed	14.4	42	High	81.1%	72.5%	62.4%	High	88.8%	75.7%	63.5%
C 23.1	LKD	28.1	76	Minimum	61.1%	39.1%	13.3%	Minimum	74.9%	33.6%	0.4%
C 23.2	Bed	13.6	31	Medium	75.5%	61.7%	44.7%	Medium	86.4%	67.2%	47.2%
C 24.1	LKD	31.3	82	High	78.3%	68.7%	56.8%	High	86.2%	68.7%	53.0%
C 24.2	Bed	10.9	31	High	83.7%	74.8%	63.7%	High	89.9%	77.1%	65.0%
C 24.3	Bed	14.7	42	High	79.6%	68.8%	53.5%	High	88.6%	74.1%	57.6%
C 25.1	LKD	24.9	62	Medium	69.2%	56.0%	42.2%	Medium	77.4%	50.8%	34.7%
C 25.2	Bed	13.8	36	High	79.0%	69.4%	59.2%	High	87.9%	73.8%	61.5%
C 26.1	LKD	32.4	75	High	84.4%	77.3%	70.5%	High	90.7%	80.7%	72.0%
C 26.2	Bed	11.9	35	High	82.1%	73.0%	63.6%	High	88.8%	75.1%	64.3%
C 26.3	Bed	14.7	42	Minimum	64.3%	48.1%	32.5%	Medium	79.3%	53.3%	33.0%
C 27.1	LKD	34.6	85	High	88.0%	83.4%	77.6%	High	93.2%	84.4%	77.3%
C 27.2	Bed	11.0	32	High	89.1%	84.9%	79.9%	High	94.3%	86.2%	80.6%
C 28.1	LKD	29.1	78	Minimum	65.0%	48.3%	30.4%	Minimum	76.0%	42.8%	19.9%
C 28.2	Bed	11.5	35	High	81.3%	73.1%	62.7%	High	89.1%	76.3%	64.4%
C 28.3	Bed	14.0	42	High	82.9%	74.9%	65.1%	High	89.6%	77.3%	66.1%
C 29.1	LKD	34.7	90	High	86.6%	80.7%	73.6%	High	93.0%	83.7%	75.4%
C 29.2	Bed	10.6	31	High	84.1%	76.8%	67.7%	High	90.0%	78.1%	67.6%
C 29.3	Bed	12.6	36	High	84.3%	77.1%	68.0%	High	90.0%	78.1%	67.3%
C 30.1	LKD	26.9	66	Medium	74.1%	57.0%	39.2%	Minimum	80.3%	48.5%	16.3%
C 30.2	Bed	11.7	31	High	85.3%	77.5%	68.2%	High	91.7%	80.4%	70.7%
C 30.3	Bed	14.0	31	High	80.8%	70.9%	56.6%	High	88.9%	74.7%	59.5%
C 31.1	LKD	34.1	84	High	84.1%	76.5%	68.7%	High	89.5%	77.5%	67.4%
C 31.2	Bed	11.2	27	High	85.9%	79.0%	71.1%	High	90.8%	80.0%	70.4%
C 31.3	Bed	16.0	36	High	81.3%	71.5%	57.2%	Medium	86.8%	68.7%	49.7%
C 31.4	Bed	9.8	26	High	85.6%	77.9%	68.9%	High	90.7%	78.8%	68.0%
C 32.1	LKD	28.2	69	High	76.7%	66.3%	55.4%	Medium	83.0%	62.5%	48.4%
C 32.2	Bed	17.2	44	High	88.1%	83.7%	77.8%	High	87.4%	73.7%	62.6%
C 32.3	Bed	12.0	33	High	76.5%	66.4%	54.5%	High	86.1%	69.0%	54.7%
C 33.1	LKD	34.6	87	High	86.4%	80.9%	74.5%	High	91.7%	82.3%	74.4%
C 33.2	Bed	9.4	25	High	79.0%	69.1%	56.0%	High	86.6%	69.4%	53.5%
C 33.3	Bed	12.9	33	High	87.6%	82.9%	76.7%	High	88.8%	76.3%	65.4%
C 33.4	Bed	15.3	34	High	84.6%	77.3%	68.8%	High	88.4%	75.0%	62.0%
C 34.1	LKD	29.6	74	High	86.5%	80.3%	73.2%	High	90.3%	78.6%	68.5%
C 34.2	Bed	12.6	31	High	87.0%	81.1%	74.1%	High	92.6%	82.9%	74.6%
C 34.3	Bed	15.6	40	High	88.2%	83.3%	76.8%	High	92.2%	82.4%	73.4%
C 35.1	LKD	43.6	114	High	85.3%	77.9%	71.0%	High	89.5%	77.4%	68.0%
C 35.2	Bed	12.2	35	High	88.7%	84.2%	77.4%	High	95.1%	86.5%	80.2%
C 35.3	Bed	10.9	26	High	88.7%	84.2%	77.2%	High	94.1%	84.9%	76.8%
C 35.4	Bed	16.2	38	High	85.9%	78.4%	69.9%	High	87.7%	71.2%	52.4%
C 36.1	LKD	39.5	101	High	89.8%	85.6%	80.7%	High	95.6%	87.3%	82.4%

Block C - EN17037:2018 Daylight Provision Room Compliance											
Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
C 36.2	Bed	12.3	33	High	88.9%	84.7%	79.7%	High	90.9%	81.0%	72.1%
C 36.3	Bed	11.5	36	High	90.3%	86.3%	82.6%	High	95.1%	86.6%	81.9%
C 36.4	Bed	8.6	24	High	80.8%	71.4%	61.5%	High	87.2%	71.6%	59.1%

**Table 18: Block C - EN17037:2018 Daylight Provision individual room compliance values.**



## Appendix C - Annual Probable Sunlight Hours for Apartment Blocks

Block A : Annual Probable Sunlight Hours					
Location ID	Within 90° South	% of APSH	% of WPSH Sept 21 - Mar 21	Meets Criteria APSH	Meets Criteria WPSH
A 01	Yes	46.1%	28.7%	Y	Y
A 02	Yes	46.5%	29.3%	Y	Y
A 03	No	20.9%	3.9%	N	N
A 04	No	27.1%	10.1%	Y	Y
A 05	No	19.8%	6.7%	N	Y
A 06	Yes	25.0%	7.7%	Y	Y
A 07	Yes	22.0%	8.6%	N	Y
A 08	Yes	38.7%	26.3%	Y	Y
A 09	Yes	38.2%	26.8%	Y	Y
A 10	No	18.5%	3.9%	N	N
A 11	No	24.4%	8.9%	N	Y
A 12	No	24.5%	8.9%	N	Y
A 13	Yes	22.0%	6.7%	N	Y
A 14	Yes	19.9%	7.5%	N	Y
A 15	Yes	40.1%	27.5%	Y	Y
A 16	Yes	39.5%	27.6%	Y	Y
A 17	No	18.5%	3.9%	N	N
A 18	No	24.4%	8.9%	N	Y
A 19	No	24.5%	8.9%	N	Y
A 20	Yes	23.1%	7.1%	N	Y
A 21	Yes	21.6%	7.9%	N	Y
A 22	Yes	40.6%	27.8%	Y	Y
A 23	Yes	40.0%	27.8%	Y	Y
A 24	No	18.5%	3.9%	N	N
A 25	No	24.4%	8.9%	N	Y
A 26	No	24.0%	8.5%	N	Y
A 27	Yes	24.4%	7.7%	N	Y
A 28	Yes	23.5%	8.5%	N	Y
A 29	Yes	41.0%	28.1%	Y	Y
A 30	Yes	40.2%	27.9%	Y	Y
A 31	No	18.5%	3.9%	N	N
A 32	No	24.4%	8.9%	N	Y
A 33	No	45.6%	13.3%	Y	Y
A 34	Yes	26.9%	9.5%	Y	Y
A 35	Yes	26.0%	9.5%	Y	Y
A 36	Yes	79.5%	31.7%	Y	Y
A 37	Yes	80.2%	31.8%	Y	Y
A 38	No	42.9%	10.1%	Y	Y
A 39	No	45.4%	13.4%	Y	Y
A 40	Yes	49.0%	15.0%	Y	Y
A 41	Yes	49.1%	15.3%	Y	Y
A 42	Yes	80.3%	32.0%	Y	Y
A 43	Yes	48.3%	14.7%	Y	Y
A 44	Yes	50.3%	16.0%	Y	Y

**Table 19: Block A - Annual Probable Sunlight Hours**

Block B : Annual Probable Sunlight Hours					
Location ID	Within 90° South	% of APSH	% of WPSH Sept 21 - Mar 21	Meets Criteria APSH	Meets Criteria WPSH
B 01	No	15.7%	2.6%	N	N
B 02	Yes	37.2%	6.1%	Y	Y
B 03	No	16.3%	8.7%	N	Y
B 04	No	16.7%	6.1%	N	Y
B 05	Yes	18.7%	6.0%	N	Y
B 06	Yes	16.5%	2.9%	N	N
B 07	Yes	39.6%	7.1%	Y	Y
B 08	Yes	37.4%	21.8%	Y	Y
B 09	Yes	63.7%	25.3%	Y	Y
B 10	No	18.6%	8.7%	N	Y
B 11	No	18.3%	6.3%	N	Y
B 12	Yes	20.2%	6.6%	N	Y
B 13	Yes	18.1%	3.1%	N	N
B 14	Yes	41.9%	9.0%	Y	Y
B 15	Yes	39.8%	23.0%	Y	Y
B 16	Yes	65.6%	26.7%	Y	Y
B 17	No	21.2%	8.7%	N	Y
B 18	No	19.6%	6.5%	N	Y
B 19	Yes	22.3%	7.7%	N	Y
B 20	Yes	21.3%	3.2%	N	N
B 21	Yes	45.0%	11.6%	Y	Y
B 22	Yes	42.1%	24.7%	Y	Y
B 23	Yes	67.0%	27.8%	Y	Y
B 24	No	23.6%	9.2%	N	Y
B 25	No	21.5%	7.5%	N	Y
B 26	Yes	23.2%	8.4%	N	Y
B 27	Yes	25.8%	3.4%	Y	N
B 28	Yes	47.2%	13.4%	Y	Y
B 29	Yes	44.9%	27.0%	Y	Y
B 30	Yes	70.8%	29.0%	Y	Y
B 31	No	46.1%	13.9%	Y	Y
B 32	Yes	46.5%	13.5%	Y	Y
B 33	Yes	18.6%	1.1%	N	N
B 34	Yes	70.2%	29.8%	Y	Y
B 35	Yes	75.7%	30.8%	Y	Y
B 36	Yes	63.6%	27.6%	Y	Y
B 37	No	41.8%	9.3%	Y	Y
B 38	Yes	80.0%	32.0%	Y	Y

**Table 20: Block B - Annual Probable Sunlight Hours**

Block C : Annual Probable Sunlight Hours					
Location ID	Within 90° South	% of APSH	% of WPSH Sept 21 - Mar 21	Meets Criteria APSH	Meets Criteria WPSH
C 01	No	20.4%	8.9%	N	Y
C 02	No	8.9%	0.0%	N	N
C 03	Yes	21.5%	14.1%	N	Y
C 04	Yes	24.0%	18.4%	N	Y
C 05	Yes	40.2%	17.8%	Y	Y
C 06	Yes	62.6%	18.3%	Y	Y
C 07	No	35.4%	11.6%	Y	Y
C 08	No	20.7%	9.2%	N	Y
C 09	No	9.6%	0.0%	N	N
C 10	Yes	22.1%	14.6%	N	Y
C 11	Yes	25.5%	19.6%	Y	Y
C 12	Yes	45.5%	22.2%	Y	Y
C 13	Yes	72.4%	26.5%	Y	Y
C 14	No	37.7%	13.2%	Y	Y
C 15	No	21.1%	9.4%	N	Y
C 16	No	9.6%	0.0%	N	N
C 17	Yes	22.1%	14.6%	N	Y
C 18	Yes	25.5%	19.6%	Y	Y
C 19	Yes	49.5%	22.3%	Y	Y
C 20	Yes	77.9%	31.1%	Y	Y
C 21	No	37.9%	13.2%	Y	Y
C 22	No	22.8%	9.4%	N	Y
C 23	No	9.6%	0.0%	N	N
C 24	Yes	44.4%	19.0%	Y	Y
C 25	Yes	25.4%	19.6%	Y	Y
C 26	Yes	58.9%	28.2%	Y	Y
C 27	Yes	78.6%	31.5%	Y	Y
C 28	No	37.9%	13.2%	Y	Y
C 29	No	41.0%	13.2%	Y	Y
C 30	No	12.2%	0.0%	N	N
C 31	Yes	50.5%	20.2%	Y	Y
C 32	Yes	78.6%	31.5%	Y	Y
C 33	Yes	78.6%	31.5%	Y	Y
C 34	Yes	43.2%	13.3%	Y	Y
C 35	No	68.3%	25.3%	Y	Y
C 36	Yes	78.6%	31.5%	Y	Y

**Table 21: Block C - Annual Probable Sunlight Hours**

## **Appendix D - Reference Documents**

- Site Layout Planning for Daylight and Sunlight. A guide to good practice. Second Edition (2011) BRE Trust
- BS 8206-2: 2008      Lighting for Buildings – Part 2: Code of Practice for Daylighting
- IS EN 17037:2018      Daylight in Buildings
- Planning Guidelines 28 Sustainable urban housing: design standards for new apartments. Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act, 2000 (as amended) Department of Housing, Planning, and Local Government (2020)
- Urban Development and Building Heights: Guidelines for Planning Authorities (2018) Department of Housing, Local Government & Heritage