REP01

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 260088-03

Ove Arup & Partners Ltd 13 Fitzroy Street

London W1T 4BQ United Kingdom www.arup.com

Great George Street Developments **Great George Street** Daylight Analysis

Issue | 25 September 2018



Document Verification



Job title Document title		Great George Street Daylight Analysis			Job number 260088-03	
					File reference	
Document r	ef	REP01				
Revision	Date	Filename	2018-08-15 Gre	eat George Street - Da	aylight Analysis.docx	
Draft 1 15 Aug 2018		Description	Draft for Comment			
			Prepared by	Checked by	Approved by	
		Name	Jerell Gill	Paul Lynch	Steve Walker	
		Signature				
Issue	25 Sep 2018	Filename	2018-09-25 Gre ISSUE.docx	eat George Street - Da	aylight Analysis	
		Description	Issue to Client			
			Prepared by	Checked by	Approved by	
		Name	Jerell Gill	Paul Lynch	Steve Walker	
		Signature				
		Filename				
		Description				
			Prepared by	Checked by	Approved by	
		Name				
		Signature				
		Filename				
		Description				
			Prepared by	Checked by	Approved by	
		Name				
		Signature				
	I	1	Issue Do	cument Verification wit	h Document 🗸	

Contents

			Page				
1	Intro	luction	2				
2	Dayli	ght and Sunlight Assessment Methodology	3				
	2.1	Daylight in Buildings	3				
	2.2	Sunlight in External Spaces	3				
3	Analy	Analysis Results and Discussion					
	3.1	Nearby residential properties	5				
	3.2	Great George Street Scheme – Daylight in Internal Spaces	13				
	3.3	Great George Street Scheme – Sunlight in External Spaces	18				
4	Concl	usions	21				
	4.1	Nearby residential properties	21				
	4.2	Great George Street Scheme – Daylight in Internal Spaces	21				
	4.3	Great George Street Scheme – Sunlight in External Spaces	22				

Executive Summary

An assessment of daylight and sunlight access has been carried out for the proposed development at Great George Street. This assessment has been carried out in line with the recommendations of the BRE Guide 209: Site Layout Planning for Daylight and Sunlight (2nd Edition).

Nearby residential properties

The daylight access for existing properties adjacent to the site boundaries has been assessed in terms of the Vertical Sky Component. The resulting values have been compared against the existing condition and the condition with the scheme which currently holds outline planning permission for the site (Application Number 150/1998).

VSC range	Performance	Description
>27%	Good	Good daylight access. Conventional window design will usually give reasonable results.
15-27%	Marginal	Reduced daylight access. Special measures (e.g. larger windows, changes to room layout) are usually required to provide adequate daylight. More detailed analysis of internal light may be required.
<15%	Poor	Poor daylight access. Very difficult to provide adequate daylight unless very large windows are used.

In general, the proposed development improves the daylight access for the existing properties over that achieved with the consented scheme, with the exception of two single-storey residential properties on Cookson Street.

Street	VSC - Consented Scheme	VSC - Proposed Scheme	Comments
Duncan St	Majority of the rear elevations achieve <15% Front elevations generally >27%, with some areas 15- 27%	Majority of the rear elevations achieve 15-27% Front elevations generally >27%, with some areas 15- 27%	Proposed scheme provides a significant improvement on the currently consented scheme in terms of daylight access
Upper Pitt St	Generally front elevations achieve 15-27%, with localised areas dropping below 15%	Generally front elevations achieve 15-27%, with localised areas dropping below 15%. Values generally slightly higher than in consented scheme.	Proposed scheme provides a marginal improvement on the currently consented scheme in terms of daylight access
Cookson St	Front elevations achieve 15- 27%	Front elevations achieve <15%	Proposed scheme significantly reduces daylight access

Values of VSC less than 27% (the level recommended in BRE 209 for good daylight access) are predicted for a number of the existing properties. However, it is recognised that this level is often difficult to achieve in city centre developments with a high rise component.

Values of VSC less than 15%, where adequate internal daylight is difficult to achieve, are only predicted for the properties on Cookson Street, and a small portion of the rear elevations of the properties at the south end of Duncan Street. However, the properties on Duncan Street benefit from large windows to the front, where daylight access is very good, which may counteract the impact of the proposed development to the rear.

An assessment of the sunlight access to the gardens on Duncan Street was also carried out. Just over half of these gardens (at the northern end of the terrace) receive more than the BRE recommended quantity of sunlight for gardens and open spaces. The gardens at the south end of the terrace receive less than the recommended quantity direct sunlight, and their amenity will be reduced. The level of sunlight achieved in these gardens is similar to that achieved by the consented scheme.

It is noted that the Case Officer Report regarding the planning permission for the homes on Duncan Street (Application Number 13F/2954) states, in reference to the change in location of the outdoor amenity space to the rear of these properties, that

- "In order to ensure that the remainder of Phase 1 as approved under the master plan can still be implemented, the Divisional Manager-Planning has sought to ensure that the changes to the design/layout do not impact on the overall concepts of the design of the site as a whole.
- The Divisional Manager-Planning is satisfied that the site is still suitable for residential development and can be developed without compromising the ability to implement and deliver the wider scheme."

Great George Street Scheme – Daylight in Internal Spaces

The proposed buildings with residential accommodation benefit from generally good levels of daylight access. Areas where residential units will receive reduced levels of daylight have been identified – these are particularly in areas that face onto neighbouring buildings. There are relatively few areas achieving a VSC of less than 15%, where achieving adequate daylight will be difficult.

Consideration should be given to the window design and room layout to ensure that units with a VSC of less than 27% achieve adequate internal daylight levels. The interior layout may also be adapted to avoid locating residential units in areas where light levels are low.

Building	Comments
	VSC generally >27%.
2A	Some areas of VSC 15-27% up to 5 th storey on elevation facing courtyard, and up to 6 th storey in localised area close to Building 2B.
20	VSC generally >27% on elevation facing Cookson St.
20	VSC generally 15-27% on elevation facing courtyard, with areas of VSC <15% up to 3 rd storey.
	VSC generally >27%.
3A	Localised area of VSC 15-27% at corner facing public square.
	Elevation facing Building 3C VSC generally <15%.
3C	VSC generally >27% at upper storeys.
	Areas of VSC 15-27% up to 5^{th} storey, and VSC <15% up to 2^{nd} storey on elevation facing St James' Street.
	Areas of VSC 15-27% extend up to approximately the 13^{th} storey on the elevation facing the public square, with localised areas of VSC <15%.

Great George Street Scheme – Sunlight in External Spaces

A number of external spaces within the proposed development have been assessed for sunlight access:

A summary of these assessments is given in the following table:

Area	Comments
Residents' courtyard between blocks 2A and 2C	Good sunlight access throughout the year, thanks to its south-westerly orientation.
Park Area between block 2B and Great George	Good sunlight access throughout the year, particularly in the morning.
Podium Garden adjacent to block 2B	Good sunlight access throughout the year, particularly in the afternoon.
Commercial event space within Phase 3	Poor sunlight access through the winter
Office courtyard adjacent to block 3B	Poor sunlight access through the winter

Introduction

1

The proposed Great George Street (phase 2 and 3) development comprises 7 plots including residential, retail, leisure and office space over a 5-acre site in Liverpool. Great George Street borders the site to the east and a number of existing residential buildings lie near to the site's west border. The site area is shown in Figure 1, and the plan layout of the proposed plots are shown in Figure 2.



Figure 1: Outline of Great George Street site

Arup have carried out an assessment of daylight and sunlight access to the buildings and open spaces both within and directly surrounding the development.



Figure 2: Overall site plan with phase and plot numbering. Neighbouring buildings with windowed facades facing the development are highlighted in blue.

2 **Daylight and Sunlight Assessment Methodology**

We have followed the BRE 209 Site Layout Planning for Daylight and Sunlight good practice guide for assessing the impact of the proposed scheme on the following:

- Daylight in surrounding residential buildings;
- Sunlight in surrounding external amenity spaces;
- Daylight in residential units within the proposed scheme, and •
- Sunlight in external amenity spaces within the proposed scheme. •

As part of this assessment, we have carried out a 3D analysis of the site using Radiance, a physically-based rendering software, based on backward ray tracing.

BRE 209 gives advice on site layout planning to achieve good daylighting and sunlighting, within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylighting recommendations in BS 8206-2 Code of practice for daylighting, and in the CIBSE publication Lighting guide: daylighting and window design. BRE 209 complements them by providing advice on the planning of the external environment. If these guidelines on site layout are followed, along with the detailed window design guidance in BS 8206-2 and Lighting guide: daylighting and window design, there is the potential to achieve good daylighting in new buildings, and retain it in existing buildings nearby.

The introduction to BRE 209 states that:

"The guide is intended for building designers and their clients, consultants and planning officials. 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."

As such, the numerical values presented in this report should be interpreted with flexibility, with consideration for the wider context of the development.

Daylight in Buildings 2.1

The Vertical Sky Component (VSC) is proposed in BRE 209 as a high-level assessment of daylight access for building facades. VSC is the ratio of direct sky illuminance falling at a point on a vertical wall, to the illuminance on a horizontal surface with no obstructions. It does not include reflected light either from the ground or other buildings.

A CIE overcast sky is used, which makes this study independent of time of year or geographical location.

Typically, a VSC of 27% or above will provide for good daylight access for buildings with standard window design. This can vary depending on the type of room, but usually gives reasonable results.

For existing buildings, if, after the addition of the new development, the VSC is less than 27%, and less than 80% of the VSC in the existing condition, occupants in the buildings are likely to notice the reduction in daylight.

If the VSC is between 15% and 27% good daylight levels can be achieved, but large windows and changes to the room layout are usually required. For example, bedrooms need less daylight than living rooms and kitchens, and bathrooms and storage areas do not have a special requirement for daylight.

For a VSC less than 15%, it will be very difficult to achieve adequate daylighting.

Further studies of interior conditions using methodologies described in BS 8206-2 may be carried out where a VSC < 27% is found.

2.2 **Sunlight in External Spaces**

BRE 209 includes guidelines on sunlight in gardens and other external spaces. These include:

- Gardens, usually the main rear garden of a house
- Parks and playing fields
- Children's playgrounds
- Outdoor swimming pools and paddling pools
- Sitting out areas such as those between non-domestic buildings and in public squares
- Focal points for views such as a group of monuments or fountains

Sunlight in external spaces is valuable to:

- Provide attractive sunlit views;
- Make outdoor activities like sitting and out children's play more pleasant;
- Encourage plant growth;
- Dry out the ground;
- Melt frost, ice and snow;
- Dry clothes.

The equinox on 21st March is specified in BRE 209 as an appropriate date for assessment. BRE 209 recommends that at least half of the area classed as gardens and open spaces (listed above) receive at least 2 hours of sunlight on this day.

3 **Analysis Results and Discussion**

The results in this section show images from the daylight analysis for internal spaces and sunlight analysis for external spaces.

Where relevant, a comparison is drawn between the conditions for the proposed scheme and the scheme previously consented for outline planning permission (Application Number 150/1998, labelled "Consented Scheme"). The existing condition is also shown, where relevant.

The daylight analysis results show plots of VSC and are colour coded as described below:

Key:	Colour	VSC range	Performance	Description
VSC	Grey/unshaded	>27%	Good	Good daylight access. Conventional window design will usually give reasonable results.
15-27%	Green	15- 27%	Marginal	Reduced daylight access. Special measures (e.g. larger windows, changes to room layout) are usually required to provide good daylight. More detailed assessment may be required.
	Purple	<15%	Poor	Poor daylight access. Very difficult to provide adequate daylight unless very large windows are used.

The sunlight analysis results show plots of hours of direct sunlight at the equinox and are colour coded as described below:



Note that these numerical values are based on the guidance in BRE 209, and should be interpreted with flexibility, as described in section 2.

Description

The space will be well sunlit through most of the year

Sunlight will be limited. During winter, the outdoor space will be permanently in shade, reducing the amenity of the space.

3.1 Nearby residential properties

3.1.1 Duncan Street



Duncan Street comprises a row of residential properties directly adjacent to the proposed scheme, with their rear façade and gardens facing the phase 3 plot. The front façades (facing Duncan Street), shown in Figure 4, comprise large windows and the properties appear to have been designed so as to receive the majority of their daylight from this side.

Figure 3: Image showing the surroundings analysed in the Duncan Street area, annotated with views 1 and 2.



Figure 4: Photograph of residential properties on Duncan Street close to proposed scheme, view of the front.

© Google



Figure 5: Photograph of residential properties on Duncan Street close to proposed scheme, view of the back.



Front Elevation of Residential Properties on Duncan Street

Figure 6: Image showing surroundings analysed in the Duncan Street area, annotated with view 1.







Rear Elevation of Residential Properties on Duncan Street

VSC VSC 15-27% 15-27% <15% <15% Figure 13: Plot of VSC on rear façade of Duncan Street properties. Scenario with the consented scheme. Figure 12: Plot of VSC on rear façade of Duncan Street properties. Scenario with the existing condition.

The proposed scheme achieves a very similar performance as the consented scheme for daylight access to the front façade of the residential properties on Duncan Street, shown in Figure 6. In the existing condition, there is a small area in which VSC is 15-27% on this façade. For the proposed and consented schemes, (Figure 7 and Figure 9) there is an increase in this 15-17% VSC area at the north end.

The proposed scheme provides a significant improvement over the consented scheme in terms of daylight access to the rear of the houses on Duncan Street. For the consented scheme, the VSC is less than 15% for much of the rear façade of this terrace, meaning daylight access would be poor. In the proposed scheme, the height of building 3B has been reduced, and space has been introduced between buildings 2B and 3A providing more daylighting from the east and south, which increases VSC into the 15-27% range for much of the rear façade. Areas of VSC less than 15% are largely reduced to near inner corners, where there is some self shading.



Sunlight in Rear Gardens on Duncan Street







The proposed scheme achieves similar overall performance to the consented scheme for sunlight in the rear gardens of the residential properties on Duncan Street, shown in Figure 14. Approximately half of the back gardens (at the northern end of the terrace) achieve more than 2 hours of sunlight at the equinox. Compared to the consented scheme, the proposed scheme performs slightly less favourably at the south end, but better at the north end where it achieves performance approaching that in the existing condition.

Upper Pitt Street 3.1.2



The buildings along Upper Pitt Street opposite the phase 2 plot comprise 3- and 4-storey residential properties and have windowed facades facing the proposed scheme, as shown in Figure 19. Figure 20 shows the Frank Carroll Court building on the corner of Upper Pitt Street and Duncan Street to have large windows on both façades, which will assist in achieving good daylight within.

Figure 18: Image showing surroundings analysed in the Upper Pitt Street area, annotated with view.



Figure 19: Photograph of residential properties on Upper Pitt Street close to proposed scheme, view of the back. © Google





Figure 21: Image showing surroundings analysed in the Upper Pitt Street area, annotated with view 1.





The proposed scheme improves daylight access for the buildings on Upper Pitt Street compared to the consented scheme. There is a decrease in the areas with VSC less than 15% at the ground floor level of Frank Carroll Court, and in the recessed parts of the facade. Figure 23 shows that there are large areas of 15-27% VSC in these recessed parts in the existing condition, which is largely due to self-shading. The daylight access to the terrace on Upper Pitt Street is very similar in the proposed and consented schemes.

Cookson Street 3.1.3



Figure 25: Image showing surroundings analysed in the Cookson Street area, annotated with view.

View of Residential Properties on Cookson Street



Figure 26: Photograph of residential properties on Cookson Street. © Google

There are two single-storey residential properties at the centre of Cookson Street. These face phase 2 of the proposed scheme. The buildings to either end of Cookson Street do not have windows facing the proposed development, and so will be unaffected.



Figure 27: Image illustrating the Cookson Street area analysed, annotated with view.



Figure 28: Plot of VSC on Cookson Street buildings. Scenar



Figure 30 and Figure 28 show that there is a significant decrease in VSC from 15-27% in the consented scheme to less than 15% in the proposed scheme, respectively, across the façade of the residential property facing the proposed scheme.

rio with the proposed scheme.

3.2 Great George Street Scheme – Daylight in Internal Spaces

The analysis in this section is focussed on the daylighting performance of the residential units (including townhouses and apartments) across the proposed scheme.

3.2.1 **Building 2A**



Building 2A spans 10 storeys and comprises commercial units on the ground and 1st floors, and residential units on all floors.

Figure 31: Plan view illustration of the proposed scheme, highlighting building 2A and the views analysed.

Figure 32: Typical layout of a near-ground floor in building 2A containing residential units.



On the side of the building facing away from the courtyard (view 1), Figure 33 shows a small area of VSC less than 15%, which reaches the 3rd storey at its highest point, and areas of 15-27% VSC, which reach the 6th storey at their highest point. The daylight in these areas is reduced due to the proximity of building 2B.

On side of the building facing the courtyard (view 2), Figure 34 shows very small, local areas of VSC less than 15% at the corners of the ground level, and areas of 15-27% VSC, which reach up to the 5th storey at their highest point. The daylight in these areas is reduced due to the proximity of building 2C, particularly towards the northern end, where building 2A angles towards 2C.

The window design and layouts for the residential units should be consider how to ensure adequate daylight, particularly to the kitchen area, where the requirement for daylight is typically highest.



3.2.2 **Building 2C**

Building 2C spans 6 storeys and comprises residential units across all floors, with townhouse units on levels 0-3, and apartments on levels 4 and 5.







On the side of the building facing Cookson Street (view 1), Figure 37 shows VSC above 27% across the entire façade. On the side of the building facing the courtyard (view 2), Figure 38 shows a significant area of VSC less than 15%, which reaches the 4th storey at its highest point, and a large area of 15-27%, which reaches the top of the building at its highest point.

Daylighting is reduced on the façade facing the courtyard are due to the proximity of building 2A, particularly towards the north end, where building 2A angles towards building 2C. Particular consideration should be given to ensuring adequate daylight within the residential units on this side of the building, with particular regard to the townhouse units on levels 0-3.

3.2.3 **Building 3A**

Building 3A spans 13 storeys and comprises commercial units on the ground and 1st floors, and residential units from the 2nd floor up.



On the side of the building facing the inner public square (view 1), Figure 41 shows areas of 15-27% VSC concentrated towards the southern end. The daylight in these areas is reduced primarily due to the proximity and height of building 3C. On the side of the building facing Great George Street (view 2), Figure 42 shows VSC above 27% across the entire façade.

The façade facing building 3C achieves VSC less than 15%, however it is assumed that the main windows for the units along this side of the building are located on the other, more favourable façades, which achieve a VSC greater than 15% throughout.

3.2.4 **Building 3C**

Building 3C spans 18 storeys and comprises commercial units on the ground and 1st floors, and residential units from the 2nd floor up.



Figure 43: Plan view illustration of the proposed scheme, highlighting building 3C and the views analysed.

Figure 44: Typical layout of a floor in building 3C containing residential units.



On the side of the building facing St James' Street (view 1), Figure 45 shows some areas of VSC less than 15%, which reach the 2nd storey at their highest point, and areas of 15-27% VSC, which reach the 5th storey at their highest point, with the exception of the concave corner near the centre of this side of the building, where an area of 15-27% VSC reaches the top of the building. Figure 43 shows that two bedrooms typically meet at this corner and bedrooms have less stringent daylighting requirements than other rooms.

On the side of the building facing the inner public square (view 2), Figure 46 shows significant areas of VSC less than 15%, and areas of 15-27% VSC that reach up to around the 13th storey, again with the exception of the concave corner near the centre of the building, where an area of 15-27% VSC reaches the top of the building.

Particular consideration should be given to ensuring adequate daylight within the residential units on the side of the building facing the public square.

3.3 Great George Street Scheme – Sunlight in External Spaces

3.3.1 Phase 2, Residents' Courtyard



Figure 47: Plan illustration of the proposed scheme with the residents' courtyard outlined.



Figure 48: Plot of the hours of sunlight in the residents' courtyard.

At the equinox, more than 2 hours of sunlight is achieved in the majority of the resident's courtyard between buildings 2A and 2C. In the remaining area of the courtyard, towards the north end, only marginally below 2 hours of sunlight is achieved. This space will be generally well sunlit throughout the year.



3.3.2 Phase 2, Great George Street Park Area and Podium Garden



Figure 49: Plan illustration of the proposed scheme with the areas around building 2B outlined.



Figure 50: Plot of hours of sunlight in areas adjacent to building 2B.

The public park area and private podium garden adjacent to building 2B both benefit from good access to sunlight, achieving more than 2 hours of direct sunlight throughout on the equinox. These spaces will be generally well sunlit throughout the year.



3.3.3 Phase 3, Commercial Event Space and Office Courtyard

Figure 51: Plan illustration of the proposed scheme with the public square outlined.





Figure 52: Plot of hours of sunlight in the public square.

The majority of the external spaces in Phase 3 achieve less than two hours of direct sunlight at the equinox. This area is shaded primarily due to the height of buildings 3A and 3C, and their positions to the south and east.

These buildings shade light from the sun as it moves across the sky to the south for most of the year, and the square will be in shade throughout the winter, potentially impacting on the amenity value of this space.

The area to the north of this area, near to the opening between buildings 2B and 3A receives more than 2 hours of sunlight at the equinox, and will be well sunlit.

Conclusions 4

An assessment of daylight and sunlight access has been carried out for the proposed development at Great George Street. This assessment has been carried out in line with the recommendations of the BRE Guide 209: Site Layout Planning for Daylight and Sunlight.

Nearby residential properties 4.1

The daylight access for existing properties adjacent to the site boundaries has been assessed in terms of the Vertical Sky Component. The resulting values have been compared against the existing condition and the condition with the scheme which currently holds outline planning permission for the site (Application Number 150/1998).

VSC range	Performance	Description
>27%	Good	Good daylight access. Conventional window design will usually give reasonable results.
15-27%	Marginal	Reduced daylight access. Special measures (e.g. larger windows, changes to room layout) are usually required to provide adequate daylight. More detailed analysis of internal light may be required.
<15%	Poor	Poor daylight access. Very difficult to provide adequate daylight unless very large windows are used.

In general, the proposed development improves the daylight access for the existing properties over that achieved with the consented scheme, with the exception of two single-storey residential properties on Cookson Street.

Street	VSC - Consented Scheme	VSC - Proposed Scheme	Comments
Duncan St	Majority of the rear elevations achieve <15% Front elevations generally >27%, with some areas 15- 27%	Majority of the rear elevations achieve 15-27% Front elevations generally >27%, with some areas 15- 27%	Proposed scheme provides a significant improvement on the currently consented scheme in terms of daylight access
Upper Pitt St	Generally front elevations achieve 15-27%, with localised areas dropping below 15%	Generally front elevations achieve 15-27%, with localised areas dropping below 15%. Values generally slightly higher than in consented scheme.	Proposed scheme provides a marginal improvement on the currently consented scheme in terms of daylight access
Cookson St	Front elevations achieve 15- 27%	Front elevations achieve <15%	Proposed scheme significantly reduces daylight access

Values of VSC less than 27% (the level recommended in BRE 209 for good daylight access) are predicted for a number of the existing properties. However, it is recognised that this level is often difficult to achieve in city centre developments with a high rise component.

Values of VSC less than 15%, where adequate internal daylight is difficult to achieve, are only predicted for the properties on Cookson Street, and a small portion of the rear elevations of the properties at the south end of Duncan Street. However, the properties on Duncan Street benefit

from large windows to the front, where daylight access is very good, which may counteract the impact of the proposed development to the rear.

An assessment of the sunlight access to the gardens on Duncan Street was also carried out. Just over half of these gardens (at the northern end of the terrace) receive more than the BRE recommended quantity of sunlight for gardens and open spaces. The gardens at the south end of the terrace receive less than the recommended quantity direct sunlight, and their amenity will be reduced. The level of sunlight achieved in these gardens is similar to that achieved by the consented scheme.

It is noted that the Case Officer Report regarding the planning permission for the homes on Duncan Street (Application Number 13F/2954) states, in reference to the change in location of the outdoor amenity space to the rear of these properties, that

"In order to ensure that the remainder of Phase 1 as approved under the master plan can still be implemented, the Divisional Manager-Planning has sought to ensure that the changes to the design/layout do not impact on the overall concepts of the design of the site as a whole.

The Divisional Manager-Planning is satisfied that the site is still suitable for residential development and can be developed without compromising the ability to implement and deliver the wider scheme."

4.2 **Great George Street Scheme – Daylight in Internal Spaces**

The proposed buildings with residential accommodation benefit from generally good levels of daylight access. Areas where residential units will receive reduced levels of daylight have been identified – these are particularly in areas that face onto neighbouring buildings. There are relatively few areas achieving a VSC of less than 15%, where achieving adequate daylight will be difficult.

Consideration should be given to the window design and room layout to ensure that units with a VSC of less than 27% achieve adequate internal daylight levels. The interior layout may also be adapted to avoid locating residential units in areas where light levels are low.

Building	Comments
2A	VSC generally >27%. Some areas of VSC 15-27% up to 5 th storey on elevation facing courtyard, and up to 6 th storey in localised area close to Building 2B.
2C	VSC generally >27% on elevation facing Cookson St. VSC generally 15-27% on elevation facing courtyard, with areas of VSC <15% up to 3 rd storey.
3A	VSC generally >27%. Localised area of VSC 15-27% at corner facing public square. Elevation facing Building 3C VSC generally <15%.
3C	VSC generally >27% at upper storeys. Areas of VSC 15-27% up to 5 th storey, and VSC <15% up to 2 nd storey on elevation facing St James' Street. Areas of VSC 15-27% extend up to approximately the 13 th storey on the elevation facing the public square, with localised areas of VSC <15%.

4.3 Great George Street Scheme – Sunlight in External Spaces

A number of external spaces within the proposed development have been assessed for sunlight access:

A summary of these assessments is given in the following table:

Area	Comments	
Residents' courtyard between blocks 2A and 2C	Exceeds BRE 209 guidance. Good sunlight access throughout the year, thanks to its south-westerly orientation.	
Park Area between block 2B and Great George	Exceeds BRE 209 guidance. Good sunlight access throughout the year, particularly in the morning.	
Podium Garden adjacent to block 2B	Exceeds BRE 209 guidance. Good sunlight access throughout the year, particularly in the afternoon.	
Commercial event space within Phase 3	Does not meet BRE 209 guidance. Poor sunlight access through the winter	
Office courtyard adjacent to block 3B	Does not meet BRE 209 guidance. Poor sunlight access through the winter	