create
CONSULTING
ENGINEERS LTD

1 ALPHA ROAD, HILLINGDON – Assessment of daylight/sunlight availability for existing ground floor property at 32 Pole Hill Road, Hillingdon, after amendments to proposed development

1 ALPHA ROAD, HILLINGDON, UB10 0QA

Assessment of daylight/sunlight availability for existing ground floor property at 32 Pole Hill Road, Hillingdon, after amendments to proposed development

Engineer: Create Consulting Engineers Limited
15 Princes Street
Norwich
Norfolk
NR3 1AF

Tel: 01603 877010
Email: enquiries@createconsultingengineers.co.uk
Web: www.createconsultingengineers.co.uk

Report By: Sarah Leggo, BEng (Hons) LCEA

Checked By: Deborah Elliot BSc (Hons)

Reference: SL/CS/P16-1140/03

Date: July 2017

1 ALPHA ROAD, HILLINGDON – Assessment of daylight/sunlight availability for existing ground floor property at 32 Pole Hill Road, Hillingdon, after amendments to proposed development

1 ALPHA ROAD, HILLINGDON

Assessment of daylight/sunlight availability for existing ground floor property at 32 Pole Hill Road, Hillingdon, after amendments to proposed development

Contents

1.0 Introduction
2.0 Calculation Methodology
3.0 Average Daylight Factor
4.0 Sunlight Analysis
5.0 Conclusion
6.0 Disclaimer

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By

EXECUTIVE SUMMARY

This report has been commissioned in order to accompany the formal planning application for 1 Alpha Road, Hillingdon. The report will demonstrate:

1. The proposed development at 1 Alpha Road will not significantly affect the daylight or sunlight access of the neighbouring property at 32 Pole Hill Road.

2. The Council's 45 degree principle as described in paragraph 4.11 of the HDAS SPD has been applied to the latest design of the proposed development with the results showing adequate daylight and sunlight will continue to be enjoyed by the existing property at 32 Pole Hill Road.

3. Through detailed calculations based upon the guidance and methodologies detailed in the 2011 Building Research Establishment's (BRE) Publication 'Site Layout Planning for Daylight and Sunlight', an adequate provision of daylight and sunlight access will continue to be available for the occupants of the ground floor property at 32 Pole Hill Road.

A higher level of accuracy using calculations to produce Average Daylight Factors, Annual Probable Sunlight Hours and hour-by-hour images for overshadowing has been undertaken using TAS (Thermal Analysis Software, EDSL) in order to predict the amount of daylight and sunlight that the ground floor property at 32 Pole Hill Road receives. These more detailed daylight and sunlight calculations have been produced due to amendments to the proposed development as the previous application raised concerns in terms of the impact that the erection would have on the light and outlook to the ground floor windows serving the lounge and dining area of 32 Pole Hill Road.

The proposed building has:

1. Been shifted away from the boundary in order to be within the Council's 45 degree principle.

2. A revised roof that has been hipped away from the boundary in order to reduce the overall bulk of the building.

The calculations are based on CAD and pdf drawings of the proposed development and neighbouring buildings received from the Client. These include floor plans and elevations.

EDSL TAS Version 9.4.1 software is fully accredited to produce daylight and sunlight assessments.

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd has been commissioned by the Client to undertake a further Daylight/Sunlight assessment to accompany the planning application for the proposed development at 1 Alpha Road, Hillingdon, UB10 0QA.

1.2 This amended report assesses the daylight and sunlight availability for the existing ground floor property at 32 Pole Hill Road after amendments to the proposed development.

1.3 In particular, it addresses issues raised in the pre-application advice offered by the London Borough of Hillingdon Planning Applications Team on policy BE20 'Daylight and sunlight considerations'.

1.4 The Council's 45 degree principle as described in paragraph 4.11 of the HDAS SPD has been applied to the latest design of the proposed development with the results showing adequate daylight and sunlight will continue to be enjoyed by the existing property at 32 Pole Hill Road.

1.5 Additional, more detailed calculations based upon the guidance and methodologies detailed in the 2011 Building Research Establishment's (BRE) Publication 'Site Layout Planning for Daylight and Sunlight' show adequate provision of daylight and sunlight access will continue to be available for the occupants of the ground floor property at 32 Pole Hill Road.

1.6 For the purpose of this report the above 2011 (BRE) publication 'Site Layout Planning for Daylight and Sunlight' will now be referred to as the BRE Guide.

Amendments to Proposed Development

1.7 The proposed building will continue to accommodate four two bedroom flats with car parking at the front and amenity area at the rear.

1.8 The amendments to the original design include shifting the proposed building away from the boundary shared with 32 Pole Hill Road. The front corner of the amended design stands 1.193m away from the shared boundary whilst the existing buildings front corner is currently 0.459m away from the boundary. See image below.

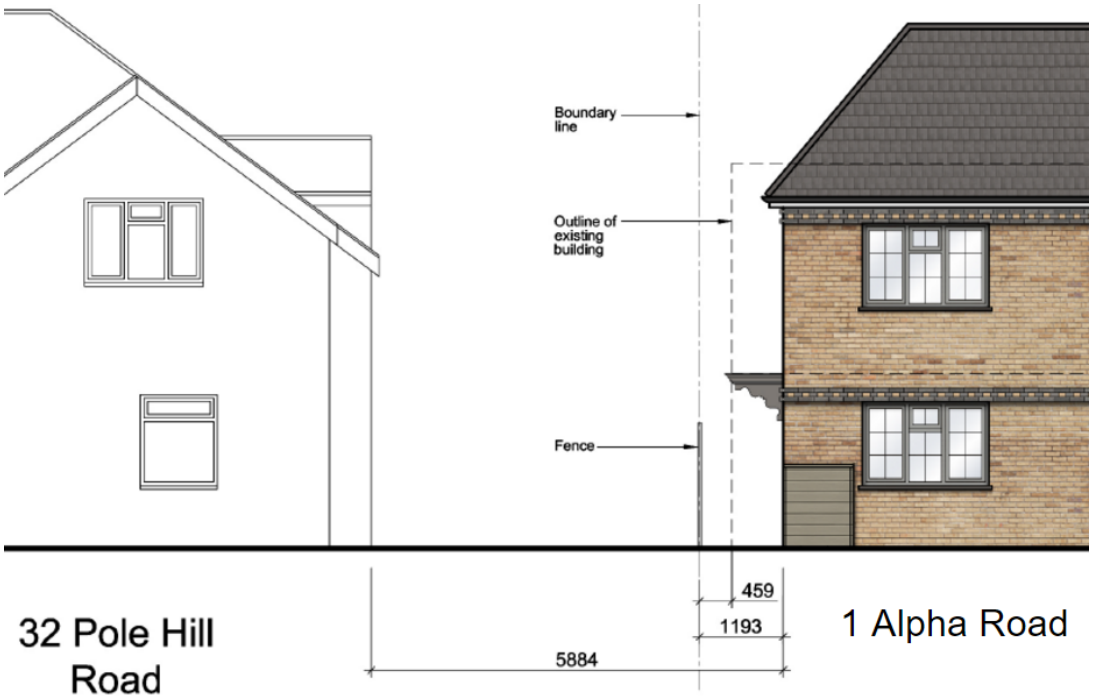


Image 1.1: Shows the distances from the boundary for the existing and proposed building. It also outlines the profile of the existing building.

1.9 The roof of the proposed property has been amended with the roof being hipped away from the boundary with 32 Pole Hill Road.

1.10 Both of these features will reduce the overall bulk of the building and allow more daylight and sunlight to penetrate the amenity of the ground floor property at 32 Pole Hill Road.

Policy Context

1.11 Hillingdon Design and Accessibility Statement – Supplementary Planning Document – specifies that the Council's 45 degree principle will be applied and is designed to ensure that adequate daylight and sunlight is continued to be enjoyed in the existing buildings.

1.12 Recommendations on the amount of light, both daylight and sunlight to a new development is given in the BRE Guide. This guide is widely used by authorities to help determine planning applications. This assessment has been carried out with reference to the second edition of the report, which was published in October 2011.

2.0 CALCULATION METHODOLOGY

2.1 The assessment and methods used to determine daylight access have been based upon geometric information supplied by the client.

Limitations and Assumptions

2.2 The following assumptions and limitations have been made within this assessment.

- In accordance with guidance provided by the BRE Guide, the effect of trees and plant life on daylight and sunlight access has not been included within this study.
- Window positions for surrounding properties have been based upon CAD and pdf drawings supplied by the client.

45 Degree Principle

2.3 Paragraph 4.11 of the HDAS SPD specifies that the Council's 45 degree principle be applied to ensure that adequate daylight and sunlight is enjoyed in new and existing dwellings. The principle involves drawing a line from the mid-point of an existing/new window that is potentially affected by a new dwelling at an angle of 45 degrees towards the new building. If the proposed building breaches that line, it is unlikely to be acceptable.

BRE Guide

2.4 The BRE Guide suggests measures for determining the impact of new developments upon the daylight and sunlight availability to existing properties. The following measures have been used in this report:

Average Daylight Factor (ADF)

2.5 The average level of daylight available to a given space is expressed as the Average Daylight Factor (ADF). The ADF is the most accurate test available to calculate the amount of daylight that will be received in an internal space.

2.6 The daylight factor for a space (or room) is the ratio between the internal and external luminance of a space. It is expressed as a percentage. As the amount of natural light will vary in any one space depending on the time of day and year, it is impossible to set one standard level of illuminance for any given space. As the daylight factors are expressed as ratios this is not an issue and so they can be used irrespective of the actual availability of natural light at any one time.

2.7 Average Daylight Factor (ADF) values have been determined using the daylight component of TAS v9.4.1. TAS has different levels of accuracy in the software. Reflective convergence for daylight factors has been used to produce the results with a high level of accuracy.

Annual Probable Sunlight Hours

2.8 The BRE Guide recommends that loss of sunlight should be checked for main living spaces of dwellings, and conservatories, if they have windows facing within 90° of due south.

2.9 According to the BRE Guide, if the centre of the window can receive more than one quarter of annual probable sunlight hours (APSH), including at least 5% of APSH in the winter months (between 21 September and 21 March), then the room should still receive enough sunlight. If the window already receives less than this, a reduction in lighting to both, less than 0.8 times its current value, and, more than 4% of annual probable sunlight hours over the year, may lead the room it serves to "appear colder and less cheerful and pleasant."

Overshadowing Impact on Garden

2.10 The overshadowing impact has been determined using a 3D computer simulation of the proposed development. As a check, the BRE Guide recommends that at least half of the garden area should receive at least two hours of sunlight on the 21 March. If an existing garden is already heavily obstructed then any further loss of sunlight should be kept to a minimum. If the proposed development reduces the amount of sunlight to less than 0.8 times its former amount the garden will tend to look more heavily overshadowed.

3.0 45 DEGREE PRINCIPLE

3.1 The Council's 45 degree principle has been applied to the amended design. By shifting the proposed development away from the boundary with 32 Pole Hill Road the development now complies with the 45 degree principle. The image below shows the angles from both ground floor windows to both corners of the proposed development.

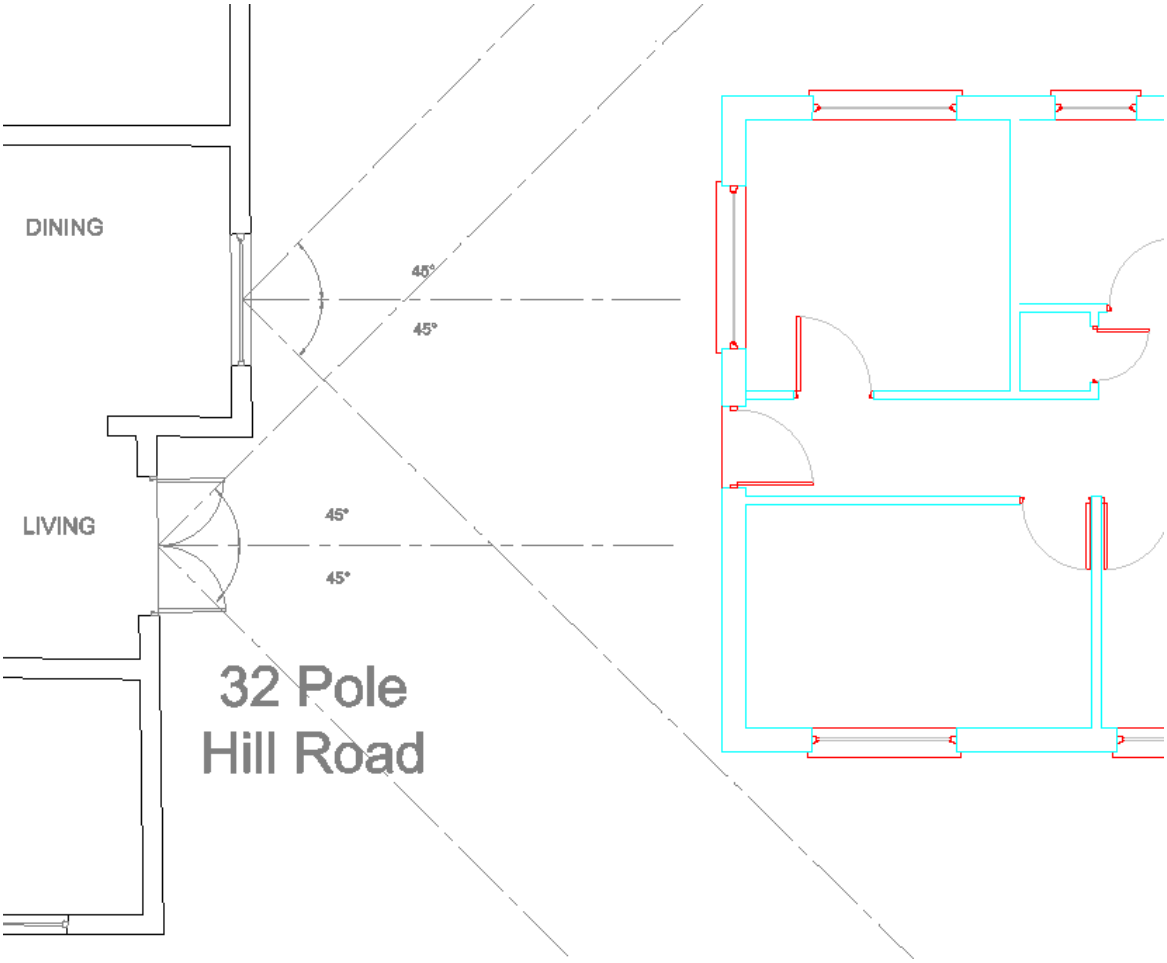


Image 3.1: 45 Degree Principle showing that the amended development does not breach the line created by the 45 degree angle.

4.0 AVERAGE DAYLIGHT FACTOR

4.1 The daylight factor is measured using the CIE standard overcast sky and as such only the indirect sky light component (not direct sunlight) is assessed. This is essentially the worst-case scenario for assessing daylight availability. As a ratio, daylight factors are expressed as percentages.

4.2 The BRE Guide recommends average daylight factors for each defined living space as detailed in Table 4.1 below.

Room Type	Recommended Daylight Factor
Bedroom	1%
Living Room	1.5%
Kitchen	2%

Table 4.1: Recommended ADF levels

4.3 Table 4.2 shows the results of the ADF calculations for the rear of 32 Pole Hill Road.

Name of space	Location	Existing Daylight Factor (%)	Proposed Daylight Factor (%)
Dining area	GF Rear	1.966	1.524
Living area	GF Rear	2.063	1.696

Table 4.2: Summary of Existing and Proposed ADF Values

4.4 The calculations show that the lounge area has an ADF result of 1.696% after the proposed development which is over the recommended level of 1.5%. The dining area has an ADF of 1.524% after the proposed development is in place which is also over the recommended level for living areas. The loss of light to these areas has been kept to a minimum and is therefore compliant with the recommendations of the BRE Guide.

5.0 SUNLIGHT ANALYSIS

5.1 Sunlight is direct light from the sun as opposed to diffused light or daylight.

Window Sunlight

5.2 The BRE Guide states that if the centre of the window can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March, then the room should still receive enough sunlight. If the window already receives less than this, a reduction in sunlight to both, less than 0.8 times its current value (annual and winter) and, more than 4% of annual probable sunlight hours over the year may lead to the room it serves appearing colder and less cheerful and pleasant.

5.3 Software has been used to calculate the annual probable sunlight hours (APSH) for the ground floor rear windows of living spaces at 32 Pole Hill Road as it exists; for the previous proposed; and again after the amendments to the proposed development.

5.4 Due to the orientation of the buildings, the rear of 32 Pole Hill Road enjoys plenty of sunshine hours throughout the year on its windows and external space.

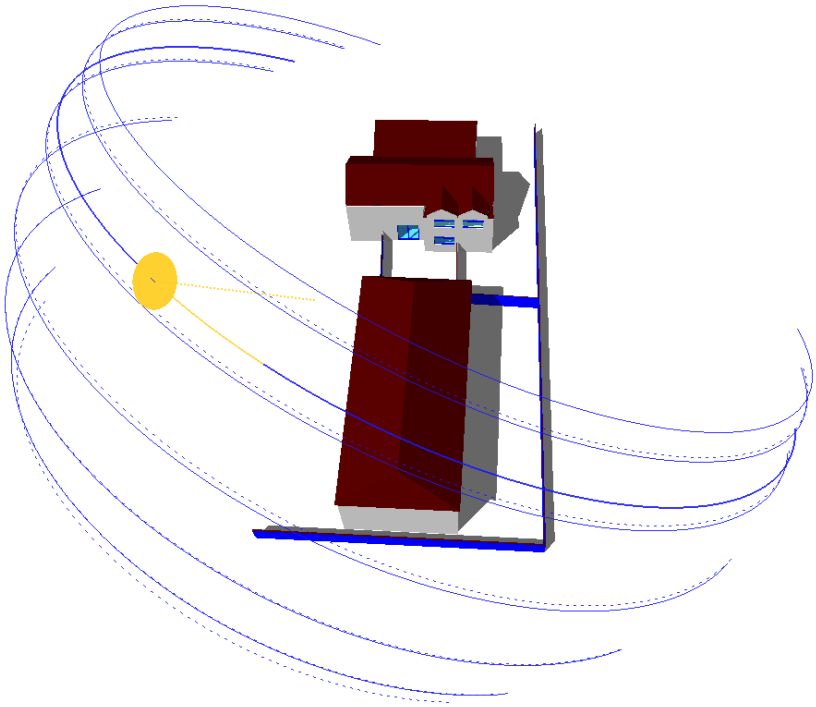


Image 5.1: Sun arcs displayed for 13:00 hours on March 21 with the proposed development in place

5.5 Table 5.1 below shows the results from the sun path calculations for APSH values (annual sunlight hours and winter sunlight hours) for rear windows which serve the lounge and dining room on the ground floor of 32 Pole Hill Road.

Annual Probable Sunlight Hours								
	Annual Sunlight Hours				Winter Sunlight Hours			
GF Pole Hill Road	**Existing %**	*Original Proposed*	**Amended Proposed %**	**Ratio Prop/ Existing**	**Existing %**	*Original Proposed*	**Proposed %**	**Ratio Prop/ Existing**
Dining	**52.68**	*43.15*	**48.15**	**0.91**	**16.91**	*12.75*	**13.75**	**0.81**
Lounge	**50.19**	42.22	**48.14**	**0.96**	**17.68**	*16.74*	**17.24**	**0.98**

Table 5.1: Percentage of Probable Solar Hours on lounge and dining room windows, GF Property, 32 Pole Hill Road

5.6 The results show that the amount of sunlight which the ground floor windows of 32 Pole Hill Road receive has been improved on by the amended design. The loss of sunlight has been kept to a minimum. The results meet BRE guidelines for sunlight provision by having a value of annual probable sunlight hours with the proposed building in place of greater than 25% annual sunlight, including more than 5% in the winter months. Sunlight continues to be enjoyed throughout the year.

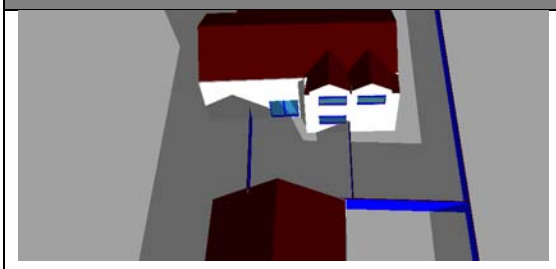
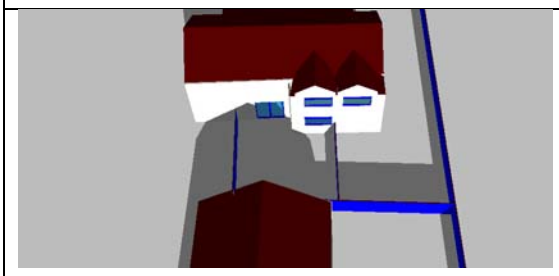
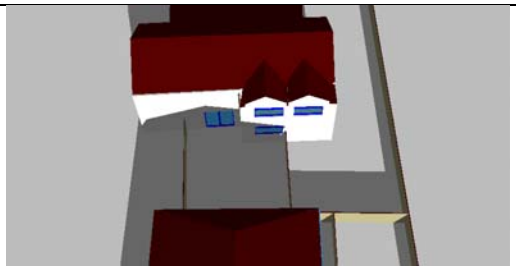
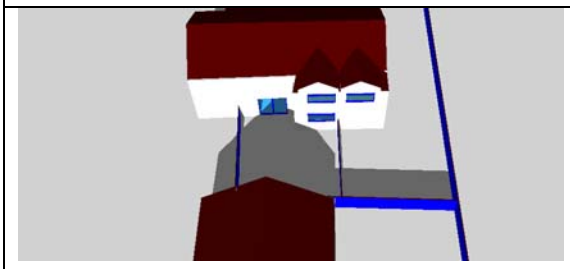
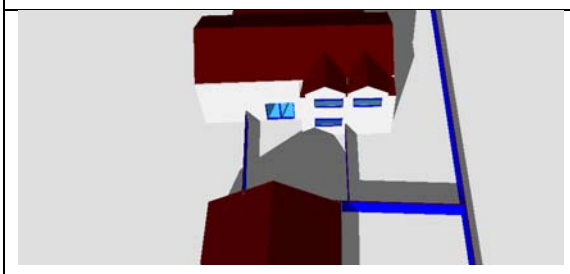
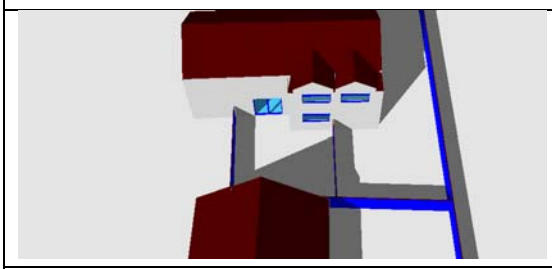
Overshadowing of Garden

5.7 The impact on sunlight availability to the outdoor areas has been assessed against the BRE Guide.

5.8 The BRE Guide recommends that in order for a garden or amenity area to appear to be adequately sunlit throughout the year at least half of the area receives at least 2 hours of direct sunlight on the 21 March, the spring equinox. The 21 March is used as this represents the average case for direct solar exposure.

5.9 To allow the overshadowing impact of the proposed building to be evaluated, hourly images have been produced between 8:00 – 17:00 on March 21 for the existing and proposed development. Due to the orientation of 32 Pole Hill Road the external area is in full self-shadow from 17:00.

5.10 Image 5.2 below shows the shadowing of the external area of 32 Pole Hill Road for both existing and proposed.

EXISTING	PROPOSED
	
8:00	**8:00**
	
9:00	**9:00**
	
10:00	**10:00**
	
11:00	**11:00**
	
12:00	**12:00**

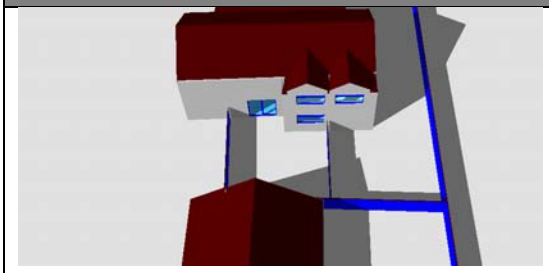
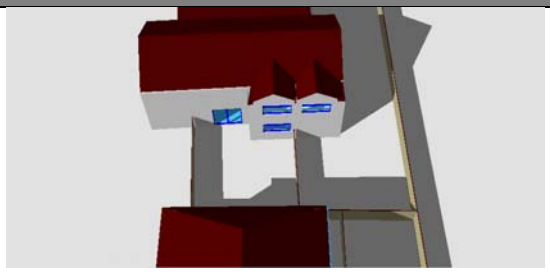
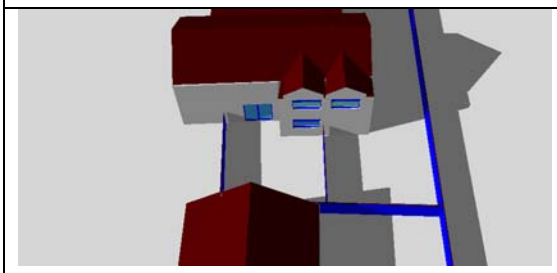
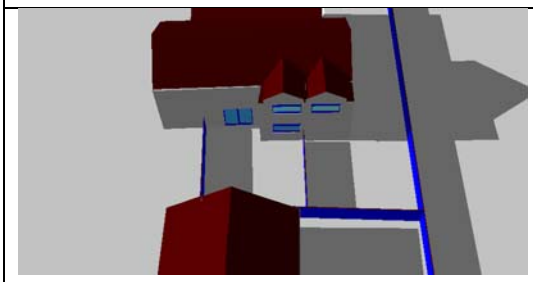
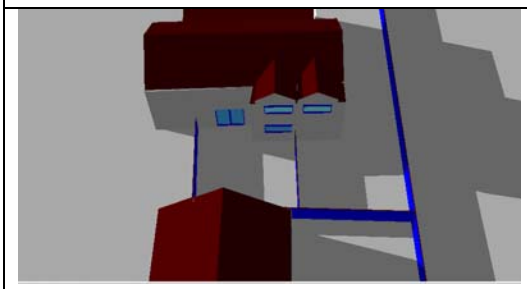
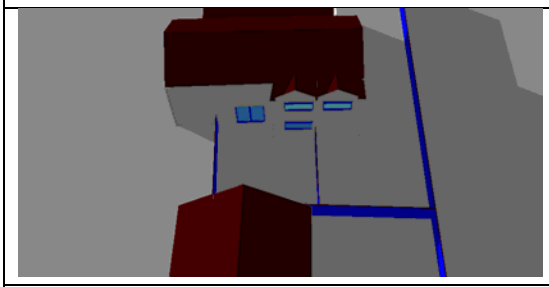
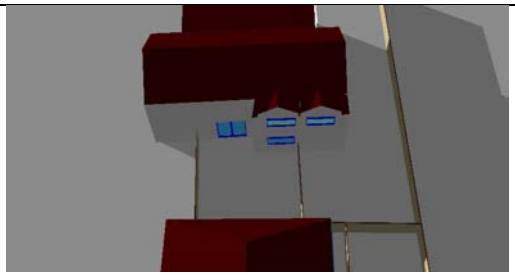
EXISTING	PROPOSED
	
13:00	**13:00**
	
14:00	**14:00**
	
15:00	**15:00**
	
16:00	**16:00**
	
17:00	**17:00**

Image 5.2: Solar exposure on external area of 32 Pole Hill Road both existing and proposed development

5.11 The external area for the ground floor property at 32 Pole Hill Road has been analysed. The hourly images show that the external area will receive at least two hours of sunlight exposure to at least half of the area on 21 March which conforms to BRE recommendations.

5.12 The proposed development does create some further shading to the garden space, this is mainly limited to between 8:00 and 10:00 in the morning. The garden continues to receive good levels of sunlight through the afternoon.

5.13 Due to the orientation of the buildings, the rear of 32 Pole Hill Road enjoys plenty of sunshine hours throughout the year on its windows and external space both annually and during the winter months.

6.0 CONCLUSION

6.1 This assessment examines in greater detail the impact on daylight and sunlight levels, that the amended proposed development has on the ground floor accommodation of 32 Pole Hill Road.

6.2 The internal daylight and sunlight levels have been calculated for the windows which serve the lounge and dining room belonging to the ground floor property of 32 Pole Hill Road in accordance with the guidance stipulated in the BRE Guide.

6.3 A detailed daylight factor analysis has been performed for the lounge and dining room of 32 Pole Hill Road. The BRE Guide recommends average daylight factors for living rooms be 1.5%.

6.4 The calculations show that the lounge area has an ADF result of 1.696% after the proposed development which is over the recommended level of 1.5%. The dining area has an ADF of 1.524% after the proposed development is in place which is also over the recommended level for living areas. The loss of light to these areas has been kept to a minimum and is therefore compliant with the recommendations of the BRE Guide.

6.5 Direct sunlight access to the windows has been assessed. The results show that both windows analysed meet BRE guidelines for sunlight provision by having a value of annual probable sunlight hours of greater than 25%, including more than 5% in the winter months.

6.6 The external area for the ground floor property at 32 Pole Hill Road has been analysed. The hourly images show that the external area will receive at least two hours of sunlight exposure to at least half of the area on 21 March which conforms to BRE recommendations.

6.7 The proposed development does create some further shading to the garden space, this is mainly limited to between 8:00 and 10:00 in the morning. The garden continues to receive good levels of sunlight through the afternoon.

6.8 Due to the orientation of the buildings, the rear of 32 Pole Hill Road enjoys plenty of sunshine hours throughout the year on its windows and external space both annually and during the winter months.

6.9 The conclusion of this report is that the proposed development at 1 Alpha Road will not significantly affect the daylight or sunlight access of the neighbouring property at 32 Pole Hill Road and that the recommendations of the BRE Guide for daylight and sunlight have been fully complied with.

7.0 DISCLAIMER

7.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.

7.2 The copyright of this report is vested in Create Consulting Engineers Ltd and the Client. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or the Client.

7.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.