PRELIMINARY ASSESSMENT OF DAYLIGHT IMPACTS REGISTERING ON PROPERTIES IN THE NEIGHBOURHOOD OF A PROPOSED DEVELOPMENT ON WOODBINE ROAD, DUBLIN 5.

Prepared for Fold Housing Association Ireland Ltd. Date: 28TH May 2021 PRELIM REV 04



Rev.	Description	Issued by	Date	Checked
Prelim Rev 01	Preliminary assessment of impact registering on neighbouring properties	RW	19 th May 2021	KR
Prelim Rev 02	As above with additional commentary provided within results sections	RW	25 th May 2021	KR
Prelim Rev 03	As above with minor clarifications added	RW	28 th May 2021	KR
Prelim Rev04	As above with minor clarifications and corrections to Appendix D	RW	28 th May 2021	KR

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Glossary

Average Daylight Factor ratio of total daylight flux incident on a reference area to the total area of the reference area, expressed as a percentage of outdoor illuminance on a horizontal plane due to an unobstructed sky of assumed or known luminance distribution.

Annual Probable the long-term average of the total number of Sunlight Hours (APSH) the unobstructed ground (when clouds are considered)

Daylight combined sunlight and skylight

- Daylight Factor the ratio of the illuminance at a particular point within an enclosure to the simultaneous unobstructed outdoor illuminance under the same sky conditions, expressed as a percentage.
- Skylight part of solar radiation that reaches the earth's surface as a result of scattering in the atmosphere.
- Sunlight part of solar radiation that reaches the earth's surface as parallel rays after selective attenuation by the atmosphere.

Vertical Sky Componentratio of the part of illuminance, at a point on a
given vertical plane, that is received directly
from a CIE (Commission Internationale De
L'Eclairge) standard overcast sky, to
illuminance on a horizontal plane due to an
unobstructed hemisphere of this sky. The VSC
does not include reflected light, either from the
ground of from other buildingsWinter Probablethe long-term average of the total number of

Working Plane

Winter Probable the long-term average of the total number of Sunlight Hours (WPSH) the long-term average of the total number of hours between the 21st of September and the 21st of March in which direct sunlight reaches the unobstructed ground (when clouds are considered)

horizontal, vertical, or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85m above the floor in houses and factories, 0.7 m above the floor in offices.

Introduction

BPG3 have been engaged by Fold Housing Association Ireland Ltd to carry out an early-stage assessment of the daylight levels associated with a proposed residential development on Woodbine Road, Dublin 5.

The proposed development relates to the construction of 52 apartments which are organised across four stories within a permitter block form.

As mandated in Irish planning policy¹ all assessments have been carried out with regard to the methods outlined in the BRE (Building Research Establishment) guide *'Site layout planning for daylight and sunlight - A guide to good practice'* 2nd Edition and BS 8206-2: 2008 – *'Lighting for Buildings – Part 2: Code of Practice for Daylighting'*, British Standards Institute, 2008.

A total of three separate daylight studies are presented in this preliminary report.

In order to assess the degree to which neighbouring properties would be affected by this development the following three studies have been carried out:

Study A: Assessment of skylight access levels available to neighbouring accommodation: An assessment of the extent to

which the proposed development could impact on the skylight access levels available to the accommodation located in neighbouring properties.

Study B: Assessment of sunlight access levels available to neighbouring accommodation: An assessment of the extent to which the proposed development could impact on the levels of sunlight access available to accommodation in neighbouring residences.

Study C: Assessment of sunlight levels available to neighbouring recreation areas: An assessment of the extent to which the proposed development would impact on the levels of sunlight access available to neighbouring outdoor recreation areas.

As recommended in the BRE guide, a quantitative approach to the assessment of daylight conditions has been adopted in this study. Numeric calculations have been carried out to predict the daylight levels which would be available at a number of test points and areas. The results of these calculations are presented in tables.

The quantitative assessment has been carried out using computational methods. Three-dimensional computer models of the existing site, the

¹ Please refer to Appendix A: Policy Basis for Daylight Standards

existing buildings, and the proposed development have all been generated and simulated under appropriate sky conditions in order to obtain accurate predictions.

Information relating to the proposed development and the surrounding areas has been supplied to BPG3 by Cantrell Crowley Architects in electronic format. The study assumes that the information provided is accurate and that no omissions have been made. The particular information sources which have been used to develop the models used in this study are outlined in Appendix C: Source Material.

In accordance with guidance provided in Appendix H of the BRE guide the effect which trees have on light levels has not been considered in this assessment.

It is important to note that whilst the methods presented in the BRE guide provide designers and planners with a clear and objective way of assessing daylight levels, the associated performance targets are not mandatory standards. This is clarified within the introductory section of the BRE guide:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines these should be interpreted flexibly because natural lighting is only one of many factors in site layout design." While it is accepted that advisory targets should always be aspired to, the associated imperatives which exist to create sustainable levels of urban density, to encourage the development of compact urban form and to make best use of scarce urban land will always place restrictions on the degree to which it is appropriate to pursue full compliance with advisory minimums.

Additional guidance regarding the discretion which is available to consent authorities on this matter is provided in Appendix B: Discretion available to consent authorities.

Study A: Assessment of skylight levels available to neighbouring accommodation

Study A: Assessment Overview

This assessment considers the degree to which the proposed development would affect the levels of diffuse skylight which would be available to neighbouring accommodation.

As recommended in national planning guidance² the assessment is carried out in the first instance with regard to the conventional tests recommended in the BRE guide *'Site layout planning for daylight and sunlight - A guide to good practice'* 2nd Edition. In instances where the results from this primary testing conform with the conventional BRE guidelines it is assumed that acceptable levels of skylight access would remain with the proposed development in place. In instance where primary testing identifies departures, the significance of these shortfalls is investigated in greater detail using secondary testing.

Study A: Primary Testing

According to the BRE guide, the potential for good daylighting can be assessed with respect to a measure called the Vertical Sky Component. The Vertical Sky Component is described as *the ratio of the direct sky illuminance*

Prelim Rev 04 May 2021 Page 9 of 74 falling on the vertical wall at a reference point, to the simultaneous horizontal illuminance under an unobstructed sky; see below. This reference point is taken to be positioned in the middle of the window being analysed and located on the same plane as the external surface of the attendant wall.



$$VSC = \frac{E_{obs}}{E_{hor}} \times 100\%$$
 equation 1.

The BRE recommends that the potential for good daylighting exists where a Vertical Sky Component of 27% or higher is available to the windows serving

² See Appendix A: Policy Basis for Daylight Standards

habitable accommodation. In instances where impact on neighbouring properties is being assessed the BRE provide the following recommendation:

'If the vertical sky component, with the new development in place, is both less than 27% and 0.8 times its former value, then the occupants of the existing building will notice a reduction in the amount of skylight.'

Study A: Secondary Testing

In instances where departures from the BRE's conventional targets for skylight access are identified secondary testing is carried out to assess significance. The secondary testing carried out in this assessment is outlined as follows.

While Vertical Sky Component can be relied upon to provide a reasonable indication of the levels of access which particular windows have to diffuse light from the sky³ it is important to recognise that it cannot be relied upon to provide an accurate indication of the levels of daylight amenity which would be provided within the associated interior space⁴.

Where a better understanding of daylight levels within an affected property is required it can be instructive to use the average daylight factor approach recommended in BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting', British Standards Institute, 2008.

The Average Daylight Factor (ADF) test detailed in BS 8206 provides a better indication of internal daylight amenity because more of the physical factors which affect it are included in its calculation. In addition to external obstructions (which VSC is principally concerned with) an ADF calculation accounts for the size and layout of the subject room; the number, size, and configuration of the windows which serve it, as well as the reflectivity of both internal and external surfaces. An outline explanation of the assessment method and performance targets is provided within Appendix E: Secondary Testing - ADF Assessment.

In Ireland the acceptability of daylight amenity within new-build residences is assessed with respect to the minimum ADF targets recommended in BS 8206. Minimum ADF's of 2%, 1.5% and 1% are recommended for kitchens, living rooms and bedrooms, respectively.

indeed the size of the room the windows serve. Further to this VSC takes no account of the type of glass used within the windows or the type of surface finishes (walls, ceilings, floors etc.) present within a room. Additionally, VSC takes no account of the light which can be reflected into a room from external surfaces. Having regard to these limitations it is clear that VSC cannot be relied upon to provide an accurate picture of daylight amenity which would be provided in interior spaces.

³ As recommended in the BRE guide the sky is assumed to be overcast and is modelled in accordance with the CIE (Commission Internationale De L'Eclairge) standard overcast sky.

⁴ VSC is measured at a discrete point located in the middle of the window under consideration and aligned with the external plane of the attending wall. The calculation of VSC takes no account of the size of the windows serving a room or

Having regard to these recommendations it is reasonable to propose that impacts which register on existing properties in urban areas can be considered to fall within tolerable bounds in instances where the levels of daylight amenity retained internally are commensurate with the minimum ADF standards recommended for new build accommodation.

Study A: Assessment Points

A careful appraisal of the neighbouring environment identifies a number of existing properties which could potentially experience some form of altered lighting conditions as a result of the proposed development.

This study has assessed the levels of skylight access available to a total of 200 windows in the immediate neighbourhood, see Appendix F: Windows selected for analysis in Studies A & B. These windows have been selected to capture the worst-case impacts which could register on neighbouring properties.

In each case the analysis point refers to a discrete point which is located at the centre of the selected window. The point is aligned with the external plane of the attendant walls.

Study A: Results

This study has assessed the levels of skylight access (assessed with respect to Vertical Sky Component) available to a number of properties located in the immediate vicinity of the proposed development. In order to determine the levels of impact arising skylight access levels have been calculated for both "before development" and "after development" scenarios. The results of this study are presented in Table 1.

The results of this study (see Table 1) indicate that full compliance with BRE guidelines would be achieved in most cases. Of the 200 windows assessed in this study 192 of them are found to retain skylight access levels which satisfy the advisory minimums recommended by the BRE; it follows that the impacts registering on these windows can be considered to fall within acceptable bounds.

The small number of instances where departures register all relate to windows which serve rooms (many of which are dual aspect) located within the neighbouring healthcare facility (Windows 183, 185, 186, 187, 188, 189, 191, 193). In assessing the significance of these departures, a number of ameliorating factors are worth considering:

In the first instance it is important to recognise that many of these windows serve rooms which are served by other windows. In circumstances where a room is served by more than one window it is instructive to assess skylight levels with reference to the average of the levels which register on individual windows⁵. This is particularly true in circumstances where a room is dual aspect as it is very likely that at least one of the windows serving this type of room would be significantly less affected by the proposed development. When this approach is adopted a reduced loss of light is identified, see Appendix D: Room Averaged VSC Results.

Assessed on this basis the dual aspect staff canteen associated with Windows 184, 186, 190 and 192 is found to retain skylight access levels which exceed the minimum advised by the BRE.

Assessed on this basis the departure identified for the dual aspect physiotherapy room associated with Windows 194, 193, 188, and 185 is found to be modest in magnitude.

Further to this it is important to recognise that the accommodation in question is non-domestic and that prolonged occupation of these spaces is not expected. As the accommodation in question is non-domestic and does not automatically qualify for the protections provided within the BRE guide, it is reasonable to assume that a reduced level of significance should be attributed to the departures identified. An examination of the floor plans for the healthcare facility indicates that Window 191 serves a nurse's suite; Window 183 serves a staff kitchen and Windows 187 & 189 serve WC facilities.

⁵ A facility to use this approach is provided within BRE guidance.

Table 1 Vertical Sky Component Results

Window ID	VSC Existing Scenario	C (%) Proposed Scenario	VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
1	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
2	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
3	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
4	34	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
5	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
6	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
7	35	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
8	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
9	35	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
10	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
11	35	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
12	33	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
13	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
14	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
15	31	31	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
16	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
17	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
18	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
19	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
20	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
21	34	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
22	33	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
23	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
24	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
25	34	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

Window ID	VSC Existing Scenario	C (%) Proposed Scenario	VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
26	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
27	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
28	34	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
29	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
30	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
31	34	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
32	36	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
33	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
34	36	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
35	36	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
36	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
37	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
38	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
39	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
40	35	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
41	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
42	36	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
43	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
44	31	29	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
45	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
46	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
47	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
48	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
49	30	29	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
50	29	28	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
51	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
52	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

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Window ID	VSC Existing Scenario	C (%) Proposed Scenario	VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
53	36	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
54	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
55	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
56	35	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
57	21	20	No	Yes	Yes	The reduction predicted falls within acceptable bounds (α)
58	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
59	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
60	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
61	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
62	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
63	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
64	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
65	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
66	36	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
67	38	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
68	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
69	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
70	38	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
71	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
72	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
73	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
74	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
75	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
76	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
77	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
78	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
79	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

Window ID	VSC Existing Scenario	C (%) Proposed Scenario	VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
80	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
81	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
82	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
83	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
84	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
85	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
86	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
87	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
88	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
89	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
90	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
91	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
92	35	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
93	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
94	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
95	35	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
96	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
97	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
98	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
99	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
100	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
101	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
102	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
103	35	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
104	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
105	34	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
106	36	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

Window ID	VSC Existing Scenario	VSC (%) Existing Proposed remain Scenario Scenario above 27		Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
107	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
108	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
109	36	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
110	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
111	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
112	33	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
113	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
114	35	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
115	35	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
116	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
117	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
118	33	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
119	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
120	33	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
121	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
122	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
123	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
124	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
125	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
126	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
127	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
128	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
129	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
130	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
131	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
132	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
133	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

Window ID	VSC Existing Scenario	VSC (%) Existing Proposed remains Scenario Scenario above 27%?		Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
134	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
135	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
136	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
137	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
138	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
139	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
140	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
141	34	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
142	31	30	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
143	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
144	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
145	34	31	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
146	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
147	34	31	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
148	32	29	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
149	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
150	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
151	37	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
152	37	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
153	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
154	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
155	29	28	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
156	39	39	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
157	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
158	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
159	31	30	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
160	36	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

Window ID	VSC (%) Existing Proposed Scenario Scenario		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is <= 20%?	Full Compliance with BRE guidelines achieved?	Professional interpretation of result
161	37	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
162	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
163	36	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
164	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
165	35	32	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
166	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
167	34	31	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
168	32	29	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
169	37	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
170	38	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
171	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
172	37	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
173	38	37	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
174	36	34	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
175	37	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
176	34	33	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
177	33	31	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
178	36	35	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
179	29	27	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
180	23	22	No	Yes	Yes	The reduction predicted falls within acceptable bounds ($lpha$)
181	22	21	No	Yes	Yes	The reduction predicted falls within acceptable bounds (α)
182	19	19	No	Yes	Yes	The reduction predicted falls within acceptable bounds ($lpha$)
183	35	8	No	No	No	Result considered in greater detail within body of report (π)
184	32	29	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
185	38	13	No	No	No	Result considered in greater detail within body of report (π)
186	39	22	No	No	No	Result considered in greater detail within body of report (π)
187	36	13	No	No	No	Result considered in greater detail within body of report (π)

Window ID	VSC (%) Existing Proposed Scenario Scenario		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is <= 20%?Full Compliance with BRE guidelines achieved?		Professional interpretation of result
188	38	19	No	No	No	Result considered in greater detail within body of report (π)
189	36	18	No	No	No	Result considered in greater detail within body of report (π)
190	39	29	Yes	No	Yes	Acceptable levels of skylight access would be retained (∂)
191	36	22	No	No	No	Result considered in greater detail within body of report (π)
192	39	39	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
193	38	26	No	No	No	Result considered in greater detail within body of report (π)
194	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
195	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
196	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
197	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
198	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
199	36	36	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)
200	38	38	Yes	Yes	Yes	Acceptable levels of skylight access would be retained (∂)

(*d*) Full compliance with BRE guidelines has been demonstrated. As a VSC above 27% is predicted with the proposed development in place it is possible to conclude that acceptable levels of skylight access would be retained.

(α) Full compliance with BRE guidelines has been demonstrated. As VSC levels are predicted to fall by less than 20% as a result of the proposed development the reduction is considered to fall within acceptable bounds.

(π) A departure from BRE's advisory targets for skylight access is identified; the significance of this result is considered in greater detail within the commentary which precedes this table.

Study B: Assessment of sunlight levels available to neighbouring living rooms

Study B: Assessment Approach

Sunlight access is assessed with respect to a measure called Annual Probable Sunlight Hours (APSH). This measure relates to the total number of hours in the year that the sun is typically expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

According to the BRE guide a dwelling, or non -domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided:

- At least one main window wall faces within 90° of due south and
- The centre of at least one window to a main living room can receive 25% annual probable sunlight hours, including at least 5% of annual probable sunlight hours in winter months (take to fall between the 21st of September and the 21st of March).

Further to this the BRE advise that the sunlighting of existing dwellings may be adversely affected if the centre of the window in question:

 Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between the 21st of September and the 21st of March and

- Receives less than 0.8 times its former sunlight hours during either period and
- Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

While the BRE guide requests that sunlight levels should be assessed at a point positioned in the middle of a window and located on the same plane as the internal surface of the external wall, it is generally considered acceptable to assess sunlight access at the same point that had been specified when assessing skylight access, i.e., middle of window and located on the same plane as the outside surface of the external wall. In the interest of modelling economy this is the convention which has been adopted in this study.

Study B: Assessment Points

A careful appraisal of the neighbouring environment identifies a number of existing properties which could potentially experience some form of altered lighting conditions as a result of the proposed development.

This study considers the sunlight access available to a total of 200 windows in the immediate neighbourhood, see Appendix F: Windows selected for analysis in Studies A & B. These windows have been selected to capture the worst-case impacts which could register on neighbouring properties. The assessment restricts itself to the testing of sunlight access to main living rooms within residential properties. Further to this it is assumed that the nondomestic accommodation which neighbours the proposed development does not qualify for assessment.

Study B: Results

This study has assessed the sunlight levels available to a number of windows located in the immediate neighbourhood of the proposed development. In order to assess impacts both the "before development" and "after development" levels have been calculated. The assessment conducted considers both annual and winter sunlight levels.

The results of this study (see Table 2 & Table 3) identifies that no significant impacts would register on neighbouring residences. With the proposed development in place all the living rooms which neighbour this development would retain sunlight access levels which either meet or exceed advisory minimums.

Table 2 Percentage of annual probable sunlight hours for windows assessed in this study.

ID	Assumed Room Type	Orientation: N=North S=South	Existing Scenario	Proposed (%) H Scenario	APSH with development in place remains above 25%?	Reduction in APSH, caused by proposed development, is less than 20%?	Reduction in APSH, caused by proposed development, is less than 4% APSH?	BRE guidelines satisfied?	Professional interpretation of levels predicted
1	Livingroom	S	85	85	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
2	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
3	Livingroom	S	85	85	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
4	Livingroom	S	77	76	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
5	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
6	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
7	Livingroom	S	75	74	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
8	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
9	Livingroom	S	84	84	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
10	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
11	Livingroom	S	84	83	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
12	Livingroom	S	74	73	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
13	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
14	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
15	Livingroom	S	66	65	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
16	Livingroom	S	83	81	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
17	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
18	Livingroom	S	84	82	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
19	Livingroom	S	84	82	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
20	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
21	Livingroom	S	83	80	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
22	Livingroom	S	75	73	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *

		on: South	APSI	H (%)	:h n place e 25%?	APSH, posed is less 5?	APSH, posed is less SH?	nes ?	
ID	Assumed Room Type	Orientatic N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in caused by pro development, than 20%	Reduction in caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
23	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
24	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
25	Livingroom	S	75	72	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
26	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
27	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
28	Livingroom	S	75	72	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
29	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
30	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
31	Livingroom	S	74	70	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
32	Livingroom	S	86	82	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
33	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
34	Livingroom	S	86	83	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
35	Livingroom	S	85	81	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
36	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
37	Livingroom	S	76	74	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
38	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
39	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
40	Livingroom	S	80	77	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
41	Livingroom	S	88	86	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
42	Livingroom	S	87	83	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
43	Livingroom	S	88	86	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
44	Livingroom	S	75	72	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
45	Livingroom	S	88	86	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
46	Livingroom	S	88	86	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *

		on: South	APSH	H (%)	h n place e 25%?	APSH, posed is less s?	APSH, posed is less SH?	nes ?	
ID	Assumed Room Type	Orientatic N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in caused by pro development, than 20%	Reduction in caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
47	Livingroom	S	75	72	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
48	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
49	Livingroom	S	65	64	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
50	Livingroom	S	59	57	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
51	Livingroom	S	88	85	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
52	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
53	Livingroom	S	81	79	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
54	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
55	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
56	Livingroom	S	80	78	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
57	Front Porch	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
58	Livingroom	S	88	86	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
59	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
60	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
61	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
62	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
63	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
64	Livingroom	S	88	87	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
65	Livingroom	S	88	88	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
66	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
67	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
68	Livingroom	N	-	-	-	_	-	-	Testing is only applicable to south facing windows
69	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
70	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

		on: South	APSH	⊣ (%)	.h n place e 25%?	APSH, posed is less s?	APSH, posed is less SH?	nes ?	
ID	Assumed Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in , caused by pro development, than 20%	Reduction in , caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
71	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
72	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
73	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
74	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
75	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
76	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
77	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
78	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
79	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
80	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
81	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
82	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
83	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
84	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
85	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
86	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
87	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
88	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
89	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
90	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
91	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
92	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
93	Livingroom	N	-	-	-	_	-	-	Testing is only applicable to south facing windows
94	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

		on: South	APSI	H (%)	:h n place e 25%?	APSH, posed is less 5?	APSH, posed is less SH?	nes ?	
ID	Assumed Room Type	Orientatic N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in caused by pro development, than 20%	Reduction in caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
95	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
96	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
97	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
98	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
99	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
100	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
101	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
102	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
103	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
104	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
105	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
106	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
107	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
108	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
109	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
110	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
111	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
112	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
113	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
114	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
115	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
116	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
117	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
118	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

		on: South	APSI	H (%)	h n place e 25%?	APSH, posed is less s?	APSH, posed is less SH?	nes ?	
ID	Assumed Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in , caused by pro development, than 20%	Reduction in , caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
119	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
120	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
121	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
122	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
123	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
124	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
125	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
126	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
127	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
128	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
129	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
130	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
131	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
132	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
133	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
134	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
135	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
136	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
137	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
138	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
139	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
140	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
141	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
142	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows

		on: South	APSI	⊣ (%)	:h n place e 25%?	APSH, pposed is less s?	APSH, pposed is less SH?	ines ?	
ID	Assumed Room Type	Orientatic N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in caused by pro development, than 20%	Reduction in caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
143	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
144	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
145	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
146	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
147	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
148	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
149	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
150	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
151	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
152	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
153	Non-domestic	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
154	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
155	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
156	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
157	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
158	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
159	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
160	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
161	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
162	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
163	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
164	Non-domestic	S	-	-	_	-	-	-	Testing restricted to domestic living rooms
165	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
166	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms

		on: South	APSI	⊣ (%)	.h n place e 25%?	APSH, posed is less 5?	APSH, posed is less SH?	nes ?	
ID	Assumed Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in , caused by pro development, than 20%	Reduction in , caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
167	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
168	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
169	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
170	Non-domestic	S	-	-	_	-	-	-	Testing restricted to domestic living rooms
171	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
172	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
173	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
174	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
175	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
176	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
177	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
178	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
179	Non-domestic	S	-	-	_	-	-	-	Testing restricted to domestic living rooms
180	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
181	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
182	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
183	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
184	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
185	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
186	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
187	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
188	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
189	Non-domestic	S	-	-	_	-	-	-	Testing restricted to domestic living rooms
190	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms

		on: South	APSH	H (%)	:h n place e 25%?	APSH, pposed is less	APSH, posed is less SH?	ines ?	
ID	Assumed Room Type	Orientatic N=North S=	Existing Scenario	Proposed Scenario	APSH wit development i remains above	Reduction in caused by pro development, than 20%	Reduction in caused by prc development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
191	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
192	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
193	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
194	Non-domestic	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
195	Non-domestic	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
196	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
197	Non-domestic	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
198	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
199	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
200	Non-domestic	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

* Full compliance with BRE guidelines has been demonstrated. As the window is predicted to receive more than 25% of annual probable sunlight hours, with the proposed development in place, it is possible to conclude that acceptable levels of sunlight access would be retained.

** Full compliance with BRE guidelines has been demonstrated. As a relative reduction in APSH levels which is less than 20% is predicted, with the proposed development in place, it is possible to conclude that the resulting impact falls within tolerable bounds.

*** Full compliance with BRE guidelines has been demonstrated. As an absolute reduction in APSH levels which is less than 4% APSH is predicted, with the proposed development in place, it is possible to conclude that the resulting impact falls within tolerable bounds.

Table 3 Percentage of annual probable sunlight hours (available during winter period – September 21st to March 21st) for windows assessed in this study.

	Associated	on: South	두 APSH (%) during · · · · · · · · · · · · · · · · · · ·		APSHs uring iths?	APSH, pposed , is less 6?	20%? in APSH, proposed ent, is less APSH?	ines ?	
ID	Associated Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	At least 5% of available du winter mor	Reduction in caused by pro development than 209	Reduction in caused by pro development than 4% AF	BRE guidel satisfied	Professional interpretation of levels predicted
1	Livingroom	S	28	28	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
2	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
3	Livingroom	S	28	28	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
4	Livingroom	S	27	27	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
5	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
6	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
7	Livingroom	S	27	27	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
8	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
9	Livingroom	S	28	27	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
10	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
11	Livingroom	S	27	26	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
12	Livingroom	S	26	25	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
13	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
14	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
15	Livingroom	S	22	21	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
16	Livingroom	S	26	24	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
17	Livingroom	S	31	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
18	Livingroom	S	27	25	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
19	Livingroom	S	27	25	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
20	Livingroom	S	32	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
21	Livingroom	S	26	23	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
22	Livingroom	S	25	23	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *

		on: South	APSH (% winter i) during months	APSHs uring ths?	APSH, pposed is less 6?	APSH, pposed is less SH?	ines ?	
ID	Associated Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	At least 5% of available du winter mon	Reduction in caused by prc development, than 20%	Reduction in caused by pro development, than 4% AF	BRE guidel satisfied	Professional interpretation of levels predicted
23	Livingroom	S	31	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
24	Livingroom	S	31	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
25	Livingroom	S	27	24	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
26	Livingroom	S	31	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
27	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
28	Livingroom	S	27	23	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
29	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
30	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
31	Livingroom	S	26	22	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
32	Livingroom	S	29	25	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
33	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
34	Livingroom	S	29	26	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
35	Livingroom	S	29	24	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
36	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
37	Livingroom	S	28	25	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
38	Livingroom	S	31	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
39	Livingroom	S	31	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
40	Livingroom	S	29	26	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
41	Livingroom	S	31	29	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
42	Livingroom	S	30	26	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
43	Livingroom	S	31	29	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
44	Livingroom	S	31	28	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
45	Livingroom	S	31	29	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
46	Livingroom	S	32	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *

		n: South	APSH (% winter	b) during months	APSHs Iring ths?	APSH, posed is less	APSH, posed is less SH?	nes ?	
ID	Associated Room Type	Orientatic N=North S=	Existing Scenario	Proposed Scenario	At least 5% of available du winter mon	Reduction in caused by pro development, than 20%	Reduction in caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
47	Livingroom	S	29	26	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
48	Livingroom	S	32	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
49	Livingroom	S	25	23	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
50	Livingroom	S	22	20	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
51	Livingroom	S	31	28	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
52	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
53	Livingroom	S	30	28	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
54	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
55	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
56	Livingroom	S	29	27	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
57	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
58	Livingroom	S	31	29	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
59	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
60	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
61	Livingroom	S	32	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
62	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
63	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
64	Livingroom	S	32	30	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
65	Livingroom	S	32	31	Yes	Yes	Yes	Yes	Acceptable levels of sunlight access would be retained *
66	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
67	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
68	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
69	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
70	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

		n: South	APSH (% winter	b) during months	APSHs rring ths?	APSH, posed is less	APSH, posed is less SH?	nes ?	
ID	Associated Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	At least 5% of available du winter mon	Reduction in / caused by pro development, than 20%	Reduction in / caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
71	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
72	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
73	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
74	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
75	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
76	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
77	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
78	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
79	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
80	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
81	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
82	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
83	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
84	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
85	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
86	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
87	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
88	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
89	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
90	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
91	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
92	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
93	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
94	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

ID	Associated Room Type	Orientation: =North S=South	%) HSH (%) Scenario Scenario) during months Cenario Scenario	least 5% of APSHs available during winter months?	eduction in APSH, iused by proposed evelopment, is less than 20%?	eduction in APSH, uused by proposed evelopment, is less than 4% APSH?	BRE guidelines satisfied?	Professional interpretation of levels predicted
05	1	2			At		8 0 0		
95	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
96	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
97	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
98	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
99	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
100	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
101	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
102	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
103	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
104	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
105	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
106	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
107	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
108	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
109	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
110	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
111	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
112	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
113	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
114	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
115	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
116	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
117	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
118	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
ID	Associated Room Type	rientation: rth S=South	ting winter في أي في أي أي	5) during months	st 5% of APSHs lable during ter months?	ction in APSH, d by proposed ppment, is less han 20%?	ction in APSH, d by proposed ppment, is less n 4% APSH?	E guidelines atisfied?	Professional interpretation of levels predicted
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		0r N=No	Exis Scer	Prop Scer	At leas avai wint	Reduo causeo develo tl	Reduo causeo develo thai	BRE	
119	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
120	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
121	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
122	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
123	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
124	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
125	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
126	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
127	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
128	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
129	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
130	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
131	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
132	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
133	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
134	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
135	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
136	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
137	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
138	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
139	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
140	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
141	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
142	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

		in: South	다 APSH (%) during winter months		APSHs rring ths? APSH, posed is less ? APSH, posed			nes ?	
ID	Associated Room Type	Orientatio N=North S=5	Existing Scenario	Proposed Scenario	At least 5% of available du winter moni	Reduction in / caused by pro development, than 20%	Reduction in / caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
143	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
144	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
145	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
146	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
147	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
148	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
149	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
150	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
151	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
152	Livingroom	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
153	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows
154	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
155	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
156	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
157	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
158	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
159	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
160	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
161	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
162	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
163	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
164	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
165	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
166	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms

		APSH orth winte		5) during months	APSHs ring ths?	APSH, posed is less ?	APSH, posed is less SH?	nes ?	
ID	Associated Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	At least 5% of available du winter moni	Reduction in / caused by pro development, than 20%	Reduction in / caused by pro development, than 4% AP	BRE guideli satisfied	Professional interpretation of levels predicted
167	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
168	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
169	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
170	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
171	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
172	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
173	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
174	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
175	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
176	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
177	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
178	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
179	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
180	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
181	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
182	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
183	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
184	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
185	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
186	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
187	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms
188	Non-domestic	S	-	-	-	-	-	_	Testing restricted to domestic living rooms
189	Non-domestic	S	-	-	-	-	_	-	Testing restricted to domestic living rooms
190	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms

		on: South	APSH (% winter	b) during months	APSHs uring ths?	APSH, pposed is less 6?	APSH, pposed i is less SH?	ines ?		
ID	Associated Room Type	Orientatio N=North S=	Existing Scenario	Proposed Scenario	At least 5% of available du winter mon	Reduction in caused by prc development, than 20%	Reduction in caused by pro development, than 4% AF	BRE guidel satisfied	Professional interpretation of levels predicted	
191	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms	
192	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
193	Non-domestic	S	-	-	-	-	-	-	Testing restricted to domestic living rooms	
194	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
195	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
196	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
197	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
198	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
199	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	
200	Non-domestic	Ν	-	-	-	-	-	-	Testing is only applicable to south facing windows	

* Full compliance with BRE guidelines has been demonstrated. As the percentage of Annual Probable Sunlight Hours registering during the months between 21st September and 21st of March is predicted to exceed 5%, with the proposed development in place, it is possible to conclude that acceptable levels of sunlight access would be retained during winter months.

** Full compliance with BRE guidelines has been demonstrated. As the relative reduction in APSH levels registering during winter months is predicted to be less than 20%, with the proposed development in place, it is possible to conclude that the resulting impact falls within acceptable bounds.

*** Full compliance with BRE guidelines has been demonstrated. As the absolute reduction in APSH levels is predicted to be less than 4% APSH, with the proposed development in place, it is possible to conclude that the resulting impact falls within acceptable bounds.

Study C: Assessment of sunlight levels available to neighbouring recreation areas.

Study C: Assessment Approach

The BRE recommends that a garden or amenity area will appear adequately sunlit throughout the year if at least half of it can receive at least two hours of sunlight on the 21st of March.

When impacts are being assessed the BRE advises that a noticeable loss of sunlight will register on a neighbouring recreation space if as a result of a new development less than 50% of the area is capable of receiving 2hrs of sunshine on the 21st of March and the area which is capable of receiving two hours is less than 0.8 times it former value.

In order to assess a particular amenity space an analysis grid is specified across its area. At each point on this grid the cumulative number of sunlight hours registering are calculated for the course of a specified day (21st of March). The percentage of the assessed area which receives more than 2 hours of sunlight on that day is then obtained.

Study C: Assessment Areas

A survey of the neighbouring environment identifies 23 neighbouring outdoor recreation spaces where altered sunlighting levels could potentially register, see Figure 1.



Figure 1 Plan showing the neighbouring recreation spaces which have been assessed in this study

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Study C: Results

This study has assessed the degree to which the proposed development would impact on the levels of sunlight available to 23 neighbouring recreation spaces. Numeric results are presented in Table 4, the associated solar distribution diagrams are presented in Figure 2 & Figure 3. Supplementary shadow casting imagery has been included within Appendix G: Shadow Casting Imagery.

Having carried out this assessment it is possible to conclude that acceptable levels of sunlight access would be retained in all cases. Full compliance with BRE advisory minimums has been demonstrated for all the gardens assessed in this study.

On the basis that the sample of gardens assessed in this study capture the worst-case impacts that could register it is reasonable to conclude that acceptable levels of sunlight would be retained within all of the recreation spaces which neighbour this proposed development.

Table 4 Sunlight amenity levels available to neighbouring outdoor areas

ID	% Area capable of receiving at least 2hrs of sunshine on the 21st of March		n 50% of garden nains capable of thrs of sunlight on f March with the development in place?	n in sunlit area, I by proposed nent, is less than 20%?	ommendations atisfied ?	Professional interpretation of result
	Existing Scenario	Proposed Scenario	More tha area rem receiving 2 the 21st o proposed	Reductio causec developm	BRE rec	
1	79%	78%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
2	64%	64%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
3	63%	63%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
4	54%	54%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
5	56%	56%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
6	57%	57%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
7	58%	58%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
8	49%	49%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
9	50%	50%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
10	56%	56%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
11	55%	55%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
12	45%	45%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
13	46%	46%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
14	36%	36%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
15	64%	64%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
16	34%	34%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
17	34%	34%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
18	34%	34%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
19	35%	35%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **

ID	% Area of rece least 2 sunsh the 2 Ma	capable tiving at 2hrs of ine on 1st of arch	in 50% of garden nains capable of thrs of sunlight on of March with the I development in place?	n in sunlit area, d by proposed nent, is less than 20%?	commendations satisfied?	Professional interpretation of result
	Existing Scenario Proposed Scenario More than		More tha area rem receiving 2 the 21st o proposed	Reductio causec developm	BRE rec	
20	46%	46%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
21	44%	42%	No	Yes	Yes	Compliance demonstrated as predicted reduction falls within tolerable bounds **
22	100%	100%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *
23	100%	100%	Yes	Yes	Yes	Compliance demonstrated as acceptable levels of access retained *

* Full compliance with BRE guidelines has been demonstrated. As over 50% of the area is predicted to be capable of receiving 2hrs of direct sunlight on the 21st of March, with the proposed development in place, it is possible to conclude that acceptable levels of sunlight access would be retained.

** Full compliance with BRE guidelines has been demonstrated. As the area capable of receiving 2hrs of direct sunlight on the 21st of March is predicted to fall by less than 20%, as a result of the proposed development, it is possible to conclude that the impact falls within tolerable bounds.

*** A departure from BRE's advisory targets for sunlight access is identified; additional consideration is required.

-Tonlegee Rd < /illas 23 Millwood 22 -MIIIwood Park Wood

TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MARCH (HRS)

0 to 2 > 2

Figure 3 Solar access distribution predicted for neighbouring recreation spaces (Proposed Scenario). Areas highlighted in yellow can receive at least 2hrs of sunshine on the 21st of March



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MARCH (HRS)

0 to 2	
--------	--

> 2

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Figure 2 Solar access distribution predicted for neighbouring recreation spaces (Proposed Scenario). Areas highlighted in yellow can receive at least 2hrs of sunshine on the 21st of March

The Importance of Interpreting Daylight Results Flexibly

As outlined in the BRE guide, the results presented in this report should be interpreted with a degree of flexibility. The flexibility available in the BRE guide is outlined in the introductory section as follows:

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

This approach is also supported by recently published ministerial guidelines. Specific guidance is provided within Section 3.2 of the DoHPLG Building Heigh Design Guidelines 2018:

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

Conclusions

This report has been prepared to assess the daylight levels associated with a proposed development on Woodbine Road, Dublin 5. In assessing the significance of the daylight levels which have been predicted for this development it is important to bear a number of factors in mind.

In the first instance it is clear that this development conforms to and experiences many of the typical issues which arise when developments are proposed on urban sites. Having regard to the governments stated aims to support an increase in housing supply and to encourage sustainable development patterns, it is reasonable to propose that lands located at close proximity to urban centres must now be developed at higher densities. It is in this regard that it may not now always be appropriate to purse full compliance with the guideline targets recommended in the BRE Guide or BS 8206. While care should be taken to ensure that substantial levels of compliance with the recommendations in these guides are achieved, it is often the case that the particulars of a given site place insurmountable restrictions on the ability of a development to achieve full compliance at all points of assessment. In this regard it is important to weigh up the isolated cases where full compliance with guideline targets has not been satisfied against the broader benefits which a development can provide to the compactness, vitality and viability of an urban neighbourhood.

In conducting this assessment regard has been paid to the recommendations provided in the BRE guide *'Site layout planning for daylight and sunlight - A guide to good practice'* 2nd Edition and BS 8206-2: 2008 – *'Lighting for Buildings – Part 2: Code of Practice for Daylighting'*, British Standards Institute. A number of component studies have been carried out.

The impact that the proposed development would have on existing daylight levels has been assessed with regard to three separate studies including Study A, Study B and Study C. The results of these studies indicate that substantial conformity with guideline recommendations would be achieved.

Study A assessed the impact that the proposed development would have on the levels of skylight access which would be available to neighbouring accommodation. The results of this assessment indicate that skylight access levels, with the proposed development in place, would comply with advisory targets in the majority of cases. In the small number of cases where it has not been possible to demonstrate full compliance with advisory minimums, these departures are found to register on windows serving the neighbouring healthcare facility. On the basis that the windows in question serve nondomestic accommodation (much of which would be infrequently occupied) it is reasonable to propose that a reduced level of significance should be attributed to these departures. Study B assessed the impact that the proposed development would have on the levels of sunlight available to the neighbouring properties. The results of this study (see Table 2 & Table 3) identifies that no significant impacts would register. With the proposed development in place all the main living rooms which neighbour this development would retain sunlight access levels which either meet or exceed advisory minimums.

When assessed in the round it is reasonable to conclude that the development proposed demonstrates substantial levels of conformity with daylight guidelines. In making best use of this strategic site, it is inevitable that some departures from advisory targets would occur; provision is made within current planning policy to accommodate departures of this nature in instances where wider planning objectives countervail, see Appendix B: Discretion available to consent authorities.

Appendix A: Policy Basis for Daylight Standards

The particular provisions which have been made to promote good daylighting in planning guidance are identified as follows:

Sustainable Residential Development in Urban Areas, DoEHLG 2009

Published by the Department of Environment Housing and Local Government in 2009, this guide includes a number of provisions related to daylight. Section 7.9 of the guide is particularly relevant:

"7.9 - Overshadowing will generally only cause problems where buildings of significant height are involved or where new buildings are located very close to adjoining buildings. Planning authorities should require that daylight and shadow projection diagrams be submitted in all such proposals. The recommendations of "Site Layout Planning for Daylight and Sunlight: A Guide to good Practice" (BRE 1991) or BS 8206 "Lighting for Buildings, Part 2 1992: Code of Practice for Daylighting" should be followed in this regard." Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities

Published by the Department of Environment Housing and Local Government in March 2018, provisions are made to safeguard daylight within Section 6.6 and 6.7:

"6.6 - Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd Edition) or BS 8206-2:2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

6.7 - 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 constraint 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."

Urban Development and Building Heights – Guidelines for Planning Authorities

Published by the Department of Environment Housing and Local Government in March 2018, provisions are made to safeguard daylight within Section 3.2. The specific guidance is provided within the part of Section 3.2 which deals with development management at the scale of the site/building:

"At the scale of the site/building

- The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.
- Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'.
- Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

Appendix B: Discretion available to consent authorities

Irish planning policy advises that in instances where it is not possible to demonstrate full compliance with advisory minimums consent-authorities are entitled to accept departures where other planning objective are found to countervail.

Specific guidance on this matter is provided within Section 4.5 the National Planning Framework⁶ (Section 4.5). The guidance provided is as follows:

"To enable brownfield development, planning policies and standards need to be flexible, focusing on design led and performance-based outcomes, rather than specifying absolute requirements in all cases. Although sometimes necessary to safeguard against poor quality design, planning standards should be flexibly applied in response to well-designed development proposals that can achieve urban infill and brownfield development objectives in settlements of all sizes. This is in recognition of the fact that many current urban planning standards were devised for application to greenfield development sites and cannot account for the evolved layers of complexity in existing built-up areas." [Emphasis added]

The NPF goes further and introduces the need for tolerances and alternative solutions as a National Policy Objective. National Policy Objective 13 of the NPF is stated as follows:

"In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high-quality outcomes in order to achieve targeted growth. These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected." [Emphasis added]

On the basis that this guidance is applicable to daylight standards it is reasonable to propose that a clear basis exists for the consent authorities to accept shortfalls from advisory minimums in instances where a countervailing planning objective exists.

Additional support for this facility is provided within the Urban Design Manual published by the Department of Energy Heritage and Local Government, 2009. On page 43 of this manual the following guidance is provided:

⁶ DoHPLG 2018 National Planning Framework

Prelim Rev 04 May 2021 Page 50 of 74 "Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas **it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths.**" [Emphasis added]

The need for tolerance and flexibility to be exercised when interpreting the significance of daylight results is reflected in the wording which has been adopted in recent building height guidelines⁷. Specific guidance is provided within Section 3.2 of the guidelines:

"At the scale of the site/building

- The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.
- Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'.

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

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⁷ DoHPLG 2018 – Urban Development and Building Heights – Guidelines for Planning Authorities

Appendix C: Source Material

The 3D models used in our analysis were generated using information garnered from the following sources.

Model Elements	Source	Drawing No. / File Name /	Title / Description	Date Issued / Accessed
Proposed Development	CCA	1911 SKU P01 Options F 2021.04.19	3D Model of Development	13 th May 2021
Neighbouring Context	CCA	1911 S 002	Existing Site Topographical Plan	19 th April 2021
Macro Landscape and Wider Context	Google Earth	-	-	-

Appendix D: Room Averaged VSC Results

Where a room is served by more than one window the BRE advise that the VSC results can be averaged in instances where the windows are the same size. A sensible extension of this approach, which can be used in instances where a room is served by windows of different sizes, is to adopt an area weighted approach in the calculation of average VSC. In instances where the windows serving a room are not all the same size the contribution which individual window results make to the overall room result has been determined with reference to the size of each individual window; this approach relies on an area weighted calculation procedure.

The area weighted calculations for two separate rooms within the neighbouring healthcare facility are provided on the following pages.

žε			v	30 (70)	Alea Weighted VSC (70)			
ID of Windov Serving Rooi	Estimated Window Area (m2)	Weighting	Existing Scenario	Proposed Scenario	Existing Scenario	Proposed Scenario		
194	4.93	0.36	38.0	38.0	13.7	13.7		
193	2.20	0.16	38.0	26.0	6.1	4.2		
188	2.36	0.17	38.0	19.0	6.6	3.3		
185	4.22	0.31	38.0	13.0	11.7	4.0		
	13.71				38.0	25.1		
			Area weighted	average VSC for room u	under existing scenario (%)	38.0		
			Area weighted av	verage VSC for room un	der proposed scenario (%)	25.1		
	Room averaged VSC with development in place remains above 27%?							
	No							
	No							
				The magnitude of the	departure is considered to h	ne modest. Having regard to the		

VISC (0/)

Table D1: Area weighted average VSC level available to physiotherapy room on the 1st floor of neighbouring healthcare facility

Professional interpretation of result:

The magnitude of the departure is considered to be modest. Having regard to the non-domestic nature of the associated accommodation it is possible to assume that reasonable levels of skylight would be retained.

Aron Waightad VSC (%)

	Area weighted average VSC for room under existing scenario (%)	33.9
	Area weighted average VSC for room under proposed scenario (%)	28.0
	Room averaged VSC with development in place remains above 27%?	Yes
	Reduction in VSC, caused by proposed development, is <= 20%?	Yes
	Full Compliance with BRE guidelines satisfied?	Yes
Professional interpretation of result:	Full compliance with guidelines demonstrated; it follows that skylight access can be safely assumed.	reasonable levels of

VSC (%)

Proposed Scenario

29.0

22.0

29.0

39.0

Table D2: Area weighted average VSC level available to staff canteen on the 2nd floor of neighbouring healthcare facility

Existing

Scenario

32.0

39.0

39.0

39.0

Weighting

0.19

0.18

0.22

0.31

ID of Windows Serving Room

184

186

190

192

Estimated Window Area

(m2)

2.58

2.50

3.05

4.27

12.39

Area Weighted VSC (%)

Proposed Scenario

5.4

4.0

6.4

12.1

28.0

Existing Scenario

6.0

7.1

8.7

12.1

33.9

Appendix E: Secondary Testing - ADF Assessment

Skylight amenity relates to the general impression of brightness which is provided within a room. For the purpose of this study, it relates to the general illumination achieved within a room as a consequence of the diffuse light which enters, either directly or indirectly, from an overcast sky.

Skylight amenity is assessed with respect to a parameter called the average daylight factor⁸. Rooms with a high average daylight factor are capable of accepting a relatively large proportion of the diffuse skylight which is available outside; BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting', British Standards Institute, 2008 advises that a predominantly daylit appearance can generally be achieved in rooms with an average daylight factor above 2%.

Assessment Approach

The Average Daylight Factor (ADF) assessment is carried out with regard to the methodology outlined in BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting', British Standards Institute, 2008.

⁸ Regrettably the terms skylight and daylight are used interchangeably within BS 8206 and the BRE Guide. While daylight is defined within the glossary at the start of

The ADF is a measure of the overall amount of daylight in a space. It is defined as the average illuminance on the working plane in a room, divided by the illuminance on the unobstructed horizontal surface outdoors; see below.



$$ADF = \frac{\overline{E_{in}}}{E_{out}} \times 100\%$$
 equation 2.

When the unobstructed outdoor illuminance level is 10,000 lux and the average internal daylight level is 200 lux within a given room, then the average daylight factor for that room will be 2%.

the BRE guide as an umbrella term which covers both skylight and sunlight, the average daylight factor test presented in this section actually only considers skylight.

Fold Housing Association Ireland Ltd Daylight Assessment for Development on Woodbine Road Copyright © BPG3 For a given room the daylight factor is a permanent factor, which occurs on days with overcast skies. The daylight factor is calculated under a standard overcast sky, which means that the calculation is per definition independent of window orientation.

BS 8206-2 recommends that a minimum average daylight factor of 2%, 1.5% and 1% should be sought for kitchens, living rooms and bedrooms, respectively. The guide recommends that no analysis need be carried out for bathroom, ancillary or circulatory spaces.

In order to obtain an average daylight factor figure for each room, the daylight factor at an array of points within the room is assessed first. This exercise has been carried out by computational means.

The particular reflectance values adopted for secondary testing are detailed in Table 5.

Table 5 Reflectance values adopted in the calculation of average daylight factors.

Surface Type	Assumed Finish	Reflectance / Transmittance	Source
Interior Wall	Light Grey	0.68	BS 8206
Interior Floor	Mid Grey	0.45	BS 8206
Interior Ceiling	White	0.85	BS 8206
Exterior Roof	Mid Grey	0.45	BS 8206
General Context	Mid Grey	0.45	BS 8206
Exterior Wall	Pale Cream	0.81	BS 8206
Window Frame	Light Grey	0.68	BS 8206
External Ground	Paving	0.2	BS 8206
Balcony Deck	Mid Grey	0.45	BS 8206
Balcony Soffit	Pale Cream	0.81	BS 8206
Balustrade Glazing	Clear Glass Single Pane	0.8	BS 8206
Glazing	Clear Double Glazing	0.68	BS 8206
Courtyard areas	Paving	0.2	BS 8206

Appendix F: Windows selected for analysis in Studies A & B.



Figure 4 Overview image showing the location and direction of the views used to present the windows selected for analysis in Studies A and B; see following pages.

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Figure 5 Windows visible within View 1 which have been identified for analysis, see Figure 4 for location and direction of view.

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Figure 6 Windows visible within View 2 which have been identified for analysis, see Figure 4 for location and direction of view.

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Figure 7 Windows visible within View 3 which have been identified for analysis, see Figure 4 for location and direction of view.

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Figure 8 Windows visible within View 4 which have been identified for analysis, see Figure 4 for location and direction of view.

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Figure 9 Windows visible within View 5 which have been identified for analysis, see Figure 4 for location and direction of view.

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Figure 10 Windows visible within View 6 which have been identified for analysis, see Figure 4 for location and direction of view.

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Figure 11 Windows visible within View 7 which have been identified for analysis, see Figure 4 for location and direction of view.

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Appendix G: Shadow Casting Imagery

The set of overshadowing diagrams which accompany this report are discretionary and are not an integral part of the recommended assessment procedure. They have been included simply to provide the reader with some context regarding the orientation of the site with respect to the sun.

The BRE Guide provides the following guidance with respect to shadow plots:

"When there are existing buildings as well as the proposed one, 'before' and 'after' shadow plots showing the difference that the proposed building makes may be helpful. In interpreting the impact of such differences, it must be borne in mind that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected. "

Further to this the BRE guide recommends that if a space is used all year round, that the spring equinox is the best date for which to prepare shadow plots as it gives an average level of overshadowing. Shadow casting imagery for salient times on the 21st of March have been generated for this project.





Shadows Cast at 8am (UTC+0) on the 21st March - Before Development Scenario

Shadows Cast at 8am (UTC+0) on the 21^{st} March - After Development Scenario



Shadows Cast at 10am (UTC+0) on the 21st March - Before Development Scenario

Shadows Cast at 10am (UTC+0) on the 21^{st} March - After Development Scenario



Shadows Cast at 12pm (UTC+0) on the 21st March - Before Development Scenario

Shadows Cast at 12pm (UTC+0) on the 21st March - After Development Scenario



Shadows Cast at 2pm (UTC+0) on the 21st March - Before Development Scenario

Shadows Cast at 2pm (UTC+0) on the 21^{st} March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document 'Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.

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Shadows Cast at 4pm (UTC+0) on the 21st March - Before Development Scenario

Shadows Cast at 4pm (UTC+0) on the 21st March - After Development Scenario
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Shadows Cast at 6pm (UTC+0) on the 21st March - Before Development Scenario

Shadows Cast at 6pm (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document 'Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning

Authorities' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.





Appendix H: About the Author



Rory Walsh BEng MEngSc MScSP PhD MIPI is a building performance engineer with key competencies in energy, comfort, and daylight modelling. Specialising in the assessment of daylight adequacy in a planning and development context Rory has had cause to write and review many daylight reports over the past ten years. Rory acts as principal consultant with BPG3.

Education & Experience:

- Bachelor's degree in mechanical engineering, awarded by NUIG (1st Class Honours)
- Master's in Engineering Science awarded for research on the subject of thermal mass in non-domestic buildings with the Energy Research Group, UCD
- Doctorate awarded for research on the subject of natural ventilation in non-domestic buildings with TrinityHaus, Trinity College Dublin.
- Master's in Spatial Planning, awarded by TU Dublin.
- 10 years practice as a daylight consultant working with Aurea Consult and BPG3.