Daylight & Sunlight Assessments of a Mixed Use Development at Firhouse Road, Dublin 24.

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1. Introduction

Permission is sought for a mixed use development with 83 apartments, at Firhouse Road, Dublin 24 and all site and enabling works as described in statutory notices.

1.1 Executive Summary

This report assesses the impact of the proposed development for Daylight and Sunlight on the neighbouring buildings and the quality of daylight and sunlight within the proposed development. This analysis is carried out based on the drawings of O'Mahoney Pike Architects.

The report has been prepared by John Healy - Diploma Architectural Technology, M.Sc Environmental Design of Buildings, PG Dip Digital Media. John is a Director at Digital Dimensions for the last 25 Years.

John has been working as a Daylight and Sunlight consultant for the last 15 years following completion of a Masters of Science in Environmental Design of Buildings at Cardiff University. The Masters focused on passive design strategies including daylight and sunlight optimisation. John has worked on an extensive list of projects over the years varying in scale and location from restricted city sites to urban and rural projects throughout Ireland. Some previous work include;

- Oscar Traynor Wood; 850 unit housing and apartment development for Glenveagh Homes / Dublin City Council.
- Belcamp North Dublin; 2527 unit residential scheme for Gannon Homes.
- Taylor's Lane Apartment Development; 402 units apartment development for Shannon Homes.
- Social Housing Bundles (SHB) 4&5; 17 social housing sites for the NDFA.
- No.9 -12 Dawson Street: Extension to listed office block in Dublin for Oakmount.

1.2 Assessment of Potential Impact to Daylight and Sunlight Availability on Adjacent Properties

The current apartment proposal is inline with the planning approved scheme (Reg. Ref. LRD24A/0001 / ABP Ref. 319568-24) with the main design change being a change to the internal layout to accommodate 5 no. additional units and revised unit mix, the change from a pitched to a flat roof which in essence is a reduction in massing. The overall external design is similar to the planning approved scheme and the main change is to fenestration and material rather than scale or massing. As such the current proposal will have a similar or lesser impact to daylight and sunlight in the neighbouring properties and a new assessment was not deemed necessary.

1.3 Assessment of the Quality of Daylight and Sunlight within the Proposed Development

The residential units were designed in line with the recommendations of the BRE guidelines (2022). A number of design iterations were conducted to improve the daylight and sunlight within the proposed development. The guidelines clearly state that the targets are recommendations only and flexibility is required when setting and interpreting the targets.

The BRE guidelines (2022) recommends assessment methods set out in BS EN 17037 for daylight provision. BS EN 17037 contains a National Annex which sets out minimum daylight levels to be achieved in the UK and channel Islands. Ireland has a similar latitude and climate to the UK. The UK annex to BS EN 17037 states that the target values set out in EN 17037 Table A1 may be hard to achieve in the UK, it sets alternative minimum values for rooms to dwellings. The minimum illuminance levels set out in BS EN17037:2018+A1:2021 are: Kitchens and living spaces containing a kitchen 200lux (1.3%DF). Living rooms 150lux (1%DF) and bedrooms 100lux (DF0.7%).

The levels set out in the UK annex are used in this assessment, as the primary results to be achieved, because these are referenced in the BRE guidelines (2022), as recommended by the local authority. The BRE guidelines (2022) deals with daylight and sunlight to adjacent properties and defers to BS EN17037:2018+A1:2021 for daylight and sunlight within the proposed development and allows for a complete assessment of the proposed development and its surroundings. The BRE guidelines (2022) presents a discussion on aspects of daylight and sunlight and interpreting the results of these assessments.

IS EN17037:2018 does not set out any guidance for assessing the impact to daylight and sunlight from a proposed development on neighbouring buildings nor is there any Irish governmental guidance on interpreting results and percentages of units to achieve the target results in multi unit developments. IS EN17037:2018 does not set out room use specific targets but instead designates a Minimum and Target lux level to be achieved in all rooms regardless of use. The function of a room historically has been the key factor in informing the design of a building and the window sizes to allow adequate daylight levels for the task typical to that room to be achieved. The lack of variance in target levels for the tasks typical to a room can lead to substantially oversized windows in rooms with a lower requirement for daylight levels, for example bedrooms. The aim to achieve the minimum target lux level to all rooms in a multi unit residential building is not practical and could lead to overheating of units that have greater access to the sky and sunlight. This could also lead to higher energy usage due to oversized windows and a balance needs to be met.

The results for the Minimum and Target levels set out in Table A1 in IS EN17037:2018 are presented in the assessment as supplementary for completeness, however, conclusions can not be made due to lack of clear guidance on interpenetration of results.

The assessment is carried out with the existing mature trees in the model.

1.3.1 Assessment of Daylight in Accordance with BR209:2022 and BS EN 17037:2018+A1:2021

99.5% of the Living, Dining, Kitchen and Bedroom spaces within the proposed development achieve the target values set out in BS EN 17037:2018+A1:2021 Table NA1. These are the minimum values, per specified use, to be achieved in habitable rooms and meets the recommendations of the BRE guidelines (2022).

1.3.2 Sunlight within the Proposed Development

This scheme is well designed for sunlight, with 83.1% of units meeting the minimum recommended 1.5 direct sunlight hours. This is in line with the BRE guideline example for an apartment layout where 4 in 5 achieves the target sunlight hours.

The vast majority of public open space provided achieves high levels of sunlight. The communal amenity spaces are well oriented for sunlight and both achieve high levels of sunlight, meeting the criteria of 2 hours sunlight on the 21st March over in excess of 50% of the area.

The proposed development meets the recommendations for sunlight in the BRE guidelines BR209:2022 (third edition).

1.4 Supplementary Information - Assessment of Daylight in Accordance with IS EN 17037:2018

EN 17037:2018 sets out values for target illuminance, minimum target illuminance and fractions of reference plane to be achieved. The target and minimum target levels set out in EN17037:2018 are for any type of building; they do not take into account room use or make allowance for rooms that have a lesser requirement for daylight. The results of this assessment indicate a high level of daylight provision, with 93.2% of rooms achieving Minimum Illuminance and 86.9% achieving Target Illuminance. Appendix B identifies any rooms which do not achieve minimum illuminance or target illuminance levels.

To date there is no guidance from governmental bodies on the use or interpretation of IS EN 17037:2018. Apartment guidelines and local authorities guidelines refer to BR209 2022: “Site layout planning for daylight and sunlight” (third edition) which in turn references BS EN 17037. BS EN17037:2018+A1:2021 is the same as IS EN 17037:2018 with the addition of a National Annex (NA1) and the annex specifically refers to and sets room specific values for dwellings in the UK and Channel Islands. Therefore the assessment against IS EN 17037:2018 is included as supplementary information only, noting there are no room specific recommendations for daylight and because of this limitation, it is considered the recommendations made in the BRE guidelines (2022) are more appropriate.

1.5 Conclusions

Overall the design team worked in response to the context to ensure the proposed development performs with regards to achieving the best possible daylight and sunlight quality. All habitable rooms, excepting a single LKD (B2-106.1), meet the minimum standard for daylight provision as per BS EN 17037:2018+A1:2021 as referred to in the BRE guidelines BR209:2022 (third edition).

In the assessment of daylight in accordance with IS EN 17037:2018, shown for supplementary information, the majority of habitable rooms achieve daylight provision as set out in IS EN 17037:2018

With regard to internal daylighting, Section 3.2 of the Urban Development and Building Heights: Guidelines for Planning Authorities (2018) states:

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

The habitable room, B2-106.1 does not meet the minimum standard for daylight provision, due to its proximity to the existing mature trees to the west. These trees are deciduous, so will have no leaves and provide less obstruction in the winter period, when the availability of daylight is low. In compensation, this unit has the following positive attributes:

- It exceeds the minimum floor area by c. 14%
- The private open space exceeds the minimum area
- Floor to ceiling height exceeds the minimum set out in the apartment guidelines
- West facing aspect over a large area of open space

2. Methodology

2.1 Standards and Guidelines

Ministerial guidance is provided in Sustainable Residential Development and Compact Settlements: Guidelines for Planning Authorities (2024) Section 5.3.7(b).

> *"In cases where a technical assessment of daylight performance is considered by the planning authority to be necessary regard should be had to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings IS EN17037:2018, UK National Annex BS EN17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context."*

The Daylight and Sunlight assessments included in this report demonstrates the level of compliance with these three documents:

- BR209:2022 Site Layout Planning for Daylight and Sunlight (third edition), also referred to as the BRE guidelines (2022).
- BS EN 17037:2018+A1:2021 Daylight in Buildings, also referred to as the UK Annex.
- IS EN 17037:2018 Daylight in Buildings.

2.2 BRE Guidance Document BR209:2022 Site Layout Planning for Daylight and Sunlight (third edition)

In its opening summary, the BRE guidelines (2022) states that the report *"is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."* The recommendations of the BRE guidelines (2022) are not suitable for rigid application to all developments in all contexts. This is of particular importance in the context of national and local policies for the consolidation and densification of urban areas.

The BRE guidelines (2022) sets out the assessment metrics to be applied when assessing the potential impact of a development on the daylight and sunlight of neighbouring properties. This is broadly in line with the previous version of the BRE guidelines (2011). The metrics for assessing impact to neighbouring buildings for Daylight is the Vertical Sky Component (VSC) and Sunlight is the Annual Probable Sunlight Hours (APSH). Sunlight to neighbouring amenity space is assessed through the measurement of sunlight availability on the 21st March and the plotting of shadow diagrams.

When assessing the quality of interior spaces in proposed developments, the BRE guidelines (2022) Appendix C states; *"The guidance contained in this publication is intended to be used with BS EN 17037 and its UK National Annex."* The BRE guidelines (2022) also states in Section 1.7 that *"The guidance here is intended for use in the United Kingdom and in the Republic of Ireland, though recommendations in the Irish Standard IS EN 17037 may vary from those in BS EN17037."*

2.3 Daylight in Buildings EN 17037:2018

EN 17037 is a unified daylighting standard published by the European Committee for Standardization (CEN) in 2018. It is applicable across all countries within the EU including Ireland, with the Irish edition IS EN17037:2018. The standard is enacted in Britain under BS EN 17037:2018+A1:2021 with a UK National Annex for regional assessments. The daylight and sunlight assessment methods for internal daylight and sunlight provision are common to both the Irish Standard version and the UK version. The EN17037:2018 Standard deals exclusively with new developments and does not give guidance or metrics on loss of light or sunlight to existing properties.

The UK National Annex (NA) provides further recommendations for daylight provision in the UK and Channel Islands. The UK annex states that the daylight target levels in BS EN 17037:2018 Clause A.2 may be hard to achieve in buildings in the UK, in particular dwellings in urban areas with significant obstructions or tall trees outside. The UK annex sets out minimum daylight provision to be achieved in UK dwellings. Table NA.1 sets out room specific minimum values to be achieved in the UK and Channel Islands. All the rooms achieve the minimum DF factor levels set out in A1 for Bedrooms (DF0.7%), Living Rooms (1%DF) and Kitchens and Living Spaces containing a Kitchen(1.3%). The Daylight Factor percentage values are derived from minimum room specific illuminance levels set out in NA+1 and the Median External Diffuse Illuminance ($E_{v,d,med}$) for Dublin from Table A.3 EN17037:2018. The illuminance levels and corresponding DF% are given in Table 5 below.

2.4 Daylight to Existing Buildings

BRE guidelines (2022) Section 2.2.2 sets out which rooms need to be assessed for daylight.

> *"The guidelines here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed. The guidelines may also be applied to any existing non-domestic building where the occupants have a reasonable expectation of daylight; this would normally include schools, hospitals, hotels and hostels, small workshops and some offices."*

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 its distance from the existing dwelling. BRE guidelines (2022) Section 2.2.4 states 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.*" In this report, we refer to this as the 'zone of influence'.

BRE guidelines (2022) Section 2.2.23 states; *"If any part of a new building or extension, measured in a vertical section perpendicular to a 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 daylighting of the existing building may be adversely affected*."

If a window falls within a 45° angle both in plan and elevation with a new development in place, the window may be affected and should be assessed.

For loss of daylight the BRE guidelines (2022) recommends calculation of the Vertical Sky Component. VSC can be defined as the amount of skylight that falls on a vertical window. It 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 (2022) 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 (2022) 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 through the Vertical Sky Component (VSC) as per the methodologies contained in the BRE guidelines (2022).

2.5 Sunlight to Existing Buildings

The BRE guidelines (2022) recommend assessing 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 of the existing window 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 of 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 Winter Probable Sunlight Hours (taken to fall between the 21st of September and the 21st of March).

Table 1 below 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 Éireann Sunlight Hours Data Set 1991-2020													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Average Sunlight Hours/ Day	1:54	2:54	3:42	5:24	6:24	6:00	5:17	5:00	4:24	3:24	2:24	1:42	
Average Sunlight Hours/ Month	58:54	81:12	114:42	162:00	198:24	180:00	163:47	155:00	132:00	105:24	72:00	52:42	1449.1
Total Available Sunlight Hours	252	265	358	412	483	485	496	451	375	320	250	236	4383
Probable Sunlight Hours Ratio	23.4%	30.6%	32.9%	39.3%	41.1%	37.1%	33.0%	34.4%	35.2%	32.9%	16.8%	22.3%	33.1%

Table 1: Average monthly sunlight hours recorded at Dublin Airport - Data set 1991-2020

The BRE guidelines (2022) recommend that the centre of a window or 1.6m above ground for a door be assessed and it should receive at least 25% of the APSH and it should receive 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.

2.6 Sunlight to Gardens and Open Spaces

For calculations of sunlight analysis it is general practice to use March 21st. The BRE guidelines (2022) Section 3.3.17 states:

> *"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."*

2.7 BRE Guidelines (2022) Appendix G: Calculations of Trees & Hedges

Trees are not usually included in the assessments of impact on neighbouring properties, unless specified otherwise. In relation to the effects of trees and hedges the BRE guidelines (2022) Section G1.2 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 BRE guidelines (2022) recommends that sometimes trees should be taken into account for the proposed development where the new development is proposed near large existing trees. This needs to be done by modelling a representative of the existing trees. Reflectance and transparency should be taken into account. Table G1 in BR209:2022 gives values for transparencies of tree crowns in summer and winter for deciduous trees, dense evergreen can be assessed as opaque. Table G2 gives general reflectance values for shades of trees.

2.8 BRE Guidelines (2022) Appendix H: Environmental Impact Assessment

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 in relation to an Environmental Impact Assessment. The guide does not give a specific range or percentages but sets out parameters as 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, e.g. 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."*

The BRE guidelines does not set out a specific value range for the different classification of impact level of Minor, Moderate and Major to each window. For the purpose of this report one of five classification levels will be applied:

Imperceptible:	There is no reduction in the VSC levels or where the levels are 95% of the existing value.
Negligible:	A reduction in the VSC level but it retains a VSC >27% or <27% but >80% of the existing value.
Minor reduction:	VSC below 27% but greater than 20%, or ratio greater than 65% of the existing value.
Moderate reduction:	VSC below 20% but greater than 10%, or ratio greater that 50% of the existing value.
Major reduction:	VSC below 10% or ratio less than 50% of the existing value.

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. The evaluation of the impact should be considered in conjunction with other factors when determining the overall impact level to a property.

2.9 Assessment Model Parameters

The BRE guidelines (2022) recommends surface reflectances should represent real conditions and where reflectance values have not been measured or specified default values are set out in Table C4 of the guidance document. The surface reflectances have been specified and are set out in Table 2 below. This table also shows the input values for material used and additional assessment model input parameters.

Input Values for Assessment Model			
Surface Reflectance			
Element	Reflectance	Transmittance	Material Description
Internal walls	80%	0%	White Painted Walls
Internal ceiling	80%	0%	White Painted Ceiling
Floor - light wood	40%	0%	Light wood Flooring
External walls - proposed development	50%	0%	Brick
External walls - outside site	50%	0%	CIBSE
External ground	20%	0%	CIBSE
Glass		68%	Triple glazed clear glass
Maintenance Factor for Glass		Assessment Plane	
Suburban Vertical no overhang	0.96	Sensor Grid spacing	0.3m
Suburban Vertical sheltered by balcony or overhang	0.88	Sensor grid inset	0.35m
Framing Factor: Patio Doors	0.77	Minimum inset	0.3m
		Work plane offset	0.85m

Table 2: Surface reflectance parameters and input values for model calculations

2.10 Daylight in the Proposed Development.

The BRE guidelines (2022) Appendix C sets out interior daylight recommendations, it states; “BS EN 17037 supersedes BS8206 Part 2 ‘Code of practice for daylighting’ which contained a method of assessment based on Average Daylight Factor, which is now no longer recommended.”

BS EN 17037 sets out two methods for assessing daylight provision in proposed buildings. One method is called the **Illuminance method.** This is based on Target illuminances for daylight to be achieved across specified fractions of a reference plane at working plane height (0.85m) for half the daylight hours in a year. The Illuminance Method requires the use of a suitable weather file with local climate conditions and takes into account the orientation of the space.

The alternative method is called the **Daylight Factor Method.** This method is based on calculating the daylight factors achieved over specific fractions of a reference plane. The Daylight factor is the illuminance at a point on a reference plane in a space, divided by the illuminance on an unobstructed horizontal surface outdoors. This method uses an overcast sky for calculation and the assessment of the space is orientation independent. BS EN 17037 gives the Median External Diffuse Illuminance (Ev,d,med) for the capital cities throughout Europe to account for external local illuminance levels.

The UK committee formed the opinion that the Target Illuminance recommendations in Clause A.2 of BS EN 17037 may not be achievable for some buildings, particularly dwellings. The UK committee believes this could be the case for dwellings with basement rooms or those with significant external obstructions. In BS EN 17037:2018+A1:2021, the UK National Annex (NA) sets out additional minimum room specific Target Daylight Factor values for the UK. Clause NA.2 sets out illuminance values to be exceeded over at least 50% of the points on a reference plane 0.85m above the floor for at least half the daylight hours.

EN 17037:2018 sets out values for Minimum and Target levels to be achieved with a minimum, medium and high compliance level for each. The guideline recommends that the minimum level should be achieved for both target levels but it does not give guidance on the number of units or fraction within a multiple residential unit 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. The UK annex sets out factors for UK specific settings where it is difficult to achieve natural daylighting.

The compliance calculation is based on an annual, climate-based simulation of interior illuminance distributions. The BRE guidelines (2022) refers to this method as the Illuminance Method. For each hour of the year, the percentage of the floor area achieving minimum and target illuminance thresholds are measured on a room-by-room basis. Two target types are set with 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.

BS EN 17037 gives three levels of recommendation for daylight provision in an interior space: Minimum, Medium and High. The BRE guidelines (2022) Section C3 recommends for compliance with the standard, a space should achieve the Minimum level.

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:

Target Illuminance From Daylight Over At Least Half The Daylight Hours		
Level of recommendation	Target illuminance E_T(lx) for half of the assessment grid	Minimum illuminance E_{TM}(lx) for 95% of the assessment grid
Minimum	300 lux	100 lux
Medium	500 lux	300 lux
High	750 lux	500 lux

Table 3: IS / BS EN 17037:2018 Target Illuminance from Daylight over at least half the daylight hours.

Target Daylight Factor (D) for Dublin*		
Level of recommendation	Target daylight factor D for half of the assessment grid	Minimum daylight factor D for 95% of the assessment grid
Minimum	2%	0.7%
Medium	3.5%	2%
High	5%	3.5%

Table 4: IS / BS EN 17037:2018 Target Daylight Factor (D) for Dublin.

Target Minimum Daylight Factor (D) for Dublin* based on UK National Annex		
Room Type	Target illuminance E_T(lx) for half of the assessment grid	Target daylight factor D from Table A.3 EN17037 $E_{v,d,med}$ for Dublin -14,900
Bedroom	100 lux	0.7%
Living Room	150 lux	1%
Kitchen	200 lux	1.3%

* EN17037 uses the latitude of the capital city of each European country to set individual values for daylight and sunlight metrics for use in setting the target levels to be achieved in a particular country.

Table 5: BS EN 17037:2018+A1:2021 Target Illuminance levels and Daylight Factor (D) for Dublin.

2.11 Sunlight within Proposed Developments

The BRE guidelines (2022) Section 3.1.7 states:

> *"that for large residential developments the overall sunlight potential can be initially assessed by counting the number of windows facing south, east and west and the aim should be to minimise the number of living rooms facing solely north, north-east or north-west unless there is some compensating factor such as an appealing view to the north."*

In Section 3.1.8 the guideline acknowledges that it may not be possible to have every living room facing within 90° of south in large developments, however, it recommends maximising the number of units with a southerly aspect.

The BRE guidelines (2022) Section 3.1.10 recommends that BS EN 17037 should be used to assess for interior access to direct sunlight. BS EN 17037 Table A.6 sets recommendations for access to sunlight and notes three levels of achievement; Minimum, Medium and High. In dwellings at least one habitable room, preferably a living room, should achieve the Minimum of 1.5 direct hours on a specified date between 1st February and 21st March, with a cloudless sky. This assessment uses the 21st March. The guidelines recommend a time step of 5 minutes or less for the assessment interval. The Minimum level to achieve is 1.5, the Medium level is 3 hours and the High level is 4 hours direct sunlight.

3. Daylight within the Proposed Development

All habitable rooms within the units were assessed for daylight provision by illuminance method. The Illuminance method assesses the daylight levels over at least 50% daylight hours in the year and uses a weather file data set. These methods take into account the orientation of the space. They provide an accurate representation of the daylight provision to a specific room in the context of the proposed environment.

Compliance is demonstrated by a calculation of Daylight Provision with the illuminance method under BS EN 17037:2018+A1:2021. A summary of the results are presented in Table 6 below and a complete set of room results are shown in Appendix A.

For supplementary information, an assessment of Daylight Provision with the illuminance method under IS /BS EN 17037:2018 is undertaken. A summary of the results are presented in Table 7 below and a complete set of room results are shown in Appendix B.

3.1 Assessment for Daylight Provision BS EN 17037:2018+A1:2021

The UK National Annex (A1) contains minimum room specific target values for dwellings in the UK. The UK committee fully supports the recommendations of EN17037:2018 but considers the target daylight levels may be hard to achieve in UK dwellings, in particular in urban areas and areas with mature trees. The Target and Minimum levels set out in IS / BS EN17037:2018 does not take into account room use or make allowance for room that have a lesser requirement for daylight. The UK National Annex A1 in BS EN17037:2018+A1:2021 sets out room specific minimum values to be achieved in the UK and Channel Islands. These target values are set to achieve similar minimum daylight levels as the superseded Average Daylight Factor method (ADF) in BS8206-2 2008.

Minimum daylight provision UK NA.1 - BS EN 17037:2018+A1:2021					
	Room Use	Number of rooms	Target illuminance E_T(lx) for half of the assessment grid	Number of rooms to achieve target Lux over 50% of the assessment grid	Percentage of rooms achieving Target
Apartments	LKD/ Studio	83	200	82	98.8%
	Bedrooms	108	100	108	100.0%
Total		191		190	99.5%

Table 6: Summary of room for Target Illuminance compliance with BS EN 17037:2018+A1:2021. Individual room results can be viewed in Appendix A.

3.2 Conclusion

BR209:2022 recommends assessment methods set out in BS EN 17037 for daylight provision. 99.5% of the Living, Dining, Kitchen and Bedroom spaces achieve the target values set out in BS EN 17037:2018+A1:2021 section NA1. These are the minimum values, per specified use, to be achieved in habitable rooms.

3.3 Supplementary Information - Assessment for Daylight Provision IS / BS EN 17037:2018

A summary of Minimum and Target Illuminance levels under IS EN 17037:2018 Annex A Table A1 are set out in the table below.

Daylight provision Illuminance Method IS EN 17037:2018						
		Below Target	Minimum	Medium	High	Percentage of rooms achieving Target
Overall total	Target Illuminance	13.1%	37.2%	28.8%	20.9%	86.9%
	Minimum Illuminance	6.8%	42.9%	30.4%	19.9%	93.2%

Table 7: Percentage of rooms at each level to IS/BS EN 17037:2018. Individual room results can be viewed in Appendix B.

The results indicate a high level of daylight provision, with 93.2% of rooms achieving Minimum Illuminance and 86.9% achieving Target Illuminance. The rooms will be bright and pleasant spaces.

The recommendations for Daylight provision in Table A1 are not specific for dwellings and do not make allowance for room use. BS EN 17037:2018+A1:2021 address this with the National Annex NA.1 which sets out room specific targets for dwellings and compliance for this is presented in Section 3.2.

4. Sunlight within the Proposed Development

4.1 Sunlight Hours

The BRE guidelines BR209:2022 (third edition) and BS EN 17037:2018+A1:2021 set out recommendations for sunlight hours to be achieved. It states that; *"For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion."* The guidelines recommend the sunlight hours should be assessed preferably on the 21st March over the course of the day. The guidelines set three levels of achievement. Minimum 1.5h, Medium 3h and High 4h. The guideline does not set the percentage of units that need the achieve the recommendations but they do give an example of a well designed floor layout in the figure below where 4 out of 5 units in an apartment building would achieve the target sunlight.

Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

Figure 1: Extract from BR209:2022 Section 3 Sun-lighting: Diagram indicating sample floor plan to maximise units with a main living space facing south.

In dual aspect units the southerly facing rooms have been selected for assessment. In the assessment preference is given to living spaces, however the recommendations of the BRE guidelines are met if minimum sunlight hours are achieved in any habitable room within a dwelling.

Detailed results are presented in Appendix C. It indicates if the habitable room has a relevant south facing window, together with the number of hours it receives sunlight, on the 21st March. A summary of these results are displayed in the table below.

Sunlight Hours Summary Table									
Apartments Units	Total Units	Habitable room with a window within 90° south		Below recommendation <1.5 hours	Minimum >1.5 hours	Medium >3 Hours	High >4 Hours	Number meets criteria	Ratio meets criteria
		No.	Ratio						
Habitable Rm	83	41	49.4%	14	26	14	29	69	83.1%

Table 8: Summary of Results of Assessment of Sunlight Hours

4.2 Comment on EN 17037 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. The guidelines acknowledge that for large developments with site constraints its not possible to achieve south facing windows to all main living spaces and that achieving sunlight hours in another habitable room meets the criteria. In this development with 83 no. units 49.4% (41 no.) have window to a habitable room which faces within 90° south.

Windows with an aspect of greater than 90° due south, to the north west or north east, will still receive sunlight, but it is likely to be lesser amounts especially in the winter period. In this development with 83 no. units 83.1% (69 no.) have a habitable room which achieves the minimum recommended 1.5 direct sunlight hours.

4.3 Conclusion

This scheme is well designed for sunlight, with 83.1% of units meeting the minimum recommended 1.5 direct sunlight hours. This is in line with the BRE guideline example for an apartment layout where 4 in 5 achieves the target sunlight hours

5. Sunlight to Amenity within the Proposed Development

The BRE guidelines BR209:2022 (third edition) indicate that for an amenity area to have good quality sunlight throughout the year, 50% of the ground, should receive in excess of 2 hours sunlight on the 21st of March. It also states that front gardens need not be assessed for sunlight.

5.1 Sunlight to Amenity within the Proposed Development

The amenity area within this proposal have been assessed with a calculation of Sun on the Ground on the 21st March. Generated analysis is shown in Figure 2 and the results are set out in Table 9 below.

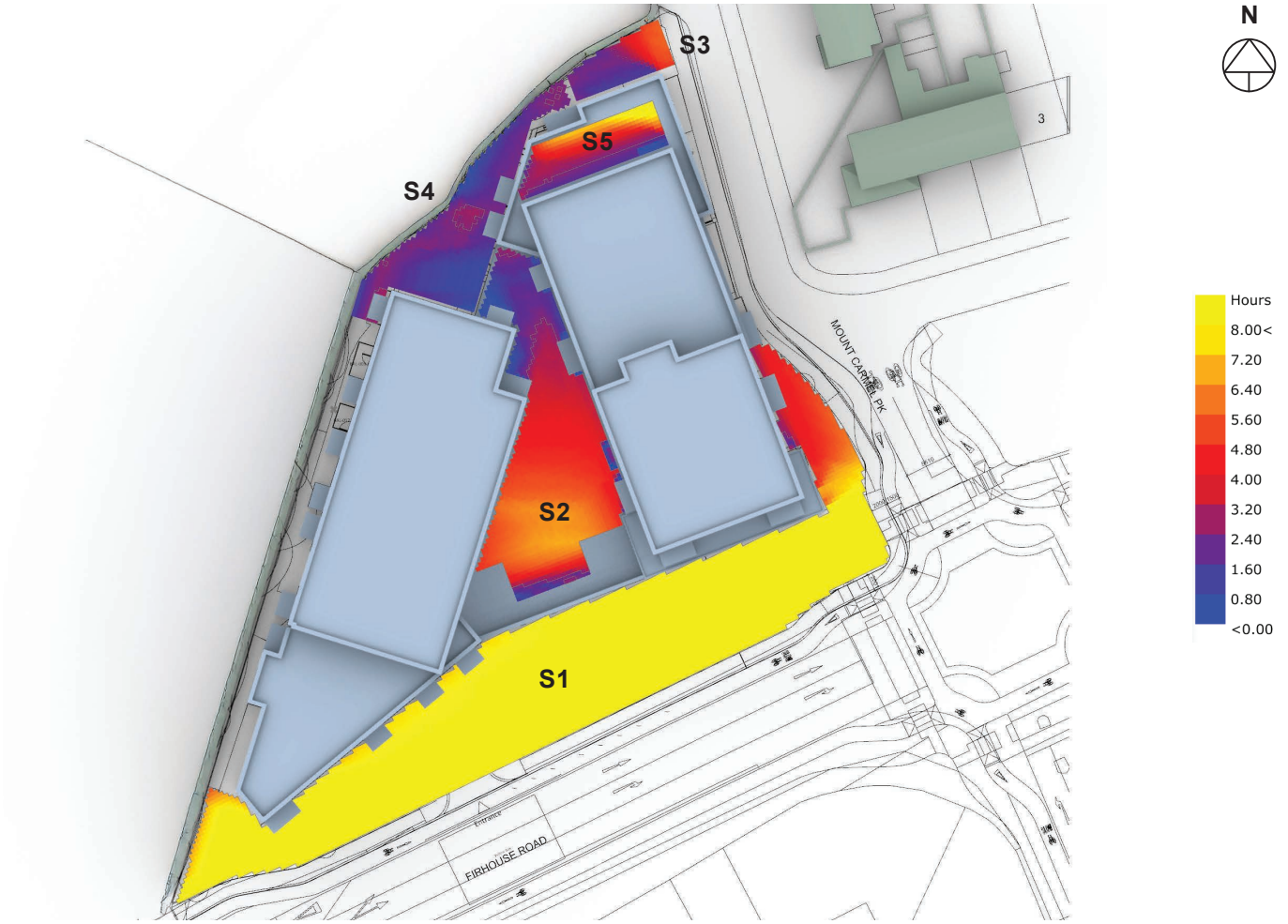

Figure 2: Radiation map of amenity within the proposed development, showing available sunlight on 21st March. The scale represents the sunlight received from 0 - 8 hours.

Sunlight on the Ground - Public & Communal Amenity				
ID No.	Details	Area receiving 2 hours sunlight on 21st March m2	Percent of area receiving 2 hours sunlight on 21st March %	Meets criteria if >50% area receiving 2 hours sunlight on 21st March
S1	POS	1,307.1	99.8%	Y
S2	POS	66.3	42.6%	N
S3	COS	437.4	74.1%	Y
S4	Creche	217.9	6.6%	N
S5	COS	134.3	73.9%	Y

Table 9: Calculation of Sun on the Ground to Amenity Areas within the Proposed Development

5.2 Conclusion

The vast majority of public open space provided achieves high levels of sunlight. The communal amenity spaces are well oriented for sunlight and both achieve high levels of sunlight, meeting the criteria of 2 hours sunlight on the 21st March over in excess of 50% of the area. The proposed development meets the recommendations for sunlight in the BRE guidelines BR209:2022 (third edition).

Appendix A -BS EN17037:2021+A1 Minimum room specific Daylight Provision in accordance with UK National Annex Table NA.1.

Figure 3: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Figure 4: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Figure 5: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block 1 - Minimum Illuminance Levels to BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded - Minimum 50% of Grid	Meets Criteria
B1-001.1	LKD	30.5	278	200	1169	100.0%	Y
B1-001.2	Bed	11.3	99	100	619	100.0%	Y
B1-001.3	Bed	10.9	88	100	680	100.0%	Y
B1-002.1	LKD	23.9	228	200	504	100.0%	Y
B1-002.2	Bed	14.0	113	100	415	100.0%	Y
B1-003.1	LKD	23.9	228	200	528	100.0%	Y
B1-003.2	Bed	14.0	113	100	458	100.0%	Y
B1-004.1	LKD	27.6	247	200	409	98.0%	Y
B1-004.2	Bed	7.5	50	100	861	100.0%	Y
B1-004.3	Bed	11.7	99	100	1302	100.0%	Y
B1-005.1	LKD	30.9	275	200	560	96.7%	Y
B1-005.2	Bed	14.1	120	100	686	100.0%	Y
B1-005.3	Bed	10.7	80	100	865	100.0%	Y
B1-006.1	LKD	32.7	292	200	462	70.2%	Y
B1-006.2	Bed	14.9	126	100	500	100.0%	Y
B1-007.1	Studio	27.3	245	200	814	100.0%	Y
B1-008.1	LKD	27.2	244	200	372	63.9%	Y
B1-008.2	Bed	7.1	50	100	986	100.0%	Y
B1-008.3	Bed	10.8	88	100	501	100.0%	Y
B1-009.1	LKD	23.5	211	200	379	64.0%	Y
B1-009.2	Bed	10.6	80	100	539	100.0%	Y
B1-010.1	LKD	26.6	225	200	655	77.3%	Y
B1-010.2	Bed	10.9	89	100	301	98.9%	Y
B1-011.1	LKD	27.1	229	200	507	67.2%	Y
B1-011.2	Bed	11.6	96	100	1256	100.0%	Y
B1-012.1	LKD	37.8	342	200	716	99.7%	Y
B1-012.2	Bed	11.3	93	100	353	100.0%	Y
B1-012.3	Bed	8.8	71	100	812	100.0%	Y
B1-101.1	LKD	36.0	330	200	1203	100.0%	Y
B1-101.2	Bed	8.1	55	100	736	100.0%	Y
B1-101.3	Bed	9.6	80	100	1089	100.0%	Y
B1-102.1	LKD	32.8	301	200	577	100.0%	Y
B1-102.2	Bed	10.3	82	100	1412	100.0%	Y
B1-102.3	Bed	11.5	95	100	799	100.0%	Y
B1-103.1	LKD	31.1	280	200	605	100.0%	Y
B1-103.2	Bed	10.1	80	100	944	100.0%	Y
B1-103.3	Bed	12.5	104	100	782	100.0%	Y
B1-104.1	LKD	32.0	290	200	2274	100.0%	Y
B1-104.2	Bed	10.3	89	100	923	100.0%	Y
B1-104.3	Bed	10.5	88	100	1674	100.0%	Y
B1-105.1	LKD	28.6	253	200	2474	100.0%	Y
B1-105.2	Bed	12.5	108	100	1479	100.0%	Y
B1-105.3	Bed	11.1	88	100	782	100.0%	Y
B1-106.1	LKD	20.9	190	200	531	95.8%	Y
B1-106.2	Bed	9.5	72	100	1338	100.0%	Y
B1-107.1	LKD	27.2	244	200	389	69.3%	Y
B1-107.2	Bed	7.1	50	100	932	100.0%	Y
B1-107.3	Bed	10.8	88	100	457	100.0%	Y
B1-108.1	LKD	23.2	210	200	411	62.4%	Y
B1-108.2	Bed	10.8	88	100	483	100.0%	Y

Block 1 - Minimum Illuminance Levels to BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded - Minimum 50% of Grid	Meets Criteria
B1-109.1	LKD	26.6	225	200	910	91.1%	Y
B1-109.2	Bed	10.9	89	100	429	100.0%	Y
B1-110.1	LKD	27.1	229	200	712	75.1%	Y
B1-110.2	Bed	11.6	97	100	1330	100.0%	Y
B1-111.1	LKD	23.7	223	200	1502	100.0%	Y
B1-111.2	Bed	11.8	92	100	1231	100.0%	Y
B1-112.1	LKD	25.4	216	200	391	72.2%	Y
B1-112.2	Bed	10.9	88	100	743	100.0%	Y
B1-201.1	LKD	20.7	178	200	701	100.0%	Y
B1-201.2	Bed	12.4	96	100	544	100.0%	Y
B1-202.1	LKD	32.9	304	200	619	100.0%	Y
B1-202.2	Bed	9.8	80	100	1733	100.0%	Y
B1-202.3	Bed	11.8	96	100	780	100.0%	Y
B1-203.1	LKD	30.8	280	200	600	100.0%	Y
B1-203.2	Bed	10.0	80	100	921	100.0%	Y
B1-203.3	Bed	12.2	104	100	766	100.0%	Y
B1-204.1	LKD	32.0	290	200	2207	100.0%	Y
B1-204.2	Bed	9.3	81	100	981	100.0%	Y
B1-204.3	Bed	10.5	88	100	1626	100.0%	Y
B1-205.1	LKD	30.2	260	200	2314	100.0%	Y
B1-205.2	Bed	12.5	108	100	1437	100.0%	Y
B1-205.3	Bed	11.1	88	100	916	100.0%	Y
B1-206.1	LKD	20.8	190	200	455	92.6%	Y
B1-206.2	Bed	10.2	81	100	1455	100.0%	Y
B1-207.1	LKD	23.0	204	200	913	100.0%	Y
B1-207.2	Bed	6.7	45	100	1348	100.0%	Y
B1-207.3	Bed	10.7	88	100	731	100.0%	Y
B1-208.1	LKD	23.3	211	200	867	82.9%	Y
B1-208.2	Bed	10.8	88	100	771	100.0%	Y
B1-209.1	LKD	22.2	185	200	1874	100.0%	Y
B1-209.2	Bed	10.5	81	100	732	100.0%	Y
B1-210.1	LKD	20.8	179	200	2236	100.0%	Y
B1-210.2	Bed	9.0	72	100	844	100.0%	Y
B1-301.1	LKD	40.6	384	200	822	100.0%	Y
B1-301.2	Bed	12.2	96	100	1720	100.0%	Y
B1-301.3	Bed	12.0	96	100	881	100.0%	Y
B1-302.1	LKD	32.0	290	200	2630	100.0%	Y
B1-302.2	Bed	9.3	81	100	985	100.0%	Y
B1-302.3	Bed	10.5	88	100	1642	100.0%	Y
B1-303.1	LKD	30.2	260	200	2837	100.0%	Y
B1-303.2	Bed	12.5	108	100	1505	100.0%	Y
B1-303.3	Bed	11.1	88	100	1339	100.0%	Y
B1-304.1	LKD	20.8	190	200	757	100.0%	Y
B1-304.2	Bed	10.2	81	100	1763	100.0%	Y

Table 10: Minimum Daylight Provision Compliance for Habitable Rooms to BS EN17037:2018+A1:2021

Block 2 - Minimum Illuminance Levels to BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded - Minimum 50% of Grid	Meets Criteria
B2-001.1	LKD	28.0	213	100	499	85.9%	Y
B2-001.2	Bed	8.8	74	100	1400	100.0%	Y
B2-001.3	Bed	10.9	80	100	2469	100.0%	Y
B2-002.1	LKD	22.5	201	100	404	100.0%	Y
B2-002.2	Bed	10.6	88	100	568	100.0%	Y
B2-003.1	LKD	24.2	200	100	490	100.0%	Y
B2-003.2	Bed	9.6	72	100	802	100.0%	Y
B2-004.1	LKD	20.0	177	100	670	100.0%	Y
B2-004.2	Bed	13.0	112	100	666	100.0%	Y
B2-005.1	LKD	25.3	216	100	1211	100.0%	Y
B2-005.2	Bed	10.4	80	100	835	100.0%	Y
B2-006.1	LKD	20.4	190	100	659	100.0%	Y
B2-006.2	Bed	9.4	80	100	459	100.0%	Y
B2-007.1	LKD	31.3	277	100	707	100.0%	Y
B2-007.2	Bed	14.5	120	100	776	100.0%	Y
B2-101.1	LKD	20.4	184	200	1653	100.0%	Y
B2-101.2	Bed	11.5	90	100	1239	100.0%	Y
B2-102.1	LKD	28.9	260	200	1881	100.0%	Y
B2-102.2	Bed	14.7	130	100	976	100.0%	Y
B2-103.1	LKD	21.1	182	200	1310	100.0%	Y
B2-103.2	Bed	11.3	96	100	1418	100.0%	Y
B2-104.1	LKD	21.7	187	200	2078	100.0%	Y
B2-104.2	Bed	11.0	83	100	1615	100.0%	Y
B2-105.1	LKD	35.7	335	200	2405	100.0%	Y
B2-105.2	Bed	10.5	88	100	3088	100.0%	Y
B2-105.3	Bed	12.0	104	100	416	100.0%	Y
B2-106.1	LKD	30.5	268	200	187	27.6%	N
B2-106.2	Bed	9.2	77	100	418	100.0%	Y
B2-107.1	LKD	22.5	183	200	302	51.4%	Y
B2-107.2	Bed	10.8	88	100	335	100.0%	Y
B2-108.1	LKD	23.0	187	200	341	59.9%	Y
B2-108.2	Bed	10.7	80	100	386	100.0%	Y
B2-109.1	LKD	22.5	183	200	405	82.0%	Y
B2-109.2	Bed	10.7	88	100	583	100.0%	Y
B2-110.1	LKD	24.2	200	200	575	93.0%	Y
B2-110.2	Bed	9.6	72	100	815	100.0%	Y
B2-111.1	LKD	20.1	177	200	797	100.0%	Y
B2-111.2	Bed	12.8	112	100	700	100.0%	Y
B2-112.1	LKD	25.6	240	200	1339	100.0%	Y
B2-112.2	Bed	10.5	80	100	869	100.0%	Y
B2-113.1	LKD	20.3	190	200	709	100.0%	Y
B2-113.2	Bed	9.4	80	100	522	100.0%	Y
B2-114.1	LKD	30.8	277	200	782	70.4%	Y
B2-114.2	Bed	10.7	88	100	1148	100.0%	Y
B2-114.3	Bed	11.7	96	100	981	100.0%	Y
B2-201.1	LKD	20.4	184	200	1622	100.0%	Y
B2-201.2	Bed	11.5	90	100	851	100.0%	Y
B2-202.1	LKD	28.9	260	200	2235	100.0%	Y
B2-202.2	Bed	14.7	130	100	991	100.0%	Y
B2-203.1	LKD	21.1	182	200	1756	100.0%	Y
B2-203.2	Bed	11.3	96	100	1533	100.0%	Y

Block 2 - Minimum Illuminance Levels to BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded - Minimum 50% of Grid	Meets Criteria
B2-204.1	LKD	21.7	187	200	2624	100.0%	Y
B2-204.2	Bed	11.0	83	100	1657	100.0%	Y
B2-205.1	LKD	35.7	335	200	2997	100.0%	Y
B2-205.2	Bed	10.5	88	100	3218	100.0%	Y
B2-205.3	Bed	12.0	104	100	651	100.0%	Y
B2-206.1	LKD	30.5	268	200	431	50.6%	Y
B2-206.2	Bed	9.2	77	100	634	100.0%	Y
B2-207.1	LKD	22.5	183	200	676	80.3%	Y
B2-207.2	Bed	10.8	88	100	493	100.0%	Y
B2-208.1	LKD	23.0	187	200	387	59.9%	Y
B2-208.2	Bed	10.7	80	100	525	100.0%	Y
B2-209.1	LKD	22.5	183	200	435	82.5%	Y
B2-209.2	Bed	10.7	88	100	647	100.0%	Y
B2-210.1	LKD	24.2	200	200	617	94.5%	Y
B2-210.2	Bed	9.6	72	100	819	100.0%	Y
B2-211.1	LKD	20.1	177	200	823	100.0%	Y
B2-211.2	Bed	12.8	112	100	699	100.0%	Y
B2-212.1	LKD	25.6	240	200	1387	100.0%	Y
B2-212.2	Bed	10.5	80	100	882	100.0%	Y
B2-213.1	LKD	20.3	190	200	949	100.0%	Y
B2-213.2	Bed	9.4	80	100	568	100.0%	Y
B2-214.1	LKD	30.8	277	200	970	83.4%	Y
B2-214.2	Bed	10.7	88	100	1346	100.0%	Y
B2-214.3	Bed	11.7	96	100	1109	100.0%	Y
B2-301.1	LKD	30.8	277	200	1285	100.0%	Y
B2-301.2	Bed	10.7	88	100	1249	100.0%	Y
B2-301.3	Bed	11.7	96	100	1225	100.0%	Y
B2-302.1	LKD	20.4	184	200	1628	100.0%	Y
B2-302.2	Bed	11.5	90	100	1276	100.0%	Y
B2-303.1	LKD	27.2	241	200	3535	100.0%	Y
B2-303.2	Bed	12.4	108	100	1888	100.0%	Y
B2-303.3	Bed	12.0	102	100	1182	100.0%	Y
B2-304.1	LKD	21.1	183	200	3721	100.0%	Y
B2-304.2	Bed	10.8	88	100	616	100.0%	Y
B2-305.1	LKD	23.0	187	200	693	78.1%	Y
B2-305.2	Bed	10.7	80	100	676	100.0%	Y
B2-306.1	LKD	22.5	183	200	772	97.8%	Y
B2-306.2	Bed	10.7	88	100	741	100.0%	Y
B2-307.1	LKD	24.2	200	200	856	99.5%	Y
B2-307.2	Bed	9.6	72	100	902	100.0%	Y
B2-308.1	LKD	20.1	177	200	1098	100.0%	Y
B2-308.2	Bed	12.8	112	100	749	100.0%	Y
B2-309.1	LKD	25.6	240	200	1607	100.0%	Y
B2-309.2	Bed	10.5	80	100	891	100.0%	Y
B2-310.1	LKD	20.3	190	200	1470	100.0%	Y
B2-310.2	Bed	9.4	80	100	626	100.0%	Y

Table 11: Minimum Daylight Provision Compliance for Habitable Rooms to BS EN17037:2018+A1:2021

Appendix B - Supplementary Information - IS/ BS EN17037:2018 Table A.1 Daylight Provision Room Results

Figure 6: Daylight Provision and Annual Average Illuminance to all Habitable Rooms

Figure 7: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Figure 8: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block 1 EN17037:2018 Table A.1 Daylight Provision Room Schedule

Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
B1-001.1	LKD	30.5	278	Medium	74.7%	61.2%	46.1%	Medium	80.9%	53.5%	30.1%
B1-001.2	Bed	11.3	99	Minimum	65.9%	48.9%	29.3%	Medium	82.6%	57.2%	36.9%
B1-001.3	Bed	10.9	88	Minimum	65.0%	47.3%	25.0%	Medium	81.0%	52.4%	25.6%
B1-002.1	LKD	23.9	228	Minimum	56.3%	35.0%	14.5%	Minimum	77.8%	44.2%	16.5%
B1-002.2	Bed	14.0	113	Minimum	50.2%	24.9%	8.1%	Minimum	75.5%	36.6%	10.6%
B1-003.1	LKD	23.9	228	Minimum	60.0%	39.5%	18.3%	Minimum	79.5%	48.9%	22.1%
B1-003.2	Bed	14.0	113	Minimum	53.5%	28.4%	10.8%	Minimum	76.7%	39.7%	13.9%
B1-004.1	LKD	27.6	247	Fail	41.8%	16.6%	6.0%	Minimum	69.4%	23.7%	4.9%
B1-004.2	Bed	7.5	50	Medium	73.6%	58.9%	42.9%	Medium	83.5%	59.9%	39.3%
B1-004.3	Bed	11.7	99	High	80.2%	69.6%	56.6%	High	88.9%	76.6%	63.2%
B1-005.1	LKD	30.9	275	Minimum	52.5%	28.3%	9.5%	Minimum	69.1%	23.0%	4.9%
B1-005.2	Bed	14.1	120	Minimum	59.8%	37.9%	18.6%	Minimum	76.2%	37.9%	10.7%
B1-005.3	Bed	10.7	80	Medium	72.1%	56.3%	36.6%	Medium	83.4%	58.7%	35.0%
B1-006.1	LKD	32.7	292	Fail	44.9%	25.3%	8.4%	Fail	48.6%	5.7%	0.4%
B1-006.2	Bed	14.9	126	Minimum	50.6%	24.2%	6.4%	Minimum	72.3%	26.9%	4.4%
B1-007.1	Studio	27.3	245	Minimum	54.2%	38.2%	22.6%	Minimum	72.2%	40.5%	18.7%
B1-008.1	LKD	27.2	244	Fail	35.4%	15.8%	5.6%	Fail	32.0%	3.4%	0.0%
B1-008.2	Bed	7.1	50	Minimum	62.9%	47.8%	35.9%	Medium	78.5%	51.3%	34.7%
B1-008.3	Bed	10.8	88	Minimum	53.5%	32.6%	13.6%	Minimum	71.7%	33.9%	8.8%
B1-009.1	LKD	23.5	211	Fail	42.3%	18.8%	6.2%	Fail	47.1%	2.9%	0.5%
B1-009.2	Bed	10.6	80	Minimum	57.1%	37.6%	18.1%	Minimum	75.8%	41.3%	17.6%
B1-010.1	LKD	26.6	225	Fail	48.4%	24.4%	8.3%	Minimum	64.0%	13.4%	4.6%
B1-010.2	Bed	10.9	89	Fail	18.9%	5.9%	0.4%	Fail	46.0%	2.0%	0.0%
B1-011.1	LKD	27.1	229	Fail	44.7%	20.1%	8.3%	Minimum	56.6%	8.9%	3.9%
B1-011.2	Bed	11.6	96	High	82.9%	74.8%	62.1%	High	89.8%	78.6%	66.4%
B1-012.1	LKD	37.8	342	Minimum	61.3%	42.4%	20.0%	Minimum	70.6%	28.8%	4.8%
B1-012.2	Bed	11.3	93	Minimum	51.6%	21.5%	3.2%	Minimum	69.4%	18.3%	1.9%
B1-012.3	Bed	8.8	71	Medium	71.5%	56.7%	41.1%	Medium	83.9%	62.1%	43.5%
B1-101.1	LKD	36.0	330	Medium	73.3%	59.6%	44.2%	Minimum	76.4%	41.8%	13.6%
B1-101.2	Bed	8.1	55	Minimum	63.1%	42.8%	21.8%	Minimum	79.8%	48.6%	22.6%
B1-101.3	Bed	9.6	80	High	78.0%	65.0%	50.5%	High	87.1%	70.4%	54.1%
B1-102.1	LKD	32.8	301	Minimum	59.9%	38.2%	15.1%	Minimum	78.1%	42.4%	11.8%
B1-102.2	Bed	10.3	82	High	81.5%	71.2%	58.6%	High	87.8%	72.6%	57.2%
B1-102.3	Bed	11.5	95	Minimum	67.1%	49.3%	28.3%	Minimum	79.9%	48.5%	21.1%
B1-103.1	LKD	31.1	280	Minimum	58.1%	35.9%	15.6%	Minimum	70.6%	26.6%	5.5%
B1-103.2	Bed	10.1	80	Medium	73.7%	58.0%	40.6%	Medium	84.4%	61.9%	41.0%
B1-103.3	Bed	12.5	104	Minimum	65.6%	47.1%	26.5%	Minimum	78.9%	46.2%	18.2%
B1-104.1	LKD	32.0	290	High	83.6%	76.9%	68.1%	High	88.2%	76.8%	65.5%
B1-104.2	Bed	10.3	89	Medium	70.9%	54.7%	36.1%	Medium	82.4%	55.3%	30.8%
B1-104.3	Bed	10.5	88	Medium	74.0%	61.7%	49.9%	Medium	83.4%	63.1%	47.0%
B1-105.1	LKD	28.6	253	High	83.0%	76.1%	66.9%	High	88.0%	76.3%	64.8%
B1-105.2	Bed	12.5	108	Medium	70.8%	57.8%	45.7%	Medium	81.9%	59.2%	43.2%
B1-105.3	Bed	11.1	88	Minimum	60.1%	47.1%	28.8%	Minimum	72.4%	44.2%	15.0%
B1-106.1	LKD	20.9	190	Fail	48.3%	28.0%	11.1%	Minimum	60.5%	23.1%	3.4%
B1-106.2	Bed	9.5	72	Medium	73.6%	60.7%	49.4%	Medium	82.1%	58.9%	45.2%
B1-107.1	LKD	27.2	244	Fail	37.9%	16.7%	6.7%	Fail	33.9%	0.6%	0.0%
B1-107.2	Bed	7.1	50	Minimum	58.8%	44.6%	29.3%	Minimum	73.8%	44.1%	24.7%
B1-107.3	Bed	10.8	88	Fail	45.6%	22.1%	5.6%	Minimum	59.8%	13.4%	1.0%
B1-108.1	LKD	23.2	210	Fail	44.7%	20.1%	6.8%	Fail	47.3%	3.0%	0.5%
B1-108.2	Bed	10.8	88	Minimum	51.5%	28.1%	7.5%	Minimum	66.7%	23.6%	3.9%

Block 1 EN17037:2018 Table A.1 Daylight Provision Room Schedule											
Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
B1-109.1	LKD	26.6	225	Minimum	56.4%	35.0%	16.7%	Minimum	68.1%	22.9%	6.1%
B1-109.2	Bed	10.9	89	Fail	22.9%	7.1%	2.8%	Fail	48.1%	4.0%	0.0%
B1-110.1	LKD	27.1	229	Minimum	53.7%	30.3%	14.7%	Minimum	62.6%	14.7%	5.4%
B1-110.2	Bed	11.6	97	High	83.9%	76.4%	64.6%	High	89.8%	78.7%	66.6%
B1-111.1	LKD	23.7	223	High	82.7%	75.1%	64.1%	High	88.3%	75.7%	61.3%
B1-111.2	Bed	11.8	92	High	79.6%	68.8%	54.8%	Medium	86.5%	67.0%	48.1%
B1-112.1	LKD	25.4	216	Fail	42.5%	13.0%	5.1%	Minimum	59.8%	6.8%	2.4%
B1-112.2	Bed	10.9	88	Medium	72.0%	57.4%	42.3%	High	86.0%	67.4%	50.4%
B1-201.1	LKD	20.7	178	Medium	66.8%	50.1%	30.1%	Medium	80.3%	51.4%	26.3%
B1-201.2	Bed	12.4	96	Minimum	54.7%	31.3%	12.8%	Minimum	77.5%	43.3%	16.9%
B1-202.1	LKD	32.9	304	Minimum	63.7%	45.9%	24.5%	Medium	81.3%	52.7%	28.6%
B1-202.2	Bed	9.8	80	High	84.1%	77.1%	66.5%	High	90.0%	79.1%	67.5%
B1-202.3	Bed	11.8	96	Minimum	66.9%	49.7%	29.0%	Minimum	79.6%	48.7%	21.6%
B1-203.1	LKD	30.8	280	Minimum	58.3%	35.9%	14.0%	Minimum	71.2%	27.7%	5.6%
B1-203.2	Bed	10.0	80	Medium	73.1%	57.5%	40.3%	Medium	83.6%	60.4%	38.6%
B1-203.3	Bed	12.2	104	Minimum	65.1%	47.0%	25.6%	Minimum	78.7%	46.1%	18.5%
B1-204.1	LKD	32.0	290	High	83.1%	76.3%	67.4%	High	88.2%	76.9%	65.5%
B1-204.2	Bed	9.3	81	Medium	72.7%	57.2%	40.2%	Medium	84.7%	63.4%	43.4%
B1-204.3	Bed	10.5	88	Medium	73.4%	61.4%	49.4%	Medium	83.4%	63.4%	47.7%
B1-205.1	LKD	30.2	260	High	82.8%	75.9%	66.7%	High	83.8%	65.9%	52.5%
B1-205.2	Bed	12.5	108	Medium	70.3%	57.3%	45.3%	Medium	82.0%	59.5%	43.3%
B1-205.3	Bed	11.1	88	Medium	65.5%	53.1%	37.1%	Medium	77.2%	50.4%	27.3%
B1-206.1	LKD	20.8	190	Fail	47.6%	25.0%	9.4%	Minimum	60.6%	16.0%	3.3%
B1-206.2	Bed	10.2	81	High	75.5%	63.7%	53.0%	Medium	82.6%	61.4%	47.6%
B1-207.1	LKD	23.0	204	Minimum	59.9%	45.1%	28.1%	Minimum	71.6%	39.1%	15.0%
B1-207.2	Bed	6.7	45	Medium	70.5%	58.2%	46.9%	Medium	78.9%	54.0%	37.6%
B1-207.3	Bed	10.7	88	Minimum	57.1%	39.6%	18.9%	Minimum	70.4%	34.7%	5.7%
B1-208.1	LKD	23.3	211	Minimum	58.8%	38.4%	22.0%	Minimum	61.6%	17.6%	5.0%
B1-208.2	Bed	10.8	88	Minimum	60.2%	43.6%	21.7%	Minimum	73.6%	36.6%	9.2%
B1-209.1	LKD	22.2	185	High	85.6%	78.5%	69.4%	High	87.4%	70.0%	53.9%
B1-209.2	Bed	10.5	81	Medium	73.2%	56.0%	39.1%	Medium	86.3%	65.5%	45.7%
B1-210.1	LKD	20.8	179	High	87.4%	82.3%	76.2%	High	92.4%	83.5%	76.4%
B1-210.2	Bed	9.0	72	Medium	77.3%	62.6%	47.5%	High	87.0%	68.8%	50.2%
B1-301.1	LKD	40.6	384	Medium	72.9%	56.5%	39.5%	Minimum	78.5%	45.6%	11.6%
B1-301.2	Bed	12.2	96	High	83.5%	75.7%	65.0%	High	89.2%	77.4%	64.4%
B1-301.3	Bed	12.0	96	Medium	69.0%	52.4%	33.8%	Medium	81.1%	52.1%	25.5%
B1-302.1	LKD	32.0	290	High	84.2%	77.9%	70.0%	High	88.8%	77.8%	67.4%
B1-302.2	Bed	9.3	81	Medium	72.3%	57.0%	39.8%	Medium	84.5%	63.0%	42.9%
B1-302.3	Bed	10.5	88	Medium	73.6%	61.6%	49.7%	Medium	83.1%	62.8%	46.9%
B1-303.1	LKD	30.2	260	High	84.7%	79.1%	71.9%	High	85.4%	68.3%	56.3%
B1-303.2	Bed	12.5	108	Medium	71.2%	58.4%	46.4%	Medium	82.1%	60.3%	43.6%
B1-303.3	Bed	11.1	88	Medium	73.7%	60.5%	49.1%	Medium	82.5%	60.3%	43.4%
B1-304.1	LKD	20.8	190	Minimum	61.3%	45.8%	26.2%	Minimum	74.3%	42.6%	12.9%
B1-304.2	Bed	10.2	81	High	79.8%	70.5%	60.0%	High	87.0%	72.1%	58.8%

Table 12: Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Block 2 EN17037:2018 Table A.1 Daylight Provision Room Schedule

Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
B2-001.1	LKD	28.0	213	Minimum	50.4%	28.4%	13.6%	Fail	30.0%	0.0%	0.0%
B2-001.2	Bed	8.8	74	Medium	72.9%	57.2%	40.8%	Minimum	74.9%	37.9%	17.6%
B2-001.3	Bed	10.9	80	High	83.1%	76.2%	65.7%	High	88.8%	77.1%	64.7%
B2-002.1	LKD	22.5	201	Minimum	54.7%	25.0%	7.8%	Minimum	68.4%	14.4%	2.1%
B2-002.2	Bed	10.6	88	Minimum	64.0%	42.1%	19.6%	Minimum	80.4%	48.2%	19.3%
B2-003.1	LKD	24.2	200	Minimum	55.3%	31.1%	11.2%	Minimum	67.3%	15.9%	3.9%
B2-003.2	Bed	9.6	72	Medium	70.8%	52.8%	33.1%	Medium	84.2%	59.1%	35.5%
B2-004.1	LKD	20.0	177	Minimum	66.3%	46.7%	25.7%	Medium	80.4%	50.3%	24.1%
B2-004.2	Bed	13.0	112	Minimum	61.4%	39.3%	19.4%	Minimum	77.5%	39.8%	13.7%
B2-005.1	LKD	25.3	216	High	82.6%	75.0%	62.0%	High	87.2%	69.6%	52.4%
B2-005.2	Bed	10.4	80	Minimum	68.7%	49.8%	30.6%	Medium	81.8%	55.0%	30.6%
B2-006.1	LKD	20.4	190	Minimum	66.0%	49.1%	30.7%	Minimum	75.6%	40.0%	16.1%
B2-006.2	Bed	9.4	80	Minimum	57.5%	33.3%	5.4%	Minimum	76.5%	33.9%	1.9%
B2-007.1	LKD	31.3	277	Minimum	52.3%	35.3%	20.0%	Minimum	54.5%	16.3%	4.6%
B2-007.2	Bed	14.5	120	Minimum	54.6%	39.2%	24.8%	Minimum	76.0%	46.3%	29.1%
B2-101.1	LKD	20.4	184	High	77.6%	65.8%	54.5%	Medium	82.2%	60.7%	44.3%
B2-101.2	Bed	11.5	90	Medium	75.4%	62.2%	49.6%	High	86.8%	71.2%	56.6%
B2-102.1	LKD	28.9	260	High	80.8%	72.5%	61.9%	High	85.0%	67.3%	52.0%
B2-102.2	Bed	14.7	130	Minimum	63.3%	45.6%	27.3%	Minimum	73.1%	32.7%	12.2%
B2-103.1	LKD	21.1	182	Medium	71.1%	57.8%	44.9%	Medium	78.8%	51.1%	32.6%
B2-103.2	Bed	11.3	96	Medium	71.1%	57.6%	43.4%	Medium	81.4%	58.0%	39.2%
B2-104.1	LKD	21.7	187	High	80.1%	71.6%	61.6%	High	88.5%	77.4%	66.0%
B2-104.2	Bed	11.0	83	Medium	74.4%	62.0%	48.9%	Medium	83.2%	63.3%	47.2%
B2-105.1	LKD	35.7	335	High	83.5%	77.8%	69.3%	High	89.0%	79.5%	69.1%
B2-105.2	Bed	10.5	88	High	84.4%	78.4%	70.9%	High	90.9%	81.3%	73.3%
B2-105.3	Bed	12.0	104	Fail	36.6%	11.9%	4.1%	Minimum	61.6%	11.1%	2.6%
B2-106.1	LKD	30.5	268	Fail	3.5%	0.0%	0.0%	Fail	16.6%	0.0%	0.0%
B2-106.2	Bed	9.2	77	Fail	30.9%	10.0%	4.4%	Minimum	54.9%	7.2%	1.8%
B2-107.1	LKD	22.5	183	Fail	25.1%	7.0%	3.4%	Fail	42.1%	2.8%	0.6%
B2-107.2	Bed	10.8	88	Fail	23.8%	6.1%	3.3%	Minimum	53.1%	5.9%	2.3%
B2-108.1	LKD	23.0	187	Fail	33.9%	6.8%	2.9%	Fail	48.4%	0.7%	0.0%
B2-108.2	Bed	10.7	80	Fail	25.3%	6.7%	3.7%	Fail	48.7%	5.3%	0.5%
B2-109.1	LKD	22.5	183	Minimum	52.3%	23.0%	4.4%	Minimum	66.6%	9.3%	1.6%
B2-109.2	Bed	10.7	88	Minimum	65.2%	44.0%	21.3%	Minimum	79.8%	47.7%	18.5%
B2-110.1	LKD	24.2	200	Minimum	60.3%	37.7%	16.5%	Minimum	68.6%	19.8%	4.6%
B2-110.2	Bed	9.6	72	Medium	71.5%	54.1%	34.5%	Medium	83.6%	58.3%	35.6%
B2-111.1	LKD	20.1	177	Medium	69.3%	51.4%	32.5%	Medium	82.1%	55.2%	31.6%
B2-111.2	Bed	12.8	112	Minimum	64.0%	43.6%	23.0%	Minimum	77.7%	41.5%	14.5%
B2-112.1	LKD	25.6	240	High	83.9%	76.6%	65.5%	High	87.3%	70.6%	53.9%
B2-112.2	Bed	10.5	80	Medium	69.2%	51.1%	32.9%	Medium	81.8%	55.3%	31.7%
B2-113.1	LKD	20.3	190	Medium	68.4%	53.0%	35.9%	Minimum	75.8%	43.0%	19.1%
B2-113.2	Bed	9.4	80	Minimum	62.4%	40.3%	11.9%	Minimum	78.1%	41.5%	5.6%
B2-114.1	LKD	30.8	277	Minimum	53.5%	37.0%	19.8%	Minimum	51.3%	8.5%	0.0%
B2-114.2	Bed	10.7	88	Medium	67.4%	53.6%	41.4%	Medium	80.2%	55.3%	39.9%
B2-114.3	Bed	11.7	96	Minimum	62.3%	47.6%	31.7%	Minimum	74.5%	44.6%	22.6%
B2-201.1	LKD	20.4	184	High	77.2%	65.4%	53.9%	Medium	82.6%	60.9%	45.8%
B2-201.2	Bed	11.5	90	Medium	68.0%	53.1%	36.3%	Medium	83.9%	63.5%	46.2%
B2-202.1	LKD	28.9	260	High	81.5%	74.0%	63.8%	High	85.0%	67.6%	52.7%
B2-202.2	Bed	14.7	130	Minimum	62.9%	45.8%	26.5%	Minimum	73.9%	34.2%	12.9%
B2-203.1	LKD	21.1	182	Medium	75.1%	62.5%	49.9%	Medium	79.8%	53.9%	36.2%

Block 2 EN17037:2018 Table A.1 Daylight Provision Room Schedule											
Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
B2-203.2	Bed	11.3	96	Medium	72.6%	59.1%	46.5%	Medium	82.0%	59.6%	42.4%
B2-204.1	LKD	21.7	187	High	82.2%	75.8%	65.7%	High	89.9%	79.8%	70.6%
B2-204.2	Bed	11.0	83	Medium	74.8%	62.3%	49.5%	Medium	83.9%	65.0%	49.1%
B2-205.1	LKD	35.7	335	High	85.8%	81.1%	74.5%	High	90.8%	81.8%	74.2%
B2-205.2	Bed	10.5	88	High	84.8%	79.1%	71.8%	High	91.2%	81.8%	74.7%
B2-205.3	Bed	12.0	104	Minimum	61.2%	36.0%	17.6%	Minimum	76.3%	33.6%	11.0%
B2-206.1	LKD	30.5	268	Fail	24.9%	6.5%	3.3%	Minimum	56.5%	4.5%	1.4%
B2-206.2	Bed	9.2	77	Minimum	61.2%	34.0%	15.9%	Minimum	74.1%	24.5%	7.0%
B2-207.1	LKD	22.5	183	Minimum	58.0%	32.9%	16.0%	Minimum	65.9%	13.1%	5.1%
B2-207.2	Bed	10.8	88	Fail	43.3%	18.0%	7.6%	Minimum	64.8%	12.4%	4.5%
B2-208.1	LKD	23.0	187	Fail	36.0%	9.1%	3.9%	Fail	39.4%	0.6%	0.0%
B2-208.2	Bed	10.7	80	Fail	44.2%	19.3%	8.1%	Minimum	66.2%	12.7%	4.0%
B2-209.1	LKD	22.5	183	Minimum	53.0%	24.2%	5.2%	Minimum	65.2%	6.7%	1.1%
B2-209.2	Bed	10.7	88	Minimum	65.2%	43.9%	21.0%	Minimum	80.3%	49.5%	20.3%
B2-210.1	LKD	24.2	200	Minimum	61.6%	40.4%	18.6%	Minimum	69.7%	23.2%	5.5%
B2-210.2	Bed	9.6	72	Medium	70.8%	53.7%	35.4%	Medium	84.1%	59.9%	37.6%
B2-211.1	LKD	20.1	177	Medium	70.0%	53.2%	34.8%	Medium	82.3%	55.9%	33.2%
B2-211.2	Bed	12.8	112	Minimum	64.6%	44.5%	23.2%	Minimum	78.1%	43.5%	15.8%
B2-212.1	LKD	25.6	240	High	84.4%	77.3%	67.1%	High	87.6%	71.8%	55.5%
B2-212.2	Bed	10.5	80	Medium	69.5%	51.9%	34.3%	Medium	82.4%	56.1%	33.1%
B2-213.1	LKD	20.3	190	Medium	76.7%	62.1%	48.7%	Medium	82.7%	59.2%	40.0%
B2-213.2	Bed	9.4	80	Minimum	66.7%	46.8%	19.0%	Minimum	79.6%	46.9%	9.3%
B2-214.1	LKD	30.8	277	Minimum	60.4%	46.1%	28.7%	Minimum	59.8%	13.3%	0.7%
B2-214.2	Bed	10.7	88	Medium	72.9%	59.4%	48.3%	Medium	81.2%	57.8%	42.4%
B2-214.3	Bed	11.7	96	Medium	66.6%	53.0%	37.6%	Minimum	77.3%	49.7%	26.3%
B2-301.1	LKD	30.8	277	Medium	73.6%	60.3%	46.6%	Minimum	70.9%	33.2%	4.6%
B2-301.2	Bed	10.7	88	Medium	70.7%	57.0%	44.7%	Medium	80.9%	57.4%	39.3%
B2-301.3	Bed	11.7	96	Medium	70.7%	56.7%	43.6%	Medium	80.5%	55.6%	35.6%
B2-302.1	LKD	20.4	184	High	77.3%	66.2%	54.3%	Medium	83.0%	61.7%	45.4%
B2-302.2	Bed	11.5	90	High	76.4%	64.3%	52.0%	High	87.2%	73.3%	58.9%
B2-303.1	LKD	27.2	241	High	86.2%	81.5%	75.6%	High	91.1%	82.1%	74.9%
B2-303.2	Bed	12.4	108	High	80.3%	71.3%	60.7%	High	88.4%	76.8%	64.2%
B2-303.3	Bed	12.0	102	Medium	70.9%	56.5%	41.3%	Medium	79.1%	50.2%	26.5%
B2-304.1	LKD	21.1	183	High	87.6%	82.9%	77.6%	High	92.5%	83.5%	77.3%
B2-304.2	Bed	10.8	88	Minimum	60.2%	33.3%	14.0%	Minimum	76.6%	29.9%	9.0%
B2-305.1	LKD	23.0	187	Minimum	58.9%	33.3%	14.6%	Minimum	61.1%	7.4%	1.7%
B2-305.2	Bed	10.7	80	Minimum	64.2%	38.2%	19.4%	Minimum	74.7%	26.8%	8.1%
B2-306.1	LKD	22.5	183	Minimum	65.9%	44.7%	23.7%	Minimum	72.2%	25.0%	5.8%
B2-306.2	Bed	10.7	88	Minimum	68.0%	48.9%	28.0%	Medium	81.8%	54.2%	27.6%
B2-307.1	LKD	24.2	200	Minimum	67.1%	48.4%	28.4%	Minimum	73.4%	31.5%	9.0%
B2-307.2	Bed	9.6	72	Medium	73.7%	58.2%	41.0%	Medium	85.1%	63.1%	43.2%
B2-308.1	LKD	20.1	177	Medium	76.2%	62.0%	46.0%	Medium	84.4%	61.8%	41.7%
B2-308.2	Bed	12.8	112	Minimum	65.5%	46.3%	25.1%	Minimum	78.0%	43.4%	16.0%
B2-309.1	LKD	25.6	240	High	85.4%	78.2%	69.6%	High	87.7%	72.8%	56.9%
B2-309.2	Bed	10.5	80	Medium	68.6%	51.3%	33.7%	Medium	82.7%	57.7%	35.0%
B2-310.1	LKD	20.3	190	High	82.9%	75.6%	64.3%	High	87.6%	72.5%	57.6%
B2-310.2	Bed	9.4	80	Medium	69.4%	51.5%	28.1%	Medium	82.1%	54.6%	25.4%

Table 13: Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Appendix C - Sunlight Hours to Habitable Rooms Within the Proposed Development

Sunlight Hours Apartments Block 1				
Unit ID	Room Use	Habitable room window within 90° south	No. sunlight hours on 21st March	EN17037:2018 Level of exposure to sunlight
B1-001.1	LKD	No	3.7	Medium
B1-002.1	LKD	No	2.2	Minimum
B1-003.1	LKD	No	1.4	Below criteria
B1-004.1	LKD	No	2.8	Minimum
B1-005.1	LKD	No	3.8	Medium
B1-006.1	LKD	Yes	1.7	Minimum
B1-007.1	Studio	Yes	2.8	Minimum
B1-008.2	Bed	Yes	1.8	Minimum
B1-009.1	LKD	Yes	1.2	Below criteria
B1-010.1	LKD	No	2.3	Minimum
B1-011.1	LKD	No	2.8	Minimum
B1-012.1	LKD	No	3.0	Medium
B1-101.1	LKD	No	3.7	Medium
B1-102.1	LKD	No	1.8	Minimum
B1-103.1	LKD	No	3.8	Medium
B1-104.1	LKD	Yes	6.8	High
B1-105.1	LKD	Yes	6.9	High
B1-106.2	Bed	Yes	1.5	Minimum
B1-107.1	LKD	Yes	1.0	Below criteria
B1-108.1	LKD	Yes	2.0	Minimum
B1-109.1	LKD	Yes	2.6	Minimum
B1-110.1	LKD	No	3.3	Medium
B1-111.1	LKD	No	3.9	Medium
B1-112.1	LKD	No	2.1	Minimum
B1-201.1	LKD	No	2.5	Minimum
B1-202.1	LKD	No	2.1	Minimum
B1-203.1	LKD	No	3.8	Medium
B1-204.1	LKD	Yes	6.9	High
B1-205.1	LKD	Yes	7.0	High
B1-206.2	Bed	Yes	1.6	Minimum
B1-207.1	LKD	Yes	2.7	Minimum
B1-208.1	LKD	Yes	2.3	Minimum
B1-209.1	LKD	Yes	6.1	High
B1-210.1	LKD	No	3.8	Medium
B1-301.1	LKD	No	3.3	Medium
B1-302.1	LKD	Yes	8.9	High
B1-303.1	LKD	Yes	8.9	High
B1-304.1	LKD	Yes	3.1	Medium

Table 14: Sunlight Hours In Apartments

Sunlight Hours Apartments Block 2				
Unit ID	Room Use	Habitable room window within 90° south	No. sunlight hours on 21st March	EN17037:2018 Level of exposure to sunlight
B2-001.1	LKD	Yes	2.6	Minimum
B2-002.1	LKD	No	0.9	Below criteria
B2-003.1	LKD	No	2.2	Minimum
B2-004.1	LKD	No	3.1	Medium
B2-005.1	LKD	No	4.0	High
B2-006.1	LKD	Yes	0.0	Below criteria
B2-007.1	LKD	Yes	2.5	Minimum
B2-101.1	LKD	Yes	5.1	High
B2-102.1	LKD	Yes	6.7	High
B2-103.1	LKD	Yes	6.8	High
B2-104.1	LKD	Yes	6.9	High
B2-105.1	LKD	Yes	5.5	High
B2-106.1	LKD	No	0.2	Below criteria
B2-107.1	LKD	No	0.3	Below criteria
B2-108.1	LKD	No	1.1	Below criteria
B2-109.1	LKD	No	0.6	Below criteria
B2-110.1	LKD	No	2.3	Minimum
B2-111.1	LKD	No	4.0	High
B2-112.1	LKD	No	4.0	High
B2-113.1	LKD	Yes	0.0	Below criteria
B2-114.1	LKD	Yes	2.8	Minimum
B2-201.1	LKD	Yes	5.1	High
B2-202.1	LKD	Yes	7.8	High
B2-203.1	LKD	Yes	7.8	High
B2-204.1	LKD	Yes	7.8	High
B2-205.1	LKD	Yes	7.8	High
B2-206.1	LKD	No	0.7	Below criteria
B2-207.1	LKD	No	2.0	Minimum
B2-208.1	LKD	No	1.2	Below criteria
B2-209.1	LKD	No	0.4	Below criteria
B2-210.1	LKD	No	2.9	Minimum
B2-211.1	LKD	No	4.0	High
B2-212.1	LKD	No	4.0	High
B2-213.1	LKD	Yes	0.0	Below criteria
B2-214.1	LKD	Yes	3.3	Medium
B2-301.1	LKD	Yes	4.3	High
B2-302.1	LKD	Yes	4.9	High
B2-303.1	LKD	Yes	9.3	High
B2-304.1	LKD	Yes	8.9	High
B2-305.1	LKD	No	1.6	Minimum
B2-306.1	LKD	No	1.7	Minimum
B2-307.1	LKD	No	4.0	High
B2-308.1	LKD	No	4.0	High
B2-309.1	LKD	No	4.0	High
B2-310.1	LKD	Yes	3.8	Medium

Table 15: Sunlight Hours In Apartments