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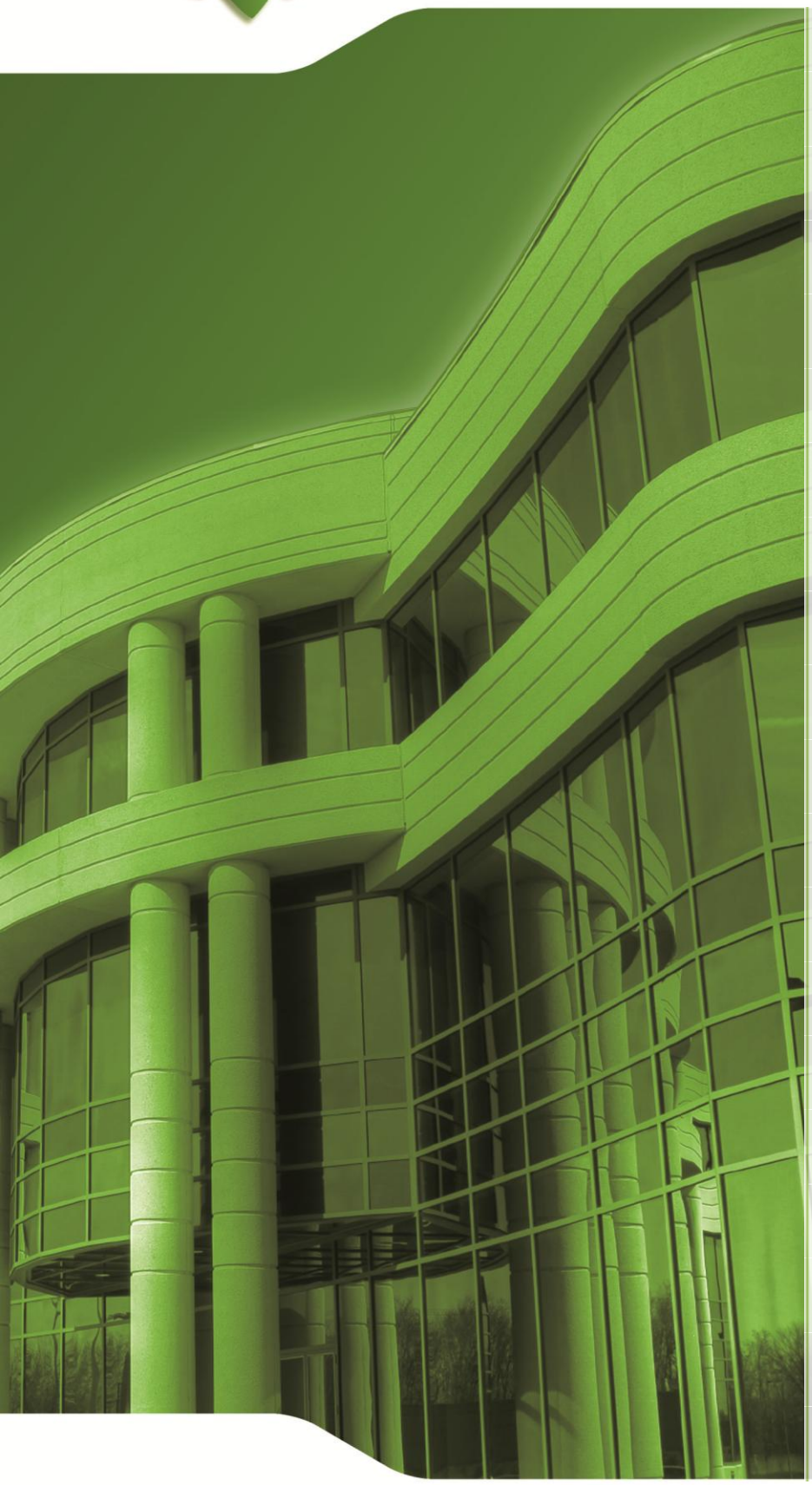
Intelligent & Green Building Solutions



Daylight, Sunlight & Overshadowing Report

June 2014

2 Broad Street, Teddington TW11 8RF

Quality Standards Control

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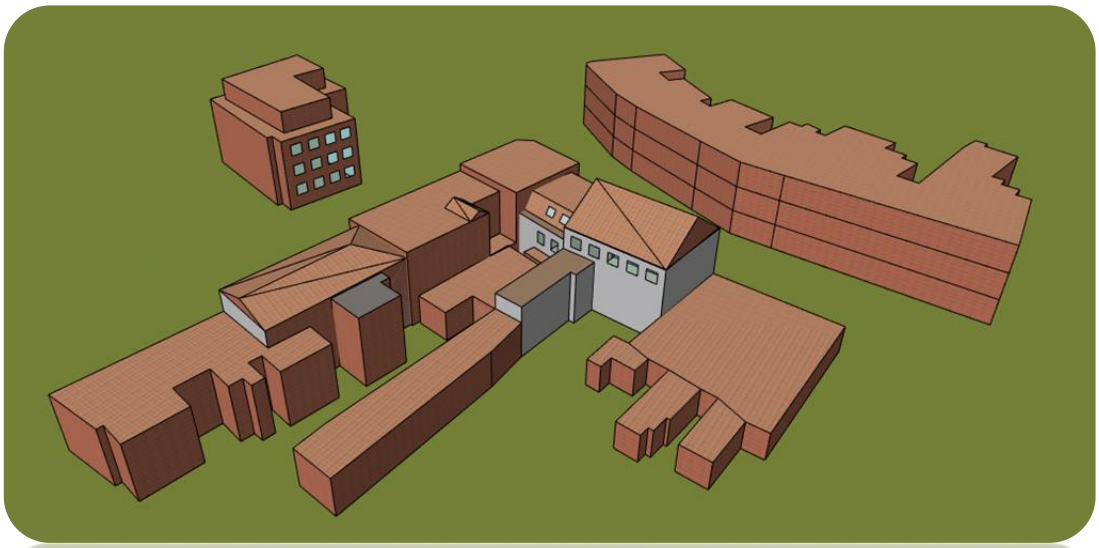
DATE	PRODUCED BY	APPROVED BY
25.06.2014	CA/FC	AWK



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Date	04/09/2013	24/10/2013	25/06/2013
Prepared by	FC	FC	CA/FC
Checked by	AWK	AWK	AWK
Authorised by	AWK	AWK	AWK

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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 **June 2014** 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.

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1. Executive summary

This report demonstrates the impact of the proposed development **on the surrounding buildings and amenity areas/gardens/open spaces**.

The results of the assessment show that in terms of:

- Daylight, **none of the surrounding buildings** will be adversely impacted by the proposed development.

  The BRE criteria are met: ☑

- Sunlight, **none of the surrounding buildings** will be adversely impacted by the proposed development.

  The BRE criteria are met: ☑

- Overshadowing, no existing amenity areas/gardens/open spaces have been identified on the drawings and/or site plan.

➧ **It can be concluded that the proposed scheme is acceptable.**

2. Introduction

This report has been prepared to support the planning application for the proposed development at 2 Broad Street, Teddington TW11 8RF. The new scheme will be comprised of the **'Refurbishment and remodelling of the existing workshop (Use Class B1: light industrial) including infill extensions and alterations, conversion of seven x one self-contained flats to six residential flats (4x2 and 2x1 bed), with associated works including access and cycle parking'**.

The report assesses the daylight, sunlight and overshadowing effect of the proposed development on the surrounding buildings and specifically focuses on the windows of the building located on Broad Street and Queens Road. The assessment is undertaken in accordance with ***"BRE 209 Digest: Site Layout Planning For Daylight and Sunlight – A Guide to Good Practice".***

The existing & proposed drawings (in AutoCAD format) of the project were provided by **McLarenExcell** on the **06th June 2014** and have been used in preparing this report.

The study has been undertaken by constructing a 3D IES model of the existing and proposed site and surrounding buildings in order to analyse the daylight, sunlight and overshadowing impact of the new development on the affected buildings. The assessment is based on 2D AutoCAD drawings (floor plans, sections and elevations) and 3D model.

3. Planning policy

There are no national or local policies specifically relating to daylight, sunlight and overshadowing.

4. Guidance document

4.1. Building Research Establishment (BRE) report (BRE 209): "Site layout planning for daylight and sunlight: A guide to good practice" Second Edition (2011)

The Second Edition of the report replaces the 1991 document of the same name and come into effect from October 2011.

It is important to note that the introduction to the 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.

5. Assessment methodology

5.1. General

This report assesses the potential impact of the proposed development in relation to daylight, sunlight and overshadowing on the buildings on Broad Street and Queens Road. Specifically, it takes into consideration the possible effect and influence that the new development would have on the properties.

7 target surfaces (S1 to S7) for external levels of daylight VSCs (Vertical Sky Components) and sunlight availability, as shown in section 3 in Appendix, have been selected based on anticipated worse case impact judged from professional experience and also following guidance within the BRE guidelines *"Site layout planning for daylight and sunlight".*

No amenity areas/gardens/open spaces have been identified on the drawings and/or site plan.

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 and Average Daylight Factors (ADF) can be simulated using Radiance.

- SunCast: 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.

5.2. BRE Digest 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.

5.2.1. Daylight

The BRE guidelines *"Site layout planning for daylight and sunlight"* incorporate two main methods of calculating daylight: the Vertical Sky Component (VSC) method and the Average Daylight Factor (ADF) method.

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.

In this assessment, VSC is selected and more details on the numerical criteria for the VSC method are presented in section 8.6.

5.2.2. 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.

To provide a concise and comprehensive indicative analysis, the closest surfaces within the surrounding properties were analysed for both daylight and sunlight. Their locations are shown in section 8.4.1 in Appendix.

More details on the numerical criteria for the APSH method are presented in section 8.7.

5.2.3. 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, no more than two-fifths and preferably no more than a quarter of any garden or amenity area should be prevented by buildings from receiving any sun at all 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 some 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)

More details on the numerical criteria for the overshadowing method are presented in section 8.8.

6. BRE Digest 209: Significant criteria

6.1. Daylight

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

"The daylighting is not considered to be substantially affected when the Vertical Sky Component (VSC) measured at the centre of a window is >27%. A window may be adversely affected if the VSC measured at the centre of the window is less than 27% and less than 0.8 times its former value".

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.

6.2. Sunlight

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 consideration to show the impact significance likely to be incurred.

6.3. Overshadowing to gardens and open spaces

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

"It is suggested that, for it to appear adequately sunlit throughout the year, no more than 40% and preferably no more than 25% of any garden or amenity area should be prevented by buildings from receiving any sun at all 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 some sun on 21st March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable".

Assessment points that do not meet the above criteria require further consideration to show the level of impact likely to be incurred.

6.4. Criteria for assessing daylight, sunlight and overshadowing effects

The table 1 is a summary of the criteria to assess daylight, sunlight and overshadowing impacts:

Magnitude of effect	Criteria		
Major beneficial	An improvement ratio > 1.3 of the baseline value		
Moderate beneficial	An improvement ratio ≤1.3 and > 1.1 of the baseline value		
Minor beneficial	An improvement ratio ≤1.1 and > 1.0 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 More than 40% of any amenity areas receives direct sunlight on 21st March Or A reduction ratio <1.0 and ≥ 0.8 of the baseline value
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

7. Assessment

7.1. BS 8206-2: 1992

The foreword to BS 8206-2: 1992 states that:

"The aim of the standard is to give guidance to architects, builders and others who carry out lighting design. It is recognised that lighting is only one of many matters that influence fenestration. These include other aspects of environmental performance (such as noise, thermal equilibrium and the control of energy use), fire hazards, constructional requirements, the external appearance and the surroundings of the site. The best design for a building does not necessarily incorporate the ideal solution for any individual function. For this reason, careful judgement should be exercised when using the criteria given in the standards for other purposes, particularly town planning control."

7.2. Daylight

The daylight results are presented in section 8.6 in Appendix. The images and results show and compare the external levels of daylight (VSC – Vertical Sky Components) on the windows with and without the proposed development. The assessment evaluates the impact on the windows from the new development.

A summary of results is displayed in the table 2 below:

Building	Daylight assessment				
	Target surface	VSC (existing) >27%	VSC (proposed) >27%	Ratio	Result
Livingston House	Surface 1	34.08	32.34	0.94	Negligible
Livingston House	Surface 2	36.76	35.56	0.96	Negligible
Livingston House	Surface 3	38.75	38.50	0.99	Negligible
Broad Street - rear house	Surface 4	49.36	46.65	0.94	Negligible
Broad Street - rear house	Surface 5	39.29	38.82	0.98	Negligible
Broad Street	Surface 6	34.79	34.81	1.00	Negligible
Broad Street	Surface 7	34.79	34.73	0.99	Negligible

Table 2: Daylight results

Note: For location of target surfaces, see Appendix section 8.4 "Site plan and location"

As it can be seen on the table above, none of the surfaces will adversely impact on the proposed development.

- ✓ **The slight loss in daylight for the surfaces are not considered of concern as the VSC levels are above 27% and will provide adequate levels of daylight.**

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

7.3. Sunlight

Where necessary (as defined in the Assessment Methodology section of this report) Annual Probable Sunlight Hours (APSH) tests have been undertaken with the results presented in section 8.7 in the appendix.

The table of results show the likely levels of sunlight with and without the proposed development.

A summary of results is displayed in the table 3 below:

Building	Target surface	Sunlight assessment				Ratio	Result
		Total APSH >25%		Winter APSH >5%			
		Existing	Proposed	Existing	Proposed		
Livingston House	Surface 1	42.64	41.64	45.21	43.05	0.97	Negligible
Livingston House	Surface 2	48.42	46.39	51.69	47.24	0.95	Negligible
Livingston House	Surface 3	53.37	51.81	57.22	54.27	0.97	Negligible
Broad Street - rear house	Surface 4	67.84	63.84	78.53	70.38	0.94	Negligible
Broad Street - rear house	Surface 5	80.03	76.81	95.72	90.90	0.96	Negligible
Broad Street	Surface 6	72.28	71.31	74.07	81.44	0.99	Negligible
Broad Street	Surface 7	74.66	72.96	81.89	83.99	0.97	Negligible

Table 3: Sunlight results

Note: For location of target surfaces, see Appendix section 8.4 "Site plan and location"

As it can be seen on the table above, none of the surfaces will adversely impact on the proposed development.

- ✓ **The slight loss in sunlight for the surfaces are not considered of concern as the annual APSH are above 25% and the winter APSH are above 5% and will therefore provide adequate levels of sunlight.**

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

7.4. Overshadowing

No existing amenity areas/gardens/open spaces have been identified on the drawings and/or site plan.

8. Conclusion

8.1. Daylight

This report demonstrates that **none of the surrounding buildings** will be adversely impacted by the proposed development.

BRE criteria met: ☑

8.2. Sunlight

This report demonstrates that **none of the surrounding buildings** will be adversely impacted by the proposed development.

BRE criteria met: ☑

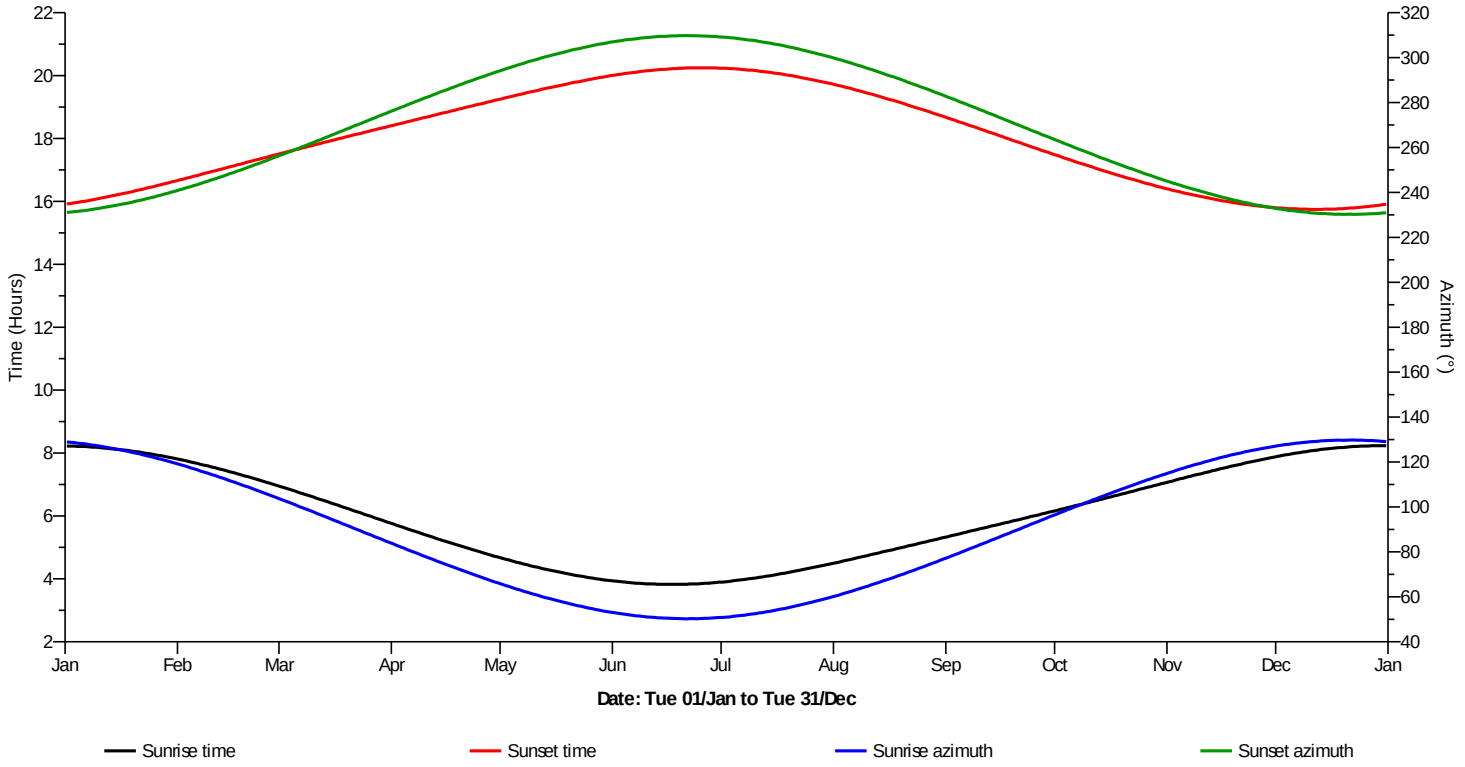
8.3. Overshadowing

No existing amenity areas/gardens/open spaces have been identified on the drawings and/or site plan.

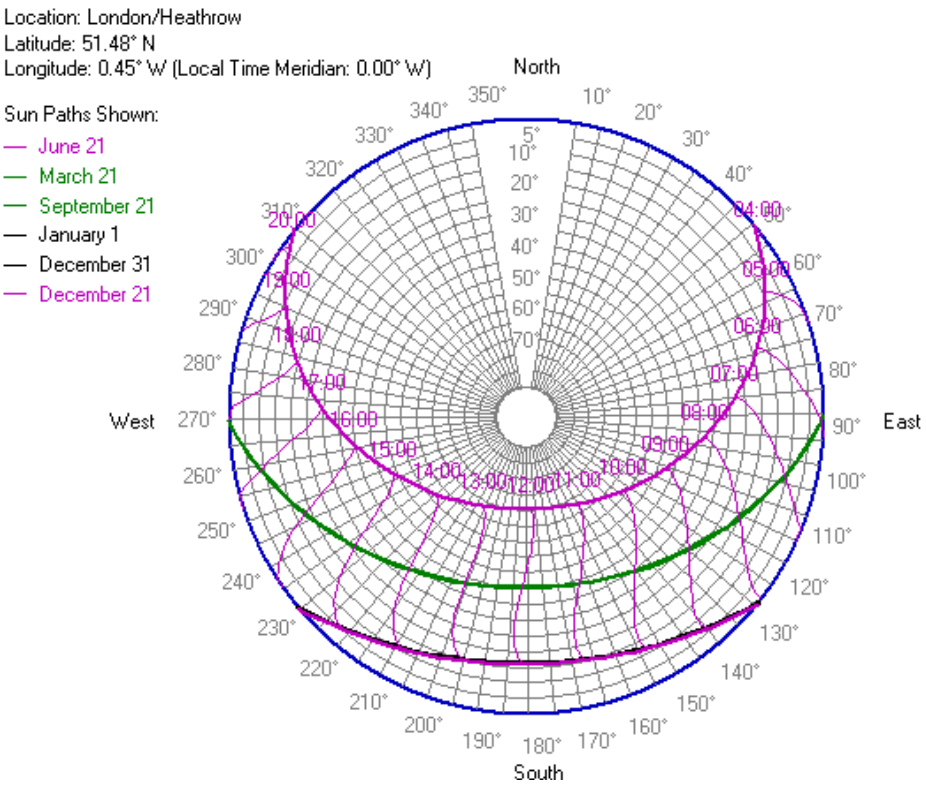
↳ **It can be concluded that the proposed scheme is acceptable.**

9. Appendix

9.1. Sunrise and sunset time

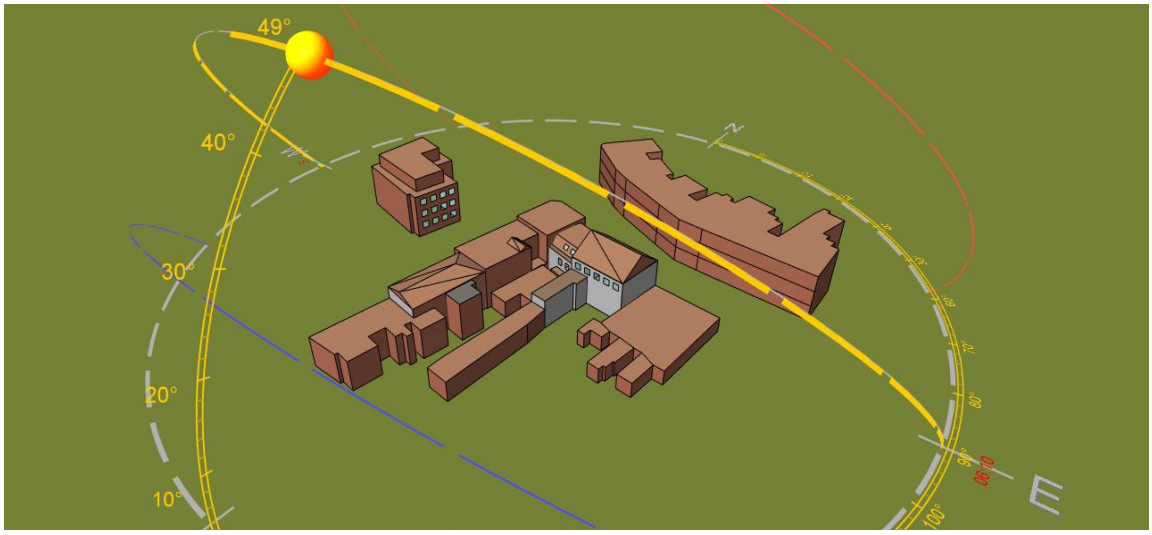


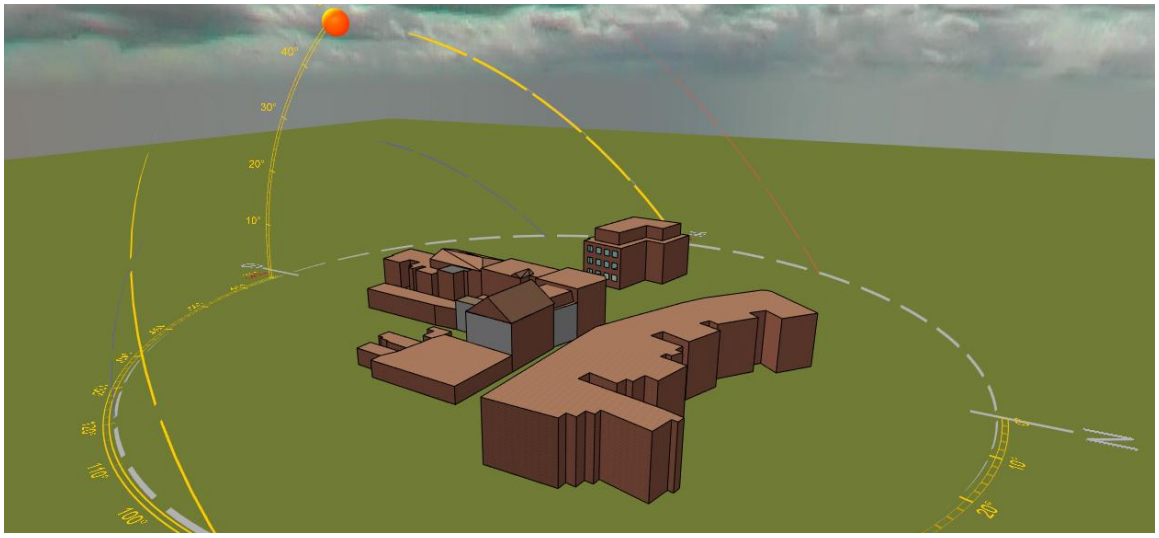
9.2. Sun path



9.3. Suntrace

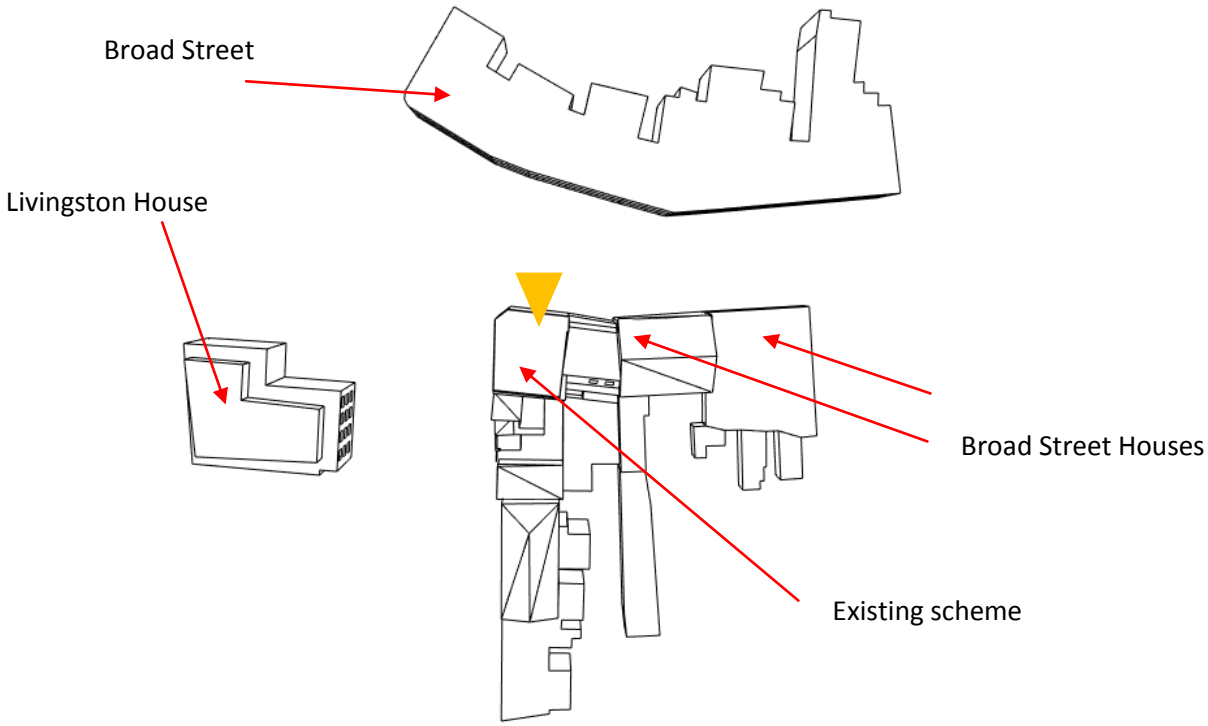
- The red line represents the sun's path during June.
- The yellow line represents the sun's path during March/September.
- The blue line represents the sun's path during December.



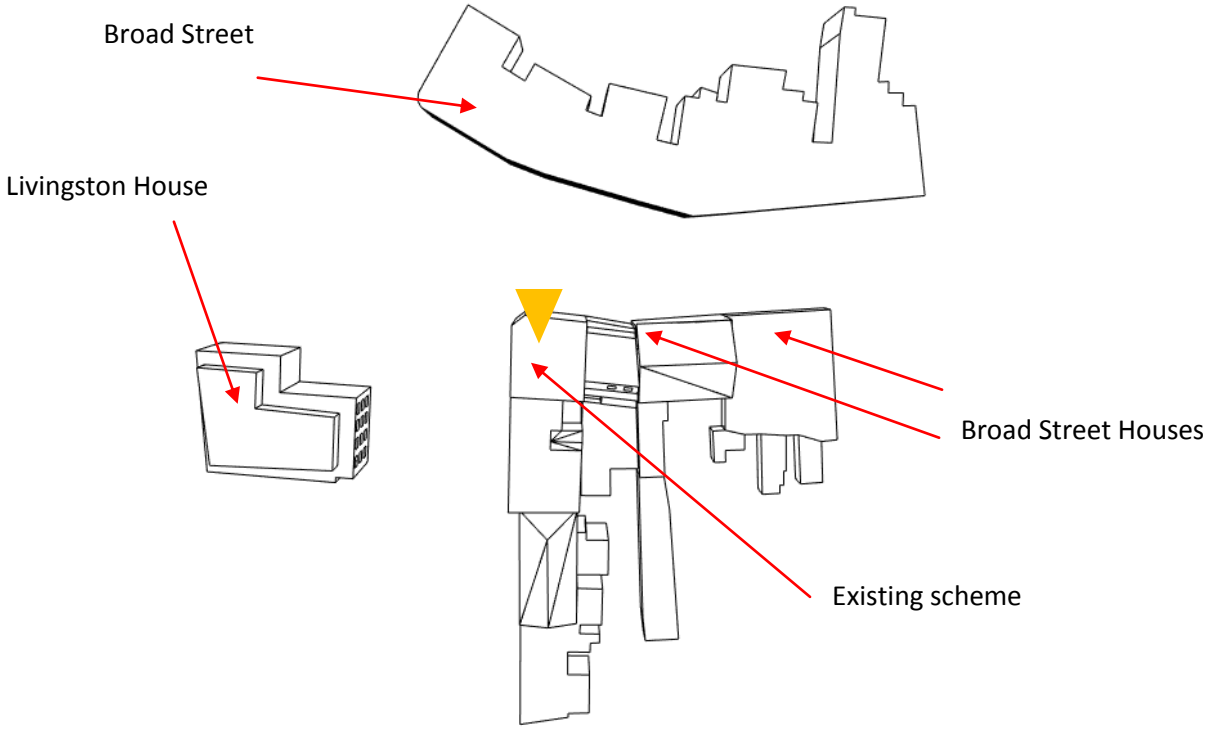


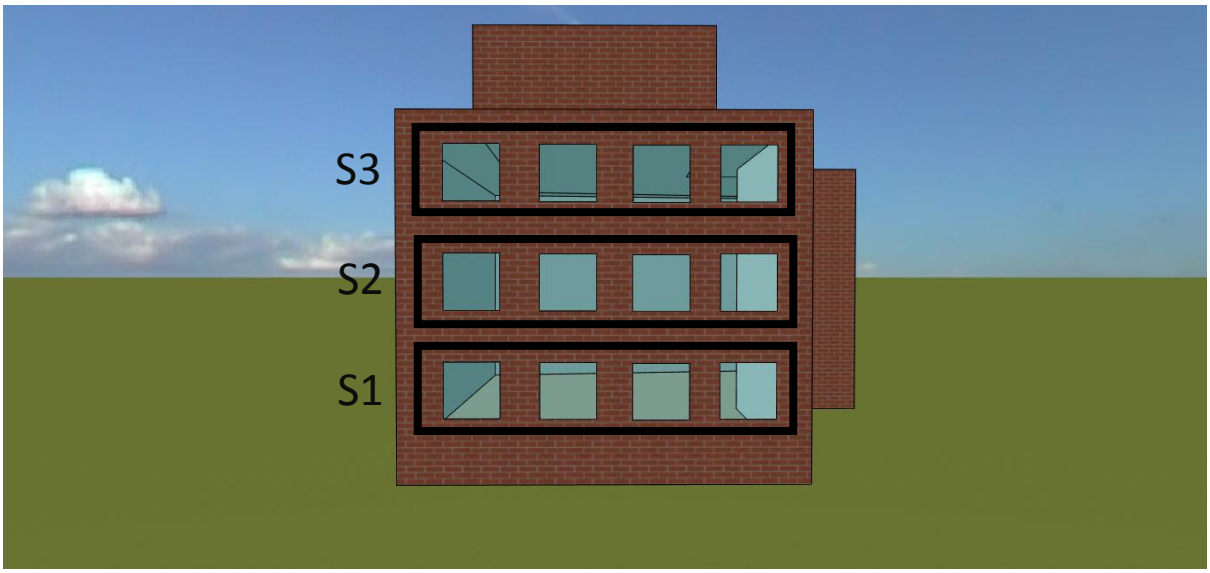
9.4. Site plan and location

9.4.1. Existing site layout



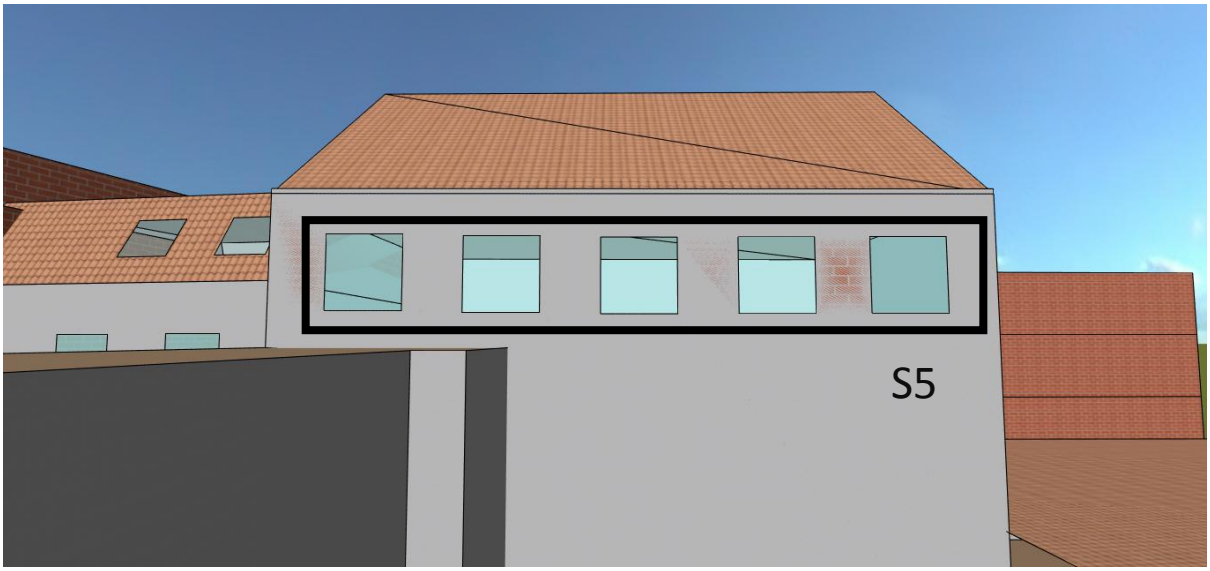
9.4.2. Proposed site layout



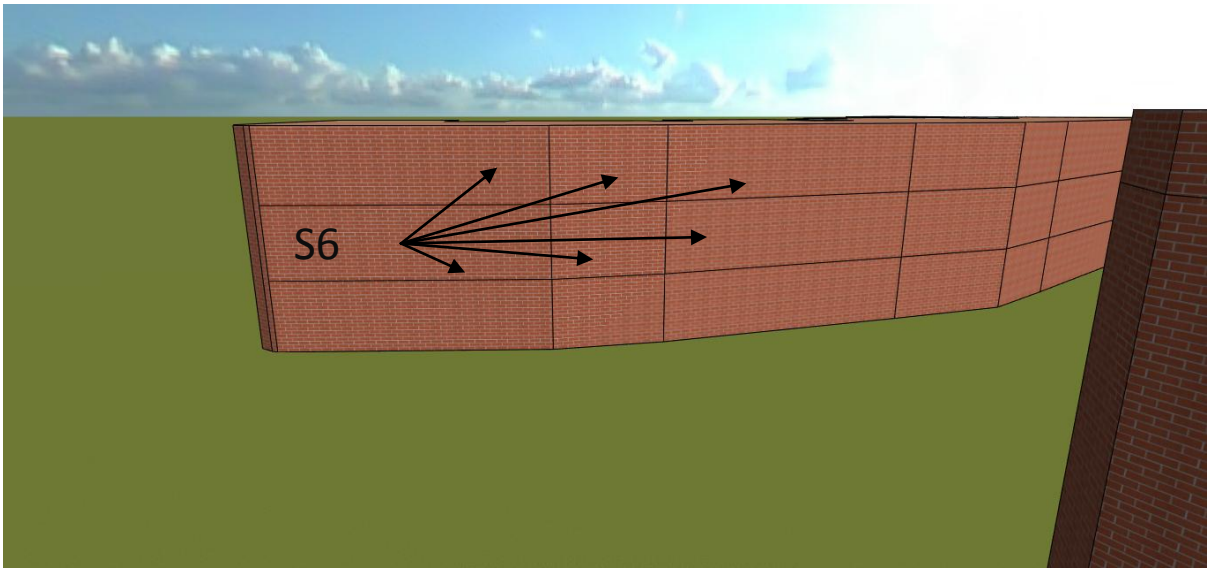


Livingstone House

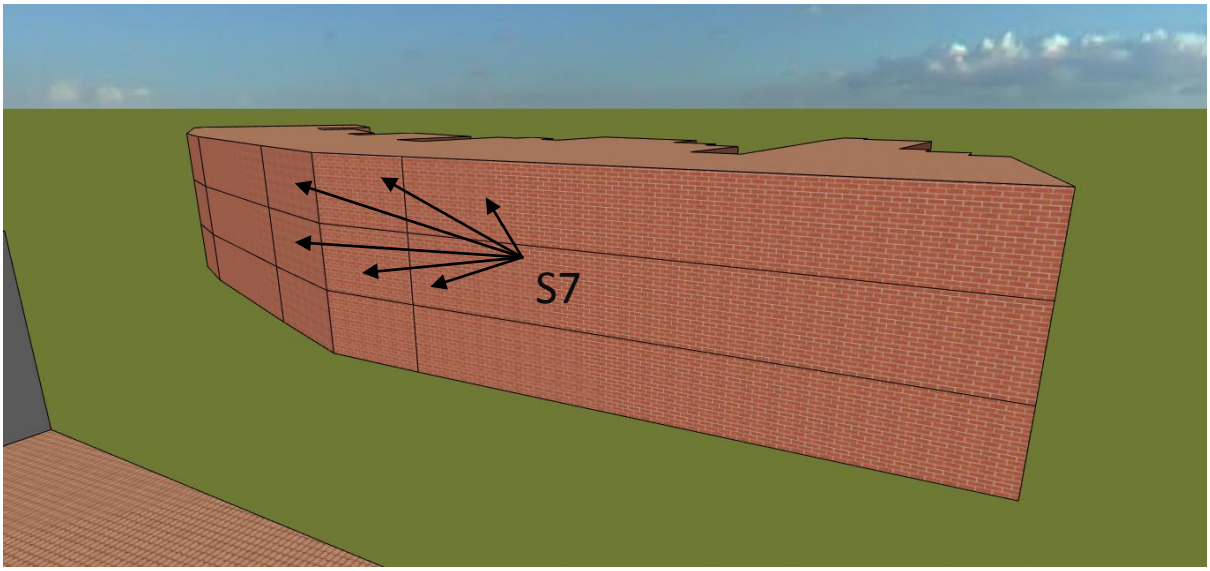
Broad Street - rear house



Broad Street - rear house



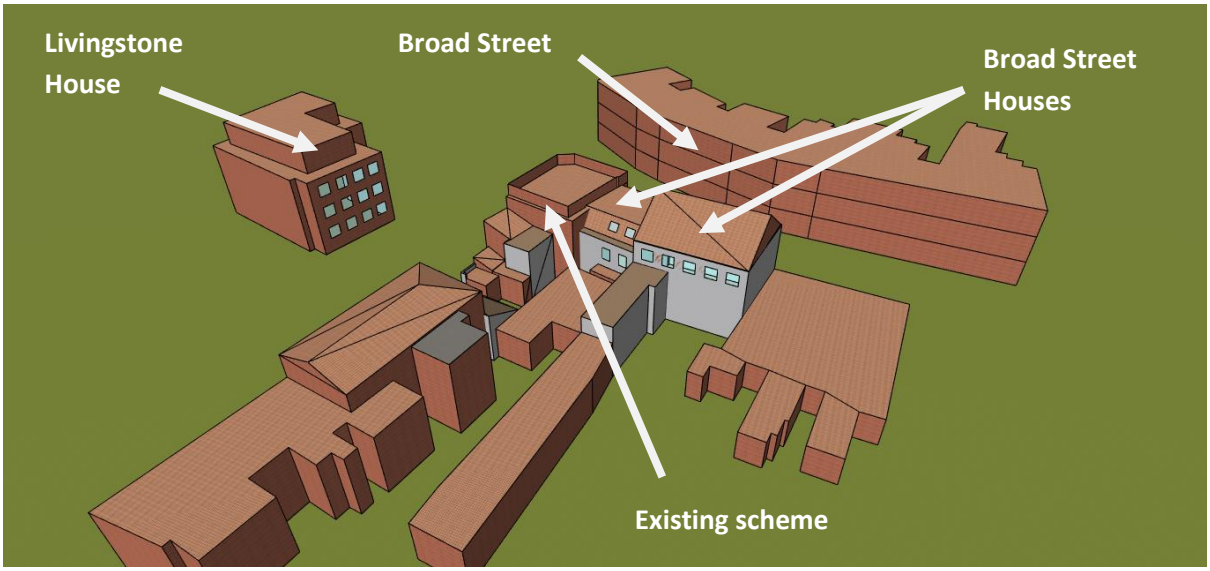
Broad Street



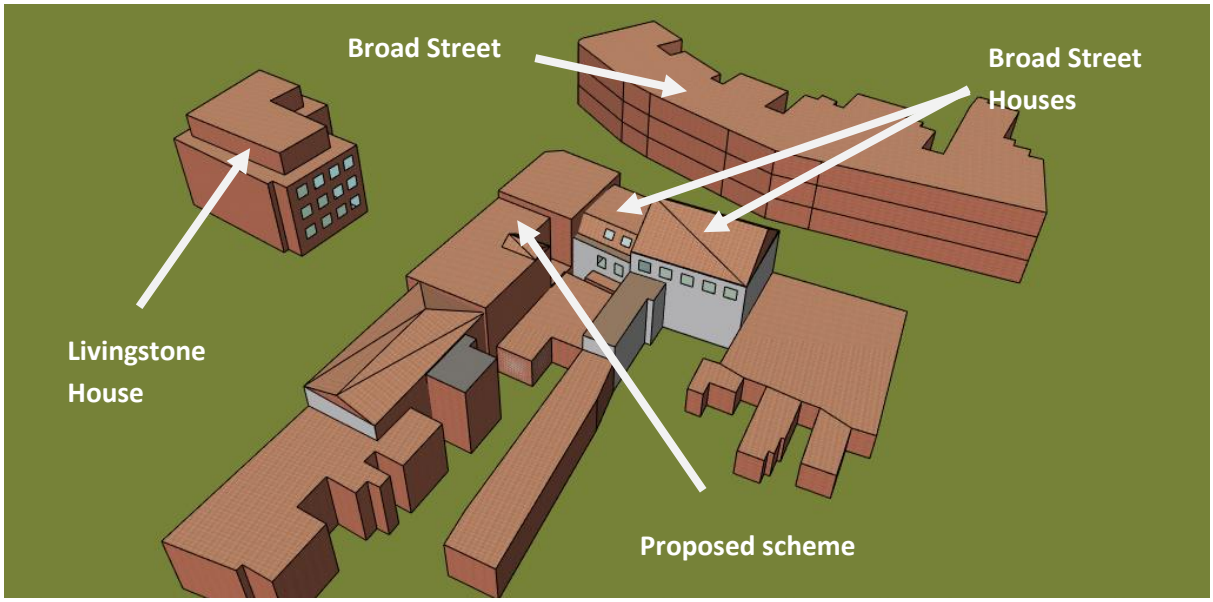
Broad Street

Location	2 Broad Street, Teddington TW11 8RF
Latitude (°)	51.42 N
Longitude (°)	0.34 W

9.5. Model images



Existing scheme

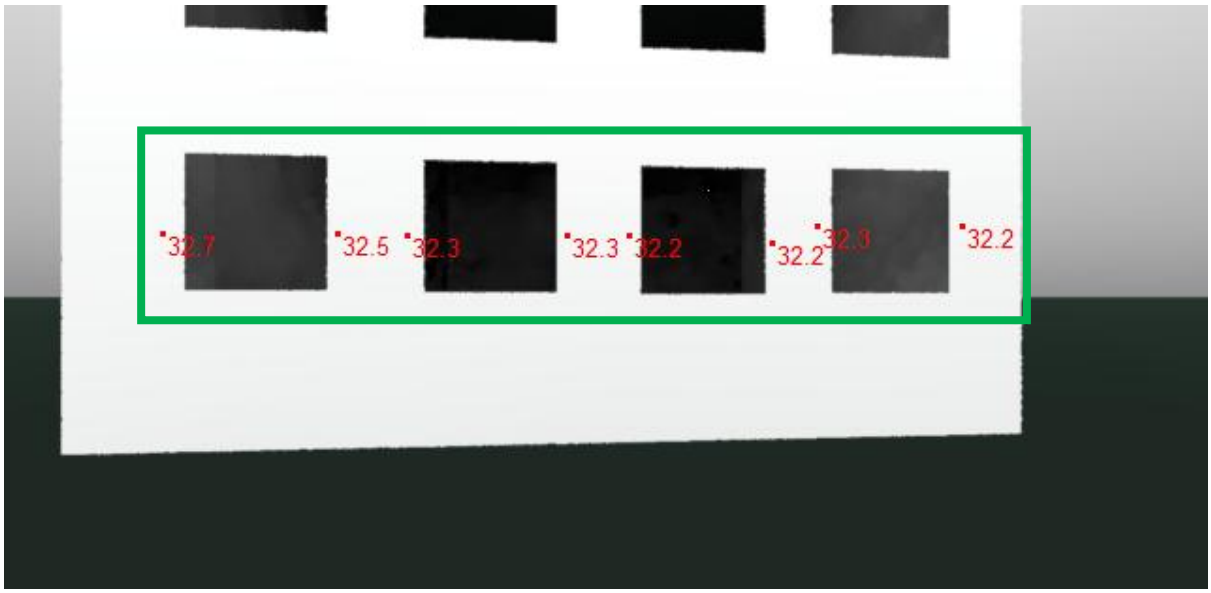


Proposed scheme

9.6. Daylight results

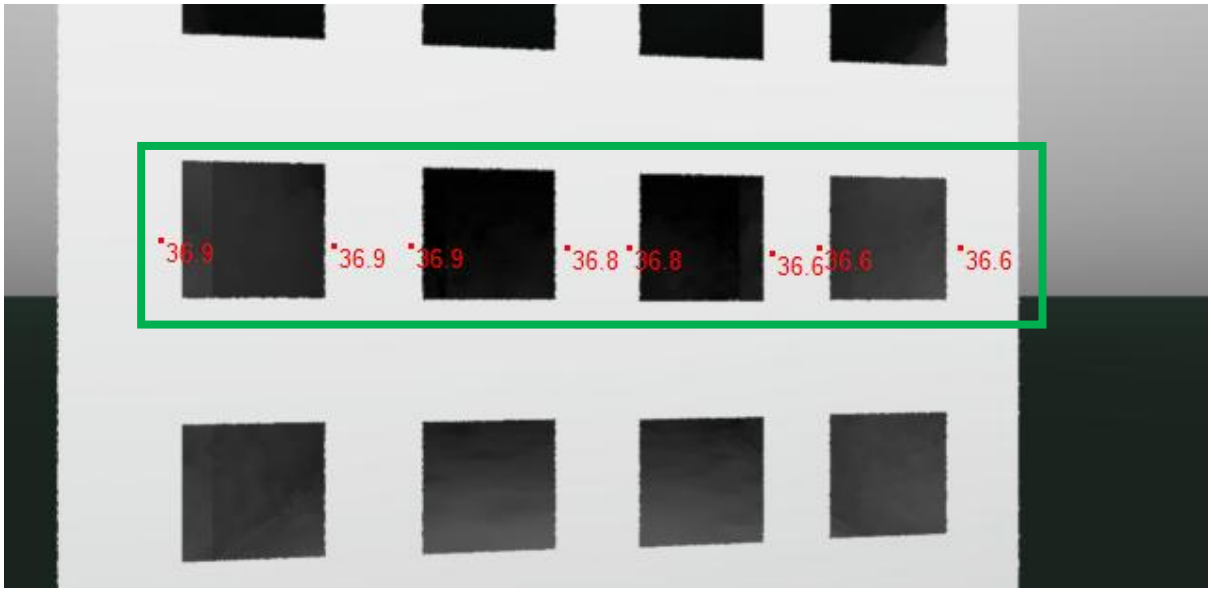
Surface 1 - Livingstone House - Ground Floor

	Existing Sample of VSC								Average
S1	34.50	34.40	34.20	34.20	34.10	33.70	33.90	33.60	34.08

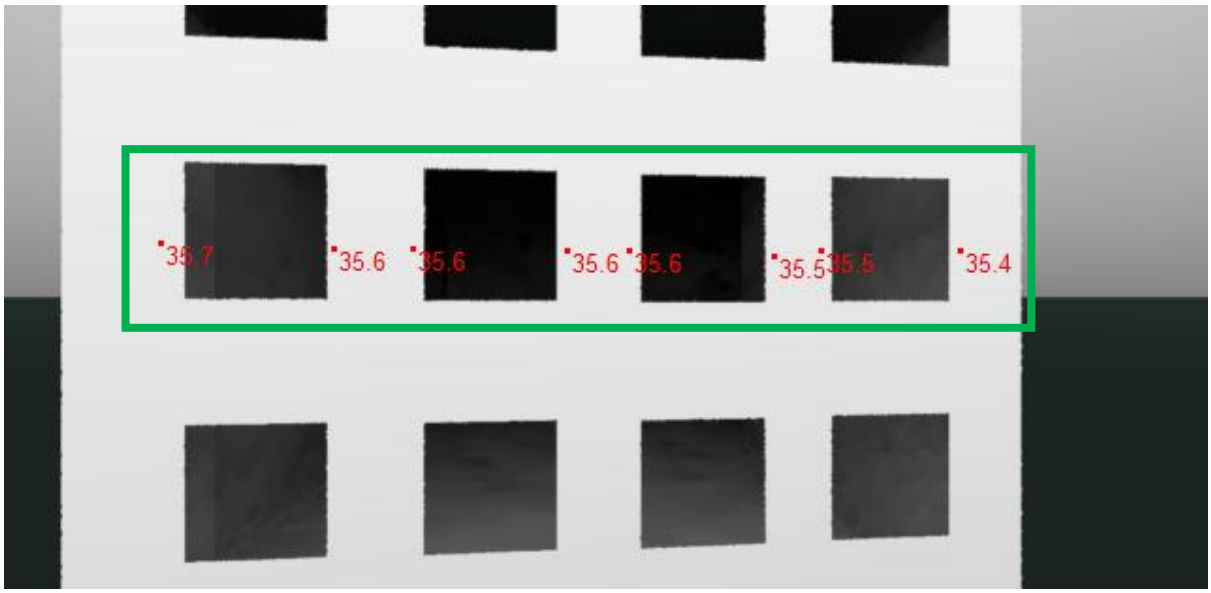


	Proposed Sample of VSC								Average
S1	32.70	32.50	32.30	32.30	32.20	32.20	32.30	32.20	32.34

Surface 2 - Livingstone House - First Floor



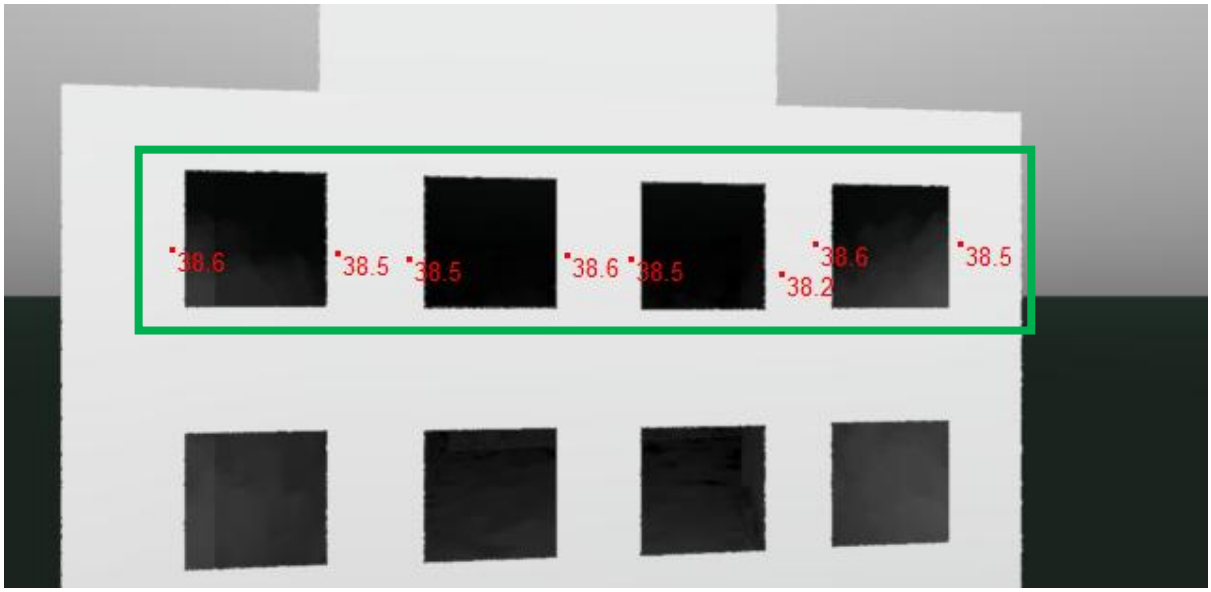
	Existing Sample of VSC								Average
S2	36.90	36.90	36.90	36.80	36.80	36.60	36.60	36.60	36.76



	Proposed Sample of VSC								Average
S2	35.70	35.60	35.60	35.60	35.60	35.50	35.50	35.40	35.56

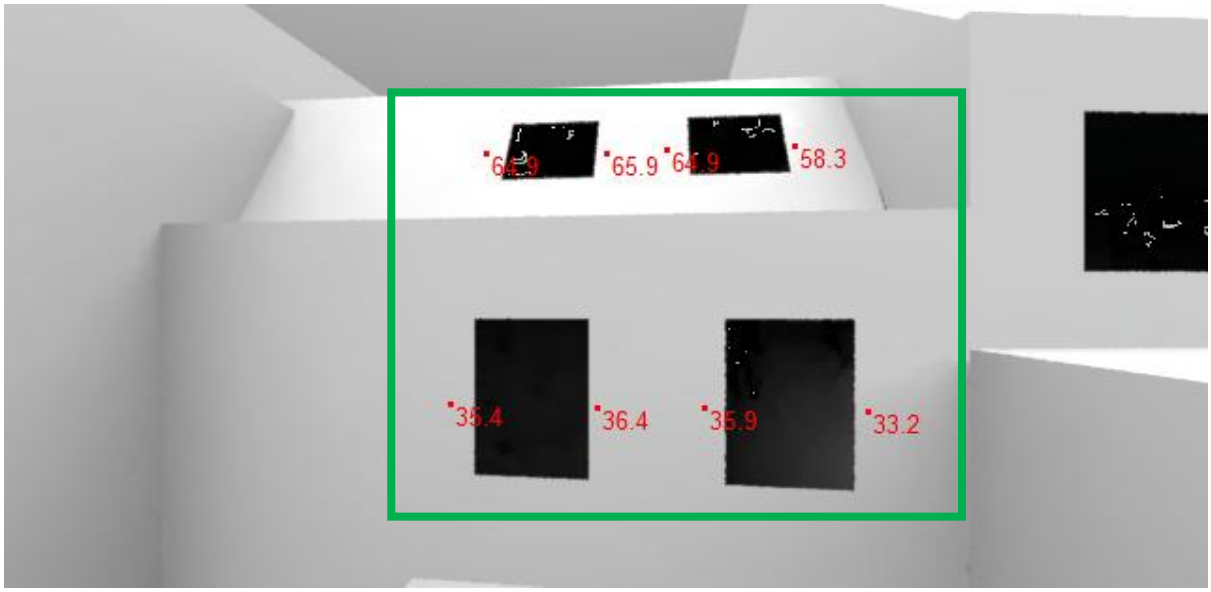
Surface 3 - Livingstone House - Second Floor

	Existing Sample of VSC								Average
S3	38.80	38.90	38.70	38.70	38.70	38.60	38.80	38.80	38.75

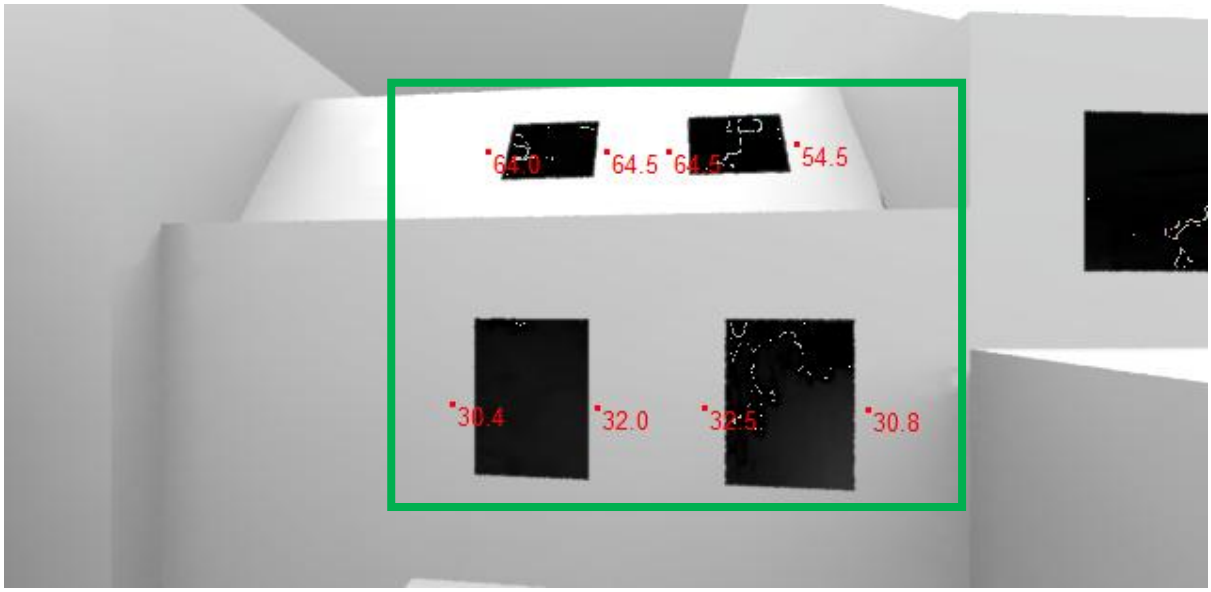


	Proposed Sample of VSC								Average
S3	38.60	38.50	38.50	38.60	38.50	38.20	38.60	38.50	38.50

Surface 4 - Broad Street - Rear house

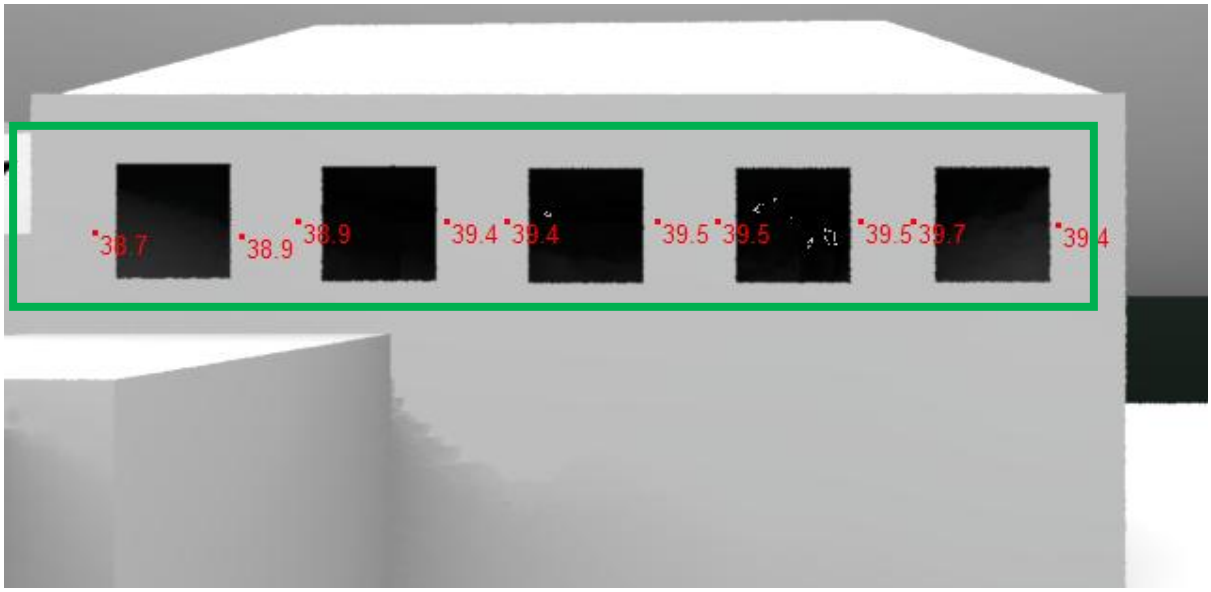


	Existing Sample of VSC								Average
S4	35.40	36.40	35.90	33.20	64.90	65.90	64.90	58.30	49.36

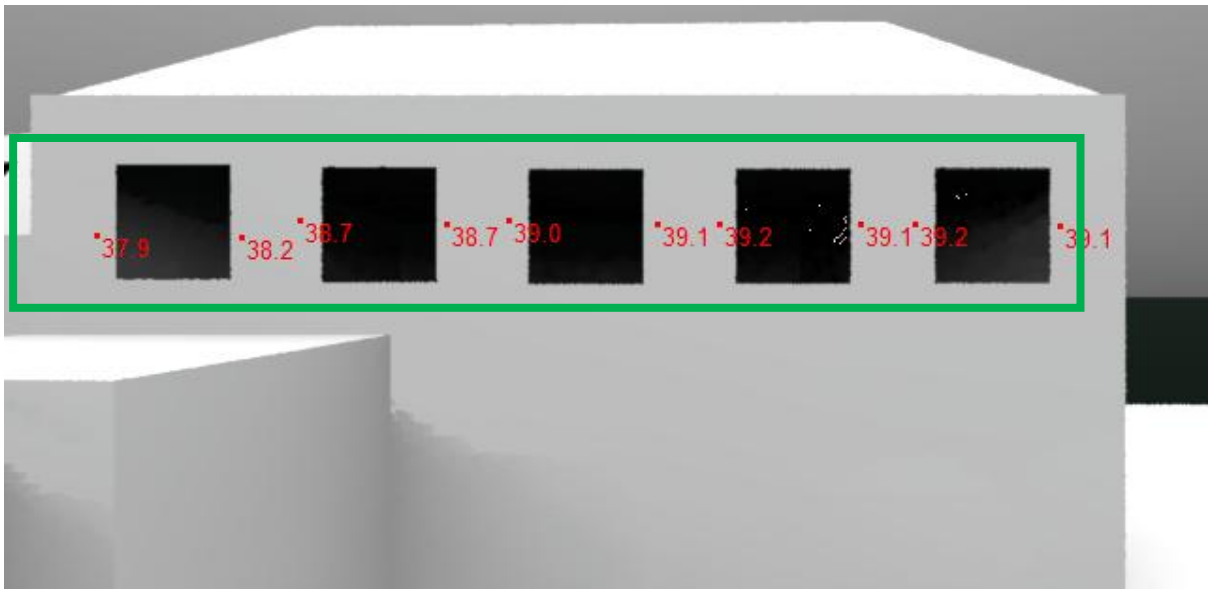


	Proposed Sample of VSC								Average
S4	30.40	32.00	32.50	30.80	64.00	64.50	64.50	54.50	46.65

Surface 5 - Broad Street - Rear house

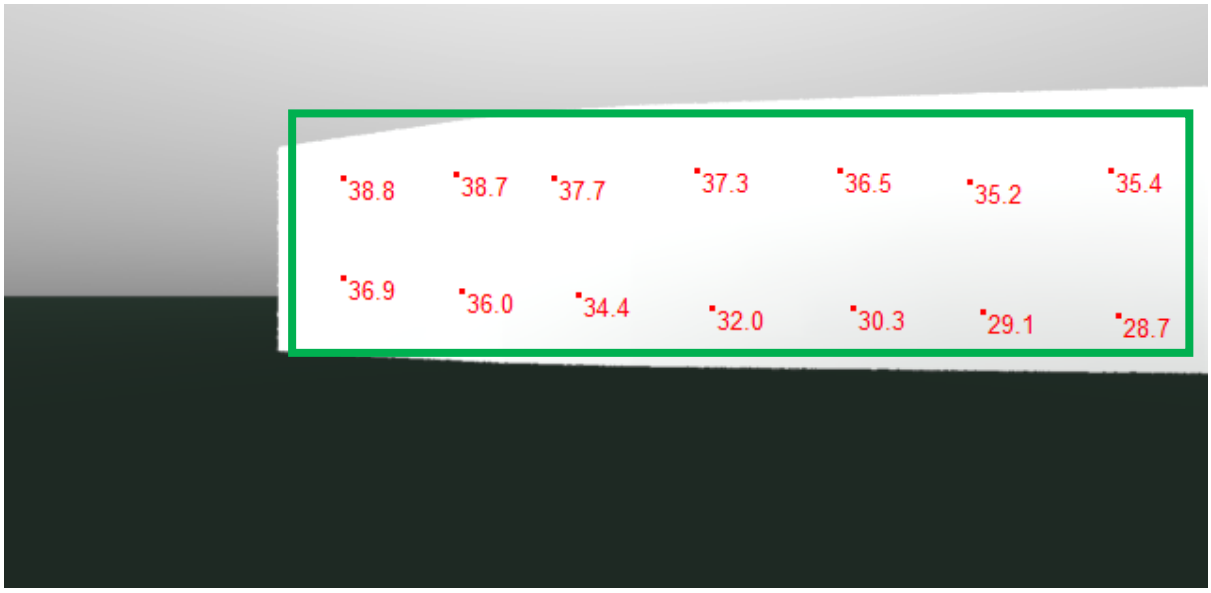


	Existing Sample of VSC										Average
S5	38.70	38.90	38.90	39.40	39.40	39.50	39.50	39.50	39.70	39.40	39.29

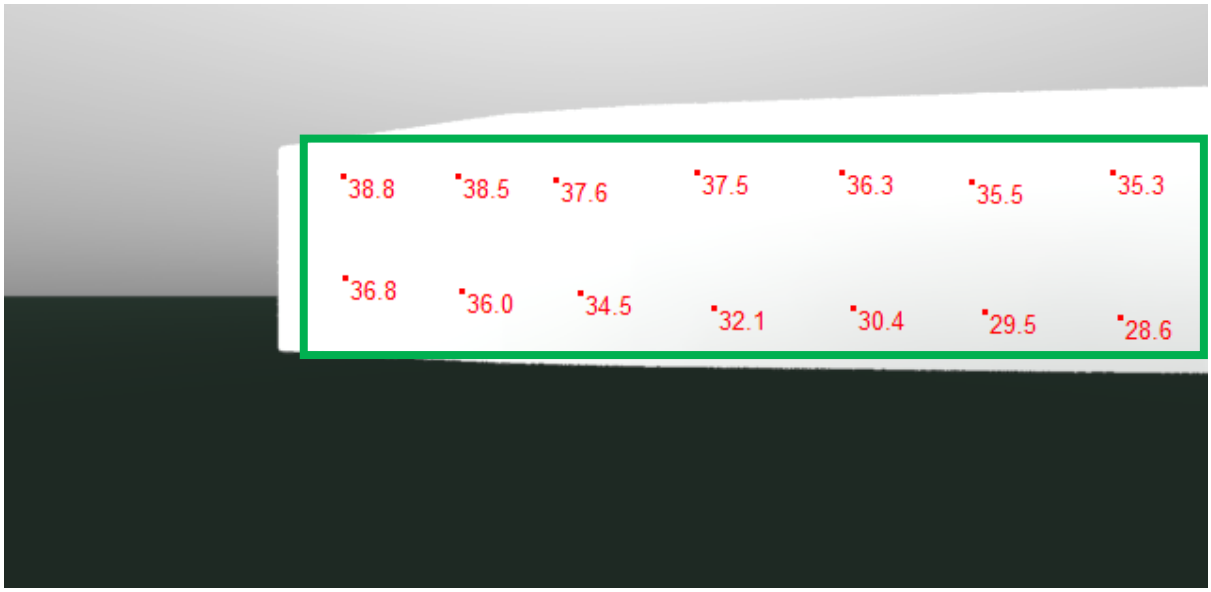


	Proposed Sample of VSC										Average
S5	37.90	38.20	38.70	38.70	39.00	39.10	39.20	39.10	39.20	39.10	38.82

Surface 6 - Broad Street

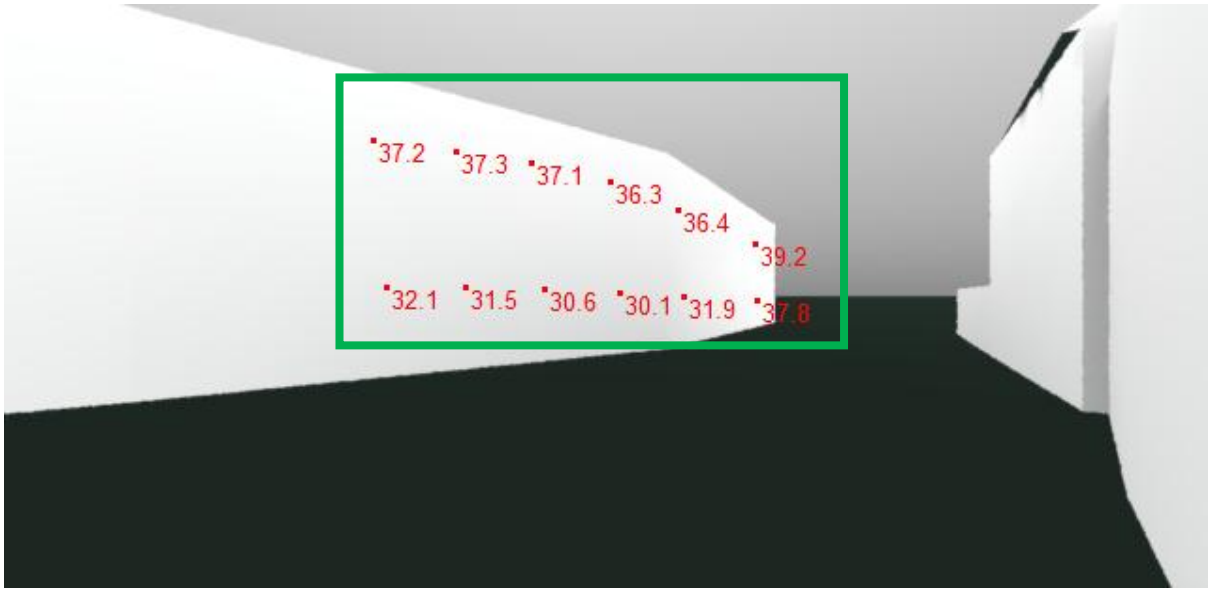


	Existing														
	Sample of VSC														Average
S6	38.8	38.7	37.7	37.3	36.5	35.2	35.4	36.9	36.0	34.4	32.0	30.3	29.1	28.7	34.79

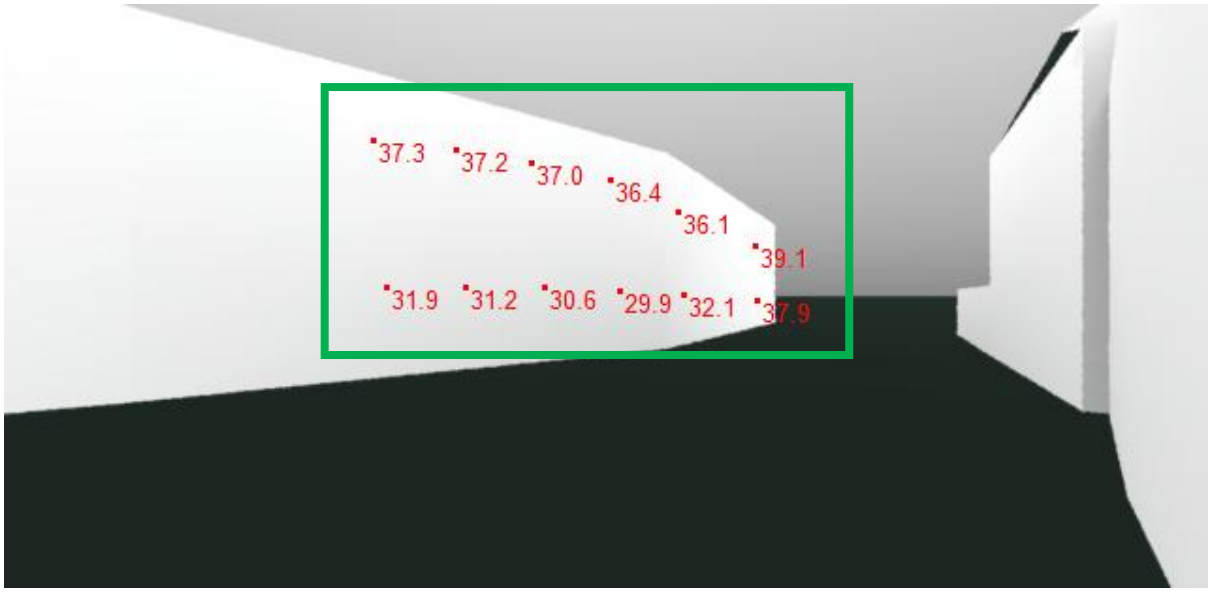


	Proposed														
	Sample of VSC														Average
S6	38.8	38.5	37.6	37.5	36.3	35.5	35.3	36.8	36.0	34.5	32.1	30.4	29.5	28.6	34.81

Surface 7 - Broad Street



	Existing												
	Sample of VSC												Average
S7	37.2	37.3	37.1	36.3	36.4	39.2	32.1	31.5	30.6	30.1	31.9	37.8	34.79



	Proposed												
	Sample of VSC												Average
S7	37.3	37.2	37.0	36.4	36.1	39.1	31.9	31.2	30.6	29.9	32.1	37.9	34.73

9.7. Sunlight results

Surface 1 - Livingstone House - Ground Floor

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00				
Feb					50.00	69.38	100.00	100.00	100.00	100.10	0.00	0.00	0.00	0.00			
Mar				50.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Apr		0.00	0.00	80.38	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
May		0.00	0.50	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jun	0.00	35.83	3.50	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul		0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aug			0.00	75.63	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sep			0.00	72.63	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Oct				6.05	18.30	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00				
Nov					0.00	0.00	100.00	100.00	100.00	0.00	0.00	0.00					
Dec						0.00	92.73	100.00	100.00	0.00	0.00	0.00					

Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						86.23	100.00	100.00	100.00	100.20	0.00	0.00	0.00				
Feb					0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Mar				0.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Apr			0.00	64.70	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
May		0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jun		0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jul		0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aug			0.00	46.60	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Sep			0.00	0.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Oct				0.00	54.38	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00				
Nov					0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00					
Dec						85.50	100.00	100.00	100.00	0.00	0.00	0.00					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
42.64	41.64	0.97	45.21	43.05

Surface 2 - Livingstone House - First Floor

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						5.93	100.00	100.00	100.00	100.00	0.00	0.00	0.00				
Feb					66.03	100.00	100.00	100.00	100.00	100.10	0.00	0.00	0.00	0.00			
Mar				91.98	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Apr		0.00	8.83	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
May		26.83	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jun	0.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul		42.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aug			0.88	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sep			3.90	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Oct				80.98	98.13	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00				
Nov					0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00					
Dec						0.00	100.00	100.00	100.00	0.00	0.00	0.00					

Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	100.00	100.00	100.20	0.00	0.00	0.00				
Feb					94.55	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Mar				23.65	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Apr		0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
May		0.00	92.55	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jun	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul		0.00	52.98	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aug			0.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sep			0.00	99.40	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Oct				0.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00				
Nov					63.33	100.00	100.00	100.00	100.00	0.00	0.00	0.00					
Dec						100.00	100.00	100.00	100.00	0.00	0.00	0.00					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
48.42	46.39	0.95	51.69	47.24

Surface 3 - Livingstone House - Second Floor

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00				
Feb					100.00	100.00	100.00	100.00	100.00	100.10	0.00	0.00	0.00	0.00			
Mar				100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Apr		0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
May		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jun	2.63	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul		87.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aug			100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sep			41.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Oct				99.48	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00				
Nov					47.73	100.00	100.00	100.00	100.00	0.00	0.00	0.00					
Dec						100.00	100.00	100.00	100.00	0.00	0.00	0.00					

Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	100.00	100.00	100.20	0.00	0.00	0.00				
Feb					100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Mar				100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
Apr		0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00		
May		26.95	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Jun	0.00	73.53	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul		0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aug			97.18	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sep			3.93	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00			
Oct				100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00				
Nov					100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00					
Dec						100.00	100.00	100.00	100.00	0.00	0.00	0.00					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
53.37	51.81	0.97	57.22	54.27

Surface 4 - Broad Street - Rear house

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						47.00	76.63	96.50	100.00	100.00	100.00	57.45	75.00				
Feb					19.40	60.30	82.15	99.35	100.00	100.00	100.00	100.00	100.00	56.63			
Mar				0.00	41.40	68.50	91.98	100.00	100.00	100.00	100.00	100.00	100.00	71.05	0.00		
Apr		0.00	0.00	0.00	66.45	80.90	98.20	100.00	100.00	100.00	100.00	100.00	99.95	58.00	0.00		
May		0.00	0.00	0.00	25.00	86.28	99.65	100.00	100.00	100.00	100.00	100.00	100.00	57.23	0.90	0.00	
Jun	0.00	0.00	0.00	0.00	25.00	86.28	99.50	100.00	100.00	100.00	100.00	100.00	100.00	53.33	11.75	0.00	0.00
Jul		0.00	0.00	0.00	24.95	83.30	98.53	100.00	100.00	100.00	100.00	100.00	100.00	62.70	5.93	0.00	
Aug			0.00	0.00	65.03	79.45	97.45	100.00	100.00	100.00	100.00	100.00	100.00	64.25	0.00	0.00	
Sep			0.00	0.00	58.93	75.08	96.53	100.00	100.00	100.00	100.00	100.00	99.85	53.50			
Oct				11.63	42.00	68.48	93.33	100.00	100.00	100.00	100.00	100.00	88.85				
Nov					26.88	55.00	85.78	99.13	100.00	100.00	95.93	50.00					
Dec						44.80	78.40	96.03	100.00	100.00	89.80	50.00					

Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						61.90	86.55	99.85	100.00	100.00	100.00	70.18	28.18				
Feb					28.83	65.90	90.03	100.00	100.00	100.00	100.00	75.40	50.00	35.30			
Mar				0.00	49.00	73.08	94.95	100.00	100.00	100.00	100.00	96.88	70.75	28.60	0.00		
Apr		0.00	0.00	0.00	23.05	81.85	98.63	100.00	100.00	100.00	100.00	100.00	96.95	28.68	0.00		
May		0.00	0.00	0.00	24.88	35.65	99.55	100.00	100.00	100.00	100.00	100.00	100.00	55.40	1.00	0.00	
Jun	0.00	0.00	0.00	0.00	24.40	34.73	99.23	100.00	100.00	100.00	100.00	100.00	100.00	66.15	9.98	0.00	0.00
Jul		0.00	0.00	0.00	21.95	32.55	98.25	100.00	100.00	100.00	100.00	100.00	100.00	69.93	6.48	0.00	
Aug			0.00	0.00	21.10	80.35	97.95	100.00	100.00	100.00	100.00	100.00	98.78	34.30	0.00	0.00	
Sep			0.00	0.00	63.50	80.18	98.63	100.00	100.00	100.00	100.00	94.83	59.65	25.08			
Oct				18.15	60.25	77.83	98.35	100.00	100.00	100.00	97.48	61.98	50.00				
Nov					46.68	70.90	95.00	100.00	100.00	100.00	95.50	50.98					
Dec						63.20	89.23	99.95	100.00	100.00	99.25	52.53					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
67.84	63.84	0.94	78.53	70.38

Surface 5 - Broad Street - Rear house

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00				
Feb					100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	86.14			
Mar				100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00		
Apr		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00		
May		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Jun	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Jul		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Aug			0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Sep			0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00			
Oct				100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00				
Nov					100.00	100.00	100.00	100.00	100.00	100.00	100.00	94.42					
Dec						100.00	100.00	100.00	100.00	100.00	100.00	84.10					

Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00				
Feb					100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	92.96	0.00			
Mar				100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	73.94	0.00	0.00		
Apr		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	72.06	0.00		
May		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.44	0.00	0.00	
Jun	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
Jul		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Aug			0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	77.38	0.00	0.00	
Sep			0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	58.16	0.00			
Oct				100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.76				
Nov					100.00	100.00	100.00	100.00	100.00	100.00	100.00	92.64					
Dec						100.00	100.00	100.00	100.00	100.00	100.00	84.10					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
80.03	76.81	0.96	95.72	90.90

Surface 6 - Broad Street

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						72.78	51.85	58.52	60.23	72.03	84.03	63.62	8.43				
Feb					33.33	100.00	99.87	97.27	95.85	91.32	88.10	93.12	57.07	42.55			
Mar				0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	99.48	100.00	95.53	100.00		
Apr		0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
May		0.00	0.00	0.00	0.00	33.37	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.97	
Jun	0.00	0.00	0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	66.67	33.33
Jul		0.00	0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Aug			0.00	0.00	0.00	66.70	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Sep			0.00	0.00	33.33	99.97	100.00	100.00	100.00	100.00	100.00	99.73	100.00	98.63			
Oct				0.00	66.67	100.00	96.33	96.10	91.82	88.72	89.63	70.75	46.98				
Nov					51.82	59.68	54.70	56.08	63.15	78.95	78.28	41.57					
Dec						42.82	47.12	49.57	59.18	74.92	76.80	40.45					

Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	99.78	99.82	99.17	92.35	92.35	54.58				
Feb					33.33	66.67	100.00	100.00	100.00	100.00	100.00	98.98	100.00	69.58			
Mar				0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
Apr		0.00	0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
May		0.00	0.00	0.00	0.00	0.00	33.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	66.67	
Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	66.67	0.00
Jul		0.00	0.00	0.00	0.00	0.00	33.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Aug			0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	
Sep			0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00			
Oct				0.00	66.67	100.00	100.00	100.00	100.00	100.00	99.97	98.75	66.60				
Nov					66.67	100.00	99.45	99.72	99.52	96.20	90.30	77.57					
Dec						84.77	89.50	94.85	95.27	89.88	87.12	75.60					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
72.28	71.31	0.98	74.07	81.44

Surface 7 - Broad Street

Existing

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						98.77	100.00	100.00	92.07	81.27	66.73	45.32	4.92				
Feb					100.00	100.00	100.00	100.00	94.72	82.62	72.73	61.57	48.80	5.60			
Mar				100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	84.27	66.87	100.00		
Apr		0.00	0.00	66.60	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00		
May		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Jun	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.20	0.00	0.00	0.00
Jul		0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Aug			0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	
Sep			0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.42	78.03	54.03			
Oct				100.00	100.00	100.00	100.00	99.53	87.93	77.23	67.58	53.67	29.73				
Nov					100.00	100.00	100.00	98.73	87.62	75.83	57.42	30.05					
Dec						94.30	99.63	100.00	87.65	72.50	52.13	26.00					

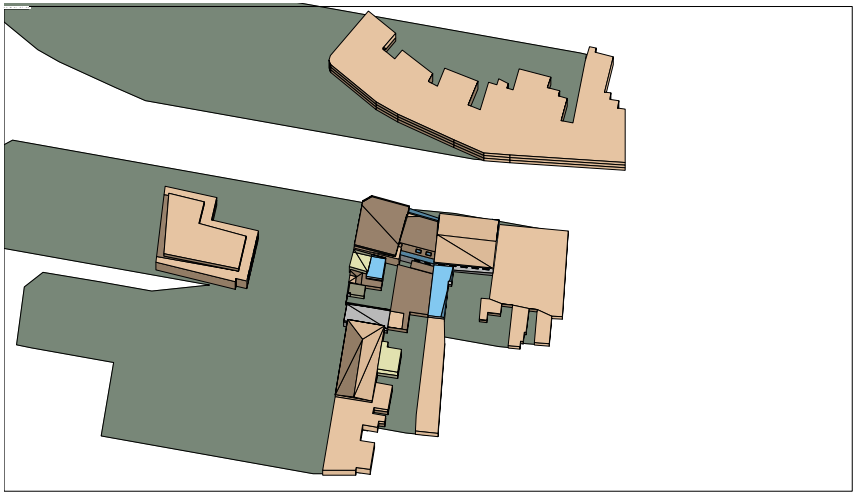
Proposed

Month	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Jan						100.00	100.00	97.77	91.58	81.63	71.08	56.73	46.60				
Feb					100.00	100.00	100.00	100.00	100.00	100.00	100.00	95.22	58.82	48.27			
Mar				66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.15	100.00		
Apr		0.00	0.00	0.00	66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	33.33		
May		0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	33.33	33.33	0.00	
Jun	0.00	0.00	0.00	0.00	0.00	66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	33.33	33.33	0.00	0.00
Jul		0.00	0.00	0.00	0.00	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	33.33	33.33	33.30	
Aug			0.00	0.00	66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	33.33	0.00	
Sep			0.00	66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	89.10			
Oct				80.00	100.00	100.00	100.00	100.00	100.00	100.00	99.75	75.20	53.10				
Nov					100.00	100.00	99.78	94.88	86.60	77.18	65.13	53.63					
Dec						100.00	99.88	89.55	78.03	67.75	63.05	55.07					

Sunlight assessment				
Total APSH (%)			Winter months APSH (%)	
Existing	Proposed	Ratio	Existing	Proposed
74.66	72.96	0.97	81.89	83.99

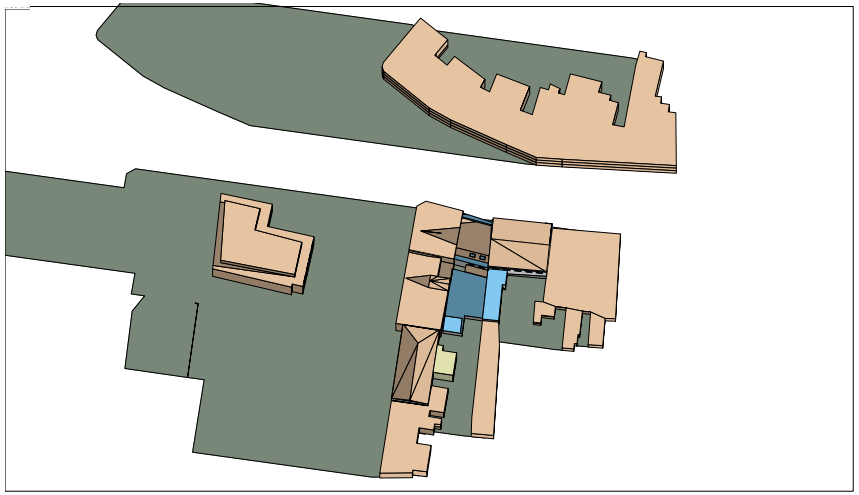
9.8. Overshadowing pictures

Suncast image:
View time = 22 Mar 07:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 100.26 alt = 8.05
Eye: azi = 180.00 alt = 80.50



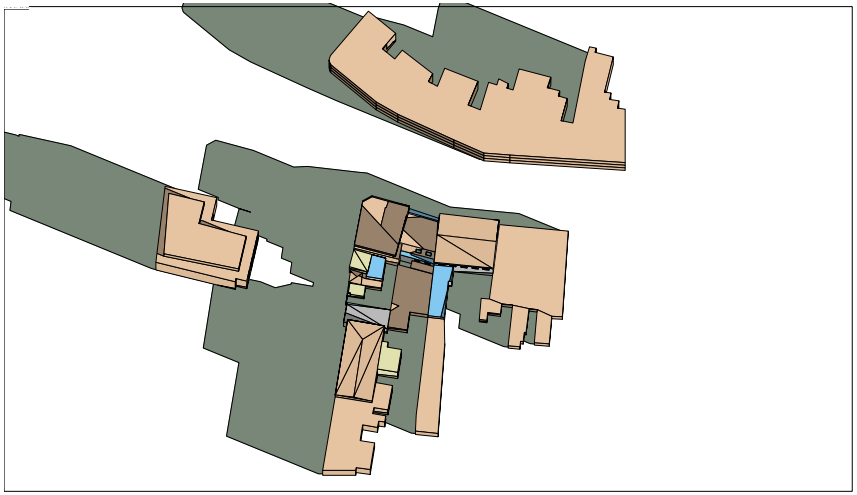
Existing

Suncast image:
View time = 21 Mar 07:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 98.60 alt = 9.47
Eye: azi = 180.56 alt = 80.56



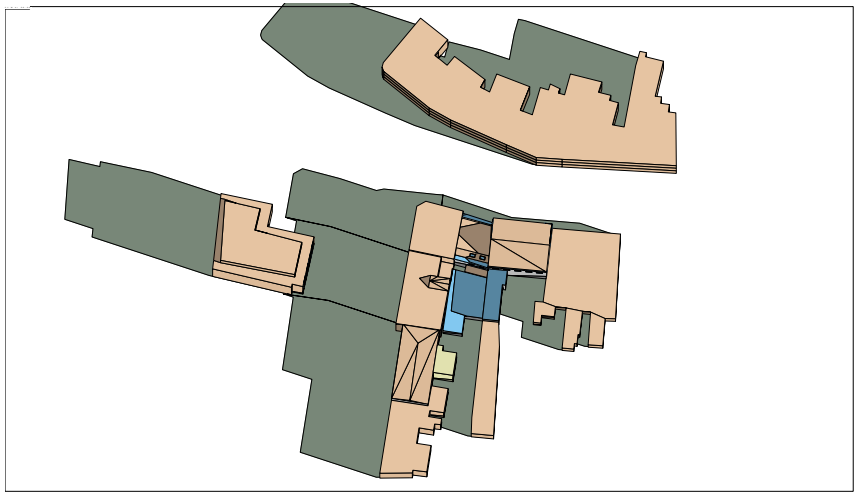
Proposed

Suncast image:
View time = 22 Mar 08:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 112.62 alt = 16.99
Eye: azi = 180.00 alt = 80.50



Existing

Suncast image:
View time = 21 Mar 08:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 109.01 alt = 20.61
Eye: azi = 180.56 alt = 80.56

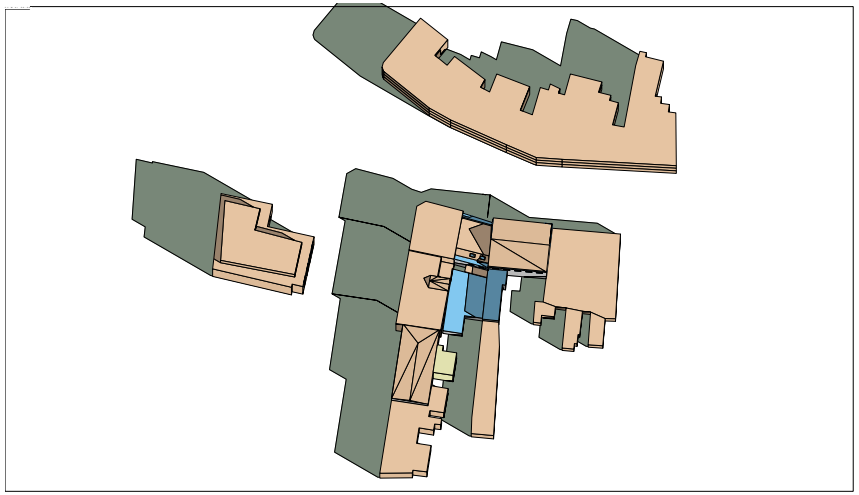


Proposed

Suncast image:
View time = 22 Mar 09:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 126.15 alt = 25.12
Eye: azi = 180.00 alt = 80.50

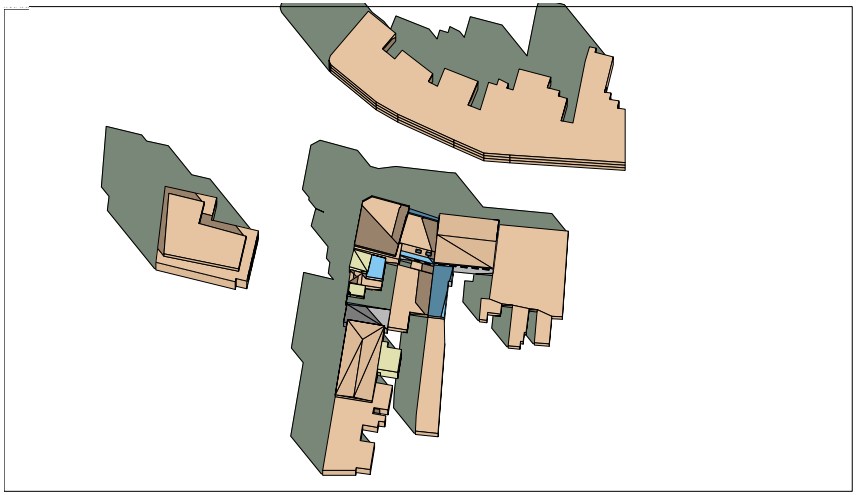
Existing

Suncast image:
View time = 21 Mar 09:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 121.05 alt = 31.02
Eye: azi = 180.56 alt = 80.56



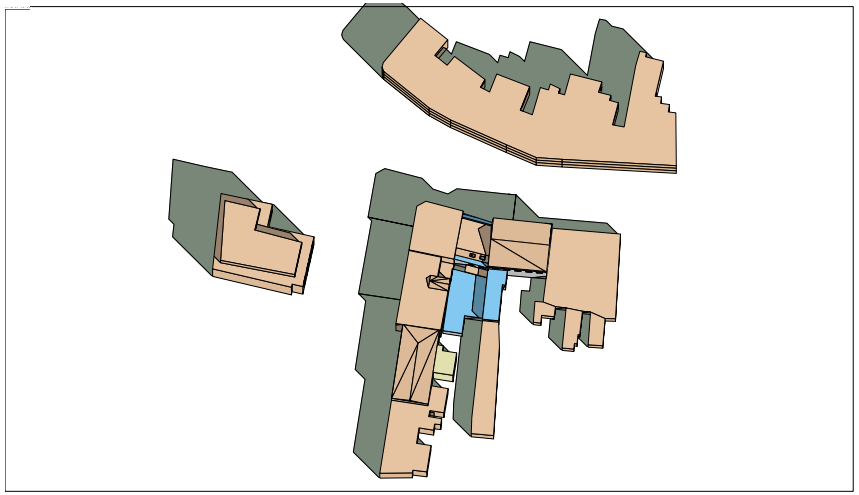
Proposed

Suncast image:
View time = 22 Mar 10:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 141.42 alt = 31.85
Eye: azi = 180.00 alt = 80.50



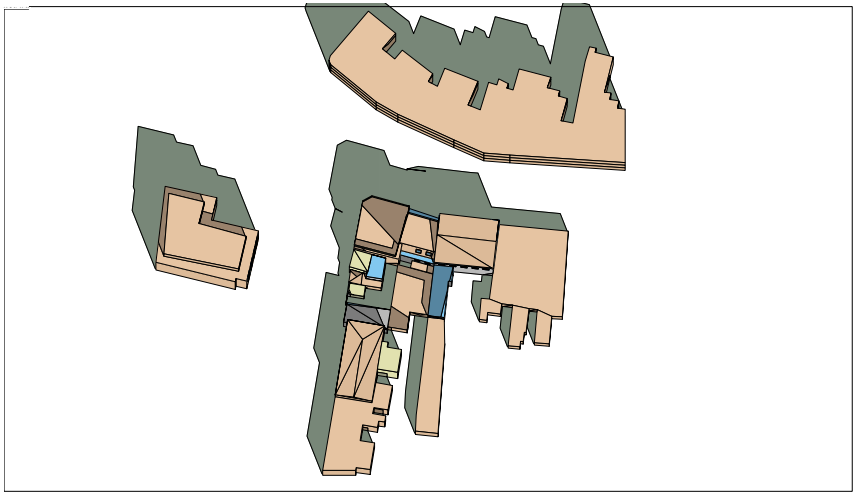
Existing

Suncast image:
View time = 21 Mar 10:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 135.83 alt = 40.03
Eye: azi = 180.56 alt = 80.56



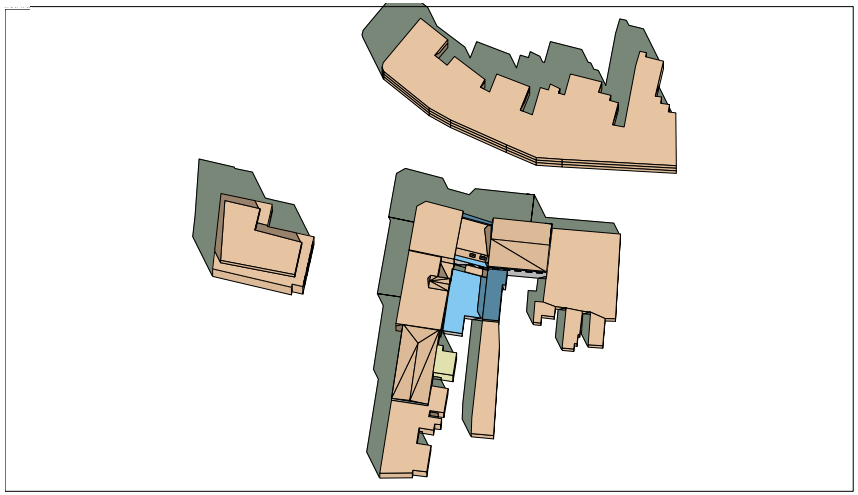
Proposed

Suncast image:
View time = 22 Mar 11:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 158.69 alt = 36.52
Eye: azi = 180.00 alt = 80.50



Existing

Suncast image:
View time = 21 Mar 11:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 154.43 alt = 46.62
Eye: azi = 180.56 alt = 80.56

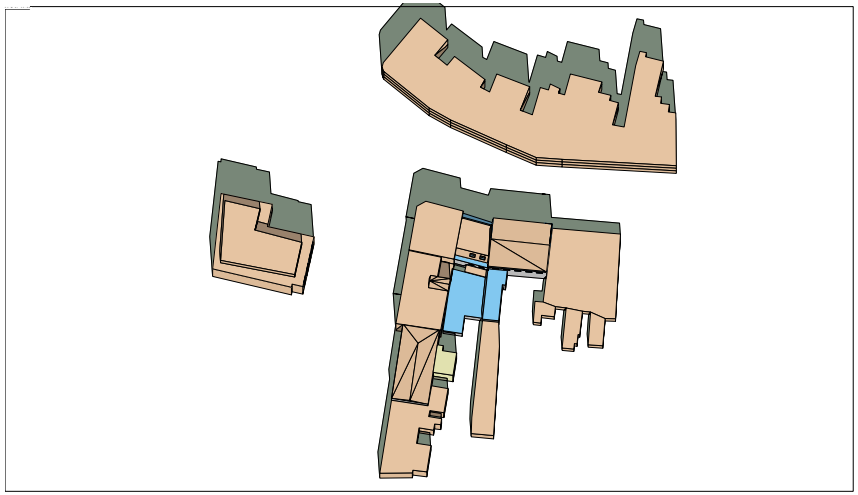


Proposed

Suncast image:
View time = 22 Mar 12:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 177.47 alt = 38.45
Eye: azi = 180.00 alt = 80.50

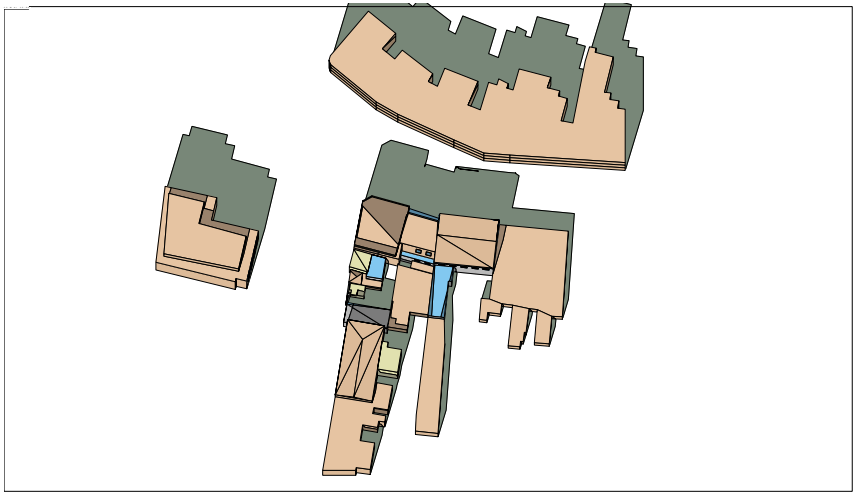
Existing

Suncast image:
View time = 21 Mar 12:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 176.54 alt = 49.52
Eye: azi = 180.56 alt = 80.56



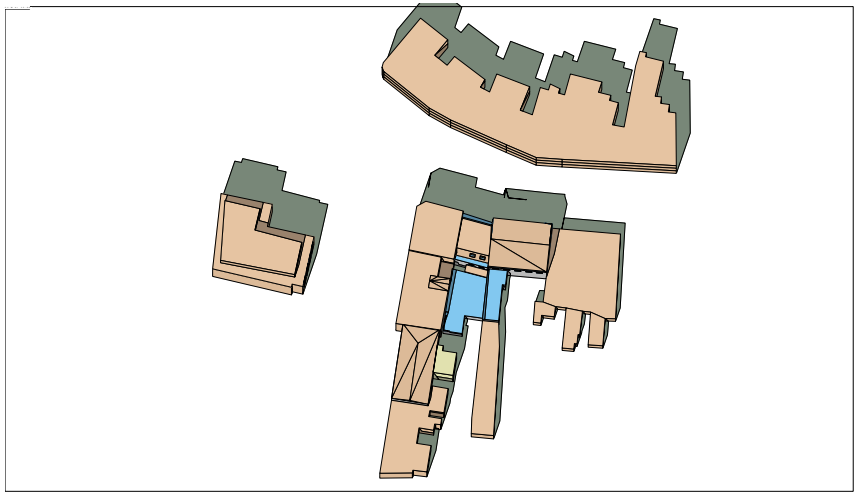
Proposed

Suncast image:
View time = 22 Mar 13:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 196.45 alt = 37.31
Eye: azi = 180.00 alt = 80.50



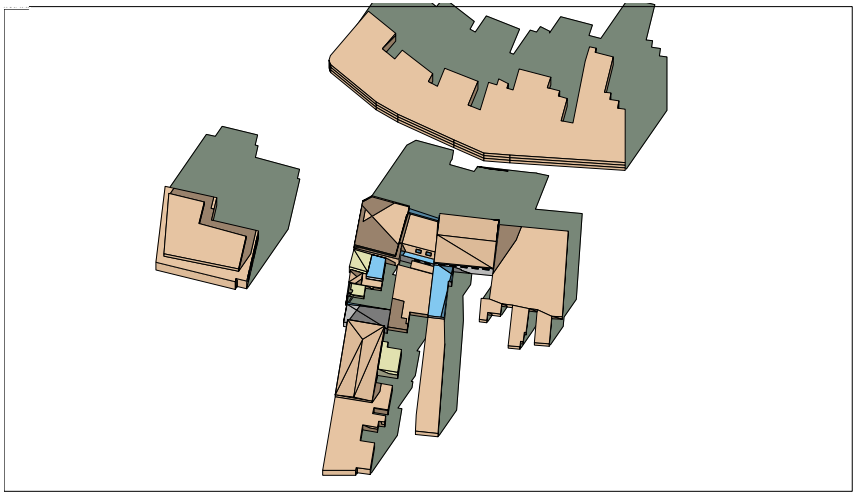
Existing

Suncast image:
View time = 21 Mar 13:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 199.24 alt = 47.93
Eye: azi = 180.56 alt = 80.56



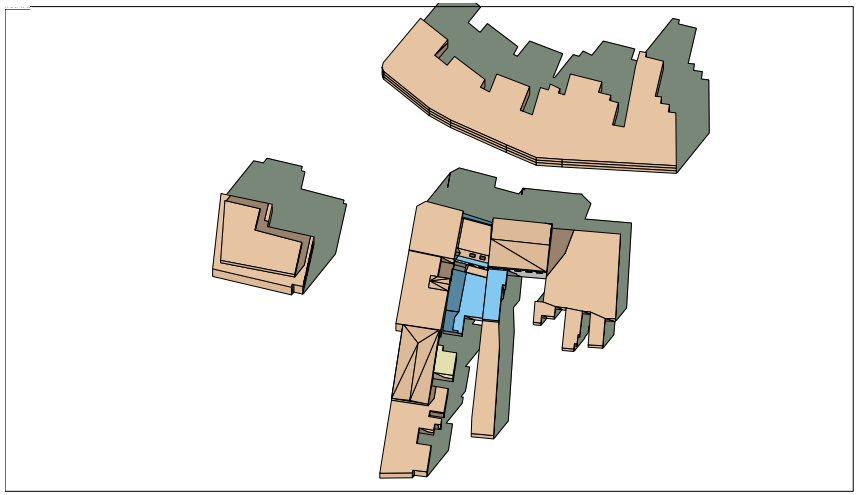
Proposed

Suncast image:
View time = 22 Mar 14:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 214.20 alt = 33.32
Eye: azi = 180.00 alt = 80.50



Existing

Suncast image:
View time = 21 Mar 14:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 219.03 alt = 42.31
Eye: azi = 180.56 alt = 80.56

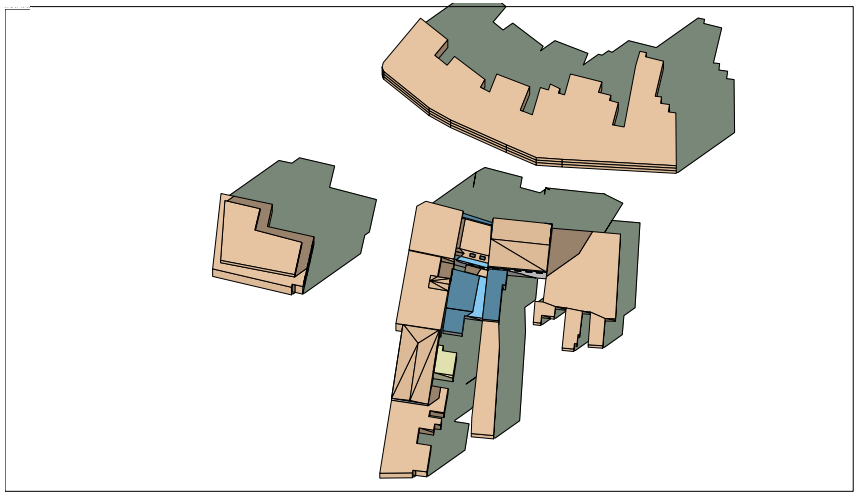


Proposed

Suncast image:
View time = 22 Mar 15:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 230.00 alt = 27.06
Eye: azi = 180.00 alt = 80.50

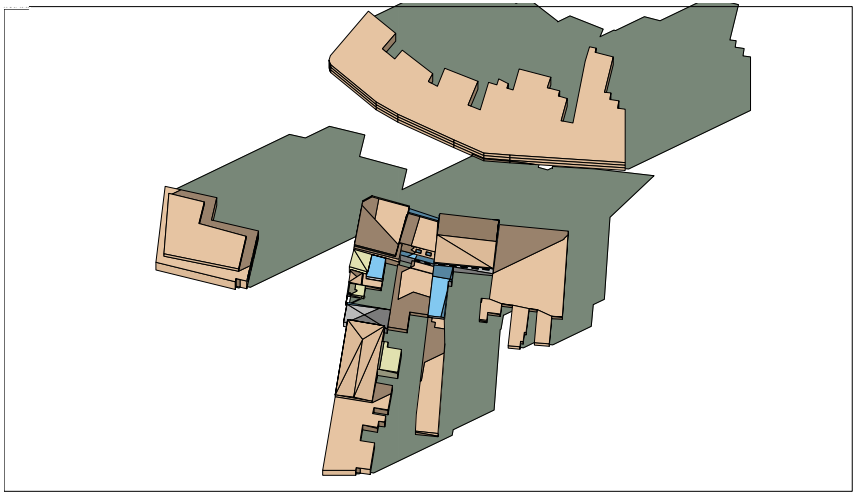
Existing

Suncast image:
View time = 21 Mar 15:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 234.87 alt = 33.90
Eye: azi = 180.56 alt = 80.56



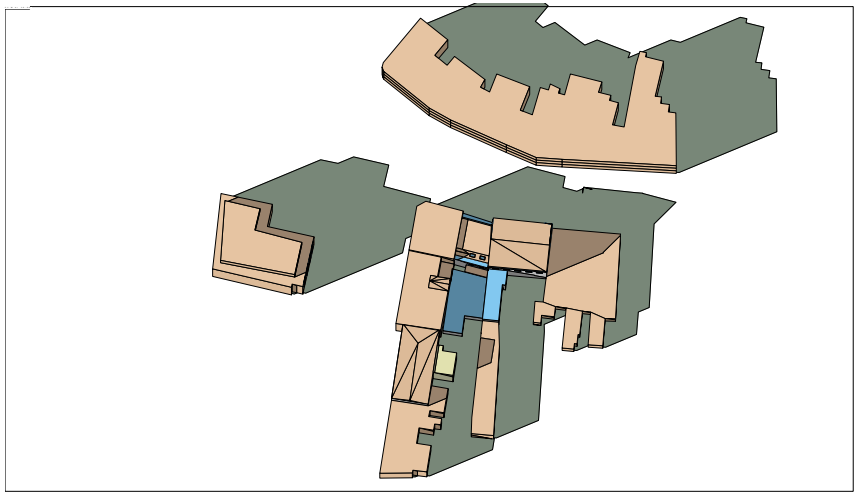
Proposed

Suncast image:
View time = 22 Mar 16:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 243.95 alt = 19.24
Eye: azi = 180.00 alt = 80.50



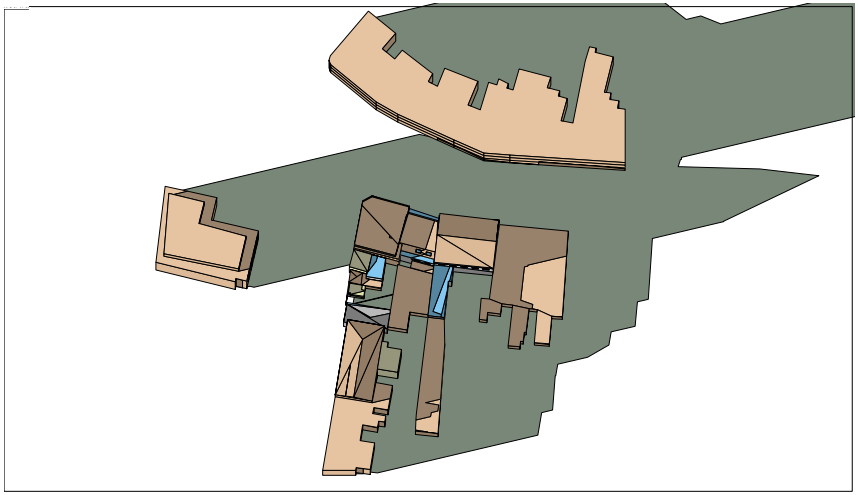
Existing

Suncast image:
View time = 21 Mar 16:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 247.61 alt = 23.83
Eye: azi = 180.56 alt = 80.56



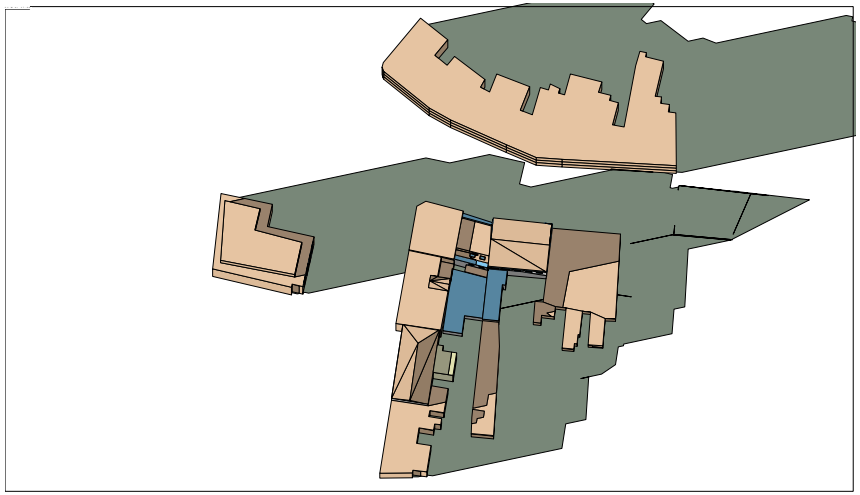
Proposed

Suncast image:
View time = 22 Mar 17:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 256.55 alt = 10.47
Eye: azi = 180.00 alt = 80.50



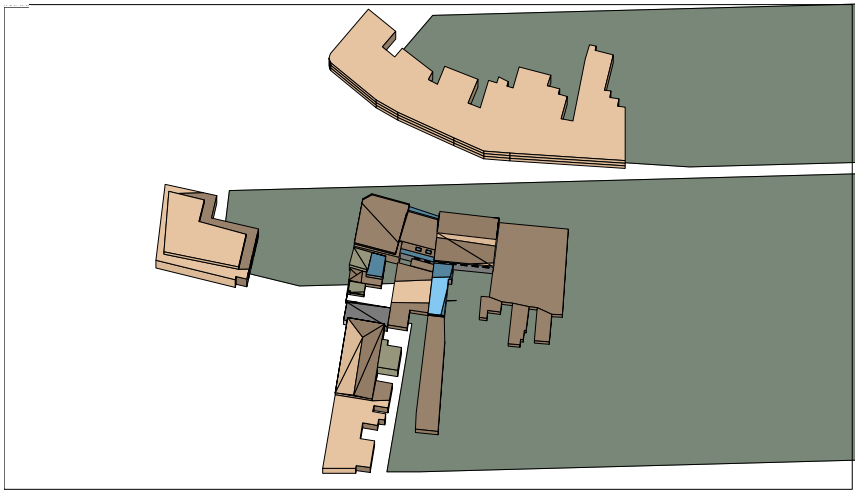
Existing

Suncast image:
View time = 21 Mar 17:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 258.40 alt = 12.85
Eye: azi = 180.56 alt = 80.56



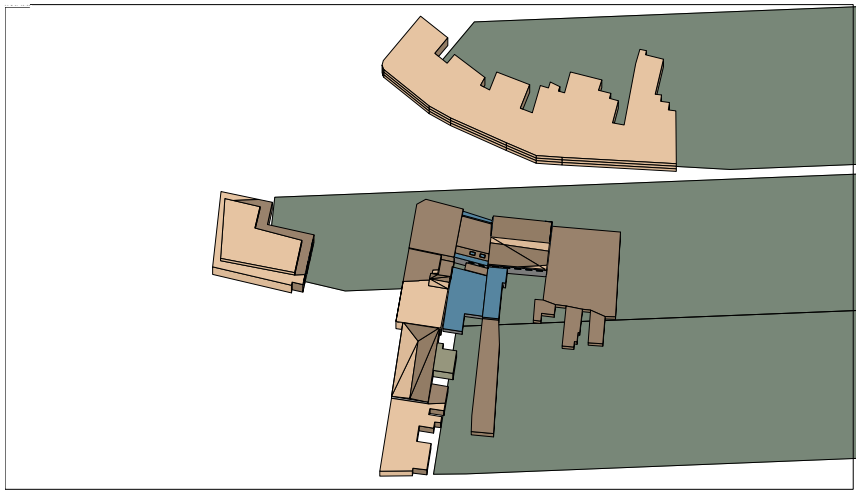
Proposed

Suncast image:
View time = 22 Mar 18:00
Site Latitude = 51.52
Longitude diff. = -0.10
Model Bearing = 0.00
Sun: azi = 268.45 alt = 1.23
Eye: azi = 180.00 alt = 80.50



Existing

Suncast image:
View time = 21 Mar 18:00
Site Latitude = 40.02
Longitude diff. = -0.28
Model Bearing = 0.00
Sun: azi = 268.24 alt = 1.46
Eye: azi = 180.56 alt = 80.56



Proposed