Daylight & Sunlight Assessments of a Proposed Residential Development at Forbes Lane, Dublin 8

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1. Introduction

This design report was prepared for National Development Finance Agency (NDFA) on behalf of Dublin City Council, to accompany a Part 8 proposal for the development of 108 no. residential units on a site of circa 0.57 hectares (gross), located at Forbes Lane and Marrowbone Lane, Dublin 8.

The proposed development consists of the following:

> The construction of 108 apartments units at a site c. 0.58 ha at the Road Maintenance Depot, Marrowbone Lane and Forbes Lane, Dublin 8. Development at the site will consist of the following:
> * The demolition of the existing sheds and garages and site clearance works
> * Partial retention and modification of the existing rubble stone wall fronting Forbes Lane.
> * Retention and modification of the former Gate House structure's east elevation along Marrowbone Lane. The removal of the remaining existing boundary wall fronting Marrowbone Lane and subsequent widening to facilitate an active travel route which will be subject to separate consent.
> * Construction of 108 no. apartment units in two blocks (Block A and Block B) with frontage onto Marrowbone Land and Forbes Lane comprising 108 residential units (64 no. 1-bed, 31 no. 2-bed, 13 no. 3-bed)
>   o Block A ranges from 6-7 storeys and consists of 81 residential units (50 no. 1-bed, 19 no. 2-bed, 12 no. 3-bed)
>   o Block B is 5-storeys and consists of 27 residential units (14 no. 1-bed, 12 no. 2 bed, 1 no. 3-bed)
> * 165 long-stay and 54 short-stay bicycle parking spaces and 2 car parking spaces.
> * 190 sq.m of community, cultural and arts space.
> * 800 sq.m of public realm space and 700 sq.m of communal open space.
> * One vehicular access is proposed from Marrowbone Lane. A pedestrian and cycle access route is proposed at Forbes Lane which also provides emergency vehicle access.
> * Traffic calming measure in the form of raised tables are proposed on the public road at the intersection of Pim Street and Forbes Lane and between the proposed vehicular access and Marrowbone Lane. A new signalised crossing point is also proposed on Marrowbone Lane.
> * Boundary treatments, landscaping and public realm works, public lighting, site drainage works, internal road surfacing and footpath, ESB substation and meter rooms, stores, bin and cycle storage, plant rooms; and
> * All ancillary site services and development works above and below ground.

1.1 Executive Summary

This report assesses the impact of the proposed development for Daylight and Sunlight on the neighbouring buildings and the quality of daylight and sunlight within the proposed development. This analysis is carried out based on the drawings of MCORM Architecture & Urban Design.

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

1.2.1 Daylight to Adjacent Properties

The majority of the window the neighbouring residential properties retain a VSC level greater that 27% or if less that 27% VSC then they are not reduced below 80% of their existing value. There are a small number of windows that have a reduction below 27% VSC. The guidelines sets out alternative target VSC levels for these conditions and the majority of windows achieve the alternative target VSC levels. Any reduction in available daylight is in-line with emerging trends in the area and any impact will be negligible.

In considering the acceptability of the results / level of impact, it must be acknowledged that the proposed development is located on a small infill site where it would be impossible to avoid a level of perceptible impact on neighbouring properties, without severely limiting the height of development on the application site, and prejudicing the possibility and viability of its redevelopment.

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

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

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

1.2.2 Sunlight to Adjacent Properties

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

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

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

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

BR209:2022 recommends assessment methods set out in BS EN 17037 for daylight provision. BS EN 17037 contains a National Annex (NA1) which sets out minimum daylight levels to be achieved in the UK and channel Islands. Ireland has a similar latitude and climate to the UK. The National Annex in BS EN 17037 states that the target values set out in Table A1 may be hard to achieve in the UK and as a result sets alternative minimum values for rooms to dwellings. The minimum illuminance levels set out in BS EN17037:2018+A1:2021 are: Kitchens and living spaces containing a kitchen 200lux (1.3%DF). Living rooms 150lux (1%DF) and bedrooms 100lux (DF0.7%).

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 85.2% of units meeting the minimum recommended 1.5 direct sunlight hours. This is in line with the BRE guidelines example for an apartment layout where 4 in 5 achieves the target sunlight hours.

All public and communal amenity areas meet and exceed the recommendations of the BRE guidelines, achieving sunlight levels that exceed 2 hours sunlight over 50% of the amenity space on the 21st March.

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

EN 17037:2018 sets out values for target illuminance, minimum target illuminance and fractions of reference plane to be achieved. The target and minimum target levels set out in EN17037:2018 are for any type of building; they do not take into account room use or make allowance for rooms that have a lesser requirement for daylight. The results of this assessment indicate a high level of daylight provision, with 97.1% of rooms achieving Minimum Illuminance and 86.1% achieving Target Illuminance. Appendix B identifies any rooms which do not achieve minimum illuminance and /or target illuminance levels.

Apartment guidelines and local authorities guidelines refer to BR209 2022: "Site layout planning for daylight and sunlight" (Third edition) which in turn references BS EN 17037. BS EN17037:2018+A1:2021 is the same as IS EN 17037:2018 with the addition of a National Annex (NA1) and the annex specifically refers to and sets room specific values for dwellings in the UK and Channel Islands.

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

1.5 Conclusions

Overall the design team worked in response to the context to ensure the proposed development performed with regards to achieving the best possible daylight and sunlight quality. All apartments meet the minimum standard for daylight provision as per BS EN 17037:2018+A1:2021 as referred to in the BRE guidelines BR209:2022 (third edition). The majority of the apartment units achieve daylight provision as set out in IS EN 17038:2018.

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

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

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

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

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

2. Methodology

2.1 Standards and Guidelines

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

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

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

The Daylight and Sunlight assessments included in this report demonstrates the level of compliance with these three documents:
- BR209:2022 Site Layout Planning for Daylight and Sunlight (3rd edition), also referred to as the BRE guidelines.
- BS EN 17037:2018+A1:2021 Daylight in Buildings, also referred to as the UK Annex.
- IS EN 17037:2018 Daylight in Buildings.

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

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

The BRE guidelines (2022) state at the outset that "It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location." The recommendations of the BRE guidelines (2022) are not suitable for rigid application to all developments in all contexts and this is of particular importance in the context of national and local policies for the consolidation and densification of urban areas.

BR209 2022 sets out the assessment metrics to be applied when assessing the potential impact of a development on the daylight and sunlight of neighbouring properties. The metrics for assessing impact to adjacent buildings in the areas of Daylight is the Vertical Sky Component (VSC) and Sunlight is the Annual Probable Sunlight Hours (APSH). Sunlight to adjacent amenity space is assessed through the measurement of sunlight availability on the 21st March and the plotting of shadow diagrams.

The BRE guidelines (2022) recommend the use of BS EN 17037:2018 for assessing the quality of interior spaces in proposed developments. BS EN 17037 sets out assessment methods for daylight provision and access to sunlight. It states that "The guidance here is intended for use in the United Kingdom and in the Republic of Ireland, though recommendations in the Irish Standard IS EN 17037 may vary from those in BS EN17037."

EN 17037 is a unified daylighting standard published by the European Committee for Standardization (CEN) in 2018. It is applicable across all countries within the EU including Ireland with the Irish edition IS EN17037:2018. The standard is enacted in Britain under BS EN 17037:2018+A1:2021 with a UK National Annex for regional assessments. The daylight and sunlight assessment methods for internal daylight and sunlight provision are common to both the Irish Standard Version and the UK version.

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

The UK National Annex A1 sets out room specific minimum values to be achieved in the UK and Channel Islands. All the rooms achieve the minimum DF factor levels set out in A1 for Bedrooms (DF0.7%), Living Rooms (1%DF) and Kitchens and Living Spaces containing a Kitchen(1.3%). The Daylight Factor percentage values are derived from minimum room specific illiminance levels set out in NA+1 and the Median External Diffuse Illuminance ($E_{v,d,med}$) for Dublin from Table A.3 EN17037:2018. The illuminance levels and corresponding DF% are given in Table 5 below.

2.3 Daylight to Existing Dwellings

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

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

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

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

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

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

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

The BRE guidelines (2022) recommend one of two criteria is met when assessing for the Vertical Sky Component;
a) Where the Vertical Sky Component at the centre of the existing window exceeds 27% with the new development in place then enough sky light should still be reached by the existing window.

b) Where the Vertical Sky Component with the new development in place is both less than 27% and less than 0.8 times its former value, then the area lit by the window is likely to appear more gloomy, and electric light will be needed more of the time.

The BRE guidelines (2022) state that if the VSC is:
- At least 27%, then conventional window design will usually give reasonable results;
- Between 15% and 27%, then special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight;
- Between 5% and 15%, then it is very difficult to prove adequate daylight unless very large windows are used;
- Less than 5%, then it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed

This report assesses the percentage of direct sky illuminance that falls on the centre point of neighbouring windows that could be affected by the proposed development through the Vertical Sky Component (VSC) as per the methodologies contained in the BRE guidelines (2022).

2.4 Sunlight to Existing Buildings

The BRE guidelines (2022) recommend assessing the main living rooms and conservatories if they have a window wall facing within 90° of due south. Kitchens and bedrooms are less important but care should be taken not to block too much sun. If the proposed development is fully north of the existing window then sunlight need not be assessed.

The Annual Probable Sunlight Hours (APSH) is used to assess the quantity of sunlight for a given location. This is the total amount of sunshine for a given location on an unobstructed horizontal surface taking cloud cover into account. Statistical data from the Irish Meteorological Service is used to assess the APSH and the Winter Probable Sunlight Hours (taken to fall between the 21st of September and the 21st of March).
Table 1 below shows the average sunlight hours for each month and the maximum possible without any cloud cover. This gives the factor of possible sunlight hours for each month.

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

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

The BRE guidelines (2022) recommend that the centre of a window or 1.6m above ground for a door be assessed and it should receive at least 25% of the APSH and it should receive at least 5% during the period of 21st September to 21st March. If the available APSH is less than this then it should not be reduced below 0.8 times its former value or noticeable loss of sunlight may occur.

2.5 Sunlight to Gardens and Open Spaces
For calculations of sunlight analysis it is general practice to use March 21st. The BRE guidelines (2022) states:

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

2.6 Calculations of Trees & Hedges
Trees are not usually included in the assessments of impact on neighbouring properties, unless specified otherwise. In relation to the effects of trees and hedges the BRE guidelines (2022) states;

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

BR209:2022 recommends that sometimes trees should be taken into account for the proposed development where the new development is proposed near large existing trees. This needs to be done by modelling a representative of the existing trees. Reflectance and transparency should be taken into account. Table G1 in BR209:2022 gives values for transparencies of tree crowns in summer and winter for deciduous trees, dense evergreen can be assessed as opaque. Table G2 gives general reflectance values for shades of trees.

2.7 BRE Guidelines (2022) Appendix H: Environmental Impact Assessment
The BRE guidelines sets out criteria for classification for assessment of impact where a new development affects a number of existing buildings or open spaces in relation to an Environmental Impact Assessment. The guide does not give a specific range or percentages but sets out parameters as set out below.

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

Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:
* *only a small number of windows or limited area of open space are affected*
* *the loss of light is only marginally outside the guidelines*
* *an affected room has other sources of skylight or sunlight*
* *the affected building or open space only has a low level requirement for skylight or sunlight*
* *there are particular reasons why an alternative, less stringent, guideline should be applied.*

Factors tending towards a major adverse impact include:
* *a large number of windows or large area of open space are affected*
* *the loss of light is substantially outside the guidelines*
* *all the windows in a particular property are affected*
* *the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, e.g. a living room in a dwelling or a children's playground.*

Beneficial impacts occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space. Beneficial impacts should be worked out using the same principles as adverse impacts. Thus a tiny increase in light would be classified as a negligible impact, not a minor beneficial impact."

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

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

1. Imperceptible: There is no reduction in the VSC levels or where the levels are 99% of the existing value.
2. Negligible: 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 but greater than 20% VSC and /or greater than 65% of the existing value.
4. Moderate reduction: A reduction below 20%VSC but greater than 10% VSC and /or greater that 50% of the existing value.
5. Major reduction: A reduction below 10%VSC and /or less than 50% of the existing value.

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

2.8 Daylight in the Proposed Development.

BR209 (2022) Appendix C sets out interior daylight recommendations. The guideline sets out the that; "BS EN 17037 supersedes BS8206 Part 2 'Code of practice for daylighting' which contained a method of assessment based on Average Daylight Factor, which is now no longer recommended.

BS EN 17037:2018+A1 sets out two methods for assessing daylight provision in proposed buildings. One method is called the **Illuminance method.** This is based on Target illuminances for daylight to be achieved across specified fractions of a reference plane at working plane height (0.85m) for half the daylight hours in a year. The Illuminance Method requires the use of a suitable weather file with local climate conditions and takes into account the orientation of the space.

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

The UK National Annex (NA) sets out additional minimum room specific Target Daylight Factor values for the UK where the target values in A2 are hard to achieve. NA.2 sets out illuminance values to be exceeded over at least 50% of the points on a reference plane 0.85m above the floor for at least half the daylight hours. The UK committee formed the opinion that the Target Illuminance recommendations in Clause A.2 of BS EN 17037 may not be achievable for some buildings, particularly dwellings. The UK committee believes this could be the case for dwellings with basement rooms or those with significant external obstructions.

BR209 (2022) recommends surface reflectances should represent real conditions and where reflectance values have not been measured or specified default values are set out in Table C4 of the guidance document. The surface reflectances have been specified and are set out in Table 2 below. This table also shows the input values for material used and additional assessment model input parameters.

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

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

The EN17037:2018 Standard deals exclusively with new developments and does not give guidance or metrics on loss of light or sunlight to existing properties. EN 17037:2018 sets out values for Minimum and Target levels to be achieved with a minimum, medium and high compliance level for each. The guideline recommends that the minimum level should be achieved for both target levels but it does not give guidance on the number of units or fraction within a multiple residential unit development that

should achieve these values. Additionally it does not differentiate between room use and weighted targets for rooms which would have a lesser requirement. The UK National annex sets out factors for UK specific settings where it is difficult to achieve natural daylighting.

The compliance calculation is based on an annual, climate-based simulation of interior illuminance distributions. BR209 refers to this method as the Illuminance Method. For each hour of the year, the percentage of the floor area achieving minimum and target illuminance thresholds are measured on a room-by-room basis. Two target types are set with the following criteria:

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

BS EN 17037 gives three levels of recommendation for daylight provision in an interior space: Minimum, Medium and High. BR209:2022 Section C3 recommends for compliance with the standard, a space should achieve the Minimum level.

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

Target Illuminance from Daylight over at least half the daylight hours		
Level of recommendation	Target illuminance E_T(lx) for half of the assessment grid	Minimum illuminance E_{TM}(lx) for 95% of the assessment grid
Minimum	300 lux	100 lux
Medium	500 lux	300 lux
High	750 lux	500 lux

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

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

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

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

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

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

2.9 Sunlight within Proposed Developments

The BRE guidelines (2022) recommend that for large residential developments the overall sunlight potential can be initially assessed by counting the number of windows facing south, east and west and the aim should be to minimise the number of living rooms facing solely north, north-east or north-west unless there is some compensating factor such as an appealing view to the north. The guideline acknowledges that it may not be possible to have every living room facing within 90° of south in large developments, however, it recommends maximising the number of units with a southerly aspect.

The BRE guidelines (2022) state that BS EN 17037 should be used to assess for interior access to direct sunlight and that the assessment of APSH should no longer be used. BS EN 17037 sets recommendations for access to sunlight and notes three levels of achievement; Minimum, Medium and High. In dwellings at least one habitable room, preferably a living room, should achieve the Minimum of 1.5 direct hours on a specified date between 1st February and 21st March, with a cloudless sky. This assessment uses the 21st March. The guidelines recommend a time step of 5 minutes or less for the assessment interval. The Minimum level to achieve is 1.5, the Medium level is 3 hours and the High level is 4 hours direct sunlight.

3. Daylight in Neighbouring Buildings

3.1 Site Overview

The proposed development is on a site currently in use as Dublin City Council services depot. The structures on site are generally 1- 2 storey structures consisting of offices,service and storage sheds and porta-cabins. The entire site is in hard stand for storage of vehicles and materials.

It is bounded to the north by Forbes Lane and an existing residential building 'Culvert Apartments'. It is bounded to the east by Marrowbone Lane with St. Catherine's Sport Centre and St. Catherine's Foyer, a sheltered housing scheme opposite the site. To the south is an existing residential development called 'The Malthouse'. There is a telecommunications building to the west with no windows facing the proposed development.

Figure 1: Indicative view of the site, taken from Google Maps.
Please refer to architectural drawings for statutory boundaries.

3.2 Preliminary Assessment of Adjoining Dwellings

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

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

The document also states that if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25º to the horizontal, then the diffuse light of the existing building may be adversely affected. If a window falls within a 45° angle both in plan and elevation with a new development in place then the window may be affected and should be assessed.
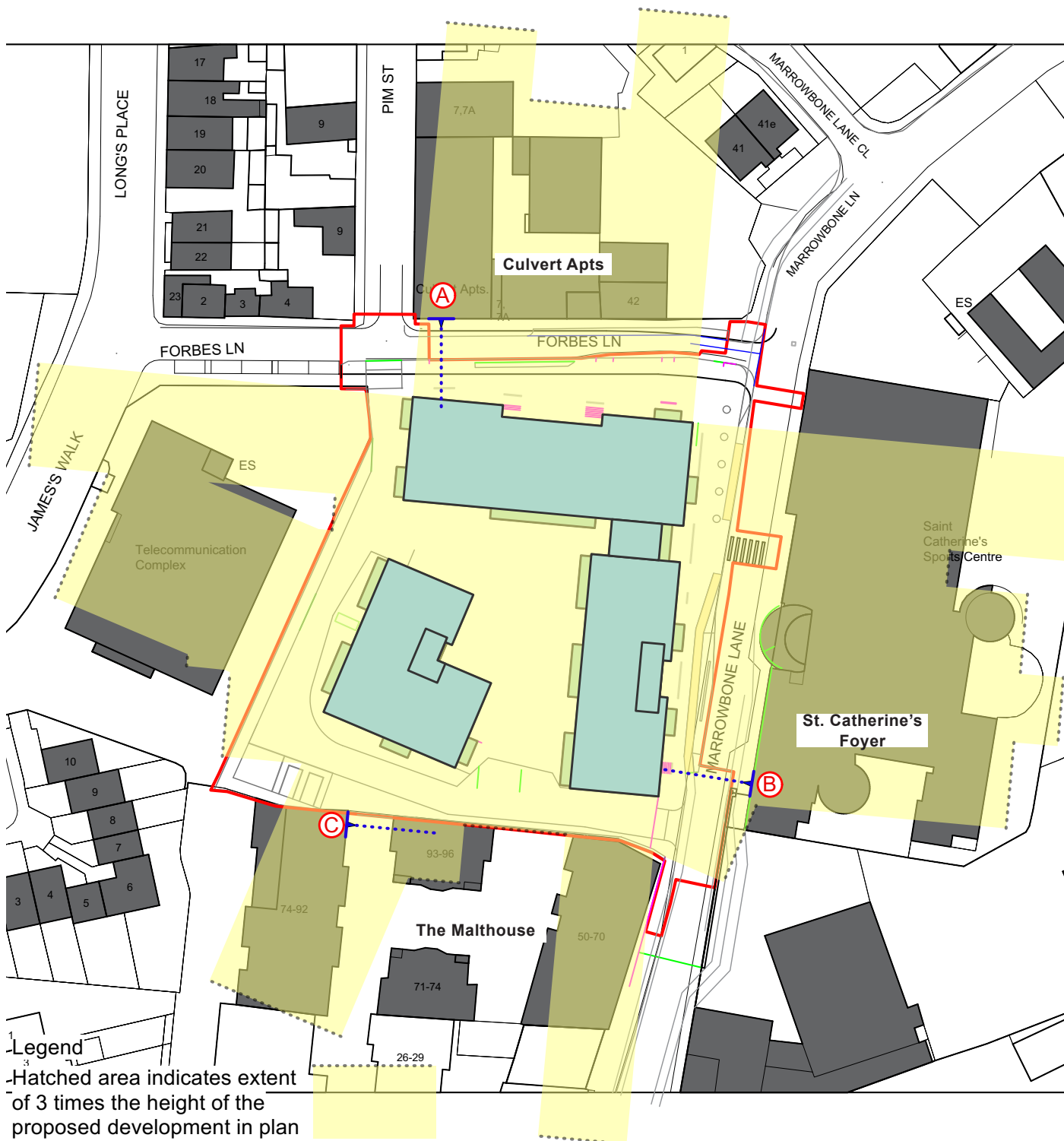
Figure 2: Proposed site plan showing the zone of influence (3 times the height of the proposed building) and direction of the window wall of adjacent residential properties.

Section through window wall at location A

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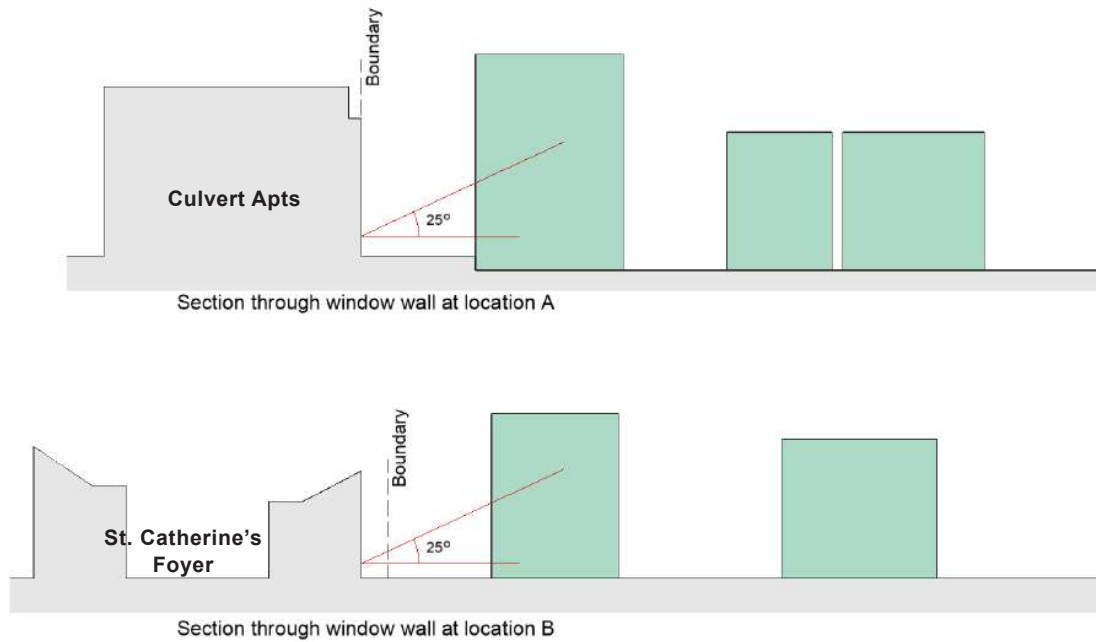
Figure 3: Section perpendicular to window wall at locations indicated in Figure 2.

3.3 Establishing Alternative VSC Target for the Inner City Location

The BRE guidelines gives an advisory target VSC of 27% when assessing windows to adjacent dwellings. It states that *"These targets are purely advisory and different targets may be used based on the special requirements of the proposed development or its location."* The site is located in the city centre where the majority of buildings are built directly on the boundary in a continuous form. The guidelines sets out occasions where, and methods for establishing alternative values. In cases where an existing building has windows that are unusually close to the boundary the guideline states;

> *"To ensure that a new development matches the heights and proportions of an existing building, the VSC, daylight distribution and APSH targets for these windows could be set to those for a 'mirror-image building of the same height and size, an equal distance away from the other side of the boundary."*

Table F1 gives alternative VSC values based on the established obstructing angle of the buildings in the area. It also recommends where there is a tall building on or close to the boundary that a hypothetical mirror image building should be used to establish the obstructing angle and VSC. Figure 5 indicates sections on the surrounding streets to the site to establish the existing obstructing angles.

Virtual section through window wall at location A

Virtual section through window wall at location B
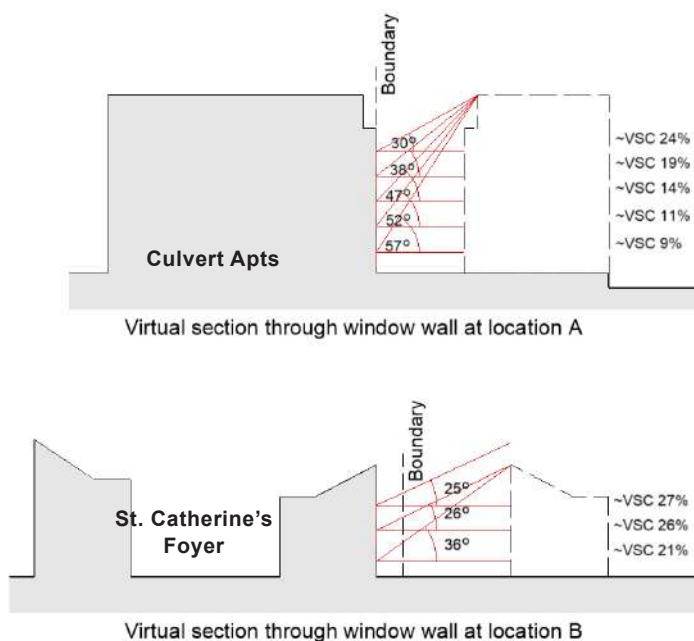
Figure 4: Sections indicating existing and hypothetical obstructing angles to the surrounding areas
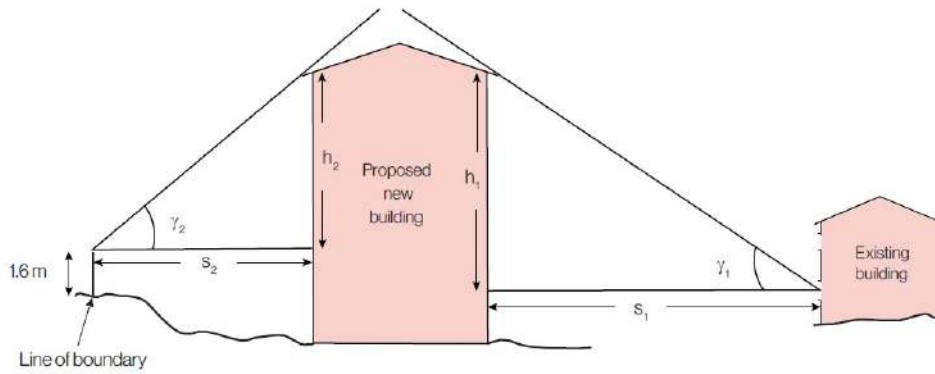
Figure F2: Angles, spacings and heights used in Table F1

Obstruction angle γ on building, degrees to horizontal	Equivalent spacing to height ratio (s_1/h_1)	Equivalent vertical sky component (VSC) (%)	Obstruction angle γ_1 at boundary (degrees to horizontal)	Spacing from boundary, divided by height (s_2/h_2)	Vertical sky component at boundary (%)
16	3.5	32	30	1.7	24
18	3.1	31	33	1.5	23
20	2.7	30	36	1.4	21
22	2.5	29	39	1.2	19
24	2.2	28	42	1.1	17
25	2.1	27	43	1.1	17
26	2.1	27	44	1.0	16
28	1.9	26	47	0.93	14
30	1.7	24	49	0.87	13
32	1.6	23	51	0.81	12
34	1.5	22	53	0.75	11
36	1.4	21	55	0.69	10
38	1.3	20	57	0.64	9
40	1.2	18	59	0.60	8
42	1.1	17	61	0.56	7
44	1.0	16	63	0.52	6
46	1.0	15	64	0.48	6
48	0.90	14	66	0.45	5
50	0.84	13	67	0.42	4

Table F1 – Equivalent VSCs, spacing-to-height ratios and boundary parameters corresponding to particular obstruction angles between rows of buildings.

Note: Heights and angles are usually relative to a point at the centre of a window (see Figure F2)

Figure 5: Table with obstructing angles and equivalent alternative VSC values. Extract from BR209:2022 BRE guidelines

3.4 Comment on preliminary assessment

Locations A; Culvert Apartments: The 25º line subtends the proposed development and these windows will be assessed in detail.

Location B; St. Catherine's Foyer: The 25º line subtends the proposed development and these windows will be assessed in detail.

Location C; The Malthouse: These windows in the side elevation do not look directly towards the proposed development, indicating any reduction in available daylight is likely to be negligible. However due to proximity, these windows have been selected for further assessment.

Windows identified in preliminary analysis will be subject to detailed study in Section 3.5.

3.5 Detailed Assessment to Adjoining Dwellings

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

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

Test points representing windows in the adjacent dwellings at locations identified in the preliminary analysis are indicated in Figures 6 - 8. The results are shown in Tables 6 - 8 below.

3.5.1 The Culvert Apartments
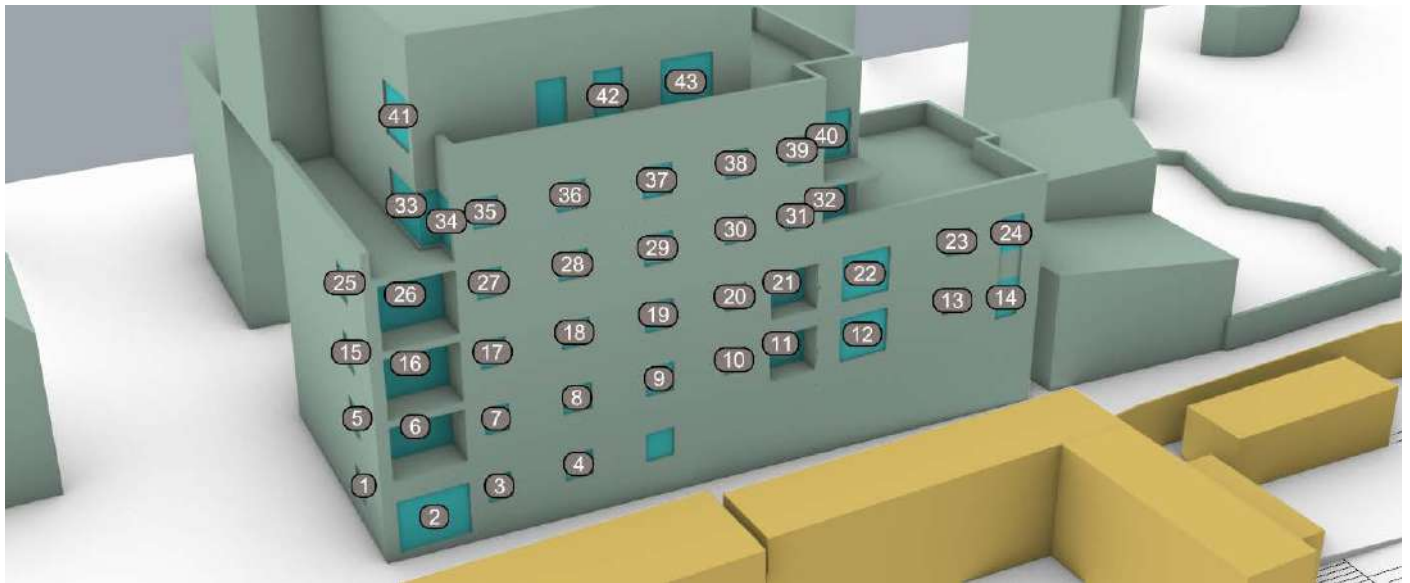
Figure 6: The Culvert Apartments, Forbes Lane - View of model locating VSC and APSH test points.

Vertical Sky Component						
Window ID	Vertical Sky Component. Alternative value for area based on sections and Table F1				Meets criteria if > alternative VSC or >80% existing value	Notes
	Existing	Proposed	Ratio: Proposed to Existing Recommended > 80%			
Ground Floor					Alternative VSC >9%	
1	31.3	31.3	100.0%	* Avg 66.3%	Y	*Dual aspect LKD
2	30.0	19.2	64.1%	* Avg 66.3%	Y	*Dual aspect LKD
3	31.0	16.7	53.8%	* Avg 66.3%	Y	*Dual aspect LKD
4	31.1	14.7	47.3%	* Avg 66.3%	Y	*Dual aspect LKD
First Floor					Alternative VSC >11%	
5	34.6	34.6	100.0%	* Avg 65.8%	Y	*Dual aspect bedroom
6	14.2	4.5	31.6%	* Avg 65.8%	N	*Dual aspect bedroom
7	36.6	18.6	50.9%		Y	
8	36.7	16.9	45.9%		Y	
9	36.9	15.8	42.9%		Y	
10	36.7	15.2	41.6%	* Avg 23.7%	Y	LKD served by two windows
11	19.3	1.1	5.9%		N	Window obstructed by balcony above
12	37.4	15.9	42.6%		Y	
13	36.6	15.9	43.5%		Y	
14	37.1	16.6	44.8%		Y	

Vertical Sky Component

Window ID	Vertical Sky Component. Alternative value for area based on sections and Table F1				Meets criteria if > alternative VSC or >80% existing value	Notes
	Existing	Proposed	Ratio: Proposed to Existing Recommended > 80%			
Second Floor					Alternative VSC >14%	
15	37.1	37.1	100.0%	* Avg 63.3%	Y	*Dual aspect LKD
16	16.0	5.4	33.9%	* Avg 63.3%	N	Window obstructed by balcony above
17	37.3	20.9	56.0%	* Avg 63.3%	Y	*Dual aspect LKD
18	37.5	19.3	51.4%		Y	
19	37.6	18.4	48.9%		Y	
20	37.4	18.0	48.2%	* Avg 30.9%	Y	LKD served by two windows
21	19.8	2.7	13.6%	* Avg 30.9%	N	Window obstructed by balcony above
22	38.1	18.8	49.3%		Y	
23	37.4	19.0	50.8%		Y	
24	37.7	19.5	51.7%		Y	
Third Floor					Alternative VSC >19%	
25	38.2	38.2	100.0%	* Avg 66.7%	Y	*Dual aspect LKD
26	16.6	6.3	37.8%	* Avg 66.7%	N	Window obstructed by balcony above
27	37.8	23.5	62.3%	* Avg 66.7%	Y	*Dual aspect LKD
28	38.0	22.2	58.4%		Y	
29	38.0	21.5	56.6%		Y	
30	37.8	21.5	56.8%	* Avg 48.8%	Y	LKD served by three windows
31	37.8	21.7	57.4%	* Avg 48.8%	Y	LKD served by three windows
32	18.2	5.9	32.2%	* Avg 48.8%	N	Window obstructed by balcony above
Fourth Floor					Alternative VSC >24%	
33	38.4	38.2	99.5%	* Avg 83.9%	Y	*Dual aspect LKD
34	34.4	34.1	99.2%	* Avg 83.9%	Y	*Dual aspect LKD
35	37.9	26.5	69.9%	* Avg 83.9%	Y	*Dual aspect LKD
36	38.1	25.6	67.1%	* Avg 83.9%	Y	*Dual aspect LKD
37	38.2	25.2	66.0%		Y	
38	38.0	25.4	66.8%	* Avg 68.1%	Y	LKD served by three windows
39	38.0	25.7	67.7%		Y	LKD served by three windows
40	31.0	21.7	69.9%		N	LKD served by three windows
Fifth Floor					VSC >27	
41	38.6	38.5	99.7%		Y	
42	38.5	31.1	80.8%	* Avg 81.1%	Y	*Dual aspect LKD
43	38.8	31.6	81.4%	* Avg 81.1%	Y	*Dual aspect LKD

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

Table 6: Vertical sky component - Culvert Apartments

3.5.2 Comment on the assessment of VSC to the Culvert Apartments

Forbes lane exists as a narrow street, to mitigate the potential impact on the Culvert Apartments, the proposed development is set back from the boundary. Given the typology in this inner city location, these windows have been assessed with alternative VSC as per BRE guidelines and most windows meet these values. While a reduction in daylight is noted to individual windows, many rooms are dual aspect and the perceived impact would be lessened.
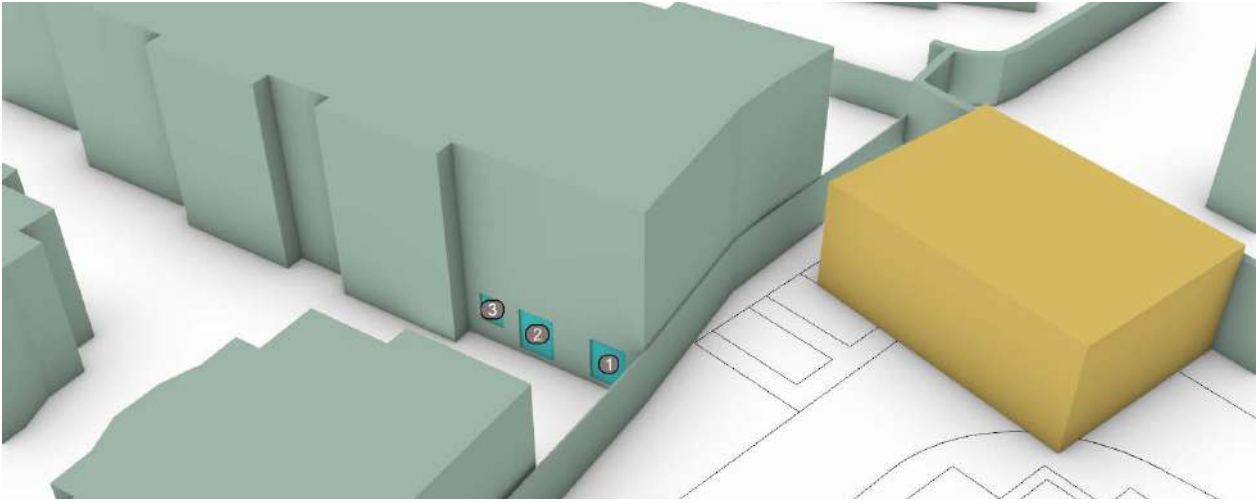
Figure 7: The Malthouse Apartments - View of model locating VSC test points.

Vertical Sky Component					
Window ID	Vertical Sky Component			Meets criteria of >27% VSC Or <27% but >80% existing value	Notes
	VSC: Existing	VSC: Proposed	Ratio: Proposal to Existing Recommended > 80%		
1	21.28	18.77	88.2%	Y	
2	23.49	19.90	84.7%	Y	
3	22.17	19.41	87.6%	Y	

Table 7: Vertical sky component for windows in The Malthouse

3.5.3 Comment on the assessment of VSC to the Malthouse Apartments

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

3.5.4 St. Catherine's Foyer
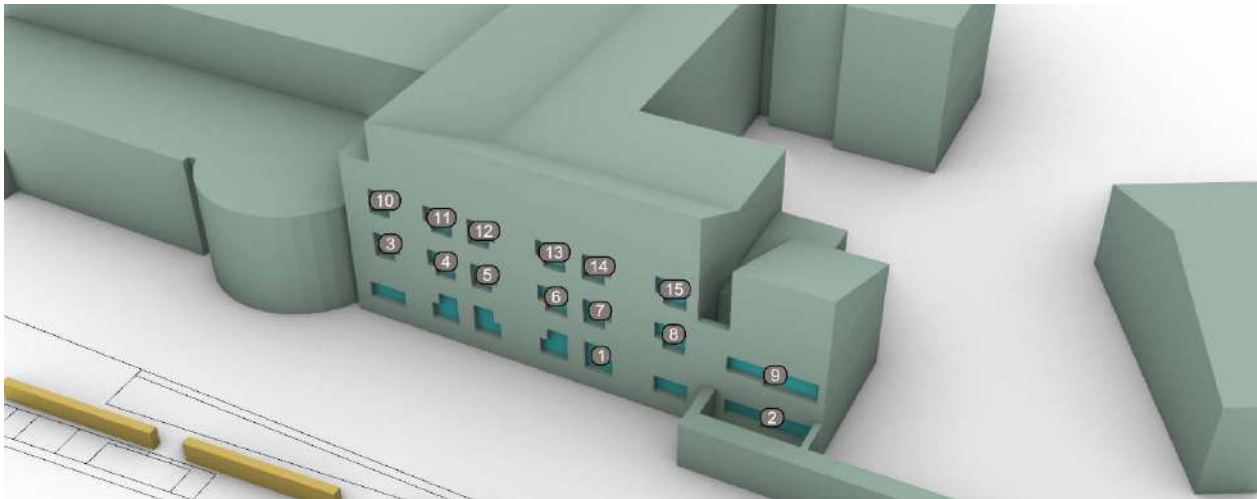
Figure 8: St. Catherine's Foyer - View of model locating VSC test points.

Vertical Sky Component					
Window ID	Vertical Sky Component. Alternative value for area based on sections and Table F1			Meets criteria if > alternative VSC or >80% existing value	Notes
	Existing	Proposed	Ratio: Proposed to Existing		
Ground Floor				VSC >21%	
1	28.03	9.30	33.2%	N	
2	16.94	9.23	54.5%	N	
First Floor				VSC >26%	
3	29.89	9.58	32.1%	N	
4	29.97	9.85	32.9%	N	
5	29.78	10.05	33.7%	N	
6	29.44	10.72	36.4%	N	
7	29.17	11.64	39.9%	N	
8	28.85	13.69	47.5%	N	
9	25.63	14.13	55.1%	N	
Second Floor				VSC >27%	
10	30.74	12.32	40.1%	N	
11	30.82	12.61	40.9%	N	
12	30.70	12.81	41.7%	N	
13	30.48	13.48	44.2%	N	
14	30.22	14.30	47.3%	N	
15	30.20	16.45	54.5%	N	

Table 8: Vertical sky component - St. Catherine's Foyer

3.5.6 Comment on the assessment of VSC to St. Catherine's Foyer

All the windows are reduced below the recommended VSC level. Currently there is only a single storey wall on the site opposite the existing windows, this is almost no obstruction. The results indicate that any development is likely to result in a substantial relative reduction in VSC levels.

3.5.7 Detailed Assessment of St. Catherine's Foyer

The assessment of the VSC level is recommended where room use is not known and only gives an indication of available daylight at a centre point to the window. It does not take into account the window size or room layouts. The plans of St. Catherines's Foyer are available with the room use and layouts. The habitable rooms have been assessed for compliance with Daylight Provision by the illuminance method under BS EN 17037:2018+A1:2021. This method assesses the daylight levels over at least 50% daylight hours in the year and uses a weather file data set. It takes into account the orientation of the space. It provides an accurate representation of the daylight provision to a specific room in the context of the proposed environment.

Ground Floor   **First Floor**   **Second Floor**

Figure 9: BS EN17037:2018+A1:2021 Minimum room specific Daylight Provision in accordance with UK National Annex Table NA.1.

Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded: Minimum 50% of grid	Meets Criteria
St. Catherine's Foyer: Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1							
CC-0.1	LKD	19.3	177	200	515	65.0%	Y
CC-0.2	Office	11.3	90	200	391	47.8%	N
CC-0.3	Bed	10.8	80	100	530	100.0%	Y
CC-0.4	Office	31.7	304	200	370	72.0%	Y
CC-0.5	Office	32.7	320	200	286	45.0%	N
CC-1.1	LKD	21.6	191	200	506	100.0%	Y
CC-1.2	Bed	14.9	129	100	422	100.0%	Y
CC-1.3	Bed	14.3	114	100	336	100.0%	Y
CC-1.4	Bed	14.0	113	100	326	98.2%	Y
CC-1.5	Bed	13.9	113	100	304	99.1%	Y
CC-1.6	Bed	14.7	129	100	301	97.7%	Y
CC-1.7	Bed	14.3	114	100	242	75.4%	Y
CC-2.1	Bed	14.9	129	100	466	100.0%	Y
CC-2.2	Bed	14.3	114	100	379	100.0%	Y
CC-2.3	Bed	14.0	113	100	379	100.0%	Y
CC-2.4	Bed	13.9	113	100	354	100.0%	Y
CC-2.5	Bed	14.7	129	100	353	100.0%	Y
CC-2.6	Bed	14.3	114	100	291	96.5%	Y

Table 9: Minimum Daylight Provision BS EN17037:2018+A1:2021 Table NA.1 compliance for habitable rooms

3.5.8 Conclusion to daylight assessment of St. Catherine's Foyer

There is a reduction to the windows of St Catherine's Foyer. The rooms are in use as office use and bedrooms. All the bedrooms achieve the minimum recommended lux levels for daylight as set out in BS EN 17037:2018+A1:2021.

4. Sunlight in Neighbouring Buildings

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

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

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

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

The windows identified in the preliminary assessment and indicated in Figures 6-8, that face within 90° of due south are assessed regardless of use. The results are set out in the tables below.

Annual Probable Sunlight Hours								
	APSH >25% Target			Sept 21 - Mar 21 WPSH >5% Target			Meets criteria of >25% APSH and >5% PSH Or <25% or <5% PSH but >80% Existing Value	
Location ID	Existing	Proposed	Ratio	Existing	Proposed	Ratio		
	% of APSH	% of APSH	If less than 25% APSH Target >80%	% WPSH	% WPSH	If less than 5% WPSH Target >80%		
Culvert Apartments								
1	63.3%	47.1%	74.4%	14.8%	9.3%	62.9%	Y	Y
2	67.5%	45.2%	66.9%	18.3%	8.2%	44.9%	Y	Y
3	67.2%	42.7%	63.6%	18.1%	6.1%	33.8%	Y	Y
4	25.6%	8.5%	33.1%	20.5%	6.8%	33.3%	N	Y
5	80.1%	50.6%	63.2%	28.8%	10.2%	35.5%	Y	Y
6	80.8%	48.8%	60.4%	29.4%	8.3%	28.1%	Y	Y
7	80.7%	44.8%	55.6%	29.4%	5.8%	19.9%	Y	Y
8	80.7%	43.8%	54.2%	29.3%	4.9%	16.6%	Y	N
9	35.2%	2.2%	6.4%	22.9%	0.0%	0.0%	N	N
10	80.4%	43.8%	54.4%	29.1%	4.2%	14.4%	Y	N
11	80.5%	45.0%	56.0%	29.3%	4.9%	16.8%	Y	N
12	80.2%	44.0%	54.9%	29.0%	5.0%	17.3%	Y	Y
13	28.8%	11.2%	39.0%	21.8%	8.0%	36.8%	N	Y
14	83.2%	55.8%	67.1%	31.4%	12.2%	38.8%	Y	Y
15	83.2%	53.2%	63.9%	31.4%	9.8%	31.3%	Y	Y
16	82.8%	49.7%	60.0%	31.1%	7.2%	23.0%	Y	Y
17	82.9%	48.5%	58.5%	31.1%	6.0%	19.2%	Y	Y
18	36.1%	4.6%	12.9%	23.6%	0.5%	2.1%	N	N
19	82.5%	48.6%	58.9%	30.9%	5.3%	17.3%	Y	Y
20	83.0%	49.8%	60.0%	31.4%	6.3%	20.0%	Y	Y
21	82.9%	50.1%	60.4%	31.3%	6.8%	21.5%	Y	Y
22	29.5%	12.3%	41.7%	22.0%	8.3%	37.9%	N	Y
23	85.3%	60.8%	71.3%	33.1%	14.1%	42.7%	Y	Y
24	85.2%	57.6%	67.6%	33.1%	11.7%	35.5%	Y	Y
25	85.1%	55.5%	65.2%	33.0%	9.8%	29.7%	Y	Y
26	85.1%	54.2%	63.6%	33.0%	8.6%	26.0%	Y	Y
27	85.2%	54.0%	63.3%	33.0%	8.1%	24.5%	Y	Y
28	85.3%	65.0%	76.3%	33.1%	16.3%	49.2%	Y	Y
29	85.3%	62.4%	73.2%	33.1%	14.1%	42.7%	Y	Y
30	85.3%	60.5%	70.9%	33.1%	12.5%	37.7%	Y	Y
31	85.3%	59.8%	70.2%	33.1%	12.0%	36.2%	Y	Y
32	85.3%	59.7%	70.0%	33.1%	11.8%	35.8%	Y	Y

Table 10: Annual Probable Sunlight Hours to Adjoining Properties

There will be a perceptible level of reduction to a number of windows, which in the majority of the cases, are marginally below the target APSH and WPSH levels.

Culvert Apartments

There is a reduction in the APSH to window ids 4, 12 and 20. These windows have balconies overhead and gable obstructions which are considerable obstructions to sunlight. They also have windows to the gable which will receive additional sunlight. It can be seen from the levels of reduction to the adjacent windows in the window which achieve the sunlight levels that the main cause of reduction in sunlight levels is resultant from the over head and side obstructions.

St Catherine's Foyer

The windows are in excess of 90° to due south and servicing bedrooms which do not need to be assessed. These window are in the majority bedrooms and have a lesser requirement for sunlight.

The Malthouse

The windows to Malthouse are entirely south of the proposed development and will not experience any reduction in sunlight levels.

4.2 Conclusion

The majority of windows assessed exceed the target values set out for annual and winter probable sunlight hours. Overall the reductions in APSH is limited and not excessive. A design development iteration process was carried out to minimise the impact on surrounding properties and any reduction is in line with a development in an inner city location.

It should also be noted that the building is built to the boundary on a narrow street facing with unobstructed access to the sky from the direction of the proposed development and any reduction to available sunlight is in-line with a building of similar scale and distance from the boundary.

5. Sunlight to Gardens and Open Spaces to 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.

5.1 Amenity Space to Neighbouring Properties.

There are no public or private amenity spaces to the adjacent properties. There will be no reduction in sunlight to the adjacent amenities and the proposed development meets the recommendations of the BRE guidelines BR209:2022 (third edition)

6. Daylight within the Proposed Development

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

Compliance is demonstrated by a calculation of Daylight Provision with the illuminance method under BS EN 17037:2018+A1:2021. A summary of the results are presented in Table 10 below and a complete set of room results are shown in Appendix A.

For supplementary information, an assessment of Daylight Provision with the illuminance method under IS /BS EN 17037:2018 is undertaken. A summary of the results are presented in Table 11 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 does not take into account room use or make allowance for room that have a lesser requirement for daylight. The UK National Annex A1 in BS EN17037:2018+A1:2021 sets out room specific minimum values to be achieved in the UK and Channel Islands. These target values are set to achieve similar minimum daylight levels as the superseded Average Daylight Factor method (ADF) in BS8206-2 2008.

Minimum daylight provision UK NA.1 - BS EN 17037:2018+A1:2021					
	Room Use	Number of rooms	Target illuminance E_T(lx) for half of the assessment grid	Number of rooms to achieve target Lux over 50% of the assessment grid	Percentage of rooms achieving Target
Apartments	LKD	108	200	108	100.0%
	Bedrooms	165	100	165	100.0%
Total		273		273	100.0%

Table 11: 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 Supplementary Information - Assessment for Daylight Provision IS / BS EN 17037:2018

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

Daylight provision Illuminance Method IS EN 17037:2018						
		Below Target	Minimum	Medium	High	Percentage of rooms achieving Target
Overall total	Target Illuminance	13.9%	31.5%	32.6%	22.0%	86.1%
	Minimum Illuminance	2.9%	45.8%	30.8%	20.5%	97.1%

Table 12: Percentage of rooms at each level to IS/BS EN 17037:2018. Individual room results can be viewed in Appendix B.

The results indicate a high level of compliance for Minimum level with 97.1% and Target level with 86.1% 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 units in an apartment building would achieve the target sunlight.
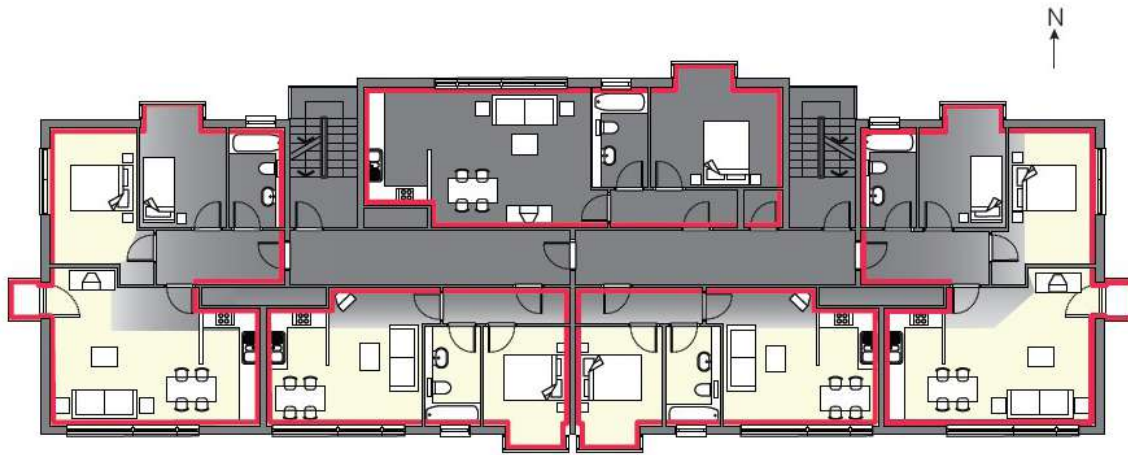
Figure 26: Careful layout design means that four out of the five flats shown have a south-facing living room

Figure 10: 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						
Overall Total	108	48	44.4%	16	23	20	49	92	85.2%

Table 13: 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 acknowledge that for large developments with site constraints, it is not possible to achieve south facing windows to all main living spaces. 48no. of the 108no. (44.4%) apartment units have a window to a living room or kitchen/ dining room which face within 90° of due south.

Windows with an aspect of greater than 90° due south, to the north west or north east, will still receive sunlight, but it is likely to be lesser amounts especially in the winter period. 92no. of the 108no. units (85.2%) 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 85.2% of units meeting the minimum recommended 1.5 direct sunlight hours. This is in-line with the BRE guidelines BR209:2022 (third edition) example for an apartment layout where 4 in 5 achieves the target sunlight hours.

8. Sunlight to Amenity within the Proposed Development

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

8.1 Sunlight to amenity within the proposed development

The amenity area within this proposal have been assessed with a calculation of Sun on the Ground on the 21st March. Generated analysis is shown in Figure 11 and the results are set out in Table 13 below.
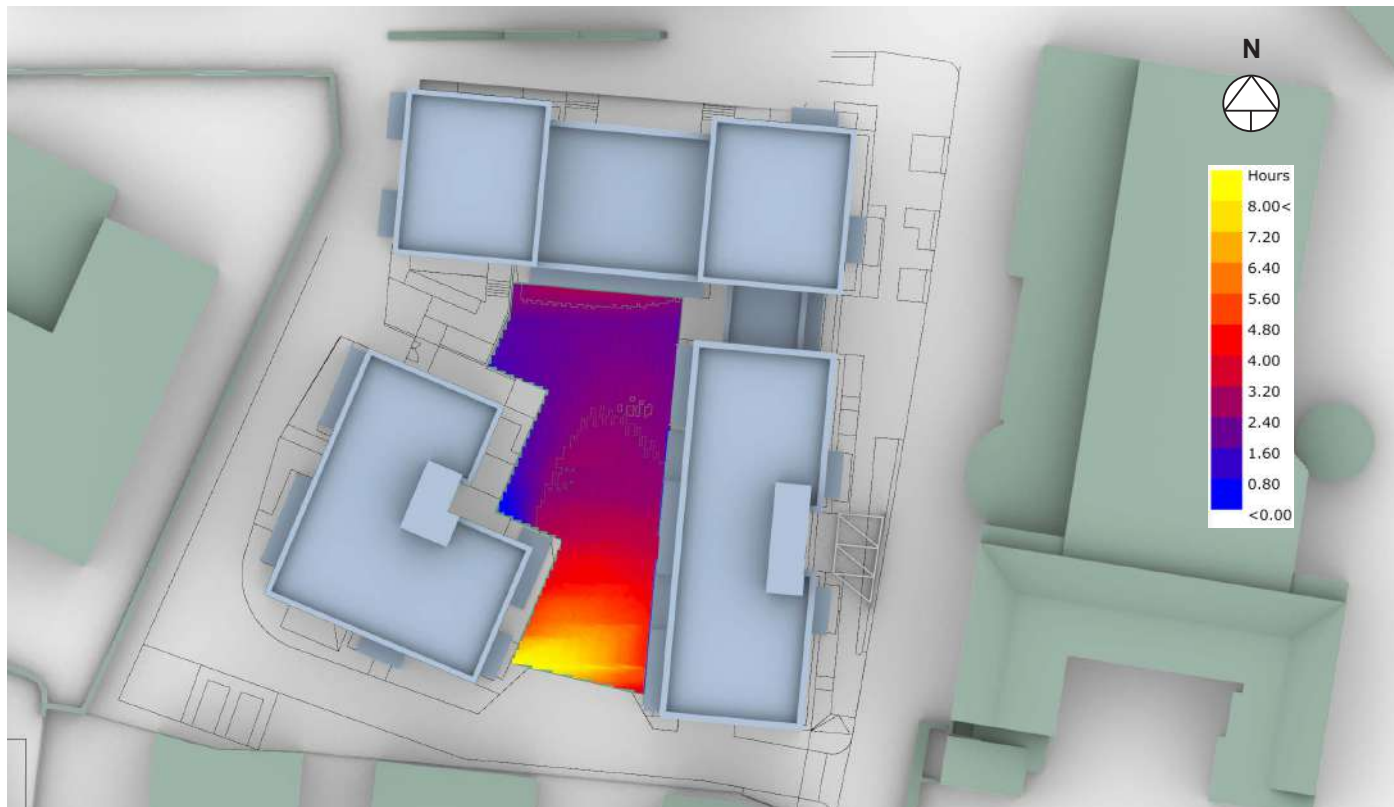
Figure 11: Communal Open Space - Radiation map of amenity area, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hrs.

Sunlight on the Ground - Communal Amenity		
	Proposed: % Area receiving 2 hours sunlight on 21st March	Meets Criteria
S1	54.90%	Yes

Table 14: Calculation of Sunlight on the Ground to communal amenity space within the development

8.1 Conclusion on amenity in within the proposed development

All public and communal amenity areas meet and exceed the recommendations of the BRE guidelines, achieving sunlight levels that exceed 2 hours sunlight over 50% of the amenity space on the 21st March.

9. Shadow Study

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

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

June 21st and December 21st are provided below for information but it should be noted that the summer solstice is the best case scenario with shadows at their shortest. The summer solstice diagrams 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 recommends that Sunlight at an altitude of 10° or less does not count. Below are the times for the Equinox and Solstice that the sun is above 10° altitude rounded to the nearest half hour.

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

Section 9.2 shows the 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.

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
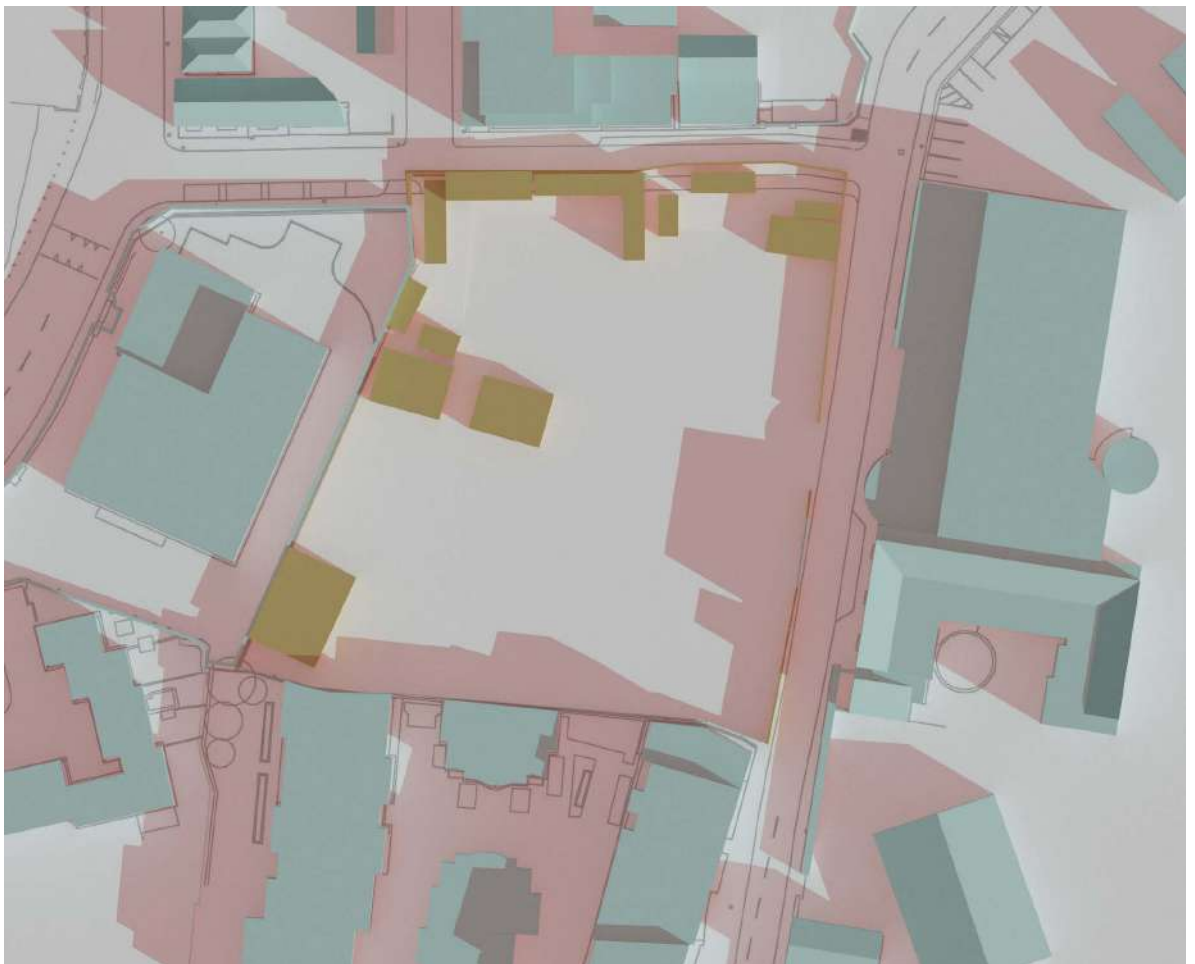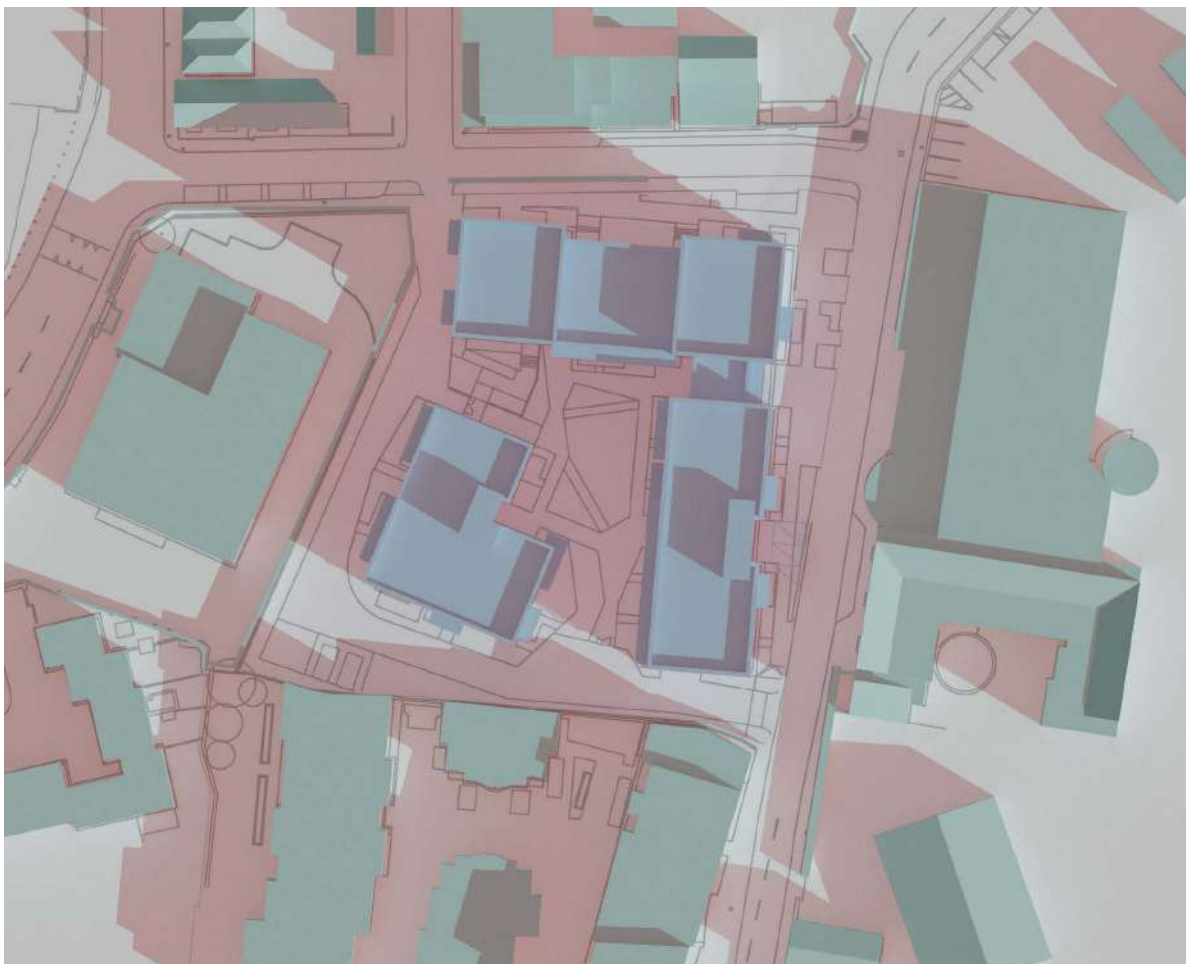
Proposed

Figure 12: Shadow diagrams 21 March 09:00 UTC

Existing

N
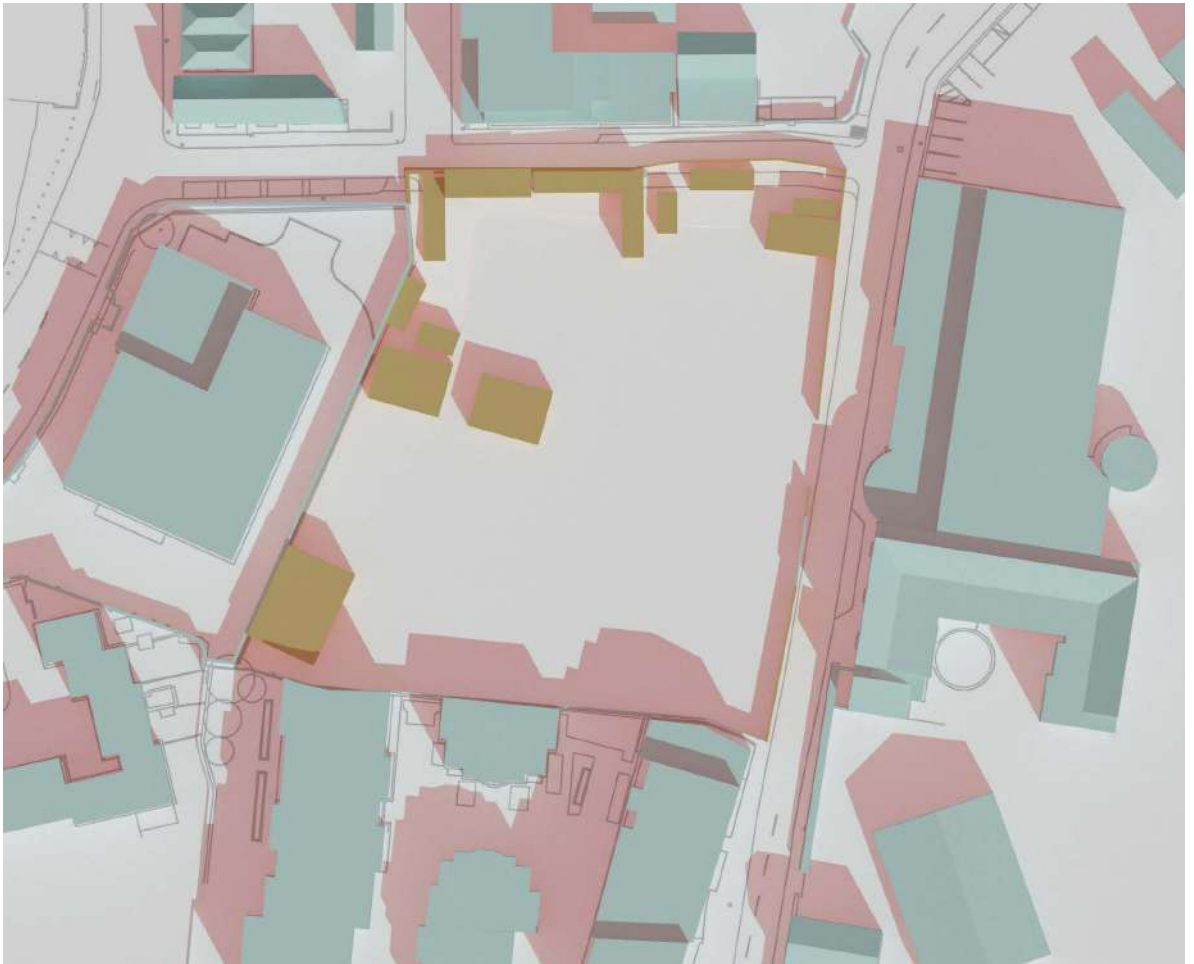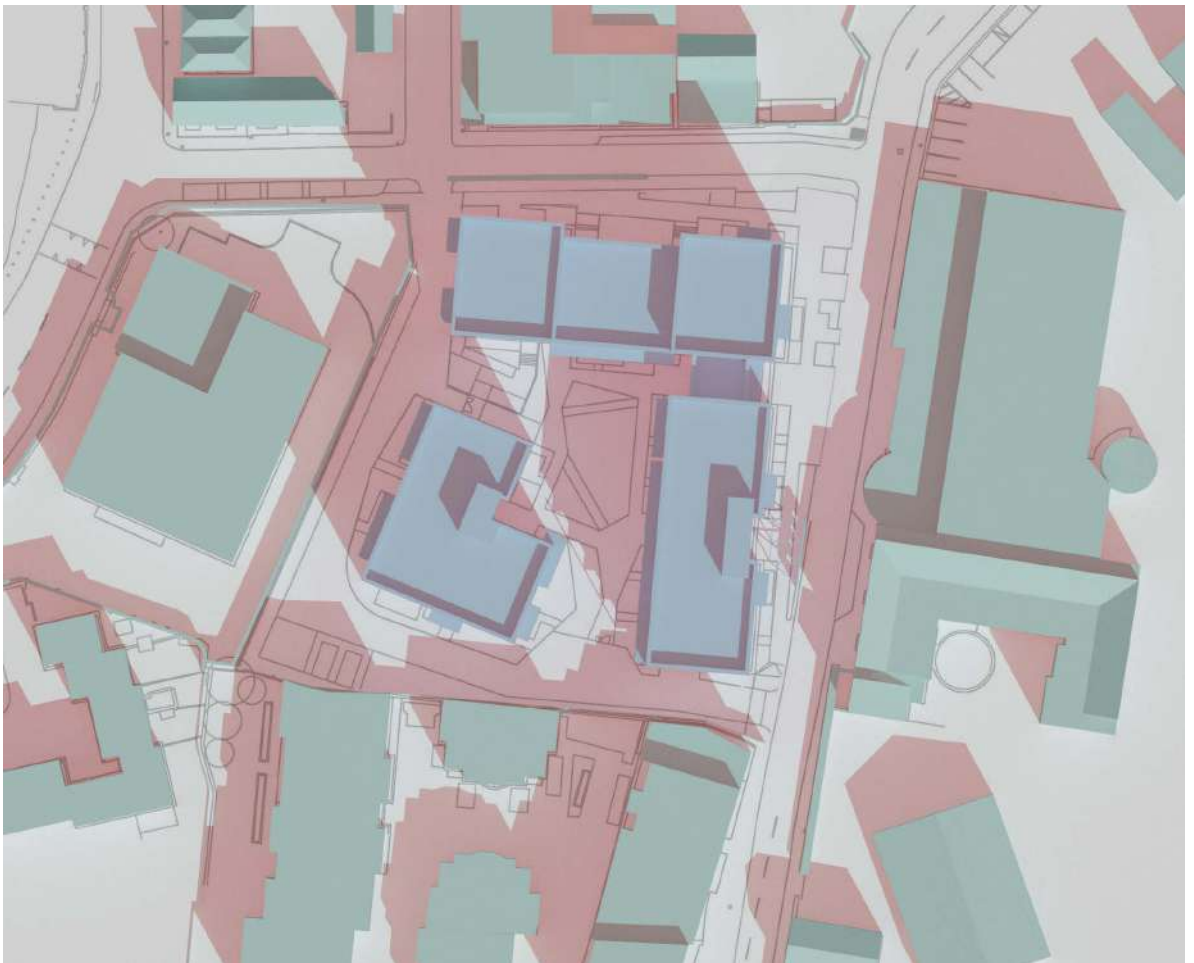
Proposed

Figure 13: Shadow diagrams 21 March 11:00 UTC

Existing

N
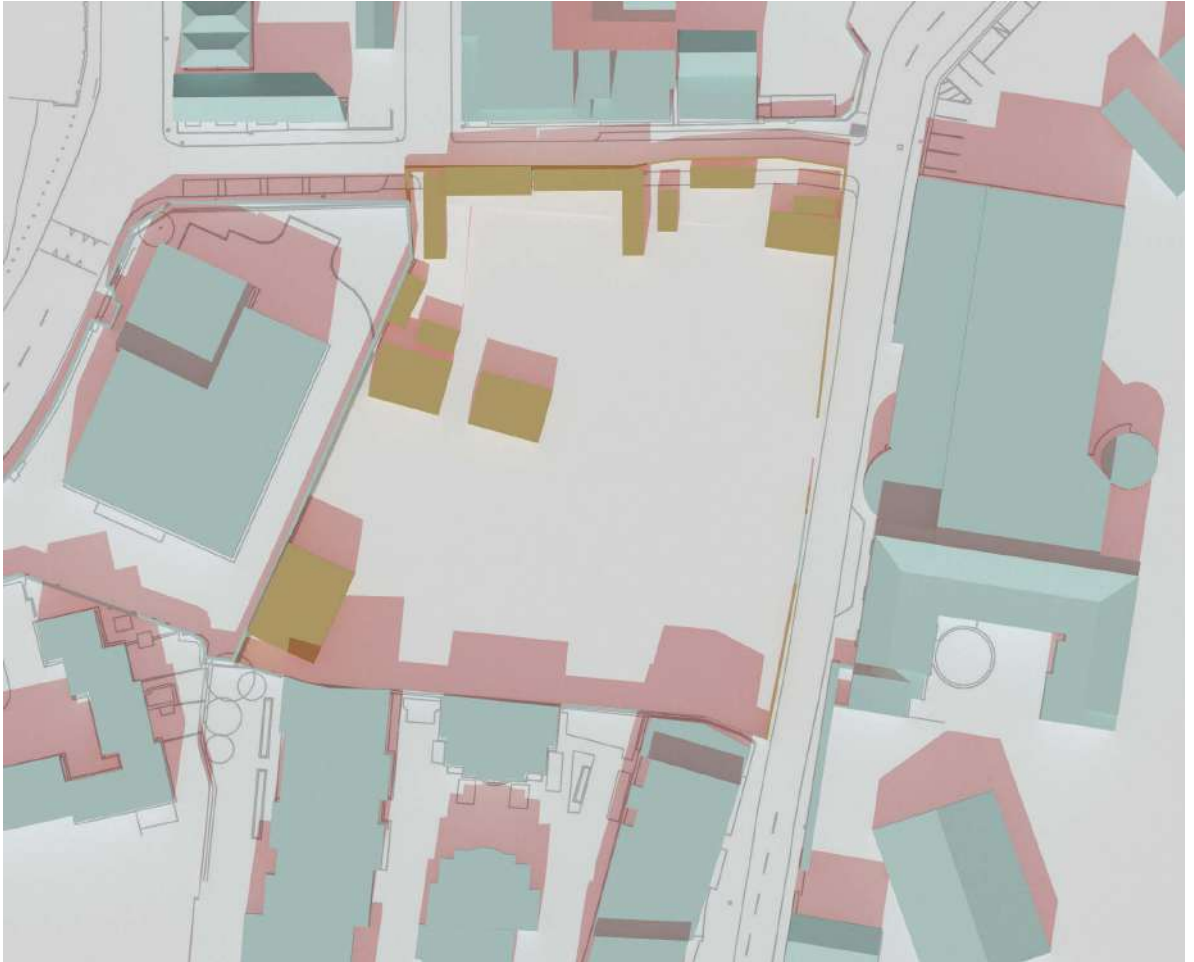
Proposed

Figure 14: Shadow diagrams 21 March 13:00 UTC

Existing

N
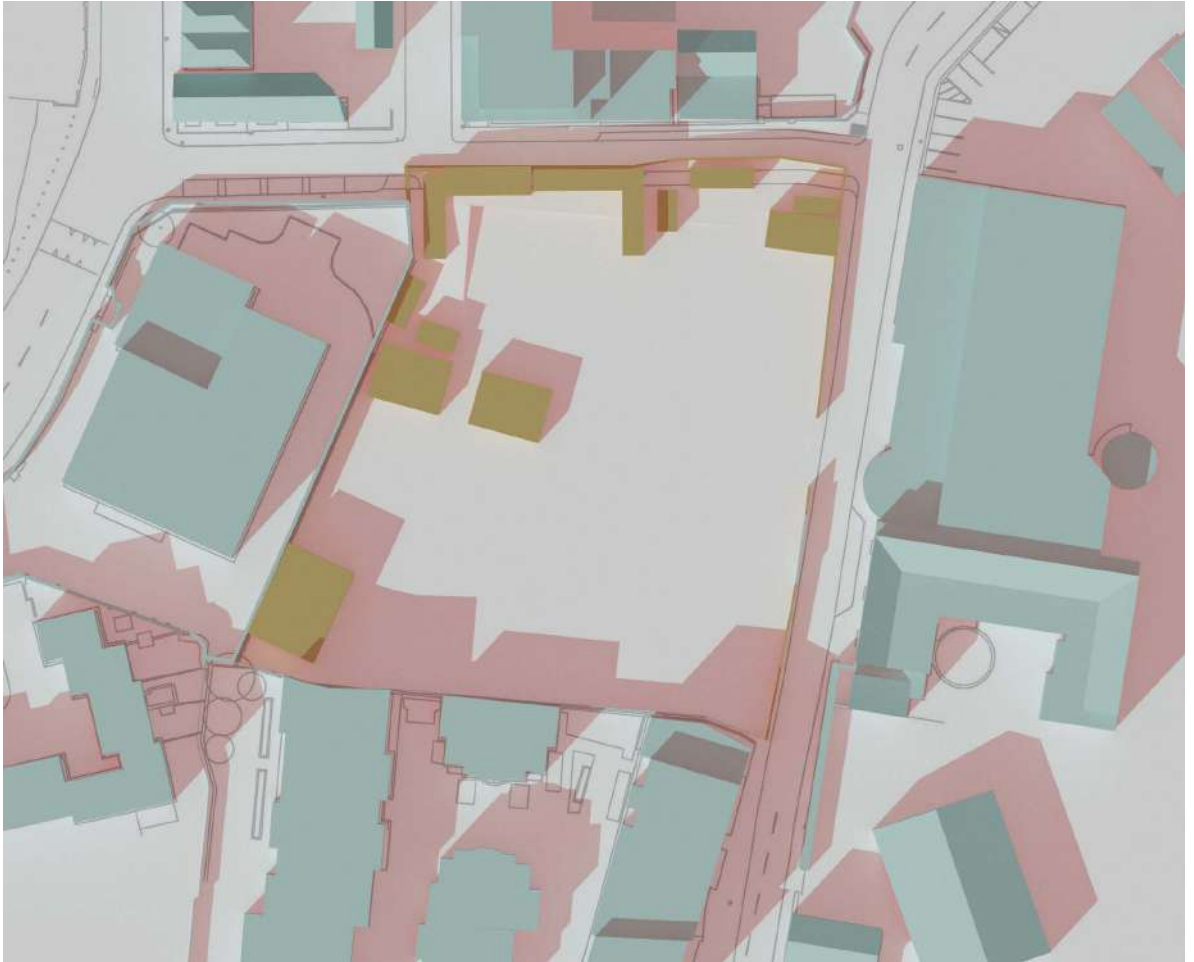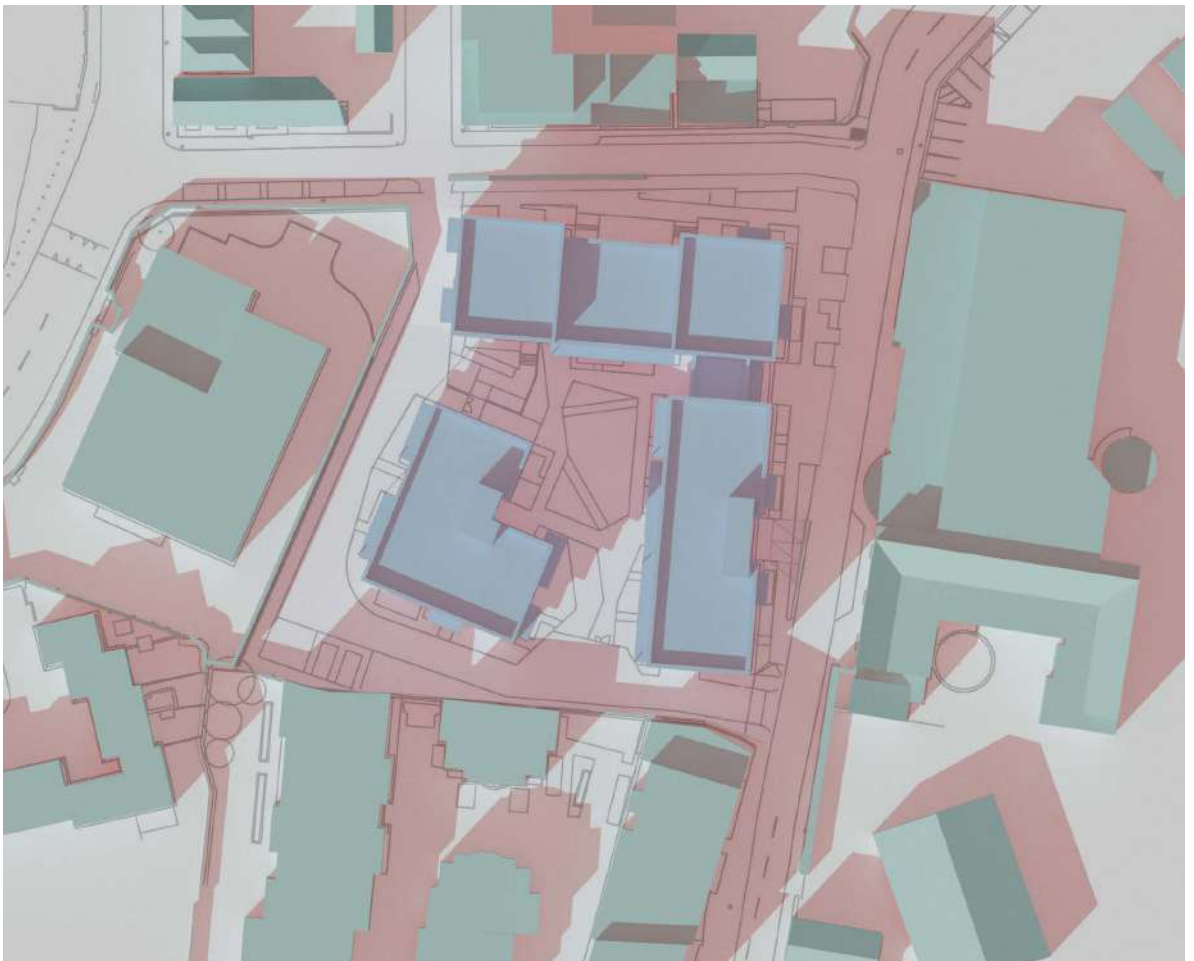
Proposed

Figure 15: Shadow diagrams 21 March 15:00 UTC

Existing

N
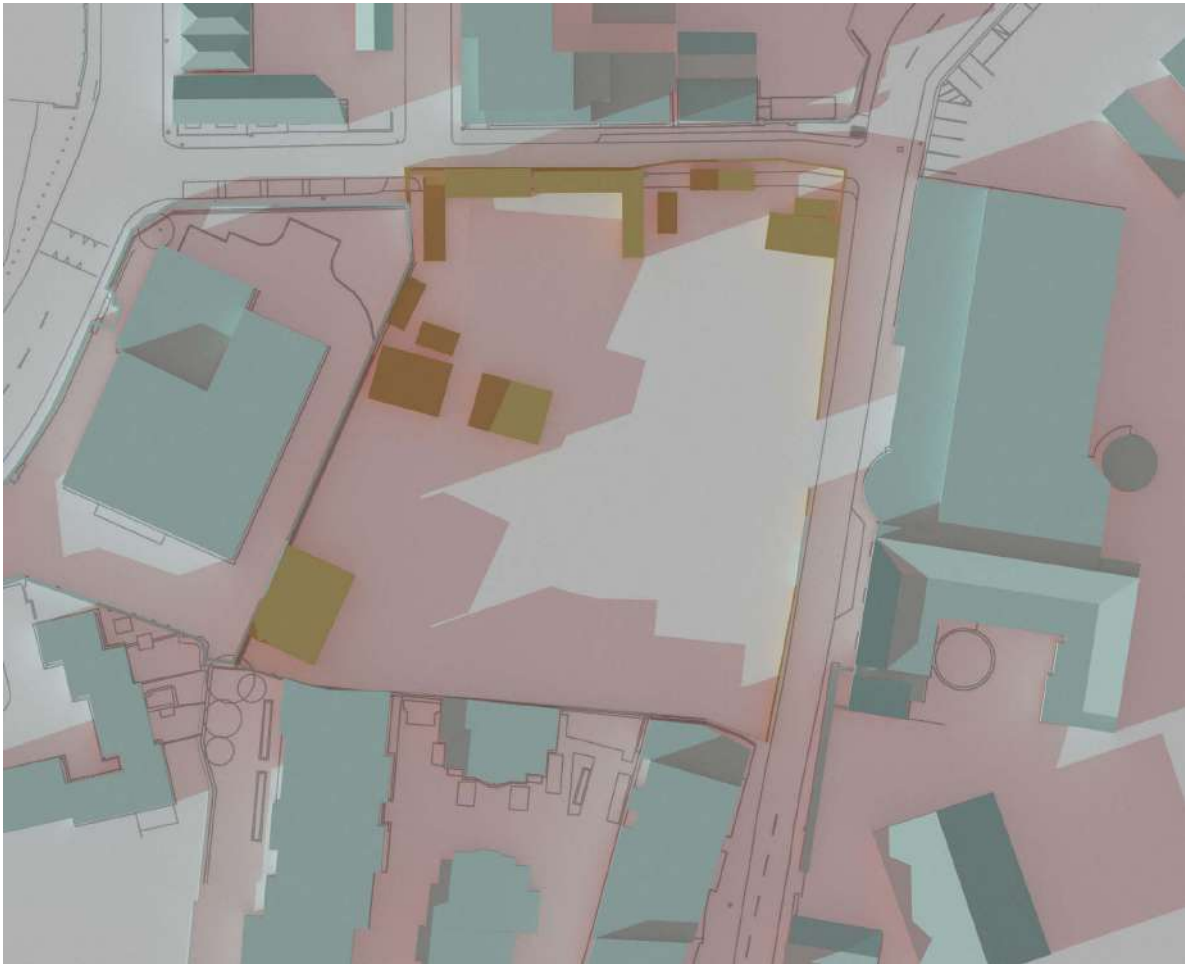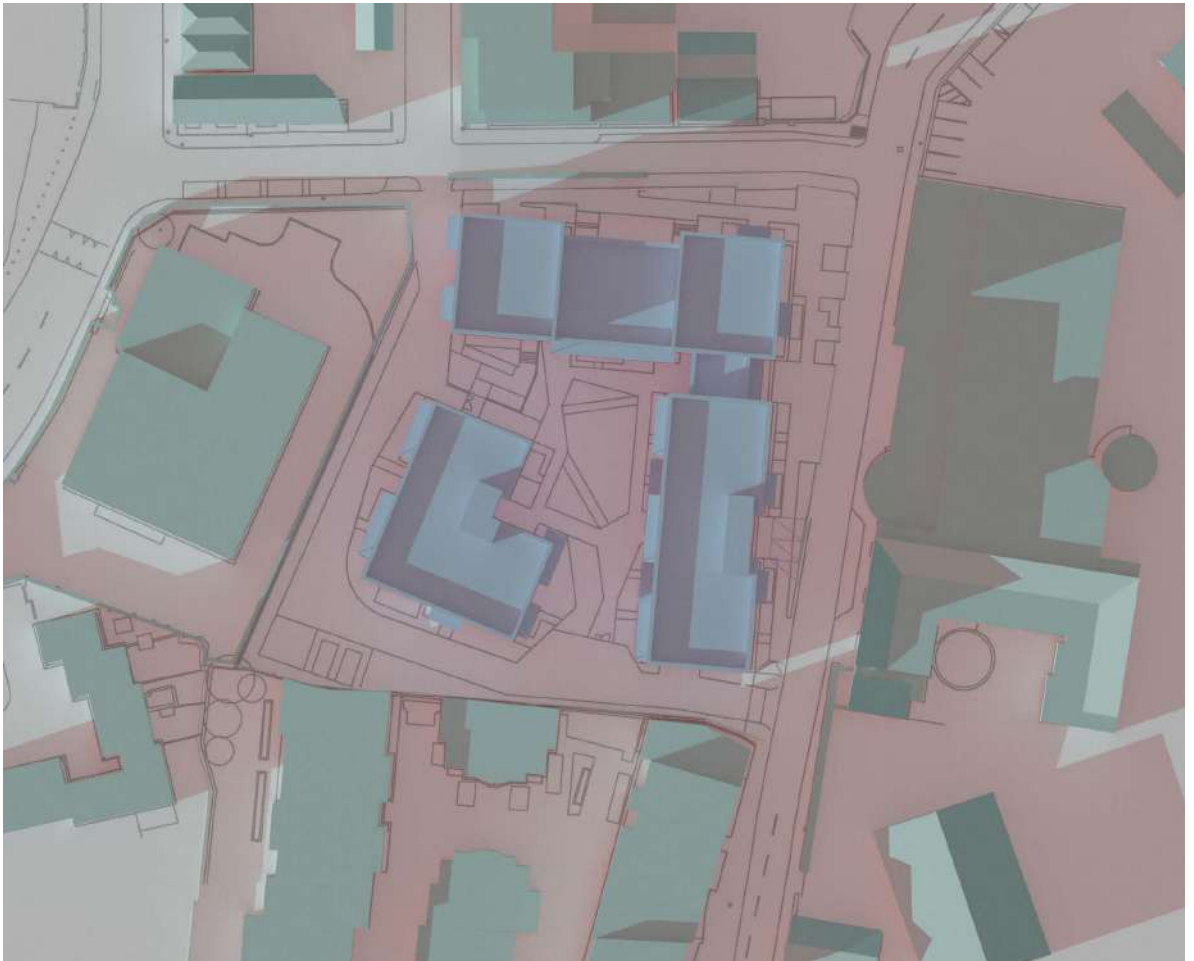
Proposed

Figure 16: Shadow diagrams 21 March 17:00 UTC

9.3 Shadow Casting diagrams June Solstice

Existing

N
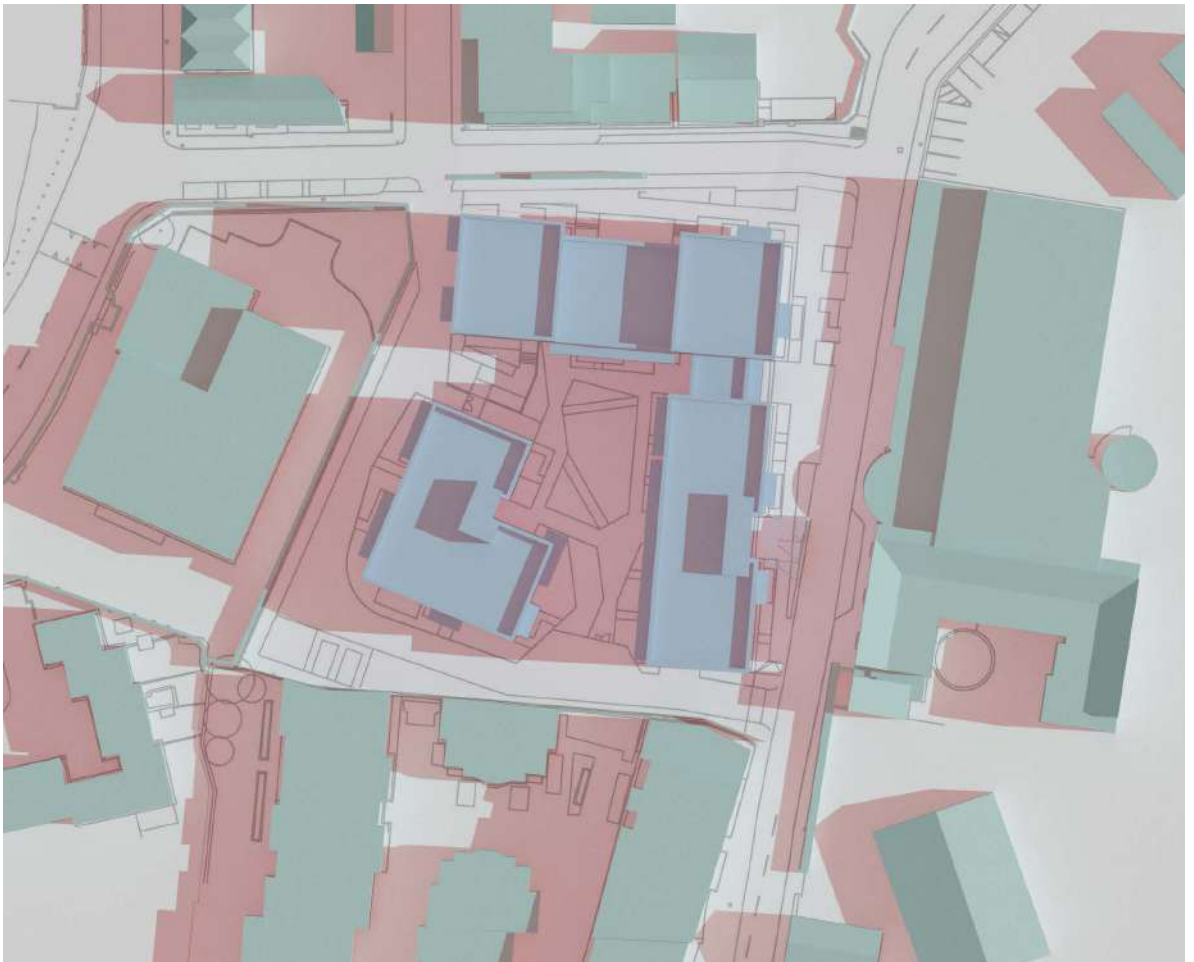
Proposed

Figure 17: Shadow diagrams 21 June 09.00 UTC +1

Existing

N
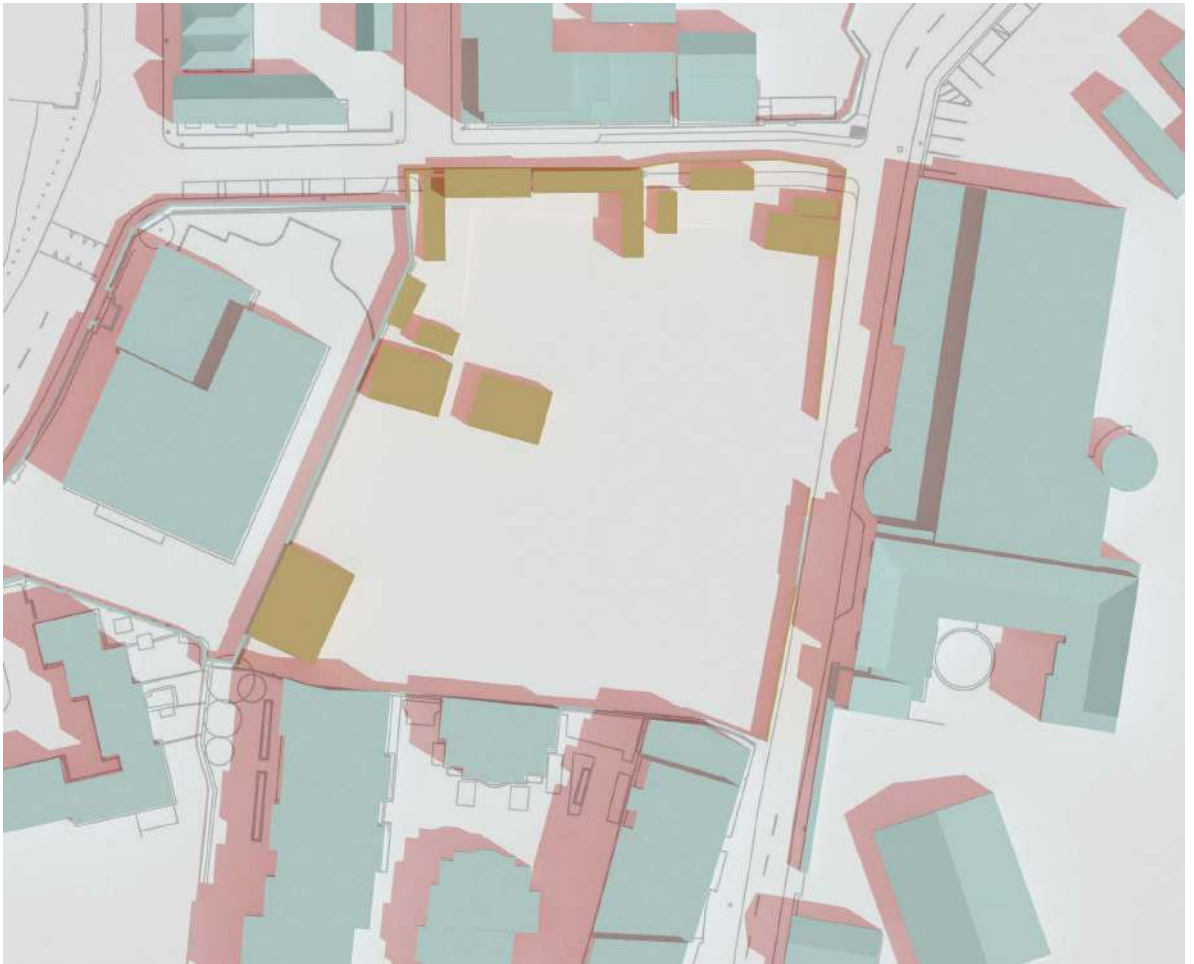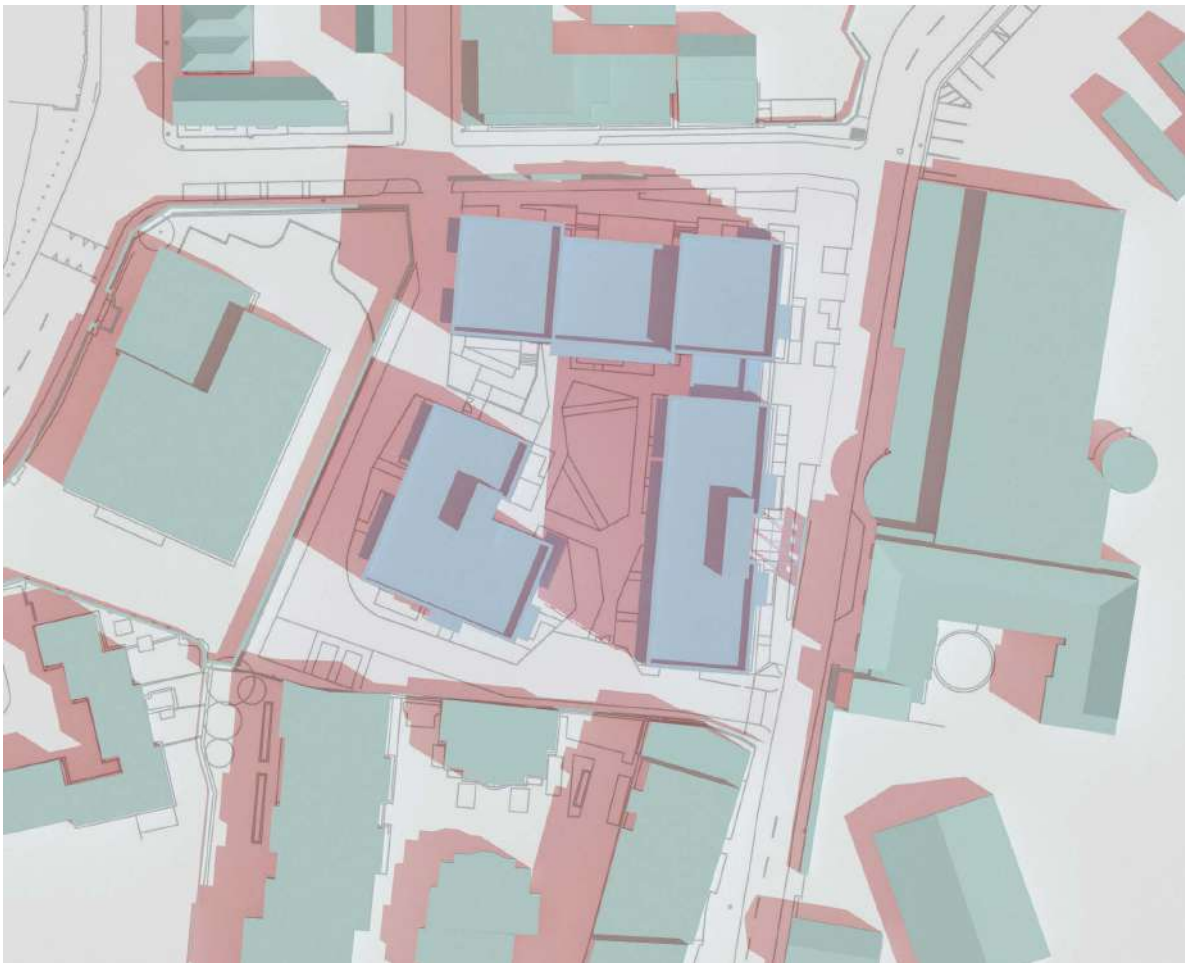
Proposed

Figure 18: Shadow diagrams 21 June 11:00 UTC +1

Existing

N
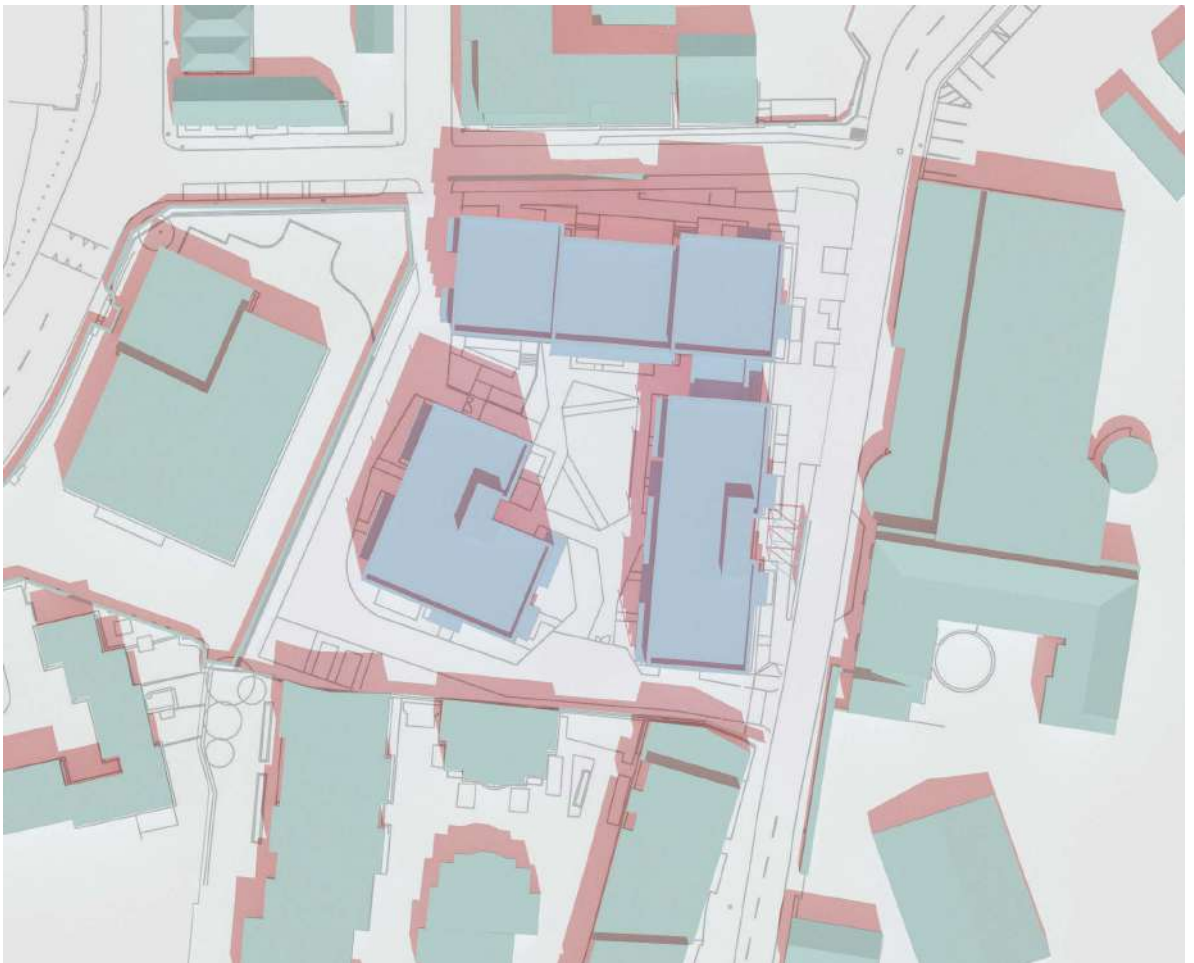
Proposed

Figure 19: Shadow diagrams 21 June 13:00 UTC +1

Existing

N
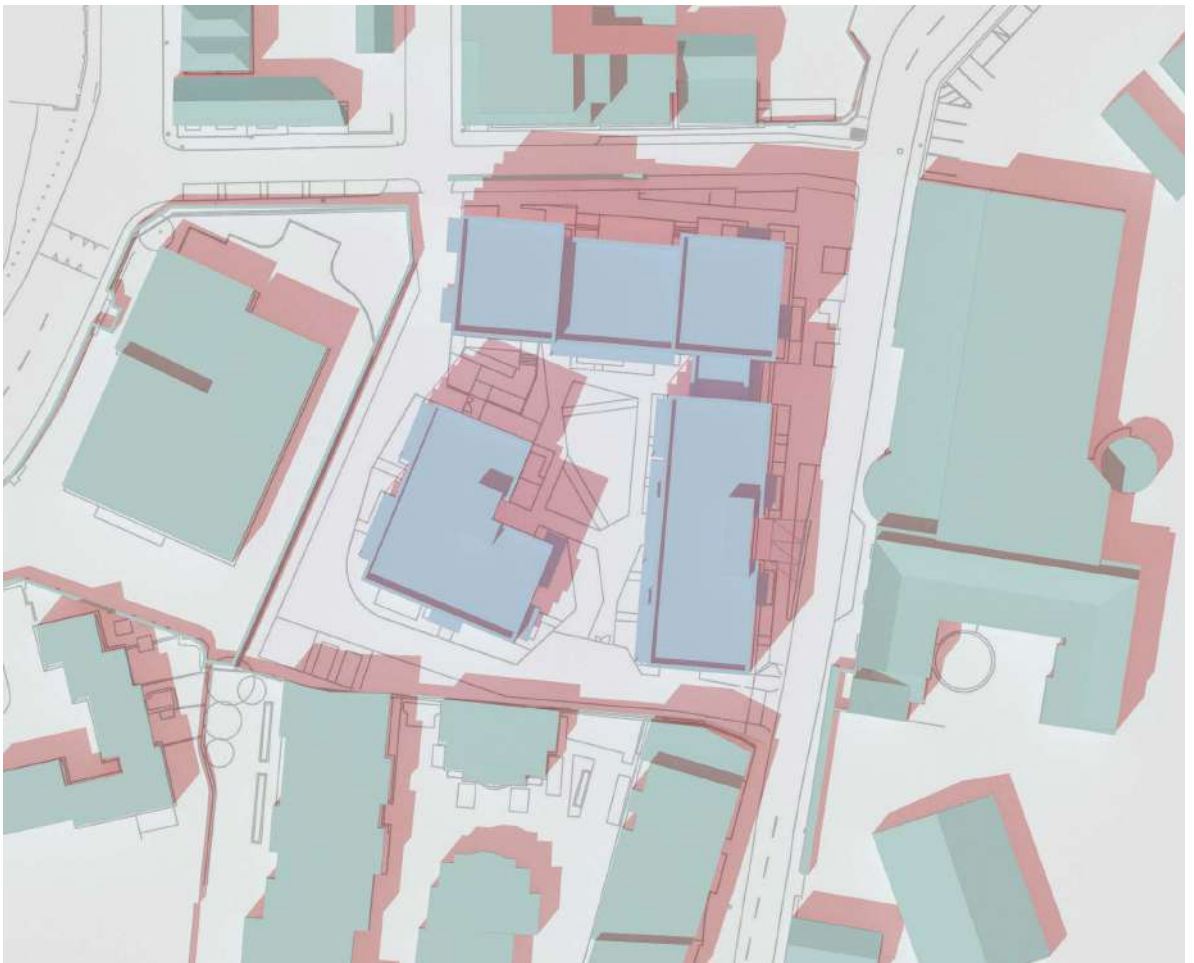
Proposed

Figure 20: Shadow diagrams 21 June 15:00 UTC +1

Existing

N
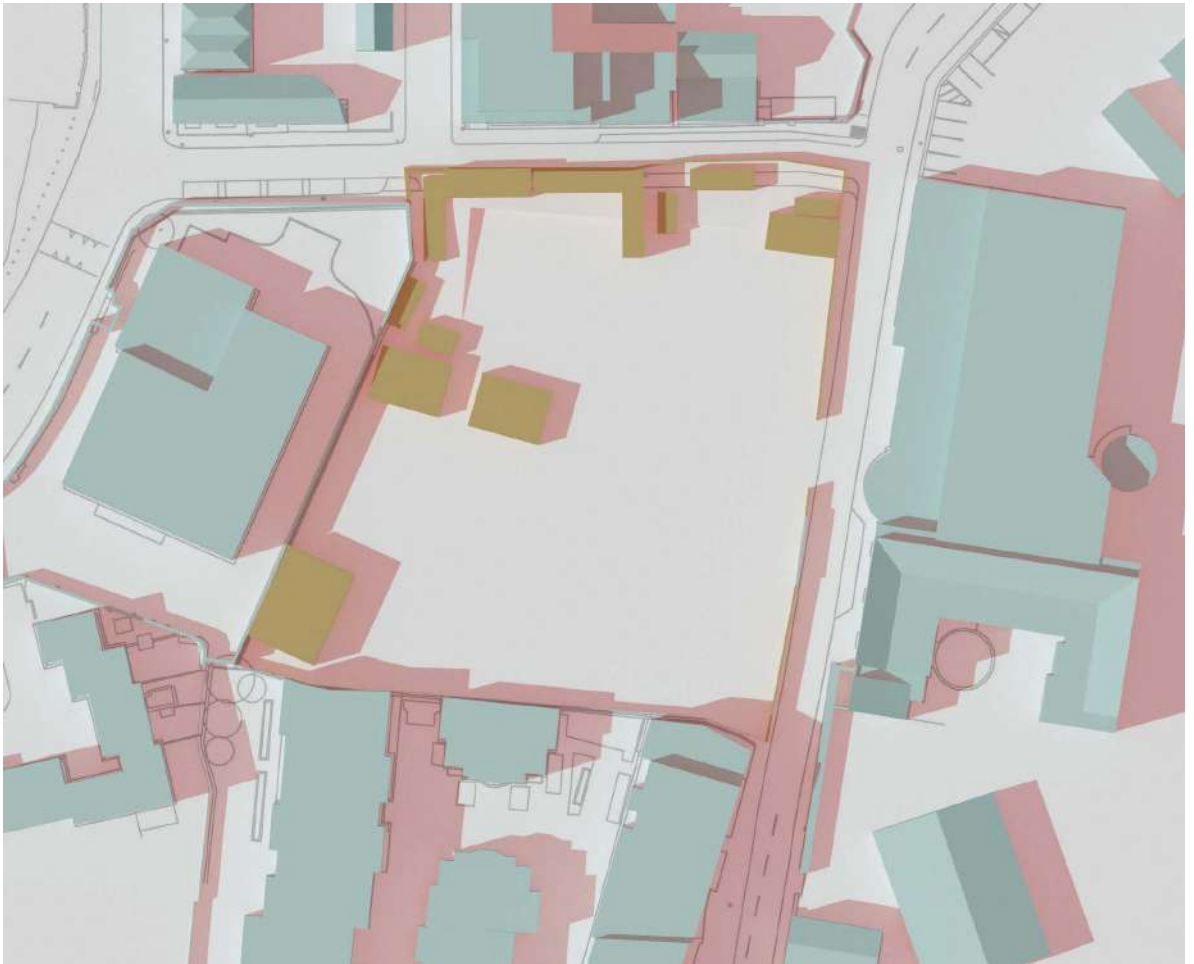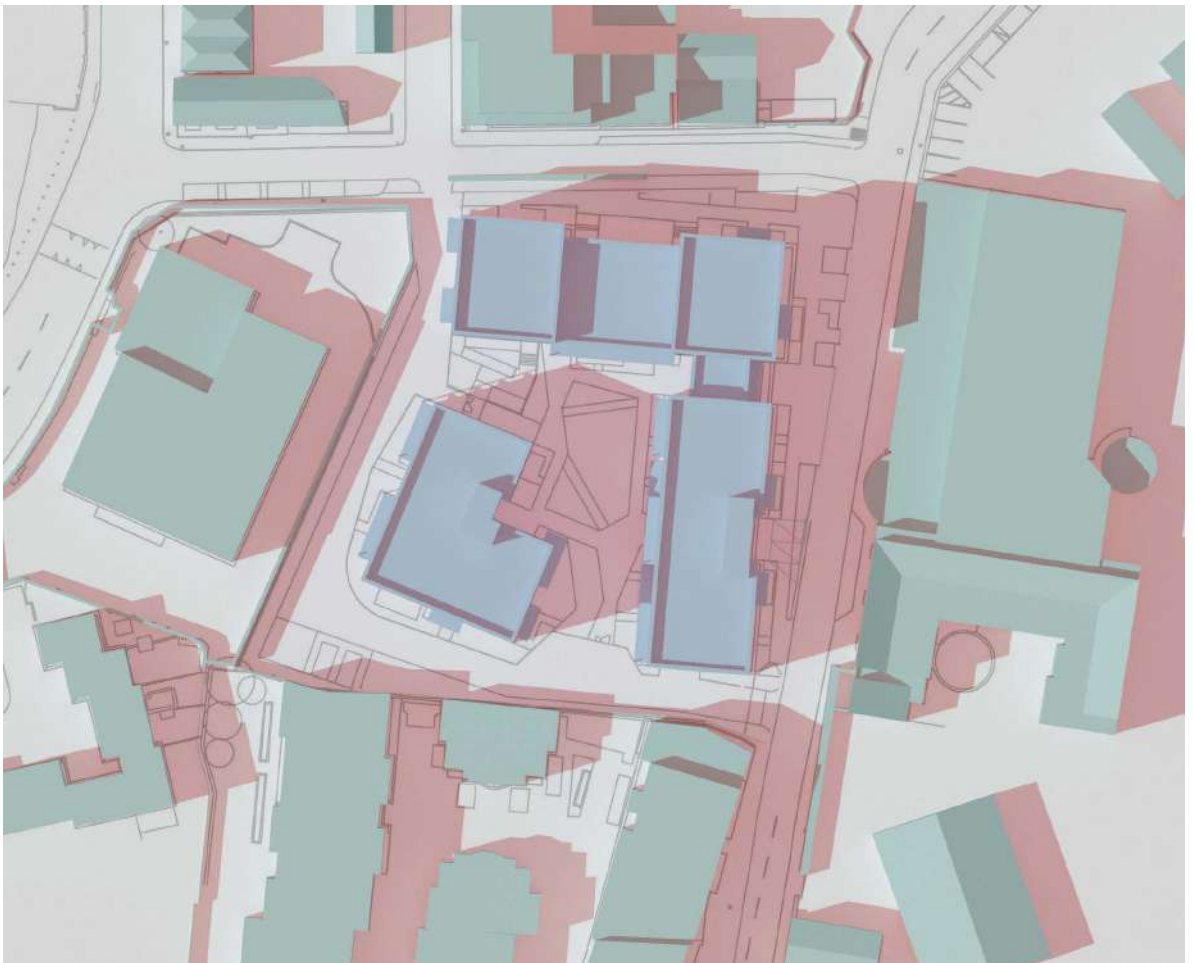
Proposed

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

Existing

N
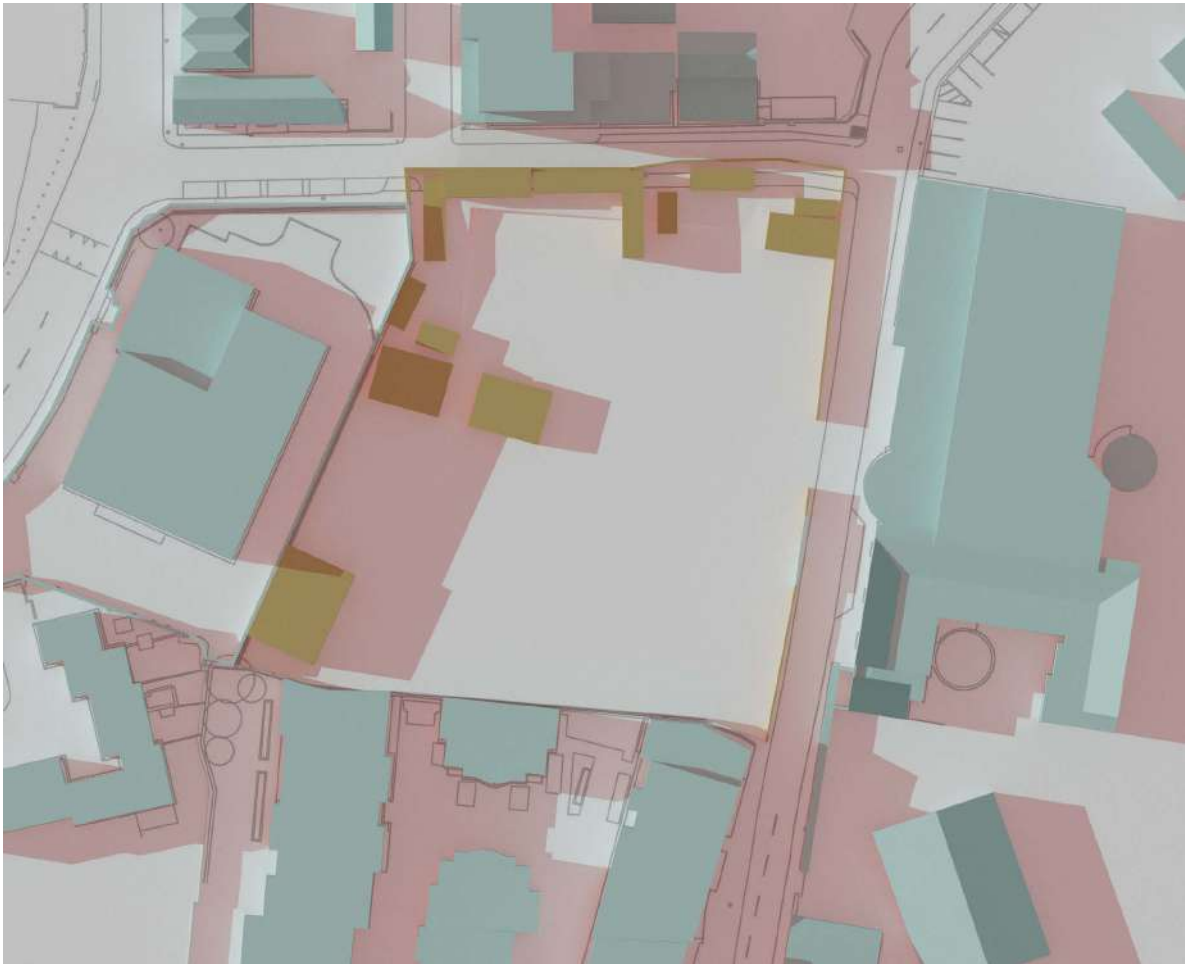
Proposed

Figure 22: Shadow diagrams 21 June 19:00 UTC +1

9.4 Shadow Casting diagrams December Solstice

Existing

N

Proposed

Figure 23: Shadow diagrams 21 December 09:00 UTC

Existing

N
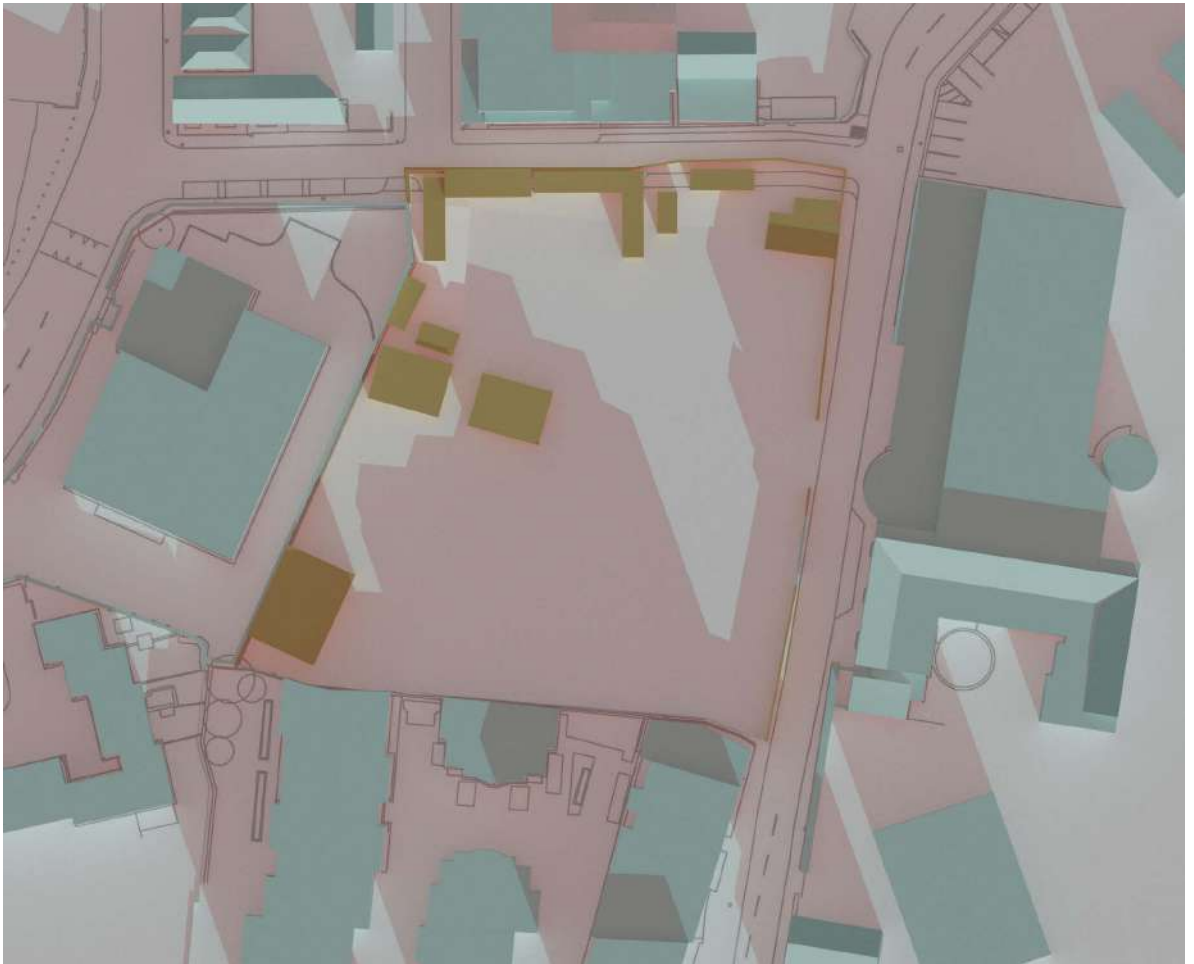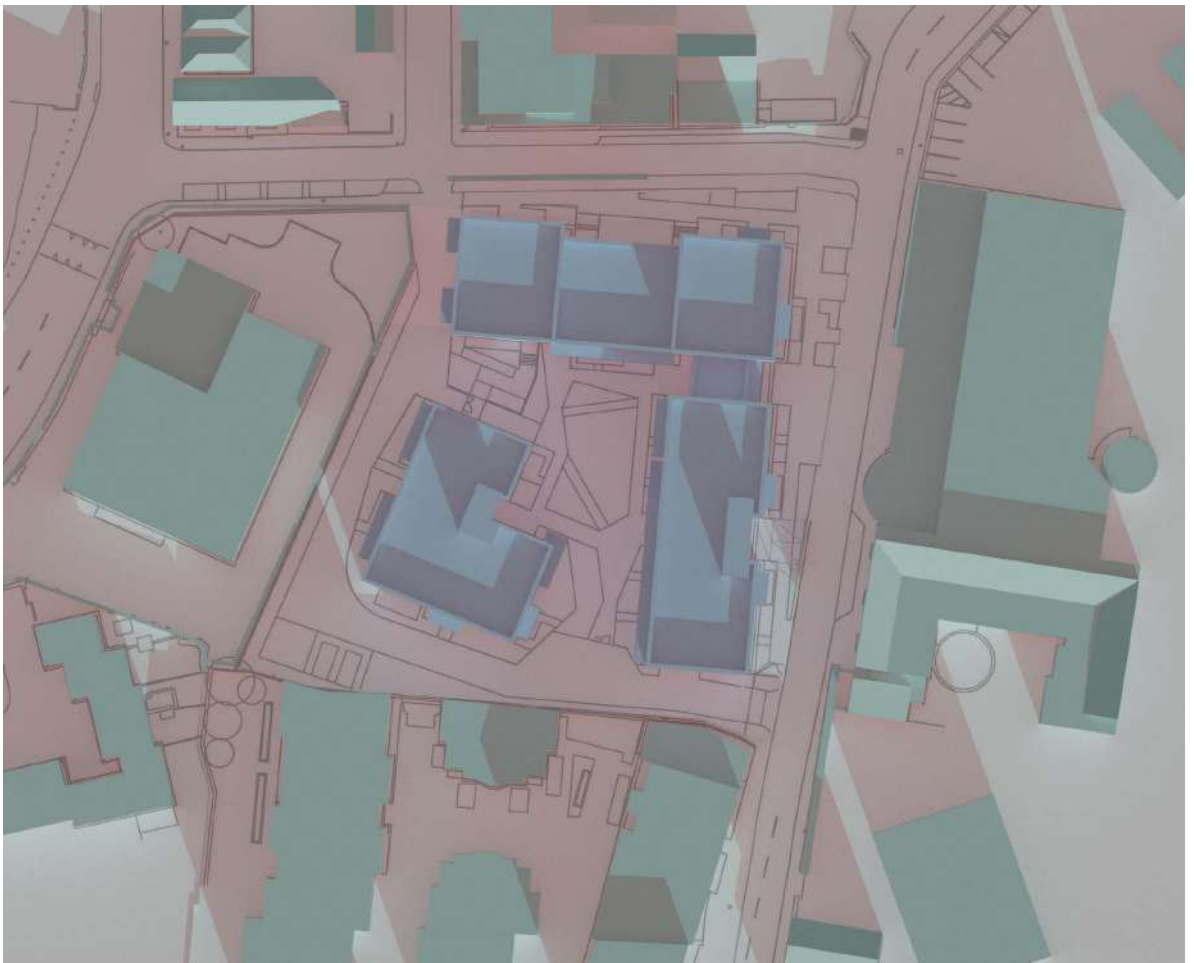
Proposed

Figure 24: Shadow diagrams 21 December 11:00 UTC

Existing

N
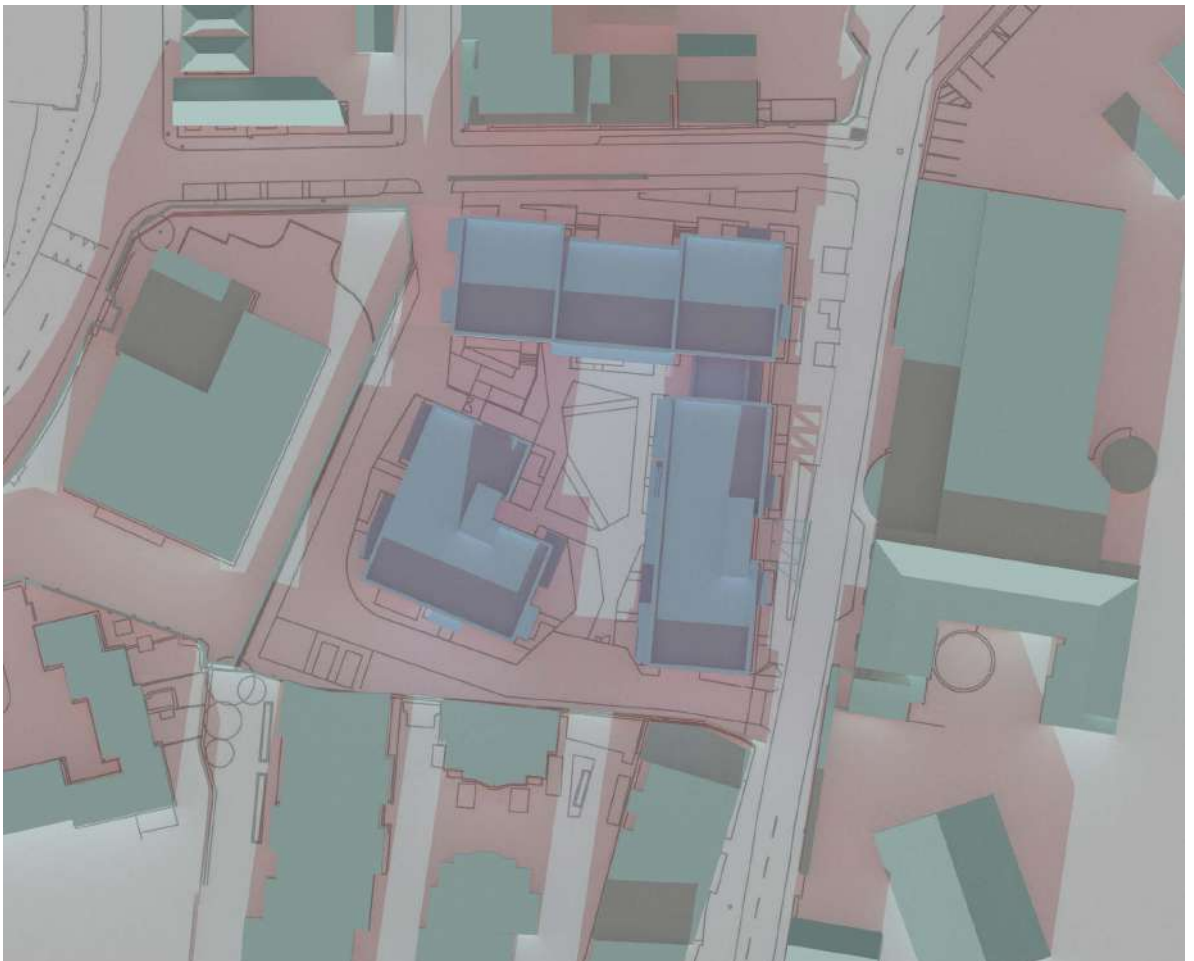
Proposed

Figure 25: Shadow diagrams 21 December 13:00 UTC

Existing

N
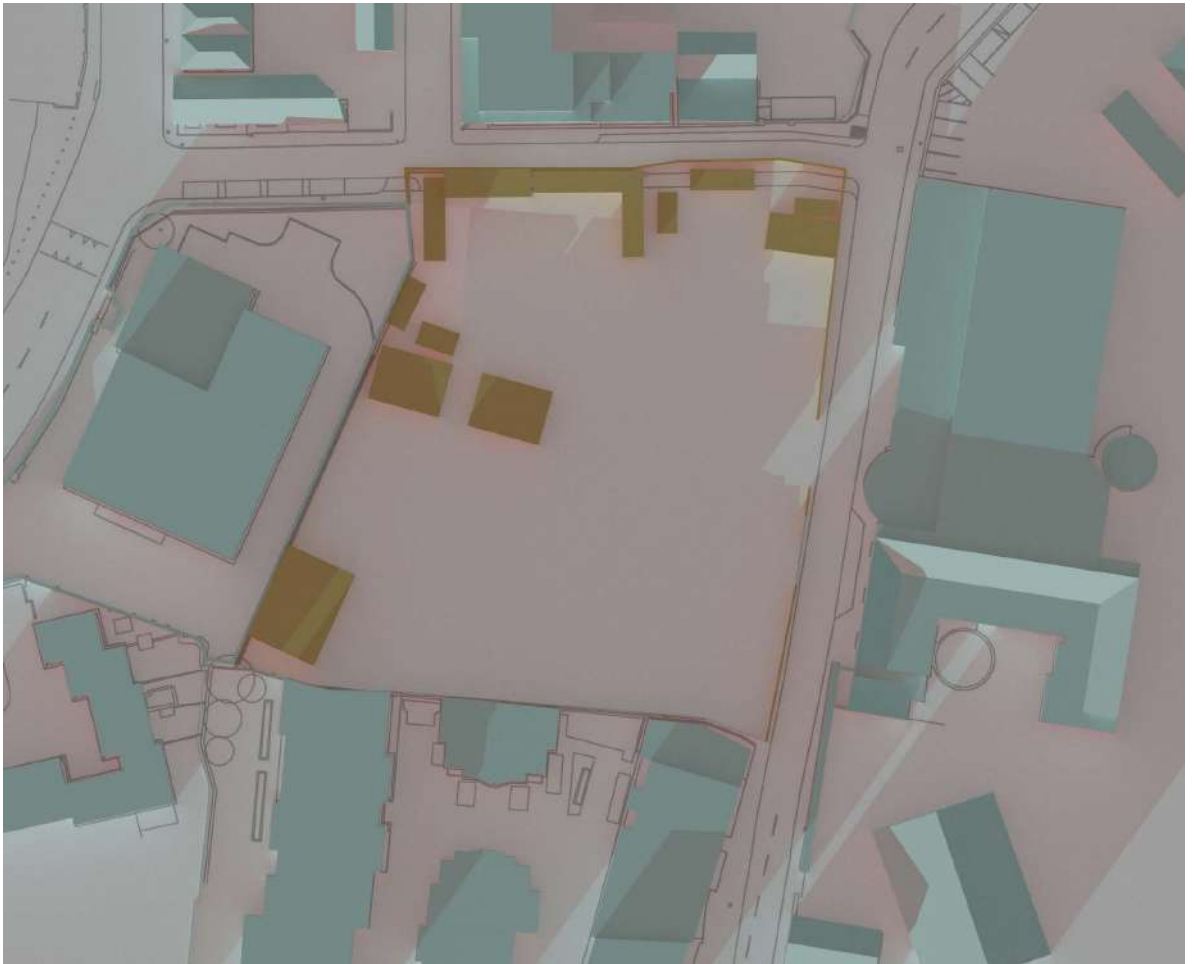
Proposed
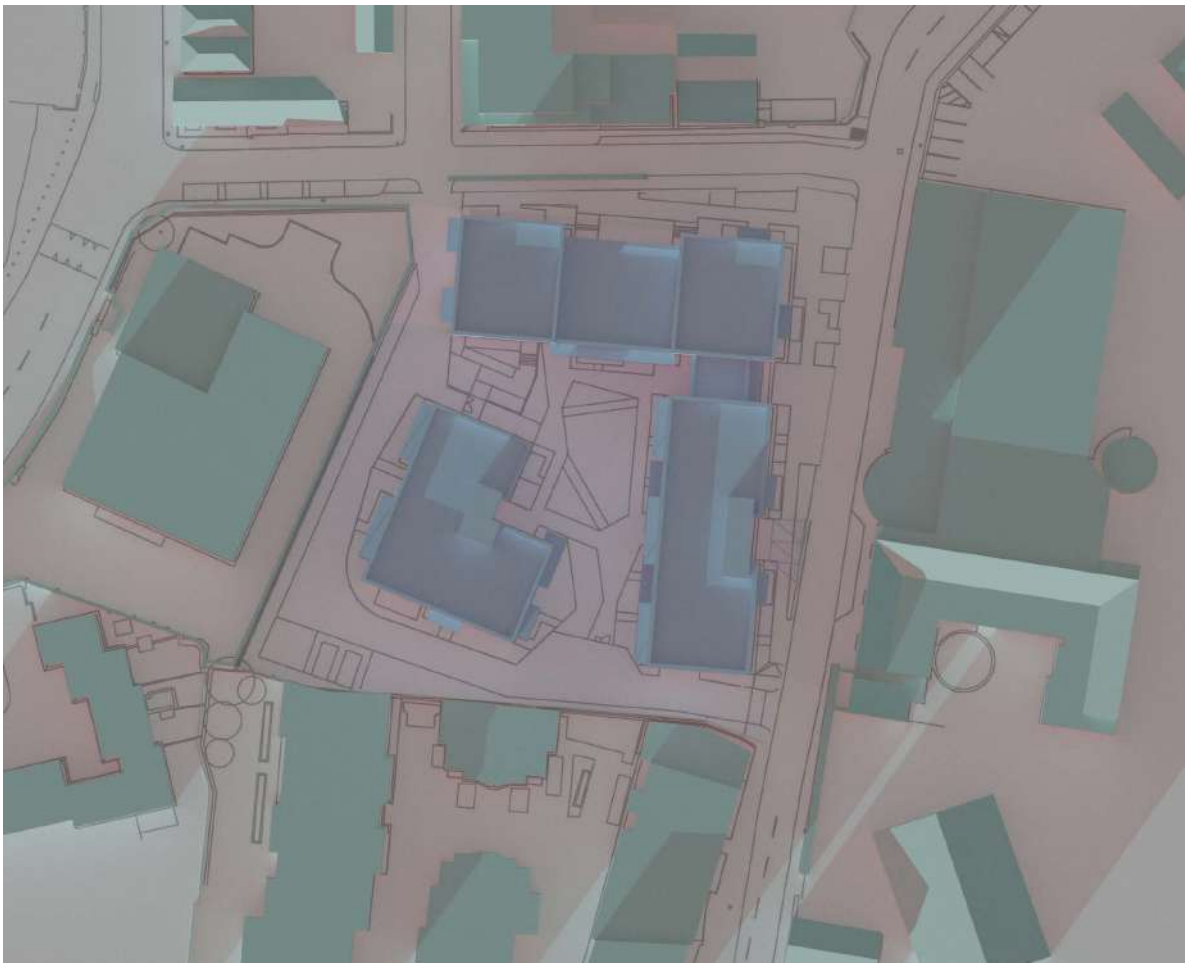
Figure 26: Shadow diagrams 21 December 15:00 UTC

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

Ground Floor

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

First Floor

Second Floor

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

Third Floor

Fourth Floor

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

Fifth Floor

Sixth Floor

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

Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	sDA: % of grid target exceeded Minimum 50% of grid	Meets Criteria
A0-01.1	LKD	33.8	300	200	480	66.0%	Y
A0-01.2	Bed	12.2	110	100	419	100.0%	Y
A0-01.3	Bed	5.5	42	100	519	100.0%	Y
A0-01.4	Bed	10.8	88	100	537	100.0%	Y
A0-02.1	LKD	31.6	272	200	463	80.5%	Y
A0-02.2	Bed	14.1	120	100	262	98.3%	Y
A0-02.3	Bed	11.6	91	100	549	100.0%	Y
A0-03.1	LKD	31.2	266	200	462	75.2%	Y
A0-03.2	Bed	14.1	120	100	303	99.2%	Y
A0-03.3	Bed	11.6	91	100	465	100.0%	Y
A0-04.1	LKD	30.6	278	200	489	68.7%	Y
A0-05.2	Bed	9.8	75	100	667	100.0%	Y
A0-05.3	Bed	11.0	81	100	676	100.0%	Y
A1-01.1	LKD	33.6	316	200	1046	100.0%	Y
A1-01.2	Bed	13.9	117	100	488	100.0%	Y
A1-01.3	Bed	6.1	40	100	1128	100.0%	Y
A1-01.4	Bed	13.4	105	100	500	100.0%	Y
A1-02.1	LKD	22.7	181	200	679	83.4%	Y
A1-02.2	Bed	10.0	81	100	810	100.0%	Y
A1-03.1	LKD	28.3	256	200	622	83.2%	Y
A1-03.2	Bed	10.1	81	100	445	100.0%	Y
A1-03.3	Bed	8.2	65	100	455	100.0%	Y
A1-04.1	LKD	28.3	256	200	624	83.6%	Y
A1-04.2	Bed	10.1	81	100	482	100.0%	Y
A1-04.3	Bed	8.2	65	100	520	100.0%	Y
A1-05.1	LKD	22.7	181	200	567	78.5%	Y
A1-05.2	Bed	10.0	81	100	299	100.0%	Y
A1-06.1	LKD	21.6	180	200	1454	100.0%	Y
A1-06.2	Bed	12.3	99	100	888	100.0%	Y
A1-07.1	LKD	24.2	203	200	878	97.5%	Y
A1-07.2	Bed	10.9	87	100	961	100.0%	Y
A1-08.1	LKD	24.0	204	200	468	100.0%	Y
A1-08.2	Bed	9.0	72	100	766	100.0%	Y
A1-09.1	LKD	32.3	303	200	357	57.4%	Y
A1-09.2	Bed	11.1	86	100	1001	100.0%	Y
A1-09.3	Bed	7.0	49	100	1248	100.0%	Y
A1-09.4	Bed	11.9	98	100	1333	100.0%	Y
A1-10.1	LKD	22.7	181	200	474	79.6%	Y
A1-10.2	Bed	10.0	81	100	628	100.0%	Y
A1-11.1	LKD	22.7	181	200	437	79.6%	Y
A1-11.2	Bed	10.0	81	100	537	100.0%	Y
A1-12.1	LKD	22.7	181	200	471	80.1%	Y
A1-12.2	Bed	10.0	81	100	685	100.0%	Y
A1-13.1	LKD	22.7	181	200	608	82.9%	Y
A1-13.2	Bed	10.0	81	100	645	100.0%	Y
A1-14.1	LKD	32.3	303	200	744	100.0%	Y
A1-14.2	Bed	11.1	86	100	988	100.0%	Y
A1-14.3	Bed	8.6	63	100	1133	100.0%	Y
A1-14.4	Bed	11.9	98	100	1204	100.0%	Y
A2-01.1	LKD	23.0	206	200	1219	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	sDA: % of grid target exceeded Minimum 50% of grid	Meets Criteria
					Block A - Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1		
A2-01.2	Bed	14.6	126	100	772	100.0%	Y
A2-02.1	LKD	28.9	266	200	1270	100.0%	Y
A2-02.2	Bed	9.9	80	100	899	100.0%	Y
A2-02.3	Bed	12.4	100	100	791	100.0%	Y
A2-03.1	LKD	22.7	181	200	823	89.0%	Y
A2-03.2	Bed	10.0	81	100	996	100.0%	Y
A2-04.1	LKD	28.5	256	200	745	98.4%	Y
A2-04.2	Bed	11.2	90	100	490	100.0%	Y
A2-04.3	Bed	10.9	88	100	410	100.0%	Y
A2-05.1	LKD	28.5	256	200	725	99.2%	Y
A2-05.2	Bed	11.2	90	100	520	100.0%	Y
A2-05.3	Bed	10.9	88	100	429	100.0%	Y
A2-06.1	LKD	22.7	181	200	643	80.1%	Y
A2-06.2	Bed	10.0	81	100	372	100.0%	Y
A2-07.1	LKD	23.0	206	200	1470	100.0%	Y
A2-07.2	Bed	14.6	126	100	914	100.0%	Y
A2-08.1	LKD	24.2	203	200	975	100.0%	Y
A2-08.2	Bed	10.9	87	100	1043	100.0%	Y
A2-09.1	LKD	24.0	204	200	517	100.0%	Y
A2-09.2	Bed	9.0	72	100	829	100.0%	Y
A2-10.1	LKD	32.3	303	200	438	65.0%	Y
A2-10.2	Bed	11.1	86	100	1102	100.0%	Y
A2-10.3	Bed	7.0	49	100	1398	100.0%	Y
A2-10.4	Bed	11.9	98	100	1577	100.0%	Y
A2-11.1	LKD	22.7	181	200	579	82.9%	Y
A2-11.2	Bed	10.0	81	100	753	100.0%	Y
A2-12.1	LKD	22.7	181	200	536	81.2%	Y
A2-12.2	Bed	10.0	81	100	633	100.0%	Y
A2-13.1	LKD	22.7	181	200	579	84.0%	Y
A2-13.2	Bed	10.0	81	100	812	100.0%	Y
A2-14.1	LKD	22.7	181	200	696	92.3%	Y
A2-14.2	Bed	10.0	81	100	766	100.0%	Y
A2-15.1	LKD	32.3	303	200	879	100.0%	Y
A2-15.2	Bed	11.1	86	100	1118	100.0%	Y
A2-15.3	Bed	8.6	63	100	1343	100.0%	Y
A2-15.4	Bed	11.9	98	100	1535	100.0%	Y
A3-01.1	LKD	23.0	206	200	1310	100.0%	Y
A3-01.2	Bed	14.6	126	100	815	100.0%	Y
A3-02.1	LKD	28.9	266	200	1490	100.0%	Y
A3-02.2	Bed	9.9	80	100	1197	100.0%	Y
A3-02.3	Bed	12.4	100	100	1024	100.0%	Y
A3-03.1	LKD	22.7	181	200	1023	96.1%	Y
A3-03.2	Bed	10.0	81	100	1247	100.0%	Y
A3-04.1	LKD	28.5	256	200	905	100.0%	Y
A3-04.2	Bed	11.2	90	100	559	100.0%	Y
A3-04.3	Bed	10.9	88	100	468	100.0%	Y
A3-05.1	LKD	28.5	256	200	843	100.0%	Y
A3-05.2	Bed	11.2	90	100	580	100.0%	Y
A3-05.3	Bed	10.9	88	100	479	100.0%	Y
A3-06.1	LKD	22.7	181	200	738	87.3%	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	sDA: % of grid target exceeded Minimum 50% of grid	Meets Criteria
A3-06.2	Bed	10.0	81	100	483	100.0%	Y
A3-07.1	LKD	23.0	206	200	1545	100.0%	Y
A3-07.2	Bed	14.6	126	100	969	100.0%	Y
A3-08.1	LKD	24.2	203	200	1055	100.0%	Y
A3-08.2	Bed	10.9	87	100	1103	100.0%	Y
A3-09.1	LKD	24.0	204	200	574	100.0%	Y
A3-09.2	Bed	9.0	72	100	884	100.0%	Y
A3-10.1	LKD	32.3	303	200	528	74.6%	Y
A3-10.2	Bed	11.1	86	100	1156	100.0%	Y
A3-10.3	Bed	7.0	49	100	1497	100.0%	Y
A3-10.4	Bed	11.9	98	100	1759	100.0%	Y
A3-11.1	LKD	22.7	181	200	693	91.2%	Y
A3-11.2	Bed	10.0	81	100	879	100.0%	Y
A3-12.1	LKD	22.7	181	200	677	87.3%	Y
A3-12.2	Bed	10.0	81	100	723	100.0%	Y
A3-13.1	LKD	22.7	181	200	710	93.4%	Y
A3-13.2	Bed	10.0	81	100	934	100.0%	Y
A3-14.1	LKD	22.7	181	200	776	98.3%	Y
A3-14.2	Bed	10.0	81	100	843	100.0%	Y
A3-15.1	LKD	32.3	303	200	990	100.0%	Y
A3-15.2	Bed	11.1	86	100	1176	100.0%	Y
A3-15.3	Bed	8.6	63	100	1463	100.0%	Y
A3-15.4	Bed	11.9	98	100	1757	100.0%	Y
A4-01.1	LKD	23.0	206	200	1374	100.0%	Y
A4-01.2	Bed	14.6	126	100	831	100.0%	Y
A4-02.1	LKD	28.9	266	200	1737	100.0%	Y
A4-02.3	Bed	9.9	80	100	1546	100.0%	Y
A4-02.3	Bed	12.4	100	100	1286	100.0%	Y
A4-03.1	LKD	22.7	181	200	1236	100.0%	Y
A4-03.2	Bed	10.0	81	100	1492	100.0%	Y
A4-04.1	LKD	28.5	256	200	1063	100.0%	Y
A4-04.2	Bed	11.2	90	100	603	100.0%	Y
A4-04.3	Bed	10.9	88	100	512	100.0%	Y
A4-05.1	LKD	28.5	256	200	982	100.0%	Y
A4-05.2	Bed	11.2	90	100	615	100.0%	Y
A4-05.3	Bed	10.9	88	100	511	100.0%	Y
A4-06.1	LKD	22.7	181	200	912	94.5%	Y
A4-06.2	Bed	10.0	81	100	709	100.0%	Y
A4-07.1	LKD	23.0	206	200	1579	100.0%	Y
A4-07.2	Bed	14.6	126	100	993	100.0%	Y
A4-08.1	LKD	24.2	203	200	1083	100.0%	Y
A4-08.2	Bed	10.9	87	100	1144	100.0%	Y
A4-09.1	LKD	24.0	204	200	746	100.0%	Y
A4-09.2	Bed	9.0	72	100	1308	100.0%	Y
A4-10.1	LKD	32.3	303	200	612	88.8%	Y
A4-10.2	Bed	11.1	86	100	1187	100.0%	Y
A4-10.3	Bed	7.0	49	100	1552	100.0%	Y
A4-10.4	Bed	11.9	98	100	1851	100.0%	Y
A4-11.1	LKD	22.7	181	200	807	98.3%	Y
A4-11.2	Bed	10.0	81	100	974	100.0%	Y

Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	sDA: % of grid target exceeded Minimum 50% of grid	Meets Criteria
A4-12.1	LKD	22.7	181	200	785	97.8%	Y
A4-12.2	Bed	10.0	81	100	825	100.0%	Y
A4-13.1	LKD	22.7	181	200	831	99.4%	Y
A4-13.2	Bed	10.0	81	100	1017	100.0%	Y
A4-14.1	LKD	22.7	181	200	851	100.0%	Y
A4-14.2	Bed	10.0	81	100	944	100.0%	Y
A4-15.1	LKD	32.3	303	200	1054	100.0%	Y
A4-15.2	Bed	11.1	86	100	1218	100.0%	Y
A4-15.3	Bed	8.6	63	100	1518	100.0%	Y
A4-15.4	Bed	11.9	98	100	1838	100.0%	Y
A5-01.1	LKD	23.0	206	200	1427	100.0%	Y
A5-01.2	Bed	14.6	126	100	848	100.0%	Y
A5-02.1	LKD	28.9	266	200	1876	100.0%	Y
A5-02.2	Bed	9.9	80	100	1744	100.0%	Y
A5-02.3	Bed	12.4	100	100	1451	100.0%	Y
A5-03.1	LKD	22.7	181	200	2001	100.0%	Y
A5-03.2	Bed	10.0	81	100	1704	100.0%	Y
A5-04.1	LKD	28.5	256	200	1759	100.0%	Y
A5-04.2	Bed	11.2	90	100	643	100.0%	Y
A5-04.3	Bed	10.9	88	100	552	100.0%	Y
A5-05.1	LKD	28.5	256	200	1703	100.0%	Y
A5-05.2	Bed	11.2	90	100	643	100.0%	Y
A5-05.3	Bed	10.9	88	100	541	100.0%	Y
A5-06.1	LKD	22.7	181	200	1757	100.0%	Y
A5-06.2	Bed	10.0	81	100	1344	100.0%	Y
A5-07.1	LKD	23.0	206	200	1610	100.0%	Y
A5-07.2	Bed	14.6	126	100	1020	100.0%	Y
A5-08.1	LKD	24.2	203	200	1098	100.0%	Y
A5-08.2	Bed	10.9	87	100	1172	100.0%	Y
A5-09.1	LKD	32.3	303	200	964	100.0%	Y
A5-09.2	Bed	11.1	86	100	1224	100.0%	Y
A5-09.3	Bed	7.0	49	100	1664	100.0%	Y
A5-09.4	Bed	11.9	98	100	2521	100.0%	Y
A5-10.1	LKD	22.7	181	200	1243	100.0%	Y
A5-10.2	Bed	10.0	81	100	1071	100.0%	Y
A5-11.1	LKD	22.7	181	200	1233	100.0%	Y
A5-11.2	Bed	10.0	81	100	1012	100.0%	Y
A5-12.1	LKD	22.7	181	200	1282	100.0%	Y
A5-12.2	Bed	10.0	81	100	1121	100.0%	Y
A5-13.1	LKD	22.7	181	200	1275	100.0%	Y
A5-13.2	Bed	10.0	81	100	1068	100.0%	Y
A5-14.1	LKD	32.3	303	200	1356	100.0%	Y
A5-14.2	Bed	11.1	86	100	1241	100.0%	Y
A5-14.3	Bed	8.6	63	100	1562	100.0%	Y
A5-14.4	Bed	11.9	98	100	2493	100.0%	Y
A6-01.1	LKD	23.0	206	200	1761	100.0%	Y
A6-01.2	Bed	14.6	126	100	827	100.0%	Y
A6-02.1	LKD	28.9	266	200	2215	100.0%	Y
A6-02.2	Bed	9.9	80	100	1809	100.0%	Y
A6-02.3	Bed	12.4	100	100	1526	100.0%	Y

Block A - Minimum illuminance levels from BS EN17037:2018+A1:2021 - 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	sDA: % of grid target exceeded Minimum 50% of grid	Meets Criteria
A6-03.1	LKD	23.0	206	200	1796	100.0%	Y
A6-03.2	Bed	14.6	126	100	1054	100.0%	Y
A6-04.1	LKD	29.3	274	200	1787	100.0%	Y
A6-04.2	Bed	9.9	80	100	1666	100.0%	Y
A6-04.3	Bed	12.4	100	100	1523	100.0%	Y

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

Block B - Minimum illuminance levels from BS EN17037:2018+A1:2021 - Table NA.1								
Space ID	Use	Area m2	Sensor Count	Target Lux	Mean Lux	% of grid target exceeded: Minimum 50% of grid	Meets Criteria
B0-01.1	LKD	23.1	208	200	424	61.1%	Y
B0-01.2	Bed	11.0	89	100	347	100.0%	Y
B0-02.1	LKD	34.0	323	200	1102	100.0%	Y
B0-02.2	Bed	12.1	94	100	383	100.0%	Y
B0-02.3	Bed	5.2	35	100	1758	100.0%	Y
B0-02.4	Bed	9.5	80	100	848	100.0%	Y
B0-03.1	LKD	30.2	276	200	1026	100.0%	Y
B0-03.2	Bed	11.8	96	100	796	100.0%	Y
B1-01.1	LKD	30.2	272	200	715	100.0%	Y
B1-01.2	Bed	13.2	112	100	483	100.0%	Y
B1-01.3	Bed	12.3	102	100	417	100.0%	Y
B1-02.1	LKD	22.7	181	200	539	81.8%	Y
B1-02.2	Bed	10.0	81	100	660	100.0%	Y
B1-03.1	LKD	22.7	181	200	530	80.7%	Y
B1-03.2	Bed	10.0	81	100	554	100.0%	Y
B1-04.1	LKD	30.0	276	200	1327	100.0%	Y
B1-04.2	Bed	10.9	88	100	1334	100.0%	Y
B1-04.3	Bed	13.1	108	100	1036	100.0%	Y
B1-05.1	LKD	22.7	181	200	1150	100.0%	Y
B1-05.2	Bed	10.0	81	100	1316	100.0%	Y
B1-06.1	LKD	30.0	276	200	1474	100.0%	Y
B1-06.2	Bed	13.2	112	100	313	100.0%	Y
B1-06.3	Bed	13.5	113	100	262	100.0%	Y
B2-01.1	LKD	30.2	272	200	840	100.0%	Y
B2-01.2	Bed	13.2	112	100	626	100.0%	Y
B2-01.3	Bed	12.3	102	100	551	100.0%	Y
B2-02.1	LKD	22.7	181	200	664	90.1%	Y
B2-02.2	Bed	10.0	81	100	765	100.0%	Y
B2-03.1	LKD	22.7	181	200	643	91.2%	Y
B2-03.2	Bed	10.0	81	100	655	100.0%	Y
B2-04.1	LKD	30.0	276	200	1546	100.0%	Y
B2-04.2	Bed	10.9	88	100	1540	100.0%	Y
B2-04.3	Bed	13.1	108	100	1202	100.0%	Y
B2-05.1	LKD	22.7	181	200	1367	100.0%	Y
B2-05.2	Bed	10.0	81	100	1496	100.0%	Y
B2-06.1	LKD	30.0	276	200	1686	100.0%	Y
B2-06.2	Bed	13.2	112	100	370	100.0%	Y
B2-06.3	Bed	13.5	113	100	312	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
B3-01.1	LKD	30.2	272	200	953	100.0%	Y
B3-01.2	Bed	13.2	112	100	785	100.0%	Y
B3-01.3	Bed	12.3	102	100	732	100.0%	Y
B3-02.1	LKD	22.7	181	200	757	100.0%	Y
B3-02.2	Bed	10.0	81	100	852	100.0%	Y
B3-03.1	LKD	22.7	181	200	729	98.9%	Y
B3-03.2	Bed	10.0	81	100	740	100.0%	Y
B3-04.1	LKD	30.0	276	200	1681	100.0%	Y
B3-04.2	Bed	10.9	88	100	1622	100.0%	Y
B3-04.3	Bed	13.1	108	100	1289	100.0%	Y
B3-05.1	LKD	22.7	181	200	1475	100.0%	Y
B3-05.2	Bed	10.0	81	100	1577	100.0%	Y
B3-06.1	LKD	30.0	276	200	1834	100.0%	Y
B3-06.2	Bed	13.2	112	100	429	100.0%	Y
B3-06.3	Bed	13.5	113	100	384	100.0%	Y
B4-01.1	LKD	30.2	272	200	1258	100.0%	Y
B4-01.2	Bed	13.2	112	100	973	100.0%	Y
B4-01.3	Bed	12.3	102	100	919	100.0%	Y
B4-02.1	LKD	22.7	181	200	1089	100.0%	Y
B4-02.2	Bed	10.0	81	100	911	100.0%	Y
B4-03.1	LKD	22.7	181	200	1071	100.0%	Y
B4-03.2	Bed	10.0	81	100	885	100.0%	Y
B4-04.1	LKD	30.0	276	200	1958	100.0%	Y
B4-04.2	Bed	10.9	88	100	1660	100.0%	Y
B4-04.3	Bed	13.1	108	100	1339	100.0%	Y
B4-05.1	LKD	22.7	181	200	2051	100.0%	Y
B4-05.2	Bed	10.0	81	100	1628	100.0%	Y
B4-06.1	LKD	30.0	276	200	2328	100.0%	Y
B4-06.2	Bed	13.2	112	100	500	100.0%	Y
B4-06.3	Bed	13.5	113	100	458	100.0%	Y

Table 16: Block B - 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

Ground Floor

1000

Lux
0
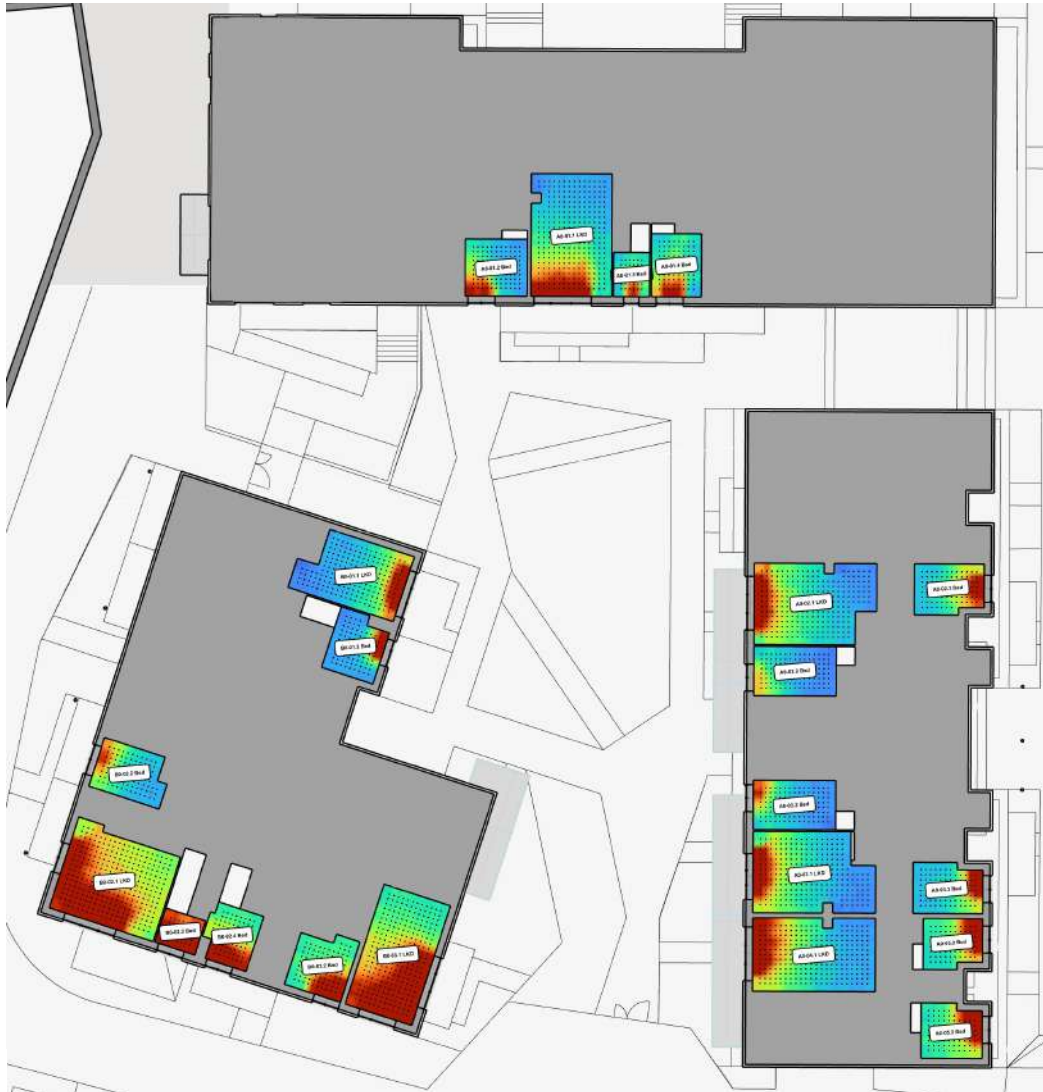
Figure 31: Daylight Provision and Annual Average Illuminance to all habitable rooms

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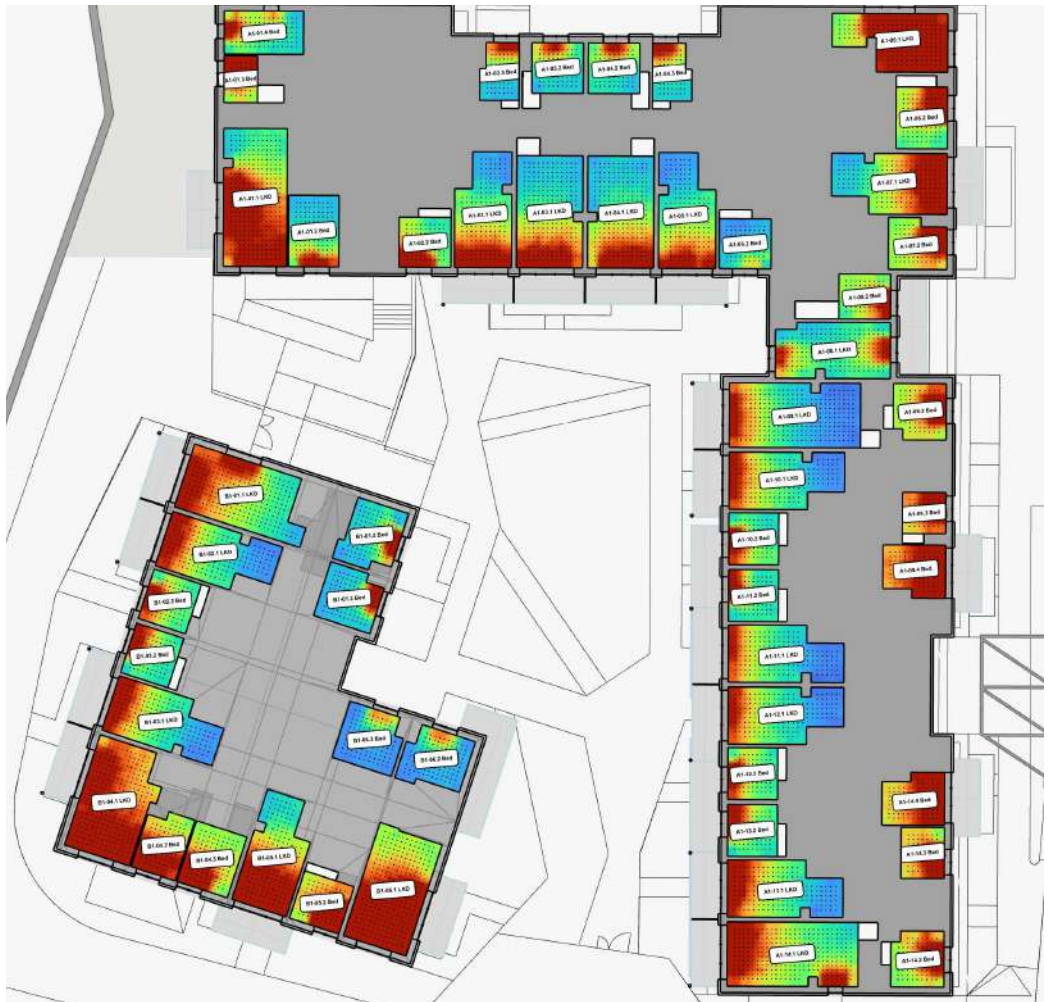
Second Floor
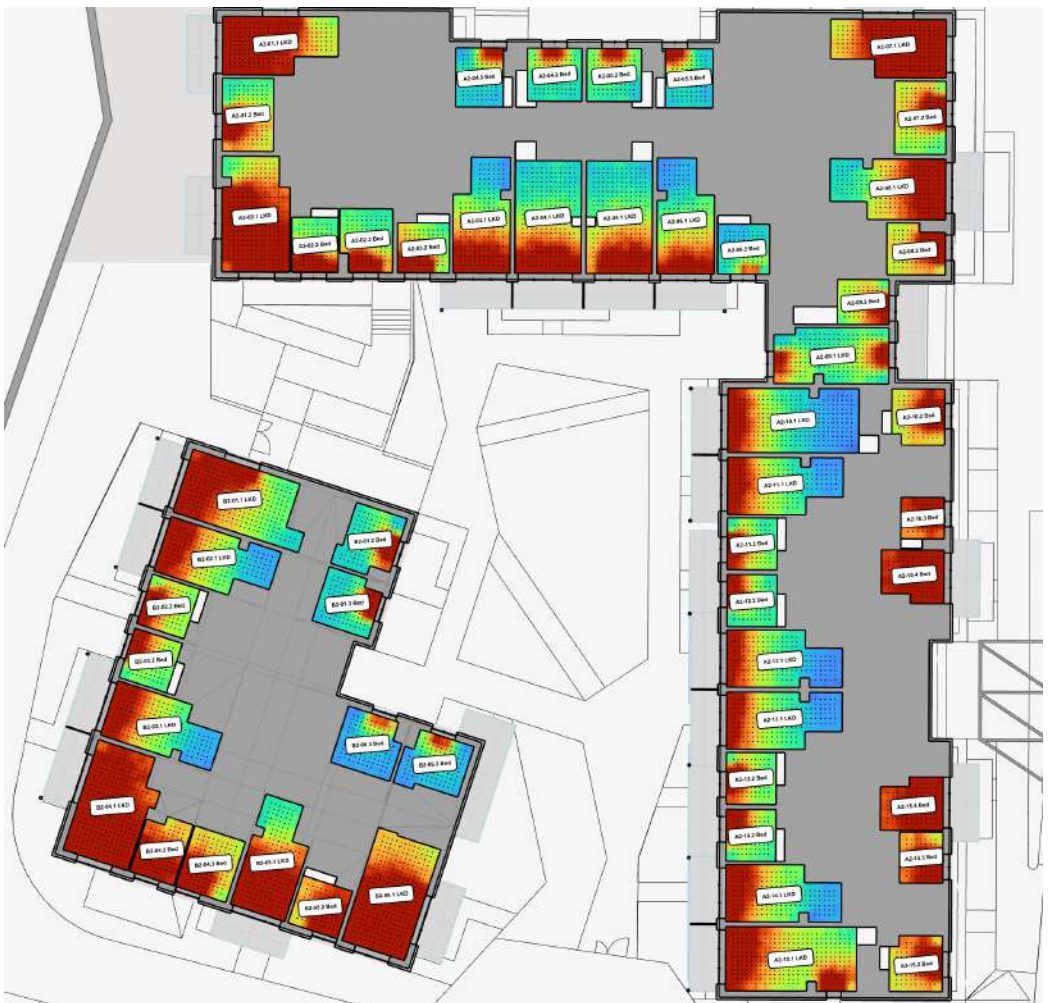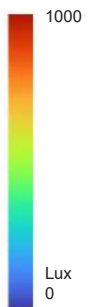
Figure 32: Daylight Provision and Annual Average Illuminance to all habitable rooms

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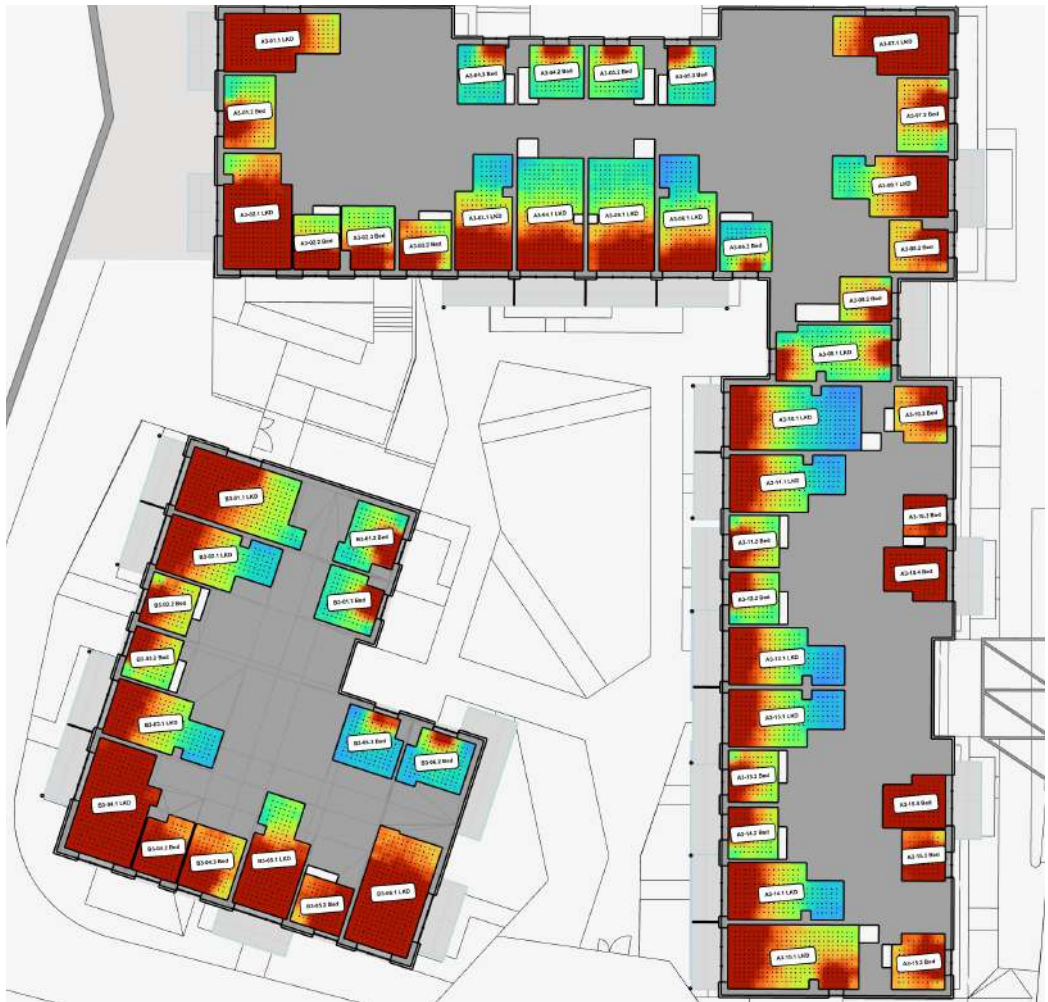
Fourth Floor
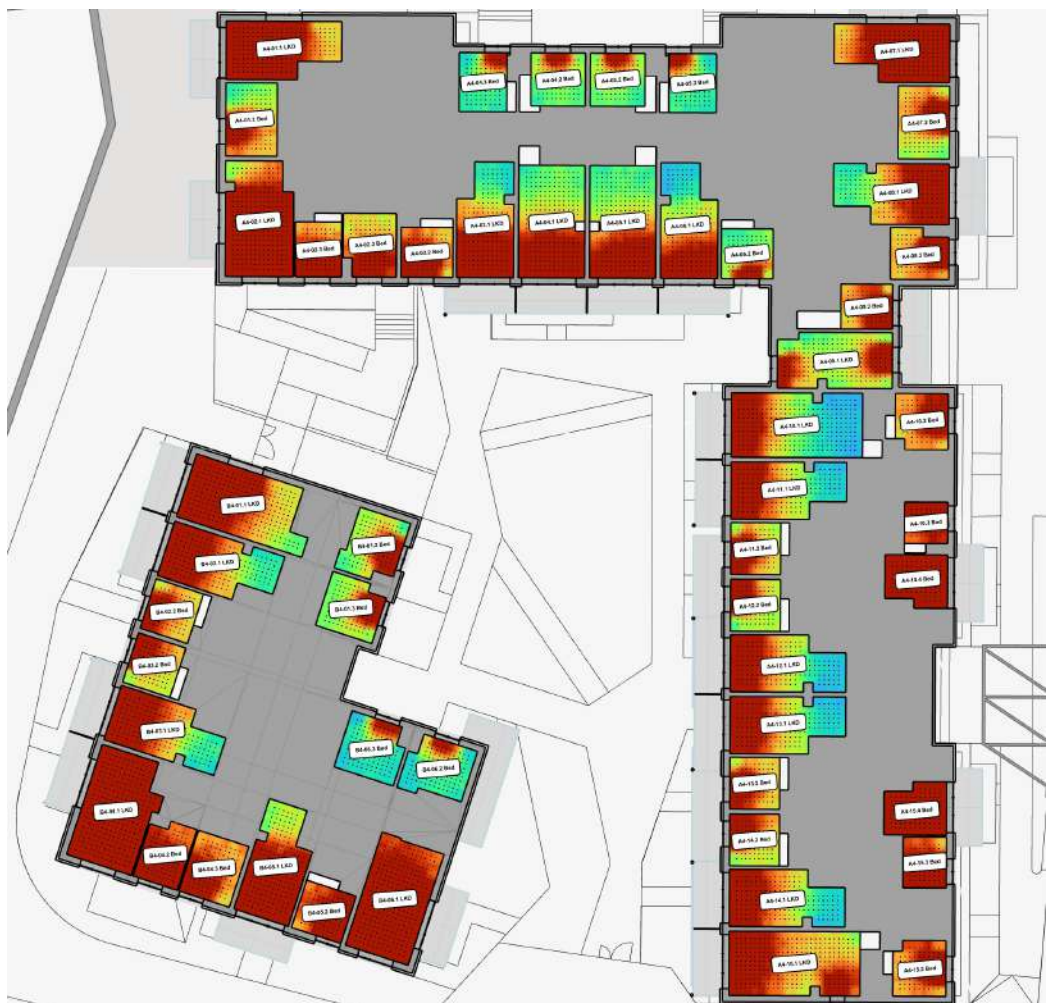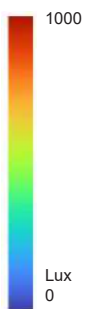
Figure 33: Daylight Provision and Annual Average Illuminance to all habitable rooms

Fifth Floor

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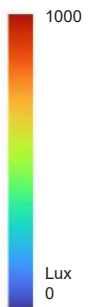
Figure 34: Daylight Provision and Annual Average Illuminance to all habitable rooms

Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
								Block A - EN 17037:2018 Table A.1 Daylight Provision Room Schedule			
A0-01.1	LKD	33.8	300	Fail	35.8%	16.6%	6.7%	Minimum	54.8%	15.1%	4.7%
A0-01.2	Bed	12.2	110	Fail	31.4%	10.9%	5.4%	Minimum	53.2%	12.2%	3.6%
A0-01.3	Bed	5.5	42	Fail	40.5%	22.7%	10.7%	Minimum	60.5%	24.0%	7.8%
A0-01.4	Bed	10.8	88	Fail	43.8%	24.7%	10.9%	Minimum	62.5%	24.7%	8.6%
A0-02.1	LKD	31.6	272	Fail	44.7%	22.2%	5.5%	Minimum	53.2%	8.2%	2.3%
A0-02.2	Bed	14.1	120	Fail	24.6%	4.6%	0.9%	Fail	47.8%	2.4%	0.0%
A0-02.3	Bed	11.6	91	Fail	44.9%	22.5%	7.4%	Minimum	65.3%	23.3%	5.6%
A0-03.1	LKD	31.2	266	Fail	41.8%	20.9%	5.0%	Fail	49.6%	5.8%	2.1%
A0-03.2	Bed	14.1	120	Fail	27.6%	6.7%	3.6%	Fail	48.8%	4.9%	1.1%
A0-03.3	Bed	11.6	91	Fail	38.5%	16.7%	5.3%	Minimum	61.9%	21.8%	4.9%
A0-04.1	LKD	30.6	278	Fail	43.6%	22.7%	6.2%	Minimum	55.0%	9.9%	4.2%
A0-05.2	Bed	9.8	75	Minimum	51.2%	32.2%	14.0%	Minimum	70.5%	34.9%	12.5%
A0-05.3	Bed	11.0	81	Minimum	52.6%	34.3%	15.8%	Minimum	73.5%	38.4%	17.2%
A1-01.1	LKD	33.6	316	Medium	73.2%	58.5%	45.1%	Minimum	75.1%	41.6%	19.9%
A1-01.2	Bed	13.9	117	Fail	40.8%	21.5%	8.0%	Minimum	60.5%	22.8%	6.6%
A1-01.3	Bed	6.1	40	Medium	74.9%	60.9%	43.4%	Medium	83.2%	58.1%	37.9%
A1-01.4	Bed	13.4	105	Minimum	54.3%	31.9%	13.0%	Minimum	73.9%	33.9%	8.3%
A1-02.1	LKD	22.7	181	Minimum	52.9%	37.2%	21.7%	Minimum	53.0%	11.7%	3.9%
A1-02.2	Bed	10.0	81	Minimum	53.9%	38.2%	23.3%	Minimum	72.4%	40.4%	21.9%
A1-03.1	LKD	28.3	256	Fail	47.6%	30.9%	15.8%	Minimum	61.0%	23.7%	7.5%
A1-03.2	Bed	10.1	81	Minimum	52.3%	28.6%	5.2%	Minimum	75.2%	34.0%	4.4%
A1-03.3	Bed	8.2	65	Fail	48.6%	26.2%	4.0%	Minimum	69.9%	25.3%	0.4%
A1-04.1	LKD	28.3	256	Fail	46.5%	28.0%	15.1%	Minimum	60.3%	22.6%	6.7%
A1-04.2	Bed	10.1	81	Minimum	57.6%	34.7%	8.2%	Minimum	75.7%	35.1%	5.3%
A1-04.3	Bed	8.2	65	Minimum	55.8%	33.2%	8.8%	Minimum	76.2%	36.1%	6.1%
A1-05.1	LKD	22.7	181	Fail	47.1%	29.1%	15.1%	Minimum	50.1%	10.6%	3.8%
A1-05.2	Bed	10.0	81	Fail	25.3%	8.5%	5.4%	Fail	48.0%	10.1%	4.2%
A1-06.1	LKD	21.6	180	High	82.2%	73.6%	62.3%	Medium	85.2%	63.9%	46.3%
A1-06.2	Bed	12.3	99	Minimum	63.5%	45.2%	25.9%	Minimum	78.7%	47.4%	24.1%
A1-07.1	LKD	24.2	203	Minimum	65.8%	49.8%	31.4%	Minimum	66.2%	25.7%	6.5%
A1-07.2	Bed	10.9	87	Minimum	64.2%	47.4%	29.1%	Medium	80.1%	51.2%	30.7%
A1-08.1	LKD	24.0	204	Minimum	51.3%	26.8%	6.2%	Minimum	70.8%	32.7%	4.4%
A1-08.2	Bed	9.0	72	Minimum	57.0%	38.0%	19.9%	Minimum	77.2%	43.2%	22.7%
A1-09.1	LKD	32.3	303	Fail	35.2%	12.6%	5.3%	Fail	42.5%	3.9%	0.5%
A1-09.2	Bed	11.1	86	Minimum	65.7%	49.0%	31.8%	Medium	81.9%	54.7%	34.6%
A1-09.3	Bed	7.0	49	Medium	74.9%	60.7%	45.6%	Medium	85.4%	65.6%	47.9%
A1-09.4	Bed	11.9	98	High	77.7%	65.6%	52.5%	High	85.6%	66.7%	50.9%
A1-10.1	LKD	22.7	181	Minimum	51.4%	31.0%	11.8%	Minimum	50.4%	5.8%	0.8%
A1-10.2	Bed	10.0	81	Minimum	56.1%	36.5%	16.7%	Minimum	73.9%	38.6%	14.0%
A1-11.1	LKD	22.7	181	Fail	48.7%	26.5%	8.1%	Fail	45.5%	2.3%	0.0%
A1-11.2	Bed	10.0	81	Minimum	52.5%	31.2%	9.7%	Minimum	74.5%	38.4%	13.2%
A1-12.1	LKD	22.7	181	Fail	49.5%	29.6%	10.5%	Fail	49.5%	4.1%	0.0%
A1-12.2	Bed	10.0	81	Minimum	56.6%	39.6%	21.1%	Minimum	75.3%	43.5%	23.1%
A1-13.1	LKD	22.7	181	Minimum	56.7%	39.4%	19.1%	Minimum	56.6%	9.2%	2.8%
A1-13.2	Bed	10.0	81	Minimum	55.6%	37.4%	16.8%	Minimum	75.1%	42.8%	21.7%
A1-14.1	LKD	32.3	303	Minimum	60.3%	44.4%	27.8%	Minimum	74.7%	44.2%	23.9%
A1-14.2	Bed	11.1	86	Medium	66.7%	51.9%	36.6%	Medium	80.3%	53.5%	34.9%
A1-14.3	Bed	8.6	63	Medium	67.5%	53.4%	41.1%	Medium	83.3%	60.1%	43.8%
A1-14.4	Bed	11.9	98	High	75.5%	62.3%	50.4%	Medium	84.8%	64.2%	49.0%
A2-01.1	LKD	23.0	206	High	80.3%	70.7%	59.2%	Medium	86.1%	66.4%	49.5%

Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A2-01.2	Bed	14.6	126	Minimum	65.5%	47.5%	28.3%	Minimum	77.1%	43.7%	20.1%
A2-02.1	LKD	28.9	266	High	77.6%	66.1%	54.1%	Medium	83.1%	61.5%	45.6%
A2-02.2	Bed	9.9	80	Minimum	57.8%	42.1%	26.4%	Minimum	75.4%	45.2%	26.1%
A2-02.3	Bed	12.4	100	Minimum	53.0%	36.8%	20.5%	Minimum	73.2%	40.6%	22.4%
A2-03.1	LKD	22.7	181	Minimum	59.9%	44.5%	31.4%	Minimum	61.3%	24.3%	5.9%
A2-03.2	Bed	10.0	81	Minimum	60.2%	44.6%	31.0%	Minimum	75.7%	46.2%	29.6%
A2-04.1	LKD	28.5	256	Minimum	52.3%	35.9%	21.8%	Minimum	66.7%	33.0%	12.3%
A2-04.2	Bed	11.2	90	Minimum	56.1%	34.9%	9.1%	Minimum	78.0%	42.6%	13.1%
A2-04.3	Bed	10.9	88	Fail	48.2%	20.8%	1.3%	Minimum	71.6%	29.8%	0.7%
A2-05.1	LKD	28.5	256	Minimum	51.8%	34.2%	20.3%	Minimum	66.3%	30.7%	12.2%
A2-05.2	Bed	11.2	90	Minimum	59.8%	39.1%	11.2%	Minimum	78.2%	43.2%	12.5%
A2-05.3	Bed	10.9	88	Fail	49.1%	20.9%	1.4%	Minimum	74.5%	31.8%	2.6%
A2-06.1	LKD	22.7	181	Minimum	51.8%	33.7%	19.5%	Minimum	54.9%	15.4%	4.3%
A2-06.2	Bed	10.0	81	Fail	33.4%	15.0%	6.5%	Minimum	59.4%	20.6%	6.2%
A2-07.1	LKD	23.0	206	High	82.6%	74.7%	63.6%	High	87.5%	71.7%	56.5%
A2-07.2	Bed	14.6	126	Minimum	66.0%	49.5%	30.0%	Medium	81.6%	54.9%	32.2%
A2-08.1	LKD	24.2	203	Medium	69.5%	55.1%	38.9%	Minimum	74.1%	38.9%	11.5%
A2-08.2	Bed	10.9	87	Medium	67.1%	51.8%	35.5%	Medium	83.3%	60.4%	41.1%
A2-09.1	LKD	24.0	204	Minimum	56.3%	35.2%	8.7%	Minimum	76.0%	42.1%	8.5%
A2-09.2	Bed	9.0	72	Minimum	63.0%	44.9%	26.3%	Medium	80.2%	51.7%	28.4%
A2-10.1	LKD	32.3	303	Fail	42.2%	18.2%	6.6%	Minimum	51.6%	6.2%	2.4%
A2-10.2	Bed	11.1	86	Medium	69.7%	54.5%	38.7%	Medium	84.1%	61.6%	42.3%
A2-10.3	Bed	7.0	49	Medium	77.0%	63.5%	49.8%	High	86.7%	70.0%	54.7%
A2-10.4	Bed	11.9	98	High	80.6%	71.2%	60.2%	High	88.1%	75.0%	61.0%
A2-11.1	LKD	22.7	181	Minimum	57.4%	38.2%	19.3%	Minimum	57.3%	9.2%	3.3%
A2-11.2	Bed	10.0	81	Minimum	60.1%	43.5%	23.9%	Minimum	76.2%	44.4%	20.5%
A2-12.1	LKD	22.7	181	Minimum	55.2%	35.4%	13.6%	Minimum	53.2%	5.0%	0.9%
A2-12.2	Bed	10.0	81	Minimum	59.5%	40.8%	19.7%	Minimum	76.8%	45.3%	20.4%
A2-13.1	LKD	22.7	181	Minimum	56.2%	38.4%	17.3%	Minimum	57.3%	8.5%	1.1%
A2-13.2	Bed	10.0	81	Minimum	61.9%	46.2%	29.4%	Minimum	77.7%	49.7%	29.2%
A2-14.1	LKD	22.7	181	Minimum	60.4%	44.7%	26.1%	Minimum	60.8%	14.3%	3.2%
A2-14.2	Bed	10.0	81	Minimum	61.6%	45.3%	26.5%	Minimum	78.1%	49.7%	28.3%
A2-15.1	LKD	32.3	303	Medium	65.1%	52.7%	36.3%	Medium	79.4%	54.5%	37.3%
A2-15.2	Bed	11.1	86	Medium	70.4%	56.2%	42.3%	Medium	83.6%	62.1%	45.2%
A2-15.3	Bed	8.6	63	Medium	74.6%	61.0%	48.5%	Medium	84.8%	65.5%	49.8%
A2-15.4	Bed	11.9	98	High	79.4%	69.1%	58.5%	High	87.3%	72.9%	58.9%
A3-01.1	LKD	23.0	206	High	81.5%	73.2%	62.1%	High	86.8%	69.6%	53.7%
A3-01.2	Bed	14.6	126	Medium	67.4%	50.6%	31.4%	Minimum	78.7%	48.2%	24.7%
A3-02.1	LKD	28.9	266	High	79.6%	70.0%	59.1%	High	85.1%	66.0%	51.3%
A3-02.2	Bed	9.9	80	Medium	65.4%	51.5%	39.6%	Medium	78.3%	51.3%	36.1%
A3-02.3	Bed	12.4	100	Minimum	60.1%	45.4%	31.8%	Minimum	77.1%	48.9%	32.6%
A3-03.1	LKD	22.7	181	Medium	64.7%	50.1%	37.7%	Minimum	64.4%	30.9%	8.2%
A3-03.2	Bed	10.0	81	Medium	66.0%	52.0%	39.0%	Medium	79.2%	53.5%	37.1%
A3-04.1	LKD	28.5	256	Minimum	59.6%	43.5%	31.0%	Minimum	72.5%	40.0%	20.6%
A3-04.2	Bed	11.2	90	Minimum	62.1%	41.7%	16.1%	Medium	80.4%	51.2%	24.7%
A3-04.3	Bed	10.9	88	Minimum	54.6%	30.5%	5.2%	Minimum	77.4%	40.1%	7.2%
A3-05.1	LKD	28.5	256	Minimum	56.4%	39.1%	26.7%	Minimum	71.6%	37.1%	17.9%
A3-05.2	Bed	11.2	90	Minimum	65.0%	45.9%	21.2%	Medium	81.7%	52.5%	25.7%
A3-05.3	Bed	10.9	88	Minimum	54.9%	31.7%	5.8%	Minimum	77.9%	41.5%	8.7%
A3-06.1	LKD	22.7	181	Minimum	57.2%	39.5%	26.7%	Minimum	58.9%	19.9%	6.2%

Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A3-06.2	Bed	10.0	81	Fail	41.4%	24.2%	10.5%	Minimum	64.5%	26.7%	9.3%
A3-07.1	LKD	23.0	206	High	83.3%	76.4%	65.3%	High	88.0%	73.7%	59.2%
A3-07.2	Bed	14.6	126	Medium	68.4%	53.0%	35.7%	Medium	82.5%	57.8%	36.9%
A3-08.1	LKD	24.2	203	Medium	73.0%	59.2%	44.9%	Minimum	77.6%	46.0%	18.9%
A3-08.2	Bed	10.9	87	Medium	70.2%	55.7%	41.4%	Medium	84.5%	64.3%	46.8%
A3-09.1	LKD	24.0	204	Minimum	59.5%	40.8%	13.7%	Minimum	78.2%	48.7%	20.0%
A3-09.2	Bed	9.0	72	Minimum	65.7%	49.3%	29.7%	Medium	82.2%	57.0%	35.2%
A3-10.1	LKD	32.3	303	Minimum	50.5%	27.8%	9.7%	Minimum	57.9%	9.2%	3.6%
A3-10.2	Bed	11.1	86	Medium	73.8%	59.1%	44.2%	Medium	84.9%	65.3%	47.9%
A3-10.3	Bed	7.0	49	High	78.6%	66.8%	53.6%	High	87.8%	73.8%	59.5%
A3-10.4	Bed	11.9	98	High	82.1%	74.1%	63.4%	High	89.4%	78.4%	66.9%
A3-11.1	LKD	22.7	181	Minimum	62.1%	46.3%	27.8%	Minimum	63.4%	19.7%	5.9%
A3-11.2	Bed	10.0	81	Medium	65.6%	50.1%	33.5%	Medium	79.2%	51.7%	31.2%
A3-12.1	LKD	22.7	181	Minimum	61.8%	46.1%	26.3%	Minimum	60.8%	11.6%	2.9%
A3-12.2	Bed	10.0	81	Minimum	64.6%	48.2%	29.2%	Medium	80.2%	53.3%	31.3%
A3-13.1	LKD	22.7	181	Minimum	62.5%	47.7%	29.2%	Minimum	63.1%	18.9%	3.4%
A3-13.2	Bed	10.0	81	Medium	67.2%	52.7%	36.6%	Medium	81.3%	57.0%	38.8%
A3-14.1	LKD	22.7	181	Medium	66.2%	52.5%	35.6%	Minimum	65.4%	27.2%	5.4%
A3-14.2	Bed	10.0	81	Medium	67.0%	52.3%	36.8%	Medium	81.5%	57.0%	38.1%
A3-15.1	LKD	32.3	303	Medium	68.9%	56.3%	44.9%	Medium	81.9%	60.0%	45.5%
A3-15.2	Bed	11.1	86	Medium	73.4%	59.9%	45.8%	High	85.2%	67.0%	50.9%
A3-15.3	Bed	8.6	63	High	77.4%	65.5%	53.1%	High	86.1%	69.8%	55.6%
A3-15.4	Bed	11.9	98	High	82.0%	73.9%	63.1%	High	89.1%	77.9%	65.9%
A4-01.1	LKD	23.0	206	High	82.5%	75.2%	64.5%	High	87.1%	70.8%	55.8%
A4-01.2	Bed	14.6	126	Medium	67.9%	51.7%	32.9%	Medium	79.1%	50.2%	26.5%
A4-02.1	LKD	28.9	266	High	81.3%	73.2%	63.2%	High	85.9%	68.5%	55.3%
A4-02.3	Bed	9.9	80	Medium	73.2%	60.9%	49.5%	Medium	82.9%	62.4%	47.7%
A4-02.3	Bed	12.4	100	Medium	66.4%	53.5%	41.1%	Medium	81.3%	57.9%	41.9%
A4-03.1	LKD	22.7	181	Medium	68.8%	55.9%	44.1%	Minimum	71.6%	40.5%	18.6%
A4-03.2	Bed	10.0	81	Medium	72.2%	59.1%	46.9%	Medium	82.8%	61.8%	46.6%
A4-04.1	LKD	28.5	256	Minimum	64.2%	49.1%	36.9%	Minimum	75.5%	46.7%	28.9%
A4-04.2	Bed	11.2	90	Minimum	65.9%	46.9%	24.5%	Medium	82.4%	55.2%	32.3%
A4-04.3	Bed	10.9	88	Minimum	57.4%	35.5%	10.0%	Minimum	79.1%	47.1%	17.6%
A4-05.1	LKD	28.5	256	Minimum	63.0%	47.1%	35.2%	Minimum	74.6%	44.0%	27.0%
A4-05.2	Bed	11.2	90	Minimum	68.0%	49.8%	27.2%	Medium	82.4%	55.1%	31.8%
A4-05.3	Bed	10.9	88	Minimum	57.6%	36.6%	9.4%	Minimum	79.7%	48.4%	17.3%
A4-06.1	LKD	22.7	181	Minimum	62.8%	47.8%	34.3%	Minimum	65.3%	29.7%	8.9%
A4-06.2	Bed	10.0	81	Minimum	54.2%	36.2%	22.6%	Minimum	74.6%	40.9%	24.1%
A4-07.1	LKD	23.0	206	High	83.7%	76.9%	66.0%	High	88.1%	74.6%	60.0%
A4-07.2	Bed	14.6	126	Medium	69.4%	54.3%	38.4%	Medium	82.8%	59.1%	39.5%
A4-08.1	LKD	24.2	203	Medium	74.2%	60.6%	47.3%	Minimum	77.8%	47.5%	19.6%
A4-08.2	Bed	10.9	87	Medium	71.6%	57.6%	43.6%	Medium	84.8%	65.5%	49.0%
A4-09.1	LKD	24.0	204	Medium	66.0%	50.1%	31.9%	Medium	81.2%	56.2%	36.2%
A4-09.2	Bed	9.0	72	Medium	72.9%	57.7%	43.0%	Medium	84.2%	63.2%	45.7%
A4-10.1	LKD	32.3	303	Minimum	56.1%	36.0%	14.1%	Minimum	64.9%	17.7%	5.6%
A4-10.2	Bed	11.1	86	Medium	74.1%	60.1%	46.3%	High	85.4%	66.8%	50.3%
A4-10.3	Bed	7.0	49	High	79.6%	68.9%	57.2%	High	88.3%	75.3%	61.5%
A4-10.4	Bed	11.9	98	High	82.5%	75.1%	64.6%	High	89.8%	79.2%	68.4%
A4-11.1	LKD	22.7	181	Medium	67.0%	53.0%	35.5%	Minimum	69.6%	32.1%	7.8%
A4-11.2	Bed	10.0	81	Medium	69.8%	55.5%	39.9%	Medium	82.7%	59.8%	40.7%

Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A4-12.1	LKD	22.7	181	Medium	67.8%	53.8%	36.7%	Minimum	68.4%	27.7%	5.4%
A4-12.2	Bed	10.0	81	Medium	67.4%	52.0%	35.2%	Medium	82.7%	59.3%	39.9%
A4-13.1	LKD	22.7	181	Medium	68.1%	54.7%	38.9%	Minimum	69.4%	33.5%	7.1%
A4-13.2	Bed	10.0	81	Medium	70.6%	57.4%	43.3%	Medium	84.1%	63.3%	46.7%
A4-14.1	LKD	22.7	181	Medium	70.4%	57.3%	42.4%	Minimum	71.3%	37.2%	7.4%
A4-14.2	Bed	10.0	81	Medium	70.6%	56.5%	41.6%	Medium	84.1%	62.8%	45.1%
A4-15.1	LKD	32.3	303	Medium	71.8%	59.4%	48.2%	High	83.3%	63.8%	50.2%
A4-15.2	Bed	11.1	86	Medium	74.6%	61.1%	48.4%	High	85.5%	67.6%	52.6%
A4-15.3	Bed	8.6	63	High	78.0%	66.8%	54.9%	High	86.7%	71.1%	56.8%
A4-15.4	Bed	11.9	98	High	82.9%	75.5%	65.5%	High	89.5%	78.7%	67.6%
A5-01.1	LKD	23.0	206	High	83.7%	76.8%	66.5%	High	87.3%	71.7%	56.6%
A5-01.2	Bed	14.6	126	Medium	67.9%	52.0%	34.0%	Medium	80.2%	52.8%	29.8%
A5-02.1	LKD	28.9	266	High	82.4%	74.9%	65.3%	High	86.7%	71.8%	58.5%
A5-02.2	Bed	9.9	80	High	76.8%	65.8%	54.4%	High	85.4%	67.8%	53.8%
A5-02.3	Bed	12.4	100	Medium	71.1%	58.4%	46.1%	Medium	83.5%	64.0%	49.0%
A5-03.1	LKD	22.7	181	High	77.7%	67.3%	56.5%	Medium	79.9%	53.8%	39.5%
A5-03.2	Bed	10.0	81	High	75.0%	63.6%	52.8%	High	85.4%	67.7%	53.9%
A5-04.1	LKD	28.5	256	Medium	73.1%	60.8%	49.6%	Medium	81.7%	58.8%	43.4%
A5-04.2	Bed	11.2	90	Medium	68.7%	51.2%	30.5%	Medium	84.7%	59.9%	39.0%
A5-04.3	Bed	10.9	88	Minimum	59.4%	38.6%	12.8%	Medium	81.1%	51.9%	25.3%
A5-05.1	LKD	28.5	256	Medium	73.0%	60.4%	48.8%	Medium	81.2%	57.2%	42.3%
A5-05.2	Bed	11.2	90	Medium	68.6%	50.8%	29.7%	Medium	84.0%	58.7%	37.0%
A5-05.3	Bed	10.9	88	Minimum	59.2%	38.4%	11.1%	Medium	80.9%	51.6%	23.4%
A5-06.1	LKD	22.7	181	High	74.6%	63.0%	51.7%	Minimum	75.9%	48.2%	32.3%
A5-06.2	Bed	10.0	81	Medium	71.1%	57.4%	46.3%	Medium	82.4%	60.4%	45.5%
A5-07.1	LKD	23.0	206	High	84.0%	77.5%	66.6%	High	88.4%	75.5%	61.2%
A5-07.2	Bed	14.6	126	Medium	70.3%	55.4%	40.5%	Medium	83.3%	60.7%	41.2%
A5-08.1	LKD	24.2	203	Medium	74.5%	61.2%	47.7%	Minimum	78.3%	48.7%	22.5%
A5-08.2	Bed	10.9	87	Medium	72.4%	58.7%	44.5%	High	84.9%	66.2%	50.1%
A5-09.1	LKD	32.3	303	Medium	67.2%	52.3%	33.9%	Minimum	73.4%	35.3%	12.1%
A5-09.2	Bed	11.1	86	Medium	75.0%	61.3%	48.1%	High	86.1%	68.3%	52.9%
A5-09.3	Bed	7.0	49	High	80.0%	69.7%	58.4%	High	88.4%	76.0%	62.9%
A5-09.4	Bed	11.9	98	High	85.1%	79.0%	70.8%	High	91.2%	81.1%	72.6%
A5-10.1	LKD	22.7	181	Medium	75.7%	63.2%	50.0%	Minimum	78.0%	47.4%	21.1%
A5-10.2	Bed	10.0	81	Medium	72.8%	59.5%	45.0%	Medium	85.0%	65.5%	48.1%
A5-11.1	LKD	22.7	181	High	76.6%	64.3%	51.1%	Minimum	78.0%	48.3%	20.5%
A5-11.2	Bed	10.0	81	Medium	73.3%	59.5%	45.0%	Medium	85.4%	65.2%	47.6%
A5-12.1	LKD	22.7	181	High	76.7%	64.8%	52.3%	Medium	78.8%	50.7%	25.3%
A5-12.2	Bed	10.0	81	Medium	74.2%	61.8%	48.8%	High	85.8%	67.4%	51.6%
A5-13.1	LKD	22.7	181	High	76.7%	65.0%	52.3%	Medium	79.2%	51.9%	26.2%
A5-13.2	Bed	10.0	81	Medium	73.6%	60.9%	47.7%	High	85.9%	66.6%	50.5%
A5-14.1	LKD	32.3	303	High	76.2%	64.7%	54.4%	High	85.5%	67.6%	54.7%
A5-14.2	Bed	11.1	86	Medium	75.2%	61.9%	49.7%	High	85.6%	68.0%	53.3%
A5-14.3	Bed	8.6	63	High	78.7%	68.0%	56.2%	High	87.0%	72.7%	58.5%
A5-14.4	Bed	11.9	98	High	85.3%	79.2%	71.1%	High	91.3%	81.5%	72.9%
A6-01.1	LKD	23.0	206	High	86.0%	79.0%	71.0%	High	87.9%	74.2%	59.4%
A6-01.2	Bed	14.6	126	Medium	67.5%	50.8%	32.3%	Minimum	78.8%	47.9%	24.9%
A6-02.1	LKD	28.9	266	High	84.1%	77.4%	68.8%	High	88.0%	75.5%	62.8%
A6-02.2	Bed	9.9	80	High	77.2%	66.3%	55.4%	High	86.2%	70.4%	57.1%
A6-02.3	Bed	12.4	100	Medium	73.1%	60.8%	49.2%	High	84.6%	66.4%	52.3%

					Block A - EN 17037:2018 Table A.1 Daylight Provision Room Schedule							
Space ID	Description	Area [m^2]	Sensor Count	Target Compliance	300lux_50	500lux_50	750lux_50	Minimum Compliance	100lux_95	300lux_95	500lux_95
A6-03.1	LKD	23.0	206	High	85.6%	78.9%	70.8%	High	89.3%	77.9%	65.0%
A6-03.2	Bed	14.6	126	Medium	71.3%	56.9%	42.0%	Medium	83.4%	60.8%	42.2%
A6-04.1	LKD	29.3	274	High	81.5%	73.4%	62.3%	High	88.7%	76.5%	63.8%
A6-04.2	Bed	9.9	80	High	75.3%	64.1%	52.9%	High	85.6%	68.3%	54.7%
A6-04.3	Bed	12.4	100	Medium	73.5%	61.7%	49.9%	High	84.7%	66.7%	52.6%

Table 17: Block A - Daylight Provision individual values for all habitable rooms to EN 17037 Table A.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
B0-01.1	LKD	23.1	208	Fail	32.1%	10.4%	3.9%	Fail	49.2%	6.4%	2.5%
B0-01.2	Bed	11.0	89	Fail	23.1%	4.3%	2.0%	Minimum	53.4%	8.0%	1.6%
B0-02.1	LKD	34.0	323	Minimum	63.1%	49.3%	35.5%	Medium	78.9%	52.1%	36.3%
B0-02.2	Bed	12.1	94	Fail	41.1%	15.9%	4.2%	Minimum	60.9%	19.9%	2.7%
B0-02.3	Bed	5.2	35	Medium	74.6%	62.2%	49.7%	Medium	84.7%	63.7%	48.9%
B0-02.4	Bed	9.5	80	Minimum	55.4%	40.0%	25.8%	Minimum	72.0%	40.0%	21.5%
B0-03.1	LKD	30.2	276	Minimum	64.6%	49.7%	37.4%	Minimum	72.3%	41.6%	24.1%
B0-03.2	Bed	11.8	96	Fail	47.8%	32.6%	16.8%	Minimum	70.2%	37.2%	20.8%
B1-01.1	LKD	30.2	272	Medium	67.3%	51.9%	36.4%	Minimum	76.4%	43.6%	18.6%
B1-01.2	Bed	13.2	112	Fail	38.8%	17.6%	4.9%	Minimum	61.6%	22.0%	4.1%
B1-01.3	Bed	12.3	102	Fail	34.2%	11.8%	3.2%	Minimum	61.3%	20.4%	2.9%
B1-02.1	LKD	22.7	181	Minimum	54.3%	35.1%	13.5%	Minimum	54.0%	6.2%	0.9%
B1-02.2	Bed	10.0	81	Minimum	58.8%	41.7%	21.2%	Minimum	77.1%	45.4%	21.9%
B1-03.1	LKD	22.7	181	Minimum	55.6%	36.9%	13.7%	Minimum	55.4%	7.1%	0.6%
B1-03.2	Bed	10.0	81	Minimum	58.2%	39.5%	16.2%	Minimum	76.5%	44.1%	17.2%
B1-04.1	LKD	30.0	276	High	75.0%	62.4%	52.0%	High	85.6%	66.4%	53.3%
B1-04.2	Bed	10.9	88	Medium	69.2%	56.4%	44.4%	Medium	80.4%	56.4%	40.5%
B1-04.3	Bed	13.1	108	Minimum	60.8%	45.8%	32.7%	Minimum	77.8%	49.9%	34.5%
B1-05.1	LKD	22.7	181	Medium	67.4%	55.2%	43.2%	Minimum	67.5%	37.3%	11.9%
B1-05.2	Bed	10.0	81	Medium	66.8%	53.8%	41.3%	Medium	80.2%	56.0%	41.4%
B1-06.1	LKD	30.0	276	High	75.0%	63.9%	52.6%	Medium	79.4%	54.5%	41.1%
B1-06.2	Bed	13.2	112	Fail	30.6%	6.5%	0.0%	Minimum	57.1%	5.8%	0.0%
B1-06.3	Bed	13.5	113	Fail	21.0%	1.9%	0.0%	Minimum	52.0%	1.3%	0.0%
B2-01.1	LKD	30.2	272	Medium	72.5%	58.9%	45.3%	Medium	79.2%	51.7%	30.7%
B2-01.2	Bed	13.2	112	Fail	46.8%	26.5%	6.7%	Minimum	68.6%	33.4%	8.4%
B2-01.3	Bed	12.3	102	Fail	42.8%	21.5%	4.8%	Minimum	67.7%	30.8%	5.7%
B2-02.1	LKD	22.7	181	Minimum	64.3%	47.8%	29.5%	Minimum	62.8%	18.1%	3.7%
B2-02.2	Bed	10.0	81	Medium	66.7%	50.3%	33.5%	Medium	81.2%	55.3%	34.5%
B2-03.1	LKD	22.7	181	Minimum	64.6%	48.7%	29.2%	Minimum	63.9%	18.9%	2.7%
B2-03.2	Bed	10.0	81	Minimum	64.7%	47.1%	26.9%	Medium	81.1%	54.5%	32.7%
B2-04.1	LKD	30.0	276	High	78.8%	68.7%	58.4%	High	87.5%	73.7%	60.7%
B2-04.2	Bed	10.9	88	Medium	73.6%	61.0%	49.5%	Medium	83.2%	63.2%	48.0%
B2-04.3	Bed	13.1	108	Medium	65.7%	51.9%	38.1%	Medium	81.8%	58.5%	42.2%
B2-05.1	LKD	22.7	181	High	73.8%	61.7%	50.3%	Minimum	74.2%	44.7%	23.9%
B2-05.2	Bed	10.0	81	Medium	71.2%	59.0%	46.9%	Medium	82.9%	62.0%	47.3%
B2-06.1	LKD	30.0	276	High	78.1%	67.3%	57.3%	Medium	83.2%	63.8%	50.0%
B2-06.2	Bed	13.2	112	Fail	41.8%	14.9%	1.5%	Minimum	61.1%	12.1%	0.0%
B2-06.3	Bed	13.5	113	Fail	32.5%	5.8%	0.4%	Minimum	59.6%	8.3%	0.0%

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
B3-01.1	LKD	30.2	272	High	76.0%	63.1%	51.4%	Medium	82.2%	59.4%	41.2%
B3-01.2	Bed	13.2	112	Minimum	55.5%	38.2%	18.6%	Minimum	72.9%	40.2%	16.0%
B3-01.3	Bed	12.3	102	Minimum	52.4%	33.2%	14.6%	Minimum	73.9%	40.1%	15.1%
B3-02.1	LKD	22.7	181	Medium	69.9%	55.0%	38.6%	Minimum	73.0%	37.2%	7.0%
B3-02.2	Bed	10.0	81	Medium	71.0%	55.8%	40.4%	Medium	84.2%	62.4%	43.9%
B3-03.1	LKD	22.7	181	Medium	70.2%	55.5%	38.9%	Minimum	72.2%	35.6%	5.7%
B3-03.2	Bed	10.0	81	Medium	70.6%	55.5%	38.7%	Medium	84.3%	60.9%	41.6%
B3-04.1	LKD	30.0	276	High	80.8%	72.1%	61.8%	High	88.6%	77.1%	65.3%
B3-04.2	Bed	10.9	88	High	75.0%	63.4%	52.0%	High	84.4%	66.0%	51.6%
B3-04.3	Bed	13.1	108	Medium	68.3%	56.0%	42.1%	Medium	82.7%	61.8%	46.6%
B3-05.1	LKD	22.7	181	High	75.8%	64.7%	53.7%	Medium	78.2%	51.6%	34.3%
B3-05.2	Bed	10.0	81	High	74.0%	61.6%	50.5%	High	84.3%	65.9%	52.2%
B3-06.1	LKD	30.0	276	High	80.2%	70.7%	62.1%	High	84.7%	66.9%	53.4%
B3-06.2	Bed	13.2	112	Minimum	50.5%	25.8%	3.7%	Minimum	70.1%	28.5%	0.8%
B3-06.3	Bed	13.5	113	Fail	42.3%	14.7%	1.7%	Minimum	66.6%	21.3%	0.5%
B4-01.1	LKD	30.2	272	High	79.0%	69.1%	58.2%	Medium	85.7%	65.2%	48.8%
B4-01.2	Bed	13.2	112	Minimum	62.3%	47.9%	29.6%	Medium	78.4%	51.2%	28.9%
B4-01.3	Bed	12.3	102	Minimum	61.1%	45.1%	26.1%	Medium	78.9%	50.9%	29.8%
B4-02.1	LKD	22.7	181	Medium	76.6%	63.5%	49.0%	Minimum	78.6%	48.1%	20.9%
B4-02.2	Bed	10.0	81	Medium	73.2%	59.1%	44.8%	Medium	86.0%	66.3%	49.4%
B4-03.1	LKD	22.7	181	Medium	76.8%	64.0%	49.7%	Minimum	78.4%	47.2%	19.2%
B4-03.2	Bed	10.0	81	Medium	72.8%	58.5%	43.7%	Medium	86.3%	66.3%	49.4%
B4-04.1	LKD	30.0	276	High	82.8%	75.8%	66.3%	High	90.1%	80.1%	70.4%
B4-04.2	Bed	10.9	88	High	75.9%	64.6%	53.3%	High	85.4%	67.6%	54.3%
B4-04.3	Bed	13.1	108	Medium	69.8%	57.3%	45.0%	Medium	83.4%	63.9%	49.2%
B4-05.1	LKD	22.7	181	High	78.7%	68.2%	58.6%	Medium	80.8%	56.3%	40.8%
B4-05.2	Bed	10.0	81	High	74.7%	63.3%	52.2%	High	85.0%	67.0%	53.8%
B4-06.1	LKD	30.0	276	High	82.6%	75.9%	66.3%	High	86.6%	72.3%	60.2%
B4-06.2	Bed	13.2	112	Minimum	56.8%	35.6%	10.4%	Minimum	76.0%	40.4%	6.2%
B4-06.3	Bed	13.5	113	Minimum	50.8%	27.9%	5.4%	Minimum	74.6%	36.9%	5.5%

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

Appendix C - Sunlight Hours to Living Spaces within the Proposed Development

Block A - Sunlight Hours			
Unit ID	LKD window within 90° south	No. sunlight hours on 21st March	BRE Recommendation
A0-01.1	yes	2.92	Minimum
A0-02.1	no	0.25	Below criteria
A0-03.1	no	2.00	Minimum
A0-04.1	no	2.33	Minimum
A1-01.1	no	2.58	Minimum
A1-02.1	yes	3.58	Medium
A1-03.1	yes	3.58	Medium
A1-04.1	yes	3.42	Medium
A1-05.1	yes	2.83	Minimum
A1-06.1	yes	3.83	Medium
A1-07.1	yes	2.50	Minimum
A1-08.1	no	0.00	Below criteria
A1-09.1	no	0.42	Below criteria
A1-10.1	no	1.58	Minimum
A1-11.1	no	0.42	Below criteria
A1-12.1	no	0.75	Below criteria
A1-13.1	no	2.58	Minimum
A1-14.1	no	3.83	Medium
A2-01.1	no	3.33	Medium
A2-02.1	no	3.58	Medium
A2-03.1	yes	5.17	High
A2-04.1	yes	4.75	High
A2-05.1	yes	4.33	High
A2-06.1	yes	3.50	Medium
A2-07.1	yes	4.58	High
A2-08.1	yes	3.25	Medium
A2-09.1	no	0.00	Below criteria
A2-10.1	no	0.83	Below criteria
A2-11.1	no	2.17	Minimum
A2-12.1	no	0.75	Below criteria
A2-13.1	no	0.92	Below criteria
A2-14.1	no	2.58	Minimum
A2-15.1	no	4.42	High
A3-01.1	no	3.33	Medium
A3-02.1	no	4.67	High
A3-03.1	yes	6.83	High
A3-04.1	yes	7.00	High
A3-05.1	yes	6.08	High
A3-06.1	yes	5.00	High
A3-07.1	yes	5.08	High
A3-08.1	yes	3.75	Medium
A3-09.1	no	0.08	Below criteria
A3-10.1	no	1.33	Below criteria
A3-11.1	no	2.58	Minimum
A3-12.1	no	1.33	Below criteria
A3-13.1	no	1.42	Below criteria
A3-14.1	no	2.58	Minimum
A3-15.1	no	4.58	High
A4-01.1	no	3.33	Medium
A4-02.1	yes	8.42	High
A4-03.1	yes	6.83	High

Block A - Sunlight Hours			
Unit ID	LKD window within 90° south	No. sunlight hours on 21st March	BRE Recommendation
A4-04.1	yes	7.00	High
A4-05.1	yes	6.83	High
A4-06.1	yes	5.50	High
A4-07.1	yes	5.08	High
A4-08.1	yes	3.75	Medium
A4-09.1	no	0.25	Below criteria
A4-10.1	no	2.42	Minimum
A4-11.1	no	3.17	Medium
A4-12.1	no	2.17	Minimum
A4-13.1	no	2.25	Minimum
A4-14.1	no	2.58	Minimum
A4-15.1	no	4.58	High
A5-01.1	no	3.33	Medium
A5-02.1	yes	8.42	High
A5-03.1	yes	9.33	High
A5-04.1	yes	9.50	High
A5-05.1	yes	9.50	High
A5-06.1	yes	9.33	High
A5-07.1	yes	5.08	High
A5-08.1	yes	3.75	Medium
A5-09.1	no	4.83	High
A5-10.1	no	4.83	High
A5-11.1	no	4.25	High
A5-12.1	no	4.83	High
A5-13.1	no	4.83	High
A5-14.1	no	4.83	High
A6-01.1	no	4.83	High
A6-02.1	yes	8.42	High
A6-03.1	yes	5.08	High
A6-04.1	yes	5.33	High

Table 19: Block A sunlight hours to living spaces

Block B - Sunlight Hours			
Unit ID	LKD window within 90° south	No. sunlight hours on 21st March	BRE Recommendation
B0-01.1	no	0.83	Below criteria
B0-02.1	no	7.50	High
B0-03.1	no	5.75	High
B1-01.1	no	0.92	Below criteria
B1-02.1	no	1.83	Minimum
B1-03.1	no	1.50	Minimum
B1-04.1	yes	8.08	High
B1-05.1	yes	6.17	High
B1-06.1	yes	7.83	High
B2-01.1	no	1.50	Minimum
B2-02.1	no	2.42	Minimum
B2-03.1	no	1.58	Minimum
B2-04.1	yes	8.58	High
B2-05.1	yes	6.58	High
B2-06.1	yes	8.33	High
B3-01.1	no	2.42	Minimum
B3-02.1	no	3.25	Medium
B3-03.1	no	2.42	Minimum
B3-04.1	yes	8.58	High
B3-05.1	yes	6.92	High
B3-06.1	yes	8.58	High
B4-01.1	no	3.83	Medium
B4-02.1	no	3.83	Medium
B4-03.1	no	3.83	Medium
B4-04.1	yes	8.58	High
B4-05.1	yes	9.00	High
B4-06.1	yes	8.58	High

Table 20: Block B sunlight hours to living spaces