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Daylight and Sunlight Assessment

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Contents

Executive Summary

Price & Myers have carried out a daylight and sunlight impact assessment in order to support the planning application of the proposed development at 59-61, Leighton Road in London Borough of Camden.

This report is an assessment of the impact of the proposed scheme on the availability of daylight and sunlight of the existing surrounding buildings and amenity spaces. It determines whether the proposed design meets the criteria set out in Building Research Establishment Report 'Site layout planning for daylight and sunlight: A guide to good practice' 2011and British Standard BS 8206-02 'Lighting for buildings – Part 2: Code of practice for daylighting' (2008).

The assessment was carried out on the windows of the residential properties along the Leighton Road located within the BRE assessment boundary. It also includes the windows of the adjacent residential buildings 1-6 Margaret house, 1-10 Dunne Mews, Kennistoun House and 1-32 Willingham Close.

The results of the daylight assessment indicate that all the identified windows of the surrounding properties either have VSC values above the recommended levels, or have a reduction in their VSC values from the baseline scenario that is within the limits set by BRE. This means that the rooms associated with these windows will continue to receive good level of daylight even with the proposed development in place. Therefore, it can be concluded that the proposed extension is likely to have no impact on the surrounding existing buildings.

The sunlight assessment indicates that all the tested windows associated with the adjacent properties will receive adequate level of sunlight throughout the year including winter months as the APSH and WPSH values are more than the levels recommended by BRE. Therefore, it is concluded that proposed extension will have no impact on the surrounding buildings.

The overshadowing analysis confirms that the amenity space associated with 1-32 Willingham Close and Christians church Hall will receive adequate amounts of sunlight without any obstructions from the proposed extension.

The assessment thus indicates that the proposed single storey extension on the rear blocks of 59-61 Leighton Road development will have no impact on the daylight and sunlight availability within the surrounding existing buildings and amenities.

1 Introduction

Price & Myers have carried out a daylight and sunlight impact assessment in order to support the planning application of the proposed extension of the new development at 59-61, Leighton Road in London Borough of Camden.

The new scheme entails the addition of a new floor on the top of 3 storey rear block of the newly constructed development on the site. The proposed extension will provide a 2 bedroom south facing residential unit.

Figure 1-1 indicates the proposed extension.

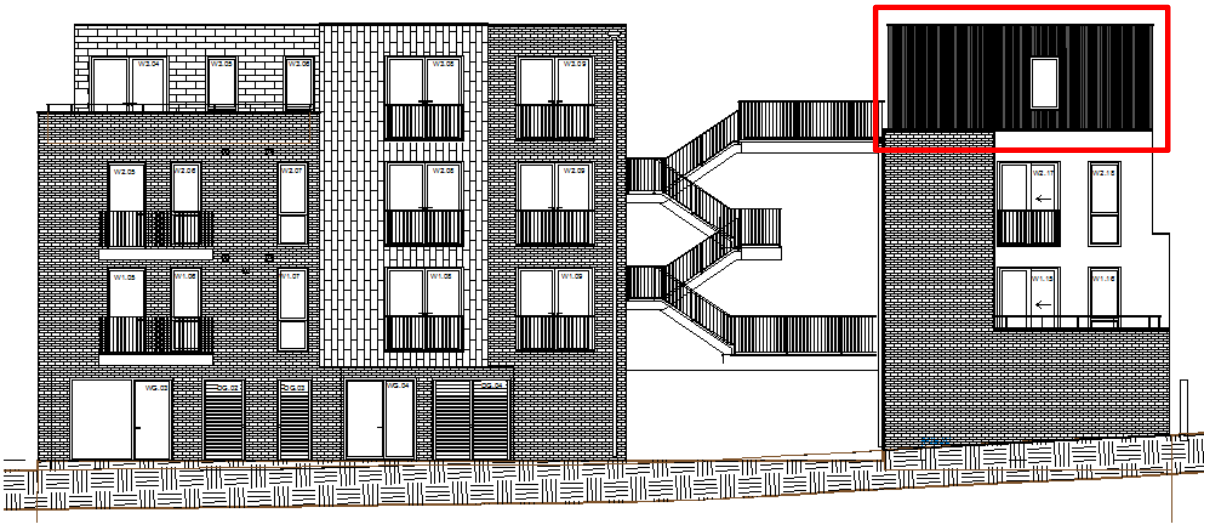

Figure 1-1 East elevation of the proposed scheme

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) and British Standard BS 8206-02 'Lighting for buildings – Part 2: Code of practice for daylighting' (2008).

The assessment is based on drawings provided by PPM planning and the information regarding adjacent buildings has been obtained from internet mapping to create the 3D model for assessment.

2 Site Analysis

2.1 Site surrounding buildings

The site is mostly surrounded by residential properties. On the south orientation of the site, there are 2 to 3 stories terraced houses along Leighton road. On the east orientation of the application site is Willingham Terrace that includes large amenity space. In addition, there is a playground associated with the church on the north orientation. On the west orientation of the site, the application site is bound by Dunne Mews and the 4 storey Kennistoun House.

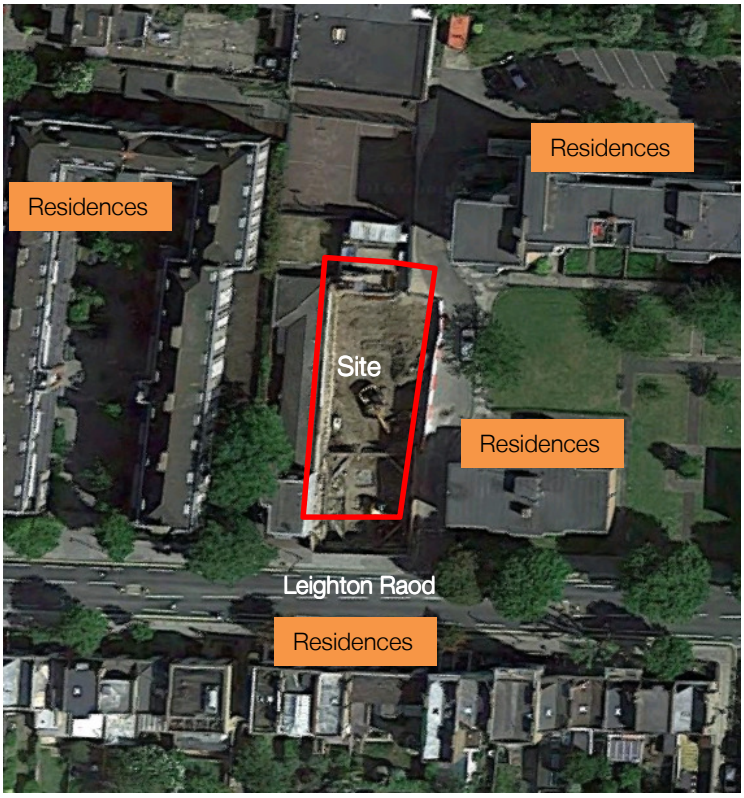

Figure 2-1 Site surroundings

2.2 Site Model

A three-dimensional models of both existing and proposed building were built in AutoCAD to ensure the level of impact on the daylight and sunlight availability on windows in adjacent properties. The adjacent properties were also built in accordance with the methodology described in section 2.2. The rest of the surrounding buildings are not expected to be affected by the proposed development.

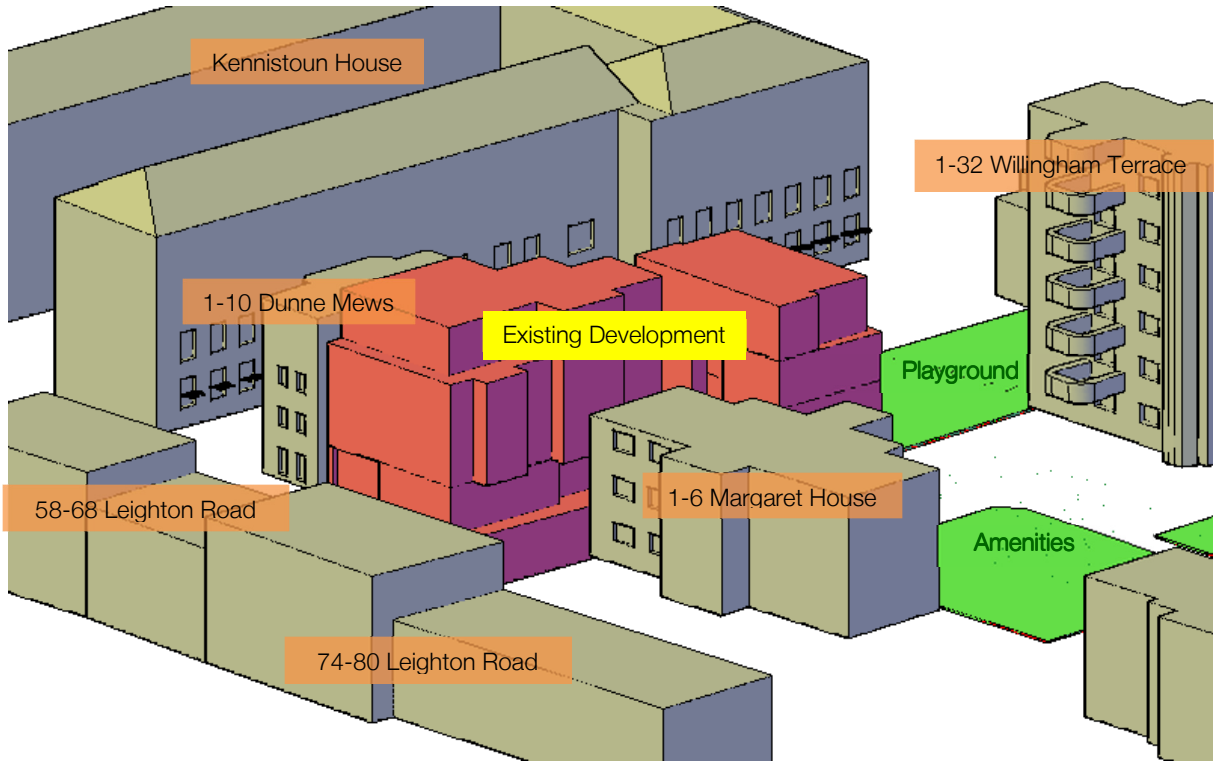

Figure 2-2 Model of the Existing building on site and surrounding buildings

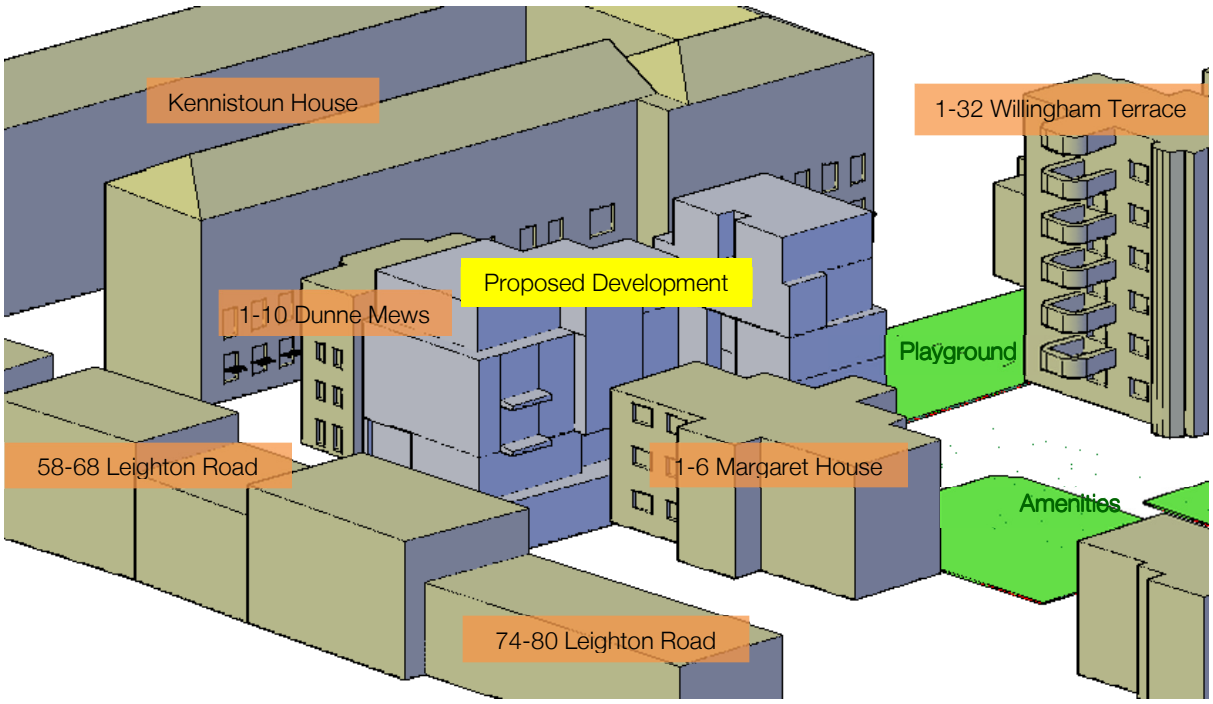

Figure 2-3 Model of the Proposed building on site and surrounding buildings

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.

BRE (clause 2.2.4) suggests that the surrounding buildings located within a radius equivalent to three times the height of the proposed building, above the centre of the existing window, are likely to be affected by the proposed development. Based on this, only those existing and foreseen developments that are situated within a radius of 32.7 from the proposed development (within the circle) might have their daylight and sunlight potentially impacted. Figure 3-1 below shows the masterplan fall within the assessment range and other developments in the vicinity are located outside the limits of the spacing guidelines are therefore have not been tested.

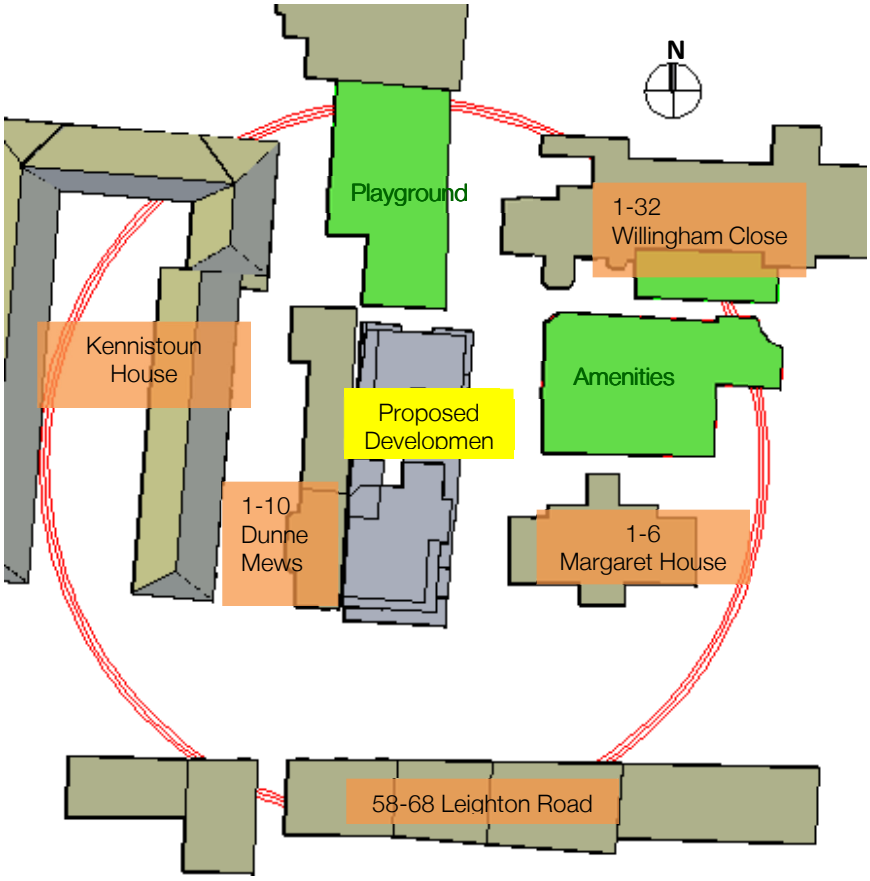

Figure 3-1 Extent of daylight and sunlight assessment <radius will vary with height>

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 ground level windows of the potentially affected properties as they represent the worst case scenario. East facing windows of Kennistoun House and north facing windows of the properties at Leighton Road have been tested. South facing windows of 1-10 Dunne Mews and 1-6 Margaret house have also been tested. In addition to these, windows of Willingham Terrace have been tested.

Kennistoun House

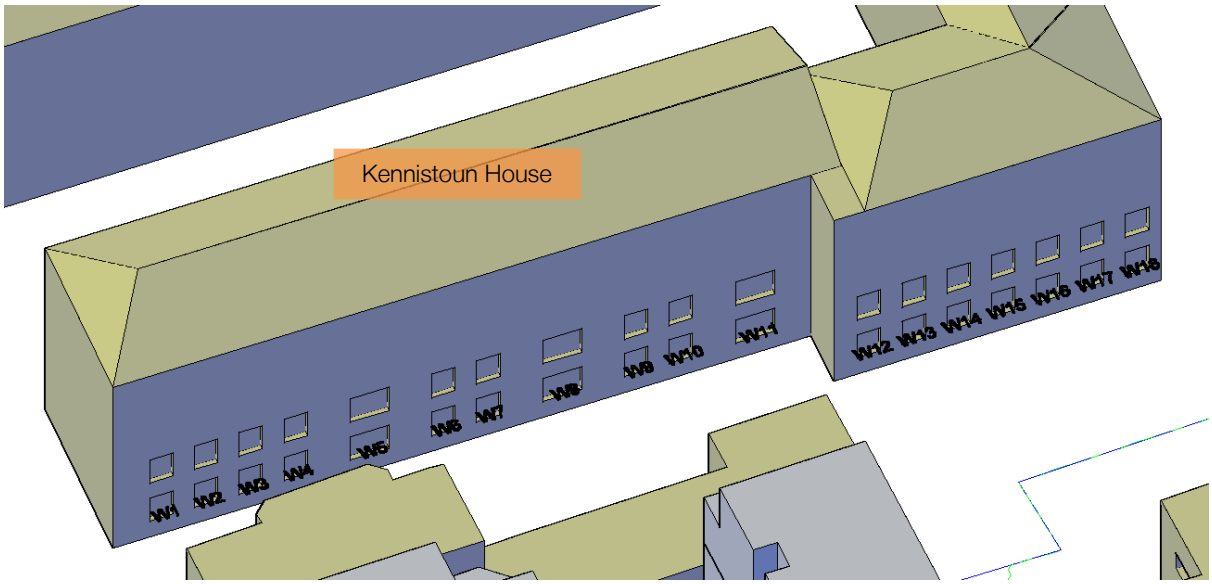

Figure 3-2 Windows assessed for daylight – Kennistoun House

The calculated values of VSC measured at the identified windows in Figure 3-2 are shown in the following table.

Property	Tested windows	VSC % (proposed case) ≥ 27%	VSC % (Existing case) ≥ 27%	% of existing case (80% and above acceptable)	BRE Criteria Met?
Kennistoun House	W1	22.27	22.35	100%	YES
	W2	20.33	20.47	99%	YES
	W3	19.54	19.81	99%	YES
	W4	20.03	20.47	98%	YES
	W5	22.5	23.13	97%	YES
	W6	24.97	25.72	97%	YES
	W7	25.83	26.65	97%	YES
	W8	26.62	27.47	97%	YES
	W9	26.14	27.05	97%	YES
	W10	25.58	26.51	96%	YES
	W11	22.46	23.35	96%	YES
	W12	28.34	–	–	YES
	W13	29.24	–	–	YES
	W14	30.01	–	–	YES
	W15	30.65	–	–	YES
	W16	31.21	–	–	YES
	W17	31.73	–	–	YES
	W18	32.19	–	–	YES

Table 3-1 VSC results for Kennistoun House

The results show that all the tested windows of Kennistoun House either receive VSC values that are above the recommended levels, or have a reduction in their VSC values from the baseline scenario that are within the limits set by BRE.

1-10 Dunne Mews and 1-6 Margaret House

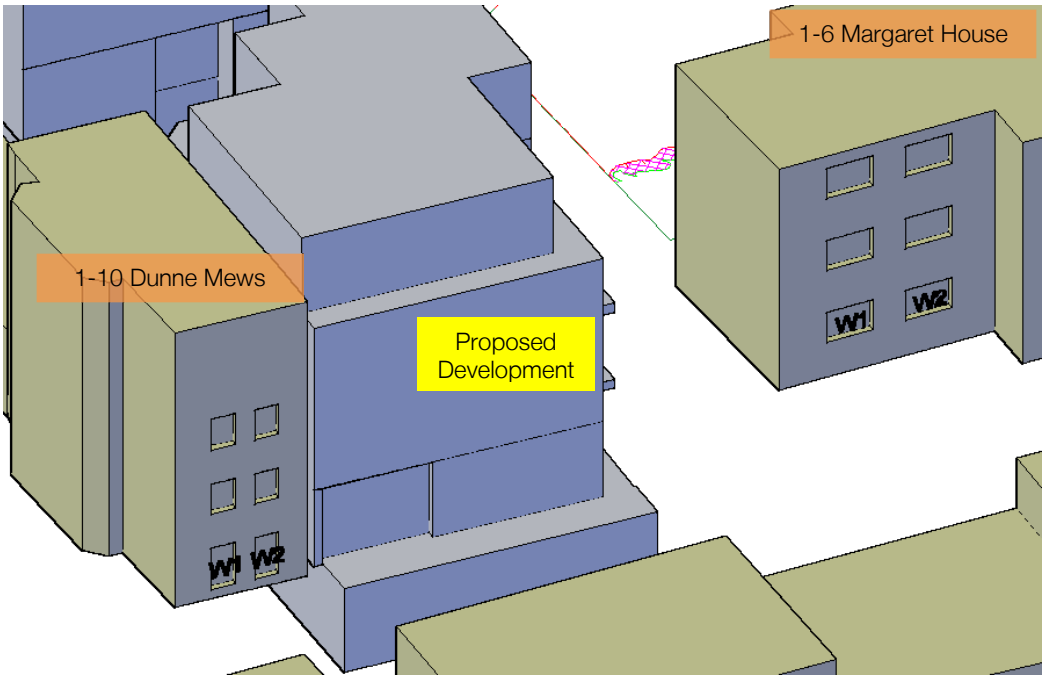

Figure 3-3 Windows assessed for daylight – 1-10 Dunne Mews and 1-6 Margaret House

The calculated values of VSC measured at the identified windows in Figure 3-3 are shown in the following table.

Property	Tested windows	VSC % (proposed case) ≥ 27%	VSC % (Existing case) ≥ 27%	% of existing case (80% and above acceptable)	BRE Criteria Met?
1-10 Dunne Mews	W1	29.8	—	—	YES
	W2	29.44	—	—	YES
1-6 Margaret House	W1	30.63	—	—	YES
	W2	27.12	—	—	YES

Table 3-2 VSC Results for 1-10 Dunne Mews and 1-6 Margaret House

The results show that all the tested windows of 1-10 Dunne Mews and 1-6 Margaret House are able to meet the BRE criteria for daylighting.

50-56, 58-62 and 64 Leighton Road

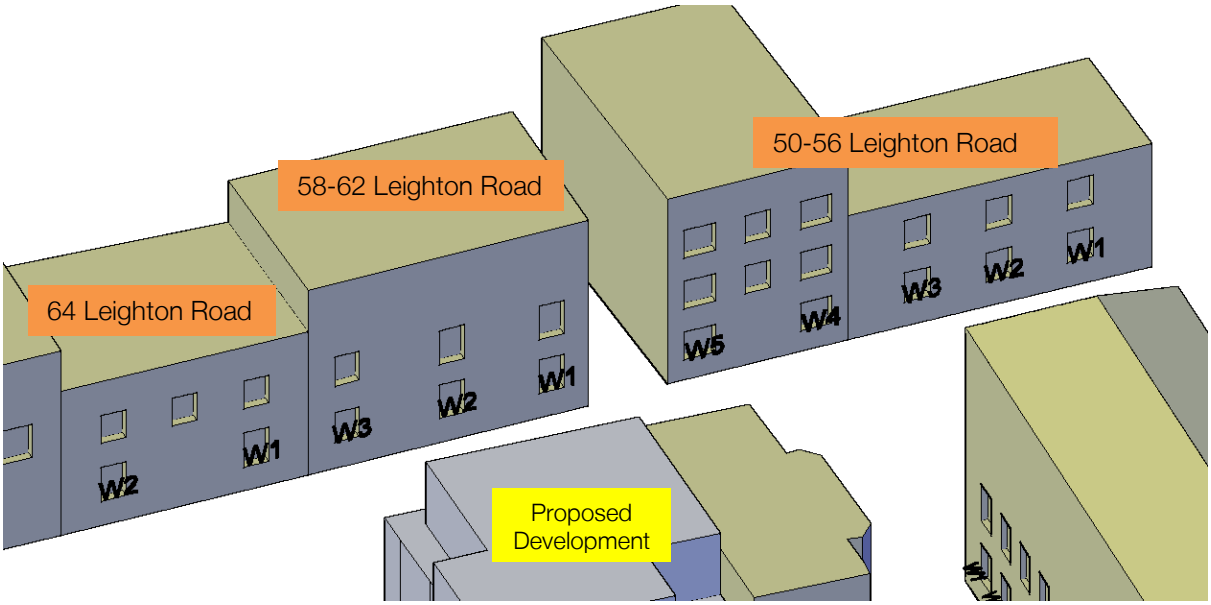

Figure 3-4 Windows assessed for daylight – 50-56, 58-62 and 64 Leighton Road

The calculated values of VSC measured at the identified windows in Figure 3-4 are shown in the following table.

Property	Tested windows	VSC % (proposed case) ≥ 27%	VSC % (existing case) ≥ 27%	% of existing case (80% and above acceptable)	BRE Criteria Met?
50-56 Leighton Road	W1	29.68	–	–	YES
	W2	29.32	–	–	YES
	W3	29.14	–	–	YES
	W4	28.98	–	–	YES
	W5	28.27	–	–	YES
58-62 Leighton Road	W1	27.82	–	–	YES
	W2	27.66	–	–	YES
	W3	27.86	–	–	YES
64 Leighton Road	W1	28.48	–	–	YES
	W2	29.74	–	–	YES

Table 3-3 VSC results for 50-56, 58-62 and 64 Leighton Road

The results show that all the tested windows of 50-56, 58-62 and 64 Leighton Road are able to meet the BRE Criteria for daylighting

66-68 and 74-80 Leighton Road

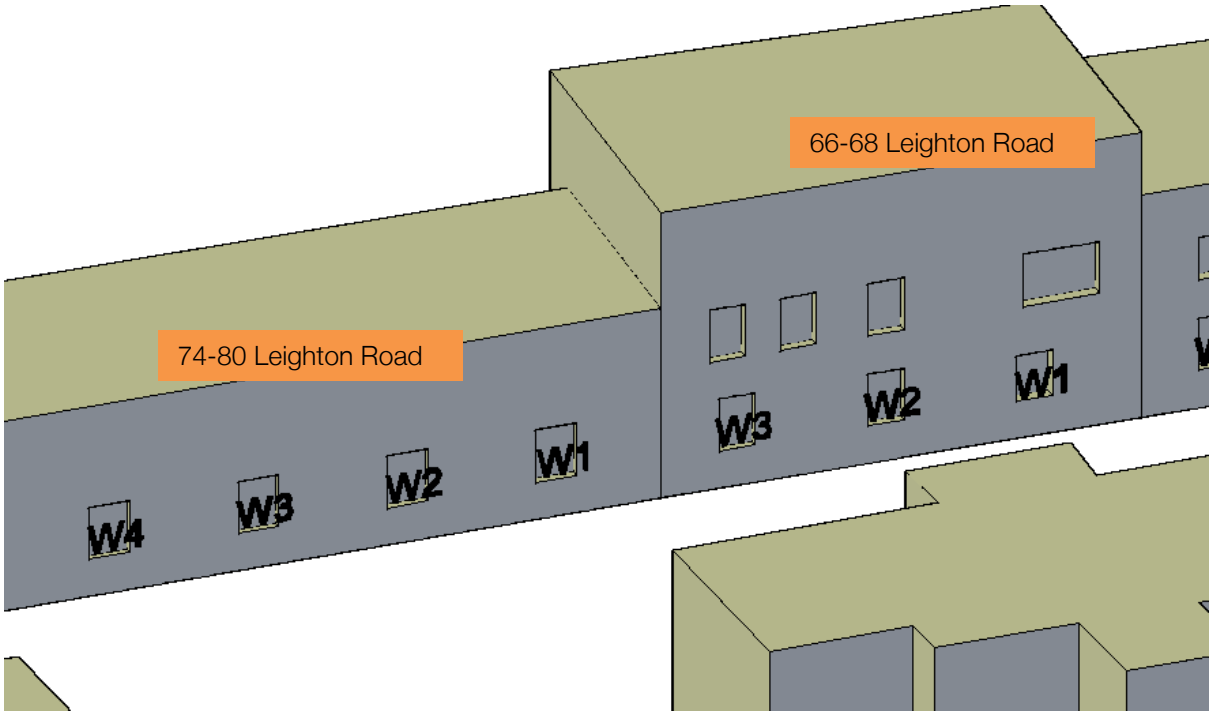

Figure 3-5 Windows assessed for daylight – 66-68 and 74-80 Leighton Road

The calculated values of VSC measured at the identified windows in Figure 3-5 are shown in the following table.

Property	Tested windows	VSC % (proposed case) ≥ 27%	VSC % (existing case) ≥ 27%	% of existing case (80% and above acceptable)	BRE Criteria Met?
66-68 Leighton Road	W1	30.19	–	–	YES
	W2	30.4	–	–	YES
	W3	30.61	–	–	YES
74-80 Leighton Road	W1	30.97	–	–	YES
	W2	31.25	–	–	YES
	W3	31.52	–	–	YES
	W4	31.74	–	–	YES
	W5	31.88	–	–	YES

Table 3-4 VSC results for 66-68 and 74-80 Leighton Road

The results show that all the tested windows of properties at 66-68 and 74-80 Leighton Road are able to meet the BRE Criteria for daylighting.

1-32 Willingham Terrace

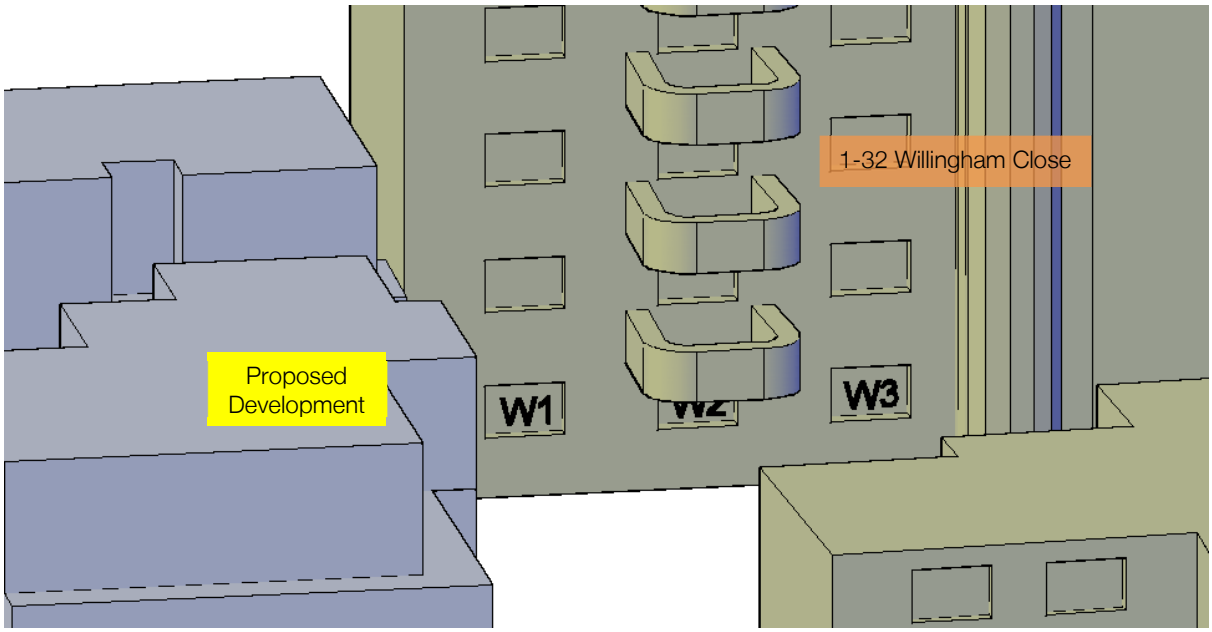

Figure 3-6 Windows assessed for daylight – 1-32 Willingham Terrace

The calculated values of VSC measured at the identified windows in Figure 3-6 are shown in the following table.

Property	Tested windows	VSC % (proposed case) ≥ 27%	VSC % (existing case) ≥ 27%	% of existing case (80% and above acceptable)	BRE Criteria Met?
1 -32 Willingham Terrace	W1	22.48	23.95	94%	YES
	W2	4.27	4.42	97%	YES
	W3	25.5	25.48	100%	YES

Table 3-5 VSC results for 1-32 Willingham Terrace

The results show that all the tested windows at 1-32 Willingham Terrace have VSC values above the recommended levels, or have a reduction in their VSC values from the baseline scenario that are within the limits set by the BRE.

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, therefore identified receptors are shown in Figure 3-7 that requires sunlight assessment.

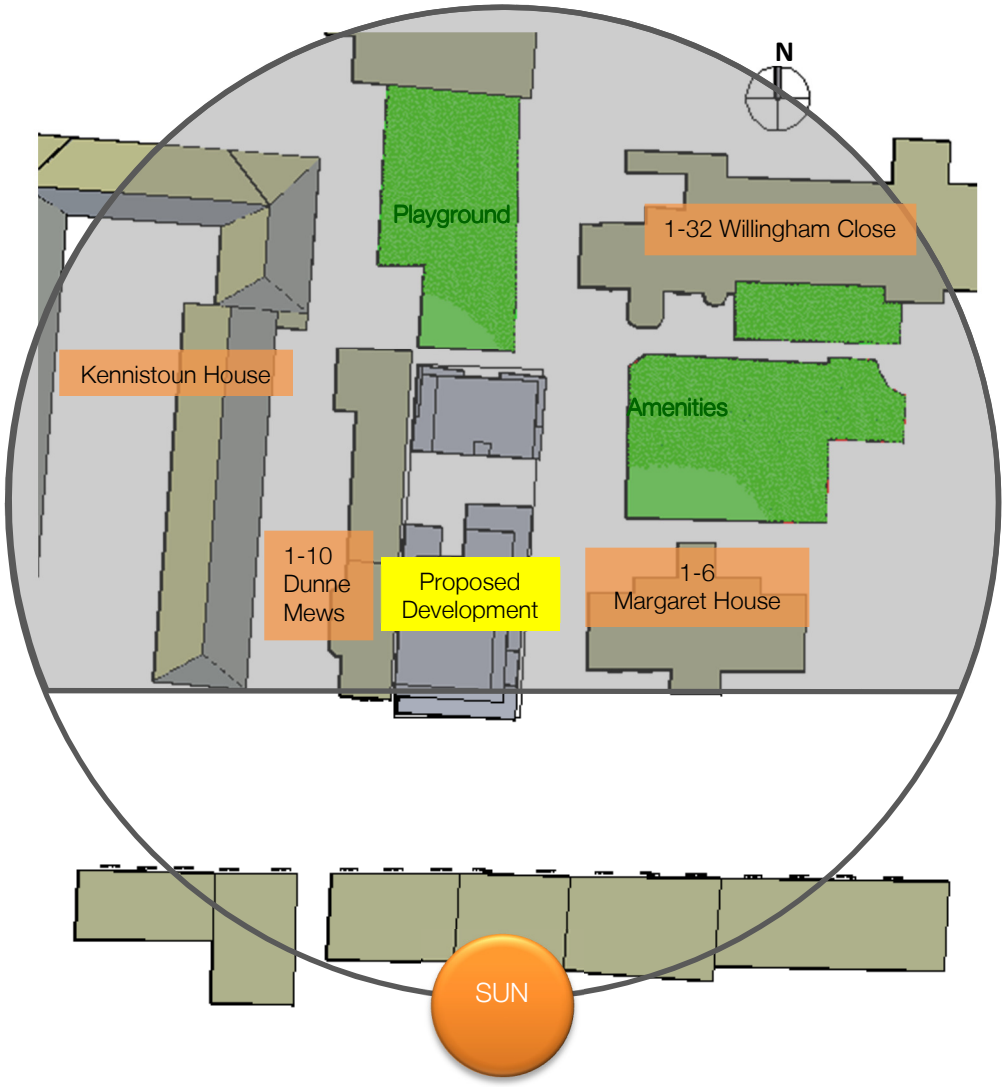

Figure 3-7 properties likely to be affected

3.3 Annual Probable Sunlight Hours (APSH) / 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 21st September to 21st 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 the 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 of their former value then occupants of the existing building will notice the loss of sunlight.

The results of the APSH and WPSH for the identified buildings are shown in Table 3-6 below. Please refer to Figure 3-2 to Figure 3-6 for window numbers.

Property	Tested windows	APSH(%) Proposed ≥ 25%	APSH(%) Existing ≥ 25%	% of existing case (80% and above acceptable)	BRE Criteria Met?	WPSH(%) Proposed ≥ 5%	WPSH(%) Existing ≥ 5%	% of existing case (80% and above acceptable)	BRE Criteria Met?
Kennistoun House	W1	36	–	–	YES	12	–	–	YES
	W2	30	–	–	YES	10	–	–	YES
	W3	31	–	–	YES	12	–	–	YES
	W4	26	26	100%	YES	10	–	–	YES
	W5	29	–	–	YES	9	–	–	YES
	W6	33	–	–	YES	8	–	–	YES
	W7	34	–	–	YES	8	–	–	YES
	W8	39	–	–	YES	7	–	–	YES
	W9	36	–	–	YES	9	–	–	YES
	W10	37	–	–	YES	10	–	–	YES
	W11	36	–	–	YES	8	–	–	YES
	W12	37	–	–	YES	6	–	–	YES
	W13	38	–	–	YES	6	–	–	YES
	W14	39	–	–	YES	8	–	–	YES
	W15	37	–	–	YES	8	–	–	YES
	W16	39	–	–	YES	10	–	–	YES
	W17	42	–	–	YES	11	–	–	YES
	W18	46	–	–	YES	12	–	–	YES
1-10 Dunne Mews	W1	79	–	–	YES	20	–	–	YES
	W2	79	–	–	YES	20	–	–	YES
1-6 Margaret house	W1	68	–	–	YES	24	–	–	YES
	W2	58	–	–	YES	20	–	–	YES
1-32 Willingham Terrace	W1	49	–	–	YES	15	–	–	YES
	W2	11	11	100%	YES	5	–	–	YES
	W3	51	–	–	YES	20	–	–	YES

Table 3-6 APSH and WPSH results

3.4 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 a garden space 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 21st March. If as a result of a new development, an existing garden or amenity area does not meet this criterion, and the area which can receive two hours of sun on 21st 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 associated with the Christians church Hall, located on the north orientation of the site that is likely to be overshadowed by the proposed development. In addition there are large amounts of amenity areas between the Willingham Terrace and the Margaret House on the east side of the site.

An overshadowing analysis has been undertaken for all the existing amenity spaces. Figure 3-8 shows the amenity spaces that have been tested.

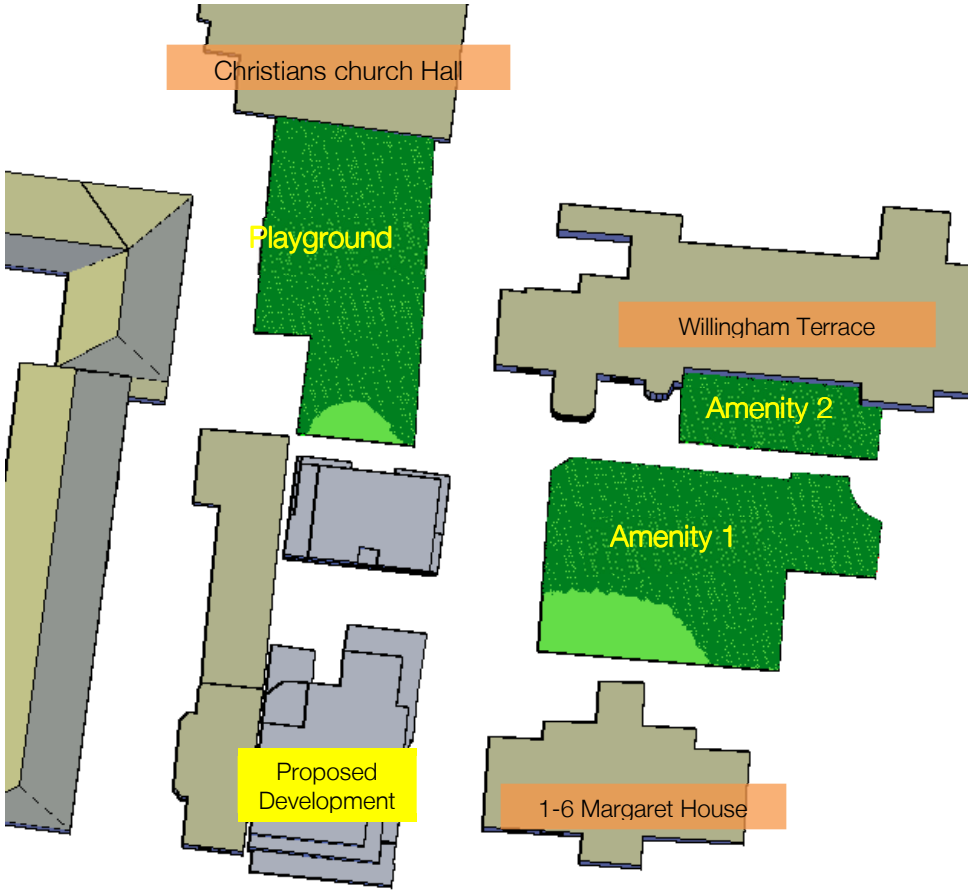

Figure 3-8 Shadow range between 9:00 and 11:00 hrs on 21st March

Space tested	Total Area	Existing Lit Area	Proposed Lit Area	Percentage of area receiving at least 2 hrs of sunlight	BRE Criteria Met?
Amenity 1	21.37	301.07	301.07	100%	Yes
Amenity 2	33.36	88.8	88.8	100%	Yes
Playground	9.16	287.01	287.01	100%	Yes

Table 3-7 Sunlight availability in amenity spaces with existing amenities

Table 3-7 shows that there are no impacts on the sunlight availability of amenity spaces, thus meeting the BRE criteria. It can be concluded that the proposed extension does not affect sunlight availability of the existing surrounding amenity spaces.

4 Conclusion

An assessment of the daylight and sunlight impacts from the proposed extension at 59-61 Leighton Road on the existing surrounding buildings and their associated garden spaces was carried out.

This report determines whether the proposed design meets the criteria set out in Building Research Establishment Report 'Site layout planning for daylight and sunlight: A guide to good practice' 2011and British Standard BS 8206-02 'Lighting for buildings – Part 2: Code of practice for daylighting' (2008).

The assessment was carried out on the windows of the residential properties along the Leighton Road located within the BRE assessment boundary. It also includes the windows of the adjacent residential buildings 1-6 Margaret house, 1-10 Dunne Mews, Kennistoun House and 1-32 Willingham Close.

The results of the daylight assessment indicate that all the identified windows of the surrounding properties either have VSC values above the recommended levels, or have a reduction in their VSC values from the baseline scenario that is within the limits set by BRE. This means that the rooms associated with these windows will continue to receive good level of daylight even with the proposed development in place. Therefore, it can be concluded that the proposed extension is likely to have no impact on the surrounding existing buildings.

The sunlight assessment indicates that all the tested windows associated with the adjacent properties will receive adequate level of sunlight throughout the year including winter months as the APSH and WPSH values are more than the levels recommended by BRE. Therefore, it is concluded that proposed extension will have no impact on the surrounding buildings.

The overshadowing analysis confirms that the amenity space associated with 1-32 Willingham Close and Christians church Hall will receive adequate amounts of sunlight without any obstructions from the proposed extension.

The assessment thus indicates that the proposed single storey extension on the rear blocks of 59-61 Leighton Road development will have no impact on the daylight and sunlight availability within the surrounding existing buildings and amenities.