



**Nathaniel Lichfield
& Partners**

Planning. Design. Economics.

Nos. 25-26 Redington Gardens

**Daylight, Sunlight and Shadow
Assessment**

25-26 Redington Gardens LLP

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Appendix 1: Reference Plans

1.0 Introduction

- 1.1 This report considers the effects of the proposed redevelopment of the site at Nos. 25-26 Redington Gardens, Hampstead on the levels of daylight, sunlight and shadow received by nearby residential properties and gardens. It also considers the levels of natural light that will be experienced within the new residential accommodation and amenity space proposed at the site. The assessment has been prepared on behalf of 25-26 Redington Gardens LLP.
- 1.2 The proposal comprises the demolition of existing houses at the site and redevelopment to provide two new semi-detached homes of three storeys above basement and lower ground floor levels, plus rear gardens.
- 1.3 The daylight and sunlight assessment considers the effects of the proposal on residential properties situated adjacent to and opposite the site on Redington Gardens. It considers the levels of daylight and sunlight that will be received within the lower ground floor level residential accommodation in the development. The assessment also considers the levels of sunlight and shadow that will be experienced within existing and proposed gardens.
- 1.4 The quantitative assessment has been undertaken in accordance with the guidelines set out in the revised Building Research Establishment (BRE) report “*Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice*” (October 2011). The Guide is intended to be advisory and does not contain mandatory standards. The introduction states:
- “The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not 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. In special circumstances the developer or planning authority may wish to use different target values. For example in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings.”*
- 1.5 This assessment considers the impacts of the development in terms of daylight and sunlight. It does not address rights to light, which is a legal matter rather than a material planning consideration.
- 1.6 This assessment has been carried out using the following information:
- Measured site survey drawings;
 - The planning application drawings prepared by dMFK Architects;
 - Ordnance Survey Superplan digital mapping of the area;
 - Aerial photography;
 - A photographic survey of the site and surroundings.

1.7

The report is divided into the following subsequent sections:

- Section 2.0 provides a brief description of the site and surroundings and the nature of the proposed development, highlighting features of relevance to the assessment of daylight and sunlight levels;
- Section 3.0 outlines the scope of the assessment;
- Section 4.0 provides an assessment of the impacts of the proposal on levels of daylight;
- Section 5.0 considers the proposal's impacts in terms of sunlighting;
- Section 6.0 considers the scheme's overshadowing effects;
- Section 7.0 provides a summary of the assessment and our conclusions are drawn.

1.8

The assessment is supported by a series of reference plans at Appendix 1.

2.0 **Site, surroundings and the proposal**

Site and Surroundings

2.1 The application site is situated on the north western side of Redington Gardens between Redington Road and Templewood Gardens. It is currently occupied by a pair of semi-detached houses which rise to two storeys above ground. To the north west, these properties are each served by a long rear garden.

2.2 The site is situated in a predominantly residential area between Hampstead and Finchley Road. It is flanked to the north east by Conrad Court a four storey residential block with a rear garden at No. 27 Redington Gardens. To the south west of the site, No. 24 Redington Gardens comprises a two storey residential property again with a long rear garden. Opposite the site, the southern side of Redington Gardens is fronted by larger residential properties of between two and four storeys.

On the basis of this review, the assessment has focused on the daylight and sunlight levels experienced by residential accommodation within Conrad Court and Nos. 15 and 24 Redington Gardens. Other buildings in the vicinity of the site will be less affected by the development in daylight and sunlight terms.

2.3 A complete description of the site and surroundings is provided in the submitted Planning Statement and Design and Access Statement.

The Proposal

2.4 The proposed development comprises the demolition of existing houses and redevelopment to provide two new semidetached houses rising to three storeys above basement and lower ground floor levels. Private rear gardens are proposed to the north west of the houses.

2.5 The layout of the properties is illustrated at Appendix 1.

3.0 **Scope of Assessment**

3.1 This section of the assessment provides an overview of the scope of the daylight, sunlight and shadow assessment in terms of the neighbouring properties, proposed units and amenity spaces assessed.

3.2 The locations of the window reference points, main rooms/bedrooms and gardens assessed are illustrated at Appendix 1.

Neighbouring Properties Assessed

3.3 The assessment has provided an analysis of the impacts of the development on natural light levels within neighbouring residential accommodation.

3.4 As outlined in the preceding section, the assessment has considered the effects of the development on the closest windows serving neighbouring residential accommodation within Conrad Court and Nos. 15 and 24 Redington Gardens. This comprises the following windows:

- 1 South westernmost ground floor window set in the rear elevation of Conrad Court;
- 2 North easternmost ground floor window set in the rear elevation of No. 24 Redington Gardens;
- 3 North east facing ground floor set in the projecting rear range of No. 24 Redington Gardens;
- 4 South westernmost ground floor window set in the street elevation of No. 15 Redington Gardens.

3.5 The windows selected for analysis represented the windows serving the neighbouring residential properties that are most likely to be affected by the proposed development. They are closest to the application site and are most sensitive to its redevelopment in terms of natural light.

3.6 Other windows serving these properties and other properties in the area will be less affected by the development in daylight and sunlight terms. Consequently, the analysis of this accommodation enables inferences to be drawn regarding the wider effects of the development on other less sensitive neighbouring properties.

3.7 The four windows identified for daylight assessment have been considered in terms of ambient daylight (Vertical Sky Component; VSC).

3.8 There are no neighbouring properties that could be affected by the development in terms of sunlight availability. The above windows are all north facing, the south facing windows serving the immediate neighbouring properties will be unaffected by the development and properties opposite the site across Redington Road are situated to the south of the site. Other properties further north on Templewood Gardens are a sufficient distance from the scheme to be unaffected in terms of sunlight availability. Consequently, no

windows in the vicinity of the site require assessment in terms of sunlight availability.

Proposed Units Assessed

- 3.9 The proposed houses will each include four residential storeys, between lower ground and second floor levels, plus an enclosed basement containing a cinema room and swimming pool. The lowest habitable rooms within the development will therefore be located at lower ground floor level and will receive natural light via lightwells at the front and rear of the property.
- 3.10 The assessment has therefore considered the levels of light that will be received within the bedroom and dining room/kitchen in the front and rear sections respectively of each property. Again, the assessment of the lowest floor of habitable rooms in the development enables inferences to be drawn regarding the levels of natural light that will be received by the proposed accommodation in the floors above.
- 3.11 The windows serving these rooms have been assessed in terms of ambient daylight (VSC) levels. The rooms they serve have been assessed in terms of internal daylighting (Average Daylight Factor and Daylight Distribution). The south facing windows serving these rooms have been assessed in terms of annual and winter sunlight availability.

Overshadowing

- 3.12 The shadow analysis has considered the proportionate levels of sunlight and shadow received by the neighbouring garden serving Conrad Court and the rear gardens serving the proposed houses. Other neighbouring gardens, including the adjacent garden serving No. 24, are situated to the south of the site or are a sufficient distance from the development to remain unaffected by the scheme.
- 3.13 The gardens assessed have been considered in terms of the BRE two-hour sunlight contour analysis.

4.0 Daylight

4.1 This section of the assessment assesses the impact of the proposed development on the level of daylight received at the aforementioned window reference points and rooms.

Methodology

4.2 The daylight assessment is based on the analysis of Vertical Sky Component (VSC) and Average Daylight Factor (ADF). Neighbouring properties have been considered in terms of VSC as the room layouts, room types and other parameters required for interior daylight analyses are frequently unknown. The rooms assessed at lower ground floor level within the proposed development have been assessed in terms of both VSC and ADF.

4.3 The following sets out the methodology for calculating VSC and ADF.

Vertical Sky Component

4.4 The level of ambient daylight received by a window is quantified in terms of its Vertical Sky Component (VSC), which represents the amount of vertical skylight falling on a vertical window. The daylight assessment has been based on three dimensional AutoCAD models constructed for the site and surroundings as existing and with the proposed development in place. The heights and locations of the surrounding buildings and the proposed development have been taken from measured site survey information, Ordnance Survey digital plan data, site observations, aerial photography of the site and surroundings and drawings produced by dMFK Architects.

4.5 The VSC level at each of the windows requiring assessment has been quantified using Waldram Tools daylight and sunlight software (MBS Software Ltd).

4.6 The BRE good practice guide outlines numerical guidelines that represent flexible targets for new developments in relation to the vertical sky component at nearby reference points. The document states that:

*“If the vertical sky component, with the new development in place, is **both** less than 27% **and** less than 0.8 times its former value, then the loss of light is likely to be noticeable.” (our emphasis)*

4.7 The guidelines therefore require that either the VSC target or the degree of change in daylighting are met (i.e. if the 27% target is adhered to, there is no requirement under the BRE guidelines for the resultant VSC level to remain at 0.8 times the former VSC level).

Average Daylight Factor

- 4.8 The BRE guide advises that the calculation of Average Daylight Factor (ADF) provides an alternative means of assessing the level of daylight received by the interior of the room served by a window. It is an appropriate means of assessment for proposed accommodation where the parameters required for the ADF calculations are known.
- 4.9 The calculation of ADF provides a more sophisticated method of calculating the daylight level experienced within a room than VSC as it takes into account the size and reflectance of room's surfaces and the number, size and transmittance of its window(s), as well as the ambient daylight level (VSC) received at the window(s).
- 4.10 The Average Daylight Factor (df) is defined as the average internal illuminance as a percentage of the unobstructed external illuminance under standard overcast conditions.
- 4.11 ADF can be calculated using the following formula (amended in the updated BRE guide, 2011):

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

Where:

- T is the diffuse visible transmittance of the glazing (a value of 0.65 is typical for double glazed clear glass; a value of 0.18 is used for obscured glazing);
- A_w is the net glazed area of the window (m^2);
- θ is the angle of visible sky in degrees;
- A is the total area of the room surfaces: ceiling, floor, walls and windows (m^2);
- R is the average reflectance (a value of 0.7 is applicable for new/proposed accommodation with light internal surface treatments¹).

- 4.12 The updated BRE guide (2011) introduces a separate procedure for floor to ceiling windows and glazed doors. It states that areas of glazing below the working plane should be treated as a separate window and an extra factor is applied to it to take account of the reduced effectiveness of low level glazing in lighting the room. The BRE states that a value equivalent to the floor reflectance can be taken for this factor. An adjustment factor of 0.3 is appropriate for medium timber floors and has been used in this case.

¹ A 0.7 reflectance value assumes white painted walls and ceiling (0.85) and a medium wooden floor (0.3).

4.13 The approach to assessing internal daylighting using the ADF method is set out at Appendix C of the BRE guide. The BRE guide and British Standard BS8206 set the following minimum recommended ADF levels for different room types:

- Kitchens: 2%;
- Living rooms: 1.5%;
- Bedrooms: 1%.

Daylight Results: Neighbouring Properties

4.14 The following table contains the VSC results for the neighbouring buildings assessed.

Floor	Window	Scenario	VSC	Change	Above/ Below BRE Guide Level
Conrad Court					
Ground	W1	Existing	36.15%	99% (1% reduction)	Above
		Proposed	35.84%		
No. 24 Redington Gardens					
Ground	W2	Existing	32.81%	99% (1% reduction)	Above
		Proposed	32.55%		
Ground	W3	Existing	24.85%	93% (7% reduction)	Above
		Proposed	22.99%		
No. 15 Redington Gardens					
Ground	W4	Existing	33.99%	96% (4% reduction)	Above
		Proposed	32.70%		

Table 4.1: Summary of VSC Results for Neighbouring Properties

4.15 The results of the daylight analysis (Table 4.1) illustrate that all four of the windows serving the immediate neighbouring properties and the property directly opposite the site will comply fully with the BRE guidance for ambient daylight with the development in place. All of these windows will experience a very modest and imperceptible reduction in VSC (1%-7%); well below the permissible 20% reduction advised by the BRE.

4.16 Other windows serving accommodation within these neighbouring buildings will be less affected by the development. Consequently, it is reasonable to conclude that Conrad Court, No. 24 Redington Gardens and No. 15 Redington Gardens will not experience any materially noticeable effects as a result of the development in terms of ambient daylighting.

4.17 These are the closest and most sensitive neighbouring properties and other residential properties in the area will be less affected by the scheme and, hence, similarly compliant with the guidance.

4.18 On this basis, the effects of the development on the daylight levels experienced by all neighbouring properties are acceptable in the context of the BRE guidance and relevant policy.

Daylight Results: Proposed Units

- 4.19 The development has been designed to ensure that daylight levels within the proposed units are maximised. The following table contains the VSC and ADF results obtained for the proposed residential accommodation at lower ground floor within the development.

Floor	Room	Window	VSC	Above/ Below	Above/ Below	ADF	Above/ Below
House No. 1 (No. 26 Redington Gardens)							
LG	Bedroom	W1	20.82%	Below [BRE Guide 27%]	Above	2.54%	Above [BRE Target: 1%]
LG	Dining Room/ Kitchen	W2	33.64%	Above [BRE Guide 27%]	Above	6.4%	Above [BRE Target: 2%]
House No. 2 (No. 25 Redington Gardens)							
LG	Bedroom	W3	27.48%	Above [BRE Guide 27%]	Above	3.02%	Above [BRE Target: 1%]
LG	Dining Room/ Kitchen	W4	33.48%	Above [BRE Guide 27%]	Above	6.23%	Above [BRE Target: 2%]

Table 4.2: Proposed Units – Summary of Daylight Results

- 4.20 The results of the daylight analyses for the proposed units show that the lower ground floor level windows serving the kitchen/ dining rooms within the rear sections of each of the new houses and the bedroom within House No. 2 will achieve the BRE guide levels for VSC. The bedroom window assessed within House No. 1 will experience a VSC level marginally below the BRE guide level.
- 4.21 This latter result is common for lower ground floor level accommodation served by a lightwell in an urban environment given that the BRE guidance is predicated on a suburban scale of development.
- 4.22 As discussed above, VSC merely provides a measure of the obstructions to skylight taken at the midpoint of each window. It does not take into account the size of each window aperture, the size, layout and nature of the room served by the window, or the number of windows serving a room. In contrast, the calculation of ADF provides a more sophisticated method of calculating the daylight conditions experienced within a room. ADF takes into account the size and reflectance of room's surfaces and the number, size and transmittance of its window(s), as well as the ambient daylight level (VSC) received at the window(s).
- 4.23 The ADF results for the proposed accommodation demonstrate that all of the rooms assessed at lower ground floor level will achieve very high levels of interior daylight and will comply with the BS/BRE guide levels for their respective room types. This full compliance with the guidance is unusual for an urban development project.
- 4.24 Given that the lower ground floor accommodation will all comply with the BRE guide levels in terms of interior daylight, it is reasonable to conclude that the habitable rooms in the floors above will similarly comply with the guidance.

4.25

Overall, it is considered that the proposed residential units within the development will experience good levels of interior daylight for an urban development project in the context of the BS/BRE guidance.

5.0 Sunlight

5.1 This section of the report assesses the effects of the proposed development on levels of sunlight at the window reference points. As noted at Section 3, there are no neighbouring windows in the vicinity of the site which require assessment in terms of sunlight availability.

5.2 The south facing windows serving the proposed bedrooms at lower ground floor level within the development, however, require assessment in terms of sunlight availability under the BRE guidance.

5.3 The methodology is summarised below.

Methodology

5.4 The levels of sunlight availability at the window reference points assessed have been calculated based on the three dimensional AutoCAD models of the site and surroundings with the development in place, using the Waldram Tools daylight and sunlight software. The calculations provide the percentage year round sunlight availability and the percentage of sunlight availability received during the winter months.

5.5 The BRE good practice guide states that the sunlighting experienced by a south facing window should receive more than 25% of annual probable sunlight hours and more than 5% of annual probable sunlight hours during the winter months.

Sunlight Results: Proposed Units

5.6 The following table contains the annual and winter sunlight results for the proposed residential accommodation.

Floor	Room	Window	APSH	Above/ Below	WPSH	Above/ Below
House No. 1 (No. 26 Redington Gardens)						
LG	Bedroom	W1	47%	Above [BRE Guide: 25%]	8%	Above [BRE Guide: 5%]
LG	Dining Room/ Kitchen	W2	n/a*	-	n/a*	-
House No. 2 (No. 25 Redington Gardens)						
LG	Bedroom	W3	64%	Above [BRE Guide: 25%]	16%	Above [BRE Guide: 5%]
LG	Dining Room/ Kitchen	W4	n/a*	-	n/a*	-

Table 5.2: Proposed Units – Summary of Sunlight Results [* north facing windows]

- 5.7 The results of the sunlight analyses for the proposed units demonstrate that the south facing bedroom windows assessed will achieve very high levels of annual and winter sunlight and will comply with the BRE guide levels. The rear kitchen/dining room windows face north and do not require assessment under the BRE guidance.
- 5.8 On the basis that the lower ground floor level windows serving the proposed accommodation will achieve (and significantly exceed) the BRE guide levels, it is reasonable to conclude that other accommodation in the floors above with south facing windows will also experience high levels of direct sunlight in accordance with the BRE guidance.
- 5.9 Overall, the proposed accommodation will experience good levels of sunlighting.

6.0 Overshadowing

6.1 The effects of the development on the levels of sunlight experienced within the neighbouring garden serving Conrad Court and the two proposed gardens within the development have been assessed. The areas assessed are illustrated at Appendix 1. The following outlines the methodology and results of this overshadowing assessment.

Methodology

6.2 The BRE 'test' for a development's overshadowing impacts relates to the area of an amenity space that receives more than two hours of sunlight on 21 March (the Spring Equinox). The guide states:

"...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 new development, an existing garden or amenity area does not meet the above, and the area which 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".

6.3 The assessment has, therefore, considered the areas of amenity space that can receive more than two hours of direct sunlight on this date.

Results

Neighbouring Garden

6.4 The following table sets out the shadow results for the rear garden space to Conrad Court.

Amenity Space	Amenity Area (sqm)	Lit Area Existing (sqm)	Lit Area Proposed (sqm)	Change %	Above/Below BRE guide level
Rear garden to Conrad Court	388.6sqm	351.3sqm (90.4%)	322.8sqm (83.1%)	91.9% [8.1% reduction]	Above

Table 6.1: Overshadowing Results for Neighbouring Garden

6.5 The results of the shadow analysis demonstrate that the neighbouring garden assessed will comply with the BRE guidance in terms of the proportion of sunlight and shadow it will experience following construction of the proposed development.

6.6 No other neighbouring gardens require assessment under the BRE guidance.

6.7 As a result, the development is fully compliant with the BRE guidance in terms of overshadowing of neighbouring gardens.

Proposed Gardens

- 6.8 Within the proposed development, the two private gardens to the north west of the development have been assessed in terms of sunlight and shadow. The following table contains the results of the shadow analysis for these proposed gardens.

Floor Ref.		Amenity Area	Lit Area Proposed	Above/ Below BRE
House 1 - Garden				
Ground	Area m2	130.1sqm	112.1sqm	Above
	Percentage		86%	
House 2 – Garden				
Ground	Area m2	135.2sqm	116.5sqm	Above
	Percentage		86%	

Table 6.2: Overshadowing Results for the Proposed Gardens

- 6.9 The results of the shadow analysis illustrate that the two rear gardens in the development will comply with the BRE guidance in terms of the proportionate areas of direct sunlight and overshadowing they will receive. Both gardens will experience a sunlit area of 86%; well above the BRE guide level of 50%.

7.0 **Summary and Conclusions**

- 7.1 The results of the assessment demonstrate that the proposed development at Nos. 25 and 26 Redington Gardens will comply fully with the BRE daylight, sunlight and shadow guidance in relation to neighbouring properties and their gardens. The analysis has illustrated that the closest and most sensitive neighbouring windows and gardens will achieve the BRE guide levels for ambient daylight, sunlight and overshadowing with the development in place. Other less sensitive neighbouring properties will be less affected by the development and, hence, similarly compliant with the guidance.
- 7.2 Consequently, the development will not result in any materially noticeable reduction in the natural light levels receive by all neighbouring properties and gardens in the context of the BRE guidance.
- 7.3 The assessment of the lower ground floor level accommodation within the proposed development has shown that the habitable rooms assessed will achieve the BRE guide levels for internal daylighting (ADF) and sunlight availability. This accommodation represents the lowest floor of habitable rooms in the development and the floors above will also achieve the relevant guide levels for daylight and sunlight. The overshadowing analysis for the proposed gardens also demonstrates that both rear gardens within the development will receive sunlit areas well above the relevant BRE guide levels.
- 7.4 The assessment has, therefore, demonstrated that good levels of natural light will be experienced within the proposed houses and their gardens in accordance with the BRE guidance.
- 7.5 In conclusion, the proposed development will not result in any materially unacceptable daylight or sunlight effects. The development is consistent with the objectives and requirements of the BRE guidance and relevant planning policy in relation to both neighbouring properties and their gardens and the proposed accommodation and amenity space in the scheme. We respectfully conclude that there are no reasons on which planning permission could reasonably be refused on daylight and sunlight impact grounds.