

ASSESSMENT OF DAYLIGHT LEVELS ASSOCIATED WITH A PROPOSED RESIDENTIAL DEVELOPMENT AT FRASCATI SHOPPING CENTRE, BLACKROCK, CO. DUBLIN

Prepared for IMRF II Frascati Limited Partnership acting through its general partner Davy IMRF II GP Limited
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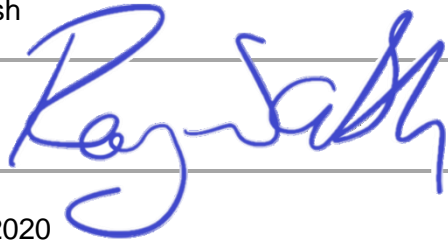
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CONTENTS

GLOSSARY	6
INTRODUCTION	7
STUDY A: ASSESSMENT OF SKYLIGHT LEVELS AVAILABLE TO NEIGHBOURING ACCOMMODATION	10
STUDY B: ASSESSMENT OF SUNLIGHT LEVELS AVAILABLE TO NEIGHBOURING LIVING ROOMS	25
STUDY C: ASSESSMENT OF SUNLIGHT LEVELS AVAILABLE TO NEIGHBOURING RECREATION AREAS.	39
STUDY D: ASSESSMENT OF SKYLIGHT AMENITY AVAILABLE WITHIN PROPOSED ACCOMMODATION	46
STUDY E: ASSESSMENT OF DIRECT SUNLIGHT ACCESS AVAILABLE TO PROPOSED ACCOMMODATION	68
STUDY F: ASSESSMENT OF SUNLIGHT AMENITY AVAILABLE TO PROPOSED RECREATION AREAS	89
CONCLUSIONS	92
APPENDIX A: POLICY BASIS FOR DAYLIGHT STANDARDS	95
APPENDIX B: POLICY BASIS FOR FLEXIBILITY IN APPLYING DAYLIGHT STANDARDS	97
APPENDIX C: SECONDARY TESTING - ADF ASSESSMENT	100
APPENDIX D: DAYLIGHT FACTOR DISTRIBUTION DIAGRAMS - SECONDARY TESTING	102
APPENDIX E: SOURCE MATERIAL	113
APPENDIX F: AVERAGE DAYLIGHT FACTOR IN OPEN PLAN SPACES	114
APPENDIX G: SHADOW CASTING IMAGERY	116

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	Vertical Sky Component	ratio 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 or from other buildings
Annual Probable Sunlight Hours (APSH)	the long-term average of the total number of hours during the year in which direct sunlight reaches the unobstructed ground (when clouds are considered)	Winter Probable 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)
Daylight	combined sunlight and skylight	Working Plane	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.
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		

Introduction

BPG3 have been engaged by IMRF II Frascati Limited Partnership acting through its general partner Davy IMRF II GP Limited to assess the daylight levels associated with a residential development which is being proposed at above the Frascati Shopping Centre in Blackrock, Co. Dublin.

The development in question includes a total of 102 apartments which are organised in two separate phases. The Phase One development (associated with Reg. Ref. D17A/0950 & ABP Ref.300745-18) sits above the shopping centre while the Phase Two development sits above the existing car park located to the north of the site.

This assessment investigates two principal questions. In the first case consideration is given to the effect that the proposed development could have on the light levels available to neighbouring properties. Further to this the assessment considers the levels of daylight amenity which would be provided within the accommodation which is being proposed as part of this development.

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 six separate daylight studies are presented in this 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.

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

Three additional studies have been commissioned to assess the adequacy of the daylight levels which would be provided within the accommodation which is being proposed as part of this development.

Study D: Assessment of skylight amenity available within proposed accommodation: An assessment of the skylight amenity which would be provided within the accommodation which is being proposed as part of this development.

Study E: Assessment of sunlight amenity available to proposed accommodation: An assessment of the sunlight amenity which would be available to the accommodation which is being proposed as part of this development.

Study F: Assessment of sunlight amenity available within proposed outdoor recreation areas: An assessment of the degree to which the potential for good sunlighting exists within the main outdoor recreation space which is being proposed as part of this development.

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

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 Reddy Architecture and Urbanism 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 E: 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 flexibility which can be applied when assessing sunlight and daylight is detailed in Appendix B: Policy basis for flexibility in applying daylight standards.

Study A: Assessment of skylight levels available to neighbouring accommodation

Study A: Assessment Overview

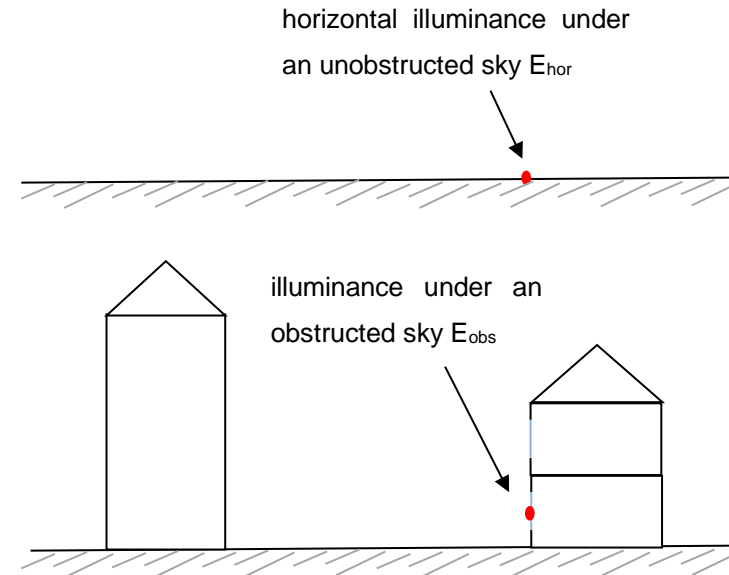
This assessment considers the degree to which the proposed development would affect the levels of diffuse skylight which would be available to neighbouring accommodation.

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*

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.



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

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.

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

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 C: 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

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 residential buildings which could potentially experience some form of altered lighting conditions as a result of the proposed development. These buildings include a number of terraced and detached dwellings on George's Avenue, Frascati Park Rd, and Mount Merrion Avenue. A number of apartments located within the Lisalea Complex on the Rock Road have also been identified for assessment.

This study has assessed the levels of skylight access available to a total of 109 windows in the immediate neighbourhood, see Figure 1, Figure 2, Figure 3 and Figure 4. These windows have been selected in order to capture the worst-case impacts which could register on neighbouring properties.

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

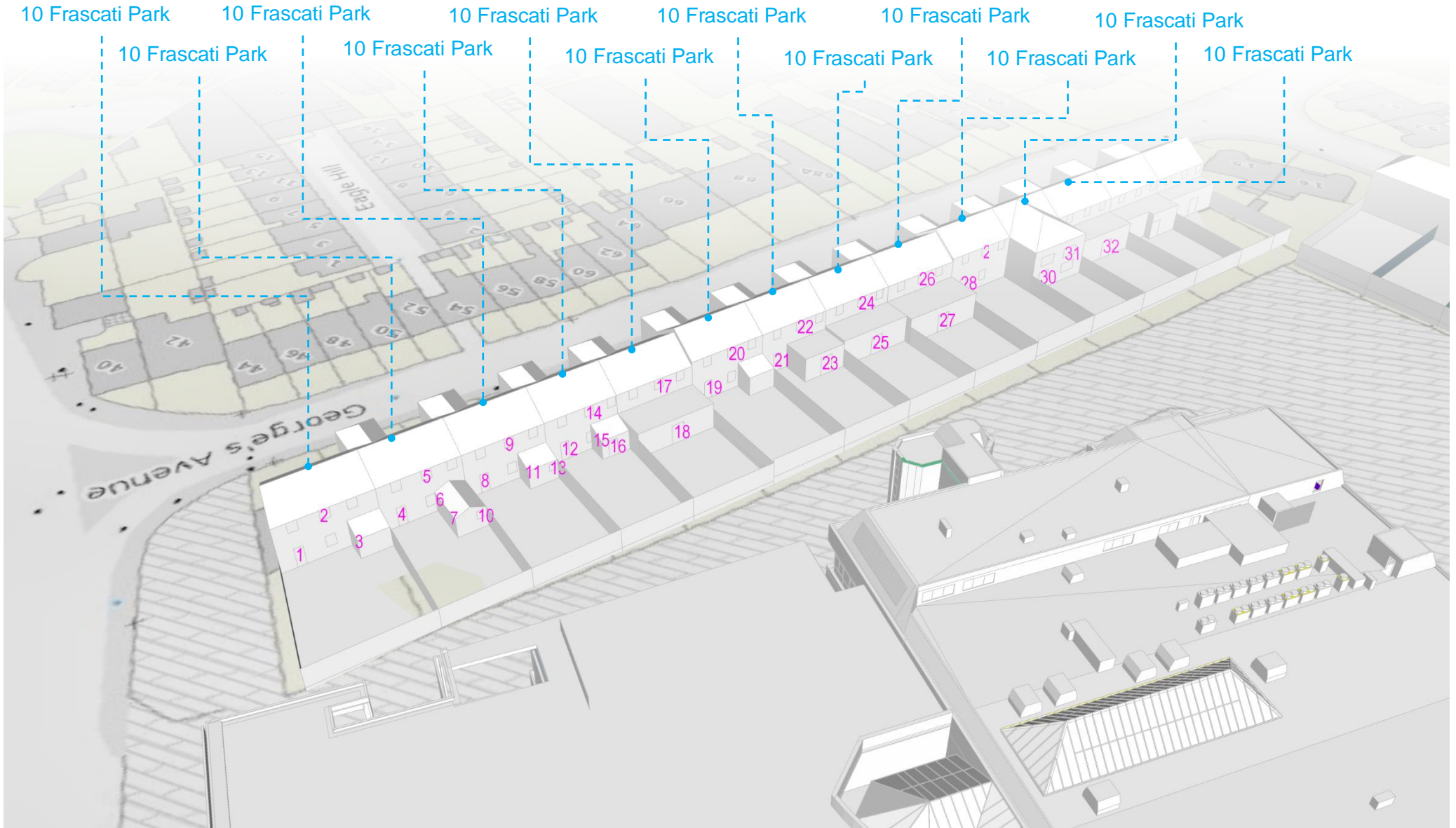


Figure 1 Windows identified for analysis on properties located on George's Avenue

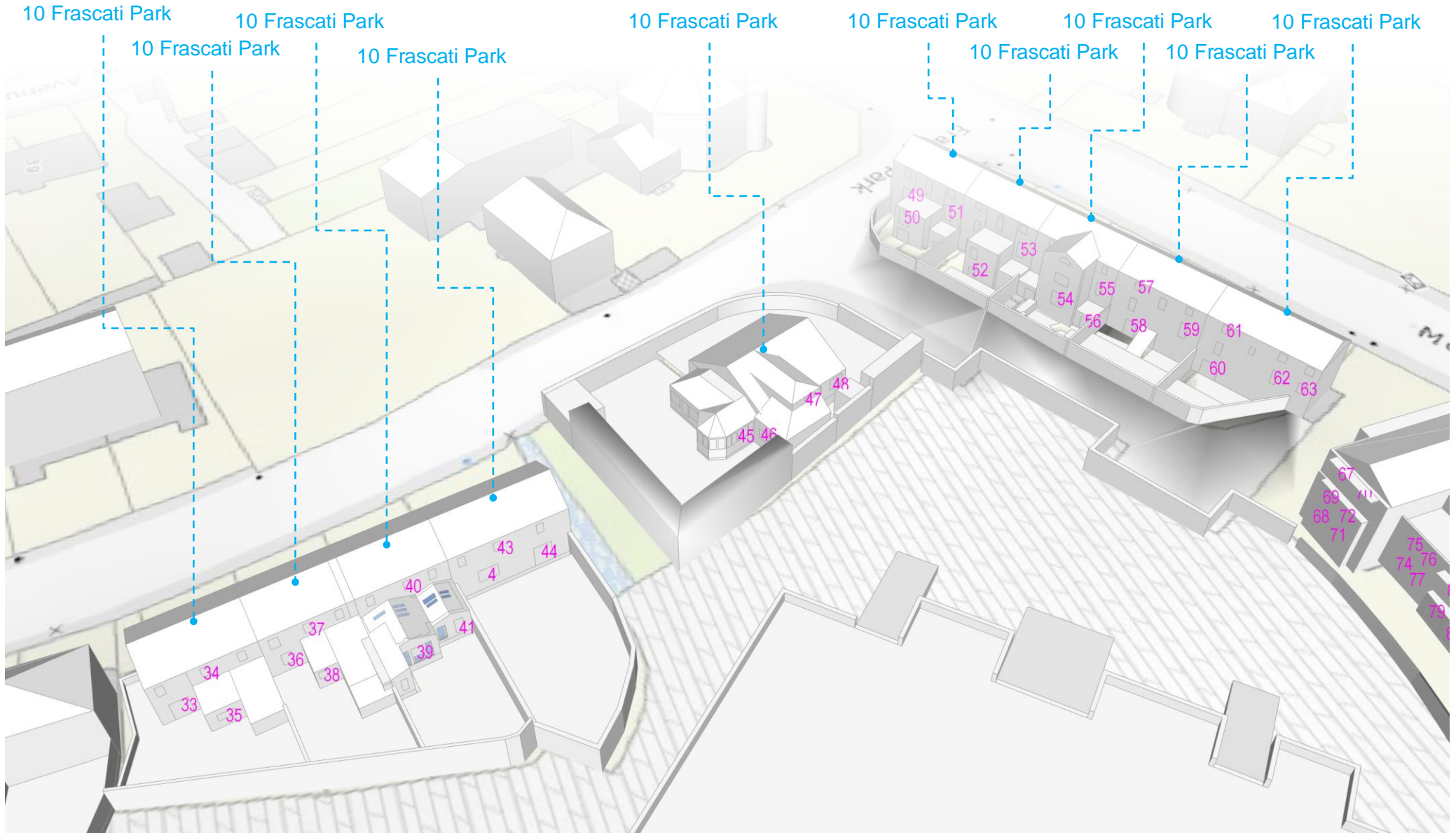


Figure 2 Windows identified for analysis on properties located on Frascati Park Road and Mount Merrion Avenue

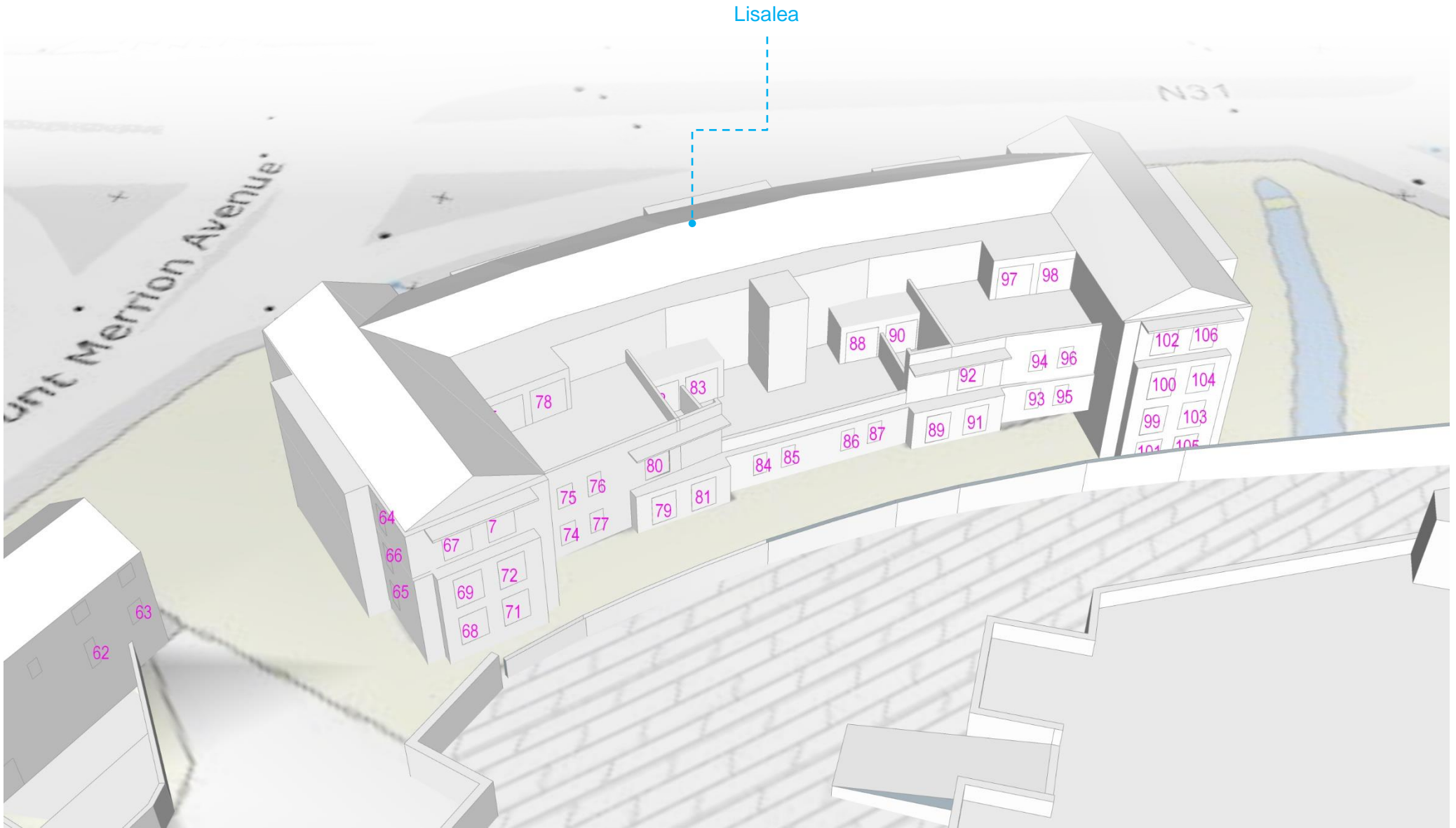


Figure 3 Windows identified for analysis on Apartments located within Lisalea, Rock Road.

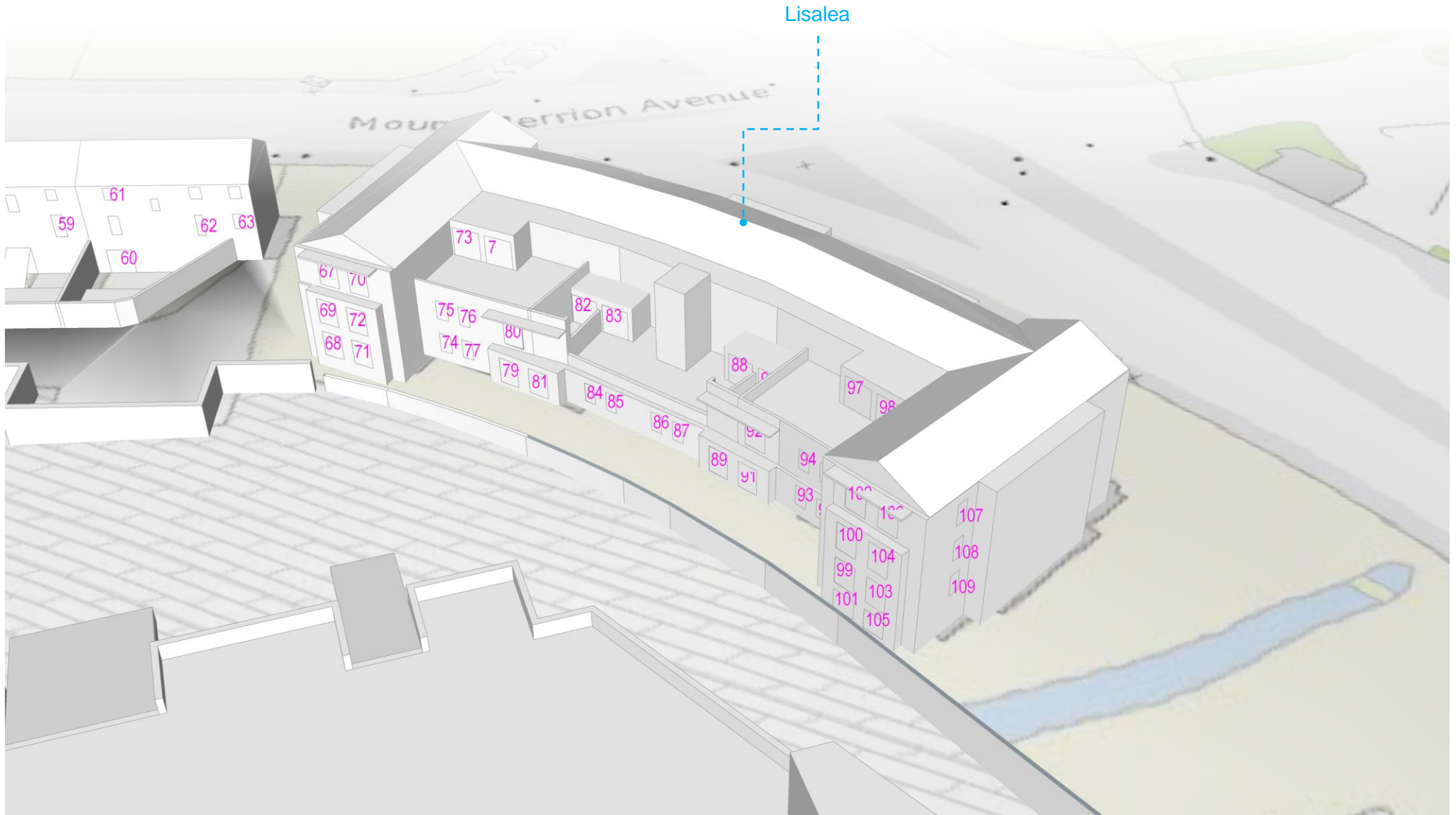


Figure 4 Windows identified for analysis on Apartments located within Lisalea, Rock Road.

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 impacts would fall within acceptable bounds in the majority of cases. Of the 109 windows assessed in this study 83 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.

In the cases where VSC levels are found to fall short of conventional BRE minimums (Windows 39, 67, 70, 74, 75, 77, 79, 80, 81, 84, 85, 86, 87, 89, 91, 92, 93, 94, 95, 96, 99, 100, 102, 103, 104 and 106), more detailed secondary testing has been carried out, see Table 2. This secondary testing has been carried out with regard to the average daylight factor approach outlined in BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’, British Standards Institute, 2008.

Having carried out this secondary testing it is possible to conclude that impacts would fall within tolerable bounds in all cases, see Table 2. This assertion is supported as follows:

- The results obtained indicate that the minimum recommended skylight level associated with the rooms predominant use would be satisfied within the rooms associated with windows 39, 67, 70, 75, 77, 80, 84, 85, 86, 87, 92, 93, 94, 96, 99, 100, 102, 103, 104, 106; it follows that the potential for acceptable levels of internal skylight amenity would be retained in these spaces, see Table 2.
- The daylight factor distribution diagrams which have been generated for the rooms associated with windows 74, 79, 81, 89, 91, 95 indicate that while an increased reliance on artificial lighting can be expected to the rear of these rooms, the potential for acceptable levels of daylight amenity would remain available to the front, see Table 2 and Appendix C: Secondary Testing - ADF Assessment.

When assessed in the round and in relation to wider planning imperatives it is appropriate to conclude that the development proposed would not cause undue loss of skylight amenity to neighbouring accommodation.

Table 1 Vertical Sky Component Results

ID	VSC (%)		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is less than 20%?	Full Compliance with BRE guidelines satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
1	30	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
2	34	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
3	22	21	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
4	28	25	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
5	34	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
6	18	17	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
7	26	25	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
8	29	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
9	34	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
10	25	21	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
11	22	21	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
12	29	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
13	25	21	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
14	34	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
15	19	18	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
16	27	25	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
17	34	32	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
18	30	28	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
19	30	29	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
20	35	33	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
21	24	24	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
22	35	34	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
23	31	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
24	35	35	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>

ID	VSC (%)		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is less than 20%?	Full Compliance with BRE guidelines satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
25	32	32	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
26	36	36	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
27	33	33	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
28	31	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
29	36	36	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
30	35	35	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
31	37	37	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
32	36	36	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
33	30	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
34	37	34	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
35	31	29	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
36	26	25	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
37	37	33	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
38	33	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
39	29	23	No	No	No	<i>Additional consideration warranted ***</i>
40	37	32	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
41	31	27	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
42	34	27	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
43	37	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
44	34	27	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
45	25	21	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
46	24	24	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
47	37	29	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
48	23	21	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
49	30	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
50	37	35	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>

ID	VSC (%)		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is less than 20%?	Full Compliance with BRE guidelines satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
51	32	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
52	27	27	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
53	30	28	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
54	37	34	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
55	25	22	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
56	24	23	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
57	38	35	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
58	31	28	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
59	37	33	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
60	29	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
61	38	34	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
62	35	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
63	34	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
64	33	33	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
65	28	28	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
66	30	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
67	23	17	No	No	No	<i>Additional consideration warranted ***</i>
68	36	28	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
69	38	30	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
70	23	17	No	No	No	<i>Additional consideration warranted ***</i>
71	37	27	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
72	38	29	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
73	30	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
74	30	21	No	No	No	<i>Additional consideration warranted ***</i>
75	31	24	No	No	No	<i>Additional consideration warranted ***</i>
76	35	28	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>

ID	VSC (%)		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is less than 20%?	Full Compliance with BRE guidelines satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
77	33	25	No	No	No	<i>Additional consideration warranted ***</i>
78	36	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
79	36	26	No	No	No	<i>Additional consideration warranted ***</i>
80	22	15	No	No	No	<i>Additional consideration warranted ***</i>
81	36	26	No	No	No	<i>Additional consideration warranted ***</i>
82	22	20	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
83	31	27	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
84	36	26	No	No	No	<i>Additional consideration warranted ***</i>
85	36	26	No	No	No	<i>Additional consideration warranted ***</i>
86	36	26	No	No	No	<i>Additional consideration warranted ***</i>
87	36	25	No	No	No	<i>Additional consideration warranted ***</i>
88	32	28	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
89	36	24	No	No	No	<i>Additional consideration warranted ***</i>
90	22	22	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
91	35	24	No	No	No	<i>Additional consideration warranted ***</i>
92	21	12	No	No	No	<i>Additional consideration warranted ***</i>
93	33	22	No	No	No	<i>Additional consideration warranted ***</i>
94	35	25	No	No	No	<i>Additional consideration warranted ***</i>
95	30	19	No	No	No	<i>Additional consideration warranted ***</i>
96	31	22	No	No	No	<i>Additional consideration warranted ***</i>
97	36	31	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
98	30	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
99	35	21	No	No	No	<i>Additional consideration warranted ***</i>
100	37	24	No	No	No	<i>Additional consideration warranted ***</i>
101	18	16	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
102	22	13	No	No	No	<i>Additional consideration warranted ***</i>

ID	VSC (%)		VSC with development in place remains above 27%?	Reduction in VSC, caused by proposed development, is less than 20%?	Full Compliance with BRE guidelines satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
103	35	21	No	No	No	<i>Additional consideration warranted ***</i>
104	36	24	No	No	No	<i>Additional consideration warranted ***</i>
105	19	17	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>
106	22	12	No	No	No	<i>Additional consideration warranted ***</i>
107	33	30	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
108	30	27	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
109	29	26	No	Yes	Yes	<i>The reduction predicted falls within acceptable bounds **</i>

* 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.

** 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 it is possible to conclude the reduction falls within acceptable bounds.

*** A departure from BRE's advisory targets for skylight access is identified; additional analysis is required to investigate the consequences this would have for the skylight levels within the room associated with this window, see Table 2.

Table 2 Average daylight factor results predicted for affected rooms in neighbouring properties – secondary testing.

Neighbouring Room Associated with Window IDs	Principal use assumed for room	Advisory minimum ADF associated with principal use	Existing ADF [%]	ADF with proposed development in place [%]	Professional opinion regarding the impacts registering
39	Livingroom	1.5	5.1	5.0	Impacts fall within tolerable bounds, see (ð)
67, 64	Bedroom	1.0	3.1	2.6	Impacts fall within tolerable bounds, see (ð)
70	Living	1.5	2.1	1.8	Impacts fall within tolerable bounds, see (ð)
74	Bedroom	1.0	1.3	0.9	Impacts fall within tolerable bounds, see (Δ)
75	Bedroom	1.0	1.3	1.1	Impacts fall within tolerable bounds, see (ð)
77	Bedroom	1.0	1.9	1.4	Impacts fall within tolerable bounds, see (ð)
79	Living	1.5	1.7	1.3	Impacts fall within tolerable bounds, see (Δ)
80	Living	1.5	1.7	1.5	Impacts fall within tolerable bounds, see (ð)
81	Living	1.5	1.9	1.4	Impacts fall within tolerable bounds, see (Δ)
84	Bedroom	1.0	2.3	1.7	Impacts fall within tolerable bounds, see (ð)
85	Bedroom	1.0	1.5	1.3	Impacts fall within tolerable bounds, see (ð)
86	Bedroom	1.0	1.6	1.2	Impacts fall within tolerable bounds, see (ð)
87	Bedroom	1.0	2.5	2.0	Impacts fall within tolerable bounds, see (ð)
89	Living	1.5	1.9	1.4	Impacts fall within tolerable bounds, see (Δ)
91	Living	1.5	1.6	1.2	Impacts fall within tolerable bounds, see (Δ)
92	Living	1.5	1.9	1.5	Impacts fall within tolerable bounds, see (ð)
93	Bedroom	1.0	2.1	1.6	Impacts fall within tolerable bounds, see (ð)
94	Bedroom	1.0	2.2	1.9	Impacts fall within tolerable bounds, see (ð)
95	Bedroom	1.0	1.2	0.8	Impacts fall within tolerable bounds, see (Δ)
96	Bedroom	1.0	1.2	1.0	Impacts fall within tolerable bounds, see (ð)
99	Living	1.5	2.1	1.5	Impacts fall within tolerable bounds, see (ð)

Neighbouring Room Associated with Window IDs	Principal use assumed for room	Advisory minimum ADF associated with principal use	Existing ADF [%]	ADF with proposed development in place [%]	Professional opinion regarding the impacts registering
100	Living	1.5	2.3	1.7	Impacts fall within tolerable bounds, see (∂)
102	Living	1.5	2.3	1.7	Impacts fall within tolerable bounds, see (∂)
103, 109	Bedroom	1.0	4.2	3.0	Impacts fall within tolerable bounds, see (∂)
104, 108	Bedroom	1.0	4.1	3.4	Impacts fall within tolerable bounds, see (∂)
106, 107	Bedroom	1.0	2.7	2.1	Impacts fall within tolerable bounds, see (∂)

- (∂) *With the proposed development in place the advisory minimum associated with this rooms predominant use is still satisfied; the potential for acceptable levels of internal skylight can be assumed on this basis.*
- (Δ) *The daylight factor distribution diagrams which have been generated indicate that while an increased reliance on artificial lighting can be expected to the rear of this room acceptable levels of daylight amenity would remain available to the front, see Appendix D: Daylight Factor Distribution Diagrams – Secondary Testing*

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

All of the windows which had previously been assessed for skylight access (Study A) have been included again in this assessment (109 windows in total). These particular windows have been selected in order to capture the worst-case impacts which could register in the neighbouring environment.

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. Further to this both annual

and winter sunlight levels have been considered. The numeric results obtained in this study are presented in Table 3 and Table 4 below.

Having carried out this assessment it is possible to conclude that very high levels of compliance with advisory guidelines would be achieved. Of the 109 windows assessed 108 of them are found to satisfy the minimum targets recommended by the BRE for annual sunlight access; 107 of the windows assessed are found to satisfy the minimum targets recommended by the BRE for winter sunlight access.

In the small number of cases where it has not been possible to demonstrate full compliance with BRE guidelines (Window 92 for Annual Sunlight Access and Windows 99 and 101 for Winter Sunlight Access) the magnitude of the departures is considered to be modest in all cases. When expressed in absolute terms Window 92 is found to fall short of the BRE's advisory minimum target for annual sunlight access by 1% AP SH. When expressed in absolute terms Windows 99 and 101 are found to fall short of the BRE's advisory minimum target for winter sunlight access by 1% and 0.6% AP SH respectively.

When assessed in the round and in relation to wider planning imperatives it is appropriate to conclude that the development proposed would not cause undue loss of sunlight amenity to neighbouring accommodation.

Table 3 Percentage of annual probable sunlight hours for windows assessed in this study

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%)		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
			Existing Scenario	Proposed Scenario					
1	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
2	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
3	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
4	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
5	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
6	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
7	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
8	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
9	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
10	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
11	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
12	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
13	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
14	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
15	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
16	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
17	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
18	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
19	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
20	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%)		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
			Existing Scenario	Proposed Scenario					
21	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
22	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
23	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
24	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
25	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
26	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
27	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
28	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
29	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
30	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
31	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
32	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
33	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
34	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
35	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
36	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
37	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
38	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
39	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
40	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
41	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%)		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
			Existing Scenario	Proposed Scenario					
42	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
43	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
44	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
45	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
46	Livingroom	S	50	49	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
47	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
48	Livingroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
49	Livingroom	S	62	62	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
50	Livingroom	S	80	77	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
51	Livingroom	S	66	63	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
52	Livingroom	S	56	55	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
53	Livingroom	S	58	54	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
54	Livingroom	S	80	75	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
55	Livingroom	S	42	37	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
56	Livingroom	S	45	44	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
57	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
58	Livingroom	S	59	54	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
59	Livingroom	S	79	72	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
60	Livingroom	S	57	48	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
61	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
62	Livingroom	S	75	67	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%)		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
			Existing Scenario	Proposed Scenario					
63	Livingroom	S	72	64	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
64	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
65	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
66	Bedroom	N	-	-	-	-	-	-	<i>Testing is only applicable to south facing windows</i>
67	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
68	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
69	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
70	Livingroom	S	44	33	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
71	Livingroom	S	87	68	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
72	Livingroom	S	88	71	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
73	Livingroom	S	62	56	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
74	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
75	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
76	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
77	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
78	Livingroom	S	82	75	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
79	Livingroom	S	78	59	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
80	Livingroom	S	42	28	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
81	Livingroom	S	82	60	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
82	Livingroom	S	46	41	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
83	Livingroom	S	66	57	Yes	Yes	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%)		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
			Existing Scenario	Proposed Scenario					
84	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
85	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
86	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
87	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
88	Livingroom	S	67	61	Yes	Yes	No	Yes	Acceptable levels of skylight access would be retained *
89	Livingroom	S	78	56	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
90	Livingroom	S	48	46	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
91	Livingroom	S	78	56	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
92	Livingroom	S	41	24	No	No	No	No	Additional consideration required
93	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
94	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
95	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
96	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
97	Livingroom	S	79	70	Yes	Yes	No	Yes	Acceptable levels of skylight access would be retained *
98	Livingroom	S	61	54	Yes	Yes	No	Yes	Acceptable levels of skylight access would be retained *
99	Livingroom	S	82	54	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
100	Livingroom	S	84	61	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
101	Livingroom	S	47	42	Yes	Yes	No	Yes	Acceptable levels of skylight access would be retained *
102	Livingroom	S	48	31	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
103	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
104	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%)		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
			Existing Scenario	Proposed Scenario					
105	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
106	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
107	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
108	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
109	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>

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

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%) during winter months		At least 5% of APSHs available during winter months?	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
			Existing Scenario	Proposed Scenario					
1	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
2	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
3	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
4	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
5	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
6	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
7	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
8	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
9	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
10	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
11	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
12	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
13	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
14	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
15	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
16	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
17	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
18	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
19	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
20	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%) during winter months		At least 5% of APSHs available during winter months?	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
			Existing Scenario	Proposed Scenario					
21	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
22	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
23	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
24	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
25	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
26	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
27	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
28	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
29	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
30	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
31	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
32	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
33	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
34	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
35	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
36	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
37	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
38	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
39	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
40	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
41	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%) during winter months		At least 5% of APSHs available during winter months?	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
			Existing Scenario	Proposed Scenario					
42	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
43	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
44	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
45	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
46	Livingroom	S	14	14	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
47	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
48	Livingroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
49	Livingroom	S	24	24	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
50	Livingroom	S	29	27	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
51	Livingroom	S	18	16	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
52	Livingroom	S	9	9	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
53	Livingroom	S	18	14	Yes	No	Yes	Yes	Acceptable levels of skylight access would be retained *
54	Livingroom	S	30	25	Yes	Yes	No	Yes	Acceptable levels of skylight access would be retained *
55	Livingroom	S	15	9	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
56	Livingroom	S	16	16	Yes	Yes	Yes	Yes	Acceptable levels of skylight access would be retained *
57	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
58	Livingroom	S	20	14	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
59	Livingroom	S	30	23	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
60	Livingroom	S	15	7	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
61	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
62	Livingroom	S	30	23	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%) during winter months		At least 5% of APSHs available during winter months?	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
			Existing Scenario	Proposed Scenario					
63	Livingroom	S	29	22	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
64	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
65	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
66	Bedroom	N	-	-	-	-	-	-	Testing is only applicable to south facing windows
67	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
68	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
69	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
70	Livingroom	S	32	21	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
71	Livingroom	S	30	11	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
72	Livingroom	S	31	14	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
73	Livingroom	S	22	16	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
74	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
75	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
76	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
77	Bedroom	S	-	-	-	-	-	-	Testing is only applicable to living room windows
78	Livingroom	S	28	21	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
79	Livingroom	S	30	10	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
80	Livingroom	S	31	16	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
81	Livingroom	S	30	9	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
82	Livingroom	S	14	9	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *
83	Livingroom	S	21	12	Yes	No	No	Yes	Acceptable levels of skylight access would be retained *

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%) during winter months		At least 5% of APSHs available during winter months?	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
			Existing Scenario	Proposed Scenario					
84	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
85	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
86	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
87	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
88	Livingroom	S	18	11	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
89	Livingroom	S	27	5	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
90	Livingroom	S	7	6	Yes	Yes	Yes	Yes	<i>Acceptable levels of skylight access would be retained *</i>
91	Livingroom	S	27	5	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
92	Livingroom	S	28	11	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
93	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
94	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
95	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
96	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
97	Livingroom	S	24	15	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
98	Livingroom	S	14	7	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
99	Livingroom	S	26	4	No	No	No	No	<i>Additional consideration required</i>
100	Livingroom	S	28	7	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
101	Livingroom	S	2	1	No	No	No	No	<i>Additional consideration required</i>
102	Livingroom	S	29	12	Yes	No	No	Yes	<i>Acceptable levels of skylight access would be retained *</i>
103	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
104	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>

ID	Assumed Room Type	Orientation: N=North S=South	APSH (%) during winter months		At least 5% of APSHs available during winter months?	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
			Existing Scenario	Proposed Scenario					
105	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
106	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
107	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
108	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>
109	Bedroom	S	-	-	-	-	-	-	<i>Testing is only applicable to living room windows</i>

* 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 its 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 24 neighbouring outdoor recreation spaces where altered sunlighting levels could potentially register, see Figure 5.

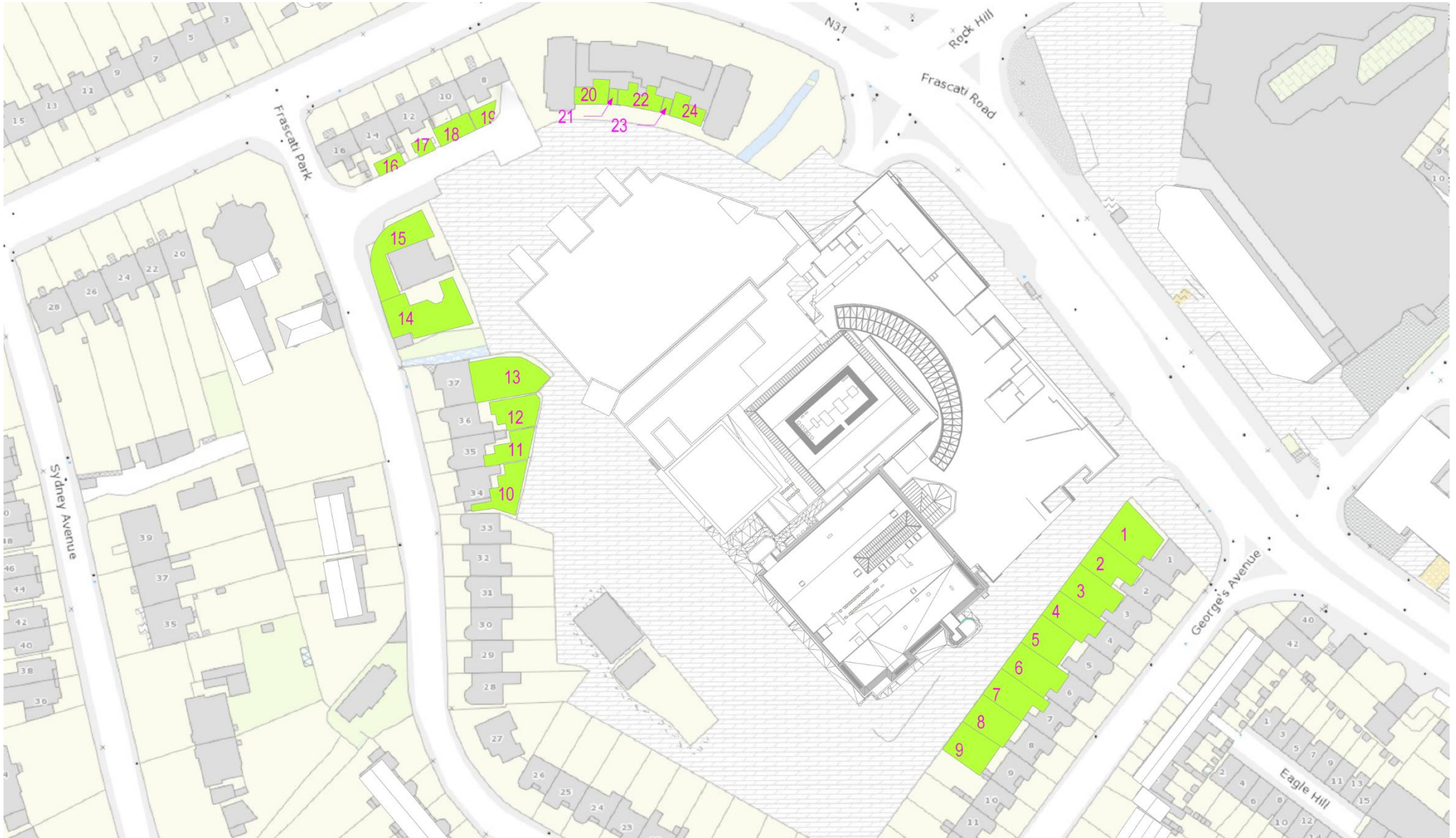


Figure 5 Plan showing the neighbouring recreation spaces which have been assessed in this study

Study C: Results

This study has assessed the degree to which the proposed development would impact on the levels of sunlight available to four neighbouring recreation spaces. Numeric results are presented in Table 5, the associated solar distribution diagrams are presented in Figure 6 and Figure 7. Supplementary shadow casting imagery has been included within Appendix G: Shadow Casting Imagery.

Having carried out this assessment it is possible to conclude that full compliance with BRE guidelines would be achieved in all cases; it follows that acceptable levels of solar access would be retained with the proposed development in place.

Table 5 Sunlight amenity levels available to neighbouring outdoor areas

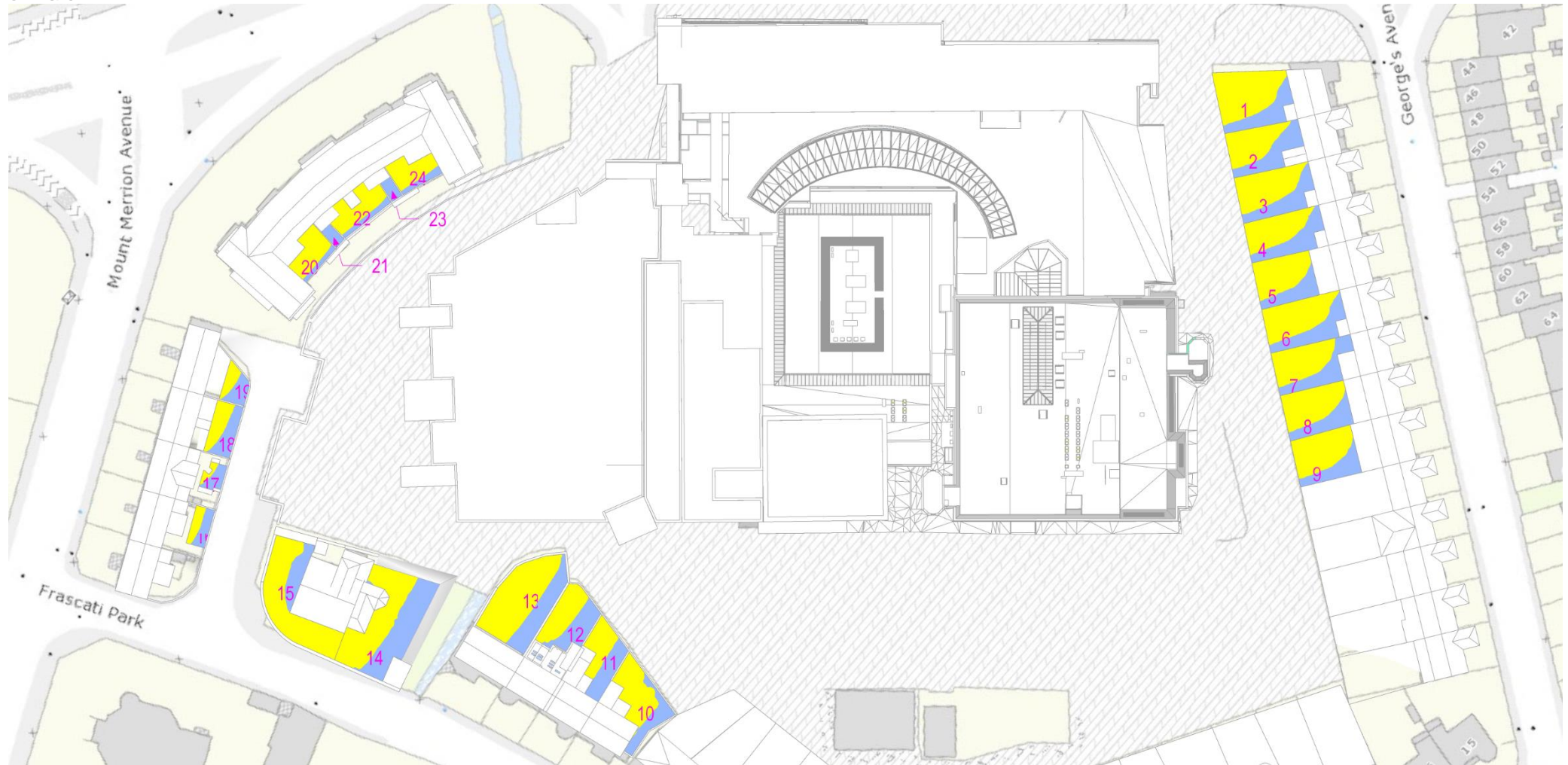
ID	% Area capable of receiving at least 2hrs of sunshine on the 21st of March		More than 50% of garden area remains capable of receiving 2hrs of sunlight on the 21st of March with the proposed development in place?	Reduction in sunlit area, caused by proposed development, is less than 20%?	BRE recommendations satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
1	70%	70%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
2	57%	57%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
3	64%	64%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
4	59%	59%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
5	68%	68%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
6	64%	64%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
7	62%	62%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
8	67%	67%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
9	69%	69%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
10	68%	68%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
11	52%	52%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
12	57%	57%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
13	70%	70%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
14	56%	56%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
15	83%	83%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
16	46%	46%	No	Yes	Yes	<i>Compliance demonstrated as predicted reduction falls within tolerable bounds **</i>
17	29%	29%	No	Yes	Yes	<i>Compliance demonstrated as predicted reduction falls within tolerable bounds **</i>
18	51%	51%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
19	46%	46%	No	Yes	Yes	<i>Compliance demonstrated as predicted reduction falls within tolerable bounds **</i>
20	84%	84%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>
21	0%	0%	No	Yes	Yes	<i>Compliance demonstrated as predicted reduction falls within tolerable bounds **</i>
22	82%	82%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>

ID	% Area capable of receiving at least 2hrs of sunshine on the 21st of March		More than 50% of garden area remains capable of receiving 2hrs of sunlight on the 21st of March with the proposed development in place?	Reduction in sunlit area, caused by proposed development, is less than 20%?	BRE recommendations satisfied?	Professional interpretation of result
	Existing Scenario	Proposed Scenario				
23	0%	0%	No	Yes	Yes	<i>Compliance demonstrated as predicted reduction falls within tolerable bounds **</i>
24	78%	78%	Yes	Yes	Yes	<i>Compliance demonstrated as acceptable levels of access retained *</i>

* 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.

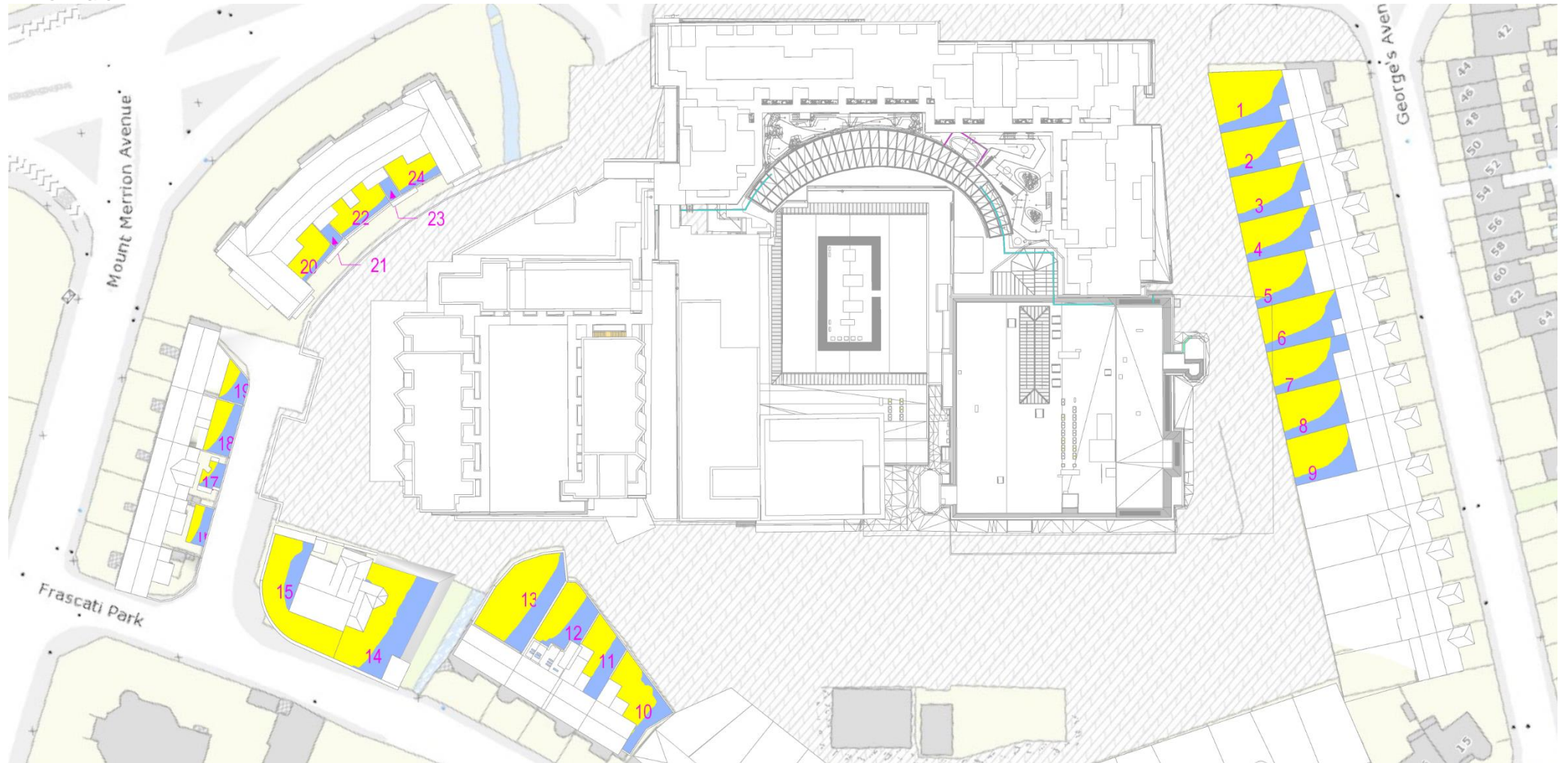
Figure 6 Solar access distribution predicted for neighbouring recreation spaces (Existing Scenario). Areas highlighted in yellow can receive at least 2hrs of sunshine on the 21st of March



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



Figure 7 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)



Study D: Assessment of skylight amenity available within proposed accommodation

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, directly and indirectly, from an overcast sky.

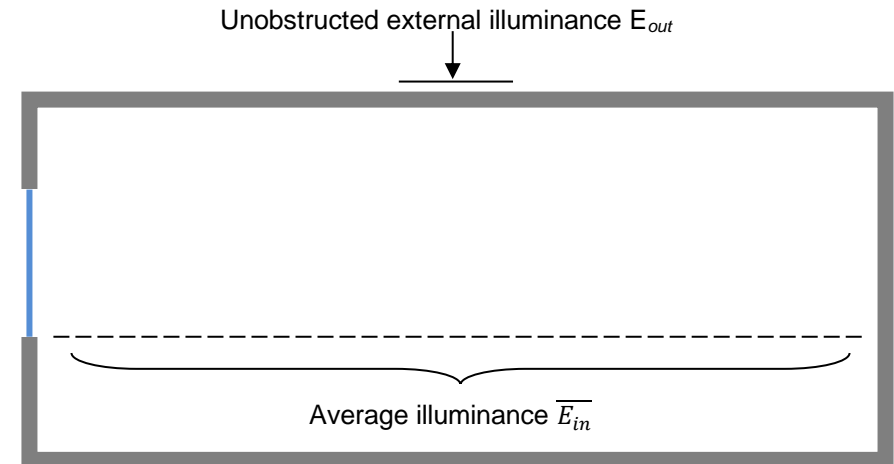
Skylight amenity is assessed with respect to a parameter called the average daylight factor⁵. Rooms with a high average daylight factor are capable of accepting a relatively large proportion of the diffuse skylight which is available outside; BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’, British Standards Institute, 2008 advises that a predominantly daylit appearance can be expected in rooms where an average daylight factor above 2% is achieved.

Study D: 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.

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.



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

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%.

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

⁵ 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 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.

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. BS 8206-2 recommends that in situations where an open plan space includes both a living room and a kitchen, the room should be assessed against the higher of the two thresholds.

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 by computational means.

As the average daylight factor approach takes account of light which has been reflected from both external and internal surfaces, care has been taken to attribute reasonable reflectance values to all of the surfaces which are present within the computational model. The particular reflectance values adopted for different building elements in this study are outlined in Table 6.

Table 6 Reflectance values adopted in the calculation of average daylight factors.

Surface Type	Assumed Finish	Reflectance / Transmittance	Source
Interior Wall	Pale Cream	0.81	BS 8206
Interior Floor	Mid Grey	0.45	BS 8206
Interior Ceiling	White	0.85	BS 8206
Exterior Roof	Paving	0.2	BS 8206

Surface Type	Assumed Finish	Reflectance / Transmittance	Source
General Context	Mid Grey	0.45	BS 8206
Exterior Wall	Light Grey	0.68	BS 8206
Window Frame	Light Grey	0.68	BS 8206
External Ground	Paving	0.2	BS 8206
Deck of Balcony/Gantry	Mid Grey	0.45	BS 8206
Soffit of Balcony	White	0.85	BS 8206
Balustrade Glazing	Clear Glass Single Pane	0.8	BS 8206
Window Frame	Light Grey	0.68	BS 8206
Glazing	Clear Double Glazing	0.68	BS 8206
Wintergarden Glazing	Clear Glass Single Pane	0.8	BS 8206
Courtyard areas	Paving	0.2	BS 8206
Proposed Elevations to Frascati Park	Light Render with Hanging Greenery	0.4	BS 8206
Proposed Elevations	Pale Cream	0.81	BS 8206
Proposed Shading on Phase 1	Dark Grey	0.14	BS 8206

Study D: Assessment Points

This study assesses internal skylight amenity in all of the habitable rooms which are proposed as part of this development; a total of 247 rooms (including all open plan kitchen/dinning/living rooms and all bedrooms) have been considered.

Study D: Results

The level of skylight amenity which would be provided within the accommodation which is being proposed as part of this development has been assessed. A total of 247 rooms have been analysed.

The Average Daylight Factors (ADFs) calculated in each case are presented in Table 7, the associated daylight factor distribution diagrams are presented in Figure 8, Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, Figure 14, and Figure 15 .

The results of this study demonstrate that an acceptable level of compliance with minimum standards would be achieved. Of the 247 rooms assessed 230 are found to either meet or exceed the advisory minimums recommended in BS 8206; this finding equates to an overall compliance rate of 93%. When the accommodation associated with Phase 1 is considered in isolation a compliance rate of 88% is identified (121 of 138 rooms meet advisory minimums); the compliance rate associate with Phase 2 is 100% (109 of 109 rooms meet advisory minimums).

While average daylight factor levels are predicted to fall short of advisory minimums in a small number of instances (17 rooms) it is possible to assert that adequate levels of skylight amenity would remain available in the majority of these cases. Support for this assertion is provided as follows:

- In the first instance it is important to recognise that a strict interpretation of BS 8206 has been adopted in this assessment and open plan living rooms which contain a kitchen have been assessed against the higher 2.0% ADF target associated with kitchens. While this is the correct approach to use when assessing compliance rates, it is reasonable to propose that acceptable levels of internal skylight amenity would still be provided in instances where the lower 1.5% ADF target (associated with living rooms) is achieved, see Appendix F: Average Daylight Factor in Open Plan Spaces.
- The results of this study demonstrate that of the 5 open plan kitchen dining living rooms which fall short of the strict 2.0% ADF target prescribed in BS 8206 (Rooms 110, 151, 154, 200 and 203), 3 of these rooms (Rooms 154, 200 and 203) are predicted to capable of satisfying the minimum level of internal skylight recommended for living rooms (equal to or greater than 1.5% ADF). A reliance on artificial lighting is assumed for Rooms 110 and 151 however the daylight factor distribution diagrams generated for these rooms do indicate that he potential exists for natural light to make a meaningful contribution to local areas proximate to external windows.
- While a reliance on artificial light is expected within Bedrooms 115, 117, 120, 122, 143, 146, 149, 164, 169 and 171, the daylight factor distribution diagrams generated for bedrooms 134 and 198 indicate that the potential exists for adequate levels of natural light to be

provided within local areas proximate to external windows. When occupants orientate themselves towards these areas the potential exists for a significant portion of the room to appear adequately daylit.

When assessed in the round it is possible to conclude that acceptable levels of skylight amenity would be provided within this development.

Table 7 Average daylight factors predicted for proposed accommodation

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
1	Bedroom	1.0	5.4	Yes	Acceptable levels of internal skylight amenity would be provided*
2	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
3	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
4	Bedroom	1.0	4.2	Yes	Acceptable levels of internal skylight amenity would be provided*
5	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
6	Bedroom	1.0	1.6	Yes	Acceptable levels of internal skylight amenity would be provided*
7	Bedroom	1.0	4.2	Yes	Acceptable levels of internal skylight amenity would be provided*
8	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
9	Bedroom	1.0	1.4	Yes	Acceptable levels of internal skylight amenity would be provided*
10	Bedroom	1.0	4.3	Yes	Acceptable levels of internal skylight amenity would be provided*
11	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
12	Bedroom	1.0	1.3	Yes	Acceptable levels of internal skylight amenity would be provided*
13	Bedroom	1.0	4.3	Yes	Acceptable levels of internal skylight amenity would be provided*
14	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
15	Bedroom	1.0	1.1	Yes	Acceptable levels of internal skylight amenity would be provided*
16	Kitchen/Living/Dining	2.0	7.8	Yes	Acceptable levels of internal skylight amenity would be provided*
17	Kitchen/Living/Dining	2.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
18	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
19	Kitchen/Living/Dining	2.0	4.9	Yes	Acceptable levels of internal skylight amenity would be provided*
20	Kitchen/Living/Dining	2.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
21	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
22	Kitchen/Living/Dining	2.0	3.8	Yes	Acceptable levels of internal skylight amenity would be provided*
23	Kitchen/Living/Dining	2.0	3.9	Yes	Acceptable levels of internal skylight amenity would be provided*
24	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
25	Kitchen/Living/Dining	2.0	3.8	Yes	Acceptable levels of internal skylight amenity would be provided*
26	Bedroom	1.0	2.2	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
27	Kitchen/Living/Dining	2.0	4.0	Yes	Acceptable levels of internal skylight amenity would be provided*
28	Bedroom	1.0	2.1	Yes	Acceptable levels of internal skylight amenity would be provided*
29	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
30	Bedroom	1.0	2.2	Yes	Acceptable levels of internal skylight amenity would be provided*
31	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
32	Bedroom	1.0	4.9	Yes	Acceptable levels of internal skylight amenity would be provided*
33	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
34	Bedroom	1.0	2.3	Yes	Acceptable levels of internal skylight amenity would be provided*
35	Bedroom	1.0	5.4	Yes	Acceptable levels of internal skylight amenity would be provided*
36	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
37	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
38	Bedroom	1.0	4.3	Yes	Acceptable levels of internal skylight amenity would be provided*
39	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
40	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
41	Bedroom	1.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
42	Kitchen/Living/Dining	2.0	5.0	Yes	Acceptable levels of internal skylight amenity would be provided*
43	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
44	Bedroom	1.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
45	Kitchen/Living/Dining	2.0	5.3	Yes	Acceptable levels of internal skylight amenity would be provided*
46	Bedroom	1.0	3.0	Yes	Acceptable levels of internal skylight amenity would be provided*
47	Kitchen/Living/Dining	2.0	9.8	Yes	Acceptable levels of internal skylight amenity would be provided*
48	Kitchen/Living/Dining	2.0	5.8	Yes	Acceptable levels of internal skylight amenity would be provided*
49	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
50	Kitchen/Living/Dining	2.0	4.9	Yes	Acceptable levels of internal skylight amenity would be provided*
51	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
52	Kitchen/Living/Dining	2.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
53	Bedroom	1.0	2.3	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
54	Bedroom	1.0	2.5	Yes	Acceptable levels of internal skylight amenity would be provided*
55	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
56	Bedroom	1.0	2.6	Yes	Acceptable levels of internal skylight amenity would be provided*
57	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
58	Bedroom	1.0	2.5	Yes	Acceptable levels of internal skylight amenity would be provided*
59	Kitchen/Living/Dining	2.0	4.9	Yes	Acceptable levels of internal skylight amenity would be provided*
60	Bedroom	1.0	2.2	Yes	Acceptable levels of internal skylight amenity would be provided*
61	Kitchen/Living/Dining	2.0	5.0	Yes	Acceptable levels of internal skylight amenity would be provided*
62	Kitchen/Living/Dining	2.0	5.6	Yes	Acceptable levels of internal skylight amenity would be provided*
63	Bedroom	1.0	6.6	Yes	Acceptable levels of internal skylight amenity would be provided*
64	Kitchen/Living/Dining	2.0	8.1	Yes	Acceptable levels of internal skylight amenity would be provided*
65	Bedroom	1.0	7.6	Yes	Acceptable levels of internal skylight amenity would be provided*
66	Bedroom	1.0	6.9	Yes	Acceptable levels of internal skylight amenity would be provided*
67	Kitchen/Living/Dining	2.0	6.0	Yes	Acceptable levels of internal skylight amenity would be provided*
68	Bedroom	1.0	5.9	Yes	Acceptable levels of internal skylight amenity would be provided*
69	Bedroom	1.0	7.6	Yes	Acceptable levels of internal skylight amenity would be provided*
70	Kitchen/Living/Dining	2.0	5.9	Yes	Acceptable levels of internal skylight amenity would be provided*
71	Bedroom	1.0	5.3	Yes	Acceptable levels of internal skylight amenity would be provided*
72	Bedroom	1.0	6.3	Yes	Acceptable levels of internal skylight amenity would be provided*
73	Kitchen/Living/Dining	2.0	6.1	Yes	Acceptable levels of internal skylight amenity would be provided*
74	Bedroom	1.0	7.2	Yes	Acceptable levels of internal skylight amenity would be provided*
75	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
76	Kitchen/Living/Dining	2.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
77	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
78	Kitchen/Living/Dining	2.0	4.5	Yes	Acceptable levels of internal skylight amenity would be provided*
79	Bedroom	1.0	2.7	Yes	Acceptable levels of internal skylight amenity would be provided*
80	Bedroom	1.0	2.9	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
81	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
82	Bedroom	1.0	3.0	Yes	Acceptable levels of internal skylight amenity would be provided*
83	Kitchen/Living/Dining	2.0	5.4	Yes	Acceptable levels of internal skylight amenity would be provided*
84	Bedroom	1.0	3.1	Yes	Acceptable levels of internal skylight amenity would be provided*
85	Kitchen/Living/Dining	2.0	5.2	Yes	Acceptable levels of internal skylight amenity would be provided*
86	Bedroom	1.0	2.5	Yes	Acceptable levels of internal skylight amenity would be provided*
87	Kitchen/Living/Dining	2.0	5.3	Yes	Acceptable levels of internal skylight amenity would be provided*
88	Kitchen/Living/Dining	2.0	7.6	Yes	Acceptable levels of internal skylight amenity would be provided*
89	Kitchen/Living/Dining	2.0	6.1	Yes	Acceptable levels of internal skylight amenity would be provided*
90	Kitchen/Living/Dining	2.0	5.7	Yes	Acceptable levels of internal skylight amenity would be provided*
91	Kitchen/Living/Dining	2.0	4.5	Yes	Acceptable levels of internal skylight amenity would be provided*
92	Kitchen/Living/Dining	2.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
93	Bedroom	1.0	4.0	Yes	Acceptable levels of internal skylight amenity would be provided*
94	Bedroom	1.0	3.5	Yes	Acceptable levels of internal skylight amenity would be provided*
95	Kitchen/Living/Dining	2.0	5.6	Yes	Acceptable levels of internal skylight amenity would be provided*
96	Bedroom	1.0	3.7	Yes	Acceptable levels of internal skylight amenity would be provided*
97	Kitchen/Living/Dining	2.0	5.6	Yes	Acceptable levels of internal skylight amenity would be provided*
98	Bedroom	1.0	3.3	Yes	Acceptable levels of internal skylight amenity would be provided*
99	Kitchen/Living/Dining	2.0	5.6	Yes	Acceptable levels of internal skylight amenity would be provided*
100	Kitchen/Living/Dining	2.0	5.1	Yes	Acceptable levels of internal skylight amenity would be provided*
101	Bedroom	1.0	8.2	Yes	Acceptable levels of internal skylight amenity would be provided*
102	Bedroom	1.0	6.1	Yes	Acceptable levels of internal skylight amenity would be provided*
103	Bedroom	1.0	6.1	Yes	Acceptable levels of internal skylight amenity would be provided*
104	Kitchen/Living/Dining	2.0	6.6	Yes	Acceptable levels of internal skylight amenity would be provided*
105	Bedroom	1.0	6.2	Yes	Acceptable levels of internal skylight amenity would be provided*
106	Kitchen/Living/Dining	2.0	6.7	Yes	Acceptable levels of internal skylight amenity would be provided*
107	Bedroom	1.0	6.0	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
108	Kitchen/Living/Dining	2.0	6.8	Yes	Acceptable levels of internal skylight amenity would be provided*
109	Kitchen/Living/Dining	2.0	6.7	Yes	Acceptable levels of internal skylight amenity would be provided*
110	Kitchen/Living/Dining	2.0	1.4	No	A reliance on artificial light is anticipated
111	Bedroom	1.0	1.4	Yes	Acceptable levels of internal skylight amenity would be provided*
112	Kitchen/Living/Dining	2.0	5.6	Yes	Acceptable levels of internal skylight amenity would be provided*
113	Bedroom	1.0	1.7	Yes	Acceptable levels of internal skylight amenity would be provided*
114	Bedroom	1.0	1.0	Yes	Acceptable levels of internal skylight amenity would be provided*
115	Bedroom	1.0	0.4	No	A reliance on artificial light is anticipated
116	Kitchen/Living/Dining	2.0	5.3	Yes	Acceptable levels of internal skylight amenity would be provided*
117	Bedroom	1.0	0.5	No	A reliance on artificial light is anticipated
118	Bedroom	1.0	2.1	Yes	Acceptable levels of internal skylight amenity would be provided*
119	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
120	Bedroom	1.0	0.1	No	A reliance on artificial light is anticipated
121	Kitchen/Living/Dining	2.0	3.9	Yes	Acceptable levels of internal skylight amenity would be provided*
122	Bedroom	1.0	0.4	No	A reliance on artificial light is anticipated
123	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
124	Kitchen/Living/Dining	2.0	3.8	Yes	Acceptable levels of internal skylight amenity would be provided*
125	Bedroom	1.0	1.1	Yes	Acceptable levels of internal skylight amenity would be provided*
126	Bedroom	1.0	3.0	Yes	Acceptable levels of internal skylight amenity would be provided*
127	Kitchen/Living/Dining	2.0	3.3	Yes	Acceptable levels of internal skylight amenity would be provided*
128	Bedroom	1.0	1.2	Yes	Acceptable levels of internal skylight amenity would be provided*
129	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
130	Kitchen/Living/Dining	2.0	4.0	Yes	Acceptable levels of internal skylight amenity would be provided*
131	Bedroom	1.0	1.1	Yes	Acceptable levels of internal skylight amenity would be provided*
132	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
133	Kitchen/Living/Dining	2.0	3.5	Yes	Acceptable levels of internal skylight amenity would be provided*
134	Bedroom	1.0	0.8	No	Adequate levels of internal skylight amenity would be provided***

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
135	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
136	Kitchen/Living/Dining	2.0	3.8	Yes	Acceptable levels of internal skylight amenity would be provided*
137	Bedroom	1.0	1.2	Yes	Acceptable levels of internal skylight amenity would be provided*
138	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
139	Kitchen/Living/Dining	2.0	4.0	Yes	Acceptable levels of internal skylight amenity would be provided*
140	Bedroom	1.0	1.0	Yes	Acceptable levels of internal skylight amenity would be provided*
141	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
142	Kitchen/Living/Dining	2.0	3.9	Yes	Acceptable levels of internal skylight amenity would be provided*
143	Bedroom	1.0	0.4	No	A reliance on artificial light is anticipated
144	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
145	Kitchen/Living/Dining	2.0	7.6	Yes	Acceptable levels of internal skylight amenity would be provided*
146	Bedroom	1.0	0.6	No	A reliance on artificial light is anticipated
147	Bedroom	1.0	3.3	Yes	Acceptable levels of internal skylight amenity would be provided*
148	Bedroom	1.0	1.1	Yes	Acceptable levels of internal skylight amenity would be provided*
149	Bedroom	1.0	0.6	No	A reliance on artificial light is anticipated
150	Bedroom	1.0	1.4	Yes	Acceptable levels of internal skylight amenity would be provided*
151	Kitchen/Living/Dining	2.0	0.8	No	A reliance on artificial light is anticipated
152	Bedroom	1.0	1.2	Yes	Acceptable levels of internal skylight amenity would be provided*
153	Bedroom	1.0	1.2	Yes	Acceptable levels of internal skylight amenity would be provided*
154	Kitchen/Living/Dining	2.0	1.9	No	Adequate levels of internal skylight amenity would be provided**
155	Bedroom	1.0	3.5	Yes	Acceptable levels of internal skylight amenity would be provided*
156	Kitchen/Living/Dining	2.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
157	Bedroom	1.0	1.2	Yes	Acceptable levels of internal skylight amenity would be provided*
158	Kitchen/Living/Dining	2.0	2.3	Yes	Acceptable levels of internal skylight amenity would be provided*
159	Kitchen/Living/Dining	2.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
160	Bedroom	1.0	1.4	Yes	Acceptable levels of internal skylight amenity would be provided*
161	Kitchen/Living/Dining	2.0	5.9	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
162	Bedroom	1.0	2.1	Yes	Acceptable levels of internal skylight amenity would be provided*
163	Bedroom	1.0	1.3	Yes	Acceptable levels of internal skylight amenity would be provided*
164	Bedroom	1.0	0.6	No	A reliance on artificial light is anticipated
165	Kitchen/Living/Dining	2.0	6.2	Yes	Acceptable levels of internal skylight amenity would be provided*
166	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
167	Bedroom	1.0	2.2	Yes	Acceptable levels of internal skylight amenity would be provided*
168	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
169	Bedroom	1.0	0.2	No	A reliance on artificial light is anticipated
170	Kitchen/Living/Dining	2.0	4.0	Yes	Acceptable levels of internal skylight amenity would be provided*
171	Bedroom	1.0	0.6	No	A reliance on artificial light is anticipated
172	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
173	Kitchen/Living/Dining	2.0	3.8	Yes	Acceptable levels of internal skylight amenity would be provided*
174	Bedroom	1.0	1.6	Yes	Acceptable levels of internal skylight amenity would be provided*
175	Bedroom	1.0	2.9	Yes	Acceptable levels of internal skylight amenity would be provided*
176	Kitchen/Living/Dining	2.0	3.3	Yes	Acceptable levels of internal skylight amenity would be provided*
177	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
178	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
179	Kitchen/Living/Dining	2.0	4.1	Yes	Acceptable levels of internal skylight amenity would be provided*
180	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
181	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
182	Kitchen/Living/Dining	2.0	3.5	Yes	Acceptable levels of internal skylight amenity would be provided*
183	Bedroom	1.0	1.5	Yes	Acceptable levels of internal skylight amenity would be provided*
184	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
185	Kitchen/Living/Dining	2.0	3.8	Yes	Acceptable levels of internal skylight amenity would be provided*
186	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
187	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
188	Kitchen/Living/Dining	2.0	4.1	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
189	Bedroom	1.0	1.4	Yes	Acceptable levels of internal skylight amenity would be provided*
190	Bedroom	1.0	2.1	Yes	Acceptable levels of internal skylight amenity would be provided*
191	Kitchen/Living/Dining	2.0	3.9	Yes	Acceptable levels of internal skylight amenity would be provided*
192	Bedroom	1.0	1.1	Yes	Acceptable levels of internal skylight amenity would be provided*
193	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
194	Kitchen/Living/Dining	2.0	6.9	Yes	Acceptable levels of internal skylight amenity would be provided*
195	Bedroom	1.0	4.2	Yes	Acceptable levels of internal skylight amenity would be provided*
196	Bedroom	1.0	3.4	Yes	Acceptable levels of internal skylight amenity would be provided*
197	Bedroom	1.0	1.4	Yes	Acceptable levels of internal skylight amenity would be provided*
198	Bedroom	1.0	0.7	No	Adequate levels of internal skylight amenity would be provided***
199	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
200	Kitchen/Living/Dining	2.0	1.6	No	Adequate levels of internal skylight amenity would be provided**
201	Bedroom	1.0	1.0	Yes	Acceptable levels of internal skylight amenity would be provided*
202	Bedroom	1.0	1.8	Yes	Acceptable levels of internal skylight amenity would be provided*
203	Kitchen/Living/Dining	2.0	1.9	No	Adequate levels of internal skylight amenity would be provided**
204	Bedroom	1.0	3.2	Yes	Acceptable levels of internal skylight amenity would be provided*
205	Kitchen/Living/Dining	2.0	4.4	Yes	Acceptable levels of internal skylight amenity would be provided*
206	Bedroom	1.0	4.2	Yes	Acceptable levels of internal skylight amenity would be provided*
207	Kitchen/Living/Dining	2.0	2.2	Yes	Acceptable levels of internal skylight amenity would be provided*
208	Bedroom	1.0	3.4	Yes	Acceptable levels of internal skylight amenity would be provided*
209	Bedroom	1.0	4.5	Yes	Acceptable levels of internal skylight amenity would be provided*
210	Bedroom	1.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
211	Kitchen/Living/Dining	2.0	6.8	Yes	Acceptable levels of internal skylight amenity would be provided*
212	Bedroom	1.0	3.9	Yes	Acceptable levels of internal skylight amenity would be provided*
213	Kitchen/Living/Dining	2.0	6.0	Yes	Acceptable levels of internal skylight amenity would be provided*
214	Kitchen/Living/Dining	2.0	10.1	Yes	Acceptable levels of internal skylight amenity would be provided*
215	Bedroom	1.0	2.1	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
216	Bedroom	1.0	2.1	Yes	Acceptable levels of internal skylight amenity would be provided*
217	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
218	Bedroom	1.0	3.6	Yes	Acceptable levels of internal skylight amenity would be provided*
219	Kitchen/Living/Dining	2.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
220	Bedroom	1.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
221	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
222	Kitchen/Living/Dining	2.0	4.5	Yes	Acceptable levels of internal skylight amenity would be provided*
223	Bedroom	1.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
224	Bedroom	1.0	3.0	Yes	Acceptable levels of internal skylight amenity would be provided*
225	Kitchen/Living/Dining	2.0	4.0	Yes	Acceptable levels of internal skylight amenity would be provided*
226	Bedroom	1.0	5.4	Yes	Acceptable levels of internal skylight amenity would be provided*
227	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
228	Kitchen/Living/Dining	2.0	4.9	Yes	Acceptable levels of internal skylight amenity would be provided*
229	Bedroom	1.0	4.9	Yes	Acceptable levels of internal skylight amenity would be provided*
230	Bedroom	1.0	1.9	Yes	Acceptable levels of internal skylight amenity would be provided*
231	Kitchen/Living/Dining	2.0	4.1	Yes	Acceptable levels of internal skylight amenity would be provided*
232	Bedroom	1.0	4.4	Yes	Acceptable levels of internal skylight amenity would be provided*
233	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
234	Kitchen/Living/Dining	2.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
235	Bedroom	1.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
236	Bedroom	1.0	2.2	Yes	Acceptable levels of internal skylight amenity would be provided*
237	Kitchen/Living/Dining	2.0	4.8	Yes	Acceptable levels of internal skylight amenity would be provided*
238	Bedroom	1.0	4.6	Yes	Acceptable levels of internal skylight amenity would be provided*
239	Bedroom	1.0	2.0	Yes	Acceptable levels of internal skylight amenity would be provided*
240	Kitchen/Living/Dining	2.0	8.1	Yes	Acceptable levels of internal skylight amenity would be provided*
241	Bedroom	1.0	4.7	Yes	Acceptable levels of internal skylight amenity would be provided*
242	Bedroom	1.0	5.0	Yes	Acceptable levels of internal skylight amenity would be provided*

Room ID	Room Type	Minimum ADF recommended in BS 8206	Predicted ADF	Compliance Demonstrated?	Professional opinion regarding levels predicted
243	Bedroom	1.0	12.1	Yes	Acceptable levels of internal skylight amenity would be provided*
244	Bedroom	1.0	15.7	Yes	Acceptable levels of internal skylight amenity would be provided*
245	Kitchen/Living/Dining	2.0	9.3	Yes	Acceptable levels of internal skylight amenity would be provided*
246	Kitchen/Living/Dining	2.0	11.4	Yes	Acceptable levels of internal skylight amenity would be provided*
247	Bedroom	1.0	12.4	Yes	Acceptable levels of internal skylight amenity would be provided*

- * *As the average daylight factor predicted for this room exceeds the minimum level recommended in BS 8206 the potential for acceptable levels of internal skylight can be safely assumed*
- ** *The potential for acceptable levels of internal skylight is assumed as the advisory minimum recommended for living rooms in BS 8206 is satisfied.*
- *** *While an increased reliance on artificial light can be expected for this space the predicted daylight factor distribution indicates that adequate levels of natural light would be provided to local areas proximate to external windows. When occupants orientate themselves towards these areas a significant portion of the room will appear adequately daylight.*

Figure 8 Daylight factor distribution diagram for rooms assessed at Level 01 in Phase 2 Development.

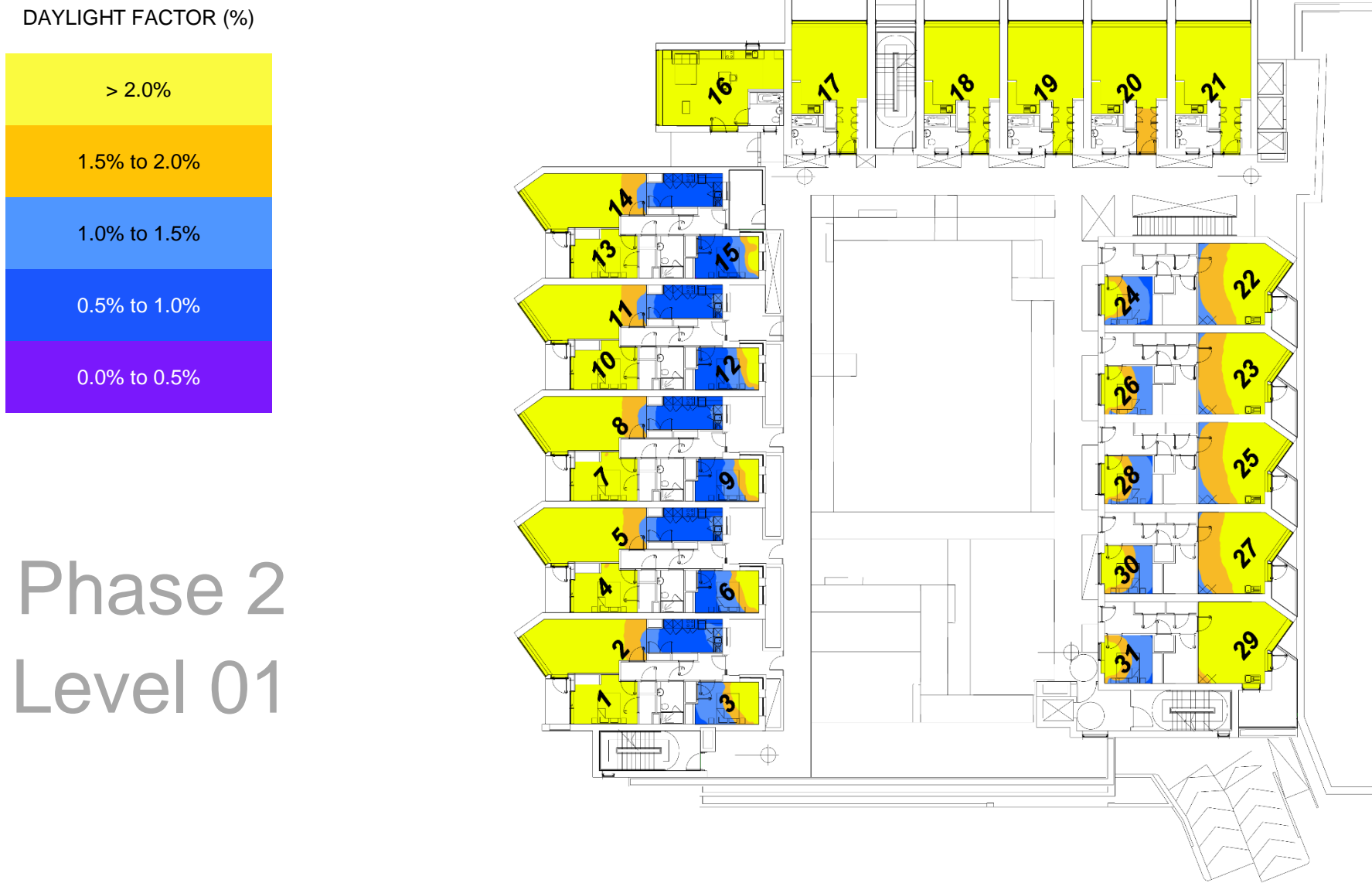


Figure 9 Daylight factor distribution diagram for rooms assessed at Level 02 in Phase 2 Development.



Figure 10 Daylight factor distribution diagram for rooms assessed at Level 03 in Phase 2 Development.

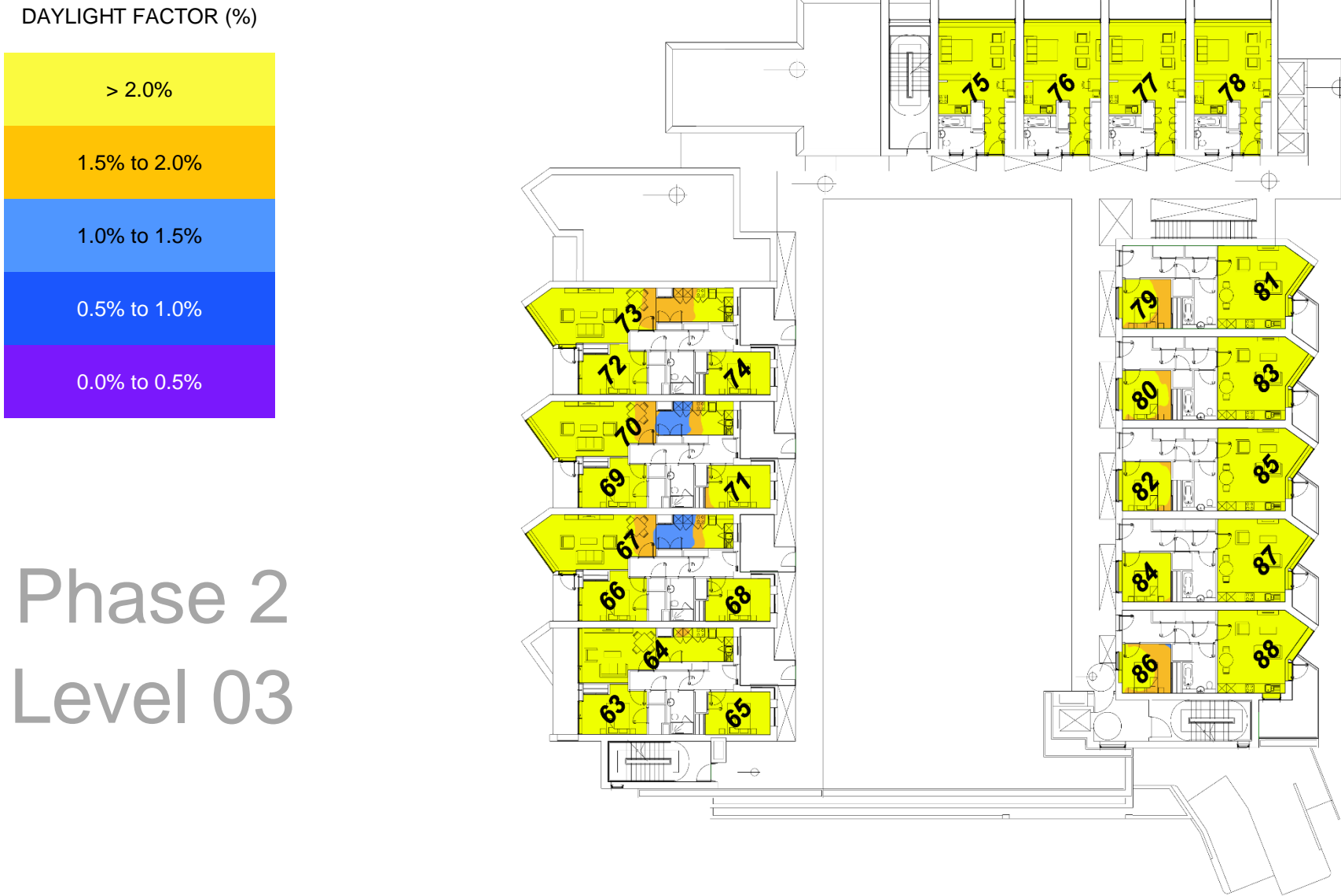


Figure 11 Daylight factor distribution diagram for rooms assessed at Level 04 in Phase 2 Development.

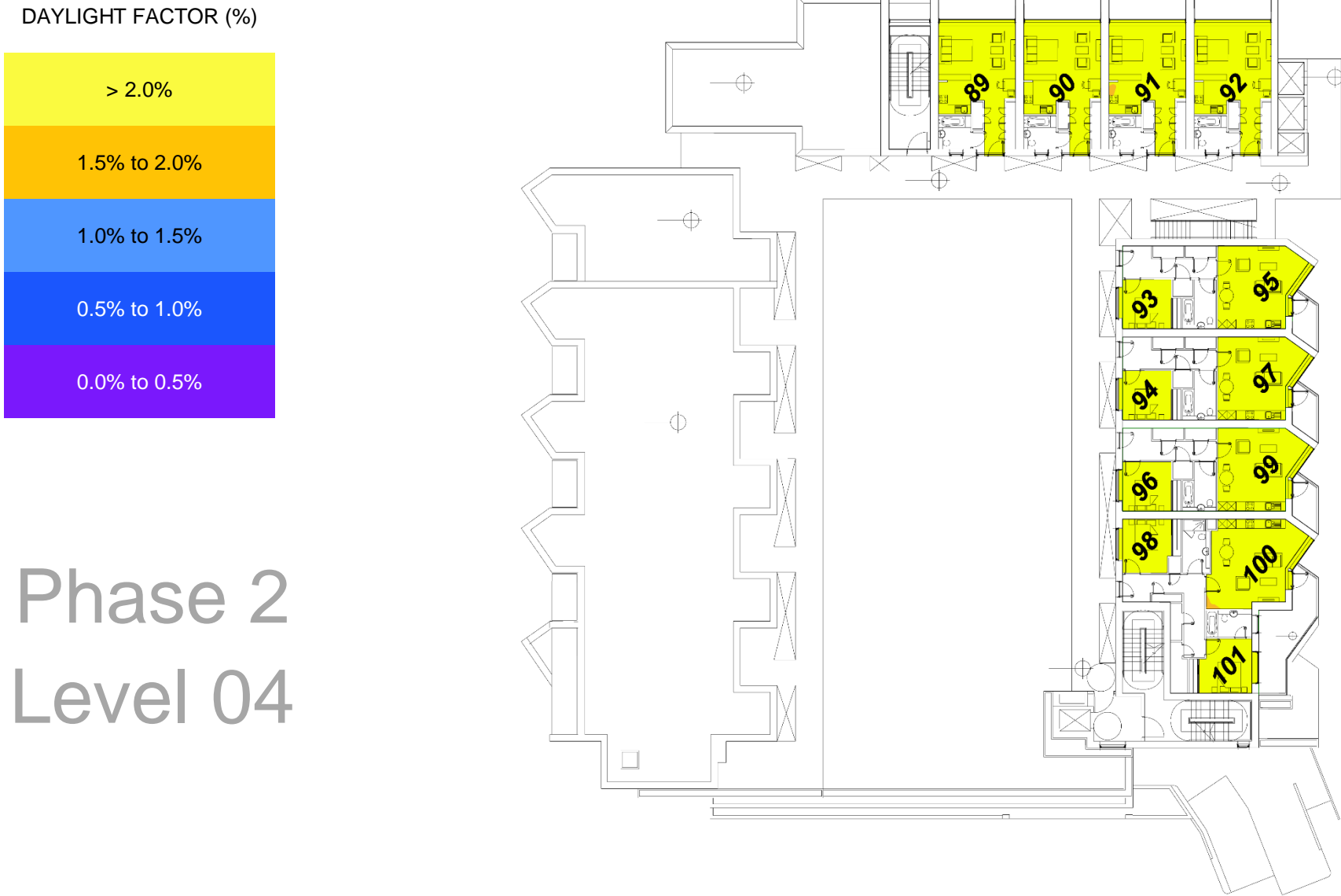


Figure 12 Daylight factor distribution diagram for rooms assessed at Level 05 in Phase 2 Development.

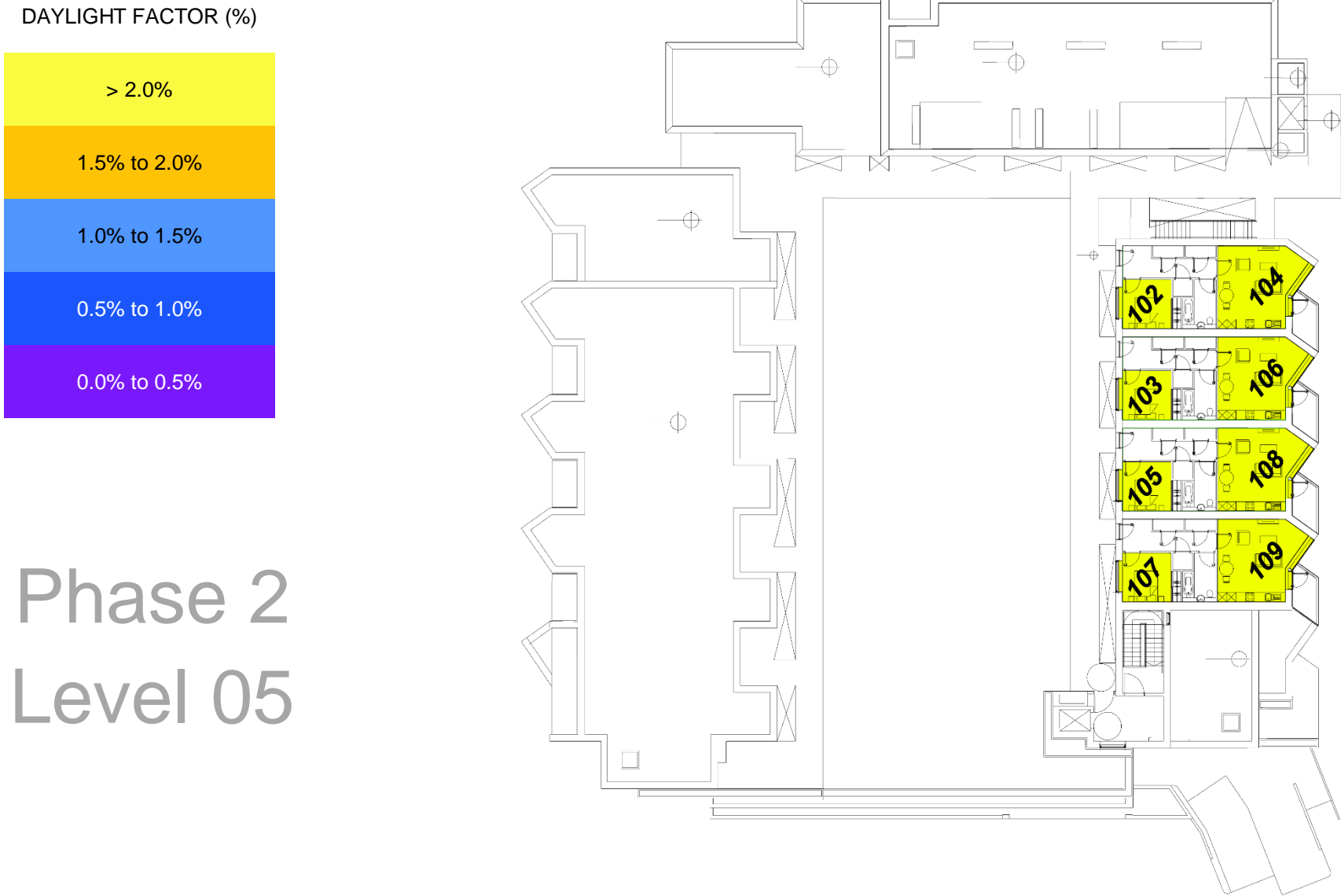


Figure 13 Daylight factor distribution diagram for rooms assessed at Level 02 in Phase 1 Development.

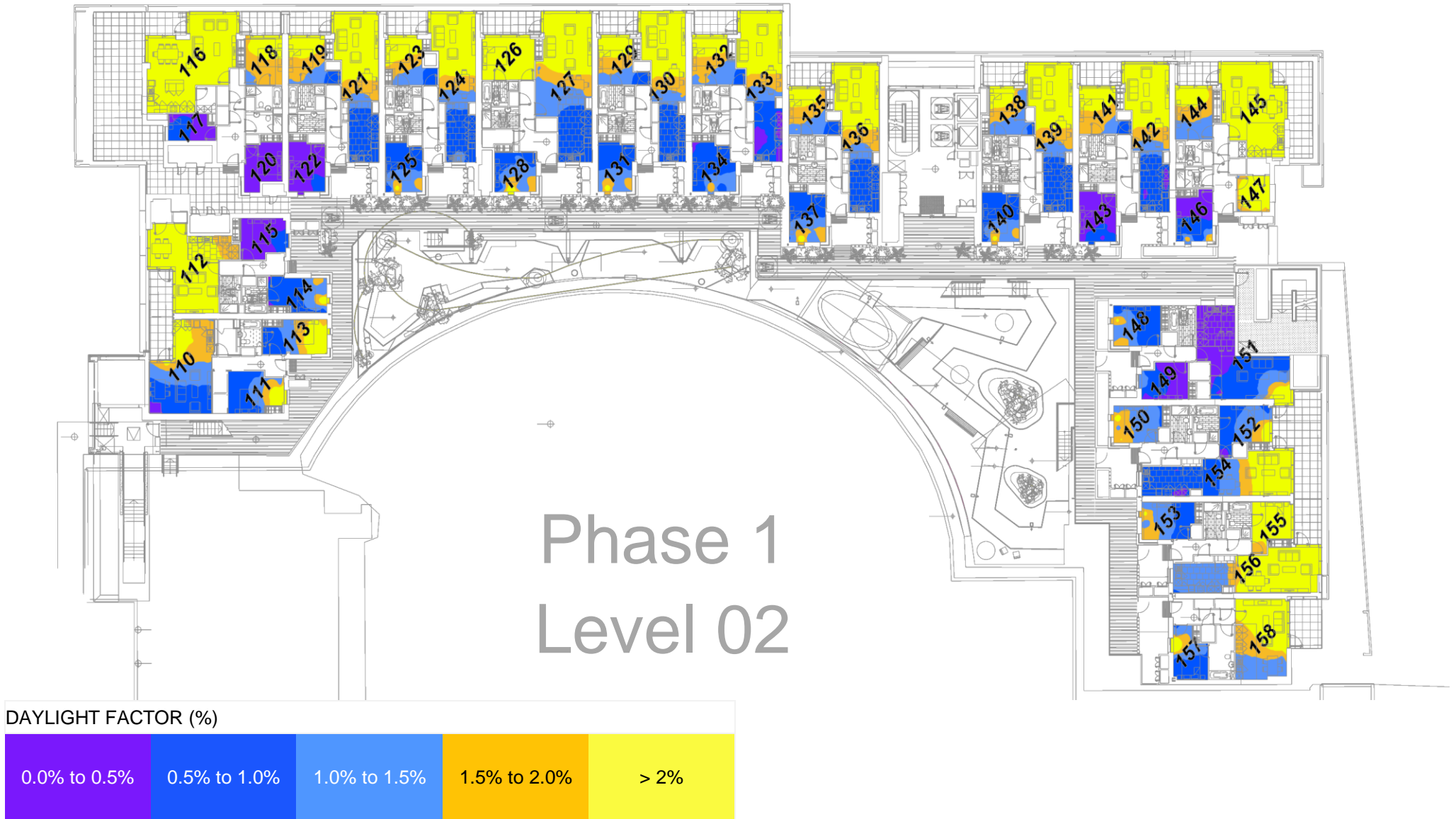


Figure 14 Daylight factor distribution diagram for rooms assessed at Level 03 in Phase 1 Development.

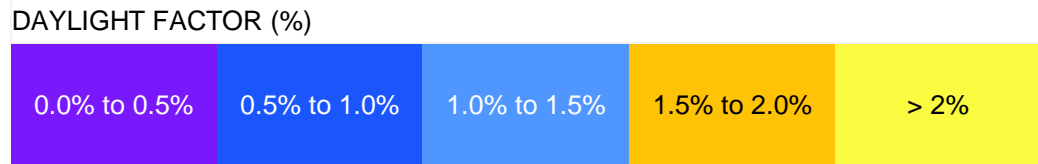
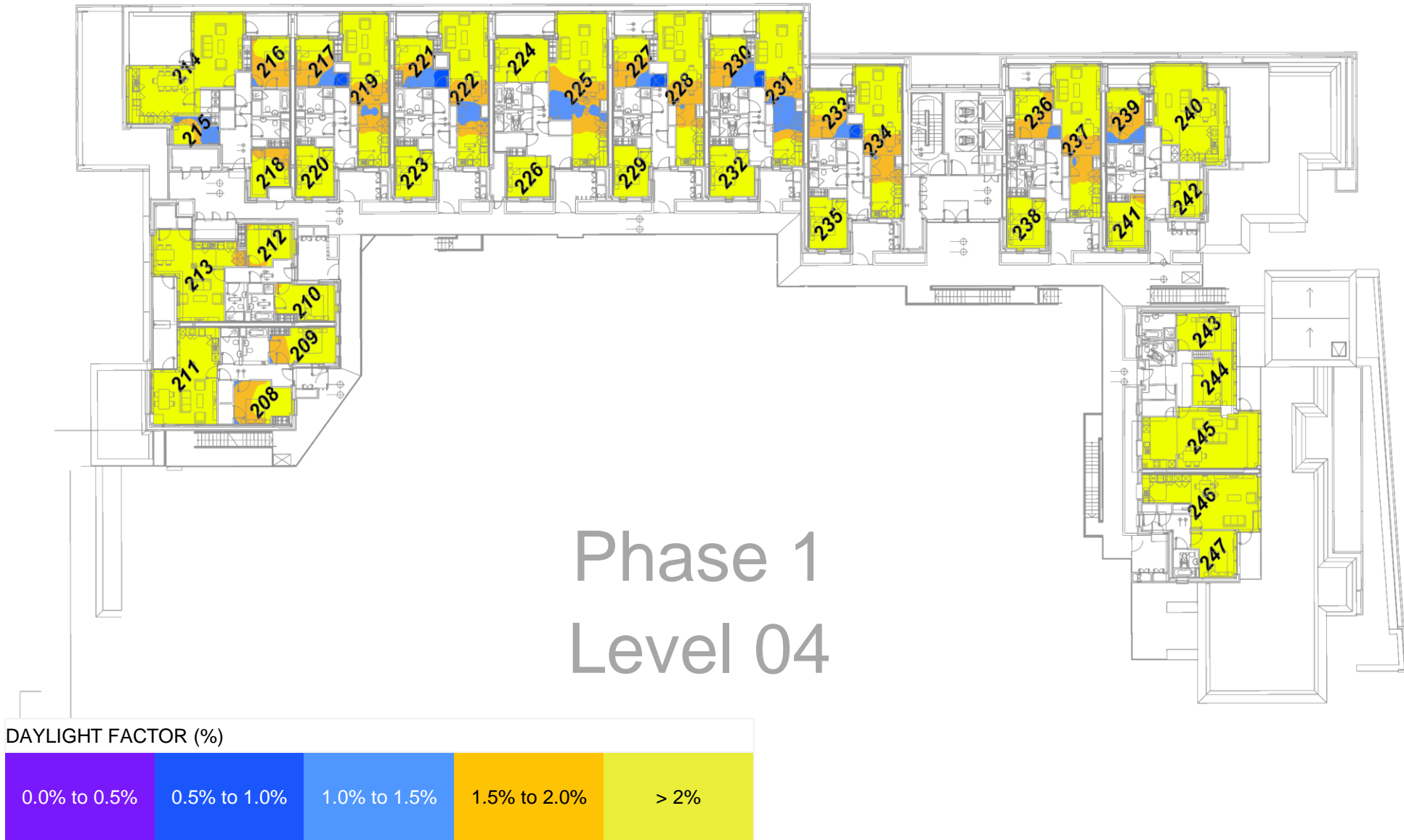


Figure 15 Daylight factor distribution diagram for rooms assessed at Level 04 in Phase 1 Development.



Study E: Assessment of direct sunlight access available to proposed accommodation

Sunlight, within the meaning of BS 8206 and the BRE Guide, is understood to relate to the visible portion of direct beam radiation; it is the visible light which travels directly from the sun as parallel rays.

From an amenity point of view, direct sunlight is generally welcomed for its ability to enliven the appearance of an interior (direct sunlight creates dynamic patches of brilliant light on walls, floors and furniture) but also for its ability to provide warmth and heat to a space.

In Ireland, due to the prevalence of overcast conditions, the availability of direct sunlight is typically limited to a small number of hours in the day. Over the course of a typical year, the average daily duration when direct sunlight is available in Dublin is approximately four hours⁶. The number of hours in a day when sunlight can enter a given window will be much lower because of its particular orientation and the presence of occluding obstructions.

It is on this basis that sunlight cannot be relied upon to provide basic daylighting within interior spaces. Basic daylighting within interior spaces is provided by diffuse light from the sky⁷, which while not as bright as direct sunlight, is always available during daytime hours.

⁶ <https://www.met.ie/climate-ireland/1981-2010/dublin.html>

⁷ The degree to which the spaces in this development would be lit by diffuse light from the sky has been assessed in Study A.

Following from this, it is reasonable to propose that in Ireland the daylight amenity within a space is not as critically reliant on the presence of sunlight as it is on the presence of skylight. Stated another way, a room which receives good levels of skylight, but poor levels of sunlight, can still be expected to maintain a pleasant and bright appearance for most parts of the day; in contrast, a room which receives good levels of sunlight, but poor levels of skylight, is likely to present as gloomy and unpleasant for extended periods.

In recognition of the secondary importance which sunlight plays in the provision of internal daylight amenity, it is reasonable to propose that a lenient and flexible approach should be adopted when interpreting the significance of sunlight results. This approach is advocated within both the BRE Guide and BS 8206. Further to this it is important to note that the BRE guide recognises that it is not realistic for every unit within an apartment block to achieve full compliance with sunlight standards⁸.

Study E: 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.

⁸ This claim is supported by the information provided in Figure 26 on page 15 of the BRE guide, 'Site layout planning for daylight and sunlight. A guide to good practice.' 2nd Edition.

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 (taken to fall between the 21st of September and the 21st of March).

As these particular criteria are often challenging to meet the BRE advocates that the assessment criteria should be applied with a degree of flexibility.

Adopting a flexible approach in the assessment of sunlight amenity is necessary as the performance targets recommended in BS 8206 and the BRE Guide can be challenging to meet in many circumstances. The performance targets for sunlight provision are particularly challenging to meet in urban locations where neighbouring buildings and site orientation can often conspire to restrict access to direct sunlight. Guidance on this matter is provided within Section 5.3 of the British Standards, BS 8206:

“The degree of satisfaction is related to the expectation of sunlight. If a room is necessarily north facing or if the building is in a densely built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary.”

Further to this the BRE advise that, in cases where it is not possible to demonstrate full compliance with sunlight targets at living room windows, it is possible to conclude that occupants would still maintain access to sufficient sunlight in scenarios where the targets can be satisfied at a window serving an alternative room within the dwelling⁹. This relaxation has been availed of where necessary in this assessment.

Study E: Assessment Points

Sunlight access (APSH) has been assessed at all the windows serving habitable accommodation within this development; a total of 881 windows have been considered.

⁹ The validity of this approach is confirmed within section 5.5 of review document which was prepared by the author of the BRE guide (PJ Littlefair) in support of the

planning application which was lodged for the ESB Headquarters on Lower Fitzwilliam Street, DCC Reg. Ref.: 3052/14.

Study E: Results

In line with the recommendations provided within the BRE guide, sunlight access has been assessed with principal regard to the main living rooms which are present in each apartment. The results obtained for annual sunlight levels are presented in Figure 16, Figure 17, Figure 18, Figure 19, Figure 20, Figure 26, Figure 27 and Figure 28; results for winter sunlight levels are presented in Figure 21, Figure 22, Figure 23, Figure 24, Figure 25, Figure 29, Figure 30, Figure 31.

The results obtained in this study indicate that occupants would be provided with acceptable levels of sunlight access in most cases. An overall compliance rate of 54% is predicted when annual sunlight levels are considered (see Table 12); an overall compliance rate of 51% is estimated when winter sunlight levels are considered (see Table 13). In assessing the significance of these compliance rates, it is important to bear a number of factors in mind.

In the first instance it is important to appreciate that access to direct sunlight is of secondary importance to the provision of internal skylight amenity (as assessed in Study D); it follows that a lower level of significance should be attributed to departures registering.

It is also important to recognise that the compliance rates reported above have been determined with reference to a strict interpretation of the BRE guidelines. This strict interpretation assumes that the levels of sunlight provided within a unit are linked exclusively to the sunlight levels which

register within the main living room. Having regard to the possibility that occupants are also likely to seek and enjoy sunlight which registers in other rooms within their apartments, it is reasonable to propose that this additional sunlight should be accounted for.

When sunlight access is assessed with regard to the unique number of probable sunlight hours which register within both the main living room and the other habitable rooms which are present within a given unit a higher proportion of units are found to satisfy the minimum 25% APSH target recommended by the BRE. When this relaxation is adopted 91% of the units within this development are found to either meet or exceed an APSH target of 25%; when winter sunlight is assessed on this basis 83% of units are found to receive at least 5% of APSH during winter months.

Further to the above it is helpful to consider the unique development constraints which have been encountered on this site. More specifically it is important to recognise that the pursuit of a compact development form which addresses the main Frascati Road creates a principal elevation within Phase 1 which faces in a north easterly direction. While the accommodation which sits on this elevation will inevitably receive reduced levels of sunlight, it is reasonable to propose that the views over Dublin Bay act as a compensating factor.

When assessed in the round, and in relation to wider planning imperatives, it is possible to conclude that acceptable levels of internal sunlight amenity would be provided within this development.

Table 8 Proportion of units in Phase 2 complying with BRE guidelines for annual probable sunlight hours.

	Total Number of Units	No. of Units which fully comply with BRE guidelines for annual sunlight hours	Strict Compliance Rate
L01	16	7	44%
L02	16	12	75%
L03	13	12	92%
L04	8	8	100%
L05	4	4	100%
Total	57	43	75%

Table 9 Proportion of units in Phase 2 complying with BRE guidelines for annual probable sunlight hours registering during winter months

	Total Number of Units	No. of Units which fully comply with BRE guidelines for annual sunlight hours registering during winter months	Strict Compliance Rate
L01	16	6	38%
L02	16	8	50%
L03	13	13	100%
L04	8	8	100%
L05	4	4	100%
Total	57	39	68%

Table 10 Proportion of units in Phase 1 complying with BRE guidelines for annual probable sunlight hours.

	Total Number of Units	No. of Units which fully comply with BRE guidelines for annual sunlight hours	Strict Compliance Rate
L02	16	5	31%
L03	16	4	25%
L04	13	3	23%
Total	45	12	27%

Table 11 Proportion of units in Phase 1 complying with BRE guidelines for annual probable sunlight hours registering during winter months

	Total Number of Units	No. of Units which fully comply with BRE guidelines for annual sunlight hours registering during winter months	Strict Compliance Rate
L02	16	5	31%
L03	16	5	31%
L04	13	3	23%
Total	45	13	29%

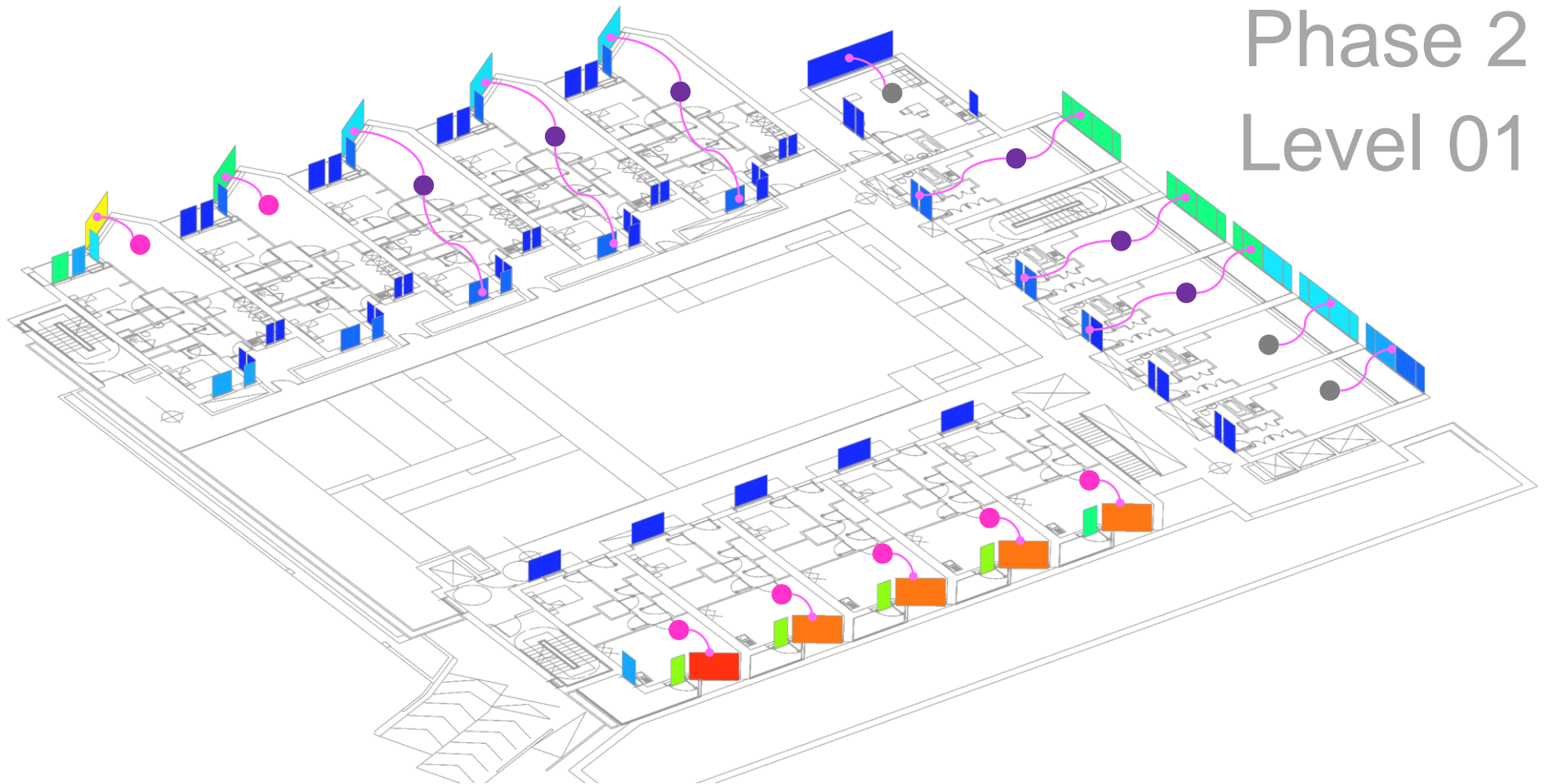
Table 12 Proportion of units in total development (Phase 1 and Phase 2 combined) complying with BRE guidelines for annual probable sunlight hours.

	Total Number of Units	No. of Units which fully comply with BRE guidelines for annual sunlight hours	Strict Compliance Rate
L01	16	7	44%
L02	32	17	53%
L03	29	16	55%
L04	21	11	52%
L05	4	4	100%
Total	102	55	54%

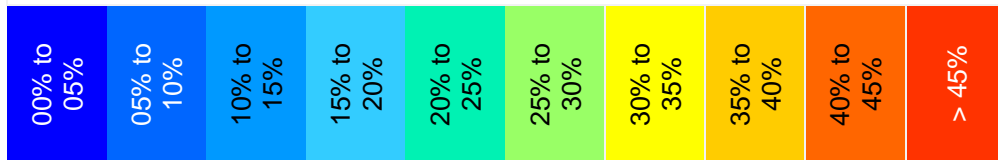
Table 13 Proportion of units in total development (Phase 1 and Phase 2 combined) complying with BRE guidelines for annual probable sunlight hours registering during winter months

	Total Number of Units	No. of Units which fully comply with BRE guidelines for annual sunlight hours	Strict Compliance Rate
L01	16	6	38%
L02	32	13	41%
L03	29	18	62%
L04	21	11	52%
L05	4	4	100%
Total	102	52	51%

Figure 16 Annual Probable Sunlight Hours predicted for windows located at Level 01 within Phase 2 Development.



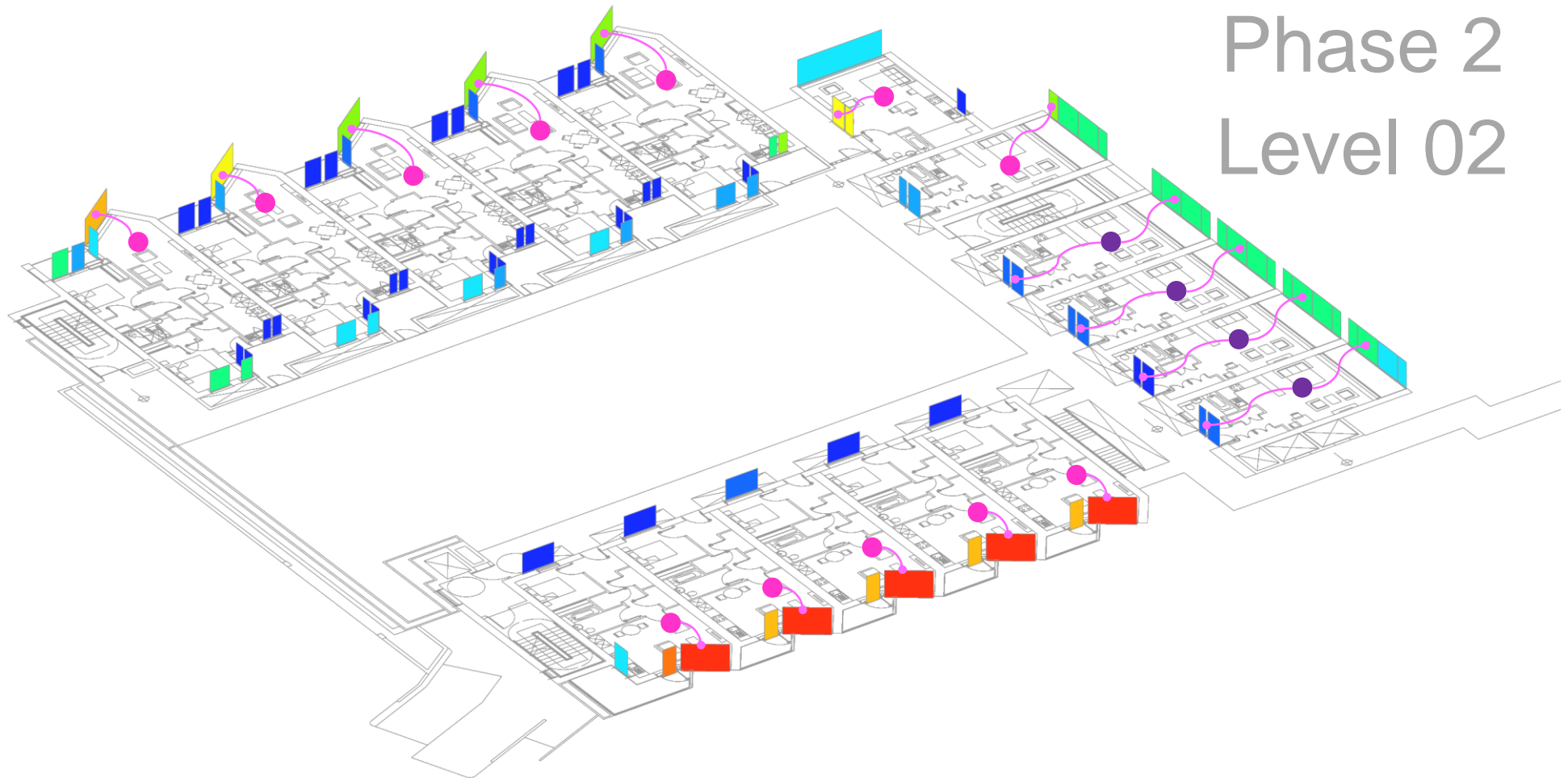
ANNUAL PROBABLE SUNLIGHT HOURS (%)



CONFORMITY WITH GUIDELINES

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	7	●
No. Unit which satisfy relaxed BRE criteria	6	●
No. Units which fall short of BRE criteria	3	●

Figure 17 Annual Probable Sunlight Hours predicted for windows located at Level 02 within Phase 2 Development.

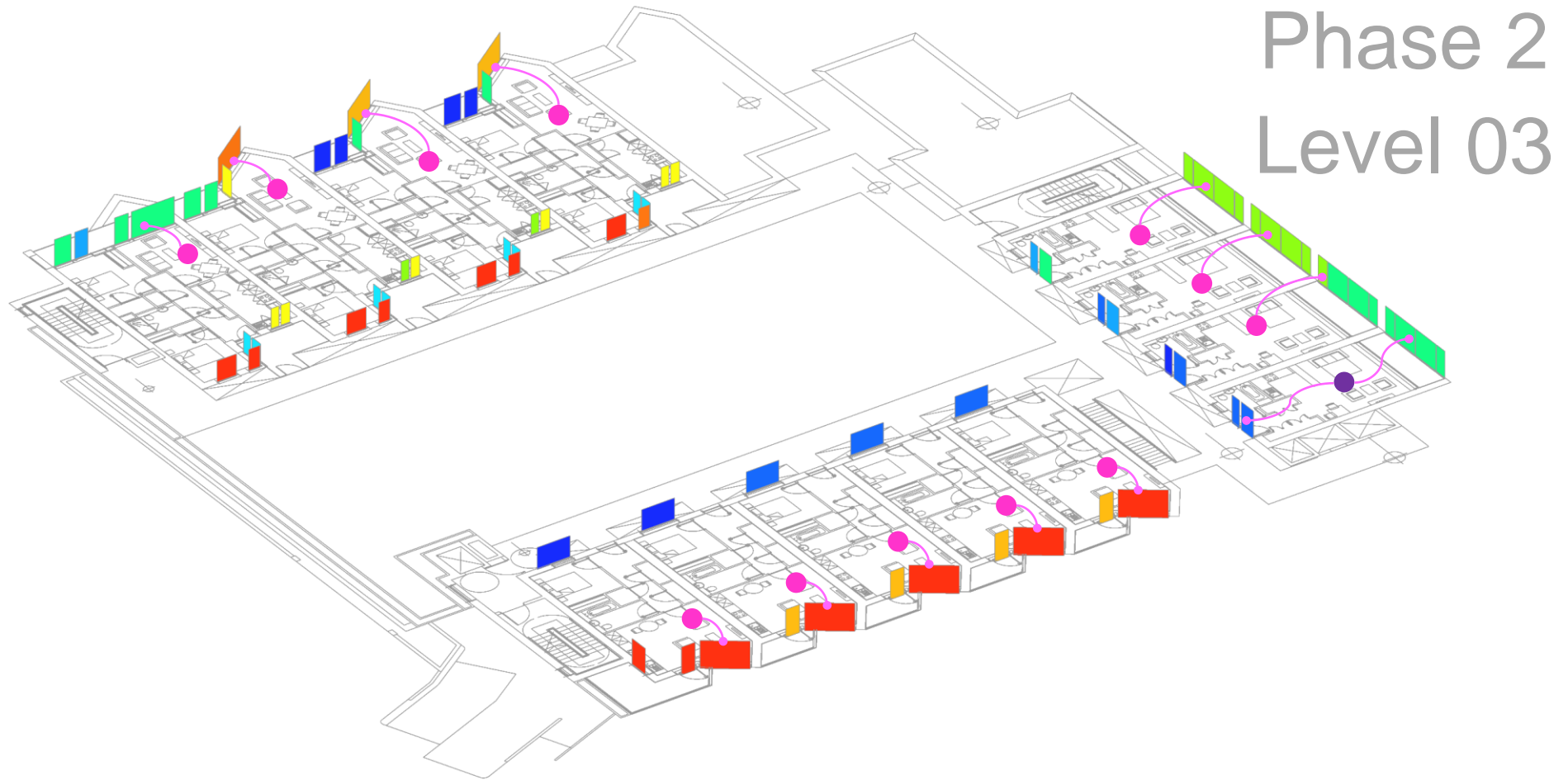


Phase 2 Level 02

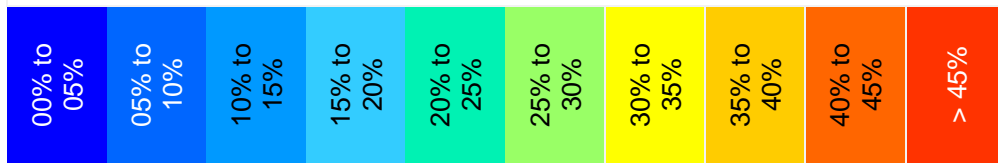
ANNUAL PROBABLE SUNLIGHT HOURS (%)									
00% to 05%	05% to 10%	10% to 15%	15% to 20%	20% to 25%	25% to 30%	30% to 35%	35% to 40%	40% to 45%	> 45%

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	12	●
No. Unit which satisfy relaxed BRE criteria	4	●
No. Units which fall short of BRE criteria	0	●

Figure 18 Annual Probable Sunlight Hours predicted for windows located at Level 03 within Phase 2 Development.



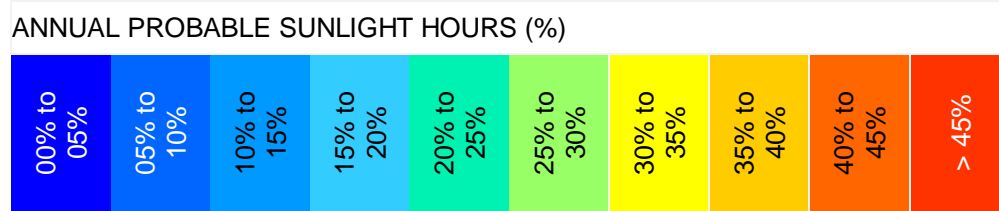
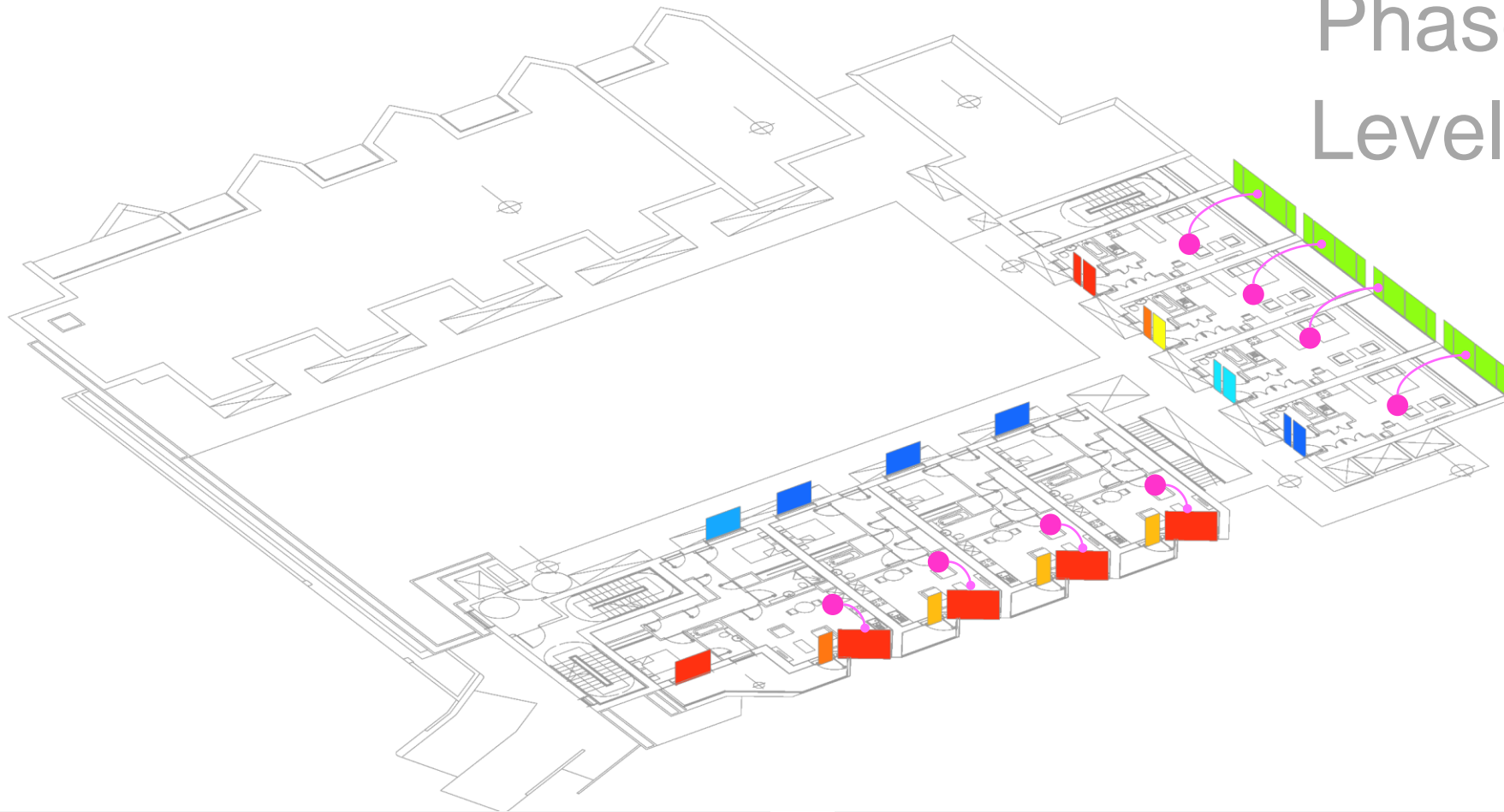
ANNUAL PROBABLE SUNLIGHT HOURS (%)



CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	12	●
No. Unit which satisfy relaxed BRE criteria	1	●
No. Units which fall short of BRE criteria	0	●

Figure 19 Annual Probable Sunlight Hours predicted for windows located at Level 04 within Phase 2 Development.

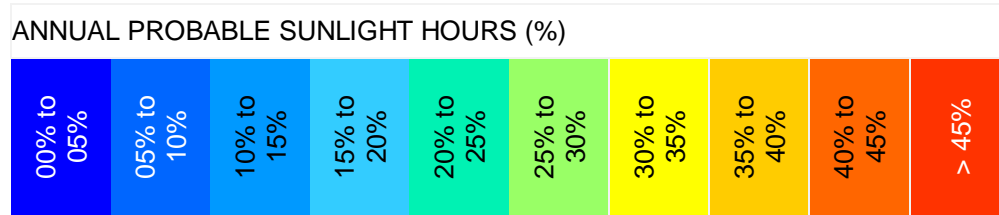
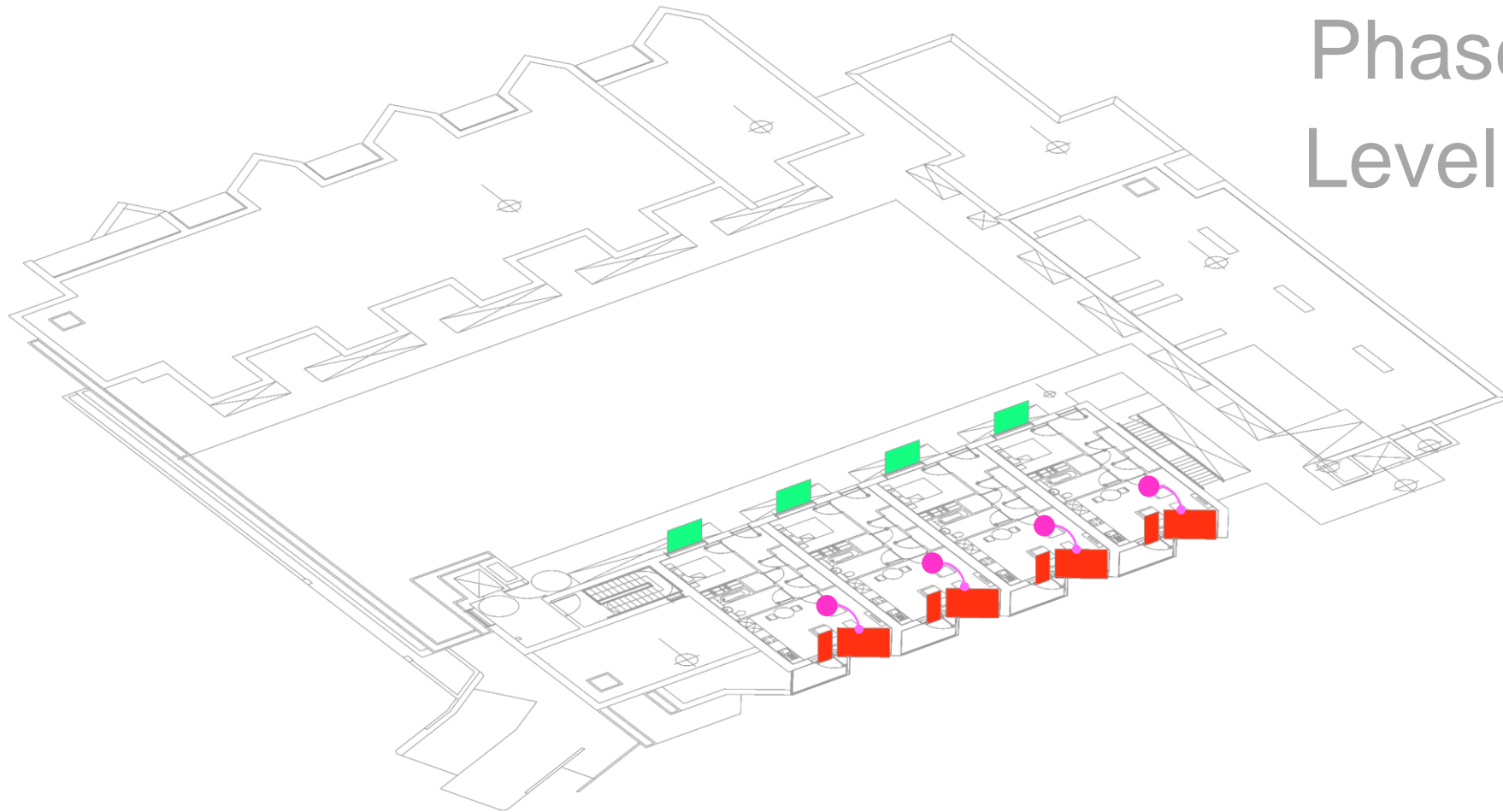
Phase 2 Level 04



CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	8	●
No. Unit which satisfy relaxed BRE criteria	0	●
No. Units which fall short of BRE criteria	0	●

Figure 20 Annual Probable Sunlight Hours predicted for windows located at Level 05 within Phase 2 Development.

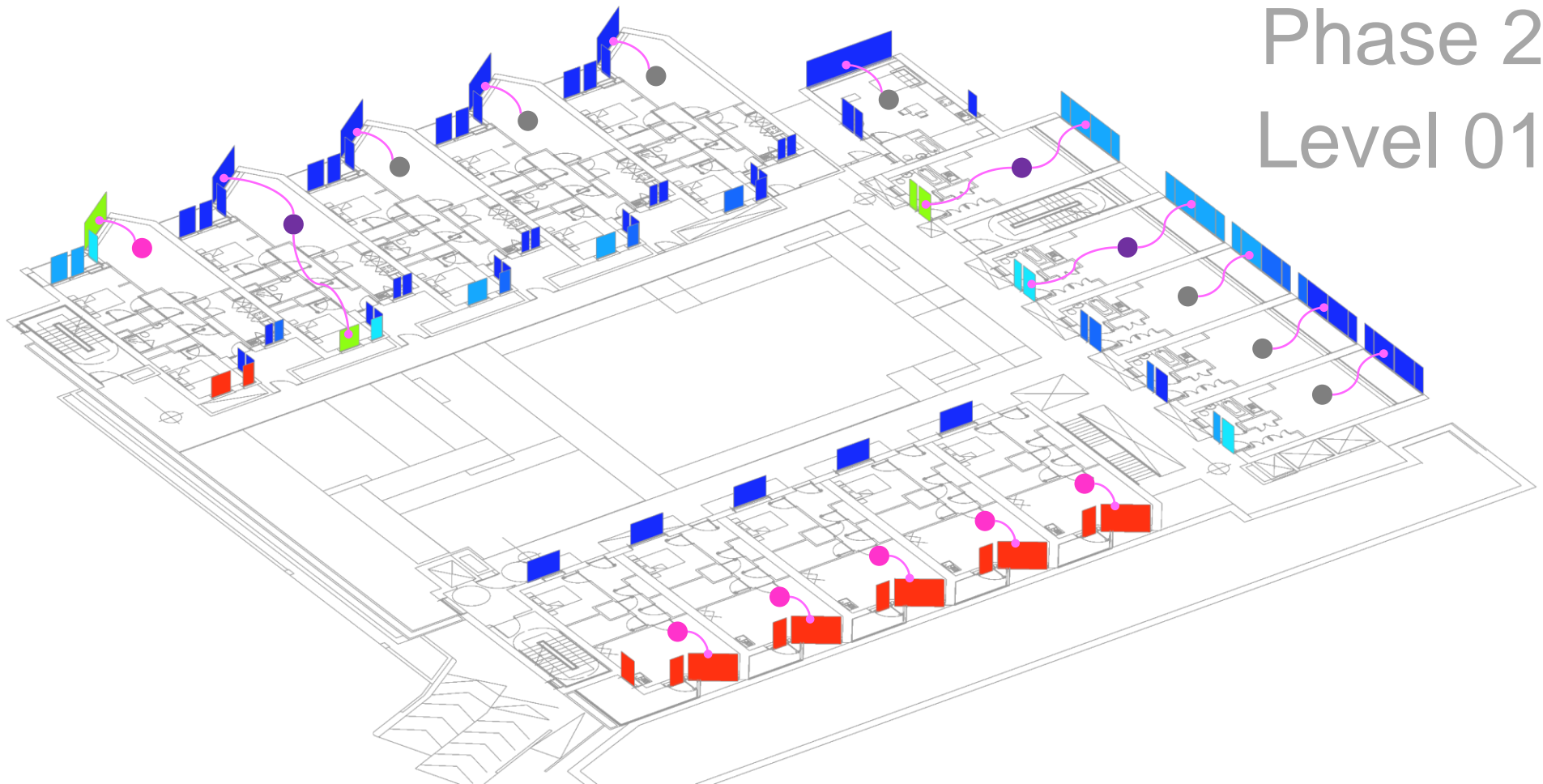
Phase 2 Level 05



CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	4	●
No. Unit which satisfy relaxed BRE criteria	0	●
No. Units which fall short of BRE criteria	0	●

Figure 21 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 01 within Phase 2 Development

Phase 2 Level 01

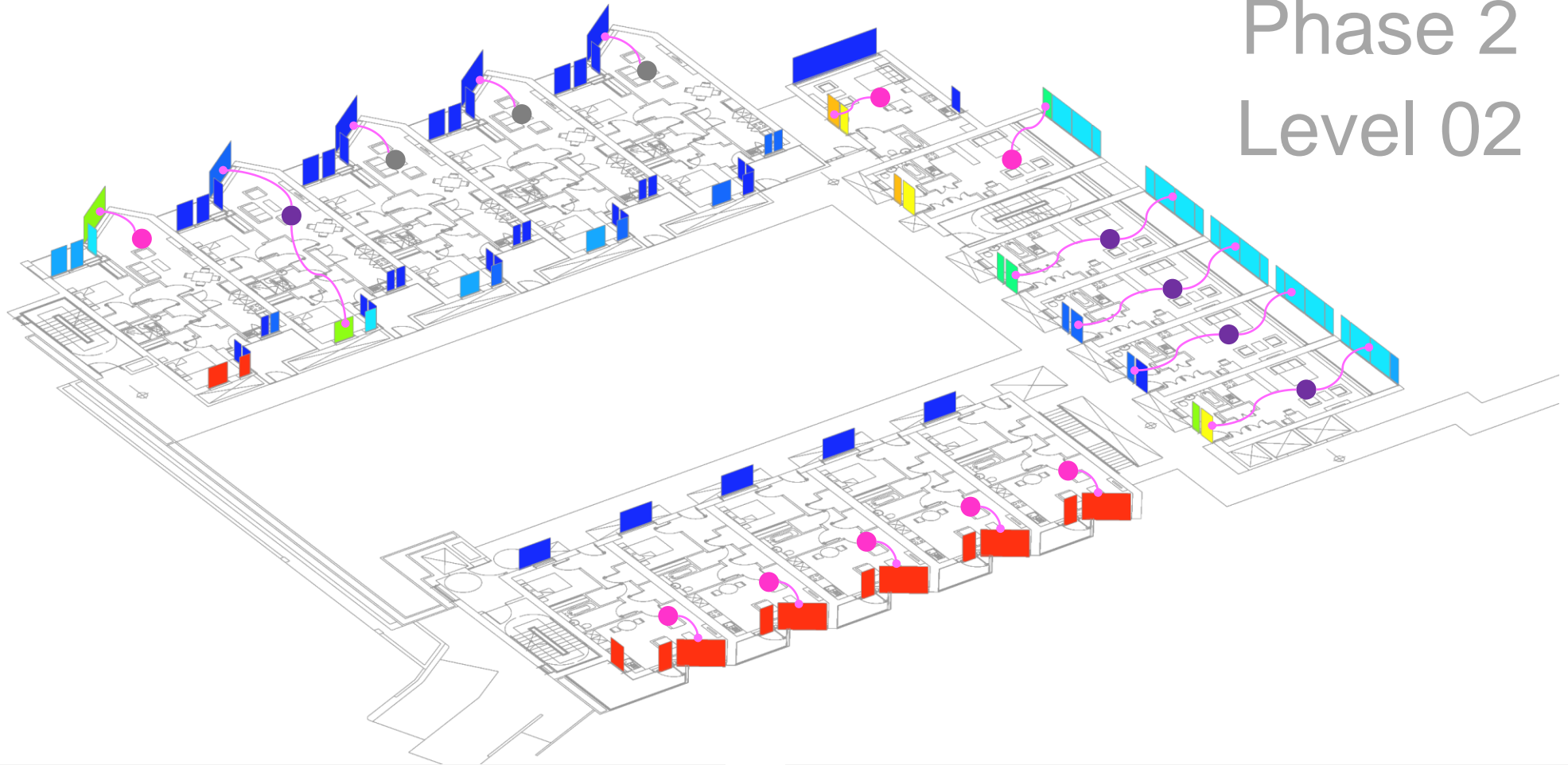


ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS									
00% to 01%	01% to 02%	02% to 03%	03% to 04%	04% to 05%	05% to 06%	06% to 07%	07% to 08%	08% to 09%	> 09%

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	6	● (Pink)
No. Unit which satisfy relaxed BRE criteria	3	● (Purple)
No. Units which fall short of BRE criteria	7	● (Grey)

Figure 22 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 02 within Phase 2 Development

Phase 2 Level 02

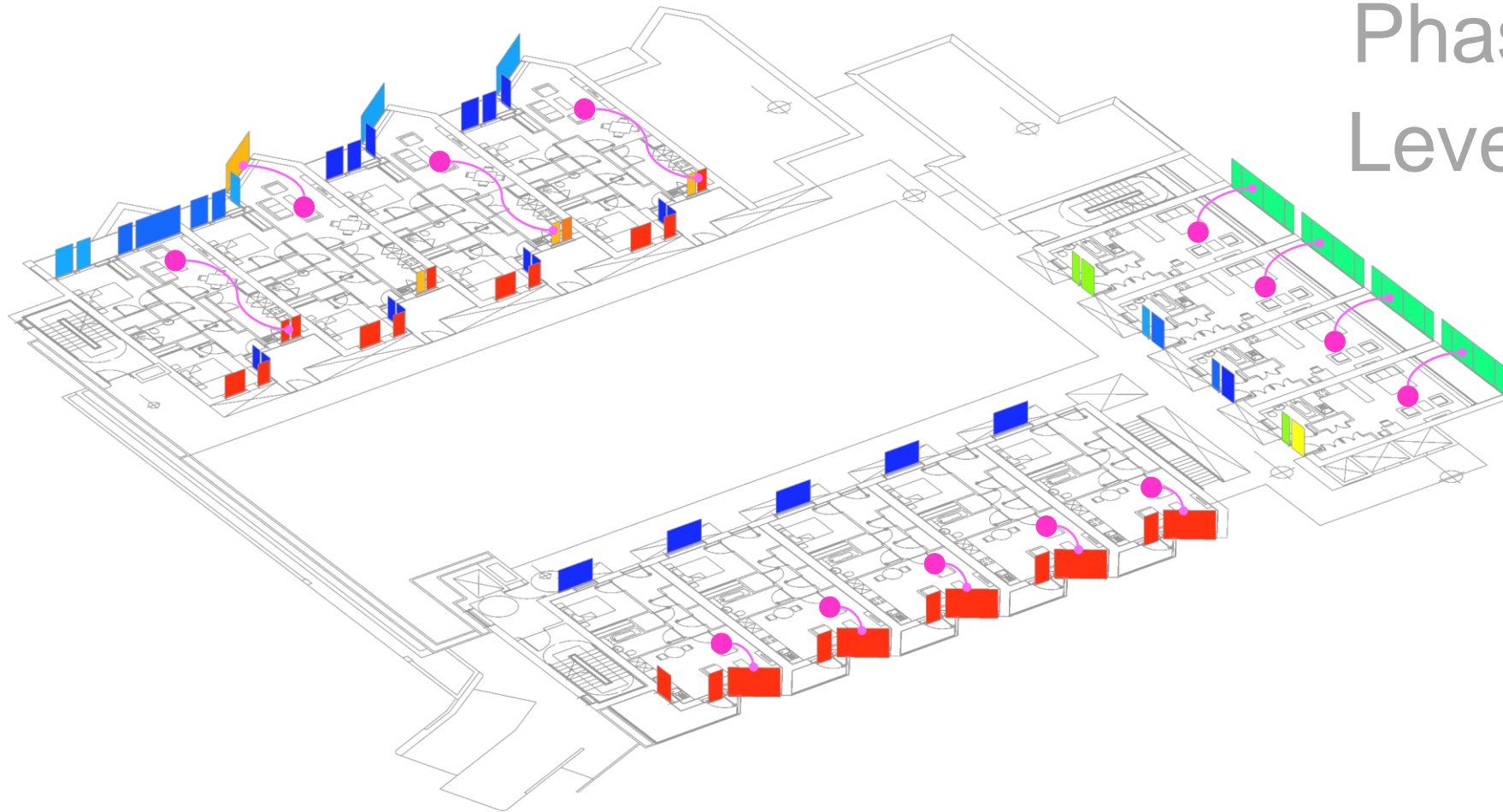


ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS									
00% to 01%	01% to 02%	02% to 03%	03% to 04%	04% to 05%	05% to 06%	06% to 07%	07% to 08%	08% to 09%	> 09%

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	8	●
No. Unit which satisfy relaxed BRE criteria	5	●
No. Units which fall short of BRE criteria	3	●

Figure 23 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 03 within Phase 2 Development

Phase 2 Level 03

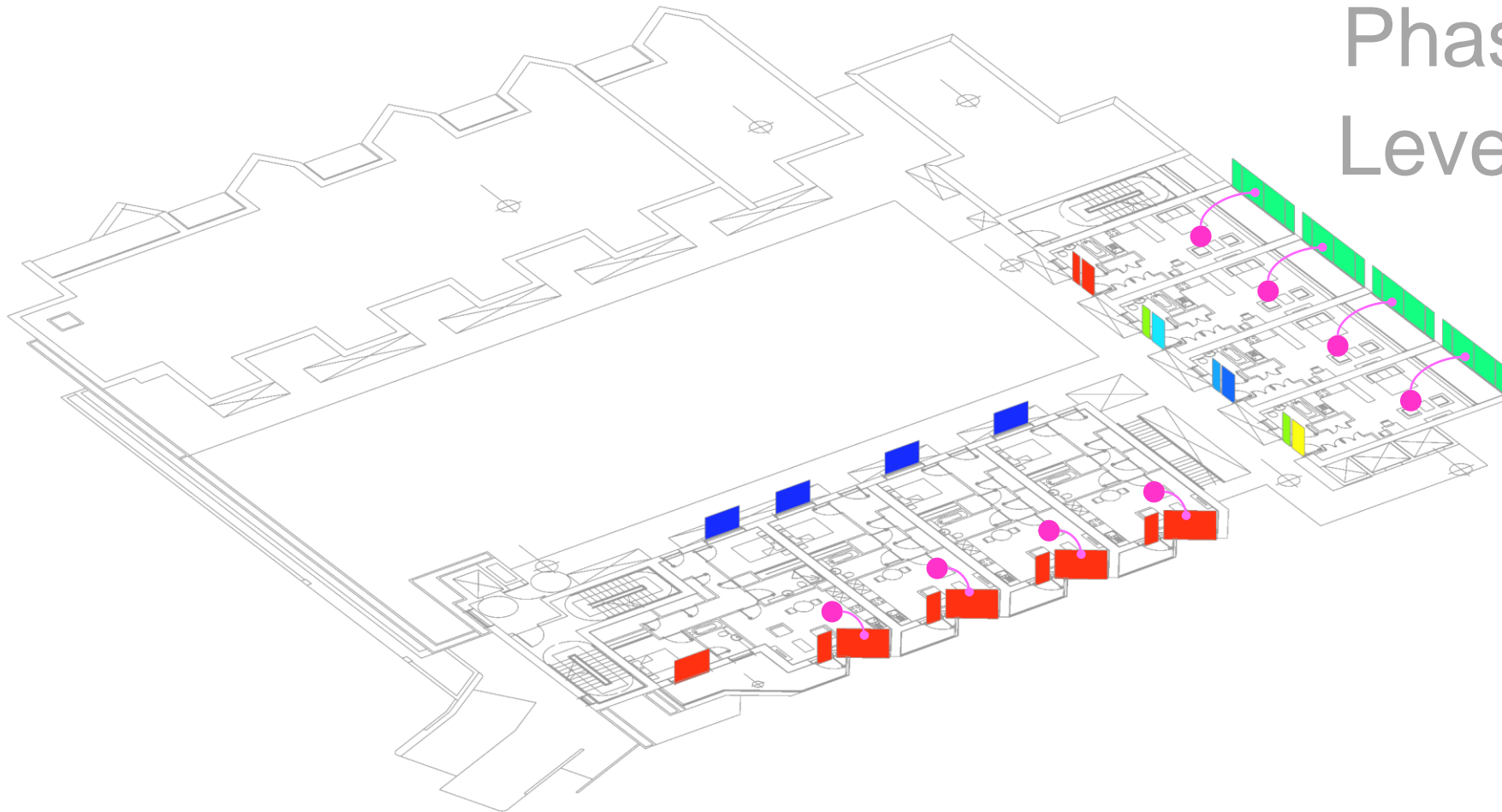


ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS									
00% to 01%	01% to 02%	02% to 03%	03% to 04%	04% to 05%	05% to 06%	06% to 07%	07% to 08%	08% to 09%	> 09%

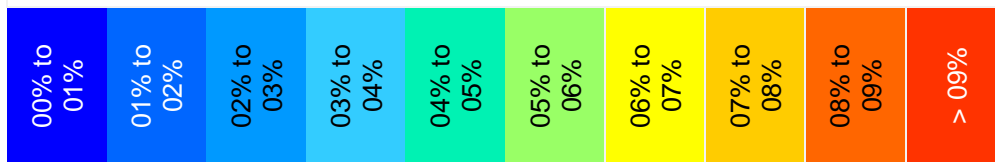
CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	13	●
No. Unit which satisfy relaxed BRE criteria	0	●
No. Units which fall short of BRE criteria	0	●

Figure 24 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 04 within Phase 2 Development

Phase 2 Level 04



ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS

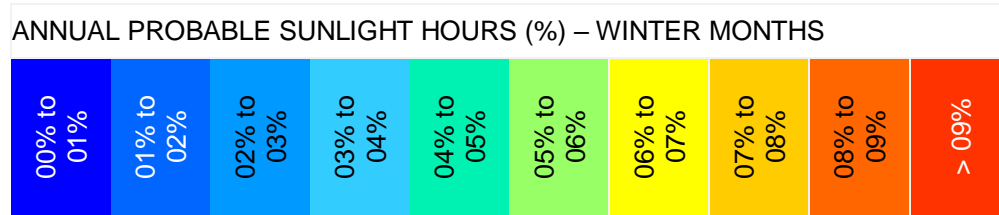
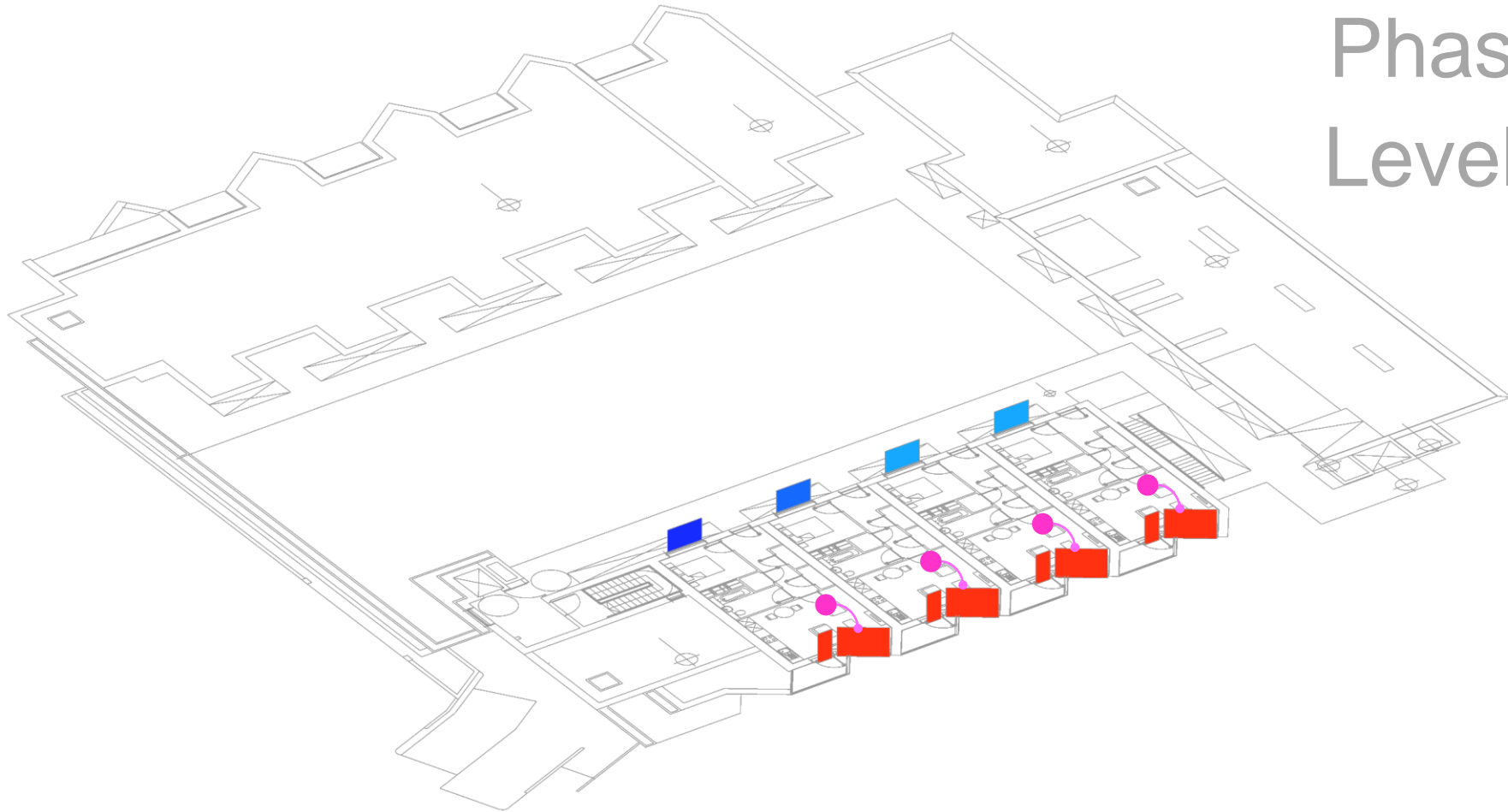


CONFORMITY WITH GUIDELINES

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	8	●
No. Unit which satisfy relaxed BRE criteria	0	●
No. Units which fall short of BRE criteria	0	●

Figure 25 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 05 within Phase 2 Development

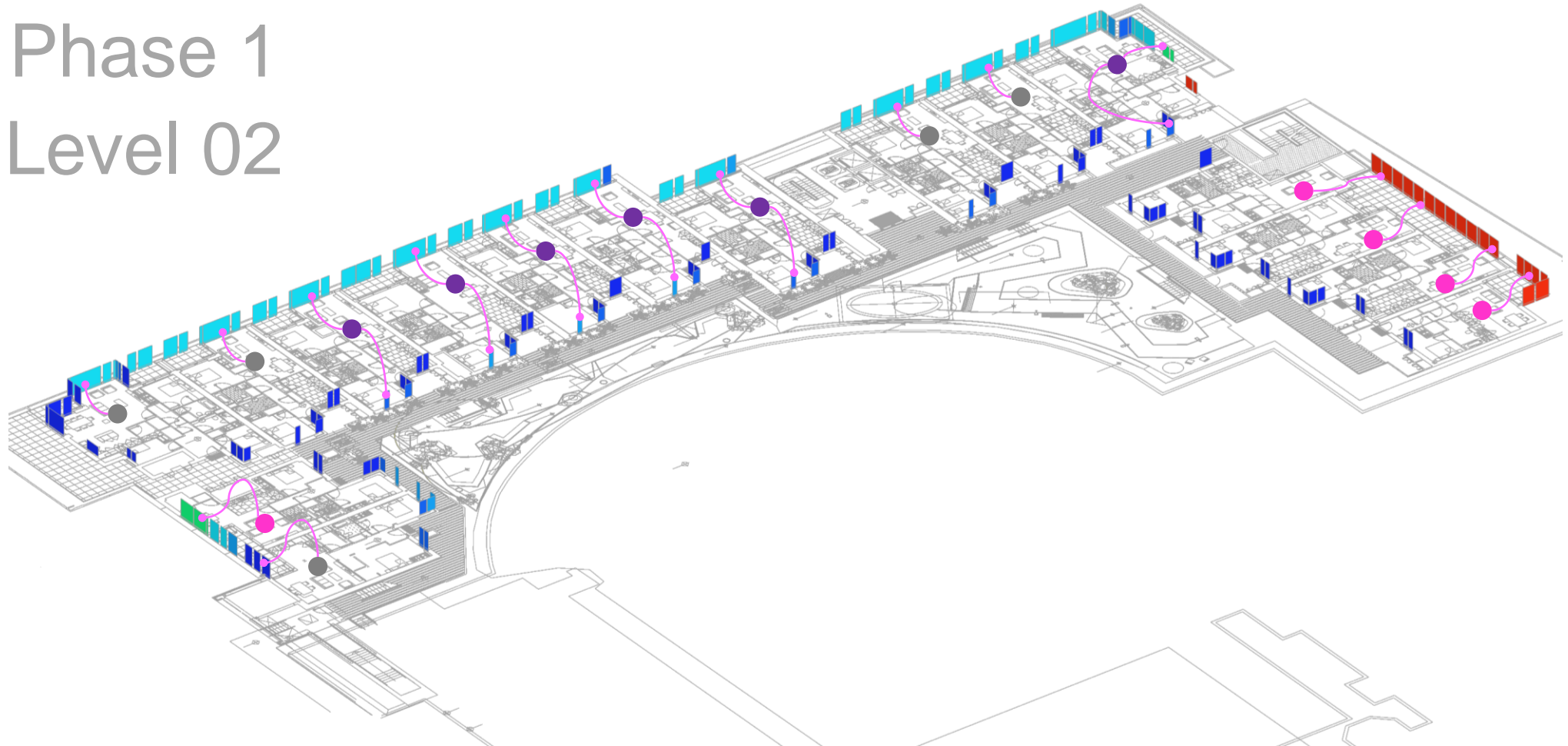
Phase 2 Level 05



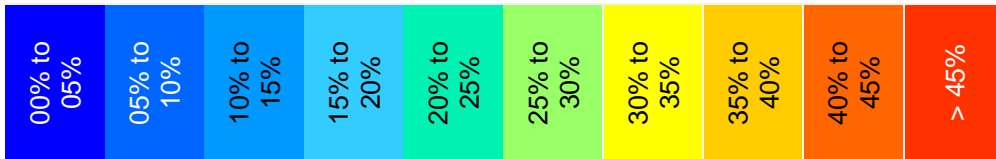
CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	4	●
No. Unit which satisfy relaxed BRE criteria	0	●
No. Units which fall short of BRE criteria	0	●

Figure 26 Annual Probable Sunlight Hours predicted for windows located at Level 02 within Phase 1 Development.

Phase 1 Level 02



ANNUAL PROBABLE SUNLIGHT HOURS (%)



CONFORMITY WITH GUIDELINES

- No. Units which satisfy strict BRE criteria
- No. Unit which satisfy relaxed BRE criteria
- No. Units which fall short of BRE criteria

QUANTITY

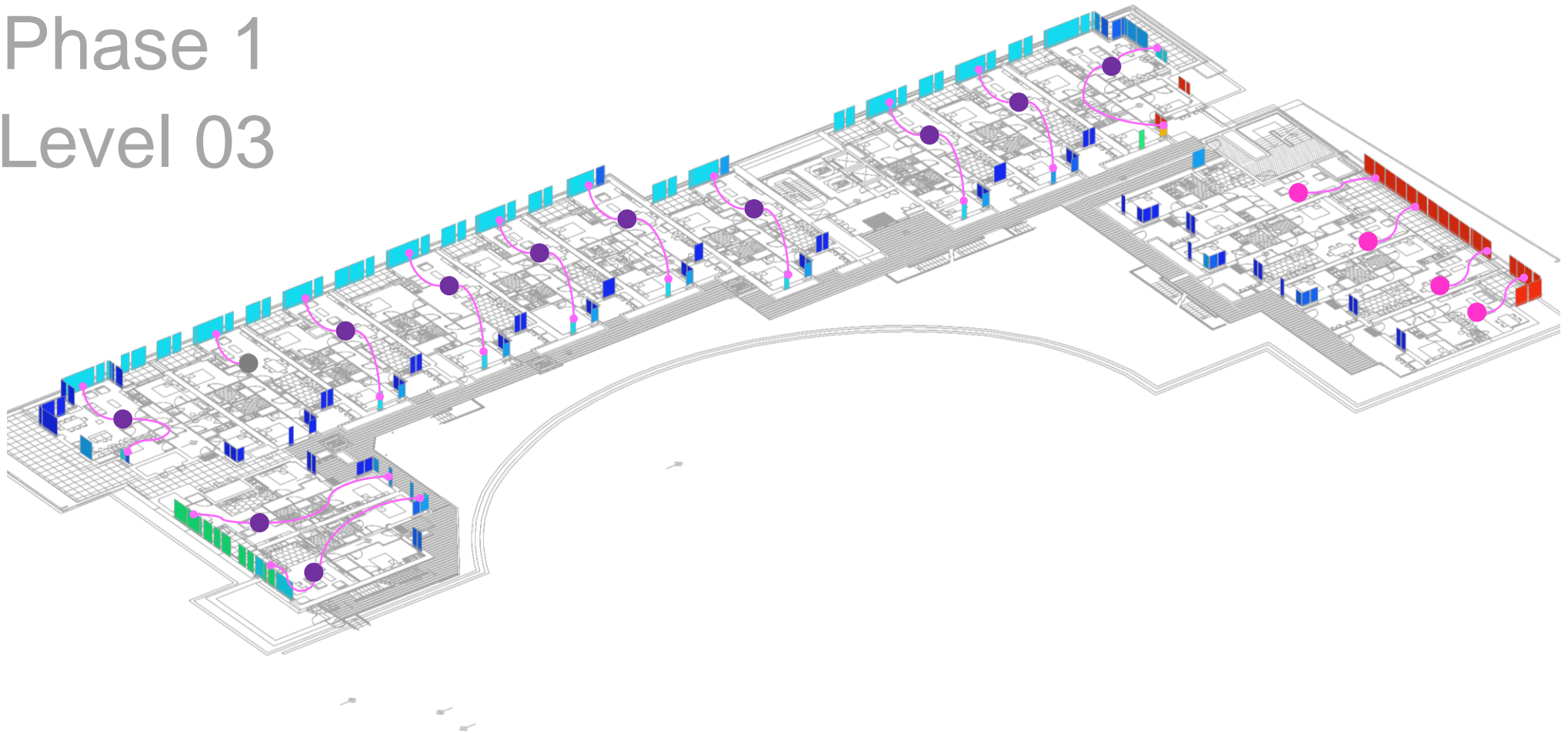
- 5
- 6
- 5

INDICATOR

-
-
-

Figure 27 Annual Probable Sunlight Hours predicted for windows located at Level 03 within Phase 1 Development.

Phase 1 Level 03

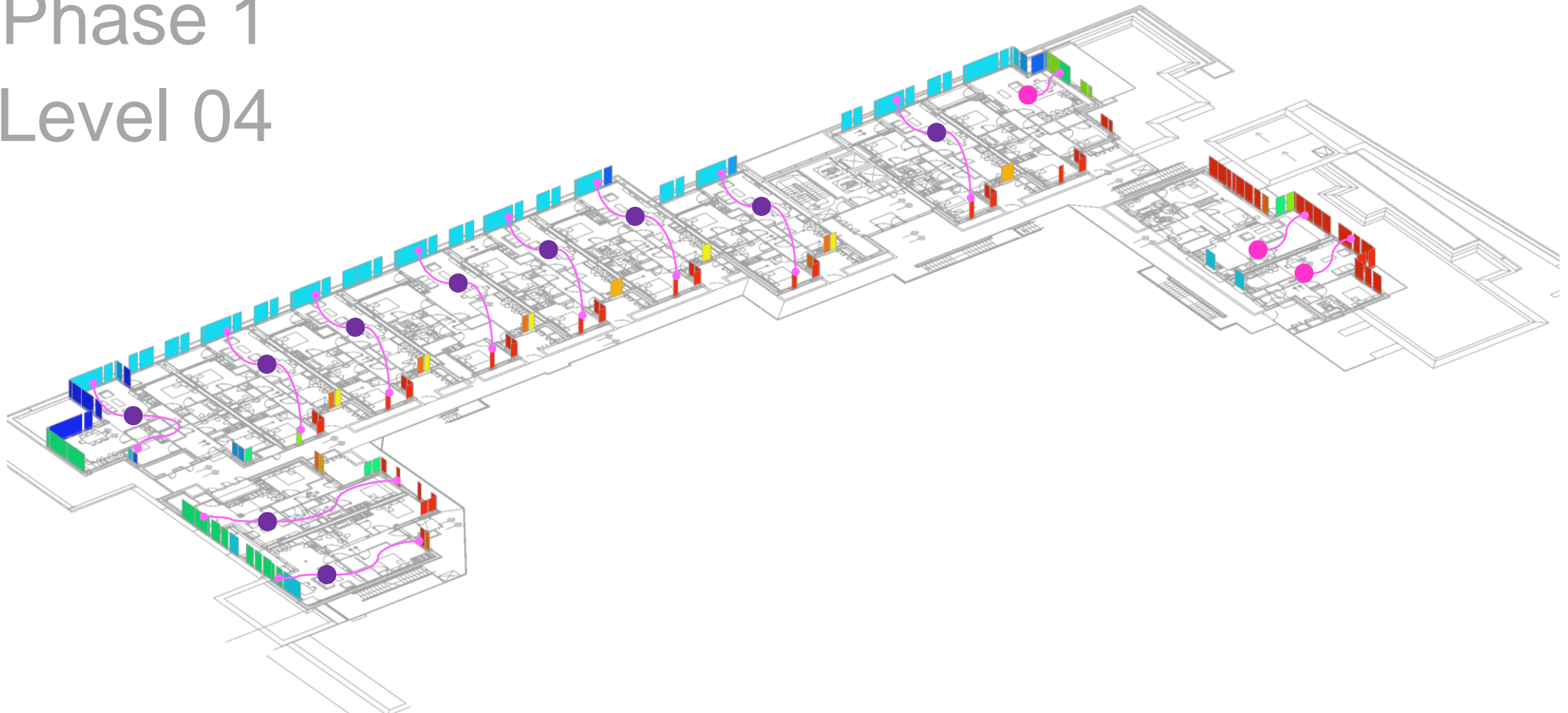


ANNUAL PROBABLE SUNLIGHT HOURS (%)									
00% to 05%	05% to 10%	10% to 15%	15% to 20%	20% to 25%	25% to 30%	30% to 35%	35% to 40%	40% to 45%	> 45%

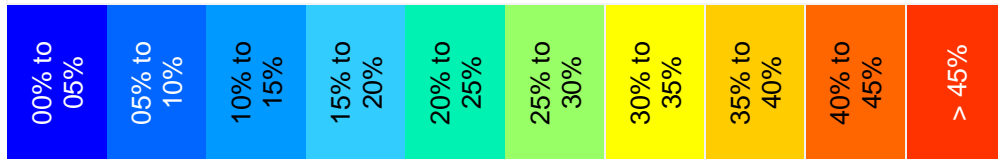
CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	4	● (Pink)
No. Unit which satisfy relaxed BRE criteria	11	● (Purple)
No. Units which fall short of BRE criteria	1	● (Grey)

Figure 28 Annual Probable Sunlight Hours predicted for windows located at Level 04 within Phase 1 Development.

Phase 1 Level 04



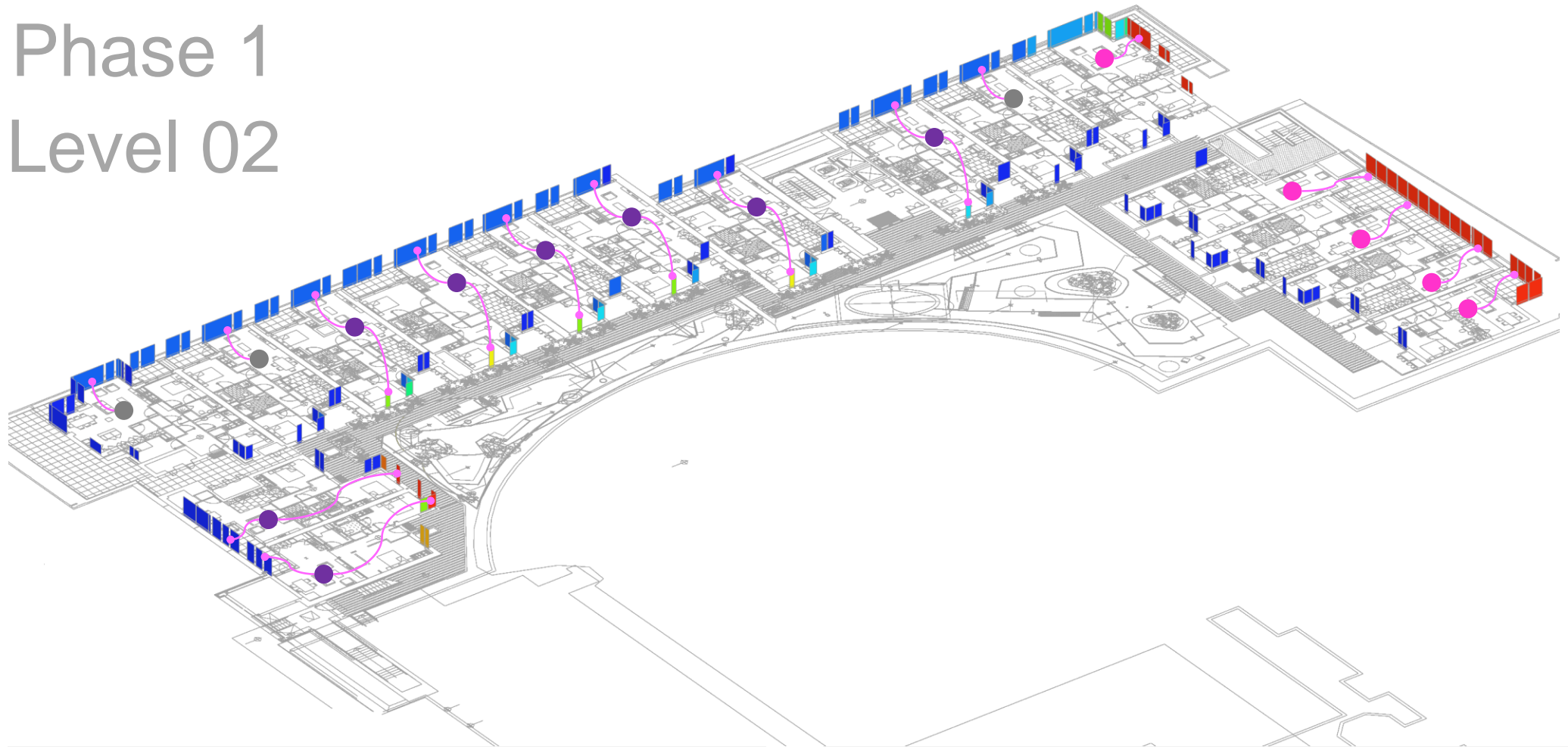
ANNUAL PROBABLE SUNLIGHT HOURS (%)



CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	3	●
No. Unit which satisfy relaxed BRE criteria	10	●
No. Units which fall short of BRE criteria	0	●

Figure 29 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 02 within Phase 1 Development

Phase 1 Level 02



ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS									
00% to 01%	01% to 02%	02% to 03%	03% to 04%	04% to 05%	05% to 06%	06% to 07%	07% to 08%	08% to 09%	> 09%

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	5	●
No. Unit which satisfy relaxed BRE criteria	8	●
No. Units which fall short of BRE criteria	3	●

Figure 30 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 03 within Phase 1 Development

Phase 1 Level 03

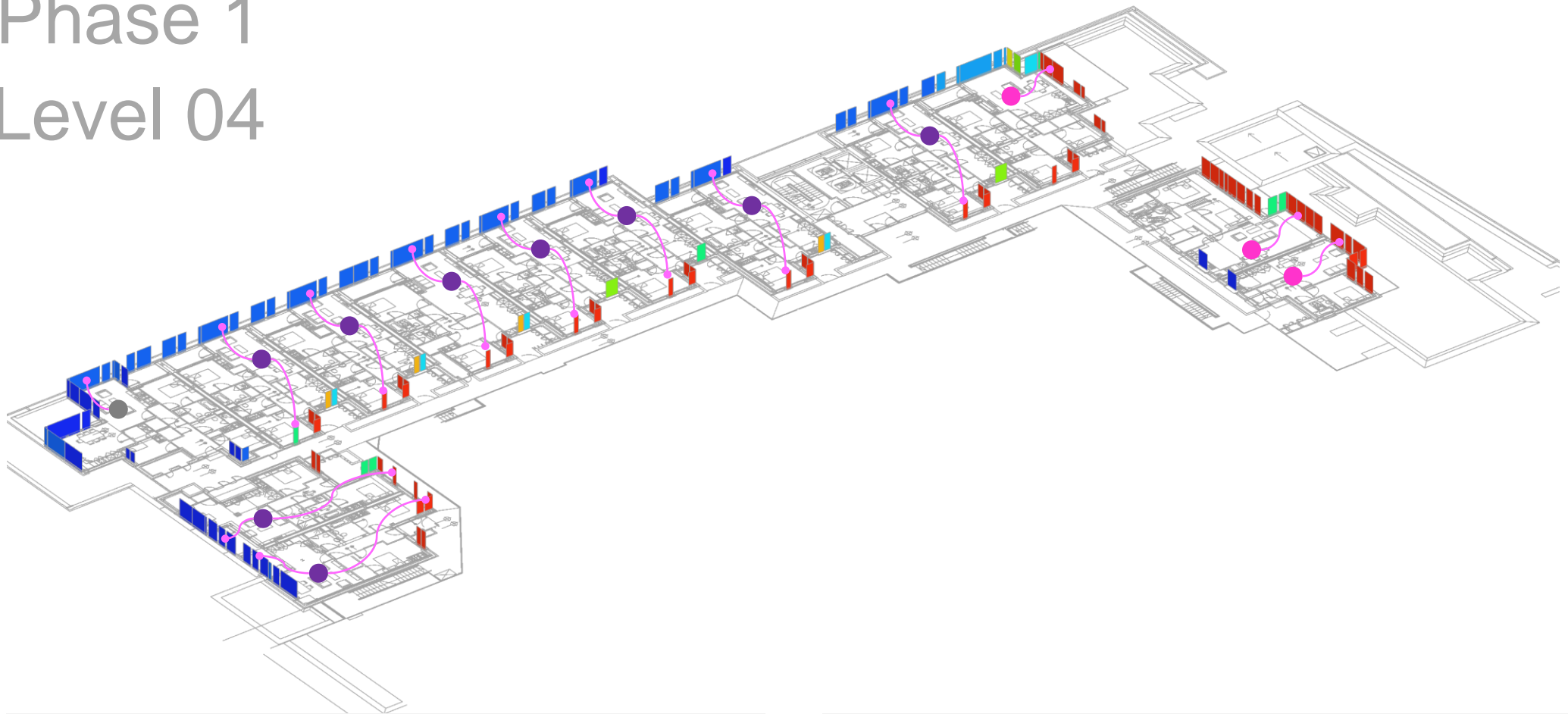


ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS									
00% to 01%	01% to 02%	02% to 03%	03% to 04%	04% to 05%	05% to 06%	06% to 07%	07% to 08%	08% to 09%	> 09%

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	5	●
No. Unit which satisfy relaxed BRE criteria	8	●
No. Units which fall short of BRE criteria	3	●

Figure 31 Annual Probable Sunlight Hours (registering during winter months 21st Oct – 21st March) predicted for windows located at Level 04 within Phase 1 Development

Phase 1 Level 04



ANNUAL PROBABLE SUNLIGHT HOURS (%) – WINTER MONTHS									
00% to 01%	01% to 02%	02% to 03%	03% to 04%	04% to 05%	05% to 06%	06% to 07%	07% to 08%	08% to 09%	> 09%

CONFORMITY WITH GUIDELINES	QUANTITY	INDICATOR
No. Units which satisfy strict BRE criteria	3	●
No. Unit which satisfy relaxed BRE criteria	9	●
No. Units which fall short of BRE criteria	1	●

Study F: Assessment of sunlight amenity available to proposed recreation areas

Study F: Assessment Approach

According to the BRE guide, 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.

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 are calculated for the course of a specified day (the 21st of March in this case). The percentage of the analysed area which is capable of receiving more than 2 hours of sunlight over the course of the test day is then obtained.

Study F: Assessment Points

Four outdoor recreation spaces have been considered within this study, see Figure 32. The space selected for assessment include the courtyards located at Level 01 within Phase 2 and Level 02 within Phase 1 as well as two terraces located at roof level.

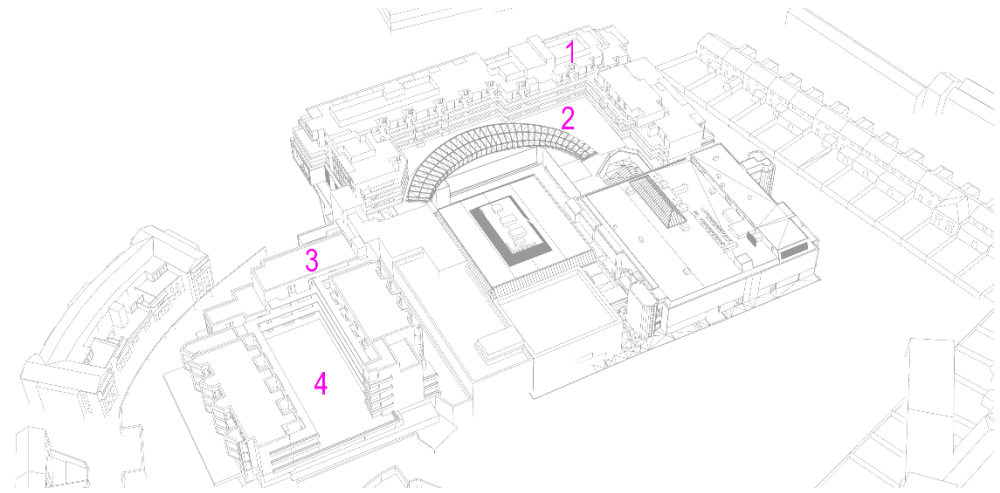


Figure 32 Outdoor area assessed

Study F: Results

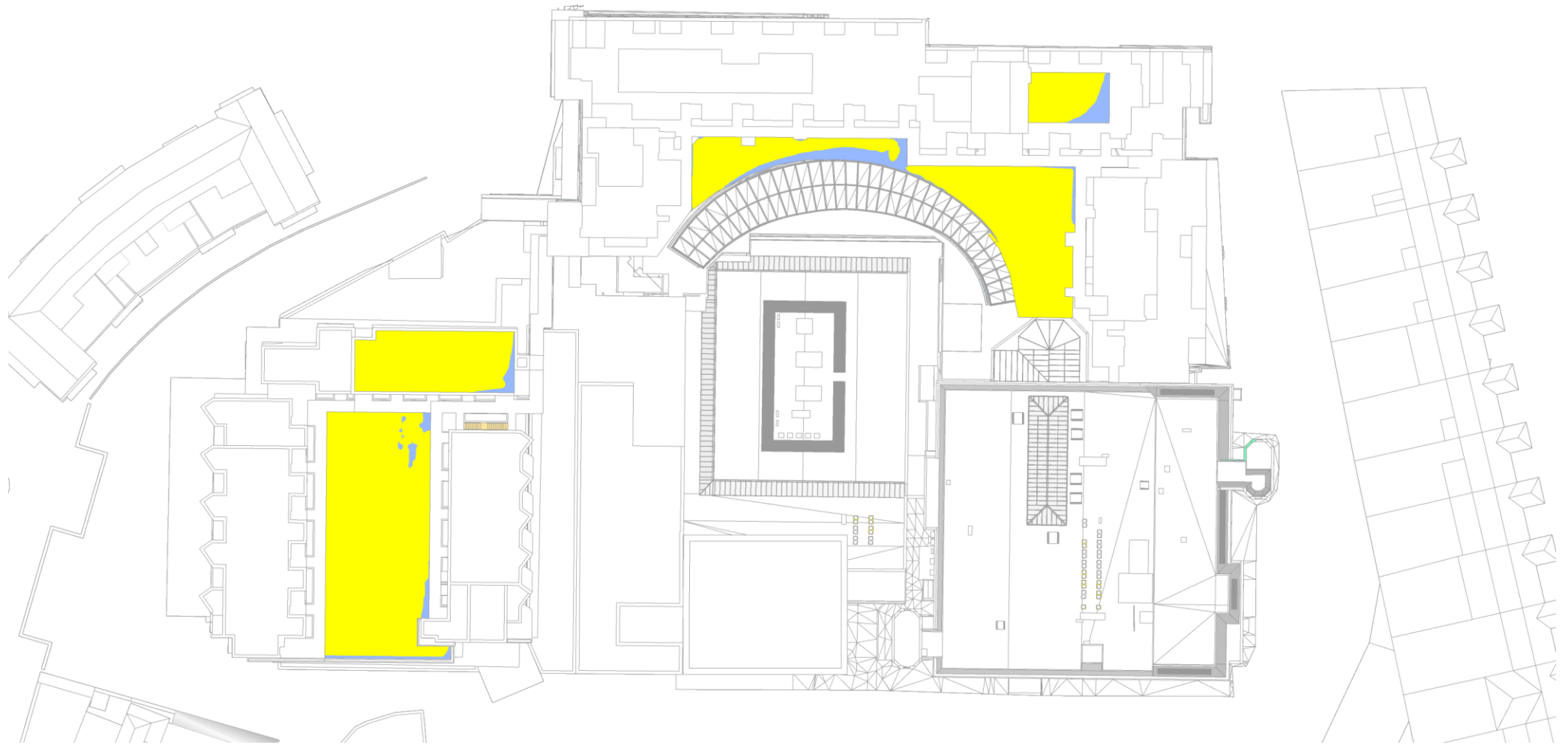
This study has assessed the levels of sunlight amenity that would be available to four outdoor recreation spaces which are being proposed as part of this development. The results obtained in this study indicate the recommendations of the BRE guide would be satisfied in all cases, see Table 14 . Having regard to this finding it can be confidently concluded that the future residents of this development would have access to good levels of outdoor sunlight amenity. The distribution of solar access predicted for this development is presented in in Figure 33.

Table 14 Sunlight access predicted for outdoor recreation spaces proposed within the development

Space ID	% Area capable of receiving at least 2hrs of sunshine on the 21st of March	More than 50% of garden area can receive at least 2hrs of sunlight on the 21st of March?	BRE recommendations satisfied?	Professional interpretation of result
1	81%	Yes	Yes	<i>Acceptable levels of light are retained *</i>
2	82%	Yes	Yes	<i>Acceptable levels of light are retained *</i>
3	96%	Yes	Yes	<i>Acceptable levels of light are retained *</i>
4	98%	Yes	Yes	<i>Acceptable levels of light are retained *</i>

Full compliance with BRE guidelines has been demonstrated; it follows that acceptable levels of solar access will be retained with the proposed development in place

Figure 33 Sunlight access levels predicted for outdoor recreation space



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



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 recognised within planning guidance which has been published by the Irish Government. On page 43 of the Urban Design Manual 2009 the following advice is provided:

“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.”

For more information please see Appendix B: Policy basis for flexibility in applying daylight standards

Conclusions

This report has been prepared to assess the potential impact which a proposed development at Frascati Shopping Centre would have on the levels of daylight amenity available to neighbouring properties. The report also investigates the degree to which acceptable levels of daylight amenity would be provided within the new accommodation which is being proposed as part of this development.

In assessing the significance of the sunlight and skylight predictions which have been obtained 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 pursue 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 structurally impede 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 emerging 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 baseline conditions has been assessed with regard to three separate studies including Study A, Study B and Study C. The results of these studies indicate that the minimum levels of skylight and sunlight access recommended in relevant guidelines would be satisfied in most cases.

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. Where it has not been possible to demonstrate full compliance with advisory minimums for skylight access it has been possible to determine that the impacts in question would still fall within tolerable bounds. It is on this basis that the impacts identified in primary testing can be considered to fall within tolerable bounds.

Study B assessed the impact that the proposed development would have on the levels of sunlight available to neighbouring accommodation. The results of this assessment indicate that substantial levels of compliance with advisory minimums would be achieved. In the small number of cases where it has not been possible to demonstrate full compliance with advisory minimums the magnitude of the departures registering are found to be modest in all cases.

Study C assessed the impact that the proposed development would have on the levels of sunlight available to a number of neighbouring recreation areas. In this case full compliance with BRE guidelines has been demonstrated in all cases. It follows that no significant loss of sunlight amenity can be reasonably anticipated for any of the gardens located in the immediate neighbourhood of the proposed development.

Three additional studies have been carried out to assess the adequacy of the daylight levels which would be provided within the accommodation which is being proposed as part of this development:

Study D assessed the level of skylight amenity which the accommodation proposed within this development would be capable of receiving. The results of this study demonstrate that advisory minimums would be satisfied in most cases (a compliance rate of 93% is predicted). Having regard to this finding it is reasonable to conclude that the potential for acceptable levels of internal skylight amenity would be provided within this development.

Study E assessed the levels of sunlight amenity which would be available to the accommodation which is being proposed as part of this development. The results of this study indicate that acceptable levels of sunlight access would be provided within the development and that this is particularly true when the aggregate contribution of unique sunlight hours, registering on all of the windows in each unit, is accounted for. While lower levels of sunlight access are identified within Phase 1 by comparison to Phase 2, it is also clear that the views over Dublin Bay which are available from Phase 1 accommodation represent a compensating factor.

Study F assessed the levels of sunlight amenity which would be available to the principal outdoor recreation spaces which are being proposed as part of this development. The result of this study demonstrates that full compliance with guideline recommendations would be achieved in all cases; it follows that good levels of outdoor sunlight amenity can be anticipated.

When assessed in the round, and in relation to the other factors which contribute to the proper planning and sustainable development of this area, it is possible to conclude that acceptable levels of daylight amenity would be provided within this development and that acceptable levels of daylight would remain available to neighbouring properties.

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: Policy basis for flexibility in applying daylight standards

The particular provisions which have been made to ensure that a permissive approach can be taken in the assessment of daylight adequacy are identified as follows:

Specific guidance on this matter is provided within Section 4.5 the National Planning Framework¹⁰ (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 adoption of a permissive approach to the assessment of daylight adequacy. 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:

*“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***

¹⁰ DoHPLG 2018 National Planning Framework

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 in the application of daylight standards is reflected in the particular wording which has been adopted in recent building height guidelines¹¹. Specific guidance on the regard which should be paid to daylight standards 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]

Accepting that a valid planning basis exists for adopting alternative targets it is also clear that this approach is supported within BR 209¹².

Within the introductory section of the BRE guide the following advice is provided:

*“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. **In special circumstances the developer or planning authority may wish to use different target values” [Emphasis added]***

Additional guidance regarding the facility which exists to use flexibility is provided within Appendix F of the BRE Guide. More specifically, the following

¹¹ DoHPLG 2018 – Urban Development and Building Heights – Guidelines for Planning Authorities

¹² BRE 2011 – Site layout planning for daylight and sunlight: a guide to good practice otherwise known as BR 209

advice is provided regarding the particular performance targets recommended by the BRE:

“Section 2.1,2.3 and 2.3 give numerical target values in assessing how much light from the sky is blocked by obstructing buildings. These values are purely advisory and different targets may be used based on the special requirements of the proposed development or its location. Such alternative targets may be generated from the layout dimensions of existing development, or they may be derived from considering the internal layout and daylighting needs of the proposed development itself. “

Appendix C: 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.

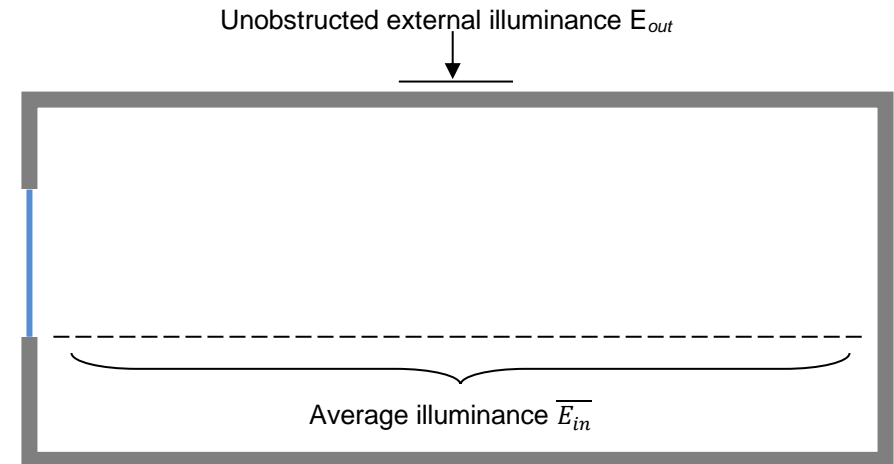
Skylight amenity is assessed with respect to a parameter called the average daylight factor¹³. Rooms with a high average daylight factor are capable of accepting a relatively large proportion of the diffuse skylight which is available outside; BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’, British Standards Institute, 2008 advises that a predominantly daylight 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.

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.



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

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%.

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

¹³ 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 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.

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.

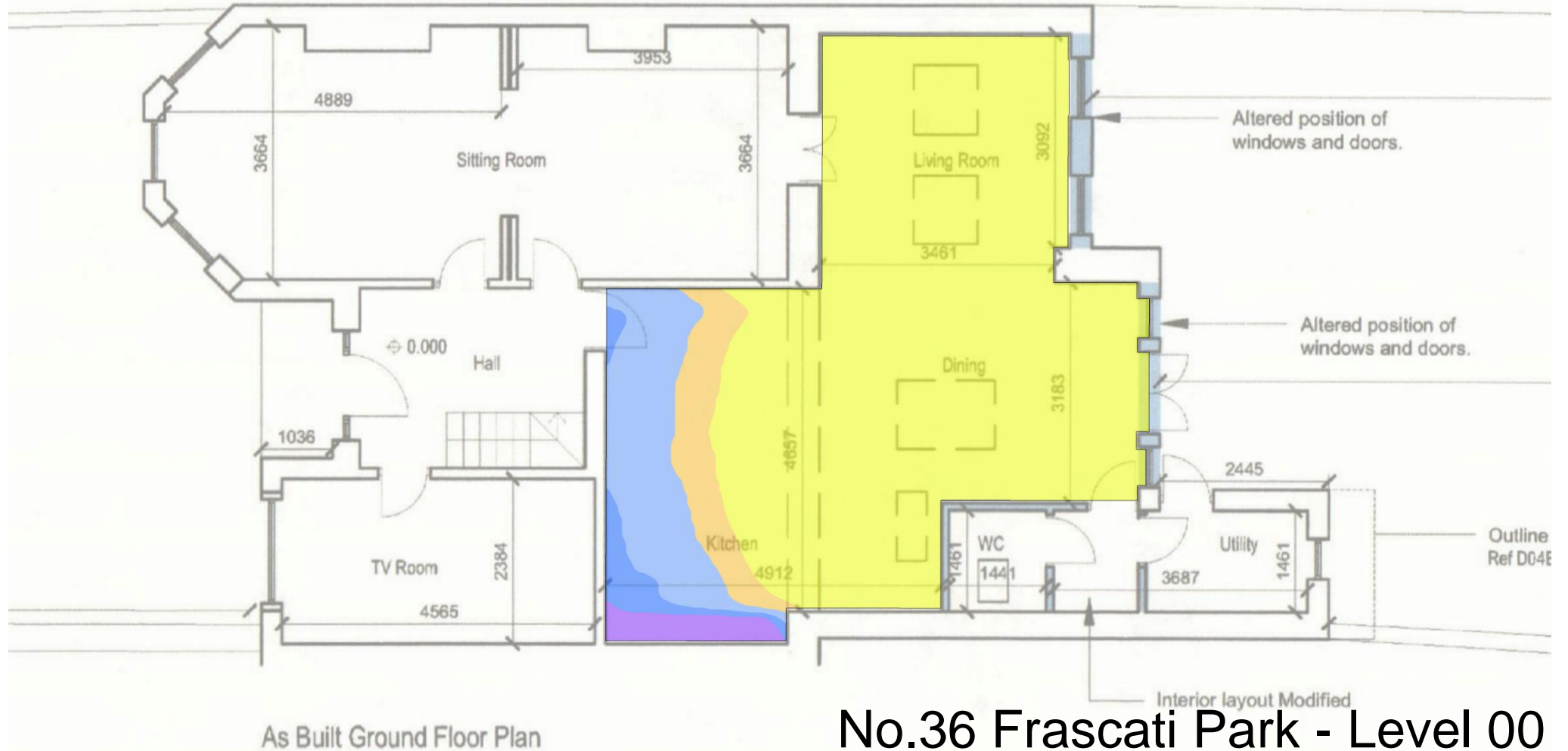
The particular reflectance values adopted for secondary testing are detailed in Table 15.

Table 15 Reflectance values adopted in the calculation of average daylight factors.

Surface Type	Assumed Finish	Reflectance / Transmittance	Source
Interior Wall	Pale Cream	0.81	BS 8206
Interior Floor	Mid Grey	0.45	BS 8206
Interior Ceiling	White	0.85	BS 8206
Exterior Roof	Paving	0.2	BS 8206
General Context	Mid Grey	0.45	BS 8206
Exterior Wall	Light Grey	0.68	BS 8206
Window Frame	Light Grey	0.68	BS 8206
External Ground	Paving	0.2	BS 8206
Deck of Balcony/Gantry	Mid Grey	0.45	BS 8206
Soffit of Balcony	White	0.85	BS 8206
Balustrade Glazing	Clear Glass Single Pane	0.8	BS 8206
Window Frame	Light Grey	0.68	BS 8206
Glazing	Clear Double Glazing	0.68	BS 8206
Wintergarden Glazing	Clear Glass Single Pane	0.8	BS 8206
Courtyard areas	Paving	0.2	BS 8206
Proposed Elevations to Frascati Park	Light Render with Hanging Greenery	0.4	BS 8206
Proposed Elevations	Pale Cream	0.81	BS 8206
Proposed Shading on Phase 1	Dark Grey	0.14	BS 8206

Appendix D: Daylight Factor Distribution Diagrams - Secondary Testing

Figure 34 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (Before Development Scenario)



No.36 Frascati Park - Level 00 Before Development

DAYLIGHT FACTOR (%)

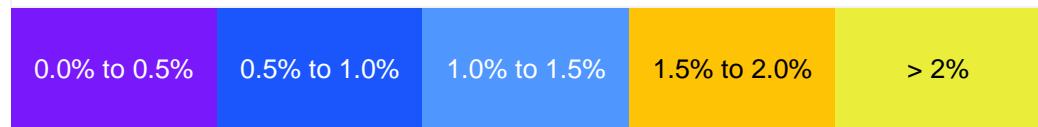
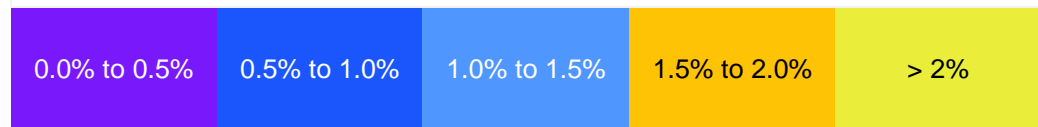


Figure 35 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (Before Development Scenario)



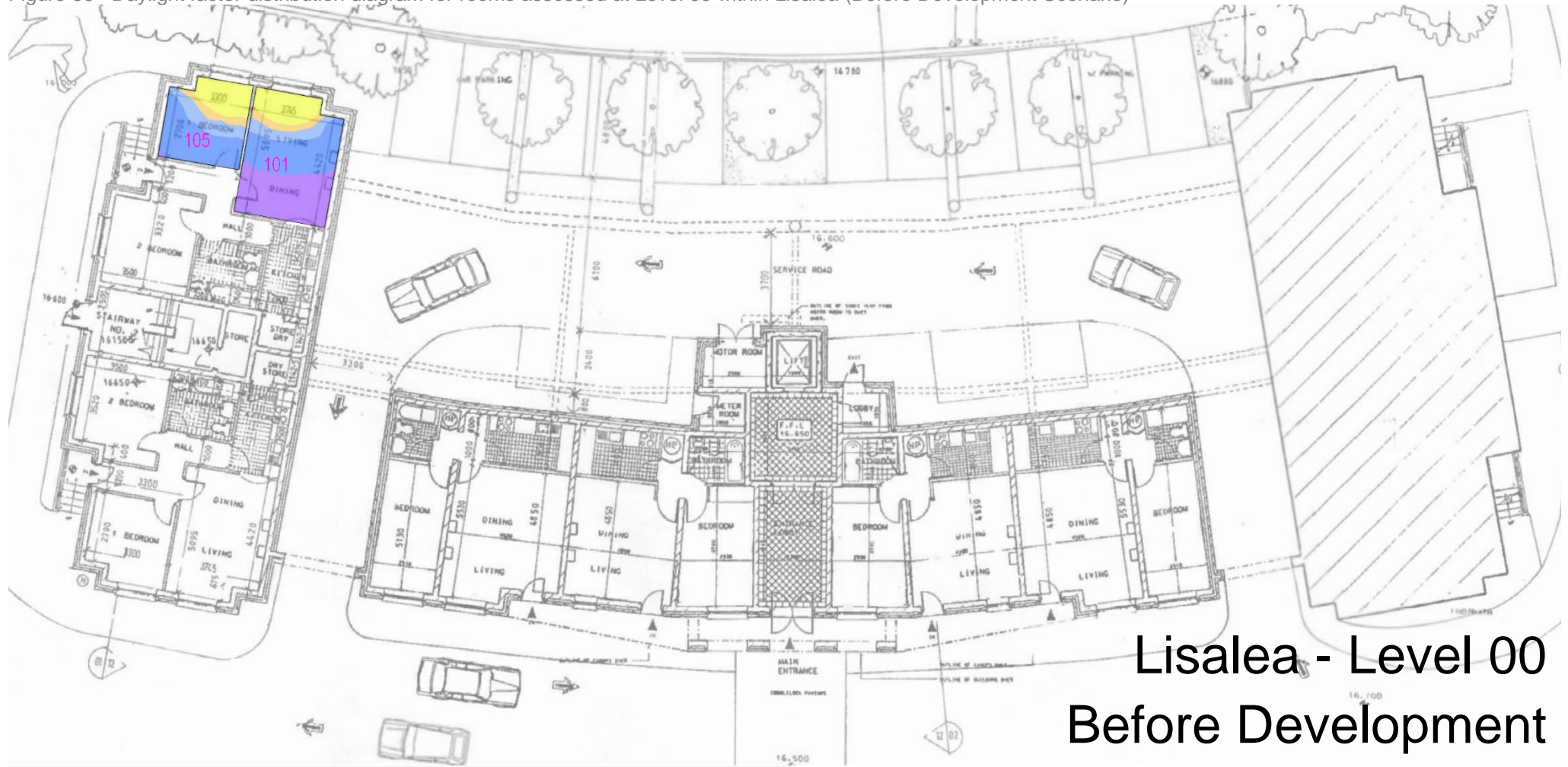
As Built Ground Floor Plan

DAYLIGHT FACTOR (%)



No.36 Frascati Park - Level 00 After Development

Figure 36 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (Before Development Scenario)



Lisalea - Level 00 Before Development

DAYLIGHT FACTOR (%)

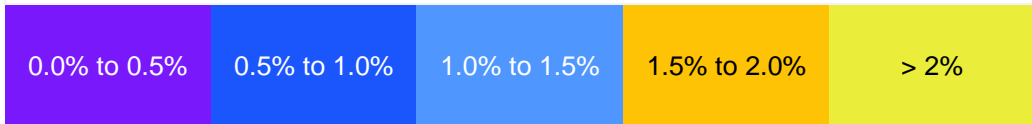
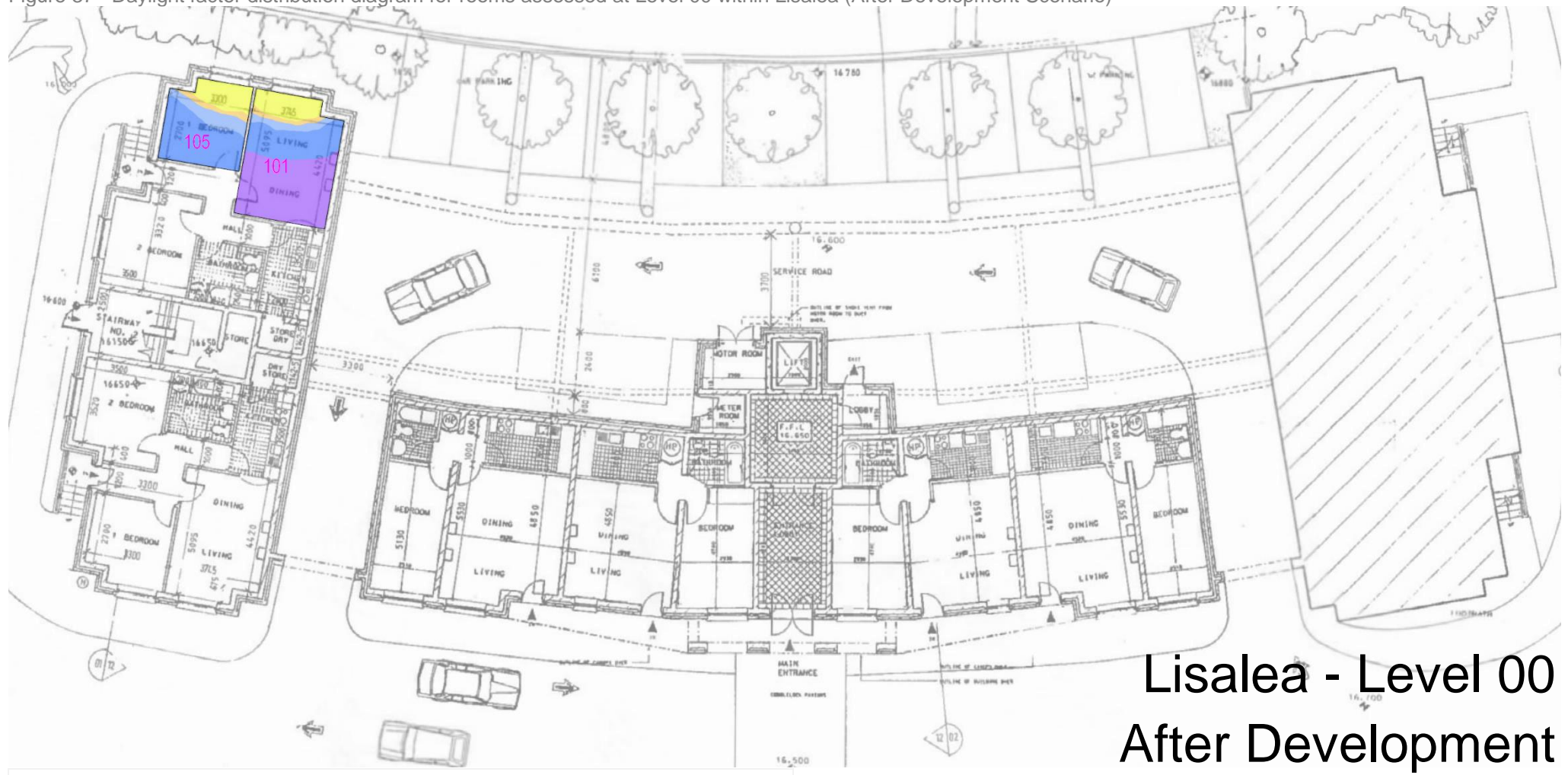


Figure 37 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)



Lisalea - Level 00 After Development

DAYLIGHT FACTOR (%)

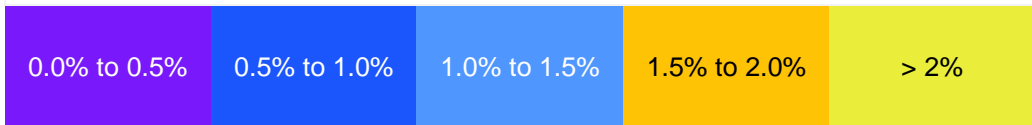
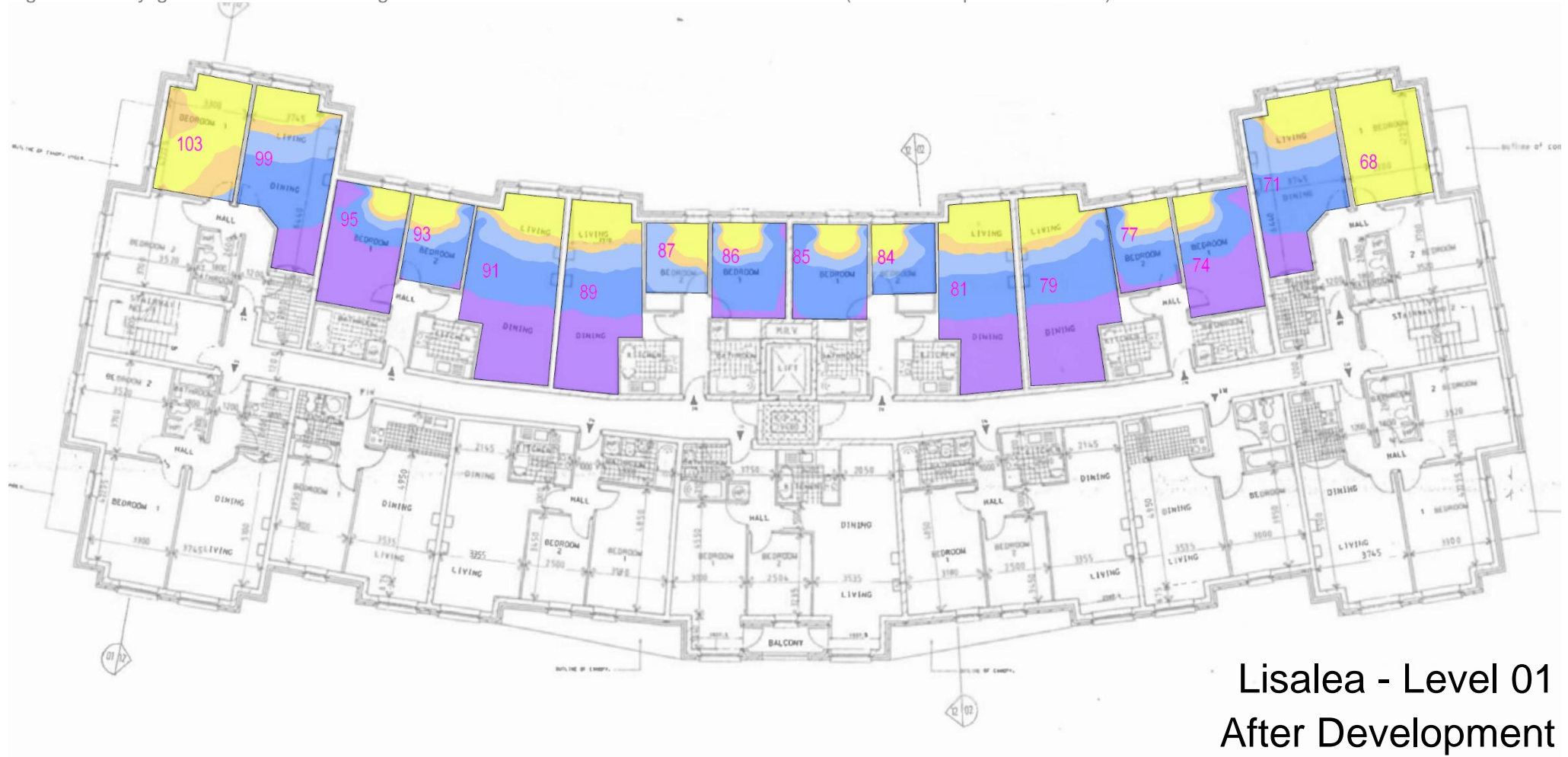


Figure 38 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)



DAYLIGHT FACTOR (%)				
0.0% to 0.5%	0.5% to 1.0%	1.0% to 1.5%	1.5% to 2.0%	> 2%

Figure 39 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)



Lisalea - Level 01
After Development

DAYLIGHT FACTOR (%)				
0.0% to 0.5%	0.5% to 1.0%	1.0% to 1.5%	1.5% to 2.0%	> 2%

Figure 40 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)



Lisalea - Level 02 Before Development

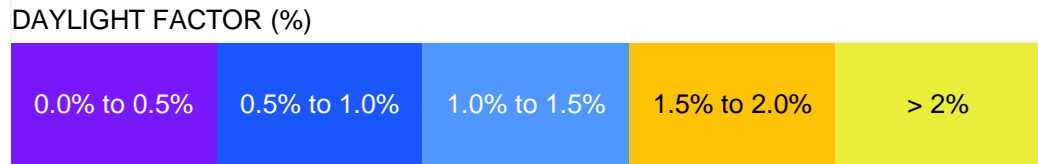


Figure 41 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)



Lisalea - Level 02 After Development

DAYLIGHT FACTOR (%)

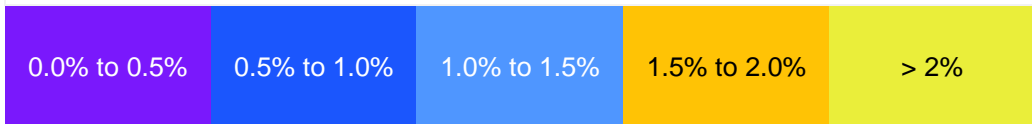


Figure 42 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)

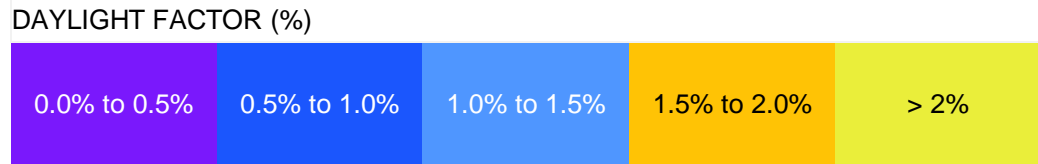
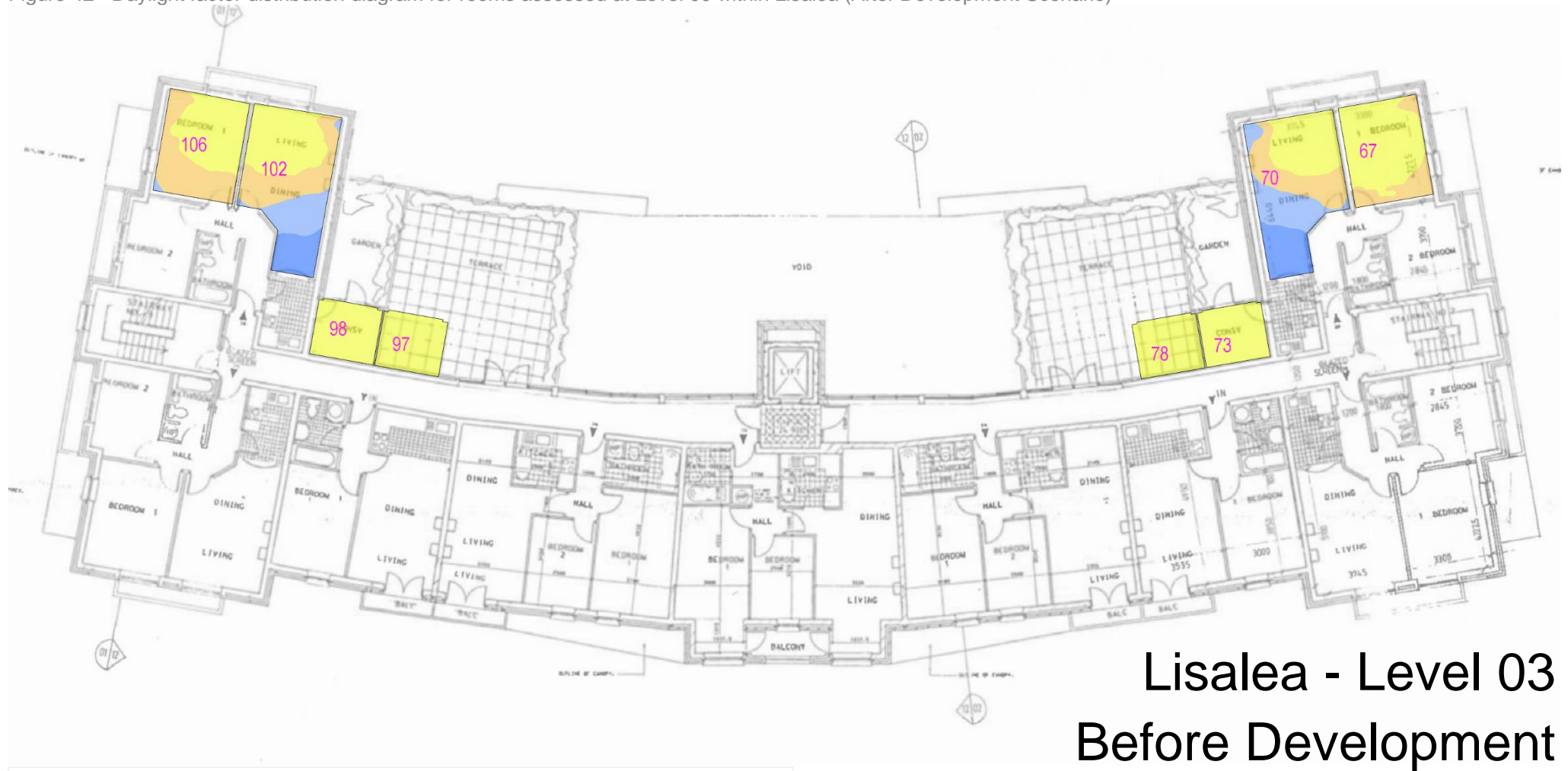
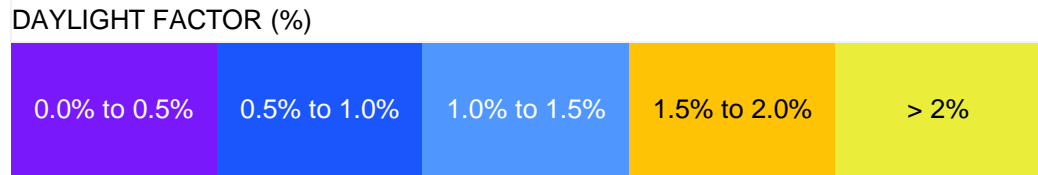
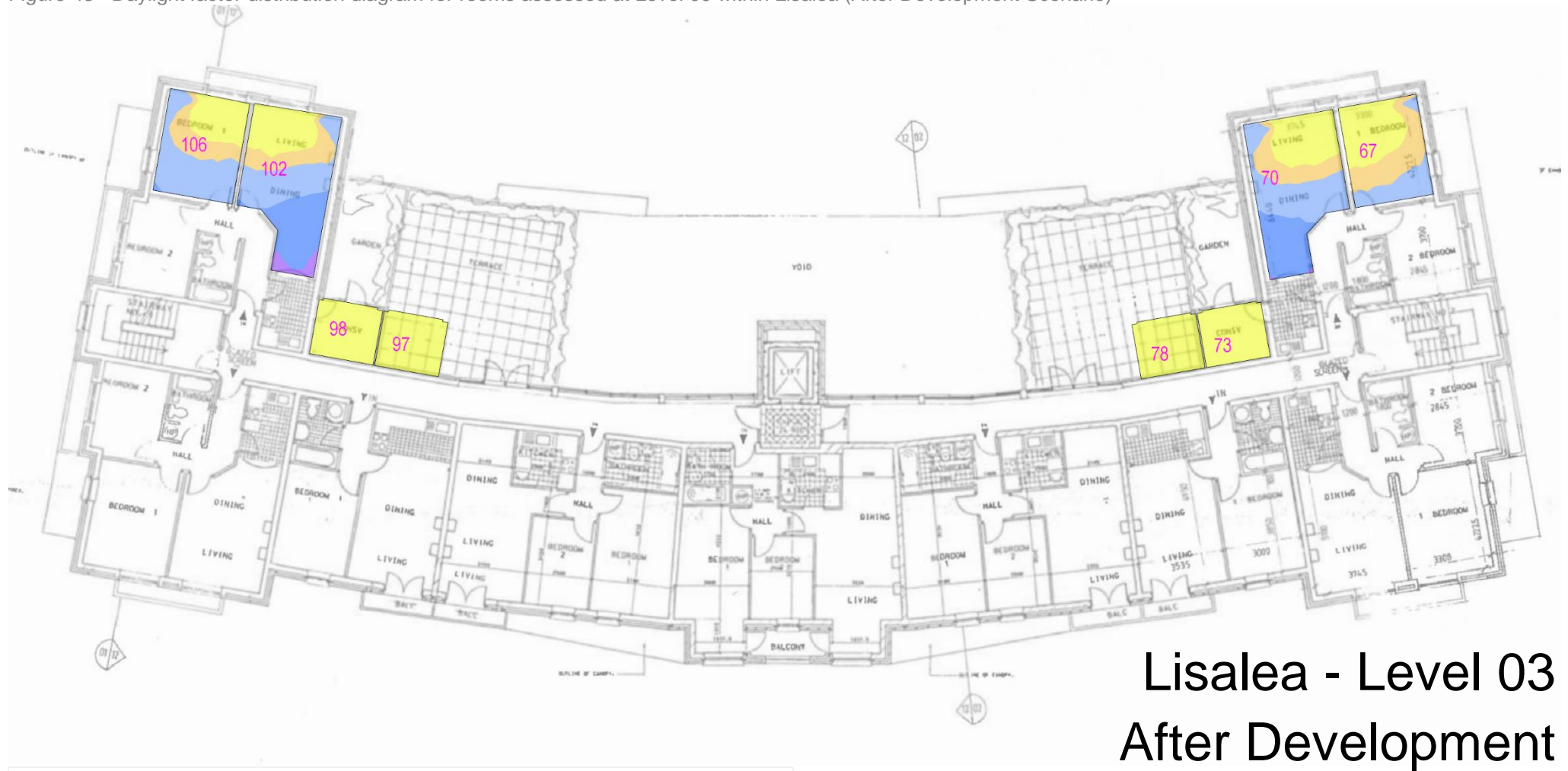


Figure 43 Daylight factor distribution diagram for rooms assessed at Level 00 within Lisalea (After Development Scenario)



Appendix E: 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	Date Issued / Accessed
Proposed Development	RAU	AR-08-PL-101B	Proposed First Floor Plan (Residential Level)	24 th July 2020
		AR-08-PL-102	Proposed Second Floor Plan	24 th July 2020
		AR-08-PL-103	Proposed Third Floor Plan	24 th July 2020
		AR-08-PL-104	Proposed Fourth Floor Plan	24 th July 2020
		AR-08-PL-105	Proposed Fifth Floor Plan	24 th July 2020
		AR-08-PL-120	Elevations	24 th July 2020
		AR-08-PL-140	Proposed Sections	24 th July 2020
Neighbouring Buildings - Site Levels		AR-08-PL-140	Proposed Sections	24 th July 2020
Internal Room Layouts within Lisalea	DLRCC 291/93	2016_03_C	Ground Floor Plan	13 th August 2019
		2016_04_C	First Floor Plan	
		2016_05_C	Second Floor Plan	
		2016_06_C	Third Floor Plan	
Internal Room Layouts within No.36 Frascati Park	D19B_0316	19/03/R/003	Ground Floor Plans	28 th September 2019
Macro Landscape and Wider Context	Google Earth	-	-	-

Appendix F: Average Daylight Factor in Open Plan Spaces

Within BS 8206 a minimum Average Daylight Factor (ADF) target of 1% is proposed for bedrooms, 1.5% is proposed for living rooms and 2% is proposed for kitchens. Accepting that it is also proposed within BS 8206 that an ADF target of 2% should be pursued in cases where an open plan space includes both a living room and a kitchen, BPG3 respectfully submits that it is reasonable to conclude that acceptable levels of internal skylight are provided when the lower 1.5% target (associated with living room use) is achieved. A justification for this approach is outlined as follows:

- a. As a starting point it is important to recognise that it is often challenging for conventional open plan kitchen/living room layouts (deep room with kitchen located on interior wall) to satisfy the 2% ADF target proposed within BS 8206. It follows that the requirement to achieve an internal ADF of 2% in open plan kitchen/living rooms, were it to be enforced by a local authority, would place significant restrictions on the number of units which can be accommodated with a given development form. While it would be possible to achieve the 2% ADF target using alternative (shallower) room layouts, or dual aspect rooms, the cost of delivering such schemes would inevitably increase, with project viability and overall housing supply being affected as a consequence. It is on this basis that it is reasonable to

propose that a persuasive reason would need to exist to justify the validity of the higher 2% ADF target. It follows that careful consideration should be given to the reasons why a higher ADF of 2% is recommended for kitchens and open plan kitchen/living rooms by extension.

- b. While no rationale for the elevated kitchen ADF target is provided within BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’, British Standards Institute, 2008 the origins of the 2% ADF target can be traced back through a number of preceding standards to guidance which was provided in Chapter 1: Part 1 of the British Standard Code of Practice CP3 (1964). Advice provided in this standard indicates that the overriding reason why a higher ADF target of 2% was recommended for kitchens is because the tasks carried out around the cooker, sink and preparation table are thought to be visually demanding.
- c. The significance of this finding is that the elevated ADF level recommended for kitchens would appear to relate more directly to the execution of functional activities within the kitchen rather than any particular aesthetic requirement which may exist for an elevated daylight appearance.
- d. This finding is of consequence because, while artificial lighting cannot be relied upon to recreate the aesthetic qualities of natural light, modern luminaires can be relied upon to provide sufficient lighting to meet the functional requirements of most tasks. By comparison to the artificial lighting which would have existed in 1964,

when the ADF target of 2% for kitchens was originally deemed necessary, modern luminaries are capable of providing light of a much higher quality; both in terms of the levels of lux delivered, the uniformity of light provided and the degree of colour rendering achieved.

- e. It is on this basis, where the higher 2% ADF target recommended for kitchens (and kitchen/living rooms by extension) relates principally to the provision of adequate light to support the functional activities of the space, that it is reasonable to propose that any shortfall from this target can in practice be easily compensated for with artificial lighting.
- f. On review, given that the original purpose of the elevated 2% ADF target can be easily achieved using alternative means, BPG3 respectfully submits that a persuasive case does not exist to justify the pursuit of this higher ADF target in all circumstances. This position is found to be particularly true when considered against the significant consequence, the imposition of the higher target, would have for the delivery of conventional apartment typologies in Ireland.
- g. Having regard to the above, it is reasonable to proposed that the target recommended in BS 8206 for living rooms (ADF of 1.5%) is an acceptable target to pursue for open plan kitchen/living rooms as it relates more directly to the predominant use within these spaces; further to this it is reasonable to propose that any shortfall from target which may be encountered within the kitchen area of these open plan spaces can be easily addressed using artificial lighting.

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.

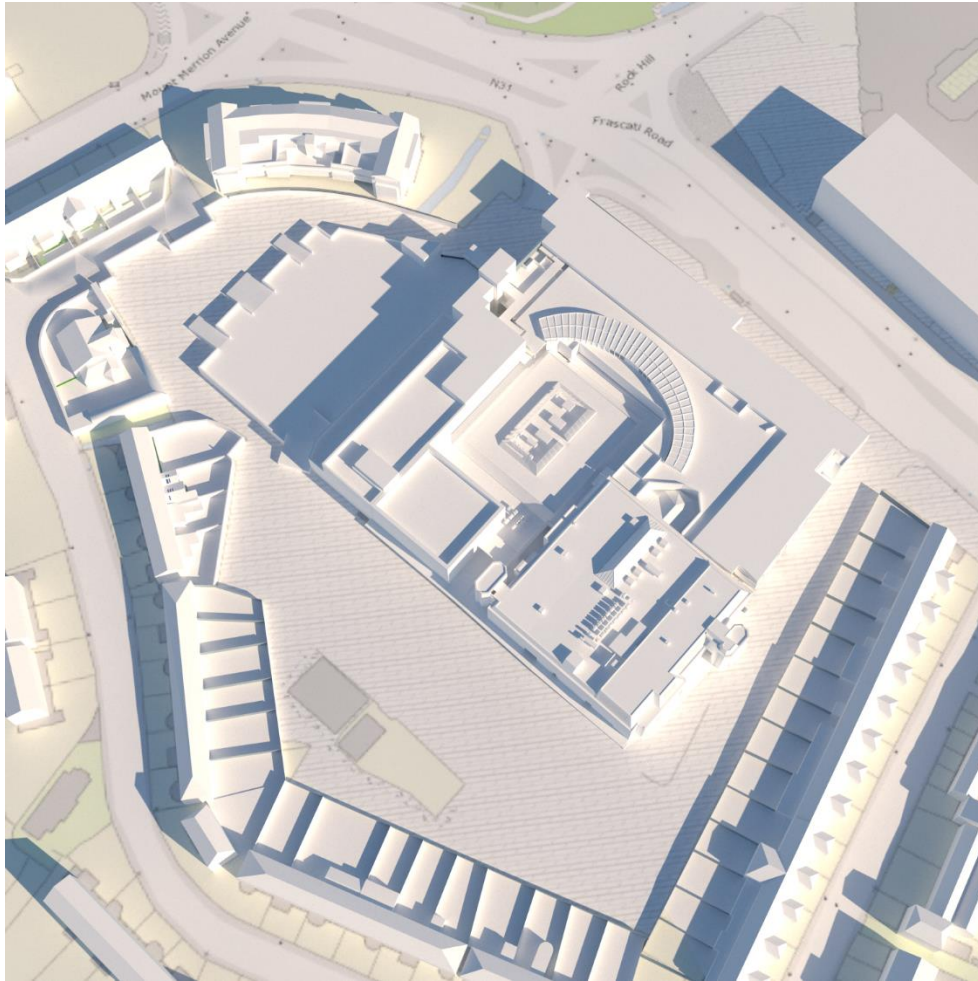


Shadows Cast at 8am (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 8am (UTC+0) on the 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.

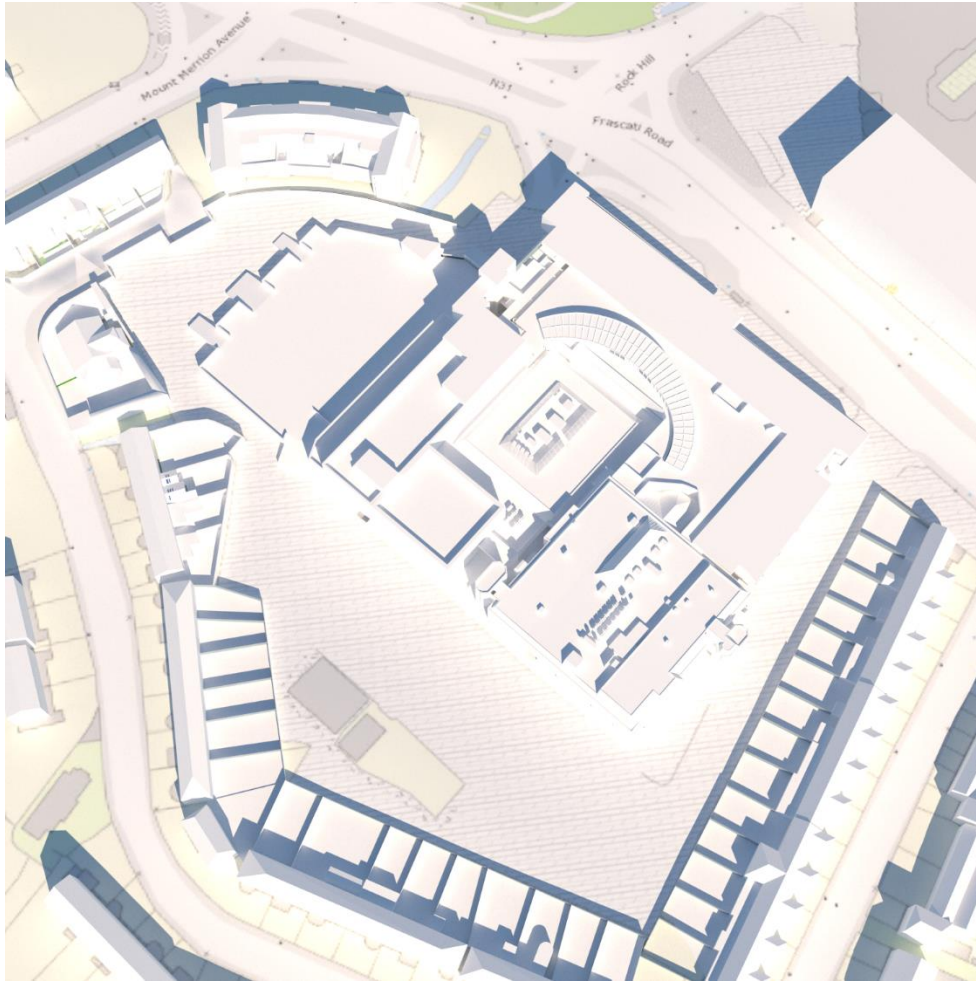


Shadows Cast at 10am (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 10am (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.

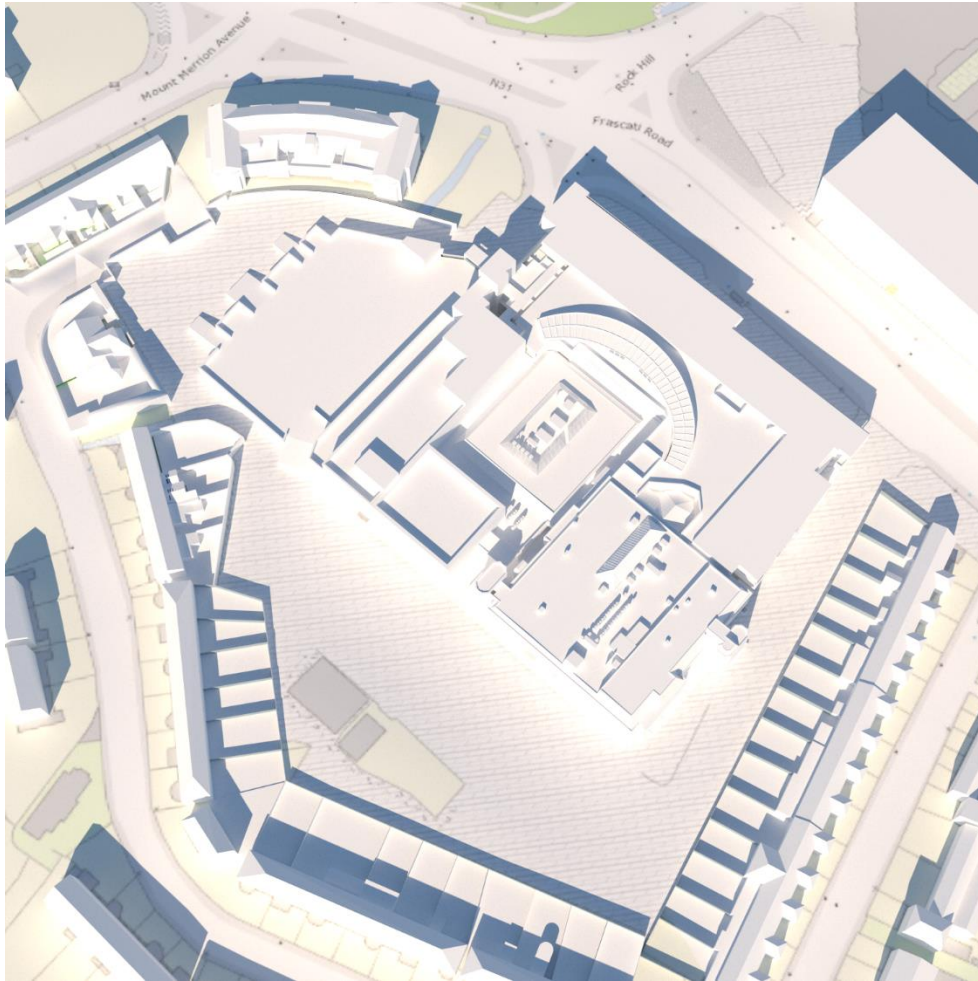


Shadows Cast at 12pm (UTC+0) on the 21st March - Before Development Scenario



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

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.



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



Shadows Cast at 2pm (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.

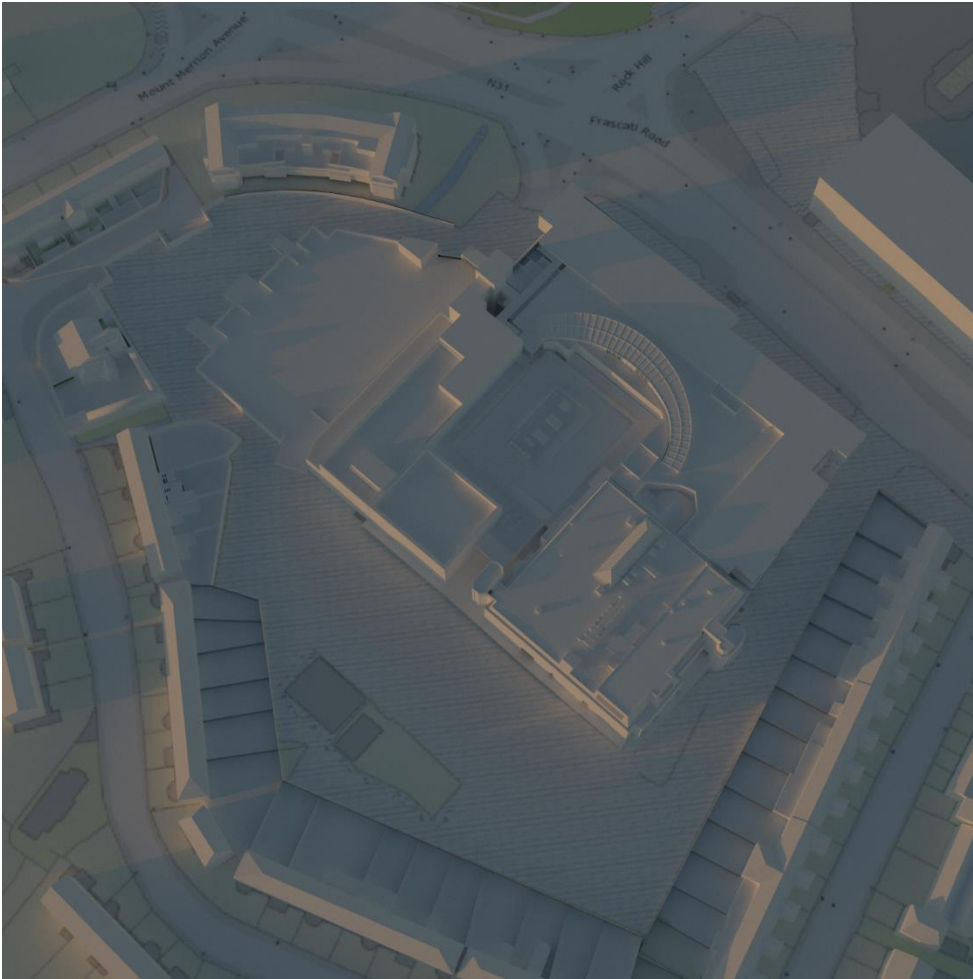


Shadows Cast at 4pm (UTC+0) on the 21st March - Before Development Scenario



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

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.



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.