



18 Pield
Heath,
Uxbridge, UB8
3NF

Daylight, Sunlight & Overshadowing Report

April 2022



Ref: 22-8959

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Revision	-
Date	05/04/2022
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1 EXECUTIVE SUMMARY

This report demonstrates the impact of the proposed development **on the surrounding neighbouring buildings.**

The results of the assessment show that in terms of:

- Daylight - this report demonstrates that all neighboring windows of the properties associated with 18 Pield Heath development along Pield Heath Avenue are compliant.
- Sunlight - this report demonstrates that two neighbouring windows of the properties associated with 18 Pield Heath development along Pield Heath Avenue are minorly affected in terms of daylight by the proposed development.
- Overshadowing - this report demonstrates that all neighboring amenity spaces (gardens) of the properties associated with 18 Pield Heath development are compliant.

It can be concluded that the proposed development is not expected to cause any significant impact to daylight and sunlight access for surrounding properties alongside Pield Heath Avenue, since it only affects minorly two windows.

2 INTRODUCTION

2.1 General

Syntegra Consulting Ltd has been appointed to prepare a Daylight, Sunlight and Overshadowing assessment in order to examine the impact of the proposed new development on **18 Pield Heath, Uxbridge, UB8 3NF** on the neighbouring developments alongside Pield Heath Avenue..

The Building Research Establishment (BRE) sets out good practice daylight and sunlight guidance in BR209 “*Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice*”, 2nd Ed, guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings. This document states that it is also intended to be used in conjunction with the interior daylight recommendations found within the British Standard BS8206-2:2008 and the *Applications Manual on Window Design* of the Chartered Institution of Buildings Services Engineers (CIBSE).

Daylight and sunlight calculations have been carried out in accordance with BR209.

2.2 The Nature and Effect of Daylight

The provision of daylight is as important as ensuring low levels of noise or low levels of odour in maintaining the enjoyment of one’s property. Adequate levels of daylight are important not only to light and heat the home, but also for an occupant’s emotional well-being.

Daylight is widely accepted to have a positive psychological effect on human beings and there is a great deal of evidence to suggest that people who are deprived of daylight are more susceptible to depression and mood swings. This is common in northern countries, such as Norway, Iceland, and Canada where daylight is scarce during the winter months.

2.3 Daylighting Simulation Model

We have proposed the following methodology in order to examine all required parameters:

- Prepare 3D visualization models using IES <VE> 2021 to understand and visualize the existing and the proposed scenario.
- Carry out a daylight assessment using the methodologies set out in by BRE and British Standard Guidelines for diffuse daylight and sunlight conditions in order to determine the VSC (Vertical Sky Component).
- Carry out a sunlight assessment using the methodologies set out in by BRE and British Standard Guidelines for diffuse daylight and sunlight conditions in order to determine the A/WPSH (Annual / Winter Probable Sunlight Hours).
- Carry out an overshadowing assessment using the methodologies set out in by BRE.

2.4 Description of the Development

The study covers the proposed new build development on **18 Pield Heath, Uxbridge, UB8 3NF** and the impact upon the neighbouring developments alongside Pield Heath Avenue.

Figure 1 below demonstrates the location plan.



Image 1 – Location and site plan

The existing & proposed drawings (in AutoCAD format) of the project were provided by **Whiterock development Architects** on **March 2022** and have been used in preparing this report. Please note that the surrounding buildings elevations have not been provided to carry out this assessment. Hence the size and location of the assessed windows have been assumed based on the provided pictures and Google maps.

The study has been undertaken by constructing a 3D IES VE model of the existing site, the proposed site and the surrounding buildings and is based upon the drawings received by **Whiterock development Architects**. This model analyses the daylight, sunlight and overshadowing impact of the new development 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 PLANNING POLICY

Where the proposed development 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 (Second Edition 2011)**

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

4.1 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 development in relation to daylight, sunlight and overshadowing on the surrounding buildings and amenities along side Pield Heath Avenue and across 18 Pield Heath development.

Thirty-six windows have been assessed for external levels of daylight VSCs (Vertical Sky Components) and sunlight APSHs (Annual Probable Sunlight Hours) while eight gardens have been assessed for overshadowing. The location of the assessed windows and gardens can be found in appendix 7.2.2 for this report.

The IES Virtual Environment modelling 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 IES software modules utilised for this assessment are the following:

- **ModelIT:** enables you to create a 3D "Virtual Environment" model without CAD data, or alternatively allows you to create a 3D model from 2D CAD data. Interfaces with AutoCAD and Google Sketchup.
- **Radiance:** is a detailed 3D simulation tool designed to predict daylight and electric light levels, and the appearance of a space prior to construction. Vertical Sky Components (VSC) can be simulated using Radiance.
- **SunCast:** Annual Probable Sunlight Hours (APSH) and overshadowing can be simulated using SunCast. It produces visual, graphical and numerical information that can be used to explain to colleagues, clients and planning authorities how the sun impacts on and inside the building, and on the site.

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

4.2 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.

4.2.1 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 paragraph 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 considerations to show the level of impact likely to be incurred.

4.2.2 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 development:

"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 considerations 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.

4.2.3 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 IES "Virtual Environment" SunCast software package has 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)

4.2.4 Criteria for assessing daylight, sunlight and overshadowing effects

Table 1 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	Sunlight	Overshadowing
	<p>A VSC of 27% or above in the proposed scenario with adequate daylight distribution</p> <p style="text-align: center;">Or</p> <p>A reduction ratio <1.0 and ≥ 0.8 of the baseline value</p>	<p>An APSH of 25%, of which 5% are in the winter months</p> <p style="text-align: center;">Or</p> <p>A reduction ratio <1.0 and ≥ 0.8 of the baseline value</p>	<p>50% of any amenity areas receiving at least 2 hours of direct sunlight on 21st March</p> <p style="text-align: center;">Or</p> <p>A reduction ratio <1.0 and ≥ 0.8 of the baseline value</p>
Minor adverse	A reduction ratio <0.8 and ≥ 0.7 of the baseline value		
Moderate adverse	A reduction ratio <0.7 and ≥ 0.6 of the baseline value		
Major adverse	A reduction ratio <0.6 of the baseline value		

Table 1 Criteria for assessing daylight, sunlight and overshadowing effects

5 ASSESSMENT

5.1 Daylight

The daylight results show and compare the external levels of daylight (VSC – Vertical Sky Components) on the surfaces of the neighbouring properties alongside Piled Heath Avenue between the existing and the proposed development.

A summary of results is displayed in the table below. Location of the assessed windows can be found in section 7.2.2 of this report.

Vertical Sky Component (VSC) - 18 Field Heath Road					
Window ID	Associated Property	Existing VSC	Proposed VSC	minimum 0.8 ratio difference	Compliance
1	3 Pield Heath Avenue	37.14	33.56	0.90	PASS
2		37.68	34.52	0.92	PASS
3	7 Pield Heath Avenue	29.52	29.3	0.99	PASS
4		35.08	34.71	0.99	PASS
5		20.94	20.92	1.00	PASS
6		37.79	36.78	0.97	PASS
7		37.8	36.84	0.97	PASS
8	20 Pield Heath Avenue	32.52	31.61	0.97	PASS
9		38.08	36.87	0.97	PASS
10		32.03	32.32	1.01	PASS
11		30.85	29.6	0.96	PASS
12		38.38	37.23	0.97	PASS
13		35.85	35.9	1.00	PASS
14	5 Pield Heath Avenue	33.51	31.16	0.93	PASS
15	5 Pield Heath Avenue	38.95	37.58	0.96	PASS
16		38.86	37.9	0.98	PASS
17		38.97	37.21	0.95	PASS
18		37.91	35.88	0.95	PASS
19		37.46	34.84	0.93	PASS
20		33.93	33.33	0.98	PASS
21		37.02	35.94	0.97	PASS
22		37.69	35.96	0.95	PASS
23		37.07	35.3	0.95	PASS
24		33.55	31.88	0.95	PASS
25	5 Pield Heath Avenue	33.54	32.19	0.96	PASS
26		37.21	35.26	0.95	PASS
27		37.83	35.35	0.93	PASS
28		37.09	34.59	0.93	PASS
29	9 Pield Heath Avenue	38	37.62	0.99	PASS
30		38.03	37.4	0.98	PASS
31		38.78	38.53	0.99	PASS
32		38.32	37.83	0.99	PASS

33	Pield Heath Avenue	35.26	31.77	0.90	PASS
34		26.92	25.97	0.96	PASS
35		34.62	30.93	0.89	PASS
36		38.79	36.22	0.93	PASS

Table 2 Daylight results

As shown in the above table no neighbouring windows are impacted from the proposed development. Hence, **in terms of daylight we can state that overall there is no impact from the proposed development.**

5.2 Sunlight

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 of the neighbouring properties alongside Piled Heath Avenue between the existing and the proposed development.

A summary of results is displayed in the table below. Location of the assessed windows can be found in section 7.2.2 of this report.

Vertical Sky Component (VSC) - Walton High Street (Balconies ON)							
Window ID	Associated Property	APSH >25%		WPSH >5%		APSH Ratio	Compliance
		Existi ng	Propos ed	Existi ng	Propos ed		
1	3 Pield Heath Avenue	30	25.62	5.71	5.71	0.85	PASS
2		36.81	34.71	12.5	12.5	0.94	PASS
3/1/1900	7 Pield Heath Avenue	12.5	11.11	0.69	0	0.89	PASS
4		21.75	20.61	0.8	0.35	0.95	PASS
5		17.02	16.55	0.13	0.13	0.97	PASS
6		32.63	29.67	9.72	8.33	0.91	PASS
7		32.85	30.15	9.72	8.33	0.92	PASS
8		20 Pield Heath Avenue	17.36	17.36	1.39	1.39	1.00
9	42.36		42.36	14.59	14.59	1.00	PASS
10	41.72		41.72	13.77	13.77	1.00	PASS
11	17.36		17.36	1.39	1.39	1.00	PASS
12	42.36		42.36	14.59	14.59	1.00	PASS
13	49.17		49.17	18.38	18.38	1.00	PASS
14	5 Pield Heath Avenue	36.15	29.54	10.03	8.64	0.82	PASS
15	5 Pield Heath Avenue	36.11	32.39	11.11	9.72	0.90	PASS
16		35.89	33.25	11.11	9.72	0.93	PASS
17		35.93	31.24	11.11	9.72	0.87	PASS
18		32.88	28.01	9.56	8.51	0.85	PASS

19		30.56	24.32	7.2	5.81	0.80	PASS
20		12.55	9.76	0.2	0	0.78	MINOR IMPACT
21		23.51	19.2	4.33	2.78	0.82	PASS
22		33.11	28.76	10.59	9.03	0.87	PASS
23		37.03	32.51	11.77	10.13	0.88	PASS
24		35.27	31.26	10.82	9.77	0.89	PASS
25	5 Pield Heath Avenue	13.85	8.33	0.69	0	0.60	MODERATE IMPACT
26		24.96	18.58	4.86	3.47	0.74	MINOR IMPACT
27		34.44	27.9	10.87	9.48	0.81	PASS
28		39.31	32.58	12.32	10.93	0.83	PASS
29	9 Pield Heath Avenue	33.41	31.23	10.51	8.33	0.93	PASS
30		32.91	31.52	9.98	8.6	0.96	PASS
31		35.65	32.78	11.11	8.94	0.92	PASS
32		77.78	75.77	35.42	34.1	0.97	PASS
33	Pield Heath Avenue	20.65	15.39	1.8	1.26	0.75	MINOR IMPACT
34		45.11	40.66	14.47	13.78	0.90	PASS
35		32.56	28.98	10.38	10.38	0.89	PASS
36		34.72	29.63	10.42	10.19	0.85	PASS

Table 4 Sunlight results

From the results on the above table we can see that **W20** is part of a large oval glazing – so only a single glazing pane fails / all other pass / The average of the entire glazing pane between existing and proposed is 85% which is compliant (80% is the margin). **W25/26** are part of a large oval glazing that probably serves a living space / only two panes fail out of 5 / the average of the pane calculated between existing and proposed is 79% which is not compliant (80% is the margin). **W33** is minorly affected by the proposed development (75%)

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

5.3 Overshadowing

The following results represent the cumulative overshadowing impacts of the proposed development. As identified from the AutoCAD drawings and/or site plan, **eight existing amenity areas are located alongside Pield Heath Avenue and on Pield Heath Road**. In accordance with the BRE guidelines, overshadowing has been assessed during times of the day where the sun’s altitude is above 10° (from 7:00am to 6:00pm).

"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".

A summary of results is displayed in the table below. Location of the assessed amenity areas can be found in section 7.3 of this report.

Amenity Overshadowing - 18 Pield Heath Road							
Amenity ID	Associated Property	Existing Overshadowing	Existing Overshadowing %	Proposed Overshadowing	Proposed Overshadowing %	80% ratio	Compliance
G1	7 Pield Heath Road	>2 hours	0.6	>2 hours	0.58	0.97	PASS
G2	5 Pield Heath Road	>2 hours	0.6	>2 hours	0.57	0.95	PASS
G3	Pield Heath Road	>2 hours	0.64	>2 hours	0.64	1.00	PASS
G4	3 Pield Heath Road	>2 hours	0.6	>2 hours	0.6	1.00	PASS
G5	20 Pield Heath Road	>2 hours	0.85	>2 hours	0.85	1.00	PASS
G6	4 Pield Heath Road	>2 hours	0.72	>2 hours	0.71	0.99	PASS
G7	12 Pield Heath Road	>2 hours	0.65	>2 hours	0.57	0.88	PASS
G8	10 Pield Heath Road	>2 hours	0.88	>2 hours	0.8	0.91	PASS

Table 5 Overshadowing results

6 CONCLUSION

This report demonstrates the impact of the proposed development **on the surrounding neighbouring buildings.**

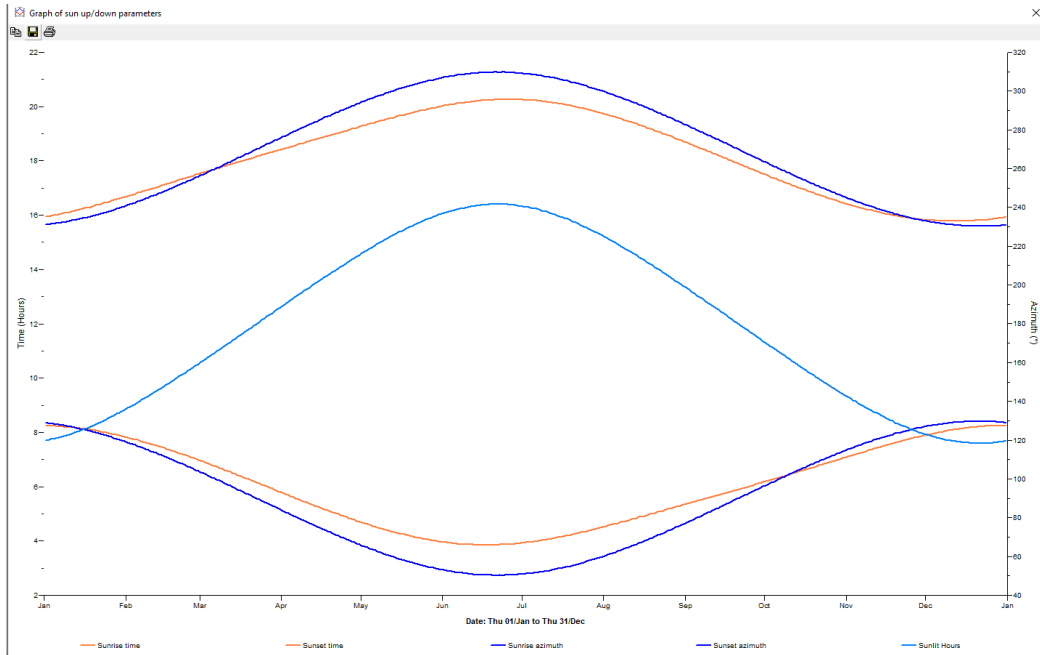
The results of the assessment show that in terms of:

- Daylight - this report demonstrates that all neighboring windows of the properties associated with 18 Pield Heath development along Pield Heath Avenue are compliant.
- Sunlight - this report demonstrates that two neighbouring windows of the properties associated with 18 Pield Heath development along Pield Heath Avenue are minorly affected in terms of daylight by the proposed development.
- Overshadowing - this report demonstrates that all neighboring amenity spaces (gardens) of the properties associated with 18 Pield Heath development are compliant.

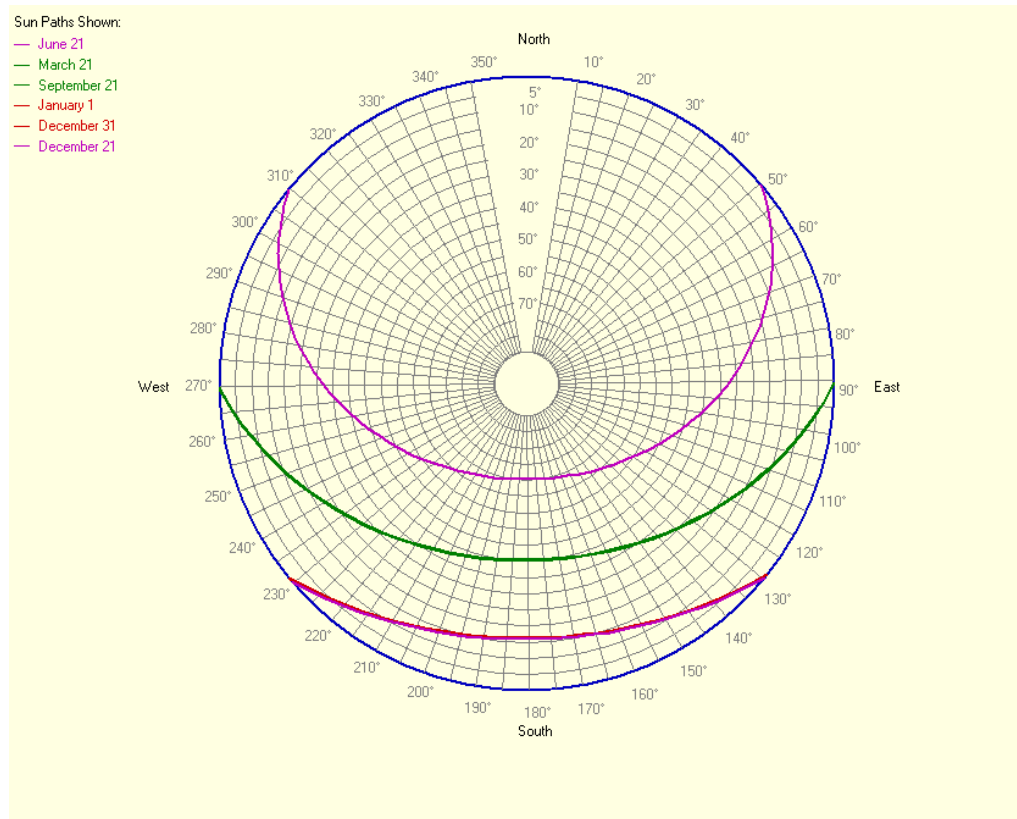
It can be concluded that the proposed development is not expected to cause any significant impact to daylight and sunlight access for surrounding properties alongside Pield Heath Avenue, since it only affects minorly two windows.

7 APPENDIX

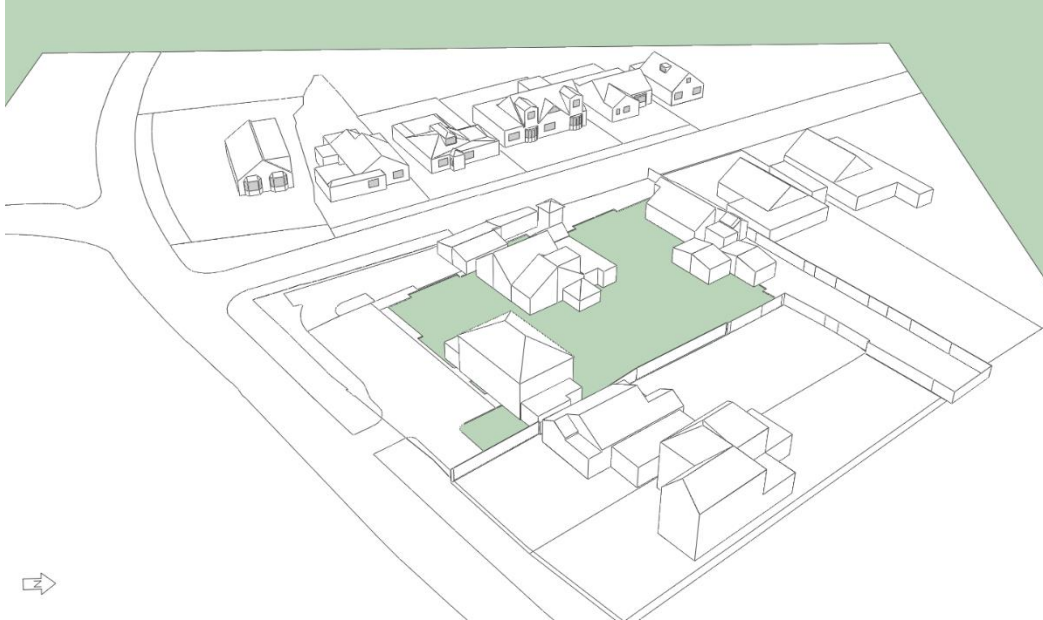
7.1 Sunrise and sunset time



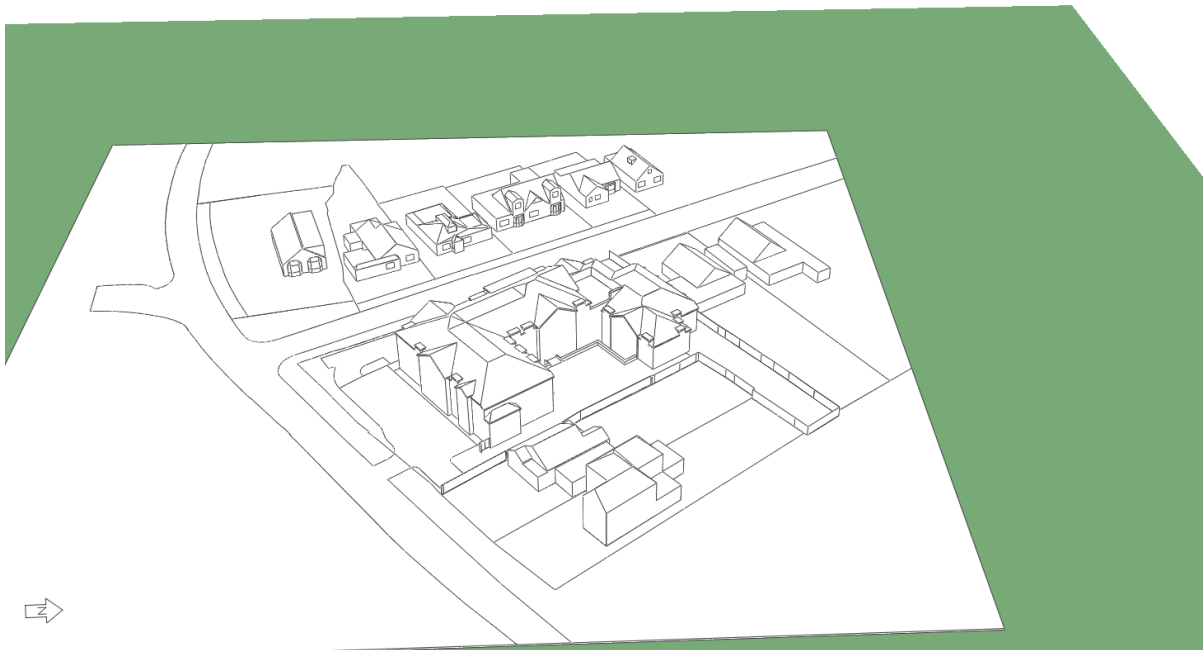
7.2 Sun path



7.2.1 Site Plans

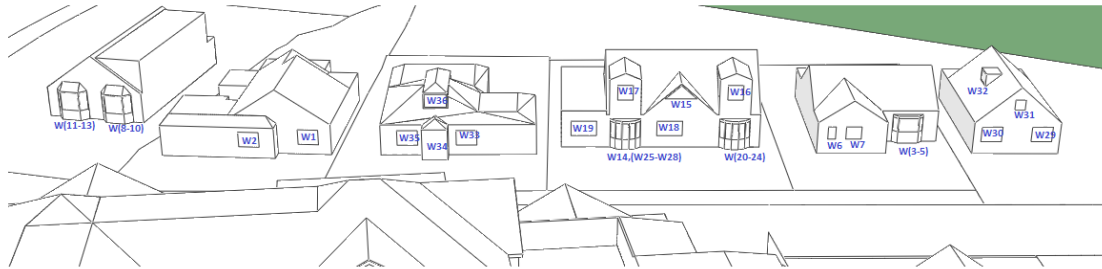


Existing site axonometric view



Proposed site axonometric view

7.2.2 Location of Assessed Surfaces



Window Reference



Amenity Reference

mail@syntegragroup.com
Tel: 0330 053 6774

LONDON | READING | TONBRIDGE | BRISTOL

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

