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Daylight and Sunlight

**Ingestre Road**

Prepared by: Daniel Maddox

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**Document References:**

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**Author for and Behalf of GIA:** Daniel Maddox

**Authorisation for GIA:** .....

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*Appended to this report:*



Sources of Information:

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| 3D Models: | VERTEX -IR06-21.03.18 |
| | IR08-Barton Wilmore-13.06.18 |
| Site Photos: | GIA |
| | Google: Maps & Street Views |

## 1.0 Executive Summary

GIA have undertaken a daylight and sunlight assessment for the proposed redevelopment of the Ingestre Road, in Camden.

It is inevitable when constructing buildings in an urban environment that alterations in daylight and sunlight to adjoining properties can occur. The numerical guidance given in the BRE document, *"Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice"*, 2011 ("the BRE") should be treated flexibly, especially in dense urban environments and particularly where neighbouring properties are located within narrow streetscapes and with design obstructions restricting the availability of daylight and sunlight.

From the outset of the design process careful consideration has been given to ensure that the proposed scheme caused as little impact on the daylight and sunlight amenity of the adjacent residential units as possible. However, when considering the current underdeveloped nature of the site, the local topography some reductions in amenity to the adjacent units is unavoidable. However, while this loss of amenity must be weighed in balance with the desperate need to provide housing to alleviate the shortage in central London, the proposals have sought to ensure that the retained levels of amenity within the adjacent units are good and comparative with the general urban grain of the area and other similar areas in central London.

Planning Policy in the form of the GLA Housing Supplementary Planning Guidance (SPG) informs us that:

> *"An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding land and properties. Guidelines should be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where the BRE advice suggests considering the use of alternative targets. This should take into account local circumstances; the need to optimise housing capacity; and scope for the character and form of an area to change over time.*
>
> *The degree of harm on adjacent properties and the daylight targets within a proposed scheme should be assessed drawing on broadly comparable residential typologies within the area and of a similar nature across London. Decision makers should recognise that fully optimising housing potential on large sites may necessitate standards which depart from those presently experienced but which still achieve satisfactory levels of residential amenity and avoid unacceptable harm." (Paragraphs 1.3.45 and 1.3.46)*

The technical analysis undertaken demonstrates that although there is some alteration to the daylight and sunlight of the surrounding residential units, for the most part there is good compliance with the BRE guidelines. Where there are windows and rooms which do experience transgressions of the traditional BRE tests, these are unavoidable should the site be developed in a meaningful way. In almost all situations however where there are reductions in daylight and sunlight the retained levels are considered to be good and comparable with other units in the local area and in similar areas across London.

## 2.0 Instructions

GIA have been instructed to undertake detailed technical assessments to understand the potential daylight and sunlight changes that the proposed Barton Willmore scheme, received by GIA 13th June 2018 for the Ingestre Road site will have upon the surrounding residential properties.

The daylight and sunlight review within this report considers residential properties only as they are recognised by the BRE as having the highest expectation for natural light when compared to other uses, such as commercial. The criteria suggested within the BRE have been used to understand and compare the existing levels of light and the light achieved subsequent to the development of the Proposed Scheme.

## 3.0 Introduction

*Daylight and Sunlight*

The technical analysis that forms the basis of this report has been predicated against the methodologies set out within the BRE. The guidelines in question are precisely that - guidelines which provide a recommendation to inform Site layout and design. They are not mandatory, nor do they form planning policy and their interpretation may be treated flexibility depending on the specifics of each site.

The BRE guidelines provide three methodologies for daylight assessment, namely;

1) Vertical Sky Component ("VSC");
2) No Sky Line ("NSL"); and,
3) Average Daylight Factor ("ADF").

VSC and NSL assessment methods have been used to analyse the effects of the Proposed Scheme on the surrounding properties. ADF is not generally recommended by the BRE for assessing daylight to existing surrounding properties, however, it may be used in certain circumstances and these are explained in more detail within the BRE handbook.

In addition, we have used one methodology provided by the BRE guidelines for sunlight assessment, denoted as Annual Probable Sunlight Hours ("APSH").

Appendix 01 of this report elaborates on the mechanics of each of the above assessment criteria, explains the appropriateness of their use and the parameters of each specific recommendation.

***"Mirror massing" assessment - Notional Massing Block***

In order to establish what an alternative target value might be, the BRE suggest (Appendix F, paragraphs F1 and F5 respectively);

*"...different targets may be used based on the special requirements of the proposed development or its location. Such alternative targets may be generated from the layout dimensions of existing development, or they may be derived from considering the internal layout and daylighting needs of the proposed development itself."*

*"To ensure that new development matches the height and proportions of existing buildings, the VSC and APSH targets for these windows should be set to those for a "mirror image" building of the same height and size and equal distance away from the other side of the boundary."*

Therefore, where the significant massing of the Grangemill block we have set an alternate baseline scenario by placing a theoretical "mirror massing block" in place on the site adjacent. An image of this can be seen below.


***Figure 01 - Mirror Massing Alternative Baseline***

***Analysis Scenarios***

We have undertaken the daylight and sunlight analysis in two separate scenarios.

(1) *The Proposed Scheme against the existing site as a baseline*

This is the standard "Existing State vs Proposed Scheme" scenario, whereby the changes in daylight and sunlight are assessed prior to and following implementation of the proposed scheme.

(2) *The Proposed Scheme against the notional massing block as if it were the existing baseline – a "Mirror Massing" exercise*

As previously described, this scenario incorporates a 'mirror massing block' and assesses the Proposed Scheme as if the notional massing block was in place on site in the existing state.

## 4.0 Assumptions

a) We have relied upon 3D measured survey information a photogrammetric model (circa. 300mm tolerance) and Site photographs to produce the three-dimensional computer model which forms the basis of the technical analysis;

b) All residential buildings have been identified by reference to the Valuation Office Agency search and/or external observation;

c) We have not sought access to the adjoining properties thus have made reasonable assumptions as to the internal layouts of the rooms behind the fenestration based upon the building form and architecture. This is normal practice where access to adjoining properties is not available. Unless the building form dictates otherwise, we assume a standard 4.2m deep room (14ft) for residential properties; and,

d) Floor levels have been assumed for the adjoining properties. This dictates the level of the working place which is relevant for the NSL assessment.

## 5.0 Relevant Planning Legislation and Policy

### National Planning Policy Framework 2018

11.123 - c) in the recently released NPPF 2018 states;

*local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards).*

### Housing Supplementary Planning Guidance, 2016 – Greater London Authority

The SPG draws on the London Plan, primarily policy '7.6 - Architecture', and provides further guidance on standards to daylight and sunlight.

In the section covering 'Optimising Housing Potential' in paragraphs 1.3.45 and 1.2.46 the guidance states that *"an appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves."*

It continues *"guidelines should be applied sensitively to higher density development…where BRE advice suggests considering the use of alternative targets' taking in to account the 'local circumstances; the need to optimise housing capacity; and scope for character and form of an area to change over time."*

*The degree of harm on adjacent properties and the daylight targets within a proposed scheme should be assessed drawing on broadly comparable residential typologies within the area and of a similar nature across London. Decision makers should recognise that fully optimising housing potential on large sites may necessitate standards which depart from those presently experienced but which still achieve satisfactory levels of residential amenity and avoid unacceptable harm."*

### London Borough of Camden Local Policy

London Borough of Camden Core Strategy and Development Policies Documents 2010-2025, 2010

The current Local Development Framework for LBC covers the period 2010 to 2025, and comprises the Core Strategy and Development Policies. There are no policies relevant to daylight, sunlight, overshadowing and glare within the Core Strategy.

*Camden Planning Guidance - Amenity, 2016*

*The key messages within this SPG in relation to daylight and sunlight are that the Council expects "all buildings to receive adequate daylight and sunlight, daylight and sunlight reports will be required where there is potential to reduce existing levels of daylight and sunlight".*

*The guidance goes onto state that "a daylight and sunlight report should assess the impact of the development following the methodology set out in the most recent version of Building Research Establishment's (BRE) 'Site layout planning for daylight and sunlight: A guide to good practice'".*

Further in the guidance it states, *"as the BRE guidance suggests, the readings will be interpreted flexibly as their aim is to support rather than constrain natural lighting".* In addition, it states *"daylight is only one of the many factors in site layout design"* and *"when applying these standards in Camden, we will take into consideration other site factors and constraints."*

In relation to sunlight the guidance states the *"design of your development should aim to maximise the amount of sunlight into rooms without overheating the space and to minimise overshadowing."*

*London Borough of Camden Local Plan, 2017*

The Camden Local Plan states that many aspects including daylight and sunlight have a critical impact on health and wellbeing all of which can affect physical and mental health and influence life chances, in relation to delivering high quality accessible homes.

*Policy 'A1 - Managing the impact of development'* states that the council *"will seek to protect the quality of life of occupiers and neighbours"* and that permission would be granted for development unless it causes *"unacceptable harm to amenity"* with sunlight, daylight and overshadowing listed as factors to be considered.

The document goes on to state that LBC *"will take into account the most recent standards recommended by the Building Research Establishment (currently the Building Research Establishment's Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011)" and that further detail is provided within the council's supplementary planning document 'Camden Planning Guidance 6: Amenity'.*

## Camden Planning Guidance 6

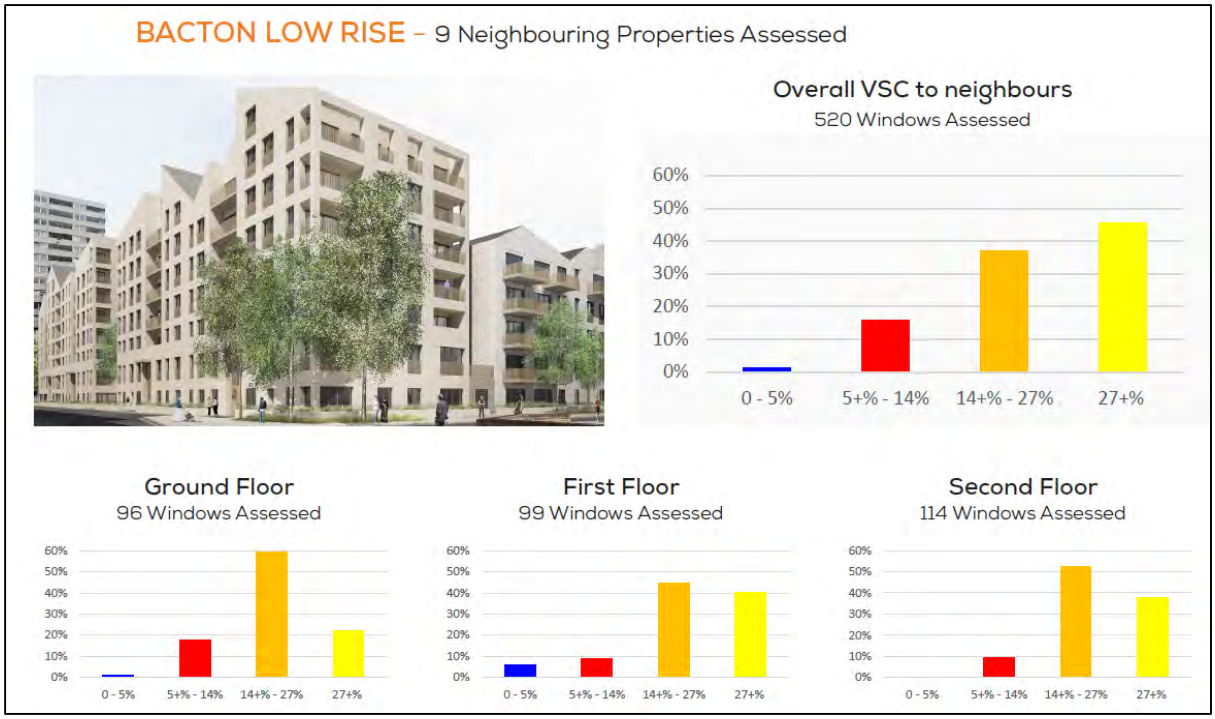
This document goes further on the flexible use of the BRE methodology;

*While we (the Council) strongly support the aims of the BRE methodology for assessing sunlight and daylight we will view the results flexibly and where appropriate we may accept alternative targets to address any special circumstances of a site. For example, to enable new development to respect the existing layout and form in some historic areas. This flexible approach is at the Council's discretion and any exception from the targets will assessed on a case by case basis.*

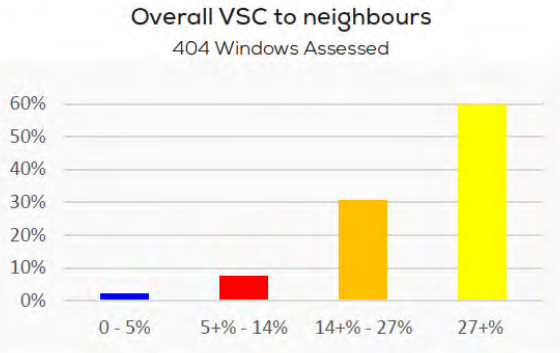
## Retained VSC Comparison with nearby consented schemes

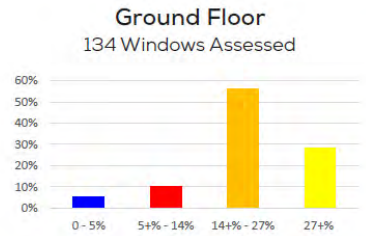
The study provides relevant insight into the daylight levels that are associated with recently consented developments of similar nature in Camden. The diagrams illustrate the VSC levels which were deemed acceptable by the Council for schemes of comparable typology and aspirations, as suggested in the Housing SPG.

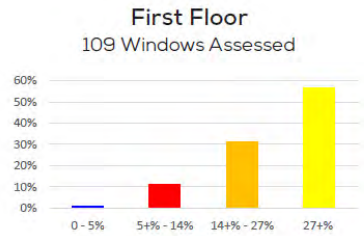
The following diagrams consider the retained levels of VSC by neighbouring properties after the implementation of the proposed developments.

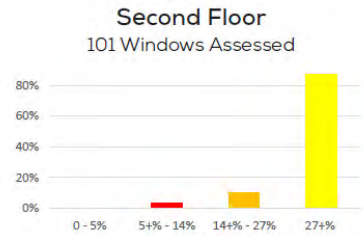


## 156 WEST END LANE - 24 Neighbouring Properties Assessed

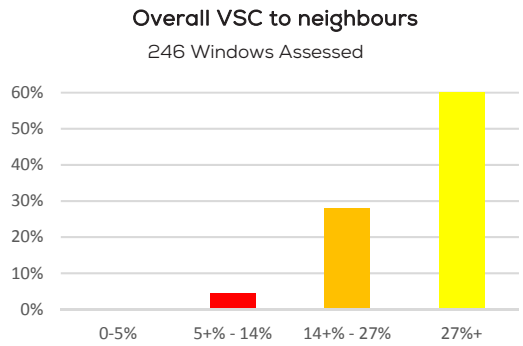


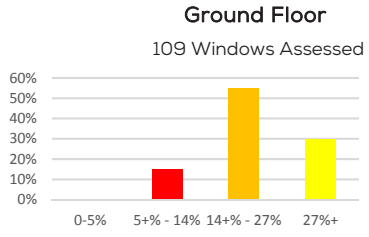



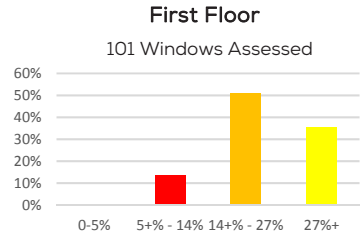



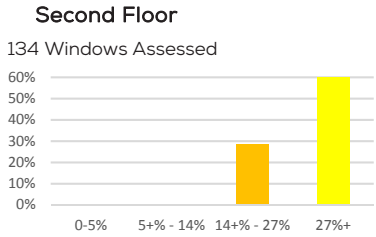




## INGESTRE ROAD (Site) - 7 Neighbouring Properties Assessed




The analysis of retained VSC levels for recently consented schemes shows that Ingestre Road's impact upon neighbours is in line with those experienced by other developments' surrounding properties.

In addition, Ingestre Road's neighbours will not see any window with VSC lesser than 5%, overall 96% of windows would retain a VSC greater than 15%.

## 6.0 The Site

The Site is located on Ingestre Road in the London Borough of Camden, London. The Site comprises a former care home and is bounded by residential properties on all boundaries. The existing Site condition is shown below in Figure 02 and in drawings located in Appendix 02 of this report.

The existing site sits lower in the topography than most of the adjoining residential buildings which as a consequence receive a large amount of light over the site.


***Figure 02 - Existing Site condition shown in brown***

## 7.0 The Proposed Scheme

The Proposed Scheme seeks to demolish the existing building on Site and to erect a new assisted living facility. GIA's understanding of the Proposed Scheme is illustrated in Figure 03 below and in drawings located within Appendix 02 of this report.

The technical analysis is based on the Proposed Scheme massing model provided by Barton Willmore 13 June 2018.

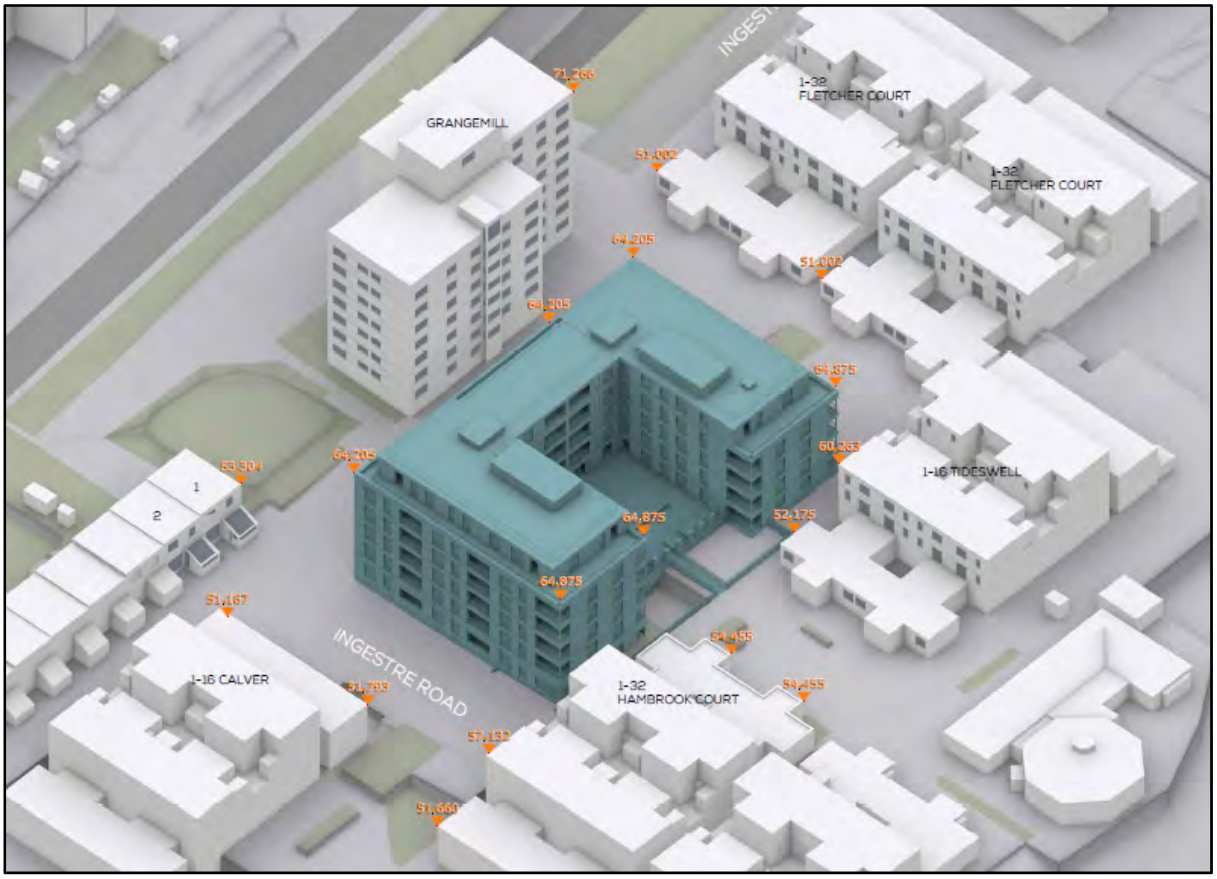



***Figure 03 - Proposed Scheme shown in green***

## 8.0 Surrounding Properties

We have created a three-dimensional computer model of the Site and the surrounding properties to allow for a detailed daylight and sunlight assessment.

The baseline condition of the existing buildings on Site allows us to calculate the current daylight and sunlight conditions within the neighbouring buildings. From this we can then compare them with the conditions within these properties assuming the Proposed Scheme is in place.

It is well-established and accepted that the BRE guidelines, which set out the numerical benchmark for daylight and sunlight assessments, are predicated on a relatively low rise suburban environment. The methodologies and the resultant BRE daylight and sunlight recommendations are also predicated upon this suburban model. The guidance provided by the BRE is not mandatory and it is principally proposed to aid the architects and planners in achieving good Site design. Clearly, in more densely developed urban locations and urban areas such as the application Site, the technical specifications recommended by the BRE guidelines need to be treated with care.

Pertinent residential accommodation which is relevant for daylight and sunlight assessment is located on all boundaries of the Site on Ingestre Road.

### *Properties Experiencing No Noticeable Change to their Daylight and Sunlight Amenity*

Technical analysis indicates that there will be no material daylight or sunlight loss to nos. 1 & 2 Ingestre Road, located north west of the Site, as a result of the Proposed Scheme, as they meet the recommended target values set out within the BRE.

A short commentary of the potential daylight and sunlight alterations to the remaining properties is provided below.

*1-43 Grangemill*

This property is located north of the Site and is residential in use. Partial floor plans have been obtained from public records and the 3D computer model has been updated to reflect these. Where layouts have not been obtained these have been assumed as per the assumptions outlined in Section 04 of this report.

A copy of the window maps for this property, showing the location of each window assessed are located within Appendix 04.

*Daylight – VSC and NSL*

VSC and NSL analysis has been undertaken against 79 rooms, served by 79 windows located between the ground and eighth floors, in both the existing and proposed scenarios.

Technical analysis found that 62 (78.5%) of the 79 windows assessed will meet the VSC daylight criteria, meaning there will be a negligible alteration in light to these windows.

Of the 17 remaining windows which fall short of the BRE recommendations, 8 serve bedrooms which the BRE states are less important in terms of daylight expectations than other key habitable spaces such as living rooms and kitchens. On this basis, we do not consider that serious harm will be caused as a result of alterations to the bedrooms. Further, 8 of the remaining windows which experience alterations in VSC beyond the 20% threshold, retain between 17.1 and 25.1% VSC once the Proposed Scheme is built. These retained levels are widely considered to be good for an urban location such as that of the Site and should also be considered within the context of a low rise existing Site condition. It is somewhat expected where there are low rise existing site conditions, that reductions in light amenity will occur where significantly increased massing is implemented and the retained light levels should be carefully considered within that appropriate context.

The 1 remaining window, located on the ground floor within close proximity to the Site, experiences a large VSC transgression as a result of the Proposed Scheme, however does retain 14.2% VSC in the proposed scenario.

For NSL, 79 rooms were tested, of which 66 (83.5%) meet the BRE recommendations. Of the remaining 13 rooms which experience transgressions of the BRE 20% guideline, 5 retain between 51.8% and 72.5% NSL once the proposed Scheme is built. These retained levels are widely considered to ensure that there will be sufficient daylight distribution in the proposed scenario. A further 4 rooms are bedrooms and as aforementioned, these are not considered to be as important as other habitable rooms for daylight amenity.

### *Sunlight - APSH*

In total, 79 windows serving 79 habitable rooms are relevant for APSH analysis as they are oriented within 90 degrees of due south and thus have been assessed against the BRE criteria.

Technical analysis found that 73 (92.4%) of the 79 windows assessed will retain sufficient levels of both annual and winter sunlight as per the BRE recommendations. As a result, there is a negligible alteration in sunlight to these windows.

The 6 windows which fall short of the BRE recommendations experience transgressions of the winter sunlight criterion. Winter sunlight amenity is affected for these windows due to the low trajectory of the sun during the winter months, which is unobstructed in the existing scenario by the uncharacteristically low rise building currently on Site. In the proposed scenario the increased massing causes an obstruction to the low position of the sun in the sky at this time of year, however all 6 windows experience excellent overall annual sunlight levels which far exceed the BRE target value of 25%. These 6 windows retain between 37% and 48% of annual sunlight which indicates that there will not be an adverse alteration in overall sunlight amenity.

### *Mirror Massing Study*

Given the substantial mass of the Grangemill Buildings and their proximity to the low rise site, some alteration is to be expected if any additional massing is to be achieved on site. To better assess whether these alterations should be considered acceptable within the context of the surrounding area the BRE recommends undertaking a mirror massing study.
This alternative baseline assessment places a mirror of the potentially affected building onto the site in place of the existing site situation to allow us to understand whether the proposed building causes more or less affect than the affected building itself would.

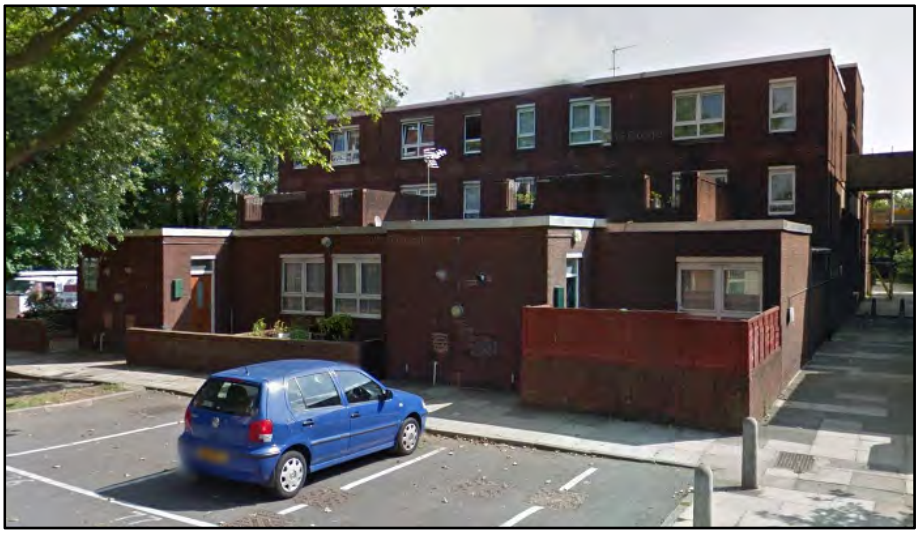
The VSC results contained in Appendix 03 demonstrate that against a mirror of Grangemill the proposed scheme results in significantly higher levels of daylight to the windows. In all situations (apart from 3 windows on each floor which retain over 30% VSC due to an oblique angle to the site) the proposed scheme demonstrates significantly better results than the mirror massing, with an average of a 30% improvement.

*Conclusion*

The retained amenity for the majority of windows and rooms which experience breaches of the traditional BRE tests, are widely considered to be good for a dense urban location such as that of the application Site and should be considered within the context of a low rise existing Site condition.

The positive outcome of the mirror massing study demonstrates that the proposed building on site would cause significantly less impact on the adjoining owners were a mirror of Grangemill to be proposed.

*1-32 Fletcher Court*



This property is located north east of the Site and is residential in use. Partial floor plans have been obtained from public records and the 3D computer model has been updated to reflect these. Where layouts have not been obtained these have been assumed as per the assumptions in Section 04 of this report.

A copy of the window maps for this property, showing the location of each window assessed are located within Appendix 04.

*Daylight – VSC and NSL*

VSC and NSL analysis has been undertaken against 48 rooms, served by 56 windows located between the ground and third floors, in both the existing and proposed scenarios.

Technical analysis found that 51 (91.1%) of the 56 windows assessed will meet the VSC daylight criteria, meaning there will be a negligible alteration in light to these windows.

Of the 5 windows which fall short of the BRE recommendations for VSC, 4 experience only minor transgressions of the 20% threshold of between 20-30%, which are not considered to cause a significant or adverse effect upon overall daylight amenity. The one remaining window experiences a moderate alteration of 30.5%. Nevertheless, once the Proposed Scheme is built, all 5 windows will retain between 18.4% and 20.9% VSC, which are considered to be good levels within the dense and urban location of the application Site. These levels are considered to be particularly good in this case where there is a low rise existing Site condition.

In terms of NSL, 44 (91.7%) of the 48 rooms tested meet the BRE recommendations. The 4 remaining rooms which experience BRE transgressions, all retain between 54.4% and 65.8% NSL in the proposed scenario, which is widely considered to ensure that the rooms receive adequate daylight amenity once the Proposed Scheme is built.

*Sunlight - APSH*

In total, 56 windows serving 48 habitable rooms are relevant for APSH analysis as they are oriented within 90 degrees of due south and thus have been assessed against the BRE criteria.

Technical analysis found that 54 (96.4%) of the 56 windows assessed will experience a negligible alteration in sunlight.

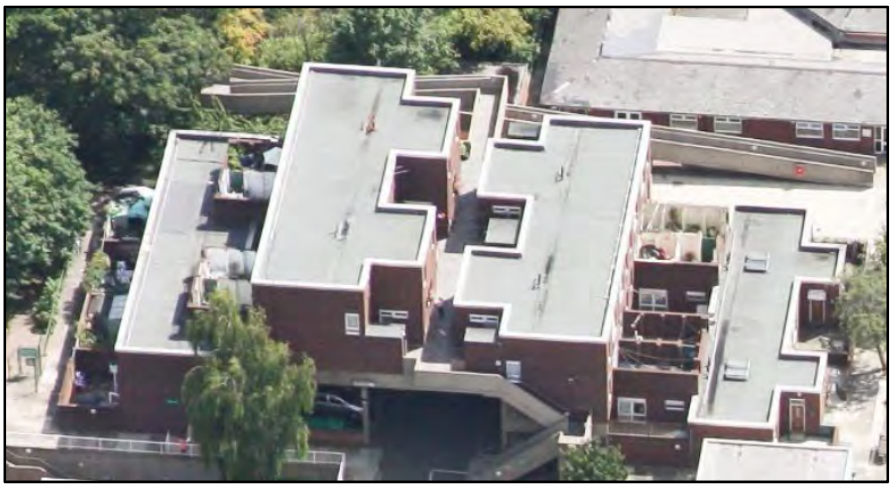
Of the two remaining windows which experience BRE transgressions, one window sees a reduction in winter sunlight beyond the BRE target value. However, it does achieve 4% winter sunlight which is only marginally below the 5% target value and therefore unlikely to cause an adverse alteration in sunlight amenity. Further this window achieves excellent annual sunlight in the proposed scenario of 32% which is far in excess of the 25% BRE recommendation. On this basis it is not considered that this window will experience an adverse impact on overall sunlight amenity.

The 1 remaining window experiences a 100% reduction in winter sunlight, however experiences a very low winter sunlight level of 1% in the existing scenario, which has triggered a disproportionate percentage change. A 1% change in winter sunlight is unlikely to be noticeable by an occupier and therefore will not cause an adverse impact upon sunlight amenity. This window also experiences a reduction in annual sunlight beyond the BRE recommendations, however does retain 19% annual sunlight which is considered to be a good level for the urban location of the Site and in consideration of the effect of the low rise existing Site condition.

The sunlight to this window is also heavily restricted in the existing situation due to the topography of the site, where Tideswell House sits to the south and is elevated above these units which significantly occludes the sun path for the majority of the day. This can be seen in the image below which is taken from a street off Ingestre Road facing south. The relevant window has been highlighted in red.

Overall, this property experiences a very high level of compliance to the BRE target values for daylight and sunlight criteria. Whilst there is a small number of BRE transgressions, these are considered to be minor and/or the retained levels of light are generally commensurate with expectations for dense and urban locations such as this and in line with the effects of a low rise existing Site condition.

*1-16 Tideswell*



This property is located south east of the Site and is residential in use. Floor plans have been assumed as per the assumptions in Section 04 of this report.

A copy of the window maps for this property, showing the location of each window assessed are located within Appendix 04.

*Daylight – VSC and NSL*

VSC and NSL analysis has been undertaken for 29 rooms, served by 37 windows located between the ground and third floors, in both the existing and proposed scenarios.

Technical analysis found that 33 (89.2%) of the 37 windows assessed will meet the VSC daylight criteria, meaning there will be a negligible alteration in light to these windows.

One of the 4 windows which experience transgressions of the VSC BRE guidelines, experiences a minor transgression beyond the 20% threshold of 28.1% and one further window experiences a moderate alteration of 34.4%. However, this window does retain between 24.2% VSC once the proposed Scheme is built which is considered to be a good level of retained daylight within the densely built context of the Site.

The two remaining windows, located on the ground floor, experience larger VSC reductions as a result of the scheme, however these are exaggerated by their onerous building design including projecting wings on either side of these windows. The existing projecting wings next to these windows heavily obstructs their access to daylight, however the large VSC reductions are mainly as a result of the effect of an unusually low rise existing Site condition and the effect of significantly increased massing in the proposed scenario, thus causing large overall percentage reductions.

In terms of NSL, 28 (96.6%) of the 29 rooms tested meet the BRE recommendations. The one remaining room experiences a reduction in daylight distribution as a result of the proposed Scheme, however this is likely to be compounded by the design of their building, i.e. projecting wings on either side of the window. This existing building design will limit access to daylight and sky visibility and the distribution within the room. Notwithstanding this, the Proposed Scheme is within close proximity to this room and comprises a large obstruction in comparison to the existing low rise building on Site.

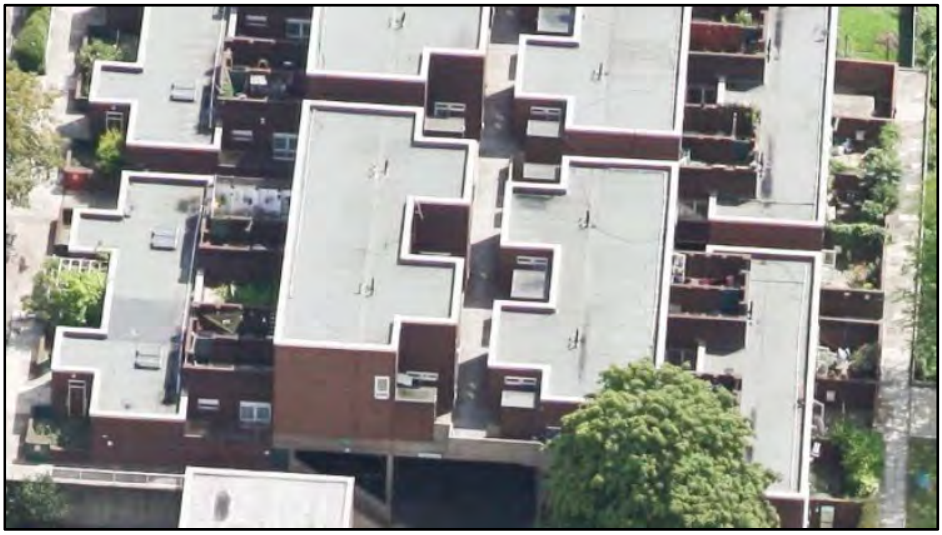
### *Sunlight - APSH*

In total, 28 windows serving 24 habitable rooms are relevant for APSH analysis as they are oriented within 90 degrees of due south and thus have been assessed against the BRE criteria.

Technical analysis found that all of the 28 windows assessed will retain sufficient levels of both annual and winter sunlight as per the BRE recommended target values. As a result, there is a negligible alteration in sunlight to these windows.

Overall, this property displays a high compliance to the BRE recommended target values for the daylight and sunlight criterion. A small number of BRE transgressions do occur as a result of the Proposed Scheme, however these are mostly considered to be minor. One room on the ground floor, located directly opposite the Proposed Scheme, experiences significant daylight reductions, however this is likely due to its restricted location behind two projecting wings and also as a result of a low rise existing Site condition.

*Hambrook Court*



This property is located south west of the Site and is residential in use. Partial floor plans have been assumed as per the assumptions in Section 04 of this report.

A copy of the window maps for this property, showing the location of each window assessed are located within Appendix 04.

*Daylight – VSC and NSL*

VSC and NSL analysis has been undertaken for 21 rooms, served by 27 windows located between the ground and second floors, in both the existing and proposed scenarios.

Technical analysis found that 25 (92.6%) of the 27 windows assessed will meet the VSC daylight criteria, meaning there will be a negligible alteration in light to these windows.

The 2 remaining windows experience VSC reductions as a result of the Proposed Scheme. These 2 windows are located within close proximity to the Site and show large reductions as a result of the increase in massing in the proposed scenario compared to the uncharacteristically low rise building currently on Site. The alteration in light levels are further exaggerated by the existing projecting wings on either side of the affect windows, which limits the access to daylight and sky visibility. One of these windows is located in an entrance door, as such there is potential that these windows could serve entrance/circulation space which would be considered non-habitable.

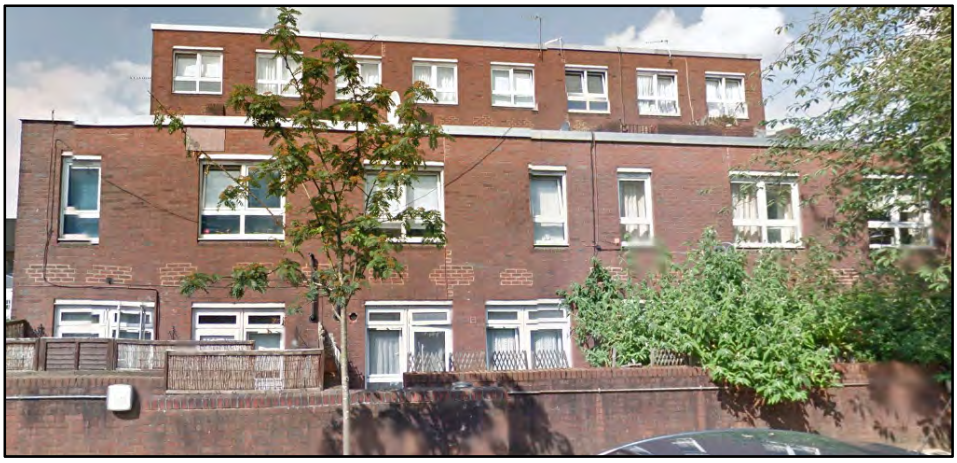
In terms of NSL, 20 (95.2%) of the 21 rooms tested meet the BRE recommendations. The 1 room which experiences a change in daylight distribution as a result of the scheme is located directly opposite and within close proximity to the Proposed massing and therefore the NSL reduction is due to the effect of a low rise existing Site condition. That being said the room will retain around 50% NSL which is considered a good retained level which is commensurate with the urban location of the /site. This can be clearly seen by a number of other rooms in this building currently have around this level of NSL in the existing situation.

*Sunlight - APSH*

One window in this property, located on the ground floor is relevant for APSH assessment due to being oriented within 90 degrees of due south and meets the BRE criteria, showing no change in sunlight levels as a result of the Proposed Scheme.

Overall, this property shows excellent compliance to the BRE recommended target values for daylight. Where there are a small number of transgressions, these are due in part to the proximity of windows/rooms to the Site and the large percentage changes triggered by the effect of having a low rise existing Site condition. However, the effects are compounded by the existing projecting wings of the neighbouring building which limit the access to daylight and sky visibility to the windows and rooms behind. No windows are relevant for sunlight assessment.

*1-16 Calver*



This property is located west of the Site and is residential in use. Partial floor plans have been obtained in the public domain and the 3D computer model has been updated to reflect them. Where floor plans have not been obtained, layouts have been assumed as per the assumptions in Section 04 of this report.

A copy of the window maps for this property, showing the location of each window assessed are located within Appendix 04.

*Daylight – VSC and NSL*

VSC and NSL analysis has been undertaken for 24 rooms, served by 32 windows located between the ground and third floors, in both the existing and proposed scenarios.

Technical analysis found that 19 (59.4%) of the 32 windows assessed will meet the VSC daylight criteria, meaning there will be a negligible alteration in light to these windows.

Of the remaining 13 windows assessed which fall short of the BRE guidelines, 4 experience only minor transgressions of the 20% threshold of between 20-30% and therefore it is not considered that serious harm will be caused to the daylight amenity to these windows. The remaining 9 windows assessed experience moderate VSC alterations, however all retain between 17.9% and 22.7% VSC once the proposed Scheme is built which is considered a good level of retained daylight amenity when considering the context of the Site.

In terms of NSL, 18 (75%) of the 24 rooms tested meet the BRE recommendations. The 6 remaining rooms experience percentage reductions beyond the 20% suggested within the BRE, however 4 of these retain between 54.9% and 78.2% NSL once the Proposed Scheme is built. These retained NSL levels indicate that there will not be serious harm caused to the daylight amenity of the subject rooms. The 2 remaining rooms experience reductions in NSL as a result of implementing the Proposed Scheme, which will leave them just slightly lower than 50% (47% and 49%).

*Sunlight - APSH*

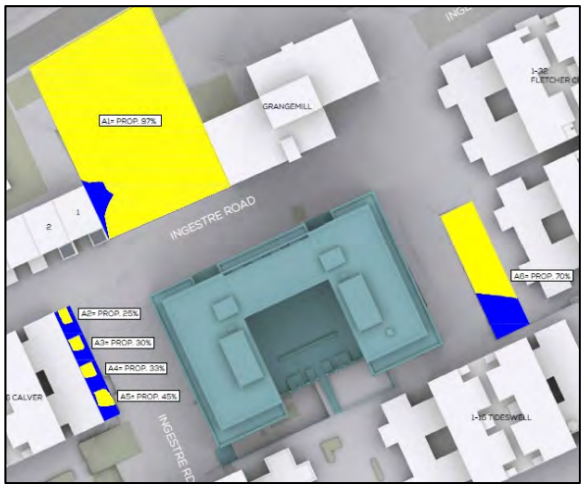
No windows within this property which face the Site are oriented within 90 degrees of due south and therefore they are not relevant for APSH testing as per the BRE guidelines.

Overall, this property experiences high compliance rates to the BRE daylight criterion and where breaches do occur, the retained levels are mostly considered to be commensurate with the context of the Site. No windows are relevant for sunlight testing.

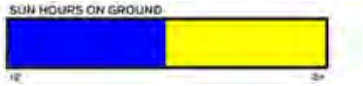
## 9.0 Overshadowing Assessment – Sun Hours on Ground

GIA have identified four private and two communal amenity areas which is in close proximity to the Development that should be tested for overshadowing. The following Sun Hours on Ground assessment demonstrates the percentage of the adjacent amenity area that receives the BRE recommendation of two or more hours of direct sunlight on the 21st of March. The results are as follows:

Existing Situation



Proposed Situation




| Amenity area | Existing percentage of area to receive 2 hours of sun on the 21st of March | Proposed percentage of area to receive 2 hours of sun on the 21st of March |
|---|---|---|
| Communal Area Adjacent Grangemill – A1 | 99% | 97% |
| Communal Area Adjacent Fletcher Court – A6 | 75% | 70% |
| Private Garden Calver – A2 | 36% | 25% |
| Private Garden Calver – A3 | 33% | 30% |
| Private Garden Calver – A4 | 33% | 33% |
| Private Garden Calver – A5 | 45% | 45% |

While there are some minor increases in the area that receives 2 hours of sunlight on the 21st of March to four of the areas, there is only one that would experience a reduction of over 20% when comparing the existing vs. the proposed situation. This one small private amenity area in Calver attached to the northern ground floor flat facing the site that will experience a reduction in the area that receives 2 hours of sun outside the BRE recommended 20%. While the technical reduction is 30%, the actual area lost is less than 2 metres, which as you can see from the image above the lost area is thinly spread along the wall closest to the building which therefore results in a very small amount of usable area being affected. These areas are also in fact set slightly below the road line and have high fences which limit the sunlight in the existing situation.

GIA therefore find the amenity areas assessed to be acceptable in terms of overshadowing from the proposed scheme.

## 10.0 Conclusions

GIA have undertaken a detailed daylight and sunlight assessment for the Barton Willmore Proposed Scheme for the Ingestre Road Site in Camden, London.

It is inevitable when constructing buildings in an urban environment that alterations in daylight and sunlight to adjoining properties can occur. The numerical guidance given in the BRE guidelines should be treated flexibly, especially in dense urban environments and particularly where neighbouring properties are located within narrow streetscapes and with design obstructions restricting the availability of daylight and sunlight.

In consideration of this, throughout the design process, the Proposed Scheme has been subjected to significant testing to minimise the daylight and sunlight impacts to the surrounding residential properties.

The technical analysis shows that the surrounding residential properties will experience a very high level of compliance within the daylight and sunlight criterion. Where breaches of guidance do occur, they are generally minor, and we would consider that the retained daylight levels are good and commensurate with levels in the surrounding area and other similar urban areas of London.

GIA's technical analysis therefore demonstrates the Proposed Scheme will not have a detrimental effect on the daylight and sunlight amenity of the adjoining residential accommodation.

# Appendix 01

*Principles of Daylight and Sunlight*

# Principles of Daylight and Sunlight

## Background

The quality of amenity and open spaces is often stipulated within planning policy for protection or enhancement and is often a concern for adjoining properties and other interested parties.

Historically the department of environment provided guidance with the issues, and in this country, this role has now been taken on by the Building Research Establishment (BRE), the British Standards Institutions (BSI) and the Chartered Institute of Building Services Engineers (CIBSE). Fortunately they have collaborated in many areas, to provide as much unified advice as possible in the form of industry best practice.

Many local planning authorities consider daylight and sunlight an important factor for determining planning applications. Policies refer to both the protection of daylight and sunlight amenity within existing properties as well as the creation of proposed dwellings with high levels of daylight and sunlight amenities.

In terms of considering what is material, local authorities typically refer to the BRE guidelines and apply their criteria set out within. The guidelines were originally produced in 1991, but superseded by the BRE guidelines (2011*) site layout planning for daylight and sunlight.*

Where developers are seeking to maximise their development value, it is often in the area of daylight and sunlight issues that they may seek to push the boundaries. Particularly in London, there is a priority on the creation of more housing thus resulting in the densification of urban areas. Local authorities vary in their attitude of how flexible they can be with the degree of impact on the daylight and sunlight amenity enjoyed by neighbouring owners and it is one factor among many planning aspects considered when determining an application. In city centres where high density is common, the protection of amenity is more challenging and there are many factors that need to be taken into account: each case has to be considered on its own merits.

## The BRE Guidelines

The guidelines are typically referred to for daylight and sunlight amenity issues, however they were not intended to be used as an instrument of planning policy. In the introduction of 'Site Layout Planning for Daylight and Sunlight (2011)', section 1.6 (page 1), states that:-

> *"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design (see Section 5). In special circumstances the developer or Planning Authority may wish to use different target values. For example, in an 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".*

Again, the paragraph 2.2.3 (page 7) of the document states:-

> *"Note that numerical values given here are purely advisory. Different criteria may be used, based on the requirements for daylighting in an area viewed against other site layout constraints".*

The numerical criteria suggested by the BRE are therefore designed to provide industry advice/guidance to plan/design with daylight in mind. Alternative values may be appropriate in certain circumstances such as highly dense urban areas around London, for e.g. the approach to creating alternative criteria is detailed within Appendix F of the BRE.

**Measurement and Criteria for Daylight and Sunlight as set out in the BRE Guidelines**

The BRE guidelines state that they are;

> *"intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedroom. Windows to bathrooms, toilets, garages need not be analysed."*

They are therefore primarily designed to be used for residential properties however, the BRE guidelines continue to state that they may be applied to any existing non-residential buildings where there may be a reasonable expectation of daylight including; schools, hospitals, hostels, small workshop and some offices.

***Daylight***

In the first instance, if a proposed development falls beneath a 25 degree angle taken from the centre point of the lowest window, then the BRE suggests that no further analysis is required as there will be adequate sky light (i.e. sky visibility). This rule is applied when considering the scope of any assessments.

The BRE guidelines provide two methods for calculating daylight to existing surrounding properties:

- Vertical Sky Component (VSC)
- No Sky Line (NSL) also referred to as daylight distribution

A further method, the Average Daylight Factor (ADF) is provided for calculating daylight within proposed properties. However, it is sometimes applied as a supplementary assessment for exiting surrounding properties.

Each method is described below:

***Vertical Sky Component***

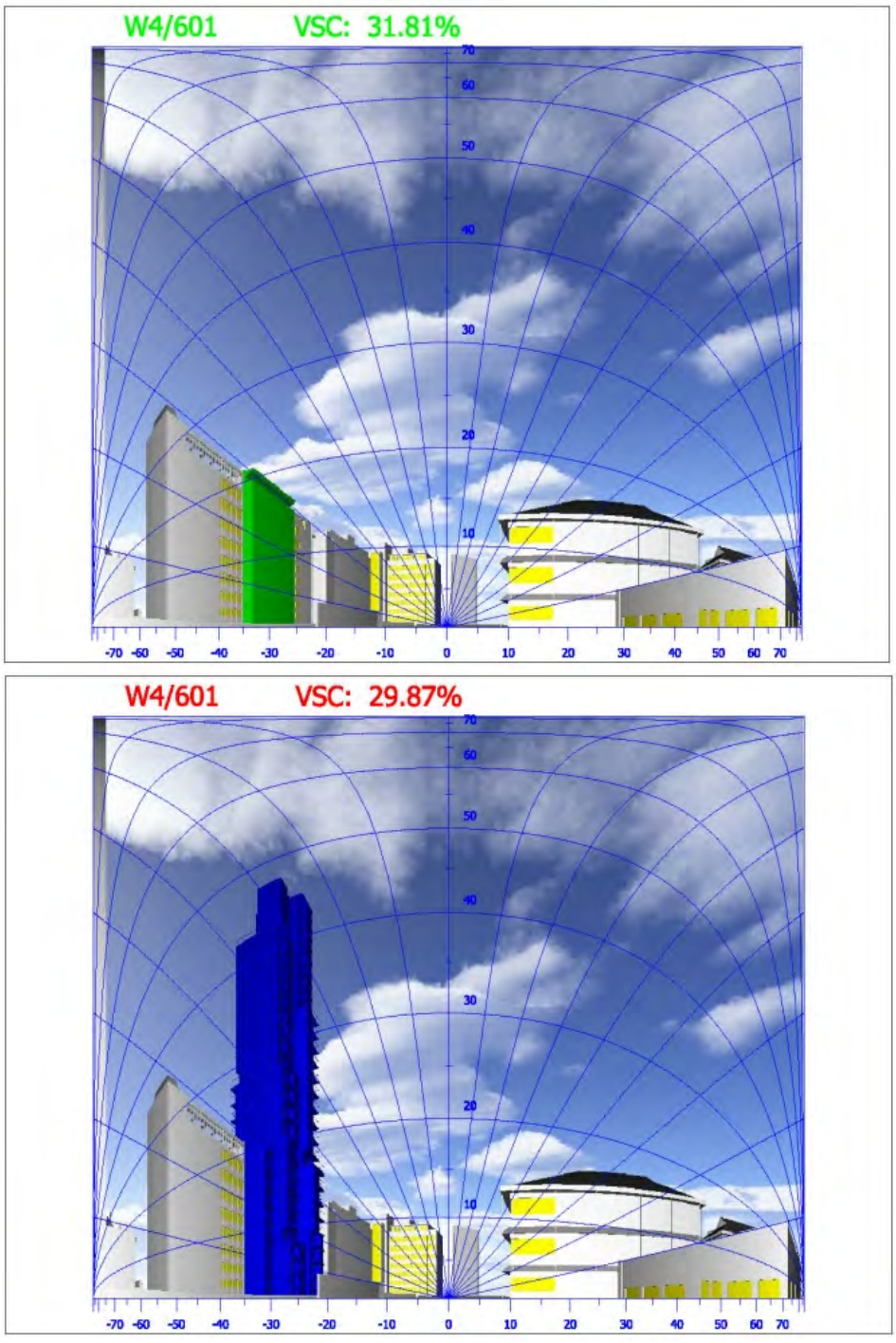
*Methodology*

This is defined in the BRE as:-

> *"Ratio of that part of illuminance, at a point on a given vertical plane that, is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky."*

This statement means, in practice that if one had a totally unobstructed view of the sky, looking in a single direction, then just under 40% of the complete hemisphere would be visible. The measurement of this vertical sky component is undertaken using two indicators, namely a skylight indicator and a transparent direction finder.

Alternatively a further method of measuring the VSC, which is easier to understand both in concept and analysis, is often more precise and can deal with more complex instructions, is that of the Waldram diagram.




The point of reference is the same as for the skylight indicator, at the centre of the outward window face. Effectively a snap shot is taken from that point of the sky in front of the window, before and after the obstruction is put in place together with all the relevant obstructions to it, i.e. the buildings.

An unobstructed sky from that point of reference would give a vertical sky component of 39.6%, corresponding to 50% of the hemisphere, and therefore the purpose of the diagram is to discover how much sky remains once obstructions exist in front of that point.

*Criteria*

The BRE Handbook provides criteria for:

(a) New Development
(b) Existing Buildings
(c) Adjoining Development Land

(a) New Development

Paragraph 2.1.21 of the BRE states that:

"Obstructions can limit access to light from the sky. This can be checked by measuring or calculating the angle of visible sky 'theta', angle of obstruction or Vertical Sky Component (VSC) at the centre of the lowest window where daylight is required. If VSC is:

- at least 27% ('theta' is greater than 65 degrees, obstruction angle less than 25 degrees) conventional window design will usually give reasonable results.
- between 15% and 27% ('theta' is between 45 degrees and 65 degrees, obstruction angle between 25 degrees and 45 degrees) special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight.
- between 5% and 15% ('theta' is between 25 degrees and 45 degrees, obstruction angle between 45 degrees and 65 degrees) it is very difficult to provide adequate daylight unless very large windows are used.
- less than 5% ('theta' less than 25 degrees, obstruction angle more than 65 degrees) it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed."

(b) Existing Buildings

Para 2.2.21 (page 11) of the BRE states:

*"If any part of a new building or extension measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25 degree to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if the vertical sky component measured at the centre of an existing main window is less than 27%, and less than 0.8 times its former value".*

The VSC provides a quick and simple test which looks to give an early indication of the potential for light at the window face. However considered in isolation, it does not, in any fashion, indicate the quality of actual light within a space. It does not take into account the window size, the room size or room use. It helps by indicating that if there is an appreciable amount of sky visible from a given point there will be a reasonable potential for daylighting.

(c) Adjoining Development Land

Paragraph 2.3.10 of the BRE guidelines states:

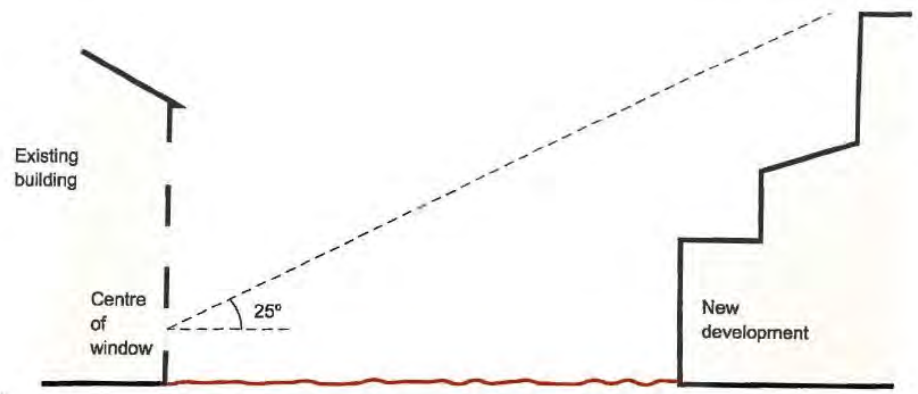
*"in broad general terms, a development site next to a proposed new building will retain the potential for good diffuse daylighting provided that on each common boundary:*

*(a) no new building, measured in a vertical section perpendicular to the boundary, from a point 1.6m above ground level, subtends an angle of more than 43 degrees to the horizontal;*

*(b) or, If (a) is not satisfied, then all points 16.m above the boundary line are within 4m (measured along the boundary) of a point which has a VSC (looking towards the new building(s)) of 17% or more 2m above ground level are within 4m (measured sideways) of a point which has a vertical sky component of 27% or more.*

*Alternative VSC criteria as per Appendix F of the BRE guidelines*

The 27% VSC target criteria is based upon a sub-urban type environment whereby a 25 degree line was taken from the centre point on a ground floor window as shown below:




However, in city centre locations and urban areas where density levels are increasing, these values may not be considered appropriate. The BRE guidelines provide that "*different targets may be used based on the special requirements of the proposed development or its location*" (paragraph F1).

Appendix F of the BRE suggests several approaches as to how alternative targets may be considered including:

- Consented scheme - use of an extant planning permission to establish alternative benchmark criteria for VSC and APSH. It is not appropriate to treat a permitted scheme in the same manner as an existing building and allow a 20% reduction beyond this. If the levels of daylight and sunlight retained are similar to a previously consented scheme then it follows that these levels should be considered acceptable again, notwithstanding other planning considerations.
- Mirror massing – to ensure a development matches the height and proportions of existing buildings, the VSC and APSH targets could be set to those of a mirror image of the same height and size, an equal distance away from the boundary (paragraph F5).
- Consider surrounding context and existing obstruction angles as well as spacing to height ratios.

In addition, due to the requirements for external amenity space within local planning policies, many residential buildings are served by balconies. Balconies can restrict the view of the sky dome whereby even the modest obstruction may result in a large relative impact on the VSC. The BRE guidelines therefore provide that an assessment can be carried out comparing the levels of VSC with and without the balconies in place for both the existing and proposed scenarios, to establish whether it is the presence of the balcony or the size of the new obstruction that is the main factor in the loss of light (paragraph 2.2.11).

***No Sky Line***

*Methodology*

The NSL method is a measure of the distribution of daylight at the working plane within a room. The 'working plane' means a horizontal 'desktop' plane 0.85m in height for residential properties. The NSL divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane lies beyond the NSL (i.e. it receives no direct sky light), then the distribution of daylight in the room will be poor and supplementary electric lighting may be required.

It is similar to the VSC approach in that a reduction of 0.8 times in the area of sky visibility at the working plane may be deemed to be noticeable. It is however, very dependent upon knowing the actual room layouts or having a reasonable understanding of the likely layouts.

It is assessed by plotting the area of a room which can see the sky and which cannot, referred to as the NSL contour or daylight distribution contour. The contours assist in helping to understand the way the daylight is distributed within a room and the comparisons of existing and limitations of proposed circumstances within neighbouring properties. Like the VSC method, it relates to the amount of visible sky but does not consider the room use in its criteria, it is simply a test to assess the change in position of the No Sky Line, between the existing and proposed situation. It does take into account the number and size of windows to a room, but does not give any quantitative or qualitative assessment of the light in the rooms, only where sky can or cannot be seen.

*Criteria*

BS 8206 Part 2 (para 5.7) that the:

> *"uniformity of daylight is considered to be unsatisfactory if a significant part of the working plane (normally more than 20%) lies behind the no-sky line".*

Therefore, it is implied that an NSL of at least 80% would be considered satisfactory in regards to deep rooms which are lit by windows on one side, the BRE Guidelines state (para, 2.2.10):

In regards to the alteration as a result of a proposed development or obstruction the BRE provide that the daylight may be adversely affected if *" the area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value. ".*

***Average Daylight Factor***

*Methodology*

The Average Daylight Factor (ADF) is defined within the 2011 BRE Guidelines as:

> *'a ratio of total daylight flux incident on a reference area to the total area of the reference area, expressed as a percentage of outdoor luminance on a horizontal plane, due to an unobstructed sky of assumed or known luminance distribution'.*

Whilst the BRE guidelines provide this measure as a tool to understand daylight within proposed dwellings not existing dwellings, if room layouts are known it can provide a useful supplementary measure of daylight and is often requested by many local authorities.

The ADF method of assessment considers:

- The diffuse visible transmittance of the glazing to the room in question (i.e. how much light gets through the window glass). A transmittance value of 0.8% is assumed for single glazing and 0.65% for double glazed windows;
- The net glazed area of the window in question;
- The total area of the room surfaces (ceiling, walls, floor and windows); and
- The angle of visible sky reaching the window(s) in question

In addition, the ADF method makes allowance for the average reflectance of the internal surfaces of the room and of external obstruction (assumed to be 0.5 unless otherwise stated).

*Criteria*

The criteria for ADF is taken from the British Standard 8206 part II which gives the following criteria based on the room use:

- Bedroom – 1% ADF
- Living room – 1.5% ADF
- Kitchen – 2% ADF

Where a room has multiple uses such as a living kitchen diner (LKD) or a studio apartment, the highest value is taken so in these cases the required ADF is 2%.

***Sunlight***

*Methodology*

The BS 8206 part 2 (section 5.2) states that:

> *"Provided that the entry of sunlight is properly controlled, it is generally welcome in most buildings in the UK. Dissatisfaction can arise as much from the permanent exclusion of sunlight as from its excess. The provision of sunlight is important in dwellings, particularly during winter months. Sunlight is especially valued in habitable rooms used for long periods during the day."*

## Principles of Daylight and Sunlight

Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of Annual Probable Sunlight Hours (APSH). Where no obstruction exists the total APSH would amount to 1486 hours and therefore each spot equates to 14.86 hours of the total annual sunlight hours.

The number of spots is calculated for both the whole year and also during the winter period (21st September to 21st March) prior to an obstruction and after the obstruction is put in place. This provides a percentage of APSH for each of the time periods for each window assessed. The 2011 BRE Guidelines note that:

- *"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."*

- *"all main living rooms of dwellings…should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun";*

- *"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked."*

- *"…a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".*

When a room has multiple windows, not all may have a southerly orientation however, these windows may contribute to the levels of sunlight within a given room even if by 1-2% APSH. As well as the assessment on a window basis the BRE guidelines provide that an assessment can be undertaken on a room basis.

Whilst the emphasis of the BRE guidelines is in regards to living rooms, it is not always possible to determine the room uses within all of the properties assessed and therefore typically all windows or all rooms with windows facing within 90 degrees of due south and facing the site are assessed.

*Criteria*

The BRE provide that for existing buildings a window maybe adversely affected if a point at the centre of a window receives:

- Less than 25% of the APSH during the whole year, of which 5% APSH must be in the winter period; and
- Receives less than 0.8 times its former sunlight hours in either time period; and
- Has a reduction in sunlight for the whole year more than 4% APSH.

In terms of the assessment on a room basis the criteria applied is the same.

For proposed buildings the BRE provide (paragraph 3.1.15) that a dwelling or building which has a particular requirement for sunlight will appear reasonably sunlit provided:

- At least one main window faces within 90 degrees of due south; and

- Centre of one main living room window can receive 25% of APSH including 5% APSH in the winter months.

It continues that where groups of dwellings are planned the layout should aim to maximise the number of living rooms that meet the above recommendations.

***Overshadowing***

As well as daylight and sunlight amenity to neighbouring dwellings, planning policy often refers to the levels of overshadowing to amenity areas such as parks, public squares, playgrounds etc. The BRE guidelines provide two methods of calculation in regards to overshadowing which are as follows:

***Sun Hours on Ground***

*Methodology*

This method of overshadowing assessment uses the sun on ground indicator to determine the areas which receive direct sunlight and those which do not. This method applies to both new and existing areas of amenity space. The BRE Guidelines suggest that the Spring Equinox (21st March) is a suitable date for the assessment as this is the midpoint of the suns position throughout the year. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not.

*Criteria*

The BRE guidelines recommend that at least half of an amenity space should receive at least two hours of direct sunlight on March 21st. In regards to existing spaces where the existing sunlit area is less than half of the area, the area which receives two hours of sunlight should not be reduced by more than 20% (it should retain 0.8 times its former value).

*Transient Overshadowing*

The BRE guidelines suggest that where large buildings are proposed which may affect a number of gardens or open spaces, it is useful to plot a shadow plan to illustrate the location of shadows at different times of the day and year. For the purpose of this assessment, shadow has been mapped at the following times of the year:

- 21st March (Spring equinox)
- 21st June (Summer solstice)
- 21st December (Winter solstice)

The September equinox is not assessed as this would provide the same results as those for March 21st.

For each of these dates the overshadowing is calculated at hourly intervals throughout the day however some images may not be present given the early sunset during the Winter period.

The BRE guidelines do not provide any criteria for transient overshadowing. Therefore the analysis provides a description of where additional shadow is cast as a result of a development with professional judgement to determine the effect comparing the shadow resulting from the proposed development against that of the existing site.

***Light pollution and Solar Glare***

Light pollution is defined as any light emitting from artificial sources into spaces where it is not wanted for example from offices into neighbouring residential properties where it could cause a nuisance. The ILP Guidance notes provide details of how to measure light pollution and criteria based on the urban density of the respective area to determine the acceptability of the light levels.

Solar glare is particularly important at pedestrian and road junctions as well as along railway lines where the glare can cause a temporary blinding to drivers or pedestrians. Glare can occur from reflective materials such as glazed areas or metal cladding on the facades. This assessment is therefore undertaken from viewpoints surrounding the site at junctions and positioned at the driver's eye level. Focal points are dictated by the location of signals or oncoming traffic.

***Other Amenity Considerations***

Daylight and sunlight is one factor among many under the heading of residential amenity considerations for any given development design or planning application; others include:

- outlook
- sense of enclosure
- privacy
- access to outdoor space e.g. balconies or communal garden/courtyard

ADDRESS

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THE WHITEHOUSE

BELVEDERE ROAD

LONDON  SE1 8GA

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CONTACT

.

TEL 020 7202 1400

FAX 020 7202 1401

MAIL@GIA.UK.COM

.

WWW.GIA.UK.COM