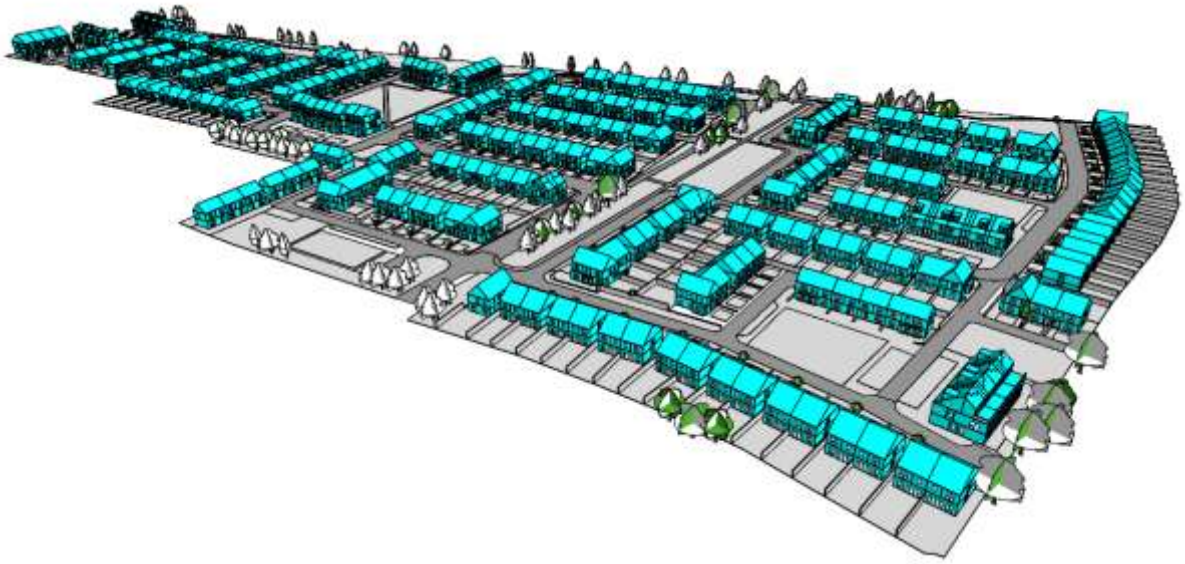
Project: Fermoy Residential Development

Report Title: Daylight, Sunlight & Overshadowing Report



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EXECUTIVE SUMMARY

A comprehensive Daylight, Sunlight and Overshadowing Assessment for this proposed project is presented in this report. This assessment makes reference to the prescribed methodologies of the BRE guide and applied the specific daylight / sunlight quantitative performance standards contained therein. The BRE guidance refers to the BRE document 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' (2011) (herein referred to as the "BRE Guide") by P J Littlefair, which is based on the previous British daylighting standard (BS 8206-2:2008) and has been accepted as good practice by Planning Authorities. The BRE Guide gives advice on site layout to achieve provision of daylight and sunlight both within buildings, and in the open spaces between them. In general, it aims to aid designers in considering the relationship between new and existing buildings to ensure that each retains the potential to achieve good daylighting and sunlight levels. This authoritative document is widely used to provide guidance during the planning and design stages of building development in the UK and Ireland.

However, it should be noted that the previous BS 8206-2:2008 standard has been replaced with an updated European standard – EN 17037. As a result, the BRE Guide is currently being revised. While the new revision of the BRE Guide is not yet published, it will refer to the requirements of the new European Standard EN 17037.

It is noted that BS 8206-2:2008: Lighting for Buildings - Part 2: Code of practice for daylighting was recently replaced with EN 17037:2018 Daylight in Buildings. BRE is currently revising the BRE Guide (BR209) to align their guidance with the new EN 17037:2018 however, this updated guidance document has not yet been published. Until the new BRE Guide is released, the position of BRE can be summarised from a post by Dr. Littlefair on the LinkedIn Planning Daylight & Sunlight Group (BRE BR209):

"BR209 currently refers to the former British Standard BS 8206 Part 2. For the time being, until BR209 is rewritten, we are adopting a flexible approach to applying the two standards, for example in assessing the daylight and sunlight available in new buildings. So for example if we were reviewing a daylight report for a local authority, we would consider it reasonable to accept either average daylight factor tables calculated using BS8206 or median daylight factors/median illuminances calculated using EN17037, provided they were calculated and presented properly.
EN17037 does not deal with loss of daylight or sunlight to existing buildings, so the current BR209 methodology can be used here, until the revised version is published.".

As a consequence of this, we have carried out a comprehensive daylighting analysis using both standards, providing daylighting results in terms of Average Daylight Factor (based on previous British Standard – BS 8206-2) and Spatial Daylight Autonomy (based on current European Standard – EN 17037). The sunlight component of this assessment has been carried out in accordance with existing BRE guidance (BR209).

It is important that the guidelines that exist in relation to daylight and sunlight are read in the correct context and are not viewed as mandatory requirements. Requirements for daylight should be balanced against other elements of the design such as thermal performance (which is directly impacted by the size, shape and location of glazing) and the risk of overheating due to excessive glazing areas. This approach will ensure an optimal overall solution is reached for the development.

A summary of each component of the analysis is provided below:

Impact on surrounding areas	
Assessment Type	**Results Summary**
Impact of loss of daylight to neighbouring properties	Due to the low-rise nature of the development and the distance to the nearest existing residential property, it was not necessary to analyse the impact of loss of daylight to neighbouring residential properties. The proposed development will not cause any perceivable loss of daylight to existing residential properties.
Sunlight availability in surrounding living spaces	Due to the low-rise nature of the development and the distance to the nearest existing residential property, it was not necessary to analyse the level of sunlight availability in surrounding living spaces. The proposed development will not cause any perceivable loss of sunlight in the living spaces of any existing residential properties.
Sunlight availability within surrounding amenity spaces	Due to the low-rise nature of the development and the distance to the nearest existing amenity space, it was not necessary to carry out an analysis to determine sunlight availability in surrounding amenity spaces. The proposed development will not cause a perceivable loss of sunlight to any adjacent amenity space.

Impact within proposed development	
Assessment Type	**Results Summary**
Average Daylight Factor within the proposed dwellings	Average Daylight Factor results are covered in detail in *Section 8* of this report. Daylight performance for this development has been assessed using BR209 (BRE guidance document based on the standards outlined in BS8206-2) and EN 17037 (latest European Standard which supersedes BS8206). A summary of the results are as follows; **Average Daylight Factor (BS8206-2: 2008)** Minimum recommended Average Daylight Factors (ADF) are: • Bedrooms - 1.00 % • Living Rooms / Kitchen – 2.00 % All relevant rooms within the representative sample units (bedrooms and living spaces) were included in this ADF assessment. The results show that the majority of rooms assessed achieve the recommended ADF value outlined in the BRE Guide. Many of the rooms that do not meet these targets have achieved an ADF that is only marginally below the BRE recommendation. A summary of the ADF results are as follows; • **99.53%** of bedrooms achieve an ADF of ≥ **1.00%** • **95.27%** of living spaces achieve an ADF of ≥ **1.50%** • **91.22%** of the living spaces achieve an ADF of ≥ **2.00%** The results of this ADF analysis are tabulated in detail in *Appendix B* of this report. **Spatial Daylight Autonomy (EN 17037:2018)** In order to comply with the daylighting standard set out in EN 17037, each space assessed must achieve the following: • 300 Lux over at least 50% of its floor area for over 50% of annual daylit hours, and • 100 Lux over at least 95% of its floor area for over 50% of annual daylit hours

	The results of this spatial daylight autonomy assessment are summarised below and tabulated in detail in Appendix C of this report in accordance with EN 17037. • 78.14% of bedrooms achieve the required annual illuminance • 73.65% of kitchens/living/dining rooms achieve the required annual illuminance • **76.31%** of the total number of spaces assessed achieve the annual required illuminance. A number of compensatory factors exist within the spaces that do not meet the daylight performance criteria outlined above. These are described in *Section 10* of this report.
Sunlight availability within proposed amenity spaces	Sunlight availability results are covered in detail in Section 10 of this report. All proposed amenity areas were analysed as part of this study including any common open areas and private gardens. BRE Guidelines recommend that in order for an amenity space to appear adequately sunlit throughout the year, <u>at least half of the amenity space should receive at least two hours of sunlight on the design day, March 21st.</u> This study confirms the following: 1. The vast majority of amenity areas within the proposed development achieve more than two hours of sunshine on the design day (21st March) over at least half of the amenity space. 2. Any localised cases where 2 hours of direct sunlight is not achieved over 50% of the area occur in north-facing gardens due to the orientation of the house relative to its garden. 21st March is the appropriate date for assessing impacts on sunlight availability as per the BRE Guidance, as it provides sunlight information for an average day of the year – i.e., neither peak summer (where ample sunlight is available) nor peak winter (where relatively little sunlight is available in any location). It should be noted that amenity area sunlight assessments during winter months are of limited use due to the low angle and reduced hours of

	sunlight at this time. The use of these outdoor amenity areas will also significantly reduce during winter months due to potential rainfall and colder temperatures, reducing the requirement for high levels of sunlight availability at this time. For this reason, the sunlight availability to the amenity spaces was not assessed specifically for winter months in accordance with BRE guidance. The sunlight availability results within the proposed amenity areas are further discussed in *Section 9* of this report.
Sunlight availability in proposed living spaces	The BRE guidance document states that living rooms will appear reasonably sunlit provided: • at least one main window wall faces within 90° of due south and • the centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21st September and 21st March. This analysis confirms that each of the openings of the proposed living spaces that face within 90° of due south receive at least 25% of annual probable sunlight hours and 5% of their probable sunlight hours during winter months. For the purpose of this analysis, a “living space” is defined as the main living room within the dwelling and does not refer to kitchens or bedrooms. In line with BRE guidance, any openings that do not face within 90° of due south were not assessed as a part of this analysis. Due to their orientation and the sun path, these windows will not receive any significant level of direct sunlight in any case. Compensatory factors are outlined in Section 10 of this report for any space that does not achieve the BRE recommendation.

Overshadowing Analysis	**March 21st** No significant overshadowing of properties within the development. Any minor additional overshadowing limited to short time periods in the early morning and late evening. **June 21st** No significant overshadowing of properties within the development. **December 21st** Minor overshadowing of properties within the proposed development due to the proximity of the units/gardens and the low angle of the winter sunlight. See Appendix A for Overshadowing Images.

Having carried out a comprehensive assessment, in our opinion this proposed residential development largely achieves the best practice industry guidelines in relation to Daylight, Sunlight and Overshadowing as outlined in the BRE Guide and EN 17037:2018 – Daylight in Buildings. Consideration should always be given to other aspects of the design of dwellings such as thermal performance and the risk of overheating, both of which are statutory requirements under TGD Part L.

1. INTRODUCTION

Passive Dynamics Sustainability Consultants has prepared this Daylight, Sunlight and Overshadowing report for and on behalf of Cumnor Construction Ltd. to accompany a Strategic Housing Development planning application for the proposed Residential Development in Fermoy, Co. Cork. The scope of the assessment was to determine the following:

- Assessment of daylight performance within the proposed units
- Sunlight availability within amenity spaces within the proposed development.
- Overshading analysis

Daylight and Sunlight calculations have been carried out in accordance with BRE's 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' (2011) (herein referred to as the "BRE Guide") by P J Littlefair, which is accepted as good practice by Planning Authorities. This document refers specifically to the BRE Guidance and requires planning authorities to have regard to the quantitative performance approaches outlined in documents such as the BRE Guidance document.

This report also makes reference to the standards outlined in the European Standard EN 17037 – Daylight in Buildings. This standard provides recommended daylight performance levels for residential developments in Europe and is the most current standard available to design teams.

The BRE Guide gives advice on site layout to achieve provision of daylight and sunlight both within buildings, and in the open spaces between them. In general, it aims to aid designers in considering the relationship between new and existing buildings to ensure that each retains the potential to achieve good daylighting and sunlight levels.

The BRE Guide states in the introduction that: "The guide is intended for building designers and their clients, consultants and planning officials. ***The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy;*** *its aim is to help rather 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.*** *In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings".* **It is important that the guidelines that exist in relation**

to daylight and sunlight are read in the correct context and are not viewed as mandatory requirements. Requirements for daylight should be balanced against other elements of the design such as thermal performance (which is directly impacted by the size, shape and location of glazing) and the risk of overheating due to excessive glazing areas. This approach will ensure an optimal overall solution is reached for the development.

2. PROPOSED DEVELOPMENT SUMMARY

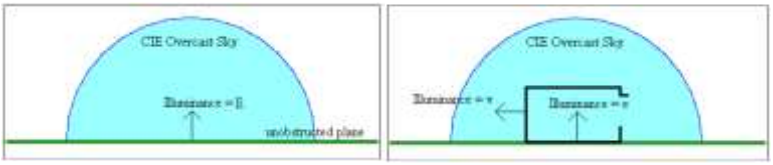
The development will consist of:

- 336 no. residential units, comprising 242 no. dwelling houses and 94 no. duplex and simplex apartments as follows:
    - 39 no. 1 bed apartments
    - 55 no. 2 bed apartments
    - 10 no. 2 bed dwelling houses
    - 182 no. 3 bed dwelling houses
    - 46 no. 4 bed dwelling houses
    - 4 no. 5 bed dwelling houses
- 602 no. car parking spaces for residential units, bicycle storage for each duplex & simplex building

The development will also consist of 1) Communal bin storage for each apartment building 2) Open space of c. 1.7 hectares including play areas 3) landscaping works with public lighting and provision for potential pedestrian connections to lands to the west and north 4) Pedestrian access from main entrance 5) Biodiversity corridor along the east of the site as well as 6) a creche (gross floor area 587m2), providing 86 child places, along with associated play area and car parking.

3. DEFINITIONS

The technical definitions that are referred to in this report are explained below.

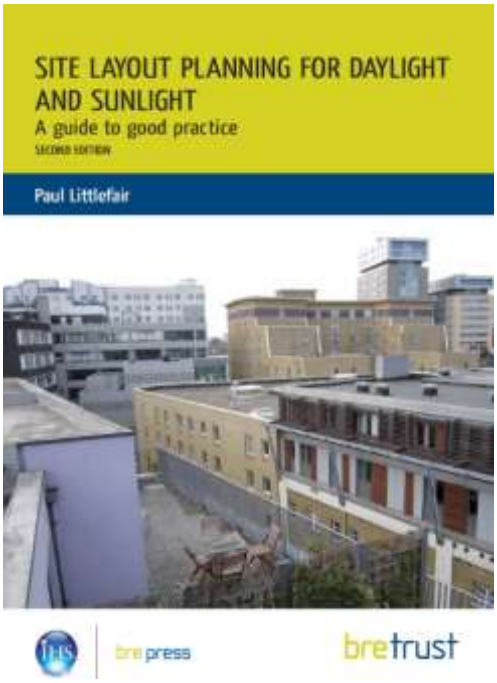
BRE	The Building Research Establishment (BRE) is a centre of building science in the United Kingdom, owned by charitable organisation the BRE Trust. It is a former UK government national laboratory that was privatised in 1997.
Vertical Sky Component (VSC)	The Vertical Sky Component (VSC) measures the amount of skylight available to a window. This represents the amount of daylight available to the window. The BRE Guide describes the VSC as the "Ratio of that part of illuminance, at a point on a given vertical plane that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the "given vertical plane" is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings."  E= illuminance on an unobstructed plane. (the amount of daylight available in an open space with no obstructions) v= illuminance at a point in the centre of a vertical opening (the amount of daylight available at a point in the centre of a vertical opening) Vertical Sky Component = v/E
CIE Standard Overcast Sky	CIE Standard Overcast Sky is a typical overcast sky used for daylight analysis. For this completely overcast sky, the ratio of its luminance Ly at an angle of elevation y above the horizontal to the luminance Lz at the zenith is given by: $L_y = L_z \frac{(1 + 2\sin y)}{3}$ The CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead).
Average Daylight Factor (ADF)	This is a measure of the amount of daylight available to a space relative to the level of light outside. The ratio of total daylight flux incident on a reference area to total area of reference area, expressed as a percentage of outdoor illuminance on a horizontal plane due to an unobstructed hemisphere of sky of assumed or known luminance distribution. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance.

Annual Probable Sunlight Hours (APSH)	Annual Probable Sun Hours (APSH) represents the sunlight that a given window may expect over a year period. APSH is expressed as the percentage of direct sunlight hours divided by number of hours when sky was clear with sun.
sDA	Spatial Daylight Autonomy (sDA) examines whether a space receives enough daylight during standard operating hours (8 a.m. to 6 p.m.) on an annual basis using hourly illuminance grids on the horizontal work plane. sDA is calculated virtually through computational simulation with precise parameters. It references a local climate file to run hourly illuminance maps in the lighting software package.
EN	European Norm (EN) abbreviation verifies that the technical standard referenced throughout this report (EN 17037) is drafted and maintained by the European Committee for Standardisation (CEN).

4. GUIDANCE DOCUMENTS REFERENCED DURING THIS STUDY

This Daylight, Sunlight and Overshadowing Assessment has been carried out in accordance with the following best practice standard as outlined by the BRE and cross referenced by the Department of Housing, Planning and Local Government.

The BRE Guide states in the introduction that: “The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather 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.

	This document gives advice on site layout planning to achieve good sun lighting and daylighting, both within buildings and in the open spaces between them. This authoritative document is widely used to provide advice during the planning and design stages of building development in the UK and Ireland. Guidance is given on site layout for good sun lighting and daylighting; safeguarding of daylight and sunlight within existing buildings nearby; and the protection of daylighting of adjoining land for future development.

	**EN 17037:2018** This European standard provides target illumincance levels to be achieved within a horizontal plane in a space in order for the space to be considered adequately daylit. The standard "encourages building designers to assess and ensure successfully daylit spaces. It also allows building designers and developers to target ambitions with respect to daylighting, as well as addressing other issues related to daylight design". The document defines metrics used for the evaluation of daylighting conditions and gives principles of calculation and verification. These principles address the issue of variability of daylight over the days and the year.

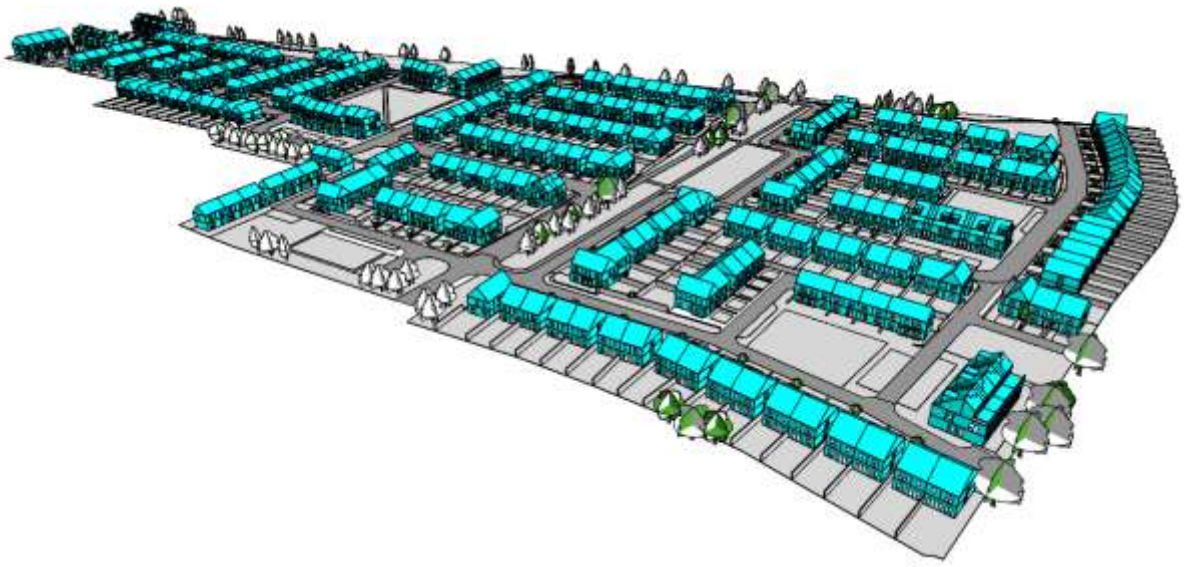
It is noted that BS 8206-2:2008: Lighting for buildings - Part 2: Code of practice for daylighting was recently replaced with BS EN 17037:2018 Daylight in Buildings. BRE is currently looking to update and re-publish the BRE Guide (BR209) to align their guidance with the new EN 17037:2018 in 2020. Until then, the position of BRE can be summarised from a post by Dr. Littlefair on the LinkedIn Planning Daylight & Sunlight Group (BRE BR209):

"BR209 currently refers to the former British Standard BS 8206 Part 2. For the time being, until BR209 is rewritten, we are adopting a flexible approach to applying the two standards, for example in assessing the daylight and sunlight available in new buildings. So for example if we were reviewing a daylight report for a local authority, we would consider it reasonable to accept either average daylight factor tables calculated using BS8206 or median daylight factors/median illuminances calculated using EN17037, provided they were calculated and presented properly.

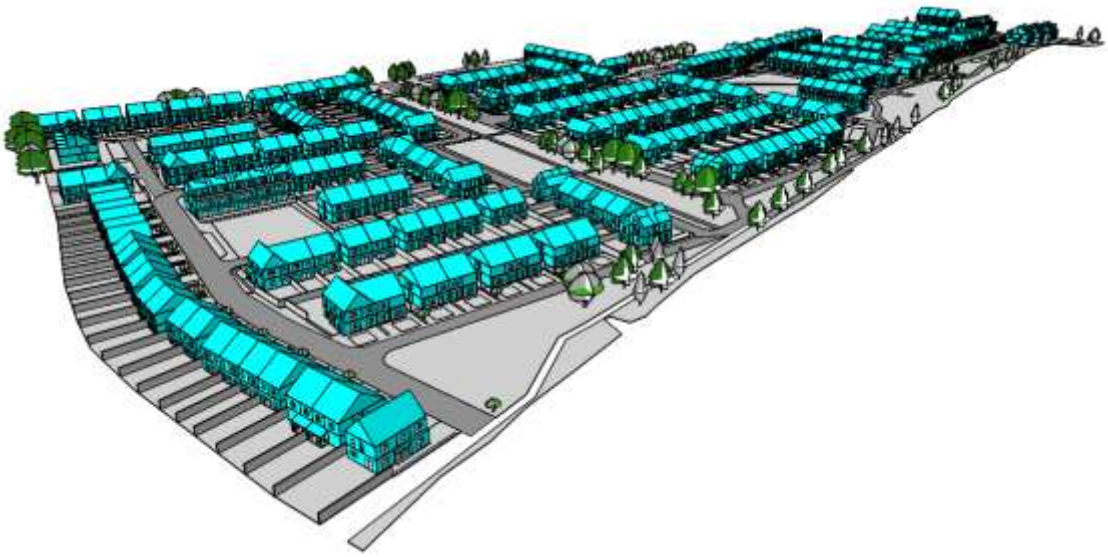
EN17037 does not deal with loss of daylight or sunlight to existing buildings, so the current BR209 methodology can be used here, until the revised version is published.".

5. SIMULATION MODEL IMAGES

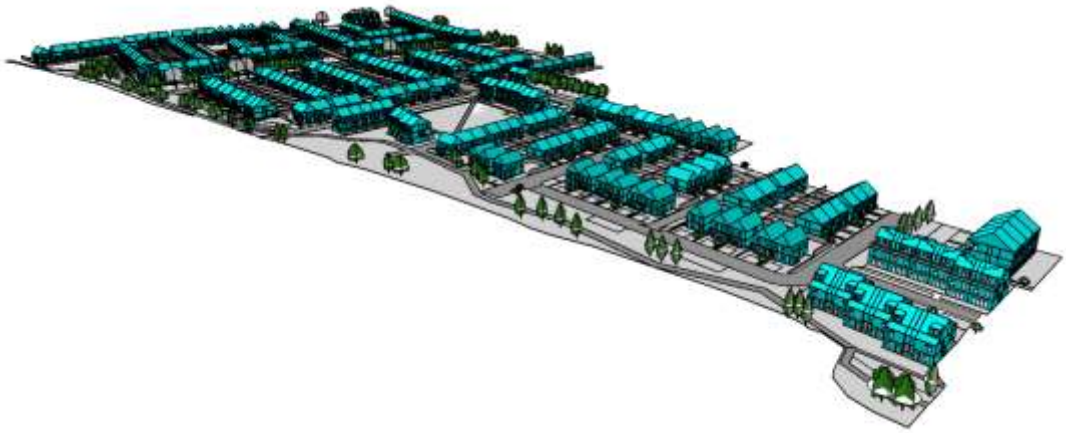
The following images show the simulation model that was constructed to analyse the daylight, sunlight and overshadowing performance for this proposed scheme.



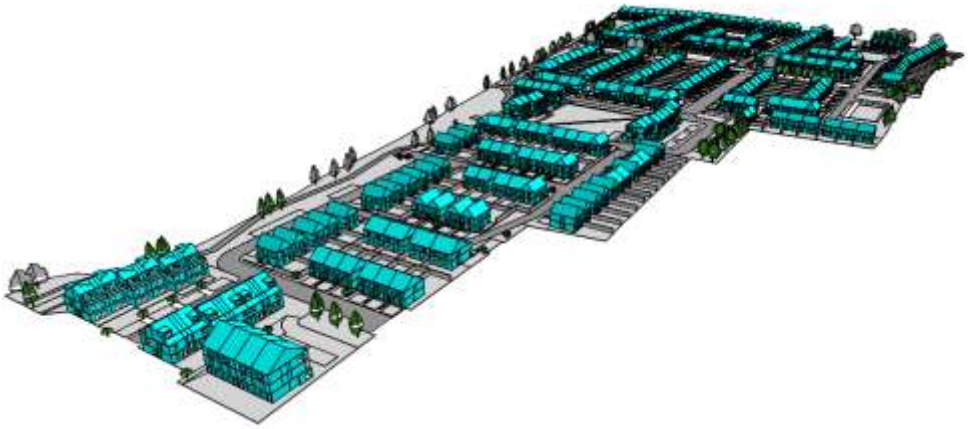
Above: Simulation model image of the proposed development from the southwest.



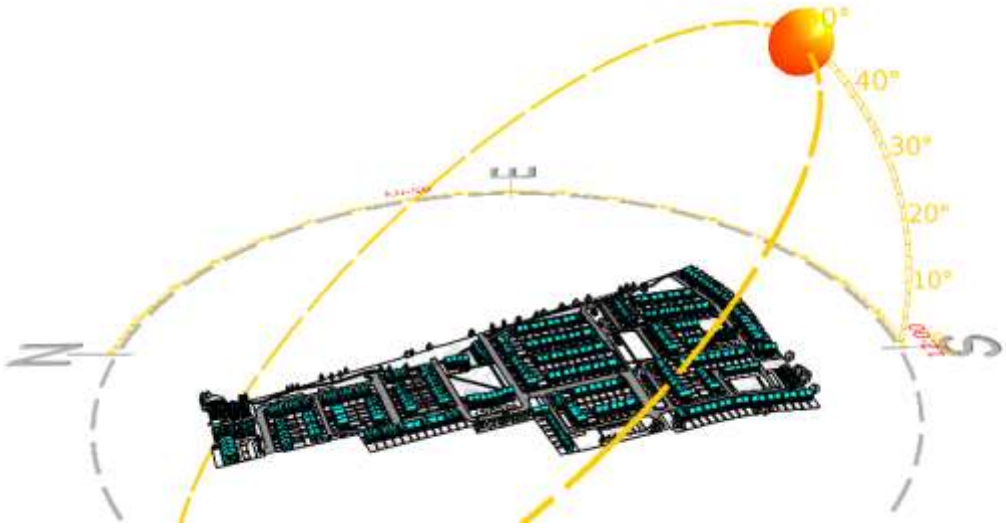
Above: Simulation model image of the proposed development from the southeast.



Above: Simulation model image of the proposed development from the northeast.



Above: Simulation model image of the proposed development from the northwest.



Above: Simulation model image of the proposed development from the West with the Sun path during the summer.

6. SIMULATION SOFTWARE DESCRIPTION

IES VIRTUAL ENVIRONMENT

IES Virtual Environment is the world's leading building performance analysis tool. The software provides an in-depth suite of integrated analysis tools which allow an integrated design approach and highly detailed results. This software contains the tools described below which were used to carry out each component of the analysis provided.

IES VIRTUAL ENVIRONMENT - RADIANCE

Radiance is a software package developed by the Lighting Systems Research group at the Lawrence Berkeley Laboratory in California, USA. Radiance was developed as a research tool for predicting the distribution of visible radiation in illuminated spaces. This tool was used to assess the daylight performance of the proposed development. The *Radiance* tool was used to calculate the average daylight factor and vertical sky component results outlined in this assessment.

IES VIRTUAL ENVIRONMENT - SUNCAST

SunCast enables engineers to perform shading and solar insolation analysis studies and can generate images and animations. SunCast generates shadows and internal solar insolation from any sun position defined by date, time, orientation, site latitude and longitude. SunCast can be used at any stage of the design process from a model created by the IES Model Builder. This tool was used to assess the sunlight availability in both the openings and amenity spaces of the proposed development. The annual probable sunlight hours results outlined in this assessment were determined using the *SunCast* tool.

DESIGNBUILDER - SPATIAL DAYLIGHT AUTONOMY

DesignBuilder is a 3D modelling and analysis software that is capable of carrying out dynamic simulation modelling. Using DesignBuilder, an in-depth simulation was carried out to determine the annual daylight performance of the proposed development.

7. ASSESSMENT METHODOLOGY

The assessment methodology used for this analysis is taken from the BRE Guidance document (BR209) based on the standards set out in the British Standard BS8206:2. This analysis also refers to the standards outlined in European Standard EN 17037:2018.

DAYLIGHT ASSESSMENT – AVERAGE DAYLIGHT FACTOR (ADF) USING BS 8206-2:2008 / BR209)

BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight states the following with respect to Average Daylight Factors (ADF).

> C4 If a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These additional recommendations are minimum values of ADF which should be attained even if a predominantly daylit appearance is not achievable.

From BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight

In the case of a combined Living Room/Kitchen, the higher 2.0% ADF target value will be used.

Therefore, minimum recommended average daylight factors are:

- **Bedrooms - 1.00 %**
- **Living Rooms / Kitchen – 2.00 %**

The following assumptions have been applied in this study:

- Sky Conditions: Standard CIE overcast sky
- Time (24hr): 12:00
- Working Plane: 0.85m

DAYLIGHT ASSESSMENT – SPATIAL DAYLIGHT AUTONOMY (sDA) USING EN 17037:2018

EN 17037:2018 – Daylight in Buildings states the following with respect to daylight provision within a space:

> **5.1.2 Criteria for daylight provision**
>
> A space is considered to provide adequate daylight if a target illuminance level is achieved across a fraction of the reference plane within a space for at least half of the daylight hours.
>
> In addition, for spaces with vertical or inclined daylight openings, a minimum target illuminance level is also to be achieved across the reference plane.
>
> The reference plane of the space is located 0,85 m above the floor, unless otherwise specified. A small fraction of the reference plane may be disregarded to account for singularities.
>
> Values for target illuminances, minimum target illuminances and fractions of reference plane are given in Table A.1.

This assessment was carried out in accordance with *Method 2* which is described below:

> Method 2) Calculation method of illuminance levels on the reference plane using climatic data for the given site and an adequate time step. Annex A gives values for target illuminances and minimum target illuminances to be achieve.

Table A.1 – Recommendations of daylight provision by daylight openings in vertical and inclined surfaces provides target illuminance values which are required to meet the minimum level of recommendation for daylight provision.

In line with the European standard, the following targets were adopted for all spaces assessed during this analysis:

- **300 Lux achieved over at least 50% of the reference plane (0.85m) and**
- **100 Lux achieved over at least 95% of the reference plane (0.85m)**

A space is considered to provide adequate daylight if both target illuminance levels above are achieved across the specified fraction of the space (as per above) for at least 50% of the daylight hours.

Table A.1 — Recommendations of daylight provision by daylight openings in vertical and inclined surface

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

Above: Table A.1 – Recommendations of daylight provision by daylight openings in vertical and inclined surfaces taken from EN 17037:2018

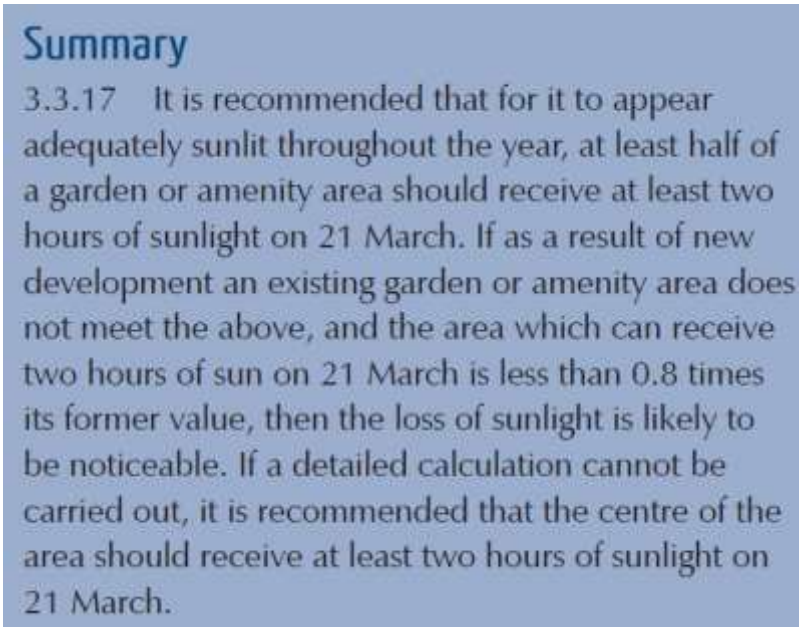
The working plane has been set at 0.85m in accordance with EN17037.

The following surface reflectance's were applied in this study for both assessments (ADF and sDA):

Material Surface	Reflectance Value	Glass/Window Details
External Wall	0.82	-
Internal Partition	0.82	-
Roof (external)	0.20	-
Ground (external)	0.20	-
Floor/Ceiling (Floor)	0.40	-
Floor/Ceiling (Ceiling)	0.88	-
Glass Light transmittance	-	70%
Window Frame Thickness	-	50 mm

SUNLIGHT ASSESSMENT – PROPOSED AMENITY SPACE

BRE Guidelines recommend that in order for an amenity space to appear adequately sunlit throughout the year, at least half of the amenity space should receive at least two hours of sunlight on the design day, March 21st. The BRE Guide is widely accepted as a suitable standard for assessing sunlight availability within outdoor amenity spaces and so, no additional standards have been adopted for this assessment.



Summary

3.3.17 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.

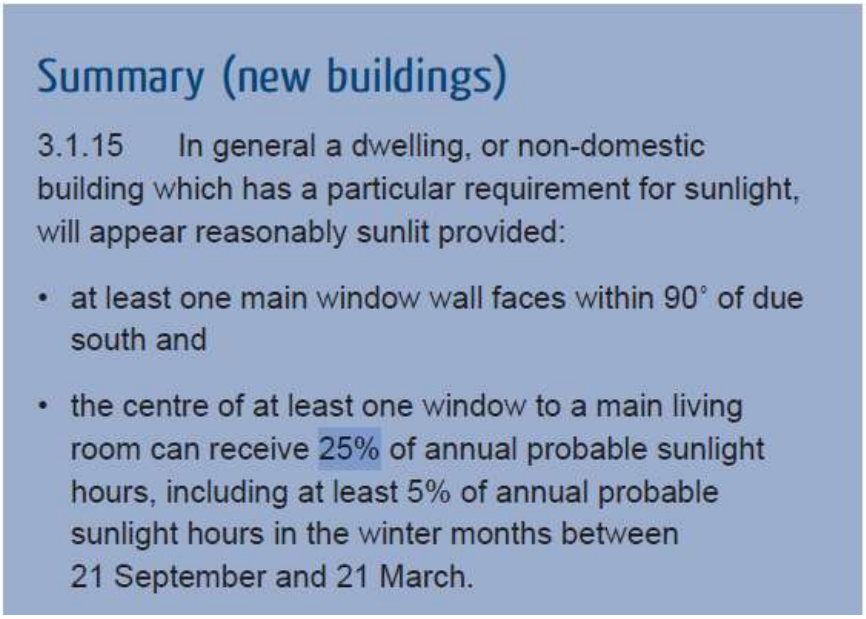
BRE Guidance in relation to protecting Sunlight in Gardens, Open Spaces and Amenity spaces.

21st March is the appropriate date for assessing impacts on sunlight availability as per the BRE Guidance, as it provides sunlight information for an average day of the year – i.e., neither peak summer (where ample sunlight is available) nor peak winter (where relatively little sunlight is available in any location). It should be noted that amenity area sunlight assessments during winter months are of limited use due to the low angle and reduced hours of sunlight at this time. For this reason, the sunlight availability to the amenity spaces was not assessed specifically for winter months in accordance with BRE guidance.

The amount of sunlight available to proposed amenity spaces (such as the central amenity area and private gardens) is assessed as part of this analysis. The results are outlined in *Section 9* of this report.

SUNLIGHT ASSESSMENT – PROPOSED BUILDINGS

According to the BRE guide, living rooms will appear reasonably sunlit if they receive 25% or more of their annual probable sunlight hours for the year, and 5% or more of their annual probable sunlight hours during the winter months. Analysis was carried out in line with the BRE guide, ensuring that the proposed development receives adequate levels of sunlight. The BRE Guide is widely accepted as a suitable standard for assessing sunlight availability at living room openings and so, no additional standards have been adopted for this assessment.



Above: BRE Guidance in relation to achieving adequate levels of sunlight in new buildings

Summary

3.2.11 If a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected. This will be the case if the centre of the window:

- receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21 September and 21 March and
- receives less than 0.8 times its former sunlight hours during either period and
- has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

Above: BRE Guidance in relation to maintaining adequate levels of sunlight in existing buildings.

In line with BRE guidance, any openings that do not face within 90º of due south were not assessed as a part of this analysis. Due to their orientation and the sun path, these windows will not receive any significant level of direct sunlight in any case.

Results for this assessment are shown in *Section 9* of this report.

8. DAYLIGHT RESULTS – PROPOSED SCHEME

A representative sample of units have been assessed to determine the daylight availability within the proposed development. This sample includes 75 of the 336 proposed units. Daylighting results have been provided for all relevant rooms within the sample units (bedrooms, kitchens, living rooms, dining rooms). The units assessed as part of this analysis are highlighted in the site plan below:

The daylight availability within the proposed development was assessed using both the new EN17037 Standard and the now superseded BS8206-2 (and associated BR209 guidance document from the BRE). Results are presented in the summary below for each assessment method.

Spatial Daylight Autonomy - EN17037			
Room Type	**Number of Rooms Assessed**	**Passing**	**Passing (%)**
Bedroom	215	168	78.14
Kitchen/Living/Dining	148	109	73.65
Overall	363	277	76.31

Average Daylight Factor - BS8206-2/BRE Guidance 2.0% Kitchen/Living/Dining ADF Target			
Room Type	**Number of Rooms Assessed**	**Passing**	**Passing (%)**
Bedroom	215	214	99.53
Kitchen/Living/Dining	148	135	91.22
Total	363	349	96.14

Average Daylight Factor - BS8206-2/BRE Guidance 1.5% Kitchen/Living/Dining ADF Target			
Room Type	**Number of Rooms Assessed**	**Passing**	**Passing (%)**
Bedroom	215	214	99.53
Kitchen/Living/Dining	148	141	95.27
Total	363	355	97.80

A detailed breakdown of the results of each analysis is provided in Appendix B and Appendix C of this document.

8.1. AVERAGE DAYLIGHT FACTOR

For the BRE Guidance on Average Daylight Factor refer to *Section 7* of this report. The calculated ADF results are summarised below:

Average Daylight Factor - BS8206-2/BRE Guidance 2.0% Kitchen/Living/Dining ADF Target			
Room Type	**Number of Rooms Assessed**	**Passing**	**Passing (%)**
Bedroom	215	214	99.53
Kitchen/Living/Dining	148	135	91.22
Total	363	349	96.14

Average Daylight Factor - BS8206-2/BRE Guidance 1.5% Kitchen/Living/Dining ADF Target			
Room Type	**Number of Rooms Assessed**	**Passing**	**Passing (%)**
Bedroom	215	214	99.53
Kitchen/Living/Dining	148	141	95.27
Total	363	355	97.80

As shown above, the development achieves a high overall passing rate (96.14%) according to the BRE Guide, with 99.53% of bedrooms and 91.22% of kitchens/living spaces/dining areas achieving the BRE recommended ADF performance.

This increases to 97.8% of the assessed rooms passing if and combined kitchen/living/dining spaces were assessed against an ADF target of 1.50% (the BRE recommended ADF performance for a living space).

Only 14 no. spaces assessed fall short of the BRE recommended ADF target These spaces are tabulated below:

Room	ADF Achieved	BRE Recommended ADF Target	Comment
No. 061 00_B2_LIVING	1.47	1.50%	ADF is only marginally below target value
No. 055 00_B2_LIVING	1.44		ADF is only marginally below target value
No. 125 00_B2_LIVING	1.47		ADF is only marginally below target value
No. 048 00_B2_LIVING	1.49		ADF is only marginally below target value
No. 154 00_B9.1_LIVING	1.35		-
No. 126 00_B9.1_LIVING	1.43		ADF is only marginally below target value
No. 193 00_B9_LIVING	1.29		-
No. 047 00_C2.1_DINING	1.79	2.00%	ADF is only marginally below target value
No. 033 00_C2.1_DINING	1.98		ADF is only marginally below target value
No. 270 00_C13.1_DINING	1.91		ADF is only marginally below target value
No. 132 00_C17_DINING	1.73		-
No. 261 00_C20_DINING	1.82		ADF is only marginally below target value
No. 271 00_C20_DINING	1.60		-
No. 292 01_D4_BEDROOM 2	0.65	1.00%	-

A number of compensatory factors exist which are described in Section 10 of this report.

The results for each individual space assessed are tabulated in Appendix B of this document.

8.2. SPATIAL DAYLIGHT AUTONOMY

In line with EN 17037:2018 Table A.1, the minimum target daylight provisions for bedrooms and kitchen/living spaces are:

- 300 Lux achieved over at least 50% of the reference plane (0.85m) and
- 100 Lux achieved over at least 95% of the reference plane (0.85m)

A representative sample of rooms were analysed as a part of this spatial daylight autonomy assessment. Only relevant space types (bedrooms and kitchen/living spaces) were included in the sample group for the assessment. The results show that 76.31% of the rooms assessed meet the overall minimum recommended target illuminance according to *EN 17037 Table A.1*. A summary of the results are as follows;

Spatial Daylight Autonomy - EN17037			
Room Type	**Number of Rooms Assessed**	**Passing**	**Passing (%)**
Bedroom	215	168	78.14
Kitchen/Living/Dining	148	109	73.65
Overall	363	277	76.31

As shown, 76.31% of the rooms assessed are compliant with the new European daylighting standard, achieving 300 lux over at least 50% of their floor area and 100 lux over at least 95% of their floor area for at least 50% of annual daylit hours.

It should be noted that this standard is generally more onerous than the previously used BS 8206-2:2008 and a lower passing rate is expected. This standard requires an annual dynamic simulation to be carried out, assessing each zone for daylighting across the entire year. This is more detailed than the average daylight factor calculation which uses fixed external conditions and assesses the daylight availability at a single point in time.

Within EN 17037, different daylight performance targets are not provided for different room types (bedrooms, kitchens, etc.) as they are in BS 8206-2. For this reason, bedrooms are expected to achieve the same level of daylight performance as kitchens and living spaces under the new standard. The British interpretation of the new European Standard (BS EN 17037) includes a *National Annex* which provides lower illuminance targets for bedrooms and living spaces in line with the methodology of the previous guidance document. However, the Irish version of this document

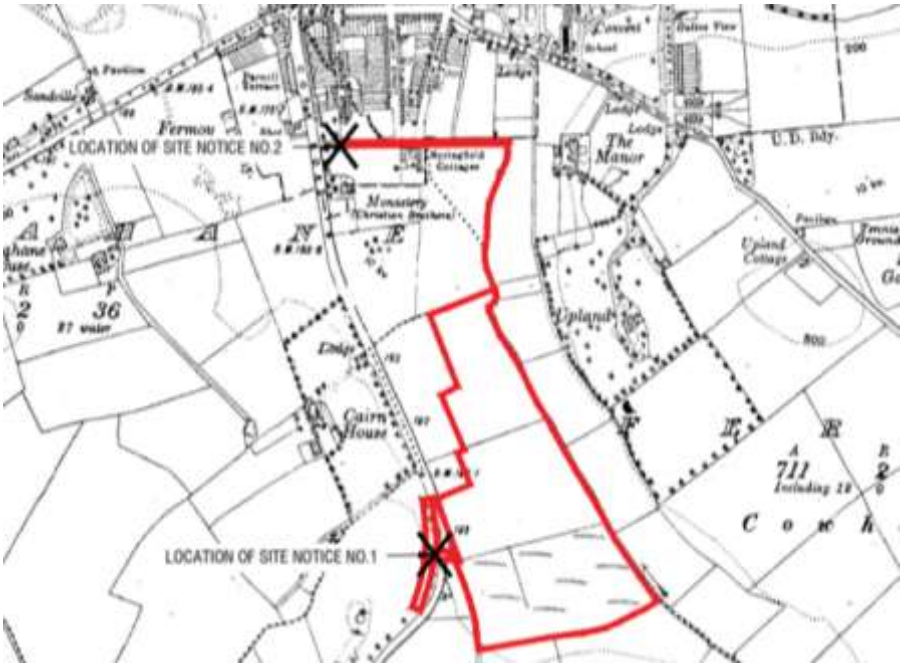
(IS EN 17037) contains no such annex and so, the full European Standard targets have been applied in this assessment.

The results of this sDA analysis are tabulated in detail in Appendix C of this document.

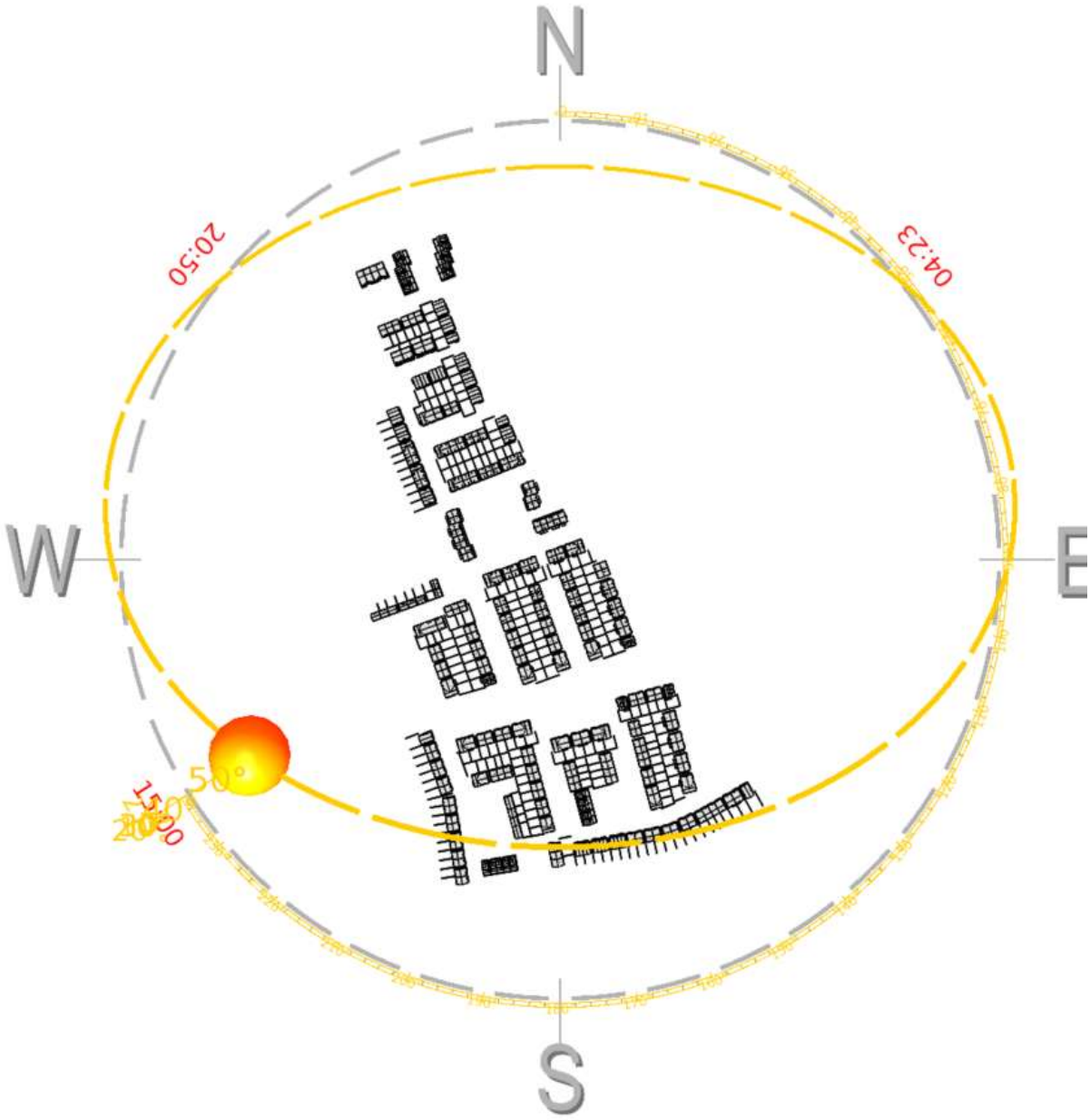
9. SUNLIGHT ASSESSMENT RESULTS

For the BRE Guidance on Sunlight in Amenity Space refer to Section 7 of this report.

Above: Google Earth Image of the existing site.

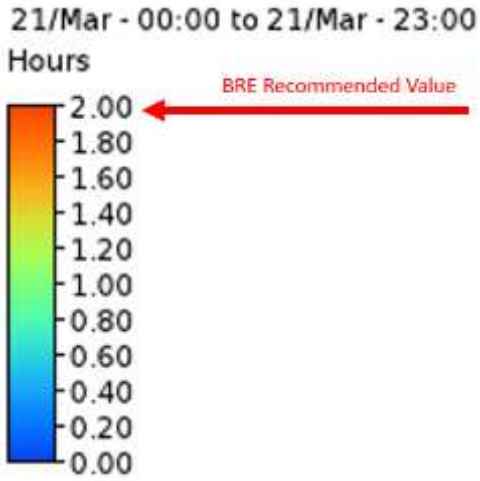


Above: OS map site location.

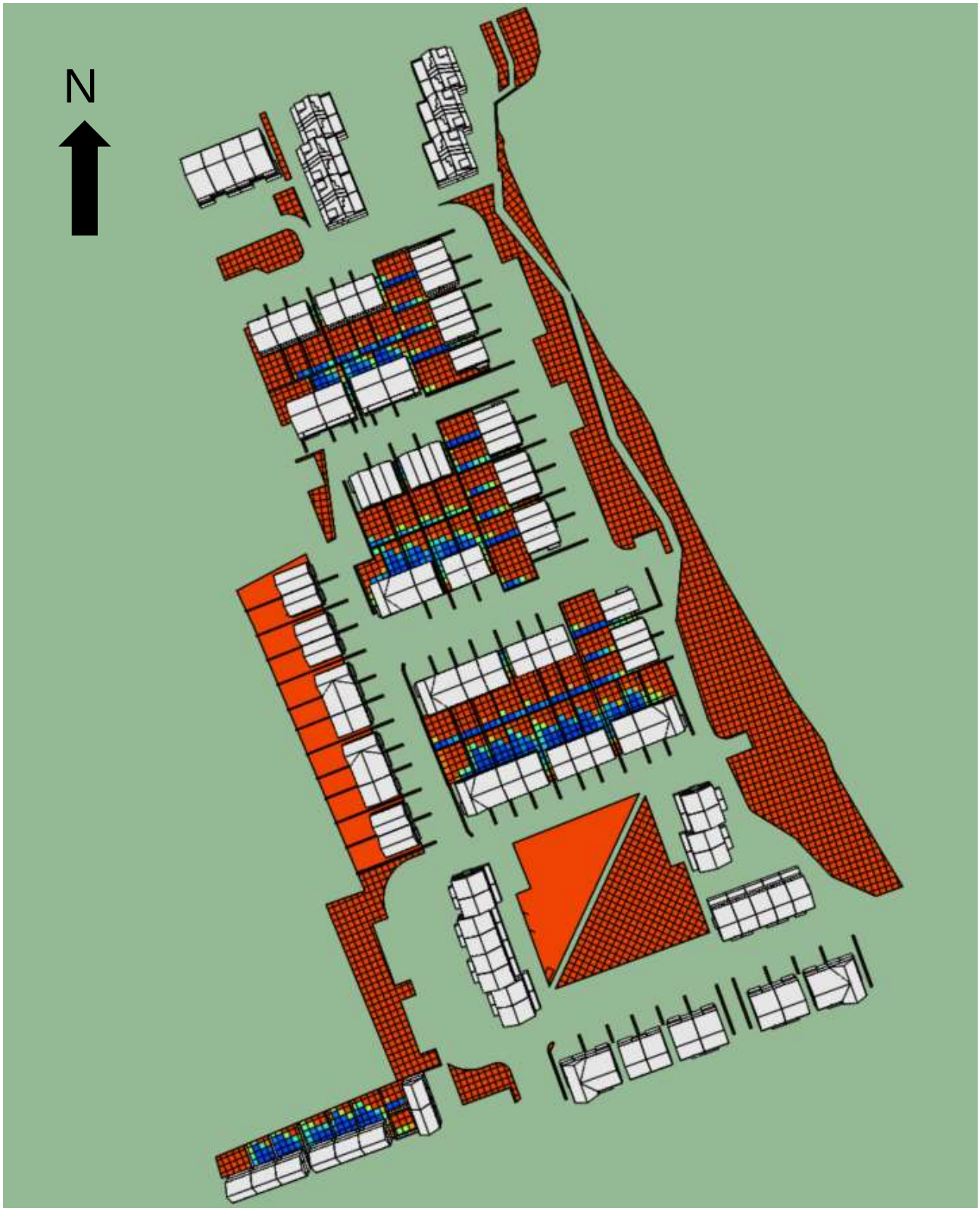


Above: Sun path over the proposed development.

Annual Probable Sunlight Hours – Amenity Spaces



Above: Probable sunlight hours on March 21st (hours) legend



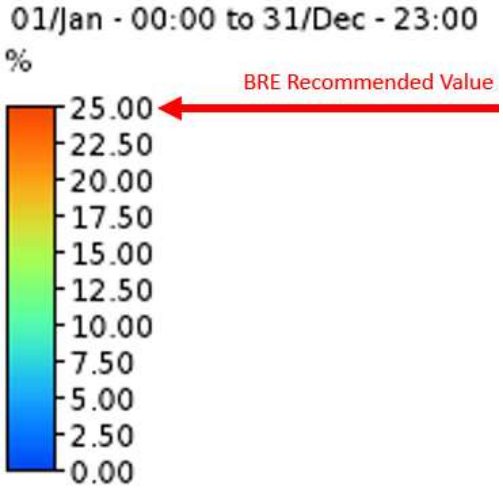
Above: The amenity/garden areas shown in red above are achieving 2 hours of sunshine on the 21st March as per the BRE Industry Guidelines. Any individual square shown in red achieves the 2 hour

target for sunlight. If the number of red squares within a zone (or individual garden) is greater than 50% of the total squares in that area, the area is deemed to have met the sunlight target. Any individual gardens within the proposed development, where 2 hours of sunshine is not available over at least 50% of the area (shown in blue & green above) are north-facing gardens, predominantly shaded by the house itself. More than 50% of each common amenity space within the proposed development will achieve 2 hours of Sunshine on the 21st of March in line with BRE recommendations.

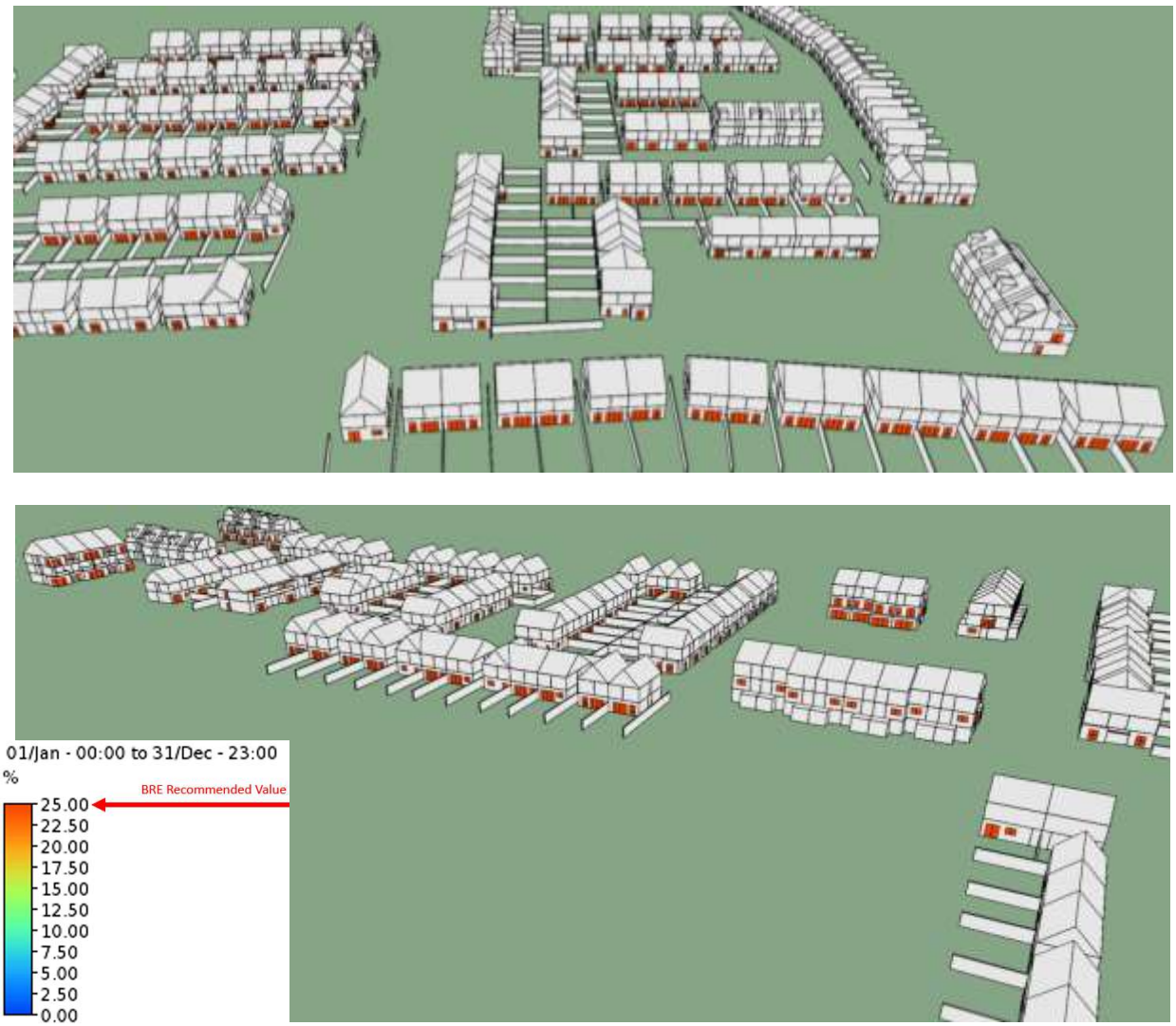
Annual Probable Sunlight Hours – Proposed Development

As outlined in *Section 7* of this report, the living spaces of these developments will appear adequately sunlit provided they receive 25% of their annual probable sunlight hours during the year and 5% of their probable sunlight hours during the winter months. The results of this assessment are represented below for all relevant areas.

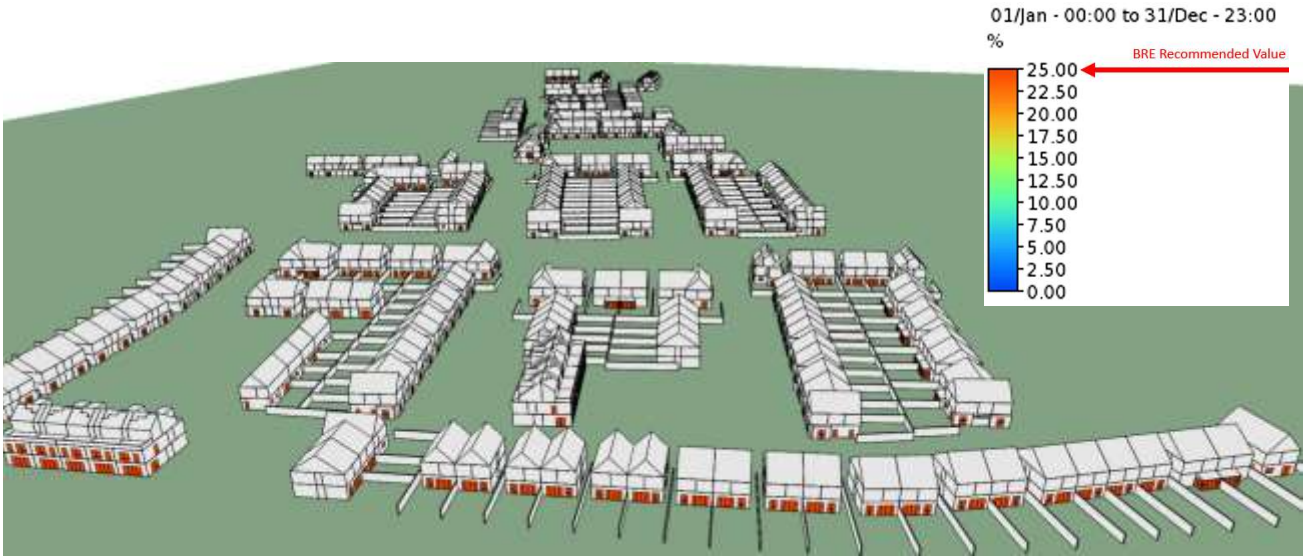
Annual Assessment – Proposed Development

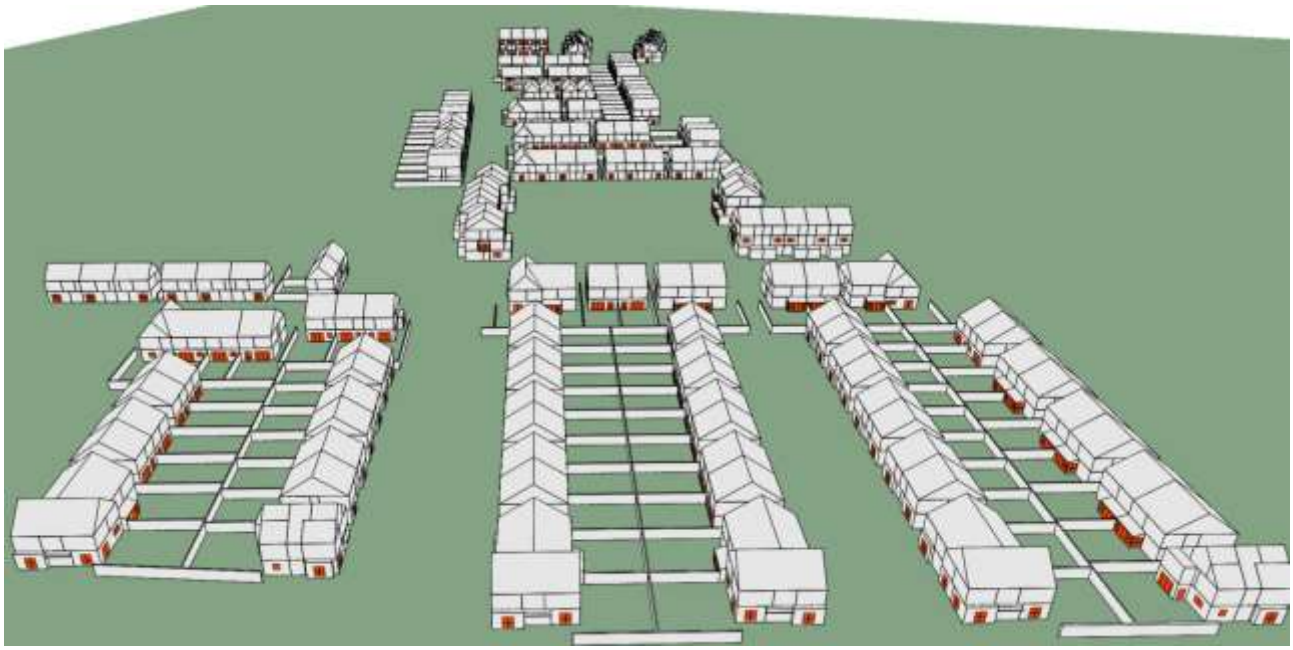


Above: Annual probable sunlight hours (%) legend

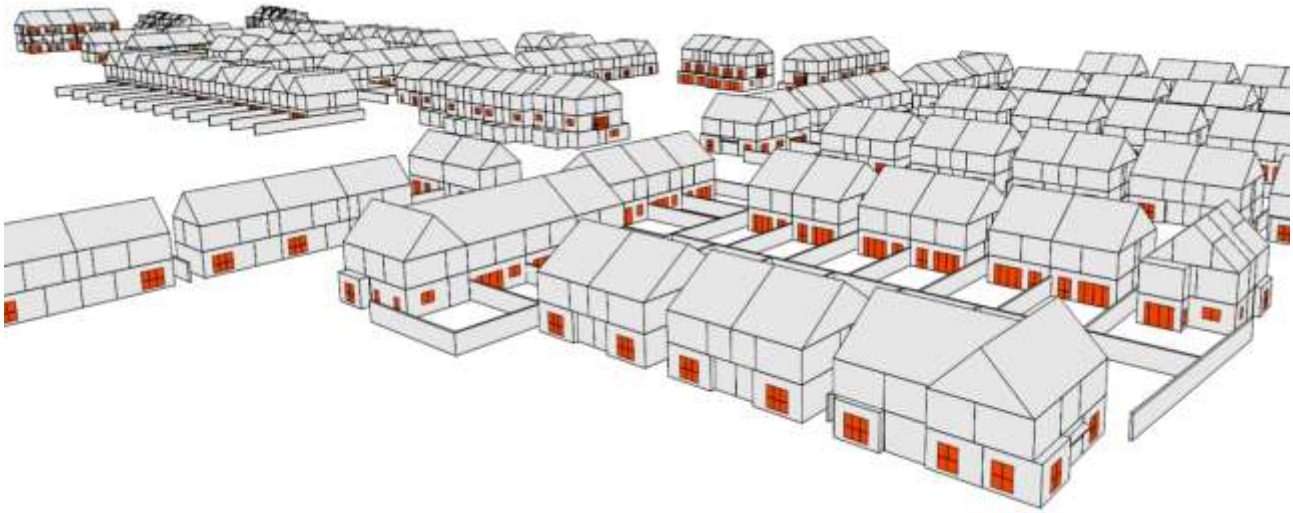


Above: The images above (taken from the west) show that the living spaces along the west elevations of the proposed development achieve at least 25% of their annual probable sunlight hours (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance. The guidance states that the site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations.





Above: The images above (taken from the south) show that the living spaces along the south elevations of the proposed development achieve at least 25% of their annual probable sunlight hours (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance. The guidance states that the site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations.



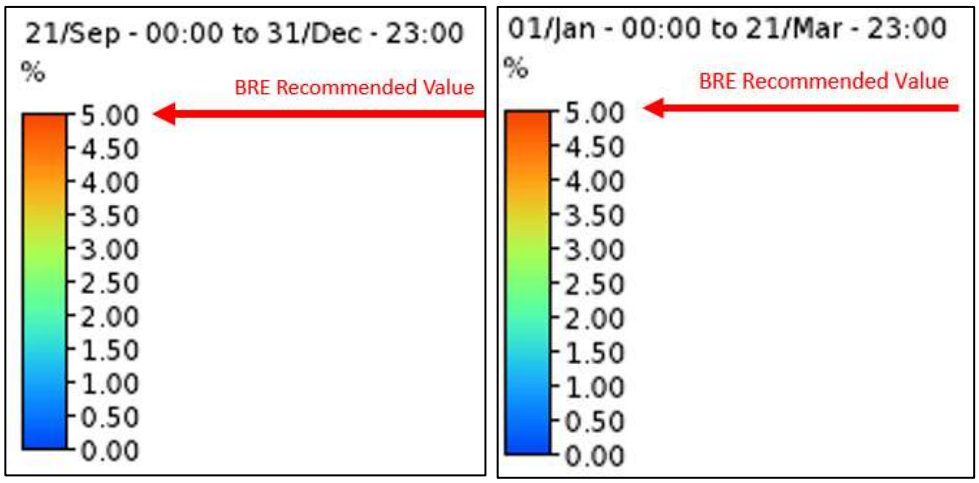
Above: Close-up image taken from the southwest showing the living spaces along the south and west elevations of the proposed development achieve at least 25% of their annual probable sunlight hours (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance.

It should be noted that windows that are more than 90° from due south are not expected to achieve the criteria outlined in the BRE Guide and so should not be considered as part of the annual probable sunlight analysis. Due to the orientation of the proposed development, certain sections of the building have living room windows that do not face within 90° of due south.

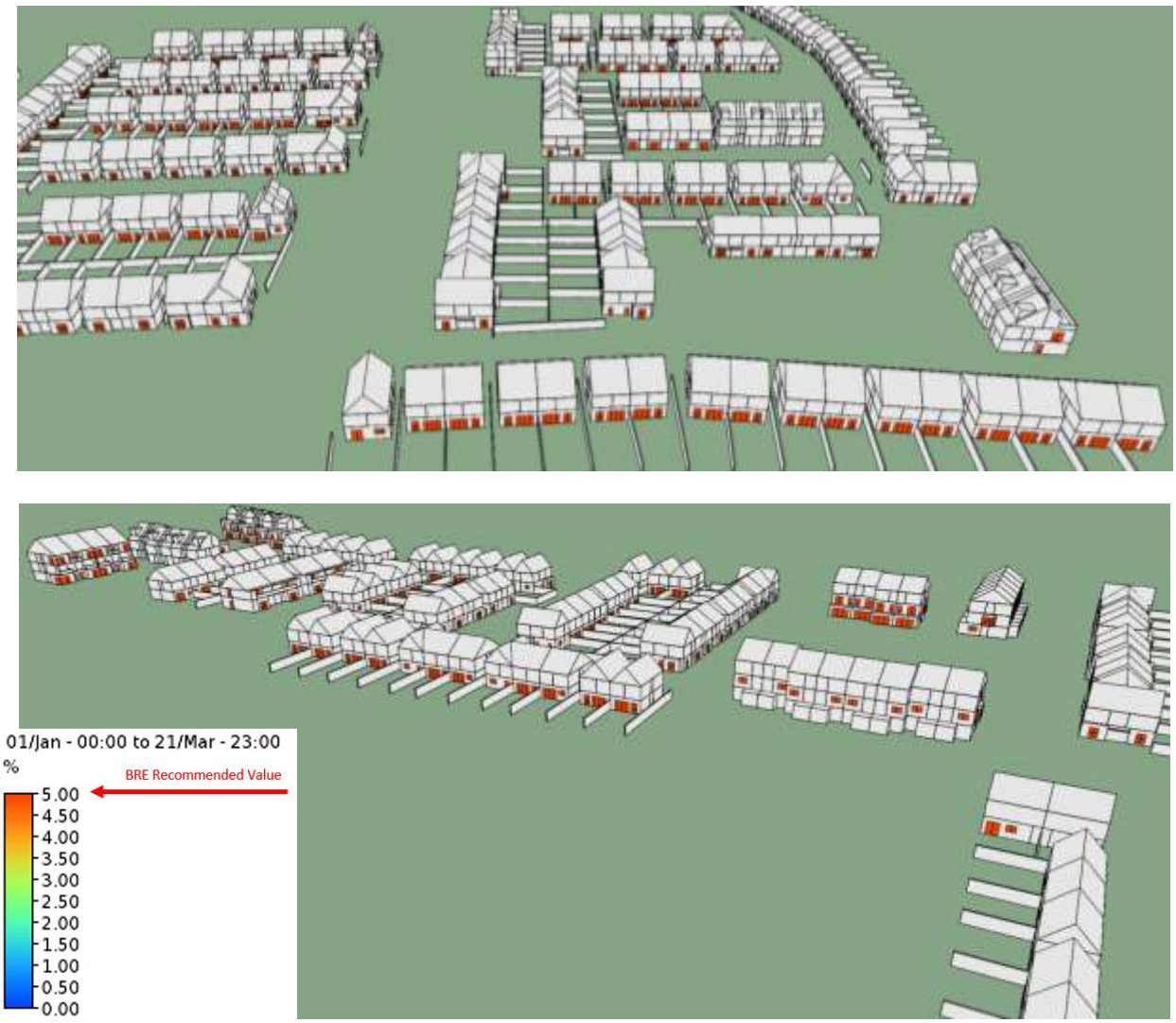
As shown, due to the orientation of the site, the only living room windows facing within 90° of due south are those of along the west and south elevations. For that reason, the annual probable sunlight hours of the other windows (not within 90° of due south) were not assessed as they are not expected to achieve the benchmark level of sunlight according to BRE Guidance.

All windows suitable for assessment (living room windows that face within 90° of due south) meet the probable sunlight hours criteria outlined in the BRE Guide as shown in the above model images for the annual assessment.

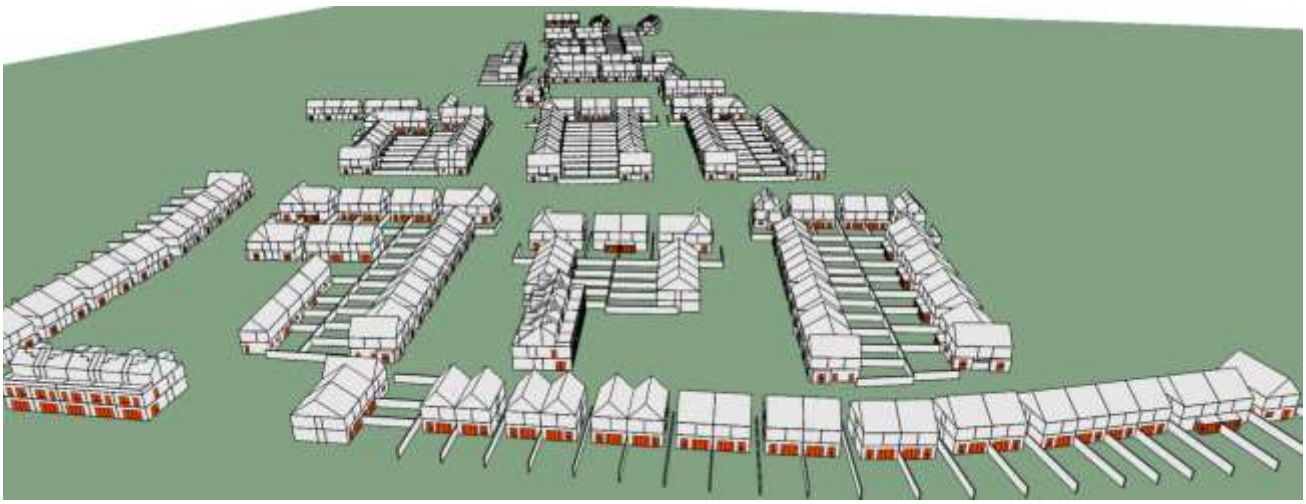
Annual Probable Sunlight Hours – Proposed Development: Winter Assessment

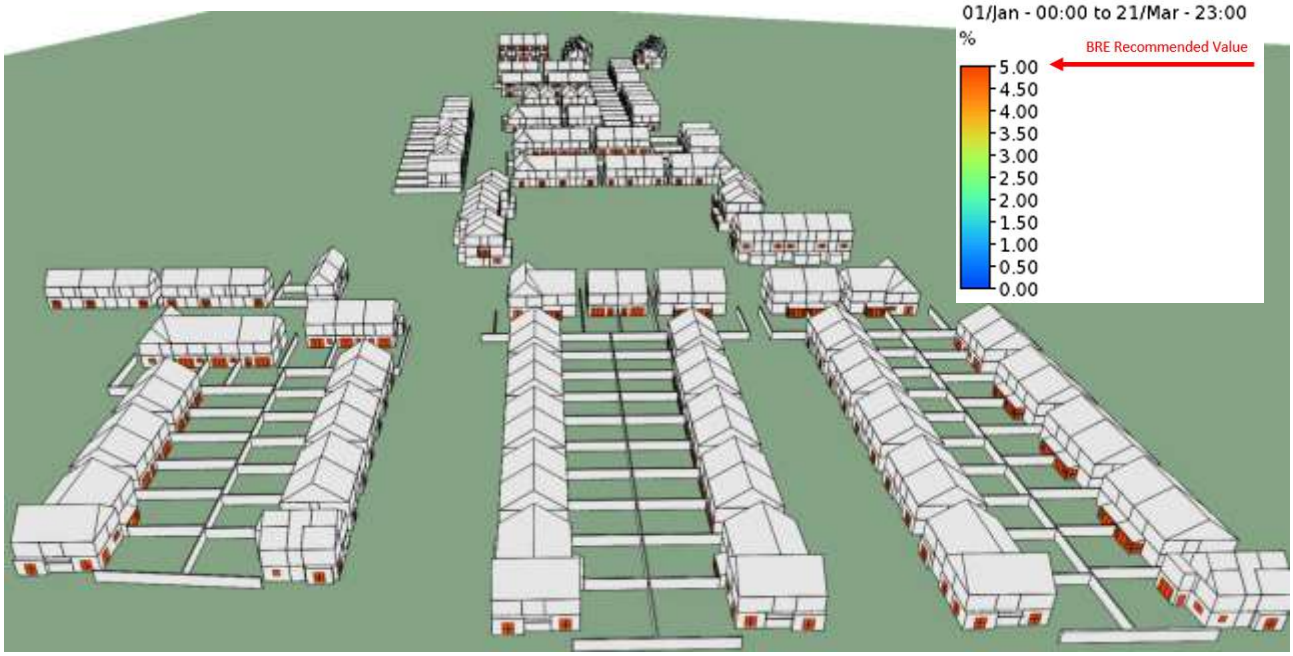


Above: Probable sunlight hours from September 21st to March 21st (%) legend



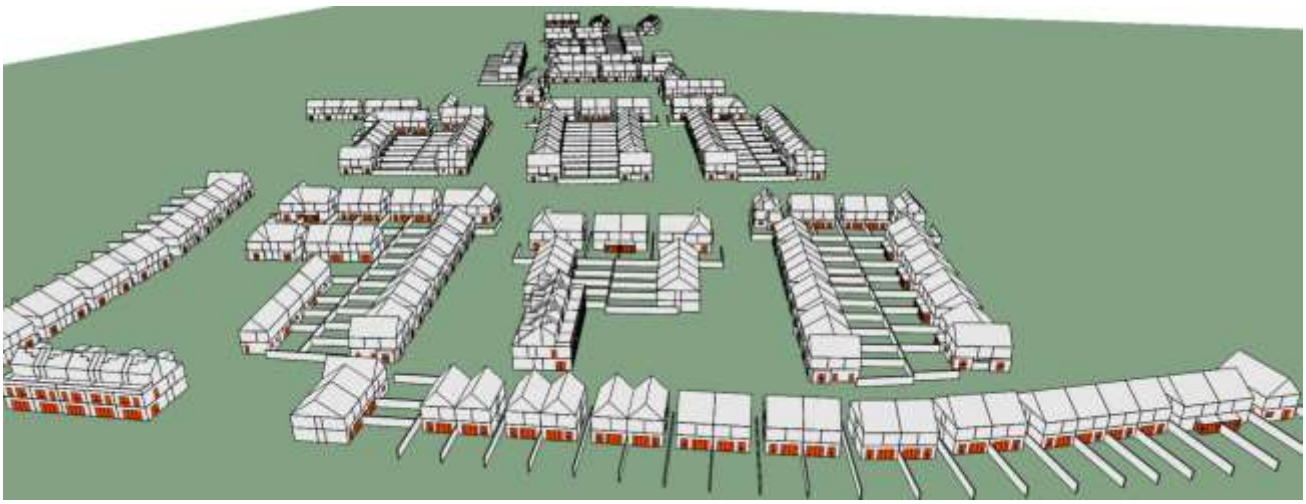
Above: The images above (taken from the west) show that the living spaces along the west elevations of the proposed development achieve at least 5% of their probable sunlight hours during winter months between 1st of January and 21st of March (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance. The guidance states that the site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

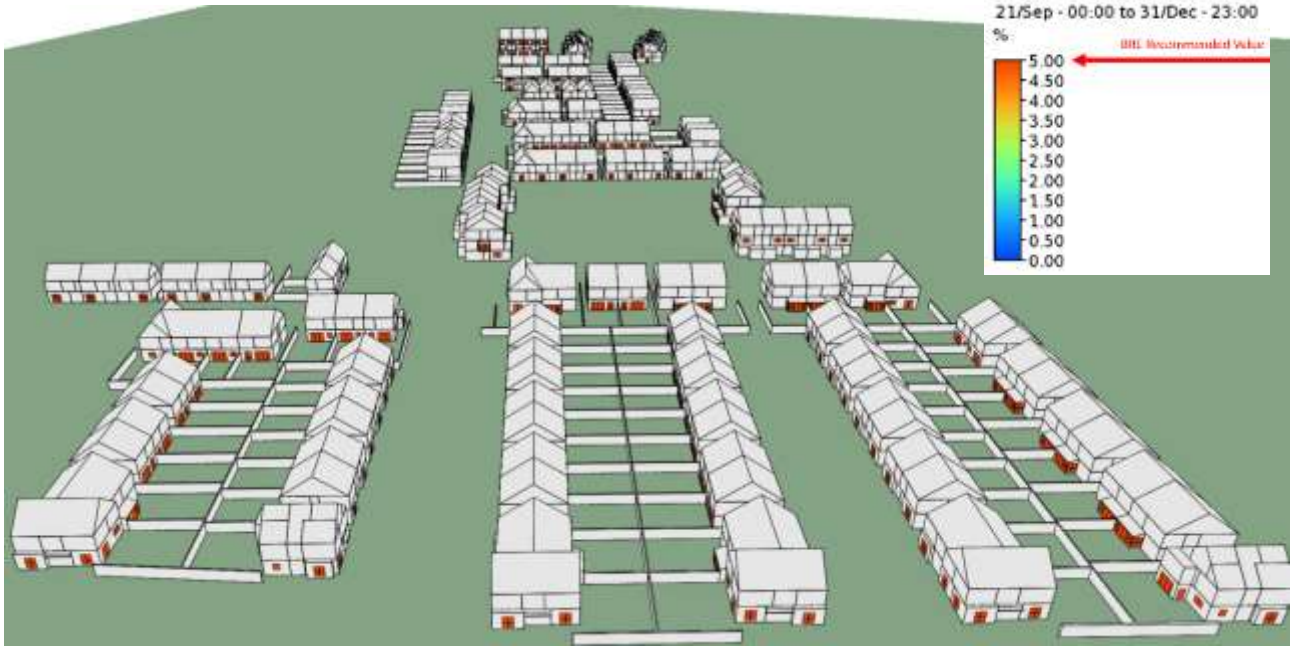




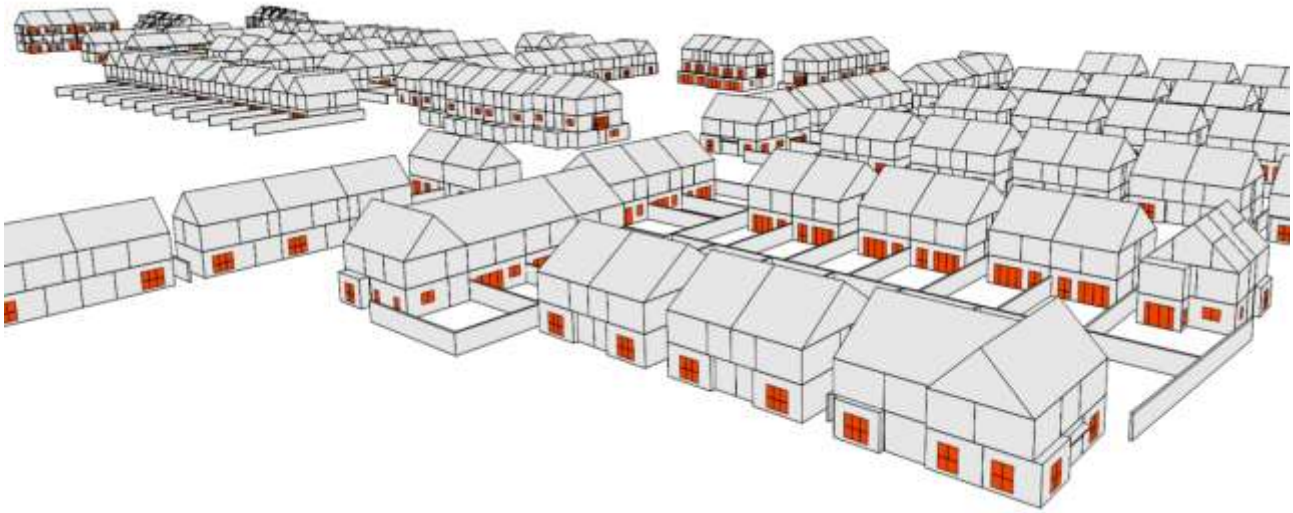
Above: The images above (taken from the south) show that the living spaces along the south elevations of the proposed development achieve at least 5% of their probable sunlight hours during winter months between 1st of January and 21st of March (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance. The guidance states that the site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

Above: The images above (taken from the west) show that the living spaces along the west elevations of the proposed development achieve at least 5% of their probable sunlight hours during winter months between 21st of September and 31st of December (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance. The guidance states that the site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations.





Above: The images above (taken from the south) show that the living spaces along the south elevations of the proposed development achieve at least 5% of their probable sunlight hours during winter months between 21st of September and 31st of December (highlighted in red) meaning these spaces will appear reasonably sunlit in line with BRE guidance. The guidance states that the site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations.



Above: Close-up image taken from the southwest showing the living spaces along the south and west elevations of the proposed development achieve at least 5% of their probable sunlight hours during winter months (highlighted in red) meaning these spaces will appear reasonably sunlit in winter in line with BRE guidance.

It should be noted that windows that are more than 90° from due south are not expected to achieve the criteria outlined in the BRE Guide and so should not be considered as part of the annual probable sunlight analysis. Due to the orientation of the proposed development, certain sections of the building have living room windows that do not face within 90° of due south.

As shown, due to the orientation of the site, the only living room windows facing within 90° of due south are those of along the west and south elevations. For that reason, the annual probable sunlight hours of the other windows (not within 90° of due south) were not assessed as they are not expected to achieve the benchmark level of sunlight according to BRE Guidance.

All windows suitable for assessment (living room windows that face within 90° of due south) meet the probable sunlight hours criteria outlined in the BRE Guide as shown in the above model images for the winter assessment.

10. COMPENSATORY FACTORS

Note: When assessing the significance of the departures identified in this study it is important to recognise a number of compensating factors:

− A carefully designed artificial lighting strategy is envisaged to balance the light levels which would be present to the rear of the rooms with the light levels which would be provided to the front.

− Supplementary task lighting is envisaged in kitchen areas

− Additional features which would contribute to the attractiveness of the proposed dwellings Include:

- the proximity to essential services and amenities in Fermoy Town, which is within 1km of the development
- the provision of a biodiversity corridor along the eastern edge of the site, as well as walking and cycling routes throughout the scheme

− Large private gardens have been provided which would benefit from good levels of sunlight amenity in most cases.

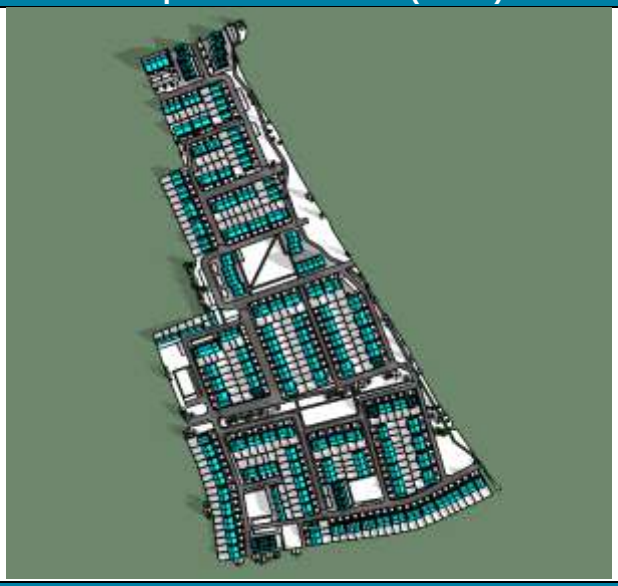
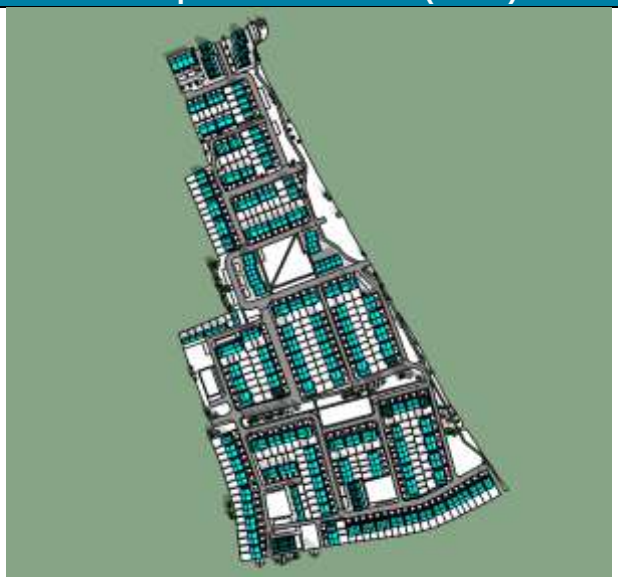
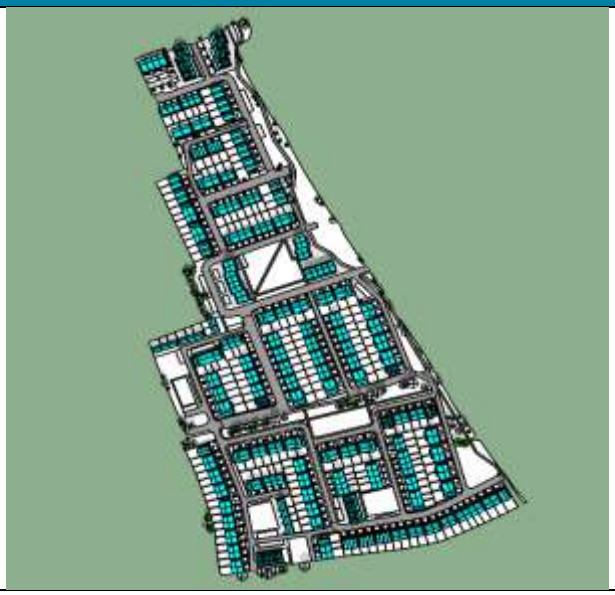
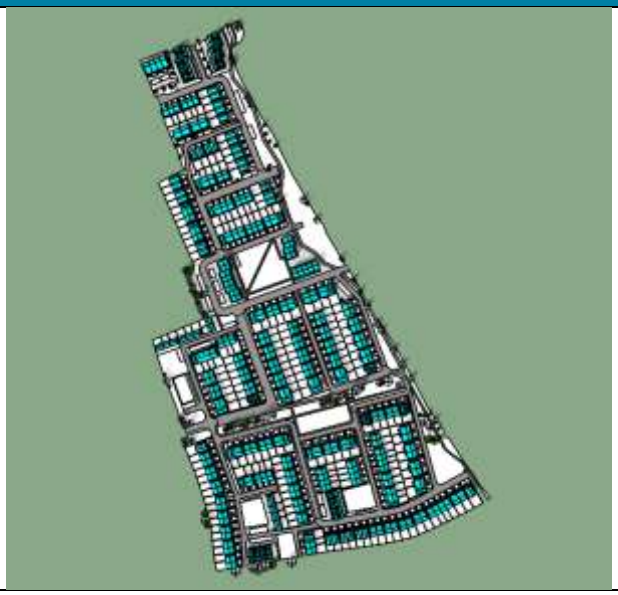
− Occupants would also have access to high levels of sunlight amenity within a number of outdoor recreation spaces, with over 15% of the site dedicated to public open space.

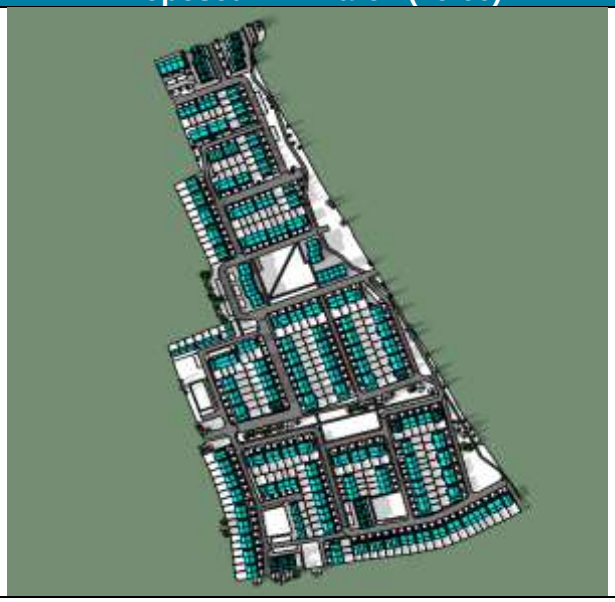
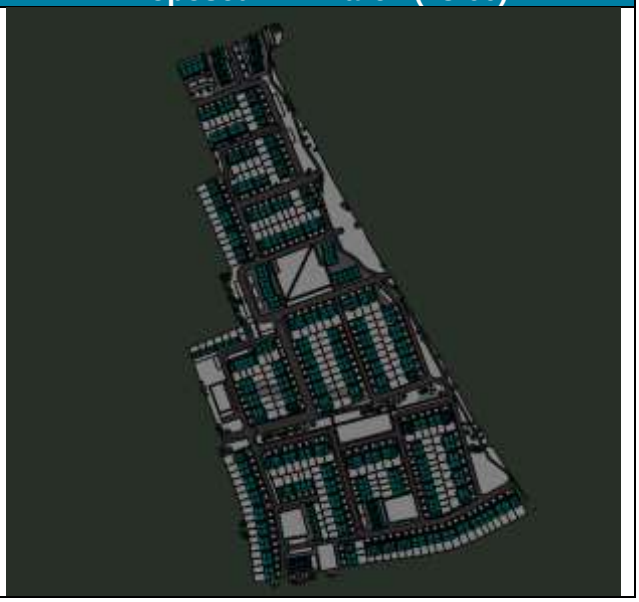
− To the extent that sunlight is relied upon to provide passive solar heating, this reliance is significantly offset by the low u-values which are proposed for the building fabric, with all units to achieve an A2 energy rating.

− The wider scheme has been designed to a high standard with high quality internal and external finishes, all units are own-door units, and external landscaping enhances the natural features of the site, including existing mature alder trees.

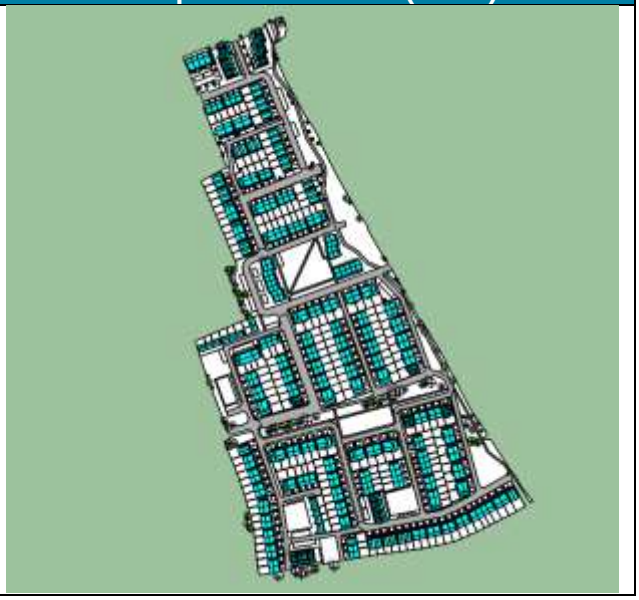
APPENDIX A | OVERSHADOWING IMAGES

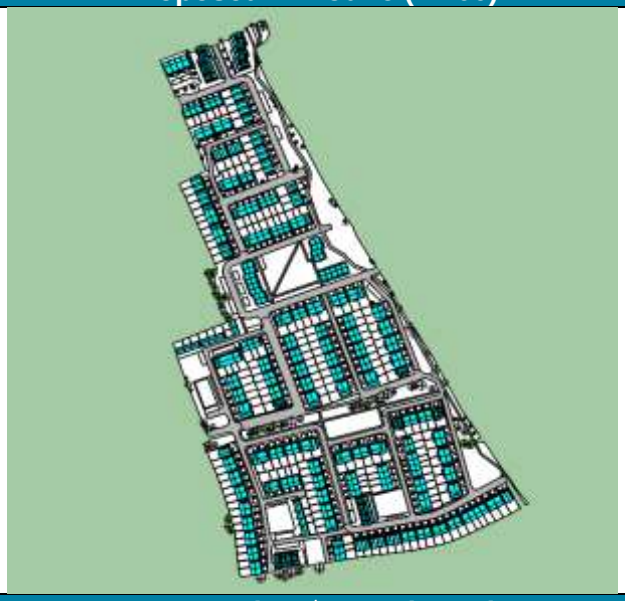
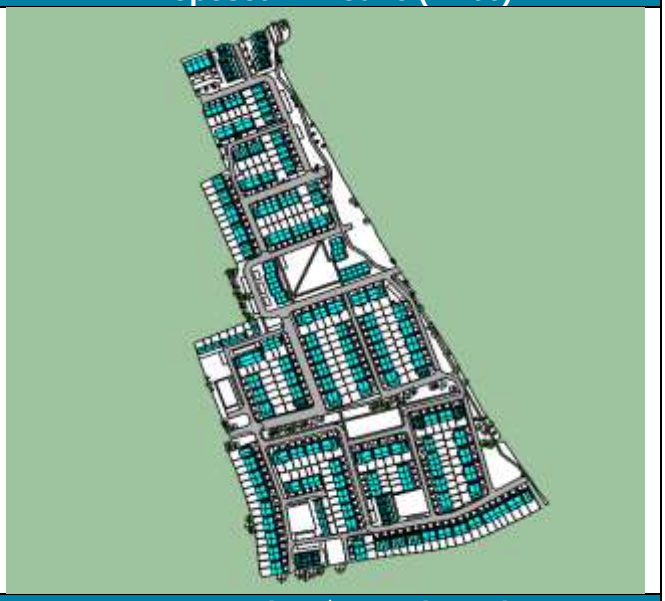
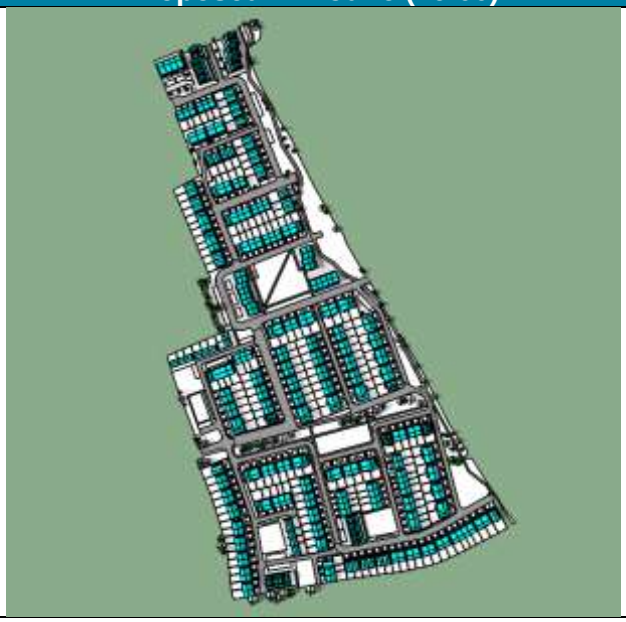
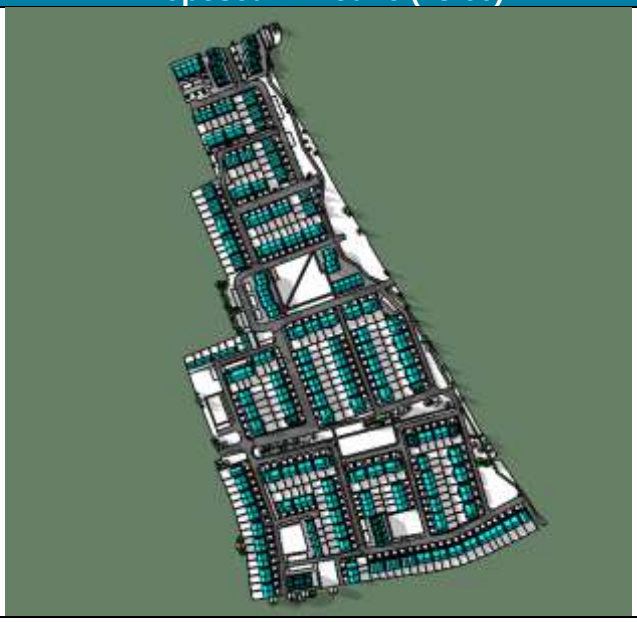
Plan View Images
Plan View – 21st March

Proposed 21st March (08:00)	Proposed 21st March (10:00)
	
Proposed 21st March (12:00)	**Proposed 21st March (14:00)**
	

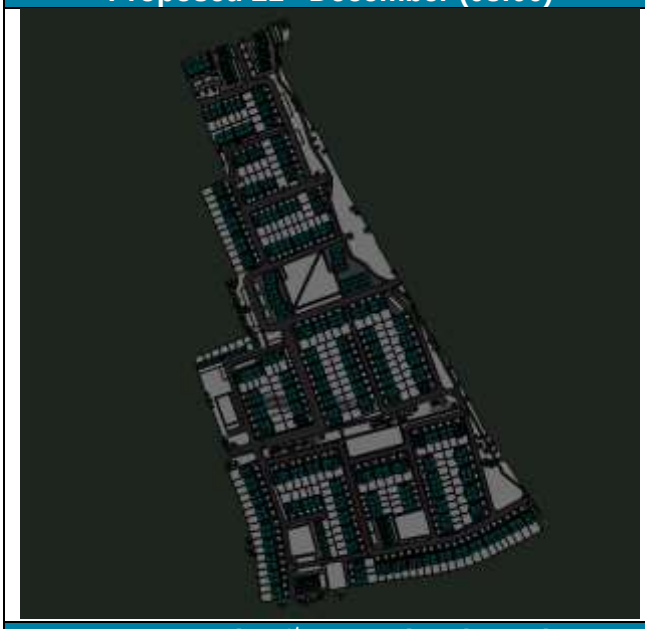
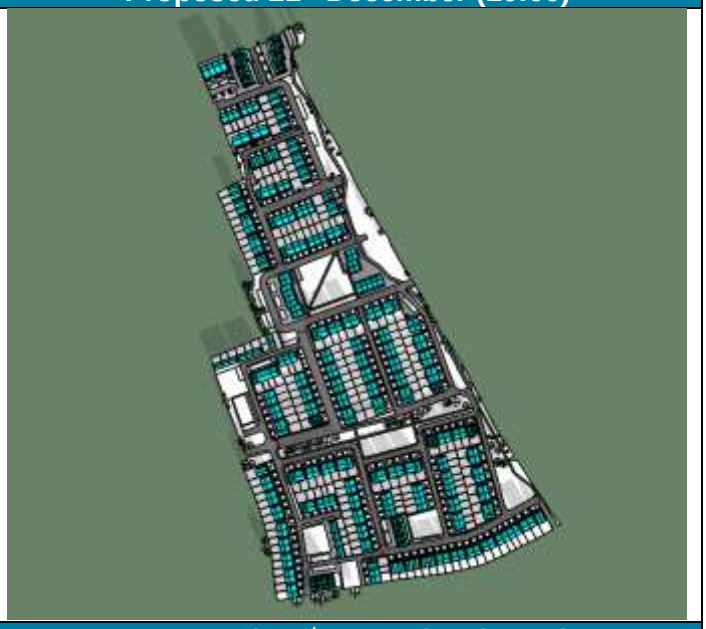
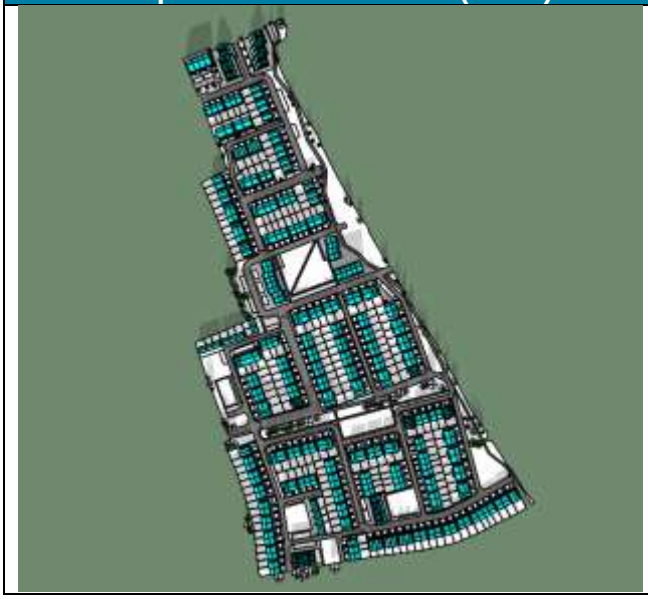
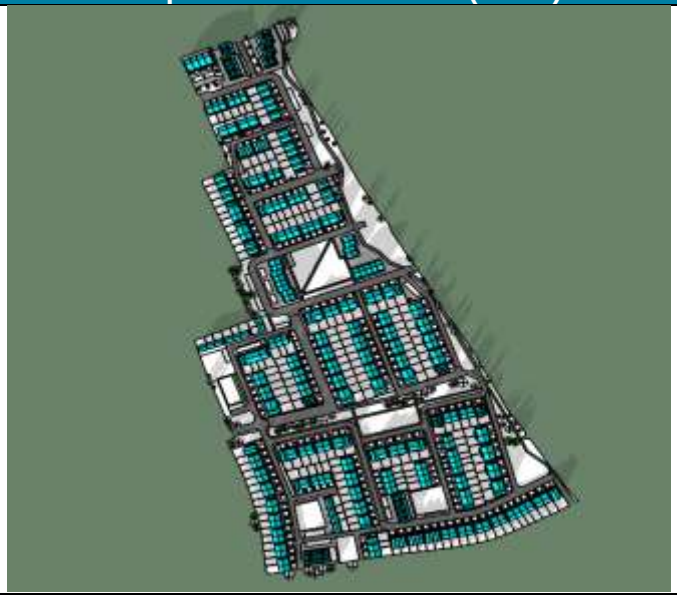
Proposed 21st March (16:00)	Proposed 21st March (18:00)
	

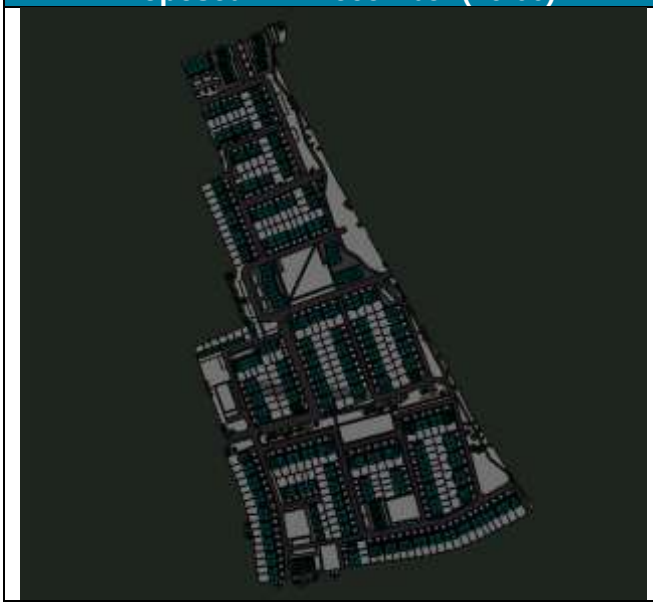
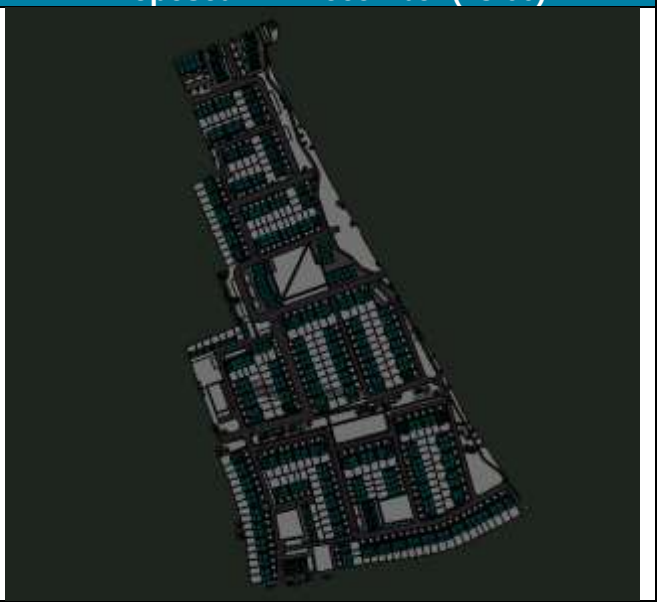
Plan View – 21st June

Proposed 21st June (08:00)	Proposed 21st June (10:00)
	

Proposed 21st June (12:00)	Proposed 21st June (14:00)
	
Proposed 21st June (16:00)	**Proposed 21st June (18:00)**
	

Plan View – 21st December

Proposed 21st December (08:00)	Proposed 21st December (10:00)
	
Proposed 21st December (12:00)	**Proposed 21st December (14:00)**
	

Proposed 21st December (16:00)	Proposed 21st December (18:00)
	

APPENDIX B | DAYLIGHTING RESULTS – BS 8206-2:2008 AVERAGE DAYLIGHT FACTOR

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 117 00_A1.1_KITCHEN/LIVING	3.03	Yes	
No. 117 00_A1.1_SITTING	3.36	Yes	
No. 202 00_A2_KITCHEN/LIVING	2.99	Yes	
No. 202 00_A2_SITTING	3.60	Yes	
No. 061 00_B2_LIVING	1.47	No	ADF is only marginally below target value
No. 061 00_B2_SITTING/OFFICE	3.85	Yes	
No. 055 00_B2_DINING/KITCHEN	3.45	Yes	
No. 061 00_B2_DINING/KITCHEN	3.58	Yes	
No. 048 00_B2_DINING/KITCHEN	3.68	Yes	
No. 108 00_C6_KITCHEN/DINING	2.95	Yes	
No. 108 00_C6_LIVING	1.83	Yes	
No. 100 00_B3.1_LIVING	1.62	Yes	
No. 100 00_B3.1_SITTING/OFFICE	4.21	Yes	
No. 125 00_B2_LIVING	1.47	No	ADF is only marginally below target value
No. 125 00_B2_SITTING/OFFICE	3.82	Yes	
No. 125 00_B2_DINING/KITCHEN	3.88	Yes	
No. 100 00_B3.1_DINING/KITCHEN	3.89	Yes	
No. 055 00_B2_LIVING	1.44	No	ADF is only marginally below target value
No. 055 00_B2_SITTING/OFFICE	4.12	Yes	
No. 048 00_B2_SITTING/OFFICE	3.77	Yes	
No. 048 00_B2_LIVING	1.49	No	ADF is only marginally below target value
No. 001 00_B3_DINING/KITCHEN	4.05	Yes	
No. 001 00_B3_SITTING/OFFICE	4.02	Yes	
No. 001 00_B3_LIVING	1.57	Yes	
No. 154 00_B9.1_DINING/KITCHEN	3.85	Yes	
No. 126 00_B9.1_DINING/KITCHEN	3.68	Yes	
No. 154 00_B9.1_LIVING	1.35	No	
No. 154 00_B9.1_SITTING/OFFICE	4.14	Yes	
No. 126 00_B9.1_LIVING	1.43	No	ADF is only marginally below target value
No. 126 00_B9.1_SITTING/OFFICE	4.14	Yes	
No. 193 00_B9_DINING/KITCHEN	3.72	Yes	
No. 193 00_B9_LIVING	1.29	No	
No. 193 00_B9_SITTING/OFFICE	4.03	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 252 00_C10_LIVING	1.82	Yes	
No. 252 00_C10_KITCHEN/DINING	3.77	Yes	
No. 300 00_C11_LIVING	1.84	Yes	
No. 300 00_C11_KITCHEN/DINING	3.12	Yes	
No. 304 00_C11_LIVING	1.92	Yes	
No. 304 00_C11_KITCHEN/DINING	3.52	Yes	
No. 267 00_C11_LIVING	1.85	Yes	
No. 267 00_C11_KITCHEN/DINING	3.42	Yes	
No. 170 00_C16_KITCHEN/DINING	3.21	Yes	
No. 170 00_C16_LIVING	1.80	Yes	
No. 138 00_C22_LIVING	3.04	Yes	
No. 138 00_C22_KITCHEN/DINING	4.34	Yes	
No. 079 00_C6_KITCHEN/DINING	2.74	Yes	
No. 079 00_C6_LIVING	1.88	Yes	
No. 080 00_C8_KITCHEN/DINING	3.95	Yes	
No. 080 00_C8_LIVING	2.28	Yes	
No. 249 00_C9.1_KITCHEN/DINING	3.91	Yes	
No. 249 00_C9.1_LIVING	2.23	Yes	
No. 260 00_C9.1_KITCHEN/DINING	4.26	Yes	
No. 260 00_C9.1_LIVING	2.34	Yes	
No. 277 00_C9.1_KITCHEN/DINING	3.39	Yes	
No. 277 00_C9.1_LIVING	2.60	Yes	
No. 169 00_B10_SITTING	1.91	Yes	
No. 193 00_B8_KITCHEN/DINING	2.81	Yes	
No. 193 00_B8_LIVING	2.51	Yes	
No. 038 00_C1.1_LIVING	2.40	Yes	
No. 038 00_C1.1_KITCHEN/DINING	3.54	Yes	
No. 047 00_C2.1_DINING	1.79	No	ADF is only marginally below target value
No. 047 00_C2.1_LIVING	3.56	Yes	
N0. 006 00_C1.1_KITCHEN/DINING	3.79	Yes	
No. 065 00_C1_KITCHEN/DINING	3.38	Yes	
No. 065 00_C1_LIVING	2.45	Yes	
N0. 006 00_C1.1_LIVING	2.44	Yes	
No. 052 00_C1.1_KITCHEN/DINING	3.63	Yes	
No. 012 00_C1.1_KITCHEN/DINING	3.83	Yes	
No. 090 00_C1.1_KITCHEN/DINING	3.88	Yes	
No. 012 00_C1.1_LIVING	2.51	Yes	
No. 042 00_C1.1_KITCHEN/DINING	3.58	Yes	
No. 042 00_C1.1_LIVING	2.46	Yes	
No. 090 00_C1.1_LIVING	2.49	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 032 00_C2.1_DINING	1.98	No	ADF is only marginally below target value
No. 032 00_C2.1_LIVING	3.25	Yes	
No. 052 00_C1.1_LIVING	2.52	Yes	
No. 281 00_C12.1_DINING	2.23	Yes	
No. 281 00_C12.1_LIVING	3.45	Yes	
No. 298 00_C12.1_DINING	2.38	Yes	
No. 298 00_C12.1_LIVING	3.50	Yes	
No. 270 00_C13.1_DINING	1.91	No	ADF is only marginally below target value
No. 270 00_C13.1_LIVING	3.86	Yes	
No. 175 00_C15.1_KITCHEN/DINING	3.47	Yes	
No. 175 00_C15.1_LIVING	3.14	Yes	
No. 130 00_C15.1_KITCHEN/DINING	3.45	Yes	
No. 143 00_C15_LIVING	3.33	Yes	
No. 130 00_C15.1_LIVING	3.62	Yes	
No. 143 00_C15_KITCHEN/DINING	3.57	Yes	
No. 189 00_C15_KITCHEN/DINING	3.43	Yes	
No. 185 00_C15_KITCHEN/DINING	3.38	Yes	
No. 185 00_C15_LIVING	3.35	Yes	
No. 161 00_C15_KITCHEN/DINING	3.44	Yes	
No. 139 00_C15_KITCHEN/DINING	3.51	Yes	
No. 139 00_C15_LIVING	3.35	Yes	
No. 161 00_C15_LIVING	3.45	Yes	
No. 189 00_C15_LIVING	3.43	Yes	
No. 095 00_C3_LIVING	2.47	Yes	
No. 101 00_C17_LIVING	3.50	Yes	
No. 101 00_C17_DINING	2.08	Yes	
No. 132 00_C17_LIVING	3.48	Yes	
No. 132 00_C17_DINING	1.73	No	
No. 245 00_C19_KITCHEN/DINING	3.23	Yes	
No. 245 00_C19_LIVING	2.54	Yes	
No. 017 00_C1_KITCHEN/DINING	3.94	Yes	
No. 017 00_C1_LIVING	2.39	Yes	
No. 239 00_C20.1_DINING	2.38	Yes	
No. 239 00_C20.1_LIVING	3.487	Yes	
No. 261 00_C20_LIVING	3.33	Yes	
No. 261 00_C20_DINING	1.82	No	ADF is only marginally below target value

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 271 00_C20_DINING	1.60	No	
No. 271 00_C20_LIVING	3.01	Yes	
No. 095 00_C3_KITCHEN/DINING	3.71	Yes	
No. 027 00_C3_KITCHEN/DINING	2.99	Yes	
No. 027 00_C3_LIVING	2.71	Yes	
No. 032 00_C5_KITCHEN/DINING	2.67	Yes	
No. 032 00_C5_LIVING	3.56	Yes	
No. 019 00_E1_BEDROOM 1	2.95	Yes	
No. 025 00_E1_BEDROOM 1	3.15	Yes	
No. 315 00_E3.1_BEDROOM 1	2.99	Yes	
No. 314 00_E3.1_LIVING/DINING	3.78	Yes	
No. 324 00_E3.1_LIVING/DINING	3.56	Yes	
No. 326 00_E3.2_BEDROOM 1	3.11	Yes	
No. 334 00_E3.2_BEDROOM 1	3.26	Yes	
No. 335 00_E3.2_LIVING/DINING	3.56	Yes	
No. 153 00_D2_LIVING/KITCHEN/DINING	2.83	Yes	
No. 146 00_D3_LIVING/KITCHEN/DINING	3.48	Yes	
No. 236 00_E2.1_BEDROOM 1	1.87	Yes	
No. 237 00_E2.1_KITCHEN/DINING/LIVING	5.14	Yes	
No. 225 00_E2.2_BEDROOM 1	1.48	Yes	
No. 222 00_E2.2_LIVING/KITCHEN/DINING	3.60	Yes	
No. 211 00_E2_BEDROOM 1	1.85	Yes	
No. 217 00_E2_BEDROOM 1	1.76	Yes	
No. 204 00_E2_LIVING/KITCHEN/DINING	5.81	Yes	
No. 308 00_E4_LIVING/KITCHEN/DINING	3.34	Yes	
No. 309 00_E4_BEDROOM 1	3.05	Yes	
No. 292 00_D4_BEDROOM 2	3.44	Yes	
No. 292 00_D4_SITTING/KITCHEN/DINING	2.24	Yes	
No. 292 00_D4_BEDROOM 1	1.38	Yes	
No. 117 01_A1.1_BEDROOM 2	2.20	Yes	
No. 117 01_A1.1_BEDROOM 1	3.41	Yes	
No. 117 01_A1.1_BEDROOM 4	2.45	Yes	
No. 117 01_A1.1_BEDROOM 3	3.97	Yes	
No. 202 01_A2_BEDROOM 1	3.42	Yes	
No. 202 01_A2_BEDROOM 2	2.71	Yes	
No. 202 01_A2_BEDROOM 4	2.50	Yes	
No. 202 01_A2_BEDROOM 3	3.84	Yes	
No. 169 01_B10_BEDROOM 2	2.12	Yes	
No. 169 01_B10_BEDROOM 1	1.92	Yes	
No. 193 01_B8_BEDROOM 3	2.43	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 193 01_B8_BEDROOM 4	4.46	Yes	
No. 169 01_B10_BEDROOM 3	1.86	Yes	
No. 169 01_B10_BEDROOM 4	1.53	Yes	
No. 193 01_B8_BEDROOM 2	1.51	Yes	
No. 193 01_B8_BEDROOM 1	2.32	Yes	
No. 065 01_C1_BEDROOM 1	1.97	Yes	
No. 065 01_C1_BEDROOM 3	1.75	Yes	
No. 065 01_C1_BEDROOM 2	2.13	Yes	
No. 047 01_C2.1_BEDROOM 2	1.23	Yes	
No. 047 01_C2.1_BEDROOM 1	2.97	Yes	
No. 047 01_C2.1_BEDROOM 3	3.54	Yes	
N0. 006 01_C1.1_BEDROOM 1	1.99	Yes	
No. 038 01_C1.1_BEDROOM 1	2.00	Yes	
No. 090 01_C1.1_BEDROOM 1	2.00	Yes	
No. 090 01_C1.1_BEDROOM 2	2.37	Yes	
No. 090 01_C1.1_BEDROOM 3	1.89	Yes	
No. 012 01_C1.1_BEDROOM 1	2.01	Yes	
No. 033 01_C2.1_BEDROOM 2	1.24	Yes	
No. 033 01_C2.1_BEDROOM 1	2.64	Yes	
No. 033 01_C2.1_BEDROOM 3	3.46	Yes	
No. 052 01_C1.1_BEDROOM 1	2.05	Yes	
No. 042 01_C1.1_BEDROOM 1	1.94	Yes	
No. 042 01_C1.1_BEDROOM 2	2.22	Yes	
No. 042 01_C1.1_BEDROOM 3	1.82	Yes	
No. 052 01_C1.1_BEDROOM 2	2.19	Yes	
No. 052 01_C1.1_BEDROOM 3	1.90	Yes	
N0. 006 01_C1.1_BEDROOM 2	2.40	Yes	
N0. 006 01_C1.1_BEDROOM 3	1.86	Yes	
No. 038 01_C1.1_BEDROOM 2	2.20	Yes	
No. 038 01_C1.1_BEDROOM 3	1.82	Yes	
No. 012 01_C1.1_BEDROOM 2	2.32	Yes	
No. 012 01_C1.1_BEDROOM 3	2.00	Yes	
No. 281 01_C12.1_BEDROOM 2	2.41	Yes	
No. 281 01_C12.1_BEDROOM 1	2.68	Yes	
No. 281 01_C12.1_BEDROOM 3	3.32	Yes	
No. 298 01_C12.1_BEDROOM 2	2.46	Yes	
No. 298 01_C12.1_BEDROOM 1	2.84	Yes	
No. 298 01_C12.1_BEDROOM 3	3.37	Yes	
No. 270 01_C13.1_BEDROOM 2	1.25	Yes	
No. 270 01_C13.1_BEDROOM 1	2.81	Yes	
No. 270 01_C13.1_BEDROOM 3	3.51	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 143 01_C15_BEDROOM 1	2.96	Yes	
No. 143 01_C15_BEDROOM 2	1.24	Yes	
No. 143 01_C15_BEDROOM 3	3.36	Yes	
No. 130 01_C15.1_BEDROOM 1	3.02	Yes	
No. 130 01_C15.1_BEDROOM 3	3.39	Yes	
No. 130 01_C15.1_BEDROOM 2	1.24	Yes	
No. 175 01_C15.1_BEDROOM 1	3.02	Yes	
No. 175 01_C15.1_BEDROOM 3	3.33	Yes	
No. 175 01_C15.1_BEDROOM 2	1.25	Yes	
No. 161 01_C15_BEDROOM 2	1.28	Yes	
No. 161 01_C15_BEDROOM 3	3.47	Yes	
No. 161 01_C15_BEDROOM 1	2.87	Yes	
No. 185 01_C15_BEDROOM 2	1.25	Yes	
No. 185 01_C15_BEDROOM 3	3.52	Yes	
No. 185 01_C15_BEDROOM 1	2.81	Yes	
No. 139 01_C15_BEDROOM 1	2.94	Yes	
No. 189 01_C15_BEDROOM 2	1.24	Yes	
No. 189 01_C15_BEDROOM 3	3.33	Yes	
No. 189 01_C15_BEDROOM 1	2.38	Yes	
No. 139 01_C15_BEDROOM 2	1.18	Yes	
No. 139 01_C15_BEDROOM 3	3.38	Yes	
No. 132 01_C17_BEDROOM 2	1.35	Yes	
No. 132 01_C17_BEDROOM 1	2.74	Yes	
No. 132 01_C17_BEDROOM 3	3.65	Yes	
No. 101 01_C17_BEDROOM 1	2.80	Yes	
No. 101 01_C17_BEDROOM 2	1.21	Yes	
No. 101 01_C17_BEDROOM 3	3.56	Yes	
No. 095 01_C3_BEDROOM 1	2.08	Yes	
No. 245 01_C19_BEDROOM 1	1.99	Yes	
No. 245 01_C19_BEDROOM 3	1.90	Yes	
No. 245 01_C19_BEDROOM 2	2.24	Yes	
No. 017 01_C1_BEDROOM 1	1.99	Yes	
No. 017 01_C1_BEDROOM 3	2.03	Yes	
No. 017 01_C1_BEDROOM 2	2.29	Yes	
No. 239 01_C20.1_BEDROOM 1	3.26	Yes	
No. 239 01_C20.1_BEDROOM 2	2.64	Yes	
No. 239 01_C20.1_BEDROOM 3	4.31	Yes	
No. 271 01_C20_BEDROOM 2	1.20	Yes	
No. 271 01_C20_BEDROOM 1	2.56	Yes	
No. 271 01_C20_BEDROOM 3	3.33	Yes	
No. 261 01_C20_BEDROOM 2	1.28	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 261 01_C20_BEDROOM 1	3.21	Yes	
No. 261 01_C20_BEDROOM 3	3.36	Yes	
No. 027 01_C3_BEDROOM 2	1.19	Yes	
No. 027 01_C3_BEDROOM 3	3.18	Yes	
No. 027 01_C3_BEDROOM 1	2.11	Yes	
No. 095 01_C3_BEDROOM 2	1.36	Yes	
No. 095 01_C3_BEDROOM 3	3.42	Yes	
No. 032 01_C5_BEDROOM 2	1.50	Yes	
No. 032 01_C5_BEDROOM 1	2.38	Yes	
No. 032 01_C5_BEDROOM 3	3.73	Yes	
No. 048 01_B2_BEDROOM 2	1.89	Yes	
No. 048 01_B2_BEDROOM 1	2.50	Yes	
No. 048 01_B2_BEDROOM 3	4.32	Yes	
No. 048 01_B2_BEDROOM 4	2.55	Yes	
No. 125 01_B2_BEDROOM 1	2.36	Yes	
No. 125 01_B2_BEDROOM 2	2.05	Yes	
No. 125 01_B2_BEDROOM 3	4.31	Yes	
No. 125 01_B2_BEDROOM 4	2.66	Yes	
No. 061 01_B2_BEDROOM 2	2.01	Yes	
No. 061 01_B2_BEDROOM 1	2.70	Yes	
No. 061 01_B2_BEDROOM 3	4.30	Yes	
No. 061 01_B2_BEDROOM 4	2.73	Yes	
No. 055 01_B2_BEDROOM 2	2.09	Yes	
No. 055 01_B2_BEDROOM 1	2.76	Yes	
No. 055 01_B2_BEDROOM 3	4.50	Yes	
No. 055 01_B2_BEDROOM 4	2.71	Yes	
No. 126 01_B9.1_BEDROOM 2	2.24	Yes	
No. 126 01_B9.1_BEDROOM 1	2.44	Yes	
No. 126 01_B9.1_BEDROOM 3	4.42	Yes	
No. 126 01_B9.1_BEDROOM 4	2.59	Yes	
No. 154 01_B9.1_BEDROOM 2	2.18	Yes	
No. 154 01_B9.1_BEDROOM 1	2.52	Yes	
No. 154 01_B9.1_BEDROOM 3	4.31	Yes	
No. 154 01_B9.1_BEDROOM 4	2.49	Yes	
No. 193 01_B9_BEDROOM 2	2.02	Yes	
No. 193 01_B9_BEDROOM 1	2.87	Yes	
No. 193 01_B9_BEDROOM 3	4.47	Yes	
No. 193 01_B9_BEDROOM 4	2.57	Yes	
No. 252 01_C10_BEDROOM 1	1.97	Yes	
No. 252 01_C10_BEDROOM 2	1.51	Yes	
No. 252 01_C10_BEDROOM 3	3.51	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 100 01_B3.1_BEDROOM 2	2.14	Yes	
No. 100 01_B3.1_BEDROOM 1	3.34	Yes	
No. 100 01_B3.1_BEDROOM 3	4.64	Yes	
No. 100 01_B3.1_BEDROOM 4	3.28	Yes	
No. 001 01_B3_BEDROOM 1	2.68	Yes	
No. 001 01_B3_BEDROOM 2	2.16	Yes	
No. 001 01_B3_BEDROOM 3	4.40	Yes	
No. 001 01_B3_BEDROOM 4	3.22	Yes	
No. 267 01_C11_BEDROOM 1	2.48	Yes	
No. 300 01_C11_BEDROOM 1	2.56	Yes	
No. 304 01_C11_BEDROOM 1	2.58	Yes	
No. 300 01_C11_BEDROOM 3	2.81	Yes	
No. 300 01_C11_BEDROOM 2	2.28	Yes	
No. 304 01_C11_BEDROOM 2	2.38	Yes	
No. 304 01_C11_BEDROOM 3	2.47	Yes	
No. 267 01_C11_BEDROOM 3	2.63	Yes	
No. 267 01_C11_BEDROOM 2	2.37	Yes	
No. 170 01_C16_BEDROOM 2	2.24	Yes	
No. 170 01_C16_BEDROOM 3	2.73	Yes	
No. 170 01_C16_BEDROOM 1	2.41	Yes	
No. 138 01_C22_BEDROOM 1	3.66	Yes	
No. 138 01_C22_BEDROOM 3	2.80	Yes	
No. 138 01_C22_BEDROOM 2	3.16	Yes	
No. 108 01_C6_BEDROOM 1	2.28	Yes	
No. 108 01_C6_BEDROOM 3	2.56	Yes	
No. 108 01_C6_BEDROOM 1	2.57	Yes	
No. 079 01_C6_BEDROOM 1	2.27	Yes	
No. 079 01_C6_BEDROOM 3	2.68	Yes	
No. 079 01_C6_BEDROOM 1	2.46	Yes	
No. 080 01_C8_BEDROOM 1	1.89	Yes	
No. 080 01_C8_BEDROOM 2	2.38	Yes	
No. 080 01_C8_BEDROOM 3	2.14	Yes	
No. 249 01_C9.1_BEDROOM 1	1.88	Yes	
No. 277 01_C9.1_BEDROOM 1	1.97	Yes	
No. 260 01_C9.1_BEDROOM 1	1.86	Yes	
No. 260 01_C9.1_BEDROOM 2	2.33	Yes	
No. 260 01_C9.1_BEDROOM 3	2.22	Yes	
No. 277 01_C9.1_BEDROOM 2	2.06	Yes	
No. 277 01_C9.1_BEDROOM 3	2.05	Yes	
No. 249 01_C9.1_BEDROOM 3	2.20	Yes	
No. 249 01_C9.1_BEDROOM 2	2.28	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 153 01_D2_BEDROOM 1	2.50	Yes	
No. 146 01_D3_BEDROOM 1	2.69	Yes	
No. 146 01_D3_BEDROOM 2	1.31	Yes	
No. 292 01_D4_BEDROOM 1	2.79	Yes	
No. 292 01_D4_KITCHEN	2.14	Yes	
No. 292 01_D4_BEDROOM 2	0.65	No	
No. 292 01_D4_SITTING ROOM	1.56	Yes	
No. 025 01_E1_BEDROOM 1	3.00	Yes	
No. 019 01_E1_BEDROOM 1	3.02	Yes	
No. 025 01_E1_KITCHEN	2.24	Yes	
No. 315 01_E3.1_BEDROOM 1	2.84	Yes	
No. 314 01_E3.1_KITCHEN	3.00	Yes	
No. 324 01_E3.1_KITCHEN	3.11	Yes	
No. 326 01_E3.2_BEDROOM 1	3.01	Yes	
No. 334 01_E3.2_BEDROOM 1	3.12	Yes	
No. 335 01_E3.2_KITCHEN	3.16	Yes	
No. 236 01_E2.1_LIVING	2.73	Yes	
No. 236 01_E2.1_KITCHEN/DINING	3.40	Yes	
No. 237 01_E2.1_LIVING	3.74	Yes	
No. 225 01_E2.2_LIVING	3.91	Yes	
No. 225 01_E2.2_KITCHEN/DINING	3.71	Yes	
No. 222 01_E2.2_LIVING	3.25	Yes	
No. 217 01_E2_KITCHEN/DINING	3.30	Yes	
No. 217 01_E2_LIVING	4.34	Yes	
No. 211 01_E2_KITCHEN/DINING	3.79	Yes	
No. 211 01_E2_LIVING	4.08	Yes	
No. 204 01_E2_LIVING	4.70	Yes	
No. 308 01_E4_BEDROOM 2	2.21	Yes	
No. 309 01_E4_BEDROOM 2	2.07	Yes	
No. 237 02_E2.1_BEDROOM 1	4.47	Yes	
No. 236 02_E2.1_BEDROOM 2	3.83	Yes	
No. 225 02_E2.2_BEDROOM 2	3.60	Yes	
No. 222 02_E2.2_BEDROOM 1	2.81	Yes	
No. 204 02_E2_BEDROOM 1	6.03	Yes	
No. 217 02_E2_BEDROOM 2	3.45	Yes	
No. 211 02_E2_BEDROOM 2	3.74	Yes	
No. 308 02_E4_LIVING/KITCHEN/DINING	3.61	Yes	
No. 309 02_E4_BEDROOM 1	3.37	Yes	
No. 309 02_E4_LIVING/KITCHEN/DINING	5.14	Yes	
No. 169 00_B10_KITCHEN/DINING	2.64	Yes	

Zone	ADF (%)	Room meets BS8206-2 criteria	Comments
No. 117 02_A1.1_BEDROOM 5	2.17	Yes	
No. 117 02_A1.1_STUDY	2.08	Yes	
No. 202 02_A2_BEDROOM 5	2.27	Yes	
No. 202 02_A2_STUDY	2.00	Yes	
No. 019 02_E1_BEDROOM 2	1.89	Yes	
No. 025 02_E1_BEDROOM 2	2.08	Yes	
No. 315 02_E3.1_BEDROOM 2	1.99	Yes	
No. 334 02_E3.2_BEDROOM 2	2.00	Yes	
No. 326 02_E3.2_BEDROOM 2	1.91	Yes	

APPENDIX C | DAYLIGHTING RESULTS – EN 17037 SPATIAL DAYLIGHT AUTONOMY

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 117 00_A1.1_KITCHEN/LIVING	82.79	100.00	yes
No. 117 00_A1.1_SITTING	99.38	100.00	yes
No. 202 00_A2_KITCHEN/LIVING	99.34	100.00	yes
No. 202 00_A2_SITTING	100.00	100.00	yes
No. 061 00_B2_LIVING	23.67	88.17	no
No. 061 00_B2_SITTING/OFFICE	100.00	100.00	yes
No. 055 00_B2_DINING/KITCHEN	100.00	100.00	yes
No. 061 00_B2_DINING/KITCHEN	100.00	100.00	yes
No. 048 00_B2_DINING/KITCHEN	100.00	100.00	yes
No. 108 00_C6_KITCHEN/DINING	65.09	100.00	yes
No. 108 00_C6_LIVING	33.64	98.18	no
No. 100 00_B3.1_LIVING	30.23	97.09	no
No. 100 00_B3.1_SITTING/OFFICE	100.00	100.00	yes
No. 125 00_B2_LIVING	24.26	93.49	no
No. 125 00_B2_SITTING/OFFICE	100.00	100.00	yes
No. 125 00_B2_DINING/KITCHEN	100.00	100.00	yes
No. 100 00_B3.1_DINING/KITCHEN	100.00	100.00	yes
No. 055 00_B2_LIVING	22.49	85.21	no
No. 055 00_B2_SITTING/OFFICE	100.00	100.00	yes
No. 048 00_B2_SITTING/OFFICE	99.09	100.00	yes
No. 048 00_B2_LIVING	22.49	87.57	no
No. 001 00_B3_DINING/KITCHEN	100.00	100.00	yes
No. 001 00_B3_SITTING/OFFICE	100.00	100.00	yes
No. 001 00_B3_LIVING	28.41	89.21	no
No. 154 00_B9.1_DINING/KITCHEN	100.00	100.00	yes
No. 126 00_B9.1_DINING/KITCHEN	100.00	100.00	yes
No. 154 00_B9.1_LIVING	35.54	97.59	no
No. 154 00_B9.1_SITTING/OFFICE	100.00	100.00	yes
No. 126 00_B9.1_LIVING	40.96	100.00	no
No. 126 00_B9.1_SITTING/OFFICE	100.00	100.00	yes
No. 193 00_B9_DINING/KITCHEN	100.00	100.00	yes
No. 193 00_B9_LIVING	21.08	69.88	no
No. 193 00_B9_SITTING/OFFICE	100.00	100.00	yes
No. 252 00_C10_LIVING	33.78	97.30	no
No. 252 00_C10_KITCHEN/DINING	100.00	100.00	yes
No. 300 00_C11_LIVING	32.11	98.17	no
No. 300 00_C11_KITCHEN/DINING	74.32	100.00	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 304 00_C11_LIVING	39.66	100.00	no
No. 304 00_C11_KITCHEN/DINING	100.00	100.00	yes
No. 267 00_C11_LIVING	33.62	100.00	no
No. 267 00_C11_KITCHEN/DINING	93.23	100.00	yes
No. 170 00_C16_KITCHEN/DINING	84.90	100.00	yes
No. 170 00_C16_LIVING	33.04	99.13	no
No. 138 00_C22_LIVING	84.21	100.00	yes
No. 138 00_C22_KITCHEN/DINING	100.00	100.00	yes
No. 079 00_C6_KITCHEN/DINING	58.01	100.00	yes
No. 079 00_C6_LIVING	33.62	99.14	no
No. 080 00_C8_KITCHEN/DINING	100.00	100.00	yes
No. 080 00_C8_LIVING	38.96	97.40	no
No. 249 00_C9.1_KITCHEN/DINING	100.00	100.00	yes
No. 249 00_C9.1_LIVING	37.91	98.69	no
No. 260 00_C9.1_KITCHEN/DINING	100.00	100.00	yes
No. 260 00_C9.1_LIVING	42.48	100.00	no
No. 277 00_C9.1_KITCHEN/DINING	100.00	100.00	yes
No. 277 00_C9.1_LIVING	57.52	100.00	yes
No. 169 00_B10_SITTING	36.91	100.00	no
No. 193 00_B8_KITCHEN/DINING	85.40	100.00	yes
No. 193 00_B8_LIVING	57.60	100.00	yes
No. 038 00_C1.1_LIVING	43.32	96.79	no
No. 038 00_C1.1_KITCHEN/DINING	100.00	100.00	yes
No. 047 00_C2.1_DINING	36.50	99.00	no
No. 047 00_C2.1_LIVING	99.53	100.00	yes
N0. 006 00_C1.1_KITCHEN/DINING	100.00	100.00	yes
No. 065 00_C1_KITCHEN/DINING	100.00	100.00	yes
No. 065 00_C1_LIVING	39.04	99.47	no
N0. 006 00_C1.1_LIVING	43.01	98.93	no
No. 052 00_C1.1_KITCHEN/DINING	100.00	100.00	yes
No. 012 00_C1.1_KITCHEN/DINING	100.00	100.00	yes
No. 090 00_C1.1_KITCHEN/DINING	100.00	100.00	yes
No. 012 00_C1.1_LIVING	44.92	100.00	no
No. 042 00_C1.1_KITCHEN/DINING	100.00	100.00	yes
No. 042 00_C1.1_LIVING	40.64	99.47	no
No. 090 00_C1.1_LIVING	40.21	98.94	no
No. 033 00_C2.1_DINING	68.00	100.00	yes
No. 033 00_C2.1_LIVING	85.92	100.00	yes
No. 052 00_C1.1_LIVING	42.78	100.00	no
No. 281 00_C12.1_DINING	47.48	100.00	no

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 281 00_C12.1_LIVING	92.38	100.00	yes
No. 298 00_C12.1_DINING	47.98	100.00	no
No. 298 00_C12.1_LIVING	93.81	100.00	yes
No. 270 00_C13.1_DINING	38.89	97.98	no
No. 270 00_C13.1_LIVING	98.57	100.00	yes
No. 175 00_C15.1_KITCHEN/DINING	100.00	100.00	yes
No. 175 00_C15.1_LIVING	52.69	97.31	yes
No. 130 00_C15.1_KITCHEN/DINING	94.79	100.00	yes
No. 143 00_C15_LIVING	55.91	100.00	yes
No. 130 00_C15.1_LIVING	100.00	100.00	yes
No. 143 00_C15_KITCHEN/DINING	100.00	100.00	yes
No. 189 00_C15_KITCHEN/DINING	94.79	100.00	yes
No. 185 00_C15_KITCHEN/DINING	87.20	100.00	yes
No. 185 00_C15_LIVING	62.90	99.46	yes
No. 161 00_C15_KITCHEN/DINING	87.68	100.00	yes
No. 139 00_C15_KITCHEN/DINING	100.00	100.00	yes
No. 139 00_C15_LIVING	56.99	100.00	yes
No. 161 00_C15_LIVING	69.36	100.00	yes
No. 189 00_C15_LIVING	69.89	100.00	yes
No. 095 00_C3_LIVING	47.46	99.44	no
No. 101 00_C17_LIVING	100.00	100.00	yes
No. 101 00_C17_DINING	41.21	97.99	no
No. 132 00_C17_LIVING	99.52	100.00	yes
No. 132 00_C17_DINING	90.82	100.00	yes
No. 245 00_C19_KITCHEN/DINING	74.65	100.00	yes
No. 245 00_C19_LIVING	87.98	100.00	yes
No. 017 00_C1_KITCHEN/DINING	100.00	100.00	yes
No. 017 00_C1_LIVING	45.75	100.00	no
No. 239 00_C20.1_DINING	48.49	100.00	no
No. 239 00_C20.1_LIVING	97.61	100.00	yes
No. 261 00_C20_LIVING	77.47	100.00	yes
No. 261 00_C20_DINING	57.58	100.00	yes
No. 271 00_C20_DINING	29.80	91.92	no
No. 271 00_C20_LIVING	95.24	100.00	yes
No. 095 00_C3_KITCHEN/DINING	100.00	100.00	yes
No. 027 00_C3_KITCHEN/DINING	72.60	100.00	yes
No. 027 00_C3_LIVING	66.11	100.00	yes
No. 032 00_C5_KITCHEN/DINING	99.56	100.00	yes
No. 032 00_C5_LIVING	100.00	100.00	yes
No. 019 00_E1_BEDROOM 1	58.76	100.00	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 025 00_E1_BEDROOM 1	61.18	100.00	yes
No. 315 00_E3.1_BEDROOM 1	100.00	100.00	yes
No. 314 00_E3.1_LIVING/DINING	98.60	100.00	yes
No. 324 00_E3.1_LIVING/DINING	100.00	100.00	yes
No. 326 00_E3.2_BEDROOM 1	75.00	100.00	yes
No. 334 00_E3.2_BEDROOM 1	83.13	100.00	yes
No. 335 00_E3.2_LIVING/DINING	100.00	100.00	yes
No. 153 00_D2_LIVING/KITCHEN/DINING	87.37	100.00	yes
No. 146 00_D3_LIVING/KITCHEN/DINING	97.55	100.00	yes
No. 236 00_E2.1_BEDROOM 1	32.94	100.00	no
No. 237 00_E2.1_KITCHEN/DINING/LIVING	100.00	100.00	yes
No. 225 00_E2.2_BEDROOM 1	33.72	79.07	no
No. 222 00_E2.2_LIVING/KITCHEN/DINING	86.58	100.00	yes
No. 211 00_E2_BEDROOM 1	61.18	100.00	yes
No. 217 00_E2_BEDROOM 1	43.16	100.00	no
No. 203 00_E2_LIVING/KITCHEN/DINING	100.00	100.00	yes
No. 308 00_E4_LIVING/KITCHEN/DINING	94.37	100.00	yes
No. 309 00_E4_BEDROOM 1	93.75	100.00	yes
No. 292 00_D4_BEDROOM 2	82.08	100.00	yes
No. 292 00_D4_SITTING/KITCHEN/DINING	41.75	93.15	no
No. 292 00_D4_BEDROOM 1	69.44	100.00	yes
No. 117 01_A1.1_BEDROOM 2	56.14	99.12	yes
No. 117 01_A1.1_BEDROOM 1	100.00	100.00	yes
No. 117 01_A1.1_BEDROOM 4	96.55	100.00	yes
No. 117 01_A1.1_BEDROOM 3	100.00	100.00	yes
No. 202 01_A2_BEDROOM 1	100.00	100.00	yes
No. 202 01_A2_BEDROOM 2	96.10	100.00	yes
No. 202 01_A2_BEDROOM 4	94.19	100.00	yes
No. 202 01_A2_BEDROOM 3	100.00	100.00	yes
No. 169 01_B10_BEDROOM 2	52.27	100.00	yes
No. 169 01_B10_BEDROOM 1	39.88	99.41	no
No. 193 01_B8_BEDROOM 3	67.86	100.00	yes
No. 193 01_B8_BEDROOM 4	100.00	100.00	yes
No. 169 01_B10_BEDROOM 3	98.41	100.00	yes
No. 169 01_B10_BEDROOM 4	85.71	100.00	yes
No. 193 01_B8_BEDROOM 2	37.35	98.80	no
No. 193 01_B8_BEDROOM 1	96.91	100.00	yes
No. 065 01_C1_BEDROOM 1	39.42	100.00	no
No. 065 01_C1_BEDROOM 3	64.52	100.00	yes
No. 065 01_C1_BEDROOM 2	81.25	100.00	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 047 01_C2.1_BEDROOM 2	28.77	100.00	no
No. 047 01_C2.1_BEDROOM 1	87.22	97.74	yes
No. 047 01_C2.1_BEDROOM 3	100.00	100.00	yes
N0. 006 01_C1.1_BEDROOM 1	42.22	100.00	no
No. 038 01_C1.1_BEDROOM 1	44.53	100.00	no
No. 090 01_C1.1_BEDROOM 1	38.57	100.00	no
No. 090 01_C1.1_BEDROOM 2	100.00	100.00	yes
No. 090 01_C1.1_BEDROOM 3	98.39	100.00	yes
No. 012 01_C1.1_BEDROOM 1	46.04	100.00	no
No. 033 01_C2.1_BEDROOM 2	36.99	98.63	no
No. 033 01_C2.1_BEDROOM 1	82.44	93.13	no
No. 033 01_C2.1_BEDROOM 3	100.00	100.00	yes
No. 052 01_C1.1_BEDROOM 1	43.80	100.00	no
No. 042 01_C1.1_BEDROOM 1	45.26	100.00	no
No. 042 01_C1.1_BEDROOM 2	92.86	100.00	yes
No. 042 01_C1.1_BEDROOM 3	69.36	100.00	yes
No. 052 01_C1.1_BEDROOM 2	100.00	100.00	yes
No. 052 01_C1.1_BEDROOM 3	90.32	100.00	yes
N0. 006 01_C1.1_BEDROOM 2	100.00	100.00	yes
N0. 006 01_C1.1_BEDROOM 3	98.39	100.00	yes
No. 038 01_C1.1_BEDROOM 2	91.96	100.00	yes
No. 038 01_C1.1_BEDROOM 3	72.58	100.00	yes
No. 012 01_C1.1_BEDROOM 2	100.00	100.00	yes
No. 012 01_C1.1_BEDROOM 3	92.19	100.00	yes
No. 281 01_C12.1_BEDROOM 2	84.51	100.00	yes
No. 281 01_C12.1_BEDROOM 1	82.03	95.31	yes
No. 281 01_C12.1_BEDROOM 3	100.00	100.00	yes
No. 298 01_C12.1_BEDROOM 2	85.92	100.00	yes
No. 298 01_C12.1_BEDROOM 1	82.03	95.31	yes
No. 298 01_C12.1_BEDROOM 3	100.00	100.00	yes
No. 270 01_C13.1_BEDROOM 2	18.31	98.59	no
No. 270 01_C13.1_BEDROOM 1	82.81	97.66	yes
No. 270 01_C13.1_BEDROOM 3	100.00	100.00	yes
No. 143 01_C15_BEDROOM 1	84.56	100.00	yes
No. 143 01_C15_BEDROOM 2	26.36	100.00	no
No. 143 01_C15_BEDROOM 3	100.00	100.00	yes
No. 130 01_C15.1_BEDROOM 1	100.00	100.00	yes
No. 130 01_C15.1_BEDROOM 3	100.00	100.00	yes
No. 130 01_C15.1_BEDROOM 2	15.46	100.00	no
No. 175 01_C15.1_BEDROOM 1	77.94	100.00	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 175 01_C15.1_BEDROOM 3	100.00	100.00	yes
No. 175 01_C15.1_BEDROOM 2	23.64	100.00	no
No. 161 01_C15_BEDROOM 2	19.09	100.00	no
No. 161 01_C15_BEDROOM 3	100.00	100.00	yes
No. 161 01_C15_BEDROOM 1	100.00	100.00	yes
No. 185 01_C15_BEDROOM 2	14.45	100.00	no
No. 185 01_C15_BEDROOM 3	100.00	100.00	yes
No. 185 01_C15_BEDROOM 1	100.00	100.00	yes
No. 139 01_C15_BEDROOM 1	81.62	100.00	yes
No. 189 01_C15_BEDROOM 2	17.23	70.00	no
No. 189 01_C15_BEDROOM 3	100.00	100.00	yes
No. 189 01_C15_BEDROOM 1	81.62	100.00	yes
No. 139 01_C15_BEDROOM 2	30.00	100.00	no
No. 139 01_C15_BEDROOM 3	100.00	100.00	yes
No. 132 01_C17_BEDROOM 2	44.44	100.00	no
No. 132 01_C17_BEDROOM 1	82.58	94.70	no
No. 132 01_C17_BEDROOM 3	100.00	100.00	yes
No. 101 01_C17_BEDROOM 1	86.15	96.92	yes
No. 101 01_C17_BEDROOM 2	41.10	100.00	no
No. 101 01_C17_BEDROOM 3	100.00	100.00	yes
No. 095 01_C3_BEDROOM 1	50.79	100.00	yes
No. 245 01_C19_BEDROOM 1	99.25	100.00	yes
No. 245 01_C19_BEDROOM 3	31.67	100.00	no
No. 245 01_C19_BEDROOM 2	53.64	100.00	yes
No. 017 01_C1_BEDROOM 1	48.20	100.00	no
No. 017 01_C1_BEDROOM 3	93.75	100.00	yes
No. 017 01_C1_BEDROOM 2	100.00	100.00	yes
No. 239 01_C20.1_BEDROOM 1	87.02	100.00	yes
No. 239 01_C20.1_BEDROOM 2	100.00	100.00	yes
No. 239 01_C20.1_BEDROOM 3	100.00	100.00	yes
No. 271 01_C20_BEDROOM 2	27.40	93.15	no
No. 271 01_C20_BEDROOM 1	85.50	95.42	yes
No. 271 01_C20_BEDROOM 3	100.00	100.00	yes
No. 261 01_C20_BEDROOM 2	28.77	97.26	no
No. 261 01_C20_BEDROOM 1	80.92	90.08	no
No. 261 01_C20_BEDROOM 3	100.00	100.00	yes
No. 027 01_C3_BEDROOM 2	16.82	59.81	no
No. 027 01_C3_BEDROOM 3	100.00	100.00	yes
No. 027 01_C3_BEDROOM 1	93.80	100.00	yes
No. 095 01_C3_BEDROOM 2	44.66	100.00	no

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 095 01_C3_BEDROOM 3	100.00	100.00	yes
No. 032 01_C5_BEDROOM 2	58.11	94.60	no
No. 032 01_C5_BEDROOM 1	96.12	100.00	yes
No. 032 01_C5_BEDROOM 3	95.83	100.00	yes
No. 048 01_B2_BEDROOM 2	75.00	100.00	yes
No. 048 01_B2_BEDROOM 1	97.58	100.00	yes
No. 048 01_B2_BEDROOM 3	100.00	100.00	yes
No. 048 01_B2_BEDROOM 4	82.80	100.00	yes
No. 125 01_B2_BEDROOM 1	97.60	100.00	yes
No. 125 01_B2_BEDROOM 2	96.08	100.00	yes
No. 125 01_B2_BEDROOM 3	100.00	100.00	yes
No. 125 01_B2_BEDROOM 4	92.55	100.00	yes
No. 061 01_B2_BEDROOM 2	38.46	98.08	no
No. 061 01_B2_BEDROOM 1	82.26	100.00	yes
No. 061 01_B2_BEDROOM 3	100.00	100.00	yes
No. 061 01_B2_BEDROOM 4	87.10	100.00	yes
No. 055 01_B2_BEDROOM 2	42.31	98.08	no
No. 055 01_B2_BEDROOM 1	85.48	100.00	yes
No. 055 01_B2_BEDROOM 3	100.00	100.00	yes
No. 055 01_B2_BEDROOM 4	75.27	100.00	yes
No. 126 01_B9.1_BEDROOM 2	92.16	100.00	yes
No. 126 01_B9.1_BEDROOM 1	97.56	100.00	yes
No. 126 01_B9.1_BEDROOM 3	100.00	100.00	yes
No. 126 01_B9.1_BEDROOM 4	100.00	100.00	yes
No. 154 01_B9.1_BEDROOM 2	98.04	100.00	yes
No. 154 01_B9.1_BEDROOM 1	97.56	100.00	yes
No. 154 01_B9.1_BEDROOM 3	100.00	100.00	yes
No. 154 01_B9.1_BEDROOM 4	100.00	100.00	yes
No. 193 01_B9_BEDROOM 2	40.00	100.00	no
No. 193 01_B9_BEDROOM 1	91.87	100.00	yes
No. 193 01_B9_BEDROOM 3	100.00	100.00	yes
No. 193 01_B9_BEDROOM 4	75.27	100.00	yes
No. 252 01_C10_BEDROOM 1	40.95	100.00	no
No. 252 01_C10_BEDROOM 2	54.37	100.00	yes
No. 252 01_C10_BEDROOM 3	100.00	100.00	yes
No. 100 01_B3.1_BEDROOM 2	50.98	100.00	yes
No. 100 01_B3.1_BEDROOM 1	94.17	100.00	yes
No. 100 01_B3.1_BEDROOM 3	100.00	100.00	yes
No. 100 01_B3.1_BEDROOM 4	100.00	100.00	yes
No. 001 01_B3_BEDROOM 1	91.87	100.00	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 001 01_B3_BEDROOM 2	45.10	100.00	no
No. 001 01_B3_BEDROOM 3	100.00	100.00	yes
No. 001 01_B3_BEDROOM 4	97.98	100.00	yes
No. 267 01_C11_BEDROOM 1	100.00	100.00	yes
No. 300 01_C11_BEDROOM 1	100.00	100.00	yes
No. 304 01_C11_BEDROOM 1	100.00	100.00	yes
No. 300 01_C11_BEDROOM 3	71.11	100.00	yes
No. 300 01_C11_BEDROOM 2	58.42	100.00	yes
No. 304 01_C11_BEDROOM 2	67.59	100.00	yes
No. 304 01_C11_BEDROOM 3	68.75	100.00	yes
No. 267 01_C11_BEDROOM 3	80.00	100.00	yes
No. 267 01_C11_BEDROOM 2	59.81	100.00	yes
No. 170 01_C16_BEDROOM 2	54.63	100.00	yes
No. 170 01_C16_BEDROOM 3	70.83	100.00	yes
No. 170 01_C16_BEDROOM 1	100.00	100.00	yes
No. 138 01_C22_BEDROOM 1	100.00	100.00	yes
No. 138 01_C22_BEDROOM 3	76.09	100.00	yes
No. 138 01_C22_BEDROOM 2	99.06	100.00	yes
No. 108 01_C6_BEDROOM 1	60.19	100.00	yes
No. 108 01_C6_BEDROOM 3	72.92	100.00	yes
No. 108 01_C6_BEDROOM 1	100.00	100.00	yes
No. 079 01_C6_BEDROOM 1	59.63	100.00	yes
No. 079 01_C6_BEDROOM 3	72.92	100.00	yes
No. 079 01_C6_BEDROOM 1	100.00	100.00	yes
No. 080 01_C8_BEDROOM 1	31.88	100.00	no
No. 080 01_C8_BEDROOM 2	100.00	100.00	yes
No. 080 01_C8_BEDROOM 3	100.00	100.00	yes
No. 249 01_C9.1_BEDROOM 1	35.56	100.00	no
No. 277 01_C9.1_BEDROOM 1	47.41	100.00	no
No. 260 01_C9.1_BEDROOM 1	36.30	100.00	no
No. 260 01_C9.1_BEDROOM 2	100.00	100.00	yes
No. 260 01_C9.1_BEDROOM 3	100.00	100.00	yes
No. 277 01_C9.1_BEDROOM 2	94.55	100.00	yes
No. 277 01_C9.1_BEDROOM 3	83.33	100.00	yes
No. 249 01_C9.1_BEDROOM 3	98.33	100.00	yes
No. 249 01_C9.1_BEDROOM 2	100.00	100.00	yes
No. 153 01_D2_BEDROOM 2	16.09	87.36	no
No. 153 01_D2_BEDROOM 1	63.46	99.04	yes
No. 146 01_D3_BEDROOM 1	98.10	100.00	yes
No. 146 01_D3_BEDROOM 2	57.47	98.85	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 292 01_D4_BEDROOM 1	95.39	100.00	yes
No. 292 01_D4_KITCHEN	46.77	100.00	no
No. 292 01_D4_BEDROOM 2	18.75	90.63	no
No. 292 01_D4_SITTING ROOM	97.22	100.00	yes
No. 025 01_E1_BEDROOM 1	63.54	98.96	yes
No. 019 01_E1_BEDROOM 1	69.31	100.00	yes
No. 025 01_E1_KITCHEN	92.41	100.00	yes
No. 315 01_E3.1_BEDROOM 1	81.52	100.00	yes
No. 314 01_E3.1_KITCHEN	90.55	100.00	yes
No. 324 01_E3.1_KITCHEN	86.33	100.00	yes
No. 326 01_E3.2_BEDROOM 1	76.00	100.00	yes
No. 334 01_E3.2_BEDROOM 1	75.82	100.00	yes
No. 335 01_E3.2_KITCHEN	89.74	100.00	yes
No. 236 01_E2.1_LIVING	74.03	99.57	yes
No. 236 01_E2.1_KITCHEN/DINING	100.00	100.00	yes
No. 237 01_E2.1_LIVING	100.00	100.00	yes
No. 225 01_E2.2_LIVING	85.43	100.00	yes
No. 225 01_E2.2_KITCHEN/DINING	100.00	100.00	yes
No. 222 01_E2.2_LIVING	97.89	100.00	yes
No. 217 01_E2_KITCHEN/DINING	100.00	100.00	yes
No. 217 01_E2_LIVING	100.00	100.00	yes
No. 211 01_E2_KITCHEN/DINING	100.00	100.00	yes
No. 211 01_E2_LIVING	91.94	100.00	yes
No. 204 01_E2_LIVING	100.00	100.00	yes
No. 308 01_E4_BEDROOM 2	96.43	98.21	yes
No. 309 01_E4_BEDROOM 2	42.67	98.00	no
No. 237 02_E2.1_BEDROOM 1	90.00	97.27	yes
No. 236 02_E2.1_BEDROOM 2	95.51	100.00	yes
No. 225 02_E2.2_BEDROOM 2	100.00	100.00	yes
No. 222 02_E2.2_BEDROOM 1	70.30	90.10	no
No. 204 02_E2_BEDROOM 1	96.36	100.00	yes
No. 217 02_E2_BEDROOM 2	100.00	100.00	yes
No. 211 02_E2_BEDROOM 2	100.00	100.00	yes
No. 308 02_E4_LIVING/KITCHEN/DINING	99.32	100.00	yes
No. 309 02_E4_BEDROOM 1	99.02	100.00	yes
No. 309 02_E4_LIVING/KITCHEN/DINING	100.00	100.00	yes
No. 169 00_B10_KITCHEN/DINING	39.11	71.29	no
No. 117 02_A1.1_BEDROOM 5	48.42	100.00	no
No. 117 02_A1.1_STUDY	90.22	100.00	yes
No. 202 02_A2_BEDROOM 5	50.54	100.00	yes

Zone	sDA Area in Range (%) 300 Lux (Target ≥50%)	sDA Area in Range (%) 100 Lux (Target ≥95%)	Room meets overall EN17037 Criteria
No. 202 02_A2_STUDY	69.23	100.00	yes
No. 019 02_E1_BEDROOM 2	38.24	96.22	no
No. 025 02_E1_BEDROOM 2	43.00	97.00	no
No. 315 02_E3.1_BEDROOM 2	67.74	99.08	yes
No. 334 02_E3.2_BEDROOM 2	44.65	98.61	no
No. 326 02_E3.2_BEDROOM 2	38.63	96.57	no