

LOVE DESIGN STUDIO/O

DAYLIGHT AND SUNLIGHT STUDY

25 Dene Road, Northwood
by Love Design Studio

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PR0707_V3



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EXECUTIVE SUMMARY

Love Design Studio are appointed by Gavacan Homes to prepare a daylight and sunlight assessment for the proposed development at 25 Dene Road, Northwood.

This assessment has been undertaken following request from Hillingdon Council to assess the daylight and sunlight impact following the submission of a Section 73 application at the site which proposes to add balconies on the ground and first floor rear elevations. The following bedrooms and living/kitchen/dining rooms (LKDs) were assessed:

- Unit 1, Bedroom 1 (Lower ground floor)
- Unit 2, LKD (Lower ground floor)
- Unit 3, LKD (Ground floor)
- Unit 4, LKD (Ground floor)
- Unit 5, LKD (First floor)
- Unit 6, LKD (First floor)

The assessment has been undertaken in accordance with the Building Research Establishment's publication "Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice" (2022) (the "BRE Guidelines").

A previous daylight and sunlight assessment was prepared by Rapleys as part of the planning application for the proposed development (Planning reference: 46479/APP/2020/3055). The previous assessment used the superseded BRE Guidelines (published 2011), due to the report having been prepared before June 2022, and only assessed the lower ground floor units.

Please see below a concise summary of the study.

PROPOSED SCHEME DAYLIGHT ACCESS

Assessments were made using the illuminance method to measure on-site daylight provision. All habitable rooms within the proposed development were assessed by calculating if bedrooms and LKDs meet a target illuminance of 100 and 150, respectively, across a minimum of 50% of the reference plane, for at least 50% of the daylight hours.

The illuminance analysis indicates that five out of six assessed rooms exceed daylight targets with the proposed balconies in place. The room that falls short of the daylight target is the LKD within Unit 2 on the lower ground floor.

However, without the balconies in place, the LKD also falls short of the daylight criteria, achieving its respective illuminance target across 27% of the reference plane. Therefore, three high-level windows have been incorporated to the flank

elevation of the LKD to improve daylight access. With the three additional windows, the LKD achieves its respective illuminance target across 31% of the reference plane; receiving a higher level of daylight than that achieved without the balcony above.

Regarding sunlight, the sunlight exposure assessment demonstrates that four out of six assessed rooms achieve a minimum of 1.5 hours of sunlight on March 21 with the proposed balconies in place. The rooms that fall short of the sunlight threshold are the bedroom within Unit 1 and the LKD within unit 2 on the lower ground floor.

Regarding Unit 1, although the bedroom falls short of the sunlight target, the dwelling has a south facing dining/kitchen room and living room that is unobstructed from balconies. Therefore, Unit 1 has at least one habitable room that achieves the minimum sunlight requirement, as accepted by the BRE.

Regarding Unit 2, although the LKD falls short of the sunlight target, the dwelling has a south facing bedroom that is unobstructed from balconies. Therefore, Unit 2 has at least one habitable room that achieves the minimum sunlight requirement, as accepted by the BRE.

It is also important to consider the environmental factors that play a crucial role in building design that should be weighed alongside daylight and sunlight concerns. Balconies provide increased amenity space for residents, as well as reducing solar gain to minimise overheating risk in the summer.

Our evaluation takes into account the presence of crucial components such as trees and amenity areas (balconies). Where daylight and sunlight reductions have been identified; this is considered acceptable when acknowledging the role these components have in boosting occupant health and well-being.

It should also be highlighted that the proposal includes an outdoor terrace area for occupants on the lower ground floor. This terrace, located to the south of the complex, allows for the enjoyment of sunlight when outside. Overall, the design meets the approved requirements that actively contribute to its residents' health and well-being, aligning with the BRE Guidelines.

INTRODUCTION

Love Design Studio are appointed by Gavacan Homes to prepare a daylight and sunlight assessment for the proposed development at 25 Dene Road, Northwood, HA6 2BX. The site has permission for the demolition of the existing building on-site to construct a 2.5-storey building consisting of 7 no. self-contained flats with associated parking, cycle and bin storage, and landscape works. This daylight and sunlight assessment is regarding a Section 73 application for the addition of balconies to the ground and first floor rear elevations.



Figure 1: Existing Site (25 Dene Road, Red)

A previous daylight and sunlight assessment was prepared by Rapleys as part of the planning application for the proposed development (Planning reference: 46479/APP/2020/3055). The previous assessment was prepared prior to the introduction of balconies to the proposal and used the superseded BRE Guidelines (published 2011) to assess the lower ground floor units only.

METHODOLOGY

MODELLING METHODOLOGY

Using architectural drawings prepared by Ascot Design, 3D models were created in industry accepted daylight and sunlight software. These included the proposed development and neighbouring properties.

The 3D model of the proposed development includes the internal configurations and window locations of one bedroom within Unit 1, and the LKDs within Units 2, 3, 4, 5, and 6.

The guidelines for modelling and testing the scheme’s daylight and sunlight access were provided by the BRE’s “Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice” by PJ Littlefair (2022). For further guidance on the methodology please see the BRE’s document¹.

Assessments were made using the ‘illuminance method’ to measure daylight provision.

For interior daylight of new developments, the BRE guidelines are intended to be used with the British Standard “Daylight in buildings” (BS EN 17037) and its UK National Annex.

BS EN 17037 states that a target illuminance should be achieved across a minimum of 50% of the reference plane, for at least 50% of the daylight hours.

The document sets numerical values for the target illuminance and seeks to ensure that habitable rooms receive ample daylight access. Depending on the room type there are different guidelines on the target illuminance; a table of the scheme’s target illuminance values are set out below.

Table 1: The proposed scheme target illuminance values

Item	Target Illuminance	% assessment grid
Bedrooms	100 Lux	50%
Living Rooms	150 Lux	50%
Kitchen	200 Lux	50%

¹ <https://www.bregroup.com/services/testing/indoor-environment-testing/natural-light/>

As the proposed scheme contains LKDs, a target of 150 lux for living rooms was used, as recommended in Appendix C of the BRE guidelines.

Assumptions of the reflectance and other modelling variables are set out below:

Table 2: The proposed scheme variables.

Item	Value	Comment
Maintenance factor	96%	Based on Suburban, vertical glazing
Frame factor	70%	BRE Default
External wall reflectance	0.2	BRE Default
Internal wall reflectance	0.5	BRE Default
Internal ceiling reflectance	0.7	BRE Default
Internal floor reflectance	0.2	BRE Default

Assessments were made of Sunlight Exposure for measure of sunlight. The BRE guidelines states that a dwelling must receive a minimum of 1.5 hours of sunlight on March 21 in at least one habitable room, preferably a main living room.

SURROUNDING TREES MODELLING METHODOLOGY

Trees and hedges are not usually considered within daylight and sunlight assessments due to their irregular shapes making it difficult to accurately model. However, Appendix G of the BRE guidelines states that trees should be considered if large existing trees surround a proposed development.

As per Appendix G of the BRE guidelines, the surrounding trees were considered by modelling a representative shape of the trees using data collected on site of the tree profiles.

The Arboriculture Report for the proposed site (prepared by Arbol EuroConsulting, October 2020) and the proposed site plan (prepared by Ascot Design, March 2021), were used to model the relevant surrounding trees on site.

Typically, the amount of daylight that passes through the tree's crown is represented in the model by applying the relevant transparency to the crown, based on Appendix G of the BRE guidelines.

For example, the BRE guidelines state an English Oak would have a low transparency (20%) in the summer when the tree is in full leaf but would have high transparency (55%) in the winter when its branches are bare. Evergreen trees do not have a listed transparency within the BRE guidelines, so the lowest transparency (10%) was applied to the evergreen green trees on-site.

The proposed site plan also indicates several proposed trees surrounding the development. As the species and dimensions of the proposed trees are yet to be specified, all trees on site were assumed to be evergreen to represent the worst-case scenario with regards to daylight and sunlight.

Additionally, trees have different reflectance values throughout the seasons. Following the values set out in Appendix G of the BRE guidelines, all evergreen trees were modelled with a reflectance value of 10% throughout the year.

ASSUMPTIONS & LIMITATIONS

Where limited access or information is available, assumptions have been made which may affect the conclusions reached in this report. Namely, the proposed trees and planting on-site were modelled using simplified shapes and their transparency and reflectance values were assumed to replicate evergreen trees as a worst-case scenario.

The report provided is solely for the use of the client and no liability to anyone else is accepted and this report is based upon and subject to the scope of work set out in Love Design Studio's terms and conditions

MODEL IMAGES

For reference, please see below images of the constructed model from the relevant software; this is for illustrative purposes only.

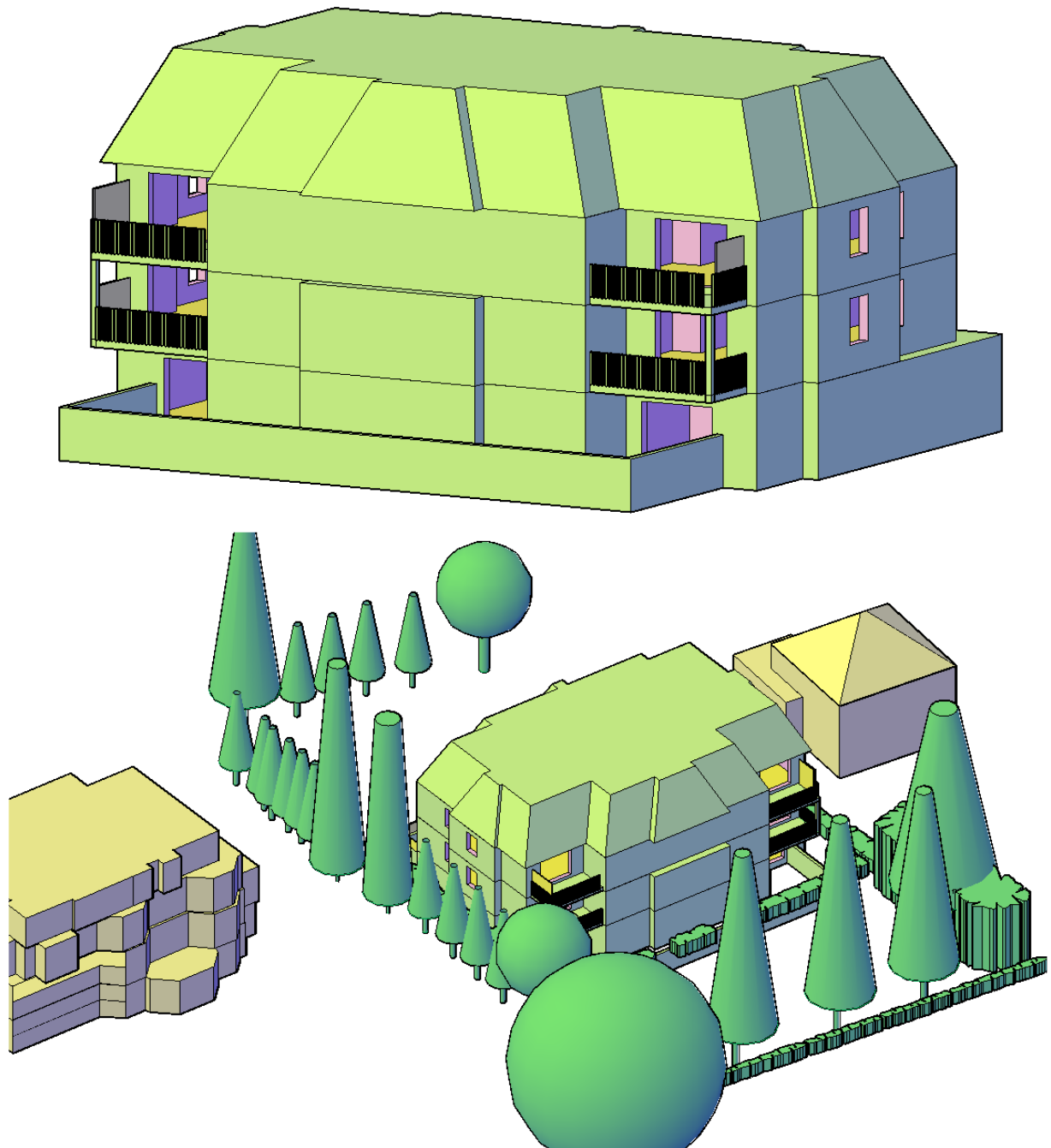


Figure 2: Aerial views of the daylight and sunlight model of the assessed rooms within the proposed development (top, southeast view; bottom, southwest view with surrounding buildings and trees)

SCHEME DRAWINGS

For reference, please see below images of the pdf drawings used to model the internal layouts.

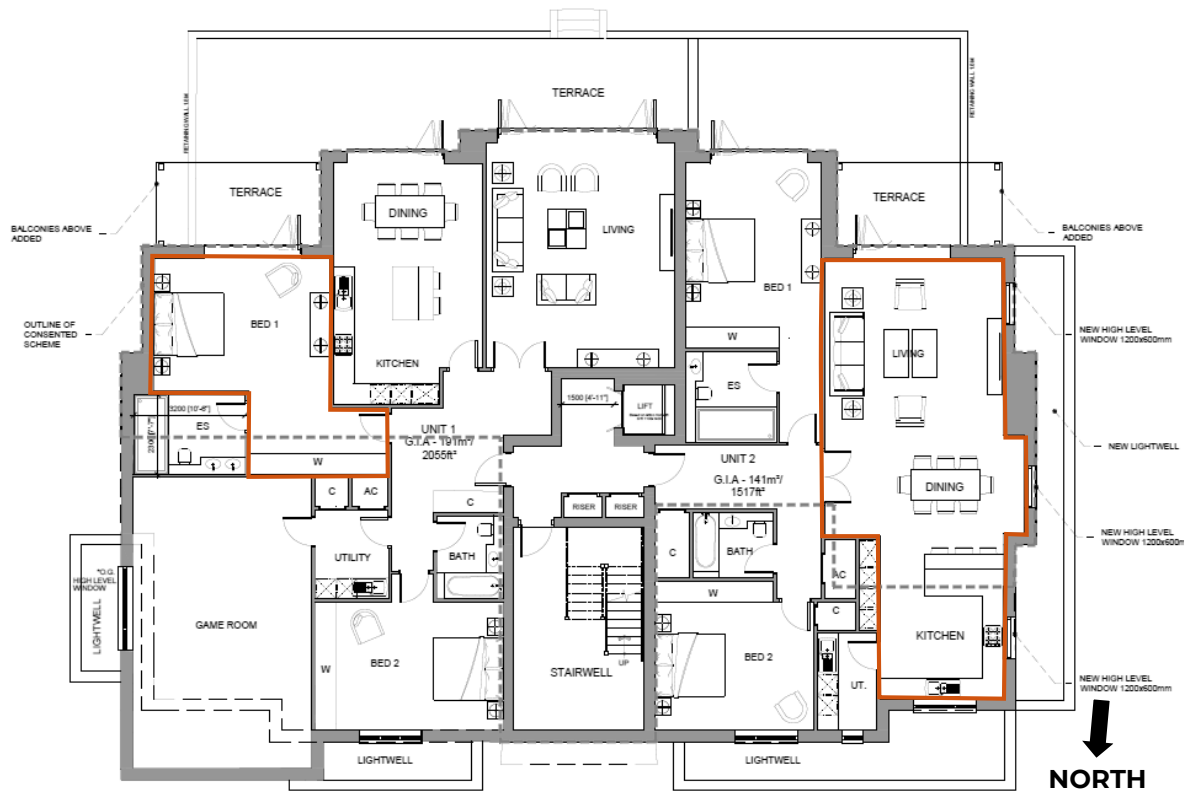


Figure 3: Lower Ground Floor Plan by Ascot Design; rooms assessed (red)

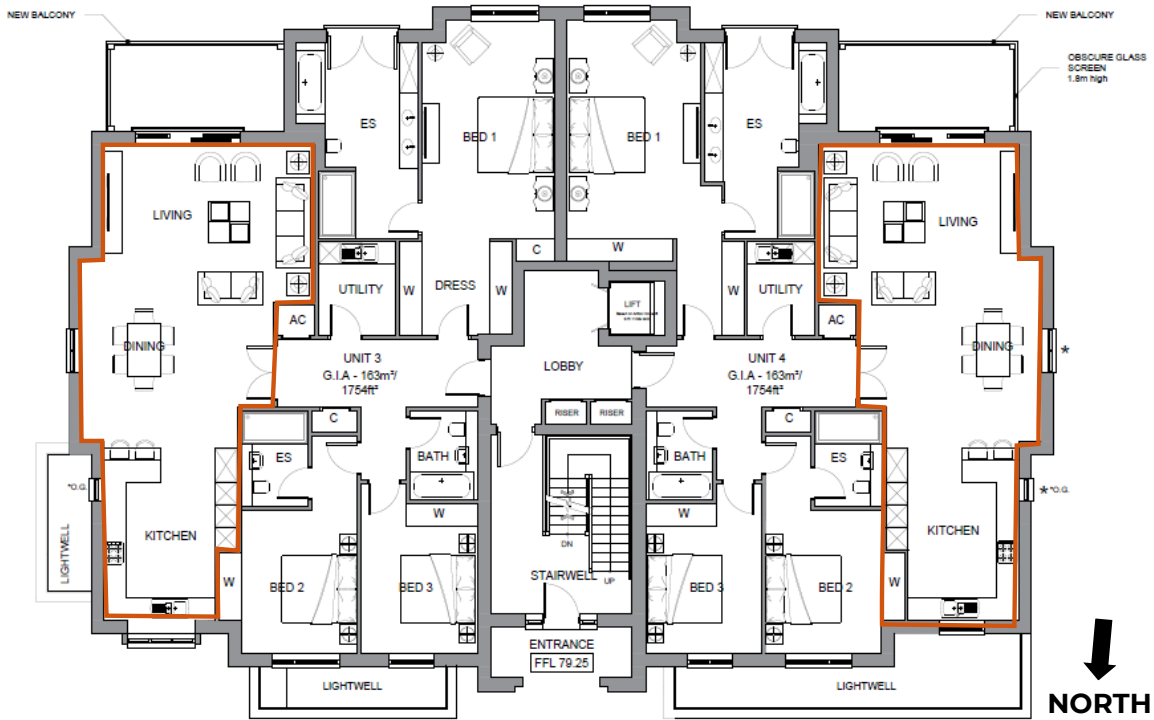


Figure 4: Ground Floor Plan by Ascot Design; rooms assessed (red)

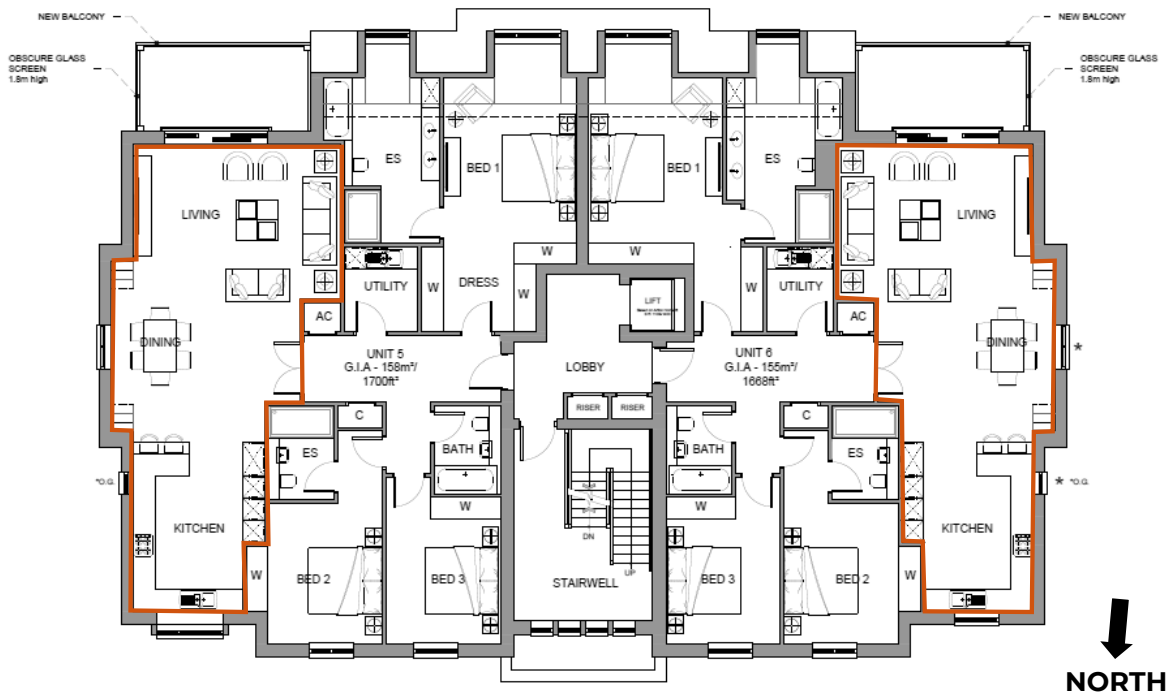


Figure 5: First Floor Plan by Ascot Design; rooms assessed (red)

PROPOSED SCHEME SUMMARY

Assessments were made using the illuminance method to measure on-site daylight provision. All habitable rooms within the proposed development were assessed by calculating if bedrooms and LKDs meet a target illuminance of 100 and 150, respectively, across a minimum of 50% of the reference plane, for at least 50% of the daylight hours.

Assessments were made using Sunlight Exposure for measure of sunlight. The BRE guidelines states that a dwelling must receive a minimum of 1.5 hours of sunlight on March 21 in at least one habitable room, preferably a main living room.

Six habitable rooms were assessed for daylight and sunlight, including one bedroom and one LKD on the lower ground floor, and five LKDs on the ground and first floor. The full set of daylight and sunlight results are set out in the table below.

Table 3: Full Daylight and Sunlight Test results for the proposed development, with and without the proposed balconies

Reference*	Target Illuminance Area Achieved (%)		Sunlight Exposure (Hours)	
	Without balconies	With balconies	Without balconies	With balconies
Unit 1/LGF/Bed/R1	97%	68%	5	1.3
Unit 2 /LGF/LKD/R2	27%	31%	3.7	0.6
Unit 3 /GF/LKD/R3	87%	63%	6.1	3.1
Unit 4/GF/LKD/R4	89%	60%	7.2	3.3
Unit 5/1F/LKD/R5	99%	98%	6.9	6.9
Unit 6/1F/LKD/R6	100%	99%	7.7	7.7

*X/XX(X)/XX/XX – Flat No./Floor/Room Use/Room Ref

The illuminance analysis indicates that five out of six assessed rooms exceed daylight targets with the proposed balconies in place. The one room that falls short of the daylight target is the LKD within Unit 2 on the lower ground floor.

However, without the balconies in place, the LKD also falls short of the daylight criteria, achieving its respective illuminance target across 27% of the reference plane. Therefore, three high-level windows have been incorporated to the flank elevation of the LKD to improve daylight access. With the three additional windows, the LKD achieves its respective illuminance target across 31% of the reference plane; receiving a higher level of daylight than that achieved without the balcony above.

Regarding sunlight, the sunlight exposure assessment demonstrates that four out of six assessed rooms achieve a minimum of 1.5 hours of sunlight on March 21 with the proposed balconies in place. The rooms that fall below the sunlight threshold are the bedroom within Unit 1 and the LKD within unit 2 on the lower ground floor.

Without the balconies in place, all six rooms achieve a minimum of 1.5 hours of sunlight on March 21.

Regarding Unit 1, although the bedroom falls short of the sunlight target, the dwelling has a south facing dining/kitchen room and living room that do not have external obstructions, such as balconies, that restrict sunlight access. Therefore, Unit 1 likely has at least one habitable room that achieves the minimum sunlight requirement, as accepted by the BRE.

Regarding Unit 2, although the LKD falls short of the sunlight target, the dwelling has a south facing bedroom that also does not have external obstructions that may disrupt sunlight access. Therefore, Unit 2 likely has at least one habitable room that achieves the minimum sunlight requirement, as accepted by the BRE.

It is also important to consider the environmental factors that play a crucial role in building design that should be weighed alongside daylight and sunlight concerns. Balconies provide increased amenity space for residents, as well as reducing solar gain to minimise overheating risk in the summer.

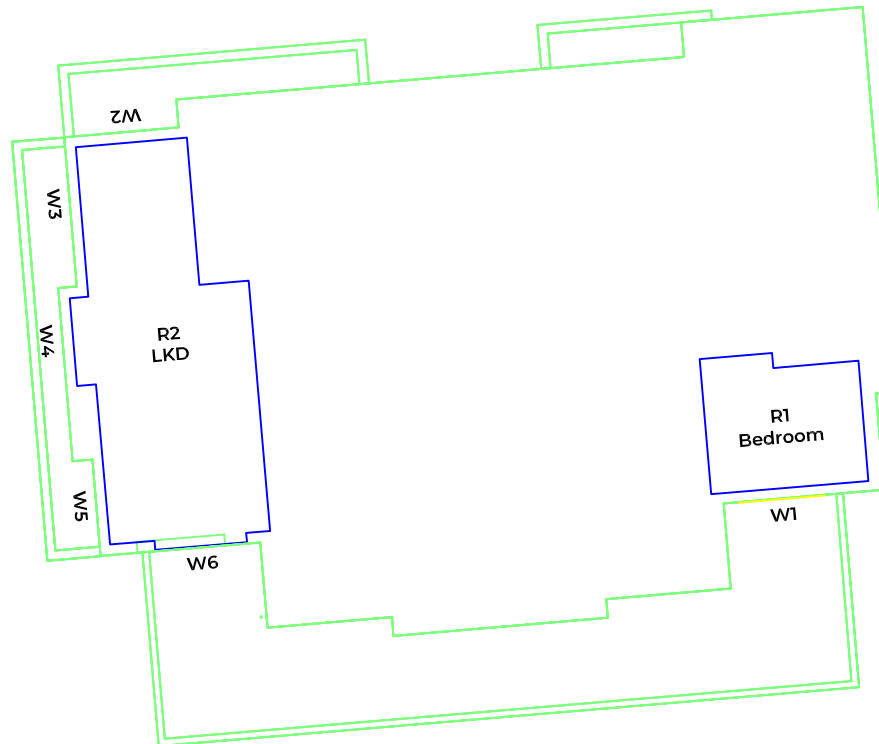
Our evaluation takes into account the presence of crucial components such as trees and amenity areas (balconies). Where daylight and sunlight reductions have been identified; this is considered acceptable when acknowledging the role these components have in boosting occupant health and well-being.

It should also be highlighted that the proposal includes an outdoor terrace area for occupants on the lower ground floor. This terrace, located to the south of the complex, allows for the enjoyment of sunlight when outside. Overall, the design meets the approved requirements that actively contribute to its residents' health and well-being, aligning with the BRE Guidelines.

APPENDIX A - WINDOW AND ROOM LOCATIONS

The following images reference the window and room locations as per the results tables from earlier sections.

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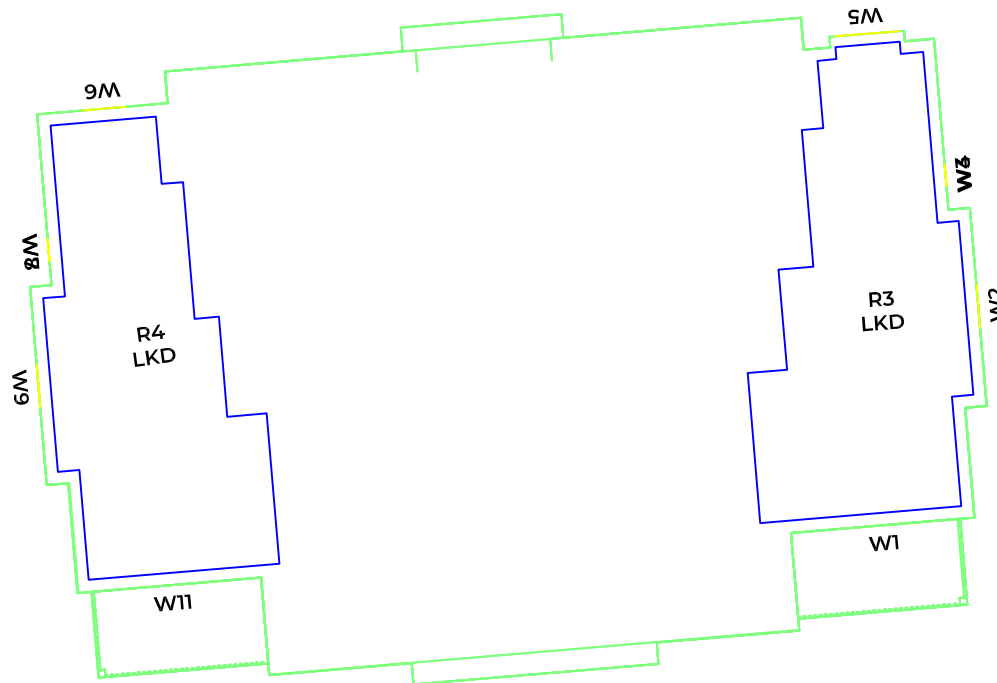
25 Dene Road
Lower Ground Floor
Room Reference
Window Reference

NOT TO SCALE
ILLUSTRATIVE ONLY

Date: 11/04/2024
Drawing: 0707-25DR/RR-LGF
Issue: 01A

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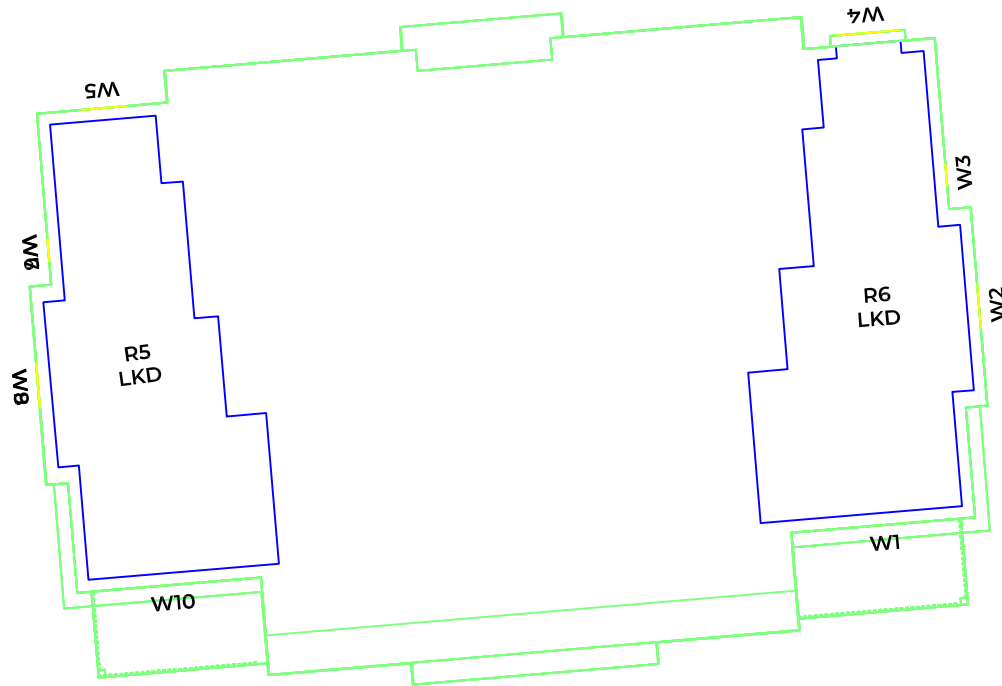
25 Dene Road
Ground Floor
Room Reference
Window Reference

NOT TO SCALE
ILLUSTRATIVE ONLY

Date: 11/04/2024
Drawing: 0707-25DR-WR/RR-GF
Issue: 01A

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25 Dene Road
First Floor
Room Reference
Window Reference

NOT TO SCALE
ILLUSTRATIVE ONLY

Date: 11/04/2024
Drawing: 0707-25DR-WR/RR-1F
Issue: 01A

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