

## 10B Fairhazel Gardens, London NW6 3SG Daylight and Sunlight Assessment

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## Executive Summary

Price & Myers have been instructed by Wren Architecture Ltd. to carry out a daylight and sunlight impact assessment in order to support the planning application of the proposed extension of the property at 10B Fairhazel Gardens, London.

The project is located within the London Borough of Camden. The proposed scheme comprises an extension of the 3 bedroom semi-detached house to accommodate two more bedrooms and a larger living and dining room.

This report is an assessment of the impact of the proposed extension on the availability of daylight and sunlight in the existing surrounding buildings and amenity spaces. The purpose of this report is to determine whether the proposed design meets the criteria set out in the Building Research Establishment Report 'Site layout planning for daylight and sunlight- A guide to good practice' (2011)

A 3D model was developed for the purpose of assessment that included all the surrounding buildings that are likely to be affected. Site Analysis indicated the adjacent residential properties at 121, 123 and 125 Goldhurst Terrace to be sensitive receptors for daylight and sunlight assessment and properties at 1 and 3 Fairfax Place to be sensitive receptors for daylight assessment only. Other developments in the vicinity of the site were found to be located outside the limit of the spacing guideline set by the BRE and therefore will not have any impact from the proposed development.

The daylight assessment was carried out by determining the Vertical Sky Component at the centre of surrounding windows for both existing and proposed scenarios, to ascertain the magnitude of impact on the potential receptors from the proposed extension. The result indicated that the VSC values meet the BRE criteria and therefore the proposed scheme has impact of negligible significance on daylight availability of the identified receptors.

The sunlight assessment was carried out for the receptors facing 90° of due south and lying to the north orientation of the site, as described in the BRE guide. Annual Probable Sunlight Hours (APSH) values and Winter Probable Sunlight Hours (WPSH) values at the centre of surrounding windows for both existing and proposed scenarios were calculated, to ascertain the magnitude of impact on the potential receptors from the proposed extension. The result of the assessment indicated that all the tested windows met the BRE criteria for annual sunlight hours and winter sunlight hours. Therefore the proposed extension will have impact of negligible significance on sunlight availability within the adjacent properties.

Site analysis indicated that there are garden spaces on east and west orientation of the site that are likely to be overshadowed by the proposed extension. The result of overshadowing assessment showed that more than half of their area will receive at least 2 hours of sunlight on 21<sup>st</sup> march, thus meeting the BRE criteria.

Therefore, the study indicates that the proposed extension has no impact on the daylight and sunlight availability within the surrounding existing buildings and amenity spaces.

# 1 Introduction

Price & Myers have been instructed by Wren Architecture Ltd. to carry out a daylight and sunlight impact assessment in order to support the planning application of the proposed extension of the property at 10B Fairhazel Gardens, London.

The project is located within the London Borough of Camden. The proposed scheme comprises an extension of the 3 bedroom semi-detached house to accommodate two more bedrooms and larger living and dining room. The single storey side extension matches the existing gable roof such that the overall height remains as existing. Figure 1-1 shows the proposed extension.



Figure 1-1 Existing and Proposed elevation of the scheme

This report is an assessment of the impact of the proposed scheme on the availability of daylight and sunlight of the adjacent building and amenities. The purpose of this report is to determine whether the proposed design meets the criteria set out in the Building Research Establishment Report 'Site layout planning for daylight and sunlight- A guide to good practice' (2011)

The assessment is based on drawings provided by the architect for the proposed development including information on the adjacent building. Street views and site photos were also used to model the surroundings of the project site.

## 2 Site Analysis

### 2.1 The existing and proposed development

The site is located within an urban neighbourhood in London Borough of Camden. The 3 storey semi-detached house has kitchen cum living room and a study room on the ground floor and bedrooms on the upper floors. The house has a gable roof and the single storey study has a mono pitch roof.



Figure 2-1 View of the Existing building at 41A Ivy Road

### 2.2 Site surrounding buildings

The site is mostly surrounded by 3 storey residential developments on the north, east and west orientation. On the south orientation is a three storeyed retail building with rear parking space. The site is accessible from the main Fairhazel Gardens Road. Site analysis indicates that there are gardens on both east and west orientations of the site which may have some overshadowing from the proposed extension. These are associated with the adjacent residential properties.



Figure 2-2 Site surrounding buildings

2.3 Site Model

A three-dimensional model was built in AutoCAD using the drawings provided by the architect for the proposed residence at 10B Fairhazel Garden and the adjacent properties. Other surrounding buildings were modelled on the basis of information available from site pictures and internet mapping.

The proposed building is expected to have some level of impact on the daylight and sunlight availability through the windows of the adjacent residential properties at Goldhurst Terrace and Fairfax Place. The rest of the surrounding buildings are expected to not have any impact from the proposed extension. This has been further investigated in later sections.

The properties are expected to experience some overshadowing from the adjacent trees. However in order to ascertain clear impact of the proposed building, trees and other landscape features were not included in the assessment model as shown in figures below.

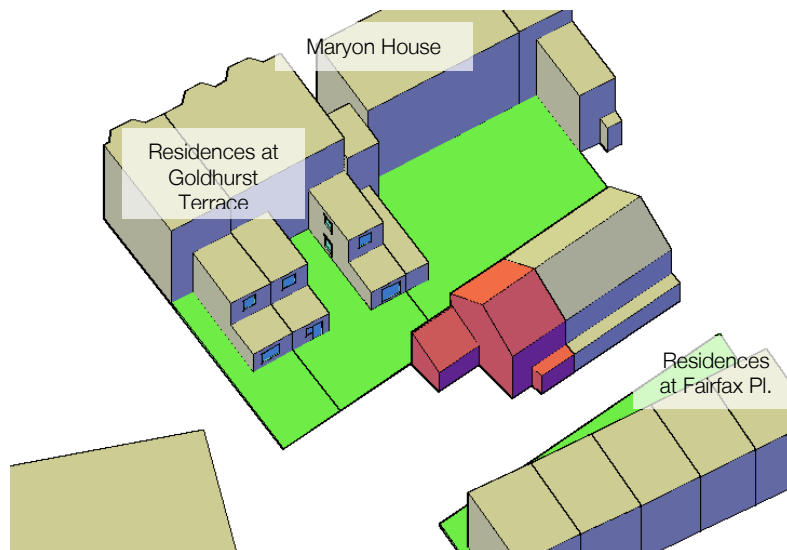


Figure 2-4 Model of the Existing building on site and surrounding buildings



Figure 2-3 Model of the proposed extension and surrounding buildings

### 3 Daylight and Sunlight Assessment

The BRE guide is intended to aid designers in considering the relationship between new and existing buildings to ensure that each retains the potential to achieve good daylighting and sunlight levels. The author of the guide, Dr Paul Littlefair states in the introduction that:

*"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and should not be used 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 because natural lighting is only one of many factors in site layout design".*

In designing a new development or extension to a building, care should be taken to safeguard the access to daylight and sunlight for existing buildings. The guidelines given in the BRE guide are intended for use for rooms in adjoining dwellings where daylight and sunlight 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 and sunlight, like schools, hospital and offices.

Loss of light to existing windows need not be analysed if the distance of each part of the proposed extension from the existing window is more than three times of its height from the centre of the existing window. According to the spacing guidelines, only those existing developments that are situated within 9.5m offset from the proposed development (within the shaded area in Figure 3-1) might have daylight and sunlight potentially impacted. The residential properties 121, 123 and 125 Goldhurst Terrace and 1 and 3 Fairfax Place fall within the assessment range. All other developments in the vicinity are located outside the limits of the spacing guidelines and are therefore not tested.

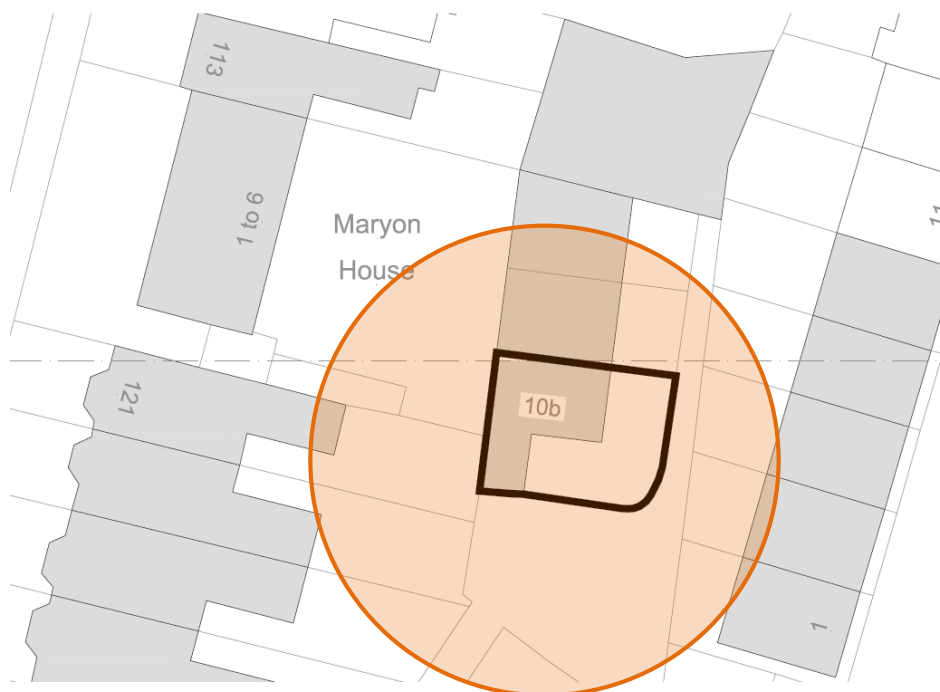


Figure 3-1 Extent of daylight and sunlight assessment

### 3.1 Daylight

Daylight can be described as the diffused light from the sky. It is assumed to be uniform and non-directional in nature. There are various methods of measuring and assessing daylight in buildings and the choice of test depends upon the circumstances of each particular window.

#### Vertical Sky Component (VSC)

A quantitative indicator of the amount of daylight available at the window wall requires the calculation of the Vertical Sky Component (VSC). The VSC is the ratio of the direct sky illuminance falling on a vertical wall at a reference point to the simultaneous horizontal illuminance under an unobstructed sky. The maximum value is almost 40% for a completely unobstructed vertical wall.

The VSC has been calculated using the Waldram tools through MBS Survey in AutoCAD. A Waldram diagram has azimuth angle on the horizontal scale and altitude on vertical scale. As explained in the BRE guide, for each vertical plane obstructions from the surrounding buildings should be plotted on the Waldram diagram. The remaining area on the diagram is then proportional to the sky component value on that plane. The software plots a Waldram diagram for each of the identified window and thus gives the VSC value for both the existing and the proposed scenario.

The BRE guide states that if the VSC is greater than 27% with the proposed development then enough daylight should still be reaching the existing windows. If the VSC calculated at the centre of the windows is less than 27% with the proposed development, then the BRE guide suggests that the former VSC (that is, the VSC without the proposed development) should be calculated. If the VSC with the proposed development in place is both less than 27% and less than 0.8 times its former value, then occupants of the existing building will notice the reduction in daylight and electric lighting will be needed more of the time.

VSC calculations have been carried out on the windows of the identified properties. These are rear windows of the residential properties at Goldhurst Terrace and Fairfax Place. The windows are illustrated in Figure 3-2 and Figure 3-3.

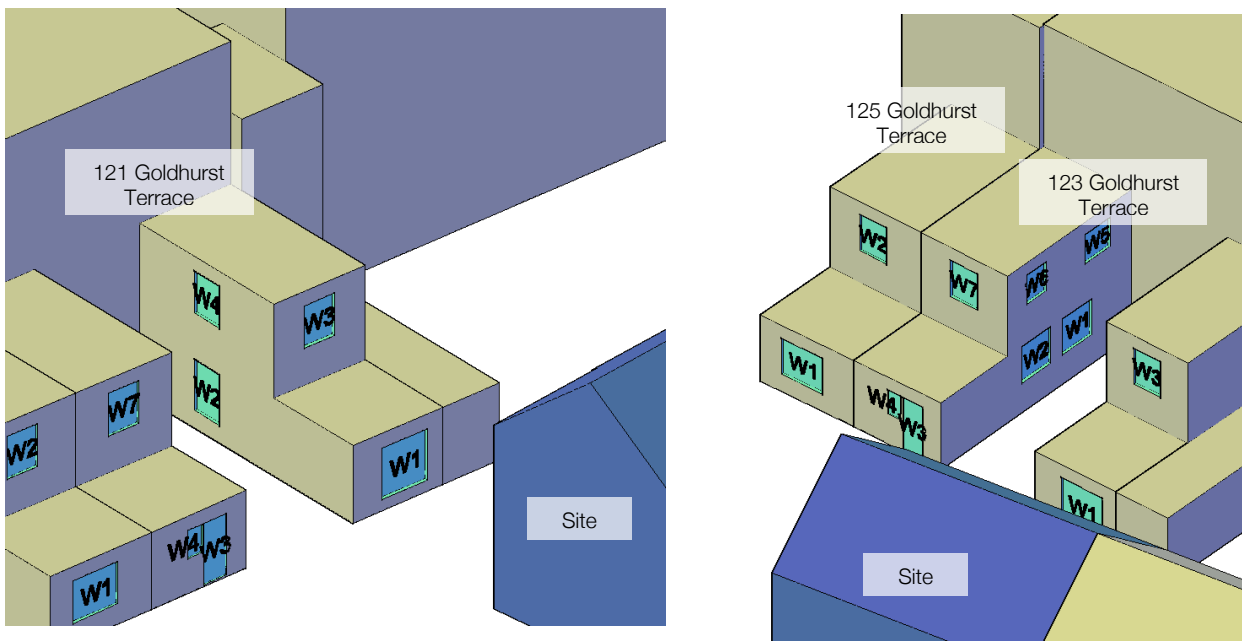


Figure 3-2 Windows assessed for daylight – Goldhurst Terrace Road



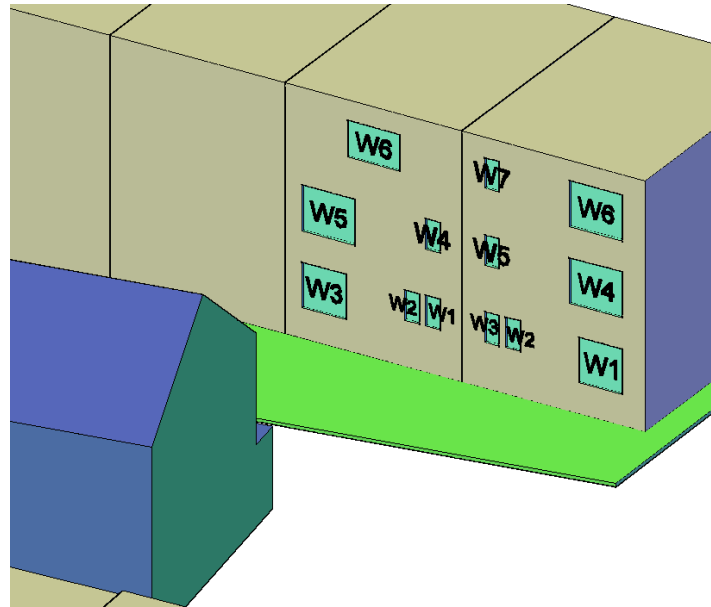


Figure 3-3 Windows assessed for daylighting - 1 & 3 Fairfax Place

The calculated values of VSC measured at the identified windows are shown in the following table.

Table 3-1 VSC results

Tested windows		Vertical Sky Component (VSC) BRE minimum recommended value of 27%			BRE Criteria Met?
		VSC % (proposed case)	VSC % (existing case)	% of existing case (80% and above acceptable)	
121 Goldhurst Terrace	W1	24.40	26.39	92%	PASS
	W2	12.65	12.65	100%	PASS
	W3	33.92			PASS
	W4	23.69	23.69	100%	PASS
123 Goldhurst Terrace	W1	11.9	12.17	98%	PASS
	W2	16.26	16.63	98%	PASS
	W3	31.27			PASS
	W4	32.31			PASS
	W5	20.74	20.9	99%	PASS
	W6	26.79	27.06	99%	PASS
	W7	36.34			PASS
125 Goldhurst Terrace	W1	33.18			PASS
	W2	36.99			PASS
	W1	32.42			PASS

Tested windows		Vertical Sky Component (VSC) BRE minimum recommended value of 27%			BRE Criteria Met?
		VSC % (proposed case)	VSC % (existing case)	% of existing case (80% and above acceptable)	
1 Fairfax Place	W2	32.1			PASS
	W3	31.96			PASS
	W4	35.11			PASS
	W5	34.84			PASS
	W6	37.47			PASS
	W7	37.41			PASS
3 Fairfax Place	W1	31.56			PASS
	W2	31.43			PASS
	W3	30.44			PASS
	W4	34.56			PASS
	W5	33.79			PASS
	W6	37.11			PASS

The result of the daylight assessment indicates that all the tested windows of the surrounding properties meet the BRE criteria for daylighting. This means that the rooms associated with these windows will continue to receive good level of daylight even with the proposed extension in place. Therefore the proposed extension is likely to have an impact of **negligible significance** on daylight availability within the surrounding buildings.

### 3.2 Sunlight

Unlike daylight, sunlight is dependent upon direction. The UK lies in the northern hemisphere and we receive our sun from a southerly direction- with the sun rising in the east and setting in the west. The availability of sunlight is therefore dependent upon the orientation of the window or area in question relative to the position of due south.

Sunlight assessment is only applicable where some part of the new development is situated within 90° of due south of a main window wall of an existing building and if any part of the new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window. In this case the proposed extension lies to the west of the identified receptor and therefore may impact sunlight from that direction. As the front façade of the adjacent residence faces 90° of due south all the identified windows have been tested.

#### Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH)

The criterion to assess sunlight suggests that an interior space appears reasonably sunlit when a window serving these spaces receives at least 25% of the Annual Probable Sunlight Hours (APSH) and at least 5% of the Winter Probable Sunlight Hours (WPSH) during the winter months of 21<sup>st</sup> September to 21<sup>st</sup> March.

The APSH and WPSH have been calculated using MBS Survey in AutoCAD. Sunlight availability can also be represented on a Waldram diagram. The software calculates the shading patterns from the surrounding buildings on a vertical plane and based on unobstructed area of the Waldram diagram calculates the percentage of total sunlight hours reaching the plane, annually and in winter.

The BRE guide suggests minimum figures of 25% and 5% respectively. If a window fails this test then the BRE guide states that the former values of APSH and WPSH (i.e. the values without the proposed development) should be calculated. If the values with the proposed development in place are less than 0.8 times their former value then occupants of the existing building will notice the loss of sunlight.

Following the BRE guidelines, APSH and WPSH calculations have been carried out on the facades illustrated in Figure 3-4 that are located 90° of due south of the proposed development and that are expected to be affected.

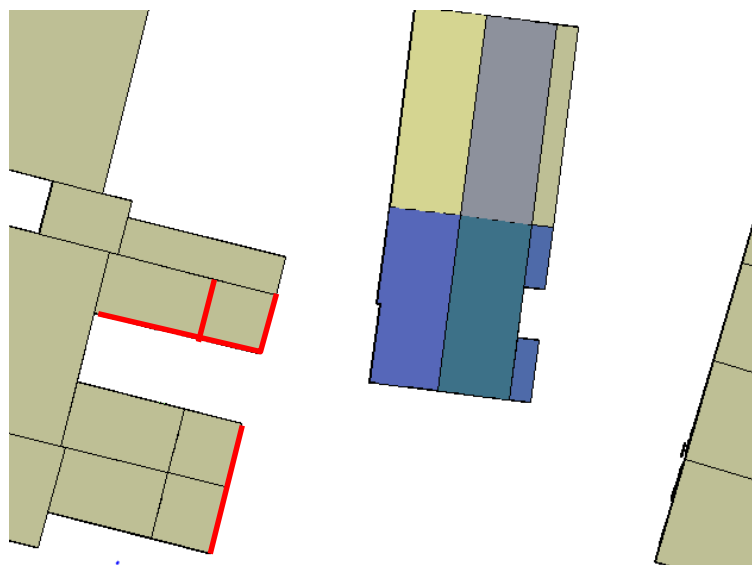


Figure 3-4 Windows assessed for sunlight

The calculated values of APSH and WPSH are shown in the following tables 3-2 and 3-3.

Table 3-2 APSH results

Property / Façade/ Tested windows		Annual Probable Sunlight Hours (APSH %)		% of existing case (80% and above acceptable)	BRE Criteria Met?
		BRE minimum recommended value 25%			
		APSH % (proposed case)	APSH % (Base case)		
121 Goldhurst Terrace	W1	41			PASS
	W2	36			PASS
	W3	55			PASS
	W4	56			PASS
	W3	53			PASS

123 Goldhurst Terrace	W4	55			PASS
	W7	58			PASS
125 Goldhurst Terrace	W1	54			PASS
	W2	59			PASS

Table 3-3 WPSH results

Property / Façade/ Tested windows		Winter Probable Sunlight Hours (APSH %)		% of existing case (80% and above acceptable)	BRE Criteria Met?
		BRE minimum recommended value 5%			
		WPSH % (proposed case)	WPSH % (proposed case)		
121 Goldhurst Terrace	W1	17			PASS
	W2	7			PASS
	W3	20			PASS
	W4	20			PASS
123 Goldhurst Terrace	W3	17			PASS
	W4	18			PASS
	W7	20			PASS
125 Goldhurst Terrace	W1	16			PASS
	W2	20			PASS

For the identified building and facades, both APSH and WPSH values for all the tested windows is above the 25% and 5% minimum recommended values respectively. Therefore the proposed extension will have impact of **negligible significance** on sunlight availability of the surrounding properties.

**Gardens and Open Spaces**

Good site layout planning for daylight and sunlight should not limit itself to providing good natural lighting inside buildings. Sunlight in amenity spaces between buildings has an important impact on the overall appearance and ambience of a development.

According to the BRE Guide, it is recommended that for a garden or amenity area to appear adequately sunlit throughout the year, at least half of the area should receive at least two hours of sunlight on 21<sup>st</sup> March. If as a result of a 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<sup>st</sup> March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

Site analysis indicates that there are amenity spaces on the east and west orientation of the site. These are the rear gardens of the residential properties at Goldhurst Terrace and Fairfax Place.



Figure 3-5 Shadow range between 12:00 and 14:00hrs on 21st March

The assessment indicates that more than half of the area of tested amenity spaces will get a minimum of 2hrs of sunlight on 21<sup>st</sup> March with the proposed extension in place, thus meeting the BRE criteria.

### 3.3 Summary of result

The proposed extension will have impact of **negligible significance** on the daylight availability within the surrounding buildings. This is shown in the table below as all the tested windows meet the BRE criteria for daylighting.

The overall impact of the proposed extension on the sunlight availability of the adjacent property at Goldhurst Terrace and Fairfax Place is of **negligible significance**. Therefore the surrounding properties will get adequate level of sunlight with the proposed extension in place.

A summary of daylight and sunlight assessment is given below.

Property	No. of Windows Tested	Criteria	No. of windows passing/failing	Pass
121 Goldhurst Terrace	4	Daylighting	4	Pass
	4	APSH	4	Pass
		WPSH		
123 Goldhurst Terrace	7	Daylighting	7	Pass
	3	APSH	3	Pass
		WPSH		
125 Goldhurst Terrace	2	Daylighting	2	Pass
	2	APSH	2	Pass
		WPSH		
1 Fairfax Place	7	Daylighting	7	Pass
3 Fairfax Place	6	Daylighting	6	Pass

## 4 Conclusion

An assessment was carried out to ascertain the impacts of the proposed extension of the property at 10B Fairhazel Gardens on the daylight and sunlight availability within the existing surrounding buildings.

Site Analysis indicated the adjacent residential properties at 121, 123 and 125 Goldhurst Terrace to be sensitive receptors for daylight and sunlight assessment and properties at 1 and 3 Fairfax Place to be sensitive receptors for daylight assessment only. Other developments in the vicinity of the site were found to be located outside the limit of the spacing guideline set by the BRE and therefore will not have any impact from the proposed development.

The daylight assessment was carried out by determining the Vertical Sky Component at the centre of surrounding windows for both existing and proposed scenarios, to ascertain the magnitude of impact on the potential receptors from the proposed extension. The result indicated that the VSC values meet the BRE criteria and therefore the proposed scheme has impact of negligible significance on daylight availability of the identified receptors.

The sunlight assessment was carried out for the receptors facing 90° of due south and lying to the north orientation of the site, as described in the BRE guide. Annual Probable Sunlight Hours (APSH) values and Winter Probable Sunlight Hours (WPSH) values at the centre of surrounding windows for both existing and proposed scenarios were calculated, to ascertain the magnitude of impact on the potential receptors from the proposed extension. The result of the assessment indicated that all the tested windows met the BRE criteria for annual sunlight hours and winter sunlight hours. Therefore the proposed extension will have impact of negligible significance on sunlight availability within the adjacent properties.

Site analysis indicated that there are garden spaces on east and west orientation of the site that are likely to be overshadowed by the proposed extension. The result of overshadowing assessment showed that more than half of their area will receive at least 2 hours of sunlight on 21<sup>st</sup> march, thus meeting the BRE criteria.

Therefore, the study indicates that the proposed extension has no impact on the daylight and sunlight availability within the surrounding existing buildings and amenity spaces.