



Eaton Court,

Oxford Road, Reading,

Daylight and Sunlight Assessment

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Document Prepared By:

Document Authorised By:

Ollie Westover

Bernice Waterman

Dated:

Dated:

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01.06.25

Signed:

Signed:




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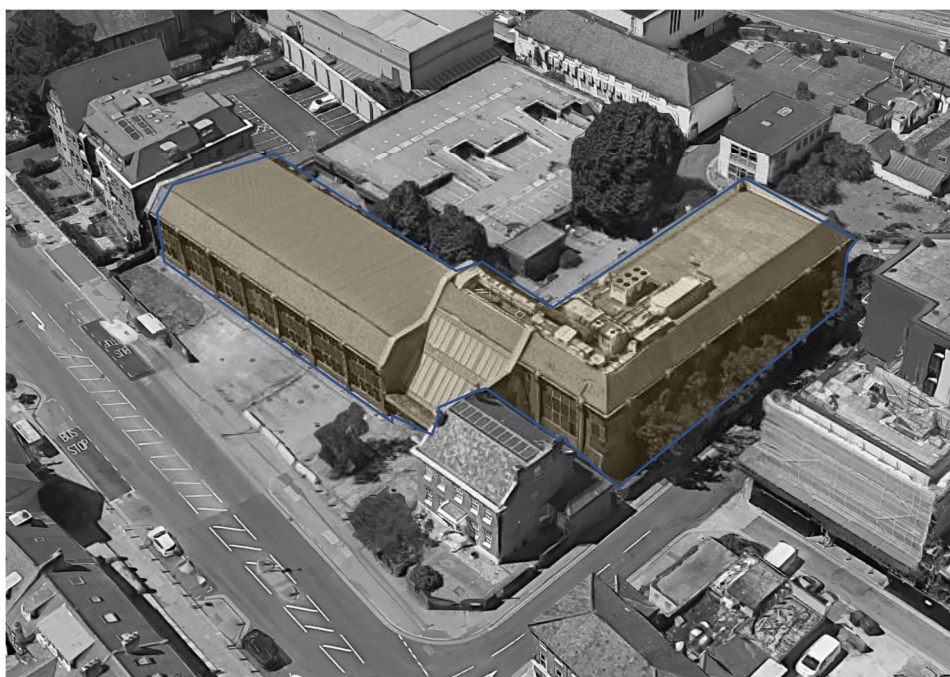
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1.0 Introduction

- 1.1 This daylight and sunlight assessment has been prepared in relation to a Class AA application for the proposed extension of the site known as Eaton Court, Oxford Road, Reading.
- 1.2 The report assesses the proposals in respect of daylight, sunlight and overshadowing matters, having regard to industry standard guidance.
- 1.3 There is no existing specific National Planning Policy relating to the prospective impacts of developments on daylight and sunlight on their surrounding environment.
- 1.4 However, the NPPF, 2024 (Para 130(c)) does refer to daylight and sunlight in relation to density, encouraging Local Planning Authorities to take a flexible approach to applying policies and guidance relating to the impacts of proposals where they would otherwise inhibit making effective use of the site.
- 1.5 The BRE Report 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice' (3rd Edition, 2022) 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 environs of the site and the assessment of light within proposed new dwellings.
- 1.6 It refers in turn to the daylight and sunlight recommendations in BS EN 17037: 2018+A1:2021 (with UK Annexe): 'Daylight in Buildings'
- 1.7 These reference documents are accepted as the authoritative works in the field on daylight, sunlight and overshadowing and the BRE guidance specifically referred to in many Local Authorities' planning policy guidance for daylighting.
- 1.8 The methodology therein has been used in numerous lighting analyses and the standards of permissible reduction in light are accepted as the industry standards.

2.0 Project Summary

- 2.1 The proposal site lies at the corner of Oxford Road and Eaton Place, Reading and is currently occupied by a part-2, part-3 storey detached building known as Eaton Court.
- 2.2 The proposal is for a 2-storey rooftop extension to part of the existing building, creating 20 new dwellings.
- 2.3 The impacts of the scheme have been assessed, in line with BRE guidance. Generally, it is the impacts on residential neighbours which are of primary concern.
- 2.4 To the east of the site, there is a recently constructed residential development which rises to 7 storeys in height.
- 2.5 This neighbouring site has been modelled from the consented planning drawings, and both the impacts of this scheme on that development, as well as the impacts of that proposal on light within these proposed dwellings have been accounted for and assessed.
- 2.6 Further details on the location of the assessed neighbours and their windows are given in Section 5.0.
- 2.7 In addition to assessing the impacts of the scheme on neighbours, daylight within the proposed new dwellings has also been assessed.



Site Location

3.0 Methodology

- 3.1 For this analysis, we have undertaken the most common calculations for the change in daylight and sunlight to existing buildings, as recommended in BRE Digest 209. These are:
- Vertical Sky Component (VSC) for daylight impacts
 - Annual Probable Sunlight Hours and Winter Probable Sunlight Hours (WPSH) (APSH) for sunlight impacts
 - Target Daylight Factor (DF_T) for daylight within the proposal
- 3.2 The VSC method measures the general amount of light available on the outside plane of the window as a ratio (%) of the amount of total unobstructed sky viewable following introduction of visible barriers such as buildings. The maximum value is just under 40% for a completely unobstructed vertical wall.
- 3.3 The VSC is calculated using computer simulation under a CIE overcast sky. This works by simulating the amount of visible sky from the centre point of each window. It is not affected by orientation and so all potentially affected windows are assessed.
- 3.4 The NSL test calculates the distribution of daylight within rooms by determining the area of the room at desk / work surface height (the 'working plane') which can and cannot receive a direct view of the sky and hence 'sky light'. The working plane height is set at 850mm above floor level within residential properties.
- 3.5 The NSL test can be carried out where neighbouring room layouts are known.
- 3.6 Annual Probable Sunlight Hours (APSH) and Winter Probable Sun light Hours (WPSH) are a measure of the amount of potential direct sunlight that is available to a given surface. APSH covers sunlight over the whole year and WPSH from September 21st to March 21st.
- 3.7 The number of total available hours is calculated from a data file in the software, built up over a number of years of actual weather data records.
- 3.8 Only windows which face within 90° of due south need be assessed for sunlight. This is looked at in Section 10.
- 3.9 APSH can also be used to assess the impact on external spaces such as gardens and balconies. In this instance no neighbouring gardens or open spaces require assessment.

4.0 Modelling & Data Sources

- 4.1 The first stage of the analysis is to create the analysis model of the existing site condition and the proposal. This allows us to analyse the impact of the proposal when compared to the existing condition.
- 4.2 2D drawings have been provided by the design team. These drawings are used to construct a 3D analysis model which is exported into the specialist daylight software. Calculations are then run, for both existing and proposed scenarios.
- 4.3 Sufficient detail is added to the model for the analysis. In accordance with BRE recommendations, trees and foliage have been omitted from the calculations.
- 4.4 Information on the properties has been provided to us by the design team in the form of drawings giving the site as existing and proposed and photographs of the site and surroundings.
- 4.5 Web-based mapping sources and planning records for neighbouring buildings have also been used.



Sketch Visual – As Proposed

5.0 BRE Guidance Targets

- 5.1 The reference document for this analysis, BRE Digest 209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice' (3rd Edition, 2022) gives the methodology for undertaking the calculations.
- 5.2 It also provides benchmark figures for the acceptable reduction in the daylight on existing properties which might be affected by development.
- 5.3 Specifically, the guidance gives figures for the VSC and APSH, as a percentage reduction that is "permissible" for the effect on existing windows.
- 5.4 It is worth noting the following statement in the Guidance introduction:
 - "The guide is intended for building designers and their clients, consultants and planning officials. 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 developer.
 - Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."
- 5.5 The relevant BRE recommendations for daylight and sunlight are:
 - The Vertical Sky Component measured at the centre of a window should be no less than 27%, or if reduced to below this, no less than 0.8 times the former value.
 - The window should receive at least 25% of available annual sunlight hours and more than 5% during the winter months (September 21st to March 21st), or, where this is not the case, 80% of its former value

6.0 Window Schedules



Mayer House – West Elevation



104 Oxford Road



10 Eaton Place

7.0 Daylight Impact Results – Vertical Sky Component

- 7.1 The Vertical Sky Component has been calculated for each of the 31 assessed windows for both the existing and proposed conditions.
- 7.2 As can be seen in the results below, 11 of the 31 assessed windows pass using the standard vertical sky component test by virtue of retaining 80% of their existing daylight or having a proposed VSC greater than 27.
- 7.3 Of the 20 windows which fall short, all are on the neighbouring site to the east.
- 7.4 It should be noted that the neighbouring scheme, Mayer House, has been built with windows to habitable rooms in close proximity to the street.
- 7.5 This arrangement adversely affects the buildability of the site opposite, at Eaton Court.
- 7.6 Where this is the case, the BRE guidance recommends that a more flexible approach to the numerical guidelines should be adopted to ensure that new development matches the height and proportions of existing neighbours.
- 7.7 For the windows at Mayer House which fall short of the guidance, an additional set of results have been undertaken using the BRE Guidance's 'mirrored massing approach'.
- 7.8 This assessment is looked at in Section 8.0.
- 7.9 As no floor plans for the neighbouring dwellings could be obtained, the No Sky Line test could not be undertaken.

7.0 Daylight Impact Results – Vertical Sky Component

Vertical Sky Component				
Window	Existing VSC	Proposed VSC	% Retained	Meets BRE Guidance?
1	27.478	18.863	68.65%	No
2	31.341	21.761	69.43%	No
3	31.132	21.459	68.93%	No
4	19.011	15.278	80.36%	Yes
5	17.851	16.437	92.08%	Yes
6	39.374	39.374	100.00%	Yes
7	26.762	17.650	65.95%	No
8	30.744	20.660	67.20%	No
9	30.838	20.672	67.03%	No
10	30.972	23.052	74.43%	No
11	29.926	26.987	90.18%	Yes
12	39.374	39.374	100.00%	Yes
13	26.492	17.161	64.78%	No
14	30.616	20.299	66.30%	No
15	30.820	20.441	66.32%	No
16	31.125	23.020	73.96%	No
17	30.076	27.059	89.97%	Yes
18	39.374	39.374	100.00%	Yes
19	26.412	17.052	64.56%	No
20	30.901	20.553	66.51%	No
21	34.422	24.009	69.75%	No
22	26.502	17.227	65.00%	No
23	31.192	20.932	67.11%	No
24	35.797	25.475	71.16%	No
25	26.677	17.768	66.61%	No
26	31.401	21.497	68.46%	No
27	36.035	26.040	72.26%	No
28	31.490	29.240	92.85%	Yes
29	31.716	28.063	88.48%	Yes
30	30.731	26.821	87.28%	Yes
31	33.981	29.818	87.75%	Yes

8.0 Daylight Impact Results – Mirrored Massing Approach

- 8.1 The windows on the neighbouring scheme to the east have been additionally assessed instead using the mirrored massing approach which is set out in the BRE Report (3rd Edition 2022).
- 8.2 This involves creating a notional “mirror image” of the existing building, mirrored about the common boundary. The VSC results for the windows with this notional building in place are then used as a baseline for the “existing” values within the results.
- 8.3 The reasoning behind this test is that good urban planning sometimes requires buildings to follow a grain in terms of massing and it would be prejudicial on the proposal site to not be permitted to follow this grain, provided the impacts are not appreciably worse than a building which followed this existing massing pattern.
- 8.4 The BRE guidance states that *“to ensure that new development matches the height and proportions of existing buildings or proposed neighbouring developments, the VSC...targets for these windows could be set to those for a ‘mirror-image’ building of the same height and size, an equal distance from the boundary.* ‘Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice’ (3rd Edition, 2022)’
- 8.5 Essentially, this test demonstrates that, were the developer of the proposal site be permitted to construct a similar building as that consented or built adjacent, then their development would not cause any more harm than the neighbouring development causes to their own site.
- 8.6 As can be seen from the results table below, when this approach is adopted, all windows retain 80% of their existing values in compliance with the recommendations of the BRE guidance.
- 8.7 As the neighbouring scheme is significantly larger than the proposal site, some windows show an improvement in levels using this test, which is to be expected

8.0 Daylight Impact Results – Mirrored Massing Approach

Vertical Sky Component				
Window	Existing VSC	Proposed VSC	% Retained	Meets BRE Guidance?
1	21.572	18.865	87.45%	Yes
2	24.542	21.764	88.68%	Yes
3	23.883	21.484	89.95%	Yes
4	16.245	15.285	94.09%	Yes
5	16.173	16.443	101.67%	Yes
6	38.680	39.377	101.80%	Yes
7	20.228	17.651	87.26%	Yes
8	23.246	20.665	88.89%	Yes
9	22.887	20.694	90.42%	Yes
10	23.829	23.081	96.86%	Yes
11	25.540	27.017	105.78%	Yes
12	37.590	39.378	104.75%	Yes
13	20.029	17.163	85.69%	Yes
14	23.259	20.301	87.28%	Yes
15	23.101	20.456	88.55%	Yes
16	24.237	23.044	95.08%	Yes
17	25.834	27.083	104.83%	Yes
18	37.649	39.377	104.59%	Yes
19	20.577	17.055	82.88%	Yes
20	24.349	20.556	84.42%	Yes
21	27.624	24.015	86.94%	Yes
22	21.371	17.229	80.62%	Yes
23	25.514	20.934	82.05%	Yes
24	29.980	25.477	84.98%	Yes
25	22.105	17.769	80.39%	Yes
26	26.824	21.498	80.14%	Yes
27	31.242	26.041	83.35%	Yes
28	30.876	29.192	94.54%	Yes
29	16.690	28.062	168.13%	Yes
30	16.779	26.821	159.85%	Yes
31	19.779	29.817	150.75%	Yes

9.0 Sunlight Impact Results

- 9.1 BRE guidance states that only windows which face within 90° of due south need be assessed for sunlight provision.
- 9.2 In this instance, 28 windows fall into this category. The remaining windows do not need to be assessed as they face within 90° of north.
- 9.3 The Annual and Winter Probable Sunlight Hours have been calculated for each of these windows for both the existing and proposed conditions using the methodology described previously - both over the whole year, and through the "winter months" (September 21st until March 21st)
- 9.4 The BRE guidance states that the sun lighting may be adversely affected if the centre of the window:
- Receives less than 25% of annual hours or less than 5% of winter hours
and
 - Receives less than 80% of its current sunlight hours during either period
and
 - Has a reduction in sunlight over the whole year greater than 4% of annual probable sunlight hours
- 9.5 It is clear from the wording of the above that all three clauses need to be met to qualify as an adverse impact. Thus, if the window does not meet any one of these criteria, the impact is acceptable.
- 9.6 The results below show that all windows retain 25% of annual sunlight hours and 5% of winter hours.
- 9.7 The proposal is therefore fully compliant with the BRE Guidance in relation to impacts on sunlight to neighbouring windows.

9.0 Sunlight Impact Results

	Annual Sunlight Hours			Winter Sunlight Hours				
Window	Ex. Hrs Received (%)	Prop. Hrs Received	% Retained	Ex. Hrs Received	Prop. Hrs Received	% Retained	Meets Annual Target	Meets Winter Target
1	35.620	25.821	N/A	9.979	6.584	N/A	Yes	Yes
2	42.134	26.359	N/A	12.474	7.277	N/A	Yes	Yes
3	38.184	25.928	N/A	12.543	7.554	N/A	Yes	Yes
7	36.175	25.994	N/A	10.187	7.484	N/A	Yes	Yes
8	42.481	26.232	N/A	12.751	8.247	N/A	Yes	Yes
9	38.531	26.319	N/A	12.682	7.692	N/A	Yes	Yes
10	33.056	29.453	N/A	10.534	8.593	N/A	Yes	Yes
11	32.017	32.017	N/A	10.534	10.534	N/A	Yes	Yes
12	51.629	51.629	N/A	14.830	14.830	N/A	Yes	Yes
13	39.709	28.413	N/A	10.187	8.177	N/A	Yes	Yes
14	45.530	28.760	N/A	12.959	8.593	N/A	Yes	Yes
15	39.709	25.918	N/A	13.929	8.870	N/A	Yes	Yes
16	35.967	32.432	N/A	13.236	11.296	N/A	Yes	Yes
17	34.581	34.581	N/A	13.028	13.028	N/A	Yes	Yes
18	51.629	51.629	N/A	14.830	14.830	N/A	Yes	Yes
19	40.541	28.898	N/A	11.019	8.801	N/A	Yes	Yes
20	48.164	31.809	N/A	13.167	9.217	N/A	Yes	Yes
21	51.213	38.115	N/A	14.830	10.464	N/A	Yes	Yes
22	41.026	30.423	N/A	11.504	10.187	N/A	Yes	Yes
23	48.164	32.987	N/A	13.167	10.395	N/A	Yes	Yes
24	51.213	38.184	N/A	14.830	10.949	N/A	Yes	Yes
25	41.234	31.254	N/A	11.712	11.296	N/A	Yes	Yes
26	48.302	34.442	N/A	13.306	11.850	N/A	Yes	Yes
27	51.213	39.570	N/A	14.830	11.920	N/A	Yes	Yes
28	42.065	42.065	N/A	13.514	13.514	N/A	Yes	Yes
29	74.705	67.706	N/A	21.414	19.473	N/A	Yes	Yes
30	73.181	66.528	N/A	19.958	17.949	N/A	Yes	Yes
31	77.547	69.785	N/A	22.869	19.473	N/A	Yes	Yes

10.0 Daylight Within the Proposal

10.1 The BRE and BS EN 17037 guidance allows for two alternative methods to assess daylight within new dwellings. This report uses the following method:

- Target Daylight Factor (DF_T)

10.2 The DF_T method is a complex and representative calculation to determine natural internal luminance.

10.3 It takes into account such factors as window size, number of windows available to the room, room size and layout, room surface reflectance, and the angle of visible sky reaching the window.

10.4 The calculations have assumed a white ceiling, cream walls and mid-grey carpet or wooden floor using reflectance values taken from the BS EN 170437 Guidance.

10.5 As this scheme involves work to an existing building, it falls under the category of "hard to light" dwellings and therefore an alternative target can be used. The minimum DF_T values for various UK locations and room types are provided below:

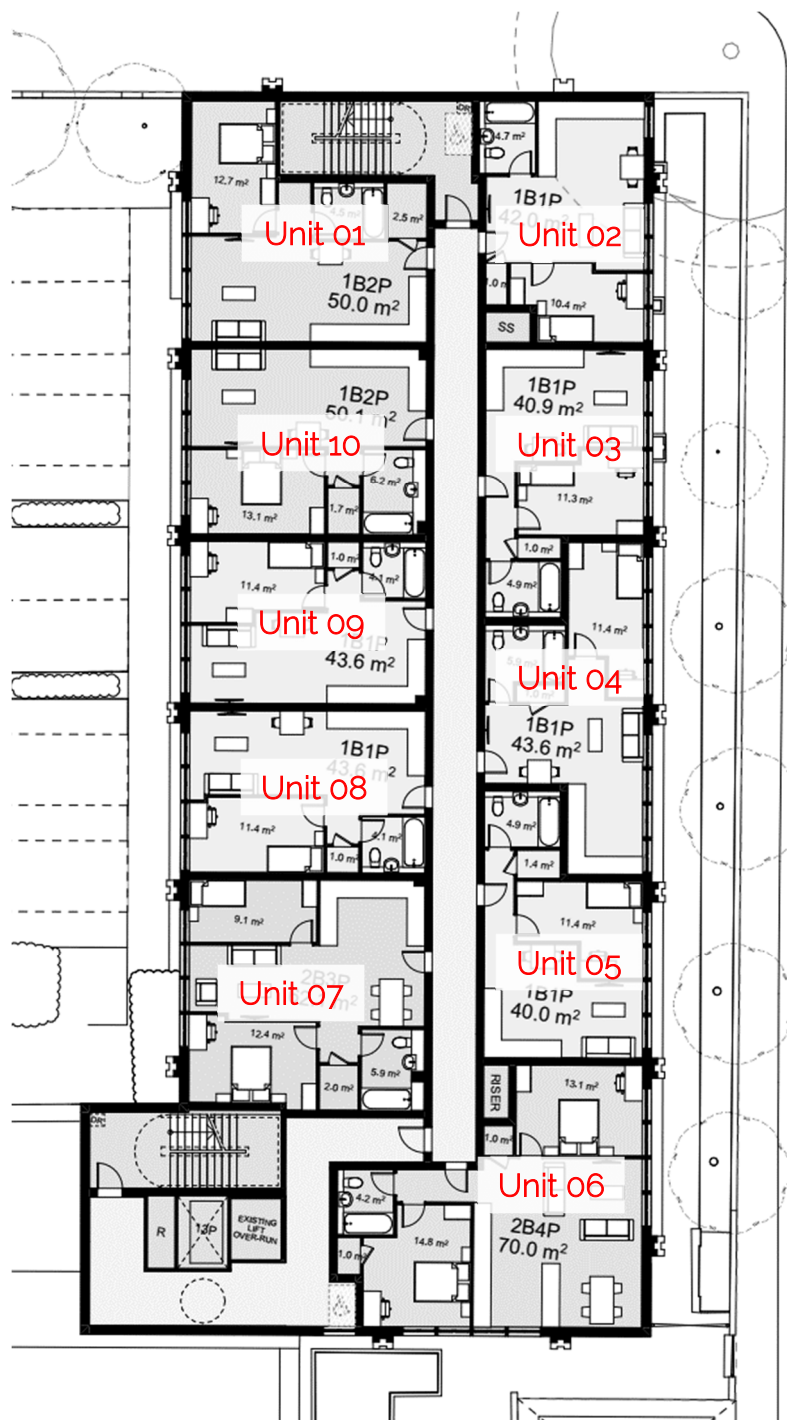
Table C3 – Target daylight factors (D_T) to achieve over at least 50% of the assessment grid in UK domestic habitable rooms with vertical and/or inclined daylight apertures			
Location	D_T for 100 lx (Bedroom)	D_T for 150 lx (Living room)	D_T for 200 lx (Kitchen)
St Peter (Jersey)	0.6%	0.9%	1.2%
London (Gatwick Airport)	0.7%	1.1%	1.4%
Birmingham	0.6%	0.9%	1.2%
Hemsby (Norfolk)	0.6%	0.9%	1.3%
Finningley (Yorkshire)	0.7%	1.0%	1.3%
Aughton (Lancashire)	0.7%	1.1%	1.4%
Belfast	0.7%	1.0%	1.4%
Leuchars (Fife)	0.7%	1.1%	1.4%
Oban	0.8%	1.1%	1.5%
Aberdeen	0.7%	1.1%	1.4%

10.6 It is deemed by the guidance that if the minimum DF_T criteria are met, then the occupiers of the dwelling will have sufficient daylight.

10.7 As the 4th floor is a direct duplicate of the 3rd, only the lower of the two floors needs to be assessed.

10.8 As can be seen from the results below that all assessed habitable rooms meet and exceed the minimum levels of internal daylight.

10.0 Daylight Within the Proposal



3rd Floor as Proposed

10.0 Daylight Within the Proposal

Minimum Target Daylight Factor				
Unit	Room	Required DF _T Over 50% of Room Area	Area Of Room Receiving Required DF _T	Meets Standards?
01	Living/Kitchen/Dining	1.4%	68.4%	Yes
01	Bedroom 1	0.7%	100.0%	Yes
02	Living/Kitchen/Dining	1.4%	64.8%	Yes
02	Bedroom 1	0.7%	100.0%	Yes
03	Living/Kitchen/Dining	1.4%	70.5%	Yes
03	Bedroom 1	0.7%	100.0%	Yes
04	Living/Kitchen/Dining	1.4%	88.9%	Yes
04	Bedroom 1	0.7%	100.0%	Yes
05	Living/Kitchen/Dining	1.4%	66.5%	Yes
05	Bedroom 1	0.7%	100.0%	Yes
06	Living/Kitchen/Dining	1.4%	69.1%	Yes
06	Bedroom 1	0.7%	100.0%	Yes
06	Bedroom 2	0.7%	100.0%	Yes
07	Living/Kitchen/Dining	1.4%	54.9%	Yes
07	Bedroom 1	0.7%	76.9%	Yes
07	Bedroom 2	0.7%	81.6%	Yes
08	Living/Kitchen/Dining	1.4%	62.6%	Yes
08	Bedroom 1	0.7%	100.0%	Yes
09	Living/Kitchen/Dining	1.4%	62.7%	Yes
09	Bedroom 1	0.7%	100.0%	Yes
10	Living/Kitchen/Dining	1.4%	61.0%	Yes
10	Bedroom 1	0.7%	100.0%	Yes

11.0 Conclusions

- 11.1 Using industry standard methodology, we have made numerical analyses to ascertain the effects of the proposal at Eaton Court, Reading and the levels of change in daylight and sunlight for the windows of the neighbouring properties.
- 11.2 The main criteria used in this analysis to show compliance are the Vertical Sky Component and No Sky Line for daylight impacts and Annual and Winter Probable Sunlight Hours for sunlight impacts
- 11.3 As has been shown, some neighbouring windows retain 80% of current levels, in full compliance with the BRE Guidance. All windows which fall short of the BRE guidance using this test are on the newly constructed development to the east of the site
- 11.4 The windows that do not meet the VSC target, are shown to retain over 80% of existing levels, when assessed using the mirrored massing approach.
- 11.5 In the context of the site limitations, a moderate adverse impact to a neighbouring window that is in close proximity to the site boundary should be considered alongside the NPPF guidance (para 130(c) which states:
 - Local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site.

And

BRE guidance paragraph 1.6 which states:

11.0 Conclusions

- The guide is intended for building designers and their consultants and planning officials. 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 flexibly since natural lighting is only one of many factors in site layout design.
- 11.6 In terms of sunlight, all assessed windows retain 25% of their existing annual hours and 5% of winter hours, in full compliance with the BRE guidance.
- 11.7 No neighbouring amenity spaces are understood to require assessment.
- 11.8 The development is therefore fully compliant with BRE guidance in relation to sunlight impacts.
- 11.9 The new dwellings all receive sufficient daylight in line with the BRE Guidance and BS EN 17037 (UK Annex), and, where relevant, sunlight levels in line with both sets of guidance documents.
- 11.10 From a planning perspective therefore, it is the conclusion of this report that the proposed development will cause limited adverse impact on neighbouring dwellings and shows an acceptable level of reduction in the context of its urban location.



T16 Design Ltd.

T: 01206 572452

E: info@t16design.com

W: www.t16design.com

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