DAYLIGHT, SUNLIGHT & OVERSHADOWING

Barnes Hospital

Produced by XCO2 for Star Land Realty UK Ltd

November 2021

XCO2
56 Kingsway Place, Sans Walk
London EC1R 0LU

+44 (0)20 7700 1000
mail@xco2.com
xco2.com

CONTENTS

	01	02	03	04			
Remarks	Draft	For planning	Update	For planning			
Prepared by	FH	FH	FH	FH			
Checked by	SP	SP	SP	SP			
Authorised by	RM	RM	RM	RM			
Date	16/07/2021	28/07/2021	20/08/2021	16/11/2021			
Project reference	8.972	8.972	8.972	8.972			

EXECUTIVE SUMMARY

The daylight, sunlight and overshadowing analysis indicates that there will not be a significant impact on surrounding properties arising from the proposed development at Barnes Hospital.

Daylight and Sunlight analysis was carried out for the proposed development at Barnes Hospital, located within the London Borough of Richmond upon Thames. This report outlines the results of the analysis for the planning application, assessing the daylight and sunlight impacts on surrounding developments.

The methodology set out in this report is in accordance with BRE's "Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice" by PJ Littlefair (2011) which is accepted as good practice by Planning Authorities.

The following assessments were carried out:

- Daylight: 25 Degree Line
- Daylight: Vertical Sky Component
- Sunlight: Sunlight Access
- Sunlight: Sunlight Overshadowing

Computer modelling software was used to carry out the assessments. The model used was based on drawings and a 3D model provided by the architects (Scott Brownrigg) together with desktop research on neighbouring properties and an existing 3D massing model provided by the architects.

DAYLIGHT ASSESSMENT

A total of 90 windows from buildings surrounding the site were highlighted as being in close proximity to, and facing the proposed development.

Daylighting levels for potentially affected windows of surrounding developments by the proposed development at Barnes Hospital were found to be acceptable.

In summary,

- Windows belonging to 1-40 North Worple Way, 1-2 South Worple Avenue and 2-26 Buxton Road passed the 25-degree line test;
- 70 of the 90 windows from the other neighbouring developments achieved VSCs greater than 27%;
- 19 windows of the remaining 20 achieved relative VSCs over 0.8 of their former values
- The remaining window achieves relatively high absolute VSC of 24.7% and a relative VSC of 0.76 over its former value. It is worth noting that in a city urban environment, VSC values in excess of 20% should be considered as satisfactory.

Overall, the development is not anticipated to have any notable impact on the daylight received by neighbouring properties.

SUNLIGHT ASSESSMENT

A total of 55 windows from buildings surrounding the site were assessed for sunlight access. The analysis indicated that 54 windows achieve annual probable sunlight hours (APSH) greater than 25% and winter probable sunlight hours (WPSH) greater than 5% or at least 80% of their former value. The remaining window has less than 4% reduction in annual sunlight. Thus, all windows satisfied the BRE criteria for annual probable sunlight hours (APSH) and winter probable sunlight hours (WPSH).

Therefore, the proposed development at Barnes Hospital is not considered to have any notable impact on sunlight access to windows of surrounding developments.

OVERSHADOWING ASSESSMENT

A solar access analysis was undertaken for a total of 20 amenity spaces for the full 24 hours on 21st of March including 19 residential gardens to the east, 2 outdoor spaces belonging to SEN School and the Healthcare Centre of the outline planning permission to the east, and the Old Mortlake Burial Ground cemetery to the west. 20 of the amenity spaces (A1, A3, and A5 to A22) are predicted to have a minimum of 2 hours of sunlight on 21 March over at least 50% of each assessed amenity space. Where this is not achieved (A2 and A4), the difference between the area achieving 2 hours of sun on 21 March is higher than 0.8 times its former value.

The proposed development is therefore not considered to have any significant impact on sunlight access to the amenity spaces surrounding the site.

Table 1: Daylight results summary

Number of windows tested	90
Number of windows with a VSC higher than 27%	70
Number of windows with a VSC of at least 0.8 of existing value	19
Number of windows that belong to rooms meeting the NSL test	0
Number of windows that have a good VSC of over 24%	1

Table 2: Sunlight results summary

Total number of windows facing within 90° of south	55
Number of south facing windows passing the 25°/45° initial test	0
Number of south facing windows with APSH greater than 25% and WPSH greater than 5%, or of at least 0.8 of their former existing value	54
Number of south facing windows with less than 4% reduction in annual sunlight	1
Number of windows that do not meet any of the above criteria	0

INTRODUCTION

The site is located in an urban environment and the interpretation of the results requires careful consideration of the BRE guidance.

This report assesses the daylight, sunlight and overshadowing impacts the proposed new build residential development may have on the existing properties and open spaces surrounding the site.

The approach is based on the BRE's "*Site Layout Planning for daylight and sunlight, a Guide to good practice"* PJ Littlefair 2011, which is generally accepted as good practice by Town and Country Planning authorities.

It should be noted that although the numerical values stated by the BRE provide useful guidance to designers, consultants and planning officials, these are purely advisory and may vary depending on context. Dense urban areas, for example, may often experience greater site constraints when compared to low-rise suburban areas, and thus a high degree of obstruction is often unavoidable. Appendix F of the BRE document is dedicated to the use of alternative values and it also demonstrates the manner in which the criteria for skylight was determined for the summary given above, i.e. the need for 27% vertical sky component for adequate daylighting.

This figure of 27% was achieved using the following methodology: a theoretical road was created with two storey terraced houses upon either side, approximately twelve metres apart. The houses have windows at ground and first floor level, and a pitched roof with a central ridge. Thereafter, a reference point was taken at the centre of a ground floor window of one of the properties and a line was drawn from this point to the central ridge of the property on the other side of the road.

The angle of this line equated to 25 degrees (the 25 degrees referred to in the summaries given with reference to the criteria for skylight). This 25-degree line obstructs 13% of the totally unobstructed sky available, leaving a resultant figure of 27% which is deemed to give adequate daylighting. This figure of 27% is the recommended criteria referred to in this report. It will be readily appreciated that in an urban area, this kind of urban form and setting is unlikely and impractical.

Furthermore, the BRE guidance also focuses on 'relative change' which is likely to be exaggerated given the low-rise nature of the existing structures on site. Where there is more than a 20% reduction in VSC, this does not mean that the level of daylight will be unacceptable but, rather, that there may be a noticeable change in daylight levels to the occupants.

Therefore, given the location of the proposed development, with the height of the immediate neighbouring buildings to the east and south and the currently low-rise nature of the existing site, it is important to take into account that, although the 27% VSC target is the standard criterion available, it is not fully applicable to the development and that a lower VSC target is acceptable.

SITE

The proposed development is a residential 3-block development located within the London Borough of Richmond upon Thames on South Worple Way Street. The total new build area is approximately 7,500 square metres brining a total of 109 residential units. The site is in a low-density urban area made up of mostly semi-detached and terraced houses with front and back gardens. The site comprises a number of red-brick buildings ranging in date from 1889-1999.

An outline application was submitted in 2018 (Application Reference Number: 18/3642/OUT) and was granted in September 2020. This current submission has been prepared in relation to the detailed application of the residential plot of the Barnes Hospital Site as approved under the Outline Planning Permission.

The adjoining site is assessed under the Outline Planning Permission scenario given that the existing buildings are non-domestic and partially vacant, and therefore not anticipated to have critical daylight expectations compared to the outline planning permission scenario which introduces a school as part of the development, with some daylight expectations.

Additionally, the outline planning permission buildings and the adjoining existing buildings have very similar proximity to the proposed development, therefore any alternative scenarios results are unlikely to differ from the results of the assessment.

Site analysis was carried out to identify any potential daylight and sunlight impacts on the surrounding properties. Relevant properties tested in this report adjacent to the proposed development are annotated in the figure on the following page.

The following neighbouring buildings were tested in detail:

- 1-40 North Worple Way;
- 1-2 South Worple Avenue;
- 2-26 (even) Buxton Road;
- 57-75 (odd) Grosvenor Avenue;
- SEN school to the east of the site (outline planning permission);
- Healthcare Centre to the northeast of the site (outline planning permission).

Figure 1: Site location and neighbouring buildings assessed

METHODOLOGY

The assessment is based on guidelines set out in the BRE "Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice" (2011).

DAYLIGHT

DAYLIGHT TO SURROUNDING WINDOWS

A plane is drawn at 25 degrees from the horizontal, at the centre of an existing window. If the new development intersects with this plane, the internal daylight levels of the surrounding windows may be reduced. When an obstruction of the 25-degree plane occurs, a more detailed assessment involving the Vertical Sky Component of the affected window would need to be carried out.

ABSOLUTE VERTICAL SKY COMPONENT (VSC)

The Vertical Sky Component is the ratio of the direct sky illuminance falling on the vertical wall at a reference point, to the simultaneous horizontal illuminance under an unobstructed sky. To maintain good levels of daylight, the Vertical Sky Component of a window needs to be 27% or greater. If the VSC is less than 27%, then a comparison of existing and proposed levels of VSC level would need to be calculated.

RELATIVE VERTICAL SKY COMPONENT

Good levels of daylighting can still be achieved if VSC levels are within 0.8 of their former value.

SUNLIGHT

ACCESS TO SUNLIGHT (APSH)

The BRE test relates mainly to existing living room windows, although care should be taken to ensure that kitchens and bedrooms receive reasonable amounts of sunlight. Annual Probable Sunlight Hour (APSH) assessment is carried out when there is an obstruction within the 25-degree line and the window is facing within 90 degrees due south. The APSH assessment states that the existing living room window should receive at least:

- 25% of annual probable sunlight hours (APSH) throughout the year;
- 5% of annual probable sunlight hours during the winter months;
- not less than 80% of its former sunlight hours during either period;
- not more than a 4% reduction in sunlight received over the whole year (APSH).

The term 'annual probable sunlight hours' refers to the long-term average of the total of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account). The 'winter probable sunlight hours' is used to mean the same but only for the winter period (21 September – 21 March).

OVERSHADOWING

SUNLIGHT TO AMENITY SPACES

Open spaces should retain a reasonable amount of sunlight throughout the year. The BRE states that for an amenity space to "appear adequately sunlit throughout the year, at least half of the area should receive at least 2 hours of sunlight on 21 March". Where this is not achieved, the difference between the area achieving 2 hours of sun on 21 March should be no less than 0.8 times its former value.

DAYLIGHT ASSESSMENT

The analysis indicates that the proposed development is unlikely to have a significant impact on neighbouring windows in terms of daylight. The following subsections detail the findings for each neighbouring building individually.

1-40 NORTH WORPLE WAY

These properties are located to the north of the proposed development. Figure 2 shows a view of the windows to North Worple Way street facades of the typical property characteristic of this area. The assessed windows were identified to be at ground floor level in the front façade of the properties, facing the proposed development.

The results show that all windows passed the 25-degree line test (illustrated in Figure 3); therefore, these properties windows are not deemed to be affected by the proposed development and hence have been excluded from the further detailed assessment in line with the BRE Guidance.

Figure 2: 1-15 North Worple Way windows

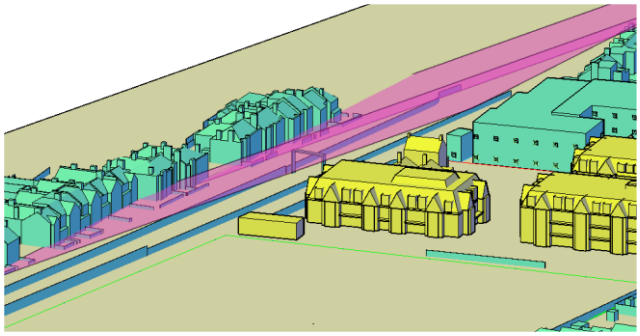


Figure 3: 25-degree plane from assessed windows at 1-40 North Worple Way

1-2 SOUTH WORPLE AVENUE

These properties on South Worple Avenue are located east of the proposed development. Figure 4 shows a view of the windows facades of the two semi-detached houses in closest proximity to the proposed development. The assessed windows were identified to be at ground floor level in the front façade of the properties, facing the proposed development.

The results show that all windows passed the 25-degree line test (illustrated in Figure 5); therefore, these properties windows are not deemed to be affected by the proposed development and hence have been excluded from the further detailed assessment in line with the BRE Guidance.

Figure 4: 1-2 South Worple Avenue windows

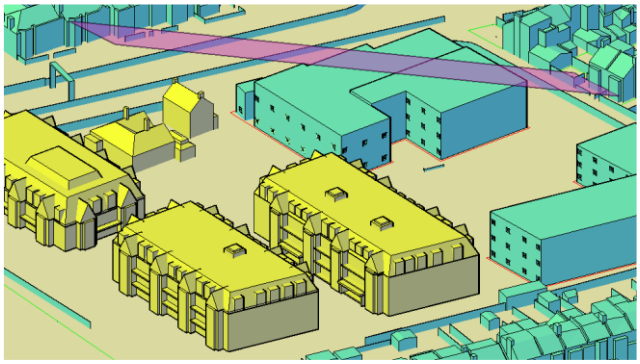


Figure 5: 25-degree plane from assessed windows at 1-2 South Worple Avenue

2-26 BUXTON ROAD

These properties (even numbers) on Boxton Road are located east of the proposed development. Figure 6 shows a view of the windows facades of the terraced houses. The assessed windows were identified to be at ground floor level in the front façade of the properties, facing the proposed development.

The results show that all windows passed the 25-degree line test (illustrated in Figure 7); therefore, these properties windows are not deemed to be affected by the proposed development and hence have been excluded from the further detailed assessment in line with the BRE Guidance.

Figure 6: 2-26 Buxton Road windows

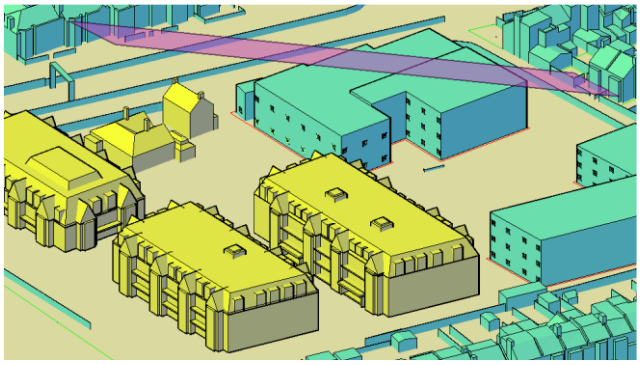


Figure 7: 25-degree plane from assessed windows at 2-26 Buxton Road

57-75 GROSVENOR AVENUE

These properties on Grosvenor Avenue are located south of the proposed development. Figure 8 shows the assessed windows. The potentially affected windows were identified to be at ground floor level on the rear façade of the properties, facing the proposed development. The upper floor windows of these properties would pass the 25-degree line test; therefore, they are deemed not to be affected by the proposed development and hence have been excluded from the further detailed assessment in line with the BRE Guidance. Some research on the planning portal was undertaken to obtain elevations drawings of these neighbouring properties.

The results show that 10 of the assessed windows achieve a VSC higher than 27%. The remaining window achieves a relative VSC of more than 80% of the existing scenario. The proposed development is therefore not considered to have any significant impact on 57-75 Grosvenor Avenue. The table below summarises the findings.

Detailed results are presented in Appendix B - Detailed Daylight Results.

Figure 8: 57-75 Grosvenor Avenue assessed windows

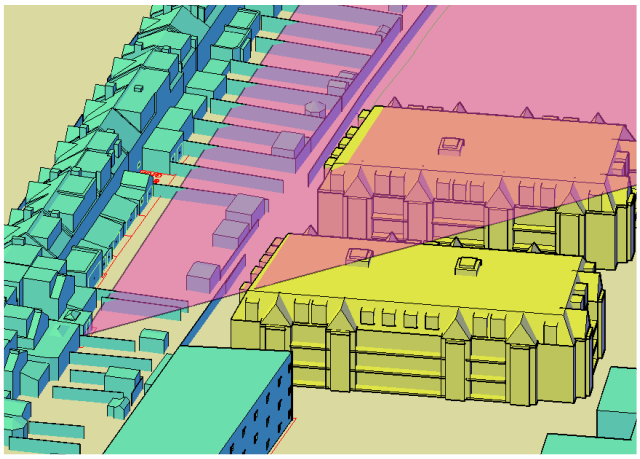


Figure 9: 25-degree plane from potentially affected windows at 57-75 Grosvenor Avenue on ground floor intersecting with the proposed development

Table 3: Daylight results summary for 57-75 Grosvenor Avenue

Number of windows tested	11
Number of windows with a VSC higher than 27%	10
Number of windows with a VSC of at least 0.8 of existing value	1
Number of windows that belong to rooms meeting the NSL test	0
Number of windows that do not meet any of the above criteria	0

SEN SCHOOL (OUTLINE PLANNING PERMISSION)

This building is part of the adjoining site outline planning permission (Application Reference Number: 18/3642/OUT) located to the east of the proposed development. Figure 10 shows the assessed windows. It should be noted that since this neighbouring development does not currently have detailed planning consent, windows were placed every 5 metres on the façade of the outline planning parameter massing facing the proposed development, to act as receptors.

The results show that 38 of the assessed windows achieve a VSC higher than 27%. 12 out of the remaining 13 windows achieve a relative VSC of more than 80% of the existing scenario. The remaining window achieves relatively high absolute VSC of 24.7% and a relative VSC of 0.76 over its former value. It is worth noting that in a city urban environment, VSC values in excess of 20% should be considered as satisfactory. The proposed development is therefore not considered to have any significant impact on the SEN School. The table below summarises the findings.

Detailed results are presented in Appendix B - Detailed Daylight Results.

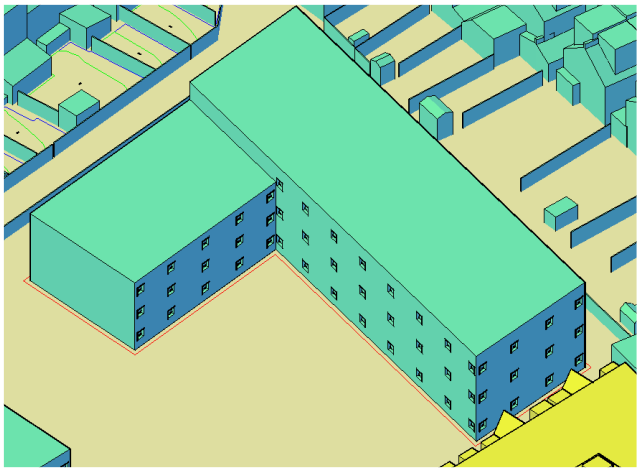


Figure 10: SEN School assessed windows

Table 4: Daylight results summary for the SEN School (outline planning permission)

Number of windows tested	51
Number of windows with a VSC higher than 27%	38
Number of windows with a VSC of at least 0.8 of existing value	12
Number of windows that belong to rooms meeting the NSL test	0
Number of windows that have a good VSC of over 24%	1

HEALTHCARE CENTRE (OUTLINE PLANNING PERMISSION)

This building is part of the adjoining site outline planning permission (Application Reference Number: 18/3642/OUT) located to the east of the proposed development. Figure 11 shows the assessed windows. Worth noting that since this neighbouring development does not have planning consent yet, Windows were placed every 5 metres on the façade of the outline parameter massing facing the proposed development, to act as receptors.

The results show that 22 of the assessed windows achieve a VSC higher than 27%. The remaining 6 windows achieve a relative VSC of more than 80% of the existing scenario. The proposed development is therefore not considered to have any significant impact on the Healthcare Centre. The table below summarises the findings.

Detailed results are presented in Appendix B - Detailed Daylight Results.

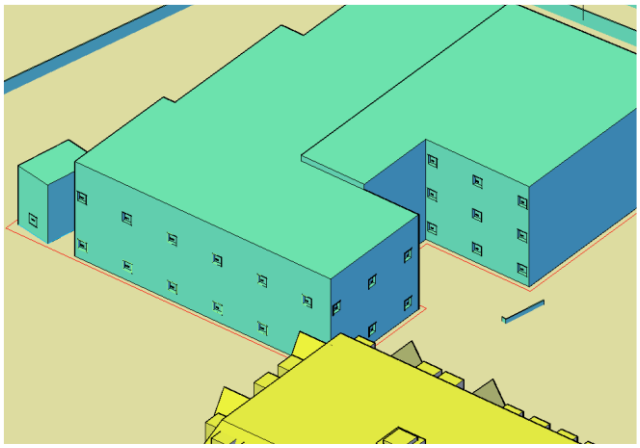


Figure 11: Healthcare Centre assessed windows

Table 5: Daylight results summary for the Healthcare Centre (outline planning application)

Number of windows tested	28
Number of windows with a VSC higher than 27%	22
Number of windows with a VSC of at least 0.8 of existing value	6
Number of windows that belong to rooms meeting the NSL test	0
Number of windows that do not meet any of the above criteria	0

SUNLIGHT ASSESSMENT

The analysis indicates that the proposed development is unlikely to have a significant impact on neighbouring south facing windows in terms of sunlight.

The BRE guide states that:

"if a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected"

A total of 55 windows from buildings surrounding the site were highlighted as facing the development and within 90° of due south. These windows belong to the SEN School and the Healthcare Centre (outline planning permission) included within this assessment.

The analysis indicated that all windows within 90° due south satisfy the BRE criteria for sunlight.

The table below shows the results summary. The detailed results can be found in Appendix C - Detailed Sunlight Results.

Overall, the proposed development is not considered to have any notable impact on sunlight access to windows of surrounding developments.

Table 6: Sunlight results summary

Total number of windows facing within 90° of south	**55**
Number of south facing windows with APSH greater than 25% and WPSH greater than 5%, or of at least 0.8 of their former existing value	54
Number of south facing windows with less than 4% reduction in annual sunlight	1
Number of windows that do not meet any of the above criteria	0

OVERSHADOWING ASSESSMENT

The analysis indicates that the proposed development is unlikely to have a significant impact on the sunlight received by neighbouring amenity spaces.

A review of the site plan showed that there are 22 amenity or open spaces in close proximity to the proposed development, including 19 residential gardens to the east, 2 outdoor spaces belonging to SEN School and the Healthcare Centre of the outline planning permission to the east, and the Old Mortlake Burial Ground cemetery to the west as shown in the figure below. A Solar Access Analysis was undertaken on these amenity areas for the full 24 hours on 21 March as set out by the BRE.

The images show that at least 50% of the analysed spaces (A1, A3, and A5 to A22) will receive more than 2 hours of sunlight on 21 March under proposed conditions, meeting the BRE requirements for overshadowing. Where this is not achieved (A2 and A4 achieve 17% and 44% respectively), the difference between the area achieving 2 hours of sun on 21 March is higher than 0.8 times its former value.

The proposed development is not considered to have any significant impact on sunlight access to neighbouring amenity and open spaces.

Figure 12: Amenity and open spaces in close proximity to development site

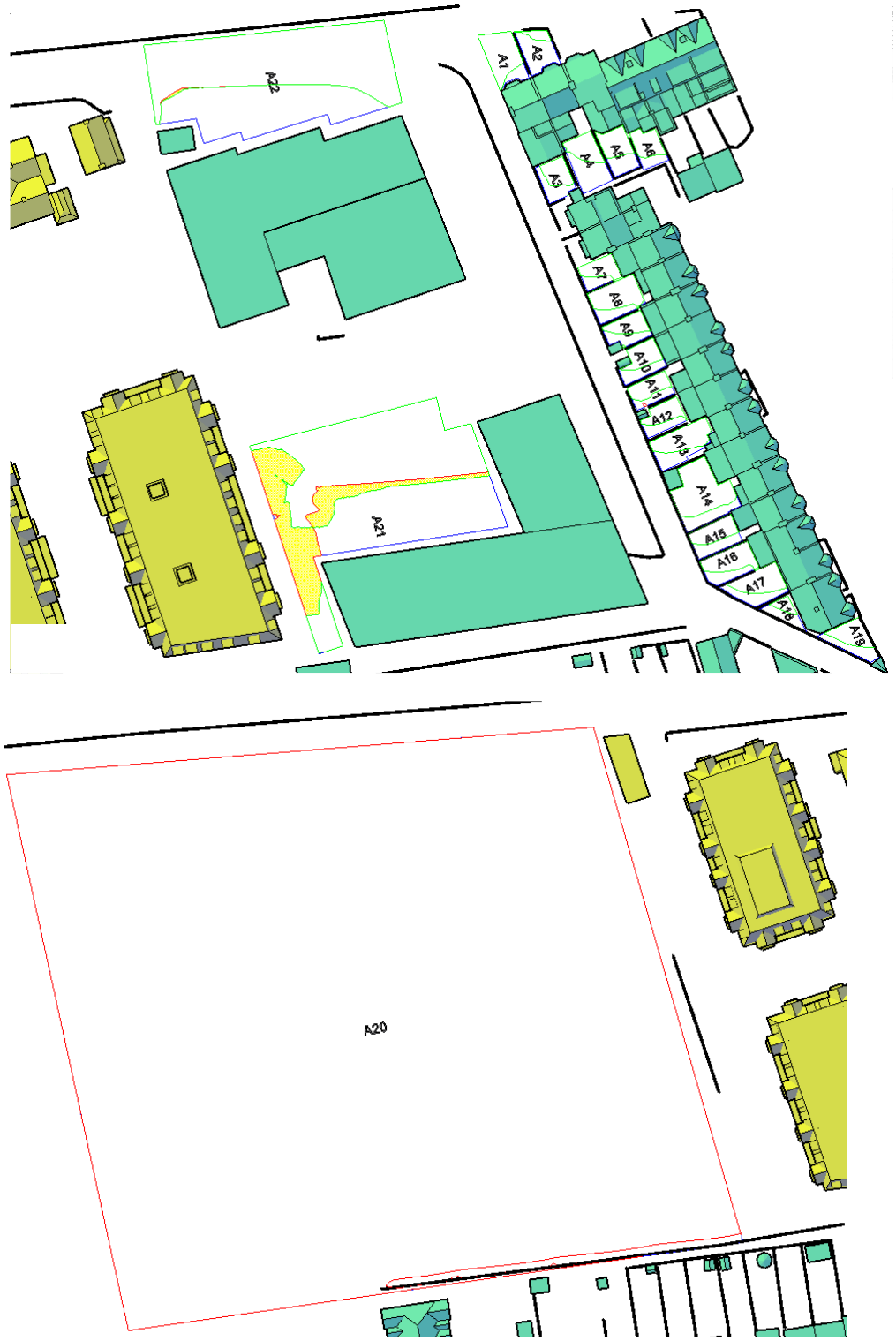


Figure 13: 21st of March overshadowing results for proposed lit area (red contour line) and existing lit area (green contour line) indicating minimal reduction/no reduction in the sunlight received between proposed and existing scenarios (contours are on top of each other in most spaces). Yellow hatch indicates the difference in lit area between proposed and existing scenarios)

CONCLUSION

The daylight, sunlight and overshadowing analysis indicates that there will not be a significant impact on surrounding properties arising from the proposed residential development at Barnes Hospital.

DAYLIGHT ASSESSMENT

A total of 90 windows from buildings surrounding the site were highlighted as being in close proximity to, and facing the proposed development.

Daylighting levels for potentially affected windows of surrounding developments by the proposed development were found to be acceptable.

In summary,

- Windows belonging to 1-40 North Worple Way, 1-2 South Worple Avenue and 2-26 Buxton Road passed the 25-degree line test;
- 70 of the 90 windows from the other neighbouring developments achieved VSCs greater than 27%;
- 19 windows of the remaining 20 achieved relative VSCs over 0.8 of their former values
- The remaining window achieves relatively high absolute VSC of 24.7% and a relative VSC of 0.76 over its former value. It is worth noting that in a city urban environment, VSC values in excess of 20% should be considered as satisfactory.

Overall, the development is not anticipated to have any notable impact on the daylight received by neighbouring properties.

SUNLIGHT ASSESSMENT

A total of 55 windows from buildings surrounding the site were assessed for sunlight access. The analysis indicated that 54 windows achieve annual probable sunlight hours (APSH) greater than 25% and winter probable sunlight hours (WPSH) greater than 5% or at least 80% of their former value. The remaining window has less than 4% reduction in annual sunlight. Thus, all windows satisfied the BRE criteria for annual probable sunlight hours (APSH) and winter probable sunlight hours (WPSH).

Therefore, the proposed development at Barnes Hospital is not considered to have any notable impact on sunlight access to windows of surrounding developments.

OVERSHADOWING ASSESSMENT

A solar access analysis was undertaken for a total of 20 amenity spaces for the full 24 hours on 21st of March including 19 residential gardens to the east, 2 outdoor spaces belonging to SEN School and the Healthcare Centre of the outline planning permission to the east, and the Old Mortlake Burial Ground cemetery to the west. 20 of the amenity spaces (A1, A3, and A5 to A22) are predicted to have a minimum of 2 hours of sunlight on 21 March over at least 50% of each assessed amenity space. Where this is not achieved (A2 and A4), the difference between the area achieving 2 hours of sun on 21 March is higher than 0.8 times its former value.

The proposed development is therefore not considered to have any significant impact on sunlight access to the amenity spaces surrounding the site.

APPENDIX A - WINDOW REFERENCE

DO NOT SCALE

BACKGROUND DRAWING INFORMATION

FILE NAME	ORIGINATOR NAME	DESCRIPTION NAME	REV	DATE REC'D

Notes

Rev	Date	Description	Chk'd	Appr
XX	00.00.16	XX	XX	XX

Planning

XCO2
The Gymnasium,
56 Kingsway Place,
Sans Walk, London
EC1R 0LU
+44 (0) 20 7700 1000
mail@xco2.com
www.xco2.com

Client
Star Land Realty UK Ltd

Architect
Scott Brownrigg

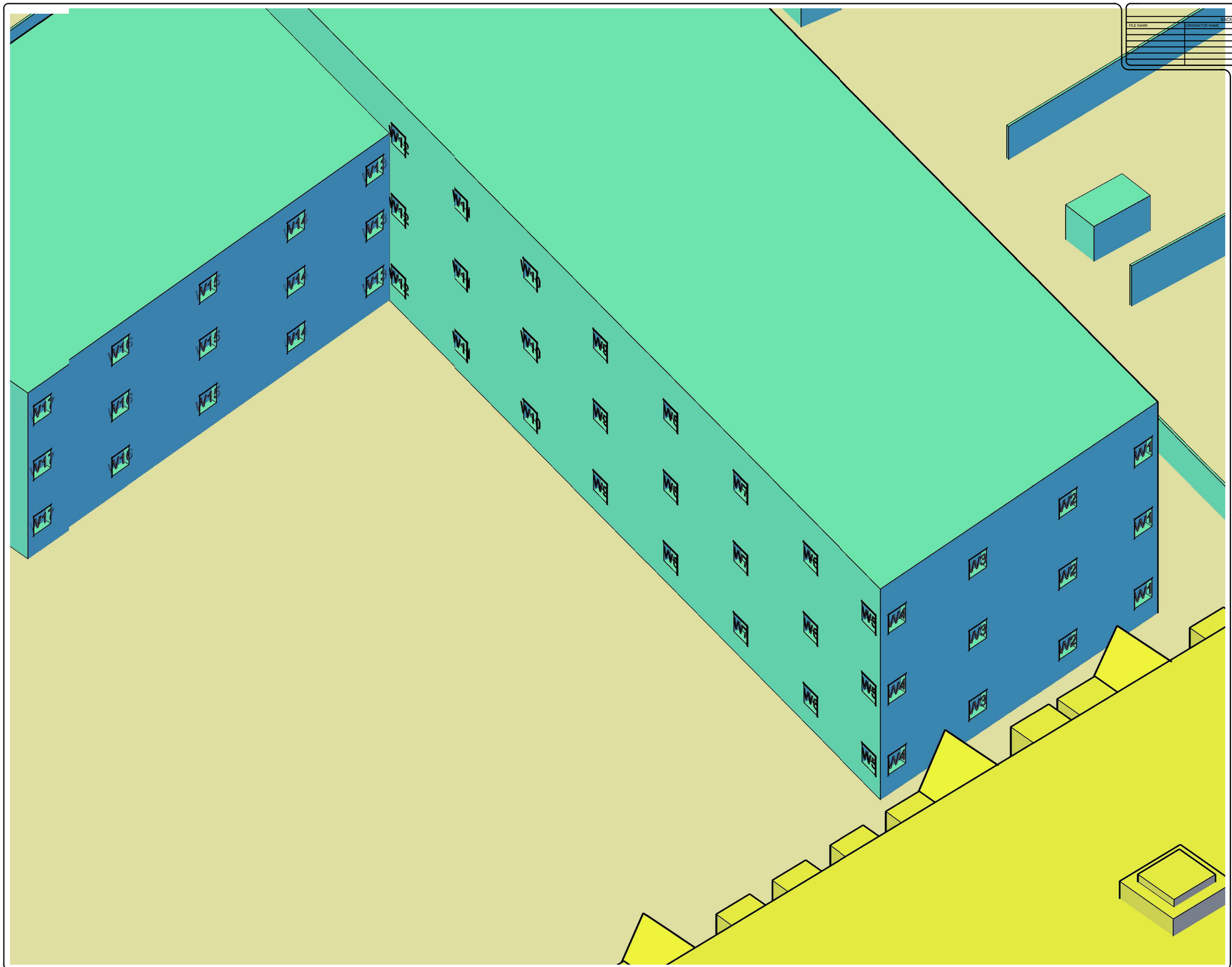
Project
Barnes Hospital

Title
DSO impact on surrounding buildings
57-75 Grosvenor Avenue
Window references

Scale@A3	Drawn	Checked	Date
N.T.S	FH	SP	28.07.2021

Drawing Number
8972-DSO-01

Revision
-



DO NOT SCALE

BACKGROUND DRAWING INFORMATION

FILE NAME	ORIGINATOR NAME	DESCRIPTION NAME	REV	DATE REC'D

Notes

Rev.	Date	Description	Chk'd	Appr
XX	00.00.16	XX	XX	XX

Planning

XCO2
The Gymnasium,
56 Kingsway Place,
Sans Walk, London
EC1R 0LU
+44 (0) 20 7700 1000
mail@xco2.com
www.xco2.com

Client
Star Land Realty UK Ltd

Architect
Scott Brownrigg

Project
Barnes Hospital

Title
DSO impact on surrounding buildings
SEN School (outline planning)
Window references

Scale@A3	Drawn	Checked	Date
N.T.S	FH	SP	28.07.2021

Drawing Number	Revision
8972-DSO-01	-

DO NOT SCALE

BACKGROUND DRAWING INFORMATION

FILE NAME	ORIGINATOR NAME	DESCRIPTION NAME	REV	DATE REC'D

Notes

Rev	Date	Description	Chk'd	Appr
XX	00.00.16	XX	XX	XX

Planning

XCO2
The Gymnasium,
56 Kingsway Place,
Sans Walk, London
EC1R 0LU
+44 (0) 20 7700 1000
mail@xco2.com
www.xco2.com

Client
Star Land Realty UK Ltd

Architect
Scott Brownrigg

Project
Barnes Hospital

Title
DSO impact on surrounding buildings
Healthcare Centre (outline planning)
Window references

Scale@A3	Drawn	Checked	Date
N.T.S	FH	SP	28.07.2021

Drawing Number
8972-DSO-01

Revision
-

APPENDIX B - DETAILED DAYLIGHT RESULTS

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
75 Grosvenor Ave	Ground	W1	Further testing required	28.8%	-	-	Pass
71 Grosvenor Ave	Ground	W1	Further testing required	30.9%	-	-	Pass
69 Grosvenor Ave	Ground	W1	Further testing required	30.6%	-	-	Pass
69 Grosvenor Ave	Ground	W2	Further testing required	31.0%	-	-	Pass
67 Grosvenor Ave	Ground	W1	Further testing required	31.2%	-	-	Pass
65 Grosvenor Ave	Ground	W1	Further testing required	30.9%	-	-	Pass
63 Grosvenor Ave	Ground	W1	Further testing required	27.4%	-	-	Pass
63 Grosvenor Ave	Ground	W2	Further testing required	31.7%	-	-	Pass
61 Grosvenor Ave	Ground	W1	Further testing required	23.6%	25.7%	0.92	Pass
59 Grosvenor Ave	Ground	W1	Further testing required	28.5%	-	-	Pass
59 Grosvenor Ave	Ground	W2	Further testing required	32.3%	-	-	Pass
SEN School	Ground	W1	Further testing required	27.7%	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
SEN School	Ground	W2	Further testing required	26.8%	31.0%	0.86	Pass
SEN School	Ground	W3	Further testing required	21.5%	23.4%	0.92	Pass
SEN School	Ground	W4	Further testing required	18.4%	18.3%	1.01	Pass
SEN School	Ground	W5	Further testing required	31.0%	-	-	Pass
SEN School	Ground	W6	Further testing required	32.2%	-	-	Pass
SEN School	Ground	W7	Further testing required	32.7%	-	-	Pass
SEN School	Ground	W8	Further testing required	32.6%	-	-	Pass
SEN School	Ground	W9	Further testing required	31.6%	-	-	Pass
SEN School	Ground	W10	Further testing required	29.1%	-	-	Pass
SEN School	Ground	W11	Further testing required	23.2%	23.6%	0.98	Pass
SEN School	Ground	W12	Further testing required	14.3%	14.6%	0.98	Pass
SEN School	Ground	W13	Further testing required	14.1%	14.9%	0.95	Pass
SEN School	Ground	W14	Further testing required	21.1%	22.0%	0.96	Pass

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
SEN School	Ground	W15	Further testing required	26.3%	27.5%	0.96	Pass
SEN School	Ground	W16	Further testing required	29.1%	-	-	Pass
SEN School	Ground	W17	Further testing required	30.3%	-	-	Pass
SEN School	First	W1	Further testing required	33.6%	-	-	Pass
SEN School	First	W2	Further testing required	31.3%	-	-	Pass
SEN School	First	W3	Further testing required	27.2%	-	-	Pass
SEN School	First	W4	Further testing required	24.7%	32.3%	0.76	Fall slightly short of relative VSC target but achieves relatively high absolute VSC
SEN School	First	W5	Further testing required	34.3%	-	-	Pass
SEN School	First	W6	Further testing required	35.2%	-	-	Pass
SEN School	First	W7	Further testing required	35.7%	-	-	Pass
SEN School	First	W8	Further testing required	35.8%	-	-	Pass
SEN School	First	W9	Further testing required	35.4%	-	-	Pass
SEN School	First	W10	Further testing required	34.2%	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
SEN School	First	W11	Further testing required	30.1%	-	-	Pass
SEN School	First	W12	Further testing required	16.7%	16.9%	0.98	Pass
SEN School	First	W13	Further testing required	15.4%	16.1%	0.96	Pass
SEN School	First	W14	Further testing required	24.8%	25.6%	0.97	Pass
SEN School	First	W15	Further testing required	30.1%	-	-	Pass
SEN School	First	W16	Further testing required	32.3%	-	-	Pass
SEN School	First	W17	Further testing required	33.2%	-	-	Pass
SEN School	Second	W1	Further testing required	37.2%	-	-	Pass
SEN School	Second	W2	Further testing required	36.1%	-	-	Pass
SEN School	Second	W3	Further testing required	33.9%	-	-	Pass
SEN School	Second	W4	Further testing required	32.4%	-	-	Pass
SEN School	Second	W5	Further testing required	37.5%	-	-	Pass
SEN School	Second	W6	Further testing required	38.0%	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
SEN School	Second	W7	Further testing required	38.4%	-	-	Pass
SEN School	Second	W8	Further testing required	38.6%	-	-	Pass
SEN School	Second	W9	Further testing required	38.7%	-	-	Pass
SEN School	Second	W10	Further testing required	38.8%	-	-	Pass
SEN School	Second	W11	Further testing required	38.9%	-	-	Pass
SEN School	Second	W12	Further testing required	39.0%	-	-	Pass
SEN School	Second	W13	Further testing required	17.6%	18.2%	0.97	Pass
SEN School	Second	W14	Further testing required	30.5%	-	-	Pass
SEN School	Second	W15	Further testing required	34.3%	-	-	Pass
SEN School	Second	W16	Further testing required	35.5%	-	-	Pass
SEN School	Second	W17	Further testing required	36.0%	-	-	Pass
Healthcare Centre	Ground	W1	Further testing required	25.2%	27.2%	0.93	Pass
Healthcare Centre	Ground	W2	Further testing required	19.6%	21.6%	0.91	Pass

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
Healthcare Centre	Ground	W3	Further testing required	11.1%	11.9%	0.94	Pass
Healthcare Centre	Ground	W4	Further testing required	30.7%	-	-	Pass
Healthcare Centre	Ground	W5	Further testing required	30.1%	-	-	Pass
Healthcare Centre	Ground	W6	Further testing required	28.0%	-	-	Pass
Healthcare Centre	Ground	W7	Further testing required	29.1%	-	-	Pass
Healthcare Centre	Ground	W8	Further testing required	31.1%	-	-	Pass
Healthcare Centre	Ground	W9	Further testing required	32.1%	-	-	Pass
Healthcare Centre	Ground	W10	Further testing required	32.3%	-	-	Pass
Healthcare Centre	Ground	W11	Further testing required	31.8%	-	-	Pass
Healthcare Centre	Ground	W12	Further testing required	30.4%	-	-	Pass
Healthcare Centre	Ground	W13	Further testing required	28.2%	-	-	Pass
Healthcare Centre	First	W1	Further testing required	30.7%	-	-	Pass
Healthcare Centre	First	W2	Further testing required	26.0%	27.5%	0.94	Pass

Building	Floor	Window no.	25/45-degree plane test	VSC tests			Comments
				Proposed VSC 27%?	Existing VSC (%)	Relative VSC >0.8?	
Healthcare Centre	First	W3	Further testing required	15.3%	15.9%	0.96	Pass
Healthcare Centre	First	W4	Further testing required	35.5%	-	-	Pass
Healthcare Centre	First	W5	Further testing required	35.1%	-	-	Pass
Healthcare Centre	First	W6	Further testing required	33.7%	-	-	Pass
Healthcare Centre	First	W7	Further testing required	34.2%	-	-	Pass
Healthcare Centre	First	W8	Further testing required	35.5%	-	-	Pass
Healthcare Centre	First	W9	Further testing required	36.2%	-	-	Pass
Healthcare Centre	First	W10	Further testing required	36.5%	-	-	Pass
Healthcare Centre	First	W11	Further testing required	36.6%	-	-	Pass
Healthcare Centre	First	W12	Further testing required	36.3%	-	-	Pass
Healthcare Centre	Second	W1	Further testing required	36.5%	-	-	Pass
Healthcare Centre	Second	W2	Further testing required	34.9%	-	-	Pass
Healthcare Centre	Second	W3	Further testing required	23.5%	23.9%	0.98	Pass

APPENDIX C - DETAILED SUNLIGHT RESULTS

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
75 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
71 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
69 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
69 Grosvenor Ave	Ground	W2	North	n/a	-	-	-	-	-	-	-	Pass
67 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
65 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
63 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
63 Grosvenor Ave	Ground	W2	North	n/a	-	-	-	-	-	-	-	Pass
61 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
59 Grosvenor Ave	Ground	W1	North	n/a	-	-	-	-	-	-	-	Pass
59 Grosvenor Ave	Ground	W2	North	n/a	-	-	-	-	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
SEN School	Ground	W1	South	Further testing required	45.0%	-	-	14.0%	-	-	-	Pass
SEN School	Ground	W2	South	Further testing required	49.0%	-	-	20.0%	-	-	-	Pass
SEN School	Ground	W3	South	Further testing required	41.0%	-	-	18.0%	-	-	-	Pass
SEN School	Ground	W4	South	Further testing required	33.0%	-	-	14.0%	-	-	-	Pass
SEN School	Ground	W5	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W6	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W7	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W8	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W9	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W10	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W11	North	n/a	-	-	-	-	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
SEN School	Ground	W12	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Ground	W13	South	Further testing required	8.0%	9.0%	0.89	0.0%	0.0%	-	-	Pass
SEN School	Ground	W14	South	Further testing required	18.0%	19.0%	0.95	0.0%	0.0%	-	-	Pass
SEN School	Ground	W15	South	Further testing required	38.0%	-	-	0.0%	1.0%	0.00	2.0%	Pass
SEN School	Ground	W16	South	Further testing required	45.0%	-	-	6.0%	-	-	-	Pass
SEN School	Ground	W17	South	Further testing required	47.0%	-	-	8.0%	-	-	-	Pass
SEN School	First	W1	South	Further testing required	54.0%	-	-	21.0%	-	-	-	Pass
SEN School	First	W2	South	Further testing required	53.0%	-	-	21.0%	-	-	-	Pass
SEN School	First	W3	South	Further testing required	46.0%	-	-	18.0%	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
SEN School	First	W4	South	Further testing required	40.0%	-	-	14.0%	-	-	-	Pass
SEN School	First	W5	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W6	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W7	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W8	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W9	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W10	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W11	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W12	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	First	W13	South	Further testing required	8.0%	9.0%	0.89	0.0%	0.0%	-	-	Pass
SEN School	First	W14	South	Further testing required	30.0%	-	-	0.0%	0.0%	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
SEN School	First	W15	South	Further testing required	46.0%	-	-	6.0%	-	-	-	Pass
SEN School	First	W16	South	Further testing required	52.0%	-	-	12.0%	-	-	-	Pass
SEN School	First	W17	South	Further testing required	54.0%	-	-	14.0%	-	-	-	Pass
SEN School	Second	W1	South	Further testing required	58.0%	-	-	21.0%	-	-	-	Pass
SEN School	Second	W2	South	Further testing required	57.0%	-	-	21.0%	-	-	-	Pass
SEN School	Second	W3	South	Further testing required	54.0%	-	-	19.0%	-	-	-	Pass
SEN School	Second	W4	South	Further testing required	53.0%	-	-	18.0%	-	-	-	Pass
SEN School	Second	W5	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W6	North	n/a	-	-	-	-	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
SEN School	Second	W7	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W8	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W9	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W10	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W11	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W12	North	n/a	-	-	-	-	-	-	-	Pass
SEN School	Second	W13	South	Further testing required	12.0%	12.0%	1.00	0.0%	0.0%	-	-	Pass
SEN School	Second	W14	South	Further testing required	45.0%	-	-	4.0%	4.0%	1.00	-	Pass
SEN School	Second	W15	South	Further testing required	55.0%	-	-	14.0%	-	-	-	Pass
SEN School	Second	W16	South	Further testing required	59.0%	-	-	18.0%	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
SEN School	Second	W17	South	Further testing required	60.0%	-	-	19.0%	-	-	-	Pass
Healthcare Centre	Ground	W1	South	Further testing required	44.0%	-	-	15.0%	-	-	-	Pass
Healthcare Centre	Ground	W2	South	Further testing required	40.0%	-	-	16.0%	-	-	-	Pass
Healthcare Centre	Ground	W3	South	Further testing required	30.0%	-	-	13.0%	-	-	-	Pass
Healthcare Centre	Ground	W4	South	Further testing required	69.0%	-	-	21.0%	-	-	-	Pass
Healthcare Centre	Ground	W5	South	Further testing required	70.0%	-	-	18.0%	-	-	-	Pass
Healthcare Centre	Ground	W6	South	Further testing required	65.0%	-	-	15.0%	-	-	-	Pass
Healthcare Centre	Ground	W7	South	Further testing required	45.0%	-	-	7.0%	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
Healthcare Centre	Ground	W8	South	Further testing required	48.0%	-	-	10.0%	-	-	-	Pass
Healthcare Centre	Ground	W9	South	Further testing required	49.0%	-	-	12.0%	-	-	-	Pass
Healthcare Centre	Ground	W10	South	Further testing required	51.0%	-	-	13.0%	-	-	-	Pass
Healthcare Centre	Ground	W11	South	Further testing required	52.0%	-	-	16.0%	-	-	-	Pass
Healthcare Centre	Ground	W12	South	Further testing required	49.0%	-	-	16.0%	-	-	-	Pass
Healthcare Centre	Ground	W13	South	Further testing required	39.0%	-	-	13.0%	-	-	-	Pass
Healthcare Centre	First	W1	South	Further testing required	49.0%	-	-	16.0%	-	-	-	Pass
Healthcare Centre	First	W2	South	Further testing required	47.0%	-	-	17.0%	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
Healthcare Centre	First	W3	South	Further testing required	39.0%	-	-	13.0%	-	-	-	Pass
Healthcare Centre	First	W4	South	Further testing required	81.0%	-	-	28.0%	-	-	-	Pass
Healthcare Centre	First	W5	South	Further testing required	82.0%	-	-	26.0%	-	-	-	Pass
Healthcare Centre	First	W6	South	Further testing required	80.0%	-	-	23.0%	-	-	-	Pass
Healthcare Centre	First	W7	South	Further testing required	51.0%	-	-	14.0%	-	-	-	Pass
Healthcare Centre	First	W8	South	Further testing required	52.0%	-	-	15.0%	-	-	-	Pass
Healthcare Centre	First	W9	South	Further testing required	55.0%	-	-	18.0%	-	-	-	Pass
Healthcare Centre	First	W10	South	Further testing required	56.0%	-	-	19.0%	-	-	-	Pass

DAYLIGHT, SUNLIGHT & OVERSHADOWING

Building	Floor	Window no.	Orientation	25/45-degree plane test	APSH test			WPSH test			Total reduction<4%?	Comments
					Proposed APSH >25%?	Existing APSH (%)	Relative APSH >0.8?	Proposed WPSH >5%?	Existing WPSH (%)	Relative WPSH >0.8?		
Healthcare Centre	First	W11	South	Further testing required	57.0%	-	-	19.0%	-	-	-	Pass
Healthcare Centre	First	W12	South	Further testing required	58.0%	-	-	19.0%	-	-	-	Pass
Healthcare Centre	Second	W1	South	Further testing required	57.0%	-	-	18.0%	-	-	-	Pass
Healthcare Centre	Second	W2	South	Further testing required	56.0%	-	-	18.0%	-	-	-	Pass
Healthcare Centre	Second	W3	South	Further testing required	49.0%	-	-	18.0%	-	-	-	Pass

XCO2
56 Kingsway Place, Sans Walk
London EC1R 0LU

+44 (0)20 7700 1000
mail@xco2.com
xco2.com