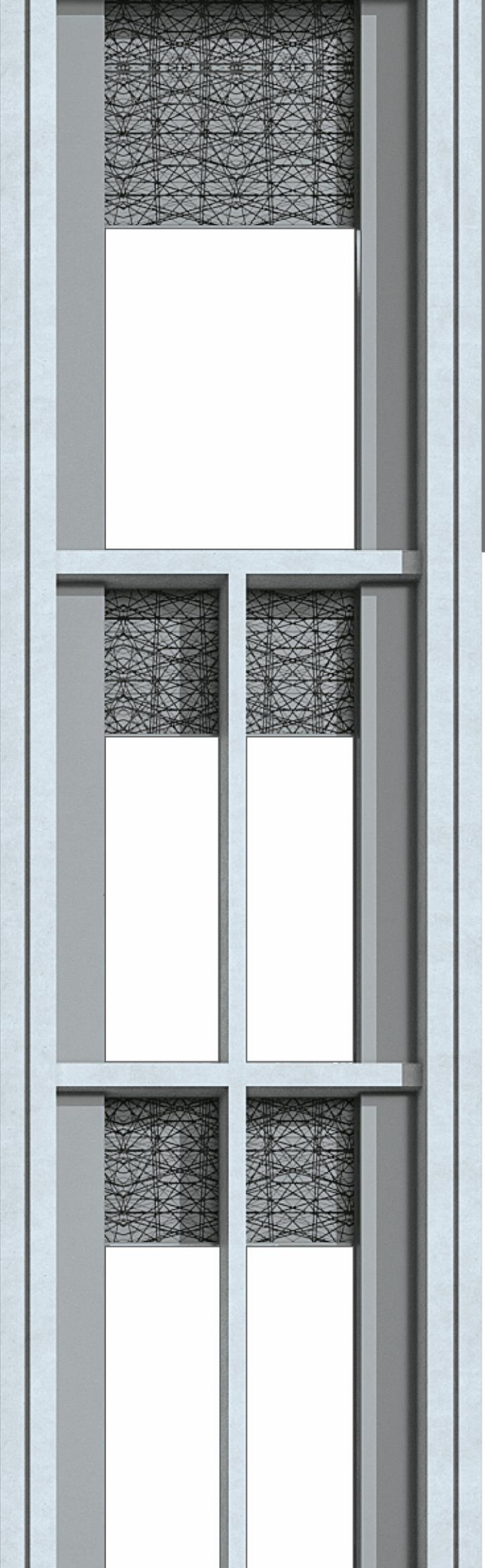

Pioneer

ANGELO GORDON

Grafton Centre

Daylight and Sunlight Report

Submission Issue 1 | June 2023

AA PROJECTS
PART OF DREES & SOMMER

Daylight Sunlight Report

Private and Confidential

Pioneer Group Limited
July 2023

Grafton Centre Redevelopment

Grafton Centre

Abbeygate House

and

11-12 Burleigh Street

Cambridge

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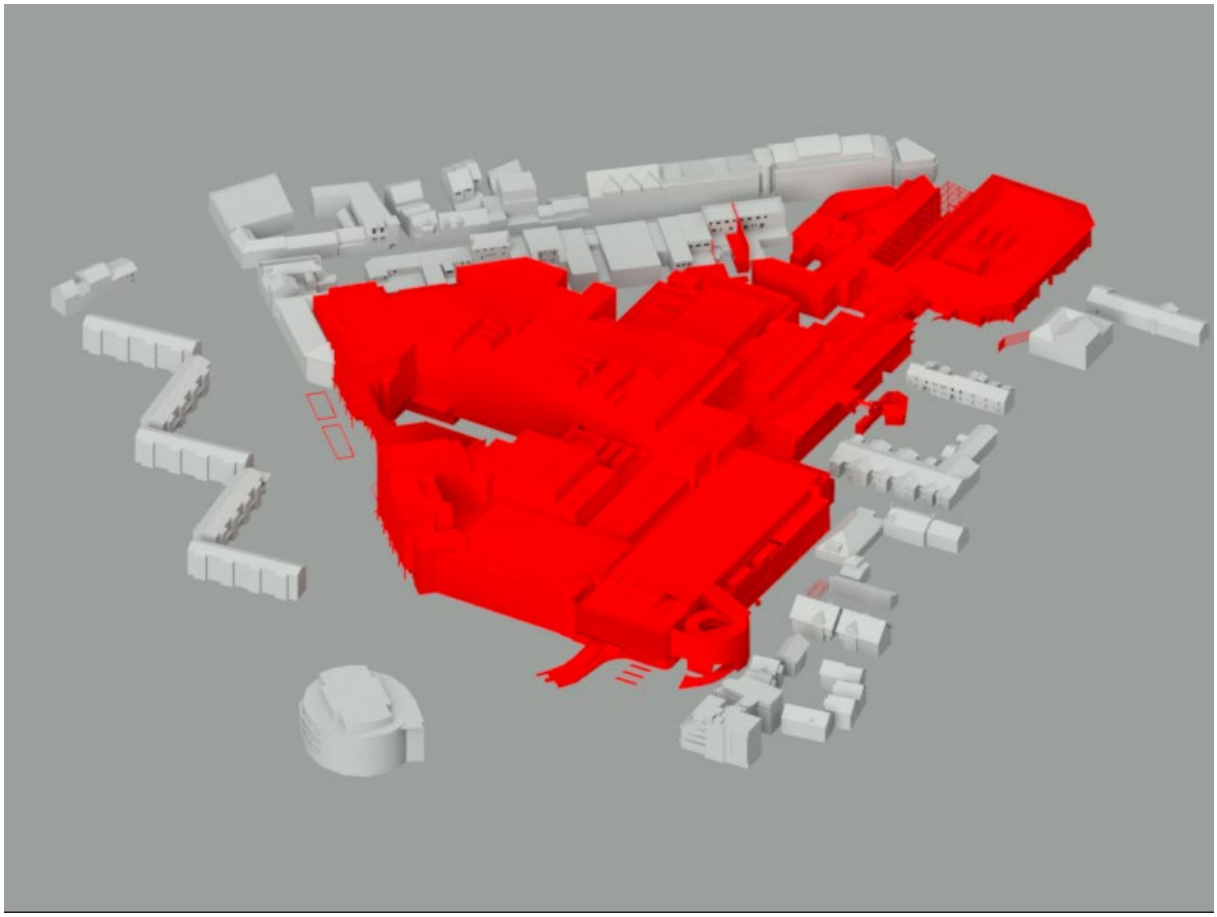
1.0 Executive Summary

1.1 Introduction

The brief for this commission is the preparation of a Daylight Sunlight report to examine the effect of the proposed development on the daylight and sunlight enjoyed by the principal neighbouring residential properties.

The development consists of various additions / extensions to the Grafton Centre in Cambridge.



The daylight sunlight review in this report has been based on the methodologies set out in the Building Research Establishment (BRE) report 'Site layout planning for daylight and sunlight - A guide to good practice 2022' by P. J. Littlefair, We shall refer to this report throughout as the 'BRE guide / document'.

One of the primary sources for the BRE document is the more detailed guidance contained within BS EN 17037 Daylight in buildings and in the CIBSE publication LG 10 Daylighting – a guide for designers.

The criteria contained in the BRE document are provided for guidance and should be interpreted flexibly. In its introduction the BRE guide states *"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. 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 covered in more detail in section 2.1 below.

We have checked the Planning portal and the site does benefit from a relevant Planning approval for the construction of a new hotel on the existing bus turning head (ref 19/0512/FUL). A validated application has also been submitted for the development of Abbeygate House (ref 21/01136/FUL – demolition of existing building and construction of new retail and office development). At the time of writing this report, the portal notes the Planning decision as awaited. However, we understand that the Planning committee has passed a resolution to grant Planning permission subject to a S106 agreement.

As these parts of the development have already received Planning approval and any Daylight Sunlight impacts considered as part of the granting those approvals, we have included them as an existing mass in our 3D modelling so that this report only considers the Daylight Sunlight impacts of the additional / amended parts of the proposed development.

This report focuses on the nearest sensitive receptors, which are the residential properties in the immediate vicinity of the site, as these have the highest reasonable expectation of daylight and sunlight when compared to other uses such as commercial.

The properties assessed are therefore as follows:

B1	4 Christchurch Street, Cambridge
B2	5 & 6 Christchurch Street, Cambridge
B3	7 Christchurch Street, Cambridge
B4	8 Christchurch Street, Cambridge
B5	9 Christchurch Street, Cambridge
B6	10 Christchurch Street, Cambridge
B7	1-33 Stanton House, Christchurch Street, Cambridge
B8	10 Burleigh Street, Cambridge
B12	The Snug, 170 East Road, Cambridge
B13	80 Paradise Street, Cambridge
B14	82 Paradise Street, Cambridge
B15	84 Paradise Street, Cambridge
B16	44-45 Burleigh Street, Cambridge
B18	Flat 1, Hilderstone House, Staffordshire Street, Cambridge
B19	Land and buildings on the east side of East Road & land and buildings lying to the south of Norfolk Street, Cambridge

All other surrounding properties are considered either too distant or are of commercial use and as such have not been considered by this report.

A 3D computer model of the existing properties/surrounding areas and the proposed development has been created and then run through proprietary software to calculate the proposed light levels at each window and within each room being assessed. These light levels were then compared with the corresponding levels in the BRE guidelines.

1.2 Applying BRE Guidance Flexibly

It is of special note that the BRE assessment is guidance only and it is widely recognised that in assessing dense urban schemes, including tall buildings, it has a number of shortcomings. This is because the BRE tests used are based on a typical (two storey) suburban model of development and expectations of levels of daylight sunlight are different in larger developments such as this in a built-up, high-rise city centre area.

The guidance is, therefore, to be applied with some flexibility when assessing such schemes as that at the Grafton Centre. The principles of how the BRE guide should be interpreted flexibly and in context are exemplified in various decisions on major urban developments. Notably in the appeal case for a dense scheme at the Whitechapel Estate (appeal decision ref APP/E5900/W/17/3171437). The following findings are informative:

- Paragraph 107 - It was agreed that the starting point in the assessment of the effect on residents' living conditions arising from daylight and sunlight should be the Building Research Establishment 2011 publication Site layout planning for daylight and sunlight: A guide to good practice, ('the BRE guide'). Note, this guide was updated in 2022 but remains in essence the same as the 2011 version for assessing adjacent properties
- Paragraph 108 - It was confirmed that the BRE document offers guidance on generally acceptable standards of daylight and sunlight, but advises that numerical values are not to be rigidly applied and recognises the importance of the specific circumstances of each case
- Paragraph 109 - It was agreed that daylight impact on adjacent properties should be assessed drawing on broadly comparable residential typologies within the area

Notably, the Inspector concluded, against the above backdrop, that:

- Paragraph 112 - Residual vertical sky component (VSC) values in the mid-teens (as opposed to the BRE target value of 27%) are appropriate and have been accepted on many schemes
- Paragraph 116 - It was acknowledged that light to bedrooms is less important
- Paragraph 128 - That using a target value ADF of 1.5% for mixed use living / dining/ kitchens within a proposed development is reasonable (where the BRE targets are 2% for kitchens and 1.5% for living rooms)
- Paragraph 125 - Comparing the daylight sunlight results for impact on adjacent properties or within the proposed development by reference to other approved similar schemes either by looking at an approved schemes daylight sunlight report or undertaking calculations where that report is missing (or was not requested) was reasonable

The above decision recognised that while the BRE guide requirements are based on a two-storey suburban model, more appropriate values and measures should be used when evaluating developments in a city centre area, which by definition will naturally have different conditions to properties in a suburban area.

In addition, the BRE guide also states that an adjacent building's windows may experience large and unavoidable relative reductions in sky visibility (VSC) if they are located below a balcony (as the balcony cuts out light from the top part of the sky) or the window has projecting wings on one or both sides. Section 2.2.13 specifically states:

"Because the balcony cuts out light from the top part of the sky, even a modest obstruction opposite may result in a large relative impact on the VSC, and on the area receiving direct skylight. One way to demonstrate this would be to carry out an additional calculation of the VSC and area receiving direct skylight, for both the existing and proposed situations, without the balcony in place."

Any impact caused by a development on daylight sunlight results to adjacent properties with balconies or recessed windows should therefore be reviewed accordingly.

In making our assessment of what levels of daylight sunlight would be suitable for a scheme such as this, we have therefore drawn on broadly comparable residential typologies and other suitable evidence as follows:

- Firstly, we have calculated the daylight sunlight results for the scheme with a baseline set as the current massing on the site plus the consented hotel (ref 19/0512/FUL) and the development of Abbeygate House (ref 21/01136/FUL – demolition of existing building and construction of new retail and office development), which we understand the Planning committee passed a resolution to grant Planning permission subject to a S106 agreement.
- Our assessment then moves onto consider the results against VSC levels in the mid-teens (as opposed to 27%) as advocated in the appeal case noted above in section 1.2
- We have then looked at the daylight sunlight results for comparable schemes in Cambridge

1.3 Overall Daylight Sunlight Assessment - Adjacent Properties

Overall, our detailed technical assessment results are as shown below:

Vertical Sky Component (VSC)

		VSC											
		VSC - Existing Site as Baseline											
		Meet or Exceed BRE Guidelines (greater			Below BRE Guidelines								
Building No.	Address	Total no. of Windows	No. Windows that Meet or Exceed BRE Guidelines		21-30% Reduction - Minor			31-40% Reduction - Moderate			>40% Reduction - Major		
							Which are Bedrooms			Which are Bedrooms			Which are Bedrooms
B1	4 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B2	5 & 6 Christchurch Street	9	9	100%	0	0%	0	0	0%	0	0	0%	0
B3	7 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B4	8 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B5	9 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B6	10 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B7	1-33 Stanton House	14	14	100%	0	0%	0	0	0%	0	0	0%	0
B8	10 Burleigh Street	4	3	75%	1	25%	0	0	0%	0	0	0%	0
B12	The Snug, 170 East Road	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B13	80 Paradise Street	1	1	100%	0	0%	0	0	0%	0	0	0%	0
B14	82 Paradise Street	1	1	100%	0	0%	0	0	0%	0	0	0%	0
B15	84 Paradise Street	1	1	100%	0	0%	0	0	0%	0	0	0%	0
B16	44-45 Burleigh Street	4	4	100%	0	0%	0	0	0%	0	0	0%	0
B18	Flat 1, Hilderstone House	14	12	86%	2	14%	0	0	0%	0	0	0%	0
B19	Land and buildings on the east side of East Road & land and buildings lying to the south of Norfolk Street	5	5	100%	0	0%	0	0	0%	0	0	0%	0
	Total	71	68	96%	3	4%	0	0	0%	0	0	0%	0

In respect of VSC (a measure of daylight from the sky reaching windows), the results against the BRE criteria demonstrate 96% overall compliance, with 100% compliance to all properties assessed other than for B8 and B18.

To B8, 3 out of the 4 (75%) of windows assessed fully pass the BRE criteria and the remaining 1 window experiences a minor reduction in daylight. This particular window maintains an overall VSC of 24% (where 27% is the target value) and thus would remain very well-lit after the development. In addition, if the VSC target value was set to be in the mid-teens as advocated in the appeal decision discussed is section 1.2 above for a city centre environment, then B8 would also fully pass the assessment.

To B18, 12 of the 14 (86%) of windows assessed (i.e. windows that could be affected by the development) fully pass and the remaining 2 windows have a minor reduction in daylight. These two windows have a reduction of 21% and 26% (where 20% is the permitted) and are therefore very minor deviations.

Overall, the daylight received by the adjacent property windows fully pass the BRE criteria or experience very minor deviations.

No Sky Line (or Daylight Distribution) (NSL)

		NSL - Existing Site as Baseline											
		Meet or Exceed BRE			Below BRE Guidelines								
Building No.	Address	Total no. of Rooms	No. Rooms that Meet or Exceed BRE Guidelines		21%-30% Reduction - Minor			31%-40% Reduction - Moderate			>40% Reduction - Major		
							Which are Bedrooms			Which are Bedrooms			Which are Bedrooms
B1	4 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B2	5 & 6 Christchurch Street	5	5	100%	0	0%	0	0	0%	0	0	0%	0
B3	7 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B4	8 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B5	9 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B6	10 Christchurch Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B7	1-33 Stanton House	10	10	100%	0	0%	0	0	0%	0	0	0%	0
B8	10 Burleigh Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
B12	The Snug, 170 East Road	1	1	100%	0	0%	0	0	0%	0	0	0%	0
B13	80 Paradise Street	1	0	0%	1	100%	1	0	0%	0	0	0%	0
B14	82 Paradise Street	1	0	0%	1	100%	1	0	0%	0	0	0%	0
B15	84 Paradise Street	1	0	0%	1	100%	1	0	0%	0	0	0%	0
B16	44-45 Burleigh Street	4	4	100%	0	0%	0	0	0%	0	0	0%	0
B18	Flat 1, Hilderstone House	12	10	83%	0	0%	0	1	8%	0	1	8%	0
B19	Land and buildings on the east side of East Road & land and buildings lying to the south of Norfolk Street	3	3	100%	0	0%	0	0	0%	0	0	0%	0
	Total	56	51	91%	3	5%	3	1	2%	0	1	2%	0

In respect of NSL (the measure of how daylight (VSC) is then distributed around a room), the results against the BRE criteria demonstrate 91% overall compliance with 100% compliance across all properties assessed other than for B13, B14, B15 and B18.

To B13, B14 and B15, all the rooms assessed experienced a minor reduction in light distribution. In addition, all the rooms were bedrooms (which are to be treated with less importance under the BRE guide) and the windows to these rooms also fully passed the VSC test (meaning the light reaching the windows is very good / unaffected in any event).

To B18, 10 of the 12 rooms (83%) assessed fully pass the BRE criteria, with 1 experiencing a moderate and 1 a major reduction in light distribution. It should be noted that the two windows that serve these particular rooms only experience very minor reductions in daylight as a result of the development (see VSC above) and therefore the internal changes in light distribution will largely be due to other factors.

The NSL (daylight distribution) to adjacent rooms is on the whole excellent with only minor deviations from the BRE guide and in keeping with a built up city area.

Annual Probable Sunlight Hours (APSH)

Summer

		Summer APSH - Existing Site as Baseline													
		Meet or Exceed Summer BRE Guidelines				Below Threshold for Summer APSH									
Building No.	Address	Total no. of Windows	No. Windows that Pass BRE Criteria			21%-30% Reduction - Minor			31%-40% Reduction - Moderate			>40% Reduction - Major			Significance
			Not Within 90 Degrees of South	Pass	%			Which are Bedrooms			Which are Bedrooms			Which are Bedrooms	
B1	4 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B2	5 & 6 Christchurch Street	9	9	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B3	7 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B4	8 Christchurch Street	3	3	0	100%	0	0%	0	0	6%	0	0	0%	0	Negligible
B5	9 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B6	10 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B7	1-33 Stanton House	14	0	14	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B8	10 Burleigh Street	4	4	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B12	The Snug, 170 East Road	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B13	80 Paradise Street	1	1	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B14	82 Paradise Street	1	1	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B15	84 Paradise Street	1	1	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B16	44-45 Burleigh Street	4	4	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B18	Flat 1, Hilderstone House	14	9	5	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B19	Land and buildings on the east side of East Road & land and buildings lying to the south of Norfolk Street	5	0	5	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
	Total	71	47	24	100%	0	0%	0	0	0%	0	0	0%	0	0

Winter

		Winter APSH - Existing Site as Baseline													
		Meet or Exceed Winter BRE Guidelines				Below Threshold for Winter APSH									
Building No.	Address	Total no. of Windows	No. Windows that Pass BRE Criteria			21%-30% Reduction - Minor			31%-40% Reduction - Moderate			>40% Reduction - Major			Significance
			Not Within 90 Degrees of South	Pass	%			Which are Bedrooms			Which are Bedrooms			Which are Bedrooms	
B1	4 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B2	5 & 6 Christchurch Street	9	9	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B3	7 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B4	8 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B5	9 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B6	10 Christchurch Street	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B7	1-33 Stanton House	14	0	14	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B8	10 Burleigh Street	4	4	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B12	The Snug, 170 East Road	3	3	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B13	80 Paradise Street	1	1	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B14	82 Paradise Street	1	1	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B15	84 Paradise Street	1	1	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B16	44-45 Burleigh Street	4	4	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B18	Flat 1, Hilderstone House	14	9	5	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B19	Land and buildings on the east side of East Road & land and buildings lying to the south of Norfolk Street	5	0	5	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
	Total	71	47	24	100%	0	0%	0	0	0%	0	0	0%	0	0

In respect of APSH (a measure of direct sunlight from the sky reaching windows), the results against the BRE criteria demonstrate 100% compliance in summer and winter for all buildings.

1.4 Comparables

We have also reviewed broadly comparable Planning approvals and their relevant daylight sunlight reports to understand the levels of daylight sunlight previously considered acceptable for similar schemes in Cambridge city centre (as advocated by the BRE guide and Planning appeal decisions). We have found that the above results are consistent with those accepted on other similar schemes.

1.5 Overall Summary

In summary, the daylight sunlight assessment ultimately demonstrates that the proposed development will have negligible effects in terms of neighbouring properties' ambient daylight conditions. The results are also comparable to those for other similar schemes that have recently been granted planning approval in the Cambridge city centre. On this basis and having regard to the built up character of the site and the flexible suburban basis of the BRE guidance, the development's effects on neighbouring properties are considered fully acceptable.

Where there are minor deviations from the BRE guidelines, their significance is also offset by the following:

- It is inevitable when constructing buildings in an urban environment that alterations in daylight and sunlight to adjoining properties can occur
- Deviations from the BRE baseline are generally extremely marginal
- The BRE guidelines indicate that in interpreting the results of an assessment, a degree of flexibility is required, especially in a dense urban environment where neighbouring properties are located within narrow streetscapes and with design obstructions restricting the availability of daylight or sunlight
- The current NPPF states that ''a flexible approach should be taken in applying policies relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site''
- The BRE tests are based on a typical (two storey) suburban model of development and it is reasonable to assume that expectations of levels of daylight sunlight will be different in developing larger properties such as this. This is noted in the guide itself

2.0 Introduction & Methodology

2.1 Methodology

The daylight sunlight review in this report has been based on the methodologies set out in the Building Research Establishment (BRE) report 'Site layout planning for daylight and sunlight - A guide to good practice 2022' by P. J. Littlefair, One of the primary sources for the BRE document is the more detailed guidance contained within BS EN 17037 Daylight in buildings and in the CIBSE publication LG 10 Daylighting – a guide for designers.

The criteria contained in the BRE document are provided for guidance and should be interpreted flexibly. In its introduction the BRE guide states *"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. 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."*

The BRE guide also notes in section 3.1.2 that *"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."*Other areas such as bedrooms are therefore to be treated as less important.

We examine 2 measures of diffuse daylight in this study, namely Vertical Sky Component (VSC) and No-Sky Line (NSL). In terms of sunlight, we examine the BRE Annual Probable sunlight Hours (APSH). These measures of daylight and sunlight are discussed in Appendices A to D.

In addition, the new National Planning Policy Framework (NPPF) amended 2021 stipulates that: *"A flexible approach should be taken in applying policies relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site."*

The development site in question is in a built-up high-rise urban area and in developing the site to a greater extent, some windows in the immediately adjacent properties may inevitably fail to meet the strict interpretation of some of the guidelines. A reasonable approach in this case is, rather than to apply strict numerical comparisons, to consider whether the daylight and sunlight levels enjoyed after development are reasonable for the location and in accordance with precedents set by previously consented schemes for the site or other nearby recently consented schemes.

We have checked the Planning portal and the site does benefit from a relevant Planning approval for the construction of a new hotel on the existing bus turning head (ref 19/0512/FUL). A validated application has also been submitted for the development of Abbeygate House (ref 21/01136/FUL – demolition of existing building and construction of new retail and office development). At the time of writing this report, the portal notes the Planning decision as awaited. However, we understand that the Planning committee has passed a resolution to grant Planning permission subject to a S106 agreement.

As these parts of the development have already received Planning approval and any Daylight Sunlight impacts considered as part of granting those approvals, we have included them as an existing mass in our 3D modelling so that this report only considers the Daylight Sunlight impacts of the additional / amended parts of the proposed development.

The various measures and appropriateness of daylight and sunlight calculations are discussed and set out below.

2.2 Vertical Sky Component (VSC)

VSC is a measure of the light reaching a point at the centre of a window, and the BRE guideline is based on the loss of VSC at a single window. It is therefore not appropriate in cases where rooms are served by multiple windows and in particular when a room is dual or multi-aspect. If one window fails the criterion, in reality the daylight to the room would not necessarily be seriously impacted, and the daylight within the room would in all probability remain good. In addition, VSC takes no account of the size of a window. The VSC at the centre of a very small window is identical to VSC at the centre of a large window.

Clearly a measure of daylight which accounts for the size and number of windows is therefore more appropriate. This is accomplished by NSL.

We have performed the VSC calculations and the figures are tabulated in Appendix E.

2.3 No-Sky Line (NSL) (also known as Daylight Distribution (DD))

No-Sky Line (NSL) is a measure of the distribution of daylight within a room. As it maps out the region within a room where light can penetrate directly from the sky, it therefore accounts for the size of and number of windows by simple geometry. This is also its weakness.

To quote from Appendix B, - 'in principle a point lies within the No-Sky Line no matter how small a patch of sky it can see—even if for instance there is only a keyhole allowing light in to the room. Clearly the method is intended to map out areas within a room which receive a significant amount of direct daylight from the sky, so that it would be better if a small but finite amount of direct daylight were used to divide the two regions. This would also reduce the tendency for the No-Sky Line position to vary wildly at the rear of a room, rather like when small variations in tidal height cause the tide line to move by large distances on a virtually level beach'.

The position of the no-sky line can therefore be very sensitive to very small changes in light levels. In addition, NSL does not account for other factors that determine the daylight level in a room. Double glazing has a transmittance of say 64%. In comparing an unglazed window with a double glazed window, the position of the No-Sky line doesn't change at all, even though the light level has been reduced by nearly half. A further factor which influences the daylight levels within a room is the colour (or more specifically – the reflectance) of the walls, ceiling and floor.

If these are all very dark colours, clearly the room will not have a very daylight appearance. No account is taken of this important factor. There is clearly a need for a measure of daylight which attempts to account for all the important factors which contribute to the interior daylight in a room, and this measure is the Average Daylight Factor (ADF).

The NSL figures are tabulated in Appendix F.

2.4 Average Daylight Factor (ADF)

Whilst the BRE guide recommends that ADF is mainly used to assess daylight within a proposed development (as the developer has control of the design), it is still a very useful measure of actual daylight within a room based on room volume, glazing ration and use, particularly where the other measures (VSC and NSL) are not conclusive.

The BRE guide provides a series of progressive tests and it is only necessary to progress to the next test if the window/room does not pass the test being applied to it. Thus, where a window does not pass the VSC test, the BRE guide suggest that the ADF of the room behind it should be considered. As all windows/rooms have acceptable VSC and NSL values, this is not assessed further in this report.

ADF is a measure of the daylight within a room and accounts for factors such as the number of windows and their size in relation to the size of the room. Clearly a small room with a large window will be better illuminated by daylight than a large room with a small window. It also accounts for the above-mentioned window transmittance and internal reflectance.

The general idea is that one calculates the daylight which reaches each of the windows, and allowing for the window size, the light which then enters the room through all of the windows. The light is then imagined to bounce around within the room, controlled by the reflectance of the internal surfaces.

The ADF is detailed in British Standard 8206 Part 2. As for the BRE report, it provides guidance for acceptable values in the presence of supplementary electric lighting, depending on the room use. These are 1.0% for a bedroom, 1.5% for a living room and 2.0% for a kitchen.

No ADF calculations were carried out.

2.5 Annual Probable Sunlight Hours (APSH)

In relation to sunlight, the BRE recommends that the Annual Probable sunlight Hours (APSH) received at a given window in the proposed case should be at least 25% of the total available including at least 5% in winter. Only those residential windows that face within 90 degrees of south should be considered.

The sunlight figures are provided in tabular form in Appendix G.

2.6 Calculations & Assessment

In order to calculate the various measures of daylight and sunlight it is necessary to construct a 3D computer model. The proposed development was modelled from the sources listed above. The site and surrounding properties were set out using a 3D laser scan model. The 3D model was created so as to reproduce the massing of the buildings both on and surrounding the site, at a level of detail appropriate to the calculations performed. All heights are given Above Ordnance Datum (AOD).

The model was analysed using proprietary software to calculate the proposed light levels at each window and within each room (being assessed). These light levels were then compared with the corresponding levels in the BRE guidelines.

We shall now discuss the results of the calculations of the various measures of daylight and sunlight in relation to the selected properties, rooms and windows.

We refer to the drawings in the appendices showing the locations of rooms and windows on a floor-by-floor basis. These drawings also show the existing and proposed No-Sky Lines and the room uses.

Also, please refer to the following appendices:
Appendix E – VSC table
Appendix F – No-Sky Line results are tabulated
Appendix G – Annual Probable Sunlight Hours are tabulated
Appendix H – Results Summary Spreadsheets

In terms of VSC, the BRE guide recommends that a VSC level of over 27% is achieved or the reduction is no greater than 20% (or 80% of the former value).

The BRE does not state a required amount of No-Sky Line floor area that should remain after a development but merely suggests a maximum reduction (proposed No-Sky Line floor areas should be more than 0.8 times the existing).

The BRE guidelines for ADF of Kitchens (2%), Living Rooms (1.5%) and Bedrooms (1%) should be noted when reading this report. There is no stated acceptable reduction in values where these values are not met. However, the accepted reduction in VSC noted above would typically result in a 14% reduction in ADF as noted in C8 of the BRE guide. This would therefore also be classed as a reasonable reduction (as noted in the appendices of the BRE guide). This measure is only used where VSC and NSL measures are not met to a reasonable degree (not applicable here).

In relation to sunlight, we note that the BRE guidelines for Annual Probable Sunlight Hours (APSH) only apply to windows that face within 90 degrees of due south and therefore only rooms and windows that fall into this category have been considered.

The BRE recommends that the APSH received at a given window in the proposed case should be at least 25% of the total available including at least 5% in winter or the reduction should be no greater than 20%.

A table summarising the above is set out below:

Method	BRE Criteria
VSC	A window may be adversely affected if its VSC measured at the center of the window is less than 27% and less than 0.8 times its former value. Note that a second set of results have been run with a target of VSC 16% / 20% reduction as advocated by the more flexible approach for an inner city area.
NSL	A room may be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.

Method	BRE Criteria
ADF	Rooms within a proposed development should achieve ADF values of 2% (Kitchens), 1.5% (Living Rooms), 1% (Bedrooms). Where used to assess losses to adjacent properties, the reduction should be less than 14% as noted in Appendix C8 of the BRE guide.
APSH	A window may be adversely affected if a point at the center of the window received for the whole year, less than 25% of the APSH including at least 5% of the APSH during the winter months (21st September to 21st March) and less than 0.8 times its former sunlight hours during either period, and for existing neighboring buildings, if there is a reduction in total APSH which is greater than 4%.

Where the BRE guidelines are met (based on a less than 20% reduction), the effects of the proposed development will be considered negligible.

With regard to the BRE guidelines, professional judgement has been used to determine whether the potential effects will result in adverse or beneficial effects.

Beneficial effects are experienced when the massing/design of a new building results in improved BRE guideline results to the adjacent properties when compared to the results obtained from the previous building on the site. Alternatively, beneficial effects can often be seen when the analysis shows that the proposed development design would return better BRE results than would be obtained from a previous extant Planning Permission.

The initial numerical criteria for determining the category of an adverse effect is based on percentage alterations, as follows:

- 20-29.9% alteration = minor adverse;
- 30-39.9% alteration = moderate adverse; and
- 40% alteration = major adverse

In respect of ADF the numerical criteria for determining the category of effect is based on percentage alterations, as follows:

- 0-14% alteration = negligible
- 15-21% alteration = minor adverse;
- 22-28% alteration = moderate adverse; and
- 29% and above alteration = major adverse

Other factors tending towards a minor impact are:

- Only a small number of windows are affected;
- The loss of light is only marginally outside the guidelines;
- An affected room has other sources of skylight or sunlight; and
- The affected building only has a low level of requirement for skylight or sunlight

Other factors tending towards a major adverse impact are:

- A large number of windows are affected;
- The loss of light is substantially outside the guidelines;
- All the windows in a particular property are affected; and
- The affected indoor spaces have a particular strong requirement for skylight or sunlight, e.g. a living room in a dwelling

However, when assigning criteria per property, consideration has been given to the proportion of rooms/windows affected, as well as the percentage alterations, absolute changes, and any other relevant factors, such as there may be mitigating factors such as balconies, overhangs or design features which may also affect the determination of assigning the criteria.

For example, where an adjacent property has overhanging balconies, the windows below them will be very reliant on horizontal light/sky visibility. Any development near to those windows may therefore return poor BRE guideline daylight sunlight results but this would be largely due to the adjoining buildings own design rather than the size and massing of the new development. The same principal applies to adjacent recessed windows. The BRE guide goes further to say that the daylight sunlight analysis can be undertaken without the adjacent building balconies in place if the results are overly affected by them.

In addition, where a room in an adjacent building is served by more than one window, the BRE guide states that it is acceptable to take an average of the VSC results. Thus, the room may have one window that passes the BRE VSC test and one that fails but when averaged, the results may very well mean the room passes VSC as a whole. Also, for APSH if a room is served by multiple windows which face in different directions, the values can be added together or, if they have the same orientation, the lower value can be disregarded.

The BRE guidelines also note that *"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."* Other areas such as bedrooms are therefore to be treated as less important.

3.0 Site and Surrounding Properties

The site is known in short as Grafton Centre, Abbeygate House, and 11-12 Burleigh Street, Cambridge ('the site').

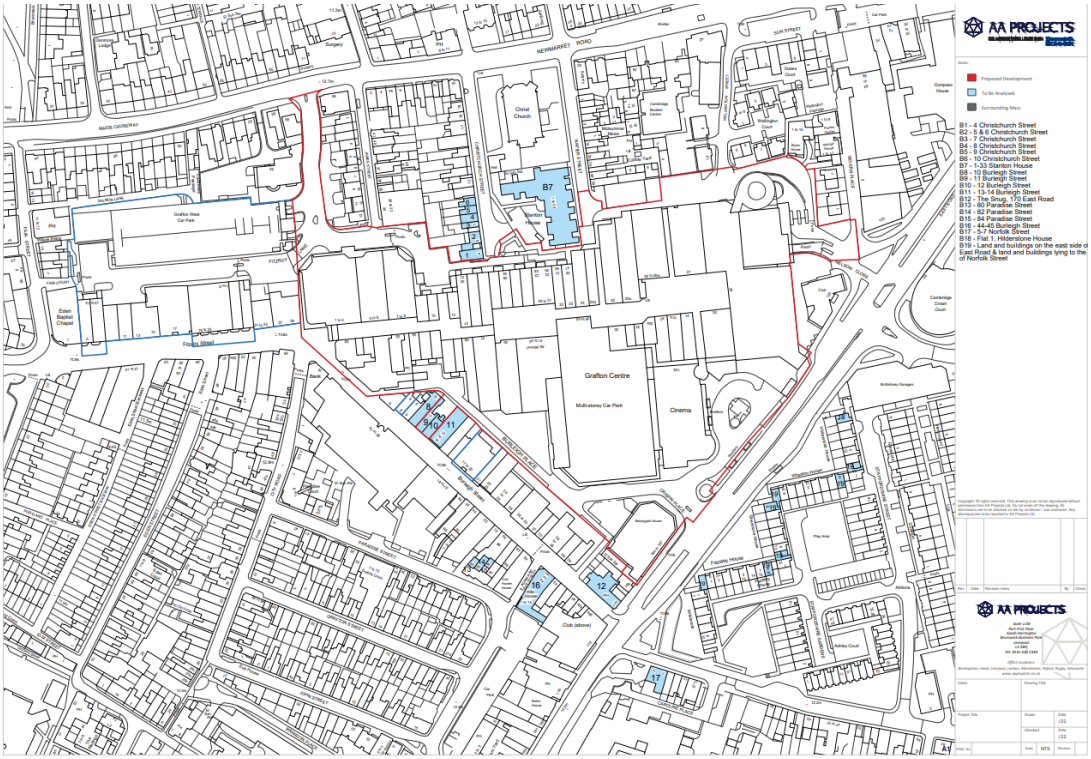
The site is roughly triangular in plan and located to the Northeast of Cambridge city centre, amongst a variety of commercial and residential properties.

In terms of the immediate surrounding context, to the north, the site is bound by Maids Causeway and Newmarket Road, residential units along James Street, Christchurch Street, Napier Street and Wellington Street. To the west of the site, is Grafton West Car Park and retail units along Fitzroy Street. To the south-west is Burleigh Street and associated retail units. Whilst to the east of the site is East Road, the Cambridge Working Men's Club, and residential units along Severn Place.

An aerial photograph and site plan of the development site is included below for information.

Aerial Photograph

Site Plan



In accordance with BRE guidelines, we have assessed the impact of the proposed development on the daylight sunlight levels to principal adjacent residential properties (the impact on commercial properties has not been considered). We have also checked the Planning Portal to assess whether there any other surrounding consented schemes that would create a cumulative impact along with the proposed development and added these to the 3D model.

4.0 Proposed Scheme

The proposed scheme consists of the alteration, extension and addition to various areas of the Grafton Centre as noted in the drawings below.

Various drawings prepared by Corstorphine & Wright Architects were provided of the proposed development to allow us to carry out this report.

22388-CW-ZZ-XX-M3-A-001A-EXISTING
22388-CW-ZZ-XX-M3-A-001B-EXISTING.rvt
22388-CW-ZZ-XX-M3-A-0002-CWA INTERNALS.rvt
22388-CW-ZZ-XX-M3-A-0010-CWA CAR PARK.rvt
22388-CW-ZZ-XX-M3-A-0011-CWA CINEMA.rvt
22388-CW-ZZ-XX-M3-A-0012-CWA HOTEL.rvt
22388-CW-ZZ-XX-M3-A-0014-CWA SITE CONTEXT.rvt
22388-CW-ZZ-XX-M3-A-PL01-CWA EXTERNALS.rvt
22388-SE-XX-XX-M3-SE-0003-PLACEHOLDER-STRUCTURE.rvt

5.0 Previously Consented Schemes

We have checked the Planning portal and the site does benefit from a relevant Planning approval for the construction of a new hotel on the existing bus turning head (ref 19/0512/FUL). A validated application has also been submitted for the development of Abbeygate House (ref 21/01136/FUL – demolition of existing building and construction of new retail and office development). At the time of writing this report, the portal notes the Planning decision as awaited. However, we understand that the Planning committee has passed a resolution to grant Planning permission subject to a S106 agreement.

As these parts of the development have already received Planning approval and any Daylight Sunlight impacts considered as part of granting those approvals, we have included them as an existing mass in our 3D modelling so that this report only considers the Daylight Sunlight impacts of the additional / amended parts of the proposed development.

6.0 Calculations and Assumptions

We have not gained access into any of the surrounding properties and were unable to obtain floor plans for some of the surrounding buildings from the planning portal or other online sources. Some of the floor plans and floor levels for the surrounding buildings have therefore been assumed / determined using the architectural form of the building.

We have assumed that the surrounding properties will be double glazed with a window transmittance of 0.64 and rooms with an average internal surface reflectance of 0.6. These typical values are provided in both the BRE and the British Standard publications. VSC values were calculated on the outer plane of the windows, while APSH values were calculated on the inner plane.

7.0 Results Discussion

7.1 4 Christchurch Street, Cambridge (B1)

Front Elevation

This property is a two-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the side and rear elevation which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.1.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 3 windows (100%) to habitable rooms either exceed the BRE target figure of 27% or their VSC values do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.1.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.1.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 3 windows do not fall within 90 degrees of due South, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) therefore pass the BRE guideline in summer and winter.

7.2 5 and 6 Christchurch Street, Cambridge (B2)

Front Elevation

This property is a two-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the front and rear elevations (at an oblique angle), which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been approximated as no information was available from the Planning Portal/web search or estate agent details.

7.2.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 9 windows (100%) to habitable rooms either exceed the BRE target figure of 27% or their VSC values do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.2.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 5 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.2.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 9 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) therefore pass the BRE guideline in summer and winter.

7.3 7 Christchurch Street, Cambridge (B3)

Front Elevation

This property is a two-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development in the front and rear elevations (at an oblique angle) which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been approximated as no information was available from the Planning Portal/web search or estate agent details.

7.3.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 3 windows (100%) to habitable rooms either exceed the BRE target figure of 27% or their VSC values do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.3.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.3.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 3 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) pass the BRE guideline in summer and winter.

7.4 8 Christchurch Street, Cambridge (B4)

Front Elevation

This property is a two-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the front and rear elevations (at an oblique angle), which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been approximated as no information was available from the Planning Portal/web search or estate agent details.

7.4.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 3 windows (100%) to habitable rooms either exceed the BRE target figure of 27% or their VSC values do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.4.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.4.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 3 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) pass the BRE guideline in summer and winter.

7.5 9 Christchurch Street, Cambridge (B5)

Front Elevation

This property is a two-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the front and rear elevations (at an oblique angle) which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been approximated as no information was available from the Planning Portal/web search or estate agent details.

7.5.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 3 windows (100%) to habitable rooms either exceed the BRE target figure of 27% or their VSC values do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.5.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.5.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 3 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) pass the BRE guideline in summer and winter.

7.6 10 Christchurch Street, Cambridge (B6)

Front Elevation

This property is a two-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the side and rear elevations (at an oblique angle) which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been approximated as no information was available from the Planning Portal/web search or estate agent details.

7.6.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 3 windows (100%) to habitable rooms exceed the BRE target figure of 27% or their VSC values do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.6.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.6.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 3 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) pass the BRE guideline in summer and winter.

7.7 1-33 Stanton House, Christchurch Street, Cambridge (B7)

Front Elevation

This property is a two-storey sheltered housing residential apartment building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site at the front, side and rear elevations which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.7.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 14 windows (100%) to habitable rooms exceed the BRE target figure of 27% or do not reduce by more than 20% and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.7.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 10 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.7.3 Annual Probable Sunlight Hours (APSH)

The summer annual probable sunlight hours calculated to all 14 windows assessed (100%) are well above the BRE recommended levels of 25% in summer or do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

The winter annual probable sunlight hours calculated to all 14 windows assessed (100%) are well above the BRE recommended levels of 5% in winter or do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All the windows (100%) pass the BRE guideline in summer and winter.

7.8 10 Burleigh Street, Cambridge (B8)

Front Elevation

This property is a two-storey part residential part commercial building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site at the rear elevation, which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.8.1 Vertical Sky Component (VSC)

The results in Appendix E show that 3 of the 4 windows (75%) to habitable rooms exceed the BRE target figure of 27% or do not reduce by more than 20% and therefore pass the BRE criteria.

The reductions in VSC to the remaining window (25%) is 29% (less than 10% above the permitted 20%) and is considered to be minor adverse.

All windows (100%) therefore pass the BRE guideline or are considered to be minor adverse.

7.8.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.8.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 4 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) pass the BRE guideline in summer and winter.

7.9 11 Burleigh Street, Cambridge (B9)

Front Elevation

This residential property will be demolished as part of the new development and therefore has not been assessed further.

7.10 12 Burleigh Street, Cambridge (B10)

Front Elevation

This residential property will be demolished as part of the new development and therefore has not been assessed further.

7.11 13-14 Burleigh Street, Cambridge (B11)

Front Elevation

This property was found to be commercial as part of further research and has not been assessed further.

7.12 The Snug, 170 East Road, Cambridge (B12)

Rear Elevation

Front Elevation

This property is a two-storey part residential part commercial pub building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the rear / side elevations, which provides light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.12.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 3 windows (100%) to habitable rooms exceed the BRE target figure of 27% or do not reduce by more than 20% and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.12.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for the 1 room analysed (100%) does not reduce by more than 20% as a result of the proposed development and therefore passes the BRE criteria.

The room assessed (100%) therefore passes the BRE guideline.

7.12.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 3 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

All the windows (100%) pass the BRE guideline in summer and winter.

7.13 80 Paradise Street, Cambridge (B13)

Front Elevation

This property is a three-storey residential building of traditional brick and lead cladding construction with a pitched tiled roof. There are glazed windows facing the development site in the rear elevation which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.13.1 Vertical Sky Component (VSC)

The results in Appendix E show that the 1 window (100%) to a habitable room exceeds the BRE target figure of 27% or does not reduce by more than 20% and therefore passes the BRE criteria.

The window (100%) therefore passes the BRE guideline.

7.13.2 No-Sky Line (NSL)

The table in Appendix F shows that the NSL value of the only room analysed (100%) has a reduction in NSL of 27% (less than 10% above the permitted 20%) and is considered to be minor adverse. However, this room is a bedroom which is deemed to be less important by the BRE guide.

7.13.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that the only window analysed does not fall within 90 degrees of due south, this window is therefore exempt from this measure and has not been assessed further.

The window (100%) passes the BRE guideline in summer and winter.

7.14 82 Paradise Street, Cambridge (B14)

Front Elevation

This property is a three-storey residential building of traditional brick and lead cladding construction with a pitched tiled roof. There are glazed windows facing the development site in the rear elevation which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.14.1 Vertical Sky Component (VSC)

The results in Appendix E show that the 1 window (100%) to a habitable room exceeds the BRE target figure of 27% or does not reduce by more than 20% and therefore passes the BRE criteria.

The window (100%) therefore passes the BRE guideline.

7.14.2 No-Sky Line (NSL)

The table in Appendix F shows that the NSL value of the only room analysed (100%) has a reduction in NSL of 23% (less than 10% above the permitted 20%) and is considered to be minor adverse. However, this room is a bedroom which is deemed to be less important by the BRE guide.

7.14.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that the only window analysed does not fall within 90 degrees of due south, this window is therefore exempt from this measure and has not been assessed further.

The window (100%) passes the BRE guideline in summer and winter.

7.15 84 Paradise Street, Cambridge (B15)

Front Elevation

This property is a three-storey residential building of traditional brick and lead cladding construction with a pitched tiled roof. There are glazed windows facing the development site in the rear elevation which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.15.1 Vertical Sky Component (VSC)

The results in Appendix E show that the 1 window (100%) to a habitable room exceeds the BRE target figure of 27% or does not reduce by more than 20% and therefore passes the BRE criteria.

The window (100%) therefore passes the BRE guideline.

7.15.2 No-Sky Line (NSL)

The table in Appendix F shows that the NSL value of the only room analysed (100%) has a reduction in NSL of 26% (less than 10% above the permitted 20%) and is considered to be minor adverse. However, this room is a bedroom which is deemed to be less important by the BRE guide.

7.15.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that the only window analysed does not fall within 90 degrees of due south, this window is therefore exempt from this measure and has not been assessed further.

The window (100%) passes the BRE guideline in summer and winter.

7.16 44-45 Burleigh Street, Cambridge (B16)

Front Elevation

This property is a three-storey part residential part commercial coffee shop building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site at the front and side elevations, which provide light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.16.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 4 windows (100%) to habitable rooms exceed the BRE target figure of 27% or do not reduce by more than 20% and therefore pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.16.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for all 4 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All of the rooms (100%) therefore pass the BRE guideline.

7.16.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that all 4 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

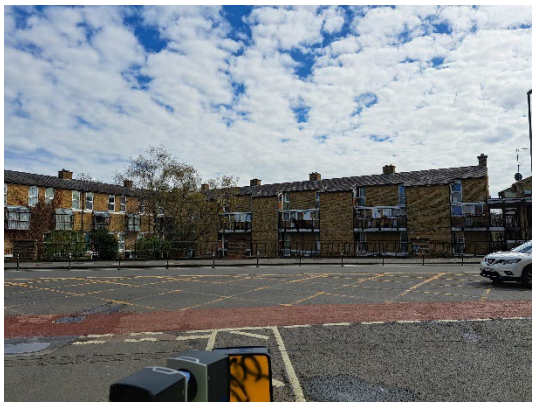
All the windows (100%) pass the BRE guideline in summer and winter.

7.17 5-7 Norfolk Street, Cambridge (B17)

Front Elevation

This property was found to be commercial as part of further research and has not been assessed further.

7.18 Flat 1, Hilderstone House, Staffordshire Street, Cambridge (B18)



Front Elevation

This property is a three-storey residential building of traditional brick construction with a pitched tiled roof. There are glazed windows facing the development site in the front elevation, which provides light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.18.1 Vertical Sky Component (VSC)

The results in Appendix E show that 12 of the 14 windows (86%) to habitable rooms exceed the BRE target figure of 27% or do not reduce by more than 20% and therefore pass the BRE criteria. The reductions in VSC values to the remaining 2 windows (14%) are 21% and 26% and are considered to be minor adverse based on the percentage reduction.

7.18.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values for 10 of the 12 rooms analysed (83%) do not reduce by more than 20% as a result of the proposed development and therefore pass the BRE criteria.

1 of the remaining 2 rooms (8%) has a reduction in NSL of 35% (less than 20% above the permitted 20%) and is considered to be moderate adverse. The remaining 1 room (8%) has a reduction in NSL greater than 40% and is considered to be major adverse.

7.18.3 Annual Probable Sunlight Hours (APSH)

The results in Appendix G show that 9 of the 14 windows do not fall within 90 degrees of due south, all windows are therefore exempt from this measure and have not been assessed further.

The summer annual probable sunlight hours calculated to the remaining 5 windows assessed (100%) are well above the BRE recommended levels of 25% in summer or do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

The winter annual probable sunlight hours calculated to the remaining 5 windows assessed (100%) are well above the BRE recommended levels of 5% in winter or do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All the windows (100%) pass the BRE guideline in summer and winter.

7.19 Land and buildings on the east side of East Road & land and buildings lying to the south of Norfolk Street, Cambridge (B19)

Front Elevations

These properties all appear on the same title search and have been grouped together. They are three-storey residential buildings of traditional brick construction with pitched tiled roofs. There are glazed windows facing the development site in the front and side elevations which provides light into bedrooms and living spaces.

The floor layouts for this property used in the 3D model have been built up based on information found on the Planning Portal.

7.19.1 Vertical Sky Component (VSC)

The results in Appendix E show that all 5 windows (100%) to habitable rooms exceed the BRE target figure of 27% or do not reduce by more than 20% and therefore fully pass the BRE criteria.

All windows (100%) therefore pass the BRE guideline.

7.19.2 No-Sky Line (NSL)

The table in Appendix F shows that that the NSL values all 3 rooms analysed (100%) do not reduce by more than 20% as a result of the proposed development and therefore fully pass the BRE criteria.

All rooms (100%) therefore pass the BRE guideline.

7.19.3 Annual Probable Sunlight Hours (APSH)

The summer annual probable sunlight hours calculated to all 5 windows assessed (100%) are well above the BRE recommended levels of 25% in summer or do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

The winter annual probable sunlight hours calculated to all 5 windows assessed (100%) are well above the BRE recommended levels of 5% in winter or do not reduce more than 20% as a result of the proposed development and therefore pass the BRE criteria.

All the windows (100%) pass the BRE guideline in summer and winter.

8.0 Summary & Conclusions

We have considered the proposed development in relation to the BRE guidelines on daylight and sunlight for the selected windows to the adjacent residential accommodation and the results are tabulated in the Appendices and summarised above.

In summary, the daylight sunlight assessment ultimately demonstrates that the proposed development have negligible effects in terms of neighbouring properties' ambient daylight conditions. The results are also comparable to those for other similar schemes that have recently been granted planning approval in the Cambridge city centre.

On this basis and having regard to the character of the site and surroundings and the flexible suburban basis of the BRE guidance, the development's effects on neighbouring properties are considered acceptable.

Where there are deviations from the BRE guidelines, their significance is also offset by the following:

- It is inevitable when constructing buildings in an urban environment that alterations in daylight and sunlight to adjoining properties can occur
- Deviations from the BRE baseline are generally extremely marginal

- The BRE guidelines indicate that in interpreting the results of an assessment, a degree of flexibility is required, especially in a dense urban environment where neighbouring properties are located within narrow streetscapes and with design obstructions restricting the availability of daylight or sunlight
- The current NPPF states that ''a flexible approach should be taken in applying policies relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site''
- The BRE tests are based on a typical (two storey) suburban model of development and it is reasonable to assume that expectations of levels of daylight sunlight will be different in developing larger properties such as this. This is noted in the guide itself

Given the existing built urban context, we feel that the impacts to the surrounding residential properties are entirely reasonable.

We trust this report is of assistance and look forward to receiving your further instructions. In the meantime, if you have any comments or queries, please do not hesitate to contact me.

9.0 Conditions of Use of This Report

This report is to be regarded as confidential to and for the sole use of the recipient. Consequently, no responsibility is accepted to any third party in respect of its contents in whole or in part.

Appendix A

Vertical Sky Component (VSC)