



148 Station Road, Sidcup, DA15 7AB

**Daylight, Sunlight, and Overshadowing Assessment
for Adjacent Properties and
Proposed Development**

Document Issue Record

This document has been revised and issued as below:

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Calculations are based on the drawings and information provided to us, which have been accepted in good faith as being accurate and valid. The accuracy of this information may have an impact on the daylight, sunlight, and overshadowing assessments.

We have used our best endeavours to ensure that all relevant windows within the neighbouring properties and that all external amenity spaces have been identified.

We can make no guarantee as to the status (successful/unsuccessful) of the planning application following the submission of our report.

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1.0 Executive Summary

A daylight, sunlight, and overshadowing assessment has been carried out for the surrounding properties that are close to the proposed new extensions at 148 Station Road, Sidcup, DA15 7AB.

An internal daylight assessment has also been carried out to determine the amount of daylight received by the proposed developments habitable rooms.

This report outlines the results of the two assessments in order to assist with the developments planning application.

Calculations have been based on the drawings and information provided to us by the client / architect, which have been accepted in good faith as being accurate and valid, internet and OS mapping sources, and publicly available planning records where available. The accuracy of this information may have an impact on the daylight, sunlight, and overshadowing assessments carried out.

The methodology used for this assessment follows the most recognised guidance document for daylight and sunlight within dwellings and is titled 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' *Second Edition 2011*; by Paul Littlefair and is published by the Building Research Establishment.

1.1 Assessment for Surrounding Properties

This assessment investigated the changes in natural light received between the existing and proposed schemes. The following daylight, sunlight, and overshadowing assessments were carried out with the use of computer modelling software in order to provide the most accurate results possible.

- Vertical Sky Component (VSC)
- No Sky Line / Daylight Distribution
- Average Daylight Factor
- Annual and Winter Probable Sunlight Hours
- Overshadowing Assessment

The VSC results for the windows that will be within the proposed development at 142-146 Station Road show that, with the exception of Window W4, all of them would only receive a negligible impact due to the proposed development at 148 Station Road.

Window W4 is shown on the planning drawings to serve a bedroom (Unit 5 Bedroom) which is also served by window W3 which will be predominantly unaffected by the proposed development. To gain a greater understanding of how the daylight to the bedroom overall will be impacted and not just the windows, further daylight assessments have been carried out.

The daylight distribution results show that the loss of daylight distribution across the Unit 5 Bedroom would be negligible under the proposed scheme, as the ratio between the existing and proposed is above the BRE recommended target of 0.80.

The average daylight factor results show that the Unit 5 Bedroom would receive an average daylight factor under the proposed scheme of 1.80%. This is considerably greater than the minimum target daylight factor recommended by BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting for a Bedroom of 1% and therefore the overall impact to the daylight received will be negligible.

As can be seen from the VSC results none of the windows that would be impacted by the proposed development at 148 Station Road are within 90° of due south and therefore there would be no impact to the amount of sunlight hours received by the Units at 142-146 Station Road.

The overshadowing results show that the proposed development at 148 Station Road will have virtually no impact on the amount of overshadowing experienced by the 142-146 Station Road Private and Communal Garden Areas, therefore satisfying the guidelines in terms of overshadowing.

In summary, the assessment for the surrounding properties has shown that there would be just one window (Window W4) within 142-146 Station Road that would be impacted by the proposed development at 148 Station Road. However, further daylight tests on the Bedroom that the window serves have shown that the room itself would not be negatively impacted and the BRE guidelines would ultimately be satisfied.

Therefore, we feel that the proposed development should be considered as acceptable in regard to its neighbourly impact on daylight and sunlight.

1.2 Assessment for Proposed Development

This assessment investigated the amount of natural daylight received by the habitable rooms (Kitchen/Living/Dining Areas and Bedrooms) within the proposed development itself. The following daylight assessments were carried out with the use of computer modelling software in order to provide the most accurate results possible.

- Average Daylight Factors

The ADF results show that all of the habitable rooms within the proposed development would meet the recommended minimum daylight factors set within BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting.

Therefore, we feel that the proposed development should be considered as acceptable in regard to its own amount natural daylight received.

2.0 Introduction

EEABS (Elmstead Energy Assessments & Building Services) has been instructed by to undertake a daylight, sunlight, and overshadowing assessment for the nearby properties of the proposed new extensions at 148 Station Road, Sidcup, DA15 7AB. We were also asked to determine the amount of daylight that is to be received by the habitable rooms within the proposed extension itself.

Therefore, this report will investigate the changes in natural daylight and sunlight received between the existing and proposed plans for surrounding properties. It will also determine the average daylight factors achieved within each of the proposed developments habitable rooms.

The key elements of this report are:

- To review the relevant guidance and methodology with respect to daylight, sunlight, and overshadowing that relate to the development.
- Calculate the surrounding properties levels of daylight, sunlight and overshadowing for the existing scheme in accordance with standard methodology.
- Calculate the surrounding properties levels of daylight, sunlight and overshadowing for the proposed scheme in accordance with standard methodology.
- Calculate the internal average daylight factors received by the proposed new developments habitable rooms.
- To summarise and compare the findings against regulation guidelines for daylight and sunlight of neighbouring buildings, the overshadowing of amenity spaces, and the daylight received by new rooms.

2.1 The Site and Development Proposal

The site is located at 148 Station Road, Sidcup, DA15 7AB and can be seen outlined in red on the satellite image below. The existing building has commercial premises on the ground floor and a residential flat on the first floor.

Also shown on the map below is the surrounding properties that have their levels of daylight and sunlight evaluated under this assessment. The closest property, 142-146 Station Road, has also recently been approved for a large extension (Planning Code 19/02130/FUL), drawings have been taken from the planning portal and this proposed development has been included for within our model.



Figure 1 - Satellite Image of 148 Station Road, Sidcup, DA15 7AB

The proposal for 148 Station Road is to have two 2-Bed domestic flats and two ground floor commercial spaces. The two Commercial spaces will be at the front of the property, the ground floor will also be extended to the rear and have the living area for Flat 148B. The first floor will also be extended at the rear and have the two bedrooms for Flat 148B at the back. Flat 148C will be located at the front. Figure 2 below show some images of the existing and proposed schemes.

This assessment has been based on the drawings and information provided to us by the client / architect, which have been accepted in good faith as being accurate and valid, internet and OS mapping sources, and publicly available planning records where available. A drawing register can be found within Appendix A.

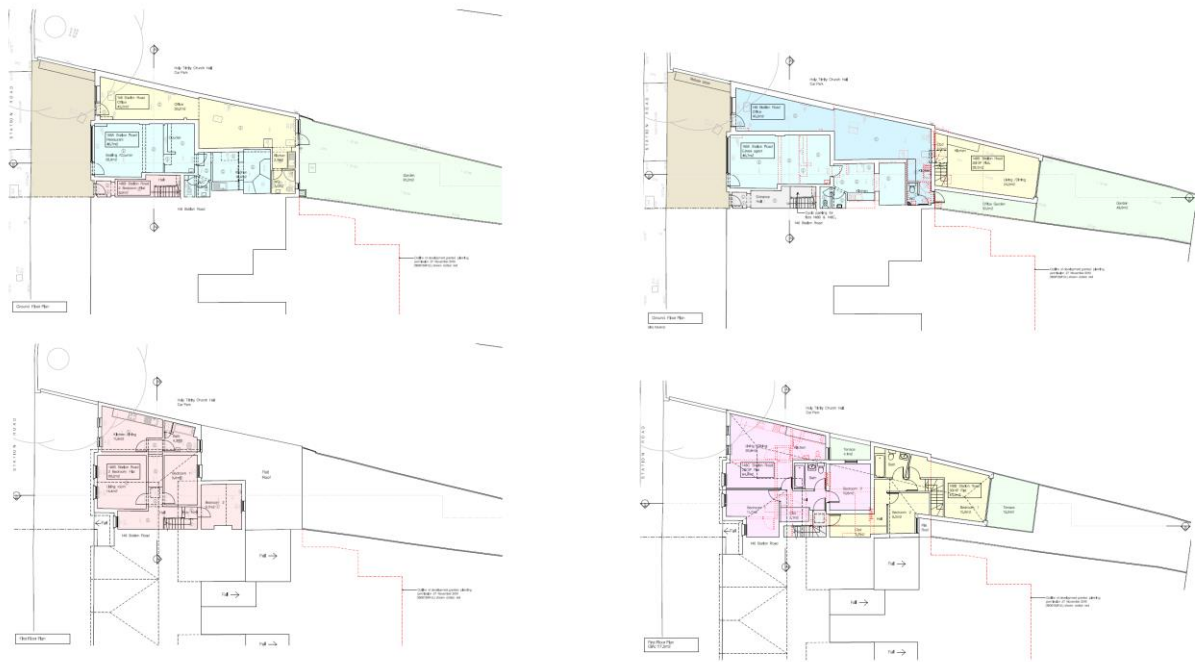


Figure 2 - Existing (Left) and Proposed (Right) Ground and First Floor Plans

2.2 Planning Policy and Guidance

The most recognised guidance document for natural light within dwellings is titled 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' *Second Edition 2011*; by Paul Littlefair and is published by the Building Research Establishment.

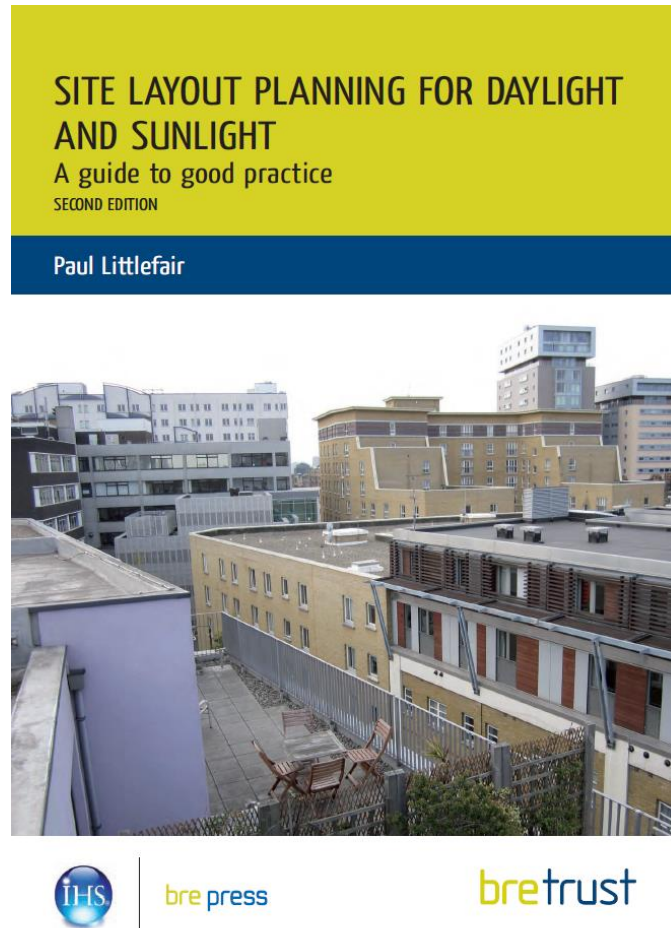


Figure 3 - BRE: Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice

Although the BRE guide clearly states that its recommendations are not mandatory and the document should not be considered as an instrument of planning policy, it can be used in conjunction with the British Standard BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting.

While the BRE Guidelines are the most recognised document for natural light within dwellings they also do state that:

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen 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 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."

As the numerical values within the BRE guide are purely advisable, Appendix I of the guide provides further assistance on how to assess the impact to daylight and sunlight of the surrounding properties.

Criteria	Impact
Where the loss of skylight or sunlight fully meets the guidelines and only a small number of windows or limited area of open space lose light.	None / Negligible
<p>Where the loss of skylight or sunlight is only just within the guidelines and a large number of windows or open spaces are affected.</p> <p>Where the loss of skylight or sunlight does not meet the guidelines but one or more of the following applies:</p> <ul style="list-style-type: none"> • Only a small number of windows or limited area of open spaces are affected. • The loss of light is only just outside the guidelines. • The affected room has other sources of light. • The affected building/room or open space has a low requirement for light. 	Minor Adverse
<p>Where the loss of skylight or sunlight does not meet the guidelines and one or more of the following applies:</p> <ul style="list-style-type: none"> • A large number of windows or large area of open space are affected. • The loss of light is substantially outside the guidelines. • All windows within a particular property are affected. • The affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight. 	Major Adverse

Absent of any particular planning requirements for daylight, sunlight and overshadowing, the methodology and target benchmarks set out within the BRE guide have been used to assess the surrounding properties under the existing and proposed schemes.

We generally consider a value greater than 0.8 times its former value to have a Negligible impact, between 0.5 and 0.8 to have a minor impact, and a value less than 0.5 to have a major impact.

Any trees located close to proposed development have been excluded from the model as recommended by the BRE Guide, which states:

"Where the effect of a new building on existing buildings nearby is being analysed, it is usual to ignore the effect of existing trees."

2.3 Methodology

The following methodology and calculations set out within the BRE Guide 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' *Second Edition 2011* were used to carry out the daylight, sunlight, and overshadowing assessment for the surrounding properties and the proposed extensions at 148 Station Road, Sidcup, DA15 7AB.

2.3.1 Daylight

Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) is a ratio (expressed as a percentage) of the direct sky illuminance falling on the outside mid-point of a window, to the horizontal illuminance under a standard CIE overcast sky. For example, a window looking across an unobstructed field would achieve the highest possible value of just under 40% (39.6%).

For a window to be considered as receiving a good level of daylight, a VSC value of 27% should be achieved. However, for existing windows if the VSC value is less than 27%, then a window is still said to achieve a good level of daylight provided its VSC is within 0.8 of its former value.

No Sky Line / Daylight Distribution

The No Sky Line calculation investigates the distribution of daylight across a room at working plan height. It represents the line in the room where beyond it, there will be no view of the sky. Daylight distribution is similar but instead determines the total area of a room that will be able to see the sky.

As with the vertical sky component test, if following the construction of the extension the no sky line / daylight distribution is 0.8 times its former value then there could be a noticeable loss of daylight to the occupants.

Average Daylight Factor (ADF)

The average daylight factor is the ratio of the average illuminance on the working plane in a room, divided by the outside illuminance on a horizontal surface under a CIE overcast sky. The ratio is usually expressed as a percentage and guidance for adequate levels of daylight are laid out within the British Standard BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting and referenced within the BRE guide.

Room type	Minimum average daylight factor %
Bedrooms	1
Living rooms	1.5
Kitchens	2

Figure 4 - BS 8206-2:2008 Minimum Average Daylight Factors

For combined Kitchen/Living/Dining Spaces a value of 1.5% should be achieved.

2.3.2 Sunlight

Annual Probable Sunlight Hours

To determine if an adequate amount of sunlight is achieved within a room the following criteria needs to be met. At least one main window wall should face within 90° of due south and at least one window should receive at least 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21st September and 21st March.

The term Annual probable sunlight hours means the total amount of hours during a year in which direct sunlight will reach the ground. The winter annual probable sunlight hours are the same thing but only during 21st September to 21st March.

If any of the surrounding windows that face within 90° of due south fail to meet the 25% of annual probable sunlight hours and 5% of winter sunlight hours, then they can still be said to receive a good amount of sunlight providing they are within 0.8 times of their former value or the reduction in sunlight received over the whole year is not greater than 4%.

The BRE guide states that the above guidance is to be applied for living room windows only.

2.3.3 Overshadowing

To be determined as adequately sunlit throughout the year, at least half of a garden and other similar amenity spaces should receive at least two hours of sunlight on 21st March.

For the existing garden or amenity spaces being calculated due to the proposed development, the results should be within 0.8 times of their former values in order for a loss of light to not be noticeable.

3.0 Dynamic Simulation Modelling

EDSL TAS Dynamic Simulation Modelling software was used to carry out the daylight, sunlight, and overshadowing calculations, as this can provide a more accurate means of assessment over the 'by hand' indicator method outlined within the BRE guide.

The daylight calculations are carried out under a standard CIE overcast sky. For the sunlight and overshadowing calculations, the computer model uses actual hourly weather data for the proposed location, in this instance CIBSE London TRY weather data was used.

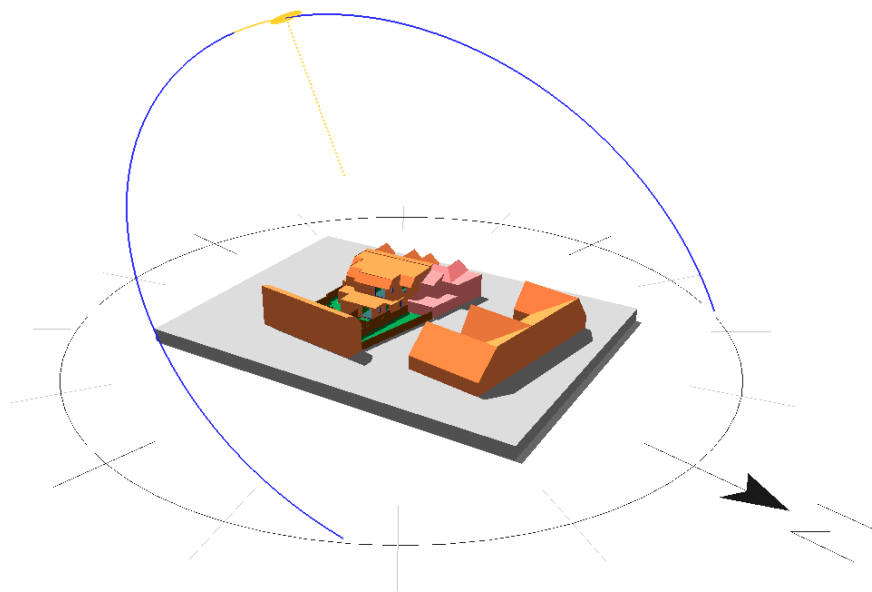


Figure 5 - EDSL TAS Computer Model of the Existing Site

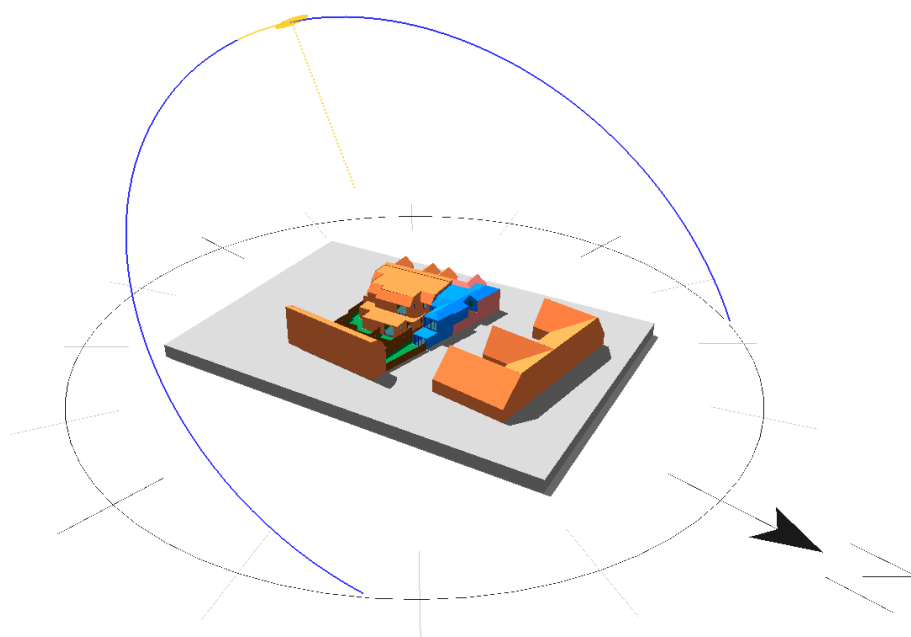


Figure 6 - EDSL TAS Computer Model of the Proposed Site

4.0 Surrounding Properties

The windows that were most likely to be affected by the proposed development have undergone the following calculations and can be found in Appendix B - Window Reference Diagrams.

4.1 Daylight Assessments

4.1.1 Vertical Sky Component

The VSC calculated for the surrounding windows can be found in the tables below.

Property	Win Ref	Orientation (°)	VSC Existing (%)	VSC Proposed (%)	VSC Ratio	Impact
142-146 Station Road	W1	76	27.00	27.00	1.00	None
	W2	346	32.15	28.50	0.89	Negligible
	W3	76	26.78	26.64	0.99	Negligible
	W4	346	29.69	10.22	0.34	Major Adverse
	W5	76	34.80	34.74	1.00	Negligible
	W6	346	33.05	30.53	0.92	Negligible
	W7	76	30.54	29.02	0.95	Negligible

The VSC results for the windows that will be within the proposed development at 142-146 Station Road show that, with the exception of Window W4, all of them would only receive a negligible impact due to the proposed development at 148 Station Road.

Window W4 is shown on the planning drawings to serve a bedroom (Unit 5 Bedroom) which is also served by window W3 which will be predominantly unaffected by the proposed development.

To gain a greater understanding of how the daylight to the bedroom overall will be impacted and not just the windows, further daylight assessments have been carried out.

4.1.2 No Sky Line / Daylight Distribution

As the room geometry for the proposed Unit 5 Bedroom at 142-146 is known, further daylight tests can be carried out to gain a greater understanding of how the proposed scheme at 148 Station Road will impact the daylight levels received.

For the no sky line / daylight distribution calculation the working plane height was assumed to be 0.85m as proposed by the BRE Guide for dwellings.

The daylight distribution calculated can be found in following table below.

Room	Total Room Area (m ²)	Scheme	Area with View of the Sky (m ²)	Daylight Distribution (%)	Ratio	Impact
142-146 Station Road - Unit 5 Bedroom	12.77	Existing	12.46	98	0.98	Negligible
		Proposed	12.25	96		

The daylight distribution results show that the loss of daylight distribution across the Unit 5 Bedroom would be negligible under the proposed scheme, as the ratio between the existing and proposed is above the BRE recommended target of 0.80.

4.1.3 Average Daylight Factor

An average daylight factor calculation has also been carried out for the Unit 5 bedroom under the existing and proposed schemes of 148 Station Road.

Room	Scheme	Average Daylight Factor (%)	Impact
142-146 Station Road - Unit 5 Bedroom	Existing	2.62	Negligible
	Proposed	1.80	

The average daylight factor results show that the Unit 5 Bedroom would receive an average daylight factor under the proposed scheme of 1.80%. This is considerably greater than the minimum target daylight factor recommended by BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting for a Bedroom of 1% and therefore the overall impact to the daylight received will be negligible.

Figure 7 below shows how the average daylight factor changes across the 142-146 Station Road Unit 5 Bedroom under the existing and proposed schemes for 148 Station Road.

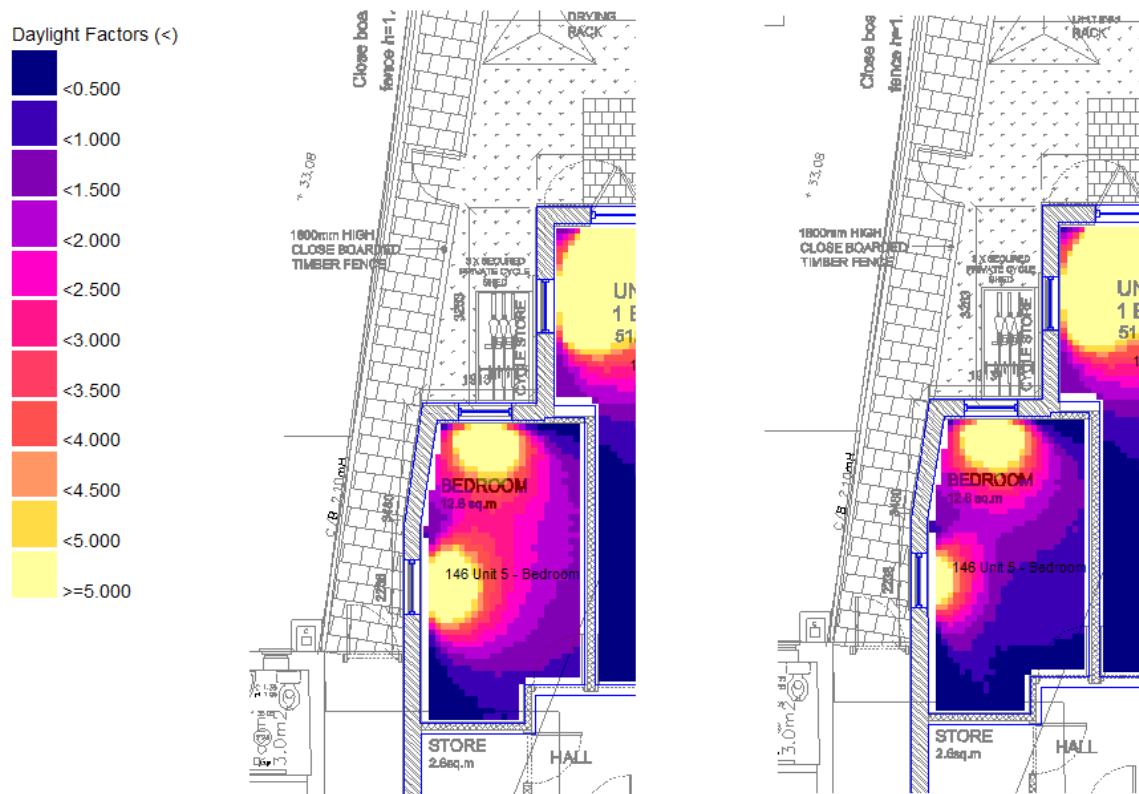


Figure 7 - Average Daylight Factor Plot for 142-146 Station Road Unit 5 Bedroom under the Existing and Proposed Schemes

4.2 Sunlight Assessment

4.2.1 Annual and Winter Probable Sunlight Hours

Only living room windows within 90° of due south need to have the amount of sunlight they can receive assessed (Due south is taken as 180°, therefore a windows orientation should be between 90° and 270° to be assessed). The orientation of each of the windows can be seen within the VSC results.

As can be seen from the VSC results none of the windows that would be impacted by the proposed development at 148 Station Road are within 90° of due south and therefore there would be no impact to the amount of sunlight hours received by the Units at 142-146 Station Road.

4.3 Overshadowing Assessment

The only external amenity areas close to the proposed development at 148 Station Road would be the private garden area of Unit 5 142-146 Station Road and also the communal garden area of 142-146 Station Road.

Overshadowing assessment results can be seen in the table below, the lit area is the area of the zone that receives at least 2 hours of sunlight on the 21st of March.

Outside Space	Area (m ²)	Existing Scheme Lit Area (m ²)	Proposed Scheme Lit Area (m ²)	Ratio	Impact
142-146 Unit 5 Private Garden	24.55	11.94	11.94	1.00	None
142-146 Communal Garden	123.05	96.85	96.83	1.00	Negligible

The overshadowing results show that the proposed development at 148 Station Road will have virtually no impact on the amount of overshadowing experienced by the 142-146 Station Road Private and Communal Garden Areas, therefore satisfying the guidelines in terms of overshadowing.

Shadow cast images for the existing and proposed schemes can be found within Appendix D.

5.0 Proposed Development

An average daylight factor calculation will also be carried out on the domestic habitable rooms of the proposed development at 148 Station Road as recommended by the BRE Guide.

“To Check that adequate daylight is provided in new rooms, the ADF may be calculated and compared with the recommendations in BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting”.

5.1 Average Daylight Factor (ADF)

For the average daylight factor calculation, the windows were assumed to be clear double glazing with a light transmittance value of 0.80. The working plane height was assumed to be 0.85m.

Property	Room	Target Minimum ADF (%)	Calculated ADF (%)	Result
148B	Bedroom 1	1	5.29	Pass
	Bedroom 2	1	2.20	Pass
	Kitchen/Living/Dining	1.5	2.52	Pass
148C	Bedroom 1	1	2.67	Pass
	Bedroom 2	1	1.69	Pass
	Kitchen/Living/Dining	1.5	2.01	Pass

The ADF results show that all of the habitable rooms within the proposed development would meet the recommended minimum daylight factors set within BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting.

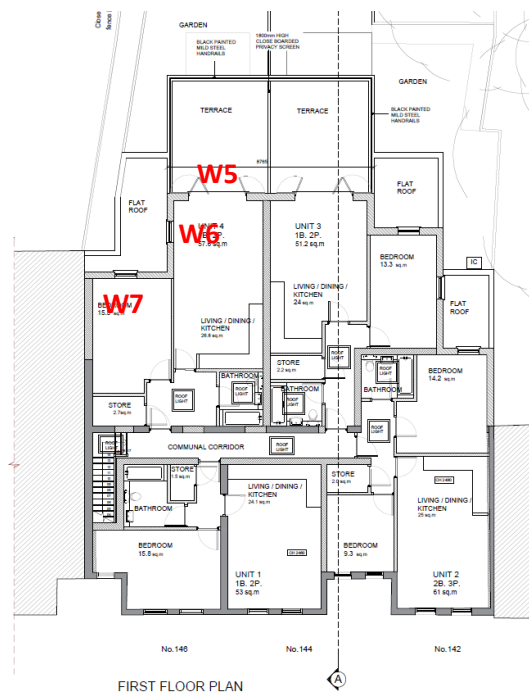
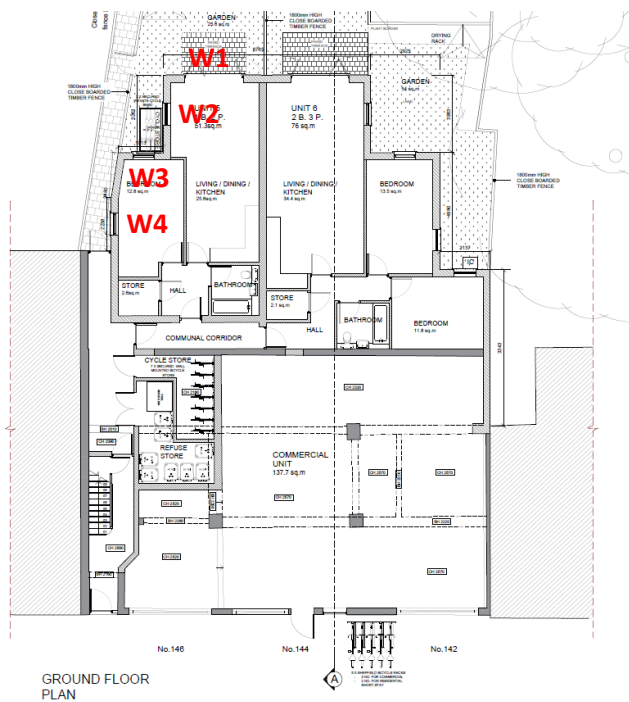
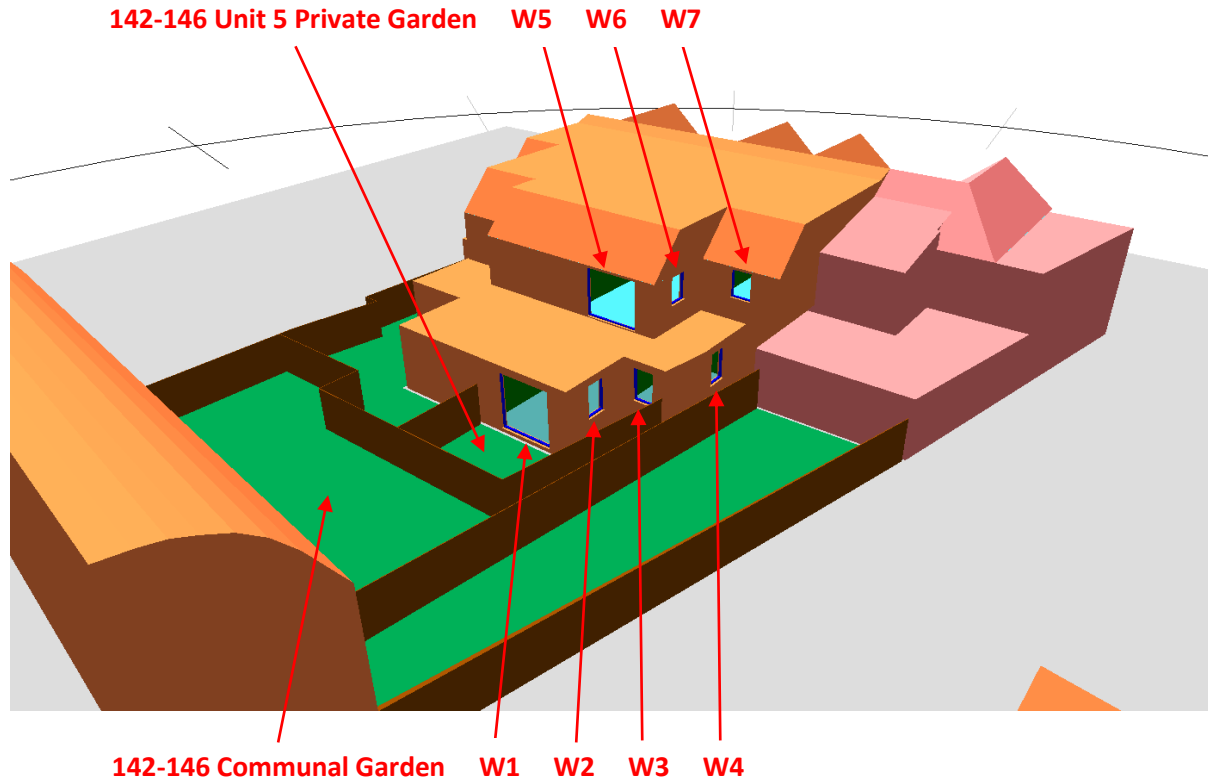
Daylight Factor plots can be found within Appendix C.

Appendix A - Drawing Register

Drawing Number	Drawing Title
3377-L-01	Location Plan
3377-L-02	Block Plan
3377-P-01	Existing Site Plan
3377-P-02	Existing Ground Floor Plan
3377-P-03	Existing First Floor Plan
3377-P-04	Existing Roof Plan
3377-P-05	Existing Elevations (West & East)
3377-P-06	Existing Elevations (North & South)
3377-P-07	Existing Sections (AA & BB)
3377-P-21	Proposed Site Plan
3377-P-22	Proposed Ground Floor Plan
3377-P-23	Proposed First Floor Plan
3377-P-24	Proposed Roof Plan
3377-P-25	Proposed Elevations (West & East)
3377-P-26	Proposed Elevations (North & South)
3377-P-27	Proposed Sections (AA & BB)
142-146 Station Road	Planning Drawings (19/02130/FUL)

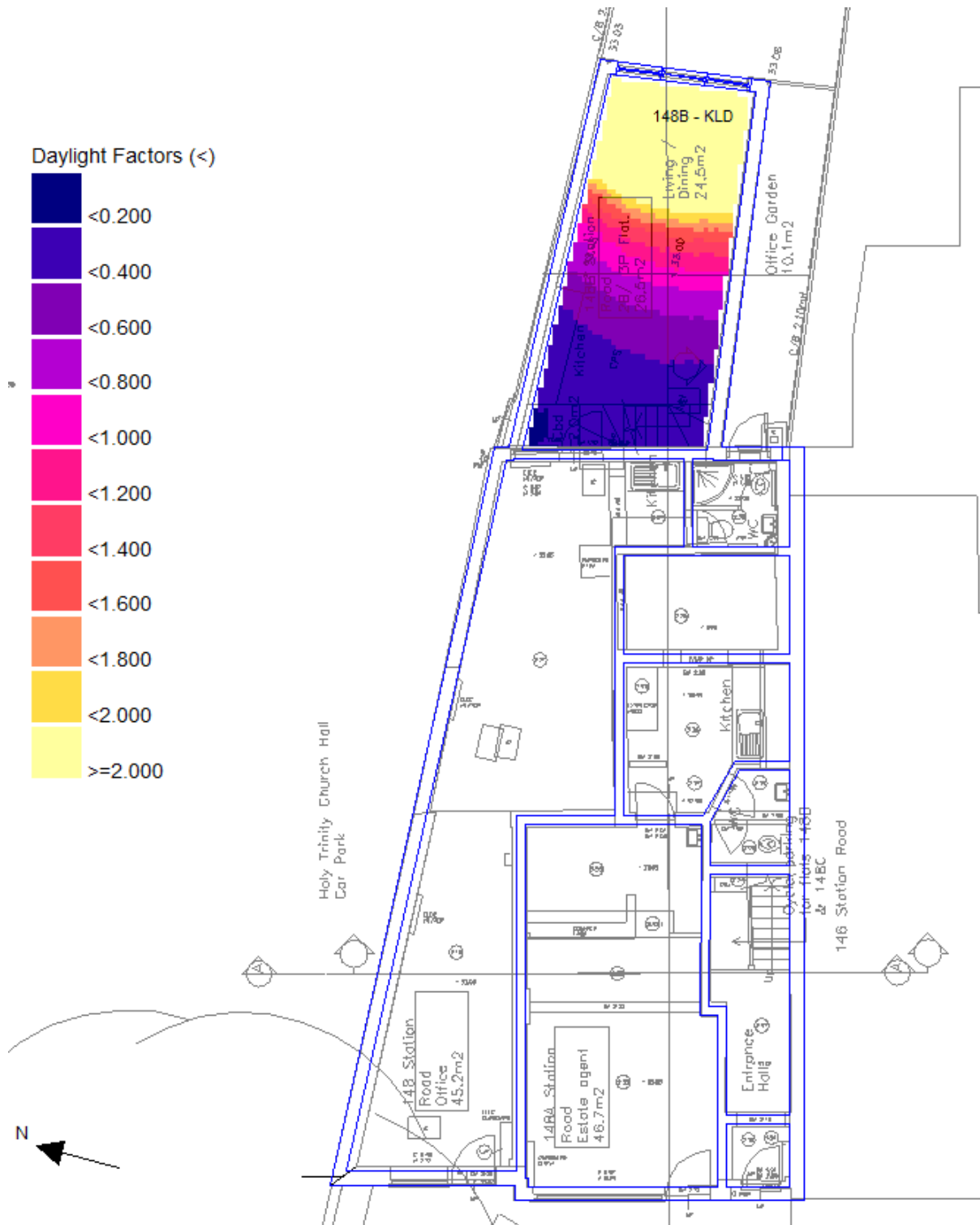
Appendix B - Window Reference Diagrams

142-146 Station Road – Window References

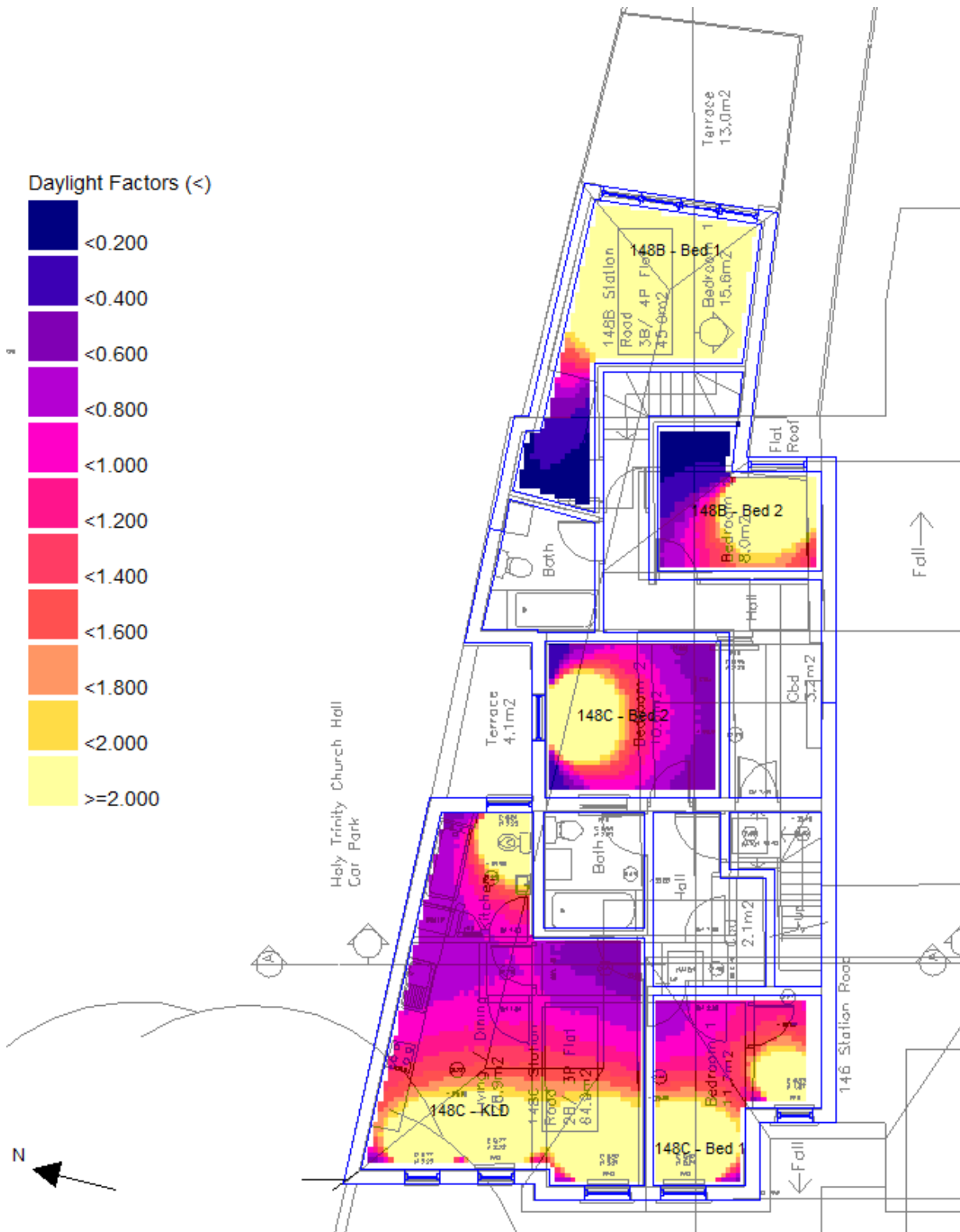


Appendix C - Average Daylight Factor Plots

Ground Floor

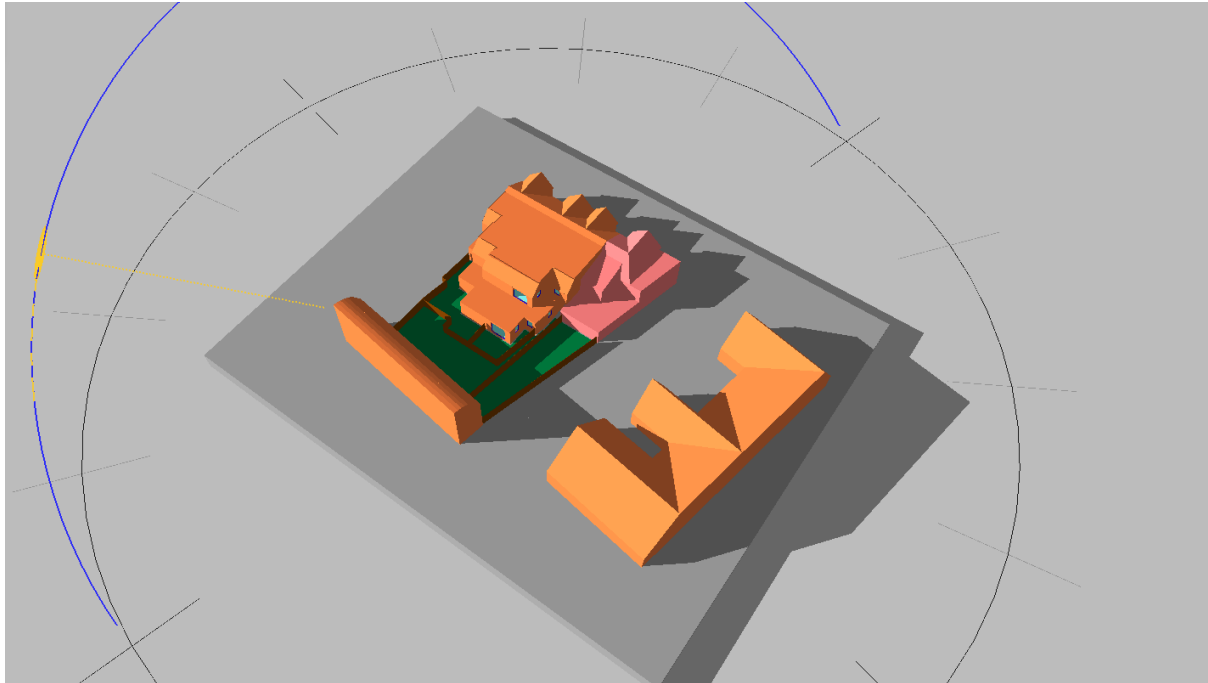


First Floor

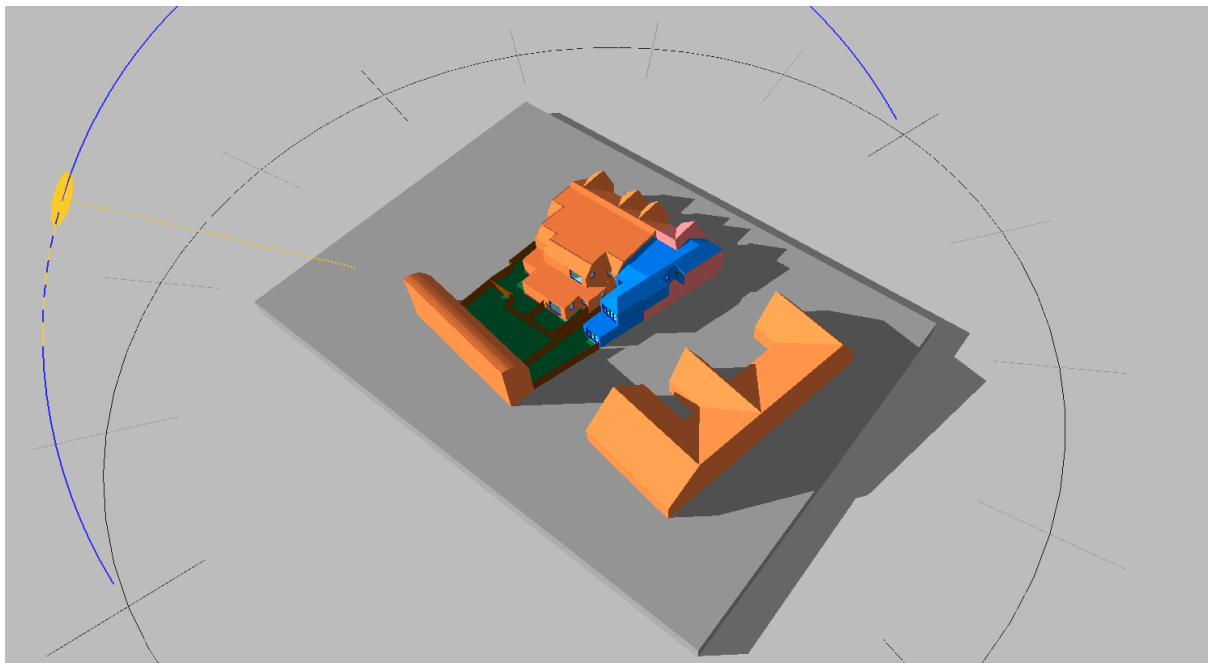


Appendix D - Overshadowing Assessment Shadow Castings

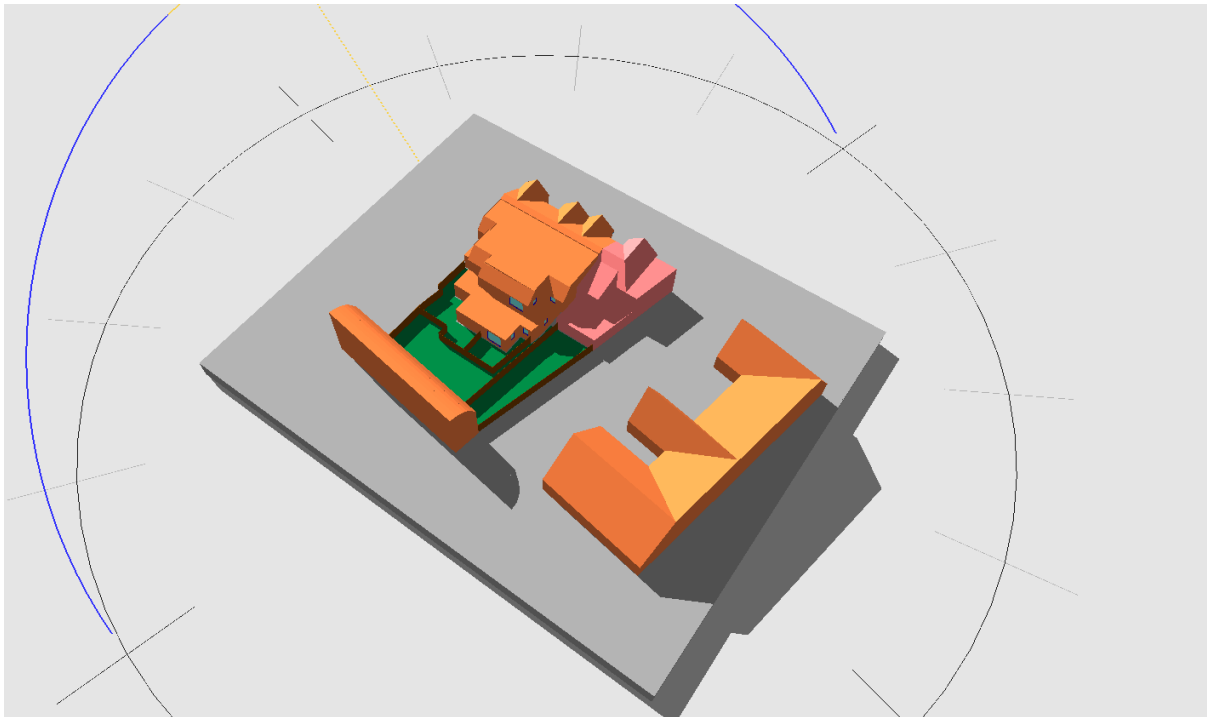
Existing Site - 09:00 March 21st



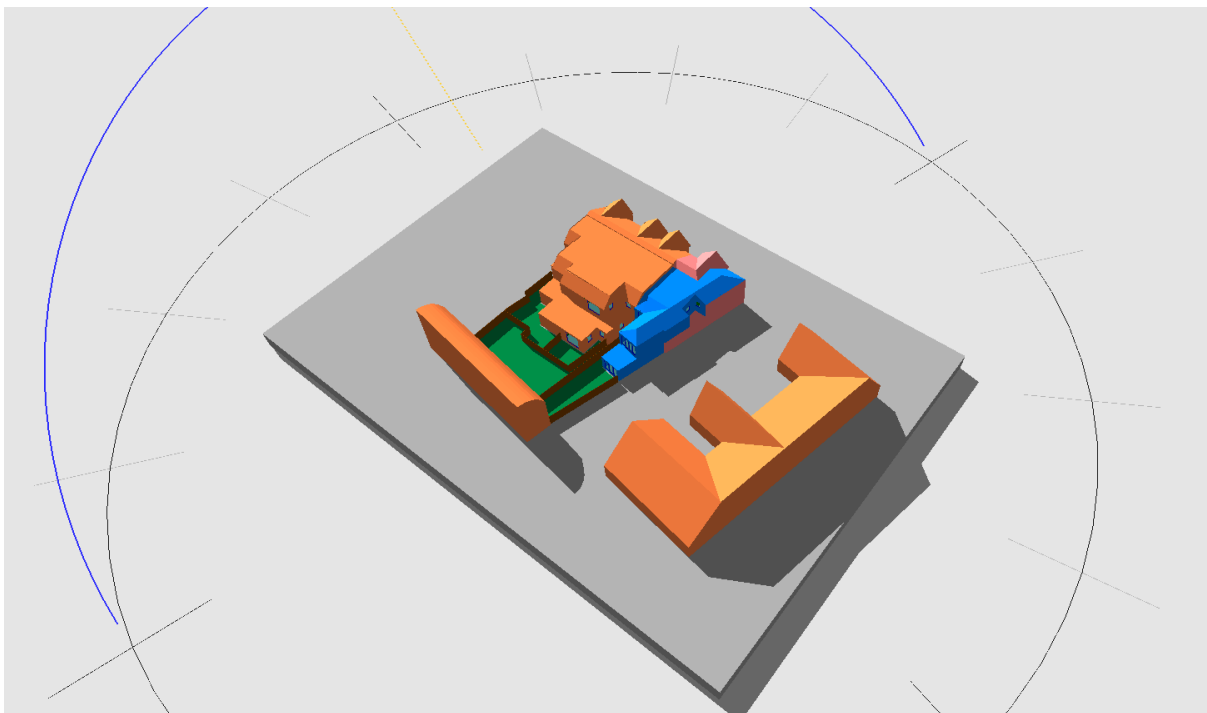
Proposed Site - 09:00 March 21st



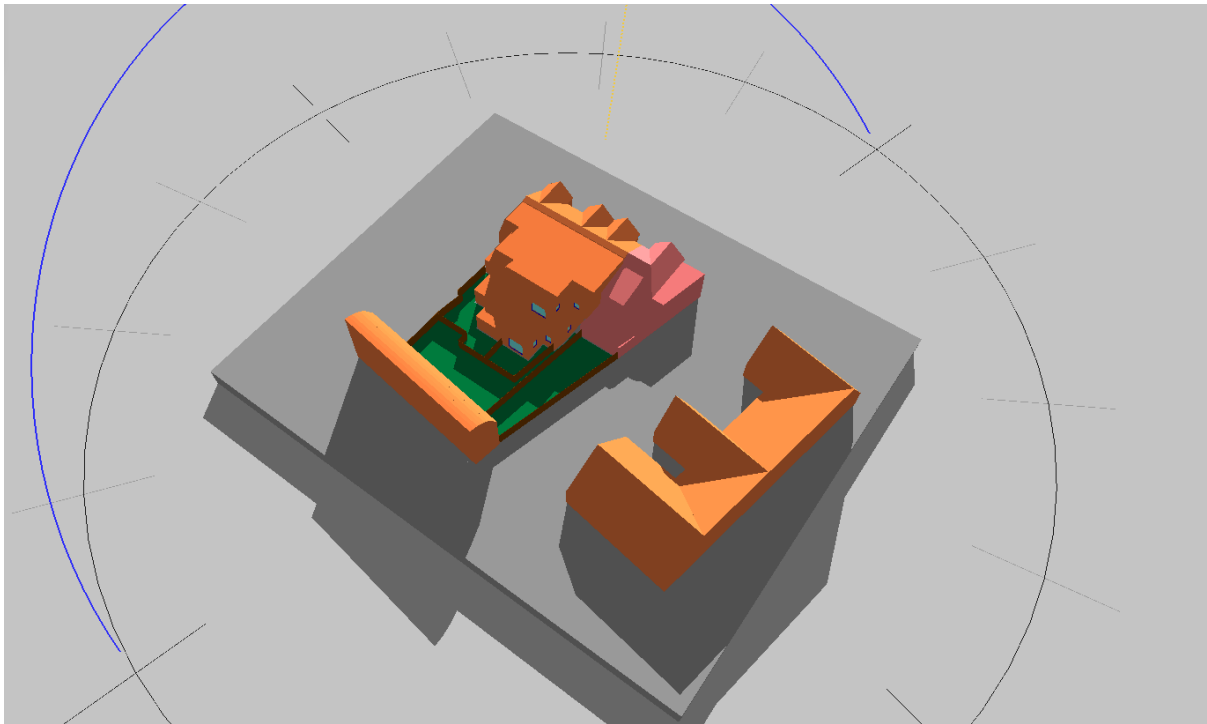
Existing Site - 12:00 March 21st



Proposed Site - 12:00 March 21st



Existing Site - 15:00 March 21st



Proposed Site - 15:00 March 21st

