MAY 2021

Daylight, Sunlight and Overshadowing Assessment

Hayes Park North, UB4 8EE

Iceni Projects Limited on behalf of

Universities Superannuation

Scheme Limited.

May 2021

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Daylight, Sunlight and Overshadowing Assessment

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CONTENTS

1. EXECUTIVE SUMMARY 1
2. INTRODUCTION 3
3. PLANNING POLICY FRAMEWORK 7
4. METHODOLOGY 8
5. RESULTS 12
6. CONCLUSIONS AND RECOMMENDATIONS 14

APPENDICES

A1. FULL RESULTS

1. EXECUTIVE SUMMARY

1.1 Iceni Projects Ltd were commissioned to prepare a Daylight, Sunlight and Overshadowing Assessment for the proposed building conversion from office to residential at Hayes Park North on behalf of Universities Superannuation Scheme Ltd.

1.2 An assessment has been carried out on the daylight and sunlight availability to habitable rooms within the proposed development. As the building massing will be unchanged following development, and as there are no sensitive receptors close to the site, the impact of the proposed development on daylight and sunlight amenity to neighbouring buildings has not been assessed. The consistency in the building massing pre and post development has also meant that an impact assessment of overshadowing of external amenity spaces is not required.

1.3 The methodology followed within this analysis is in line with the BRE's "Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice" by PJ Littlefair. Although this document should not be used as a strict planning tool, it should be seen as good practice guidance to planning authorities.

1.4 The BRE guide outlines a number of assessments to be undertaken when analysing daylight and sunlight amenity in new developments. The following assessments were therefore carried out under the proposed onsite conditions:

- Average Daylight Factor (ADF)
- Probable Sunlight Hours (PSH)

1.5 The analysis has been conducted using industry compliant software. The model used for this analysis has been built based on the 2D plans provided by Iceni Projects.

Daylight

1.6 The rooms evaluated in the internal daylight assessment include a sample of 21 habitable spaces, spread across 9 apartments and located on all three floors. These are considered to be the worst case in terms of daylight access due to their location in the northern cut-out of the massing. For the purposes of this assessment, all habitable space including kitchens, living rooms, dining rooms and bedrooms within the sample dwellings have been analysed, although these have been based on preliminary internal layout sketches that may be subject to change.

1.7 The results of the internal daylight analysis indicate that 20 of the 21 assessed habitable spaces achieve the corresponding BRE internal daylight criteria. The single remaining kitchen/living/dining

space falls only marginally below the recommended BRE internal daylight criteria, and is a result of the room being provided with additional deep plan space.

1.8 Therefore, it can be concluded that 62 of the 64 proposed apartments (97%) will meet BRE guidelines relating to internal daylight targets, and that the proposed conversion will therefore receive good levels of daylight to habitable spaces.

Sunlight

1.9 In accordance with BRE sunlight criteria, only living rooms with at least one main window facing within 90 degrees due south have a reasonable expectation of sunlight.

1.10 Given that internal layouts have yet to be confirmed, all windows of the proposed conversion have been assessed. A total of 102 windows facing within 90 degrees of due south have been identified.

1.11 96 windows pass the BRE Annual PSH target and 93 windows pass the BRE Winter PSH target. It is likely that bedrooms (which do not have a requirement for sunlight access, according to the BRE guidance) can be positioned adjacent to four of the nine windows which do not achieve both relevant sunlight targets. Two of the remaining five windows, likely to serve living room spaces, will still receive adequate sunlight on an annual basis, leaving only three windows serving living rooms that do not meet either of the annual or winter sunlight criteria.

1.12 The flexibility with which the BRE Guidance can be applied and overall high level of compliance across the majority of the scheme suggest that the proposed conversion will provide adequate access to sunlight in living spaces. Of the 64 apartments proposed for the conversion, only three (5% of apartments) will therefore fail to meet both sunlight targets. This is due to a constraint associated with the existing building northern cut out obscuring sunlight for inner corner apartments.

1.13 Overall, the results of the sunlight assessment suggest that the proposed design will provide adequate access to sunlight in the vast majority of living spaces.

2. INTRODUCTION

2.1 Iceni Projects Ltd were commissioned by Universities Superannuation Scheme Ltd to prepare a daylight, sunlight and overshadowing assessment to support the proposed conversion of the Hayes Park North building from office to residential use.

2.2 An assessment has been carried out on the impact on daylight and sunlight availability to habitable rooms within the proposed development.

2.3 The assessment strategy follows the approach laid out within the BRE's Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice, by PJ Littlefair. This document is accepted as good practice in terms daylight and sunlight availability by planning authorities.

2.4 It is worth noting that the guidance figures stated within the BRE guide are useful in providing a target for designers, consultants and planners, however they should be seen as purely advisory. Expectations of daylight and sunlight levels will vary significantly depending on site context. Dense urban areas, for example, are likely to experience a greater constraint on natural lighting available when compared with suburban and rural locations.

Site and Context

2.5 The Hayes Park site is located just off Hayes End Road within the London Borough of Hillingdon. The wider site is generally rectangular in shape and is bound to the east by the open parkland of Hayes Park, and to the north and west by the agricultural land and buildings of Home Farm. The entirety of the site and the surrounding land is located within the Green Belt.

2.6 Hayes Park North is situated at the north of the site and is currently occupied by Pladis Global (who are due to vacate the building in July 2021). The building is three storeys in height, with a basement level used for servicing and deliveries. The building is in good condition and has undergone little change since first constructed. The image below shows the approximate site location.

Figure 2.1 - Map showing approximate site location

2.7 The proposed development involves the conversion of the building use to provide 64 apartments from ground to second floor, with the following mix of studios, 1, 2 and 3-bed apartments:

- Studios: 6
- 1-bed: 33
- 2-bed: 19
- 3-bed: 6

2.8 The images below show sample plans for the proposed conversion.

Figure 2.2 - Proposed Ground Floor Plan

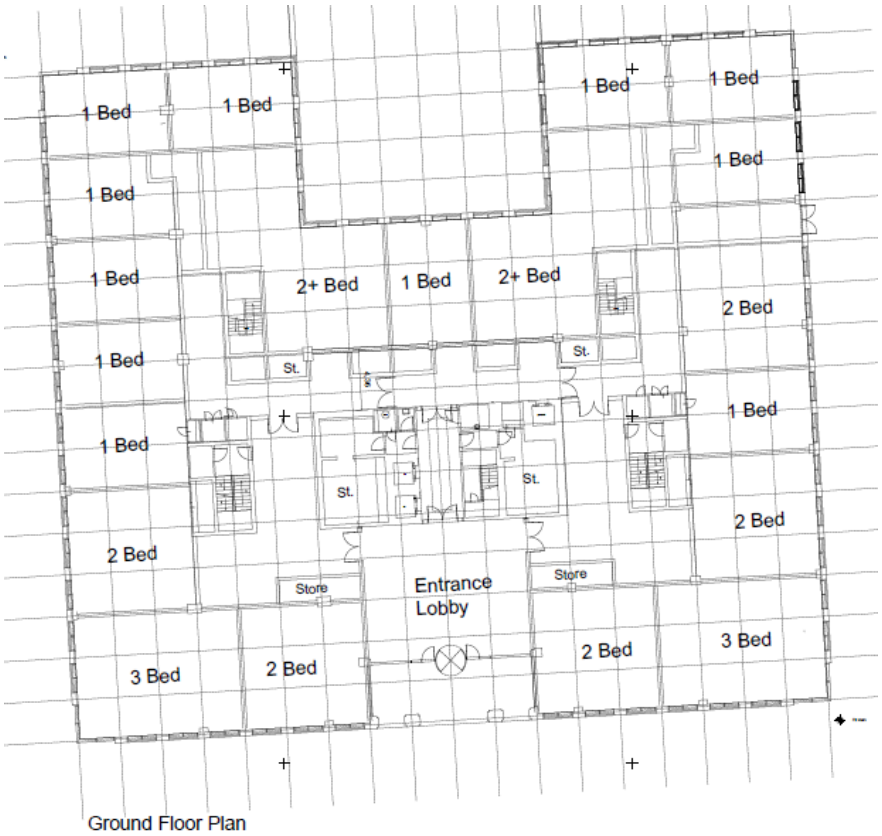


Figure 2.3 - Proposed First Floor Plan

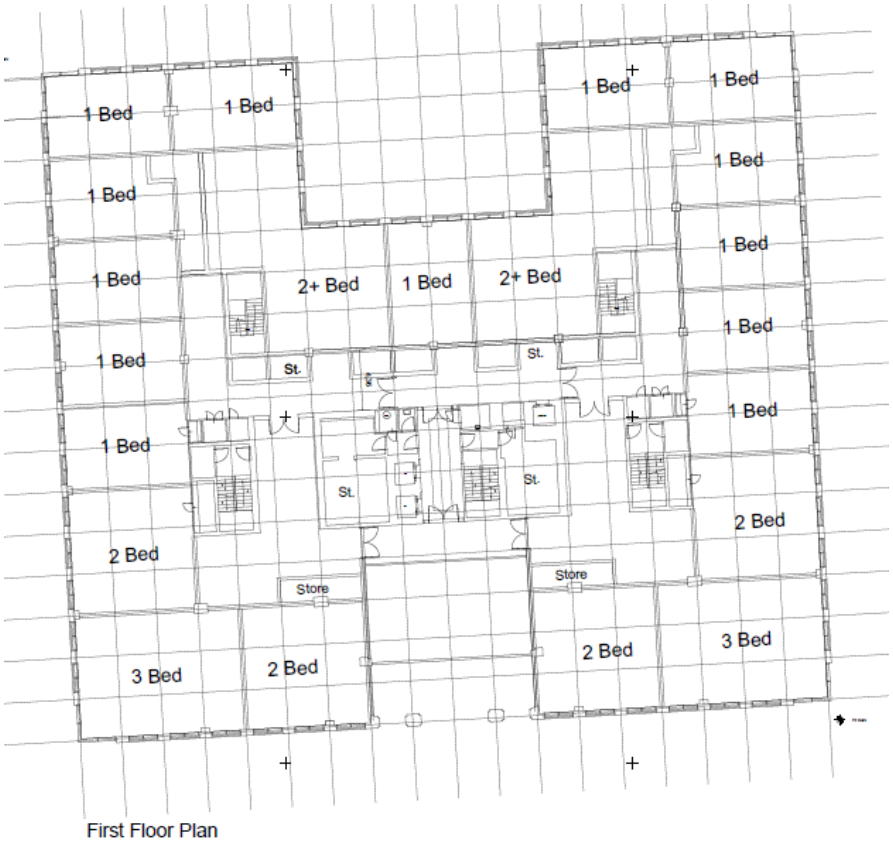


Figure 2.4 - Proposed Second Floor Plan

3. PLANNING POLICY FRAMEWORK

3.1 The London Borough of Hillingdon provides the following policy and guidance related to daylight and sunlight availability.

London Borough of Hillingdon Local Plan Part 2 (Adopted January 2020)

3.2 Policy DMHB 11: Design of New Development states that development proposals should not adversely impact on the amenity, daylight and sunlight of adjacent properties and open space.

3.3 The Council will aim to minimise the impact of the loss of daylight and sunlight and unacceptable overshadowing caused by new development on habitable rooms, amenity space and public open space. The Council will also seek to ensure that the design of new development optimises the levels of daylight and sunlight. The Council will expect the impact of the development to be assessed following the methodology set out in the most recent version of the Building Research Establishment's (BRE) "Site layout planning for daylight and sunlight: A guide to good practice".

4. METHODOLOGY

BRE Guide: Site Layout for Daylight and Sunlight

4.1 The British Research Establishment (BRE) Guide 'Site Layout Planning for Daylight and Sunlight: a good practice guide' by P J Littlefair 2011 sets out standards for calculating the daylight and sunlight availability both within buildings and open spaces.

4.2 The BRE Guide includes advice on how to achieve good daylighting and sunlight levels, while also covering guidance to safeguard daylight and sunlight of existing buildings nearby and the protection of daylighting of adjoining land for future development.

4.3 The standards set out in the BRE guide are intended to be used flexibly. In instances where there is a special requirement for daylight or sunlight, higher levels may be deemed necessary. In other situations, such as with urban developments, lower daylight and sunlight levels may be unavoidable. The following statement is extracted directly from the BRE guide:

"…The guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and this document should not be considered 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 because natural lighting is only one of the many factors in site layout design."

4.4 Whilst the BRE Guide provides numerical guidelines for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets since, as the document states, the intention of the Guide is to help rather than constrain the designer. The Guide is not an instrument of planning policy, therefore, whilst the methods given are technically robust, some level of flexibility should be applied given the context and constraints of the site.

4.5 The BRE Guide gives recommendations on interior daylighting recommendations based on British Standard BS 8206 Part 2 and the CIBSE Lighting Guide LG10 Daylighting and Window Design.

Daylight

4.6 The BRE guidelines use the Average Daylight Factor calculation (ADF) for the assessment of internal daylight level. The ADF is a measure of internal daylight illuminance to the outside illuminance expressed as a percentage. The level of daylight considered acceptable for a given room has been determined based on the BS 8206-2 Code of Practice for Daylighting. These ADF standards are as follows:

- 1.0% for bedrooms
- 1.5% for living rooms
- 2.0% for kitchens

4.7 Due to the lack of sensitive receptors in the vicinity of the site, and the fact that the proposed conversion will not alter the massing of the building, this assessment only investigates the daylight availability within the proposed scheme.

Sunlight

4.8 Sunlight availability is assessed in terms of Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH). APSH refers to the long term average number of hours within a year in which direct sunlight reaches the unobscured ground. WPSH refers to the long term average number of hours within the winter months (21 September and 21 March) in which direct sunlight reaches the unobscured ground. Rooms are considered adequately sunlit if at least one main window facing within 90 degrees due south receives 25% of annual probable sunlight hours and 5% of annual probable sunlight hours during the winter months.

4.9 To note, the BRE sunlight test is only relevant to living rooms with at least 1 main window facing within 90 degrees due south. Despite this, care should be taken to ensure that other habitable space including kitchens and bedrooms should receive a reasonable level of sunlight.

4.10 Again, as there are no sensitive receptors in the vicinity of the site, this assessment only investigates the sunlight availability within the proposed scheme.

Overshadowing

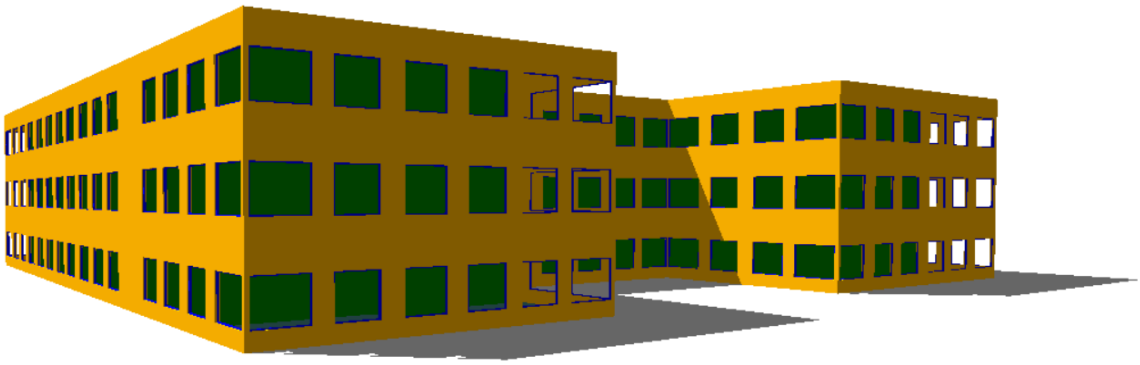
4.11 Open amenity space should aim to retain as much direct sunlight as reasonably possible. For an amenity space to appear adequately sunlit throughout the year the BRE suggest that at least half of its area should receive at least 2 hours of sunlight on 21 March. Due to the fact that the proposed massing will be unchanged following conversion, no external amenity spaces have been assessed.

Assessment Modelling

4.12 This assessment has been based on a simplified 3D model, built using 2D plans and elevations of the proposed scheme provided by Iceni Projects in May 2021.

4.13 The availability of daylight and sunlight to the habitable spaces within a sample of the proposed development has been assessed. The analysis is consistent with the nationally recognised methodology specified by the BRE.

Figure 4.1 - 3D model of proposed scheme



4.14 Daylight modelling has been undertaken for nine apartments on the ground, first and second floors, deemed to be worst-case in terms of access to daylight, due to their location within the northern cut out of the existing building. These are indicated on the sketch below, with sample layouts defining the habitable rooms (although these are yet to be confirmed).

Figure 4.2 – Apartments assessed for daylight availability

4.15 For each apartment modelled, the bedrooms and living/kitchen spaces have been assessed using the BRE criteria detailed above.

4.16 Sunlight assessment has been undertaken for all of the converted apartment windows that will face within 90 degrees of due south. Although BRE guidance states that only living room windows need to be assessed, the lack of confirmed internal layouts at this stage makes it appropriate to assess all windows, to provide guidance to potential apartment layouts.

4.17 A total of 102 apartment windows that face within 90 degrees of due south have been identified across the three floors of the building.

5. RESULTS

Daylight Assessment

5.1 This assessment identified nine apartments located across ground, first and second floors as worst case in relation to their potential to receive daylight. A total of 21 habitable rooms including kitchens, living rooms, dining rooms and bedrooms within these nine dwellings were assessed for their daylight access. Table 5.1 lists calculated room ADF with the corresponding target. Full daylight results for all rooms can be found in Appendix A1.

Table 5.1 - Internal daylight results

Unit ref	Room type	Room ADF (%)	Target ADF (%)	Comments
Gnd 01 (1 bed)	Kitchen/Living/Diner	10.7	2.0	BRE target met
	Bed	2.6	1.0	BRE target met
Gnd 02 (2 bed)	Kitchen/Living/Diner	1.4	2.0	BRE target not met
	Bed	3.3	1.0	BRE target met
	Bed	2.8	1.0	BRE target met
Gnd 03 (1 bed)	Kitchen/Living/Diner	2.0	2.0	BRE target met
	Bed	4.3	1.0	BRE target met
1st 01 (1 bed)	Kitchen/Living/Diner	11.0	2.0	BRE target met
	Bed	3.1	1.0	BRE target met
1st 02 (2 bed)	Kitchen/Living/Diner	1.6	2.0	Exceeds BRE target for living spaces
	Bed	4.1	1.0	BRE target met
	Bed	3.1	1.0	BRE target met
1st 03 (1 bed)	Kitchen/Living/Diner	2.2	2.0	BRE target met
	Bed	4.6	1.0	BRE target met
2nd 01 (1 bed)	Kitchen/Living/Diner	11.1	2.0	BRE target met
	Bed	3.5	1.0	BRE target met
2nd 02 (2 bed)	Kitchen/Living/Diner	1.9	2.0	Exceeds BRE target for living spaces
	Bed	4.9	1.0	BRE target met
	Bed	3.6	1.0	BRE target met
2nd 03 (1 bed)	Kitchen/Living/Diner	2.3	2.0	BRE target met
	Bed	5.0	1.0	BRE target met

Table 5.2 - Daylight results summary

Number of habitable rooms tested	**21**
Number of kitchen/living/dining rooms	**9**
Number of kitchens/living/dining rooms with ADF meeting 2.0%	6
Number of kitchens/living/dining rooms with ADF meeting 1.5%	2
Number of bedrooms	**12**
Number of bedrooms with ADF meeting 1.0%	12

Sunlight Assessment

5.2 This analysis has been undertaken for all apartment windows facing within 90 degrees of due south. For the proposed scheme, 102 apartment windows have been identified that face within 90 degrees of due south. Table 5.3 summarises the probable sunlight hours with the corresponding target. Full sunlight results can be found in Appendix A1.

Table 5.3 - Proposed scheme sunlight summary

Number of rooms tested	**102**
Number of windows achieving APSH >25% & WPSH >5%	93
Number of windows achieving APSH >25%	96
Number of windows achieving WPSH >5%	93
Number of windows not meeting any of the above criteria	6

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 The results of this daylight, sunlight and overshadowing analysis indicate that the habitable rooms of the proposed conversion of Hayes Park North will achieve good levels of daylight and sunlight.

Daylight

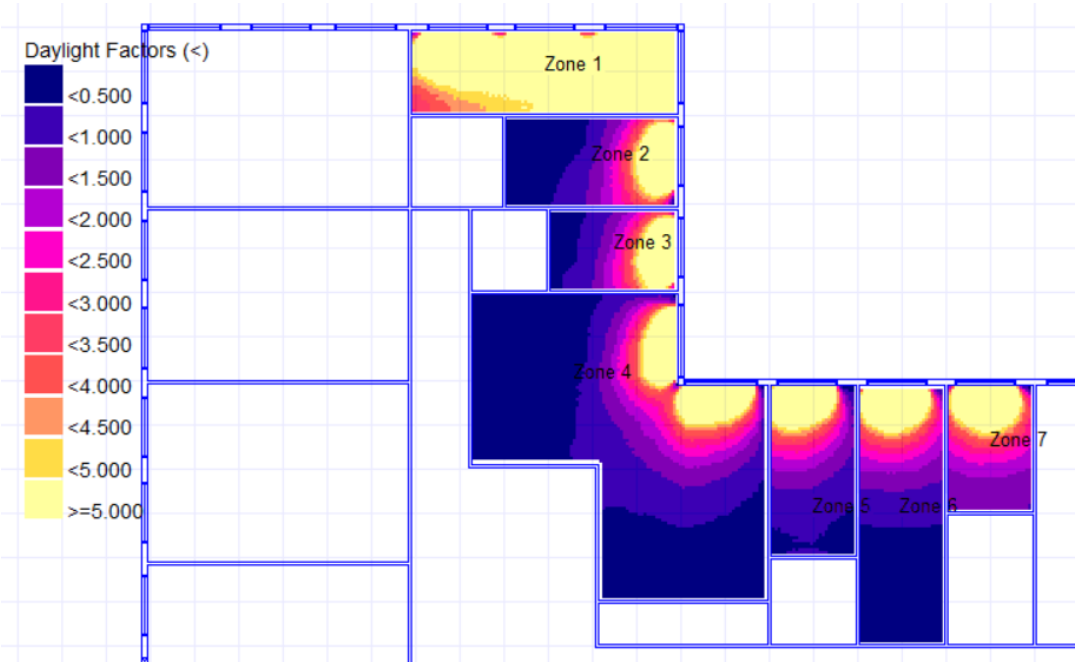
6.2 A sample of 21 habitable spaces across nine dwellings, considered to be the worst case in terms of daylight access, have been assessed in terms of daylight availability.

6.3 The results of the internal daylight analysis indicate that 18 of the 21 assessed habitable spaces achieve the corresponding BRE internal daylight criteria.

6.4 The kitchen, living and dining room spaces located on the 2-bed apartment on the ground, first and second floor were found to fall sort of the 2% target with calculated ADF values of 1.4%, 1.6% and 1.9%. Despite this shortfall, the calculated ADF exceeds the BRE target for living space (1.5%) for the first and second floors. As these spaces are not standalone kitchens, it is likely that they will be used as a living spaces for the majority of occupied hours, therefore the target of 1.5% is considered more appropriate.

6.5 These rooms are served by two extensive windows, with decent views out to the woodlands to the north of the site, and have generous internal spaces for living, dining and kitchen spaces. The depth of the rooms, split across the corner leads to the lower daylight factors, as shown below:

Figure 6.1 – Ground floor daylight factor plot



6.6 These results (zone 4) show good levels of daylight through the majority of the space, with only the deeper plan spaces falling short. The corresponding first and second floor spaces both achieve the recommended daylight levels for living spaces.

6.7 Following the assessment of internal daylight levels for the proposed scheme it can be concluded that the proposed development as a whole will receive good levels of daylight to all habitable spaces. For this reason, the scheme is considered to provide a good level of accommodation in terms of daylight availability. Given that the dwellings tested for daylight were selected as the worst case apartments, the analysis presented above demonstrates that only the two ground floor inner corner dwellings out of the 64 proposed as part of the conversion will fail to meet the required BRE daylight standard, and only by a very small fraction.

Sunlight

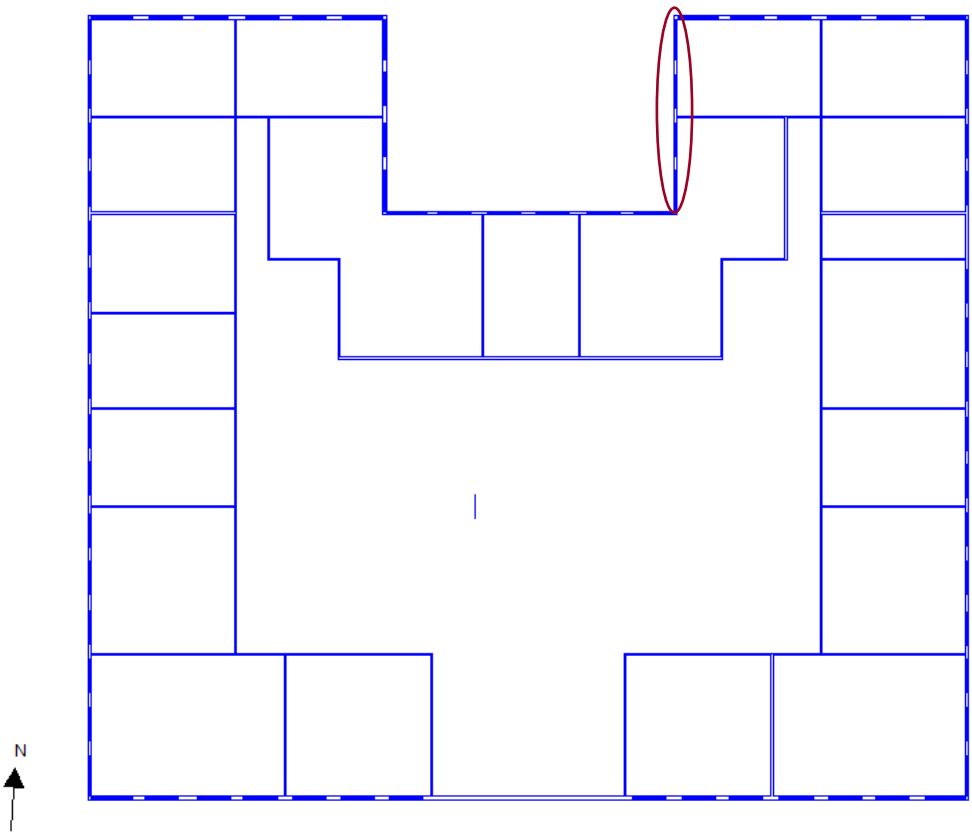
6.8 In accordance with BRE sunlight criteria, only living rooms with at least one main window facing within 90 degrees due south have a reasonable expectation of sunlight.

6.9 As internal layouts have not been confirmed for the proposed conversion, all 102 apartment windows facing within 90 degrees of due south have been assessed for sunlight availability.

6.10 The results of the proposed scheme sunlight assessment indicate that the vast majority of assessed windows will achieve the recommended Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) target set by the BRE.

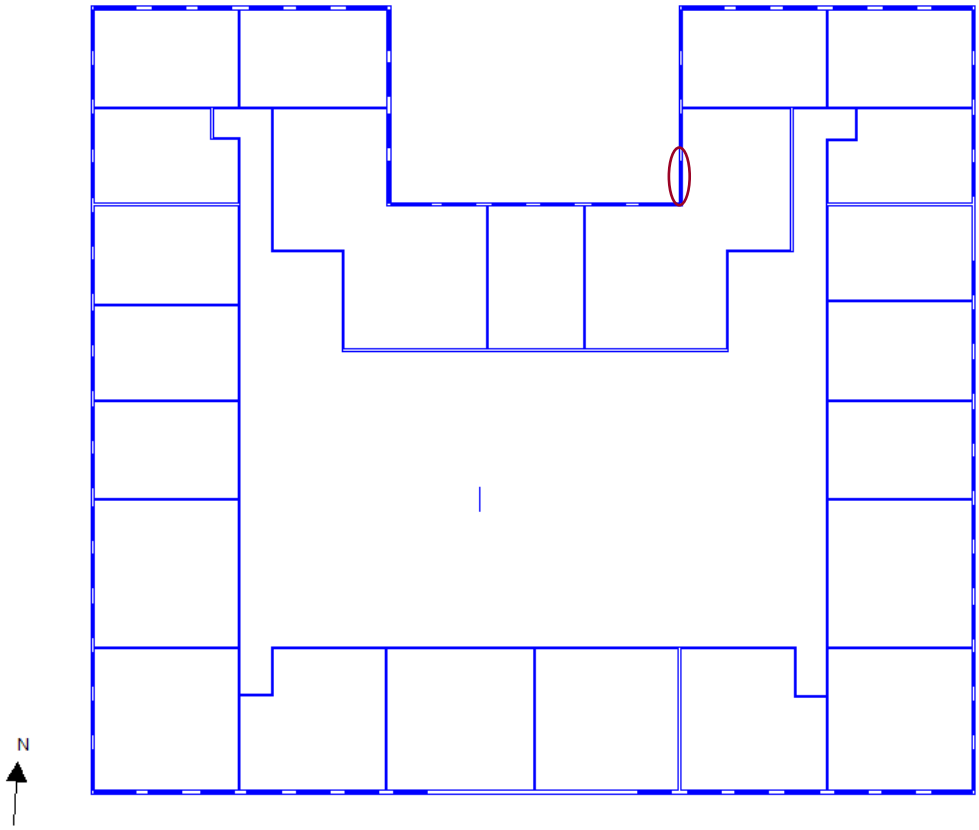
6.11 The eight windows on the ground and first floor that do not meet the BRE targets are shown below.

Figure 6.2 – Ground/first floor windows not meeting BRE sunlight targets



6.12 The single window on the second floor that does not meet the BRE targets is shown below.

Figure 6.3 – Second floor window not meeting BRE sunlight targets



6.13 Given the likely layout of the proposed conversion (Figure 4.2), it is probable that bedrooms (which do not have a requirement for sunlight access, according to the BRE guidance) can be positioned adjacent to four of the nine windows which do not achieve relevant sunlight targets. Two of the remaining five windows, likely to serve living room spaces, will still receive adequate sunlight on an annual basis, leaving only three windows serving living rooms on the inner corner 2-bed apartments that do not meet either of the annual or winter sunlight criteria. This limitation is due to the geometry of the northern cut out, with the building obscuring sunlight for the inner corner apartments.

6.14 The overall high level of compliance across the majority of the scheme suggests that the proposed conversion will provide adequate access to sunlight in living spaces. Of the 64 apartments proposed for the conversion, only three (5% of apartments) will therefore fail to meet both sunlight targets for living spaces.

Overall Assessment

6.15 The results of this assessment indicate that, when accounting for the constraints of the existing building and the desire to provide greater internal spaces for new residents, the proposed conversion will meet relevant local authority planning policy relating to daylight and sunlight amenity for future residents.

A1. FULL RESULTS

A1.1 Daylight results

Zone ID	Floor	Intended Usage	Predicted ADF
1	Ground	L/K/D	10.7
2	Ground	Bedroom	2.6
3	Ground	Bedroom	3.3
4	Ground	L/K/D	1.4
5	Ground	Bedroom	2.8
6	Ground	L/K/D	2.0
7	Ground	Bedroom	4.3
8	First	L/K/D	11.0
9	First	Bedroom	3.1
10	First	Bedroom	4.1
11	First	L/K/D	1.6
12	First	Bedroom	3.1
13	First	L/K/D	2.2
14	First	Bedroom	4.6
15	Second	L/K/D	11.1
16	Second	Bedroom	3.5
17	Second	Bedroom	4.9
18	Second	L/K/D	1.9
19	Second	Bedroom	3.6
20	Second	L/K/D	2.3
21	Second	Bedroom	5.0

A1.2 Sunlight Results

Zone	Ref Ex	Floor Ref	APSH (%)	WPSH (%)	Annual Pass?	Winter Pass?
Zone 1	W200	Ground Floor	82.88	30.78	Pass	Pass
Zone 1	W201	Ground Floor	82.88	30.78	Pass	Pass
Zone 1	W202	Ground Floor	82.88	30.78	Pass	Pass

Zone	Ref Ex	Floor Ref	APSH (%)	WPSH (%)	Annual Pass?	Winter Pass?
Zone 2	W193	Ground Floor	82.88	30.78	Pass	Pass
Zone 2	W194	Ground Floor	82.88	30.78	Pass	Pass
Zone 2	W195	Ground Floor	82.88	30.78	Pass	Pass
Zone 2	W196	Ground Floor	82.88	30.78	Pass	Pass
Zone 2	W197	Ground Floor	46.35	12.58	Pass	Pass
Zone 2	W198	Ground Floor	46.35	12.58	Pass	Pass
Zone 2	W199	Ground Floor	46.35	12.58	Pass	Pass
Zone 3	W159	Ground Floor	46.35	12.58	Pass	Pass
Zone 3	W160	Ground Floor	46.35	12.58	Pass	Pass
Zone 3	W161	Ground Floor	46.35	12.58	Pass	Pass
Zone 4	W182	Ground Floor	46.35	12.58	Pass	Pass
Zone 4	W183	Ground Floor	46.35	12.58	Pass	Pass
Zone 5	W166	Ground Floor	46.35	12.58	Pass	Pass
Zone 5	W167	Ground Floor	46.35	12.58	Pass	Pass
Zone 6	W164	Ground Floor	46.35	12.58	Pass	Pass
Zone 6	W165	Ground Floor	46.35	12.58	Pass	Pass
Zone 7	W175	Ground Floor	46.35	12.58	Pass	Pass
Zone 7	W176	Ground Floor	46.35	12.58	Pass	Pass
Zone 8	W177	Ground Floor	46.35	12.58	Pass	Pass
Zone 8	W178	Ground Floor	46.35	12.58	Pass	Pass
Zone 12	W210	Ground Floor	5.89	0.00	Fail	Fail
Zone 12	W211	Ground Floor	0.00	0.00	Fail	Fail
Zone 14	W143	Ground Floor	18.61	0.00	Fail	Fail

Zone	Ref Ex	Floor Ref	APSH (%)	WPSH (%)	Annual Pass?	Winter Pass?
Zone 14	W144	Ground Floor	26.45	0.00	Pass	Fail
Zone 20	W189	Ground Floor	82.88	30.78	Pass	Pass
Zone 20	W190	Ground Floor	82.88	30.78	Pass	Pass
Zone 20	W191	Ground Floor	82.88	30.78	Pass	Pass
Zone 20	W192	Ground Floor	82.88	30.78	Pass	Pass
Zone 21	W148	Ground Floor	82.88	30.78	Pass	Pass
Zone 21	W149	Ground Floor	82.88	30.78	Pass	Pass
Zone 21	W150	Ground Floor	82.88	30.78	Pass	Pass
Zone 22	W72	First Floor	82.88	30.78	Pass	Pass
Zone 22	W73	First Floor	82.88	30.78	Pass	Pass
Zone 22	W74	First Floor	82.88	30.78	Pass	Pass
Zone 23	W97	First Floor	46.35	12.58	Pass	Pass
Zone 23	W98	First Floor	46.35	12.58	Pass	Pass
Zone 23	W99	First Floor	46.35	12.58	Pass	Pass
Zone 23	W100	First Floor	82.88	30.78	Pass	Pass
Zone 23	W101	First Floor	82.88	30.78	Pass	Pass
Zone 23	W102	First Floor	82.88	30.78	Pass	Pass
Zone 23	W103	First Floor	82.88	30.78	Pass	Pass
Zone 24	W94	First Floor	46.35	12.58	Pass	Pass
Zone 24	W95	First Floor	46.35	12.58	Pass	Pass
Zone 24	W96	First Floor	46.35	12.58	Pass	Pass
Zone 25	W82	First Floor	46.35	12.58	Pass	Pass
Zone 25	W83	First Floor	46.35	12.58	Pass	Pass
Zone 26	W84	First Floor	46.35	12.58	Pass	Pass
Zone 26	W85	First Floor	46.35	12.58	Pass	Pass
Zone 27	W87	First Floor	46.35	12.58	Pass	Pass
Zone 27	W88	First Floor	46.35	12.58	Pass	Pass
Zone 28	W130	First Floor	46.35	12.58	Pass	Pass
Zone 28	W131	First Floor	46.35	12.58	Pass	Pass
Zone 29	W113	First Floor	46.35	12.58	Pass	Pass
Zone 29	W114	First Floor	46.35	12.58	Pass	Pass
Zone 33	W136	First Floor	21.11	0.00	Fail	Fail
Zone 33	W137	First Floor	6.29	0.00	Fail	Fail
Zone 35	W108	First Floor	31.39	0.07	Pass	Fail
Zone 35	W109	First Floor	36.60	3.99	Pass	Fail
Zone 42	W126	First Floor	82.88	30.78	Pass	Pass
Zone 42	W127	First Floor	82.88	30.78	Pass	Pass

Zone	Ref Ex	Floor Ref	APSH (%)	WPSH (%)	Annual Pass?	Winter Pass?
Zone 42	W128	First Floor	82.88	30.78	Pass	Pass
Zone 42	W129	First Floor	82.88	30.78	Pass	Pass
Zone 43	W75	First Floor	82.88	30.78	Pass	Pass
Zone 43	W76	First Floor	82.88	30.78	Pass	Pass
Zone 43	W77	First Floor	82.88	30.78	Pass	Pass
Zone 44	W53	Second Floor	82.88	30.78	Pass	Pass
Zone 45	W54	Second Floor	82.88	30.78	Pass	Pass
Zone 45	W55	Second Floor	82.88	30.78	Pass	Pass
Zone 45	W56	Second Floor	82.88	30.78	Pass	Pass
Zone 46	W41	Second Floor	82.88	30.78	Pass	Pass
Zone 46	W42	Second Floor	82.88	30.78	Pass	Pass
Zone 46	W43	Second Floor	82.88	30.78	Pass	Pass
Zone 46	W44	Second Floor	46.35	12.58	Pass	Pass
Zone 46	W45	Second Floor	46.35	12.58	Pass	Pass
Zone 46	W46	Second Floor	46.35	12.58	Pass	Pass
Zone 47	W31	Second Floor	46.35	12.58	Pass	Pass
Zone 47	W32	Second Floor	46.35	12.58	Pass	Pass
Zone 47	W33	Second Floor	46.35	12.58	Pass	Pass
Zone 48	W34	Second Floor	46.35	12.58	Pass	Pass
Zone 48	W35	Second Floor	46.35	12.58	Pass	Pass
Zone 49	W18	Second Floor	46.35	12.58	Pass	Pass
Zone 49	W19	Second Floor	46.35	12.58	Pass	Pass
Zone 50	W16	Second Floor	46.35	12.58	Pass	Pass
Zone 50	W17	Second Floor	46.35	12.58	Pass	Pass
Zone 51	W11	Second Floor	46.35	12.58	Pass	Pass

Zone	Ref Ex	Floor Ref	APSH (%)	WPSH (%)	Annual Pass?	Winter Pass?
Zone 51	W12	Second Floor	46.35	12.58	Pass	Pass
Zone 52	W1	Second Floor	46.35	12.58	Pass	Pass
Zone 52	W2	Second Floor	46.35	12.58	Pass	Pass
Zone 56	W65	Second Floor	39.72	5.95	Pass	Pass
Zone 56	W66	Second Floor	20.03	0.00	Fail	Fail
Zone 58	W26	Second Floor	43.91	10.15	Pass	Pass
Zone 58	W27	Second Floor	46.35	12.58	Pass	Pass
Zone 65	W50	Second Floor	82.88	30.78	Pass	Pass
Zone 65	W51	Second Floor	82.88	30.78	Pass	Pass
Zone 65	W52	Second Floor	82.88	30.78	Pass	Pass
Zone 66	W58	Second Floor	82.88	30.78	Pass	Pass
Zone 66	W59	Second Floor	82.88	30.78	Pass	Pass
Zone 66	W60	Second Floor	82.88	30.78	Pass	Pass
Zone 67	W57	Second Floor	82.88	30.78	Pass	Pass