Daylight & Sunlight Assessments of a Proposed Residential Development at Collins Avenue, Dublin 9

Applicant: Dublin City Council
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1. Introduction

Development at the site will consist of the following:

- The demolition of the existing office building, sheds, warehouses and garages and site clearance works.
- Three apartment blocks comprising a total of 106 residential units and 375.3 sqm of community, arts and cultural space.
- Block A ranges from 3 to 6 storeys and consists of 50 no. residential units (22 no. 1 bed, 20 no. 2 bed and 8 no. 3 bed units) and 272 sqm of community, arts and cultural facilities at ground floor level.
- Block B ranges from 4 to 6 storeys and consists of 38 no. residential units (17 no. 1 bed, 9 no. 2 bed and 12 no. 3 bed units) and 99 sqm of community, arts and cultural facilities at ground floor level.
- Block C ranges from 4 to 5 storeys and consists of 18 no. residential units (10 no. 1 bed and 8 no. 2 bed units).
- 183 no. long-stay and 63 no. short-stay bicycle parking space, 57 no. car parking spaces and 5 no. motorcycle spaces.
- 1,925 sqm of public open space and 3,140 sqm of communal open space.
- One signalised vehicular access is proposed via Collins Avenue and Collins Avenue Extension.
- Provision of pedestrian and cyclist access at northern boundary to allow for future link via Shanowen Business Estate and the Shanowen Hall and Square
- Boundary treatments and planting, public lighting, site drainage works, internal road surfacing and footpath, ESB meter rooms, stores, bin and cycle storage, plant rooms, landscaping; and
- All ancillary site services and development works above and below ground.

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 Coady Architects.

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

1.2.1 Daylight to Adjacent Properties

The impact on the VSC levels is in-line with developments in urban locations and the Sustainable and Compact Settlements: Guidelines for Planning Authorities (2024) recommends flexibility when interpreting results.

It is important to recognise that the guideline targets published by the BRE are intended to be employed with a degree of discretion and flexibility. The flexibility available in the BRE guide is outlined in the introductory section as follows:

> *"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical targets these should be interpreted flexibly because natural lighting is only one of many factors in site layout design."*

This approach is recognised within planning guidance which has been published by Government. On page 43 of the Urban Design Manual 2009 the following advice is provided:

> *"Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths."*

All the window the neighbouring residential properties retain a VSC level greater that 27% or if less that 27% VSC then they are not reduced below 80% of their existing value. Any reduction in available daylight with be negligible.

1.2.2 Sunlight to Adjacent Properties

There will be minimal reduction to the available sunlight to the neighbouring properties and any impact will be imperceptible.

There will be no reduction to sunlight to existing adjacent private amenity spaces and any perceived reduction will be negligible.

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

The apartments were designed in line with the recommendations of the BRE guidelines. Numerous rounds of design iterations were conducted to improve the daylight and sunlight within in the proposed development. The guidelines clearly state that the they are recommendations only and flexibility is required when setting and interpreting the targets.

BR209:2022 recommends assessment methods set out in BS EN 17037 for daylight provision. BS EN 17037 contains a National Annex (NA1) 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 National Annex in BS EN 17037 states that the target values set out in Table A1 may be hard to achieve in the UK and as a result 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%).

There are existing mature trees to the southern boundary of the site adjoining the rear of the houses at Collins Avenue and Crestfield Close. All daylight and sunlight assessments are undertaken with and without the retained existing trees in place.

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

100% (96.6% with the influence of trees) 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 section NA.1. These are the minimum values, per specified use, to be achieved in habitable rooms and meet the recommendations of the BRE guidelines.

1.3.2 Sunlight within the Proposed Development

This scheme is well designed for sunlight, with 95.3% (84% with the influence of trees) 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.

1.3.3 Sunlight to the Amenity Space within the Proposed Development.

All of the proposed communal and public amenity spaces achieve sunlight levels that exceed 2 hours sunlight over 50% of the amenity space on the 21st March.

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 98.6% (73.4% with trees) of rooms achieving Minimum Illuminance and 88.3%(57.1% with trees) achieving Target Illuminance. Appendix B identifies any rooms which do not achieve target illuminance levels.

To date there is no guidance from governmental bodies on the use or interpretation of IS EN 17038:2018. 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.

Appendix 16- Sunlight and Daylight of the Dublin City Development Plan 2022-2028 gives guidance on the two daylight provision metrics as follows:
Section 3.3 BS EN 17037:2018 – Daylight in Buildings states that:*“The minimum daylight provision targets given within the national annex have relevance.”*
Section 3.4 IS EN 17037:2018 – Daylight in Buildings states that due to the lack of localisation and provision for specific guidance on individual room use that: *“These limitations make it unsuitable for use in planning policy or during planning applications. BR 209 must still be used for this purpose.“*

1.5 Conclusions

There will be minimal reduction to the daylight or sunlight availability of the adjacent properties and any impact will be negligible. The proposed development meets the recommendations of the BRE guidelines BR209:2022 (third edition)

Overall the design team worked in response to the context to ensure the proposed development performed with regards to achieving the best possible daylight and sunlight quality. All apartments 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). The majority of the apartment units achieve daylight provision as set out in IS EN 17038:2018.

Also of note with regards to internal daylighting section 6.7 of the Sustainable Urban Housing: Design Standards for New Apartments July 2023 states the following:

> *“Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific (sic). This may arise due to design constraints associated with the site or location and the balancing of that assessment against the desirability of*

achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

Furthermore Section 3.2 of the Urban Development and Building Heights: Guidelines for Planning Authorities (2018) states the following:

"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."

It is our opinion that all the rooms within the proposed development achieve the minimum target daylight levels set out in BS EN 17037:2018+A1:2021 as referred to in The BRE guidelines BR209:2022 (third edition) and no compensatory measures are required.

2. Methodology

2.1 Standards and Guidelines

Ministerial guidance is provided in Sustainable 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."*

This is accordance with Section 6.6 of the Sustainable Urban Housing: Design Standards for New Apartments (2023), and Section 3.2 of the Urban Development and Building Heights Guidelines for Planning Authorities (2018).

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 (3rd edition), also referred to as the BRE guidelines.
- BS EN 17037:2018+A1:2021 Daylight in Buildings, also referred to as the UK Annex.
- IS EN 17037:2018 Daylight in Buildings.

As Appendix 16- Sunlight and Daylight of the Dublin City Development Plan 2022-28 references the BR209:2011 Site Layout Planning for Daylight and Sunlight (2nd edition), it is considered that the guidance in the Development Plan has been superseded by BR209:2022 and therefore it is not necessary to assess the scheme against the recommendations in Appendix 16 also.

2.2 BRE Guidance Document BR209:2022 - Site Layout Planning for Daylight and Sunlight (3rd edition).

The BRE guidelines (2022) state at the outset that "It 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 and this is of particular importance in the context of national and local policies for the consolidation and densification of urban areas.

BR209 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. The metrics for assessing impact to adjacent buildings in the areas of Daylight is the Vertical Sky Component (VSC) and Sunlight is the Annual Probable Sunlight Hours (APSH). Sunlight to adjacent amenity space is assessed through the measurement of sunlight availability on the 21st March and the plotting of shadow diagrams.

The BRE guidelines (2022) recommend the use of BS EN 17037:2018 for assessing the quality of interior spaces in proposed developments. BS EN 17037 sets out assessment methods for daylight provision and access to sunlight. It states 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."

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 UK National Annex (NA) provides further recommendations for daylight provision in the UK and Channel Islands. NA.1 states that the UK committee supports the recommendations for daylight in buildings given in BS EN17037:2018. The annex states that the daylight target levels in Clause A.2 may be hard to achieve in buildings in the UK and in particular dwellings in urban areas with significant obstructions or tall trees outside. NA.2 sets out minimum daylight provision to be achieved in UK dwellings.

The UK National Annex A1 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 illiminance 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.

2.3 Daylight to Existing Dwellings

BRE guidance document (2022) "Site layout planning for daylight and sunlight" relates to daylight and sunlight to potential impact in neighbouring buildings. As set out above, this is broadly in line with the previous version of the BRE guidelines (2011). The metrics are the same for assessing impact in the areas of Daylight (VSC) and Sunlight (APSH) to adjacent buildings. Sunlight to adjacent amenity space is assessed through the measurement of sunlight availability on the 21st March.

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

BRE guidelines (2022) recommend that; *"Loss of light to existing windows need not be assessed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window."*

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

The guidelines sets out which rooms need to be assessed for daylight in Section 2.2;

> *"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";*

For loss of daylight the BRE guidelines (2022) recommends calculation of the Vertical Sky Component. This is the ratio of direct sky illuminance falling on the outside window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE Overcast Sky is used and the ratio is usually expressed as a percentage. The maximum value is just under 40% for a completely unobstructed vertical wall. The Vertical Sky Component on a window is a good measure of the amount of daylight entering it.

The BRE guidelines (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).

2.4 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.

2.5 Sunlight to Gardens and Open Spaces

For calculations of sunlight analysis it is general practice to use March 21st. The BRE guidelines (2022) 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."*

2.6 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) 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."*

BR209:2022 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.

2.7 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."*

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 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:

1. Imperceptible: There is no reduction in the VSC levels or where the levels are 99% of the existing value.
2. No substantial change: A reduction in the VSC level but it retains a VSC >27% or <27% but >80% of the existing value
3. Minor reduction: A reduction below <27%VSC and <80% of the existing value but greater than 20% VSC.
4. Moderate reduction: A reduction below <20%VSC and <80% of the existing value but greater than 10% VSC.
5. Major reduction: A reduction below <10%VSC and <80% of the existing value.

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

2.8 Daylight in the Proposed Development.

BR209 (2022) Appendix C sets out interior daylight recommendations. The guideline sets out the that; “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 17037:2018+A1 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 National Annex (NA) sets out additional minimum room specific Target Daylight Factor values for the UK where the target values in A2 are hard to achieve. 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. 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.

BR209 (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

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. 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 National 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. BR209 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. BR209:2022 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 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.

2.9 Sunlight within Proposed Developments

The BRE guidelines (2022) recommend 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. 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) state that BS EN 17037 should be used to assess for interior access to direct sunlight and that the assessment of APSH should no longer be used. BS EN 17037 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 to adjacent buildings.

3.1 Site Overview

The site is located off Collins Avenue to the rear of the houses on Collins Avenue and Crestfield Close. The site is currently in use as a Dublin City Council Depot with one to two storey buildings. The site is mostly set out in handstand for vehicle parking and equipment storage. There are mature trees to the southern boundary along Collins Avenue and Crestfield Close.

Figure 1: Indicative view of the site, taken from Google Maps.

3.2 Preliminary Assessment of Adjoining Dwellings

The BRE guidelines BR209:2022 (third edition) recommend that loss of light to existing windows need not be assessed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window. The zone of influence 3 times the height of the proposal is plotted in Figure 2 in yellow.

Section planes perpendicular to the window wall of the adjacent properties facing the proposed development are indicated in blue in Figure 2. The planes at the indicated locations extend and if they intersect the proposed development, they are plotted in Figure 3 below.

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

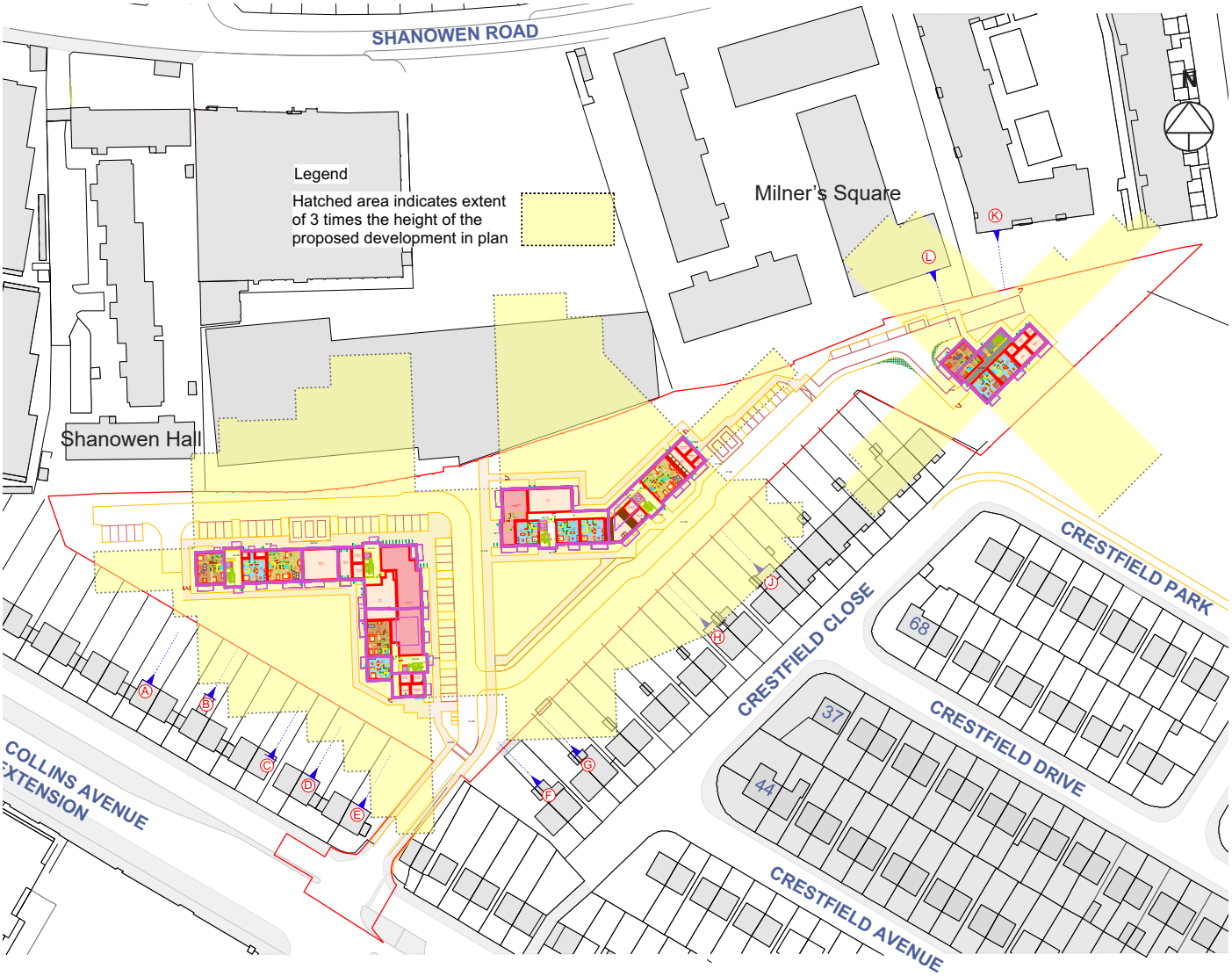


Figure 2: Proposed site plan showing the zone of influence (3 times the height of the proposed building) and direction of the window wall of adjacent residential properties.

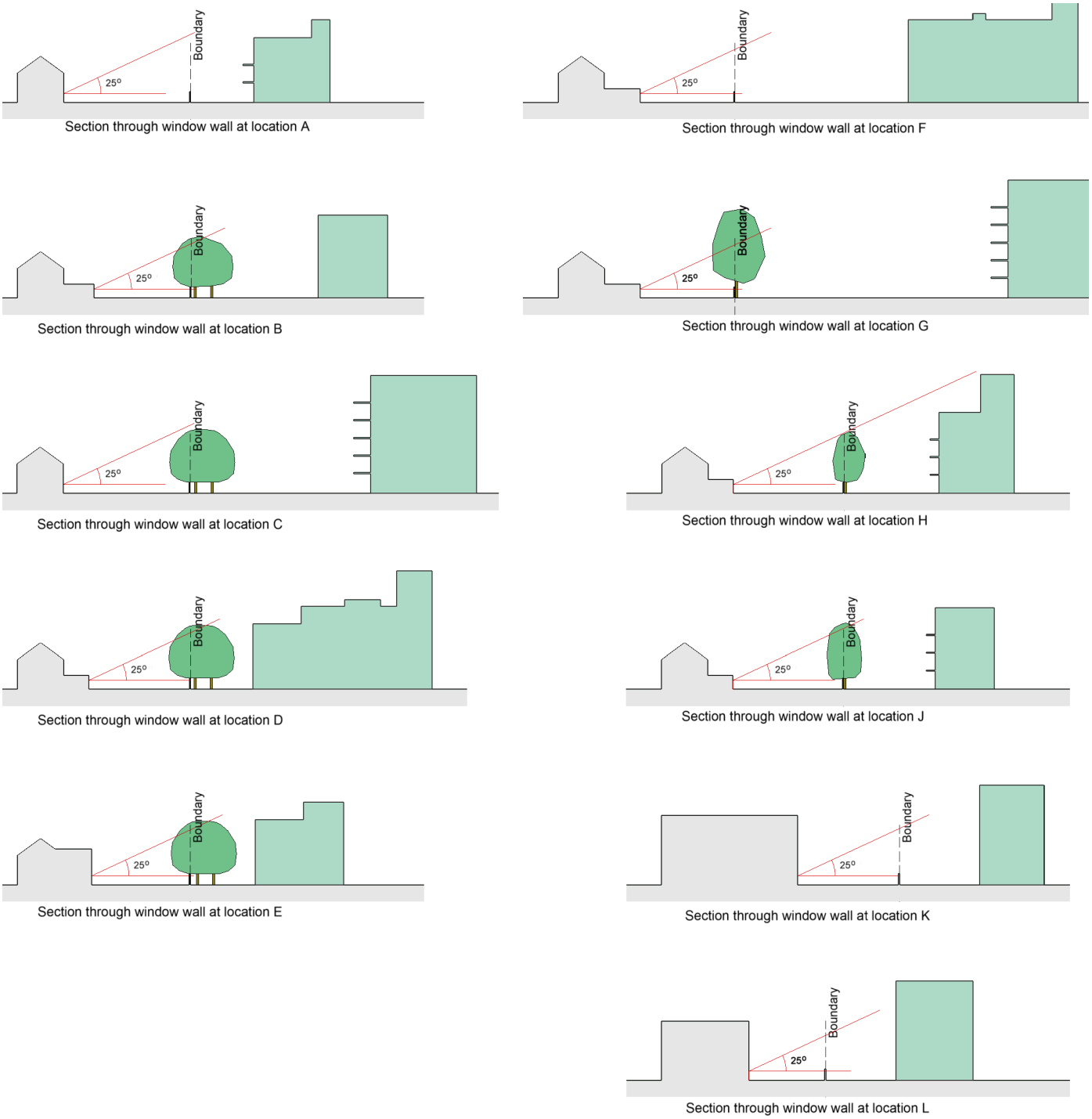


Figure 3: Section perpendicular to window wall at locations indicated in Figure 2.

3.3 Comment on Preliminary Assessment

Locations A-E; The rear of the houses to Collins Avenue. The proposed development is greater than 3 times it's height from the rear wall of the existing houses and the proposed development does not subtend the 25º line of the section plane perpendicular to the rear wall of the existing houses. There will be no precipitable reduction in daylight or sunlight to these houses and a detailed assessment is not required.

Locations F-J; The rear of the houses at Crestfield Close. The proposed development is greater than 3 times it's height from the rear wall of the existing houses and the proposed development does not subtend the 25º line of the section plane perpendicular to the rear wall of the existing houses. There will be no precipitable reduction in daylight or sunlight to these houses and a detailed assessment is not required.
Location B; 31 Sackville Avenue. The proposed development subtends the 25º line and these houses will be assessed in detail.

Locations L and K; Milner's Square Apartment Complex. The proposed development subtends the 25° section line and the windows to the two apartment blocks facing the proposed Block C will be assessed in detail for VSC levels in Section 3.4.

3.4 Detailed Assessment to Adjoining Dwellings

The BRE guidelines BR209:2022 (third edition) recommend assessing the Vertical Sky Component (VSC) to adjacent properties, where the layouts are not known. Annual Probable Sunlight Hours (APSH) will also be assessed, where that is relevant.

If a window retains a VSC in excess of 27% with the proposed development in place then it will still receive enough daylight. If the existing VSC is below 27% or is reduced below 27% and below 0.8 times its former value then the diffuse light maybe adversely affected.

Test points representing windows in the adjacent dwellings at locations identified in the preliminary analysis are indicated in Figures 4-5. The results are shown in Table 6-7.

Figure 4: Milner's Square : View of model locating VSC and APSH test points.

Vertical Sky Component				
Location	Vertical Sky Component Recommended Value > 27%		Ratio: Proposal to Existing Recommended > 80%	Meets criteria if >27% VSC or <27% but >80% Existing Value
	Existing %	Proposed %		
1	29.7	27.2	91.4%	Y
2	34.7	31.9	91.7%	Y
3	34.5	31.3	90.7%	Y
4	32.9	29.9	90.8%	Y
5	31.4	28.6	91.1%	Y
6	37.1	33.7	90.6%	Y
7	37.5	33.2	88.5%	Y
8	36.7	31.9	87.0%	Y
9	32.7	30.2	92.3%	Y
10	38.4	35.4	92.0%	Y
11	38.9	34.9	89.9%	Y
12	39.0	33.9	87.0%	Y
13	37.3	36.5	97.9%	Y
14	37.9	36.5	96.3%	Y
15	33.2	31.9	96.2%	Y
16	38.9	36.9	94.8%	Y

Table 6: Vertical sky component for windows in Milner Square Block D

3.5 Conclusion of Potential Impact to Existing Dwellings in Milner Sq Block D

All windows retain a VSC in excess of 27% or they are not reduced below 80% of the existing VSC value and any potential loss of daylight light will be minimal. Any reduction in available daylight from the proposed development will be negligible and meets the recommendations of the BRE guidelines BR209:2022 (third edition).

Figure 5: Milner's Square Block E: View of model locating VSC and APSH test points.

Vertical Sky Component				
Location	Vertical Sky Component Recommended Value > 27%		Ratio: Proposal to Existing Recommended > 80%	Meets criteria if >27% VSC or <27% but >80% Existing Value
	Existing %	Proposed %		
1	35.81	30.86	86.18%	Yes
2	36.57	31.53	86.22%	Yes
3	36.3	31.5	86.78%	Yes
4	37.18	33.67	90.56%	Yes
5	37.19	34.25	92.09%	Yes
6	18.32	15.84	86.46%	Yes
7	34.16	32.16	94.15%	Yes
8	22.06	20.53	93.06%	Yes
9	37.75	32.76	86.78%	Yes
10	18.67*(28.94)	14.13*(24.44)	75.68%*(84.45%)	*Yes
11	38.01	33.36	87.77%	Yes
12	35.43	31.37	88.54%	Yes
13	18.6	14.98	80.54%	Yes
14	38.4	35.08	91.35%	Yes
15	38.28	35.43	92.55%	Yes
16	19.3	16.95	87.82%	Yes
17	36.29	34.19	94.21%	Yes
18	23.6	21.89	92.75%	Yes
19	38.55	34.49	89.47%	Yes
20	19.08	15.42	80.82%	Yes
21	38.39	34.72	90.44%	Yes
22	35.89	32.76	91.28%	Yes
23	18.78	15.96	84.98%	Yes
24	38.69	36.09	93.28%	Yes
25	38.54	36.34	94.29%	Yes
26	19.37	17.6	90.86%	Yes
27	38.6	36.94	95.70%	Yes
28	38.52	37.17	96.50%	Yes
29	38.76	36.03	92.96%	Yes

Vertical Sky Component				
Location	Vertical Sky Component Recommended Value > 27%		Ratio: Proposal to Existing Recommended > 80%	Meets criteria if >27% VSC or <27% but >80% Existing Value
	Existing %	Proposed %		
30	29.61	28	94.56%	Yes
31	38.59	36.45	94.45%	Yes
32	18.78	16.93	90.15%	Yes
33	38.8	37.01	95.39%	Yes

* Values in brackets indicate the VSC level without the influence of the overhead balcony obstruction.

Table 7: Vertical sky component for windows Milner's Square Block E

3.6 Conclusion of Potential Impact to Existing Dwellings in Milner's Square Block E

One window is marginally below the recommended VSC level. The BRE guidelines BR209:2022 (third edition) recommend that where there is a reduction below the recommended VSC level and there is balcony overhead an assessment should be carried out without the balcony to determine if the balcony is a contributing factor. The assessment without the balcony indicates that the VSC level would be in excess of 80% of its existing value and meets the recommendations.

All windows retain a VSC in excess of 27% or are not reduced below 80% of the existing VSC value and any potential loss of daylight light will be minimal. Any reduction in available daylight from the proposed development will be negligible and meets the recommendations of the BRE guidelines BR209:2022 (third edition).

4. Sunlight in Neighbouring Buildings

4.1 Sunlight the Neighbouring Dwellings APSH (Annual Probable Sunlight Hours)

The BRE guidelines BR209:2022 (third edition) recommends assessing window walls for the APSH that face within 90º of due south. The guidelines state that;

> *" In housing the main requirement for sunlight is living rooms, where it is valued at any time of day, but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens, where people prefer it in the morning rather than the afternoon."*

For a proposed development to have a noticeable impact on the annual Probable Sunlight Hours the value need to be reduced below the recommended 25% annual or 5% in the winter period from September to March. If the value is either below this to begin with or is reduced below this then it should not be reduced below 0.8 times its former value.

The houses to Collins Avenue and Crestfield Close are to the south of the proposed development and the window wall to the rear of the houses facing the proposed development are all in excess of 90° to due south and do need to be assessed. The windows to the apartment developments to the north at Shanowen Hall and Milner's Square have been assessed for the APSH.

Annual Probable Sunlight Hours

	APSH >25% Target			Sept 21 - Mar 21 WPSH >5% Target			Meets criteria of >25% APSH and >5% PSH Or <25% or <5% PSH but >80% Existing Value	
Location ID	Existing	Proposed	Ratio	Existing	Proposed	Ratio		
	% of APSH	% of APSH	If less than 25% APSH Target >80%	% WPSH	% WPSH	If less than 5% WPSH Target >80%		
Shanowen Hall								
1	53.1%	47.9%	90.1%	18.3%	14.4%	78.8%	Y	Y
2	66.4%	60.9%	91.8%	23.3%	19.2%	82.1%	Y	Y
3	68.5%	62.8%	91.6%	23.1%	18.4%	80.0%	Y	Y
4	67.8%	62.6%	92.3%	21.1%	16.8%	79.7%	Y	Y
5	56.3%	50.2%	89.2%	20.4%	15.5%	76.1%	Y	Y
6	72.2%	64.1%	88.8%	27.3%	20.6%	75.4%	Y	Y
7	77.7%	67.7%	87.1%	28.6%	20.3%	71.0%	Y	Y
8	77.1%	66.3%	86.0%	28.4%	19.5%	68.5%	Y	Y
9	59.6%	52.5%	88.0%	22.8%	16.8%	73.9%	Y	Y
10	78.8%	69.1%	87.7%	30.1%	22.0%	73.3%	Y	Y
11	81.5%	70.8%	86.9%	31.3%	22.4%	71.6%	Y	Y
12	81.7%	70.3%	86.0%	31.7%	22.2%	70.1%	Y	Y
13	76.1%	73.6%	96.7%	28.2%	26.1%	92.6%	Y	Y
14	77.1%	71.1%	92.2%	31.9%	26.9%	84.4%	Y	Y
15	66.1%	60.2%	91.0%	29.9%	24.9%	83.4%	Y	Y
16	82.8%	75.0%	90.6%	32.0%	25.5%	79.7%	Y	Y
Milner's Square								
1	73.4%	65.8%	89.7%	26.5%	20.2%	76.3%	Y	Y
2	74.7%	67.2%	90.1%	26.5%	20.4%	76.8%	Y	Y
3	75.5%	67.9%	89.9%	27.2%	20.8%	76.6%	Y	Y
4	73.7%	68.3%	92.7%	27.9%	23.4%	84.0%	Y	Y
5	73.9%	68.6%	92.9%	28.4%	24.0%	84.5%	Y	Y
6	32.3%	27.0%	83.4%	22.3%	17.8%	80.0%	Y	Y
7	67.1%	62.7%	93.3%	28.6%	24.9%	87.0%	Y	Y
8	46.6%	41.5%	89.1%	28.5%	24.3%	85.2%	Y	Y
9	79.5%	71.2%	89.6%	30.2%	23.3%	77.2%	Y	Y
10	34.1%	26.1%	76.6%	24.2%	17.6%	72.6%	Y	Y
11	81.6%	73.0%	89.5%	31.1%	23.9%	77.0%	Y	Y
12	70.1%	63.5%	90.6%	28.8%	23.3%	80.9%	Y	Y
13	33.6%	27.6%	82.1%	24.1%	19.1%	79.2%	Y	Y
14	79.1%	73.1%	92.4%	30.9%	25.9%	83.9%	Y	Y
15	79.0%	72.9%	92.3%	30.8%	25.8%	83.6%	Y	Y
16	34.4%	28.8%	83.6%	24.0%	19.3%	80.5%	Y	Y

Annual Probable Sunlight Hours								
	APSH >25% Target			Sept 21 - Mar 21 WPSH >5% Target			Meets criteria of >25% APSH and >5% PSH Or <25% or <5% PSH but >80% Existing Value	
Location ID	Existing	Proposed	Ratio	Existing	Proposed	Ratio		
	% of APSH	% of APSH	If less than 25% APSH Target >80%	% WPSH	% WPSH	If less than 5% WPSH Target >80%		
17	70.2%	65.9%	94.0%	30.7%	27.2%	88.5%	Y	Y
18	52.1%	47.9%	91.9%	30.6%	27.0%	88.5%	Y	Y
19	81.7%	75.7%	92.6%	30.9%	25.9%	83.9%	Y	Y
20	34.1%	29.2%	85.7%	24.2%	20.1%	83.3%	Y	Y
21	82.8%	76.8%	92.8%	31.9%	26.9%	84.4%	Y	Y
22	70.4%	66.0%	93.7%	29.0%	25.4%	87.4%	Y	Y
23	33.6%	29.3%	87.1%	24.1%	20.5%	85.0%	Y	Y
24	82.5%	77.5%	94.0%	32.0%	27.9%	87.1%	Y	Y
25	82.6%	77.6%	94.0%	32.1%	28.0%	87.2%	Y	Y
26	34.4%	30.2%	87.9%	24.0%	20.6%	85.6%	Y	Y
27	81.4%	77.4%	95.1%	32.0%	28.7%	89.6%	Y	Y
28	79.7%	75.6%	94.9%	31.7%	28.3%	89.2%	Y	Y
29	83.2%	80.2%	96.4%	32.1%	29.6%	92.2%	Y	Y
30	52.5%	52.5%	100.0%	22.9%	22.9%	100.0%	Y	Y
31	82.9%	81.8%	98.7%	32.3%	31.3%	97.1%	Y	Y
32	33.6%	33.6%	100.0%	24.1%	24.1%	100.0%	Y	Y
33	83.5%	81.8%	97.9%	32.4%	30.9%	95.5%	Y	Y

Table 8: Annual Probable Sunlight hours to adjoining properties

4.2 Conclusion

All windows assessed for APSH exceed the target values set out for annual and winter probable sunlight hours. The proposed development meets the recommendations of the BRE guidelines BR209:2022 (third edition) and any potential loss of sunlight will be negligible.

5. Sunlight to Amenity in Neighbouring Properties

The BRE guidelines BR209:2022 (third edition) indicates that for an amenity area to have good quality sunlight throughout the year, 50% should receive in excess of 2 hours sunlight on the 21st March. It also states that front gardens need not be assessed for sunlight. Amenity spaces that are entirely south of the proposed development would not have a reduction in sunlight and need not be assessed.

5.1 Amenity Space to Neighbouring Properties.

The rear garden private amenity space to the houses adjacent the development site along Collins Avenue and Crestfield Close are due south of the proposed buildings within the proposed development and will not perceive a reduction in sunlight. The private amenity spaces to the apartment developments to the north and Shanowen Hall and Milner's Square have been assessed for a potential reduction in available sunlight to the amenity space. The existing and proposed generated analysis are shown in Figure 6, the results are shown in Table 9 below.

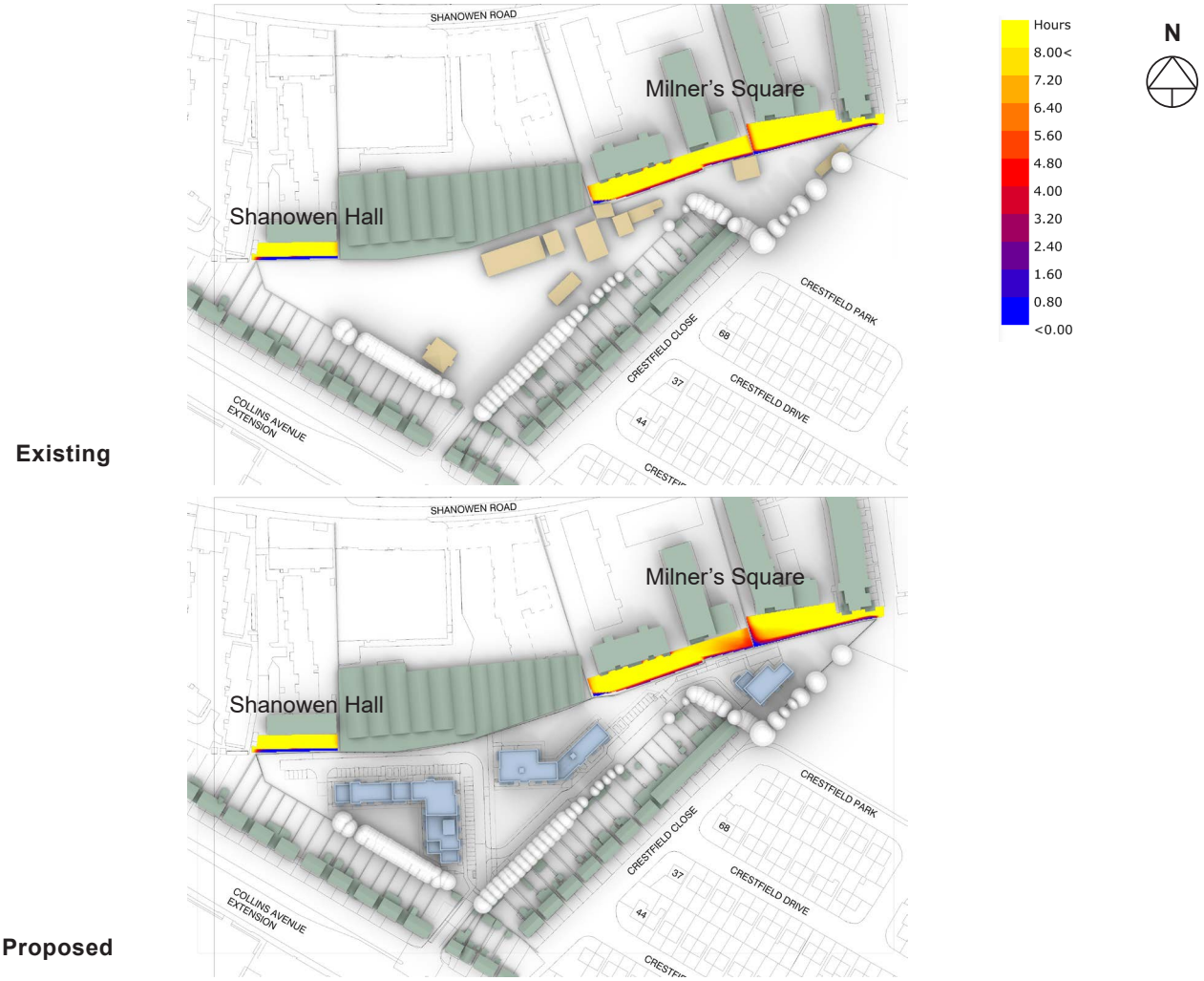


Figure 6: Existing & Proposed Radiation map of amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.

Sunlight on the ground - Adjacent properties				
No.	% Area receiving 2 hours sunlight on 21st March		Ratio	Meets criteria of >50% area Or if <50% then target >80% Existing Value
	Existing	Proposed	Proposed: Existing	
L1	7.1%	7.1%	100.0%	Meets criteria
L2	9.9%	9.9%	100.0%	Meets criteria
L3	2.2%	2.2%	100.0%	Meets criteria

Table 9: Calculation of Sun on the Ground to adjacent amenity areas

5.2 Conclusion

All the private amenity space to the surrounding properties were assessed for sunlight in accordance with the recommendations set out in the BRE guidelines BR209:2022 (third edition). All the amenity spaces will retain 2 hours sunlight over 50% of the area on the 21st March or will not be reduced below 80% of the existing levels. The proposed development meets the recommendations of the BRE guidelines BR209:2022 (third edition) .

6. 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. This assessment was undertaken both with and without the existing trees in the model. A summary of the results are presented in Table 10 below. A complete set of room results are shown in Appendix A, without trees and Appendix B, with trees in the model.

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 11 below and a complete set of room results are shown in Appendix C.

6.1 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 do 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 assessment grid	Model with trees		Model without trees	
			No. of rooms to achieve target lux over 50% of assessment grid	Percentage of rooms achieving target	No. of rooms to achieve target Lux over 50% of assessment grid	Percentage of rooms achieving target
LKD	106	200	96	90.6%	106	100.0%
Bedrooms	184	100	184	100.0%	184	100.0%
Total	290		280	96.6%	290	100.0%

Table 10: Summary of room for Target Illuminance compliance with BS EN 17037:2018+A1:2021. Individual room results can be viewed in Appendix A.

6.2 Conclusion

BR209:2022 recommends the assessment methods set out in BS EN 17037: 2018 for daylight provision. 100% 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.

6.3 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
Model with trees	Target Illuminance	42.9%	49.1%	6.9%	1.0%	57.1%
	Minimum Illuminance	26.6%	68.9%	4.5%	0.0%	73.4%
Model without trees	Target Illuminance	11.7%	60.3%	24.5%	3.4%	88.3%
	Minimum Illuminance	1.4%	75.9%	22.8%	0.0%	98.6%

Table 11: 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 98.6% of rooms achieving Minimum Illuminance and 88.3% 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 6.1.

7. Sunlight within the Proposed Development

7.1 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 figure 7 below where 4 out of 5 units in an apartment building would achieve the target sunlight.

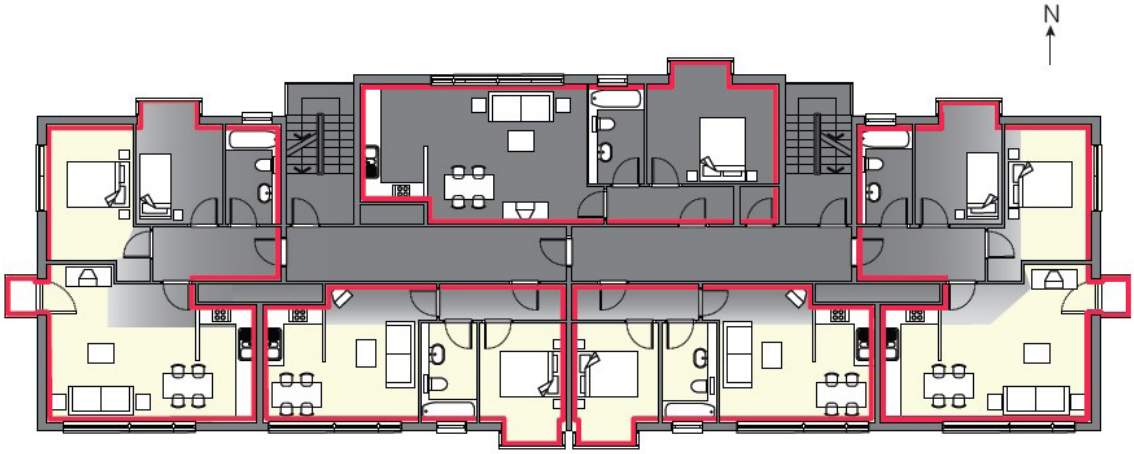


Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

Figure 7: Extract from BR209:2022 Section 3 Sun-lighting: Diagram indicating sample floor plan to maximise units with a main living space facing south.

Appendix C details the results per habitable room, indicating if this room has a relevant South facing window. A summary of these results are displayed in the table below.

Sunlight Hours Summary Table

	Total Units	Rooms 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						
Model with trees	106	85	80.2%	17	8	14	67	89	84.0%
Model without trees				5	1	12	88	101	95.3%

Table 12: Summary of results of assessment of Sunlight Hours

7.2 Comment on EN 17037 Sunlight Hours

The BRE guidelines BR209:2022 (third edition) 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 it is not possible to achieve south facing windows to all main living spaces. 85 no. (80%) of the 106 apartment units have a window to a living room or kitchen/ dining room which face within 90° of due south.

Windows with an aspect of greater than 90° due south, to the north-west or north-east, will receive sunlight, but it is likely to be lesser amounts especially in the winter period. 89no. of the 108no. units 84%) have a living spaces that achieves the minimum recommended 1.5 direct sunlight hours. Additionally units with dual aspect will receive sunlight to a bedroom space.

7.3 Conclusion

This scheme is well designed for sunlight, with 95.3% of units meeting the minimum recommended 1.5 direct sunlight hours. When the existing trees are included in the assessment model, 84% of units meet the minimum recommended 1.5 direct sunlight hours. These results are in line with the BRE guidelines example for an apartment layout where 4 in 5 achieves the target sunlight hours.

8. Sunlight to Amenity Spaces within the Proposed Development

The BRE guidelines BR209:2022 (third edition) indicates that for an amenity area to have good quality sunlight throughout the year, 50% should receive in excess of 2 hours sunlight on the 21st March.

8.1 Sunlight to Amenity within the Proposed Development

The amenity 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 8 and the results are set out in Table 13 below.

Figure 8: Communal Open Space - Radiation map of amenity area, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.

Sunlight on the Ground - Communal Amenity			
	Amenity Space	Proposed: % Area receiving 2 hours sunlight on 21st March	Meets criteria of >50% area
S1	Communal Open Space	96.3%	Yes
S2	Communal Open Space	97.4%	Yes
S3	Public Open Space	100.0%	Yes
S4	Communal Open Space	72.9%	Yes
S5	Communal Open Space	99.8%	Yes
S6	Communal Open Space	97.7%	Yes

Table 13: Calculation of Sun on the Ground to public amenity spaces within the development

8.2 Comment on Public and Communal Amenity Areas

The proposed development has been well designed for sunlight. All public open spaces will achieve in excess of 2 hours sunlight on the 21st March over 50% of the amenity area.

The proposed development meets the recommendations of the BRE guidelines BR209:2022 (third edition) for gardens and open spaces.

9. Shadow Study

9.1 BRE Guidance on Shadow Studies

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

> *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing. Lengths of shadows at the autumn equinox (21 September) will be the same as those for 21 March, so a separate set of plots for September is not required."*

June 21st and December 21st are provided below for information but it should be noted that the summer solstice is the best case scenario with shadows at their shortest. The summer solstice diagrams in section 9.2 are included here with the Daylight Saving Time (UTC+1) applied. In Winter even low buildings will cast long shadows and it is common for large areas of the ground to be in shadow throughout the day especially in a built up area and sun barely rises above an altitude of 10° during the course of the day. The guidelines recommend that Sunlight at an altitude of 10° or less does not count. Below are the times for the Equinox and Solstice that the sun is above 10° altitude rounded to the nearest half hour.

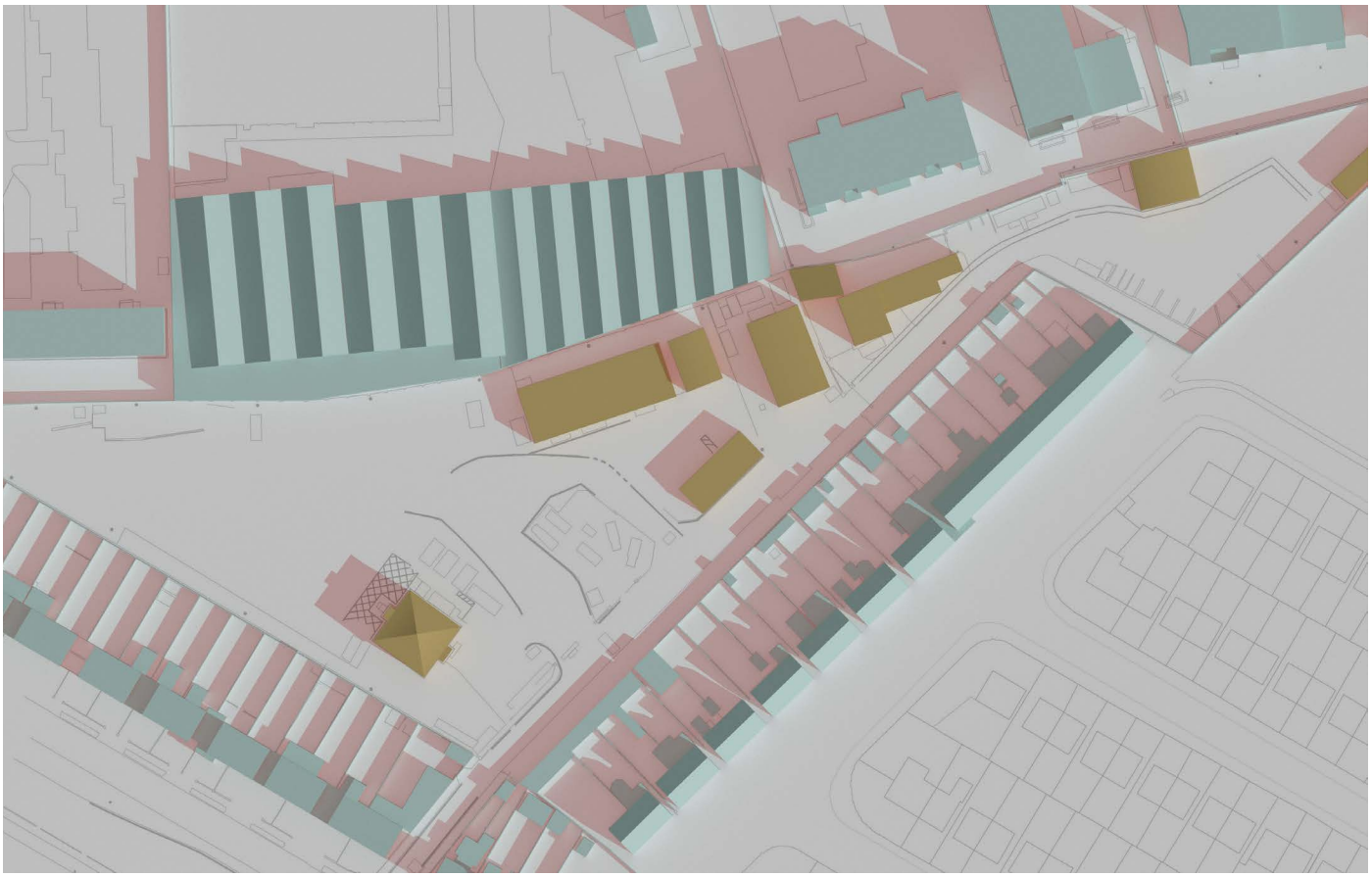
Equinox: between 8:30 and 17:30
Summer Solstice: Between 6:30 and 20:00
Winter Solstice: Between 10:30 and 14:00

Each time stop of the shadow study shows the existing and the proposed development.

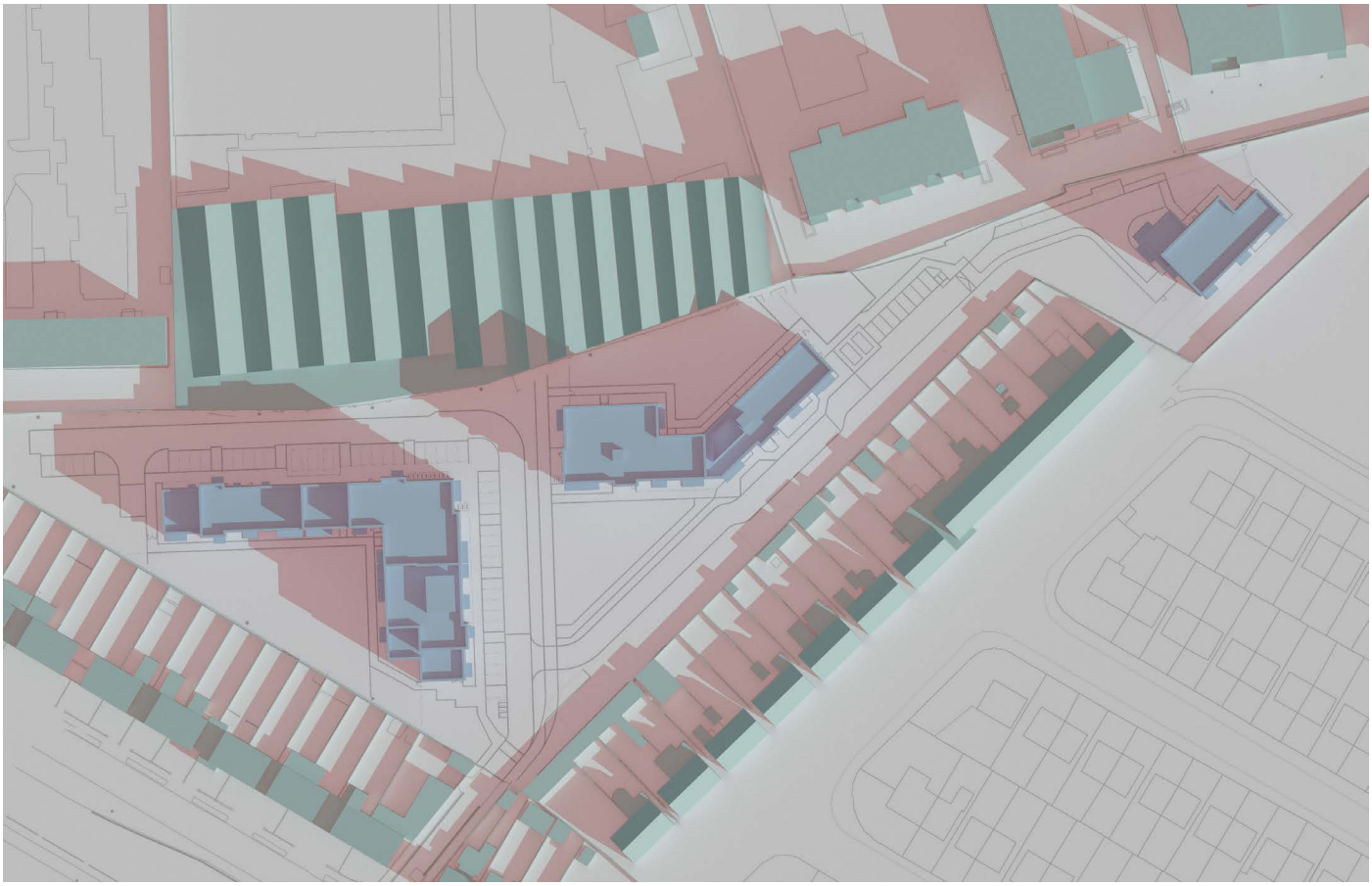
Section 9.2 presents the shadow diagrams for the Equinox on the 21st March at 2 hourly intervals during the day between 09:00 and 17:00.
Section 9.3 shows the shadow diagrams for the Summer Solstice on the 21st June at 2 hourly intervals during the day between 09:00 and 19:00.
Section 9.4 shows the shadow diagrams for the Winter Solstice on the 21st December at 2 hourly intervals during the day between 09:00 and 15:00.

Shadow diagrams are a visual aid to understand where possible shading may occur. The use of shadow diagrams as an assessment method should be taken over the course of the day and not a specific time due to the transient nature of the sun and the shade caused by obstructions.

9.2 Shadow Casting diagrams March Equinox



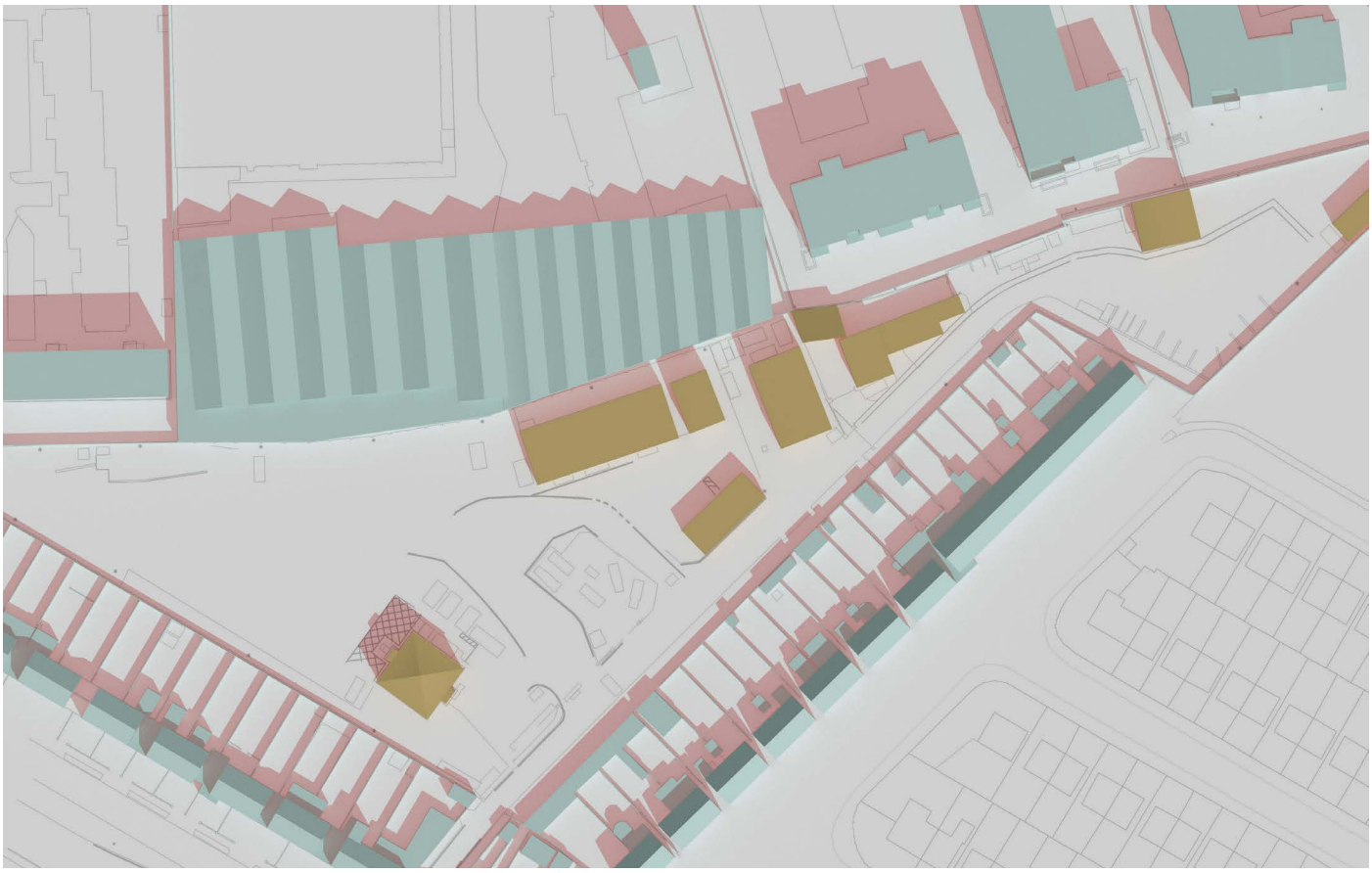
Existing



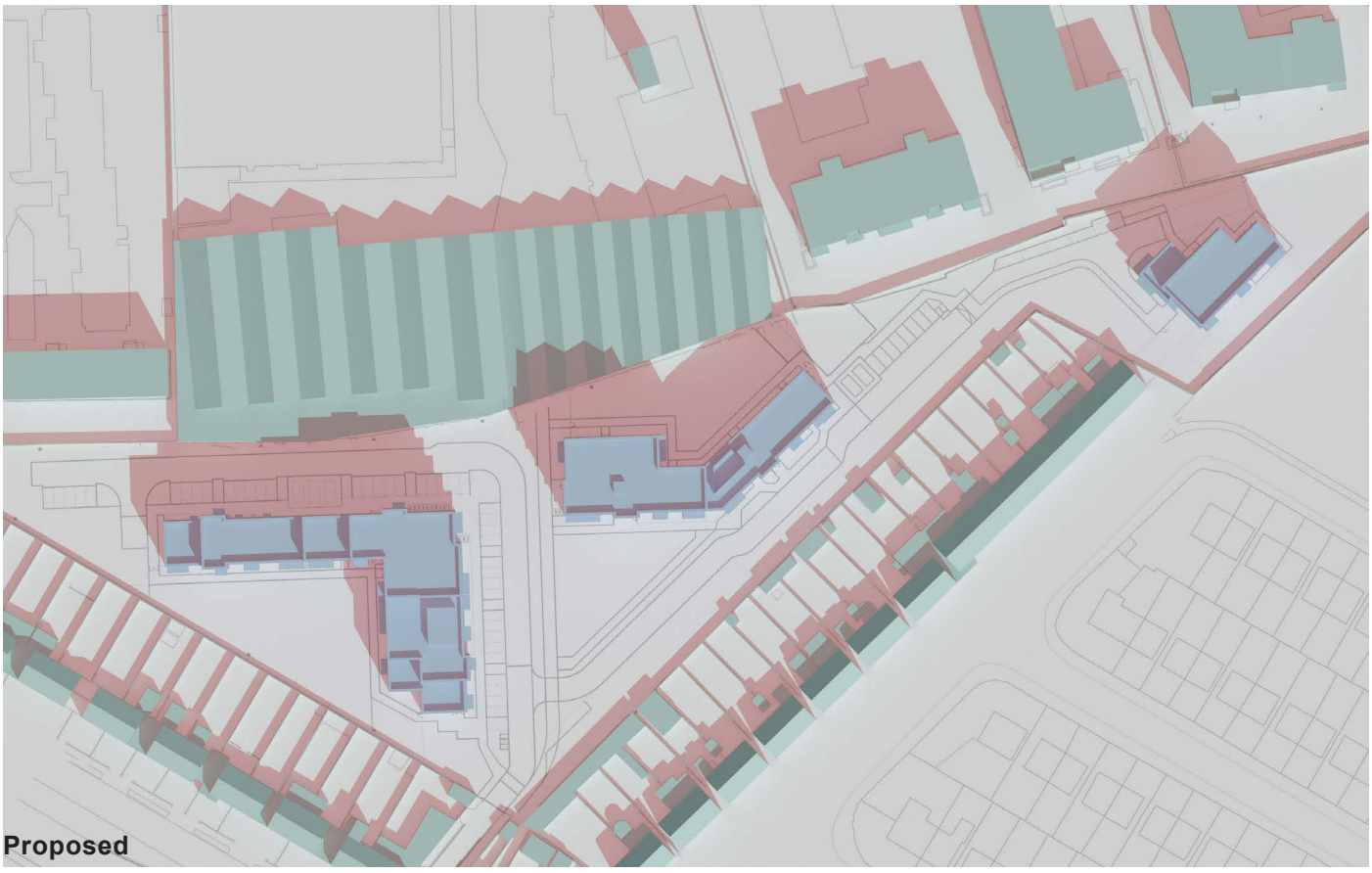
Proposed

N

Figure 9: Shadow diagrams 21 March 09:00 UTC



Existing

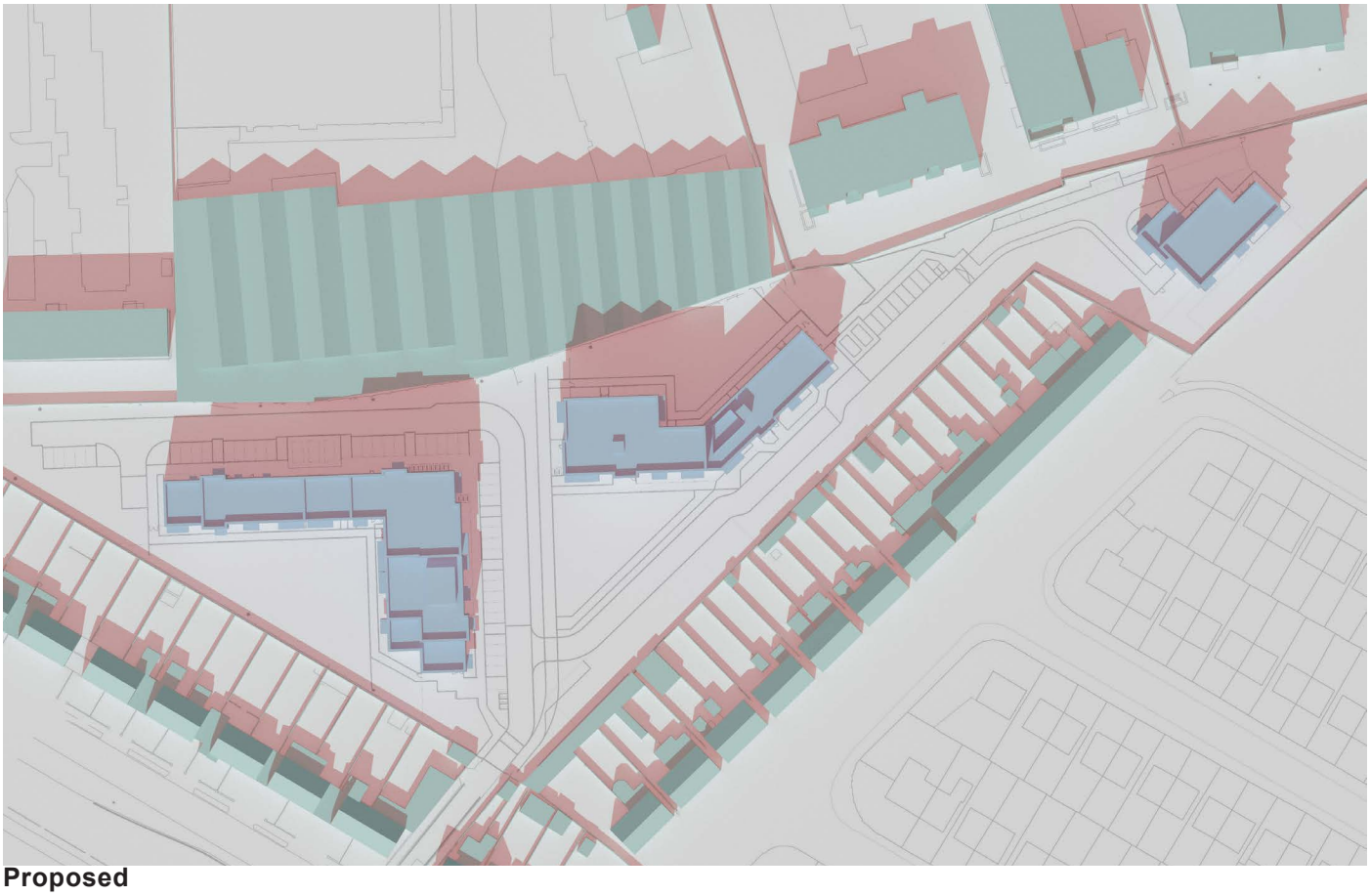


Proposed

N

Figure 10: Shadow diagrams 21 March 11:00 UTC

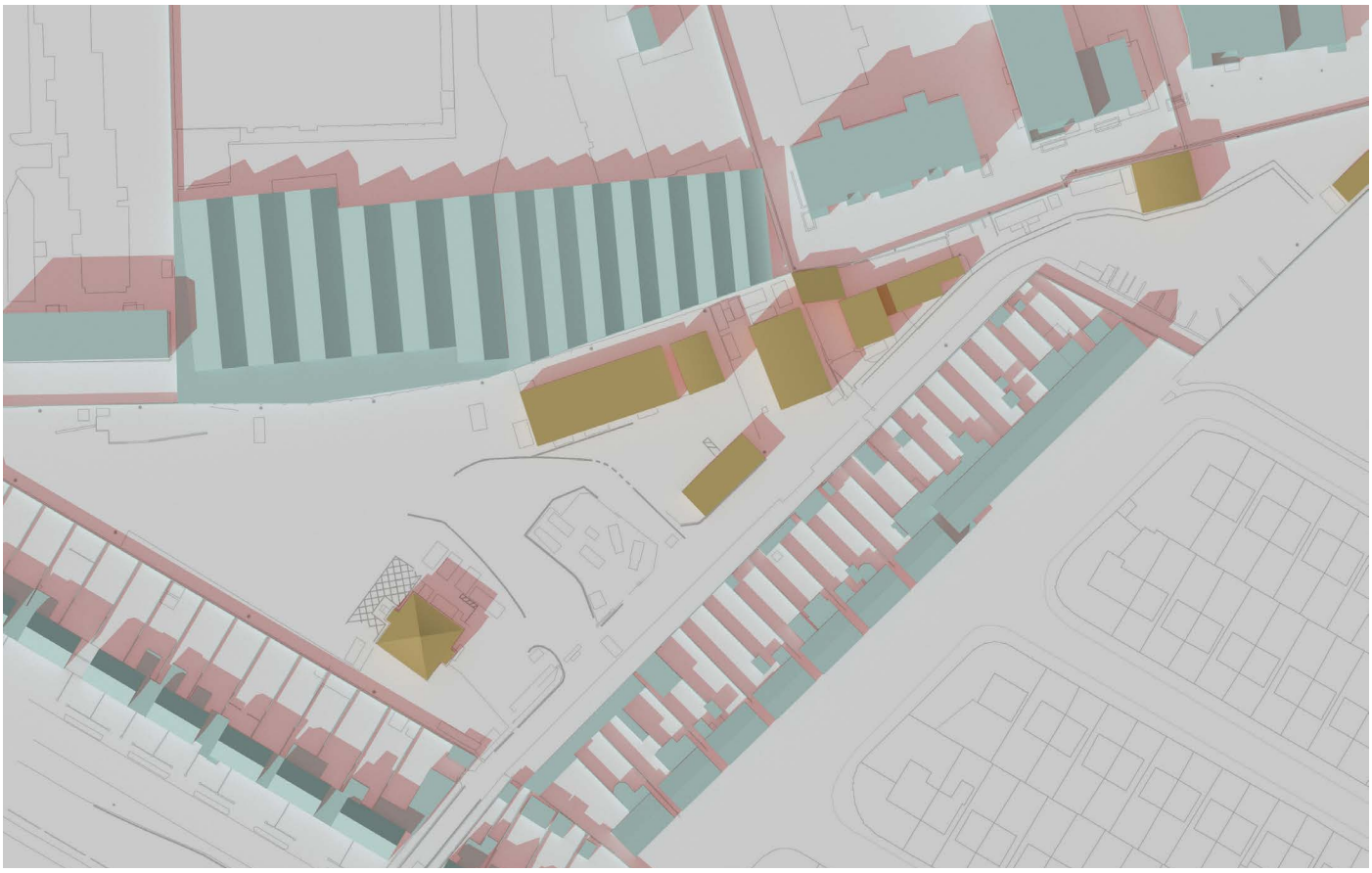
Existing



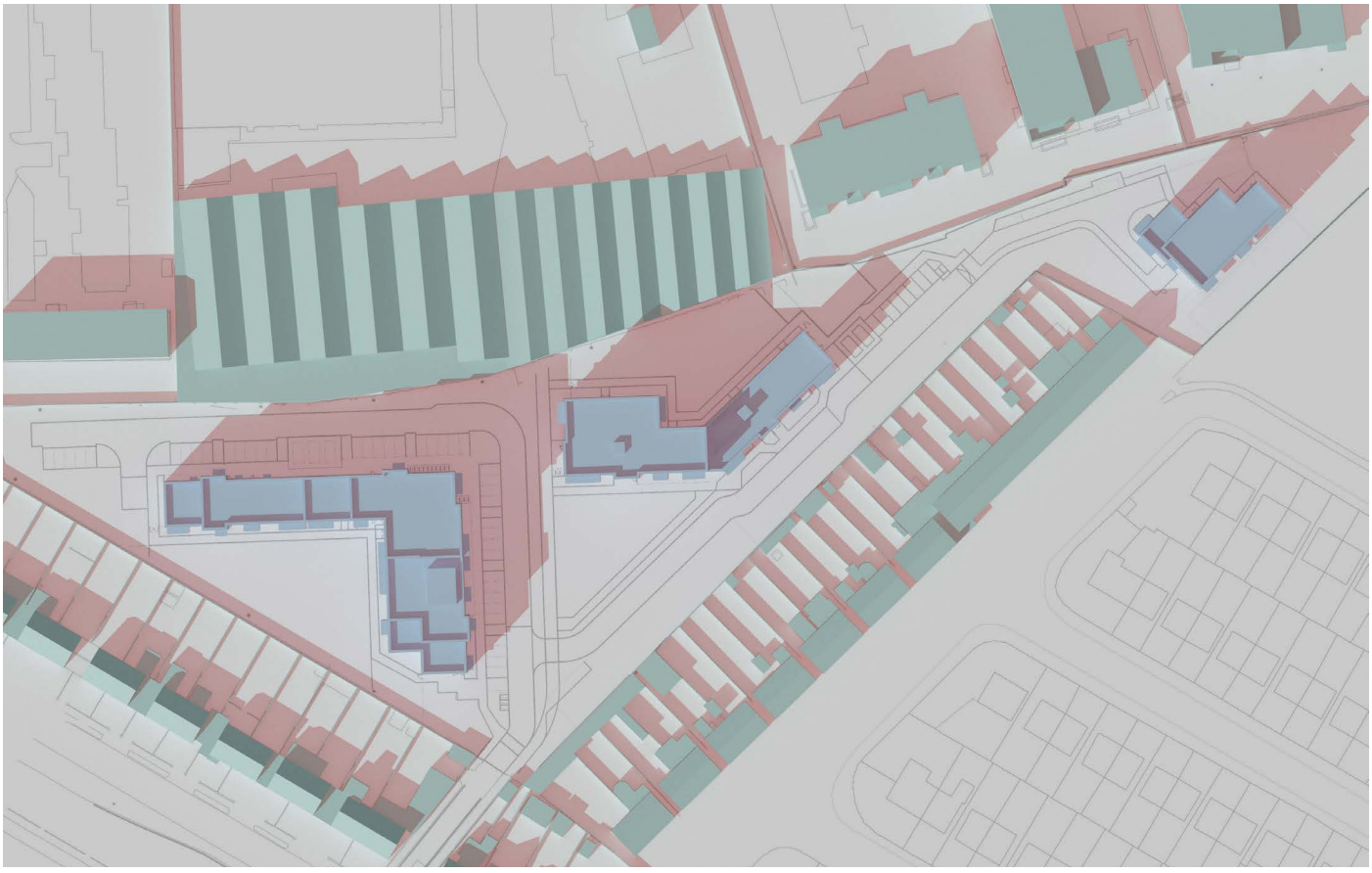
Proposed

N

Figure 11: Shadow diagrams 21 March 13:00 UTC



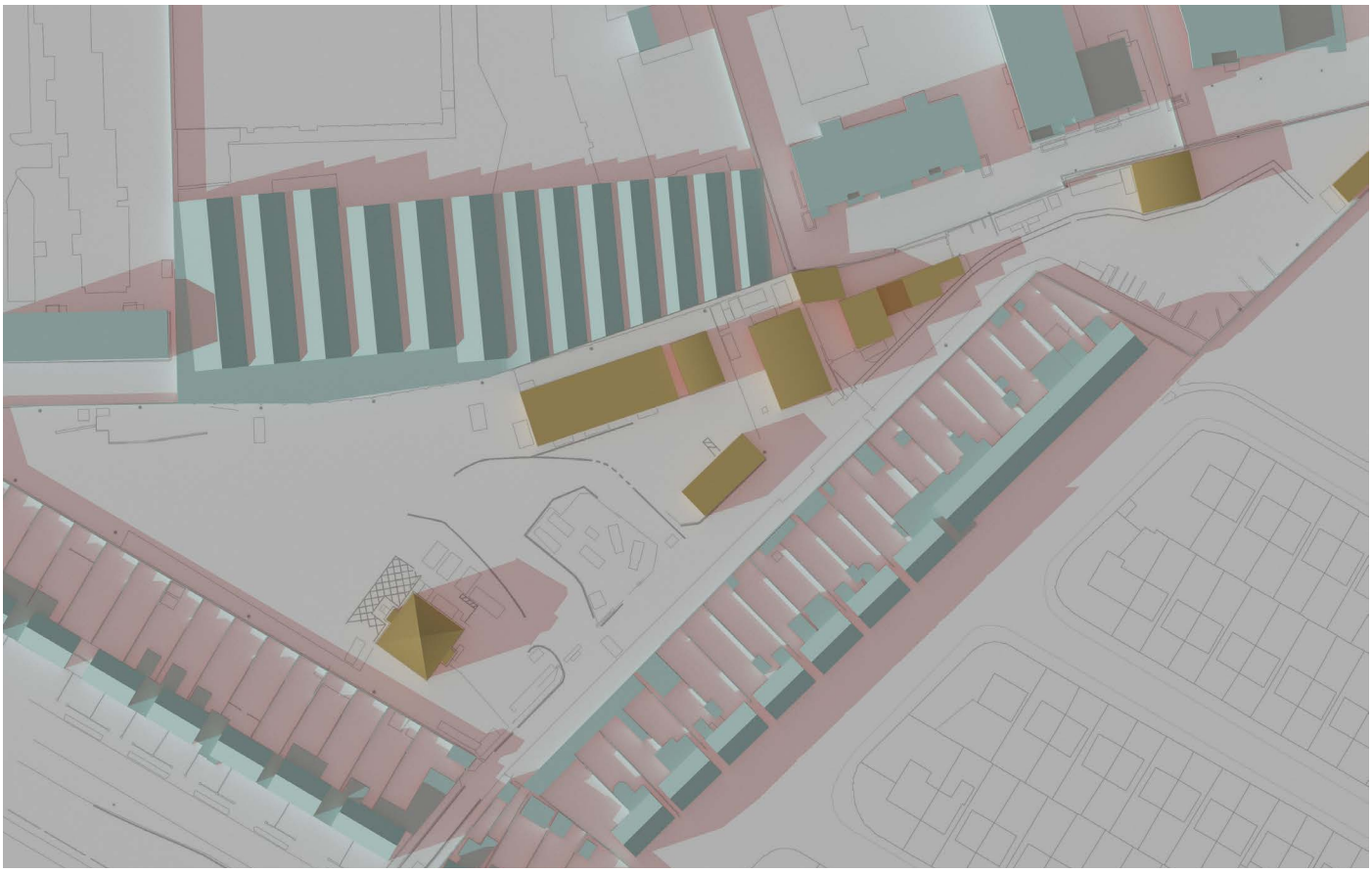
Existing



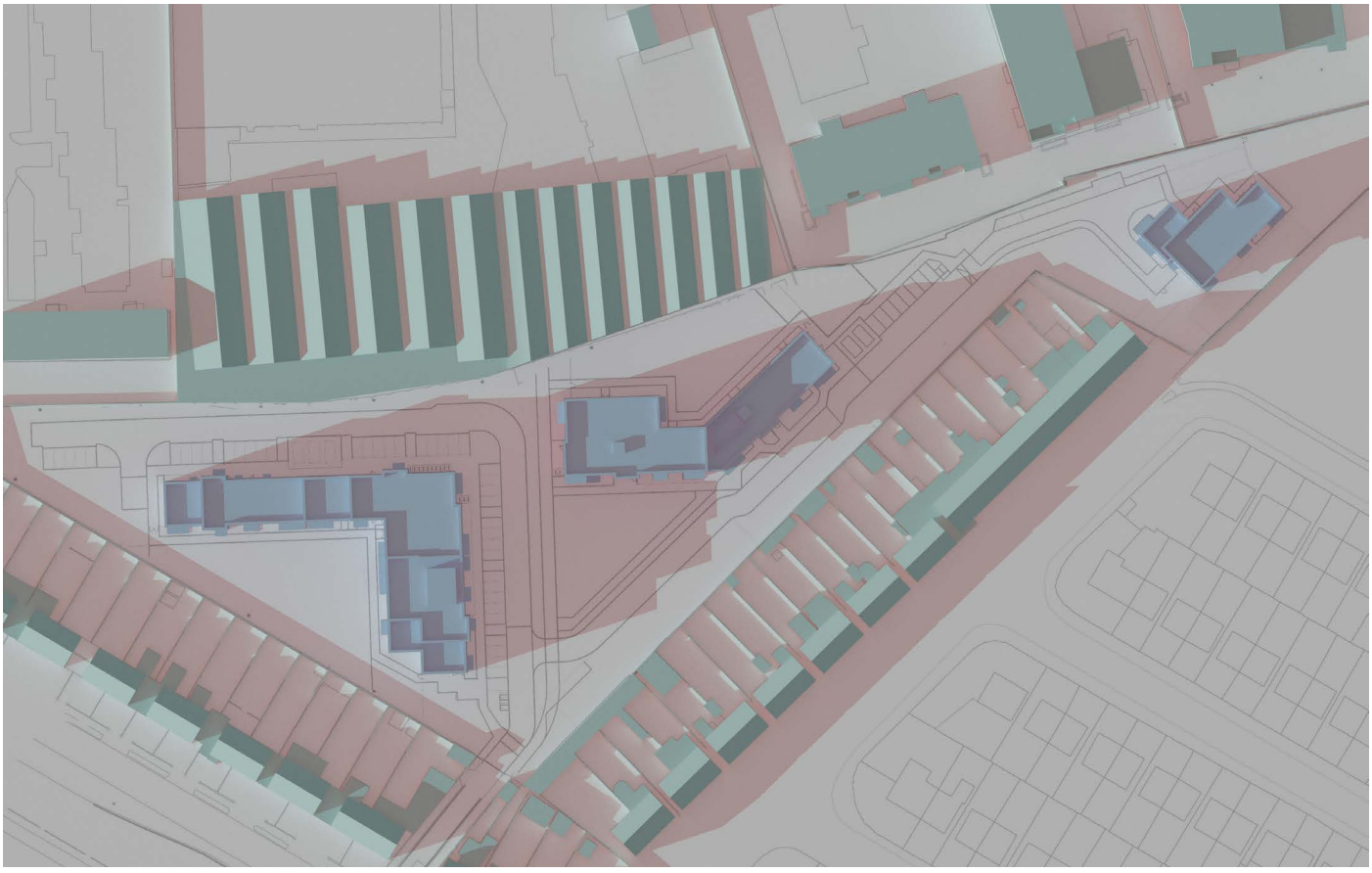
Proposed

N

Figure 12: Shadow diagrams 21 March 15:00 UTC



Existing

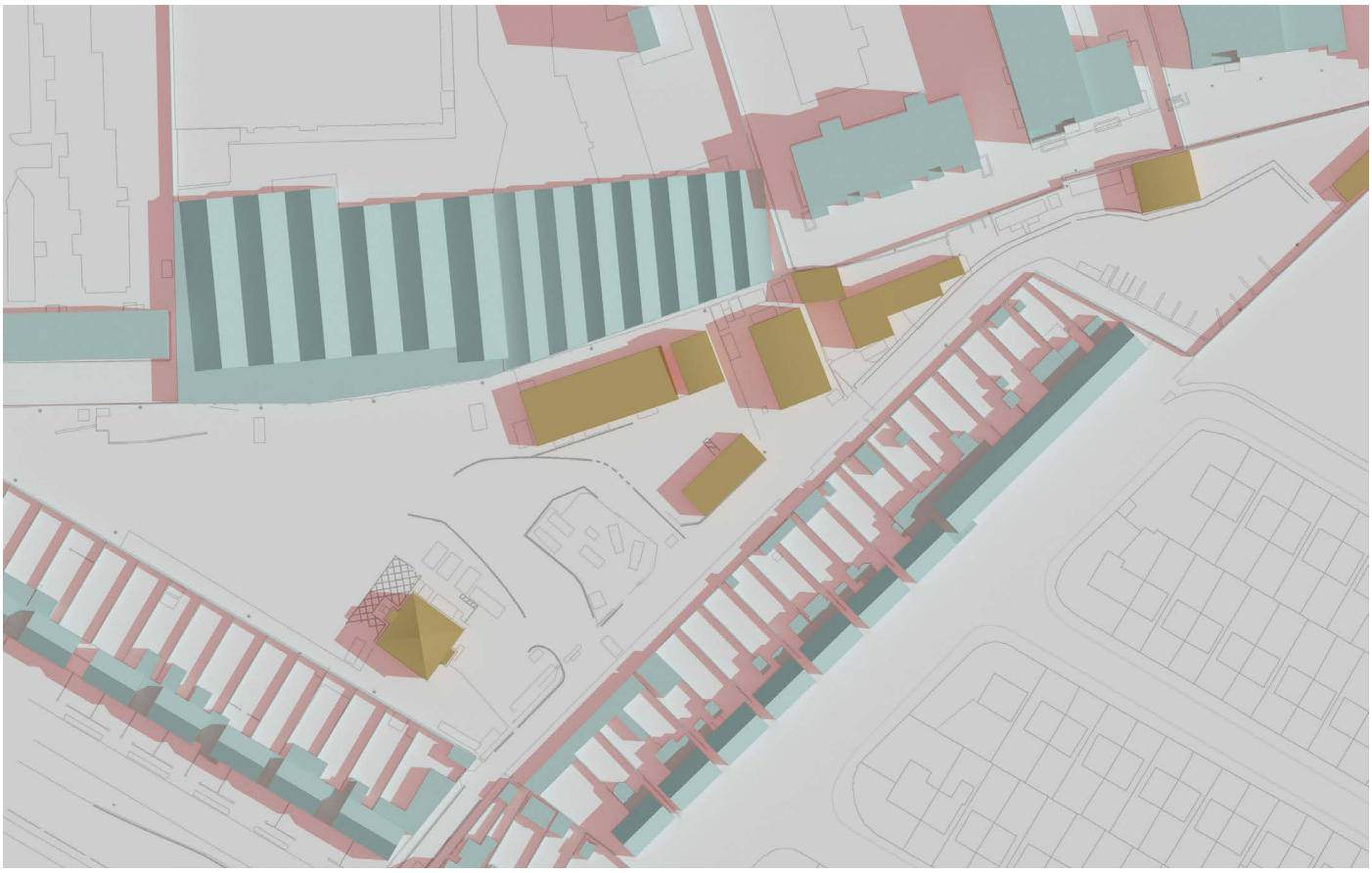


Proposed

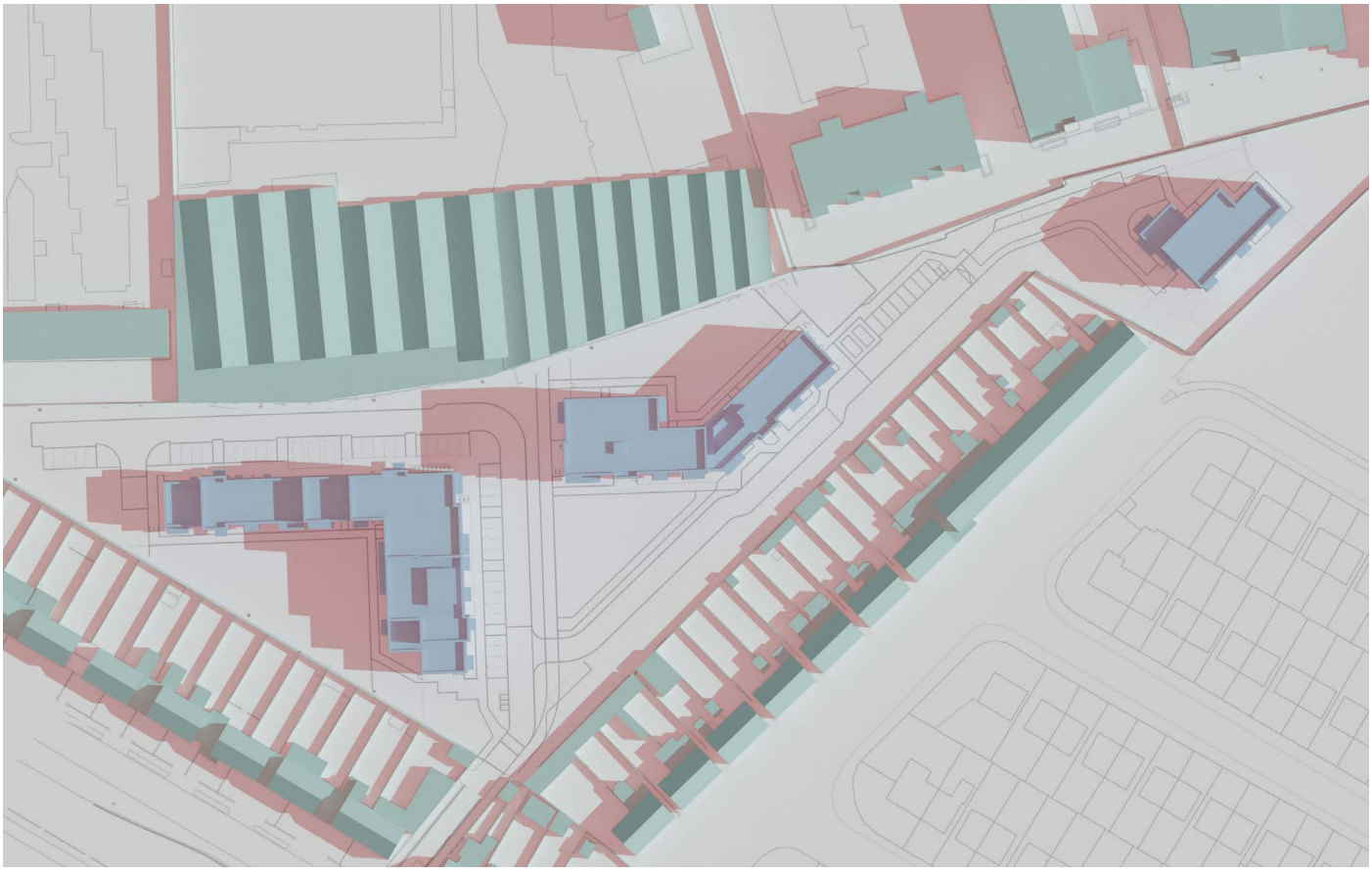
N

Figure 13: Shadow diagrams 21 March 17:00 UTC

9.3 Shadow Casting diagrams June Solstice



Existing



Proposed

N

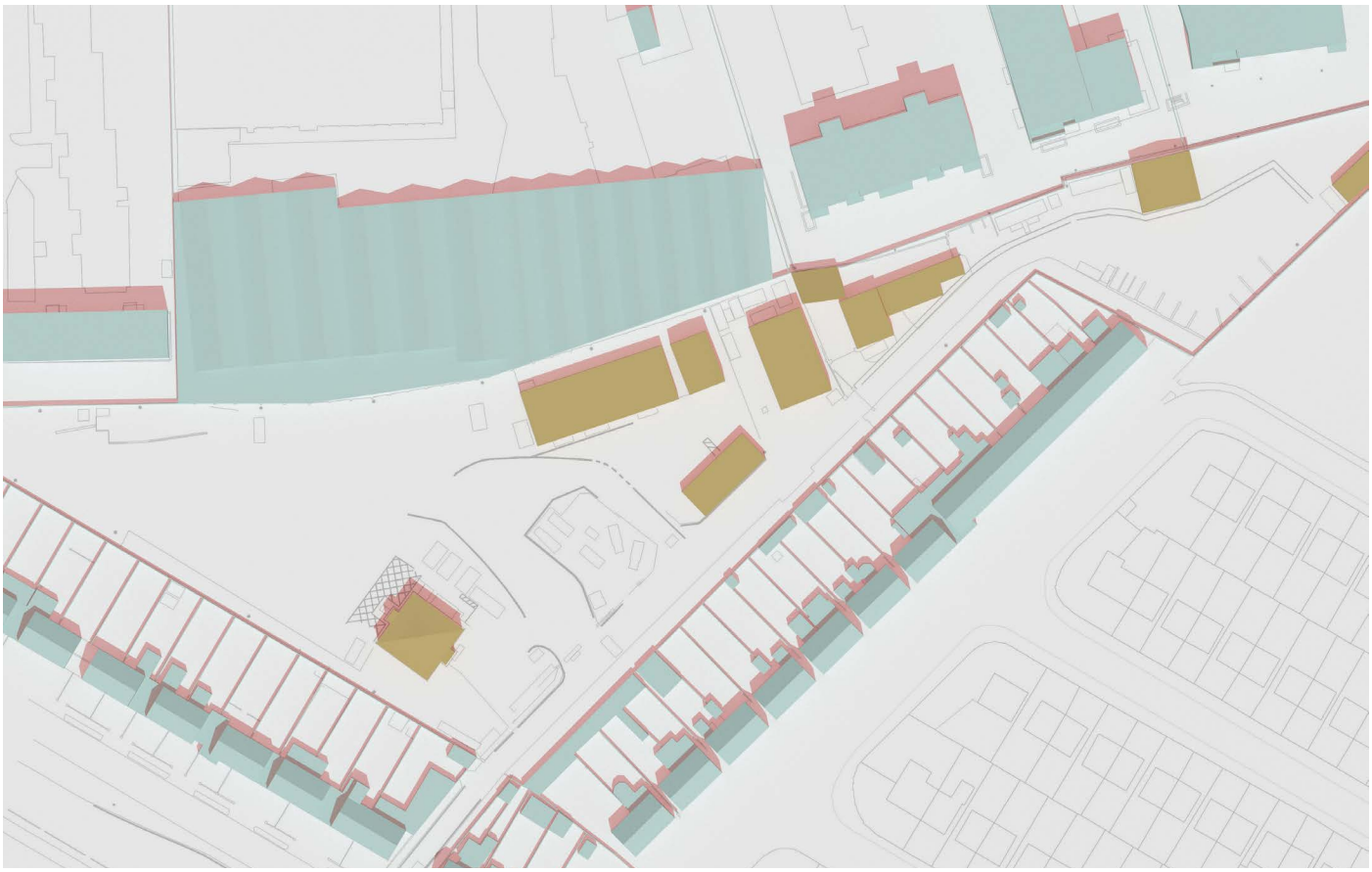
Figure 14: Shadow diagrams 21 June 09.00 UTC +1

Existing

Proposed

N

Figure 15: Shadow diagrams 21 June 11:00 UTC +1



Existing

Proposed

N

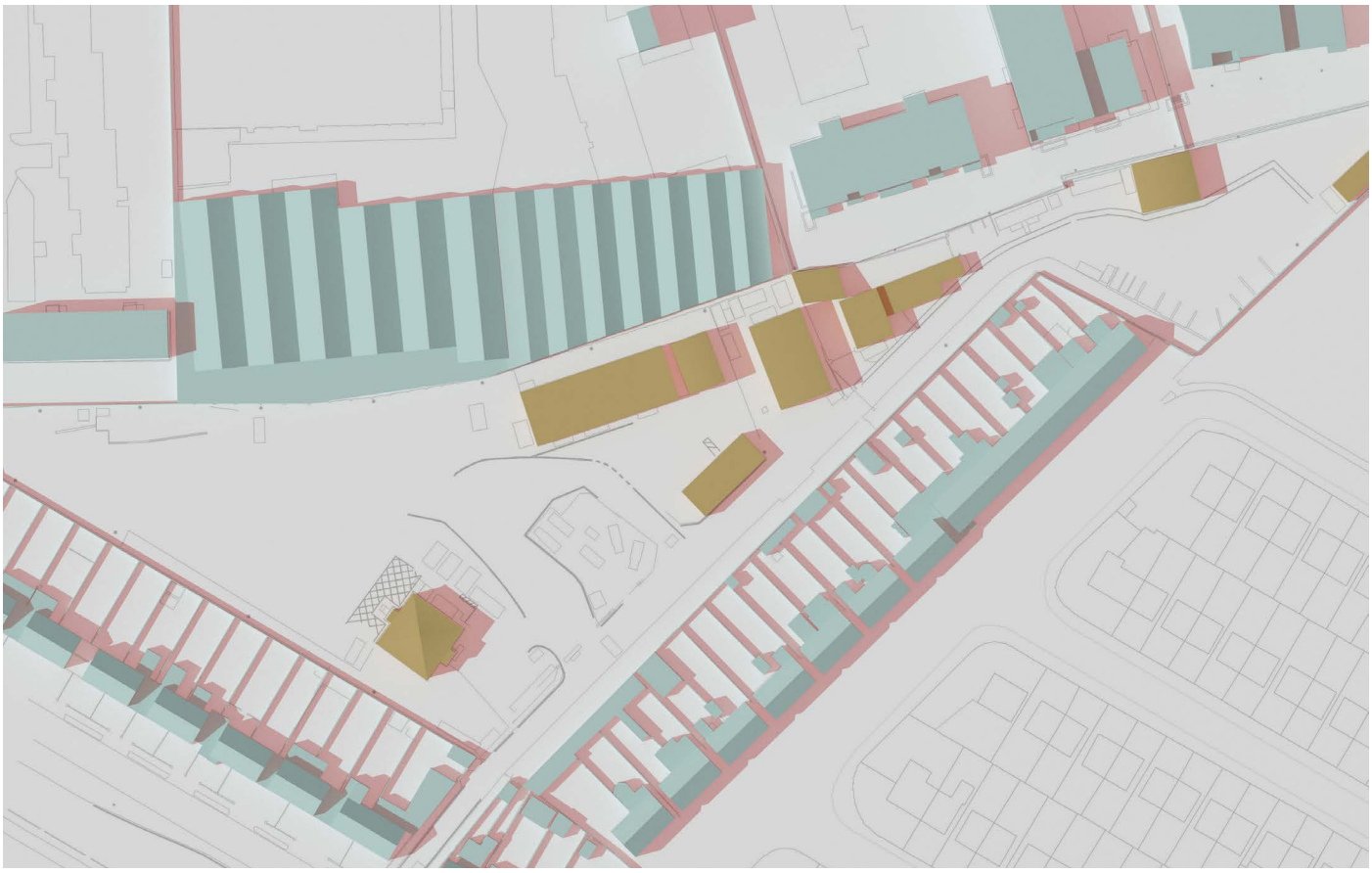
Figure 16: Shadow diagrams 21 June 13:00 UTC +1

Existing

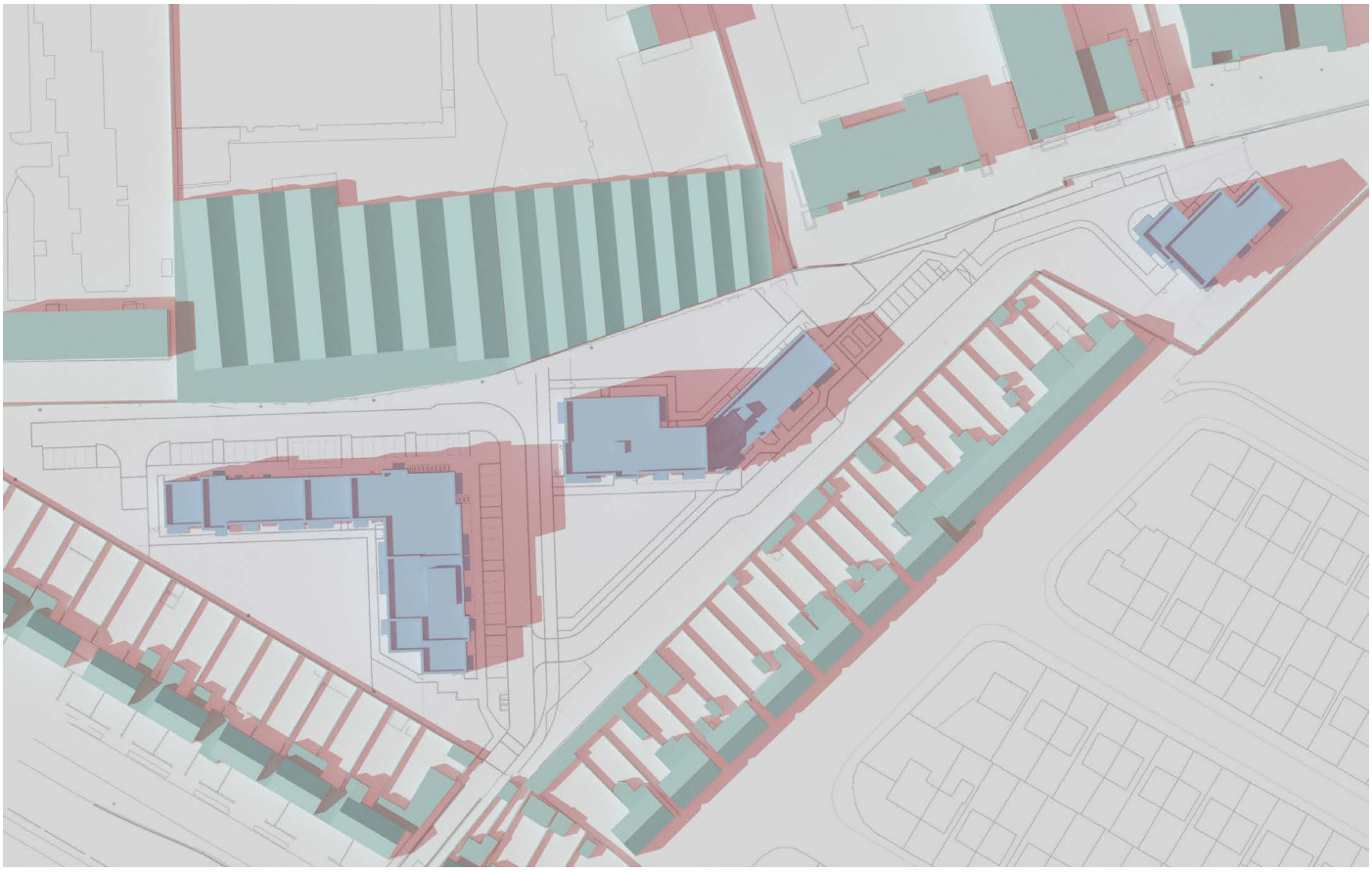
Proposed

N

Figure 17: Shadow diagrams 21 June 15:00 UTC +1



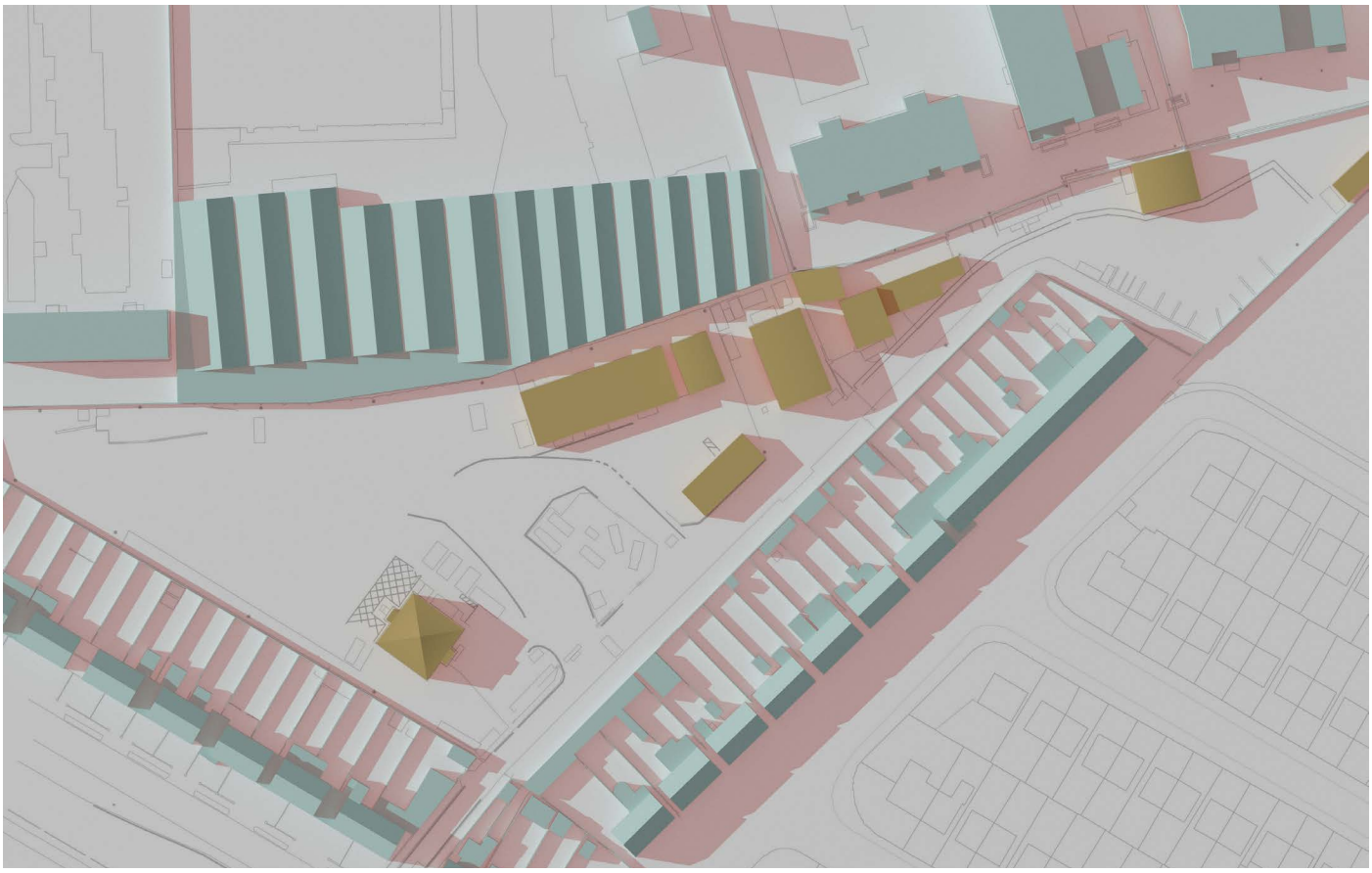
Existing



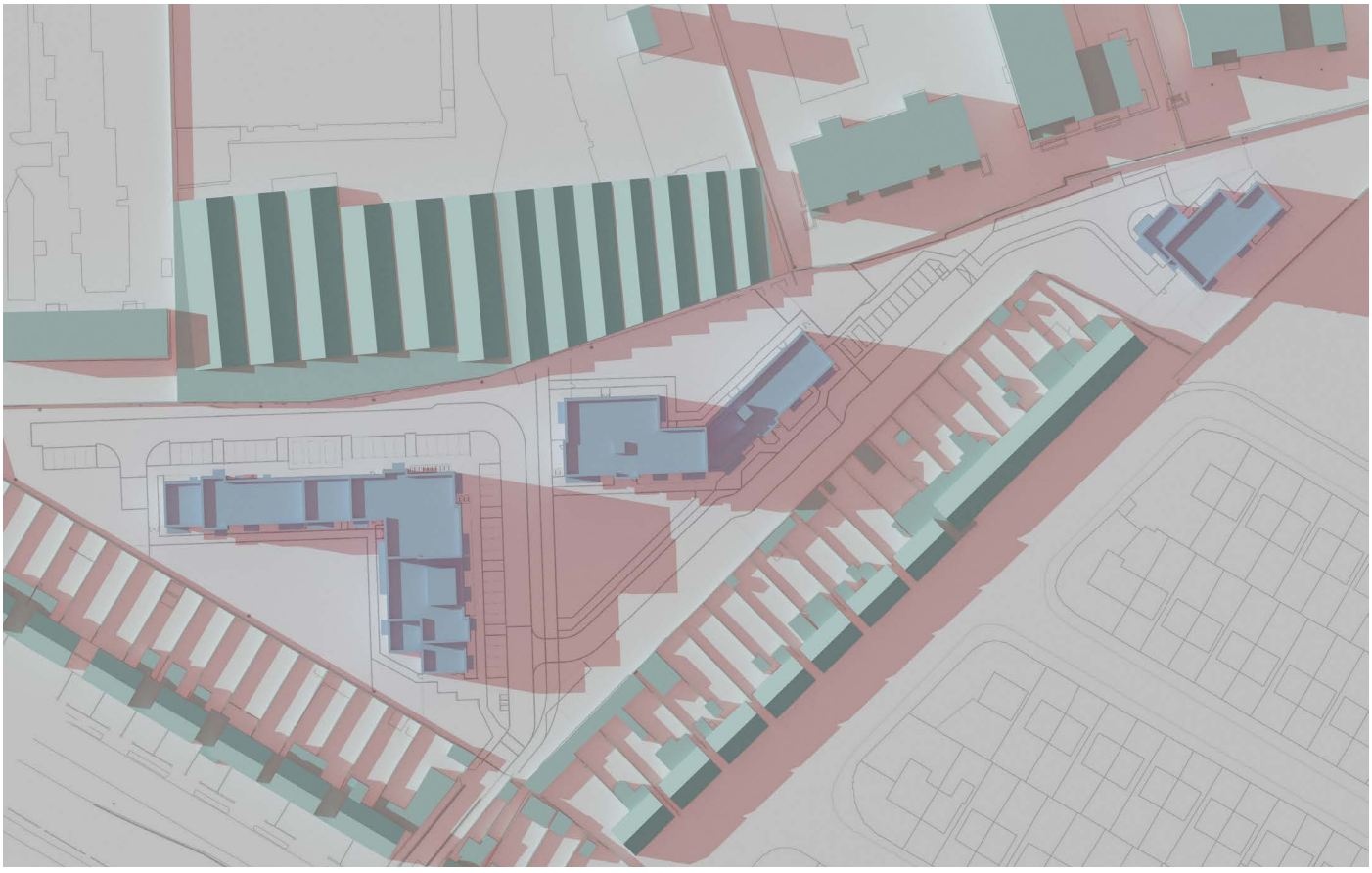
Proposed

N

Figure 18: Shadow diagrams 21 June 17:00 UTC +1



Existing

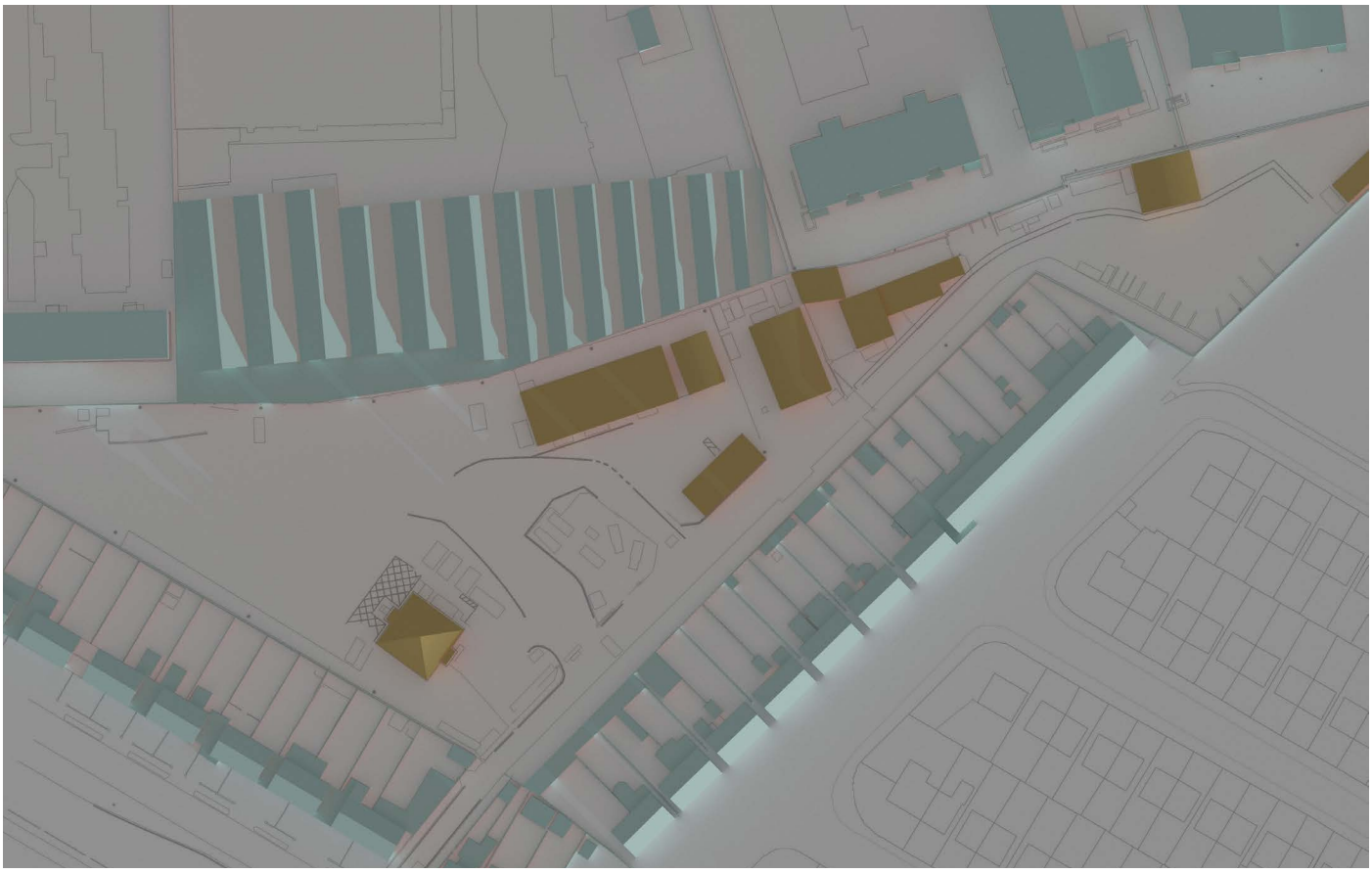


Proposed

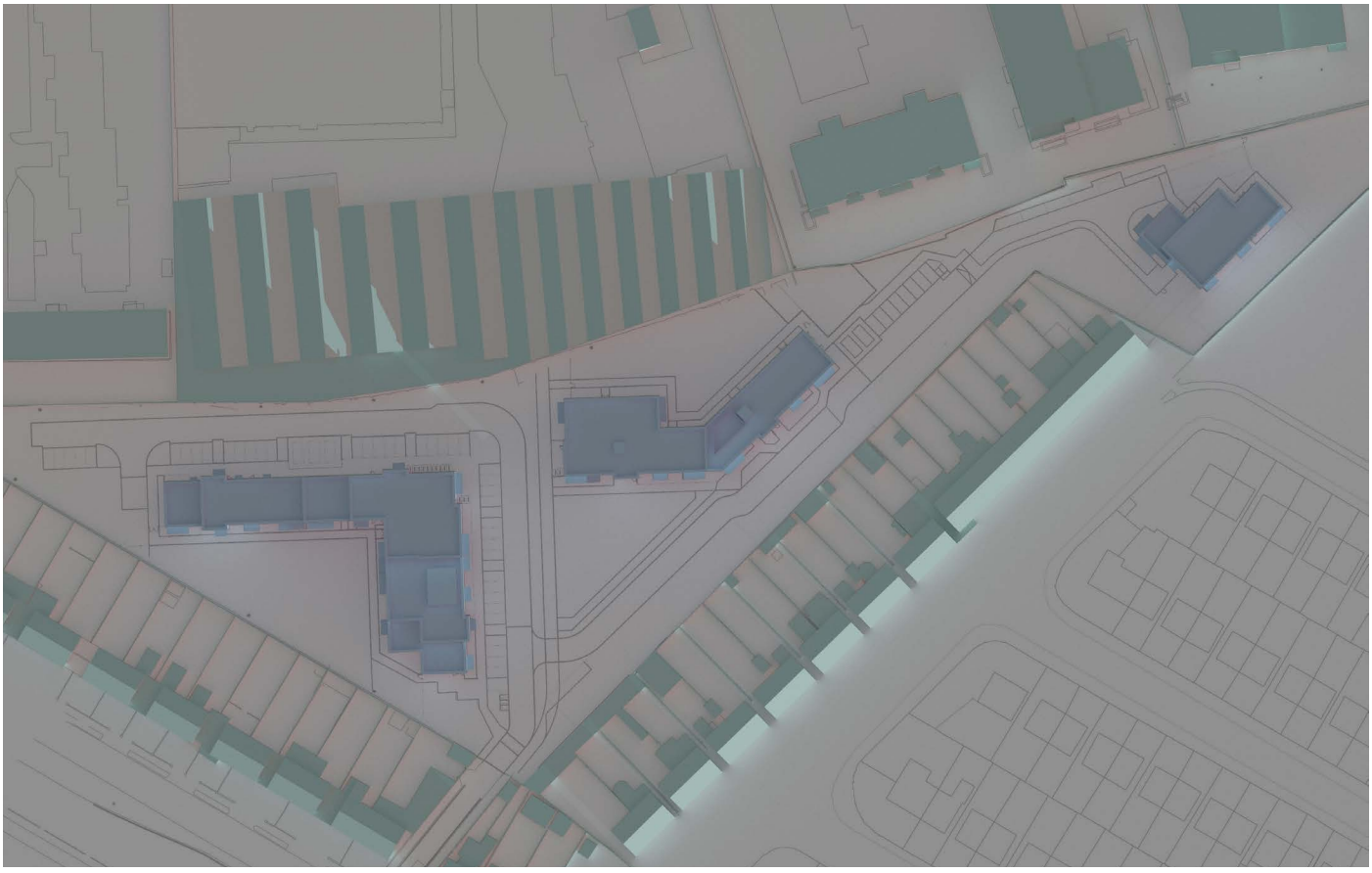
N

Figure 19: Shadow diagrams 21 June 19:00 UTC +1

9.4 Shadow Casting diagrams December Solstice



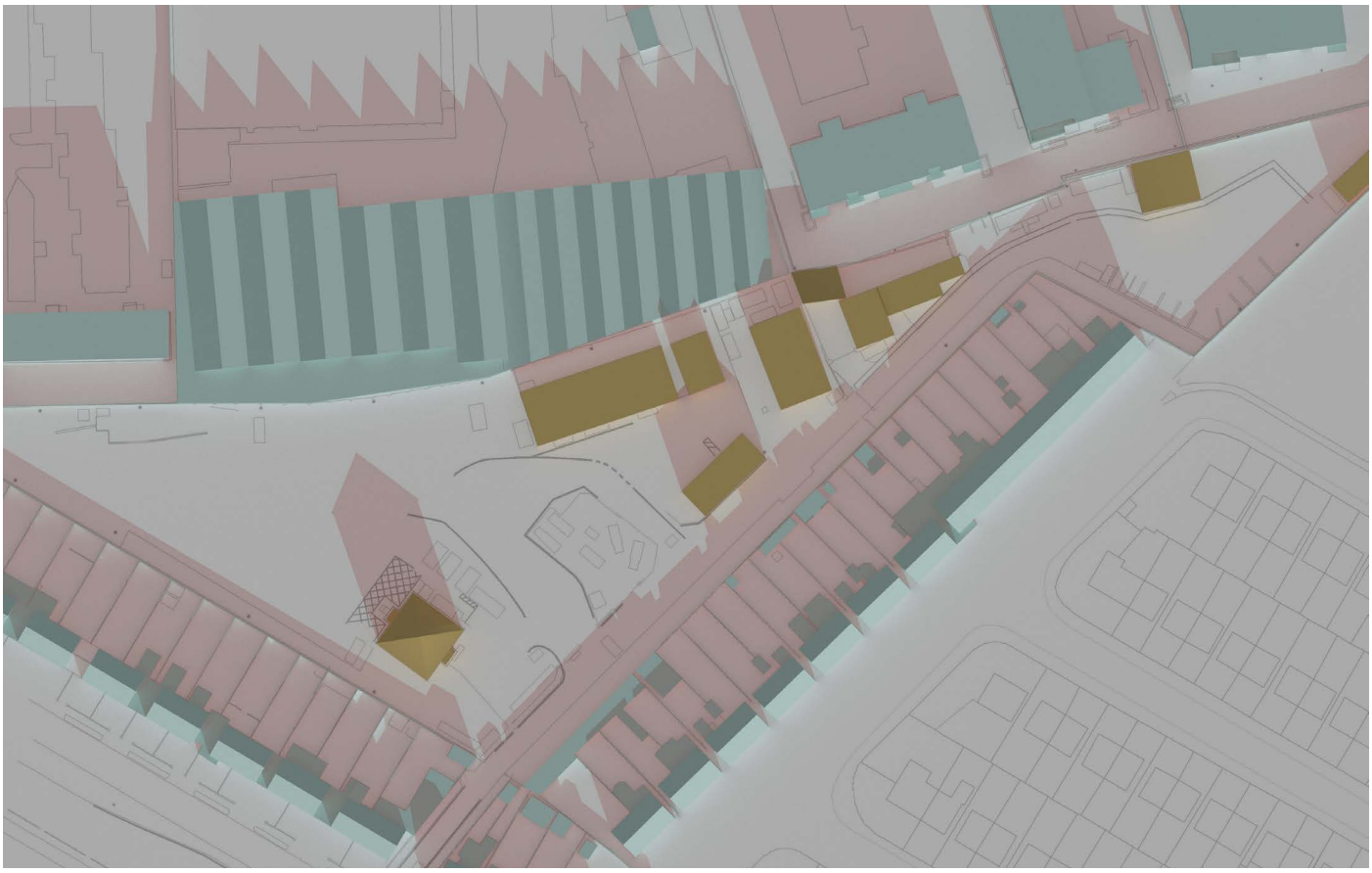
Existing



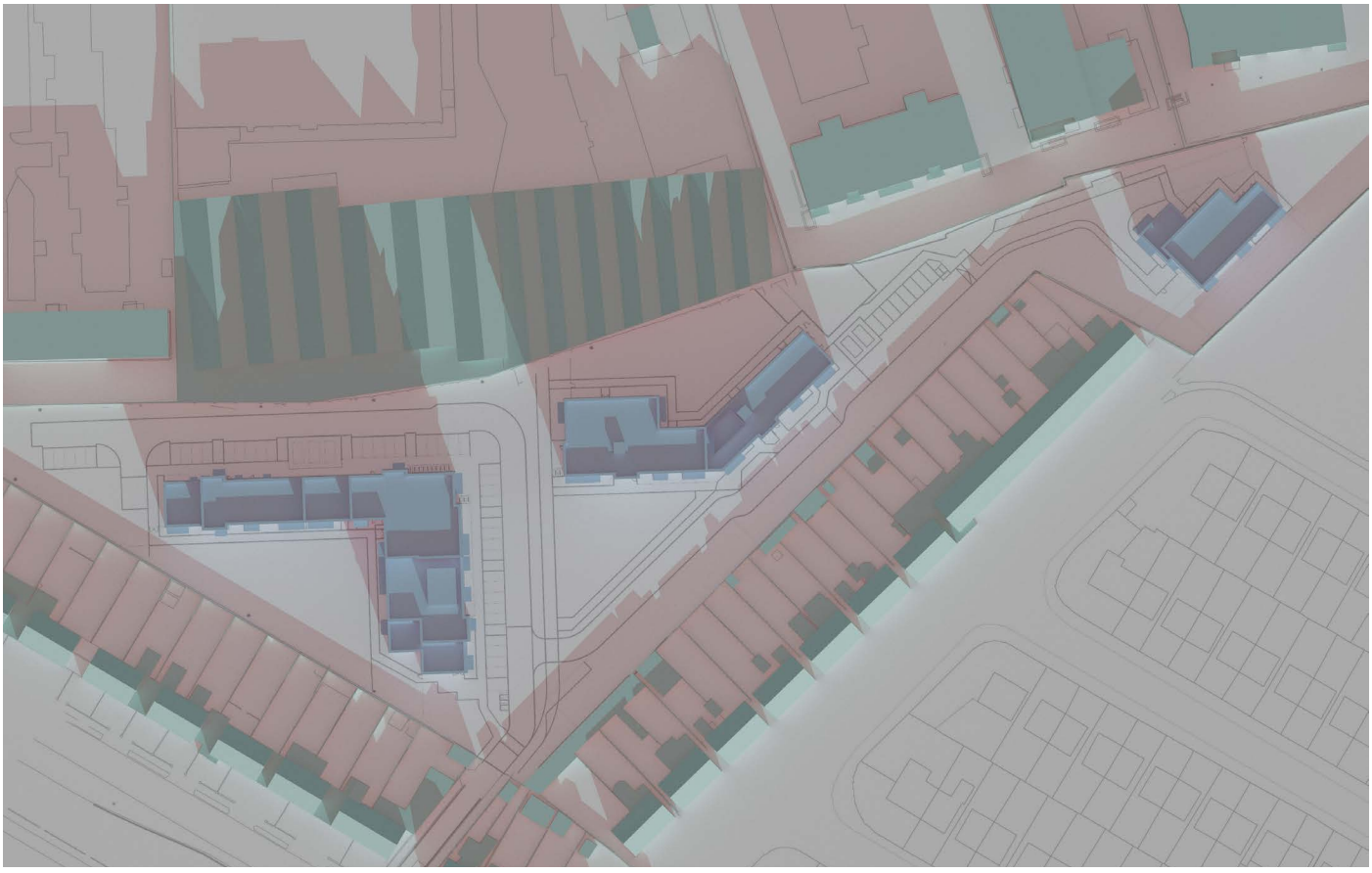
Proposed

N

Figure 20: Shadow diagrams 21 December 09:00 UTC



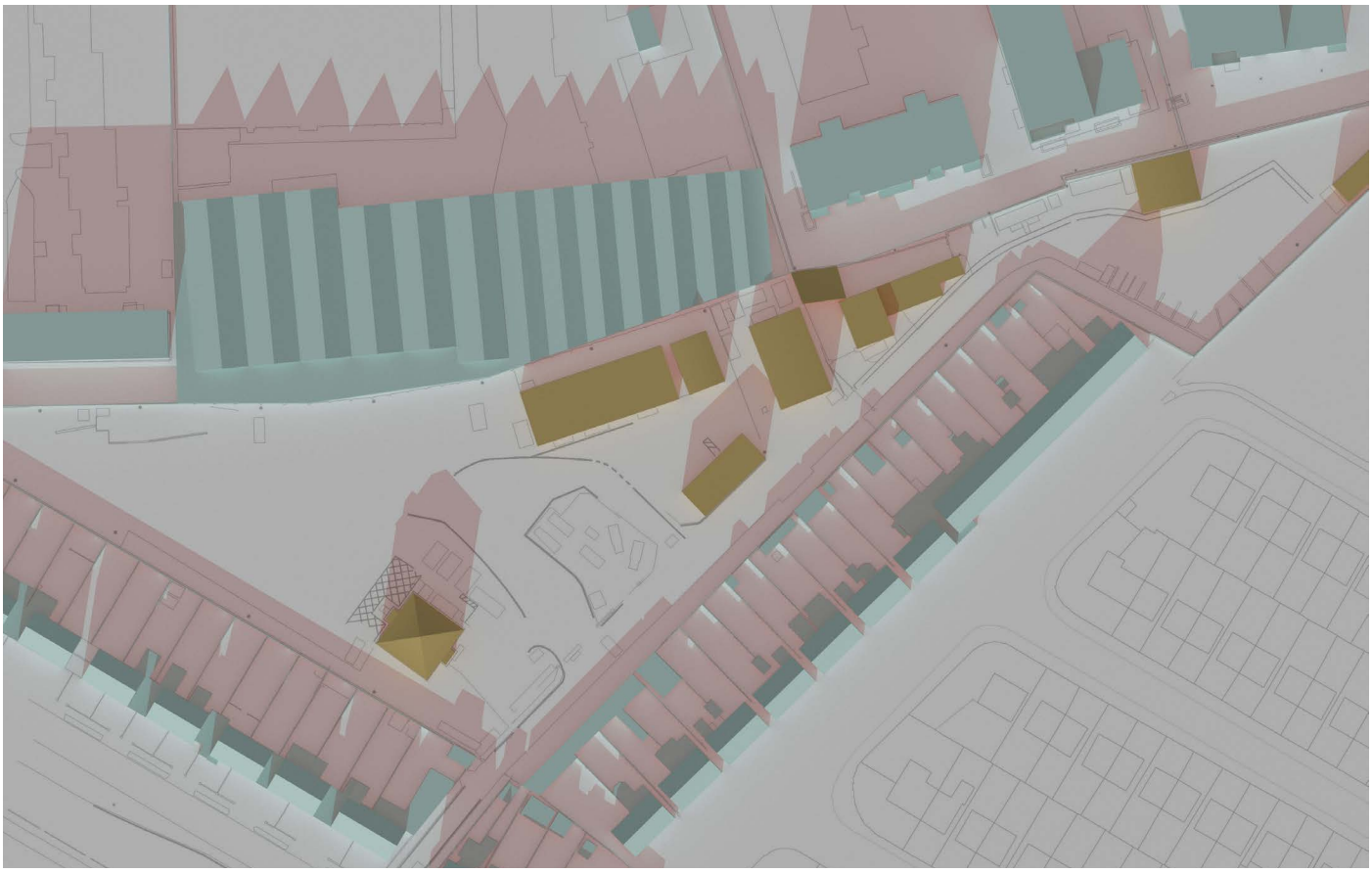
Existing



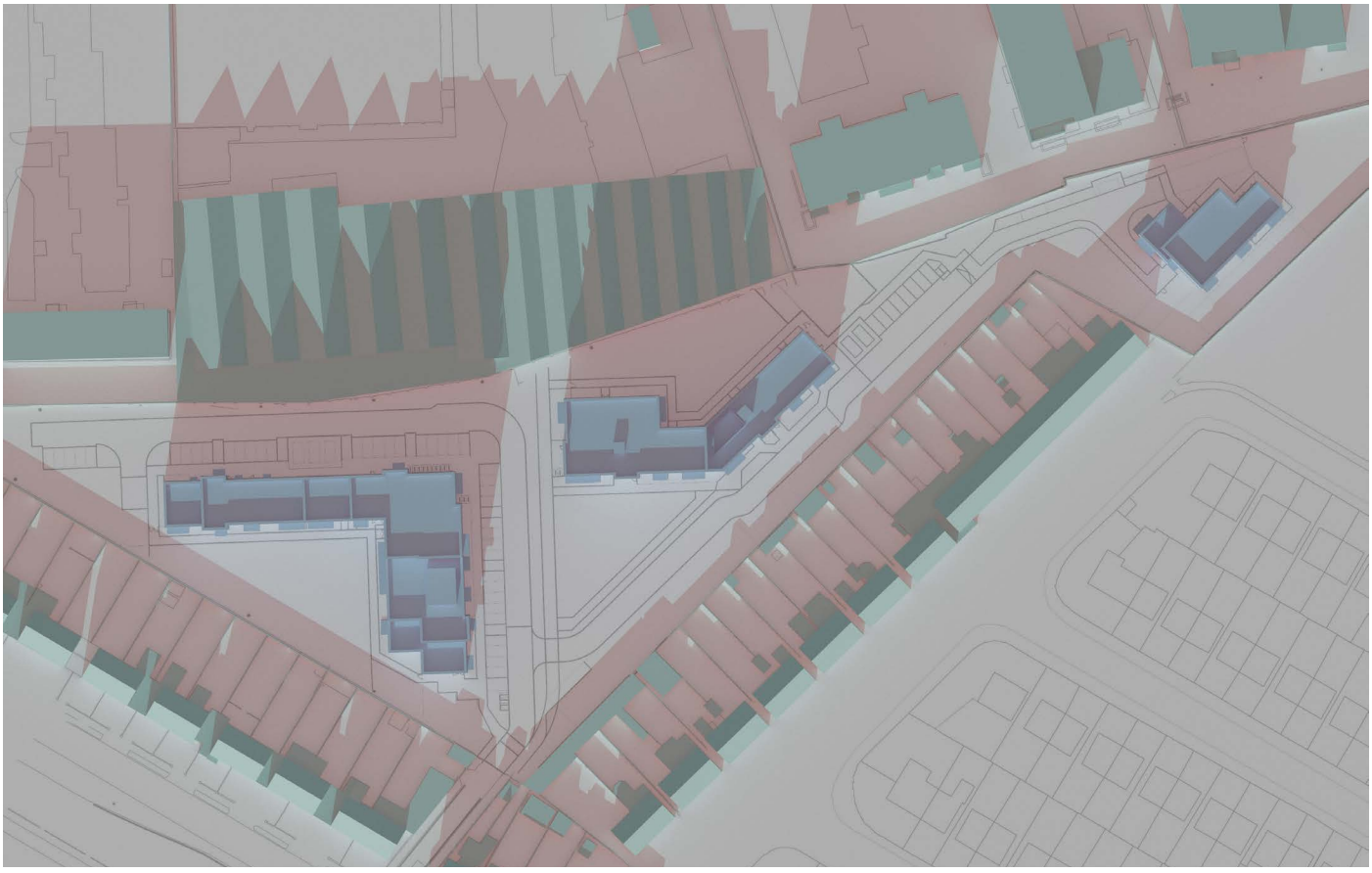
Proposed

N

Figure 21: Shadow diagrams 21 December 11:00 UTC



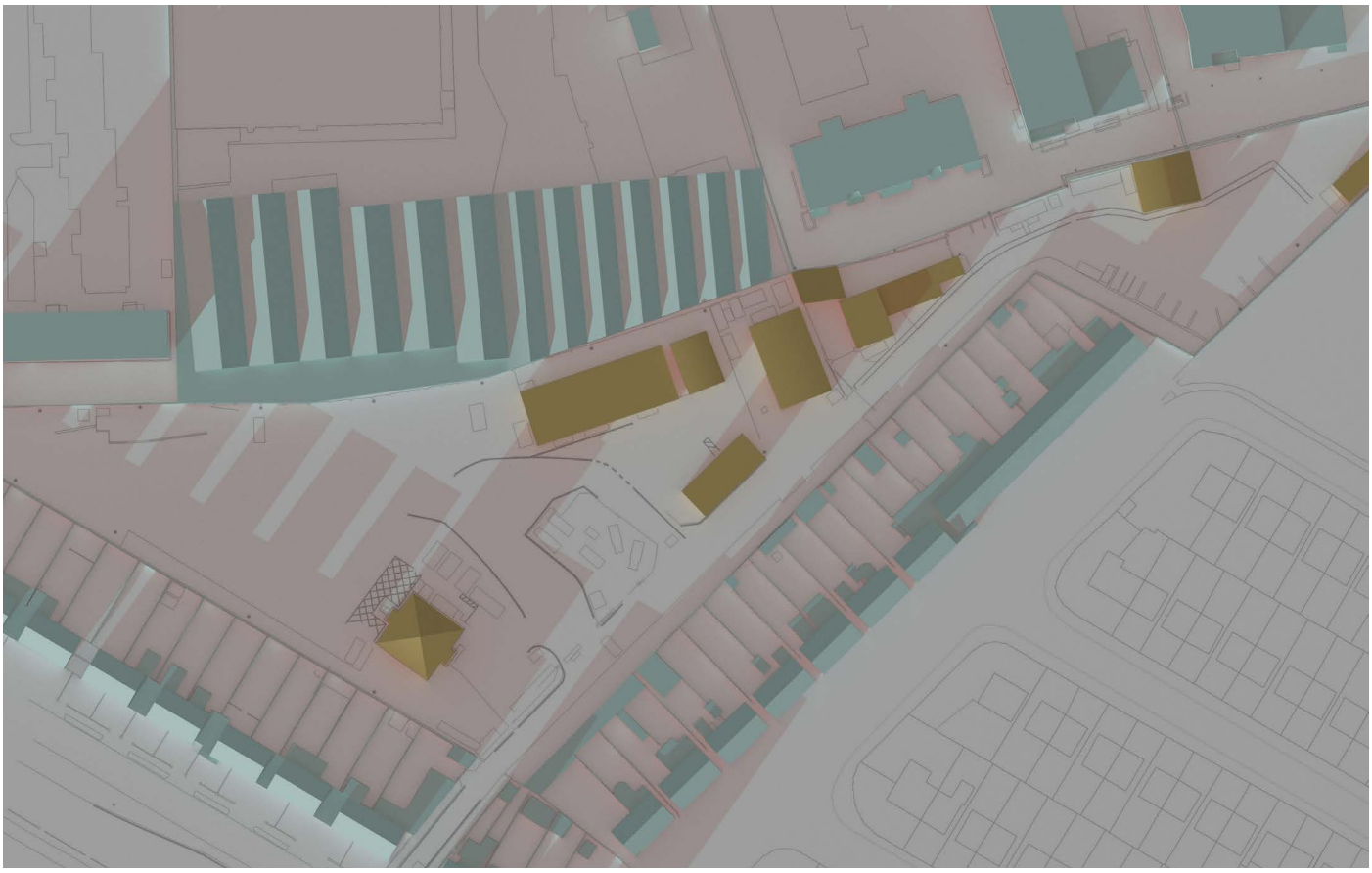
Existing



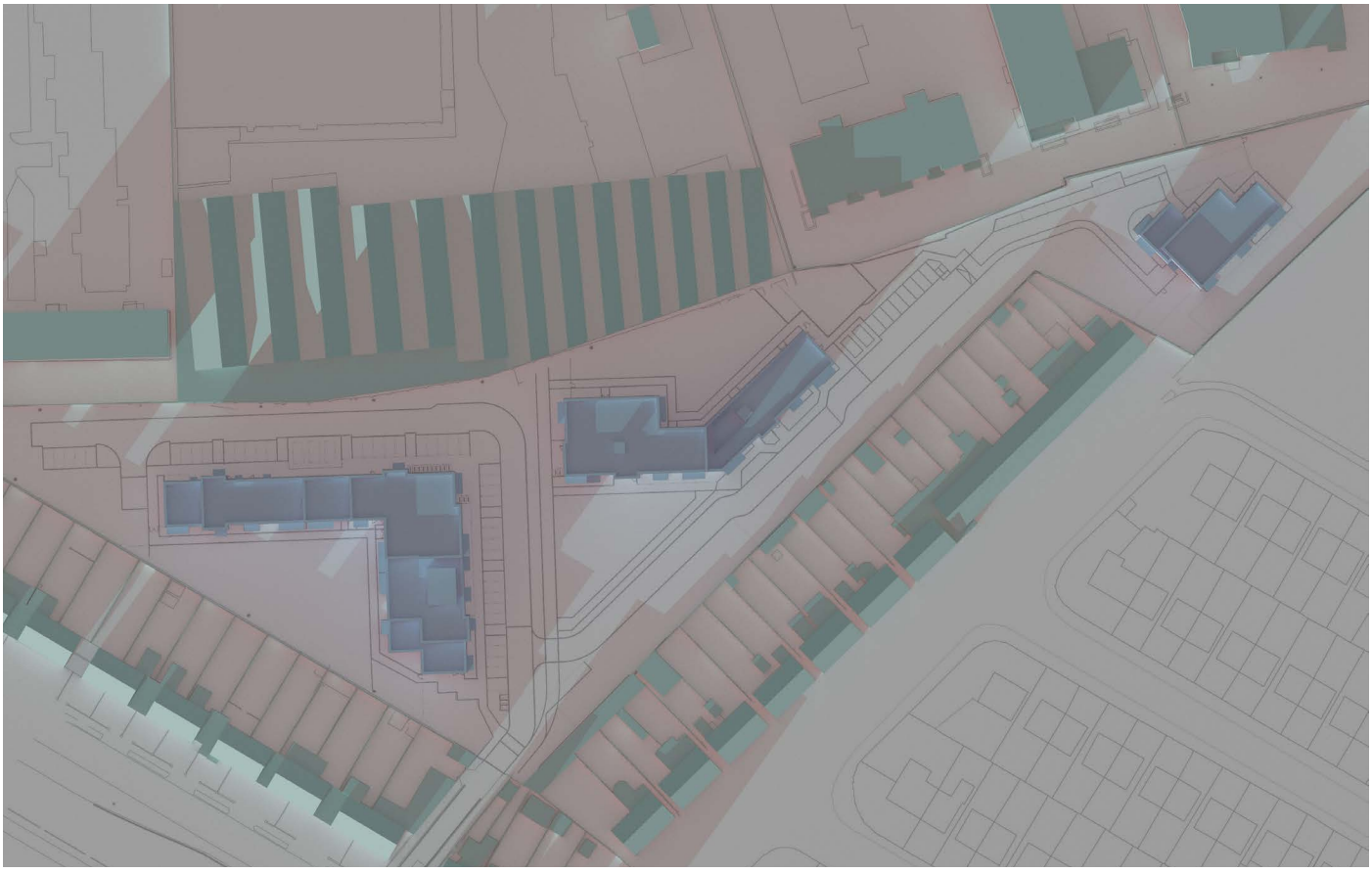
Proposed

N

Figure 22: Shadow diagrams 21 December 13:00 UTC



Existing



Proposed

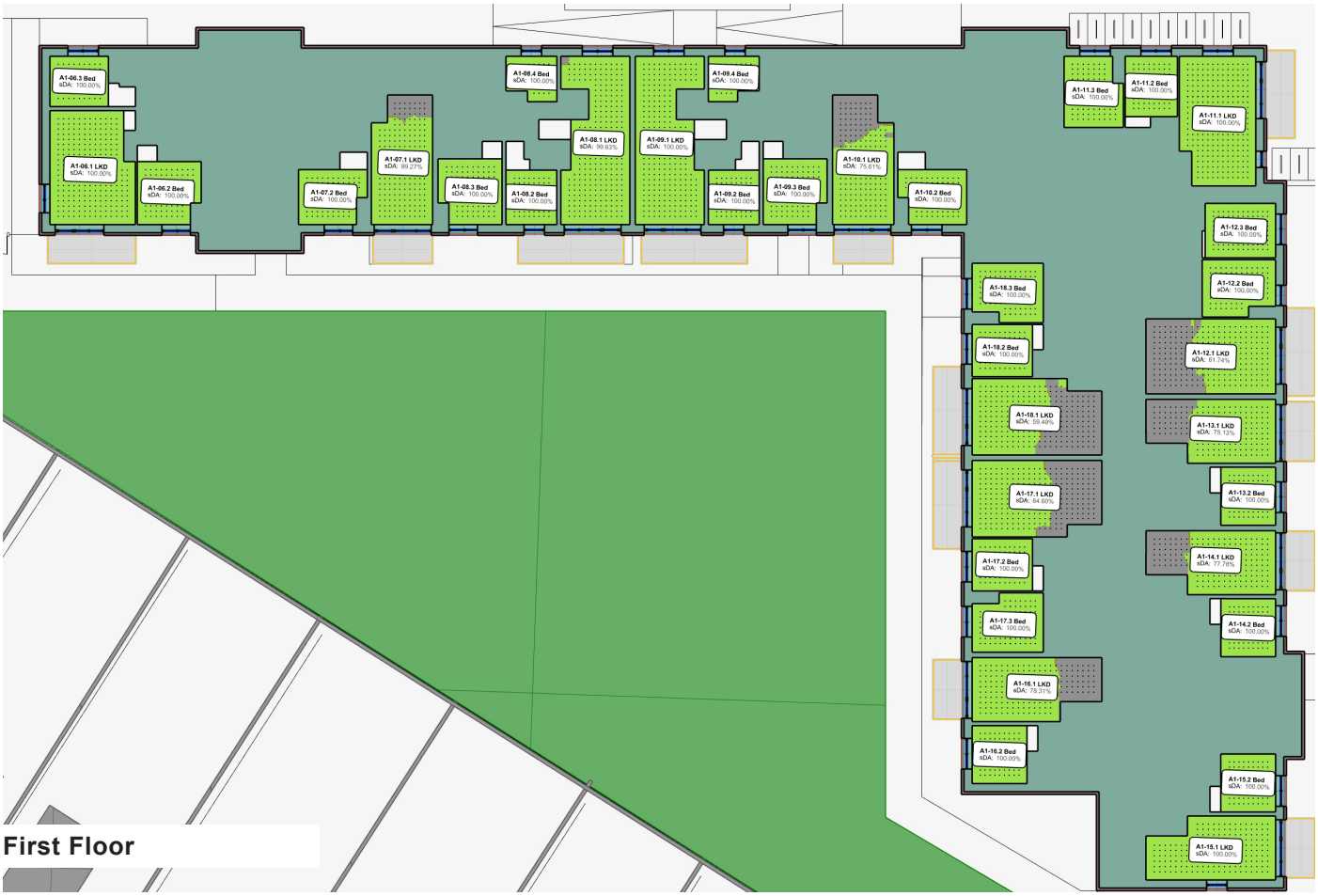
N

Figure 23: Shadow diagrams 21 December 15:00 UTC

Appendix A - Model without trees - BS EN17037:2021+A1

Minimum room specific Daylight Provision to UK National Annex Table NA.1.

Ground Floor



First Floor

Figure 24: Block A - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

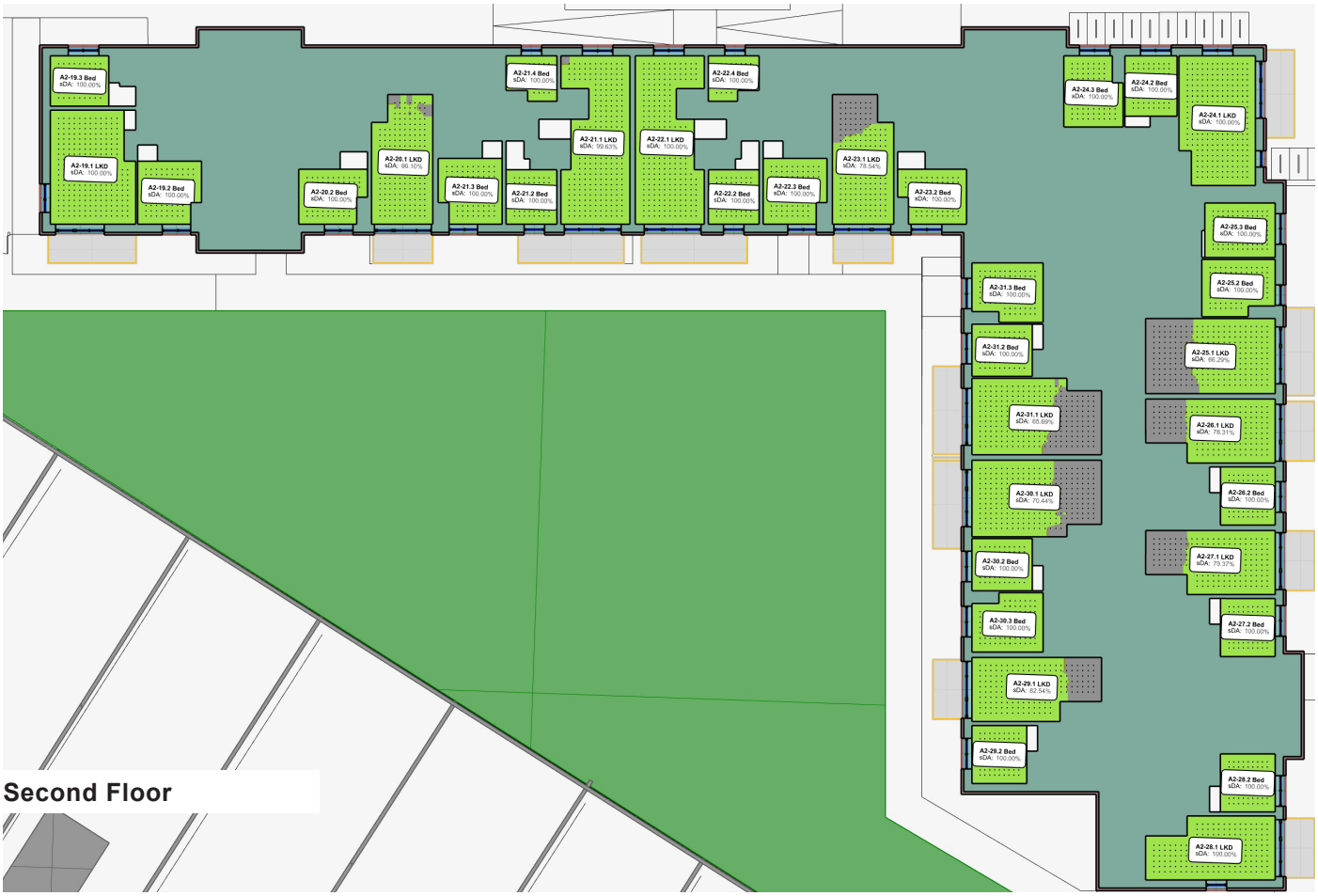


Figure 25: Block A - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Figure 26: Block A - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block A - Minimum illuminance levels from 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
A0-01.1	LKD	28.2	260	200	1062	99.6%	Y
A0-01.2	Bed	11.7	92	100	958	100.0%	Y
A0-01.3	Bed	9.1	72	100	539	100.0%	Y
A0-02.1	LKD	23.1	205	200	990	86.8%	Y
A0-02.2	Bed	10.8	88	100	1156	100.0%	Y
A0-03.1	LKD	31.6	271	200	855	99.6%	Y
A0-03.2	Bed	8.5	72	100	848	100.0%	Y
A0-03.3	Bed	12.2	102	100	990	100.0%	Y
A0-03.4	Bed	6.4	48	100	447	100.0%	Y
A0-04.1	LKD	29.3	274	200	516	62.0%	Y
A0-04.2	Bed	9.7	80	100	874	100.0%	Y
A0-04.3	Bed	12.2	98	100	667	100.0%	Y
A0-05.1	LKD	23.0	189	200	650	73.0%	Y
A0-05.2	Bed	9.8	81	100	920	100.0%	Y
A1-06.1	LKD	28.2	260	200	1009	100.0%	Y
A1-06.2	Bed	11.7	92	100	995	100.0%	Y
A1-06.3	Bed	9.1	72	100	589	100.0%	Y
A1-07.1	LKD	23.1	205	200	912	89.3%	Y
A1-07.2	Bed	10.8	88	100	1194	100.0%	Y
A1-08.1	LKD	31.6	271	200	798	99.6%	Y
A1-08.2	Bed	8.5	72	100	753	100.0%	Y
A1-08.3	Bed	12.2	102	100	1019	100.0%	Y
A1-08.4	Bed	6.4	48	100	474	100.0%	Y
A1-09.1	LKD	31.6	271	200	766	100.0%	Y
A1-09.2	Bed	8.5	72	100	710	100.0%	Y
A1-09.3	Bed	12.2	102	100	872	100.0%	Y
A1-09.4	Bed	6.4	48	100	471	100.0%	Y
A1-10.1	LKD	23.1	205	200	688	75.6%	Y
A1-10.2	Bed	10.8	88	100	825	100.0%	Y
A1-11.1	LKD	29.3	274	200	763	100.0%	Y
A1-11.2	Bed	9.7	80	100	524	100.0%	Y
A1-11.3	Bed	12.2	98	100	420	100.0%	Y
A1-12.1	LKD	30.0	264	200	463	61.7%	Y
A1-12.2	Bed	12.1	98	100	407	100.0%	Y
A1-12.3	Bed	11.8	108	100	771	100.0%	Y
A1-13.1	LKD	23.0	189	200	606	75.1%	Y
A1-13.2	Bed	9.8	81	100	920	100.0%	Y
A1-14.1	LKD	23.0	189	200	616	77.8%	Y
A1-14.2	Bed	9.8	81	100	872	100.0%	Y
A1-15.1	LKD	23.0	189	200	1143	100.0%	Y
A1-15.2	Bed	9.8	81	100	919	100.0%	Y
A1-16.1	LKD	23.0	189	200	603	78.3%	Y
A1-16.2	Bed	9.8	81	100	953	100.0%	Y
A1-17.1	LKD	29.3	274	200	467	64.6%	Y
A1-17.2	Bed	9.7	80	100	918	100.0%	Y
A1-17.3	Bed	12.2	98	100	700	100.0%	Y
A1-18.1	LKD	29.3	274	200	439	59.5%	Y
A1-18.2	Bed	9.7	80	100	732	100.0%	Y
A1-18.3	Bed	12.2	98	100	669	100.0%	Y
A2-19.1	LKD	28.2	260	200	1272	100.0%	Y
A2-19.2	Bed	11.7	92	100	1028	100.0%	Y

Block A - Minimum illuminance levels from 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
A2-19.3	Bed	9.1	72	100	610	100.0%	Y
A2-20.1	LKD	23.1	205	200	933	96.1%	Y
A2-20.2	Bed	10.8	88	100	1202	100.0%	Y
A2-21.1	LKD	31.6	271	200	824	99.6%	Y
A2-21.2	Bed	8.5	72	100	765	100.0%	Y
A2-21.3	Bed	12.2	102	100	1038	100.0%	Y
A2-21.4	Bed	6.4	48	100	488	100.0%	Y
A2-22.1	LKD	31.6	271	200	801	100.0%	Y
A2-22.2	Bed	8.5	72	100	750	100.0%	Y
A2-22.3	Bed	12.2	102	100	930	100.0%	Y
A2-22.4	Bed	6.4	48	100	486	100.0%	Y
A2-23.1	LKD	23.1	205	200	733	78.5%	Y
A2-23.2	Bed	10.8	88	100	865	100.0%	Y
A2-24.1	LKD	29.3	274	200	797	100.0%	Y
A2-24.2	Bed	9.7	80	100	538	100.0%	Y
A2-24.3	Bed	12.2	98	100	431	100.0%	Y
A2-25.1	LKD	30.0	264	200	479	66.3%	Y
A2-25.2	Bed	12.1	98	100	416	100.0%	Y
A2-25.3	Bed	11.8	108	100	795	100.0%	Y
A2-26.1	LKD	23.0	189	200	623	78.3%	Y
A2-26.2	Bed	9.8	81	100	946	100.0%	Y
A2-27.1	LKD	23.0	189	200	630	79.4%	Y
A2-27.2	Bed	9.8	81	100	889	100.0%	Y
A2-28.1	LKD	23.0	189	200	1320	100.0%	Y
A2-28.2	Bed	9.8	81	100	996	100.0%	Y
A2-29.1	LKD	23.0	189	200	806	82.5%	Y
A2-29.2	Bed	9.8	81	100	984	100.0%	Y
A2-30.1	LKD	29.3	274	200	487	70.4%	Y
A2-30.2	Bed	9.7	80	100	939	100.0%	Y
A2-30.3	Bed	12.2	98	100	740	100.0%	Y
A2-31.1	LKD	29.3	274	200	460	65.7%	Y
A2-31.2	Bed	9.7	80	100	761	100.0%	Y
A2-31.3	Bed	12.2	98	100	693	100.0%	Y
A3-32.1	LKD	23.1	205	200	1223	99.5%	Y
A3-32.2	Bed	10.8	88	100	1231	100.0%	Y
A3-33.1	LKD	31.6	271	200	1092	100.0%	Y
A3-33.2	Bed	8.5	72	100	1091	100.0%	Y
A3-33.3	Bed	12.2	102	100	1076	100.0%	Y
A3-33.4	Bed	6.4	48	100	497	100.0%	Y
A3-34.1	LKD	31.6	271	200	837	100.0%	Y
A3-34.2	Bed	8.5	72	100	768	100.0%	Y
A3-34.3	Bed	12.2	102	100	983	100.0%	Y
A3-34.4	Bed	6.4	48	100	494	100.0%	Y
A3-35.1	LKD	23.1	205	200	780	81.5%	Y
A3-35.2	Bed	10.8	88	100	893	100.0%	Y
A3-36.1	LKD	29.3	274	200	826	100.0%	Y
A3-36.2	Bed	9.7	80	100	546	100.0%	Y
A3-36.3	Bed	12.2	98	100	441	100.0%	Y
A3-37.1	LKD	30.0	264	200	511	68.2%	Y
A3-37.2	Bed	12.1	98	100	422	100.0%	Y
A3-37.3	Bed	11.8	108	100	815	100.0%	Y

Block A - Minimum illuminance levels from 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
A3-38.1	LKD	23.0	189	200	803	81.5%	Y
A3-38.2	Bed	9.8	81	100	986	100.0%	Y
A3-39.1	LKD	23.0	189	200	805	82.0%	Y
A3-39.2	Bed	9.8	81	100	910	100.0%	Y
A3-40.1	LKD	29.3	274	200	697	78.5%	Y
A3-40.2	Bed	9.7	80	100	971	100.0%	Y
A3-40.3	Bed	12.2	98	100	748	100.0%	Y
A3-41.1	LKD	29.3	274	200	660	74.8%	Y
A3-41.2	Bed	9.7	80	100	628	100.0%	Y
A3-41.3	Bed	12.2	98	100	694	100.0%	Y
A4-42.1	LKD	31.6	271	200	1110	100.0%	Y
A4-42.2	Bed	8.5	72	100	1097	100.0%	Y
A4-42.3	Bed	12.2	102	100	1015	100.0%	Y
A4-42.4	Bed	6.4	48	100	497	100.0%	Y
A4-43.1	LKD	23.1	205	200	823	86.8%	Y
A4-43.2	Bed	10.8	88	100	961	100.0%	Y
A4-44.1	LKD	29.3	274	200	858	100.0%	Y
A4-44.2	Bed	9.7	80	100	554	100.0%	Y
A4-44.3	Bed	12.2	98	100	450	100.0%	Y
A4-45.1	LKD	30.0	264	200	525	69.7%	Y
A4-45.2	Bed	12.1	98	100	429	100.0%	Y
A4-45.3	Bed	11.8	108	100	844	100.0%	Y
A4-46.1	LKD	23.0	189	200	1138	100.0%	Y
A4-46.2	Bed	9.8	81	100	883	100.0%	Y
A5-47.1	LKD	23.1	205	200	1169	98.5%	Y
A5-47.2	Bed	10.8	88	100	1122	100.0%	Y
A5-48.1	LKD	29.3	274	200	1050	100.0%	Y
A5-48.2	Bed	9.7	80	100	564	100.0%	Y
A5-48.3	Bed	12.2	98	100	454	100.0%	Y
A5-49.1	LKD	30.0	264	200	699	77.7%	Y
A5-49.2	Bed	12.1	98	100	495	100.0%	Y
A5-49.3	Bed	11.8	108	100	860	100.0%	Y
A5-50.1	LKD	23.0	189	200	1354	100.0%	Y
A5-50.3	Bed	9.8	81	100	962	100.0%	Y

Table 14: Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Ground Floor

First Floor

Second Floor

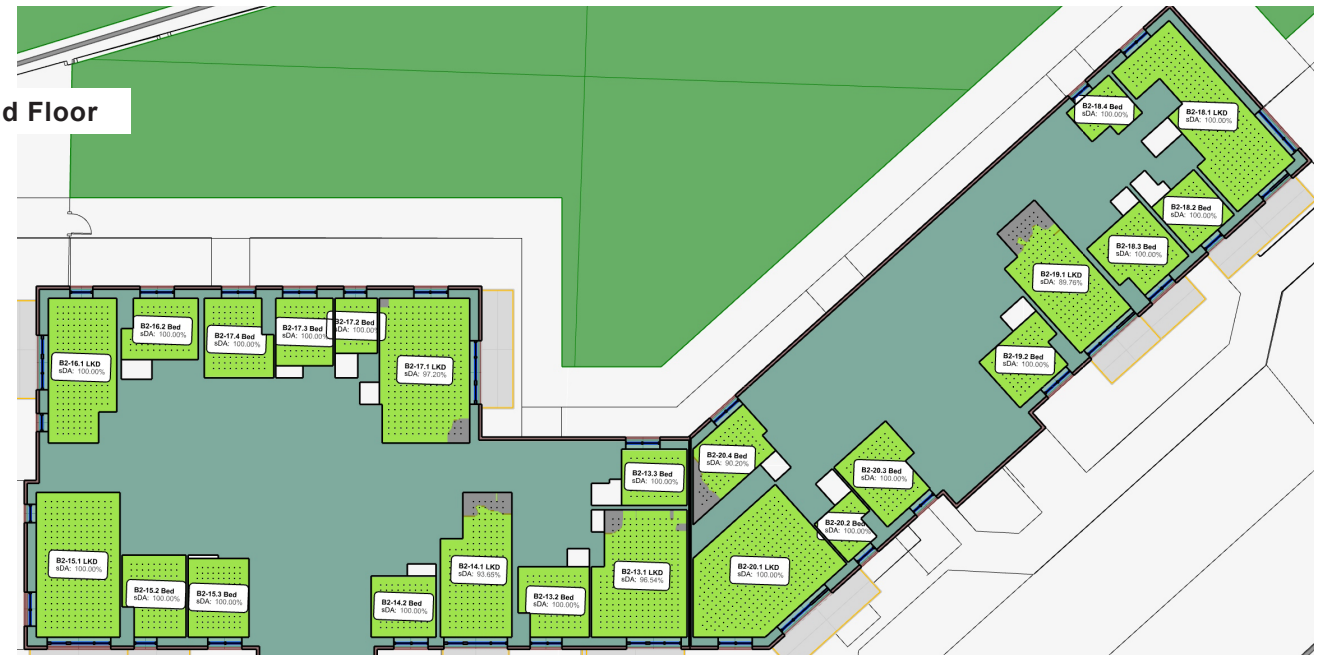
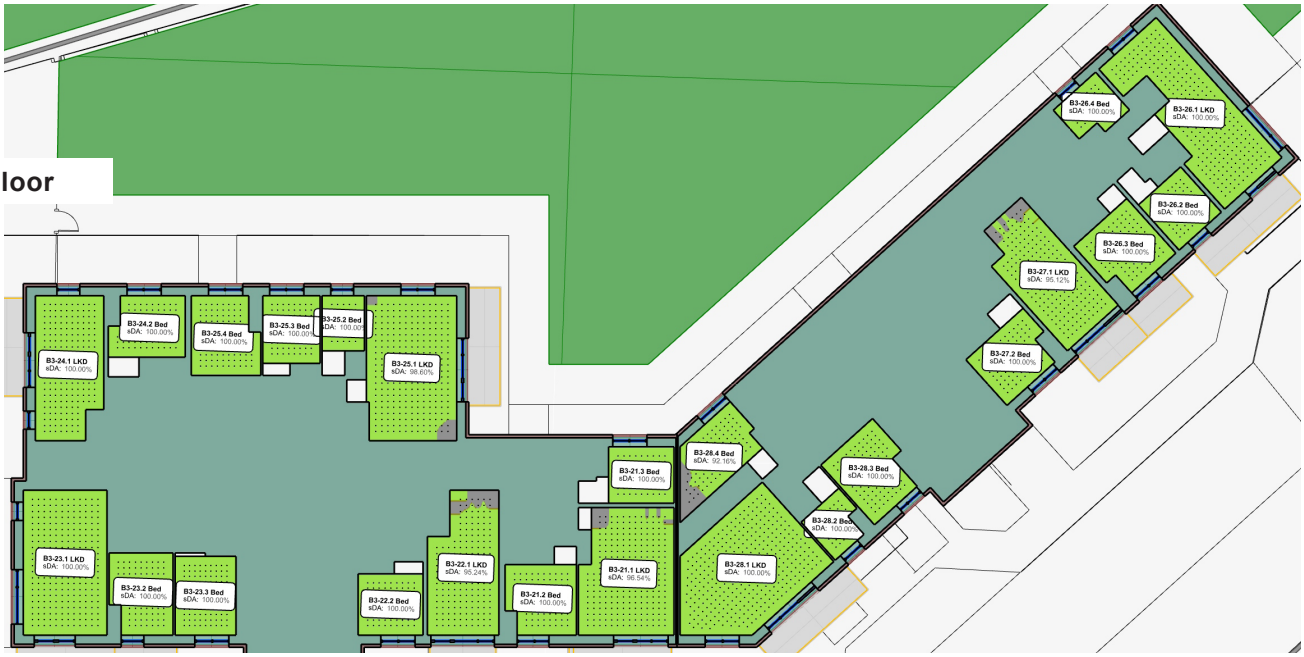


Figure 27: Block B - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Third Floor



Fourth Floor

Fifth Floor

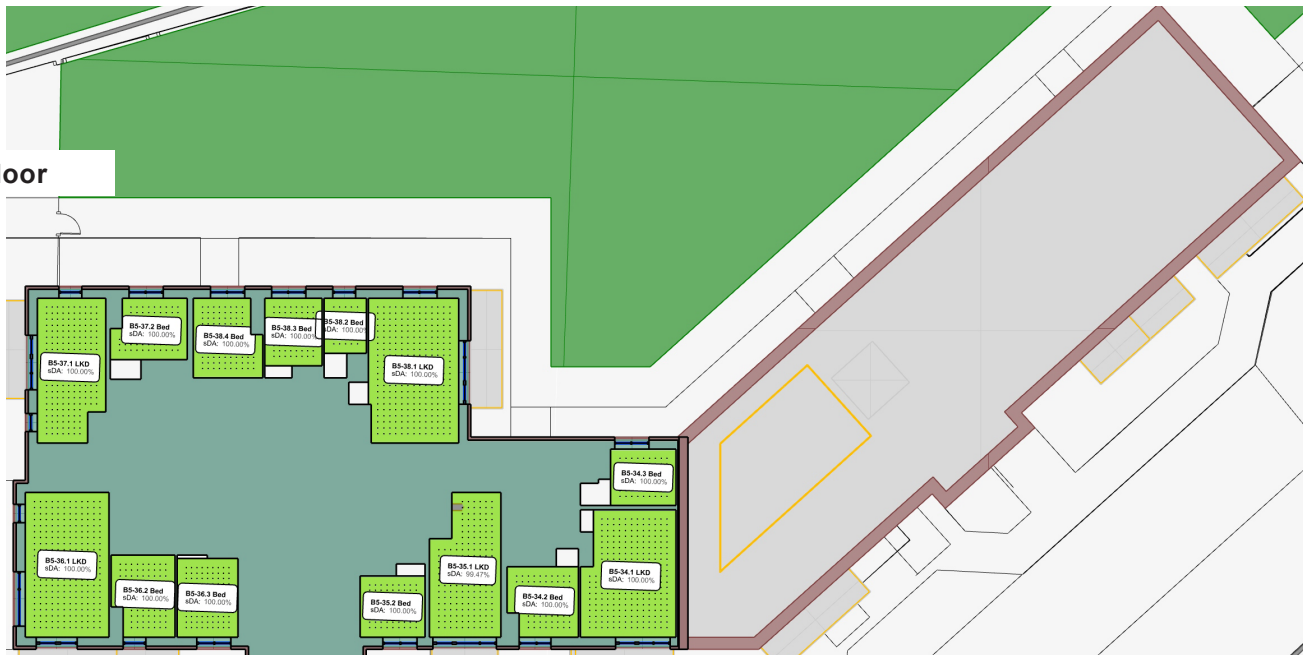


Figure 28: Block B - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block B - Minimum illuminance levels from 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
B0-01.1	LKD	23.1	205	200	1030	89.8%	Y
B0-01.2	Bed	10.8	88	100	1228	100.0%	Y
B0-02.1	LKD	23.1	189	200	1094	88.9%	Y
B0-02.2	Bed	9.8	81	100	1400	100.0%	Y
B0-03.1	LKD	23.0	189	200	1172	88.4%	Y
B0-03.2	Bed	9.8	81	100	1433	100.0%	Y
B0-04.1	LKD	31.6	271	200	939	97.0%	Y
B0-04.2	Bed	8.5	72	100	1112	100.0%	Y
B0-04.3	Bed	12.2	102	100	1023	100.0%	Y
B0-04.4	Bed	7.1	56	100	412	98.2%	Y
B1-05.1	LKD	28.2	260	200	655	90.8%	Y
B1-05.2	Bed	11.7	92	100	1055	100.0%	Y
B1-05.3	Bed	9.1	72	100	470	100.0%	Y
B1-06.1	LKD	23.0	189	200	934	92.1%	Y
B1-06.2	Bed	9.8	81	100	1419	100.0%	Y
B1-07.1	LKD	30.0	264	200	1020	100.0%	Y
B1-07.2	Bed	12.1	98	100	643	100.0%	Y
B1-07.3	Bed	11.8	108	100	1254	100.0%	Y
B1-08.1	LKD	23.1	205	200	679	100.0%	Y
B1-08.2	Bed	10.8	88	100	499	100.0%	Y
B1-09.1	LKD	32.1	286	200	366	92.0%	Y
B1-09.2	Bed	5.8	40	100	468	100.0%	Y
B1-09.3	Bed	9.6	80	100	527	100.0%	Y
B1-09.4	Bed	12.6	108	100	434	100.0%	Y
B1-10.1	LKD	31.6	271	200	977	100.0%	Y
B1-10.2	Bed	8.5	72	100	740	100.0%	Y
B1-10.3	Bed	12.2	102	100	959	100.0%	Y
B1-10.4	Bed	6.4	48	100	515	100.0%	Y
B1-11.1	LKD	23.1	205	200	854	85.9%	Y
B1-11.2	Bed	10.8	88	100	1181	100.0%	Y
B1-12.1	LKD	36.1	345	200	1202	100.0%	Y
B1-12.2	Bed	5.7	41	100	1167	100.0%	Y
B1-12.3	Bed	12.7	107	100	693	100.0%	Y
B1-12.4	Bed	12.6	102	100	305	87.3%	Y
B2-13.1	LKD	28.2	260	200	671	96.5%	Y
B2-13.2	Bed	11.7	92	100	1077	100.0%	Y
B2-13.3	Bed	9.1	72	100	486	100.0%	Y
B2-14.1	LKD	23.0	189	200	952	93.7%	Y
B2-14.2	Bed	9.8	81	100	1431	100.0%	Y
B2-15.1	LKD	30.0	264	200	1152	100.0%	Y
B2-15.2	Bed	12.1	98	100	656	100.0%	Y
B2-15.3	Bed	11.8	108	100	1272	100.0%	Y
B2-16.1	LKD	23.1	205	200	732	100.0%	Y
B2-16.2	Bed	10.8	88	100	507	100.0%	Y
B2-17.1	LKD	32.1	286	200	428	97.2%	Y
B2-17.2	Bed	5.8	40	100	479	100.0%	Y
B2-17.3	Bed	9.6	80	100	540	100.0%	Y
B2-17.4	Bed	12.6	108	100	448	100.0%	Y
B2-18.1	LKD	31.6	271	200	899	100.0%	Y
B2-18.2	Bed	8.5	72	100	753	100.0%	Y
B2-18.3	Bed	12.2	102	100	987	100.0%	Y

Block B - Minimum illuminance levels from 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
B2-18.4	Bed	6.4	48	100	530	100.0%	Y
B2-19.1	LKD	23.1	205	200	879	89.8%	Y
B2-19.2	Bed	10.8	88	100	1223	100.0%	Y
B2-20.1	LKD	36.1	345	200	1235	100.0%	Y
B2-20.2	Bed	5.7	41	100	1181	100.0%	Y
B2-20.3	Bed	12.7	107	100	717	100.0%	Y
B2-20.4	Bed	12.6	102	100	320	90.2%	Y
B3-21.1	LKD	28.2	260	200	670	96.5%	Y
B3-21.2	Bed	11.7	92	100	1074	100.0%	Y
B3-21.3	Bed	9.1	72	100	507	100.0%	Y
B3-22.1	LKD	23.0	189	200	954	95.2%	Y
B3-22.2	Bed	9.8	81	100	1438	100.0%	Y
B3-23.1	LKD	30.0	264	200	1159	100.0%	Y
B3-23.2	Bed	12.1	98	100	662	100.0%	Y
B3-23.3	Bed	11.8	108	100	1273	100.0%	Y
B3-24.1	LKD	23.1	205	200	778	100.0%	Y
B3-24.2	Bed	10.8	88	100	519	100.0%	Y
B3-25.1	LKD	32.1	286	200	499	98.6%	Y
B3-25.2	Bed	5.8	40	100	497	100.0%	Y
B3-25.3	Bed	9.6	80	100	554	100.0%	Y
B3-25.4	Bed	12.6	108	100	461	100.0%	Y
B3-26.1	LKD	31.6	271	200	1018	100.0%	Y
B3-26.2	Bed	8.5	72	100	1021	100.0%	Y
B3-26.3	Bed	12.2	102	100	1029	100.0%	Y
B3-26.4	Bed	6.4	48	100	535	100.0%	Y
B3-27.1	LKD	23.1	205	200	1146	95.1%	Y
B3-27.2	Bed	10.8	88	100	1235	100.0%	Y
B3-28.1	LKD	36.1	345	200	1497	100.0%	Y
B3-28.2	Bed	5.7	41	100	1302	100.0%	Y
B3-28.3	Bed	12.7	107	100	721	100.0%	Y
B3-28.4	Bed	12.6	102	100	334	92.2%	Y
B4-29.1	LKD	28.2	260	200	675	95.8%	Y
B4-29.2	Bed	11.7	92	100	1085	100.0%	Y
B4-29.3	Bed	9.1	72	100	535	100.0%	Y
B4-30.1	LKD	23.0	189	200	961	94.7%	Y
B4-30.2	Bed	9.8	81	100	1449	100.0%	Y
B4-31.1	LKD	30.0	264	200	1234	100.0%	Y
B4-31.2	Bed	12.1	98	100	663	100.0%	Y
B4-31.3	Bed	11.8	108	100	1286	100.0%	Y
B4-32.1	LKD	23.1	205	200	812	100.0%	Y
B4-32.2	Bed	10.8	88	100	526	100.0%	Y
B4-33.1	LKD	32.1	286	200	545	99.3%	Y
B4-33.2	Bed	5.8	40	100	494	100.0%	Y
B4-33.3	Bed	9.6	80	100	564	100.0%	Y
B4-33.4	Bed	12.6	108	100	465	100.0%	Y
B5-34.1	LKD	28.2	260	200	925	100.0%	Y
B5-34.2	Bed	11.7	92	100	1118	100.0%	Y
B5-34.3	Bed	9.1	72	100	553	100.0%	Y
B5-35.1	LKD	23.0	189	200	1290	99.5%	Y
B5-35.2	Bed	9.8	81	100	1488	100.0%	Y
B5-36.1	LKD	30.0	264	200	1418	100.0%	Y

Block B - Minimum illuminance levels from 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
B5-36.2	Bed	12.1	98	100	712	100.0%	Y
B5-36.3	Bed	11.8	108	100	1299	100.0%	Y
B5-37.1	LKD	23.1	205	200	1057	100.0%	Y
B5-37.2	Bed	10.8	88	100	525	100.0%	Y
B5-38.1	LKD	32.1	286	200	771	100.0%	Y
B5-38.2	Bed	5.8	40	100	507	100.0%	Y
B5-38.3	Bed	9.6	80	100	568	100.0%	Y
B5-38.4	Bed	12.6	108	100	473	100.0%	Y

Table 15: Block B - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Ground Floor

First Floor

Second Floor

Figure 29: Block C - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Third Floor

Fourth Floor

Figure 30: Block C - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block C - Minimum illuminance levels from 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
C0-01.1	LKD	28.2	260	200	640	84.2%	Y
C0-01.2	Bed	11.7	92	100	914	100.0%	Y
C0-01.3	Bed	9.1	72	100	387	100.0%	Y
C0-02.1	LKD	23.0	189	200	1584	100.0%	Y
C0-02.2	Bed	9.8	81	100	1307	100.0%	Y
C0-03.1	LKD	23.1	205	200	901	83.4%	Y
C0-03.2	Bed	10.8	88	100	1277	100.0%	Y
C1-04.1	LKD	28.2	260	200	637	89.6%	Y
C1-04.2	Bed	11.7	92	100	986	100.0%	Y
C1-04.3	Bed	9.1	72	100	443	100.0%	Y
C1-05.1	LKD	23.0	189	200	1563	100.0%	Y
C1-05.2	Bed	9.8	81	100	1356	100.0%	Y
C1-06.1	LKD	23.1	205	200	831	86.8%	Y
C1-06.2	Bed	10.8	88	100	1315	100.0%	Y
C1-07.1	LKD	29.3	274	200	952	100.0%	Y
C1-07.2	Bed	9.7	80	100	1377	100.0%	Y
C1-07.3	Bed	12.2	98	100	1113	100.0%	Y
C2-08.1	LKD	28.2	260	200	662	93.5%	Y
C2-08.2	Bed	11.7	92	100	1009	100.0%	Y
C2-08.3	Bed	9.1	72	100	478	100.0%	Y
C2-09.1	LKD	23.0	189	200	1572	100.0%	Y
C2-09.2	Bed	9.8	81	100	1380	100.0%	Y
C2-10.1	LKD	23.1	205	200	840	87.8%	Y
C2-10.2	Bed	10.8	88	100	1319	100.0%	Y
C2-11.1	LKD	29.3	274	200	958	100.0%	Y
C2-11.2	Bed	9.7	80	100	1393	100.0%	Y
C2-11.3	Bed	12.2	98	100	1116	100.0%	Y
C3-12.1	LKD	28.2	260	200	846	96.9%	Y
C3-12.2	Bed	11.7	92	100	1019	100.0%	Y
C3-12.3	Bed	9.1	72	100	511	100.0%	Y
C3-13.1	LKD	23.0	189	200	1586	100.0%	Y
C3-13.2	Bed	9.8	81	100	1384	100.0%	Y
C3-14.1	LKD	23.1	205	200	850	89.3%	Y
C3-14.2	Bed	10.8	88	100	1333	100.0%	Y
C3-15.1	LKD	29.3	274	200	968	100.0%	Y
C3-15.2	Bed	9.7	80	100	1398	100.0%	Y
C3-15.3	Bed	12.2	98	100	1124	100.0%	Y
C4-17.1	LKD	23.0	189	200	1900	100.0%	Y
C4-17.2	Bed	9.8	81	100	1395	100.0%	Y
C4-18.1	LKD	23.1	205	200	1144	95.1%	Y
C4-18.2	Bed	10.8	88	100	1355	100.0%	Y
C4-19.1	LKD	29.3	274	200	1279	100.0%	Y
C4-19.2	Bed	9.7	80	100	1439	100.0%	Y
C4-19.3	Bed	12.2	98	100	1134	100.0%	Y

Table 16: Block C - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Appendix B - Model with trees - BS EN17037:2021+A1

Minimum room specific Daylight Provision to UK National Annex Table NA.1.

Ground Floor

First Floor

Figure 31: Block A - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

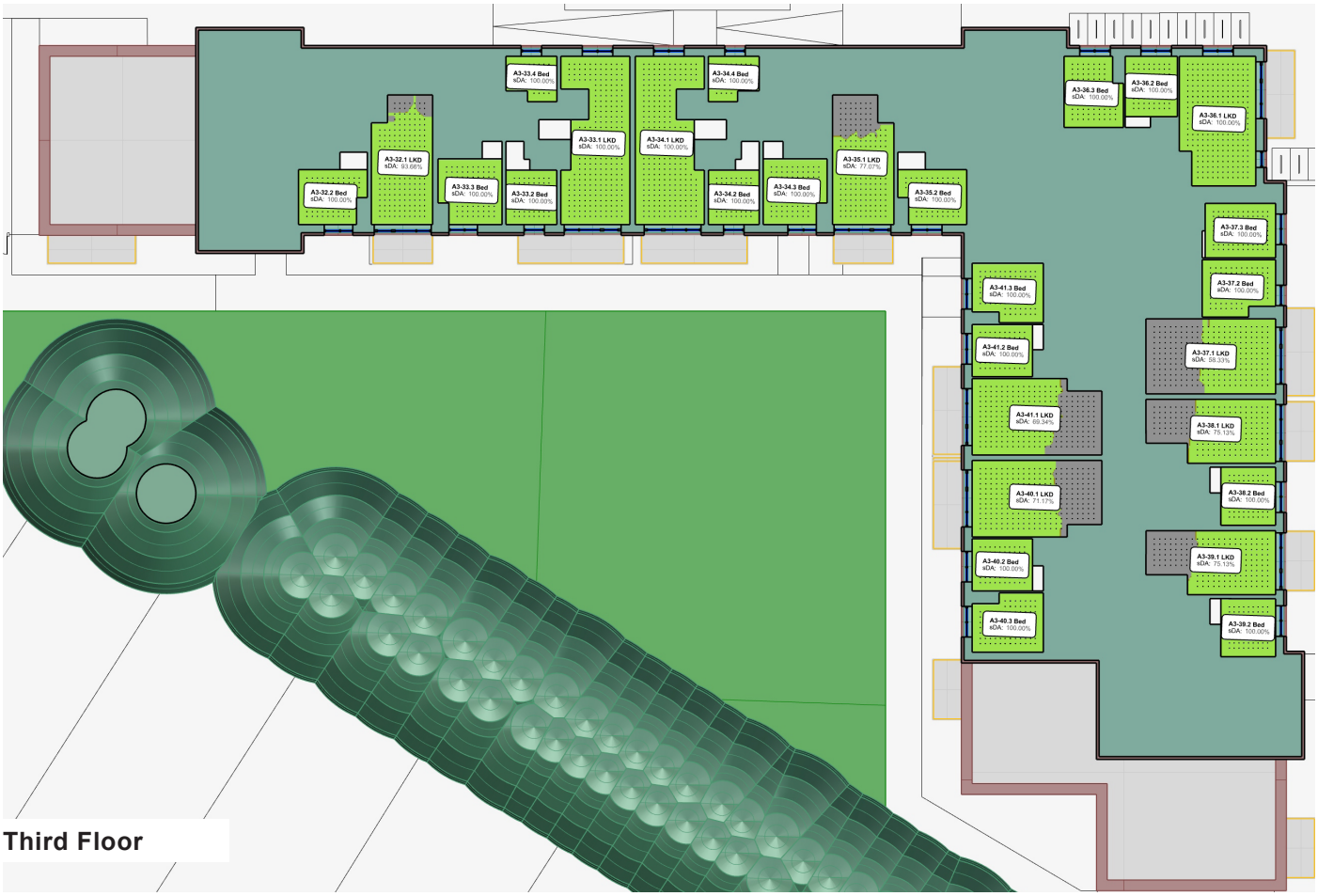
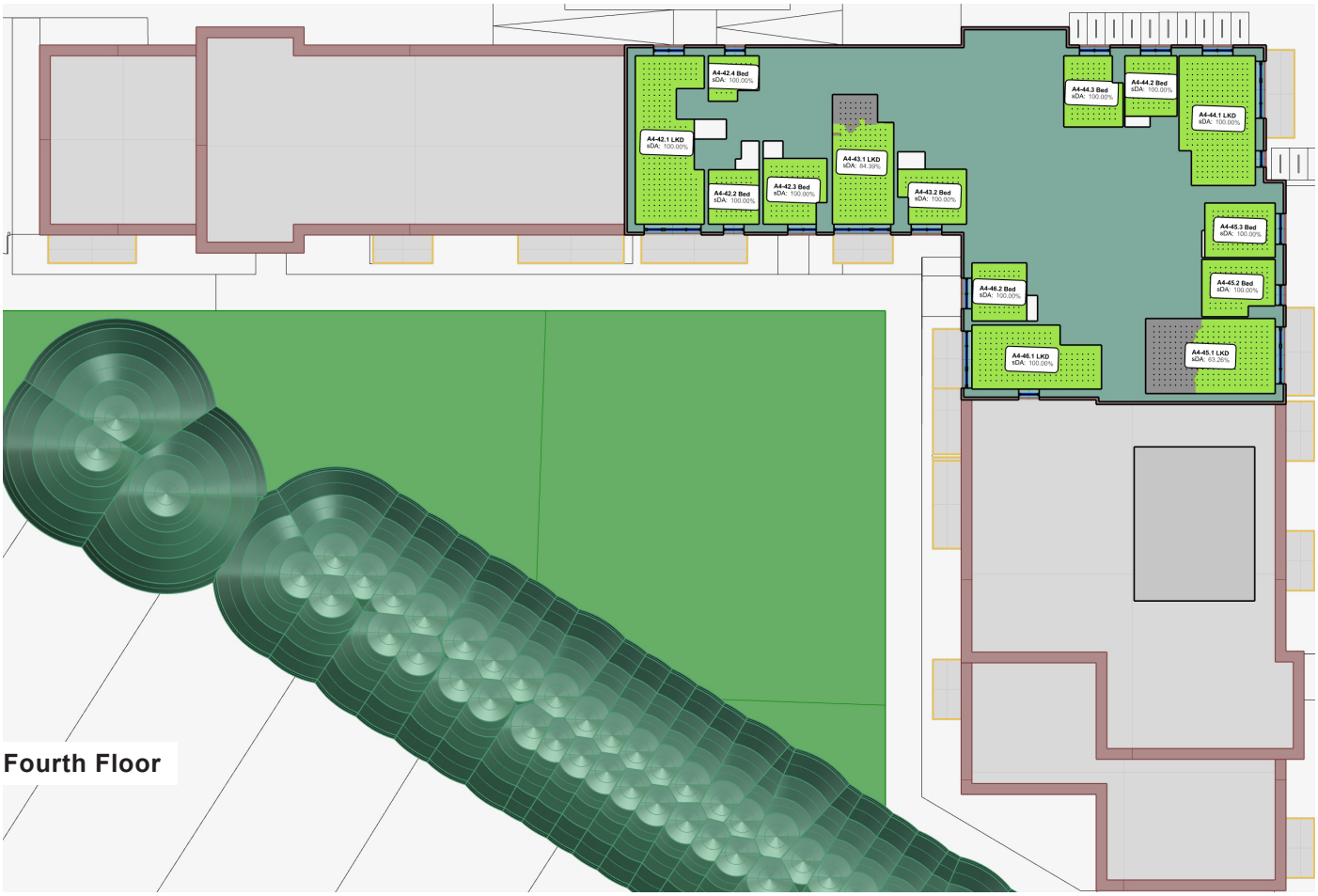


Figure 32: Block A - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1



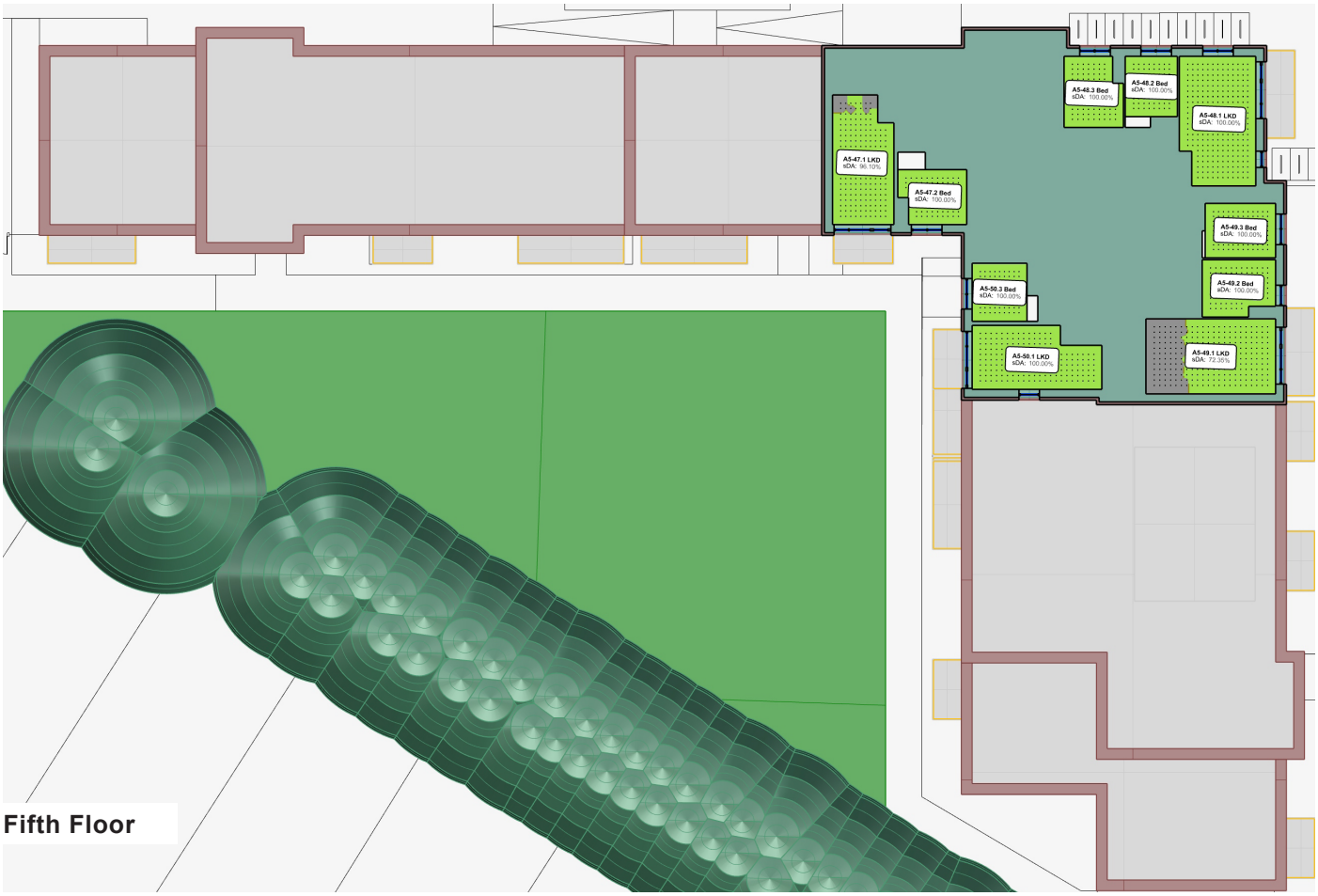


Figure 33: Block A - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

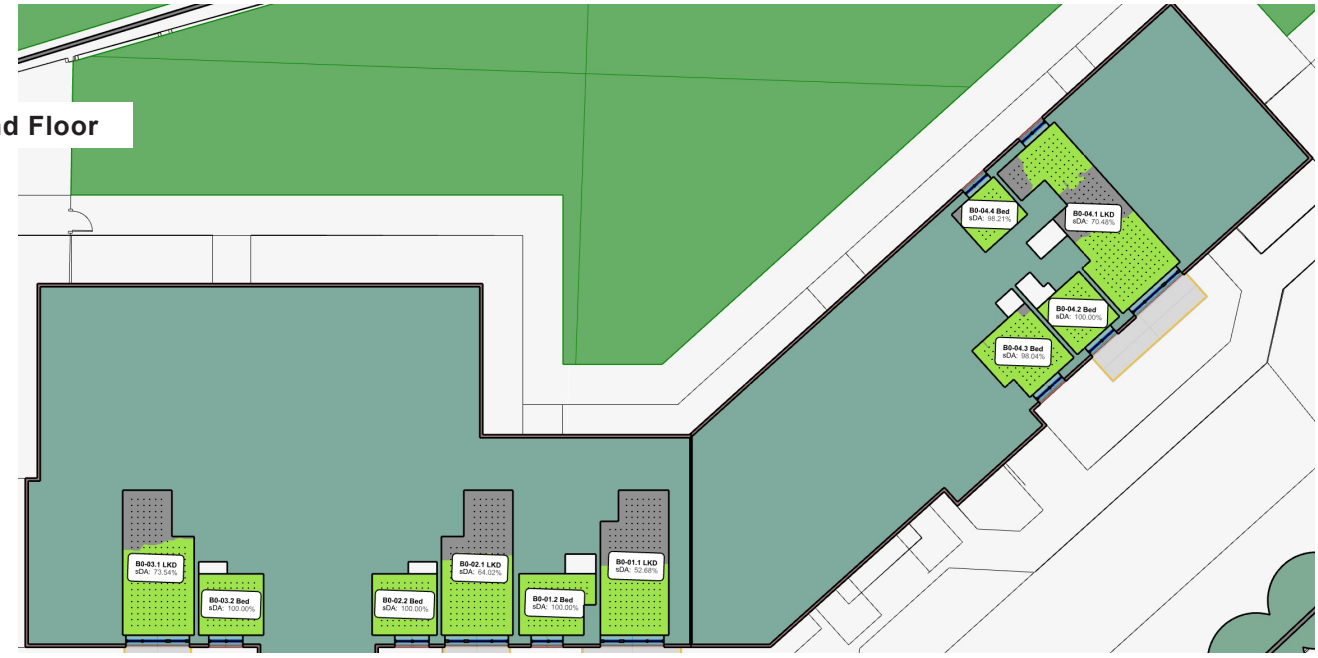
Block A - Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded: Minimum 50% of grid	Meets Criteria
A0-01.1	LKD	28.2	260	200	605	71.2%	Y
A0-01.2	Bed	11.7	92	100	318	80.4%	Y
A0-01.3	Bed	9.1	72	100	505	100.0%	Y
A0-02.1	LKD	23.1	205	200	536	47.8%	N
A0-02.2	Bed	10.8	88	100	670	100.0%	Y
A0-03.1	LKD	31.6	271	200	579	64.6%	Y
A0-03.2	Bed	8.5	72	100	571	100.0%	Y
A0-03.3	Bed	12.2	102	100	592	100.0%	Y
A0-03.4	Bed	6.4	48	100	394	100.0%	Y
A0-04.1	LKD	29.3	274	200	360	38.3%	N
A0-04.2	Bed	9.7	80	100	631	100.0%	Y
A0-04.3	Bed	12.2	98	100	431	88.8%	Y
A0-05.1	LKD	23.0	189	200	279	35.4%	N
A0-05.2	Bed	9.8	81	100	292	86.4%	Y
A1-06.1	LKD	28.2	260	200	659	78.5%	Y
A1-06.2	Bed	11.7	92	100	522	98.9%	Y
A1-06.3	Bed	9.1	72	100	561	100.0%	Y
A1-07.1	LKD	23.1	205	200	621	60.0%	Y
A1-07.2	Bed	10.8	88	100	899	100.0%	Y
A1-08.1	LKD	31.6	271	200	636	79.7%	Y
A1-08.2	Bed	8.5	72	100	597	100.0%	Y
A1-08.3	Bed	12.2	102	100	782	100.0%	Y
A1-08.4	Bed	6.4	48	100	439	100.0%	Y
A1-09.1	LKD	31.6	271	200	641	77.9%	Y
A1-09.2	Bed	8.5	72	100	625	100.0%	Y
A1-09.3	Bed	12.2	102	100	781	100.0%	Y
A1-09.4	Bed	6.4	48	100	420	100.0%	Y
A1-10.1	LKD	23.1	205	200	588	59.0%	Y
A1-10.2	Bed	10.8	88	100	740	100.0%	Y
A1-11.1	LKD	29.3	274	200	694	97.8%	Y
A1-11.2	Bed	9.7	80	100	466	100.0%	Y
A1-11.3	Bed	12.2	98	100	365	100.0%	Y
A1-12.1	LKD	30.0	264	200	399	51.9%	Y
A1-12.2	Bed	12.1	98	100	364	98.0%	Y
A1-12.3	Bed	11.8	108	100	713	100.0%	Y
A1-13.1	LKD	23.0	189	200	514	63.5%	Y
A1-13.2	Bed	9.8	81	100	821	100.0%	Y
A1-14.1	LKD	23.0	189	200	500	61.9%	Y
A1-14.2	Bed	9.8	81	100	756	100.0%	Y
A1-15.1	LKD	23.0	189	200	736	81.0%	Y
A1-15.2	Bed	9.8	81	100	725	100.0%	Y
A1-16.1	LKD	23.0	189	200	353	44.4%	N
A1-16.2	Bed	9.8	81	100	531	100.0%	Y
A1-17.1	LKD	29.3	274	200	367	47.4%	N
A1-17.2	Bed	9.7	80	100	744	100.0%	Y
A1-17.3	Bed	12.2	98	100	542	100.0%	Y
A1-18.1	LKD	29.3	274	200	367	46.0%	N
A1-18.2	Bed	9.7	80	100	657	100.0%	Y
A1-18.3	Bed	12.2	98	100	611	100.0%	Y
A2-19.1	LKD	28.2	260	200	1096	97.7%	Y
A2-19.2	Bed	11.7	92	100	783	100.0%	Y

Block A - Minimum illuminance levels from 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
A2-19.3	Bed	9.1	72	100	588	100.0%	Y
A2-20.1	LKD	23.1	205	200	803	76.1%	Y
A2-20.2	Bed	10.8	88	100	1057	100.0%	Y
A2-21.1	LKD	31.6	271	200	740	98.2%	Y
A2-21.2	Bed	8.5	72	100	698	100.0%	Y
A2-21.3	Bed	12.2	102	100	911	100.0%	Y
A2-21.4	Bed	6.4	48	100	469	100.0%	Y
A2-22.1	LKD	31.6	271	200	728	96.7%	Y
A2-22.2	Bed	8.5	72	100	703	100.0%	Y
A2-22.3	Bed	12.2	102	100	871	100.0%	Y
A2-22.4	Bed	6.4	48	100	448	100.0%	Y
A2-23.1	LKD	23.1	205	200	666	64.9%	Y
A2-23.2	Bed	10.8	88	100	797	100.0%	Y
A2-24.1	LKD	29.3	274	200	743	99.3%	Y
A2-24.2	Bed	9.7	80	100	499	100.0%	Y
A2-24.3	Bed	12.2	98	100	394	100.0%	Y
A2-25.1	LKD	30.0	264	200	429	55.3%	Y
A2-25.2	Bed	12.1	98	100	384	100.0%	Y
A2-25.3	Bed	11.8	108	100	750	100.0%	Y
A2-26.1	LKD	23.0	189	200	556	68.8%	Y
A2-26.2	Bed	9.8	81	100	865	100.0%	Y
A2-27.1	LKD	23.0	189	200	546	65.6%	Y
A2-27.2	Bed	9.8	81	100	805	100.0%	Y
A2-28.1	LKD	23.0	189	200	1091	88.9%	Y
A2-28.2	Bed	9.8	81	100	857	100.0%	Y
A2-29.1	LKD	23.0	189	200	680	68.8%	Y
A2-29.2	Bed	9.8	81	100	759	100.0%	Y
A2-30.1	LKD	29.3	274	200	424	55.8%	Y
A2-30.2	Bed	9.7	80	100	833	100.0%	Y
A2-30.3	Bed	12.2	98	100	634	100.0%	Y
A2-31.1	LKD	29.3	274	200	414	53.6%	Y
A2-31.2	Bed	9.7	80	100	706	100.0%	Y
A2-31.3	Bed	12.2	98	100	645	100.0%	Y
A3-32.1	LKD	23.1	205	200	1167	93.7%	Y
A3-32.2	Bed	10.8	88	100	1155	100.0%	Y
A3-33.1	LKD	31.6	271	200	1059	100.0%	Y
A3-33.2	Bed	8.5	72	100	1051	100.0%	Y
A3-33.3	Bed	12.2	102	100	1007	100.0%	Y
A3-33.4	Bed	6.4	48	100	492	100.0%	Y
A3-34.1	LKD	31.6	271	200	801	100.0%	Y
A3-34.2	Bed	8.5	72	100	741	100.0%	Y
A3-34.3	Bed	12.2	102	100	938	100.0%	Y
A3-34.4	Bed	6.4	48	100	472	100.0%	Y
A3-35.1	LKD	23.1	205	200	744	77.1%	Y
A3-35.2	Bed	10.8	88	100	846	100.0%	Y
A3-36.1	LKD	29.3	274	200	792	100.0%	Y
A3-36.2	Bed	9.7	80	100	524	100.0%	Y
A3-36.3	Bed	12.2	98	100	419	100.0%	Y
A3-37.1	LKD	30.0	264	200	472	58.3%	Y
A3-37.2	Bed	12.1	98	100	401	100.0%	Y
A3-37.3	Bed	11.8	108	100	786	100.0%	Y

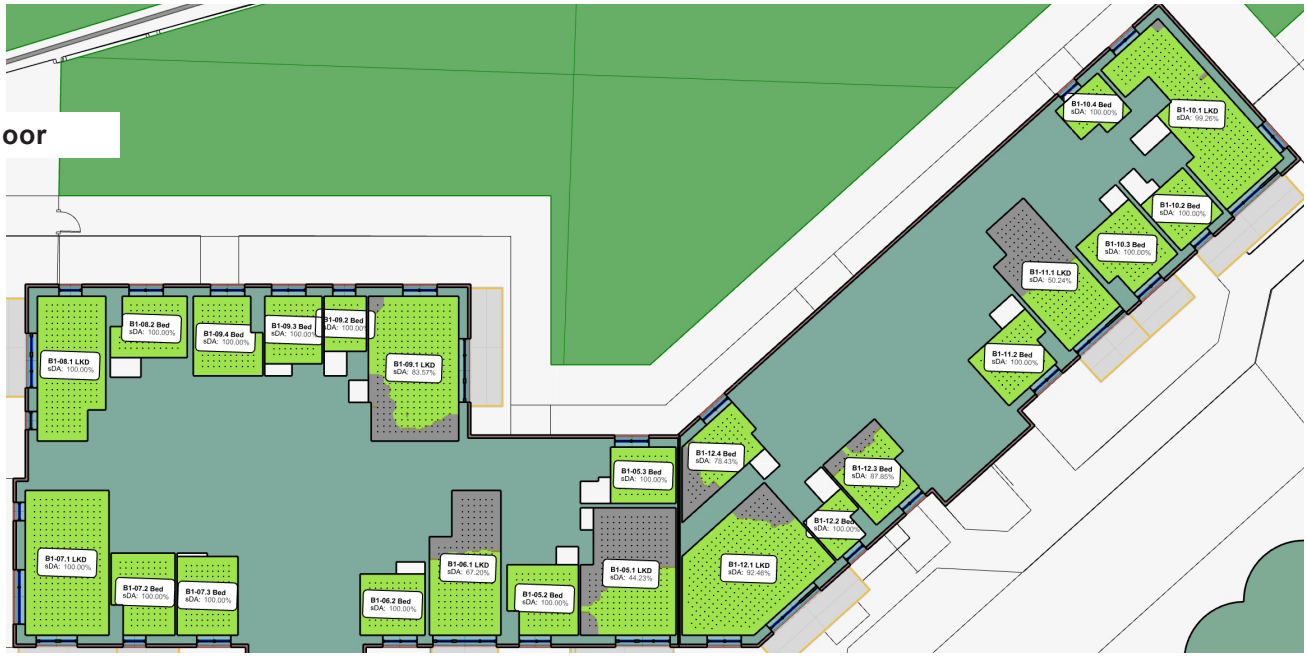
Block A - Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded: Minimum 50% of grid	Meets Criteria
A3-38.1	LKD	23.0	189	200	755	75.1%	Y
A3-38.2	Bed	9.8	81	100	929	100.0%	Y
A3-39.1	LKD	23.0	189	200	743	75.1%	Y
A3-39.2	Bed	9.8	81	100	840	100.0%	Y
A3-40.1	LKD	29.3	274	200	659	71.2%	Y
A3-40.2	Bed	9.7	80	100	902	100.0%	Y
A3-40.3	Bed	12.2	98	100	675	100.0%	Y
A3-41.1	LKD	29.3	274	200	635	69.3%	Y
A3-41.2	Bed	9.7	80	100	595	100.0%	Y
A3-41.3	Bed	12.2	98	100	664	100.0%	Y
A4-42.1	LKD	31.6	271	200	1082	100.0%	Y
A4-42.2	Bed	8.5	72	100	1076	100.0%	Y
A4-42.3	Bed	12.2	102	100	976	100.0%	Y
A4-42.4	Bed	6.4	48	100	498	100.0%	Y
A4-43.1	LKD	23.1	205	200	797	84.4%	Y
A4-43.2	Bed	10.8	88	100	929	100.0%	Y
A4-44.1	LKD	29.3	274	200	836	100.0%	Y
A4-44.2	Bed	9.7	80	100	555	100.0%	Y
A4-44.3	Bed	12.2	98	100	441	100.0%	Y
A4-45.1	LKD	30.0	264	200	499	63.3%	Y
A4-45.2	Bed	12.1	98	100	409	100.0%	Y
A4-45.3	Bed	11.8	108	100	807	100.0%	Y
A4-46.1	LKD	23.0	189	200	1113	100.0%	Y
A4-46.2	Bed	9.8	81	100	846	100.0%	Y
A5-47.1	LKD	23.1	205	200	1149	96.1%	Y
A5-47.2	Bed	10.8	88	100	1091	100.0%	Y
A5-48.1	LKD	29.3	274	200	1043	100.0%	Y
A5-48.2	Bed	9.7	80	100	571	100.0%	Y
A5-48.3	Bed	12.2	98	100	463	100.0%	Y
A5-49.1	LKD	30.0	264	200	674	72.3%	Y
A5-49.2	Bed	12.1	98	100	482	100.0%	Y
A5-49.3	Bed	11.8	108	100	827	100.0%	Y
A5-50.1	LKD	23.0	189	200	1322	100.0%	Y
A5-50.3	Bed	9.8	81	100	929	100.0%	Y

Table 17: Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Ground Floor



First Floor



Second Floor

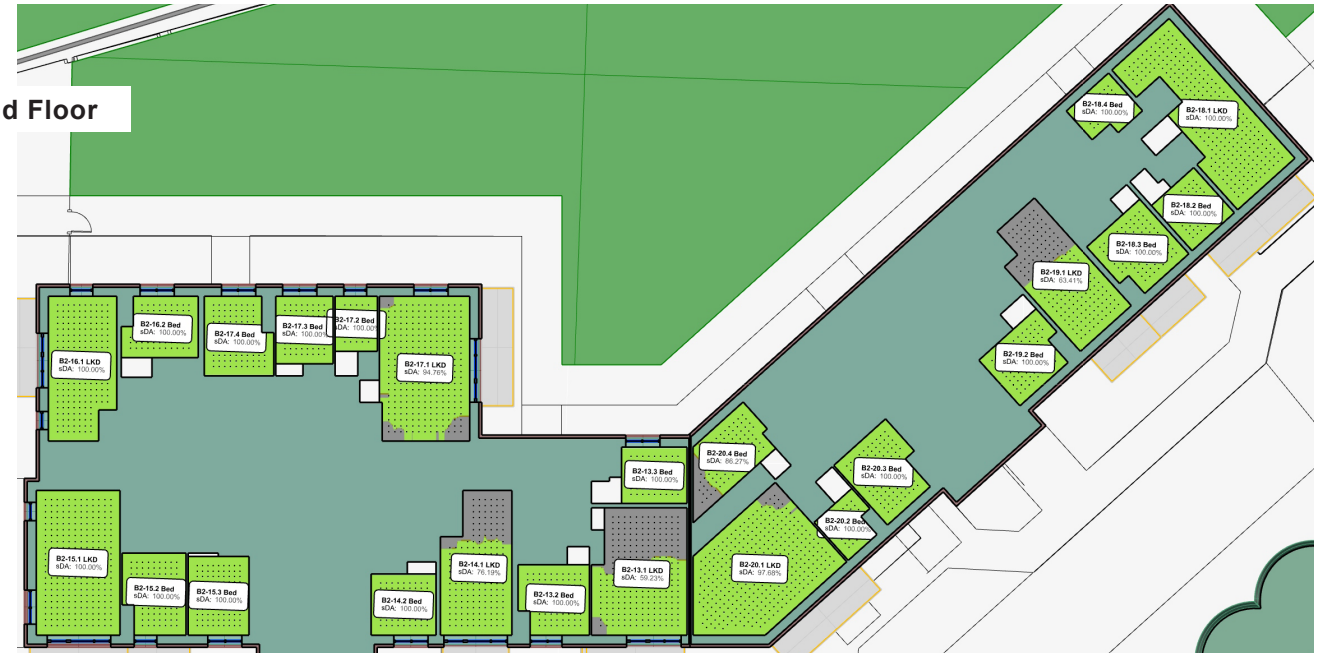
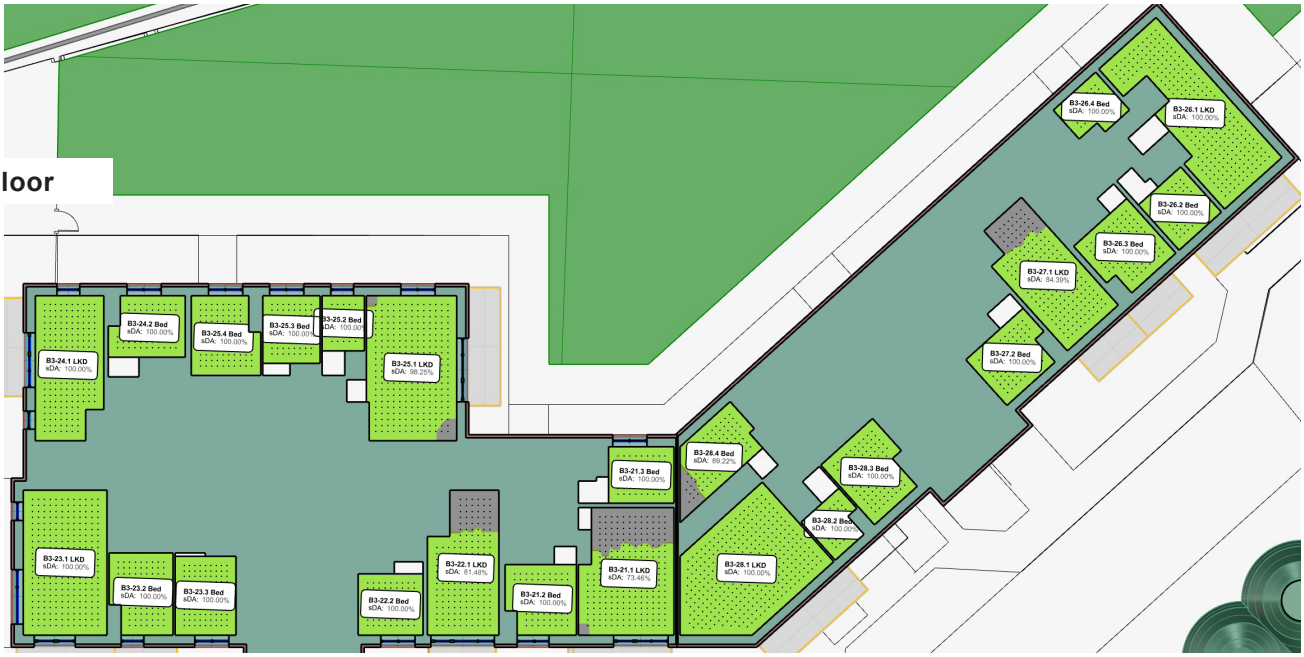


Figure 34: Block B - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Third Floor



Fourth Floor

Fifth Floor

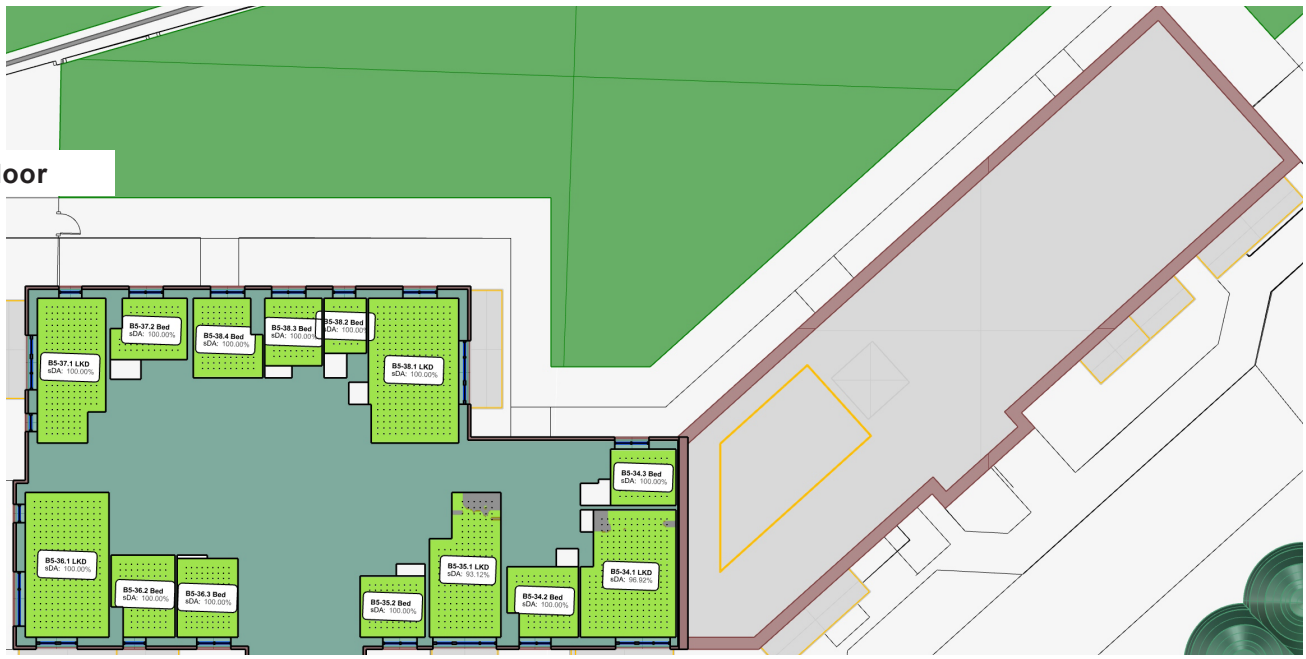


Figure 35: Block B - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block B - Minimum illuminance levels from 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
B0-01.1	LKD	23.1	205	200	561	52.7%	Y
B0-01.2	Bed	10.8	88	100	822	100.0%	Y
B0-02.1	LKD	23.1	189	200	707	64.0%	Y
B0-02.2	Bed	9.8	81	100	1003	100.0%	Y
B0-03.1	LKD	23.0	189	200	944	73.5%	Y
B0-03.2	Bed	9.8	81	100	1179	100.0%	Y
B0-04.1	LKD	31.6	271	200	600	70.5%	Y
B0-04.2	Bed	8.5	72	100	513	100.0%	Y
B0-04.3	Bed	12.2	102	100	525	98.0%	Y
B0-04.4	Bed	7.1	56	100	354	98.2%	Y
B1-05.2	Bed	11.7	92	100	801	100.0%	Y
B1-05.3	Bed	9.1	72	100	440	100.0%	Y
B1-06.1	LKD	23.0	189	200	654	67.2%	Y
B1-06.2	Bed	9.8	81	100	1143	100.0%	Y
B1-07.1	LKD	30.0	264	200	951	100.0%	Y
B1-07.2	Bed	12.1	98	100	564	100.0%	Y
B1-07.3	Bed	11.8	108	100	1084	100.0%	Y
B1-08.1	LKD	23.1	205	200	630	100.0%	Y
B1-08.2	Bed	10.8	88	100	427	100.0%	Y
B1-09.1	LKD	32.1	286	200	342	83.6%	Y
B1-09.2	Bed	5.8	40	100	426	100.0%	Y
B1-09.3	Bed	9.6	80	100	472	100.0%	Y
B1-09.4	Bed	12.6	108	100	386	100.0%	Y
B1-10.1	LKD	31.6	271	200	819	99.3%	Y
B1-10.2	Bed	8.5	72	100	556	100.0%	Y
B1-10.3	Bed	12.2	102	100	682	100.0%	Y
B1-10.4	Bed	6.4	48	100	461	100.0%	Y
B1-11.1	LKD	23.1	205	200	538	50.2%	Y
B1-11.2	Bed	10.8	88	100	840	100.0%	Y
B1-12.1	LKD	36.1	345	200	700	92.5%	Y
B1-12.2	Bed	5.7	41	100	863	100.0%	Y
B1-12.3	Bed	12.7	107	100	467	87.9%	Y
B1-12.4	Bed	12.6	102	100	284	78.4%	Y
B2-13.1	LKD	28.2	260	200	490	59.2%	Y
B2-13.2	Bed	11.7	92	100	911	100.0%	Y
B2-13.3	Bed	9.1	72	100	473	100.0%	Y
B2-14.1	LKD	23.0	189	200	770	76.2%	Y
B2-14.2	Bed	9.8	81	100	1258	100.0%	Y
B2-15.1	LKD	30.0	264	200	1059	100.0%	Y
B2-15.2	Bed	12.1	98	100	600	100.0%	Y
B2-15.3	Bed	11.8	108	100	1151	100.0%	Y
B2-16.1	LKD	23.1	205	200	684	100.0%	Y
B2-16.2	Bed	10.8	88	100	459	100.0%	Y
B2-17.1	LKD	32.1	286	200	414	94.8%	Y
B2-17.2	Bed	5.8	40	100	459	100.0%	Y
B2-17.3	Bed	9.6	80	100	508	100.0%	Y
B2-17.4	Bed	12.6	108	100	410	100.0%	Y
B2-18.1	LKD	31.6	271	200	844	100.0%	Y
B2-18.2	Bed	8.5	72	100	665	100.0%	Y
B2-18.3	Bed	12.2	102	100	841	100.0%	Y
B2-18.4	Bed	6.4	48	100	489	100.0%	Y

Block B - Minimum illuminance levels from 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
B2-19.1	LKD	23.1	205	200	713	63.4%	Y
B2-19.2	Bed	10.8	88	100	1033	100.0%	Y
B2-20.1	LKD	36.1	345	200	916	97.7%	Y
B2-20.2	Bed	5.7	41	100	1030	100.0%	Y
B2-20.3	Bed	12.7	107	100	583	100.0%	Y
B2-20.4	Bed	12.6	102	100	306	86.3%	Y
B3-21.1	LKD	28.2	260	200	588	73.5%	Y
B3-21.2	Bed	11.7	92	100	973	100.0%	Y
B3-21.3	Bed	9.1	72	100	500	100.0%	Y
B3-22.1	LKD	23.0	189	200	856	81.5%	Y
B3-22.2	Bed	9.8	81	100	1336	100.0%	Y
B3-23.1	LKD	30.0	264	200	1126	100.0%	Y
B3-23.2	Bed	12.1	98	100	615	100.0%	Y
B3-23.3	Bed	11.8	108	100	1192	100.0%	Y
B3-24.1	LKD	23.1	205	200	749	100.0%	Y
B3-24.2	Bed	10.8	88	100	484	100.0%	Y
B3-25.1	LKD	32.1	286	200	489	98.3%	Y
B3-25.2	Bed	5.8	40	100	474	100.0%	Y
B3-25.3	Bed	9.6	80	100	526	100.0%	Y
B3-25.4	Bed	12.6	108	100	434	100.0%	Y
B3-26.1	LKD	31.6	271	200	976	100.0%	Y
B3-26.2	Bed	8.5	72	100	989	100.0%	Y
B3-26.3	Bed	12.2	102	100	950	100.0%	Y
B3-26.4	Bed	6.4	48	100	512	100.0%	Y
B3-27.1	LKD	23.1	205	200	1077	84.4%	Y
B3-27.2	Bed	10.8	88	100	1138	100.0%	Y
B3-28.1	LKD	36.1	345	200	1345	100.0%	Y
B3-28.2	Bed	5.7	41	100	1221	100.0%	Y
B3-28.3	Bed	12.7	107	100	659	100.0%	Y
B3-28.4	Bed	12.6	102	100	329	89.2%	Y
B4-29.1	LKD	28.2	260	200	631	81.9%	Y
B4-29.2	Bed	11.7	92	100	1008	100.0%	Y
B4-29.3	Bed	9.1	72	100	532	100.0%	Y
B4-30.1	LKD	23.0	189	200	898	85.2%	Y
B4-30.2	Bed	9.8	81	100	1367	100.0%	Y
B4-31.1	LKD	30.0	264	200	1200	100.0%	Y
B4-31.2	Bed	12.1	98	100	632	100.0%	Y
B4-31.3	Bed	11.8	108	100	1231	100.0%	Y
B4-32.1	LKD	23.1	205	200	797	100.0%	Y
B4-32.2	Bed	10.8	88	100	504	100.0%	Y
B4-33.1	LKD	32.1	286	200	540	99.3%	Y
B4-33.2	Bed	5.8	40	100	486	100.0%	Y
B4-33.3	Bed	9.6	80	100	548	100.0%	Y
B4-33.4	Bed	12.6	108	100	451	100.0%	Y
B5-34.1	LKD	28.2	260	200	895	96.9%	Y
B5-34.2	Bed	11.7	92	100	1062	100.0%	Y
B5-34.3	Bed	9.1	72	100	555	100.0%	Y
B5-35.1	LKD	23.0	189	200	1251	93.1%	Y
B5-35.2	Bed	9.8	81	100	1445	100.0%	Y
B5-36.1	LKD	30.0	264	200	1402	100.0%	Y
B5-36.2	Bed	12.1	98	100	693	100.0%	Y

Block B - Minimum illuminance levels from 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
B5-36.3	Bed	11.8	108	100	1234	100.0%	Y
B5-37.1	LKD	23.1	205	200	1050	100.0%	Y
B5-37.2	Bed	10.8	88	100	523	100.0%	Y
B5-38.1	LKD	32.1	286	200	778	100.0%	Y
B5-38.2	Bed	5.8	40	100	501	100.0%	Y
B5-38.3	Bed	9.6	80	100	569	100.0%	Y
B5-38.4	Bed	12.6	108	100	468	100.0%	Y

Table 18: Block B - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Ground Floor

First Floor

Second Floor

Figure 36: Block C - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Third Floor

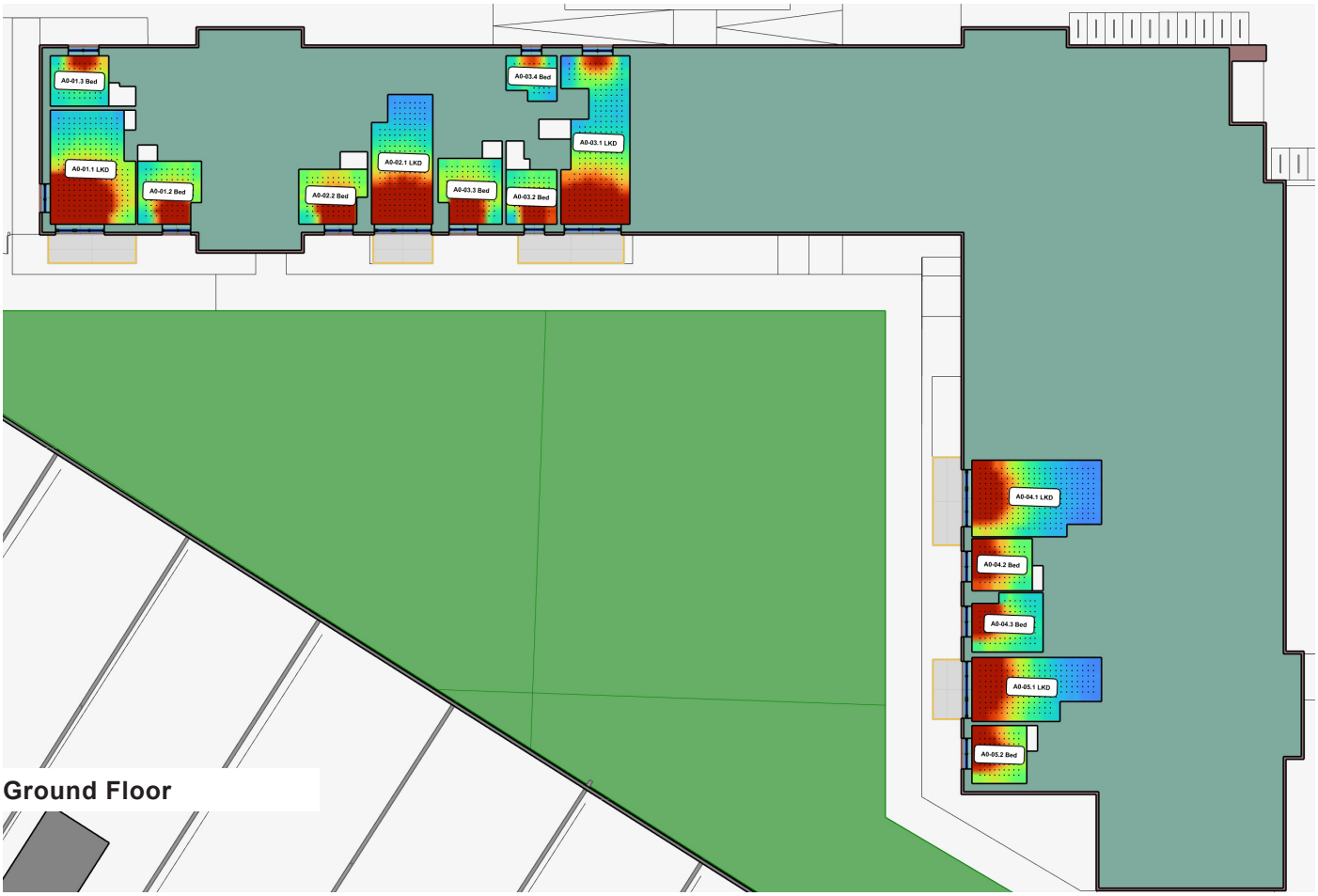
Fourth Floor

Figure 37: Block C - Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Block C - Minimum illuminance levels from 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
C0-01.1	LKD	28.2	260	200	397	58.8%	Y
C0-01.2	Bed	11.7	92	100	429	97.8%	Y
C0-01.3	Bed	9.1	72	100	383	100.0%	Y
C0-02.1	LKD	23.0	189	200	510	81.0%	Y
C0-02.2	Bed	9.8	81	100	340	100.0%	Y
C0-03.1	LKD	23.1	205	200	243	33.7%	N
C0-03.2	Bed	10.8	88	100	356	98.9%	Y
C1-04.1	LKD	28.2	260	200	469	66.2%	Y
C1-04.2	Bed	11.7	92	100	612	100.0%	Y
C1-04.3	Bed	9.1	72	100	440	100.0%	Y
C1-05.1	LKD	23.0	189	200	595	80.4%	Y
C1-05.2	Bed	9.8	81	100	358	100.0%	Y
C1-06.1	LKD	23.1	205	200	209	27.8%	N
C1-06.2	Bed	10.8	88	100	372	100.0%	Y
C1-07.1	LKD	29.3	274	200	404	92.7%	Y
C1-07.2	Bed	9.7	80	100	363	100.0%	Y
C1-07.3	Bed	12.2	98	100	281	93.9%	Y
C2-08.1	LKD	28.2	260	200	571	77.7%	Y
C2-08.2	Bed	11.7	92	100	779	100.0%	Y
C2-08.3	Bed	9.1	72	100	468	100.0%	Y
C2-09.1	LKD	23.0	189	200	741	84.1%	Y
C2-09.2	Bed	9.8	81	100	443	100.0%	Y
C2-10.1	LKD	23.1	205	200	230	31.7%	N
C2-10.2	Bed	10.8	88	100	448	100.0%	Y
C2-11.1	LKD	29.3	274	200	437	94.9%	Y
C2-11.2	Bed	9.7	80	100	442	100.0%	Y
C2-11.3	Bed	12.2	98	100	351	92.9%	Y
C3-12.1	LKD	28.2	260	200	807	90.0%	Y
C3-12.2	Bed	11.7	92	100	905	100.0%	Y
C3-12.3	Bed	9.1	72	100	504	100.0%	Y
C3-13.1	LKD	23.0	189	200	881	88.9%	Y
C3-13.2	Bed	9.8	81	100	618	100.0%	Y
C3-14.1	LKD	23.1	205	200	304	38.0%	N
C3-14.2	Bed	10.8	88	100	635	100.0%	Y
C3-15.1	LKD	29.3	274	200	510	98.9%	Y
C3-15.2	Bed	9.7	80	100	628	100.0%	Y
C3-15.3	Bed	12.2	98	100	484	99.0%	Y
C4-17.1	LKD	23.0	189	200	1383	98.4%	Y
C4-17.2	Bed	9.8	81	100	908	100.0%	Y
C4-18.1	LKD	23.1	205	200	744	59.0%	Y
C4-18.2	Bed	10.8	88	100	884	100.0%	Y
C4-19.1	LKD	29.3	274	200	949	100.0%	Y
C4-19.2	Bed	9.7	80	100	934	100.0%	Y
C4-19.3	Bed	12.2	98	100	691	100.0%	Y

Table 19: Block C - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Appendix C - Supplementary Information - IS/ BS EN17037:2018 Table A.1 Daylight Provision Room Results - Model without trees and Model with trees



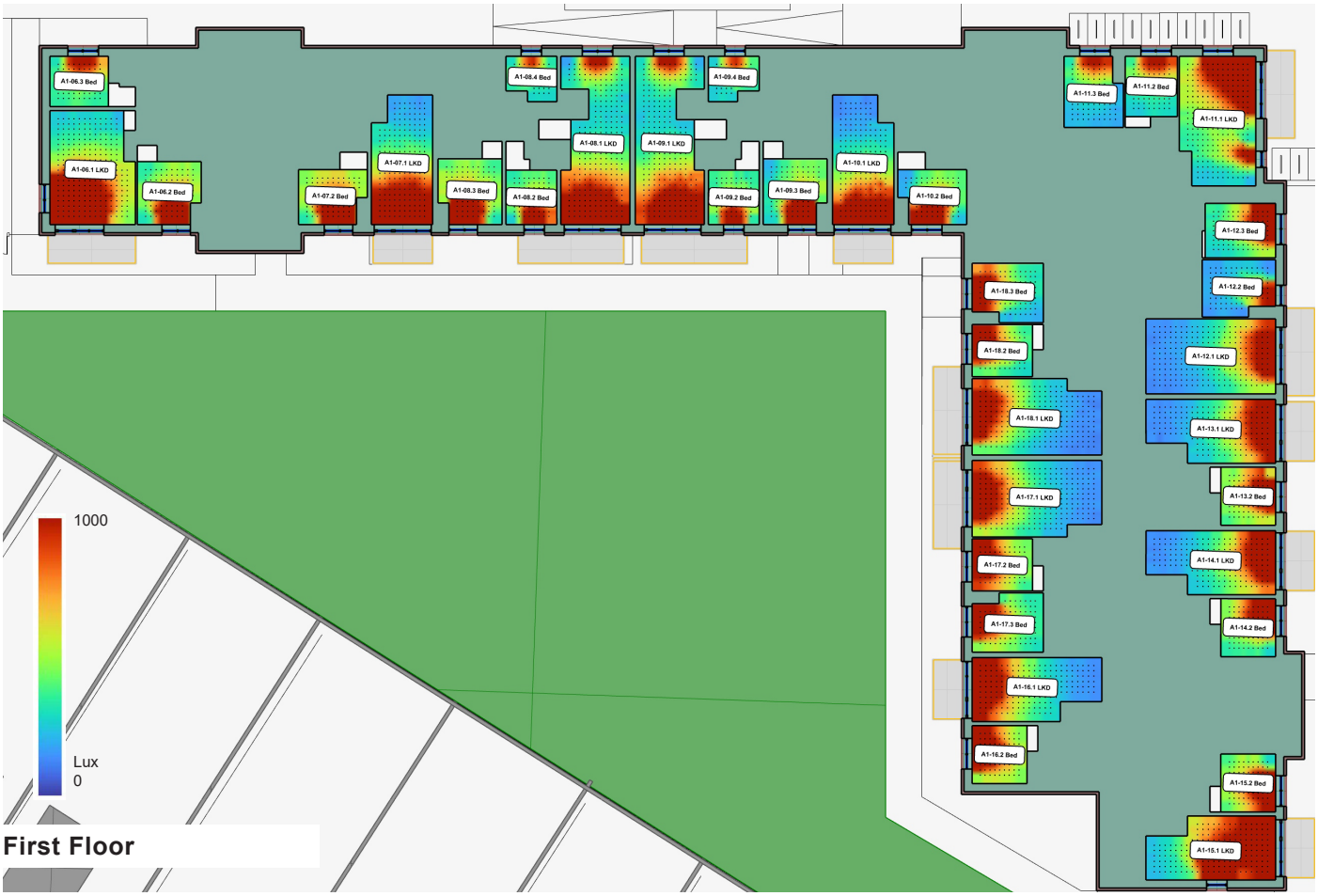
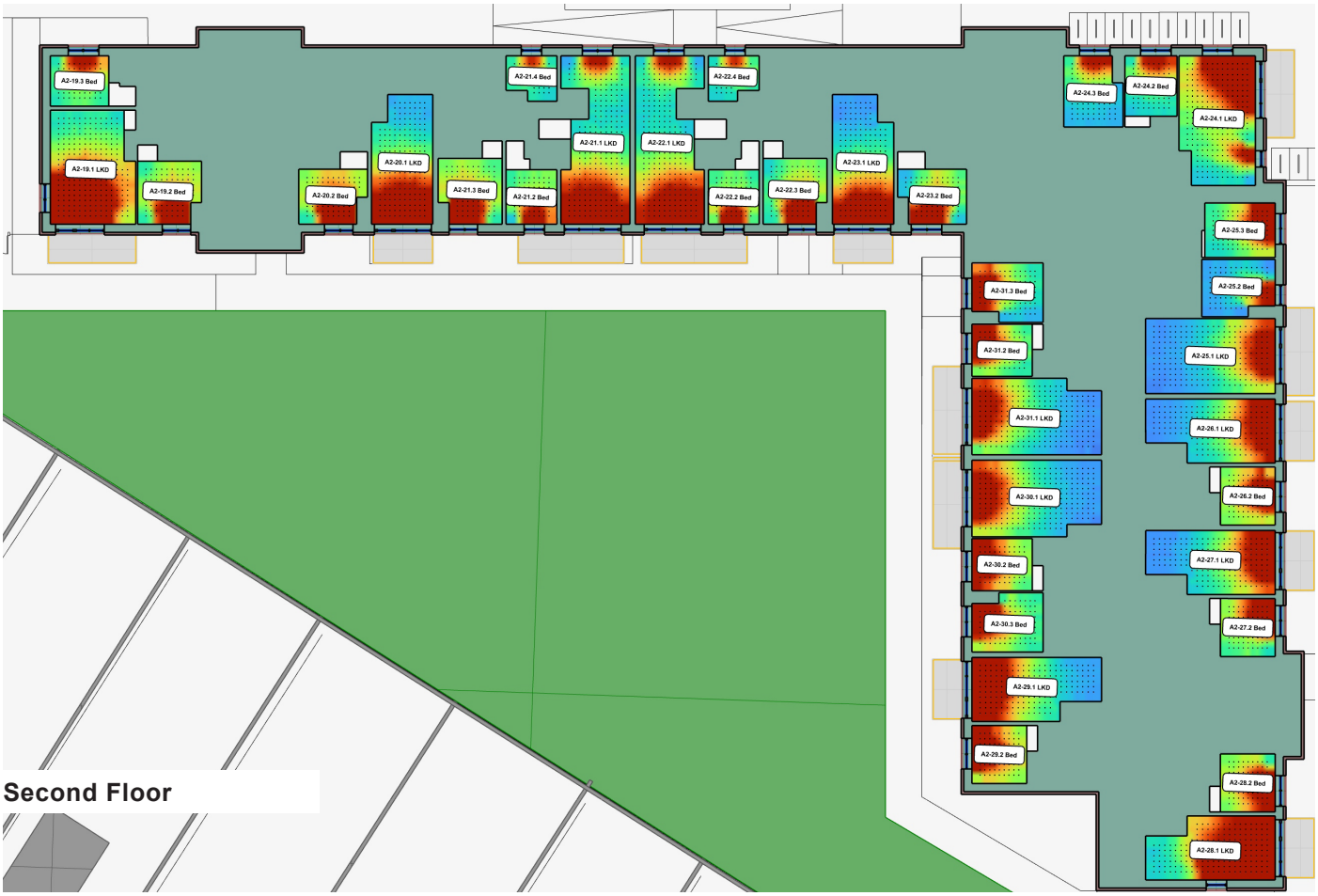


Figure 38: Block A without trees - Daylight Provision & Annual Average Illuminance to habitable rooms



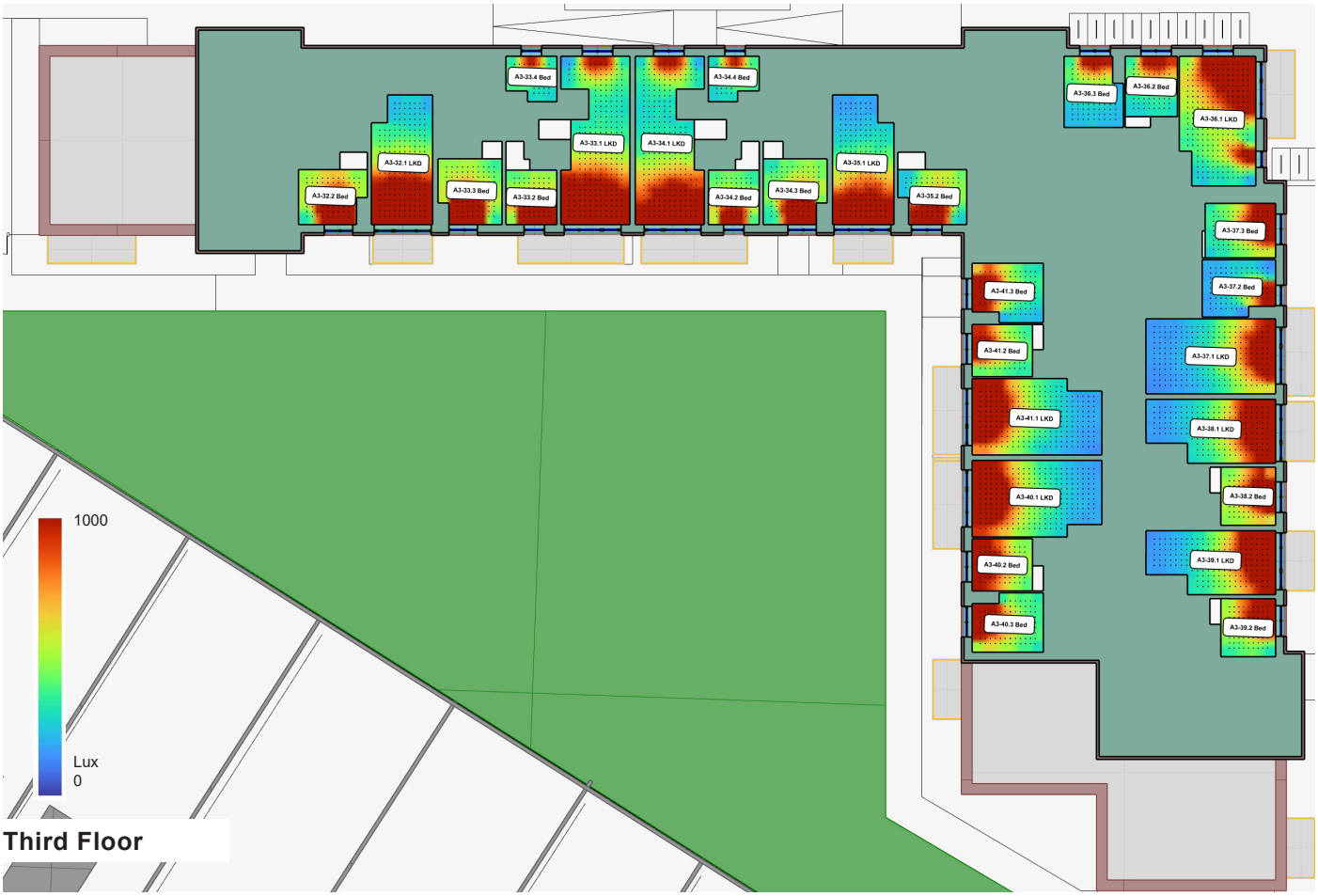


Figure 39: Block A without trees - Daylight Provision & Annual Average Illuminance to habitable rooms

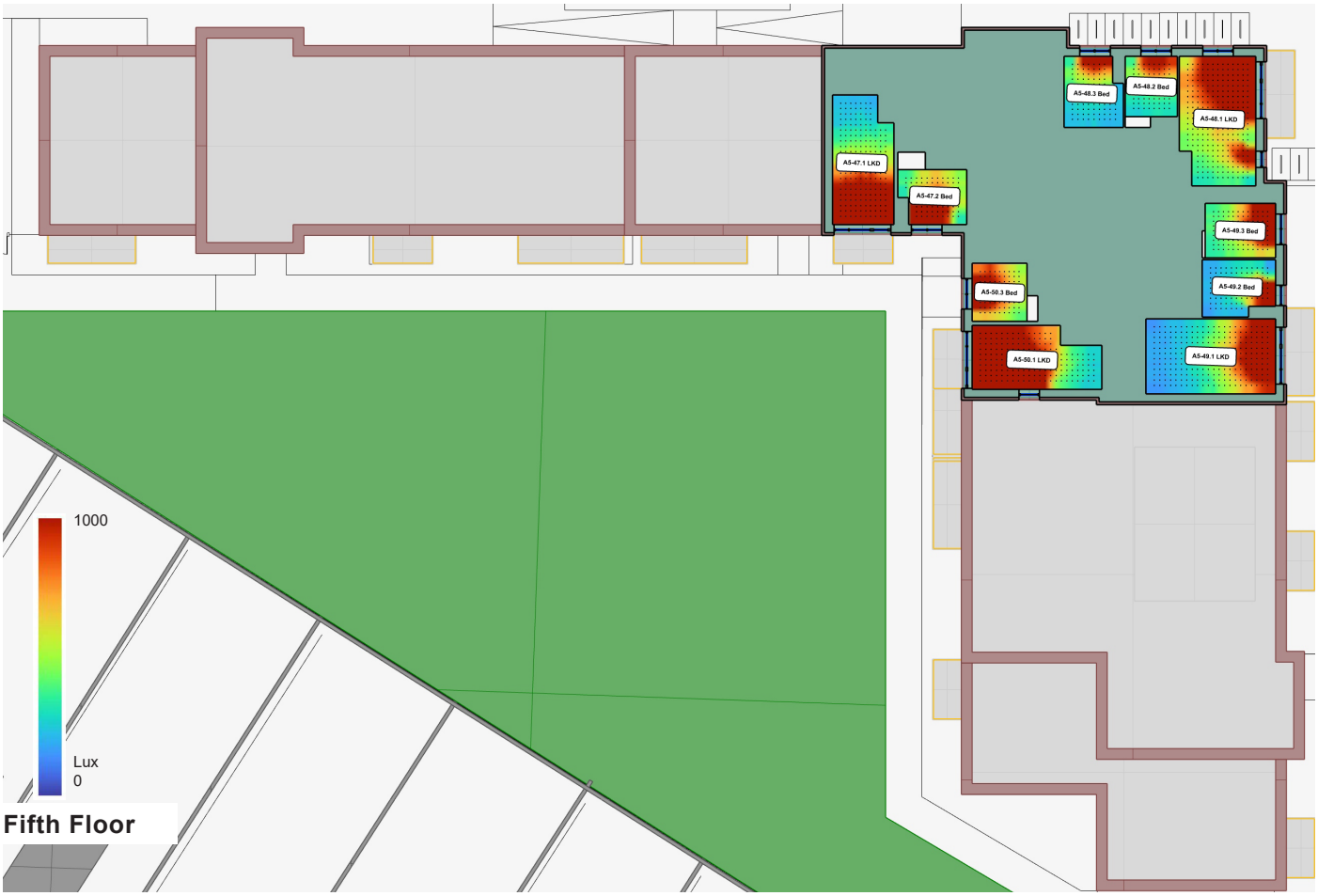


Figure 40: Block A without trees - Daylight Provision & Annual Average Illuminance to habitable rooms

Block A - without trees - 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
A0-01.1	LKD	28.2	260	Minimum	62.9%	48.7%	34.8%	Minimum	67.1%	36.9%	11.1%
A0-01.2	Bed	11.7	92	Minimum	55.6%	40.6%	26.9%	Minimum	70.0%	39.6%	19.3%
A0-01.3	Bed	9.1	72	Minimum	65.1%	44.3%	12.1%	Minimum	79.9%	48.8%	11.8%
A0-02.1	LKD	23.1	205	Minimum	54.7%	41.1%	24.8%	Minimum	55.3%	16.6%	4.8%
A0-02.2	Bed	10.8	88	Minimum	61.1%	46.3%	34.7%	Minimum	74.6%	44.6%	28.2%
A0-03.1	LKD	31.6	271	Minimum	60.6%	42.4%	22.1%	Minimum	71.5%	35.4%	2.9%
A0-03.2	Bed	8.5	72	Minimum	57.0%	40.8%	27.8%	Minimum	71.1%	39.8%	19.4%
A0-03.3	Bed	12.2	102	Minimum	55.8%	41.3%	29.0%	Minimum	72.8%	42.4%	24.9%
A0-03.4	Bed	6.4	48	Minimum	59.2%	31.3%	4.5%	Minimum	79.3%	42.9%	5.1%
A0-04.1	LKD	29.3	274	Fail	39.4%	18.5%	9.3%	Minimum	50.1%	8.7%	4.0%
A0-04.2	Bed	9.7	80	Minimum	64.9%	45.1%	28.8%	Minimum	77.8%	43.9%	22.1%
A0-04.3	Bed	12.2	98	Minimum	52.3%	29.9%	14.3%	Minimum	71.8%	29.9%	10.6%
A0-05.1	LKD	23.0	189	Minimum	51.5%	29.1%	13.3%	Minimum	50.4%	7.7%	3.4%
A0-05.2	Bed	9.8	81	Minimum	65.9%	47.6%	30.2%	Medium	80.0%	50.8%	28.9%
A1-06.1	LKD	28.2	260	Medium	64.2%	50.3%	36.3%	Minimum	70.2%	39.1%	11.3%
A1-06.2	Bed	11.7	92	Minimum	57.8%	43.1%	29.9%	Minimum	72.9%	42.4%	23.1%
A1-06.3	Bed	9.1	72	Minimum	67.2%	48.4%	22.6%	Medium	81.8%	53.7%	25.6%
A1-07.1	LKD	23.1	205	Minimum	54.9%	40.6%	24.2%	Minimum	59.7%	18.8%	5.0%
A1-07.2	Bed	10.8	88	Minimum	63.1%	48.4%	36.1%	Minimum	76.6%	48.2%	31.8%
A1-08.1	LKD	31.6	271	Minimum	61.7%	44.1%	24.8%	Minimum	73.3%	38.2%	4.6%
A1-08.2	Bed	8.5	72	Minimum	54.6%	39.2%	22.8%	Minimum	70.9%	40.5%	19.1%
A1-08.3	Bed	12.2	102	Minimum	58.6%	43.1%	30.7%	Minimum	74.5%	44.7%	28.4%
A1-08.4	Bed	6.4	48	Minimum	60.9%	36.9%	5.8%	Minimum	79.7%	45.9%	9.1%
A1-09.1	LKD	31.6	271	Minimum	60.2%	41.6%	21.5%	Minimum	72.6%	37.0%	3.7%
A1-09.2	Bed	8.5	72	Minimum	52.0%	34.7%	18.6%	Minimum	70.5%	38.3%	16.7%
A1-09.3	Bed	12.2	102	Minimum	51.8%	35.0%	20.8%	Minimum	66.3%	35.0%	15.0%
A1-09.4	Bed	6.4	48	Minimum	62.6%	38.9%	6.2%	Minimum	78.8%	42.4%	4.7%
A1-10.1	LKD	23.1	205	Fail	45.4%	29.0%	14.4%	Minimum	51.7%	10.1%	3.4%
A1-10.2	Bed	10.8	88	Minimum	54.4%	36.8%	24.0%	Minimum	61.4%	26.5%	9.1%
A1-11.1	LKD	29.3	274	Minimum	65.5%	48.4%	25.6%	Minimum	76.2%	41.4%	9.1%
A1-11.2	Bed	9.7	80	Minimum	63.5%	41.6%	9.4%	Minimum	79.1%	44.7%	6.3%
A1-11.3	Bed	12.2	98	Minimum	51.8%	19.0%	0.0%	Minimum	72.6%	22.9%	0.0%
A1-12.1	LKD	30.0	264	Fail	36.6%	11.7%	5.5%	Minimum	53.2%	6.0%	3.0%
A1-12.2	Bed	12.1	98	Fail	25.7%	8.3%	3.9%	Minimum	55.5%	7.2%	2.2%
A1-12.3	Bed	11.8	108	Minimum	58.2%	37.4%	18.1%	Minimum	72.9%	35.6%	11.2%
A1-13.1	LKD	23.0	189	Fail	49.8%	24.5%	10.9%	Minimum	53.6%	7.5%	3.3%
A1-13.2	Bed	9.8	81	Minimum	66.0%	47.9%	29.1%	Medium	80.7%	52.3%	28.5%
A1-14.1	LKD	23.0	189	Minimum	50.7%	25.8%	10.8%	Minimum	54.2%	8.1%	3.4%
A1-14.2	Bed	9.8	81	Minimum	64.2%	45.3%	26.1%	Minimum	78.3%	46.5%	22.4%
A1-15.1	LKD	23.0	189	High	75.4%	63.1%	51.3%	Minimum	69.1%	35.4%	11.6%
A1-15.2	Bed	9.8	81	Minimum	65.2%	47.5%	28.5%	Medium	79.7%	51.0%	26.1%
A1-16.1	LKD	23.0	189	Minimum	54.7%	30.3%	12.9%	Minimum	55.2%	9.1%	3.3%
A1-16.2	Bed	9.8	81	Medium	67.7%	51.3%	33.9%	Medium	80.9%	55.0%	32.7%
A1-17.1	LKD	29.3	274	Fail	40.6%	17.2%	8.2%	Minimum	54.2%	9.2%	3.6%
A1-17.2	Bed	9.7	80	Minimum	66.0%	48.6%	31.1%	Minimum	78.8%	48.7%	25.1%
A1-17.3	Bed	12.2	98	Minimum	57.2%	35.8%	16.7%	Minimum	75.5%	38.6%	15.1%
A1-18.1	LKD	29.3	274	Fail	37.0%	13.6%	7.5%	Fail	48.8%	6.6%	3.0%
A1-18.2	Bed	9.7	80	Minimum	56.9%	37.6%	19.7%	Minimum	72.8%	37.2%	14.5%
A1-18.3	Bed	12.2	98	Fail	48.4%	26.4%	11.8%	Minimum	60.7%	21.8%	7.4%
A2-19.1	LKD	28.2	260	Medium	67.3%	54.7%	43.3%	Minimum	75.1%	46.3%	24.1%

Block A - without trees - 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
A2-19.2	Bed	11.7	92	Minimum	59.9%	44.3%	31.0%	Minimum	75.3%	46.6%	29.2%
A2-19.3	Bed	9.1	72	Medium	68.4%	50.3%	26.8%	Medium	81.8%	53.7%	26.8%
A2-20.1	LKD	23.1	205	Minimum	58.0%	43.4%	28.2%	Minimum	62.7%	23.1%	5.9%
A2-20.2	Bed	10.8	88	Medium	64.9%	50.3%	37.2%	Medium	77.9%	50.2%	33.4%
A2-21.1	LKD	31.6	271	Minimum	62.4%	45.6%	27.2%	Minimum	74.7%	39.9%	5.8%
A2-21.2	Bed	8.5	72	Minimum	55.7%	40.7%	22.9%	Minimum	73.6%	42.9%	21.6%
A2-21.3	Bed	12.2	102	Minimum	59.9%	44.7%	31.8%	Minimum	75.4%	46.8%	29.8%
A2-21.4	Bed	6.4	48	Minimum	61.3%	38.6%	6.7%	Minimum	79.4%	46.5%	8.9%
A2-22.1	LKD	31.6	271	Minimum	61.0%	43.4%	24.5%	Minimum	74.0%	39.2%	6.0%
A2-22.2	Bed	8.5	72	Minimum	54.3%	39.3%	21.5%	Minimum	72.9%	40.8%	19.1%
A2-22.3	Bed	12.2	102	Minimum	55.0%	40.0%	25.2%	Minimum	71.0%	40.0%	20.0%
A2-22.4	Bed	6.4	48	Minimum	61.9%	38.8%	6.8%	Minimum	80.1%	46.6%	9.7%
A2-23.1	LKD	23.1	205	Fail	49.2%	33.4%	16.4%	Minimum	54.7%	13.2%	4.3%
A2-23.2	Bed	10.8	88	Minimum	56.4%	38.8%	26.9%	Minimum	63.5%	29.8%	11.3%
A2-24.1	LKD	29.3	274	Medium	66.8%	50.3%	29.6%	Minimum	77.7%	44.9%	14.3%
A2-24.2	Bed	9.7	80	Minimum	63.4%	41.4%	9.9%	Minimum	79.1%	44.9%	6.9%
A2-24.3	Bed	12.2	98	Minimum	52.2%	22.2%	0.2%	Minimum	74.1%	26.9%	0.1%
A2-25.1	LKD	30.0	264	Fail	38.6%	12.3%	5.8%	Minimum	54.9%	6.9%	3.3%
A2-25.2	Bed	12.1	98	Fail	28.4%	9.0%	4.0%	Minimum	57.9%	8.4%	2.5%
A2-25.3	Bed	11.8	108	Minimum	61.5%	42.1%	21.5%	Minimum	74.6%	38.8%	13.3%
A2-26.1	LKD	23.0	189	Minimum	51.8%	26.5%	11.5%	Minimum	55.3%	8.9%	3.6%
A2-26.2	Bed	9.8	81	Medium	67.1%	50.1%	31.2%	Medium	81.1%	54.5%	31.3%
A2-27.1	LKD	23.0	189	Minimum	52.7%	27.3%	11.3%	Minimum	56.1%	8.8%	3.5%
A2-27.2	Bed	9.8	81	Minimum	64.9%	46.6%	27.0%	Medium	79.5%	50.0%	25.2%
A2-28.1	LKD	23.0	189	High	77.6%	66.7%	55.1%	Minimum	73.3%	41.3%	13.4%
A2-28.2	Bed	9.8	81	Medium	67.2%	50.6%	31.7%	Medium	80.8%	53.9%	29.9%
A2-29.1	LKD	23.0	189	Minimum	59.9%	39.3%	21.6%	Minimum	61.7%	12.5%	5.2%
A2-29.2	Bed	9.8	81	Medium	69.7%	54.2%	36.6%	Medium	82.5%	58.4%	38.2%
A2-30.1	LKD	29.3	274	Fail	45.4%	20.2%	9.6%	Minimum	57.8%	9.6%	4.2%
A2-30.2	Bed	9.7	80	Medium	67.5%	51.0%	33.5%	Medium	80.0%	52.0%	28.0%
A2-30.3	Bed	12.2	98	Minimum	59.3%	39.1%	20.0%	Minimum	77.0%	43.2%	17.8%
A2-31.1	LKD	29.3	274	Fail	41.6%	15.9%	8.6%	Minimum	53.4%	8.5%	3.2%
A2-31.2	Bed	9.7	80	Minimum	59.4%	41.2%	23.4%	Minimum	75.1%	42.8%	18.4%
A2-31.3	Bed	12.2	98	Minimum	52.1%	30.8%	13.0%	Minimum	62.2%	23.7%	8.0%
A3-32.1	LKD	23.1	205	Minimum	61.6%	46.1%	34.0%	Minimum	65.7%	31.6%	9.2%
A3-32.2	Bed	10.8	88	Medium	65.7%	51.5%	38.8%	Medium	77.9%	50.5%	34.8%
A3-33.1	LKD	31.6	271	Minimum	64.7%	49.5%	33.9%	Minimum	76.6%	44.7%	16.9%
A3-33.2	Bed	8.5	72	Minimum	62.5%	48.7%	35.7%	Minimum	76.1%	47.5%	31.1%
A3-33.3	Bed	12.2	102	Minimum	61.0%	45.9%	33.1%	Minimum	76.3%	47.9%	31.3%
A3-33.4	Bed	6.4	48	Minimum	61.7%	39.2%	7.3%	Minimum	79.6%	46.9%	10.6%
A3-34.1	LKD	31.6	271	Minimum	62.7%	46.4%	29.0%	Minimum	75.2%	41.3%	7.0%
A3-34.2	Bed	8.5	72	Minimum	55.7%	40.3%	23.9%	Minimum	73.6%	42.3%	20.3%
A3-34.3	Bed	12.2	102	Minimum	57.8%	42.2%	29.5%	Minimum	73.4%	42.1%	25.2%
A3-34.4	Bed	6.4	48	Minimum	62.9%	40.4%	9.5%	Minimum	79.9%	46.6%	10.1%
A3-35.1	LKD	23.1	205	Minimum	52.6%	35.3%	20.1%	Minimum	57.9%	16.9%	4.8%
A3-35.2	Bed	10.8	88	Minimum	58.9%	41.5%	28.8%	Minimum	65.8%	31.6%	13.8%
A3-36.1	LKD	29.3	274	Medium	68.2%	51.8%	32.0%	Minimum	78.5%	47.8%	16.9%
A3-36.2	Bed	9.7	80	Minimum	62.9%	41.3%	10.9%	Minimum	78.7%	44.4%	9.5%
A3-36.3	Bed	12.2	98	Minimum	52.7%	24.7%	0.6%	Minimum	74.7%	30.0%	0.2%
A3-37.1	LKD	30.0	264	Fail	42.2%	14.8%	6.7%	Minimum	55.8%	8.3%	3.3%

Block A - without trees - 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
A3-37.2	Bed	12.1	98	Fail	29.3%	8.7%	4.4%	Minimum	59.0%	8.6%	2.6%
A3-37.3	Bed	11.8	108	Minimum	63.3%	44.3%	23.9%	Minimum	75.5%	41.5%	13.8%
A3-38.1	LKD	23.0	189	Minimum	56.6%	34.0%	16.6%	Minimum	59.8%	11.3%	4.6%
A3-38.2	Bed	9.8	81	Medium	68.7%	51.8%	34.9%	Medium	82.2%	57.0%	34.9%
A3-39.1	LKD	23.0	189	Minimum	58.1%	36.1%	18.7%	Minimum	60.6%	11.0%	4.7%
A3-39.2	Bed	9.8	81	Minimum	66.0%	48.9%	29.0%	Medium	80.7%	52.4%	27.6%
A3-40.1	LKD	29.3	274	Minimum	53.2%	29.7%	13.4%	Minimum	62.1%	13.0%	5.3%
A3-40.2	Bed	9.7	80	Medium	68.4%	53.2%	35.6%	Medium	80.4%	53.7%	30.2%
A3-40.3	Bed	12.2	98	Minimum	61.8%	42.7%	21.7%	Minimum	77.5%	45.5%	19.4%
A3-41.1	LKD	29.3	274	Fail	49.5%	26.9%	12.5%	Minimum	59.3%	12.2%	5.1%
A3-41.2	Bed	9.7	80	Minimum	58.3%	40.3%	20.8%	Minimum	75.4%	44.3%	18.4%
A3-41.3	Bed	12.2	98	Minimum	53.9%	31.7%	13.0%	Minimum	67.0%	29.3%	8.7%
A4-42.1	LKD	31.6	271	Minimum	64.9%	49.4%	34.7%	Minimum	76.7%	45.5%	17.0%
A4-42.2	Bed	8.5	72	Minimum	62.2%	48.2%	34.2%	Minimum	76.8%	48.7%	32.4%
A4-42.3	Bed	12.2	102	Minimum	59.6%	43.3%	30.9%	Minimum	75.3%	45.8%	28.7%
A4-42.4	Bed	6.4	48	Minimum	62.6%	40.9%	9.3%	Minimum	79.5%	46.7%	10.6%
A4-43.1	LKD	23.1	205	Minimum	54.4%	37.4%	22.1%	Minimum	59.6%	19.0%	5.0%
A4-43.2	Bed	10.8	88	Minimum	60.5%	44.3%	29.5%	Minimum	69.9%	36.7%	17.0%
A4-44.1	LKD	29.3	274	Medium	69.5%	53.8%	35.2%	Minimum	79.1%	49.4%	20.3%
A4-44.2	Bed	9.7	80	Minimum	65.3%	45.0%	16.9%	Minimum	79.3%	46.6%	11.0%
A4-44.3	Bed	12.2	98	Minimum	52.6%	23.7%	0.2%	Minimum	74.9%	30.7%	0.2%
A4-45.1	LKD	30.0	264	Fail	45.6%	19.3%	7.8%	Minimum	57.1%	8.8%	3.3%
A4-45.2	Bed	12.1	98	Fail	30.8%	9.7%	4.4%	Minimum	62.0%	9.7%	3.3%
A4-45.3	Bed	11.8	108	Minimum	64.5%	46.8%	25.6%	Minimum	77.3%	45.6%	17.8%
A4-46.1	LKD	23.0	189	High	75.0%	62.5%	52.3%	Minimum	69.1%	37.2%	13.5%
A4-46.2	Bed	9.8	81	Minimum	62.8%	46.9%	29.2%	Minimum	77.6%	48.8%	26.1%
A5-47.1	LKD	23.1	205	Minimum	59.4%	43.3%	31.2%	Minimum	64.2%	30.1%	8.6%
A5-47.2	Bed	10.8	88	Minimum	63.4%	48.1%	35.1%	Minimum	74.8%	44.7%	27.9%
A5-48.1	LKD	29.3	274	Medium	73.7%	58.8%	43.7%	Medium	81.3%	53.9%	27.6%
A5-48.2	Bed	9.7	80	Minimum	64.9%	44.9%	15.6%	Minimum	79.5%	47.4%	13.1%
A5-48.3	Bed	12.2	98	Minimum	53.0%	25.7%	0.5%	Minimum	74.9%	30.3%	0.3%
A5-49.1	LKD	30.0	264	Minimum	51.4%	26.9%	11.4%	Minimum	62.1%	12.4%	4.5%
A5-49.2	Bed	12.1	98	Fail	36.3%	11.8%	5.1%	Minimum	62.4%	12.7%	4.0%
A5-49.3	Bed	11.8	108	Minimum	65.3%	48.5%	26.6%	Minimum	78.4%	48.2%	20.2%
A5-50.1	LKD	23.0	189	High	77.5%	66.6%	56.4%	Minimum	71.8%	41.6%	14.1%
A5-50.3	Bed	9.8	81	Medium	67.4%	52.3%	35.5%	Medium	80.4%	54.8%	33.4%

Table 20: Block A - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

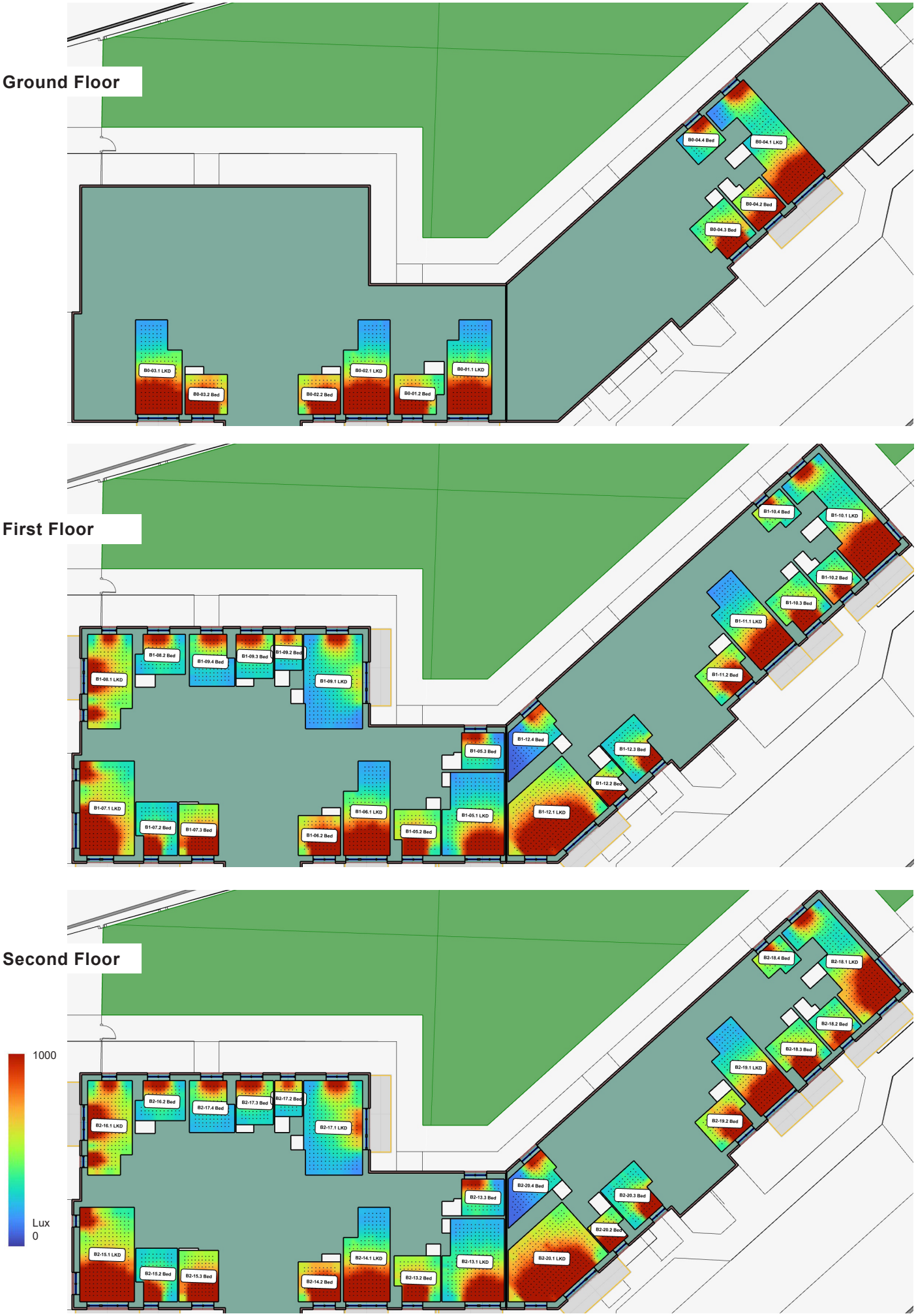


Figure 41: Block B without trees - Daylight Provision & Annual Average Illuminance to habitable rooms

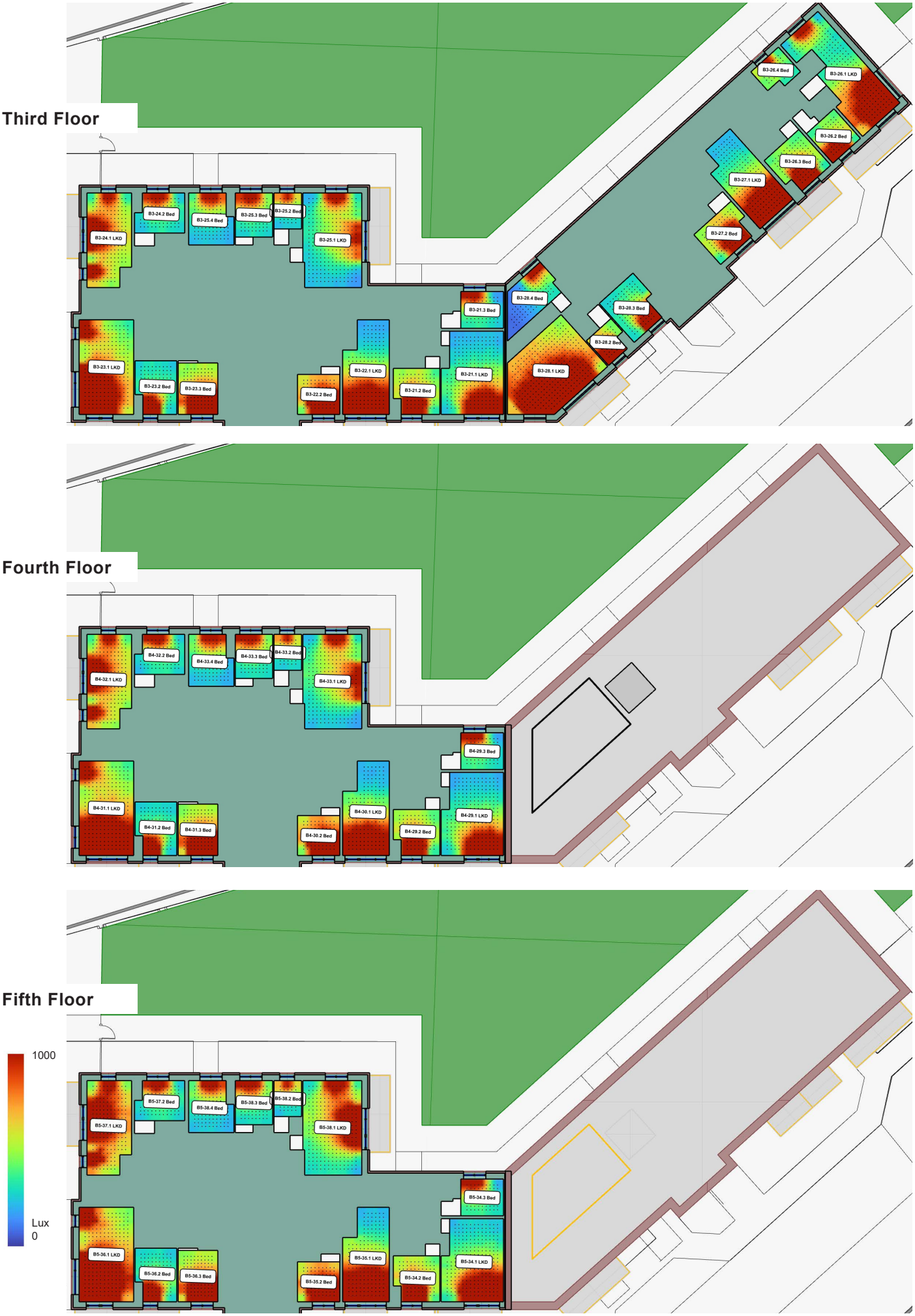


Figure 42: Block B without trees - Daylight Provision & Annual Average Illuminance to habitable rooms

Block B - without trees - 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
B0-01.1	LKD	23.1	205	Minimum	55.6%	42.2%	25.9%	Minimum	58.5%	19.5%	5.6%
B0-01.2	Bed	10.8	88	Medium	65.2%	51.2%	39.4%	Minimum	74.4%	45.4%	28.6%
B0-02.1	LKD	23.1	189	Minimum	58.4%	43.7%	31.5%	Minimum	56.8%	18.9%	5.7%
B0-02.2	Bed	9.8	81	Medium	67.9%	54.0%	42.2%	Medium	80.1%	55.1%	40.3%
B0-03.1	LKD	23.0	189	Minimum	59.7%	43.6%	32.2%	Minimum	58.7%	22.1%	6.7%
B0-03.2	Bed	9.8	81	Medium	67.9%	54.1%	41.6%	Medium	80.7%	55.0%	40.1%
B0-04.1	LKD	31.6	271	Minimum	62.1%	46.0%	23.6%	Minimum	73.1%	34.3%	0.4%
B0-04.2	Bed	8.5	72	Medium	66.2%	51.5%	37.7%	Medium	79.7%	52.8%	34.1%
B0-04.3	Bed	12.2	102	Minimum	57.8%	41.0%	26.3%	Minimum	75.3%	41.6%	22.9%
B0-04.4	Bed	7.1	56	Minimum	61.8%	39.0%	13.8%	Minimum	78.0%	36.5%	9.2%
B1-05.1	LKD	28.2	260	Fail	47.5%	31.4%	11.1%	Minimum	60.0%	20.1%	5.1%
B1-05.2	Bed	11.7	92	Minimum	60.1%	44.8%	32.4%	Minimum	75.5%	46.7%	29.7%
B1-05.3	Bed	9.1	72	Minimum	57.5%	31.3%	3.7%	Minimum	73.6%	22.3%	0.0%
B1-06.1	LKD	23.0	189	Minimum	58.6%	43.6%	30.5%	Minimum	60.3%	20.0%	5.1%
B1-06.2	Bed	9.8	81	Medium	68.7%	55.6%	43.2%	Medium	81.4%	57.5%	41.7%
B1-07.1	LKD	30.0	264	Medium	67.2%	54.2%	40.2%	Medium	77.8%	52.0%	29.6%
B1-07.2	Bed	12.1	98	Fail	42.6%	24.5%	9.2%	Minimum	63.7%	30.0%	8.1%
B1-07.3	Bed	11.8	108	Medium	65.4%	51.3%	38.4%	Medium	77.9%	50.2%	34.7%
B1-08.1	LKD	23.1	205	Medium	67.4%	50.3%	28.1%	Medium	81.8%	55.7%	31.0%
B1-08.2	Bed	10.8	88	Minimum	57.8%	34.3%	4.0%	Minimum	78.6%	41.9%	4.1%
B1-09.1	LKD	32.1	286	Minimum	50.0%	17.6%	0.2%	Minimum	68.3%	11.1%	0.0%
B1-09.2	Bed	5.8	40	Minimum	61.5%	37.5%	6.2%	Minimum	77.6%	37.7%	3.1%
B1-09.3	Bed	9.6	80	Minimum	64.7%	43.7%	12.2%	Minimum	79.1%	44.5%	6.0%
B1-09.4	Bed	12.6	108	Minimum	52.7%	22.5%	0.0%	Minimum	74.3%	27.1%	0.0%
B1-10.1	LKD	31.6	271	Medium	67.7%	53.7%	35.3%	Minimum	76.9%	44.9%	5.6%
B1-10.2	Bed	8.5	72	Minimum	54.0%	35.4%	20.5%	Minimum	72.1%	37.6%	17.0%
B1-10.3	Bed	12.2	102	Minimum	57.2%	40.0%	24.8%	Minimum	74.5%	42.9%	22.1%
B1-10.4	Bed	6.4	48	Minimum	63.1%	42.3%	17.4%	Minimum	78.0%	41.1%	12.6%
B1-11.1	LKD	23.1	205	Minimum	55.5%	37.2%	20.9%	Minimum	57.8%	15.4%	4.1%
B1-11.2	Bed	10.8	88	Minimum	64.0%	49.9%	34.0%	Minimum	76.8%	47.0%	27.7%
B1-12.1	LKD	36.1	345	Medium	69.2%	56.5%	43.2%	Medium	79.2%	53.7%	38.2%
B1-12.2	Bed	5.7	41	Medium	65.7%	51.0%	35.1%	Minimum	76.2%	46.3%	27.4%
B1-12.3	Bed	12.7	107	Fail	45.8%	25.9%	11.5%	Minimum	67.0%	30.5%	10.2%
B1-12.4	Bed	12.6	102	Fail	36.9%	3.2%	0.0%	Fail	31.1%	0.0%	0.0%
B2-13.1	LKD	28.2	260	Fail	48.9%	34.0%	12.6%	Minimum	63.4%	23.2%	6.0%
B2-13.2	Bed	11.7	92	Minimum	61.1%	45.7%	32.7%	Minimum	75.9%	47.7%	31.0%
B2-13.3	Bed	9.1	72	Minimum	59.6%	35.3%	5.5%	Minimum	73.5%	26.5%	0.0%
B2-14.1	LKD	23.0	189	Minimum	61.1%	45.1%	32.3%	Minimum	62.0%	23.1%	5.4%
B2-14.2	Bed	9.8	81	Medium	69.6%	56.3%	43.8%	Medium	82.0%	59.2%	43.0%
B2-15.1	LKD	30.0	264	Medium	68.5%	55.6%	45.0%	Medium	79.7%	54.8%	37.9%
B2-15.2	Bed	12.1	98	Fail	43.6%	26.3%	9.4%	Minimum	64.4%	29.7%	7.8%
B2-15.3	Bed	11.8	108	Medium	65.9%	52.1%	39.4%	Medium	78.5%	51.7%	35.6%
B2-16.1	LKD	23.1	205	Medium	69.1%	52.4%	31.7%	Medium	82.1%	57.1%	33.1%
B2-16.2	Bed	10.8	88	Minimum	59.2%	36.4%	5.1%	Minimum	77.6%	40.2%	3.9%
B2-17.1	LKD	32.1	286	Minimum	54.5%	27.5%	3.0%	Minimum	71.6%	21.1%	1.3%
B2-17.2	Bed	5.8	40	Minimum	60.9%	38.0%	6.4%	Minimum	77.1%	36.7%	2.0%
B2-17.3	Bed	9.6	80	Minimum	64.3%	43.6%	12.6%	Minimum	79.4%	46.1%	9.3%
B2-17.4	Bed	12.6	108	Minimum	53.6%	27.0%	1.4%	Minimum	74.5%	29.3%	0.1%
B2-18.1	LKD	31.6	271	Medium	71.2%	56.8%	39.4%	Minimum	78.0%	45.3%	6.6%
B2-18.2	Bed	8.5	72	Minimum	56.0%	38.2%	22.9%	Minimum	73.0%	39.0%	16.9%

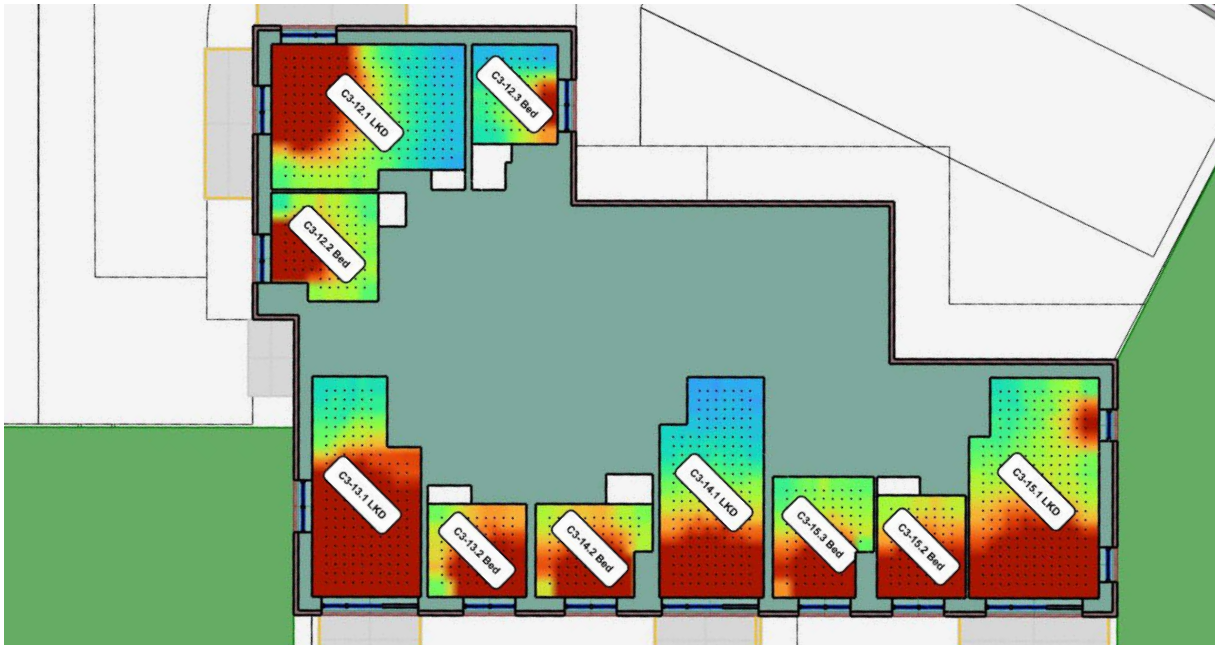
Block B - without trees - EN17037:2018 Table A.1 Daylight Provision Room Schedule											
Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
B2-18.3	Bed	12.2	102	Minimum	58.9%	41.9%	25.5%	Minimum	76.5%	45.6%	25.0%
B2-18.4	Bed	6.4	48	Minimum	63.1%	43.2%	19.2%	Minimum	78.8%	44.2%	15.3%
B2-19.1	LKD	23.1	205	Minimum	57.4%	38.9%	21.8%	Minimum	62.8%	21.4%	6.2%
B2-19.2	Bed	10.8	88	Medium	66.1%	51.5%	35.4%	Medium	79.2%	51.5%	31.2%
B2-20.1	LKD	36.1	345	Medium	70.5%	57.8%	45.2%	Medium	80.6%	56.6%	39.7%
B2-20.2	Bed	5.7	41	Medium	66.7%	52.0%	35.9%	Minimum	77.5%	48.8%	29.4%
B2-20.3	Bed	12.7	107	Fail	47.8%	28.8%	12.7%	Minimum	69.0%	33.6%	13.2%
B2-20.4	Bed	12.6	102	Fail	37.1%	3.5%	0.0%	Fail	36.7%	0.0%	0.0%
B3-21.1	LKD	28.2	260	Fail	49.5%	34.2%	13.2%	Minimum	63.4%	24.1%	6.2%
B3-21.2	Bed	11.7	92	Minimum	61.8%	46.6%	33.2%	Minimum	76.9%	48.9%	31.8%
B3-21.3	Bed	9.1	72	Minimum	61.5%	38.0%	7.6%	Minimum	77.0%	33.2%	2.2%
B3-22.1	LKD	23.0	189	Minimum	61.4%	45.2%	32.8%	Minimum	62.1%	21.8%	5.1%
B3-22.2	Bed	9.8	81	Medium	69.9%	56.3%	43.9%	Medium	82.1%	59.6%	43.8%
B3-23.1	LKD	30.0	264	Medium	70.4%	57.9%	45.8%	Medium	80.6%	56.1%	39.1%
B3-23.2	Bed	12.1	98	Fail	43.8%	25.9%	9.8%	Minimum	66.3%	31.6%	9.7%
B3-23.3	Bed	11.8	108	Medium	66.4%	52.5%	39.7%	Medium	78.7%	52.1%	36.1%
B3-24.1	LKD	23.1	205	Medium	70.2%	54.7%	34.9%	Medium	82.5%	58.8%	36.7%
B3-24.2	Bed	10.8	88	Minimum	60.9%	38.5%	7.5%	Minimum	77.8%	41.4%	5.0%
B3-25.1	LKD	32.1	286	Minimum	59.1%	37.5%	9.7%	Minimum	74.0%	29.9%	2.4%
B3-25.2	Bed	5.8	40	Minimum	62.6%	39.8%	8.1%	Minimum	78.1%	40.6%	4.6%
B3-25.3	Bed	9.6	80	Minimum	64.6%	44.4%	14.3%	Minimum	78.8%	45.0%	8.4%
B3-25.4	Bed	12.6	108	Minimum	54.5%	28.9%	1.6%	Minimum	75.3%	31.4%	0.3%
B3-26.1	LKD	31.6	271	Medium	72.5%	58.4%	42.7%	Minimum	78.3%	46.8%	11.3%
B3-26.2	Bed	8.5	72	Minimum	61.1%	43.6%	30.2%	Minimum	76.3%	44.4%	24.8%
B3-26.3	Bed	12.2	102	Minimum	61.0%	44.7%	29.4%	Minimum	77.4%	47.9%	28.2%
B3-26.4	Bed	6.4	48	Minimum	64.1%	44.3%	20.4%	Minimum	78.6%	44.7%	16.2%
B3-27.1	LKD	23.1	205	Minimum	60.7%	43.6%	28.6%	Minimum	64.6%	25.7%	8.7%
B3-27.2	Bed	10.8	88	Medium	66.7%	52.7%	36.9%	Medium	79.7%	53.1%	33.2%
B3-28.1	LKD	36.1	345	Medium	72.7%	60.8%	48.5%	Medium	81.9%	59.6%	43.6%
B3-28.2	Bed	5.7	41	Medium	68.3%	54.7%	39.4%	Minimum	77.4%	49.7%	30.7%
B3-28.3	Bed	12.7	107	Fail	49.6%	30.8%	13.6%	Minimum	68.9%	33.6%	12.1%
B3-28.4	Bed	12.6	102	Fail	41.4%	5.8%	0.0%	Fail	42.6%	0.0%	0.0%
B4-29.1	LKD	28.2	260	Fail	49.6%	34.6%	13.1%	Minimum	63.3%	23.7%	5.8%
B4-29.2	Bed	11.7	92	Minimum	61.9%	47.0%	33.3%	Minimum	75.8%	47.4%	30.0%
B4-29.3	Bed	9.1	72	Minimum	62.0%	40.0%	8.9%	Minimum	76.9%	36.4%	4.0%
B4-30.1	LKD	23.0	189	Minimum	61.2%	45.3%	32.3%	Minimum	63.0%	23.2%	5.8%
B4-30.2	Bed	9.8	81	Medium	69.9%	56.5%	44.2%	Medium	82.3%	60.1%	43.7%
B4-31.1	LKD	30.0	264	Medium	70.9%	58.5%	47.4%	Medium	80.6%	56.2%	40.3%
B4-31.2	Bed	12.1	98	Fail	43.8%	26.0%	9.9%	Minimum	66.2%	31.0%	8.3%
B4-31.3	Bed	11.8	108	Medium	66.2%	52.4%	39.7%	Medium	79.6%	53.4%	37.3%
B4-32.1	LKD	23.1	205	Medium	70.7%	55.7%	36.7%	Medium	83.8%	61.0%	39.5%
B4-32.2	Bed	10.8	88	Minimum	60.4%	38.4%	7.1%	Minimum	78.2%	42.6%	5.7%
B4-33.1	LKD	32.1	286	Minimum	62.5%	42.6%	15.0%	Minimum	75.4%	34.5%	3.1%
B4-33.2	Bed	5.8	40	Minimum	62.3%	40.3%	10.2%	Minimum	78.4%	41.8%	5.7%
B4-33.3	Bed	9.6	80	Minimum	65.5%	45.8%	17.4%	Minimum	79.6%	47.7%	13.6%
B4-33.4	Bed	12.6	108	Minimum	54.5%	28.9%	1.5%	Minimum	73.6%	28.7%	0.1%
B5-34.1	LKD	28.2	260	Minimum	54.1%	41.4%	24.4%	Minimum	66.3%	32.7%	10.2%
B5-34.2	Bed	11.7	92	Minimum	63.3%	48.6%	34.9%	Medium	77.9%	51.1%	34.4%
B5-34.3	Bed	9.1	72	Minimum	64.3%	43.6%	13.8%	Minimum	79.0%	45.3%	8.8%
B5-35.1	LKD	23.0	189	Medium	64.9%	50.3%	38.5%	Minimum	64.9%	31.0%	8.7%

Block B - without trees - 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
B5-35.2	Bed	9.8	81	Medium	70.8%	57.5%	45.4%	Medium	82.0%	59.6%	43.7%
B5-36.1	LKD	30.0	264	High	74.4%	62.4%	51.7%	Medium	82.4%	60.7%	45.1%
B5-36.2	Bed	12.1	98	Fail	47.6%	31.5%	12.3%	Minimum	66.1%	32.5%	9.9%
B5-36.3	Bed	11.8	108	Medium	67.1%	53.4%	41.4%	Medium	79.3%	53.0%	36.4%
B5-37.1	LKD	23.1	205	Medium	75.8%	61.8%	45.6%	Medium	85.5%	64.4%	45.0%
B5-37.2	Bed	10.8	88	Minimum	60.8%	38.5%	7.7%	Minimum	78.4%	43.4%	6.1%
B5-38.1	LKD	32.1	286	Medium	68.8%	51.1%	29.1%	Minimum	78.6%	45.7%	16.4%
B5-38.2	Bed	5.8	40	Minimum	63.3%	42.4%	9.8%	Minimum	78.1%	41.6%	5.1%
B5-38.3	Bed	9.6	80	Minimum	65.2%	45.4%	17.8%	Minimum	79.3%	47.0%	12.7%
B5-38.4	Bed	12.6	108	Minimum	55.0%	30.6%	2.7%	Minimum	74.6%	30.5%	0.2%

Table 21: Block B - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Figure 43: Block C without trees - Daylight Provision & Annual Average Illuminance to habitable rooms

Third Floor



Fourth Floor

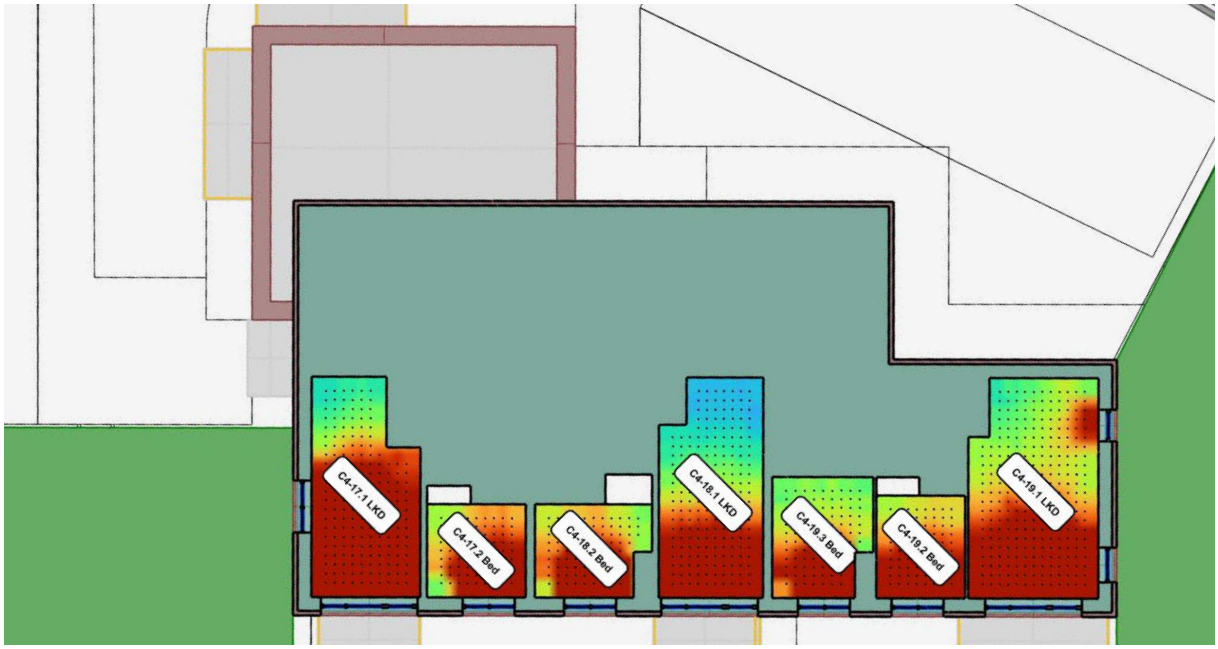


Figure 44: Block C without trees - Daylight Provision & Annual Average Illuminance to habitable rooms

Block C - without trees - 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
C0-01.1	LKD	28.2	260	Minimum	53.4%	32.1%	13.1%	Minimum	61.4%	17.4%	4.6%
C0-01.2	Bed	11.7	92	Minimum	56.2%	38.7%	23.9%	Minimum	71.1%	38.1%	18.4%
C0-01.3	Bed	9.1	72	Minimum	52.6%	18.7%	0.5%	Minimum	65.0%	5.0%	0.0%
C0-02.1	LKD	23.0	189	High	77.9%	67.2%	57.8%	Minimum	72.9%	45.3%	18.4%
C0-02.2	Bed	9.8	81	Medium	67.5%	52.9%	37.5%	Medium	79.2%	52.0%	32.9%
C0-03.1	LKD	23.1	205	Minimum	53.1%	35.3%	19.2%	Minimum	57.4%	16.8%	5.4%
C0-03.2	Bed	10.8	88	Medium	66.3%	51.5%	37.0%	Minimum	78.1%	48.4%	30.8%
C1-04.1	LKD	28.2	260	Minimum	55.6%	36.0%	14.0%	Minimum	63.3%	19.0%	4.5%
C1-04.2	Bed	11.7	92	Minimum	59.9%	43.2%	28.7%	Minimum	74.8%	44.2%	24.3%
C1-04.3	Bed	9.1	72	Minimum	57.3%	33.0%	3.3%	Minimum	70.9%	19.7%	0.0%
C1-05.1	LKD	23.0	189	High	78.6%	67.8%	58.6%	Minimum	74.6%	46.9%	20.6%
C1-05.2	Bed	9.8	81	Medium	69.9%	55.7%	41.5%	Medium	80.6%	55.7%	37.3%
C1-06.1	LKD	23.1	205	Minimum	55.8%	37.4%	20.8%	Minimum	60.8%	19.3%	5.8%
C1-06.2	Bed	10.8	88	Medium	68.4%	53.8%	39.0%	Medium	80.0%	54.3%	35.2%
C1-07.1	LKD	29.3	274	Medium	66.4%	50.7%	33.4%	Medium	78.8%	50.5%	25.9%
C1-07.2	Bed	9.7	80	Medium	70.8%	55.8%	42.0%	Medium	81.0%	56.2%	37.7%
C1-07.3	Bed	12.2	98	Minimum	62.1%	46.5%	30.4%	Minimum	77.9%	47.9%	27.9%
C2-08.1	LKD	28.2	260	Minimum	57.4%	39.3%	16.5%	Minimum	65.5%	23.1%	5.6%
C2-08.2	Bed	11.7	92	Minimum	61.7%	45.9%	30.3%	Minimum	77.1%	47.7%	27.9%
C2-08.3	Bed	9.1	72	Minimum	60.6%	39.2%	6.5%	Minimum	73.5%	28.3%	0.0%
C2-09.1	LKD	23.0	189	High	79.2%	68.7%	60.1%	Minimum	74.9%	47.2%	23.3%
C2-09.2	Bed	9.8	81	Medium	69.9%	55.8%	41.4%	Medium	80.8%	56.1%	38.1%
C2-10.1	LKD	23.1	205	Minimum	56.0%	37.7%	21.2%	Minimum	59.3%	18.4%	6.0%
C2-10.2	Bed	10.8	88	Medium	69.3%	54.8%	41.2%	Medium	79.6%	53.7%	34.2%
C2-11.1	LKD	29.3	274	Medium	67.0%	51.8%	34.6%	Medium	79.5%	52.2%	28.8%
C2-11.2	Bed	9.7	80	Medium	71.0%	56.4%	42.6%	Medium	81.1%	56.8%	38.4%
C2-11.3	Bed	12.2	98	Minimum	62.2%	46.3%	29.7%	Minimum	77.8%	48.5%	28.1%
C3-12.1	LKD	28.2	260	Minimum	61.8%	44.8%	26.1%	Minimum	68.5%	30.2%	8.4%
C3-12.2	Bed	11.7	92	Minimum	62.3%	46.8%	30.5%	Medium	78.4%	50.6%	30.3%
C3-12.3	Bed	9.1	72	Minimum	62.2%	42.4%	10.8%	Minimum	75.0%	34.2%	1.1%
C3-13.1	LKD	23.0	189	High	79.4%	69.2%	60.6%	Minimum	75.6%	48.0%	25.5%
C3-13.2	Bed	9.8	81	Medium	69.9%	55.7%	41.8%	Medium	81.1%	56.3%	38.7%
C3-14.1	LKD	23.1	205	Minimum	56.7%	38.8%	22.4%	Minimum	61.2%	19.4%	6.1%
C3-14.2	Bed	10.8	88	Medium	69.0%	54.8%	41.2%	Medium	79.8%	54.7%	36.1%
C3-15.1	LKD	29.3	274	Medium	67.8%	52.7%	36.2%	Medium	79.4%	52.2%	28.3%
C3-15.2	Bed	9.7	80	Medium	70.9%	56.6%	42.9%	Medium	80.7%	56.2%	38.5%
C3-15.3	Bed	12.2	98	Minimum	63.1%	47.9%	31.7%	Minimum	77.9%	49.2%	28.4%
C4-17.1	LKD	23.0	189	High	80.8%	71.7%	62.9%	Minimum	76.8%	49.5%	30.9%
C4-17.2	Bed	9.8	81	Medium	70.5%	56.6%	43.6%	Medium	81.0%	56.7%	39.3%
C4-18.1	LKD	23.1	205	Minimum	59.6%	42.3%	28.4%	Minimum	63.3%	25.0%	8.6%
C4-18.2	Bed	10.8	88	Medium	70.2%	55.8%	42.1%	Medium	80.7%	55.8%	37.4%
C4-19.1	LKD	29.3	274	Medium	69.8%	55.8%	40.5%	Medium	80.5%	54.6%	33.6%
C4-19.2	Bed	9.7	80	Medium	71.6%	57.5%	44.0%	Medium	81.7%	58.3%	41.4%
C4-19.3	Bed	12.2	98	Minimum	63.2%	48.2%	32.4%	Medium	78.6%	50.3%	30.0%

Table 22: Block C - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

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

Block A - with trees - 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
A0-01.1	LKD	28.2	260	Minimum	50.6%	28.5%	11.9%	Fail	49.1%	7.7%	1.6%
A0-01.2	Bed	11.7	92	Fail	13.0%	5.4%	2.0%	Fail	35.7%	4.1%	1.0%
A0-01.3	Bed	9.1	72	Minimum	59.4%	37.8%	9.3%	Minimum	76.5%	38.3%	6.6%
A0-02.1	LKD	23.1	205	Fail	28.0%	10.2%	5.3%	Fail	24.5%	2.2%	0.0%
A0-02.2	Bed	10.8	88	Fail	39.2%	22.7%	9.3%	Fail	49.5%	17.1%	6.3%
A0-03.1	LKD	31.6	271	Fail	40.5%	18.4%	6.4%	Fail	49.2%	7.5%	0.4%
A0-03.2	Bed	8.5	72	Fail	42.4%	26.0%	10.2%	Fail	49.4%	14.9%	4.2%
A0-03.3	Bed	12.2	102	Fail	34.0%	16.2%	7.6%	Fail	48.1%	14.6%	6.3%
A0-03.4	Bed	6.4	48	Minimum	50.9%	20.6%	0.4%	Minimum	70.3%	24.8%	0.2%
A0-04.1	LKD	29.3	274	Fail	18.9%	7.7%	4.3%	Fail	20.7%	3.5%	1.1%
A0-04.2	Bed	9.7	80	Fail	46.5%	27.6%	14.1%	Minimum	57.6%	19.0%	7.3%
A0-04.3	Bed	12.2	98	Fail	29.4%	11.1%	5.1%	Fail	39.0%	6.4%	2.9%
A0-05.1	LKD	23.0	189	Fail	13.1%	4.6%	2.6%	Fail	6.1%	0.5%	0.0%
A0-05.2	Bed	9.8	81	Fail	23.8%	6.3%	2.3%	Fail	40.0%	3.7%	0.7%
A1-06.1	LKD	28.2	260	Minimum	54.5%	35.3%	16.1%	Minimum	53.8%	9.1%	1.8%
A1-06.2	Bed	11.7	92	Fail	32.2%	11.5%	6.0%	Fail	44.3%	6.9%	2.7%
A1-06.3	Bed	9.1	72	Minimum	63.7%	44.4%	17.5%	Minimum	78.4%	46.3%	17.4%
A1-07.1	LKD	23.1	205	Fail	39.4%	21.1%	7.4%	Fail	30.6%	3.1%	0.5%
A1-07.2	Bed	10.8	88	Fail	48.8%	34.6%	20.3%	Minimum	62.0%	29.6%	10.1%
A1-08.1	LKD	31.6	271	Fail	49.1%	30.5%	9.1%	Minimum	56.1%	10.7%	1.1%
A1-08.2	Bed	8.5	72	Fail	46.2%	30.5%	11.5%	Minimum	60.2%	25.9%	5.1%
A1-08.3	Bed	12.2	102	Fail	46.9%	31.0%	15.2%	Minimum	60.0%	27.6%	8.6%
A1-08.4	Bed	6.4	48	Minimum	55.3%	30.8%	4.7%	Minimum	74.6%	35.8%	4.1%
A1-09.1	LKD	31.6	271	Fail	48.9%	31.0%	9.8%	Minimum	56.8%	12.3%	1.3%
A1-09.2	Bed	8.5	72	Fail	44.7%	29.3%	13.4%	Minimum	62.1%	28.4%	7.2%
A1-09.3	Bed	12.2	102	Fail	43.4%	29.0%	15.1%	Minimum	60.1%	28.8%	9.2%
A1-09.4	Bed	6.4	48	Minimum	54.3%	28.0%	3.8%	Minimum	69.8%	26.8%	1.0%
A1-10.1	LKD	23.1	205	Fail	36.5%	19.9%	7.9%	Fail	34.7%	4.8%	1.7%
A1-10.2	Bed	10.8	88	Fail	47.6%	30.4%	17.3%	Minimum	52.6%	20.0%	6.9%
A1-11.1	LKD	29.3	274	Minimum	59.4%	41.9%	19.5%	Minimum	68.4%	31.1%	6.3%
A1-11.2	Bed	9.7	80	Minimum	54.4%	29.6%	7.0%	Minimum	68.0%	27.2%	2.7%
A1-11.3	Bed	12.2	98	Fail	39.1%	10.5%	0.0%	Minimum	59.2%	10.7%	0.0%
A1-12.1	LKD	30.0	264	Fail	24.1%	8.5%	4.8%	Fail	30.8%	3.9%	1.6%
A1-12.2	Bed	12.1	98	Fail	19.5%	5.5%	2.6%	Fail	43.3%	4.3%	2.0%
A1-12.3	Bed	11.8	108	Minimum	52.8%	31.0%	14.6%	Minimum	67.7%	25.6%	7.5%
A1-13.1	LKD	23.0	189	Fail	37.7%	16.1%	7.5%	Fail	24.2%	3.7%	1.4%
A1-13.2	Bed	9.8	81	Minimum	59.2%	38.1%	21.3%	Minimum	77.5%	41.6%	19.8%
A1-14.1	LKD	23.0	189	Fail	38.6%	17.0%	6.6%	Fail	24.1%	3.4%	1.0%
A1-14.2	Bed	9.8	81	Minimum	55.6%	34.8%	18.2%	Minimum	74.3%	35.1%	13.6%
A1-15.1	LKD	23.0	189	Minimum	58.4%	41.3%	24.6%	Fail	47.0%	9.5%	1.2%
A1-15.2	Bed	9.8	81	Minimum	51.4%	30.7%	15.0%	Minimum	67.9%	26.6%	8.7%
A1-16.1	LKD	23.0	189	Fail	22.5%	8.7%	5.0%	Fail	10.9%	2.1%	0.2%
A1-16.2	Bed	9.8	81	Fail	43.2%	21.3%	8.2%	Minimum	55.0%	13.5%	4.3%
A1-17.1	LKD	29.3	274	Fail	25.6%	10.3%	5.4%	Fail	25.8%	4.4%	2.0%
A1-17.2	Bed	9.7	80	Minimum	54.6%	34.7%	20.7%	Minimum	71.0%	30.3%	11.7%
A1-17.3	Bed	12.2	98	Fail	42.2%	20.7%	8.5%	Minimum	56.3%	14.2%	5.1%
A1-18.1	LKD	29.3	274	Fail	26.1%	10.1%	5.5%	Fail	28.9%	4.5%	1.9%
A1-18.2	Bed	9.7	80	Minimum	50.3%	31.4%	13.4%	Minimum	67.8%	29.5%	10.2%

Block A - with trees - 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
A1-18.3	Bed	12.2	98	Fail	40.1%	20.8%	10.5%	Minimum	53.4%	14.2%	6.7%
A2-19.1	LKD	28.2	260	Minimum	63.5%	49.2%	35.6%	Minimum	64.3%	31.3%	9.6%
A2-19.2	Bed	11.7	92	Fail	48.5%	31.9%	14.5%	Minimum	61.0%	28.4%	8.6%
A2-19.3	Bed	9.1	72	Minimum	66.1%	48.2%	22.9%	Medium	79.2%	50.0%	21.3%
A2-20.1	LKD	23.1	205	Fail	49.3%	34.2%	17.1%	Fail	44.7%	7.3%	3.0%
A2-20.2	Bed	10.8	88	Minimum	57.1%	42.1%	28.2%	Minimum	70.5%	39.7%	20.4%
A2-21.1	LKD	31.6	271	Minimum	54.6%	37.9%	15.6%	Minimum	64.6%	28.4%	3.9%
A2-21.2	Bed	8.5	72	Minimum	51.0%	35.2%	17.7%	Minimum	66.9%	34.2%	11.5%
A2-21.3	Bed	12.2	102	Minimum	52.9%	37.4%	22.4%	Minimum	68.0%	36.6%	17.0%
A2-21.4	Bed	6.4	48	Minimum	57.4%	34.7%	6.9%	Minimum	76.1%	39.1%	7.5%
A2-22.1	LKD	31.6	271	Minimum	54.4%	37.5%	14.8%	Minimum	64.2%	26.4%	4.3%
A2-22.2	Bed	8.5	72	Minimum	50.9%	34.8%	17.7%	Minimum	67.7%	34.9%	13.2%
A2-22.3	Bed	12.2	102	Minimum	51.2%	33.1%	20.3%	Minimum	65.3%	33.9%	14.1%
A2-22.4	Bed	6.4	48	Minimum	57.0%	34.4%	7.4%	Minimum	72.3%	31.8%	1.9%
A2-23.1	LKD	23.1	205	Fail	43.3%	25.4%	12.5%	Fail	43.3%	6.1%	3.0%
A2-23.2	Bed	10.8	88	Minimum	51.4%	35.2%	20.4%	Minimum	60.7%	26.5%	8.9%
A2-24.1	LKD	29.3	274	Minimum	62.7%	45.6%	24.4%	Minimum	72.3%	36.1%	7.7%
A2-24.2	Bed	9.7	80	Minimum	56.9%	35.1%	10.0%	Minimum	71.1%	32.4%	5.2%
A2-24.3	Bed	12.2	98	Fail	42.5%	14.5%	0.2%	Minimum	61.1%	14.3%	0.0%
A2-25.1	LKD	30.0	264	Fail	29.4%	10.0%	5.2%	Fail	38.0%	4.5%	2.1%
A2-25.2	Bed	12.1	98	Fail	22.6%	7.1%	3.4%	Fail	48.7%	5.5%	2.1%
A2-25.3	Bed	11.8	108	Minimum	56.8%	35.8%	16.7%	Minimum	70.2%	31.1%	9.0%
A2-26.1	LKD	23.0	189	Fail	43.3%	19.8%	9.1%	Fail	32.5%	4.3%	2.4%
A2-26.2	Bed	9.8	81	Minimum	62.7%	43.6%	25.2%	Minimum	78.4%	45.6%	21.9%
A2-27.1	LKD	23.0	189	Fail	42.9%	20.3%	8.5%	Fail	29.8%	4.4%	1.6%
A2-27.2	Bed	9.8	81	Minimum	59.3%	38.6%	21.6%	Minimum	77.2%	42.6%	18.9%
A2-28.1	LKD	23.0	189	Medium	70.5%	56.8%	43.1%	Minimum	56.1%	14.9%	6.5%
A2-28.2	Bed	9.8	81	Minimum	59.2%	38.7%	22.6%	Minimum	74.5%	36.6%	15.5%
A2-29.1	LKD	23.0	189	Fail	46.9%	25.9%	12.3%	Fail	33.7%	6.1%	2.6%
A2-29.2	Bed	9.8	81	Minimum	58.2%	35.7%	21.3%	Minimum	75.2%	34.5%	15.7%
A2-30.1	LKD	29.3	274	Fail	34.7%	13.1%	7.5%	Fail	37.6%	5.8%	3.0%
A2-30.2	Bed	9.7	80	Minimum	62.8%	42.3%	26.5%	Minimum	75.5%	36.8%	16.3%
A2-30.3	Bed	12.2	98	Minimum	51.3%	28.9%	13.3%	Minimum	67.3%	22.8%	8.4%
A2-31.1	LKD	29.3	274	Fail	32.2%	12.2%	7.2%	Fail	40.6%	5.7%	2.7%
A2-31.2	Bed	9.7	80	Minimum	55.8%	36.6%	18.5%	Minimum	72.0%	34.5%	12.4%
A2-31.3	Bed	12.2	98	Fail	45.8%	25.3%	11.4%	Minimum	57.9%	16.6%	6.6%
A3-32.1	LKD	23.1	205	Minimum	58.2%	43.4%	31.0%	Minimum	59.7%	23.3%	7.1%
A3-32.2	Bed	10.8	88	Minimum	61.2%	45.8%	34.3%	Minimum	74.6%	43.1%	26.0%
A3-33.1	LKD	31.6	271	Minimum	62.6%	46.6%	30.9%	Minimum	72.3%	38.9%	12.9%
A3-33.2	Bed	8.5	72	Minimum	60.8%	46.2%	34.4%	Minimum	75.3%	45.3%	28.0%
A3-33.3	Bed	12.2	102	Minimum	57.0%	42.6%	29.7%	Minimum	74.0%	43.1%	24.7%
A3-33.4	Bed	6.4	48	Minimum	59.4%	37.9%	9.7%	Minimum	77.6%	43.1%	12.2%
A3-34.1	LKD	31.6	271	Minimum	59.2%	41.4%	24.1%	Minimum	68.4%	34.2%	6.2%
A3-34.2	Bed	8.5	72	Minimum	53.9%	38.4%	21.5%	Minimum	71.6%	39.5%	17.3%
A3-34.3	Bed	12.2	102	Minimum	54.3%	39.2%	23.2%	Minimum	68.9%	39.2%	18.1%
A3-34.4	Bed	6.4	48	Minimum	58.4%	36.1%	8.2%	Minimum	76.6%	38.9%	6.3%
A3-35.1	LKD	23.1	205	Fail	48.5%	33.4%	17.0%	Minimum	53.6%	13.6%	4.1%
A3-35.2	Bed	10.8	88	Minimum	54.7%	37.8%	24.6%	Minimum	63.7%	29.6%	11.4%
A3-36.1	LKD	29.3	274	Minimum	65.6%	48.8%	28.8%	Minimum	75.9%	43.5%	13.8%
A3-36.2	Bed	9.7	80	Minimum	60.0%	39.2%	13.2%	Minimum	74.3%	37.4%	8.0%

Block A - with trees - 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
A3-36.3	Bed	12.2	98	Fail	46.8%	17.5%	1.6%	Minimum	66.4%	21.7%	0.2%
A3-37.1	LKD	30.0	264	Fail	36.4%	12.4%	5.9%	Fail	45.8%	5.4%	3.0%
A3-37.2	Bed	12.1	98	Fail	25.5%	7.6%	4.0%	Minimum	53.2%	6.8%	2.3%
A3-37.3	Bed	11.8	108	Minimum	60.9%	40.8%	20.8%	Minimum	73.5%	36.1%	10.8%
A3-38.1	LKD	23.0	189	Minimum	51.9%	28.8%	14.1%	Fail	48.3%	7.6%	3.3%
A3-38.2	Bed	9.8	81	Minimum	66.7%	49.0%	30.7%	Minimum	79.7%	49.7%	25.8%
A3-39.1	LKD	23.0	189	Minimum	51.9%	28.9%	13.8%	Fail	45.7%	6.3%	3.2%
A3-39.2	Bed	9.8	81	Minimum	61.9%	42.6%	23.4%	Minimum	78.2%	44.7%	20.3%
A3-40.1	LKD	29.3	274	Fail	48.1%	25.9%	12.3%	Minimum	56.1%	11.5%	5.1%
A3-40.2	Bed	9.7	80	Minimum	65.6%	46.6%	29.0%	Minimum	78.0%	45.0%	20.9%
A3-40.3	Bed	12.2	98	Minimum	56.3%	33.4%	16.4%	Minimum	72.9%	30.6%	10.9%
A3-41.1	LKD	29.3	274	Fail	45.3%	24.2%	12.1%	Minimum	55.3%	11.6%	4.9%
A3-41.2	Bed	9.7	80	Minimum	55.4%	35.1%	17.0%	Minimum	73.5%	37.3%	12.3%
A3-41.3	Bed	12.2	98	Fail	49.3%	27.0%	11.3%	Minimum	61.8%	21.5%	6.8%
A4-42.1	LKD	31.6	271	Minimum	63.7%	48.2%	32.4%	Minimum	74.1%	41.4%	13.4%
A4-42.2	Bed	8.5	72	Minimum	61.2%	46.8%	33.8%	Minimum	74.8%	44.8%	29.3%
A4-42.3	Bed	12.2	102	Minimum	56.7%	42.0%	27.7%	Minimum	73.4%	42.3%	22.4%
A4-42.4	Bed	6.4	48	Minimum	60.0%	39.0%	10.3%	Minimum	77.8%	43.0%	8.9%
A4-43.1	LKD	23.1	205	Minimum	51.0%	35.4%	19.8%	Minimum	57.1%	17.1%	4.9%
A4-43.2	Bed	10.8	88	Minimum	56.7%	39.7%	28.0%	Minimum	68.0%	34.7%	15.9%
A4-44.1	LKD	29.3	274	Medium	67.1%	51.3%	32.4%	Minimum	77.6%	47.2%	19.3%
A4-44.2	Bed	9.7	80	Minimum	61.1%	41.2%	14.9%	Minimum	76.9%	41.8%	12.4%
A4-44.3	Bed	12.2	98	Minimum	51.5%	23.5%	2.6%	Minimum	69.1%	25.5%	0.8%
A4-45.1	LKD	30.0	264	Fail	40.7%	15.1%	6.5%	Minimum	51.6%	6.2%	3.3%
A4-45.2	Bed	12.1	98	Fail	26.5%	7.8%	4.1%	Minimum	55.5%	7.2%	2.6%
A4-45.3	Bed	11.8	108	Minimum	62.2%	42.7%	22.4%	Minimum	75.6%	39.7%	14.0%
A4-46.1	LKD	23.0	189	High	74.6%	61.7%	51.3%	Minimum	68.7%	36.3%	13.3%
A4-46.2	Bed	9.8	81	Minimum	61.4%	43.6%	26.6%	Minimum	75.7%	43.9%	20.8%
A5-47.1	LKD	23.1	205	Minimum	58.0%	42.5%	30.8%	Minimum	63.2%	28.9%	8.2%
A5-47.2	Bed	10.8	88	Minimum	62.3%	46.2%	33.7%	Minimum	74.2%	43.6%	26.7%
A5-48.1	LKD	29.3	274	Medium	72.0%	57.9%	41.6%	Medium	80.0%	52.8%	28.2%
A5-48.2	Bed	9.7	80	Minimum	63.6%	44.4%	18.0%	Minimum	77.8%	45.5%	14.9%
A5-48.3	Bed	12.2	98	Minimum	54.5%	27.8%	4.0%	Minimum	72.9%	31.8%	2.4%
A5-49.1	LKD	30.0	264	Fail	49.4%	24.5%	10.6%	Minimum	58.7%	10.8%	4.5%
A5-49.2	Bed	12.1	98	Fail	32.3%	11.0%	4.9%	Minimum	60.4%	11.5%	3.9%
A5-49.3	Bed	11.8	108	Minimum	63.5%	45.6%	23.1%	Minimum	76.8%	43.4%	15.9%
A5-50.1	LKD	23.0	189	High	76.9%	65.7%	55.2%	Minimum	71.2%	41.2%	14.2%
A5-50.3	Bed	9.8	81	Minimum	65.8%	49.8%	32.4%	Medium	80.1%	52.9%	30.8%

Table 23: Block A - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Block B - with trees - 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
B0-01.1	LKD	23.1	205	Fail	33.8%	12.8%	5.7%	Fail	30.4%	2.1%	0.2%
B0-01.2	Bed	10.8	88	Minimum	50.1%	35.3%	20.7%	Minimum	61.6%	29.2%	11.2%
B0-02.1	LKD	23.1	189	Fail	40.3%	20.8%	9.3%	Fail	35.8%	4.1%	0.7%
B0-02.2	Bed	9.8	81	Minimum	53.7%	40.1%	27.7%	Minimum	65.4%	36.5%	15.7%
B0-03.1	LKD	23.0	189	Fail	48.9%	35.3%	19.2%	Fail	41.0%	8.4%	2.0%
B0-03.2	Bed	9.8	81	Minimum	61.4%	47.4%	35.3%	Minimum	74.1%	44.6%	29.9%
B0-04.1	LKD	31.6	271	Fail	42.1%	19.0%	6.3%	Minimum	55.8%	6.3%	0.0%
B0-04.2	Bed	8.5	72	Fail	38.0%	19.9%	8.3%	Minimum	53.2%	16.5%	7.0%
B0-04.3	Bed	12.2	102	Fail	25.3%	10.6%	5.6%	Fail	44.1%	10.7%	4.4%
B0-04.4	Bed	7.1	56	Fail	41.1%	10.0%	0.1%	Minimum	58.4%	4.3%	0.0%
B1-05.2	Bed	11.7	92	Fail	49.3%	33.9%	17.7%	Minimum	61.0%	29.7%	9.6%
B1-05.3	Bed	9.1	72	Minimum	54.1%	26.9%	2.4%	Minimum	67.2%	11.0%	0.0%
B1-06.1	LKD	23.0	189	Fail	43.3%	26.0%	9.8%	Fail	35.0%	3.8%	0.8%
B1-06.2	Bed	9.8	81	Minimum	60.2%	46.3%	33.9%	Minimum	69.9%	41.3%	22.6%
B1-07.1	LKD	30.0	264	Medium	63.8%	50.8%	34.3%	Minimum	75.3%	46.3%	20.8%
B1-07.2	Bed	12.1	98	Fail	38.5%	18.3%	7.2%	Minimum	52.4%	16.0%	3.7%
B1-07.3	Bed	11.8	108	Minimum	58.3%	43.4%	31.9%	Minimum	68.0%	38.6%	19.0%
B1-08.1	LKD	23.1	205	Minimum	62.2%	45.7%	23.9%	Minimum	77.8%	48.2%	23.3%
B1-08.2	Bed	10.8	88	Minimum	51.9%	24.0%	0.3%	Minimum	68.0%	20.5%	0.1%
B1-09.1	LKD	32.1	286	Fail	44.4%	11.7%	0.2%	Minimum	63.4%	7.0%	0.0%
B1-09.2	Bed	5.8	40	Minimum	56.0%	32.6%	4.6%	Minimum	66.8%	20.3%	0.1%
B1-09.3	Bed	9.6	80	Minimum	55.8%	32.9%	4.4%	Minimum	73.2%	33.5%	0.8%
B1-09.4	Bed	12.6	108	Fail	44.7%	13.2%	0.0%	Minimum	64.5%	10.9%	0.0%
B1-10.1	LKD	31.6	271	Minimum	60.7%	43.1%	19.1%	Minimum	66.4%	23.0%	2.6%
B1-10.2	Bed	8.5	72	Fail	42.6%	24.4%	9.7%	Minimum	55.0%	17.6%	5.5%
B1-10.3	Bed	12.2	102	Fail	40.9%	22.2%	9.7%	Minimum	56.5%	19.3%	6.2%
B1-10.4	Bed	6.4	48	Minimum	57.1%	36.3%	10.3%	Minimum	71.7%	31.6%	2.9%
B1-11.1	LKD	23.1	205	Fail	29.5%	11.5%	6.1%	Fail	23.0%	2.5%	0.0%
B1-11.2	Bed	10.8	88	Fail	47.9%	29.8%	15.0%	Minimum	62.5%	26.1%	10.6%
B1-12.1	LKD	36.1	345	Fail	48.9%	31.2%	13.3%	Minimum	59.2%	23.1%	7.9%
B1-12.2	Bed	5.7	41	Minimum	51.5%	32.9%	19.5%	Minimum	55.9%	18.9%	6.0%
B1-12.3	Bed	12.7	107	Fail	24.8%	8.3%	4.7%	Fail	38.9%	6.7%	3.1%
B1-12.4	Bed	12.6	102	Fail	25.2%	0.2%	0.0%	Fail	26.5%	0.0%	0.0%
B2-13.1	LKD	28.2	260	Fail	36.6%	13.3%	4.9%	Fail	37.5%	4.8%	1.0%
B2-13.2	Bed	11.7	92	Minimum	52.8%	37.6%	21.4%	Minimum	67.8%	36.8%	15.8%
B2-13.3	Bed	9.1	72	Minimum	56.5%	32.4%	5.2%	Minimum	71.9%	22.2%	0.0%
B2-14.1	LKD	23.0	189	Fail	49.9%	33.5%	17.9%	Fail	40.3%	5.4%	1.8%
B2-14.2	Bed	9.8	81	Minimum	63.2%	49.0%	36.6%	Minimum	75.4%	46.5%	30.7%
B2-15.1	LKD	30.0	264	Medium	65.3%	51.9%	39.7%	Minimum	76.1%	48.7%	27.9%
B2-15.2	Bed	12.1	98	Fail	40.5%	20.5%	8.1%	Minimum	57.3%	18.3%	4.4%
B2-15.3	Bed	11.8	108	Minimum	60.6%	46.3%	34.5%	Minimum	72.0%	41.2%	23.9%
B2-16.1	LKD	23.1	205	Minimum	65.4%	48.9%	28.9%	Medium	79.4%	51.6%	28.7%
B2-16.2	Bed	10.8	88	Minimum	54.1%	29.6%	2.9%	Minimum	71.8%	29.7%	0.7%
B2-17.1	LKD	32.1	286	Minimum	51.3%	24.3%	2.3%	Minimum	67.0%	17.1%	1.2%
B2-17.2	Bed	5.8	40	Minimum	57.1%	34.1%	4.9%	Minimum	70.9%	24.8%	0.2%
B2-17.3	Bed	9.6	80	Minimum	58.6%	37.9%	9.1%	Minimum	75.4%	36.9%	4.2%
B2-17.4	Bed	12.6	108	Fail	48.7%	19.7%	0.2%	Minimum	66.5%	19.0%	0.0%
B2-18.1	LKD	31.6	271	Medium	67.5%	52.4%	32.9%	Minimum	73.5%	35.8%	4.4%
B2-18.2	Bed	8.5	72	Fail	49.4%	31.2%	15.7%	Minimum	66.2%	30.7%	11.0%
B2-18.3	Bed	12.2	102	Minimum	50.6%	30.9%	16.9%	Minimum	65.3%	29.2%	12.7%

Block B - with trees - 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
B2-18.4	Bed	6.4	48	Minimum	60.8%	41.6%	16.2%	Minimum	74.3%	37.1%	5.4%
B2-19.1	LKD	23.1	205	Fail	42.6%	25.3%	11.9%	Fail	35.2%	5.4%	1.6%
B2-19.2	Bed	10.8	88	Minimum	56.1%	39.8%	24.7%	Minimum	72.6%	37.7%	18.2%
B2-20.1	LKD	36.1	345	Minimum	59.3%	44.4%	30.8%	Minimum	64.8%	33.0%	11.1%
B2-20.2	Bed	5.7	41	Minimum	58.6%	40.4%	26.4%	Minimum	70.7%	35.0%	16.6%
B2-20.3	Bed	12.7	107	Fail	34.4%	15.7%	7.7%	Minimum	53.5%	15.2%	5.3%
B2-20.4	Bed	12.6	102	Fail	32.6%	1.7%	0.0%	Fail	32.7%	0.0%	0.0%
B3-21.1	LKD	28.2	260	Fail	42.7%	23.3%	7.9%	Fail	46.8%	7.5%	2.7%
B3-21.2	Bed	11.7	92	Minimum	55.3%	40.3%	25.3%	Minimum	71.9%	39.5%	19.5%
B3-21.3	Bed	9.1	72	Minimum	58.8%	36.5%	6.9%	Minimum	74.3%	30.0%	0.6%
B3-22.1	LKD	23.0	189	Minimum	54.4%	40.2%	23.7%	Fail	46.3%	7.5%	3.1%
B3-22.2	Bed	9.8	81	Medium	66.1%	52.1%	40.5%	Medium	77.6%	50.1%	35.4%
B3-23.1	LKD	30.0	264	Medium	68.5%	55.9%	42.6%	Medium	78.8%	53.7%	33.1%
B3-23.2	Bed	12.1	98	Fail	41.3%	21.6%	8.5%	Minimum	57.4%	20.6%	5.2%
B3-23.3	Bed	11.8	108	Minimum	62.1%	47.9%	35.8%	Minimum	74.4%	44.0%	29.1%
B3-24.1	LKD	23.1	205	Medium	67.2%	51.7%	33.8%	Medium	80.9%	55.8%	33.6%
B3-24.2	Bed	10.8	88	Minimum	56.3%	33.4%	5.0%	Minimum	73.2%	33.2%	2.7%
B3-25.1	LKD	32.1	286	Minimum	58.2%	35.6%	9.2%	Minimum	71.2%	27.6%	2.4%
B3-25.2	Bed	5.8	40	Minimum	60.5%	38.3%	8.9%	Minimum	73.4%	32.1%	0.8%
B3-25.3	Bed	9.6	80	Minimum	61.1%	40.5%	13.6%	Minimum	76.9%	40.7%	7.8%
B3-25.4	Bed	12.6	108	Minimum	51.7%	23.7%	0.7%	Minimum	69.1%	22.9%	0.1%
B3-26.1	LKD	31.6	271	Medium	70.6%	56.2%	38.9%	Minimum	76.2%	41.4%	6.6%
B3-26.2	Bed	8.5	72	Minimum	59.2%	42.1%	28.5%	Minimum	73.3%	40.2%	21.8%
B3-26.3	Bed	12.2	102	Minimum	55.9%	37.9%	24.4%	Minimum	73.3%	39.1%	20.0%
B3-26.4	Bed	6.4	48	Minimum	62.0%	42.9%	17.7%	Minimum	77.1%	43.2%	10.4%
B3-27.1	LKD	23.1	205	Minimum	55.6%	38.7%	24.9%	Minimum	57.9%	18.3%	6.8%
B3-27.2	Bed	10.8	88	Minimum	61.2%	44.7%	29.1%	Minimum	77.1%	45.0%	25.5%
B3-28.1	LKD	36.1	345	Medium	68.1%	55.0%	41.2%	Minimum	77.0%	47.9%	32.6%
B3-28.2	Bed	5.7	41	Minimum	64.1%	48.3%	33.9%	Minimum	76.2%	43.4%	26.1%
B3-28.3	Bed	12.7	107	Fail	39.7%	21.1%	9.3%	Minimum	62.8%	24.3%	7.3%
B3-28.4	Bed	12.6	102	Fail	36.9%	4.4%	0.0%	Fail	37.5%	0.0%	0.0%
B4-29.1	LKD	28.2	260	Fail	46.0%	25.9%	9.7%	Minimum	55.9%	15.3%	4.5%
B4-29.2	Bed	11.7	92	Minimum	58.1%	42.0%	29.9%	Minimum	74.2%	42.6%	25.8%
B4-29.3	Bed	9.1	72	Minimum	61.9%	40.5%	11.6%	Minimum	76.9%	37.3%	4.0%
B4-30.1	LKD	23.0	189	Minimum	57.5%	42.9%	26.6%	Minimum	54.3%	13.5%	4.3%
B4-30.2	Bed	9.8	81	Medium	67.5%	53.3%	41.5%	Medium	80.6%	55.0%	39.4%
B4-31.1	LKD	30.0	264	Medium	69.6%	57.0%	46.1%	Medium	79.7%	54.8%	38.4%
B4-31.2	Bed	12.1	98	Fail	42.0%	23.2%	8.9%	Minimum	61.9%	25.4%	6.4%
B4-31.3	Bed	11.8	108	Medium	64.6%	50.2%	37.1%	Minimum	75.9%	47.1%	31.4%
B4-32.1	LKD	23.1	205	Medium	70.0%	55.5%	36.7%	Medium	81.8%	58.0%	36.9%
B4-32.2	Bed	10.8	88	Minimum	57.9%	36.4%	7.9%	Minimum	75.6%	37.1%	2.5%
B4-33.1	LKD	32.1	286	Minimum	61.9%	42.4%	15.6%	Minimum	73.4%	32.7%	3.1%
B4-33.2	Bed	5.8	40	Minimum	60.3%	38.7%	8.6%	Minimum	76.3%	36.1%	3.3%
B4-33.3	Bed	9.6	80	Minimum	62.7%	42.4%	14.6%	Minimum	77.9%	44.0%	10.5%
B4-33.4	Bed	12.6	108	Minimum	53.3%	27.1%	1.3%	Minimum	71.5%	25.9%	0.3%
B5-34.1	LKD	28.2	260	Minimum	52.2%	37.8%	22.2%	Minimum	63.9%	30.5%	8.6%
B5-34.2	Bed	11.7	92	Minimum	59.8%	44.9%	31.8%	Minimum	75.8%	46.9%	30.0%
B5-34.3	Bed	9.1	72	Minimum	63.9%	44.5%	15.6%	Minimum	77.6%	42.1%	6.6%
B5-35.1	LKD	23.0	189	Minimum	62.4%	47.1%	35.7%	Minimum	61.7%	25.0%	7.0%
B5-35.2	Bed	9.8	81	Medium	68.3%	54.5%	42.5%	Medium	81.2%	55.8%	40.7%

Block B - with trees - 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
B5-36.1	LKD	30.0	264	High	73.9%	61.8%	51.1%	Medium	81.6%	59.2%	43.5%
B5-36.2	Bed	12.1	98	Fail	45.0%	30.0%	11.6%	Minimum	64.1%	29.5%	8.5%
B5-36.3	Bed	11.8	108	Medium	64.8%	50.5%	37.2%	Minimum	76.9%	48.6%	32.5%
B5-37.1	LKD	23.1	205	Medium	75.0%	61.5%	46.1%	Medium	84.5%	63.3%	45.0%
B5-37.2	Bed	10.8	88	Minimum	58.6%	37.9%	8.4%	Minimum	77.7%	43.1%	7.1%
B5-38.1	LKD	32.1	286	Medium	68.3%	50.8%	29.7%	Minimum	78.2%	45.8%	16.8%
B5-38.2	Bed	5.8	40	Minimum	63.0%	42.5%	11.1%	Minimum	77.1%	39.2%	4.6%
B5-38.3	Bed	9.6	80	Minimum	64.5%	45.3%	17.8%	Minimum	78.5%	45.3%	12.7%
B5-38.4	Bed	12.6	108	Minimum	55.5%	31.5%	3.0%	Minimum	73.1%	29.4%	0.3%

Table 24: Block B - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Block C - with trees - 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
C0-01.1	LKD	28.2	260	Fail	30.9%	9.1%	4.0%	Fail	32.7%	2.2%	0.0%
C0-01.2	Bed	11.7	92	Fail	14.2%	5.9%	3.1%	Fail	34.7%	5.4%	2.6%
C0-01.3	Bed	9.1	72	Minimum	51.9%	18.7%	0.0%	Minimum	65.0%	5.1%	0.0%
C0-02.1	LKD	23.0	189	Fail	31.6%	5.9%	3.3%	Fail	34.5%	2.9%	0.2%
C0-02.2	Bed	9.8	81	Fail	7.0%	1.0%	0.0%	Fail	33.1%	0.3%	0.0%
C0-03.1	LKD	23.1	205	Fail	2.1%	0.2%	0.0%	Fail	5.0%	0.0%	0.0%
C0-03.2	Bed	10.8	88	Fail	11.0%	3.3%	0.4%	Fail	27.0%	0.5%	0.0%
C1-04.1	LKD	28.2	260	Fail	41.8%	18.2%	6.5%	Fail	39.8%	3.9%	0.0%
C1-04.2	Bed	11.7	92	Fail	29.4%	13.9%	6.5%	Fail	44.9%	11.0%	4.5%
C1-04.3	Bed	9.1	72	Minimum	57.0%	32.2%	3.2%	Minimum	71.3%	20.3%	0.0%
C1-05.1	LKD	23.0	189	Fail	35.3%	11.5%	5.5%	Fail	28.9%	4.5%	0.4%
C1-05.2	Bed	9.8	81	Fail	8.2%	3.2%	0.3%	Fail	31.8%	2.4%	0.0%
C1-06.1	LKD	23.1	205	Fail	1.1%	0.0%	0.0%	Fail	1.1%	0.0%	0.0%
C1-06.2	Bed	10.8	88	Fail	11.1%	3.7%	1.0%	Fail	29.6%	2.4%	0.3%
C1-07.1	LKD	29.3	274	Fail	32.1%	6.3%	0.0%	Minimum	61.6%	8.4%	0.0%
C1-07.2	Bed	9.7	80	Fail	9.8%	3.1%	0.3%	Fail	31.0%	2.1%	0.0%
C1-07.3	Bed	12.2	98	Fail	4.0%	0.9%	0.0%	Fail	17.5%	0.3%	0.0%
C2-08.1	LKD	28.2	260	Minimum	51.1%	28.1%	9.2%	Minimum	53.8%	8.0%	1.3%
C2-08.2	Bed	11.7	92	Fail	43.2%	27.6%	14.4%	Minimum	55.6%	21.7%	7.7%
C2-08.3	Bed	9.1	72	Minimum	59.2%	37.2%	6.0%	Minimum	73.6%	28.8%	0.1%
C2-09.1	LKD	23.0	189	Fail	49.3%	28.6%	9.1%	Fail	38.2%	6.2%	0.7%
C2-09.2	Bed	9.8	81	Fail	12.7%	5.3%	2.1%	Fail	34.9%	4.3%	1.8%
C2-10.1	LKD	23.1	205	Fail	3.7%	0.0%	0.0%	Fail	1.5%	0.0%	0.0%
C2-10.2	Bed	10.8	88	Fail	16.8%	5.7%	2.6%	Fail	31.7%	4.7%	1.1%
C2-11.1	LKD	29.3	274	Fail	35.5%	9.5%	1.7%	Minimum	61.4%	9.8%	0.0%
C2-11.2	Bed	9.7	80	Fail	15.7%	6.0%	2.6%	Fail	30.1%	3.8%	1.2%
C2-11.3	Bed	12.2	98	Fail	6.7%	2.4%	0.5%	Fail	20.3%	1.8%	0.0%
C3-12.1	LKD	28.2	260	Minimum	56.0%	35.2%	13.8%	Minimum	61.9%	16.2%	3.7%
C3-12.2	Bed	11.7	92	Minimum	52.5%	34.1%	21.6%	Minimum	69.4%	33.7%	16.0%
C3-12.3	Bed	9.1	72	Minimum	61.5%	40.9%	10.2%	Minimum	75.1%	32.7%	0.8%
C3-13.1	LKD	23.0	189	Minimum	58.5%	43.4%	25.8%	Fail	47.1%	8.4%	2.6%
C3-13.2	Bed	9.8	81	Fail	23.7%	10.5%	5.2%	Fail	42.7%	10.6%	4.1%
C3-14.1	LKD	23.1	205	Fail	7.6%	2.7%	0.2%	Fail	6.3%	0.0%	0.0%
C3-14.2	Bed	10.8	88	Fail	26.3%	12.3%	5.9%	Fail	37.1%	6.5%	3.9%
C3-15.1	LKD	29.3	274	Fail	42.8%	18.9%	4.8%	Minimum	64.7%	17.4%	2.5%
C3-15.2	Bed	9.7	80	Fail	26.0%	10.8%	6.0%	Fail	39.6%	7.9%	3.6%
C3-15.3	Bed	12.2	98	Fail	12.7%	5.6%	3.3%	Fail	27.9%	4.5%	0.9%
C4-17.1	LKD	23.0	189	Medium	71.3%	59.4%	47.9%	Minimum	58.6%	19.8%	5.8%
C4-17.2	Bed	9.8	81	Fail	43.3%	26.2%	14.1%	Minimum	58.3%	22.4%	8.7%
C4-18.1	LKD	23.1	205	Fail	31.7%	15.3%	7.1%	Fail	30.2%	5.1%	0.8%
C4-18.2	Bed	10.8	88	Fail	44.3%	27.7%	14.3%	Minimum	53.5%	17.6%	6.6%
C4-19.1	LKD	29.3	274	Minimum	57.6%	37.1%	21.4%	Minimum	73.5%	35.3%	12.2%
C4-19.2	Bed	9.7	80	Fail	46.0%	29.9%	15.1%	Minimum	53.3%	18.8%	6.8%
C4-19.3	Bed	12.2	98	Fail	29.8%	14.4%	6.3%	Fail	42.6%	9.6%	4.6%

Table 25: Block C - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Appendix D - Sunlight Hours to living spaces within the Proposed Development

Block A - Sunlight Hours					
Unit ID	LKD window within 90° South	No. sunlight hours on 21st March	BRE Recommendation	No. sunlight hours on 21st March	BRE Recommendation
		Model with trees		Model without trees	
A0-01.1	Yes	5.3	High	8.6	High
A0-02.1	Yes	5.8	High	8.1	High
A0-03.1	Yes	6.4	High	7.3	High
A0-04.1	Yes	1.3	Below criteria	3.7	Medium
A0-05.1	Yes	0.0	Below criteria	4.5	High
A1-06.1	Yes	7.3	High	8.7	High
A1-07.1	Yes	8.6	High	8.6	High
A1-08.1	Yes	7.9	High	7.9	High
A1-09.1	Yes	7.3	High	7.3	High
A1-10.1	Yes	5.7	High	5.7	High
A1-11.1	No	3.1	Medium	3.4	Medium
A1-12.1	No	2.3	Minimum	3.4	Medium
A1-13.1	No	3.4	Medium	4.8	High
A1-14.1	No	3.2	Medium	4.7	High
A1-15.1	Yes	5.3	High	5.6	High
A1-16.1	Yes	1.8	Minimum	4.8	High
A1-17.1	Yes	2.3	Minimum	3.5	Medium
A1-18.1	Yes	2.7	Minimum	3.7	Medium
A2-19.1	Yes	8.7	High	8.7	High
A2-20.1	Yes	9.1	High	9.1	High
A2-21.1	Yes	8.5	High	8.5	High
A2-22.1	Yes	7.9	High	7.9	High
A2-23.1	Yes	6.1	High	6.1	High
A2-24.1	No	3.3	Medium	3.6	Medium
A2-25.1	No	2.8	Minimum	3.6	Medium
A2-26.1	No	4.0	High	4.9	High
A2-27.1	No	3.7	Medium	4.9	High
A2-28.1	Yes	5.6	High	5.6	High
A2-29.1	Yes	3.8	Medium	5.1	High
A2-30.1	Yes	3.1	Medium	3.7	Medium
A2-31.1	Yes	3.3	Medium	3.8	Medium
A3-32.1	Yes	9.2	High	9.2	High
A3-33.1	Yes	8.5	High	8.5	High
A3-34.1	Yes	8.1	High	8.1	High
A3-35.1	Yes	6.1	High	6.1	High
A3-36.1	No	3.5	Medium	3.6	Medium
A3-37.1	No	4.4	High	4.9	High
A3-38.1	No	4.4	High	4.9	High
A3-39.1	No	4.3	High	4.9	High
A3-40.1	Yes	4.9	High	5.1	High
A3-41.1	Yes	5.0	High	5.1	High
A4-42.1	Yes	8.1	High	8.1	High
A4-43.1	Yes	6.3	High	6.3	High
A4-44.1	No	3.6	Medium	3.6	Medium
A4-45.1	No	4.9	High	4.9	High
A4-46.1	Yes	5.1	High	5.1	High
A5-47.1	Yes	7.3	High	7.3	High
A5-48.1	No	4.9	High	4.9	High
A5-49.1	No	4.9	High	4.9	High
A5-50.1	Yes	5.1	High	5.1	High

Table 26: Sunlight hours to living spaces

Block B - Sunlight Hours					
Unit ID	LKD window within 90° South	No. sunlight hours on 21st March	BRE Recommendation	No. sunlight hours on 21st March	BRE Recommendation
		Model with trees		Model without trees	
B0-01.1	Yes	7.1	High	9.1	High
B0-02.1	Yes	7.4	High	8.8	High
B0-03.1	Yes	7.5	High	8.2	High
B0-04.1	Yes	3.6	Medium	4.7	High
B1-05.1	Yes	8.6	High	8.7	High
B1-06.1	Yes	8.8	High	8.8	High
B1-07.1	Yes	7.2	High	7.2	High
B1-08.1	Yes	2.9	Minimum	2.9	Minimum
B1-09.1	No	0.0	Below criteria	0.0	Below criteria
B1-10.1	Yes	5.0	High	5.0	High
B1-11.1	Yes	5.7	High	6.5	High
B1-12.1	Yes	3.0	Medium	5.2	High
B2-13.1	Yes	8.7	High	8.7	High
B2-14.1	Yes	9.0	High	9.0	High
B2-15.1	Yes	8.2	High	8.2	High
B2-16.1	Yes	3.7	Medium	3.7	Medium
B2-17.1	No	0.0	Below criteria	0.0	Below criteria
B2-18.1	Yes	5.1	High	5.3	High
B2-19.1	Yes	6.8	High	6.8	High
B2-20.1	Yes	4.0	High	5.5	High
B3-21.1	Yes	8.7	High	8.7	High
B3-22.1	Yes	9.0	High	9.0	High
B3-23.1	Yes	7.8	High	7.8	High
B3-24.1	Yes	5.0	High	5.0	High
B3-25.1	No	0.0	Below criteria	0.0	Below criteria
B3-26.1	Yes	6.7	High	6.9	High
B3-27.1	Yes	7.6	High	7.6	High
B3-28.1	Yes	7.5	High	7.6	High
B4-29.1	Yes	8.7	High	8.7	High
B4-30.1	Yes	9.0	High	9.0	High
B4-31.1	Yes	9.2	High	9.2	High
B4-32.1	Yes	5.0	High	5.0	High
B4-33.1	No	0.8	Below criteria	0.8	Below criteria
B5-34.1	Yes	8.7	High	8.7	High
B5-35.1	Yes	9.0	High	9.0	High
B5-36.1	Yes	7.8	High	7.8	High
B5-37.1	Yes	5.0	High	5.0	High
B5-38.1	No	0.0	Below criteria	0.0	Below criteria

Table 27: Sunlight hours to living spaces

Block C - Sunlight Hours					
Unit ID	LKD window within 90° South	No. sunlight hours on 21st March	BRE Recommendation	No. sunlight hours on 21st March	BRE Recommendation
		Model with trees		Model without trees	
C0-01.1	Yes	0.9	Below criteria	5.3	High
C0-02.1	Yes	0.4	Below criteria	7.3	High
C0-03.1	Yes	0.6	Below criteria	7.0	High
C1-04.1	Yes	3.0	Medium	5.0	High
C1-05.1	Yes	0.3	Below criteria	6.4	High
C1-06.1	Yes	0.9	Below criteria	6.1	High
C1-07.1	Yes	0.3	Below criteria	5.1	High
C2-08.1	Yes	4.7	High	5.1	High
C2-09.1	Yes	0.8	Below criteria	6.4	High
C2-10.1	Yes	1.3	Below criteria	6.1	High
C2-11.1	Yes	0.3	Below criteria	5.1	High
C3-12.1	Yes	6.7	High	6.7	High
C3-13.1	Yes	1.6	Minimum	6.4	High
C3-14.1	Yes	1.8	Minimum	6.1	High
C3-15.1	Yes	1.0	Below criteria	5.1	High
C4-17.1	Yes	4.4	High	7.5	High
C4-18.1	Yes	4.0	High	7.5	High
C4-19.1	Yes	5.2	High	7.5	High

Table 28: Sunlight hours to living spaces