ELMSTEAD ENERGY ASSESSMENTS AND BUILDING SERVICES

127 Ducks Hill Road, Northwood

Daylight, Sunlight, and Overshadowing Assessment for Surrounding Properties

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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 to the proposed extension at 127 Ducks Hill Road, Northwood. The properties investigated under this assessment were 125a Ducks Hill Road and 129 Ducks Hill Road. This report outlines the results of the assessment 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, internet and OS mapping sources, and publicly available planning records, 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 assessment.

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.

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

- Vertical Sky Component (VSC)
- Annual and Winter Probable Sunlight Hours
- Overshadowing Assessment

The VSC results for the surrounding windows show that they would all receive only a negligible impact as their VSC Values under the proposed scheme are above 0.8 times their former values, they would therefore all satisfy the BRE Guidelines with respect to daylight.

The sunlight results for the southerly facing windows show that they would only receive a negligible impact under the proposed scheme. This is because their annual and winter sunlight ratios are greater than 0.8, and under the proposed scheme they will all still meet the BRE target of 25% Annual and 5% Winter sunlight hours. Therefore, all of the surrounding windows would meet the BRE Guidelines regarding sunlight.

The overshadowing results show that the proposed extension at 127 Ducks Hill Road will have no impact on the amount of overshadowing experienced by the surrounding rear garden areas, the BRE Guidelines regarding overshadowing would therefore be satisfied.

For these reasons we feel that the proposed extension at 127 Ducks Hill Road should be considered as acceptable overall in regard to its neighbourly impact on daylight, sunlight, and overshadowing.

2.0 Introduction

EEABS (Elmstead Energy Assessments & Building Services) have been instructed to undertake a daylight, sunlight, and overshadowing assessment for the surrounding properties to the proposed extension at 127 Ducks Hill Road, Northwood.

The client wished to determine the effect that the proposed extension may have on the daylight and sunlight received by the surrounding windows, as well as the amount of overshadowing that could occur within surrounding amenity spaces.

Therefore, this report will investigate the changes in natural daylight and sunlight received between the existing and proposed plans.

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.
- To summarise and compare the findings against regulation guidelines for daylight and sunlight of neighbouring buildings, and the overshadowing of amenity spaces.

2.1 The Site and Development Proposal

The site is located at 127 Ducks Hill Road, Northwood and can be seen outlined in red on the Satellite Image below. The properties investigated under this assessment were:

- 125a Ducks Hill Road
- 129 Ducks Hill Road

These were chosen as they are the closest domestic properties that have windows that will face the proposed development and nearby garden amenity areas.

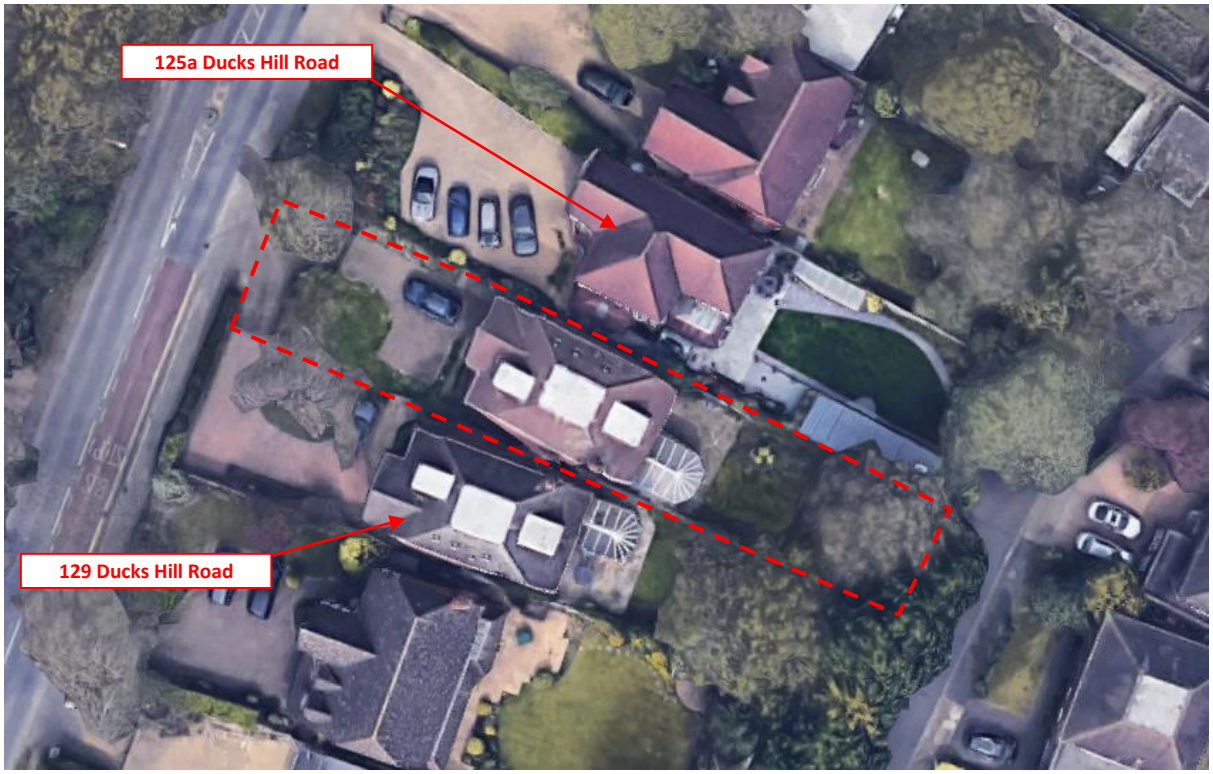


Figure 1 - Satellite Image of 127 Ducks Hill Road, Northwood

The proposal is for the removal of the existing ground floor conservatory and for the addition of a ground floor rear extension in its place.

Existing and proposed architectural floor plans and elevations can be seen in Figures 2 and 3 respectively.

This assessment has been based on the drawings and information provided to us by the client / architect, internet and OS mapping sources, and publicly available planning records. A drawing register can be found within Appendix A.

Figure 2 - Existing Architectural Floor Plans and Elevations

Figure 3 - Proposed Architectural Floor Plans and Elevations

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.

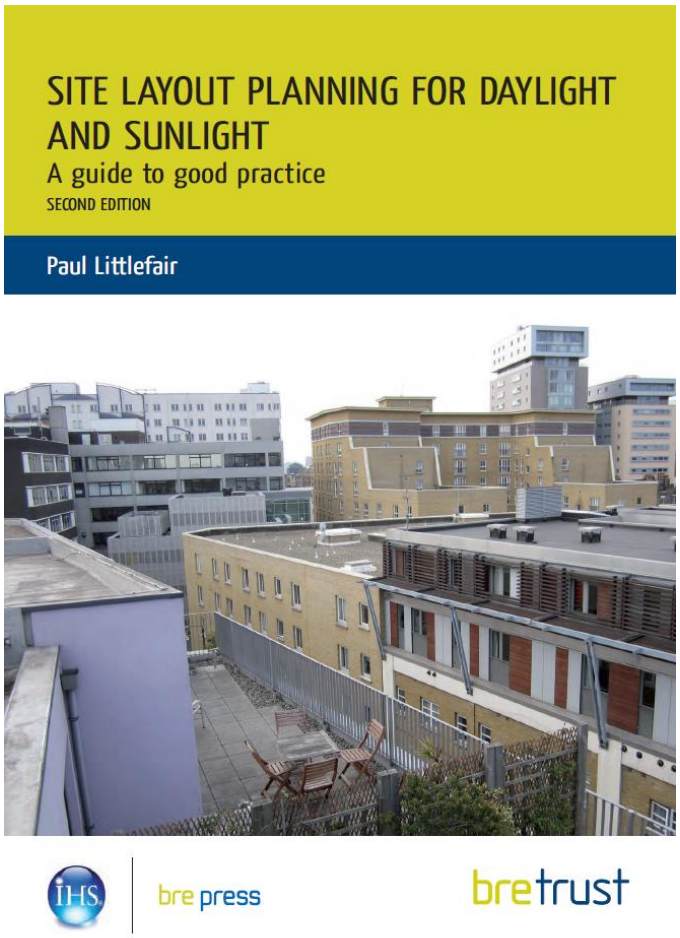


Figure 4 - BRE: Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice

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.	Negligible
Where the loss of skylight or sunlight is only just within the guidelines and a large number of windows or open spaces are affected. Where the loss of skylight or sunlight does not meet the guidelines but one or more of the following applies: • 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
Where the loss of skylight or sunlight does not meet the guidelines and one or more of the following applies: • 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

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.

A value greater than 0.8 times its former value will be determined to have a Negligible impact, values lower than this will be determined as either minor or major adverse dependent on the which factors apply as described in the table above.

The BRE Guide states that these guidelines "*are intended for rooms in adjoining properties where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.*"

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 of 127 Ducks Hill Road, Northwood.

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 times of its former value.

2.3.2 Sunlight

Annual and Winter 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 and 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 and conservatories 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 (the Equinox).

For the existing garden or amenity spaces being calculated due to a proposed development, the results should be no less than 0.8 times of 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 current CIBSE London TRY weather data was used.

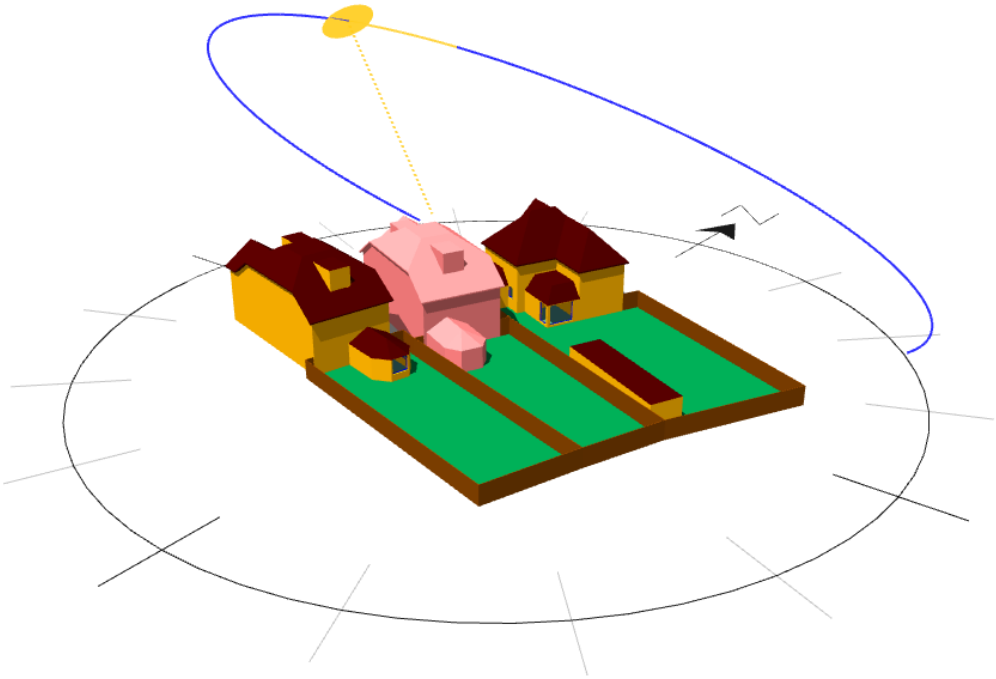


Figure 5 - EDSL TAS Computer Model of the Existing Site

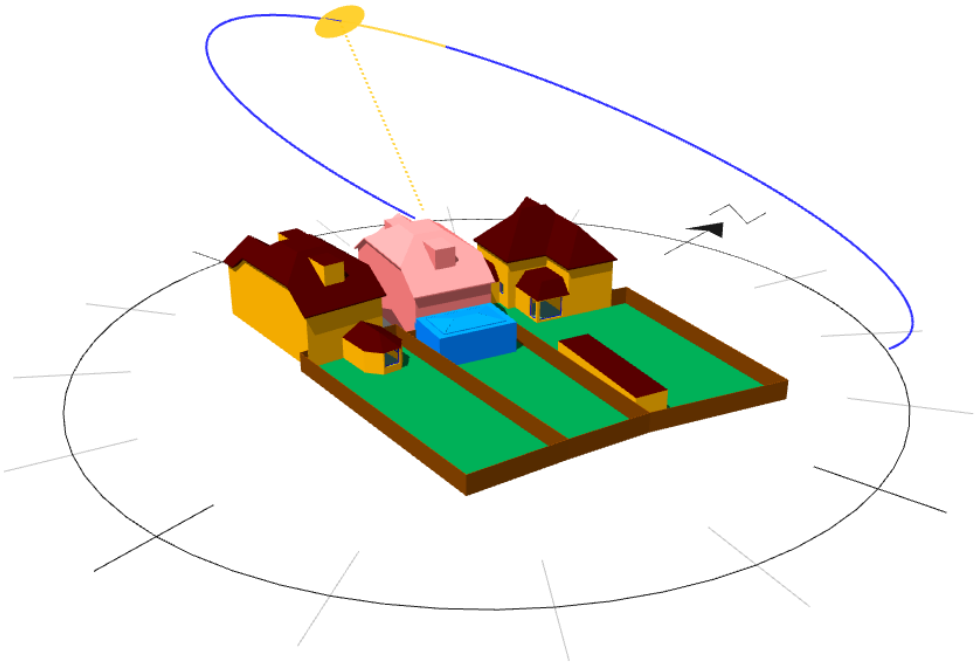


Figure 6 - EDSL TAS Computer Model of the Proposed Site

4.0 Daylight Assessment

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 Vertical Sky Component (VSC)

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

Property	Win Ref	Orientation (°)	VSC Existing (%)	VSC Proposed (%)	Ratio	Overall Impact
125a Ducks Hill Road	W1	204	9.90	9.62	0.97	Negligible
	W2	204	22.01	19.88	0.90	Negligible
	W3	114	37.48	36.99	0.99	Negligible
129 Ducks Hill Road	W1	14	15.24	12.30	0.81	Negligible
	W2	52	30.38	25.66	0.84	Negligible
	W3	104	37.86	37.28	0.98	Negligible

The VSC results for the surrounding windows show that they would all receive only a negligible impact as their VSC Values under the proposed scheme are above 0.8 times their former values, they would therefore all satisfy the BRE Guidelines with respect to daylight.

5.0 Sunlight Assessment

5.1 Annual and Winter Probable Sunlight Hours

Only living room and conservatory 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°).

The orientation of each of the windows can be seen within the VSC results. All southerly facing windows have been assessed to provide a comprehensive assessment.

Property	Win Ref	APSH Ext (%)	APSH Pro (%)	Ratio	Overall Impact	WPSH Ext (%)	WPSH Pro (%)	Ratio	Overall Impact
125a Ducks Hill Road	W1	27	26	0.96	Negligible	9	8	0.89	Negligible
	W2	50	47	0.94	Negligible	20	17	0.85	Negligible
	W3	65	64	0.98	Negligible	23	22	0.96	Negligible
129 Ducks Hill Road	W3	61	61	1.00	Negligible	22	22	1.00	Negligible

The sunlight results for the southerly facing windows show that they would only receive a negligible impact under the proposed scheme. This is because their annual and winter sunlight ratios are greater than 0.8, and under the proposed scheme they will all still meet the BRE target of 25% Annual and 5% Winter sunlight hours. Therefore, all of the surrounding windows would meet the BRE Guidelines regarding sunlight.

6.0 Overshadowing Assessment

The garden amenity areas of the surrounding properties that are close to the proposed development have also had their levels of overshadowing assessed. The lit area is the area of the zone that receives at least 2 hours of sunlight on the 21st of March.

Amenity Space	Area (m^2)	Lit Area - Existing (m^2)	Lit Area - Proposed (m^2)	Ratio	Overall Impact
125a Ducks Hill Road – Rear Garden	298.79	256.68	256.68	1.00	Negligible
129 Ducks Hill Road – Rear Garden	223.57	190.15	190.15	1.00	Negligible

The overshadowing results show that the proposed extension at 127 Ducks Hill Road will have no impact on the amount of overshadowing experienced by the surrounding rear garden areas, the BRE Guidelines regarding overshadowing would therefore be satisfied.

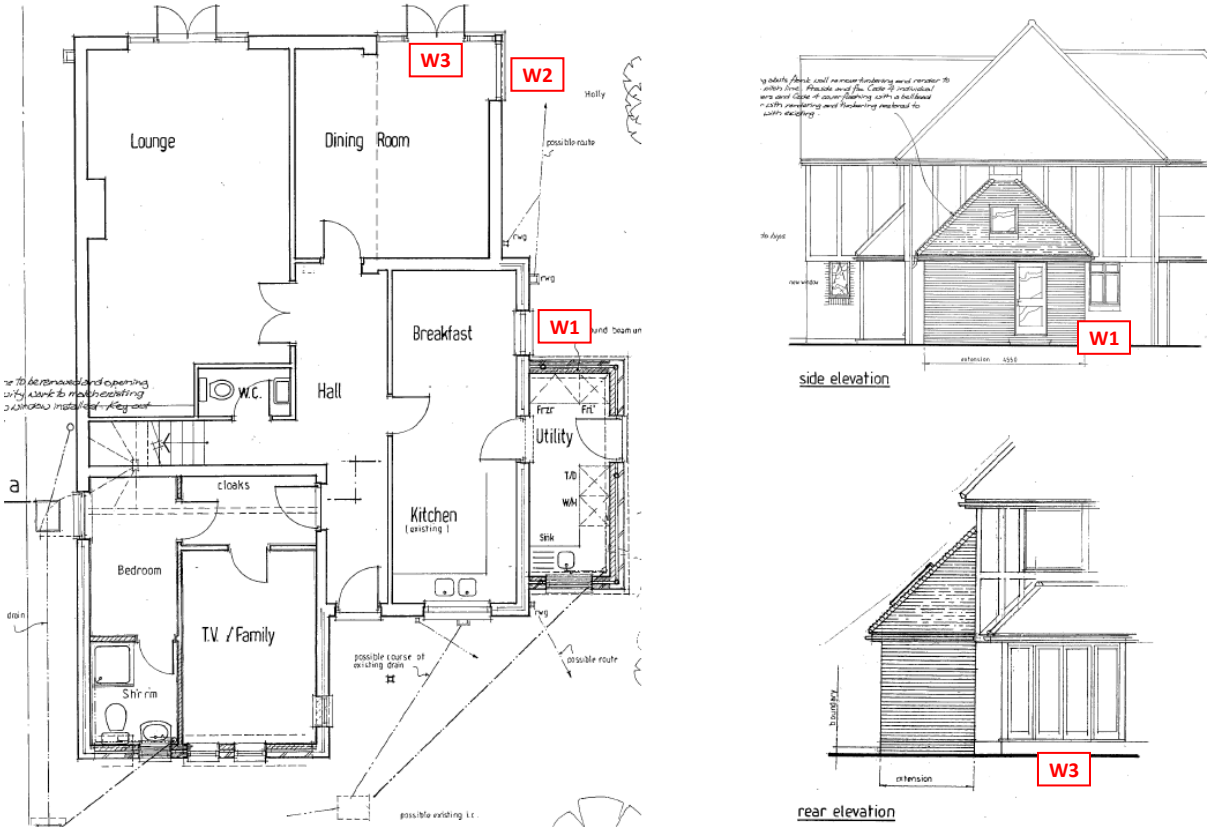
Shadow cast images for the existing and proposed schemes for various times in the day on the Spring Equinox, March 21st, can be found within Appendix C.

Appendix A - Drawing Register

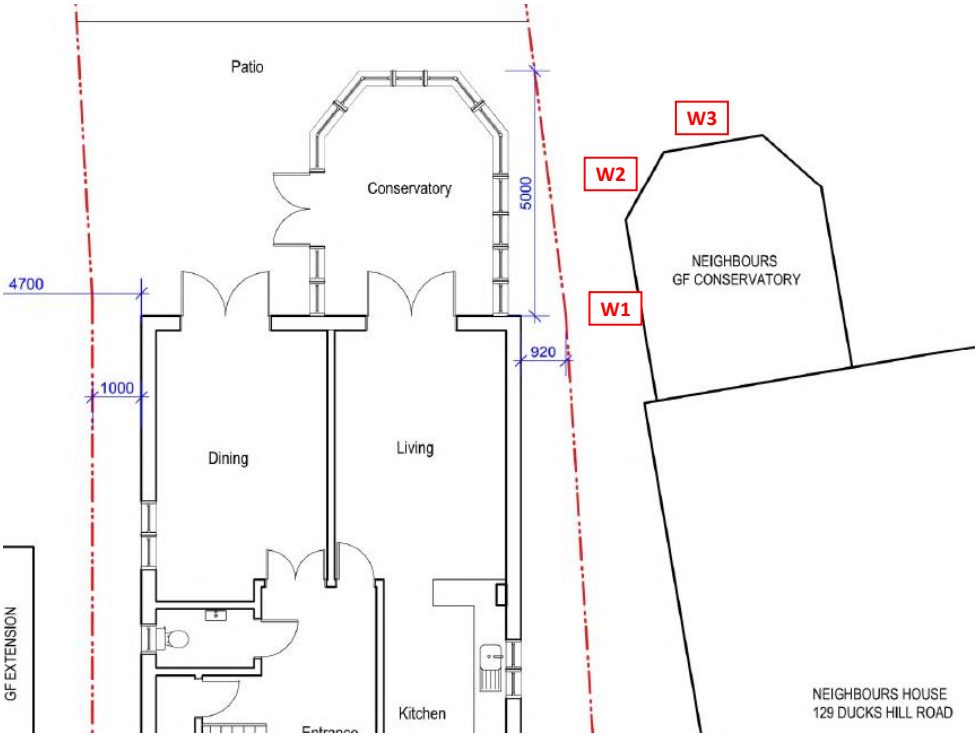
Drawing Number	Drawing Title/Information Received
01	Location Plan
02	Aerial Photos
03	Existing Ground Floor Plan
04	Existing Roof Plan
05	Existing Elevations – Front and Rear
06	Existing Elevations – Sides
07	Existing 3D View
08	Site Photos
09	Site Photos
10	Site Photos
11	Proposed Ground Floor Plan
12	Proposed Roof Plan
13	Proposed Elevations – Front and Rear
14	Proposed Elevations – Sides
15	Proposed 3D View
-	Planning Record Drawings for 125a Ducks Hill Road

Appendix B - Window Reference Diagrams

125a Ducks Hill Road - Window References

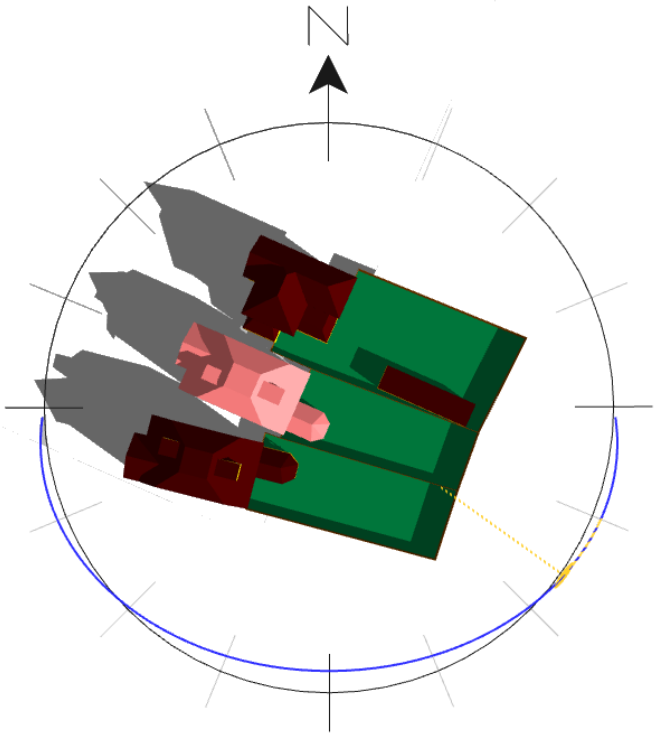


129 Ducks Hill Road - Window References

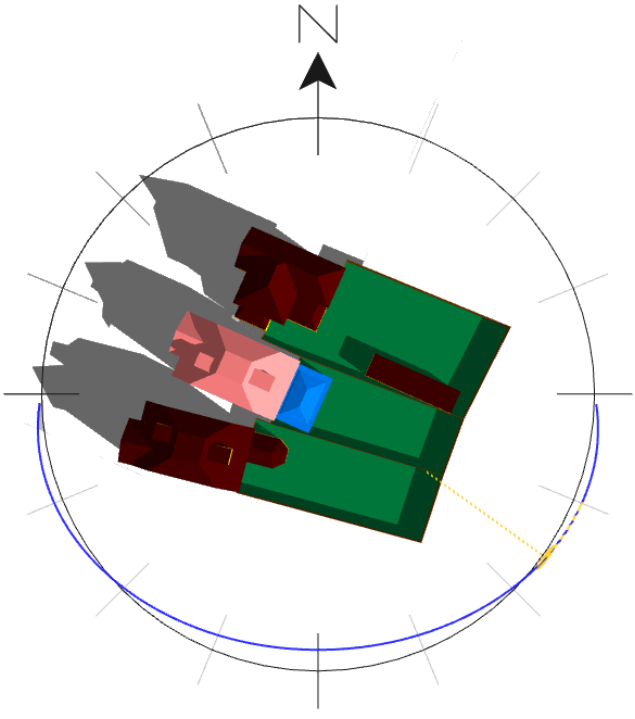


Appendix C - Overshadowing Assessment Shadow Castings

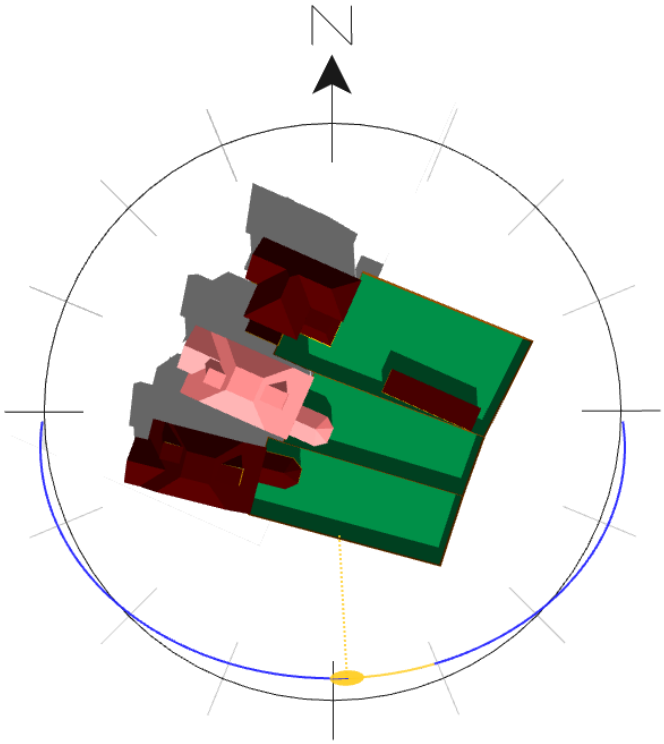
Existing Site - 09:00 March 21st



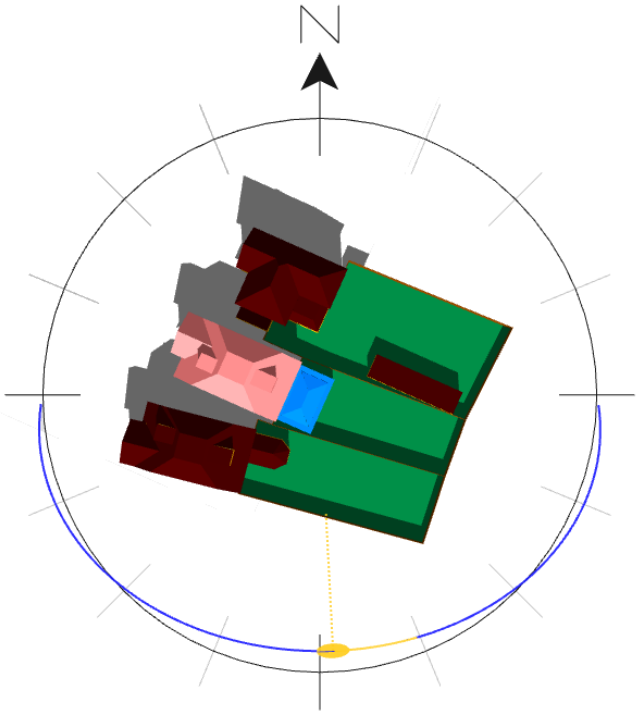
Proposed Site - 09:00 March 21st



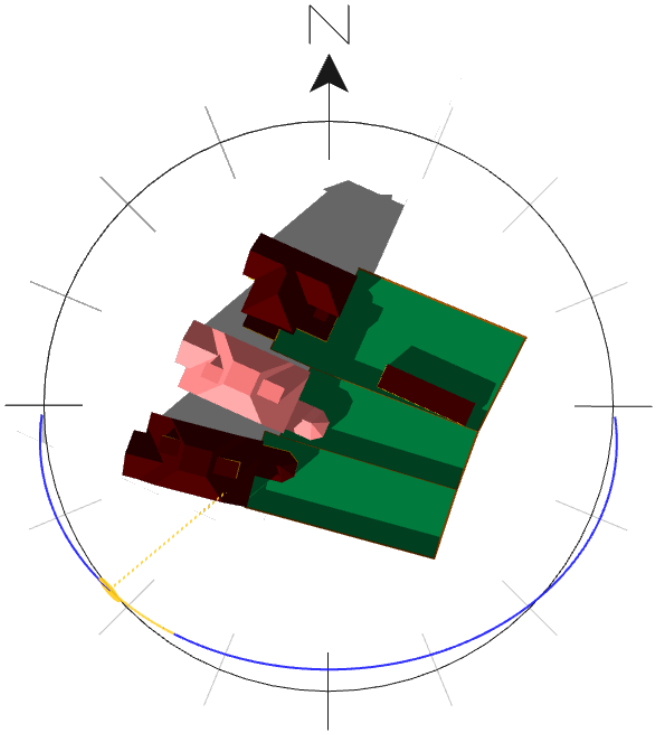
Existing Site - 12:00 March 21st



Proposed Site - 12:00 March 21st



Existing Site - 15:00 March 21st



Proposed Site - 15:00 March 21st