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DAYLIGHT & SUNLIGHT SELF TEST REPORT

of

Campion House, Thornbury Road, Osterley, Middlesex

on behalf of

Linden Homes Chiltern Limited

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Date: 9 November 2009

1. Scope of Instructions & Brief

Description

- 1.1 Linden Homes Chiltern Limited have instructed Behan Partnership LLP to prepare a further self test study to assess the likely impact of the development on the natural lighting experienced within the new proposed accommodation; we have tested the worst case scenario for each type of unit within the scheme.
- 1.2 The study has been carried out in accordance with the recommendations of the Building Research Establishment Report "Site Layout Planning for Daylight & Sunlight 1991".
- 1.3 The result tables and drawings, which are attached at the rear, illustrate the results for the daylight and sunlight assessments.

Policy Guidelines

- 1.4 This study has been carried out in accordance with the recommendations of the Building Research Establishment Report "Site Layout Planning for Daylight & Sunlight 1991". This is the standard adopted in the London Borough of Hounslow Unitary Development Plan December 2003 (amended September 2007, November 2008 and January 2009), Chapter 5, A.5 and SPG (February 1997), chapter 4 1.0 & 2.0 "Daylight & Sunlight".
 - 1.5 The Guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the Report should not be seen as a part of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design. In certain circumstances, the developer or planning authority may wish to use alternative target values.
 - 1.6 Whilst technical analysis can be carried out in accordance with numerical guidelines and reported factually by comparison with those guidelines, the final assessment as to whether affected dwellings are left with acceptable amounts of daylight and sunlight in an inner city contest where the findings are to be interpreted in a flexible manner is a matter of subjective opinion.
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METHODOLOGY

- 1.7 The Daylight & Sunlight assessments have been undertaken by reference to the Building Research Establishment (BRE) Guidelines "Site Layout Planning for Daylight & Sunlight. A Guide to Good Practice".
- 1.8 The BRE Report advises that daylight and sunlight levels should be assessed for the main habitable rooms of neighbouring residential properties. Habitable rooms in residential properties are defined as kitchens, living rooms and dining rooms. Bedrooms are less important as they are mainly occupied at night time. The Report also makes reference to other property types, which may be regarded as "sensitive receptors" such as schools, hospitals, hotels and hostels, small workshops and most offices.

Daylight

- 1.9 The BRE Guide states that:-

"If, for any part of the new development, the angle from the centre of the lowest affected window to the head of the new development is more than 25°, then a more detailed check is needed to find the loss of skylight to the existing buildings."

- 1.10 The BRE Guidelines propose several methods for calculating daylight. The 2 main methods predominantly used are those involving the measurement of the total amount of skylight available:-

- vertical sky component (VSC) and
 - Average Daylight Factor (ADF).
- i. The VSC calculation is a general test of potential for daylight to a building, measuring the light available on the outside plane of windows.
- ii. The second recognised method of assessment for daylight is the Average Daylight Factor (ADF) calculation which assesses the quality and distribution of light within a
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room served by a window and takes into account the VSC value, the size and number of the windows and room and the use to which the room is put. The ADF is the effective proportion of sky visibility available as luminance within a room. Rather than simply assessing the external obstructions as seen from a window, as in the VSC analysis, the ADF calculation takes the external sky visibility and incorporates it within a calculation that takes account of window size, number of windows, internal room surface area, glass transmittance and internal surface reflectance.

Where the analysis shows that the VSC results show values outside the BRE standards, we would then analyse the ADF results and this has been provided for completeness.

The ADF is calculated using the following formula:-

$$df = \frac{TA}{A} \theta \%$$
$$A(1-R^2)$$

Where:

- T is the diffuse visible transmittance of the glazing, including corrections for dirt on glass and any blinds or curtains. (For clean clear single glass, a value of 0.8 can be used)
- Aw is the net glazed area of the window (m²)
- A is the total area of the room surfaces: ceiling, floor, walls, doors and windows (m²)
- R is their average reflectance. For fairly light-coloured rooms a value of 0.5 can be taken
- θ is the angle of visible sky in degrees derived from the vertical sky component

The BRE Report advises that, where supplementary electric lighting is available, the minimum standards of ADF that should be attained are 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

- 1.11 The ADF assesses actual light distribution within defined room areas, whereas the VSC considers potential light. British Standard 8206, Code of Practice for Daylighting recommends ADF values of 1% in bedrooms, 1.5% in living rooms and 2% in kitchens. For other uses, where it is expected that supplementary electric lighting will be used throughout the daytime, such as in offices, the ADF value should be 2%. There is no general requirement within the

BRE Guidelines to assess ADF values, other than for neighbouring residential buildings. The Average Daylight Factor is more reliable than the first two diffuse daylight tests. This is because the Average Daylight Factor test takes into account a range of variables which the other tests do not. For example, only the Average Daylight Factor test takes into account the size of the window and whether the room has more than one window. These are important factors which affect the level of illumination within a room.

1.12 At the time of the assessment, detailed information was available on the internal arrangements of the proposed property and therefore we have laid the template over the architect's drawings to give a good idea of the effects the scheme may have.

1.13 The daylight assessment has been undertaken using the VSC and ADF calculation methods. All relevant windows have been considered for each of these methods.

Significant Criteria

1.14 In describing the significance criteria as set out below, it should be noted that they have been developed to protect residential properties, which are the most sensitive receptors.

1.15 The Guidance given by BRE has been used as a basis for the criteria to assess the Development's potential impacts. The BRE guidance specifies:

"...In special circumstances the developer or planning authority may wish to use different target values. For example, in an historic city centre a higher degree of obstruction may be unavoidable..."

1.16 The report adds:

"...Different criteria may be used, based on the requirements for daylighting in an area viewed against other site layout constraints."

1.17 In consideration of the above, it is important to note that the Site is located in an urban centre that, in parts, currently experiences daylight levels below the BRE recommendations.

This is discussed within the 'Baseline Conditions' section of this report. Thus, in these instances the BRE guidance states that the:

"...guidelines should be applied sensibly and flexibly".

1.18 Under these circumstances, the less stringent, higher BRE target percentage loss values and significance criteria may be justifiable.

Daylight and Sunlight

1.19 The BRE Guidance is summarised in the below table and this has been used as the basis for the criteria used in the assessment of daylight and sunlight impacts.

Test:	British Research Establishment (BRE) Criteria:
Daylight	A window may be adversely affected if the vertical sky component (VSC) measured at the centre of the window is less than 27% and less than 0.8 times its former value. A room may be adversely affected if the average daylight factor (ADF) is less than 1% for a bedroom, 1.5% for a living room or 2% for a kitchen. For offices a minimum figure of 2% is required.
Sunlight	A window may be adversely affected if a point at the centre of the window receives in the year less than 25% of the annual probable sunlight hours (APSH) including at least 5% of the annual probable sunlight hours during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period.

1.20 The BRE guidance has been used to generate significance criteria that have been used to assess the impact of the development.

1.21 For VSC, they are:-

- Windows experiencing less than 20% reduction represent negligible to minor beneficial impacts;
- Windows experiencing between 20 and 29.9% reduction represent minor adverse impacts;
- Windows experiencing between 30 and 39.9% reduction represent moderate adverse impacts; and
- Windows experiencing greater than 40% reduction represents substantial adverse impacts.

1.22 For ADF criteria, they are:-

- Greater than 1.5% represents minor beneficial impacts;
- 1.0 - 1.49% represents negligible to minor adverse impacts;
- 0.5 - 0.99% represents minor adverse to moderate adverse impacts; and
- Less than 0.49% represents substantial adverse impacts.

2. Results – Proposed Development

Daylight VSC & ADF

- 2.1 The results of the Vertical Sky Component (VSC) analysis on the relevant overlooking windows are presented in the table at Appendix 1.
- 2.2 The potential lighting on the outside face of the glazing is far in excess of the recommended 27% VSC figure with the exception of one window which is borderline. However, the architect has designed the rooms and windows to achieve excellent levels of light and the room far exceeds the BRE standard under the ADF test.
- 2.3 We have tested all the worse case windows / rooms which are located on the ground floors.
- 2.4 As the results show they all comfortably pass the ADF study and this gives a good indication on how the building as a whole should perform.

Sunlight

- 2.5 As with the daylight results above, the resultant tables confirms that all windows receive excellent annual, winter and summer sunlight and fully complies with the BRE guidelines.

3. Conclusion

- 3.1 The site is situated in the London Borough of Hounslow and is in proximity to the residential properties to the north, east and south.
- 3.2 The main methods of self test assessment included the Vertical Sky Component (VSC) and ADF method for daylight analysis using the Waldram diagram template drawings provided by the Building Research Establishment.
- 3.3 All the ground floor windows within the new accommodation that is likely to be affected has been considered in this assessment.
- 3.4 The VSC daylight analysis indicates that all the windows will comply with the guidelines with the exception of one borderline window but the ADF analysis indicates that all the windows will remain adequately lit (excellent levels of natural lighting) as a result of the development proposals.
- 3.5 The scheme is also considered to fully comply with the sunlight criteria since all windows tested fully pass the minimum standard.
- 3.6 The analysis undertaken demonstrates that given the approach recommended by the BRE guidelines, the impact of the proposed development is considered acceptable in daylight and sunlight terms.
- 3.7 The development should therefore be considered to meet the requirements of the London Borough of Hounslow Unitary Development Plan in daylight and sunlight terms on the self-test basis.



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APPENDIX 1

Proposed Site Plan	2009536/01
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