gia
CHARTERED SURVEYORS

DAYLIGHT & SUNLIGHT

IMPACT ON NEIGHBOURING PROPERTIES

Yield Hall Place at The Oracle

29 November 2022

GIA No: **2137**

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Client	**The Oracle Limited Partnership**
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Contents Page

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Document References:
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Principles of Daylight and Sunlight
Existing Drawings: 2137-REL01-IS01-001 to 2137-REL01-IS01-003
Proposed Drawings: 2137-REL01-IS01-004 to 2137-REL01-IS01-006
Results and Window Maps

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	Section	Page
1.0	Executive Summary	1
2.0	Instructions	2
3.0	Introduction	3-5
4.0	Sources of Information	6
5.0	Assumptions	7
6.0	The Site	8
7.0	The Proposal	9
8.0	Surrounding Properties	10-14
9.0	Surrounding Overshadowing Assessment	15
10.0	Internal Overshadowing Assessment	16
11.0	Conclusions	17

Appended to this report:

Appendix 01	-	Principles of Daylight and Sunlight
Appendix 02	-	Existing Drawings
Appendix 03	-	Proposed Drawings
Appendix 04	-	Results and Window Maps

1.0 Executive Summary

We have undertaken a daylight and sunlight assessment for the proposed development to be known as Yield Hall Place at The Oracle, Reading.

We have completed a technical analysis using the methodologies set out within the Building Research Establishment Guidelines entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2022)'.

The BRE 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 flexibly depending on the context of each site.

Notwithstanding, the results indicate a very good level of compliance for the surrounding properties that have been assessed. The results for each property are summarised in the table below:

Name/Address of Building	**Percentage of Windows Above Guidelines for VSC Daylight**	**Percentage of Rooms Above Guidelines for NSL Daylight**	**Percentage of Rooms Above Guidelines for APSH Sunlight**
New Century Place	41/41 (100%)	20/24 (83%)	19/19 (100%)
George Hotel	19/19 (100%)	19/19 (100%)	-
Dukesbridge Chambers	69/69 (100%)	52/52 (100%)	42/42 (100%)
Townsend House	20/20 (100%)	10/10 (100%)	1/1 (100%)

We have also undertaken an overshadowing analysis to the amenity areas surrounding the site. Our assessment indicates that all amenity areas surrounding the proposed development will meet the BRE targets.

Additionally, we have assessed the amenity areas within the proposed development. Two of the three rooftop amenity areas will fully comply with the BRE criteria for sunlight amenity, whilst one will fall marginally short.

The overall impact of the scheme on the surrounding residential properties and amenity areas is therefore considered wholly acceptable, whilst the amenity areas within the proposed development will exhibit very good levels of sunlight.

2.0 Instructions

GIA have been instructed by The Oracle Limited Partnership to undertake a detailed technical assessment to understand the potential daylight and sunlight changes that the proposed development to be known as Yield Hall Place at The Oracle, Reading will have upon the surrounding sensitive receptors.

The daylight and sunlight review within this report considers existing and consented residential properties only, as they are recognised by the Building Research Establishment (BRE 2022) 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.

Planning permission is sought for the repurposing and redevelopment of sites at the eastern end of the Oracle to provide a mixed-use development comprising residential and town centres uses. The proposals focus around two main sites:

- Former Debenhams department store at the eastern end of the Oracle shopping centre building and northern side of the River Kennet, to be known as Yield Hall Place 1; and
- Vue cinema building on the southern side of the River Kennet and to the east of the Oracle Riverside multi storey car park, to be known as Yield Hall Place 2.

Two detailed planning applications are submitted; one application for Yield Hall Place 1 and one application for Yield Hall Place 2. These applications will be submitted concurrently to Reading Borough Council and expected to be considered and determined in this way by the local planning authority. This report is submitted in respect of both applications and considers the proposals as a single scheme for the purpose of the technical assessment undertaken. An illustrative plan is submitted with both planning application which identifies the full extent of the proposed developments, and the schemes assessed for the purposes of this report.

Where matters only pertain to one of the planning application sites, these are specifically identified within the report.

3.0 Introduction

Daylight and Sunlight

We have undertaken technical analysis using the methodologies set out within the Building Research Establishment Guidelines entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2022)', (the "BRE Guide").

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 flexibly depending on the specifics of each site.

The BRE Guide provides two methodologies for daylight assessment to surrounding properties, namely:

- The Vertical Sky Component (VSC); and
- The No Sky Line (NSL).

There is one methodology for sunlight assessment, denoted as Annual Probable Sunlight Hours (APSH).

The methodology for overshadowing assessment is Sun Hours on Ground (SHOG).

The following table provides a summary of the criteria set out within the BRE Guidelines for daylight and sunlight.

Method	BRE Criteria
VSC	A window may be adversely affected if its VSC measured at the centre of the window is less than 27% and less than 0.8 times is former value.
NSL	A room may be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.
APSH	A window may be adversely affected if a point at the centre of the window receives for the whole year, less than 25% of the APSH including at least 5% of the APSH during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period, and for existing neighbouring buildings, if there is a reduction in total APSH which is greater than 4%.
SHOG	An amenity area may be adversely affected if less than 50% of its area receives less than 2 hours of direct sunlight on 21st March and less than 0.8 times its former value.

For daylight and sunlight, the BRE Guidelines outline the approach within the accompanying Appendix I, in terms of assigning criteria to assess the effects:

"Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required…The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied."

"Where the loss of skylight or sunlight fully meets the guidelines, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines and a larger number of windows or open space are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space."

"Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:

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

The classification of major adverse is documented within Paragraph 7 of the BRE Guidelines:

"Factors tending towards a major adverse impact include:

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

Beneficial impacts occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building. Beneficial impacts should be worked out on the same principals as adverse impacts."

The BRE Guidelines do not provide any Guidance on what constitutes a moderate adverse impact.

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

Magnitude of Effect	Percentage Alteration
Negligible	0-20%
Minor	20-29.9%
Moderate	30-39.9%
Major	40%+

When considering the significance of daylight and sunlight effects, professional judgement has been used. Consideration has been given to the proportion of rooms/windows affected, as well as the percentage alterations, absolute changes, retained daylight and sunlight levels and sensitivity of the receptor. This is in addition to any other relevant factors, such as there may be mitigating factors including location and nature of the development, balconies, overhangs or design features which may also affect the determination of assigning the criteria.

4.0 Sources of Information

In compiling this report, we have used the following information:

GIA

Site photographs

Measured Survey

VU.CITY Modelling

Baseline model

CRTKL Architects

IR06-20221103-CRTKL

Reading Planning Portal

New Century Place drawings

5.0 Assumptions

a) All residential buildings have been identified by reference to the Valuation Office Agency (VOA) search and/or external observation.

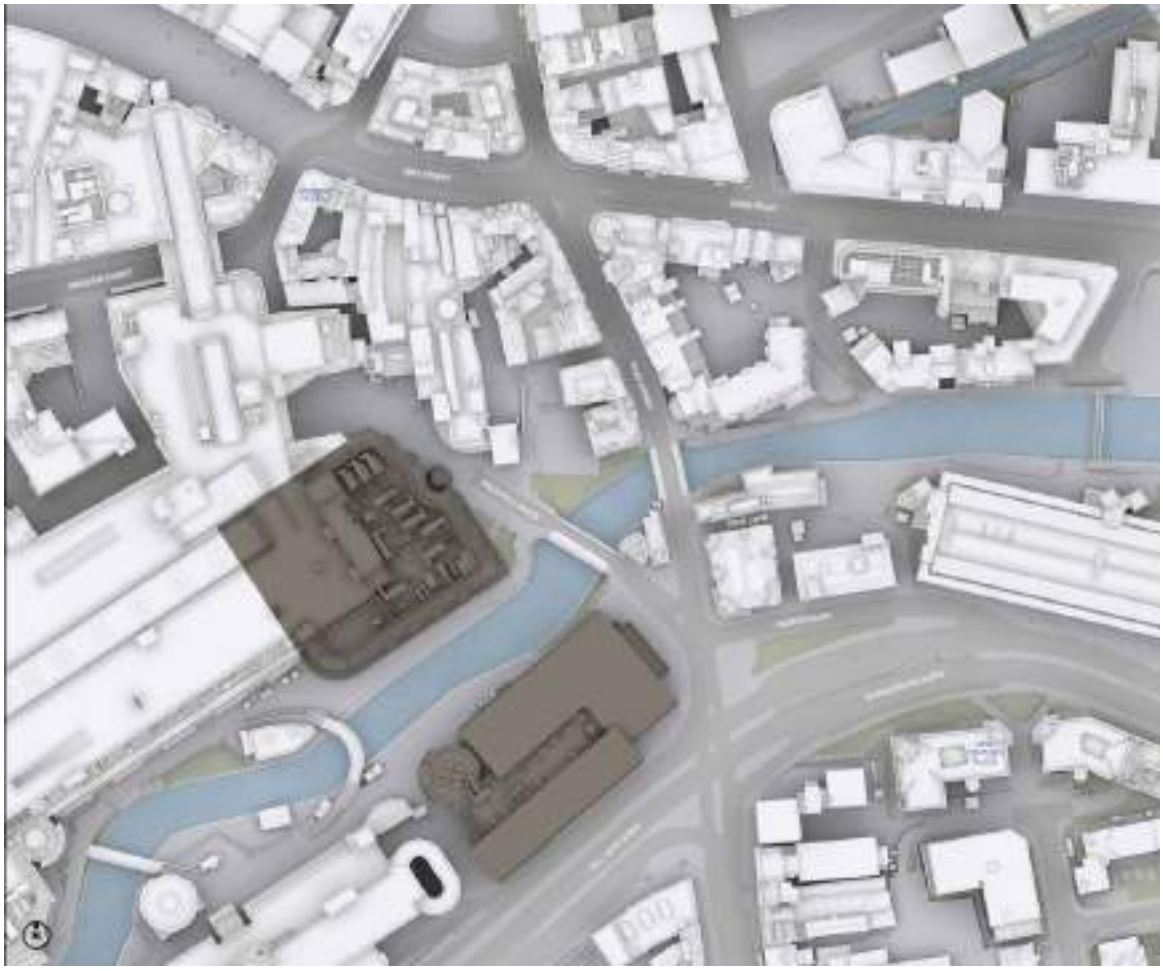
b) We have not sought access to the adjoining properties, thus if plans were not publicly available, we have made reasonable assumptions as to the internal layouts of the rooms behind the fenestration based upon the building form and architecture. This is normal practice where access to adjoining properties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

c) Floor levels have been assumed for the adjoining properties. This dictates the level of the working plane which is relevant for the No Skyline assessment.

6.0 The Site

Yield Hall Place 1 is bound by Yield Hall Place to the north and east, the River Kennet to the south and The Oracle Shopping Centre to the west.

Yield Hall Place 2 is bound by the River Kennet to the north, London Street to the east, Mill Lane to the south and The Oracle multi-storey car park to the west. The drawing extract below shows the existing site:



Our understanding of these existing buildings and the surrounding context is depicted on GIA drawings 2137-REL01-IS01-01, 2137-REL01-IS01-02 and 2137-REL01-IS01-03 within Appendix 02.

7.0 The Proposal

GIA's understanding of the proposed scheme is illustrated in drawings 2137-REL01-IS01-04, 2137-REL01-IS01-05 and 2137-REL01-IS01-06 shown within Appendix 03.

Our analysis of this option is based on the proposed scheme drawings produced by CRTKL Architects, received on 03 November 2022.

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.

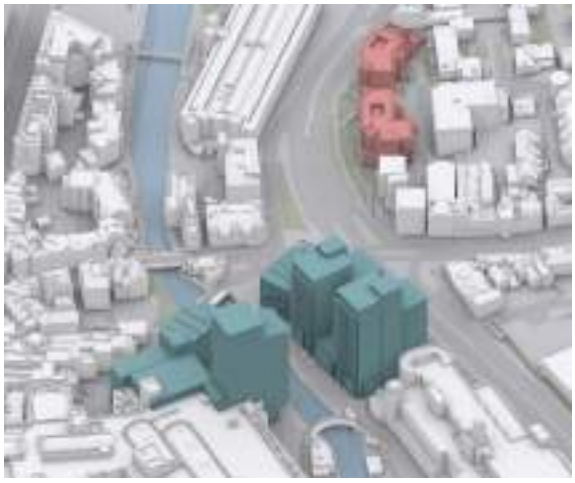
The benchmark condition of the site allows us to calculate the daylight and sunlight conditions within the neighbouring buildings. From this, we can then compare them with the conditions within these properties assuming the current proposed development is in place.

Those properties surrounding the site that are thought to have the potential to be impacted by the proposed development are listed in the table below:

Name/Address of Building	Assumed Use	Position (in relation to the Development)
New Century Place	Residential	South east
George Hotel	Residential	North east
Dukesbridge Chambers	Mixed	North east
Townsend House	Healthcare	South

A short commentary of the impacts of the current proposal to each property is set out below, and full results and contour plots are contained at Appendix 04.

New Century Place



Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
New Century Place	41/41 (100%)	20/24 (83%)	19/19 (100%)

With the proposed development in place, this property will fully accord with the BRE target criteria for VSC daylight and APSH sunlight.

Twenty of the twenty-four rooms assessed will fully comply with BRE target criteria for NSL daylight. Three of the four rooms which do not meet the criteria are reduced by 20-30%, which is a minor impact and considered acceptable given the context of the site and its location in a dense, urban environment. The remaining room is reduced by 32%, which is a moderate impact.

The BRE states that *"if an existing building contains rooms lit from one side only and greater than 5m deep, then a greater movement of the no sky line may be unavoidable".* The four rooms that do not meet the BRE criteria for NSL daylight are single aspect studio apartments, with a depth of approximately six metres, This makes it difficult for daylight to penetrate to the rear of the rooms, and places a high burden on the development site to maintain existing levels

Finally, all the rooms will receive a view of the sky to in excess of 50% of their area, which is considered acceptable given the dense, urban nature of the site.

Overall, given the minor, limited reductions and the flexibility with which the BRE guide is intended to be used, the daylight and sunlight results are considered wholly acceptable.

George Hotel

Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
George Hotel	19/19 (100%)	19/19 (100%)	-

With the proposed development in place, this property will fully accord with the BRE criteria for VSC and NSL daylight. No living rooms face within 90 degrees of due south and, as such, an APSH assessment is not necessary.

Dukesbridge Chambers

Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
Dukesbridge Chambers	69/69 (100%)	52/52 (100%)	42/42(100%)

With the proposed development in place, this property will fully accord with the BRE criteria for VSC and NSL daylight, and APSH sunlight.

Townsend House

Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
Townsend House	20/20 (100%)	10/10 (100%)	1/1 (100%)

With the proposed development in place, this property will fully accord with the BRE criteria for VSC and NSL daylight, and APSH sunlight.

9.0 Surrounding Overshadowing Assessment

We have undertaken an overshadowing assessment of the levels of direct sunlight received to the amenity areas surrounding the site.

The amenity areas which are subject to assessment, and their position relative to the proposed development, are set out in the table below:

Name/Address of Amenity Area	Position in Relation to the Development
River Kennet	West

The method for assessing overshadowing is the 'sun-on-ground indicator' (SHOG). The assessment applies to both new and existing gardens/amenity areas which are affected by new developments.

The BRE Guidelines suggest that the Spring Equinox (21 March) is a suitable date for the assessment as this is the Spring Equinox and the midpoint of the sun's 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.

The BRE Guidelines recommend that at least half (50%) of a garden or amenity area should receive at least two hours of sunlight on 21 March or the area which receives two hours of direct sunlight should not be reduced to less than 0.8 times its former value (i.e. there should be no more than a 20% reduction).

The below table shows the sunlight levels to the surrounding amenity areas in the existing and proposed scenarios:

Name/Address of Building	Existing Percentage Area Receiving 2 Hours Sunlight on 21 March	Proposed Percentage Area Receiving 2 Hours Sunlight on 21 March
River Kennet Area 1	88.50%	88.50%
River Kennet Area 2	100%	100%

Our overshadowing assessment indicates that all surrounding amenity areas will continue to receive at least two hours of sunlight to in excess of 50% of their area on 21 March. As such, they will fully accord with the BRE guidelines with the proposed development in place.

10.0 Internal Overshadowing Assessment

We have also undertaken an overshadowing assessment of the levels of direct sunlight received to the amenity areas within the proposed development using the same SHOG method.

The below table shows the sunlight levels to the proposed amenity areas once constructed and operational:

Name/Address of Building	Proposed Percentage Area Receiving 2 Hours Sunlight on 21 March
Yield Hall Place 1 – Rooftop 1	62.32%
Yield Hall Place 2 – Rooftop 1	48.73%
Yield Hall Place 2 – Rooftop 2	100%

Two of the three rooftop amenity areas will fully comply with BRE guidance for sunlight amenity. The central rooftop amenity area to Yield Hall Place 2 will fall marginally short of BRE guidance, receiving two hours of direct sunlight to 48.73% of its area against a target of 50%. This is a marginal deviation from the target criteria and, as such, is considered a minor and acceptable impact.

As such, given the flexibility with which the BRE guide was intended to be used, we consider the sunlight to the amenity areas within the proposed development to be wholly appropriate.

11.0 Conclusions

We have undertaken a daylight and sunlight assessment for the proposed development to be known as Yield Hall Place at The Oracle, Reading.

We have completed a technical analysis using the methodologies set out within the Building Research Establishment Guidelines entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2022)'.

Our assessment has identified limited impacts to the surrounding residential properties, which are typically minor and considered acceptable given the dense, urban nature of the site and the flexibility with which the BRE guidelines are intended to be used in such instances.

Our overshadowing assessments indicates that both amenity areas surrounding the proposed development will meet the BRE target criteria for sunlight amenity. Two of the three amenity areas within the proposed development will fully comply with BRE target criteria for sunlight amenity and one will fall marginally short.

The overall impact of the scheme on the surrounding residential properties and amenity areas is therefore considered wholly acceptable, whilst the amenity areas within the proposed development will exhibit very good levels of sunlight.

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 in 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 charted 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 out 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 sand sunlight issues that they may seek to push the boundaries. Particularly in London, there is a priority on the creation of more housing and thus resulting in the densification of urban areas. Local authority 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 ins 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 refereed 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 refer4eed 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

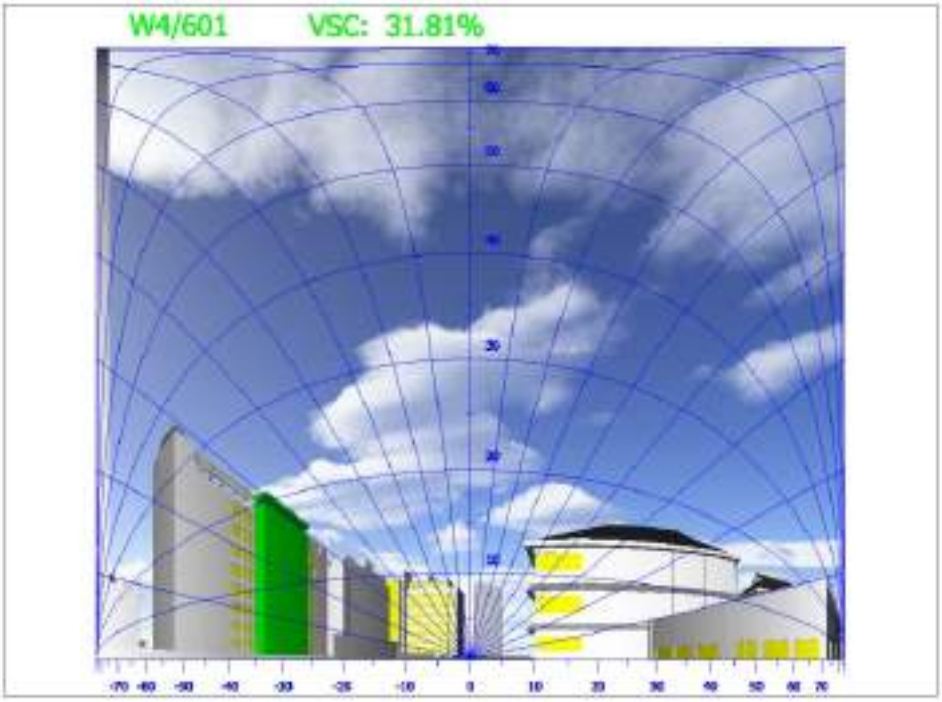
Methodology

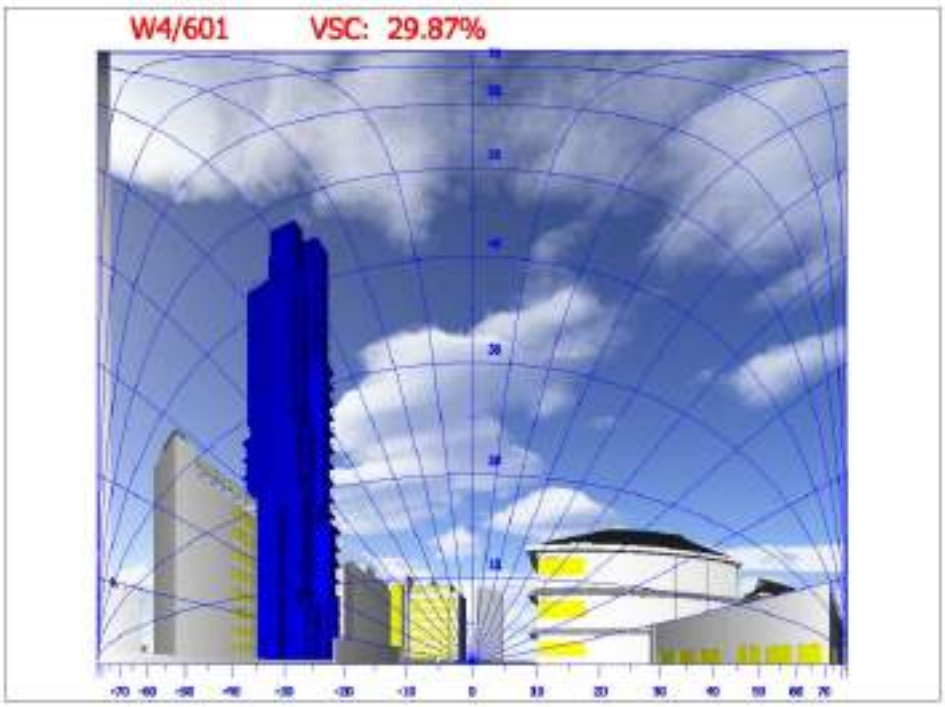
This is defined in the BRE as:-

> *"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 illuminate 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 provide 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:

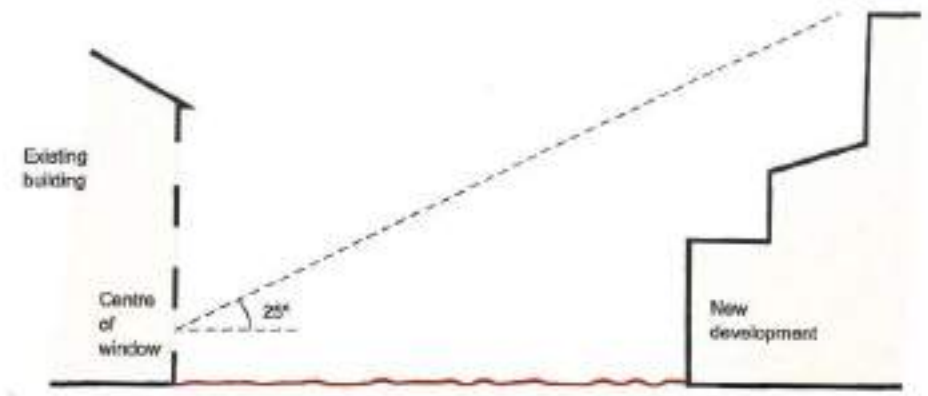
"in broad general terms, a development site next to a proposed new building will retain the potential for good diffuse daylighting providd that on each common boundary:

(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 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 directs 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"; and*

- *"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 2 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 2 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 sun set 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 of 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 drive's eye level. Focal points are dictated by the location of signals or oncoming traffic.

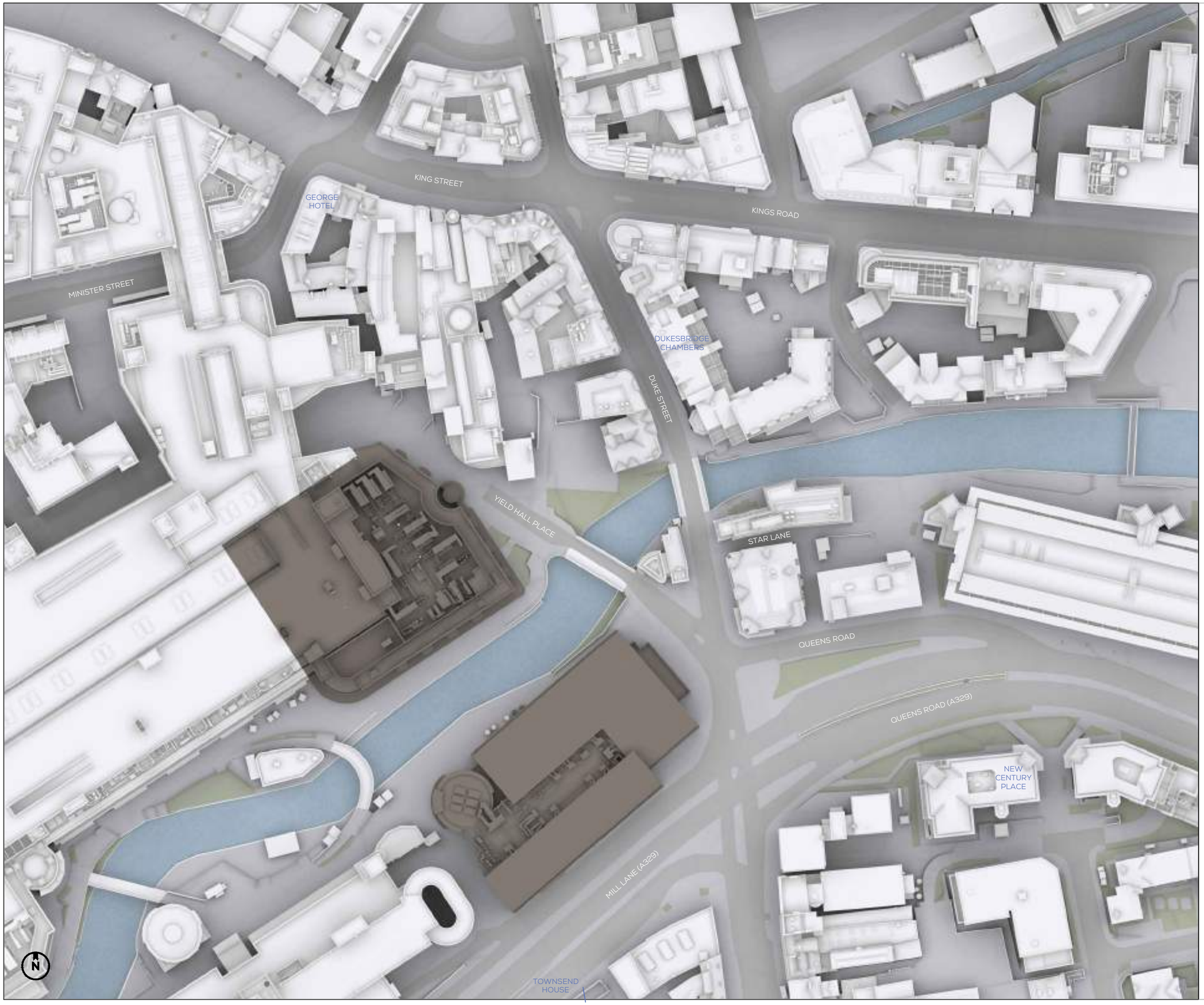
Other Amenity Considerations

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

Appendix 02

Existing Drawings



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DRAWING NAME:
PLAN VIEW EXISTING

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PROJ No.	REL No.	IS No.	DWG No.	REV No.
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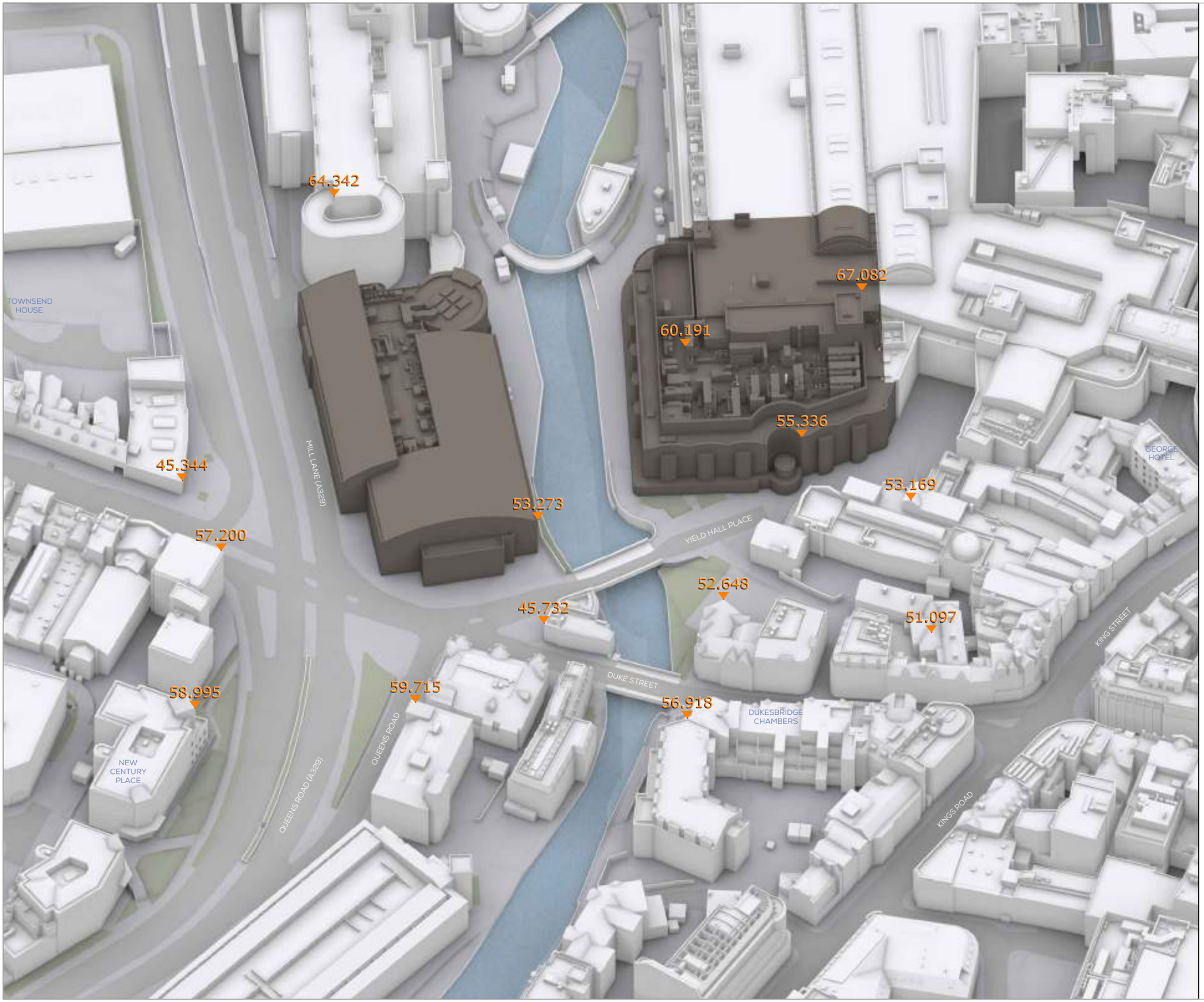

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Appendix 03

Proposed Drawings