Daylight, Sunlight and Overshadowing Assessment

139-141 Queens Crescent

For Suresh Patel

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XCO2 energy

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Contents

About us:
XCO2 Energy are a low-carbon consultancy working in the built environment. We are a multi-disciplinary company consisting of both architects and engineers, with specialists including CIBSE low carbon consultants, Code for Sustainable Homes, EcoHomes and BREEAM assessors, BRE trained daylight consultants and LEED accredited professionals.

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Executive Summary

Daylight and Sunlight analysis was carried out for the proposed development at 139-141 Queens Crescent, located within the London Borough of Camden. 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
- Daylight: No Sky Line
- Sunlight: Sunlight Access
- Sunlight: Sunlight Overshadowing

Computer modelling software was used to carry out the assessments. The model used was based on drawings, desktop research and a 3D model provided by the design team.

Daylight Assessment

A total of 35 worst-case 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 139-141 Queens Crescent were found to be acceptable.

In summary,
- 18 out of 35 windows passed the 25 degree line test;
- 10 of the remaining 17 windows achieved a VSC of greater than 27%;
- 5 windows achieved relative VSCs over 0.8 of their former value
- One of the remaining two windows was found to meet the no skyline test;
- Only one window was not found to perform well due to its unfavourable position. Its location is almost enclosed and the daylight it receives is already compromised by the building it belongs to. Therefore, it would be reasonable to expect this window to not perform very well, should the site at 139-141 Queens Crescent be redeveloped.

The above results were calculated for neighbouring windows which are the closest to the development and are most likely to be affected. Therefore, they constitute the worst-case. Any other windows belonging to the neighbouring buildings assessed are not expected to experience any notable impact.

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

Sunlight Assessment

A total of 25 windows from buildings surrounding the site were assessed for sunlight access. The analysis indicated that 10 of the 25 windows passed the 25 degree line test. All of the remaining 15 windows satisfied the BRE criteria for annual probable sunlight hours (APSH) and winter probable sunlight hours (WPSH).

Therefore, the proposed development at 139-141 Queens Crescent is not considered to have any impact on sunlight access to windows of surrounding developments.

Overshadowing Assessment

No amenity spaces were identified to be in close proximity to the development that could experience an overshadowing impact. Therefore, the proposed development will not have any overshadowing impacts on open spaces.

Introduction

This report assesses the daylight, sunlight and overshadowing impacts the proposed development at 139-141 Queens Crescent may have on the existing properties and open spaces surrounding the site.

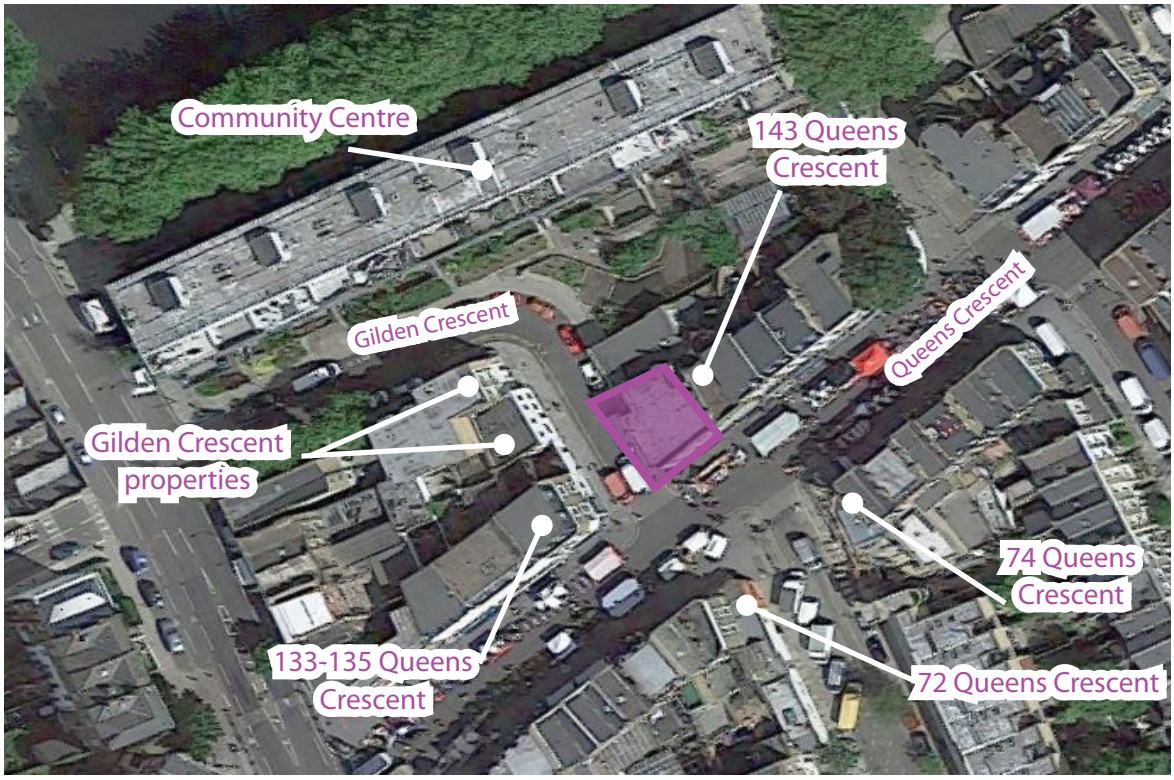
The approach is based on the BRE's "Site Layout Planning for daylight and sunlight, a Guide to good practice" PJ Littlefair 2011, which is generally accepted as good practice by Town and Country Planning authorities.

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.

Site

The proposed development is a residential extension comprising four dwelings in the London Borough of Camden.

Site analysis was carried out to identify any potential daylight and sunlight impacts on the surrounding developments. The relevant properties tested in this report are situated close to the proposed development, and annotated in the figure below.



Aerial view of surrounding areas of the proposed development at 139-141 Queens Crescent (approximate site area highlighted in pink).

Methodology

The following methodology was used to carry out the daylight, sunlight and overshadowing assessments. The methodology is based on the guidelines set out in the BRE "*Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice" (2011).*

Daylight

1. 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.

2. Absolute Vertical Sky Component

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.

3. Relative Vertical Sky Component

Good levels of daylighting can still be achieved if VSC levels are within 80% of their former value.

4. % of room with view of the sky (NSL)

Rooms connected to the windows assessed will not experience a noticeable loss in daylight if the percentage (%) of the room's working plane with view of the sky is over 0.8 of its former value. The former value could refer either to the existing development in place or the mirror image buildings for properties with windows close to site boundaries.

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 when there is an obstruction within the 25 degree line, calculated from the centre of the window and the proposed development is situated within 90 degrees due south of the window.

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 it's 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). Note that the BRE guidance expects the above to be met for living room windows only.

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

A total of 36 windows from buildings surrounding the proposed development were highlighted as being in close proximity to, and facing the proposed development.

These buildings include:

- Community Centre - properties to the north of the site (worst-case windows no. A1-A4)
- 143 Queens Crescent - property to the east of the site (windows no. B1-B2)
- 74 Queens Crescent - property to the south of the site (worst-case windows no. C1-C2)
- 72 Queens Crescent - property to the south of the site (windows no. D1-D6)
- 133-135 Queens Crescent - property to the west of the site (windows no. E1-E7)
- Gilden Crescent - properties to the west of the site (windows no. F1-F14)

The daylight analysis follows for each building individually in the following pages of the report.

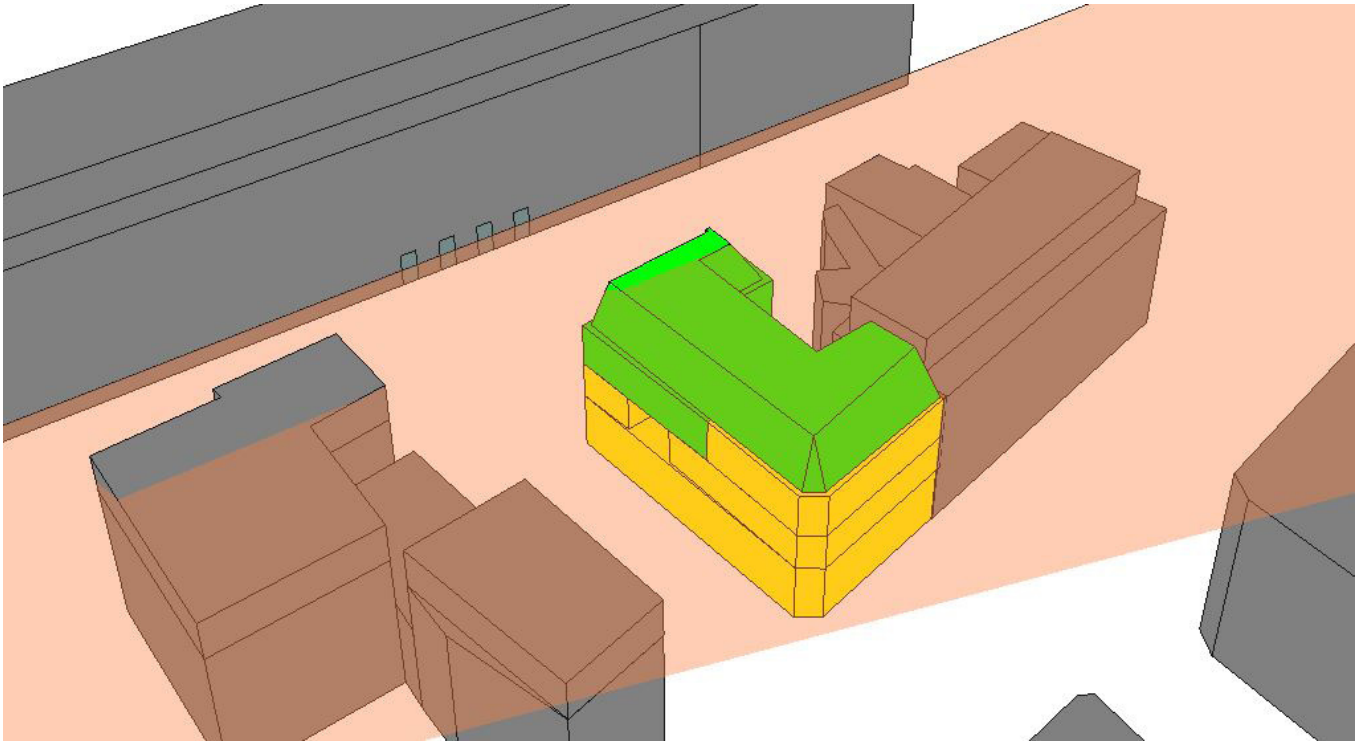
Community Centre

This building has a number of windows facing the proposed development. A total of 4 worst-case windows were selected for analysis. These windows are located on the ground floor and were selected based on their position which is the closest to the proposed development. The image below shows their location.

Assessed worst-case windows at Community Centre

The analysis showed that these windows did not meet the 25° test only marginally but were found to achieve very good VSCs with the proposed development in place. The detailed results of the analysis are shown in the appendix.

Therefore, the proposed development is not anticipated to have any impact on the daylight received by all windows at the Community Centre to the north of the site.



25 degree line from the ground floor windows at Community Centre

143 Queens Crescent

Two windows were identified as facing the proposed development. The image and plans show their locations.

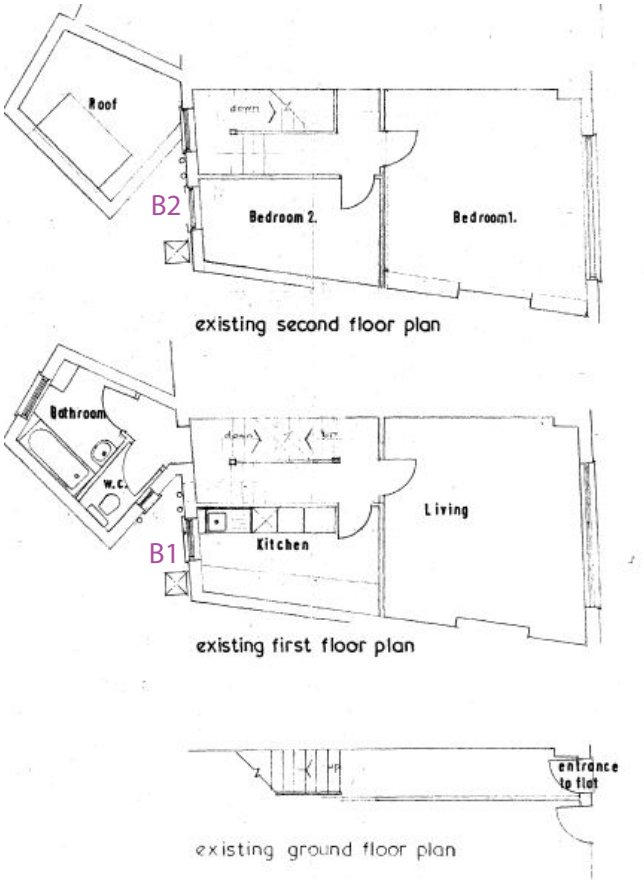
It can be seen that these windows, especially B1, are already located in a very unfavourable position to receive daylight. This is due to the degree of enclosure they experience from the building they belong to.

This observation was corrobarated by the technical analysis in line with the BRE guidance. Window B1 was found to receive low levels of illumination in the existing site condition (VSC<10%). On this basis, it would be reasonable to expect this window to not perform very well if the adjoining application site was to be redeveloped. Based on this site-specific consideration, the proposed development was not deemed to affect window B1 significantly.

Window B2 was found to perform better and the analysis indicated that it can satisfy the no sky line test. The detailed results can be found in the appendix.

Overall, the proposed development is not considered to compromise the daylight received by these two windows at 143 Queens Crescent, taking into account the unfavourable location of the ground floor window.

Assessed windows at 143 Queens Crescent



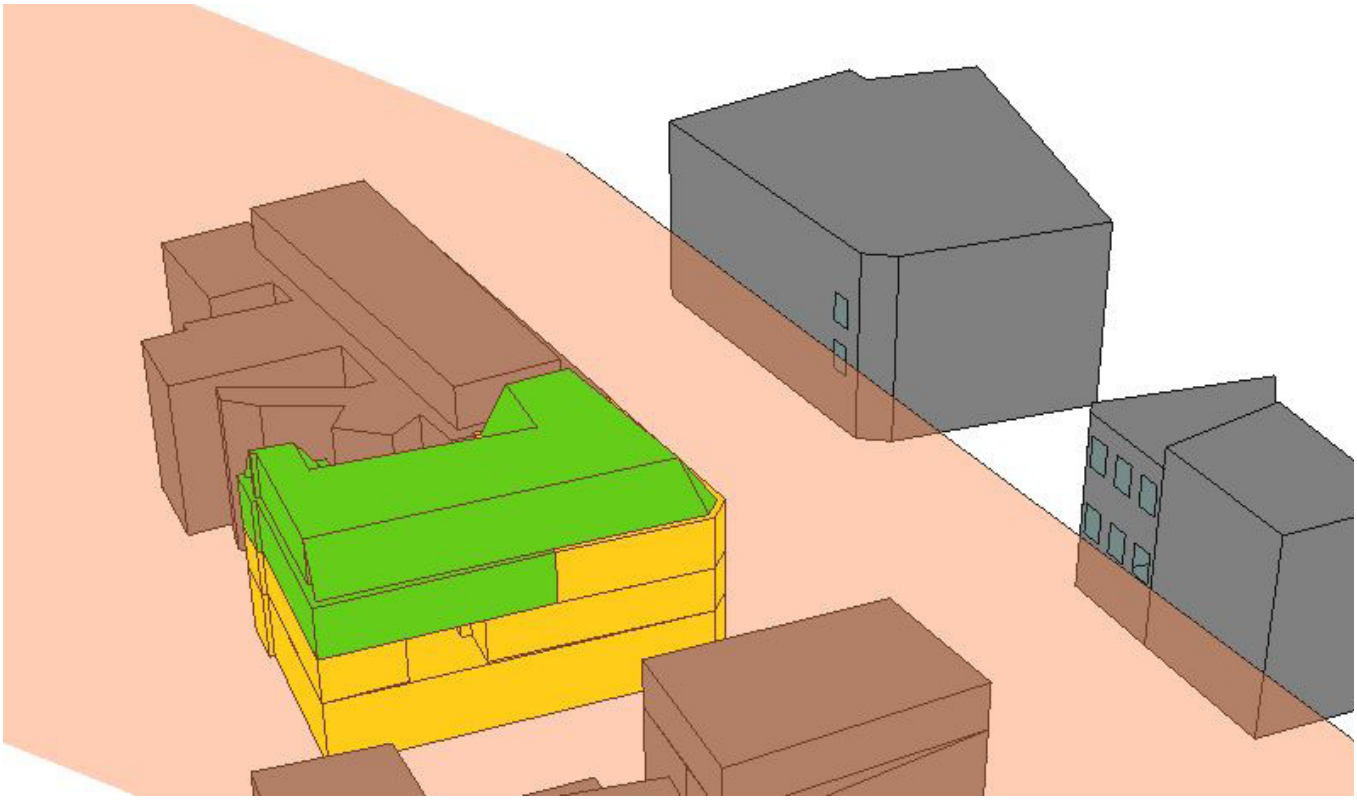
Room layouts for windows B1 & B2. Sourced from Camden council website (application ref: 86020767).

74 Queens Crescent

This building has several windows facing the proposed development. Only those which were are the closest were tested in detail as a worst-case approach. These are shown in the image on this page. The ground floor windows belong to retail space, where there is no daylight expectation. On this basis, they were omitted from the analysis.

The tested worst-case windows passed the 25° line test meeting the BRE criteria. Therefore, the proposed development will not have any impact on the daylight they receive.

Assessed windows at 74 Queens Crescent



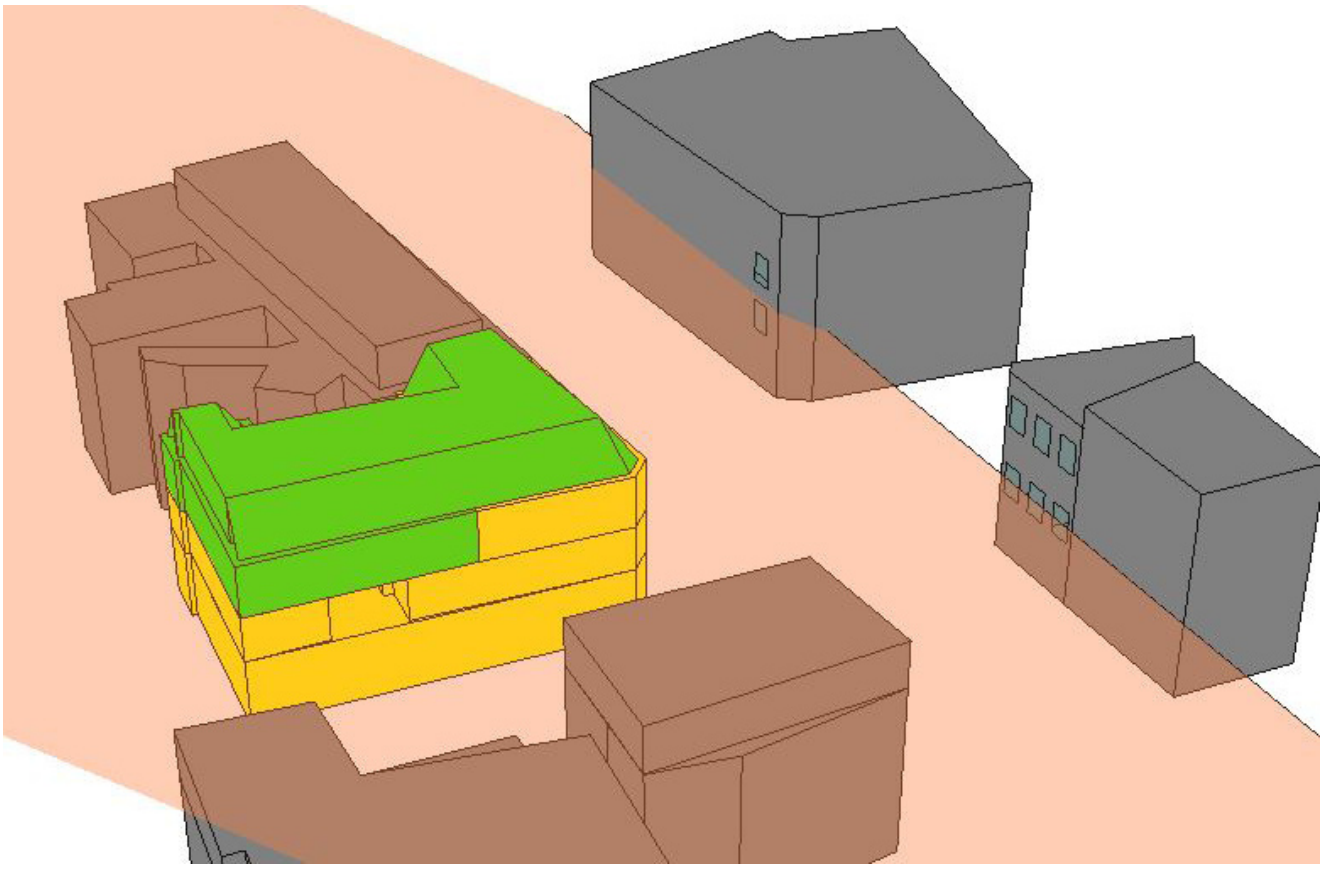
25 degree line from 74 Queens Crescent

72 Queens Crescent

This building has several windows facing the proposed development. Only those which were are the closest were tested in detail as a worst-case approach. These are shown in the image on this page. The ground floor windows belong to retail, where there is no daylight expectation. On this basis, they were omitted from the analysis.

As with 74 Queens Crescent, the tested worst-case windows passed the 25° line test meeting the BRE criteria. Therefore, the proposed development will not have any impact on the daylight they receive.

Assessed windows at 72 Queens Crescent



25 degree line from 72 Queens Crescent

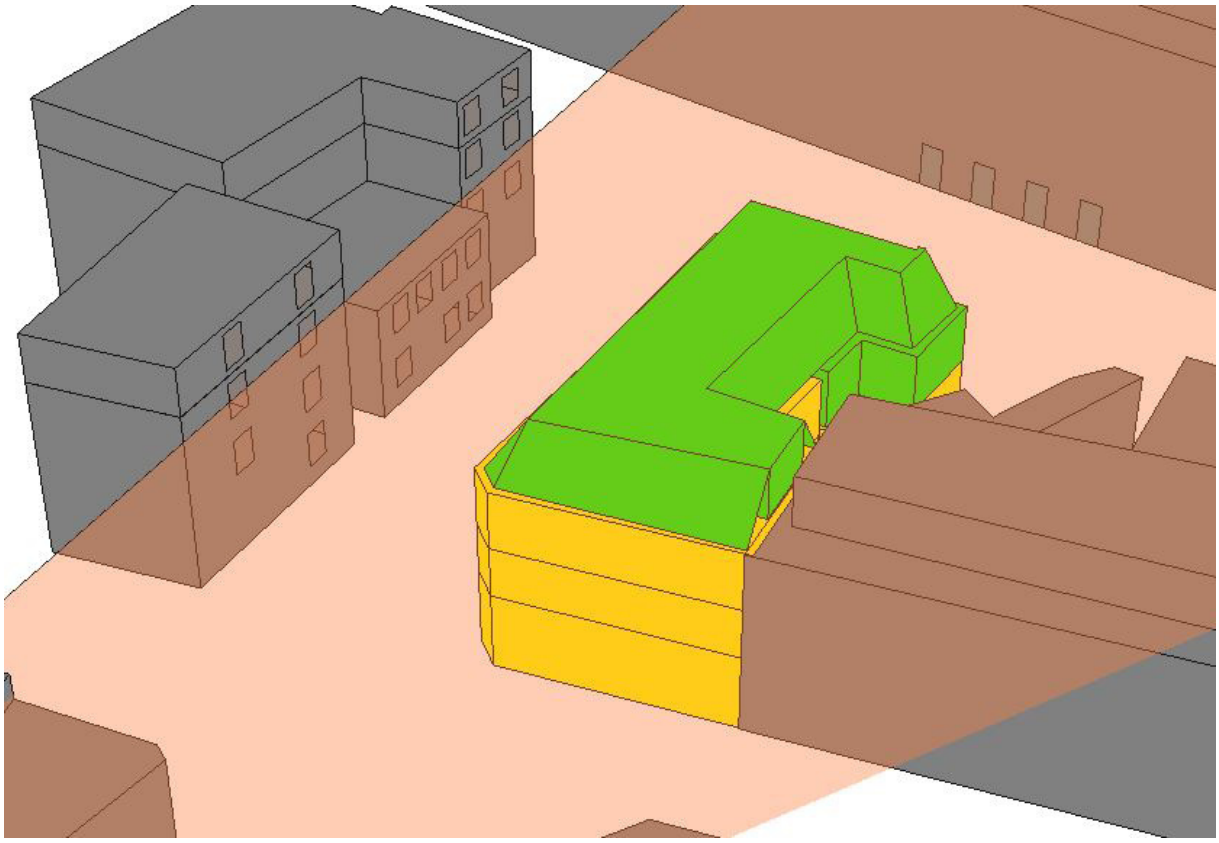
133-135 Queens Crescent

The east facade windows of this building are facing the proposed development and were tested in detail.

Windows from the second floor and above were found to pass the 25° line test. The first floor windows achieved VSCs over 27% and the remaining window (E1) passed the relative VSC test. The detailed results are shown in the appendix.

Therefore, the proposed development was not found to have any impact on daylight to 133-135 Queens Crescent.

Assessed windows at 133-135 Queens Crescent



25 degree line from 133-135 Queens Crescent second floor windows

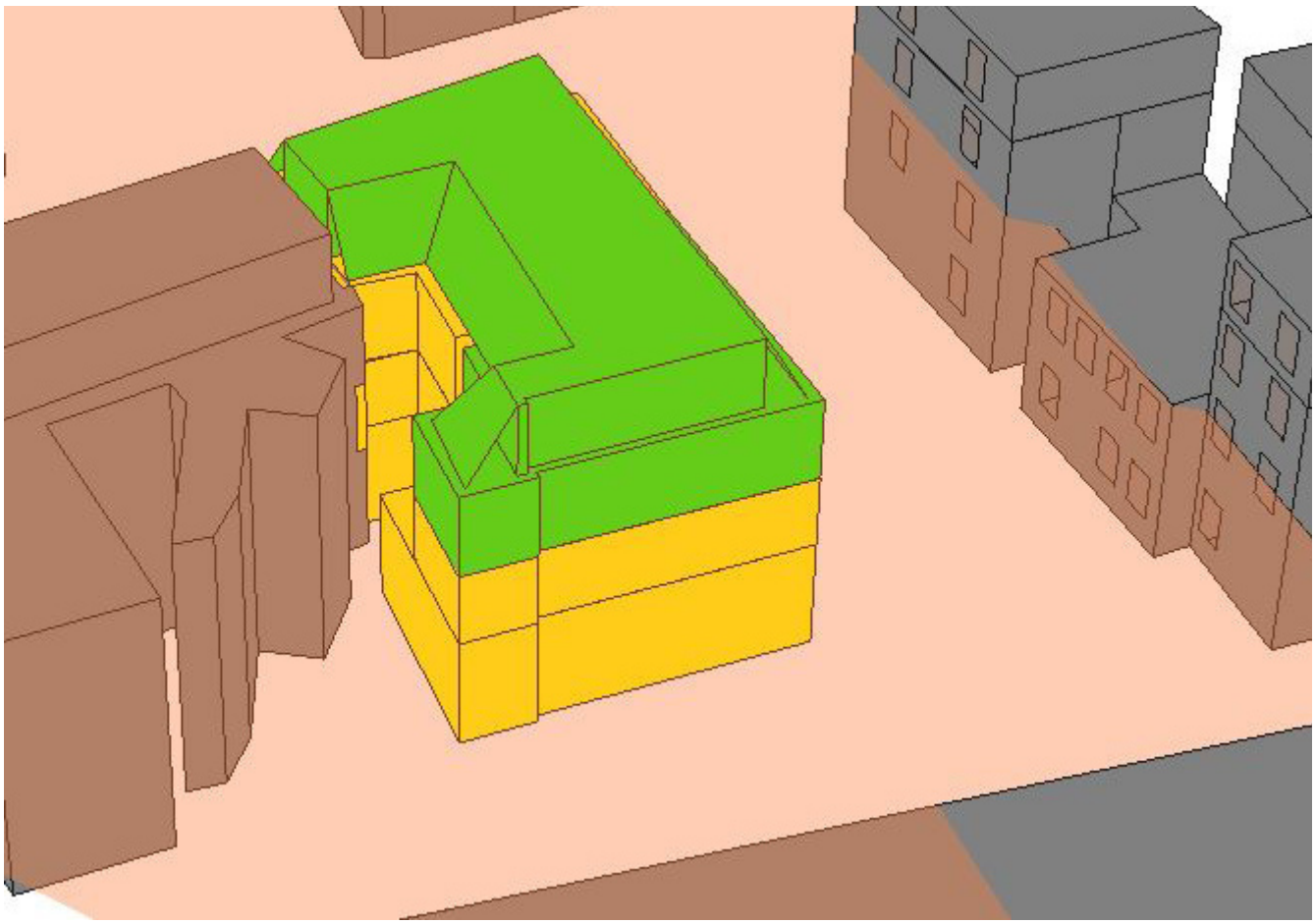
Gilden Crescent properties

The east facade windows of this building are facing the proposed development and were tested in detail.

Windows F9-F14 were found to pass the 25° line test. The remaining windows passed either the 27% VSC or the relative VSC tests. The detailed results are shown in the appendix.

Therefore, the proposed development was not found to have any impact on daylight to the Gilden Crescent properties.

Assessed windows at Gilden Crescent



25 degree line from window F9 at Gilden Crescent properties

Daylight Results summary

The table below summarises the findings of the daylight analysis. It can be seen that the development does not result in any significant impact on the worst-case neighbouring windows assessed in detail.

Considering the overall site context and other windows associated with the buildings tested in detail, it can be concluded that the impact of the development is minimal and well within acceptable limits.

Total number of windows tested	35
Number of windows passing the 25 degree plane test	18
Number of windows with a VSC greater then 27%	10
Number of windows that have a VSC of at least 80% of existing value	5
Windows that have relative no sky line of at least 80% of existing value	2
Windows that do not meet any of the above criteria due to their unfavourable position	1

Sunlight Assessment

Sunlight Access Assessment

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 ly affected"*

A total of 25 windows from buildings surrounding the site were highlighted as facing the development and within 90° of due south. These windows belong to the Community Centre, 133-135 Queens Crescent and Gilden Crescent properties 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 the appendix.

Therefore, the proposed development at 139-141 Queens Crescent is not considered to have any impact on sunlight access to windows of surrounding developments.

Summary of Sunlight Results for Surrounding Windows

Total number of windows facing south	25
Number of windows passing the 25 degree plane test	10
Number of windows with APSH greater than 25%	14
Number of windows with APSH of at least 80% of existing value	0
Number of windows with WPSH greater than 5%	15
Number of windows with WPSH of at least 80% of existing value	0
Number of windows with less than 4% annual reduction in APSH	1
Windows that do not meet any of the above criteria	0

Overshadowing Assessment

A review of the site plan showed that there are no amenity spaces that may be affected by the proposed development. The open spaces to the north of the site are purely landscaped areas and on this basis no further analysis was undertaken.

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

Potential open areas surrounding the site

Landscaped areas to the north of the proposed development

Conclusion

The daylight, sunlight and overshadowing analysis indicates that there will not be a significant impact on surrounding properties arising from the proposed development at 139-141 Queens Crescent.

Daylight Assessment

A total of 35 worst-case 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 139-141 Queens Crescent were found to be acceptable.

In summary,

- 18 out of 35 windows passed the 25 degree line test;
- 10 of the remaining 17 windows achieved a VSC of greater than 27%;
- 5 windows achieved relative VSCs over 0.8 of their former value
- One of the remaining two windows was found to meet the no skyline test;
- Only one window was not found to perform well due to its unfavourable position. Its location is almost enclosed and the daylight it receives is already compromised by the building it belongs to. Therefore, it would be reasonable to expect this window to not perform very well, should the site at 139-141 Queens Crescent be redeveloped.

The above results were calculated for neighbouring windows which are the closest to the development and are most likely to be affected. Therefore, they constitute the worst-case. Any other windows belonging to the neighbouring buildings assessed are not expected to experience any notable impact.

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

Sunlight Assessment

A total of 25 windows from buildings surrounding the site were assessed for sunlight access. The analysis indicated that 10 of the 25 windows passed the 25 degree line test. All of the remaining 15 windows satisfied the BRE criteria for annual probable sunlight hours (APSH) and winter probable sunlight hours (WPSH).

Therefore, the proposed development at 139-141 Queens Crescent is not considered to have any impact on sunlight access to windows of surrounding developments.

Overshadowing Assessment

No amenity spaces were identified to be in close proximity to the development that could experience an overshadowing impact. Therefore, the proposed development will not have any overshadowing impacts on open spaces.

Appendix - Detailed results

Daylight Assessment

Window no.	25 degree plane test	VSC tests			No Sky Line test			Comments
		Proposed VSC >27% ?	Existing VSC (%)	Relative VSC >80% ?	Proposed NSL (%)	Existing NSL (%)	Relative NSL >80% ?	
A1-A4	Further Testing Required	>27.0%	-	-	-	-	-	Good levels of daylight
B1	Further Testing Required	4.7%	8.9%	52.9%	51.8%	75.9%	68.2%	Low levels of daylight due to window location
B2	Further Testing Required	11.4%	18.2%	62.7%	84.2%	86.6%	97.2%	Good levels of daylight
C1-C2	PASS	-	-	-	-	-	-	
D1-D6	PASS	-	-	-	-	-	-	
E1	Further Testing Required	23.7%	27.0%	87.8%	-	-	-	
E2-E3	Further Testing Required	>27.0%	-	-	-	-	-	
E4-E7	PASS	-	-	-	-	-	-	
F1	Further Testing Required	22.9%	27.4%	83.6%	-	-	-	
F2	Further Testing Required	24.2%	28.1%	86.1%	-	-	-	
F3	Further Testing Required	25.5%	28.8%	88.5%	-	-	-	
F4	Further Testing Required	20.1%	22.3%	90.1%	-	-	-	
F5-F8	Further Testing Required	>27.0%	-	-	-	-	-	
F9-F14	PASS	-	-	-	-	-	-	

Sunlight Assessment

Window no.	25 degree plane test	APSH test			WPSH test			Total % reduction < 4% ?	Comments
		Proposed APSH > 25% ?	Existing APSH (%)	Relative APSH>80% ?	Proposed WPSH >5% ?	Existing WPSH (%)	Relative WPSH >80% ?		
A1	Further Testing Required	66.0%	-	-	20.0%	-	-	-	Good sunlight levels
A2		65.0%	-	-	19.1%	-	-	-	
A3		64.0%	-	-	18.3%	-	-	-	
A4		65.0%	-	-	19.4%	-	-	-	
E1		27.7%	-	-	10.7%	-	-	-	
E2		37.4%	-	-	14.1%	-	-	-	
E3		35.0%	-	-	14.5%	-	-	-	
E4-E7	PASS	-	-	-	-	-	-	-	
F1	Further Testing Required	27.3%	-	-	10.8%	-	-	-	
F2		27.6%	-	-	10.0%	-	-	-	
F3		29.8%	-	-	9.8%	-	-	-	
F4		12.4%	15.6%	79.3%	9.8%	-	-	3.2%	
F5		32.5%	-	-	12.5%	-	-	-	
F6		32.3%	-	-	12.2%	-	-	-	
F7		32.9%	-	-	11.7%	-	-	-	
F8		35.3%	-	-	11.6%	-	-	-	
F9-F14	PASS	-	-	-	-	-	-	-	