



Elliot Group

18-24 Seel Street Liverpool

Proposed Residential Extension

Daylight Assessment

March 2018

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1.0 Introduction

WYG Environment Planning Transport were commissioned by Elliot Group to undertake a Daylight Assessment to assess the impact of a proposed residential development at 18-24 Seel Street Liverpool. .

1.1 Assessment Overview

This assessment has been undertaken to review the existing access to daylight and sunlight in the vicinity of the site. Potential impacts have been assessed in accordance with BRE Guidance (Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice) and BS 8206-2:2008 (Lighting for Buildings, Part 2: Code of Practice for Daylighting). The assessment methodology and results are detailed in the following sections of the report.



2.0 Extant Policy, Legislation and Relevant Agencies

2.1 Documents Consulted

The following documents were consulted during the undertaking of this assessment:

- Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice, BRE, 2011; and,
- BS 8206-2: 2008 – Lighting for Buildings – Part 2: Code of Practice for Daylighting, British Standards Institute, 2008.
- National Planning Policy Framework, Office of the Deputy Prime Minister, 2012;
- National Planning Practice Guidance on Light Pollution, Department for Communities and Local Government, 6th March 2013;
- Liverpool Core Strategy 2012

2.2 Planning Guidance

The National Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. This document gives some guidance in regards to access to daylight and sunlight when considering new buildings.

Paragraph 27:

"Account should be taken of local climatic conditions, including daylight and sunlight, wind, temperature and frost pockets."

However, no quantifiable assessment methodology is provided in the national policy so the BRE Report 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice' is the established National guidance to aid the developer to prevent and/or minimise the impact of a new development on the availability of daylight and sunlight in the vicinity of the site. It has been developed in conjunction with interior daylight recommendations in BS 8206: Part 2: 'Lighting for Buildings - Code of Practice for Daylighting'.



2.2.1 BRE Site Layout for Planning and Guidance

The BRE document "Site Layout Planning for Daylight and Sunlight: a guide to good practice" is the standard for assessing developments for access to daylight and sunlight. However, in section 1.6 it states that

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

The BRE guidance is used to complement BS8202-2, 2008 "Lighting for Buildings" which states that:

"The aim of the standard is to give guidance to architects, engineers, builders and others who carry out lighting design. It is recognized that lighting is only one of many matters that influence fenestration. These include other aspects of environmental performance (such as noise, thermal equilibrium and the control of energy use) fire hazards, constructional requirements, the external appearance and the surroundings of the site. The best design for a building does not necessarily incorporate the ideal solution for any individual function. For this reason, careful judgement needs to be exercised when using the criteria given in the standard for other purposes, particularly town planning control".

Based on the above guidance, the results contained within the following sections of this technical assessment should not be viewed as absolute as the guideline values are not achievable in all circumstances might be necessary or desirable. In city or urban centres adjoining the strategic transport network, a compromise between internal access to daylight and other factors, such as the convenience of living in these locations or making efficient use of land resources can be made.

2.2.2 Local Policy

Liverpool Core Strategy 2012

Following a review of local policy including the Liverpool Core Strategy 2012, no references to daylight, sunlight or overshadowing were identified.



3.0 Assessment Methodology

Predictions are necessary when forecasting future impacts. Established good practice methods are used throughout this assessment to ensure that these predictions are as accurate as possible.

Impacts of the proposed scheme on daylight and sunlight have been assessed with reference to the baseline environment and the following guidance:

- Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice, BRE, 2011; and,
- BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting', British Standards Institute, 2008.

Daylight, sunlight and overshadowing modelling was undertaken using Ecotect Analysis 2011 software, an independent lighting model which is capable of calculating daylight and artificial lighting scenes in interior and exterior scenarios.

3.1 Daylight

3.1.1 Context

The BRE Guidance outlines a number of different assessment methods to assess the potential for daylight to enter a room where it is required. These include:

- Stage 1 - "25° Rule" – the preliminary screening method of assessment;
- Stage 2 - Vertical Sky Component (VSC) method; and,
- Stage 3 - Average Daylight Factor (ADF).

The "25° Rule" is described by BRE as:

"No obstruction, measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal."

BRE state that if the 25° Rule is satisfied then the proposed development is unlikely to have a significant effect on the diffuse skylight received by adjoining properties. Detailed numerical testing is therefore not required if the 25° test is satisfied. Where the proposed development results in an exceedance of the 25° test, any reduction in the amount of skylight can be determined by calculating the Vertical Sky Component



(VSC). The VSC is the measure of the amount of daylight falling on a vertical wall or window and is defined by BRE as:

"The ratio of that part of illuminance, at a point on a given vertical plane (window wall), that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky."

The following daylight criteria given within the BRE Guidelines can be used as a basis to assess the potential impacts of a proposed development on access to daylight:

- For existing properties, diffuse lighting may be adversely affected if the VSC measured at the centre of the window is less than 27%; and less than 80% its former value.
- For proposed properties, if the VSC is at least 27% conventional window design will usually give reasonable results. If the VSC is below 27%, special measures (larger windows) are usually required.

As such if the VSC is greater than 27% then sufficient skylight should be reaching the windows of existing and proposed buildings. Where existing room layouts are known, the 'no sky line' may also be plotted.

To check adequate daylight is provided in new rooms, the Average Daylight Factor (ADF) may be calculated. The ADF is used as the measure of general illumination from skylight within a room and is defined by BRE as:

"Ratio of total daylight flux incident on the working plane (0.85 for domestic use and 0.7m for office use) to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE Standard Overcast Sky."

It is considered good practice to ensure that rooms have a predominantly daylight appearance. BS 8206-2 recommends that the ADF should be at least the relevant value described in Table 1.

Table 1 Recommended Minimum ADF

Room Type	Minimum ADF (%)
Bedroom	1.0
Living Room	1.5
Kitchens	2.0

BRE note that not only the amount of daylight within a room but the distribution should also be considered.



The following sections describe a standard approach for a daylight assessment, as outlined in the BRE Guidance.

3.1.2 Assessment Method

Stage 1

Each sensitive building façade surrounding the proposed development has been identified and a tangent 25° to the horizontal at a height of 2m plotted. Where the proposals intersected this tangent, the BRE 25° test is not met and the proposed development should be assessed in more detail by calculating the VSC values. A Stage 2 assessment has therefore been undertaken for these locations.

Stage 2

Where the 25° Rule was not achieved, worst case window locations have been included within the Ecotect model along the building façade, in accordance with BRE methodology.

At each window location the VSC for the existing and proposed scenarios in place has been calculated.

Where the VSC is less than 27%, the baseline conditions have been analysed to calculate the marginal change and determine if any changes would be significant, i.e. less than 0.8 times its former value.

Stage 3

Should significant impacts be determined during Stage 2 of the assessment, a further stage may be undertaken to quantify the 'no sky line' at working height within the affected rooms to establish any potential right to light claims. BRE recommend a height of 0.85m is used in dwellings and 0.70m in offices. If the percentage of room which has a view of the sky is within 0.8 of its value in the baseline scenario, it is not considered that the change in daylight will be noticeable.



4.0 Identification of Impacts

Potential direct impacts of the proposed development on access to daylight include reduction in the quality of daylight available in neighbouring residential properties. These identified impacts were assessed in accordance with the previously stated methodology and the results summarised in the following sections.

4.1 Model

This assessment was undertaken using Ecotect Software, a building analysis program which utilises the analysis methods outlined within BRE Guidance. A model was produced based upon the block plans and elevations of the proposals.

4.2 Daylight Assessment

Existing Receptors

It should be noted that Epsley House (Receptors 31-42) is used for student accommodation and therefore due to the pattern of use it is considered to be less sensitive in terms of daylight than the surrounding residential properties as the length of tenure is temporary, there is precedent for this, (Apex House Islington, HGY/2015/2915).

4.2.1 Stage 1

Properties along Gradwell Street immediately south of the site do not meet the BRE 25° screening test, and therefore further analysis is required.

4.2.2 Stage 2

At each assessment location, at the centre of the windows, the VSC was calculated in both the existing and proposed development scenarios, the findings of these calculations are shown in Table A1 in Appendix A.

As indicated in Table A1 in appendix A, the results show that out of 65 windows assessed, the BRE VSC criterion is achieved at 12 locations and failed at 53 locations. Further analysis of the worst-case internal room layouts for the ground and first floor of Lever Court and Epsley House has been examined in section 4.2.3 below.

4.2.3 Stage 3

Existing Receptors

Analysis of the daylight within the worst case internal room layouts for the ground and first floor of Lever Court and Epsley House was undertaken; supplied by windows 31 and 40 respectively. The results of the 'no



sky line' analysis are presented in Table 3 below. Reference should be made to Figures 4-5 for an illustrative representation of the daylight distribution calculated.

As stated in the RICS guidance, the '50:50 rule' may be used here to determine the effect of the development in terms of right to light. This involves determining what percentage of a room receives adequate light (i.e above 0.2% sky factor) on a working plane 850mm above the floor. An injury may be considered to have occurred where the percentage is reduced to less than 50%. Where more than 50% of the room still receives adequate light however, an injury may not be considered to have occurred, irrespective of the amount of light that has been lost.

Table 3 Summary of Internal Daylight Analysis

Room Location	Room Type	Area of Room above 0.2% Sky Factor (%)		Ratio	Meets Criteria?
		Baseline	Proposed		
Worst-case room of Lever Court Window 22	Bedroom	67.8	50.5	0.74	Yes
Worst-case room of Epsley House Window 31	Living room / Kitchen.	27.5	15.7	0.57	No

As the above table shows, the worst-case room supplied by Window 22 respectively has over 50% 0.2 sky factor therefore will still receive adequate light i.e above 0.2% Sky Factor. It should be noted that this assessment is of a room with a relatively small window compared to the rest of Lever Court, is set back from the facade and still meets the 50% 0.2 sky factor criteria therefore is it considered; given the considerably larger windows of the rest of the development (Figure 2), that rooms of Lever Court should receive a 0.2 sky factor above 50%. The worst-case room supplied by Window 31 will receive less than 50% above 0.2% Sky Factor therefore the reduction in daylight at these rooms (Epsley House) as a result of the proposed development is below the BRE criteria, however considering the temporary nature of the use of these student rooms, these are considered to be less sensitive to daylight.

It should also be noted that given the narrow nature of Gradwell Street any development on this site, even one reduced in height would have a similar effect on daylight.



5.0 Summary and Conclusions

WYG Environment Planning Transport were commissioned by Elliott Group to undertake a Daylight Assessment to assess the effect of a new development at Seel Street, Liverpool on the adjacent properties at Gradwell Street.

Building Research Establishment Guidance (Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice) and BS 8206-2:2008 (Lighting for Buildings, Part 2: Code of Practice for Daylighting) were used to assess potential impacts and determine the significance of any change in access to daylight and sunlight.

Worst case windows were identified surrounding the development which would receive some obstruction as a result of the proposed development. The results of the detailed technical analysis demonstrate that the daylight targets would be achieved 12 locations of the 65 assessed locations. Further analysis of the worst-case internal room layouts for the ground floor at Epsley House showed that the worst-case room assessed was below the BRE Criteria however considering the temporary nature of the use of these student rooms, these are considered to be less sensitive. Give the results of a worst-case assessment of the first floor of Lever Court it is considered that all rooms of Lever Court should receive over 50% 0.2% Sky Factor and therefore sufficient daylight.

It should also be noted that given the narrow nature of Gradwell Street any development on this site, even one reduced in height would have a similar effect on daylight.

Based on the above guidance, the results contained within the technical assessment should not be viewed as absolute as the guideline values are not achievable in all circumstances where development might be necessary or desirable. In city or urban centres adjoining the strategic transport network, a compromise between internal access to daylight and other factors, such as the convenience of living in these locations or making efficient use of land resources can be made.



Figures



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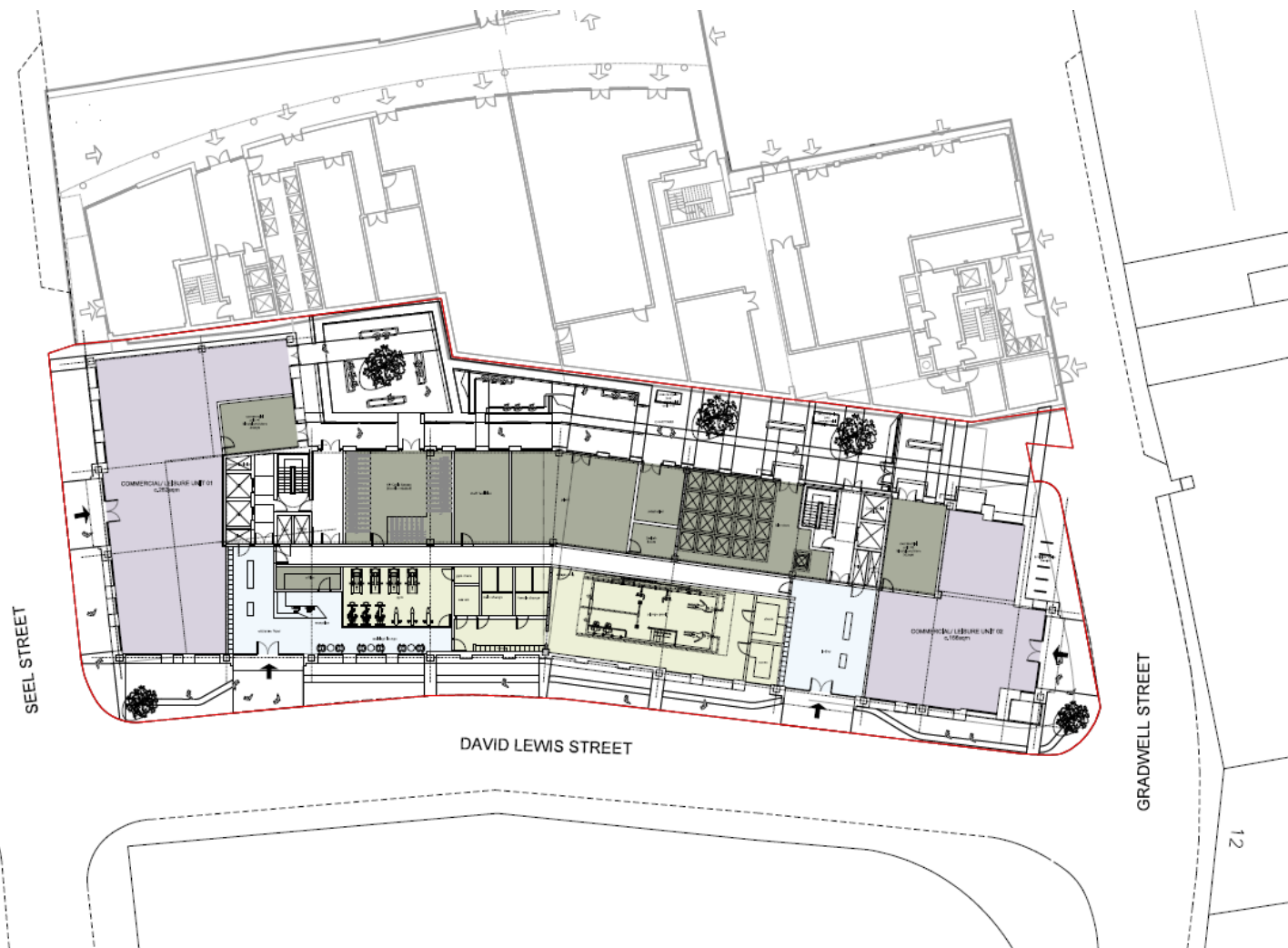
Elliot Group

Client:

18-24 Seel Street

Drawing Title:

Figure 1: Site Boundary



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Figure 2: Window Receptors ,



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Drawing Title:

Figure 3: Worst-Case Room
Assessment Locations

Room 1 – Lever Court



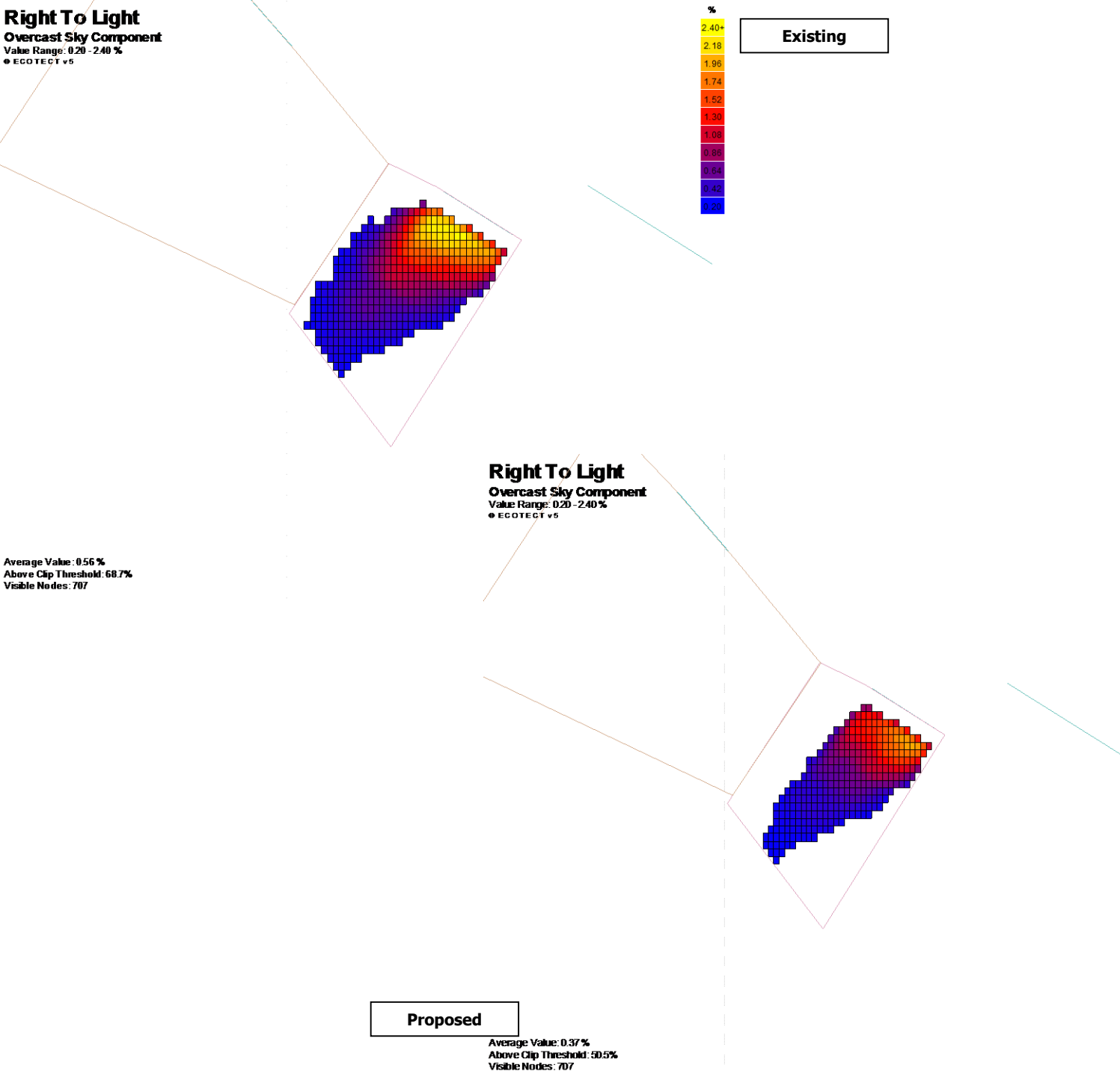
Room 2 – Epsnal House



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Right To Light
Overcast Sky Component
Value Range: 0.20 - 2.40 %
● ECOTECT v5



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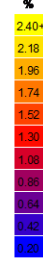
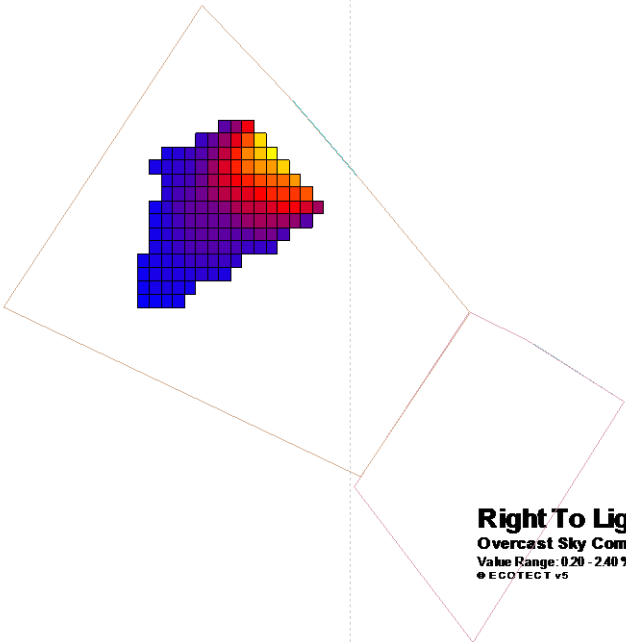
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Figure 4: No Skyline % for Worst-case First Floor of Room 1 Lever Court

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Average Value: 0.23 %
Above Clip Threshold: 27.5 %
Visible Nodes: 619

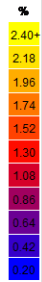
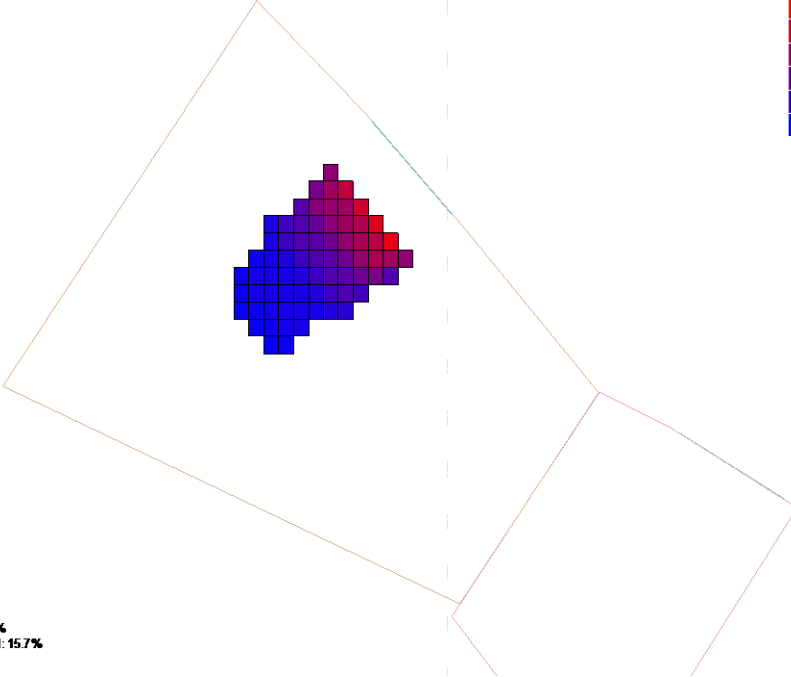


Existing

Right To Light
Overcast Sky Component
Value Range: 0.20 - 2.40 %
© ECOTECT v5

Proposed

Average Value: 0.10 %
Above Clip Threshold: 15.7 %
Visible Nodes: 619



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Figure 5: No Skyline % for
Worst-case Ground Floor of
Room 2 Epsnal House

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Appendix A – Daylight Results



Table A1 Summary of the Daylight Assessment Results for Existing Receptors – VSC

Window Location	Vertical Sky Component (%)		Difference	Ratio	Within Criteria?
	Existing Condition	Proposed Development			
1	21.39	11.10	-10.29	0.52	No
2	22.31	9.31	-13.00	0.42	No
3	18.45	7.64	-10.81	0.41	No
4	10.39	2.24	-8.15	0.22	No
5	16.24	7.04	-9.20	0.43	No
6	25.01	10.42	-14.59	0.42	No
7	25.77	10.16	-15.61	0.39	No
8	2.47	2.26	-0.21	0.91	Yes
9	26.33	11.01	-15.32	0.42	No
10	27.35	11.57	-15.78	0.42	No
11	28.24	11.41	-16.83	0.40	No
12	3.35	3.10	-0.25	0.93	Yes
13	28.70	12.42	-16.28	0.43	No
14	29.84	13.00	-16.84	0.44	No
15	30.77	12.94	-17.83	0.42	No
16	4.23	3.42	-0.81	0.81	Yes
17	33.04	16.39	-16.65	0.50	No
18	32.02	14.72	-17.30	0.46	No
19	32.95	14.64	-18.31	0.44	No
20	5.00	4.43	-0.57	0.89	Yes
21	23.93	14.32	-9.61	0.60	No
22	8.89	6.99	-1.90	0.79	No
23	26.37	16.18	-10.19	0.61	No
24	9.90	7.85	-2.05	0.79	No
25	28.88	18.22	-10.66	0.63	No
26	11.09	8.90	-2.19	0.80	Yes
27	26.26	17.21	-9.05	0.66	No
28	11.93	9.74	-2.19	0.82	Yes
29	28.47	19.38	-9.09	0.68	No
30	4.47	3.16	-1.31	0.71	No
31	11.70	6.23	-5.47	0.53	No
32	20.56	13.64	-6.92	0.66	No
33	12.38	7.46	-4.92	0.60	No
34	23.14	15.96	-7.18	0.69	No
35	13.39	8.30	-5.09	0.62	No
36	25.76	18.48	-7.28	0.72	No
37	14.43	9.38	-5.05	0.65	No
38	29.29	22.14	-7.15	0.76	No
39	16.35	11.12	-5.23	0.68	No
40	32.65	25.88	-6.77	0.79	No
41	19.96	15.47	-4.49	0.78	No
42	28.99	24.82	-4.17	0.86	Yes
43	11.61	5.61	-6.00	0.48	No
44	14.91	10.20	-4.71	0.68	No
45	19.28	13.15	-6.13	0.68	No
46	16.87	12.07	-4.80	0.72	No
47	21.64	15.52	-6.12	0.72	No
48	19.14	14.48	-4.66	0.76	No
49	24.48	18.52	-5.96	0.76	No
50	22.20	17.60	-4.60	0.79	No
51	27.74	21.97	-5.77	0.79	No

18-24 Seel Street

Daylight Assessment



Window Location	Vertical Sky Component (%)		Difference	Ratio	Within Criteria?
	Existing Condition	Proposed Development			
52	25.83	21.51	-4.32	0.83	Yes
53	31.45	26.06	-5.39	0.83	Yes
54	29.98	25.87	-4.11	0.86	Yes
55	35.20	30.21	-4.99	0.86	Yes
56	34.66	30.73	-3.93	0.89	Yes