



Daylight, Sunlight and Overshadowing Assessment

Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

This document must only be treated as a draft unless it has been signed by the originators and approved by a director.

<i>Revision</i>	<i>Initial</i>	<i>Rev 1</i>	<i>Rev 2</i>	<i>Rev 3</i>
Date				
Prepared by				
Checked by				
Authorised by				



LONDON | READING | TONBRIDGE | BRISTOL

Registered Company No. 06408056
 VAT Registration No. 980016044
 BSI Certificate Number FS 710041



Limitations

Syntegra Consulting Ltd (“SC”) has prepared this report for the sole use of the client in accordance with the agreement under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by SC.

The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by SC has not been independently verified by SC, unless otherwise stated in the report.

The methodology adopted and the sources of information used by SC in providing its services are outlined in this report. The work described in this report was undertaken in **January 2023** and is based on the conditions encountered and the information available during the said period of time. The scope of this report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

SC disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to SC’s attention after the date of the report.

Certain statements made in the report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. SC specifically does not guarantee or warrant any estimate or projections contained in this report.

Costs may vary outside the ranges quoted. Whilst cost estimates are provided for individual issues in this report these are based upon information at the time which can be incomplete. Cost estimates for such issues may therefore vary from those provided. Where costs are supplied, these estimates should be considered in aggregate only. No reliance should be made in relation to any division of aggregate costs, including in relation to any issue, site or other subdivision.

No allowance has been made for changes in prices or exchange rates or changes in any other conditions which may result in price fluctuations in the future. Where assessments of works or costs necessary to achieve compliance have been made, these are based upon measures which, in SC’s experience, could normally be negotiated with the relevant authorities under present legislation and enforcement practice, assuming a proactive and reasonable approach by site management.

Forecast cost estimates do not include such costs associated with any negotiations, appeals or other non-technical actions associated with the agreement on measures to meet the requirements of the authorities, nor are potential business loss and interruption costs considered that may be incurred as part of any technical measures.

Copyright

© This report is the copyright of SC. Any unauthorised reproduction or usage by any person other than the addressee is strictly prohibited.

Table of Contents

1. EXECUTIVE SUMMARY..... 6

2. INTRODUCTION 7

3. GUIDANCE..... 8

4. ASSESSMENT METHODOLOGY 9

General 9

 BRE 209: "Site layout planning for daylight and sunlight" 9

 Daylight 9

 Vertical Sky Component (VSC)..... 10

 Sunlight 10

 Overshadowing to gardens and open spaces 10

5. CRITERIA FOR ASSESSING DAYLIGHT, SUNLIGHT AND OVERSHADOWING EFFECTS12

6. ASSESSMENT14

 6.1 Daylight (VSC).....14

 6.2 Sunlight (APSH/WPSH)15

 6.3 Overshadowing (SHOG)16

7. CONCLUSION.....17

8. APPENDIX.....18

 8.1 Sunrise and sunset time18

 8.2 Sun Path.....18

 8.3 Site plan and location18

 8.4 Site Images19

 8.5 Location of Assessed Surfaces and Amenities21

 8.6 Results23



Figures

- Image 1 : Site Location
- Image 2: Existing site
- Image 3: Proposed site
- Image 4: Window Locations Mayfield
- Image 5: Window Locations 1 Maylins Drive
- Image 6: Amenity location
- Image 7: VSC Results Mayfield
- Image 8: VSC Results 1 Maylins Drive
- Image 9: Amenity Results – Existing
- Image 10: Amenity Results – Proposed

Tables

- Table 1 Document list used for assessment
- Table 2 Criteria for assessing daylight, sunlight and overshadowing effects
- Table 3 Daylight results (VSC)
- Table 4 Sunlight results (APSH/WPSH)
- Table 5 Overshadowing results (SHOG)



1. Executive Summary

This report demonstrates the impact of the proposed extension at Sawbridgeworth Evangelical Church **on the neighbouring buildings.**

The results of the assessment show that in terms of:

- ✓ Daylight, this report demonstrates that none of the neighbouring windows will see any noticeable impact caused by the proposed extension.
- ✓ Sunlight, this report demonstrates that none of the neighbouring windows will see any noticeable loss of sunlight internally.
- ✓ Overshadowing, this report demonstrates that none of the neighbouring gardens will see any noticeable loss in terms of sunlight access.

It can, therefore, be concluded that the proposed extension is not expected to cause any significant impact to the daylight and sunlight access for neighbouring properties **Mayfield and 1 Maylins drive.**



2. Introduction

This report has been prepared to support the planning application for the proposed extension at Sawbridgeworth evangelical church.

The report assesses the daylight and sunlight effect of the proposed extension on the neighbouring buildings **Mayfield and 1 Maylins drive**. The assessment is undertaken in accordance with "BRE 209 Digest: Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice".

The proposed drawings (in dwg format) of the project were provided by the architects on the 11th of December 2023 and has been used in preparing this report. The elevations and plans for the neighbouring buildings were modelled using the data from our point cloud survey as well as drawings obtained from the planning portal, site visit (including point cloud scan) and Google earth (2020) and street view (2023).

No.	Document Name	Format	Received Date
1	SECC.20-125B - PROPOSED SECTIONS	dwg	11-12-2023
2	SECC.20-121C - PROPOSED ELEVATIONS - NORTH AND SOUTH	dwg	11-12-2023
3	SECC.20-105 - EXISTING FIRST FLOOR PLAN	dwg	11-12-2023
4	SECC.20-104A - EXISTING GROUND FLOOR PLAN	dwg	11-12-2023
5	SECC.20-103 - EXISTING SITE PLAN	dwg	11-12-2023
6	SECC.20-102A - PROPOSED SITE PLAN	dwg	11-12-2023

Table 1 Document list used for assessment

The study has been undertaken by constructing a 3D Sketchup model of the existing site, the proposed site and the surrounding buildings. This model analyses the daylight, sunlight and overshadowing impact of the new extension on the affected buildings. All images used in this report are technical 3D models created using 2D AutoCAD Drawings (floor plans, sections and elevations) and is not 3D visualisation images.



3. Guidance

Where the proposed extension has the potential to negatively impact the existing levels of daylight or sunlight on neighbouring properties, a daylight and sunlight assessment must accompany the planning application.

The daylight and sunlight assessment includes the necessary information to meet the criteria outlined in Building Research Establishment report **BRE 209: Site layout planning for daylight and sunlight (Third Edition 2022)**.

It is important to note that the BRE report stresses that the document is provided for guidance purposes only and it is not intended to be interpreted as a strict and rigid set of rules. It also recommends that it may be appropriate to adopt a flexible approach and alternative target values in dealing with “special circumstances” for example “in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings”. This is amplified by the following extracts from the introduction (p1, para. 6) and Section 2.2:

“The advice given here is not mandatory and this document 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 because natural lighting is only one of many factors in site layout design”. (p1, para. 1.6)

“In special circumstances the Developer or Planning Authority may wish to use different target values”. (p1, para. 1.6)

“Note that numerical values given here are purely advisory. Different criteria may be used, based upon the requirements for daylight in an area viewed against other site layout constraints. Another important issue is whether the existing building is itself a good neighbour, standing a reasonable distance from the boundary and taking no more than its fair share of light”. (p7 para. 2.2.3)

The examples given in the report can be applied to any part of the country: suburban, urban and rural areas. The inflexible application of the target values given in the report may make reaching the BRE criteria difficult in a tight, urban environment where there is unlikely to be the same expectation of daylight and sunlight amenity as in a suburban or rural environment.



4. Assessment methodology

General

When assessing any potential effects on the surrounding properties, the BRE guidelines suggest that only those windows that have a reasonable expectation of daylight or sunlight need be assessed. In particular the BRE guidelines at paragraph 2.2.2 state:

“The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed. The guidelines may also be applied to any existing non-domestic buildings where the occupants have a reasonable expectation of daylight; this would normally include schools, hospitals, hotels and hostels, small workshops and some offices.”

Further to the above statement, it is considered that the vast majority of commercial properties do not have a reasonable expectation of daylight or sunlight. This is because they are generally designed to rely on electric lighting rather than natural daylight or sunlight.

This report assesses the potential impact of the proposed extension in relation to daylight, sunlight and overshadowing on the neighbouring properties at properties **Mayfield and 1 Maylins drive**. Specifically, it takes into consideration the possible effect and influence that the new extension would have on the property and on their external amenity.

The MBS analysis software utilised for the compilation of this report has been accredited by CIBSE and acknowledged by the BRE as a suitable software tool for undertaking daylight, sunlight and overshadowing assessments in accordance with the BRE Good Practice guidelines. The specific MBS software modules utilised for this assessment are the following:

- Vertical Sky Components (VSC) and Annual Probable Sunlight Hours/Winter Probable sunlight Hours (APSH/WPSH) can be simulated using MBS.
- Sun Hours on Ground (SHOG) to assess the amount of sunlight seen in neighbouring amenity areas.

If a property is considered to have a reasonable expectation of daylight or sunlight the following methodology to assess the impacts has been used.

BRE 209: "Site layout planning for daylight and sunlight"

This section provides a brief description of the calculating methods for the daylight, sunlight and overshadowing to gardens and open spaces criteria presented in BRE Digest 209.

Daylight

The BRE guidelines "Site layout planning for daylight and sunlight" set out methods for assessing the daylight within section 2.



Vertical Sky Component (VSC)

The VSC method measures the amount of light available on the outside plane at the centre of a window, as a ratio (expressed as a percentage) of the amount of total unobstructed sky visible following the introduction of visible barriers such as buildings. The BRE guidelines at paragraphs 2.2.6 and 2.2.7 state:

"Any reduction in the total amount of skylight can be calculated by finding the VSC at the centre of each main window." and "If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight."

In the assessment, the reduction between existing and proposed situations is expressed as a percentage, where a change in daylight levels above 20% equates to a figure of less than 0.8 times its former value. Assessment points that do not meet the above criteria require further consideration to show the level of impact likely to be incurred.

Sunlight

The BRE guidelines *"Site layout planning for daylight and sunlight"* recommend that access to sunlight is assessed with a development proposal. Potential impacts on available sunlight were assessed using the BRE's Annual Probable Sunlight Hours (APSH) method. This method involves the forecasting of sunlight availability throughout the year and in the winter months, for the main window of each habitable room that faces within 90° of due south. The buildings surrounding the site that do not contain windows that face within 90° of due south has been excluded from the sunlight assessment.

The sunlight criteria given within the BRE guidelines have been used as a basis to assess the potential impacts of the extension:

"A window may be adversely affected if a point at the centre of the window receives in the year less than 25% of the Annual Probable Sunlight Hours (APSH) including at least 5% of the APSH during the winter months (21st October to 21st March)".

Assessment points that do not meet the above criteria require further consideration to show the level of impact likely to be incurred. To provide a concise and comprehensive indicative analysis, the closest surfaces within the surrounding properties were analysed for both daylight and sunlight.

Overshadowing to gardens and open spaces

The BRE guidelines *"Site layout planning for daylight and sunlight"* provide sunlight availability criteria for open spaces. In particular it gives guidance for calculating any areas of open space that may be in permanent shadow on 21st March.

In summary the BRE document states:

"It is suggested that, for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March. If as a result of new development, an existing garden or amenity area does not meet these guidelines, 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".

For this assessment the MBS Daylight software have been used. A 3D model of the proposed and surrounding buildings was first modelled and the sunlight-tracking feature within the software used to view the shadow results. The study illustrated the extent of the shadow on one key date:

- March 21 (Spring Equinox)



5. Criteria for assessing daylight, sunlight and overshadowing effects

The table 2 is a summary of the criteria to assess daylight, sunlight and overshadowing impacts as per the BRE 209 guidance. Based on that, Syntegra classifies the magnitude of effect according to the ratio.

Magnitude of effect	Criteria		
Beneficial	An improvement ratio > 1.3 of the baseline value		
Negligible	Daylight A VSC of 27% or above in the proposed scenario with adequate daylight distribution Or A reduction ratio <1.0 and ≥ 0.8 of the baseline value	Sunlight An APSH of 25%, of which 5% are in the winter months Or A reduction ratio <1.0 and ≥ 0.8 of the baseline value	Overshadowing 50% of any amenity areas receiving at least 2 hours of direct sunlight on 21 st March Or A reduction ratio <1.0 and ≥ 0.8 of the baseline value
	A reduction ratio <0.8 and ≥ 0.7 of the baseline value		
Minor adverse	A reduction ratio <0.7 and ≥ 0.6 of the baseline value		
Moderate adverse	A reduction ratio <0.6 of the baseline value		
Major adverse			

Table 2 Criteria for assessing daylight, sunlight and overshadowing effects



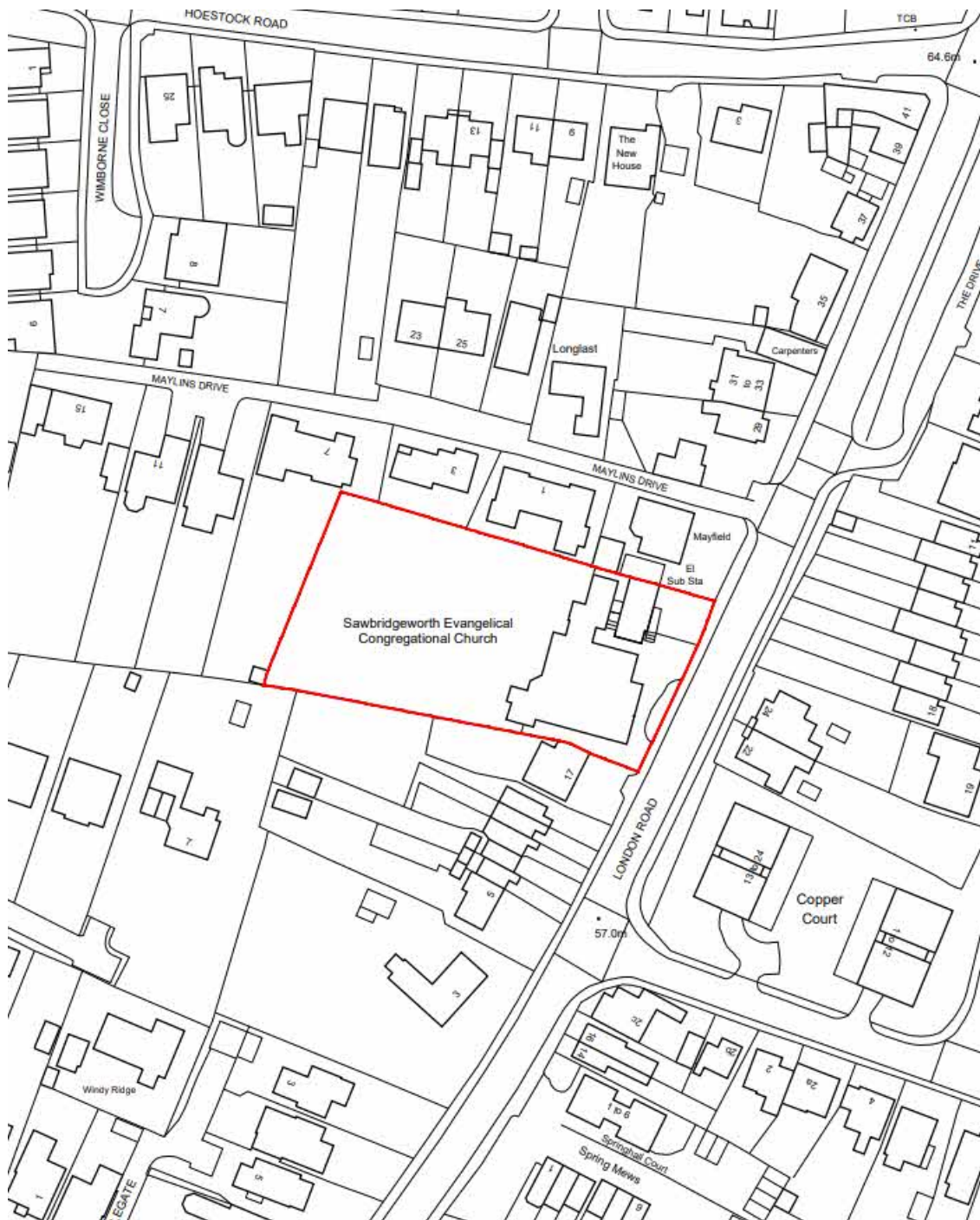


Image 1 – Site Location

6. ASSESSMENT

6.1 Daylight (VSC)

The daylight results show and compare the external levels of daylight (VSC – Vertical Sky Components) on the surfaces at **Mayfield and 1 Maylins drive** with the existing and proposed scenarios.

A summary of results is displayed in the table below. Location of the assessed windows can be found in section 8.4 of this report.

Daylight assessment (Surrounding buildings)					
Address	Assessed Window	Existing VSC>27%	Proposed VSC>27%	Ratio	Result
Mayfield	1	34.41	34.27	1	Negligible
	2	33.33	33.26	1	Negligible
	3	19.63	21.54	1.1	Negligible
	4	24.5	24.34	0.99	Negligible
1 Maylins Drive	5	21.63	21.5	0.99	Negligible
	6	29.31	27.88	0.95	Negligible
	7	30.07	27.5	0.91	Negligible
	8	22.89	19.53	0.85	Negligible

Table 3 Daylight results (VSC)

The previous table shows that none of the neighbouring windows will see any significant loss in terms of daylight. Therefore, it can be concluded that the daylight access to the neighbouring properties will not be impacted.



6.2 Sunlight (APSH/WPSH)

Where necessary (as defined in the Assessment Methodology section of this report) the Annual Probable Sunlight Hours (APSH) tests have been undertaken.

The table below indicates the likely levels of sunlight on the surfaces at **Mayfield and 1 Maylins drive** with the existing and proposed scenarios.

A summary of results is displayed in the table below. Location of the assessed windows can be found in section 8.4 of this report.

Sunlight assessment (Surrounding buildings)							
Address	Assessed Window	Total APSH >25%		Winter WPSH >5%		Annual Ratio	Result
		Ex	Pr	Ex	Pr		
Mayfield	1	30	30	6	6	N/A	N/A
	2	30	29	3	2	N/A	N/A
	3	46	49	5	8	1.07	Negligible
	4	22	22	3	3	N/A	N/A
1 Maylins Drive	5	59	60	6	7	1.02	Negligible
	6	69	65	21	17	0.94	Negligible
	7	68	64	18	14	0.94	Negligible
	8	59	53	7	2	0.9	Negligible

Table 4 Sunlight results (APSH/WPSH)

NOTE: N/A - Not applicable. This is because the sunlight is directional, and the North-facing windows will only receive sunlight at the height of summer at occasional times. As such, pursuant to the BRE guide, North-facing windows are not considered to have a reasonable expectation of sunlight and do not require assessment.

The previous table shows that none of the neighbouring windows will see any noticeable impacts in terms of sunlight access. Therefore, it is concluded that the neighbouring windows will not be significantly impacted by the proposed extension in terms of sunlight availability.

It should be noted that the values provided in the BRE 209 are for guidance purposes only.



6.3 Overshadowing (SHOG)

The overshadowing results show and compare the external levels of sunlight to the gardens at **Mayfield and 1 Maylins drive** with the existing and proposed scenarios.

Overshadowing assessment				
Amenity Area	Existing %	Proposed %	Pr/Ex	Result
1 Maylins Drive A	48%	42%	0.86	Negligible
1 Maylins Drive B	44%	44%	1	Negligible
Mayfield	65%	70%	1.07	Negligible

Table 5 Overshadowing results (SHOG)

The table above shows that none of the neighbouring gardens will see a significant loss in terms of sunlight access on the 21st of March in accordance with the BRE standard. Therefore, it is concluded that the proposed extension will not have a negative impact on the neighbouring amenity areas.



7. Conclusion

This report demonstrates the impact of the proposed extension at Sawbridgeworth Evangelical Church **on the neighbouring buildings.**

The results of the assessment show that in terms of:

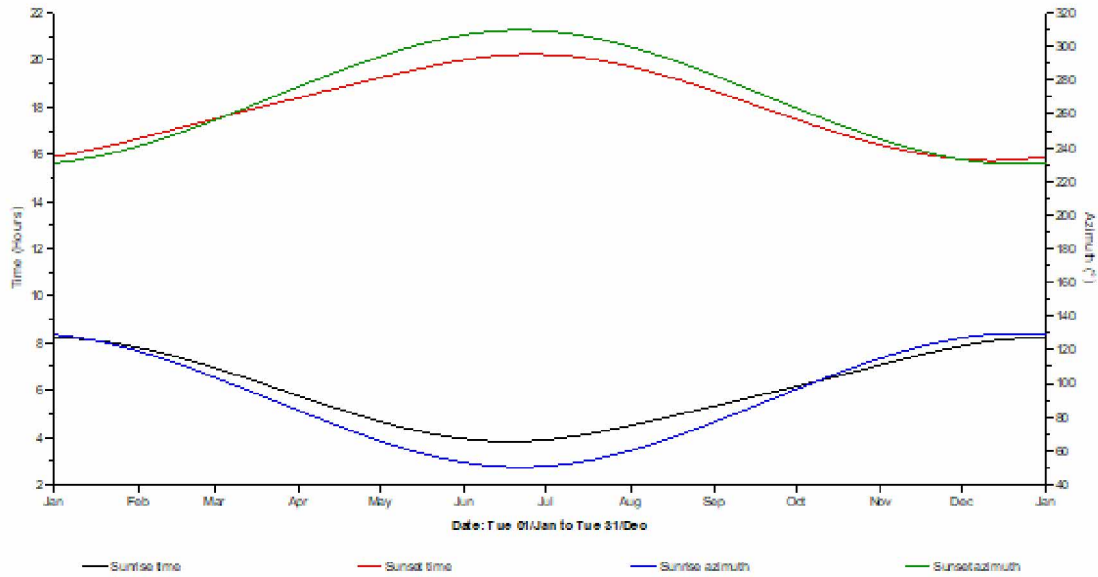
- ✓ Daylight, this report demonstrates that none of the neighbouring windows will see any noticeable impact caused by the proposed extension.
- ✓ Sunlight, this report demonstrates that none of the neighbouring windows will see any noticeable loss of sunlight internally.
- ✓ Overshadowing, this report demonstrates that none of the neighbouring gardens will see any noticeable loss in terms of sunlight access.

It can, therefore, be concluded that the proposed extension is not expected to cause any significant impact to the daylight and sunlight access for neighbouring properties **Mayfield and 1 Maylins drive.**

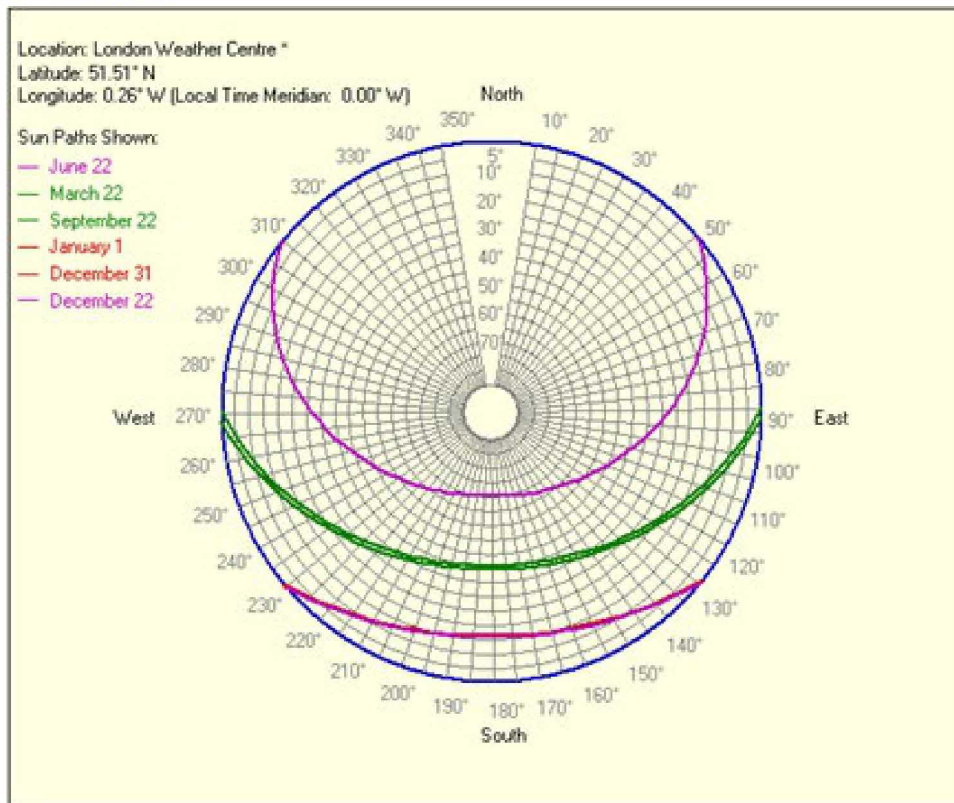


8. Appendix

8.1 Sunrise and sunset time



8.2 Sun Path



8.3 Site plan and location

	Location
Latitude (°)	51.81 N
Longitude (°)	0.15 W

8.4 Site Images

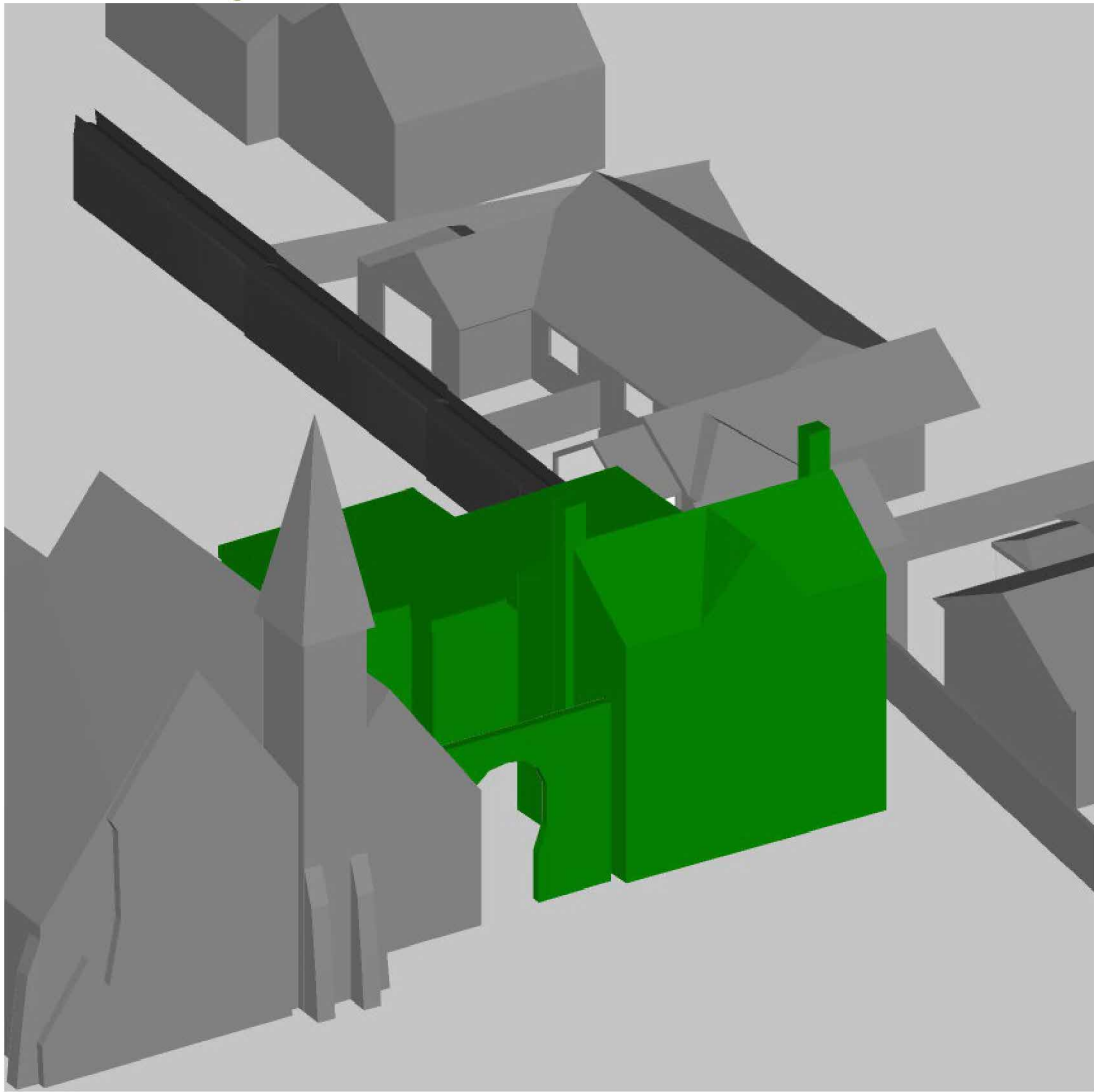


Image 2: Existing site



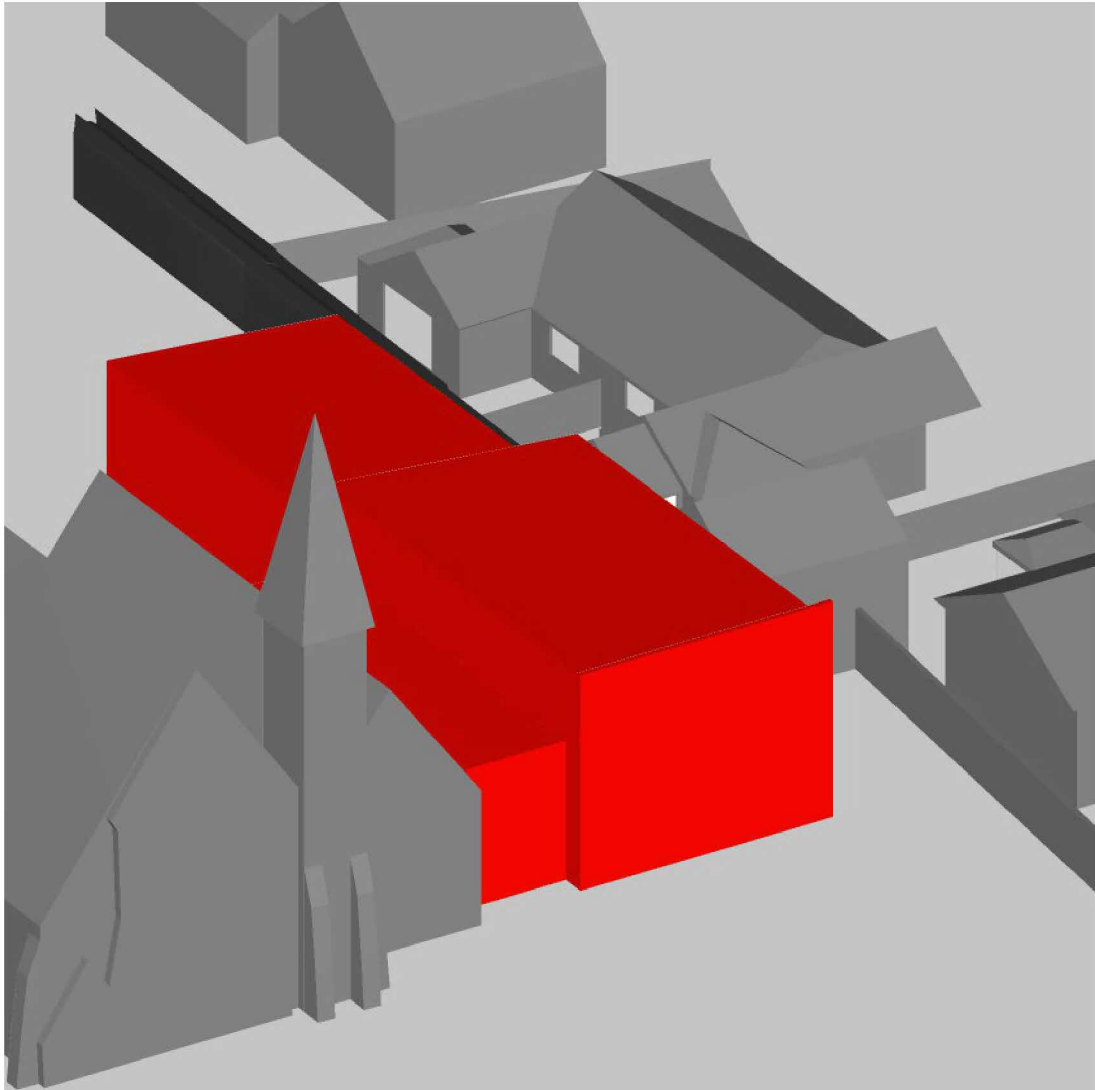


Image 3: Proposed site



8.5 Location of Assessed Surfaces and Amenities



Image 4: Window Locations Mayfield

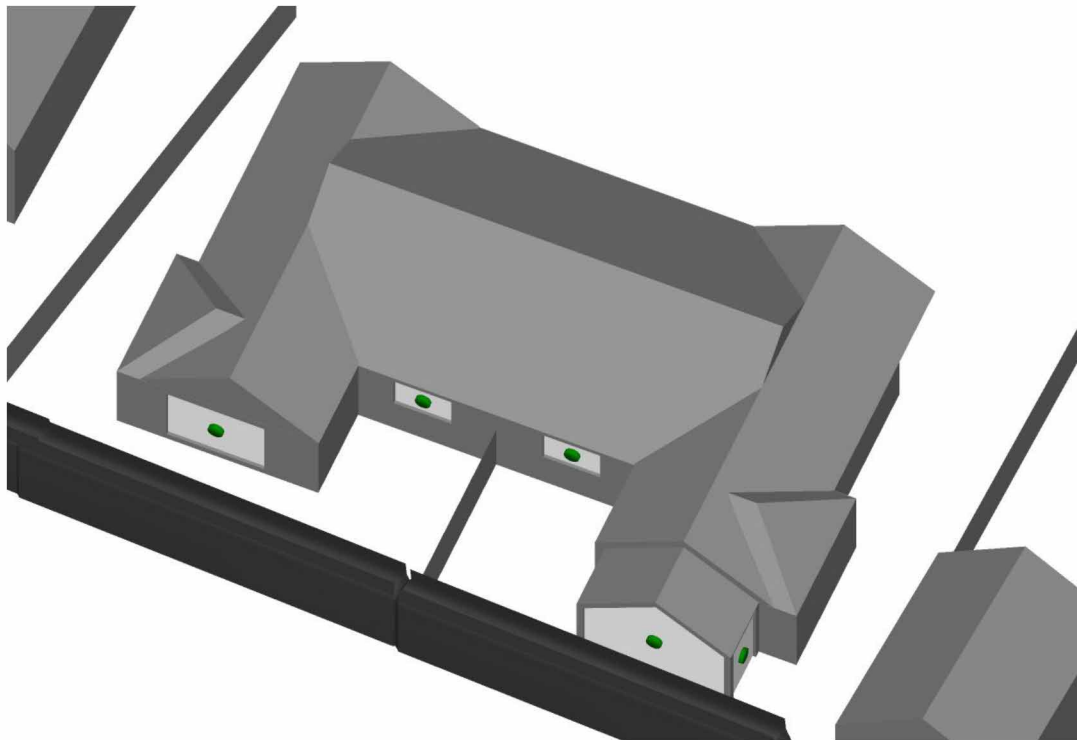


Image 5: Window Locations 1 Maylins Drive



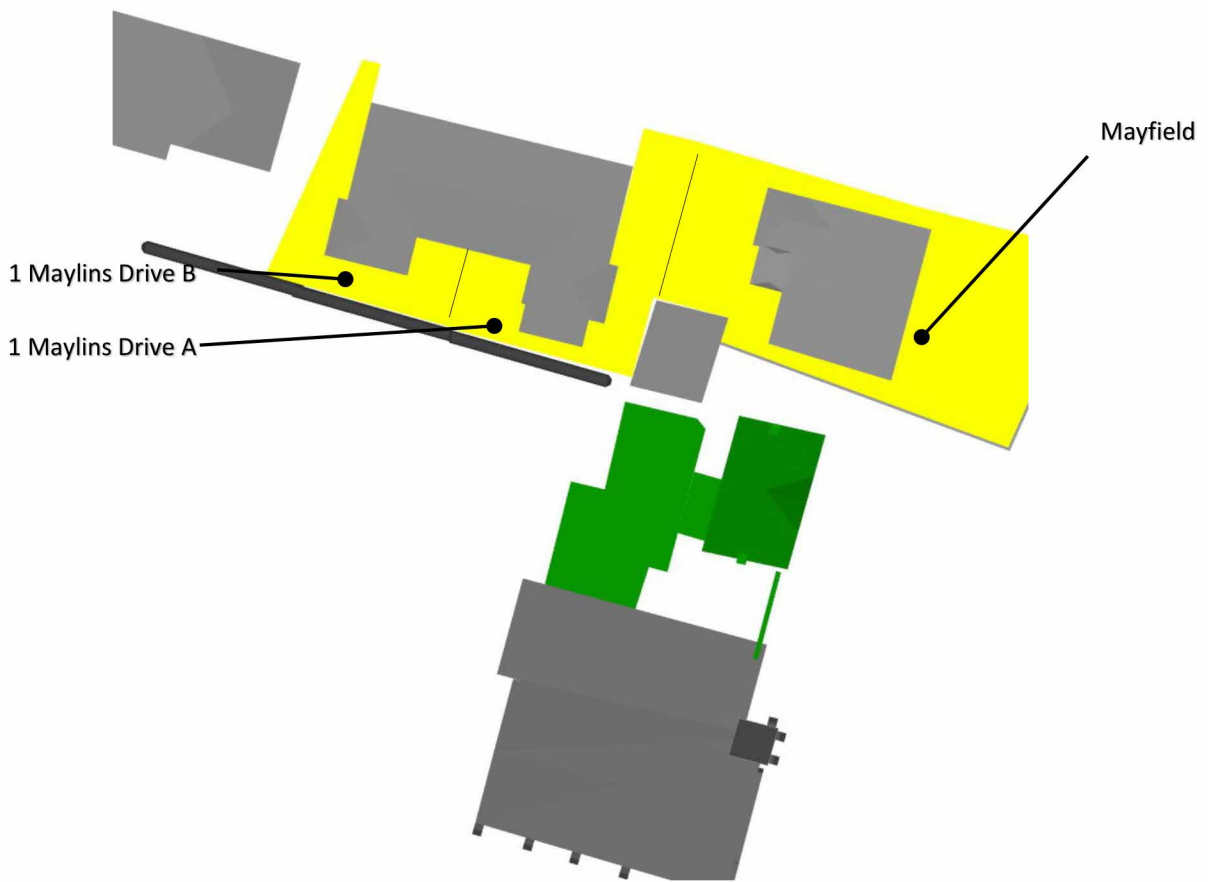


Image 6: Amenity location

8.6 Results

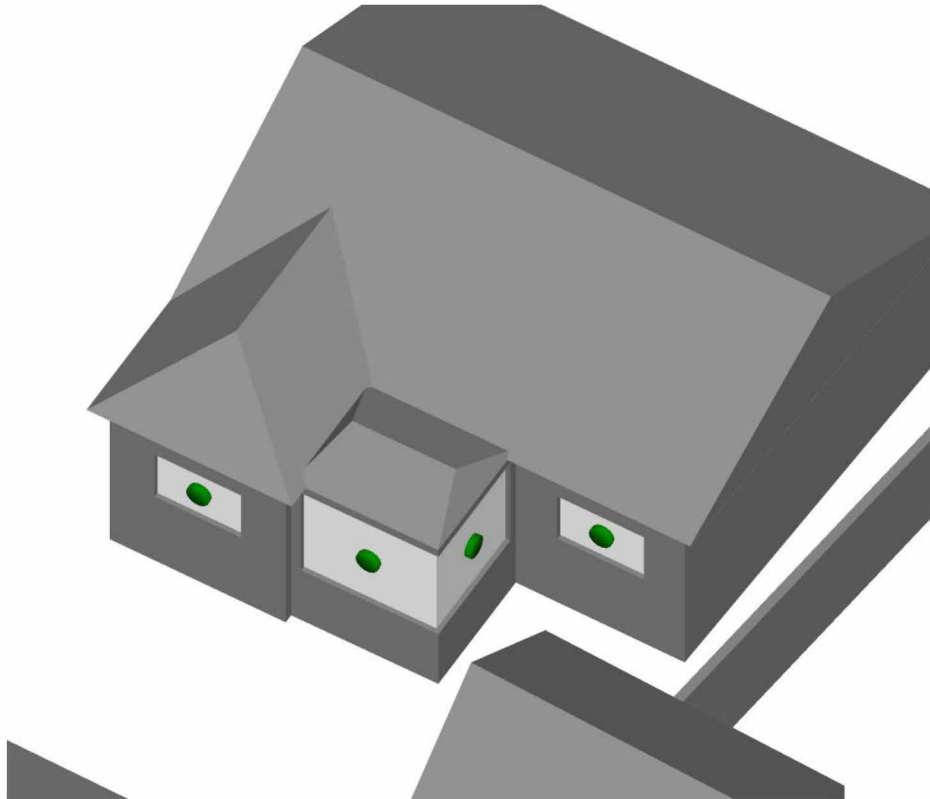


Image 7: VSC Results Mayfield

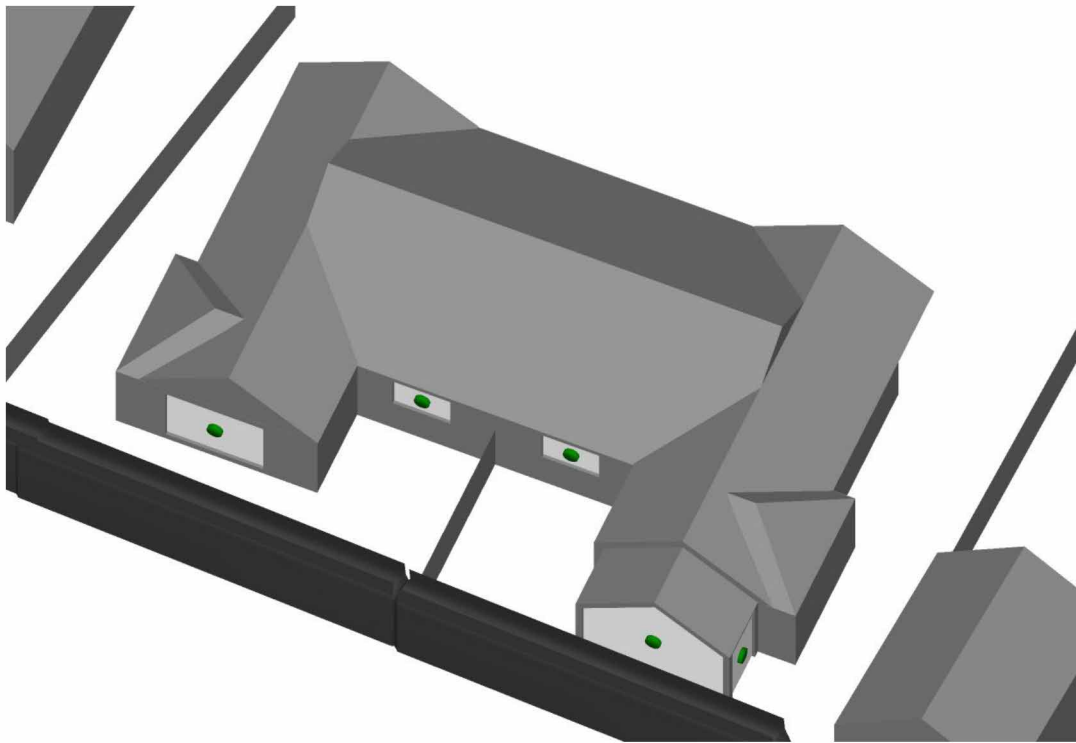


Image 8: VSC Results 1 Maylins Drive

 VSC PASS
 VSC FAIL

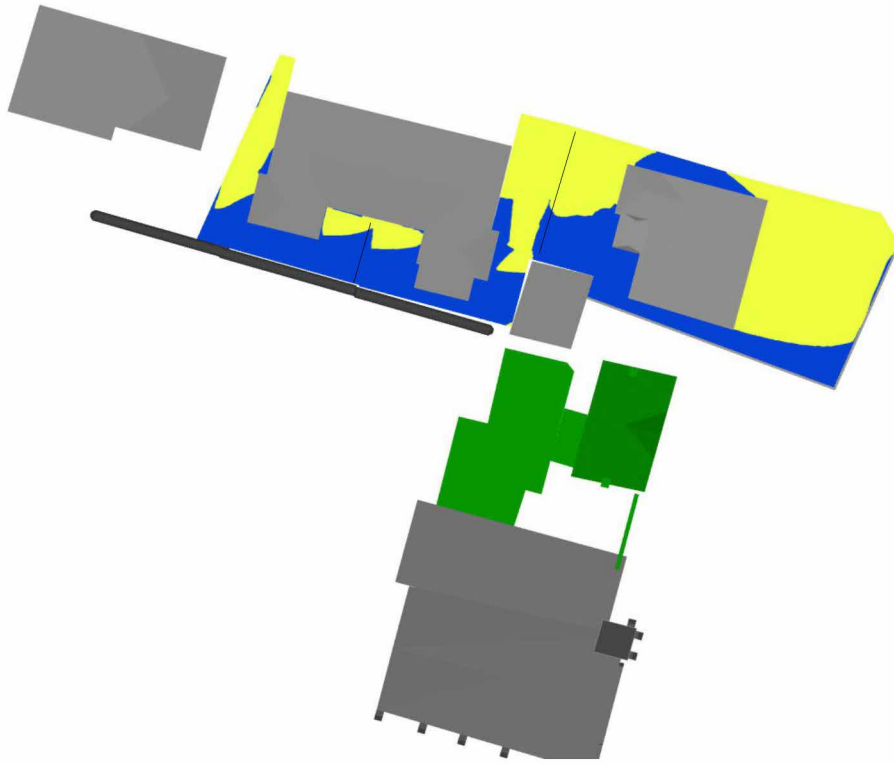


Image 9: Amenity Results – Existing

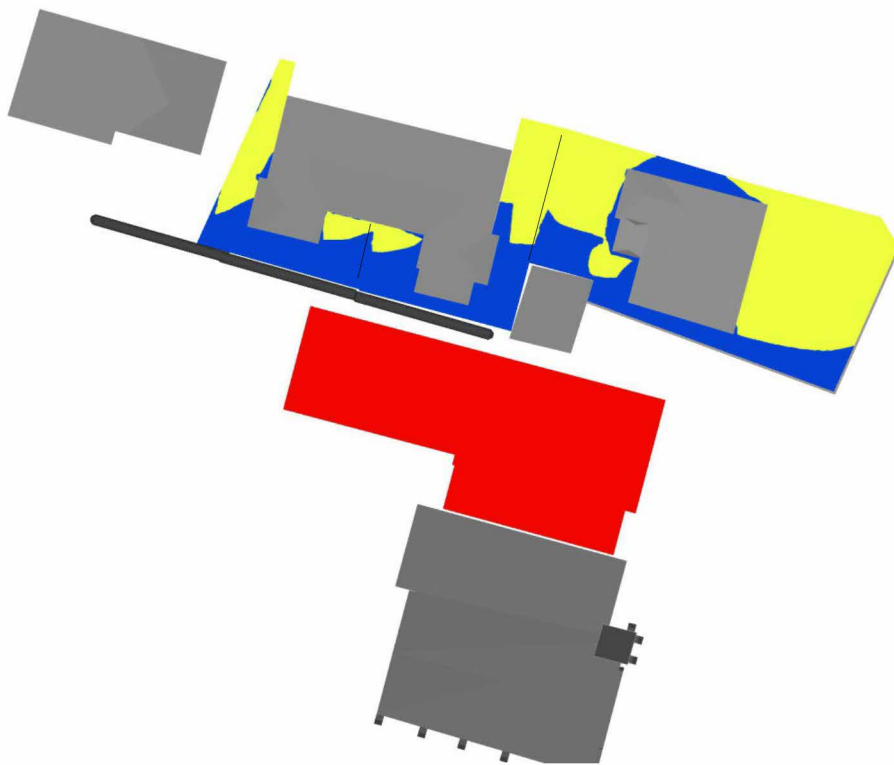


Image 10: Amenity Results – Proposed

PASS (+2hrs)
 FAIL (-2hrs)



LONDON | READING | TONBRIDGE | BRISTOL

Registered Company No. 06408056
 VAT Registration No. 980016044
 BSI Certificate Number FS 710041