

LRD at Kilternan Village, Co. Dublin

Proposed – Amendment Application

Daylight and Sunlight Assessment Report
Applicant: Liscove Limited

"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design." - BR 209

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The following report has been prepared by 3D Design Bureau (3DDB). 3DDB have over ten years' experience in producing daylight and sunlight assessments for large scale planning applications and are recognised as experts in the field. This report has been reviewed and overseen by Nicholas Polley and Richard Dalton. Nicholas is CEO of 3D Design Bureau and is a qualified Building Services Engineer (B.Sc.(Eng) Dip Eng) with over 25 years' experience in the industry. Richard is Associate Director of 3DDB and has a bachelor's degree in Building Information Modelling (BIM) with over 20 years' experience in the industry.

1.0 Executive Summary

1.1 Summary of Assessment

3D Design Bureau (3DDB) were commissioned to carry out a comprehensive daylight and sunlight assessment, along with an accompanying shadow study for the proposed amendments to the permitted mixed-use development at Kiltarnan Village, Co. Dublin, submitted to Dún Laoghaire-Rathdown County Council as a Large-scale Residential Development (Reg. Ref. LRD24A/0597).

The proposed amendments principally comprise: the replacement of the permitted 3-storey Duplex Blocks E & F (comprising 30 no. duplex units) with a 4-storey building comprising 31 no. apartment units, increasing the total number of residential units within the scheme from 483 no. to 484 no.; amendments to the permitted Neighbourhood Centre building, resulting in a larger part 2- to part 4-storey building; and the provision of a multi-use games area.

The scheme performance assessments of this report relate to the habitable rooms of the proposed apartment building, while the impact assessments consider the effect of the amended elements on the relevant surrounding granted units of the permitted development (highlighted in the figure below).

Assessments have been broken down into the following two main categories, 'Impact Assessment' and 'Scheme Performance', of which there are subcategories as summarised below:

Explanations of key terms and the relevant daylight and sunlight assessment standards are included in sections E.0 & F.0 at the end of this report.

Impact Assessment

Following advice within section 2.2 of the BRE Guidelines (BR 209 - 2022), the surrounding context was carefully considered to ensure all properties and amenity spaces that may potentially experience a level of effect were included in the study. As the proposed amendment sits within a wider permitted development, the properties considered for this assessment are the granted residential blocks surrounding the amended area. Only the granted blocks that could experience an adverse level of effect as per the BRE criteria were brought forward for detailed assessment. A more detailed explanation of the criterion applied can be found in section "2.1 Impact Assessment, Window Selection Criteria" on page 8.

The impact assessment that was carried out for the purpose of this report is in accordance with the BRE Guidelines. The potential levels of effect that the proposed amendments would have on the surrounding granted properties have been assessed in the 'baseline state' versus the 'proposed state'. For the purpose of this amendment application, the baseline state comprises the development as permitted, which is under construction, and the proposed state comprises the development incorporating the proposed amendments. For definitions of the model states, including visual representations, please refer to section "2.2 Preparing the analytical model" on page 10.

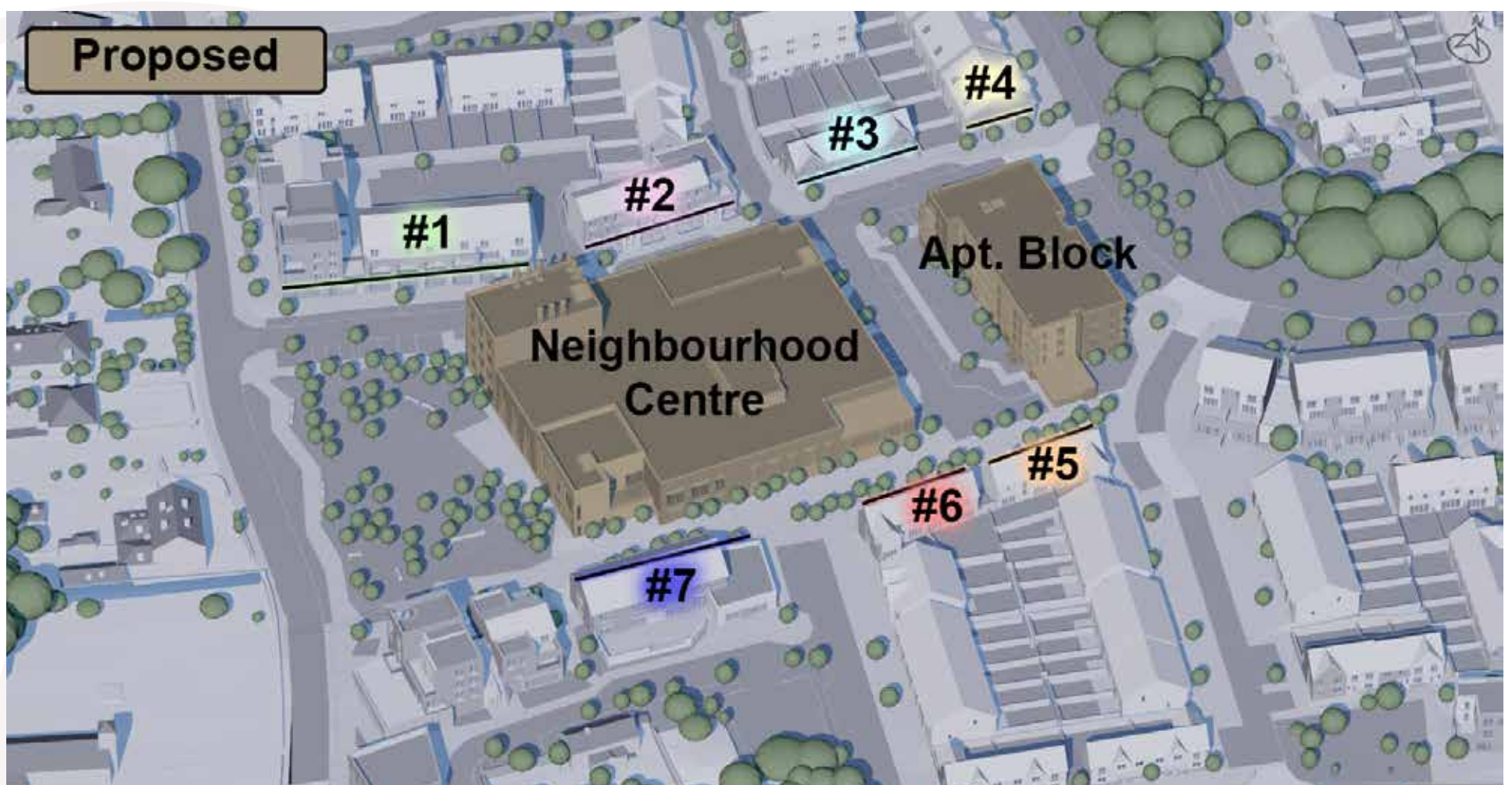


Figure 1.1: Scope of granted properties and proposed elements assessed.

- Property Group A (1) • Property Group C (3) • Property Group E (5) • Property Group G (7)
- Property Group B (2) • Property Group D (4) • Property Group F (6)

The assessed properties, indicated in Figure 1.1 above, include:

The impact assessment, in accordance with the BRE Guidelines, covered the following metrics:

- **Vertical Sky Component (VSC):** Assessment of the potential effect on daylight to the windows of the properties listed above.

- **No Sky Line (NSL):** Assessment of the potential effect on daylight distribution within rooms of the properties listed above. As the internal layouts of the granted properties are known from the permitted planning submission, the NSL assessment was carried out for all rooms served by the windows assessed for VSC.
- **Annual and Winter Probable Sunlight Hours (APSH/WPSH):** Assessment of the potential effect on sunlight to windows oriented within 90° of due south. On this basis, this assessment only comprises the windows of property groups A to D.
- **Sun on Ground (SOG):** The granted gardens and amenity areas surrounding the amended elements have been considered for impact assessment. No quantitative SOG assessment was warranted, as these areas are located behind the granted blocks they serve, relative to the proposed amendments, or to the south of the amended elements. However, a qualitative assessment is provided by the comparative shadow study, and the false colour plan presented for the scheme performance SOG.
- **Supplementary Spatial Daylight Autonomy (SDA):** A supplementary assessment of daylight provision within the rooms served by windows recording adverse effects in the NSL assessment. In accordance with paragraph F9 of Appendix F of the BRE Guidelines, an assessment against set daylight illuminance target values is an appropriate criterion for loss of light where the affected building forms part of a series of new buildings designed as part of the larger group, or is proposed but not yet built - both of which apply to the granted properties assessed in this report. Further detail on this methodology is provided in section 2.3.3 on page 14.

The results of the impact assessments can be found in section A.0 on page 31. These results are summarised in section 1.2 and explained in section “3.1 Analysis of Impact Assessment Results” on page 20.

Scheme Performance

- **Spatial Daylight Autonomy (SDA):** Assessment of daylight availability within the habitable rooms of the proposed apartment block which is part of the amendment application.
- **Sunlight Exposure (SE):** Assessment of sunlight exposure within the same habitable rooms.
- **Sun on Ground (SOG):** Assessment of sunlight availability across the proposed external amenity space in the 2 no. proposed external amenity spaces on March 21st. This date corresponds to the spring equinox, when day and night are of approximately equal duration, and is commonly used as a representative assessment date.

The results of these scheme performance assessments, which are in accordance with the BRE Guidelines, can be found in section C.0 on page 70. These results are summarised in section 1.3 and explained in section “3.2 Analysis of Scheme Performance Results” on page 24.

Supplementary scheme performance studies have also been carried out. These include an SDA assessment under the I.S. EN 17037 criterion, and a No Sky Line (NSL) study within proposed habitable rooms. The results of the supplementary scheme performance assessments can be found in section D.0 on page 84.

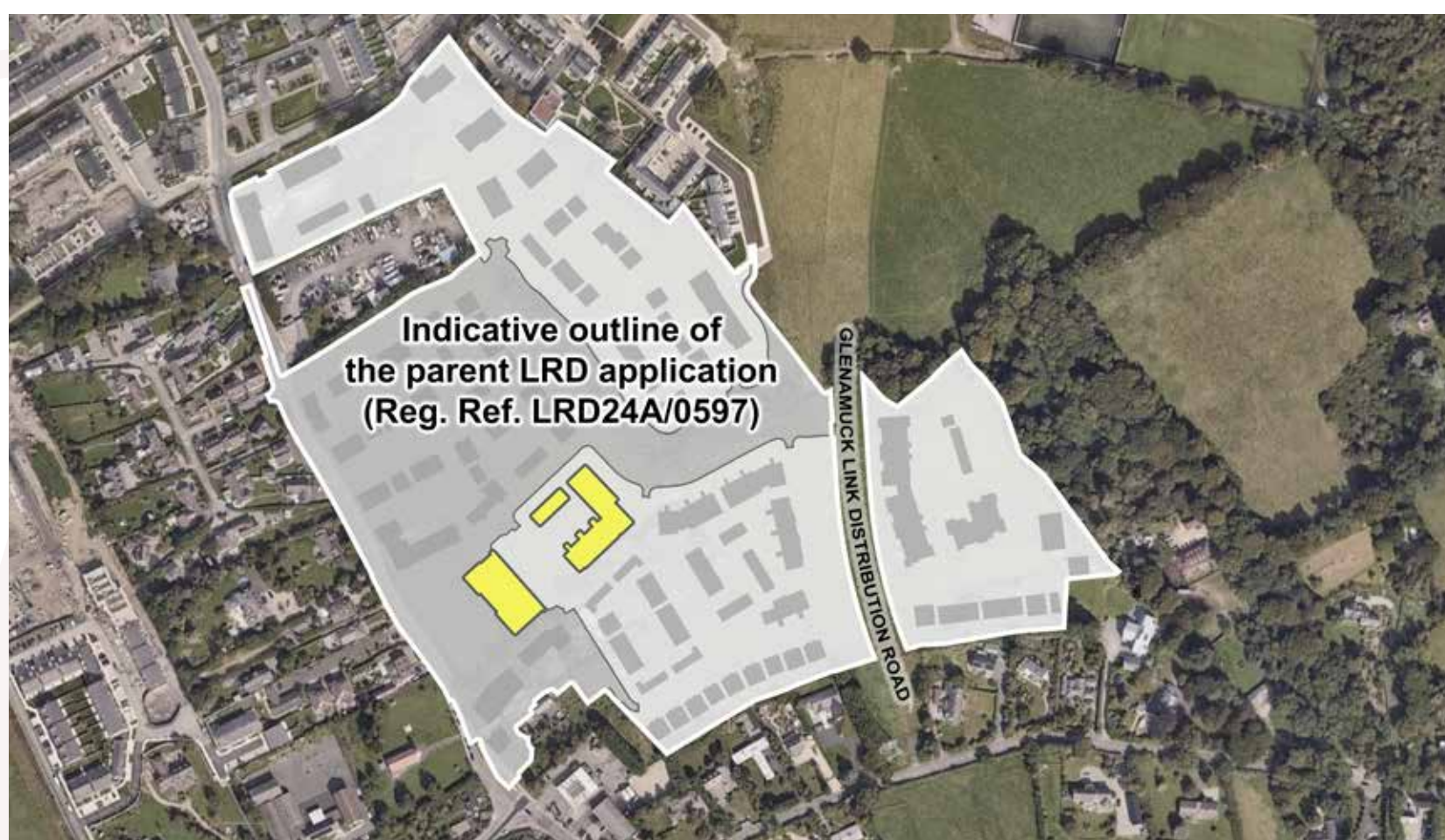


Figure 1.2: Aerial View of the Master Plan (parent application) - Blocks highlighted in yellow are the subject of this amendment application.

Qualitative Assessment

In addition to the quantitative assessments detailed in the ‘Impact Assessment’ and ‘Scheme Performance’ sections, a qualitative assessment has been undertaken to provide further understanding of the variation in sunlight across the surrounding environment. This includes:

- **Shadow Study:** Hourly renderings illustrating shadow movement and extent of shadow on three key dates: the spring equinox (March 21st), summer solstice (June 21st), and winter solstice (December 21st) (section B.0 on page 61).

The false colour plans produced as part of the Sun on Ground (SOG) assessment (section C.4 on page 82) also provide a qualitative indication of sunlight distribution across the amenity areas.

1.2 Impact Assessment Results Overview - Neighbouring Granted Properties:

The levels of effect in the tables below describe the effect the proposed development would have, based on its compliance with the various BRE Target Values. A full list of definitions and a numerical rationale for each can be found in the section “Definition of Effects” on page 95 of this report.

Effect to Daylight - Vertical Sky Component (VSC):

Effect to Vertical Sky Component (VSC)	
Assessed Windows/Rooms Total	82
Compliance Total	74
Categorisation of Effects	
Beneficial Impact*	2
Negligible	72
Minor Adverse	4
Moderate Adverse	3
Major Adverse	1
n.a.**	0

Effect to Sunlight - Annual Probable Sunlight Hours (APSH): ‡

Effect to Annual Probable Sunlight Hours (APSH)	
Assessed Windows/Rooms Total	56
Compliance Total	53
Categorisation of Effects	
Beneficial Impact*	0
Negligible	53
Minor Adverse	0
Moderate Adverse	1
Major Adverse	2
n.a.**	0

No Balcony Study (APSH)	
Assessed Windows/Rooms Total	20
Compliance Total	19
Categorisation of Effects	
Beneficial Impact*	0
Negligible	19
Minor Adverse	1
Moderate Adverse	0
Major Adverse	0
n.a.**	0

Effect to Sunlight - Winter Probable Sunlight Hours (WPSH): ‡

Effect to Winter Probable Sunlight Hours (WPSH)	
Assessed Windows/Rooms Total	56
Compliance Total	50
Categorisation of Effects	
Beneficial Impact*	1
Negligible	49
Minor Adverse	3
Moderate Adverse	1
Major Adverse	2
n.a.**	0

No Balcony Study (WPSH)	
Assessed Windows/Rooms Total	20
Compliance Total	16
Categorisation of Effects	
Beneficial Impact*	0
Negligible	16
Minor Adverse	1
Moderate Adverse	2
Major Adverse	1
n.a.**	0

Effect to Daylight No Sky Line (NSL):

No Sky Line (NSL)	
Assessed Rooms Total	82
Compliance Total	79
Categorisation of Effects	
Beneficial Impact*	1
Negligible	78
Minor Adverse	0
Moderate Adverse	2
Major Adverse	1
n.a.**	0

* ‘Beneficial Impact’ will only be stated if the ratio of change is greater than 1.20 (an improvement of 20%). Should less perceptible improvements occur a ‘Negligible’ level of effect will be stated.

**In instances where a baseline value is particularly low, levels of effects can appear exaggerated. To mitigate such occurrences, if the baseline value in the VSC, APSH/WPSH or NSL studies is below 1%, 3DDB have categorised the level of effect as n.a. (not applicable).

‡ APSH/WPSH Note: as per the recommendations made in section 3.2.3 of the BRE Guidelines, only windows/rooms with an orientation within 90° of due south need to be included in the APSH/WPSH impact assessment. Therefore, the number of windows assessed in this study is typically reduced when compared with the VSC impact assessment. The ‘No Balcony Study’ is a sensitivity study in which the APSH/WPSH assessment was repeated for all assessed windows of Duplex B with the overhanging balconies of the granted design omitted from both model states. The windows recording the highest adverse sunlight effects are located below these balconies, which constrain their access to the sun irrespective of the proposed amendments; the study quantifies the contribution of the granted design itself to the recorded levels of effect.

1.3 Scheme Performance Results Overview:

Spatial Daylight Autonomy (SDA):

Spatial Daylight Autonomy (SDA) BRE 209 Criteria	
Unit Count	31
Rooms Assessed	88
Without Trees	
Compliant	87
Non-compliant	1
Compliance Rate*	c. 99%
With Trees (Proposed and Existing Trees)	
Compliant	87
Non-compliant	1
Compliance Rate*	c. 99%

Note: It is the expert opinion of 3DDB that the appropriate criteria for SDA assessments are those of the BRE Guidelines (BRE 209)

* Compliance rates stated for the SDA analysis are based on the rooms that have been assessed within the apartment block of the proposed amendment. Compensatory design solutions have been provided by the project architects for the unit that contains the non-compliant room listed above.

Sunlight Exposure (SE):

Sunlight Exposure (SE)	
Units Assessed	31
SE without deciduous trees	
Non-Compliant	8
Minimum	4
Medium	0
High	19
Compliance Rate*	c. 74%
SE with all trees	
Non-Compliant	8
Minimum	5
Medium	0
High	18
Compliance Rate*	c. 74%

For the interpretation of levels of Sunlight Exposure please refer to "E.3 Definition of Levels of Sunlight Exposure" on page 96.

* Compliance rates stated for the SE analysis are based on the residential units that have been assessed.

Sun On Ground (SOG) in proposed gardens / amenity areas:

Sun On Ground (SOG)	
Areas Assessed	2
Areas meeting the guidelines	2
Areas not meeting the guidelines	0

1.4 Supplementary Assessment Results Overview

Spatial Daylight Autonomy (SDA) under I.S. EN 17037 Criterion:

Spatial Daylight Autonomy (SDA) under I.S. EN 17037 Criterion	
Unit Count	31
Rooms Assessed	88
Without Trees	
Compliant	87
Non-compliant	1
Compliance Rate*	c. 99%
With Trees (Proposed and Existing Trees)	
Compliant	80
Non-compliant	8
Compliance Rate*	c. 91%

Note: The study under the I.S. EN 17037 criterion should be considered a supplementary assessment. It is the expert opinion of 3DDB that the appropriate criteria are that of the BRE Guidelines (BRE 209)

* Compliance rates stated for the SDA analysis are based on the rooms that have been assessed. In cases where rooms comply with the criteria of BR 209 but do not meet the criteria of I.S. EN 17037, it is the recommendation of 3D Design Bureau that these rooms will be adequately daylit. This recommendation is based on the fact that BR 209 provides room-specific criteria, unlike I.S. EN 17037. BR 209 considers the varying daylight requirements for different room types, which I.S. EN 17037 does not account for.

No Sky Line (NSL):

No Sky Line (NSL):	
Unit Count	31
Rooms Assessed	88
Yes	86
No	2
Compliance Rate*	c. 98%

Note: As the BRE Guidelines do not provide a recommended minimum for NSL in proposed developments, compliance rates for NSL are calculated using a criteria applied by 3DDB.

* Compliance rates stated for the NSL analysis are based on the rooms that have been assessed within the proposed apartment building. This supplementary study assesses the daylight distribution within the proposed rooms themselves and is distinct from the NSL impact assessment, which measures the change in daylight distribution within the rooms of the surrounding granted properties.

2.0 Methodology

2.1 Impact Assessment, Window Selection Criteria

To determine the properties to be included in the impact assessment, the decision chart taken from Figure 20 of the BRE Guidelines has been followed, as shown in Figure 2.1 below.

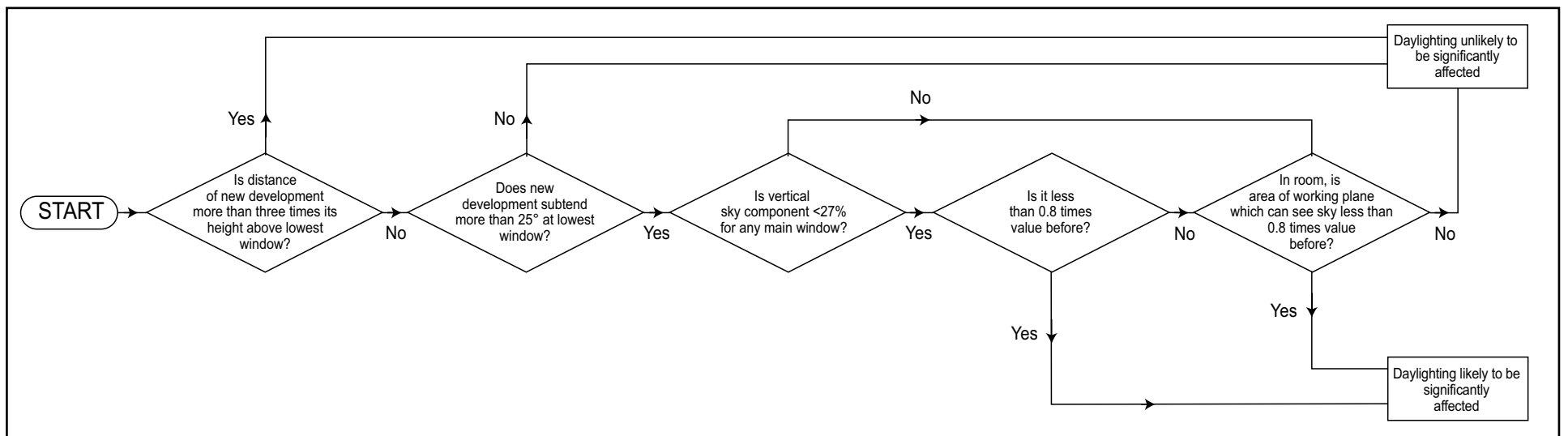


Figure 2.1: VSC decision chart, replicated from section 2.2 of the BRE Guidelines.



Figure 2.2: Properties within 3 times the height of the proposed amended development

Accordingly, all properties within a distance of three times the height of the proposed amended development, as illustrated in Figure 2.2, have been considered for impact assessment.

The proposed amendments comprise two elements with the potential to alter obstruction to surrounding properties: the proposed 4 no. storey apartment building replacing the permitted Duplex Blocks E & F, and the amended Neighbourhood Centre building, which is located in close proximity to the proposed apartment building.

The screening exercise described in this section has therefore been applied to both amended elements.

As the proposed amendments sit within the wider permitted development, the properties within the screening radius comprise the granted residential blocks surrounding the amended area, indicated as property groups A to G in Figure 1.1 on page 3

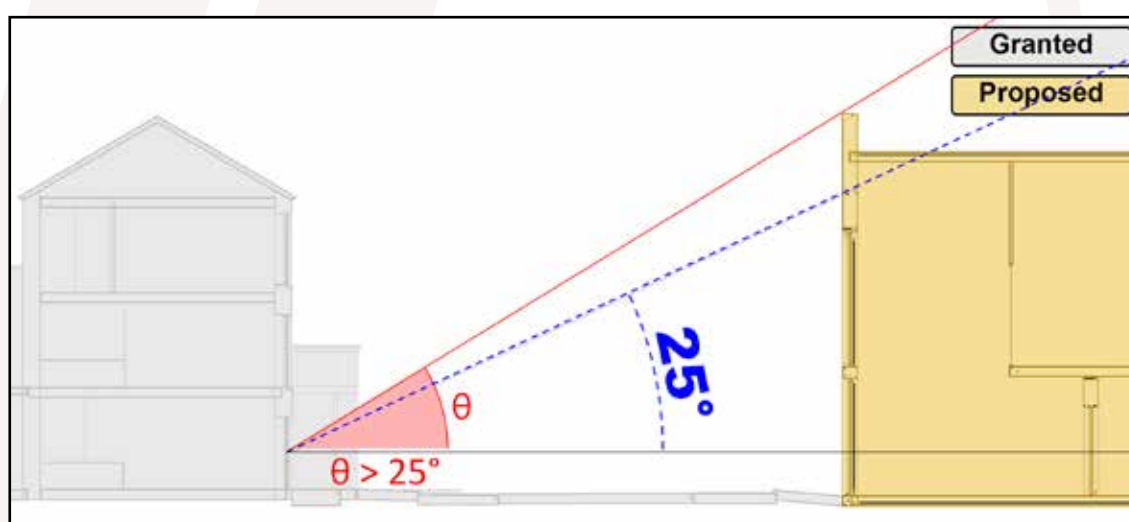


Figure 2.3: Example Section A-A taken through Duplex B (Property Group B)

As per the recommendation made in section 2.2.5 of the BRE Guidelines, a perpendicular section has been drawn from the main window wall of the potentially affected properties to determine if the proposed amended elements subtend an angle of more than 25° at the lowest window.

If the proposed amended elements subtend an angle of more than 25° in this section, then a VSC assessment should be conducted. Figure 2.3 shows a perpendicular section taken through Duplex Group B which provides an example of where the proposed amendments subtend an angle of 25° when measured in a perpendicular section through a granted window.

However, if the proposed development does not subtend 25° in a perpendicular section, daylight is unlikely to be significantly affected and no further assessment will be carried out. In the case of this assessment, each of the assessed granted properties listed in the impact assessment contains at least one habitable window, on a facade facing the proposed amendments, that subtends an angle of more than 25° in a perpendicular section. Where one window of a facade meets this criterion, other windows of that facade have been included in the assessment, providing a more comprehensive understanding of the effect on the property. No granted property within three times the height of the amended elements was excluded from the assessment under the 25° criterion.

Additionally, if a proposed obstruction falls within 45° when measured both in a plan and elevation view, then it is also appropriate to conduct a VSC impact assessment to determine if daylight will be affected. This is referred to in section 2.2.17 of the BRE Guidelines as the '45° approach'. The 45° approach has been taken into consideration when determining which properties to include in the impact assessment. In the case of the proposed amendments, no granted windows fall within 45° of the proposed obstruction when measured in both plan and elevation views without also subtending 25° in a perpendicular section. Accordingly, no properties have been included in the impact assessment solely on the basis of the 45° approach: all assessed property groups were identified through the perpendicular section criterion described above.

According to section 2.2.10 of the BRE Guidelines, it is advisable that where VSC assessments are conducted, a No Sky Line (NSL) assessment should also be carried out where room layouts are known. However, an NSL assessment requires accurate dimensions and layouts of the existing rooms and windows. As the assessed properties form part of the permitted development, their internal layouts are known from the permitted planning drawings. An NSL assessment has therefore been carried out for all rooms served by the windows assessed for VSC. A detailed description regarding the methodology of the VSC assessment can be found in section 2.3.1 on page 13 and for the NSL in section 2.3.2 on page 14.

Section 3.2.9 of BRE Guidelines also applies the 25° rule to determine the need for an impact assessment for loss of sunlight (APSH/WPSH). They also advise that only windows with an orientation within 90° of due south should be assessed. The BRE recommends assessing the main living rooms of dwellings and conservatories, while APSH/WPSH assessments are typically not required for kitchens and bedrooms.

In practice, 3DDB include all windows meeting the proximity criteria in an APSH/WPSH assessment if they are reasonably assumed to serve habitable spaces. This approach avoids distinguishing whether the windows serve bedrooms or living areas, thereby eliminating the need to make assumptions about the specific functions of rooms in existing dwellings. In the case of this assessment, the room uses of the granted properties are known from the permitted planning drawings; nonetheless, all windows within 90° of due south that meet the proximity criteria have been assessed, providing a more comprehensive understanding of the overall effect on the properties.

While section 2.1.21 and 2.2.23 of the BRE Guidelines recommends conducting an impact assessment on the lowest window where daylight/sunlight is needed, if a property is found to have a window potentially affected by the proposed development, based on the previously explained criteria, other windows facing the proposed development on that property may also be assessed. This approach provides a more comprehensive understanding of the overall impact on the property.

2.2 Preparing the analytical model

2.2.1 Building the Model States

The project architect, MCORM, supplied 3DDB with AutoCAD drawings of the proposed amendments, from which the 3D analytical model prepared for the parent application (Reg. Ref. LRD24A/0597) was updated to reflect the amended scheme. Landscape drawings were provided by Niall Montgomery + Partners. The original Daylight and Sunlight Assessment for the permitted scheme was prepared by 3DDB as part of the parent application, and the same modelling approach, assessment methodology and BRE criteria have been retained for this report.

The proposed amendments comprise, principally, the replacement of the permitted 3-storey Duplex Blocks E & F, comprising 30 no. duplex units, with a 4-storey apartment building comprising 31 no. units, increasing the total number of residential units within the scheme from 483 no. to 484 no. units.

In line with standard practice, a desktop-based approach was adopted at the time of the parent application to gather information regarding the subject site and its surroundings. In lieu of a bespoke on-site survey, a combination of available survey information, aerial photography, and ordnance survey data was used to model the wider surrounding context. As information gathered from online sources is not as precise as a physical survey, a reasonable tolerance should be allowed for elements of the wider context within the model. It is noted, however, that the properties assessed in this report form part of the permitted development and are represented in the analytical model as prepared for the parent application, based on the design information received from the project architect at that time; this tolerance therefore applies to the wider existing context only, and not to the assessed receptors.

Baseline model state (Parent Granted Scheme)



Figure 2.4: Model view of the baseline model state

As illustrated in Figure 2.4, the baseline model state reflects the environment that would arise if the development is built as permitted (Reg. Ref. LRD24A/0597). It comprises the permitted development in full, including Duplex Blocks E & F and the Neighbourhood Centre building, each in their permitted form, together with the existing surrounding context. This baseline is considered appropriate for the assessment of the proposed amendments, as it represents the daylight and sunlight conditions that the granted properties would experience in the absence of the amendments now proposed. Proposed trees for the granted application were included as per the permitted landscape drawings.

Proposed model state (Amendment Application)

As illustrated in Figure 2.5, the proposed model state reflects the development incorporating the proposed amendments. In this model state, the permitted Duplex Blocks E & F are replaced with the proposed 4-storey apartment building and the Neighbourhood Centre building is amended as proposed. Notwithstanding conditioned changes to Cell 16, the model state is otherwise identical to the baseline: the remaining granted blocks and existing surrounding context are retained as per the analytical model prepared for the parent application (DLRCC Reg. Ref. LRD24A/0597), with proposed trees and landscaping updated in accordance with the amended landscape plans. Any variation in the results between the two model states is attributable solely to the proposed amendments, the required changes to Cell 16 would have no bearing on the results generated for this amendment application. Proposed trees were updated as per the amended landscape drawings.



Figure 2.5: Model view of the proposed model state

The assessment model includes all surrounding windows identified in accordance with the screening criteria for impact assessment, as set out in section 2.1 of this report. This ensures that all receptors with the potential to experience an adverse effect have been captured within the VSC and APSH/WPSH analysis.

All of the above information was subsequently used to prepare a digital analytical model in software specifically designed for daylight and sunlight analysis.

Relevant weather and climatic data has been obtained for this report using a localised EnergyPlus Weather File (IRL_Dublin.039690_IWEC.epw).

2.2.2 Trees

As stated in section 3.3.9 of the BRE Guidelines, the exact shapes of trees are “almost impossible to predict”. When modelling trees for assessments tree geometry is simplified. Where tree survey information is not provided, the position and size of existing trees are estimated using photogrammetry information. The shape of the trees is simplified and an average transmittance value is applied using information from table G1 from the BRE Guidelines. Simplified models of proposed trees within the development are also included in accordance with the landscape plans prepared by the landscape architects, as updated for the proposed amendments. Proposed trees are included in both model states as per the respective landscape design: the baseline state includes the landscaping of the permitted scheme, and the proposed state includes the landscaping as amended.

BR 209 provides guidance on how trees should be treated depending on the study being carried out, as summarised below:

Impact to Vertical Sky Component (VSC) and Annual / Winter Probable Sunlight Hours (APSH / WPSH)

Section G1.2 of the BRE Guidelines states that when assessing the effect a new development would have on existing buildings, “it is usual to ignore the effect of deciduous trees”. This is because daylight is at its scarcest and most valuable in winter when most trees will not be in leaf. Evergreen trees should be included, particularly where a dense belt or group of evergreens is specifically planned as a windbreak or for privacy purposes.

Sun On Ground (SOG)

Regarding SOG assessments, section G4.1 of the BRE Guidelines states:

“...trees and shrubs are not normally included in the calculation unless a dense belt or group of evergreens is specifically planned as a windbreak or for privacy purposes. This is partly because the dappled shade of a tree is more pleasant than the deep shadow of a building (this applies especially to deciduous trees).”

As such, deciduous trees are not included in the calculation of SOG, unless there is a dense belt present or a group of trees specifically planned as a windbreak or for privacy purposes. Evergreen trees are included in the SOG assessment.

Sunlight Exposure (SE)

Section G3.1 of the BRE Guidelines states that as deciduous trees would not be in full leaf on the recommended assessment date (March 21st), sunlight would be expected to penetrate deciduous trees. However, as trees have so many variables, it is impossible to accurately represent how they would affect sunlight at a given time. The suggested methodology (BR 209) to allow for this is to run the sunlight exposure study in two states. Firstly, with all trees as opaque objects and secondly, without deciduous trees in the assessment model. This gives a range of potential sunlight hours.

Spatial Daylight Autonomy (SDA)

BR 209 recommends when assessing daylight in a proposed building, it is appropriate to run the assessment with trees represented over the course of the whole year. Light transmittance values for the modelled trees are varied to account for summer and winter foliage.

Since the preparation of the parent application assessment, 3DDB have refined the representation of deciduous trees within SDA calculations: deciduous trees are now represented through averaged seasonal light transmittance values applied across the annual calculation, in accordance with BRE Digest 350, in lieu of the previously adopted approach of separate summer and winter calculation runs. This refinement affects the representation of trees only and does not alter the SDA calculation methodology, target values, or compliance criteria applied.

Taking average dates from *BRE Digest 350*, appropriate light transmittance values are applied to deciduous trees to represent the ‘full leaf’ and ‘bare branch’ states.

Evergreen trees are represented as ‘full-leaf’ throughout the year.

The BRE Guidelines (section G2.3) also state:

“The calculation model should account for the obstruction to daylight caused by the trees. This needs to be done by modelling a representative shape of the trees. Often trees are irregularly shaped and simple modelling, using height and spread data and assuming a circular tree, will give inaccurate results. A special survey on site is generally required to produce the required data on the tree profile, using a clinometer or other device to measure tree height. Buildings and other solid objects should also be taken into account.”

In the absence of a ‘special survey’ being conducted, as mentioned above, simplified models representing trees are used. The information for these trees is taken from photogrammetry information and an arborist report when available. A reasonable tolerance should be applied to the results generated to account for trees not being represented exactly as they appear on site.

Units are also assessed without trees to give an understanding of how the architecture performs should trees not be factored into the calculation.

I.S. EN 17037 does not give any guidance on how trees should be represented. For the purpose of this report, the SDA calculation under the I.S. EN 17037 criteria is carried out with trees represented in the same manner as the BR 209 assessment. Units are also assessed without trees to give an understanding of how the architecture performs should trees not be factored into the calculation.

The supplementary SDA assessment carried out within the granted rooms for the purpose of the impact assessment (section A.4 on page 60) has been run without trees in the assessment model. This is consistent with the treatment of trees across the impact assessment metrics of this report, whereby, in line with section G12 of the BRE Guidelines, the effect of deciduous trees is ignored when assessing the effect of a proposed development on the daylight and sunlight received by surrounding buildings.

No Sky Line (NSL)

Because some sky can usually be seen through a tree canopy, deciduous trees are not included in the No Sky Line assessment model. Evergreen trees may be included in this assessment, particularly if there is a dense belt or group planned for windbreak or for privacy purposes.

Shadow Study

The hourly renderings of the shadow study are generated with evergreen trees represented as opaque objects, where applicable, and typically without deciduous trees. This method best represents the methodology used for the impact assessment and allows for a better understanding of potential shadows cast by the proposed development through the tree canopy.

2.3 Quantitative Impact Assessment Overview

2.3.1 Effect on Vertical Sky Component (VSC)

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.

Section 2.1 outlines the decision process which was used to determine the appropriate properties to be included in the VSC impact assessment.

For proposed developments, all properties within a distance of three times the height of the proposed development are considered with regards to an impact assessment. Should the angle from the windows to the proposed development subtend 25° in a perpendicular section, then VSC is calculated in both the baseline and proposed model states, and a comparison made.

A No Sky Line assessment requires accurate dimensions and layouts of both rooms and windows. However, the required information is rarely available for existing dwellings. As such, it is not common practice to carry out a No Sky Line (NSL) impact assessment.

VSC can be defined as the amount of skylight that falls on a vertical wall or window.

Where applicable, this report assesses the percentage of direct sky illuminance that falls on the assessment point of neighbouring windows that could be affected by the proposed development.

Section 2.1.6 of the BRE Guidelines states 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 provide 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.

Where a VSC assessment is warranted, the values for each relevant window/room may be calculated in the corresponding model states, as outlined in section 2.2 on page 10. A comparison of these results can be used to indicate the level of effect.

A proposed development could possibly have a noticeable effect on the daylight received by an existing window, if the following occurs:

- The VSC value drops below the guideline value of 27%; **and**
- The VSC value is less than 0.8 times the existing value.

In instances where a baseline value is less than 1%, the impact will be considered '*non-applicable*' (n.a.).

Under BRE Guidelines (section 2.2.2), only habitable rooms need to be assessed for effect to VSC. In the absence of design layouts or floor plans, or information pertaining to the internal 'as-built' layouts, assumptions have been made regarding the function of the windows of the existing surrounding properties (i.e. what room type is served by the window being assessed).

Typically, the effect on ground floor windows is greater than the effect on windows of subsequent floors. However, floors above ground floor level may be included in this study to give a more comprehensive assessment.

Assessment Points

The VSC impact assessment is carried out on the windows/rooms of the neighbouring properties that could be affected by the proposed development. Windows/rooms of the granted properties that could be affected by the proposed amendment as highlighted in Figure 1.1 on page 3.

The assessment points for measuring VSC are taken from the centre point of a standard window. If the window being assessed is a full height window, the assessment point is taken at 1600 mm above the finished floor level.

Weighted Averages

If it can be determined or reasonably assumed that multiple windows are servicing the same room, each window has been assessed and a room VSC will be calculated by applying a weighted average calculation to the results.

When calculating weighted averages the proportion of the total glazing area represented for each window is taken into account. It should be noted that estimations typically need to be made regarding window sizes, so a tolerance should be applied regarding calculated weighted averages.

In instances where weighted averages have been calculated, the VSC figures will be stated for each window on an individual basis as well as the calculated figure to be applied to the room, but the level of effect will only be stated for the room.

Project Assessment

Following the BRE decision chart, as illustrated in Figure 2.1 on page 8, a VSC impact assessment has been carried out on the windows/rooms of the granted properties that could be affected by the proposed elements of the amendment.

The assessed properties comprise the granted property groups tagged as A to G, as indicated in Figure 1.1 on page 3.

No VSC impact assessment was conducted for other properties that are within three times the height of the proposed

development. This is because none of the windows to these properties satisfy the relevant BRE screening criteria, namely the 25° test (measured in a perpendicular section) or the 45° approach (measured in both plan and elevation).

The results for the VSC assessment can be found in the appendix results section A.1 on page 31, with analysis of the results in section 3.1.1 on page 20.

2.3.2 Effect on No Sky Line (NSL)

No Sky Line (NSL) is a study of whether or not the sky is visible from a hypothetical working plane within a room. In residential properties the working plane is assumed to be 850mm above the finished floor level, and for offices, it is set at 700mm.

The BRE advises that if, following the construction of a new development, the no sky line moves in such a way that the area of the existing room, which currently receives direct skylight, is reduced to less than 0.80 times its former value, this change will be noticeable to the occupants, and more of the room will appear poorly lit.

NSL assessment is recommended for main rooms where daylight is expected. In residential properties these include living rooms, dining rooms, and kitchens. The BRE Guidelines state that *“bedrooms should also be analysed although they are less important.”*

A No Sky Line (NSL) assessment has been carried out for all rooms served by the windows assessed in the VSC assessment. As the assessed properties form part of the permitted development, their internal layouts are known from the design information underpinning the parent application assessment, allowing the NSL assessment to be carried out comprehensively rather than being limited to properties for which layout information happens to be available.

3D Design Bureau asserts that the No Sky Line (NSL) assessment is more informative than a Vertical Sky Component (VSC) assessment. This is because a VSC assessment considers only the light reaching a single point on a window, whereas an NSL assessment evaluates daylight distribution throughout the room. If a window or room fails to meet the BRE recommendation for VSC impact but meets the criteria for NSL impact, it indicates that while light intensity is reduced, its distribution will not be adversely affected.

Project Assessment

An NSL impact assessment has been carried out in all rooms of the granted property groups tagged as A to G served by the windows assessed for VSC.

The results for the NSL assessment can be found in the appendix results section A.2 on page 41, with analysis of the results in section 2.3.2 on page 14.

2.3.3 Supplementary Daylight Provision Assessment (SDA) - Impact Assessment

In addition to the VSC and NSL assessments recommended by the BRE Guidelines for the assessment of loss of daylight to existing buildings, a supplementary Spatial Daylight Autonomy (SDA) assessment has been carried out within the rooms served by windows recording adverse effects in the NSL impact assessment.

The VSC and NSL are ratio-based metrics: they measure the change in sky visibility relative to a baseline condition. The VSC is calculated at a single reference point on the outer face of a window and depends only on the external obstruction, while the NSL measures the distribution of direct sky visibility across the working plane within a room. Neither metric quantifies the daylight illuminance actually achieved within the room, and consequently neither indicates whether a room remains adequately daylighted following a recorded reduction.

Appendix F of the BRE Guidelines addresses the selection of appropriate criteria for the assessment of loss of light. Paragraph F7 identifies the VSC as the generally recommended parameter for assessing loss of light to an existing building, as it depends only on obstruction and is therefore a measure of the daylight environment as a whole. Paragraph F8 notes that the use of daylight factor or daylight illuminance for loss of light to existing buildings is not generally recommended, as this can penalise well-daylit existing buildings while allowing rooms marginally above the recommended minimum to restrict what could be built nearby.

However, paragraph F9 identifies specific situations where meeting set daylight factor or illuminance target values (Appendix C of the BRE Guidelines) with the new development in place “could be appropriate as a criterion for loss of light”. Per F9(i), these include cases where the existing building is one of a series of new buildings being built one after another, each designed as part of the larger group; and per F9(ii), as a special case of (i), where the existing building is proposed but not yet built - the typical example given by the Guidelines being a neighbouring building that has received planning permission but has not yet been constructed.

The granted properties assessed in this report fall within both of these situations. They form part of the same permitted development as the proposed amendments, designed as part of the larger group, and they have received planning permission and are under construction. Accordingly, at the time of writing, there are no existing occupants whose current daylight amenity would be reduced; the relevant consideration is the daylight amenity that future occupants of these rooms will experience with the amended scheme in place. The supplementary SDA assessment measures precisely this: the daylight illuminance achieved within the affected rooms, assessed against the target values of Appendix C of the BRE Guidelines, in the context of the amended scheme.

The supplementary SDA assessment has been run without trees in the assessment model, consistent with the treatment of trees across the impact assessment metrics of this report, as detailed in section 2.2.2 on page 12.

The results of the VSC and NSL assessments remain the primary reporting metrics of this study and are presented in full in section A.4 on page 60. The supplementary SDA assessment is presented as additional context to those results, in accordance with the framework set out in Appendix F of the BRE Guidelines.

2.3.4 Effect on Annual/Winter Probable Sunlight Hours (APSH/WPSH)

Annual/Winter Probable Sunlight Hours (APSH/WPSH) is a measure of sunlight that a given window may expect to receive over the period of a year. The percentage of APSH/WPSH that windows in existing properties receive might be affected by a proposed development.

A proposed development could potentially have a negative effect on the level of sunlight that a neighbouring property receives, if the obstructing building is located to the south and is large in relation to its distance from the existing dwelling. This can be determined if the distance of a proposed development is less than three times its height from an existing dwelling, or if the angle from an existing window to the proposed development subtends an angle of 25° to the horizontal when measured in a perpendicular section.

Whether a window is considered for APSH/WPSH impact assessment is based on its orientation. A south-facing window will, in general, receive the most sunlight. North facing windows may receive sunlight on only a handful of occasions in a year, and windows facing eastwards or westwards will receive sunlight only at certain times of the day. Taking this into account, section 3.2.3 of the BRE Guidelines suggest that windows with an orientation within 90 degrees of due south should be assessed.

Section 2.1 outlines the decision process which is used to determine the appropriate properties to be included in an APSH/WPSH impact assessment.

The APSH/WPSH for each of the assessed windows should be calculated in the relevant model states, as outlined in section 2.2 on page 10. A comparison between the results generated using these model states can be used to determine the level of effect.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, the APSH/WPSH will be assessed for the room as opposed to each individual window. When APSH/WPSH is assessed for a room it considers sunlight coming from all windows, but does not double count if sunlight is reaching multiple windows at the same time.

If a room can receive more than 25% of APSH, including at least 5% of the WPSH, then the room should receive enough sunlight. Despite being two components of the same technical study, the results for APSH and WPSH are presented separately in this report. This approach distinguishes between annual and winter sunlight impacts, thereby facilitating a more detailed analysis of the effect of the proposed development.

A proposed development could possibly have a noticeable effect on the sunlight received by an existing window/room, if the following occurs:

- The APSH value drops below the annual (25%) or winter (5%) guidelines; **and**
- The APSH value is less than 0.8 times the baseline value; **and**
- There is a reduction of more than 4% to the annual APSH.

In some circumstances, the available sunlight during the winter period (WPSH) may both drop below the recommended minimum of 5% with a proposed value of less than 0.8 times the baseline value, but the reduction to annual probable sunlight (APSH) is less than 4%. Such occurrences are considered compliant with the BRE Guidelines (Section 3.2.6), and the impact to WPSH will be stated as 'n.a.' on that basis.

Additionally, where a baseline value is less than 1%, the impact will be considered 'non-applicable' (n.a.)

According to section 3.2.3 of the BRE Guidelines, only main living-rooms, or rooms comprising living space, need to be assessed for effect on sunlight. As the internal layouts and room uses of the assessed granted properties are known from the permitted planning drawings, no assumptions were required regarding which rooms comprise living space. Nonetheless, all windows with an orientation within 90° of due south and in relative close proximity to the proposed amendments have been included in the APSH/WPSH assessment, irrespective of room use, providing a more comprehensive understanding of the overall effect on the properties.

Typically, the effect on ground floor windows is greater than the effect on windows of subsequent floors. However, floors above ground floor level may be included in this study to give a more comprehensive assessment.

Assessment Points

The assessment points for measuring APSH/WPSH are taken from the centre point of a standard window. If the window being assessed is a full height window, the assessment point is taken at 1600 mm above the finished floor level.

Project Assessment

The APSH/WPSH impact assessment has been carried out on the windows/rooms of the granted properties that could be affected by the proposed elements of the amendment as indicated in Figure 1.1 on page 3, with an orientation within 90 degrees of due south.

As indicated in Figure 1.1 on page 3, the assessed properties comprise property groups A to D, whose windows facing the proposed amendments are oriented within 90° of due south. No APSH/WPSH assessment has been conducted for property groups E, F and G on the basis that the windows of these properties that face the proposed amendments have an orientation within 90° of due north.

No APSH/WPSH impact assessment was conducted for other properties that are within three times the height of the proposed development. This is because none of the windows to these properties satisfy the relevant BRE screening criteria, namely the 25° test (measured in a perpendicular section) or the 45° approach (measured in both plan and elevation).

The results for the APSH/WPSH assessment can be found in the appendix results section A.3 on page 49, with analysis of the results in section 3.1.4 on page 22.

2.3.5 Effect on Sun On Ground in Existing Gardens/Amenity Areas (SOG)

Section 3.3.17 of the BRE Guidelines recommend that for a garden or amenity area to appear adequately sunlit throughout the year, at least half the area should receive at least two hours of sunlight on March 21st. As the BRE Guidelines do not provide clear criteria on which neighbouring properties should be included in an impact on SOG study, 3DDB have carefully considered the neighbouring properties that may be affected when running the impact assessment. Gardens or amenity areas included in this study are typically located within close proximity, to the north of the proposed development.

Where a quantitative assessment has not been carried out it is on the basis that the omitted areas are unlikely to be adversely affected. Such instances may be because the areas are not deemed to be in close proximity to the proposed development or because they are located to the south. Should there be any concerns over the potential impact on any areas that have not been included in the quantitative assessment, a qualitative assessment may be carried out using a shadow study and/or false colour plans.

March 21st, also known as the spring equinox, is chosen as the assessment date as daytime and night-time are of approximately equal duration on this date.

In accordance with section 3.3.9 of the BRE Guidelines, deciduous trees will not typically be included unless there is a particularly dense belt. The analytical model for SOG impact assessment includes evergreen trees, where applicable.

Where applicable, the percentage of assessed areas which can receive two hours or more of direct sunlight on March 21st is calculated in the relevant model states, as outlined in section 2.2 on page 10. A comparison between the results generated with these model states can be used to determine the level of effect.

A proposed development could possibly have a noticeable effect on the sunlight received by an existing garden and/or amenity area, if the following occurs:

- Half the area of the space does not receive at least two hours of sunlight during the spring equinox; **and**
- The area that receives more than two hours of sun on the spring equinox is less than 0.8 times its former value.

In instances where a baseline value is less than 1%, the impact will be considered '*non-applicable*' (n.a.)

Effect on sunlight to existing neighbouring gardens and/or amenity areas has been assessed north of the proposed development, as areas located to the south are unlikely to be affected as the sun does not cast shadows in this direction. Overshadowing is highly unlikely to occur in areas that are due south of any proposed development.

Project Assessment

The SOG impact assessment has been carried out on the neighbouring gardens/amenity areas that could be affected by the proposed development as outlined above.

The granted gardens and amenity areas surrounding the amended elements have been considered for SOG impact assessment in accordance with the criteria outlined above. No quantitative SOG impact assessment has been carried out, on the following basis:

The gardens and amenity areas serving the granted property groups A to D are located behind the granted blocks relative to the proposed amendments, that is, the granted blocks themselves stand between the amended elements and their associated amenity areas. Any variation in sun on ground within these areas arising from the proposed amendments would therefore be minimal, as the principal obstruction to these areas is, and remains, the granted blocks they serve. The gardens and amenity areas of property groups E, F and G, and other areas located to the south of the proposed amendments, are unaffected as shadows are cast in the opposite direction, making overshadowing of these areas highly unlikely.

Should there be any concerns over the potential effect on any areas that have not been included in a quantitative assessment, the false colour plan of the proposed model state shown in section C.4 on page 82 and the hourly renderings of the shadow study in section B.0 on page 61 allow for a qualitative sunlight assessment of the surrounding areas, and demonstrate the variation in shadow patterns arising from the proposed amendments.

2.4 Qualitative Assessment - Shadow Study

2.4.1 Shadow Study

A shadow study has been carried out to allow a qualitative comparison between the relevant model states, as outlined in section 2.2 on page 10. For the purpose of this amendment application, the hourly renderings present the baseline (granted) and proposed (amended) model states comparatively, illustrating the variation in shadow patterns arising from the proposed amendments. This visual representation of the shadows cast by the proposed amendments can be found in the hourly shadow diagrams in the appendix results section B.0 on page 61.

Hourly renderings have been shown from sunrise to sunset on the following dates in 2026:

- Spring equinox: March 21st Sunrise 6:32 | Sunset 18:32. (GMT)
- Summer solstice: June 21st Sunrise 5:04 | Sunset 21:49. (BST) (Daylight savings)
- Winter solstice: December 21st Sunrise 8:45 | Sunset 16:00. (GMT)

The shadow study has been generated using the same model states as described in section 2.2.1. In certain cases, assumptions or estimations may have been made when modelling elements of the surrounding context and/or proposed site details when creating the various model states. Therefore, it is advisable for a reasonable tolerance to be applied when interpreting shadows in the qualitative assessment. It is noted that the amended elements are modelled from the proposed amendment drawings, and the granted blocks are represented as per the analytical model prepared for the parent application.

The hourly renderings of the shadow study will be generated without deciduous trees and with evergreen trees, where applicable, represented as opaque objects when present in the model states.

Note: The spring equinox (March 21st) and autumn equinox (21st September) yield similar shadows, albeit with a one hour difference as daylight saving time (BST) would be in effect. Only the spring equinox was included in the shadow study images in accordance with section 3.3.14 of the BRE Guidelines.

2.5 Quantitative Scheme Performance Assessment Overview

2.5.1 Spatial Daylight Autonomy in Proposed Habitable Rooms (SDA)

Since the publication of the 3rd edition of the BRE Guidelines (BR 209 - 2022), Spatial Daylight Autonomy (SDA) is the recommended metric for assessing daylight access within a proposed development. Spatial Daylight Autonomy replaces Average Daylight Factor (ADF) in this regard, which was the recommended metric under the 2nd edition of the BRE Guidelines (BR 209 - 2011).

Spatial Daylight Autonomy assesses whether a room receives sufficient daylight on a working plane during standard operating hours on an annual basis. A given target value should be achieved across 50% of the working plane for half of the daylight hours.

There are two methods for calculating SDA:

- **Calculation method using illuminance level:** This requires the use of a detailed daylight calculation method where hourly (or sub-hourly) internal daylight illuminance values for a typical year are computed using hourly (or sub-hourly) sky and sun conditions derived from climate data appropriate to the site. This calculation method determines daylight provision directly from simulated illuminance values on the reference plane. The illuminance value of at least half the required area of the space should equal or exceed the target values.
- **Calculation method using daylight factor:** The daylight factor method assumes a constant ratio between internal and external illuminance. The daylight factors in the space shall be calculated by any reliable method that is based on the ISO 15469:2004 standard overcast sky (TYPE 1 or TYPE 16). Daylight factors are to be predicted across grid of points on a plane 0.85m above the floor of the space. The daylight factor of at least half the required area of the space should equal or exceed the target values.

It is the opinion of 3DDB that the calculation method using illuminance level better represents a real-world scenario as it accounts for the quality of daylight based on orientation. As such, the illuminance methodology has been adopted as the preferred SDA assessment methodology by 3DDB. A localised EnergyPlus Weather File is used to apply the relevant climate information. In the case of this report, the weather file used is IRL_Dublin.039690_IWEC.epw.

In terms of housing, *BR 209* provides target SDA values to be received across at least 50% of the working plane for at least half the daylight hours. The target values differ based on the function of the room assessed:

- 200 Lux for kitchens • 150 Lux for living rooms • 100 Lux for bedrooms

Where rooms serve more than one function, the higher SDA target value should be taken. In the case of the proposed amendment, the assessed rooms comprise the LKDs and bedrooms of the 31 no. proposed apartment units; the LKDs have been assessed against the 200 Lux target, being the higher value applicable to their combined function.

Under I.S. EN 17037 at least 50% of the working plane should receive above 300 lux for at least half the daylight hours, with 95% of the working plane receiving above 100 Lux for all rooms. The target SDA values do not vary depending on the room function under this criteria.

This study has assessed the Spatial Daylight Autonomy (SDA) received in the habitable rooms of the proposed development under the BR 209 criterion. The SDA of the proposed development has been calculated under the I.S. EN 17037 criterion as part of a supplementary assessment.

Defining Rooms

The definition of rooms are typically taken directly from the architectural drawings supplied by the project architect. Sometimes, the applied names of rooms may differ slightly. e.g. A "Kitchen / Living / Dining room (KLD)" may be referred to as a "Living / Kitchen / Dining room (LKD).

According to section 2.1.14 of the BRE Guidelines areas like bathrooms, stairwells, garages, and storage areas do not have a special requirement for daylight. As such these spaces have not been assessed.

Where an SDA assessment has been conducted, an indication of the assessed space in each room will be indicated in the floor plans that correspond to the SDA results in the appendix section "Proposed Apartment Floor Plans" on page 70.

Working Plane

The calculation of SDA is carried out on a hypothetical working plane which lies 850 mm from the finished floor level in residential units and 700 mm in academic and office spaces.

In the BR 209 study the working plane is offset 300 mm from the room boundaries. Under the I.S. EN 17037 criteria the working plane is offset 500 mm from the room boundaries. The working plane has a grid density of c. 300 mm.

Material Palette

Following consultation with the design team, the material values used for SDA calculations are as per the table below. The same material palette applied in the Daylight and Sunlight Assessment of the parent application has been retained for this report, ensuring consistency between the assessments of the permitted and amended schemes:

Table No. 2.5.1 - Material Palette for SDA Calculations					
Object	Material	Reflectance	Object	Material	Reflectance
					Transmittance
Exterior walls	Standard Brick	0.3	Interior Walls	Pastel paint	0.7
	Light Brick	0.4	Interior Ceiling	White paint	0.8
	Dark Brick	0.15	Interior Floor	Light timber	0.4
	Render	0.6	Miscellaneous	Miscellaneous	0.5
	Concrete	0.4	Glass	Glass transmittance value	0.80
Ground cover	Paving	0.4		Maintenance factor	0.91
	Tarmac	0.2		Glass adjusted for maintenance	0.73
	Grass	0.2		Frosted glass	0.5

Project Assessment

The results for the study on SDA can be found in the appendix results section C.2 on page 72.

Analysis of the results can be found in section 3.2.1 on page 24.

The results of the supplementary SDA study under the I.S. EN 17037 criterion can be found in section D.0 on page 84.

This study indicates the daylight potential of the proposed development. As-built daylight performance within the occupied development may vary from the results of this assessment due to changes to the exterior context, weather conditions and/or occupiers choice of interior finishes and furniture placement.

2.5.2 Sunlight Exposure in Proposed Habitable Rooms (SE)

Since the publication of the 3rd edition of the BRE Guidelines (BR 209 - 2022), Sunlight Exposure (SE) is the recommended metric for assessing sunlight access within a proposed development. Sunlight Exposure replaces APSH/WPSH in this regard, which was the recommended metric under the 2nd edition of the BRE Guidelines (BR 209 - 2011).

Sunlight exposure (SE) is a measure of sunlight that a given window may expect to receive on a given date between the 1st of February and the 21st of March. Section 3.1.10 of the BRE guidelines suggests that March 21st (equinox) is used as the assessment date.

In the presence of trees, SE results have been generated, both with deciduous trees as opaque objects and without the inclusion of deciduous trees, in accordance with section G3 of the BRE Guidelines. Evergreen trees have been included as opaque objects, where applicable, in both states.

The level of sunlight exposure is categorised as follows:

- 1.5 Hours - Minimum • 3 Hours - Medium • 4 Hours - High

The recommendation for dwellings is that at least one habitable room, preferably a main living room, should receive at least the minimum criterion. Should no room within a given unit meet the recommended minimum level of sunlight exposure, it will be stated as non-compliant.

Sunlight exposure is assessed on habitable rooms within a proposed development. The assessment point for windows is 1.2m above the finished floor level, or 0.3m above the sill level (whichever is higher). If a room has multiple windows, the amount of sunlight received by each can be added together provided they occur at different times and sunlight hours are not double counted.

The criterion applies to rooms of all orientations, although if a room faces significantly north of due east or west it is unlikely to be met. As such, it is not always possible to achieve full compliance, especially in developments that contain single aspect units.

The sunlight exposure assessment focuses on habitable residential rooms. Unless sunlight access is deemed important for the functionality of a non-residential room in a proposed development, it will not be included in the study, which remains limited to residential rooms. In the case of the proposed amendment, the assessment remains limited to the habitable rooms of the 31 no. proposed apartment units.

Project Assessment

The results for the study on sunlight exposure can be found in the appendix results section C.3 on page 77, with analysis of the results in section 3.2.2 on page 25.

This study predicts the sunlight potential of the proposed units. Real-world performance post-construction can vary based on actual weather patterns and any alterations to the external environment.

2.5.3 Sun On Ground in Proposed Outdoor Amenity Areas (SOG)

Section 3.3.17 of the BRE Guidelines recommends that for a garden or amenity area to appear adequately sunlit throughout the year, at least half of it should receive at least two hours of sunlight on March 21st.

March 21st, also known as the spring equinox, is chosen as the assessment date as daytime and night-time are of approximately equal duration on this date.

The analytical model for SOG assessment in proposed amenity areas includes evergreen trees, where applicable, as per section G4.1 of the BRE Guidelines. Typically deciduous trees will not be included unless there is a particularly dense belt.

A quantitative SOG assessment may be carried out on the areas as indicated by the project architect. Shadow studies and false colour plans can allow for a qualitative assessment for all other areas.

The portion of each assessed space capable of receiving 2 hours of direct sunlight on March 21st should be calculated individually. These areas can be combined to give the development average where appropriate.

Project Assessment

The levels of sunlight to proposed amenity areas, as indicated by the architect, have been assessed. However, it should be noted that the numbering of these spaces in the Daylight and Sunlight Assessment Report has been assigned by 3DDB specifically for the purposes of this report. If other consultants are referencing these spaces in their own reports, it is unlikely they will be numbered the same.

The results for the study of sun on ground in the proposed outdoor amenity areas (including a visual representation in the form of 2-hour false colour plans) can be found in the appendix results section C.4 on page 82, with analysis of the results in section 3.2.3 on page 26.

This analysis quantifies the anticipated sunlight levels within the assessed amenity areas. The as-built outcome is subject to variation, depending on real-world weather and any changes to the exterior setting.

2.5.4 No Sky Line in Proposed Habitable Rooms (NSL)

The No Sky Line divides the areas of the working plane which can receive direct skylight, from those which cannot. It indicates the distribution of direct daylight within a room.

Section D3 of the BRE Guidelines recommends the No Sky Line study as an appropriate metric for an impact assessment to daylight, but only where room layouts are known.

"The calculation can only be carried out where room layouts are known. Using estimated room layouts is likely to give inaccurate results and is not recommended."

All advice regarding NSL in the BRE Guidelines (section 2.2) is in relation to impact assessments. NSL is not mentioned in the BRE section regarding daylight in new developments. Nevertheless, an NSL assessment was carried out on the proposed development as a supplementary study as it is requested in the DCC Development Plan 2022-2028 (Section 5.1, Appendix 16). Although the proposed development is not under Dublin City Council's jurisdiction, the NSL study has been included to provide consistency across 3DDB daylight and sunlight assessments.

Since the BRE Guidelines do not provide a recommended minimum NSL for proposed developments, compliance rates are calculated using criteria applied by 3DDB, derived from the logic of the Guidelines. Specifically, an NSL of 80% is considered an appropriate benchmark; this aligns with Section 2.2.10 of the BRE Guidelines, which states that supplementary electric lighting is required if a significant portion of the working plane—defined as 20% or more—lies beyond the No Sky Line.

The results of the supplementary NSL study can be found in section D.0 on page 84.

3.0 Analysis of Results

3.1 Analysis of Impact Assessment Results

3.1.1 Effect on Vertical Sky Component (VSC)



Figure 3.6: Scope of granted properties and proposed elements assessed.

The effect on VSC has been assessed for 82 no. windows/rooms across the granted property groups tagged as A to G surrounding the amended elements of this application:

- Property Group A (1)
- Property Group B (2)
- Property Group C (3)
- Property Group D (4)
- Property Group E (5)
- Property Group F (6)
- Property Group G (7)

Using the rationale explained in section E.2 on page 95, the effect on the VSC of these windows (or rooms if an average of multiple windows has been taken) would be considered:

- negligible: 72 no.
- beneficial impact: 2 no.
- minor adverse: 4 no.
- moderate adverse: 3 no.
- major adverse: 1 no.

For the assessed properties, there are instances where multiple windows serve the same room. In the VSC impact assessment, each individual window is assessed and a weighted average based on the window size is calculated to determine the level of effect on the room. Windows labelled with a hash-tag and a serial number denote that the window is part of a room. The room will be identified with the hash tag, but without the serial number. (e.g. windows 'Xa#1' and 'Xa#2' would determine the weighted VSC for room 'Xa#').

The recorded levels of effect are predominantly 'negligible' (74 of the 82 no. assessed windows/rooms remain BRE compliant in the proposed state). It should be noted that 2 no. rooms, at Houses E1 and E2 (group E, #5 in Figure 3.6), record a 'beneficial impact', with proposed VSC values exceeding their baseline values (ratios of 1.29 and 1.28). This reflects the nature of the proposed amendments: the permitted blocks presented a greater obstruction to these properties than the proposed apartment building that replaces them, and the amendment results in an improvement in the daylight received by these rooms.

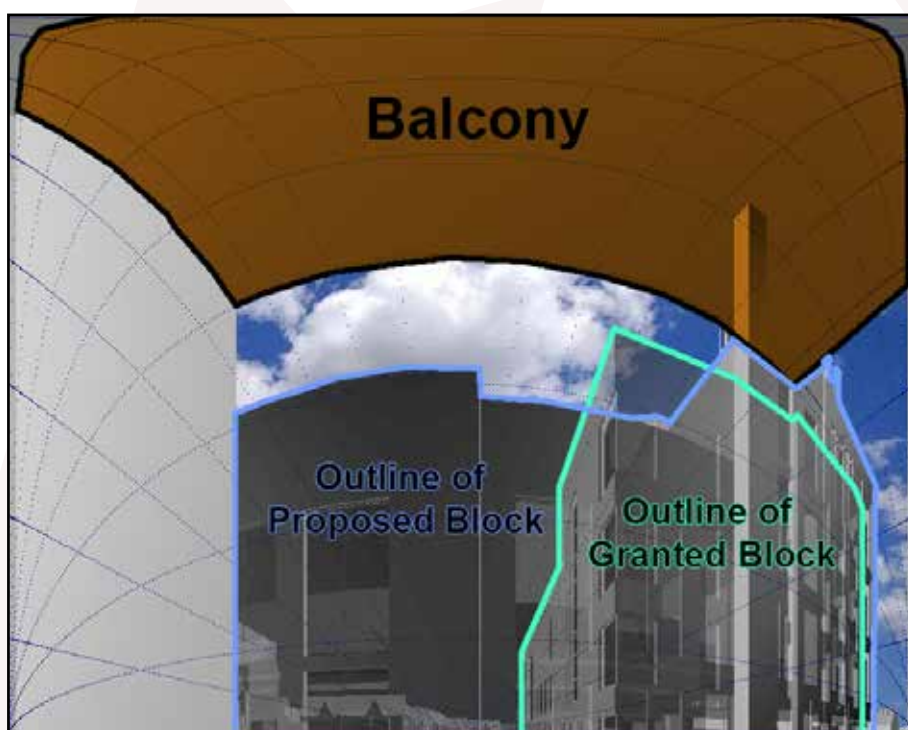


Figure 3.7: View-out from window DB01_Bedroom 1

The adverse levels of effect are concentrated at Duplex B (property group B), where the bedrooms of units DB01, DB02 and DB03 record the highest effects (moderate/moderate/major). The LKDs of the same units recording 'minor' and 'moderate adverse' effects, and at Houses F1 and F2 in group F, where their living rooms record 'minor adverse' effects.

It is noted that the three bedrooms recording the highest adverse effects are located directly below balconies of this granted Duplex B design, as illustrated in the view-out images in Figure 3.7. The overhanging balcony occupies a substantial portion of the sky vault above each window, constraining the baseline VSC values of these bedrooms; a given change in obstruction, from new proposed buildings, consequently produces a proportionally greater reduction in the ratio-based assessment (ratios of change ranging from 0.36 to 0.43). By contrast, the LKDs of the same units and same facade, served by windows not located below balconies, record milder effects, with ratios of change of 0.64 and above, notwithstanding that they face the same amended elements.

The VSC identifies a reduction in the skylight available at the assessed windows; it does not, however, indicate how the daylight within the rooms they serve is affected. In accordance with section 2.2.10 of the BRE Guidelines, a No Sky Line assessment has been carried out for all rooms served by the windows of this assessment, examining the effect on daylight distribution within the rooms; the results are analysed in the following section.

The results of the study on VSC can be found in section A.1 on page 31.

3.1.2 Effect on No Sky Line (NSL)

In accordance with section 2.2.10 of the BRE Guidelines, the effect on the No Sky Line has been assessed for the 82 no. rooms served by the windows of the VSC assessment, with room layouts taken from the design information underpinning the analytical model, as described in 2.2.

Using the rationale explained in section E.2 on page 95, the effect on the NSL of these rooms would be considered:

- negligible: 78 no.
- beneficial impact: 1 no.
- moderate adverse: 2 no.
- major adverse: 1 no.

The results of this assessment considerably narrow the extent of the effects identified by the VSC study. Of the 82 no. rooms assessed, 79 no. (c. 96%) record a BRE-compliant effect on daylight distribution in the proposed model state.

The adverse effects are limited to the same 3 no. bedrooms of Duplex B located below the balconies of the granted design. The bedrooms of units DB01 and DB02 record 'moderate adverse' effects (ratios of 0.49 and 0.43) and the bedroom of unit DB03 records a 'major adverse' effect (ratio of 0.35).

It is worth noting that the other rooms recording adverse effects in the VSC assessment - including the LKDs of the same Duplex B units - record 'negligible' effects on the NSL.

As set out in section 2.2 where a room fails to meet the BRE recommendation for VSC impact but meets the criteria for NSL, this indicates that while the intensity of light reaching the windows is reduced, the distribution of daylight within the room is not adversely affected. For these rooms, the reduction identified at the windows does not translate into a perceptible change in the extent of the room receiving direct skylight.

The results of the study on NSL can be found in section A.2.

For the 3 no. bedrooms recording adverse effects on both the VSC and NSL, a further consideration applies: the VSC and NSL are ratio-based metrics, measuring change relative to the baseline rather than the adequacy of the resulting daylight conditions. As the assessed properties are granted but not yet constructed, a supplementary assessment of the daylight provision within these rooms has been carried out in accordance with Appendix F of the BRE Guidelines; the results are analysed in the following section.

3.1.3 Supplementary Daylight Provision Assessment (SDA) - Impact Assessment

A supplementary SDA assessment has been carried out within the 3 no. bedrooms of Duplex B recording adverse effects in the NSL assessment.

As these rooms form part of the permitted development and are under construction, a supplementary assessment of the daylight provision within them has been carried out in accordance with Appendix F, clause F9(i) of the BRE Guidelines, which identifies the use of illuminance target values (Appendix C) as an appropriate criterion for loss of light where the affected building is one of a series of new buildings designed as part of the same larger group - the precise relationship between the granted units and the proposed amendments.

The assessment was carried out with the proposed amendments in place, against the target illuminance values recommended by the BRE Guidelines (100 lux for bedrooms, to be achieved across at least 50% of the working plane for at least half of the annual daylight hours), applying the same calculation methodology as the scheme performance assessment described in section 2.5.1.

The assessment was run without trees in the model, consistent with the treatment of deciduous trees across the impact assessment metrics of this report.

All 3 no. assessed bedrooms exceed the BRE target for daylight provision in the context of the amended scheme.

- DB01_Bedroom 1: 73%
- DB02_Bedroom 1: 64%
- DB03_Bedroom 1: 65%

These results provide the appropriate context for the adverse categorisations recorded by the VSC and NSL assessments. While the proposed design changes, subject of this amendment application, reduce the skylight available at the windows of these bedrooms relative to the permitted baseline - a reduction amplified by the overhanging balconies of the granted design, the daylight provision within the rooms themselves will meet the recommended illuminance levels of the BRE Guidelines with the amendments in place. It is further noted that this result is achieved without any trees represented in the assessment model; the daylight provision within the affected rooms is therefore a product of the architecture and massing alone, and is not reliant on tree cover.

The results of the VSC and NSL assessments remain the primary reporting metrics of this study.

The supplementary SDA assessment is presented as additional context to those results, in accordance with the framework set out in Appendix F of the BRE Guidelines.

The results of the supplementary assessment can be found in section A.4 on page 60.

3.1.4 Effect on Annual/Winter Probable Sunlight Hours (APSH/WPSH)

The effect on APSH/WPSH has been assessed for 56 no. windows/rooms of the surrounding granted properties across property groups A to D. Only windows that have an orientation within 90 degrees of due south have been included in this assessment.

No APSH/WPSH assessment has been carried out on the windows of property groups E to G on the basis that the windows of these properties that face the proposed amended elements are not orientated within 90° of due south.

Using the rationale explained in section E.2 on page 95, the effect on the APSH of these windows or rooms would be considered:

- negligible: 53 no.
- moderate adverse: 1 no.
- major adverse: 2 no.

The effect on the WPSH of these windows or rooms would be considered:

- negligible: 49 no.
- minor adverse: 3 no.
- moderate adverse: 1 no.
- major adverse: 2 no.

In considering these results, it is relevant to note the weighting the BRE Guidelines apply to sunlight assessment by room use. Section 3.2.3 of the Guidelines directs the assessment of sunlight at the main living rooms of dwellings, and states that sunlight need not be assessed for kitchens and bedrooms, these being regarded as less important in sunlight terms.

As set out in section 2.3.4 of this report, all south-facing windows meeting the proximity criteria have been assessed in this study irrespective of room use, for completeness. The results should, however, be read in that context: the rooms recording the highest adverse effects - the bedrooms of units DB01, DB02 and DB03 - are rooms for which the Guidelines do not require a sunlight assessment, while the rooms at which the Guidelines direct the assessment, the LKDs, record 'negligible' effects on annual sunlight (APSH) throughout, with every assessed LKD remaining BRE compliant on an annual basis in the proposed state.

The winter sunlight (WPSH) results record a broader extent of effect than the annual (APSH) results, reflecting the geometry of the assessment: the assessed properties lie to the north of the amended elements, and the low-altitude winter sun is more susceptible to obstruction than the higher annual sun path. The LKD of unit DB02 records a 'major adverse' effect on winter sunlight. It is noted, however, that this room retains a proposed annual sunlight value of c. 47% APSH - nearly twice the 25% annual criterion - recording a 'negligible' annual effect. The winter effect to this room therefore represents a seasonal reduction within a room that will continue to enjoy sunlight access well in excess of the annual recommendation. The same applies to the LKD of unit DB03 ('minor adverse' winter effect; proposed annual value of c. 41%).

To quantify the contribution of the granted design itself to the recorded effects, a No Balcony study was carried out, with the overhanging balconies of Duplex B omitted from both model states. The results demonstrate the substantial influence of the granted overhangs: on an annual basis, the adverse effects reduce to a single 'minor adverse' effect (the bedroom of unit DB02), with all other windows recording 'negligible' effects. On a winter basis, the effects at unit DB03 reduce to 'negligible' in both its bedroom and LKD, and the remaining effects comprise a 'minor adverse' effect at the bedroom of unit DB01, a 'major adverse' effect at the bedroom of unit DB02, and 'moderate adverse' effects at the LKD of unit DB02 and the bedroom of unit DB04. The higher categorisations of the primary assessment at units DB01 and DB03 are therefore materially attributable to the overhanging balconies of the granted design. It is noted that the results for the bedroom of unit DB04 are unchanged between the two studies, its window not being influenced by the balcony elements; the winter effect to this room, which records a 'negligible' effect on annual sunlight and is a bedroom, for which the Guidelines regard sunlight as less important, arises from the amended massing itself.

The most affected receptor across the sunlight metrics is the bedroom of unit DB02, which records adverse effects on both annual and winter sunlight in the primary assessment and retains a winter effect in the No Balcony study. It is reiterated that this is a bedroom and that the daylight provision within this room is separately demonstrated to meet the recommended illuminance levels of the BRE Guidelines.

The results of the study on APSH/WPSH can be found in Section A.3 on page 49.

3.1.5 Effect on Sun On Ground in Granted Gardens

No quantitative comparative SOG assessment has been carried out. The gardens and amenity areas serving the granted property groups considered for the impact assessment are located mostly behind the granted blocks relative to the proposed amendments. Granted property blocks considered are indicated in the figure below (Group A (1), Group B (2), Group C (3), Group D (4), Group E (5), Group F (6), Group G (7).

The proposed Village Green public open space adjoining the amended Neighbourhood Centre and the communal open space of the Apartment Block, have been assessed quantitatively in the proposed state as part of the scheme performance assessment, achieving the BRE recommendation.

A false colour plan of the proposed model state can be found in section C.4 on page 82 and allows for a qualitative sunlight assessment of the surrounding areas.

The comparative shadow study in section B.1 on page 61 illustrates the variation in shadow patterns between the permitted and amended schemes across the surrounding amenity areas on the three key assessment dates.

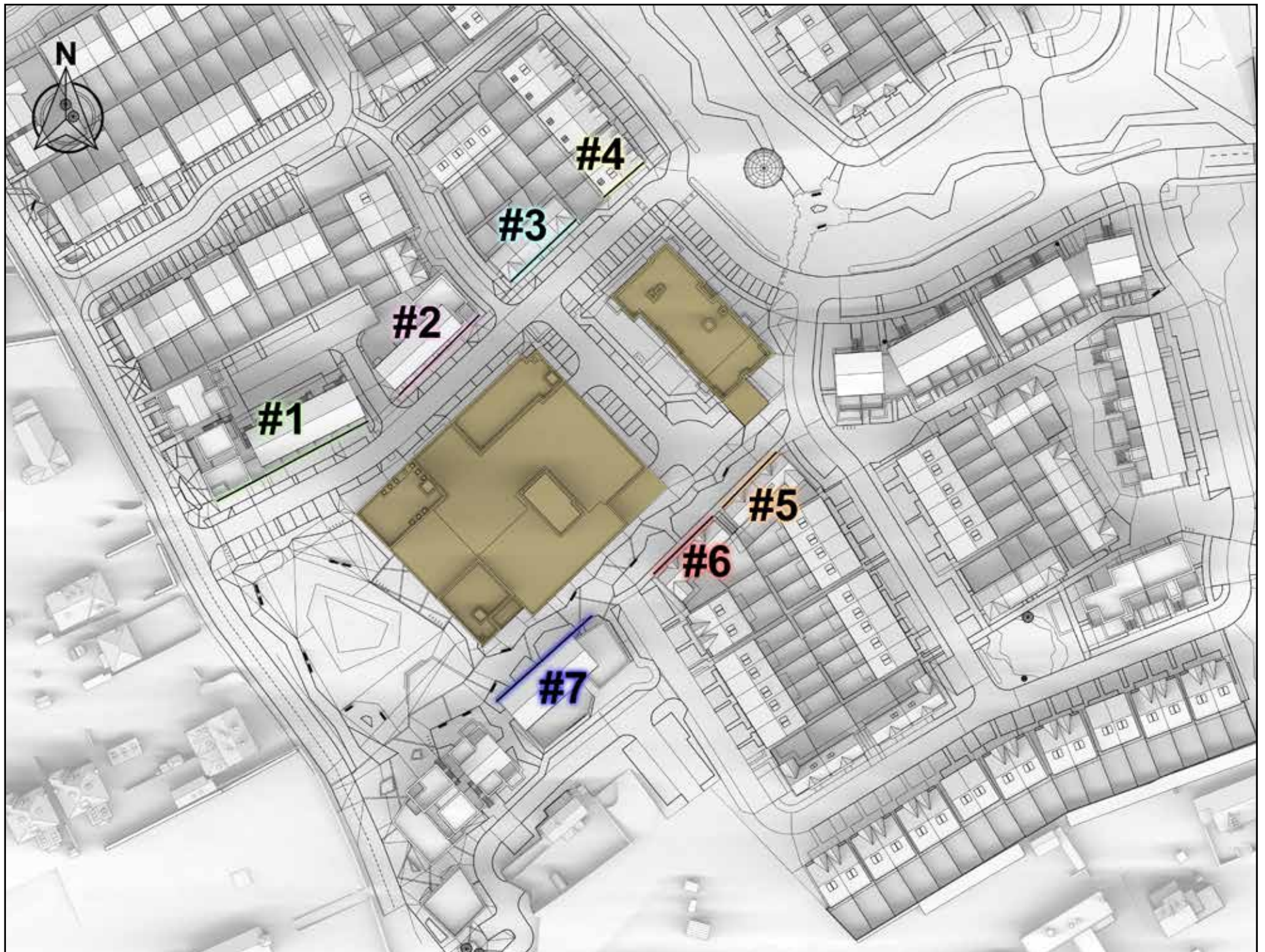


Figure 3.8: Proposed Blocks of this amendment application highlighted

3.2 Analysis of Scheme Performance Results

3.2.1 Spatial Daylight Autonomy (SDA)

This study has assessed the Spatial Daylight Autonomy (SDA) for all the habitable rooms within the proposed apartment block of this amendment application. Rooms were tested with and without trees in the analytical model. This dual approach ensures a comprehensive understanding of the development's daylight potential.

The amended Neighbourhood Centre building comprises retail, commercial and medical uses, and does not contain habitable rooms as defined by the BRE Guidelines; it has therefore not been included in the scheme performance assessment.

This proposed apartment block consists of 31 no. units, which makes up approximately 88 no. habitable rooms.

In the assessment including trees, 87 of the 88 no. assessed rooms (c. 99%) meet their target illuminance. This result is unchanged in the assessment without trees: no room's compliance is affected by the presence of trees in the model.



Figure 3.9: Underperforming room - Ground-Floor level

The single non-compliant room is the LKD of unit A.06, at ground floor level, which achieves the 200 lux target across 21% of the working plane in the assessment with trees (32% without trees), against the 50% recommendation. The result is explained by the room's position within the proposed building: as illustrated in Figure 3.9, the window of this LKD is flanked by a projecting wall of the building's own massing, which constrains the room's access to the sky. The equivalent mirrored LKD across the entrance core (unit A.02) - similarly served by a window below a balcony, but with a reduced flanking obstruction and oriented towards an open area - achieves 86% (60% with trees) and is compliant in both states, demonstrating that the shortfall at unit A.06 is a localised geometric condition.

Noteworthy, while non-compliant against its 200 lux target - the higher value applicable to the room's combined kitchen, living and dining function - the daylight achieved within the room warrants context. In the assessment without trees, the median illuminance recorded across the working plane is 150 lux, meaning that 50% of the working plane achieves 150 lux or more for at least half of the annual daylight hours: the level the BRE Guidelines recommend for living rooms. The daylight provision within the room is therefore consistent with that of a compliant living space, with the shortfall arising against the more onerous target attaching to the kitchen function. In the assessment with trees at their expected mature size in 10 years, the median illuminance recorded is 123 lux; meaning that the daylight conditions experienced by occupants will range seasonally between these values.

Having regard to the localised nature of this single shortfall, the daylight performance achieved within the room itself, and the compensatory design measures described below, the outcome can be considered an excellent level of compliance for the residential units within the amended elements of the proposed application as a whole.

I.S. EN 17037 sets out more onerous recommendations for SDA. As such, the number of habitable rooms achieving compliance under this standard is 80 in the assessment that includes trees. This gives a circa compliance rate of 91%. The additional SDA assessment, under this standard, that does not include trees has shown a compliance rate of c. 99%.

In cases where rooms comply with the criteria of BR 209 but do not meet the criteria of I.S. EN 17037, it is the recommendation of 3D Design Bureau that these rooms will be adequately daylight. This recommendation is based on the fact that BR 209 provides room-specific criteria, unlike I.S. EN 17037. BR 209 considers the varying daylight requirements for different room types, which I.S. EN 17037 does not account for.

Floor plans indicating unit numbers can be found in section C.1 on page 70. The results for the study on SDA can be seen in section C.2 on page 72.

Compensatory Design Solutions (CDS)

This report identifies where assessed rooms do not meet the daylight targets set in section 2.1 of the BRE Guidelines. It is intended to inform the planning authority's discretionary review, which is based on an assessment of the project's specific circumstances.

The following list details each unit and room that does not achieve the recommended daylight levels in BR 209. The project architect has provided a rationale and/or a compensatory design solution for the only unit containing a room below the compliance threshold:

Unit A.06: provides a total floor area of 79.80 m², exceeding the 76 m² minimum requirement for its unit type; the unit is served by 2.25 metre tall windows, maximising the daylight admitted through the available facade; and the communal open space provided for the proposal exceeds the minimum requirement.

3.2.2 Sunlight Exposure (SE)

A sunlight exposure assessment has been carried out on all habitable rooms within the residential units of the proposed apartment block. As part of this assessment, both existing surrounding trees and proposed trees have been incorporated into the analytical model and treated as opaque elements.

The assessments have been carried out in two states:

- All trees (evergreen and deciduous) included in the assessment model.
- Only evergreen trees included in the assessment model.

This approach provides a range of potential sunlight hours, accounting for the seasonal variability of deciduous trees and is in accordance with section G3 of the BRE Guidelines.

In total, 31 no. units have been assessed. Using the rationale explained in section E.3 on page 96, the level of sunlight exposure for the assessed units is as follows:

In the assessment carried out with all tree types:

- high: 18 no. (at least 4 hours)
- medium: 0 no. (at least 3 hours)
- minimum: 5 no. (at least 1.5 hours)
- below minimum recommendation: 8 no. (less than 1.5 hours)

With only evergreen trees included in the assessment model:

- high: 19 no. (at least 4 hours)
- medium: 0 no. (at least 3 hours)
- minimum: 4 no. (at least 1.5 hours)
- below minimum recommendation: 8 no. (less than 1.5 hours)

The SE assessment has shown that the compliance rate for the assessed units, in accordance with the BRE Guidelines, is c. 74% in both assessment states: no unit's compliance is affected by the presence of deciduous trees in the model.

Note: For a unit to be compliant under BR 209, at least one habitable room within the unit needs to meet the guideline values.

Whilst the criterion applies to rooms of all orientations, it should be noted that if a room faces significantly north of due east or west it is unlikely to be met. As such, it is not always possible to achieve full compliance, especially in developments that contain single aspect units.



Figure 3.10: Underperforming stacked units location



Figure 3.11: Underperforming single-aspect units highlighted

The result of the proposed development is directly explained by this orientation principle, as illustrated in the above Figure. The 8 no. non-compliant units comprise two vertical stacks of single-aspect units - units A.02, A.09, A.17 and A.25, and units A.03, A.10, A.18 and A.26, at ground to third floor level respectively - whose habitable rooms are solely oriented to the north-east. Every dual-aspect unit within the proposed building is compliant, as is every single-aspect unit oriented to the south-west, demonstrating that the recorded non-compliance is a function of orientation rather than of obstruction or design. It is further noted that the majority of the compliant units - 18 no. - achieve a 'High' rating, indicating sunlight access well in excess of the recommended minimum.

The non-compliant units nonetheless receive some level of direct sunlight: between 0.8 and 1.4 hours in the assessment with only evergreen trees, and between 0.3 and 1.4 hours in the assessment with all tree types, against the 1.5-hour recommended minimum.

No recommendation is made regarding the performance of a development as a whole for SE performance within the BRE Guidelines. However, it is the opinion of 3DDB that the proposed development performs favourably in this regard.

The results for the study on SE in the habitable rooms of the proposed units can be seen in section C.3 on page 77.

3.2.3 Sun On Ground in Proposed Outdoor Amenity Areas

This study has assessed the level of sunlight on March 21st within the proposed amenity areas as indicated in Figure 3.12 below.

In total 2 no. spaces have been assessed, both of which meet the criteria as set out in section 3.3 of the BRE Guidelines.

The assessed spaces comprises the Village Green public open space (#1) adjoining the amended Neighbourhood Centre building and the communal open space (#2) serving the proposed Apartment Block - the amenity spaces with the greatest potential to be influenced by the amended massing, given their immediate proximity to the enlarged building. The spaces achieve 2 hours of direct sunlight on March 21st across 99.7% and 100% of their areas, respectively, against the BRE recommendation that at least half of the area should achieve this level. The result demonstrates that, notwithstanding the increased massing of the amended Neighbourhood Centre, the adjoining amenity spaces will remain very well sunlit, meeting the BRE criterion by a substantial margin.

The remaining amenity provision of the permitted development is unaffected by the proposed amendments in sunlight terms and was assessed as part of the parent application.

The results for the study on sunlighting in the proposed outdoor amenity spaces can be found in section C.4 on page 82.

A visual representation of these readings can be seen in the false colour plan in section C.4 and in the hourly shadow diagrams for March 21st in section B.1 on page 61 of the appendix section of this report.



Figure 3.12: Indication of the amenity area that has been analysed

4.0 Conclusion

3D Design Bureau (3DDB) were commissioned to carry out a daylight assessment, sunlight assessment and shadow study for the proposed amendments to the permitted residential development at Kilternan Village, Co. Dublin (parent permission DLRCC Reg. Ref. LRD24A/0597).

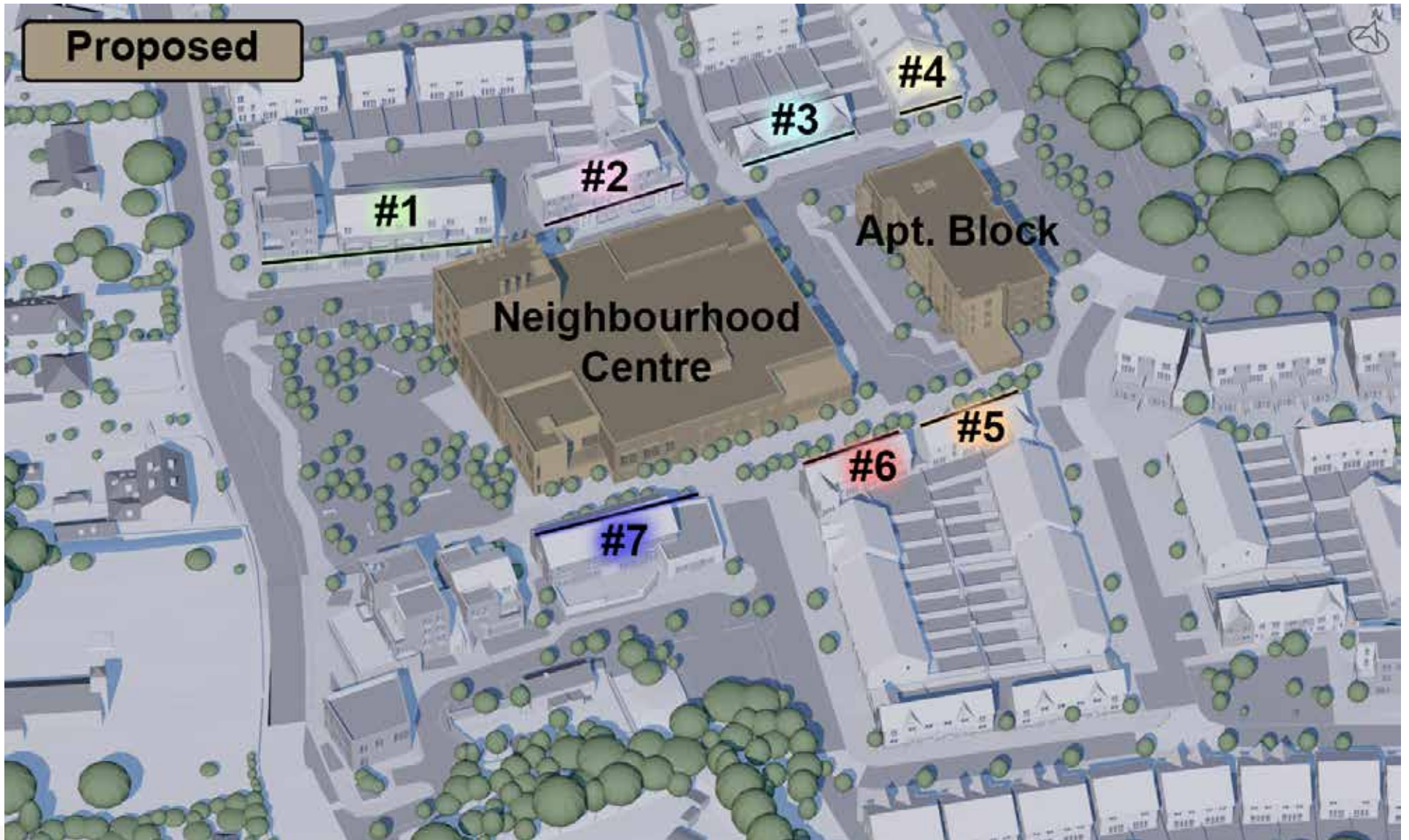


Figure 4.1: Scope of surrounding properties and environment assessed.

- **Impact Assessment:**

The impact assessment for this report has quantified the effect the proposed amendments would have on the level of daylight and sunlight received by the surrounding granted properties that fall under the criteria outlined in section “2.1 Impact Assessment, Window Selection Criteria” on page 8. These include the granted property groups A to G as indicated in Figure 4.1 above (Property Group A (1), Property Group B (2), Property Group C (3), Property Group D (4), Property Group E (5), Property Group F (6), Property Group G (7)).

The recorded levels of effect are predominantly ‘negligible’ across all assessed metrics: 74 of the 82 no. assessed windows/rooms record BRE-compliant effects on VSC, 79 no. of rooms record BRE-compliant effects on NSL, and 53 of the 56 no. south-facing windows/rooms record ‘negligible’ effects on annual sunlight.

Beneficial impacts are also recorded, at the living rooms of dwellings E1 and E2 (VSC) and at property group C (NSL and WPSH), reflecting that the proposed apartment building presents a lesser obstruction to certain properties than the permitted duplex blocks it replaces.

The adverse effects are concentrated at Duplex B (property group B) and arise principally at 3 no. bedrooms located directly below the overhanging balconies of the granted design - a self-obstructing feature that constrains these windows’ access to the sky and sun irrespective of the proposed amendments, as demonstrated by the No Balcony study carried out for the sunlight metrics. As the affected properties are granted but not yet constructed and form part of the same overall development, a supplementary daylight provision assessment (SDA) was carried out within these rooms in accordance with Appendix F of the BRE Guidelines: all 3 no. bedrooms will exceed the BRE target illuminance with the amended scheme in place.

In sunlight terms, the adverse annual effects are confined to the same 3 no. bedrooms - rooms for which the BRE Guidelines do not require a sunlight assessment - while every assessed living space remains BRE compliant on an annual basis in the proposed state. A small number of additional effects arise on winter sunlight only, within rooms that retain annual sunlight values well in excess of the recommended minimum. The No Balcony sensitivity study demonstrates that the recorded levels of effect are materially attributable to the overhanging balconies of the granted design itself.

No granted amenity space is materially affected by the proposed amendments, as demonstrated by the comparative shadow study.

- **Scheme Performance:**

The scheme performance assessment for this report has quantified the level of daylight (SDA) and sunlight (SE) within the proposed development.

The daylight performance of the proposed apartment building has returned excellent results: 87 of the 88 no. assessed habitable rooms (c. 99%) meet their target illuminance, a result unchanged by the presence or absence of trees in the model. The single non-compliant room, the LKD of unit A.06, is constrained by a localised projection of the building's own massing, and the daylight achieved within it corresponds to the BRE recommendation for living rooms, with the shortfall arising only against the higher target attaching to its kitchen function.

The sunlight performance of the proposed units reflects their orientation within the wider masterplan: c. 74% of units are compliant in both assessment states, every dual-aspect unit is compliant, and the majority of compliant units achieve a 'High' rating, in excess of 4 hours of direct sunlight. The 8 no. non-compliant units comprise two vertical stacks of single-aspect north-east facing units - an orientation the BRE Guidelines acknowledge is unlikely to meet the criterion - and all receive some level of direct sunlight.

Finally, the Sun on Ground assessment demonstrates that the 2 no. amenity open spaces adjoining the amended proposed elements of this amendment application will receive 2 hours of direct sunlight on March 21st across at least 99.7% of their areas - nearly double the BRE recommendation - confirming that these amenity spaces will remain very well sunlit with the amendments in place.

Having regard to the above, it is the opinion of 3DDB that the proposed amendments will not give rise to any material deterioration in the daylight and sunlight amenity of the surrounding granted development, that the rooms recording adverse effects will remain adequately daylit with the amendments in place, and that the daylight and sunlight performance of the proposed development is favourable in the context of the BRE Guidelines.

Appendix - Results



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Assessment criteria and detailed analysis of results can be found in the accompanying report.

A.0 Impact Assessment Results

A.1 Effect on Vertical Sky Component (VSC)

Below is an example of the table used to describe the effect on VSC.

Table Example. A.1 - VSC Impact Assessment						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended Minimum VSC	Level of Compliance with BRE Guidelines	Effect of Proposed Development
A	B	C	D	E	F	G

A: Window Number

The number in this column will identify the assessed window. All windows are represented visually in the corresponding figure.

B: Baseline VSC Value

The *Baseline VSC Value* represents the VSC value of the assessed window which is calculated in the existing baseline model state (as explained in the “Building the Model States” on page 10).

C: Proposed VSC Value

The *Proposed VSC Value* represents the VSC value of the assessed window which is calculated in the proposed model state (as explained in the “Building the Model States” on page 10).

D: Ratio of Proposed VSC to Baseline VSC

This column expresses the ratio of change between the baseline VSC value and the proposed VSC value. Section 2.2.23 of the BRE Guidelines recommend that if the proposed value is less than 0.8 times the baseline value, then the reduction in daylight is more likely to be perceptible.

E: Recommended minimum VSC

The *BRE Target Value* for each window has been set according to section 2.2.23 of the BRE Guidelines. The Guidelines state that a proposed development could possibly have a noticeable effect on the daylight received by an existing window, if the VSC value **both** drops below the guideline value of 27% **and** the VSC value is less than 0.8 times the baseline value.

Therefore, to determine the *recommended minimum Value*, 80% of the *Baseline VSC value* has been calculated. If this value is above the 27% threshold, a target value of 27% will be applied. If 80% of the baseline value is below 27%, then 80% of the baseline value is the appropriate target value.

F: Level of Compliance with the BRE Guidelines

This column states the compliance of the *Proposed VSC Value* with the *recommended minimum VSC* as per the BRE Guidelines. In essence, it shows whether or not the assessed window would experience a perceptible level of impact. If the window complies with the BRE Guidelines this cell will state “*BRE Compliant*”. If the window does not meet the criteria as set out in the BRE Guidelines, a percentage of compliance with the *recommended minimum* will be stated.

G: Effect of Proposed Development

The levels of effect in this column describe the effect an assessed window will experience, based on its compliance with the *BRE Target Value*. A full list of definitions and a numerical rationale for each can be found in the section “*Definition of Effects*” on page 95.

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation of these figures may yield a negligible difference and should not be considered an error.

A.1.1 Property Group A

Table No. A.1.1 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DA02_LKDa#1	35.85%	35.46%	0.99	27.00%	BRE Compliant	-
DA02_LKDa#2	35.62%	35.15%	0.99	27.00%	BRE Compliant	-
DA02_LKDa#3	14.63%	14.29%	0.98	11.70%	BRE Compliant	-
DA02_LKDa#4	9.07%	8.92%	0.98	7.26%	BRE Compliant	-
DA02_LKDa#	23.52%	23.16%	0.98	18.82%	BRE Compliant	Negligible
DA03_Kitchen Dining#1	17.90%	17.42%	0.97	14.32%	BRE Compliant	-
DA03_Kitchen Dining#2	18.30%	17.91%	0.98	14.64%	BRE Compliant	-
DA03_Kitchen Dining#	18.04%	17.59%	0.98	14.43%	BRE Compliant	Negligible
DA03_Bed1	34.97%	34.28%	0.98	27.00%	BRE Compliant	Negligible
DA04_Kitchen Dining#1	17.20%	16.31%	0.95	13.76%	BRE Compliant	-
DA04_Kitchen Dining#2	21.33%	20.80%	0.98	17.06%	BRE Compliant	-
DA04_Kitchen Dining#	19.91%	19.25%	0.97	15.93%	BRE Compliant	Negligible
DA04_Bed1	34.79%	33.73%	0.97	27.00%	BRE Compliant	Negligible
DA05_Kitchen Dining#1	18.98%	17.44%	0.92	15.18%	BRE Compliant	-
DA05_Kitchen Dining#2	18.50%	17.87%	0.97	14.80%	BRE Compliant	-
DA05_Kitchen Dining#	18.81%	17.59%	0.93	15.05%	BRE Compliant	Negligible
DA05_Bed1	34.24%	32.69%	0.95	27.00%	BRE Compliant	Negligible
DA06_Kitchen Dining#1	14.67%	12.64%	0.86	11.74%	BRE Compliant	-
DA06_Kitchen Dining#2	18.58%	16.90%	0.91	14.86%	BRE Compliant	-
DA06_Kitchen Dining#	17.23%	15.43%	0.90	13.79%	BRE Compliant	Negligible
DA06_Bed1	32.63%	30.44%	0.93	26.10%	BRE Compliant	Negligible
DA07_Kitchen Dining#1	23.49%	20.75%	0.88	18.79%	BRE Compliant	-
DA07_Kitchen Dining#2	27.70%	24.82%	0.90	22.16%	BRE Compliant	-
DA07_Kitchen Dining#	24.21%	21.45%	0.89	19.37%	BRE Compliant	Negligible
DA07_Bed1	31.75%	29.40%	0.93	25.40%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

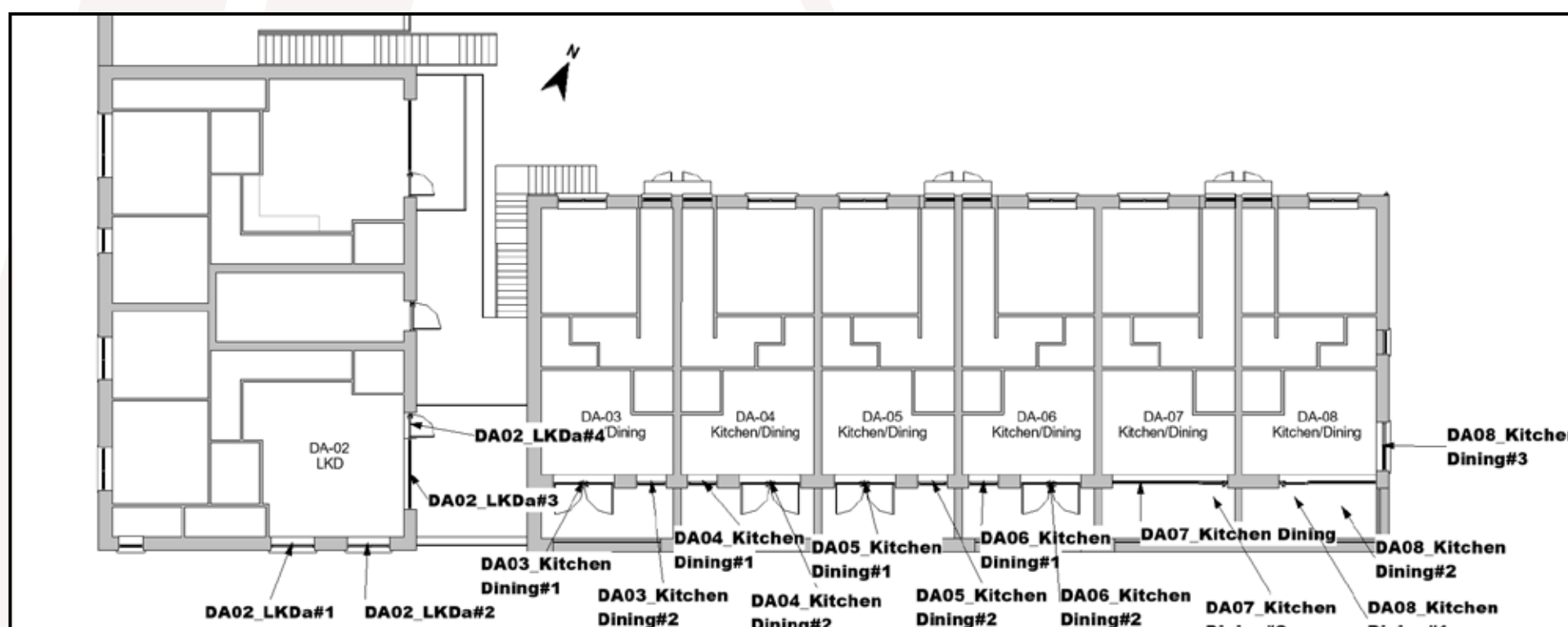


Figure A.1: Floorplans with indication of the assessed windows/rooms

A.1.2 Property Group A

Table No. A.1.2 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DA08_Kitchen Dining#1	28.51%	25.51%	0.89	22.81%	BRE Compliant	-
DA08_Kitchen Dining#2	28.25%	25.28%	0.89	22.60%	BRE Compliant	-
DA08_Kitchen Dining#3	29.89%	28.45%	0.95	23.91%	BRE Compliant	-
DA08_Kitchen Dining#	28.82%	26.35%	0.91	23.06%	BRE Compliant	Negligible
DA08_Bed1	30.54%	28.27%	0.93	24.43%	BRE Compliant	Negligible
DA09_KD#1	16.17%	16.17%	1.00	12.94%	BRE Compliant	-
DA09_KD#2	20.19%	20.19%	1.00	16.15%	BRE Compliant	-
DA09_KD#3	36.74%	36.40%	0.99	27.00%	BRE Compliant	-
DA09_KD#4	36.56%	36.15%	0.99	27.00%	BRE Compliant	-
DA09_KD#5	25.55%	24.87%	0.97	20.44%	BRE Compliant	-
DA09_KD#	28.89%	28.61%	0.99	23.11%	BRE Compliant	Negligible
DA09_Living#1	38.18%	38.18%	1.00	27.00%	BRE Compliant	-
DA09_Living#2	25.06%	25.02%	1.00	20.05%	BRE Compliant	-
DA09_Living#3	22.65%	22.65%	1.00	18.12%	BRE Compliant	-
DA09_Living#	27.46%	27.45%	1.00	21.97%	BRE Compliant	Negligible
DA09_Bed1#1	38.24%	38.24%	1.00	27.00%	BRE Compliant	-
DA09_Bed1#2	17.68%	17.64%	1.00	14.14%	BRE Compliant	-
DA09_Bed1#	31.39%	31.38%	1.00	25.12%	BRE Compliant	Negligible
DA09_Bed2#1	37.30%	36.94%	0.99	27.00%	BRE Compliant	-
DA09_Bed2#2	32.84%	32.30%	0.98	26.27%	BRE Compliant	-
DA09_Bed2#	35.82%	35.40%	0.99	27.00%	BRE Compliant	Negligible
DA09_Bed3#1	13.30%	13.30%	1.00	10.64%	BRE Compliant	-
DA09_Bed3#2	37.42%	37.12%	0.99	27.00%	BRE Compliant	-
DA09_Bed3#	29.39%	29.19%	0.99	23.51%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

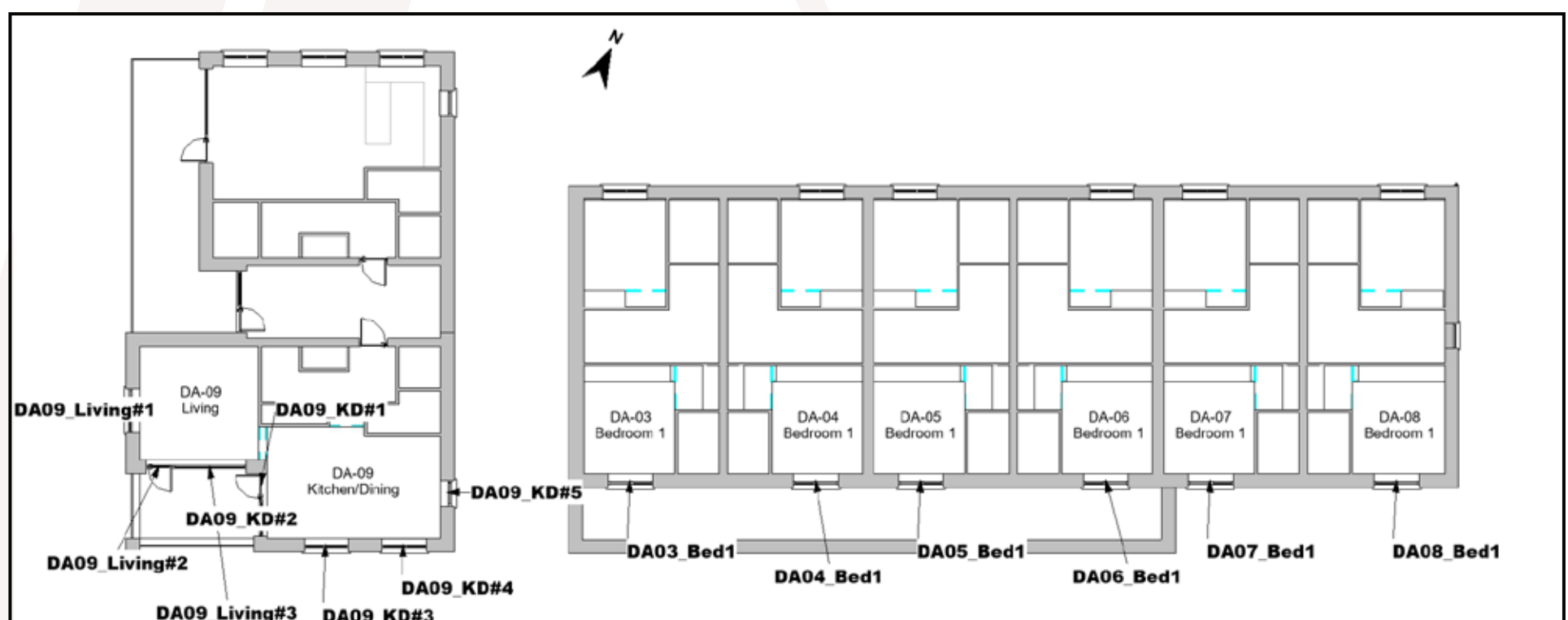


Figure A.2: Floorplans with indication of the assessed windows/rooms

A.1.3 Property Group B

Table No. A.1.3 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB01_Bedroom 1	10.44%	4.44%	0.43	8.35%	53%	Moderate Adverse
DB01_LKD#1	22.31%	15.60%	0.70	17.85%	87%	-
DB01_LKD#2	20.67%	13.51%	0.65	16.54%	82%	-
DB01_LKD#	20.82%	13.70%	0.66	16.65%	82%	Minor Adverse
DB02_Bedroom 1	13.25%	5.25%	0.40	10.60%	50%	Moderate Adverse
DB02_LKD#1	22.85%	14.46%	0.63	18.28%	79%	-
DB02_LKD#2	24.53%	16.26%	0.66	19.62%	83%	-
DB02_LKD#	23.00%	14.62%	0.64	18.40%	79%	Moderate Adverse
DB03_Bedroom 1	12.45%	4.44%	0.36	9.96%	45%	Major Adverse
DB03_LKD#1	25.20%	17.09%	0.68	20.16%	85%	-
DB03_LKD#2	22.82%	14.41%	0.63	18.26%	79%	-
DB03_LKD#	23.03%	14.66%	0.64	18.43%	80%	Minor Adverse
DB04_Bed1#1	23.61%	18.72%	0.79	18.89%	99%	-
DB04_Bed1#2	26.52%	21.05%	0.79	21.22%	99%	-
DB04_Bed1#3	29.59%	29.87%	1.01	23.67%	BRE Compliant	-
DB04_Bed1#	26.47%	23.53%	0.89	21.17%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

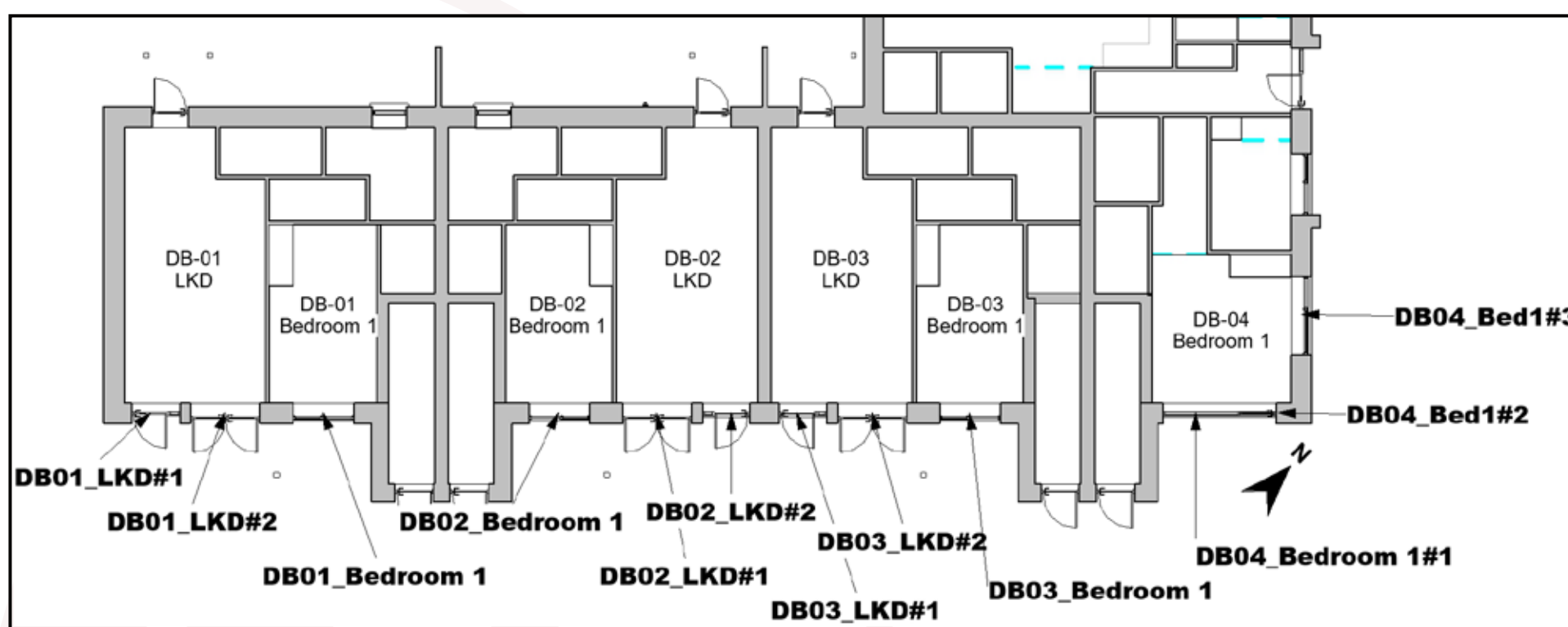


Figure A.3: Floorplans with indication of the assessed windows/rooms

A.1.4 Property Group B

Table No. A.1.4 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB05_LKD#1	31.47%	26.36%	0.84	25.18%	BRE Compliant	-
DB05_LKD#2	30.79%	25.40%	0.82	24.63%	BRE Compliant	-
DB05_LKD#3	29.19%	24.14%	0.83	23.35%	BRE Compliant	-
DB05_LKD#	30.84%	25.65%	0.83	24.67%	BRE Compliant	Negligible
DB05_Bed1	33.19%	30.46%	0.92	26.55%	BRE Compliant	Negligible
DB05_Bed2	33.99%	31.07%	0.91	27.00%	BRE Compliant	Negligible
DB05_Bed3	32.62%	29.77%	0.91	26.10%	BRE Compliant	Negligible
DB06_LKD#1	30.47%	24.68%	0.81	24.38%	BRE Compliant	-
DB06_LKD#2	31.86%	25.90%	0.81	25.49%	BRE Compliant	-
DB06_LKD#3	33.51%	27.40%	0.82	26.81%	BRE Compliant	-
DB06_LKD#	32.44%	26.43%	0.81	25.95%	BRE Compliant	Negligible
DB06_Bed1	34.97%	31.67%	0.91	27.00%	BRE Compliant	Negligible
DB06_Bed2	34.46%	31.34%	0.91	27.00%	BRE Compliant	Negligible
DB06_Bed3	33.69%	30.43%	0.90	26.95%	BRE Compliant	Negligible
DB07_LKD#1	33.77%	27.70%	0.82	27.00%	BRE Compliant	-
DB07_LKD#2	32.55%	26.75%	0.82	26.04%	BRE Compliant	-
DB07_LKD#3	31.15%	25.46%	0.82	24.92%	BRE Compliant	-
DB07_LKD#	32.91%	26.99%	0.82	26.33%	BRE Compliant	Negligible
DB07_Bed1	35.17%	31.86%	0.91	27.00%	BRE Compliant	Negligible
DB07_Bed2	35.39%	32.24%	0.91	27.00%	BRE Compliant	Negligible
DB07_Bed3	34.27%	30.99%	0.90	27.00%	BRE Compliant	Negligible
DB08_LKD#1	23.27%	21.65%	0.93	18.62%	BRE Compliant	-
DB08_LKD#2	28.23%	25.84%	0.92	22.58%	BRE Compliant	-
DB08_LKD#3	33.69%	33.78%	1.00	26.95%	BRE Compliant	-
DB08_LKD#4	32.88%	32.89%	1.00	26.30%	BRE Compliant	-
DB08_LKD#	29.95%	28.94%	0.97	23.96%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

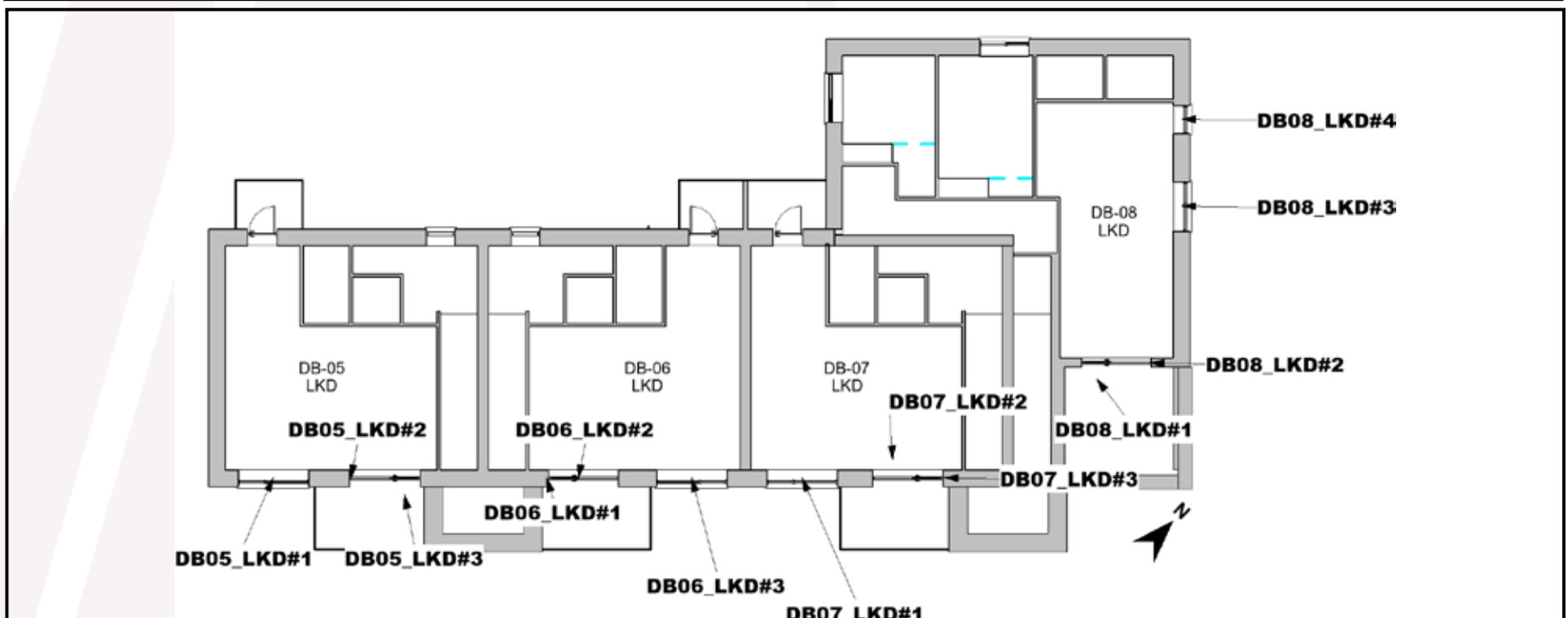


Figure A.4: Floorplans with indication of the assessed windows/rooms

A.1.5 Property Group C

Table No. A.1.5 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House C1_LKD2	28.93%	29.70%	1.03	23.14%	BRE Compliant	Negligible
House C1_Bd1	31.60%	32.11%	1.02	25.28%	BRE Compliant	Negligible
House C1_Bd2#1	31.12%	31.42%	1.01	24.90%	BRE Compliant	-
House C1_Bd2#2	31.52%	30.20%	0.96	25.22%	BRE Compliant	-
House C1_Bd2#3	31.18%	30.03%	0.96	24.94%	BRE Compliant	-
House C1_Bd2#	31.27%	30.55%	0.98	25.02%	BRE Compliant	Negligible
House C2_LKD1	28.58%	29.25%	1.02	22.86%	BRE Compliant	Negligible
House C2_Bd1	30.53%	30.96%	1.01	24.42%	BRE Compliant	Negligible
House C2_Bd2	30.42%	30.61%	1.01	24.34%	BRE Compliant	Negligible
House C3_LKD1	29.53%	28.96%	0.98	23.62%	BRE Compliant	Negligible
House C3_Bd1	31.27%	30.58%	0.98	25.02%	BRE Compliant	Negligible
House C3_Bd2	30.69%	30.47%	0.99	24.55%	BRE Compliant	Negligible
House C4_LKD	30.19%	28.94%	0.96	24.15%	BRE Compliant	Negligible
House C4_Bd1	32.68%	31.46%	0.96	26.14%	BRE Compliant	Negligible
House C4_Bd2#1	32.38%	30.74%	0.95	25.90%	BRE Compliant	-
House C4_Bd2#2	30.94%	30.66%	0.99	24.75%	BRE Compliant	-
House C4_Bd2#3	30.18%	29.96%	0.99	24.14%	BRE Compliant	-
House C4_Bd2#	31.17%	30.45%	0.98	24.93%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

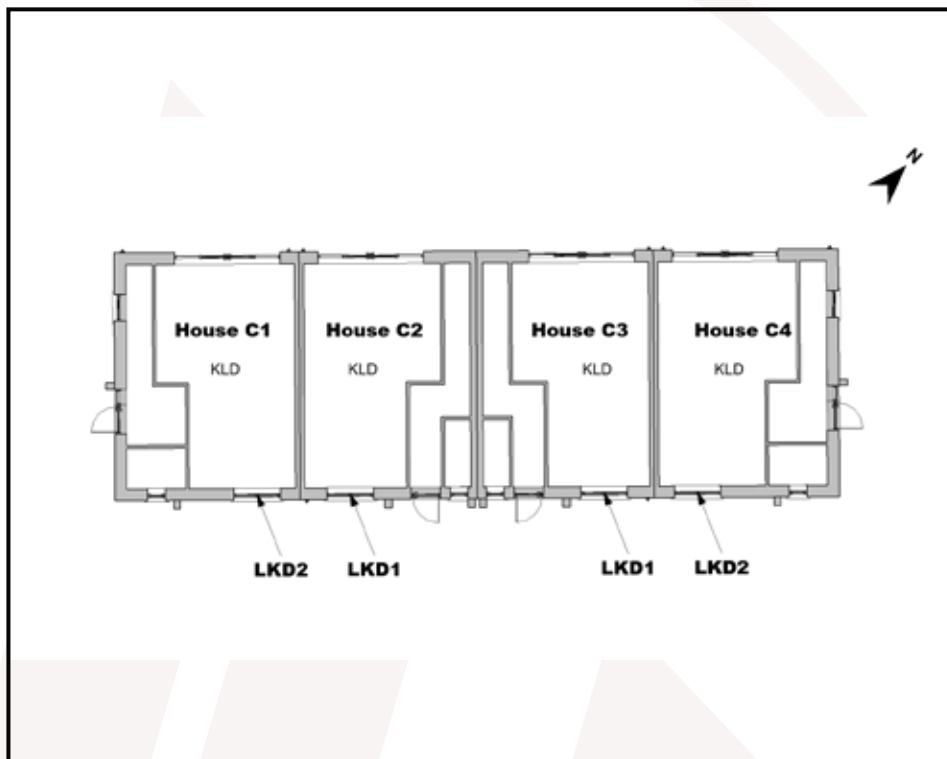


Figure A.5: Floorplans with indication of the assessed windows/rooms

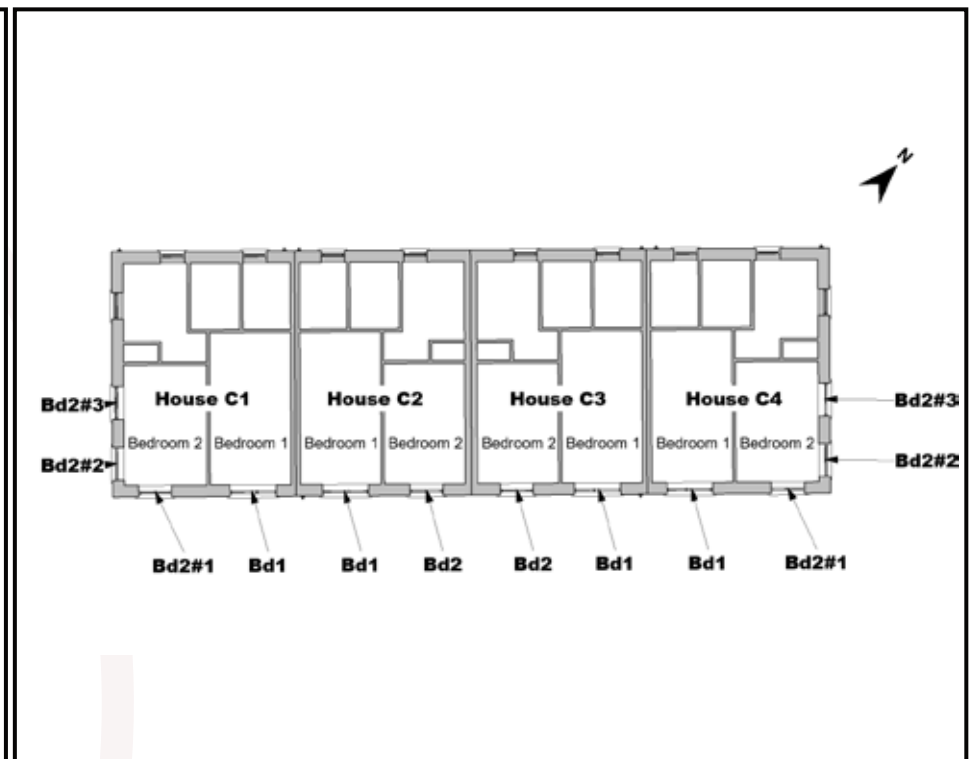


Figure A.6: Floorplans with indication of the assessed windows/rooms

A.1.6 Property Group D

Table No. A.1.6 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House D1_KD#1	27.91%	27.65%	0.99	22.33%	BRE Compliant	-
House D1_KD#2	26.25%	25.93%	0.99	21.00%	BRE Compliant	-
House D1_KD#3	28.43%	26.47%	0.93	22.74%	BRE Compliant	-
House D1_KD#4	29.69%	27.97%	0.94	23.75%	BRE Compliant	-
House D1_KD#	28.03%	27.17%	0.97	22.42%	BRE Compliant	Negligible
House D1_LR#1	34.78%	34.78%	1.00	27.00%	BRE Compliant	-
House D1_LR#2	35.33%	35.33%	1.00	27.00%	BRE Compliant	-
House D1_LR#3	34.51%	34.51%	1.00	27.00%	BRE Compliant	-
House D1_LR#4	30.71%	29.07%	0.95	24.57%	BRE Compliant	-
House D1_LR#5	30.42%	28.74%	0.94	24.34%	BRE Compliant	-
House D1_LR#	33.85%	33.46%	0.99	27.00%	BRE Compliant	Negligible
House D1_Bd3#1	31.28%	30.94%	0.99	25.02%	BRE Compliant	-
House D1_Bd3#2	31.03%	29.31%	0.94	24.82%	BRE Compliant	-
House D1_Bd3#3	32.28%	30.67%	0.95	25.82%	BRE Compliant	-
House D1_Bd3#	31.79%	30.57%	0.96	25.43%	BRE Compliant	Negligible
House D1_Bd4	31.33%	31.17%	0.99	25.06%	BRE Compliant	Negligible
House D1_EntR#1	36.33%	36.33%	1.00	27.00%	BRE Compliant	-
House D1_EntR#2	36.26%	36.26%	1.00	27.00%	BRE Compliant	-
House D1_EntR#3	32.01%	30.57%	0.96	25.61%	BRE Compliant	-
House D1_EntR#4	32.83%	31.22%	0.95	26.26%	BRE Compliant	-
House D1_EntR#	34.90%	34.29%	0.98	27.00%	BRE Compliant	Negligible
House D1_Bd2_Inc	86.80%	86.54%	1.00	27.00%	BRE Compliant	Negligible
House D1_MB	38.09%	38.09%	1.00	27.00%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

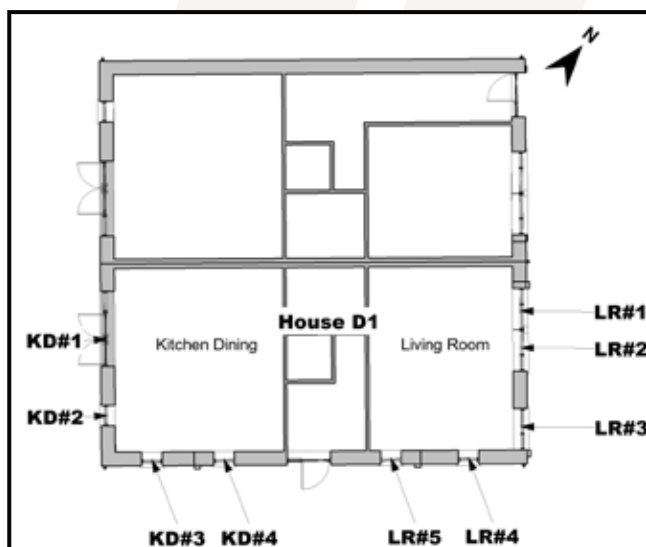


Figure A.7: Floorplans with indication of the assessed windows/rooms

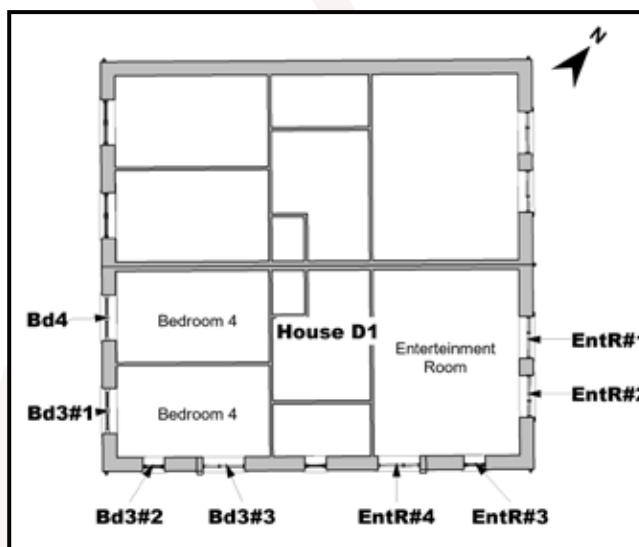


Figure A.8: Floorplans with indication of the assessed windows/rooms

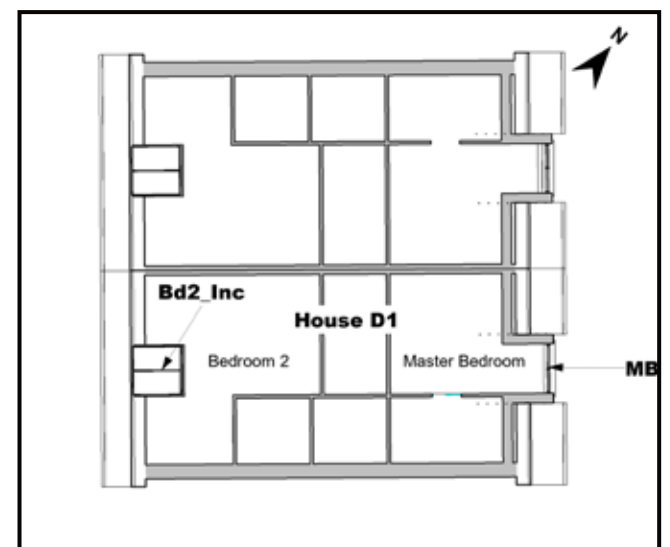


Figure A.9: Floorplans with indication of the assessed windows/rooms

A.1.7 Property Group E

Table No. A.1.7 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House E1_KD#3	32.32%	32.10%	0.99	25.86%	BRE Compliant	-
House E1_KD#4	26.62%	29.39%	1.10	21.30%	BRE Compliant	-
House E1_KD#	30.42%	31.20%	1.03	24.34%	BRE Compliant	Negligible
House E1_LR2	11.95%	15.45%	1.29	9.56%	BRE Compliant	Beneficial Impact
House E1_Bd1	27.00%	29.50%	1.09	21.60%	BRE Compliant	Negligible
House E1_Bd3	28.66%	30.71%	1.07	22.93%	BRE Compliant	Negligible
House E1_Bd4	29.25%	31.55%	1.08	23.40%	BRE Compliant	Negligible
House E2_KD1	27.21%	29.70%	1.09	21.77%	BRE Compliant	Negligible
House E2_LR1	12.13%	15.50%	1.28	9.70%	BRE Compliant	Beneficial Impact
House E2_Bd1	27.03%	29.63%	1.10	21.62%	BRE Compliant	Negligible
House E2_Bd2	29.00%	31.16%	1.07	23.20%	BRE Compliant	Negligible
House E2_Bd3	29.41%	31.86%	1.08	23.53%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

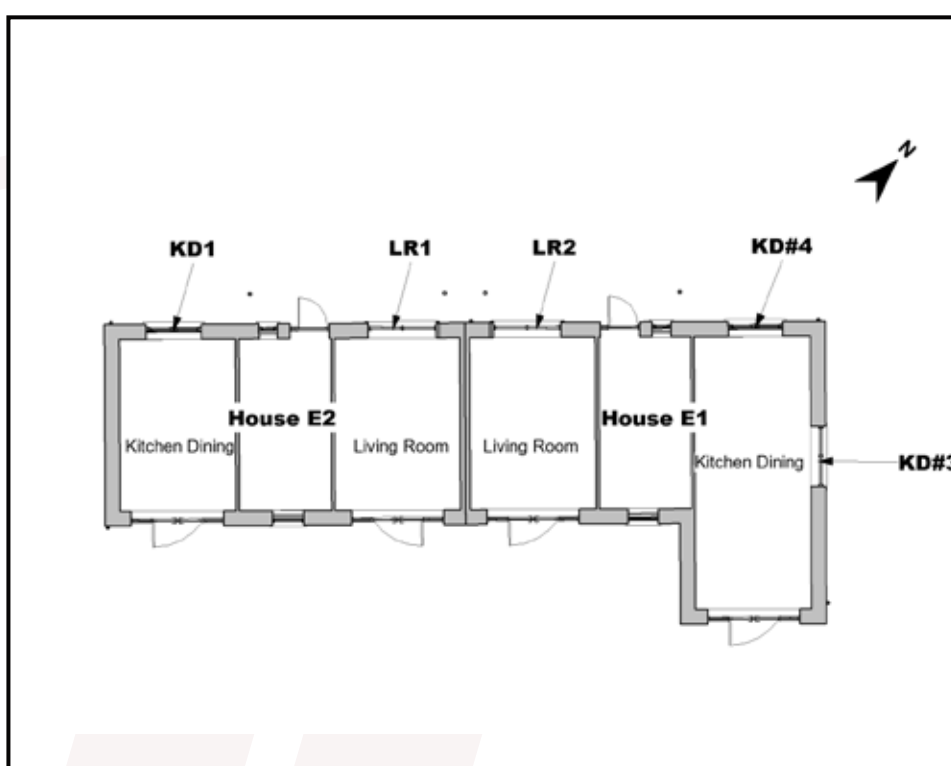


Figure A.10: Floorplans with indication of the assessed windows/rooms

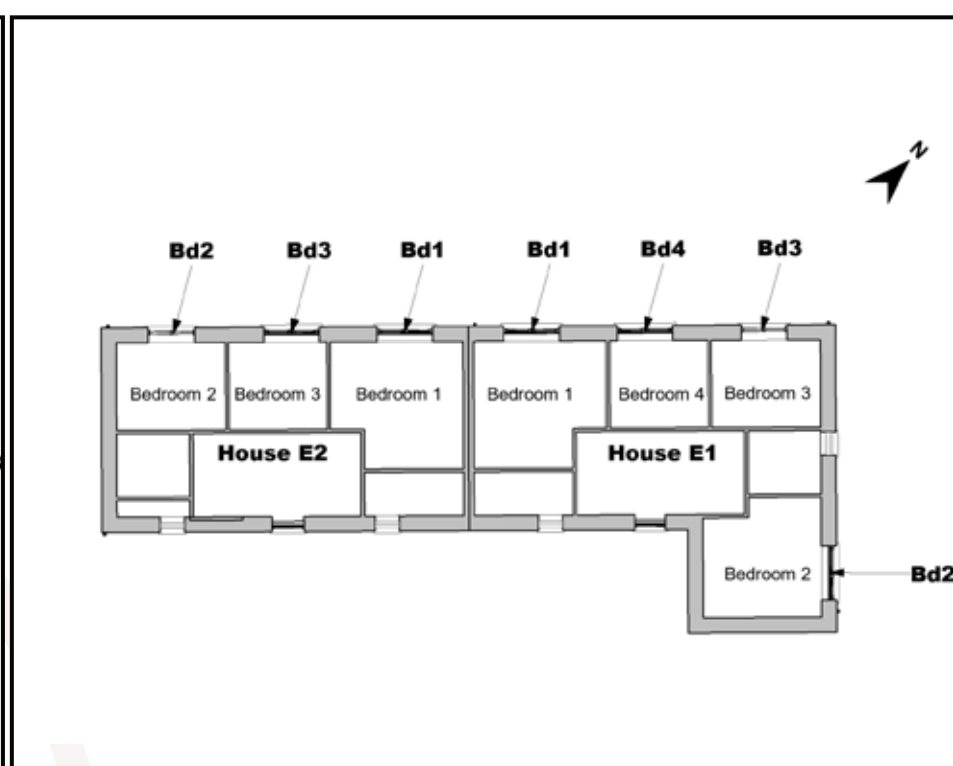


Figure A.11: Floorplans with indication of the assessed windows/rooms

A.1.8 Property Group F

Table No. A.1.8 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House F1_KD1	28.96%	28.85%	1.00	23.17%	BRE Compliant	Negligible
House F1_LR1	15.69%	12.04%	0.77	12.55%	96%	Minor Adverse
House F1_Bd1	29.51%	27.74%	0.94	23.61%	BRE Compliant	Negligible
House F1_Bd2	30.26%	30.66%	1.01	24.21%	BRE Compliant	Negligible
House F1_Bd3	31.39%	30.64%	0.98	25.11%	BRE Compliant	Negligible
House F2_KD#3	33.60%	32.85%	0.98	26.88%	BRE Compliant	-
House F2_KD#4	30.90%	24.54%	0.79	24.72%	99%	-
House F2_KD#	32.70%	30.08%	0.92	26.16%	BRE Compliant	Negligible
House F2_LR2	16.17%	11.04%	0.68	12.94%	85%	Minor Adverse
House F2_Bd1	29.82%	27.09%	0.91	23.86%	BRE Compliant	Negligible
House F2_Bd3	31.83%	27.44%	0.86	25.46%	BRE Compliant	Negligible
House F2_Bd4	32.24%	28.84%	0.89	25.79%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

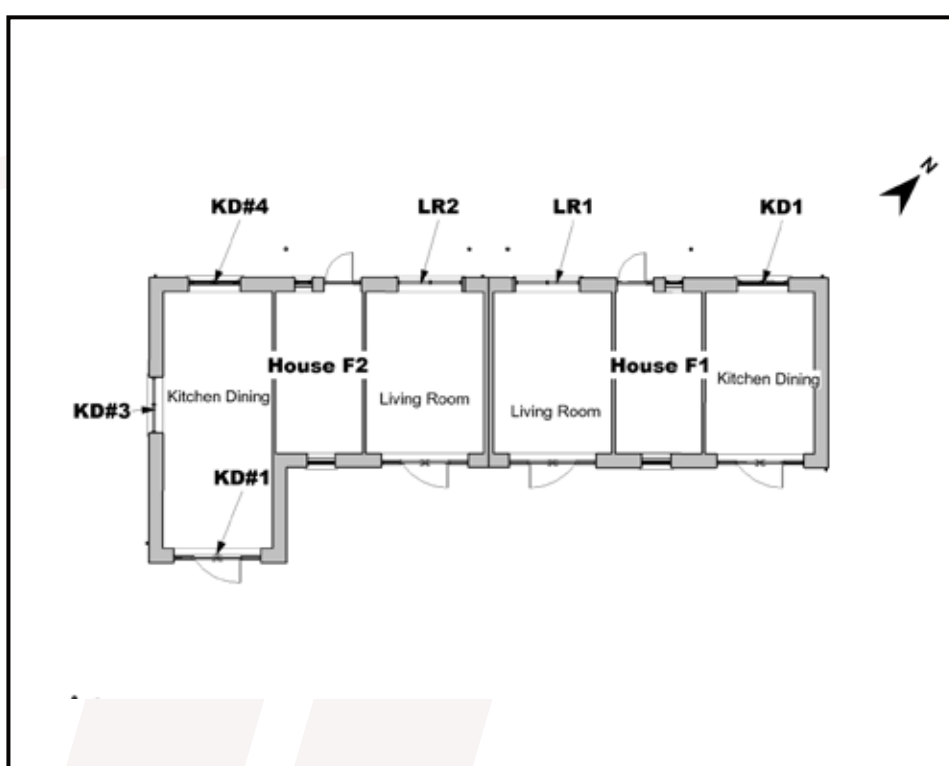


Figure A.12: Floorplans with indication of the assessed windows/rooms

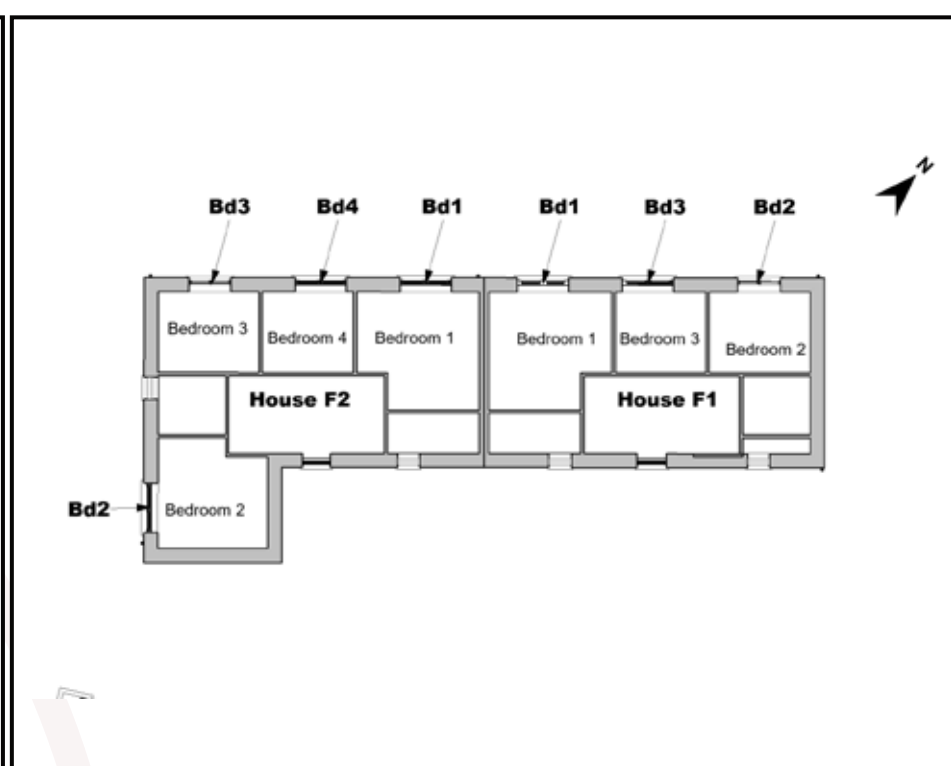


Figure A.13: Floorplans with indication of the assessed windows/rooms

A.1.9 Property Group G

Table No. A.1.9 - VSC Results:						
Window Number	Baseline VSC Value	Proposed VSC Value	Ratio of Proposed VSC to Baseline VSC	Recommended minimum VSC*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
Creche_SR#1	25.35%	24.07%	0.95	20.28%	BRE Compliant	-
Creche_SR#2	26.53%	25.20%	0.95	21.22%	BRE Compliant	-
Creche_SR#	26.08%	24.77%	0.95	20.87%	BRE Compliant	Negligible
Creche_Class1#1	23.90%	21.98%	0.92	19.12%	BRE Compliant	-
Creche_Class1#2	24.81%	23.16%	0.93	19.85%	BRE Compliant	-
Creche_Class1#	24.55%	22.83%	0.93	19.64%	BRE Compliant	Negligible
Creche_Class3#1	27.48%	19.89%	0.72	21.98%	90%	-
Creche_Class3#2	25.63%	18.67%	0.73	20.50%	91%	-
Creche_Class3#3	31.57%	30.37%	0.96	25.26%	BRE Compliant	-
Creche_Class3#	28.43%	22.76%	0.80	22.74%	BRE Compliant	Negligible
Creche_Class7	30.85%	29.80%	0.97	24.68%	BRE Compliant	Negligible
Creche_Class8	29.17%	27.89%	0.96	23.34%	BRE Compliant	Negligible

* Section 2.2.23 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the VSC of an existing window, the value needs to both drop below the stated target value of 27% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows serve the same room, each individual window is labelled with a hash-tag and a serial number (e.g. Xa#1, Xa#2). Each window is assessed, and a weighted average is calculated to determine the level of effect on the room. Rooms are identified with a hash-tag at the end (e.g. Xa#). In such cases, the 'effect of proposed development' column will display a dash (-) for the individual windows, with the overall level of effect indicated in the row corresponding to the room.

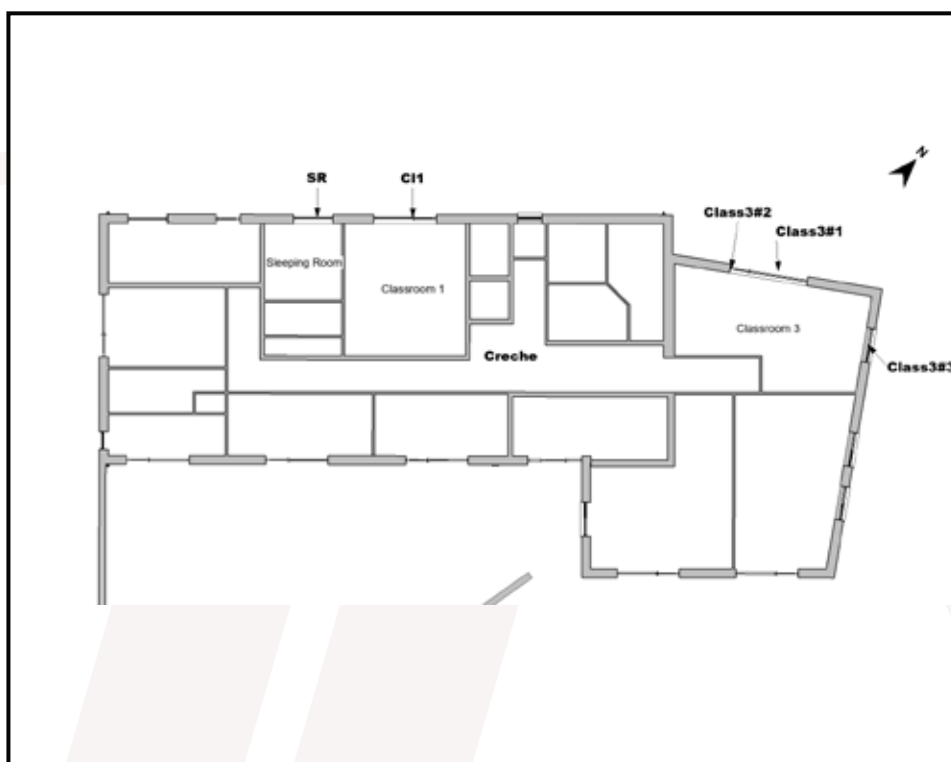


Figure A.14: Floorplans with indication of the assessed windows/rooms

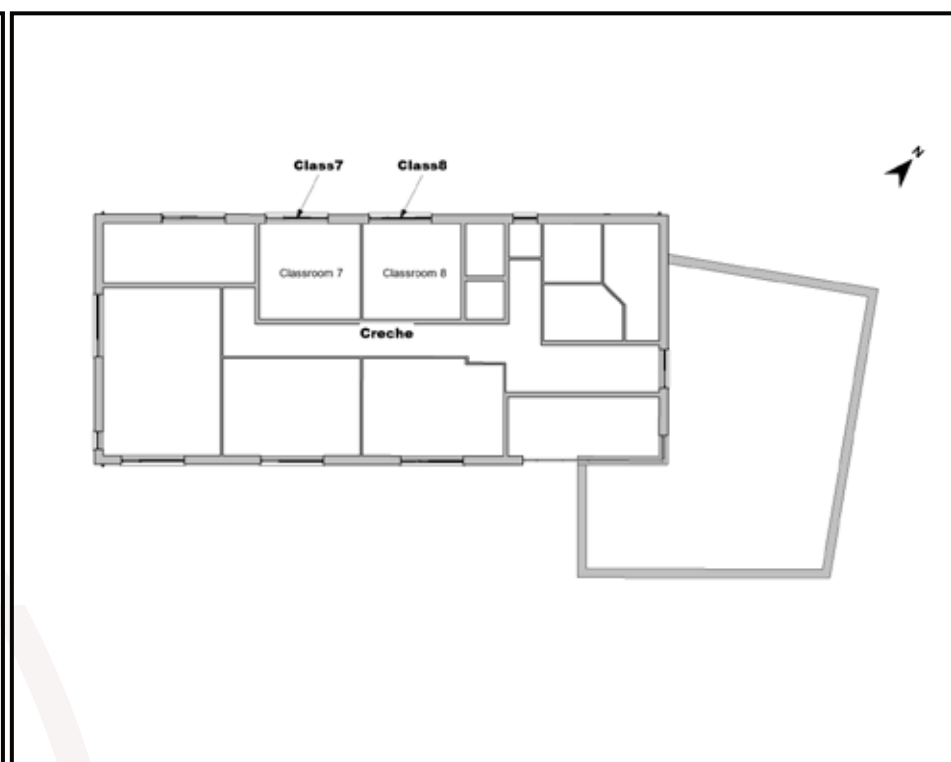


Figure A.15: Floorplans with indication of the assessed windows/rooms

A.2 Effect on No Sky Line (NSL)

Below is an example of the table used to describe the effect on NSL.

Table Example. A.2 - NSL Impact Assessment						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL	Level of Compliance with BRE Guidelines	Effect of Proposed Development
A	B	C	D	E	F	G

A: Room Number

The number in this column will identify the assessed room. The relevant façade of the assessed rooms are represented visually in the corresponding figure.

B: Baseline NSL Value

The *Baseline NSL Value* represents the NSL value of the assessed room which is calculated in the existing baseline model state (as explained in the “Building the Model States” on page 10).

C: Proposed NSL Value

The *Proposed NSL Value* represents the NSL value of the assessed room which is calculated in the proposed model state (as explained in the “Building the Model States” on page 10).

D: Ratio of Proposed NSL to Baseline NSL

This column expressed the ratio of change between the baseline NSL value and the proposed NSL value. The BRE Guidelines recommend that if the proposed value is less than 0.8 times the baseline value, then the reduction in daylight is more likely to be perceptible.

E: Recommended minimum NSL

The *BRE Target Value* for each room has been set according to the BRE Guidelines. The Guidelines state that a proposed development could possibly have a noticeable effect on the daylight received by an existing room, if the NSL value **both** drops below the guideline value of 80% **and** the NSL value is less than 0.8 times the baseline value.

Therefore, to determine the *recommended minimum Value*, 80% of the *Baseline NSL value* has been calculated. If this value is above the 80% threshold, then 80% of the baseline value is the appropriate target value.

F: Level of Compliance with the BRE Guidelines

This column states the compliance of the *Proposed NSL Value* with the *recommended minimum NSL* as per the BRE Guidelines. In essence, it shows whether or not the assessed room would experience a perceptible level of impact. If the room complies with the BRE Guidelines this cell will state “*BRE Compliant*”. If the room does not meet the criteria as set out in the BRE Guidelines, a percentage of compliance with the *recommended minimum* will be stated.

G: Effect of Proposed Development

The levels of effect in this column describe the effect an assessed room will experience, based on its compliance with the *BRE Target Value*. A full list of definitions and a numerical rationale for each can be found in the section “Definition of Effects” on page 95.

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation on these figures may yield a negligible difference and should not be considered an error.

A.2.1 Property Group A

Table No. A.2.1 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DA02_LKDa#	98.63%	98.64%	1.00	78.90%	BRE Compliant	Negligible
DA03_Kitchen Dining#	99.22%	99.21%	1.00	79.38%	BRE Compliant	Negligible
DA03_Bed1	97.49%	97.48%	1.00	77.99%	BRE Compliant	Negligible
DA04_Kitchen Dining#	99.53%	99.53%	1.00	79.62%	BRE Compliant	Negligible
DA04_Bed1	97.87%	97.87%	1.00	78.30%	BRE Compliant	Negligible
DA05_Kitchen Dining#	99.17%	98.97%	1.00	79.34%	BRE Compliant	Negligible
DA05_Bed1	98.21%	97.35%	0.99	78.57%	BRE Compliant	Negligible
DA06_Kitchen Dining#	99.11%	98.44%	0.99	79.29%	BRE Compliant	Negligible
DA06_Bed1	97.87%	94.44%	0.96	78.30%	BRE Compliant	Negligible
DA07_Kitchen Dining#	94.51%	95.78%	1.01	75.61%	BRE Compliant	Negligible
DA07_Bed1	98.33%	87.33%	0.89	78.66%	BRE Compliant	Negligible
DA08_Kitchen Dining#	99.53%	99.49%	1.00	79.62%	BRE Compliant	Negligible
DA08_Bed1	98.13%	89.02%	0.91	78.50%	BRE Compliant	Negligible
DA09_KD#	99.82%	99.82%	1.00	79.86%	BRE Compliant	Negligible
DA09_Living#	99.84%	99.84%	1.00	79.87%	BRE Compliant	Negligible
DA09_Bed1#	99.52%	99.52%	1.00	79.62%	BRE Compliant	Negligible
DA09_Bed2#	99.30%	99.30%	1.00	79.44%	BRE Compliant	Negligible
DA09_Bed3#	97.12%	97.11%	1.00	77.70%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

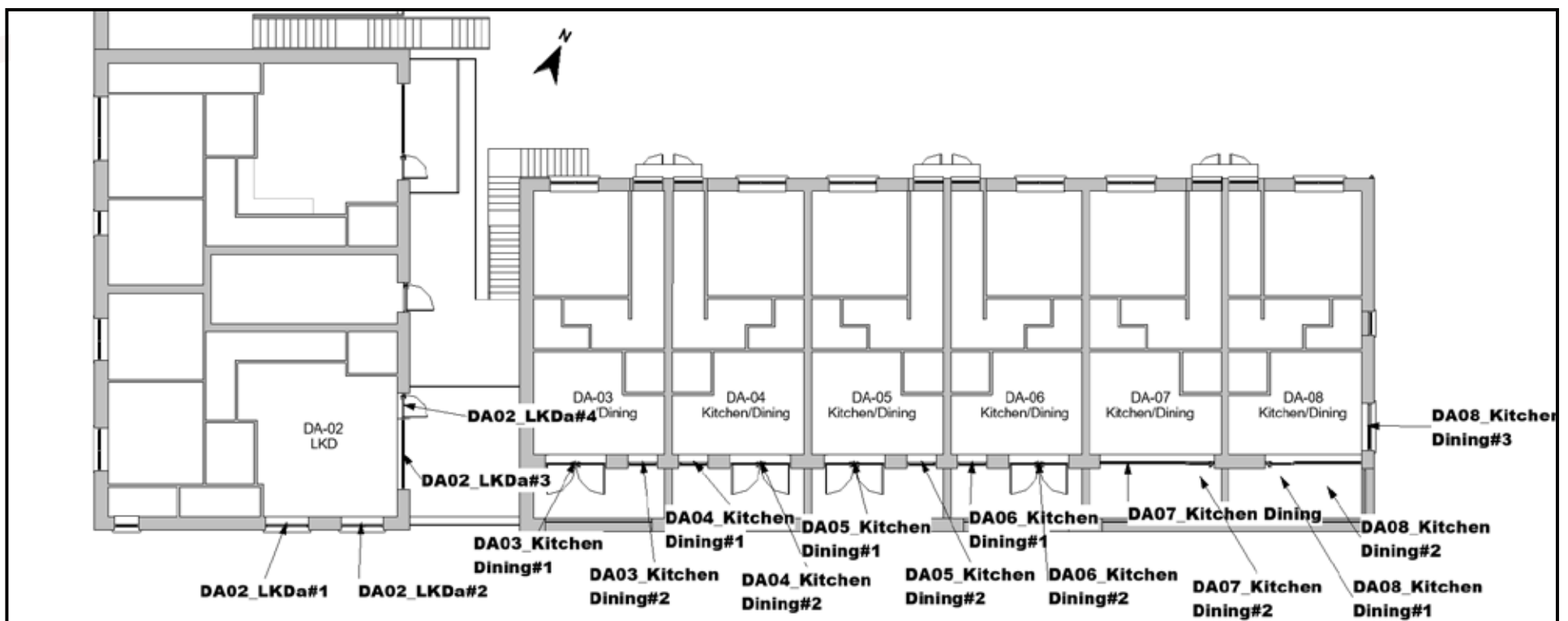


Figure A.16: Floorplans with indication of the assessed windows/rooms

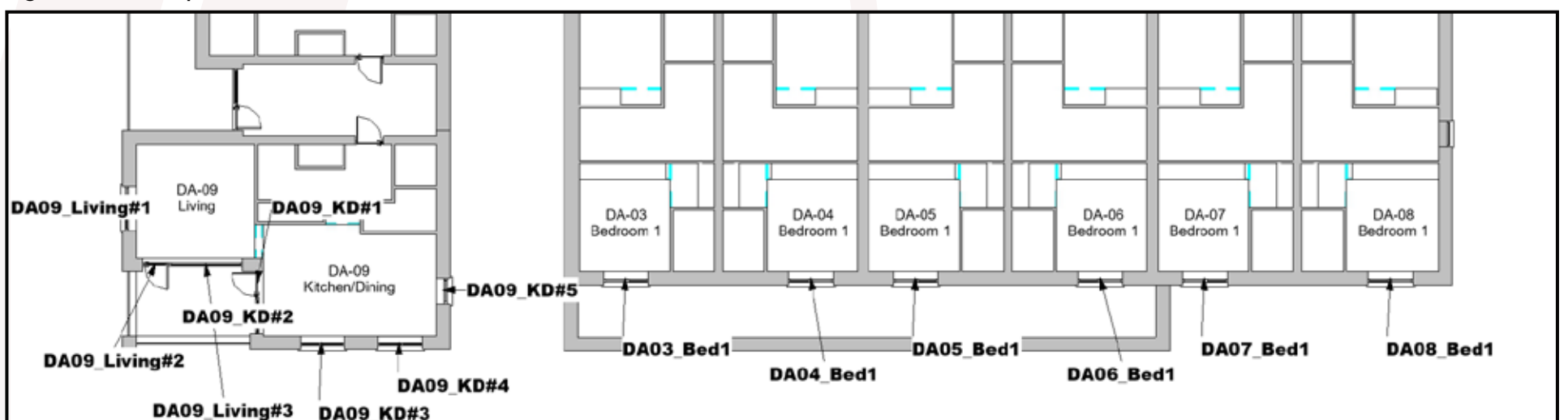


Figure A.17: Floorplans with indication of the assessed windows/rooms

A.2.2 Property Group B

Table No. A.2.2 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB01_Bedroom 1	97.50%	48.21%	0.49	78.00%	62%	Moderate Adverse
DB01_LKD#	99.67%	97.38%	0.98	79.74%	BRE Compliant	Negligible
DB02_Bedroom 1	98.13%	41.71%	0.43	78.50%	53%	Moderate Adverse
DB02_LKD#	99.72%	86.52%	0.87	79.78%	BRE Compliant	Negligible
DB03_Bedroom 1	98.14%	34.61%	0.35	78.51%	44%	Major Adverse
DB03_LKD#	99.45%	89.67%	0.90	79.56%	BRE Compliant	Negligible
DB04_Bed1#	99.93%	99.93%	1.00	79.94%	BRE Compliant	Negligible
DB05_LKD#	99.69%	92.32%	0.93	79.75%	BRE Compliant	Negligible
DB05_Bed1	99.08%	99.67%	1.01	79.26%	BRE Compliant	Negligible
DB05_Bed2	99.12%	99.13%	1.00	79.30%	BRE Compliant	Negligible
DB05_Bed3	97.89%	97.88%	1.00	78.31%	BRE Compliant	Negligible
DB06_LKD#	99.71%	93.02%	0.93	79.77%	BRE Compliant	Negligible
DB06_Bed1	99.37%	99.35%	1.00	79.50%	BRE Compliant	Negligible
DB06_Bed2	98.71%	98.70%	1.00	78.97%	BRE Compliant	Negligible
DB06_Bed3	98.41%	98.34%	1.00	78.73%	BRE Compliant	Negligible
DB07_LKD#	99.73%	87.86%	0.88	79.78%	BRE Compliant	Negligible
DB07_Bed1	99.46%	99.45%	1.00	79.57%	BRE Compliant	Negligible
DB07_Bed2	99.62%	99.59%	1.00	79.70%	BRE Compliant	Negligible
DB07_Bed3	98.09%	98.05%	1.00	78.47%	BRE Compliant	Negligible
DB08_LKD#	99.56%	99.41%	1.00	79.65%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

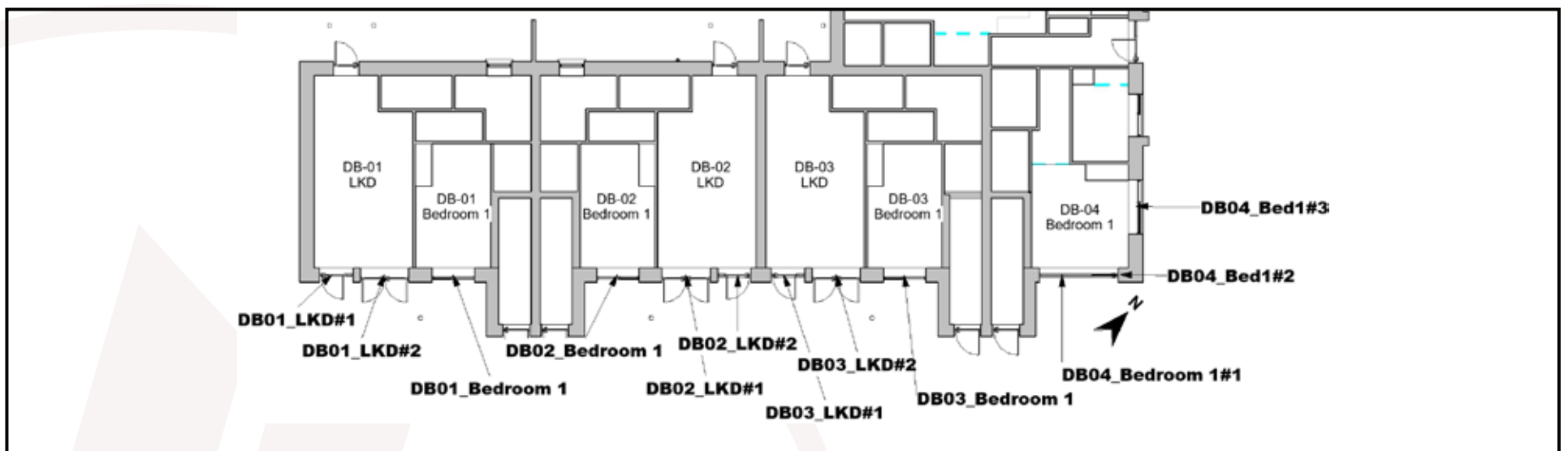


Figure A.18: Floorplans with indication of the assessed windows/rooms

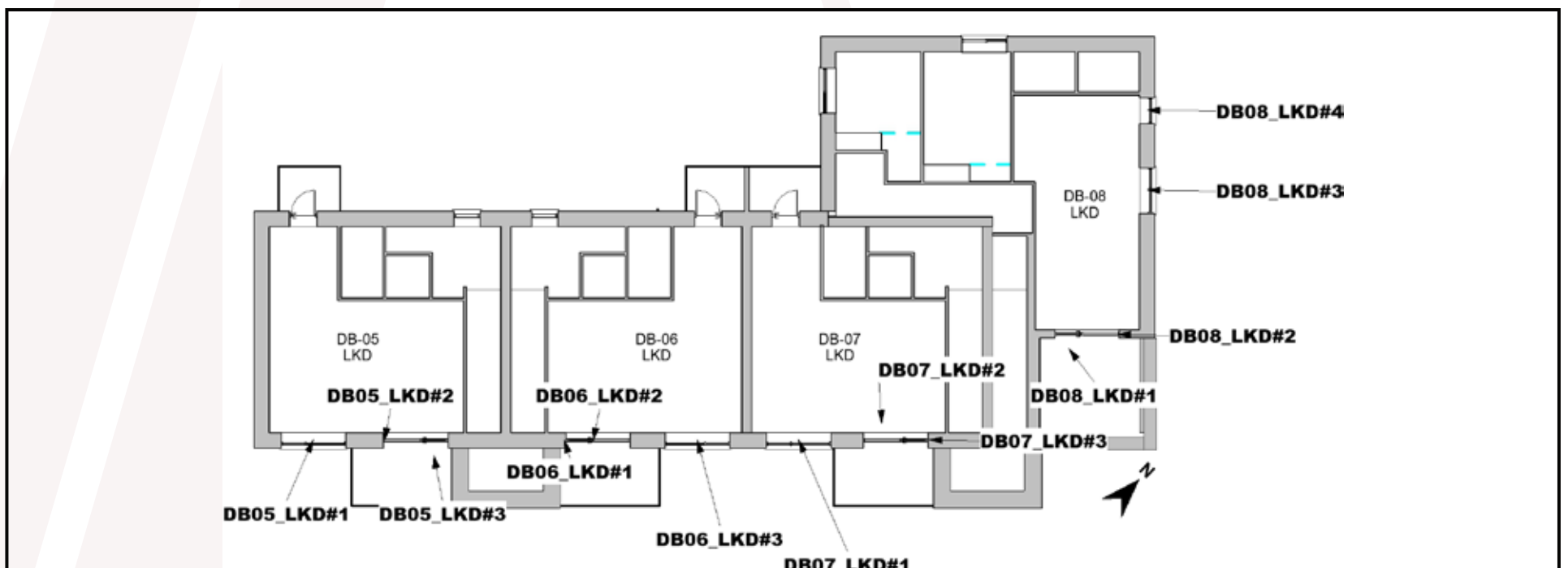


Figure A.19: Floorplans with indication of the assessed windows/rooms

A.2.3 Property Group C

Table No. A.2.3 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House C1_LKD2	99.35%	99.35%	1.00	79.48%	BRE Compliant	Negligible
House C1_Bd1	79.87%	98.96%	1.24	63.90%	BRE Compliant	Beneficial Impact
House C1_Bd2#	99.66%	99.64%	1.00	79.73%	BRE Compliant	Negligible
House C2_LKD1	99.37%	99.39%	1.00	79.50%	BRE Compliant	Negligible
House C2_Bd1	98.23%	98.15%	1.00	78.58%	BRE Compliant	Negligible
House C2_Bd2	97.38%	96.13%	0.99	77.90%	BRE Compliant	Negligible
House C3_LKD1	98.94%	98.97%	1.00	79.15%	BRE Compliant	Negligible
House C3_Bd1	95.37%	92.09%	0.97	76.30%	BRE Compliant	Negligible
House C3_Bd2	98.30%	93.77%	0.95	78.64%	BRE Compliant	Negligible
House C4_27	90.92%	90.92%	1.00	72.74%	BRE Compliant	Negligible
House C4_14	98.79%	81.60%	0.83	79.03%	BRE Compliant	Negligible
House C4_Bd2#	99.44%	99.38%	1.00	79.55%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

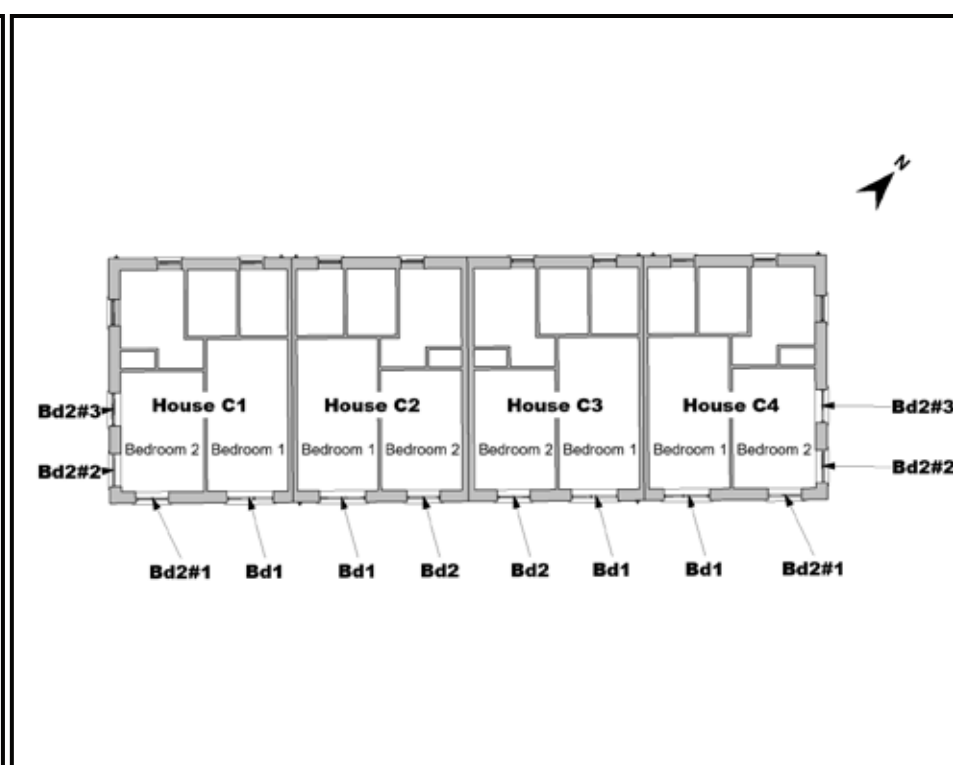
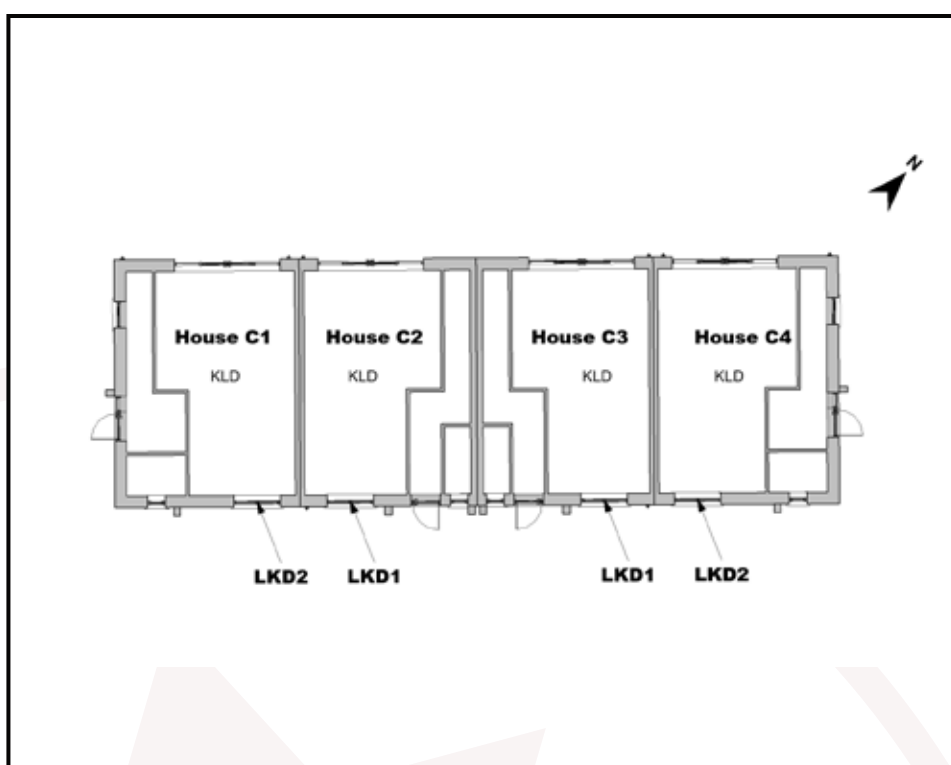


Figure A.20: Floorplans with indication of the assessed windows/rooms

Figure A.21: Floorplans with indication of the assessed windows/rooms

A.2.4 Property Group D

Table No. A.2.4 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House D1_KD#	99.09%	99.07%	1.00	79.27%	BRE Compliant	Negligible
House D1_LR#	99.68%	99.61%	1.00	79.74%	BRE Compliant	Negligible
House D1_Bd3#	98.51%	98.49%	1.00	78.81%	BRE Compliant	Negligible
House D1_Bd4	89.08%	89.08%	1.00	71.26%	BRE Compliant	Negligible
House D1_EntR#	99.02%	98.02%	0.99	79.22%	BRE Compliant	Negligible
House D1_Bd2_Inc	98.03%	98.02%	1.00	78.42%	BRE Compliant	Negligible
House D1_MB	83.07%	83.07%	1.00	66.46%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

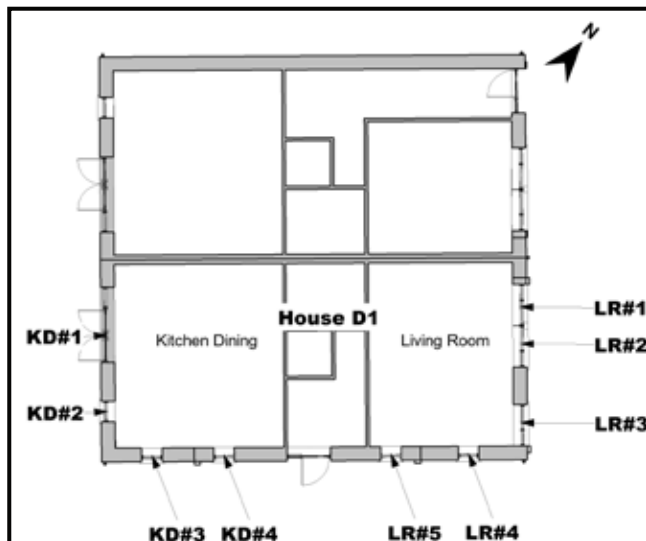


Figure A.22: Floorplans with indication of the assessed windows/rooms

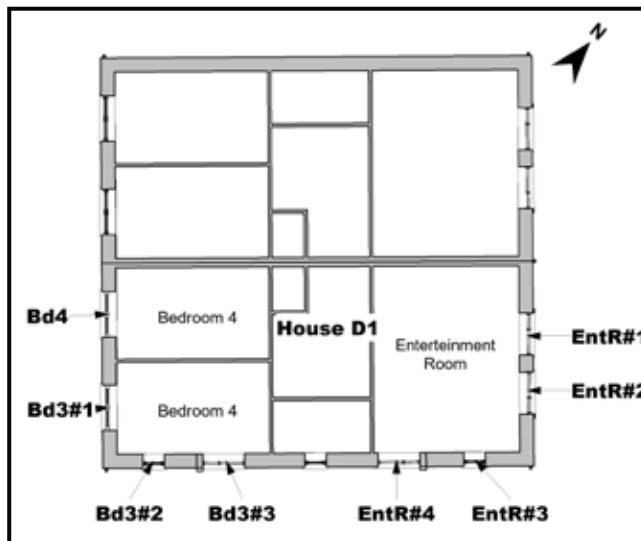


Figure A.23: Floorplans with indication of the assessed windows/rooms

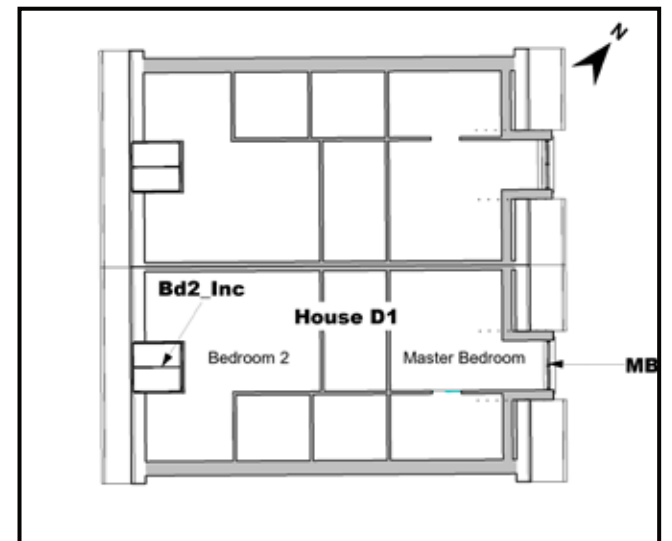


Figure A.24: Floorplans with indication of the assessed windows/rooms

A.2.5 Property Group E

Table No. A.2.5 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House E1_KD#	99.02%	99.26%	1.00	79.22%	BRE Compliant	Negligible
House E1_LR2	98.94%	99.13%	1.00	79.15%	BRE Compliant	Negligible
House E1_Bd1	87.06%	96.79%	1.11	69.65%	BRE Compliant	Negligible
House E1_Bd3	95.81%	95.73%	1.00	76.65%	BRE Compliant	Negligible
House E1_Bd4	98.15%	98.19%	1.00	78.52%	BRE Compliant	Negligible
House E2_KD1	99.64%	99.64%	1.00	79.71%	BRE Compliant	Negligible
House E2_LR1	98.73%	98.50%	1.00	78.98%	BRE Compliant	Negligible
House E2_Bd1	84.95%	97.35%	1.15	67.96%	BRE Compliant	Negligible
House E2_Bd2	97.05%	97.10%	1.00	77.64%	BRE Compliant	Negligible
House E2_Bd3	97.13%	97.18%	1.00	77.70%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

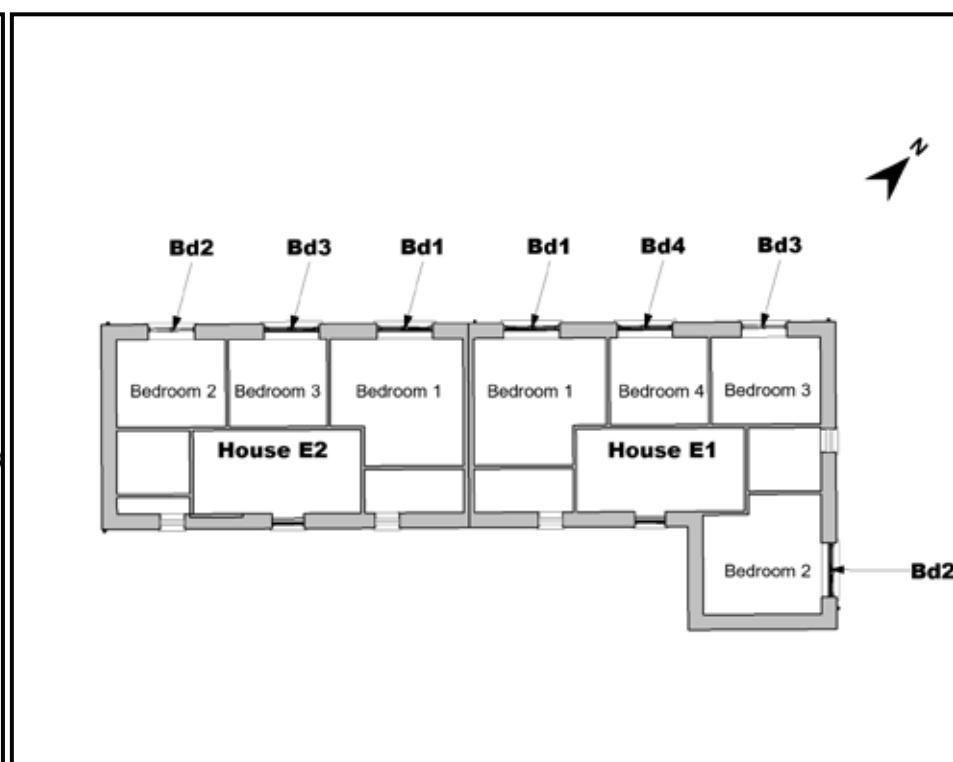
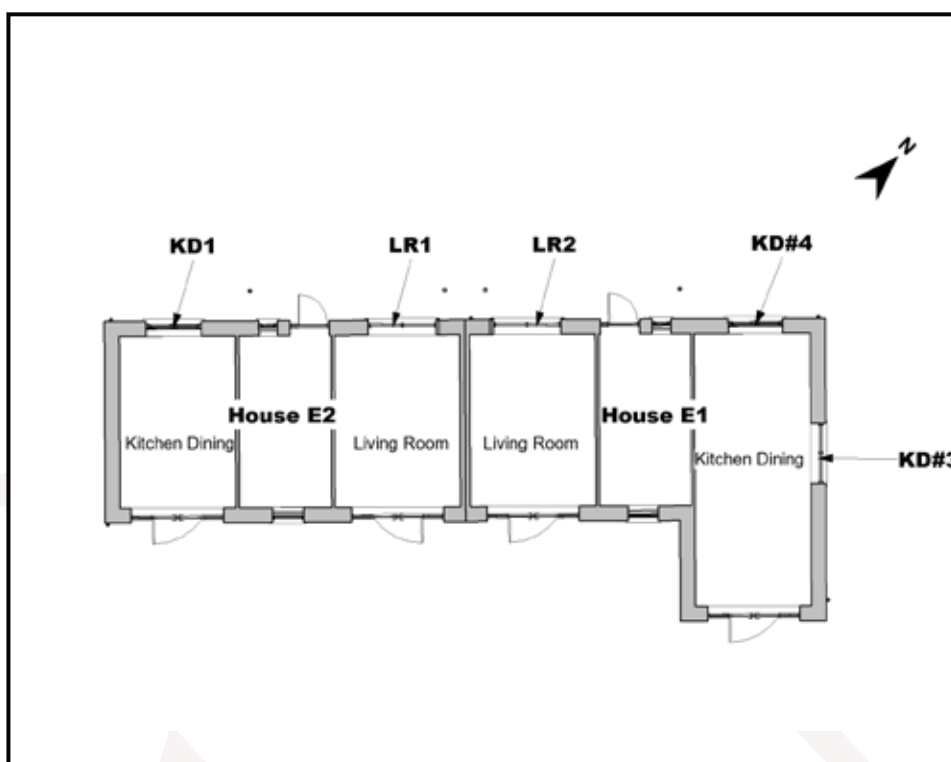


Figure A.25: Floorplans with indication of the assessed windows/rooms Figure A.26: Floorplans with indication of the assessed windows/rooms

A.2.6 Property Group F

Table No. A.2.6 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House F1_KD1	99.67%	99.67%	1.00	79.74%	BRE Compliant	Negligible
House F1_LR1	98.25%	98.05%	1.00	78.60%	BRE Compliant	Negligible
House F1_Bd1	97.18%	97.79%	1.01	77.74%	BRE Compliant	Negligible
House F1_Bd2	96.59%	96.61%	1.00	77.27%	BRE Compliant	Negligible
House F1_Bd3	98.47%	98.46%	1.00	78.78%	BRE Compliant	Negligible
House F2_KD#	99.57%	98.99%	0.99	79.66%	BRE Compliant	Negligible
House F2_LR2	99.71%	99.71%	1.00	79.77%	BRE Compliant	Negligible
House F2_Bd1	97.45%	94.63%	0.97	77.96%	BRE Compliant	Negligible
House F2_Bd3	96.91%	96.66%	1.00	77.53%	BRE Compliant	Negligible
House F2_Bd4	97.15%	97.11%	1.00	77.72%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

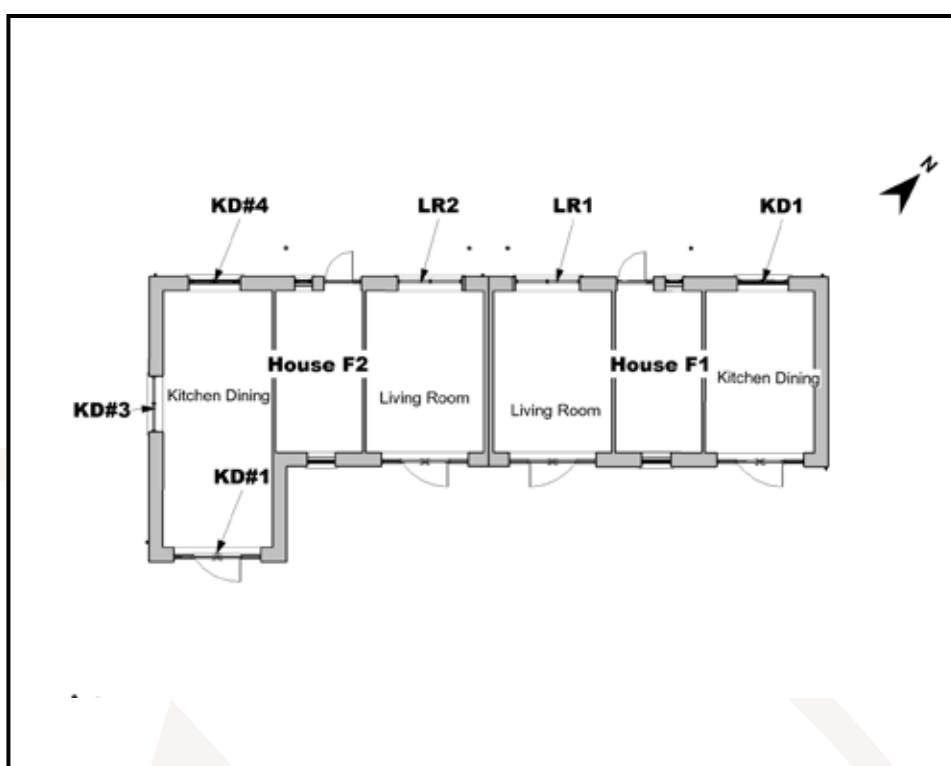


Figure A.27: Floorplans with indication of the assessed windows/rooms

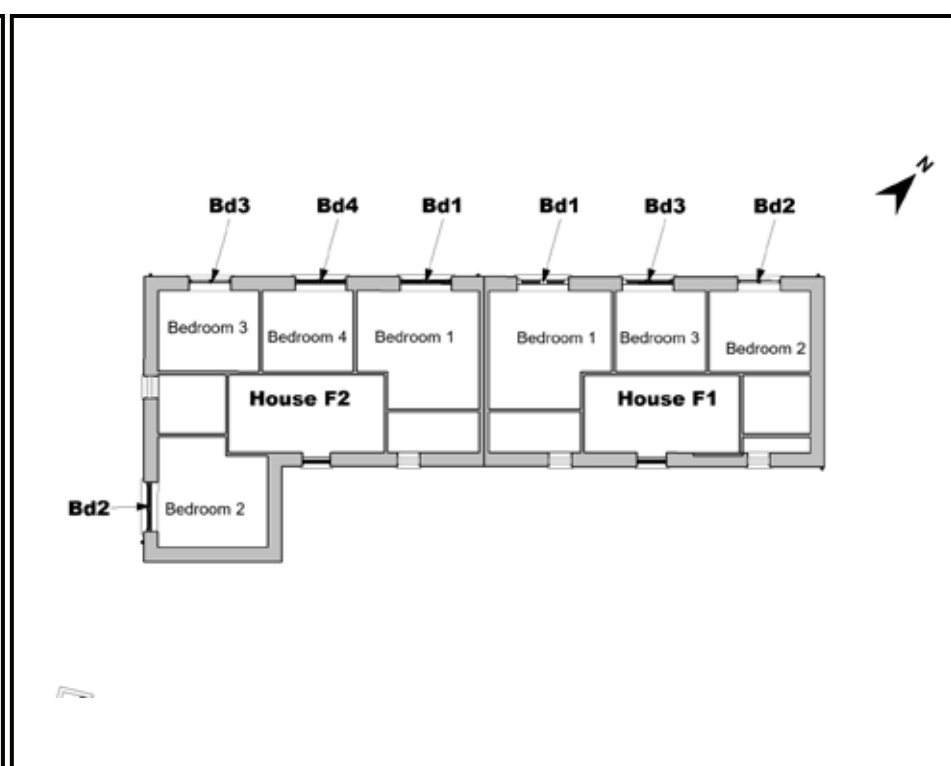


Figure A.28: Floorplans with indication of the assessed windows/rooms

A.2.7 Property Group G

Table No. A.2.7 - NSL Results:						
Room Number	Baseline NSL Value	Proposed NSL Value	Ratio of Proposed NSL to Baseline NSL	Recommended minimum NSL*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
Creche_SR#	70.53%	74.40%	1.05	56.43%	BRE Compliant	Negligible
Creche_Class1#	54.53%	56.62%	1.04	43.62%	BRE Compliant	Negligible
Creche_Class3#	97.88%	86.34%	0.88	78.30%	BRE Compliant	Negligible
Creche_Class7	96.72%	97.85%	1.01	77.37%	BRE Compliant	Negligible
Creche_Class8	92.44%	96.11%	1.04	73.95%	BRE Compliant	Negligible

* The BRE Guidelines state that in order for a proposed development to have a noticeable effect on the daylight received by an existing room, the value needs to both drop below the guideline value of 80% **and** be less than 0.8 times the baseline value.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

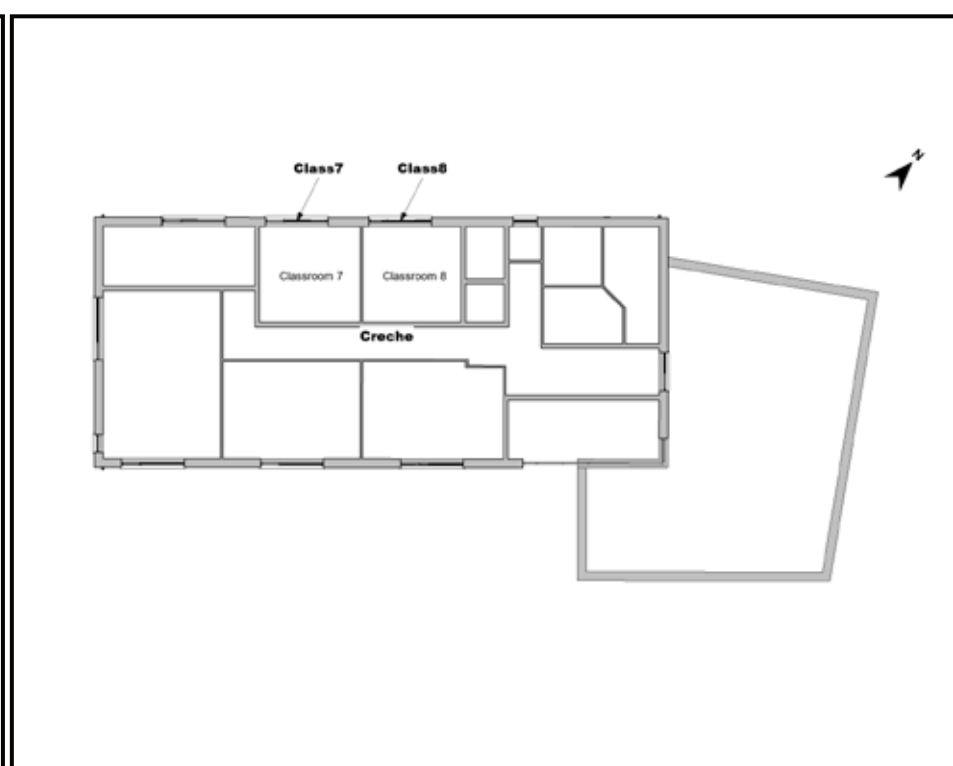
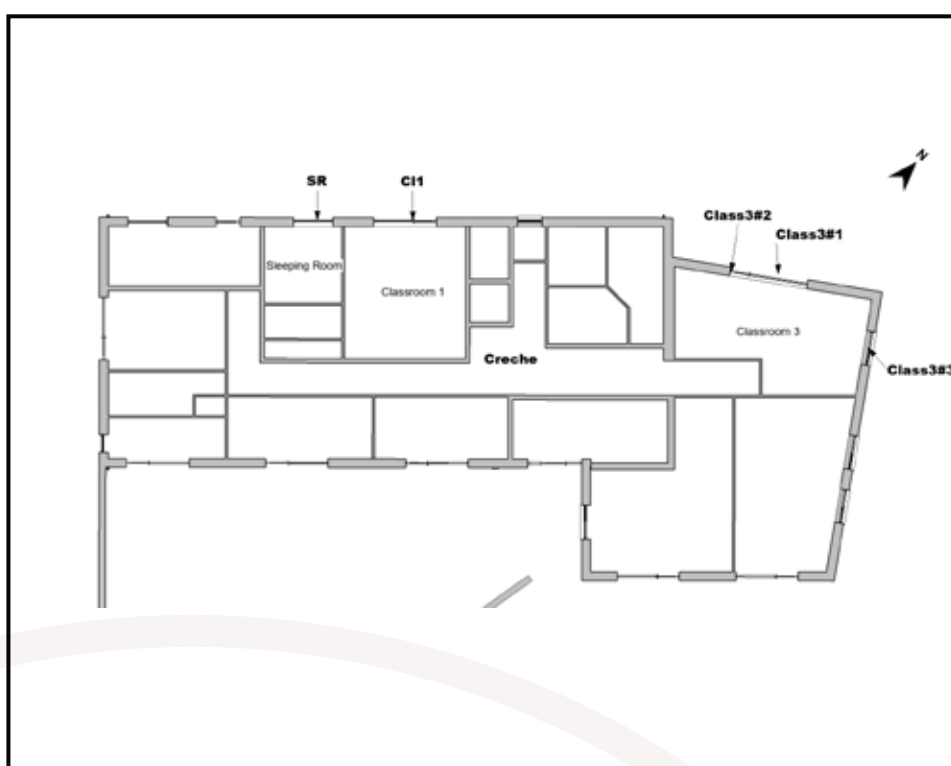


Figure A.29: Floorplans with indication of the assessed windows/rooms Figure A.30: Floorplans with indication of the assessed windows/rooms

A.3 Effect on Annual/Winter Probable Sunlight Hours (APSH/WPSH)

Below is an example of the table used to describe the effect to the APSH/WPSH of existing windows / rooms.

Table Example. A.3 - APSH/WPSH Impact Assessment						
Window / Room Number	Baseline APSH/WPSH	Proposed APSH/WPSH	Ratio of Proposed to Baseline APSH/WPSH	Recommended Minimum APSH/WPSH	Level of Compliance with BRE Guidelines	Effect of Proposed Development
A	B	C	D	E	F	G

A: Window / Room Number

The number in this column will identify the assessed window / room. All windows / rooms are represented visually in the corresponding figure.

B: Baseline APSH/WPSH

The *Baseline APSH/WPSH Value* represents the percentage of the probable sunlight hours that the assessed window / room can receive, calculated in the existing baseline model state (as explained in the “Building the Model States” on page 10). The annual and winter assessments will be represented in separate tables.

C: Proposed APSH/WPSH

The *Proposed APSH/WPSH Value* represents the percentage of probable sunlight hours that the assessed window / room can receive, calculated in the proposed model state (as explained in the “Building the Model States” on page 10).

D: Ratio of Proposed to Baseline APSH/WPSH

This column expresses the ratio of change between the baseline APSH/WPSH value and the proposed APSH/WPSH value. Section 3.2.13 of the BRE Guidelines recommends that if the proposed value is less than 0.8 times the baseline value, then the reduction to sunlight is more likely to be perceptible.

E: Recommended Minimum APSH/WPSH

The *BRE Target Value* for each window / room has been set according to section 3.2.13 of the BRE Guidelines. The Guidelines state that a proposed development could possibly have a noticeable effect on the sunlight received by an existing window / room, if the APSH value drops below the annual (25%) or WPSH value below the winter (5%) guidelines; **and** the APSH/WPSH value is less than 0.8 times the baseline value; **and** there is a reduction of more than 4% to the APSH.

Therefore, to determine the *recommended minimum APSH Value* for the annual study, 80% of the *Baseline APSH value* has been calculated. If this value is above the 25% threshold, a target value of 25% will be applied. If 80% of the baseline value is below 25%, then 80% of the baseline value is the appropriate target value.

To determine the *recommended minimum WPSH Value* for the winter study, 80% of the *Baseline winter APSH value* has been calculated. If this value is above the 5% threshold, a target value of 5% will be applied. If 80% of the baseline value is below 5%, then 80% of the baseline value is the appropriate target value.

F: Level of Compliance with BRE Guidelines

This column states the compliance of the *Proposed APSH/WPSH Value* with the *recommended minimum APSH/WPSH* as per the BRE Guidelines. In essence, it shows whether or not the assessed window / room would experience a perceptible level of impact. If the window / room complies with the BRE Guidelines this cell will state “*BRE Compliant*”. If the window / room does not meet the criteria as set out in the BRE Guidelines, a percentage of compliance with the *recommended minimum* will be stated.

G: Effect of Proposed Development

The levels of effect in this column describe the effect an assessed window / room will experience, based on its compliance with the *BRE Target Value*. A full list of definitions and a numerical rationale for each can be found in the section “*Definition of Effects*” on page 95.

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation of these figures may yield a negligible difference and should not be considered an error.

A.3.1 Property Group A - Annual Probable Sunlight Hours

Table No. A.3.1 - APSH Results:						
Window / Room Number	Baseline APSH	Proposed APSH	Ratio of Proposed APSH to Baseline APSH	Recommended minimum APSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DA02_LKDa#	73.27%	71.33%	0.97	25.00%	BRE Compliant	Negligible
DA03_Kitchen Dining#	40.33%	38.93%	0.97	25.00%	BRE Compliant	Negligible
DA03_Bed1	69.15%	67.06%	0.97	25.00%	BRE Compliant	Negligible
DA04_Kitchen Dining#	45.38%	44.29%	0.98	25.00%	BRE Compliant	Negligible
DA04_Bed1	71.25%	70.01%	0.98	25.00%	BRE Compliant	Negligible
DA05_Kitchen Dining#	44.18%	41.65%	0.94	25.00%	BRE Compliant	Negligible
DA05_Bed1	70.24%	68.30%	0.97	25.00%	BRE Compliant	Negligible
DA06_Kitchen Dining#	48.70%	44.99%	0.92	25.00%	BRE Compliant	Negligible
DA06_Bed1	67.27%	63.71%	0.95	25.00%	BRE Compliant	Negligible
DA07_Kitchen Dining#	63.12%	60.19%	0.95	25.00%	BRE Compliant	Negligible
DA07_Bed1	65.35%	62.44%	0.96	25.00%	BRE Compliant	Negligible
DA08_Kitchen Dining#	64.59%	58.77%	0.91	25.00%	BRE Compliant	Negligible
DA08_Bed1	63.16%	60.46%	0.96	25.00%	BRE Compliant	Negligible
DA09_KD#	87.10%	85.78%	0.98	25.00%	BRE Compliant	Negligible
DA09_Living#	84.07%	84.07%	1.00	25.00%	BRE Compliant	Negligible
DA09_Bed1#	72.42%	72.42%	1.00	25.00%	BRE Compliant	Negligible
DA09_Bed2#	78.40%	77.78%	0.99	25.00%	BRE Compliant	Negligible
DA09_Bed3#	80.73%	80.11%	0.99	25.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

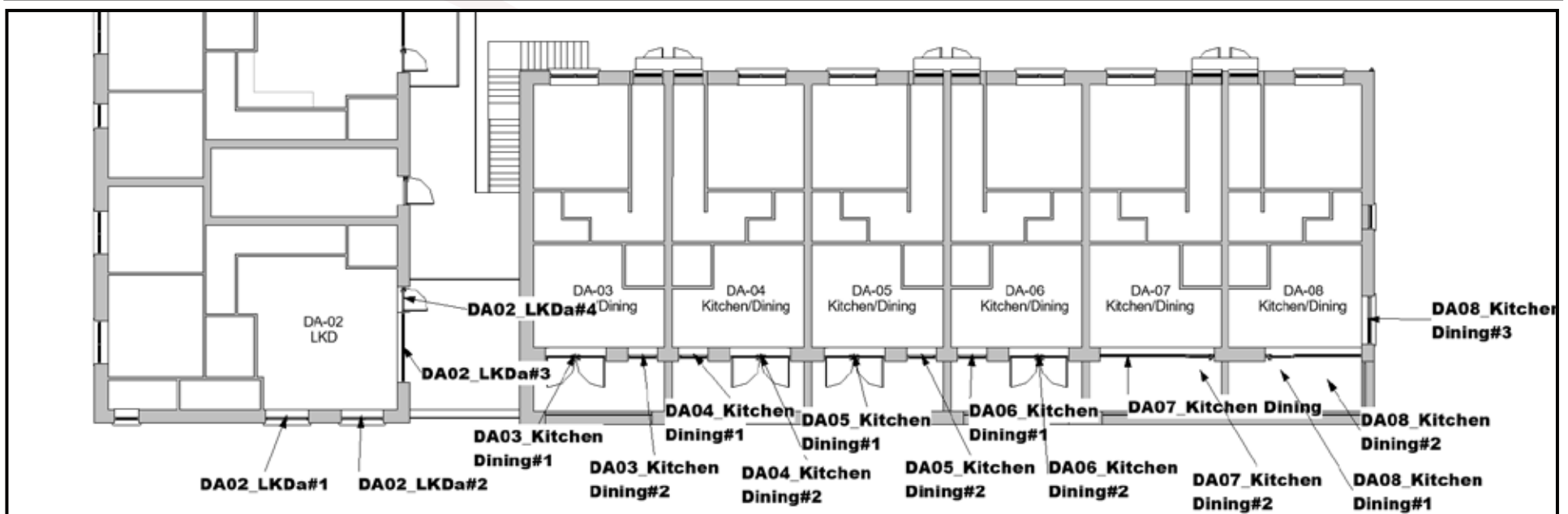


Figure A.31: Floorplans with indication of the assessed windows/rooms

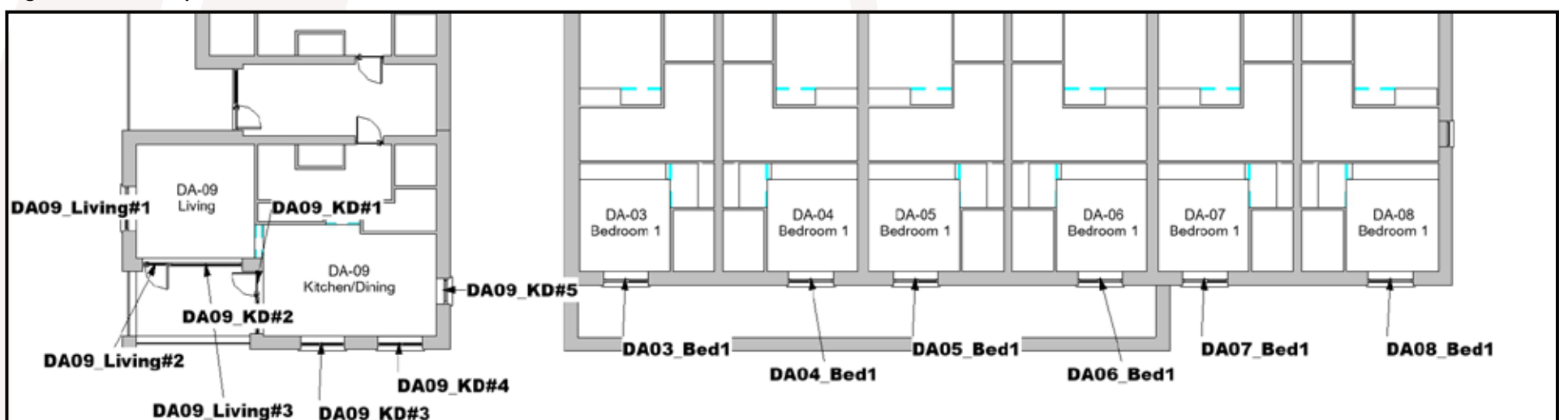


Figure A.32: Floorplans with indication of the assessed windows/rooms

A.3.2 Property Group A - Winter Probable Sunlight Hours

Table No. A.3.2 - WPSH Results:						
Window / Room Number	Baseline WPSH	Proposed WPSH	Ratio of Proposed WPSH to Baseline WPSH	Recommended minimum WPSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DA02_LKDa#	30.07%	29.91%	0.99	5.00%	BRE Compliant	BRE Compliant
DA03_Kitchen Dining#	23.08%	22.61%	0.98	5.00%	BRE Compliant	Negligible
DA03_Bed1	27.58%	26.81%	0.97	5.00%	BRE Compliant	Negligible
DA04_Kitchen Dining#	24.01%	23.62%	0.98	5.00%	BRE Compliant	Negligible
DA04_Bed1	27.35%	26.65%	0.97	5.00%	BRE Compliant	Negligible
DA05_Kitchen Dining#	22.53%	21.52%	0.96	5.00%	BRE Compliant	Negligible
DA05_Bed1	26.50%	25.02%	0.94	5.00%	BRE Compliant	Negligible
DA06_Kitchen Dining#	19.58%	18.10%	0.92	5.00%	BRE Compliant	Negligible
DA06_Bed1	22.61%	20.28%	0.90	5.00%	BRE Compliant	Negligible
DA07_Kitchen Dining#	15.70%	14.58%	0.93	5.00%	BRE Compliant	Negligible
DA07_Bed1	20.67%	18.15%	0.88	5.00%	BRE Compliant	Negligible
DA08_Kitchen Dining#	16.26%	13.16%	0.81	5.00%	BRE Compliant	Negligible
DA08_Bed1	17.93%	16.01%	0.89	5.00%	BRE Compliant	Negligible
DA09_KD#	31.16%	31.08%	1.00	5.00%	BRE Compliant	Negligible
DA09_Living#	31.47%	31.47%	1.00	5.00%	BRE Compliant	Negligible
DA09_Bed1#	30.23%	30.23%	1.00	5.00%	BRE Compliant	Negligible
DA09_Bed2#	30.54%	30.38%	0.99	5.00%	BRE Compliant	Negligible
DA09_Bed3#	31.16%	30.85%	0.99	5.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

† Windows that have a reduction of less than 4% in the APSH assessment may be indicated as "n.a." in the WPSH assessment regardless of values.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

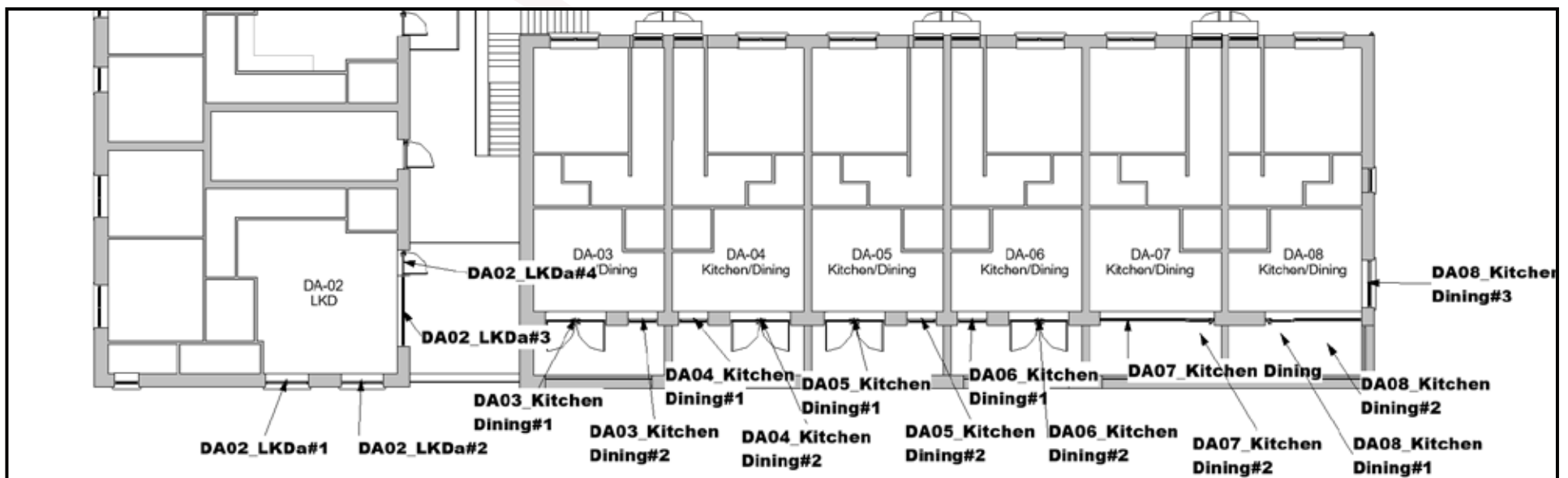


Figure A.33: Floorplans with indication of the assessed windows/rooms

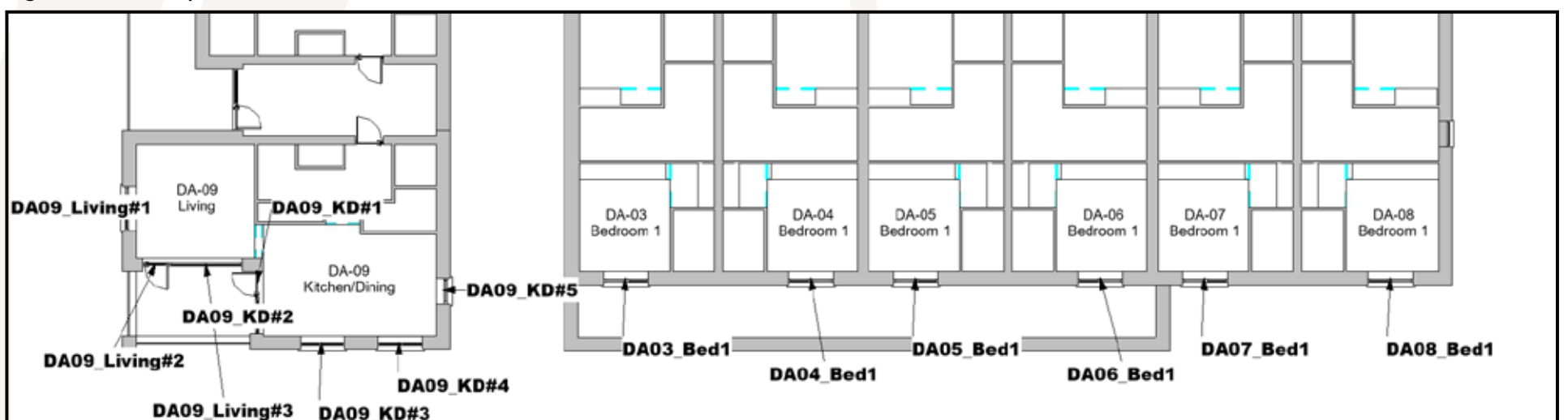


Figure A.34: Floorplans with indication of the assessed windows/rooms

A.3.3 Property Group B - Annual Probable Sunlight Hours

Table No. A.3.3 - APSH Results:						
Window / Room Number	Baseline APSH	Proposed APSH	Ratio of Proposed APSH to Baseline APSH	Recommended minimum APSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB01_Bedroom 1	18.26%	8.39%	0.46	14.26%	59%	Moderate Adverse
DB01_LKD#	60.40%	47.55%	0.79	25.00%	BRE Compliant	Negligible
DB02_Bedroom 1	23.62%	8.62%	0.37	18.90%	46%	Major Adverse
DB02_LKD#	63.23%	47.46%	0.75	25.00%	BRE Compliant	Negligible
DB03_Bedroom 1	23.14%	7.76%	0.34	18.51%	42%	Major Adverse
DB03_LKD#	56.62%	40.65%	0.72	25.00%	BRE Compliant	Negligible
DB04_Bed1#	49.73%	37.30%	0.75	25.00%	BRE Compliant	Negligible
DB05_LKD#	75.99%	65.66%	0.86	25.00%	BRE Compliant	Negligible
DB05_Bed1	62.16%	56.95%	0.92	25.00%	BRE Compliant	Negligible
DB05_Bed2	65.27%	59.21%	0.91	25.00%	BRE Compliant	Negligible
DB05_Bed3	58.04%	52.06%	0.90	25.00%	BRE Compliant	Negligible
DB06_LKD#	79.41%	65.70%	0.83	25.00%	BRE Compliant	Negligible
DB06_Bed1	67.21%	59.91%	0.89	25.00%	BRE Compliant	Negligible
DB06_Bed2	65.66%	58.90%	0.90	25.00%	BRE Compliant	Negligible
DB06_Bed3	60.45%	53.07%	0.88	25.00%	BRE Compliant	Negligible
DB07_LKD#	65.97%	53.66%	0.81	25.00%	BRE Compliant	Negligible
DB07_Bed1	67.13%	60.61%	0.90	25.00%	BRE Compliant	Negligible
DB07_Bed2	68.61%	61.62%	0.90	25.00%	BRE Compliant	Negligible
DB07_Bed3	62.63%	55.87%	0.89	25.00%	BRE Compliant	Negligible
DB08_LKD#	46.93%	41.26%	0.88	25.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

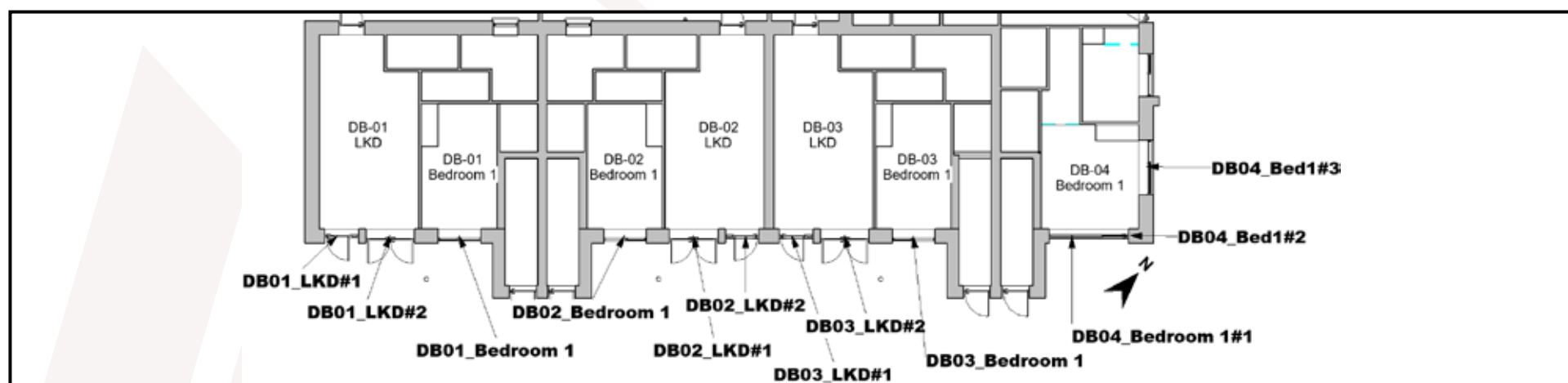


Figure A.35: Floorplans with indication of the assessed windows/rooms

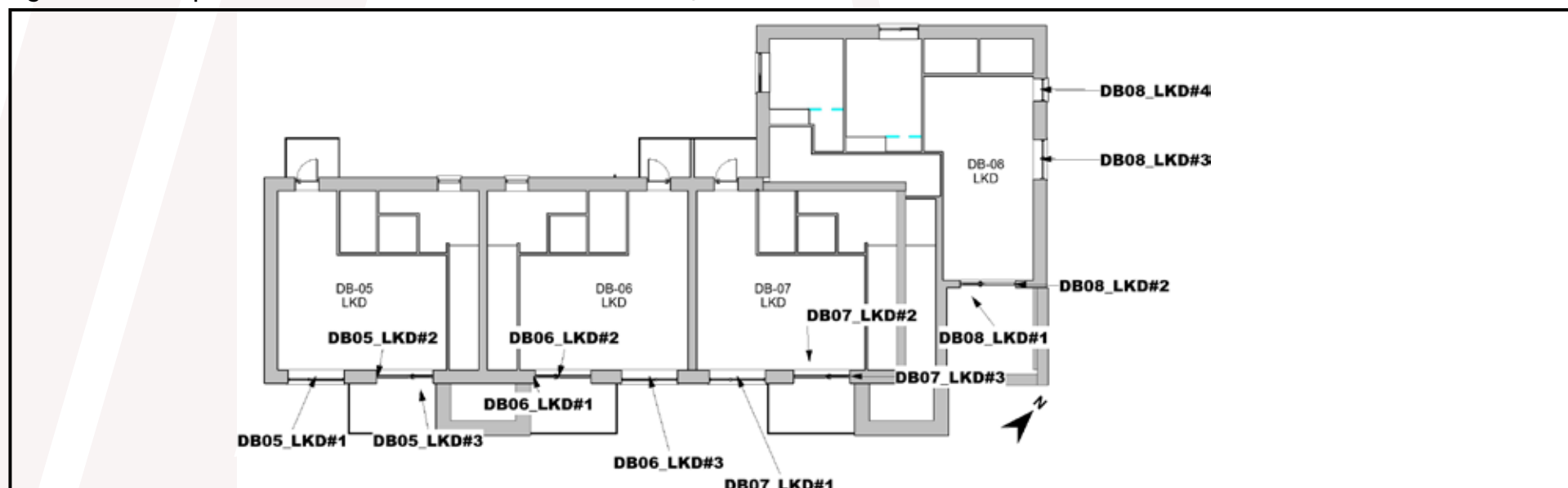


Figure A.36: Floorplans with indication of the assessed windows/rooms

A.3.4 Property Group B - Winter Probable Sunlight Hours

Table No. A.3.4 - WPSH Results:						
Window / Room Number	Baseline WPSH	Proposed WPSH	Ratio of Proposed WPSH to Baseline WPSH	Recommended minimum WPSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB01_Bedroom 1	12.43%	4.58%	0.37	5.00%	92%	Minor Adverse
DB01_LKD#	13.08%	6.37%	0.49	5.00%	BRE Compliant	Negligible
DB02_Bedroom 1	10.41%	0.47%	0.04	5.00%	9%	Major Adverse
DB02_LKD#	14.00%	1.95%	0.14	5.00%	39%	Major Adverse
DB03_Bedroom 1	17.86%	4.10%	0.23	5.00%	82%	Minor Adverse
DB03_LKD#	17.84%	4.06%	0.23	5.00%	81%	Minor Adverse
DB04_Bed1#	15.38%	3.19%	0.21	5.00%	64%	Moderate Adverse
DB05_LKD#	18.49%	11.03%	0.60	5.00%	BRE Compliant	Negligible
DB05_Bed1	19.27%	15.23%	0.79	5.00%	BRE Compliant	Negligible
DB05_Bed2	22.38%	17.09%	0.76	5.00%	BRE Compliant	Negligible
DB05_Bed3	18.88%	13.75%	0.73	5.00%	BRE Compliant	Negligible
DB06_LKD#	22.61%	10.84%	0.48	5.00%	BRE Compliant	Negligible
DB06_Bed1	24.55%	17.95%	0.73	5.00%	BRE Compliant	Negligible
DB06_Bed2	23.00%	16.78%	0.73	5.00%	BRE Compliant	Negligible
DB06_Bed3	21.60%	14.84%	0.69	5.00%	BRE Compliant	Negligible
DB07_LKD#	22.53%	11.39%	0.51	5.00%	BRE Compliant	Negligible
DB07_Bed1	24.48%	18.57%	0.76	5.00%	BRE Compliant	Negligible
DB07_Bed2	25.95%	19.11%	0.74	5.00%	BRE Compliant	Negligible
DB07_Bed3	23.78%	16.94%	0.71	5.00%	BRE Compliant	Negligible
DB08_LKD#	12.12%	6.92%	0.57	5.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

† Windows that have a reduction of less than 4% in the APSH assessment may be indicated as "n.a." in the WPSH assessment regardless of values.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

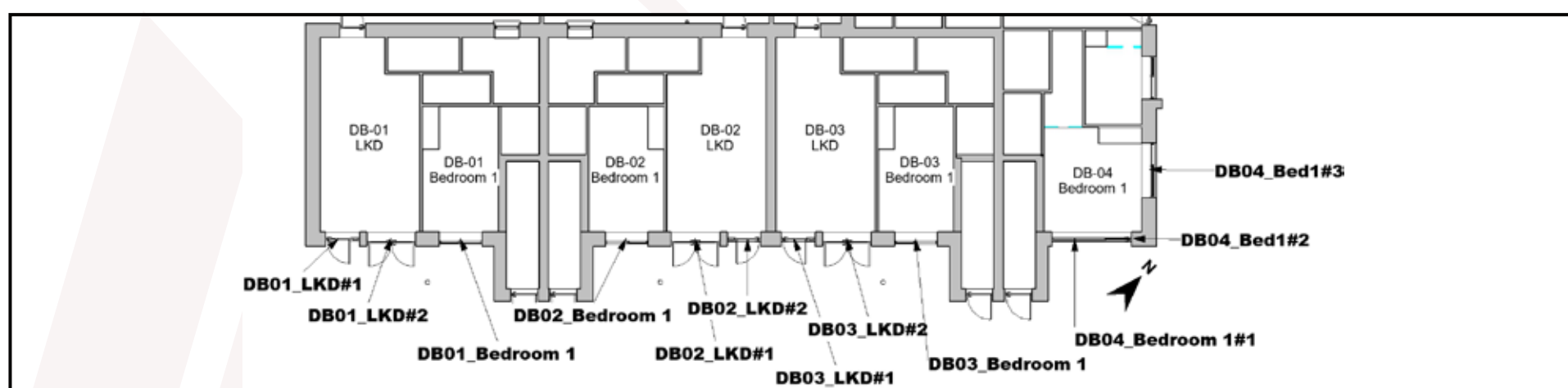


Figure A.37: Floorplans with indication of the assessed windows/rooms

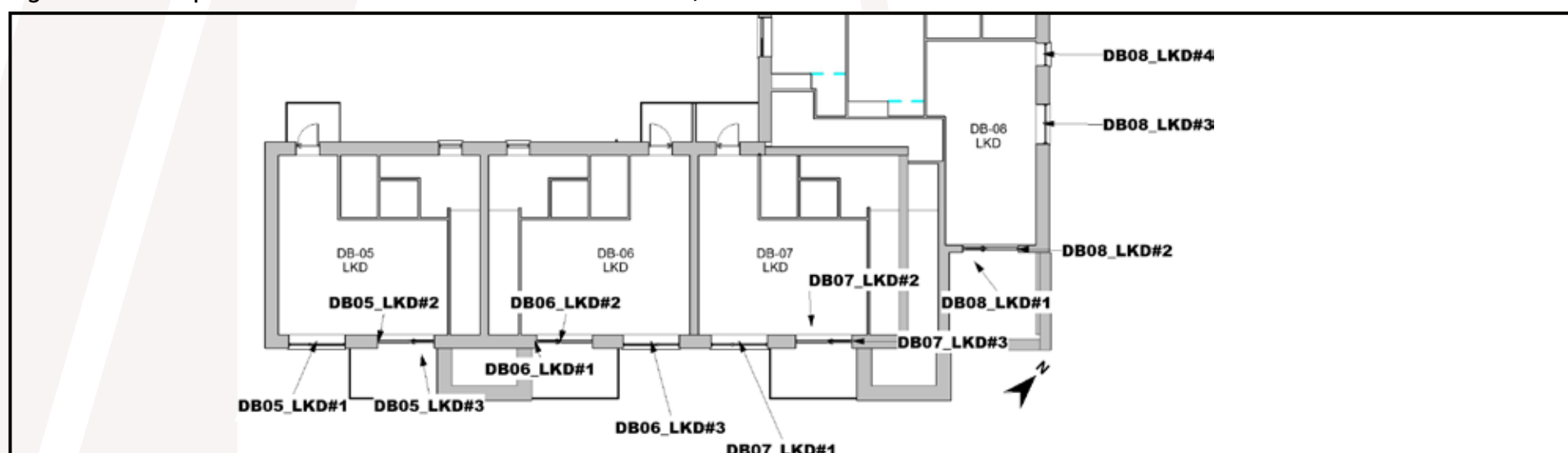


Figure A.38: Floorplans with indication of the assessed windows/rooms

A.3.5 Property Group B - Supplementaty No Balcony Study

Table No. A.3.5 - APSH No Balcony Results:						
Window / Room Number	Baseline APSH	Proposed APSH	Ratio of Proposed APSH to Baseline APSH	Recommended minimum APSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB01_Bedroom 1	43.67%	33.41%	0.77	25.00%	BRE Compliant	Negligible
DB01_LKD	61.64%	48.80%	0.79	25.00%	BRE Compliant	Negligible
DB02_Bedroom 1	37.06%	21.99%	0.59	25.00%	88%	Minor Adverse
DB02_LKD	70.26%	53.79%	0.77	25.00%	BRE Compliant	Negligible
DB03_Bedroom 1	49.34%	33.57%	0.68	25.00%	BRE Compliant	Negligible
DB03_LKD	58.97%	42.93%	0.73	25.00%	BRE Compliant	Negligible
DB04_Bedroom 1	49.73%	37.30%	0.75	25.00%	BRE Compliant	Negligible
DB05_LKD	75.99%	65.66%	0.86	25.00%	BRE Compliant	Negligible
DB05_Bed 1	62.16%	56.95%	0.92	25.00%	BRE Compliant	Negligible
DB05_Bed 2	65.27%	59.21%	0.91	25.00%	BRE Compliant	Negligible
DB05_Bed 3	58.04%	52.06%	0.90	25.00%	BRE Compliant	Negligible
DB06_LKD	79.41%	65.70%	0.83	25.00%	BRE Compliant	Negligible
DB06_Bed 1	67.21%	59.91%	0.89	25.00%	BRE Compliant	Negligible
DB06_Bed 2	65.66%	58.90%	0.90	25.00%	BRE Compliant	Negligible
DB06_Bed 3	60.45%	53.07%	0.88	25.00%	BRE Compliant	Negligible
DB07_LKD	65.97%	53.66%	0.81	25.00%	BRE Compliant	Negligible
DB07_Bed 1	67.13%	60.61%	0.90	25.00%	BRE Compliant	Negligible
DB07_Bed 2	68.61%	61.62%	0.90	25.00%	BRE Compliant	Negligible
DB07_Bed 3	62.63%	55.87%	0.89	25.00%	BRE Compliant	Negligible
DB08_LKD	46.93%	41.26%	0.88	25.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.



Figure A.39: Indication of windows assessed and balconies removed

A.3.6 Property Group B - Supplementaty No Balcony Study

Table No. A.3.6 - WPSH No Balcony Results:						
Window / Room Number	Baseline WPSH	Proposed WPSH	Ratio of Proposed APSH to Baseline WPSH	Recommended minimum WPSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
DB01_Bedroom 1	13.13%	4.90%	0.37	5.00%	98%	Minor Adverse
DB01_LKD	13.08%	6.37%	0.49	5.00%	BRE Compliant	Negligible
DB02_Bedroom 1	10.41%	0.47%	0.04	5.00%	9%	Major Adverse
DB02_LKD	16.08%	3.34%	0.21	5.00%	67%	Moderate Adverse
DB03_Bedroom 1	19.66%	5.52%	0.28	5.00%	BRE Compliant	Negligible
DB03_LKD	18.96%	5.17%	0.27	5.00%	BRE Compliant	Negligible
DB04_Bedroom 1	15.38%	3.19%	0.21	5.00%	64%	Moderate Adverse
DB05_LKD	18.49%	11.03%	0.60	5.00%	BRE Compliant	Negligible
DB05_Bed 1	19.27%	15.23%	0.79	5.00%	BRE Compliant	Negligible
DB05_Bed 2	22.38%	17.09%	0.76	5.00%	BRE Compliant	Negligible
DB05_Bed 3	18.88%	13.75%	0.73	5.00%	BRE Compliant	Negligible
DB06_LKD	22.61%	10.84%	0.48	5.00%	BRE Compliant	Negligible
DB06_Bed 1	24.55%	17.95%	0.73	5.00%	BRE Compliant	Negligible
DB06_Bed 2	23.00%	16.78%	0.73	5.00%	BRE Compliant	Negligible
DB06_Bed 3	21.60%	14.84%	0.69	5.00%	BRE Compliant	Negligible
DB07_LKD	22.53%	11.39%	0.51	5.00%	BRE Compliant	Negligible
DB07_Bed 1	24.48%	18.57%	0.76	5.00%	BRE Compliant	Negligible
DB07_Bed 2	25.95%	19.11%	0.74	5.00%	BRE Compliant	Negligible
DB07_Bed 3	23.78%	16.94%	0.71	5.00%	BRE Compliant	Negligible
DB08_LKD	12.12%	6.92%	0.57	5.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

† Windows that have a reduction of less than 4% in the APSH assessment may be indicated as "n.a." in the WPSH assessment regardless of values.

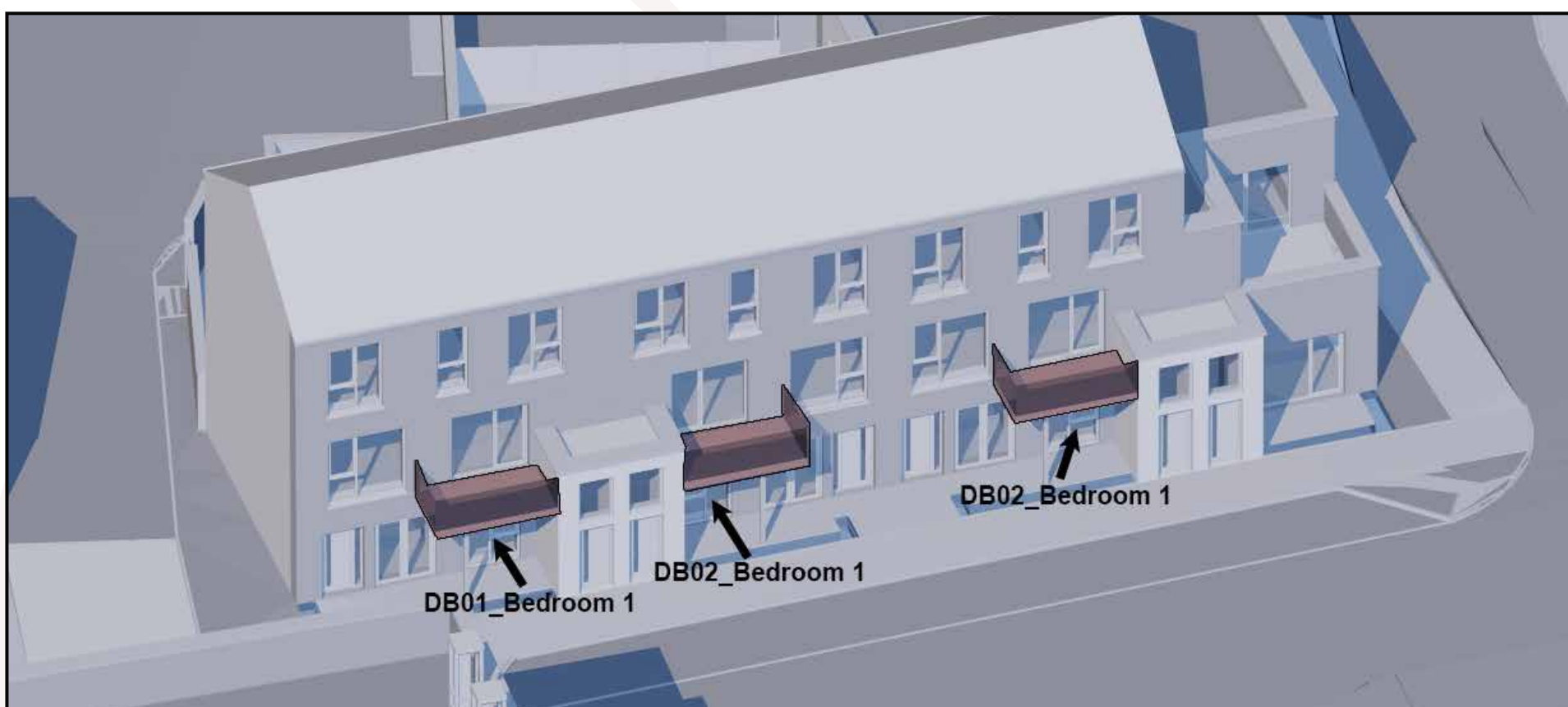


Figure A.40: Indication of windows assessed and balconies removed

A.3.7 Property Group C - Annual Probable Sunlight Hours

Table No. A.3.7 - APSH Results:						
Window / Room Number	Baseline APSH	Proposed APSH	Ratio of Proposed APSH to Baseline APSH	Recommended minimum APSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House C1_LKD2	74.98%	75.45%	1.01	25.00%	BRE Compliant	Negligible
House C1_Bd1	60.76%	60.76%	1.00	25.00%	BRE Compliant	Negligible
House C1_Bd2#	88.58%	87.49%	0.99	25.00%	BRE Compliant	Negligible
House C2_LKD1	74.59%	76.46%	1.03	25.00%	BRE Compliant	Negligible
House C2_Bd1	58.90%	60.53%	1.03	25.00%	BRE Compliant	Negligible
House C2_Bd2	58.28%	59.29%	1.02	25.00%	BRE Compliant	Negligible
House C3_LKD1	74.16%	75.95%	1.02	25.00%	BRE Compliant	Negligible
House C3_Bd1	60.92%	61.62%	1.01	25.00%	BRE Compliant	Negligible
House C3_Bd2	59.52%	60.06%	1.01	25.00%	BRE Compliant	Negligible
House C4_LKD	77.16%	78.72%	1.02	25.00%	BRE Compliant	Negligible
House C4_Bd1	62.43%	62.12%	1.00	25.00%	BRE Compliant	Negligible
House C4_Bd2#	61.91%	59.58%	0.96	25.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

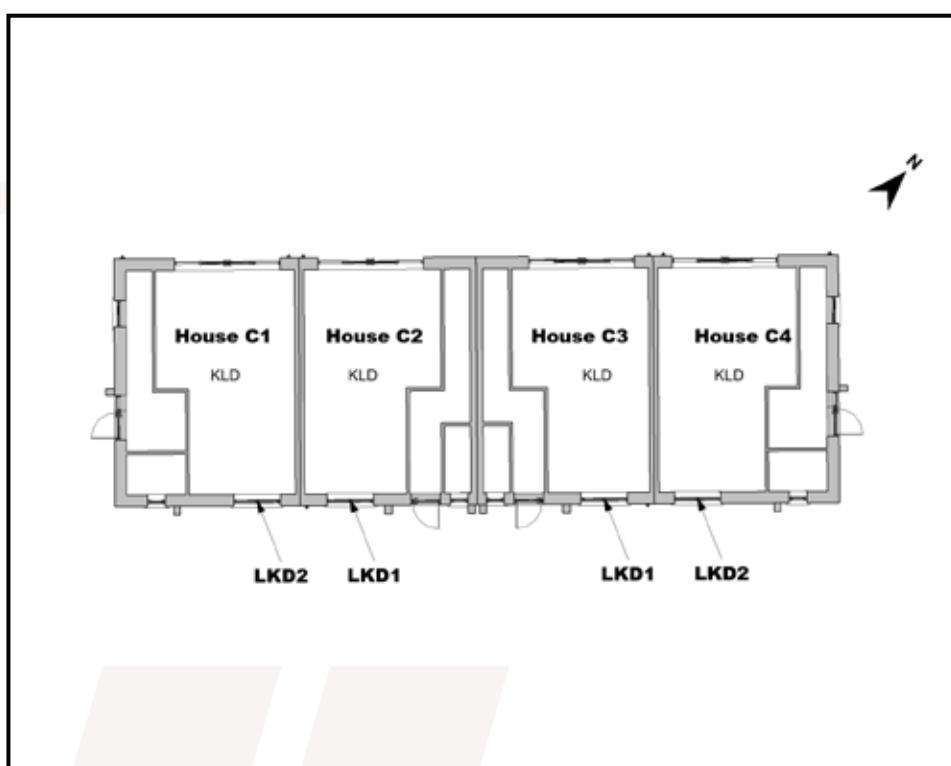


Figure A.41: Floorplans with indication of the assessed windows/rooms

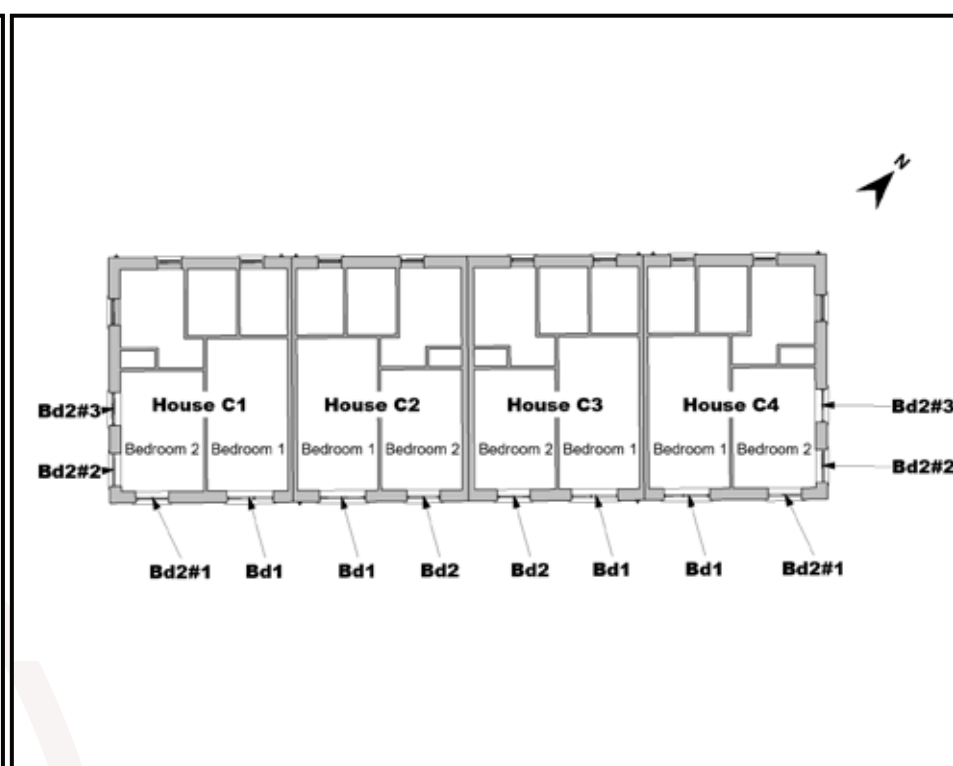


Figure A.42: Floorplans with indication of the assessed windows/rooms

A.3.8 Property Group C - Winter Probable Sunlight Hours

Table No. A.3.8 - WPSH Results:						
Window / Room Number	Baseline WPSH	Proposed WPSH	Ratio of Proposed WPSH to Baseline WPSH	Recommended minimum WPSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House C1_LKD2	15.00%	17.17%	1.15	5.00%	BRE Compliant	Negligible
House C1_Bd1	18.96%	20.36%	1.07	5.00%	BRE Compliant	Negligible
House C1_Bd2#	22.46%	22.92%	1.02	5.00%	BRE Compliant	Negligible
House C2_LKD1	15.00%	18.65%	1.24	5.00%	BRE Compliant	Negligible
House C2_Bd1	19.19%	21.76%	1.13	5.00%	BRE Compliant	Negligible
House C2_Bd2	19.35%	21.52%	1.11	5.00%	BRE Compliant	Negligible
House C3_LKD1	14.76%	17.64%	1.19	5.00%	BRE Compliant	Negligible
House C3_Bd1	21.06%	22.14%	1.05	5.00%	BRE Compliant	Negligible
House C3_Bd2	20.20%	22.30%	1.10	5.00%	BRE Compliant	Negligible
House C4_LKD	16.71%	19.43%	1.16	5.00%	BRE Compliant	Negligible
House C4_Bd1	20.67%	20.98%	1.02	5.00%	BRE Compliant	Negligible
House C4_Bd2#	21.29%	19.35%	0.91	5.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

† Windows that have a reduction of less than 4% in the APSH assessment may be indicated as "n.a." in the WPSH assessment regardless of values.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

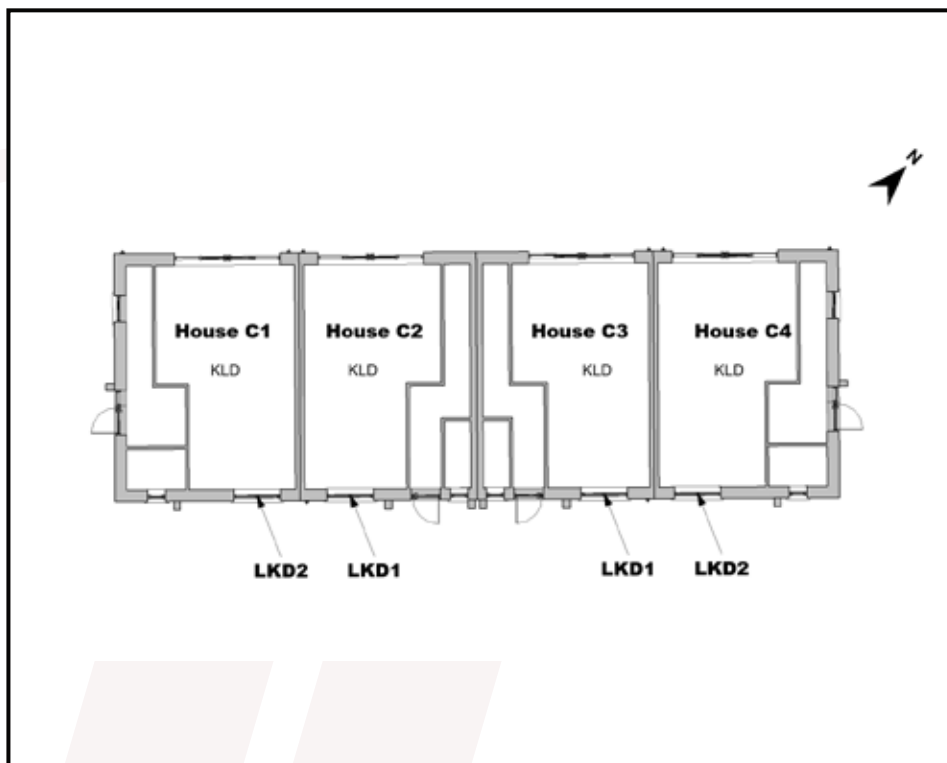


Figure A.43: Floorplans with indication of the assessed windows/rooms

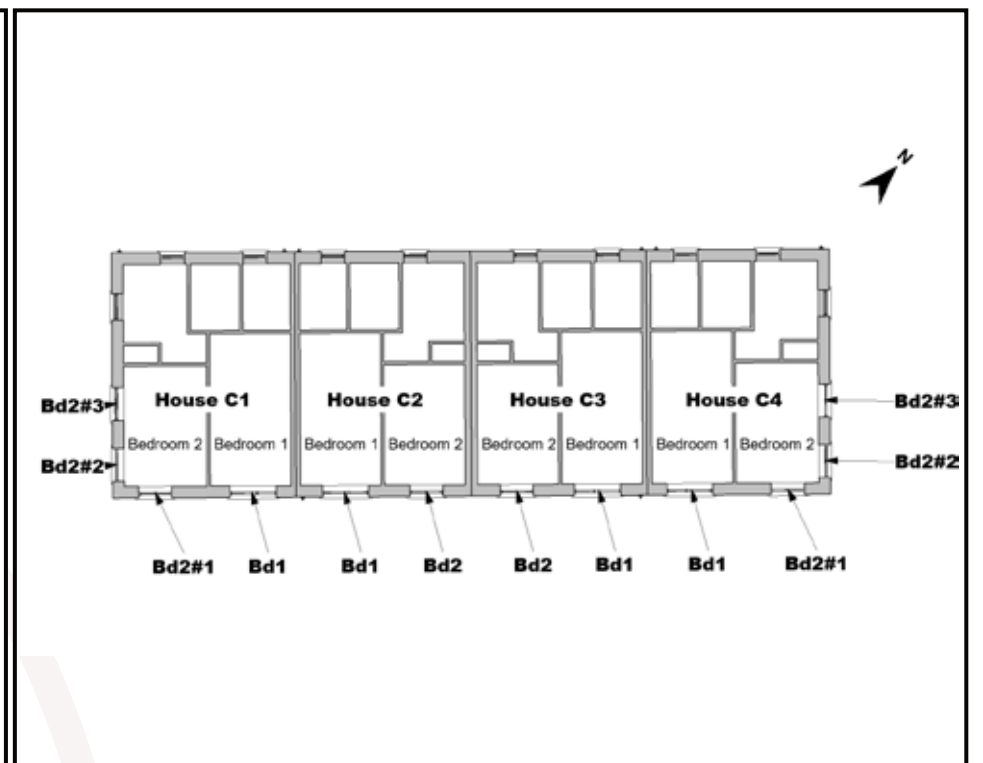


Figure A.44: Floorplans with indication of the assessed windows/rooms

A.3.9 Property Group D - Annual Probable Sunlight Hours

Table No. A.3.9 - APSH Results:						
Window / Room Number	Baseline APSH	Proposed APSH	Ratio of Proposed APSH to Baseline APSH	Recommended minimum APSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House D1_KD#	88.34%	82.74%	0.94	25.00%	BRE Compliant	Negligible
House D1_LR#	58.04%	53.46%	0.92	25.00%	BRE Compliant	Negligible
House D1_Bd3#	92.67%	87.54%	0.94	25.00%	BRE Compliant	Negligible
House D1_Bd4	60.84%	58.51%	0.96	25.00%	BRE Compliant	Negligible
House D1_EntR#	67.72%	62.90%	0.93	25.00%	BRE Compliant	Negligible
House D1_Bd2_Inc	85.94%	84.23%	0.98	25.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

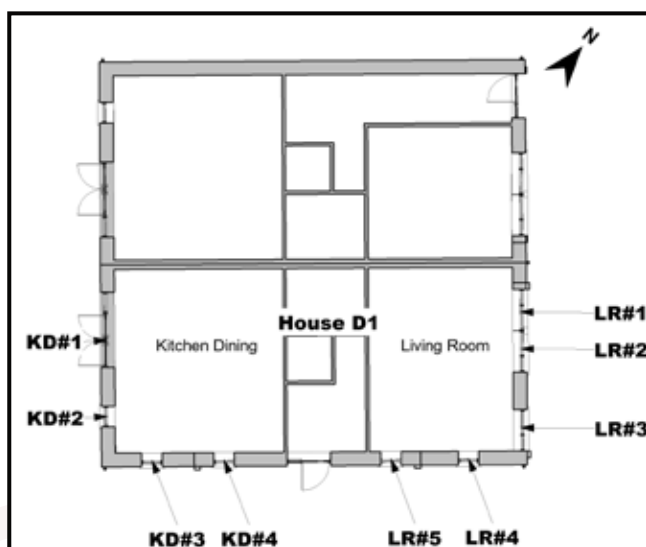


Figure A.45: Floorplans with indication of the assessed windows/rooms

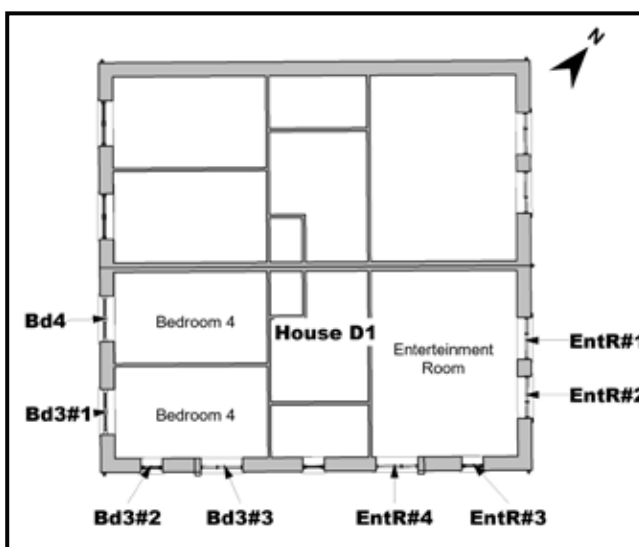


Figure A.46: Floorplans with indication of the assessed windows/rooms

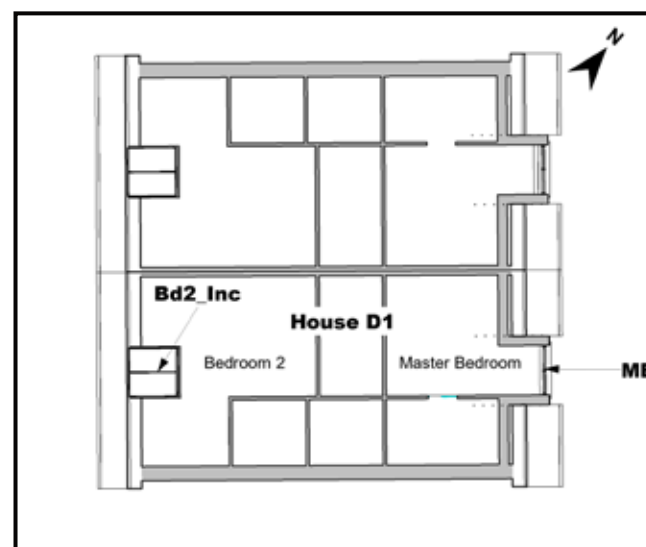


Figure A.47: Floorplans with indication of the assessed windows/rooms

A.3.10 Property Group D - Winter Probable Sunlight Hours

Table No. A.3.10 - WPSH Results:						
Window / Room Number	Baseline WPSH	Proposed WPSH	Ratio of Proposed WPSH to Baseline WPSH	Recommended minimum WPSH*	Level of Compliance with BRE Guidelines	Effect of Proposed Development**
House D1_KD#	24.48%	18.88%	0.77	5.00%	BRE Compliant	Negligible
House D1_LR#	19.19%	14.61%	0.76	5.00%	BRE Compliant	Negligible
House D1_Bd3#	26.26%	21.13%	0.80	5.00%	BRE Compliant	Negligible
House D1_Bd4	19.66%	17.33%	0.88	5.00%	BRE Compliant	Beneficial Impact
House D1_EntR#	25.56%	20.75%	0.81	5.00%	BRE Compliant	Negligible
House D1_Bd2_Inc	27.82%	26.11%	0.94	5.00%	BRE Compliant	Negligible

* Section 3.2 of the BRE Guidelines states that in order for a proposed development to have a noticeable effect on the APSH/WPSH of an existing window / room, the value needs to drop below the stated target value of 25% (annual) / 5% (winter) **and** be less than 0.8 times the baseline value **and** it has to have a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

** For the interpretation of level of effects please refer to "E.2 Definition of Effects" on page 95.

† Windows that have a reduction of less than 4% in the APSH assessment may be indicated as "n.a." in the WPSH assessment regardless of values.

If it can be determined or reasonably assumed that multiple windows are servicing the same room, APSH/WPSH has been calculated for the room rather than the individual windows.

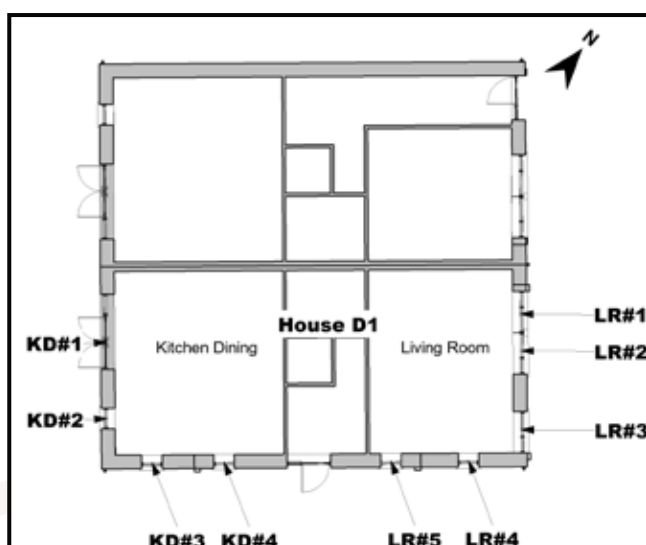


Figure A.48: Floorplans with indication of the assessed windows/rooms

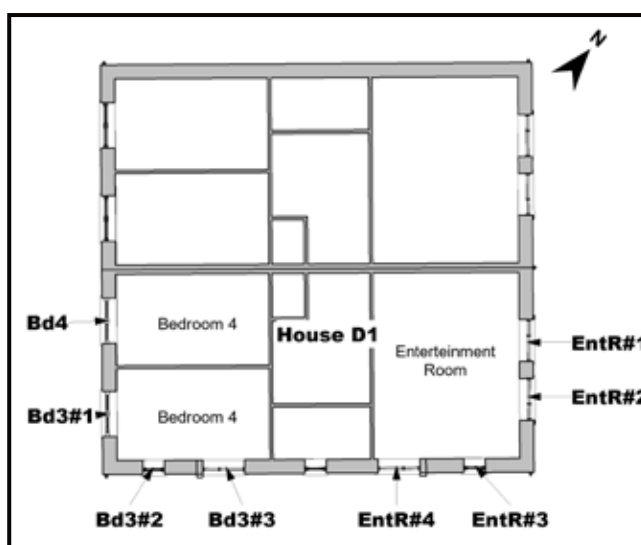


Figure A.49: Floorplans with indication of the assessed windows/rooms

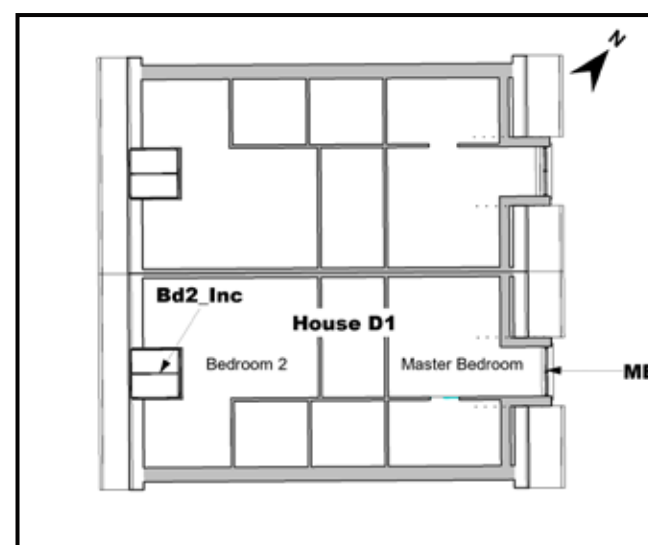


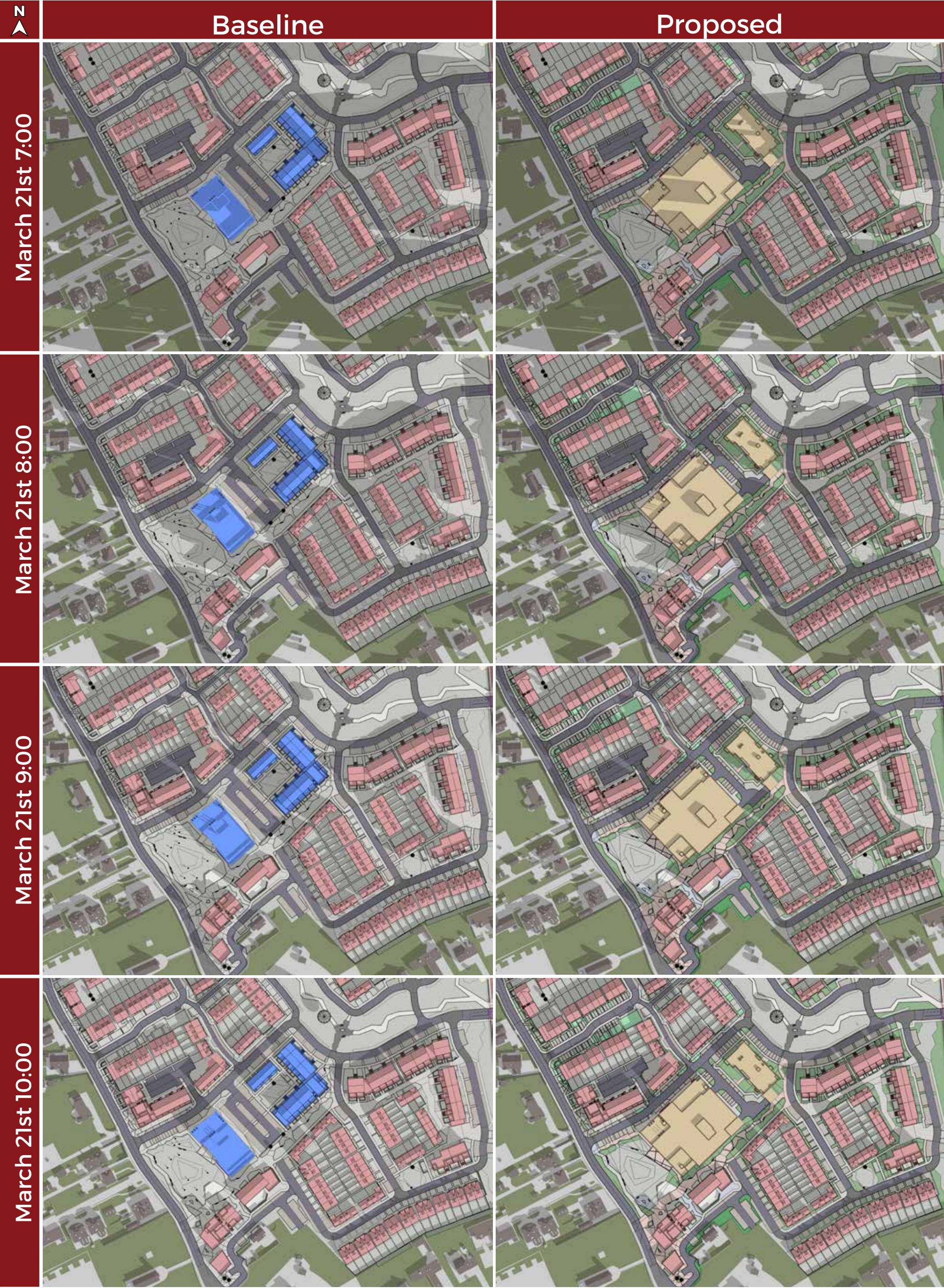
Figure A.50: Floorplans with indication of the assessed windows/rooms

A.4 Supplementary Daylight Provision Assessment (SDA) - Impact Assessment

In addition to the VSC and NSL assessments recommended by the BRE Guidelines for the assessment of loss of daylight to existing buildings, a supplementary Spatial Daylight Autonomy (SDA) assessment has been carried out within the rooms served by windows recording adverse effects in the NSL assessment.

Results are presented below:

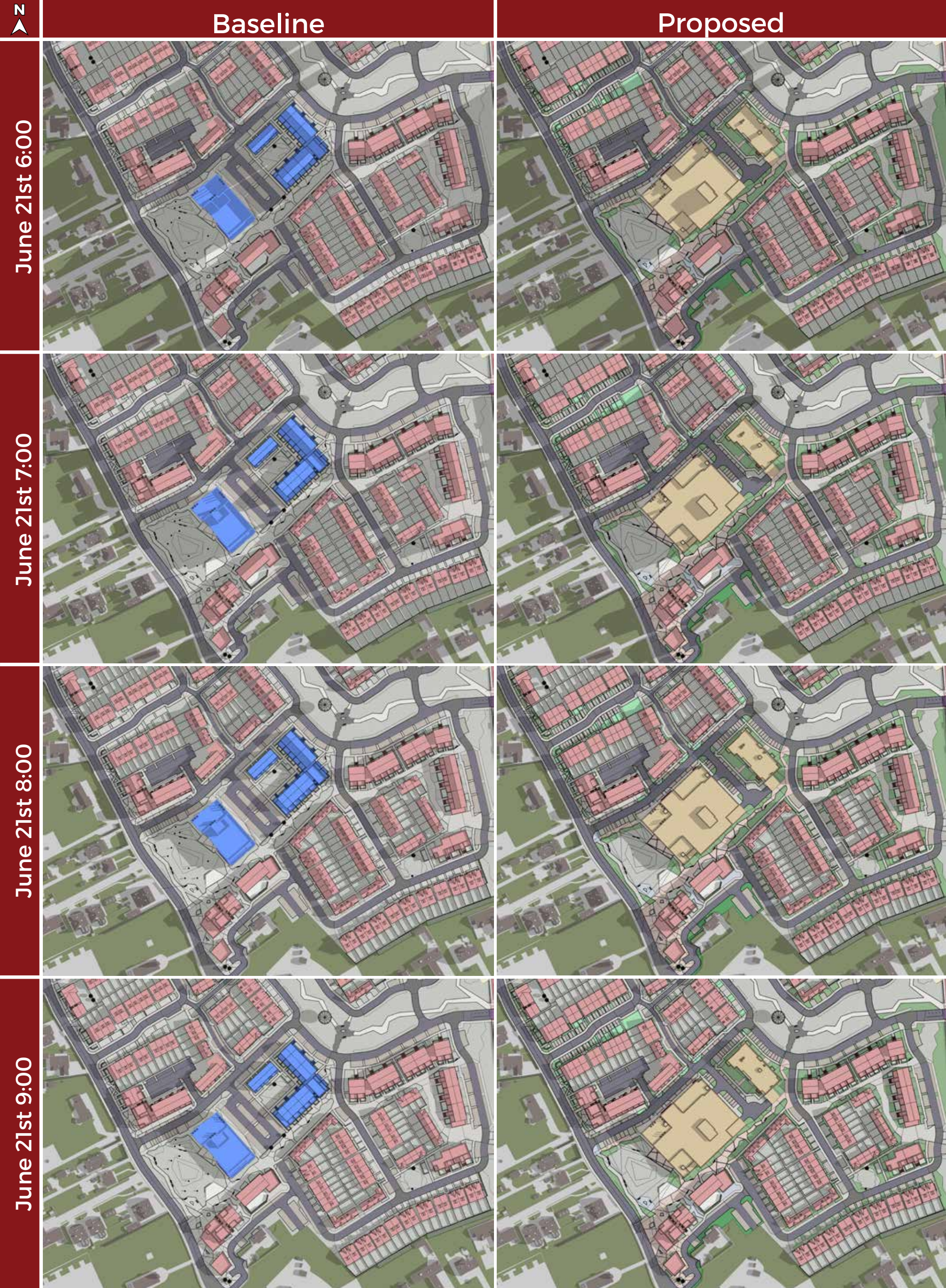
Table No. A.4.10 - SDA Impact Results:				
Unit Number	Room Description	Target Lux*	% of area above target Lux* (recommendation ≥50%)	Compliance with BR 209 Criteria*
			Without Trees***	
DB01_Bedroom 1	Bedroom 1	100	73%	Compliant
DB02_Bedroom 1	Bedroom 1	100	64%	Compliant
DB03_Bedroom 1	Bedroom 1	100	65%	Compliant
* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17. *** The SDA assessment without trees indicates the level of daylight within the assessed room when trees are not included in the analytical model. This study provides an understanding of how trees affect daylight within the assessed room.				



B.0	Shadow Studies	Project: LRD Kiltarnan Village, Co. Dublin	Permitted Blocks Retained	Proposed
B.1	Shadow Study 21 March	Proposed - Amendment Application	Permitted Blocks Replaced	
March 21st Sunrise 6:32 Sunset 18:32		Applicant: Liscove Limited		 3D DESIGN BUREAU

Baseline		Proposed	
March 21st 11:00			
Project: LRD Kiltarnan Village, Co. Dublin Proposed - Amendment Application		Permitted Blocks Retained	Proposed
Applicant: Liscove Limited		Permitted Blocks Replaced	3D DESIGN BUREAU

Baseline		Proposed	
March 21st 15:00			
Project: LRD Kiltarnan Village, Co. Dublin Proposed - Amendment Application		Permitted Blocks Retained	Proposed
Applicant: Liscove Limited		Permitted Blocks Replaced	3D DESIGN BUREAU

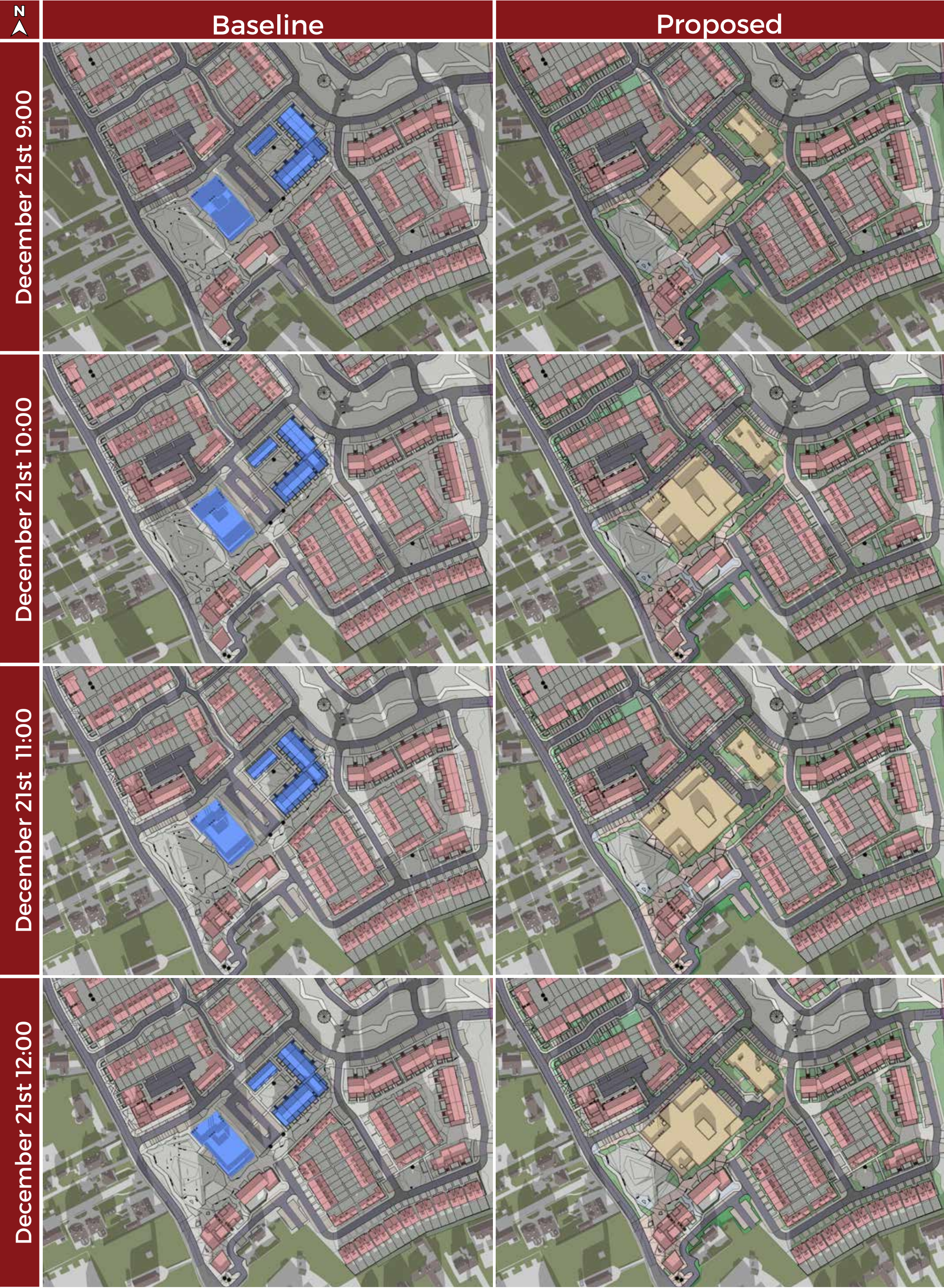


B.2	Shadow Study 21 June	Project: LRD Kiltarnan Village, Co. Dublin Proposed - Amendment Application	Permitted Blocks Retained	Proposed
	June 21st Sunrise 5:04 Sunset 21:49	Applicant: Liscove Limited	Permitted Blocks Replaced	3D DESIGN BUREAU

Baseline		Proposed	
June 21st 10:00			
June 21st 11:00			
June 21st 12:00			
June 21st 13:00			
Project: LRD Kilternan Village, Co. Dublin Proposed - Amendment Application		Permitted Blocks Retained	Proposed
Applicant: Liscove Limited		Permitted Blocks Replaced	3D DESIGN BUREAU

Baseline		Proposed	
June 21st 14:00			
Project: LRD Kilternan Village, Co. Dublin Proposed - Amendment Application		Permitted Blocks Retained	Proposed
Applicant: Liscove Limited		Permitted Blocks Replaced	3D DESIGN BUREAU

Baseline		Proposed	
June 21st 18:00			
Project: LRD Kilternan Village, Co. Dublin Proposed - Amendment Application		Permitted Blocks Retained	Proposed
Applicant: Liscove Limited		Permitted Blocks Replaced	3D DESIGN BUREAU



B.3	Shadow Study 21 December	Project: LRD Kiltarnan Village, Co. Dublin Proposed - Amendment Application	Permitted Blocks Retained	Proposed
	December 21st Sunrise 8:45 Sunset 16:00	Applicant: Liscove Limited	Permitted Blocks Replaced	 3D DESIGN BUREAU

Z		Baseline		Proposed	
December 21st	13:00				
	14:00				
	15:00				
	16:00				
December 21st Sunrise 8:45 Sunset 16:00		Project: LRD Kilternan Village, Co. Dublin Proposed - Amendment Application		Permitted Blocks Retained	Proposed
		Applicant: Liscove Limited		Permitted Blocks Replaced	3D DESIGN BUREAU

C.0 Scheme Performance

C.1 Proposed Apartment Floor Plans



Figure C.3: Apartment Block - Level 1



Figure C.4: Apartment Block - Level 2



Figure C.5: Apartment Block - Level 3



C.2 Spatial Daylight Autonomy (SDA) in Proposed Units

Below is an example of the table used to describe the spatial daylight autonomy results in proposed units.

Table Example. C.2 - Scheme Performance SDA					
Unit Number	Room Description	Target Lux*	% of area above target Lux* (recommendation ≥50%)		Compliance with BR 209 Criteria
			Without Trees	With Trees	
A	B	C	D	E	F

A: Unit Number

This column identifies the assessed unit. All unit numbers are determined by the architect's drawings, unless otherwise stated.

B: Room Description

Room Description details which room in the unit has been assessed, e.g. bedroom, LKD, etc.

C: Target Lux

Under BR 209 the appropriate target lux levels to be achieved across 50% of the working plane of a room differ depending on the room type. Kitchens have a target lux of 200, living rooms have a target lux of 150 and bedrooms have a target lux of 100. In a room providing more than one function, such as an LKD, the higher target value should be taken i.e. 200 Lux.

D: % of area above target Lux (Without Trees)

BR 209 recommends target lux levels to be achieved across at least 50% of the working plane for at least half the daylight hours. The target values differ depending on the room function, 200 lux for Kitchens, 150 lux for Living Rooms or 100 lux for Bedrooms.

This column states percentage of the working plane of the assessed room that is capable of receiving more than the appropriate target lux for at least half the daylight hours with trees excluded from the analytical model. The figures shown in this column should be considered part of a supplementary study that helps identify if trees are having an effect on daylight within the proposed units.

E: % of area above target Lux (With Trees)

BR 209 recommends target lux levels to be achieved across at least 50% of the working plane for at least half the daylight hours. The target values differ depending on the room function, 200 lux for Kitchens, 150 lux for Living Rooms or 100 lux for Bedrooms.

This column states percentage of the working plane of the assessed room that is capable of receiving more than the appropriate target lux for at least half the daylight hours with the foliage of deciduous trees varied to account for summer and winter conditions, i.e. full leaf and bare branch.

F: Compliance with BR 209 Criteria

This column states if the assessed room achieves the recommended level of daylight as per BR 209 with consideration to the various tree states.

If the target lux level is achieved across more than 50% of the working plane, for half the daylight hours, both with and without trees, this column will state: *'Compliant'*.

If the target lux level is not achieved across more than 50% of the working plane, for half the daylight hours, both with and without trees, this column will state: *'Non-compliant'*.

If the target lux level is achieved across more than 50% of the working plane, for half the daylight hours, without trees but is not achieved with trees, this column will state: *'Trees affecting compliance'*.

Compliance rates will be stated for SDA, both with and without trees.

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation of these figures may yield a negligible difference and should not be considered an error.

C.2.1 SDA Results: Proposed Apartment Block - Ground Floor

Table No. C.2.1 - SDA Results:					
Unit Number	Room Description	Target Lux*	% of area above target Lux* (recommendation ≥50%)		Compliance with BR 209 Criteria*
			Without Trees***	With Trees**	
A.01	KLD	200	100%	100%	Compliant
A.01	Bedroom 01	100	100%	100%	Compliant
A.01	Bedroom 02	100	100%	100%	Compliant
A.02	KLD	200	86%	60%	Compliant
A.02	Bedroom 01	100	100%	100%	Compliant
A.02	Bedroom 02	100	100%	100%	Compliant
A.03	KLD	200	79%	60%	Compliant
A.03	Bedroom 01	100	100%	100%	Compliant
A.04	KLD	200	100%	100%	Compliant
A.04	Bedroom 01	100	100%	100%	Compliant
A.04	Bedroom 02	100	100%	100%	Compliant
A.05	KLD	200	72%	69%	Compliant
A.05	Bedroom 01	100	100%	100%	Compliant
A.06	KLD	200	32%	21%	Non-compliant
A.06	Bedroom 01	100	100%	89%	Compliant
A.06	Bedroom 02	100	100%	100%	Compliant
A.07	KLD	200	100%	98%	Compliant
A.07	Bedroom 02	100	100%	100%	Compliant
A.07	Bedroom 01	100	100%	100%	Compliant

* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17.

** Under the BR 209 study the SDA has been calculated with indicative trees represented accounting for annual foliage.

*** The SDA assessment without trees indicates the level of daylight within the proposed development when trees are not included in the analytical model. This study provides an understanding of how trees affect daylight within the proposed development. The SDA circa compliance rates across the assessed units can be found in section 3.2.1 on page 24. For floor plans of the assessed units please refer to section C.1 on page 70.

C.2.2 SDA Results: Proposed Apartment Block - First Floor

Table No. C.2.2 - SDA Results:					
Unit Number	Room Description	Target Lux*	% of area above target Lux* (recommendation ≥50%)		Compliance with BR 209 Criteria*
			Without Trees***	With Trees**	
A.08	KLD	200	100%	100%	Compliant
A.08	Bedroom 01	100	100%	100%	Compliant
A.08	Bedroom 02	100	100%	100%	Compliant
A.09	KLD	200	95%	70%	Compliant
A.09	Bedroom 01	100	100%	100%	Compliant
A.09	Bedroom 02	100	100%	100%	Compliant
A.10	KLD	200	84%	70%	Compliant
A.10	Bedroom 01	100	100%	100%	Compliant
A.11	KLD	200	100%	100%	Compliant
A.11	Bedroom 02	100	100%	100%	Compliant
A.11	Bedroom 01	100	100%	100%	Compliant
A.12	KLD	200	100%	100%	Compliant
A.12	Bedroom 01	100	100%	100%	Compliant
A.12	Bedroom 02	100	100%	100%	Compliant
A.13	KLD	200	82%	81%	Compliant
A.13	Bedroom 02	100	100%	100%	Compliant
A.13	Bedroom 01	100	100%	100%	Compliant
A.14	KLD	200	83%	81%	Compliant
A.14	Bedroom 01	100	100%	100%	Compliant
A.14	Bedroom 02	100	100%	100%	Compliant
A.15	KLD	200	100%	100%	Compliant
A.15	Bedroom 02	100	100%	100%	Compliant
A.15	Bedroom 01	100	100%	100%	Compliant

* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17.

** Under the BR 209 study the SDA has been calculated with indicative trees represented accounting for annual foliage.

*** The SDA assessment without trees indicates the level of daylight within the proposed development when trees are not included in the analytical model. This study provides an understanding of how trees affect daylight within the proposed development.

The SDA circa compliance rates across the assessed units can be found in section 3.2.1 on page 24.

For floor plans of the assessed units please refer to section C.1 on page 70.

C.2.3 SDA Results: Proposed Apartment Block - Second Floor

Table No. C.2.3 - SDA Results:					
Unit Number	Room Description	Target Lux*	% of area above target Lux* (recommendation ≥50%)		Compliance with BR 209 Criteria*
			Without Trees***	With Trees**	
A.16	KLD	200	100%	100%	Compliant
A.16	Bedroom 01	100	100%	100%	Compliant
A.16	Bedroom 02	100	100%	100%	Compliant
A.17	KLD	200	99%	76%	Compliant
A.17	Bedroom 01	100	100%	100%	Compliant
A.17	Bedroom 02	100	100%	100%	Compliant
A.18	KLD	200	84%	75%	Compliant
A.18	Bedroom 01	100	100%	100%	Compliant
A.19	KLD	200	100%	100%	Compliant
A.19	Bedroom 02	100	100%	100%	Compliant
A.19	Bedroom 01	100	100%	100%	Compliant
A.20	KLD	200	100%	100%	Compliant
A.20	Bedroom 01	100	100%	100%	Compliant
A.20	Bedroom 02	100	100%	100%	Compliant
A.21	KLD	200	98%	97%	Compliant
A.21	Bedroom 02	100	100%	100%	Compliant
A.21	Bedroom 01	100	100%	100%	Compliant
A.22	KLD	200	98%	97%	Compliant
A.22	Bedroom 01	100	100%	100%	Compliant
A.22	Bedroom 02	100	100%	100%	Compliant
A.23	KLD	200	100%	100%	Compliant
A.23	Bedroom 02	100	100%	100%	Compliant
A.23	Bedroom 01	100	100%	100%	Compliant
* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17. ** Under the BR 209 study the SDA has been calculated with indicative trees represented accounting for annual foliage. *** The SDA assessment without trees indicates the level of daylight within the proposed development when trees are not included in the analytical model. This study provides an understanding of how trees affect daylight within the proposed development. The SDA circa compliance rates across the assessed units can be found in section 3.2.1 on page 24. For floor plans of the assessed units please refer to section C.1 on page 70.					

C.2.4 SDA Results: Proposed Apartment Block - Third Floor

Table No. C.2.4 - SDA Results:					
Unit Number	Room Description	Target Lux*	% of area above target Lux* (recommendation ≥50%)		Compliance with BR 209 Criteria*
			Without Trees***	With Trees**	
A.24	KLD	200	100%	100%	Compliant
A.24	Bedroom 01	100	100%	100%	Compliant
A.24	Bedroom 02	100	100%	100%	Compliant
A.25	KLD	200	100%	100%	Compliant
A.25	Bedroom 01	100	100%	100%	Compliant
A.25	Bedroom 02	100	100%	100%	Compliant
A.26	KLD	200	100%	92%	Compliant
A.26	Bedroom 01	100	100%	100%	Compliant
A.27	KLD	200	100%	100%	Compliant
A.27	Bedroom 02	100	100%	100%	Compliant
A.27	Bedroom 01	100	100%	100%	Compliant
A.28	KLD	200	100%	100%	Compliant
A.28	Bedroom 01	100	100%	100%	Compliant
A.28	Bedroom 02	100	100%	100%	Compliant
A.29	KLD	200	96%	95%	Compliant
A.29	Bedroom 02	100	100%	100%	Compliant
A.29	Bedroom 01	100	100%	100%	Compliant
A.30	KLD	200	98%	97%	Compliant
A.30	Bedroom 01	100	100%	100%	Compliant
A.30	Bedroom 02	100	100%	100%	Compliant
A.31	KLD	200	100%	100%	Compliant
A.31	Bedroom 02	100	100%	100%	Compliant
A.31	Bedroom 01	100	100%	100%	Compliant

* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17.
 ** Under the BR 209 study the SDA has been calculated with indicative trees represented accounting for annual foliage.
 *** The SDA assessment without trees indicates the level of daylight within the proposed development when trees are not included in the analytical model. This study provides an understanding of how trees affect daylight within the proposed development.
 The SDA circa compliance rates across the assessed units can be found in section 3.2.1 on page 24.
 For floor plans of the assessed units please refer to section C.1 on page 70.

C.3 Sunlight Exposure (SE) in Proposed Units

Below is an example of the table used to describe the SE performance of proposed habitable rooms.

Table Example. C.3 - Scheme Performance Sunlight Exposure							
Unit Number	Room Description	Deciduous Trees as Opaque Objects			Without Deciduous Trees		
		SE Hours on March 21st	Level of SE on March 21st	Unit compliance based on highest performing room	SE Hours on March 21st	Level of SE on March 21st	Unit compliance based on highest performing room
A	B	C	D	E	F	G	H

A: Unit Number

This column identifies the assessed unit. All unit numbers are determined by the architect's drawings, unless otherwise stated.

B: Room Description

Room Description details which room of the unit has been assessed, e.g. bedroom, living room, etc.

C: SE Hours on March 21st (Deciduous Trees as Opaque Objects)

This column will state the number of hours the assessed room can expect to receive on March 21st with the assessment carried out with deciduous trees as opaque objects.

D: Level of SE on March 21st (Deciduous Trees as Opaque Objects)

BR 209 recommends a minimum sunlight exposure of 1.5 hours for a proposed unit with preference given to main living rooms. BR 209 categorises sunlight exposure as minimum, medium and high, this column will categorise the level of sunlight exposure with deciduous trees as opaque objects based on the following:

- Less than 1.5 hours: *Below minimum*,
- Between 1.5 hours and 3 hours: *Minimum*
- Between 3 hours and 4 hours: *Medium*
- More than 4 hours: *High*

E: Unit compliance based on highest performing room (Deciduous Trees as Opaque Objects)

A proposed unit is considered to be compliant provided any habitable room within the unit is capable of receiving at least 1.5 hours of sunlight on the assessment date. This column will identify the highest performing room within a unit and state compliance for the associated unit based on that room with the assessment carried out with deciduous trees as opaque objects.

Typically unit compliance will be stated for the best performing room per unit only, with lesser performing rooms indicated with a dash (-).

F: SE Hours on March 21st (Without Deciduous Trees)

This column will state the number of hours the assessed room can expect to receive on March 21st with the assessment carried out without deciduous trees.

G: Level of SE on March 21st (Without Deciduous Trees)

BR 209 recommends a minimum sunlight exposure of 1.5 hours for a proposed unit with preference given to main living rooms. BR 209 categorises sunlight exposure as minimum, medium and high, this column will categorise the level of sunlight exposure without deciduous trees using the same criteria as the study with deciduous trees as opaque objects.

H: Unit compliance based on highest performing room (Without Deciduous Trees)

A proposed unit is considered to be compliant provided any habitable room within the unit is capable of receiving at least 1.5 hours of sunlight on March 21st. This column will identify the highest performing room within a unit and state compliance for the associated unit based on that room with the assessment carried out without deciduous trees. Typically only one room per unit will be populated in this column, with lesser performing rooms indicated with a dash (-).

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation of these figures may yield a negligible difference and should not be considered an error.

C.3.1 SE Results: Proposed Apartment Block - Ground Floor

Table No. C.3.1 - Sunlight Exposure Results:							
Unit Number	Room Description	Deciduous Trees as Opaque Objects*			Without Deciduous Trees*		
		SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**	SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**
A.01	KLD	1.60	Minimum	Compliant	1.80	Minimum	Compliant
A.01	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-
A.01	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.02	KLD	0.00	Below Minimum	-	0.00	Below Minimum	-
A.02	Bedroom 01	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.02	Bedroom 02	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.03	KLD	0.30	Below Minimum	Non-Compliant	0.30	Below Minimum	-
A.03	Bedroom 01	0.00	Below Minimum	-	0.80	Below Minimum	Non-Compliant
A.04	KLD	4.00	High	Compliant	5.90	High	Compliant
A.04	Bedroom 01	0.00	Below Minimum	-	0.00	Below Minimum	-
A.04	Bedroom 02	0.00	Below Minimum	-	0.00	Below Minimum	-
A.05	KLD	5.60	High	Compliant	5.60	High	Compliant
A.05	Bedroom 01	4.60	High	-	5.20	High	-
A.06	KLD	0.00	Below Minimum	-	1.50	Minimum	-
A.06	Bedroom 01	1.10	Below Minimum	-	5.00	High	Compliant
A.06	Bedroom 02	2.50	Minimum	Compliant	4.90	High	-
A.07	KLD	4.90	High	Compliant	6.20	High	Compliant
A.07	Bedroom 02	0.40	Below Minimum	-	0.60	Below Minimum	-
A.07	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-

* Rooms are tested with deciduous trees as opaque objects and without deciduous trees to account for the range of possible sunlight hours.
 ** Section 3.1.15 of the BRE Guidelines recommends that for a unit to be compliant any room within the unit should receive a minimum of 1.5 hours of direct sunlight on March 21st, preferably a main living room. The SE circa compliance rates can be found in section 3.2.2 on page 25.
 *** For the interpretation of levels of Sunlight Exposure please refer to "E.3 Definition of Levels of Sunlight Exposure" on page 96.
 For floor plans of the assessed units please refer to section C.1 on page 70.

C.3.2 SE Results: Proposed Apartment Block - First Floor

Table No. C.3.2 - Sunlight Exposure Results:							
Unit Number	Room Description	Deciduous Trees as Opaque Objects*			Without Deciduous Trees*		
		SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**	SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**
A.08	KLD	2.70	Minimum	Compliant	2.70	Minimum	Compliant
A.08	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-
A.08	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.09	KLD	0.00	Below Minimum	-	0.00	Below Minimum	-
A.09	Bedroom 01	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.09	Bedroom 02	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.10	KLD	1.40	Below Minimum	Non-Compliant	1.40	Below Minimum	Non-Compliant
A.10	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-
A.11	KLD	6.10	High	Compliant	6.10	High	Compliant
A.11	Bedroom 02	0.00	Below Minimum	-	0.00	Below Minimum	-
A.11	Bedroom 01	0.80	Below Minimum	-	0.80	Below Minimum	-
A.12	KLD	9.40	High	Compliant	9.40	High	Compliant
A.12	Bedroom 01	6.00	High	-	6.00	High	-
A.12	Bedroom 02	6.00	High	-	6.00	High	-
A.13	KLD	3.70	Medium	-	3.70	Medium	-
A.13	Bedroom 02	6.00	High	Compliant	6.00	High	Compliant
A.13	Bedroom 01	6.00	High	Compliant	6.00	High	Compliant
A.14	KLD	3.70	Medium	-	3.70	Medium	-
A.14	Bedroom 01	5.80	High	Compliant	5.80	High	Compliant
A.14	Bedroom 02	5.80	High	Compliant	5.80	High	Compliant
A.15	KLD	5.60	High	Compliant	5.60	High	Compliant
A.15	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.15	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-

* Rooms are tested with deciduous trees as opaque objects and without deciduous trees to account for the range of possible sunlight hours.
 ** Section 3.1 of the BRE Guidelines recommend that for a unit to be compliant any room within the unit should receive a minimum of 1.5 hours of direct sunlight on March 21st, preferably a main living room. The SE circa compliance rates can be found in section 3.2.2 on page 25.
 *** For the interpretation of levels of Sunlight Exposure please refer to "E.3 Definition of Levels of Sunlight Exposure" on page 96.
 For floor plans of the assessed units please refer to section C.1 on page 70.

C.3.3 SE Results: Proposed Apartment Block - Second Floor

Table No. C.3.3 - Sunlight Exposure Results:							
Unit Number	Room Description	Deciduous Trees as Opaque Objects*			Without Deciduous Trees*		
		SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**	SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**
A.16	KLD	2.50	Minimum	Compliant	2.50	Minimum	Compliant
A.16	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-
A.16	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.17	KLD	0.00	Below Minimum	-	0.00	Below Minimum	-
A.17	Bedroom 01	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.17	Bedroom 02	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.18	KLD	1.40	Below Minimum	Non-Compliant	1.40	Below Minimum	Non-Compliant
A.18	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-
A.19	KLD	6.10	High	Compliant	6.10	High	Compliant
A.19	Bedroom 02	0.00	Below Minimum	-	0.00	Below Minimum	-
A.19	Bedroom 01	0.80	Below Minimum	-	0.80	Below Minimum	-
A.20	KLD	9.40	High	Compliant	9.40	High	Compliant
A.20	Bedroom 01	6.00	High	-	6.00	High	-
A.20	Bedroom 02	6.00	High	-	6.00	High	-
A.21	KLD	3.80	Medium	-	3.80	Medium	-
A.21	Bedroom 02	6.00	High	Compliant	6.00	High	Compliant
A.21	Bedroom 01	6.00	High	Compliant	6.00	High	Compliant
A.22	KLD	3.80	Medium	-	3.80	Medium	-
A.22	Bedroom 01	6.00	High	Compliant	6.00	High	Compliant
A.22	Bedroom 02	6.00	High	Compliant	6.00	High	Compliant
A.23	KLD	5.60	High	Compliant	5.60	High	Compliant
A.23	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.23	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-

* Rooms are tested with deciduous trees as opaque objects and without deciduous trees to account for the range of possible sunlight hours.
 ** Section 3.1 of the BRE Guidelines recommend that for a unit to be compliant any room within the unit should receive a minimum of 1.5 hours of direct sunlight on March 21st, preferably a main living room. The SE circa compliance rates can be found in section 3.2.2 on page 25.
 *** For the interpretation of levels of Sunlight Exposure please refer to "E.3 Definition of Levels of Sunlight Exposure" on page 96.
 For floor plans of the assessed units please refer to section C.1 on page 70.

C.3.4 SE Results: Proposed Apartment Block - Third Floor

Table No. C.3.4 - Sunlight Exposure Results:							
Unit Number	Room Description	Deciduous Trees as Opaque Objects*			Without Deciduous Trees*		
		SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**	SE Hours on March 21st	Level of SE on March 21st***	Unit compliance based on highest performing room**
A.24	KLD	2.50	Minimum	Compliant	2.50	Minimum	Compliant
A.24	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-
A.24	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.25	KLD	0.00	Below Minimum	-	0.00	Below Minimum	-
A.25	Bedroom 01	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.25	Bedroom 02	0.80	Below Minimum	Non-Compliant	0.80	Below Minimum	Non-Compliant
A.26	KLD	1.40	Below Minimum	Non-Compliant	1.40	Below Minimum	Non-Compliant
A.26	Bedroom 01	0.80	Below Minimum	-	0.80	Below Minimum	-
A.27	KLD	6.10	High	Compliant	6.10	High	Compliant
A.27	Bedroom 02	0.00	Below Minimum	-	0.00	Below Minimum	-
A.27	Bedroom 01	0.80	Below Minimum	-	0.80	Below Minimum	-
A.28	KLD	8.40	High	Compliant	8.40	High	Compliant
A.28	Bedroom 01	6.00	High	-	6.00	High	-
A.28	Bedroom 02	6.00	High	-	6.00	High	-
A.29	KLD	2.30	Minimum	-	2.30	Minimum	-
A.29	Bedroom 02	6.00	High	Compliant	6.00	High	Compliant
A.29	Bedroom 01	6.00	High	Compliant	6.00	High	Compliant
A.30	KLD	2.30	Minimum	-	2.30	Minimum	-
A.30	Bedroom 01	6.00	High	Compliant	6.00	High	Compliant
A.30	Bedroom 02	6.00	High	Compliant	6.00	High	Compliant
A.31	KLD	6.50	High	Compliant	6.50	High	Compliant
A.31	Bedroom 02	0.60	Below Minimum	-	0.60	Below Minimum	-
A.31	Bedroom 01	0.60	Below Minimum	-	0.60	Below Minimum	-

* Rooms are tested with deciduous trees as opaque objects and without deciduous trees to account for the range of possible sunlight hours.
 ** Section 3.1 of the BRE Guidelines recommend that for a unit to be compliant any room within the unit should receive a minimum of 1.5 hours of direct sunlight on March 21st, preferably a main living room. The SE circa compliance rates can be found in section 3.2.2 on page 25.
 *** For the interpretation of levels of Sunlight Exposure please refer to "E.3 Definition of Levels of Sunlight Exposure" on page 96.
 For floor plans of the assessed units please refer to section C.1 on page 70.

C.4 Sun On Ground (SOG) in Proposed Outdoor Amenity Areas

Below is an example of the table used to describe SOG in proposed gardens and amenity spaces.

Table Example. C.4 - Scheme Performance SOG					
Assigned Area Number	Assessed Area	Area Capable of Receiving 2 Hours of Sunlight on March 21st	Recommended Minimum	Level of Compliance with BRE Guidelines	Meets BR 209 Criteria
A	B	C	D	E	F

A: Assigned Area Number

This column indicates the number that 3DDB have assigned to the assessed areas, which is included for the sole purpose of aiding in the identification of the corresponding space shown in the corresponding figure.

B: Assessed Area

This column identifies the assessed garden/amenity area.

C: Area Capable of Receiving 2 Hours of Sunlight on March 21st

The percentage of the proposed area that can receive more than 2 hours of sunlight on March 21st.

D: Recommended Minimum

Section 3.3.17 of the BRE Guidelines state that the percentage of a garden/amenity area that can receive more than 2 hours of sunlight on March 21st should be 50%. The target value for all spaces is set to 50%.

E: Level of Compliance with BRE Guidelines

This column states the compliance of the assessed space with the *BRE Target Value*. If the assessed garden or amenity area complies with the BRE Guidelines this cell will state "*BRE Compliant*". If the garden or amenity area does not meet the criteria as set out in the BRE Guidelines, a percentage of compliance with the *recommended minimum* will be stated.

F: Meets BR 209 Criteria

This column states if the assessed area achieves the recommended level of sunlight on March 21st as per BR 209.

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation of these figures may yield a negligible difference and should not be considered an error.

C.4.1 Sun On Ground in Proposed Outdoor Amenity Areas

Table No. C.4.1 - SOG in Proposed Outdoor Amenity Areas Results:					
Assigned Area Number	Assessed Area	Area Capable of Receiving 2 Hours of Sunlight on March 21st	Recommended minimum	Level of Compliance with BRE Guidelines*	Meets BR 209 Criteria*
1	Village Green POS	99.66%	50.00%	BRE Compliant	Yes
2	Apt. Block COS	100.00%	50.00%	BRE Compliant	Yes

* Section 3.3.17 of the BRE Guidelines recommends that for a garden or amenity 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 March 21st.



Figure C.6: Indication of the amenity areas that have been analysed (L), Area capable of receiving 2 hours of sunlight on March 21st shown in white (R)

D.0 Supplementary Study Results

D.1 SDA study, under the I.S. EN 17037 criteria

Below is an example of the table used to describe the supplementary study results for proposed units in the assessment of SDA under the I.S. EN 17037 criteria. In cases where rooms comply with the criteria of BR 209 but do not meet the criteria of I.S. EN 17037, it is the recommendation of 3D Design Bureau that these rooms will be adequately daylighted. This recommendation is based on the fact that BR 209 provides room-specific criteria, unlike I.S. EN 17037. BR 209 considers the varying daylight requirements for different room types, which I.S. EN 17037 does not account for.

Table Example. D.1 - Supplementary Scheme Performance SDA (I.S. EN 17037 criteria)						
Unit Number	Room Description	No Trees		With Trees		Compliance with I.S. EN 17037 Criteria
		Area above 300 Lux	Area above 100 Lux	Area above 300 Lux	Area above 100 Lux	
A	B	C	D	E	F	G

A: Unit Number

This column identifies the assessed unit. All unit numbers are determined by the architect's drawings, unless otherwise stated.

B: Room Description

Room Description details which room in the unit has been assessed, e.g. bedroom, LKD, etc.

C: % of area above 300 Lux (No Trees)

I.S. EN 17037 recommends at least 50% of the working plane receives above 300 lux for at least half the daylight hours.

This column states percentage of the working plane of the assessed room that is capable of receiving more than 300 lux for at least half the daylight hours when the assessment is carried out without trees in the analytical model.

D: % of area above 100 Lux (No Trees)

I.S. EN 17037 recommends at least 95% of the working plane receives above 100 lux for at least half the daylight hours.

This column states percentage of the working plane of the assessed room that is capable of receiving more than 100 lux for at least half the daylight hours when the assessment is carried out without trees in the analytical model.

E: % of area above 300 Lux (Winter Trees)

I.S. EN 17037 recommends at least 50% of the working plane receives above 300 lux for at least half the daylight hours.

This column states percentage of the working plane of the assessed room that is capable of receiving more than 300 lux for at least half the daylight hours with the foliage of deciduous trees varied to account for summer and winter conditions, i.e. full leaf and bare branch.

F: % of area above 100 Lux (Winter Trees)

I.S. EN 17037 recommends at least 95% of the working plane receives above 100 lux for at least half the daylight hours.

This column states percentage of the working plane of the assessed room that is capable of receiving more than 100 lux for at least half the daylight hours with the foliage of deciduous trees varied to account for summer and winter conditions.

G: Compliance with I.S. EN 17037 Criteria

This column states if the assessed room achieves the recommended level of daylight as per I.S. EN 17037 with consideration to the various tree states.

If the recommended lux levels are achieved on the working plane, for half the daylight hours, both with and without trees, this column will state: *'Compliant'*.

If the recommended lux levels are not achieved on the working plane, for half the daylight hours, both with and without trees, this column will state: *'Non-compliant'*.

If the recommended lux levels are achieved on the working plane, for half the daylight hours, without trees but are not achieved with trees, this column will state: *'Trees affecting compliance'*.

Compliance rates will be stated for SDA compliance with trees in all of the above states.

It should be noted that the figures displayed in the table of results have been rounded off. A manual calculation of these figures may yield a negligible difference and should not be considered an error.

D.1.1 Supplementary SDA Results (I.S. EN 17037 criteria): Apartment Block - Ground Floor

Table No. D.1.1 - Supplementary SDA Results (I.S. EN 17037 criteria):						
Unit Number	Room Description	No Trees		With Trees		Compliance with I.S. EN 17037 Criteria*
		Area above 300 Lux*	Area above 100 Lux*	Area above 300 Lux*	Area above 100 Lux*	
A.01	KLD	100%	100%	95%	100%	Compliant
A.01	Bedroom 01	87%	100%	83%	100%	Compliant
A.01	Bedroom 02	85%	100%	83%	100%	Compliant
A.02	KLD	53%	100%	40%	100%	Trees affecting compliance
A.02	Bedroom 01	72%	100%	58%	100%	Compliant
A.02	Bedroom 02	100%	100%	83%	100%	Compliant
A.03	KLD	55%	100%	41%	100%	Trees affecting compliance
A.03	Bedroom 01	92%	100%	71%	100%	Compliant
A.04	KLD	100%	100%	96%	100%	Compliant
A.04	Bedroom 01	94%	100%	37%	100%	Trees affecting compliance
A.04	Bedroom 02	93%	100%	50%	100%	Compliant
A.05	KLD	53%	100%	50%	100%	Compliant
A.05	Bedroom 01	78%	100%	67%	100%	Compliant
A.06	KLD	14%	82%	7%	67%	Non-compliant
A.06	Bedroom 01	57%	100%	23%	91%	Trees affecting compliance
A.06	Bedroom 02	89%	100%	59%	100%	Compliant
A.07	KLD	94%	100%	91%	100%	Compliant
A.07	Bedroom 02	98%	100%	88%	100%	Compliant
A.07	Bedroom 01	98%	100%	78%	100%	Compliant
* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17. For floor plans of the assessed units please refer to section C.1 on page 70.						

D.1.2 Supplementary SDA Results (I.S. EN 17037 criteria): Apartment Block - First Floor

Table No. D.1.2 - Supplementary SDA Results (I.S. EN 17037 criteria):						
Unit Number	Room Description	No Trees		With Trees		Compliance with I.S. EN 17037 Criteria*
		Area above 300 Lux*	Area above 100 Lux*	Area above 300 Lux*	Area above 100 Lux*	
A.08	KLD	100%	100%	100%	100%	Compliant
A.08	Bedroom 01	98%	100%	96%	100%	Compliant
A.08	Bedroom 02	100%	100%	100%	100%	Compliant
A.09	KLD	54%	100%	44%	100%	Trees affecting compliance
A.09	Bedroom 01	80%	100%	72%	100%	Compliant
A.09	Bedroom 02	100%	100%	100%	100%	Compliant
A.10	KLD	58%	100%	49%	100%	Trees affecting compliance
A.10	Bedroom 01	100%	100%	92%	100%	Compliant
A.11	KLD	100%	100%	100%	100%	Compliant
A.11	Bedroom 02	100%	100%	96%	100%	Compliant
A.11	Bedroom 01	100%	100%	81%	100%	Compliant
A.12	KLD	100%	100%	100%	100%	Compliant
A.12	Bedroom 01	86%	100%	86%	100%	Compliant
A.12	Bedroom 02	100%	100%	100%	100%	Compliant
A.13	KLD	60%	100%	59%	100%	Compliant
A.13	Bedroom 02	100%	100%	100%	100%	Compliant
A.13	Bedroom 01	85%	100%	80%	100%	Compliant
A.14	KLD	65%	100%	62%	100%	Compliant
A.14	Bedroom 01	77%	100%	70%	100%	Compliant
A.14	Bedroom 02	100%	100%	100%	100%	Compliant
A.15	KLD	99%	100%	99%	100%	Compliant
A.15	Bedroom 02	100%	100%	100%	100%	Compliant
A.15	Bedroom 01	100%	100%	100%	100%	Compliant
* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17. For floor plans of the assessed units please refer to section C.1 on page 70.						

D.1.3 Supplementary SDA Results (I.S. EN 17037 criteria): Apartment Block - Second Floor

Table No. D.1.3 - Supplementary SDA Results (I.S. EN 17037 criteria):						
Unit Number	Room Description	No Trees		With Trees		Compliance with I.S. EN 17037 Criteria*
		Area above 300 Lux*	Area above 100 Lux*	Area above 300 Lux*	Area above 100 Lux*	
A.16	KLD	100%	100%	100%	100%	Compliant
A.16	Bedroom 01	100%	100%	100%	100%	Compliant
A.16	Bedroom 02	100%	100%	100%	100%	Compliant
A.17	KLD	57%	100%	48%	100%	Trees affecting compliance
A.17	Bedroom 01	86%	100%	78%	100%	Compliant
A.17	Bedroom 02	100%	100%	100%	100%	Compliant
A.18	KLD	59%	100%	55%	100%	Compliant
A.18	Bedroom 01	100%	100%	98%	100%	Compliant
A.19	KLD	100%	100%	100%	100%	Compliant
A.19	Bedroom 02	100%	100%	100%	100%	Compliant
A.19	Bedroom 01	100%	100%	100%	100%	Compliant
A.20	KLD	100%	100%	100%	100%	Compliant
A.20	Bedroom 01	97%	100%	96%	100%	Compliant
A.20	Bedroom 02	100%	100%	100%	100%	Compliant
A.21	KLD	70%	100%	69%	100%	Compliant
A.21	Bedroom 02	100%	100%	100%	100%	Compliant
A.21	Bedroom 01	97%	100%	97%	100%	Compliant
A.22	KLD	72%	100%	71%	100%	Compliant
A.22	Bedroom 01	86%	100%	86%	100%	Compliant
A.22	Bedroom 02	100%	100%	100%	100%	Compliant
A.23	KLD	100%	100%	100%	100%	Compliant
A.23	Bedroom 02	100%	100%	100%	100%	Compliant
A.23	Bedroom 01	100%	100%	100%	100%	Compliant
* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17. For floor plans of the assessed units please refer to section C.1 on page 70.						

D.1.4 Supplementary SDA Results (I.S. EN 17037 criteria): Apartment Block - Third Floor

Table No. D.1.4 - Supplementary SDA Results (I.S. EN 17037 criteria):

Unit Number	Room Description	No Trees		With Trees		Compliance with I.S. EN 17037 Criteria*
		Area above 300 Lux*	Area above 100 Lux*	Area above 300 Lux*	Area above 100 Lux*	
A.24	KLD	100%	100%	100%	100%	Compliant
A.24	Bedroom 01	100%	100%	100%	100%	Compliant
A.24	Bedroom 02	100%	100%	100%	100%	Compliant
A.25	KLD	69%	100%	65%	100%	Compliant
A.25	Bedroom 01	88%	100%	80%	100%	Compliant
A.25	Bedroom 02	100%	100%	100%	100%	Compliant
A.26	KLD	66%	100%	63%	100%	Compliant
A.26	Bedroom 01	100%	100%	100%	100%	Compliant
A.27	KLD	100%	100%	100%	100%	Compliant
A.27	Bedroom 02	100%	100%	100%	100%	Compliant
A.27	Bedroom 01	100%	100%	100%	100%	Compliant
A.28	KLD	100%	100%	100%	100%	Compliant
A.28	Bedroom 01	100%	100%	100%	100%	Compliant
A.28	Bedroom 02	100%	100%	100%	100%	Compliant
A.29	KLD	59%	100%	59%	100%	Compliant
A.29	Bedroom 02	100%	100%	100%	100%	Compliant
A.29	Bedroom 01	100%	100%	100%	100%	Compliant
A.30	KLD	64%	100%	64%	100%	Compliant
A.30	Bedroom 01	97%	100%	97%	100%	Compliant
A.30	Bedroom 02	100%	100%	100%	100%	Compliant
A.31	KLD	100%	100%	100%	100%	Compliant
A.31	Bedroom 02	100%	100%	100%	100%	Compliant
A.31	Bedroom 01	100%	100%	100%	100%	Compliant

* For information regarding the criteria under the various guidelines including target Lux please refer to section 2.5.1 on page 17.
For floor plans of the assessed units please refer to section C.1 on page 70.

D.2 Supplementary No Sky Line (NSL) assessment in proposed units.

Below is an example of the table used to describe the supplementary assessment results for ‘No Sky Line’ in proposed units.

Table Example. D.2 - Supplementary Scheme Performance NSL			
Unit Number	Room Description	No Sky Line (NSL)	
		% of room where the sky is visible from the working plane	Above 80%
A	B	C	D

- A: Unit Number**
 This column identifies the assessed unit. All unit numbers are determined by the architect’s drawings, unless otherwise stated.
- B: Room Description**
Room Description details which room in the unit has been assessed, e.g. bedroom, LKD, etc.
- C: % of room where the sky is visible from the working plane**
 This column states the percentage of the room from which there is a direct line of sight to the sky when assessed at the working plane height, which is 850mm above the finished floor level in residential rooms or 700mm above the finished floor level in offices or classrooms.
- D: Above 80%**
 Whilst the BRE Guidelines only provide recommendations for NSL in the context of an impact analysis, section 2.2.10 states that “Supplementary electric lighting will be needed if a significant part of the working plane (20% of the room or more) lies beyond the No Sky Line.”
 If this column states: ‘Yes’, it signifies that the sky will be visible from more than 80% of the working plane.
 If this column states: ‘No’, it signifies that the sky will be visible from less than 80% of the working plane and supplementary electric lighting may be required.



D.2.1 Supplementary NSL Results: Apartment Block - Ground Floor

Table No. D.2.1 - Supplementary NSL Results:			
Unit Number	Room Description	No Sky Line (NSL)	
		% of room where the sky is visible from the working plane	Above 80%*
A.01	KLD	100%	Yes
A.01	Bedroom 01	97%	Yes
A.01	Bedroom 02	99%	Yes
A.02	KLD	99%	Yes
A.02	Bedroom 01	98%	Yes
A.02	Bedroom 02	99%	Yes
A.03	KLD	100%	Yes
A.03	Bedroom 01	98%	Yes
A.04	KLD	100%	Yes
A.04	Bedroom 01	98%	Yes
A.04	Bedroom 02	97%	Yes
A.05	KLD	68%	No
A.05	Bedroom 01	98%	Yes
A.06	KLD	42%	No
A.06	Bedroom 01	83%	Yes
A.06	Bedroom 02	98%	Yes
A.07	KLD	99%	Yes
A.07	Bedroom 02	98%	Yes
A.07	Bedroom 01	96%	Yes

* Whilst the BRE Guidelines do not provide target values for NSL in a proposed development, section 2.2.10 states that "Supplementary electric lighting will be needed if a significant part of the working plane (20% of the room or more) lies beyond the No Sky Line."

For floor plans of the assessed units please refer to section C.1 on page 70.

D.2.2 Supplementary NSL Results: Apartment Block - First Floor

Table No. D.2.2 - Supplementary NSL Results:			
Unit Number	Room Description	No Sky Line (NSL)	
		% of room where the sky is visible from the working plane	Above 80%*
A.08	KLD	100%	Yes
A.08	Bedroom 01	97%	Yes
A.08	Bedroom 02	99%	Yes
A.09	KLD	99%	Yes
A.09	Bedroom 01	98%	Yes
A.09	Bedroom 02	99%	Yes
A.10	KLD	100%	Yes
A.10	Bedroom 01	98%	Yes
A.11	KLD	100%	Yes
A.11	Bedroom 02	97%	Yes
A.11	Bedroom 01	98%	Yes
A.12	KLD	99%	Yes
A.12	Bedroom 01	98%	Yes
A.12	Bedroom 02	99%	Yes
A.13	KLD	98%	Yes
A.13	Bedroom 02	99%	Yes
A.13	Bedroom 01	98%	Yes
A.14	KLD	97%	Yes
A.14	Bedroom 01	99%	Yes
A.14	Bedroom 02	99%	Yes
A.15	KLD	100%	Yes
A.15	Bedroom 02	98%	Yes
A.15	Bedroom 01	96%	Yes
* Whilst the BRE Guidelines do not provide target values for NSL in a proposed development, section 2.2.10 states that "Supplementary electric lighting will be needed if a significant part of the working plane (20% of the room or more) lies beyond the No Sky Line." For floor plans of the assessed units please refer to section C.1 on page 70.			

D.2.3 Supplementary NSL Results: Apartment Block - Second Floor

Table No. D.2.3 - Supplementary NSL Results:			
Unit Number	Room Description	No Sky Line (NSL)	
		% of room where the sky is visible from the working plane	Above 80%*
A.16	KLD	100%	Yes
A.16	Bedroom 01	97%	Yes
A.16	Bedroom 02	99%	Yes
A.17	KLD	99%	Yes
A.17	Bedroom 01	98%	Yes
A.17	Bedroom 02	99%	Yes
A.18	KLD	100%	Yes
A.18	Bedroom 01	98%	Yes
A.19	KLD	100%	Yes
A.19	Bedroom 02	97%	Yes
A.19	Bedroom 01	98%	Yes
A.20	KLD	100%	Yes
A.20	Bedroom 01	99%	Yes
A.20	Bedroom 02	99%	Yes
A.21	KLD	99%	Yes
A.21	Bedroom 02	99%	Yes
A.21	Bedroom 01	98%	Yes
A.22	KLD	99%	Yes
A.22	Bedroom 01	99%	Yes
A.22	Bedroom 02	99%	Yes
A.23	KLD	100%	Yes
A.23	Bedroom 02	98%	Yes
A.23	Bedroom 01	96%	Yes
* Whilst the BRE Guidelines do not provide target values for NSL in a proposed development, section 2.2.10 states that "Supplementary electric lighting will be needed if a significant part of the working plane (20% of the room or more) lies beyond the No Sky Line." For floor plans of the assessed units please refer to section C.1 on page 70.			

D.2.4 Supplementary NSL Results: Apartment Block - Third Floor

Table No. D.2.4 - Supplementary NSL Results:			
Unit Number	Room Description	No Sky Line (NSL)	
		% of room where the sky is visible from the working plane	Above 80%*
A.24	KLD	100%	Yes
A.24	Bedroom 01	97%	Yes
A.24	Bedroom 02	99%	Yes
A.25	KLD	99%	Yes
A.25	Bedroom 01	98%	Yes
A.25	Bedroom 02	99%	Yes
A.26	KLD	100%	Yes
A.26	Bedroom 01	98%	Yes
A.27	KLD	100%	Yes
A.27	Bedroom 02	97%	Yes
A.27	Bedroom 01	98%	Yes
A.28	KLD	100%	Yes
A.28	Bedroom 01	98%	Yes
A.28	Bedroom 02	99%	Yes
A.29	KLD	99%	Yes
A.29	Bedroom 02	99%	Yes
A.29	Bedroom 01	98%	Yes
A.30	KLD	99%	Yes
A.30	Bedroom 01	99%	Yes
A.30	Bedroom 02	99%	Yes
A.31	KLD	100%	Yes
A.31	Bedroom 02	98%	Yes
A.31	Bedroom 01	96%	Yes
* Whilst the BRE Guidelines do not provide target values for NSL in a proposed development, section 2.2.10 states that "Supplementary electric lighting will be needed if a significant part of the working plane (20% of the room or more) lies beyond the No Sky Line." For floor plans of the assessed units please refer to section C.1 on page 70.			

E.0 Glossary

E.1 Terms and Definitions

Below is a list of daylight and sunlight terminology that may be used in this report depending on the assessments carried out.

Skylight

Non directional ambient light cast from the sky and environment.

Sunlight

Direct parallel rays of light emitted from the sun.

Daylight

Combined skylight and sunlight.

Overcast sky model

A completely overcast sky model, used for daylight calculation.

Cloudless sky model

A completely cloudless sky model, used for sunlight exposure calculation.

Model State

The model state is a term used to describe the configuration of the digital model used to run analysis. Model states will typically reflect a baseline state and a proposed or cumulative state. For a definition of the model states used in the analysis carried out in this report, please refer to "Preparing the analytical model" on page 10.

Vertical Sky Component (VSC)

Ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from an overcast sky model, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.

Annual Probable Sunlight Hours (APSH) / Winter Probable Sunlight Hours (WPSH)

Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) are a measure of sunlight that a given window may expect over a one-year period (1 Jan - 31 Dec), or the winter period (21 Sep - 21 Mar) respectively.

North facing windows may receive sunlight on only a handful of occasions in a year, and windows facing eastwards or westwards will receive sunlight only at certain times of the day. Taking this into account, section 3.2.9 of the BRE Guidelines suggest that windows with an orientation within 90 degrees of due north need not be assessed.

Sun On Ground (SOG)

Assessment of what portion of a garden or amenity space is capable of receiving 2 hours or more of direct sunlight on March 21st.

Sunlight Exposure (SE)

The number of hours of direct sunlight a room can expect to receive on a given date between February 1st and March 21st at a determined point on the windows.

Spatial Daylight Autonomy (SDA)

Spatial Daylight Autonomy assesses whether a space receives sufficient daylight on a working plane during standard operating hours on an annual basis. For compliance, the target value is achieved across 50% of the working plane for half of the occupied period.

No Sky Line (NSL)

The No Sky Line divides points on the working plane which can and cannot see the sky.

Working plane

Horizontal, vertical or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 850 mm above the floor in houses and factories, 700 mm above the floor in offices. The plane is offset 300mm from the room boundaries under BR 209 criteria, and 500mm from the room boundaries under I.S. EN 17037 criteria.

LKD

Living / Kitchen / Dining room.

BRE Target Value

When assessing the effect a proposed development would have on a neighbouring property, a target value will be applied. This applied target value is generated as per the criteria set out for each study in the BRE Guidelines.

Alternative Target Value

It could be appropriate to use alternative target values when conducting assessment of effect on existing properties. If such instances occur the rationale will be clearly explained and the instances where the alternative target values have been applied will be clearly identified.

Level of BRE Compliance

Each table in the study that has a column identified as "Level of BRE Compliance", identifies how an assessed instance performs in relation to the appropriate target value. If the instance is in compliance with the recommendations as made in the BRE Guidelines the value will be expressed as "BRE Compliant". If the instance does not meet the criteria as set out in the BRE Guidelines a percentage will be expressed to determine the level of compliance with the recommendation. This value determines the definition of effect.

LUX

Lux is a standardised unit of measurement of light level intensity. A measurement of 1 lux is equal to the illumination of a one metre square surface that is one metre away from a single candle.

No Balcony Assessment

A 'No Balcony Assessment' is a hypothetical impact assessment carried out on a neighbouring window/room that is located underneath a balcony or overhanging element, such as a canopy. This assessment is conducted to understand what constraints the overhanging element is having on the potentially affected window.

E.2 Definition of Effects

Section H3 and H4 of the BRE Guidelines states that:

“Adverse impacts occur when there is a significant decrease 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. The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.”

As such, planning authorities should consider a range of localised factors when making decisions. The terminology suggested in section H6 of the BRE Guidelines is listed below, whilst the assessment of impact should depend on a combination of factors. The BRE Guidelines (section H2) also state:

“Where a new development affects a number of existing buildings or open spaces, the clearest approach is usually to assess the impact on each one separately. It is also clearer to assess skylight and sunlight impacts separately.”

Taking this advice, 3DDB have categorised the level of effect on each window/room/open space on an individual basis. In quantifying the levels of effect, 3DDB have assigned numerical values to the levels of compliance with the BRE recommendations. By applying a numerical logic to the terminology used in defining the levels of effect there is no ambiguity regarding how the levels of effect have been categorised within this report.

The list of definitions given below is taken from ‘Appendix H: Environmental impact assessment’ of the BR 209 with a clear indication of how they have been applied in the context of this report.

Negligible

For the purposes of this Sunlight and Daylight Assessment Report a ‘Negligible’ level of effect will be stated if the level of effect is within the criteria as recommended in the BRE Guidelines and the applied target value has been achieved.

Minor Adverse

For the purposes of this Sunlight and Daylight Assessment Report, a ‘Minor Adverse’ level of effect will be stated if the level of effect is marginally outside of the criteria as stated in the BRE Guidelines. Typically a ‘Minor Adverse’ level of effect will be applied if the level of daylight or sunlight is reduced to equal or greater than 80% and less than 100% of the applied target value.

Moderate Adverse

For the purposes of this Sunlight and Daylight Assessment Report, a ‘Moderate Adverse’ level of effect will be stated if the level of daylight or sunlight is reduced to equal or greater than 50% and less than 80% of the applied target value. ‘Moderate Adverse’ levels of effect are quite typical in instances where a proposed development is planned on an under-developed plot of land.

Major Adverse

An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment. For the purposes of this Sunlight and Daylight Assessment Report a ‘Major Adverse’ level of effect will be stated if the proposed development reduces the availability of daylight or sunlight of a neighbouring property to significantly below a baseline level. A ‘Major Adverse’ level of effect will be stated if the level of daylight or sunlight is reduced to less than 50% of the applied target value.

Beneficial Impact

In relation to sunlight or daylight access, it is conceivable that a proposed development could yield positive effects on the neighbouring properties. In such circumstances the development would typically involve a reduction to the size or scale of built form (e.g. such as the demolition of a building or the removal of a large belt of evergreen trees, which might result in an increase in light access). Where such improvements occur, a ‘Beneficial Impact’ will only be stated if the ratio of change is greater than 1.20 (an improvement of 20%). Should less perceptible improvements occur a ‘Negligible’ level of effect will be stated.

Not Applicable (n.a.)

In instances where a baseline value is particularly low, levels of effects can appear exaggerated. To mitigate such occurrences, if the baseline value in the VSC, APSH/WPSH or SOG studies is below 1%, 3DDB have categorised the level of effect as n.a. (not applicable).

Averaged Windows (-)

If it can be determined or reasonably assumed that multiple windows are servicing the same room, each window will be assessed and a weighted average will be calculated. In such instances the level of effect for the room will be stated, but the level of effect for the individual windows contributing towards the average will be left blank in the table. This will be indicated in the tables with the dash symbol. (-)

E.3 Definition of Levels of Sunlight Exposure

For interiors, access to sunlight can be quantified. BR 209 recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used. The medium level of recommendation is three hours and the high level of recommendation four hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

Level of Sunlight Exposure:

The level of sunlight exposure will be stated for each assessed room in the tables under section “C.3 Sunlight Exposure (SE) in Proposed Units” on page 77. Below is a list of the terms used to categorise the levels of sunlight exposure:

Below Minimum

Sunlight exposure will be categorised as ‘below minimum’ if the potential sunlight for the assessed room is less than 1.5 hours on March 21st. Note: the recommendation is that a room within a proposed unit is capable of receiving 1.5 hours of direct sunlight on March 21st. If an individual room of a proposed unit does not achieve this recommendation, it does not mean that the unit is non-compliant.

Minimum

A ‘minimum’ level of sunlight exposure will be stated if the potential sunlight for the assessed room is between 1.5 hours and 3 hours on March 21st.

Medium

A ‘medium’ level of sunlight exposure will be stated if the potential sunlight for the assessed room is between 3 hours and 4 hours on March 21st.

High

A ‘high’ level of sunlight exposure will be stated if the potential sunlight for the assessed room is greater than 4 hours on March 21st.

Unit Compliance:

In addition to the level of sunlight exposure expressed for each room, compliance will be stated on a unit-by-unit basis. A proposed unit is considered to be compliant if any habitable room within the unit is capable of receiving at least 1.5 hours of sunlight on the assessment date.

Non-Compliant

If no habitable rooms within a proposed unit can receive 1.5 hours of sunlight on the assessment date, the unit will be categorised as ‘Non-Compliant’.

Compliant

If at least one habitable room within a proposed unit can receive 1.5 hours or more of sunlight on the assessment date, the unit will be categorised as ‘Compliant’.

Typically unit compliance will be stated for the best performing room per unit only, with lesser performing rooms indicated with a dash (-). However, if more than one room in a given unit is considered to be the best performing room (i.e. they have the same number of SE hours on March 21st), then the unit compliance column will be populated in the first instance only.

F.0 Guidelines / Standards

Overview

Neither the British Standard, European Standard, British Annex to the European Standard nor the BRE Guidelines (BR 209) set out rigid standards or limits. They are all considered advisory documents. The BRE Guide is preceded by the following very clear statement as to how the design advice contained therein should be used:

“The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design.”

That the recommendations of the BRE Guidelines are not suitable for rigid application to all developments in all contexts, is of particular importance in the context of national and local policies for the consolidation and densification of urban areas or when assessing applications for highly constrained sites (e.g. lands in close proximity or immediately to the south of residential lands). A compromise may have to be made concerning daylight and sunlight compliance to achieve national or local planning objectives.

It is the expert opinion of 3D Design Bureau, that the BRE Guidelines (BR 209) are the most appropriate guiding document for daylight and sunlight assessment. For daylight within proposed developments, a supplementary study has also been carried out under the criteria of I.S. EN 17037. The rationale for this opinion is outlined below.

BR 209 - Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice (2022)

This document will be referred to as the *BRE Guidelines*, the *BRE Guide* or *BR 209* in this report.

At the time of writing this report, the BRE Guidelines are in the third edition (BR 209). The BRE Guidelines set out recommendations for appropriate levels of daylight and sunlight within a proposed development, as well as providing guidance on impacts arising from a proposed development to surrounding properties and amenity areas.

Upon publication of the 3rd Edition of the BR 209 (2022), the 2nd edition (2011) has been withdrawn. Among the updates from the 2nd to the 3rd edition are some changes in the recommended metrics to use for carrying out scheme performance assessments.

Daylight within proposed developments was previously assessed under the 2011 guidelines using an ‘Average Daylight Factor’ assessment (ADF). This has been replaced with a ‘target illuminance assessment’, also known as a ‘Spatial Daylight Autonomy’ assessment (SDA).

Sunlight within proposed developments was previously assessed under the 2011 guidelines using an ‘Annual / Winter Probable Sunlight Hours’ assessment (APSH/WPSH). This has been replaced with a ‘Sunlight Exposure’ assessment (SE). However, APSH/WPSH is still recommended for sunlight impact assessments.

As such, no ADF or APSH/WPSH assessment will be included as part of a scheme performance assessment under the updated guidelines.

Details of the criteria for new metrics, and all other relevant metrics, can be found in the methodology section on Page 8 of this report.

It is the expert opinion of 3D Design Bureau that the BRE Guidelines are the most appropriate guiding document for assessing daylight potential within a proposed development. The rationale for this opinion is outlined in the Dublin City Council development plan (2022-2028), which states:

“Prior to 2018, Ireland had no standard for daylight. In 2018, the National Standards Authority of Ireland adopted EN 17037 to directly become IS EN 17037. It is important to note that no amendments were made to this document and unlike BS EN 317037 [sic – likely intended to reference BS EN 17037], it does not contain a national annex. It offers only a single target for new buildings (there are no space by space targets – e.g. a kitchen would have the same target as a warehouse or office). It does not offer guidance on how new developments will impact on surrounding existing environments. These limitations make it unsuitable for use in planning policy or during planning applications. BR 209 must still be used for this purpose.”

While the BRE Guidelines draws reference from BS EN 17037, there are some subtle differences between BR 209 and BS EN 17037. For the purposes of this report, the BRE Guidelines (BR 209) is considered the appropriate reference document.

A detailed description of the various recommendations for impact assessment and scheme performance is contained in section “2.3 Quantitative Impact Assessment Overview” on page 13 of this report.

EN 17037:2018: Daylight in Buildings (2018)

EN 17037 is a European Standard that provides recommendations for daylight within spaces. (Emphasis added)

EN 17037:2018 recommends that 300 lux should be received across 50% of a hypothetical reference plane of any room for half of the daylight hours of the year, with no less than 100 lux received across 95% of the reference plane. No distinction is made for the function of the room for target lux levels within this standard.

It is the opinion of 3D Design Bureau that these target values are less appropriate for proposed residential developments than the recommendations made in the BRE Guidelines, which apply room-specific target values for appropriate LUX levels.

Recommendations made in EN 17037 regarding Sunlight Exposure for proposed developments have been incorporated into the BRE Guidelines. As such, Sunlight Exposure is deemed the appropriate assessment for sunlight within habitable rooms of the proposed development.

EN 17037 also makes recommendations related to glare and quality of view out. These aspects are not addressed in this report as these assessments have less relevance in a residential context where occupants have the freedom to move about in order to improve level of glare or alter the view out.

I.S. EN 17037:2018 Daylight in Buildings (2018)

I.S. EN 17037 is a direct adoption of the European Standard *EN 17037:2018* that provides recommendations for daylight within spaces.

The target values given within *I.S. EN 17037* are directly adopted from *EN 17037*. As such, there are no room-specific recommendations for daylight. Because of these limitations, it is the expert opinion of 3D Design Bureau, that the recommendations made in the *BRE Guidelines* are more appropriate to use than those within *I.S. EN 17037*.

Regardless, a supplementary SDA study has been carried out on the proposed development using the criterion of *I.S. EN 17037*, with compliance rates stated. However, this should be considered a supplementary study.

BS EN 17037:2018: Daylight in Buildings (2018)

BS EN 17037 is the British Annex to the European Standard (see above). The British Annex acknowledges that a rigid application of the European Standard “may not be achievable”. It states “... it is the opinion of the UK committee that the recommendations for daylight provision in a space [...] may not be achievable for some buildings, particularly dwellings.”

In BS EN 17037, daylight recommendations differ depending on the function of a room. Target lux levels are applied across 50% of the reference plane of a room for half of the daylight hours. The target lux levels are:

- 200 Lux for kitchens • 150 Lux for living rooms • 100 Lux for bedrooms

No minimum is stated to be achieved across 95% of the working plane. If a space has dual purposes it is advised that the higher target value should be applied.

Planning Design Standards for Apartments: Guidelines for Planning Authorities (2025)

In July 2025, the Department of Housing, Local Government and Heritage published an updated guidance document for new apartments, ‘*Planning Design Standards for Apartments: Guidelines for Planning Authorities, 2025*’. This document, which may be referred to by the simplified name ‘*Apartment Guidelines*’, supersedes the previous guidance document for apartments ‘*Sustainable Urban Housing: Design Standards for New Apartments, 2023*’.

Unlike the 2023 edition, the current *Apartment Guidelines* do not directly reference any specific guidance document for daylight and sunlight. Instead, they refer to ‘*Sustainable Residential Development and Compact Settlements Guidelines (2024)*’:

“The provision of acceptable levels of natural light in new apartment developments is an important planning consideration, as it contributes to the liveability and amenity enjoyed by apartment residents. It is also important to safeguard against a detrimental impact on the amenity of other sensitive occupiers of adjacent properties. Section 5.3.7 of the SRDCSGs outlines requirements for the provision of acceptable levels of daylight in new residential developments and adjoining properties.” (emphasis added.)

The relevant section of ‘*Sustainable Residential Development and Compact Settlements Guidelines*’ (SRDCGS), 5.3.7, is referenced in the following section of this report.

Paragraph 6.7 of the superseded 2023 apartment guidelines states:

“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. This may arise due to a design constraints [sic] 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.”

Although the above requirement has been removed from the 2025 apartment guidelines, the request remains in some local authority development plans. As such, the design team may still provide a rationale and/or compensatory design solutions for instances where daylight recommendations have not been achieved.

Note: Section 3.2 of the ‘*Urban Development and Building Height Guidelines 2018*’, provides similar guidance as the ‘2023 apartment guidelines’ as referenced above. However, it should be noted that at the time of publication of the *Urban Development and Building Height Guidelines (2018)*, BR 209 was in its second edition, first published in 2011. Since then, a third edition of BR 209 has been published (June 2022) and the 2nd edition has been withdrawn. BR 209 no longer references BS 8206-2:2008, which has also been withdrawn. The standard now referenced in BR 209 edition 3 is BS EN 17037.

Sustainable Residential Development and Compact Settlements Guidelines (2024)

Often referred to as “The Compact Growth Guidelines” this document advises on compact growth principles as a means to promote sustainable development, efficient land use, and infrastructure while minimizing sprawl and environmental degradation, contributing to sustainable urban growth, enhance liveability and support broader planning objectives.

In regard to daylight, section 5.3.7 states:

“The provision of acceptable levels of daylight in new residential developments is an important planning consideration, in the interests of ensuring a high quality living environment for future residents. It is also important to safeguard against a detrimental impact on the amenity of other sensitive occupiers of adjacent properties.

(a) The potential for poor daylight performance in a proposed development or for a material impact on neighbouring

properties will generally arise in cases where the buildings are close together, where higher buildings are involved, or where there are other obstructions to daylight. Planning authorities do not need to undertake a detailed technical assessment in relation to daylight performance in all cases. It should be clear from the assessment of architectural drawings (including sections) in the case of low-rise housing with good separation from existing and proposed buildings that undue impact would not arise, and planning authorities may apply a level of discretion in this regard.

(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 EN 17037:2018, UK National Annex BS EN 17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context.

In drawing conclusions in relation to daylight performance, planning authorities must weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision, against the location of the site and the general presumption in favour of increased scales of urban residential development. Poor performance may arise due to design constraints associated with the site or location and there is a need to balance that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

The Compact Growth Guidelines should be applied within statutory development plans and during the consideration of individual planning applications. Flexibility in interpretation allows planning authorities to tailor recommendations to specific local contexts and planning objectives.

Dun Laoghaire-Rathdown County Development Plan (2022-2028)

The guidance provided in the Dun Laoghaire-Rathdown County Development Plan 2022-2028 (DLR) references the 2nd Edition of the BRE guidelines (BR 209).

Section 12.3.4.2 of the DLR Development Plan states:

"Development shall be guided by the principles of Site Layout Planning for Daylight and Sunlight, A guide to good practice (Building Research Establishment Report, 2011) and/or any updated, or subsequent guidance, in this regard."

The DLR Development Plan allows for consideration of any updated or subsequent guidance and, therefore, the 3rd edition of the BRE guidelines (BR 209), which was released in 2022 after the publication of the DLR Development Plan, is considered as the primary document.

Guidelines / Standards Summary

According to the aforementioned guiding documents, the following assessments are typically conducted for a daylight and sunlight study, depending on the specific requirements of the project.

Impact on the Surrounding Properties

Impact to daylight is assessed through a Vertical Sky Component (VSC) on all relevant surrounding windows: A VSC impact assessment is typically conducted, where appropriate, on the relevant surrounding windows determined by the BRE decision chart as illustrated in Figure 2.1 on page 8.

Impact to daylight can be further assessed through a No Sky Line (NSL) on surrounding properties: Section D3 of the BRE Guidelines recommends a No Sky Line study "where room layouts are known". Consequently, NSL assessments are typically conducted only on properties where detailed floor plans have been provided.

Impact to sunlight in neighbouring properties is assessed through an Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) on all relevant surrounding windows: An APSH/WPSH impact assessment is typically conducted, where appropriate, on the relevant surrounding windows/rooms that have an orientation within 90° of due south.

Impact to sunlight in neighbouring gardens and/or amenity areas is assessed through a Sunlight on Ground (SOG) assessment in all surrounding amenity spaces: A SOG impact assessment is typically carried out, where appropriate, on the neighbouring gardens/ amenity spaces located within close proximity and to the north of the subject site.

Performance of the Proposed Development

Target Illuminance in all habitable rooms: A target illuminance assessment, also known as a Spatial Daylight Autonomy (SDA) assessment. The two recommended methodologies for this assessment are detailed in section 2.5.1 on page 17. In a scheme performance assessment, the SDA is typically calculated for the habitable rooms of the proposed development. A supplementary SDA assessment may also be conducted under the criteria of IS EN 17037.

When conducting a scheme performance assessment for sunlight in the habitable rooms of the proposed development, Sunlight Exposure (SE) is the relevant metric.

Sunlight on Ground (SOG) in all amenity spaces: A SOG assessment is typically carried out, for the amenity spaces of the proposed development.

No Sky Line (NSL) in all habitable rooms: An NSL assessment is typically conducted for the habitable rooms of the proposed development as a supplementary study as part of a scheme performance assessment.