HILLINGDON CIRCUS
Mixed Use Redevelopment

Daylight, Sunlight & Overshadowing

Drivers Jonas Deloitte.
Proposed Development at Hillingdon Circus
London UB10 9NR
Daylight, Sunlight & Overshadowing Report
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1 Introduction

1.1 Drivers Jonas Deloitte has been appointed by Bridehall Developments to undertake a daylight, sunlight and overshadowing impact study with regard to the proposed development at the vacant land next to Hillingdon Circus UB10 9NR.

1.2 This report will assess the potential daylight, sunlight and overshadowing impacts to the surrounding residential properties as a result of the proposals and, in addition, assess the likely daylight levels that would be enjoyed within the proposed habitable rooms.

1.3 The assessment has been based on the following plans and elevations supplied by DarntonEGS Built Environment Consultancy.

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1.4 In addition to the above, topographical and elevation surveys produced by Malcolm Hughes Land Surveyors of the site and surrounding area has been utilised. Where survey information was not available, the location and size of the surrounding windows has been estimated from site photographs.
2 Executive Summary

2.1 The proposed site is located within the London Borough of Hillingdon and the potential effects have therefore been assessed in accordance with Hillingdon’s current planning policies and the recommendations set out in the BRE guidelines.

2.2 We have assessed Chestlands Court on Hercies Road and have used the first method which is to strike a line at an angle of 25º from the centre of the lowest existing windows. The proposed development sits beneath the 25º angle line and therefore the development is unlikely to have a substantial effect on the daylight enjoyed by the existing building.

2.3 There is a planning application which has been submitted for a development across Long Lane which comprises of a Tesco store, a hotel and a residential element. The residential blocks are on the other side of the Tesco store, away from Long Lane and the proposed development is unlikely to have a substantial effect on the daylight enjoyed by the approved residential blocks.

2.4 The proposed internal daylight results show that the majority of the rooms tested will receive an acceptable level of daylight.

2.5 The proposed amenity area overshadowing results show that between the hours of 11:00 and 15:00 both of the proposed amenity spaces receive sunlight to over 50% of their areas meeting the BRE guidelines suggested criteria.

2.6 Overall it is considered that these findings show that the proposed development will have little impact on the surrounding residential properties and their respective amenity areas.
3 Planning Policy & Guidance

Policy

3.1 The proposed site is within The London Borough of Hillingdon (Hillingdon) and the proposals have therefore been considered against Hillingdon’s Unitary Development Plan (UDP) dated 2007.

3.2 The Policy states:

BE19 The Local Planning Authority will seek to ensure that new development within residential areas complements or improves the amenity and character of the area.

5.23 Ensuring adequate sunlight and daylight reaches both habitable rooms (including kitchens) and external private amenity space is an important principle of housing design which affects the enjoyment of occupants’ living conditions. The Local Planning Authority will pay full regard to the effects of a proposal, whether it be for a new building or extensions of an existing one, on the sunlight and daylight reaching neighbouring properties, and will have regard to the recommendations of "Site Layout Planning for Daylight and Sunlight" (Building Research Establishment, 1991). Some proposals of substantial width, height and depth, particularly when built close to a party boundary, may not cause loss of amenity by reason of daylight or sunlight but may be overdominant in relation to the adjoining property and/or its private amenity space. This can result in a depressing outlook detracting from residential amenity.

BE20 BUILDINGS SHOULD BE LAID OUT SO THAT ADEQUATE DAYLIGHT AND SUNLIGHT CAN PENETRATE INTO AND BETWEEN THEM AND THE AMENITIES OF EXISTING HOUSES ARE SAFEGUARDED.

Guidance

3.3 As stated in Hillingdon’s planning policy, the proposals have been considered utilising the standards and recommendations set out in the Building Research Establishment (BRE) report:


3.4 The BRE guidelines also refer to British Standard BS:8206-02:2008 “Lighting for Buildings – Part 2 Code of Practice for Daylighting” and CIBSE publication “Lighting guide: Daylighting and window design”.
4 Daylight, Sunlight and Overshadowing Methodology

4.1 When assessing any potential effects on the surrounding properties, the BRE guidelines suggest that only those windows that have a reasonable expectation of daylight or sunlight need be assessed. In particular the BRE guidelines at paragraph 2.2.2 state:

“The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed. The guidelines may also be applied to any existing non-domestic building where the occupants have a reasonable expectation of daylight; this would normally include schools, hospitals, hotels and hostels, small workshops and some offices.”

4.2 Further to the above statement, it is considered that the vast majority of commercial properties do not have a reasonable expectation of daylight or sunlight. This is because they are generally designed to rely on electric lighting rather than natural daylight or sunlight.

4.3 If a property is considered to have a reasonable expectation of daylight or sunlight the following methodology to assess the impacts has been used.

Daylighting

4.4 Where the internal arrangements are not known, the BRE guidelines set out three methods for assessing the daylight impacts on neighbouring properties. These methods are summarised below.

4.5 The first of these methods is to strike a line at an angle of 25º from the centre of the lowest existing windows. If the profile of the proposed development sits beneath the 25º angle line then the development is unlikely to have a substantial effect on the daylight enjoyed by the existing building. This test is known as the 25º angle test.

4.6 If the proposed development protrudes past the 25º angle line then the second test needs to be applied. For this assessment, the first method has not been used as it does not always reflect the differing heights and layouts of the buildings in the local area.

4.7 The second method calculates the Vertical Sky Component (VSC) at the centre point of each affected window on the outside face of the wall. The VSC is an external daylighting calculation that measures the amount of direct daylight to a specific window point on the outside of a property. The calculations fundamentally assess the amount of blue sky that you will see, converting results into a percentage. A window looking into an empty field will achieve a maximum value of 40%. However, the BRE suggests that 27% VSC is a good level of daylight. If a window does not achieve 27% VSC in the proposed scenario, then the third test is used.

4.8 The third method involves calculating the VSC at the window in the existing situation, i.e. before redevelopment. If the reduction of VSC is less than 0.8 times its former value, then the occupants of the adjoining building are likely to notice the reduction in daylight.
4.9 In conjunction with the VSC tests, the BRE guidelines and British Standard 8206-2:2008 suggest that the distribution of daylight is assessed using the No Sky Line (NSL) test. This test separates those areas of the working plane that can receive direct skylight and those that cannot.

4.10 The BRE guidelines suggest that the daylight distribution test is undertaken to existing surrounding properties when the internal arrangements are known. To assess the impact of any reduction the BRE guidelines suggest:

If, following construction of a new development, the no sky line moves so that the area of the existing room, which does receive direct skylight, is reduced to less than 0.8 times its former value this will be noticeable to the occupants, and more of the room will appear poorly lit.

4.11 A further daylighting method, which is used for the internal daylighting levels of all the new residential construction, is the Average Daylight Factor (ADF) calculation. This calculation takes into account the size and shape of the room and window, the reflectance of the room’s surfaces and diffuse transmittance of the glazing as well as the amount of blue sky calculated in the VSC calculation.

4.12 The BRE guidelines set out the ADF test at Appendix C and further guidance, such as the reflectance of certain materials, is given within the British Standard BS8206-2:2008.

4.13 The BRE guidelines and British Standard 8206-2:2008 suggest that the following ADF values should be achieved for the following room types:

- Bedrooms 1%;
- Living Rooms 1.5%; and
- Kitchens 2%.

4.14 Certain constants are assumed in the formula, which are as follows:

(a) The diffuse light transmittance of the glazing, including a maintenance factor for dirt on glass, was taken as 0.59.

(b) The average reflectance of the interior surfaces was taken as 0.5.

4.15 The ADF results are obtained for each room individually and expressed as a percentage. Where there are two or more windows serving one room the ADF is found separately for each window, and the results summed.

4.16 For new developments the British Standard 8206-2:2008 suggests that the uniformity of daylight within a room will be poor if a significant area of the working plane lies beyond the no sky line. The British Standard BS8206-2:2008 also suggests that ‘a significant area’ is more than 20% i.e. 80% of the room area should be in front of the no sky line. Taking into account an urban setting and modern designs of large living/dining areas it is suggested that ‘a significant area’ should be interpreted as more than 50%. i.e. it would be usual to have less than 50% of the room area in front of the no-sky line.

Sunlighting

4.17 The amount of direct sunlight a window can enjoy is dependent on its orientation and the extent of any external obstructions. For example a window that faces directly north, no matter what external obstructions are present, will not be able to enjoy good levels of sunlight throughout the year. However, a window that faces directly south with no obstructions will enjoy very high levels of sunlight throughout the year. As the potential to receive sunlight is dependent on a window’s orientation, the BRE guidelines state:
To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun.

4.18 To assess the potential effect on existing windows the BRE guidelines set out three methods. These methods are summarised below.

4.19 The first test is to apply the 25° angle test as detailed above. If the profile of the proposed development sits beneath the 25° angle line then the development is unlikely to have a substantial effect on the sunlight enjoyed by the existing building. If the proposed development protrudes past the 25° angle line then the second test needs to be applied.

4.20 As for the daylight assessments, the 25° angle test has not been used for this assessment as it does not always reflect the differing heights and layouts of the buildings in the local area.

4.21 For the second sunlighting test the BRE guidelines suggest calculating the Annual Probable Sunlight Hours (APSH) at the centre of each window on the outside face of the window wall. The BRE guidelines suggest that:

"If this window point can receive more than one quarter of APSH (see section 3.1), including at least 5% of APSH in the winter months between 21st September and 21st March, then the room should still receive enough sunlight".

4.22 The third method involves calculating the APSH at the window in the existing situation, i.e. before redevelopment. If the reduction of APSH between the existing and proposed situations is less than 0.8 times its former value for either the total APSH or in the winter months; and greater than 4% for the total APSH, then the occupants of the adjoining building are likely to notice the reduction in sunlight.

Overshadowing

4.23 Part 3.3 of the BRE guidelines provides guidance for assessing the effect of overshadowing of gardens and amenity areas for both existing and new spaces.

4.24 The BRE guidelines suggest that the availability of sunlight should be checked for all open spaces where it is required. These include:

- ‘gardens, usually the main back garden of a house
- parks and playing fields
- children's playgrounds
- outdoor swimming pools and paddling pools
- sitting out areas such as those between non-domestic buildings and in public squares
- focal points for views such as groups of monuments or fountains’.

4.25 Where there is an expectation of sunlight the BRE guidelines suggest:

"It is suggested that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of a new development an existing garden or amenity area does not meet the above, and the area that can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March.”
4.26 For the assessments undertaken in this report, computer software has been used to plot the shadows in the existing and proposed condition at hourly intervals on 21 March.

4.27 A visual assessment has first been undertaken of the hourly images to establish whether each amenity area receives at least two hours of sunlight on 21 March. This is considered to be the case if:

- Three consecutive hourly images clearly show that the amenity space will receive sunlight to over half of its area, e.g. the images for 11am, 12pm, 1pm and 2pm show more than half of the area is in direct sunlight; or
- Two sets of two consecutive hourly images show the amenity space will receive sunlight to over half of its area, e.g. the images for 10am, 11am and 2pm, 3pm show more than half of the area is in direct sunlight.

4.28 If an amenity area will not meet the criteria a second visual assessment is undertaken comparing the existing and proposed overshadowing images. If it is clear that any additional overshadowing effects will meet the above criteria no further assessments are considered necessary.

4.29 If it is not clear from the visual assessments that the suggested criteria will be met detailed assessments calculating the areas of shade throughout the day have been carried out.
5 Surrounding Residential Properties

5.1 Using the Valuation Office Agency website we have identified which properties are registered as paying council tax and therefore in residential occupation. The following properties have been identified and assessed for daylight and sunlight impacts.

- Chestlands Court – Hercies Road
- Tesco Development – Long Lane

5.2 A site plan highlighting the location of the above residential properties is given at Appendix A.

5.3 All other surrounding properties are considered to be in commercial use and are not considered to have a reasonable expectation of daylight and sunlight to require detailed assessment.
6 Assessment Results

Chestlands Court – Hercies Road

6.1 The windows to Chestlands Court sit over 100m from the site.

6.2 Because of this we have used the first method which is to strike a line at an angle of 25º from the centre of the lowest existing windows. The proposed development sits beneath the 25º angle line and therefore the development is unlikely to have a substantial effect on the daylight enjoyed by the existing building.

Tesco Development – Across Long Lane

6.3 There is a planning application which has been submitted for a development across Long Lane which comprises of a Tesco store, a hotel and a residential element. The residential blocks are on the other side of the Tesco store, away from Long Lane and the proposed development is therefore unlikely to have a notable effect on the daylight enjoyed by the approved residential blocks. Detailed assessments have not therefore been carried out.

Overshadowing

6.4 There are no existing amenity areas located close to the proposed site which are likely to be affected. An overshadowing study in the existing condition has not therefore been carried out.

Proposed Internal Daylight Levels

6.5 Full results for the internal daylight analysis to the proposed habitable rooms are shown at Appendix B.

6.6 Of the 59 bedrooms assessed to the podium level, 56 achieve an ADF of 1% or above. The three rooms that do not meet the BRE recommended target value achieve results of between 0.92% and 0.95%, so are only marginally below the target.

6.7 The British Standard 8206-2 suggests that where a room has more than one use i.e. a kitchen, living room and dining room, the higher of the ADF criteria for the uses should be used. A kitchen has the highest ADF criteria of 2% ADF which has therefore been used to consider whether such spaces will meet the suggested criteria. However, although the above is considered best practice it is also considered appropriate to place less significance on a room that receives an overall ADF below that suggested for a kitchen but above the suggested standard for a living room (1.5% ADF).
6.8 In conjunction with the above, the ADF calculation is designed to quantify the amount of daylight in a room as a whole and does not therefore illustrate the likely levels of daylight in the different areas of a large multi use room. For example, where the living room is generally situated at the front of the room, followed by the dining area and then the kitchen at the rear, the living room area may actually receive good levels of daylight whilst the kitchen at the back may not. Although the open plan living space as a whole may not strictly meet the ADF criteria, it is suggested that the significance of the impact should be reduced if the living area at the front of the room can still receive good levels of daylight.

6.9 It is recognised that the above view can raise questions on the appropriateness of large open plan living arrangements. However, in order to utilise the available space of the site, whilst still providing adequate areas of amenity space, and to ensure the building is as efficient and sustainable as possible, the use of large open living/dining/kitchen spaces is considered appropriate for urban locations.

6.10 The BRE guidelines support the above view by stating at paragraph 2.1.14:

Non-daylit internal kitchens should be avoided wherever possible, especially if the kitchen is used as a dining area too. If the layout means that a small internal gallery-type kitchen is inevitable, it should be directly linked to a well daylit living room.

6.11 In addition to the above internal kitchens are not considered uncommon and the design of open plan living/dining/kitchens can normally be re-configured to create a separately enclosed kitchen, which would then be excluded from the ADF assessment. However, as set out in the BRE guidelines it is considered more beneficial to include the kitchen in the open plan area as this reflects the current trends of urban living accommodation.

6.12 To meet the above criteria, ADF calculations have been undertaken to the living room / dining areas only. The results for this analysis show that all living room / dining areas will enjoy an ADF above 1.5%. The daylight levels to the living room / dining are therefore considered acceptable and in accordance with the BRE guidelines.

6.13 The no-sky line assessment show that all rooms on the podium level will experience direct skylight to at least 50% of the room areas.

6.14 We have not analysed the residential levels above the podium level as it is clear from the assessments undertaken that the upper floors should also achieve or exceed the target values.

Proposed Amenity Areas Overshadowing

6.15 A full set of transient overshadowing images for 21 March, showing the proposed amenity areas, are given at Appendix C.

6.16 The transient overshadowing images clearly show that between the hours of 11:00 and 15:00 both of the proposed amenity spaces receive sunlight to over 50% of their areas meeting the BRE guidelines suggested criteria.
Appendix A-Site Plan
Proposed Site

For identification purposes only. All dimensions to be checked on site and used in preference to those given or scaled from the drawing, and must be brought to the attention of the Surveyor.
Appendix B-Proposed Internal Daylight Levels
For identification purposes only. All dimensions to be checked on site and used in preference to those given or scaled from the drawing, and must be brought to the attention of the Surveyor.
## No Sky Line Results Table

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Appendix C-Transient Overshadowing
For identification purposes only. All dimensions to be checked on site and used in preference to those given or scaled from the drawing, and must be brought to the attention of the Surveyor.