Daylight & Sunlight Assessments of a Proposed Part 8 Residential Development, Kishoge, Lucan, Co. Dublin.

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1. Introduction

This Proposed Part 8 Residential Development at Kishoge, Lucan, Co. Dublin consists of:

i 118 no. residential units in a mix of two storey houses, 3 storey duplex units and apartment blocks of 4 – 6 storeys comprising 26 no. 1 bed apartments; 42 no. 2 bed apartments; 21 no. 3 bed apartments; 23 no. 3 bed houses; and 6 no. 4 bed houses, with renewable energy design measures (which may be provided externally) for each housing unit;

ii Landscaping works including provision of (a) communal open space areas (b) outdoor sports and play areas; (c) new pedestrian and cycle connections; and (d) civic plaza;

iii Associated site and infrastructural works including provision for (a) ESB substations and switchrooms; (b) energy centre to the rear of 6 storey block; (c) photovoltaic panels; (d) car and bicycle parking; (e) public lighting; (f) bin storage; (g) temporary construction signage; (h) estate signage; and (i) varied site boundary treatment comprising walls and fencing; and

iv all associated site development works.

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 McCrossan O'Rourke Manning Architects.

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

There will be minimal reduction to the available daylight and sunlight levels to the adjacent dwellings. The results find that any impact on the adjacent residential structures would be imperceivable. All areas assessed continue to meet or exceed the recommendations of the BRE guidelines (2022).

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.

The BRE Guidelines 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 no existing mature trees within the vicinity of any of the proposed units that would influence the daylight levels and the assessment is carried out without any trees.

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

100% 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 NA1. These are the minimum values, per specified use, to be achieved in habitable rooms and meets the recommendations of the BRE guidelines.

1.3.2 Sunlight Within the Proposed Development

This scheme is well designed for sunlight with 94.4% 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 1 in 5 achieves the target sunlight hours.

All of the proposed public and communal amenity spaces achieve sunlight levels that exceed 2 hours sunlight over 50% of the amenity space on the 21st March. 76.5% of private amenity spaces (rear gardens) achieve the target sunlight levels set out in BR209:2022 (third edition). The private amenity space is well considered and designed.

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 100% of rooms achieving Minimum Illuminance and 98.1% 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.

1.5 Conclusions

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 in 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 (Third edition), also referred to as The BRE guidelines BR209:2022 (third edition).
- BS EN 17037:2018+A1:2021 Daylight in Buildings, also referred to as the UK Annex.
- IS EN 17037:2018 Daylight in Buildings.

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

The BRE guidelines BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition).

2.4 Sunlight to Existing Buildings

The BRE guidelines BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) do 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 BR209:2022 (third edition) 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 BR209:2022 (third edition) 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 in Neighbouring Buildings.

3.1 Site Overview

The site is located at Kishoge, Lucan, Co. Dublin. It is bounded by Lynch's Park road to north and with Kishogue National School. Lynch's Park housing is located to the east. There is a rail line to the south with Kishoge Railway Station. To the west is an access road with future development greenfield lands.

Figure 1: View 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 & 3. The plane at location A extends, if it intersects the proposed development, a section is plotted.

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.

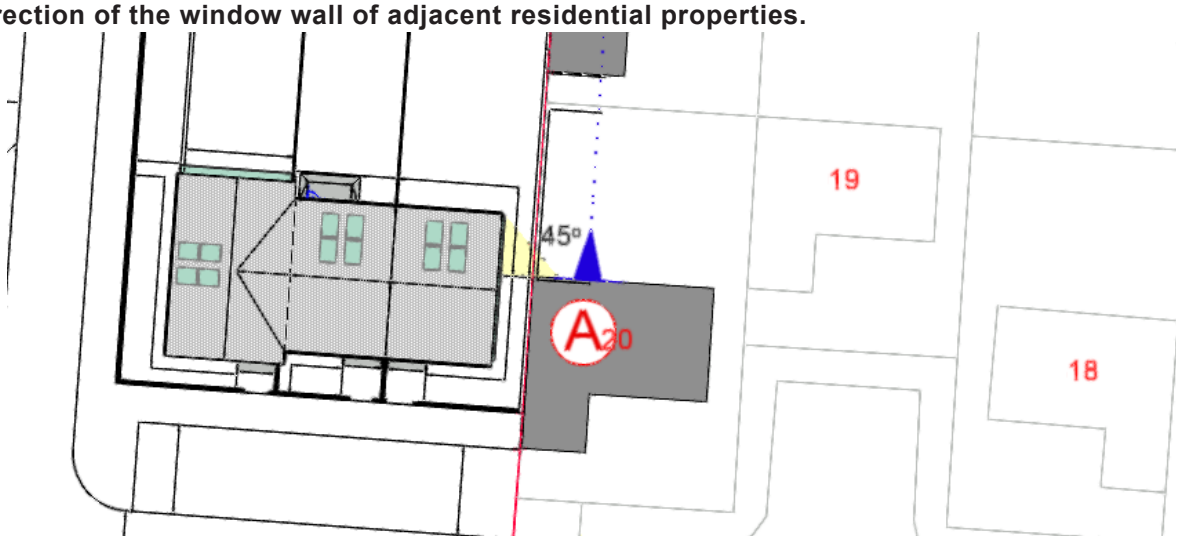


Figure 3: Site plan - Detail at location A, indicating the 45° angle in plan and the window wall of the closest residential property

3.3 Comment on Preliminary Assessment

There are no existing dwellings with a window wall facing the proposed development within the zone of influence (three times the height of the proposed development). The house with a window wall perpendicular to the proposed development at location A in Figure 3 has a window close to the boundary but the centre point of this window does not fall within the 45° angle in plan, so not further assessment is required.

3.4 Conclusion

A detailed assessment is not required on any of the adjacent properties and any reduction in available daylight with be minimal.

4. Sunlight in Neighbouring Buildings

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

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 APSH the value needs to be reduced below the recommended 25% annually or below 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 house at location A in figure 3 has a window wall that is in excess to 90° due south. Direct access to sunlight does not exist at present, it cannot be impacted and so is an assessment for APSH is not required. All adjacent properties are beyond the zone of influence and there are no windows with a requirement for sunlight adjacent to the proposed development.

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% of the space 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 which are entirely south of the proposed development will not perceive any reduction in sunlight.

Figure 4: 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.

5.1 Amenity Space to Neighbouring Properties.

There are 3 amenity space to the houses to the east adjacent to the proposed development. The amenity spaces were assessed and the results are set out in Table 6. There are no other private or public amenity spaces in the vicinity of the proposed development.

Sunlight on the Ground - Adjacent properties					
Location ID	House 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	10 Lynch's Park	97.2%	97.2%	Y	Meets criteria
L2	11 Lynch's Park	87.5%	87.5%	Y	Meets criteria
L3	20 Lynch's Park	61.6%	57.6%	Y	Meets criteria

Table 6: Calculation of Sun on the Ground to Adjacent Amenity Spaces.

5.2 Conclusion

All relevant private amenity spaces to the surrounding properties were assessed for sunlight in accordance with the recommendations set out in BR209:2022. On the 21st March, the amenity space will retain 2 hours sunlight over 50% of the area 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) and any impact will be negligible.

6. Daylight within the Proposed Development

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

Compliance is demonstrated by a calculation of Daylight Provision with the illuminance method under BS EN 17037:2018+A1:2021. A summary of the results are presented in Table 7 below and a complete set of room results are shown in Appendix A.

Compliance is also demonstrated with a calculation of Daylight Provision with the illuminance method under IS /BS EN 17037:2018. A summary of the results are presented in Table 8 below and a complete set of room results are shown in Appendix B.

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 the assessment grid	Number of rooms to achieve target Lux over 50% of the assessment grid	Percentage of rooms achieving Target
All units	LKD/ KD	118	200	118	100%
	Liv	50	150	50	100%
	Bedrooms	263	100	263	100%
Total		431		431	100%

Table 7: 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 assessment methods set out in BS EN 17037 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 Assessment for Daylight Provision IS / BS EN 17037:2018

A summary of Minimum and Target Illuminance level compliance 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
All units	Target Illuminance	0.2%	7.0%	46.2%	46.6%	99.8%
	Minimum Illuminance	0.2%	9.0%	43.2%	47.6%	99.8%

Table 8: Summary of room for Target Illuminance compliance with IS/BS EN 17037:2018. Percentage of rooms at each compliance level. Individual room results can be viewed in Appendix B.

The results indicate a high level of compliance for Minimum level of 99.8% and Target level with 99.8% of the spaces achieving the minimum target for each metric. The results indicate that the rooms will achieve high levels of daylight and they will be bright and pleasant.

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 the figure below where 4 out of 5 (80%) units in an apartment building would achieve the target sunlight.

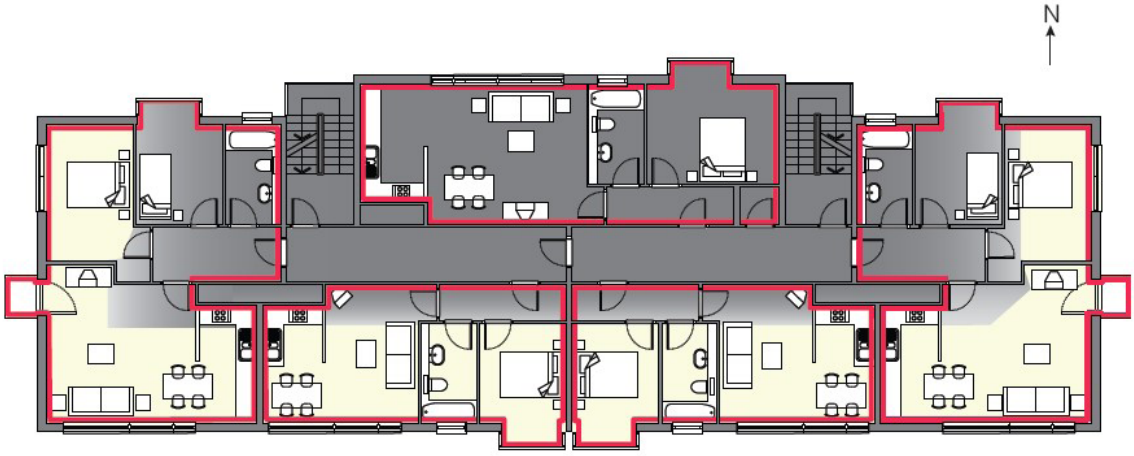


Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

Figure 5: 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						
Apartments	47	29	61.7%	4	8	5	30	43	91.5%
Duplex Units	42	31	73.8%	1	9	5	27	41	97.6%
Overall total	89	60	67.4%	5	17	10	57	84	94.4%

Table 9: Summary of results of assessment of Sunlight Hours

7.2 Comment on EN 17037 Sunlight Hours

The BRE Guidelines recommend maximising the amount of units that have a window within 90° due South but does not have set targets. The guidelines acknowledges that for large developments with site constraints its not possible to achieve south facing windows to all main living spaces. 89 no. apartments and duplex units were assessed. Of these 60 no. (67.4%) have window to a Living room or Kitchen/ Dining room which face within 90° 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. 84no. of the 89no. apartment and duplex units (94.4%) 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 94.4% of units achieving the minimum recommended 1.5 direct sunlight hours. This is in line with the BRE guideline example for an apartment layout where 1 in 5 achieves the target sunlight hours.

8. Sunlight to Amenity Spaces within the Proposed Development

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

8.1 Sunlight to Amenity within the Proposed Development

Public and private amenity areas within this proposal have been assessed with a calculation of sunlight availability on the ground plane on the 21st March. Generated analysis is shown in Figure 6 and the results are set out in Tables 10 and 11 below.

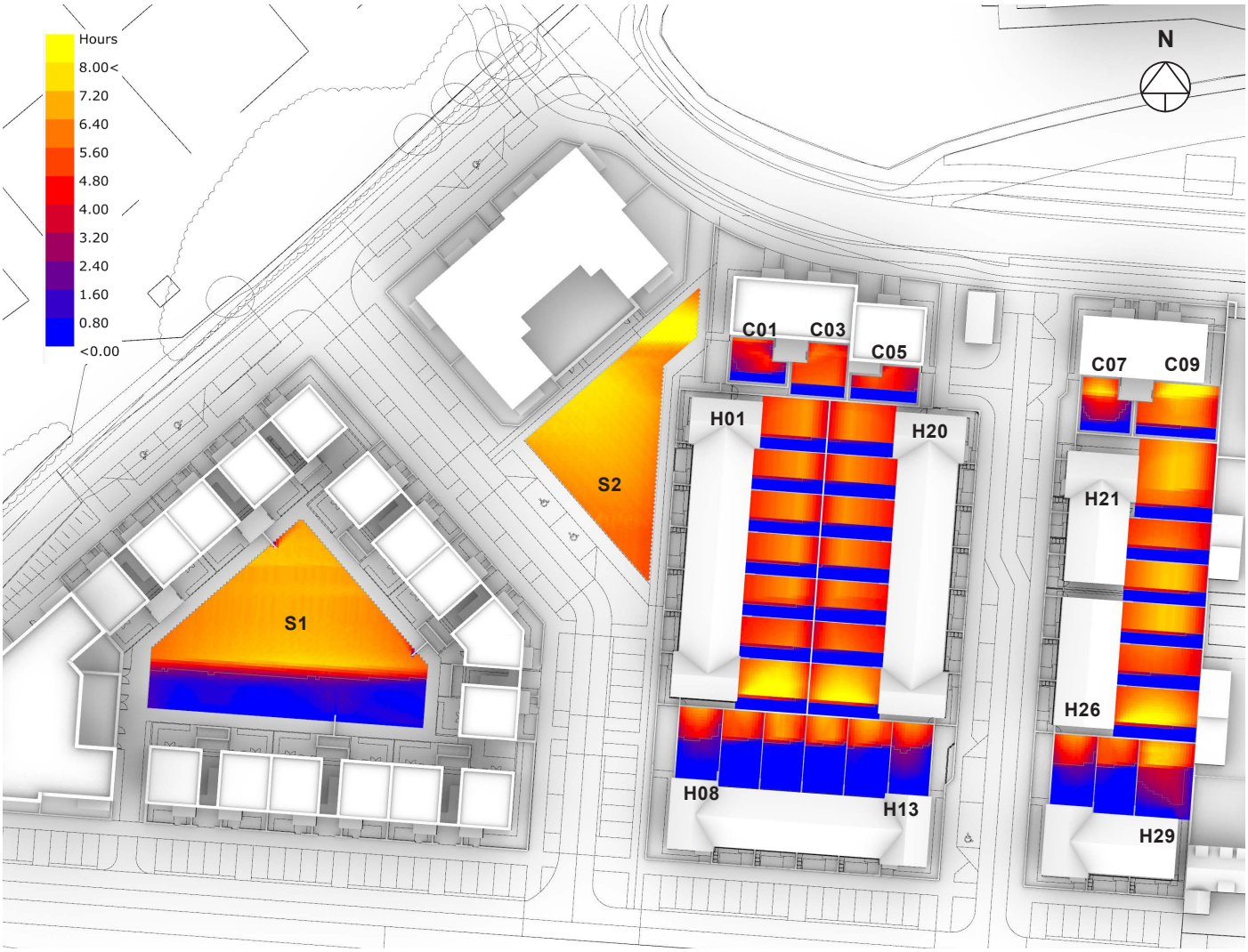


Figure 6: Radiation map of amenity within the Proposed Development, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.

Sunlight on the ground - within development			
No.	Use	Proposed	Meets criteria of >50% area
S1	Communal Open Space	67.8%	Y
S2	Amenity with playground	100.0%	Y

Table 10: Calculation of Sun on the Ground to amenity area within the proposed development.

8.2 Comment on public and communal amenity areas

The public amenity areas are well oriented for sunlight and they 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 The BRE guidelines BR209:2022 (third edition) for gardens and open spaces.

8.3 Assessment of Private Amenity Spaces

There are many factors and design constraints that influence the layout of a proposed development and it is not always possible for all private amenity spaces to achieve the recommend values for sunlight. All private amenity spaces at ground level were assessed. a summary of the results are shown in Table 11 below. The full schedule of spaces are shown in Appendix D.

Sunlight on the Ground - Proposed Development		
Total number private amenity to houses & duplex area C	Number of gardens that Proposed receiving in excess 2 hours sunlight on 21st March >50% of Area	Percentage that achieve target
34	26	76.5%

Table 11: Calculation of Sun on the Ground to private amenity spaces of the houses and duplex units

8.4 Conclusion

The proposed development has been well designed and a high percentage (76.5%) of private amenity areas achieve the target sunlight hours. The proposed development meets the recommendations of the BRE guidelines for gardens and open spaces.

9. Shadow Study

9.1 BRE Guidance on Shadow Studies

The BRE guidelines BR209:2022 (third edition) 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

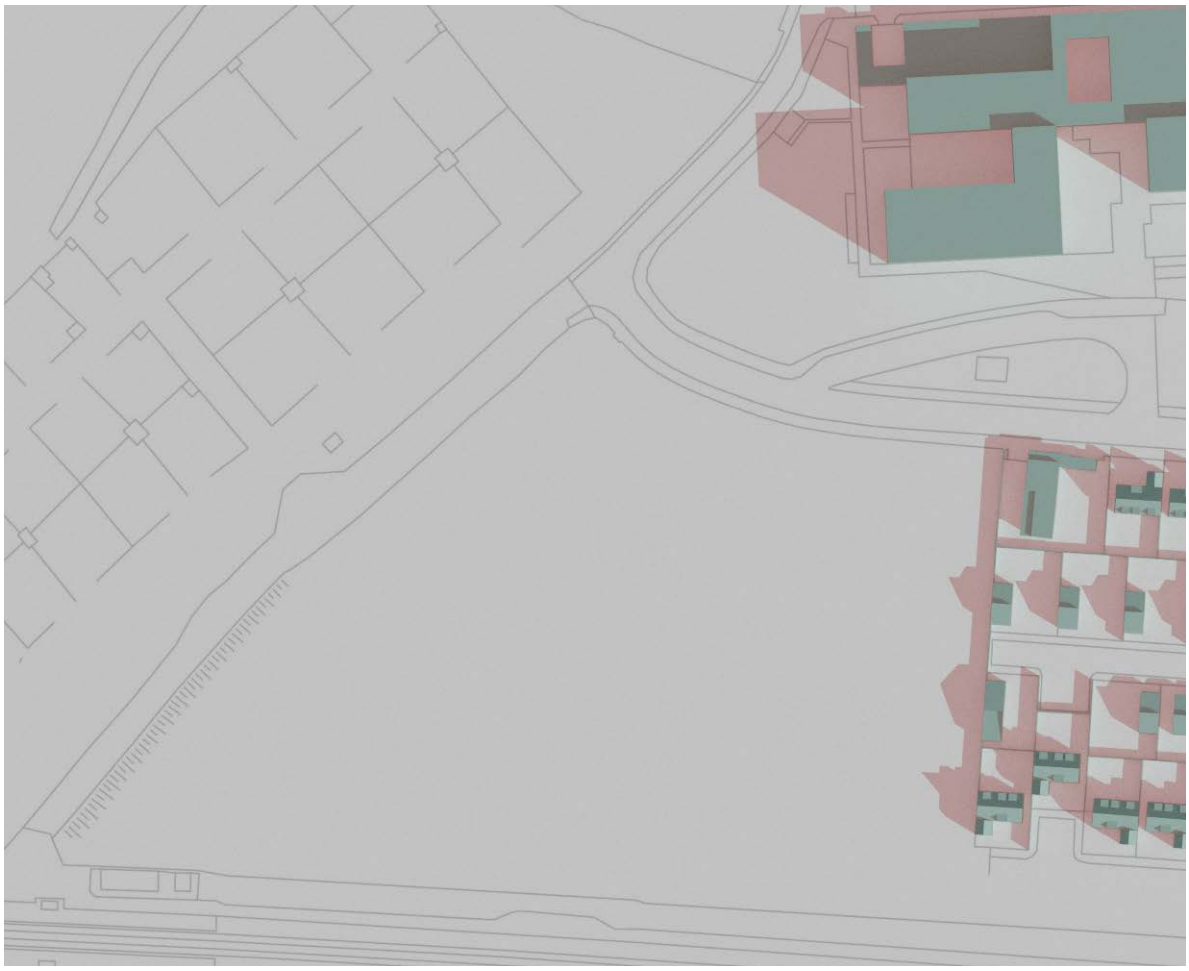
Section 9.2 shows the existing and proposed shadow diagrams for the Equinox on the 21st March at 2 hourly intervals during the day between 09:00 and 17:00.
Section 9.3 shows the existing and proposed shadow diagrams for the Summer Solstice on the 21st June at 2 hourly intervals during the day between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

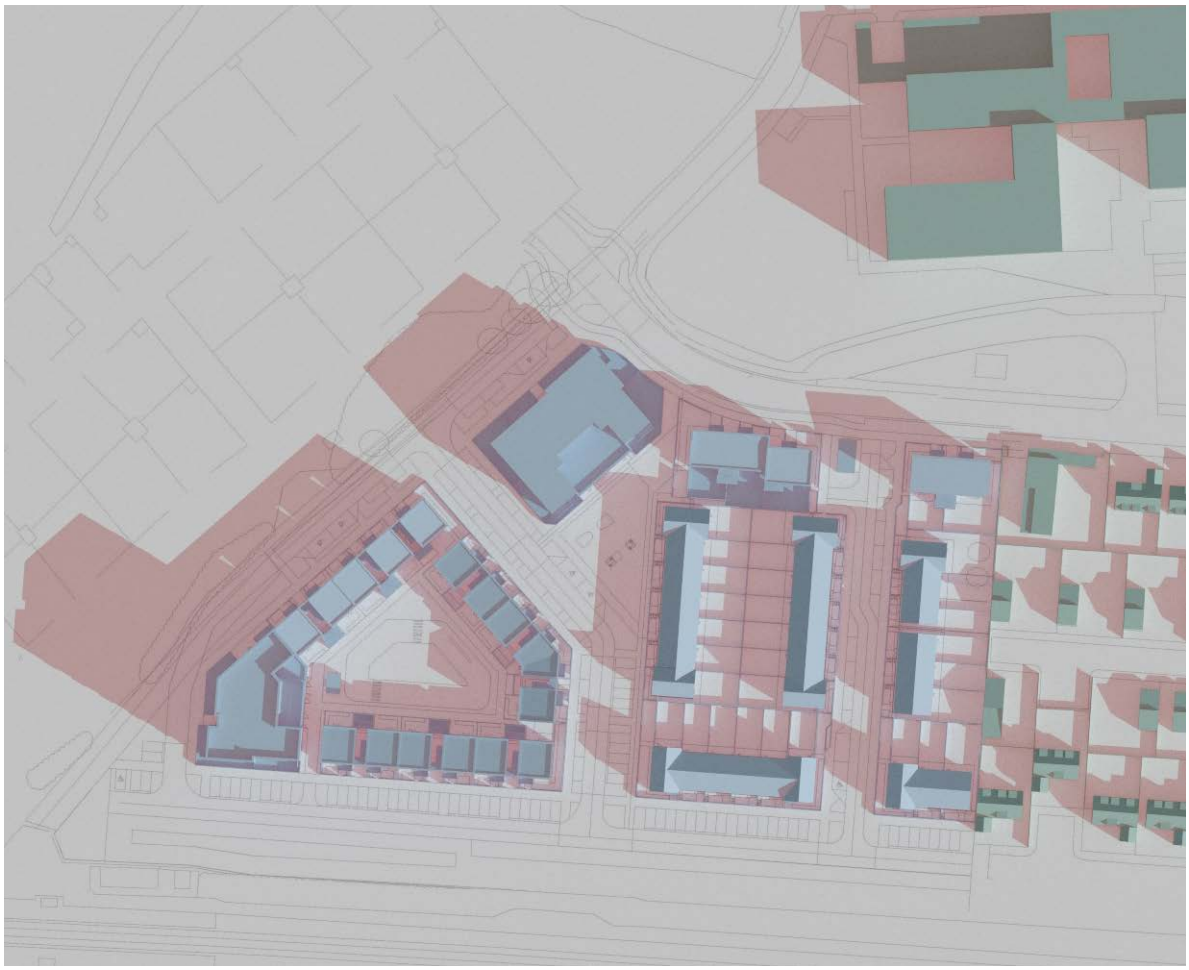
The site is currently a greenfield site with no structures or features that will cast any considerable shadows. Shadow diagrams are a visual aid to understand where possible shading may occur. The use of shadow diagrams as an assessment method should be taken over the course of the day and not a specific time due to the transient nature of the sun and the shade caused by obstructions.

9.2 Shadow Casting diagrams March Equinox

Existing

N



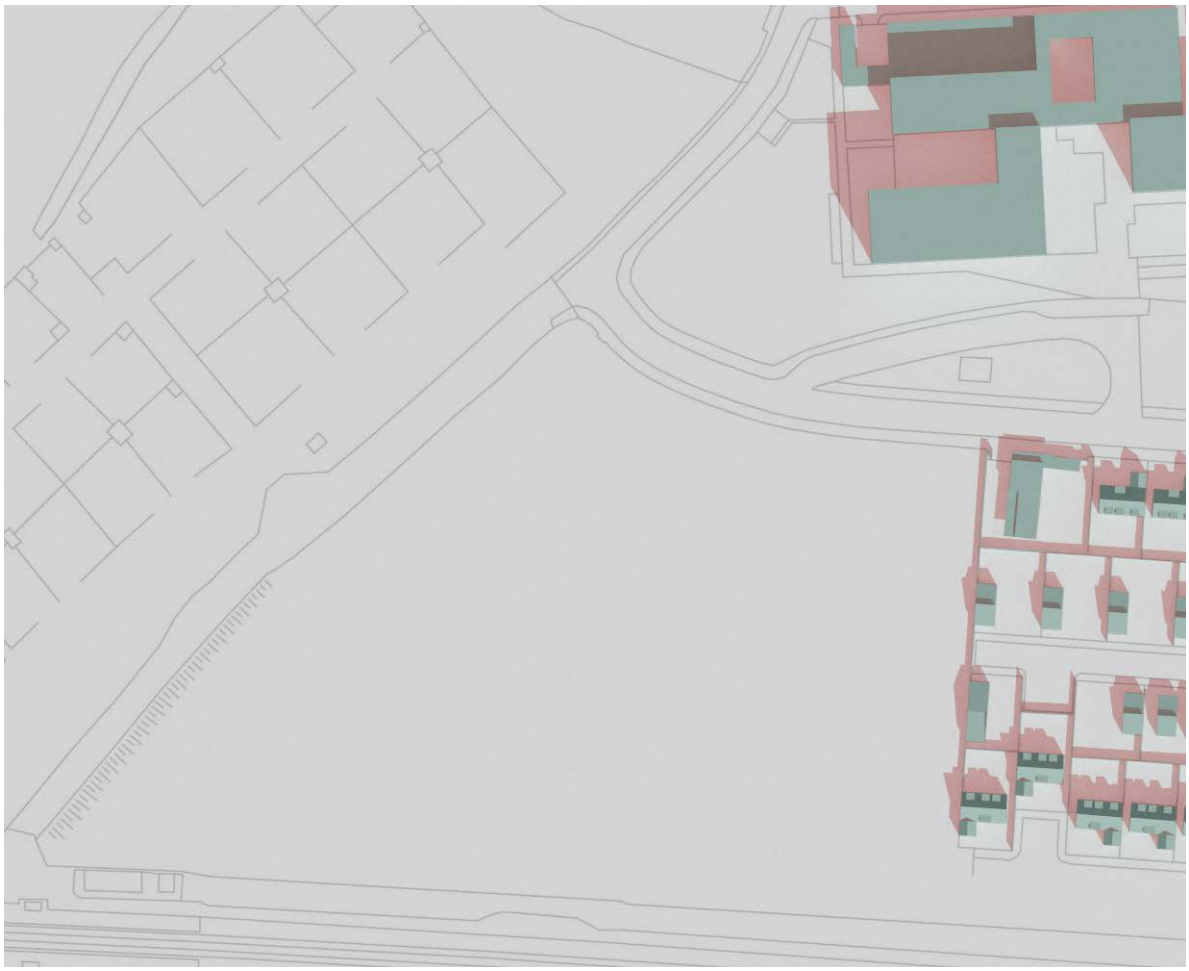


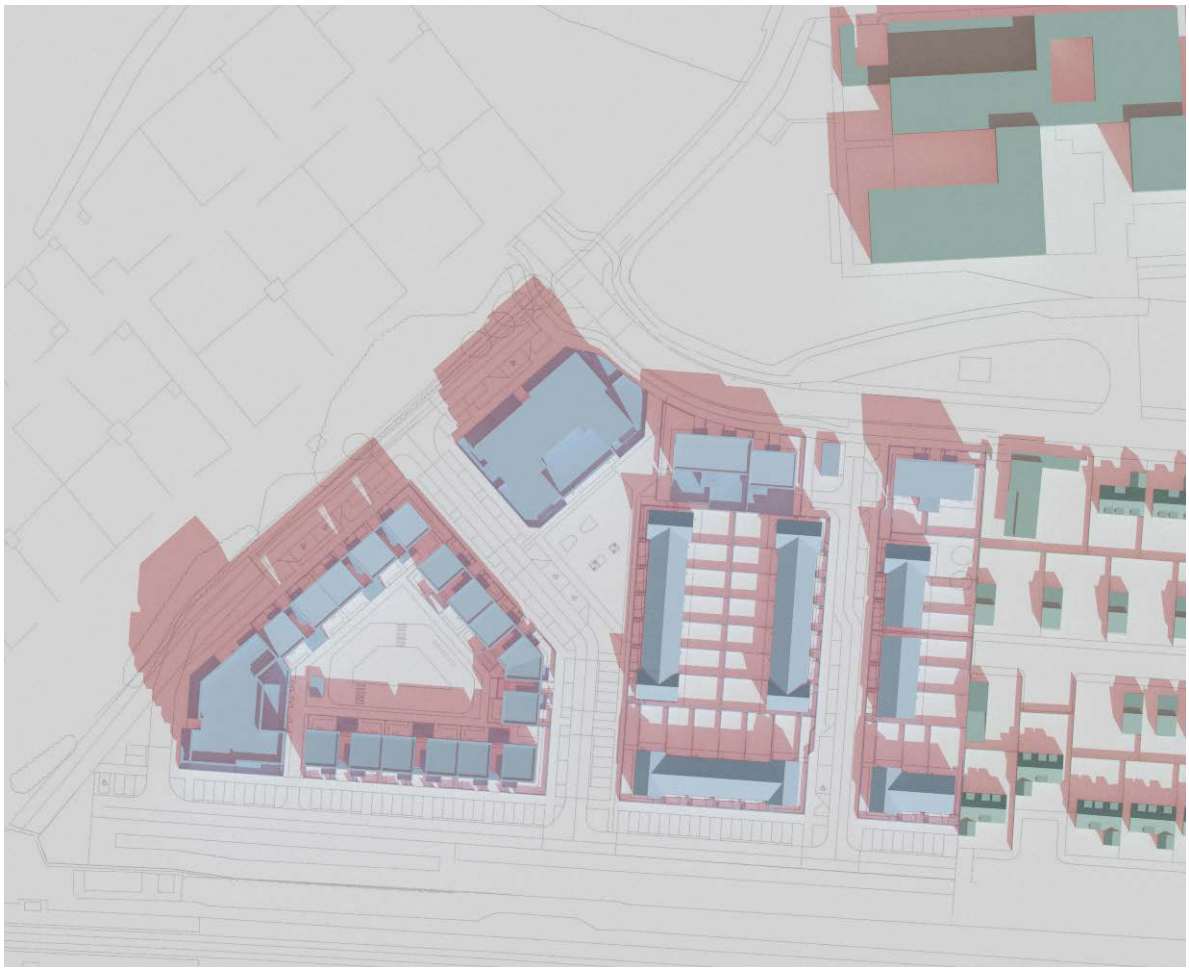
Proposed

Figure 7: Shadow diagrams 21 March 09:00 UTC

Existing

N



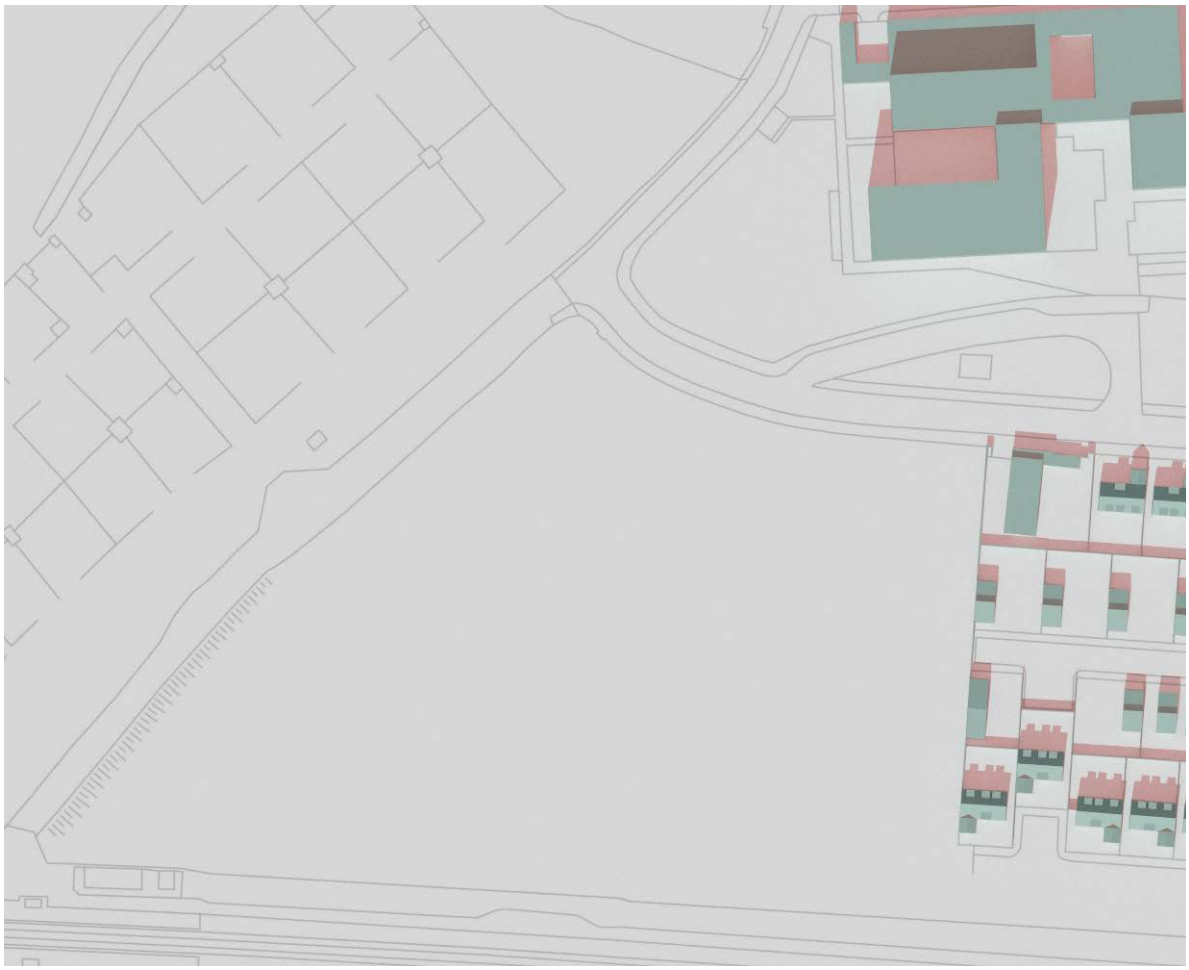


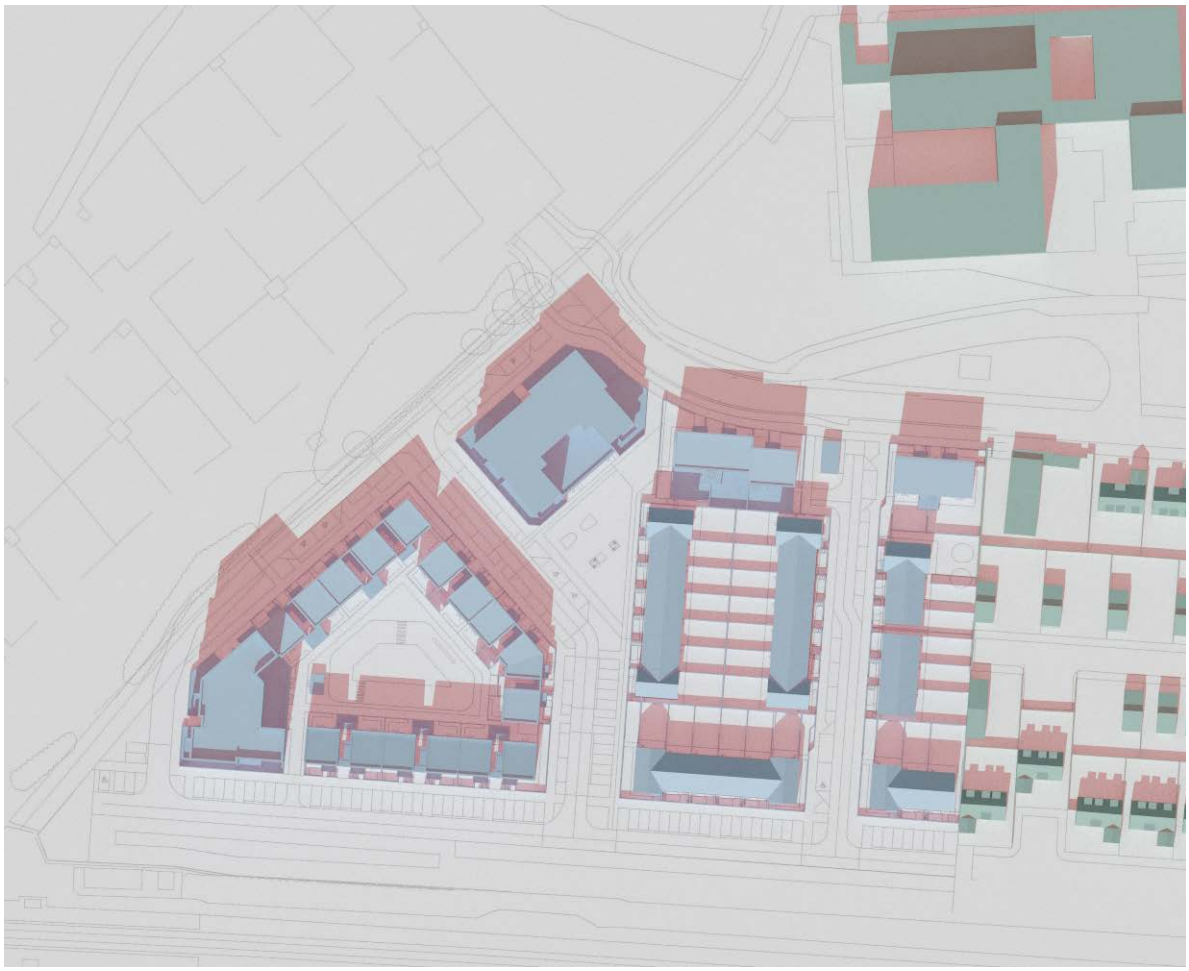
Proposed

Figure 8: Shadow diagrams 21 March 11:00 UTC

Existing

N



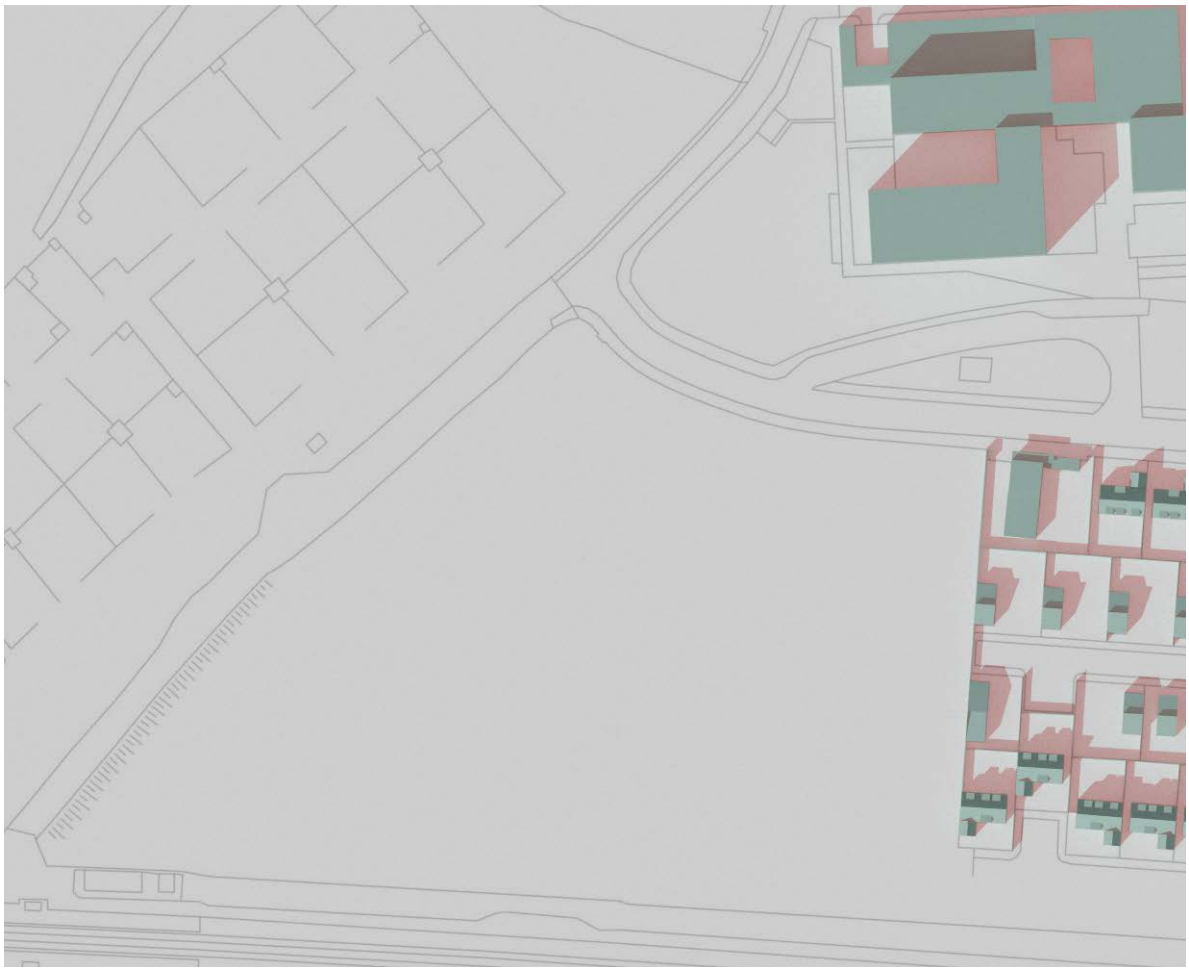


Proposed

Figure 9: Shadow diagrams 21 March 13:00 UTC

Existing

N

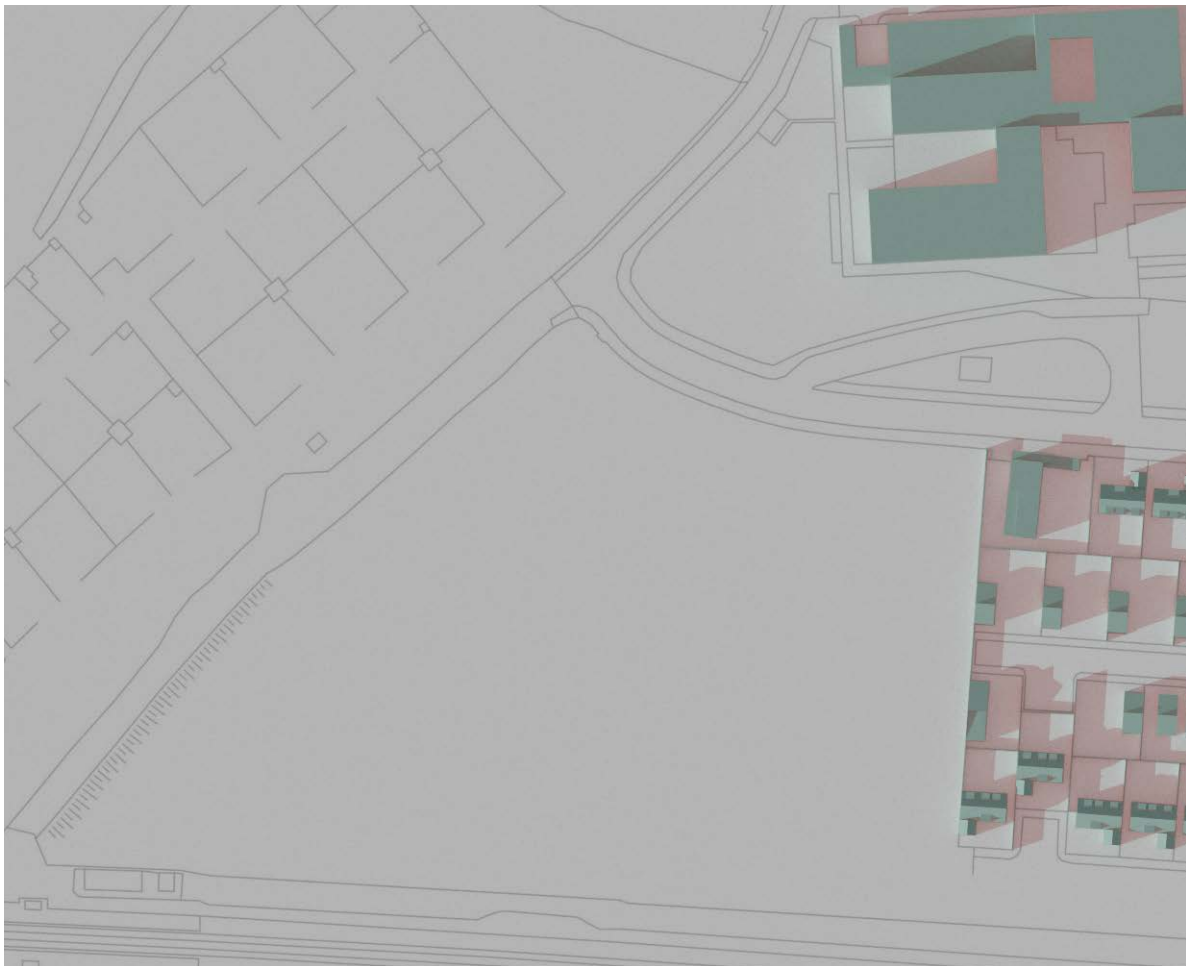


Proposed

Figure 10: Shadow diagrams 21 March 15:00 UTC

Existing

N



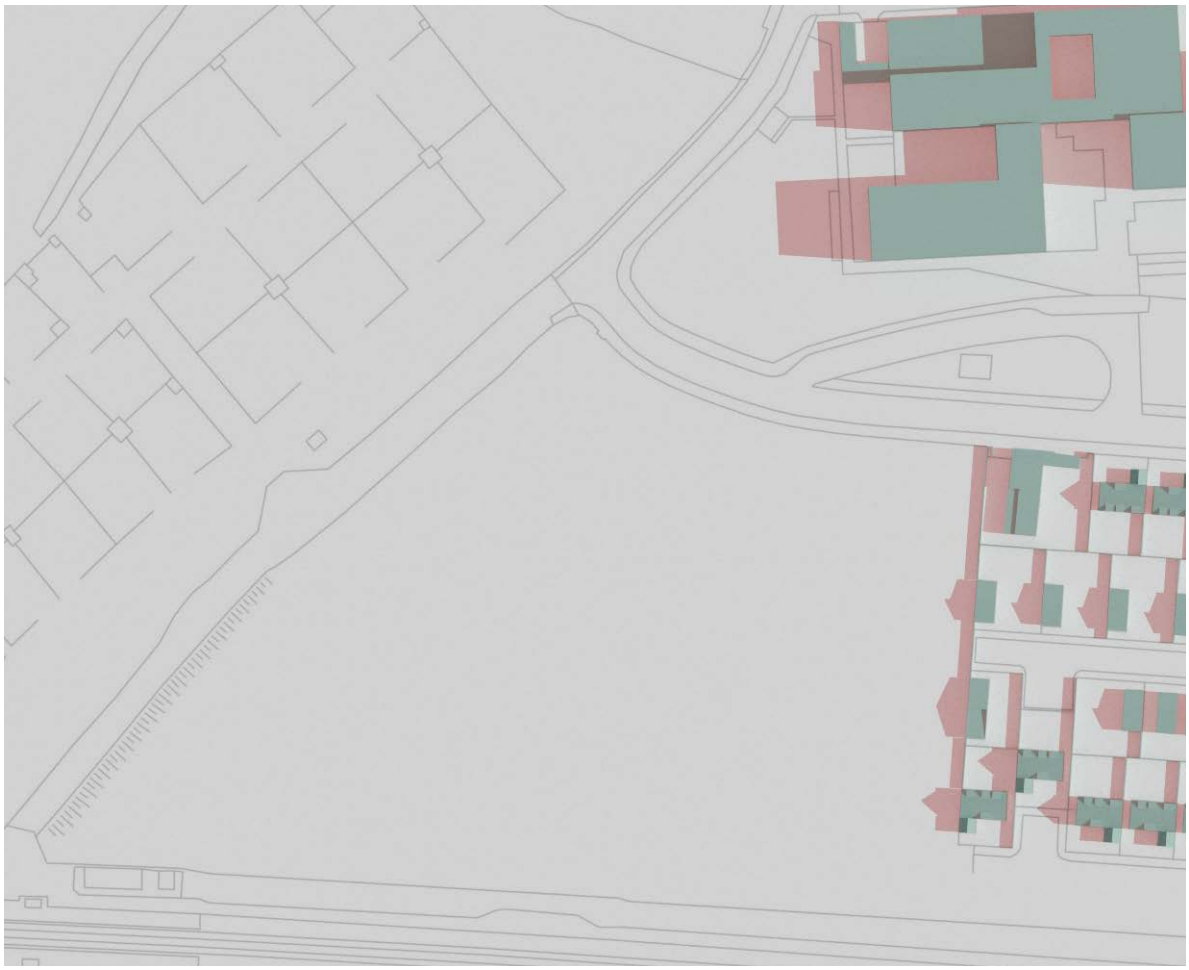
Proposed

Figure 11: Shadow diagrams 21 March 17:00 UTC

9.3 Shadow Casting diagrams June Solstice

Existing

N

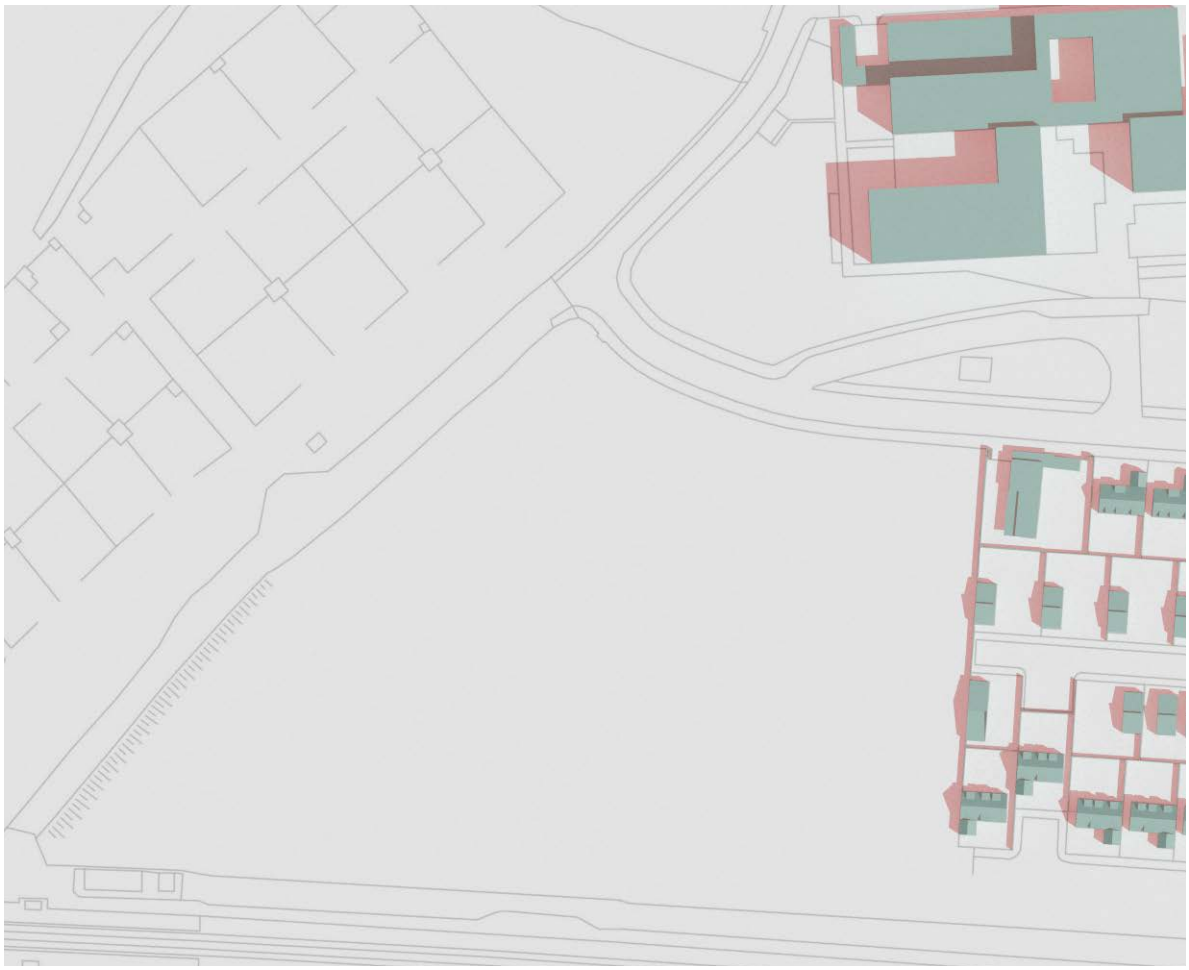


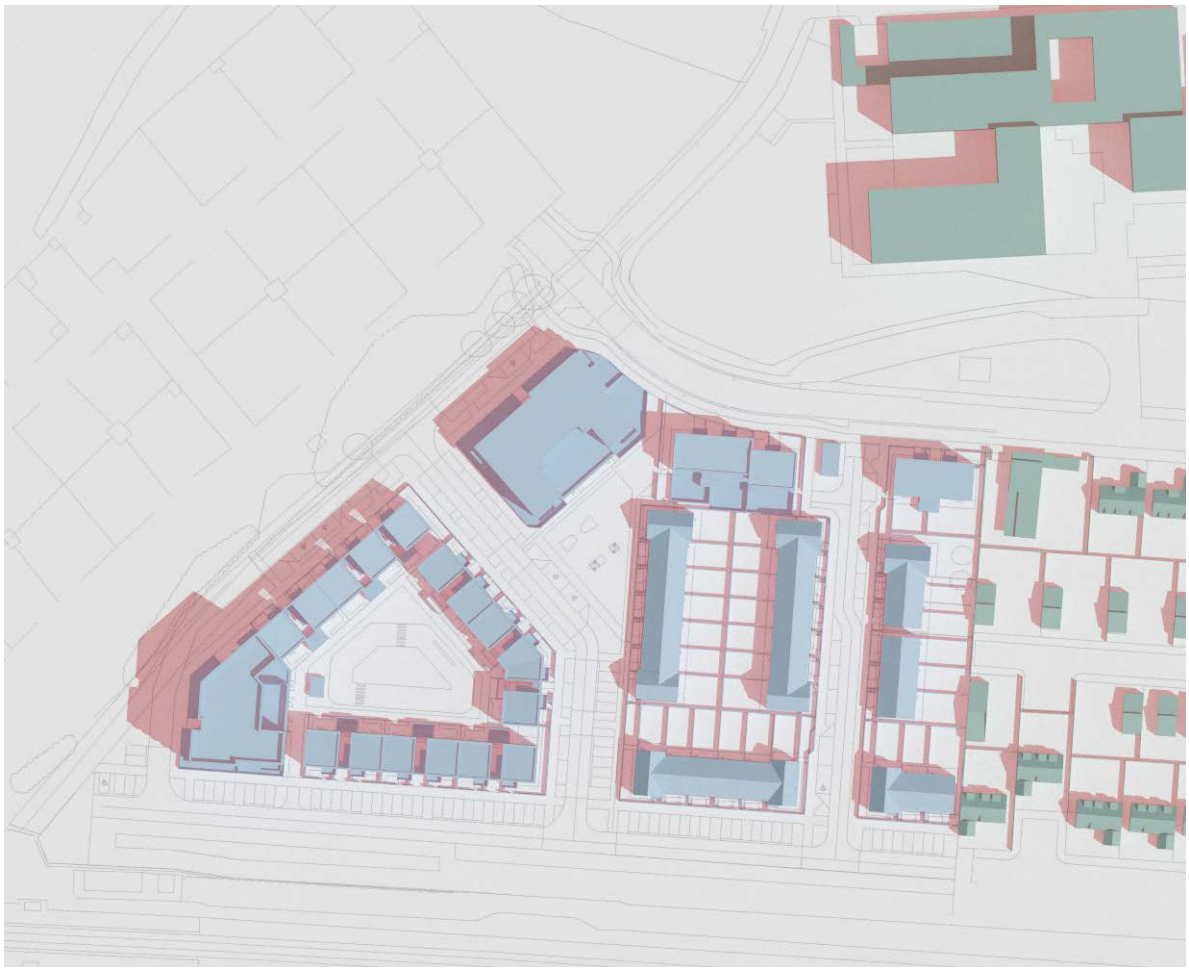
Proposed

Figure 12: Shadow diagrams 21 June 09.00 UTC +1

Existing

N



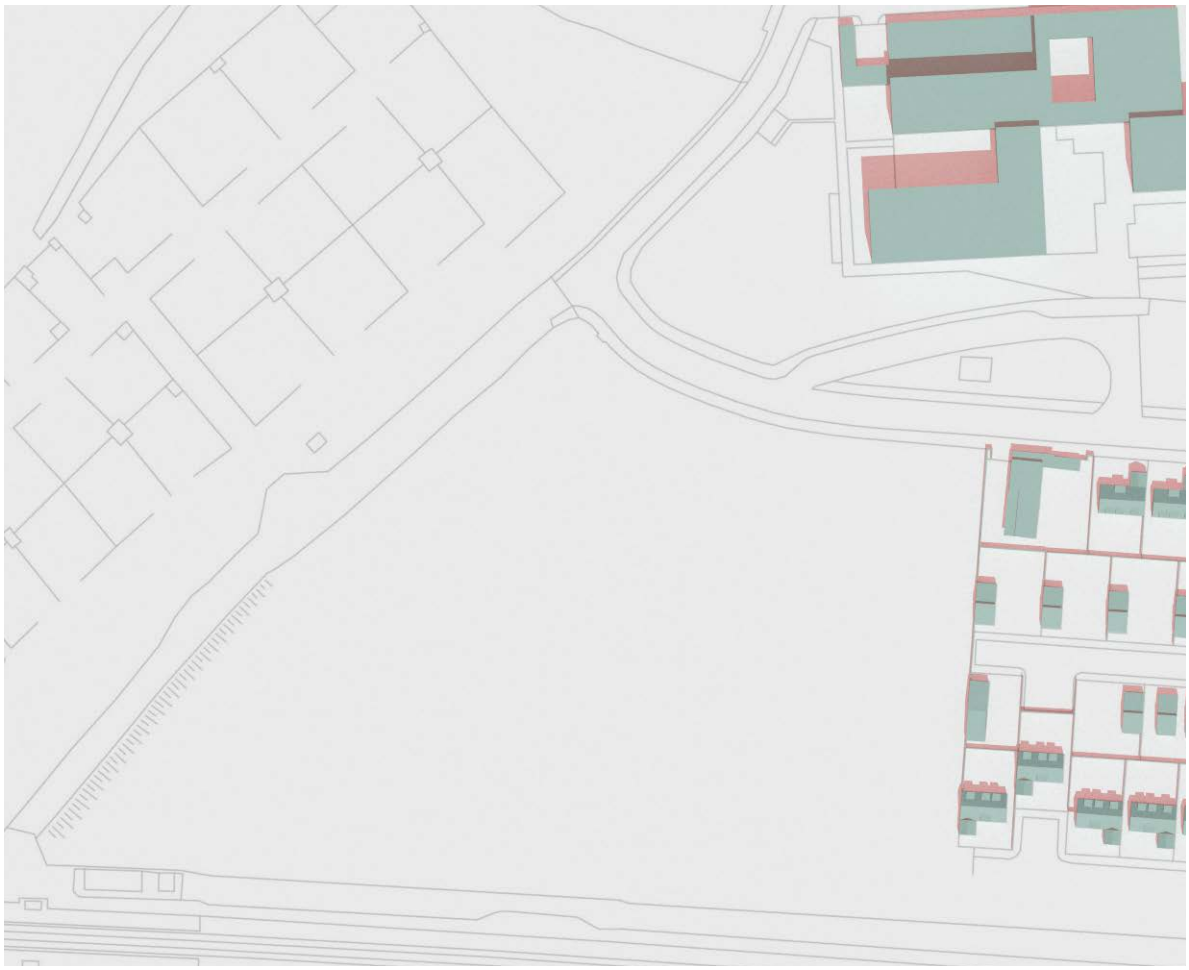


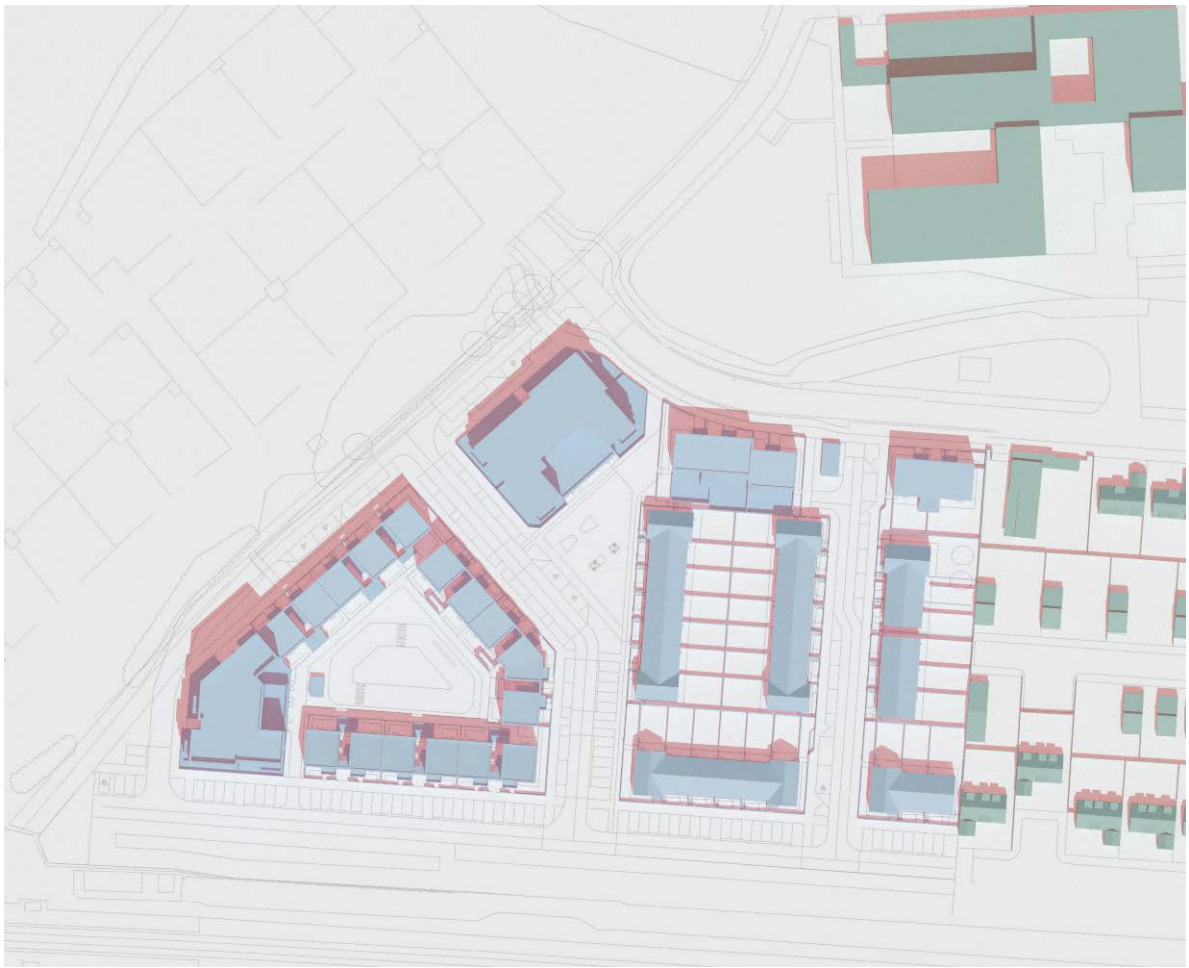
Proposed

Figure 13: Shadow diagrams 21 June 11:00 UTC +1

Existing

N





Proposed

Figure 14: Shadow diagrams 21 June 13:00 UTC +1

Existing

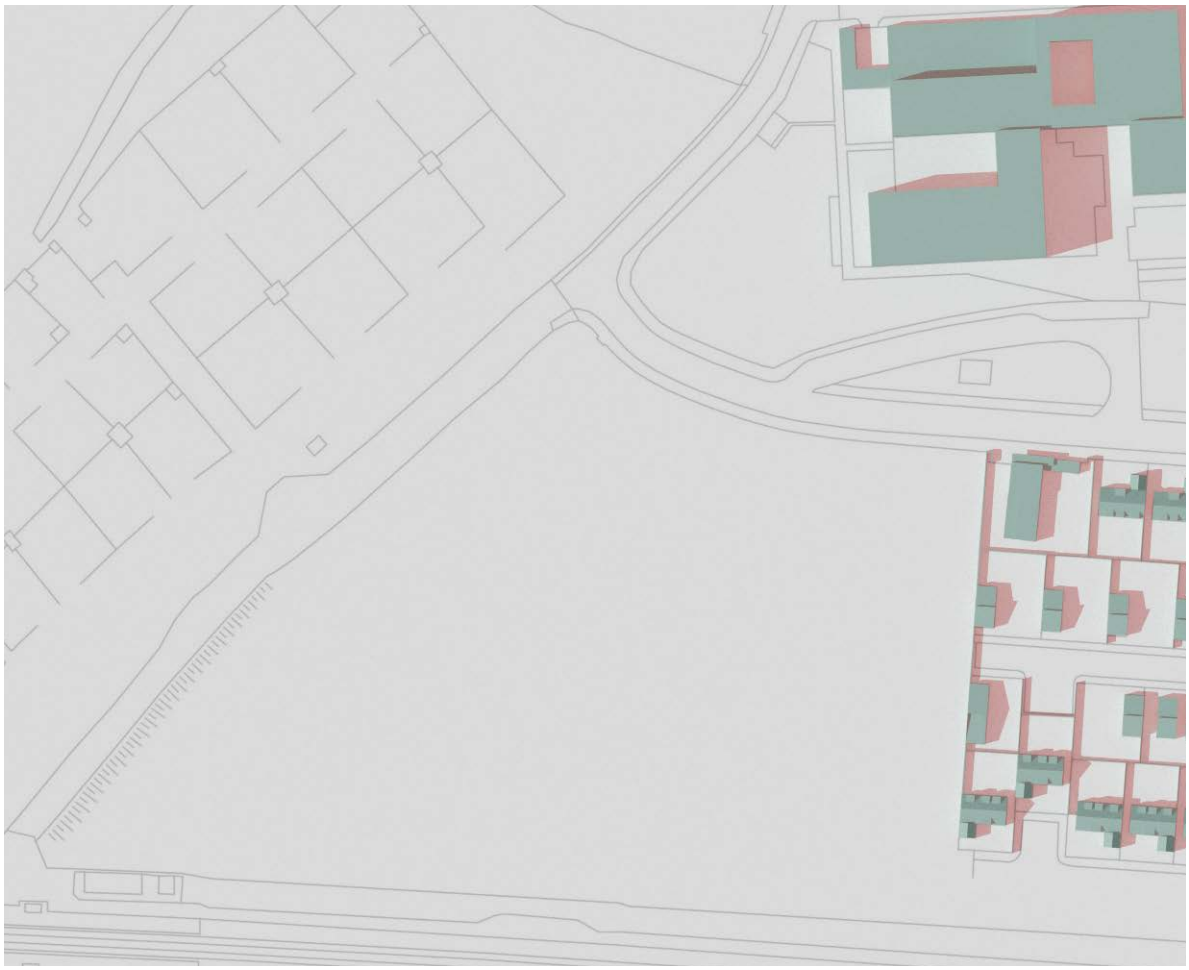
N

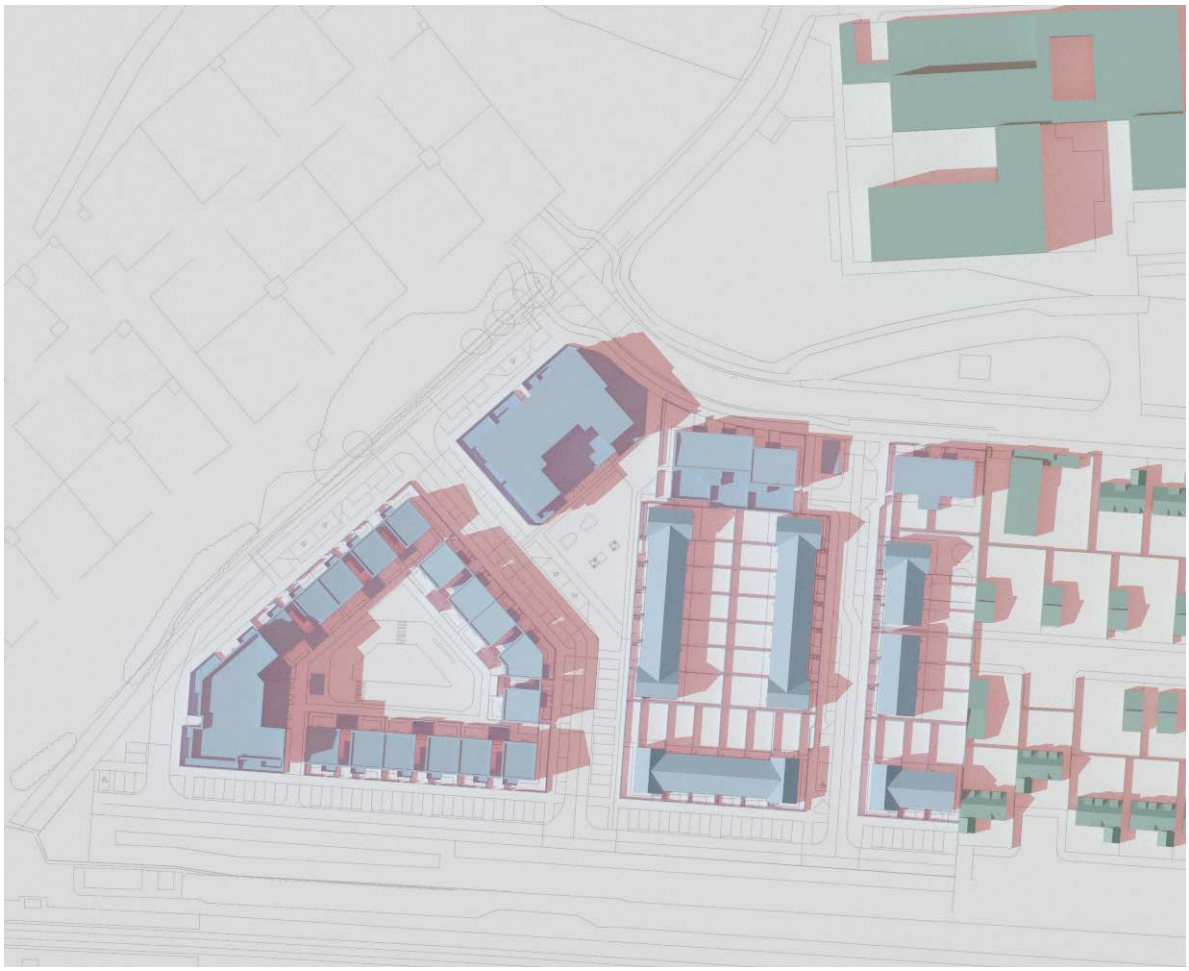
Proposed

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

Existing

N



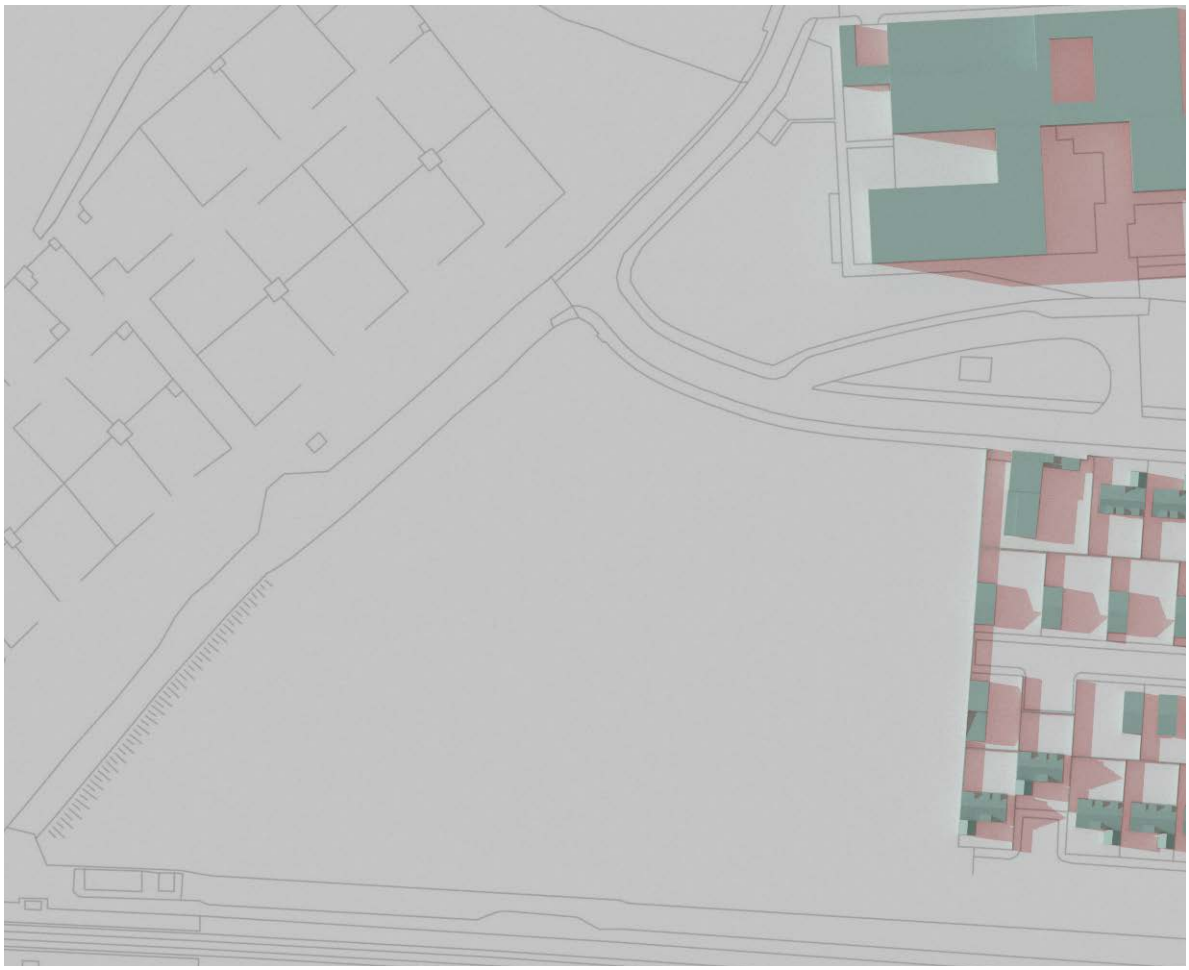


Proposed

Figure 16: Shadow diagrams 21 June 17:00 UTC +1

Existing

N



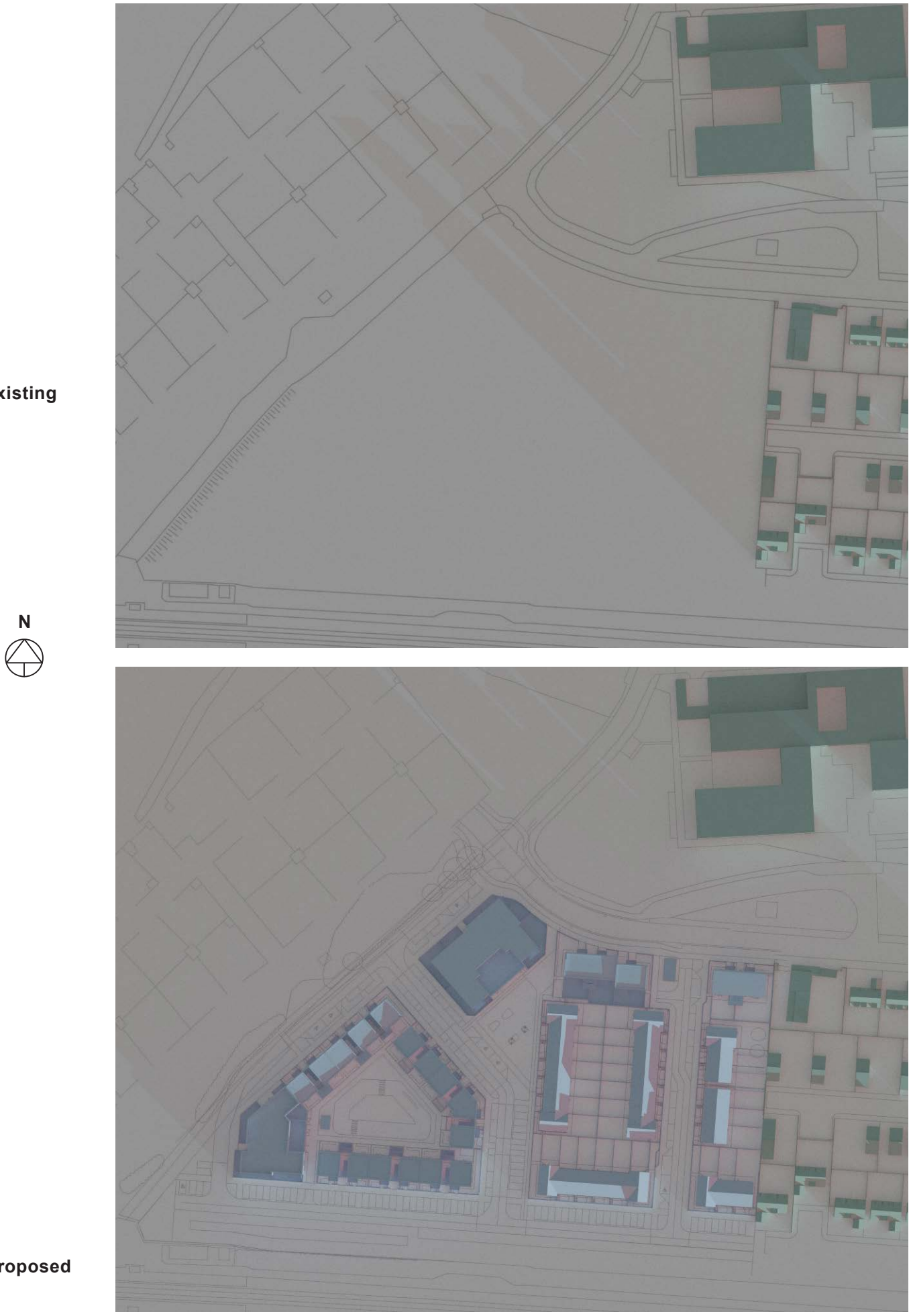
Proposed

Figure 17: Shadow diagrams 21 June 19:00 UTC +1

9.4 Shadow Casting diagrams December Solstice

Existing

N

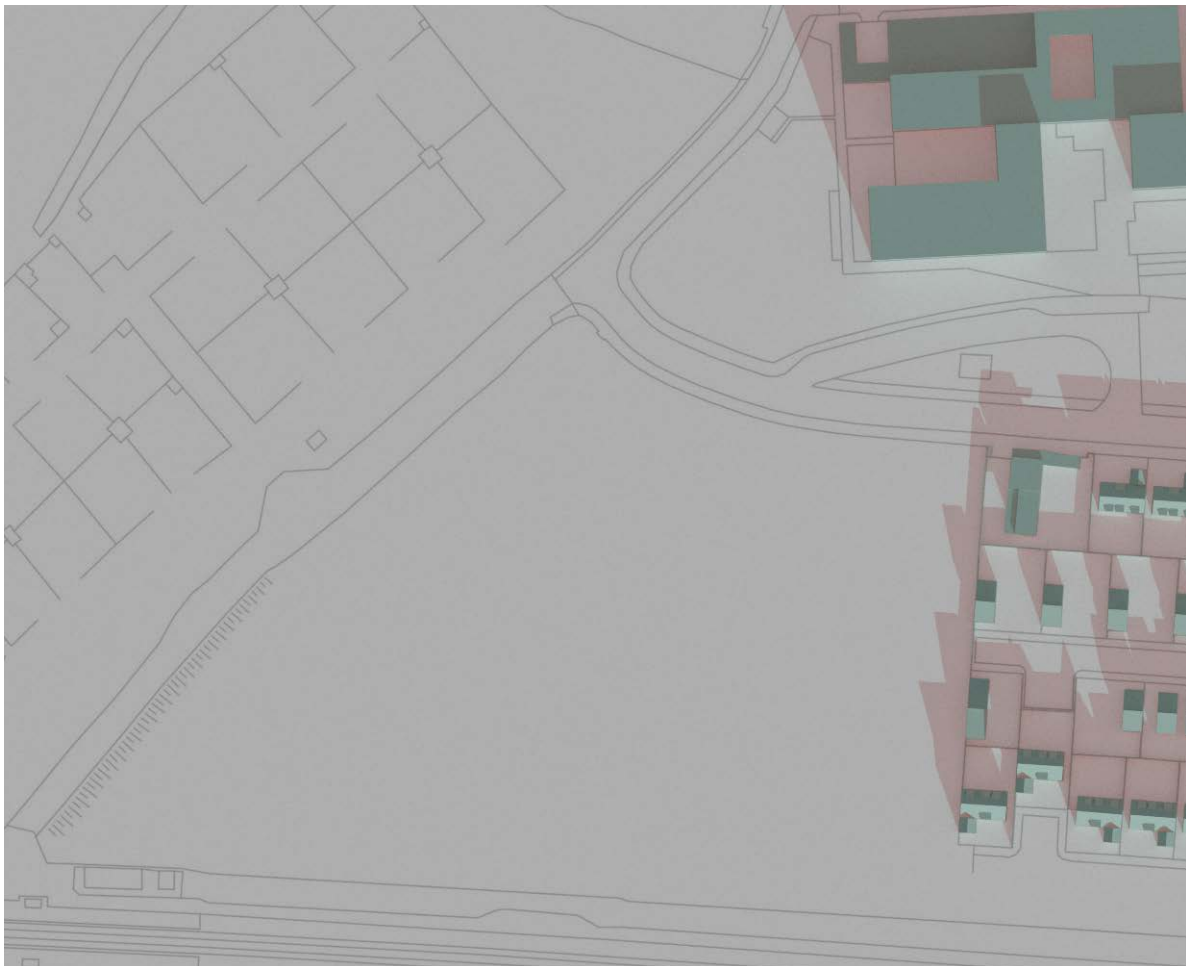


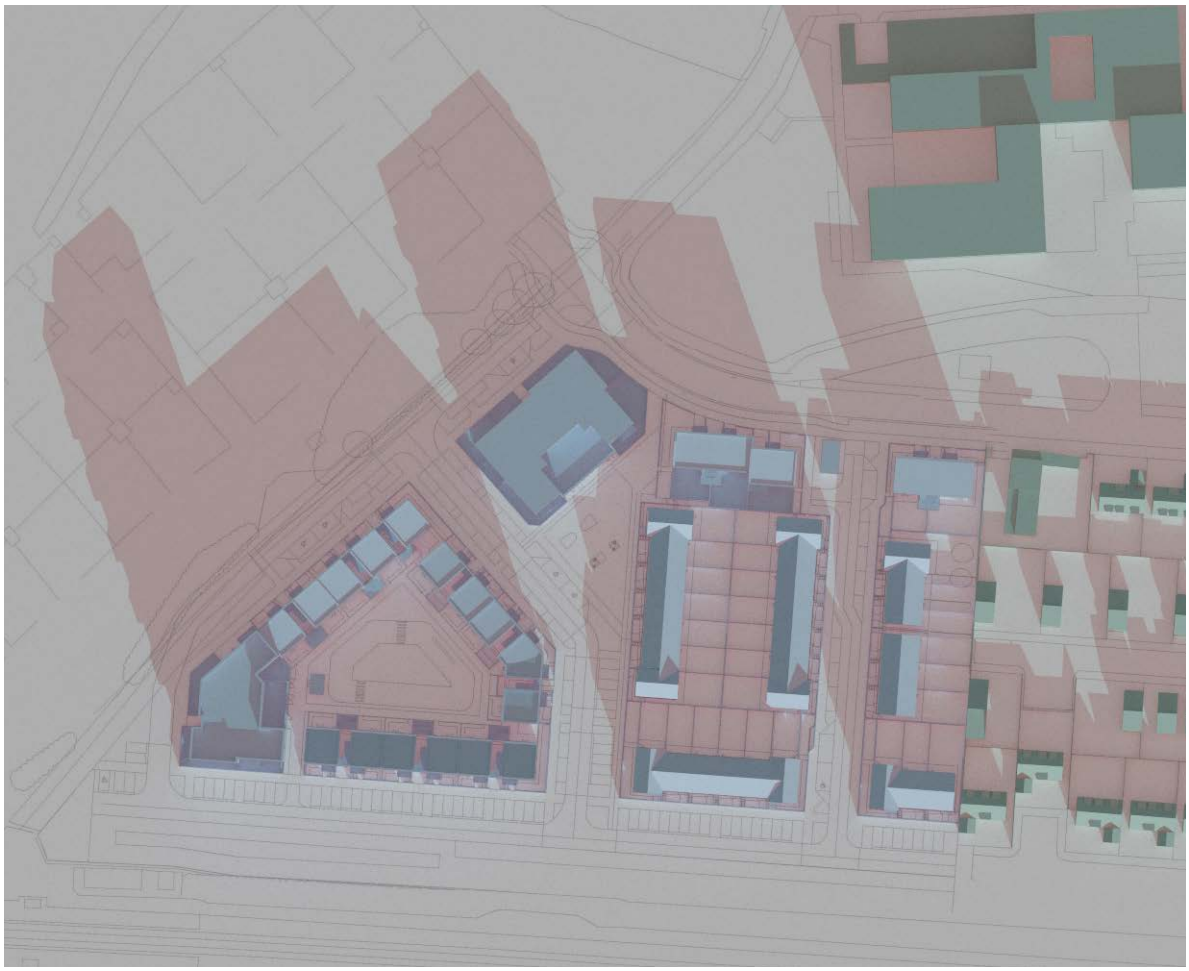
Proposed

Figure 18: Shadow diagrams 21 December 09:00 UTC

Existing

N



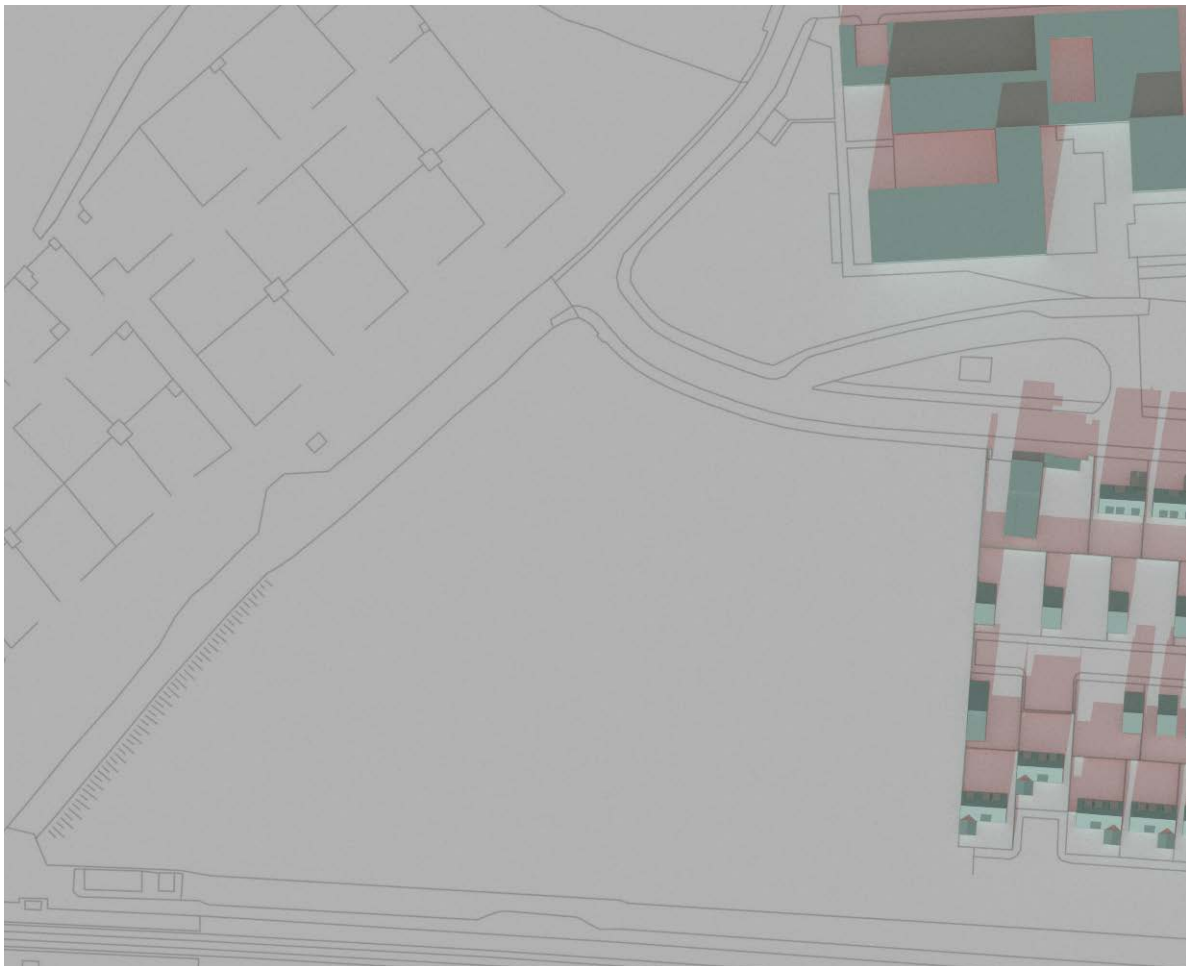


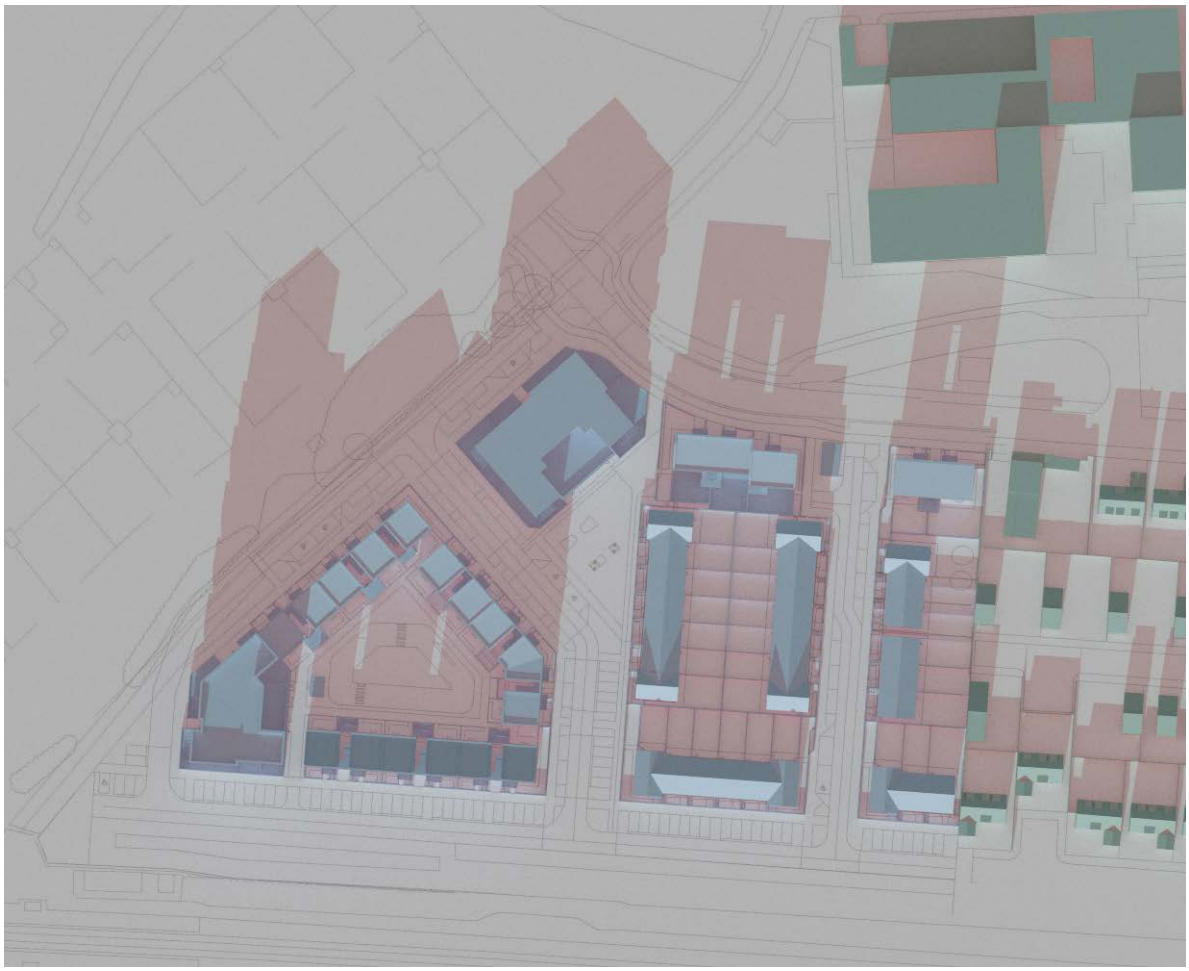
Proposed

Figure 19: Shadow diagrams 21 December 11:00 UTC

Existing

N

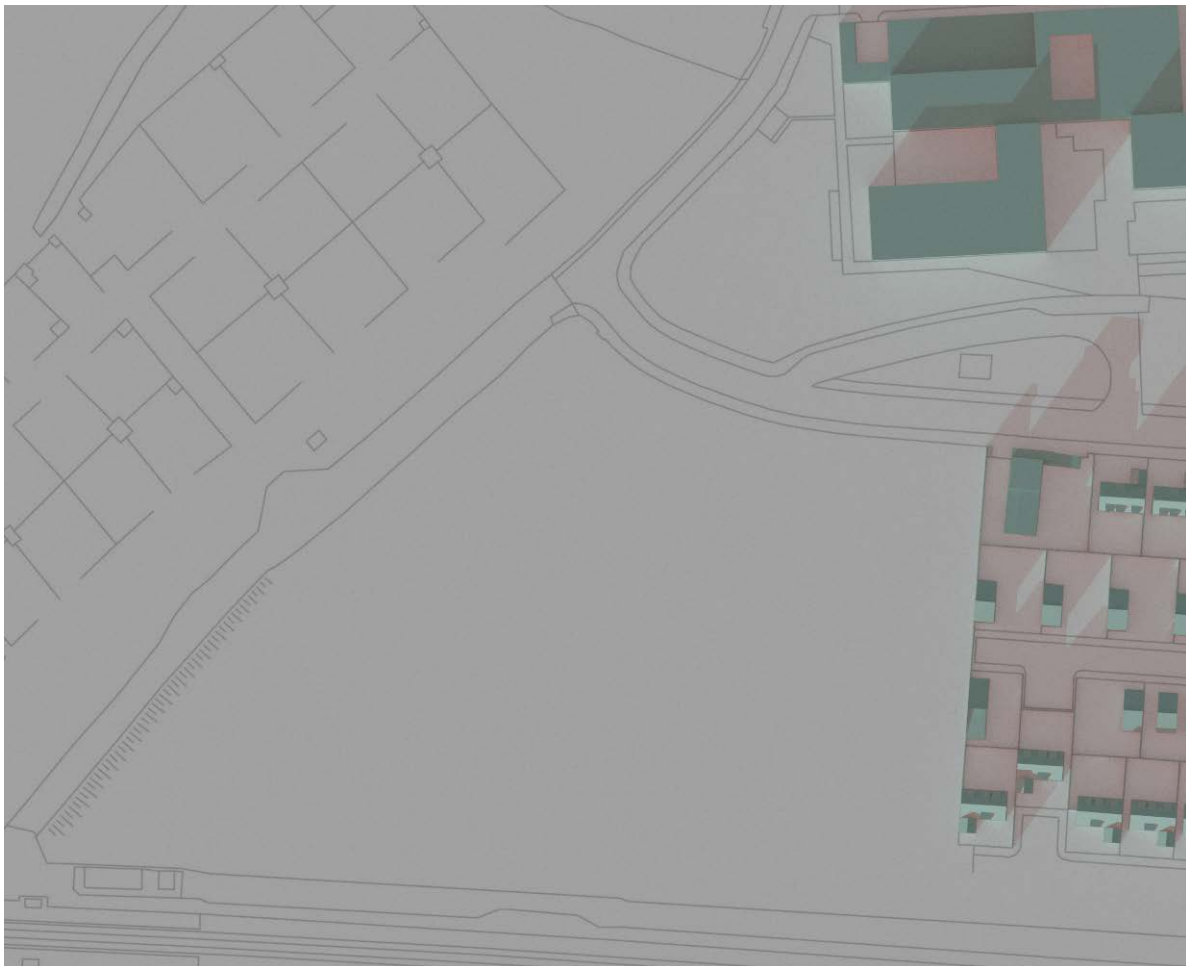




Proposed

Figure 20: Shadow diagrams 21 December 13:00 UTC

Existing



N

Proposed

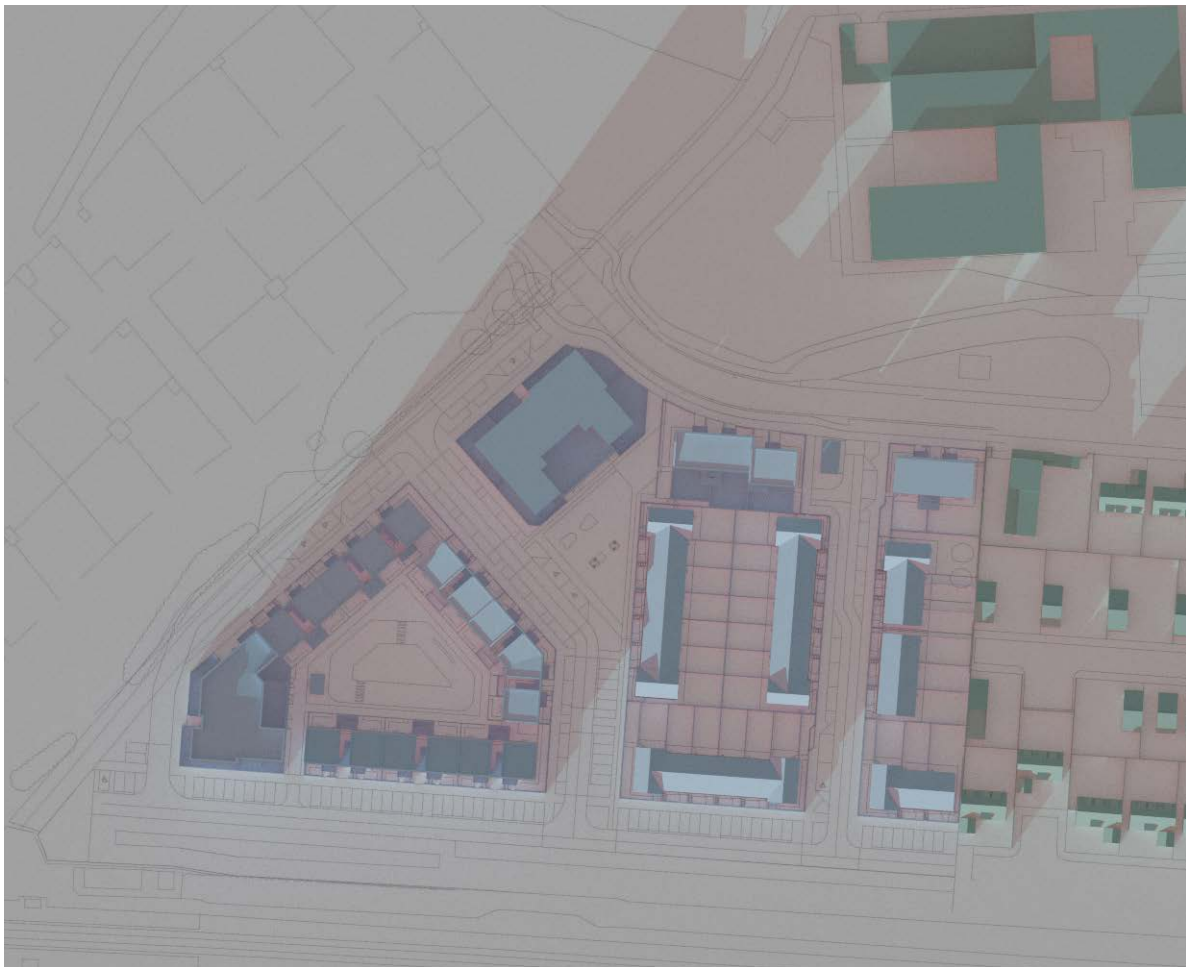


Figure 21: Shadow diagrams 21 December 15:00 UTC

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

Block A

Third Floor

Fourth Floor

Fifth Floor

Ground Floor

First Floor

Second Floor

Figure 22: 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	31.0	292	200	1612	100.0%	Y
A0-01.2	Bed	9.8	80	100	2322	100.0%	Y
A0-01.3	Bed	12.5	108	100	1761	100.0%	Y
A0-02.1	LKD	31.0	292	200	2194	100.0%	Y
A0-02.2	Bed	9.8	80	100	2245	100.0%	Y
A0-02.3	Bed	12.5	108	100	1965	100.0%	Y
A0-03.1	LKD	33.0	294	200	809	99.0%	Y
A0-03.2	Bed	12.0	99	100	1221	100.0%	Y
A0-03.3	Bed	12.4	104	100	731	100.0%	Y
A1-01.1	LKD	31.0	292	200	1540	100.0%	Y
A1-01.2	Bed	9.8	80	100	2324	100.0%	Y
A1-01.3	Bed	12.5	108	100	1744	100.0%	Y
A1-02.1	LKD	31.0	292	200	2091	100.0%	Y
A1-02.2	Bed	9.8	80	100	2246	100.0%	Y
A1-02.3	Bed	12.5	108	100	1990	100.0%	Y
A1-03.1	LKD	33.0	294	200	744	100.0%	Y
A1-03.2	Bed	12.0	99	100	1212	100.0%	Y
A1-03.3	Bed	12.4	104	100	722	100.0%	Y
A1-04.1	LKD	31.0	292	200	962	100.0%	Y
A1-04.2	Bed	9.8	80	100	897	100.0%	Y
A1-04.3	Bed	12.5	108	100	772	100.0%	Y
A2-01.1	LKD	31.0	292	200	1727	100.0%	Y
A2-01.2	Bed	9.8	80	100	2299	100.0%	Y
A2-01.3	Bed	12.5	108	100	1766	100.0%	Y
A2-02.1	LKD	31.0	292	200	2099	100.0%	Y
A2-02.2	Bed	9.8	80	100	2264	100.0%	Y
A2-02.3	Bed	12.5	108	100	1969	100.0%	Y
A2-03.1	LKD	33.0	294	200	753	100.0%	Y
A2-03.2	Bed	12.0	99	100	1237	100.0%	Y
A2-03.3	Bed	12.4	104	100	729	100.0%	Y
A2-04.1	LKD	31.0	292	200	1053	100.0%	Y
A2-04.2	Bed	9.8	80	100	902	100.0%	Y
A2-04.3	Bed	12.5	108	100	778	100.0%	Y
A3-01.1	LKD	31.0	292	200	1884	100.0%	Y
A3-01.2	Bed	9.8	80	100	2311	100.0%	Y
A3-01.3	Bed	12.5	108	100	1761	100.0%	Y
A3-02.1	LKD	31.0	292	200	2103	100.0%	Y
A3-02.2	Bed	9.8	80	100	2283	100.0%	Y
A3-02.3	Bed	12.5	108	100	1989	100.0%	Y
A3-03.1	LKD	33.0	294	200	753	100.0%	Y
A3-03.2	Bed	12.0	99	100	1222	100.0%	Y
A3-03.3	Bed	12.4	104	100	736	100.0%	Y
A3-04.1	LKD	31.0	292	200	1078	100.0%	Y
A3-04.2	Bed	9.8	80	100	928	100.0%	Y
A3-04.3	Bed	12.5	108	100	790	100.0%	Y
A4-01.1	LKD	31.0	292	200	1928	100.0%	Y
A4-01.2	Bed	9.8	80	100	2313	100.0%	Y
A4-01.3	Bed	12.5	108	100	1761	100.0%	Y
A4-02.1	LKD	31.0	292	200	2086	100.0%	Y
A4-02.2	Bed	9.8	80	100	2277	100.0%	Y
A4-02.3	Bed	12.5	108	100	2002	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
A4-03.1	LKD	33.0	294	200	757	99.7%	Y
A4-03.2	Bed	12.0	99	100	1251	100.0%	Y
A4-03.3	Bed	12.4	104	100	742	100.0%	Y
A4-04.1	LKD	31.0	292	200	1114	100.0%	Y
A4-04.2	Bed	9.8	80	100	935	100.0%	Y
A4-04.3	Bed	12.5	108	100	793	100.0%	Y
A5-01.1	LKD	31.0	292	200	2291	100.0%	Y
A5-01.2	Bed	9.8	80	100	2362	100.0%	Y
A5-01.3	Bed	12.5	108	100	1769	100.0%	Y
A5-02.1	LKD	31.0	292	200	2340	100.0%	Y
A5-02.2	Bed	9.8	80	100	2236	100.0%	Y
A5-02.3	Bed	12.5	108	100	1983	100.0%	Y
A5-03.1	LKD	33.0	294	200	985	100.0%	Y
A5-03.2	Bed	12.0	99	100	1294	100.0%	Y
A5-03.3	Bed	12.4	104	100	746	100.0%	Y
A5-04.1	LKD	31.0	292	200	1269	100.0%	Y
A5-04.2	Bed	9.8	80	100	931	100.0%	Y
A5-04.3	Bed	12.5	108	100	806	100.0%	Y

Table 12: Block A - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Figure 23: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

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

Duplex Units - 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
D0-01.1	KD	19.6	176	200	718	100.0%	Y
D0-01.2	L	15.6	132	150	2400	100.0%	Y
D0-01.3	Bed	9.8	80	100	1550	100.0%	Y
D0-01.4	Bed	12.2	108	100	1892	100.0%	Y
D0-01.5	Bed	8.7	72	100	825	100.0%	Y
D0-03.1	KD	19.6	176	200	761	100.0%	Y
D0-03.2	L	15.6	132	150	2355	100.0%	Y
D0-03.3	Bed	9.8	80	100	1571	100.0%	Y
D0-03.4	Bed	12.2	108	100	1885	100.0%	Y
D0-03.5	Bed	8.7	72	100	837	100.0%	Y
D0-05.1	KD	19.6	176	200	758	100.0%	Y
D0-05.2	L	15.6	132	150	2356	100.0%	Y
D0-05.3	Bed	9.8	80	100	1584	100.0%	Y
D0-05.4	Bed	12.2	108	100	1834	100.0%	Y
D0-05.5	Bed	8.7	72	100	855	100.0%	Y
D0-07.1	KD	19.6	176	200	734	100.0%	Y
D0-07.2	L	15.6	132	150	2346	100.0%	Y
D0-07.3	Bed	9.8	80	100	1547	100.0%	Y
D0-07.4	Bed	12.2	108	100	1873	100.0%	Y
D0-07.5	Bed	8.7	72	100	837	100.0%	Y

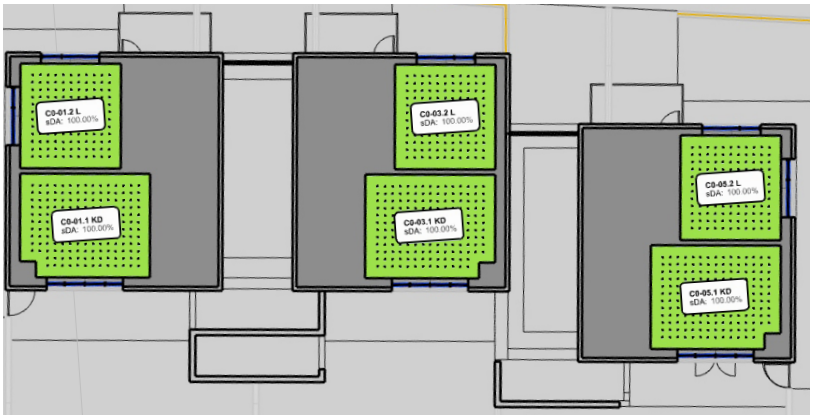
Duplex Units - Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded: Minimum 50% of grid	Meets Criteria
D0-09.1	KD	19.6	176	200	705	100.0%	Y
D0-09.2	L	15.6	132	150	2374	100.0%	Y
D0-09.3	Bed	9.8	80	100	1583	100.0%	Y
D0-09.4	Bed	12.2	108	100	1891	100.0%	Y
D0-09.5	Bed	8.7	72	100	811	100.0%	Y
D0-11.1	KD	19.6	176	200	531	100.0%	Y
D0-11.2	L	15.6	132	150	3707	100.0%	Y
D0-11.3	Bed	10.1	80	100	1579	100.0%	Y
D0-11.4	Bed	11.9	96	100	3640	100.0%	Y
D0-11.5	Bed	8.7	72	100	758	100.0%	Y
D0-13.1	KD	19.6	176	200	948	100.0%	Y
D0-13.2	L	15.6	132	150	2186	100.0%	Y
D0-13.3	Bed	10.1	80	100	1119	100.0%	Y
D0-13.4	Bed	11.9	96	100	2356	100.0%	Y
D0-13.5	Bed	8.7	72	100	1130	100.0%	Y
D0-15.1	KD	27.9	248	200	1288	100.0%	Y
D0-15.2	L	18.7	163	150	440	74.2%	Y
D0-15.3	Bed	10.2	88	100	670	100.0%	Y
D0-15.4	Bed	11.6	96	100	1383	100.0%	Y
D0-15.5	Bed	10.3	90	100	1444	100.0%	Y
D0-17.1	KD	19.6	176	200	1619	100.0%	Y
D0-17.2	L	15.6	132	150	936	100.0%	Y
D0-17.3	Bed	9.8	80	100	711	100.0%	Y
D0-17.4	Bed	12.2	108	100	774	100.0%	Y
D0-17.5	Bed	8.7	72	100	1886	100.0%	Y
D0-19.1	KD	19.6	176	200	1675	100.0%	Y
D0-19.2	L	15.6	132	150	928	100.0%	Y
D0-19.3	Bed	9.8	80	100	700	100.0%	Y
D0-19.4	Bed	12.2	108	100	770	100.0%	Y
D0-19.5	Bed	8.7	72	100	1874	100.0%	Y
D0-21.1	KD	19.6	176	200	1580	100.0%	Y
D0-21.2	L	15.6	132	150	1279	100.0%	Y
D0-21.3	Bed	9.8	80	100	720	100.0%	Y
D0-21.4	Bed	12.2	108	100	1542	100.0%	Y
D0-21.5	Bed	8.7	72	100	1971	100.0%	Y
D0-23.1	KD	19.6	176	200	611	100.0%	Y
D0-23.2	L	15.6	132	150	1681	100.0%	Y
D0-23.3	Bed	10.1	80	100	684	100.0%	Y
D0-23.4	Bed	11.9	96	100	1818	100.0%	Y
D0-23.5	Bed	8.7	72	100	763	100.0%	Y
D0-25.1	KD	19.6	176	200	1653	100.0%	Y
D0-25.2	L	15.6	132	150	910	100.0%	Y
D0-25.3	Bed	10.1	80	100	660	100.0%	Y
D0-25.4	Bed	11.9	96	100	749	100.0%	Y
D0-25.5	Bed	8.7	72	100	1970	100.0%	Y
D0-27.1	KD	19.6	176	200	1873	100.0%	Y
D0-27.2	L	15.6	132	150	887	100.0%	Y
D0-27.3	Bed	9.8	80	100	688	100.0%	Y
D0-27.4	Bed	12.2	108	100	722	100.0%	Y
D0-27.5	Bed	8.7	72	100	2039	100.0%	Y

Duplex Units - 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
D0-29.1	KD	19.6	176	200	1831	100.0%	Y
D0-29.2	L	15.6	132	150	899	100.0%	Y
D0-29.3	Bed	9.8	80	100	661	100.0%	Y
D0-29.4	Bed	12.2	108	100	738	100.0%	Y
D0-29.5	Bed	8.7	72	100	2082	100.0%	Y
D0-31.1	KD	19.6	176	200	1548	100.0%	Y
D0-31.2	L	15.6	132	150	827	100.0%	Y
D0-31.3	Bed	9.8	80	100	670	100.0%	Y
D0-31.4	Bed	12.2	108	100	710	100.0%	Y
D0-31.5	Bed	8.7	72	100	1867	100.0%	Y
D2-02.1	LKD	22.0	187	200	2154	100.0%	Y
D2-02.2	Bed	10.1	80	100	773	100.0%	Y
D2-04.1	LKD	22.0	187	200	2151	100.0%	Y
D2-04.2	Bed	10.1	80	100	763	100.0%	Y
D2-06.1	LKD	22.0	187	200	2149	100.0%	Y
D2-06.2	Bed	10.1	80	100	756	100.0%	Y
D2-08.1	LKD	22.0	187	200	2184	100.0%	Y
D2-08.2	Bed	10.1	80	100	755	100.0%	Y
D2-10.1	LKD	22.0	187	200	2146	100.0%	Y
D2-10.2	Bed	10.1	80	100	758	100.0%	Y
D2-12.1	LKD	22.0	192	200	2858	100.0%	Y
D2-12.2	Bed	10.1	80	100	795	100.0%	Y
D2-14.1	LKD	22.4	196	200	1398	100.0%	Y
D2-14.2	Bed	10.1	80	100	1041	100.0%	Y
D2-16.1	LKD	24.8	214	200	1249	100.0%	Y
D2-16.2	Bed	10.2	81	100	1180	100.0%	Y
D2-18.1	LKD	22.0	187	200	977	100.0%	Y
D2-18.2	Bed	10.1	80	100	1668	100.0%	Y
D2-20.1	LKD	22.0	187	200	961	100.0%	Y
D2-20.2	Bed	10.1	80	100	1657	100.0%	Y
D2-22.1	LKD	22.0	187	200	964	100.0%	Y
D2-22.2	Bed	10.1	80	100	1661	100.0%	Y
D2-24.1	LKD	22.9	198	200	1333	100.0%	Y
D2-24.2	Bed	10.5	84	100	1077	100.0%	Y
D2-26.1	LKD	22.9	198	200	885	100.0%	Y
D2-26.2	Bed	10.5	84	100	1738	100.0%	Y
D2-28.1	LKD	22.9	198	200	872	100.0%	Y
D2-28.2	Bed	10.5	84	100	1763	100.0%	Y
D2-30.1	LKD	22.9	198	200	875	100.0%	Y
D2-30.2	Bed	10.5	84	100	1800	100.0%	Y
D2-32.1	LKD	22.9	198	200	816	100.0%	Y
D2-32.2	Bed	10.5	84	100	1634	100.0%	Y

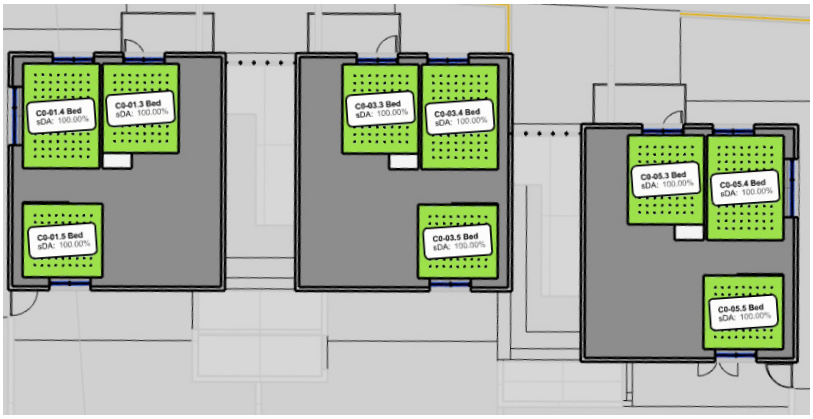
Table 13: Duplex Units - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Duplex Units
C 01 - 10

Ground Floor



First Floor



Second Floor

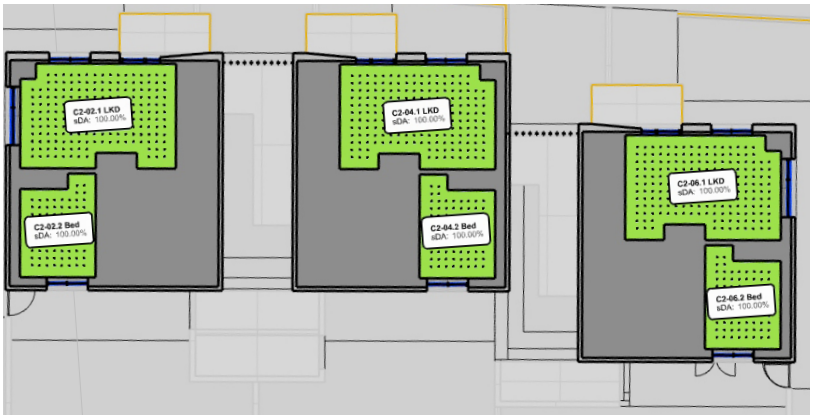


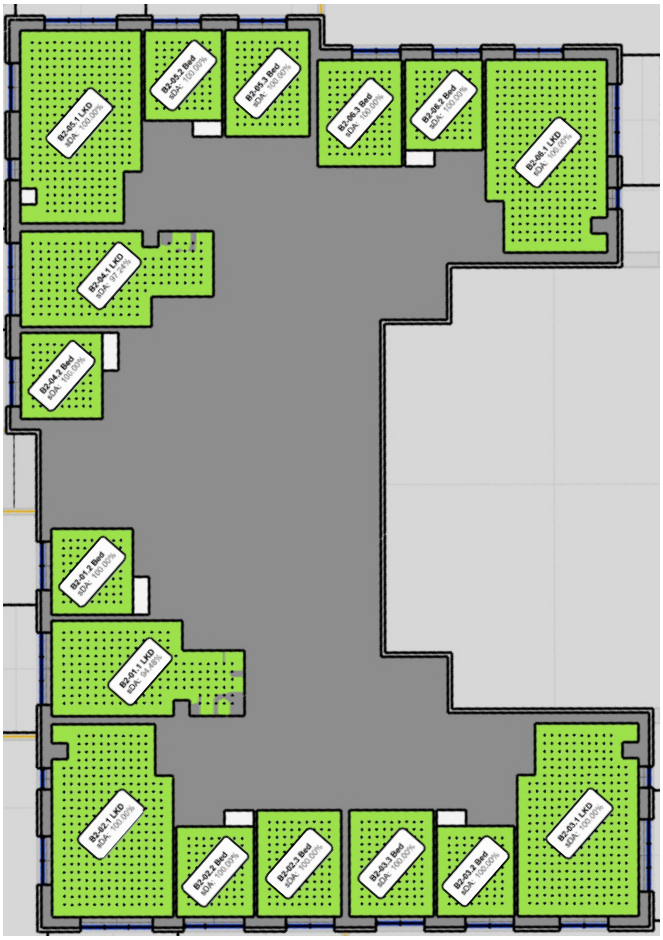
Figure 25: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Duplex 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	KD	19.6	176	200	1630	100.0%	Y
C0-01.2	L	15.6	132	150	1810	100.0%	Y
C0-01.3	Bed	10.1	80	100	629	100.0%	Y
C0-01.4	Bed	11.9	96	100	2081	100.0%	Y
C0-01.5	Bed	8.7	72	100	1995	100.0%	Y
C0-03.1	KD	19.6	176	200	1891	100.0%	Y
C0-03.2	L	15.6	132	150	835	100.0%	Y
C0-03.3	Bed	10.1	80	100	629	100.0%	Y
C0-03.4	Bed	11.9	96	100	692	100.0%	Y
C0-03.5	Bed	8.7	72	100	2191	100.0%	Y
C0-05.1	KD	19.6	176	200	1462	100.0%	Y
C0-05.2	L	15.6	132	150	2099	100.0%	Y
C0-05.3	Bed	10.1	80	100	617	100.0%	Y
C0-05.4	Bed	11.9	96	100	2488	100.0%	Y
C0-05.5	Bed	8.7	72	100	1932	100.0%	Y
C0-07.1	KD	19.6	176	200	1725	100.0%	Y
C0-07.2	L	15.6	132	150	1998	100.0%	Y
C0-07.3	Bed	10.1	80	100	626	100.0%	Y
C0-07.4	Bed	11.9	96	100	2252	100.0%	Y
C0-07.5	Bed	8.7	72	100	2083	100.0%	Y
C0-09.1	KD	19.6	176	200	2126	100.0%	Y
C0-09.2	L	15.6	132	150	2323	100.0%	Y
C0-09.3	Bed	10.1	80	100	651	100.0%	Y
C0-09.4	Bed	11.9	96	100	2572	100.0%	Y
C0-09.5	Bed	8.7	72	100	2300	100.0%	Y
C2-02.1	LKD	22.9	198	200	1420	100.0%	Y
C2-02.2	Bed	10.5	84	100	1911	100.0%	Y
C2-04.1	LKD	22.9	198	200	820	100.0%	Y
C2-04.2	Bed	10.5	84	100	1856	100.0%	Y
C2-06.1	LKD	22.9	198	200	1560	100.0%	Y
C2-06.2	Bed	10.5	84	100	1909	100.0%	Y
C2-08.1	LKD	22.9	198	200	1451	100.0%	Y
C2-08.2	Bed	10.5	84	100	1961	100.0%	Y
C2-10.1	LKD	22.9	198	200	1555	100.0%	Y
C2-10.2	Bed	10.5	84	100	1959	100.0%	Y

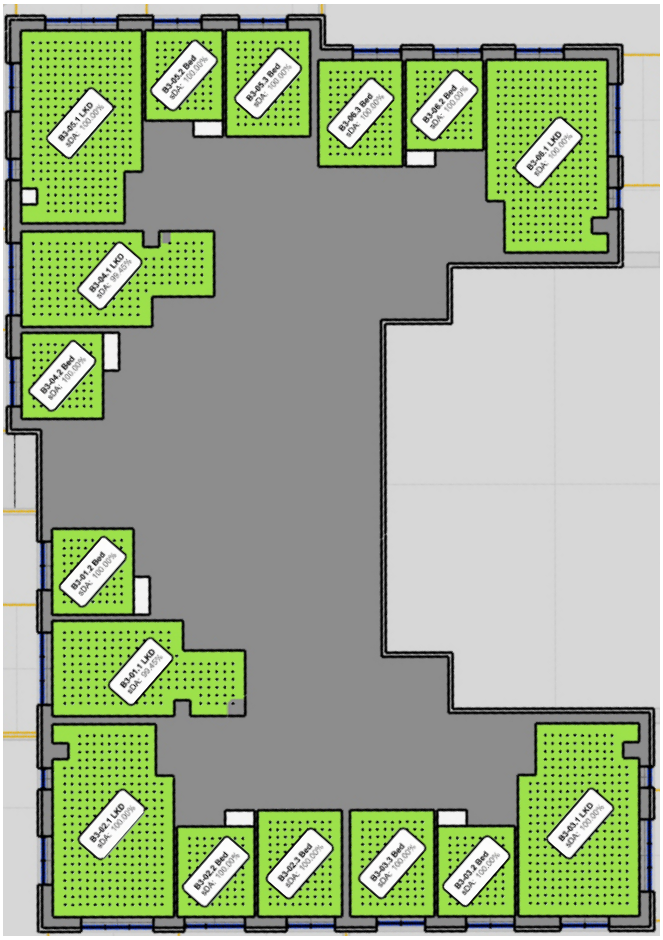
Table 14: Duplex C - Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

Block B

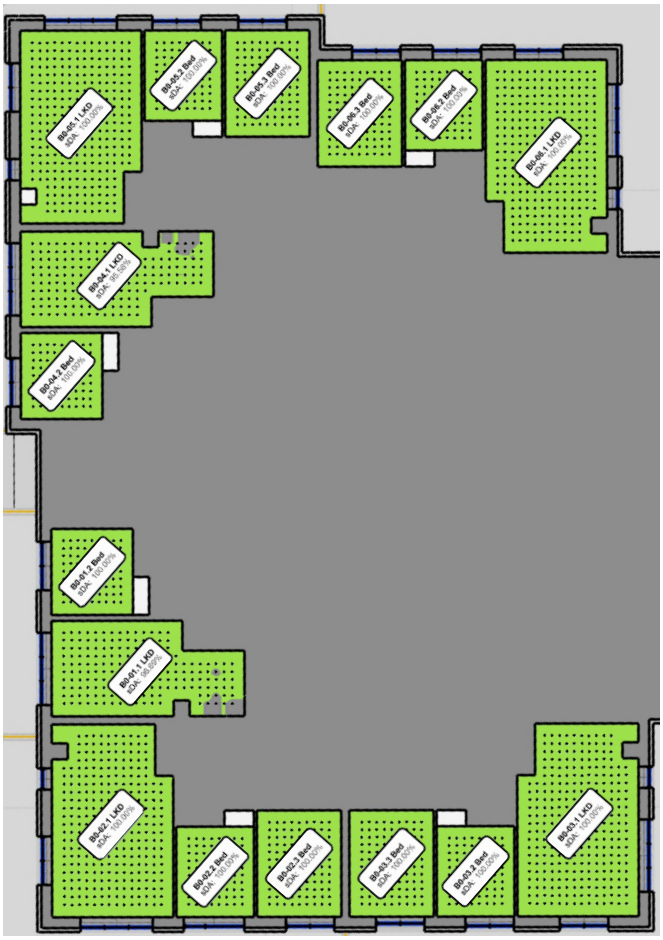
Second Floor



Third Floor



Ground Floor



First Floor

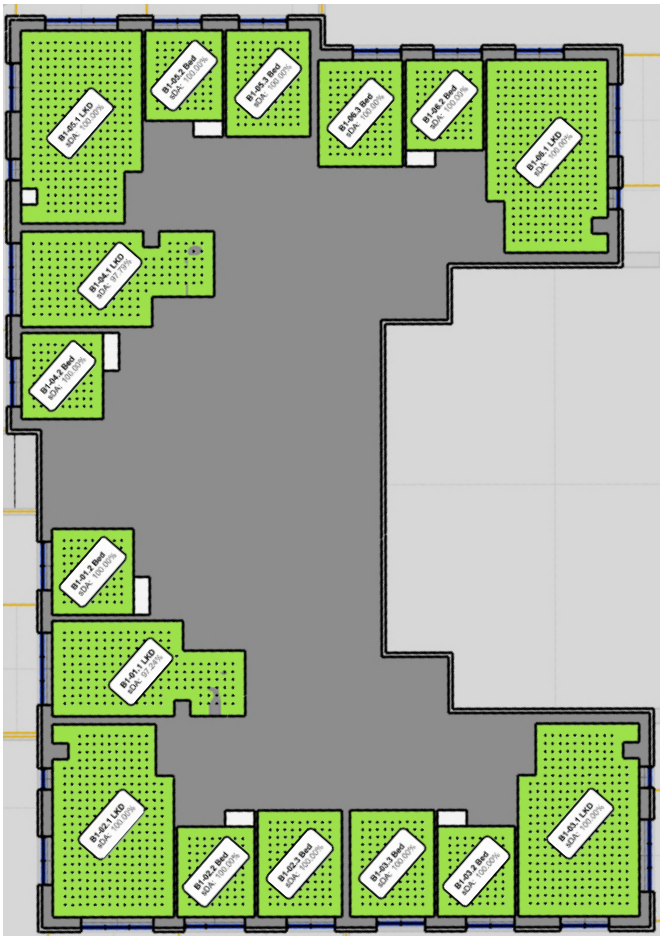


Figure 26: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

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	22.7	181	200	722	96.1%	Y
B0-01.2	Bed	9.8	81	100	912	100.0%	Y
B0-02.1	LKD	31.0	288	200	1435	100.0%	Y
B0-02.2	Bed	9.8	80	100	2057	100.0%	Y
B0-02.3	Bed	12.5	108	100	1310	100.0%	Y
B0-03.1	LKD	31.0	288	200	2009	100.0%	Y
B0-03.2	Bed	9.8	80	100	1505	100.0%	Y
B0-03.3	Bed	12.5	108	100	1322	100.0%	Y
B0-04.1	LKD	22.7	181	200	719	98.9%	Y
B0-04.2	Bed	9.8	81	100	904	100.0%	Y
B0-05.1	LKD	31.0	288	200	1082	100.0%	Y
B0-05.2	Bed	9.8	80	100	1001	100.0%	Y
B0-05.3	Bed	12.5	108	100	872	100.0%	Y
B0-06.1	LKD	31.0	288	200	1561	100.0%	Y
B0-06.2	Bed	9.8	80	100	1052	100.0%	Y
B0-06.3	Bed	12.5	108	100	889	100.0%	Y
B1-01.1	LKD	22.7	181	200	682	97.8%	Y
B1-01.2	Bed	9.8	81	100	912	100.0%	Y
B1-02.1	LKD	31.0	288	200	1410	100.0%	Y
B1-02.2	Bed	9.8	80	100	2301	100.0%	Y
B1-02.3	Bed	12.5	108	100	1522	100.0%	Y
B1-03.1	LKD	31.0	288	200	2007	100.0%	Y
B1-03.2	Bed	9.8	80	100	1739	100.0%	Y
B1-03.3	Bed	12.5	108	100	1529	100.0%	Y
B1-04.1	LKD	22.7	181	200	700	97.2%	Y
B1-04.2	Bed	9.8	81	100	963	100.0%	Y
B1-05.1	LKD	31.0	288	200	1051	100.0%	Y
B1-05.2	Bed	9.8	80	100	1024	100.0%	Y
B1-05.3	Bed	12.5	108	100	904	100.0%	Y
B1-06.1	LKD	31.0	288	200	1618	100.0%	Y
B1-06.2	Bed	9.8	80	100	1102	100.0%	Y
B1-06.3	Bed	12.5	108	100	906	100.0%	Y
B2-01.1	LKD	22.7	181	200	683	97.2%	Y
B2-01.2	Bed	9.8	81	100	924	100.0%	Y
B2-02.1	LKD	31.0	288	200	1472	100.0%	Y
B2-02.2	Bed	9.8	80	100	2472	100.0%	Y
B2-02.3	Bed	12.5	108	100	1633	100.0%	Y
B2-03.1	LKD	31.0	288	200	2140	100.0%	Y
B2-03.2	Bed	9.8	80	100	1888	100.0%	Y
B2-03.3	Bed	12.5	108	100	1651	100.0%	Y
B2-04.1	LKD	22.7	181	200	706	98.3%	Y
B2-04.2	Bed	9.8	81	100	950	100.0%	Y
B2-05.1	LKD	31.0	288	200	1070	100.0%	Y
B2-05.2	Bed	9.8	80	100	1018	100.0%	Y
B2-05.3	Bed	12.5	108	100	897	100.0%	Y
B2-06.1	LKD	31.0	288	200	1776	100.0%	Y
B2-06.2	Bed	9.8	80	100	1051	100.0%	Y
B2-06.3	Bed	12.5	108	100	896	100.0%	Y
B3-01.1	LKD	22.7	181	200	864	98.9%	Y
B3-01.2	Bed	9.8	81	100	964	100.0%	Y
B3-02.1	LKD	31.0	288	200	1854	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
B3-02.2	Bed	9.8	80	100	2651	100.0%	Y
B3-02.3	Bed	12.5	108	100	1720	100.0%	Y
B3-03.1	LKD	31.0	288	200	2613	100.0%	Y
B3-03.2	Bed	9.8	80	100	1974	100.0%	Y
B3-03.3	Bed	12.5	108	100	1708	100.0%	Y
B3-04.1	LKD	22.7	181	200	862	99.4%	Y
B3-04.2	Bed	9.8	81	100	995	100.0%	Y
B3-05.1	LKD	31.0	288	200	1215	100.0%	Y
B3-05.2	Bed	9.8	80	100	1048	100.0%	Y
B3-05.3	Bed	12.5	108	100	903	100.0%	Y
B3-06.1	LKD	31.0	288	200	2234	100.0%	Y
B3-06.2	Bed	9.8	80	100	1051	100.0%	Y
B3-06.3	Bed	12.5	108	100	891	100.0%	Y

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

Houses
H 01-20
Ground Floor

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

Houses
H 01-20
First Floor

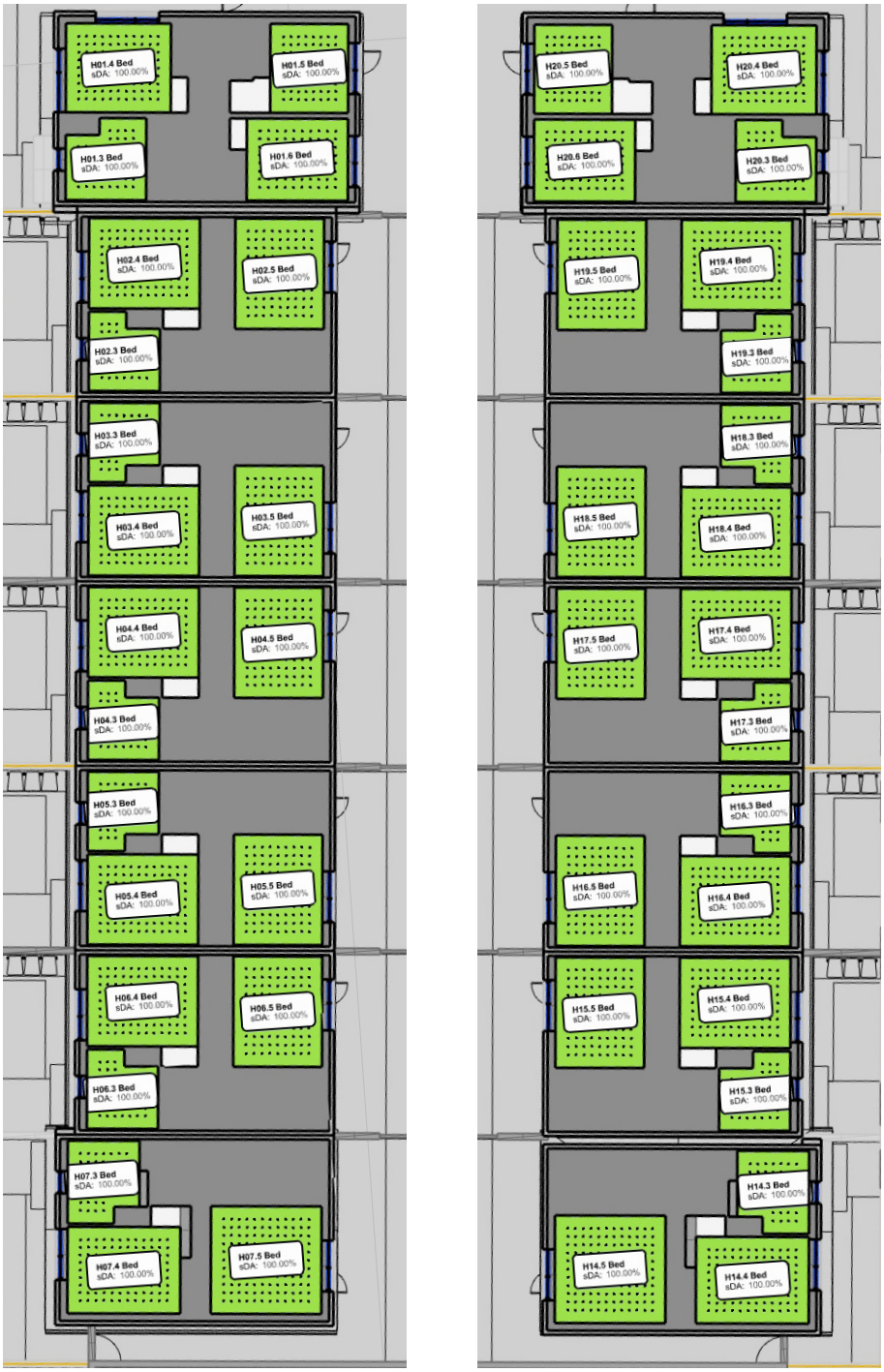


Figure 28: Floor plans indicating Daylight Provision to BS EN17037:2021+A1 Table NA.1

Houses
H 21-29

Ground Floor

First Floor

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

Houses - 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
H01.	KD	22.4	204	200	1419	100.0%	Y
H01.	L	17.6	156	150	1643	100.0%	Y
H01.3	Bed	7.6	56	100	602	100.0%	Y
H01.4	Bed	11.7	99	100	2272	100.0%	Y
H01.5	Bed	8.7	72	100	1660	100.0%	Y
H01.6	Bed	10.4	80	100	1453	100.0%	Y
H02.	KD	16.9	135	200	1399	100.0%	Y
H02.	L	14.8	121	150	1107	100.0%	Y
H02.3	Bed	6.4	48	100	695	100.0%	Y
H02.4	Bed	12.5	108	100	1015	100.0%	Y
H02.5	Bed	12.3	99	100	1281	100.0%	Y
H03.	KD	16.9	135	200	1380	100.0%	Y
H03.	L	14.8	121	150	1093	100.0%	Y
H03.3	Bed	6.4	48	100	735	100.0%	Y
H03.4	Bed	12.5	108	100	917	100.0%	Y
H03.5	Bed	12.3	99	100	1277	100.0%	Y
H04.	KD	16.9	135	200	1392	100.0%	Y
H04.	L	14.8	121	150	1072	100.0%	Y
H04.3	Bed	6.4	48	100	691	100.0%	Y
H04.4	Bed	12.5	108	100	999	100.0%	Y
H04.5	Bed	12.3	99	100	1305	100.0%	Y
H05.	KD	16.9	135	200	1413	100.0%	Y
H05.	L	14.8	121	150	1056	100.0%	Y
H05.3	Bed	6.4	48	100	718	100.0%	Y
H05.4	Bed	12.5	108	100	905	100.0%	Y
H05.5	Bed	12.3	99	100	1299	100.0%	Y
H06.	KD	16.9	135	200	1392	100.0%	Y
H06.	L	14.8	121	150	1063	100.0%	Y
H06.3	Bed	6.4	48	100	663	100.0%	Y
H06.4	Bed	12.5	108	100	981	100.0%	Y
H06.5	Bed	12.3	99	100	1288	100.0%	Y
H07.	KD	16.9	135	200	1425	100.0%	Y
H07.	L	14.8	121	150	1086	100.0%	Y
H07.3	Bed	6.4	48	100	712	100.0%	Y
H07.4	Bed	12.5	108	100	910	100.0%	Y
H07.5	Bed	12.3	99	100	1289	100.0%	Y
H08.	KD	22.4	204	200	1379	100.0%	Y
H08.	L	17.6	156	150	3082	100.0%	Y
H08.3	Bed	7.6	56	100	1070	100.0%	Y
H08.4	Bed	11.7	99	100	3813	100.0%	Y
H08.5	Bed	8.7	72	100	926	100.0%	Y
H08.6	Bed	10.4	80	100	796	100.0%	Y
H09.	KD	16.9	135	200	786	100.0%	Y
H09.	L	14.8	121	150	2115	100.0%	Y
H09.3	Bed	6.4	48	100	1316	100.0%	Y
H09.4	Bed	12.5	108	100	1772	100.0%	Y
H09.5	Bed	12.3	99	100	700	100.0%	Y
H10.	KD	16.9	135	200	789	100.0%	Y
H10.	L	14.8	121	150	2123	100.0%	Y
H10.3	Bed	6.4	48	100	1299	100.0%	Y
H10.4	Bed	12.5	108	100	1758	100.0%	Y

Houses - 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
H10.5	Bed	12.3	99	100	717	100.0%	Y
H11.	KD	16.9	135	200	785	100.0%	Y
H11.	L	14.8	121	150	2143	100.0%	Y
H11.3	Bed	6.4	48	100	1317	100.0%	Y
H11.4	Bed	12.5	108	100	1760	100.0%	Y
H11.5	Bed	12.3	99	100	724	100.0%	Y
H12.	KD	16.9	135	200	769	100.0%	Y
H12.	L	14.8	121	150	2116	100.0%	Y
H12.3	Bed	6.4	48	100	1323	100.0%	Y
H12.4	Bed	12.5	108	100	1748	100.0%	Y
H12.5	Bed	12.3	99	100	694	100.0%	Y
H13.	KD	22.4	204	200	1477	100.0%	Y
H13.	L	17.6	156	150	3222	100.0%	Y
H13.3	Bed	7.6	56	100	1126	100.0%	Y
H13.4	Bed	11.7	99	100	3991	100.0%	Y
H13.5	Bed	8.7	72	100	939	100.0%	Y
H13.6	Bed	10.4	80	100	823	100.0%	Y
H14.	KD	16.9	135	200	1229	100.0%	Y
H14.	L	14.8	121	150	1280	100.0%	Y
H14.3	Bed	6.4	48	100	888	100.0%	Y
H14.4	Bed	12.5	108	100	1135	100.0%	Y
H14.5	Bed	12.3	99	100	1117	100.0%	Y
H15.	KD	16.9	135	200	1244	100.0%	Y
H15.	L	14.8	121	150	1278	100.0%	Y
H15.3	Bed	6.4	48	100	848	100.0%	Y
H15.4	Bed	12.5	108	100	1199	100.0%	Y
H15.5	Bed	12.3	99	100	1128	100.0%	Y
H16.	KD	16.9	135	200	1238	100.0%	Y
H16.	L	14.8	121	150	1238	100.0%	Y
H16.3	Bed	6.4	48	100	843	100.0%	Y
H16.4	Bed	12.5	108	100	1120	100.0%	Y
H16.5	Bed	12.3	99	100	1125	100.0%	Y
H17.	KD	16.9	135	200	1218	100.0%	Y
H17.	L	14.8	121	150	1238	100.0%	Y
H17.3	Bed	6.4	48	100	836	100.0%	Y
H17.4	Bed	12.5	108	100	1204	100.0%	Y
H17.5	Bed	12.3	99	100	1121	100.0%	Y
H18.	KD	16.9	135	200	1231	100.0%	Y
H18.	L	14.8	121	150	1257	100.0%	Y
H18.3	Bed	6.4	48	100	872	100.0%	Y
H18.4	Bed	12.5	108	100	1118	100.0%	Y
H18.5	Bed	12.3	99	100	1134	100.0%	Y
H19.	KD	16.9	135	200	1239	100.0%	Y
H19.	L	14.8	121	150	1230	100.0%	Y
H19.3	Bed	6.4	48	100	819	100.0%	Y
H19.4	Bed	12.5	108	100	1205	100.0%	Y
H19.5	Bed	12.3	99	100	1116	100.0%	Y
H20.	KD	22.4	204	200	1319	100.0%	Y
H20.	L	17.6	156	150	1842	100.0%	Y
H20.3	Bed	7.6	56	100	705	100.0%	Y
H20.4	Bed	11.7	99	100	2515	100.0%	Y

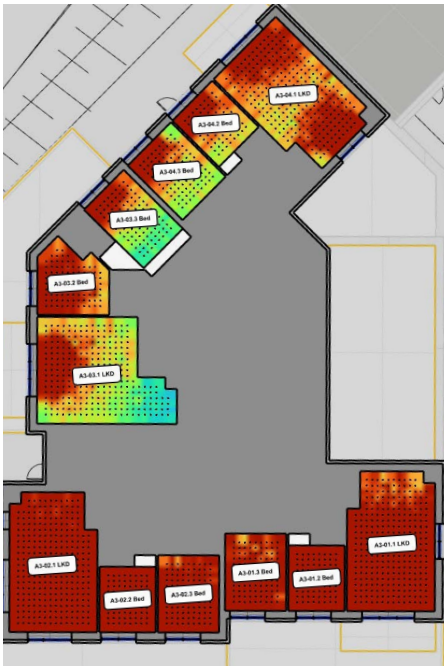
Houses - Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1							
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded: Minimum 50% of grid	Meets Criteria
H20.5	Bed	8.7	72	100	1459	100.0%	Y
H20.6	Bed	10.4	80	100	1245	100.0%	Y
H21.	KD	22.4	204	200	1749	100.0%	Y
H21.	L	17.6	156	150	1657	100.0%	Y
H21.3	Bed	7.6	56	100	631	100.0%	Y
H21.4	Bed	11.7	99	100	2337	100.0%	Y
H21.5	Bed	8.7	72	100	1733	100.0%	Y
H21.6	Bed	10.4	80	100	1508	100.0%	Y
H22.	KD	16.9	135	200	1603	100.0%	Y
H22.	L	14.8	121	150	1103	100.0%	Y
H22.3	Bed	6.4	48	100	775	100.0%	Y
H22.4	Bed	12.5	108	100	969	100.0%	Y
H22.5	Bed	12.3	99	100	1361	100.0%	Y
H23.	KD	16.9	135	200	1600	100.0%	Y
H23.	L	14.8	121	150	1109	100.0%	Y
H23.3	Bed	6.4	48	100	723	100.0%	Y
H23.4	Bed	12.5	108	100	1050	100.0%	Y
H23.5	Bed	12.3	99	100	1320	100.0%	Y
H24.	KD	16.9	135	200	1591	100.0%	Y
H24.	L	14.8	121	150	1108	100.0%	Y
H24.3	Bed	6.4	48	100	757	100.0%	Y
H24.4	Bed	12.5	108	100	974	100.0%	Y
H24.5	Bed	12.3	99	100	1348	100.0%	Y
H25.	KD	16.9	135	200	1593	100.0%	Y
H25.	L	14.8	121	150	1122	100.0%	Y
H25.3	Bed	6.4	48	100	726	100.0%	Y
H25.4	Bed	12.5	108	100	1065	100.0%	Y
H25.5	Bed	12.3	99	100	1318	100.0%	Y
H26.	KD	16.9	135	200	1581	100.0%	Y
H26.	L	14.8	121	150	1142	100.0%	Y
H26.3	Bed	6.4	48	100	767	100.0%	Y
H26.4	Bed	12.5	108	100	963	100.0%	Y
H26.5	Bed	12.3	99	100	1327	100.0%	Y
H27.	KD	22.4	204	200	1385	100.0%	Y
H27.	L	17.6	156	150	3081	100.0%	Y
H27.3	Bed	7.6	56	100	1111	100.0%	Y
H27.4	Bed	11.7	99	100	3795	100.0%	Y
H27.5	Bed	8.7	72	100	917	100.0%	Y
H27.6	Bed	10.4	80	100	817	100.0%	Y
H28.	KD	16.9	135	200	796	100.0%	Y
H28.	L	14.8	121	150	2145	100.0%	Y
H28.3	Bed	6.4	48	100	1329	100.0%	Y
H28.4	Bed	12.5	108	100	1779	100.0%	Y
H28.5	Bed	12.3	99	100	709	100.0%	Y
H29.	KD	16.9	135	200	821	100.0%	Y
H29.	L	14.8	121	150	2153	100.0%	Y
H29.3	Bed	6.4	48	100	1294	100.0%	Y
H29.4	Bed	12.5	108	100	1761	100.0%	Y
H29.5	Bed	12.3	99	100	730	100.0%	Y

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

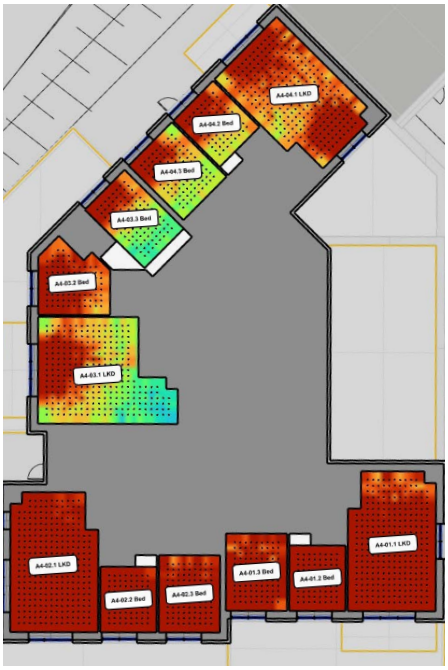
Appendix B - Supplementary Information - IS/ BS EN17037:2018 Table A.1 Daylight Provision Room Results

Block A

Third Floor

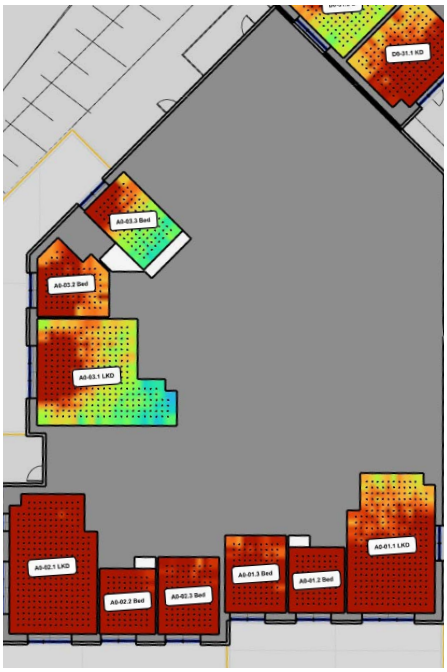


Fourth Floor

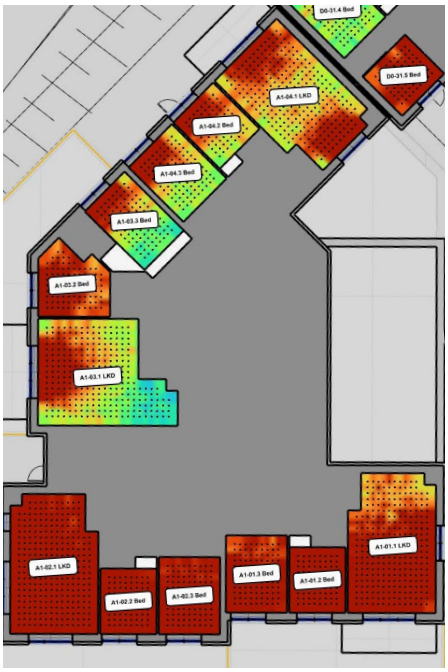


Fifth Floor

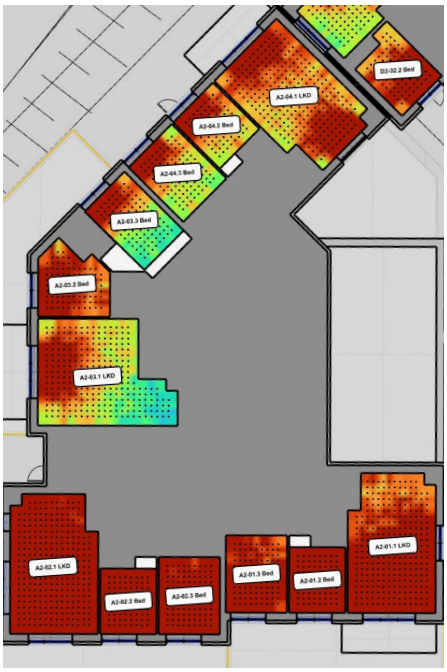
Ground Floor



First Floor



Second Floor



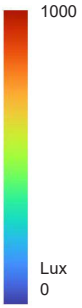


Figure 30: Daylight Provision and Annual Average Illuminance to all habitable rooms

Block A - 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	31.0	292	High	75.3%	63.9%	52.9%	High	84.1%	64.8%	50.3%
A0-01.2	Bed	9.8	80	High	80.4%	71.2%	61.2%	High	87.5%	74.8%	62.4%
A0-01.3	Bed	12.5	108	High	74.8%	62.4%	51.4%	High	84.8%	66.8%	52.3%
A0-02.1	LKD	31.0	292	High	82.7%	75.5%	66.1%	High	88.6%	77.4%	65.9%
A0-02.2	Bed	9.8	80	High	79.5%	69.4%	60.2%	High	87.3%	74.2%	61.7%
A0-02.3	Bed	12.5	108	High	76.8%	66.4%	55.6%	High	86.3%	70.8%	57.6%
A0-03.1	LKD	33.0	294	Minimum	66.6%	47.6%	27.9%	Minimum	77.4%	40.4%	17.2%
A0-03.2	Bed	12.0	99	Medium	76.7%	63.4%	46.8%	High	87.1%	69.6%	50.8%
A0-03.3	Bed	12.4	104	Medium	69.7%	50.6%	28.7%	Medium	82.1%	53.7%	25.9%
A1-01.1	LKD	31.0	292	High	77.2%	66.3%	55.5%	High	84.2%	65.3%	51.3%
A1-01.2	Bed	9.8	80	High	80.4%	71.0%	61.0%	High	87.6%	75.1%	62.9%
A1-01.3	Bed	12.5	108	High	75.1%	63.6%	52.8%	High	85.0%	67.7%	54.0%
A1-02.1	LKD	31.0	292	High	82.5%	75.1%	65.5%	High	88.5%	77.4%	66.1%
A1-02.2	Bed	9.8	80	High	80.0%	70.3%	60.5%	High	87.3%	74.4%	61.9%
A1-02.3	Bed	12.5	108	High	77.8%	67.3%	56.5%	High	86.3%	71.2%	58.1%
A1-03.1	LKD	33.0	294	Minimum	66.3%	48.8%	28.5%	Minimum	77.1%	41.9%	16.0%
A1-03.2	Bed	12.0	99	Medium	77.3%	64.2%	48.9%	High	87.1%	69.7%	52.4%
A1-03.3	Bed	12.4	104	Medium	69.5%	51.7%	31.0%	Medium	82.1%	54.6%	28.0%
A1-04.1	LKD	31.0	292	Medium	74.6%	59.2%	45.7%	Medium	86.2%	66.9%	50.0%
A1-04.2	Bed	9.8	80	Medium	76.9%	62.3%	45.8%	High	87.2%	69.4%	51.1%
A1-04.3	Bed	12.5	108	Medium	72.4%	55.9%	37.3%	Medium	85.9%	63.7%	43.3%
A2-01.1	LKD	31.0	292	High	79.1%	69.0%	59.4%	High	85.3%	67.5%	54.0%
A2-01.2	Bed	9.8	80	High	81.1%	72.5%	62.0%	High	87.8%	75.5%	63.9%
A2-01.3	Bed	12.5	108	High	75.1%	63.1%	51.9%	High	85.6%	68.2%	54.3%
A2-02.1	LKD	31.0	292	High	82.4%	75.1%	65.7%	High	88.4%	77.1%	65.3%
A2-02.2	Bed	9.8	80	High	80.0%	70.3%	60.5%	High	87.7%	75.4%	64.0%
A2-02.3	Bed	12.5	108	High	78.3%	68.0%	57.2%	High	86.5%	72.0%	58.6%
A2-03.1	LKD	33.0	294	Minimum	66.5%	49.4%	29.4%	Minimum	76.6%	41.2%	14.9%
A2-03.2	Bed	12.0	99	Medium	77.1%	64.3%	49.5%	High	87.1%	70.5%	53.8%
A2-03.3	Bed	12.4	104	Medium	70.8%	53.5%	33.7%	Medium	82.1%	54.3%	28.0%
A2-04.1	LKD	31.0	292	High	76.6%	63.0%	50.8%	High	86.6%	69.8%	54.1%
A2-04.2	Bed	9.8	80	Medium	76.6%	61.9%	45.5%	High	87.1%	68.5%	50.5%
A2-04.3	Bed	12.5	108	Medium	72.0%	55.6%	38.3%	Medium	85.9%	64.0%	43.7%
A3-01.1	LKD	31.0	292	High	81.6%	74.0%	64.0%	High	86.7%	72.9%	59.9%
A3-01.2	Bed	9.8	80	High	81.1%	72.6%	61.8%	High	87.7%	75.2%	63.5%
A3-01.3	Bed	12.5	108	High	75.1%	63.5%	52.3%	High	85.5%	68.1%	54.1%
A3-02.1	LKD	31.0	292	High	82.6%	75.4%	66.0%	High	88.3%	77.1%	65.4%
A3-02.2	Bed	9.8	80	High	80.1%	70.6%	60.8%	High	87.6%	74.9%	62.8%
A3-02.3	Bed	12.5	108	High	77.6%	67.2%	56.3%	High	86.6%	72.3%	58.7%
A3-03.1	LKD	33.0	294	Medium	67.0%	50.2%	30.3%	Minimum	77.3%	43.3%	15.7%
A3-03.2	Bed	12.0	99	High	77.4%	64.8%	50.1%	High	87.1%	70.4%	53.7%
A3-03.3	Bed	12.4	104	Medium	71.2%	54.6%	36.4%	Medium	82.0%	54.8%	30.3%
A3-04.1	LKD	31.0	292	High	77.3%	63.7%	52.6%	High	86.9%	70.4%	55.3%
A3-04.2	Bed	9.8	80	Medium	76.8%	62.4%	46.6%	High	87.4%	70.1%	52.7%
A3-04.3	Bed	12.5	108	Medium	71.7%	55.5%	38.6%	Medium	86.2%	65.5%	45.9%
A4-01.1	LKD	31.0	292	High	81.9%	74.6%	64.8%	High	86.7%	73.3%	60.3%
A4-01.2	Bed	9.8	80	High	80.7%	71.6%	61.4%	High	87.7%	75.4%	63.7%
A4-01.3	Bed	12.5	108	High	75.3%	63.9%	52.7%	High	85.6%	68.4%	54.8%
A4-02.1	LKD	31.0	292	High	82.6%	75.4%	66.1%	High	88.5%	77.3%	65.9%
A4-02.2	Bed	9.8	80	High	80.2%	70.5%	61.0%	High	87.4%	74.4%	62.2%

Block A - 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
A4-02.3	Bed	12.5	108	High	78.2%	67.9%	57.4%	High	86.7%	72.8%	59.3%
A4-03.1	LKD	33.0	294	Medium	66.8%	50.3%	30.2%	Minimum	77.0%	43.0%	16.4%
A4-03.2	Bed	12.0	99	High	77.4%	65.4%	51.0%	High	87.1%	70.2%	54.3%
A4-03.3	Bed	12.4	104	Medium	70.5%	53.8%	35.8%	Medium	81.6%	54.2%	29.4%
A4-04.1	LKD	31.0	292	High	77.6%	64.3%	53.5%	High	87.0%	70.9%	55.7%
A4-04.2	Bed	9.8	80	Medium	76.8%	62.7%	47.2%	High	87.5%	70.4%	53.8%
A4-04.3	Bed	12.5	108	Medium	72.2%	56.1%	39.2%	Medium	85.9%	64.0%	45.1%
A5-01.1	LKD	31.0	292	High	83.2%	76.7%	67.5%	High	87.4%	75.0%	61.7%
A5-01.2	Bed	9.8	80	High	81.3%	73.1%	62.7%	High	87.6%	75.1%	63.5%
A5-01.3	Bed	12.5	108	High	75.7%	64.3%	53.3%	High	85.8%	69.2%	55.7%
A5-02.1	LKD	31.0	292	High	83.2%	76.6%	68.0%	High	89.0%	78.3%	67.7%
A5-02.2	Bed	9.8	80	High	80.8%	71.8%	61.4%	High	87.4%	74.6%	62.6%
A5-02.3	Bed	12.5	108	High	78.1%	67.9%	57.3%	High	86.5%	72.0%	58.4%
A5-03.1	LKD	33.0	294	Medium	71.8%	56.3%	38.8%	Minimum	79.5%	49.0%	24.8%
A5-03.2	Bed	12.0	99	High	77.6%	65.7%	52.1%	High	87.2%	70.8%	55.5%
A5-03.3	Bed	12.4	104	Medium	70.3%	53.4%	35.1%	Medium	82.9%	56.6%	33.8%
A5-04.1	LKD	31.0	292	High	79.1%	68.5%	57.7%	High	87.6%	73.9%	59.2%
A5-04.2	Bed	9.8	80	Medium	77.3%	63.4%	49.2%	High	87.3%	70.0%	53.2%
A5-04.3	Bed	12.5	108	Medium	72.4%	56.2%	40.1%	Medium	86.3%	65.8%	46.8%

Table 17: Block A - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Figure 31: Daylight Provision and Annual Average Illuminance to all habitable rooms

Figure 32: Daylight Provision and Annual Average Illuminance to all habitable rooms

Duplex 01-32 - 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
D0-01.1	KD	19.6	176	Medium	68.4%	50.6%	31.0%	Medium	82.4%	54.3%	31.3%
D0-01.2	L	15.6	132	High	80.3%	70.7%	60.8%	High	87.4%	74.9%	62.7%
D0-01.3	Bed	9.8	80	High	75.3%	64.6%	53.7%	High	85.5%	68.9%	55.1%
D0-01.4	Bed	12.2	108	High	75.6%	64.3%	53.5%	High	85.1%	67.9%	53.8%
D0-01.5	Bed	8.7	72	Medium	74.0%	58.7%	41.6%	Medium	86.1%	65.5%	45.0%
D0-03.1	KD	19.6	176	Medium	71.7%	55.5%	37.7%	Medium	84.8%	60.4%	38.7%
D0-03.2	L	15.6	132	High	80.1%	70.3%	60.4%	High	87.1%	73.8%	61.0%
D0-03.3	Bed	9.8	80	High	76.1%	65.3%	54.3%	High	85.6%	69.1%	55.6%
D0-03.4	Bed	12.2	108	High	75.7%	64.4%	53.2%	High	85.7%	68.7%	54.7%
D0-03.5	Bed	8.7	72	Medium	75.8%	60.4%	45.3%	Medium	86.5%	67.6%	48.6%
D0-05.1	KD	19.6	176	Medium	71.8%	55.3%	37.5%	Medium	84.9%	60.0%	37.8%
D0-05.2	L	15.6	132	High	79.8%	70.1%	60.3%	High	87.3%	74.3%	61.8%
D0-05.3	Bed	9.8	80	High	75.5%	64.6%	53.8%	High	85.6%	69.3%	55.5%
D0-05.4	Bed	12.2	108	High	76.0%	65.2%	54.1%	High	85.4%	68.4%	54.0%
D0-05.5	Bed	8.7	72	Medium	76.8%	62.4%	47.4%	Medium	86.8%	67.9%	49.5%
D0-07.1	KD	19.6	176	Medium	70.6%	54.1%	35.4%	Medium	83.8%	56.7%	34.3%
D0-07.2	L	15.6	132	High	79.9%	70.0%	60.5%	High	87.1%	73.8%	60.9%
D0-07.3	Bed	9.8	80	High	75.8%	65.0%	53.8%	High	85.4%	68.2%	54.5%
D0-07.4	Bed	12.2	108	High	75.7%	64.6%	53.5%	High	85.5%	68.5%	54.7%

Duplex 01-32 - EN17037:2018 Table A.1 Daylight Provision Room Schedule

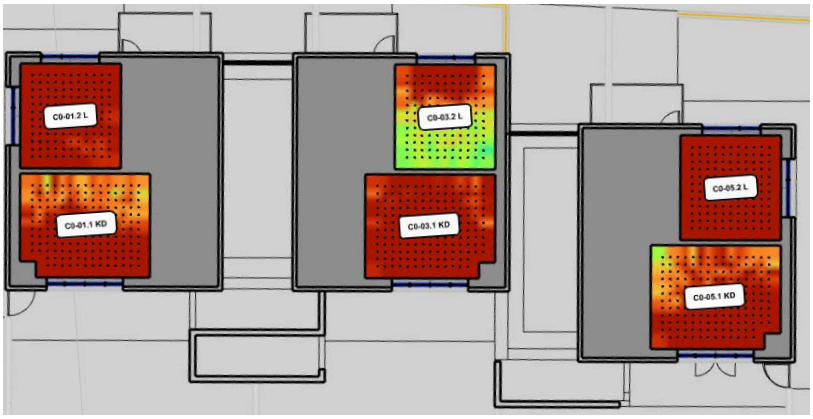
Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
D0-07.5	Bed	8.7	72	Medium	75.8%	59.6%	44.5%	Medium	86.5%	66.1%	47.3%
D0-09.1	KD	19.6	176	Medium	68.5%	51.3%	31.7%	Medium	82.6%	54.2%	30.8%
D0-09.2	L	15.6	132	High	80.0%	70.3%	60.5%	High	87.3%	74.4%	62.1%
D0-09.3	Bed	9.8	80	High	75.5%	64.7%	54.0%	High	85.3%	68.8%	54.9%
D0-09.4	Bed	12.2	108	High	75.6%	64.6%	53.6%	High	85.6%	68.8%	54.9%
D0-09.5	Bed	8.7	72	Medium	76.2%	59.7%	44.3%	Medium	86.1%	65.2%	45.3%
D0-11.1	KD	19.6	176	Minimum	55.8%	35.9%	15.8%	Minimum	75.3%	38.8%	12.9%
D0-11.2	L	15.6	132	High	86.8%	82.0%	76.8%	High	92.2%	83.9%	77.4%
D0-11.3	Bed	10.1	80	High	76.1%	65.3%	54.3%	High	85.6%	68.6%	55.0%
D0-11.4	Bed	11.9	96	High	87.7%	83.4%	78.0%	High	92.6%	84.5%	78.4%
D0-11.5	Bed	8.7	72	Medium	64.9%	50.1%	34.0%	Medium	80.9%	53.5%	33.8%
D0-13.1	KD	19.6	176	Medium	70.4%	54.2%	38.1%	Medium	83.1%	56.4%	35.8%
D0-13.2	L	15.6	132	High	83.3%	76.6%	66.6%	High	89.4%	78.2%	66.9%
D0-13.3	Bed	10.1	80	Medium	73.6%	60.2%	46.7%	Medium	84.4%	64.2%	47.2%
D0-13.4	Bed	11.9	96	High	84.1%	77.7%	68.3%	High	90.4%	80.3%	71.0%
D0-13.5	Bed	8.7	72	Medium	75.8%	61.2%	47.1%	Medium	86.7%	67.6%	49.7%
D0-15.1	KD	27.9	248	High	77.9%	66.0%	52.6%	Medium	85.5%	65.6%	48.3%
D0-15.2	L	18.7	163	Fail	30.1%	11.6%	5.4%	Fail	48.9%	10.2%	2.9%
D0-15.3	Bed	10.2	88	Minimum	66.5%	49.8%	30.5%	Medium	81.9%	54.8%	30.6%
D0-15.4	Bed	11.6	96	High	81.3%	71.8%	60.3%	High	86.6%	69.7%	53.8%
D0-15.5	Bed	10.3	90	High	79.5%	68.9%	57.9%	High	87.3%	73.0%	58.8%
D0-17.1	KD	19.6	176	Medium	74.2%	61.5%	49.8%	Medium	84.6%	63.9%	47.3%
D0-17.2	L	15.6	132	Medium	73.7%	59.1%	43.8%	Medium	85.2%	62.9%	42.7%
D0-17.3	Bed	9.8	80	Medium	68.0%	52.1%	34.0%	Medium	82.3%	57.3%	35.8%
D0-17.4	Bed	12.2	108	Medium	70.1%	54.0%	35.7%	Medium	83.3%	58.2%	36.6%
D0-17.5	Bed	8.7	72	High	77.8%	66.3%	56.3%	High	86.8%	71.3%	57.2%
D0-19.1	KD	19.6	176	High	73.8%	61.6%	50.0%	Medium	85.3%	64.8%	49.8%
D0-19.2	L	15.6	132	Medium	74.7%	60.4%	45.5%	Medium	84.5%	61.5%	40.9%
D0-19.3	Bed	9.8	80	Medium	68.0%	52.2%	35.6%	Medium	81.9%	55.6%	34.5%
D0-19.4	Bed	12.2	108	Medium	69.6%	53.7%	35.3%	Medium	82.4%	56.7%	34.9%
D0-19.5	Bed	8.7	72	High	77.5%	66.0%	55.5%	High	86.6%	70.5%	57.1%
D0-21.1	KD	19.6	176	Medium	72.1%	59.3%	48.5%	Medium	83.2%	61.4%	47.0%
D0-21.2	L	15.6	132	High	80.0%	70.4%	58.6%	High	88.1%	73.6%	57.9%
D0-21.3	Bed	9.8	80	Medium	68.8%	54.5%	37.3%	Medium	82.9%	58.0%	39.3%
D0-21.4	Bed	12.2	108	High	83.4%	76.3%	65.4%	High	90.0%	78.6%	67.5%
D0-21.5	Bed	8.7	72	High	77.6%	66.6%	56.8%	High	87.2%	72.6%	58.7%
D0-23.1	KD	19.6	176	Minimum	55.1%	36.2%	14.8%	Minimum	74.0%	38.5%	13.2%
D0-23.2	L	15.6	132	High	86.2%	79.3%	71.4%	High	91.7%	81.8%	73.2%
D0-23.3	Bed	10.1	80	Medium	71.9%	55.1%	37.5%	Medium	85.2%	61.4%	41.5%
D0-23.4	Bed	11.9	96	High	86.9%	80.7%	74.6%	High	92.6%	83.2%	76.1%
D0-23.5	Bed	8.7	72	Minimum	63.9%	49.1%	32.6%	Medium	79.6%	52.0%	31.2%
D0-25.1	KD	19.6	176	Medium	72.1%	58.9%	46.8%	Medium	83.6%	61.9%	47.0%
D0-25.2	L	15.6	132	Medium	77.2%	62.2%	45.6%	High	87.4%	69.7%	51.4%
D0-25.3	Bed	10.1	80	Medium	72.4%	55.5%	36.9%	Medium	85.0%	60.8%	39.8%
D0-25.4	Bed	11.9	96	Medium	70.7%	53.7%	35.0%	Medium	84.6%	59.7%	37.6%
D0-25.5	Bed	8.7	72	High	76.3%	65.0%	53.8%	High	86.4%	70.7%	56.7%
D0-27.1	KD	19.6	176	High	75.9%	63.1%	51.9%	High	85.5%	66.6%	51.4%
D0-27.2	L	15.6	132	Medium	77.5%	63.3%	46.6%	High	87.5%	70.0%	51.6%
D0-27.3	Bed	9.8	80	Medium	70.9%	53.9%	35.3%	Medium	85.3%	61.8%	41.0%
D0-27.4	Bed	12.2	108	Medium	71.1%	54.0%	34.5%	Medium	85.0%	60.9%	38.9%

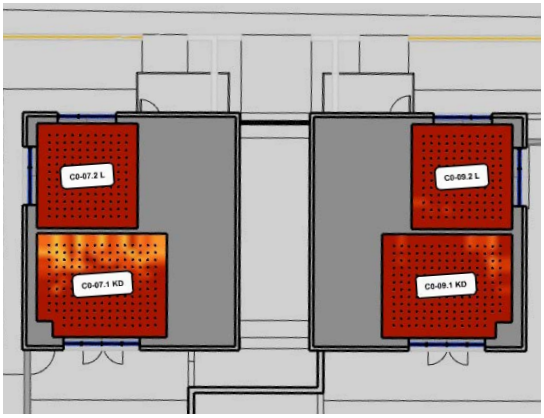
Duplex 01-32 - EN17037:2018 Table A.1 Daylight Provision Room Schedule											
Space ID	Description	Area m2	Sensor Count	Target Illuminance	300lux_50	500lux_50	750lux_50	Minimum Target Illuminance	100lux_95	300lux_95	500lux_95
D0-27.5	Bed	8.7	72	High	78.2%	67.1%	56.4%	High	87.1%	73.3%	58.7%
D0-29.1	KD	19.6	176	High	75.8%	62.0%	50.9%	High	85.3%	65.7%	50.9%
D0-29.2	L	15.6	132	Medium	77.2%	62.2%	45.4%	Medium	87.2%	68.9%	49.9%
D0-29.3	Bed	9.8	80	Medium	71.3%	54.4%	36.1%	Medium	85.7%	62.8%	41.7%
D0-29.4	Bed	12.2	108	Medium	70.5%	52.8%	33.3%	Medium	85.5%	61.9%	40.4%
D0-29.5	Bed	8.7	72	High	78.2%	67.2%	56.4%	High	86.9%	72.5%	58.2%
D0-31.1	KD	19.6	176	Medium	72.5%	56.8%	42.7%	Medium	83.7%	60.6%	42.8%
D0-31.2	L	15.6	132	Medium	75.6%	59.2%	40.5%	Medium	86.3%	65.0%	43.0%
D0-31.3	Bed	9.8	80	Medium	70.6%	53.6%	33.7%	Medium	84.9%	60.9%	39.8%
D0-31.4	Bed	12.2	108	Medium	70.0%	52.2%	31.3%	Medium	84.7%	60.2%	37.7%
D0-31.5	Bed	8.7	72	High	77.5%	65.1%	52.7%	High	86.6%	70.9%	54.1%
D2-02.1	LKD	22.0	187	High	80.1%	70.6%	60.7%	High	86.8%	73.3%	60.4%
D2-02.2	Bed	10.1	80	Medium	71.2%	54.7%	36.3%	Medium	84.9%	61.6%	39.6%
D2-04.1	LKD	22.0	187	High	80.0%	70.3%	60.5%	High	86.7%	73.1%	59.6%
D2-04.2	Bed	10.1	80	Medium	72.2%	55.8%	38.0%	Medium	85.6%	62.8%	41.9%
D2-06.1	LKD	22.0	187	High	79.9%	70.3%	60.4%	High	86.6%	72.4%	59.5%
D2-06.2	Bed	10.1	80	Medium	72.2%	56.4%	38.3%	Medium	85.2%	61.8%	41.3%
D2-08.1	LKD	22.0	187	High	79.9%	70.4%	60.4%	High	87.0%	73.4%	60.0%
D2-08.2	Bed	10.1	80	Medium	71.9%	55.6%	38.0%	Medium	85.3%	62.1%	39.9%
D2-10.1	LKD	22.0	187	High	80.4%	70.9%	61.0%	High	86.6%	72.3%	59.5%
D2-10.2	Bed	10.1	80	Medium	71.8%	55.2%	38.0%	Medium	85.2%	61.8%	40.6%
D2-12.1	LKD	22.0	192	High	84.5%	78.6%	71.1%	High	89.8%	80.1%	71.2%
D2-12.2	Bed	10.1	80	Medium	66.8%	52.9%	37.6%	Medium	81.8%	57.1%	37.9%
D2-14.1	LKD	22.4	196	High	78.1%	66.5%	54.1%	High	86.7%	70.8%	55.5%
D2-14.2	Bed	10.1	80	Medium	73.6%	58.6%	44.3%	Medium	85.0%	63.0%	43.9%
D2-16.1	LKD	24.8	214	High	79.7%	69.3%	57.1%	High	88.0%	73.5%	58.1%
D2-16.2	Bed	10.2	81	Medium	73.0%	59.2%	44.6%	Medium	84.3%	63.9%	45.5%
D2-18.1	LKD	22.0	187	Medium	76.8%	63.7%	49.0%	Medium	86.0%	66.6%	49.1%
D2-18.2	Bed	10.1	80	High	75.7%	63.7%	53.2%	High	85.3%	65.9%	52.3%
D2-20.1	LKD	22.0	187	Medium	77.0%	63.9%	49.3%	Medium	85.5%	65.2%	47.6%
D2-20.2	Bed	10.1	80	High	75.6%	63.4%	53.2%	High	85.4%	66.3%	52.4%
D2-22.1	LKD	22.0	187	Medium	76.5%	63.3%	49.0%	Medium	85.4%	65.6%	47.8%
D2-22.2	Bed	10.1	80	High	74.8%	63.5%	52.4%	High	85.3%	66.2%	52.8%
D2-24.1	LKD	22.9	198	High	83.2%	75.6%	64.3%	High	89.1%	77.0%	62.9%
D2-24.2	Bed	10.5	84	Medium	66.3%	53.1%	38.2%	Medium	81.0%	54.6%	35.3%
D2-26.1	LKD	22.9	198	Medium	76.8%	61.8%	46.1%	High	87.1%	69.0%	51.1%
D2-26.2	Bed	10.5	84	High	75.6%	63.2%	52.4%	High	84.4%	65.3%	51.1%
D2-28.1	LKD	22.9	198	Medium	76.8%	61.9%	45.9%	Medium	86.9%	68.1%	49.5%
D2-28.2	Bed	10.5	84	High	76.3%	63.4%	52.5%	High	84.9%	66.8%	52.1%
D2-30.1	LKD	22.9	198	Medium	76.9%	61.9%	46.1%	High	87.1%	68.4%	50.1%
D2-30.2	Bed	10.5	84	High	76.3%	63.4%	52.0%	High	85.2%	67.0%	51.7%
D2-32.1	LKD	22.9	198	Medium	76.1%	60.0%	43.8%	Medium	85.9%	63.8%	43.1%
D2-32.2	Bed	10.5	84	Medium	74.9%	60.9%	47.9%	Medium	84.4%	63.9%	47.3%

Table 18: Duplex D - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

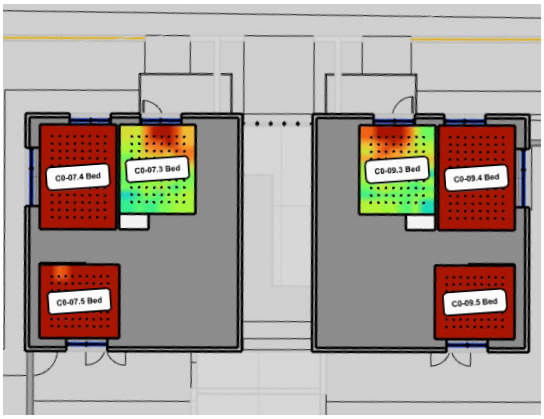
Duplex Units
C 01 - 10

Ground Floor

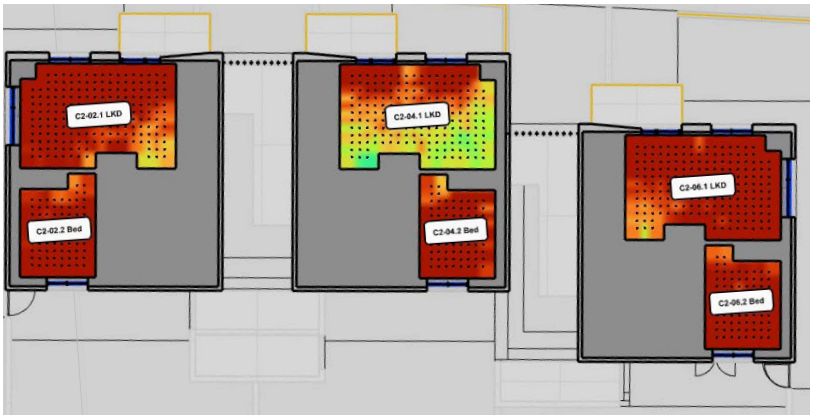


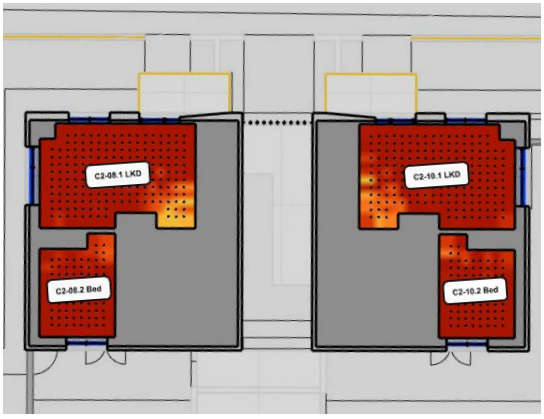


First Floor



Second Floor





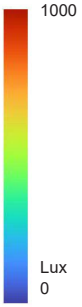


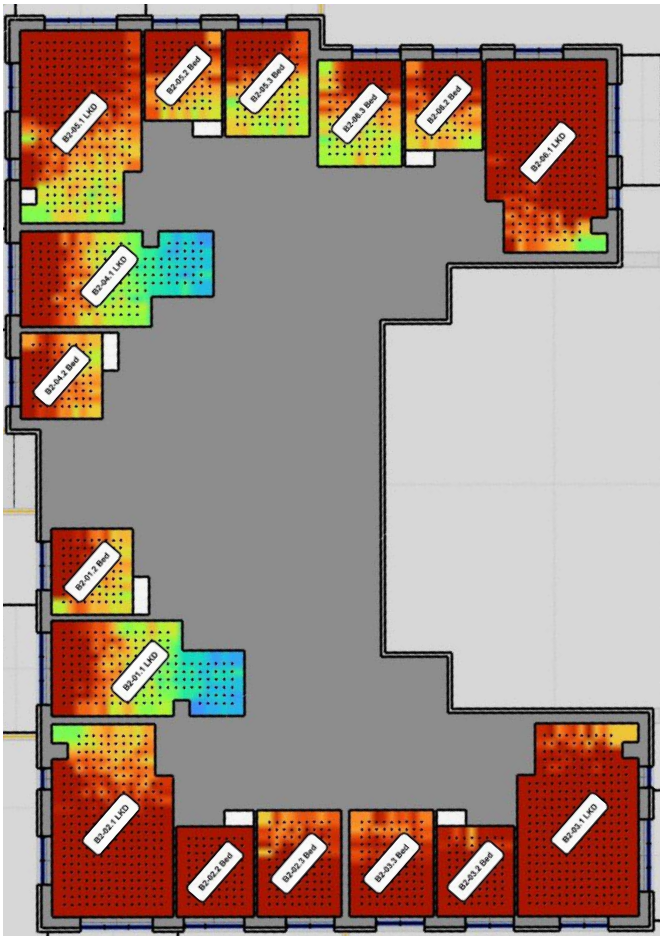
Figure 33: Daylight Provision and Annual Average Illuminance to all habitable rooms

Duplex C - 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	KD	19.6	176	Medium	72.4%	59.1%	48.0%	Medium	83.3%	61.1%	46.9%
C0-01.2	L	15.6	132	High	85.3%	78.0%	69.3%	High	90.6%	79.5%	69.4%
C0-01.3	Bed	10.1	80	Medium	71.6%	53.9%	33.4%	Medium	85.0%	60.9%	39.0%
C0-01.4	Bed	11.9	96	High	86.4%	79.7%	72.4%	High	91.4%	81.1%	72.4%
C0-01.5	Bed	8.7	72	High	78.2%	67.6%	57.6%	High	87.5%	73.9%	60.2%
C0-03.1	KD	19.6	176	High	74.4%	62.8%	52.1%	High	85.4%	66.3%	51.8%
C0-03.2	L	15.6	132	Medium	77.0%	61.4%	43.7%	Medium	87.0%	68.5%	48.3%
C0-03.3	Bed	10.1	80	Medium	70.6%	52.9%	31.8%	Medium	84.9%	60.0%	36.9%
C0-03.4	Bed	11.9	96	Medium	72.0%	53.9%	33.5%	Medium	85.1%	59.7%	36.8%
C0-03.5	Bed	8.7	72	High	79.2%	69.2%	59.8%	High	87.4%	74.0%	61.4%
C0-05.1	KD	19.6	176	Medium	70.6%	57.5%	45.6%	Medium	82.9%	60.7%	46.0%
C0-05.2	L	15.6	132	High	86.3%	80.1%	72.5%	High	91.8%	82.0%	72.7%
C0-05.3	Bed	10.1	80	Medium	70.7%	53.0%	31.5%	Medium	85.0%	60.4%	38.0%
C0-05.4	Bed	11.9	96	High	87.5%	82.5%	76.9%	High	93.1%	84.6%	77.7%
C0-05.5	Bed	8.7	72	High	77.7%	66.7%	56.9%	High	87.1%	72.2%	58.8%
C0-07.1	KD	19.6	176	High	75.3%	63.5%	52.3%	High	85.5%	66.3%	52.5%
C0-07.2	L	15.6	132	High	86.8%	80.1%	73.2%	High	91.9%	81.8%	73.8%
C0-07.3	Bed	10.1	80	Medium	71.1%	53.5%	33.2%	Medium	84.8%	60.4%	38.7%
C0-07.4	Bed	11.9	96	High	87.5%	81.8%	76.3%	High	92.6%	83.7%	76.6%
C0-07.5	Bed	8.7	72	High	79.7%	69.9%	60.0%	High	87.2%	73.2%	60.3%
C0-09.1	KD	19.6	176	High	77.9%	67.6%	57.6%	High	86.7%	71.9%	59.3%
C0-09.2	L	15.6	132	High	86.7%	81.5%	74.6%	High	92.4%	83.3%	75.9%
C0-09.3	Bed	10.1	80	Medium	71.3%	54.0%	34.0%	Medium	85.2%	61.5%	40.1%
C0-09.4	Bed	11.9	96	High	87.9%	83.0%	77.5%	High	92.9%	84.4%	77.9%
C0-09.5	Bed	8.7	72	High	80.3%	70.7%	61.4%	High	88.0%	75.8%	63.7%
C2-02.1	LKD	22.9	198	High	83.2%	76.0%	65.3%	High	89.0%	77.0%	62.9%
C2-02.2	Bed	10.5	84	High	77.2%	66.4%	55.7%	High	86.7%	71.6%	57.9%
C2-04.1	LKD	22.9	198	Medium	77.2%	62.9%	46.6%	High	87.0%	69.0%	50.1%
C2-04.2	Bed	10.5	84	High	76.4%	65.7%	54.6%	High	85.9%	68.8%	55.5%
C2-06.1	LKD	22.9	198	High	84.2%	77.2%	66.3%	High	89.5%	77.8%	64.7%
C2-06.2	Bed	10.5	84	High	77.6%	66.7%	56.0%	High	86.8%	72.1%	58.7%
C2-08.1	LKD	22.9	198	High	84.0%	76.8%	66.7%	High	89.5%	77.9%	65.7%
C2-08.2	Bed	10.5	84	High	77.6%	66.7%	56.4%	High	86.6%	71.8%	58.1%
C2-10.1	LKD	22.9	198	High	84.3%	77.4%	66.6%	High	89.8%	78.4%	66.6%
C2-10.2	Bed	10.5	84	High	77.7%	67.1%	56.3%	High	86.6%	72.5%	59.0%

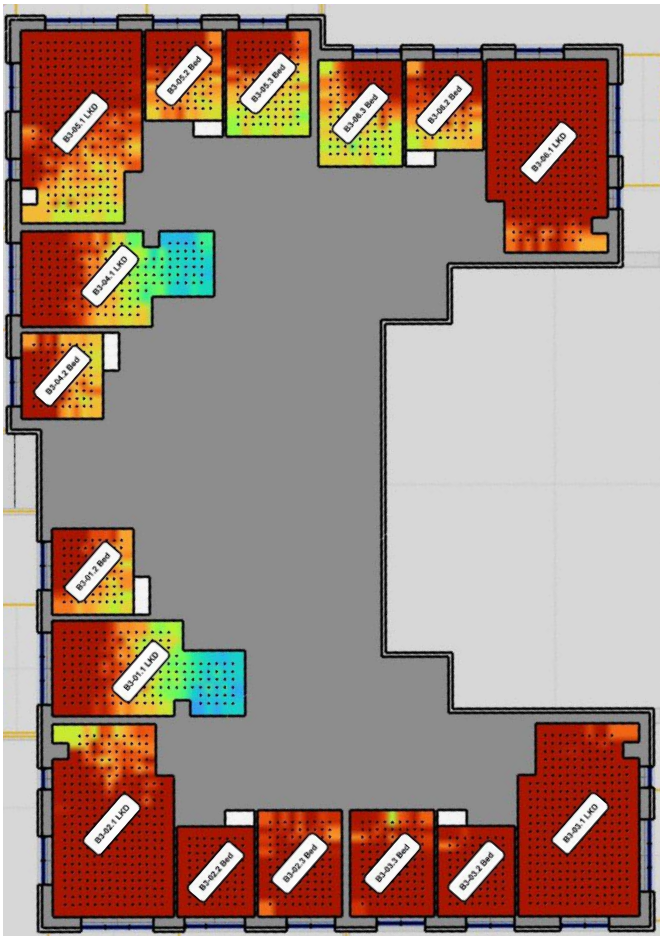
Table 19: Duplex C - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.1.

Block B

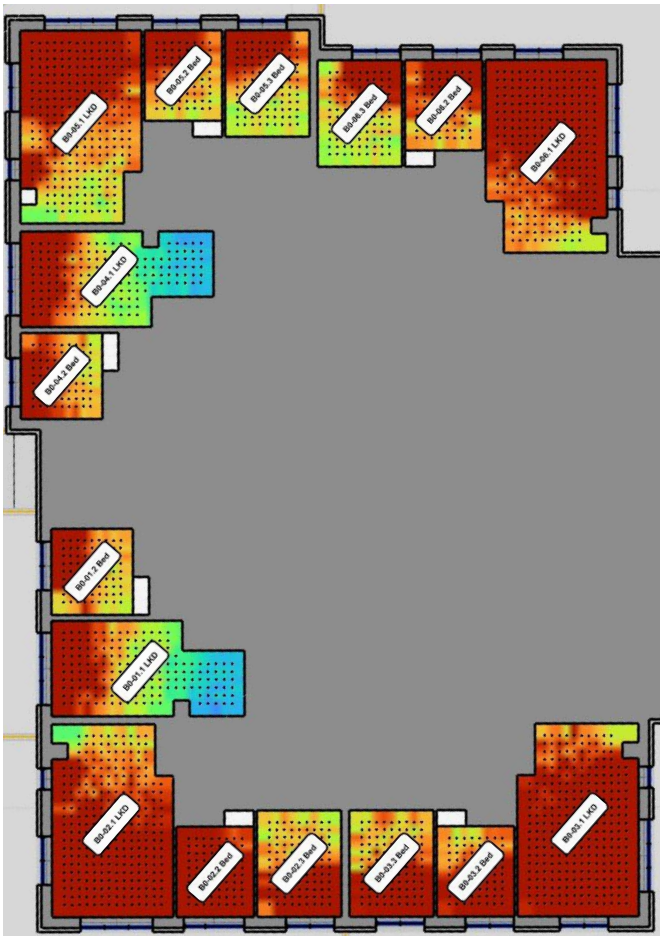
Second Floor



Third Floor



Ground Floor



First Floor

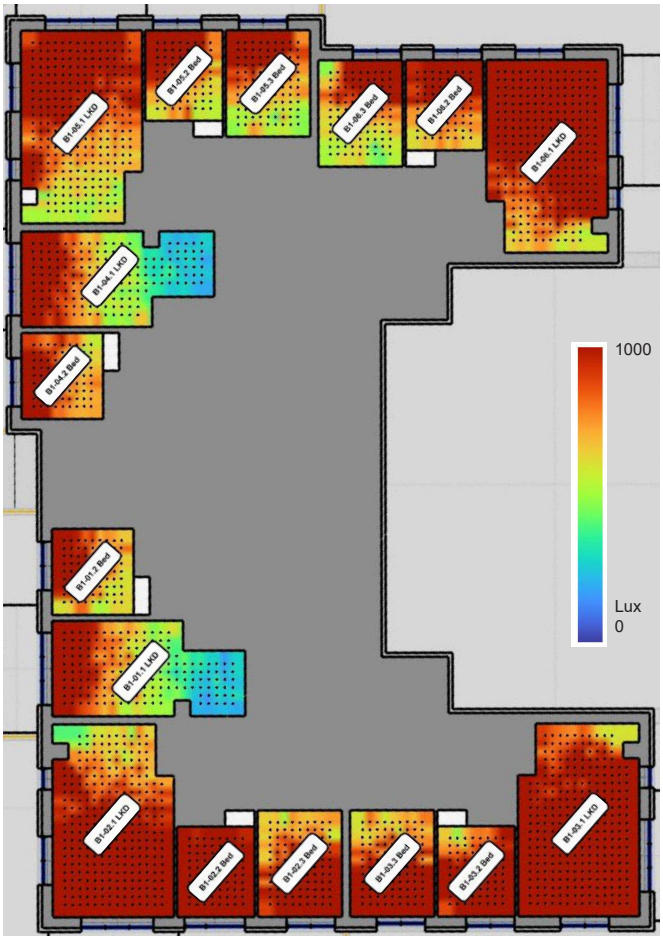


Figure 34: Daylight Provision and Annual Average Illuminance to all habitable rooms

Block B - 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	22.7	181	Medium	70.8%	53.2%	31.8%	Minimum	73.5%	25.6%	3.7%
B0-01.2	Bed	9.8	81	Medium	78.1%	64.7%	48.2%	High	87.9%	71.1%	53.1%
B0-02.1	LKD	31.0	288	High	79.2%	69.0%	57.0%	High	86.6%	68.3%	50.3%
B0-02.2	Bed	9.8	80	High	79.7%	70.6%	59.9%	High	86.9%	71.6%	57.4%
B0-02.3	Bed	12.5	108	Medium	70.6%	57.4%	43.3%	Medium	81.9%	58.0%	39.9%
B0-03.1	LKD	31.0	288	High	78.9%	68.3%	59.5%	High	85.1%	66.7%	53.5%
B0-03.2	Bed	9.8	80	Medium	73.7%	61.0%	49.9%	Medium	82.6%	60.8%	43.9%
B0-03.3	Bed	12.5	108	Medium	70.3%	57.0%	44.0%	Medium	82.0%	57.9%	40.7%
B0-04.1	LKD	22.7	181	Medium	70.3%	52.2%	29.8%	Minimum	76.0%	32.0%	4.5%
B0-04.2	Bed	9.8	81	Medium	78.0%	64.6%	48.0%	High	87.5%	70.3%	52.1%
B0-05.1	LKD	31.0	288	High	79.5%	69.4%	55.8%	High	87.5%	71.4%	54.2%
B0-05.2	Bed	9.8	80	Medium	77.9%	63.7%	47.7%	Medium	87.0%	69.2%	49.9%
B0-05.3	Bed	12.5	108	Medium	75.5%	60.0%	41.6%	Medium	86.3%	65.7%	44.7%
B0-06.1	LKD	31.0	288	High	79.4%	69.0%	58.9%	High	85.9%	67.7%	53.1%
B0-06.2	Bed	9.8	80	Medium	77.7%	63.9%	47.5%	High	87.2%	70.2%	52.1%
B0-06.3	Bed	12.5	108	Medium	73.1%	56.6%	36.5%	Medium	85.7%	63.4%	41.6%
B1-01.1	LKD	22.7	181	Medium	70.8%	54.0%	34.9%	Minimum	74.0%	28.4%	3.4%
B1-01.2	Bed	9.8	81	High	78.3%	65.5%	50.4%	High	88.0%	72.2%	55.0%
B1-02.1	LKD	31.0	288	High	80.0%	70.6%	59.7%	High	86.6%	68.8%	53.9%
B1-02.2	Bed	9.8	80	High	81.3%	73.4%	63.3%	High	88.2%	76.0%	63.0%
B1-02.3	Bed	12.5	108	High	73.9%	61.6%	50.1%	High	84.4%	64.5%	50.4%
B1-03.1	LKD	31.0	288	High	80.3%	71.2%	62.3%	High	86.0%	69.5%	56.4%
B1-03.2	Bed	9.8	80	High	76.4%	64.6%	54.4%	High	85.9%	67.6%	54.2%
B1-03.3	Bed	12.5	108	High	75.1%	62.5%	51.4%	Medium	83.8%	63.5%	49.0%
B1-04.1	LKD	22.7	181	Medium	71.4%	54.9%	36.1%	Minimum	74.8%	33.4%	4.3%
B1-04.2	Bed	9.8	81	Medium	78.0%	65.0%	49.9%	High	88.0%	72.6%	55.8%
B1-05.1	LKD	31.0	288	High	79.8%	70.0%	56.6%	High	87.1%	70.3%	53.3%
B1-05.2	Bed	9.8	80	High	78.1%	64.8%	50.4%	High	87.3%	70.6%	53.1%
B1-05.3	Bed	12.5	108	Medium	75.3%	60.1%	43.7%	Medium	86.2%	66.1%	47.0%
B1-06.1	LKD	31.0	288	High	80.5%	71.8%	61.3%	High	85.9%	68.6%	55.3%
B1-06.2	Bed	9.8	80	High	78.2%	65.1%	50.8%	High	87.9%	71.9%	55.0%
B1-06.3	Bed	12.5	108	Medium	73.9%	58.1%	41.2%	Medium	85.8%	64.8%	44.8%
B2-01.1	LKD	22.7	181	Medium	71.6%	55.1%	37.4%	Minimum	73.9%	32.6%	3.2%
B2-01.2	Bed	9.8	81	High	78.2%	65.6%	50.9%	High	88.0%	71.9%	55.3%
B2-02.1	LKD	31.0	288	High	80.7%	71.7%	61.0%	High	86.7%	69.9%	56.0%
B2-02.2	Bed	9.8	80	High	82.6%	75.4%	65.7%	High	88.7%	77.9%	66.3%
B2-02.3	Bed	12.5	108	High	76.1%	64.2%	53.7%	High	85.7%	67.4%	54.1%
B2-03.1	LKD	31.0	288	High	81.8%	74.2%	65.0%	High	86.7%	73.2%	60.9%
B2-03.2	Bed	9.8	80	High	78.3%	67.1%	57.8%	High	86.6%	71.2%	58.2%
B2-03.3	Bed	12.5	108	High	76.6%	64.6%	54.1%	High	85.8%	67.9%	54.5%
B2-04.1	LKD	22.7	181	Medium	72.0%	55.5%	37.9%	Minimum	74.9%	33.6%	2.9%
B2-04.2	Bed	9.8	81	High	78.2%	65.5%	51.0%	High	87.8%	71.7%	55.0%
B2-05.1	LKD	31.0	288	High	79.6%	69.7%	56.4%	High	87.1%	70.2%	53.8%
B2-05.2	Bed	9.8	80	High	78.3%	64.9%	50.6%	High	87.4%	70.7%	53.5%
B2-05.3	Bed	12.5	108	Medium	75.6%	60.5%	44.7%	Medium	86.0%	65.3%	47.3%
B2-06.1	LKD	31.0	288	High	81.2%	73.6%	63.4%	High	86.8%	72.1%	59.1%
B2-06.2	Bed	9.8	80	High	78.2%	64.8%	50.3%	High	86.8%	69.3%	51.7%
B2-06.3	Bed	12.5	108	Medium	72.4%	56.6%	39.6%	Medium	85.9%	65.0%	45.9%
B3-01.1	LKD	22.7	181	Medium	75.2%	59.1%	42.9%	Minimum	77.0%	39.7%	7.8%
B3-01.2	Bed	9.8	81	High	78.7%	67.0%	52.6%	High	88.1%	73.0%	56.1%

Block B - 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
B3-02.1	LKD	31.0	288	High	82.3%	74.5%	64.3%	High	87.5%	73.2%	59.5%
B3-02.2	Bed	9.8	80	High	83.2%	77.1%	67.9%	High	89.5%	79.4%	68.8%
B3-02.3	Bed	12.5	108	High	77.3%	65.8%	55.3%	High	86.6%	71.3%	57.6%
B3-03.1	LKD	31.0	288	High	83.2%	77.0%	67.6%	High	87.9%	76.5%	64.8%
B3-03.2	Bed	9.8	80	High	79.7%	69.9%	60.4%	High	87.3%	74.2%	61.1%
B3-03.3	Bed	12.5	108	High	77.4%	66.0%	55.8%	High	86.7%	71.3%	57.8%
B3-04.1	LKD	22.7	181	Medium	75.3%	59.5%	43.4%	Minimum	76.6%	38.2%	6.2%
B3-04.2	Bed	9.8	81	High	78.5%	66.4%	52.2%	High	88.1%	73.1%	56.5%
B3-05.1	LKD	31.0	288	High	81.1%	72.2%	59.1%	High	87.6%	72.1%	55.7%
B3-05.2	Bed	9.8	80	High	78.4%	65.6%	51.9%	High	87.2%	70.5%	53.7%
B3-05.3	Bed	12.5	108	Medium	74.3%	59.3%	43.9%	Medium	86.4%	67.3%	49.3%
B3-06.1	LKD	31.0	288	High	83.4%	76.8%	67.9%	High	87.9%	75.2%	62.1%
B3-06.2	Bed	9.8	80	High	78.2%	65.0%	50.2%	High	87.4%	70.8%	54.1%
B3-06.3	Bed	12.5	108	Medium	72.0%	56.7%	40.1%	Medium	85.5%	64.8%	46.3%

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

Houses
H 01-20
Ground Floor

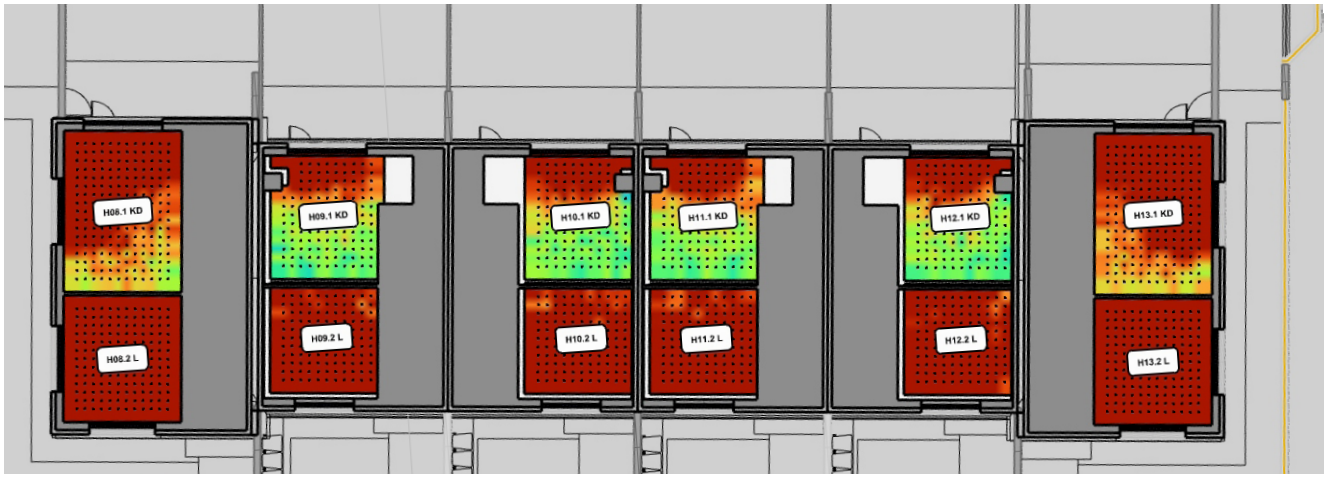
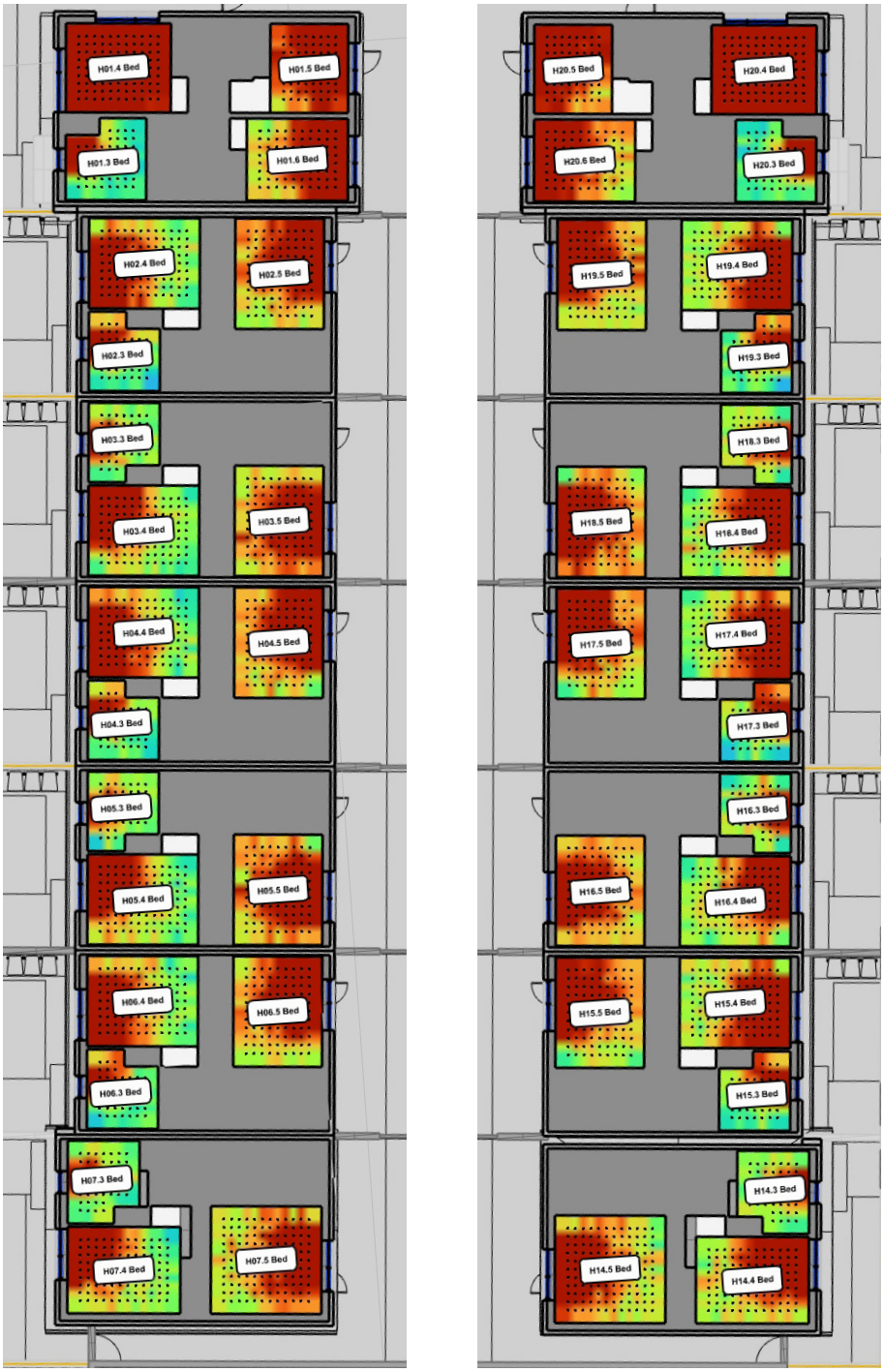


Figure 35: Daylight Provision and Annual Average Illuminance to all habitable rooms

Houses
H 01-20
First Floor



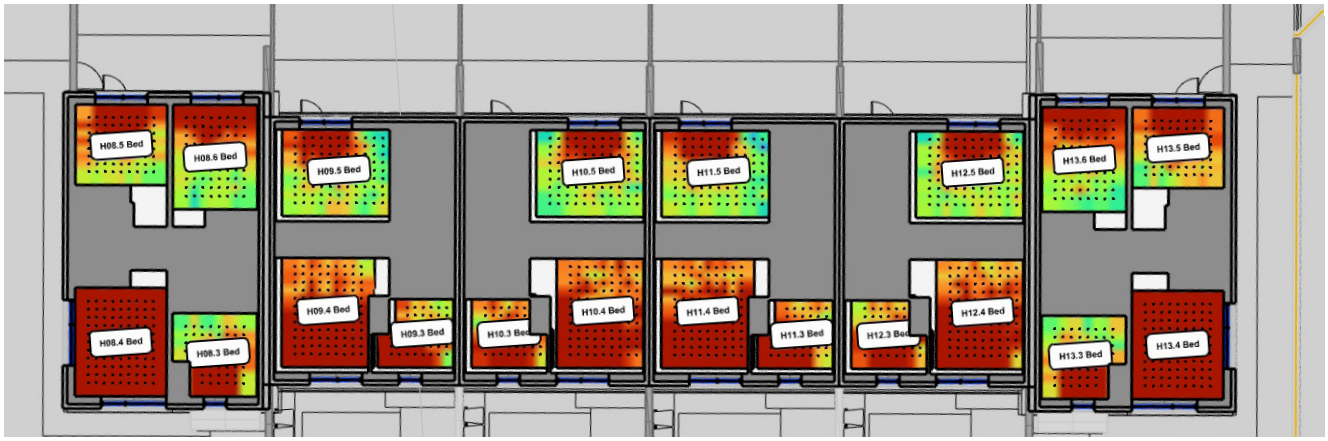


Figure 36: Daylight Provision and Annual Average Illuminance to all habitable rooms

Houses
H 21-29

Ground Floor

First Floor

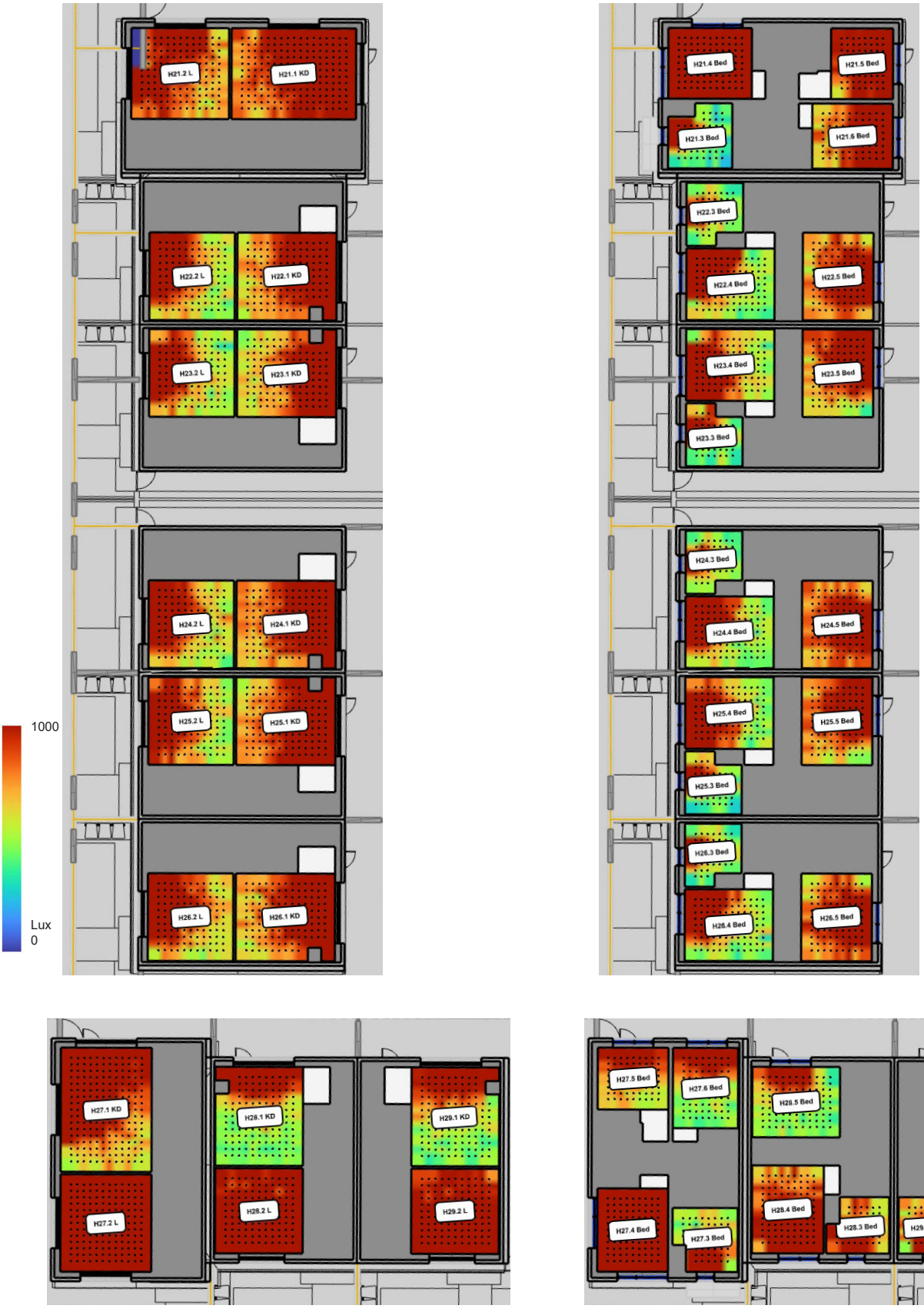


Figure 37: Daylight Provision and Annual Average Illuminance to all habitable rooms

Houses - 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
H01.	KD	22.4	204	High	78.0%	66.4%	55.0%	Medium	83.7%	61.8%	45.2%
H01.	L	17.6	156	High	81.4%	72.9%	61.9%	High	88.0%	74.0%	60.0%
H01.3	Bed	7.6	56	Minimum	53.8%	32.9%	12.1%	Minimum	70.5%	29.6%	6.7%
H01.4	Bed	11.7	99	High	87.1%	81.3%	75.1%	High	91.0%	80.8%	71.6%
H01.5	Bed	8.7	72	High	78.7%	68.1%	56.3%	High	85.7%	67.5%	52.2%
H01.6	Bed	10.4	80	High	75.3%	62.7%	50.5%	Medium	83.4%	61.4%	44.0%
H02.	KD	16.9	135	Medium	74.1%	61.3%	48.4%	Medium	83.8%	61.9%	45.2%
H02.	L	14.8	121	Medium	71.1%	57.7%	42.1%	Medium	83.0%	60.1%	41.2%
H02.3	Bed	6.4	48	Minimum	61.5%	43.2%	21.7%	Minimum	76.3%	40.0%	13.9%
H02.4	Bed	12.5	108	Medium	67.7%	53.2%	36.5%	Medium	79.7%	51.0%	27.4%
H02.5	Bed	12.3	99	Medium	74.3%	61.3%	48.3%	Medium	84.0%	62.7%	44.7%
H03.	KD	16.9	135	Medium	74.0%	61.2%	47.7%	Medium	83.9%	61.8%	44.9%
H03.	L	14.8	121	Medium	71.6%	57.9%	42.2%	Medium	83.4%	60.1%	41.1%
H03.3	Bed	6.4	48	Minimum	63.2%	44.2%	23.5%	Minimum	78.3%	45.2%	21.0%
H03.4	Bed	12.5	108	Medium	66.9%	51.1%	33.1%	Medium	79.6%	50.6%	24.2%
H03.5	Bed	12.3	99	Medium	73.5%	60.5%	47.3%	Medium	84.0%	62.6%	44.2%
H04.	KD	16.9	135	Medium	74.3%	61.3%	48.4%	Medium	84.1%	62.4%	46.0%
H04.	L	14.8	121	Medium	71.8%	57.7%	42.1%	Medium	83.1%	59.5%	39.3%
H04.3	Bed	6.4	48	Minimum	63.0%	43.7%	22.1%	Minimum	77.7%	43.2%	17.4%
H04.4	Bed	12.5	108	Medium	67.8%	52.2%	33.8%	Medium	79.9%	50.9%	25.0%
H04.5	Bed	12.3	99	Medium	74.2%	61.1%	47.5%	Medium	84.2%	62.4%	44.5%
H05.	KD	16.9	135	Medium	73.3%	59.9%	46.8%	Medium	83.8%	61.3%	44.9%
H05.	L	14.8	121	Medium	71.3%	57.0%	41.5%	Medium	82.9%	59.0%	39.2%
H05.3	Bed	6.4	48	Minimum	60.4%	41.0%	21.1%	Minimum	76.9%	42.1%	17.4%
H05.4	Bed	12.5	108	Medium	66.4%	50.1%	30.1%	Minimum	79.3%	48.6%	22.9%
H05.5	Bed	12.3	99	Medium	74.4%	61.0%	47.7%	Medium	84.1%	63.1%	44.6%
H06.	KD	16.9	135	Medium	73.9%	60.6%	47.6%	Medium	84.3%	62.2%	45.0%
H06.	L	14.8	121	Medium	71.1%	57.1%	41.5%	Medium	81.8%	56.8%	35.5%
H06.3	Bed	6.4	48	Minimum	61.4%	41.6%	19.3%	Minimum	77.4%	42.6%	14.9%
H06.4	Bed	12.5	108	Medium	67.2%	52.2%	33.9%	Minimum	79.2%	49.2%	23.4%
H06.5	Bed	12.3	99	Medium	74.3%	61.0%	47.8%	Medium	84.4%	63.5%	45.3%
H07.	KD	16.9	135	Medium	74.5%	60.3%	47.4%	Medium	84.8%	63.3%	46.6%
H07.	L	14.8	121	Medium	71.7%	57.6%	43.1%	Medium	82.6%	58.7%	40.1%
H07.3	Bed	6.4	48	Minimum	62.4%	44.5%	22.9%	Minimum	78.4%	44.7%	19.1%
H07.4	Bed	12.5	108	Medium	66.9%	51.8%	33.7%	Minimum	79.5%	50.0%	25.1%
H07.5	Bed	12.3	99	Medium	74.6%	61.2%	47.2%	Medium	84.0%	62.3%	42.9%
H08.	KD	22.4	204	High	80.9%	72.1%	60.1%	High	86.4%	68.4%	52.7%
H08.	L	17.6	156	High	85.6%	80.0%	73.4%	High	91.0%	81.8%	74.2%
H08.3	Bed	7.6	56	Minimum	63.3%	49.2%	36.5%	Medium	78.7%	50.9%	34.0%
H08.4	Bed	11.7	99	High	88.0%	83.3%	78.5%	High	92.6%	84.0%	77.9%
H08.5	Bed	8.7	72	Medium	77.1%	63.8%	49.3%	Medium	86.3%	67.2%	49.5%
H08.6	Bed	10.4	80	Medium	73.9%	58.2%	42.0%	Medium	81.8%	54.3%	31.6%
H09.	KD	16.9	135	Medium	69.9%	54.2%	36.3%	Medium	83.3%	56.4%	34.6%
H09.	L	14.8	121	High	78.6%	68.3%	58.0%	High	86.5%	72.7%	59.3%
H09.3	Bed	6.4	48	Medium	68.4%	54.9%	43.2%	Medium	81.0%	55.2%	38.8%
H09.4	Bed	12.5	108	Medium	73.9%	61.8%	50.0%	Medium	83.4%	64.2%	48.4%
H09.5	Bed	12.3	99	Medium	70.5%	53.8%	35.0%	Medium	82.1%	54.8%	32.0%
H10.	KD	16.9	135	Medium	72.0%	54.8%	37.0%	Medium	84.5%	58.3%	36.0%
H10.	L	14.8	121	High	78.3%	68.2%	57.6%	High	86.6%	72.5%	59.1%
H10.3	Bed	6.4	48	Medium	69.6%	56.3%	44.3%	Medium	81.7%	58.1%	42.3%
H10.4	Bed	12.5	108	High	73.7%	61.1%	50.2%	Medium	83.1%	63.0%	47.5%

Houses - 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
H10.5	Bed	12.3	99	Medium	71.0%	54.2%	35.4%	Medium	83.2%	56.7%	32.6%
H11.	KD	16.9	135	Medium	71.1%	54.6%	36.9%	Medium	84.7%	59.2%	37.1%
H11.	L	14.8	121	High	77.9%	67.6%	56.7%	High	86.6%	72.6%	59.0%
H11.3	Bed	6.4	48	Medium	68.5%	54.8%	43.2%	Medium	82.1%	58.3%	41.6%
H11.4	Bed	12.5	108	High	74.3%	62.3%	50.5%	Medium	83.4%	63.6%	48.2%
H11.5	Bed	12.3	99	Medium	70.7%	53.5%	34.8%	Medium	83.7%	56.9%	33.8%
H12.	KD	16.9	135	Medium	69.1%	53.8%	35.4%	Medium	82.8%	56.0%	34.0%
H12.	L	14.8	121	High	78.0%	67.9%	57.2%	High	86.5%	71.7%	58.3%
H12.3	Bed	6.4	48	Medium	68.0%	54.6%	43.5%	Medium	81.4%	57.6%	41.5%
H12.4	Bed	12.5	108	High	74.5%	62.2%	50.8%	Medium	83.1%	62.5%	47.2%
H12.5	Bed	12.3	99	Medium	69.1%	52.6%	33.0%	Medium	82.8%	55.6%	31.4%
H13.	KD	22.4	204	High	81.8%	73.4%	62.6%	High	86.8%	70.4%	55.3%
H13.	L	17.6	156	High	85.1%	79.7%	73.2%	High	90.9%	81.6%	73.8%
H13.3	Bed	7.6	56	Minimum	63.4%	49.0%	37.2%	Medium	77.6%	50.3%	33.5%
H13.4	Bed	11.7	99	High	88.0%	84.1%	79.0%	High	92.7%	84.6%	78.5%
H13.5	Bed	8.7	72	High	77.5%	64.9%	50.9%	High	86.4%	67.9%	50.3%
H13.6	Bed	10.4	80	Medium	72.6%	57.4%	41.3%	Medium	82.1%	55.4%	32.5%
H14.	KD	16.9	135	Medium	73.8%	58.6%	45.6%	Medium	84.6%	61.8%	44.8%
H14.	L	14.8	121	Medium	73.5%	60.0%	47.2%	Medium	84.6%	64.3%	47.5%
H14.3	Bed	6.4	48	Minimum	64.7%	48.3%	28.5%	Minimum	79.3%	49.7%	23.9%
H14.4	Bed	12.5	108	Medium	69.4%	55.0%	40.1%	Medium	81.4%	56.1%	33.1%
H14.5	Bed	12.3	99	Medium	73.8%	59.2%	45.3%	Medium	84.3%	61.8%	43.6%
H15.	KD	16.9	135	Medium	74.0%	59.7%	46.9%	Medium	84.1%	61.3%	45.0%
H15.	L	14.8	121	Medium	72.5%	58.4%	45.3%	Medium	83.2%	59.9%	42.7%
H15.3	Bed	6.4	48	Minimum	63.3%	45.9%	26.3%	Minimum	78.0%	46.3%	19.7%
H15.4	Bed	12.5	108	Medium	68.9%	54.7%	39.7%	Medium	80.4%	53.2%	30.8%
H15.5	Bed	12.3	99	Medium	72.8%	58.7%	45.0%	Medium	84.2%	61.9%	43.6%
H16.	KD	16.9	135	Medium	72.9%	59.4%	46.4%	Medium	84.2%	61.5%	44.3%
H16.	L	14.8	121	Medium	72.3%	58.3%	45.0%	Medium	83.3%	59.7%	42.5%
H16.3	Bed	6.4	48	Minimum	65.7%	48.9%	29.7%	Minimum	78.7%	48.0%	22.7%
H16.4	Bed	12.5	108	Medium	68.6%	54.6%	39.4%	Medium	81.4%	55.5%	33.7%
H16.5	Bed	12.3	99	Medium	73.4%	59.7%	45.6%	Medium	85.0%	63.6%	45.4%
H17.	KD	16.9	135	Medium	73.4%	59.3%	46.4%	Medium	83.9%	60.9%	43.6%
H17.	L	14.8	121	Medium	71.4%	57.3%	44.4%	Medium	83.5%	60.3%	43.0%
H17.3	Bed	6.4	48	Minimum	63.5%	46.3%	26.6%	Minimum	78.1%	46.1%	19.2%
H17.4	Bed	12.5	108	Medium	69.5%	55.5%	41.5%	Medium	80.9%	54.2%	33.3%
H17.5	Bed	12.3	99	Medium	74.4%	60.3%	46.6%	Medium	84.2%	61.9%	42.9%
H18.	KD	16.9	135	Medium	73.0%	59.3%	46.0%	Medium	83.9%	61.0%	44.0%
H18.	L	14.8	121	Medium	71.8%	57.9%	44.9%	Medium	83.3%	59.5%	42.6%
H18.3	Bed	6.4	48	Minimum	64.7%	48.0%	29.0%	Minimum	78.5%	47.8%	22.8%
H18.4	Bed	12.5	108	Medium	68.7%	53.9%	38.8%	Medium	80.8%	53.5%	31.2%
H18.5	Bed	12.3	99	Medium	73.9%	60.4%	46.6%	Medium	84.4%	63.4%	45.1%
H19.	KD	16.9	135	Medium	73.9%	60.7%	47.6%	Medium	84.0%	62.0%	45.6%
H19.	L	14.8	121	Medium	71.6%	58.5%	44.8%	Medium	83.7%	61.1%	43.7%
H19.3	Bed	6.4	48	Minimum	63.9%	46.2%	25.5%	Minimum	78.2%	45.5%	20.0%
H19.4	Bed	12.5	108	Medium	69.5%	55.6%	40.5%	Medium	81.3%	55.3%	33.5%
H19.5	Bed	12.3	99	Medium	73.2%	60.2%	46.3%	Medium	83.8%	62.0%	44.4%
H20.	KD	22.4	204	High	78.1%	66.8%	55.4%	Medium	83.2%	60.7%	43.9%
H20.	L	17.6	156	High	83.9%	76.7%	66.3%	High	89.4%	77.8%	65.8%
H20.3	Bed	7.6	56	Minimum	55.6%	35.8%	14.0%	Minimum	74.4%	34.9%	11.0%
H20.4	Bed	11.7	99	High	87.6%	82.5%	76.9%	High	92.5%	83.8%	77.0%

Houses - 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
H20.5	Bed	8.7	72	High	78.4%	67.7%	56.3%	High	86.3%	68.7%	53.2%
H20.6	Bed	10.4	80	Medium	74.3%	61.9%	48.9%	Medium	82.8%	60.9%	43.3%
H21.	KD	22.4	204	High	81.9%	73.7%	63.5%	High	87.7%	73.8%	59.6%
H21.	L	17.6	156	High	82.3%	75.0%	63.8%	High	88.6%	76.4%	61.8%
H21.3	Bed	7.6	56	Minimum	54.8%	35.3%	12.2%	Minimum	73.5%	32.4%	8.7%
H21.4	Bed	11.7	99	High	87.3%	81.6%	76.1%	High	91.6%	81.7%	73.8%
H21.5	Bed	8.7	72	High	79.9%	69.3%	57.6%	High	86.7%	69.9%	55.1%
H21.6	Bed	10.4	80	High	77.2%	64.4%	51.0%	Medium	84.5%	64.2%	46.7%
H22.	KD	16.9	135	High	77.8%	65.3%	51.4%	High	86.6%	69.9%	53.9%
H22.	L	14.8	121	Medium	71.5%	57.3%	43.1%	Medium	82.7%	58.3%	40.1%
H22.3	Bed	6.4	48	Minimum	65.2%	47.6%	28.5%	Minimum	78.7%	47.2%	22.9%
H22.4	Bed	12.5	108	Medium	68.5%	53.5%	36.7%	Medium	80.4%	53.1%	30.5%
H22.5	Bed	12.3	99	Medium	75.2%	61.7%	47.9%	Medium	84.9%	66.4%	48.9%
H23.	KD	16.9	135	High	77.5%	64.8%	51.1%	High	86.6%	70.0%	53.9%
H23.	L	14.8	121	Medium	72.6%	58.6%	44.9%	Medium	82.8%	58.6%	41.3%
H23.3	Bed	6.4	48	Minimum	63.3%	45.5%	24.4%	Minimum	78.2%	44.9%	18.2%
H23.4	Bed	12.5	108	Medium	68.2%	53.8%	38.2%	Medium	80.7%	53.9%	32.2%
H23.5	Bed	12.3	99	Medium	75.1%	61.2%	46.7%	Medium	84.8%	64.7%	46.1%
H24.	KD	16.9	135	High	77.7%	65.2%	51.5%	High	86.5%	69.4%	52.6%
H24.	L	14.8	121	Medium	72.2%	58.2%	44.2%	Medium	83.7%	60.3%	43.0%
H24.3	Bed	6.4	48	Minimum	63.1%	46.0%	26.4%	Minimum	78.0%	46.6%	22.6%
H24.4	Bed	12.5	108	Medium	69.7%	54.3%	38.4%	Medium	80.2%	53.4%	30.4%
H24.5	Bed	12.3	99	Medium	74.3%	60.4%	45.8%	Medium	84.8%	65.7%	48.0%
H25.	KD	16.9	135	High	77.7%	65.3%	51.6%	High	86.7%	70.4%	54.1%
H25.	L	14.8	121	Medium	72.7%	58.6%	45.1%	Medium	82.7%	58.9%	41.8%
H25.3	Bed	6.4	48	Minimum	63.0%	45.4%	23.9%	Minimum	78.2%	46.2%	19.9%
H25.4	Bed	12.5	108	Medium	69.5%	54.6%	39.2%	Medium	80.9%	54.0%	31.7%
H25.5	Bed	12.3	99	Medium	75.1%	61.3%	46.8%	Medium	84.7%	64.5%	46.2%
H26.	KD	16.9	135	High	77.9%	65.3%	51.2%	High	86.5%	69.6%	52.8%
H26.	L	14.8	121	Medium	73.1%	59.1%	45.5%	Medium	83.0%	60.0%	42.0%
H26.3	Bed	6.4	48	Minimum	63.1%	45.3%	26.0%	Minimum	79.0%	47.7%	24.3%
H26.4	Bed	12.5	108	Medium	68.7%	53.3%	37.6%	Medium	80.8%	54.1%	31.0%
H26.5	Bed	12.3	99	Medium	75.2%	61.4%	47.1%	Medium	85.2%	66.1%	48.4%
H27.	KD	22.4	204	High	81.2%	72.6%	61.0%	High	87.1%	71.3%	55.4%
H27.	L	17.6	156	High	85.7%	80.2%	73.5%	High	90.4%	81.4%	73.0%
H27.3	Bed	7.6	56	Minimum	62.7%	48.6%	35.8%	Medium	78.2%	50.7%	33.0%
H27.4	Bed	11.7	99	High	88.2%	83.5%	78.6%	High	92.8%	84.2%	78.3%
H27.5	Bed	8.7	72	High	78.2%	66.4%	52.1%	Medium	86.2%	67.5%	49.4%
H27.6	Bed	10.4	80	Medium	72.4%	57.1%	40.2%	Medium	82.1%	55.7%	33.3%
H28.	KD	16.9	135	Medium	71.0%	55.2%	37.1%	Medium	84.1%	59.4%	37.2%
H28.	L	14.8	121	High	78.3%	67.9%	57.4%	High	86.3%	71.7%	58.8%
H28.3	Bed	6.4	48	Medium	68.8%	55.2%	43.4%	Medium	81.7%	57.3%	42.1%
H28.4	Bed	12.5	108	High	74.0%	62.1%	50.0%	Medium	83.2%	63.7%	47.8%
H28.5	Bed	12.3	99	Medium	70.6%	54.7%	35.8%	Medium	83.0%	56.7%	34.5%
H29.	KD	16.9	135	Medium	74.1%	57.9%	40.6%	Medium	85.4%	62.8%	41.8%
H29.	L	14.8	121	High	78.7%	68.2%	58.2%	High	86.7%	72.9%	59.3%
H29.3	Bed	6.4	48	Medium	69.0%	55.7%	44.0%	Medium	82.1%	59.3%	42.7%
H29.4	Bed	12.5	108	High	74.2%	61.6%	50.3%	Medium	83.3%	63.6%	48.1%
H29.5	Bed	12.3	99	Medium	71.8%	55.2%	36.1%	Medium	84.9%	61.0%	38.8%

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

Appendix C - Sunlight Hours to living spaces within the apartments and duplex units

Sunlight Hours - Apartments			
Unit ID	LKD window within 90° South	No. sunlight hours on 21st March	BRE Recommendation
Block A			
A0-01.1	Yes	9.0	High
A0-02.1	Yes	8.5	High
A0-03.1	No	4.8	High
A1-01.1	Yes	9.0	High
A1-02.1	Yes	8.5	High
A1-03.1	No	3.5	Medium
A1-04.1	Yes	4.8	High
A2-01.1	Yes	9.0	High
A2-02.1	Yes	8.5	High
A2-03.1	No	3.5	Medium
A2-04.1	Yes	5.1	High
A3-01.1	Yes	9.0	High
A3-02.1	Yes	8.5	High
A3-03.1	No	3.5	Medium
A3-04.1	Yes	6.5	High
A4-01.1	Yes	9.0	High
A4-02.1	Yes	8.5	High
A4-03.1	No	3.5	Medium
A4-04.1	Yes	6.6	High
A5-01.1	Yes	9.0	High
A5-02.1	Yes	8.5	High
A5-03.1	No	4.8	High
A5-04.1	Yes	6.9	High
Block B			
B0-01.1	No	1.8	Minimum
B0-02.1	Yes	7.0	High
B0-03.1	Yes	6.2	High
B0-04.1	No	1.8	Minimum
B0-05.1	No	1.3	Below criteria
B0-06.1	Yes	4.6	High
B1-01.1	No	1.8	Minimum
B1-02.1	Yes	5.3	High
B1-03.1	Yes	4.8	High
B1-04.1	No	1.8	Minimum
B1-05.1	No	1.3	Below criteria
B1-06.1	Yes	3.1	Medium
B2-01.1	No	1.8	Minimum
B2-02.1	Yes	5.3	High
B2-03.1	Yes	5.4	High
B2-04.1	No	1.8	Minimum
B2-05.1	No	1.3	Below criteria
B2-06.1	Yes	4.3	High
B3-01.1	No	1.8	Minimum
B3-02.1	Yes	7.3	High
B3-03.1	Yes	7.7	High
B3-04.1	No	1.8	Minimum
B3-05.1	No	1.3	Below criteria
B3-06.1	Yes	7.7	High

Table 22: Sunlight hours to living spaces in apartments

Sunlight Hours- Duplex Units			
Unit ID	LKD window within 90° South	No. sunlight hours on 21st March	BRE Recommendation
Duplex C			
C0-01.1	Yes	7.8	High
C2-02.1	No	3.0	Medium
C0-03.1	Yes	7.6	High
C2-04.1	No	0.0	Below criteria
C0-05.1	Yes	7.9	High
C2-06.1	Yes	3.8	Medium
C0-07.1	Yes	8.1	High
C2-08.1	No	3.7	Medium
C0-09.1	Yes	8.6	High
C2-10.1	Yes	4.6	High
Duplex D			
D0-01.2	Yes	9.3	High
D2-02.1	Yes	8.3	High
D0-03.2	Yes	9.3	High
D2-04.1	Yes	8.3	High
D0-05.2	Yes	9.3	High
D2-06.1	Yes	8.3	High
D0-07.2	Yes	9.3	High
D2-08.1	Yes	8.3	High
D0-09.2	Yes	9.3	High
D2-10.1	Yes	8.3	High
D0-11.2	Yes	9.3	High
D2-12.1	Yes	8.3	High
D0-13.2	Yes	4.7	High
D2-14.1	Yes	5.0	High
D0-15.1	Yes	3.6	Medium
D2-16.1	Yes	3.8	Medium
D0-17.1	Yes	5.1	High
D2-18.1	No	2.7	Minimum
D0-19.1	Yes	5.2	High
D2-20.1	No	1.9	Minimum
D0-21.1	Yes	4.8	High
D2-22.1	No	2.8	Minimum
D0-23.1	Yes	1.9	Minimum
D2-24.1	No	1.6	Minimum
D0-25.1	Yes	5.1	High
D2-26.1	No	1.6	Minimum
D0-27.1	Yes	6.3	High
D2-28.1	No	1.5	Minimum
D0-29.1	Yes	6.5	High
D2-30.1	No	1.6	Minimum
D0-31.1	Yes	5.0	High
D2-32.1	No	1.5	Minimum

Table 23: Sunlight hours to living spaces in duplex units

Appendix D - Sunlight to private amenity spaces within the Proposed Development

Sunlight on the Ground - Private Amenity		
Plot ID	% Area receiving 2 hours sunlight on 21st March	Meets Criteria
House 1	75.2%	Y
House 2	67.4%	Y
House 3	68.2%	Y
House 4	68.2%	Y
House 5	68.2%	Y
House 6	68.2%	Y
House 7	74.0%	Y
House 8	41.0%	N
House 9	37.0%	N
House 10	36.8%	N
House 11	35.9%	N
House 12	34.3%	N
House 13	34.2%	N
House 14	74.2%	Y
House 15	66.9%	Y
House 16	67.0%	Y
House 17	66.9%	Y
House 18	66.9%	Y
House 19	66.6%	Y
House 20	74.4%	Y
House 21	82.4%	Y
House 22	67.9%	Y
House 23	68.3%	Y
House 24	69.2%	Y
House 25	67.2%	Y
House 26	73.8%	Y
House 27	39.2%	N
House 28	35.9%	N
House 29	63.7%	Y
Duplex C1-C2	67.8%	Y
Duplex C3-C4	73.4%	Y
Duplex C5-C6	57.3%	Y
Duplex C7-C8	53.6%	Y
Duplex C9-C10	73.6%	Y

Table 24: Sun on the ground to private amenity spaces at ground level