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DAYLIGHT & SUNLIGHT STUDY

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CONTENTS **PAGE**

INTRODUCTION

Delva Patman Associates have been instructed by Unite Group Plc to prepare a daylight and sunlight study to assess the likely impact of the proposed redevelopment of 11-13 St Pancras Way by Bellis Cooley Architects on the neighbouring residential amenity adjacent to the site.

This study has been carried out in accordance with the recommendations of the Building Research Establishment Report "Site Layout Planning for Daylight & Sunlight 1991" (BRE209).

The template drawings, which are attached, illustrate the results for the daylight and sunlight assessments and identify the drawings used in these studies.

THE PROPOSAL

The proposals include the demolition of the existing Travis Parkins units and the construction of a mixed use building varying between six and ten storeys in height. Travis Perkins will be reinstated within the ground floor with student accommodation above.

POLICY / GUIDELINES

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 specifically identified in the London Borough of Camden Core Strategy and Development Policies DPD by which daylight and sunlight should be assessed.

The BRE 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.

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 context where the findings are to be interpreted in a flexible manner is a matter of subjective opinion.

METHODOLOGY

The Daylight, Sunlight & Shadow assessments have been undertaken in accordance with the Building Research Establishment (BRE) guidelines "Site Layout Planning for Daylight & Sunlight. A Guide to Good Practice".

The BRE Report advises that daylight 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.

Delva Patman Associates have worked together with Bellis Cooley Architects on the height, bulk, massing and orientation of the building blocks to maintain realistic levels of possible BRE compliance for daylight and sunlight with regard to neighbouring residential amenity whilst working within the constraints of a city centre environment.

Daylight

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^{o}, then a more detailed check is needed to find the loss of skylight to the existing buildings."*

The BRE guidelines propose several methods for calculating daylight.

The two main methods predominantly used are those involving the measurement of the total amount of skylight available (the vertical sky component (VSC)) and its distribution within the building (the No-Sky line).

The VSC calculation is a general test of potential for daylight to a building, measuring the light available on the outside plane of windows.

The "No-Sky" Line divides those areas of the working plane which can receive direct skylight, from those which cannot. It provides an indication of how good the daylight distribution is within a room.

The third recognised method of assessment for daylight is the Average Daylight Factor (ADF) calculation which assesses the quality and distribution of light within a 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. ADF assesses actual light distribution within a defined room area 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.

This report fully considers all three methods of daylight analysis.

Sunlight

The BRE have produced sunlight templates for London, Manchester and Edinburgh indicating the Annual Probable Sunlight Hours (APSH) for these regions. The London template has been selected for this study as the London indicator template is the closest of the three available from BRE in terms of latitude.

Sunlight analysis is undertaken by measuring annual probable sunlight hours (APSH) for the main windows of rooms which face within 90^{o} of due south. The maximum number of annual probable sunlight hours for the London orientation is 1,486 hours. The BRE guidelines propose that the appropriate date for undertaking a sunlight assessment is on 21st March, being the spring equinox. Calculations of both summer and winter availability are made with the winter analysis covering the period from the 21st September to 21st March. For residential accommodation, the main

requirement for sunlight is in living rooms and it is regarded as less important in bedrooms and kitchens.

Due to orientation and room use not all windows assessed for daylight qualify for sunlight assessment in accordance with BRE Guidance.

SOURCE DATA

The studies have been undertaken by calculating the daylight & sunlight based on the template drawings provided within the BRE guidelines. The study was undertaken with plan drawings derived from:

- Existing and Surrounding buildings: 3D model provide by ZMapping;
- Proposed Scheme: Bellis Cooley Architects: 3D Model provided January 2011;
- Beaumont Court: DMWR Architects LLP: Dwg No's: 2412_A1/109L, 110K, 111J, 112H, 113G, 114F, 115G, 116H, 117F, 118F & A0/300I;
- Site Photography: January 2011.

No access has been obtained into any of the neighbouring properties for the purposes of these assessments. Floor plans have been provided for Beaumont Court to the north but no internal information was available for the other adjacent properties so notional layouts have been adopted to provide an indicative analysis.

Due to orientation neighbouring room uses the only property that qualifies for sunlight analysis is Beaumont Court.

SIGNIFICANCE CRITERIA

The guidance given by BRE has been used as a basis for the criteria to assess the Development's potential effects. 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…"*

The report adds:

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

In consideration of the above, it is important to note that the Site is located in a dense urban centre that, in parts, currently experiences adverse daylight and sunlight levels. 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".*

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

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.

TABLE 1: BRE DAYLIGHT GUIDANCE USED IN THE ASSESSMENT

Issue	Criteria
Daylight	A window may be 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 a significant are of the room is beyond the **No-Sky Line** and is 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 including at least 5% of the annual probable sunlight hours **(APSH)** during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period.

It is of note that for both sunlight and daylight calculations, total reliance upon numerical values and particularly percentage changes may be misleading particularly where baseline values are already comparatively low, as is often the case in dense urban locations such as this. A percentage change of more than 20% may well represent only a very small difference in actual light value.

Additionally, it should be borne in mind that Page 1 of the BRE guidance suggests that circumstances will exist where an alternative criteria value may be used, for example, in a city centre:

> *"…where a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings".*

In such instances, the BRE guidance advises that the numerical guidelines should be interpreted flexibly, and alternative numerical values may be used. The Site's dense urban location justifies this flexible interpretation of the BRE guidance.

It is also noted that the majority of neighbouring accommodation adjacent to the development site and considered within this report is itself student housing. There is therefore argument that this nature of accommodation can warrant some departure from the BRE amenity standards that are generally applied to residential accommodation intended for normal domestic occupation.

Student accommodation is generally occupied by individual students for less than a year and its main function is for sleeping. Therefore the perceived impacts by the individual students are likely to be much less than that perceived by occupants of traditional residential accommodation.

It is also noted that Delva Patman Associates have worked on a number of similarly sized projects in Camden and other surrounding London Boroughs where planning consent has been granted where BRE Guidance was not fully achieved:

Loudoun Road	(Camden)
Texaco Garage Chalk Farm	(Camden)
Mid City place	(Camden)
Chichester House	(Camden)
St Andrews Hospital site	(Tower Hamlets)
Whatman House	(Tower Hamlets)
New Festival Quarter	(Tower Hamlets)

21 Wapping Lane	(Tower Hamlets)
8-10 Grafton Street	(Westminster)
190 Strand	(Westminster)
Kingsland Wharf	(Hackney)
Eagle House	(Hackney)
New Street Square	(City of London)

BASELINE CONDITIONS

An analysis of the impact of the existing buildings (the baseline conditions) against which to compare any potential impact arising from the development has been undertaken based on Drawing 11015/SPT/800 in Appendix A.

It is noted that the Site is in close proximity to adjacent properties that surround the site to the north, south and west. The site is bounded to the south by 9 St Pancras Way, by the Royal Veterinary College and College Grove to the west, by St Pancras Way to the east and Beaumont Court to the north. The neighbouring residential properties generally receive good levels of light over and above the existing and surrounding buildings due to their relative height and proximity considering the site is set in an urban environment.

This can be seen from the technical results, both in graphical and tabular form in the Technical Appendices A -C.

An analysis of the existing daylight and sunlight levels enjoyed by the neighbouring residential amenity has been undertaken in order to provide a baseline against which the impacts arising from the proposed development can be assessed.

RESULTS – COMPLETED DEVELOPMENT

DAYLIGHT – VSC

The full results of the daylight analyses are presented in Appendix B in tabular form. A summary of the results of the Vertical Sky Component (VSC) analysis on the relevant overlooking windows are presented in the Table 2 below. This identifies where habitable rooms / windows are left with adequate light.

TABLE 2: NUMBER OF WINDOWS EXPERIENCING DAYLIGHT IMPACTS AS A RESULT OF THE DEVELOPMENT (VSC METHOD)

Address	Total Number of Windows Tested	Windows Meeting BRE Guidelines for VSC	Number of Windows Experiencing Adverse Impacts			
			<20% reduction (negligible impact)	20-29.9% reduction (minor adverse impact)	30-39.9% reduction (moderate adverse impact	>40% reduction (substantial adverse impact)
Beaumont Court	133	113	113	20	0	0
1-12 College Grove	48	28	28	11	8	1
9 St Pancras Way	4	1	1	3	0	0
Total	**185**	**142**	**142**	**34**	**8**	**1**

Table 2 indicates that 142 (76.8%) of the 185 windows assessed will fully comply with BRE Guidance, 34 (18.4%) will experience a minor adverse effect, 8 (4.3%) will experience a moderate adverse effect and the remaining window (0.5%) will experience a substantial adverse effect when measured against the BRE assessment criteria for VSC.

It is recognised that the VSC assessment measures the potential to receive light only and does not take into account the size and type of internal accomodation affected.

It is considered that the impact measured around the development site, is more as a result of the very good levels of existing light seen over the uncharacteristically low (for an urban location such as this) Travis Perkin units and undeveloped goods yards rather than as a result of the scale of the proposed development. It should be recognised that it is this which has created the disparity between the existing and proposed analysis giving the impression of an adverse impact in daylight terms.

Furthermore, the proposed VSC figures (fully presented in Appendix B) do indicate good levels of potential daylight for a dense urban location such as this with only the 2 (1.1%) out of the 185 windows assessed receiving VSC figures of less than 15% which is considered good for a city centre location.

DAYLIGHT – "NO SKY" LINE

The full results of the daylight analyses are presented in Appendix B in tabular form. A summary of the results of the "No Sky" Line analysis on the relevant overlooking rooms are presented in the Table 3 below.

TABLE 3: NUMBER OF ROOMS EXPERIENCING DAYLIGHT IMPACTS AS A RESULT OF THE DEVELOPMENT ("NO SKY" LINE METHOD)

Address	Total Number of Rooms Tested	Rooms Meeting BRE Guidelines for No-Sky Line	Number of Rooms Experiencing Adverse Impacts
Beaumont Court	128	128	0
1-12 College Grove	48	46	2
9 St Pancras Way	3	3	0
Total	**179**	**177**	**2**

Table 3 shows that 177 (98.9%) of the 179 neighbouring habitable rooms assessed will comfortably comply with the target values set by the BRE for the "No Sky" Line assessment.

This analysis demonstrates that apart from 2 ground floor rooms in 1-12 College Grove directly adjacent to the North West corner of the development site that generally the distribution of light within the habitable rooms of the neighbouring residential properties will remain in accordance with BRE "No Sky" Line Guidance.

DAYLIGHT – ADF

The full results of the daylight analyses are presented in Appendix B in tabular form. A summary of the results of the Average Daylight Factor (ADF) analysis on the relevant overlooking rooms are presented in the Table 4 below. This identifies where habitable rooms are left with adequate light.

TABLE 4: NUMBER OF ROOMS EXPERIENCING DAYLIGHT IMPACTS AS A RESULT OF THE DEVELOPMENT (ADF METHOD)

Address	Total Number of Rooms Tested	Rooms Meeting BRE Guidelines for ADF Line	Number of Rooms Experiencing Adverse Impacts
Beaumont Court	128	128	0
1-12 College Grove	48	42	6 (3)
9 St Pancras Way	3	3	0
Total	**179**	**173**	**6 (3)**

Table 4 indicates that 173 (96.6%) of the 179 rooms assessed in the neighbouring properties will fully comply with the BRE guidelines for daylight in ADF terms. It should be noted that 3 of the 6 rooms below BRE Guidance are also currently below BRE Guidance so in effect only 3 rooms will experience an adverse impact as a direct result of the development proposals.

It is clear therefore that this ADF analysis also demonstrates that apart from the ground floor student kitchens in 1-12 College Grove directly adjacent to the North West corner of the development site that generally the quantity and quality of light within the habitable rooms of the neighbouring residential properties will comfortably remain in accordance with BRE ADF Guidance.

It is noted that only two rooms adjacent to the development will fail all 3 methods of assessment. These two rooms, on the ground floor of 1-12 College Grove, are both thought to serve relatively small kitchens in student blocks (not considered large enough where the occupants could comfortably sit at a table and dine) and currently receive relatively low levels of daylight due to the relative height and proximity of Beaumont Animals Hospital which currently inhibits the access of direct light.

Overall it is considered that the scheme proposals will have a negligible to highly localised moderate adverse effect on neighbouring residential amenity in daylight terms.

DAYLIGHT – SELF-TEST ANALYSIS

Delva Patman Associates have not undertaken a full assessment of every habitable room within the development proposals. Instead DPA have used their professional experience and understanding of the scheme in the wider site context to assess the “worst case” scenario rooms at podium/first floor level in order to determine the level of compliance for the scheme as a whole.

This being the lowest level of residential accommodation it follows that if rooms comply with the guidelines at these levels they will also receive adequate levels of light at the upper floors of the scheme. The results of the self-test daylight adequacy analysis on the habitable rooms within the development proposals are presented in graphical and tabular form in Appendix B of this report.

The Average Daylight Factor analysis clearly indicates that all but four rooms within the proposed scheme will fully comply with the minimum daylight adequacy requirements set by the BRE in ADF terms.

All four of the rooms which do not comply with the BRE Guidelines are open plan kitchen/diner spaces at podium/first floor. In the majority of cases BRE compliance could simply be achieved by either reconfiguring the internal layouts or by increasing the size of the windows or a combination of the two to the four rooms in question.

When considering the total number of habitable rooms within the scheme proposals these four rooms represent a very small percentage of non compliance with the BRE Guidelines for ADF.

Overall the development proposals are considered to have a largely negligible impact with highly localised small instances of minor adverse impact at podium/first floor level on daylight adequacy within the scheme proposals.

SUNLIGHT – APSH

The full results of the sunlight analyses are presented in Appendix C in tabular form. A summary of the results of the Annual Probable Sunlight Hours (APSH) analysis on the relevant overlooking windows are presented in the Table 5 below. This identifies where habitable rooms are left with adequate light.

TABLE 5: NUMBER OF WINDOWS EXPERIENCING SUNLIGHT IMPACTS AS A RESULT OF THE DEVELOPMENT (APSH METHOD)

Address	Total Number of Windows Tested	Windows Meeting BRE Guidelines for APSH	Number of Windows Experiencing Adverse Impacts			
			<20% reduction (negligible impact)	20-29.9% reduction (minor adverse impact)	30-39.9% reduction (moderate adverse impact	>40% reduction (substantial adverse impact)
Beaumont Court	5	5	5	0	0	0

Table 5 shows that all windows/rooms assessed that qualify for sunlight assessment will fully comply with the BRE guidelines for sunlight in APSH terms.

Overall the development proposals are considered to have a negligible impact on sunlight to neighbouring habitable rooms and will fully comply with the BRE guidelines in sunlight terms.

CONCLUSIONS

It is noted that the Site is in close proximity to adjacent properties that surround the site to the north, south and west. The site is bounded to the south by 9 St Pancras Way, by the Royal Veterinary College and College Grove to the west, by St Pancras Way to the east and Beaumont Court to the north. The neighbouring residential properties generally receive good levels of light over and above the existing and surrounding buildings due to their relative height and proximity considering the site is set in an urban environment.

To assess the potential impact of the Development on daylight and sunlight on neighbouring properties a baseline assessment was undertaken. The methods of assessment used were

Vertical Sky Component (VSC), “No Sky” Line and Average Daylight Factor (ADF) for daylight and Annual Probable Sunlight Hours (ASPH) for sunlight.

The London Borough of Camden Core Strategy and Development Policies DPD identifies the Building Research Establishment report “Site Layout Planning for Daylight & Sunlight 1991” by which daylight should be assessed.

The majority of accommodation adjacent to the site is student accommodation where the accommodation is generally occupied by individual students for less than a year and its main function is for sleeping. Therefore the perceived impacts by the individual students are likely to be much less than that perceived by occupants of traditional residential accommodation.

The daylight analysis demonstrates that generally the quality, quantity and distribution of light to neighbouring residential properties will remain within BRE compliance. Only two neighbouring rooms will experience an adverse impact when measured against all three methods of assessment. This is not only due to the development proposals but is also because of the size and orientation of the rooms in relation to the windows serving the rooms and also because they are largely affected by the height and proximity of the Beaumont Animals Hospital which also currently inhibits the access of direct light.

The daylight adequacy analysis to the habitable rooms within the scheme proposals demonstrates generally negligible impact with only four rooms within the entire scheme receiving a minor adverse impact. This represents only a very small percentage of non compliance with the BRE Guidelines for ADF.

The sunlight analysis demonstrates that all relevant overlooking rooms/windows will fully comply with the BRE Guidance in sunlight terms.

Overall, it is felt that Bellis Cooley Architects have worked to minimise the adverse nature of impact on daylight and sunlight through their design process and have taken neighbouring residential amenity into consideration as much as reasonably practically possible with this design.

It is considered that the effects measured are not so strong as to make the neighbouring accommodation unacceptable for the proposed purpose.

Therefore, the analysis undertaken demonstrates that given the approach recommended by the BRE guidelines, the impact of the proposed development is generally considered acceptable in daylight and sunlight terms on the surrounding amenity in this location.

The development proposals by Bellis Cooley Architects are therefore considered to recognise and observe the intentions of the London Borough of Camden Core Strategy and Development Policies DPD and BRE Guidance Note 209 and should therefore be considered to address the requirements of the London Borough of Camden Unitary Development Plan in daylight and sunlight terms.

Delva Patman Associates

APPENDIX A

LOCATION DRAWINGS

11015/LOC/800 - 803

11015/SPT/800

APPENDIX B

DAYLIGHT ANALYSIS

11015/NSL/001 – 003

11015/LOC/804

DAYLIGHT TABLES

APPENDIX C

SUNLIGHT ANALYSIS

SUNLIGHT TABLES